



APPENDIX 6-2

BAT SURVEY REPORT

Appendix 6-2 – Bat Survey Report

Cahermurphy West Wind
Farm, Co. Clare



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APPENDICES

Appendix 1 - Bat Habitat Suitability Appraisal

Appendix 2 - Site Risk Assessment

Appendix 3 - Overall Site Risk Assessment

Appendix 4 - 2023 Bat Survey Results

1. INTRODUCTION

MKO was commissioned to undertake a comprehensive bat impact assessment to inform a planning application for a proposed renewable energy development at Cahermurphy, County Clare. This report presents the results of 2025 bat surveys, detailing the survey design, methodologies, and findings. It also includes an assessment of potential effects on bats and outlines mitigation measures designed to avoid or minimise significant impacts.

Surveys were carried out throughout 2025, based on a layout comprising eight turbines. The methodology followed industry best practice, primarily NatureScot (2021), and employed a combination of approaches, including desktop study, habitat and landscape appraisal, roost surveys, manual transects, and static detector surveys at ground level.

The assessment and recommended mitigation measures have been developed in accordance with NatureScot (2021), with further consideration of the Northern Ireland Environment Agency (NIEA) Natural Environment Division guidance (August 2021, amended April 2024), where relevant.

As detailed in Section 1.1.1 of Chapter 1 of the EIAR, the following terminology is used throughout this report:

- Where the 'Proposed Project' is referred to, this relates to all the project components described in detail in Chapter 4 of this EIAR i.e. Proposed Wind Farm and Proposed Grid Connection.
- Where 'the Site' is referred to, this relates to the primary study area for the EIAR, as delineated by the EIAR Site Boundary in green. Generally, the study area extends beyond the planning application site boundary depending on the requirements of individual assessments. Individual topics for assessment purposes, i.e., each chapter, will indicate the study area used for that topic. The planning application red line boundary occupies a smaller area within the primary EIAR Site Boundary. The EIAR Site Boundary represents the primary area of study and not necessarily areas where proposed works will occur as part of the Proposed Project. The EIAR Site Boundary encompasses an area of approximately 637 hectares (ha). Where the 'Application Site Boundary' is referred to, this refers to the planning application boundaries as shown in Figure 1-4 and Appendices 4-1 and 4-2, of this EIAR. Two planning application boundaries are included for within the Proposed Project, which denote the 'Proposed Wind Farm' and 'Proposed Grid Connection'. Both Application Site Boundaries are shown in Figure 1-4.
- Where the 'Proposed Wind Farm' is referred to, this refers to turbines and associated foundations and hard-standing areas, meteorological mast, site entrance, junction accommodation works, access roads, accommodation works along the turbine delivery route (TDR Works), temporary construction compounds, temporary transition compound, 110kV electrical substation, underground cabling, borrow pits, site drainage, tree felling, biodiversity management and enhancement measures and all ancillary works. The Proposed Wind Farm site (EIAR Site Boundary without corridor that encompasses the Proposed Grid Connection) is shown in Figure 1-2. The Proposed Wind Farm site encompasses an area of approximately 375 hectares (ha). The permanent footprint of the Proposed Wind Farm measures approximately 15.55 ha, which represents approximately 4.1% of the Proposed Wind Farm site.
- Where 'Proposed Grid Connection' is referred to, this refers to the underground 110kV electrical cabling and all associated site development works connecting the Proposed Wind Farm to the existing Moneypoint 110kV electrical substation in the townlands of Carrowdotia South and Carrowdotia North, Co. Clare. The Proposed Grid Connection is shown in Figure 1-3.

A full description of the Proposed Project is provided in Chapter 4 of this EIAR.

1.1 Background

Wind energy is a key component of Ireland's renewable energy strategy; however, operational wind farms may also affect bats through direct mortality and indirect impacts such as habitat loss and disturbance. Global syntheses report bat fatalities at wind farms and highlight potential cumulative, population-level risks (Arnett *et al.*, 2016). In a European context, studies collated by Voigt *et al.* (2022) estimate approximately 1.5-30 bats killed per turbine per year. UK carcass-search data indicate 0-5.25 bats per

turbine per month during peak activity (July–October), with substantial between-site variation (Mathews *et al.*, 2016). While these figures are not directly transferable in an Irish context, the broadly similar bat assemblages of Ireland and Britain make them a useful reference point for assessing potential risks.

Known mechanisms of bat mortality at wind farms include collisions with moving blades (Horn *et al.*, 2008; Cryan *et al.*, 2014) and barotrauma (Baerwald *et al.*, 2008), which refers to internal injuries caused by sudden air pressure changes. Bats may also be attracted to turbines due to behavioural and environmental factors such as habitat associations, mating activity, and weather conditions.

Robust pre-construction bat surveys are undertaken to establish baseline activity and assess the potential risks associated with turbine operation. Survey design and impact assessment were guided by current legislation, scientific literature, and best-practice guidance, with full consideration given to spatial, temporal, and behavioural patterns relevant to bat ecology.

1.2

Bat Survey and Assessment Guidance

A range of guidance documents exists for surveying bats at wind energy developments across Europe, the UK, and Ireland.

At the European level, the Advisory Committee to the EUROBATS Agreement (to which Ireland is a signatory) published the *Guidelines for Consideration of Bats in Wind Farm Projects* (Rodrigues, 2015). These offer a structured framework for assessing potential impacts on bats during planning, construction, and operation. However, as they are based on continental bat assemblages, which differ significantly from those in Ireland, some survey recommendations may not be appropriate for Irish contexts. Nonetheless, they provide a valuable benchmark and encourage the development of locally tailored guidance.

In Ireland, Bat Conservation Ireland (BCI, 2012a) issued the *Wind Turbine/Wind Farm Development Bat Survey Guidelines*, which outline surveyor competencies, health and safety, survey methods, and reporting standards. However, these guidelines are broad and not underpinned by detailed, Ireland-specific data.

The most comprehensive current guidance is *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation* (NatureScot, 2021), which replaced earlier NatureScot and Natural England publications. It provides detailed direction for assessing both direct (collision risk) and indirect impacts, as well as mitigation strategies. It now serves as the standard approach for wind farm assessments in Ireland due to its clarity, structure, and evidence base.

Additional Irish-context recommendations have since been published by the Northern Ireland Environment Agency (NIEA, 2021; amended 2024), building on NatureScot's work and providing further clarification on survey effort, curtailment, and mitigation.

The survey scope and impact assessment presented in this report follow the NatureScot (2021) guidance, with additional reference to the NIEA (2021) recommendations. The most recent edition of the BCT *Bat Surveys for Professional Ecologists* (Collins, 2023) was also used to ensure current best practice was followed throughout.

1.3

Irish Bats: Legislation, Policy and Status

Ireland has nine resident bat species, comprising more than half of Ireland's native terrestrial mammals (Montgomery *et al.*, 2014). All Irish bats are protected under European legislation, namely the Habitats Directive (92/43/EEC). All Irish species are listed under Annex IV of the Directive, requiring strict protection for individuals, their breeding sites and resting places. The lesser horseshoe bat (*Rhinolophus hipposideros*) is further listed under Annex II of the Directive, requiring the designation of conservation areas for the species. Under this Directive, Ireland is obliged to maintain the favourable conservation status of Annex-listed species. This Directive has been transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011, as amended).

In addition, Irish species are further protected by national legislation (Wildlife Acts 1976, as amended). Under this legislation, it is an offence to intentionally disturb, injure or kill a bat, or disturb its roost. Any work at a roost site must be carried out with the agreement of the National Parks and Wildlife Service (NPWS).

The NPWS monitors the conservation status of European protected habitats and species and reports their findings to the European Commission every 6 years in the form of an Article 17 Report. The most recent report for the Republic of Ireland was submitted in 2025. Table 1-1 summarises the current conservation status of Irish bat species and identified threats to Irish bat populations.

Table 1-1 Irish bat species conservation status and threats (NPWS, 2025). 'Influence' of pressures and threats are ranked from Low to High in the 2025 Article 17 report.

Bat Species	Conservation Status	Principal Pressures and Threats
Common pipistrelle <i>Pipistrellus pipistrellus</i>	Favourable	PX04 No pressures or threats
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	Favourable	PX04 No pressures or threats
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	Unknown	PD01 Wind, wave and tidal power (including infrastructure)
Leisler's bat <i>Nyctalus leisleri</i>	Favourable	PD01 Wind, wave and tidal power (including infrastructure) - <i>Low</i> PF02 Construction or modification (e.g. of housing and settlements) in existing built-up areas - <i>Low</i>
Daubenton's bat <i>Myotis daubentoni</i>	Favourable	PA22 Drainage for use as agricultural land - <i>Medium</i> PF12 Residential, commercial and industrial activities and structures generating noise, light, heat or other forms of pollution - <i>Medium</i>
Natterer's bat <i>Myotis nattereri</i>	Favourable	PA04 Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) - <i>Low</i> PB09 Clear-cutting, removal of all trees - <i>Low</i> PE01 Roads, paths, railroads and related infrastructure - <i>Low</i> PF01 Conversion from other land uses to built-up areas - <i>Low</i> PF02 Construction or modification (e.g. of housing and settlements) in existing built-up areas - <i>Low</i>
Whiskered bat <i>Myotis mystacinus</i>	Favourable	PA04 Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) - <i>Low</i> PB09 Clear-cutting, removal of all trees - <i>Low</i> PE01 Roads, paths, railroads and related infrastructure - <i>Low</i> PF01 Conversion from other land uses to built-up areas - <i>Low</i> PF02 Construction or modification (e.g. of housing and settlements) in existing built-up areas - <i>Low</i>
Brown long-eared bat <i>Plecotus auritus</i>	Favourable	PX04 No pressures or threats
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	Inadequate	PA04 Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) - <i>Medium</i> PA15 Use of other pest control methods in agriculture (excluding tillage) - <i>Medium</i> PB09 Clear-cutting, removal of all trees - <i>Medium</i> PE01 Roads, paths, railroads and related infrastructure - <i>Medium</i> PF01 Conversion from other land uses to built-up areas - <i>Medium</i> PF02 Construction or modification (e.g. of housing and settlements) in existing built-up areas - <i>Medium</i> PF13 Drainage, land reclamation and conversion of wetlands, marshes, bogs, etc. for built-up areas - <i>Low</i> PH04 Vandalism or arson (incl. human introduced wild fire) - <i>Low</i> PJ01 Temperature changes and extremes due to climate change - <i>Low</i> PM07 Natural processes without direct or indirect influence from human activities or climate change - <i>Low</i>

Statement of Authority

MKO's Ecology team includes a dedicated bat unit with expertise in scoping, conducting, and reporting bat surveys, as well as preparing impact assessments. All ecologists hold relevant academic qualifications, licences, and training to meet required survey standards.

Survey scoping was prepared by Ryan Connors. Bat surveys were carried out by Clare Mifsud, Marie Greaney and Noel Fahy. Data manual ID were carried out by Marie Greaney and Noel Fahy. This report was prepared by Ryan Connors and Clare Mifsud and was reviewed and approved by Aoife Joyce. Staff's roles and relevant training are presented in Table 1-2 below.

Table 1-2 Project team qualifications and training.

Staff	Role	Qualifications and Training
Aoife Joyce (B.Sc., M.Sc., MCIEEM)	Project Director	B.Sc. (Hons) Environmental Science, University of Galway, Ireland. M.Sc. (Hons) Agribioscience, University of Galway, Ireland. Ecological Impact Assessments, Appropriate Assessment Screening Reports, Natura Impact Statements, Advanced Bat Survey Techniques (BCI), Bat Impacts and Mitigation (CIEEM), Bat Tree Roost Identification and Endoscope Training (BCI), Bats in Heritage Structures (BCI), Bats and Lighting (BCI), Kaleidoscope Pro Analysis (Wildlife Acoustics). Full member of Chartered Institute of Ecology and Environmental Management.
Clare Mifsud (Ph.D.)	Project Bat Ecologist	B.Sc. (Hons) Biology and Chemistry (Hons), University of Malta. M.Sc. Bat Ecology and Conservation, University of Malta. Ph.D. Bat Ecology, Genetics and Conservation, University of Malta. Bat Habitat Appraisal. Bat acoustic surveys (manual transects and statics deployment). Bat echolocation analysis and species identification (Kaleidoscope, Wildlife Acoustics). Roost survey techniques and winter bat hibernation census surveys (Wroclaw University, Poland). Preliminary Roost Assessments (PRA) - buildings and trees. Thermal Imaging for bat surveys. Bat capture, tissue sampling and handling techniques (University of Leeds, UK).
Ryan Connors (B.Sc., M.Sc.)	Bat Ecologist	B.Sc. (Hons) Zoology, University College Galway, Ireland. M.Sc. (Hons) Conservation Behaviour, Atlantic Technological University, Galway, Ireland. Surveying Trees for Bats (BRTS), Preliminary Ecological Appraisal (CIEEM), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal), Kaleidoscope Pro Analysis (Internal), Winter Tree Identification (Internal), Wintering Bird Surveying (Internal).
Marie Greaney (B.Sc., M.Sc.)	Seasonal Bat Ecologist	B.Sc. (Hons) Zoology, University of Galway, Ireland. M.Sc. (Hons) Conservation Behaviour, Atlantic Technological University, Galway, Ireland. Kaleidoscope Pro Analysis (Wildlife Acoustics), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal). Introduction to Bats and Using Detectors (BCI).
Noel Fahy (B.Sc.)	Seasonal Bat Ecologist	B.Sc. (Hons) Zoology, University of Galway, Ireland. Kaleidoscope Pro Analysis (Wildlife Acoustics), Endoscope Training (Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).

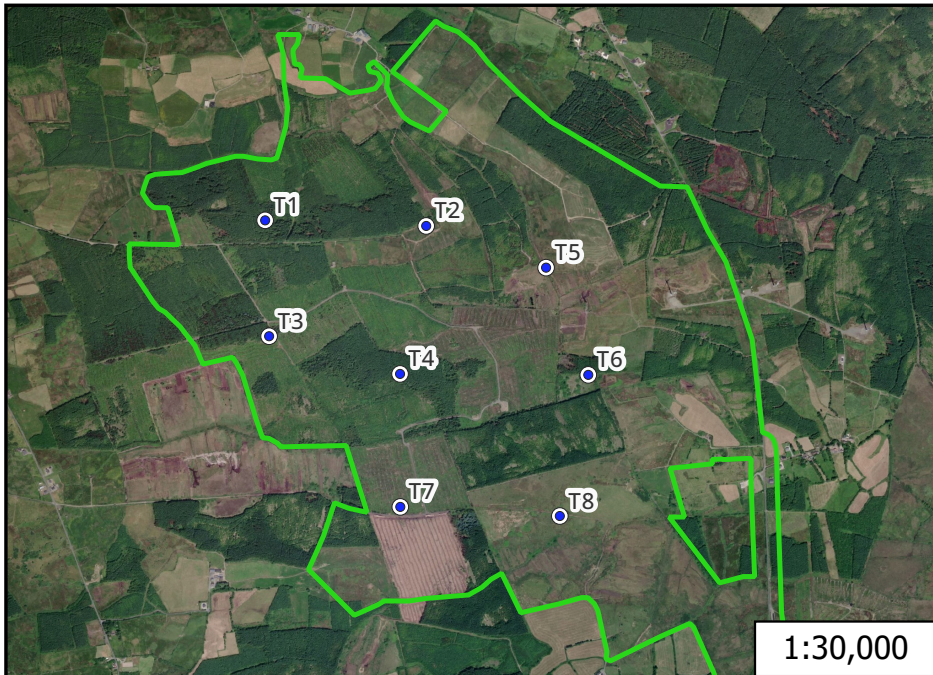
2. PROJECT DESCRIPTION

The Wind Farm Site is located approximately 4.3km northwest of Kilmihil, 4.3km southeast of Mullagh, and 4.7km northwest of Creegh, Co. Clare. The Grid Reference co-ordinates for the approximate centre of the site are E508533 N668982. The Wind Farm Site is accessed via local roads from the R483 Regional Road, which travels north-south of the Wind Farm Site, the R484 Regional Road which travels east-west between Kilmihil and Creegh and the L-2048 local road, which travels in a northeast-southwest direction between Kilmaley and Creegh. The Site itself is served by a number of existing forestry tracks.

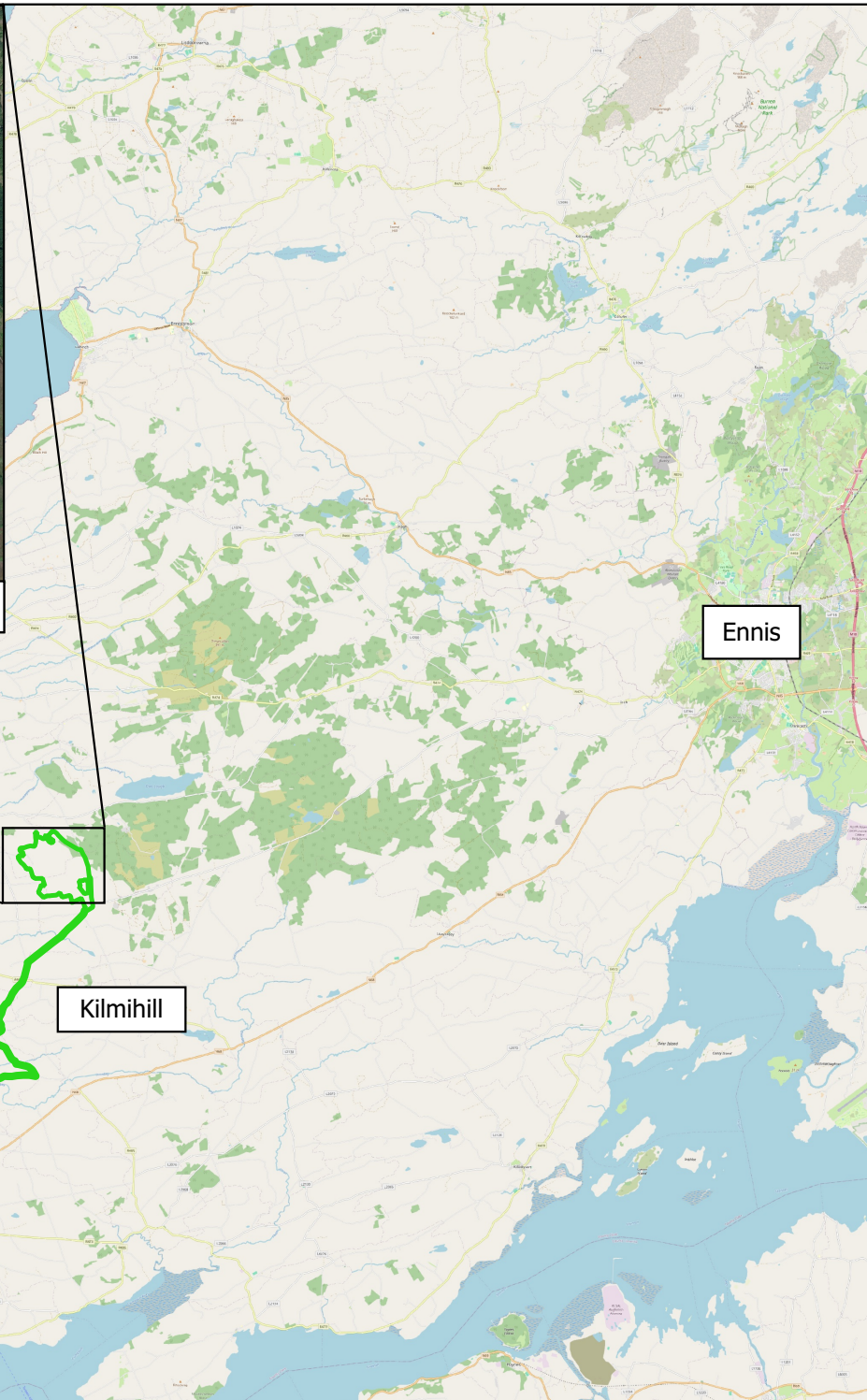
Current land-use on the Proposed Wind Farm site comprises coniferous forestry under Coillte management, peat bog and third-party lands currently being used for agriculture and forestry. Current land-use along the Proposed Grid Connection comprises primarily of public road corridor, as well as some instances of private land. Land-use in the wider landscape comprises a mix of agriculture, low density residential, renewable energy generation and commercial forestry.

The Proposed Grid Connection includes for underground 110kV electrical cabling from the proposed onsite 110kV electrical substation within the Wind Farm Site to the Moneypoint 110kV electrical substation in the townlands of Carrowdotia South and Carrowdotia North, Co. Clare. The underground cable route measures approximately 25km in length, located within existing forestry tracks, private lands and predominantly within the public road corridor.

The Site location context is shown in Figure 2-1, and a full description of the Proposed Project is provided in Chapter 4 of this EIAR.



1:30,000



Map Legend

- EIAR Site Boundary
- Proposed Turbine Layout



Drawing Title	
Site Location	
Project Title	
Proposed Cahermurphy West Wind Farm	
Drawn By	Checked By
KL	CM
Project No.	Drawing No.
230407-a	Figure 2-1
Scale	Date
1:250,000	2026-02-23
 MKO Planning and Environmental Consultants Tuam Road, Galway Ireland, H91 VW84 +353 (0) 91 735611 email: info@mkofireland.ie Website: ww.mkofireland.ie	

3. METHODS

3.1 Consultation

A scoping exercise was undertaken as part of the EIAR for the Proposed Project. A Scoping Document, providing details of the Site and the Proposed Project, was prepared by MKO and circulated to consultees in April 2024. As part of this exercise, prominent Irish conservation groups were contacted, and Bat Conservation Ireland (BCI), and the Department of Housing, Local Government and Heritage-Development Applications Unit (NPWS) were specifically invited to comment on the potential of the Proposed Project to affect bats.

Details of consultation responses specifically related to bats are provided in Section 4.1 below.

Further details of the consultation and scoping process, including the full range of consultees and responses received, are provided in Chapter 2 of the main EIAR.

3.2 Desk Study

A desk study of published material was undertaken prior to conducting field surveys. The aim was to provide context to the Proposed Wind Farm in order to assist bat survey planning and assessment. This included the identification of designated sites, species of interest or any other potential risk factors within the Proposed Wind Farm and the surrounding region. The results of the desk study including sources of information utilised are provided below.

3.2.1 Previous Baseline Surveys (2023)

Bat surveys at the Proposed Wind Farm were undertaken by MKO in 2023. These included a bat habitat appraisal, seasonal dusk transect surveys, emergence surveys and deployment of static detectors. Although now outside the valid temporal scope for this EIAR, the data are presented as supplementary information to provide additional context on baseline conditions and to complement the 2025 survey results. Full methods and summary results from the 2023 surveys are provided in **Appendix 4**.

3.2.2 Bat Records

A search for existing bat records was undertaken within a 10 km radius of a central point of the Proposed Wind Farm (Irish Grid Reference: R 08729 69164). Data were sourced from the National Bat Database of Ireland (Bat Conservation Ireland, BCI) and the National Biodiversity Data Centre (NBDC). Records included results from national monitoring schemes, roost records, and ad-hoc observations. Data were provided by BCI on 18th February 2025 and confirmed no additional records on the 3rd February 2026. This data was supplemented by NBDC bat records for the relevant 10 km grid squares (R06, R07, R16 and R17). The 10 km search radius follows established best-practice guidance for wind farm bat assessments (BCI, 2012; Hundt, 2012; NatureScot, 2021).

3.2.3 Bat Species' Range

EU member states are obliged to monitor the conservation status of natural habitats and species listed in the Annexes of the Habitats Directive. Under Article 17, they are required to report to the European Commission every six years. In August 2025, Ireland submitted the fourth assessment of conservation status for Annex-listed habitats and species, including all species of bats (NPWS, 2025).

The 2025 Article 17 Reports were reviewed for information on bat species' range and distribution in relation to the location of the Proposed Wind Farm. The aim was to identify any high-risk species at the edge of their range (NatureScot, 2021).

3.2.4 Designated Sites

A search for designated conservation sites for bats was undertaken within a 10 km radius of a Proposed Wind Farm central point (Irish Grid Reference: R 08729 69164). Data was obtained from the National Parks and Wildlife Service (NPWS) map viewer and website. The search included European designated sites (Special Areas of Conservation, SACs) and nationally designated sites (Natural Heritage Areas, NHAs and proposed Natural Heritage Areas, pNHAs) relevant to bat conservation. The 10 km radius is consistent with best-practice guidance for wind farm bat assessments (BCI, 2012; Hundt, 2012; NatureScot, 2021).

3.2.5 Landscape Features

3.2.5.1 Ordnance Survey Mapping

Ordnance survey maps (OSI 1:5,000 and 1:50,000) and aerial photographs were reviewed to identify any habitats and landscape features likely to be used by bats. Maps and images of the Proposed Wind Farm and general landscape were examined for suitable foraging or commuting habitats including woodlands and forestry, hedgerows, treelines and watercourses. In addition, any potential roost sites, such as buildings and bridges, were noted for further investigation.

3.2.5.2 Underground Sites

The University of Bristol Speleological Society (UBSS) Cave Database for the Republic of Ireland and the GSI Karst Database were consulted to identify any natural subterranean sites, such as caves, with potential to support roosting bats within 10 km of the Proposed Wind Farm (BCI, 2012). The database was last searched on 1st December 2025. In addition, the National Inventory of Architectural Heritage (NIAH) and the National Monuments Service (NMS) datasets were reviewed for records of manmade underground structures (e.g. souterrains) within 10 km of the Proposed Wind Farm that may provide suitable potential bat roosting opportunities. These datasets were also last searched on 1st December 2025.

3.2.5.3 National Biodiversity Data Centre Bat Landscape Mapping

The National Biodiversity Data Centre (NBDC) map viewer presents “Bat Landscape” maps for individual species and for all species combined. Lundy *et al.* (2011) used Maximum Entropy Models to examine the relative importance of bat landscape and habitat associations in Ireland. The resulting map provides a 5-point scale, ranging from highest habitat suitability index (presented in red) to lowest suitability index (presented in green). It is important to note that areas classified as less suitable in the model may still support locally abundant bat populations.

The location of the Proposed Wind Farm was reviewed in relation to bat habitat suitability indices. The aim of this was to assess habitat suitability for all bat species within the Proposed Wind Farm. It is worth noting that these results are based on a modelling exercise and not confirmed bat species records. Regardless, they may provide a useful indication of potential favourable bat associations within the Proposed Wind Farm.

3.2.5.4 Additional Projects in the Wider Landscape

A search for proposed, existing and permitted wind energy developments within 10 km of the Proposed Wind Farm was undertaken (NatureScot, 2021). The Wind Energy Ireland (WEI) interactive wind map (windenergyireland.com) was reviewed in conjunction with wind farm planning applications from Clare County Council. Other infrastructure developments and proposals (e.g. road projects and extractive industries) were also noted. Information on the location and scale of these developments was gathered to inform cumulative effects. More details on other infrastructure developments within the vicinity of the Proposed Project can be found in Chapter 2 of the main EIAR.

3.2.6 Multidisciplinary Surveys

Multidisciplinary walkover surveys were undertaken throughout 2024, 2025 and 2026. The Site was systematically and thoroughly walked in a ground-truthing exercise with the habitats on the Site assessed and classified. The habitats (including any culverts/bridges) were assessed for bat commuting, foraging and roosting suitability.

Multidisciplinary walkover survey dates and dedicated bat survey dates are provided in Table 3-1.

Table 3-1 Multidisciplinary walkover surveys and dedicated bat survey dates

Multidisciplinary Survey	Dedicated Bat Survey
16 th July 2024	9 th April 2025
18 th July 2024	30 th April 2025
9 th October 2024	11 th June 2025
13 th February 2025	3 rd July 2025
14 th January 2026	19 th August 2025
15 th January 2026	19 th September 2025

3.3 Field Surveys

The current field surveys build on an established baseline understanding of bats at the site derived from surveys undertaken in 2023 (Section 3.2.1), with the 2025–2026 surveys providing the primary evidence base for the assessment.

3.3.1 Bat Habitat Suitability Appraisal

Bat walkover surveys were carried out throughout 2025 and 2026. During these surveys, habitats within the Proposed Wind Farm were assessed for their suitability to support roosting, foraging and commuting bats. Connectivity with the wider landscape was also considered. Suitability was assessed according to Collins (2023) which provides a grading protocol for roosting habitats and for commuting and foraging areas. Suitability categories are divided into *High, Moderate, Low, Negligible or None* and are described fully in **Appendix 1**.

3.3.2 Roost Surveys

Daytime Roost Inspections

A search for roosts was undertaken within the Proposed Wind Farm and within 200 m plus the maximum rotor radius (i.e. 81.5 m) of each proposed turbine location (NatureScot, 2021). The aim was to determine the presence of roosting bats and the need for further survey work or mitigation. Daytime roost inspections were carried out in April, June and August 2025. Walkover surveys were carried out and included a search for Potential Roosting Features (PRFs) in trees, buildings, and other structures where present. These were assessed for their potential to support roosting bats according to Collins (2023) (see **Appendix 1** for roost assessment criteria).

Three structures, and their associated outbuildings, were identified within and around the Proposed Wind Farm site and assessed for bat roost potential (Table 3-2). These were subject to a roost assessment which comprised a detailed inspection of the interiors and exteriors to look for evidence of bat use, including live and dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises. Locations of all inspected structures are presented in Figure 3-1.

Table 3-2 Structures inspected within the Cahermurphy West Wind Farm site

Structure No.	Description	IG Reference	Nearest Turbine	Distance to nearest turbine (m)
1	Farm Building	R 07771 69493	T3	230
2	Farm Shed A	R 08080 69548	T1	325
3	Farm Shed B	R 07325 69642	T1	500

Targeted ground-level inspections were undertaken of broadleaved trees within the wind farm development footprint, including the Turbine Delivery Route (TDR) works areas and relevant portions of the Hen Harrier Enhancement Plan lands, with particular emphasis on trees scheduled for felling. Commercial conifer plantations were excluded from detailed tree inspection as they do not provide suitable roosting features for bats due to their species composition, uniform structure and intensive management regime, which limits the development of cavities, cracks, loose bark or other potential roost features.

Each broadleaved tree scheduled for felling was systematically inspected for rot holes, hazard beams, cracks and splits, partially detached bark, knot holes, gaps between overlapping branches and any other potential roost features (PRFs), in accordance with Andrews (2018). Inspections were undertaken using a high-output torch, thermal imaging camera and endoscope, with safe ladder access used where required to facilitate closer inspection of features at height.

The Proposed Grid Connection underground electrical cabling route, including watercourse crossing infrastructure, and turbine delivery route accommodations works areas, were also assessed for any suitability to host roosting bats. Surveys were carried out on the 9th October 2024 and 13th February 2025 and comprised an inspection of existing infrastructure to look for evidence of bat use and assess the roosting suitability according to Collins (2023).

Emergence Surveys

Emergence surveys at dusk were carried out which focused on the PRFs identified during the bat habitat appraisal. During these surveys, surveyors were equipped with Bat Logger M bat detectors (Elekon AG, Lucerne, Switzerland). The emergence surveys commenced at least 15 minutes before sunset and concluded 90 minutes after sunset. Table 3-3 summarises survey effort in relation to emergence surveys carried out in 2025. Where possible, species identification was made in the field and any other relevant information was also noted, e.g., numbers, behaviour, features used, etc. All bat echolocation was recorded for subsequent analysis to confirm species identifications.

Surveyors were located at PRFs identified during the daytime roost inspection surveys with a focus on potential access point and roosting features. The purpose was to identify any bat species, numbers, access points and roosting locations within the PRF structure. Surveys were carried out in favourable weather conditions.

