Appendix 15.3

Baseline Bat Report

Coolglass Wind Farm EIAR Volume 3

Coolglass Wind Farm Limited

SLR Project No.: 501.V00727.00006

27 June 2023

BAT SURVEY REPORT

Coolglass Wind Farm

Prepared for: Coolglass Wind Farm Ltd

SLR Ref: 501.00727.00004
Version No: Issue01
April 2023

Document Control	
Document Properties	
Organisation	SLR Consulting Ireland
Project Name	Coolglass Wind Farm
Report Title	Bat Survey Report
Author(s)	Dr Jonathon Dunn
Draft version/final	Issue01
Document reference	501.00727.00004

DATE	**Revision No**	**Prepared by**	**Reviewed by**	**Approved by**	**Status**	**Comments**
19/04/2023	Issue01	Dr Jonathon Dunn	Nicola Faulks	Nicola Faulks	For client review	

BASIS OF REPORT

CONTENTS

DOCUMENT REFERENCES

TABLES

CHARTS

FIGURES

APPENDICES

1.0 Introduction

1.1 Background

SLR Consulting Ireland Ltd (hereafter 'SLR') was commissioned by Coolglass Wind Farm Ltd in July 2021 to undertake bat surveys for the proposed Coolglass Wind Farm (the Project). The Project is located approximately 1.2 km north of the nearest large settlement, which is the village of The Swan, and approximately 2.4 km southeast of the village of Timahoe. This baseline report provides the results of surveys for bats, carried out between July to September 2021, and May to August 2022. It is intended that this report will be used to inform the resulting ecological impact assessment report (EIAR).

1.2 Site Description

The Project location (hereafter 'Project Site') is shown in **Figure 1**. There are two proposed turbine clusters called the 'northern cluster' and 'southern cluster' comprising of a combined total of 13 turbines. The northern cluster is centred on Irish National Grid (ING) reference S 56099 88016 and the southern cluster is centred on ING reference S 57127 84198. The Project Site is in the east of Co. Laois, within the townlands of Brennanshill, Coolglass, Crissard, Fallowbeg Upper, Coolglass Upper, Gorreelagh Kylenabehy and Scotland near the local roads L3851 and L38501, and regional road R426.

There are also two grid route options called 'Pinewoods option (option A)' and 'Coolnabacky option (option B)'. The majority of both route options follow the existing road network, with only the terminal sections entering conifer plantation and improved agricultural grassland (option A) or arable cropland (option B) where a substation is proposed to be constructed.

The topography ranges from approximately 145 m AOD at the bottom of the southern cluster to 333 m AOD in the centre of the northern cluster.

The dominant habitats within the Site include Sitka spruce *Picea sitchensis* coniferous woodland and to a lesser extent, improved agricultural grassland. The agricultural fields are bounded by linear hedgerow and treeline habitats, and there are also several forestry tracks and firebreaks within the conifer plantation.

The Fallowbeg Upper stream (EPA code 14F06) crosses the northern cluster in the east, flowing northeast before entering the Crooked [Stradbally] watercourse (EPA code 14C02) outside the Project Site. The Honey stream (EPA code 14H01) also runs near the western edge of the northern cluster. The Brennanshill (EPA code 15B51) and Clogh 15 (EPA code 15C03), both second order watercourses also flow through or are adjacent to the southern cluster, flowing south out of the Project Site.

Of these habitats, those most pertinent to bats include hedgerows, treelines, forest edges/tracks/firebreaks and, first and second order watercourses.

1.3 Scope of Study

The main aim of the surveys is to provide baseline data to inform the wind farm design process and inform the Environmental Impact Assessment (EIA) Report. More specifically, this report aims to:

- Identify the locations of any bat roosts, swarming sites, and key commuting or foraging habitat features that could be affected by the Project including the two grid route options;
- Determine the bat assemblage using the Project Site for foraging or commuting purposes;
- Compare levels of bat activity between recording locations both within the site and between seasons, to identify locations that may be of most importance to commuting or foraging bats, or indicate the nearby presence of a roost; and
- Undertake analysis to determine, if possible, relative levels of activity compared with other sites, using the online Ecobat tool[1].

The survey methodology was designed in accordance with current NatureScot wind farm-specific guidance[2] (hereafter 'NS'; while this guidance is Scottish, the guidance has been adopted in Ireland as industry-standard) and CIEEM-recommended bat survey methodology[3] (see **Section 2.6** for specific limitations). In addition, Bat Conservation Ireland guidance published in 2012[4] was also used where NS guidance was considered inappropriate in an Irish context e.g. defining the appropriate weather conditions for bat activity.

This report presents the findings of the bat surveys only. The assessment of impacts resulting from the proposed wind farm and the subsequent application of the mitigation hierarchy is beyond the scope of this report but will be addressed in the EIAR.

NS guidance[2] suggests a standardised format for presenting bat data and specifically, quantifying activity and species vulnerability, which relies on use of the Ecobat tool. As the Ecobat tool was not available at the time of writing, some of the risk assessment matrices could not be used. Consequently, the structure of this report deviates slightly from that suggested by NS guidance.

1.4 Relevant Legislation

1.4.1 Irish Legislation

Under Schedule 5 of the Wildlife Acts 1976 to 2021[5] (and as strengthened by the Wildlife Amendment Act, 2000[6]), all bat species and their roosts are protected by law. It is an offence to disturb bats or their roosts without an appropriate licence from the National Parks and Wildlife Service (NPWS).

The Wildlife Amendment Act (2000) is also the legal instrument through which Natural Heritage Areas (NHAs) are protected. These are areas containing habitats or species that require legal protection from damage, which can include bats. Not all NHAs have received statutory

---

[1]The Mammal Society. *EcoBat*. An EcoStat tool. Available online: http://www.mammal.org.uk/science-research/ecostat/ [Last accessed 19/04/2023].

[2] NatureScot (formerly 'Scottish Natural Heritage' or SNH), Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, University of Exeter & Bat Conservation Trust (2021) *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*. Available online at: https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation [Last accessed 19/04/2023]

[3] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologsts: Good Practice Guidance (3rd edn). The Bat Conservation Trust, London

[4] Bat Conservation Ireland (2012) Wind Turbine/Wind Farm Development Bat Survey Guidance, Version 2.8, December 2012. Bat Conservation Ireland, www.batconservationireland.org.

[5] https://www.irishstatutebook.ie/eli/1976/act/39/enacted/en/html#zza39y1976 [Last accessed 19/04/2023]

[6] https://www.irishstatutebook.ie/eli/2000/act/38/enacted/en/print.html [Last accessed 19/04/2023]

designation, and these are termed proposed Natural Heritage Areas (pNHAs). While lacking the same level of legal protection as NHAs, pNHAs are subject to limited protection via agri-environmental planning schemes and the recognition of the ecological value of pNHAs by planning and licencing authorities.

1.4.2 EU Legislation

Under the Habitats Directive 1992 (92/43/EEC)[7], member states of the European Union must designate Special Areas of Conservation (SACs), which form part of the EU-wide Natura 2000 protected area network. The aim of this network is to safeguard biodiversity against potentially damaging developments. SACs are designated based on the presence of habitats or species (known as 'qualifying interests' or QIs) listed under Annex I or Annex II of the Habitats Directives, respectively. The only species of bat in Ireland that is listed under Annex II of the Habitats Directives is the lesser horseshoe bat *Rhinolophus hipposideros*.

While strict protection is afforded SACs, all species of bat in Ireland also receive additional protection under Annex IV of the Habitats Directive. This prohibits the deliberate disturbance of bat species (particularly during the periods of breeding, nursing, and hibernation), as well as the deterioration and/or destruction of roosts across their entire natural range within the EU, both within and outside Natura 2000 sites.

1.4.3 International Legislation

Ireland has ratified two international wildlife laws pertaining to bats:

- The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention, 1982)[8]. Part of this convention stipulates that all bat species and their habitats are conserved; and
- The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979)[9]. The aim of this convention was to protect migratory species (which includes some species of bats) across all European borders.

[7] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043 [Last accessed 19/04/2023]
[8] https://www.coe.int/en/web/bern-convention?_sm_au_=iVVtWnJSVsMSFDZ5 [Last accessed 19/04/2023]
[9] https://www.cms.int/ [Last accessed 19/04/2023]

2.0 Methodology

2.1 Desk Study

A search was conducted to collate all the available information on bats relevant to the Project Site and the various factors at the Project Site that influence risk to bat populations.

This included examination of:

- Recent satellite maps and Environmental Sensitivity Mapper to identify features of potential value to bats at the Project Site[10];
- The bat landscapes suitability index for the Project Site[11];
- Recent bat species and roost records within 10 km from the Project Site[12];
- Previous bat surveys carried out at the Project Site[13];
- Maps of nationally and internationally designated sites for bats within 10 km from the Project Site[14];
- The location of the Project Site in relation to the edge of bat species' known Irish ranges[15];
- The location of wind energy developments and other projects within 10 km from the Project Site that could contribute to cumulative effects on local bat populations[16]; and
- The Environmental Statements (ES) of wind energy developments or other projects within 10 km of the Project Site containing information relating to bats[16].

2.2 Field Survey Methodology and Rationale

---

[10] Obtained via satellite images available on https://earth.google.com/web/ and Environmental Sensitivity Mapper (ESM) https://airomaps.geohive.ie/ESM/ [Last accessed 19/04/2023]. This was used to conduct an Initial Site Risk Assessment, assigning the habitats within the Project Site to a risk category (low, moderate or high) using criteria provided within NatureScot guidance[2] and reproduced in Appendix 1. Habitat suitability was assigned to individual features with the exception of areas of conifer plantation that were described as a block. Satellite images and the ESM were also searched for any potential roost features (e.g. buildings/structures, caves or trees) within 200 m of the Project Site boundary plus rotor radius (i.e. 200 + 79.35 = 279.35 m).

[11] Obtained via Biodiversity Ireland https://maps.biodiversityireland.ie/Map [Last accessed 19/04/2023]. The index ranks landscapes from least (0) to most favourable (100) using records held by Bat Conservation Ireland and landscape features to train a predictive model that identifies geographical areas suitable for individual bat species.

[12] Obtained via data request from Bat Conservation Ireland (BCI) received on 24 June 2022 and a search of the records contained in 10 km grid square S58 by the National Biodiversity Data Centre (NBDC) https://maps.biodiversityireland.ie/Map [Last accessed 13 July 2022].

[13] Fehily Timoney and Company (2018). Bat monitoring surveys at the proposed Fossy Wind Farm, Co. Laois 2018.

[14] Obtained via EPA map viewer https://gis.epa.ie/EPAMaps/ [Last accessed 19/04/2023].

[15] Obtained via maps contained under Article 17 reporting https://www.npws.ie/publications/article-17-reports/article-17-reports-2019 [Last accessed 19/04/2023].

[16] Obtained via the EIA portal https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1, myplan https://myplan.ie/national-planning-application-map-viewer/, Wind Energy Ireland https://windenergyireland.com/about-wind/interactve-map and Laois County Council planning portal Public Planning Application Finder (arcgis.com) [all last accessed 19/04/2023].

The field survey methodology was designed with reference to current wind farm specific guidance[2]. It comprises deployment of a suite of automated full spectrum detectors at 11 turbine locations at ground level, transect surveys, a habitat appraisal for winter and summer roosts, and an emergence survey.

No at height monitoring was undertaken, because according to the latest NS guidance[2], surveys at height are not essential and are unlikely to detect the presence of any species not recorded using detectors at ground level, unless detectors are placed in woodland. At height surveys are also only possible if there is a suitably tall (i.e. within turbine rotor swept heights) structure present where a microphone can be attached. As no suitable structures existed, an at height survey could not be undertaken. The ground level static detectors were judged to provide sufficient representation of activity of high-flying bat species as some of the static detectors were placed in more open habitats and near woodland edges and firebreaks.

Similarly, the guidance states that the use of walked transects should be discretionary and site-specific[2]. The choice of methods must be appropriate to identify connections between nearby roosts, linear features and potential key foraging areas across the development footprint. As known bat roosts were identified during the habitat appraisal and desk-search, transect surveys were judged as necessary to complement the information gained from the other surveys.

Full details of each survey type are provided below; where the methodology deviates from the guidance, a rationale has been provided.

2.2.1 Survey Area

The survey area boundary, transect locations and static detector locations are shown in **Figure 1**.

Habitat Appraisal for Potential Bat Roost Features and Assessment of Habitat Risk

NS guidance[2] states that ideally, key feature for supporting maternity roosts and significant hibernation/and or swarming sites within 200 m plus rotor radius (79.35 m) of the Project Site should be surveyed, including an assessment of the habitat risk of the Site. Access issues constrained the survey to areas within the Project Site only. Given the large survey area, focus was given to areas nearest to potential turbine locations.

In addition, all watercourse crossings along the grid connection route (GCR) options were surveyed for bat roost potential.

Activity Survey – Transect Survey

NS guidance[2] states that transects must identify connections between nearby roosts, linear features and potential key foraging areas across the development footprint. CIEEM guidance[3] also states that ideally, all habitats represented on site should be sampled. Two transects were chosen in the northern (transect 1) and southern cluster (transect 2) located along forestry tracks. The adjacent habitats were Sitka spruce conifer plantation and improved agricultural grassland, the two dominant habitats present at the Project Site. Linear features present next to the transects included treelines, hedgerows, forest edges and watercourses. The Scotland_15 stream ran next to part of transect 1 and the Brennanshill stream ran next to part of transect 2. Both transects were c. 1 km in length, each with seven to eight pre-determined stopping points.

Activity Survey – Static Bat Detector Surveys

NS guidance[2] states that survey effort should be focused in areas of the development site where

turbines are likely to be located. Detectors should be placed at or close to all known turbine locations at wind farms containing less than ten proposed turbines. Where there are more than ten proposed turbines, detectors should be placed at ten turbine locations plus a third of additional potential turbine sites for up to a maximum of 40 detectors for the largest developments. As the Project comprises 13 turbines, static detectors were placed at 11 proposed turbine locations (further information is provided in **Sections 2.2.3** and **2.6**).

2.2.2 Habitat Appraisal for Potential Bat Roost Features and Assessment of Habitat Risk

A desk study was conducted using aerial maps and 2018 survey data[13] to identify potential roosts and foraging habitats within the Project Site and along the two grid route options. The survey area was also walked during daylight hours on 7 - 10 February 2022 (winter) and 4 - 6 July 2022 (summer). The purpose of this was to search for potential winter and summer bat roost features according to CIEEM guidance[3], and to undertake an initial site risk assessment following NS guidance[2], assigning the habitat within the survey area to a risk category (low, moderate or high) as reproduced in **Appendix 1**.

All buildings, bridges and suitable trees were closely inspected externally from ground level using binoculars and a high-powered torch following CIEEM guidelines[3]. The categories used to classify the bat roost suitability of any features found are detailed in **Table 2-1**.

Table 2-1
Categories of bat roost suitability

Suitability	Typical roosting features
Negligible	Negligible habitat feature on site likely to be used by roosting 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). A 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.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their 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).
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis & potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat.

2.2.3 Emergence Survey

Following the roost searches, an emergence survey was carried out on the 15 August 2022 at a dilapidated farm building that was in the development footprint in the southern cluster (location

shown in **Confidential Appendix 3**). The building consists of a stone wall with an internal wooden frame and corrugated roof, with ivy growing inside, which are features with a reasonable likelihood of supporting bats. As it was impossible to access and inspect the structure safely, an emergence survey was judged as appropriate to search for evidence of roosting bats in accordance with CIEEM guidance[3].

Two surveyors were stationed either side of the structure (ITM co-ords 657268, 686687 for location 1, and 657248, 686697 for location 2), each with a Bat Logger-M detector to record calls. The survey lasted from sunset (20:56) until 22:20, where it was clear that bats were foraging and not emerging. Weather conditions were favourable for bat surveys (sunset temperature 16°C, wind speed 3 m/s and no rain). Target notes were made on bats exiting the structure and use of the surrounding area.

2.2.4 Activity Survey – Transect survey

Activity surveys were carried out once per season (spring, summer and autumn) at two transects in each turbine cluster. Transects were conducted simultaneously using BatLogger-M detectors to record calls. Each surveyor drove along the transect slowly and at a constant pace, stopping at predetermined 'stopping points' every three minutes. Surveys lasted 2 hours in duration. Target notes were made on flight lines, the assemblage of species present and the use of the surrounding habitats.

