



APPENDIX 6-2

BAT SURVEY REPORT

Appendix 6-2 – Bat Survey Report

Maughanaclea Renewable
Energy Development



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APPENDICES

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1. INTRODUCTION

MKO was commissioned to complete a comprehensive assessment of the potential effects on bats as part of an application for planning permission for a proposed renewable energy development at Maughanaclea and adjacent townlands, near Kealkill, Co. Cork. This report provides details of the bat surveys undertaken, including survey design, methods and results, and presents an assessment of the potential effects of the Proposed Project on bats. Where necessary, mitigation measures are prescribed to avoid or minimise any identified significant effects.

Bat surveys were undertaken throughout 2024 and were carried out in accordance with the methodologies described in NatureScot (2021). Bat surveys employed a combination of methods, including desktop study, habitat and landscape assessments, roost inspections, manual activity surveys and static detector surveys at ground level. Surveys in 2024 were based on an indicative turbine layout comprising 14 turbines.

The assessment and mitigation measures presented in this report have been designed in accordance with NatureScot (2021). Consideration was also given to the Northern Ireland Environment Agency (NIEA) Natural Environment Division (NED) Guidance, which was produced in August 2021 (amended March 2024).

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

- The ‘Proposed Project’ refers to the entirety of the project (the ‘Proposed Wind Farm’ and the ‘Proposed Grid Connection’, as described below) for the purposes of this EIAR in accordance with the EIA directive. The Proposed Project is described in detail in Chapter 4 of this EIAR and is the subject of the accompanying planning application under Section 37E of the Planning and Development Act 2000, as amended;
- The ‘Proposed Wind Farm’ refers to the 14 no. turbines and supporting infrastructure, including the proposed 110kV onsite substation (detailed description provided in Chapter 4 of this EIAR);
 - The ‘proposed turbines’ refers to the 14 no. turbines associated with the Proposed Wind Farm as outlined above
- The ‘Proposed Grid Connection’ refers to the 110kV underground cabling connection from the proposed 110kV onsite substation to the existing Dunmanway 110kV Substation, and all ancillary works and apparatus. The Proposed Grid Connection will facilitate the connection of the Proposed Wind Farm to the national electricity grid;
- The ‘Site’ refers to the primary study area for the EIAR, as delineated by the EIAR site boundary in green as shown in Figure 1-1 of the EIAR, and encompasses an area of approximately 1,175 hectares; and,
- The ‘Proposed Wind Farm site’ refers to the portion of the Site surrounding the Proposed Wind Farm but excluding the portion of the Site surrounding the Proposed Grid Connection underground cabling route.

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>

Bat Species	Conservation Status	Principal Pressures and Threats
Brown long-eared bat <i>Plecotus auritus</i>	Favourable	PX04 No pressures or threats
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	Inadequate	<p>PA04 Removal of small landscape features for agricultural land parcel consolidation (hedges, stone walls, rushes, open ditches, springs, solitary trees, etc.) - <i>Medium</i></p> <p>PA15 Use of other pest control methods in agriculture (excluding tillage) - <i>Medium</i></p> <p>PB09 Clear-cutting, removal of all trees - <i>Medium</i></p> <p>PE01 Roads, paths, railroads and related infrastructure - <i>Medium</i></p> <p>PF01 Conversion from other land uses to built-up areas - <i>Medium</i></p> <p>PF02 Construction or modification (e.g. of housing and settlements) in existing built-up areas - <i>Medium</i></p> <p>PF13 Drainage, land reclamation and conversion of wetlands, marshes, bogs, etc. for built-up areas - <i>Low</i></p> <p>PH04 Vandalism or arson (incl. human introduced wild fire) - <i>Low</i></p> <p>PJ01 Temperature changes and extremes due to climate change - <i>Low</i></p> <p>PM07 Natural processes without direct or indirect influence from human activities or climate change - <i>Low</i></p>

1.4

Statement of Authority

MKO employs a dedicated bat unit within its Ecology Team, with expertise in scoping, conducting, and reporting on bat surveys, as well as preparing ecological impact assessments. MKO ecologists have relevant academic qualifications and licences and are qualified in undertaking surveys to the levels required.

Survey scoping was prepared by Aoife Joyce and David Culleton. The daytime walkover survey and inspections were carried out by David Culleton and Nora Szijarto. Manual activity surveys were carried out by David Culleton, Ryan Connors, and Nora Szijarto. Data manual ID was carried out by David Culleton and Charlie Meehan. This report was prepared by David Culleton, reviewed by Clare Mifsud and approved by Aoife Joyce. Staff's roles, relevant ecological experience and training is presented in Table 1-2 below.

Table 1-2 Project team roles, qualifications and bat training.

Staff	Role	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	Ph.D. Conservation Biology of Bats, University of Malta. M.Sc. Bat Biology and Conservation, University of Malta. B.Sc. (Hons) Biology and Chemistry, 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).
David Culleton (B.Sc., M.Sc.)	Bat Ecologist	B.Sc. Zoology, University College Cork, Ireland. M.Sc. Conservation Behaviour, Atlantic Technological University, Galway, Ireland. Bat Detector and Survey Training (BCI), 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), Advanced bat survey skills (BCI).
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).
Nora Szjarto (B.Sc., M.Sc.)	Bat Ecologist	<p>B.Sc. Biology, University of Lausanne, Switzerland. M.Sc. Behaviour, Evolution and Conservation, University of Lausanne, Switzerland.</p> <p>Bat Detector and Survey Training (BCI), 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).</p>
Charlie Meehan (B.A., M.Sc.)	Seasonal Bat Ecologist	<p>B.A. History and Classical Studies, National University of Ireland, Galway M.Sc., Sustainable Environments, National University of Ireland, Galway</p> <p>Kaleidoscope Pro Analysis (Wildlife Acoustics), Endoscope Training (Internal), Structure and Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal)</p>

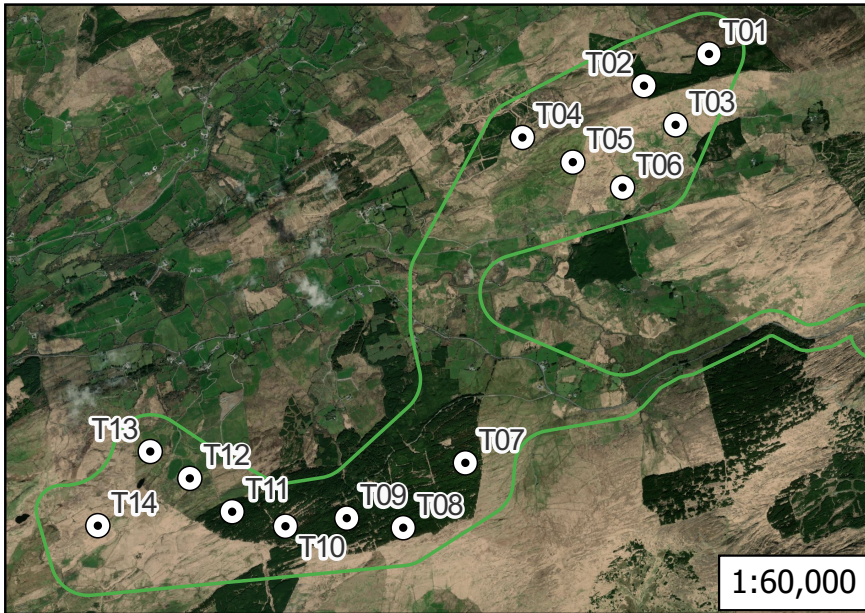
2. PROJECT DESCRIPTION

The Proposed Wind Farm site is located within a rural, agricultural setting in west Co. Cork, approximately 9.6 kilometres (km) northeast of the town Bantry, and 12.8 km west of the town of Dunmanway. The village of Keakill, Co. Cork is located approximately 2.8 km west of the nearest proposed turbine (T14), and the village of Ballinageary is located approximately 8.5km north of the nearest turbine (T01). The nearest Natura 2000 site to the Proposed Wind Farm site, i.e., Special Area of Conservation (SAC) or Special Protection Area (SPA), is the Derryclogher (Knockboy) Bog SAC which is located approximately 7km northwest of the nearest proposed turbine (T13). Elevations within the Proposed Wind Farm site range from ~428mOD (metres above Ordnance Datum) to ~132mOD. The full description of the Proposed Wind Farm is provided in Section 4.4.1 of Chapter 4 of this EIAR.

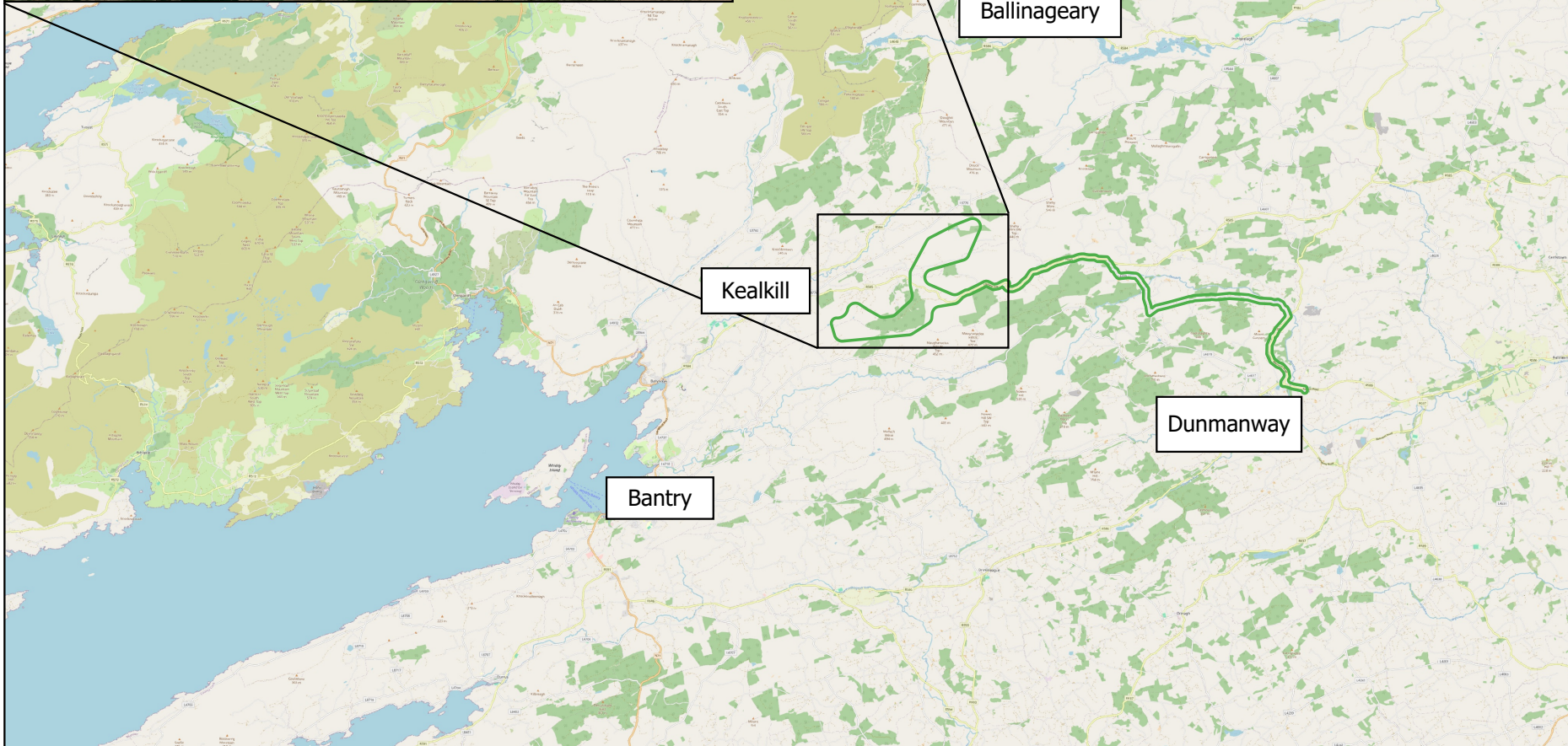
The Proposed Grid Connection consists of c.20.5 km of 110kV underground electrical cabling from the proposed 110kV onsite substation, in the townland of Maughanaclea, Co. Cork to the existing Dunmanway 110kV Substation in the townland of Ballyhalwick, Co. Cork to facilitate the connection of the Proposed Wind Farm to the national electricity grid. The Proposed Grid Connection is primarily located along the public road corridor, with a short section located across private land/tracks. The Proposed Grid Connection follows the R585, L4909, L4609, L4615, R587, and the R586 to the existing Dunmanway 110kV substation. The townlands that the Proposed Grid Connection will pass through are detailed in Table 1-1 of Chapter 1. The nearest Natura 2000 site to the Proposed Grid Connection is the Bandon River SAC. A section of the Proposed Grid Connection overlaps with the Bandon River SAC. A full description of the Proposed Grid Connection is detailed in Section 4.4.2 of Chapter 4 of this EIAR.

Current land-use on the Proposed Wind Farm site is predominantly commercial forestry, with agricultural pastures and rough grazing also present. Current land-use along the Proposed Grid Connection comprises of the public road corridor, public open space, pastures, and private land principally used by agriculture. Land-use on the wider landscape comprises a mix of pastoral agriculture, low-density residential, and small-scale commercial properties.

The location of the Proposed Project is shown on Figure 2-1.



1:60,000



Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations



Drawing Title	
Site Location	
Project Title	
Maughanaclea Renewable Energy Development	
Drawn By	Checked By
KL	CM
Project No.	Drawing No.
240225	Figure 2-1
Scale	Date
1:240,000	13.02.2026

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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 application site and the Proposed Project, was prepared by MKO and circulated to consultees in January 2025. 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 (DAU) 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.

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 Project 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 Site and the surrounding region. The results of the desk study including sources of information utilised are provided below.

3.2.1 Bat Records

The National Bat Database of Ireland holds records of bat observations received and maintained by Bat Conservation Ireland (BCI). These records include results of national monitoring schemes, roost records as well as ad-hoc observations. The most recent search examined bat presence and roost records within a 10 km radius of a central point within the Proposed Wind Farm site (Central Point Irish Grid Reference: W 10187 56177). The 10 km radius is consistent with best-practice guidance for wind farm bat assessments (BCI, 2012; Hundt, 2012; NatureScot, 2021). Available bat records were provided by Bat Conservation Ireland on 22nd July 2025.

Records from the National Biodiversity Data Centre were reviewed for bat species within the relevant 10 km grid squares within which the Site (EIAR study area) is located. In addition, available National Parks and Wildlife Service (NPWS) records of confirmed bat roosts, including lesser horseshoe bat (*Rhinolophus hipposideros*), were reviewed in relation to both the Proposed Wind Farm Site and the Proposed Grid Connection to inform the assessment of potential effects on lesser horseshoe bat roosting habitat (last search 24th February 2026).

3.2.2 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 third 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 Site. The aim was to identify any high-risk species at the edge of their range (NatureScot, 2021). Additionally, potential foraging grounds and foraging ranges for lesser horseshoe bat roosts designated under Article 17 were reviewed (NPWS, 2025).

3.2.3 Designated Sites

The National Parks and Wildlife Service (NPWS) map viewer and website provide information on sites designated for nature conservation and their site-specific Conservation Objectives, including information on qualifying interests such as lesser horseshoe bat (*Rhinolophus hipposideros*) and associated functionally linked foraging and commuting habitat. A search was undertaken of sites designated for the conservation of bats within a 10 km radius of a central point of the Proposed Wind Farm site. This included European designated sites (SACs) and nationally designated sites (NHAs and pNHAs).

3.2.4 Landscape Features

3.2.4.1 Ordnance Survey Mapping

Ordnance survey maps (OSI 1:5,000 and 1:50,000) and aerial photographs were reviewed to identify any habitats and features likely to be used by bats. Maps and images of the Site 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.

3.2.4.2 Geological Survey Ireland

The Geological Survey Ireland (GSI) online mapping tool and University of Bristol Speleological Society (UBSS) Cave Database for the Republic of Ireland were consulted for any indication of natural subterranean bat sites, such as caves, within 10 km of the Proposed Wind Farm site. Furthermore, the archaeological database of national monuments was reviewed for any evidence of manmade underground structures such as souterrains, that may be used by bats. These datasets were last searched on 24th February 2026.

3.2.4.3 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). However, squares highlighted as less favourable may still have local areas of abundance.

The location of the Site was reviewed in relation to bat habitat suitability indices. The aim of this was to assess habitat suitability for all bat species within the Site. 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 Site.

3.2.4.4 Additional Projects in the Wider Landscape

A search was conducted to identify permitted, operational and proposed wind energy developments within 10 km of the proposed turbine locations. (NatureScot, 2021). This search adhered to methodologies outlined in Chapter 2, Section 2.9. The Wind Energy Ireland (WEI) interactive wind map (windenergyireland.com) was reviewed in conjunction with wind farm planning applications from Cork and Kerry County Council. Other infrastructure developments and proposals (e.g. large 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.

3.2.5 Multidisciplinary Surveys

Multidisciplinary walkover surveys were undertaken throughout 2024 and 2025. 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. Dates for multidisciplinary walkover surveys and dedicated bat surveys are listed in Table 3-1 below.

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

Multidisciplinary Survey	Dedicated Bat Survey
17 th July 2024	16 th May 2024
18 th July 2024	30 th May 2024
28 th August 2024	16 th June 2024
12 th September 2024	15 th July 2024
25 th February 2025	2 nd September 2024
26 th February 2025	29 th September 2024
27 th February 2025	
12 th May 2025	
13 th May 2025	
14 th May 2025	
1 st July 2025	

3.3 Field Surveys

3.3.1 Bat Habitat Suitability Appraisal

Bat walkover surveys were carried out throughout 2024 and 2025. 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. 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 200 m plus the maximum rotor radius (i.e. 66.5 m) of each proposed turbine location (NatureScot, 2021). No structures, building or trees and therefore no Potential Roosting Features (PRFs) were identified within the 266.5 m roost search buffer therefore a broader 500 m roost search area was completed around each proposed turbine location to identify any features that could support roosting bats. 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 May 2024. 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).

