



Appendix 14.3: Bat Surveys 2023

Greenside Extension

February 2024

GLM Ecology



Notes:

Site: Greenside Extension
Client: GWEL Operating Company Ltd
Date: 29/01/2024
Status: Final

Version	Date	Author	Checked	Approved
Draft	19/01/2024	G Mortimer	Y	Y
Final	02/02/2024	G Mortimer	Y	Y

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1.1 Introduction

This Appendix outlines the methodology, results and recommendations for bats undertaken to determine the baseline regarding the occurrence and distribution of bats on which to base and inform the Ecological Impact Assessment for the proposed three turbine Greenside Extension. The aims of the surveys were to assess the following:

- Identify the bat species present on Site;
- Determine roost potential of the Site;
- Locate roosts;
- Determine bat activity level within different parts of the Site; and
- To collect baseline data to inform potential risk level to each species from the construction and operation of the proposed wind farm.

Bats of all species in Britain and their roosts are protected under the Conservation (Natural Habitats, &c) Amendment (Scotland) Regulations 2007. Following recent changes to legislation in Scotland, under this law it is illegal to intentionally or recklessly kill or injure a bat, to disturb a roosting bat or to damage, destroy or obstruct access to any bat roost. This applies to both summer and winter roosts, which may be in different structures. Any action, which is likely to disturb or damage a bat roost, requires a licence from the Scottish Executive. This Appendix will present the methodology and results of Bat Surveys undertaken during 2023 at Greenside Extension, Aberdeenshire which followed NatureScot guidance, published in 2019 (SNH et al., 2019¹).

Site Description

The Proposed Development at Greenside is located approximately 2-3km southeast of Crimond, Aberdeenshire. The Site lies on existing farmland with commercial plantations present which does not carry any national planning designations. The site connects with various other scattered farmhouses and surrounding farmland. The A90 Road passes from the north to the east of the Proposed Development.

Guidance & Desk Study

Guidance used in assessing appropriate survey methodology:

- NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2019; updated 2021). Bats and Onshore Wind Turbines: Survey Assessment and Mitigation;
- Collins, J. (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). Bat Conservation Trust;
- Hundt, L. (2012). Bat Surveys: Good Practice Guidelines (2nd edition). Bat Conservation Trust;
- DEFRA (2016). Understanding the Risk to European Protected Species (bats) at Onshore

¹ Scottish Natural Heritage, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (2019). Bats and Onshore Wind Turbines: survey, assessment and mitigation; <https://www.nature.scot/sites/default/files/2019-01/Bats%20and%20onshore%20wind%20turbines%20-%20survey%2C%20assessment%20and%20mitigation.pdf>

Wind Turbine Sites to inform Risk Management. University of Exeter;

- Rodrigues L., Bach L., Dubourg-Savage M.J., Karapandza B., Kovac D., Kervyn T., Dekker J., Kepel A., Bach P., Collins J., Harbusch C., Park K., Micevski B., Minderman J. (2014). Guidelines for consideration of bats in wind farm projects. Revision 2014. EUROBATS Publication Series No. 6.

1.2 Survey Methodology

A habitat and bat assessment survey were carried out at the Site in April 2023, followed by walked transect and targeted roost surveys on buildings in May and static detector surveys between May – September 2023 in accordance with NatureScot guidance (SNH et al., 2019). The objectives of the bat surveys were to identify whether the Site would be considered suitable for roosting bats and whether bats were present on Site. Potential bat roost locations of buildings and trees, if present were identified by daytime surveys and a visual assessment of potentially or possible suitable roost locations and linear features were assessed.

The aim was to provide sufficient evidence so that the potential impacts of the Proposed development on any local bat populations could be assessed and, if appropriate, mitigation suggested. A notable change in the 2019 NatureScot Guidance is that the two most common species recorded in Scotland, common and soprano pipistrelle bats, have been upgraded from medium collision risk to high-risk species with regards to wind farms (**Table 1**).