Details of the surveys are shown below in **Table 2-2**. Weather conditions were acceptable for bat surveys.

Table 2-2
Survey Dates and Weather Conditions - Transect Surveys

Season	Date	Sunset	Time of survey	Weather
Spring	26/05/2022	21:37	21:37 – 23:37	Sunset temperature 12°C, wind 2 m/s, no precipitation
Summer	16/08/2022	20:56	20:56 – 22:56	Sunset temperature 12°C, wind 6 m/s, no precipitation
Autumn	28/09/2022	19:15	19:00 – 21:00	Sunset temperature 10°C, wind 10 m/s, no precipitation

2.2.5 Activity Survey – Static Bat Detector Survey

Full spectrum bat detectors (Anabat Swift, Titley Scientific) were deployed at 11 locations (**Figure 1**) for the periods shown in **Table 2-3**. The locations were chosen based on the first turbine layout, so were at turbine locations, but following design changes, the static detectors were kept the same to allow inter seasonal comparison. The descriptions in **Table 2-4** describe the habitats and the distanced/direction to the nearest turbines.

Note that for the summer and autumn periods, 16 detectors were originally deployed, which was reflective of the number of turbines originally under consideration. However, in the winter of 2021/22, the Project layout changed markedly and 16 turbine locations were dropped. Consequently, only call data from 11 of the 16 detectors for the summer and autumn rounds were retained for analysis and inclusion in this report[17]. For the spring 2022 round, detectors were placed at 11 of the previous locations to ensure comparability between seasons. Therefore, the locations used for static detector surveys does not match the latest turbine layout exactly (see **Section 2.6** on Survey Limitations).

Table 2-3
Static Bat Detector Deployment

Season	Sampling Location(s)	Dates of Deployment	Length of Recording Period
Summer 2021	T1, T3-T5, T7	12/07/2021 – 04/08/2021	23 nights
	T8-T13	13/07/2021 – 04/08/2021	22 nights
Autumn 2021	T1, T8	07/09/2021 – 23/09/2021	16 nights
	T3-T5, T7, T9-T13	08/09/2021 – 23/09/2021	15 nights
Spring 2022	T1, T3-T5, T7-T13	26/05/2022 – 07/06/2022	12 nights

Detectors were deployed with microphones attached to wooden stakes or trees approximately 2 m above ground level (see **Photographs 2.1** and **2.2**), facing approximately north, with detectors programmed to record from half an hour before sunset until half an hour after sunrise on each night.

The locations of each static detector are shown in **Figure 1** and described in more detail in Table 2-4. Proposed turbine locations T2, T3 and T6 – T13, are within coniferous woodland habitat. Proposed turbine locations T1, T4 and T5 are located within improved agricultural grassland habitat.

[17] Raw data for the other five detectors is available on request.

Table 2-4
Static Bat Detector Locations

Sample Point	Co-ordinates (TIM)	Description
1	655180, 688168	Detector located in margin of overgrown improved agricultural grassland field near immature conifer plantation edge. Linear features within 50 m included forest edge and field margin 7 m NE of detector. Detector c. 235 m NE of T1 location but habitats are identical.
3	655856, 688191	Detector located within mature conifer plantation. There are no linear features within 50 m of detector. Detector c. 255 m SE of T3 location; forest track nearer T3 location but otherwise within the same habitat.
4	656239, 688060	Detector located within improved agricultural grassland. There are no linear features within 50 m of detector. Detector c. 236 SE of T4 location; forest edge nearer T4 location but otherwise within same habitat.
5	656849, 688364	Detector located within overgrown improved agricultural grassland, near hedgerow and some scrub. Linear features within 50 m included hedgerow 2 m NW of detector. Detector c. 40 m NW of T4 location but habitats are identical.
7	657083, 688067	Detector located at mature conifer plantation forest edge, which is a linear habitat. Detector c. 345 m NW of T7 location; forest edge nearer to detector location but otherwise within same habitat.
8	657706, 683822	Detector located within mature conifer plantation, 20 m NE of linear forest edge. Detector c. 666 m SE of T8 location; forest edge nearer detector location and T8 in recently felled conifer plantation.
9	657596, 684793	Detector located within immature conifer plantation. There are no linear features within 50 m of detector. Detector c. 228 m SE of T9 location; forest edge nearer to T9 location but otherwise within same habitat.
10	656533, 684271	Detector located within mature conifer plantation. No linear features within 50 m of detector. Detector c. 68 m NW of T10 location but otherwise within same habitat.
11	656550, 683964	Detector located at the edge of immature conifer plantation. Linear forest edge/fire break located 7 m NE of detector m. Detector c. 393 m NW of T11 location; detector in slightly less mature plantation but otherwise same habitat.
12	657075, 684138	Detector located within mature conifer plantation. Linear firebreak 2 m SE of detector. Detector c. 122 m NE of T12 location

Sample Point	Co-ordinates (TIM)	Description
		but otherwise same habitat.
13	657121, 683779	Detector located within mature conifer plantation, near forest edge. Linear features within 50 m include forest edge 5 m SE of detector. Detector c. 178 m SW of T13 location but otherwise same habitat.

Photograph 2.1
Example of static bat detector setup within coniferous woodland habitat (sample location 10)

Photograph 2.2
Example of static bat detector setup within improved agricultural grassland habitat (sample location 4)

Weather Data and Survey Dates

The NS guidance[2] states that 10 nights of data per season should be collected, within appropriate weather conditions, specifically with a sunset temperature of 10°C or above, ground level wind speed of 5m/s or lower, and no rain or very light rain. This guidance is for Scotland, and for Ireland Bat Conservation Ireland guidance[4] state that sunset temperatures should be 7°C or above.

The NS guidance[2] also states that while surveys should aim for 10 consecutive nights, in practice weather conditions may preclude this, particularly early or late in the year and in more northerly latitudes. The guidance also goes on to say that 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 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 12-23 nights during each season to maximise the chances of obtaining 10 nights of data during optimal weather conditions

Temperature and wind speed data were collected from a weather station (Davis Vantage Vue Wireless) installed at the site, which takes readings every 30 minutes.

The reading closest to sunset for each night was used to assess the suitability of temperature following the methodology outlined in NS[2] and CIEEM[3] guidance.

For wind, an average per night was determined based on the period between sunset and sunrise. This period was then used to work out the average nightly wind speed. If the average was less than 5m/s the night was considered suitable for bat surveys.

For the purposes of this assessment, light rain has been classified as total nightly rainfall less than 2 mm and/or less than 1 mm of rainfall in any one-hour period throughout the night. The same protocol for determining night length across deployments was used as described above.

In the spring session, 12 consecutive nights of appropriate weather conditions were available. In the summer session, 21 out of 22 nights of survey had appropriate weather conditions; however, of these, there were 17 consecutive nights with appropriate weather conditions. In the autumn session, 15 out of 16 survey nights had appropriate weather conditions, with 9 consecutive nights of suitable weather conditions.

The dates used in the analysis, along with details of the weather conditions on those dates, are detailed in **Table 2-5**.

Table 2-5
Survey Dates and Weather Conditions – Static Detectors

Survey Nights Used for Analysis	Sunset - Sunrise[18]	Temperature at Sunset	Nightly Average Wind Speed (m/s)	No rain or light rain[19]
Summer session - deployment dates: 12th July – 4th August 2021 (23 nights) for sample locations T1, T3-T5, T7 (5 sample points) and 13th July – 4th August 2021 (22 nights) for sample locations T8-T13 (6 sample points)				
12th July 2021	21:49 – 05:19	15 °C	1.1	Yes
13th July 2021	21:48 – 05:20	13 °C	0.5	Yes
14th July 2021	21:47- 05:22	17 °C	1.2	Yes
15th July 2021	21:46 – 05:23	17 °C	1.0	Yes
16th July 2021	21:45 – 05:24	18 °C	0.6	Yes
17th July 2021	21:44 – 05:25	21 °C	0.6	Yes
18th July 2021	21:43 – 05:27	22 °C	1.5	Yes
19th July 2021	21:42 – 05:28	22 °C	1.2	Yes
20th July 2021	21:40 – 05:30	22 °C	0.8	Yes
21st July 2021	21:39 – 05:31	21 °C	0.6	Yes
22nd July 2021	21:38 – 05:33	22 °C	0.9	Yes
23rd July 2021	21:36 – 05:34	19 °C	1.2	Yes
24th July 2021	21:35 – 05:36	16 °C	0.4	Yes
25th July 2021	21:33 – 05:37	20 °C	0.9	Yes
26th July 2021	21:32 – 05:39	16 °C	0.5	Yes
27th July 2021	21:30 – 05:40	12 °C	0.8	Yes
28th July 2021	21:28 – 05:42	11 °C	1.4	Yes
29th July 2021	21:27 – 05.43	12 °C	1.1	**No**
30th July 202	21:25 – 05:45	14 °C	0.9	Yes
31st July 2021	21:23 – 05:46	14 °C	1.4	Yes
1st August 2021	21:22 – 05:48	12 °C	0.8	Yes
2nd August 2021	21:20 – 05:50	13 °C	0.6	Yes
3rd August 2021	21:19 – 05:51	14 °C	0.6	Yes

[18] Note sunset – sunrise refers to the start/end of each survey night. Each survey night period spans two calendar dates. For example, the survey night on the 12th July 2021 is from the period of sunset on the 12th July 2021 to the period of sunrise on the 13th July 2021.
[19] Total nightly rainfall <2 mm and/or < 1 mm rain in any one-hour period in the night

Survey Nights Used for Analysis	Sunset - Sunrise[18]	Temperature at Sunset	Nightly Average Wind Speed (m/s)	No rain or light rain[19]
Autumn session - deployment dates: 7th September – 23rd September 2021 (16 nights) for sample locations T1 and T8 (2 sample points) and 8th September – 23rd September 2021 (15 nights) for sample locations T3-T5, T7 and T9-T13 (9 sample points).				
7th September 2021	20:02 – 06:51	19 °C	1.5	Yes
8th September 2021	20:00 – 06:52	18 °C	0.9	Yes
9th September 2021	19:58 – 06:54	18 °C	0.6	Yes
10th September 2021	19:55 – 06:56	16 °C	1.0	Yes
11th September 2021	19:53 – 06:57	14 °C	0.9	Yes
12th September 2021	19:51 – 06:59	14 °C	0.9	Yes
13th September 2021	19:48 – 07:01	15 °C	1.5	Yes
14th September 2021	19:46 – 07:02	16 °C	0.4	Yes
15th September 2021	19:43 – 07:04	16 °C	0.6	Yes
16th September 2021	19:41 – 07:06	17 °C	2.3	**No**
17th September 2021	19:39 – 07:08	14 °C	0.6	Yes
18th September 2021	19:36 – 07:09	13 °C	0.9	Yes
19th September 2021	19:34 – 07:11	13 °C	0.6	Yes
20th September 2021	19:31 – 07:13	16 °C	0.6	Yes
21st September 2021	19:29 – 07:14	15 °C	1.6	Yes
22nd September 2021	19:26 – 07:16	16 °C	1.5	Yes
Spring session - deployment dates: 26th May 2022 – 7th June 2021 (12 nights) Sample locations: T1, T3-T5, T7, T9-T13 (11 sample points).				
26th May 2022	21:36 – 05:14	10 °C	0.8	Yes

Survey Nights Used for Analysis	Sunset - Sunrise[18]	Temperature at Sunset	Nightly Average Wind Speed (m/s)	No rain or light rain[19]
27th May 2022	21:38 – 05:13	11 °C	0.7	Yes
28th May 2022	21:39 – 05:12	12 °C	0.7	Yes
29th May 2022	21:40 – 05:11	10 °C	0.7	Yes
30th May 2022	21:41 – 05:10	8 °C	1.1	Yes
31st May 2022	21:43 – 05:09	10 °C	1.1	Yes
1st June 2022	21:44 – 05:08	15 °C	1.5	Yes
2nd June 2022	21:45 – 05:08	14 °C	1.5	Yes
3rd June 2022	21:46 – 05:07	13 °C	1.5	Yes
4th June 2022	21:47 – 05:06	12 °C	1.7	Yes
5th June 2022	21:48 – 05:06	10 °C	1.1	Yes
6th June 2022	21:49 – 05:05	9 °C	0.6	Yes

weather data highlighted in bold indicates values that do not meet the threshold criteria for appropriate weather conditions within the NS guidance[1] (refer to **Section 2.7 for a discussion of weather limitations).*

2.3 Bat Sonogram Analysis

Bat calls were analysed in full spectrum format using Kaleidoscope Pro (version 5.1.9g) 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) for Ireland. This software allows data to be classified automatically with bat species which fit the same call characteristics that each call file provides.

All files classified as 'no ID' were manually checked to confirm identification, using call parameters within Russ (2012)[20]. A randomly selected 10% subset of files assigned by the filter as being noise were also checked manually, to ensure no faint calls were missed. *Myotis* calls were identified to species level and putative Nathusius' pipistrelle calls were manually checked, all using the parameters[21] contained within Russ (2012)[20]. The same guide was used to identify social calls to species level.

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); rather, it gives an indication of the level of bat activity in that location over each recording period. Note that where more than one species was identified within the same bat pass, the pass was manually split into

[20] Russ, J. (2012) British Bat Calls. A Guide to Species Identification. Pelagic Publishing, Exeter.
[21] Calls with a peak frequency of 41kHz or less were considered to be Nathusius' pipistrelle, which was further confirmed by detailed interrogation to check the absence of common pipistrelle calls immediately before or after the putative Nathusius' pipistrelle calls

two so an accurate number of bat passes split by species was obtained.

The presentation and statistical analysis of all bat call results was completed in R version 4.1.0.

2.4 Survey Personnel

Jonathon Dunn and Aisling Kinsella deployed the static detectors at the start of the summer session, which were subsequently collected and re-deployed by Aisling Kinsella and Faolán Linnan for the autumn season. Jonathon Dunn and Sinéad Clifford deployed and collected static detectors for the spring season, and carried out all transect surveys, roost searches and emergence surveys.

Bat call analysis was undertaken by Sinéad Clifford. The report was written by Jonathon Dunn and reviewed by Nicola Faulks.

Aisling Kinsella

Aisling is a Senior Field Ecologist with SLR and has worked in ecological consultancy since 2020. Aisling holds a BSc (Hons) in Environmental Science with a major in Zoology from University College Cork and an MSc in Wildlife Management and Conservation from University College Dublin. Her experience to date has included ECoW on a range of infrastructure developments, habitat assessments, mammal, bird and bat surveys. Aisling has helped prepare EIAR Biodiversity chapters and AA screening reports for a range of different projects as well as bird survey reports for onshore wind developments.

Faolán Linnane

Faolán Linnane is a Project Ecologist with SLR and has worked in consultancy since June 2021. Faolán holds a BSc in Environmental Science (Zoology) from University College Cork and an MSc in Marine Biology from University College Cork. Faolán gained valuable and transferable bird survey skills with the Curlew Conservation Programme on completion of his MSc. His experience in consultancy includes ECoW on a large infrastructure development, habitat surveys and a variety of bird surveys including vantage point watches, breeding wader surveys, breeding raptor surveys and goose roost surveys. He has also helped prepare AA screening reports for a range of projects.

Sinéad Clifford

Sinéad is Senior Ecologist with SLR. Sinéad holds a BSc (Hons) Wildlife Biology from Institute of Technology Tralee, and a Certificate in Ecological Consultancy (Distinction) from Ecology Training UK (formerly Acorn Ecology). Sinéad has worked in ecological consultancy since 2018. Sinéad's specialist areas are in bat ecology, mammal survey, Geographical Information Systems (GIS), habitat survey, mapping and classification. She also has an excellent understanding and experience in invasive species survey. Sinéad has prepared ecological reports for a wide range of diverse projects during her career.

Jonathon Dunn

Dr Jonathon Dunn MCIEEM wrote this report. Jonathon Dunn holds a BA (Hons) in Natural Sciences (Zoology) from the University of Cambridge, UK, an MSc in Ecology, Evolution and Conservation from Imperial College London, UK, and a PhD in Avian Ecology from Newcastle University, UK. He is a full member of the Chartered Institute of Ecology and Environmental Management. Jonathon has over eight years' experience in the environmental sector. Jonathon

has excellent understanding and experience in a variety of ecological field survey techniques, reports (including EcIA, NIS and taxon-specific) and analyses including GIS and statistics.