Table 3-3 Emergence surveys during the 2025 survey period

Date	Surveyors	Structure No.	Sunset Time	Weather
30 th April 2025	CM & MG	No. 1	21:03	16-12 °C, dry, calm, moon not-visible, <5-0% cloud cover
11 th July 2025	NF & MG	No. 1	22:01	14-13 °C, dry, calm, moon not-visible, 100% cloud cover
19 th August 2025	NF & MG	No. 2 & No. 3	20:54	19-17 °C, dry, calm, moon not-visible, 20-10% cloud cover

3.3.3 Manual Transects

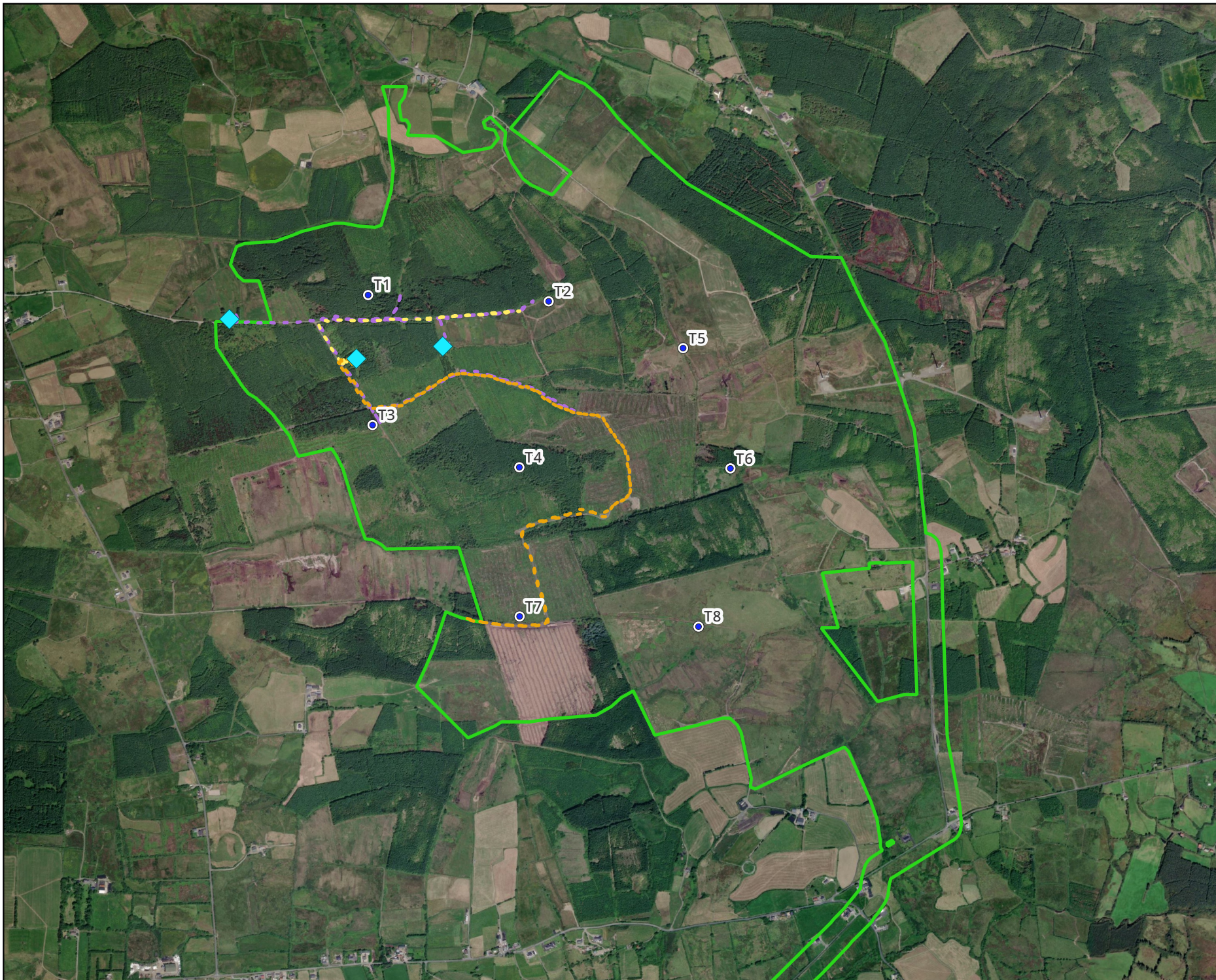
Manual activity surveys comprised of walked transects after dusk. A series of representative transect routes were selected throughout the Proposed Wind Farm. The aim of these surveys was to record species presence, relative abundance and behaviour (foraging and commuting) within the Proposed Wind Farm, and to gather additional information on habitat features of importance to bats across the site. Transect routes were prepared with reference to the proposed layout, desktop and walkover survey results as well as any health and safety considerations and access limitations. As such, transect routes generally followed existing roads and tracks. Transect routes undertaken in 2025 are presented in Figure 3-1.

Transects were walked by two surveyors, recording bats in real time. Transects commenced immediately after the dusk emergence surveys and were completed for up to 3 hours after sunset. Surveyors were equipped with active full spectrum bat detectors, the Batlogger M bat detector (Elekon AG, Lucerne, Switzerland), and all bat activity was recorded for subsequent analysis to confirm species identifications.

Transects surveys were undertaken in spring, summer and autumn 2025. Table 3-4 summarises survey effort in relation to manual transects.

Table 3-4 Manual transect surveys during the 2025 survey period

Date	Surveyors	Sunset	Start - End Time	Weather	Transect (km)
30 th April 2025	CM & MG	21:03	20:53 - 00:04	16-12 ° C, dry, calm, moon not-visible, <5-0% cloud cover	5.0
11 th July 2025	NF & MG	22:01	21:53 - 00:14	14-13 ° C, dry, calm, moon not-visible, 100% cloud cover	2.0
19 th August 2025	NF & MG	20:54	20:41 - 00:09	19-17 ° C, dry, calm, moon not-visible, 20-10% cloud cover	5.0
Total Survey Effort					12.0



Map Legend

- █ EIA Site Boundary
- Proposed Turbine Layout
- - - Spring Transect Route
30.04.2025
- - - Summer Transect Route
11.06.2025
- - - Autumn Transect Route
19.08.2025
- ◆ Structures Inspected 2025

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Drawing Title
Survey Effort 2025

Project Title
Proposed Cahermurphy West Wind Farm

Drawn By KL	Checked By CM
Project No. 230407-a	Drawing No. Figure 3-1
Scale 1:17,500	Date 2026-02-04

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3.3.4 Ground-level Static Surveys

Where developments have less than 10 turbines, NatureScot (2021) requires one detector per turbine, while for larger developments the guide suggests an additional detector for every three turbines. Given that 8 turbines were proposed, 8 detectors were deployed to ensure compliance with NatureScot (2021) guidance. Automated bat detectors were deployed for at least 10 nights in spring (April - May), 20 nights of summer (June - mid-August) and 10 nights of autumn (mid-August - October) (NatureScot, 2021). Detector placement was based on the proposed turbine locations, and these are described in Table 3-5. Figure 3-2 presents static detector locations in relation to the final proposed turbine layout.

Table 3-5 Ground-level static detector locations 2025 and habitat context

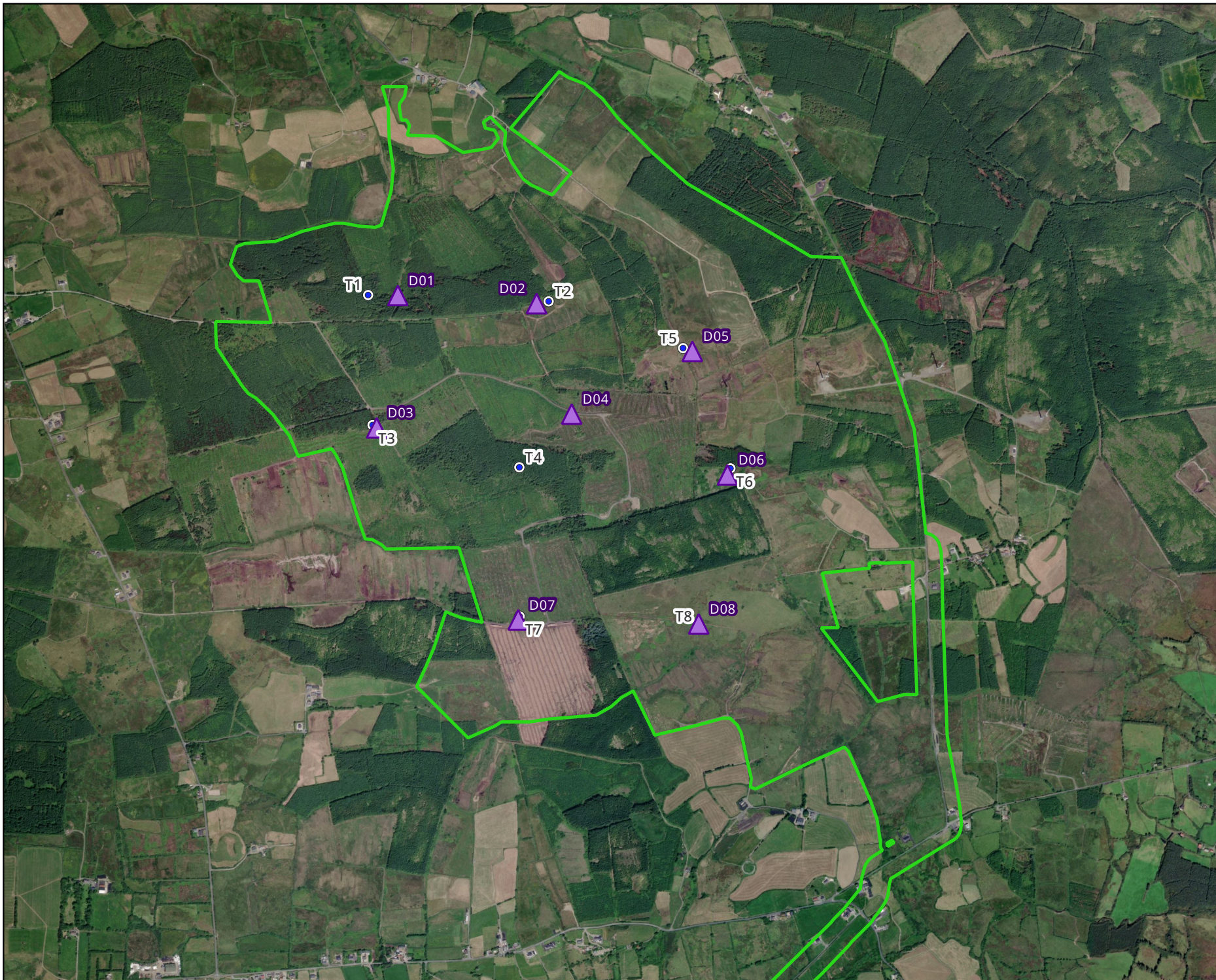
Detector ID	Location (Irish Grid Ref.)	Habitat	Linear Feature within 50m	Nearest Turbine
D01	R 07923 69722	Recently-felled woodland (WS5)	Conifer edge	T01
D02	R 08467 69707	Wet grassland (GS4)	Conifer edge	T02
D03	R 07843 69253	Recently-felled woodland (WS5)	Conifer edge	T03
D04	R 08547 69284	Recently-felled woodland (WS5)	None	T04
D05	R 08917 69558	Wet grassland (GS4)	None	T05
D06	R 09082 69095	Lowland blanket bog (PB3)/Wet heath (HH3)	Conifer edge	T06
D07	R 08345 68581	Recently-felled woodland (WS5)	None	T07
D08	R 08979 68556	Wet grassland (GS4)	None	T08

Full spectrum bat detectors, Song Meter SM4BAT (Wildlife Acoustics, Maynard, MA, USA), were employed using settings recommended for bats, with minor adjustments in gain settings and band pass filters to reduce background noise when recording. Detectors were set to record from 30 minutes before sunset until 30 minutes after sunrise. The Song Meter automatically adjusts sunset and sunrise times using the Solar Calculation Method when provided with GPS coordinates.

Onsite weather monitoring was undertaken concurrently with static detector deployments. One Vantage Pro 2 (Davis Instruments, CA, UCS) was deployed each season and night-time hourly data was tracked remotely to ensure a sufficient number of nights (i.e. minimum 10-20 nights) with appropriate weather conditions were captured (i.e. dusk temperatures above 8°C, wind speeds less than 5 m/s and no or only very light rainfall). Table 3-6 summarises survey effort achieved in 2025 for each of the detector locations.

Table 3-6 Ground-level static survey effort (2025) and weather suitability

Season	Survey Period	Total Survey Nights per Detector Location	Nights with Appropriate Weather
Spring	9 th - 30 th April 2025	21	13
Summer	11 th June - 3 rd July 2025	21	21
Autumn	19 th August - 9 th September 2025	21	13
Total Survey Effort		63	47



Map Legend

- EIA Site Boundary
- Proposed Turbine Layout
- ▲ Static Detector Locations



Drawing Title
**Static Detector Locations
 2025**

Project Title
**Proposed Cahermurphy West
 Wind Farm**

Drawn By KL	Checked By CM
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Project No. 230407-a	Drawing No. Figure 3-2
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Scale 1:17,500	Date 2026-01-23
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3.4 Bat Call Analysis

All sound recordings were analysed using bat call analysis software, Kaleidoscope Pro v.5.4.8 (Wildlife Acoustics, MA, USA). The aim was to identify, to species or genus level, the bats present at the Proposed Wind Farm. All recordings were initially processed using the Auto ID function within Kaleidoscope, utilising a site-specific custom classifier that included only species known to occur in Ireland.

Echolocation signal characteristics, including signal shape, peak frequency of maximum energy, signal slope, pulse duration, start frequency, end frequency, bandwidth, inter-pulse interval and power spectra, were compared against published signal characteristics for local bat species (Russ, 2012) to support manual verification of species identification. All recordings were subsequently manually reviewed within Kaleidoscope to determine final species classification.

Myotis species potentially including Daubenton’s bat (*Myotis daubentonii*), whiskered bat (*Myotis mystacinus*) and Natterer’s bat (*Myotis nattereri*) were classified as a single *Myotis* spp. group, due to the recognised difficulty in reliably distinguishing these species based on echolocation parameters alone (Russ, 2012). The echolocation calls of soprano pipistrelle (*Pipistrellus pygmaeus*) and common pipistrelle (*Pipistrellus pipistrellus*) are more readily distinguished based on peak frequency of maximum energy in search-phase calls (approximately 55 kHz and 45 kHz respectively; Jones & van Parijs, 1993).

Plate 3-1 illustrates typical sonograms of echolocation pulses for pipistrelle species and lesser horseshoe bat recorded using an SM4BAT static bioacoustics recording device, displayed within Wildlife Acoustics Kaleidoscope software.

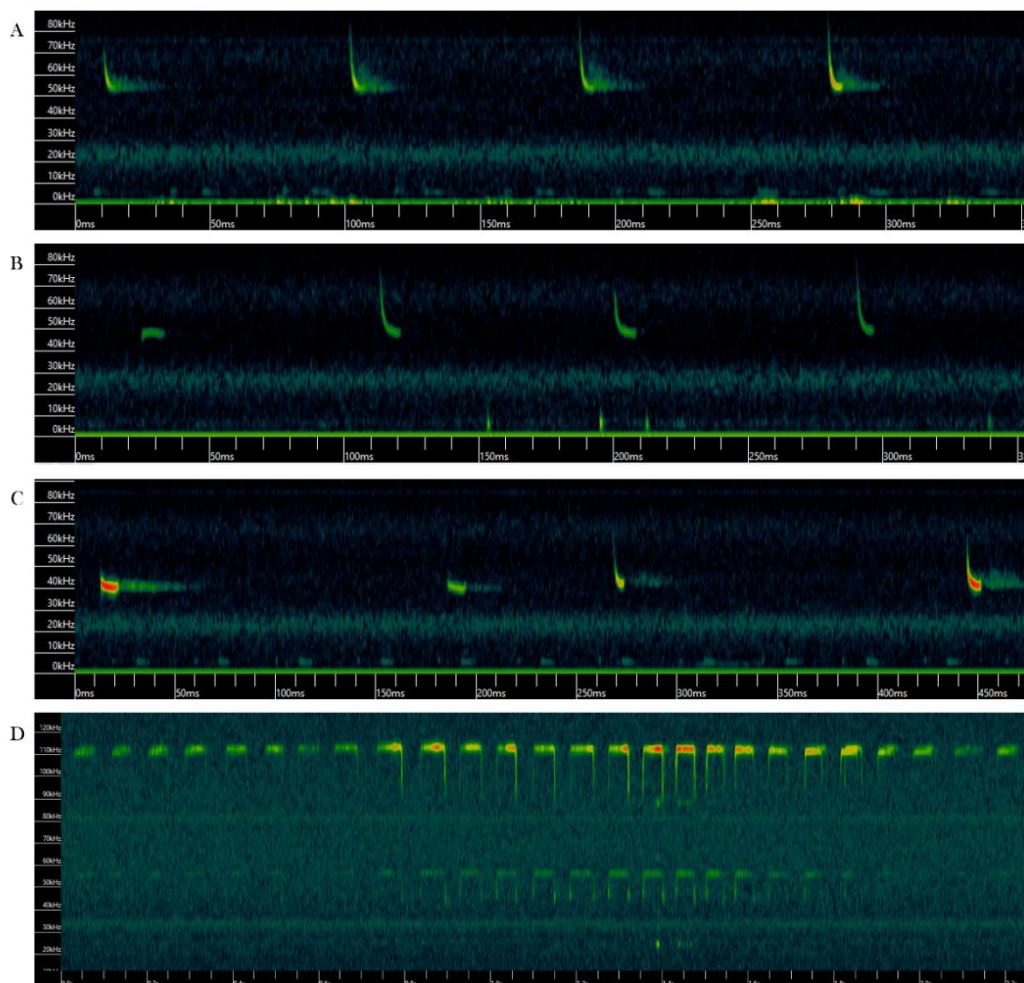


Plate 3-1 Spectrogram of echolocation pulses of (A) Soprano pipistrelle (Peak Frequency 55kHz), (B) Common pipistrelle (Peak Frequency 45kHz), (C) Nathusius’ pipistrelle (Peak Frequency 39kHz) and (D) Lesser horseshoe bat (Peak Frequency 114kHz).

Echolocation calls produced by brown long-eared bats (*Plecotus auritus*) are intrinsically low in amplitude and therefore more difficult to detect using static acoustic equipment, while calls produced by lesser horseshoe bats (*Rhinolophus hipposideros*) are highly directional and may be missed by detectors, particularly during manual surveys. To reduce the potential for under-recording of the latter species, MKO deploys omni-directional microphones as part of the acoustic survey methodology.

Manual verification of recorded data also included the review of files classified by Kaleidoscope as ‘Noise’ and ‘No ID’. This approach ensures that calls from quieter or more difficult-to-detect species are not overlooked during automated processing. Despite this additional level of scrutiny, some degree of underrepresentation is still expected for these species, and this limitation has been taken into account in the interpretation of activity levels and subsequent assessment.

Plate 3-2 illustrates typical spectrograms of echolocation pulses for *Myotis* spp., brown long-eared bat and Leisler’s bat, as well as an example of a non-bat noise file, all recorded using an SM4BAT static bioacoustics recording device and displayed within Wildlife Acoustics Kaleidoscope software.

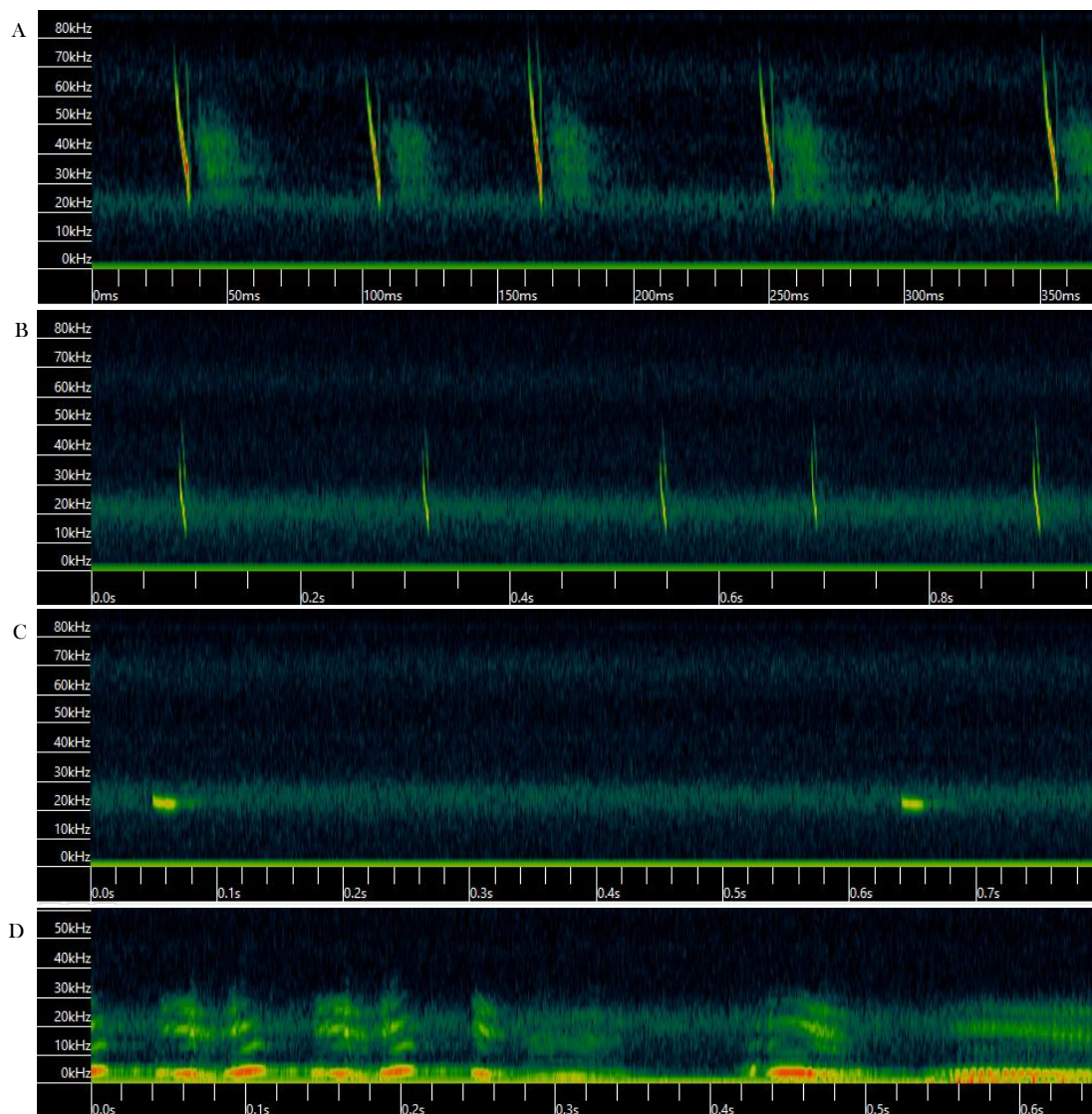


Plate 3-2 Spectrogram of typical echolocation pulses of (A) *Myotis* spp., (B) Brown long-eared bat, (C) Leisler’s bat and (D) typical non-bat sounds.

Individual bats of the same species cannot be distinguished using echolocation alone; therefore, ‘bat passes’ were used as a measure of activity (Collins, 2023). A bat pass was defined as a recording of an individual species or species group’s echolocation sequence containing at least two pulses and of a maximum duration of 15 seconds. All bat passes recorded during the surveys were classified in accordance with these criteria, allowing consistent comparison across survey periods and locations.

In some instances, more than one bat pass occurred within a single recording file. In such cases, the final species classification assigned to the file was based on the rarer or more difficult-to-detect species present. This precautionary approach minimises the risk of under-representing less frequently encountered taxa within multi-pass recordings. This conservative treatment ensures that activity levels are not biased towards more common, highly detectable species and supports a precautionary interpretation of potential impacts within the Environmental Impact Assessment Report.

3.5 Assessment of Bat Activity Levels

Data Processing and Standardisation

Following automated classification and full manual verification using Kaleidoscope Pro, statistical analysis and data visualisation were undertaken using RStudio (version 2025.05.0+496) and R (version 4.4.2). RStudio, an integrated development environment for the R programming language, was employed for data cleaning, standardisation, exploration and visualisation. Bat activity was standardised to bat passes per hour (bpph), calculated as the total number of bat passes per night divided by the duration of each recording period, to account for seasonal variation in night length (Matthews *et al.*, 2016). As bat activity is inherently variable between survey nights, the median nightly bpph was used as the primary measure of activity at each detector location (Lintott & Mathews, 2018), with maximum nightly values used to characterise peak activity. During all calculations, values were rounded to three decimal places. When visualising seasonal activity patterns, survey effort was defined as total detector hours (i.e. the cumulative recorded hours across all detectors within a season) to account for any variation in deployment effort.

Derivation of Site-Specific Activity Thresholds

The methodology used to assess activity levels across the Proposed Wind Farm site was adapted from Matthews *et al.* (2016). For widespread species (*Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*, *Nyctalus leisleri*), activity ranges were determined using the average of the maximum nightly bat pass rate (bpph) across all detectors, divided into quartiles. For all other species groups (*Myotis* spp., *Plecotus auritus* and *Pipistrellus nathusii*), the maximum nightly bat pass rate (bpph) recorded across all detectors, divided into quartiles, was used.

Median and maximum nightly activity (bpph) at each detector location were categorised as Low, Moderate or High for each recorded season. Figures below 25% of the maximum or mean maximum nightly pass rate were classified as Low activity, while values above 75% were classified as High activity. Values falling between these two quartiles were defined as Moderate activity. To avoid distortion of thresholds, statistical outliers were identified using box-and-whisker plots and excluded prior to final threshold calculation. The resulting site-specific activity thresholds for each species group are presented in Table 3-7.

Table 3-7 Site-specific activity level categories based on maximum bat passes per hour (bpph)

Assessment Level	Activity thresholds (bat passes per hour, bpph) by species				
	Soprano and common pipistrelles	Leisler's bat	<i>Myotis</i> spp.	Brown long-eared bat	Lesser horseshoe bat
Low	< 1.67	< 0.66	< 1.35	< 0.63	< 0.03
Moderate	1.67 - 5.00	0.66 - 1.97	1.35 - 4.05	0.63 - 1.88	0.03 - 0.08
High	> 5.00	> 1.97	> 4.05	> 1.88	> 0.08

Site-Specific Ranked Activity Scoring (1–5 Risk Scale)

A weighted site-specific activity score was also calculated for each detector and season. This method integrates the relative contribution of Low, Moderate and High activity records using a weighted mean approach, where numeric weights of 1 (Low), 2 (Moderate) and 3 (High), were applied to the number of records falling within each activity class. The weighted mean score was then rescaled and converted into a five-tier ranked activity scale, as shown in Table 3-8. This approach ensures that detectors with a higher proportion of moderate and high activity records receive proportionately higher ranked scores, rather than relying solely on maximum values. This ranked system provides a five-class site-specific activity

framework aligned in terminology with commonly used bat activity classifications but is derived entirely from absolute site-specific bpph values rather than from regional percentile comparison. These ranked scores are applied within the subsequent collision risk and impact assessment to provide a consistent and transparent basis for comparative risk evaluation across detector locations and seasons.

Table 3-8 Site-specific ranked bat activity intensity classes for risk assessment use

Ranked Score	Bat Activity Class
1	Low
2	Low – Moderate
3	Moderate
4	Moderate – High
5	High

A site-specific activity threshold approach was adopted for this assessment in preference to reliance on third-party percentile-based tools, as it allows full transparency, reproducibility and long-term comparability of results. While regional benchmarking tools provide useful contextual summaries, they do not provide access to the underlying comparator datasets, thereby limiting independent interrogation and re-analysis of results. In contrast, the use of absolute bat pass rates (bpph), median and maximum values, together with weighted activity scoring and graphical outputs, enables clear spatial and species-specific interpretation of activity patterns in direct relation to detector locations, habitats and turbine layout.

This approach also ensures that the 2025 baseline dataset remains fully future-proofed and directly comparable with any future post-construction or long-term monitoring datasets, independent of changes in third-party platforms, reference databases or classification algorithms. For these reasons, the site-specific approach is considered the most robust and appropriate method for informing turbine-scale impact assessment and mitigation design for the Proposed Project.

3.6 Assessment of Collision Risk

3.6.1 Population Risk

NatureScot (2021) provides a generic assessment of bat collision risk for UK species, based on species behaviour and flight characteristics. In the guidelines, this measure of collision risk is used, in combination with relative abundance, to indicate the potential vulnerability of British bat populations. No such assessment is provided for Irish bat populations.

In Table 3-9, an adapted assessment of vulnerability of Irish bat populations to collision with wind turbine blades is provided. This adaptation of the NatureScot Guidance Table 2 was based on collision risk and species abundance of Irish bat populations. Species' collision risk follows those described in NatureScot (2021). Relative abundance for Irish species was determined in accordance with Wray *et al.* (2010) using population data available in the 2025 Article 17 reports (NPWS, 2025). Feeding and commuting behaviours, and habitat preferences for bat species in Ireland were also considered.

Table 3-9 Population vulnerability of Irish bat species in relation to collision risk (adapted from NatureScot, 2021)

Relative abundance	Low Collision Risk	Medium Collision Risk	High Collision Risk
Common species			Common pipistrelle Soprano pipistrelle
Rarer species	Daubenton's bat Brown long-eared bat Lesser horseshoe bat		Leisler's bat
Rarest species	Natterer's bat Whiskered bat		Nathusius' pipistrelle

Low Population Vulnerability	Medium Population Vulnerability	High Population Vulnerability
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3.6.2 Site Risk

The likely impact of a Proposed Project on bats is related to site-based risk factors, including habitat and development features. The cross-tabulation result of habitat risk and project size determines the site risk (i.e. Low, Medium or High) (Table 3-10) i.e. Table 3a from NatureScot (2021). Table 5-1 in the results section describes the criteria and site-specific characteristics used to determine an indicative risk level for the Proposed Wind Farm. All site assessment levels, as per NatureScot (2021) are presented in **Appendix 2**.

Table 3-10 Site-risk level assessment matrix (adapted from Table 3a, NatureScot, 2021)

		Project Size		
		Small	Medium	Large
Habitat Risk	Low	1	2	3
	Moderate	2	3	4
	High	3	4	5

Low/Lowest Site Risk (1-2)	Medium Site Risk (3)	High/Highest Site Risk (4-5)
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3.6.3 Overall Risk Assessment

An overall risk assessment was undertaken by combining the site-risk level (i.e. Low, Medium or High) with the EcoBat activity category (or the equivalent site-specific activity level thresholds), using the overall risk assessment matrix presented in Table 3-11 (adapted from Table 3b of NatureScot, 2021; see **Appendix 3**).

Table 3-11 Overall risk assessment matrix (adapted from Table 3b, NatureScot, 2021)

Site Risk Level	Activity category (site-specific thresholds; EcoBat equivalent)					
	Nil (0)	Low (1)	Low-Moderate (2)	Moderate (3)	Moderate-High (4)	High (5)
Lowest (1)	0	1	2	3	4	5
Low (2)	0	2	4	6	8	10
Medium (3)	0	3	6	9	12	15
High (4)	0	4	8	12	16	20
Highest (5)	0	5	10	15	20	25

Low Overall Risk (0-4)	Medium Overall Risk (5-12)	High Overall Risk (15-25)
------------------------	----------------------------	---------------------------

This approach was applied to each high collision-risk species. Overall risk classifications were also considered in the context of potential population-level effects, particularly for species identified as having high population vulnerability (Table 3-9).

3.7 Limitations

A comprehensive suite of bat surveys has been undertaken at the Proposed Wind Farm in 2025 with additional supplementary surveys carried out in 2023. The surveys undertaken, in accordance with NatureScot (2021) Guidance, provide the information necessary to allow a complete, comprehensive and robust assessment of the potential impacts of the Proposed Wind Farm on bats receptors.

Access limitations can relate to static deployments and roost inspections:

- No access issues were encountered with the Proposed Wind Farm site during static deployments, as the detectors were deployed where intended.

Survey limitations can relate to deployment coverage, data storage, equipment failure or deployment related incidents:

- Eight detectors were deployed at eight turbine locations, in line with best practice guidance, providing good survey coverage of the Site.
- MKO employs data storage redundancy methods to ensure no data is lost from the field to final analysis and no data was lost.
- SD card corruption or fill-up can prevent data from being collected during deployments and no issues with on-site data storage were encountered.
- Bat detector's microphones are checked before every season to ensure they have good sensitivity for data collection, and detectors' software updates are installed as soon as they become available. No issues related to equipment were encountered during the surveys.
- Incidents during deployments, such as tampering or livestock interference, can prevent data from being collected effectively. No incidents were reported during the surveys.

The limitations of bat activity assessment primarily relate to data analysis procedures and a lack of standardised and Ireland-based assessment methods:

- MKO's data analysis methods include manually reviewing all recordings. This workflow also includes verifying noise files and files left without a species identification after the auto ID function has been applied. Manual verification helps address the sound analysis software's limitations in accurately identifying bat species in Ireland. Manual species identification further allows for the detection of recordings containing multiple species. To maintain methodological consistency and minimise bias across datasets, only one species is reported for each recording. When multiple species are present, priority is given to hard-to-detect species during the final manual ID, compensating for the software's limitations in recognising their echolocation calls. Although this approach may introduce some bias, it is consistently applied across all MKO bat datasets. Importantly, this bias is not expected to affect the overall conclusions of the assessment, as only commonly recorded species may be slightly underreported.
- Additionally, no activity threshold currently exists for Irish bat species to objectively assess bat activity within specific habitats, and no standardised assessment method has been established across the country.

The information provided in this report accurately and comprehensively describes the baseline environment; provides an accurate prediction of the likely effects of the Proposed Project; prescribes mitigation as necessary; and describes the predicted residual impacts. The specialist studies, analysis and reporting have been undertaken in accordance with the appropriate guidelines. No limitations in the scope, scale or context of the assessment have been identified. Overall, a comprehensive assessment has been achieved.

