TECHNICAL APPENDIX 8.4:

BAT SURVEY REPORT

Balmeanach Wind Farm

Prepared for**: Balmeanach Wind Farm Limited**

SLR Ref: 428.11223.00001
Version No: Final
July 2023

BASIS OF REPORT

CONTENTS

DOCUMENT REFERENCES

TABLES

GRAPHS

FIGURES

ANNEXES

1.0 Introduction

1.1 Background

Balmeanach Wind Farm Limited (the Applicant) is applying to The Highland Council (THC) for planning permission to develop a wind farm on land approximately 3km to the south of the settlement of Edinbane, approximately 8km to the east of Dunvegan and approximately 7km to the north of Struan on the Isle of Skye. The Applicant has appointed SLR Consulting Limited (SLR) to undertake a range of environmental studies on the site to inform an Environmental Impact Assessment (EIA) for the Proposed Development. This report provides the results of surveys for bats, carried out between May and September 2021.

1.2 Site Description

The site, which measures approximately 476ha, centred on NGR 133900, 846750 is located on moorland approximately 3km to the south of the settlement of Edinbane, approximately 8km to the east of Dunvegan and approximately 7km to the north of Struan on the north west of the Isle of Skye (**Figure 1**). The proposed turbines would be located across two landownerships – primarily on the Bracadale Estate, on ground which forms part of the Balmeanach and Caroy Common Grazings, and partly on the Coishletter Estate. Access to the site would be via the existing Ben Aketil Wind Farm access track from the A850, and then south east via the consented Ben Sca Wind Farm site access track onto the hillside.

For the main development area of the site, topography slopes to the south east from 283m AOD at the summit of Ben Sca down to the lower slopes at approximately 160m AOD adjacent to the Allt Ruairidh burn, which is part of the River Ose Catchment which flows south west discharging into Loch Bracadale. The other main watercourses which drain the site are: the Abhainn Coishleader to the north east of the site generally flowing northwards towards Coishletter before discharging into Loch Greshornish; the Abhainn Bhaile Mheadhonaich which drains to the south and the Aketil Burn to the south west which drains into the Caroy River catchment.

This report focuses on the main development area as the 'site' and does not refer to the wider application site boundary which includes the access route to the site.

The application site boundary is shown on **Figure 8.4.1.**

1.3 Scope of study

The aims of the surveys were to:

- determine the bat assemblage using the site, the level of bat activity and its spatial and temporal distribution, identify any key commuting or foraging habitat features, and identify any roosts which could be affected by the proposed works; and
- provide baseline data to inform the wind farm design process, inform the EIA, and identify the need for any mitigation and compensation measures (if required).

The survey methodology was designed in accordance with current wind farm specific guidelines[1], published in January 2019 (see Section 2.7 for specific limitations).

[1] Scottish Natural Heritage, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, University of Exeter & Bat Conservation Trust (2019) *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*.

This report presents the findings of the bat surveys. The assessment of impacts resulting from the proposed wind farm and the development of mitigation, compensation and enhancement measures (if required) is beyond the scope of this report and is presented separately within Ecology Chapter of the EIA Report.

1.4 Relevant Legislation

All bats in Scotland are classed as European protected species and receive full protection under both national and international legislation (Annex A). The overarching aim of this legislation is to protect, restore and maintain populations of protected bat species at favourable conservation status[2]. The legislation therefore makes it an offence to intentionally or recklessly kill, injure or disturb any bat, or damage or destroy a bat roost.

While bat fatalities associated with wind farms are generally considered to relate to 'incidental' killing[3] and are unlikely to class as an offence, once a certain level of fatality impact is reached, such killing may cease to be incidental and become classified as intentional or reckless. It is therefore important to understand what species of bat utilise a site, and how they use it, so that any potential impacts on populations can be adequately assessed, avoided, and/or mitigated for, to ensure compliance with relevant legislation.

2.0 Methodology

2.1 Desk Study

A preliminary ecology and ornithology desk study was undertaken by SLR Consulting in 2019 for the consented Ben Sca Wind Farm and these data also cover the Balmeanach site[4]. This included a review of publicly available online resources to identify the presence of designated sites within 10km of the site and recent records of legally protected or otherwise notable species within 5km of the site. Data were primarily sourced from the National Biodiversity Network (NBN) Atlas[5].

As there are no bat groups that cover the Isle of Skye, the NBN Atlas was consulted for records of bats within the site and a 10km radius of the site.

The following Environmental Statements (ES) and EIA Reports for nearby wind farms were also reviewed for relevant information:

- Ben Sca Wind Farm (consented)[6];
- Glen Ullinish Wind Farm (consented)[7]; and
- Ben Aketil Wind Farm (operational)[8].

2.2 Study Area

The survey area was designed to take into account the survey requirements set out in the Bats and Onshore Wind Turbines Guidance, of relevance for the survey period[1]. The habitat assessment for bat roost potential

[2] 'Favourable conservation status' describes as situation on which a species is thriving throughout its natural range and is expected to continue to thrive in the future.
[3] As described in page 49, paragraph 83 of 'Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC (2007)'. Available at: https://ec.europa.eu/environment/nature/conservation/species/guidance/pdf/guidance_en.pdf
[4] *SLR Consulting (2019) Ben Sca Desk Study Report, SLR Consulting*
[5] Available online: http://nbnatlas.org
[6] *SLR Consulting (2020) Ben Sca Wind Farm Environmental Impact Assessment Report, January 2020*
[7] *Green Cat Renewables (2014) Glen Ullinish Wind Farm Environmental Statement, October 2014*
[8] *Atmos Consulting (2009) Ben Aketil Wind Farm Extension Environmental Statement, March 2009*

included the site area (at the time of survey) and a 200m plus rotor radius buffer from proposed turbine locations; which in this instance wholly falls within the survey area shown on **Figure 8.4.1**.

