Appendix 6-2 – Bat Report

Proposed Killoshulan Wind Farm, Co. Kilkenny

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1. INTRODUCTION

MKO was commissioned to assess the potential effects of the proposed Killoshulan Wind Farm, Co. Kilkenny, on bats in support of the planning application. This report describes the survey design, methods and findings, assesses potential effects on bats, and sets out measures to avoid and reduce adverse effects.

The principal baseline dataset comprises bat surveys undertaken in 2025, including habitat suitability appraisal, roost inspections, dusk emergence surveys, night-time bat walkovers and ground-level static detector surveys. Static detectors were deployed at 11 indicative turbine locations, before the layout was revised to 10 turbines. Additional surveys undertaken in 2026 addressed the Proposed Grid Connection, TDR accommodation areas and other potentially affected features, as described in the methods section. Historical survey findings from 2022 are considered through the desktop review in Section 4.2, including records of previously confirmed roosts.

NatureScot (2021) provided the principal framework for the wind farm survey programme and collision-risk assessment. Survey effort was also informed by NIEA (2021) guidance and its March 2024 amendment. Habitat suitability appraisal, structure inspections and tree assessments were informed by Collins (2023) and Marnell, Kelleher and Mullen (2022).

BCI (2026), published after completion of the principal survey programme, informed the interpretation of findings and development of mitigation and post-construction monitoring proposals. Guidance was applied alongside professional judgement and the site-specific survey findings, with the basis for the assessment and mitigation explained in the relevant sections.

As detailed in Section 1.1.1 of Chapter 1, the project components are described using the terms ‘Proposed Project’, ‘Proposed Wind Farm’, ‘Proposed Grid Connection’ and ‘Site’. The assessment addresses the Proposed Wind Farm, Proposed Grid Connection and TDR accommodation works, as relevant. The Proposed Project is located within the EIAR Site Boundary, referred to as the ‘Site’, which measures approximately 598 hectares. The Proposed Project layout is illustrated in Figure 4-1 of Chapter 4, where a detailed project description is also provided.

1.1 Background

Wind energy is a key component of Ireland’s renewable energy strategy. However, wind energy developments and their associated infrastructure have the potential to affect bats through collision mortality, habitat loss or fragmentation, disturbance and displacement, including effects associated with artificial lighting and construction and operational noise.

Bats are considered particularly sensitive to wind energy developments due to their flight behaviour and ecological requirements. Global reviews of bat-wind farm interactions have documented bat fatalities at operational wind farms and highlighted the potential for cumulative effects at the population level (Arnett *et al.*, 2016). Many bat species commute and forage along linear landscape features such as hedgerows, treelines and woodland edges, which may overlap with areas proposed for turbines and associated infrastructure, including grid connection and BESS infrastructure. In addition, some bat species are known to fly at heights within the rotor-swept zone, particularly during seasonal movements and mating activity in late summer and autumn (Cryan & Barclay, 2009; Rydell *et al.*, 2010). These behaviours increase the potential for interaction with wind turbines and may lead to collision mortality or barotrauma. Consequently, proposed wind energy developments sites require careful assessment of bat activity, habitat use and potential roost features to inform appropriate mitigation measures.

In a European context, a review of studies by Voigt *et al.* (2022) estimated that between approximately 1.5 and 30 bats may be killed per turbine per year. Carcass-search data from the UK indicate mortality rates ranging from 0 to 5.25 bats per turbine per month during the peak bat activity period from July to

October, although substantial variation occurs between sites (Mathews *et al.,* 2016). While these figures are not directly transferable to the Irish context, the broadly similar bat assemblages present in Ireland and Britain make them a useful reference when considering potential risks.

Known mechanisms of bat mortality at wind farms include collisions with rotating turbine blades (Horn *et al.,* 2008; Cryan *et al.,* 2014) and barotrauma (Baerwald *et al.,* 2008), whereby rapid changes in air pressure near turbine blades can cause internal injuries. Bats may also be attracted to turbines due to behavioural and environmental factors, including habitat associations, mating activity and weather conditions.

Robust pre-construction bat surveys are therefore undertaken to establish baseline bat activity and habitat use and to inform the assessment of potential effects associated with the construction, operation and decommissioning of wind energy developments and their associated infrastructure. Survey design and impact assessment were guided by relevant legislation, scientific literature, and current best-practice guidance, with consideration given to spatial, temporal, and behavioural patterns in bat activity.

1.2 Bat Survey, Assessment and Mitigation Guidance

The survey programme, assessment and mitigation proposals were informed by guidance relevant to bats and onshore wind energy developments, together with general bat survey and ecological assessment guidance.

At a European level, *Guidelines for Consideration of Bats in Wind Farm Projects* (Rodrigues et al., 2015), published through EUROBATS, provides a framework for assessing potential effects on bats during the planning, construction and operational phases of wind energy developments. This was considered alongside guidance addressing conditions in the United Kingdom and Ireland.

Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation (NatureScot, 2021) provided the principal framework for the 2025 wind farm survey programme and subsequent collision-risk assessment. It informed static detector deployment, seasonal survey coverage, assessment of habitat and development-related risk factors, and consideration of typical activity and activity peaks. Its recommendations also informed habitat buffers, blade feathering, operational curtailment and post-construction monitoring.

