

Bat Survey Report

Ballincor Wind Farm,
Co. Offaly & Co.
Tipperary

April 2026

Prepared for:

RWE

O'DONNELL 
ENVIRONMENTAL



Summary

Project: Bat survey in relation to the proposed wind farm at Ballincor, Co. Offaly & Co. Tipperary.

Location: 53.035313, -7.946253 (WGS84)

Company Profile: O'Donnell Environmental is an independent environmental consultancy established by Tom O'Donnell in 2019. O'Donnell Environmental is a Chartered Institute of Ecology and Environmental Management (CIEEM) 'Registered Practice' which demonstrates our commitment to high professional standards, accountability and the delivery of the best outcomes for biodiversity and our Clients. O'Donnell Environmental maintains an ISO 9001:2015 certified Quality Management System, ensuring consistent quality and customer focus.

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1 Introduction

O'Donnell Environmental Ltd. was commissioned by RWE Renewables Ireland Ltd. (RWE) to undertake bat surveys and reporting in relation to a proposed wind energy development in Co. Offaly and Co. Tipperary. The proposed project involves the development of an 11-turbine wind farm at Ballincor, 5km southwest of the town of Birr, Co. Offaly. The proposed includes for a Turbine Delivery Route (TDR) from Foynes to site and a Grid Connection Route (GCR) to Dallow 110kV Substation. Site location maps are presented in **Figures 1.1** and **1.2**.

The aim of the current study was to determine and evaluate the likely importance of the study area and its immediate environs to bats, and to inform an assessment of effects.

1.1 PROPOSED WORKS

The 'proposed project' refers to an eleven-turbine wind farm, 100kV substation, Battery Energy Storage System (BESS), GCR and proposed works required on the TDR.

The 'proposed wind farm site' refers specifically to the area enclosed within the wind farm site boundary and includes the wind farm, 110kV substation and BESS.

The proposed project is described in **Chapter 2 Description of the Proposed Project** and are summarised as follows:

- Assembly of 11 Wind Turbine Generators (including tower sections, nacelle, hub, rotor blades) with an estimated export capacity of between 61.6 to 77MW and a blade tip height between 179.5 and 180m, rotor diameter of up to 149 to 163m, hub height of between 98.5 and 105m.
 - Associated hardstanding at each turbine location;
 - Turbine foundations;
- Upgrading of existing access tracks, construction of new founded access roads and floating roads within the proposed wind farm. Total length of internal access roads is 9.7km.
- Construction upgrades of two site entrances on R492 and L1071;
- Erection of 104m permanent meteorological mast and including lightening pole;
- Installation of new clear span watercourse or drain crossings on proposed wind farm site;
- All associated excavation, earthworks and spoil management, Surface water drainage system and sediment control;
- Three borrow pits (borrow pit 1 to borrow pit 3);
- One peat deposition area;
- Security fencing & hut;
- Four Temporary construction compounds including site office and staff facilities;
 - Parking;
 - Lighting; and
 - Rainwater harvesting equipment;
- Installation of 33kV medium voltage electrical and communication cabling underground between the proposed turbines and the proposed on-site substation and associated ancillary works;
- 110kV electricity on-site substation and switch rooms;
 - One EirGrid control building containing worker welfare facilities and equipment store, wastewater and rainwater holding tank;

- One Independent Power Producer (IPP) control building containing HV switch room, site offices, kitchen facilities, storeroom and toilet amenities, wastewater holding tank;
- All electrical plant and infrastructure and grid ancillary services equipment;
- One BESS control building containing worker welfare facilities and equipment store, wastewater holding tank; 90 Battery energy storage system (BESS) container units, inverters, underground water storage tank and associated works;
- Works along the public road and private land for a 12.2km grid connection to the existing Dallow 110 kV substation including installation of 17 joint bays along the GCR.
- Upgrading of existing access tracks, construction of new founded access roads and floating roads within the proposed wind farm and a founded road for the GCR at Clondallow, Birr, Co. Offaly.
- Electrical and communication cables, linking the turbines to the proposed grid connection point;
- Turbine Delivery Accommodation works, road surfacing works, temporary wall/vegetation removal, load bearing surface will be laid to provide a minimum 4.m running width and a 5.5 m clearance width for turbine delivery at Sharavogue cross roads.
- All associated infrastructure and services including site works and temporary construction signage;
- Operational stage site signage;
- All related site works and ancillary development including berms, landscaping, and soil excavation;
- Tree felling (7.2ha) and hedgerow removal (1km) to facilitate construction and operation of the proposed project;
- Biodiversity enhancement including hedgerow replanting (1.3km), peatland enhancement, tree planting.

A full description of the proposed project is provided in **Chapter 2** (Description of the Proposed Project) of the Environmental Impact Assessment Report (EIAR).

It is estimated that the construction phase will take approximately 24 months to complete, inclusive of all works proposed along the GCR and TDR. A 10-year planning permission and 35-year operational life from the date of commissioning of the entire wind farm is being sought for the proposed project and does not include elements of the overall proposed project, such as works on the proposed turbine delivery route (TDR). A permanent planning permission is being sought for the proposed grid connection (GCR) and substation as these will remain as a permanent part of the national infrastructure, which will be operated by the Transmission System Operator, EirGrid and owned by ESB the Transmission System Owner and will remain in place upon decommissioning of the wind farm. Following its operational life, the wind farm will be decommissioned and the decommissioning phase will last for approximately 12 months.

This report assesses the potential for effects on bats as a result of the current proposal. All aspects of the proposed project are considered including temporary and permanent construction works, as well as the potential for effects during the operational phase and decommissioning phase.

The potential effects on bats due to elements of the proposed development include the following:

- Vulnerability of bats to collision with turbines resulting in injury or mortality
- Loss of features with potential for bat roosting
- Loss of potential foraging or commuting habitat for bats

- Displacement of individuals or populations.

1.2 STATEMENT OF COMPETENCE

O'Donnell Environmental is an independent environmental consultancy established by Tom O'Donnell in 2019. O'Donnell Environmental is a Chartered Institute of Ecology and Environmental Management (CIEEM) 'Registered Practice' which demonstrates our commitment to high professional standards, accountability and the delivery of the best outcomes for biodiversity and our Clients. O'Donnell Environmental maintains an ISO 9001:2015 certified Quality Management System, ensuring consistent quality and customer focus.

Tom O'Donnell is a Chartered Environmentalist and a full member of the Chartered Institute of Ecology and Environmental Management. He was awarded a BSc in Environmental and Earth System Science [Applied Ecology] in 2007 and an MSc in Ecological Assessment in 2009, both from UCC. Tom has over 19 years professional experience in the environmental industry, including working on projects such as wind farms, overhead power lines, roads, cycleways and residential developments. Tom is licensed by NPWS for roost disturbance and to capture bats.

Oisín O Sullivan BSc (Hons) is a Senior Ecologist and an Associate member of the Chartered Institute of Ecology and Environmental Management. Oisín was awarded a BSc in Ecology and Environmental Biology at University College Cork in 2020. Oisín has experience in bat surveys for a large variety of projects including wind farms both onshore and offshore, residential and linear infrastructure. Oisín is licensed by NPWS for roost disturbance and to capture bats.

Claire McCarthy BSc (Hons) MSc is an Associate member of the Chartered Institute of Ecology and Environmental Management. She was awarded a BSc in Biological, Earth and Environmental Sciences [Zoology] in 2018 and an MSc in Marine Biology in 2022, both from UCC. Claire has contributed to the preparation of EIAR and EclA reports for renewable energy developments and has experience in preliminary roost assessments and bat activity surveys. Claire is licensed by NPWS for roost disturbance.

Colm Breslin BSc (Hons) is a Qualifying member of the Chartered Institute of Ecology and Environmental Management. He was awarded a BSc in Biological, Earth and Environmental Sciences [Ecology and Environmental Biology] in 2023 from UCC. Colm has experience in habitat mapping, bat activity surveys and preliminary roost assessments for a variety of wind farm and residential developments. Colm is licensed by NPWS for roost disturbance and to capture bats.

1.3 LEGAL STATUS OF BATS

All bat species and their roosting sites are protected under both national and international law. The purpose of this legislation is to maintain and restore bat populations within their natural range. Where human activities have the potential to compromise bat populations, measures are required to be put in place to avoid impacts or compensate and mitigate for those impacts. A grant of planning permission does not constitute a licence or permit to disturb bats or interfere with their breeding or resting places.

The key legislation which provides protection to bats is as follows:

- Wildlife Act (1976) and subsequent amendments which makes it unlawful to intentionally disturb, injure or kill a bat or disturb its resting place without a licence to derogate from Regulation 23 of the Habitats Regulations 1997, issued by National Parks & Wildlife Service (NPWS)

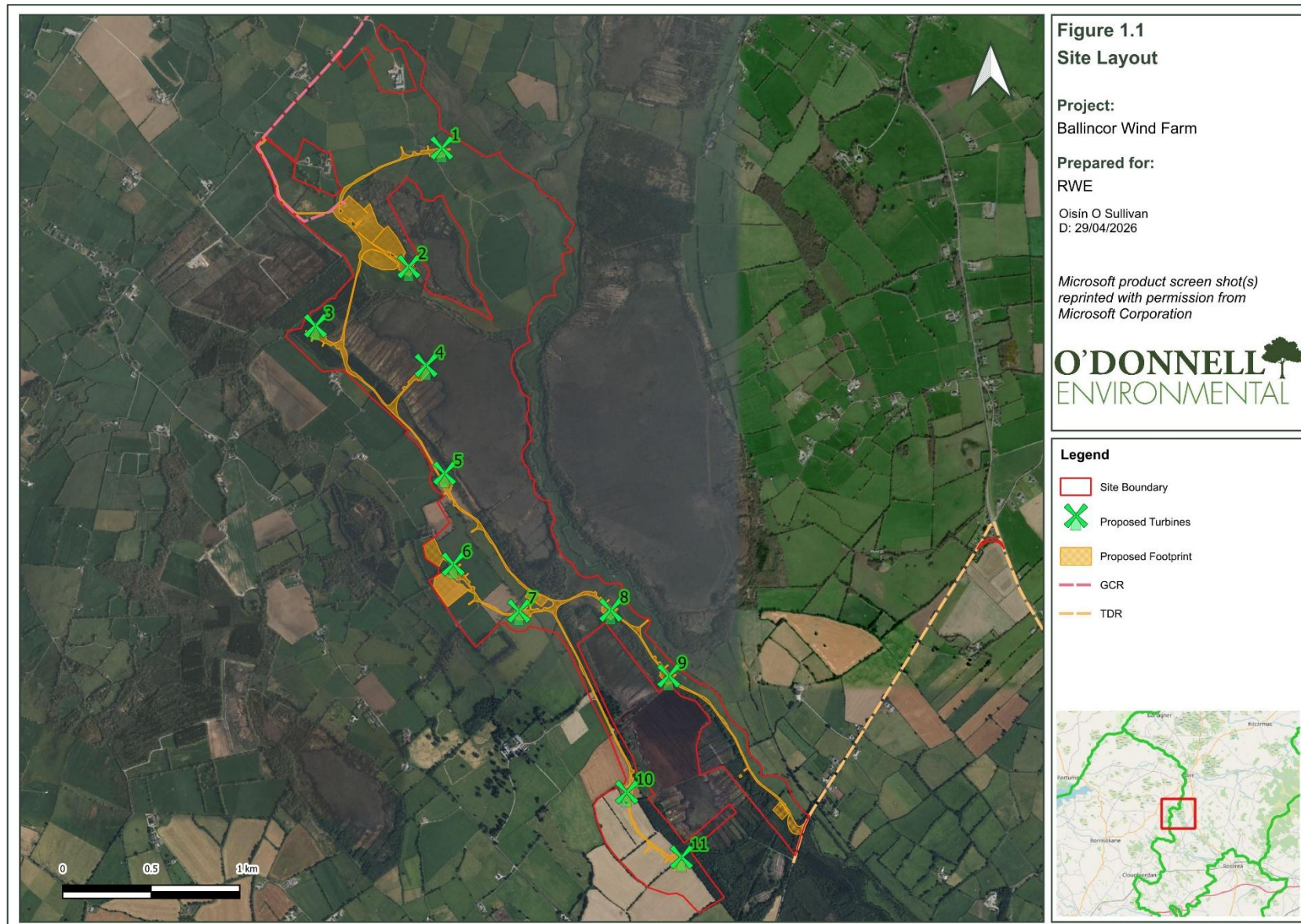
- The EU Habitats Directive (which has been transposed into Irish law with the European Communities (Birds and Natural Habitats) Regulations 2011) seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All Irish bat species are listed in Annex IV, while Annex II provides additional protection for the Lesser Horseshoe Bat.

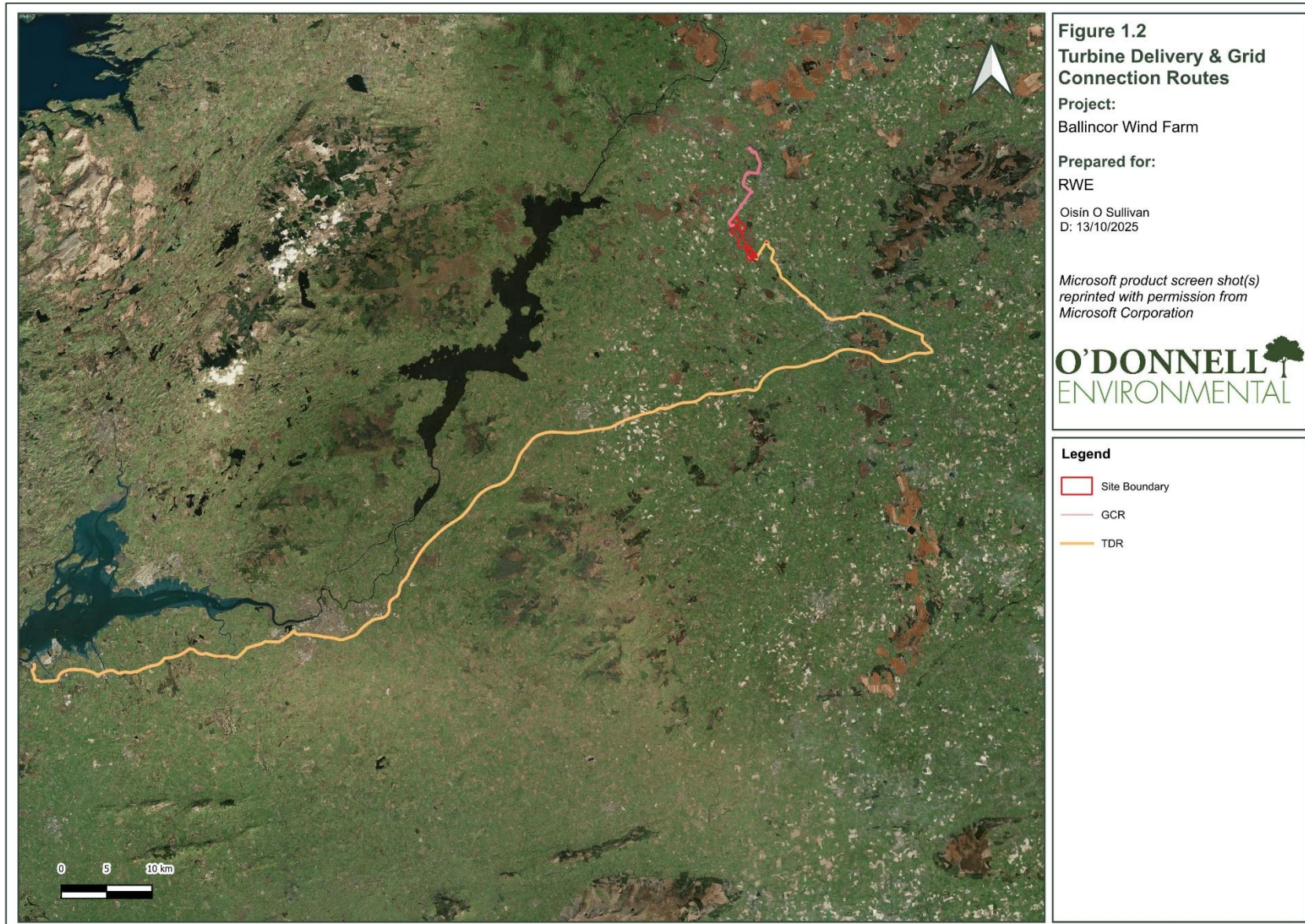
1.4 ZONE OF INFLUENCE

Following CIEEM (2018), the 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of a proposed development and associated activities. There is potential for the zone of influence to extend beyond the development boundary through hydrological or other pathways (e.g., indirect disturbance through noise, lighting etc.). The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change. It is therefore considered appropriate to identify different zones of influence for different features of the current report. The OPR (2021) further reiterates that the zone of influence must be established on a case-by-case basis.

While there is evidence of longer distance movement by bats (e.g., Shiel et al., 1999), for the purpose of cumulative assessment a zone of influence of 10km from the redline boundary was considered following NatureScot (2021). Indirect effects from the loss of foraging, loss of commuting habitat and collisions risk on known bat roosts were considered within 4km of the turbine bases, or within the core sustenance zone (CSZ) following information Collins (2023) of known maternity roosts.

A zone of influence of 300m from the proposed wind farm site redline boundary specifically was considered for direct effects on roosting features which could support maternity roosts and significant hibernation/swarming sites. This zone of influence follows a precautionary approach greater than that outlined by NatureScot (2021) which recommends an area of 200m plus one rotor radius. Considering the limited and temporary nature of works along the turbine delivery route and grid connection route, a zone of influence up to a maximum of 20m from the immediate works area was defined.





2 Methodology

This assessment was carried out for a study area which comprises the wind farm site, a GCR and relevant points of interest (POIs) along the proposed TDR. The assessment was carried out through desktop review, daytime assessment, targeted emergence surveys and passive detector surveys. Each of these elements are described below.

2.1 DESKTOP REVIEW

A desktop review of publicly available relevant data was undertaken on the National Biodiversity Data Centre (NBDC)¹ and National Parks & Wildlife Service (NPWS)² websites. The National Biodiversity Data Centre was reviewed for relevant data, specifically i) existing species records for the 10km square in which the study site is located (S09 & N00) and ii) an indication of the relative importance of the wider landscape in which the study site is located, based on Model of Bat Landscapes for Ireland (Lundy et al., 2011). In the latter, the index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats. A protected species data request was submitted to NPWS for information not otherwise publicly available regarding protected species such as the Annex II (EU Habitats Directive) listed Lesser Horseshoe Bat.

Bat Conservation Ireland (BCI) conducted a search of their records database at the request of O'Donnell Environmental on 5th March 2025. The National Bat Database of Ireland was checked on 29th April 2026 to validate the presence of new roost records that may have been submitted in the interim. The relevant search area included a 30km radius from a central point within the proposed site. Known roost locations in the target area as well as activity records from BCI Volunteer based surveys and ad-hoc activity records submitted by Ecological Consultants were provided. Where roost locations occur in private dwellings the location provided refers to the relevant 1km grid square.

Consideration was given to the location of the study site relative to the 'Core Sustainment Zones' (CSZ) of all known bat roosts proximal to the site. When considering development, Collins (2023) states that the CSZ could be used to indicate:

- The area surrounding a roost within which development work may impact the flight-paths and foraging habitat of bats using that roost
- The area within which it may be necessary to ensure no net reduction in the quality and availability of foraging habitat for the roost.

In the absence of information specific to Ireland, CSZ distances provided in Collins et al., (2023) are considered to be the best available information. CSZ distances for species known to occur in Ireland range from 1km to 4km although these distances are based on limited information in some instances (Collins et al., 2023).

2.2 POTENTIAL ROOST ASSESSMENT

Preliminary Roost Assessment (PRA) of structures (including bridges) and Ground Level Tree Assessment (GLTA) of trees were carried out following Collins (2023) within the relevant zones of influence (see **Section 1.4**). Targeted daytime surveys were carried out by Tom O'Donnell, Colm

¹ <https://maps.biodiversityireland.ie/Map>. Accessed 05/02/2025.

² <https://www.npws.ie/protected-sites>. Accessed 05/02/2025.

Breslin, Oisín O Sullivan, and Aisling Natoff BSc (Hons) MSc on the 18th August 2022, 31st July 2024 and 25th February 2025, to determine the presence of bats or Potential Roosting Features (PRFs) where proposed works may directly or indirectly effect a PRF. Daytime roost inspection surveys were carried out on bridges with suitability for roosting bats identified along the GCR on 4th March and 6th August 2025. Daytime roost inspections involved searching for signs of PRFs and any evidence of current or historic roosting by bats thorough inspection of suitable voids and crevices with an endoscope.

Surveys were non-destructive, and relevant PRFs were visually inspected from ground level to identify any evidence of bat roosting. Further inspections of potential roosting features were carried out using a torch and endoscope and those at height were accessed using a 5-meter ladder where necessary and safely possible. Signs of bat use include bat droppings, feeding remains, potential bat access points identified by characteristic staining and scratches, noise made by bats etc.

The potential suitability of structures for roosting bats was classified according to the guidelines in Collins (2023), see **Table 2.1**. Buildings, bridges and other structures can provide bats with ample shelter, stable temperatures and dry conditions considered necessary for the formation of significant roosts (i.e. maternity roosts). Bridges often present suitable crevices for roosting bats which offer suitable conditions and are in an optimal location for foraging bats, being located above a watercourse. Being linear features, river corridors connect habitats within the wider landscape and may be used by bats for commuting.

Table 2.1. Scheme for describing the potential suitability of structures for bats.

Suitability	Description
None	No habitat features likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/suitable shelter at all ground/underground levels).
Negligible	No obvious habitat features likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. 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 and not a classic cool/stable hibernation site but could be used by individual hibernating bats).
Moderate	A structure with one or more potential roost sites that could be used by bats due their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/stable hibernation site.

After 'Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition)', Collins (2023).

The Daytime Bat Walkover (DBW), of trees present on site follows the categorisations scheme outlined in **Table 2.2 & 2.3**. In line with Marnell et al. (2022), a risk-based approach was adopted in relation to survey of individual trees for the presence of PRFs. Marnell et al. (2022) recommends a risk-based approach, in which trees with a high probability of use by bats should be subject to survey. Factors listed as increasing the probability of trees being used by roosting bats include ancient woodland, large trees with complex growth form, visible damage etc. Factors listed as decreasing the probability of trees being used by roosting bats include “coniferous plantation with no specimen trees” and “young trees with simple growth form and little damage”.

Table 2.2. Scheme for describing the potential suitability of PRFs in trees on a proposed development site for bats.

Suitability	Description
None	Either no PRFs in the tree or highly unlikely to be any.
FAR	Further Assessment Required to establish if PRFs are present in the tree.
PRF	A tree with at least one PRF present.

After 'Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition)', Collins (2023).

Following the confirmation of the possible presence of PRFs in trees, the assessment of suitability is further refined during the GLTA, whereby the potential suitability of such PRFs was categorised according to the system detailed in **Table 2.3**. Trees with suitable PRFs for roosting bats were tagged using the following identification scheme (Tag No. 702-722).

Table 2.3. Scheme for describing the potential suitability of PRFs in trees for bats.

Suitability	Description
PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
PRF-M	PRF is suitable for multiple bats and may therefore be used by a maternity colony.

After 'Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition)', Collins (2023).

Winter is the optimal season to survey trees for PRFs. In winter reduced leaf cover maximises light penetration and minimises obstruction of vision (BTHK, 2018; Collins, 2023). While ground-level tree surveys can confirm the presence of roosting bats, they often cannot conclusively confirm the absence of roosting bats (Collins, 2023). In trees, evidence of recent bat occupation can rapidly disappear. For example, droppings can persist in buildings for many years while they generally do not persist for long in tree roosts.