Nicola Faulks

This report was reviewed by Nicola Faulks MCIEEM CEcol. Nicola has over 18 years of experience in the environmental sector as an ecological consultant. Undertaking baseline surveys, collation of data and assessment of potential impacts due to development and post construction monitoring. She has worked on a diverse range of projects including ecological impact assessments both in the UK and abroad, including Bosnia, Croatia, Guinea, Sri Lanka and Georgia. Nicola's proven skills include Ecological Due Diligence reviews and advice; planning, undertaking and supervision of ecological baseline surveys and preparation of EcIAs. Nicola has also been writing guidance for bat call analysis within SLR and setting up a database to store the large amounts of data generated during site surveys.

2.5 Assessment of Relative Bat Activity Levels

In accordance with NS guidance[2], the relative level of bat activity recorded during the static detector surveys should be analysed through the use of the secure online tool *Ecobat*[22], initially designed by the University of Exeter and now hosted and developed by the Mammal Society[23]. *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 Ireland as a whole.

Ecobat was not available for undertaking the required analysis as it was offline for essential maintenance at the time of writing this report. National Parks and Wildlife Services (NPWS) was contacted to make them aware of this issue. Once Ecobat is back online, the outputs generated will be used to update this report, and the report will be reissued as an update.

2.6 Survey Limitations

2.6.1 Roost Assessment

Some of the structures identified as potential bat roosts were not accessible. This was because they were either within occupied dwellings or within third-party lands. The latter was true for most of the structures adjacent to the two grid connection route options. Only one structure was targeted for emergence surveys. This was because either the potential roosts were not accessible (see above) or they were outside the development footprint, with no potential for direct or indirect impacts on roosting bats.

2.6.2 Automated Survey: Detector Locations

As mentioned in **Section 2.2.5**, the original Project under consideration for the summer and autumn 2021 survey sessions, was much larger than that at the time of the spring 2022 session.

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

[23] 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.

In the winter of 2021/22, the Project underwent several changes, with many proposed turbine locations dropped and/or moved. For the spring round, 11 detectors were placed at previously deployed locations to ensure comparability between seasons. Thus, there are some differences between final turbine layout and static detector deployment locations as shown in **Figure 1** and detailed in **Table 2-4**. However, these locational differences are not thought to represent a significant constraint, as the habitats represented by the sample locations are identical to those where the turbines are to be located.

There were also some locations where it was impractical to place detectors at the exact proposed turbine location. This was due to several factors. The first relates to the presence of livestock or farm machinery, which could have damaged the detectors. Detectors placed near turbines T1, T4 and T5 were located behind electric fences for protection. Second, there were some indicative turbine locations within conifer plantation, which will require keyhole felling prior to the installation of turbines. Consequently, where possible, detectors were located at nearby forest edges or firebreaks, which will be more representative of the baseline immediately prior to turbine operation once keyhole felling has occurred.

2.6.3 Automated Survey: Survey Timing

Surveys were carried out over summer and autumn 2021, and spring 2022. According to NS guidance[2], these surveys should ideally be carried out within the same calendar year. Where this is not possible, surveys can be split over two successive calendar years, but a justification must be provided. For the current Project, surveys were not commissioned until the summer 2021 season, thus deferring the spring deployment session until 2022.

2.6.4 Automated Survey: Weather

In the summer and spring deployment session it was possible to collect 10 consecutive nights of static bat data in suitable weather conditions. In the autumn deployment session this was not possible.

Both summer and autumn deployment sessions had one night with rain that exceeded the threshold for appropriate weather conditions (29th July 2021 and 16th September 2021, respectively). However, all survey dates were retained for analysis, as bat calls were still recorded in sub-optimal weather conditions, suggesting that the rainfall recorded on these two nights did not significantly reduce bat activity.

2.6.5 Conclusion

The survey limitations outlined above are not judged to have had a significant impact on the outcome of the baseline surveys.

3.0 Results

3.1 Desk Study

3.1.1 Habitat Assessment

Potential Roost Feature Assessment

Online satellite images, the Environmental Sensitivity Mapper[10] and previous survey data from Fehily Timoney and Company[13] showed that there were no structures or caves that could be used by roosting bats within 279.35 m (200 m plus blade length) of the northern cluster.

In the southern cluster, there are two farms near the borrow pit location north of the L3851 local road; however, both are outside optioned lands. There are also some abandoned farm sheds north of and two occupied houses either side of the L38501 local road. Further south there was also an old gable wall. There were no other structures or caves within the search area of the southern cluster.

3.1.2 Bat Landscapes

The mean bat landscapes suitability index across all bat species differs across the Project Site, with most of the northern cluster more suitable for bats than the southern cluster. For the northern cluster (except for turbine T7), the score is 28.56 (out of a maximum score of 100). For turbine T7 and the southern cluster, the score is 26.67 (out of a maximum score of 100).

Species for whom the Project Site is more suitable include common pipistrelle *Pipistrellus pipistrellus*, whiskered bat *Myotis mystacinus*, brown long-eared bat *Plecotus auritus*, soprano pipistrelle *Pipistrellus pygmaeus*, Natterer's bat *Myotis nattereri*, Leisler's bat *Nyctalus leisleri* and Daubenton's bat *Myotis daubentonii*. Species for whom the Project Site is unsuitable include lesser horseshoe bat and Nathusius' pipistrelle *Pipistrellus nathuisii*.

Bat landscape suitability scores are shown in **Table 3-1** below.

Table 3-1
Bat Landscape Suitability Index at Site

Species	Landscape Suitability Index (out of maximum of 100)	
	Turbines T1 to T6	Turbines T7 to T13
Common pipistrelle	48	46
Brown long-eared bat	36	36
Natterer's bat	42	34
Whiskered bat	40	29
Soprano pipistrelle	35	37

Species	Landscape Suitability Index (out of maximum of 100)	
	Turbines T1 to T6	Turbines T7 to T13
Leisler's bat	36	35
Daubenton's bat	20	22
Lesser horseshoe	0	0
Nathusius' pipistrelle	0	1

3.1.3 Recent Bat / Roost Records

NBDC has records for six bat species within the 10 km grid square (S58) that overlaps the Project Site as shown in **Table 3-2**.

Table 3-2
NBDC Records of Bat Species within 10 km of Project Site

Species	Year of Record	Closet Location Relative to Project Site
Brown long-eared bat	2008	2.4 km northwest
Daubenton's bat	2009	1.6 km northwest
Leisler's bat	2008	2.4 km northwest
Natterer's bat	2008	2.4 km northwest
Pipistrelle (identifiable to genus only)	2008	2.4 km northwest
Soprano pipistrelle	2009	1.6 km northwest

Bat Conservation Ireland data (**Figure 3** in Confidential Appendix 04) show that 11 recorded bat roosts are located within 10 km from the Project Site. The closest roost is a mixed-species roost for pipistrelles (common and unidentified), brown long-eared bats, Natterer's bat and Leisler's bat. The remaining roosts are for Daubenton's bat (two separate roosts), brown long-eared bat (two separate roosts) and whiskered bat. Only the mixed species roost is likely to have ecological connectivity to the Project Site i.e. the core sustenance zones (CSZ)[24] for brown long-eared bat,

[24] A CSZ as applied to bats, refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roosts. If bat commuting and foraging habitats within the CSZ are affected by the Project, then this could affect bats using the roost. Core_Sustenance_Zones_Explained_04.02.16.pdf (bats.org.uk) [Last accessed 19/04/2023]

Natterer's bat, soprano pipistrelle and Leisler's bats, as measured from the mixed species roost, all overlap with the Project Site. The BCI data showed there were two known roosts adjacent to the Coolnabacky grid route option (option B). One is a roost for Daubenton's bat and one is the mixed roost for brown long-eared bat, Natterer's bat, soprano pipistrelle and Leisler's bat described above. The BCI data did not show any roost adjacent to the Pinewoods grid route option (option A).

Eight species were recorded by transects or as ad-hoc observations: Daubenton's bat, brown long-eared bat, common, soprano and Nathusius' pipistrelle, Leisler's bat, Natterer's bat and whiskered bat.

3.1.4 National and International Designated Sites

Designated sites within 10 km from the Project Site are shown in **Table 3-3**.

There are eight pNHAs but no NHAs within 10 km of the Project Site. None of the pNHAs are designated for bats; however, there are caves at Clopook Wood pNHA and Stradbally Hill pNHA. The synopses for Ballylynan, Dunamase Woods, Kilteale Hill, Ridge of Portlaoise, Rock of Dunamase and Timahoe Esker pNHAs do not list any features which have the potential to contain bats and nor are there any caves shown on the Environmental Sensitivity Mapper[10].

There are two SACs within 10 km of the Project Site, the River Barrow and River Nore SAC and Ballyprior Grassland SAC; however, neither are designated for bats.

Table 3-3
Designated Sites Within 10 km of Project Site

Name	Site Code	Distance from Project Site (km)	Designated for Bats?
National			
Ballylynan pNHA	000857	9.6	No
Clopook Wood pNHA	000860	3.4	No
Dunamase Woods pNHA	001494	9.9	No
Kilteale Hill pNHA	000867	9.5	No
Ridge of Portlaoise pNHA	000876	9.9	No
Rock of Dunamase pNHA	000878	9.7	No
Stradbally Hill pNHA	001800	6.2	No
Timahoe Esker pNHA	000421	3.2	No
International			

Name	Site Code	Distance from Project Site (km)	Designated for Bats?
Ballyprior Grassland SAC	002252	4.7	No
River Barrow and River Nore SAC	002162	5.4	No

3.1.5 Location of Project Site Relative to Bat Range Edges

The location of the Project Site is at the range edge (the definition of range used here is the Extent of Occurrence[25]) for Nathusius' pipistrelle and whiskered bat. The 10 km square (S58) that contains the site is within the range of both species, but the next 10 km square to the north (S59) is outside the range of Nathusius' pipistrelle and the next 10 km square to the south (S57) is outside the range of whiskered bat. According to NS guidance[2], the potential for negative impact is likely to increase where there are high risk bat species on the edge of their range. This applies to Nathusius' pipistrelle (high risk) but not for whiskered bat (low risk). However, the range data comes from the latest Articled 17 report[15]. That report acknowledged that there is much uncertainty surrounding its range and could be reflective of survey effort rather than true presence.

3.1.6 Other Wind Energy Developments or Projects

The following wind farms have been granted planning consent and are located within 10 km of the Project Site:

- A consented 11 turbine wind farm located c. 4 km southwest of the Project Site, which was granted planning permission with conditions in 2019 (Laois County Council planning reference PL11.248518/16/260); and
- A consented 18 turbine wind farm located c. 5.2 km west of the Project Site, which was granted planning permission in 2013 (Laois County Council planning reference 13/268).

There are no operational wind farms within 10 km of the Project Site.

Apart from the consented wind farms named above, there are no other operational or consented projects located within 10 km from the Project Site boundary that could give rise to cumulative effects on bat populations located within the Project Site.

[25] The area contained within the shortest continuous imaginary boundary that can be drawn to encompass all the known, inferred, or project sites of present occurrence excluding cases of vagrancy.

3.2 Field Surveys

3.2.1 Habitat and Roost Assessment

Potential Roost Feature Survey

Roost features were identified and are shown in **Table 3-4**. A map showing the locations of these roost features with photographs is shown in Confidential Appendix 03 and photographs of moderate to high potential roosts is shown in Appendix 04.

There are no buildings or underground features that could be used by roosting bats within the Project Site boundary for the northern cluster. Similarly, none of the trees within the northern cluster were assessed as having any roosting potential above 'low potential', consisting predominantly of conifers without splits or holes.

At the southern cluster, there was only one tree that was classed as having any roosting potential above 'low potential'. This was one mature ash tree located c. 80 m SW of turbine T12 and within the proposed development footprint. This tree had a few large cavities near its base that could be potentially used by roosting bats, although no droppings or staining was visible. It was surrounded by forestry and the environment was quite cluttered, making it unlikely to be used as a major bat roost. Consequently, this tree was classed as having no more than moderate roost potential.

There were also two other potential roosts in the southern cluster. The first was an old gable wall covered with ivy. It was determined that this structure was of low suitability. The second consisted of two abandoned farm sheds, both with corrugated rooves and covered with ivy. No droppings or staining was visible and it was judged that the structure was of 'moderate suitability' at best. These two structures are located outside of the proposed development footprint.

There was also one other abandoned farm shed near the borrow pit location and inside the proposed development footprint. This had a corrugated roof and had three walls still standing, with extensive ivy cover. This structure could not be inspected safely, so an emergence survey was conducted (see below).

Along the GCR option A, roost sites 19, 20, 21 and 24 were classified as having no roost potential, consisting of low culverts. Sites 19, 22 and 23 had moderate potential and were stone bridges, with some ivy on the exterior. These had concrete undersides, limiting roosting potential to the sides of the bridge only. There were also some abandoned houses with high roost potential towards the end of the grid route, although they were not located within the proposed development footprint.

Along GCR option B, roost site 15 was classified as having high potential, consisting of a sandstone bridge with numerous crevices within the bridge suitable for roosting bats. All other roost sites had no potential, consisting of low culverts.

Table 3-4
Potential Roost Features

Turbine cluster	ID	Description	Suitability
South	1	Mature ash tree with some exposed cavities; cavities very near base of trunk; quite a cluttered environment making it difficult for bats to access.	Moderate
	2	Modern farm shed – outside current search area (recorded by previous surveys[13] only).	N/A
	3	Walls with thick ivy; likely to be opportunistic roost at best.	Low
	4	Two abandoned farm sheds; low with corrugated rooves; ivy taken over.	Moderate
	5	Old stone gable wall.	Low
	6	Occupied house – could not search.	N/A
	7	Occupied house – could not search.	N/A
	8	Derelict house taken over by forest – could not search (recorded by previous surveys[13] only).	N/A
	9	Abandoned farm shed; corrugated roof; somewhat exposed; extensive ivy coverage; impossible to safely survey (see Emergence Survey Section 3.2.2).	Emergence survey location
	27	Square concrete culvert; no suitable crevices for bats.	None
North	10	Abandoned sheds – outside current search area (recorded by previous surveys[13] only).	N/A
	11	Derelict farmhouse – outside current search area (recorded by previous surveys[13] only).	N/A
	12	Sheds and old house known as a brown long-eared bat roost – outside current search area (recorded by previous surveys[13] only).	N/A
	13	Occupied house – outside current search area (recorded by previous surveys[13] only).	N/A
Grid route	14	Sandstone bridge over R426 road; inside of bridge paved	None

Turbine cluster	ID	Description	Suitability
option Coolnabacky		with concrete so no crevices suitable for bats.	
	15	Sandstone bridge with numerous suitable crevices within the bridge, with good foraging habitat present.	High
	16	Concrete culvert; no crevices suitable for bats.	None
	17	Concrete culvert; no crevices suitable for bats.	None
Grid route option Pinewoods	18	Stone bridge with concrete underside; some crevices on side of bridge suitable for bats.	Moderate
	19	Concrete culvert; no crevices suitable for bats.	None
	20	Concrete culvert; no crevices suitable for bats.	None
	21	Concrete culvert; no crevices suitable for bats.	None
	22	Stone bridge with concrete underside; ivy on sides with some crevices on side of bridge suitable for bats.	Moderate
	23	Stone bridge with crevices and vegetation on side suitable for bats.	Moderate
	24	Concrete culvert; no crevices suitable for bats.	None
	25	Abandoned houses and sheds with smashed windows; many suitable crevices for roosting bats but outside development footprint.	High
	26	Abandoned house with smashed windows; many suitable crevices for roosting bats but outside development footprint.	High

Habitat Risk Assessment

The majority of the Project Site comprises Sitka spruce conifer plantation along with improved agricultural grassland, which on their own, are considered as low-quality bat foraging habitats. However, the Project Site is well-connected to the surrounding landscape, with multiple linear features present such as hedgerows, treelines, forest edges, firebreaks and streams. Consequently, it is considered the habitats at the Project Site could be extensively used by foraging bats. Similarly, while there are only a small number of low-moderate quality potential roost features present at the Project Site, the prominent linear features present provide connectivity to the wider landscape, which may provide further opportunities for roosting bats.

The habitats at the Project Site are therefore considered to be of **moderate risk** for bats according to NS guidance[2] and reproduced below (the risk assessment category is provided for each point and the overall category is the mean of these categories):

- Small number of potential roost features of low-moderate quality present within the Project Site (low).
- Habitats could be used extensively by foraging bats (moderate);
- Project Site is well-connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows (high); and
- Project Site is located the edge of the ranges for Nathusius' pipistrelle and whiskered bat (high).