The static bat detector surveys sampled the ten proposed turbine locations, as at the time of surveying (Layout B on **Figure 2.3**), (further information is provided in Sections 2.3.2 and 2.7).

At Scoping (after the above surveys had taken place), the site boundary extended south to the settlement of Balmeanach as shown on **Figure 8.4.1**. Subsequently during design evolution (see **Chapter 2**), the site boundary was refined. This report was written based on this Scoping site boundary and therefore identifies buildings close to the southern boundary of the Scoping Site boundary as having bat potential. The application site boundary no longer includes this southern area and no infrastructure is proposed in this area however these details are presented here for completeness.

The survey area boundary and static detector locations are shown on **Figure 8.4.1**.

2.3 Field Survey Methodology and Rationale

The field survey methodology was designed with reference to wind farm specific guidelines[1]. Where the methodology deviated from the guidelines, a rationale has been provided.

2.3.1 Habitat Appraisal for Potential Bat Roost Features & Assessment of Habitat Risk

The survey area (see **Figure 8.4.1**) was walked during daylight hours to identify any potential bat roost features.

The survey was undertaken in conjunction with vegetation/mammal surveys on 20 to 22 September 2020 inclusive during two days of dry, generally stable weather, while the third day was characterised by high winds and heavy rain.

The guidelines[1] state that the search area may need to be extended if there is a high level of habitat connectivity in the surrounding area as this is considered likely to attract bats into the wind farm area from further afield. However, it was not considered necessary to extend the survey area in this instance, as there are no obvious areas of high habitat connectivity between the site and surrounding areas, which comprises open moorland, likely to be of low value to bats.

The habitat within the survey area was also assessed for its risk to bats (low, moderate or high) using criteria provided within the relevant guidelines[1] and reproduced in **Annex 8.4B**.

A follow up habitat and protected species survey was undertaken in August 2022 to survey new areas within the revised site boundary in addition to an update survey for previously surveyed areas (see **Figure 8.4.1**). The survey was undertaken during generally stable weather, however, the first day was characterised with some heavy rain showers.

2.3.2 Activity Survey – Static Bat Detector Survey

Ten static bat detectors (SM4 full spectrum detectors, Wildlife Acoustics) were deployed in spring (May), summer (July) and autumn (September) 2021, to record bat activity over a period of 16 nights per season.

The locations of each static detector which corresponded with the 10 proposed turbine locations[9] (BD1-BD10)

[9] Turbine Layout B, Figure 2.3

are shown on **Figure 8.4.1** and described in more detail in **Table 2-1**. Locations 1, 2, 4, 6, 7, 9 and 10 were within blanket bog habitat. Location 5 was positioned within upland acid grassland habitat. Locations 3 and 8 were positioned within upland heathland habitat.

Detectors were deployed with microphones attached to wooden stakes approximately 1m above ground level, facing approximately north, with detectors programmed to record continuously from 30 minutes before sunset until 30 minutes after sunrise during each night of monitoring.

Table 2-1: Static Bat Detector Locations

Sample Point	Coordinates (NGR)	Description[10]
BD1	134088, 846760	Detector located at proposed location of Turbine 1, at the northern end of the site, within blanket bog habitat, with no linear features within 50m.
BD2	134557, 846553	Detector located at proposed location of Turbine 2, at the northeast end of the site, within blanket bog habitat, with no linear features within 50m.
BD3	134047, 846218	Detector located at proposed location of Turbine 3, at the north end of the site, within upland heathland habitat, with no linear features within 50m.
BD4	134343, 846045	Detector located at proposed location of Turbine 4, at the northeast end of the site, within blanket bog habitat, with no linear features within 50m.
BD5	134275, 845740	Detector located at proposed location of Turbine 5, at the southeast end of the site, within upland acid grassland habitat, with no linear features within 50m.
BD6	133422, 845857	Detector located at proposed location of Turbine 6, at the centre of the site, within blanket bog habitat, with no linear features within 50m.
BD7	133755, 845729	Detector located at proposed location of Turbine 7, at the centre of the site, within blanket bog habitat, with no linear features within 50m.
BD8	132920, 845630	Detector located at proposed location of Turbine 8, at the west end of the site, within upland heathland habitat, with no linear features within 50m.
BD9	133233, 845349	Detector located at proposed location of Turbine 9, at the west end of the site, within blanket bog habitat, with no linear features within 50m.
BD10	133604, 845153	Detector located at proposed location of Turbine 10, at the south end of the site, within blanket bog habitat, with no linear features within 50m.

Weather Data and Survey Dates

The guidelines[1] state that ten nights of data per season should be collected, within appropriate weather conditions, specifically with a dusk temperature of 8°C or above (in Scotland), ground level wind speed of 5m/s or lower, and no rain or very light rain. In general, surveys should aim for ten consecutive nights, but in practice weather conditions may preclude this, particularly early or late in the year and in more northerly latitudes. The guidelines also go on to say that in practice, particularly in more northerly latitudes, there will be limitations on the number of suitable nights and some surveys may need to take place over longer periods which sample a range of conditions. In such cases, the survey period should be planned and justified by the ecologist and the

[10] All proposed turbine locations refer to positions of Layout B, Figure 2.3

effect on bat behaviours considered taking account of weather forecasts.

The deployment of detectors was targeted for periods where the weather forecast indicated the best possible chance for suitable weather conditions. The detectors were then deployed for a period of 16 nights during each season to maximise the chances of obtaining 10 nights of data during optimal weather conditions. Despite this, in practice it was not possible to obtain 10 nights of data in optimal weather conditions during the autumn survey period and the 10 nights with the best weather conditions during each period (including all nights meeting the criteria set out in the guidelines[1]) were selected to include within the bat activity analysis.

The dates used in the analysis, along with details of the weather conditions on those dates, are detailed in **Table 2-2**.