Additional reference was made to the Northern Ireland Environment Agency's guidance on bat surveys, assessment and mitigation for onshore wind turbine developments (NIEA, 2021; amended 2024), particularly in relation to survey effort and seasonal coverage. *Bat Survey Guidelines for Wind Turbine/Wind Farm Developments in Ireland* (Bat Conservation Ireland, 2012a) provided further national context for survey methods and reporting.

General survey methods, habitat suitability appraisal, structure inspections and tree assessments were informed by *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, fourth edition (Collins, 2023), and *Bat Mitigation Guidelines for Ireland*, Version 2 (Marnell, Kelleher and Mullen, 2022).

A recently published Irish-specific guidance document, *Bat Survey, Assessment and Mitigation Guidelines for Onshore Wind Turbines in Ireland* (Bat Conservation Ireland, 2026), became available during preparation of this report, following completion of the principal 2025 baseline surveys. It draws on established sources, including NatureScot (2021), NIEA (2021; amended 2024), NPWS (2022), EUROBATS and Collins (2023), and provides additional detail on survey effort, activity interpretation, mitigation and post-construction monitoring. It is a professional best practice publication rather than a statutory or regulatory requirement.

BCI (2026) did not inform the original design of the 2025 surveys. It was considered when interpreting the findings and developing the mitigation and monitoring proposals, including operational wind-speed

and temperature thresholds, blade feathering, nacelle monitoring and adaptive management. The assessment retains the NatureScot framework, with site-specific activity thresholds and ranked scores described in the methods section. Seasonal and nightly curtailment windows were informed by the recorded activity patterns. The basis for site-specific mitigation decisions, including the retention of habitat connections and additional operational controls at T02, is explained in the relevant sections.

Ecological evaluation followed the geographical framework in the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (TII, 2009, originally published by the NRA). Species valuation principles described by Wray et al. (2010), together with conservation status information presented in NPWS (2025), informed the evaluation of the recorded bat assemblage and species sensitivity within an Irish context.

Lighting measures were informed by ILP and BCT Guidance Note 08/23 (2023). Consideration of derogation requirements was informed by *Applications for Regulation 54 Derogations for Annex IV Species: Guidance for Applicants*, Version 2 (DHLGH, 2026).

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). The influence of Pressures and Threats for bats are ranked from Low to Medium) for each species in the 2025 Article 17 report.

Bat Species	Conservation Status	Principal Threats
Common pipistrelle *Pipistrellus pipistrellus*	Favourable	**PX04** No pressures or threats
Soprano pipistrelle *Pipistrellus pygmaeus*	Favourable	**PX04** No pressures or threats
Nathusius' pipistrelle *Pipistrellus nathusii*	Unknown	**PD01** Wind, wave and tidal power (including infrastructure)
Leisler's bat *Nyctalus leisleri*	Favourable	**PD01** Wind, wave and tidal power (Low) **PF02** Construction or modification (e.g. of housing and settlements) in existing built-up areas (L)
Daubenton's bat *Myotis daubentoni*	Favourable	**PA22** Drainage for use as agricultural land (Medium) **PF12** Residential, commercial and industrial activities and structures generating noise, light, heat or other forms of pollution (M)

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

1.4 Statement of Authority

MKO employs a dedicated bat unit within its Ecology team, experienced in scoping, carrying out, and reporting on bat surveys, as well as producing impact assessments in relation to bats. MKO ecologists have relevant academic qualifications and are qualified in undertaking surveys to the levels required.

Scope development and project management were overseen by David Culleton and Aoife Joyce. Bat surveys were carried out by David Culleton, Kate Leahy, Saoirse Fitzsimmons, Marie Greaney and Cormac Roberts. Data manual ID and analysis were carried out by Emma Fitzgerald. This report was prepared by Tim Murphy, was reviewed and approved by Aoife Joyce. Staff's roles and relevant training are presented in Table 1-2 below.

Table 1-2 Project team qualifications and training.

Staff	Role	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.

		Full member of Chartered Institute of Ecology and Environmental Management. 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). Extensive experience in leading, managing and reviewing bat assessments for wind farm developments, including survey design, impact assessment, mitigation strategy development and technical review of EIAR documentation in line with current guidance.
Tim Murphy (B.Sc.)	Project Bat Ecologist	B.Sc. Environmental Biology, University College Dublin. 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), Kaleidoscope Pro Analysis for Birds and Land Animals (Wildlife Acoustics), Bat: Assessing the Impact of Development on Bats Mitigation & Enhancement (CIEEM Webinar)
David Culleton (B.Sc., M.Sc.)	Bat Ecologist	B.Sc. Zoology, University College Cork, Ireland. M.Sc. Conservation Behaviour, Atlantic Technological University, Galway, Ireland. Specialist Bat Trapping, Handling and Identification (BCI), 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).
Saoirse Fitzsimons (B.A, MSc)	Bat Ecologist	MSc. Coastal and Marine Environments; Physical Processes, Policy & Practice, National University of Ireland Galway BA (Hons) Geography, Sociology and Politics, National University of Ireland, Galway Drone Surveying - A1/A3 and A2 drone licence 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).
Kate Leahy (B.Sc.)	Bat Ecologist	B.Sc. (Hons) Zoology, University of Galway, Ireland. Structure & Tree Inspection (Internal), Endoscope Training (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal), Kaleidoscope Pro Analysis (Wildlife Acoustics), Winter Tree Identification (Internal), Introduction to Bats and Using Detectors (BCI).
Emma Fitzgerald (B.Sc.)	Bat Ecologist	B.Sc. (Hons) Zoology, University College Cork, Ireland.

