Environmental Impact Assessment Report

Beinneun 2 Wind Farm

Volume 3

Technical Appendix A6.3: Bats

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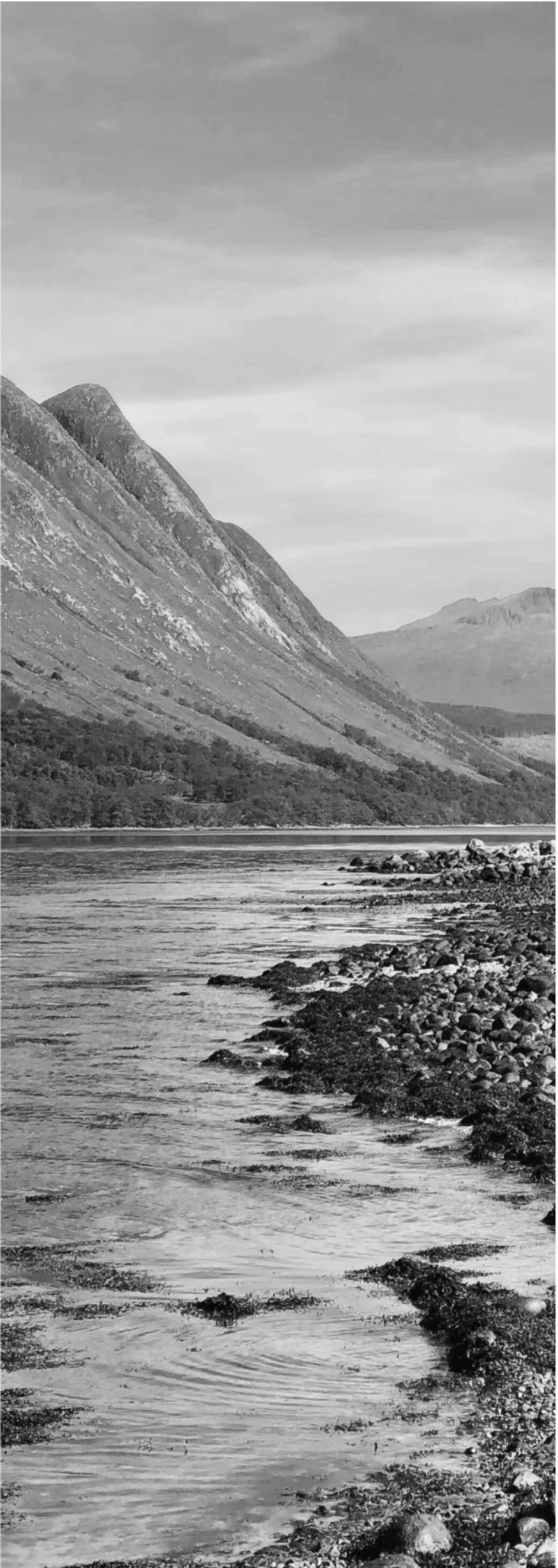

BEINNEUN 2 WIND FARM

TECHNICAL APPENDIX A6.3: BATS

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Quality Assurance

This report has been prepared according to Gavia Environmental Quality Management Process. Gavia Environmental employs consultant scientists who are members of appropriate professional institutions and adhere to professional codes of conduct.

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Contents

1 Introduction

1.1 Aims and Objectives

Gavia Environmental Ltd. ('GEL') was commissioned ENVAMS Ltd on behalf of Beinneun 2 Ltd (the 'Applicant') to undertake bat surveys at the proposed Beinneun 2 Wind Farm Site ('the Site'), which is located at National Grid Reference (NGR) NH 22538 06216, approximately 8.5km northwest of Invergarry in the Highlands of Scotland. The area of the proposed Site boundary was 1154.13ha with an access track of 17.5km.

This report describes the survey approach, methodology, and results for the bat surveys undertaken at the Site in summer and autumn 2024, and spring 2025. This work has provided an ecological baseline assessment of bat activity at the Site and has been used to inform the assessment of effects in EIA Report Chapter 6: Ecology.

This report is accompanied by **Figure 6.3.1** in **Appendix E**.

1.2 Legislation

All legislation relating to bats is included in **Appendix A**.

2 Methodology

2.1 Desk Study

A desk study was undertaken including a review of publicly available online resources to identify any records of bats within 10km of the Site. Data was primarily sourced from National Biodiversity Network (NBN) Atlas and was selected for any records within the non-commercial licenses for last 10 years.