The Proposed Grid Connection underground electrical cabling route and associated watercourse crossing infrastructure, internal 33kV cabling watercourse crossing within the Proposed Wind Farm site, and turbine delivery route accommodation areas were also assessed for any suitability to host roosting bats. Surveys were carried out in May and July 2025 and comprised an inspection of existing infrastructure to look for evidence of bat use and assess the roosting suitability according to Collins (2023).

3.3.3 Manual Activity Surveys

Manual activity surveys comprised night-time bat walkover (NBW) surveys undertaken after dusk. A series of representative transect routes were selected across the Proposed Wind Farm site to record species presence, relative abundance, behaviour (commuting and foraging), and to gather supplementary information on habitat features of importance to bats within the Site. NBW routes were designed with reference to the indicative turbine layout, findings from the desktop study and day-time walkover surveys and considering health and safety concerns and access constraints. As such, transects generally followed existing roads and tracks. NBW routes undertaken in 2024 are shown in Figure 3-1.

NBW surveys were completed in spring, summer, and autumn 2024. Each transect route was walked by two surveyors, with bat activity recorded in real time. Surveys commenced at sunset and continued for up to three hours after sunset. Surveyors were equipped with active full-spectrum detectors (Batlogger M; Elekon AG, Lucerne, Switzerland), and all recordings were subsequently analysed to verify species identifications. Survey effort for NBW surveys undertaken in 2024 is summarised in Table 3-2.

Table 3-2 Summary of Night-Time Bat Walkover (NBW) survey effort completed in 2024

Date	Surveyors	Sunset	Start Time	End Time	Weather Conditions	Transect Length (km)
30/05/2024	David Culleton & Nora Szjarto	21:45	21:38	00:32	16° C, Dry, Calm	7.8
15/08/2024	David Culleton & Nora Szjarto	21:48	21:44	00:19	13° C, Dry, Calm	5.6
26/09/2024	David Culleton & Ryan Connors	20:22	20:30	23:03	13° C, Dry, Calm	5.5



Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- Spring Transect
30.05.2024
- Summer Transect
16.07.2024
- Autumn Transect
02.09.2024



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Drawing Title	
Manual Survey Effort 2024	
Project Title	
Maughanaclea Renewable Energy Development	
Drawn By	Checked By
KL	CM
Project No.	Drawing No.
240225	Figure 3-1
Scale	Date
1:30,000	28.11.2025
<div style="display: inline-block; vertical-align: middle; font-size: x-small; margin-left: 10px;"> <p>MKO Planning and Environmental Consultants Tuam Road, Galway Ireland, H91 VW84 +353 (0) 91 735611 email: info@mkofireland.ie Website: ww.mkofireland.ie</p> </div>	

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 14 turbines were proposed at the time of the surveys, 12 detectors were deployed in 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 indicative turbine locations at the time of surveying. The static detector locations, relative to the final proposed layout, are shown in Figure 3-2 and detailed in Table 3-3.

Table 3-3 Ground-level static detector locations 2024 and habitat context

ID	Location (Irish Grid Reference)	Habitat	Linear Feature within 50m	Nearest Turbine
D01	W 12657 59105	Blanket bog (PB2), Wet heath (HH3), Conifer plantation (WD4)	Edge of Conifer Plantation (WD4)	T01
D02	W 11788 58981	Blanket bog (PB2), Wet heath (HH3), Conifer plantation (WD4)	Edge of Conifer Plantation (WD4)	T02
D03	W 12149 58731	Dry humid acid grassland (GS3), Wet grassland (GS4), Immature woodland (WS2)	Edge of Conifer Plantation (WD4)	T03
D04	W 10962 58264	Wet heath (HH3), Dry humid acid grassland (GS3), Wet grassland (GS4)	-	T04
D05	W 11827 58031	Dry humid acid grassland (GS3), Wet grassland (GS4)	-	T06
D06	W 07146 55380	Dry heath (HH2), Dense bracken (HD1)	-	T13
D07	W 07661 55724	Dry heath (HH2), Dense bracken (HD1)	-	T12
D08	W 07330 55004	Improved agricultural grassland (GA1), Wet grassland (GS4)	-	T14
D09	W 08213 55650	Improved agricultural grassland (GA1)	-	T11
D10	W 08645 55328	Conifer plantation (WD4)	Edge of Conifer Plantation (WD4)	T10
D11	W 10170 55251	Conifer plantation (WD4), Wet heath (HH3)	Edge of Conifer Plantation (WD4)	T8
D12	W 10474 55773	Conifer plantation (WD4), Wet heath (HH3)	Edge of Conifer Plantation (WD4)	T7

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.

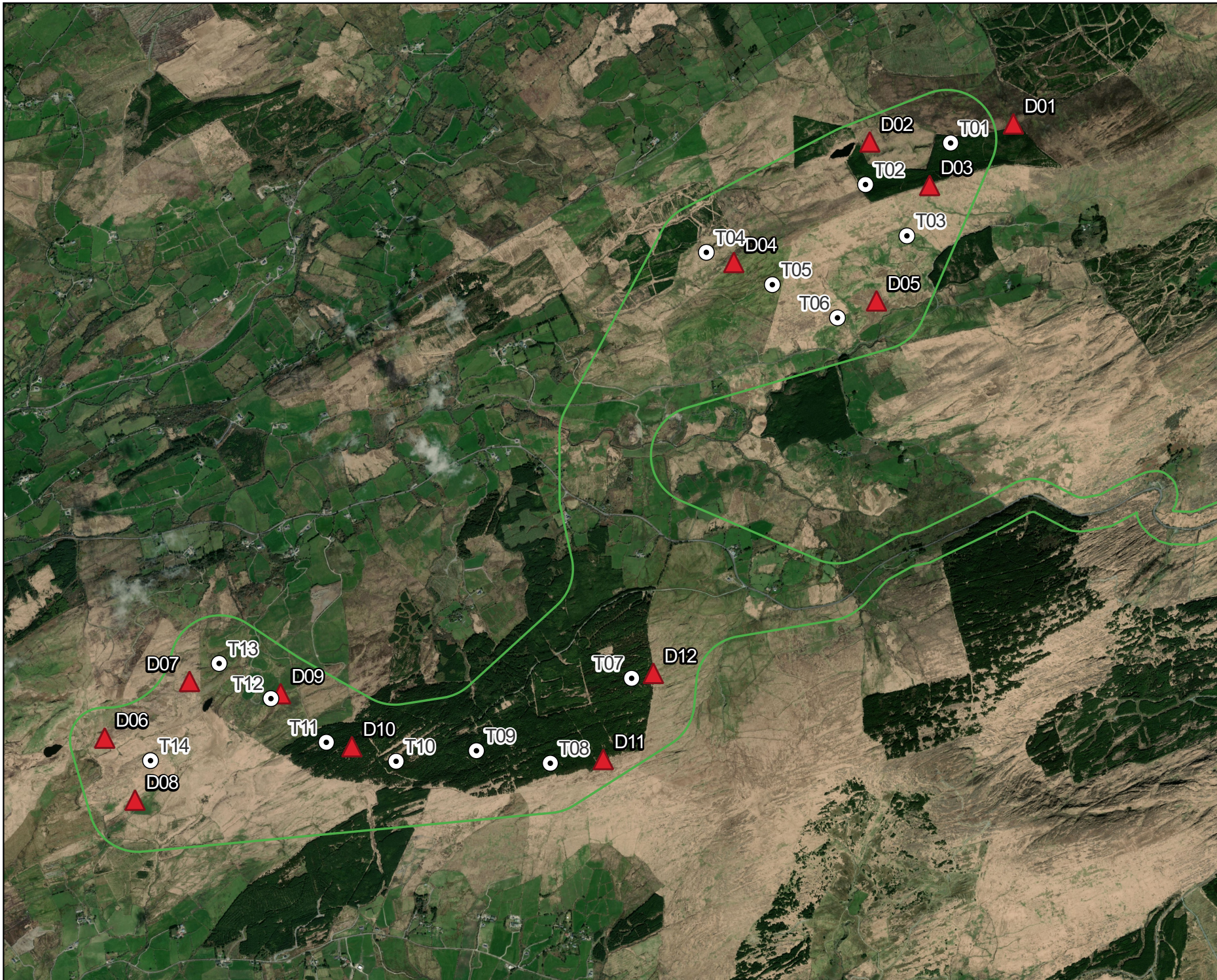
Onsite weather monitoring was undertaken concurrently with static detector deployments. One Vantage Pro 2 (Davis Instruments, CA, UCS) was deployed each season and night-time hourly data was tracked remotely to ensure a sufficient number of nights (i.e. minimum 10-20 nights) with appropriate weather 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 3-4 summarises survey effort achieved in 2024 for each of the detector locations.

An updated design layout was issued following the completion of the 2024 surveys. Given the relatively short distances between the indicative and updated turbine locations, the spatial distribution of static




detectors, and the consistent habitat context across the Proposed Wind Farm site, the 2024 survey data are considered representative of bat activity within the revised layout area.

Table 3-4 Ground-level static survey effort (2024) and weather suitability

Season	Survey Period	Total Survey Nights	Nights with Appropriate Weather
Spring 2024	17 th - 27 th May	10	10
Summer 2024	18 th July - 13 th August	25	22
Autumn 2024	2 nd - 25 th September	24	23
Total Survey Effort		59	55



Map Legend

-  EIAR Site Boundary
-  Proposed Turbine Locations
-  Static Detector Locations



Drawing Title
**Static Detector Locations
 2024**

Project Title
**Maughanaclea Renewable Energy
 Development**

Drawn By KL	Checked By CM
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Project No. 240225	Drawing No. Figure 3-2
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Scale 1:30,000	Date 28.11.2025
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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.

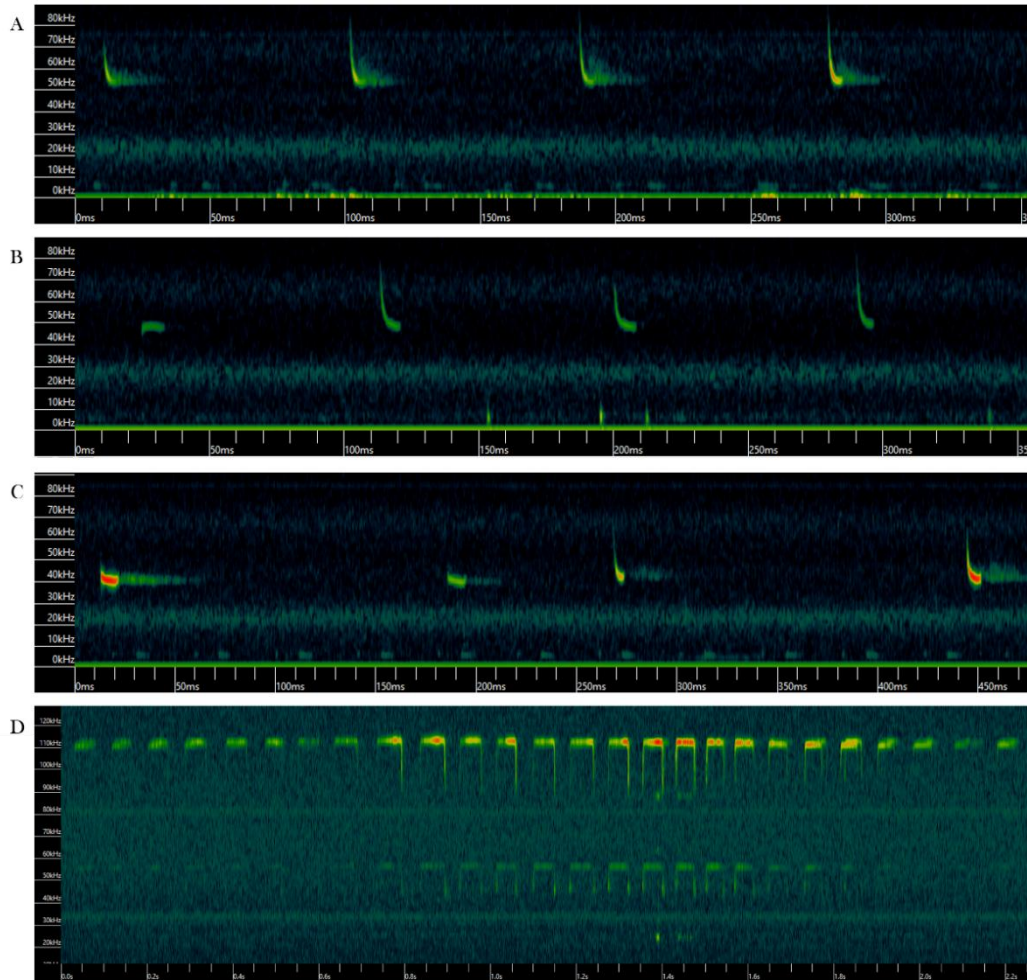


Plate 3-1 Spectrogram of echolocation pulses of (A) Soprano pipistrelle (Peak Frequency 55kHz), (B) Common pipistrelle (Peak Frequency 45kHz), (C) Nathusius' pipistrelle (Peak Frequency 39kHz) and (D) Lesser horseshoe bat (Peak Frequency 114kHz).

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.

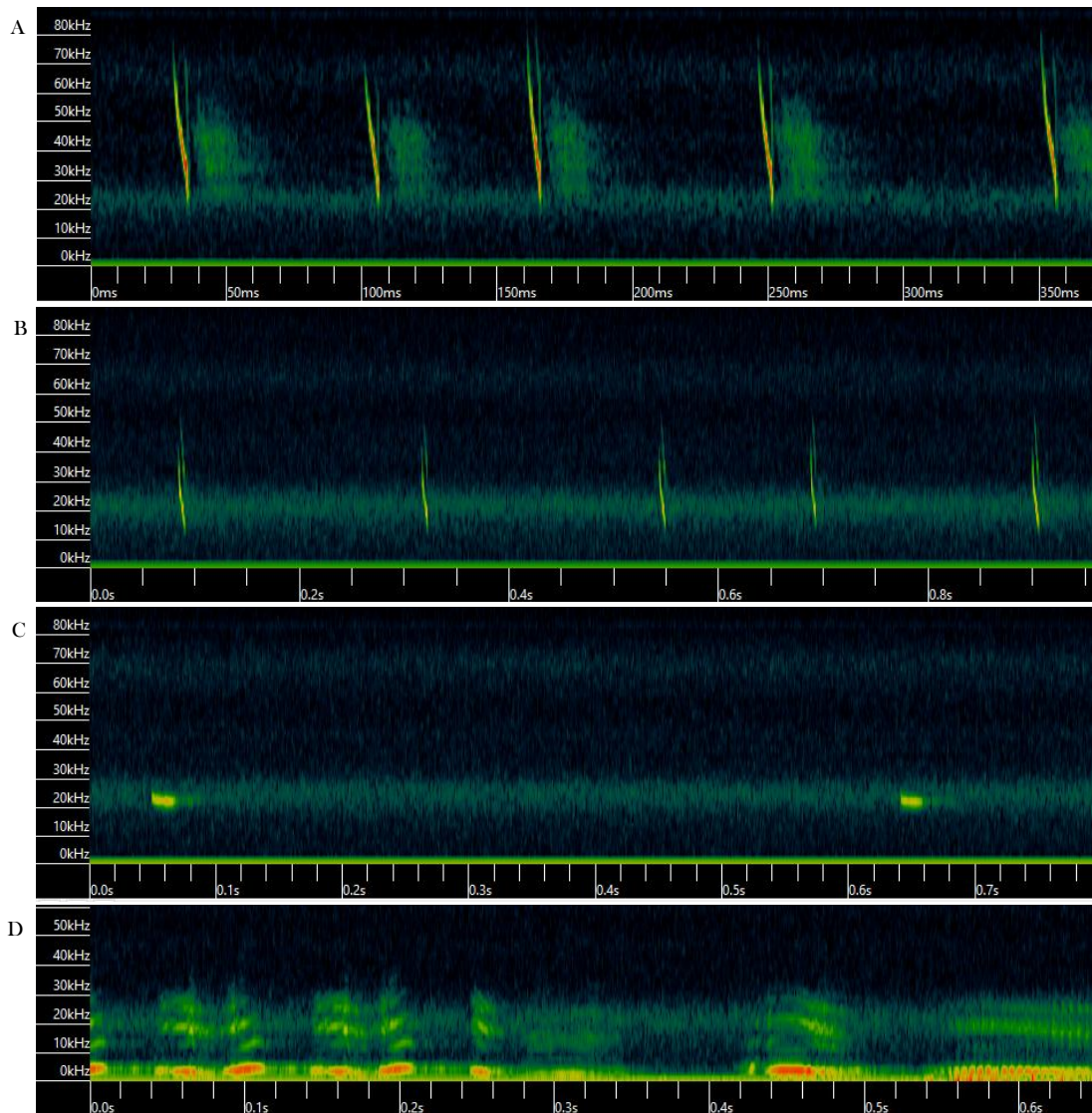


Plate 3-2 Spectrogram of typical echolocation pulses of (A) *Myotis* spp., (B) Brown long-eared bat, (C) Leisler's bat and (D) typical non-bat sounds.

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 3-5.