		Kaleidoscope Pro Analysis (Wildlife Acoustics), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal), Introduction to Bats and Using Detectors (BCI), Analyzing Kaleidoscope Pro Outputs with RStudio (Advanced) (Wildlife Acoustics)
Marie Greaney (B.Sc., M.Sc.)	Seasonal Bat Ecologist	B.Sc. (Hons) Zoology, University of Galway, Ireland. M.Sc. (Hons) Conservation Behaviour, Atlantic Technological University, Galway, Ireland. Kaleidoscope Pro Analysis (Wildlife Acoustics), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal). Introduction to Bats and Using Detectors (BCI).
Cormac Roberts	Bat Ecologist Intern (2024 & 2025)	Currently in final year of B.Sc. Environmental Science with Ecology, Atlantic Technological University, Sligo. Assisted on over 40 dusk emergence and re-entry surveys across two bat activity periods, along with additional survey work completed outside of MKO. Experience includes Bat Habitat Appraisal (Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Emergence and Re-Entry Surveys (Internal), and Kaleidoscope Pro Analysis (Internal).

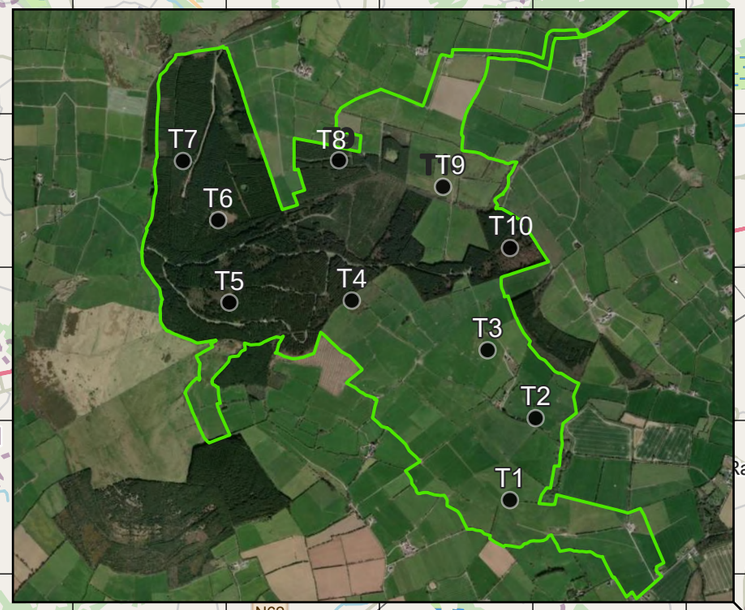
2. PROPOSED PROJECT DESCRIPTION

The Proposed Wind Farm is located approximately 4km west of the village of Freshford, 3.7km northeast of the village of Urlingford, Co. Kilkenny and approximately 15km northwest of Kilkenny City. Co. Kilkenny. During the construction phase, the Proposed Wind Farm site will be accessed via an existing agricultural access point off the R693 Regional Road. The R693 runs along the southern boundary of the Proposed Wind Farm site in the townland of Barna, Co. Kilkenny. This entrance will be upgraded and will be used as the main site entrance for HGVs and other abnormal loads during the construction phase of the Proposed Wind Farm and for the purposes of delivering large turbine components and other abnormal loads to the Proposed Wind Farm site. It is also proposed to access the Proposed 110kV Substation, during both the construction and operational phases of the Proposed Wind Farm, via this entrance. The Proposed Wind Farm is served by a number of existing public, forestry and agricultural roads and tracks. Current land-use on the Proposed Wind Farm comprises commercial forestry, agricultural pastural land, mixed forest and transitional woodland-shrub

The Proposed Grid Connection includes a Proposed 110kV Underground Cabling from the Proposed 110kV Substation, in the townland of Frankford or Ballykieran, Co. Kilkenny to the existing Ballyragget 110kV Substation in the townland of Moatpark, Co. Kilkenny. The Proposed Grid Connection to Moatpark, Co. Kilkenny measures approximately 12.6km in length and is primarily located within the public road corridor. Approximately 772m is proposed within National Roads (N77), 9.6km proposed within Local Roads, 653m proposed within the Proposed Wind Farm internal road network and approximately 1.5km proposed within agricultural lands in Frankford or Ballykieran, and Moatpark, Co. Kilkenny. Current land-use along the Proposed Grid Connection comprises of public road corridor, public open space, agriculture, commercial forestry, land principally used by agriculture with significant areas of natural vegetation, mineral extraction sites, mixed forest and discontinuous urban fabric.

The proposed project will encompass 10 No. wind turbines with blade tip height of 185 metres (m) and all associated foundations and hardstanding areas, access roads and entrances including upgrade of existing site roads and provision of new roads, 110kV electrical substation and wind farm control buildings, battery energy storage system (BESS), underground cabling, spoil management areas, borrow pit, electrical cabling for 110kV grid connection, biodiversity enhancement areas, temporary construction compounds, a permanent meteorological mast, temporary accommodation areas along the turbine delivery route. The Proposed Project will be connected to the national grid via an underground 110kV electrical cable from the proposed on-site 110kV substation to the existing Ballyragget 110kV Substation in the townland of Moatpark, Co. Kilkenny, located approximately 12.6km east of the Proposed Wind Farm site boundary.