4. SURVEY RESULTS

4.1 Consultation

4.1.1 Bat Conservation Ireland

Bat Conservation Ireland were invited to comment on the potential for the Proposed Project to affect bats. The organisation has previously advised that it does not have the capacity to engage in planning-related consultations. At the time of writing this report, no response had been received.

4.1.2 Development Applications Unit - NPWS

The Development Applications Unit were also invited to provide any feedback, comments or suggestions they might have relating to the Proposed Project. A response was received from the Department of Housing, Local Government and Heritage on the 17th May 2024, in which they gave the following response with respect to bats:

Bat roosts may be present in trees, buildings and bridges. Bat species are protected under the Wildlife Act 1976, as amended, and are subject to a regime of strict protection pursuant to the requirements of the Habitats Directive (92/43/EEC) as transposed in Irish law in Regulation 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). Therefore, damage/disturbance to any such roosts must be avoided in the first instance. While the Minister may grant a derogation licence under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011-2015, a licence can only be granted once a number of strict criteria have been met (see Regulation 54). Furthermore, following a recent CJEU judgment on the Hellfire Massey Case C-166/22, the Department recommends any potential derogation must necessarily be adopted before development consent is given.

An assessment of the impact of the proposed wind farm on bat species should be carried out noting recent guidance available, "Bat and Onshore Wind Turbines: Survey, Assessment and Mitigation, 2019" published jointly by Scottish Natural Heritage and Bat Conservation Trust and other stakeholders. The Department would like to highlight new research on patterns of bat activity in upland wind farms³ which indicates it is more appropriate to use 30 day survey periods with static automated detectors, in each season, and in different weather conditions to reduce sampling bias and to accurately determine when the curtailment mitigation is required during the operational phase. This survey should include use of detectors at different heights. Any proposed bat friendly lighting should be proven to be effective and follow up-to-date guidance.

Hedgerows and scrub should be maintained where possible, as they form wildlife corridors and provide areas for birds to nest in. Hedgerows provide a habitat for woodland flora, roosting places for bats and Badger setts may also be present. The EIAR should provide an estimate of the length/area of any hedgerow/scrub that will be removed. Where it is proposed that trees or hedgerows will be removed there should be suitable planting of native species in mitigation incorporated into the EIAR. Hedgerows, trees, scrub and uncultivated vegetation (including semi-natural habitats) should not be removed during the nesting season (i.e. 1 March to 31 August), noting the protection afforded under the Wildlife Act 1976-2018

The scoping document states the project will likely seek to connect into the existing 400 kV Moneypoint Substation. The Department notes the presence of a Lesser Horseshoe Bat roost at Moneypoint.

All recommendations made by the Department were fully considered in the design of bat surveys and the preparation of this report.

In particular, with respect to the presence of a lesser horseshoe bat roost in the vicinity of the Moneypoint Substation, the buildings at this location were visited and assessed with the agreement of the National Parks and Wildlife Service. The assessment formed part of the bat habitat suitability appraisal and impact assessment, and considered the location, conservation status and potential sensitivity of the roost to the Proposed Project. The findings of this assessment are presented in Section 4.3.1.2.

Bat surveys undertaken for the Proposed Project were designed with specific regard to the protection of sensitive bat species, including lesser horseshoe bat, and were carried out in accordance with current best practice guidance. Surveys were completed in line with NatureScot (2021), which supersedes the earlier Scottish Natural Heritage (2019) guidance referenced in the Department's response, and included static detector deployment across multiple seasons and survey periods.

The Department's reference to research on extended survey periods is based on an online webinar ('Patterns of Bat Activity at Upland Windfarms: Implications for Sampling and Mitigation'; CIEEM, 2021). As noted by the presenter, the suggested 30-day survey period has not been derived through published scientific analysis. Updated NatureScot guidance published in 2021 does not require extended 30-day survey periods, and the survey effort undertaken for the Proposed Project is therefore considered to be compliant with current industry best practice and sufficient to support a robust assessment.

Measures relating to habitat retention, hedgerows and scrub, lighting design, and seasonal constraints on vegetation removal are addressed within the relevant chapters of the EIAR and have been incorporated into the design and mitigation strategy for the Proposed Project.

4.2 Desk Study

4.2.1 Previous Baseline Surveys (2023)

Baseline bat surveys undertaken in 2023, in accordance with NatureScot (2021) guidance, comprised a desk study, habitat suitability appraisal, roost inspections, dusk emergence surveys, manual walked transects, and ground-level static detector surveys.

The same three structures that were subsequently inspected during the 2025 survey period (referred to in this report as Structure Nos. 1-3) were also inspected during the 2023 surveys. During 2023, roost inspections and emergence surveys confirmed the presence of two soprano pipistrelle individuals at Structure No. 1 and one soprano pipistrelle individual at Structure No. 3 only. No bat emergence was recorded at Structure No. 2 during the 2023 surveys.

Static detector surveys recorded approximately 19,386 bat passes during the 2023 survey season, dominated by soprano pipistrelle and common pipistrelle, with smaller proportions of Leisler's bat, *Myotis* spp. and brown long-eared bat. Nathusius' pipistrelle and lesser horseshoe bat were recorded at very low levels, with a single bat pass attributed to lesser horseshoe bat.

At the time of the 2023 assessment, the Proposed Wind Farm was considered to lie outside the core known range of lesser horseshoe bat in Ireland. However, the most recent Article 17 conservation status assessment published by the National Parks and Wildlife Service (NPWS, 2025) indicates an expanded and more continuous distribution for this species, such that the Proposed Wind Farm now falls within its mapped range. In this context, the single lesser horseshoe bat record from 2023 is no longer considered anomalous but remains indicative of very low activity within the Site.

No roosts suitable for lesser horseshoe bat were identified within the Proposed Wind Farm site or the Proposed Grid Connection corridor during field surveys. However, the desk study identified a confirmed lesser horseshoe bat roost supporting three individuals located outside the Site boundary in the vicinity of the existing Moneypoint 110 kV substation, approximately 60 m east of the Proposed Grid Connection corridor and more than 17 km south from the Proposed Wind Farm site.

A full summary of methods and results from the 2023 survey period is provided in **Appendix 4**.

4.2.2 Bat Records

Bat Conservation Ireland

A data request was sent to Bat Conservation Ireland (BCI) for records of bat activity and roosts within a 10 km radius of an approximate central point within the Proposed Wind Farm (Irish Grid Reference: R 08729 69164). Available bat records were provided by BCI on 18th February 2025. A follow-up request

was issued on 22nd January 2026, and BCI subsequently confirmed on 3rd February 2026 that no additional records were available at the time of reporting.

The search included roosts, transects and ad-hoc observations, with one roost record and several ad-hoc observations (n = 27) identified. Based on these records, six of Ireland's nine resident bat species have been recorded within 10 km of the Proposed Wind Farm. The results of the database search are provided in Table 4-1.

Table 4-1 National Bat Database of Ireland records within 10 km of the Proposed Wind Farm

Survey Type	Species	Grid Reference	Date	Location
Roost	<i>Myotis daubentonii</i> , <i>Plecotus auritus</i>	R12793 62344	N/A	Lack East Bridge
Ad-hoc	<i>Pipistrellus pygmaeus</i>	R04026 62027	19/07/2008	BATLAS 2010
	<i>Pipistrellus pygmaeus</i> , <i>Myotis</i> spp.	R13100 67600	29/08/2009	BATLAS 2010
	<i>Pipistrellus pygmaeus</i> , <i>Myotis daubentonii</i> ,	R18400 64600	29/08/2009	BATLAS 2010
	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Nyctalus leisleri</i> , <i>Myotis daubentonii</i>	R04000 62100	29/08/2009	BATLAS 2010
	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Nyctalus leisleri</i> , <i>Myotis daubentonii</i>	R14200 63500	29/08/2009	BATLAS 2010
	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Nyctalus leisleri</i>	R14000 59700	11/07/2018	BATLAS 2020
	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i>	R09070 61680	12/09/2018	BATLAS 2020
	<i>Pipistrellus pygmaeus</i>	R06256 61758	12/09/2018	BATLAS 2020
	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Myotis</i> spp.	R04026 62027	12/09/2018	BATLAS 2020
	<i>Pipistrellus pygmaeus</i>	R02108 62120	12/09/2018	BATLAS 2020
	<i>Pipistrellus pygmaeus</i>	R14150 63456	28/08/2017	BATLAS 2020
	<i>Nyctalus leisleri</i>	R10706 64551	28/08/2017	BATLAS 2020
	<i>Pipistrellus pygmaeus</i>	R01635 66438	12/09/2018	BATLAS 2020
	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i>	R07290 66826	12/09/2018	BATLAS 2020
	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Nyctalus leisleri</i> , <i>Myotis</i> spp.	R03423 66869	12/09/2018	BATLAS 2020
	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Nyctalus leisleri</i> , <i>Myotis</i> spp.	R05308 67358	12/09/2018	BATLAS 2020
	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Nyctalus leisleri</i>	R17524 78022	07/07/2018	BATLAS 2020
	<i>Pipistrellus pygmaeus</i>	R04580 77070	30/07/2019	BATLAS 2020
	<i>Nyctalus leisleri</i>	R03090 70955	30/07/2019	BATLAS 2020
	<i>Pipistrellus pipistrellus</i> , <i>Pipistrellus pygmaeus</i> , <i>Myotis nattereri</i>	R17095 79060	24/07/2015	Consultancy Surveys
<i>Pipistrellus pygmaeus</i> , <i>Myotis</i> spp.	R17730 78315	25/07/2015	Consultancy Surveys	
<i>Pipistrellus pipistrellus</i>	R03683 77225	09/06/2011	Consultancy Surveys	
<i>Pipistrellus pygmaeus</i> , <i>Pipistrellus pipistrellus</i> , <i>Myotis nattereri</i> , <i>Plecotus auritus</i>	R13290 76960	22/07/2008	Consultancy Surveys	
<i>Pipistrellus pygmaeus</i> , <i>Pipistrellus pipistrellus</i>	R13920 75260	08/08/2008	Consultancy Surveys	
<i>Pipistrellus pygmaeus</i> , <i>Pipistrellus pipistrellus</i> , <i>Myotis nattereri</i> , <i>Myotis</i> spp., <i>Plecotus auritus</i> , <i>Nyctalus leisleri</i>	R11280 77415	29/08/2008	Consultancy Surveys	

	<i>Pipistrellus pygmaeus</i>	R15990 68255	29/07/2012	Consultancy Surveys
	<i>Pipistrellus pygmaeus, Pipistrellus pipistrellus, Myotis spp., Plecotus auritus</i>	R15535 68165	01/08/2012	Consultancy Surveys

National Bat Database of Ireland

The National Bat Database of Ireland was searched for records of bat activity and roosts within a 10 km radius of the Proposed Wind Farm (last search 3rd February 2026). Hectad R06, R07, R16, and R17 lie within 10 km of the Proposed Wind Farm. Six of Ireland’s nine resident bat species were recorded within 10 km of the Proposed Wind Farm. The results of the database search are provided in Table 4-2.

Table 4-2 NBDC bat records within 10 km of the Proposed Wind Farm

Hectads	Species	Database	Designation
R06, R07, R16, R17	Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	National Bat Database of Ireland	HD Annex IV, WA
R06, R16, R17	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	National Bat Database of Ireland	HD Annex IV, WA
R06, R16,	Daubenton’s bat (<i>Myotis daubentonii</i>)	National Bat Database of Ireland	HD Annex IV, WA
R17	Natterer’s bat (<i>Myotis nattereri</i>)	National Bat Database of Ireland	HD Annex IV, WA
R16, R17	Brown long-eared bat (<i>Plecotus auritus</i>)	National Bat Database of Ireland	HD Annex IV, WA
R06, R16, R17	Leisler’s bat (<i>Nyctalus leisleri</i>)	National Bat Database of Ireland	HD Annex IV, WA

4.2.3 Bat Species Range

The potential for negative impacts is likely to increase where there are high risk species at the edge of their range (NatureScot, 2021). Therefore, range maps presented in the 2025 Article 17 Reports (NPWS, 2025) were reviewed in relation to the location of the Proposed Wind Farm.

The Proposed Wind Farm is outside the current known range for Nathusius’ pipistrelle and Natterer’s bat and is within the range of all other bat species.

4.2.4 Designated Sites

In Ireland, lesser horseshoe bat is the only bat species currently listed as a Qualifying Interest for the designation of Special Areas of Conservation (SACs).

A review of SACs within 10 km of the proposed turbine locations was undertaken, with particular focus on SACs designated for the protection of lesser horseshoe bat as a Qualifying Interest. No SACs with lesser horseshoe bat listed as a Qualifying Interest were identified within 10 km of the proposed turbine locations.

Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) may be designated for a range of conservation interests and may support bat populations even where bats are not listed as a specific feature of interest. A review of NHAs and pNHAs within 10 km of the proposed turbine locations did not identify any sites designated specifically for bat conservation.

4.2.5 Landscape Features and Habitat Suitability

A review of mapping and photographs provided insight into the habitats and landscape features present at the Proposed Wind Farm. In summary, the Proposed Wind Farm is mainly composed of conifer plantations and wet grassland with smaller areas of heath and peatland habitats. The site contains landscape features that can be suitable for use by roosting bats including a small number of farm buildings and structures and conifer edges suitable for foraging bats.

A review of the National Inventory of Architectural Heritage (NIAH) and the National Monuments Service (NMS) datasets did not indicate the presence of subterranean sites within the Proposed Wind Farm.

A search of the UBSS Cave Database for the Republic of Ireland and the GSI Karst Database, found no caves within 10 km of the Proposed Wind Farm.

A review of the NBDC bat landscape map provided a habitat suitability index of 27.11 (Yellow) for all bat species. This indicates that the Proposed Wind Farm has *Low* habitat suitability for bat species.

4.2.6 Additional Plans and Projects in the Wider Landscape

Table 4-3 provides an overview of existing, permitted, and proposed wind farms located within 5 km and 10 km of the Proposed Wind Farm. In addition, other plans and projects with the potential to give rise to cumulative effects on bats (including road infrastructure, quarry developments and residential proposals) were identified within 10 km of the proposed turbine locations.

Table 4-3 Wind Farm developments within 5 km and 10 km of the Proposed Wind Farm

Wind Farm	Status	No. of Turbines	Turbine Tip Height (m)
Within < 5 km			
Cahermurphy Wind Farm	Existing	4	131 (1 turbine 150m)
Kiltumper Wind Farm	Existing	2	120.5
Within 5 - 10 km			
Glenmore Wind Farm	Existing	12	136.5
Booltiagh Wind Farm	Existing	12	90
Booltiagh Extension Wind Farm	Existing	6	120
Coor Shanavogh Wind Farm	Proposed	6	125.5
Slieve Callan Wind Farm	Existing	29	125
Crossmore Wind Farm	Existing	7	124.5
Letteragh Wind Farm	Existing	6	136.5

Additional Projects with potential to contribute to cumulative effects on bats within 10km

Plans and projects within 10 km of the Site with the potential to contribute to cumulative effects on bats include the following planning applications:

- ACP Case ID: 247004 - Extension of existing quarry for stone extraction and associated works.
- Pl. App. 17703 - for the development of a quarry and all associated site development and infrastructure works and services (including site office, staff welfare facilities, site boundary treatment, landscaping and site reinstatement) on a site measuring approximately 1 hectare in the Townland of Glenmore, Kilmihil, Co. Clare. The proposed quarry will have an operational period of ten years after which the site will be reinstated.

4.3 Field Surveys

4.3.1 Bat Habitat Suitability Appraisal

4.3.1.1 Proposed Wind Farm Site

A total of fourteen habitats were recorded within the Proposed Wind Farm, including:

- > Conifer plantation (WD4)
- > Recently-felled woodland (WS5)
- > Wet heath (HH3)
- > Lowland blanket bog (PB3)
- > Cutover bog (PB4)
- > Wet grassland (GS4)
- > Scrub (WS1)
- > Improved agricultural grassland (GA1)
- > Mixed broadleaved woodland (WD1)
- > Spoil and bare ground (ED2)
- > Dry meadows and grassy verges (GS2)
- > Recolonising bare ground (ED3)
- > Eroding/upland rivers (FW1)
- > Drainage ditches (FW4)

The habitats within the Proposed Wind Farm are dominated by conifer plantation, with widespread areas of wet grassland, and smaller areas of wet heath occurring as a mosaic with lowland blanket bog and cutover bog habitats. Chapter 6 of the main EIAR describes the various habitats within the Site in more detail.

The desktop study and walkover surveys were used to assess habitats for their suitability to support foraging, commuting, and roosting bats, according to Collins (2023). Bat habitat suitability categories, divided into *High*, *Moderate*, *Low*, *Negligible* or *None* are described fully in **Appendix 1**.

Areas of spoil and bare ground (ED2) and recolonising bare ground (ED3), comprising the surfaced elements of forestry tracks and other exposed ground, together with open areas of improved agricultural grassland (GA1) lacking structural connectivity, were considered to be of *Negligible* suitability for foraging and commuting bats (Plate 4-1). These areas are generally open and exposed and lack linear features, shelter or habitat complexity likely to be used by bats as commuting routes or foraging habitat.

Areas of wet heath (HH3), lowland blanket bog (PB3), cutover bog (PB4), wet grassland (GS4), dry meadows and grassy verges (GS2) and recently-felled woodland (WS5) were considered to be of *Low* suitability for foraging and commuting bats (Plate 4-2; Plate 4-3). While these habitats may occasionally be used by a small number of foraging bats, they are typically open in nature, offer limited shelter, and do not form strong or continuous linear features within the wider landscape.

Conifer plantation (WD4), mixed broadleaved woodland (WD1), scrub (WS1), eroding/upland streams (FW1) and, in particular, conifer plantation edges and forestry tracks with adjacent woodland or scrub were considered to be of *Moderate* suitability for foraging and commuting bats (Plate 4-4). In the absence of hedgerows or traditional treelines, conifer woodland edges and associated linear features represent the primary sources of shelter, navigational structure and connectivity within the Site and provide the main commuting and foraging opportunities for bats within the predominantly commercial forestry landscape. No habitats within the Proposed Wind Farm were assessed as offering *High* suitability for commuting or foraging bats.



Plate 4-1 Open areas of grassland next to T2, assigned *Negligible* suitability for commuting and foraging bats.



Plate 4-2 Recently-felled woodland around T1, assigned *Low* suitability for commuting and foraging bats.



Plate 4-3 Wet heath and cutover bog area around T5 assigned *Low* suitability for commuting and foraging bats.



Plate 4-4 Conifer forestry edges and tracks leading to T2 assigned *Moderate* suitability for commuting and foraging bats.

Three farm buildings and structures were inspected for bat roosting suitability. Two of the structures were assessed as offering *Low* roosting potential and one was assessed as offering *Moderate* roosting potential. Overall, built structures within the Proposed Wind Farm were assessed as providing *Low* to *Moderate* suitability for roosting bats, and no structures or features with *High* roosting suitability were identified. Details of the inspected structures and dusk emergence surveys are presented in Section 4.3.2.

All trees within the Proposed Wind Farm footprint, including those scheduled for felling, were inspected for potential roost features (PRFs) following Andrews (2018). No PRFs were identified on any tree inspected; accordingly, all inspected trees were assessed as having no (*None*) roosting potential in line with Collins (2023). Further detail on inspected trees is provided in Section 4.3.2.

4.3.1.2 Proposed Grid Connection

The Proposed Grid Connection will consist of a permanent on-site 110 kV substation compound, which will be connected to the existing Moneypoint 110 kV substation via an underground 110 kV electrical cable. The cabling route, approximately 25 km in length, is located primarily within the public road corridor and private agricultural lands. The proposed on-site substation is situated within wet grassland (GS4), improved agricultural grassland (GA1) and scrub (WS1), while habitats along the Proposed Grid Connection route include buildings and artificial surfaces (BL3), spoil and bare ground (ED2), treelines (WL2), hedgerows (WL1), conifer plantation (WD4), stonewalls and other stonework (BL1), mixed broadleaved/conifer woodland (WD2), dry meadows and grassy verges (GS2), and various watercourses including depositing/lowland rivers (FW2) and eroding/upland rivers (FW1). Further details of habitats within the Proposed Grid Connection footprint are provided in Chapter 6, Section 6.4.1.2 of the EIAR.

The habitat at the proposed 110 kV on-site substation comprises wet grassland (GS4), improved agricultural grassland (GA1) and scrub (WS1). These habitats were assessed as offering *Negligible* to *Low* suitability for commuting and foraging bats, owing to their open nature and limited structural connectivity. Linear features along the Proposed Grid Connection route, including treelines (WL2) and hedgerows (WL1), were assessed during field surveys. These features were assigned *Low* to *Moderate* suitability for

commuting and foraging bats due to their connectivity with the wider landscape and the presence of linear vegetation providing navigational structure and shelter. Overall, habitats along the Proposed Grid Connection route were assessed as providing *Low* to *Moderate* suitability for commuting and foraging bats, with no habitats assessed as offering *High* suitability.

With regard to roosting bats, no buildings, trees or other features capable of supporting bat roosts were identified within the on-site substation footprint, and this area was therefore assessed as having no (*None*) roosting potential for bats.

Along the wider Proposed Grid Connection route, a lesser horseshoe bat roost supporting three individuals is known to occur in the vicinity of the Moneypoint substation, based on information provided by NPWS. Buildings at this location were assessed externally as part of the bat habitat appraisal and were found to present *Moderate* potential to support bat roosting, due to the presence of accessible openings such as windows and crevices within external walls, although no evidence of bat roosting was recorded during the external inspection. The surrounding area comprises mixed broadleaved woodland and overgrown vegetation, which provides suitable foraging and commuting habitat for lesser horseshoe bats and other bat species. The Proposed Grid Connection works in this area will be confined to a small area of disturbed verge and trackside vegetation within the defined working corridor, which lies more than 60 m from the known roost, and do not extend into the buildings or the adjacent broadleaved woodland associated with the roost.

Structures along the Proposed Grid Connection route, including bridges and culverts at watercourse crossings, were assessed for bat roosting potential. Of the inspected structures, four stone bridges or stone clapper crossings were assessed as offering *Low* roosting potential and one stone bridge was assessed as offering *Moderate* roosting potential, due to the presence of localised crevices or gaps in stonework above the waterline. The remaining culverts and structures were assessed as offering no (*None*) or *Negligible* roosting potential. No evidence of bat roosting was recorded at any of the inspected structures.

At locations where bridges or culverts were assessed as offering *Low* or *Moderate* roosting potential, the proposed construction methodology involves horizontal directional drilling (HDD) with setbacks of approximately 50 m from the structure, with works confined to areas away from the bridge or culvert. Full details of the assessed structures and their roosting suitability are provided in Table 4-4 below. Photographs of the bridges and stone clapper crossings assessed as offering *Low* and *Moderate* roosting potential are provided in Plates 4-5 to 4-9.

Table 4-4 Bat roost suitability of bridges/culverts along the Proposed Grid Connection underground cabling route

WC Ref	Grid Reference	Structure Type	Key Features Relevant to Bats	Bat Roost Potential	Proposed Works
WC1	R 05526 53864	Culvert	Structure obscured by dense vegetation; internal surfaces and features not visible	None identified	Standard formation crossing over culvert
WC2	R 05843 55253	Culvert (concrete pipe)	Smooth concrete surfaces; no cracks or crevices; open pipe ends only	<i>Negligible</i>	Standard formation crossing over culvert
WC3	R 05736 55906	Culvert (PVC pipe)	Smooth PVC surfaces; no visible joints, cracks or crevices	None identified	Standard formation crossing over culvert
WC4	R 05727 55971	Culvert (concrete pipe)	Smooth concrete surfaces; no cracks or crevices	<i>Negligible</i>	Standard formation crossing under culvert
WC5	R 05699 56204	Culvert (single stone clapper)	No visible cracks or crevices; structure partially obscured by dense vegetation	<i>Negligible</i>	Standard formation crossing under culvert
WC6	R 05083 57442	Stone bridge	Small, shallow stone bridge; structure	<i>Negligible</i>	Horizontal Directional

			completely obscured by dense vegetation with no exposed stonework or visible crevices		Drilling (HDD) offset from bridge
WC7	R 04856 57751	Culvert (double stone clapper)	Exposed stonework forming two open spans; localised gaps and crevices between stones providing limited sheltered roosting features above the waterline	<i>Low</i>	Horizontal Directional Drilling (HDD) offset from bridge
WC8	R 04587 58010	Culvert	Structure obscured by dense vegetation; internal surfaces and features not visible	None identified	Standard formation crossing over culvert
WC9	R 04653 59112	Culvert (single stone clapper)	No visible cracks or crevices; structure partially obscured by dense vegetation	<i>Negligible</i>	Horizontal Directional Drilling (HDD) offset from structure
WC10	R 04697 59655	Culvert (concrete pipe)	Smooth concrete surfaces; no cracks or crevices	<i>Negligible</i>	Standard formation crossing over culvert
WC11	R 04916 59807	Culvert	Structure obscured by dense vegetation; internal surfaces and features not visible	None identified	Standard formation crossing over culvert
WC12	R 05484 60633	Culvert (concrete pipe)	Smooth concrete surfaces; no cracks or crevices; open pipe ends only	<i>Negligible</i>	Standard formation crossing over culvert
WC13	R 05933 61520	Culvert (concrete pipe)	Smooth concrete surfaces with no cracks or crevices; pipe largely inundated at time of survey, leaving minimal internal space	<i>Negligible</i>	Horizontal Directional Drilling (HDD) offset from structure
WC14	R 06266 61767	Stone triple-arched bridge	Exposed stonework; recessed mortar joints and localised gaps between stones forming crevices and sheltered roosting features above the waterline	<i>Moderate</i>	Horizontal Directional Drilling (HDD) offset from bridge
WC15	R 07182 62318	Stone single-arched bridge	Stone masonry generally well pointed with intact mortar; a small number of localised but relatively deep crevices present on the bridge face and soffit, offering limited potential roosting features.	<i>Low</i>	Horizontal Directional Drilling (HDD) offset from bridge

WC16	R 06523 63349	Concrete single-arched bridge	Exposed concrete surfaces smooth and featureless with no visible cracks or crevices; remaining structure obscured by dense vegetation cover	<i>Negligible</i>	Horizontal Directional Drilling (HDD) offset from bridge
WC17	R 06680 63640	Bridge (Triple stone clapper)	Stone slabs and supporting masonry well pointed throughout with tight joints; no visible cracks or crevices suitable for roosting bats	<i>Negligible</i>	Horizontal Directional Drilling (HDD) offset from bridge
WC18	R 08024 66197	Culvert (single stone clapper)	Exposed stonework forming an open span with localised gaps and crevices between stones, providing limited sheltered roosting features above the waterline	<i>Low</i>	Horizontal Directional Drilling (HDD) offset from bridge
WC19	R 08719 66729	Culvert	Structure obscured by dense vegetation; internal surfaces and features not visible	None identified	Standard formation crossing over culvert
WC20	R 08827 66827	Stone single-arched bridge	Stonework largely obscured by dense vegetation; where exposed, a small number of crevices present above the waterline, with additional crevices occurring at low level adjacent to the channel and likely subject to periodic inundation	<i>Low</i>	Horizontal Directional Drilling (HDD) offset from bridge
WC21	R 09634 67708	Culvert	Structure obscured by dense vegetation; internal surfaces and features not visible	None identified	Standard formation crossing over culvert
WC22	R 09810 68309	Culvert (concrete pipe)	Smooth concrete surfaces; no cracks or crevices; open pipe ends only	<i>Negligible</i>	Standard formation crossing over culvert
WC23	R 09790 68744	Rendered masonry culvert	Smooth vertical faces with no visible cracks, joints or crevices; no sheltered recesses suitable for roosting bats	<i>Negligible</i>	Horizontal Directional Drilling (HDD) offset from structure
WC24	R 09760 68834	Culvert (concrete pipe)	Smooth concrete surfaces; no cracks or crevices	<i>Negligible</i>	Standard formation crossing over culvert



Plate 4-5 Double stone clapper at WC7 showing exposed stonework and localised gaps between stones above the waterline, assessed as offering Low bat roosting potential.



Plate 4-6 Stone single-arched bridge at WC15 showing generally well-pointed masonry with a small number of deep crevices, assessed as offering Low bat roosting potential.



Plate 4-7 Single stone clapper at WC18 showing exposed stonework with localised gaps and crevices between stones above the waterline, assessed as offering Low bat roosting potential.



Plate 4-8 Stone single-arched bridge at WC20 showing stonework partially obscured by vegetation, with a small number of exposed crevices above the waterline, assessed as offering Low bat roosting potential.



Plate 4-9 Stone triple-arched bridge at WC14 showing recessed mortar joints and crevices above the waterline, assessed as offering Moderate bat roosting potential.

4.3.1.3 Turbine Delivery Accommodation Works

As described in Chapter 4 of this EIAR, a number of temporary turbine delivery accommodation (TDA) works are required along the turbine transport route to facilitate the delivery of turbine components and other abnormal loads to the Proposed Wind Farm. These works occur at seven locations (Locations 1-7) and include temporary road widening within existing road corridors, temporary field crossings through agricultural land, and localised hedgerow and verge vegetation removal at field entrances and road margins. The locations of the TDA works (Locations 1-7) are described in detail in Chapter 4 of this EIAR.

Habitats within the TDA footprint comprise improved agricultural grassland (GA1), dry meadows and grassy verges (GS2), scrub (WS1), hedgerows (WL1) and small numbers of individual trees associated with gappy field boundaries and road edges. Areas of grassland, verges and disturbed ground at Locations 1, 2, 3, 6 and 7 were assessed as offering *Low* suitability for bat foraging and commuting, reflecting their open nature and limited structural connectivity. At Locations 4 and 5, gappy hedgerows and occasional trees occur along field boundaries and were also assessed as offering *Low* suitability for commuting and foraging bats, as these features do not form continuous linear corridors within the wider landscape.

No buildings, bridges or other structures capable of supporting bat roosts occur within the TDA footprint. Trees within the works areas at Locations 1 and 4 were subject to ground-level inspection in accordance with Andrews (2018) and were not found to contain any potential roost features (PRFs); accordingly, all trees affected by the TDA works were assessed as having no (*None*) roosting potential in line with Collins (2023).

4.3.1.4 Hen Harrier Enhancement Plan Lands

As described in Chapter 4 and Appendix 7-8 of this EIAR, nine discrete land parcels have been identified under the Hen Harrier Enhancement Plan and were subject to bat habitat appraisal. The location and extent of these land parcels are shown on Figure 4-1. Three parcels comprise commercial conifer plantation, where enhancement will involve permanent felling of conifers followed by re-vegetation and the creation of a more open habitat mosaic, including areas of patchy scrub. The remaining six parcels comprise farmland habitats, which will be enhanced through habitat restoration measures including adjustments to grazing regimes, planting of wildlife seed crops, retention and enhancement of existing scrub and hedgerows, rush management, and cessation of fertiliser application. These parcels were assessed during field survey to establish their current suitability for bats in terms of roosting, commuting and foraging, in accordance with Collins (2023).

The conifer plantation parcels are characterised by dense, even-aged commercial forestry with limited structural diversity, sparse understorey and a lack of internal open space. Within plantation interiors, habitat was assessed as offering *Low* suitability for commuting and foraging bats, due to the absence of sheltered flight corridors and insect-rich foraging areas. In contrast, conifer plantation edges associated with these parcels provide some structural connectivity and were assessed as offering *Moderate* suitability for commuting and foraging bats.