Tree roosts have been shown to be used in a more transient manner than buildings with many species exhibiting roost switching behaviour (Collins, 2023). For example, Waters et al. (1999) observed roost switching in Leisler's Bats every 2 to 10 days during the active season.

For the above reasons, this report takes a conservative approach when considering bat roosting potential of trees. This approach reflects the fact that any tree with bat potential may be used at some point or another and the conservation importance of multiple roosting opportunities is poorly understood.

2.2.1 Potential Significant Roosts

Further features outside the immediate works footprint were considered following NatureScot (2021), which recommends that potentially 'significant' roosting features (e.g. those which could support maternity roosts, significant hibernation and/or swarming sites) be identified in a search area extending to 200m plus one rotor radius from the "site boundary". A conservative approach was taken, and the potential for significant roosts was investigated within an area extending to a minimum of 300m from the proposed wind farm site redline boundary specifically.

In an Irish context, significant roosts are typically associated with man-made structures and underground features such as caves and mines. Features with potential to accommodate significant bat roosts were identified through examination of OSi historic 6" mapping, aerial imagery as well as ground truthing. Some of the historic features identified no longer exist. Remaining features were

surveyed for the presence of bats and their suitability to roosting bats was assessed according to the scheme outlined in Collins (2023). Features considered included bridges, culverts, buildings and trees. Information on known mines and caves was identified through the examination of publicly available information produced by Geological Survey Ireland.

All potentially significant roosting features which required further consideration were identified, in this instance consisting of three structures and one tree which were subject to targeted emergence surveys (see **Section 2.3.2**).

2.3 BAT ACTIVITY SURVEYS

Bat activity at the proposed wind farm site was investigated through the use of passive bat detection and an active driven transect survey conducted on the GCR

2.3.1 Passive Bat Surveys

A full suite of passive detection surveys was carried out in summer and autumn 2024 and spring 2025 in compliance with NatureScot (2021). Survey data recorded during previous monitoring campaigns between 2020 and 2022 are also discussed and this data provides useful additional context and strengthens baseline understanding of the site.

2.3.1.1 2020 to 2022 Passive Bat Monitoring

An ultrasonic passive detector survey was carried out at the site to record bat activity in the area from which information on species composition, relative abundance and landscape usage could be derived. Surveys were conducted between 2020 and 2022 and while the survey methodology was compliant with NatureScot (2021), not all recording locations used in 2020 to 2022 are particularly relevant to the currently proposed layout. Data from some selected relevant locations were examined and all data from historic recording has been considered in terms of local species assemblage. Historic deployments are shown in **Figure 2.2**.

Overlaying the current proposed turbine layout with the position of previous survey points, the previous data provides at least six comparable recording locations (i.e. similar habitat and <200 m from the current turbine location). Turbines with approximate coverage refers to those for which historic data was gathered in similar habitat but >200 m from the current turbine location. In the case of five turbines the nearest historical recording location was too far to provide approximate coverage. The level of coverage of the current turbine in historic data is shown in **Table 2.4**.

Table 2.4 - Coverage of surveys between 2020 and 2022.

Turbines well covered	Turbines with approximate coverage	Turbines not covered
T4	T7	T1
T6	T8	T2
T9		T3
T10		T5
		T11

2.3.1.2 Current Passive Bat Monitoring

The most recent multi-season passive detector survey was carried out from summer 2024 until spring 2025 following NatureScot (2021) guidelines, with modifications for an Irish context, and NIEA (2024).

Based on the proposed project size, a minimum of 10 passive monitoring locations is required to meet the guidance of NatureScot (2021). Passive bat detectors were deployed at 11 monitoring stations within the wind farm site for two seasonal periods in 2024 (summer and autumn) and one seasonal period in 2025 (spring) to record general bat activity in locations corresponding to the proposed design available at the time of deployment (**Figure 2.1**). The likelihood of design changes is acknowledged in NatureScot (2021). Minor amendments to the turbine layout occurred following completion of passive bat surveys, such that a portion of monitoring locations are located away from the turbine base but within similar habitats and so are considered representative of the study site and turbine locations

Wildlife Acoustic's SM4 full-spectrum bat detectors and Song Meter Mini Bat Ultrasonic full-spectrum detectors were deployed at the locations detailed in in **Figure 2.1**. Detectors were set to record from 30 minutes before sunset until 30 minutes after sunrise and the GPS locations were set on each detector. The detectors automatically adjust their start and finish times based on sunrise and sunset.

The locations of detectors deployed are provided in **Table 2.5** below and shown in **Figure 2.1**. Details of the survey periods are shown in **Table 2.7**.

Table 2.5 Passive Bat Monitoring Survey Locations 2024 - 2025

	Ref.	Latitude	Longitude
2024 / 2025	T01	53.0527884	-7.9471545
	T02	53.0470113	-7.9499932
	T03	53.0436779	-7.9577687
	T04	53.0414920	-7.9494334
	T05	53.0363750	-7.9472123
	T06	53.0314528	-7.9465228
	T07	53.0290130	-7.9406123
	T08	53.0293308	-7.9330477
	T09	53.0261286	-7.9283121
	T10	53.0200892	-7.9316444
	T11	53.0168171	-7.9270489

Individual bats of the same species cannot be distinguished by their echolocation alone and therefore 'bat registrations' are used as a measure of activity. A bat registration is defined as the presence of an individual species echolocation within a recording of maximum 15 seconds duration. All bat registrations recorded during this study follow these criteria, allowing comparison between monitoring stations. It is important to note that bat registrations do not equate to number of individuals.

Based on knowledge of the site from previous years surveys enclosures were constructed at the proposed turbine locations where livestock could potentially interfere with recording for the 2024 and 2025 survey periods. All detectors were deployed at the locations corresponding the design available at the time. (see **Plate 2.1**).

A Davis 'EnviroMonitor' weather monitoring station was installed at the location of T1 (see **Plate 2.2**), which was considered to record weather conditions representative of those at the proposed wind farm site (**Appendix A**). Relevant parameters (temperature, wind speed, rainfall) were recorded to demonstrate that weather conditions on each survey night were suitable, as set out in the NIEA (2024).



Plate 2.1 – Example of Song Meter Mini Bat Ultrasonic full-spectrum detector deployed at a proposed Turbine location.



Plate 2.2 - Weather station installed near T1.

Monitoring periods follow guidance in NatureScot (2021) and NIEA (2024). Autumn was chosen as the high-risk period based on the historic data and was subject to the additional 10 nights recording as prescribed in NIEA 2024 guidance. Full recording periods are shown in **Table 2.7**. The minimum number of survey nights for each of the three seasonal surveys was:

- Summer 2024 - 10 nights
- Autumn 2024 - 20 nights
- Spring 2025 - 10 nights.

Appropriate weather conditions for bat activity in lowland sites (<200m) are described as temperatures of 10°C and above for most of the survey period, maximum ground level wind speed of 18km/hr and no heavy rainfall (NIEA, 2024). Appropriate weather conditions prevailed during the three survey periods, for both years. It is considered that appropriate coverage was achieved in the passive bat detection surveys.

Although commonly applied in Ireland, the NatureScot (2021) guidelines 'Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation' were written for a Scottish context. While survey effort and design are carried out according to the guidelines in this study, the guidelines were adapted to an Irish context in the following ways:

- NatureScot (2021) recommends the use of an online tool, 'Ecobat' to provide a measure of relative bat activity. The tool compares site specific inputted data to a comparator database to provide an interpretation of the level of bat activity compared to other sites in Britain. The tool is not considered to be appropriate for use as yet in an Irish context (data is heavily weighted by data collected in the UK where there are a different range of bat species and differing ecology). In relation to Ecobat, NIEA (2024) states that "*caution should be exercised when using the tool as it has a significant bias towards results from Great Britain and there is a paucity of data from Northern Ireland or Ireland where we have a significantly different species assemblage. Therefore, it is currently unlikely to produce results which accurately reflect the species composition and bat activity levels normally encountered on wind turbine sites in Northern Ireland*". Interpretation of relative activity levels at the proposed site versus other similar sites in Ireland relies on the expertise and experience of the authors.
- Assessment of vulnerability of bats to wind farms, including assessment of collision risk, generally follows the procedure outlined in NatureScot (2021) but with amendments in line with NIEA (2024) to reflect the Irish species assemblage and the different relative abundance of individual species (e.g. Leisler's Bat) in an Irish context.

2.3.2 Emergence Surveys

Targeted emergence surveys were conducted on three structures and one tree associated with the proposed development during the active bat season in 2025. These surveys were conducted by six surveyors, Tom O'Donnell, Colm Breslin, Claire McCarthy, Oisín O Sullivan, Aisling Natoff and Ryan O'Sullivan BSc (Hons). Two emergence (dusk) surveys were conducted on structures 'S02' and 'S04' (see **Table 3.4**). Although outside the required search area, emergence (dusk) survey was conducted 'S05' also.

Surveyors were positioned to maximise views of the structures, in combination with night vision aids (NVAs) following best practice guidelines (Collins, 2023 and Bat Conservation Trust, 2026). Particular attention was applied to any identified access/egress points noted during previous daytime visual roost assessments. Guide IR Pro 19 thermal imaging cameras were positioned to optimise views of structures. A Nightfox RED infrared camera was used overlooking the PRF on T716. Echolocation recordings were made by surveyors on handheld Echo Touch Meter Pro 2 and Anabat Scout full spectrum recorders. Additionally, WA Song Meter Mini full-spectrum detectors were placed within the viewsheds of night vision aids to correlate any potential emergence with echolocation data. Surveys were carried out during suitable weather conditions. Surveys are detailed in **Table 2.6**, below. Images showing the field of views from camera placements are shown in **Plate 2.3** to **Plate 2.7**. Additionally, a trail camera was deployed overlooking the PRF-M feature on T716 between 23rd June 2025 and 26th of June 2025 (**Plate 2.7**).

Table 2.6 – Emergence survey details.

Date	Survey	Roost Feature	From - To Times	Sunrise / Sunset Time	Weather	Surveyors
23/06/2025	Emergence	S02, S04, S05,	21:45 – 23:30	22:02	16°C, F2, 7 Oktas, Light intermittent rain	OOS, CB, AN, TOD, CMC
05/08/2025	Emergence	S02, S04, T716	21:00 – 22:45	21:16	13°C, F1, 6 Oktas, No Rain	OOS, CB, ROS



Plate 2.3 – Thermal camera coverage of S02.



Plate 2.4 – Alternate thermal camera coverage of S02.

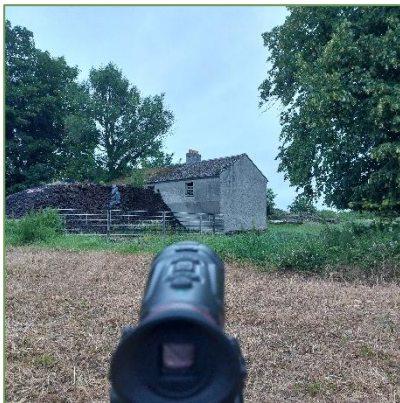


Plate 2.5 – Thermal camera coverage of S04.



Plate 2.6 – Thermal camera coverage of S05.



Plate 2.7 – Trail camera deployed on tree T716 with PRF-M feature.

2.3.3 Active Transect Surveys

An active transect survey was used to characterise bat activity along the GCR. The active survey was carried out for approximately 1.5 hours from dusk on 22nd September 2025. As this proposed infrastructure is confined to inroad works on public roadways, the zone of influence is generally limited, and this survey effect was considered appropriate, and no further surveys were considered to be warranted.

The survey was driven following methodology outlined in Roche et al. (2008). Wildlife Acoustics full-spectrum Echo Meter Touch handheld detector was used to perform the active survey. The location of the active survey routes followed the GCR as shown in **Figure 1.2**.

The 4th Edition of 'Bat Surveys for Professional Ecologists: Good Practice Guidelines' (Collins 2023) places less emphasis on active bat (transect) surveys as a means to sample bat activity. Such surveys were not considered warranted in 2025 on the wind farm site itself as passive surveys provides suitable coverage of all key habitats.

2.4 DATA ANALYSIS

Species identification was aided by post hoc sonogram analysis using Wildlife Acoustics' Kaleidoscope Professional software (v. 5.4.8) and British Trust for Ornithology (BTO) 'Acoustic Pipeline' sound analysis tool. Automatic identifications were manually verified following the parameters set out in Russ (2012; 2021) and Middleton et al. (2022). Average nightly data is the average number of registrations per night on 10 selected nights in the spring and summer seasons and 20 in the autumn. Peak data represents the maximum number of nightly registrations from any night in the relevant recording period.

2.5 EVALUATION & IMPACT ASSESSMENT

Evaluation of ecological features follows the NRA (now TII) publication 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' (2009). Impact assessment follows 'Guidelines on The Information to be Contained in Environmental Impact Assessment Reports' published by the EPA (2022). Reporting generally follows Chartered Institute of Ecology and Environmental Management (2018) 'Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater, Coastal and Marine'.

2.6 SURVEY LIMITATIONS

Of the 11 passive detectors deployed across all seasons, failure to complete the survey period of individual units occurred that resulted in that detector not recording the requisite number of compliant nights, notably at T5 where available storage limit was reached. Based on the proposed project size, a minimum of 10 passive monitoring locations are required to meet the guidance of NatureScot (2021). Considering this, the lack of data at a single location across seasons is not considered a limiting factor as the required level of coverage was achieved across all seasons.

From the 14th April 2025 to 16th April 2025 there was data transmission malfunction with the weather station. This was fixed on the 16th April 2025 after which 10 nights with compliant weather conditions were recorded.

Overall, the study was not limited in any significant way.

Table 2.7 Details of passive monitoring periods.

	Date [Night Of]	Sunset	Sunrise	Appropriate Weather ¹	T1 ²	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11 [*]
Summer 2024	31/07/2024	21:26	05:50	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	01/08/2024	21:25	05:51	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	02/08/2024	21:23	05:53		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	03/08/2024	21:21	05:54	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	04/08/2024	21:19	05:56	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	05/08/2024	21:17	05:58	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	06/08/2024	21:15	05:59	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	07/08/2024	21:13	06:01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	08/08/2024	21:11	06:03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	09/08/2024	21:10	06:04	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	10/08/2024	21:08	06:06		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	11/08/2024	21:06	06:08	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	12/08/2024	21:03	06:10	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
13/08/2024	21:01	06:11	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	
Autumn 2024	27/08/2024	06:35	20:31	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	28/08/2024	06:37	20:28	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	29/08/2024	06:39	20:26		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	30/08/2024	06:40	20:24		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	31/08/2024	06:42	20:21	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	01/09/2024	06:44	20:19	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	02/09/2024	06:45	20:17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	03/09/2024	06:47	20:14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	04/09/2024	06:49	20:12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	05/09/2024	06:50	20:10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	06/09/2024	06:52	20:07	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	07/09/2024	06:54	20:05	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
08/09/2024	06:56	20:02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
09/09/2024	06:57	20:00	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

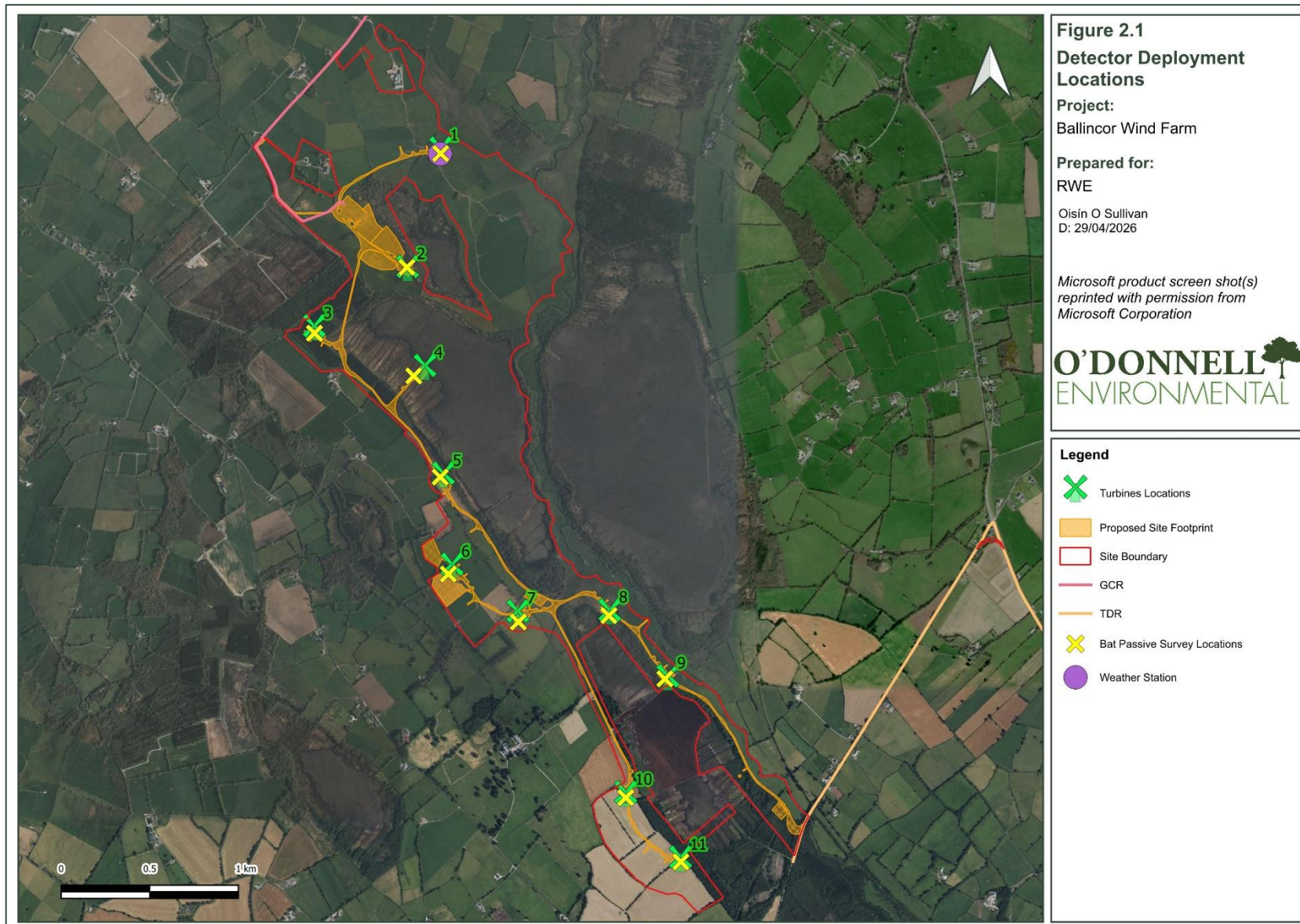
	Date [Night Of]	Sunset	Sunrise	Appropriate Weather ¹	T1 ²	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11*
	10/09/2024	06:59	19:58		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	11/09/2024	07:01	19:55		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	12/09/2024	07:02	19:53		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	13/09/2024	07:04	19:50	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	14/09/2024	07:06	19:48	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	15/09/2024	07:08	19:46	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	16/09/2024	07:09	19:43	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	17/09/2024	07:11	19:41	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	18/09/2024	07:13	19:38	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	19/09/2024	07:14	19:36		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	20/09/2024	07:16	19:34	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	21/09/2024	07:18	19:31	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	22/09/2024	07:20	19:29	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	23/09/2024	07:21	19:26	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	24/09/2024	07:23	19:24		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	25/09/2024	07:25	19:21	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	26/09/2024	07:26	19:19	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	27/09/2024	07:28	19:17		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	28/09/2024	07:30	19:14	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	29/09/2024	07:32	19:12	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	30/09/2024	07:33	19:09	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	01/10/2024	07:35	19:07		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
	02/10/2024	07:37	19:05	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
	03/10/2024	07:39	19:02	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
	04/10/2024	07:40	19:00	✓		✓	✓	✓		✓	✓	✓	✓	✓	
	05/10/2024	07:42	18:58	✓		✓	✓	✓		✓	✓	✓	✓	✓	
	06/10/2024	07:44	18:55	✓		✓	✓	✓		✓	✓	✓	✓	✓	
	07/10/2024	07:46	18:53	✓		✓	✓	✓		✓	✓	✓	✓	✓	

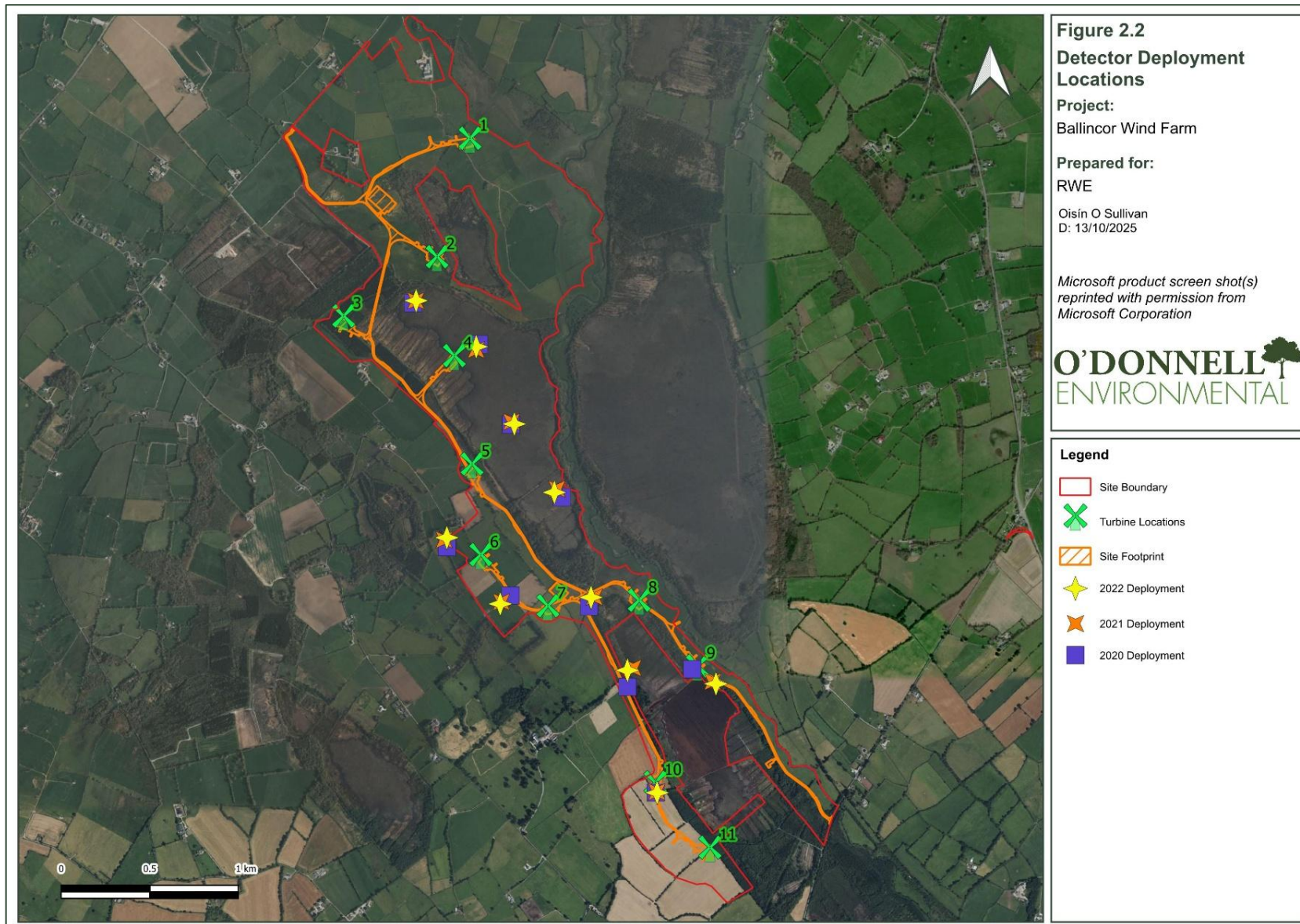
	Date [Night Of]	Sunset	Sunrise	Appropriate Weather ¹	T1 ²	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11*
	08/10/2024	07:48	18:51	✓		✓	✓	✓		✓	✓			✓	
	09/10/2024	07:49	18:48			✓	✓	✓		✓	✓			✓	
Spring 2025	03/04/2025	07:00	20:10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	04/04/2024	06:57	20:12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	05/04/2025	06:55	20:14		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	06/05/2025	06:53	20:15		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	07/05/2025	06:50	20:17		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	08/04/2025	06:48	20:19		✓	✓	✓	✓		✓	✓	✓	✓	✓	
	09/04/2025	06:46	20:21		✓	✓	✓	✓		✓	✓	✓	✓	✓	
	10/04/2025	06:43	20:23		✓	✓	✓	✓		✓	✓	✓	✓	✓	
	11/04/2025	06:41	20:24		✓	✓	✓	✓		✓	✓	✓	✓	✓	
	12/04/2025	06:39	20:26		✓	✓	✓	✓		✓	✓	✓	✓	✓	
	13/04/2025	06:36	20:28		✓	✓	✓	✓		✓	✓	✓	✓	✓	
	14/04/2025	06:34	20:30	*	✓	✓	✓	✓		✓	✓	✓	✓	✓	
	15/04/2025	06:32	20:32	*	✓	✓	✓	✓		✓	✓	✓	✓	✓	
	16/04/2025	06:30	20:33	*	✓	✓	✓	✓		✓	✓	✓	✓	✓	
	17/04/2025	06:27	20:35	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
	18/04/2025	06:25	20:37		✓	✓	✓	✓		✓	✓	✓	✓	✓	
	19/04/2025	06:23	20:39	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
	20/04/2025	06:21	20:40	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
	21/04/2025	06:18	20:42	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
	22/04/2025	06:16	20:44	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	
23/04/2025	06:14	20:46	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		
24/04/2025	06:12	20:48	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		
25/04/2025	06:10	20:49	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		
26/04/2025	06:08	20:51	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		
27/04/2025	06:06	20:53	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		
28/04/2025	06:04	20:55	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		

Note¹: With regards to weather, ✓ refers to appropriate weather conditions achieved for lowland sites parameters outlined in NIEA. * refers to weather station interference.

