

ANNEX C – ATMOS: MOORSHIELD BAT SURVEY REPORT

Survey Report

Moorshield Wind Farm

Bat Roost Assessment and Activity Surveys 2019

Wind 2 Ltd

28 October 2019



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1 Introduction

1.1 Terms of Reference

This report presents the findings of the bat roost assessment and static surveys carried out for the proposed Moorshield Wind Farm (hereafter referred to as 'the Site') in East Renfrewshire. The survey work was carried out during the 2019 survey season.

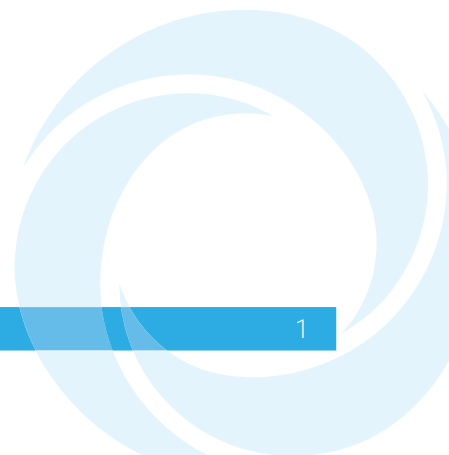
1.2 Site Description

The proposed wind farm Site is located approximately 5km south west of Eaglesham, East Renfrewshire and 10km north east of Stewarton, East Ayrshire. The Site consists of farmland with Shieldhill Farm located to the west of the site and Brennan Loch to the north.

1.3 Objectives of this Report

The objectives of the surveys documented in this report were as follows:

- To carry out a Preliminary Roost Assessment to determine the suitability of the features on and adjacent to the site for use by roosting bats;
- To carry out static detector surveys to assess the usage of the site by bats and identify the species present; and
- To identify requirements for further survey, if relevant.



2 Legislative Context

Bats and their roosts are protected under UK and European Legislation. In Scotland, this is mainly provided by the Conservation (Natural Habitats, &c) Regulations 1994, as amended (known as the Habitats Regulations). Under this legislation, bats are regarded as European Protected Species (EPS).

It is an offence to deliberately or recklessly:

- Capture, injure or kill a bat;
- Harass a bat;
- Disturb a bat while it is occupying a roost (any place of shelter or protection);
- Disturb a bat while it is rearing or otherwise caring for its young;
- Obstruct access to a roost or deny a bat use of a roost;
- Disturb a bat in a way which is likely to significantly affect the local distribution or abundance of the species;
- Disturb a bat in a way that is likely to impair its ability to survive, breed or reproduce; or rear or care for its young; and
- Disturb a bat while it is migrating or hibernating.

It is a strict liability offence to damage or destroy a bat roost. A bat roost is protected at all times irrespective as to whether any bats are using the roost at a given time.

If the work proposed is to affect bats or their roosts, an EPS licence, issued by the licensing authority SNH under Regulation 44 of the Habitats Regulations, will be required so as to permit an otherwise illegal activity. There are three tests that must be satisfied before a license will be granted, in addition to which mitigation and/or compensation will almost certainly be required. The three tests are:

- The activity must fall within one of the licensable purposes listed in Regulation 44 (including the preservation of public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment);
- There must be no satisfactory alternative; and
- The action authorised will not be detrimental to the maintenance of the population of the species as a favourable conservation status in their natural range.

2.1.1 Scottish Biodiversity Strategy

The Nature Conservation (Scotland) Act 2004 places a 'Biodiversity Duty' on public bodies to further the conservation of biodiversity and it requires Scottish Ministers to designate one or more strategies for the conservation of biodiversity as the Scottish Biodiversity Strategy. 'Scotland's Biodiversity: It's in your Hands – A strategy for the conservation and enhancement of biodiversity in Scotland' (Scottish Executive, 2004) and '2020 Challenge for Scotland's Biodiversity' (Scottish Government, 2013) together form the Scottish Biodiversity Strategy.

'Scotland's Biodiversity: It's in your Hands – A strategy for the conservation and enhancement of biodiversity in Scotland' sets out a 25-year strategy to assist

government, the private and public sectors, non-governmental bodies and individual members of the public to conserve and enhance biodiversity in Scotland. The document '2020 Challenge for Scotland's Biodiversity' was published in response to the Aichi Targets set by the United Nations Convention on Biological Diversity (2010) and the European Union's Biodiversity Strategy for 2020 (2011).