The Project is judged as being of **medium size** according to NS guidance[2] and reproduced below (the size assessment category is provided for each point and the overall category is the mean of these categories):

- Larger development (13 turbines) (moderate);
- Two other consented wind developments are located within 5 km of Project Site (moderate); and
- Project comprises turbines >100 m in height (high).

Overall, the Project Site is judged to pose a **medium risk** to bats.

3.2.2 Emergence Survey

No evidence was found of bats using the dilapidated building as a roost i.e. no emergence was detected. Bats (common and soprano pipistrelle) were recorded foraging along a nearby forest edge only.

3.2.3 Activity Surveys – Transect Surveys – All Species

Flight lines are shown in **Figure 2.**

Spring 2022

Four species were recorded during the spring transect surveys:

- Common pipistrelle;
- Leisler's bat;
- Nathusius' pipistrelle; and
- Soprano pipistrelle.

The number of bat passes recorded for each species for each transect is shown in **Table 3-5.**

Table 3-5
Spring 2022 Transect Bat Passes By Species

Species	Calls Per Transect	
	Northern	Southern
Common pipistrelle	70	44
Leisler's bat	11	16
Nathusius' pipistrelle	12	1
Soprano pipistrelle	10	22

There were no differences in the species recorded between the turbine clusters.

For the northern transect, the forest edge habitats and where a hedgerow joined to conifer plantation were areas that contained the most bat activity, with flight lines of commuting common pipistrelle and Leisler's bat recorded. These two species were recorded flying up and down the forestry track and east to west along the forest edge (flight lines 1-3). There was a large tree in the south of the transect where a hedgerow met the forestry track, where most of the foraging activity was concentrated, with flight lines of common pipistrelle recorded (flight line 4). Nathusius' pipistrelle and soprano pipistrelle were also heard but not seen.

For the southern transect, the forest edge habitats and the Brennanshill watercourse were used by foraging soprano pipistrelle (flight lines 2-5). This species was recorded foraging under the canopy and over a bridge. To the eastern end of the transect (where conifer plantation had been recently felled) commuting Leisler's bat was also recorded moving south to north (flight line 1), and on a separate occasion, a foraging soprano pipistrelle that feeding (flight line 5). Common

pipistrelle (moderate numbers) and Nathusius' pipistrelle (low numbers) were also heard but not seen.

Summer 2022

Four species were recorded during the summer transect surveys:

- Common pipistrelle;
- Daubenton's bat;
- Leisler's bat; and
- Soprano pipistrelle.

The number of bat passes recorded for each species for each transect is shown in **Table 3-6.**

Table 3-6
Summer 2021 Transect Bat Passes By Species

Species	Calls Per Transect	
	Northern	Southern
Common pipistrelle	78	45
Daubenton's bat	-	1
Leisler's bat	2	17
Soprano pipistrelle	32	24

Daubenton's bat was only recorded at the southern transect, which is likely due to the presence of the Brennanshill stream in the southern cluster. The other three species were recorded at both transects.

For the northern transect, the forest edge habitats and where a hedgerow joined to conifer plantation were areas that contained the most bat activity (like spring), with flight lines of commuting common pipistrelle and soprano pipistrelle recorded. These two species were recorded flying up and down the forestry track and east to west along the forest edge and hedgerow (flight lines 1, 3-4). Foraging occurred near a newly felled area of forestry (common pipistrelle flight line 2), at a forest edge (common pipistrelle flight line 3) and near the same tree where lots of foraging was recorded in spring (common and soprano flight line 4). Leisler' bat was also heard but not seen but in low numbers.

For the southern transect, the forest edge habitats and the bridge over the Brennanshill

watercourse were used by foraging soprano pipistrelle (flight line 1). This species was recorded foraging with common pipistrelle to the eastern end of the transect (where conifer plantation had been recently felled; flight line 3). Common pipistrelle was also seen foraging along forest edge (flight line 2). Daubenton's bat (only a single call) and Leisler's bat were also heard but not seen.

Autumn 2022

Three species were recorded during the autumn transect surveys:

- Common pipistrelle;
- Soprano pipistrelle; and
- Whiskered bat.

The number of bat passes recorded for each species for each transect is shown in **Table 3-7.**

Table 3-7
Autumn 2022 Transect Bat Passes By Species

Species	Calls Per Transect	
	Northern	Southern
Common pipistrelle	58	14
Soprano pipistrelle	27	4
Whiskered bat	3	1

There was no difference in species composition between transects.

For the northern transect, the forest edge habitats were areas that contained the most bat activity (like spring and summer), with flight lines of commuting common pipistrelle recorded (flight line 1). Foraging occurred near the same tree where lots of foraging was recorded in spring and summer (common and soprano flight line 2). Whiskered bat was also heard but not seen but in very low numbers.

For the southern transect, the forest edge habitats and the bridge over the Brennanshill watercourse were used by foraging common pipistrelle (flight lines 1-2 and 4-5). Soprano pipistrelle was also seen foraging at a forest track junction (flight line 3). Whiskered bat was also heard but not seen and again, in very low numbers.

3.2.4 Activity Surveys – Static Bat Detector Survey – All Species

Eight species were recorded during the static bat detector surveys:

- Brown long-eared bat;
- Common pipistrelle;
- Daubenton's bat;
- Leisler's bat;
- Nathusius' pipistrelle;
- Natterer's bat;
- Soprano pipistrelle; and
- Whiskered bat.

Spatial Distribution

Table 3-5 reports the maximum, mean and median bat passes per night and total bat passes across all nights at each location, for all species combined, across all seasons combined[26]. The total number of bat passes recorded at each location is also provided. The table shows that:

- The highest mean activity level per night was recorded at sample location 11 but the highest median activity level per night was at sample location 5;
- The lowest mean activity level per night was recorded at sample location 3, which also had the lowest median activity level per night, shared with sample location 10; and
- The greatest amount of activity in any one night was recorded at sample location 10, although the mean and median activity level was generally much lower.

Table 3-8
Summary of Results per Sample Location Across All Seasons

Sample Location	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
1	980	116	56
3	382	14	3
4	924	107	21
5	702	173	198
7	288	71	51

[26] Means were calculated to account for differences in deployment length i.e. nights where no bat activity was recorded were also included in the calculations. Medians were calculated based on nights with bat activity only.

Sample Location	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
8	347	36	9
9	348	34	14
10	1,776	85	3
11	870	204	110
12	208	37	10
13	526	107	24

Chart 3-1 displays the mean number of bat passes per night for all locations split by bat species. It shows that:

- For all locations, common pipistrelle was overwhelmingly the most frequently recorded bat species across all seasons combined; and
- The only location where any other bat species was even half as common as common pipistrelle was at sample location 4, where Leisler's bat was the second most frequently recorded bat species.

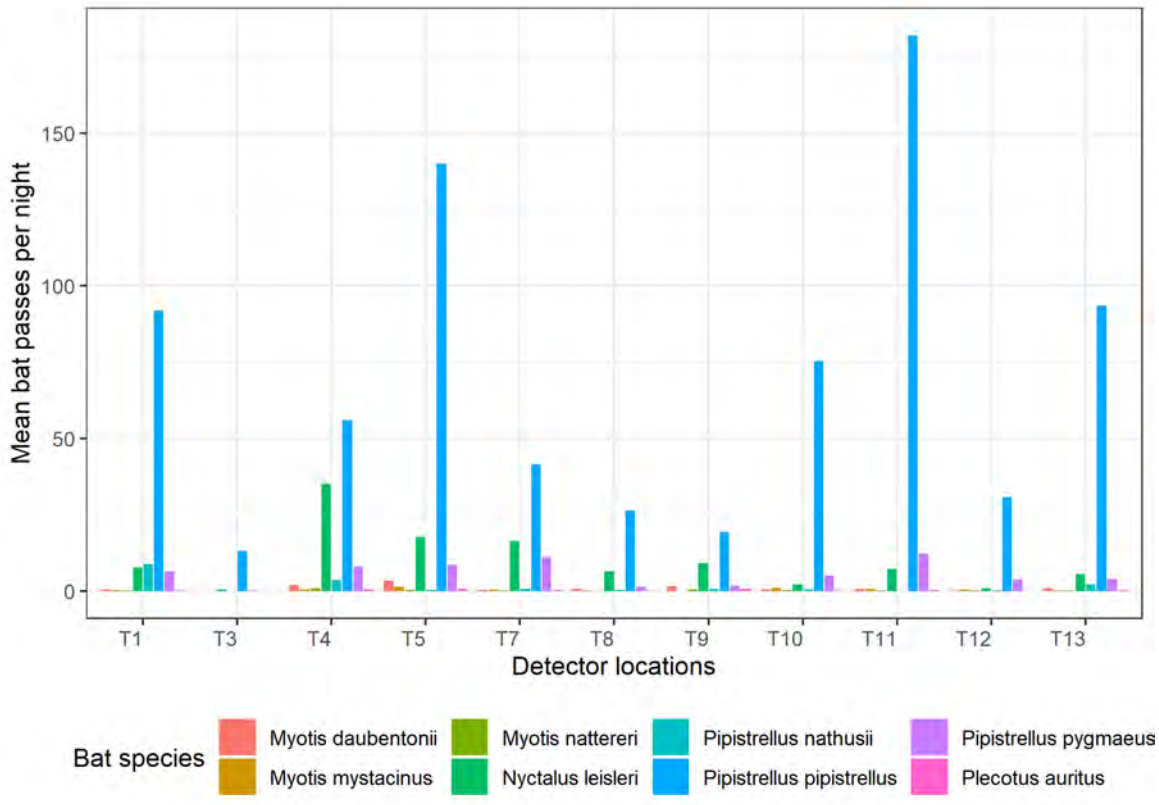


Chart 3-1
Bat passes at each detector location (N=11) for each species recorded.

Table 3-6 provides the same data, but instead summarises the results for coniferous woodland /

forest edge / firebreak habitat and improved agricultural grassland habitat. It illustrated that:

- The highest maximum, mean and median activity level per night was recorded at coniferous woodland / forest edge / firebreak habitat locations; and
- The lowest maximum, mean and median activity level per night was recorded at improved agricultural grassland locations.

Table 3-9
Summary of Results per Broad Habitat Type Across All Seasons

Habitats and Sample Locations	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
Coniferous Woodland / Forest Edge / Firebreak Habitat (1, 3, 7, 8, 9, 10, 11, 12, 13)	2,445	702	400
Improved Agricultural Grassland Habitat (4, 5)	1,270	282	158
Site Total (All locations)	3,369	983	686

Temporal Distribution

A summary of the results per survey season is provided in **Table 3-7** and **Chart 3-2** to **Chart 3-4**, to illustrate any seasonal variation.

Table 3-7 reports the maximum, mean and median bat passes per night at all locations, for all species combined, for each survey season. The table shows that:

- The highest maximum and median activity level per night was recorded in spring;
- The highest mean activity level per night was recorded in summer; and
- The lowest maximum, mean and median activity level per night was recorded in autumn.

Table 3-10
Summary of Results per Season Across All Sample Locations

Season	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
Spring	3,369	398	1,187
Summer	2,707	534	1,138
Autumn	322	52	136

Chart 3-2 shows that the most frequently recorded species across all survey locations in spring was consistently common pipistrelle, with peak activity recorded on the 4th June 2022.

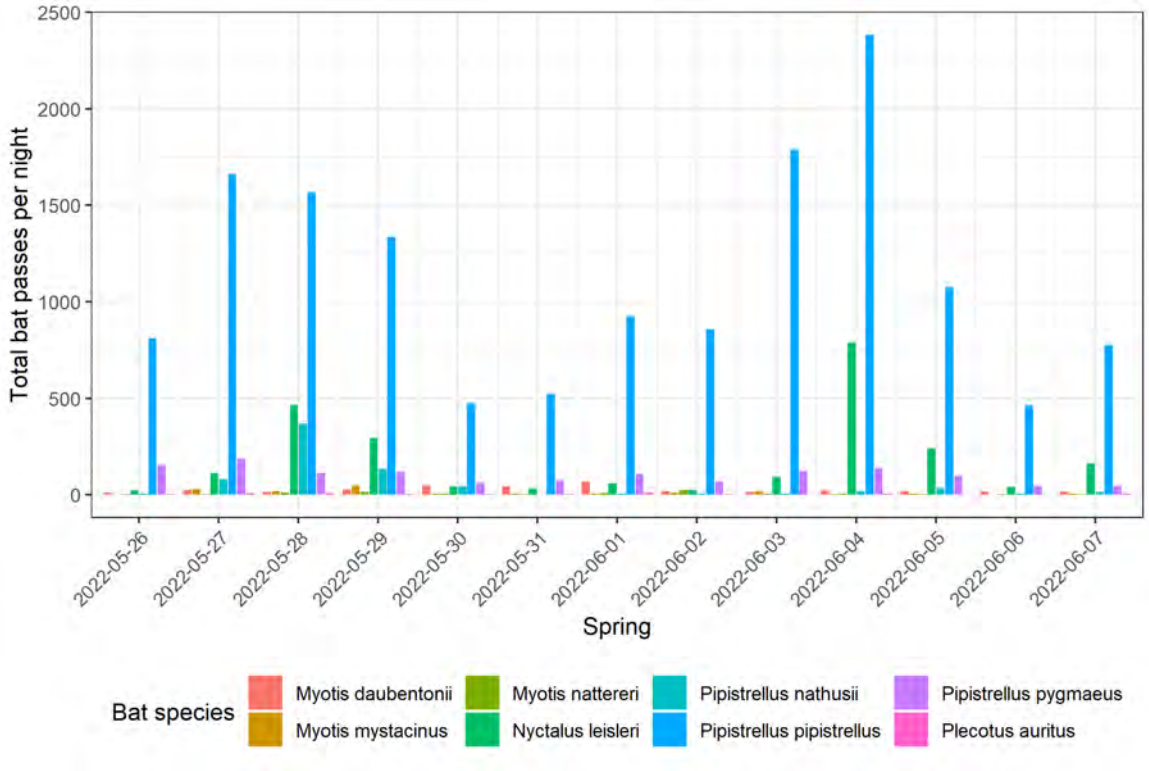


Chart 3-2
Total Bat Passes Per Night in Spring Across All Detector Locations

Chart 3-3 shows that the most frequently recorded species across all survey locations in summer was consistently common pipistrelle, with peak activity recorded on the 26th July 2021.

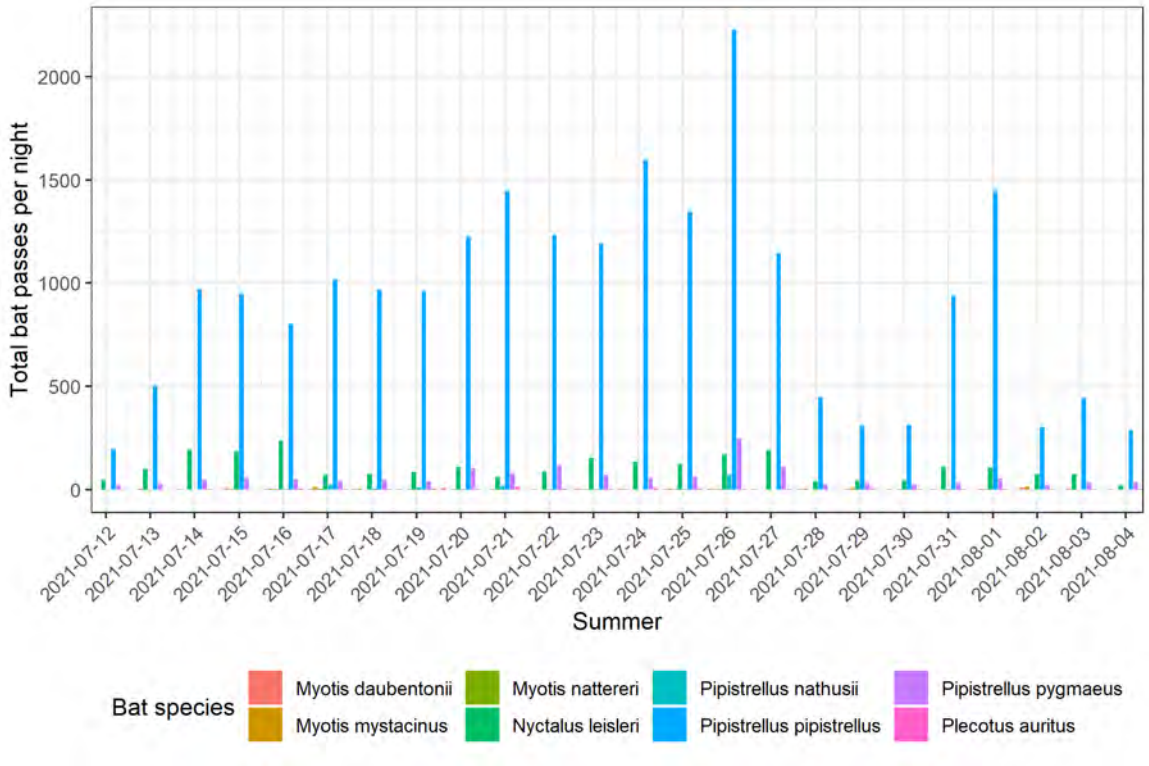


Chart 3-3
Total Bat Passes Per Night in Summer Across All Detector Locations

Chart 3-4 shows that the most frequently recorded species across all survey locations in autumn was mostly common pipistrelle with peak activity recorded on the 11th September 2021. On a few dates, Leisler's bat activity was greatest but in general, it was lower than common pipistrelle.