Note²: With regards to passive detectors, ✓ refers to a survey night where the detector successfully recorded.

Note*: T11 was redeployed in Spring 2025 from 28/04/2025 – 21/05/2025 following detector malfunction.





3 Results

The results of the desktop review and field surveys outlined are presented in detail below.

3.1 DESKTOP REVIEW

The wind farm site itself is not located within any internationally or nationally designated sites. Following NatureScot (2021), a search was undertaken for nationally and internationally designated bat roosting sites within 10km of the proposed wind farm site. Six proposed National Heritage Areas (pNHA) which include bats in their conservation interests are present within 10km of the proposed wind farm site (**Table 3.1**) and are considered relevant to the current assessment. No Special Areas of Conservation (SAC) are considered relevant to the current assessment.

Table 3.1 Relevant pNHAs present within 10km of the proposed wind farm site.

Site Name	Species	Site Code	Distance (km)*
Birr (Domestic Dwelling No.2, Occupied)	Leisler's Bat	000569	5.0
Birr (Domestic Dwelling No.1, Occupied)	Leisler's Bat	000568	5.1
Bracken's Dwelling, Near Whiteford	Leisler's Bat	002058	5.2
Miltown, Shinrone	Natterer's Bat	002065	6.0
St Joseph's Mountheaton	Brown Long-eared Bat	002063	7.5
Drumakeenan National School	Brown Long-eared Bat	002064	7.8

*Where distance is relevant to the closest proposed turbine location.

National Biodiversity Data Centre (NBDC) holds previous records of bat presence from within the 10km squares (S09 & N00) in which the proposed site and GCR are located. These records are for the following eight species:

- Brown Long-eared Bat (*Plecotus auritus*)
- Common Pipistrelle (*Pipistrellus pipistrellus*)
- Daubenton's Bat (*Myotis daubentonii*)
- Leisler's Bat (*Nyctalus leisleri*)
- Nathusius' Pipistrelle (*Pipistrellus nathusii*)
- Natterer's Bat (*Myotis nattereri*)
- Soprano Pipistrelle (*Pipistrellus pygmaeus*)
- Whiskered Bat (*Myotis mystacinus*).

It is important to note that an absence of other bat species records may be reflective of a lack of surveys undertaken to date rather than absence of bat species. No NPWS or BCI records are held for the Annex II listed Lesser Horseshoe Bat within 30 km of the proposed development site boundary (NPWS, 2019) as the proposed development is located outside of their known range.

The overall bat suitability index value (31.44) according to 'Model of Bat Landscapes for Ireland' (Lundy et al., 2011) suggests the landscape in which the proposed site is located is of moderate to high suitability for bats in general. Species specific scores are provided in **Table 3.2**.

Table 3.2 - Suitability of the study area for the bat species according to 'Model of Bat Landscapes for Ireland' (Lundy et al., 2011).

Common name	Scientific name	Suitability index
All bats	-	31.44
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	40
Brown long-eared bat	<i>Plecotus auritus</i>	42
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	46
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	4
Leisler's bat	<i>Nyctalus leisleri</i>	44
Whiskered bat	<i>Myotis mystacinus</i>	27
Daubenton's bat	<i>Myotis daubentonii</i>	30
Nathusius pipistrelle	<i>Pipistrellus nathusii</i>	3
Natterer's bat	<i>Myotis nattereri</i>	47

3.1.1 Roost Records

Available bat records were provided by Bat Conservation Ireland (BCI) from their database of roost locations and other bat records. Roost records are summarised in **Table 3.3** and shown in **Figure 3.1**. Roost records were considered in relation to their Core Sustenance Zone (CSZ; see **Section 1.4**).

The CSZ of nine BCI roost records overlap with the wind farm site and GCR. The most proximal roost to any proposed turbine is present approx. 1.6km southeast of T11 (S0694). Species recorded at this roost location are Brown Long-eared Bat, Common Pipistrelle and Soprano Pipistrelle. Review of the Brown Long-eared Bat Roost Monitoring Scheme shows a roost approximately 2km southeast of the wind farm site.

The CSZ of eight roost records overlap with the GCR. The N0505 grid square overlaps the proposed GCR. This roost consists of a Soprano Pipistrelle tree roost within the ground of Birr Castle. A further two Brown Long-eared Bat roosts lie within 2km of the GCR. One of these roosts is situated in Borris-in-Ossory, while the other is situated in a structure outside of Birr. Review of the Brown Long-eared Bat Roost Monitoring Scheme shows a roost in a large house approximately 220m from the GCR.

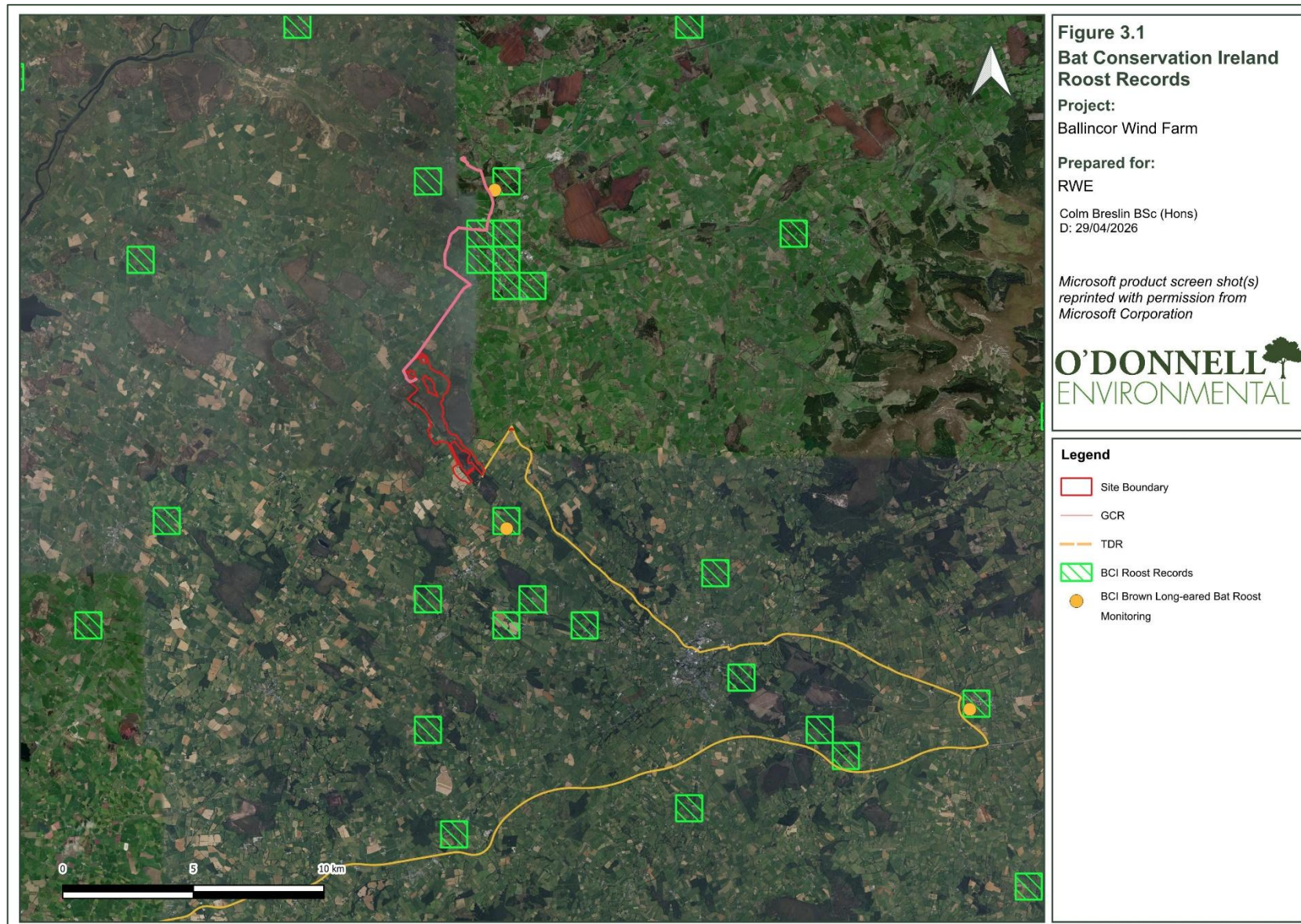
The CSZ of 12 roost records overlap with the TDR. Species recorded within these roosts include Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat, Natterer's Bat, and Daubenton's Bat. The only grid square which the TDR intersects is S1985. This roost consists of a Brown Long-eared Bat roost for which details are private. Review of the Brown Long-eared Bat Roost Monitoring Scheme shows a roost in a large house approximately 440m from the TDR.

Based on a review of Geological Survey Ireland data and the Irish Caves Database, there are no mines and caves found within 10km of the wind farm site that could support a potentially significant roost.

Table 3.3 – Bat Conservation Ireland roost records within a 30km radius of the proposed wind farm site.

Grid Reference (1km)	Record	Species
S2993	Annagh Bridge	Unidentified bat
R8384	Annaghbeg Bridge	Daubenton's Bat
N0505	Birr Castle Tree Roost	Soprano Pipistrelle
S2798	Cardtown Bridge Roost	Natterer's Bat, Unidentified bat
M9621	Clonfert Cathedral	Brown Long-eared Bat, Natterer's Bat
N0307	Derrinasallow Bridge	Daubenton's Bat
R8398	Drominagh Bridge	Daubenton's Bat
R9394	Eminiska Bridge	Unidentified bat
N2420	Esker II Bridge	Unidentified bat
R7499	Bat Boxes	Soprano Pipistrelle, Common Pipistrelle, Unidentified bat, Leisler's Bat
R7398	Bat Boxes	Soprano Pipistrelle, Common Pipistrelle, Unidentified bat
R7399	Bat Boxes	Brown Long-eared Bat, Unidentified bat, Soprano Pipistrelle, Leisler's Bat, Pip50
S0990	Lisnageeragh Bridge	Daubenton's Bat
S2992	Mill Bridge Roost, Derrynaseera Bridge	Daubenton's Bat, Unidentified bat
S0690	Milltown Bridge	Unidentified bat
R8397	Private	Whiskered Bat, Brown Long-eared Bat, Soprano Pipistrelle, Pip50, Natterer's Bat, Myotis spp.
N0604	Private	Whiskered Bat, Leisler's Bat
M8711	Private	Unidentified bat
R7896	Private	Unidentified bat
S0482	Private	Unidentified bat
S3391	Private	Unidentified bat
M8500	Private	Soprano Pipistrelle, Common Pipistrelle, Daubenton's Bat
S0694	Private	Soprano Pipistrelle, Brown Long-eared Bat, Common Pipistrelle
N0603	Private	Soprano Pipistrelle
R7996	Private	Soprano Pipistrelle
R8293	Private	Soprano Pipistrelle
R9090	Private	Soprano Pipistrelle
S2680	Private	Pip50, Common Pipistrelle, Brown Long-eared Bat
M9126	Private	Pip50
M9320	Private	Natterer's Bat, Brown Long-eared Bat, Common Pipistrelle, Soprano Pipistrelle
M8419	Private	Natterer's Bat, Brown Long-eared Bat
N3122	Private	Natterer's Bat, Brown Long-eared Bat
R8368	Private	Natterer's Bat
S0791	Private	Natterer's Bat
S1383	Private	Natterer's Bat
N0504	Private	Leisler's Bat, Daubenton's Bat
M9813	Private	Leisler's Bat

Grid Reference (1km)	Record	Species
N0703	Private	Leisler's Bat
N1705	Private	Leisler's Bat
R8471	Private	Leisler's Bat
S1588	Private	Leisler's Bat
N2525	Private	Daubenton's Bat, Natterer's Bat
N0605	Private	Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat
M9204	Private	Common Pipistrelle, Brown Long-eared Bat
S3186	Private	Common Pipistrelle
N0607	Private	Brown Long-eared Bat, Whiskered Bat
S1492	Private	Brown Long-eared Bat, Soprano Pipistrelle
S0386	Private	Brown Long-eared Bat, Common Pipistrelle, Leisler's Bat
R8392	Private	Brown Long-eared Bat, Common Pipistrelle
S2487	Private	Brown Long-eared Bat, Common Pipistrelle
S3384	Private	Brown Long-eared Bat, Common Pipistrelle
M8915	Private	Brown Long-eared Bat
N1313	Private	Brown Long-eared Bat
N3111	Private	Brown Long-eared Bat
S1886	Private	Brown Long-eared Bat
S1985	Private	Brown Long-eared Bat
S3379	Private	Brown Long-eared Bat
N3222	Private, Charleville Lough Tree Roost	Soprano Pipistrelle, Leisler's Bat
M8504	Private,	Soprano Pipistrelle, Common Pipistrelle, Leisler's Bat, Natterer's Bat, Daubenton's Bat, Brown Long-eared Bat, Whiskered Bat, Whiskered Bat/Brandt's
S0391	Weir Bridge Roost	Brown Long-eared Bat



3.2 POTENTIAL ROOST ASSESSMENT

Surveys were carried out to identify and investigate potential bat roosting features at the following locations:

- Proposed wind farm site (see **Figure 3.2 & 3.3**).
- Proposed GCR to Dallow 110kV Substation. (**Figure 3.4**)
- Proximal to the facilitation works along the proposed TDR (see **Table 3.6 & Abnormal Indivisible Load Route Survey, Pell Frischmann 2023**).

During these surveys, all trees and structures (incl. bridges) within the zone of influence (see **Section 1.4**) of the proposed works were inspected visually. The aim of this survey was to assess suitability for roosting bats in order to identify if a potential for negative effects on any roosting bats which may be present could occur. Preliminary ground level assessment of trees and inspection of structures was carried out following guidance set out in 'Bat Surveys for Professional Ecologists: Good Practice Guidelines', Collins (2023).

3.2.1 Roost Suitability at Proposed Wind farm

The roosting potential of trees on the proposed wind farm site was considered. Tree roosts are reliant upon the presence of specific features which can provide suitable shelter for roosting bats (BTHK, 2018). PRFs in trees form as a result of disease and decay from pruning, cankers, knot-holes, woodpecker-holes, tear-outs, subsidence cracks, lightning strikes, welds, lifting bark etc. Within the wind farm site there were 18 trees classified as PRF-I (**Table 3.4**) and a single tree classified as PRF-M (**Plate 3.5, Figure 3.3**).

Features with potential to accommodate significant bat roosts extending to a minimum of a precautionary 300m from turbine locations, were considered. The desk study identified 13 structures as potential roosting sites. Of these, three structures were considered to have roosting suitability; S02, S04, and S05 (**Plates 3.2 – 3.5**) were classified as having moderate or high roost suitability. (see **Table 3.4, Figure 3.2 and Figure 3.3**). These structures were further surveyed by way of emergence surveys to determine the level of roosting (if any) occurring in the structures (see below).

The structure S01 was classed as having low roosting suitability (**Figure 3.3; Plate 3.1**) and therefore is unlikely to host a 'significant' roost.

The trail camera deployed on T717 recorded bats investigating the feature but no evidence of roosting (e.g. access / egress) was recorded. Brown Long-eared Bat was recorded possibly investigating the feature on this tree (see **Plate 3.5 & 3.17**). At 01:03 an unidentified bat perches on the tree trunk briefly before resuming flight. No roosting was recorded by the night vision aid deployed on 5th August 2025. It is likely that this feature is used occasionally as a roost by individual bats but there is no evidence of 'significant' roosting occurring.



Plate 3.1 Structure S01



Plate 3.2 Structure S02



Plate 3.3 Structure S04



Plate 3.4 Structure S05

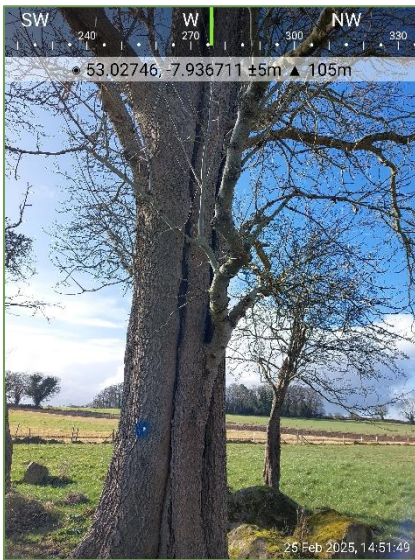
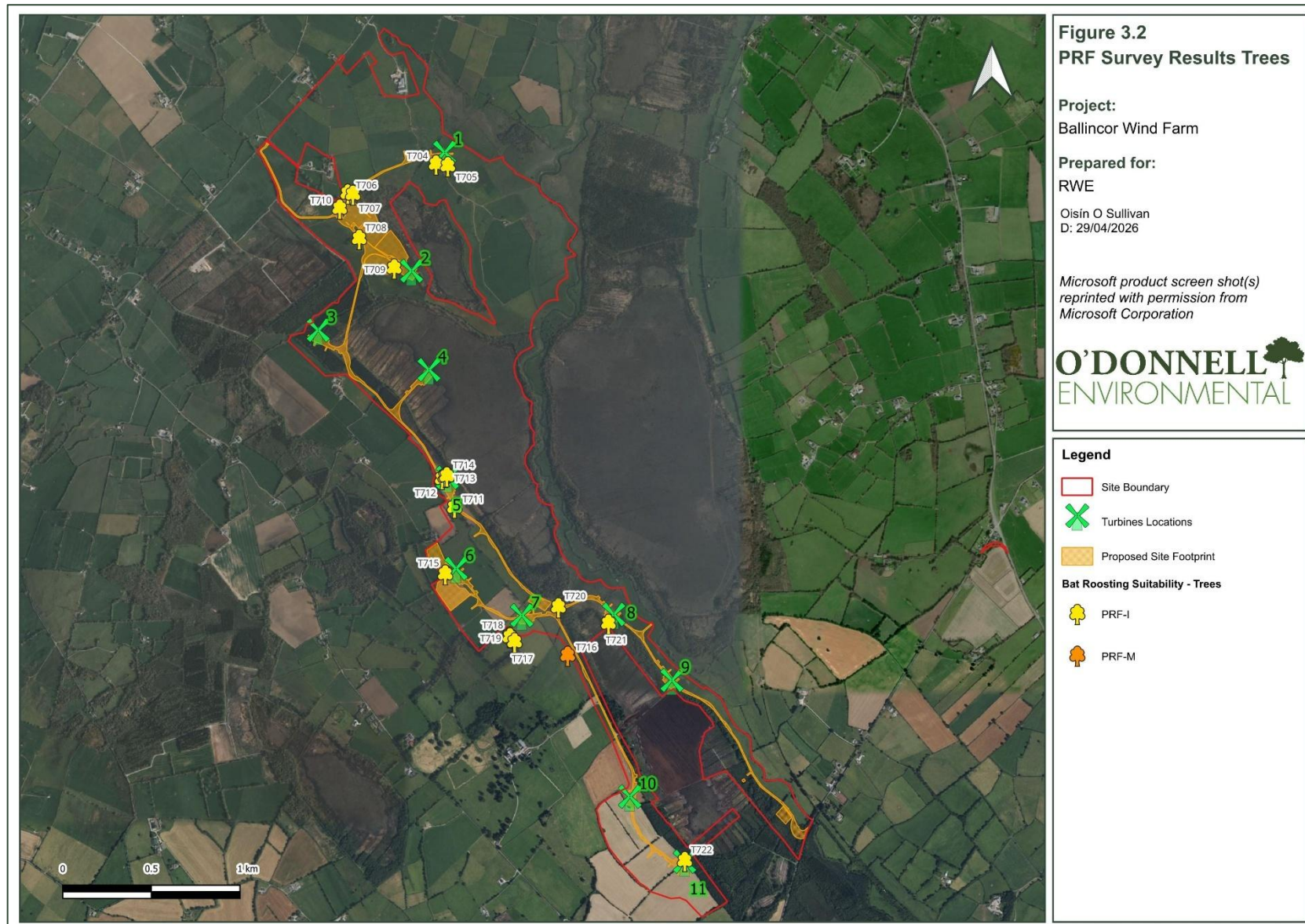


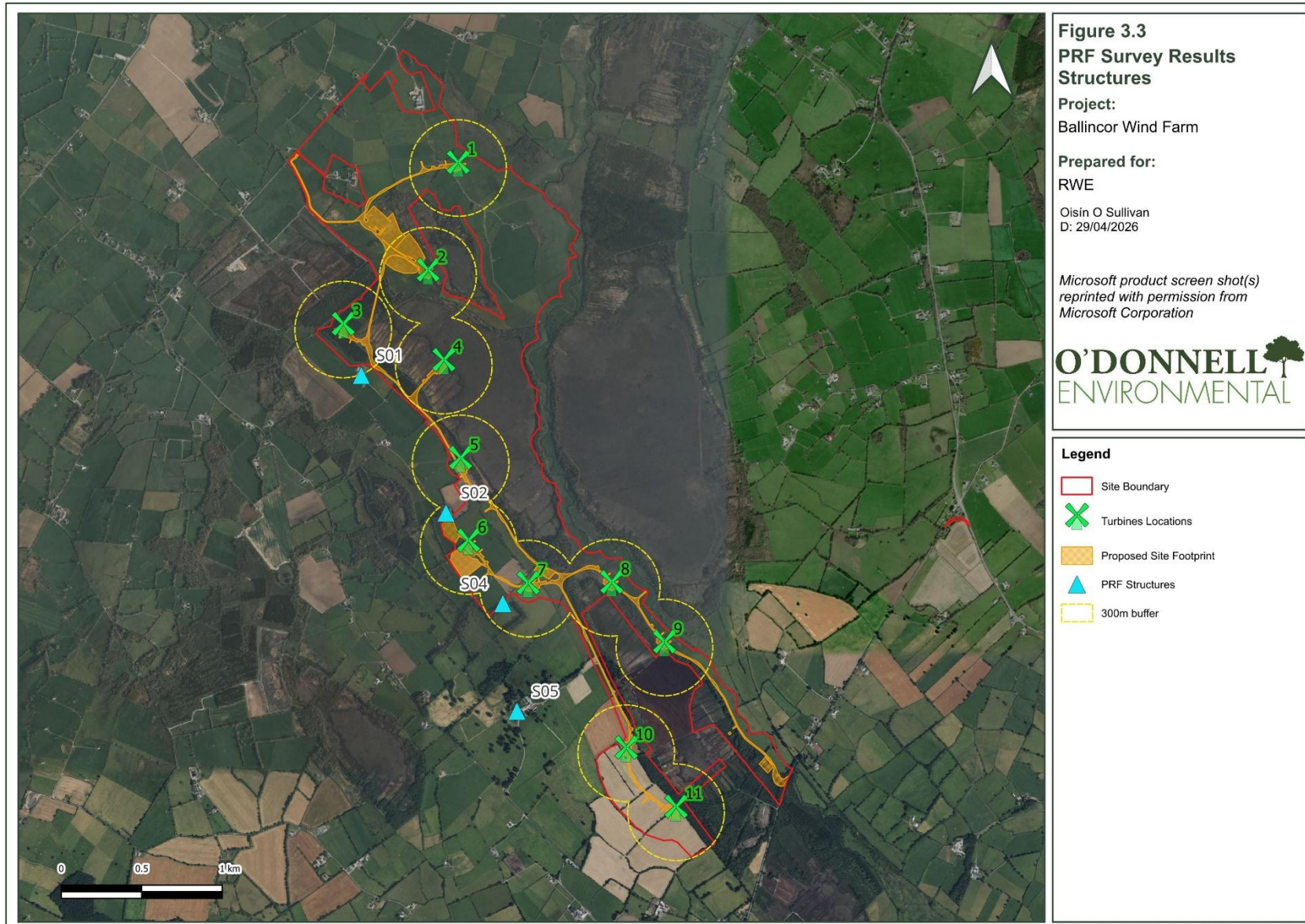
Plate 3.5 Tagged PRF- M tree T717

Table 3.4 Suitability of potential roost features at the proposed wind farm site.