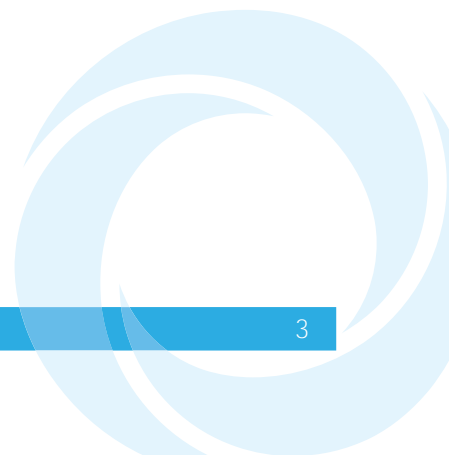
2.1.2 Scottish Biodiversity List

The Scottish Biodiversity List (BSL) was published in 2005 and last updated in 2012 (Scottish Government, 2013). The aim of the list is to help public bodies carry out their 'Biological Duty', as required by the Nature Conservation (Scotland) Act 2004, by identifying the species and habitats which are the highest priority for biodiversity conservation in Scotland. Nine species of bats are included on the SBL as detailed below;

- Brandt's bat *Myotis brandtii*
- Daubenton's bat *Myotis daubentonii*
- Whiskered bat *Myotis mystacinus*
- Natterer's bat *Myotis nattereri*
- Noctule *Nyctalus noctula*
- Nathusius' pipistrelle *Pipistrellus nathusii*
- Common pipistrelle *Pipistrellus pipistrellus*
- Soprano pipistrelle *Pipistrellus pygmaeus*
- Brown long-eared bat *Plecotus auritus*

2.1.3 Local Biodiversity Action Plan

Local Biodiversity Action Plan Partnerships were established in the UK following the ratification of the Convention on Biological Diversity in 1992. Each local partnership publishes biodiversity action plans which identify the habitats or species selected as priorities for targeted conservation work. The survey area lies within East Renfrewshire, for which the Renfrewshire Biodiversity Action Plan 2018-2022 has been published (Renfrewshire Council, 2018).



3 Methodology

3.1 Desk Study

As part of a wider desk study exercise, the MAGIC Government mapping website and SNHi websites were used to search for Statutory designated sites within 10km of the site. Non-statutory designated sites within 2km of the site and bat records up to 10km from the site were requested and obtained from the Glasgow Biological Records Centre (GBRC) in June 2019.

3.2 Preliminary Roost Assessment (PRA)

There are no structures within the Site itself, but Shieldhill Farm is located approximately 250m west of the Site boundary. A preliminary roost assessment (PRA) of Shieldhill Farm was carried out on the 4th of June 2019 by a bat licensed ecologist (SNH Licence No. 104080) and an assistant in accordance with Bat Conservation Trust Guidance (Collins, 2016).

An inspection of the external features of the buildings and internal spaces (where access was possible) was carried out to assess the buildings for the suitability for use by bats, and to look for any potential roosting features (PRFs) (e.g. cracks, crevices, holes) and evidence of bats, such as corpses, droppings and feeding remains.

A torch and endoscope (Ridgid Micro CA-100) were used where needed, and binoculars (Magnification 10x42) were used to see high level external areas.

The PRA allowed the roost suitability of the structures to be determined.

Table 1: BCT roost categories (Collins, 2016)

Potential Suitability	Key features
Negligible	Negligible habitat features not likely to be used by roosting bats
Low	A structure or tree 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 and or suitable foraging/commuting habitat to be used on a regular basis or by large numbers of bats.
Medium	A structure or tree with one or more potential roost sites that could be used by bats due to their size and surrounding habitat but which are unlikely to support a roost of high conservation importance.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by large numbers of bats on a regular basis and potentially for longer periods of time owing to their size and surrounding habitat.

3.2.1 Winter Hibernation Assessment

During the PRA the structures were assessed as to their suitability to support hibernating bats over winter using guidance in Table 1.

3.3 Automatic Bat Detector Survey

A walkover assessment of the Site was conducted on the 4th of June to assess the habitats within the Site and determine the locations for the static detectors. The methodology follows that in survey guidelines (Scottish Natural Heritage, 2019), where static detectors were deployed at each of the three turbine locations.