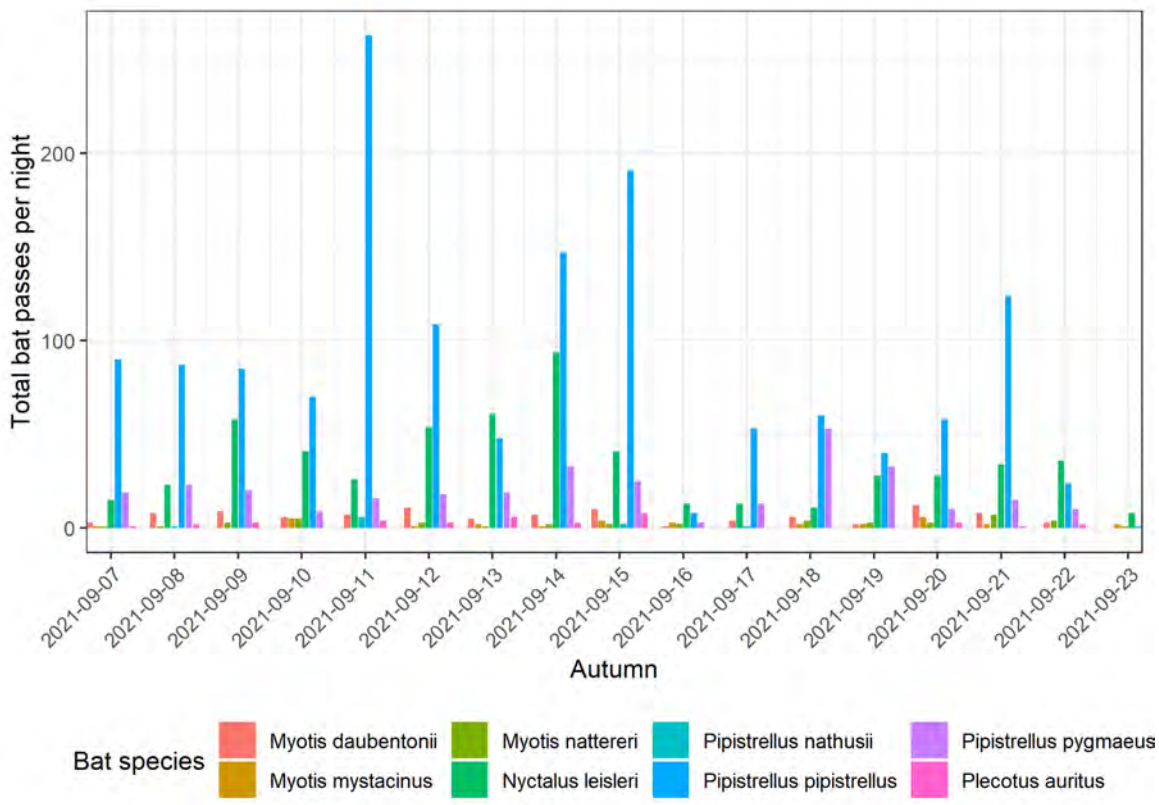


Chart 3-4
Total Bat Passes Per Night in Autumn Across All Detector Locations

3.2.5 Activity Surveys – Static Bat Detector Survey – High Collision Risk Species

Species considered to be at a higher risk of collision in Ireland, as adapted from current NatureScot guidance[2], include:

- Common pipistrelle;
- Soprano pipistrelle;
- Nathusius' pipistrelle; and
- Leisler's bat.

All four species were recorded at the Site.

Below each species recorded by the automated bat activity survey has been further analysed with reference to their spatial and temporal distributions.

Common Pipistrelle

Temporal Distribution

A summary of the common pipistrelle activity results per survey season is provided in **Table 3-8**, to illustrate any seasonal variation. **Table 3-8** reports the maximum, mean and median bat passes per night at all locations, for common pipistrelles, for each survey season. The table shows that:

- Common pipistrelle was recorded across all seasons.
- The highest mean and median activity level per night was recorded in summer;
- The lowest mean and median activity level per night was recorded in autumn; and
- The greatest amount of activity in any one night was recorded in spring.

Table 3-11
Summary of Common Pipistrelle Activity Results per Season Across All Sample Locations

Season	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
Spring	2,383	295	924
Summer	2,204	445	956
Autumn	263	29	70

Spatial Distribution

A summary of the common pipistrelle activity results per sample location is provided in **Table 3-9** and **Chart 3-5**, to illustrate any spatial variation within the Site.

Table 3-10 reports the maximum, mean and median bat passes per night at each location, for common pipistrelles, across all seasons combined. The table shows that:

- Common pipistrelle were recorded across all locations.
- The highest mean and median activity level per night was recorded at locations 11 and 5, respectively (conifer plantation/forest edge and improved agricultural grassland);
- The lowest mean and median activity level per night was recorded at location 3 (conifer plantation/fire break habitats); and
- The greatest amount of activity in any one night was recorded at location 10 (conifer plantation/forest edge).

Table 3-12
Summary of Common Pipistrelle Results per Sample Location Across All Seasons

Sample Location	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Passes per Night
1	858	92	43
3	282	13	4
4	500	56	6
5	662	140	182
7	224	42	29
8	279	26	5
9	327	19	6
10	1,652	76	5
11	839	182	97
12	205	31	22
13	519	93	13

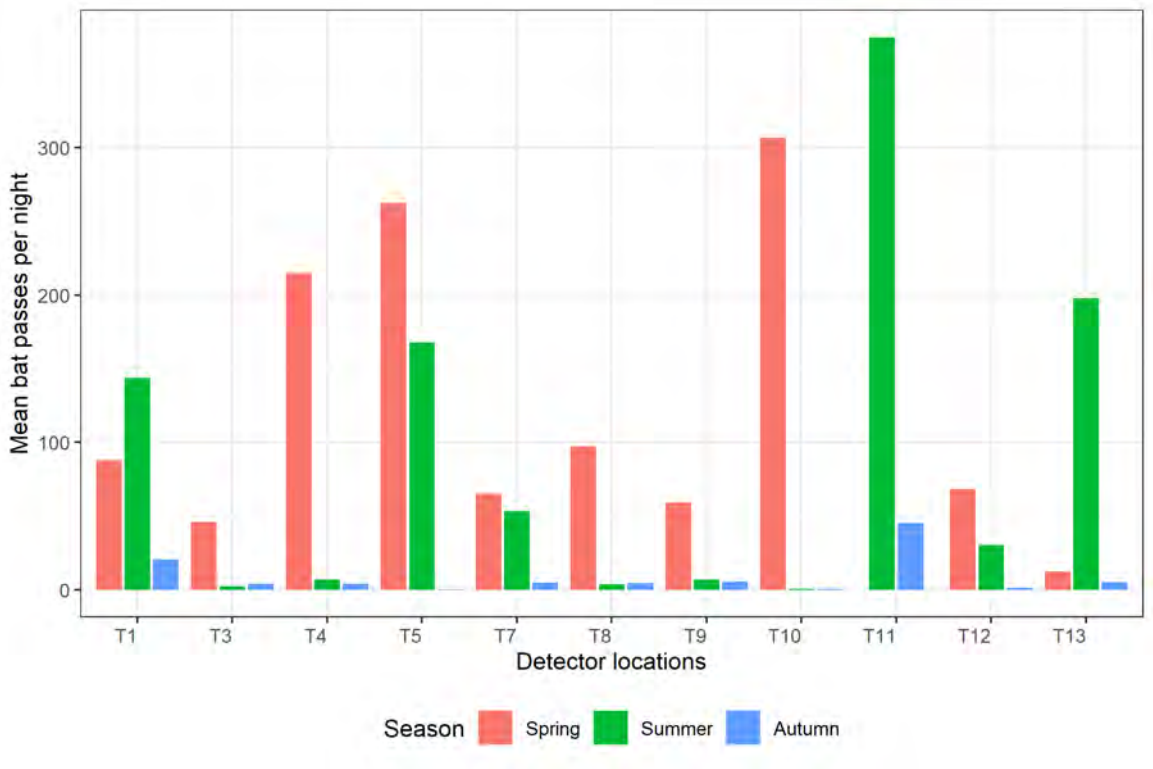


Chart 3-5
Average Common Pipistrelle Activity Per Sample Location and Season

It is evident from **Chart 3-5** that common pipistrelle was scarcely recorded at locations 3, 9 and 12 (conifer plantation and firebreak habitats) across all seasons. Activity was highest at locations 11 and 10 (conifer plantation/forest edge) in summer and spring, respectively. Despite there being very high activity at this location in summer, common pipistrelle was not recorded at location 11 in spring. However, common pipistrelle was recorded across all other locations and all seasons.

Soprano Pipistrelle

Temporal Distribution

A summary of the soprano pipistrelle activity results per survey season is provided in **Table 3-10**, to illustrate any seasonal variation. **Table 3-10** reports the maximum, mean and median bat passes per night at all locations, for soprano pipistrelles, for each survey season. It shows that:

- Soprano pipistrelle was recorded across all seasons.
- The highest mean and median activity level per night was recorded in summer and spring, respectively;
- The lowest mean and median activity level per night was recorded in autumn; and
- The greatest amount of activity in any one night was recorded in summer.

Table 3-13

Summary of Soprano Pipistrelle Activity Results per Season Across All Sample Locations

Season	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
Spring	186	27	106
Summer	246	29	48
Autumn	53	6	19

Spatial Distribution

A summary of the soprano pipistrelle activity results per sample location is provided in **Table 3-11** and **Chart 3-6**, to illustrate any spatial variation within the Site.

Table 3-12 reports the maximum, mean and median bat passes per night at each location, for common pipistrelles, across all seasons combined. The table shows that:

- Soprano pipistrelle were recorded across all locations;
- The highest mean and median activity level per night was recorded at locations 11 and 7 (conifer plantation/forest edge habitats), respectively;
- The lowest mean and median activity level per night was recorded at locations 3 and 8-9 (conifer plantation and firebreak habitats) but activity was low in general across all locations; and
- The greatest amount of activity in any one night was recorded at location 10 (conifer plantation/forest edge).

Table 3-14
Summary of Soprano Pipistrelle Results per Sample Location Across All Seasons

Sample Location	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
1	101	7	3
3	2	<1	2
4	87	8	4
5	82	9	5
7	39	11	13
8	28	1	1
9	6	2	2
10	107	5	1
11	82	12	10
12	30	4	2

Sample Location	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
13	11	4	2

Chart 3-6
Average Soprano Pipistrelle Activity Per Sample Location and Season

It is evident from **Chart 3-6** that soprano pipistrelle was scarcely recorded at locations 3, 8, 9, 12 and 13 (conifer plantation, forest edge and firebreak habitats) across all seasons. The species was not recorded at locations 3 and 10 in autumn, or at location 11 in spring. Soprano pipistrelle was only recorded during every season at locations 1, 4, 5, 7, 8, 9, 12 and 13. Generally, activity was highest in spring or summer and lower in autumn; however, at locations 3 and 9 (conifer plantation and forest edge habitats), activity was low regardless of season. Overall, soprano pipistrelle activity was lower in comparison to common pipistrelle activity.

Nathiusius' Pipistrelle

Temporal Distribution

A summary of the Nathusius' pipistrelle activity results per survey season is provided in **Table 3-12**, to illustrate any seasonal variation. **Table 3-11** reports the maximum, mean and median bat passes per night at all locations, for Nathusius' pipistrelles, for each survey season. The table shows that:

- Nathusius' pipistrelle was present in all seasons;
- The highest mean and median activity level per night was recorded in spring; and
- The greatest amount of activity in any one night was recorded in spring.

Table 3-15
Summary of Nathusius' Pipistrelle Activity Results per Season Across All Sample Locations

Season	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
Spring	368	15	14
Summer	72	3	3
Autumn	6	<1	2

Spatial Distribution

A summary of the Nathusius' pipistrelle activity results per sample location is provided in **Table 3-13** and **Chart 3-7**, to illustrate any spatial variation within the Site. **Table 3-14** reports the maximum, mean and median bat passes per night at each location, for common pipistrelles, across all seasons combined. It shows that:

- Nathusius' pipistrelle were recorded across all locations, albeit in mostly very low levels.
- The highest mean and median activity level per night was recorded at locations 1 and 4 (conifer plantation/forest edge and improved agricultural grassland habitats), respectively;
- All other locations had very low levels of activity per night; and
- The greatest amount of activity in any one night was recorded at location 1 (conifer plantation/forest edge habitat).

Table 3-16
Summary of Nathusius' Pipistrelle Results per Sample Location Across All Seasons

Sample Location	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
1	285	9	3
3	1	<1	1
4	83	4	4
5	2	<1	1
7	17	<1	1
8	4	<1	3
9	22	<1	1
10	9	<1	1
11	1	<1	2

Sample Location	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
12	5	<1	1
13	71	2	1

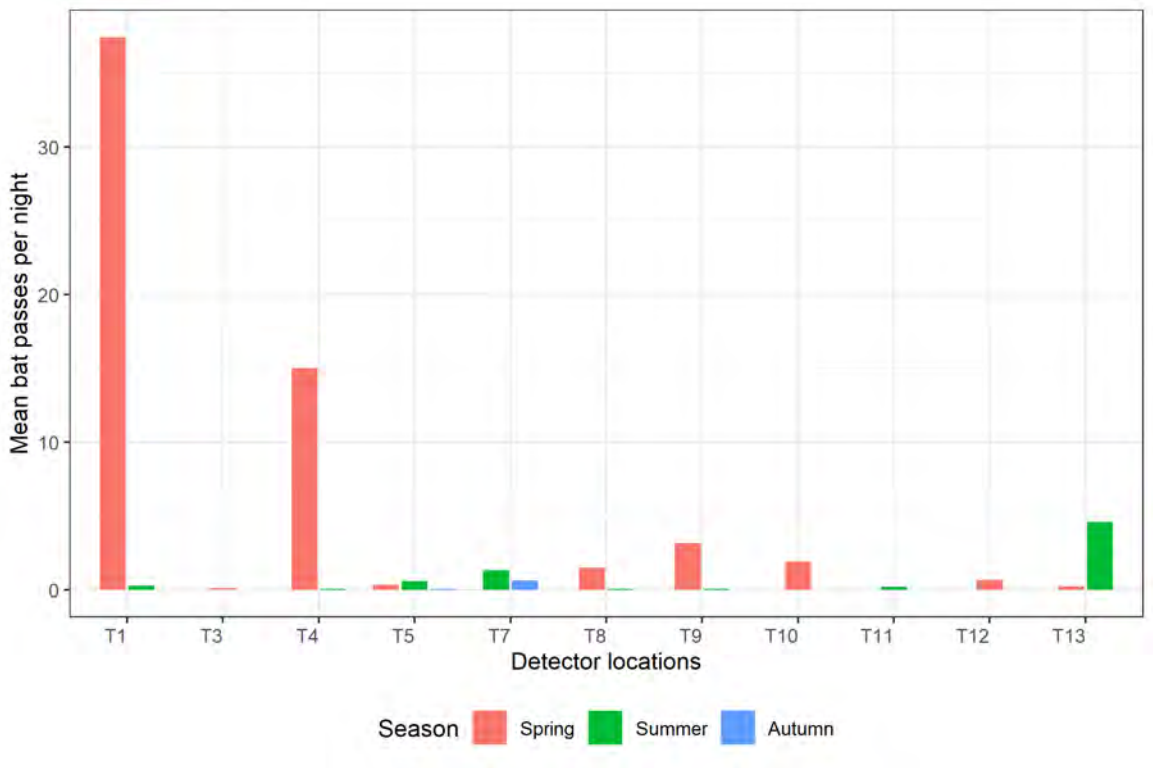


Chart 3-7
Average Nathusius' Pipistrelle Activity Per Sample Location and Season

It is evident from **Chart 3-7** that Nathusius' pipistrelle was scarcely recorded at all locations and across all seasons. The species was not recorded in autumn for all locations but location 7, and barely in summer. The species was most frequently recorded in spring, with most spring activity recorded at locations 1 and 4. The mean spring activity level was driven largely by one date (28th May 2022) where 285 bat passes were recorded. The rest of the spring activity at location 1 was much lower.