A 10km radius was also used for a search of international, national, and local designations; this information was sourced from SiteLink (NatureScot) and the results of that study have been incorporated within this assessment where appropriate.

In addition, previous and surrounding windfarm applications were used to get an understanding of the site including the following:

- Beinneun 2 Environmental Impact Assessment Scoping Report (2023), which includes information from Beinneun Windfarm Extension Environmental Statement (2014) and Beinneun Wind Farm Environmental Statement (2011);
- Bunloinn Windfarm Environmental Impact Assessment Report (2022); and
- Millennium South Wind Farm Environmental Statement (2014).

2.2 Bat Surveys

Bat surveys were undertaken in accordance with the Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation (NatureScot, 2021), guidance created to allow consideration of the potential effects of onshore wind energy developments on bats.

Survey works were undertaken in summer and autumn 2024, and spring 2025, and comprised a review of potential roost structures and the analysis of bat activity via the deployment of static bat detectors using the layout shown in **Appendix E**.

2.2.1 Buildings and Tree Surveys

A review of any artificial structures located within 200m (plus rotor radius; 87.5m) of the Site Boundary was carried out using the BCT Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th Edition (2023).

2.2.2 Assessment of Effects and Mitigation

Current guidance (NatureScot, 2021) recommends static detector locations should be focused on those parts of the Site where wind turbines are most likely to be located. At the time of deployment, 19 turbines were to be surveyed for which the locations were not yet finalised.

Based on this 19-turbine layout and following the standard recommendations (NatureScot, 2021) of siting one detector for each of the first ten potential wind turbine locations plus a third of additional potential wind turbine Sites, a minimum of 13 detectors were required to be sited. Fourteen detectors were deployed in summer 2024, 13 were deployed in autumn 2024, and 15 detectors were deployed in spring 2025. Additional detectors were deployed to allow for any potential error or detector failures during the busier bat survey season. The turbine design layout was finalised after the deployment was completed in spring 2025, with 19 turbines proposed as the design freeze stage as shown in **Figure 6.5**.

In the absence of fixed turbine locations at the time of detector deployment, the detectors were distributed across the Site to provide representative coverage across the proposed turbine locations and access track. The detectors were either secured to fence posts with cable ties or attached to wooden canes firmly dug into the ground so that the devices were above ground level (**Plate 2**). Where possible the microphone was attached 2m above the ground, with curls in the wires in order to avoid water ingress to the detectors during periods of rain.

The static detectors used were primarily Titley Anabat swift models, with one Anabat ranger used in spring, which record in full spectrum. All detectors were set up with eight AA batteries and two SD cards with at least 32GB memory. Recording settings were as detailed in **Table 1** below.

Table 1: Anabat bat detector settings.

Detector Recording Time	30mins before sunset to 30mins after sunrise
Trigger Frequency Range	15kHz to 250kHZ
Minimum Event	4 milliseconds
Max File Length	10 seconds
Sensitivity	13

The detectors were deployed on Site during three seasons; summer 2024, autumn 2024, and spring 2025, as defined in the Bats and Onshore Wind Turbines Guidance (NatureScot, 2021).

Dates were selected for analysis based on the weather conditions at sunset: 8°C or above, 5m/s wind or below and no/very light rain. The guidance recommends ten nights of data be collected per season, ideally consecutively. Due to the weather conditions, ten consecutive nights were not achieved for autumn or spring (discussed further in the Limitations Section). However, at least ten non-consecutive nights of good weather were obtained for each season, allowing representative activity level data to be collected from across the Site.

The dates the detectors were deployed are summarised in **Table 2**.

Table 2: Bat monitoring season dates.

Summer 2024	6th – 18th August 2024
Autumn 2024	11th September 2024 13th – 22nd September 2024
Spring 2025	15th – 23rd May 2025 30th May 2025

In accordance with the Bat Onshore Wind Turbine Guidance (NatureScot, 2021) a weather station was deployed, and data was downloaded for each season when the detectors were deployed. However, due to equipment failures, the 'Weather Underground' website (www.wunderground.com) was used for weather data. For all survey seasons, the weather data taken from the Weather Underground website was collected using the weather station at Faichemard Farm found approximately 6.5km to the southeast of the Site (Station ID: IINVER127, Station Name: Faichemard Farm). Data was downloaded from each season's bat detector deployment. Only nights which had suitable weather conditions (>8°C temperature, <5m/s wind speed and no/very light rain) at sunset were selected for further analysis. The difference in altitude was not considered to be a limitation as included nights were >2°C higher (i.e., >10°C) and would therefore be suitable temperature at higher altitudes.