Table 3-5 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	Nathusius' pipistrelle	Leisler's bat	<i>Myotis</i> spp.	Brown long-eared bat	Lesser horseshoe bat
Low	<4.97	<0.18	<1.43	<1.40	<0.80	<0.13
Moderate	4.97-14.92	0.18-0.53	1.43-4.28	1.40-4.20	0.80-2.40	0.13-0.38
High	>14.92	>0.53	>4.28	>4.20	>2.40	>0.38

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 3-6. 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 3-6 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 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 3-7, 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 3-7 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 development 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 3-8) 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 3-8 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 made by combining the site risk level (i.e. *Low/Medium/High*) and the Ecobat activity category (or the equivalent site-specific activity level thresholds), as shown in the overall risk assessment matrix table (Table 3-9) i.e. Table 3b from NatureScot (2021). The assessment was carried out for both median and maximum activity categories in order to provide insight into typical bat activity (i.e. median values) and activity peaks (i.e. maximum values) (**Appendix 3**).

Table 3-9 Overall risk assessment matrix (adapted from Table 3b, NatureScot, 2021)

Site Risk Level	Ecobat activity category (equivalent site-specific activity level thresholds)					
	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)
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This exercise was carried out for each high collision risk species. Overall risk assessments were also considered in the context of any potential impacts at the population level, particularly for species identified as having high population vulnerability (Table 3-7 above).

3.7 Limitations

A comprehensive suite of bat surveys has been undertaken at the Proposed Wind Farm site in 2024 and at the Proposed Grid Connection in 2025. The surveys undertaken at the Site, in accordance with NatureScot Guidance, provide the information necessary to allow a complete, comprehensive and robust assessment of the potential impacts of the Proposed Project on bats receptors.

The information provided in this report accurately and comprehensively describes the baseline environment; provides an accurate prediction of the likely potential 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 (BCI) 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

The Development Applications Unit (DAU) 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 4th April 2025. In addition, a meeting was held with the Development Applications Unit on 8th August 2025 and no further recommendations were given regarding bats.

The DAU response noted the following:

*Bat roosts may be present in trees, buildings and bridges. Bat species are protected under the Wildlife Act, 1976 to 2018, 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). 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. To take just one bat species of the many that occur in the area records exist in the Dunmanway area for the Annex II & IV protected Lesser Horse shoe bat species (*Rhinolophus hipposideros*) (bat survey methodology should take into account surveys for summer and winter Lesser Horse Shoe bat roost sites and be included in the assessment of the proposed development). Any proposed bat friendly lighting should be proven to be effective and follow up-to-date guidance. Windfarms can have significant effects on bats with regard to 1) Collision mortality, barotrauma and other injuries (Operational Phase Impact), 2) Loss or damage to commuting and foraging habitat, 3) lighting issues and all of these potential issues should be addressed in the ELAR.*

The Development Applications Unit's comments have been taken into account in the design of surveys and the assessment of potential effects on bats, as outlined below.

The bat survey programme and assessment have been undertaken in accordance with current best practice guidance, including NatureScot (2021) *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*, which supersedes earlier guidance referenced by the DAU and reflects the current standard for bat survey, assessment and mitigation in the context of onshore wind energy developments.

Records of lesser horseshoe bat (*Rhinolophus hipposideros*) in the wider Dunmanway area were reviewed as part of the desk study and informed the risk and impact assessment. The roost referred to by the Development Applications Unit in the Dunmanway area is located approximately 2 km from the nearest element of the Proposed Project, namely the Proposed Grid Connection, and approximately 5.5

km from the nearest proposed turbine. This distance places the roost at, or marginally beyond, the outer extent of the recognised Core Sustainance Zone for this species (2 km; BCT, 2020). In addition, a further ten lesser horseshoe bat roost records occur within the wider landscape at distances of approximately 3–7 km from the nearest proposed turbines and therefore lie well beyond the spatial extent over which a functional linkage with the Proposed Wind Farm site would be anticipated.

Lesser horseshoe bats are not considered to be at appreciable risk of collision with turbine blades due to their low-altitude, clutter-adapted flight behaviour and strong association with sheltered, linear landscape features. The Proposed Wind Farm will not result in the loss of key foraging or commuting habitat associated with these roosts, and no works are proposed in the vicinity of the roost structures themselves. Works along the Proposed Grid Connection will be confined to the existing road corridor and will be temporary in nature. No caves or other suitable underground features for winter hibernation are present within or in the vicinity of the Site.

On this basis, and having regard to the separation distances involved, the absence of functional linkage between known roosts and the Site, and the nature and scale of the proposed works, no significant negative effects on lesser horseshoe bat roosts or their associated foraging and commuting habitat are anticipated as a result of the Proposed Project.

Bat-sensitive lighting measures have been incorporated into the design of the Proposed Project and are detailed in the mitigation section of this report, with the aim of minimising light spill onto habitats and features of importance for bats, in accordance with current best practice guidance.

Potential effects on bats arising from the Proposed Project, including collision risk and barotrauma during operation, loss or disturbance of commuting and foraging habitat, and lighting-related effects, have been comprehensively considered within the below risk and impact assessment for all bat species recorded or potentially present within the Site.

4.2 Desk Study

4.2.1 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 a central point within the Proposed Wind Farm site (Central Point Irish Grid Ref: W 10187 56177)

Available bat records were provided by BCI on 22nd July 2025. The search included roosts, transects and ad-hoc observations, with eleven roosts, three transects and ten ad-hoc observation records identified. Based on these previous bat records, six of Ireland’s nine resident bat species were recorded within 10 km of the Proposed Wind Farm site. 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	Irish Grid Reference	Date	Location
Roost	<i>Plecotus auritus, Pipistrellus spp.</i>	W02000 50000	-	Drombroe, Bantry, County Cork
	<i>Plecotus auritus</i>	W03000 54000	-	Dromlickarue, County Cork
	<i>Plecotus auritus</i>	W04000 46000	-	Dromore, County Cork
	<i>Plecotus auritus</i>	W06000 47000	-	Glanatnaw, County Cork

	<i>Nyctalus leisleri</i>	W08000 54000	-	Gortnacowly, Bantry, County Cork
	<i>Pipistrellus pygmaeus, Pipistrellus pipistrellus, Plecotus auritus, Nyctalus leisleri</i>	W02000 55000	-	Pearsons Bridge, Ballylicky, Bantry, County
	<i>Myotis daubentonii</i>	W02000 51000	-	Inchclough, Bantry, County
	<i>Pipistrellus spp.</i>	W11000 65000	-	Inchinossig, Ballingearry, County Cork
	<i>Pipistrellus spp.</i>	W03000 53000	-	Cappnabouh Lough, Drumanassa, Bantry, County
	<i>Plecotus auritus</i>	W08000 54000	-	Gortnacowly, Bantry, County
	<i>Plecotus auritus</i>	W06000 52000	-	Dromclogh, Bantry, County
Transect	<i>Myotis daubentonii</i>	W04846 56566	-	Carriganass Bridge R584
	<i>Myotis daubentonii</i>	W12840 47327	-	Dromdaleague Townland Transect
	<i>Myotis daubentonii</i>	W02345 54515	-	Pearson's Bridge Transect
Ad-Hoc	<i>Pipistrellus pygmaeus, Pipistrellus pipistrellus</i>	W08853 59019	04/09/2008	BATLAS 2010
	<i>Myotis daubentonii, Pipistrellus pipistrellus, Pipistrellus pygmaeus</i>	W18728 56687	21/08/2008	BATLAS 2010
	<i>Myotis daubentonii, Nyctalus leisleri, Pipistrellus pipistrellus, Pipistrellus pygmaeus</i>	W16653 55170	21/08/2008	BATLAS 2010
	<i>Myotis daubentonii, Pipistrellus pipistrellus, Pipistrellus pygmaeus</i>	W18916 56093	21/08/2008	BATLAS 2010
	<i>Pipistrellus pipistrellus, Pipistrellus pygmaeus</i>	W13544 56854	04/09/2008	BATLAS 2010
	<i>Pipistrellus pipistrellus, Pipistrellus pygmaeus</i>	W06464 56642	04/09/2008	BATLAS 2010
	<i>Myotis daubentonii, Pipistrellus pygmaeus</i>	W00576 53294	04/09/2008	BATLAS 2010
	<i>Myotis daubentonii</i>	W00577 49988	04/09/2008	BATLAS 2010
	<i>Pipistrellus pipistrellus, Myotis daubentonii, Rhinolophus hipposideros, Pipistrellus pygmaeus</i>	W02000 50000	11/08/2006	Consultancy Surveys
	<i>Myotis daubentonii, Rhinolophus hipposideros, Pipistrellus pygmaeus, Pipistrellus pipistrellus</i>	W03000 50000	11/08/2006	Consultancy Surveys

National Biodiversity Data Centre

The National Biodiversity Data Centre (NBDC) was searched for records of bat activity and roosts within the relevant 10 km grid squares within which the Site is located. To capture the wider Proposed Project, the search also included records from the relevant 10 km grid squares (hectads) encompassing the Proposed Grid Connection corridor. Eight of Ireland's nine bat species were recorded within the hectads reviewed. The results are presented in Table 4-2.

Table 4-2 NBDC bat records from the relevant 10 km grid squares (hectads) within which the Site is located

Hectad	Species	Database	Designation
W05/W15	Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>)	National Lesser Horseshoe Bat Database	Annex II, IV
W05/W15/W25	Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	National Bat Database of Ireland	Annex IV
W05/W15/W25	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	National Bat Database of Ireland	Annex IV
W05/W15/W25	Leisler's bat (<i>Nyctalus leisleri</i>)	National Bat Database of Ireland	Annex IV
W05/W15/W25	Brown long-eared bat (<i>Plecotus auritus</i>)	National Bat Database of Ireland	Annex IV
W05/W15/W25	Daubenton's bat (<i>Myotis daubentonii</i>)	National Bat Database of Ireland	Annex IV
W05/W15/W25	Whiskered bat (<i>Myotis mystacinus</i>)	National Bat Database of Ireland	Annex IV
W05/W25	Natterer's bat (<i>Myotis nattereri</i>)	National Bat Database of Ireland	Annex IV

The NPWS Lesser Horseshoe Bat Database was searched for records of confirmed lesser horseshoe bat (*Rhinolophus hipposideros*) roosts within the relevant 10 km grid squares (hectads) within which the Site is located, encompassing both the Proposed Wind Farm Site and the Proposed Grid Connection. Eleven lesser horseshoe bat roosts were identified within the hectads overlapping the Site. The spatial distribution of these roosts in relation to the Proposed Wind Farm Site and the Proposed Grid Connection is presented in Table 4-3.

The recognised Core Sustainance Zone (CSZ) for lesser horseshoe bat is 2 km (BCT, 2020), within which roosts and associated foraging and commuting habitat may be considered functionally linked. The nearest known lesser horseshoe bat roost is located approximately 2 km from the Proposed Grid Connection route and approximately 5.5 km from the nearest proposed turbine (T03). The remaining ten roost records are located between approximately 3 km and 7 km from the nearest proposed turbines. None of the recorded roosts are associated with Special Areas of Conservation designated for lesser horseshoe bat, with the nearest SAC designated for this species located more than 12 km from the Site. This further indicates that no European sites designated for lesser horseshoe bat have any functional ecological linkage with the Proposed Project.

Lesser horseshoe bats are not considered to be at appreciable risk of collision with turbine blades due to their low-altitude, clutter-adapted flight behaviour and strong association with linear landscape features and sheltered foraging habitats. In addition, works associated with the Proposed Wind Farm are located at substantial distances from all known lesser horseshoe bat roosts and their immediate surrounding habitat.

In relation to the Proposed Grid Connection, the nearest lesser horseshoe bat roost (located c. 2 km from the route) is situated within the wider Dunmanway area referred to by the Development Applications Unit. Works along the Proposed Grid Connection will be confined to the existing road corridor and will not directly affect the roost structure or the surrounding roost-associated foraging and commuting habitat.

Table 4-3 NPWS lesser horseshoe bat (*Rhinolophus hipposideros*) roost records from the relevant 10 km grid squares (hectads) overlapping the Site and their proximity to the Proposed Project

Hectad	Approx. distance to EIAR site boundary (km)	Closest turbine	Approx. distance to turbine (km)
W15	2.0	T03	5.5
W05	2.5	T14	3.0
W05	2.5	T14	3.0

Hectad	Approx. distance to EIAR site boundary (km)	Closest turbine	Approx. distance to turbine (km)
W05	4.0	T14	4.5
W05	4.5	T14	5.0
W05	5.0	T14	5.5
W05	4.0	T14	4.5
W05	4.5	T14	5.0
W05	6.0	T14	6.5
W05	6.0	T14	6.5
W06	6.5	T13	7.0

4.2.2 Bat Species' Range

The potential for negative impacts is likely to increase where high-risk species occur at the edge of their range (NatureScot, 2021). Accordingly, range maps presented in the 2025 Article 17 Reports (NPWS, 2025) were reviewed in relation to the location of the Site. The Site is located within the published range of all Irish bat species, apart from Nathusius' pipistrelle and Natterer's bat.

In addition, information on potential foraging grounds and foraging ranges associated with lesser horseshoe bat roosts designated under Article 17 was reviewed (NPWS, 2025). Available information indicates that mapped core foraging areas associated with these roosts occur at distances greater than 10 km from the Proposed Project.

4.2.3 Designated Sites

Within Ireland, the lesser horseshoe bat is the only bat species for which Special Areas of Conservation (SACs) have been designated. Although the Proposed Wind Farm site lies within the current known range of this species, no SACs designated for its protection occur within 10 km of the Proposed Wind Farm.

A search of Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) within 10 km of the Proposed Wind Farm site identified one pNHA designated for bat interest (Table 4-4). This site has been proposed as an NHA since 1995 due to the historic presence of a known nursery roost for Daubenton's bat (*Myotis daubentonii*). The current status of the roost is unknown, and the site is now subject to artificial lighting at night. The pNHA is located approximately 3 km from the nearest proposed turbine, which lies outside the recognised Core Sustenance Zone (CSZ) for Daubenton's bat. The CSZ for this species is 2 km (BCT, 2020).

Given the separation distance, there is no feasible pathway for impact on the pNHA roost via loss of foraging or commuting habitat within its CSZ. Furthermore, collision risk for *Myotis* species is generally low, and no significant collision-related effects are anticipated because of the Proposed Project.

Table 4-4 Designated sites within 10 km of the Proposed Wind Farm site

Designated Site	Distance to Nearest Turbine	Species of Interest	Roost Type
Carriganass Castle pNHA, near Kealkill	3 km	Daubenton's Bat (<i>Myotis daubentonii</i>)	Maternity Roost

4.2.4 Landscape Features

A review of mapping and site photographs provided an overview of the habitats and landscape features present within the Site. The dominant habitats comprise conifer plantation, wet heath, and grassland, with only very limited treelines and hedgerows occurring across the area. These habitat types provide relatively low structural complexity and few linear features, thereby constraining the availability of high-quality commuting and foraging corridors for bats.

A review of the GSI online mapper found no indication of potential subterranean features within 10 km of the Proposed Wind Farm site. A search of the National Monuments Database identified a range of archaeological features within the Site boundary, including seven field boundaries, two boulder burials, two standing stones, three enclosures, seven hut sites, a four-poster monument, a radial-stone enclosure, and a stone circle (Table 4-5). None of these features provide suitable crevice, void or roofed structures capable of supporting bat roosts.

A search of the UBSS Cave Database and the GSI Karst Database for the Republic of Ireland confirmed the absence of caves within the Site or within 10 km of the Proposed Wind Farm site.

A review of the National Biodiversity Data Centre (NBDC) bat landscape map assigned the Proposed Wind Farm site a habitat suitability index score of 19.22 (green), indicating **Low** habitat suitability for bat species.

Table 4-5 National monument sites within the Site boundary

National Monument	Description
CO106-011	Radial-stone enclosure
CO106-010	Four poster
CO092-037	Standing stone
CO092-061001	Enclosure
CO092-061002	Hut site
CO092-062001	Hut site
CO092-048	Standing stone
CO092-064	Field boundary
CO092-086	Enclosure
CO092-087	Field boundary
CO092-089	Field boundary
CO092-090	Field boundary
CO092-091	Hut site
CO092-092	Hut site
CO092-093	Hut site
CO092-094	Field boundary
CO092-095	Field boundary
CO092-096	Field boundary
CO092-097	Hut site
CO092-088001	Enclosure
CO092-088002	Hut site
CO106-016001	Stone circle
CO106-016002	Boulder burial
CO106-016003	Boulder burial

4.2.5 Additional Projects in the Wider Landscape

Table 4-6 provides an overview of existing, permitted, and proposed wind farms located within 5 km and 10 km of the Proposed Wind Farm site. In addition, seven other large infrastructure developments and proposals (including road upgrades, quarry activities, and residential developments) were identified within 10 km of the Proposed Wind Farm.

Table 4-6 Wind farm developments within 5 km and 10 km of the proposed turbines

Wind Farm	Status	No. of Turbines	Turbine Tip Height (m)
Within < 5 km			
Shehy More Wind Farm	Existing	11	125
Gortloughra Wind Farm	Proposed	8	175
Curraglass Wind Farm	Proposed	3	156.5
Dereenacreenig West Wind Farm	Proposed	3	119.3
Within 5 - 10 km			
Milane Hill Wind Farm	Existing	9	78.5
Grousemount Wind Farm	Existing	6	126
Carrigarierk Wind Farm	Existing	5	140
Carrigarierk Extension Wind Farm	Permitted	3	176.5

Additional EIA-Scale Projects within 10 km

In addition to wind energy developments, five other EIA planning applications were identified within 10 km of the Proposed Wind Farm site. These include:

- EIA Portal Ref: 2017038 – Proposed development of (1) A 110kV electricity substation including 2 no. control buildings associated electrical plant and equipment, underground electricity cabling, fencing, alterations to a previously permitted borrow pit and temporary construction compound at the Carrigarierk Wind Farm (2) 110kV underground electricity cabling connecting the proposed substation to the existing Dunmanway ESB substation; (3) 33kV underground electricity cabling connecting the proposed substation to the permitted Carrigarierk Wind Farm together with all ancillary works and apparatus.
- EIA Portal Ref: 2018088 – Installation of approx. 3.2 km of underground cable ducting and associated electrical cabling, approx. 1.2km of overhead line supported on wood pole sets, and all other ancillary works including joint bays, culverts, marker posts.
- EIA Portal Ref: 2019165 – Substitute consent for the as-constructed electricity grid connection elements, consisting of c. 9.7km of 20 kV overhead line (OHL).
- EIA Portal Ref: 2021216 – Remove c.9.5km of overhead line (OHL) relating to the existing windfarm grid connection works. Develop the full length of a new grid connection over c.14.8km, using a combination of OHL (c.9.8km) and underground cables (c.4km) & ancillary works.

