



Dean Moor Solar Farm

Environmental Statement: Appendix 8.3 – Bat Survey Report on behalf of FVS Dean Moor Limited

March 2025
Prepared by: Stantec UK Ltd
PINS Ref: EN010155
Document Ref: 6.3
Revision: 1



Firma Energy

 **ib vogt**



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Bat Survey Report 2023-2024
Appendix 8.3

March 2024

DEAN MOOR SOLAR FARM
BAT SURVEY REPORT 2023-2024
APPENDIX 8.3
PREPARED ON BEHALF OF FVS DEAN MOOR LIMITED

Project Ref:	34641/A5/Appendix 8.3
Status:	Final
Issue/ Rev:	1
Date:	March 2024
Prepared by:	IA
Checked by:	DM

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Figure 1: Static Detector Location

1 Introduction

1.1 Overview

- 1.1.1 This report presents the results of a bat survey for the Dean Moor Solar Farm (the Proposed Development), commissioned by FVS Dean Moor Limited to undertake. This Bat Survey Report forms Appendix 8.3 of Chapter 8 – Biodiversity of the PEIR for the Proposed Development.
- 1.1.2 The Proposed Development is located on land between the villages of Gilgarran and Branthwaite in West Cumbria (the Site) which is situated within the administrative area of Cumberland Council (the Council).
- 1.1.3 The purpose of the bat survey is to identify the species using the Site and determine levels of bat activity. The results will be used to inform the ecological impact assessment, as well as the evolving design of the Proposed Development.

1.2 Site Location and Description

- 1.2.1 The Site is 279.50 hectares ('ha') in area and is located between the villages of Gilgarran and Branthwaite in West Cumbria (PEIR Figure 1.1). The Site is bisected by a minor road that runs between Gilgarran and Branthwaite Edge hereafter referred to as the "Gilgarran Road".
- 1.2.2 The Site is predominantly pasture that is grazed by sheep. It is generally drained by a series of unnamed minor watercourses which run broadly south to north and west to east in Area C. The watercourses coalesce near Branthwaite Rigg and flow north to ultimately join the River Derwent.
- 1.2.3 The land within the Site has a varied topography with steep-sided hills associated with Thief Gill in Area C; and flat land to the north, east and west around Areas A and B. Small areas of plantation woodland are present in and adjacent to Areas A and B.

- 1.2.4 Land surrounding the Site is dominated by grazing pasture and arable farmland, with large areas of plantation woodland also located north, east, and west of the Site.

1.3 Proposed Development

- 1.3.1 The Proposed Development comprises the proposed construction, operation and maintenance, and decommissioning of a renewable energy generating project on 279.50ha of land between the villages of Gilgarran and Branthwaite in West Cumbria.
- 1.3.2 The Proposed Development will have the capacity to export up to 150MW of electricity at any time. The generating station would also involve the construction and operation of up to 100MW of BESS.
- 1.3.3 A concept layout of the Proposed Development is presented in the PEIR (Figure 3.1). Site areas are shown on PEIR Figure 3.3.

1.4 Report Objectives

- 1.4.1 The objectives of this report are to:
- Outline survey methodologies and relevant survey guidance; and
 - Detail the results of the survey.

2 Methods

2.1 Overview

2.1.1 Bat activity surveys were undertaken using static bat detectors positioned around the Site in May, July, August, and September of 2023, at six locations within the Site.

2.1.2 Potential bat roosting assessment for buildings and trees as well as general habitat assessment are described in PEIR Appendix 8.1.

2.2 Field Survey

2.2.1 Static bat detector surveys were conducted using Wildlife Acoustics Song Meter 4 (SM4) bat detectors. To sample different habitats present, SM4 bat detectors were deployed across the Site.

2.2.2 SM4 bat detectors were deployed to record bat activity at six locations during the following periods: 24 May to 06 June (survey period 1); 20 July to 02 August (survey period 2); 17 to 30 August 2023 (survey period 3) and 14 to 27 September 2023 (survey period 4). A representative sample of up to 5 consecutive days from each survey period was used for data analysis purposes (see Limitations below). The data for each species was then extracted for analysis.

2.2.3 For each survey period, the detector was set to record from half an hour before sunset to half an hour after sunrise. The table below provides the location and habitat description of SM4 bat detectors (D1, D2, D3, D4, D5 and D6) which are also shown in Figure 1. Photographs of each location are also provided.