Table 2-2: Survey Dates and Weather Conditions

Survey Nights Used for Analysis	Sunset - Sunrise	Temperature at Sunset	Nightly Average Wind Speed (m/s) at 40m/10m	Daily Rainfall (mm)
Spring session - deployment dates: 15 – 30 May 2021 (16 nights) Sample locations: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 (10 sample points)				
15 May 2021	21:33 – 05:07	10.1	**5.5***/4.4	0.2
16 May 2021	21:35 – 05:05	10.8	1.9/1.5	0.0
17 May 2021	21:37 – 05:03	9.9	3.2/2.5	0.0
18 May 2021	21:39 – 05:01	10.6	2.6/2.1	0.2
19 May 2021	21:41 – 05:00	10.7	**5.1**/4.0	0.0
25 May 2021	21:51 – 04:51	10.3	**5.5**/4.4	1.0
26 May 2021	21:53 – 04:49	8.5	**5.4**/4.3	0.0
27 May 2021	21:54 – 04:48	14.4	4.1/3.2	0.0
28 May 2021	21:56 – 04:47	14.3	**5.7**/4.5	0.0
29 May 2021	21:57 – 04:45	13	4.4/3.5	0.0
Summer session - deployment dates: 09 – 27 July 2021 (19 nights) Sample locations: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 (10 sample points)				
17 July 2021	22:00 – 05:01	13.5	**6.0**/4.8	0.2
18 July 2021	21:58 – 05:03	13.9	3.3/2.6	0.0
19 July 2021	21:57 – 05:03	14.6	2.3/1.8	0.0
20 July 2021	21:55 – 05:06	16.2	2.7/2.1	0.2
21 July 2021	21:54 – 05:08	16.5	4.0/3.2	0.0
22 July 2021	21:52 – 05:10	17.4	3.4/2.7	0.0
23 July 2021	21:50 – 05:11	20.8	2.9/2.3	0.0
24 July 2021	21:49 – 05:13	21.7	4.3/3.4	0.0

Survey Nights Used for Analysis	Sunset - Sunrise	Temperature at Sunset	Nightly Average Wind Speed (m/s) at 40m/10m	Daily Rainfall (mm)
25 July 2021	21:47 – 05:15	16.5	4.6/3.6	0.0
26 July 2021	21:45 – 05:17	15.4	1.5/1.2	0.0
Autumn session - deployment dates: 10 – 25 September 2021 (16 nights) Sample locations: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 (10 sample points)				
10 September 2021	19:55 – 06:48	14	**6.8/5.4**	1.2
11 September 2021	19:52 – 06:50	10.9	**5.4**/4.3	**7.2**
12 September 2021	19:50 – 06:52	13.3	5.9/4.7	0.4
13 September 2021	19:47 – 06:54	12.8	**7.8/6.2**	0.4
14 September 2021	19:44 – 06:56	14.2	5.1/4.0	2.6
15 September 2021	19:42 – 06:8	12.6	4.6/3.6	2.8
17 September 2021	19:36 – 07:02	13.5	5.0/4.0	**8.6**
18 September 2021	19:33 – 07:06	12.1	**7.4/5.9**	0.0
20 September 2021	19:28 – 07:07	13.1	**8.8/7.0**	2.2
24 September 2021	19:17 – 07:15	12.4	**10.2/8.1**	1.2
weather data highlighted in **bold indicates values that do not meet the threshold criteria for appropriate weather conditions[1] (refer to Section 2.7.1 for a discussion of weather limitations).*				

Temperature and wind speed data were collected from a met mast installed at the site, which takes readings every 10 minutes. The lowest met mast sample point was at 40m height. A conversion was used to convert the wind speed data at 40m to 10m[11] (this is likely to be similar but marginally higher than wind speed at ground level). Rainfall data were obtained from a weather station at Herebost, Dunvegan[12] (located approximately 8km west of the site). It was not possible to obtain night-time only rainfall data, and therefore the amount of rain falling during the night is likely to be smaller than the rainfall figures given in **Table 2-2** (which includes the full 24-hour period). For the purposes of this assessment, light rain has been classified as daily rainfall of under 4mm.

Wind speed data was provided as average wind speed per 10-minute interval from May to September 2021 inclusive. Using these values, an average per night was determined. Since the duration of the night-time period varies over the course of the monitoring period, a simplifying protocol was applied to most efficiently undertake data analysis. This process, which is not considered likely to have significantly affected the results, involved assuming the same sunset and sunrise time for each day in each month, with the longest possible night-time period within each month used in the analysis, with an additional 30 minutes added prior to sunset and after sunrise to account for periods of twilight, as described in **Table 2-33**. This period was then used to work out the average nightly wind speed.

[11] https://wind-data.ch/tools/profile.php?lng=en

[12] Rainfall data was obtained from: http://www.isleofskyeweather.co.uk/index.php

Table 2-3:
Night-time Period: Maximum Extent Applied for Each Season to Determine Nightly Average Wind Speed

Month	Latest sunrise + 30 minutes	Earliest sunset -30 minutes
Spring	06:18	20:36
Summer	05:54	21:05
Autumn	07:56	18:31

2.4 Bat Sonogram Analysis

Bat files were analysed in full spectrum format using Kaleidoscope Pro (version 5.1.3) software. An auto identification filter within Kaleidoscope Pro was used initially to assign calls to likely species, using a Bats of Europe filter (version 5.1.0). This software allows data to be classified automatically with bat species which fit the same call characteristics that each call profile provides. While the software is efficient, it is not totally infallible, therefore the following manual checks by an experienced bat worker skilled in bat call identification at SLR were also undertaken as follows:

- due to the small number of calls within the data set, each of the auto-id results were manually checked and corrected if needed to confirm identification; and
- files assigned by the filter as being noise were also checked manually, to ensure no faint calls were missed.

