

SSE Renewables

Achany Extension Wind Farm

Baseline Bat Survey Report



Report for

Karen Anderson Consent Manager

SSE Renewables One Waterloo Street Glasgow G2 6AY

Main contributors

Hannah Rowding

Issued by

Alastair Miller

Approved by

Katheryn Leggat

Wood Group UK Limited

Doc Ref.

805906-WOOD-XX-XX-RP-OE-0005_S3_PO1.3

Copyright and non-disclosure notice

The contents and layout of this report are subject to copyright owned by Wood (© Wood Group UK Limited 2020) save to the extent that copyright has been legally assigned by us to another party or is used by Wood under licence. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Wood. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third Party Disclaimer set out below.

Third party disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wood at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wood excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

Management systems

This document has been produced by Wood Group UK Limited in full compliance with our management systems, which have been certified to ISO 9001, ISO 14001 and ISO 45001 by Lloyd's Register.

Document revisions

No.	Details	Date
1	Draft	25.03.21
2	Draft – Amended	12.04.21
3	Draft – Amended	11.06.21





Contents

1.	Introduction	5
1.1	Background	5
1.2	Purpose of this Report	5
1.3	Site Description	5
2.	Methodology	6
2.1	Best Practice Guidelines	6
2.2	Desk Study Data Search Previous Survey Work	6 6 6
2.3	Field Survey Habitat Assessment Bat Activity Survey	6 6 7
2.4	Data Analysis Species Identification Ecobat Potential Collision Risk Assessment Limitations	8 8 9 10
3.	Results	12
3.1	Desk Study Data Search Previous Survey Work	12 12 13
3.2	Field Survey Update Habitat Assessment Bat Activity Survey Ecobat	14 14 15 19
4.	Summary and Conclusion	22
4.1	Habitats	22
4.2	Baseline Summary by Species	22
4.3	Potential Collision Risk Assessment	26

Table 8.4.1	Criteria for assessing the potential suitability of a proposed development site for bats	7
Table 8.4.2	Summary of automated detector monitoring periods	8
Table 8.4.3	Percentile score and categorised level of bat activity	9
Table 8.4.4	Level of potential vulnerability of populations of bat species in Scotland	g
Table 8.4.5	Stage 1 - Initial site risk assessment	10
Table 8.4.6	Stage 2 - Overall risk assessment	10
Table 8.4.7	Wind Energy Developments within 10km of the Site Boundary	13
Table 8.4.8	Habitat features present on Site and potential suitability to support bats	14
Table 8.4.9	Summary of automated detector monitoring results	15

NOOD

17

27

Table 8.4.10	Earliest/ latest contact times (in hours and minutes, hh:mm) after sunset/ before sunrise per species/ sp	oecies
	group for each monitoring location.	18
Table 8.4.11	Summary table indicating the activity level (percentile) of bats recorded across the Site	19
Table 8.4.12	Site-wide risk assessment scores for 'high collision risk' bat species	21
Table 8.4.13	Summary of Survey Results	23
Table D.1	Full Details Relating to Stage 1 – Initial Site Risk Assessment	D1
Table E.1	Automated Detector Monitoring - Survey Periods and Weather Conditions	E1
Table F.1	Total Contacts (Average Contacts Per Night) During Spring 2020	F2
Table F.2	Total Contacts (Average Contacts Per Night) During Summer 2020	F3
Table F.3	Total Contacts (Average Contacts Per Night) during Autumn 2020	F4
Table G.1	Number Of Nights That Recorded Bat Activity Fell Into Each Activity Band For Each Species	G1
Table G.2	Summary Table Showing the Number of Nights Recorded Bat Activity Fell Into Each Activity Band for E	ach
	Species	G1
Table G.3	Summary Table Showing Key Metrics for Each Species Recorded.	G3
Table G.4	Summary Table Showing the Number of Nights Recorded Bat Activity Fell Into Each Activity Band For E	ach
	Species During Each Detector Month	G5
Table G.5	Summary table showing key metrics for each species recorded per month	G9
Table H.1	Location Specific Risk Assessment Scores For 'High Collision Risk' Species Recorded Within The Site	H1

Chart 8.4.1

Percentage species composition of contacts at each automated detector

References

Annex A Relevant Legislation

Annex B Locations of Automated Detectors

Annex C Scientific Species Names

Annex D Assessing Potential Site Risk

Annex E Environmental Conditions

Annex F Activity Survey Results – Automated Detector Monitoring

Annex G Ecobat Results

Annex H Location Specific Risk Assessment Results



1. Introduction

1.1 Background

- 1.1.1 Wood Group UK Ltd (Wood) was commissioned by SSE Renewables (SSER) to undertake survey work in relation to bats at the proposed Achany Extension Wind Farm (formerly known as Glencassley Wind Farm), the 'Proposed Development' or 'the Site'.
- The Proposed Development is a 20-turbine extension to the existing Achany Wind Farm; an operational 19-turbine wind farm situated to the south-east. The Site is situated approximately 4.5 kilometres (km) north of the village of Rosehall, and approximately 11km west-north-west of Lairg, within the Highland Council area (central Ordnance Survey [OS] grid reference: NC 45997 07903).

1.2 Purpose of this Report

- 1.2.1 All British bat species are protected under UK legislation (see **Annex A**), such that it is a criminal offence to disturb, injure or kill any bat, or damage or destroy a bat roost (even when no bats are present). It is, therefore, necessary to understand how bats use features within the Site so that the potential effects on bat populations can be appropriately assessed and mitigated for, in order to comply with the relevant legislation and policy.
- 1.2.2 This report outlines the methods employed to carry out bat activity monitoring in 2020, followed by the presentation of results and a summary of key findings. This data has been used to inform an assessment of the ecological effects of the Proposed Development with regards to the Environmental Impact Assessment Report (EIA Report) process and, in turn, informed layout considerations and mitigation design.

1.3 Site Description

- 1.3.1The Site is located on Glencassley and Glenrossal Estates, within the Scottish Highlands. It is
positioned on the east side of Glen Cassley, approximately 1.5km from the River Cassley which runs
parallel to the south-western part of Site. The location of the Site is illustrated in **Figure 8.4.1**.
- The elevation of the Site ranges from approximately 220 metres (m) Above Ordnance Datum (AOD) at the Allt an Rāsail watercourse to 476m AOD at the summit of Beinn Sgeireach. Landscape within the Site is formed of open upland habitat, comprised primarily of wet heath, blanket bog, and marshy grassland. Several small hill lochs are present within the Site, which are drained by a network of watercourses that flow into the River Cassley catchment.



2. Methodology

2.1 Best Practice Guidelines

A variety of survey methods have been applied to assess the use of the Site by bats, in line with best practice guidelines, interpreted using professional experience. The Bat Conservation Trust (BCT) third edition of Good Practice Guidelines (Collins, 2016) and Bats and Onshore Wind Turbines: Survey Assessment and Mitigation (SNH *et al*, 2019) were the main source of guidance considered when designing the survey methodology and programme of survey work.

2.2 Desk Study

Data Search

- To inform the survey design and provide context for the assessment, records of bat roosts and bat activity within a 10km radius of the Site boundary were requested from the Highland Biological Records Group (HBRG). Commercially available records of bat species within a 10km radius of the Site boundary recorded within the last ten years were also searched within the National Biodiversity Network (NBN) Atlas database¹.
- A search for sites designated for the purpose of bat conservation within an approximate 10km radius of the Site boundary was also carried out through use of the NatureScot Sitelink web-based application².
- Aerial imagery (from Google Maps³ and Google Earth⁴ websites) and Ordnance Survey maps⁵ were reviewed to identify landscape and habitat features that may influence how bats utilise the Site and surrounding area.
- These data were obtained in March 2020 (**Technical Appendix 8.1**).

Previous Survey Work

^{2.2.5} The Glencassley Wind Farm Environmental Statement (ES) (Environ, 2012) details the results of bat survey work carried out in 2011, which has been reviewed to provide contextual information about the Site.

2.3 Field Survey

Habitat Assessment

A habitat assessment for bats was carried out by consultant ecologist Hannah Rowding (BSc, MSc, ACIEEM) in May 2020 in conjunction with the Phase 1 habitat survey. The habitat assessment comprised a walkover of the Site and associated 200m buffer to observe, assess and record any habitats suitable for bats to commute and forage, using the criteria summarised in Table 8.4.1. A



¹ https://nbnatlas.org

² https://sitelink.nature.scot/home

³ <u>www.maps.google.co.uk</u>

⁴ https://earth.google.com/web/

⁵ www.ordnancesurvey.co.uk

general assessment of potential roosting resource was also carried out within the Site and associated 200m buffer.

Table 8.4.1	Criteria for	assessing	the potential	suitability of	a proposed	development site for	or bats
-------------	--------------	-----------	---------------	----------------	------------	----------------------	---------

Suitability	Description of roosting habitat	Commuting and foraging habitat
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features likely to be used by commuting or foraging 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 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). A tree of sufficient size and age to contain Potential roost features (PRFs) but with none seen from the ground or features seen with only very limited roost potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
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 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).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected by the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
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 and surrounding habitat.	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree lined watercourses and grazed parkland.

Note: Information within the table has been extracted from Collins (2016).

Bat Activity Survey

Automated Detector Survey

- Automated bat detector units were deployed within the Site to record full spectrum bat echolocation calls throughout the entire night, for a minimum of ten consecutive nights over three monitoring periods during the active bat season (April to October). The detectors were set up to record bat echolocation calls continuously from 30 minutes before sunset to 30 minutes after sunrise. Table 8.4.2 summarises the automated detector monitoring periods.
- Automated detectors (Wildlife Acoustics SM4BATFS) were initially placed at or near 14 proposed turbine locations to provide a representative sample of bat activity at or close to these points, in accordance with best practice guidelines (SNH *et al*, 2019). Following alteration to proposed infrastructure design, and in consultation with NatureScot, two additional detectors (Anabat Swifts)



were added to the survey suite in August. Each detector was positioned approximately 1.5m from ground level, at the locations displayed in **Figure 8.4.2** and detailed in **Annex B**.

Table 8.4.2 Su	mmary of	automated	detector	monitoring	periods
----------------	----------	-----------	----------	------------	---------

Unit reference (refer to Figure 8.5.2 for locations)	Season (months)	Monitoring dates	No. of monitoring nights	Automated detector unit deployed
A, B, C, D, E, F, G, H, I, J, K, L, M, N	Spring (May – June)	25.05.20 - 09.06.20	14	SM4BAT FS
A, C, D, E, F, G, H, I, J, K, L, N, O, P*	Summer (July – August)	22.07.20 - 04.08.20	14	SM4BAT FS
B, M*	Summer (August)	06.08.20 - 19.08.20	14	Anabat Swift
C, D, E, F, G, H, I, J, K, L, N, O, P	Autumn (September)	10.09.20 - 23.09.20	14	SM4BAT FS
В, М	Autumn (September)	10.09.20 - 23.09.20	14	Anabat Swift

* Following alterations to proposed infrastructure design and consultation with NatureScot, SM4 BATFS units from Locations 'B' and 'M' were re-deployed at Locations O and P on 22 July 2020 for the Summer monitoring period. Two additional full spectrum automated detector units (Anabat Swifts) were then deployed at Locations B and M on 06 August to maintain a full set of data for Summer and Autumn monitoring periods.

2.4 Data Analysis

Species Identification

- Analysis of bat recordings was carried out with reference to Russ (2012) to aid species identification, using BatExplorer Pro (Version 2.1.4.0) software. Where records were not identified to species level during the sound analysis process due to the overlapping call parameters of some species, records were identified to genus or species group, with the following groups used:
 - Myotis sp. (bat species in the genus Myotis);
 - Nyctalus sp. (noctule or Leisler's bat);
 - Pipistrellus sp. (common pipistrelle or soprano pipistrelle);
 - Bat sp. (calls that could not be ascribed to a species group).
- 2.4.2 Recordings of bats in the genus *Myotis* were usually grouped together, as these species in particular, have widely overlapping call parameters.
- ^{2.4.3} The scientific names of bat species and species groups presented in this report are provided in **Annex C**.