Due to the topography of the Site and limited habitat features, the Site had been deemed to consist of habitats of low quality for foraging and roosting bats. In accordance with guidance (SNH, 2019), sites with low quality habitats do not necessarily require bat activity transects. SNH were consulted in June 2019¹ and confirmed their agreement with this approach and methodology.

Static bat detectors were deployed at three locations over three visits timed in late spring (June), summer (August) and autumn (October). Full spectrum bat detectors (Wildlife Acoustics Song Meter SM2+ detectors with SMX-II weatherproof acoustic microphones) were used. The detectors were programmed to record activity from 30 minutes before sunset to 30 minutes after sunrise for a period of at least 10 nights. The detectors were deployed in areas close to the proposed turbine locations, as shown in Tables 2 and 3.

Table 2: Bat static deployment details

Visit Number	Date of deployment and retrieval	Number of nights deployed	Automatic Time on and off	Hours detector on per night
1	04/06/2019-18/06/2019	14	21:23 – 05:08	07:45
2	19/08/2019-29/08/2019	10	20:20 – 06:20	10:00
3	04/10/2019-14/10/2019	10	17:50 – 08:20	14:30

Table 3: Bat Static Location Details

Static	Habitat	Approximate Grid reference
1	Open grassland	NS 51622 49557
2	Open grassland	NS 51646 49193
3	Open grassland	NS 52103 49525

3.3.1 Data analysis

All the data gathered from the detectors during each survey was downloaded and analysed by a suitably experienced ecologist using either the 'Analog' programme or BatSound (Version 4.4.0). This allowed each bat pass to be identified to species or genera level and enabled a calculation and assessment of activity levels present across the site.

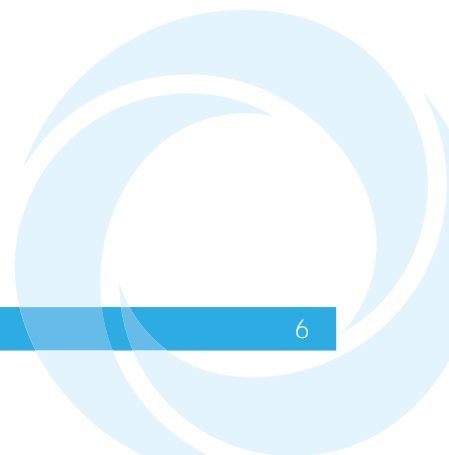
¹ Emails between Catherine Hibbert (Atmos Consulting) and David Kelly (SNH) on 11th and 12th June 2019

3.4 Survey Limitations

During the PRA, there was no access to the loft space within Shieldhill Farmhouse itself due to there being no access to the loft hatch. However, this did not affect the roost category assigned to the building and consequent recommendations.

There were no limitations to the static detector surveys.

There are limitations with regards to the identification of bat species using sound analysis (Russ, 2012). For example, a pipistrelle bat calling at 50kHz could be either a common or a soprano pipistrelle because their frequency ranges overlap and therefore would be labelled an unidentified pipistrelle. In addition to this, some very faint pipistrelle calls cannot be identified due to the signal being too weak to analyse using the analysis software.



4 Results

4.1 Desk Study

There are no statutory designated nature conservation sites within the proposed Moorshield Wind farm boundary. As shown in table 4, one Site of Special Scientific Interest (SSSI) is located within 5km, and a further three are located within 10km, none of which are designated for bat interests.

Table 4: Statutory designated sites within 10km of Moorshield Wind farm Site

Designated site	Designated features	Distance from Site
Brother and Little Lochs SSSI	Oligotrophic loch- best example of open waterbodies and emergent vegetation communities within west central Scotland; Varnished hook-moss <i>Hamatocaulis verniculosus</i> – nationally scarce bryophyte occurring in base-rich flushes and springs feeding Little Loch	2km NW
Rouken Glen SSSI	Geological designation	8km N
Waulkmill Glen SSSI	Geological designation	8km N
Cart and Kittoch Valleys SSSI	Upland mixed ash woodland – a wooded gorge fringing the rivers Cart and Kittoch with diverse ground flora.	10km NE

There are four non-statutory sites of Interest for Nature Conservation (SINCs) within 2km of the proposed Moorshield Wind Farm boundary, two of which are on Site. None of these sites are designated for bat interests.