Ref	Type	Description	Latitude	Longitude	Suitability
S01	Building	Farm buildings with corrugate metal roof. Exposed to elements and no internal attic space.	53.04119	-7.95613	Low
S02	Building	Derelict residence and adjoining agricultural building. Slate roof shed on south. Two story slate roof derelict residence with attic void (middle). Two story corrugated over thatch residence (North) with upstairs section.	53.03351	-7.9483	High
S03	Building	No longer exists.	53.03204	-7.9431	N/A
S04	Building	Intact roof with no discernible light or water ingress. Inaccessible dark loft portion. No obvious evidence of roosting but moderate suitability in terms of structural integrity	53.02845	-7.94304	Moderate
S05	Building	Historic residence, outside 300m but there is connectivity from this location to site.	53.02244	-7.94174	High
T704	Tree	Mature multi-stem ash. Compression twist from fallen co-dominant stem in recent storm at ground level with fractures throughout. Hollow in main stem at 6m facing south extending approx. 35 cm upwards. Both features inspected fully with endoscope.	53.05244	-7.94794	PRF-I
T705	Tree	Mature single-stem oak. Two tear-offs at 7m facing south with minor fissures. Potential for features to increase in roosting suitability.	53.05234	-7.94688	PRF-I
T706	Tree	Mature multi-stem ash. Co-dominant stem splitting off at base with fissure at ground level. Thick interweaving ivy stems extending up main stem. Minor fissure associated with fallen ancillary stem facing south at ground level. Features inspected with endoscope	53.05095	-7.9553	PRF-I

Ref	Type	Description	Latitude	Longitude	Suitability
T707	Tree	Mature single-stem oak. Large tear-off between 1-4m facing south with associated minor fissures.	53.0509	-7.95487	PRF-I
T710	Tree	Mature single-stem ash. Large fissure at base facing northeast extending upwards into main stem approx. 35 cm. Fully inspected with endoscope. Evidence of bird and wasp activity in cavity.	53.05018	-7.95598	PRF-I
T708	Tree	Mature multi-stem oak. Thick interweaving ivy stems at base facing west.	53.04865	-7.95434	PRF-I
T709	Tree	Semi-mature single-stem oak. Large portions of peeling bark extending up majority of main stem. Accessible portions surveyed with endoscope.	53.04716	-7.95139	PRF-I
T712	Tree	Mature single-stem oak. Two tear-offs at with minor fissures at 3m facing northeast and 6m facing south.	53.03647	-7.94737	PRF-I
T713	Tree	Mature single-stem oak. Minor tear-offs at 5m facing north	53.03657	-7.9471	PRF-I
T714	Tree	Mature single-stem oak. Minor tear-offs at 4-6m facing north. Thick interweaving ivy stems in portions.	53.0366	-7.94698	PRF-I
T711	Tree	Over-mature single-stem ash. Two tear-offs at 6m facing north with minor fissures. Cavity from tear-off at 7m facing east.	53.03501	-7.94634	PRF-I
T715	Tree	Mature single-stem oak Thick interweaving ivy stems. Minor fissure at 8m facing south on ancillary limb.	53.03163	-7.94712	PRF-I
T718	Tree	Mature single-stem oak. Tear-off at 10m facing east with minor fissures.	53.02848	-7.94172	PRF-I
T719	Tree	Mature sweet chestnut, Weld of ancillary stem at 8m facing north which extends into main stem.	53.02844	-7.94168	PRF-I
T717	Tree	Mature single-stem oak. Tear-off at 8m on ancillary stem facing east.	53.02819	-7.9413	PRF-I
T720	Tree	Dead pine. Minor fissure at 8m facing south on ancillary stem. Peeling bark at base.	53.02995	-7.9376	PRF-I
T716	Tree	Mature multi-stem ash. Large weld and associated fissure extending from base to 10m facing southeast. Large cavity entrance associated with fissure at 8m facing southeast.	53.0275	-7.93683	PRF-M
T721	Tree	Semi-mature single-stem birch. Tear-off with open cavity extending into main stem at 7m facing south.	53.02912	-7.9334	PRF-I
T722	Tree	Mature single-stem oak. Tear-off at 6m facing northeast extending into ancillary limb. Weld from previous prune with minor fissures at 5m facing south. Tear-off central within main stem at 6m facing upwards. Tear-off with cavity extending approx. 25 cm	53.01707	-7.927	PRF-I





3.2.2 Roost Suitability along the Grid Connection Route

Visual survey and inspection of PRFs which may be directly or indirectly impacted by the proposed grid connection works was carried out. Trees and structures, including bridges, recorded along the GCR were assessed in terms of their suitability to support roosting bats.

Daytime inspection of bridges along the GCR were carried out during February and August 2025 covering the Winter and Summer seasons. During the Winter inspection bridges B03, B05, B08, and B09 were inspected. During these inspections no bats were found roosting in suitable features and bridges were classed as 'negligible' or 'low' suitability. Faecal samples were found and collected at B08 and analysis confirmed that Brown Long-eared bat droppings were present (see **Appendix B**). It was determined that given the suitability of features only B03 and B08 would be subject to further inspections during the summer season. Neither presence nor additional evidence of roosting bats was found in the bridges B03 or B08 during the active season inspection. Two PRF-I trees were identified along the grid connection route. These locations are displayed in **Figure 3.4** and **Plates 3.6 - 3.11**.

Table 3.5 – Suitability of potential roost features along the GCR.

Ref.	Type	Description	Latitude	Longitude	Suitability
T702	Tree	Over-mature multi-stem oak. Dog-leg ancillary limb overhanging GCR with fissure extending up stem at 8m facing north.	53.0987789	-7.9360299	PRF-I
T703	Tree	Over-mature multi-stem oak. Tear off at 6m facing east with minor fissures extending inwards.	53.09541686	-7.93751172	PRF-I
B01	Culvert	Small round culvert. No suitability for roosting bats.	53.1222347	-7.9200707	Negligible
B02	Culvert	Small round culvert. No suitability for roosting bats.	53.1199184	-7.9172272	Negligible
B03	Bridge	Single span masonry bridge with culvert on downstream end. Recent maintenance of upstream arch face and some portions of arch itself. Abundant minor crevices in arch apex, some lead to large voids. Larger crevices lower down..	53.1073997	-7.9125931	Low
B04	Bridge	Three arch masonry bridge. All arches recently 'shot-creted' with no crevices. Some gaps in the north face brickwork west of the river.	53.1017103	-7.9205960	Negligible
B05	Underpass	Single span concrete arch cattle underpass. Some minor crevices along expansion joints but very open.	53.1022654	-7.9288880	Low
B06	Culvert	Small round culvert. No suitability for roosting bats.	53.0849183	-7.9288709	Negligible
B07	Bridge	Single arch dry bridge composed of limestone masonry. Entire arch and face well maintained with no crevices between masonry.	53.0819104	-7.9272503	Negligible
B08	Bridge	Single span concrete arch. Horizontal 10cm gap running along river left side of arch and sidewall. Extends a maximum of 1.5m horizontally.	53.0776364	-7.9324927	Roost confirmed with DNA
B09	Bridge	Single arch concrete span bridge with steel beams. Minor crevices at joints of concrete and steel. Large portion of eastern arch face base has given away with considerable void, of which a portion extends up into bridge.	53.0531161	-7.9629316	Low



Plate 3.6 Tagged tree T702



Plate 3.7 Tagged tree T703



Plate 3.8 Bridge B03



Plate 3.9 Underpass B05



Plate 3.10 Bridge B08

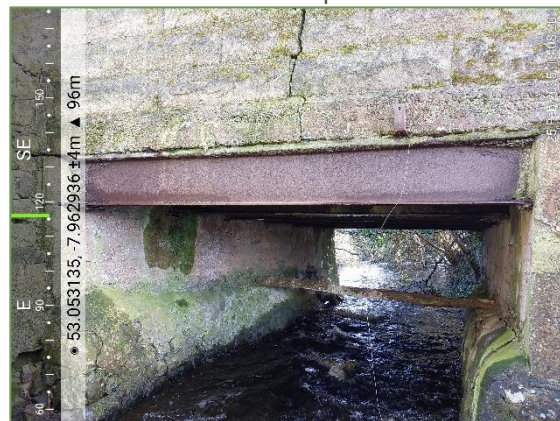
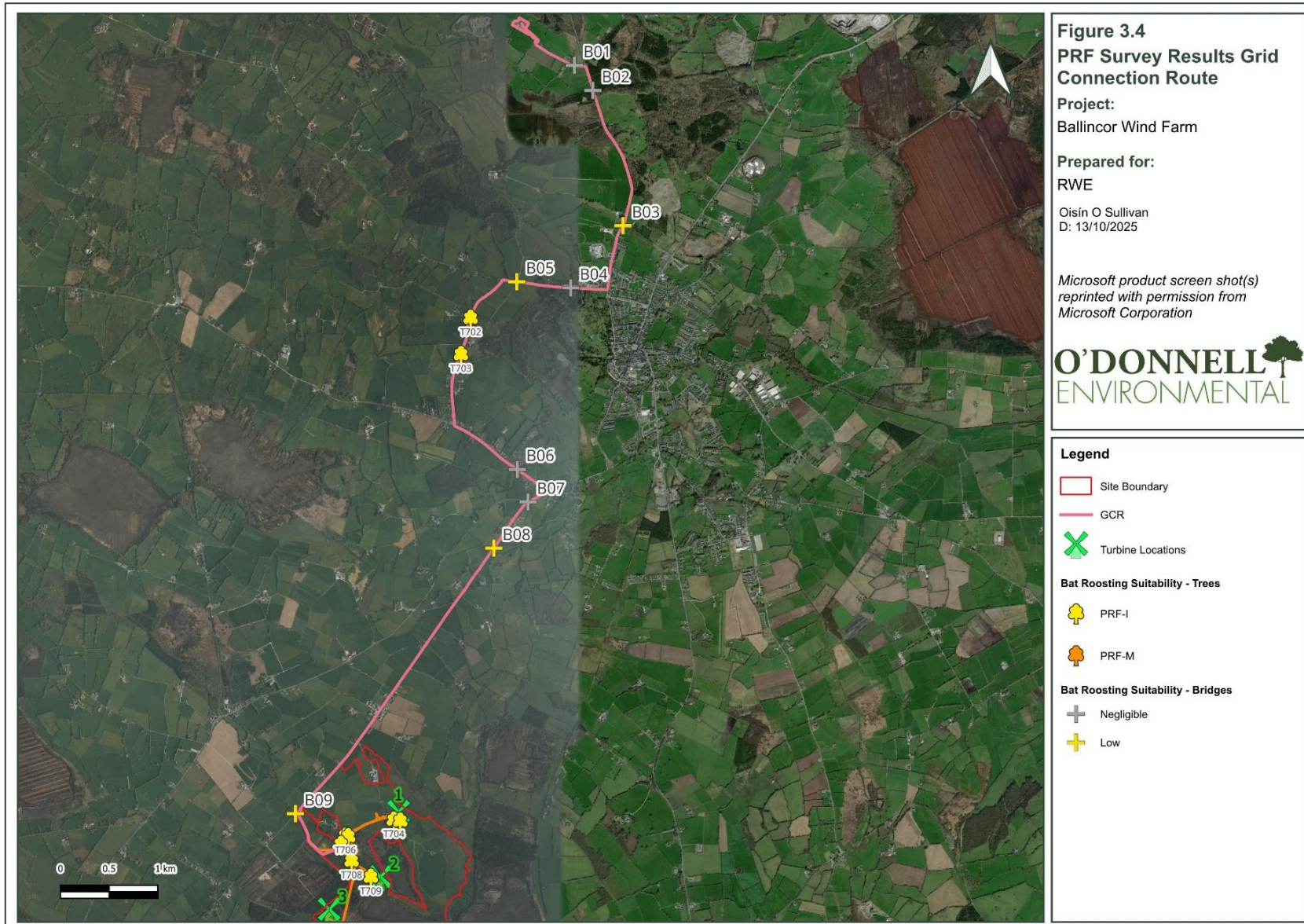


Plate 3.11 Bridge B09



3.2.3 Roost Suitability along Turbine Delivery Route

Although not included in the 'redline' boundary, the TDR is an essential component of the overall wind farm development, and the potential impact of associated facilitation works is therefore considered.

A TDR will be utilised between Foynes Port and the proposed site. 27 Points of Interest (POIs) have been identified where works will take place. For the remainder of the route, the proposal consists of the carriage of vehicles along public roads, and no works are proposed.

Visual survey and inspection of PRFs which may be directly or indirectly impacted by the proposed works was carried out.

The zone of influence of works along the TDR are considered minimal and temporary in nature (see **Section 1.4**). Vegetation clearance, trimming, and tree removal is required at 14 locations (**Table 3.6** adapted from the Abnormal Indivisible Load Route Survey, Pell Frischmann 2023).

Table 3.6 Locations along TDR where vegetation removal, trimming or tree clearance is required.

POI	Swept Path Analysis Reference	Works required
POI 3	SK01	Hedgerow clearance
POI 4	SK02	Hedgerow trim
POI 7	N/A	Vegetation trim
POI 9	N/A	Canopy trim
POI 14	SK09	Immature trees removal in centre of roundabout
POI 16	SK10	Immature trees removal in centre of roundabout
POI 17	SK11	Immature trees removal adjacent roundabout
POI 18	SK12	Immature trees removal adjacent roundabout
POI 19	SK13	Immature trees removal in centre of roundabout
POI 21	SK15	Tree removal adjacent roundabout, scoped in for survey
POI 24	SK17	Vegetation trim
POI 25	N/A	Vegetation trim
POI 26	SK18	Hedgerow removal, scoped in for survey
POI 27	N/A	Vegetation removal

Although the proposed works are limited in extent and nature, and temporary, the potential for indirect effects on any PRFs was considered. The relevant features considered in relation to the proposed works at POIs along the TDR consisted of trees and structures. The sections of the TDR assessed for a likelihood of roosting suitability were SK15 and SK18. These locations did not contain trees or structures with bat roost suitability which are proposed for removal to facilitate the delivery of turbine components. No features with displaying any suitability for roosting bats were identified at or immediately adjacent to proposed POIs.

3.3 BAT ACTIVITY SURVEYS

Bat activity at the wind farm site was assessed through the use of passive detection. The results of these surveys are described in detail below.

3.3.1 Passive data 2020 - 2022

As detailed in **Section 2.3** passive monitoring was conducted in the 2020, 2021, and 2022 active bat seasons. Although no longer directly valid following NIEA (2024) (which specifies a two-year lifespan for bat survey data in the context of onshore wind energy developments) the data is useful contextually to demonstrate any changes or lack thereof in baseline bat activity. The deployment locations relevant to the updated turbine design are outlined in **Section 2.3.1.2, Table 2.4**. A summary of activity levels is presented in **Table 3.7**.

Generally, the data recorded between 2020 to 2022 is consistent with that recorded in 2024 and 2025, and this likely reflects the absence of any significant changes in land-use in the wider area in the intervening period. The following points are a high-level comparison of the historic data and that captured in 2024. They examine the change in 'Maximum Nightly Average' number of registrations with reference to the highest activity level measured across the seasonal deployments. The discussion focuses on the species considered to be at high risk of collision with turbine blades, following NatureScot (2021).

Generally, historic data (2020 to 2022) is consistent with the results of more recent surveys (summer 2024 to spring 2025). The following was noted:

- Leisler's activity recorded historically is similar at all locations to data recorded in recent surveys with 'Moderate' or 'Moderate to Low' levels of activity recorded overall.
- Soprano and Common Pipistrelle activity at both T6 and T7 decreased slightly from 'Moderate' (historic data) to 'Moderate-Low' (2024 data) but was 'High' at T8 and T9 in historic data.
- Common and Soprano Pipistrelle had moderate activity levels at T6 in the historic data, higher than recorded in current surveys. There are variations in locations where *Myotis* spp. (Whiskered Bat, Daubenton's Bat, and Natterer's Bat) and Brown Long-eared Bat activity which peaked at 'moderate' but overall, there were no significant differences.

Table 3.7 Results of passive monitoring across 2020, 2021, and 2022

Year	Season	Common Name	T4	T6	T7	T8	T9a	T10
2020	Autumn	Soprano Pipistrelle	3.27 [10]	155.00 [790]	41.09 [151]	248.55 [630]	0.36[2]	59.18 [199]
		Common Pipistrelle	3.00 [13]	71.27 [363]	16.09 [93]	49.55 [210]	4.73[29]	69.91 [389]
		Leisler's Bat	12.82 [49]	3.18 [8]	2.64 [7]	3.36 [7]	1.91[4]	89.91 [775]
		Nathusius' Pipistrelle	0.09 [1]	0.00 [0]	0.00 [0]	0.00 [0]	1.09[4]	1.55 [13]
		Daubenton's Bat	0.18 [3]	3.27 [7]	1.55 [5]	10.36 [19]	0.18[1]	0.55 [3]
		Natterer's Bat	11.18 [37]	2.73 [7]	2.55 [6]	2.55 [6]	0.27[2]	1.45 [4]
		Brown Long-eared Bat	0.55 [3]	3.09 [14]	1.82 [7]	0.91 [3]	22.00[98]	3.00 [8]
		Whiskered Bat	0.00 [0]	0.64 [3]	0.27 [2]	4.09 [12]	0.36[2]	0.18 [1]
2021	Spring	Soprano Pipistrelle	2.27 [8]	1.36 [5]	9.27 [35]	2.64 [9]		
		Common Pipistrelle	3.27 [6]	2.09 [5]	12.00 [34]	13.82 [43]		
		Leisler's Bat	31.18 [143]	5.82 [16]	8.91 [17]	8.18 [20]		
		Nathusius' Pipistrelle	0.00 [0]	0.09 [1]	0.00 [0]	0.00 [0]		
		Daubenton's Bat	0.27 [2]	0.27 [1]	1.00 [2]	0.45 [1]		
		Natterer's Bat	0.09 [1]	0.09 [1]	1.09 [3]	0.36 [2]		
		Brown Long-eared Bat	0.00 [0]	0.00 [0]	0.64 [1]	0.18 [1]		
		Whiskered Bat	0.00 [0]	0.00 [0]	0.00 [0]	0.00 [0]		
	Summer	Soprano Pipistrelle	4.82 [15]	65.27 [190]	30.00 [105]	7.27 [24]	136.91 [533]	63.09 [260]
		Common Pipistrelle	5.45 [19]	45.55 [72]	31.40 [72]	107.73 [419]	126.18 [493]	68.91 [246]
		Leisler's Bat	41.55 [78]	21.45 [45]	23.10 [58]	104.18 [238]	43.73 [77]	31.36 [113]
		Nathusius' Pipistrelle	0.18 [1]	0.09 [1]	0.00 [0]	0.00 [0]	5.27 [46]	0.55 [4]
		Daubenton's Bat	0.09 [1]	1.36 [4]	2.00 [7]	2.82 [8]	6.00 [19]	0.55 [3]
		Natterer's Bat	0.09 [1]	1.00 [4]	0.80 [4]	2.09 [8]	1.00 [9]	0.09 [1]
		Brown Long-eared Bat	5.73 [18]	5.91 [15]	0.50 [3]	2.73 [9]	1.45 [5]	0.45 [2]
Whiskered Bat	0.00 [0]	0.18 [1]	0.00 [0]	0.00 [0]	0.18 [1]	0.27 [1]		
Autumn	Soprano Pipistrelle	7.20 [22]	185.00 [468]	14.70 [37]	12.36 [35]	1.73[6]	19.18 [92]	
	Common Pipistrelle	4.20 [15]	146.71 [394]	12.30 [102]	27.73 [74]	120.00[988]	24.73 [132]	

Year	Season	Common Name	T4	T6	T7	T8	T9a	T10	
2022		Leisler's Bat	5.20 [13]	4.57 [8]	1.70 [13]	23.91 [69]	12.55[38]	1.64 [6]	
		Nathusius' Pipistrelle	0.00 [0]	0.14 [1]	0.00 [0]	0.00 [0]	5.91[30]	0.00 [0]	
		Daubenton's Bat	0.00 [0]	4.71 [9]	0.30 [1]	1.09 [4]	6.45[64]	0.09 [1]	
		Natterer's Bat	0.70 [3]	3.71 [6]	0.20 [1]	1.18 [3]	3.45[8]	0.09 [1]	
		Brown Long-eared Bat	1.18 [3]	4.14 [8]	0.20 [1]	2.36 [7]	104.55[383]	0.91 [2]	
		Whiskered Bat	0.00 [0]	0.43 [1]	0.00 [0]	0.00 [0]	3.27[6]	0.18 [1]	
	2022	Spring	Soprano Pipistrelle	4.00 [12]	49.64 [145]	27.73 [109]	12.55 [26]	51.91 [215]	17.30 [48]
			Common Pipistrelle	5.56 [21]	176.55 [509]	19.64 [58]	58.27 [185]	26.18 [77]	53.70 [193]
			Leisler's Bat	37.78 [99]	10.73 [23]	4.09 [7]	11.36 [27]	6.91 [16]	15.60 [37]
			Nathusius' Pipistrelle	0.00 [0]	0.18 [1]	0.00 [0]	0.00 [0]	0.73 [3]	0.00 [0]
			Daubenton's Bat	0.22 [1]	1.91 [4]	1.55 [6]	1.55 [4]	3.82 [11]	0.30 [1]
			Natterer's Bat	0.00 [0]	1.73 [5]	2.00 [5]	1.36 [4]	1.09 [6]	0.30 [1]
			Brown Long-eared Bat	0.33 [1]	1.91 [4]	0.00 [0]	0.45 [2]	0.18 [1]	0.30 [1]
			Whiskered Bat	0.00 [0]	0.09 [1]	0.00 [0]	0.09 [1]	0.09 [1]	0.00 [0]
Summer		Soprano Pipistrelle	14.00 [32]	146.64 [295]	32.55 [71]	604.40 [1048]	1129.00 [1338]	25.89 [62]	
		Common Pipistrelle	14.00 [54]	324.36 [1126]	24.00 [53]	881.20 [1655]	787.00 [1037]	74.22 [217]	
		Leisler's Bat	38.91 [104]	23.55 [50]	15.55 [25]	61.00 [110]	20.67 [24]	4.00 [8]	
		Nathusius' Pipistrelle	0.18 [1]	0.09 [1]	0.00 [0]	0.00 [0]	2.00 [5]	0.00 [0]	
		Daubenton's Bat	0.27 [1]	3.18 [9]	0.73 [3]	13.20 [38]	29.00 [47]	0.78 [2]	
		Natterer's Bat	6.36 [14]	3.64 [8]	2.18 [6]	7.20 [11]	11.67 [19]	2.89 [7]	
	Brown Long-eared Bat	1.27 [3]	6.91 [12]	1.82 [4]	4.20 [9]	3.33 [4]	1.22 [4]		
	Whiskered Bat	0.09 [1]	1.36 [3]	0.00 [0]	3.60 [8]	12.33 [22]	0.11 [1]		

Note: Data is presented as "average [peak]" where average is the mean number of registrations per night on the first 10 good-weather nights across all seasons. Peak data represents the maximum number of nightly registrations from any night in the relevant recording period.