John Russ (2021)[13] was used as the main reference text for the above process. When interpreting the data, the following premise was used:

- for the purpose of differentiating between common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*Pipistrellus pygmaeus*) bat calls with a peak frequency between 41.1kHz and 50kHz have been classified as common pipistrelle. Above 50kHz as soprano pipistrelle. In this data set, only common pipistrelle was recorded.

For the comparison of results a quantity called a 'bat pass' has been created. A bat pass has been defined as a file generated by the bat detector, which contains two or more bat calls (likely attributed to the same bat). The detectors are programmed to generate a new file when no bat call has been detected for at least 1 second. The number of bat passes does not relate to the number of bats present in one location (as one bat may make several passes); yet rather, gives an indication of the level of bat activity in that location over each recording period. It must be noted that Kaleidoscope Pro will only attribute one species label to a sound file, even if more than one bat species was present.

2.5 Survey Personnel

Nicola Faulks CEcol MCIEEM undertook the habitat assessment for bat roosting potential, and Stephen Bentall deployed the static detectors at the start of the spring monitoring period. Bat call analysis was undertaken by

[13] Russ, J. (2021) Bat Calls of Britain and Europe: A Guide to Species Identification. Pelagic Publishing, Exeter

Rachel McLeod, SLR Assistant Ecologist.

Nicola is an ecologist and botanist with more than ten years' professional experience who has worked on a number of upland wind farm sites in Scotland. Stephan Bentall has over ten years' professional experience within the ecology sector.

2.6 Assessment of Relative Bat Activity Levels

In accordance with current guidelines[1], the relative level of bat activity recorded during the static detector surveys was analysed through the use of the secure online tool *Ecobat*[14], initially designed by the University of Exeter and now hosted and developed by the Mammal Society[15]. *Ecobat* compares data entered by the user with bat survey information collected from similar areas at the same time of year and (where possible) in comparable weather conditions. *Ecobat* generates a percentile rank for each night of activity and provides a numerical way of interpreting the relative levels of bat activity recorded at a site with other sites across the same regions or across Britain as a whole.

The static bat detector survey data were entered into the *Ecobat* tool and relative levels of activity were determined by comparison with a reference data set including records from within 30 days of each survey date and within 200km of the survey location. Although there is an option to include data within a 100km radius only, a 200km radius was used (covering northern and central Scotland) in order to provide enough reference points to allow for a meaningful output (the dataset was compared against 886 records within a 200km radius of the site), given the geographical location, with much of the search radius comprising sea.

Only bat presence data is captured by *Ecobat*. The tool does not capture nights or sample points where no bat activity is recorded, such that the output statistics and percentiles relate only to those nights where bats were recorded. In this instance, this related to just 11.4% of the nights surveyed.

For each night where bat activity was recorded, *Ecobat* reports the percentile (and associated confidence limits) of the night of data against the reference range. For example, data reported as being within the 80th percentile means that 80% of the nights within the reference range have less than or equal to the number of bat passes than the night being analysed.

The guidelines[1] define bat activity levels on a particular night as:

- 0 - 20th percentile – low;
- 21st - 40th percentile – low to moderate;
- 41st – 60th percentile – moderate;
- 61st – 80th percentile – moderate to high; and
- 81st – 100th percentile – high.

[14] http://www.mammal.org.uk/science-research/ecostat/

[15] 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.

2.7 Survey Limitations

2.7.1 Automated Survey: Weather

Due to the nature of the climate on the Isle of Skye it was not possible to collect 10 consecutive nights of data in suitable weather conditions in spring and autumn, as such continuous weather windows very rarely exist. For example, the average daily rainfall at Dunvegan is 4mm, and the average annual number of rain days (since 2012) is 280[12].

In summer it was possible to collect 10 consecutive nights of static bat data in suitable weather conditions.

In the spring deployment six nights had weather conditions that exceeded the threshold for appropriate weather (20 to 24 May and 30 May) and were thus removed from the analysis. The 10 nights of data used for spring are for two periods of five suitable nights, separated by five days with high rain/wind and low temperatures that exceeds the threshold.

During the autumn sampling period, of the 10 nights used for the analysis, only four nights of bat data were collected in suitable weather conditions. To meet the minimum number of nights required in the guidelines we added six additional nights with the next best weather conditions (see dates in bold in **Table 2-2**). Five of the six nights used, wind speed was between 5.4m/s and 8.1m/s which is slightly over the 5m/s threshold set within the guidelines[1]. The number of bat passes in autumn were extremely low with just two bat passes recorded through the full sampling period on 13 and 17 September where weather conditions exceeded the threshold (13 September – wind 6.2m/s and 17 September – daily rainfall 8.6mm). As such, it is concluded that the slightly higher wind speed on these nights has not precluded bat activity and is therefore not a significant constraint.

Overall, given the location of the site and the habitats present, it is concluded that sufficient bat data has been collected in suitable conditions so as to be able to assess the potential impacts of the Proposed Development upon bats.

2.7.2 Automated Survey: Equipment Malfunction

Of the 10 detectors deployed, one detector (BD6) failed to record for the full summer monitoring period and as such no survey data has been gathered at this particular sample point in summer. The reasons for the failure are not known. In our experience occasional detector failures are unavoidable, and given the failure only occurred at one location, during one recording session, it is not considered likely to significantly affect the assessment.

2.7.3 Chance

An ecological study provides only a ‘snapshot’ of the conditions prevailing at the time of survey. Lack of evidence of any one protected bat species does not necessarily preclude them from being present on site at a later date. Whilst it is considered unlikely that any significant evidence of additional bat species has been overlooked, due to the nature of the subjects of ecological surveys it is feasible that species that use the site may not have been recorded by virtue of their seasonality, habit or random chance. It is considered unlikely however, that additional surveys of the site at this time would materially alter the conclusions of this report.

During the August 2022 survey, three residential buildings were identified to have potential for bat roosts, however due to a lack of site access the buildings could not be fully assessed.