2.2.3 Bat Data Analysis

Bat data was analysed with the use of Anabat Insight by two ecologists trained in the use of the program and trained in bat call sonogram identification (Russ, 2012; Middleton *et al.* 2014). All data was initially analysed with the Bat Classify auto-identification program set at 85% probability level. All auto-identified bat calls were checked by trained ecologists.

As *Myotis* genus sonograms can be difficult to identify to species level and as recommendations would be the same for all species in this genus, all *Myotis* calls were assigned only to genus level (see limitations).

Results were then entered into a pro-forma and analysed using the Ecobat tool (Mammal Society, 2025), as recommended in the best practice guidelines (NatureScot, 2021). Ecobat is an online free tool which is used to compare bat activity levels found within the surveyed Site with other sites within a given radius at the same time of year. The reference range comparison dataset was set to compare against records only found within 30 nights of the survey data and within 100km² of the surveyed area. Ecobat uses percentiles to provide a numerical representation of activity levels by comparing with a large bat data set from various other energy developments. Percentiles can then be assigned to activity categories (low, moderate, high) to provide a quantifiable measure of bat activity (Ecobat, 2025). The suggested levels of activity are:

Low activity: 0-20th percentile;
Low to moderate activity: 21st-40th percentile;
Moderate activity: 41st-60th percentile;
Moderate to high activity: 61st-80th percentile; and
High activity: 81st-100th percentile.

2.2.4 Risk Assessment

The risk to bats from wind turbines is from death either by direct collision or through injury including barotrauma. Barotrauma is when the bat's soft tissues like their lungs are damaged due to the sudden change in air pressure in the wake of rotating turbine blades which results in internal bleeding which is fatal. The impact of a single bat being killed is not likely to be consequential on any scale, but the cumulative losses of individual bats could potentially mount up to be significant and threaten the viability of local or even national populations. The impact of the loss of one single bat on local populations depends on the size of the local population.

The risk assessment outlined in the current guidance by NatureScot (2021) recommends a 2-stage process. In stage 1, a Site risk assessment indicates potential risk based on a consideration of habitat and development related features (see **Table 3** below). Project Size and Habitat Risk criteria are outlined in **Appendix D**.

Table 3: Initial Site risk assessment

Site Risk Level (1-5)		**Project Size**		
Habitat Risk		Small	Medium	Large
	Low	Low (1)	Low/Mod (2)	Moderate (3)
	Moderate	Low/Mod (2)	Moderate (3)	High (4)
	High	Moderate (3)	High (4)	Highest (5)

Key: 1-2 = Low Site risk, 3=Medium Site risk, 4-5 = High Site risk

Stage 2 then gives an overall assessment of risk considering the Stage 1 assessment in relation to the bat activity levels on the Site as defined by the Ecobat output, which considers the relative vulnerability of each species of bat present, at the population level.

Table 4: Stage 2 Overall Risk Assessment.

Overall Risk Level (0-25)	Ecobat Activity Category					
	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
Med (3)	0	3	6	9	12	15
High (4)	0	4	8	12	16	20
Highest (5)	0	5	10	15	20	25

Key: 0-4 = Low overall risk, 5-12 = Medium overall risk, 15-25 = High overall risk

2.2.5 Limitations

Although taken from reputable sources, the data obtained throughout the desk study is controlled by third parties, and as such Gavia Environmental Ltd cannot vouch for its accuracy or be held liable for any errors in the data.

Bat Detectors D2 and D4 failed during the summer season, with Detector D4 also failing in autumn. Additionally, Detectors D4 and D8 failed during the spring season. The bat detectors which failed did not record any data. However, additional detectors were deployed to ensure that the minimum number of detectors was met. In summer and autumn 2024, only 12 bat detectors recorded data, which is below the recommended number. During spring, the minimum recommended number of detectors was met.

At the time of bat detector deployment, the finalised design with turbine locations was not available, so detectors were deployed in representative habitats across the Site. The Site boundary was updated between the autumn and spring seasons, and Detectors D1 and D2 were moved to new representative positions within the Site boundary.

As *Myotis* genus sonograms can be difficult to identify to species level and as recommendations would be the same for all species in this genus, all *Myotis* calls were assigned only to genus level.

There are limitations associated with the analysing of the bat activity levels on Proposed Development using the online tool Ecobat. This tool depends on third party data and the constant input and use of the service, therefore the accuracy and validity of the results produced requires a substantial number of records to be present.