Table 1 - Bats in Scotland and likely collision risk (Yellow = low population vulnerability; orange = medium population vulnerability; red = high population vulnerability)

	Low Collision Risk	Medium Collision Risk	High Collision Risk
Common Species			Common pipistrelle Soprano pipistrelle
Rarer Species	Brown long eared bat Daubenton's bat Natterer's bat		
Rarest Species	Whiskered bat Brandt's bat		Nathusius' pipistrelle Noctule bat Leisler's bat

Initial Site Risk Assessment

To determine the survey effort required, an Initial Site Risk Assessment was undertaken using guidance from NatureScot 2019 (**Table 2 & 3**). The project size is small (<10 turbines), and bat roost suitability on site is negligible. Two buildings are present within 500m of turbine locations. No trees with roost potential or Potential Roost Features (PRF) are present within approximately 1km of turbine locations. The coniferous plantations present are dominated by Sitka spruce and larch. These species of trees tend to have very limited bat roost potential. The habitat on Site, which is predominantly sheep and cattle grazing was quantified as low-quality foraging habitat. The following survey effort for a low-risk site was deemed appropriate for one season from April-September 2023.

Bat transect/activity surveys were undertaken on site and static recorders were deployed as per relevant guidance. Given the small size of the Site, its locality and closeness to roads static recorders placed at height were not possible on the open grazing fields, only on the plantation edge.

Table 2 - Bat Habitat Suitability Criteria (BCT Guidance 2023)

Suitability	Description of Roosting Habitat	Foraging and Commuting Habitat
Negligible	Negligible habitat features on site not likely to be used by roosting bats.	Negligible habitat features on site not likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or un-vegetated streams, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that could be used by bats due to its size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.

Table 3 - Survey effort for bats required at Greensides.

Survey area	Up to 200m + rotor radius from turbine locations or potential turbine locations
Ground level transect surveys	One visit per transect each season (spring, summer and autumn) if deemed necessary.
Automated surveys at ground level	10 consecutive nights for each single or pair of locations within the survey area, per season

Walked Transects

Under the 2019 guidance, walked transects are not obligatory but considered to be discretionary and site specific. A single visit was made with details of times and weather conditions below. The dusk survey was carried out from approximately 30mins before sunset to 2.0hrs after sunset. (**Table 4**) The Site was divided into transects (**Figure 2**) which were surveyed constantly by two individual surveyors starting at opposite ends of the transect on each visit. Stopping points (5 minutes duration) were placed at possible strategic points on the transect. The transect focused on potential linear features (track, plantation edge, buildings and burns) and differing habitats that could provide pathways for bats onto site or preferential foraging areas.

The transects were undertaken on foot and surveyors were equipped with an Anabat SD2 or BatBox Duet detectors with a GPS unit to enable accurate mapping of all bats recorded. Surveyors noted the number of individual bats, number of passes and flight heights wherever possible.

Table 4 - Survey times and weather conditions

Survey	Date	Sun Set	Sun Rise	Time	Weather Windspeed (m/s) / Temp (°C)
Dusk	20/05/23	21.31		21.00-23.30	S1. 8. CLOUD. 54F

Targeted Roost Surveys on Buildings

As the derelict building had Potential Roost Features present targeted roost surveys were undertaken at dawn and dusk to determine if bat roosts were present.

Table 5 - Survey times and weather conditions for building roost surveys.

Survey	Date	Sun Set	Sun Rise	Time	Weather Windspeed (m/s) / Temp (°C)
Dusk	29/05/23	21.47		21.10-23.10	N3. 3. CLOUD.FAIR 46F

Static Recorders

In May, July and August/September 2023, following NatureScot guidance (NatureScot et al., 2019), four Anabat Swift static bat recorders (Anabats) with omnidirectional microphones were positioned at ground level in relative proximity to proposed turbine locations for 10 nights for each recording period. The same locations were used for all three-survey periods. Locations were chosen as features that would be suitable for foraging/commuting bats and included open fields and plantation edges.

The recorders were set to start recording 0.5hrs before sunset and stop 0.5hrs after sunrise. Full spectrum data was converted into WAV files then analysis by AnaBat Insight. Bat passes were defined as a sequence of pulses within each individual recording. Weather data for the static recording deployment periods was collated from the nearest weather station to the survey area (Aberdeen). Weather parameters noted were: hourly temperature from dusk until dawn; and, hourly wind speed (m/s) from dusk until dawn. Daily rainfall was collected from the Scottish Environment Protection Agency (SEPA) rainfall data website.