The Site location is shown in on Figure 2-1 below. The full description of the Proposed Project is provided Chapter 4 of this EIAR.



Map Legend

EIAR Site Boundary

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

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SITE LOCATION - NOT TO SCALE

Drawing Title: Site Location

Project Title: Killoshulan Wind Farm, Co. Kilkenny

Project No.	Drawing No.	Scale
260172	2-1	1:200,000

Drawn By	Checked By	Date
AMcL	TM	27/10/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

3. METHODS

3.1 Scoping and Consultation

A scoping exercise was undertaken as part of the EIAR for the Proposed Project. A Scoping Document, providing details of the Proposed Project, was prepared by MKO and circulated to consultees in May 2026. Bat Conservation Ireland (BCI) and the Department of Housing, Local Government and Heritage – Development Applications Unit (DAU) were invited to comment on the potential for the Proposed Project to affect bats.

In addition, an online consultation meeting was held with representatives of the National Parks and Wildlife Service (NPWS) on 9th June 2026. MKO presented an overview of the Proposed Project, the ecological surveys undertaken and their key findings. Bat-related matters were also discussed during pre-application consultation meetings with An Coimisiún Pleanála (ACP) on 22nd June and 15th September 2026.

Details of scoping responses and consultation feedback relevant to bats are provided in Section 4.1. Copies of scoping responses are included in Appendix 2-1 of the EIAR.

3.2 Desk Study

A desk study was undertaken to inform bat survey planning and the assessment of potential effects associated with the Proposed Project. This included a review of available information on previous bat surveys, bat records, designated sites and landscape features of potential importance to bats within the Site and surrounding landscape, including the Proposed Grid Connection and Turbine Delivery Route (TDR) accommodation areas. The desk study was updated during preparation of this report. The sources consulted and search methods are described below, with the findings presented in Section 4.2.

3.2.1 Review of Previous Bat Surveys (2022)

Previous bat surveys undertaken by MKO at the Proposed Wind Farm in 2022 were reviewed as part of the desk study. These comprised habitat suitability appraisals, roost inspections, dusk emergence and dawn re-entry surveys, manual transects and ground-level static detector surveys, undertaken with reference to NatureScot (2021) and Collins (2016).

The findings were reviewed to identify previously recorded species and roost locations, providing historical context for the current assessment. A summary of the findings is presented in Section 4.2.1.

3.2.2 Bat Records

Bat Conservation Ireland

The National Bat Database of Ireland holds records of bat observations received and maintained by Bat Conservation Ireland (BCI). These include records from national monitoring schemes, roost records and ad-hoc observations. Bat activity and roost records were requested within a 10 km radius of a central point within the Proposed Wind Farm (Irish Grid Reference: S 34607 66354). This search area also encompasses the Proposed Grid Connection and TDR accommodation areas. Available records were supplied by BCI on 1st October 2026.

National Biodiversity Data Centre

The National Biodiversity Data Centre (NBDC) online database was searched for bat records within the relevant 10 km grid squares intersecting the 10 km radius centred on Irish Grid Reference S 34607 66354 within the Proposed Wind Farm. The grid squares searched comprised S36, S37, S27, S26, S46 and S47. The search was last updated on 20th October 2026.

Lesser Horseshoe Bat Database

The Lesser Horseshoe Bat Database, containing roost records provided by the National Parks and Wildlife Service (NPWS), was searched for lesser horseshoe bat roosts within the same 10 km search area. The search was last updated on 20th October 2026.

The 10 km search extent follows NatureScot (2021) and BCI (2026). Recorded roost locations are considered in relation to relevant components of the Proposed Project, taking account of the spatial precision of the supplied records.

3.2.3 Bat Species' Range

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

The species range and distribution maps presented in the 2025 Article 17 reports (NPWS, 2025) were reviewed in relation to the Proposed Wind Farm. The review considered whether the Proposed Wind Farm lies near the edge of the known range of any high collision-risk species, in accordance with NatureScot (2021).

3.2.4 Designated Sites

The National Parks and Wildlife Service (NPWS) website and map viewer were consulted to identify Special Areas of Conservation (SACs), Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) designated for bats within a 10 km radius of a central point within the Proposed Wind Farm (Irish Grid Reference: S 34607 66354), with reference to NatureScot (2021). This search area also encompasses the Proposed Grid Connection and TDR accommodation areas. Relevant site synopses and conservation objectives were reviewed to identify bat interests and supporting habitats potentially connected to the Proposed Project.

3.2.5 Landscape Features

3.2.5.1 Ordnance Survey Mapping

Ordnance Survey maps (1:5,000 and 1:50,000) and aerial photographs were reviewed to identify habitats and features of potential importance to bats within the Proposed Wind Farm, Proposed Grid Connection and TDR accommodation areas. The surrounding landscape was also examined for potential commuting and foraging connections, including woodland, forestry edges, hedgerows, treelines and watercourses. Buildings, bridges and other features potentially supporting roosting bats were identified for further investigation.

3.2.5.2 Underground Sites

The Geological Survey Ireland (GSI) online mapping tool and the University of Bristol Speleological Society (UBSS) Cave Database for the Republic of Ireland were consulted to identify potential subterranean bat sites within a 10 km radius centred on Irish Grid Reference S 34607 66354 within the Proposed Wind Farm, with reference to NatureScot (2021). The National Monuments Database was also reviewed for artificial underground structures, such as souterrains, potentially used by bats. These searches were last updated on 20th October 2026.