3 Results

3.1 Desk Study

An ecological desk study was undertaken including a review of publicly available online resources to identify any records of bats within 10km of the Site. Data was primarily sourced from the National Biodiversity Network (NBN) Atlas and was selected for any records available for commercial use dated within the last 10 years.

A 10km radius was also used for a search of international, national, and local designations. This information was sourced from SiteLink (by NatureScot) and the results of that study have been incorporated within this assessment where appropriate.

A review of all wind energy developments in relation to bats within 10km of the Proposed Development was carried out and any data found was noted.

Using the National Biodiversity Network atlas, 4 records for bats within 10km of the Site in the past 10 years were found and have been summarized in **Table 5** below:

Table 5: Species recorded.

Species	Numbers of Records	Record Date
Common pipistrelle (*Pipistrellus pipistrellus*)	2	19/05/2016
Soprano pipistrelle (*Pipistrellus pygmaeus*)	2	01/05/2019

No records of bat species were found within the Site boundary.

No statutory or non-statutory conservation designations were identified with bats as a qualifying feature within the Site boundary or within the 10km search buffer.

A review of wind farm developments within 10km of the Site was completed with details of the locations of operational, consented, and proposed wind farms. Two operational wind farms were identified: Millennium Wind Farm, consisting of 26 turbines, and Beinneun Wind Farm, consisting of 32 turbines. Bunloinn Wind Farm is proposed to be constructed 14.5km northwest of Invergarry and will consist of up to 10 turbines.

Of these wind farms:

- Millenium Wind Farm had more bat activity recorded in the lower altitudes near wooded areas. An increase of bat activity was recorded in spring. However, this was likely due to the warm weather increasing invertebrate abundance across open sections of the survey area. As a result, a small number of bats increased their foraging effort in these areas.
- Beinneun Wind Farm assessment was undertaken before most recent guidance was published, therefore, detector locations aren't directly comparable, and no spring data was collected.
- Bunloinn Wind Farm recorded the highest activity of high-risk species at the lower elevations away from turbines.

3.2 Bat Surveys

3.2.1 Structure and Tree Roosting Assessment

Trees, structures, and habitats on Site should be assessed for roosting, foraging, and commuting potential, according to Collins, 2023. No roosts were identified within the Site boundary during the walkover surveys.

The habitat within the Site boundary is composed of open and exposed areas of bog and heath, with a small area of old birch woodland lining a gorge to the south (approximate NGR NH 23917 05324), which could offer potential roosting areas, foraging/commuting habitat for bats. Blocks of coniferous plantation of various ages occur outside the edge of the Site to the southwest (NGR NH 21675 04140 to NH 19592 05928) and north of the Site (NGR NH 22245 09022). This is generally unsuitable habitat for bats due to these species of trees being densely planted and not generating suitable features, such as cracks and crevices, that are used for roosting by bats. However, it may offer good foraging/commuting between the open rides of the blocks.

3.2.2 Bat Activity Surveys

3.2.2.1 Weather

For summer 2024, 10/13 nights were selected for further analysis. For autumn 2024, 10/18 nights were selected, and for spring 2025, 10/15 nights were selected. **Tables 6, 7** and **8** below show the dates selected based on their weather conditions at the time of sunset. The nights which did not fit the weather criteria were discounted.

Table 6: Weather conditions on dates collected for summer (Faichemard Farm weather station)

Date	Sunset Time	Rain (in)	Temperature (°C)	Wind Direction	Wind Speed (m/s)
6/8/2024	21:20	0	11.7	S	1.1
7/8/2024	21:18	0	11.7	WSW	1.4
8/8/2024	21:16	0	13.9	E	0
9/8/2024	21:13	0.14	11.2	WSW	0.8
10/8/2024	21:11	0	12.2	SSE	0
11/8/2024	21:09	0	14.2	ENE	0.1
12/8/2024	21:06	0	11.9	SSW	1.2
14/8/2024	21:01	0.65	13.2	W	1.6
15/8/2024	20:59	0	11.8	WSW	1.3
16/8/2024	20:56	0	12.0	WSW	2.5
17/8/2024	20:54	0	12.1	SSW	2.0
18/8/2024	20:51	0	11.8	W	0.7

Table 7: Weather conditions on dates collected for autumn (Faichemard Farm weather station)