Ecobat

^{2.4.4} Following analysis of bat recordings, the data were then processed using Ecobat software⁶ to gain a measure of relative bat activity across the Site. Ecobat is an online tool that compares data collected by automated bat detectors at the Site with data collected by the same means at the



⁶ http://www.ecobat.org.uk/

same time of year within a defined search area. The reference range data set were stratified to include:

- Records from within 30 days of the survey dates;
- Records within a 200km radius of the survey location; and
- Records using any make or model of bat detector.
- ^{2.4.5} Through generating a percentile rank for each night of bat activity, the Ecobat tool can identify the number of nights in which the recorded level of bat species activity, as collected by an automated bat detector, could be considered to represent 'high', 'moderate/ high', 'low/moderate', or 'low' in the context of the geographical region, as shown in Table 8.4.3.

Table 8.4.3 Percentile score and categorised level of bat activity

Percentile score	Bat activity level
81 - 100	High
61 - 80	Moderate - High
41 - 60	Moderate
21 - 40	Low - Moderate
0 - 20	Low

Extracted from SNH et al (2019).

Potential Collision Risk Assessment

2.4.6

Estimating the vulnerability of bat populations to windfarms is based on three key factors:

- relative abundance;
- collision risk; and
- bat activity recorded at the site.
- The first two of these factors is pre-defined in guidance (SNH *et al*, 2019), with species categorised, as set out in Table 8.4.4.

Table 8.4.4 Level of potential vulnerability of populations of bat species in Scotland

	Collision risk						
		Low	Medium	High			
	Common species			Common pipistrelle Soprano pipistrelle			
Relative abundance	Rarer species	Brown long-eared bat Daubenton's bat Natterer's bat					
	Rarest species	Whiskered bat Brandt's bat		Nathusius' pipistrelle Noctule Leisler's bat			



Table extracted from SNH et al (2019).

Yellow – low population vulnerability; Amber – medium population vulnerability; Red – high population vulnerability.

Using the outputs from the Ecobat analysis, the assessment of potential collision risk for bats has been carried out following the two-stage process outlined in the current SNH guidance (SNH *et al*, 2019) for all those species identified on the Site that are listed as 'high collision risk' in Table 8.4.4. Stage 1 provides an indication of the potential site risk based on evaluation of habitat and the size of the development (see Table 8.4.5). For full details on how habitat risk and project size is determined, please refer to **Annex D**.

Table 8.4.5 Stage 1 - Initial site risk assessment

Site risk level (1-5)	Project size				
		Small	Medium	Large	
	Low	1	2	3	
Habitat risk	Moderate	2	3	4	
	High	3	4	5	

Table extracted from SNH et al (2019). Green (1 – 2) – lowest/ low site risk; Amber (3) – medium site risk; Red (4 – 5) – highest/ high risk

2.4.9 Stage 2 requires an overall assessment of risk, which can be made by considering the results of the initial site risk assessment in relation to bat activity output from Ecobat. This then considers the relative vulnerability, at population level, of each species of bat present (see Table 8.4.6).

Table 8.4.6 Stage 2 - Overall risk assessment

Site risk level	Ecobat activity category (or equivalent justified categorisation)						
(Irom Table 6.4.5)	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	16	18	
Highest (5)	0	5	10	15	20	25	

Overall assessment: Low (green) - 0-4; Medium (amber) 5 -12; High (red) - 15 - 25

Limitations

Activity survey

Automated detectors were initially deployed at proposed turbine locations and within areas of suitable bat habitat. However, following alterations to the proposed infrastructure layout during 2020 and subsequent engagement with NatureScot, the position of several automated detectors no longer represented exact turbine locations. Despite these changes, a robust dataset relating to bat



activity across the Site was collected by ensuring that the automated detectors were suitably distributed across the Site from the outset.

- 24.11 While no data was obtained during the spring (May to June) monitoring period for Locations O and P, data was collected over the Summer (July to August) and Autumn (September) monitoring periods, which provided an indication of bat activity within these areas. In addition, due to issues associated with automated detector microphone damage, it was not possible to obtain data for Locations A or F during the summer monitoring period, or for Location H during the Autumn monitoring period. However, it is considered that data collected from surrounding monitoring locations provides sufficient coverage and a suitable representation of bat activity across the Site.
- 2.4.12 Monitoring of bat activity at Locations B and M during Summer and Autumn survey periods was carried out using a different make of automated detector to those deployed across the rest of the Site (Anabat Swifts were used at these locations in place of SM4 BATFS units). The automated detectors at Locations B and M were also deployed over different dates during the Summer monitoring period compared to those deployed across the rest of the Site (see Table 8.4.2 for full details). Comparisons have been made between these monitoring locations and those on the rest of the Site, taking into account the different makes of automated detector and the difference in environmental conditions between the two recording periods.

Ecobat

- It is important to note that the outputs of the Ecobat tool can offer only a basic and indicative assessment of bat activity levels recorded at the Site. These outputs are considered in the context of the wider data collection and are not accepted as a rigorous appraisal method in isolation. Due to technical issues associated with the Ecobat software - relating to the summing of contacts in the species group *Pipistrellus* - records from the genus *Pipistrellus* have been removed from Ecobat output data⁷ to ensure that the data is summed accurately and that the *Pipistrellus* species group is not underrepresented.
- 2.4.14 However, the study involves the assessment and comparison of contact data collected, allowing the calculation for average number of contacts per night, which provides an effective method to compare relative activity levels across the Site.



⁷ A total of 32 *Pipistrellus* contacts (relating to common/ soprano pipistrelle and common/ Nathusius' pipistrelle) have been omitted from the Ecobat analysis output. Twenty-six contacts were attributed to Location P during the summer monitoring period, while the remaining *Pipistrellus* records relate to single contacts recorded at Locations K, M, and N during the Spring monitoring period, Location O during the summer monitoring period, and Locations G and J during the autumn monitoring period.

3. Results

3.1 Desk Study

Data Search

Statutory and Non-Statutory Designated Sites

There are no statutory or non-statutory biodiversity sites designated for bat conservation within 10km of the Site boundary.

Landscape Scale Connectivity

- The River Oykel Special Area of Conservation (SAC), of which the River Cassley forms part of its catchment (located approximately 1.5km south-west of Site), may provide suitable commuting and foraging habitat for bats. In addition, pockets of ancient woodland⁸ habitat situated between 1.2km 10km from the Site boundary may also provide suitable foraging and/or roosting habitat for bats. For full details relating to statutory and non-statutory designated sites, please refer to the Desk Study and Phase 1 Habitat Survey Report (Technical Appendix 8.1).
- The desk-based search also identified areas of suitable commuting and foraging habitat for bats immediately outside of the Site boundary. For example, OS mapping indicated that the Allt Bad na t-Sagairt watercourse flows into a wooded ravine immediately downgradient of the Site boundary. This wooded ravine may in turn serve as a sheltered flyway along the Allt Bad na t-Sagairt and provide added foraging opportunities.
- 3.1.3 A stand of relatively young woodland plantation also borders the Allt an Rāsail watercourse to the south-west of the Site boundary, of which may provide some foraging opportunities for bats whilst commuting along the watercourse.
- ^{3.1.4} In addition, Glencassley Castle is positioned approximately 1.5km south-west of the Site boundary. This historic built structure may support potential roost features, with opportunities for commuting and foraging available within the ancient woodland that surrounds it. Several other built structures (including homes and outbuildings) that may provide roosting opportunities for bats are also present within this area.

Bat Records

- 3.1.5 Records returned from HBRG identified the following bat species records within 10km of the Site, between years 2010 2020:
 - common pipistrelle, soprano pipistrelle, and Daubenton's bat recorded in flight during automated detector monitoring in Achany Glen in 2011 (located approximately 3.6km from the proposed Site entrance);
 - soprano pipistrelle recorded in flight during monitoring carried out over one night in July and September 2012, approximately 8.5km south-east of the Site entrance;



⁸ In Scotland, ancient woodland is defined as land that is currently wooded and has been continually wooded since at least 1750. Its age means that it is important for biodiversity and our cultural identity. The Ancient Woodland Inventory can be located at the following link: <u>https://gateway.snh.gov.uk/natural-spaces/dataset.jsp?dsid=AWI</u>

- one record of brown-long eared bat found on the wall of a house in the hamlet of Gruids in 2015 (located approximately 3.7km north-east of the proposed Site entrance);
- common pipistrelle and brown long-eared bat droppings (suggesting a potential roost feature unknown) recorded approximately 5km south-west of the Site entrance in 2012; and
- Daubenton's bats roosting within built structures located approximately 8km south-east of the Site entrance, recorded on multiple occasions between years 2011 and 2015.
- 3.1.6 In addition to records within the last ten years, a bat roost with a count of 100 *Pipistrellus* bat species was recorded within the roof space of a building in Gruids in years 2001, 2007, and 2009 (located approximately 3.7km north-east of the proposed Site entrance).
- 3.1.7 Commercially available records obtained from the Bat Conservation Trust identified a Daubenton's bat hibernation roost approximately 8km south of the Site entrance, of which has been recorded on multiple occasions between years 2011 and 2018 (BCT, 2020a). A *Pipistrellus* bat roost is also located approximately 8km north-east of the Site boundary, which has been recorded on several occasions between 2010 and 2019 (BCT, 2020b).

Wind Energy Developments within 10km of the Site

Table 8.4.7 presents details of other wind energy developments within 10km of the Site boundary.

Wind Farm	Status	Distance and orientation from Site	Grid Reference	Number (and tip height) of turbines
Achany Wind Farm	Operational	0km – positioned immediately adjacent to Site boundary	NC 48802 05556	19 turbines (tip height information unavailable)
Rosehall Wind Farm	Operational	Approximately 300m south- west of Site boundary	NC 48720 05118	19 turbines with blade tip of 90m.
Braemore Wind Farm	Consented	5km south-east	NC 54137 02144	18 turbines with blade tip of 126m.
Sallachy Wind Farm	Submitted	9.5km north-west	NC 42677 18695	9 turbines with blade tip height of 149.9m.
Meall Buidhe	Application/ appeal	9.5km south-west	NH 45144 96057	9 turbines with blade tip of 149.5m.

Table 8.4.7 Wind Energy Developments within 10km of the Site Boundary

Previous Survey Work

Habitat Assessment

A review of ecological data gathered to inform the 2012 ES identified that an assessment of the suitability of the Site to support bats was completed through a desk-based evaluation of habitats present on Site (derived from Phase 1 and NVC results) and general observations made during Site walkovers. An overview of habitats identified within the Site and their subsequent suitability to support bats is provided in **Table 8.4.8**.





Habitat features	Suitability for bats
Nutrient poor exposed wet heath and blanket bog	Low – poor quality foraging and commuting habitats are dominant within the Site.
Linear features – small exposed ephemeral and permanent watercourses in wet heath and blanket bog	Low – poor foraging features. Lack of trees/ bushes present along watercourses.
Potential roost sites	Low – no potential for roost sites within the Site. Lack of suitable features e.g. built structure and trees within the Site. Some ancient Scots pine trees are present near the base of Glencassley valley and in lower sections of the Allt Bad na t-Sagairt watercourse, approximately 1-2km from Site, of which may have bat roost potential.
Altitude/ exposure	Low – exposed and relatively high-altitude Site (averaging 300m AOD), subject to frequent high winds.
Nearby designated sites for bats	No designated sites within 10km
Known nearby roosts	None known within at least 3km of the Site.

Table 8.4.8 Habitat features present on Site and potential suitability to support bats

Table adapted from Environ (2012).

^{3.1.10} The overall findings of the habitat assessment indicate that the Site was considered to support low suitability for bats due to its open, exposed nature and lack of suitable foraging and commuting habitat or roosting features.