Available information on Dunmore Cave was additionally reviewed because of its known importance for bats, notwithstanding its location outside the 10 km search area.

3.2.5.3 National Biodiversity Data Centre Bat Landscape Mapping

The National Biodiversity Data Centre (NBDC) bat landscape suitability mapping was reviewed to provide landscape-scale context for the Proposed Project. This mapping is based on models of bat associations with landscape and habitat characteristics developed by Lundy *et al.* (2011).

Suitability indices for individual species and all species combined were reviewed. These indices represent modelled habitat suitability rather than confirmed species occurrence and were considered alongside the field survey findings.

3.2.6 Additional Projects in the Wider Landscape

Existing, permitted and proposed developments were reviewed to identify those with potential to contribute to cumulative effects on bats. NatureScot (2021) recommends consideration of wind energy developments within 10 km, with a wider area considered where appropriate. A 15 km search buffer from the Proposed Turbines was adopted in accordance with BCI (2026), reflecting documented Irish foraging distances of up to 13.4 km for Leisler's bat. The review drew on the cumulative project list presented in Appendix 2-3 of the EIAR, finalised on 20th October 2026, following the approach described in Section 2.9 of Chapter 2. Wind energy developments and other relevant projects were considered with regard to their location, scale and potential for cumulative effects on bat populations, roosts, commuting routes and foraging habitats in combination with the Proposed Project.

3.3 Field Surveys

3.3.1 Bat Habitat Suitability Appraisal

Bat habitat suitability appraisals were undertaken during site visits throughout 2025 and during multidisciplinary walkover surveys on 26th, 27th and 28th May and 7th August 2026. Habitats within the Proposed Wind Farm were assessed for their suitability to support roosting, foraging and commuting bats. Connectivity of suitable habitats with the wider landscape was also considered.

An assessment of bat habitat along the Proposed Grid Connection was undertaken on 28th May 2026. Further surveys covering the Proposed Grid Connection and Turbine Delivery Route (TDR) accommodation areas were undertaken on 30th July and 7th August 2026. These surveys considered the suitability of habitats within and adjoining the proposed works areas for commuting and foraging bats and identified trees, buildings and other structures, including bridges and culverts, with potential to support roosting bats.

Habitat suitability was assessed with reference to Collins (2023), taking account of habitat structure, extent and connectivity, together with the availability of potential roosting features. The suitability categories and their definitions are presented in **Appendix 1**. The methods used for subsequent assessments of trees and structures are described in Section 3.3.2.

3.3.2 Roost Surveys

3.3.2.1 Preliminary Roost Assessment

Targeted searches for potential bat roosts were undertaken within 200 m plus the rotor radius of proposed turbine locations, following NatureScot (2021). For the Proposed Turbines, the rotor radius is 81.5 m, giving a search distance of 281.5 m. Structures beyond this distance were also considered where identified through the desk study or walkover surveys, taking account of historical roost records and habitat connectivity.

Buildings and other structures were subject to Preliminary Roost Assessments (PRAs) with reference to Collins (2023). Assessments comprised external inspections and, where accessible, internal inspections to identify potential roosting features and evidence of bat use. Evidence sought included live or dead bats, droppings, feeding remains, urine staining, fur oil staining and audible bat sounds. Roosting suitability was assessed using the criteria presented in **Appendix 1**.

Five buildings or structure groups were assessed during the 2025 surveys, as summarised in Table 3-1 and illustrated in Figure 3-1. Assessments considered the individual buildings and potential roosting features within each group. Inspection findings and roosting suitability assessments are presented in Section 4.3.2.

Table 3-1 Buildings and structure groups subject to Preliminary Roost Assessment in 2025

Structure ID	Description	Inspection date(s)	Irish Grid Reference	Nearest Proposed Turbine	Distance to turbine (m)
K22A	Farm Complex comprising farmhouse, sheds and outbuildings	13th May 2025	S 35658 65462	T2	230
K22B	William's Old Farmhouse	13th May 2025	S 35093 65999	T4	380
K22C	Round Tower and adjacent outbuildings	24th April 2025	S 36100 65075	T2	370
K22D	Derelict Stone Building	24th April 2025	S 33651 67026	T7	40
K25A	Farm Shed	1st July 2025	S 35734 65742	T3	150

Six watercourse crossing points along the Proposed Grid Connection were assessed for potential bat roosting features on 28th May 2026. Existing bridges and culverts were examined for features capable of supporting roosting bats and for evidence of bat use. The assessment locations are summarised in Table 3-2, with findings presented in Section 4.3.2.

Table 3-2 Watercourse crossing points assessed for potential bat roosting features on 28th May 2026

Crossing ID	Watercourse	Description	Irish Grid Reference
WC1	Gorteenahilla	Stone culvert	S 37072 68215
WC2	Ballyring Upper	Drain with no evidence of flow recorded	S 37597 69020
WC3	Lisdowney	Stone arch bridge	S 41455 70986
WC4	Unnamed	Culvert	S 36786 67934
WC5	Ballyconra	Stone arch bridge	S 42676 70623
WC6	River Nore	No existing crossing structure	S 43986 71851

3.3.2.2 Ground-Level Tree Assessment

Trees potentially affected by the Proposed Project were assessed during site visits in 2025 and during multidisciplinary walkover surveys in 2026. Assessments also covered the Proposed Grid Connection on 28th May 2026 and the Proposed Grid Connection and TDR accommodation areas during visits on 30th July and 7th August 2026. The assessment included trees within the proposed bat felling buffers and other areas requiring tree felling, pruning or trimming.