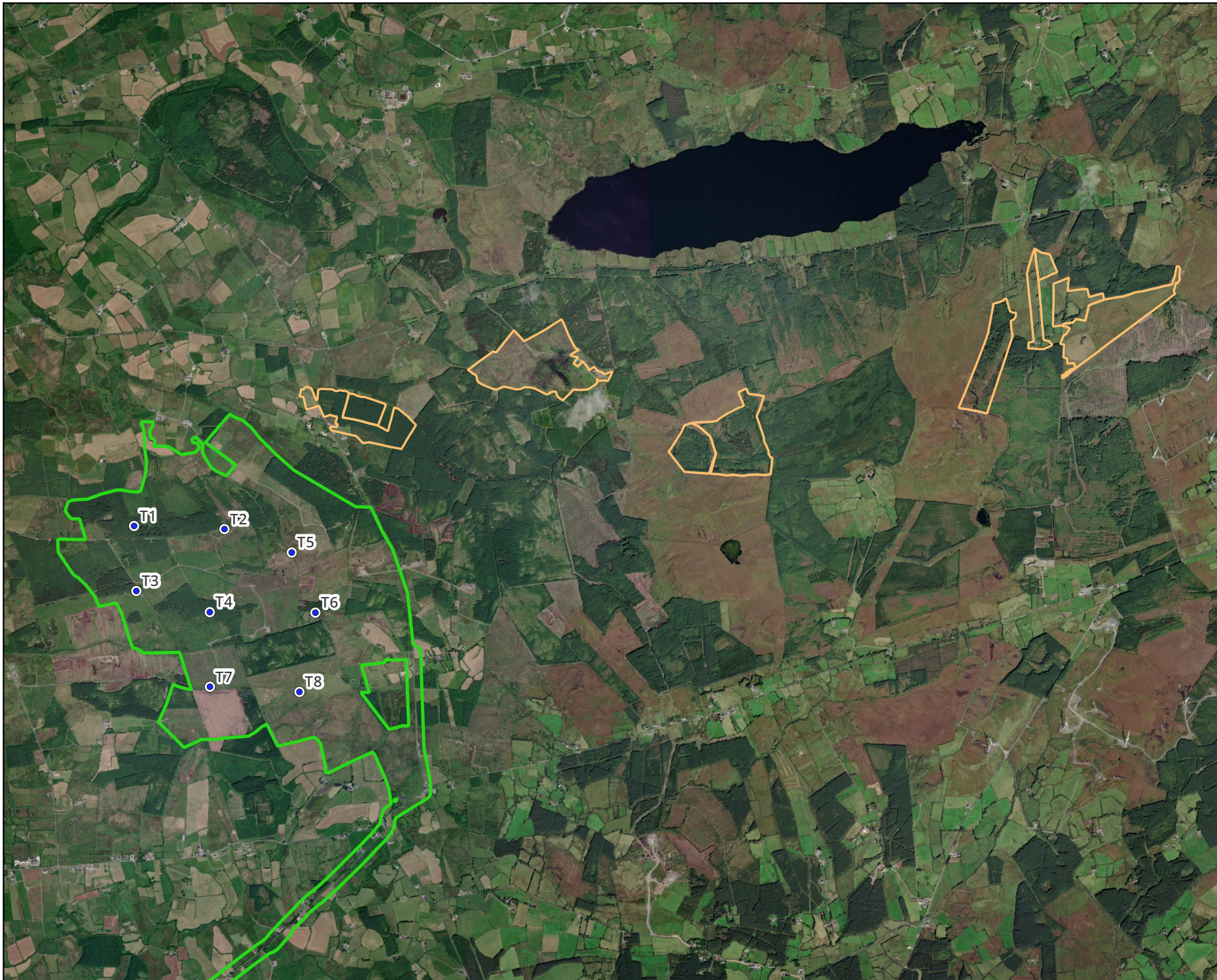
All trees within the plantation parcels proposed for felling comprise commercial conifer species, with the exception of a small, localised patch of wet willow woodland. Detailed ground-level inspections were undertaken of the broadleaved trees only, as the commercial conifer plantation trees are managed on a short to medium rotation, are generally immature to semi-mature, and are even-aged with a uniform structure. As a result, they are considered unlikely to support potential roost features typically used by bats, such as cavities, cracks, splits or areas of decay, and therefore offer *Negligible* roosting potential in the context of this site. No potential roost features (PRFs) were identified within the inspected wet willow woodland trees, and no evidence of bat use was recorded. Accordingly, all trees within the plantation parcels were assessed as having no (*None*) roosting potential.

The farmland parcels comprise improved agricultural grassland (GA1), wet grassland (GS4), wet heath (HH3), scrub (WS1), dense bracken (HD1), an acid oligotrophic lake (FL2), hedgerows (WL1), treelines (WL2) and conifer woodland edges. Open areas of improved agricultural grassland, wet grassland, wet heath, dense bracken and the acid oligotrophic lake were assessed as offering *Low* suitability for bat foraging and commuting, reflecting their generally open and exposed nature and limited structural

connectivity. In contrast, scrub, hedgerows, treelines and conifer woodland edges provide linear features and connectivity within the wider landscape and were assessed as offering *Moderate* suitability for commuting and foraging bats.

Two farmland parcels contained derelict buildings with associated outbuildings and sheds, comprising a total of six structures. All structures were internally inspected for roosting bats and evidence of bat use and were assessed as offering *Low* roosting potential due to unstable internal conditions and the presence of only a small number of shallow crevices. One bridge structure occurs within another farmland parcel and was also assessed as offering *Low* roosting potential. No evidence of bat roosting was recorded at any of the structures inspected during field survey.

All structures will be retained, and no works are proposed in their vicinity. Accordingly, these features do not represent a pathway for impact on bats. The structures are located within farmland parcels subject to enhancement measures, including retention and reinstatement of beneficial landscape features such as scrub and hedgerows, rush management, and management of grazing timing and intensity.



Map Legend

- EIA Site Boundary
- Proposed Turbine Layout
- Proposed Hen Harrier Enhancement Areas



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Drawing Title

Location of Hen Harrier Enhancement Areas

Project Title

Proposed Cahermurphy West Wind Farm

Drawn By KL	Checked By CM
Project No. 230407-a	Drawing No. Figure 4-1
Scale 1:35,000	Date 2026-01-23



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4.3.2 Roost Surveys

4.3.2.1 Daytime Roost Inspections

Three structures were identified within the Proposed Wind Farm as containing features with the potential to support roosting bats. These structures were assessed during daytime surveys undertaken in 2025 in accordance with the grading criteria set out in Collins (2023) (**Appendix 1**). Each structure was subject to an external inspection and, where accessible, an internal inspection, to identify potential roosting features and any evidence of bat use.

Of the three structures surveyed, two were assessed as having *Low* bat roost potential and one was assessed as having *Moderate* bat roost potential. All three structures will be retained and avoided as part of the Proposed Project. Further details of the structures are provided below and are summarised in Table 4-5.

The following sections describe each structure, supported by photographs and noting key features relevant to bat roosting potential.

Table 4-5 Structures inspected for roost potential within the Proposed Wind Farm

Structure No.	Description	Irish Grid Reference	Nearest Turbine	Distance to nearest turbine (m)	Bat Roost Potential
1	Farm Building	R 07771 69493	T3	230	<i>Moderate</i>
2	Farm Shed A	R 08080 69548	T1	325	<i>Low</i>
3	Farm Shed B	R 07325 69642	T1	500	<i>Low</i>

Farm Building (Structure No. 1)

This structure is located approximately 240 m south of Turbine 1 and approximately 230 m north of Turbine 3. It comprises a stone-built farm building with a corrugated metal roof and was assessed as having *Moderate* bat roost potential in accordance with the criteria outlined in Collins (2023).

The building contains three open doorways and semi-boarded windows. Small gaps were observed between the end rafters and the stone walls at both gable ends, which provide potential roosting spaces for bats. A small number of bat droppings were observed on floor material within the structure.

The building is surrounded by dense overgrown vegetation and scrub and a small area of semi-mature broadleaved woodland, with commercial conifer plantation occurring in the wider surrounding area. This landscape context provides good ecological connectivity and offers moderate suitability for commuting and foraging bats.

Plates 4-10 to 4-13 illustrate the external condition of the structure, internal features, potential roosting spaces and evidence observed during the inspection.



Plate 4-10 West aspect of Farm Building (Structure No. 1)



Plate 4-11 Internal condition of Structure No. 1



Plate 4-12 Potential roosting spaces within Structure No. 1 between end rafters and walls



Plate 4-13 Evidence of bat droppings on floor material within Structure No. 1

Farm Shed A (Structure No. 2)

This structure is located approximately 325 m southeast of Turbine 1. The shed was assessed as having *Low* bat roost potential, in accordance with the criteria set out in Collins (2023).

The structure comprises stone block construction with a corrugated metal roof. Access into the building is provided via a metal gate within the doorway, which remains open and allows bats to enter the structure. Several gaps were noted within the stonework; however, these features are limited in extent and offer only low suitability for use by roosting bats. No evidence of bat use was recorded during the daytime inspection.

The shed is situated within an area of wet grassland, with conifer plantation edges occurring in the surrounding landscape. These features provide ecological connectivity to the wider area and offer moderate suitability for bat commuting and foraging.

Plates 4-14 to 4-17 illustrate the external and internal condition of the structure, potential access features and the surrounding landscape context.



Plate 4-14 Northeast aspect of Farm Shed A (Structure No. 2)



Plate 4-15 Interior of Farm Shed A showing roof structure



Plate 4-16 Gaps within stonework of Farm Shed A (Structure No. 2)



Plate 4-17 Surrounding landscape of Structure No. 2, comprising wet grassland and adjacent conifer plantation

Farm Shed B (Structure No. 3)

This structure is located approximately 500 m west of Turbine 1 and was assessed as having *Low* bat roost potential, in accordance with the criteria set out in Collins (2023).

The shed is constructed of solid concrete walls with a galvanised metal roof and includes a gate covering the lower half of the doorway. The building is primarily used for the storage of hay bales. Small gaps were observed between the end rafters and the concrete wall, which offer limited potential roosting opportunities for bats.

No roosting bats were observed during the daytime inspection. However, a small number of bat droppings were recorded within the structure, indicating occasional bat use, consistent with the low roost potential classification.

The shed is situated within improved agricultural grassland adjacent to mature conifer trees forming part of a linear conifer edge. These features provide ecological connectivity within the surrounding landscape and offer moderate suitability for bat commuting and foraging.

Plates 4-18 to 4-21 illustrate the external and internal condition of the structure, potential roosting features and the evidence observed during the inspection.



Plate 4-18 Southwest aspect of Farm Shed B



Plate 4-19 Potential roosting spaces within Structure No. 3 between end rafters and walls



Plate 4-20 Interior of Farm Shed B



Plate 4-21 Bat dropping found at Farm Shed B

4.3.2.2 Tree Inspections

Targeted ground-level tree inspections were undertaken during the 2025 surveys where non-conifer trees were present within works areas, in accordance with Andrews (2018) and Collins (2023). Inspections focused on identifying the presence of potential roosting features (PRFs), including cracks, splits, cavities, lifted bark, woodpecker holes and evidence of decay.

Trees within the Proposed Wind Farm footprint that are required to be removed to facilitate turbine bases, crane hardstands, access tracks and associated infrastructure comprise exclusively commercial conifer plantation forestry. These trees do not provide suitable roosting features for bats due to their species composition, uniform structure and management regime, which limits the development of cavities, cracks, loose bark or other potential roost features.

Trees within the works areas associated with the Turbine Delivery Route (TDR) accommodation works, including those at Locations 1 and 4, were subject to detailed ground-level inspection (Plates 4-22 and 4-23). These trees were not found to contain any PRFs, and no evidence of bat use was recorded. Accordingly, all trees affected by the TDR works were assessed as having no (*None*) roosting potential, in line with Collins (2023).

Trees within the Hen Harrier Enhancement Plan lands proposed for felling were also inspected at ground level. Areas of commercial conifer plantation forestry proposed for felling are characterised by closed-canopy, even-aged conifer stands managed for timber production and were assessed as offering no (*None*) roosting potential for bats. A small, localised patch of broadleaved trees within one of the Hen Harrier Enhancement Plan lands, comprising predominantly willow, alder and ash, was also subject to ground-level inspection (Plates 4-24 and 4-25). No PRFs were identified within these trees, and no evidence of bat use was recorded. As such, all non-conifer trees within the Hen Harrier Enhancement Plan lands proposed for felling were also assessed as having no (*None*) roosting potential.

Overall, the tree inspections confirmed that no trees within the Proposed Project footprint, including all areas subject to felling, provide suitable roosting opportunities for bats.



Plate 4-22 Trees at Location 1 of the proposed TDR works



Plate 4-23 Trees at Location 4 of the TDR works



Plate 4-24 Mixed broadleaved trees at Parcel A of the Hen Harrier Enhancement Plan lands; no PRFs present.



Plate 4-25 Ash trees at Parcel A of the Hen Harrier Enhancement Plan lands; no PRFs present.

4.3.2.3 Emergence Surveys

Emergence surveys were undertaken during the spring, summer and autumn of 2025 to further assess the use of structures by roosting bats. The locations surveyed, survey dates and results recorded during the 2025 survey season are summarised in Table 4-6.

In addition, emergence surveys were carried out in 2023, and the results of these earlier surveys are presented in detail in **Appendix 4**. In summary, Structure No. 1 and Structure No. 3 were previously confirmed as roosts, hosting two and one soprano pipistrelle individuals, respectively, during the 2023 survey season.

During the spring and summer 2025 survey periods, Structure No. 1 (Farm Building) was subject to emergence surveys due to its classification as having *Moderate* bat roost potential. During both surveys, four soprano pipistrelle (*Pipistrellus pygmaeus*) individuals were observed emerging from one of the three open doorways of the structure.

During the autumn 2025 survey period, Structures No. 2 (Farm Shed A) and No. 3 (Farm Shed B) were subject to emergence surveys. At Structure No. 2, three soprano pipistrelle individuals were observed emerging from the apex of the shed. At Structure No. 3, four soprano pipistrelle individuals were observed emerging from the half-open doorway of the structure.

Overall, emergence survey results recorded in 2025 confirm the use of all three surveyed structures by soprano pipistrelle bats, with emergence locations corresponding to previously identified access features.

Table 4-6 Emergence survey results 2025

Structure No.	Description	Bat Roost Potential	IG Ref	Date Surveyed	Survey Results
---------------	-------------	---------------------	--------	---------------	----------------

1	Farm Building	Moderate	R 07771 69493	30 th April 2025 & 11 th July 2025	4 Soprano pipistrelles emerged
2	Farm Shed A	Low	R 08080 69548	19 th August 2025	3 Soprano pipistrelles emerged
3	Farm Shed B	Low	R 07325 69642	19 th August 2025	4 Soprano pipistrelles emerged

4.3.3 Manual Transects

Manual transects were undertaken in spring, summer and autumn 2025. Details of additional transects carried out in 2023 are included in **Appendix 4**.

Bat activity was recorded in all seasons in 2025. A total of 649 bat passes were recorded, including emergence surveys. In general, soprano pipistrelle (n=352) was recorded most frequently, followed by common pipistrelle (n=270). *Myotis* spp. (n=18), brown long-eared bat (n=6) and Leisler's bat (n=3) were less frequent (Plate 4-26).

Species composition and activity levels varied between survey periods. To account for differences in survey effort, results were expressed as bat passes per kilometre surveyed. Plate 4-27 presents result for individual species per survey period, while Figures 4-2 to 4-4 illustrate the spatial distribution of bat activity. Activity was concentrated around the structures surveyed during the emergence survey as surveyors were positioned at fixed locations for extended periods during the survey and within forestry corridors.

The spring surveys recorded significantly fewer bat passes (n = 62) compared with summer (n = 196) and autumn (n = 391). Soprano pipistrelle was most frequently recorded in summer, while common pipistrelle was recorded more frequently in autumn and *Myotis* spp. activity peaked in summer. Leisler's bats were recorded exclusively in autumn, whereas brown long-eared bats were recorded in both spring and autumn. Overall, the 2025 manual survey results are broadly similar to the 2023 manual survey results (**Appendix 4**).

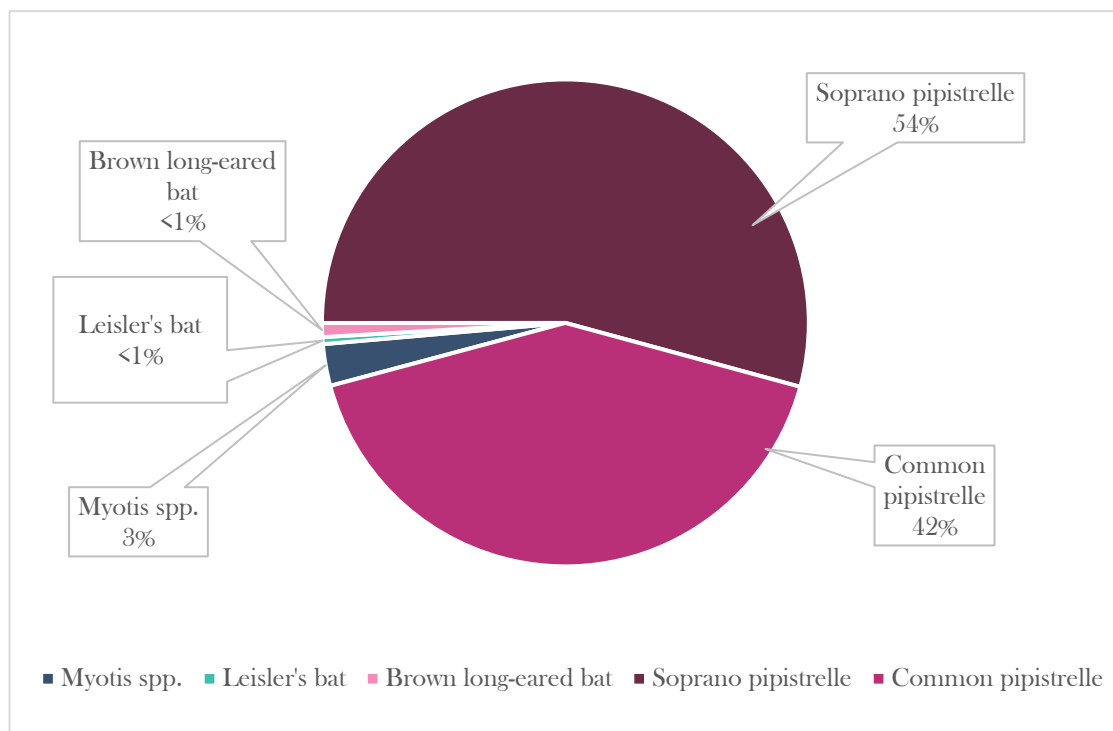


Plate 4-26 Manual activity survey results 2025 - Total species composition

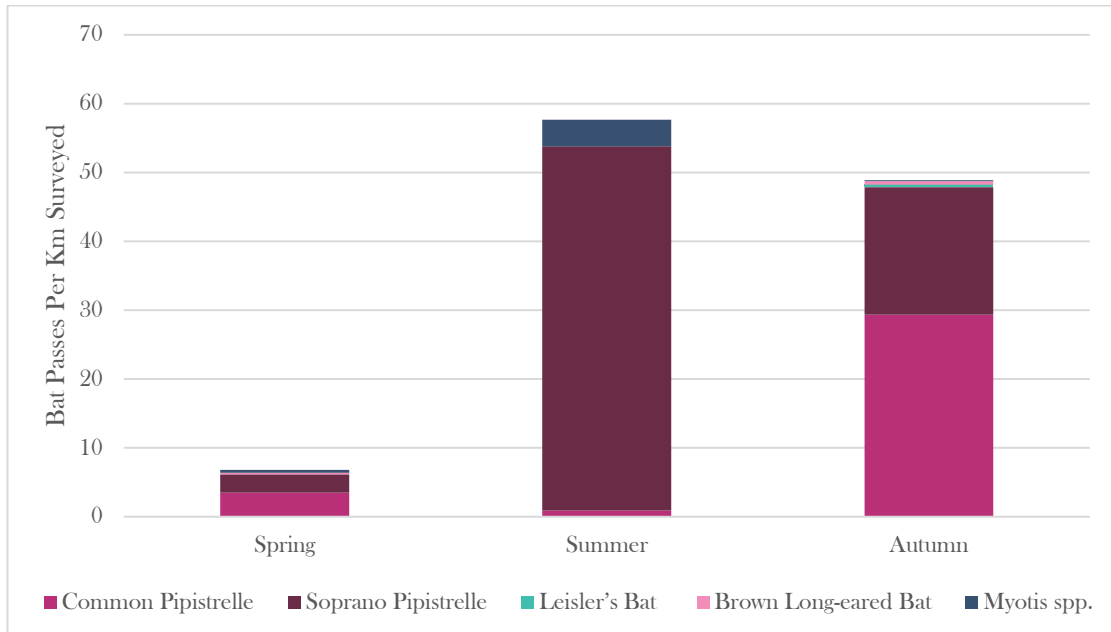
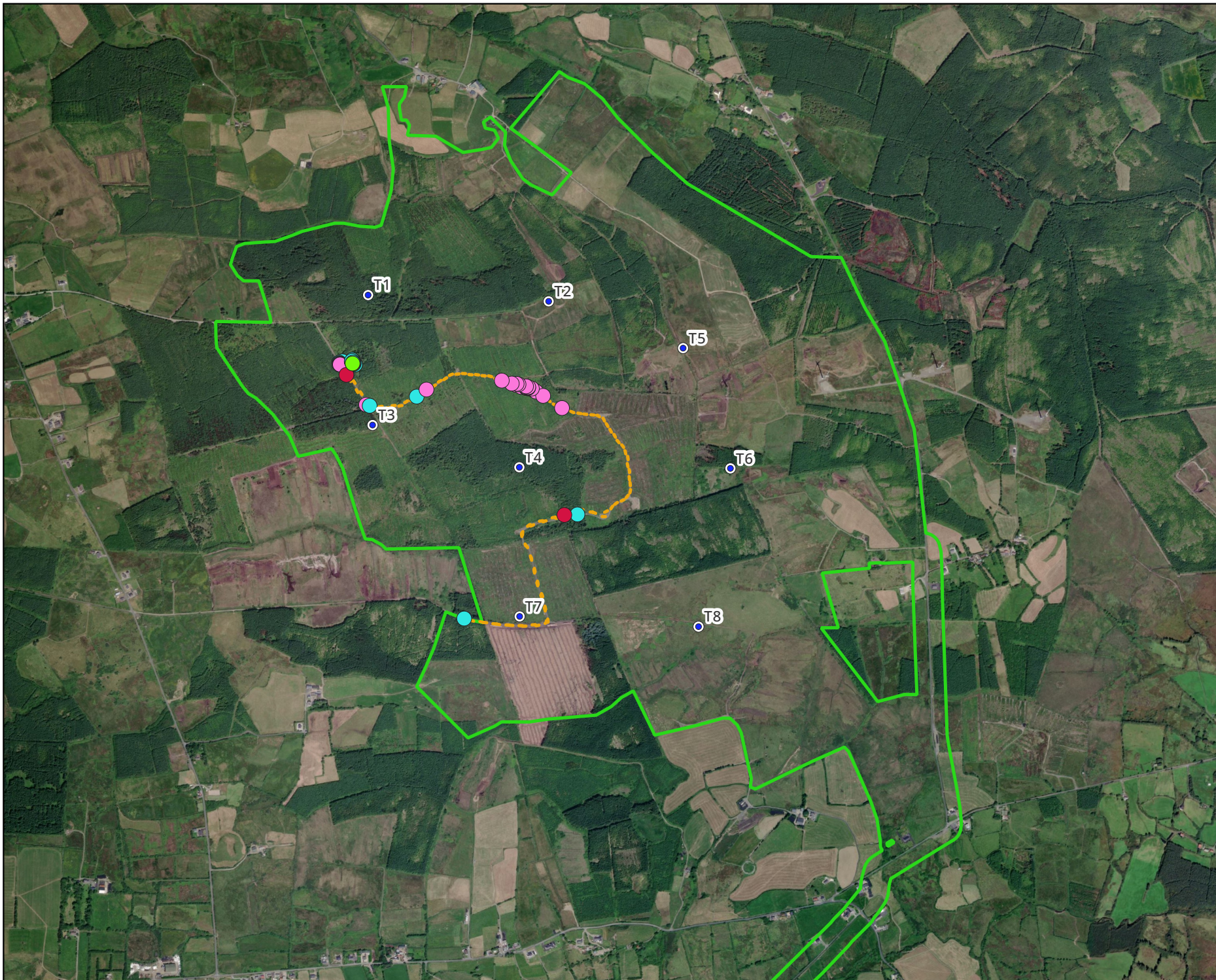


Plate 4-27 Manual activity survey results 2025 - Relative bat activity per survey period



- ### Map Legend
- EIA Site Boundary
 - Proposed Turbine Layout
 - Spring Transect Route
30.04.2025
- ### Species
- Myotis spp.
 - Common pipistrelle
 - Soprano pipistrelle
 - Brown long-eared bat

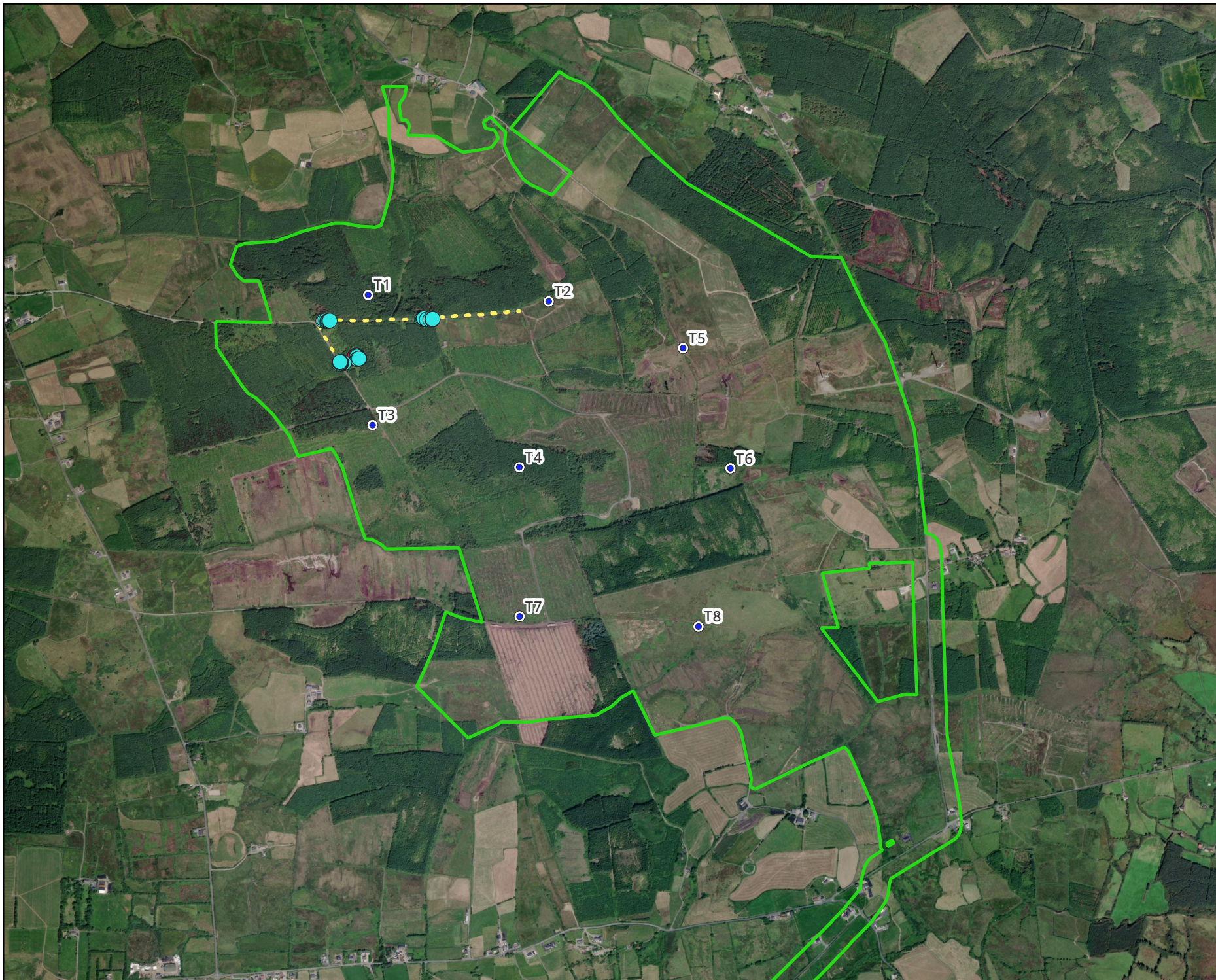


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Drawing Title Spring Manual Transect Results 2025	
Project Title Proposed Cahermurphy West Wind Farm	
Drawn By KL	Checked By CM
Project No. 230407-a	Drawing No. Figure 4-2
Scale 1:17,500	Date 2026-01-23



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Map Legend

- EIA Site Boundary
- Proposed Turbine Layout
- - - Summer Transect Route 11.06.2025

Species

- Myotis spp.
- Common pipistrelle
- Soprano pipistrelle

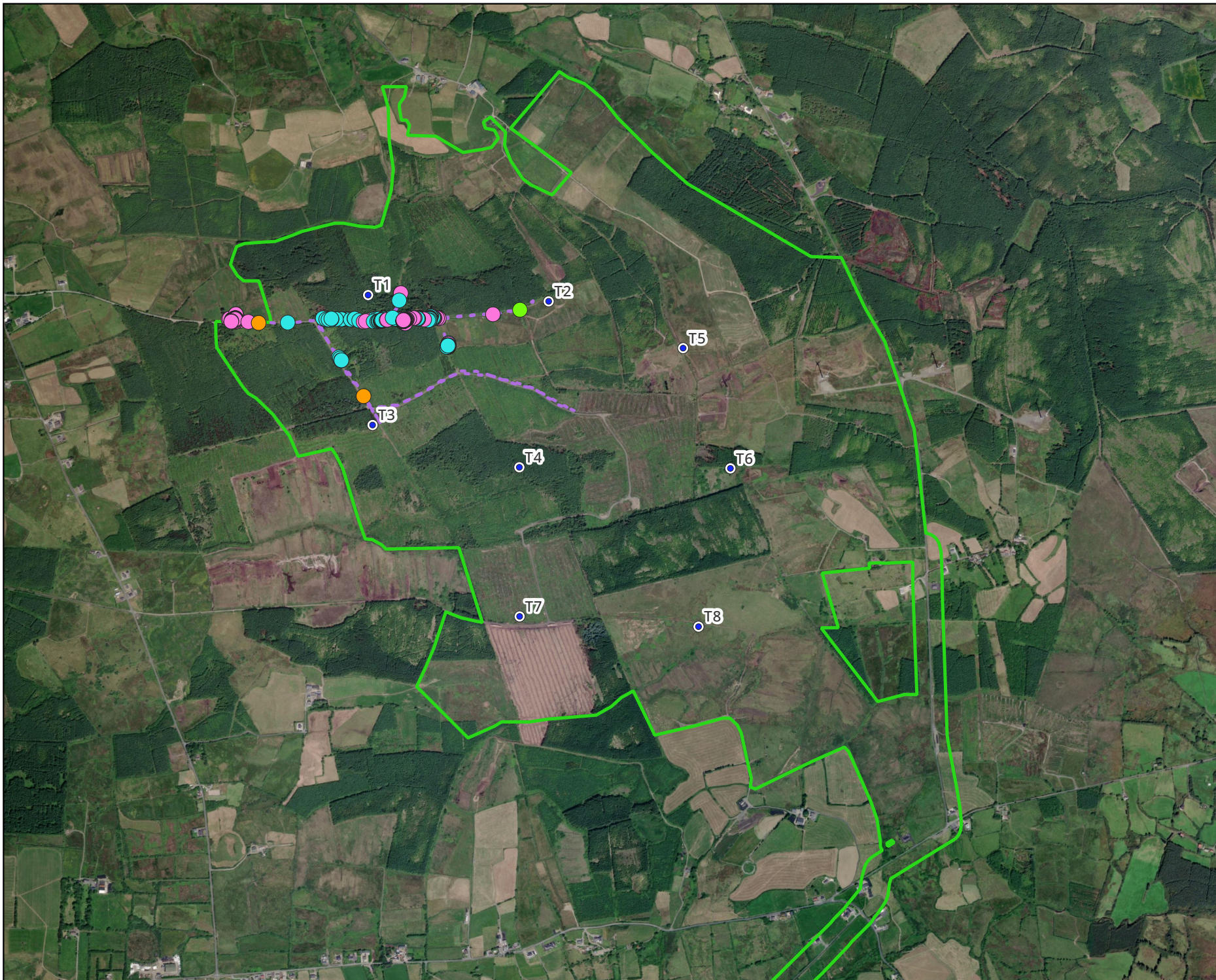


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Drawing Title	
Summer Manual Transect Results 2025	
Project Title	
Proposed Cahermurphy West Wind Farm	
Drawn By	Checked By
KL	CM
Project No.	Drawing No.
230407-a	Figure 4-3
Scale	Date
1:17,500	2026-01-23



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Map Legend

- EIAR Site Boundary
- Proposed Turbine Layout
- Autumn Transect Route
19.08.2025
- Species**
- Myotis spp.
- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared bat

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Drawing Title
Autumn Manual Transect Results 2025

Project Title
Proposed Cahermurphy West Wind Farm

Drawn By KL	Checked By CM
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Project No. 230407-a	Drawing No. Figure 4-4
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Scale 1:17,500	Date 2026-01-23
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4.3.4 Ground-level Static Surveys

In total, 19,556 bat passes were recorded across all deployments in 2025. In general, soprano pipistrelle (n=9,914) occurred most frequently, followed by common pipistrelle (n=5,468). Instances of Leisler’s bat (n=1,853), *Myotis* spp. (n=1,706), brown long-eared bat (n=614) and lesser horseshoe bat (n=1) were recorded less frequently during the 2025 survey period. Plate 4-28 presents relative species composition across all ground-level static detector surveys.