Date	Sunset Time	Rain (in)	Temperature (°C)	Wind Direction	Wind Speed (m/s)
13/9/2024	19:42	0	10.0	SSW	0.3
14/9/2024	19:39	0	16.6	SSW	2.0
15/9/2024	19:39	0	11.1	W	0.3
16/9/2024	19:34	0	13.6	SSW	0.1
17/9/2024	19:29	0	18.1	W	0
18/9/2024	19:29	0	20.7	NNE	0
19/9/2024	19:24	0	18.1	NNE	0
20/9/2024	19:24	0	14.2	N	0

Date	Sunset Time	Rain (in)	Temperature (°C)	Wind Direction	Wind Speed (m/s)
21/9/2024	19:19	0	11.4	NNW	0
22/09/2024	19:19	0	9.9	NNW	0

Table 8: Weather conditions on dates collected for spring (Faichemard Farm weather station)

Date	Sunset Time	Rain (in)	Temperature (°C)	Wind Direction	Wind Speed (m/s)
15/5/2025	21:32	0	13.5	NE	0.7
16/5/2025	21:34	0	15.7	NE	0.5
17/5/2025	21:36	0	15.4	NE	0.6
18/5/2025	21:38	0	13.8	ENE	0.8
19/5/2025	21:40	0	12.5	ENE	0.6
20/5/2025	21:42	0	15.8	N	0.4
21/5/2025	21:43	0	14.5	NE	0.6
22/5/2025	21:45	0	12.0	N	0.5
23/5/2025	21:47	0.22	9.8	NE	1.0
28/5/2025	21:56	0.11	10.6	WSW	1.8

3.2.2.2 Summer 2024 Results

In summer 2024, 14 detectors were deployed, and 12 detectors were successful in gathering 11 nights of data that met the weather condition requirements. Detectors D2 and D4 failed during summer 2024. Summer activity was predominantly Common pipistrelle (57.1%), with soprano pipistrelle (28.3%) and Myotis species (14.6%) as shown in **Table 9**.

Table 9: Total no. passes recorded of each species across all detectors in summer 2024.

Species	Passes (No.)	% of Total for Season
Common pipistrelle	121	57.1
Soprano pipistrelle	60	28.3
Myotis	31	14.6
Total	**212**	**100**

Activity levels, in terms of their relative Site levels during summer, were highest at Detector D1 for Myotis species. For common pipistrelle, activity levels were highest at Detector D11, and for soprano pipistrelle, activity was equally high at Detector D1 and Detector D11.

Detector D11 was sited close to riparian birch woodland, which correlates to the higher density of bat passes in this area. Detector D1 was sited within a coniferous plantation woodland,

with edge habitat suitable habitat for commuting and foraging pipistrelle and potentially Natterer's bats.

Table 10: Summary showing no. nights in summer 2024 with the recorded bat activity categorised into activity bands (as defined by Ecobat, 2022) for each species at all detectors.

Species	Nights of exceptional activity	Nights of high activity	Nights of high/moderate activity	Nights of moderate activity	Nights of moderate/low activity	Nights of low activity
Common pipistrelle	0	0	0	0	0	18
Soprano pipistrelle	0	0	0	0	0	18
Myotis	0	0	0	0	0	11

The data was analysed in terms of likelihood of proximity to a bat roost by comparing bat pass times with standard roost emergence times (Russ, 2012) for each relevant species. Near where Detector D11 was located, there are likely to be soprano and common pipistrelle roosts, according to the timing of passes after sunset (0-20 minutes). Detector D11 is at a lower elevation than the nearest turbine (T12) over 600m away, which is further than the recommended 101.7m buffer distance from roosting habitat features. The calculation is shown in **Appendix E**.

3.2.2.3 Autumn 2024 Results

During autumn 2024, 13 Anabat swift detectors were deployed, and 12 detectors were successful in gathering 11 nights of data that met the weather condition requirements; however, Detector D4 failed. Autumn had the highest number of calls out of all three seasons surveyed.

Common pipistrelle made up the majority of calls (70.8%) with soprano pipistrelle calls making up the remaining 29.2% (as shown in **Table 11**).

Table 11: Total no. passes recorded of each species across all detectors in autumn 2024.

Species	Passes (No.)	% of Total for Season
Common pipistrelle	1314	70.8
Soprano pipistrelle	543	29.2
Total	**1857**	**100**

Activity levels, in terms of their relative Site levels during autumn were highest at Detector D11 for both common and soprano pipistrelles. Low/moderate activity of both species was also recorded at Detector D5, Detector D9 and Detector D13.

Table 12: Summary showing no. nights in autumn 2024 with the recorded bat activity categorised into activity bands (as defined by Ecobat, 2022) for each species at all detectors.