Table 1: SM4 bat detector location and habitat description for six detectors on Site

SM4 bat detector	Location (OS grid reference)	Habitat description
D1	NY 04304 23570	Line of trees near broadleaved plantation woodland and scrub habitat on Gilgarran Road.
D2	NY 04448 23262	Edge of mixed plantation woodland near several watercourses in Area C.
D3	NY 04650 22596	Near watercourse within Thief Gill in Area C.
D4	NY 04264 24502	Hedgerow near broadleaved woodland plantation in Area A.
D5	NY 04049 24542	Hedgerow in Area A between D4 and D6.
D6	NY 03917 24428	Hedgerow near dense scrub habitat in Area A.

2.2.4 The locations were selected to be within habitat where bat activity was most likely to occur, compared to other areas of the Site (for instance, close to woodland and/or watercourse or within a hedgerow as opposed to in species poor grassland).

2.3 Call Analysis

2.3.1 Bat calls were analysed using Wildlife Acoustics Kaleidoscope Pro auto-identification software, which labelled and made a preliminary sorting of the files according to species. These were then checked manually. All *Myotis* bat species were combined into a single group labelled *Myotis* sp. Bat calls categorized as “No ID” using Kaleidoscope were manually analysed and labelled according to the appropriate species. The number of bat passes was counted and relative activity¹ calculated.

2.4 General Habitat Setting

2.4.1 The habitats on Site primarily consist of pasture grazed by cattle and sheep. Hedgerows, patches of plantation woodland and scrubland are also present. Additionally, there are ponds and several watercourses. The habitat surrounding Site is dominated by grazing pasture and arable

¹ Relative activity (referred to as ‘activity’ in the main text) of different species of bats is calculated by counting the number of bat passes (P) recorded within a unit of time – hour (h).

farmland, with large areas of plantation woodland located north, east, and west of Site.

2.4.2 The majority of the Site is likely to provide relatively limited foraging opportunities and limited cover from adverse weather including high winds.

2.5 Limitations

2.5.1 There were four instances when bat detectors did not record five full nights of activity. On two occasions microphones were accidentally disconnected by livestock; however, 3 and 4 full nights of activity were recorded. Where possible, SM4s were placed higher up beyond the reach of livestock which avoided this issue arising again. On two other occasions SD cards malfunctioned and any data recorded was lost. Details for static detector failures are provided in Table 2 below.

Table 2: SM4 bat detector failure location, total number of nights recorded and survey period

Static detector	Total number of nights recorded	Survey period of occurrence
D6	3	Survey period 2
D3	4	Survey period 4
D4	0	Survey period 3
D6	0	Survey period 4

2.5.2 All other survey periods covered 5 full nights, so that 1,421 hours of recording were successfully made across 6 static detectors. 154 hours of recording were lost as described above.

2.5.3 Table 8.3 of the BCT Bat Survey Guidelines² guidance would suggest that two static detectors would be deployed at Dean Moor (one for each part of the site – Area A and B, and Area C). This is on the basis of an assumed habitat assessment of low suitability, and also takes into account the relatively limited effects of solar development on some bat species. The

² Bat Surveys for Professional Ecologists: Good Practice Guidelines. (2016) Collins, J. Bat Conservation Trust: Guidelines 3rd Edition (ed).

results indicate a limited range of species and relatively low levels of activity, which bears out the assumption of low habitat suitability.

- 2.5.4 Six detectors were used at this Site which exceeds the number that would be recommended as part of an activity survey undertaken alongside transect surveys. This means that limited equipment failure is not likely to give rise to a significant limitation on the results (the proportion of “non-recording” time is relatively small). This is particularly the case given the overall low bat activity that was recorded. As a result, the dataset is considered sufficient to provide a comprehensive characterisation of bat activity at the Site.

3 Results

3.1 Static Bat Detector Survey Results

- 3.1.1 The data analysed were gathered across four months, over a total of 1,421 analysed survey hours. During the survey periods, six species were recorded: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, Nathusius' *Pipistrellus nathusii*, *Myotis* species *Myotis spp*, brown long-eared bat *Plecotus auritus*, and noctule bat *Nyctalus noctula*.
- 3.1.2 The number of bat passes (P) and the bat activity (B/h) across the four months of survey for each species are shown in Table 3.
- 3.1.3 Soprano pipistrelle was the most frequently recorded species (7,449 P, 2.1 B/h) followed by common pipistrelle (5,701 P, 1.6 B/h) and *Myotis* sp. (629 P, B/h 0.2).