Activity Survey

- To investigate the use of the Site by commuting and foraging bats, two transect routes of roughly equal length were surveyed during August and September 2011. The transect routes incorporated habitat features likely to be utilised by bats, including watercourses, open upland habitat, and woodland within the base of the valley (of which is positioned outside the Site boundary).
- During the surveys, a single common pipistrelle pass was recorded within the Site boundary, positioned in open upland habitat approximately 1km from the nearest woodland. No other bats were recorded during surveys within the Site. Whilst walking the section of transect positioned outside the Site boundary, low numbers of common and soprano pipistrelle passes were recorded within mature woodland habitat situated in the lowest sections of the Allt Bad na t-Sagairt and Allt an Dubh Loch Bhig watercourses.

3.2 Field Survey

Update Habitat Assessment

The Site is formed of open upland habitat comprised primarily of blanket bog, wet heath, and rush pasture. Although open upland habitat provides limited potential for foraging bats, it may serve as open commuting pathways to and from areas of more suitable foraging and roosting habitat. Two main watercourses and associated minor tributaries also intersect the Site (namely the Allt Bad na t-Sagairt and Allt an Rāsail), of which may serve as linear commuting features and provide added opportunities for foraging. The Allt Bad na t-Sagairt watercourse also flows into a wooded ravine immediately downgradient of the Site boundary, of which is comprised of semi-natural broadleaved tree species (such as birch). This watercourse and wooded ravine may in turn provide connectivity between the Site and areas of suitable bat habitat within Glen Cassley valley. Based on



habitat features present, and in order to take a precautionary approach in line with NatureScot consultation advice, the Site was assessed 'moderate' suitability for commuting and foraging bats.

However, due to the lack of potential roosting features (such as trees or built structures) within the Site, it was considered as 'negligible' suitability for roosting bats.

Bat Activity Survey

Automated Detector Survey

- 3.2.3 The environmental conditions for each night of recording are displayed in **Annex E**. Full details of automated detector monitoring results are provided in **Annex F**.
- The term 'contact' has been used to describe a unit of bat activity. One contact equates to a single file recorded on the bat detector containing a sequence of bat calls apparently made by a single bat. Where a file clearly contains two bats recorded at the same time, that has been counted as two contacts.
- The number of contacts recorded at each location is summarised in Table 8.4.9. Average contacts per night are calculated based on the number of nights of data being analysed for each location, to provide an index of bat activity. These data are intended to give an indication of relative levels of bat activity at each location and do not represent actual numbers of bats. A single bat may pass the same location repeatedly during the same evening, thus increasing the number of contacts recorded at that location. Equally, the same bat may pass more than one monitoring location, therefore being recorded by more than one detector during the same monitoring period.

Location	Number of nights	Total number of contacts (average per night)						
	unutyseu	СР	SP	CP/SP	CP/NP	М	BLE	Total
Α	14	3 (0.21)	1 (0.07)	0	0	1 (0.07)	0	5 (0.36)
В	42	4 (0.10)	2 (0.05)	0	0	1 (0.02)	0	7 (0.17)
с	42	3 (0.07)	0	0	0	0	0	3 (0.07)
D	42	22 (0.50)	0	0	0	11 (0.26)	0	33 (0.79)
E	42	13 (0.31)	0	0	0	4 (0.10)	0	17 (0.40)
F	28	2 (0.07)	0	0	0	0	0	2 (0.07)
G	42	2 (0.05)	0	1 (0.02)	0	1 (0.02)	2 (0.05)	6 (0.14)
н	28	12 (0.43)	0	0	0	6 (0.21)	0	18 (0.64)
I	42	30	2	0	0	19	0	51

Table 8.4.9 Summary of automated detector monitoring results

Location	Number of nights	Total number of contacts (average per night)						
	anarysea	СР	SP	CP/SP	CP/NP	М	BLE	Total
		(0.71)	(0.05)			(0.45)		(1.21)
ſ	42	120 (2.86)	1 (0.02)	1 (0.02)	0	23 (0.55)	2 (0.05)	147 (3.50)
к	42	44 (1.05)	0	1 (0.02)	0	16 (0.38)	2 (0.05)	63 (1.50)
L	42	21 (0.50)	2 (0.05)	0	0	5 (0.12)	1 (0.02)	29 (0.69)
м	42	12 (0.29)	1 (0.02)	0	1 (0.02)	9 (0.21)	0	23 (0.55)
Ν	42	17 (0.40)	3 (0.07)	1 (0.02)	0	21 (0.50)	1 (0.02)	43 (1.02)
ο	28	113 (4.04)	2 (0.07)	0	1 (0.04)	22 (0.79)	2 (0.07)	140 (5.00)
Ρ	28	88 (3.14)	1 (0.04)	25 (0.89)	1 (0.04)	12 (0.43)	1 (0.04)	129 (4.57)
Total	588	506	15	29	3	151	11	715
Proportion		70.77%	2.10%	4.06%	0.42%	21.12%	1.54%	

Species codes: **CP** = common pipistrelle; **SP** = soprano pipistrelle; **CP/SP** = common/soprano pipistrelle (*Pipistrellus* species); **CP/NP** = common/ Nathusius' pipistrelle (*Pipistrellus* species); **M** = *Myotis* species; and **BLE** = brown long-eared bat.

Table 8.4.9 and the data presented in **Annex F** shows that:

- The automated detectors recorded a total of 715 contacts from at least four species/ species groups over 588 monitoring nights.
- By far the most frequently encountered species was common pipistrelle, accounting for 70.77% of contacts, with activity recorded across all monitoring locations. The greatest level of common pipistrelle activity was recorded during the summer monitoring period at location P (6.29 contacts per night), which was positioned approximately 3m south-east of the Allt bad na t-Sagairt watercourse within an area of open upland habitat to the north-east of the Site. Similar levels of activity were also recorded in Autumn at Locations J and O (6.00 and 5.79 contacts per night respectively), of which were positioned near the centre of the Site, between 220m and 250m AOD, within an area of open habitat comprising wet heath and blanket bog. Location O was also positioned approximately 60m east of the Allt an Rāsail watercourse.
- The second most encountered species/ species group was *Myotis*, accounting for 21.12% of contacts. The greatest level of *Myotis* activity was recorded in summer at Location O, of which was positioned near the centre of the Site, approximately 60m east of the Allt an Rāsail watercourse, in an area of wet heath habitat.
- The remaining limited number of contacts were attributed to *Pipistrellus* species (4.48% of which includes common/ soprano pipistrelle and common/ Nathusius' pipistrelle records), Soprano pipistrelle (2.10%) and brown long-eared bat (1.54%).



- There were no confirmed recordings of Nathusius' pipistrelle made on the Site, albeit three contacts (0.42% of all contacts recorded) were categorised as potentially common pipistrelle or Nathusius' pipistrelle due to the overlapping parameters between the calls of these two species. These contacts were recorded at Locations M on 02 June 2020, O on 24 July 20, and P on 04 August 2020.
- The lowest levels of bat activity were recorded during the Spring monitoring period, with a total of 96 contacts recorded across 14 automated detectors (0.49 contacts per night) (**Annex F**). Given that locations O and P were not recorded during the Spring period, it is considered likely that activity would have been accordingly higher if activity data had been captured during this period. Bat activity was found to peak during the Summer monitoring period, with a total count of 396 contacts recorded across 14 automated detectors (2.00 contacts per night). The level of activity was then found to decrease slightly in Autumn, with 228 contacts recorded across 14 automated detectors (1.16 contacts per night).
- The highest level of bat activity was recorded at monitoring Location O, with a total of 140 contacts over 28 monitoring nights (averaging 5 contacts per night). Similar levels of activity were also recorded at Location P, with 129 contacts recorded over 28 monitoring nights (averaging 4.61 contacts per night). While monitoring Location J displayed the greatest overall number of contacts (147), average contacts per night (3.5) measured slightly lower than Locations O and P as records have been obtained over a longer time-period of 42 nights.
- In contrast, the lowest overall level of bat activity was recorded at monitoring Locations C (a total of 3 contacts recorded over 42 monitoring nights) and F (a total of 2 contacts recorded over 28 monitoring nights), with both locations averaging 0.07 contacts per night. Location C was positioned approximately 365m AOD, within an open area of wet heath habitat in the north-east of the Site, while Location F was positioned on the eastern slope of Cārn nam Bō Maola, at approximately 390m AOD.



A diagram illustrating the percentage of bat species contacts recorded at each monitoring location is displayed in Chart 8.4.1 below.

Chart 8.4.1 Percentage species composition of contacts at each automated detector



First and Last Contact Times

3.2.8

A summary of the earliest or latest contact time for each species and species group is provided in Table 8.4.10. The following observations can be made:

- Most bat species recorded were not passing through the Site within 30 minutes of sunset/ sunrise, however:
 - One late contact was recorded at Location J; a common or soprano pipistrelle bat (*Pipistrellus* species) in Autumn, recorded 14 minutes after sunrise.
 - Late and early contacts also occurred at Locations I and O; a *Myotis* species was recorded 48 minutes before sunrise during the Spring monitoring period and 59 minutes after sunset during the Summer monitoring period at Location I; and 52 minutes after sunset during the Summer monitoring period at Location O.
 - A brown long-eared bat was recorded exactly one hour after sunset at Location K in Summer, with a late contact recorded at exactly sunrise at monitoring Location P in Autumn.

Table 8.4.10 Earliest/ latest contact times (in hours and minutes, hh:mm) after sunset/ before sunrise per species/ species group for each monitoring location.

Location		Species/ species group				
	СР	SP	CP/SP	CP/NP	м	BLE
Α	01:03*	04:13*	-	-	02:13*	-
В	01:15	1:52	-	-	05:11*	-
c	01:10	-	-	-	-	-
D	01:00	1:30	-	-	01:24	-
E	01:05	-	-	-	01:18	-
F	01:33	-	-	-	-	-
G	01:40	-	01:48	-	-	04:15*
н	01:14	-	-	-	01:06	-
I	00:45	04:50*	-	-	00:48*	
J	00:55	01:16*	-00:14*	-	01:16	04:55*
к	00:41	-	04:20*	-	01:04*	01:00
L	00:53	01:03	-	-	01:19	-

Location

Species/ species group

	СР	SP	CP/SP	CP/NP	м	BLE
м	01:09*	01:34	-	-	01:10	-
Ν	00:50	01:23	01:30	-	01:01	01:32
0	00:41	01:10	-	00:55	00:52	01:42*
Р	00:45	01:44	00:51	-	01:12	00:00*

* Denotes latest contact time before sunrise (i.e. 04:13* equates to 4 hours and 13 minutes before sunrise).

Approximate emergence times of bat species (University of Bristol, 2005): CP - 20-30 minutes; SP - 20-30 minutes; CP/SP - 20 - 30 minutes; CP/NP - 20 - 30 minutes; Myotis species - variable; and BLE - 60 minutes.

Ecobat

3.2.9 Summary data relating to bat activity levels recorded across the Site is provided in Table 8.4.11. For detailed results relating to site-wide activity levels and activity levels at each automated detector location, please refer to **Annex G**.

Table 8.4.11 Summary table indicating the activity level (percentile) of bats recorded across the Site

Species/species group	Median percentile	Median percentile activity category	95% Cls	Max percentile	Max percentile activity category	Nights Recorded
СР	41	Moderate	9 - 9	97	High	121
SP	9	Low	9 - 9	41	Moderate	14
м	9	Low	9 - 9	61	Moderate - high	90
BLE	9	Low	9 - 9	41	Moderate	9

Due to issues associated with the summing of Pipistrellus in Ecobat, this species group has been removed from Ecobat output data.

3.2.10 From the data displayed in Table 8.4.11, the following observations can be made:

- Common pipistrelle data suggests an overall 'moderate' level of activity across the Site (median percentile of 41), with periods of 'high' activity also recorded during the survey period (max percentile of 97)⁹. The respective reference range was 1959, thus indicating high confidence in the accuracy of the comparison (Table G.3 in **Annex G**).
- Soprano pipistrelle data indicates an overall 'low' level of activity across the Site (median percentile of 9), with one occasion of 'moderate' activity also recorded during the survey period (max percentile of 41)¹⁰. The respective reference range was 1040, indicating high confidence in the accuracy of the comparison.
- *Myotis* species data indicates an overall 'low' level of activity across the Site (median percentile of 9), with occasions of 'moderate to high' activity also recorded during the survey

⁹ 'High' common pipistrelle activity was recorded at location P in July-August, and locations J and O during September (Table G.2 in Appendix G).