Additional large-scale projects within 10 km of the Proposed Wind Farm site include the following planning applications:

- Pl. App. 08955 - Retention of rock quarry over area of 0.9ha and permission for extraction of rock over additional area of 1.8ha (total quarry area 2.7ha) using blasting and rock breaker; Development will include quarry plant and infrastructure - crushing and screening plant, settlement pond, weighbridge, wheel-wash, site office and all associated ancillary infrastructure
- Pl. App. 013482 - Stone quarry with associated site works including access road & new entrance

4.3 Field Surveys

4.3.1 Bat Habitat Suitability Appraisal

4.3.1.1 Proposed Wind Farm site

A total of twenty habitats were recorded within the Proposed Wind Farm site including:

- *Improved Agricultural Grassland (GA1)*
- *Conifer plantation (WD4)*
- *Blanket bog (PB2)*
- *Wet heath (HH3)*
- *Dry heath (HH2)*
- *Dense bracken (HD1)*
- *Scrub (WS1)*
- *Wet grassland (GS4)*
- *Buildings & artificial surfaces (BL3)*
- *Dystrophic lakes (FL1)*
- *Spoil and bare ground (ED2)*
- *Immature woodland (WS2)*
- *Riparian woodland (WN5)*
- *Dry meadows and grassy verges (GS2)*
- *Dry humid acid grassland (GS3)*
- *Treelines (WL2)*
- *Hedgerows (WL1)*
- *Drainage ditches (FW4)*
- *Eroding upland river (FW1)*
- *Recently Felled Conifer Woodland (WS5)*

The habitats within the Proposed Wind Farm site are predominantly composed of conifer plantation, wet heath, and improved agricultural grassland. Smaller areas of blanket bog, dry heath, dry humid acid grassland and immature woodland are also present. A detailed description and evaluation of habitats within the Site is provided in Chapter 6 of the EIAR.

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**.

Exposed areas of grassland, peatland and farmland (tilled and arable) that may be used by a small number of bats, but which are poorly connected to the wider landscape were assigned *Low* suitability for foraging and commuting bats (Plate 4-1; Plate 4-2). Hedgerows, treelines, eroding upland rivers, drainage ditches, scrub and the edges of conifer plantation were considered to be of *Moderate* suitability as they provide linear connectivity to the surrounding landscape (Plate 4-3; Plate 4-4).

Tree cover within the Proposed Wind Farm site is dominated by commercial conifer plantation (Plate 4-5; Plate 4-6). Small areas of riparian woodland are also present, comprising grey willow, goat willow, basket willow (*Salix viminalis*), and gorse. No trees with bat roosting potential were identified within the bat felling buffer or other infrastructure footprint.

In addition, one existing watercourse crossing associated with the internal 33kV cabling is present within the Proposed Wind Farm site (Irish Grid Reference: W 10604 56565). This crossing comprises a stone arch bridge and was assessed for bat roosting potential during surveys. The structure was assigned *Negligible* roosting suitability due to the absence of visible crevices or voids suitable for roosting bats.

No evidence of bat roosts was recorded. No instream works or structural modifications are proposed at this crossing.



Plate 4-1 Exposed agricultural grassland assigned Low suitability for commuting and foraging bats.



Plate 4-2 Area of wet grassland assigned Low suitability for commuting and foraging bats.



Plate 4-3 Mature conifer plantation edge assigned Moderate suitability for commuting and foraging bats.



Plate 4-4 Eroding upland river considered Moderate suitability for commuting and foraging bats.



Plate 4-5 Alder and conifer trees within the Proposed Wind Farm site offering no roosting potential for bats.



Plate 4-6 Young immature conifer trees within the Proposed Wind Farm site offering no roosting potential for bats.

4.3.1.2 Proposed Grid Connection

The Proposed Grid Connection has an approximate length of 20.5km. The Proposed Grid Connection underground electrical cabling route will originate at the proposed 110kV onsite substation, and from there will run southeast for approximately 130m through an existing conifer plantation within the Proposed Wind Farm site. The Proposed Grid Connection will then travel east for approximately 810m through an existing access road within the Proposed Wind Farm site, towards the R585. The Proposed Grid Connection then exists the Proposed Wind Farm's southern turbine cluster site entrance to the east, and travels along the R585 for approximately 7km. The Proposed Grid Connection then turns right and follows the L4909 and L4609 for approximately 3km in a generally southeast direction. The

Proposed Grid Connection then turns left and is routed along the L4615 in an easterly direction for approximately 5.7km. The underground cabling route then turns right onto the R587 and runs south towards Dunmanway for approximately 3km, before turning left and travelling east on the R586. After 825m the Proposed Grid Connection exits the R586 to the south and enters the existing Dunmanway 110kV substation in the townland of Ballyhalwick.

Habitats within the Proposed Grid Connection footprint comprise Buildings and Artificial Surfaces (BL3) only, as the underground cabling follows existing hardstanding and the existing Coillte forestry track, with no off-road works proposed. With regard to commuting and foraging bats, habitats directly affected by the Proposed Grid Connection footprint which include Buildings and Artificial Surfaces (BL3) were assessed as having *Negligible* suitability.

Other habitats occurring adjacent to the Proposed Grid Connection route include:

- *Dry meadows and grassy verges (GS2)*
- *Hedgerow (WL1)*
- *Treeline (WL2)*
- *Scrub (WS1 Eroding/Upland River (FW1)/Depositing/Lowland River (FW2)*

Further details of habitats within the wider Proposed Grid Connection corridor are outlined in Chapter 6, Section 6.3.2.2.

The habitats within the wider Proposed Grid Connection corridor such as dry meadows and grassy verges (GS2) were assessed as having *Negligible* suitability. Scrub (WS1) was assessed as offering *Low* suitability to foraging and commuting bats. Linear habitat features such as treelines (WL2), hedgerows (WL1) and Eroding/Upland River (FW1) or Depositing/Lowland River (FW2) were assessed as having *Moderate* to *High* suitability for foraging and commuting bats, however, these features are not directly impacted by the Proposed Grid Connection works.

With regard to roosting bats, the majority of habitats beside the road corridor were assessed as having no roosting suitability (*None*). A small number of trees containing potential roost features (*PRF-A*) were identified along adjoining treelines; however, these features lie outside the footprint of the Proposed Grid Connection. As all cabling activities will remain within the existing roadway, no trees with potential roosting suitability will be affected, and these treelines will be fully avoided.

The Proposed Grid Connection will traverse 11 no. watercourses. The crossing points were assessed for bat roosting potential on the 12th, 13th and 14th May 2025, and 1st July 2025. A range of roosting suitability levels was recorded across the inspected structures: three crossings had no (*None*) roosting potential, five had *Negligible* potential, two had *Low* potential, and only one water crossing was assessed as having *Moderate* roosting potential. No evidence of bat roosts was identified at any of the structures. The detailed findings are presented in **Appendix 4**.

The construction methodology for the watercourse crossings has been designed to eliminate the requirement for in-stream works, as outlined in Chapter 4 of this EIAR. There are no instream works or bridge/culvert alterations proposed therefore the watercourse crossings will not be directly impacted.

4.3.1.3 Turbine Delivery Accommodation Works

Turbine Delivery Route (TDR) accommodation works may involve pruning and trimming of vegetation only, to facilitate the delivery of turbine components and other abnormal loads to the Proposed Wind Farm during the construction phase. No removal of hedgerows, treelines or broadleaved woodland is required for these works.

The hedgerows and treelines along the TDR provide *Low to Moderate* suitability for commuting and foraging bats; however, no potential roost features (PRFs) were identified within these habitats. Given that no works are proposed and in the absence of roosting opportunities, no loss of commuting, foraging or roosting habitat is anticipated along the TDR.

4.3.2 Roost Surveys

Daytime Roost Inspections

A search for roosts was undertaken within 200 m plus the maximum rotor radius (i.e. 66.5 m) of each proposed turbine location (NatureScot, 2021). No structures, buildings or trees were identified within the 266.5 m roost search buffer and no bat roosts were identified.

In addition, a broader 500 m roost search was completed around each proposed turbine location to identify any features that could support roosting bats. No structures, trees with PRFs, or evidence of roosting bats were identified within this extended roost search area.

Ground-level Tree Assessment

Trees within the Proposed Wind Farm site primarily consisted of Sitka spruce within conifer plantations. The majority of trees within the Proposed Wind Farm site will be retained as part of the Proposed Project; however, there will be some requirement to remove trees within conifer plantations to facilitate the required bat buffers and infrastructure footprint. The Proposed Project will also require the removal of a small section of hedgerow (23m) and scrub (0.6 ha) for an access road.

Conifer plantations, hedgerows and scrub do not provide potential roosting habitat of significance for bats and as such were assessed as having no (*None*) roosting potential (Collins, 2023).

4.3.3 Manual Activity Surveys

Night-time bat walkover (NBW) surveys were undertaken in spring, summer and autumn 2024. Bat activity was recorded in all seasons and a total of 485 bat passes were recorded. In general, common pipistrelle (n=352) was recorded most frequently. Soprano pipistrelle (n=65) and Leisler's bat (n=55) were recorded less frequently. *Myotis* spp. (n=10) and brown long-eared bat (n=3) were observed rarely (Plate 4-7).

Species composition and activity levels varied across the survey periods. Plate 4-8 presents the results for individual species per survey period. Figures 4-1 to 4-3 present the spatial distribution of bat activity across surveys. Bat activity was concentrated along forest edges and linear (road/track) habitats. Common pipistrelle was most frequently recorded in spring and autumn, whereas Soprano pipistrelle was most frequent in summer. Brown long-eared bat was recorded only during the spring transect. Leisler's bat was detected during summer and autumn. *Myotis* spp. species activity was low throughout 2024 surveys.

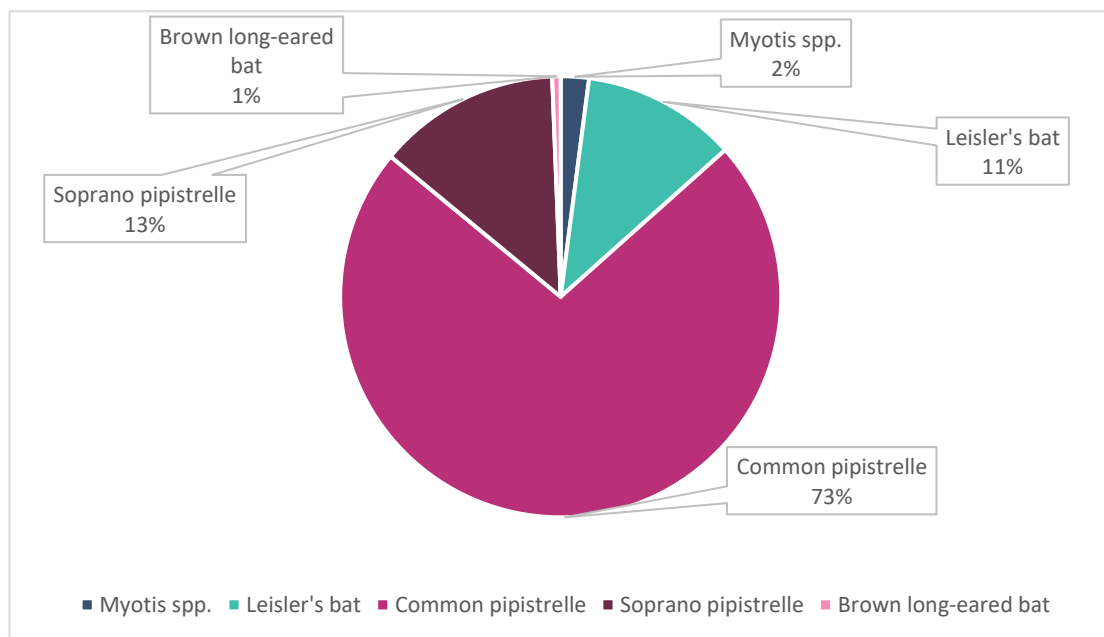


Plate 4-7 Manual activity survey results 2024 - Total species composition

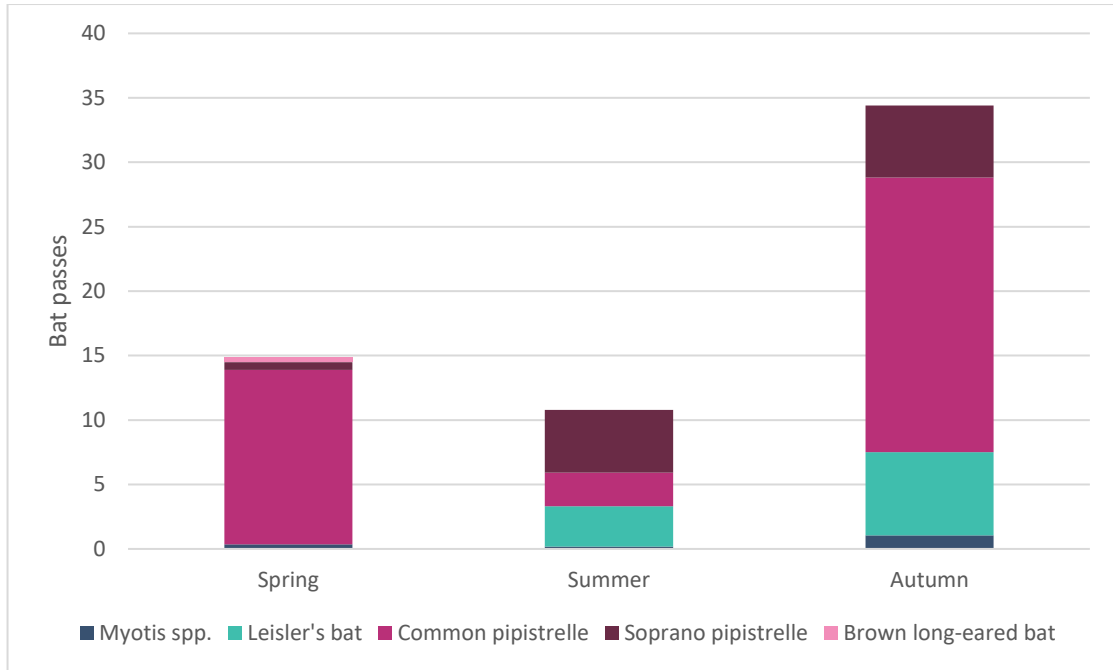
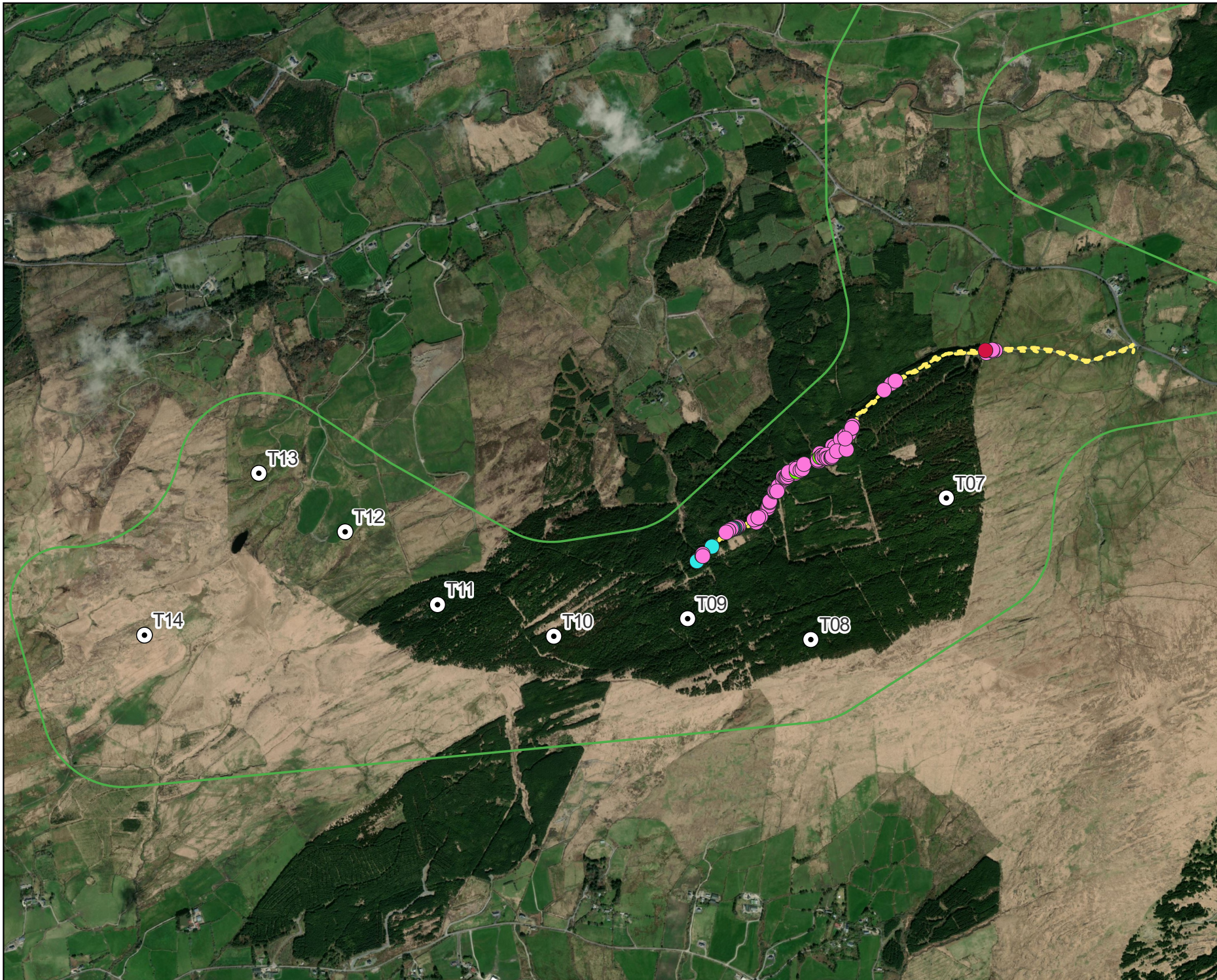