Trees were examined from ground level for potential roosting features (PRFs), with reference to Collins (2023) and Andrews (2018). Features sought included rot holes, cavities, cracks and splits, lifted or partially detached bark and other sheltered spaces capable of supporting roosting bats. Evidence of bat use was also sought where features were visible and accessible. Particular attention was given to mature broadleaved trees and trees exhibiting damage, decay or other characteristics associated with the development of PRFs.

Conifer plantation was initially appraised at stand level, considering species composition, age, growth form, structural uniformity and the presence of damaged, decaying or otherwise distinctive trees. This appraisal informed whether individual tree assessments were required. Where the observed characteristics of the plantation indicated an absence of suitable roosting features, a tree-by-tree GLTA was not undertaken. Broadleaved trees and any trees exhibiting potential roosting features were considered separately from the general plantation appraisal.

The findings of the tree assessments are presented in Section 4.3.2.

3.3.2.3 Emergence Surveys

Dusk emergence surveys were undertaken in 2025 at the Farm Complex (K22A) and Round Tower (K22C), following the preliminary roost assessments. The surveys aimed to identify bats emerging from the structures and establish their species, numbers and emergence points. The Farm Complex was surveyed on three occasions and the Round Tower on one occasion. All surveys were undertaken in suitable weather conditions. Survey effort and weather conditions are summarised in Table 3-3.

Survey effort was informed by the preliminary roost assessments and Collins (2023). For structures where roost presence has not been established, Collins (2023) recommends a minimum of one dusk emergence survey for *Low* suitability, two for *Moderate* suitability and three for *High* suitability to provide confidence in a negative result. Structures assessed as having *None* or *Negligible* roosting suitability, with no evidence of bat use, were not subject to emergence surveys.

Two surveyors attended each survey and were positioned to observe different elevations and potential bat access points. At the Farm Complex, observations covered different buildings and elevations within the group. Surveyors used Batlogger M full-spectrum bat detectors (Elekon AG, Lucerne, Switzerland), supported by thermal imaging equipment. Surveys generally commenced approximately 15 minutes before sunset and continued for at least 90 minutes after sunset. Exact survey times are provided in Table 3-3.

Bat activity, emergence locations and relevant behaviour were recorded, and acoustic recordings were retained for subsequent analysis. Thermal footage was reviewed to identify and count emergence events. Bats observed flying around a structure were distinguished from bats confirmed emerging from it. Species identifications were informed by acoustic recordings and field observations where these could be associated with an observed emergence. Where species identity could not be established confidently, emergence records were retained without assigning a species.

Table 3-3 Dusk emergence survey effort and weather conditions in 2025

Date	Structure ID	Surveyors	Start	End	Sunset	Weather conditions
13th May 2025	K22A	DC, MG	20:58	22:55	21:17	**Start:** 16°C, dry, calm, 25% cloud cover. **End:** 13°C, dry, calm, 25% cloud cover
1st July 2025	K22A	DC, KL	21:34	23:47	21:57	**Start:** 19°C, dry, calm, 80% cloud cover. **End:** 13°C, dry, light breeze, 30% cloud cover.
14th July 2025	K22C	MG, CR	21:30	23:15	21:47	**Start:** 14°C, dry, calm, 100% cloud cover.

						End: 13°C, dry, light breeze, 100% cloud cover.
26th August 2025	K22A	SF, MG	20:15	22:01	20:31	**Start:** 16°C, light drizzle, calm, 80% cloud cover. **End:** 13°C, dry, calm, 80% cloud cover.

3.3.3 Night-time Bat Walkover

Night-time bat walkover (NBW) surveys were undertaken on four occasions in 2025 following dusk emergence surveys. Representative routes were selected across the Proposed Wind Farm to identify bat species using the Site, observe commuting and foraging behaviour and identify habitat features of importance to bats. Routes were informed by the proposed turbine layout, desk study findings and daytime walkover surveys, taking account of access and health and safety considerations. Routes generally followed existing roads and tracks.

Routes were walked by two surveyors equipped with Batlogger M full-spectrum bat detectors (Elekon AG, Lucerne, Switzerland). Bat observations, including the number of bats observed, behaviour and associated habitat features, were recorded. Acoustic recordings were retained for subsequent analysis to confirm species identifications.

NBW surveys commenced following completion of the emergence surveys. All surveys were undertaken in suitable weather conditions. Survey effort and weather conditions are summarised in Table 3-4. The routes surveyed are illustrated in Figure 3-1.