3.3.2 Passive Bat Survey 2024 - 2025

Ultrasonic detector surveys were carried out at the proposed wind farm site from summer 2024 to spring 2025 to record bat activity in the area, from which information on species composition, relative abundance and landscape usage could be derived. The surveys were carried out using 11 monitoring locations. Monitoring locations in 2024 and 2025 for all turbines were considered representative of the habitats within which the turbines will be located.

Overall, a 'moderate to high' level of activity was recorded at the site in terms of total registrations. A total of 8 bat species were recorded (possibly nine, as Whiskered Bats and Brandt's Bats are indistinguishable through ultrasonic detection).

Four species comprised the majority of registrations across the site and across all survey seasons. These species include Common Pipistrelle (50.5%), Soprano Pipistrelle (35.1%), and Leisler's Bat (9.5%). These species are all considered common and widespread within an Irish context and are largely considered generalist foraging species, despite their general avoidance of peatland habitat (Roche et al., 2014; Lundy et al., 2011).

All other species accounted for less than 5% of total registrations: Natterer's Bat (1.82%), Brown Long-eared Bat (1.53%), Whiskered Bat (0.84%), Daubenton's Bat (0.69%), Nathusius' Pipistrelle (0.05%), and *Myotis* sp. (0.01%). These species were also not present across all locations in all seasons.

Activity was categorised as 'high' at three locations for Soprano Pipistrelle in summer, one location in autumn 2024 and one location in spring 2025. Common Pipistrelle activity was 'high' in six locations during both summer and autumn deployments in 2024, and three locations in spring 2025. Leisler's bat activity was assessed as having 'moderate' activity in three locations in summer, one location in autumn and at four locations in spring 2025. The highest average activity recorded per night was 1,179 registrations recorded for Common Pipistrelle at T5 in autumn 2024. The results of passive monitoring are presented in **Table 3.8**.

3.3.2.1 Summer 2024 Passive Monitoring Survey

A high level of species diversity was recorded during the summer 2024 monitoring period, with a total of eight species confirmed (with a small subset of calls being classified to a genus level in the case of *Myotis* spp., $n = 3$). A high level of activity was recorded across the 14-night survey, with a nightly average of 3,675.14 registrations recorded. This was primarily a result of high Pipistrelle species activity. T8 accounted for 25.8% of all activity recorded during this period. T5, T9, T10, and T11 accounted for between 12% - 14% each during this period. T3 accounted for 8.3% of activity, while the remaining locations accounted for less than 4% each.

Common Pipistrelle was the most abundantly recorded species at each of the monitoring stations and accounted for 55.9% of all registrations recorded during the summer season. Common Pipistrelle nightly average activity was 2,054 registrations. Common Pipistrelle activity was highest at monitoring stations at T5 and T8, accounting for 18.3% and 29.4% of all Common Pipistrelle registrations recorded, respectively. A peak of 1,319 Common Pipistrelle registrations was recorded at T8 on the 12th August 2024, the highest peak of any species recorded during the summer recording period.

Soprano Pipistrelle was the next most commonly recorded species, accounting for 31.5% of all recorded registrations. A nightly average of 1,157 registrations was recorded during the season. 23.5% of all Soprano Pipistrelle registrations were recorded at T8, and 20.3% were recorded at T9. These were the

two locations with the highest Soprano Pipistrelle activity recorded this season. Soprano Pipistrelle activity also peaked at T8 with 723 registrations recorded on 11th August.

Leisler's Bat were recorded as the third most common species across the site, accounting for 9.54% of all registrations recorded during this passive monitoring season. A nightly average of 350.5 Leisler's Bat registrations were recorded for this monitoring period across all monitoring stations. The nightly average ranged from 17.00 to 86.10 nightly registrations across recording locations. The highest activity was at T1 (mean 86.10 nightly registrations and a peak of 149).

Natterer's Bat was recorded at all monitoring stations. Two peaks in Natterer's activity were recorded at T3 and T8, at which 21.1% and 26.6% of all Natterer's registrations in this season were recorded. On average, across all monitoring stations, 25.8 Natterer's Bat registrations were recorded per night. Nathusius' Pipistrelle was recorded at three locations, with a total of only 11 registrations and a nightly average of 1.8 registrations. Nathusius' Pipistrelle activity was limited to T3 (9 registrations), T6, and T7 (1 registration at each). Nathusius' Pipistrelle is also considered to be of relatively high risk of collision with wind turbine blades.

Brown Long-eared Bat registrations were recorded at all locations. This species is often underrepresented in ultrasonic detection surveys due to its weak echolocation call, which is often only detected within 5m of an individual (Russ, 2012). A nightly average of 36.3 registrations was recorded during the summer season. The locations with the highest activity for this species were T5, T6, and T8, accounting for 18.9%, 16.1%, and 18.3% of this species activity. Low levels of Daubenton's Bat activity were recorded this monitoring season across all locations, with a nightly average of 18 registrations. Whiskered Bat was recorded sporadically as an individual or two passes at T2, T4, T5, and T6. There were two locations with notably higher levels of whiskered bat activity: T3 and T8. These locations recorded 35.5% and 58.4% of the calls for this species, respectively (n=445). Together, these five species accounted for <3.1% of all registrations recorded.

3.3.2.2 Autumn 2024 Passive Monitoring Survey

A high level of species diversity was recorded during this monitoring period, with a total of eight species confirmed (5 registrations being classified to a genus level in the case of *Myotis* spp.). A total of 75,496 bat registrations were recorded across the 20-night survey, and a nightly average of 3,774.8 registrations. Activity levels recorded at T5 were highest for this season (36% of all registrations), T3, T9, and T11 accounted for 10% - 11% of registrations each. This autumn monitoring recorded a higher nightly level of activity than the summer deployment.

Common pipistrelle was the most active species recorded during this season, accounting for 50.16% of all registrations. T5 accounted for 35.7% of all Common pipistrelles recorded in this period. T3 and T8 to T11 accounted for 10% - 15% each of Common Pipistrelle activity. All other locations accounted for 5% of seasonal Common Pipistrelle activity. Mean nightly passes for Common Pipistrelles were 1,893.5 for the autumn period, constituting high activity levels. The peak in Common Pipistrelle activity for autumn occurred at T5 on 9th September, with 1,893.5 registrations being recorded. At this location, there were six consecutive nights with more than 1,200 registrations being recorded per night between 3rd September and 8th September for Common Pipistrelle.

Soprano Pipistrelle were the second most active species on site during the autumn period. They accounted for 35.7% of all registrations during this period. The majority of registrations for this Soprano Pipistrelle were recorded at T5, with 47% of registrations for this species being recorded there. In autumn, the average nightly registrations for this species were 1,345.7. Matching the results for

Common Pipistrelle, the peak in autumn's Soprano Pipistrelle activity occurred at T5, with a slightly higher peak of 1,939 registrations recorded on the 9th September. The period of 3rd September to 8th September also had consistent high activity with nightly registrations ranging from 1,286 to 1,785 throughout.

Leisler's Bat was the third most active species recorded during this season, accounting for 9.7% of the registrations recorded. This species was most active at T1, with 46.5% of species registrations recorded at this location. The nightly average passes for this species were 365.3 during the autumn period. The peak in Leisler's Bat activity occurred at T1, with 633 registrations being recorded on 15th September. The mean nightly activity at T1 was 163 registrations, constituting moderate activity. Overall, the mean nightly activity was lower at all other locations, ranging from 4.9 to 45.9 registrations, which constitutes low activity.

Natterer's Bat was recorded at all monitoring stations, with the highest proportion of registrations recorded at T7, accounting for 7.5% of all Natterer's bat registrations in this season. Natterer's Bat accounted for 1.69% of all registrations recorded this season. On average, across all monitoring stations, 63.7 Natterer's Bat registrations were recorded per night, higher than the average recorded for summer. Nathusius' Pipistrelle was recorded at all locations except T4 during the autumn season, with a total of only 71 registrations and a nightly average of 3 registrations. The majority of registrations were recorded at T3, consisting of 29.6% of registrations for this species. While this is still considered a low level of activity, it constitutes a notable increase from the activity of Nathusius' pipistrelle in summer.

Brown Long-eared Bat registrations were recorded across all the monitoring locations (n=1,922) and represented <2% of the total registrations recorded during this passive monitoring season. As mentioned previously, Brown Long-eared Bat can be under-recorded due to the low volume of their calls, and thus, it is a possibility that this species has been under-recorded in this instance. Brown Long-eared Bat activity was highest at T11, accounting for 22.58% of registrations, followed by T6, T5 and T7, which accounted for 15%, 13.5% and 13% of registrations, respectively. T11, having the highest level of activity, is likely related to the multi-species roost noted in the Desktop Review within 1.6 km of T11. One of the species listed in the BCI data as occupying this roost is Brown Long-eared bat. However, the summer results do contradict this, with T11 not being one of the most active locations.

Daubenton's Bat and Whiskered Bat registrations accounted for <2% of all the registrations recorded. 26.5% of the total Daubenton's Bat registrations recorded were at T9. The nightly average registrations for Daubenton's Bat across all locations were 24.6. Whiskered Bat was recorded at a similar rate, with an average of 20.4 nightly passes being recorded across all locations. However, Whiskered Bat activity was much concentrated in terms of location, with 83% of activity being recorded at T3.

3.3.2.3 *Spring 2025 Passive Monitoring Survey*

A moderate level of species diversity was recorded during the spring 2025 monitoring period, with a total of seven bat species confirmed.

A high level of species aggregated activity was recorded with a total of 50,865 bat registrations across the 26-night survey period. A site-wide nightly average of 1,956.35 registrations was recorded across all detector locations. Fewer locations had high activity than recordings made in the previous two seasons. Similar locations showed higher levels of activity, such as T5, T8, T9, and T11. T11 accounted for the highest proportion of registrations recorded in this season, making up 32% of all registrations. Despite other locations having higher nightly averages and peaks, T3 had the second-highest proportion of the total registrations, amounting to 22.5%. The turbine locations T5, T8, and T10

accounted for 8%, 11%, and 8.6% of the total, respectively. All other locations accounted for <5% of the total registrations.

As in previous seasons, Common Pipistrelle accounted for the highest proportion of the registrations recorded, making up 46.1%. Common pipistrelle activity was only considered high at T5. The turbine locations T3, T4, T8, T9, and T11 were characterised as moderate activity. T11 accounted for 35.5% of all Common Pipistrelle registrations. However, this is likely influenced by more suitable weather occurring in May on the redeployment, resulting in the second-highest nightly average for Common pipistrelles (439.5). The detector at T3 recorded 19.2% of all Common Pipistrelle registrations. The turbine locations T8 and T10 accounted for 13.6 and 13.7% of Common Pipistrelle activity, respectively. The two highest nightly registration peaks across all locations and species were produced by Common Pipistrelles at T8 (1179) and T11 (1603).

Soprano Pipistrelle were the second most active species, accounting for 23.7% of registrations recorded during the season. The majority of registrations were recorded at T3 and T8 (41% and 16.5% respectively). The detectors at T4 and T5 accounted for 8.7% and 9.4% of registrations, respectively. All other locations accounted for less than 5.5% of registrations each. The location with the highest activity for Soprano Pipistrelles was also T5, the only location with activity characterised as high (448.8 nightly average). There were also peaks in Soprano Pipistrelle at T3 and T8 (549 and 521). While T11 recorded the highest proportion of Soprano Pipistrelle registrations, the nightly average was characterised as moderate (64.7 nightly average).

Leisler's bat accounted for 22.3% of all registrations. Of Leisler's registrations, 58.89% were recorded at T11. This turbine location had activity characterised as high, with a nightly average of 226.3 registrations. This is the only period and location for which high Leisler's bat activity was recorded. The peak nightly activity at this location was 801 registrations for Leisler's Bat. T1, T3, and T4 accounted for 9.3%, 11.8%, and 10.4% of Leisler's activity. All other locations accounted for <5% of registrations each.

Nathusius' Pipistrelle was not recorded during this period. Daubenton's Bat registrations accounted for <1% of all bats recorded. Daubenton's Bat activity at all locations was characterised as low, with no nightly peak exceeding 21 registrations and average nightly registrations not exceeding 5.3 at any location. Natterer's Bat activity was also characterised as low on a site-wide basis. Natterer's bat accounted for 3.8% of all registrations. The two locations with the highest activity were T2 and T3, which had nightly average registrations of 21.7 and 30.7. Whiskered Bat overall had low activity and was only recorded at 5 turbine locations (T1, T2, T3, T8, and T9). However, T3 had moderate Whiskered Bat activity with 32.2 nightly average registrations being recorded. The peak number of nightly registrations for this species was 187 and occurred on the 9th April. There were an additional five nights during this season for which >100 registrations for Whiskered Bat were recorded (08th April, 12th April, 17th April, and 28th April). This species accounted for 2.1% of all registrations recorded. Brown Long-eared Bat were recorded at all locations in low numbers. In total, this species accounted for 1.2% of all registrations recorded. Brown Long-eared Bats had activity characterised as low or moderate-low at all locations.

Overall, a 'moderate' to 'high' level of activity was recorded at the wind farm site for the 2024 to 2025 monitoring period. Eight of the nine resident species were recorded. The Annex II species Lesser Horseshoe Bat was not recorded during any of the passive surveys.

Table 3.8 Results of passive bat monitoring 2024/2025.

	Common Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Summer 2024	Soprano Pipistrelle	36.80 [58]	46.30 [124]	142.80 [197]	51.90 [77]	225.13 [412]	17.70 [34]	35.50 [54]	360.00 [723]	298.80 [564]	138.30 [356]	161.50 [463]
	Common Pipistrelle	19.20 [37]	49.00 [149]	136.10 [397]	40.30 [66]	659.13 [1169]	13.40 [28]	11.30 [19]	758.60 [1319]	278.40 [694]	429.20 [902]	368.40 [803]
	Leisler's Bat	86.10 [149]	27.60 [73]	28.80 [47]	35.20 [60]	47.38 [72]	26.10 [50]	58.90 [116]	41.30 [102]	40.20 [75]	17.00 [43]	18.60 [38]
	Nathusius' Pipistrelle	0.00 [0]	0.00 [0]	0.80 [3]	0.00 [0]	0.00 [0]	0.10 [1]	0.10 [1]	0.00 [0]	0.00 [0]	0.00 [0]	0.00 [0]
	Myotis sp.	0.00 [0]	0.00 [0]	0.00 [0]	0.00 [0]	0.00 [0]	0.00 [0]	0.00 [0]	0.20 [1]	0.00 [0]	0.10 [1]	0.10 [1]
	Daubenton's Bat	0.90 [3]	0.10 [1]	0.70 [2]	0.00 [0]	1.00 [3]	0.30 [1]	2.40 [3]	7.30 [13]	8.00 [18]	1.20 [5]	0.70 [2]
	Natterer's Bat	0.10 [1]	1.00 [3]	4.70 [9]	0.40 [2]	1.50 [5]	2.40 [6]	1.30 [3]	8.70 [17]	1.80 [4]	3.50 [10]	5.10 [13]
	Brown Long-eared Bat	1.50 [4]	1.30 [5]	2.30 [4]	2.00 [4]	12.00 [21]	7.60 [28]	2.50 [6]	7.90 [16]	2.30 [7]	2.20 [7]	6.20 [14]
	Whiskered Bat	0.00 [0]	0.20 [2]	7.90 [16]	0.10 [1]	0.13 [1]	0.10 [1]	0.00 [0]	25.10 [124]	2.10 [4]	0.00 [0]	0.00 [0]
Autumn 2024	Soprano Pipistrelle	33.45 [72]	24.65 [39]	110.15 [349]	28.00 [114]	1069.86 [1939]	16.35 [56]	34.15 [93]	76.40 [193]	180.05 [841]	144.55 [753]	99.25 [270]
	Common Pipistrelle	22.40 [54]	13.35 [41]	212.55 [624]	31.75 [198]	1178.71 [1897]	27.80 [116]	8.50 [17]	231.65 [998]	200.95 [804]	205.15 [1523]	274.45 [952]
	Leisler's Bat	168.60 [633]	4.85 [11]	33.50 [165]	23.50 [71]	45.86 [120]	17.70 [43]	25.80 [44]	12.50 [31]	26.30 [115]	8.95 [20]	15.05 [38]
	Nathusius' Pipistrelle	0.35 [2]	0.15 [0]	0.60 [3]	0.00 [0]	1.44 [3]	0.25 [2]	0.15 [2]	0.20 [1]	0.15 [2]	0.00 [0]	0.10 [1]
	Myotis sp.	0.05 [1]	0.00 [0]	0.00 [0]	0.00 [0]	1.00 [1]	0.05 [1]	0.00 [0]	0.05 [1]	0.00 [0]	0.00 [0]	0.05 [1]
	Daubenton's Bat	0.45 [2]	0.65 [2]	3.00 [23]	0.35 [3]	9.46 [46]	0.50 [1]	3.00 [8]	2.30 [6]	6.20 [17]	0.55 [2]	3.20 [10]
	Natterer's Bat	1.60 [6]	1.05 [5]	18.30 [48]	1.40 [4]	15.64 [36]	11.25 [69]	6.30 [21]	6.95 [24]	3.85 [12]	4.05 [12]	4.30 [12]
	Brown Long-eared Bat	1.70 [6]	1.10 [2]	1.45 [5]	1.45 [7]	18.57 [31]	8.25 [23]	6.35 [17]	6.15 [20]	3.85 [8]	4.15 [9]	12.70 [45]
	Whiskered Bat	0.00 [0]	0.05 [0]	16.80 [68]	0.00 [0]	2.00 [3]	0.00 [0]	0.00 [0]	2.25 [9]	1.75 [7]	0.00 [0]	0.00 [0]
Spring 2025	Soprano Pipistrelle	15.55 [38]	9.45 [34]	97.36 [549]	28.64 [135]	448.75 [489]	6.55 [24]	17.36 [40]	181.20 [521]	49.50 [150]	18.20 [94]	64.70 [163]
	Common Pipistrelle	12.45 [33]	10.45 [36]	140.91 [462]	45.55 [235]	508.50 [729]	9.91 [63]	11.64 [30]	295.90 [1179]	196.13 [549]	26.20 [98]	452.40 [1603]
	Leisler's Bat	63.73 [184]	25.00 [90]	76.00 [344]	84.73 [351]	29.75 [60]	21.73 [68]	12.73 [34]	10.90 [35]	22.50 [52]	16.00 [62]	176.00 [801]

Common Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Daubenton's Bat	0.73 [3]	5.27 [16]	4.00 [18]	0.09 [1]	4.00 [9]	0.27 [3]	2.73 [14]	1.70 [6]	2.25 [5]	0.30 [1]	2.60 [21]
Natterer's Bat	0.18 [1]	21.73 [74]	30.73 [104]	0.00 [1]	8.50 [20]	1.09 [8]	2.27 [24]	8.20 [52]	2.75 [16]	0.60 [2]	6.50 [22]
Brown Long-eared Bat	0.27 [1]	1.27 [6]	0.64 [3]	0.36 [2]	11.75 [18]	1.09 [6]	0.27 [2]	7.80 [28]	0.50 [3]	1.20 [5]	17.40 [46]
Whiskered Bat	0.09 [1]	0.00 [3]	32.18 [178]	0.00 [0]	0.00 [0]	0.00 [0]	0.00 [0]	0.90 [8]	0.75 [5]	0.00 [0]	0.00 [0]

Note: Data is presented as “average [peak]” where average is the mean number of registrations per night on the first 10 good-weather nights in the spring and summer seasons, and the first 20 good-weather nights in the autumn seasons Peak data represents the maximum number of nightly registrations from any night in the relevant recording period.

3.3.3 Emergence Surveys

Emergence surveys were conducted during summer 2025 to determine if maternity roosting occurs at identified structures within the environs of the proposed wind farm site. Although the structures will not be directly affected, surveys are required within the relevant area to determine if 'significant' roosting occurs, such that an effect could occur on the roosting site through the presence of a turbine nearby. The results for each of the structures surveyed are described separately below. Emergence locations and confirmed roosting features are shown in **Plate 3.1 – 3.4**.

3.3.3.1 *Derelict building (S02)*

The derelict building S02 was confirmed as a roost for a small number of Common Pipistrelle and Brown Long-eared Bats. The survey on 23rd June 2025 recorded an individual Common Pipistrelle light sampling and emerging from the door of the building at 22:33.

Prior to the emergence survey conducted on the 5th August 2025 a total of three Brown Long-eared Bats were recorded on an internal inspection roosting in two separate attic sections of the structure. During the emergence survey there were 10 emergences and three re-entries recorded as bats light sampled in and out of the building and surrounding sheds. It is likely the three Brown Long-eared Bats were recorded as three of these ten and were underrepresented in the calls recorded on detectors. It is estimated that approximately four Soprano Pipistrelles were also roosting in the building. These results show there is not 'significant' roosting in this building.

The survey of this building on 23rd June 2025 also recorded constant Swift activity, with individuals emerging and re-entering the building.

3.3.3.2 *Derelict building (S04)*

The survey on 23rd June 2025 did not record bats emerging from the structure. In the wider area surrounding the roost the surveyor noted there was early but limited activity in the form of commuting Common Pipistrelles and Leisler's Bat. The surveyor noted one Common Pipistrelle entering and investigating the entrance of structure at 22:58 and 23:13 before commuting away.

The survey on 5th August 2025 also recorded foraging Common Pipistrelle and Leisler's Bat in the area with more Common Pipistrelles recorded than the previous survey. Two Common Pipistrelles investigated the entrance, briefly entered and exited the building at 21:58.

While roosting was not recorded during these surveys, given the investigative behaviour exhibit at this feature there is potential for it to be used as a night roost on a temporary basis. However, it's concluded that there is no 'significant' roosting in this structure.

On both surveys the surveyor also recorded Barn Owls nesting within the structure noting their presence likely reduces the roost suitability for bats.

3.3.3.3 *Private Residence (S05)*

During the survey of this building on the 23rd June 2025, a small Common Pipistrelle roost consisting of two individuals was recorded in the eastern corner of the building. These individuals were recorded on the thermal and static detector covering this side of the building with both emergences occurring at 22:30.