Plate 4-8 Manual activity survey results 2024 – Total bat passes per survey period



Map Legend

- EIAR Site Boundary
- Proposed Turbine Locations
- Spring Transect 30.05.2024
- Species**
- Myotis spp.
- Brown long-eared bat
- Common pipistrelle
- Soprano pipistrelle

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Drawing Title
Spring Manual Transect Results 2024

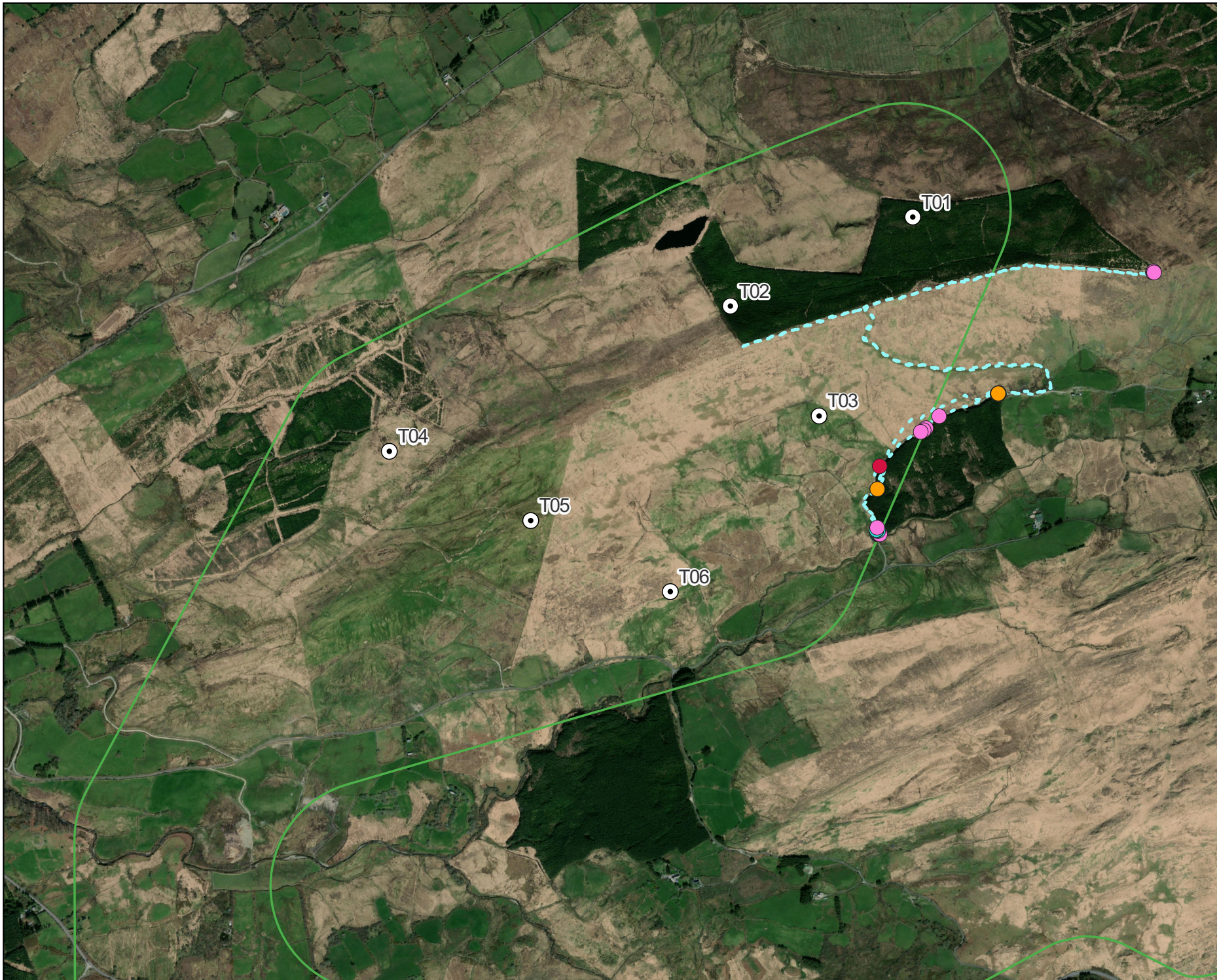
Project Title
Maughanaclea Renewable Energy Development

Drawn By KL	Checked By CM
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Project No. 240225	Drawing No. Figure 4-1
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Scale 1:18,000	Date 28.11.2025
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Map Legend

- EIAR Site Boundary
 - Proposed Turbine Locations
 - Summer Transect 16.07.2024
- Species
- Myotis spp.
 - Leisler's bat
 - Common pipistrelle
 - Soprano pipistrelle



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Drawing Title
Summer Manual Transect Results 2024

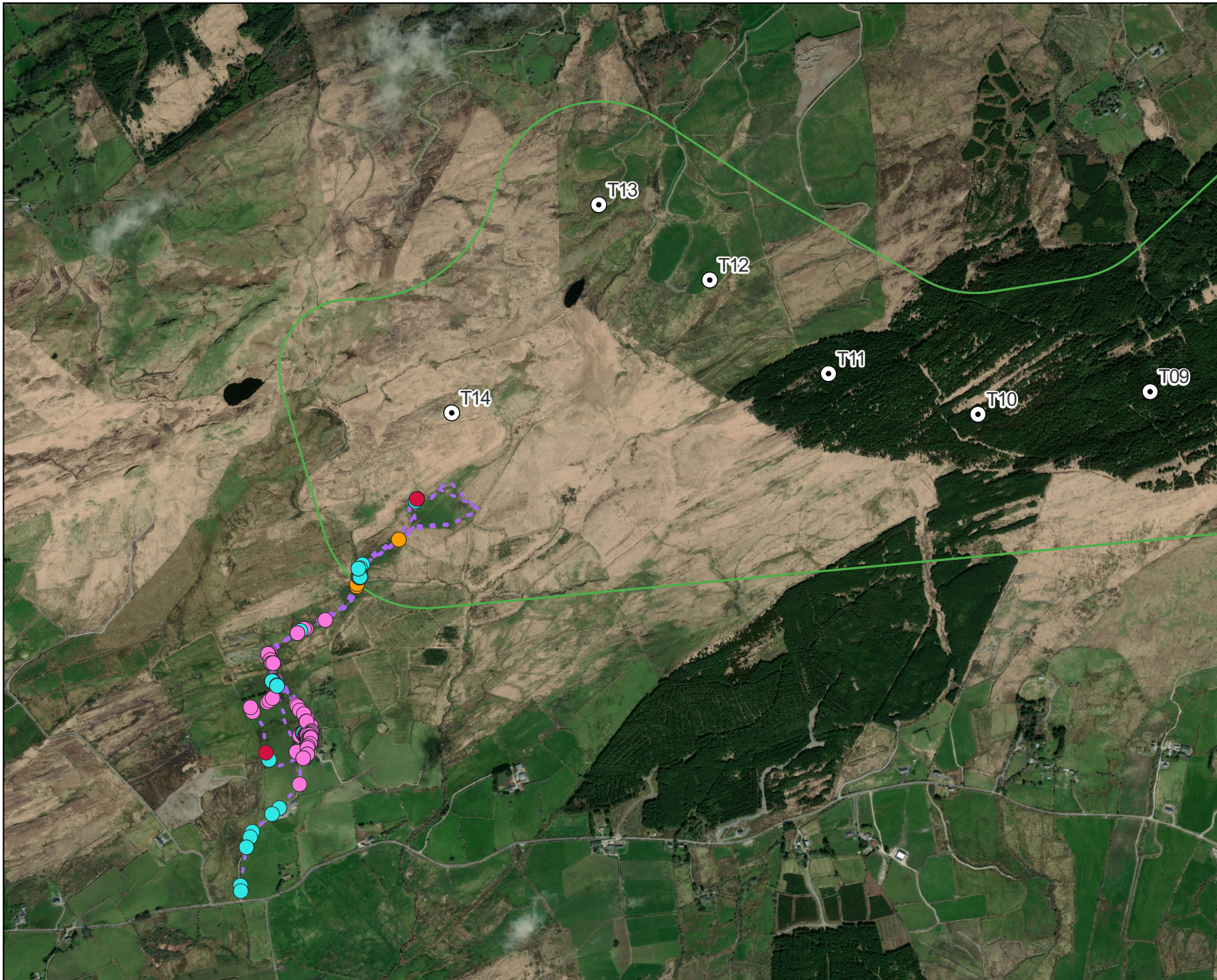
Project Title
Maughanaclea Renewable Energy Development

Drawn By KL	Checked By CM
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Project No. 240225	Drawing No. Figure 4-2
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Scale 1:14,000	Date 28.11.2025
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Map Legend

- EIAR Site Boundary
 - Proposed Turbine Locations
 - Autumn Transect 02.09.2024
- Species
- Myotis spp.
 - Leisler's bat
 - Common pipistrelle
 - Soprano pipistrelle

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Drawing Title
Autumn Manual Transect Results 2024

Project Title
Maughanaclea Renewable Energy Development

Drawn By KL	Checked By CM
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Project No. 240225	Drawing No. Figure 4-3
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Scale 1:14,000	Date 28.11.2025
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4.3.4 Ground-level Static Surveys

In total, 73,383 bat passes were recorded across all deployments. In general, common pipistrelle (n=44,517) occurred most frequently, followed by Leisler’s bat (n=11,024), Soprano pipistrelle (n=8,424) and *Myotis* spp. (n=6,527). Instances of brown long-eared bat (n=2,664) and Nathusius’ pipistrelle (n=94) were recorded less frequently during the survey period. Lesser horseshoe bat was also recorded with 93 passes detected. Plate 4-9 presents relative species composition across all ground-level static detector surveys.

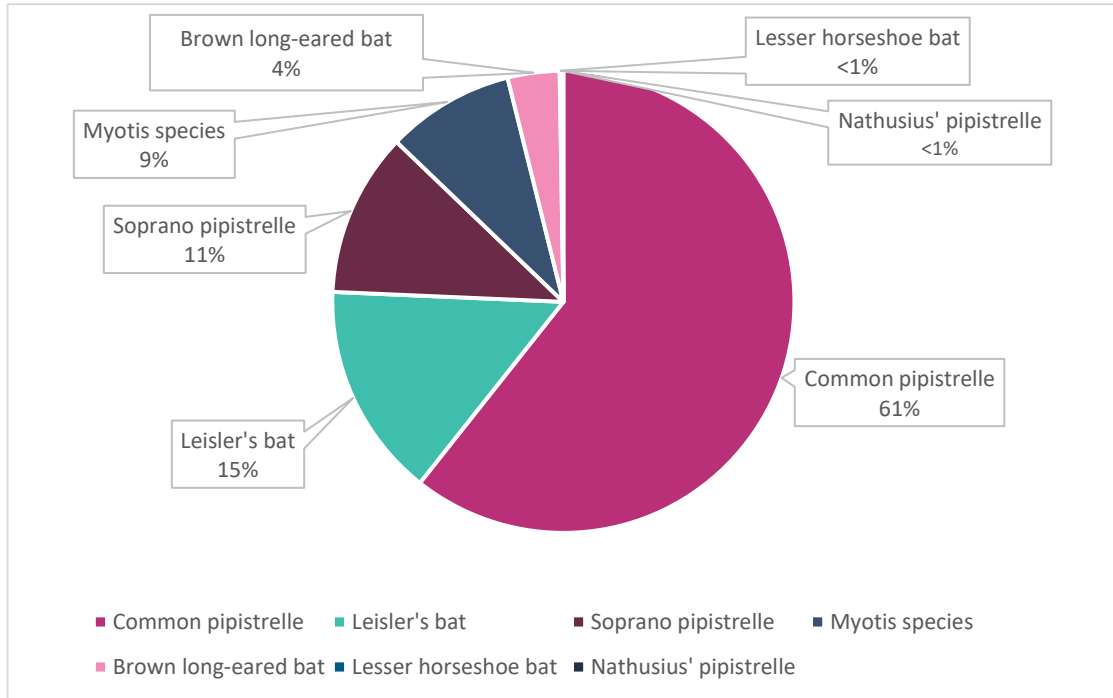


Plate 4-9 Static detector surveys 2024: Species composition across all deployments (total bat passes)

Bat activity was calculated as total bat passes per hour (bp/h) to account for any bias in survey effort, resulting from varying night lengths between seasons. Plate 4-10 and Table 4-7 presents these results for each species per season. Spring, summer and autumn activity was dominated by common pipistrelle with contributions from soprano pipistrelle and Leisler’s bat. *Myotis* spp. activity was higher in summer and autumn, with lower activity in spring. Brown long-eared bat activity was highest during the autumn period. Instances of lesser horseshoe bat and Nathusius’ pipistrelle were relatively rare throughout the survey periods.

Table 4-7 Static detector surveys 2024: Relative bat activity across all deployments (total bat passes per hour (bp/h), all nights and total survey hours per season)

	Spring	Summer	Autumn
Total Survey Hours	111.8	256	270.8
Common pipistrelle	165.0	39.2	59.2
Leisler's bat	21.8	15.7	16.8
Soprano pipistrelle	15.6	9.3	15.9
<i>Myotis</i> spp.	5.1	12.4	10.4
Brown long-eared bat	0.9	1.8	7.7
Lesser horseshoe bat	0.3	0.1	0.1
Nathusius’ pipistrelle	0.1	-	0.3

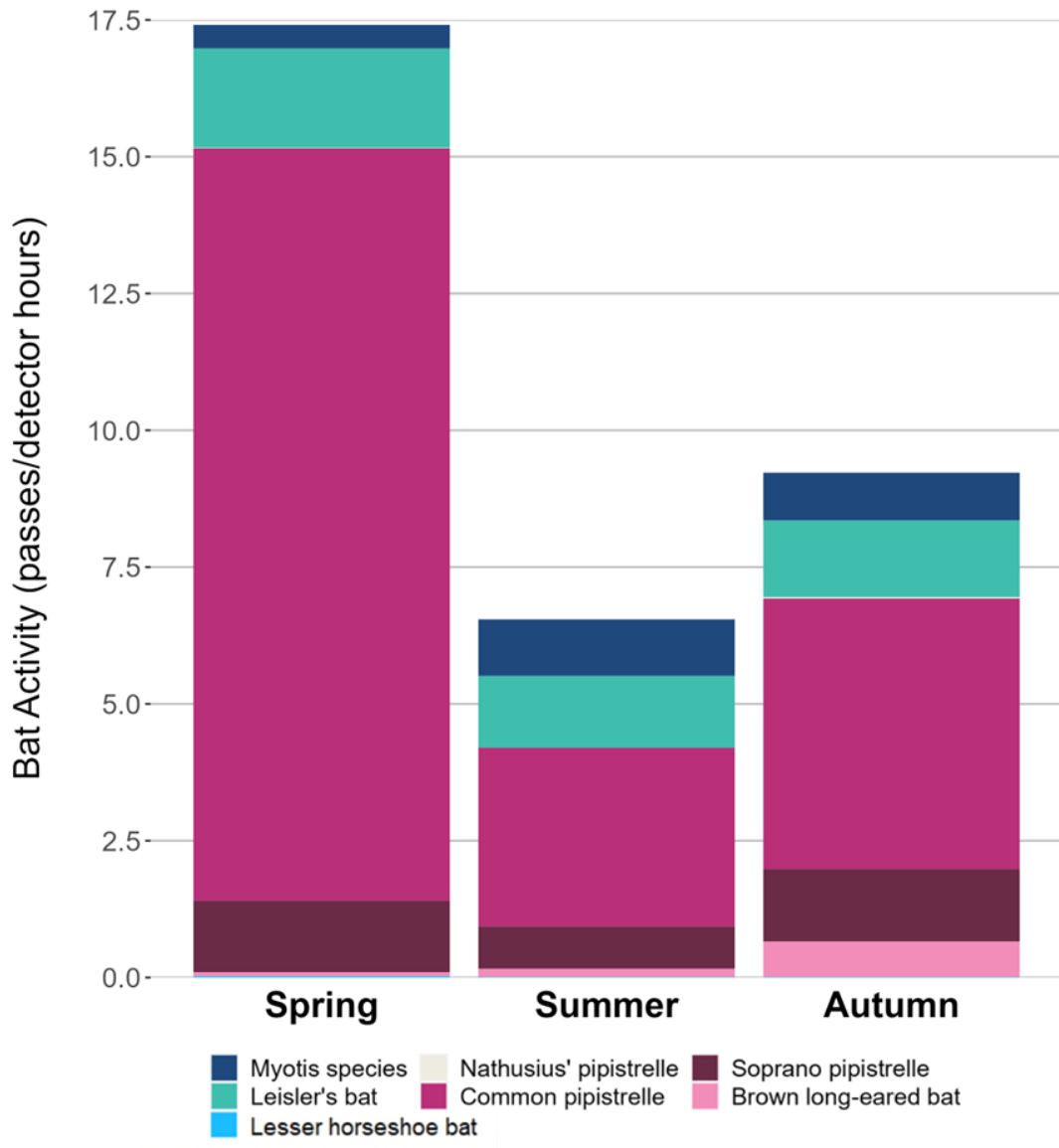


Plate 4-10 Static detector surveys 2024: Seasonal bat activity across all deployments (total bat passes per hour (bpph), all nights). Lesser horseshoe bat and Nathusius' pipistrelle are not visible on the graph due to the low number of bat passes being recorded in all seasons, with the latter species not recorded in summer. .