¹⁰ 'Moderate' soprano pipistrelle activity was recorded at location N in July (Appendix G).

VOOD

period (max percentile of 61)¹¹. The respective reference range was 542, indicating high confidence in the accuracy of the comparison.

Brown long eared bat - data indicates an overall 'low' level of activity across the Site (median
percentile of 9), with occasions of 'moderate' activity also recorded during the survey period
(max percentile of 41)¹². Due to a lack of available records for this species within 200km of the
Site for comparison (respective reference range of 63), there is a low degree of confidence in
these results.

¹¹ 'Moderate' levels of *Myotis* activity were recorded at location O in July (Appendix G).

¹² 'Moderate' levels of brown long-eared bat activity were recorded at location J in August (Appendix G).

Potential collision risk assessment

Initial site risk assessment

- An assessment of risk from the development can be made using the parameters outlined in the most recent SNH guidance (SNH *et al*, 2019).
- The Proposed Development consists of 20 turbines with a tip height of 149.9m and therefore falls within the category of 'large' project size.
- In terms of habitat risk, the open upland habitat that covers much of the Site (with a lack of trees or built structures) is considered to support negligible suitability for roosting bats and generally low suitability for foraging bats. However, the presence of linear features such as watercourses may serve as commuting pathways and provide added foraging opportunities within the Site. These linear features may also provide habitat connectivity downgradient into Glen Cassley, where stands of ancient woodland and built structures may support commuting, foraging, and potentially roosting, bats. Based on these observations, and in order to take a precautionary approach, the habitat risk has therefore been increased from 'low' to 'moderate'. According to the parameters presented in Table 8.4.5, the initial site risk assessment score for the Site is 'high' (i.e. a score of 4).

Risk assessment for 'high collision risk' species

The results of the bat activity survey indicate that two bat species classified as 'high collision risk' utilise the Site; these are common and soprano pipistrelle (SNH *et al*, 2019). Table H.1 in **Annex H** presents the results of the risk assessment scores for high collision risk species at each automated detector location within the Site. Table 8.4.12 summarises this data with an overall risk assessment score for the Site based on median and maximum percentiles.

Species Median Median risk Maximum Maximum **Initial site** Median risk Maximum percentile category percentile risk category risk score category risk category СР 41 Moderate 97 High 4 12 18 SP 9 Low 41 Moderate 4 4 12

Table 8.4.12 Site-wide risk assessment scores for 'high collision risk' bat species

Based on the data presented in Table 8.4.12, the overall Site risk assessment score for common pipistrelle is 'medium risk' (score of 12), while soprano pipistrelle displays an overall score of 'low risk' (score of 4). Both the median (i.e. the most frequent) activity percentile and the maximum (i.e. the highest) activity percentile have been displayed in the overall risk assessment in order to show both typical and unusually high levels of bat activity within the Site, so that potentially important peaks in activity are not overlooked.



22

4. Summary and Conclusion

4.1 Habitats

- 4.1.1 The Site is formed of open upland habitat comprised primarily of blanket bog, wet heath, and rush pasture. Although open upland habitat provides limited potential for foraging bats, it can act as an open commuting pathway to and from areas of more suitable foraging and roosting habitat. Within the Site, suitable foraging habitat for bats is generally limited to linear features in the form of watercourses. These watercourses are exposed in nature with little/ no tree or scrub cover and positioned within wet heath and blanket bog habitat.
- 4.1.2 Automated detectors situated near the Allt Bad na t-Sagairt and Allt an Rāsail watercourses recorded the greatest levels of activity within the Site, thus indicating that these features serve as important commuting and foraging corridors for bats. These linear features may also provide habitat connectivity downgradient into Glen Cassley valley, where stands of ancient woodland have greater potential to support commuting and foraging bats.
- ^{4.1.3} Due to the open exposed nature of the landscape, no potential roosting features were identified within the Site and associated 200m buffer. Potential roosting habitat for bats may however exist approximately 1.5km south-west of the Site boundary (within Glen Cassley valley), where stands of ancient woodland and built structures (such as the historic Glencassley Castle, homes, and outbuildings) are present.

4.2 Baseline Summary by Species

- The survey results indicate that at least four bat species/ species groups utilise the Site: common pipistrelle, soprano pipistrelle, brown long-eared, and bats of the genera *Myotis*. The activity levels and distribution recorded suggest that bats utilise the Site for commuting, with foraging activity limited to watercourses that intersect the Site.
- Table 8.4.13 presents a summary of bat species recorded within, or potentially occurring within the Site; along with a summary of data relating to each species.



Table 8.4.13 Summary of Survey Results

Species	Contextual and Desk Study Information	Activity Summary	Roosting Status
Common pipistrelle	Common and widespread nationally and throughout the Scottish Highlands ^{13,14} . Historical records for common pipistrelle in flight within 3.6km of the Site boundary, with a potential roost within 5km of the Site boundary. Records of common pipistrelle within the Site were also obtained during activity surveys in 2011.	Common pipistrelle was the most frequently encountered species during the activity survey, with contacts recorded at all automated detector locations across the Site. This indicates that common pipistrelle utilise or cross open habitat in which proposed turbines may be sited. Activity levels were highest during the Summer and Autumn monitoring periods (acknowledging that locations O and P were not surveyed during Spring period), with the greatest levels of activity recorded close to the Allt an Rāsail and Allt Bad an t-Sagairt watercourses and associated tributaries. As common pipistrelle accounts for 70.77% of total contacts, they form a potentially significant component of the bat community within the Site. Data output from the Ecobat tool shows an overall moderate level of common pipistrelle activity across the Site, with occasions of high activity also recorded during the survey period (Table 8.4.11). A total of seven nights of high activity, 20 nights of moderate – high activity, 37 nights of moderate activity, and 57 nights of low activity were recorded during the survey period (Table 6.1 Appendix G). Nights with high activity were associated with Locations J and O in Summer and Autumn, and Location P in Summer (Table 6.4 Appendix G).	Negligible potential for roosting bats within the Site.
Soprano pipistrelle	Common and widespread nationally. Site located on the edge of known range for soprano pipistrelle ¹³ . Desk study identified records within a 10km radius of the Site boundary.	Soprano pipistrelle bats were recorded in low numbers at nine out of 14 automated detectors across the Site. This species accounted for 2.1% of total contacts, thus forming a relatively small proportion component of the bat community within the Site. Data output from the Ecobat tool shows an overall low level of soprano pipistrelle activity, with one occasion of moderate activity	Negligible potential for roosting bats within the Site.

¹³ Mathews, F., Kubasiewicz, L.M., Gurnell, J., Harrower, C., McDonald, R.A., Shore, R.F (2018). A review of the population and conservation status of British Mammals. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage.

¹⁴ Information relating to the distribution and range of common pipistrelle in Scotland is available at: https://jncc.gov.uk/jncc-assets/Art17/S1309-SC-Habitats-Directive-Art17-2019.pdf

Species	Contextual and Desk Study Information	Activity Summary	Roosting Status
		recorded during the survey period (Table 8.4.11). The single night of moderate activity was recorded at Location N in Summer, while 13 nights of low activity were recorded at multiple locations across the Site during Spring, Summer, and Autumn monitoring periods (Table G.4 Appendix G).	
Pipistrellus species	As noted above, common and soprano pipistrelle are widespread nationally. Common pipistrelle is also widespread throughout the Scottish Highlands. However, the Site is positioned near the edge of the known range for soprano pipistrelle. The known range of Nathusius' pipistrelle in Scotland generally extends across the Central Belt, in a pocket surrounding Aberdeen City, and within the Shetland Isles ^{13,15} . The Site is therefore positioned outside the known range for this species. Nathusius' pipistrelle is therefore considered unlikely to be present within the Site. It is likely that contacts classified as common or Nathusius' pipistrelle (CP/NP) represent common pipistrelle flying across open upland habitat. Desk and field-based surveys identified no confirmed records of Nathusius' pipistrelle within the Site or surrounding 10km radius. Information obtained through the desk study identified bat roosts belonging to the genus <i>Pipistrellus</i> located 3.7km and 8km north-east of the Site boundary, respectively.	Species in the genus <i>Pipistrellus</i> were recorded at seven monitoring locations within the Site, accounting for 4.48% of total contacts. The greatest level of <i>Pipistrellus</i> activity was recorded at Location P in Summer. All other <i>Pipistrellus</i> contacts relate to single contacts recorded at individual monitoring locations during the Spring, Summer and Autumn monitoring periods.	Negligible potential for roosting bats within the Site.
<i>Myotis</i> bat species	Three <i>Myoti</i> s bat species typically occur in Scotland, namely Daubenton's, Natterer's and whiskered bats.	<i>Myotis</i> was the second most commonly encountered species/ species group of the activity survey, with contacts recorded at all automated detector locations across the Site. The greatest level of <i>Myotis</i> activity	Negligible potential for roosting bats within the Site.

¹⁵ Information relating to the distribution and range of Nathusius' pipistrelle in Scotland is available at: https://jncc.gov.uk/jncc-assets/Art17/S1317-SC-Habitats-Directive-Art17-2019.pdf

wood

Species	Contextual and Desk Study Information	Activity Summary	Roosting Status
	 Daubenton's bat is common and relatively widespread throughout Scotland. However, the Site is positioned near the edge of the known range for this species¹⁶. The range for Natterer's bat spans across the Scottish Central belt, with species records also present within Aberdeenshire and the Black Isle. The known range for Whiskered bat is limited to south-west Scotland¹³. Therefore, this species is unlikely to occur within the Site. Desk study data indicates historical records for Daubenton's bat in flight within 3.6km of the Site boundary. Records relating to roosting Daubenton's bat approximately 8km south and south-east of the Site entrance were also identified. No data relating to <i>Myotis</i> species were recorded within the Site during activity surveys in 2011. 	was recorded in summer at Location O, of which is positioned approximately 60m east of the Allt an Rāsail watercourse. Data output from the Ecobat tool shows an overall low level of <i>Myotis</i> activity, with occasions of moderate-high activity also recorded during the survey period (Table 8.4.11). A total of seven nights of moderate - high activity, 31 nights of moderate activity, and 52 nights of low activity were recorded across the Site (Table G.1 Appendix G). Nights with moderate - high <i>Myotis</i> activity were associated with monitoring Locations I, J, N. and O in Summer, and Location K in Autumn (Table G.4 Appendix G).	
Brown long-eared bat.	Relatively common and widespread nationally; Site located near edge of known range for this species ^{13,17} . Desk study data indicates two potential brown long- eared bat roosts. These are located 3.7km north-east and 5km south-west of the Site entrance, respectively.	Activity survey work recorded a generally low level of brown long- eared bat activity, with occasions of moderate activity also recorded (Table 8.4.11). A total of two nights of moderate activity and seven nights of low activity were recorded during the survey period (Table G.1 Appendix G), with no clear spatial trends observed. Data indicates the highest levels of activity were recorded on individual nights at Location J in Summer and G in Autumn (Table G.4 Appendix G). Due to the lack brown long-eared bat records within 200km of the Site for comparison, there is a low degree of confidence in Ecobat output results for this species.	Negligible potential for roosting bats within the Site.

¹⁶ Information relating to the distribution and range of Daubenton's bat in Scotland is available at: https://jncc.gov.uk/jncc-assets/Art17/S1314-SC-Habitats-Directive-Art17-2019.pdf

¹⁷ Information relating to the distribution and range of brown long-eared bat in Scotland is available at: https://jncc.gov.uk/jncc-assets/Art17/S1326-SC-Habitats-Directive-Art17-2019.pdf

4.3 Potential Collision Risk Assessment

Table 8.4.4 outlines the collision risk vulnerability of different bat species present in Scotland when considering the impact of wind farm developments. Survey results indicate that two bat species classified as 'high risk' of turbine collision have been confirmed to utilise the Site – these are common and soprano pipistrelle bat.