Table 5: Non-statutory designated sites within 2km of Moorshield Wind Farm Site

SINC name	Summary of designated feature	Distance from site
Shieldhill Bog SINC	A large area of blanket bog; a relatively undamaged site with a good range of associated plants and one notable species (round-leaved sundew <i>Drosera rotundifolia</i>). The Shieldhill Bog SINC covers an area of approximately 88.3ha.	On site
Floak Bridge grassland SINC	A large and typical upland composite grassland site, predominately acid grassland, with extensive marshy grassland where drainage is poor.	On site in western corner
Bennan Loch and Lochcraig Reservoir SINC	Rich marginal vegetation around the fringes of Lochcraig Reservoir. In contrast, Bennan Loch has very little marginal vegetation or any visible aquatic interest. Both sites may be important for birds.	Adjacent
Ballageich Bog SINC	A small area of blanket bog lying between Ballageich Hill and Bennan Loch. Modified by drainage and grazed. The vegetation is very typical of bog modified by management.	1km north east

The data provided by the GBRC also showed no large bat roosts nearby with connectivity to the Site.

4.2 Preliminary Roost Assessment

The Shieldhill Farm consists of the farmhouse with adjoined outbuildings and two separate large barns. Photographs of the buildings are provided in Appendix A. The farmhouse and adjoined outbuildings have pitched slated roofs. The roofs were in generally good condition but there were gaps around the slates and under the lead flashing. There were also gaps around skylights, some of which in the outbuildings were open, allowing internal access. The large barns were constructed of corrugated metal cladding with a brick work base, and metal rafters internally. No evidence of bats was found during external or internal inspection of the buildings.

The farmhouse and adjoined outbuildings were deemed to have high suitability for summer roosting bats.

The two large corrugated metal barns were deemed to have negligible suitability for roosting bats.

4.3 Winter Hibernation Assessment

The farm is occupied and in current use, and as such any features identified are unlikely to provide the stable cool and humid conditions required for large numbers of over-wintering bats.

4.4 Habitat Assessment

The habitats present on the Site are open and exposed, with no obvious linear habitat features. The Site supports mire and grassland habitats with minor watercourses feeding north into Bennan Loch and south into Soame Burn.

Off-site to the south west, Shieldhill Farm is located approximately 250m from the Site boundary. Habitat connectivity to this potential roost feature is limited, with the farm set in open grassland bounded by stock proof fencing. The Site is located at a higher elevation to the farm, where lower lying areas off-site would potentially provide more suitable sheltered foraging habitat such as the edge of the coniferous plantation adjacent to Soame Burn.

4.5 Automatic Bat Detector Survey

The static bat detectors recorded the presence of common pipistrelle and soprano pipistrelle, along with *Nyctalus* and *Myotis* calls that could not be identified to species level.

A total of 210 bat passes were recorded throughout the three static deployments, as shown in Table 6. Soprano pipistrelle was the most commonly recorded species with 42% of bat passes, while common pipistrelle was the second most commonly recorded species accounting for 32% of bat passes. 41 bat passes (20%) could only be identified down to *Pipistrelle* spp as they could not be distinguished between the two species. Small numbers of *Nyctalus* spp (3%) and *Myotis* spp (3%) were also recorded.