Table 3-4 Night-time bat walkover survey effort and weather conditions in 2025

Date	Surveyors	Sunset	Start	End	Weather conditions	Route length (km)
13th May 2025	DC, MG	21:17	22:55	00:25	13°C, dry, calm, 25% cloud cover	3.8
1st July 2025	DC, KL	21:57	23:47	00:42	13°C, dry, light breeze, 30% cloud cover	5.0
14th July 2025	MG, CR	21:47	23:15	00:45	13°C, dry, light breeze, 100% cloud cover	1.8
26th August 2025	SF, MG	20:31	22:01	23:30	13°C, dry, calm, 80% cloud cover	7.1

635000

665000

T7

Derelict Stone Building

T8

T9

T6

T10

T5

T4

William's Old Farmhouse

T3

Farm Shed

Farm Complex

T2

Round Tower and adjacent outbuildings

T1

0 0.5 1 km

635000

Map Legend

- EIAR Site Boundary
- Turbine Layout
- Structures Inspected
- Spring NBW Route (13th May 2025)
- Summer NBW Route (1st July 2025)
- Summer NBW Route (14th July 2025)
- Autumn NBW Route (26th August 2025)

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

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SITE LOCATION - NOT TO SCALE

Drawing Title
Survey Effort 2025

Project Title
Killoshulan Wind Farm, Co. Kilkenny

Project No.	Drawing No.	Scale
260172	3-1	1:15,000
Drawn By	Checked By	Date
AMcL	TM	27/10/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

3.3.4 Ground-level Static Surveys

NatureScot (2021) recommends detector coverage at proposed turbine locations, with ten locations plus approximately one-third of the additional turbine locations sampled for developments exceeding ten turbines. At the commencement of the surveys, 11 potential turbine locations were under consideration, and a detector was deployed at each location. The turbine layout was subsequently revised to ten turbines.

Automated bat detectors were deployed for a minimum of 10 nights in spring (April–May), 20 nights in summer (June–mid-August) and 10 nights in autumn (mid-August–October), in line with NatureScot (2021) recommendations and the additional survey effort recommended by NIEA (2021) for medium-risk wind farm sites. Detector locations were based on indicative turbine locations. The static detector locations, relative to the final proposed layout, are shown in Figure 3-2 and detailed in Table 3-5.

Table 3-5 Ground-level static detector locations, habitat context and corresponding turbines in the current Proposed Wind Farm layout

Detector ID	Location (Irish Grid Reference)	Habitat	Linear Feature within 50 m	Corresponding/ Nearest Turbine
D01	S 35750 64811	Improved agricultural grassland - **GA1**	Hedgerows - **WL1**	T01
D02	S 35888 65335	Improved agricultural grassland - **GA1**	Treelines - **WL2**	T02
D03	S 35786 65840	Improved agricultural grassland - **GA1**	Hedgerows - **WL1**	T03
D04	S 34849 66005	Improved agricultural grassland - **GA1**	Treelines - **WL2**	T04
D05	S 34847 66250	Improved agricultural grassland - **GA1**	Conifer plantation edge - **WD4**	T04
D06	S 33850 66209	Conifer plantation - **WD4**	None	T05
D07	S 33859 66609	Conifer plantation - **WD4**	None	T06
D08	S 33636 67031	Conifer plantation - **WD4**	None	T07
D09	S 34701 67087	Conifer plantation - **WD4**	None	T08
D10	S 35313 66882	Improved agricultural grassland - **GA1**	Hedgerows - **WL1**	T09
D11	S 35655 66458	Conifer plantation - **WD4**	None	T10

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.

On-site weather monitoring was undertaken concurrently with static detector deployments using a Vantage Pro 2 weather station (Davis Instruments, USA). Review of the recorded wind data identified consistently low values and repeated zero readings, raising concerns regarding their reliability and a possible equipment fault. Hourly weather observations were therefore obtained from Met Éireann's Oak Park station, Co. Carlow, the nearest identified operational synoptic station providing the required historical data, approximately 40 km from the Proposed Wind Farm. These data were used to provide a regional assessment of weather conditions during the recording periods. Differences in location and exposure mean that the station observations may not represent conditions at the Site.

Nights with favourable weather were identified with reference to NatureScot (2021), using a mean night-time wind speed of ≤5 m/s, a temperature of ≥10°C at the hourly observation nearest sunset and no heavy or persistent rainfall. Survey effort and the number of nights with favourable weather conditions are summarised in Table 3-6.

Table 3-6 Ground-level static detector survey periods and nights with favourable weather conditions.

Season	Survey period	Recording nights per detector	Recording nights with favourable weather conditions
Spring	24th April – 12th May 2025	19	19
Summer	1st July – 29th July 2025	29	27
Autumn	26th August – 17th September 2025	23	19
Total		71	65

635000

665000

N

T7 D08

T8 D09

T9 D10

T6 D07

D11 T10

D06 T5

D05 T4

D04

D03 T3

T2 D02

T1 D01

0 0.5 1 km

Map Legend

- EIAR Site Boundary
- Turbine Layout
- Static Detector Locations 2025

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

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N

SITE LOCATION - NOT TO SCALE

Drawing Title
Static Detector Locations 2025

Project Title
Killoshulan Wind Farm,
Co. Kilkenny

Project No.	Drawing No.	Scale
260172	3-2	1:15,000
Drawn By	Checked By	Date
AMcL	TM	28/10/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

3.4 Bat Call Analysis

All sound recordings were analysed using Kaleidoscope Pro v.5.6.8 (Wildlife Acoustics, MA, USA). The aim was to identify, to species or genus level, the bats recorded within the survey area. All recordings were initially processed using the Auto ID function within Kaleidoscope, with the species selection restricted to 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 descriptions to support manual verification of species identification (Russ, 2012; 2021). All recordings were subsequently manually reviewed within Kaleidoscope to determine the final species or species-group 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 difficulty in reliably distinguishing these species using echolocation parameters alone (Russ, 2012; 2021). The echolocation calls of soprano pipistrelle (*Pipistrellus pygmaeus*) and common pipistrelle (*Pipistrellus pipistrellus*) are more readily distinguished by the peak frequency of maximum energy in search-phase calls, typically approximately 55 kHz and 45 kHz respectively (Jones & van Parijs, 1993). Species identification considered the overall call characteristics rather than frequency alone.