Common Pipistrelle

- 4.3.2 The results of this study show an overall moderate level of common pipistrelle activity across the Site, with occasions of high activity also recorded during the survey period (Table 8.4.11). Monitoring locations with the highest levels of common pipistrelle activity were generally positioned close to watercourses and minor tributaries within the Site (i.e. Locations J, O and P), with highest levels of activity recorded during Summer and Autumn monitoring periods (Table G.4 Annex G). It should however be noted that monitoring Locations O and P had not been deployed during the Spring monitoring period and therefore the overall common pipistrelle activity levels recorded during Spring are likely to be under-represented. The activity levels and distribution recorded suggest that common pipistrelle utilise the Site for commuting, with foraging activity focused near watercourses within the Site.
- Results of the potential collision risk assessment for the Site show a median risk category score of 12, indicating that the overall collision risk for common pipistrelle is 'medium' (Table 8.4.12).
- 4.3.4 While the median risk category demonstrates typical activity levels across the Site, the maximum risk category can highlight locations and timings of peak activity, and thus may be used to inform mitigation design. The median and maximum risk category scores for each monitoring location are detailed in Table H.1 **Annex H**. The maximum risk category score for common pipistrelle was 18, suggesting 'high' collision risk during levels of peak activity at specific monitoring locations (i.e. Locations J, O and P) during certain time periods (i.e. Summer and Autumn).

Soprano Pipistrelle

- ^{4.3.5} The results of this study show an overall low level of soprano pipistrelle activity across the Site, with one night of moderate activity recorded at Location N in Summer (Table G.4 **Annex G**).
- 4.3.6 Results of the potential collision risk assessment for the Site as a whole show a median risk category score of 4, indicating a 'low' collision risk to soprano pipistrelle during nights with typical activity levels (Table 8.4.12). The maximum risk category score was 12 at Location N, indicating a 'medium' collision risk to soprano pipistrelle during peak levels of activity at this monitoring location. Given the results obtained, the overall collision risk to soprano pipistrelle is considered as 'low'.



References

Andrews, H. et al. (2020). Bat Tree Habitat Key. AEcol, Bridgwater.

Bat Conservation Trust (2020a) National Bat Monitoring Programme - Hibernation Survey.

Bat Conservation Trust (2020b). National Bat Monitoring Programme Roost Count.

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

Environ (2012). Glencassley Wind Farm Environmental Statement – July 2012, Chapter 8: Ecology

Lintott, P. R., Davison, S., Breda, J., Kubasiewicz, L., Dowse, D., Daisley, J. & Mathews, F. (2018). Ecobat: An online resource to facilitate transparent, evidence-based interpretation of bat activity data. *Ecology and Evolution*. **8**(2): 935-941.

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

Mitchell-Jones, A.J. and McLeish, A.P. (2004). Bat Workers' Manual. 3rd Edition. JNCC, Peterborough.

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

Scottish Natural Heritage., Natural England., Natural Resource Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd., University of Exeter., Bat Conservation Trust. (2019). *Bats and Onshore Wind Turbines: Survey, Assessment and mitigation*. Available at: <u>https://www.nature.scot/bats-and-onshore-wind-</u> <u>turbines-survey-assessment-and-mitigation</u>

University of Bristol (2005). The Bats of Britain. Available at: <u>http://www.bio.bris.ac.uk/research/bats/britishbats/</u>. Accessed 01.02.21



Annex A Relevant Legislation

All bat species in Scotland are afforded legal protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)¹⁸. This makes it an offence to deliberately or recklessly:

- capture, injure or kill a wild bat;
- harass a wild bat or group of wild bats;
- disturb a wild bat in a roost (any structure or place which it uses for shelter or protection);
- disturb a wild bat while it is rearing or otherwise caring for its young;
- obstruct access to a bat roost or to otherwise deny the animal use of the roost;
- disturb a wild bat 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; and
- disturb a wild bat 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.

It is also an offence to:

- Damage or destroy a breeding site or resting place of such an animal (whether deliberately or recklessly); and
- Keep, transport, sell or exchange offer for sale or exchange any wild bat (or any part or a derivative of one) obtained after June 1994.

Any activity which is likely to affect bats requires consultation with the relevant statutory nature conservation organisation prior to any works commencing. In Scotland, this is NatureScot (formerly Scottish Natural Heritage (SNH)).



¹⁸ The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) have been amended by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019. The regulations as detailed above therefore remain in force following the UK's departure from the European Union.

Annex B Locations of Automated Detectors

Location	OS Grid Reference	Latitude	Longitude	Habitat type(s)	Details
A	NC 44532 11914	58.068942	-4.6372652	Wet heath/ blanket bog	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
В	NC 44084 10914	58.059812	-4.644187	Wet heath/ blanket bog	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
c	NC 44801 11324	58.063742	-4.6323207	Wet heath	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
D	NC 45856 11030	58.061473	-4.6142669	Blanket bog	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
E	NC 45801 10094	58.053055	-4.6145839	Blanket bog	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
F	NC 45523 09601	58.048535	-4.6189651	Wet heath	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
G	NC 46392 10096	58.053279	-4.6045826	Wet heath/ blanket bog	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
н	NC 46486 09087	58.044258	-4.502333	Wet heath	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
I	NC 46323 08400	58.038037	-4.6046424	Wet heath	Automated detector and microphone positioned approximately 1.5m above ground



wood.

Location	OS Grid Reference	Latitude	Longitude	Habitat type(s)	Details
					level on a wooden stake, in open upland habitat.
ſ	NC 46462 07536	58.030333	-4.6017273	Blanket bog	Positioned near the centre of the Site, approximately 250m AOD, within an area of open blanket bog habitat. Detector positioned within 10m of a drainage channel and 150m of a minor watercourse. Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake.
К	NC 46881 06653	58.022555	-4.5940661	Blanket bog	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
L	NC 47531 06835	58.024412	-4.5831919	Wet heath/ blanket bog	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
Μ	NC 47533 06109	58.017898	-4.5826883	Blanket bog/ wet heath	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
Ν	NC 48139 05880	58.016051	-4.5722941	Blanket bog	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake, in open upland habitat.
ο	NC 46001 07702	58.031663	-4.6096332	Wet heath	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake. Located near the centre of the Site, approximately 60m east of the Allt an Rāsail watercourse, within an area of open habitat comprising wet heath.
Ρ	NC 44843 10297	58.054543	-4.6309316	Wet heath	Automated detector and microphone positioned approximately 1.5m above ground level on a wooden stake. Detector located approximately 3m south-east of the Allt bad na t-Sagairt watercourse within an area of open upland habitat to the north- east of the Site.



wood.

Annex C Scientific Species Names

Common name	Scientific name
Birch	Betula sp.
Brown long-eared bat	Plecotus auritus
Common pipistrelle	Pipistrellus pipistrellus
Daubenton's bat	Myotis daubentonii
Nathusius pipistrelle	Pipistrellus nathusii
Nyctalus bat species	Nyctalus sp.
Myotis bat species	Myotis sp.
Scots pine	Pinus sylvestris
Soprano pipistrelle	Pipistrellus pygmaeus
Whiskered bat	Myotis mystacinus



wood

Annex D Assessing Potential Site Risk

Site risk level (1-5)	Project size								
		Small	Medium	Large					
Habitat risk	Low	1	2	3					
	Moderate	2	3	4					
	High	3	4	5					
Habitat risk	Description	Description							
Low	 Small number Low quality f Isolated site 	 Small number of potential roost features, of low quality. Low quality foraging habitat 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 for foraging bats. Site is connected to the wider landscape by linear features such as scrub, tree lines and streams. 								
High	 Numerous su structures wi confirmed ro Extensive and Site is conne rivers, blocks At/ near edg Close to key 	uitable buildings, trees (par th moderate-high potentia osts present close to or or d diverse habitat mosaic of cted to the wider landscap of woodland and mature e of range and/ or an impor roost and/ or swarming sit	rticularly mature ancient wa al as roost sites on or near n the site. f high quality foraging for l e by a network of strong li hedgerows. ortant flyway. ce.	oodland) or other the site, and/ or oats. near features such as					
Project size	Description								
Small	 Small scale d 10km. Comprising t 	evelopment (≤ 10 turbines urbines <50m in height.	s). No other wind energy d	evelopments within					
Medium	 Larger development Comprising t 	opments (between 10 and ts within 5km. turbines 50 – 100m in heig	40 turbines). May have sor ht.	ne other wind					
Large	Largest deveComprising t	lopments (>40 turbines) w urbines >100m in height.	ith other wind energy deve	elopments within 5km.					

Table D.1 Full Details Relating to Stage 1 – Initial Site Risk Assessment



wood

Annex E Environmental Conditions

Survey month 2020	Monitoring period	Sunset/ sunrise	Min daily temp (°C)	Max daily temp (°C)	Min daily wind speed (mph)	Max daily wind speed (mph)	Precipitation (mm)
May - Jun	27 – 28 May	04:31/ 22:00	7	18	0	10	8.2
	28 – 29 May	04:30/22:01	11	22	0	17	0
	29 – 30 May	04:29/22:03	11	20	0	9	0
	30 – 31 May	04:27/22:05	9	26	0	12	0
	31 May – 01 June	04:26/22:06	10	24	0	10	0
	01 – 02 June	04:25:22:08	6	24	0	13	1.6
	02 – 03 June	04:24:22:09	9	14	0	14	1.6
	03 – 04 June	04:22/22:11	6	13	1	14	1
	04 – 05 June	04:21/22:12	7	10	0	16	3.2
	05 – 06 June	04:20/22:13	6	11	1	17	18.2
	06 – 07 June	04:20/22:14	8	13	1	17	2.4
	07 – 08 June	04:19/22:16	7	10	3	14	0
	08 – 09 June	04:18/22:17	1	13	0	9	0
	09 – 10 June	04:17/22:18	7	14	0	15	5.6
Jul - Aug	22- 23 July	04:52/21:55	9	17	0	7	3.2
	23 – 24 July	04:54/ 21:53	13	20	0	9	5
	24 – 25 July	04:56/21:51	8	18	0	15	0.2
	25 – 26 July	04:58/21:49	13	19	0	14	0.6
	26 – 27 July	05:00/21:47	12	18	1	23	0
	27 - 28 July	05:02/21:45	8	13	0	15	3.4
	28 – 29 July	05:04/21:43	12	15	5	26	1.4
	29 – 30 July	05:06/21:41	11	16	0	20	0.6
	30 – 31 July	05:08/21:39	7	19	0	9	3
	31 July - 01 August	05:10/21:37	14	27	0	20	0.4

Table E.1 Automated Detector Monitoring - Survey Periods and Weather Conditions

E2

wood	
	1

Survey month 2020	Monitoring period	Sunset/ sunrise	Min daily temp (°C)	Max daily temp (°C)	Min daily wind speed (mph)	Max daily wind speed (mph)	Precipitation (mm)
	01 – 02 August	05:12/21:35	14	18	6	15	0.8
	02 – 03 August	05:14/21:32	9	17	2	18	0
	03 – 04 August	05:16/21:30	8	17	1	15	0.2
	04 – 05 August	05:18/21:28	8	18	0	17	5.4
	06 – 07 August	05:23/21:23	14	20	1	13	0
	07 – 08 August	05:25/21:21	12	22	0	15	0.4
	08 – 09 August	05:27/21:18	9	19	0	10	0
	09 – 10 August	05:29/21:16	7	16	0	15	0
	10 – 11 August	05:31/21:13	13	17	0	8	0
	11 – 12 August	05:33/21:11	13	19	0	8	0.8
	12 – 13 August	05:35/21:08	15	23	0	12	3.2
	13 – 14 August	05:38/21:06	13	18	0	9	0
	14 – 15 August	05:40/21:03	12	17	0	9	0
	15 – 16 August	05:42/21:01	13	17	0	8	0.2
	16 – 17 August	05:44/20:58	12	15	0	16	0
	17 – 18 August	05:46/20:56	12	17	3	14	0
	18 – 19 August	05:48/20:53	14	17	0	6	0.2
	19 – 20 August	05:51/20:50	14	17	0	17	8.4
Sep	10 - 11 September	06:38/19:50	6	13	0	18	5
	11 – 12 September	06:40/19:47	10	17	8	29	5.2
	12 – 13 September	06:42/19:44	9	16	0	25	6.4
	13 – 14 September	06:44/19:42	10	18	0	22	7.8
	14 – 15 September	06:46/19:39	14	20	0	24	2.2
	15 – 16 September	06:48/19:36	13	22	0	12	0
	16 – 17 September	06:51/19:33	6	15	0	9	0