Species	Nights of exceptional activity	Nights of high activity	Nights of high/moderate activity	Nights of moderate activity	Nights of moderate/low activity	Nights of low activity
Common pipistrelle	0	0	0	0	6	57
Soprano pipistrelle	0	0	0	0	6	38

The data was analysed in terms of likelihood of proximity to a bat roost by comparing bat pass times with standard roost emergence times (Russ, 2012) for each relevant species. Detector D11 recorded significant common and soprano pipistrelle activity just before sunset and up to 30 minutes after sunset, which is indicative of multiple roost sites within the riparian woodland at the south of the Site. This correlates with similar findings in summer but there was significantly more activity in autumn. Detector D1, Detector D2 and Detector D9 recorded activity which was indicative of one or more common and soprano pipistrelle roosts nearby (15 minutes after sunset). Detector D8, Detector D13 and Detector D14 also recorded common pipistrelle activity indicative of potential individual nearby roost sites.

3.2.2.4 Spring 2025 Results

In spring, 15 detectors were deployed, and Detectors D4 and D8 failed. Therefore, in total, 37 detectors successfully collected data across all three survey seasons. In spring 2025, 13 detectors were successful in gathering 10 nights of data that met the weather condition requirements. Spring had the lowest number of calls out of all three seasons surveyed, which may indicate later arrival on Site. Spring activity was dominated by common pipistrelle calls, which accounted for 89.2% of all calls recorded. Brown long-eared bats *Plecotus auritus* calls were recorded but accounted for only 1.1% of calls (as shown in **Table 13**).

Table 13: Total no. passes recorded of each species across all detectors in spring 2025.

Species	Passes (No.)	% of Total for Season
Common pipistrelle	83	89.2
Soprano pipistrelle	7	7.5
Myotis	2	2.2
Brown long-eared bats	1	1.1
Total	**93**	**100**

Activity levels, in terms of their relative Site levels during spring were highest at Detector D5 and Detector D9 for Myotis and at Detector D9 for *Plecotus auritus*. For both common and soprano pipistrelles, activity levels were highest at Detector D9, followed by Detector D7.

Table 14: Summary showing no. nights in spring 2025 with the recorded bat activity categorised into activity bands (as defined by Ecobat, 2022) for each species at all detectors.

Species	Nights of exceptional activity	Nights of high activity	Nights of high/moderate activity	Nights of moderate activity	Nights of moderate/low activity	Nights of low activity
Common pipistrelle	0	0	0	0	0	11
Soprano pipistrelle	0	0	0	0	0	6
Myotis	0	0	0	0	0	2
Plecotus auritus	0	0	0	0	0	1

The data was analysed in terms of likelihood of proximity to a bat roost by comparing bat pass times with standard roost emergence times (Russ, 2012) for each relevant species. No bat calls were recorded that would indicate any nearby roosts within close proximity to any of the detectors deployed during the spring season.

4 Summary

Bat activity was recorded at varying levels at all 17 bat detector locations, except at Detector D12, and at Detector D4 which failed in all seasons. A total of four species were recorded across the three survey seasons. Two species were recorded in autumn (Common pipistrelle, *Pipistrellus pipistrellus* and Soprano pipistrelle, *Pipistrellus pygmaeus)*. In summer and spring, Myotis species bats were recorded (*Myotis sp.*). A fourth species was recorded in spring only (Brown long-eared bat, *Plecotus auritus*).

Table 15 summarises the number of bat passes recorded per species and per survey season, as well as the total for each.

Table 15: Summary of number of bat passes per species and per season as well as the total for each.

	Summer 2024	Autumn 2024	Spring 2025	Total (per species)
Pipistrellus pipistrellus	121	1314	83	1518
P. pygmaeus	60	543	7	610
Myotis sp.	31	0	2	33
Plecotus auritus	0	0	1	1
Total (per season)	212	1857	93	2162

In total, 2,162 bat passes were recorded during the entire survey period across all species. The highest number of bat passes was recorded during autumn 2024, with common pipistrelles accounting for 70% of all bat passes within that season. Brown long eared were only recorded once during the spring survey period, accounting for only 0.05% of all bat passes recorded.

Key conclusions from the data include:

- All species were recorded as "low activity" during all nights.
- The highest activity level was observed during the autumn season.