Leisler's Bat

Temporal Distribution

A summary of the Leisler's bat activity results per survey season is provided in **Table 3-14**, to illustrate any seasonal variation. **Table 3-14** reports the maximum, mean and median bat passes per night at all locations, for Leisler's bat, for each survey season. It shows that:

- Leisler's bat was present across all seasons;
- The highest mean and median activity level per night was recorded in summer but spring levels were similar; and

- The greatest amount of activity in any one night was recorded in spring.

Table 3-17
Summary of Leisler's Bat Activity Results per Season Across All Sample Locations

Season	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
Spring	788	48	92
Summer	234	50	95
Autumn	94	12	28

Spatial Distribution

A summary of the Leisler's bat activity results per sample location is provided in **Table 3-15** and **Chart 3-8**, to illustrate any spatial variation within the Site.

Table 3-16 reports the maximum, mean and median bat passes per night at each location, for common pipistrelles, across all seasons combined. The table shows that:

- Leisler's bat were recorded across all locations.
- The highest mean and median activity level per night was recorded at locations 4 and 5, respectively (improved agricultural grassland habitats);
- The lowest mean and median activity level per night was recorded at locations 3 and 12 (conifer plantation/firebreak habitats) ; and
- The greatest amount of activity in any one night was recorded at location 4.

Table 3-18
Summary of Leisler's Bat Results per Sample Location Across All Seasons

Sample Location	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
1	66	8	6
3	9	<1	1
4	762	35	5
5	64	18	25
7	95	17	10
8	117	6	3
9	102	9	5
10	23	2	2

Sample Location	Maximum Bat Passes per Night	Mean Bat Passes per Night	Median Bat Passes per Night
11	48	7	8
12	10	1	1
13	112	6	3

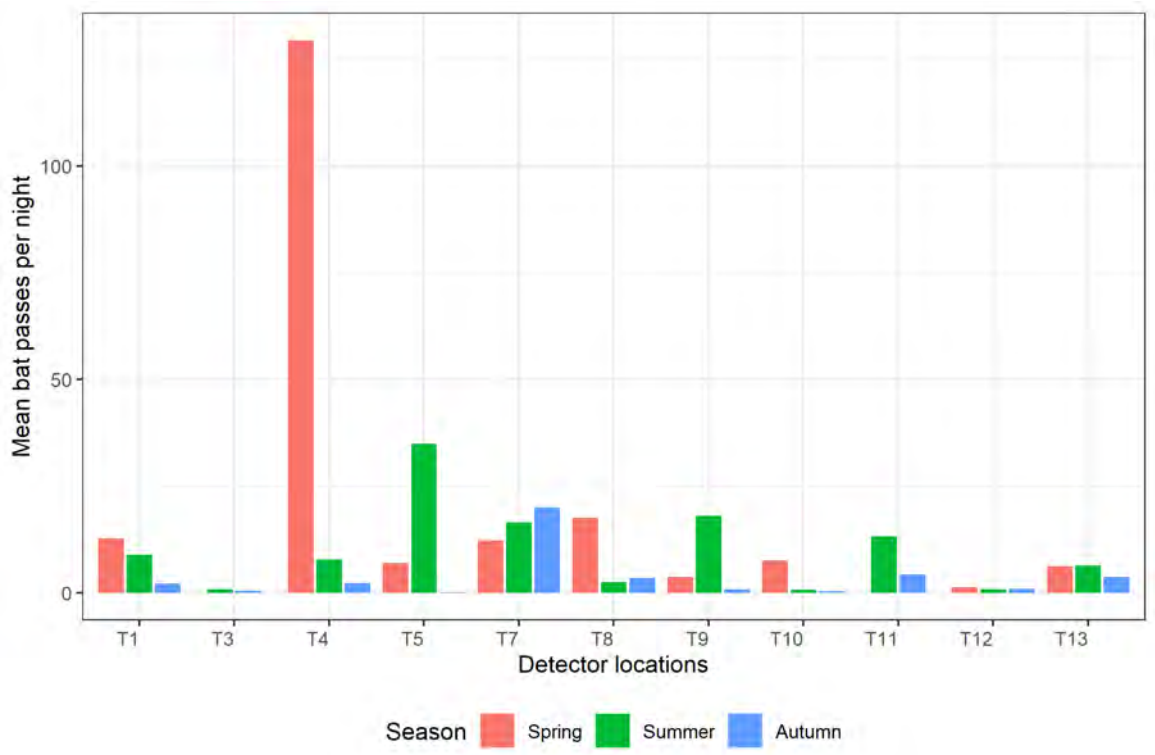


Chart 3-8
Average Leisler's Bat Activity Per Sample Location and Season

It is evident from **Chart 3-8** that Leisler's bat was mostly recorded at all locations and across all seasons and generally, activity was relatively low across all seasons and turbine locations. The exception to this was at location 4 where the spring activity level was much larger than for other locations and seasons. This was largely driven by one date (4th June 2022) where 762 bat passes were recorded. Leisler's bat was not recorded at locations 3 and 11 in spring.

3.2.6 Activity Surveys – Static Bat Detector Survey – Lower Collision Risk Species

A summary of brown long-eared, Daubenton's bat, Natterer's bat and whiskered bat activity results per sample location is provided in **Chart 3-8**, to illustrate any spatial variation within the Site. In general, the mean number of bat calls per night across all seasons and turbine locations is very low (typically <10 calls per night) for all four species. While in general, all four species were recorded at all turbine locations, they were not recorded in all seasons. Daubenton's and whiskered bat were not recorded at sample location 3 at all.

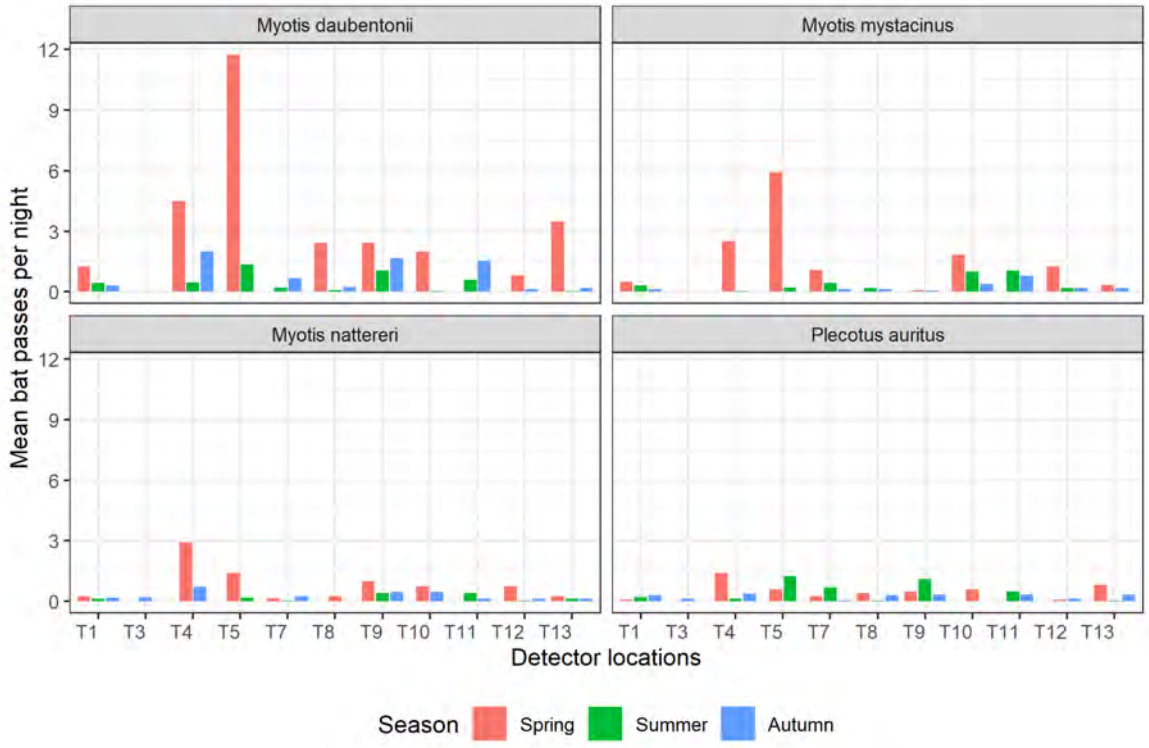


Chart 3-9
Average Brown Long-Eared Bat, Daubenton's Bat, Natterer's Bat and Whiskered Bat Activity Per Sample Location and Season

4.0 Discussion and Conclusions

4.1 Habitat and Roost Assessment

The habitats at the Project Site constitutes 'moderate risk' bat habitats, as defined within the NatureScot guidance[2] (see **Appendix 1**).

The Project Site contains multiple linear features (hedgerows, treelines, forest edges, firebreaks and streams) considered to be of value to foraging/commuting bats and provides connectivity to the wider landscape. In addition, the Project site is located at the range edge of Nathusius' pipistrelle.

BCI data showed only one roost was likely to have ecological connectivity to the Project Site (i.e. the roost is located within the CSZ of all the bat species recorded there), located c. 2.6 km northwest of the Project Site. This was a mixed-species roost for pipistrelles (common and species identified to genus only), brown long-eared bats, Natterer's bat and Leisler's bat.

Along the two grid route options, BCI provided data for two roosts adjacent to the Coolnabacky option (option B) consisting of the mixed-species roost described above and a Daubenton's bat roost. According to the BCI data, there were no known roosts adjacent to the Pinewoods option (option A).

Field surveys showed that within the bat roost search area, there were two locations with moderate bat roost potential. These locations were both within the southern cluster and consisted of mature ash tree with multiple cavities near its base and an abandoned agricultural shed with a corrugated roof and stone wall covered in ivy.

Along the two grid routes, there was one bridge that had high bat roost suitability along the Coolnabacky option. Along the Pinewoods option, there were two locations where there were abandoned houses the likely were of high bat roost suitability. While both were in third party lands and could not be accessed, they are not within the development footprint.

An emergence survey was carried out at the abandoned farm shed at the entrance of the proposed borrow pit, as it was impossible safely access the structure. No bats were recorded emerging. Only one structure was targeted for emergence surveys. This was because either the potential roosts were not accessible (see above) or they were outside the development footprint, with no potential for direct or indirect impacts on roosting bats.

4.2 Overview of Bat Activity

Previous survey data from FT recorded all Irish species at the Project Site except for lesser horseshoe.

The same eight bat species were recorded at the Site during static detector surveys conducted in summer and autumn of 2021 and spring of 2022: brown-long eared bat, common pipistrelle, Daubenton's bat, Leisler's bat, Nathusius' pipistrelle, Natterer's bat, soprano pipistrelle, and whiskered bat.

At first sight, the presence of Nathusius' pipistrelle seems to contradict the low bat landscapes suitability score for this species. However, this species is thought to be under-recorded in Ireland and is likely to be widespread, but with a small population, which explains the apparent contradiction between species presence and bat landscapes suitability score. Of the other species recorded, common pipistrelle was by far the most frequently recorded across all locations and seasons, with other species much less common.

Only common pipistrelle, Daubenton's bat, Leisler's bat, Nathusius' pipistrelle, soprano pipistrelle and whiskered bat were recorded during transect surveys. In the northern cluster, flight lines typically were of common and

soprano pipistrelle commuting along forest edges and hedgerows with consistent foraging activity located near one large tree and occasional foraging occurring near forest edge habitats. Leisler's bat, Nathusius' pipistrelle and whiskered bat were also recorded but generally in lower numbers and not always present. In the southern cluster, flight lines were typically of common and soprano pipistrelle commuting along forest edges and with consistent foraging activity at the same and over the bridge spanning the Brennanshill watercourse. Leisler's bat, Daubenton's bat, Nathusius' pipistrelle and whiskered bat were also recorded but they were not always present.

The use of forest edge, blocks of forestry and watercourse habitats by foraging and commuting bats show the Project Site is well-connected to the wider landscape.

4.3 Spatial Distribution of Bat Activity

Bats were recorded at all detector locations, but generally locations 11 and 5 (conifer plantation/forest edge and improved agricultural grassland habitats) had the greatest number of bat passes per night, across all seasons. Locations 3 and 9 had the lowest number of bat passes per night across all seasons.

Bat activity was typically higher at conifer plantation/forest edge/firebreak habitats (locations 1, 3, 7, 8, 9, 10, 11, 12, 13), where a mean of 702 bat passes per night was recorded, compared to a mean of 282 bat passes per night at improved agricultural grassland locations (locations 4 and 5).

4.4 Temporal Distribution of Bat Activity

Bat activity was highest in summer (a mean of 534 bat passes per night), and lowest in autumn (a mean of 52 bat passes per night). The difference in activity recorded between the highest and lowest season was 482 bat passes per night on average. Most social calls were present in the autumn. This is likely why more calls were recorded in autumn due to mothers still flying with their young.

4.5 'High Collision Risk' Bat Species

All four Irish 'high collision risk' species were recorded during surveys: common pipistrelle, Leisler's bat, Nathusius' pipistrelle and soprano pipistrelle. The Project Site is apparently located on the range edge of Nathusius' pipistrelle (although this could be a reflection of survey effort rather than true range); however, this species was only recorded in very low frequencies and so the overall risk the Project presents to this species in terms of collision is likely to still be low.

Common pipistrelle was the most frequently recorded species, with peak activity (largest number of mean calls per night) recorded at location 11 in the summer session and at location 10 in the spring session. The summer peak at location 11 (conifer plantation/forest edge habitats) was not driven by one or two nights, with a high number of calls per night recorded consistently. The spring peak at location 10 (conifer plantation/forest edge habitats) was driven largely by two nights, with 1,057 and 1,652 calls recorded on 3 and 4 June 2022, respectively.

Leisler's bat was the next most frequently recorded across all turbine locations and seasons. Peak Leisler's activity was in the spring session at location 4 (improved agricultural grassland) and in the summer session at location 5 (improved agricultural grassland). In spring, there was one night with very high levels of Leisler's bat activity at location 4: 4 June 2022 with 762 calls recorded. In summer at location 5, there were multiple night with high bat activity i.e. it was not the results from one night driving the pattern seen in the data.

Soprano pipistrelle was the next most frequently recorded species, with peak activity across all seasons recorded at locations 4 and 5 in spring. High bat activity on one data explained these two peaks, with 87 calls recorded at

location 4 on the 26 May 2022 and 82 calls recorded at location 5 on 27 May 2022.

4.5.1 Bat Activity Relative to Other Sites

No assessment of bat activity relative to other sites was possible (see Section 2.5).

4.6 Other Bat Species

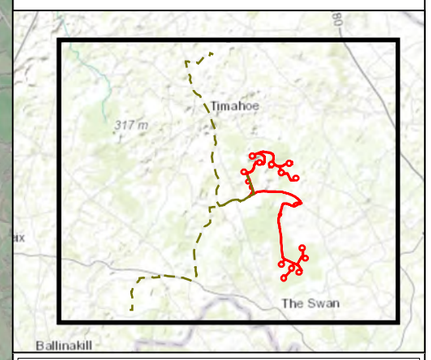
While brown long-eared bat, Daubenton's bat, Natterer's bat and whiskered bat were also recorded, these species are at low risk of collision with turbines due to their flight and foraging behaviour[27]. They were all recorded at much lower frequencies than Leisler's bat or common pipistrelle by both static detector and transect surveys and therefore, the Site does not represent important foraging or roosting habitats for them, making them unlikely to be negatively affected by any loss of habitat through wind farm construction or decommissioning.