E3

Survey month 2020	Monitoring period	Sunset/ sunrise	Min daily temp (°C)	Max daily temp (°C)	Min daily wind speed (mph)	Max daily wind speed (mph)	Precipitation (mm)
	17 – 18 September	06:53/19:30	8	22	0	12	0
	18 – 19 September	06:55/19:27	11	20	0	10	0
	19 – 20 September	06:57/19:24	13	18	0	6	0.2
	20 – 21 September	06:59/19:22	7	20	0	10	0
	21 – 22 September	07:01/19:19	13	15	9	23	0.4
	22 – 23 September	07:03/19:16	9	15	2	21	4.8
	23 – 24 September	07:06/19:13	2	12	0	9	0.2

Maximum and minimum temperature and wind speeds obtained from <u>https://www.timeanddate.com/weather/@2639146</u>. Accessed on 15.12.20

Rainfall data obtained from the Scottish Environmental Protection Agency (SEPA) automated rain gauge at Rhian Bridge (Grid reference: NC 56400 16600). Downloaded from <u>https://www2.sepa.org.uk/rainfall/data/index/115390 on 15.12.20</u>.

Annex F Activity Survey Results – Automated Detector Monitoring



Location	No. of nights analysed	Total contacts (average per night)							
		СР	SP	CP/SP	NP/CP	Μ	BLE	Total	
A	14	3 (0.21)	1 (0.07)	0	0	1 (0.07)	0	5 (0.36)	
В	14	0	0	0	0	0	0	0 (0.00)	
с	14	0	0	0	0	0	0	0 (0.00)	
D	14	3 (0.21)	0	0	0	4 (0.29)	0	7 (0.50)	
E	14	0	0	0	0	3 (0.21)	0	3 (0.21)	
F	14	1 (0.07)	0	0	0	0	0	1 (0.07)	
G	14	0	0	0	0	0	0	0 (0.00)	
н	14	4 (0.29)	0	0	0	1 (0.07)	0	5 (0.36)	
I	14	5 (0.36)	0	0	0	8 (0.57)	0	13 (0.93)	
J	14	4 (0.29)	0	0	0	4 (0.29)	0	9 (0.64)	
к	14	8 (0.57)	1 (0.07)	1 (0.07)	0	4 (0.29)	0	13 (0.93)	
L	14	5 (0.36)	0	0	0	2 (0.14)	0	7 (0.50)	
м	14	12 (0.86)	1 (0.07)	0	1 (0.07)	9 (0.64)	0	23 (1.64)	
N	14	1 (0.07)	0	1 (0.07)	0	8 (0.57)	0	10 (0.71)	
ο	0	-	-	-	-	-	-	-	
Р	0	-	-	-	-	-	-	-	
Total	196	46 (0.23)	3 (0.02)	2 (0.01)	1 (0.01)	44 (0.22)	0 (0.00)	96 (0.49)	
Proportion		47.92%	3.13%	2.08%	1.04%	45.83%	0.00%		

Table F.1Total Contacts (Average Contacts Per Night) During Spring 2020

. . .

Location	No. of nights analysed	Total contacts (average per night)							
		СР	SP	CP/SP	CP/NP	М	BLE	Total	
А	0	-	-	-	-	-	-	-	
В	14	4 (0.29)	2 (0.14)	0	0	1 (0.07)	0	7 (0.50)	
с	14	2 (0.14)	0	0	0	0	0	2 (0.14)	
D	14	18 (1.29)	0	0	0	5 (0.36)	0	23 (1.64)	
E	14	12 (0.86)	0	0	0	1 (0.07)	0	13 (0.93)	
F	0	-	-	-	-	-	-	-	
G	14	1 (0.07)	0	0	0	0	0	1 (0.07)	
н	14	8 (0.57)	0	0	0	5 (0.36)	0	13 (0.93)	
I	14	19 (1.36)	1 (0.07)	0	0	9 (0.64)	0	29 (2.07)	
J	14	32 (2.29)	0	0	0	18 (1.29)	2 (0.14)	52 (3.71)	
К	14	27 (1.93)	0	0	0	2 (0.14)	0	29 (2.07)	
L	14	12 (0.86)	2 (0.14)	0	0	2 (0.14)	1 (0.07)	17 (1.21)	
м	14	0	0	0	0	0	0	0	
Ν	14	15 (1.07)	3 (0.21)	0	0	11 (0.79)	1 (0.07)	30 (2.14)	
0	14	32 (2.29)	1 (0.07)	0	1 (0.07)	19 (1.36)	2 (0.14)	55 (3.93)	
Р	14	87 (6.21)	1 (0.07)	25 (1.79)	1 (0.07)	7 (0.50)	0	121 (8.64)	
Total	196	269 (1.37)	10 (0.05)	25 (0.13)	2 (0.01)	80 (0.41)	6 (0.03)	392 (2.00)	
Proportion		68.62%	2.55%	6.38%	0.51%	20.41%	1.53%		

Table F.2 Total Contacts (Average Contacts Per Night) During Summer 2020

. . .

Location	No. of nights analysed	Total contacts (average per night)							
		СР	SP	CP/SP	CP/NP	М	BLE	Total	
А	0	-	-	-	-	-	-	-	
В	14	0	0	0	0	0	0	0	
с	14	1 (0.07)	0	0	0	0	0	1 (0.07)	
D	14	1 (0.07)	0	0	0	2 (0.14)	0	3 (0.21)	
E	14	1 (0.07)	0	0	0	0	0	1 (0.07)	
F	14	1 (0.07)	0	0	0	0	0	1 (0.07)	
G	14	1 (0.07)	0	1 (0.07)	0	1 (0.07)	2 (0.14)	5 (0.36)	
н	0	-	-	-	-	-	-	-	
I	14	6 (0.43)	1 (0.07)	0	0	2 (0.14)	0	9 (0.64)	
J	14	84 (6.00)	0	1 (0.07)	0	1 (0.07)	0	86 (6.14)	
К	14	9 (0.64)	0	0	0	10 (0.71)	2 (0.14)	21 (1.50)	
L	14	4 (0.29)	0	0	0	1 (0.07)	0	5 (0.36)	
м	14	0	0	0	0	0	0	0	
N	14	1 (0.07)	0	0	0	2 (0.14)	0	3 (0.21)	
0	14	81 (5.79)	1 (0.07)	0	0	3 (0.21)	0	85 (6.07)	
Р	14	1 (0.07)	0	0	0	5 (0.36)	1 (0.07)	8 (0.57)	
Total	196	191 (0.97)	2 (0.01)	2 (0.01)	0 (0.00)	27 (0.14)	5 (0.03)	227 (1.16)	
Proportion		84.14%	0.88%	0.88%	0.00%	11.89%	2.20%		

Table F.3 Total Contacts (Average Contacts Per Night) during Autumn 2020



Annex G Ecobat Results

Site-Wide Results

Table G.1 Number Of Nights That Recorded Bat Activity Fell Into Each Activity Band For Each Species Nights of moderate/ Nights of moderate Nights of low/ Species/ Nights of Nights of low species group high activity high activity activity moderate activity activity 7 СР 20 37 0 57 SP 0 0 1 0 13 Μ 0 7 31 0 52 0 0 7 BLE* 2 0

Note that number of nights can exceed total recording length as multiple instances can be generated if bat activity was detected on multiple detectors during the same nights recording.

* Due to a lack of available records within 200km of the Site for this species for comparison there is a low degree of confidence in these results.

Per Location Results

Table G.2Summary Table Showing the Number of Nights Recorded Bat Activity Fell Into Each ActivityBand for Each Species

Monitoring location ID	Species/ species group	Nights of high activity	Nights of moderate/ high activity	Nights of moderate activity	Nights of low/ moderate activity	Nights of low activity
Α	Myotis	0	0	0	0	1
Α	Pipistrellus pipistrellus	0	0	1	0	1
Α	Pipistrellus pygmaeus	0	0	0	0	1
В	Myotis	0	0	0	0	1
В	Pipistrellus pipistrellus	0	0	1	0	2
в	Pipistrellus pygmaeus	0	0	0	0	2
с	Pipistrellus pipistrellus	0	0	0	0	3
D	Myotis	0	0	2	0	7
D	Pipistrellus pipistrellus	0	1	5	0	2
E	Myotis	0	0	1	0	2
E	Pipistrellus pipistrellus	0	1	3	0	1

G2



Monitoring location ID	Species/ species group	Nights of high activity	Nights of moderate/ high activity	Nights of moderate activity	Nights of low/ moderate activity	Nights of low activity
F	Pipistrellus pipistrellus	0	0	0	0	2
G	Myotis	0	0	0	0	1
G	Pipistrellus pipistrellus	0	0	0	0	2
G	Plecotus auritus *	0	0	1	0	0
н	Myotis	0	0	2	0	2
н	Pipistrellus pipistrellus	0	0	4	0	4
I	Myotis	0	2	1	0	8
I	Pipistrellus pipistrellus	0	3	3	0	6
I	Pipistrellus pygmaeus	0	0	0	0	2
J	Myotis	0	2	5	0	4
J	Pipistrellus pipistrellus	2	1	6	0	9
J	Pipistrellus pygmaeus	0	0	0	0	1
J	Plecotus auritus *	0	0	1	0	0
к	Myotis	0	1	4	0	3
к	Pipistrellus pipistrellus	0	5	3	0	6
к	Plecotus auritus *	0	0	0	0	3
L	Myotis	0	0	0	0	5
L	Pipistrellus pipistrellus	0	3	2	0	5
L	Pipistrellus pygmaeus	0	0	0	0	2
М	Myotis	0	0	3	0	2
М	Pipistrellus pipistrellus	0	2	0	0	1
М	Pipistrellus pygmaeus	0	0	0	0	1
Ν	Myotis	0	1	5	0	5
N	Pipistrellus pipistrellus	0	1	5	0	3
Ν	Pipistrellus pygmaeus	0	0	1	0	1
N	Plecotus auritus *	0	0	0	0	1
0	Myotis	0	1	6	0	4
0	Pipistrellus pipistrellus	2	1	3	0	6
0	Pipistrellus pygmaeus	0	0	0	0	2





Monitoring location ID	Species/ species group	Nights of high activity	Nights of moderate/ high activity	Nights of moderate activity	Nights of low/ moderate activity	Nights of low activity
0	Plecotus auritus *	0	0	0	0	2
Ρ	Myotis	0	0	2	0	7
Р	Pipistrellus pipistrellus	3	2	1	0	4
Р	Pipistrellus pygmaeus	0	0	0	0	1
Р	Plecotus auritus *	0	0	0	0	1

* Due to a lack of available records within 200km of the site for this species for comparison there is a low degree of confidence in these results. This is due to the low detectability of *Plecotus* species using bat recording equipment and does not necessarily indicate a lower population density

Table G.3 Summary Table Showing Key Metrics for Each Species Recorded.