3.0 Results

3.1 Desk Study

This desk study utilised data from the desk study report[16] which was undertaken for the adjacent and now consented Ben Sca Wind Farm and provides coverage of the Balmeanach site.

The Ben Sca desk study report refers to 14 bat records located between 5km and 10km from the Ben Sca site, comprising common and soprano pipistrelle. This includes:

- one common pipistrelle was recorded within 5km;
- one soprano pipistrelle record from 2013, located between 5km and 10km; and
- six records of unspecified Pipistrellus species within 5km and 10km.

In addition to the Ben Sca desk study, 12 further common pipistrelle records within 10km of the Balmeanach site were returned from NBN Atlas, dating between 1980 and 2018.

It should be noted that some of these records are only accurate to a 10km grid square, therefore they may relate to records further than 10km from the site.

Bat activity surveys using static bat detectors were carried out during the 2019 active bat season as part of the EIA for the consented Ben Sca Wind Farm, located 0.7km to the north west of the site. These surveys recorded low numbers of common pipistrelle on site, with an average of 0.31 passes per night recorded.

Low numbers of common pipistrelle were also recorded during surveys for Glen Ullinish Wind Farm (2.8km south east of the site).

A Natterer's bat (*Myotis nattereri*) summer roost was also identified at the southern end of Edinbane Wind Farm (record reported by SNH (now NatureScot)) in the Balmeanach scoping response. The precise location of this roost is not shared due to the sensitive nature of this roost, however it is around 2km south east of the Balmeanach site, as its closest point.

3.2 Field Surveys

3.2.1 Habitat Assessment

Roost Potential Survey

There are no structures, trees or underground structures such as mine entrances, which could be used by roosting bats within the study area. The nearest trees to the development site are 880m from the closest detector location (BD8).

August 2022 Survey

During the August 2022 survey there were no bat roosts identified within the site boundary. Three houses were

[16] SLR Consulting (2019) *Proposed Ben Sca Wind Farm: Desk Study Report*.

identified along the Balmeanach Road to the south of Scoping site boundary that may have bat roost potential:

- 1. Allt Ruairidh at NGR 132488, 843535;
- 2. Balmeanach House at NGR 132105, 843385; and
- 3. An Cleireach at NGR 132939, 843608.

A ground-based assessment was not carried out at these locations as no land access was granted during the site visit. No infrastructure is currently proposed in this area. If this was to change, further ground-based assessment would be required to establish the presence location of any potential roost entry and exit points and ensure appropriate mitigation is put in place.

Habitat Risk Assessment

The habitats at the site are considered to be of low habitat risk for bats, according to criteria presented in the guidelines[1] and reproduced in **Annex 8.4B**. Specifically, the majority of the site comprises exposed upland habitats with blank bog making up the principle component, with shrub heath and acid grassland, representing low quality habitat for foraging/commuting bats. There are upper reaches of burns within the site, however these are small, and constitute minor rather than prominent linear features that are only likely to be used by small numbers of foraging/commuting bats, if at all. There is a lack of potential roosting habitat on the site, and the immediately surrounding areas appear to have limited opportunities for roosting bats with some patches of forestry plantation (ascertained from aerial imagery).

3.2.2 Activity Surveys – Static Bat Detector Survey – All Species

Only one species, Common pipistrelle, was recorded during the static bat detector surveys during all seasons.

Spatial Distribution

Table 3-1 reports the maximum, median and mean bat passes per night at each location, across all seasons combined. It shows that:

- most activity (based on mean and median) was recorded at sample locations BD8 and BD9;
- least activity (based on mean and median) was recorded at sample location BD1;
- most variable activity (based on a large difference mean and median) was recorded at sample locations BD8 and BD9; and
- a total of 44 bat passes were recorded by the 10 static bat detectors over a total of 290 nights of recording during spring, summer and autumn 2021. The highest number of bat passes recorded at any one location on one night was 3 (at location BD9 on 24 and 26 July 2021; and BD3 on 29 May 2021).

Overall, the geographical variation in bat activity across the site was relatively low, with all sample locations recording <0.2 bat passes per night on average (mean).

Table 3-1: Summary of Results per Sample Location Across All Seasons

Detector Ref.	Survey Nights Included Within Analysis	Total Bat Passes: All Common Pipistrelle	Maximum Bat Activity (Bat Passes per Night)[a]	Median Bat Passes per Night	Mean Bat Passes per Night
BD1	30	1	1	0	0.03
BD2	30	6	2	0	0.2
BD3	30	8	3	0	0.3
BD4	30	2	1	0	0.07
BD5	30	3	1	0	0.1
BD6	20	2	1	0	0.07
BD7	30	5	2	0	0.2
BD8	30	3	1	0	0.1
BD9	30	9	3	0	0.3
BD10	30	5	2	0	0.2
a = highest number of bat passes recorded on any one night.					

Table 3-2 provides the same data, but instead summarises the results for blanket bog, upland heathland and upland acid grassland habitat. It illustrated that:

- most activity (based on mean) was recorded in upland heathland habitats;
- least activity (based on mean) was recorded in upland acid grassland; and
- most variable activity (based on a large difference mean and median) was recorded in upland heathland.

It should however be noted that the variation in activity exhibited was minimal and the number of bat passes recorded within all habitat types remained low.

Table 3-2: Summary of Results per Broad Habitat Type Across All Seasons

Habitat Type and Detector Ref.	Survey Nights Included Within Analysis	Total Bat Passes: All Common Pipistrelle	Maximum Bat Activity (Bat Passes per Night)[a]	Median Bat Passes per Night	Mean Bat Passes per Night
Blanket bog (BD1, BD2, BD4, BD6, BD7, BD9, BD10)	200	30	3	0	0.14
Upland heathland (BD3 and BD8)	60	11	3	0	0.18
Upland acid grassland (BD5)	30	3	1	0	0.1

Habitat Type and Detector Ref.	Survey Nights Included Within Analysis	Total Bat Passes: All Common Pipistrelle	Maximum Bat Activity (Bat Passes per Night)[a]	Median Bat Passes per Night	Mean Bat Passes per Night
Site Total (All locations)	**290**	**44**	**3**	**0**	**0.15**
a = highest number of bat passes recorded on any one night.					