The median bat activity recorded at each detector during each survey period is presented in Plates 4-11 and 4-12 (the latter incorporates a varied y-axis scale to illustrate differences between detectors more clearly). The results demonstrate clear seasonal and spatial variation in median activity levels across the survey area.

Median bpph at D02 was consistently high across all three seasons. Spring recorded the highest overall activity, particularly at D03 (33 bpph) and D02 (32.7 bpph). Detector D09 also recorded elevated spring activity (14.5 bpph), while all other detectors recorded low median values during this period.

Summer and autumn activity levels were lower than those recorded in spring. In summer, D08 (10.3 bpph) and D02 (9.75 bpph) had the highest activity, with all remaining detectors recording low levels. In autumn, D09 (12.3 bpph) recorded the highest median bpph, followed by D02 (11 bpph), with reduced activity recorded at all other detectors relative to these two locations.

The median nightly pass rate (i.e. median total bat passes per hour per night) was used as a robust measure of typical bat activity at the Proposed Wind Farm site, as shown in Plate 4-13. This metric reduces the influence of occasional high-activity nights on overall results and is recommended to account for nightly variability caused by weather, seasonal changes and other environmental factors (Lintott & Mathews, 2018). Zero values, representing nights when a given species was not detected, were retained in the dataset to avoid overestimating activity levels.

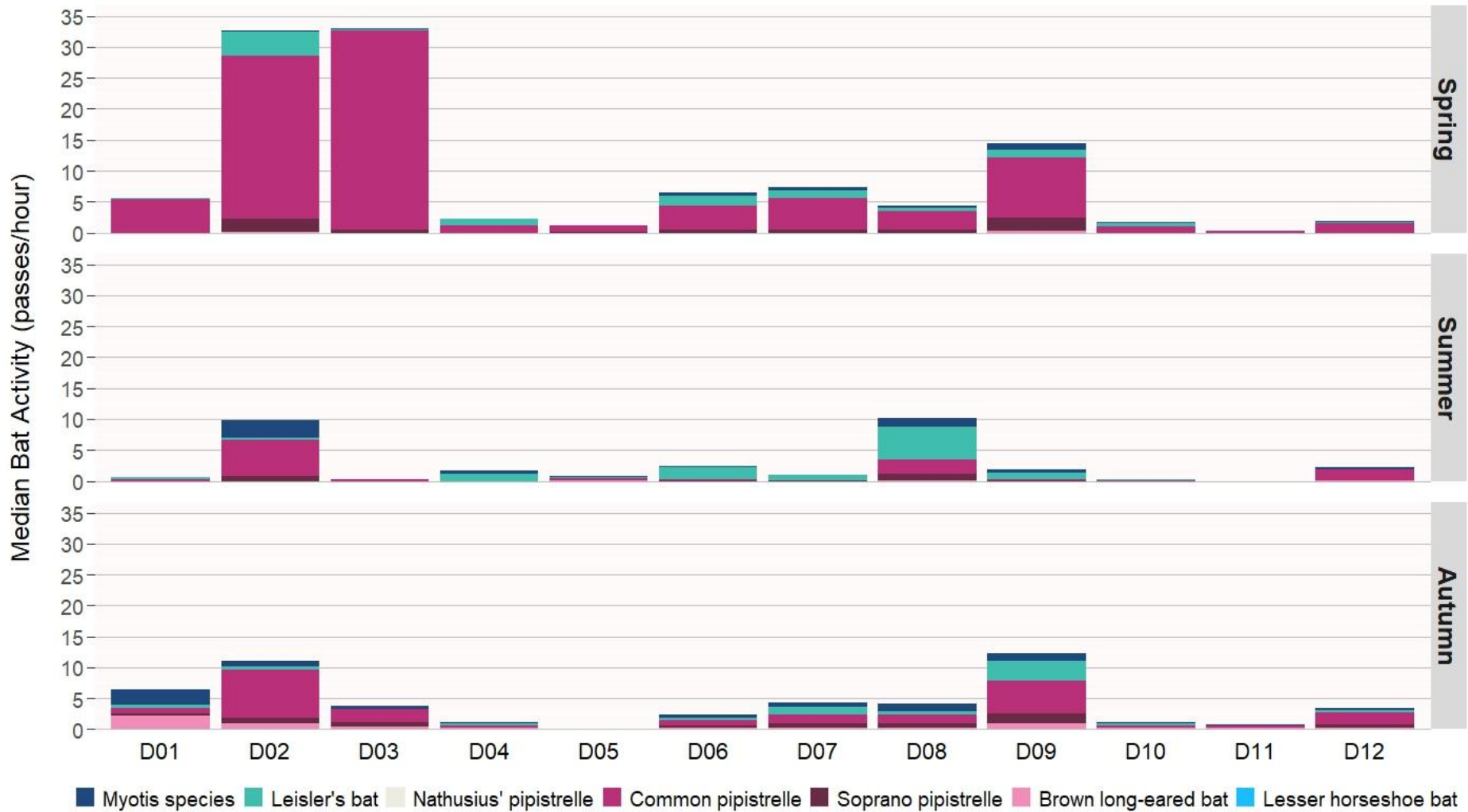


Plate 4-11 Static detector surveys 2024: Median bat pass rate (bpph), including absences, per detector location and survey period.. Lesser horseshoe bat is not visible on the graph due to a relatively small number of passes being recorded throughout the survey periods. Nathusius' pipistrelle is not visible on the graph due to a relatively small number of passes being recorded during the spring and autumn survey periods.

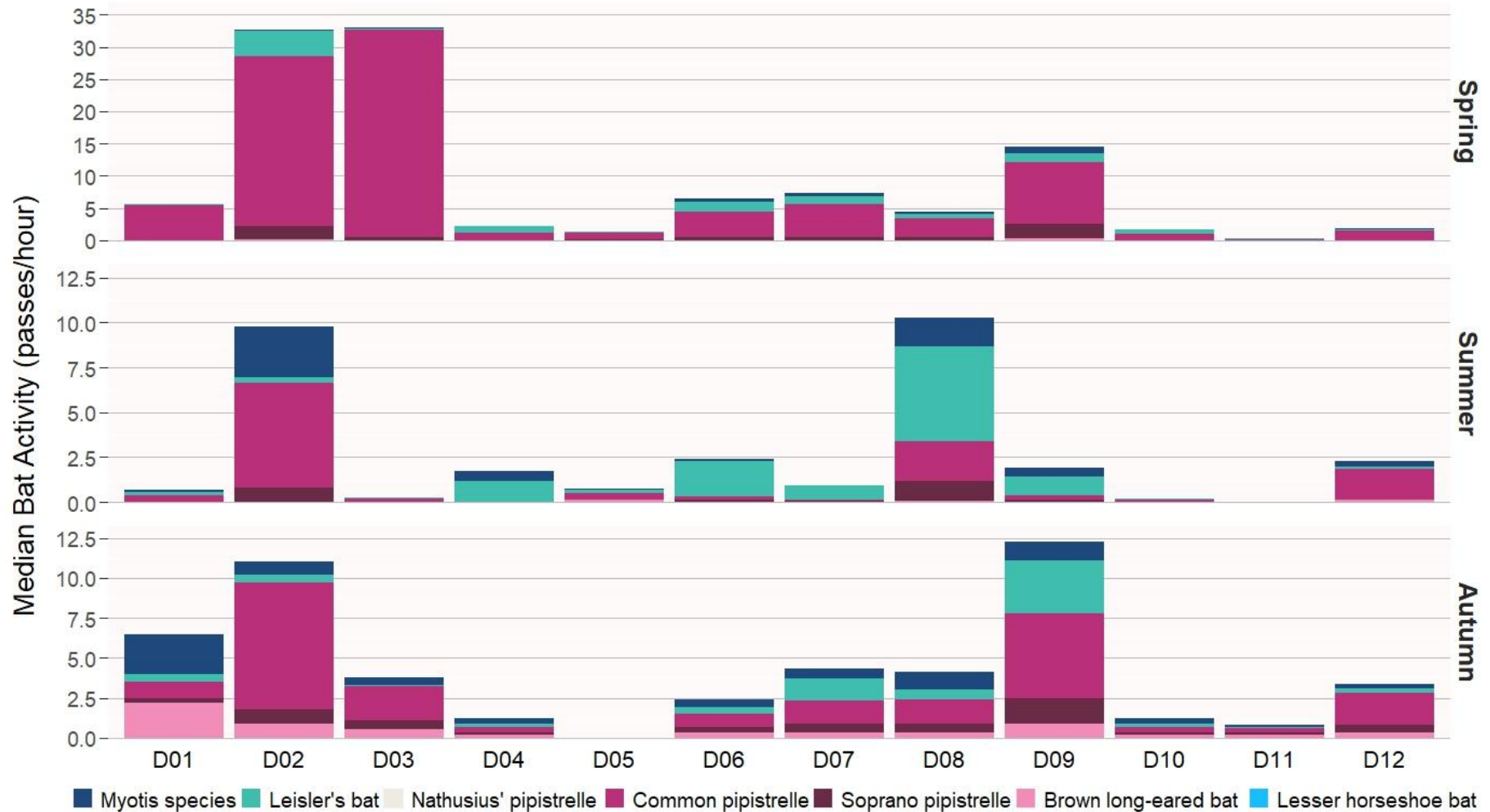


Plate 4-12 Static detector surveys 2024: Median bat pass rate (bpph) with a varied axis scale, including absences, per detector location and survey period. Lesser horseshoe bat is not visible on the graph due to a relatively small number of passes being recorded throughout the survey periods. Nathusius' pipistrelle is not visible on the graph due to a relatively small number of passes being recorded during the spring and autumn survey periods.

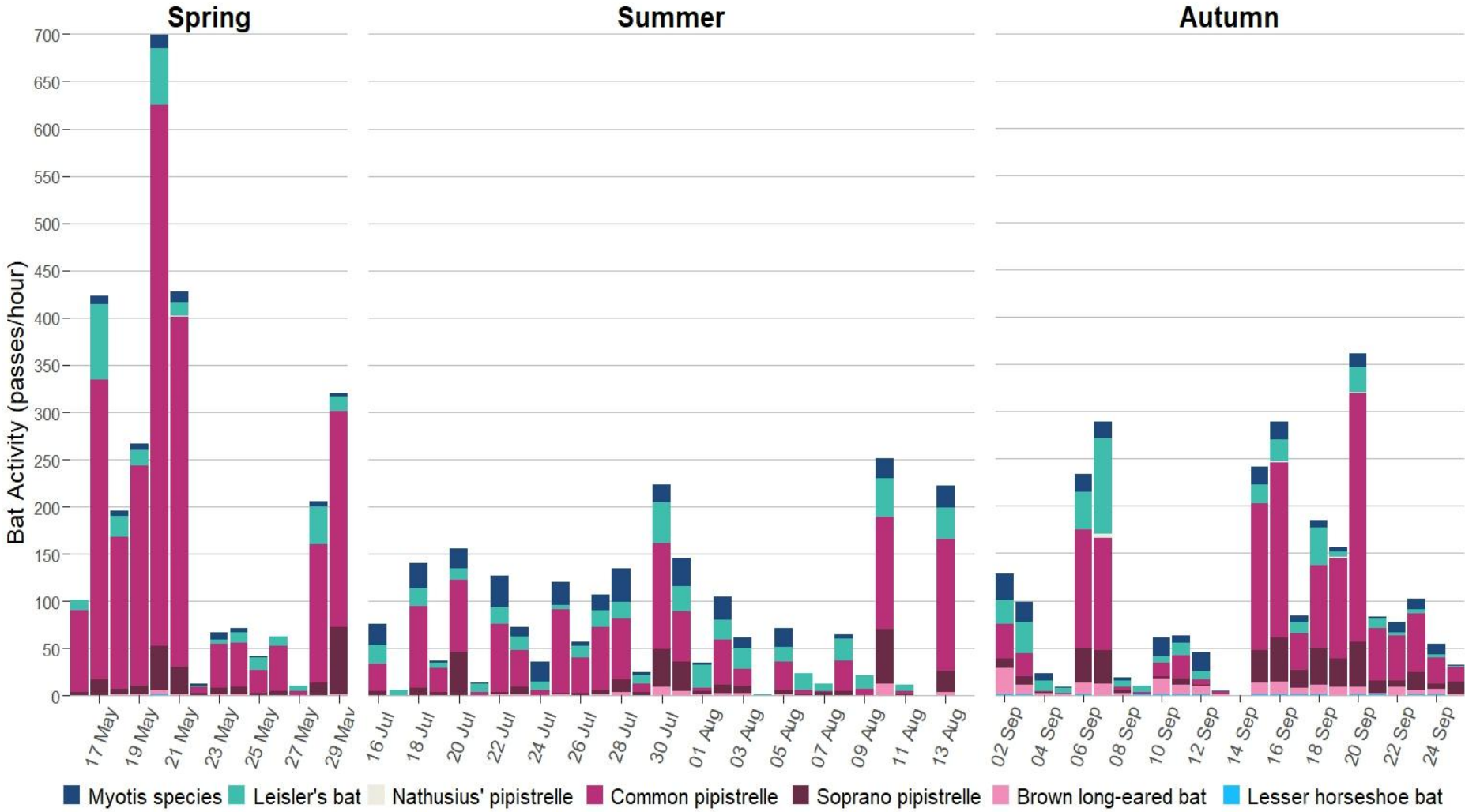


Plate 4-13 Static detector surveys 2024: Median bat pass rate (bph), including absences, per season per night. Lesser horseshoe bat is not visible on the graph due to occasionally few bat passes being recorded on some nights.

4.4 Assessment of Bat Activity Levels

4.4.1 Adapted Site-specific Ranges

Low, *Moderate* and *High* activity levels were assigned to median and maximum bat passes per hour (bpph) recorded during spring, summer and autumn at all detectors deployed across the Proposed Wind Farm site following site-specific adaptation of the activity ranges proposed by Mathews et al. (2016).. The results of the site-level assessment are presented in Table 4-8.

Leisler's bat generally exhibited *Low* median activity in spring and autumn and *Low to Moderate* levels in summer. *Moderate* activity was recorded at D02 and D06 in spring, at D06 in summer, and at D09 in autumn. *High* median activity occurred only at D08 during summer, where activity reached 5.3 bpph (maximum 17.1 bpph).

Common pipistrelle demonstrated *Low* median activity in summer and autumn and *Low to Moderate* activity in spring. *Moderate* activity levels were recorded at D01, D07 and D09 during spring, at D02 in summer, and at D02 and D09 in autumn. *High* median activity was recorded in spring at D02 (26.3 bpph) and D03 (32.3 bpph), with corresponding maximum values of 85.6 bpph and 124.9 bpph, respectively.

Soprano pipistrelle exhibited *Low* median activity across all seasons, with the highest median values of 2.2 bpph recorded at D02 and D09 during spring. *High* maximum activity levels were recorded at D09 during spring (54.4 bpph) and at D02 during summer (43.9 bpph).

Myotis species exhibited *Low* median activity overall across all seasons. *Moderate* activity levels were recorded at D02 and D08 in summer and at D01 in autumn. No *High* median activity was observed for this group; however, the highest maximum activity (26.4 bpph) was recorded at D02 in summer.

Brown long-eared bat recorded *Low* median activity in spring and summer and *Low to Moderate* activity in autumn. *Moderate* activity was observed at D01, D02 and D09 in autumn. No *High* median values were recorded, although the highest maximum activity (15 bpph) occurred at D01 in autumn.

Nathusius' pipistrelle exhibited *Low* median activity across all detectors and seasons. The highest maximum activity recorded was 4.2 bpph at D011 during autumn.

Lesser horseshoe bat exhibited *Low* median activity across all detectors and seasons. Maximum activity remained low, with the highest values recorded at D02 during spring (0.9 bpph) and summer (0.5 bpph).

Overall, the adapted site-specific activity assessment indicates that bat activity within the Proposed Wind Farm site is generally *Low to Moderate* across species and seasons, with notable localised increases primarily associated with detectors D02, D03, D08 and D09. These elevated activity levels were driven predominantly by common pipistrelle, Leisler's bat and, to a lesser extent, soprano pipistrelle and *Myotis* species. *High* median activity was recorded only occasionally and in limited locations, suggesting that while certain areas of the Proposed Wind Farm site support concentrated activity, the wider landscape exhibits relatively low baseline bat use. These patterns inform the spatial distribution of sensitivity across the Proposed Wind Farm and guide the subsequent assessment of potential impacts from the Proposed Project.