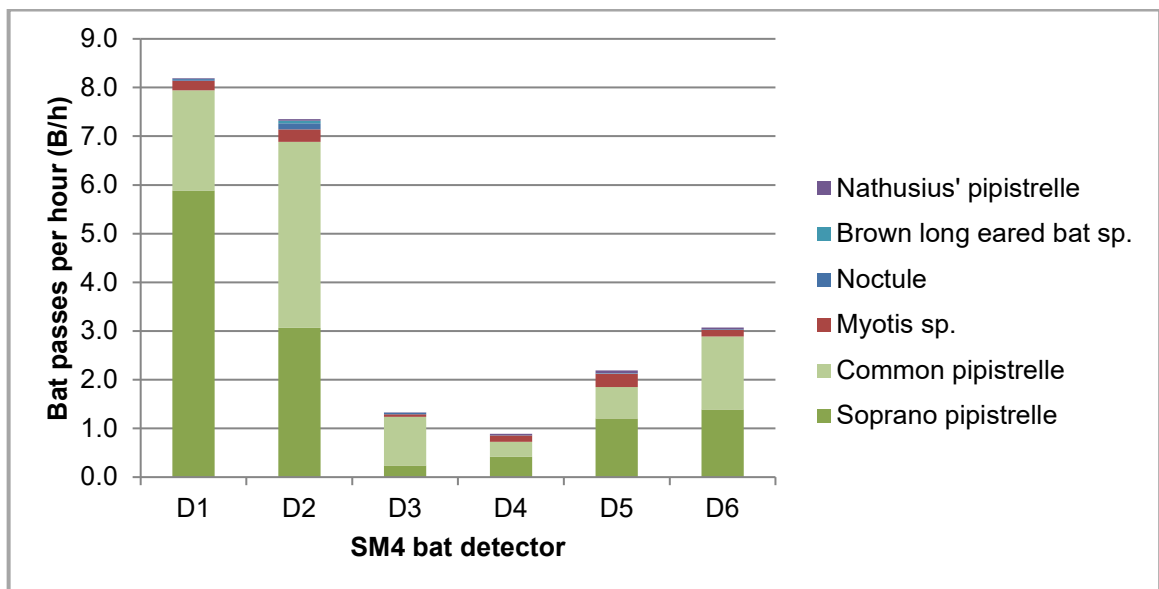
Table 3: Number of bat passes (P) and bat activity (B/h) of bat species during all automated surveys

Species	Number of bat passes (P) across 20 nights	Bat activity (B/h)
Soprano pipistrelle	7,449	2.1
Common pipistrelle	5,701	1.6
Myotis sp.	629	0.2
Noctule	133	< 0.1
Brown long-eared bat sp.	39	< 0.1
Nathusius' pipistrelle	97	< 0.1
All bats (totals)	14,048	4.0

- 3.1.4 The bat activity recorded at each detector across the four months of survey is shown in Figure 2.
- 3.1.5 The highest levels of bat activity were recorded at D1 (5,048 P, 8.2 B/h) and D2 (4,527 P, 7.3 B/h). The location of D1 is in a line of trees, across Gilgarran road from a broadleaved plantation woodland and scrub habitat (Photograph 1). Most passes at D1 were from soprano pipistrelle (3,625 P, 5.9 B/h) which accounted for 71.8% of all the activity across the survey

periods. The location of D2 was on the edge of mixed plantation woodland near several watercourses (Photograph 2). Most passes at D2 were from common pipistrelle (2,351 P, 3.8 B/h) which accounted for 51.9% of all the activity across the survey periods.

Figure 2: Bat activity (B/h) recorded at each SM4 bat detector (D1, D2, D3, D4, D5, and D6) during all automated surveys



3.1.6 The number of bat passes (P) and bat activity (B/h) per survey period is shown in Table 4. The proportion of bat activity (B/h) for each species recorded in each survey period is represented in Graph 2. Time code 13 is not shown on Graph 2 as there was no data recorded.