Tables 3-1 and **3-2** report the total number of bat passes recorded at the sample locations, as well as the median and mean bat passes per night. The data is skewed (i.e. not normally distributed), due to most nights recording nil bat passes, and most nights where bat activity has been recorded recording just one or two bat passes. Therefore, in accordance with the guidelines[1] the median bat passes per night (rather than mean) is the more representative statistic in this situation (although both have been reported for information).

Temporal Distribution

A summary of the results per survey season is provided in **Table 3-3**, to illustrate any seasonal variation. **Table 3-3** reports the maximum, median and mean bat passes per night at all locations, for all species combined, for each survey season: It shows that:

- most activity (based on mean and median) was recorded during summer;
- least activity (based on mean and median) was recorded during autumn; and
- most variable activity (based on a large difference between mean and median) was recorded during summer.

Although a slight seasonal variation was recorded with peak numbers recorded in summer, the number of bat passes recorded overall in all seasons was low, with a mean of <1 bat passes per night recorded during all seasons.

Table 3-3: Summary of Results per Season Across All Sample Locations

Season	Survey Nights Included Within Analysis	Total Bat Passes: All Common Pipistrelle	Maximum Bat Activity (Bat Passes per Night)[a]	Median Bat Passes per Night	Mean Bat Passes per Night
Spring	90	14	3	0	0.14
Summer	80	28	3	0	0.3
Autumn	90	2	1	0	0.02
a = highest number of bat passes recorded on any one night.					

High Collision Risk Species

High collision risk species in Scotland, as defined by current guidelines, include:

- Common pipistrelle;
- Soprano pipistrelle;

- Nathusius' pipistrelle (*Pipistrellus nathusii*);
- Noctule bat (*Nyctalus noctula*); and
- Leisler's bat (*Nyctalus leisleri*).

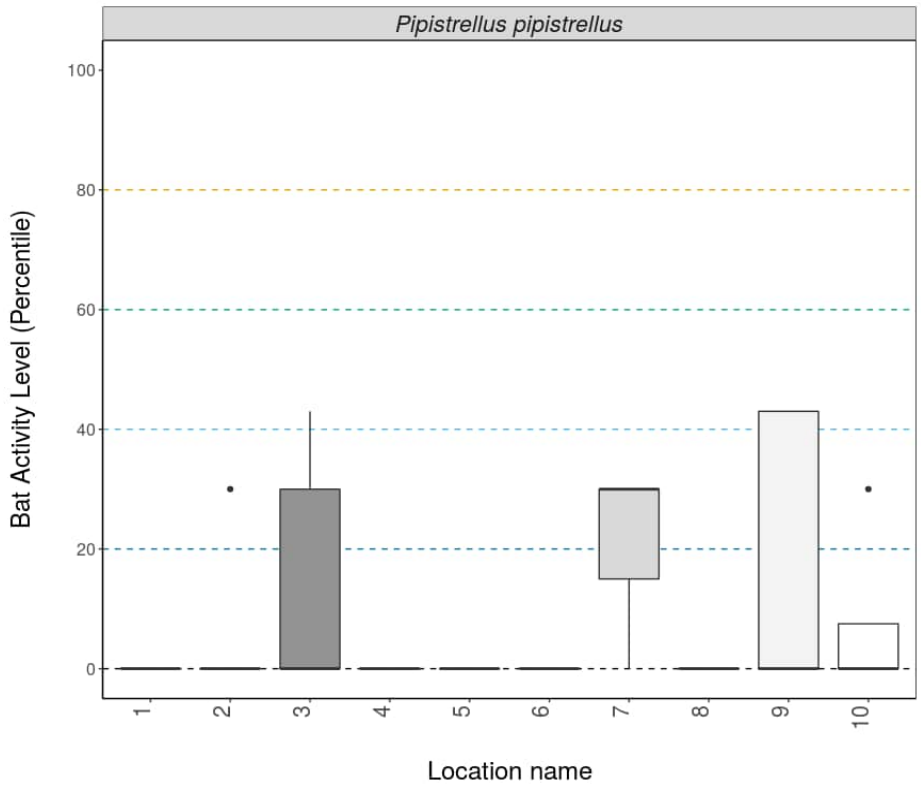
Common pipistrelle was the only high collision risk species recorded to utilise the site. Relative abundance (common, rarer or rarest species) is combined with the collision risk of a species to indicate the potential vulnerability of populations of British bat species (see **Annex 8.4C**). Common pipistrelle is classified as being common and having a medium population vulnerability in Scotland.

3.2.3 Bat Activity Relative to Other Sites

Ecobat compares the input data set with a reference range to provide a numerical way of interpreting the relative levels of bat activity recorded at a site with other sites across the same region. In this case data within 200km of the site, consisting of 886 records, have been used. **Table 3-4** and **Graph 3-1** details the percentile statistics generated from *Ecobat* for those nights where bats were recorded.

The median percentile for common pipistrelle activity on those nights where bats were recorded ranges from 0 ('low' activity; nine detector locations fell into this category) to 30 ('low to moderate' activity; one detector location fell into this category), when compared against the reference range. The detector location at which the greatest common pipistrelle activity was recorded was sample location BD7.

Although five nights represented 'low-moderate' activity, and three nights represented 'moderate' activity, this only represents 11.4% of the total nights for which data have been analysed, as the vast majority (257) of nights recorded no bats. The median number of common pipistrelle passes recorded on any night was zero at all locations, and the mean number of passes recorded (across all detector locations combined) was 0.15 passes per night (i.e. approximately one bat pass every 7 nights).



Graph 3-1: Differences in activity between static detector locations. The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity).