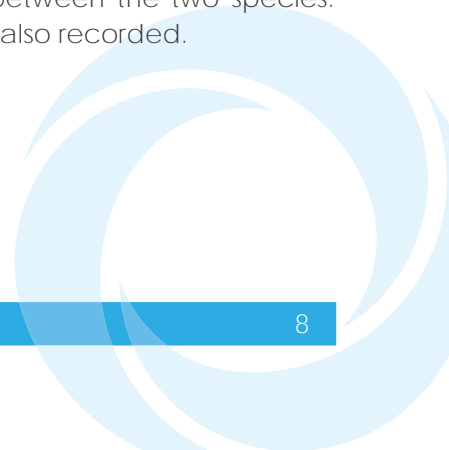


Table 6: Number of bat passes recorded at each location

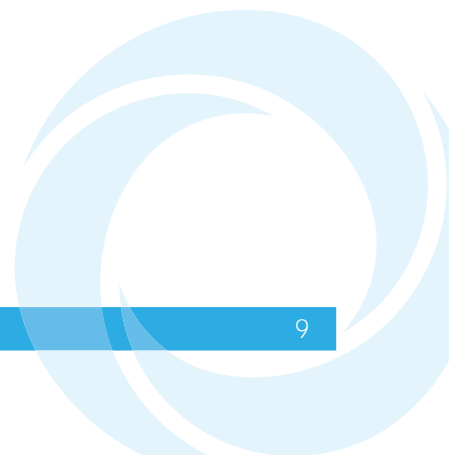
Species	Static Number									Total
	1			2			3			
	Jun	Aug	Oct	Jun	Aug	Oct	Jun	Aug	Oct	
Common pipistrelle	2	7	0	3	5	1	20	30	0	68
Soprano pipistrelle	3	21	0	2	1	0	13	48	0	88
Pipistrelle Spp	0	21	0	0	1	0	0	19	0	41
Noctule/ <i>Nyctalus spp</i>	1	2	0	0	1	0	1	2	0	7
<i>Myotis spp</i>	2	0	0	0	0	0	4	0	0	6
Total	8	51	0	5	8	1	38	99	0	210

Bats were recorded at all three static locations on the Site, with the highest level of bat activity being at static 3 with 137 passes, with static 1 recording the second highest level of bat activity with 59 bat passes. Static 2 recorded the lowest level of bat activity with 14 bat passes in total.

Both Common and Soprano pipistrelles were recorded at all three static locations as were unidentified Pipistrelle calls. *Nyctalus spp* were also recorded across all three static locations while *Myotis spp* were only recorded at statics 1 and 3.

Bat activity was greatest during the August deployment with a total of 158 bat passes in total. In comparison, June recorded 71 bat passes while October showed only a single bat pass.

The static in closest proximity to Shieldhill Farm (static 2) recorded the lowest levels of bat activity, whereas static 3 closer to Bennan Loch recorded comparatively higher activity levels.



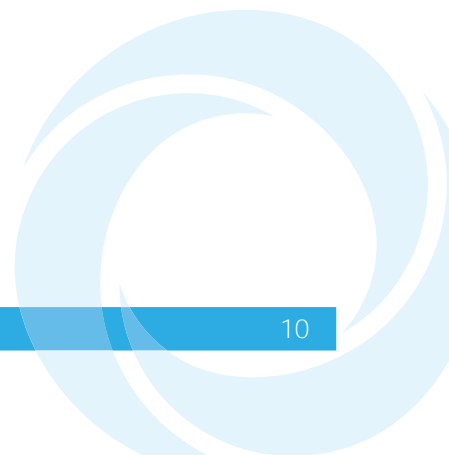
5 Summary

Bat surveys were undertaken across the Moorshield Site during the 2019 season.

There were no buildings or features with bat roost potential on the Site. Approximately 150m west, Shieldhill farmhouse and adjoined outbuildings were deemed to have high suitability for summer roosting bats, while the two large corrugated metal barns were deemed to have negligible suitability for roosting bats. No evidence of bats was found during external or internal inspection of the buildings.

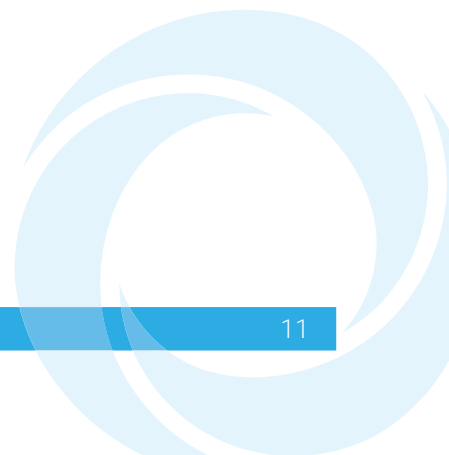
The farm buildings were considered unlikely to provide the right conditions for large numbers of over-wintering bats as the farm is currently occupied and as a result any likely features are unlikely to provide the required stable cool and humid conditions.

Three static bat detectors were deployed during June, August and October. These indicated that the Site is predominantly used by soprano and common pipistrelles, with soprano pipistrelles being the most commonly recorded bat species. Small numbers of *Nyctalus spp* and *Myotis spp* were also recorded.