[27] Rodrigues, L., Bach, M.-J., Dubourg-Savage, B., Karapandža, D., Kovacˇ, T., Kervyn, J., Dekker, A., Kepel, P., Bach, J., Collins, C., Harbusch, C., Park, K., Micevski, B. and Minderman, J., 2015. Guidance for Consideration of Bats in Wind Farm Projects – Revision 2014. EUROBATS Publication Series No. 6 (English Version). UNEP/EUROBATS Secretariat, Bonn.

FIGURES

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Grid Connection Routes to be Assessed (Separate Planning Application)
- Proposed Grid Connections to be Assessed (Separate Planning Application)
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Northern Transect
- Southern Transect
- Static Detector Location
- Bat Transect Stopping Points



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

SURVEY AREA

FIGURE 1.1

Scale 1:45,000 @ A3

Date MARCH 2023

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

654000
655500
657000
658500
688500
687000
02036.00787.0152.0 Survey Area

N

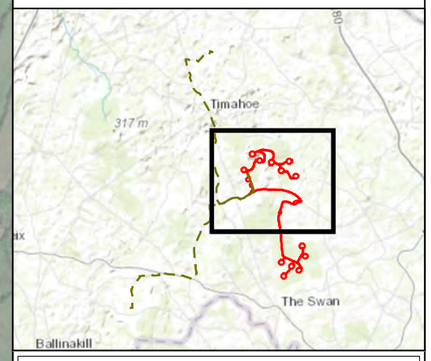
T1
T2
T3
T4
T5
T6
T7
1
3
4
5
7

Coolnabacky Option
Pinewoods Option

0
1
2
Kilometres

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Borrow Pit
- Proposed Hardstanding
- Proposed Access
- Proposed Grid Connection Routes to be Assessed (Separate Planning Application)
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Northern Transect
- Static Detector Location
- Bat Transect Stopping Points



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

SURVEY AREA

FIGURE 1.2

Scale 1:15,000 @ A3

Date MARCH 2023

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

655500
657000
658500
685500
684000

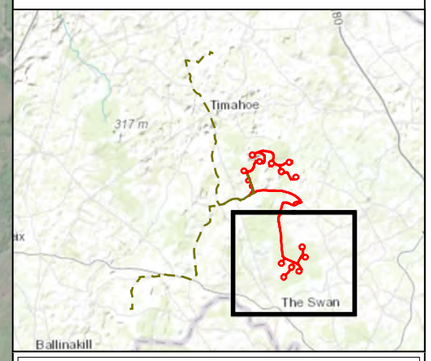
N

T9
9
T8
10
T10
12
T12
T13
11
13
8
T11

0
1
2
Kilometres

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Temporary Construction Compound
- Proposed Hardstanding
- Proposed Access
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Southern Transect
- Static Detector Location
- Bat Transect Stopping Points



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

SURVEY AREA

FIGURE 1.3

Scale 1:15,000 @ A3

Date MARCH 2023

02036.00787.0152.0 Survey Area

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

655000

688000

N

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Number of Bat Calls (Labelled with Total Number of Bat Calls)

20

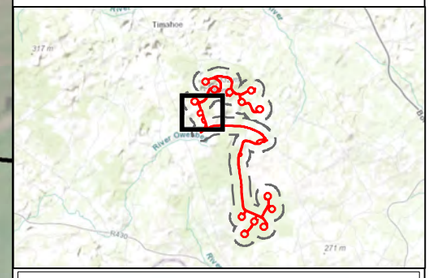
0

- Daubenton's Bat
- Whiskered Bat
- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Nathusius' Pipistrelle
- Common Pipistrelle & Soprano Pipistrelle

4
3
4
24
1
2
7
1
2
9
1
TCC1
28
5
2
10

0 250 500

Metres



Statkraft

SLR

7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

NORTHERN TRANSECT SURVEY RESULTS: SPRING 2022

FIGURE 2.1

Scale 1:4,000 @ A3

Date APRIL 2023

02036.00787.0157.0 Transect Survey Results

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

657000

N

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Number of Bat Calls (Labelled with Total Number of Bat Calls)

20

0

- Daubenton's Bat
- Whiskered Bat
- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Nathusius' Pipistrelle
- Common Pipistrelle & Soprano Pipistrelle

0 250 500

Metres

02036.00787.0157.0 Transect Survey Results

Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

SOUTHERN TRANSECT SURVEY RESULTS: SPRING 2022

FIGURE 2.2

Scale 1:4,000 @ A3

Date APRIL 2023

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

655000

688000

N

LEGEND

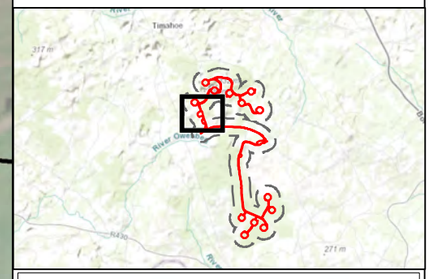
- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Number of Bat Calls (Labelled with Total Number of Bat Calls)

20

0

- Daubenton's Bat
- Whiskered Bat
- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Nathusius' Pipistrelle
- Common Pipistrelle & Soprano Pipistrelle



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

NORTHERN TRANSECT SURVEY RESULTS: SUMMER 2022

FIGURE 2.3

Scale 1:4,000 @ A3

Date APRIL 2023

0 250 500

Metres

02036.00787.0157.0 Transect Survey Results

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

657000

N

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Number of Bat Calls (Labelled with Total Number of Bat Calls)

20

0

- Daubenton's Bat
- Whiskered Bat
- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Nathusius' Pipistrelle
- Common Pipistrelle & Soprano Pipistrelle

0 250 500

Metres

02036.00787.0157.0 Transect Survey Results

Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

SOUTHERN TRANSECT SURVEY RESULTS: SUMMER 2022

FIGURE 2.4

Scale 1:4,000 @ A3

Date APRIL 2023

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

655000

688000

N

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Number of Bat Calls (Labelled with Total Number of Bat Calls)

20

0

- Daubenton's Bat
- Whiskered Bat
- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Nathusius' Pipistrelle
- Common Pipistrelle & Soprano Pipistrelle

2

1

1

TCC1

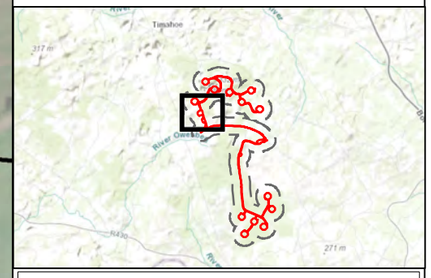
9

1

4

0 250 500

Metres



Statkraft

SLR

7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

NORTHERN TRANSECT SURVEY RESULTS: AUTUMN 2022

FIGURE 2.5

Scale 1:4,000 @ A3

Date APRIL 2023

02036.00787.0157.0 Transect Survey Results

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

657000

N

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Number of Bat Calls (Labelled with Total Number of Bat Calls)

20

0

- Daubenton's Bat
- Whiskered Bat
- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Nathusius' Pipistrelle
- Common Pipistrelle & Soprano Pipistrelle

0 250 500

Metres

02036.00787.0157.0 Transect Survey Results

Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

SOUTHERN TRANSECT SURVEY RESULTS: AUTUMN 2022

FIGURE 2.6

Scale 1:4,000 @ A3

Date APRIL 2023

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

655000

688000

N

1

2

3

4

TCC1

0 250 500

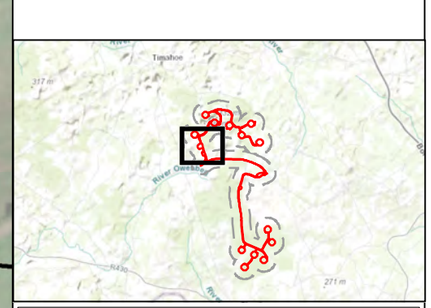
Metres

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Flightline Species Labelled with Flightline Number

- Common Pipistrelle
- Leisler's Bat



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

NORTHERN TRANSECT SURVEY RESULTS: SPRING 2022

FIGURE 2.1

Scale 1:4,000 @ A3

Date APRIL 2023

02036.00787.0158.0 Transect Survey Results Flightlines

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

657000

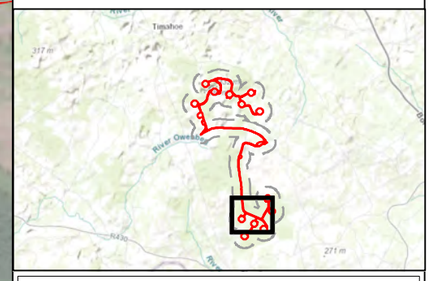
N

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Flightline Species Labelled with Flightline Number

- Leisler
- Soprano Pipistrelle



0 250 500

Metres

02036.00787.0158.0 Transect Survey Results Flightlines

Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

SOUTHERN TRANSECT SURVEY RESULTS: SPRING 2022

FIGURE 2.2

Scale 1:4,000 @ A3

Date APRIL 2023

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

655000

688000

N

1

2

3

4

TCC1

0 250 500

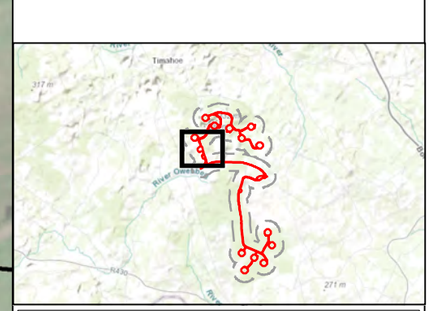
Metres

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Flightline Species Labelled with Flightline Number

- Common Pipistrelle
- Common Pipistrelle, Soprano Pipistrelle
- Soprano Pipistrelle



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

NORTHERN TRANSECT SURVEY RESULTS: SUMMER 2022

FIGURE 2.3

Scale 1:4,000 @ A3

Date APRIL 2023

02036.00787.0158.0 Transect Survey Results Flightlines

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

657000

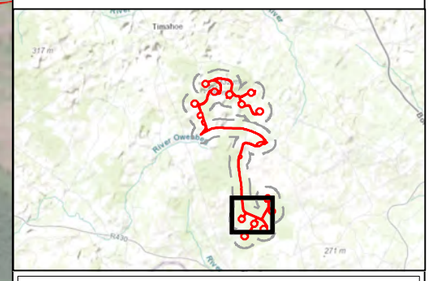
N

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Flightline Species Labelled with Flightline Number

- Common Pipistrelle
- Soprano Pipistrelle



0 250 500

Metres

02036.00787.0158.0 Transect Survey Results Flightlines

Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

SOUTHERN TRANSECT SURVEY RESULTS: SUMMER 2022

FIGURE 2.4

Scale 1:4,000 @ A3

Date APRIL 2023

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

655000

688000

N

TCC1

1

2

0 250 500

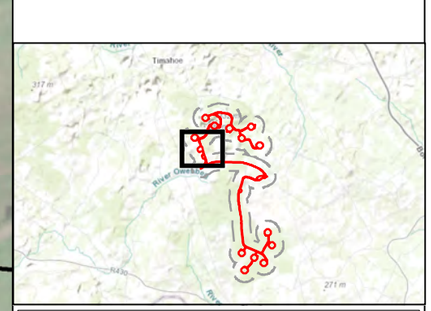
Metres

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Flightline Species Labelled with Flightline Number

- Common Pipistrelle
- Soprano Pipistrelle, Common Pipistrelle



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

NORTHERN TRANSECT SURVEY RESULTS: AUTUMN 2022

FIGURE 2.5

Scale 1:4,000 @ A3

Date APRIL 2023

02036.00787.0158.0 Transect Survey Results Flightlines

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

657000

N

1

2

3

4

5

0 250 500

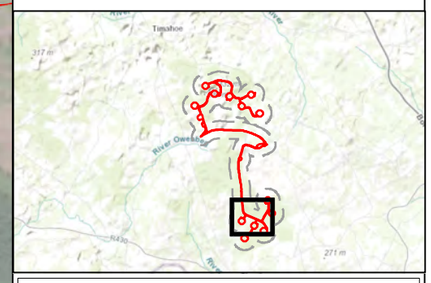
Metres

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Bat Transect Route

Flightline Species Labelled with Flightline Number

- Common Pipistrelle
- Soprano Pipistrelle



Statkraft

SLR

7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

SOUTHERN TRANSECT SURVEY RESULTS: AUTUMN 2022

FIGURE 2.6

Scale	Date
1:4,000 @ A3	APRIL 2023

02036.00787.0158.0 Transect Survey Results Flightlines

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

APPENDICES

APPENDIX 1

Criteria for Assessing Habitat Risk for Bats

Habitat Risk	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 taken from current NatureScot guidance[2].

APPENDIX 2

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

Yellow = low population vulnerability

Beige = medium population vulnerability

Red = high population vulnerability

Relative abundance	Scotland	Collision risk		
		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

Table taken from current NatureScot guidance[2].

CONFIDENTIAL APPENDIX 3

Bat Conservation Ireland Data

Table A3-1
BCI Records of Bat Species within 10 km of Project Site

X (ITM)	Y (ITM)	Species	Distance from Site (km)	Record No.
Roosts				
653156	691139	*Myotis daubentonii*	3.3	1
661436	684651	*Myotis daubentonii*	3.8	2
646441	681538	*Pipistrellus pipistrellus* (45kHz), *Pipistrellus* spp. (45kHz/55kHz), *Myotis mystacinus*	10.3	3
661437	693535	*Plecotus auritus*	6.8	4
653439	690536	*Pipistrellus* spp. (45kHz/55kHz), *Plecotus auritus*, *Myotis natterreri*, *Pipistrellus pipistrellus* (45kHz), *Nyctalus leisleri*	2.6	5
646441	696535	*Pipistrellus pipistrellus* (45kHz)	11.9	19
657438	696535	*Myotis mystacinus*	7.9	20
644441	680538	*Pipistrellus pygmaeus*	12.5	24
646441	696535	*Myotis natterreri*, *Plecotus auritus*, *Nyctalus leisleri*	11.9	25
645441	696535	*Pipistrellus pygmaeus*	12.6	26
660438	697535	*Plecotus auritus*	9.8	27
Transects				
657139	696335	Unidentified bat, *Myotis daubentonii*	7.6	21
647466	698118	*Myotis daubentonii*	12.3	28
Ad-hoc observations				

X (ITM)	Y (ITM)	Species	Distance from Site (km)	Record No.
646591	680888	*Myotis* spp., *Pipistrellus pipistrellus* (45kHz)	10.3	6
646591	681588	*Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus*, *Plecotus auritus*	10.2	7
654089	678789	Unidentified bat, *Pipistrellus pygmaeus*	5.3	8
663987	675389	*Pipistrellus pygmaeus*	10.7	9
649090	682788	*Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus*, *Nyctalus leisleri* ,*Myotis daubentonii*	7.5	10
658488	683588	*Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus*, *Nyctalus leisleri*	1.2	11
653289	689686	*Pipistrellus pygmaeus*, *Myotis daubentonii*	2.3	12
666586	681488	*Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus*, *Nyctalus leisleri*	9.5	13
660788	684787	*Pipistrellus pipistrellus* (45kHz), *Myotis daubentonii*	3.2	14
658159	689580	*Pipistrellus pygmaeus*, *Pipistrellus* spp. (45kHz/55kHz)	1.7	15
653089	689677	*Pipistrellus* spp. (45kHz/55kHz)	2.4	16
657393	690840	*Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus*	2.4	17
660438	690536	*Nyctalus leisleri*, *Pipistrellus pipistrellus* (45kHz)	4.1	18
657188	696685	*Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus*, *Nyctalus leisleri*, *Myotis daubentonii*	8.0	22
665815	696974	*Pipistrellus pygmaeus*, *Myotis daubentonii*	12.4	23
646441	698534	Unidentified bat, *Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus*, *Pipistrellus* spp. (45kHz/55kHz), *i*	13.3	29
644692	685758	*Pipistrellus pipistrellus* (45kHz), *Myotis mystacinus*	10.5	30
646491	698284	*Pipistrellus pipistrellus* (45kHz)	13.0	31
643891	685387	*Pipistrellus pipistrellus* (45kHz)	11.4	32

X (ITM)	Y (ITM)	Species	Distance from Site (km)	Record No.
646491	698684	*Pipistrellus pipistrellus* (45kHz), *Myotis daubentonii*	13.4	33
644942	696035	*Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus*, *Nyctalus leisleri*, *Myotis natterreri*, *Plecotus auritus*	12.7	34
647504	698031	*Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus*	12.2	35
647441	698035	*Pipistrellus pygmaeus*, *Pipistrellus pipistrellus* (45kHz)	12.2	36
643862	683635	*Myotis mystacinus*, *Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus*, *Pipistrellus nathusii*	11.9	37
643862	683635	*Myotis mystacinus*, *Myotis natterreri*, *Plecotus auritus*, *Nyctalus leisleri*, *Pipistrellus pipistrellus* (45kHz), *d*	11.9	38