- Common and soprano pipistrelles were recorded throughout all three seasons with common pipistrelles having the highest overall activity.
- Myotis sp. were recorded in the summer and spring seasons but had low activity levels compared to pipistrelle sp.
- Brown long eared bats were only recorded in the spring survey season and had low activity levels.
- Detector 11 was located near one or more common and soprano pipistrelle bat roosts situated within birch riparian woodland.
- In autumn, D9 recorded activity indicative of nearby common and soprano roosts. Additionally, D8, D13 and D14 recorded common pipistrelle activity indicative of nearby roosts.

5 Risk Assessment

When assessing the impact of a wind farm proposal on the mortality of bats and the impact on species numbers, it is key to consider the level of vulnerability of populations of British bat species as well as the bat activity data obtained from the Site. This information is critical to avoiding negative impacts on the conservation status of rare or vulnerable bats at both the local and national level. Using the information in **Appendix C** for the species recorded, common and soprano pipistrelle bats are classified as 'moderate risk' and 'widespread' in the wind turbine impact categorisation. Myotis species (Daubenton's and Natterer's) and brown long-eared bats are classified as 'low risk' and 'rarer'. Myotis (Whiskered bats) are 'low risk' and 'rarest' in the wind turbine impact categorisation (NatureScot, 2021).

The Site is a 'medium' scale development, as it has more than 10 proposed turbines (19 proposed) and has one operational wind energy development within 10km. Although the turbines are proposed to be up to 200 metres in height, the number of turbines proposed falls into the lower end of the 10-40 number of turbine category, hence, the 'moderate' category was chosen.

The habitat risk is considered to be 'moderate' according to the NatureScot et al. (2021) guidance. Although the Site is comprised mainly of heath and blanket bog mosaics, young coniferous plantation and birch scrub woodland, which do not generally provide many roosting opportunities, these habitats provide a vast range of foraging opportunities, across small bog pools and along forest edges. Occasional individual or small stands of mature birch trees on Site can form suitable roosting habitat for small numbers of bats. Streams and bog pools on Site provide high quality foraging opportunities for bats, especially some of the rarer species such as Myotis, as well as wider connectivity to other environments off Site.

Following the advice outlined in **Table 3** (Section 2.2.4), the stage 1 initial site risk assessment score for the Site is 3 ('Moderate'). When considering the Site within the local landscape, there are similar areas of suitable foraging habitat to the north and south of the Site boundary, with blocks of coniferous plantations as well as broadleaf woodland, which may provide more suitable habitat for foraging, commuting and roosting bats. As well as this, the majority of bat activity recorded within the Site was at one detector location, indicating that bat activity is concentrated towards the birch woodland close to D11. Given this information and the low number of bat species recorded (<5), the Site is considered to constitute a 'low risk' to the conservation status of local bat populations.

Table 16 on the following page provides an assessment of the potential risk seasonally to each of the recorded bat species based on their activity levels per season and the relative vulnerability of the species of bat present. The overall risk for all species was found to be 'low'.

Table 16: Stage 2 Overall Risk Assessment

Species	Site Risk Level	Proposed Development Site Activity Levels (based on median percentile)	Overall Potential Risk
Summer			
Common pipistrelle	Moderate (3)	Low (1)	Low (3)
Soprano pipistrelle	Moderate (3)	Low (1)	Low (3)
Myotis	Moderate (3)	Low (1)	Low (3)
Autumn			
Common pipistrelle	Moderate (3)	Low (1)	Low (3)
Soprano pipistrelle	Moderate (3)	Low (1)	Low (3)
Spring			
Common pipistrelle	Moderate (3)	Low (1)	Low (3)
Soprano pipistrelle	Moderate (3)	Low (1)	Low (3)
Myotis	Moderate (3)	Low (1)	Low (3)
Plecotus auritus	Moderate (3)	Low (1)	Low (3)

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Appendix A: Bat Legislation

All bat species in the UK are afforded full statutory protection as European Protected Species (EPS) listed in Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations 1994 as amended in Scotland, which transpose into Scots Law, the European Community's Habitats Directive (92/43/EEC). Under the terms of Regulation 39(1), with certain exceptions, it is an offence to deliberately or recklessly:

- Harass a wild bat or group of wild bats.
- Disturb a wild bat while it is occupying a building 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 breeding Site or resting place of a wild bat, or otherwise to deny the bat use of the breeding Site or resting place;
- 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;
- 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; or
- Damage or destroy a breeding Site or resting place of such an animal.

All the above protections apply regardless of the stage of the life of the animal in question.