Weather conditions were variable for all surveys with ambient temperatures and low winds. Showers were recorded in all three survey periods.

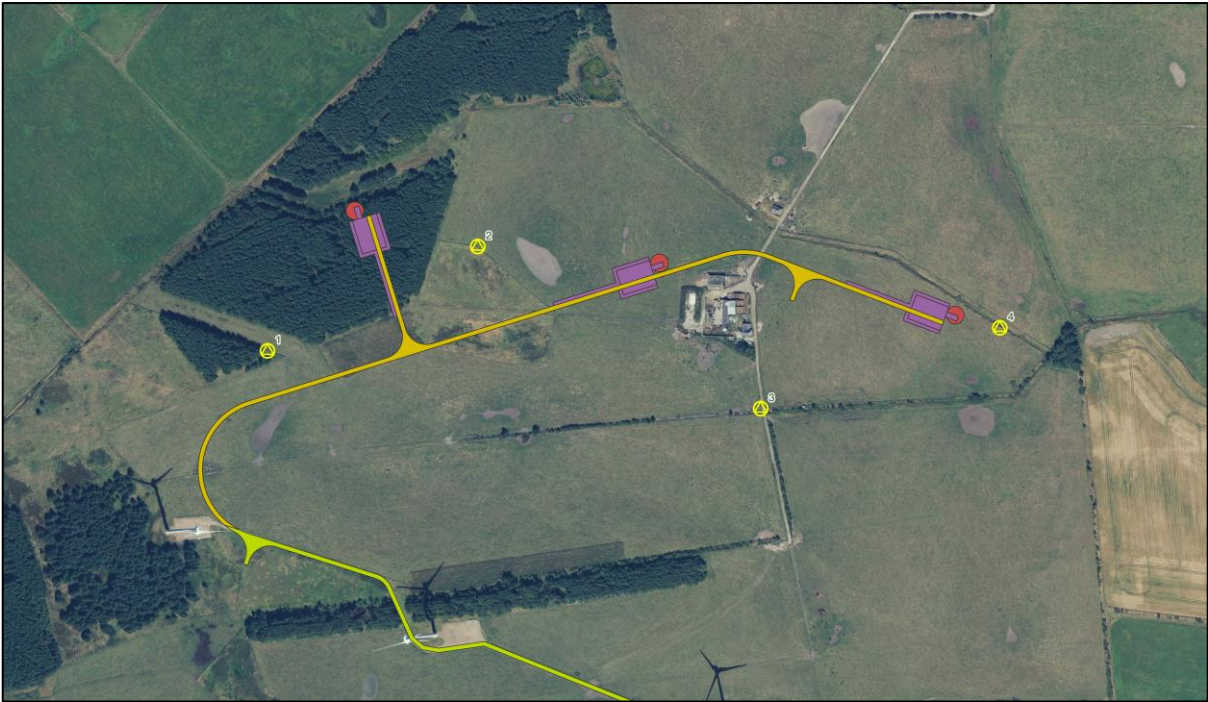


Figure 1. Four static bat recorders (1-4) were placed within open fields or in proximity to field edges, minor road and plantation edge.