A surveyor also noted two emergences of Soprano Pipistrelles from a shed adjacent to the main building being surveyed at 22:16. On completion of the survey a single Natterer's Bat was recorded inside a

separate shed in the farmyard adjacent to S05. This shed is likely used as a night roost. These structures are all >600 m from any turbine locations.

While small roosts were recorded during this survey further investigation is not warranted given the separation distances and that there is no evidence of significant roosting i.e. a maternity roost.

It was also noted that there is a swift colony of approximately 30 individuals in the structure S05, nesting predominantly in the southern and western fascia-soffit of the house.

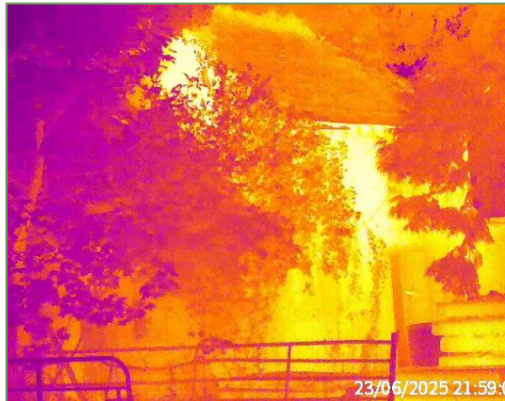


Plate 3.12 – Derelict building S02, swift visible entering building.



Plate 3.13 – Alternate camera for S02.



Plate 3.14 –Brown Long-eared Bats roosting in S02 on internal inspection.



Plate 3.15 – Thermal camera coverage of S04.



Plate 3.16 – Emergence location S05 (black arrow).



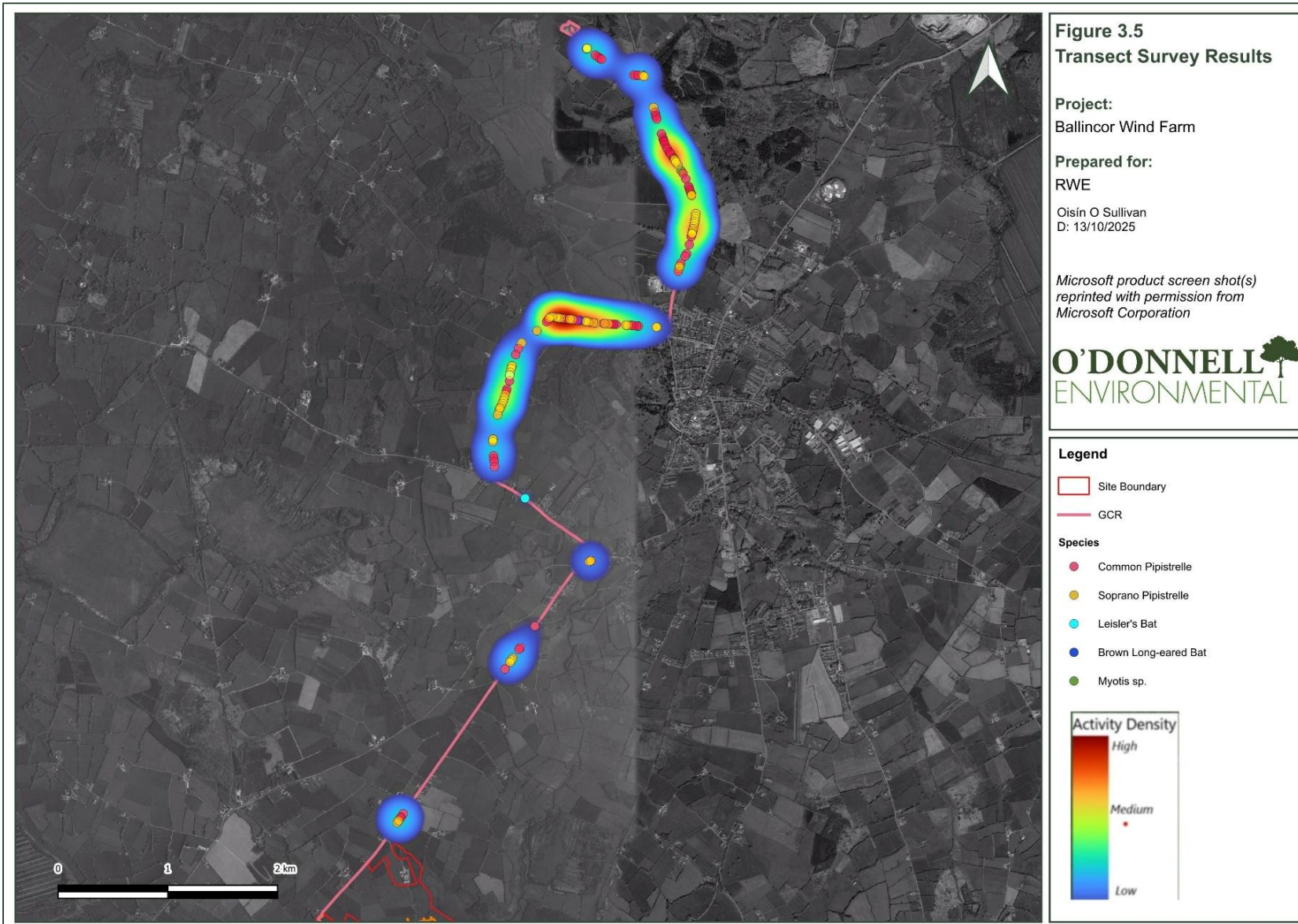
Plate 3.17 – Brown Long-eared Bat investigating PRF-M feature on Tree T716.

3.3.4 Active Transect Surveys

A driven (dusk) transect survey of the GCR was carried out on the 22nd of September 2025. See **Figure 3.5** for registration locations.

A 'moderate' level of bat activity was recorded during the activity surveys overall, however, there were peaks of high activity which was concentrated around the vegetated landscape features along the GCR, such as the hedgerows and treelines that bordered the road. Behaviour noted consisted of foraging and commuting. The results of the analysis of the data collected during the transect survey are presented in **Figure 3.5**. It should be noted that the location of bat records shown in these drawings indicate the position of the surveyor at the time of detection, as opposed to the actual location of the bat recorded. The range of the microphone can be in excess of 50m dependant on the species. Active transect surveys provide a 'snapshot' of activity over a fixed period of a single survey night. Registrations of individual bats cannot be distinguished, and number of registrations should not be inferred as numbers of individuals.

A total of 167 bat registrations were recorded: Soprano Pipistrelle (42.5%) and Common Pipistrelle (54.5%) were the most frequently recorded. Three Leisler's Bat registrations were recorded during the transect. One was recorded at the substation location while the other two were approximately a kilometre from the substation on the section of GCR directly east of Birr. A single Brown Long-eared Bat was recorded on the Croghan Road (L1077). This is also where the highest density of Pipistrelle activity was recorded. This activity is likely due to suitable foraging habitat of mature woodland and river within the Birr Castle estate. It is worth noting that this high activity stretch aligns with a higher density of known roost locations directly east of this section of GCR discovered during the desk study (**Figure 3.1**). An individual *Myotis* sp. bat registration was recorded along the R439 north of Birr. This recording could only be identified to genus level.



3.4 ECOLOGICAL SITE EVALUATION

The current report describes the proposed study area in terms of bat activity and bat habitat suitability for both roosting and foraging within the site.

Suitable foraging and roosting habitat exists within the proposed wind farm site. Moderate to high levels of bat activity were recorded overall, and the site is not considered remarkable in a local context in terms of its value to foraging and commuting bats. A robust and appropriate survey effort was deployed, and no 'significant' bat roosts are present in the relevant search area (following NatureScot, 2021). Two confirmed roosts are present used by small number of bats, and these will not be directly or indirectly affected by the proposed works. The Annex II (EU Habitats Directive) listed Lesser Horseshoe Bat was not recorded.

Taking into account the results of surveys described in this report, the modified nature of the site resulting from turbary, forestry, and agricultural management, the lack of significant roost sites, the presence small roosts, and considering its local context, the study site is considered to be of **Local Importance (Higher Value)** for bats following NRA (2009).

4 Potential Impacts

The potential for effects by the proposed Ballincor Wind Farm on bats are discussed in detail below.

4.1 POTENTIAL CONSTRUCTION PHASE IMPACTS

Wind energy developments present four potential risks to bats (NatureScot, 2021):

- Collision mortality, barotrauma and other injuries
- Loss or damage to commuting and foraging habitat
- Loss of, or damage to, roosts
- Displacement of individuals or populations.

For each of these four risks, the detailed knowledge of bat distribution and activity within the study area gained during the current assessment is used to predict the potential effects of the wind farm on bats. Several bat species were noted within the proposed site, all of which are legally protected under the Irish Wildlife Acts (1976 as amended) and listed on the EU Habitats Directive.

4.1.1 Wind Farm Site

4.1.1.1 *Vegetation clearance*

While the site mostly consists of land used for turbary and improved agricultural grassland habitat, with a general lack of roosting opportunities, suitable productivity foraging habitat and commuting habitat with good connectivity to the surrounding environment is present. High productivity foraging habitat is present occasionally within the wind farm site in the form of wet drainage ditches, plantation edge, small areas of woodland habitats etc. Pasture-based agriculture, forestry activities, and peat extraction will continue in undeveloped areas of the site post-construction.

Vegetation removal will also be required for the construction of the proposed development and associated infrastructure including; access tracks/routes, temporary compounds, turbine hard standing, met mast, onsite BESS, underground grid connection, bridges, culverts and construction works associated with the turbine delivery route and site entrance. The turbine set down area has been incorporated into existing hardstand locations. The impact of this vegetation loss will be reduced foraging and fragmented commuting habitat for bats. Loss of such habitat function has the potential to disturb or displace bats that forage at the site or commute through the site. While commercial coniferous plantations are typically unproductive foraging habitats, the increase in forest edge habitat is likely to increase foraging and commuting locally.

As a measure to limit the possibility for effects on bats as a result of collision/barotrauma, NatureScot (2021) recommends the creation of buffers around turbines where landscape features with the potential to attract bats are removed. There will be a loss of foraging and commuting habitat to facilitate the implementation of such bat buffers as detailed in **Section 4.1.1.1**. This involves the clearance of 0.12 ha of treelines and hedgerows, and 5.76 ha of woodland and scrub.

A robust and appropriate survey effort was deployed and based on best available information no bat roosts ('significant' or otherwise) will be disturbed as a result of the proposed works.

PRF-I trees (i.e. those which were assessed as having 'low' suitability to support roosting bats) are present within the bat buffers. At T1 there are two trees with PRF-I features (T704 and T705). Buffers at T5 will require the removal of T712, T713, and T714. At T6 one PRF-I will be removed (T715). The buffer at T8 will require the removal of T721 while the clearance of buffers at T11 will require the removal of T722. The locations of all these features are detailed in **Figure 3.2 & 3.3 and Table 3.4**. While bat roosting was not identified in these trees, appropriate measures are outlined below to minimise effects on any bats which may roost there in the future.

In the absence of mitigation, the loss of habitat would result in a **'slight, permanent, negative effect'** on commuting and foraging bats at a local geographical scale.

4.1.1.2 Structures

A comprehensive survey effort was carried out in relation to potential roost features in structures following Collins (2023). No significant roosting in the form of maternity or hibernation roosts are present on site. Non-significant roosting by Brown Long-eared Bat, Natterer's Bat, Soprano Pipistrelle and Common Pipistrelle have been identified in two man-made structures which are both outside the proposed works footprint (S02 is >200 m from the nearest turbine (T6). S05 is >600 m from the nearest turbine (T7)). The structures will not be directly or indirectly affected by the proposed works and given the separation distances from areas being developed no disturbance of the roosts is anticipated.

The proposed development is considered likely to have a **neutral** effect on the identified roosts S02 and S05, and no mitigation measures are warranted.

4.1.1.3 Lighting

Construction phase lighting has the potential to attract certain bat species and displace others and floodlighting can be a significant source of disturbance to bat species. However, this impact will be temporary in nature and localized to areas around the site compound. There is no lighting proposed in the areas surrounding confirmed roosts.

In the absence of mitigation lighting associated with construction will result in a temporary **'slight, temporary negative effect'** on foraging and commuting bats.

4.1.1.4 Hydrological features

Construction related run-off or degradation of aquatic habitats through hydrological links could potentially lead to a deterioration of the feeding resource for bats associated with watercourses within the site boundary and in the wider area. Assessment of potential water quality impacts is addressed elsewhere in the EIAR, and suitable mitigation measures have been applied. No further measures are considered necessary for bats specifically.

4.1.2 Turbine Delivery Route

4.1.2.1 Vegetation clearance

The locations where vegetation clearance, trimming, and tree removal are highlighted in the Abnormal Indivisible Load Route Survey (Pell Frischmann, 2023). Enabling works along the TDR will result in the loss of 22 m of treeline and 83 m of hedgerow. There will also be removal of approximately 0.07 ha of scrub habitat (WS1), 0.07 ha of improved grassland (GA1), and 0.03 ha of arable crops/horticultural land (BC1/BC2).

While hedgerows and treelines are common features in the wider landscape, the loss of commuting habitat will potentially displace some bats in the immediate locality of works and marginally reduce habitat connectivity locally. In the absence of mitigation this will result in a **'temporary slight negative'** effect on foraging and commuting bats at a local scale.

4.1.2.2 *Bridges*

There are no works required on bridges to facilitate the delivery of turbines as detailed in the Abnormal Indivisible Load Route Survey Report (Pell Frischmann 2023). Therefore, it is concluded a **neutral effect** will occur on any bats potentially roosting in bridges along the route.

4.1.3 Grid Connection Route

4.1.3.1 *Vegetation clearance*

The zone of influence of the proposed grid connection route is limited, confined to the immediate works area and is temporary in nature. In the event a bat roost was present within a private residential dwelling along the route, no potential impacts are likely to arise during the construction or operation of the cable route.

Two PRF-I (i.e. of 'low' roosting suitability) trees were identified along the GCR. Given the absence of any significant disturbance proximal to these features, there will be a **neutral effect** on bats which may make use of PRF-I tree features.

4.1.3.2 *Bridges*

Bridge 'B08' was confirmed as a roost with the collection of faecal samples which were confirmed as Brown Long-eared bat. Horizontal Directional Drilling (HDD) is proposed for the section of GCR adjacent to B08. This will avoid direct impacts to the structure of the bridge itself. There is still potential for indirect disturbance of roosting bats in this bridge through noise and vibrations with works associated with the HDD. In the absence of mitigation there will be a **'slight, temporary negative effect'** on roosting bats as a result of noise and visual cues.

4.1.3.3 *Summary of Construction Stage Effects*

Considering all impacts addressed in this section, in the absence of mitigation, potential effects resulting from the construction phase on bats would have a **'slight, temporary and permanent, negative'** effect at a local level following EPA (2022).

4.2 POTENTIAL OPERATIONAL PHASE IMPACTS

Habitat loss experienced during the construction phase (described above) will continue to persist through the operational phase. The operation of the wind farm at this site has the potential to result in disturbance to commuting and foraging bats. Bat activity at the site was variable with periods of moderate activity occurring for some high collision-risk species. Decreased connectivity resulting from removal of commuting features likely to be used by many bat species (e.g. hedgerows) will persist during the operational phase, but decreased connectivity to proposed turbine locations is desirable in terms of reducing risk of fatality or injury as a result of contact with rotating turbine blades. Collision risk is discussed further below.

4.2.1 Collision Risk

There is little or no published evidence available on prevalence of bat fatalities at wind farms in an Irish context. Where fatalities have been monitored at wind farms in the USA, most losses have been related to periods of migration (www.nationalwind.org).

Both direct collision with turbine blades and barotrauma resulting from close contact with blades have been reported as an issue for bats at wind farms (e.g. Cryan et al., 2009, Matthews et al., 2016). The susceptibility of bat species likely to be at risk of impacts from wind turbines is partly associated with the likelihood of different species flying at rotor blade height. In an Irish context, Leisler's Bat is considered to have a somewhat greater mortality risk at wind farms than the other species recorded on (or adjacent to) the site, as this species is a relatively large and high-flying species. Leisler's Bats typically do not follow landscape features such as treelines or woodland edges when foraging.

4.2.1.1 Assessment of Collision Risk

A general assessment of vulnerability of bat populations to collision with wind turbines, based on best available scientific information, is provided below. This adapts for use in an Irish context a collision risk scheme provided in NatureScot (2021). NatureScot (2021) provides a generic assessment of bat collision risk for UK species, based on species behaviour and flight categorisation as well as evidence of casualty rates in the UK and Europe. This bat species collision risk assessment is considered to represent best available information for use in an Irish context. For the purposes of this assessment, the results of the most recently completed surveys in 2024 will be considered for the collision risk assessment. The location of the monitoring stations for this survey period are considered more accurate in terms of representing activity levels at proposed turbine locations.

This species collision risk categorisation is used in combination with relative abundance to indicate the potential vulnerability of bat populations. Relative abundance for Irish species was determined in accordance with a scheme for rarity of bat species provided in Wray et al. (2010) in combination with best available population data provided in recent Article 17 reports (NPWS, 2019). The limitations in terms of Irish bat population data is acknowledged in the latter report.

The collision risk estimation scheme for Irish bat species is presented in **Table 4.3**.

Table 4.3 Scheme for estimation of Irish bat species' population vulnerability to wind energy development.

Relative Abundance	Collision-Risk		
	Low	Medium	High
Common (100,000 plus)			Common Pipistrelle Soprano Pipistrelle
Rarer (10,000 – 100,000)	Daubenton's Bat Brown Long-eared Bat Lesser Horseshoe Bat		Leisler's Bat
Rarest (under 10,000)	Natterer's Bat Whiskered Bat		Nathusius Pipistrelle

Population vulnerability: yellow = low, orange = medium, red = high.

In determining the project specific potential risk to bats, NatureScot (2021) recommends a two-stage process as follows:

- **Stage 1:** Indicatively assess potential site risk based on consideration of habitat present and development related features (i.e. number of turbines, size of turbines and proximity to other wind farms).
- **Stage 2:** Overall assessment of risk for high collision-risk species, considering bat activity results and the relative vulnerability of species.

Initially an assessment of the general site risk based on habitats present was carried out following the scheme presented in NatureScot (2021). No trees of potential roosting suitability were recorded local to the proposed wind farm site. The site represents a low productivity foraging habitat which could be used by a small number of foraging bats. Given that there are areas of woodland coverage within the site and several features with moderate to high roost suitability the site as habitat within the site is of Moderate suitability overall.

The proposed development consists of 11 turbines and as detailed in **Section 4.4** there are operational and consented developments within 5 km (Skehanagh Wind Farm and Carraig Wind Farms; **Table 4.2**). Both of these projects would be classified as small in terms of project size with 5 and 7 turbines respectively (NatureScot, 2021). There are no other sites which would influence the site size relative to the collision risk assessment (within 10 km / 5 km as detailed in Table 3a Nature Scot et al., 2021).

According to the project size categories in NatureScot (2021), turbines of height >100m are included in the 'Large' project category. This height refers to the 'tip height' of the turbine (P. Taylor (NatureScot), Pers. Comm.). The maximum tip height of the turbines proposed will be between 179.5. and 180m. However, given the number of turbines (significantly less than the threshold for a large site >40 no. turbines) it is considered that for all turbine designs 'Medium' remains the appropriate project size category. Based on the above initial site risk assessment, the proposed project is considered to be 'Medium Risk' to bats and a site risk score of 3 is applicable.

The next stage of the process is applicable to 'high collision-risk' species only and utilises information on the activity level recorded on site in each monitoring period. This assessment is intended to identify projects which are of greatest concern in terms of bat collision risk. Results are described in this section and in **Table 4.4**. The following high collision-risk species have been recorded at the current site:

- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Nathusius' Pipistrelle

Leisler's bats are considered to be a high-collision risk species due to their foraging ecology and flight characteristics. While Leisler's Bat is rare in a European context, Ireland is a stronghold for the species. Leisler's Bats are a relatively large and fast-flying species and have been recorded to have relatively large territories and to travel significant distances to reach preferred foraging habitats (Shiel et al., 2006). While strong habitat associations for the species have been difficult to identify in an Irish context, there is evidence to suggest a positive association with pasture and freshwater habitats (Roche et al., 2014). They are classified as 'Rarer' for the purposes of this assessment but the minimum population range for the species in Ireland is estimated at 63,000 to 113,000 (NPWS, 2019) and therefore the species may be 'Common'. Leisler's Bats were recorded during activity surveys across the site (see **Table 3.7 & Table 3.8**). Overall activity levels for Leisler's Bat in the context of the proposed wind farm are considered moderate.

Common Pipistrelle is a common and widespread species in Ireland and considered to be a high-collision risk species due to their foraging ecology and flight characteristics. Common Pipistrelles were one of the most commonly recorded species across the site. Overall activity levels for Common Pipistrelles in the context of the proposed wind farm is considered moderate to high.

Soprano Pipistrelle are another common and widespread species in Ireland which are considered to be a high-collision risk species due to their foraging ecology and flight characteristics. Overall activity levels for Soprano Pipistrelles in the context of the proposed wind farm are considered to be moderate to high.

It is known that Common and Soprano Pipistrelle are common and widespread in Ireland and are present in a wide variety of habitat types, and so higher activity levels for these species when compared with others is considered typical.

Nathusius' Pipistrelle has a fast flight and is slightly less agile in flight than the other Pipistrelle species and is positively associated with broadleaf woodland and areas where pasture is less extensive (Roche et al., 2014). This species is considered to be of high-collision risk due to their foraging ecology and flight characteristics. Nathusius' Pipistrelle was only recorded in spring and autumn, yielding an overall low activity category.

Table 4.4 Overall collision risk assessment of relevant (high collision-risk) species on a wind farm development assessed as a Medium Risk Level (NatureScot, 2021).

	Species	Site Risk Score	Activity Category	Overall Assessment
Summer 2024	Leisler's Bat	3	Moderate (3)	9
	Common Pipistrelle	3	Moderate – High (4)	12
	Soprano Pipistrelle	3	Moderate – High (4)	12
	Nathusius' Pipistrelle	3	Low (1)	3
Autumn 2024	Leisler's Bat	3	Moderate (3)	9
	Common Pipistrelle	3	Moderate – High (4)	12
	Soprano Pipistrelle	3	Moderate – High (4)	12
	Nathusius' Pipistrelle	3	Low (1)	3
Spring 2025	Leisler's Bat	3	Moderate (3)	9
	Common Pipistrelle	3	Moderate – High (4)	12
	Soprano Pipistrelle	3	Moderate – High (4)	12
	Nathusius' Pipistrelle	3	Low (1)	3

Overall collision risk assessment: Low (green), medium (amber), high (red) (following SNH, 2019).

While activity levels of the above species varied between survey locations (corresponding to proposed turbine locations) it is not possible to determine with any accuracy the different levels of collision risk presented by individual turbines (NatureScot, 2021).

As per NatureScot (2021) there is no requirement to complete an overall risk assessment for low-risk species. The low-risk species recorded at this proposed wind farm site were Brown Long-eared Bat, Daubenton's Bat, Natterer's Bat and Whiskered Bat. Overall activity levels were low for these species and by the virtue of their low potential vulnerability to wind energy developments, no significant collision related risk is likely.

No additional loss of foraging and commuting habitat, relative to that discussed above in relation to the construction phase, will occur during the operational phase. No other significant impacts are likely to occur on bats during the operations phase of the proposed wind farm.

Overall, in the absence of mitigation, the proposed wind farm in its operational phase would likely have a **'permanent, slight, negative'** effect on bats at a local level (following EPA, 2022).

4.3 POTENTIAL DECOMMISSIONING PHASE IMPACTS

No other potential impacts other than those already discussed above for the construction and operational phases are likely to occur during decommissioning. Decommissioning activities are assumed to be similar to construction activities, having similar type risks and sensitive receptors associated with them. However, they are considerably less intrusive.