Bat casualties at wind farms are likely to be considered an example of incidental killing as described in guidance to the Habitats Directive and may not therefore be an offence, but at a certain level of impact such killing may cease to be incidental and become intentional or reckless (according to domestic law). The level of impact that will trigger this change is a matter for courts to decide, though the implementation of appropriate mitigation measures is likely to lessen the risk of mortality and therefore the possibility of an offence being committed

Of the 18 UK bat species, ten occur in Scotland: Common pipistrelle (*Pipistrellus pipistrellus*), Soprano pipistrelle (*P. pygmaeus*), Nathusius' pipistrelle (*P. nathusii*), Natterer's (*Myotis natterer*i), Daubenton's (*M. daubentonii*), Noctule (*Nyctalus noctula*), Brown long-eared bat (*Plecotus auritus*), Leisler's (*N. leisleri*), Whiskered (*M. mystacinus*), and Brandt's (*M. brandtii*) bats.

Appendix B: Photograph Plates

Plate 1: View of existing wind turbines (Beinneun 1) facing west from the centre of the Site.

Plate 2: Typical bat detector setup.

Plate 3: Bog pool with coniferous plantation woodland at northwestern edge of the Site.

Plate 4: Birch woodland close to D11, along a valley at the south edge of the Site.

Appendix C: Level of Potential Vulnerability from Wind Turbines to Scottish Bats

Table 17: Level of Potential Vulnerability from Wind Turbines to Scottish Bats (adapted from Wray et al., 2010).

Relative Abundance	Collison Risk		
	Low Collision Risk	Medium Collision Risk	High Collision Risk
Widespread Species			Common pipistrelle, Soprano pipistrelle
Rarer Species	Brown Long - eared bat, Daubenton's bat, Natterers' bat		
Rarest Species	Whiskered bat, Brandt's bat		Nathusius pipistrelle, Noctule bat, Leislers bat

Appendix D: Habitat and Project Size Definitions

Table 18: Habitat Risk Definitions adapted from NatureScot et al (2021).

	Description
Low	A 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 19: Project Size Definition adapted from NatureScot et al (2021).

Project Size	Description
Small	Small scale development (≤10 turbines). No other wind energy developments within 10km. Comprising turbines <50m in height.
Medium	Larger developments (between 10 and 40 turbines). May have some other wind developments within 5km. Comprising turbines 50-100m in height.
Large	Largest developments (>40 turbines) with other wind energy developments within 5km. Comprising turbines >100m in height.

Appendix E: Bat Detector Locations

Figure 6.3.1: Bat Detector Locations

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Figure 6.3.1
Bat Detector Locations and Activity

Key

- Site Boundary
- 250m Buffer
- Development Footprint
- Bat Detectors

Detector	Elevation (m)	Total bat passes in Summer	Total bat passes in Autumn	Total bat passes in Spring
D1	222	41	4	
D1 Spring	482			1
D2	349		22	
D2 Spring	462			0
D3	318	0	16	0
D4	377			
D5	428	2	16	1
D6	489	0	8	2
D7	417	3	86	8
D8	406	5	21	
D9	334	9	15	81
D10	365	1	4	0
D11	302	149	1630	0
D12	415			0
D13	407	1	11	0
D14	432	1	19	0
D15	483	0		0
Total	-	212	1857	93

N

Scale @ A3: 1:24,000

0 500 1,000 m

GAVIA environmental

Date: 04-08-2025

Prepared By: AB

Reviewed By: DO

Approved By: CB

Appendix F: Calculation of buffers

The current guidelines for wind farm bat surveys (NatureScot, 2021) recommends that the distance between the tips of the wind turbine blades and the nearest habitat features which could be utilised by bats for commuting or foraging should be a minimum of 50m away. Where significant activity is present this distance should be increased as far as is reasonably practicable to further reduce risk.

This buffer distance should be included into the wind farm forestry plan in order to achieve this minimum distance between suitable habitat and wind turbine. This is especially key when edges of woodland are formed after the keyholing process and during any possible further micro-siting procedures. This buffer distance can be calculated using the below formula from NatureScot 2021:

$$b = \sqrt{(50 + bl)^2 - (hh - fh)^2}$$

In this formula bl = blade length of the turbine, hh =hub height and fh =habitat feature height, all in metres. For this development, the blade length is proposed to be 87.5 metres, hub height is 112.5 metres, and the habitat feature height is assumed to be an average of approximately 20 metres across the plantation within the Site. This calculation gives a buffer distance of **101.7 metres** which is to act as the minimum distance between the turbine base and the nearest habitat feature in order to minimise bat collision risk.