Table 4-8 Median and maximum nightly bat activity (bpph) per species, season and detector location in 2024 categorised as None, Low, Moderate, High

Species	Season	Bat activity (bpph)	D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11	D12	Activity Level	
Myotis spp.	Spring	Median	0.1	0.2	0.1	0.0	0.0	0.6	0.5	0.4	1.1	0.2	0.1	0.1	Low (1)	
		Maximum	1.0	1.4	0.5	0.5	0.5	2.3	3.7	3.8	3.6	2.0	1.0	1.0	1.0	Low-moderate (2)
	Summer	Median	0.1	2.8	0.0	0.5	0.1	0.1	0.0	1.6	0.5	0.0	0.0	0.4	Low (1)	
		Maximum	2.6	26.4	1.9	5.4	1.1	1.4	1.0	5.6	2.3	0.8	0.7	2.0	Moderate (3)	
	Autumn	Median	2.5	0.8	0.5	0.3	0.0	0.5	0.6	1.1	1.2	0.3	0.1	0.3	Low (1)	
		Maximum	11.0	3.3	1.3	1.4	0.5	1.8	2.1	2.8	11.8	1.2	0.4	1.1	Moderate (3)	
	Leisler's bat	Spring	Median	0.2	4.1	0.2	1.1	0.1	1.6	1.3	0.6	1.4	0.6	0.1	0.3	Low (1)
			Maximum	1.9	13.6	4.7	2.2	0.5	8.5	10.8	13.0	4.5	25.5	22.0	7.2	Moderate-high (4)
Summer		Median	0.2	0.3	0.1	1.2	0.2	2.0	0.8	5.3	1.1	0.1	0.0	0.1	Low-moderate (2)	
		Maximum	3.3	3.8	3.1	2.9	1.2	7.7	8.4	17.1	8.7	8.4	2.7	3.9	Moderate-high (4)	
Autumn		Median	0.5	0.5	0.1	0.2	0.0	0.4	1.4	0.6	3.3	0.2	0.1	0.3	Low (1)	
		Maximum	3.6	2.5	1.8	2.4	0.3	7.8	25.4	6.4	33.0	6.1	15.3	8.5	Moderate-high (4)	
Nathusius' pipistrelle		Spring	Median	-	0.0	-	-	-	0.0	0.0	-	-	-	0.0	-	Low (1)
			Maximum	-	0.2	-	-	-	0.5	0.2	-	-	-	0.1	-	Low-moderate (2)
	Summer	Median	-	-	-	-	-	-	-	-	-	-	0.0	-	Low (1)	
		Maximum	-	-	-	-	-	-	-	-	-	-	0.1	-	Low (1)	
	Autumn	Median	-	0.0	-	-	-	0.0	0.0	-	0.0	-	0.0	0.0	Low (1)	
		Maximum	-	0.1	-	-	-	0.1	0.1	-	0.7	-	4.2	0.3	Low-moderate (2)	
	Common pipistrelle	Spring	Median	5.4	26.3	32.3	1.1	1.1	3.9	5.2	3.0	9.7	1.0	0.2	1.5	Low-moderate (2)
			Maximum	92.3	85.6	124.9	12.3	28.4	16.9	72.5	15.3	44.4	61.6	82.4	94.0	High (5)
Summer		Median	0.4	5.9	0.2	0.0	0.4	0.2	0.1	2.2	0.3	0.2	0.0	1.8	Low (1)	
		Maximum	18.8	78.9	22.9	4.0	5.8	6.1	6.5	24.9	13.1	24.2	8.1	58.4	Moderate-high (4)	
Autumn		Median	1.0	7.9	2.1	0.4	0.0	0.8	1.4	1.5	5.3	0.4	0.3	2.0	Low (1)	
		Maximum	28.8	55.1	16.6	11.4	21.8	26.4	20.1	36.6	30.8	5.5	24.2	51.1	High (5)	
Soprano pipistrelle		Spring	Median	0.0	2.2	0.5	0.0	0.1	0.5	0.4	0.5	2.2	0.0	0.0	0.0	Low (1)
			Maximum	0.6	13.7	11.6	0.4	0.5	1.5	2.6	10.6	54.4	1.2	5.2	4.9	Low-moderate (2)
	Summer	Median	0.0	0.8	0.0	0.0	0.0	0.1	0.1	1.2	0.1	0.0	0.0	0.0	Low (1)	
		Maximum	3.3	43.9	2.2	1.2	2.1	3.5	3.5	16.7	8.1	1.0	1.8	2.9	Low-moderate (2)	
	Autumn	Median	0.3	0.9	0.6	0.1	0.0	0.4	0.6	0.6	1.6	0.1	0.1	0.5	Low (1)	
		Maximum	5.7	12.8	5.3	3.5	2.1	7.2	5.8	10.1	12.2	3.5	7.7	7.7	Moderate (3)	
	Brown long-eared bat	Spring	Median	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	Low (1)
			Maximum	1.0	1.4	0.1	0.2	0.1	0.4	0.2	0.2	0.6	0.3	0.1	0.4	Low (1)
Summer		Median	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.1	Low (1)	
		Maximum	3.0	2.3	2.4	1.3	0.5	0.4	0.5	1.6	1.4	0.6	0.1	1.9	Moderate (3)	
Autumn		Median	2.2	0.9	0.5	0.2	0.0	0.3	0.3	0.3	0.9	0.2	0.2	0.3	Low-moderate (2)	
		Maximum	15.0	3.2	2.6	0.9	0.3	1.0	0.9	2.0	2.7	1.0	2.2	1.9	Moderate-high (4)	
Lesser horseshoe bat		Spring	Median	0.0	0.0	-	-	-	0.0	0.0	-	-	0.0	0.0	0.0	Low (1)
			Maximum	0.1	0.9	-	-	-	0.1	0.1	-	-	0.1	0.1	0.2	Low-moderate (2)
	Summer	Median	0.0	0.0	-	0.0	-	-	-	0.0	0.0	-	-	0.0	Low (1)	
		Maximum	0.1	0.5	-	0.1	-	-	-	0.1	0.1	-	-	0.2	Low-moderate (2)	

	Autumn	Median	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	Low (1)
		Maximum	0.2	0.2	-	0.2	0.2	0.1	0.1	-	0.1	0.1	0.1	0.1	Low-moderate (2)

4.5

Importance of Bat Population Recorded at the Site

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 site and use of the site for foraging and commuting. No bat roosts were identified within the Proposed Wind Farm site during the 2024 survey period. In particular, no large or significant maternity roosts (i.e. those supporting >100 individuals or considered of National Importance) were recorded within or immediately adjacent to the Proposed Project.

5. RISK AND IMPACT ASSESSMENT

This risk and impact assessment has been undertaken in accordance with NatureScot Guidance. As per the 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 Site 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 development 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	No evidence of bat roosts was identified within the Site, and no trees with bat roost potential were recorded within the Proposed Wind Farm site. The Site is dominated by open grassland and peatland, with areas of conifer plantation. Habitat features of relevance to bats are largely limited to plantation edges and a small number of linear features, including treelines, hedgerows and watercourses, which may provide some localised commuting and foraging opportunities. However, overall habitat connectivity across the Site is limited. On this basis, the Proposed Wind Farm site is assessed as providing low suitability for commuting and foraging bats.	Low
Project Size	In accordance with the criteria set out in NatureScot (2021), the Proposed Wind Farm is considered to be of <i>Medium</i> scale, comprising 14 turbines. Although individual turbine heights exceed 100 m, the overall development remains well below the threshold for a Large project under NatureScot (2021). There are four other wind farms within 5 km of the Proposed Wind Farm site (11 existing turbines and 14 proposed turbines). A further five wind farms lie between 5 km and 10 km of the Proposed Wind Farm site, comprising 20 existing turbines and 14 permitted turbines. Other large infrastructure projects include two stone quarries works within 10 km of the Proposed Wind Farm site. Consequently, the Proposed Project is considered of <i>Medium size</i> .	Medium
Site Risk Assessment (from criteria in Table 3-8)		Low Site Risk (2)

The habitats within the Proposed Wind Farm site are predominantly composed of conifer plantation, wet heath, and improved agricultural grassland. Smaller areas of blanket bog, dry heath, dry humid acid grassland and immature woodland are also present. As per Table 3a of the NatureScot Guidance (2021), the Site has a *Low* habitat risk and *Medium* project size (Medium scale development including 14 turbines but comprised of turbines >100m in height). The cross tabulation of a *Medium* project on a *Low* risk site results in an overall site risk score of *Low* (NatureScot Table 3a).

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
- > Nathusius' pipistrelle

The Overall Risk Assessment for high collision risk species is provided in the sections below. Overall Risk was determined, in accordance with Table 3b of NatureScot 2021 guidance (Appendix 3), by a cross-tabulation of the site risk level (i.e. Low). The assessment was carried out for both median and maximum activity categories in order to provide insight into typical bat activity (i.e. median values) and activity peaks (i.e. maximum values). NatureScot recommends that the most appropriate activity level (i.e. median or maximum) be utilised to determine the overall risk assessment for a species.

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 for brown long-eared bat, Lesser horseshoe bat and *Myotis* spp. were *Low* across all seasons except for *Low to Moderate* activity for brown long-eared bat in autumn. No *High* median activity was recorded for any of these species. Although *Moderate* activity was detected for brown long-eared bat at D01, D02 and D09 in autumn, and for *Myotis* spp. at D02 and D08 in summer and at D01 in autumn, the overall levels of activity recorded throughout the 2024 surveys remained *Low*. On this basis, significant collision-related effects for these low-risk species are not anticipated.

Potential habitat loss and disturbance effects are assessed further in Section 5.2 below. Activity levels for these species will continue to be monitored during Year 1 of operational surveys, following the implementation of best-practice mitigation measures. Additional mitigation will be introduced if required based on Year 1 results.

5.1.2.1 Leisler's bat

The Proposed Wind Farm lies within the current known range of the Leisler's bat (*Nyctalus leisleri*) in Ireland (NPWS, 2025). Leisler's bats are considered a species of high population vulnerability due to their high risk of turbine collision (NatureScot, 2021). Leisler's bat was recorded during all static and manual activity surveys in 2024 across the Proposed Wind Farm. When interpreted in the context of the low site risk (see Section 4.5) and using Table 3b of NatureScot (2021), Leisler's bat activity was characterised by **Low** typical collision risk (based on median activity rates), and **Medium** collision risk at peak activity levels (see Table 5-2).

Notably, a high peak activity level was recorded at detector D08 in summer, with a median activity rate of 5.3 bpph and a maximum of 17.1 bpph. Walked transect results also detected higher activity levels of Leisler's bat activity during the summer and autumn period, consistent with its known seasonal increase in activity levels.

Based on the combined transect and static survey results, the local habitat context characterised mainly by conifer plantation, wet heath, and improved agricultural grassland with smaller areas of blanket bog, dry heath, dry humid acid grassland, immature woodland and sparse linear features such as hedgerows and treelines, the overall collision risk for Leisler's bat at the Proposed Wind Farm is assessed as **Low**

at typical activity levels, and with **Medium risk at peak levels**, particularly at detector locations showing concentrated activity in summer.

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 2024	Low (2)	Low (1)	Typical Risk is Low (2)	Moderate-High (4)	Peak Risk is Medium (8)
Summer 2024		Low to Moderate (2)	Typical Risk is Low (4)	Moderate-High (4)	Peak Risk is Medium (8)
Autumn 2024		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 (NPWS, 2025). This species is classified as a common species with medium population vulnerability and is considered to have a high collision risk (Table 3-8). Soprano pipistrelle activity was recorded throughout the survey periods at the Proposed Wind Farm. When evaluated against the identified site risk and in accordance with Table 3b (NatureScot, 2021), the overall typical activity risk for soprano pipistrelle was **Low** during all seasons. However, peak activity levels reached *Moderate* values in autumn resulting in a **Medium** peak risk classification for autumn and **Low** peak risk in spring and summer (see Table 5-3 below).

Based on site visits and survey data, including walked transects, the typical (median) activity levels correspond with the habitat composition of the Proposed Wind Farm, characterised mainly by conifer plantation, wet heath, and improved agricultural grassland with smaller areas of blanket bog, dry heath, dry humid acid grassland, immature woodland and sparse linear features such as hedgerows and treelines.

Therefore, the collision risk to the local soprano pipistrelle population is assessed as **Low** at typical activity levels, **Low** peak risk in spring and summer but a **Medium** risk at peak activity levels in autumn.

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 2024	Low (2)	Low (1)	Typical Risk is Low (2)	Low-Moderate (2)	Peak Risk is Low (4)
Summer 2024		Low (1)	Typical Risk is Low (2)	Low-Moderate (2)	Peak Risk is Low (4)
Autumn 2024		Low (1)	Typical Risk is Low (2)	Moderate (3)	Peak Risk is Medium (6)

5.1.2.3 Common pipistrelle

The Proposed Wind Farm is located within the current range of the common pipistrelle (NPWS, 2025). Common pipistrelle is classified as a common species with medium population vulnerability and a high collision risk (Table 3-8). This species was recorded during all activity surveys across the Proposed Wind Farm. When assessed against the identified site risk and following Table 3b (NatureScot, 2021), overall typical activity risk for common pipistrelle was **Low** during all seasons. Peak activity levels were *High* in spring and autumn and *Moderate* to *High* in summer, resulting in a **Medium** peak risk classification for all seasons (see Table 5-4 below).

Based on site visits and survey data, including walked transects, the typical (median) activity reflects the habitat composition of the Proposed Wind Farm, characterised mainly by conifer plantation, wet heath, and improved agricultural grassland with smaller areas of blanket bog, dry heath, dry humid acid grassland, immature woodland and sparse linear features such as hedgerows and treelines.

Therefore, a **Low** typical collision risk and **Medium** peak risk is assigned to the local population of common pipistrelle throughout all seasons.

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 2024	Low (2)	Low-Moderate (2)	Typical Risk is Low (4)	High (5)	Peak risk is Medium (10)
Summer 2024		Low (1)	Typical Risk is Low (2)	Moderate-High (4)	Peak risk is Medium (8)
Autumn 2024		Low (1)	Typical Risk is Low (2)	High (5)	Peak risk is Medium (10)

5.1.2.1 Nathusius' pipistrelle

The Proposed Wind Farm is within the current known range of Nathusius' pipistrelle (NPWS, 2025). Nathusius' pipistrelle is considered a rarer species, of high population vulnerability and high collision risk (Table 3-8). This species was detected at a few detector locations with low levels, suggesting occasional presence or exploratory movements rather than sustained use of the site.

When assessed in the context of the site risk and in accordance with Table 3b (NatureScot, 2021), typical activity risk for Nathusius' pipistrelle was **Low** across all seasons. Peak activity reached *Low to Moderate* levels in spring and autumn, resulting in a **Medium** peak risk, while summer peak risk remained **Low** (see Table 5-5 below).

No activity was recorded during walked transects, and detections from static monitoring were infrequent and of low intensity. This is consistent with the surrounding landscape of the Proposed Wind Farm site, characterised mainly by conifer plantation, wet heath, and improved agricultural grassland with smaller areas of blanket bog, dry heath, dry humid acid grassland, immature woodland and sparse linear features such as hedgerows and treelines.

Accordingly, the collision risk to the local population of Nathusius' pipistrelle is considered **Low** across all survey seasons with a **Medium** peak risk assessed for spring and autumn.

Table 5-5 Nathusius' 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 2024	Low (2)	Low (1)	Typical Risk is Low (2)	Low-Moderate (2)	Peak Risk is Low (4)
Summer 2024		Low (1)	Typical Risk is Low (2)	Low (1)	Peak Risk is Low (2)
Autumn 2024		Low (1)	Typical Risk is Low (2)	Low-Moderate (2)	Peak Risk is Low (4)

5.1.3 Collision Risk Summary

Site-level collision risk for high collision risk bat species was typically **Low**. Overall bat activity levels were typical of the nature of the Proposed Wind Farm site, which is dominated by conifer plantation,

wet heath, and improved agricultural grassland with smaller areas of blanket bog, dry heath, dry humid acid grassland, immature woodland and sparse linear features such as hedgerows and treelines.

Despite the generally low bat activity, some detectors showed *High* median activity levels including D02 and D03 in spring for common pipistrelle and D08 in summer for Leisler’s bat (Table 5-6).

While *High* median activity was recorded at two locations (D02 and D03), it is noted that habitats at these locations will change during the construction phase of the Proposed Project with the required implementation of the bat felling buffers (Section 6.1.3). A monitoring and mitigation strategy has been devised for the Proposed Project, in line with the case study example provided in Appendix 5 of the NatureScot 2021 Guidance and based on the site-specific data. After year 1 monitoring, if a curtailment requirement is identified, 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 if deemed necessary.

Table 5-6 Detector location recording High median activity in 2024 for High-risk bat species

Detector ID	Turbine	Species	High Median Activity Survey Period
D02	T02	Common pipistrelle	Spring 2024
D03	T03	Common pipistrelle	Spring 2024
D08	T14	Leisler’s bat	Summer 2024

5.2

Loss or Damage to Commuting and Foraging Habitat

In the absence of appropriate design, the loss or degradation of commuting and foraging habitat has the potential to reduce feeding opportunities and/or displace local bat populations. The Proposed Wind Farm site is predominantly composed of conifer plantation, wet heath and improved agricultural grassland, with smaller areas of blanket bog, dry heath, dry humid acid grassland, immature woodland and a limited number of linear features such as hedgerows and treelines.

Approximately 44 ha of conifer plantation will be felled to accommodate the bat buffer (Section 6.1.3) and the development footprint. As this plantation is a commercial crop, felling is expected regardless of the Proposed Wind Farm. The removal of dense, closed-canopy plantation is not considered detrimental to bats, as it will increase the extent of woodland edge habitat which is known to support both foraging and commuting. With these edges retained or expanded, no net loss of suitable habitat is anticipated.

A small section of hedgerow (23 m) and approximately 0.6 ha of scrub will be removed to facilitate the construction of an access road. These habitats have potential to provide some foraging and commuting opportunities; however, the Biodiversity Management and Enhancement Plan (BMEP; Appendix 6-4) has been designed to ensure there is no net loss of available habitat features within the site. The BMEP includes the establishment of 0.54 ha of native woodland within the Site, resulting in a net gain in native habitat and an improvement in the quality of edge habitat available to bats. As such, no significant effects on the availability of commuting and foraging habitat are expected.

Accommodation works along the Turbine Delivery Route are limited to vegetation trimming, with no removal of hedgerows or trees. Therefore, no significant effects on commuting or foraging bats are predicted in relation to the TDR works.