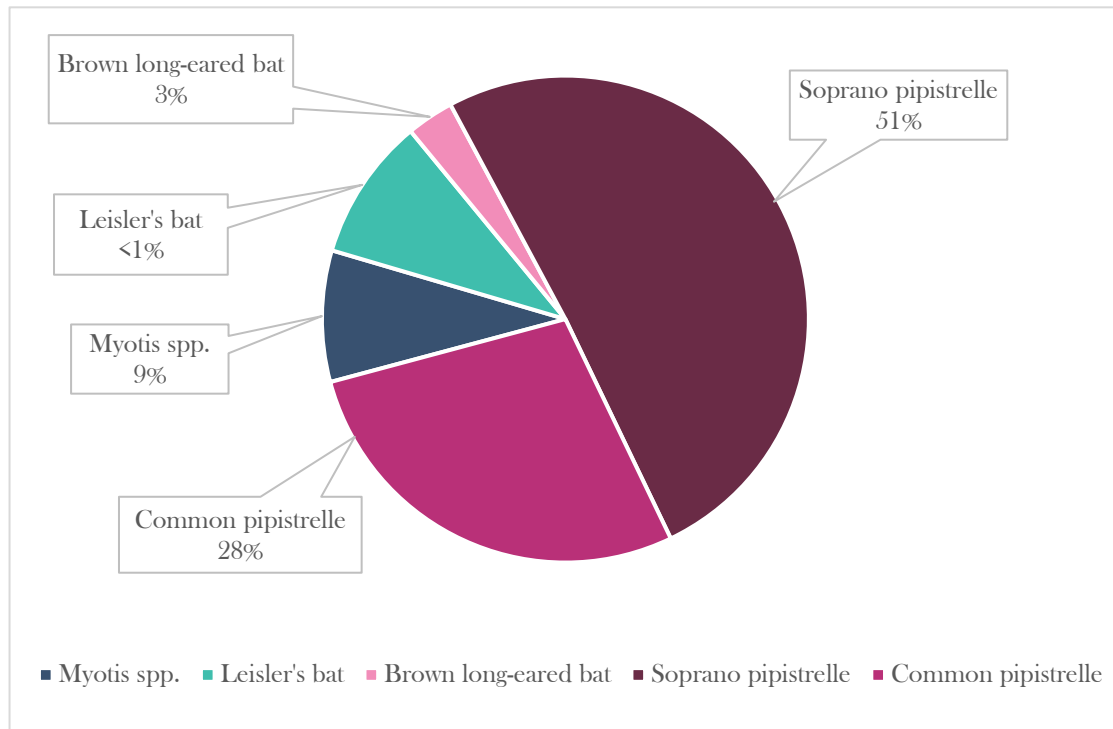


Plate 4-28 Static detector surveys 2025: Species composition across all deployments (total bat passes)

Bat activity was standardised as bat passes per hour (bph) for each survey season to account for potential bias associated with varying night lengths. The results are presented in Plate 4-29. Spring and autumn activity was dominated soprano pipistrelle while summer was dominated by both soprano and common pipistrelle. Leisler’s bat and *Myotis* spp. were recorded consistently across all three survey periods with a small increase in summer, whereas the activity of brown long-eared bat peaked in autumn. Lesser horseshoe bat was detected only once in spring.

The median bat activity recorded at each detector during each survey period is presented in Plate 4-30 and demonstrates clear seasonal and spatial variation. In spring, activity was highest at detectors D01 and D02, dominated by soprano pipistrelle at D01 and common pipistrelle at D02. During summer, D02 recorded the highest activity, with a marked increase in *Myotis* spp., while elevated activity was also recorded at D01. A notable increase in Leisler’s bat activity was recorded at D07 during summer. In autumn, D01 recorded the highest activity levels, while D02 recorded no bat activity, indicating a clear seasonal shift in activity patterns. Increased autumn activity was also recorded at D06, while D03 and D08 showed relatively even activity across the five most frequently recorded species.

The median nightly bat pass rate (total bat passes per hour per night) was used to characterise typical bat activity at the Proposed Wind Farm and to reduce the influence of occasional high-activity nights (Plate 4-31), in line with recommendations by Lintott & Mathews (2018). Results indicate high nightly variability in activity levels, with peak activity occurring during early autumn. Across each survey season, higher bat activity was concentrated within a limited number of survey nights.

Plates 4-32 to 4-34 present median nightly bat activity per species for each detector location, allowing direct comparison across survey periods and deployments. Zero values, representing nights when a species was not detected, were retained to avoid overestimation of activity levels.

Overall, median nightly activity showed a general increase during favourable weather conditions across all seasons (Plates 4-32 to 4-34). Leisler's bat was recorded only intermittently during spring but occurred more consistently during summer and autumn, while brown long-eared bat activity increased during early autumn.

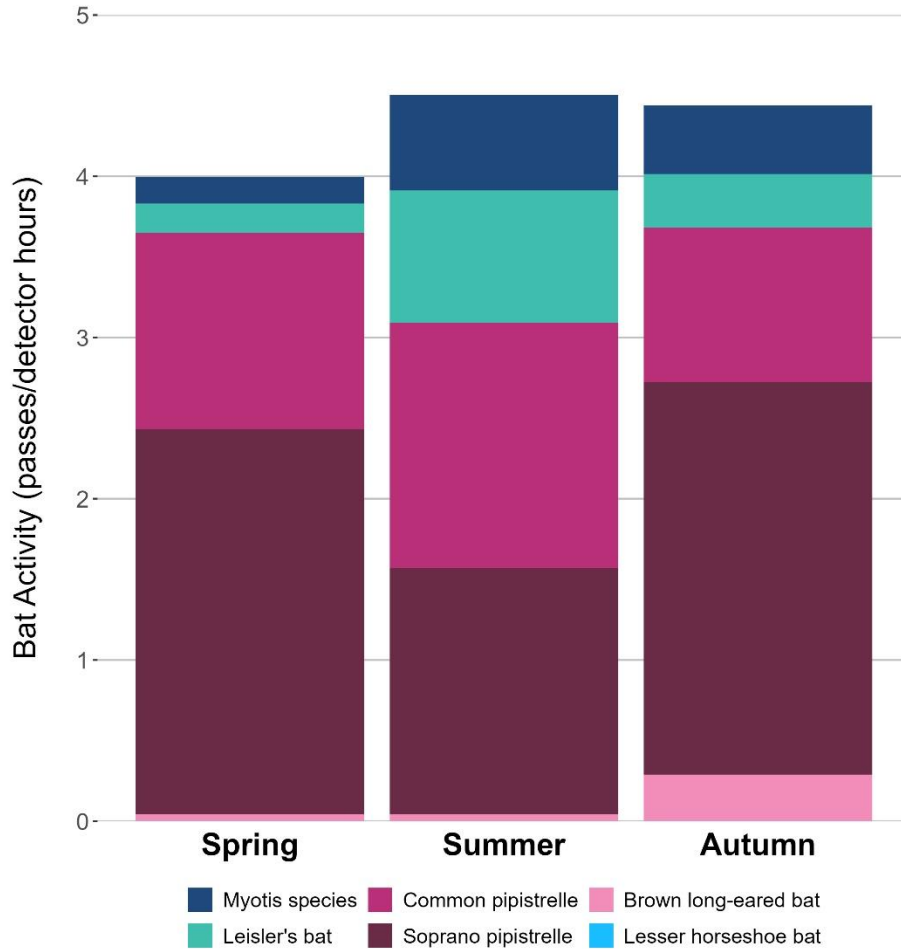


Plate 4-29 Static detector surveys 2025: Seasonal bat activity across all deployments (total bat passes per hour (bp/h), all nights). Lesser horseshoe bat is not visible on the graph due to a single bat pass being recorded during the spring survey period.

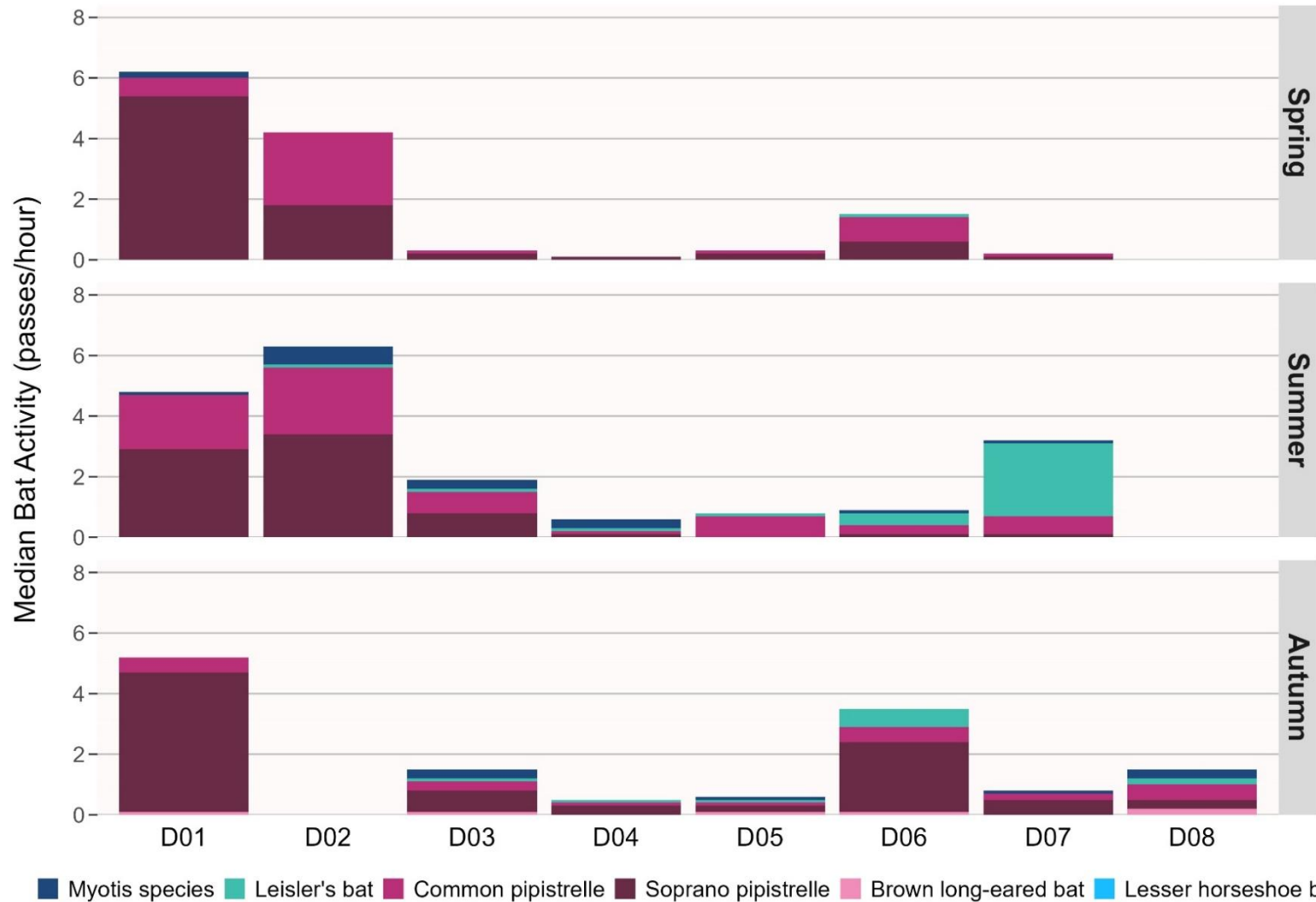


Plate 4-30 Static detector surveys 2025: Median bat pass rate (bpph), including absences, per detector location and survey period. Lesser horseshoe bat is not visible on the graph due to a single bat pass being recorded during the spring survey period.

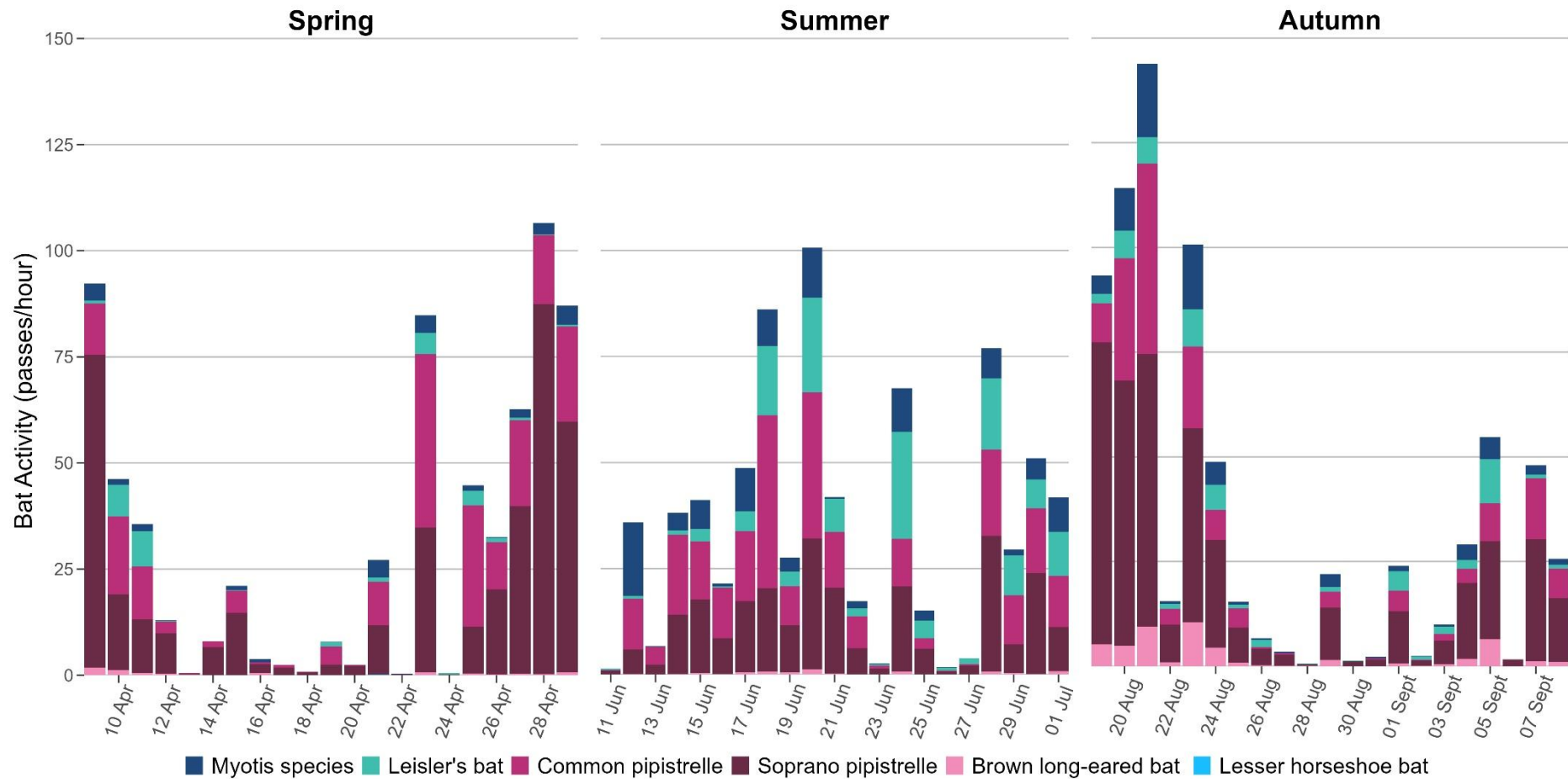


Plate 4-31 Static detector surveys 2025: Median bat pass rate (bpph), including absences, per season per night. Lesser horseshoe bat is not visible on the graph due to a single bat pass being recorded during the spring survey period.

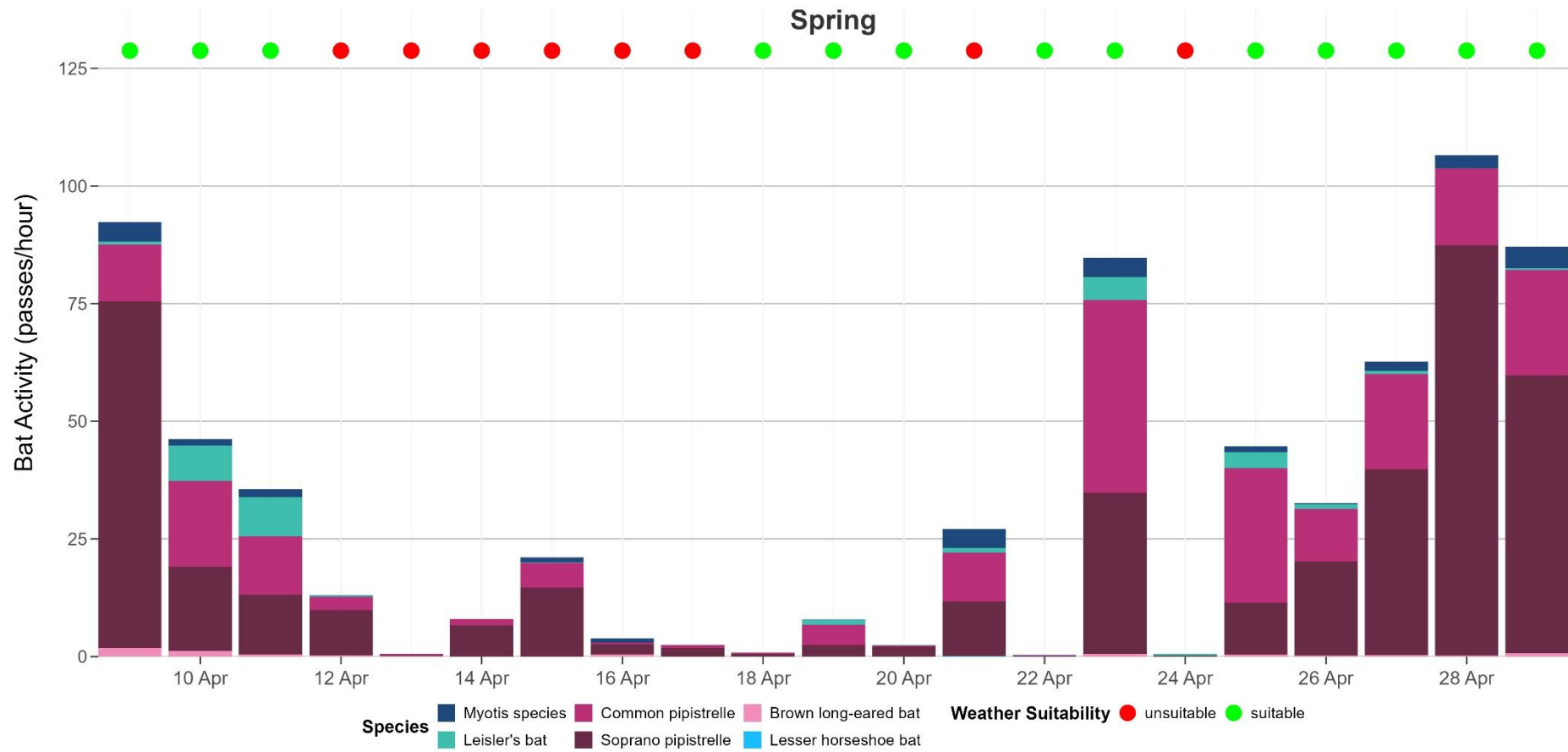


Plate 4-32 Static detector surveys 2025: Spring median bat pass rate (bpph), including absences, per night with weather suitability. Lesser horseshoe bat is not visible on the graph due to a single bat pass being recorded during the survey period.

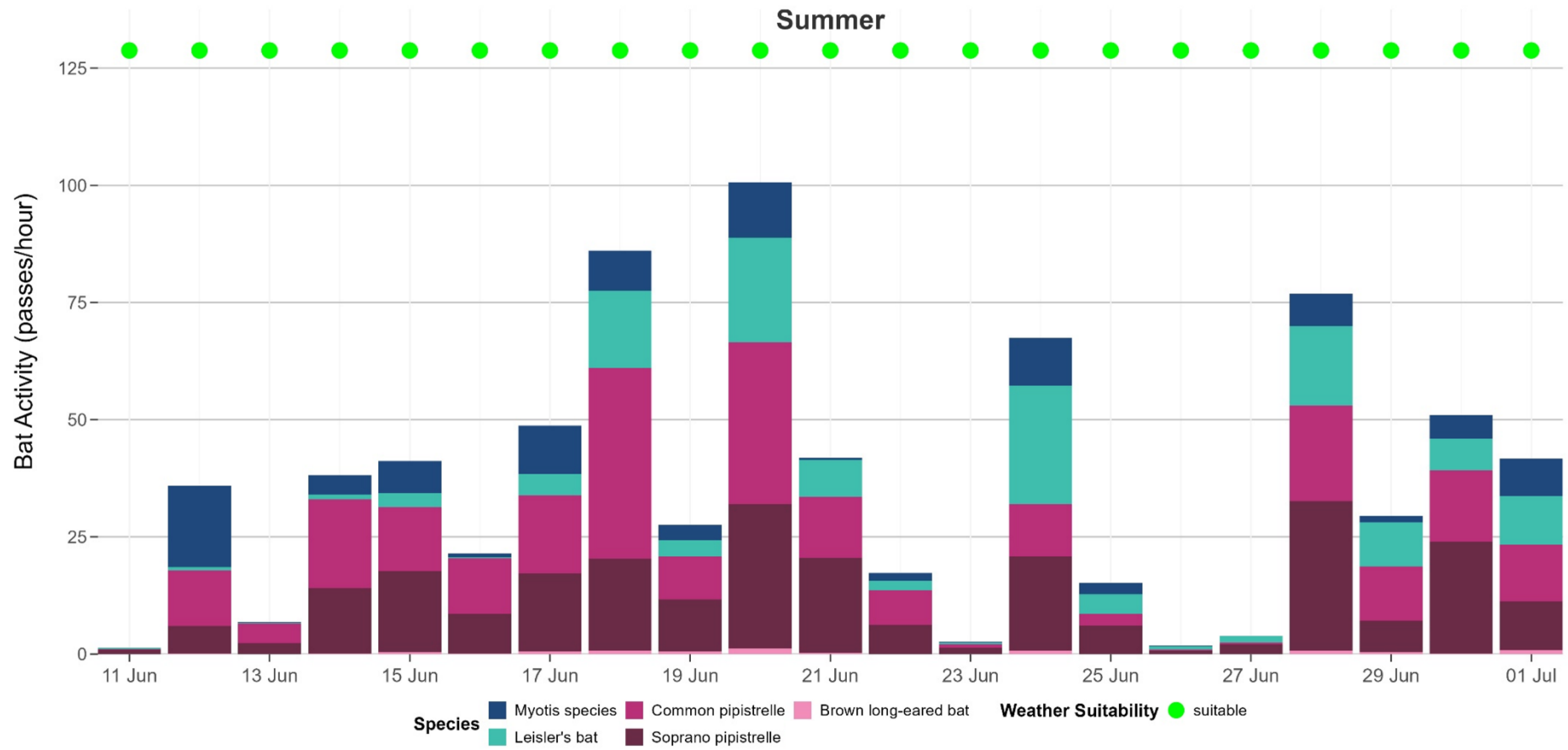


Plate 4-33 Static detector surveys 2025: Summer median bat pass rate (bph), including absences, per night with weather suitability.

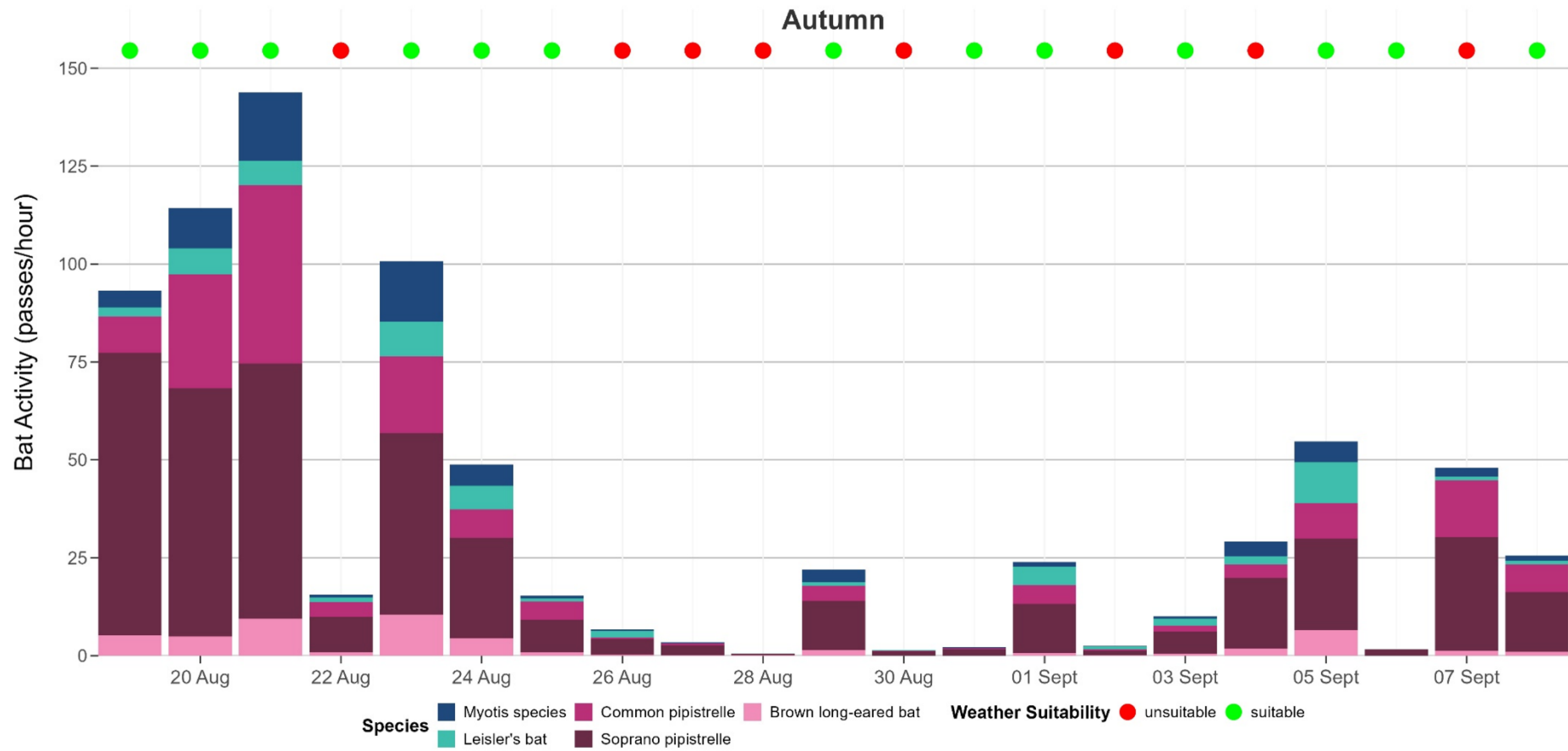


Plate 4-34 Static detector surveys 2025: Autumn median bat pass rate (bpph), including absences, per night with weather suitability.

4.4 Assessment of Bat Activity Levels 2025

4.4.1 Adapted Site-specific Ranges

Low, *Moderate* and *High* bat activity levels were assigned to median and maximum bat pass rates (bpph) recorded during spring, summer and autumn at detectors deployed across the Proposed Wind Farm, following site-specific adaptation of the activity ranges proposed by Mathews et al. (2016). The results of this site-level assessment are presented in Table 4-7.

Soprano pipistrelle recorded *High* median activity at D01 during spring (5.4 bpph), with a corresponding maximum activity of 72.1 bpph. *Moderate* median activity levels were recorded at D02 during spring and summer, at D01 during summer and autumn, and at D06 during autumn.

Common pipistrelle showed predominantly *Low* median activity levels across the site, with *Moderate* median activity recorded at D02 during spring and summer and at D01 during summer. The highest maximum activity for this species (19.2 bpph) was recorded at D02 during spring.

Leisler's bat generally exhibited *Low* median activity levels across all seasons, with a notable exception at detector D07 during summer, where *High* median activity (2.4 bpph) and a maximum activity of 9.3 bpph were recorded. The highest maximum activity for this species was recorded at D06 during summer (10.5 bpph).

Myotis spp. exhibited *Low* median activity levels across all detectors and seasons, although maximum activity reached *High* levels at D06 during summer (15.2 bpph).

Brown long-eared bat also recorded *Low* median activity levels across all detector locations and survey periods, with *Moderate* to *High* maximum activity values recorded across multiple detectors during autumn.

Lesser horseshoe bat was recorded only once, at D03 during spring, and therefore the median activity level for this species is classified as *Low*.

Overall, the adapted site-specific ranges demonstrate that bat activity across the Proposed Wind Farm is largely *Low*, with localised and seasonal peaks that are considered further in the impact assessment.

When considered alongside the 2023 baseline bat survey data presented in **Appendix 4**, the 2025 survey results indicate that, while seasonal activity patterns and the relative importance of individual detector locations vary between survey years, the overall level of bat activity and site-level activity classification remain broadly consistent across the Proposed Wind Farm.

Both datasets are characterised by generally low levels of bat activity, dominance of pipistrelle species, and limited spatial extent of moderate or higher activity. Nathusius' pipistrelle, which was recorded infrequently during the 2023 surveys, was not recorded during the 2025 survey period; this is considered consistent with the occasional and irregular occurrence of this species within the wider landscape and does not indicate a material change in baseline conditions. Overall, the combined 2023 and 2025 datasets provide a robust and internally consistent baseline against which the potential effects of the Proposed Project on bats have been assessed.

Table 4-7 Median and maximum nightly bat activity (bpph) per species, season and detector location in 2025 categorised as None, Low, Moderate and High

2025 Season	Detector	Myotis spp.		Leisler's bat		Common pipistrelle		Soprano pipistrelle		Brown long-eared bat		Lesser horseshoe bat	
		Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity
Spring	D01	0.2	2.9	0.0	1.3	0.6	13.5	5.4	72.1	0.0	0.5	-	-
	D02	0.0	1.2	0.0	0.9	2.4	19.2	1.8	7.2	0.0	0.3	-	-
	D03	0.0	0.3	0.0	5.5	0.1	3.5	0.2	5.7	0.0	0.2	0.00	0.1
	D04	0.0	0.7	0.0	0.7	0.0	2.0	0.1	0.7	0.0	0.2	-	-
	D05	0.0	0.3	0.0	2.1	0.1	2.4	0.2	3.7	0.0	0.4	-	-
	D06	0.0	0.5	0.1	1.0	0.8	6.3	0.6	30.7	0.0	0.6	-	-
	D07	0.0	0.2	0.0	0.7	0.1	2.2	0.1	0.8	0.0	0.1	-	-
	D08	0.0	0.4	0.0	0.1	0.0	3.4	0.0	1.5	0.0	0.3	-	-
Summer	D01	0.1	0.7	0.0	1.4	1.8	7.3	2.9	11.6	0.0	0.3	-	-
	D02	0.6	2.8	0.1	1.7	2.2	14.2	3.4	13.7	0.0	0.4	-	-
	D03	0.3	1.4	0.1	1.9	0.7	6.6	0.8	3.5	0.0	0.1	-	-
	D04	0.3	1.4	0.1	4.2	0.1	2.8	0.1	0.7	0.0	0.4	-	-
	D05	0.0	1.4	0.1	2.1	0.7	7.9	0.0	1.7	0.0	0.3	-	-
	D06	0.1	15.2	0.4	10.5	0.3	4.4	0.1	1.3	0.0	0.3	-	-
	D07	0.1	4.8	2.4	9.3	0.6	2.0	0.1	1.3	0.0	0.1	-	-
	D08	-	-	-	-	-	-	-	-	-	-	-	-
Autumn	D01	0.0	2.3	0.0	1.1	0.5	13.0	4.6	28.9	0.1	1.8	-	-
	D02	0.0	0.8	0.0	2.8	0.0	5.5	0.0	6.4	0.0	0.8	-	-
	D03	0.3	4.0	0.1	1.8	0.3	4.9	0.7	9.2	0.1	1.7	-	-
	D04	0.0	1.5	0.1	1.3	0.1	2.4	0.3	2.0	0.0	2.3	-	-
	D05	0.1	1.7	0.1	2.4	0.1	3.1	0.2	2.5	0.1	2.5	-	-
	D06	0.0	2.5	0.6	5.6	0.5	7.8	2.3	53.4	0.1	2.0	-	-
	D07	0.1	2.0	0.0	1.5	0.2	3.3	0.5	4.8	0.0	0.8	-	-
	D08	0.3	5.4	0.2	3.1	0.5	16.9	0.3	14.0	0.2	1.3	-	-

4.5

Importance of Bat Population Recorded at the Proposed Wind Farm

Ecological evaluation within this section follows the approach outlined in Chapter 3 of the *Guidelines for Assessment of Ecological Impacts of National Roads Schemes* (NRA, 2009).