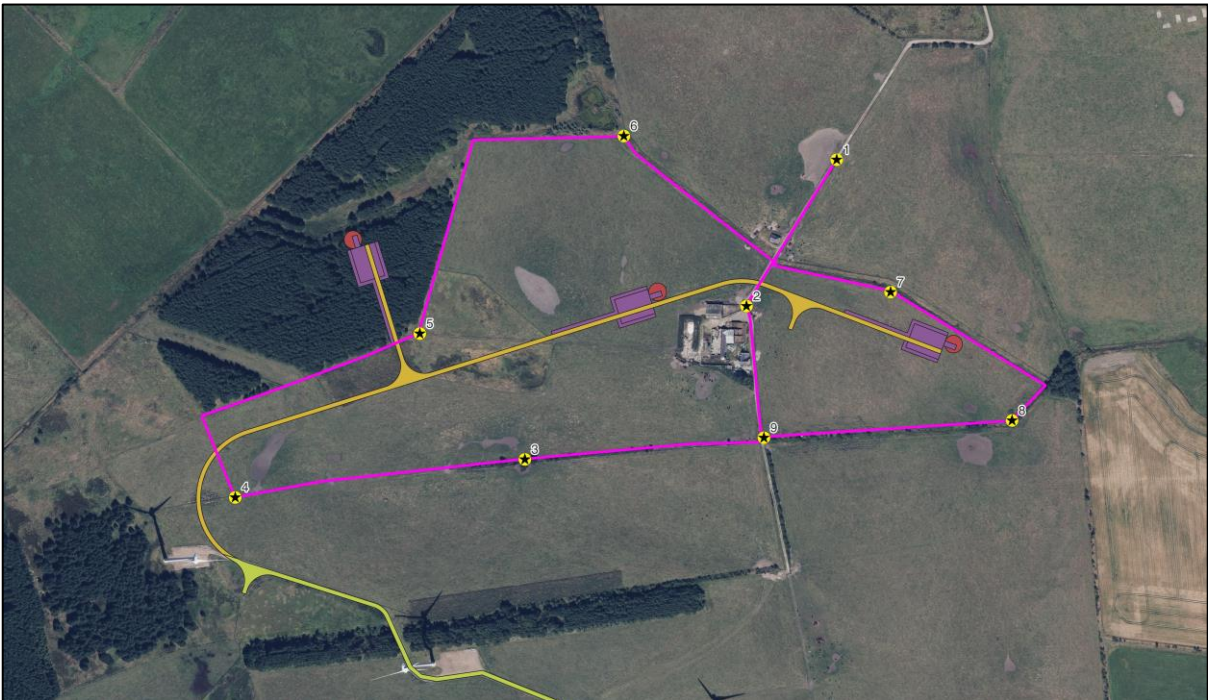


Figure 2. Transect and stopping points for walked bat activity surveys.

1.3 RESULTS

Desk Study

North East Scotland Biological Records Centre (NESBReC) supplied the following records of bats within a 2km zone of the Site.

Table 6 – NESBReC Results.

Taxon group	Scientific Name	Common Name	Key Conservation/Legal Status	Number of records	Last recorded
Bats					
	<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	HabRegs2, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, LBAP	4	2011
	<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	HabRegs2, WCA5/9.4b, WCA5/9.4c, WCA5/9.5a, SBL, LBAP, UKBAP	1	2011

Buildings

Two buildings are within 500m of turbine locations. These were surveyed for Potential Roost Features and underwent targeted bat activity surveys. No bat roosts were present.

Trees

The conifer plantation trees have no Potential Roost Features present.

Bat Roosts

There are no bat roosts present within the Planning Application Boundary of the Site.

Walked Bat Detector Survey Results

The results reveal virtually no usage of the Site by bats (**Table 7**). One species (common pipistrelle) were recorded in low numbers (2) on the surveys between Stopping Points 1-2 along the access track and another two foraging along plantation edge (Stopping Points 5-6) near water.

Table 7 - Bats recorded 20/05/23

Stopping Point	Bat Species	No. Bats	Activity
1	Common Pipistrelle	2	Commuting north along road
2	None		
3	None		
4	None		
5	Common Pipistrelle	1-2	Foraging along plantation edge

6	None		
7	None		
8	None		
9	None		

Static Recorders

Over the survey period from May - September the static surveys recorded two identified bat species (common pipistrelle, soprano pipistrelle). Data was analyzed in Anabat Insight

For pipistrelle species, the following criteria was used to classify calls.