Table 3-4: Summary of Ecobat Outputs, by Detector, Compared with Sites within 200km

Location Ref.	Species	Nights of Activity						Median Percentile (95% CIs)[17]	Median Bat Activity Level[18]	Max. Percentile	Max. Bat Activity Level[19]	No. of Records Compared Against
		High	Mod/ High	Mod	Low/ Mod	Low	Nil Activity					
1	Common pipistrelle	0	0	0	0	1	29	0 (0)	Low	0	Low	886
2	Common pipistrelle	0	0	0	1	4	25	0 (0-0)	Low	30	Low - Moderate	886
3	Common pipistrelle	0	0	1	1	3	25	0 (36.5 – 36.5)	Low	43	Moderate	886
4	Common pipistrelle	0	0	0	0	2	28	0 (0-0)	Low	0	Low	886
5	Common pipistrelle	0	0	0	0	3	27	0 (0-0)	Low	0	Low	886
6	Common pipistrelle	0	0	0	0	2	18	0 (0-0)	Low	0	Low	886
7	Common pipistrelle	0	0	0	2	1	27	30 (30-30)	Low - Moderate	30	Low - Moderate	886
8	Common pipistrelle	0	0	0	0	3	27	0 (0-0)	Low	0	Low	886
9	Common pipistrelle	0	0	2	0	3	25	0 (0-0)	Low	43	Moderate	886
10	Common pipistrelle	0	0	0	1	3	26	0 (0-0)	Low	30	Low - Moderate	886
Total (All locations)	**Common pipistrelle**	**0**	**0**	**3**	**5**	**25**	**257**	**N/A**	**Low**	**N/A**	**Low**	**886**

[17] Median percentiles and Confidence Intervals (Cis) are calculated from the nights where bat activity was recorded only (i.e. it does not include nights where no bat activity was recorded).

[18]Activity level of the median number of bat passes recorded per night, from the nights where bat activity was recorded only, determined by percentile from reference range within Ecobat, using the following parameters: 0-20th percentile=low, 21st-40th percentile=low/mod, 41st-60th percentile = mod, 61st-80th percentile = mod/high, 81st – 100th percentile = high.

[19] Activity level of the night with the highest number of bat passes recorded, determined by percentile from reference range within Ecobat as detailed above.

4.0 Discussion and Conclusions

4.1 Summary Overview

The desk study and field survey identified that:

- habitats within the site constitute 'low risk' bat habitat in accordance with criteria outlined in **Annex 8.4B**;
- a Natterer's bat summer roost was previously identified at the south end of Edinbane Wind Farm (record reported by NatureScot) although the precise location cannot be shared, it is approximately 2km south east of the Balmeanach site;
- two species of bats were recorded locally (within 10km), including common pipistrelle and soprano pipistrelle. Common pipistrelle was recorded at all survey locations during each season in small numbers. Soprano pipistrelle was not recorded to be present on site at the time of survey/at the survey locations;
- most bat activity (all species combined) was recorded at upland heathland locations, least activity was at upland acid grassland. Most regular activity was recorded in upland heathland habitats;
- location BD3 and BD9 exhibited the greatest levels of bat activity within the site, while locations BD1, BD4 and BD7 displayed considerably less activity;
- the greatest level of bat activity was recorded in autumn, across all survey locations; and
- there are three residential buildings adjacent to the road at the south of the Scoping site boundary identified as having suitably to support bat roosts. No infrastructure is currently proposed in this area.

4.2 'High Collision Risk' Bat Species

4.2.1 Common pipistrelle

Common pipistrelle is classified by the guidelines[1] as being 'common' species with a high collision risk and medium population vulnerability.

Common pipistrelle was recorded at all sample locations in the site through all three survey seasons in low numbers. The highest bat activity was recorded during autumn and sample locations BD3 and BD9. Most common pipistrelle activity recorded was in sample locations BD3 and BD9, these locations are in upland heathland and blanket bog habitats respectively. The level of activity most frequently represents 'low' bat activity levels when compared against records from a similar date and geographic location in Ecobat. For example, only 1% of nights sampled represented moderate bat activity, 1.7% represented low to moderate activity, 8.7% represented low bat activity, with zero nights representing high and moderate to high activity, and 88.6% of nights recorded nil bat activity.

4.2.2 Other High-Risk Species

Soprano pipistrelle is classified by the guidelines[1] as being a 'common' species with a high collision risk and medium population vulnerability. One soprano pipistrelle record was returned for the desk study, found between 5km and 10km of the site. The Core Sustenance Zone (CSZ) refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence of the resilience and conservation

status of the colony using the roost. The CSZ for soprano pipistrelle is 3km, given that the only recorded soprano pipistrelle was between 5km and 10km away suggests it is unlikely that this species would occur on the site. The site has limited suitable roost features and is mainly comprised of blanket bog habitat, therefore the chances of roosting and foraging is low. It is possible that this species may occasionally occur on the site, although the fact that none were recorded during the static detector surveys indicates that this would likely be an infrequent occurrence. Additionally, the consented Ben Sca Wind Farm will be approximately 0.7km north west from the Proposed Development and the bat activity surveys undertaken for Ben Sca did not record any soprano pipistrelle.

4.3 Other Bat Species

Natterer's bat is classified by the guidelines[1] as being a 'rarer species' with low collision risk and low population vulnerability. NatureScot report a roost record within the local area, and therefore it is possible that this species could occur on the site, however the fact that this species was not recorded on the site during the static detector monitoring indicates that the site is not important for this species.