All bat species in Ireland are protected under international and national legislation, including the Bonn Convention (1992), Bern Convention (1982), and the EU Habitats Directive (92/43/EEC). In Ireland, they are also protected under the Wildlife Acts 1976 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011.

Bats have been assessed as Ecological Receptors of **Local Importance (Higher Value)** based on the presence of a regularly occurring bat population recorded within the Proposed Wind Farm, including confirmed roosts and use of the site for foraging and commuting.

During the 2025 survey periods, three active bat roosts were confirmed through dusk emergence surveys within farm building structures. Each roost supported a small number of soprano pipistrelle individuals (approximately three to four bats). No large or significant maternity roosts (i.e. those supporting >100 individuals or of national importance) were identified within the Proposed Wind Farm.

5. RISK AND IMPACT ASSESSMENT

This risk and impact assessment has been undertaken in accordance with NatureScot guidance. As per NatureScot guidance, wind farms present four potential risks to bats:

- > 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 Proposed Wind Farm has been utilized to predict the potential effects of the Proposed Project on bats.

5.1 Collision Mortality

5.1.1 Assessment of Site-Risk

The likely impact of a Proposed Project on bats is related to site-based risk factors, including habitat and development features. The site risk assessment, as per Table 3a of the NatureScot guidance, is provided in Table 5-1 below.

Table 5-1 Site-risk Level Determination for the Proposed Project (Adapted from NatureScot, 2021)

Criteria	Site-specific Evaluation	Site Assessment
Habitat Risk	<p>Three small, low-value soprano pipistrelle bat roosts (≤4 individuals each) were identified within the Proposed Wind Farm.</p> <p>The site is dominated by commercial conifer plantation, with extensive areas of wet grassland and smaller areas of wet heath occurring in mosaic with lowland blanket bog and cutover bog. In the absence of hedgerows and traditional treelines, conifer plantation edges represent the primary sources of shelter, navigation and connectivity. Overall, the Site provides <i>Low</i> opportunities for commuting and foraging bats.</p>	Low
Project Size	<p>Following the criteria set out in NatureScot (2021) the project is of <i>Small</i> scale as it consists of 8 no. turbines. Whilst those turbines are over 100 m in height, it is well below the number of turbines that would constitute a <i>Large</i> development (NatureScot, 2021).</p> <p>There are two other wind farms within 5 km, and seven other wind farms within 10 km, corresponding to <i>Medium</i>. Consequently, the site is considered <i>Medium</i>.</p>	Medium
Site Risk Assessment (Plate 3-3, NatureScot 2021)	Taking account of confirmed low-value roosts, overall low habitat value, and a medium-scale project, the site is assessed as posing a Low Site Risk (2) to bats.	Low Site Risk (2)

5.1.2 Assessment of Collision Risk

The following high-risk species were recorded during the dedicated surveys:

- > Leisler’s bat,
- > Common pipistrelle
- > Soprano pipistrelle

Overall collision risk for these species was determined in accordance with Table 3b of NatureScot (2021) guidance (**Appendix 3**), by cross-referencing the site risk level (Low) with species-specific activity categories. Assessments were undertaken for both **median** activity (representing typical conditions) and **maximum** activity (representing peak levels). NatureScot recommends using the most appropriate measure (i.e. median or maximum) to determine overall risk. As per NatureScot guidance there is no requirement to complete an Overall Risk Assessment for low-risk species. During the extensive suite of surveys undertaken the following low-risk species were recorded:

- > *Myotis* spp.
- > Brown long-eared bat
- > Lesser horseshoe bat

Overall activity levels were *Low* for the above species; therefore, no significant collision related effects are anticipated. Activity levels for these species will continue to be assessed during operational monitoring following the implementation of best practice mitigations provided.

5.1.2.1 Leisler’s bat

The Proposed Wind Farm lies within the current known range of Leisler’s bat (*Nyctalus leisleri*) in Ireland (NPWS, 2025). Leisler’s bat is considered a species of high population vulnerability due to its elevated collision risk at wind farms (NatureScot, 2021).

Static detector surveys recorded Leisler’s bat activity at generally low levels across the site. A notable summer activity peak was recorded at detector D07, with a median activity rate of 2.4 bpph and a maximum of 9.3 bpph.

When assessed against Table 3b of NatureScot (2021), activity levels correspond to *Low* typical collision risk in all seasons, with *Medium* collision risk associated with peak activity levels (Table 5-2).

Overall, taking into account the recorded activity levels and the local habitat context dominated by commercial conifer plantation and wet grassland, the collision risk for Leisler’s bat at the Proposed Wind Farm is assessed as *Low* under typical conditions, increasing to *Medium* during periods of peak activity.

Table 5-2 Leisler’s bat - Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table 3b NatureScot 2021)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring 2025	Low (2)	Low (1)	Typical Risk is Low (2)	Moderate (3)	Peak Risk is Medium (6)
Summer 2025		Low-moderate (2)	Typical Risk is Low (4)	Moderate-high (4)	Peak Risk is Medium (8)
Autumn 2025		Low (1)	Typical Risk is Low (2)	Moderate-high (4)	Peak Risk is Medium (8)

5.1.2.2 Soprano pipistrelle

The Proposed Wind Farm lies within the range of the soprano pipistrelle (*Pipistrellus pygmaeus*) in Ireland (NPWS, 2025). This species is classified as a common species with medium population vulnerability and is considered to have a high collision risk (NatureScot, 2021).

Static detector surveys recorded soprano pipistrelle activity at *Low to Moderate* levels across the site. A notable spring activity peak was recorded at detector D01, with a median activity rate of 5.4 bpph and a maximum of 72.1 bpph.

When assessed against Table 3b of NatureScot (2021), activity levels correspond to *Low* typical collision risk in all seasons, with *Medium* collision risk associated with peak activity levels (Table 5-3).

Overall, taking into account the recorded activity levels and the local habitat context dominated by commercial conifer plantation and wet grassland, the collision risk for soprano pipistrelle at the Proposed Wind Farm is assessed as *Low* under typical conditions, increasing to *Medium* during periods of peak activity.

Table 5-3 Soprano pipistrelle - Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table 3b NatureScot 2021)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring 2025	Low (2)	Low-moderate (2)	Typical Risk is Low (4)	Moderate (3)	Peak Risk is Medium (6)
Summer 2025		Low-moderate (2)	Typical Risk is Low (4)	Moderate (3)	Peak Risk is Medium (6)
Autumn 2025		Low-moderate (2)	Typical Risk is Low (4)	Moderate-high (4)	Peak Risk is Medium (8)

5.1.2.3 Common pipistrelle

The Proposed Wind Farm lies within the range of the common pipistrelle (*Pipistrellus pipistrellus*) in Ireland (NPWS, 2025). This species is classified as a common species with medium population vulnerability and is considered to have a high collision risk (NatureScot, 2021).

Static detector surveys recorded common pipistrelle activity at *Low to Moderate* levels across the site. No *High* median activity levels were recorded for this species.

When assessed against Table 3b of NatureScot (2021), activity levels correspond to *Low* typical collision risk in all seasons, with *Medium* collision risk associated with peak activity levels (Table 5-4).

Overall, taking into account the recorded activity levels and the local habitat context dominated by commercial conifer plantation and wet grassland, the collision risk for common pipistrelle at the Proposed Wind Farm is assessed as *Low* under typical conditions, increasing to *Medium* during periods of peak activity.

Table 5-4 Common pipistrelle - Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table 3b NatureScot 21)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring 2025	Low (2)	Low (1)	Typical Risk is Low (2)	Moderate-high (4)	Peak Risk is Medium (8)
Summer 2025		Low-moderate (2)	Typical Risk is Low (4)	Moderate-high (4)	Peak Risk is Medium (8)
Autumn 2025		Low (1)	Typical Risk is Low (2)	Moderate-high (4)	Peak Risk is Medium (8)

5.1.3 Collision Risk Summary

Following NatureScot (2021) guidance and the application of site-specific activity thresholds, typical site-level collision risk for high-risk bat species at the Proposed Wind Farm was assessed as **Low**. At peak

activity levels, the risk assessment increased to **Medium** for Leisler’s bat, common pipistrelle, and soprano pipistrelle (Tables 5-2 to 5-4).

Overall bat activity levels were considered representative of the habitat composition at the Proposed Wind Farm, which is dominated by commercial conifer plantation, with widespread areas of wet grassland and smaller areas of wet heath occurring as a mosaic with lowland blanket bog and cutover bog habitats. Both static detector data and manual transect surveys indicated activity levels typical of a commercial forestry landscape, with moderate suitability for commuting and foraging largely limited to conifer plantation corridors.

Detailed detector-level analysis identified two locations that recorded **High median activity** for high collision-risk species (Table 5-5), indicating a small number of localised activity peaks associated with conifer plantation edges.

A bat monitoring and mitigation strategy has been devised in line with Appendix 5 of NatureScot (2021). Should Year 1 post-construction monitoring identify significant bat fatalities, a curtailment protocol will be implemented. This would be tailored to site-specific seasonal and species-specific patterns and may include curtailment based on wind speed thresholds, weather-based triggers, and increased buffer zones as required.

Table 5-5 Detector locations recording High median activity in 2025 for High-risk bat species

Detector ID	Turbine	Species	High Median Activity Survey Period
D01	T01	Soprano pipistrelle	Spring 2025
D07	T07	Leisler’s bat	Summer 2025

5.2

Loss or Damage to Commuting and Foraging Habitat

In the absence of appropriate design and mitigation, the loss or degradation of commuting and foraging habitat has the potential to reduce feeding opportunities and/or result in displacement of local bat populations. The Proposed Wind Farm site is predominantly composed of commercial conifer plantation and wet grassland habitats, with smaller areas of wet heath occurring as a mosaic with lowland blanket bog and cutover bog habitats.

Baseline habitat appraisal and activity surveys demonstrated that the commercial conifer plantation and wet grassland habitats generally provide *Low* suitability for bat commuting and foraging, reflecting their limited structural complexity and insect productivity. *Moderate* suitability is largely confined to plantation edges and corridors, which provide shelter and navigational structure within the wider forestry landscape. Overall bat activity levels recorded across the site were low and considered representative of a commercial forestry landscape.

The Proposed Project will result in the permanent removal of approximately 21 hectares of commercial forestry within the wind farm infrastructure footprint, with an additional 0.79 hectares temporarily felled to facilitate construction compounds and subsequently replanted following completion of the construction phase. A further 56.3 hectares of forestry will be permanently felled as part of the Hen Harrier Enhancement Plan. As the forestry is managed as a commercial crop, this felling will occur over the plantation lifecycle irrespective of the Proposed Project.

The removal of dense, closed-canopy conifer plantation is not anticipated to result in the loss of high-value bat commuting or foraging habitat. Any localised loss of plantation edge habitat will be limited in extent and will not result in fragmentation at the site scale.

Turbine Delivery Route accommodation works are minor and confined to areas of *Low* bat habitat suitability, with no high-value commuting or foraging habitats affected. Similarly, the grid connection works will not result in the loss or degradation of bat commuting or foraging habitat.

Within the Hen Harrier Enhancement Plan lands, the felling of commercial conifer plantation will be followed by habitat enhancement through natural regeneration and targeted management, resulting in increased structural diversity and a more open habitat mosaic. While designed primarily for hen harrier conservation, these measures are expected to provide neutral to minor beneficial effects for bats, through the creation of additional edge habitat, increased insect availability and improved foraging opportunities at a local scale.

Given that the majority of the development footprint is located within habitats of Low suitability for bat commuting and foraging, that no high-value bat habitats will be lost, and that large areas of the site will remain undisturbed with targeted habitat enhancement implemented, no significant effects on bat commuting or foraging habitat are predicted as a result of the Proposed Project.

5.3 Loss of, or Damage to, Roosts

The Proposed Wind Farm is located within a landscape that provides limited opportunities for bat roosting, with potential roost features largely confined to a small number of built structures. Commercial conifer trees within the site do not provide suitable roosting habitat due to their species composition, structure and management regime.

Three structures within the Proposed Wind Farm were assessed for bat roosting suitability. Two were assessed as offering *Low* roosting potential and one was assessed as offering *Moderate* roosting potential. Emergence surveys confirmed use of all three structures by small numbers of soprano pipistrelle. All structures will be retained and avoided as part of the Proposed Project, and no loss or disturbance of roosts is anticipated.

Although Structure No. 1 is located approximately 230 m from the nearest proposed turbine, it is situated at the west edge of the Proposed Wind Farm, between Turbine 1 and Turbine 3. No habitat modification or construction activity is proposed within approximately 170 m of the structure, and key flight paths and commuting corridors in the vicinity of the roost will be retained. In addition, the surrounding landscape to the west of the structure, both within and immediately adjacent to the site boundary, will remain largely undisturbed, with no proposed works. Given the small size of the roost at Structure No. 1 and the retention of surrounding habitat connectivity, no significant adverse effects on roosting bats are predicted as a result of the Proposed Project.

All trees within the Proposed Project footprint, including those scheduled for felling, were inspected for potential roost features and were assessed as having no (*None*) roosting potential. No loss of tree roosting habitat will occur.

A known lesser horseshoe bat roost occurs in the vicinity of the existing Moneypoint substation along the Proposed Grid Connection route. Proposed works in this area are confined to disturbed verge and trackside vegetation within the defined working corridor and are located more than 60 m from the known roost, with no works to the buildings or associated woodland. As such, no loss, damage or disturbance of the lesser horseshoe bat roost is anticipated.

Along the remainder of the grid connection route, a small number of bridges and culverts were assessed as offering *Low* to *Moderate* roosting potential; however, no evidence of bat roosting was recorded, and works will be undertaken using horizontal directional drilling (HDD) with appropriate setbacks and no alteration to these structures. Temporary turbine delivery accommodation works will not affect any roosting features, as no bat roosts or potential roosting features were identified within the works areas.

No bat roosts, including the known lesser horseshoe bat roost, will be lost, damaged or disturbed as a result of the Proposed Project, and no significant effects on bat roosting habitat are predicted.

5.4 Displacement of Individuals or Populations

The Proposed Wind Farm is located within a landscape dominated by commercial conifer plantation, wet grassland, wet heath and peatland habitats. These habitats generally provide low suitability for bat

roosting, commuting and foraging, and baseline surveys recorded low bat activity levels overall, consistent with a commercial forestry landscape.

Confirmed bat roosts within the Proposed Wind Farm will be retained and avoided, and no works are proposed that would result in the loss, damage or disturbance of roosting habitat. Along the Proposed Grid Connection route, a lesser known horseshoe bat roost occurs in the vicinity of the existing Moneypoint substation. Works in this area are confined to disturbed verge and trackside vegetation within the defined working corridor and are located more than 60 m from the known roost, with no works to the roost structure or associated broadleaved woodland. As such, no disturbance or displacement of lesser horseshoe bats is anticipated.

Construction activities associated with the Proposed Project, including grid connection works undertaken using horizontal directional drilling (HDD), are localised and temporary in nature and will not result in the fragmentation of bat habitat or a reduction in habitat availability. No bat roosts were identified at or in the immediate vicinity of HDD locations. Given the relatively low baseline activity levels, the avoidance of confirmed roosts, and the spatial separation from the known lesser horseshoe bat roost, no displacement of individual bats or local bat populations is anticipated.

Accordingly, no significant effects in relation to the displacement of bats are predicted as a result of the Proposed Project.

6. BEST PRACTICE AND MITIGATION MEASURES

This section describes the best practice and site-specific mitigation measures that are in place to avoid and reduce the potential for significant effects on local bat populations at the Proposed Wind Farm.

6.1 Standard Best Practice Measures

6.1.1 Noise Restrictions

During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001, as amended).

In relation to the Proposed Grid Connection, Horizontal Directional Drilling (HDD) and associated works will be temporary and set-back from features assessed as *Low* and *Moderate* roosting potential. The short-term nature of these works, combined with their spatial separation from potential bat habitats, will ensure that potential noise and vibration disturbance is minimised.

6.1.2 Lighting Restrictions

Where lighting is required, directional lighting will be used to prevent overspill on to woodland/forestry edges and linear features. Exterior lighting, during construction and post construction, shall be designed to minimize light spillage, reducing the effect on surrounding habitat features and bat activity. Lighting will be directed away from mature trees and treelines around the periphery of the site boundary.

Directional accessories will be used to direct light appropriately, such as light shields (Stone, 2013). All luminaires will be of a type that prevents upward and lateral spillage. The proposed lighting will comply with ILP Guidance Note 08/23 - Bats and Artificial Lighting at Night (ILP, 2023).

The applicant also commits to the Dark Sky Ireland Lighting Recommendations, ensuring that:

- > Every light is justified;
- > Light is used only when necessary;
- > It is directed where needed;
- > Light intensity is minimised;
- > Spectra are adapted to the environment;
- > White light sources will have a “warm” colour temperature (less than 3000K).

With regard to the potential for lighting to increase collision risk, it is noted that there will be limited illumination of the turbines in the form of aviation lighting. Post-construction monitoring will assess any potential for lighting-related impacts on bats. Significant effects as a result of lighting are not anticipated; however, if in the course of this monitoring, any potential for significant effects on bats is identified, the site-specific mitigation measures will be reviewed and any changes necessary will be implemented to avoid any such impacts.

6.1.3 Bat Felling Buffers

In accordance with NatureScot (2021) and NIEA (2021) guidance, a minimum 50m buffer is applied between turbines and habitat features used by bats (e.g. hedgerows, treelines). Though increased buffers (100–200m) are recommended by Eurobats No. 6 and NIEA around woodland areas, these are not currently supported by empirical evidence in the UK and Ireland.

A 50m buffer between turbine blade tip and the nearest habitat feature will be implemented, based on a worst-case-scenario turbine dimension of the largest blade with the lowest hub height (blade length 81.5

Taking a precautionary approach, and in recognition of the Medium collision risk identified at peak activity levels, an adaptive bat monitoring and mitigation strategy has been devised for the Proposed Project. This strategy has been informed by site-specific survey data and is aligned with the approach set out in Appendix 5 of NatureScot (2021). Post-construction monitoring will be used to confirm collision risk predictions and to determine whether additional mitigation measures, such as turbine operational curtailment during defined high-risk conditions, are required.

The monitoring strategy is designed to be proportionate to the assessed risk, allowing mitigation measures to be implemented only where post-construction evidence indicates a need, thereby ensuring effective protection of bat populations while avoiding unnecessary operational constraints.

6.2.1 Operational Monitoring

To assess the effects of the Proposed Project on bat activity, at least 3 years of post-construction monitoring is proposed. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision.

The results of post-construction monitoring shall be utilised to assess any potential changes in bat activity patterns and to monitor the implementation of the mitigation strategy. If the monitoring identifies a curtailment requirement (i.e. significant bat fatalities encountered), a curtailment programme, in line with relevant guidelines, will be devised around key activity periods and weather parameters, as well as a potential increase in buffers.

At the end of each year, the efficacy of the mitigation and monitoring plan will be reviewed, and any identified efficiencies incorporated into the programme. This approach allows for an evidence-based review of the potential for bat fatalities at the Proposed Wind Farm, post construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally. The effectiveness of any mitigation or curtailment needs to be monitored in order to determine (a) whether it is working effectively (i.e. the level of bat mortality is incidental), and (b) whether the curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties.

The below subsections provide additional detail on the proposed survey effort, timing, and mitigation.

6.2.1.1 Monitoring Year 1

Bat activity surveys

The post-construction surveys will be carried out as per the pre-construction survey effort. Static monitoring will take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). Full spectrum recording detectors will be utilised for the same duration as during pre-application surveys and at the same density (NatureScot, 2021). Walked survey transects will also be conducted.

Key weather parameters and other factors that are known to influence collision risk will be monitored and shall include:

- > Windspeed in m/s (measured at nacelle height)
- > Temperature (°C)
- > Precipitation (mm/hr)

Carcass searches

Carcass searches, to monitor and record bat fatalities, shall be conducted at each turbine in accordance with most recent guidance. This shall include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. Surveys should cover all activity seasons and the use of a trained dog detection team will be carried out to ensure maximum efficiency.

6.2.1.2 Monitoring Years 2 & 3

Monitoring surveys shall continue in Year 2 and 3, and where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s). The performance of the curtailment programme in terms of its ability to respond to the changes in bat abundance based on temperature and wind speed shall be analysed to confirm it is neither significantly over- nor under- curtailment during different periods of bat activity.

At the end of each year, the efficacy of the mitigation/curtailment programme shall be reviewed, and any identified efficiencies incorporated into the programme. The requirement for continued post-construction monitoring will also be considered. Should no bat fatalities be recorded in Year 1, curtailment (where applicable) in Year 2 and Year 3 could be reduced/re-evaluated or removed with monitoring continuing to inform this strategy.

6.3 Residual Effects

Taking into account the sensitive design of the Proposed Project and the implementation of best practice mitigation and adaptive post-construction monitoring measures, no significant residual effects on bats are anticipated with regard to:

1. Collision mortality, barotrauma and other injuries;
2. Loss or damage to commuting and foraging habitat;
3. Loss or damage to roosts; and
4. Displacement of individuals or populations.

6.4 Cumulative Effects

The Proposed Project was assessed in combination with other existing, permitted and proposed plans and projects in the surrounding area that have the potential to give rise to cumulative effects on bats. This cumulative assessment was informed by a review of available planning registers and relevant planning documentation to identify past, present and reasonably foreseeable future developments. Details of the plans and projects considered are provided in Section 4.2.6 of this report.

The cumulative assessment identified a number of existing and proposed wind farms within the wider landscape. Two existing wind farms are located within 5 km of the proposed turbine locations, and several additional existing and proposed wind farms are located within 10 km of the proposed turbine locations (Table 4-3). In addition, a small number of other plans and projects with the potential to contribute to cumulative effects on bats, including quarry developments, have been identified within 10 km of the site.

Following the detailed assessment presented in Sections 5.1 to 5.4, the Proposed Project is not predicted to result in any significant residual effects on bats when considered alone. Collision risk has been assessed as Low under typical activity conditions and Medium at peak activity levels for a small number of species, with adaptive post-construction monitoring proposed to confirm predictions. No loss or damage to bat roosts is anticipated, no high-value commuting or foraging habitat will be affected, and no displacement of individual bats or local bat populations is predicted.

In reviewing other relevant plans and projects, no spatial or functional linkages were identified that would give rise to cumulative effects on bat populations. The identified wind farm developments are dispersed across the wider landscape, and no shared bat roosts, high-value commuting corridors or foraging areas have been identified that would be affected by the Proposed Project in combination with other projects. Other identified plans and projects within 10 km, including quarry proposals, are spatially separated from the Proposed Project and are not anticipated to interact with bat populations in a manner that would result in cumulative impacts.

Taking into account the absence of significant residual effects from the Proposed Project alone, the nature and scale of other plans and projects in the area, and the lack of identified pathways for



interaction, no significant cumulative effects on bats are predicted to arise as a result of the Proposed Project when considered in combination with other existing, permitted or proposed plans and projects.

7. CONCLUSION

This report presents a comprehensive assessment of the potential impacts of the Proposed Project on local bat populations, based on the results of baseline surveys and in accordance with current best practice guidance, including that published by NatureScot (2021).

All potential impacts, including collision risk, roost loss, displacement, and habitat fragmentation, have been assessed in detail. Appropriate design measures and targeted mitigation have been integrated into the project to avoid or reduce impacts. These include the implementation of bat buffers, blade feathering and an adaptive post-construction monitoring and mitigation programme.

Provided that the Proposed Project is constructed and operated in accordance with the design, best practice and mitigation that is described within this report, the Proposed Project is not expected to result in significant effects on bats at any geographic scale.

8.

BIBLIOGRAPHY

- Abbott, I., Aughney, T., Langton, S., & Roche, N. (2015). *BATLAS 2020 Pilot Project Report*. Bat Conservation Ireland, Virginia, Co. Cavan.
- Amorim, F., Rebelo, H., & Rodrigues, L. (2012). Factors influencing bat activity and mortality at a wind farm in the Mediterranean region. *Acta Chiropterologica*, 14(2), 439–457.
- Andrews, H. (2018). *Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals*. Bat Tree Habitat Key. Pelagic Publishing, Exeter, UK.
- Arnett, E. B. (2006). A preliminary evaluation on the use of dogs to recover bat fatalities at wind energy facilities. *Wildlife Society Bulletin*, 34(5), 1440–1445.
- Arnett, E. B., Baerwald, E. F., Mathews, F., Rodrigues, L., Rodríguez-Durán, A., Rydell, J., ... & Voigt, C. C. (2016). Impacts of wind energy development on bats: a global perspective. In *Bats in the Anthropocene: Conservation of Bats in a Changing World* (pp. 295–323). Springer International Publishing.
- Aughney, T. (2008). *An investigation of the impact of development projects on bat populations: Comparing pre- and post-development bat faunas*. Bat Conservation Ireland.
- Aughney, T., Langton, S., & Roche, N. (2011). *Brown long-eared bat roost monitoring scheme for the Republic of Ireland: Synthesis report 2007–2010*. Irish Wildlife Manuals No. 56. NPWS, Department of Arts, Heritage and the Gaeltacht, Dublin.
- Aughney, T., Langton, S., & Roche, N. (2012). *All Ireland Daubenton's Bat Waterway Monitoring Scheme 2006–2011*. Irish Wildlife Manuals No. 61. NPWS, Department of Arts, Heritage and the Gaeltacht.
- Barataud, M., & Tupinier, Y. (2012). *Écologie acoustique des chiroptères d'Europe*. Biotope.
- Baerwald, E. F., D'Amours, G. H., Klug, B. J., & Barclay, R. M. R. (2008). Barotrauma is a significant cause of bat fatalities at wind turbines. *Current Biology*, 18(16), R695–R696.
- BCI (2012a). *Wind Turbine/Wind Farm Development Bat Survey Guidelines*, Version 2.8. Bat Conservation Ireland, Virginia, Co. Cavan.
- BCI (2012b). *Bats and Appropriate Assessment Guidelines*, Version 1. Bat Conservation Ireland, Virginia, Co. Cavan.
- Berthinussen, A., Richardson, O. C., & Altringham, J. D. (2014). *Bat Conservation: Global Evidence for the Effects of Interventions*. Pelagic Publishing.
- Carden, R., Aughney, T., Kelleher, C., & Roche, N. (2010). *Irish Bat Monitoring Schemes: BATLAS Republic of Ireland Report 2008–2009*.
- Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). Bat Conservation Trust, London.
- Collins, J. (ed.) (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edn). Bat Conservation Trust, London.
- Collins, J., & Jones, G. (2009). Differences in bat activity in relation to bat detector height: implications for bat surveys at proposed windfarm sites. *Acta Chiropterologica*, 11(2), 343–350.
- Cryan, P. M., et al. (2014). Behavior of bats at wind turbines. *Proceedings of the National Academy of Sciences*, 111(42), 15126–15131.
- EUROBATS (2016). *Report of the Intersessional Working Group on Wind Turbines and Bat Populations*, 21st Meeting of the Advisory Committee, Zandvoort, the Netherlands.
- Hein, C. D., Gruver, J., & Arnett, E. B. (2013). *Relating pre-construction bat activity and post-construction bat fatality to predict risk at wind energy facilities: A synthesis*. Bat Conservation International.

- Hill, D., Fasham, M., Tucker, P., Shewry, M., & Shaw, P. (eds.) (2005). *Handbook of Biodiversity Methods: Survey, Evaluation and Monitoring*, pp. 433–449. Cambridge University Press.
- Horn, J. W., Arnett, E. B., & Kunz, T. H. (2008). Behavioral responses of bats to operating wind turbines. *Journal of Wildlife Management*, 72(1), 123–132.
- Hundt, L. (2012). *Bat Surveys: Good Practice Guidelines* (2nd edn). Bat Conservation Trust.
- ILP (2023). *Guidance Note 08/23: Bats and Artificial Lighting at Night*. Institution of Lighting Professionals.
- Korner-Nievergelt, F., Brinkmann, R., Niermann, I., & Behr, O. (2013). Estimating bat and bird mortality at wind turbines using mixture models. *PLOS ONE*, 8(7), e67997.
- Montgomery, I., Lundy, M., & Roche, N. (2014). *Irish Bats in the 21st Century*. Bat Conservation Ireland, Virginia, Co. Cavan.
- NPWS (2025). *The Status of EU Protected Habitats and Species in Ireland: Article 17 Report*. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Dublin.
- Natural England (2014). *Bats and Onshore Wind Turbines: Interim Guidance (Technical)*. Natural England Technical Information Note TIN051.
- NatureScot (2021). *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*. NatureScot, Edinburgh.
- Northern Ireland Environment Agency (NIEA) (2021). *Guidance on bat surveys, assessment and mitigation for onshore wind turbine developments in Northern Ireland: Natural Environment Division guidance* (latest available version April 2024). NIEA, Department of Agriculture, Environment and Rural Affairs, Belfast.
- Rodrigues, L., et al. (2015). *Guidelines for Consideration of Bats in Wind Farm Projects – Revision 2014*. EUROBATS Publication Series No. 6. UNEP/EUROBATS Secretariat, Bonn, Germany.
- Roche, N., Aughney, T., & Langton, S. (2015). *Lesser Horseshoe Bat: Population Trends and Roosting Resource Status*. Irish Wildlife Manuals No. 85. NPWS, Department of Arts, Heritage and the Gaeltacht.
- Russ, J. (2012). *British Bat Calls: A Guide to Species Identification*. Pelagic Publishing.
- Rydell, J., Bach, L., Dubourg-Savage, M.-J., Green, M., Rodrigues, L., & Hedenström, A. (2010). Bat mortality at wind turbines in northwestern Europe. *Acta Chiropterologica*, 12(2), 261–274.
- Schofield, H. (2008). *The Lesser Horseshoe Bat: Conservation Handbook*. The Vincent Wildlife Trust, Ledbury, UK.
- Schuster, E., Bulling, L., & Köppel, J. (2015). Consolidating the state of knowledge: A synoptical review of wind energy's wildlife effects. *Environmental Management*, 56, 300–331.
- SNH (2019). *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*. Scottish Natural Heritage (now NatureScot).
- Stone, E. L. (2013). Bats and lighting: overview of current evidence and mitigation. In: *Bat Conservation Trust Conference Proceedings*.
- Voigt, C.C., Kaiser, K., Look, S., Scharnweber, K. & Scholz, C. (2022) Wind turbines without curtailment produce large numbers of bat fatalities throughout their lifetime: A call against ignorance and neglect. *Global Ecology and Conservation*, 37, e02149.
- Wray, S., Wells, D., Long, E., & Mitchell-Jones, T. (2010). Valuing bats in ecological impact assessment. *CIEEM In Practice*, December issue.



APPENDIX 1

BAT HABITAT SUITABILITY APPRAISAL

Updated guidelines for assessing the potential suitability of a site for bats, based on the presence of habitat features (taken from Collins, 2023)

Potential Suitability	Description	
	Roosting Habitats in Structures	Potential Flight- Paths and Foraging Habitats
None	No habitat features on site 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).	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/protection for flight-lines or generate/shelter insect populations available to foraging bats).
Negligible ^a	Negligible habitat features on site 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.	No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
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 ^b and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats, i.e. unlikely to be suitable for maternity and not a classic cool/stable hibernation site but could be used by individual hibernating bats ^c .	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^b 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).	Continuous habitat connected to the wider landscape that could be used by bats for flight-paths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure with one or 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 ^b , and surrounding habitat. These structures have the potential to support high conservation status which is established after presence is confirmed.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

- a) Negligible is defined as ‘so small or unimportant as to be not worth considering, insignificant’. This category may be used where there are places that a bat could roost or forage (due to one attribute) but it is unlikely that they actually would (due to another attribute).
- b) For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.
- c) Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten et al., 2016 and Jansen et al., 2022). Common pipistrelle swarming has been observed in the UK (Bell, 2022 and Tomlinson, 2020) and winter hibernation of numbers of this species has been detected at Seaton Delaval Hall in Northumberland (National Trust, 2018). This phenomenon requires some research in the UK, but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in prominent buildings in the landscape, urban or otherwise.

BCT Protocol for categorising the suitability of trees for bats (Collins, 2023).

Assessment	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

BCT Guidance for categorising suitability of PRFs for bats (Collins, 2023).