- Common pipistrelle ≥ 42 and < 49 kHz
- Soprano pipistrelle ≥ 51 kHz
- Nathusius pipistrelle < 39 kHz
- Common/soprano pipistrelle ≥ 49 and < 51 kHz

Table 8 – Survey hours and Dates

Survey Session	Date Period	Survey Hours per night (per individual Anabat hrs mins)	Survey Hours/Minutes (per 10 nights x Anabat)	Survey Hours/Minutes (per 4 Anabats per Season)
1	20/05/2023 – 29/05/2023	8.50	85.0	340
2	19/07/2023 - 28/07/2023	8.01	80.10	320.4
3	29/08/2023 - 07/09/2023	11.02	110.20	440.8
Total				1101.2

Table 9– Bat Passes Recorded

Detector Location Number	Bat Passes Survey Period 1	Bat Passes Survey Period 2	Bat Passes Survey Period 3	Total number of bat passes	Nights recording
1	8	12	14	34	30
2	2	14	3	19	30
3	27	31	30	88	30
4	16	15	10	41	30
Total	53	72	57	182	

Table 10 - BAI Calculations

Detector Location Number	BAI Survey Period 1	BAI Survey Period 2	BAI Survey Period 3	Yearly BAI	Total BAI for Overall Site
1	0.09	0.15	0.13	0.12	
2	0.02	0.17	0.03	0.07	
3	0.32	0.39	0.27	0.33	
4	0.19	0.19	0.09	0.16	

Total BAI for Site	0.16	0.22	0.13		0.17
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Table 11 - BAI Calculations for Individual Species

Species	Total Bat Passes	Total BAI for Overall Site
Soprano Pipistrelle	92	0.08
Common Pipistrelle	90	0.08

Overall Bat Activity

One confirmed species of bat was identified from the walked transect survey (common pipistrelle) with small numbers (<2) commuting along the minor road and foraging along plantation edge. Both common pipistrelle and soprano pipistrelle were recorded on the static recorders. A total of 182 bat registrations were recorded over a total of 1101 hours surveying (**Tables 8 – 11**). These were 92 common pipistrelle and 90 soprano pipistrelles. This gives a total BAI of 0.17 bat passes per hour for the Site. From **Table 9 & 10** it can be seen that Static 3 on the minor road had the majority of bat passes.

There was no significant increase in BAI for combined species between the survey periods. The BAI was very low for each individual survey period and overall. It was notable on numerous nights that no bats were recorded, subsequently there were more substantial records of bats on other nights. Static recorder No. 3 along the access track had the highest bat activity. This result would appear to be bats using the road as a linear feature to commute along. There are buildings along the minor road offsite and it is assumed that both soprano and common pipistrelles are roosting in these buildings. Due to the low BAI it is assumed that only very small numbers of bats are passing through Site.

In general, weather conditions over the three survey sessions for the static recorders were relatively suitable for foraging bats and low temperatures, excessive rain, and high winds were at a minimum.

1.4 RISK ASSESSMENT

An assessment of risk for the Site can be made using parameters outlined in the most recent Guidance (NatureScot *et al.*, 2023, BCT 2016, & **Tables 2 & 3**). The project is of small size with only 3 turbines proposed. Buildings are on Site, however, no bat roosts were recorded. Potential Roost Features in trees is negligible. Using the parameters outlined in the Guidance the value of the habitats and features present for foraging, commuting and roosting bats was assessed as low.

The walked transects and the static recorders found that the Site was only used by small numbers of bats, common and soprano pipistrelles, which are the most common species of bats present in the UK and Scotland. Static recorders only record bat passes, it is not possible to classify numbers of bats present. The walked transect had only 2 bats recorded along the access track and another 2 along the plantation edge, and as is normal with pipistrelles they forage up and down a foraging area, often staying in the same area all night. It would appear from the Static recorder data that pipistrelle species were using the minor road as a linear feature.

With a site risk level of low and bat activity recorded as low, the overall risk assessment for the development is considered as presenting low risk to bats. It is concluded that the development will not impact on the conservation status of any of the bats identified during the surveys, either as a direct result of collision with operating wind turbines or indirectly as a result of habitat loss. It is difficult to assess the cumulative impact with other windfarms, however, given that the windfarms are on open farmland and that bat activity is normally low over this habitat it is considered that the

impact is low. Bats are known to use linear features, roads and tree lines to both forage and commute along which would explain why there is activity along the minor road. It would appear that unknown roosts are present along the minor road, associated woodland and scattered buildings outwith the Site.