Static detector ID	Species/ species group	Median percentile	95% Cls	Max percentile	Nights recorded	Reference range*
Α	Myotis	9	0	9	1	542
Α	Pipistrellus pipistrellus	25	25 - 25	41	2	1959
Α	Pipistrellus pygmaeus	9	0	9	1	1040
в	Myotis	9	0	9	1	542
В	Pipistrellus pipistrellus	9	9 - 9	41	3	1959
В	Pipistrellus pygmaeus	9	9 - 9	9	2	1040
с	Pipistrellus pipistrellus	9	9 - 9	9	3	1959
D	Myotis	9	9 - 25	41	9	542
D	Pipistrellus pipistrellus	54	25 - 62.5	71	8	1959
E	Myotis	9	9 - 9	41	3	542
E	Pipistrellus pipistrellus	41	25 - 56	71	5	1959
F	Pipistrellus pipistrellus	9	9 - 9	9	2	1959
G	Myotis	9	0	9	1	542
G	Pipistrellus pipistrellus	9	9 - 9	9	2	1959
G	Plecotus auritus	41	0	41	1	63
н	Myotis	25	9 - 41	41	4	542
н	Pipistrellus pipistrellus	25	9 - 41	41	8	1959
I	Myotis	9	9 - 35	61	11	542
I.	Pipistrellus pipistrellus	25	9 - 54	71	12	1959



Static detector ID	Species/ species group	Median percentile	95% Cls	Max percentile	Nights recorded	Reference range*
I	Pipistrellus pygmaeus	9	9 - 9	9	2	1040
J	Myotis	41	25 - 51	61	11	542
J	Pipistrellus pipistrellus	25	9 - 47.5	97	18	1959
ſ	Pipistrellus pygmaeus	9	0	9	1	1040
J	Plecotus auritus	41	0	41	1	63
к	Myotis	41	9 - 51	61	8	542
К	Pipistrellus pipistrellus	41	25 - 58.5	76	14	1959
к	Plecotus auritus	9	9 - 9	9	3	63
L	Myotis	9	9 - 9	9	5	542
L	Pipistrellus pipistrellus	25	9 - 51	61	10	1959
L	Pipistrellus pygmaeus	9	9 - 9	9	2	1040
М	Myotis	41	9 - 47.5	54	5	542
М	Pipistrellus pipistrellus	61	9 - 74	74	3	1959
М	Pipistrellus pygmaeus	9	0	9	1	1040
N	Myotis	41	9 - 47.5	61	11	542
Ν	Pipistrellus pipistrellus	41	9 - 51	61	9	1959
N	Pipistrellus pygmaeus	25	25 - 25	41	2	1040
N	Plecotus auritus	9	0	9	1	63
ο	Myotis	41	25 - 47.5	61	11	542
0	Pipistrellus pipistrellus	25	9 - 63.5	97	12	1959
0	Pipistrellus pygmaeus	9	9 - 9	9	2	1040
0	Plecotus auritus	9	9 - 9	9	2	63
Р	Myotis	9	9 - 25	54	9	542
Р	Pipistrellus pipistrellus	51	9 - 77	93	10	1959
Р	Pipistrellus pygmaeus	9	0	9	1	1040
Р	Plecotus auritus	9	0	9	1	63

*The reference range is the number of nights for each species that the data is compared to. A reference range of 200+ is recommended to be confident in the relative activity level.



wood.

Table G.4Summary Table Showing the Number of Nights Recorded Bat Activity Fell Into Each ActivityBand For Each Species During Each Detector Month

Detector ID	Species/species Group	Month	Nights of high activity	Nights of moderate/ high activity	Nights of moderate activity	Nights of low/ moderate activity	Nights of low activity
Α	Myotis	May	0	0	0	0	1
Α	Pipistrellus pipistrellus	May	0	0	1	0	0
Α	Pipistrellus pipistrellus	Jun	0	0	0	0	1
Α	Pipistrellus pygmaeus	Jun	0	0	0	0	1
В	Myotis	Aug	0	0	0	0	1
В	Pipistrellus pipistrellus	Aug	0	0	1	0	2
В	Pipistrellus pygmaeus	Aug	0	0	0	0	2
с	Pipistrellus pipistrellus	Jul	0	0	0	0	1
c	Pipistrellus pipistrellus	Aug	0	0	0	0	1
с	Pipistrellus pipistrellus	Sep	0	0	0	0	1
D	Myotis	May	0	0	1	0	1
D	Myotis	Jun	0	0	0	0	1
D	Myotis	Jul	0	0	1	0	1
D	Myotis	Aug	0	0	0	0	2
D	Myotis	Sep	0	0	0	0	2
D	Pipistrellus pipistrellus	May	0	0	1	0	0
D	Pipistrellus pipistrellus	Jun	0	0	0	0	1
D	Pipistrellus pipistrellus	Jul	0	1	3	0	0
D	Pipistrellus pipistrellus	Aug	0	0	1	0	0
D	Pipistrellus pipistrellus	Sep	0	0	0	0	1
E	Myotis	May	0	0	1	0	0
E	Myotis	Jun	0	0	0	0	1
E	Myotis	Jul	0	0	0	0	1
E	Pipistrellus pipistrellus	Jul	0	1	2	0	0
E	Pipistrellus pipistrellus	Aug	0	0	1	0	0
E	Pipistrellus pipistrellus	Sep	0	0	0	0	1
F	Pipistrellus pipistrellus	Jun	0	0	0	0	1

wood.

Detector ID	Species/species Group	Month	Nights of high activity	Nights of moderate/ high activity	Nights of moderate activity	Nights of low/ moderate activity	Nights of low activity
F	Pipistrellus pipistrellus	Sep	0	0	0	0	1
G	Myotis	Sep	0	0	0	0	1
G	Pipistrellus pipistrellus	Jul	0	0	0	0	1
G	Pipistrellus pipistrellus	Sep	0	0	0	0	1
G	Plecotus auritus	Sep	0	0	1	0	0
н	Myotis	May	0	0	0	0	1
н	Myotis	Jul	0	0	2	0	1
н	Pipistrellus pipistrellus	May	0	0	1	0	0
н	Pipistrellus pipistrellus	Jun	0	0	1	0	0
н	Pipistrellus pipistrellus	Jul	0	0	2	0	3
н	Pipistrellus pipistrellus	Aug	0	0	0	0	1
I	Myotis	May	0	0	1	0	2
I	Myotis	Jun	0	0	0	0	3
I	Myotis	Jul	0	2	0	0	1
I	Myotis	Sep	0	0	0	0	2
I	Pipistrellus pipistrellus	May	0	0	0	0	2
I	Pipistrellus pipistrellus	Jun	0	0	1	0	0
I	Pipistrellus pipistrellus	Jul	0	2	1	0	1
I	Pipistrellus pipistrellus	Aug	0	0	1	0	2
I	Pipistrellus pipistrellus	Sep	0	1	0	0	1
I	Pipistrellus pygmaeus	Jul	0	0	0	0	1
I	Pipistrellus pygmaeus	Sep	0	0	0	0	1
J	Myotis	May	0	0	0	0	1
J	Myotis	Jun	0	0	1	0	1
J	Myotis	Jul	0	1	4	0	1
J	Myotis	Aug	0	1	0	0	0
J	Myotis	Sep	0	0	0	0	1
J	Pipistrellus pipistrellus	May	0	0	0	0	2



G7

wood.

Detector ID	Species/species Group	Month	Nights of high activity	Nights of moderate/ high activity	Nights of moderate activity	Nights of low/ moderate activity	Nights of low activity
J	Pipistrellus pipistrellus	Jun	0	0	1	0	0
J	Pipistrellus pipistrellus	Jul	1	1	2	0	4
J	Pipistrellus pipistrellus	Aug	0	0	2	0	1
J	Pipistrellus pipistrellus	Sep	1	0	1	0	2
J	Pipistrellus pygmaeus	Jun	0	0	0	0	1
J	Plecotus auritus	Aug	0	0	1	0	0
К	Myotis	May	0	0	0	0	2
К	Myotis	Jun	0	0	1	0	0
К	Myotis	Jul	0	0	1	0	0
К	Myotis	Sep	0	1	2	0	1
К	Pipistrellus pipistrellus	May	0	0	1	0	1
К	Pipistrellus pipistrellus	Jun	0	1	0	0	1
К	Pipistrellus pipistrellus	Jul	0	2	2	0	1
К	Pipistrellus pipistrellus	Aug	0	1	0	0	0
К	Pipistrellus pipistrellus	Sep	0	1	0	0	3
К	Plecotus auritus	Aug	0	0	0	0	1
К	Plecotus auritus	Sep	0	0	0	0	2
L	Myotis	May	0	0	0	0	2
L	Myotis	Jul	0	0	0	0	1
L	Myotis	Aug	0	0	0	0	1
L	Myotis	Sep	0	0	0	0	1
L	Pipistrellus pipistrellus	May	0	1	0	0	0
L	Pipistrellus pipistrellus	Jun	0	0	0	0	1
L	Pipistrellus pipistrellus	Jul	0	1	0	0	1
L	Pipistrellus pipistrellus	Aug	0	1	1	0	1
L	Pipistrellus pipistrellus	Sep	0	0	1	0	2
L	Pipistrellus pygmaeus	Aug	0	0	0	0	2
М	Myotis	May	0	0	2	0	1



Detector ID	Species/species Group	Month	Nights of high activity	Nights of moderate/ high activity	Nights of moderate activity	Nights of low/ moderate activity	Nights of low activity
М	Myotis	Jun	0	0	1	0	1
М	Pipistrellus pipistrellus	May	0	1	0	0	1
М	Pipistrellus pipistrellus	Jun	0	1	0	0	0
М	Pipistrellus pygmaeus	May	0	0	0	0	1
Ν	Myotis	May	0	0	2	0	0
N	Myotis	Jun	0	0	1	0	1
Ν	Myotis	Jul	0	1	1	0	2
Ν	Myotis	Aug	0	0	1	0	0
Ν	Myotis	Sep	0	0	0	0	2
N	Pipistrellus pipistrellus	May	0	0	0	0	1
Ν	Pipistrellus pipistrellus	Jul	0	1	3	0	1
N	Pipistrellus pipistrellus	Aug	0	0	2	0	0
Ν	Pipistrellus pipistrellus	Sep	0	0	0	0	1
N	Pipistrellus pygmaeus	Jul	0	0	1	0	1
Ν	Plecotus auritus	Jul	0	0	0	0	1
0	Myotis	Jul	0	1	5	0	2
0	Myotis	Aug	0	0	0	0	1
0	Myotis	Sep	0	0	1	0	1
0	Pipistrellus pipistrellus	Jul	1	1	0	0	3
0	Pipistrellus pipistrellus	Aug	0	0	1	0	1
0	Pipistrellus pipistrellus	Sep	1	0	2	0	2
0	Pipistrellus pygmaeus	Jul	0	0	0	0	1
0	Pipistrellus pygmaeus	Sep	0	0	0	0	1
0	Plecotus auritus	Jul	0	0	0	0	2
Р	Myotis	Jul	0	0	1	0	3
Р	Myotis	Aug	0	0	0	0	2
Р	Myotis	Sep	0	0	1	0	2
Р	Pipistrellus pipistrellus	Jul	2	2	0	0	2

. . .

Detector ID	Species/species Group	Month	Nights of high activity	Nights of moderate/ high activity	Nights of moderate activity	Nights of low/ moderate activity	Nights of low activity
Р	Pipistrellus pipistrellus	Aug	1	0	1	0	1
Р	Pipistrellus pipistrellus	Sep	0	0	0	0	1
Ρ	Pipistrellus pygmaeus	Aug	0	0	0	0	1
Р	Plecotus auritus	Sep	0	0	0	0	1

Note that some monitoring periods overlapped between two months (i.e. 25 May – 09 June, and 22 July – 04 August 2020)

Table G.5 Summary table showing key metrics for each species recorded per month

Detector ID	Species/Species Group	Month	Median Percentile	95% Cls	Max Percentile	Nights Recorded
Α	Myotis	May	9	0	9	1
Α	Pipistrellus pipistrellus	May	41	25 - 25	41	1
A	Pipistrellus pipistrellus	Jun	9	25 - 25	9	1
Α	Pipistrellus pygmaeus	Jun	9	0	9	1
В	Myotis	Aug	9	0	9	1
В	Pipistrellus pipistrellus	Aug	9	9 - 9	41	3
В	Pipistrellus pygmaeus	Aug	9	9 - 9	9	2
с	Pipistrellus pipistrellus	Jul	9	9 - 9	9	1
c	Pipistrellus pipistrellus	Aug	9	9 - 9	9	1
с	Pipistrellus pipistrellus	Sep	9	9 - 9	9	1
D	Myotis	May	25	9 - 25	41	2
D	Myotis	Jun	9	9 - 25	9	1
D	Myotis	Jul	25	9 - 25	41	2
D	Myotis	Aug	9	9 - 25	9	2
D	Myotis	Sep	9	9 - 25	9	2
D	Pipistrellus pipistrellus	May	41	25 - 62.5	41	1
D	Pipistrellus pipistrellus	Jun	9	25 - 62.5	9	1
D	Pipistrellus pipistrellus	Jul	54	25 - 62.5	71	4
D	Pipistrellus pipistrellus	Aug	54	25 - 62.5	54	1

wood.