Assessment	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



APPENDIX 2

SITE RISK ASSESSMENT

Table 3a: Stage 1 - Initial site risk assessment

Site Risk Level (1-5)*	Project Size			
		Small	Medium	Large
Habitat Risk	Low	1	2	3
	Moderate	2	3	4
	High	3	4	5
Key: Green (1-2) - low/lowest site risk; Amber (3) - medium site risk; Red (4-5) - high/highest site risk.				
* Some sites could conceivably be assessed as being of no (0) risk to bats. This assessment is only likely to be valid in more extreme environments, such as above the known altitudinal range of bats, or outside the known geographical distribution of any resident British species.				
Habitat Risk	Description			
Low	<p>Small number of potential roost features, of low quality.</p> <p>Low quality foraging habitat that could be used by small numbers of foraging bats.</p> <p>Isolated site not connected to the wider landscape by prominent linear features.</p>			
Moderate	<p>Buildings, trees or other structures with moderate-high potential as roost sites on or near the site.</p> <p>Habitat could be used extensively by foraging bats.</p> <p>Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.</p>			
High	<p>Numerous suitable buildings, trees (particularly mature ancient woodland) or other structures with moderate-high potential as roost sites on or near the site, and/or confirmed roosts present close to or on the site.</p> <p>Extensive and diverse habitat mosaic of high quality for foraging bats.</p> <p>Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows.</p> <p>At/near edge of range and/or on an important flyway.</p> <p>Close to key roost and/or swarming site.</p>			
Project Size	Description			
Small	<p>Small scale development (≤10 turbines). No other wind energy developments within 10km.</p> <p>Comprising turbines <50m in height.</p>			
Medium	<p>Larger developments (between 10 and 40 turbines). May have some other wind developments within 5km.</p> <p>Comprising turbines 50-100m in height.</p>			
Large	<p>Largest developments (>40 turbines) with other wind energy developments within 5km.</p> <p>Comprising turbines >100m in height.</p>			



APPENDIX 3

OVERALL SITE RISK ASSESSMENT

Table 3b: *Stage 2 - Overall risk assessment*

Site risk level (from Table 3a)	Ecobat activity category (or equivalent justified categorisation)					
	Nil (0)	Low (1)	Low-moderate (2)	Moderate (3)	Moderate-high (4)	High (5)
Lowest (1)	0	1	2	3	4	5
Low (2)	0	2	4	6	8	10
Med (3)	0	3	6	9	12	15
High (4)	0	4	8	12	15	18
Highest (5)	0	5	10	15	20	25

The scores in the table are a product of multiplying site risk level and the Ecobat activity category (or equivalent). The activity categories equate to those given in Table 1 for high collision risk species. Nil (0) means no bat activity was recorded across the whole site, but caution is needed here, because although the values given in this column are "0", at sites where pre-construction surveys found no bat activity, there remains the possibility that new turbines could attract some bat species, thereby altering the level of risk that applies in reality.

Overall assessment:

Low (green) 0-4
Medium (amber) 5-12
High (red) 15-25

It is important to have an understanding of both "typical" and unusually high levels of bat activity at a site so that potentially important peaks in activity are not overlooked. It is therefore recommended that both the highest Ecobat activity category and the most frequent activity category (i.e. the median) are assessed separately in Table 3b and presented in the overall risk assessment. A judgement can then be made on which is the most relevant. It should be noted that presenting mean activity levels can be highly misleading where the data are highly skewed, as is frequently the case with bat activity at wind turbines (Lintott & Mathews, 2018).



APPENDIX 4

2023 BAT SURVEY RESULTS

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1. INTRODUCTION

This appendix provides supplementary data from bat surveys undertaken at the Cahermurphy West Wind Farm site during the 2023 survey season. These surveys were designed and implemented in accordance with NatureScot (2021) guidance, and survey methodologies were consistent with those applied during the 2025 surveys, allowing the datasets to be interpreted together.

Surveys completed included:

- > Bat habitat suitability appraisal
- > Roost surveys
- > Manual activity surveys
- > Ground-level static detector surveys

The results presented here supplement the 2025 survey dataset and have been considered together with those more recent surveys in the EIAR impact assessment to inform baseline characterisation and the evaluation of potential effects on bats.

2. METHODS

2.1 Bat Habitat Suitability Appraisal

Bat walkover surveys were carried out throughout 2023. During these surveys, habitats within the Site were assessed for their suitability to support roosting, foraging and commuting bats. Connectivity with the wider landscape was also considered. The appraisal was undertaken across the entire Proposed Wind Farm site during field walkover surveys, based on the turbine layout and site boundary available at the time of survey in 2023.

Suitability was assessed according to Collins (2016), which was the most up-to-date guidance at the time. This guidance provides a grading protocol for roosting habitats and for commuting and foraging areas. Suitability categories are divided into *High*, *Moderate*, *Low* and *Negligible*, as defined in the relevant guidance. This approach is consistent with subsequent guidance (Collins, 2023), and suitability categories remain directly comparable.

Bat habitat suitability appraisal was carried out in 2023 to classify habitats, assess bat roost potential, and identify features of value for foraging and commuting bats. Surveys were undertaken systematically across the Proposed Wind Farm site (Table 2-1).

Table 2-1 Bat Survey Dates (2023)

Dedicated Bat Survey Dates
27 th April 2023
11 th May 2023
13 th June 2023
14 th July 2023
31 st August 2023
12 th September 2023

2.2 Roost Surveys

Daytime Roost Inspections

A search for roosts was undertaken within 200m plus the maximum proposed rotor radius (i.e. 81.5m) of the Proposed Project (NatureScot, 2021). The aim was to determine the presence of roosting bats and the need for further survey work or mitigation. The site was visited in April, May, June, July, August, and September of 2023. A daytime bat walkover survey was carried out, and structures were assessed for their potential to support roosting bats following the categories according to Collins (2016) as *High*, *Moderate*, *Low* and *Negligible*.

Three structures were identified as potential roost features within the Proposed Wind Farm (IG Refs: R 07770 69495, R 08080 69546 and R 07325 69640; corresponding to Structure No. 1, 2 and 3, respectively). These were subject to a roost assessment which comprised a detailed inspection of the interiors and exteriors to look for evidence of bat use, including live and dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises.

No trees with potential roost features were identified within the Proposed Wind Farm site following bat habitat suitability appraisal and walk-over surveys.

Emergence Surveys

Emergence surveys at dusk were carried out which focused on the PRFs identified during the bat habitat appraisal. During these surveys, surveyors were equipped with Bat Logger M bat detectors (Elekon AG, Lucerne, Switzerland). This detector model was also used during the 2025 surveys. The emergence surveys commenced at least 15 minutes before sunset and concluded 1 hour and 30 minutes after sunset. Table 2-2 summarises survey effort in relation to emergence surveys. Where possible, species identification was made in the field and any other relevant information was also noted, e.g., numbers, behaviour, features used, etc. All bat echolocation was recorded for subsequent analysis to confirm species identifications.

Surveyors were located at PRFs identified during the daytime roost inspection surveys with a focus on potential access point and roosting features. The purpose was to identify any bat species, numbers, access points and roosting locations within the structure. Surveys were undertaken in weather conditions considered suitable for bat activity in accordance with guidance.

Table 2-2 Survey Effort 2023 - Emergence Surveys

Date	Surveyors	Sunrise/ Sunset	Type	Weather
11 th May 2023	Ryan Connors & Laura Gránicz	21:23	Emergence	13-11 °C, dry, light breeze/calm, moon not-visible, 30-10% cloud cover
13 th June 2023	Ryan Connors & Laura Gránicz	22:02	Emergence	21-19 °C, dry, calm, moon not-visible, 90-30% cloud cover
12 th September 2023	Ryan Connors & Laura Gránicz	20:00	Emergence	15-10 °C, dry, calm, moon not-visible, 20-10% cloud cover

2.3 Manual Transects

Manual activity surveys comprised walked and partially driven transects after dusk. A series of representative transect routes were selected throughout the Site. The purpose of manual transects was to supplement static detector data and provide behavioural and spatial context to bat activity. Transect routes were prepared with reference to the proposed turbine layout, desktop and walkover survey results

as well as any health and safety considerations and access limitations. As such, transect routes generally followed existing roads and tracks. Transect routes are presented in Figure 2-1.

Transects were walked or driven by two surveyors, recording bats in real time. The driven transect followed the methodology described by Roche *et al.* (2012). Dusk transect surveys began approximately 90 minutes after sunset, immediately following the completion of emergence surveys and were completed for up to 3 hours after sunset. This timing is consistent with standard transect survey methodology. Surveyors were equipped with active full spectrum bat detectors, the Batlogger M bat detector (Elekon AG, Lucerne, Switzerland), and all bat activity was recorded for subsequent analysis to confirm species identifications. Transects surveys were undertaken in spring, summer and autumn of 2023. Table 2-3 summarises survey effort in relation to manual transects.

Table 2-3 Survey Effort 2023 - Manual Transects

Date	Surveyors	Sunrise/ Sunset	Type	Weather	Walked/ Driven (km)
11 th May 2023	Ryan Connors & Laura Gránicz	21:23	Dusk Transect	11-10 °C, dry, calm, 0% cloud cover	4.86 km
13 th June 2023	Ryan Connors & Laura Gránicz	22:02	Dusk Transect	19-17 °C, dry, calm, 30-100% cloud cover, foggy	8.63 km
12 th September 2023	Ryan Connors & Laura Gránicz	20:00	Dusk Transect	10-9 °C, dry, calm, 5-10% cloud cover	9.06 km
Total Survey Effort					22.6 km

2.4

Ground-level Static Surveys

Where developments have up to 10 turbines, NatureScot requires one detector per turbine. Given that 8 turbines were proposed, 8 detectors were deployed to ensure compliance with NatureScot guidance. Automated bat detectors were deployed for at least 10 nights of suitable weather in spring (April-May), 20 nights in summer (June-mid August) and 10 nights in autumn (mid-August-October), (NatureScot, 2021; NIEA, 2021). Detector locations were selected to represent the range of habitats and landscape features present within the Proposed Wind Farm site and in proximity to proposed turbine locations. Figure 2-1 illustrates the location of ground-level static detectors in relation to the final turbine layout, with detector locations summarised in Table 2-4.

Table 2-4 Ground-level Static Detector Locations

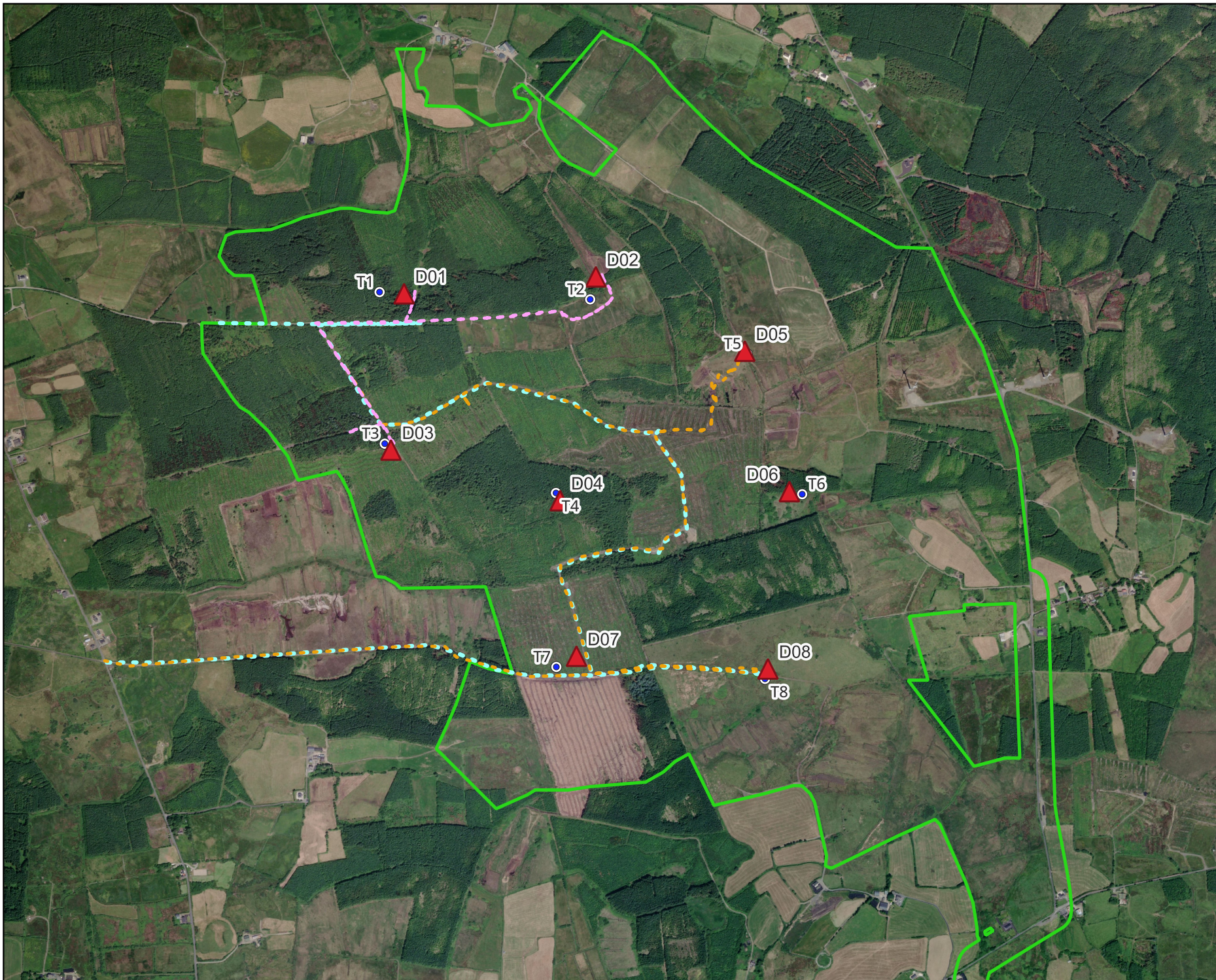
Detector ID	Location (IG Ref.)	Habitat	Linear Feature within 50m	Corresponding/ Nearest Turbine(s)
D01	R 07867 69734	Conifer plantation (WD4)	Forestry Edge	T01
D02	R 08469 69777	Conifer plantation (WD4)	Forestry Edge	T02
D03	R 07840 69259	Conifer plantation (WD4)	Forestry Edge	T03
D04	R 08368 69563	Conifer plantation (WD4)	Forestry Edge	T04
D05	R 08916 69553	Wet grassland (GS4)	Forestry Edge	T05
D06	R 09057 69127	Conifer plantation (WD4)	Forestry Edge	T06
D07	R 08410 68627	Conifer plantation (WD4)	None	T07
D08	R 08997 68587	Wet grassland (GS4)	None	T08

Full spectrum bat detectors, Song Meter SM4BAT (Wildlife Acoustics, Maynard, MA, USA), were employed using settings recommended for bats, with minor adjustments in gain settings and band pass filters to reduce background noise when recording. Detectors were set to record from 30 minutes before sunset until 30 minutes after sunrise. The Song Meter automatically adjusts sunset and sunrise times using the Solar Calculation Method when provided with GPS coordinates. Detector settings and deployment protocols were consistent with best practice guidance for static acoustic bat surveys.







Onsite weather monitoring was undertaken concurrently with static detector deployments. One Vantage Pro 2 (Davis Instruments, CA, UCS) was deployed each season and night-time hourly data was tracked remotely to ensure a sufficient number of nights with appropriate weather conditions were captured (i.e. dusk temperatures above 8 °C, wind speeds less than 5m/s and no or only very light rainfall). This ensured that activity data were derived from conditions suitable for bat activity and comparable between seasons. Table 2-5 summarises survey effort achieved in 2023 for each of the detector locations.

Table 2-5 Survey Effort 2023- Ground-level Static Surveys

Season	Survey Period	Total Survey Nights per Detector Location	Nights with Appropriate Weather
Spring	27 th April - 11 th May 2023	15	14
Summer	13 th June - 14 th July 2023	31	20
Autumn	31 st August - 12 th September 2023	11	11
Total Survey Effort		57	45



Map Legend

-  EIAR Site Boundary
-  Proposed Turbine Layout
-  Static Detector Locations
-  Spring Transect Route
11th May 2023
-  Summer Transect Route
13th June 2023
-  Autumn Transect Route
12th September 2023



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Drawing Title	
Transect Routes and Static Detector Locations 2023	
Project Title	
Cahermurphy Wind Farm	
Drawn By	Checked By
KL	CM
Project No.	Drawing No.
230407	Figure 2-1
Scale	Date
1:15,000	2026-01-26

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2.5 Bat Call Analysis

All recordings from 2023 were later analysed using bat call analysis software Kaleidoscope Pro v.5.1.9 (Wildlife Acoustics, MA, USA). The aim of this was to identify, to a species or genus level, what bats were present at the Wind Farm Site. Bat species were identified using established call parameters (Russ, 2012). Automated classifications generated by Kaleidoscope Pro were used as an initial screening tool only and were subject to subsequent manual verification. Where calls could not be reliably identified to species level, recordings were classified to genus level (e.g. *Myotis* spp.) in accordance with best practice.

2.6 Assessment of Bat Activity Levels

Activity was standardised as *bat passes per hour (bpph)* to account for variable night length. The median nightly bpph was used to represent typical levels of activity (Lintott & Mathews, 2018).

Ecobat (mammal.org.uk; Lintott *et al.*, 2018) is the recommended tool for benchmarking activity levels (NatureScot, 2021). However, the platform was unavailable at the time of analysis due to scheduled maintenance. Therefore, activity levels were assessed using site-specific thresholds adapted from Mathews *et al.* (2016), with categories defined by quartiles of maximum nightly pass rates. This approach provides a proportionate means of distinguishing relative activity levels within the site in the absence of cross-site benchmarking. To avoid bias in the derivation of activity thresholds, statistical outliers identified through box-plot analysis were excluded prior to calculating quartile values. Site-specific activity thresholds applied to the 2023 dataset are presented in Table 2-6.

Table 2-6 Site-specific Activity Thresholds as Bat Passes per Hour (bpph)

Assessment Level	Activity Threshold as Bat Passes per Hour (bpph) for Bat Species					
	<i>Myotis</i> spp.	<i>Leisler's bat</i>	<i>Common and soprano pipistrelle</i>	<i>Nathusius' pipistrelle</i>	<i>Brown long-eared bat</i>	<i>Lesser horseshoe bat</i>
<i>Low</i>	<1.24	<1.24	<2.35	<0.09	<0.63	< 0.03
<i>Moderate</i>	1.24 - 3.72	1.24 - 3.72	2.35 - 7.06	0.09 - 0.26	0.63 - 1.90	0.03 - 0.08
<i>High</i>	>3.72	>3.72	>7.06	>0.26	>1.90	> 0.08

3. RESULTS

3.1 Bat Habitat Suitability Appraisal

Results from the desktop review and walkover surveys were used to establish a baseline understanding of habitat suitability within the Proposed Wind Farm site for foraging, commuting and roosting bats, in accordance with Collins (2016). Habitats were assigned to suitability categories of *High*, *Moderate*, *Low* or *Negligible*, as defined in the relevant guidance. The appraisal was undertaken across the entire Proposed Wind Farm site during field walkover surveys, based on the turbine layout and site boundary available at the time of survey in 2023.

Habitats within the Proposed Wind Farm site are dominated by commercial conifer plantation, with additional areas of wet grassland and smaller areas of wet heath occurring as a mosaic with lowland blanket bog and cutover bog habitats.

With regard to foraging and commuting bats, areas of grassland habitat and exposed peatland were assessed as having *Low* suitability, reflecting habitat that is suitable but relatively isolated and therefore likely to be used by small numbers of commuting or foraging bats (Collins, 2016). In the absence of hedgerows or natural treelines, conifer plantation edges and forestry corridors represent the primary linear features available to bats within the site. These features provide shelter and connectivity within the landscape and were therefore classified as offering *Moderate* suitability for foraging and commuting bats (Collins, 2016).

With regard to roosting bats, all trees present within the Proposed Wind Farm comprise commercial conifer species. These trees are generally immature to semi-mature, even-aged, and managed for timber production, and therefore lack structural features typically associated with bat roosting, such as cavities, cracks, splits or areas of decay. Accordingly, no potential roost features (PRFs) were identified following ground-level inspection, and trees within the Proposed Wind Farm were assessed as having *Negligible* roosting potential for bats.

Three farm sheds within the Proposed Wind Farm were identified as having potential to support roosting bats. These represent the only built structures within the site and were the same three structures identified during the 2025 survey period. All three were subject to daytime inspections and comprised agricultural sheds with accessible openings and limited potential roosting features. Each structure was assessed as having *Low* roosting potential. These structures were therefore subject to further assessment through emergence surveys, as described in Section 3.2 below.

3.2 Roost Surveys

Daytime Roost Inspections

Three structures were identified as containing potential roost features (PRFs) within the Proposed Wind Farm site during surveys undertaken in 2023. These comprised three agricultural farm sheds, referred to as Structure No. 1, Structure No. 2 and Structure No. 3. Plate 3-1 to Plate 3-3 illustrate each structure assessed during the 2023 surveys.

During the inspection of Structure No. 1, two *Pipistrellus* spp. individuals were observed roosting between the rafters and the exterior wall on the southern elevation of the building. This observation was consistent with a small day roost. In light of this evidence of bat roosting, this structure was subsequently subject to two dusk emergence surveys during the spring and summer survey periods.

No evidence of bat use was recorded during the inspection of Structure No. 2, and no further surveys were therefore undertaken at this location, as no evidence of bat roosting was recorded.

During the inspection of Structure No. 3, evidence of feeding remains was recorded indicative of bat use. As a result, this structure was subsequently subject to a dusk emergence survey during the autumn survey period. The results of the dusk emergence surveys are presented below.



Plate 3-1 West aspect of Structure No. 1



Plate 3-2 Northeast aspect of Structure No. 2



Plate 3-3 Southwest aspect of Structure No. 3

Emergence Surveys

Dusk emergence surveys were carried out during the spring, summer and autumn survey periods of 2023. Surveys were undertaken under suitable weather conditions and in accordance with guidance.

The spring emergence survey was conducted by two surveyors on 11th May 2023 at Structure No. 1 (Plate 3-1). This structure was confirmed as an active roost for soprano pipistrelle, prompting a follow-up emergence survey during the summer survey period on 13th June 2023, which was also undertaken by two surveyors. On both occasions, a single soprano pipistrelle individual was observed emerging from the structure.

A third dusk emergence survey was undertaken on 12th September 2023 at Structure No. 3 (Plate 3-3), during which a single soprano pipistrelle individual was observed emerging from the hay shed.

The emergence survey results confirm the presence of small soprano pipistrelle roosts at Structures No. 1 and No. 3.

Table 3-1 summarises the results of the dusk emergence surveys undertaken at structures within the Proposed Wind Farm site during 2023.

Table 3-1 Emergence Survey Results 2023

Structure	PRF Suitability	IG Ref	Survey Type	Date Surveyed	Survey Results
Structure No. 1	Low	R 07771 69493	Dusk Emergence	11 th May 2023	One soprano pipistrelle individual observed emerging
Structure No. 1	Low	R 07771 69493	Dusk Emergence	13 th June 2023	One soprano pipistrelle individual observed emerging
Structure No. 3	Low	R 07324 69643	Dusk Emergence	12 th September 2023	One soprano pipistrelle individual observed emerging

3.3 Manual Transect Surveys

Manual bat activity transect surveys were undertaken during the spring, summer and autumn survey periods of 2023. Bat activity was recorded during all survey seasons. A total of 918 bat passes were recorded during manual surveys, including activity recorded in association with dusk emergence surveys, where transects immediately followed emergence survey completion. Overall, soprano pipistrelle was the most frequently recorded species (n=747), followed by common pipistrelle (n=108). Lower levels of activity were recorded for *Myotis* spp. (n=46), Leisler’s bat (n=10) and brown long-eared bat (n=7). The overall species composition recorded during manual surveys is presented in Plate 3-4.

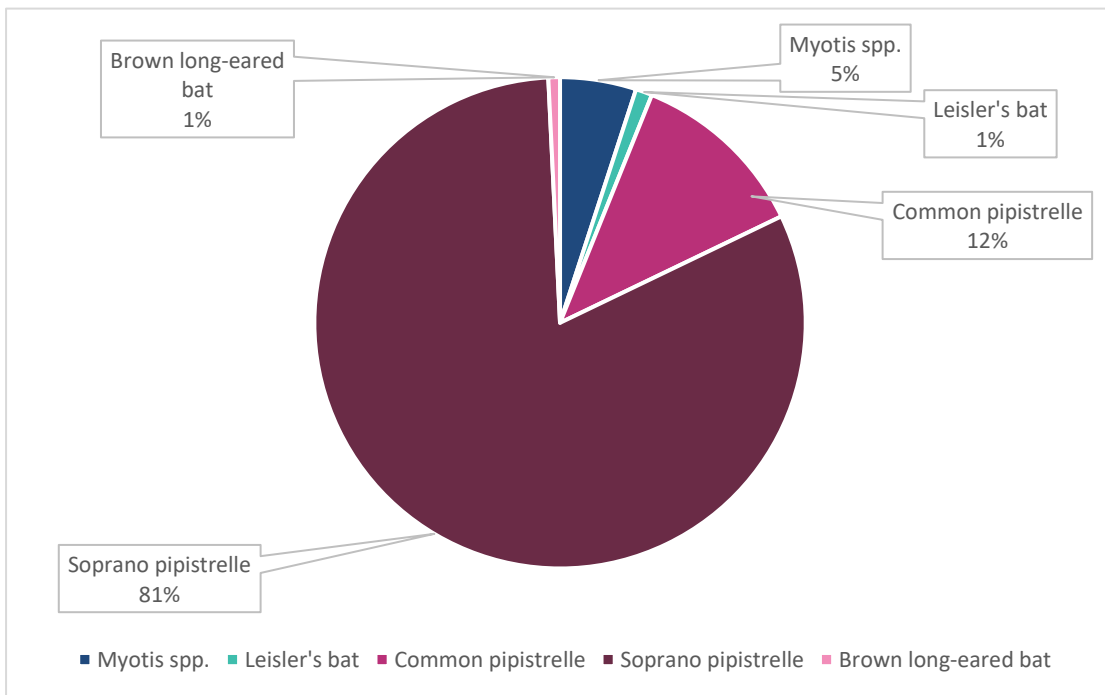


Plate 3-4: Total species composition from manual activity surveys across 2023 survey period

Transect survey results for individual species and survey periods are presented in Table 3-2. To account for differences in survey effort, transect results were standardised and expressed as bat passes per kilometre surveyed (Plate 3-5). Overall bat activity recorded during manual transect surveys was highest during the spring survey period, followed by autumn and summer, both in terms of activity levels and species diversity. The spatial distribution of bat activity recorded during spring, summer and autumn manual transect surveys is illustrated in Figures 3-1 to 3-3.

Species composition and activity levels varied between survey periods. Soprano pipistrelle activity was most pronounced during the spring and autumn transect surveys, while common pipistrelle was recorded

more frequently during the summer transect. Activity of *Myotis* spp. was highest during spring and was localised, particularly in the vicinity of the confirmed roost at Structure No. 1 and around Turbine T1. Recorded bat activity during walked and driven transects was concentrated primarily along conifer plantation edges and forestry corridors, consistent with the findings of the habitat suitability appraisal.

These results indicate that manual transect surveys recorded a bat assemblage dominated by pipistrelle species, with activity patterns varying seasonally and spatially across the site.

Table 3-2 Total bat passes per species and season recorded during manual transects in 2023.

	Spring	Summer	Autumn
Total Bat Passes	454	154	310
<i>Myotis</i> spp.	42	2	2
Leisler's bat	8	-	2
Common pipistrelle	23	64	21
Soprano pipistrelle	376	86	285
Brown long-eared bat	5	2	-

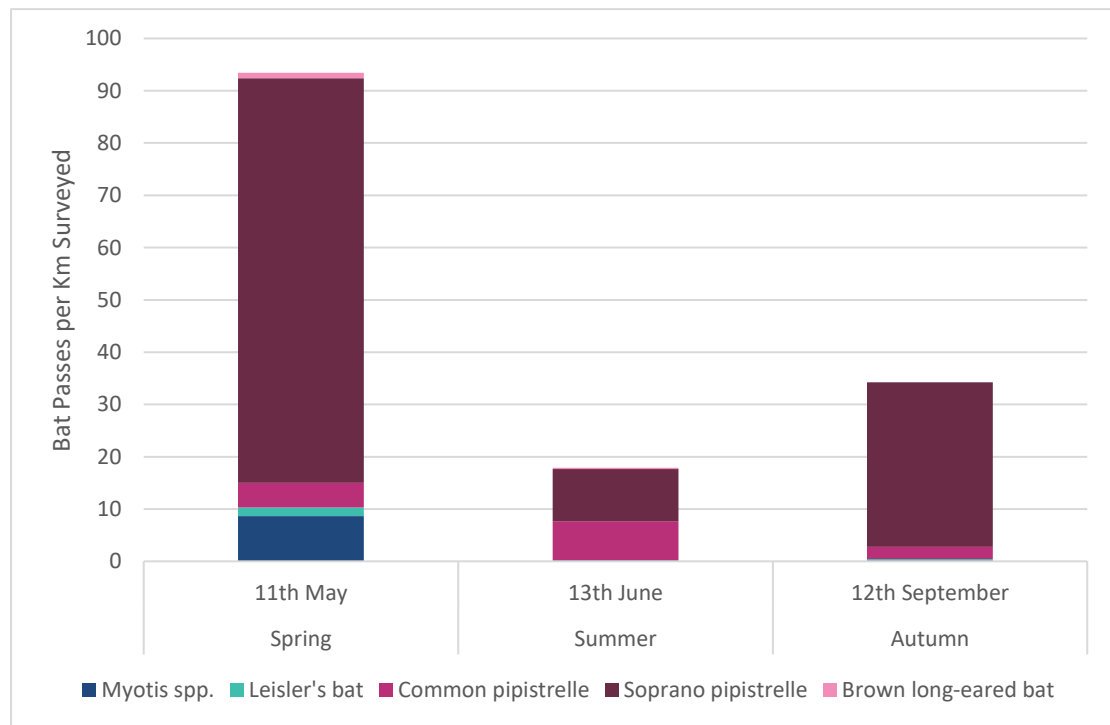
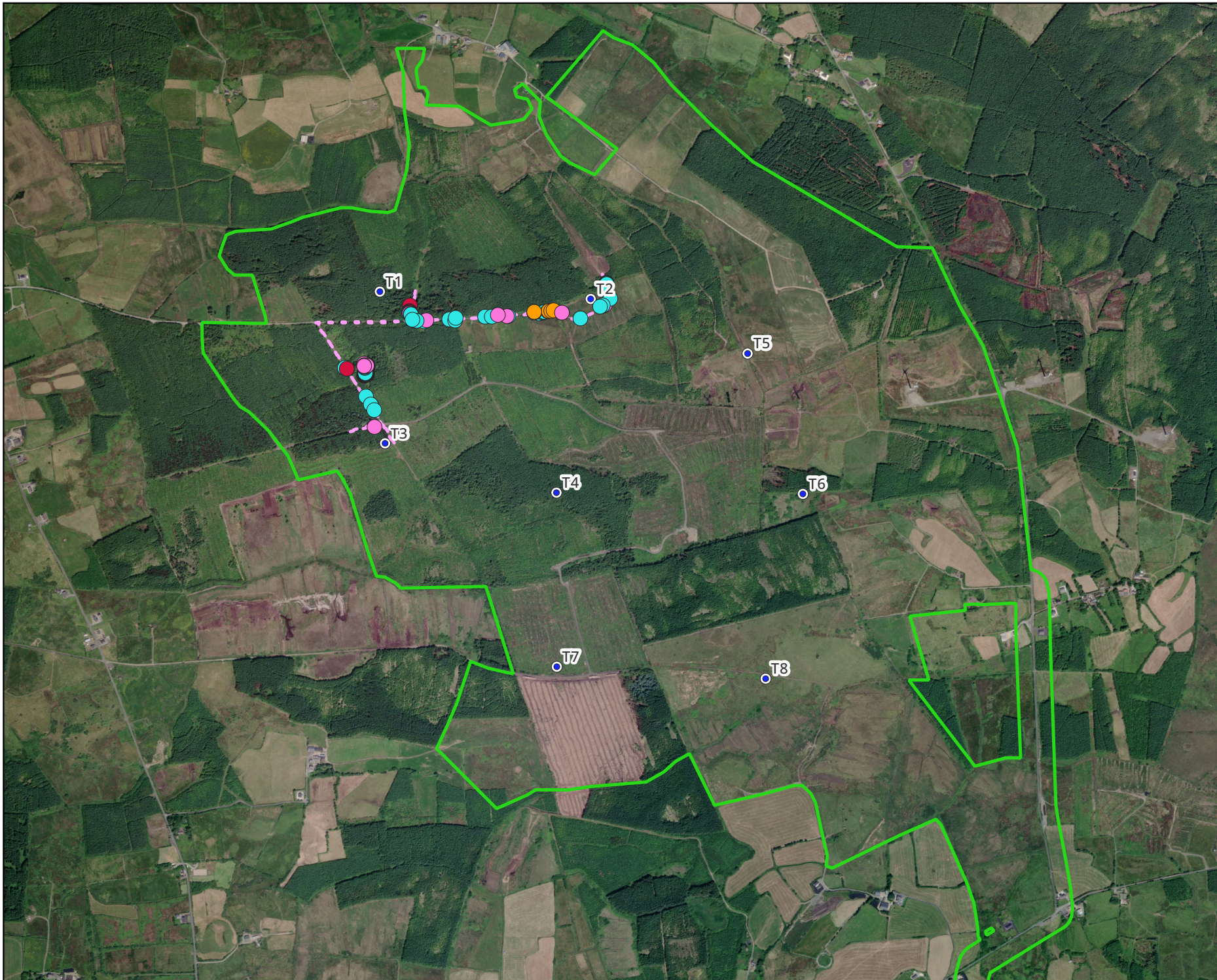