FIGURES

ANNEXES

ANNEX 8.4A

Relevant Legislation

All bat species in Scotland are classed as European protected species. They receive full protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (The Habitats Regulations) (as amended in Scotland[20]). For any bat species, this makes it an offence to deliberately or recklessly:

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

It's also an offence to:

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

In addition to the Habitats Regulations, The Nature Conservation (Scotland) Act 2004 (as amended) places a statutory duty on public bodies to further the conservation of biodiversity. Species and habitats the Scottish Ministers consider to be of principle importance for biodiversity conservation have therefore been listed within the Scottish Biodiversity List (SBL)[21]. The following bat species have been included within this list are therefore considered a conservation prioirty:

- Common pipistrelle *Pipistrellus pipistrellus*;
- Soprano pipistrelle *Pipistrellus pygmeaus*;
- Nathusius' pipistrelle *Pipistrellus nathusii*;

[20] The Conservation (Natural Habitats & c.) Regulations 1994 have been amended by the Conservation (Natural Habitats & c.) (EU Exit) (Scotland) (Amendment) Regulations 2019. This means that the Habitat Regulations remain in force following the UK's departure from the European Union.
[21] The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish ministers consider to be of principal importance for biodiversity conservation in Scotland. Available at https://www.nature.scot/doc/scottish-biodiversity-list.

- Daubentons bat *Myotis daubentonii*;
- Whiskered bat *Myotis mystacinus*;
- Natterers bat *Myotis nattereri*;
- Brants bat *Myotis brantdtii*; and
- Noctule *Nyctalus noctula*.

ANNEX 8.4B

Criteria for Assessing Habitat Risk for Bats

Habitat Description	Description
Low	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 by foraging bats. Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.
High	Numerous suitable buildings, trees (particularly mature ancient woodland) or other structures with moderate-high potential as roost sites on or near the site, and/or confirmed roosts present close to or on the site. Extensive and diverse habitat mosaic of high quality for foraging bats. Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows. At/near edge of range and/or on an important flyway. Close to key roost and/or swarming site.

Table extracted from NatureScot (2022) guidelines[1].

ANNEX 8.4C

Collision Risk, Relative Abundance and Overall Population Vulnerability of Bat Species in Scotland

Scotland	Low collision risk	Medium collision risk	High collision risk
Common species	n/a Low vulnerability	n/a Low vulnerability	Common pipistrelle Soprano pipistrelle Medium vulnerability
Rarer species	Brown long-eared Daubenton's Natterer's Low vulnerability	n/a Medium vulnerability	n/a High vulnerability
Rarest species	Whiskered Brandt's Medium vulnerability	n/a High vulnerability	Nathusius' pipistrelle Noctule Leisler's High vulnerability

Table taken from NatureScot (2021) guidelines[1].

130000 131000 132000 133000 134000 135000 136000

848000 847000 846000 845000

LEGEND

- Application Site Boundary
- Proposed Turbine Location
- Proposed Permanent Met Mast
- Proposed Crane Hardstanding
- Proposed Construction Compound
- Proposed Substation
- Proposed Turning Head
- Potential Borrow Pit
- Existing Access Track
- Consented Access Track

Proposed Track Alignment

- Proposed
- Proposed Option A
- Proposed Option A1
- Proposed Option A2
- Proposed Option B
- Scoping Site Boundary
- May 2021 Survey Area
- Bat Detector Location
- Buildings 1-3

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10

BD1 BD2 BD3 BD4 BD5 BD6 BD7 BD8 BD9 BD10

1 2 3

Ben Aketil Wind Farm
Edinbane Wind Farm
Power Station
Ben Aketil
Beinn a' Chearcaill
Cruachan Beinn a' Chearcaill
Cruachan Glen Vic Askill
Glac na Brothaig Airde
Beinn a' Chlèirich
An Cleireach
An Groban
Beinn Bheag
Cnoc a' Chrochaire
Loch Cnoc a' Chrochaire
Caroy/ An Cadha Ruadh
Balmeanach/ Baile Meadhanach
Glen Ullinish
Glen Vic Askill
Glen Heysdal
Glean Eoghainn
Caroy River
Allt a' Choire
Allt Ruairidh
Allt Bhaile Mheadhonaich
Allt nan Cat
Rageary Burn
Old Shielings
Cairns
Sheepfold
St John's Chapel (ruin)
Lag Buidhe
Sheep Wash
Waterfall

0 200 400
Metres

N

BALMEANACH WIND FARM LIMITED

SLR
4/5 LOCHSIDE VIEW
EDINBURGH PARK
EDINBURGH
EH12 9DH
T: +44 (0)131 335 6830
www.slrconsulting.com

BALMEANACH WIND FARM - EIA

TA 8.4 - BAT REPORT

STATIC DETECTOR LOCATIONS

FIGURE 8.4.1

Scale 1:20,000 @ A3

Date JULY 2023

11223.00001.0352.0 Figure 8.4.1 Static Detector Locations

EUROPEAN OFFICES

United Kingdom

AYLESBURY
T: +44 (0)1844 337380

BELFAST
T: +44 (0)28 9073 2493

BRADFORD-ON-AVON
T: +44 (0)1225 309400

BRISTOL
T: +44 (0)117 906 4280

CARDIFF
T: +44 (0)29 2049 1010

CHELMSFORD
T: +44 (0)1245 392170

EDINBURGH
T: +44 (0)131 335 6830

EXETER
T: + 44 (0)1392 490152

GLASGOW
T: +44 (0)141 353 5037

GUILDFORD
T: +44 (0)1483 889800

LONDON
T: +44 (0)203 805 6418

MAIDSTONE
T: +44 (0)1622 609242

MANCHESTER
T: +44 (0)161 872 7564

NEWCASTLE UPON TYNE
T: +44 (0)191 261 1966

NOTTINGHAM
T: +44 (0)115 964 7280

SHEFFIELD
T: +44 (0)114 245 5153

SHREWSBURY
T: +44 (0)1743 23 9250

STIRLING
T: +44 (0)1786 239900

WORCESTER
T: +44 (0)1905 751310

Ireland

DUBLIN
T: + 353 (0)1 296 4667

France

GRENOBLE
T: +33 (0)**6 23 37 14 14**