6 References

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- Renfrewshire Council. (2018). *Renfrewshire Biodiversity Action Plan 2018-2022*. Retrieved from http://www.renfrewshire.gov.uk/media/6303/Renfrewshire-Biodiversity-Action-Plan-2018-2022/pdf/Biodiversity_Action_Plan_FINAL.pdf?m=1527000856037
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7 Figures

Figure 1: Map of the Site showing static bat detector locations

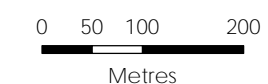
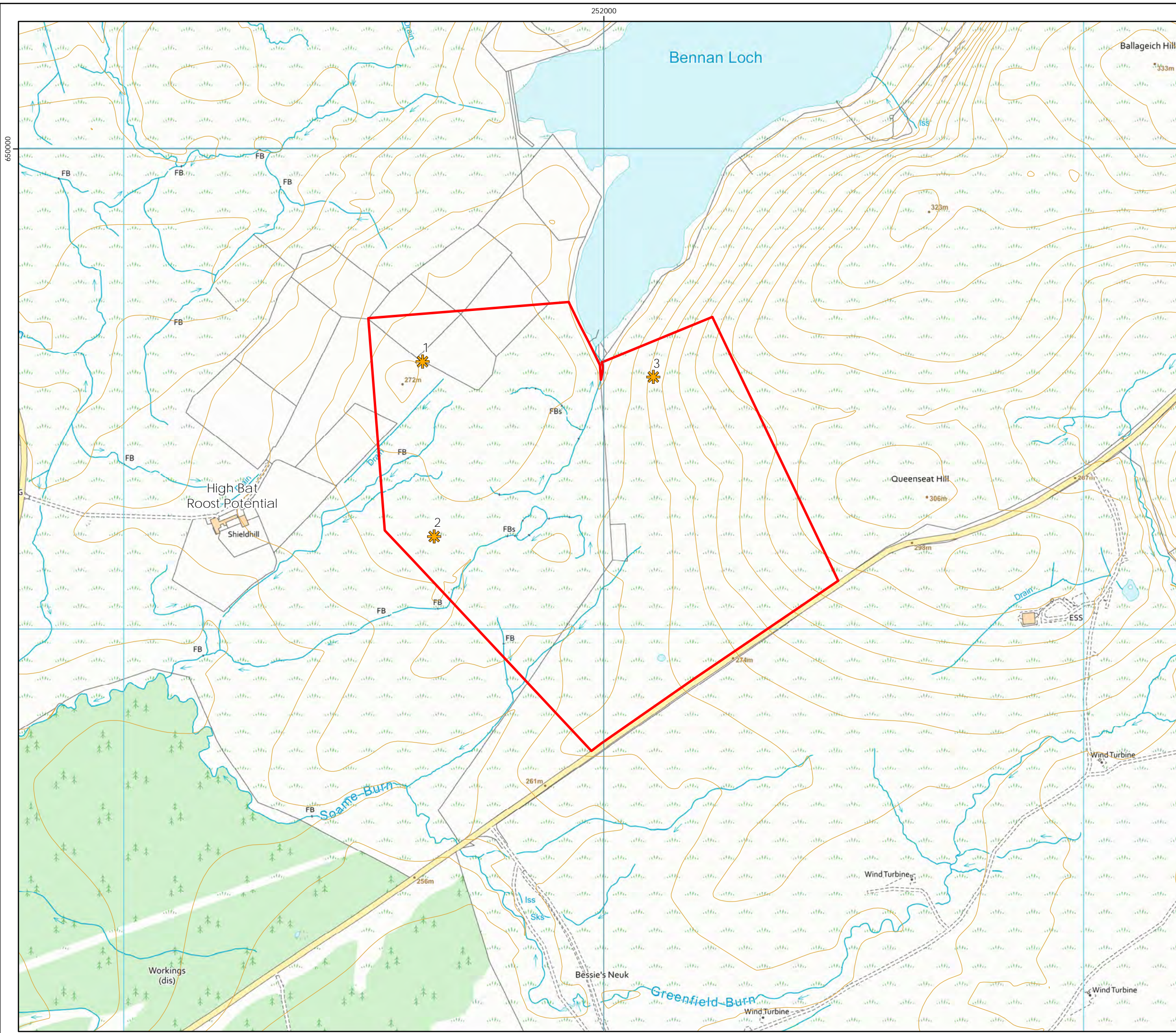
Moorshield Wind Farm



Bat Detector Locations

Key

- Development boundary
- Static detector locations 2019



Scale @ A3:
1:7,500



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Drawn by: AA Checked by: TH Approved by: CH

Appendix A: Images of Buildings

Figure 2: Shieldhill Farmhouse



Source: Echoes Ecology Ltd, June 2019

Figure 3: Shieldhill Farm corrugated metal barn



Source: Echoes Ecology Ltd, June 2019