Overall, the effect of potential impacts on bats during decommissioning of the proposed wind farm is considered to be **'neutral'** at a local level following EPA (2022).

4.4 POTENTIAL CUMULATIVE IMPACTS

While a single development may only result in a minor environmental impact, when considered in combination with other impacts it may result in a cumulative impact which could be considered significant (EPA, 2022).

Ecological Impact Assessment aims to determine what if any effects a proposed project would have on ecological conditions, relative to baseline conditions. As part of this process, the potential for cumulative effects is considered. Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2022).

Projects to be considered in an assessment of cumulative effects would include the following types of future development within the same zone of influence:

- Proposals for which consent has been applied which are awaiting determination in any regulatory process (not necessarily limited to planning permission)
- Projects which have been granted consent (not limited to planning permissions) but which have not yet been started or which have been started but are not yet completed (i.e. under construction)
- Proposals which have been refused permission, but which are subject to appeal and the appeal is undetermined to the extent that their details are in the public domain
- Proposed projects that will be implemented by a public body but for which no consent is needed from a competent authority (CIEEM, 2022).

In some situations, it may be necessary to also consider:

- Constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline
- Developments specifically referenced in a National Policy Statement, a National Plan or a Local Plan (draft or adopted) (CIEEM, 2022).

The projects considered in relation to the potential for cumulative effects and for which all relevant data was reviewed include those planning applications listed in **Table 4.1**, and relevant ongoing activities in the area, as described below.

For the purpose of the evaluation of potential cumulative effects, the term development has been taken to include:

- Any permitted electricity transmission developments, or proposed developments currently in the planning process, located within Offaly and Tipperary and surrounding areas of adjoining counties
- Permitted or proposed developments with the potential for significant cumulative effects with the proposed project, e.g., major linear infrastructure development, such as proposed road development, wind farms, other Strategic Infrastructure Development (SID), or public utilities and services along the GCR.

The review of the relevant local authorities planning registers documented in Offaly and Tipperary County Council's and ACP's websites was conducted based on data provided by TOBIN. These existing, approved and proposed planning projects have also been taken into account in describing the baseline environment and in the relevant assessments. A complete list of other major developments within 10km of the proposed wind farm is shown in **Table 4.1**

Table 4.1 List of Relevant Applications within 10 km of the proposed wind farm site.

Planning Authority	Application number	Proposal	Address	Decision Date
Solar farm				
Tipperary county council	16600136	a solar PV energy development of maximum export capacity 4 MW, to include one ESB Networks substation building with a height of 4m, two electrical transformer stations with a height of 2.7m, site access roads and solar PV panels mounted on steel support structures with a height of 2.5m, associated cabling and ducting.	Lacka , Carrig , Birr	23/08/2016
Offaly county council	21227	A 10-year permission for the construction of a solar PV development with a maximum export capacity (MEC) of up to 40MW.	Ballindown Bogderries , Ballywilliam and Ballynaguilsha , Co. Offaly	10/08/2021
Electricity and telecoms				
Offaly county council	ABP ref. 304056	Install approximately 12.5km of 38kv electricity transmission line from the permitted (wind farm) substation in Stonestown, County Offaly to the electricity substation in Clondallow, County Offaly.	Across The Townlands Of Stonestown, Kilcamin, Crancreagh, Derrinlough, Clooneen, Whigsborough, Galros East, Galros West, Cush, Boolinarg Big, Conspark, Ballaghanohar, Ross And Clondallow, Co Offaly	25/05/2020
Offaly county council	2360140	The development involves a ten-year planning permission for underground electrical cabling (38kV) from Townparks to the Dallow 110kV substation in Clondallow, facilitating the connection of the proposed Carrig Renewables Wind Farm to the national grid. It includes joint bays, communication chambers, earth sheath links, road reinstatement, and associated site works,	In the townlands of Townparks (Birr) Dovegrove , Woodfield or Tullynisk , and Clondallow Co. Offaly	07/06/2024
Other				
Tipperary county council	15600881	Horticultural Park containing an amphitheatre incorporating audience seating and a stage and all associated landscaping and ancillary works.	The Ecovillage , Oxpark , Cloughjordan	25/04/2016
Offaly county council	15349	Construction of new innovation centre and training building, construction of new stores extension with loading bay canopy, extend concrete yards, additional parking area, form new opening in west boundary wall for goods entrance / exit and all associated works.	Grant Engineering , Crinkill , Birr	31/03/2016

Planning Authority	Application number	Proposal	Address	Decision Date
Offaly county council	16433	Demolition of the existing two storey water treatment plant building, construction of a 2,000 m3 water storage reservoir including associated site development works and services.	Birr Water Treatment Plant , Seefin , Birr	11/04/2017
Offaly county council	16145	The upgrade to Birr water supply scheme which will comprise the following at the existing birr water treatment plant (WTP) site: refurbishment of the existing two storey masonry WTP building, demolition of the existing open sludge lagoon, construction of a new WTP process building with gross floor area 660sqm approximately, new tank structures, new sludge treatment and storage structures, underground watermains and service connections, together with improvements to existing boundaries, landscaping and all associated site works.	Seefin , Birr , Co. Offaly	09/11/2016
Offaly county council	16144	The upgrade to Birr water supply scheme which will comprise the following at the existing intake (for birr water treatment plant): provision of a new pumphouse building with gross floor area 37.50sqm approximately, upgrade of the existing river bankside intake structure with underground watermains and service connections, refurbishment of existing pumphouse structure, new roadside boundary setback and relocation of access to site, extension of overall site area together with improvements to existing boundaries including the existing access walkway to the Camcor river, new boundary treatment, landscaping and all associated site works.	Clonoghil Upper , Birr , Co. Offaly	17/08/2016
Tipperary county council	17601366	As-built standalone furniture manufacturing building, as built storage building, demountable office building, single storey spray building, use of portion of existing yard as open storage, together with all associated site works.	Sopwell , Cloughjordan , Co Tipperary	19/03/2018
Offaly county council	20592	The filling of lands with inert waste consisting of concrete, bricks, tiles and ceramics, soil and stone for the purpose of land reclamation, the setting up of a temporary portacabin & portaloo, weighbridge, construction of site entrance, access road and associated works.	Ballystanley , Roscrea , Co. Offaly	15/02/2022
Offaly county council	ABP ref. 306246	Application for leave to apply for substitute consent under section 177c of the planning and development act 2000, (as amended) to regularise the planning status of bord na mona's historic peat extraction (and ancillary works) on the milled peat production bogs.	Boora Bog Group Located Predominantly In County Offaly.	30/04/2020
Offaly county council	ABP ref. 314549	Application for an extension of time to apply for substitute consent in relation to peat harvesting.	Coole And Clonbeale Mor, Near Birr, Co. Offaly	28/09/2022

Planning Authority	Application number	Proposal	Address	Decision Date
Offaly county council	ABP ref. 306863	Peat harvesting.	Coole And Clonbeale Mor, Near Birr, Co. Offaly.	16/06/2021
Offaly county council	21599	Filling quarried land with topsoil, subsoil to raise level of land for agricultural purposes.	Glasshouse , Shinrone , Co. Offaly	30/03/2023
Offaly county council	22449	(1) carry out of civil engineering works to adjust the ground levels of the existing rugby training pitch and provide an underground pitch drainage system (2) erect 6 no. Columns and floodlights to existing training pitch and all associated site works.	Scurragh , Townparks Birr , Co. Offaly	25/04/2023
Offaly county council	22404	Development consisting of the construction of: (1) a 4060m2 three storey primary care centre to accommodate (a) HSE facilities comprising consulting rooms, treatment areas, meeting rooms, offices and support spaces (b) surgery space totalling 807m2 for general practitioners (c) a 138m2 pharmacy with two consulting rooms totalling 34m2; (2) a 175m2 single storey ancillary structure at the rear of primary care centre for stores, waste, back-up generator and associated external plant; (3) a 397.5m2 two storey ambulance base with single storey garage and external canopy; (4) 157 no. Car parking area including provision for 6 no. Motorcycle parking spaces, 50 no. Bicycle spaces, 16 no. Electrical charge points and traffic control barriers for employee parking; (5) section of new access distributor road 165m long with footways; (6) all associated site development works to serve the proposal including site and distributor road lighting, hard and soft landscaping, rail and fence boundary treatment and all associated signage.	Railway Road , Townparks Birr , Co. Offaly	14/04/2023
Offaly county council	22386	The construction of 7 no. Industrial units, entrance and all ancillary site works located to the rear and side of existing industrial units.	Units 1-6 Syngefield Industrial Estate , Clonoghil Upper , Birr Co. Offaly	31/08/2023
Tipperary County Council	NA0617 (ABP Ref. 318213)	Whether the permanent removal of 3.9 hectares of coniferous Sitka Spruce forestry for the purposes of nature conservation and environmental protection at Scohaboy Bog Natural Heritage Area (NHA) (site code 00937) Co. Tipperary is development and if it is development whether or not it is exempted development or requires consent of the local authority.	Scohaboy Bog Natural Heritage Area, Co. Tipperary.	Case is due to be decided by 29/01/2024
Offaly County Council	21599 (ABP Ref. 312650)	Filling quarried land with topsoil, subsoil to raise level of land for agricultural purposes.	Glasshouse, Shinrone, Co. Offaly.	21/03/2023

Planning Authority	Application number	Proposal	Address	Decision Date
Offaly County Council	16/145 (ABP Ref. 247027)	Upgrade Birr Water Supply Scheme comprising refurbishment of 2-storey masonry WTP building, demolition of open sludge lagoon, construct new WTP process building, new tank structures.	Seefin, Birr, Co. Offaly.	03/11/2016
Housing developments				
Offaly county council	22274	The following: erection of a fully serviced residential housing development of 40 units, consisting of 4.no single storey semi-detached 2 bedroom bungalows, 2 no. Single storey mid-terrace 1 bedroom bungalows, 20.no. 3 bedroom 2 storey semi-detached houses, 6.no. 3 bedroom 2 storey mid-terrace houses and 8. No. 1 bedroom apartments in 4 no. 2 storey semi-detached blocks, with all associated site services, landscaping, site works, boundary treatments, and new access.	Lands To The East Of And Accessed Via The Existing Development At Forest View, Banagher Road R439 Townparks Birr, Co. Offaly	26/10/2023
Offaly county council	22356	Change of use of the former three-storey over basement mill building, from resource and leisure use to 12 no. Self-contained apartments comprised of 5 no. One bed apartments and 7 no. Studio units, with alterations to existing elevations and layout.	The Maltings Castle Street Townparks , Birr , Co. Offaly	09/03/2023
Tipperary County Council	20612 (ABP Ref, 310643)	Construction of 6 no. two-storey semi-detached dwelling houses, new boundaries, inclusive of connection to the existing estate foul and storm drainage and all associated site works.	Ballyloughnane , Riverstown , Birr Co. Tipperary.	17/11/2021
Tipperary County Council	20614 (ABP Ref. 310679)	Construction of 4 no. two storey semi-detached dwelling houses, new boundaries inclusive of connection to the existing estate foul and storm drainage and all associated site works.	Ballyloughnane , Riverstown , Birr Co. Tipperary.	21/10/2021
Offaly County Council	2460120	The construction of 58 total no. residential units comprising of: (A) 2no. three-bedroom two-storey semi-detached (Type H); 1no. 2-bedroom bungalow (Type L2); 10no. 1&2-bedroom terraced bungalows in three blocks (Type L3/L4); 12no. two-bedroom two-storey	Townparks & Seefin , Birr , Co. Offaly	Undecided
Offaly County Council	2460122	The construction of 66 total no. residential units comprising of: (A) 20no. dwellings, comprising of 8no. four-bedroom two-storey detached houses (Type A); 8no. four-bedroom two-storey semi-detached houses (Type B1/B2); 2no. two-storey three-bedroom dual	Railway Road Townparks & Seefin , Birr , Co. Offaly	Undecided

Note: 'Development Description' field was truncated by the Planning Authority when providing data to the NPDP.

A targeted review of all existing, permitted and undecided wind farms has been conducted based on data provided by TOBIN to provide a list of wind farm development across Offaly and Tipperary and are listed in **Table 4.2**.

Table 4.2 Relevant Wind Farm Planning Applications within 20km of the Wind Farm Site.

Wind Farm	Consenting Authority	Planning Reference	Decision	No. Turbines	Distance from site approx. km
Carrig Wind Farm	ACP	318689	Granted June 2025	7	c.1.5 km
Skehanagh Wind Farm	Tipperary	5123495	Granted (Conditional)	5	c.2.8 km
Meenwaun Wind Farm	ACP	PL.19.2449	Granted (Conditional)	5	c.13 km
Domestic	Offaly	06/1508	Granted (Conditional)	1	c.17.5 km
Derrinlough Wind Farm	ACP	306706	Granted (Conditional)	21	c.17.5 km
Cush Wind Farm	ACP	318816-24	Granted November 2024	8	c.17.5 km
Cloghan Wind Farm	ACP	244053, PL19.24405	Grant permission with revised conditions	9	c.17.5 km
Monaincha Bog wind Farm	Tipperary	3510957	Granted (Conditional)	10	c.17.5 km

The nearest proposed Wind Farm to the site is Carraig Wind Farm located 2.8 km northwest of the proposed wind farm site. Conditional planning was granted in June 2025. The 7 turbines will have a maximum height of 185 m, maximum rotor diameter of 163 m and a minimum hub height of 103.5 m.

The nearest operational wind farm to the proposed wind farm is Skehanagh, located approximately 1.5 km southwest. Skehanagh Wind Farm has been in operation since 2006. The site consists of 5 Vestas V52 turbines.

The next most proximal operational wind farm is Meenwaun Wind Farm 13 km to the north. All other entries in **Table 4.2**, directly north of Meenwaun, are all directly adjacent to one another and are approximately 17.5 km north of the site.

The potential for negative effects on bats due to collision/barotrauma from turbines is reflected within the collision risk assessment presented in **Section 4.2.1.1** above (which follows NatureScot, 2021) and considers the size and proximity of turbines in the surrounding landscape.

The potential for significant cumulative effects on bats has been considered, and cumulative effects are not anticipated.

5 Mitigation Measures

The proposed mitigation measures applicable to the construction and operational phases of the proposed wind energy development at Ballincor are discussed in detail below.

5.1 CONSTRUCTION PHASE MITIGATION

Measures which will be implemented as part of the construction phase are outlined below, in relation to the wind farm site, the TDR and GCR.

5.1.1 Wind Farm Site

5.1.1.1 Structures

NatureScot (2021) recommends that key roosting features which could support maternity roosts and significant hibernation and/or swarming sites on a wind farm site be identified in a search area extending to 200m plus one rotor radius from the “site boundary”. The potential for significant roosts was investigated within an area extending to a minimum of 300m from the ‘redline’ boundary (as it relates to turbines).

A comprehensive survey effort was carried out in relation to potential roost features in structures following Collins (2023). No ‘significant’ roosting (e.g. maternity or hibernation) was identified (**Section 3.3.3**). Structures identified with small roosts detailed in **Section 3.3.3** are not proposed for removal as part of the current design. Given that there will be no impact on the roosts with the current site design (**Section 4.1.1.2**) there is no need for mitigation or Derogation under Regulation 54.

5.1.1.2 Vegetation clearance

Sections of hedgerow (WL1) and coniferous plantation (WD4) habitat removal is required to accommodate the development of the new site access roads. The implementation of the bat buffers will require the removal of coniferous plantation at T3 and T1. There will be removal of mixed woodland required at T8 and T9, For the purpose of bat buffers hedgerow and treelines (linear features) will be removed at T1, T5, T6, T7 T10, and T11. Linear features which will be removed to establish bat buffers and areas for the replanting of linear features are shown in **Figure 5.1**

The removal of trees in order to implement the bat mitigation buffers will result in the loss of 12 trees containing PRF-I features. Following Collins (2023) no further survey is warranted in relation to PRF-I features in trees. However, PRF-I features in trees may be used on a transitory basis by a small number of bats exhibiting fission-fusion behaviour during which they can occupy roosts for only a small number of days/nights (Kaňuch et al. 2022). The absence of roosting bats will be confirmed immediately prior to the removal of these trees with an internal inspection of the potential roost features. These trees will not be removed during the hibernation period (November – March inclusive) to avoid the potential for disturbance effects on any bats which may be in torpor.

To mitigate the removal of roosting features suitable for roosting by small numbers of bats, eight bat boxes will be erected at suitable locations outside of the buffer zones identified above, in consultation with a bat-licensed Ecologist. ‘Woodcrete’ bat boxes will be used as they are durable and long-lasting and do not require maintenance. A mixture of bat box types should be used to cater for seasonal and species requirements. The following products (or similar) are suitable:

- Schwegler 1FS Colony Bat Box 95
- Schwegler 2F Universal Bat Box

- Schwegler 2FN Bat Box 55.

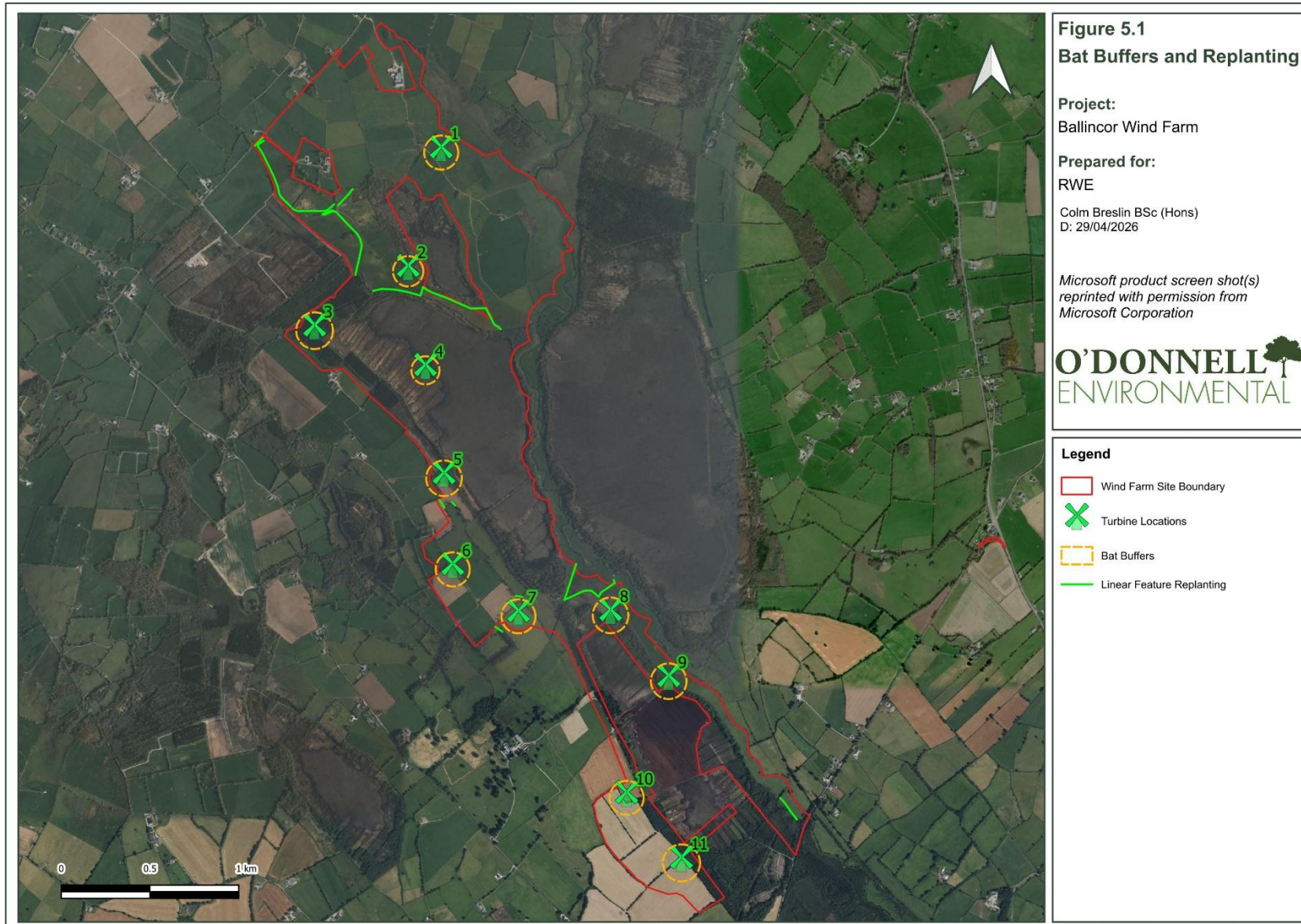
Bat boxes should be installed on suitably large trees or specially installed poles in consultation with a bat-licensed Ecologist. Boxes should be installed at a minimum height of 4 meters above ground level, at suitable aspects (not northern) and in locations which are inaccessible to unaided climbing (to minimise the risk of vandalism) and not vulnerable to artificial light or noise pollution.

As outlined above, a robust and appropriate survey effort was carried out and no evidence of bat roosting, current or historic, was identified within trees scheduled for removal. However, given the likelihood of delays between reporting and the commencement of construction, and with cognisance of CIEEM guidance on the recommended lifespan of ecological data in relation to mobile species (CIEEM, 2019), pre-construction surveys are appropriated to establish if the baseline conditions reported herein remain valid. Prior to commencement of tree felling, survey will be carried out following Collins (2023) by a bat-licensed Ecologist. If required, a Regulation 54 Derogation will be secured in advance of any tree-felling works, and appropriate mitigation measures will be put in place to avoid or reduce impacts on bats.

5.1.1.3 Lighting

Construction operations will take place during the hours of daylight in as far as possible to minimise disturbances to bats and other wildlife. It is recognised that key works such as turbine delivery and erection may require night-time working. Where working at night is required the reduction of light levels or application of motion sensor lights will be used where bat foraging habitat is present. All construction phase lighting systems will be designed to minimise nuisance through light spillage and follow ILP (2023) guidance. Shielded, downward directed lighting will be used wherever possible and all non-essential lighting will be switched off during the hours of darkness.

Directional lighting will be used to prevent overspill on to forestry/woodland edges, riparian zones or other habitat features of importance to bats. This will be achieved with the use of covers and shields (baffles, hoods or louvres) to reduce light spill and direct lighting to the intended area only. Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats. Only luminaires with an upward light ratio of 0% and with good optical control will be used. Luminaires will be mounted on the horizontal, i.e. no upward tilt.



5.1.2 Turbine Delivery Route Mitigation

Enabling works along the proposed TDR will result in the loss of 22m of tree line to facilitate the construction. Although no evidence of current or historic roosting by bats was recorded along the TDR at the time of survey, the assessment was based on the design information to date and will be subject to future assessment and application.

The majority of the TDR is composed of the M7 Motorway and N69 National Road. The final section of the route is along the R445, N62, and R492. While there are many river crossings and bridges along this route there are no works required on bridges or other features likely to support roosting bats in order to facilitate the delivery. No impact is anticipated on roosting bats as a result of future works along the TDR, and no mitigation measures are considered warranted based on current information.

5.1.3 Grid Connection Route Mitigation

No trees of 'PRF-M' suitability were recorded along either grid connection route assessed. Additionally, no tree clearance or tree trimming works are proposed to facilitate the grid connection. Due to the limited and temporary nature of the works proposed, no further surveys (following Collins, 2026), or other mitigation measures are considered necessary. Should a delay of more than 18 months occur between survey and the proposed works, it is recommended that a repeat assessment be carried out given the potential for ecological context to change over time. Horizontal Directional Drilling (HDD) is proposed for bridges B04 and B08.

Bat roosting has been confirmed within a fissure within the bridge B08 along the GCR. Droppings were identified within the fissure and these confirmed as Brown Long-eared Bat droppings through subsequent DNA analysis (**Appendix B**).