Detector ID	Species/Species Group	Month	Median Percentile	95% Cls	Max Percentile	Nights Recorded
D	Pipistrellus pipistrellus	Sep	9	25 - 62.5	9	1
E	Myotis	May	41	9 - 9	41	1
E	Myotis	Jun	9	9 - 9	9	1
E	Myotis	Jul	9	9 - 9	9	1
E	Pipistrellus pipistrellus	Jul	41	25 - 56	71	3
E	Pipistrellus pipistrellus	Aug	41	25 - 56	41	1
E	Pipistrellus pipistrellus	Sep	9	25 - 56	9	1
F	Pipistrellus pipistrellus	Jun	9	9 - 9	9	1
F	Pipistrellus pipistrellus	Sep	9	9 - 9	9	1
G	Myotis	Sep	9	0	9	1
G	Pipistrellus pipistrellus	Jul	9	9 - 9	9	1
G	Pipistrellus pipistrellus	Sep	9	9 - 9	9	1
G	Plecotus auritus	Sep	41	0	41	1
н	Myotis	May	9	9 - 41	9	1
н	Myotis	Jul	41	9 - 41	41	3
н	Pipistrellus pipistrellus	May	41	9 - 41	41	1
н	Pipistrellus pipistrellus	Jun	41	9 - 41	41	1
н	Pipistrellus pipistrellus	Jul	9	9 - 41	41	5
н	Pipistrellus pipistrellus	Aug	9	9 - 41	9	1
I.	Myotis	May	9	9 - 35	54	3
I	Myotis	Jun	9	9 - 35	9	3
I.	Myotis	Jul	61	9 - 35	61	3
I	Myotis	Sep	9	9 - 35	9	2
I.	Pipistrellus pipistrellus	May	9	9 - 54	9	2
I	Pipistrellus pipistrellus	Jun	54	9 - 54	54	1
I	Pipistrellus pipistrellus	Jul	56	9 - 54	71	4
I	Pipistrellus pipistrellus	Aug	9	9 - 54	41	3
I	Pipistrellus pipistrellus	Sep	38	9 - 54	67	2
I	Pipistrellus pygmaeus	Jul	9	9 - 9	9	1

. . .



Detector ID	Species/Species Group	Month	Median Percentile	95% Cls	Max Percentile	Nights Recorded
I	Pipistrellus pygmaeus	Sep	9	9 - 9	9	1
J	Myotis	May	9	25 - 51	9	1
J	Myotis	Jun	25	25 - 51	41	2
J	Myotis	Jul	41	25 - 51	61	6
J	Myotis	Aug	61	25 - 51	61	1
J	Myotis	Sep	9	25 - 51	9	1
J	Pipistrellus pipistrellus	May	9	9 - 47.5	9	2
J	Pipistrellus pipistrellus	Jun	41	9 - 47.5	41	1
J	Pipistrellus pipistrellus	Jul	25	9 - 47.5	84	8
J	Pipistrellus pipistrellus	Aug	41	9 - 47.5	54	3
J	Pipistrellus pipistrellus	Sep	32	9 - 47.5	97	4
J	Pipistrellus pygmaeus	Jun	9	0	9	1
J	Plecotus auritus	Aug	41	0	41	1
К	Myotis	May	9	9 - 51	9	2
к	Myotis	Jun	41	9 - 51	41	1
К	Myotis	Jul	41	9 - 51	41	1
к	Myotis	Sep	48	9 - 51	61	4
к	Pipistrellus pipistrellus	May	25	25 - 58.5	41	2
к	Pipistrellus pipistrellus	Jun	35	25 - 58.5	61	2
К	Pipistrellus pipistrellus	Jul	54	25 - 58.5	76	5
к	Pipistrellus pipistrellus	Aug	67	25 - 58.5	67	1
К	Pipistrellus pipistrellus	Sep	9	25 - 58.5	71	4
к	Plecotus auritus	Aug	9	9 - 9	9	1
к	Plecotus auritus	Sep	9	9 - 9	9	2
L	Myotis	May	9	9 - 9	9	2
L	Myotis	Jul	9	9 - 9	9	1
L	Myotis	Aug	9	9 - 9	9	1
L	Myotis	Sep	9	9 - 9	9	1
L	Pipistrellus pipistrellus	May	61	9 - 51	61	1



wood.

Detector ID	Species/Species Group	Month	Median Percentile	95% Cls	Max Percentile	Nights Recorded
L	Pipistrellus pipistrellus	Jun	9	9 - 51	9	1
L	Pipistrellus pipistrellus	Jul	35	9 - 51	61	2
L	Pipistrellus pipistrellus	Aug	41	9 - 51	61	3
L	Pipistrellus pipistrellus	Sep	9	9 - 51	41	3
L	Pipistrellus pygmaeus	Aug	9	9 - 9	9	2
М	Myotis	May	41	9 - 47.5	41	3
М	Myotis	Jun	32	9 - 47.5	54	2
м	Pipistrellus pipistrellus	May	42	9 - 74	74	2
Μ	Pipistrellus pipistrellus	Jun	61	9 - 74	61	1
м	Pipistrellus pygmaeus	May	9	0	9	1
Ν	Myotis	May	48	9 - 47.5	54	2
Ν	Myotis	Jun	25	9 - 47.5	41	2
Ν	Myotis	Jul	25	9 - 47.5	61	4
Ν	Myotis	Aug	54	9 - 47.5	54	1
Ν	Myotis	Sep	9	9 - 47.5	9	2
Ν	Pipistrellus pipistrellus	May	9	9 - 51	9	1
Ν	Pipistrellus pipistrellus	Jul	41	9 - 51	61	5
Ν	Pipistrellus pipistrellus	Aug	41	9 - 51	41	2
Ν	Pipistrellus pipistrellus	Sep	9	9 - 51	9	1
Ν	Pipistrellus pygmaeus	Jul	25	25 - 25	41	2
Ν	Plecotus auritus	Jul	9	0	9	1
0	Myotis	Jul	41	25 - 47.5	61	8
0	Myotis	Aug	9	25 - 47.5	9	1
0	Myotis	Sep	25	25 - 47.5	41	2
0	Pipistrellus pipistrellus	Jul	9	9 - 63.5	86	5
0	Pipistrellus pipistrellus	Aug	25	9 - 63.5	41	2
0	Pipistrellus pipistrellus	Sep	54	9 - 63.5	97	5
0	Pipistrellus pygmaeus	Jul	9	9 - 9	9	1
0	Pipistrellus pygmaeus	Sep	9	9 - 9	9	1



wood

Detector ID	Species/Species Group	Month	Median Percentile	95% Cls	Max Percentile	Nights Recorded
0	Plecotus auritus	Jul	9	9 - 9	9	2
Р	Myotis	Jul	9	9 - 25	41	4
Р	Myotis	Aug	9	9 - 25	9	2
Р	Myotis	Sep	9	9 - 25	54	3
Р	Pipistrellus pipistrellus	Jul	61	9 - 77	93	6
Р	Pipistrellus pipistrellus	Aug	41	9 - 77	87	3
Р	Pipistrellus pipistrellus	Sep	9	9 - 77	9	1
Р	Pipistrellus pygmaeus	Aug	9	0	9	1
Р	Plecotus auritus	Sep	9	0	9	1

Note that the reference range cannot be split by month, hence this column has not been shown in the table.

Also note that some monitoring periods overlapped between two months (i.e. 25 May - 09 June, and 22 July - 04 August 2020)



Annex H Location Specific Risk Assessment Results

Table H.1Location Specific Risk Assessment Scores For 'High Collision Risk' Species Recorded WithinThe Site

Static detector ID	Species/ species group	Median percentile	Median activity category	Max percentile	Max activity category	Initial site risk score	Median risk category	Maximum risk category
A	Pipistrellus pipistrellus	25	Low - Moderate	41	Moderate	4	8	12
Α	Pipistrellus pygmaeus	9	Low	9	Low	4	4	4
В	Pipistrellus pipistrellus	9	Low	41	Moderate	4	4	9
В	Pipistrellus pygmaeus	9	Low	9	Low	4	4	4
с	Pipistrellus pipistrellus	9	Low	9	Low	4	4	4
с	Pipistrellus pygmaeus	-	-	-	-	-	-	-
D	Pipistrellus pipistrellus	54	Moderate	71	Moderate - High	4	12	16
D	Pipistrellus pygmaeus	-	-	-		-	-	-
E	Pipistrellus pipistrellus	41	Moderate	71	Moderate - High	4	12	16
E	Pipistrellus pygmaeus	-	-	-	-	-	-	-
F	Pipistrellus pipistrellus	9	Low	9	Low	4	4	4
F	Pipistrellus pygmaeus	-	-	-	-	-		
G	Pipistrellus pipistrellus	9	Low	9	Low	4	4	4
G	Pipistrellus pygmaeus	-	-	-	-	-	-	-
н	Pipistrellus pipistrellus	25	Low - Moderate	41	Moderate	4	8	12
н	Pipistrellus pygmaeus	-	-	-	-	-	-	-
I	Pipistrellus pipistrellus	25	Low - Moderate	71	Moderate - High	4	8	16
I	Pipistrellus pygmaeus	9	Low	9	Low	4	4	4
ſ	Pipistrellus pipistrellus	25	Low - Moderate	97	High	4	8	18

. . .

H2

Static detector ID	Species/ species group	Median percentile	Median activity category	Max percentile	Max activity category	Initial site risk score	Median risk category	Maximum risk category
J	Pipistrellus pygmaeus	9	Low	9	Low	4	4	4
к	Pipistrellus pipistrellus	41	Moderate	76	Moderate - High	4	12	16
к	Pipistrellus pygmaeus	-	-	-	-	-	-	-
L	Pipistrellus pipistrellus	25	Low - Moderate	61	Moderate - High	4	8	16
L	Pipistrellus pygmaeus	9	Low	9	Low	4	4	4
М	Pipistrellus pipistrellus	61	Moderate - High	74	Moderate - High	4	16	16
М	Pipistrellus pygmaeus	9	Low	9	Low	4	4	4
Ν	Pipistrellus pipistrellus	41	Moderate	61	Moderate - High	4	12	16
Ν	Pipistrellus pygmaeus	25	Low - Moderate	41	Moderate	4	8	12
0	Pipistrellus pipistrellus	25	Low - Moderate	97	High	4	8	18
ο	Pipistrellus pygmaeus	9	Low	9	Low	4	4	4
Р	Pipistrellus pipistrellus	51	Moderate	93	High	4	12	18
Ρ	Pipistrellus pygmaeus	9	Low	9	Low	4	4	4





© Crown copyright and database rights 2021 Ordnance Survey 0100031673



Key









Кеу Site Boundary **Study** Area Turbine • Lidar Location Floated Track Founded/Cut Track Existing Track to be Upgraded Hardstanding Borrow Pit Temporary Construction Compound, Security and Storage and Batching Plant Extension to Existing **Operations Building** Substation, Welfare Facility and Store Temporary Construction Compound, Security and Storage Automated detector location Scale 1:40,000 @ A3 Km 0

Figure 8.4.2 Automated Detector Location Map

Achany Extension Wind Farm **EIA Report - Technical Appendix 8.4: Bat Survey Report**