Plate 3-5 Species composition per survey period during 2023 manual transect surveys



Map Legend

- EIA Site Boundary
- Proposed Turbine Layout
- Spring Transect Route
11th May 2023
- Species**
- Myotis spp.
- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared bat



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Drawing Title
2023 Spring Manual Results

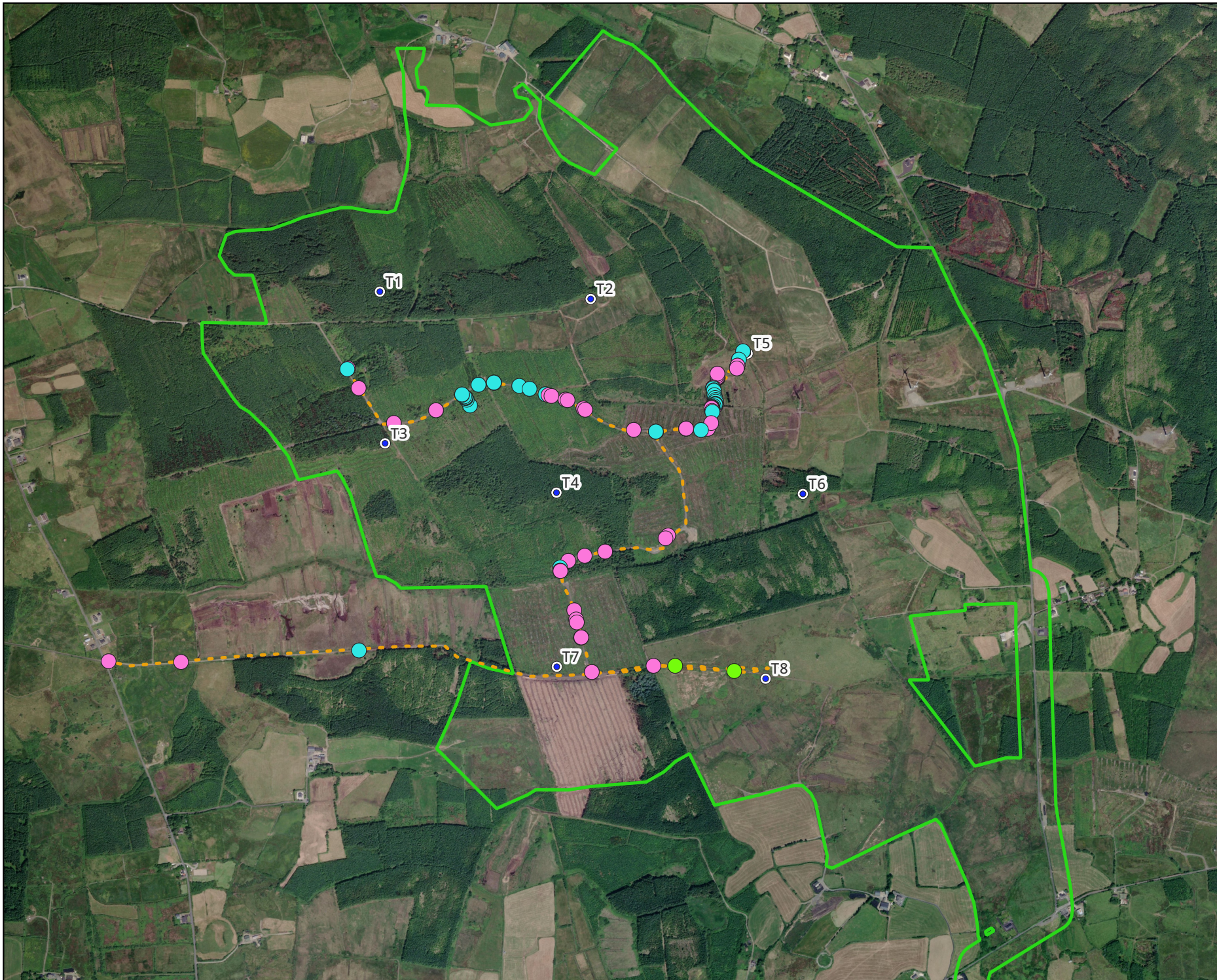
Project Title
Cahermurphy Wind Farm

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Project No. 230407	Drawing No. Figure 3-1
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Scale 1:15,000	Date 2026-01-08
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Map Legend

- EIAR Site Boundary
 - Proposed Turbine Layout
 - Summer Transect Route
13th June 2023
- Species
- Myotis spp.
 - Common pipistrelle
 - Soprano pipistrelle
 - Brown long-eared bat



Drawing Title
2023 Summer Manual Results

Project Title
Cahermurphy Wind Farm

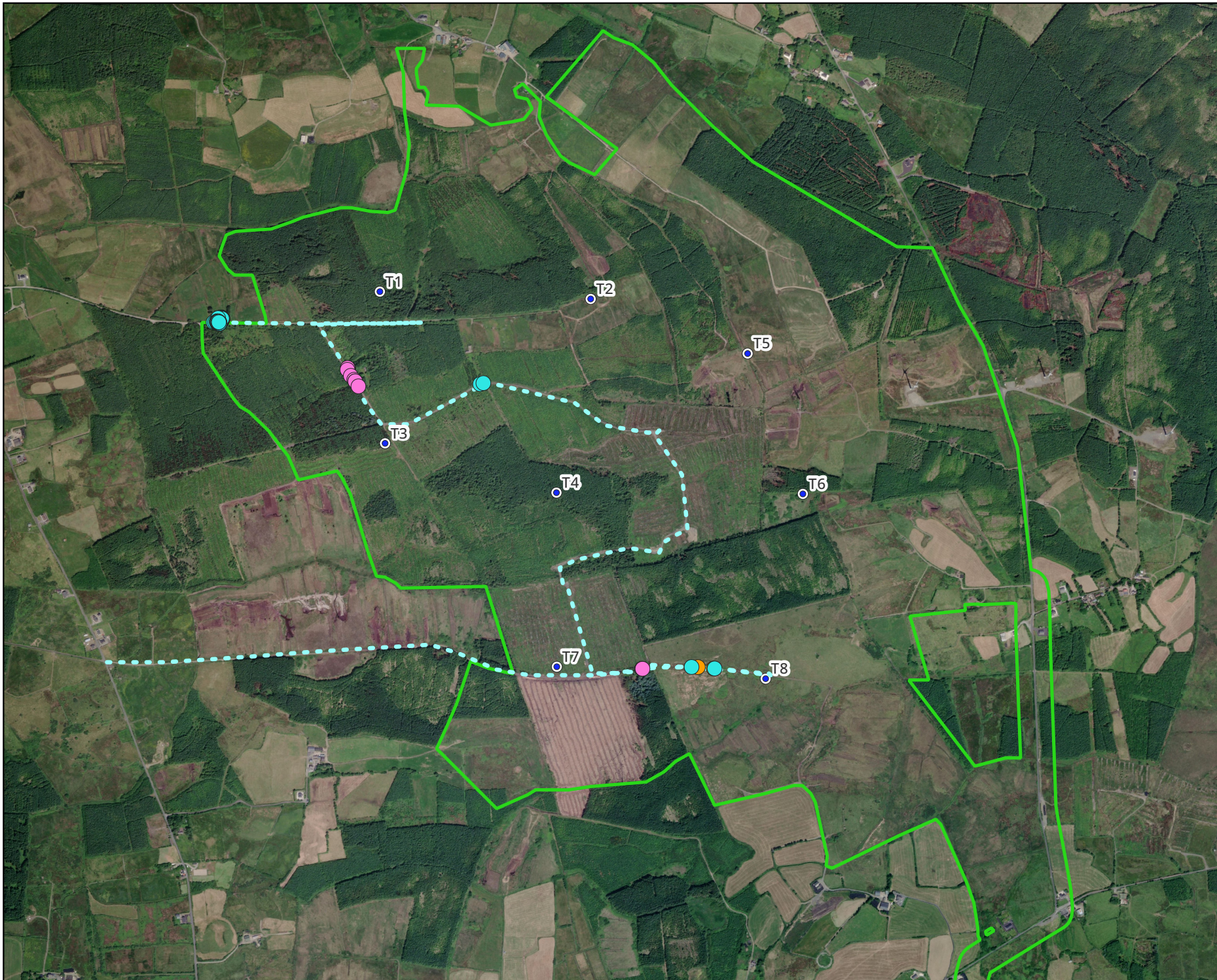
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Project No. 230407	Drawing No. Figure 3-2
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Scale 1:15,000	Date 2026-01-08
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Map Legend

- EIA Site Boundary
 - Proposed Turbine Layout
 - Autumn Transect Route
12th September 2023
- Species
- Leisler's bat
 - Common pipistrelle
 - Soprano pipistrelle



Drawing Title
2023 Autumn Manual Results

Project Title
Cahermurphy Wind Farm

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Project No. 230407	Drawing No. Figure 3-3
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3.4 Ground-level Static Surveys

In total, 19,386 bat passes were recorded in 2023. In general, Soprano pipistrelle (n= 7,534) and Common pipistrelle (n=6,561) occurred most frequently. Instances of Leisler’s bat (n= 2,137), *Myotis* spp. (n=1,813) and brown long-eared bat (n=1,317) were recorded less frequently. Observations of Nathusius’ pipistrelle (n=23) and lesser horseshoe bat (n=1) were rare. Plate 3-6 presents species composition across all ground-level static detectors.

Bat activity was calculated as total bat passes per hour (bpph) per season to account for any bias in survey effort, resulting from varying night lengths between seasons. Plate 3-7 presents these results for each species. No significant variability in species composition was recorded between seasons, however, higher activity levels for all species were recorded in autumn except for Leisler’s bat which had slightly higher activity in spring. Activity was dominated by common and soprano pipistrelles. A single lesser horseshoe bat was also recorded during the autumn season.

Bat activity is often variable between survey nights. Therefore, the median bat pass rate (bpph) was used as the most appropriate and robust measure of bat activity to compare activity at each detector location (Lintott & Mathews, 2018). Plate 3-8 illustrates median bpph per detector and survey period for 2023 (note the axis scale varies between seasons). Species composition was broadly similar between detector locations, with the exception of D04, where Leisler’s bat formed a higher proportion of recordings during the spring and summer survey periods. Median activity levels varied between detector locations: D02 recorded the highest activity during spring and summer, while in autumn relatively higher activity was recorded at D06, in addition to D01, D02 and D05. D04 recorded the lowest median activity across all seasons, and D05, D06 and D07 recorded very low bat activity during the summer survey period.

Overall, ground-level static surveys indicate a bat assemblage dominated by pipistrelle species, with only minor seasonal and spatial variation in relative activity levels across the site.

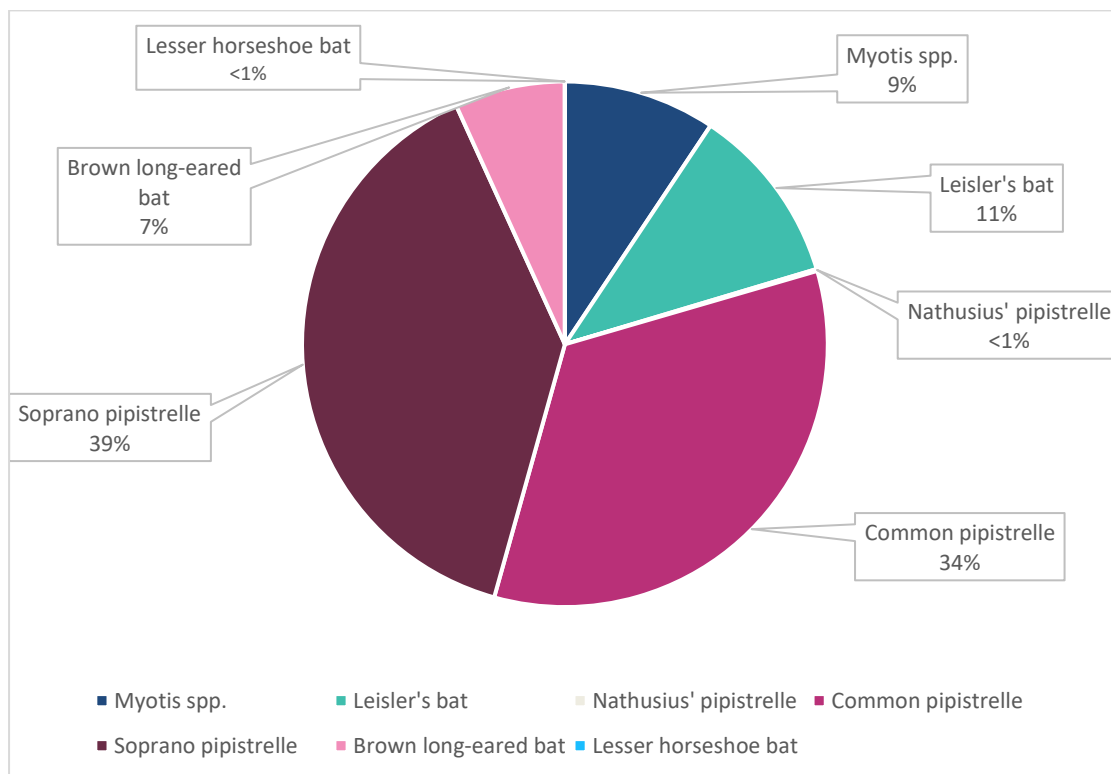


Plate 3-6 Static Detector Surveys 2023: Overall Species Composition (Total Bat Passes)

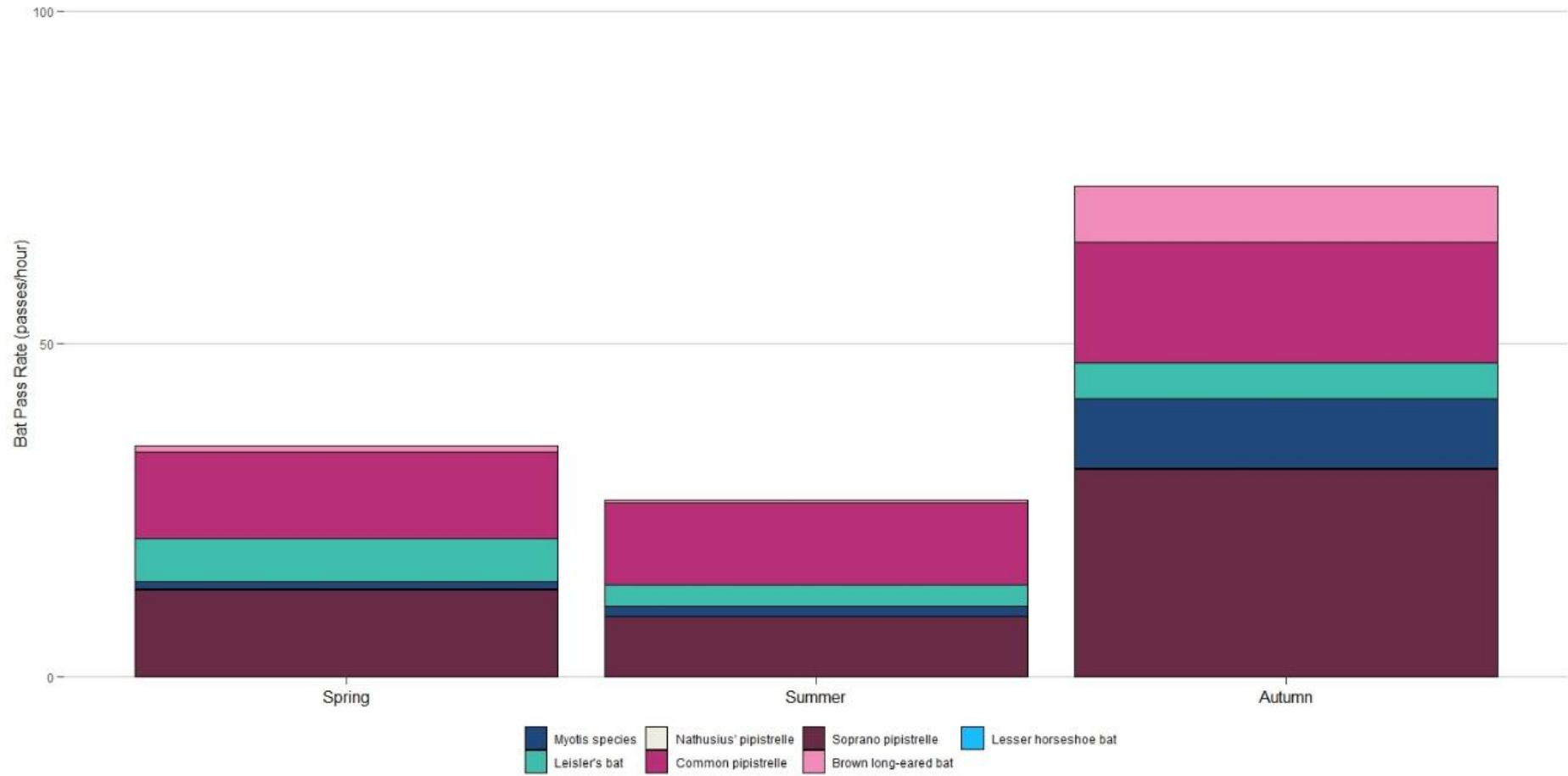


Plate 3-7 Static Detector Surveys 2023: Seasonal Bat Activity Levels (Bat Passes per Hour)

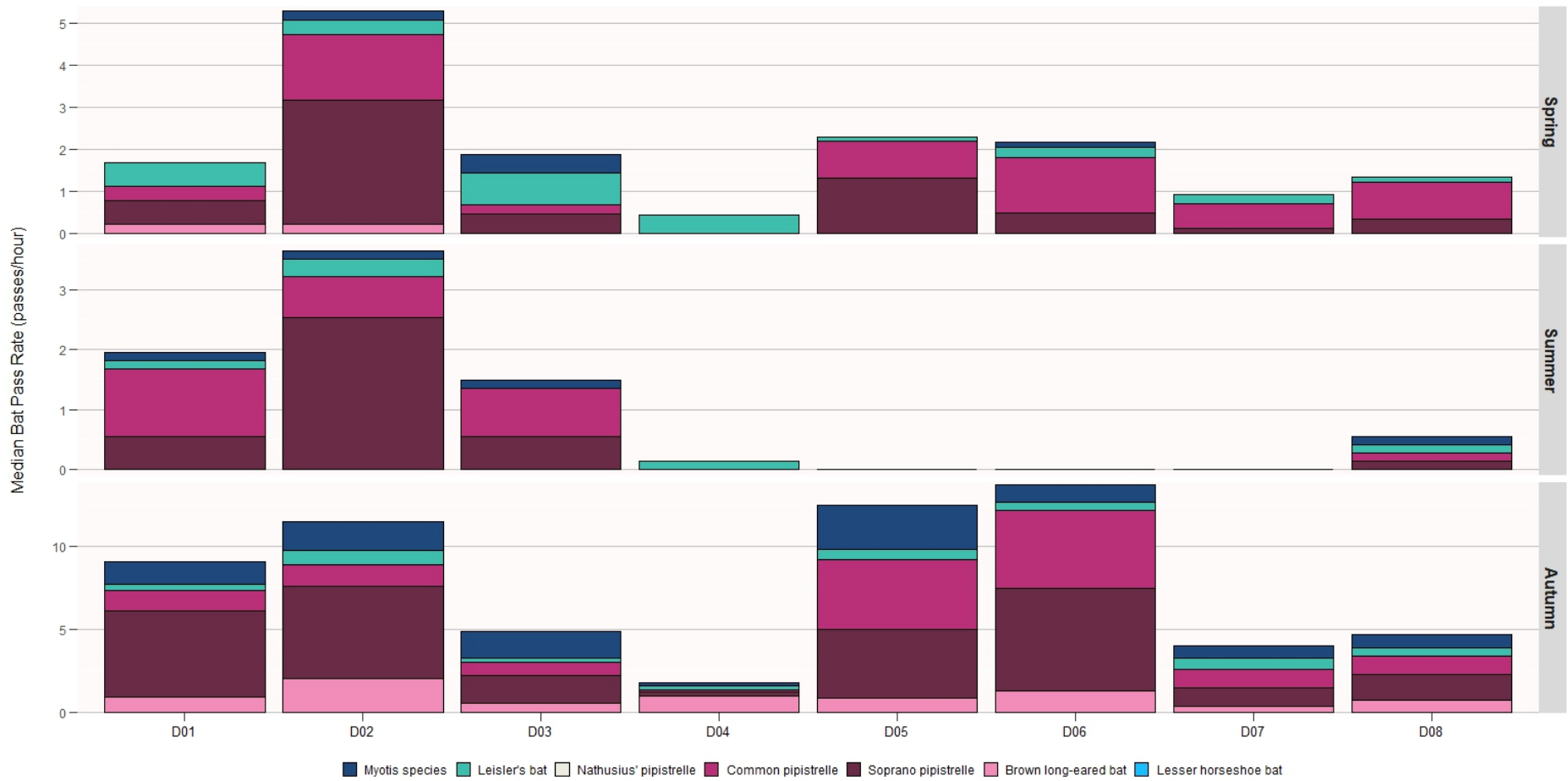


Plate 3-8 Static Detector Surveys 2023: Median Bat Passes per Hour (bp/h) per Detector and Survey Period (varied axis scale)

3.5 Assessment of Bat Activity Levels 2023

Low, *Moderate* and *High* bat activity levels were assigned to median and maximum bat pass rates (bpph) recorded during spring, summer and autumn at each detector location, using site-specific thresholds adapted from Mathews et al. (2016). This approach allows activity levels to be interpreted in a manner proportionate to the local bat assemblage. Table 3-3 presents the results of this site-level activity assessment.

Leisler's bat generally exhibited *Low* median activity levels across detector locations and seasons, with occasional *Moderate* median activity recorded at specific detectors. *Moderate* median activity was recorded during spring at D03 (0.75 bpph) and during autumn at D02 (0.81 bpph) and D07 (0.71 bpph). The highest median activity for Leisler's bat was recorded at D02 during autumn (0.81 bpph). Maximum nightly activity values varied between detector locations and seasons. The highest maximum activity for Leisler's bat was recorded at D07 during summer (10.05 bpph). Overall, the contrast between *Low* median activity and occasional elevated maximum values indicates intermittent peaks in activity, rather than sustained or consistently elevated use of the site by this species.

Common pipistrelle exhibited *Low* median activity levels across detector locations during spring and summer. During the autumn survey period, *Moderate* median activity was recorded at detector locations D05 (4.22 bpph) and D06 (4.66 bpph) while the remaining autumn median values were *Low*. Maximum nightly activity values for common pipistrelle ranged from *Low* to *High* across seasons and detectors, with the highest maximum activity recorded at D03 in summer (40.61 bpph). This disparity between generally *Low* median activity and occasional *High* maximum values indicates that common pipistrelle activity at the site was typically *Low* on most nights, but with intermittent short-duration peaks at certain locations and survey nights.

Soprano pipistrelle generally exhibited *Low* median activity levels across detector locations, with *Moderate* median activity recorded at a limited number of detectors. *Moderate* median activity was recorded at D02 in spring (2.95 bpph) and summer (2.53 bpph). During autumn, *Moderate* median activity was recorded at D01 (5.17 bpph), D02 (5.53 bpph), D05 (4.14 bpph) and D06 (6.20 bpph) with the latter representing the highest median activity value for soprano pipistrelle. Maximum nightly activity values ranged from *Moderate* to *High* across detector locations and seasons, with the highest maximum activity recorded at D01 in autumn (21.14 bpph). As with common pipistrelle, the contrast between generally *Low* to *Moderate* median activity and higher maximum values indicates that activity by soprano pipistrelle was influenced by intermittent higher-activity nights, rather than consistently elevated activity across all survey nights.

Nathusius' pipistrelle was not recorded at all detector locations or survey seasons. Where recorded, median activity levels ranged from *Moderate* to *High*, with the highest median activity recorded at D05 during the spring survey period (0.35 bpph). Median activity at other detector locations and seasons was variable and reflected infrequent detections. Maximum nightly activity values for Nathusius' pipistrelle were generally *Low*, with a single instance of *Moderate* maximum activity recorded. No *High* maximum activity values were recorded for this species. Overall, the limited spatial and seasonal occurrence of Nathusius' pipistrelle, combined with generally *Low* absolute activity levels, indicates occasional and irregular use of the site, rather than regular or sustained activity.

Myotis spp. generally exhibited *Low* median activity levels across detector locations during spring and summer, with *Moderate* median activity recorded only during the autumn survey period. In autumn, *Moderate* median activity was recorded at D01, D02, D03 and D05, with the highest median activity recorded at D05 (2.65 bpph). Median activity at all other detectors and seasons remained *Low*. Maximum nightly activity values for *Myotis* spp. were predominantly *Low*, with occasional *Moderate* and *High* values recorded. The highest maximum activity was recorded at D05 during autumn (4.95 bpph). Overall, the contrast between *Low* median activity and occasional higher maximum values indicates that *Myotis* spp. activity at the site was generally limited, with increased use occurring seasonally during the autumn period rather than consistently across survey nights.

Brown long-eared bat generally exhibited *Low* median activity levels across detector locations during spring and summer. During the autumn survey period, median activity increased, with *Low* median activity recorded at two detectors and *Moderate* median activity recorded at five detectors in autumn. A single instance of *High* median activity was recorded at D02 (2.04 bpph) in autumn, with a corresponding maximum activity of 6.42 bpph at the same location. Maximum nightly activity values for brown long-eared bat were *Low* during spring

and summer, increasing to *Moderate* and *High* values during autumn, consistent with the seasonal increase observed in median activity. Overall, these results indicate generally *Low* activity across most of the year, with a broader but still seasonally restricted increase in activity during autumn.

A single lesser horseshoe bat pass was recorded at D07 during the autumn survey period. This represented the only instance of activity for this species across the entire 2023 survey period. As a result, median activity levels were *Low*, reflecting an isolated record rather than regular or repeated site use.

Table 3-3 Median Nightly Bat Activity (bpph) per Species, per Season, per Detector Location 2023 None, Low, Moderate, High

Season 2023	Detector	Myotis spp.		Leisler's bat		Nathusius' pipistrelle		Common pipistrelle		Soprano pipistrelle		Brown long-eared bat		Lesser horseshoe bat	
		Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity	Median Bat Activity	Max Bat Activity
Spring	D01	0.00	0.66	0.55	4.01	-	-	0.34	1.55	0.56	2.62	0.22	0.70	-	-
	D02	0.23	0.44	0.33	3.02	0.11	0.11	1.56	22.31	2.95	12.47	0.22	1.66	-	-
	D03	0.46	1.00	0.75	3.80	0.11	0.11	0.22	3.55	0.46	2.44	0.00	0.34	-	-
	D04	0.00	0.33	0.44	4.55	0.11	0.11	0.00	0.68	0.00	0.44	0.00	0.00	-	-
	D05	0.00	0.12	0.11	1.41	0.35	0.35	0.87	9.66	1.31	15.85	0.00	0.22	-	-
	D06	0.11	1.00	0.24	4.67	0.11	0.11	1.34	4.78	0.47	12.27	0.00	0.46	-	-
	D07	0.00	0.33	0.23	1.83	-	-	0.58	2.39	0.11	0.76	0.00	0.23	-	-
	D08	0.00	0.23	0.12	0.78	-	-	0.87	8.25	0.33	7.51	0.00	0.23	-	-
Summer	D01	0.14	0.98	0.14	0.98	0.28	0.28	1.12	20.92	0.56	19.21	0.00	0.84	-	-
	D02	0.14	1.12	0.28	8.83	0.28	0.28	0.70	15.74	2.53	15.30	0.00	1.39	-	-
	D03	0.14	1.26	0.00	1.97	0.14	0.14	0.81	40.61	0.55	5.48	0.00	0.28	-	-
	D04	0.00	0.98	0.14	0.84	0.14	0.14	0.00	12.79	0.00	0.42	0.00	0.28	-	-
	D05	0.00	0.28	0.00	0.84	-	-	0.00	13.73	0.00	10.87	0.00	0.56	-	-
	D06	0.00	2.25	0.00	1.12	0.14	0.14	0.00	13.21	0.00	4.92	0.00	0.42	-	-
	D07	0.00	0.56	0.00	10.05	-	-	0.00	1.53	0.00	1.53	0.00	0.84	-	-
	D08	0.14	1.96	0.14	0.84	0.28	0.28	0.14	9.41	0.14	11.62	0.00	1.68	-	-
Autumn	D01	1.34	3.20	0.38	0.74	-	-	1.26	4.77	5.17	21.14	0.93	1.89	-	-
	D02	1.76	3.72	0.81	3.29	-	-	1.35	3.25	5.53	8.70	2.04	6.42	-	-
	D03	1.60	2.76	0.28	3.13	-	-	0.79	8.31	1.69	5.61	0.51	1.43	-	-
	D04	0.19	0.94	0.24	1.01	-	-	0.14	0.67	0.23	1.53	0.97	2.53	-	-
	D05	2.65	4.96	0.62	2.13	0.09	0.09	4.22	28.33	4.14	18.57	0.85	1.92	-	-
	D06	1.05	2.09	0.52	1.51	-	-	4.66	10.48	6.20	21.06	1.28	2.05	-	-
	D07	0.76	2.03	0.71	1.93	-	-	1.09	3.48	1.09	2.59	0.37	1.06	0	0.1
	D08	0.76	3.33	0.53	1.76	-	-	1.14	4.04	1.51	4.58	0.74	1.56	-	-

4. CONCLUSION

Bat surveys undertaken in 2023 established a robust baseline of bat activity within the Site, undertaken in accordance with NatureScot (2021) guidance for medium-risk wind farm sites. The 2023 baseline surveys confirmed the presence of small soprano pipistrelle roosts at two farm structures and identified conifer plantation edges and forestry corridors as the principal features used by bats for commuting and foraging within the Site.

Bat activity recorded during the 2023 survey period exhibited clear seasonal patterns, with higher activity levels recorded during the autumn survey season. Activity across the Site was dominated by common and soprano pipistrelle, with lower levels of activity recorded for Leisler's bat, *Myotis* spp. and brown long-eared bat. Nathusius' pipistrelle was recorded infrequently, and lesser horseshoe bat was recorded on a single occasion only.

Overall bat activity recorded during the 2023 baseline surveys was generally *Low*, with a small number of instances of *Moderate* median activity recorded, primarily during the autumn survey period. No *High* median activity levels were recorded for any species, with the exception of a single *High* median activity value for brown long-eared bat at detector D02 during autumn. Lesser horseshoe bat activity was limited to a single isolated record at detector D07.

Overall, the 2023 baseline surveys indicate that bat activity at Cahermurphy is characterised by widespread use by pipistrelle species, with generally *Low* activity levels and limited spatial and seasonal variation across the Site. The 2023 baseline data provide an initial characterisation of bat activity and, when considered alongside the 2025 survey results presented in the EIAR, contribute to a consistent understanding of bat activity patterns at the Site. Together, these datasets have been used to inform the impact assessment and the development of appropriate mitigation measures.

5. REFERENCES

- Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). Bat Conservation Trust, London.
- Collins, J. (ed.) (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edn). Bat Conservation Trust, London.
(cited for consistency with later guidance)
- Lintott, P. R., & Mathews, F. (2018). A review of statistical methods used to analyse bat activity data, and recommendations for appropriate use. *Ecological Informatics*, 43, 1–10.
- Lintott, P.R., Davison, S., van Breda, J., Kubasiewicz, L., Dowse, D., Daisley, J., Haddy, E., & Mathews, F. (2018). Ecobat: An online resource to facilitate transparent, evidence-based interpretation of bat activity data. *Ecology and Evolution*, 8(2), pp.935–941. <https://doi.org/10.1002/ece3.3692>
- Mathews, F., Richardson, S., Lintott, P., and Hosken, D. (2016). Understanding the Risk to European Protected Species (Bats) at Onshore Wind Turbine Sites to Inform Risk Management. Final report using University of Exeter research for RenewableUK and the Department of Energy and Climate Change.
- NatureScot (2021). *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*. NatureScot, Edinburgh.
- NIEA (2021). *Bat Survey Guidelines for Wind Energy Developments*. Northern Ireland Environment Agency.
- Roche, N., Aughney, T., & Langton, S. (2012). *Surveying Bats Using Car-based Transects*. Bat Conservation Ireland.
- Russ, J. (2012). *British Bat Calls: A Guide to Species Identification*. Exeter: Pelagic Publishing.