Information on the ecological sensitivity of bridge 'B08' was communicated to the Client and TOBIN Consulting Engineers, with a 'mitigate-by-design' approach adopted in order to avoid potential noise and disturbance effects on this roosting space. A drilling profile was developed which avoids any likely disturbance on roosting bats.

Based on the bridge design and experience of TOBIN Engineers, Bridge 'B08' is assumed to have a foundation depth of 1m below the drainage channel level. A minimum separation distance between the drill trajectory and the foundation of the bridge of 4 metres has been achieved, in order to eliminate the possibility of effects on roosting bats as a result of vibration being carried through the bridge structure.

A minimum separation of 45m between the launch and receptor pits is available and this is considered sufficient to minimise potential for noise and vibrational impacts on any bats roosting within the bridge during directional drilling. No other works will take place within the area between the launch and receptor pits (i.e., an approximately 45m exclusion area surrounding bridge 'B08') and no sources of noise and vibration disturbances, such as generators, welfare facilities etc. will be located within the areas between the launch and receptor pits. Hoarding or acoustic blankets to a height of the parapet wall will be provided prior to the commencement of work between both pits and the barrel facing the proposed works to reduce noise and visual cues.

The effect of the HDD considering the above avoidance and mitigation measures is to reduce noise and vibration levels during the directional drilling process to below that level already experienced on an ongoing basis as a result of existing road traffic etc.

In order to ensure the above measures are implemented as outlined, an Ecologist will supervise the directional drill at this location. No further measures are considered warranted.

Given this separation distance allowed between source and receptor, and the locations of roosts within enclosed crevices within the barrels of the bridge, the likelihood of disturbance effects on roosting bats as a result of the installation of the grid cable at Bridge 'B08' is considered to be negligible.

5.1.4 Regulation 54 Derogation

A 'Regulation 54 Derogation' issued under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011-2021 is required where deliberate disturbance to bats or their roosts is likely to occur (Marnell et al., 2022). Based on current information, a mitigation by design approach and proposed avoidance measures, a derogation issued under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 is not required to facilitate the proposed works.

5.2 OPERATIONAL PHASE MITIGATION

A 'High' level of overall collision risk has not been identified for any bat species in any of the bat activity seasons. Based on best available scientific information, a 'Medium' overall collision risk level has been identified in relation to high-collision-risk bat species, across all three activity seasons, with the exception of a 'Low' risk for Nathusius' Pipistrelle. The limitations of the assessment procedure and knowledge gaps in relation to bats and wind farms are acknowledged herein, particularly in an Irish context.

5.2.1 Feature Buffers

NatureScot (2021) recommends a minimum 50m buffer from the blade tip to the nearest key habitat features (e.g. woodland, hedgerow etc.) to be implemented to avoid encouraging bat activity within the 'blade-swept' area. These areas will be maintained vegetation-free during the operational life of the development. A methodology for determining the clearance area at ground level is presented in NatureScot (2021). The clearance area surrounding each individual turbine was calculated using the formula presented in **Figure 5.2**. Given that the buffer of turbines from features must be maintained for the lifetime of the projects, areas of plantation were assessed based on a potential final harvest height of trees (25 m). Following the precautionary principle, the largest turbine specifications outlined in **Section 1.1** above were modelled in relation to the maximum height of surrounding vegetation. Given that the prescribed buffer from NatureScot (2021) is a minimum stand-off to reduce bat foraging, the largest buffer is applied as mitigation to ensure this minimum standard is met regardless of the final turbine design.

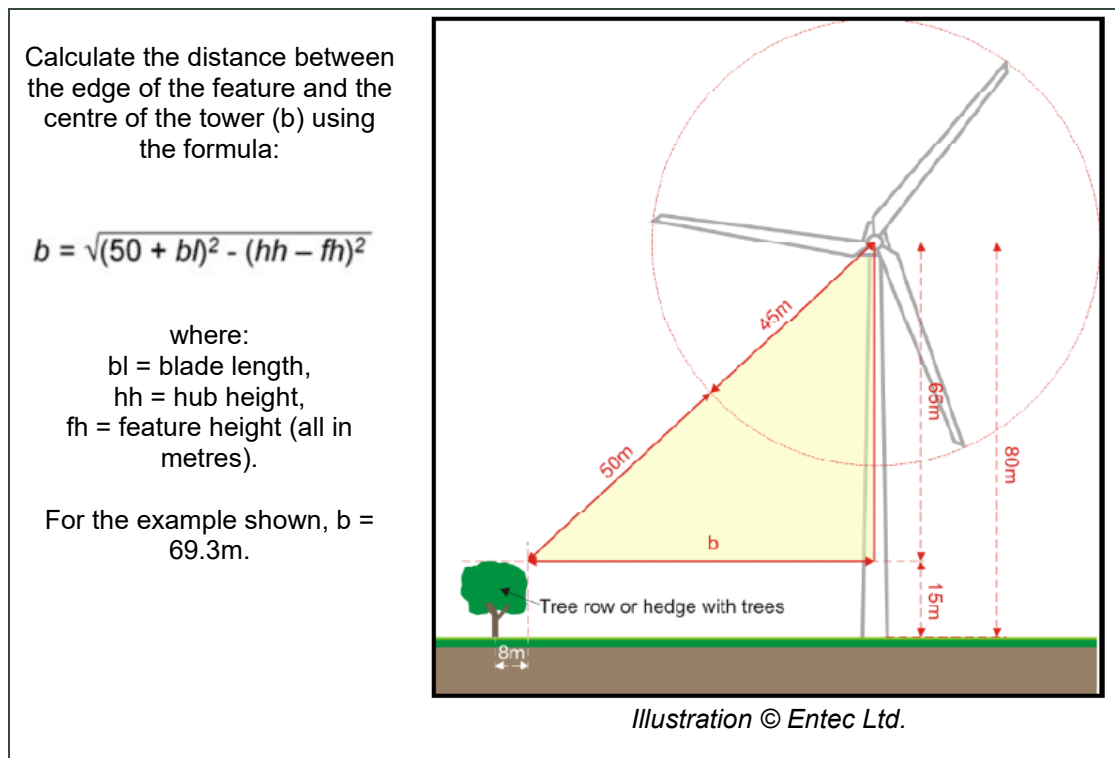


Figure 5.2 Methodology for determining the clearance area at ground level (NatureScot, 2021).

Based on turbine dimensions and vegetation characteristics, the output summarised in **Table 5.1** shows the recommended buffers surrounding each turbine. Vegetation clearance and the culverting/realignment of drainage ditches will be implemented to these buffer specifications up to the redline boundary, and these areas will be maintained free from woodland, hedgerows, treelines or surface water throughout the operational phase of the wind farm. O'Donnell Environmental Ecologists engaged with the project design team to design a treeline and hedgerow planting strategy to maintain landscape connectivity for bats following clearance of vegetation for 'bat-buffers'. Allowance will be made for replanting of vegetation removed for the purposes of this buffer throughout the windfarm site. This linear feature replanting will be carried out in the first planting season (winter) following commencement of works.

In addition to the creation of vegetation buffers between the proposed turbines and surrounding vegetation (discussed above) reduced rotation speed will be implemented when turbines are idling. 'Feathering' of idling blades may reduce incidental fatality rates by up to 50% and does not result in loss of output (NatureScot, 2021). No additional control measures to avoid/reduce collision related bat fatalities are considered warranted in this instance.

Table 5.1 Minimum buffers required at turbine locations based on the surrounding habitats.

Turbine	Nearest feature(s) & estimate potential max final height	Feature Buffer (m)
T1	Treeline 15 m	95.88
T2	Scrub 5 m	85.39
T3	Sitka spruce plantation 25 m	104.37
T4	No features within any buffer distance	79.17
T5	Treeline & Woodland 20 m	100.34
T6	Treeline & Hedgerow 15 m	95.88
T7	Hedgerow 5 m & Trees 15 m	95.88
T8	Drainage Ditch 0 m & Woodland 20 m	100.34
T9	Drainage Ditch 0 m & Woodland 20 m	100.34
T10	Hedgerow 5 m & Woodland 15 m	95.88
T11	Treeline 15 m & Mixed Plantation 25 m	104.37

5.2.2 Lighting

With the exception of aviation lighting (see Chapter 2 of EIAR) no external lighting is proposed with the exception of security lighting at the proposed substation. Permanent lighting systems will be designed in accordance with ILP (2023)³ in order to minimise nuisance through light spillage. All non-essential lighting will be switched off during the hours of darkness. No artificial lighting will illuminate any trees or structures with potential to be used by roosting bats to prevent disturbance upon emergence and re-entry. To reduce the ecological disturbance from artificial lighting, the following guidance is recommended:

- Reduce non-essential external night lighting
- Lower the angle of external night lighting
- Use of LEDs, as these emit minimal ultra-violet light
- White and blue wavelengths should be avoided; wavelength will be <2,700 kelvin
- Lights should peak higher than 550nm.

5.2.3 Post Construction Monitoring

NatureScot (2021) recommends post-construction monitoring is carried out in at least three years post-construction, but not necessarily consecutive years. Post-construction monitoring aims to assess changes in bat activity patterns relative to baseline level (e.g. in response to landscape changes such as land management and forestry rotation) and the efficacy of mitigation to inform any changes which may be required to curtailment strategy.

Post-construction monitoring requires a robust pre-construction baseline dataset for comparison, and NIEA (2024) recommends a 2-year validity period in relation to bat activity data at onshore wind farms. A 10-year permission is sought, and therefore to ensure a robust and reliable baseline dataset is available for future comparison, the passive bat survey methodology outlined above (three seasonal rounds of passive surveys utilising at least 10 monitoring points) will be repeated in advance of commencement of significant construction should construction commence in 2028 or beyond.

³ <https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/>

Post-construction fatality monitoring and activity surveys will be carried out in years 1, 2, 3, 5 and 10 post-construction, and will consist of:

- Passive bat monitoring at all turbine locations in order to monitor changes in activity levels relative to pre-construction baseline information (presented herein).
- Fatality monitoring following the methodology presented in Appendix 4 of NatureScot (2021) or subsequent updates.
- Monitoring of proposed bat boxes by a bat-licensed Ecologist, and relocation of any boxes with no evidence of use in the first year after construction.

Monitoring of linear replanting features (see **Figure 5.1**) will be carried out in the above years to ensure successful establishment of replacement linear features. Any failed plants will be replaced in the first planting season following each monitoring inspection.

Post-construction monitoring data will be analysed and presented in report format to the planning authority. Recommendations will be made in relation to a curtailment strategy if required.

5.3 DECOMMISSIONING PHASE MITIGATION

The potential for impacts during decommissioning is similar in nature, if not in scope, to those assessed for the Construction Phase. All decommissioning works will be governed by the same requirements to control run-off or potential pollution to watercourses (feeding resources for bats) as have been implemented during the construction phase. Any site compound will need to conform to the construction phase mitigation measures including those related to lighting design. Decommissioning phase works will include the reestablishment of woodland and linear features removed during the construction phase.

6 Residual Effects

The avoidance and mitigation measures described for the proposed Ballincor Wind Farm have been designed to minimise the impact of the development on the local bat population, from the construction of the wind farm infrastructure including the GCR and TDR, through the operational phase and onto decommissioning. In the absence of mitigation, the proposed development would have a **'slight' negative effect** on bats at a local level during both the construction and operational phases (EPA, 2022).

The proposed measures are expected to avoid or significantly reduce the likelihood of any significant impacts occurring on bats as a result of the construction and operation of the proposed wind farm. Ongoing monitoring and implementation of the mitigation measures will ensure the preservation and future stability of the surrounding foraging and commuting habitats for bats.

With the implementation of the above detailed mitigation measures it is concluded that the development will have an **'imperceptible', negative effect** on the bat population at a local level, following EPA (2022). This effect is fully reversible following decommissioning and reinstatement.

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Appendix A – Weather Data

Date	Time	Temp - °C	Wind Speed - km/h	Rain - mm	Suitable Survey Nights	
Summer 2024						
31/07/2024	20:00:00	20	5	0	1	
31/07/2024	21:00:00	18	3	0		
31/07/2024	22:00:00	16	2	0		
31/07/2024	23:00:00	15	0	0		
01/08/2024	00:00:00	15	0	0		
01/08/2024	01:00:00	15	0	0		
01/08/2024	02:00:00	15	0	0		
01/08/2024	03:00:00	15	0	0		
01/08/2024	04:00:00	15	0	0		
01/08/2024	05:00:00	16	2	0		
01/08/2024	06:00:00	15	0	0		
01/08/2024	07:00:00	14	0	0		
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01/08/2024	21:00:00	20	0	0		
01/08/2024	22:00:00	18	0	0		
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04/08/2024	00:00:00	14	5	0	3	
04/08/2024	01:00:00	13	6	0		
04/08/2024	02:00:00	14	6	0		

04/08/2024	03:00:00	13	6	0.2	
04/08/2024	04:00:00	13	6	0.2	
04/08/2024	05:00:00	13	6	0.4	
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2					

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24/09/2024	23:00:00	8	2	0		
25/09/2024	00:00:00	7	2	0		
25/09/2024	01:00:00	6	2	0		
25/09/2024	02:00:00	6	0	0		
25/09/2024	03:00:00	6	0	0		

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25/09/2024	23:00:00	9	13	0	
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26/09/2024	02:00:00	9	13	0	
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29/09/2024	05:00:00	10	11	0	
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01/10/2024	02:00:00	8	5	0	
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03/10/2024	00:00:00	11	6	0	
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03/10/2024	02:00:00	11	2	0	
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06/10/2024	04:00:00	13	18	0	
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06/10/2024	06:00:00	13	10	0	

29

30

31

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Spring 2025					
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06/04/2025	23:00	6	2	0
07/04/2025	00:00	5	2	0
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10/04/2025	01:00	2	0	0
10/04/2025	02:00	1	0	0
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10/04/2025	06:00	-2	0	0	
10/04/2025	07:00	-2	0	0	
10/04/2025	20:00	18	0	0	
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13/04/2025	21:00	8	6	0	
13/04/2025	22:00	7	3	0	
13/04/2025	23:00	7	5	0	

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14/04/2025	01:00	7	5	0										
14/04/2025	02:00	6	5	0										
14/04/2025	03:00	5	5	0										
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14/04/2025	07:00	--	0	0										
14/04/2025	08:00	--	0	0										
14/04/2025	09:00	--	0	0										
16/04/2025	20:00	10	10	0										
16/04/2025	21:00	8	5	0										
16/04/2025	22:00	4	2	0										
16/04/2025	23:00	2	2	0										
17/04/2025	00:00	1	2	0										
17/04/2025	01:00	1	2	0										
17/04/2025	02:00	0	2	0										
17/04/2025	03:00	-1	0	0										
17/04/2025	04:00	-1	2	0										
17/04/2025	05:00	-1	0	0										
17/04/2025	06:00	-1	3	0										
17/04/2025	07:00	-1	3	0										
17/04/2025	20:00	8	2	0										
17/04/2025	21:00	8	0	0										
17/04/2025	22:00	7	0	0										
17/04/2025	23:00	6	0	0										
18/04/2025	00:00	6	2	0					3					
18/04/2025	01:00	6	0	0						3				
18/04/2025	02:00	7	5	0.4							3			
18/04/2025	03:00	7	5	0.8								3		
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18/04/2025	05:00	6	10	1										3
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18/04/2025	21:00	9	11	0.2										
18/04/2025	22:00	9	10	0.2										
18/04/2025	23:00	10	8	0										
19/04/2025	00:00	10	6	0										
19/04/2025	01:00	10	8	0.2										
19/04/2025	02:00	10	8	1.4										
19/04/2025	03:00	9	8	1.8										
19/04/2025	04:00	9	8	1.6										

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19/04/2025	06:00	9	8	1.8	
19/04/2025	07:00	9	8	1.2	
19/04/2025	20:00	11	6	0	4
19/04/2025	21:00	10	5	0	
19/04/2025	22:00	10	6	0	
19/04/2025	23:00	10	2	0	
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21/04/2025	00:00	9	0	0	
21/04/2025	01:00	8	3	0	
21/04/2025	02:00	8	3	0.2	
21/04/2025	03:00	8	5	0.2	
21/04/2025	04:00	7	5	0.6	
21/04/2025	05:00	8	5	0.2	
21/04/2025	06:00	8	5	0	
21/04/2025	07:00	8	6	0.2	
21/04/2025	20:00	11	5	0	6
21/04/2025	21:00	9	0	0	
21/04/2025	22:00	7	2	0	
21/04/2025	23:00	5	2	0	
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22/04/2025	21:00	10	10	0	
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22/04/2025	23:00	9	6	0	

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23/04/2025	01:00	8	0	0	
23/04/2025	02:00	8	0	0	
23/04/2025	03:00	8	0	0	
23/04/2025	04:00	8	3	0	
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24/04/2025	07:00	9	8	0	
24/04/2025	20:00	12	19	0	9
24/04/2025	21:00	12	18	0.2	
24/04/2025	22:00	11	18	0.4	
24/04/2025	23:00	11	14	0.8	
25/04/2025	00:00	11	13	1	
25/04/2025	01:00	11	14	2.4	
25/04/2025	02:00	11	16	2.2	
25/04/2025	03:00	11	18	0.8	
25/04/2025	04:00	11	14	0.4	
25/04/2025	05:00	11	14	0.6	
25/04/2025	06:00	11	16	0.4	
25/04/2025	07:00	11	16	0.2	
25/04/2025	20:00	12	3	0.8	10
25/04/2025	21:00	11	0	1	
25/04/2025	22:00	11	0	1	
25/04/2025	23:00	11	0	0	
26/04/2025	00:00	11	0	0	
26/04/2025	01:00	11	2	0.2	
26/04/2025	02:00	11	0	0	
26/04/2025	03:00	10	2	0	
26/04/2025	04:00	10	2	0	
26/04/2025	05:00	9	2	0	

26/04/2025	06:00	8	2	0.2	11
26/04/2025	07:00	7	2	0	
26/04/2025	20:00	15	14	0	
26/04/2025	21:00	14	13	0	
26/04/2025	22:00	13	13	0	
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27/04/2025	00:00	12	13	0	
27/04/2025	01:00	12	10	0	
27/04/2025	02:00	12	11	0	
27/04/2025	03:00	12	14	0	
27/04/2025	04:00	12	13	0	
27/04/2025	05:00	13	11	0	
27/04/2025	06:00	13	11	0	
27/04/2025	07:00	13	16	0	
27/04/2025	20:00	15	14	0	
27/04/2025	21:00	14	16	0	
27/04/2025	22:00	14	11	0	
27/04/2025	23:00	13	8	0	
28/04/2025	00:00	13	11	0	
28/04/2025	01:00	12	10	0	
28/04/2025	02:00	13	5	0	
28/04/2025	03:00	12	5	0	
28/04/2025	04:00	12	6	0	
28/04/2025	05:00	12	10	0	
28/04/2025	06:00	11	6	0	
28/04/2025	07:00	11	8	0	
28/04/2025	20:00	15	11	0	
28/04/2025	21:00	13	6	0	
28/04/2025	22:00	12	2	0	
28/04/2025	23:00	11	8	0	
29/04/2025	00:00	10	5	0	
29/04/2025	01:00	9	2	0	
29/04/2025	02:00	9	2	0	
29/04/2025	03:00	7	2	0	
29/04/2025	04:00	7	0	0	
29/04/2025	05:00	6	0	0	
29/04/2025	06:00	5	2	0	
29/04/2025	07:00	6	2	0	
					12
					13

Appendix B – DNA Analysis Report

Folio No: 148-2025
Purchase Order: 202425
Contact: O'DONNELL ENVIRONMENTAL LTD
Issue Date: 23.04.2025
Received Date: 07.04.2025

Biological Report

Technical Report

Folio No: 148-2025
Purchase Order: 202425
Contact: O'DONNELL ENVIRONMENTAL LTD
Issue Date: 23.04.2025
Received Date: 07.04.2025

Biological Sample Analysis

Summary

Most biological materials (tissue, feces, hair, blood, etc.) contain small amounts of DNA from the organism of which it originated. Using molecular methods such as PCR (polymerase chain reaction) and DNA sequencing, SureScreen Scientifics are able to analyze an unknown sample to determine which species the sample originates from our methods are optimized for the detection of species including bats (over 92% of bat species worldwide can be identified including all 18 UK bat species), mammals; bees, wasps & hornets; birds; fish; plants (from roots, leaves, stem and even dried wood) and many more species.

Results

Lab ID	Site Name	OS Reference	Sample Type	Species Name	Match(%)
B4549	A 202425	N 04571 02978	Bat Dropping	Inconclusive	-
Genetic Sequence -					
B4550	B 202425	N 04571 02978	Bat Dropping	Inconclusive	-
Genetic Sequence -					
B4551	C 202425	N 04571 02978	Bat Dropping	Brown long-eared bat (Plecotus auritus)	100.00
Genetic Sequence AAGGCTTCGGGAAGCTGATTGGTGCCACTAATAATTGGAGCCCCTGATATAGCTTTTCCCCGAATAAATAACATAAG CTTCTGACTGCTTCCCCCATCTTTTCTACTACTTTTAGCTTCGTCTGCAGTAGAGGCTGGAGCAGGTACCGGTTGAA CAGTCTATCCTCTTAGCGGGAAATCT					

Matters affecting result: none
Reported by: Chelsea Warner

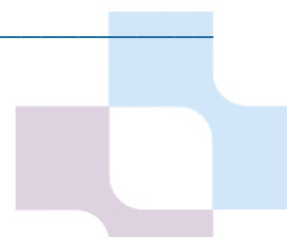
Approved by: Chelsea Warner

Methodology

Once samples have arrived in the laboratory, the DNA is isolated using a commercial DNA extraction kit. Using PCR, DNA (if present within the sample) is amplified using universal molecular markers designed to amplify a short fragment of the DNA of the target species group (i.e. mammal, fish, arthropod, reptile, plant etc.). If amplification is successful, the resulting DNA sequence is revealed using a process known as Sanger Sequencing in order to obtain the genetic sequence of the mitochondrial gene within the sample. The sequence results are aligned against a library of known reference sequences using bioinformatics software, which enables us to determine which species the DNA sequence from the sample matches with, informing the species identity and sequence similarity (match %). If the initial analysis is unsuccessful, the entire process is repeated up to two additional times with a fresh reserve sample (if available) in order to obtain a species identification. If no DNA is detected after three attempts, then we can be confident that any further analysis of the sample will likely also fail to result in species identification.

Interpretation of Results

- Sample Type:** The sample you send to us can come from a variety of sources. Fecal, dropping, urine, hair, blood, carcass (skin, flesh, bone), gamete, plant matter or unknown biological material all contain DNA that we can test for in order to identify the species of origin.
- Genetic Sequence:** The unique DNA sequence obtained from the sample.
- Match (%):** How closely matched the DNA sequence from your sample is to the sequences within our reference database. This can be interpreted as a score of result accuracy, with the maximum score of 100% indicating an exact match of the sample to the indicated species' reference sequence. Lower scores (80-99%) indicate some variation between the sample and reference sequence, likely due to natural variation between individual genetic sequences and/or systematic variations generated through the sequencing process. Scores below 80% similarity should be interpreted with care and can indicate part degraded or part contaminated samples.
- Inconclusive Result:**
- Degraded sample:**
DNA is degraded and we are unable to determine species identification due to degradation of sample DNA. This can happen either before sample collection (old samples, exposure to UV etc.) or after sample collection if stored for long periods before analysis or not handled correctly.
- Inhibited/contaminated sample:**
We are unable to determine species identity due to contamination or the suspected presence of large quantities of PCR inhibitors. Contamination sources can originate from other species which could have come into contact with the samples, or human contamination during sample collection.
- Alternative Result:**
Sometimes, for targets such as bat dropping analysis, other mammalian species such as rodents are detected. We find this to be a common occurrence as some bat droppings can be similar in appearance to rodent droppings. Although sometimes unexpected, repeat analyses in these cases would likely return the same results.



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