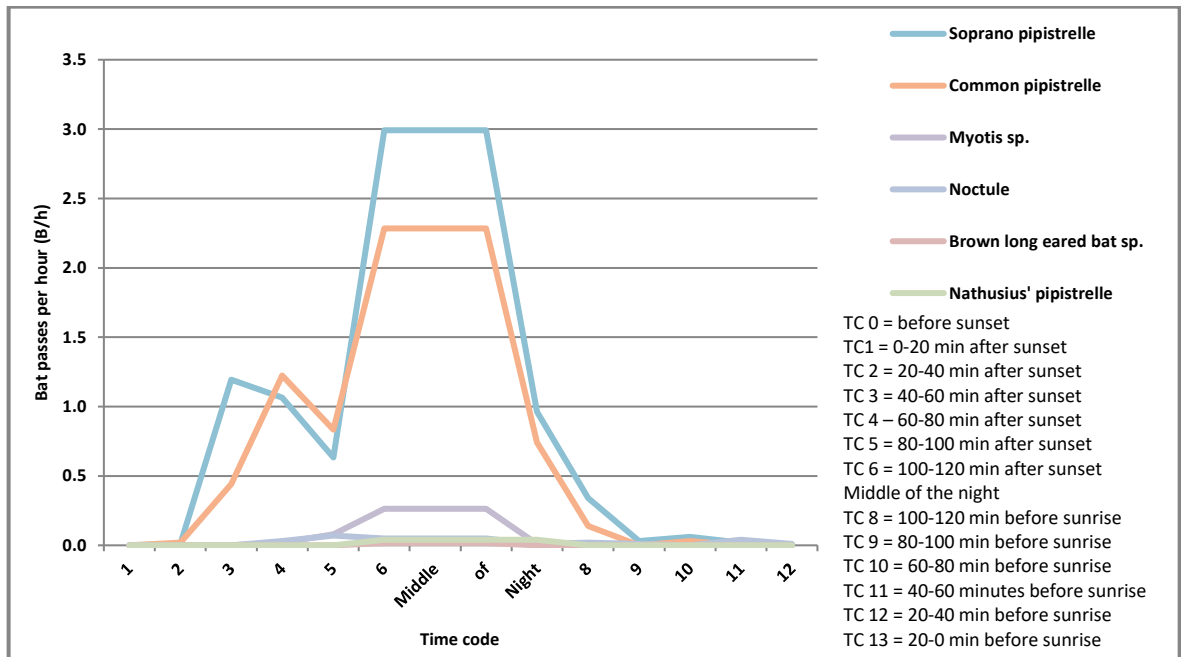
3.1.7 August had the highest level of bat activity (6,518 P, 8.5 B/h), of which soprano pipistrelle accounted for 61% of all recordings (3,981 P, 5.2 B/h) and common pipistrelle accounted for 36.8% (2,405 P, 3.1 B/h) which combined accounted for 97.8% of all recordings. Bat activity during May was also relatively high: 5,335 P, 5.8 B/h, of which common pipistrelle accounted for 47% of all recordings (2,509 P, B/h 2.7) and soprano pipistrelle accounted for 43.5% (2,326 P, B/h 2.5) which combined accounted for 90.5% of all recordings.

Table 4: Number of bat passes (P) and bat activity (B/h) per survey period

Survey period	Number of bat passes (P) across 20 nights	Bat activity (B/h)
May	5,335	5.8
July	1,125	1.2
August	6,518	8.5
September	1,070	1.2

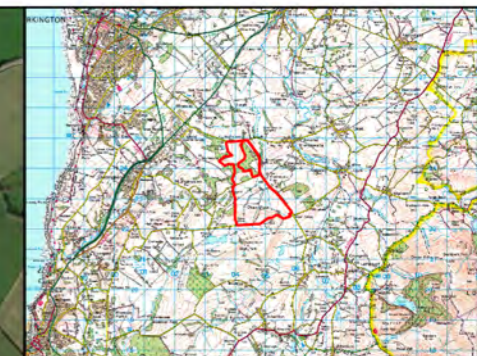
3.1.8 Graph 2 represents bat activity (B/h) throughout the night for each species across all survey periods. For soprano and common pipistrelle (the bulk of recorded calls) activity peaks and stays consistent from approximately 100-120 minutes after sunset (time code ('TC') 6) through the middle of the night and begins to taper off 100-120 minutes before sunrise (time code (TC) 8). Noctule activity, although it is very limited, appears to peak 80-100 minutes after sunset (time code (TC) 5), earlier than other species, then lowers slightly during the middle of the night before tapering off 100-120 minutes before sunrise (TC 8). For the rest of the species, activity peaks are similar to soprano and common pipistrelle, but activity occurs at much lower levels.

Figure 3: Bat activity (B/h) throughout the night for each species across all survey periods



3.1.9 Low levels of activity of common bats have been recorded at the Site across 20 nights of static detector recording. The highest encounter rate was for soprano pipistrelle at 7,449 passes recorded on six static detectors across 20 nights, the majority of which occurred at detectors 1 and 2 in Area C.

4 Figures



- Legend**
- Draft Order Limits
 - Bat Static Detector Location

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Project Title



Client

FVS Dean Moor Limited

Title

DEAN MOOR SOLAR FARM
 DEVELOPMENT CONSENT ORDER
 Bat Static Detector Locations

Scale: 1:12,500 @ A3 Date: 05/03/2024

Drawn: TL Checked: IA

Figure: 1 Rev: A



5 Photographs



Photograph 1: Static location 1



Photograph 2: Static location 2



Photograph 3: Static location 3



Photograph 4: Static location 4



Photograph 5: Static location 5



Photograph 6: Static location 6