646000 655500 665000

693500 684000

N

Coolnabacky Option

Pinewoods Option

0 2.5 5

Kilometres

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Grid Connections to be Assessed (Separate Planning Application)
- Proposed Grid Connection Routes to be Assessed (Separate Planning Application)
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Largest Core Sustenance Zone for Irish Bat Species (Wind Farm Site Boundary 4 km Buffer)

Bat Conservation Ireland (BCI)

- Ad-hoc observation
- Roost
- Transect

Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

CONFIDENTIAL BAT CONSERVATION IRELAND DATA

FIGURE 3

Scale 1:95,000 @ A3

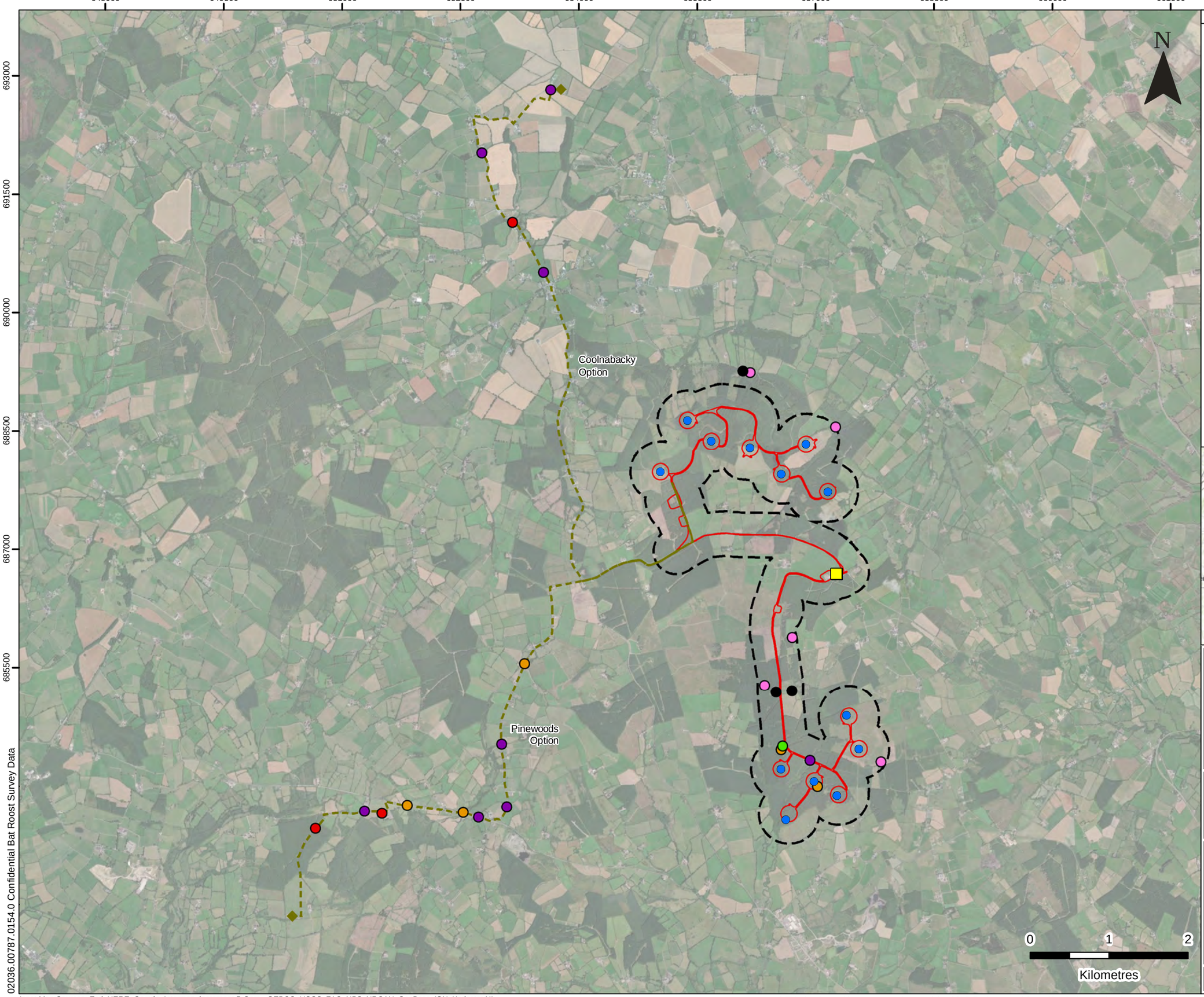
Date MARCH 2023

02036.00787.0153.0 Confidential BCI Data

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

CONFIDENTIAL APPENDIX 4

Confidential Roost Data

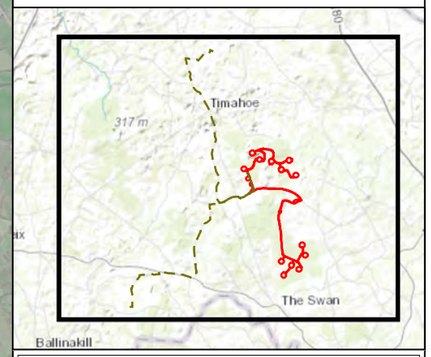


LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Grid Connections to be Assessed (Separate Planning Application)
- Proposed Grid Connection Routes to be Assessed (Separate Planning Application)
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Emergence Survey Location

Bat Roost Suitability

- High
- Moderate
- Low
- No Potential
- Historical
- Not surveyed



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

CONFIDENTIAL ROOST SURVEY DATA

FIGURE 4.1

Scale 1:45,000 @ A3

Date MARCH 2023

02036.00787.0154.0 Confidential Bat Roost Survey Data

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

654000
655500
657000
658500
688500
687000

N

13
12
11
T1
T2
T3
T4
T5
T6
T7
9
10

Coolnabacky Option
Pinewoods Option

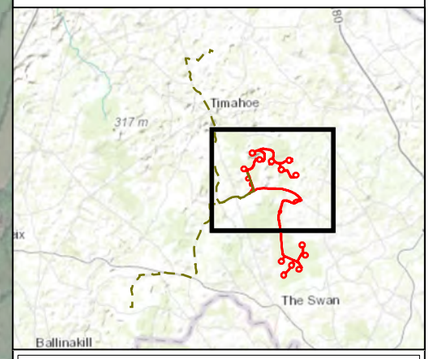
0
1
2
Kilometres

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Substation Compound
- Proposed Temporary Construction Compound
- Proposed Borrow Pit
- Proposed Hardstanding
- Proposed Access Track
- Proposed Grid Connection Routes to be Assessed (Separate Planning Application)
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)
- Emergence Survey Location

Bat Roost Suitability

- Historical
- Not surveyed



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

CONFIDENTIAL ROOST SURVEY DATA

FIGURE 4.2

Scale 1:15,000 @ A3

Date MARCH 2023

02036.00787.0154.0 Confidential Bat Roost Survey Data

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

655500 657000 658500

685500

684000

N

LEGEND

- Wind Farm Site Boundary
- Proposed Turbine Layout
- Proposed Temporary Construction Compound
- Proposed Hardstanding
- Proposed Access Track
- Bat Roost Search Area (Wind Farm Site Boundary 279.35 m Buffer)

Bat Roost Suitability

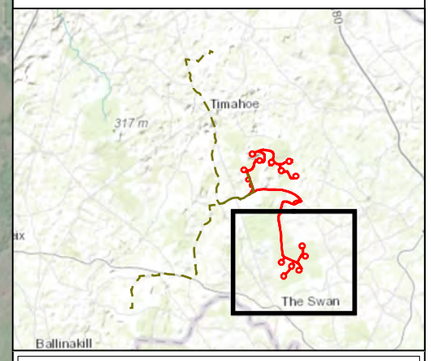
- Moderate
- Low
- No Potential
- Historical
- Not surveyed

T9 T8 T10 T12 T13 T11

10 8 6 7 3 5 4 27 2 1

0 1 2

Kilometres



Statkraft

SLR

7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

CONFIDENTIAL ROOST SURVEY DATA

FIGURE 4.3

Scale 1:15,000 @ A3

Date MARCH 2023

02036.00787.0154.0 Confidential Bat Roost Survey Data

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

651000
652500
654000
693000
691500

N

17
16
Coolnabacky
Option
15
14

0
1
2
Kilometres

LEGEND

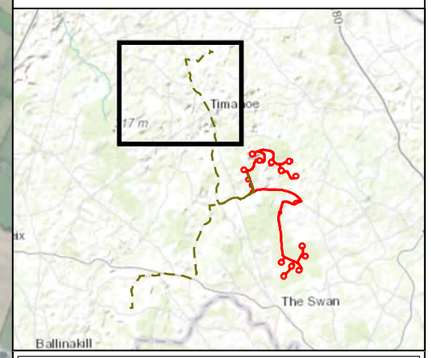
Proposed Grid Connections to be Assessed (Separate Planning Application)

Proposed Grid Connection Routes to be Assessed (Separate Planning Application)

Bat Roost Suitability

High

No Potential



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

CONFIDENTIAL ROOST SURVEY DATA

FIGURE 4.4

Scale 1:15,000 @ A3

Date MARCH 2023

02036.00787.0154.0 Confidential Bat Roost Survey Data

649500 651000 652500 654000

685500

684000

N

18

19

20

21

22

Pinewoods Option

23

24

25

26

0 1 2

Kilometres

LEGEND

Proposed Grid Connections to be Assessed (Separate Planning Application)

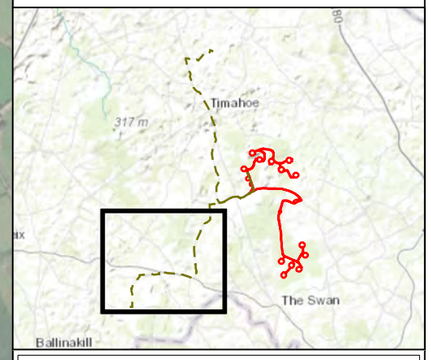
Proposed Grid Connection Routes to be Assessed (Separate Planning Application)

Bat Roost Suitability

High

Moderate

No Potential



Statkraft

SLR
7 DUNDRUM BUSINESS PARK
WINDY ARBOUR
DUBLIN D14 N2Y7
IRELAND
T: 0129 64667
www.slrconsulting.com

COOLGLASS WIND FARM

COOLGLASS WIND FARM
BASELINE BAT REPORT

CONFIDENTIAL ROOST SURVEY DATA

FIGURE 4.5

Scale 1:15,000 @ A3

Date MARCH 2023

02036.00787.0154.0 Confidential Bat Roost Survey Data

Inset Map:Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community (Aerial Imagaery 2021)

Photographs of moderate to high roosts shown below.

Photograph
Roost number 1 (southern cluster)

Photograph 2
Roost number 4 (southern cluster)

Photograph 2
Roost number 9 (emergence survey location)

Photograph 3
Roost number 25 (adjacent go GCR option A)

Photograph 4
Roost number 26 (adjacent go GCR option A)

Photograph 2.1
Roost number 25 (adjacent go GCR option B)

EUROPEAN OFFICES

AYLESBURY
T: +44 (0)1844 337380

BELFAST
belfast@slrconsulting.com

BIRMINGHAM
T: +44 (0)121 2895610

BONN
T: +49 (0)176 60374618

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

BRISTOL
T: +44 (0)117 9064280

CARDIFF
T: +44 (0)2920 491010

CHELMSFORD
T: +44 (0)1245 801630

CORK
T: +(021) 240 9000

DUBLIN
T: +353 (0)1 296 4667

EDINBURGH
T: +44 (0)131 335 6830

EXETER
T: +44 (0)1392 490152

FRANKFURT
frankfurt@slrconsulting.com

GLASGOW
glasgow@slrconsulting.com

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

KILKENNYY
kilkenny@slrconsulting.com

LEEDS
T: +44 (0)113 5120293

LONDON
T: +44 (0)203 8056418

MAIDSTONE
T: +44 (0)1622 609242

MANCHESTER
T: +44 (0)161 8727564

NETHERLANDS
T: +31 6 28 02 18 80

NEWCASTLE UPON TYNE
T: +44 (0)1844 337380

NOTTINGHAM
T: +44 (0)115 9647280

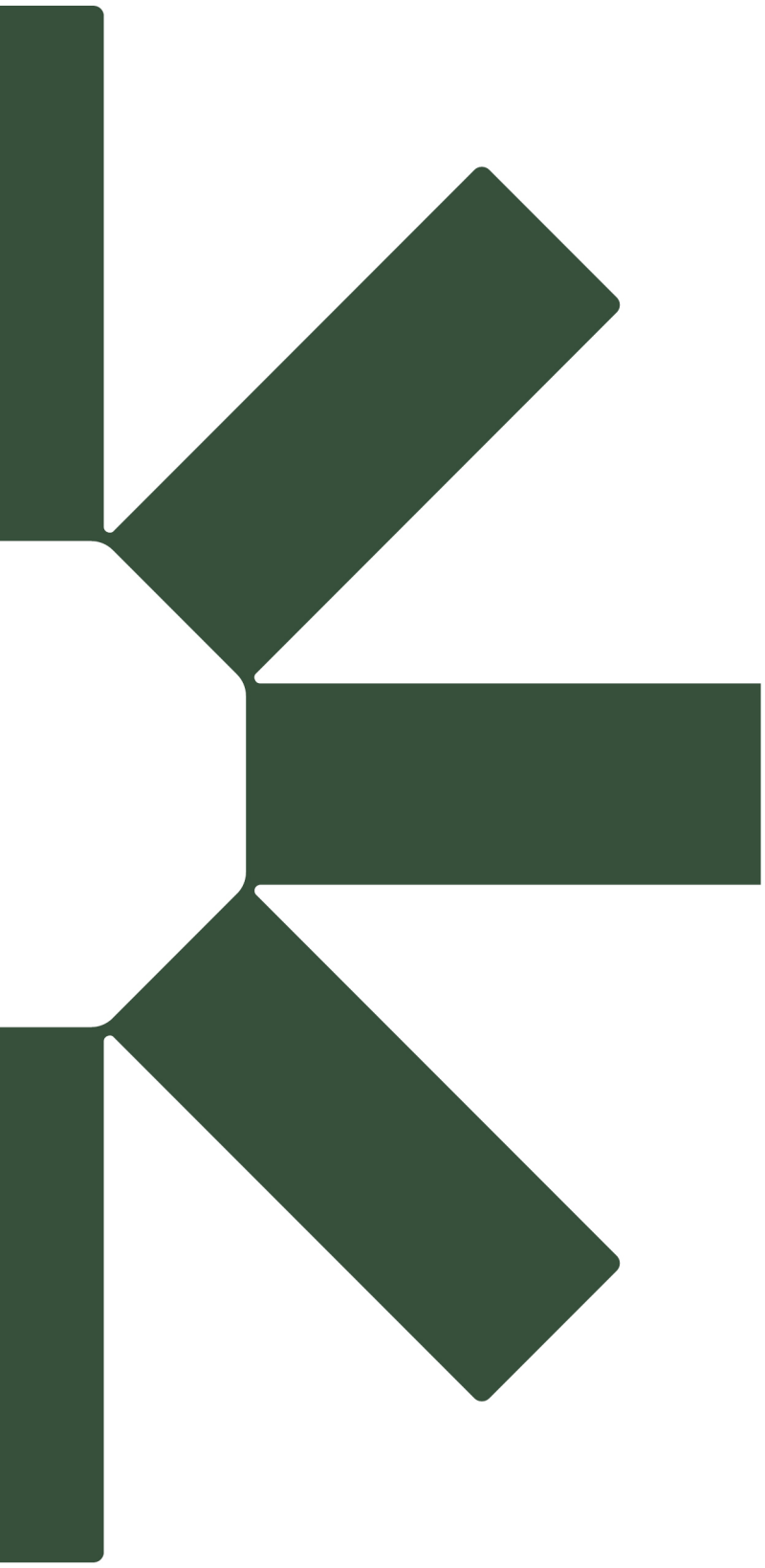
SHEFFIELD
T: +44 (0)114 2455153

SHREWSBURY
T: +44 (0)1743 239250

SPAIN
T: +34 6 82 04 83 01

STIRLING
T: +44 (0)1786 239900

WORCESTER
T: +44 (0)1905 751310



Making Sustainability Happen