The Proposed Wind Farm site lies within the current known range of lesser horseshoe bat (Article 17). This species was recorded occasionally (93 bat passes) during the 2024 baseline surveys, with detections concentrated at D01 and D02, both located at conifer-forestry edges at the northern edge of the Proposed Wind Farm site. These records indicate that the Site provides only localised and limited foraging and commuting opportunities for this species. In Ireland, lesser horseshoe bats rely on

sheltered, cluttered habitats such as broadleaved woodland, dense scrub, tall hedgerows, treelines and vegetated river corridors for foraging and commuting (NPWS 2018; NPWS & VWT 2022). Such habitats are largely absent across the Proposed Wind Farm site. However, the implementation of the BMEP, including the establishment of native woodland and enhancement of edge habitats, will improve the suitability of the Site for foraging and commuting by bats.

Given that a large proportion of the Site will remain undisturbed, and that key habitat features, including linear conifer edge habitats that were occasionally used by lesser horseshoe bats, will be retained and enhanced, **no significant adverse effects on commuting or foraging habitat** for any bat species are anticipated as a result of the Proposed Project.

5.3 Loss of, or Damage to Roosts

The Proposed Wind Farm site is predominantly composed of conifer plantation, wet heath and improved agricultural grassland, with smaller areas of blanket bog, dry heath, dry humid acid grassland, immature woodland and limited linear features. Trees within the commercial conifer plantation are of limited age and structural diversity and, due to species composition and management history, do not provide suitable roosting habitat for bats. Consequently, the removal of conifer trees associated with the bat buffers and infrastructure footprint will not result in the loss or damage of bat roosts. No buildings or other structures suitable for roosting occur within the Proposed Wind Farm site, and no confirmed bat roosts or potential roost features (PRFs) were identified during the 2024 surveys. Accordingly, no loss of, or damage to, roosting habitat is anticipated within the Proposed Wind Farm footprint as a result of the Proposed Project.

In Ireland, lesser horseshoe bats (*Rhinolophus hipposideros*) typically roost in warm, undisturbed spaces within old stone buildings during the summer maternity period and in cool, humid underground sites such as caves, mines and cellars during winter hibernation (NPWS, 2018; NPWS & VWT, 2022). No such suitable roosting features were identified within the Proposed Wind Farm site, and no caves, underground structures or SACs designated for lesser horseshoe bat occur within 10 km of the Site.

Desk study review of the NPWS Lesser Horseshoe Bat Database confirmed the presence of lesser horseshoe bat (*Rhinolophus hipposideros*) roosts within the wider landscape. The roost referred to by the Development Applications Unit in the Dunmanway area is located approximately 2 km from the Proposed Grid Connection route and approximately 5.5 km from the nearest proposed turbine. This distance places the roost outside the core foraging range typically associated with lesser horseshoe bat roosts and beyond the distance at which transitional or night roost use would reasonably be expected in relation to turbine locations. The remaining recorded lesser horseshoe bat roosts occur at distances of approximately 3–7 km from the nearest proposed turbines. None of the known lesser horseshoe bat roosts are located within the Proposed Project footprint, and no works are proposed in the vicinity of any roost structures.

On this basis, and having regard to the separation distances involved, the absence of suitable roosting features within the Site, and the nature and scale of the proposed works, no loss of, or damage to, known lesser horseshoe bat roosts is anticipated as a result of the Proposed Project.

The Proposed Grid Connection follows existing road corridors and does not require tree removal. Watercourse crossing structures along the route were assessed as having *None* to *Moderate* roosting potential; however, no bat roosts or evidence of bat use were recorded during inspections. As the proposed works will not modify these structures, no loss of roosting habitat is anticipated along the Proposed Grid Connection. One additional watercourse crossing associated with the internal 33kV cabling within the Proposed Wind Farm site was also assessed and was found to have *Negligible* roosting potential, with no evidence of bat use recorded; no works are proposed at this structure and no impacts on roosting habitat are anticipated. Turbine Delivery Route (TDR) accommodation works will involve vegetation trimming only. No trees or features with PRFs were identified along the TDR. Accordingly, no roost loss or damage is predicted in association with the TDR.

Given the absence of confirmed roosts within the Proposed Wind Farm site, the Proposed Grid Connection and the TDR, and the very limited roosting potential of features within these areas, **no significant effects relating to the loss of, or damage to, roosting habitat** for any bat species, including lesser horseshoe bat, are anticipated as a result of the Proposed Project.

5.4 Displacement of Individuals or Populations

The Proposed Project is primarily located within conifer plantation, wet heath and improved agricultural grassland, with smaller areas of blanket bog, dry heath, dry humid acid grassland, immature woodland and limited linear features. No identified roosting habitat will be lost, and key linear and edge features that facilitate commuting and foraging, such as hedgerows, treelines, forestry edges and watercourses, will be retained. A proportion of edge habitat will also be enhanced through the implementation of the Biodiversity Management and Enhancement Plan.

No structural works are required at bridge or culvert crossings along the Proposed Grid Connection route, and temporary excavations associated with launch and receiver pits for HDD works will be set back from these structures. As the crossings experience existing traffic-related noise and vibration, any additional potential disturbance arising from HDD drilling is unlikely to exceed baseline conditions to which any roosting bats in the vicinity would already be habituated. The short-term duration of these works, combined with spatial separation from suitable bat habitats, ensures that potential noise and vibration effects will be minimal and are unlikely to result in significant disturbance to bats.

Given the limited extent of habitat removal, the absence of roost loss, and the retention of functional ecological corridors throughout the Site, the habitats will continue to support bat activity. Taking this into account, and with the implementation of the proposed mitigation and enhancement measures, **no significant displacement of individual bats or local populations is anticipated** 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.

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 bridge/culvert features. 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 to minimize disturbance to bats.

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 2700K).

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 50 m buffer is applied between turbine blade tips and habitat features used by bats (e.g. hedgerows, treelines). Although increased buffers of 100–200m are recommended around woodland by Eurobats Publication No. 6 and

NIEA, these recommendations are not currently supported by empirical evidence from the UK or Ireland and are not routinely applied in wind farm planning.

For the Proposed Wind Farm, a 50 m buffer between turbine blade tip and the nearest habitat feature has been implemented, based on a conservative worst-case turbine specification (blade length: 66.5 m; hub height: 102.5 m; total height: 169 m). Buffer distances were calculated using the Natural England formula (NatureScot, 2021) as illustrated in Plate 6-1 and have been incorporated into the turbine layout.

Removal of areas of conifer plantation will be required to provide the necessary bat buffers within the Proposed Wind Farm. These vegetation-free areas (i.e. less than 2m in height) will be maintained for the duration of the operational phase and form part of the overall collision-risk mitigation strategy for bats.

The required distance (*b*) between the edge of a habitat feature and the centre of the turbine tower is calculated as follows:

$$b = \sqrt{(50 - bl)^2 - (hh - fh)^2}$$

Where:

- > *bl* = blade length (m)
- > *hh* = hub height (m)
- > *fh* = height of habitat feature (m)

Using the turbine dimensions outlined above and a feature height of 20 m for conifer forestry, the calculated offset distance (**b**) is **82.25 m**.

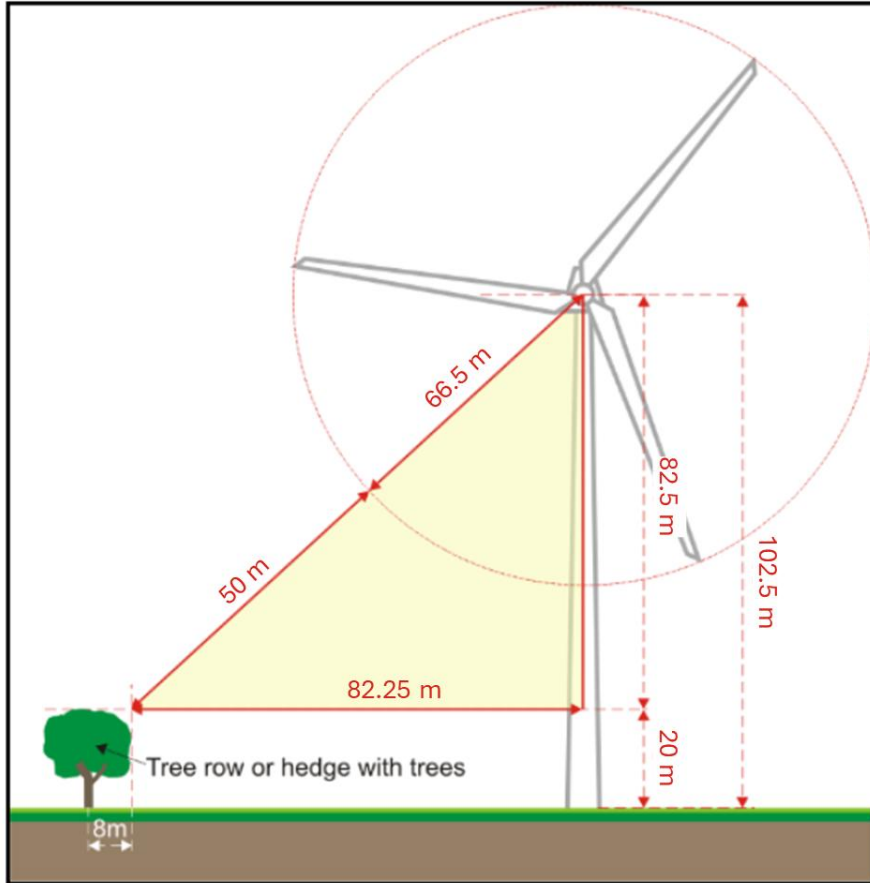


Plate 6-1 Calculation of buffer distances (NatureScot, 2021).

6.1.4 Biodiversity Management and Enhancement Plan

The Proposed Project is predominantly located within conifer plantation, wet heath and improved agricultural grassland, with smaller areas of blanket bog, dry heath and dry humid acid grassland. Linear landscape features such as hedgerows and treelines occur only intermittently within the Site, and these features have largely been retained and avoided through design. Small areas of hedgerow and scrub will be removed to facilitate an access road; however, these losses are limited in extent and will be fully offset through the measures set out in the Biodiversity Management and Enhancement Plan (BMEP; Appendix 6-4).

To compensate for the loss of hedgerow and scrub, and to enhance commuting and foraging opportunities for bats, **0.54 ha of native woodland** will be planted within the Proposed Wind Farm. One of the key planting areas lies east of the proposed 110 kV onsite substation (Figure 3-1 in BMEP; Appendix 6-4), where a young native woodland block is currently surrounded by commercial conifer plantation. A portion of this surrounding conifer plantation will be removed and replaced with native woodland. The resulting habitat will offer substantially greater value for bats than the commercial conifer stand it replaces, owing to the increased species diversity and improved structural complexity.

Overall, the Proposed Project will be no net loss in suitable bat habitat. The implementation of the BMEP will improve habitat quality and enhance long-term foraging and commuting opportunities for bats in areas strategically positioned away from turbine locations.

6.1.5 Blade Feathering

Guidance from the Northern Ireland Environment Agency (NIEA, 2021) recommends that, in addition to buffers applied to key habitat features, wind turbines implement blade feathering when wind speeds are below the cut-in speed of the turbine. Blade feathering involves pitching the turbine blades so that they are aligned parallel to the wind, thereby minimising blade rotation while the turbine is idling. Under these conditions, rotor speeds are typically reduced to less than two revolutions per minute. This measure reduces the likelihood of bat collisions during periods of low wind speed, when bat activity is typically highest.

In accordance with NIEA (2021) guidance, blade feathering will be implemented as a standard operational measure across all proposed turbines when wind speeds are below the cut-in speed of the turbine. Blade feathering below the turbine cut-in speed represents standard turbine operation and is expected to be implemented automatically through the turbine control system.

In the event that blade feathering is not available for the selected turbine model, an equivalent operational measure will be implemented to ensure that turbines do not rotate at low wind speeds when electricity generation is not occurring. This may include operational controls such as manual stop or stop-on-demand procedures during periods when turbines would otherwise idle below cut-in speed.

6.2 Bat Monitoring Plan

Overall collision risk levels for high-risk species were generally **Low** at typical levels and **Medium** collision risk at peak levels. These results reflect the character of the Site, which is dominated by conifer plantation, wet heath and improved agricultural grassland, with smaller areas of blanket bog, dry heath, dry humid acid grassland, immature woodland and only sparse hedgerows and treelines.

Adopting a precautionary approach and recognising that *High* median activity levels were recorded at certain detector locations (including D02 and D03 in spring for common pipistrelle, and D08 in summer for Leisler's bat), a tailored adaptive monitoring and mitigation strategy has been developed for the Proposed Project. This approach follows the principles outlined in the case study presented in Appendix 5 of NatureScot (2021) and is informed directly by the site-specific acoustic monitoring data.

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). As described in Section 3.5 above, the assessment of bat activity levels will include the use of 'Ecobat' (or similar alternative), a web-based interface, allowing uploaded activity data to be contrasted with a comparable reference range, allowing objective and robust interpretation. 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 NatureScot and NIEA 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

Considering the sensitive design of the project and the implementation of best practice and adaptive mitigation measures, no significant long-term 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,
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 4.2.5 of this report.

The cumulative assessment identified a number of existing and proposed wind farms within the wider landscape. One existing wind farm and three proposed wind farms are located within 5 km of the proposed turbine locations, and additional three existing and two proposed wind farms are located within 10 km of the proposed turbine locations (Table 4-6). In addition to these wind energy developments, a small number of other plans and projects with the potential to contribute to cumulative effects on bats, including two stone 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, light and noise restrictions, habitat enhancement 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.

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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

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


PROPOSED GRID CONNECTION CROSSINGS



Appendix 4: Watercourse Crossing Infrastructure – Bat Roost Suitability Assessment



Proposed Grid Connection Crossing Infrastructure



The Proposed Grid Connection underground cabling route will traverse 11 no. watercourses. The crossing points were assessed for bat roosting potential on the 12th, 13th and 14th May 2025, and 1st July 2025. A range of roosting suitability levels was recorded across the inspected structures: three crossings had no (*None*) roosting potential, five had *Negligible* potential, two had *Low* potential, and only one water crossing was assessed as having *Moderate* roosting potential. No evidence of bat roosts was identified at any of the structures. The detailed findings are presented below.



Table A4.1: Proposed Grid Connection - Bat Roost Suitability of Watercourse Crossings along the Proposed Grid Connection Underground Cabling Route



Crossing ID	Irish Grid Reference	Structure type	Photo	Bat Roost Potential
WC1	W 11052 56294	Stone Arch Bridge		Stone bridge that is inaccessible for bats due to dense vegetation. Bridge face has been repointed with no visible crevices or voids suitable for roosting bats. <i>Negligible</i> roosting suitability.

Crossing ID	Irish Grid Reference	Structure type	Photo	Bat Roost Potential
WC2	W 11683 56265	Stone Arch Bridge		<p>Stone bridge. Has not been repointed and multiple crevices present in stonework. No bats identified during inspection.</p> <p><i>Moderate</i> roosting potential.</p>
WC3	W 13508 56762	Stone Arch Bridge		<p>Concrete road bridge attached to older stone bridge. No visible crevices or voids suitable for roosting bats. Stone area has been repointed, and a small level of vegetation cover is present.</p> <p><i>Negligible</i> roosting potential.</p>

Crossing ID	Irish Grid Reference	Structure type	Photo	Bat Roost Potential
WC4	W 14518 57301	Plastic Pipe		<p>No visible crevices or voids suitable for roosting bats.</p> <p><i>None</i> roosting potential.</p>
WC5	W 18726 56714	Stone Arch Bridge		<p>Stone bridge where the under arches have been concreted over. No visible crevices or voids suitable for roosting bats either under arch or on bridge sides.</p> <p><i>Negligible</i> roosting potential.</p>

Crossing ID	Irish Grid Reference	Structure type	Photo	Bat Roost Potential
WC6	W 18885 55872	Concrete Clear-span Bridge		<p>Concrete clear-span bridge with smooth surfaces with no visible crevices or voids suitable for roosting bats.</p> <p><i>None</i> roosting potential.</p>
WC7	W 19804 56093	Two-span Stone Culvert		<p>Low stone culvert with a number of crevices but limited potential. No bats found during internal inspection.</p> <p><i>Low</i> roosting potential.</p>

Crossing ID	Irish Grid Reference	Structure type	Photo	Bat Roost Potential
WC8	W 19985 56150	Stone Culvert		<p>Bright stone culvert with very large gaps between stone. No evidence of roosting bats and gaps provided little roosting opportunity.</p> <p><i>Low</i> roosting potential.</p>
WC9	W 23432 54380	Concrete Clear-span Bridge		<p>Concrete clear-span bridge with smooth surfaces with no visible crevices or voids suitable for roosting bats.</p> <p><i>None</i> roosting potential.</p>


Crossing ID	Irish Grid Reference	Structure type	Photo	Bat Roost Potential
WC10	W 24092 53056	Stone Arch Bridge		<p>Culvert with concrete walls. Stonework on bridge has small and shallow crevices unsuitable for roosting.</p> <p><i>Negligible</i> roosting potential.</p>
WC11	W 24195 53017	Stone Arch Bridge		<p>No visible crevices or voids suitable for roosting bats.</p> <p><i>Negligible</i> roosting potential.</p>

Note: WC3 and WC10 comprise structures that were originally constructed as stone arch bridges and subsequently extended using concrete elements.

Proposed Wind Farm – Internal 33kV Cabling Watercourse Crossing

One additional existing watercourse crossing associated with the internal 33kV cabling within the Proposed Wind Farm site was assessed for bat roosting potential. No evidence of bat roosts was identified at the structure. The detailed findings are presented below.

Table A4.2: Bat Roost Suitability of Watercourse Crossing within the Proposed Wind Farm (Internal Cabling)

Crossing ID	Irish Grid Reference	Structure type	Photo	Bat Roost Potential
WC12 (PWF)	W 10604 56565	Stone Arch Bridge		<p>Stone arch bridge that is inaccessible for bats due to dense vegetation. Bridge face has been repointed with no visible crevices or voids suitable for roosting bats.</p> <p><i>Negligible</i> roosting potential.</p>