Plate 3-1 presents typical spectrograms of pipistrelle echolocation calls recorded using an SM4BAT detector and displayed in Kaleidoscope.

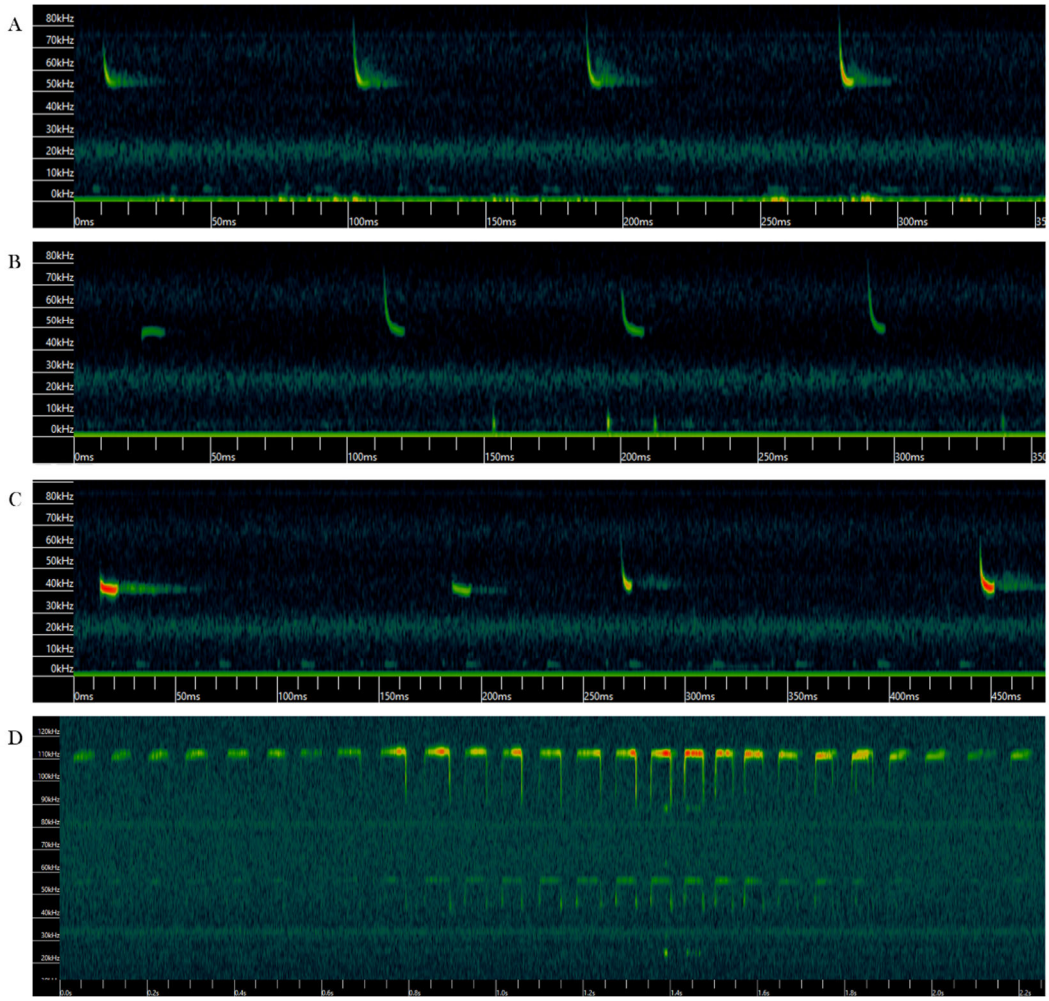


Plate 3-1 Spectrogram of echolocation pulses of (A) Soprano pipistrelle (Peak Frequency 55kHz), (B) Common pipistrelle (Peak Frequency 45kHz), (C) Nathusius' pipistrelle (Peak Frequency 39kHz) and (D) Lesser horseshoe bat (Peak Frequency 114kHz).

Echolocation calls by brown long-eared bats (*Plecotus auritus*) are intrinsically quiet and hard to record by static equipment while echolocation calls by Lesser horseshoe bats (*Rhinolophus hipposideros*) are directional and can be missed by detectors, particularly manual detectors. To address this, MKO employs omni-directional microphones to limit under-recording for the latter species. Manual checking of recorded data includes also those labelled by the Kaleidoscope software as 'Noise' files and 'No ID' files. Manually verifying and checking these files ensures that all calls for hard to detect species have been captured. Despite manual checking, a level of underrepresentation is still expected for these two species, and this is accounted for in the assessment of activity levels. Plate 3-2 shows typical spectrograms of echolocation pulses for *Myotis* spp., brown long-eared bat, Leisler's bat and a typical noise file, all recorded with the same SM4BAT recording device and illustrated using Wildlife Acoustics Kaleidoscope software.

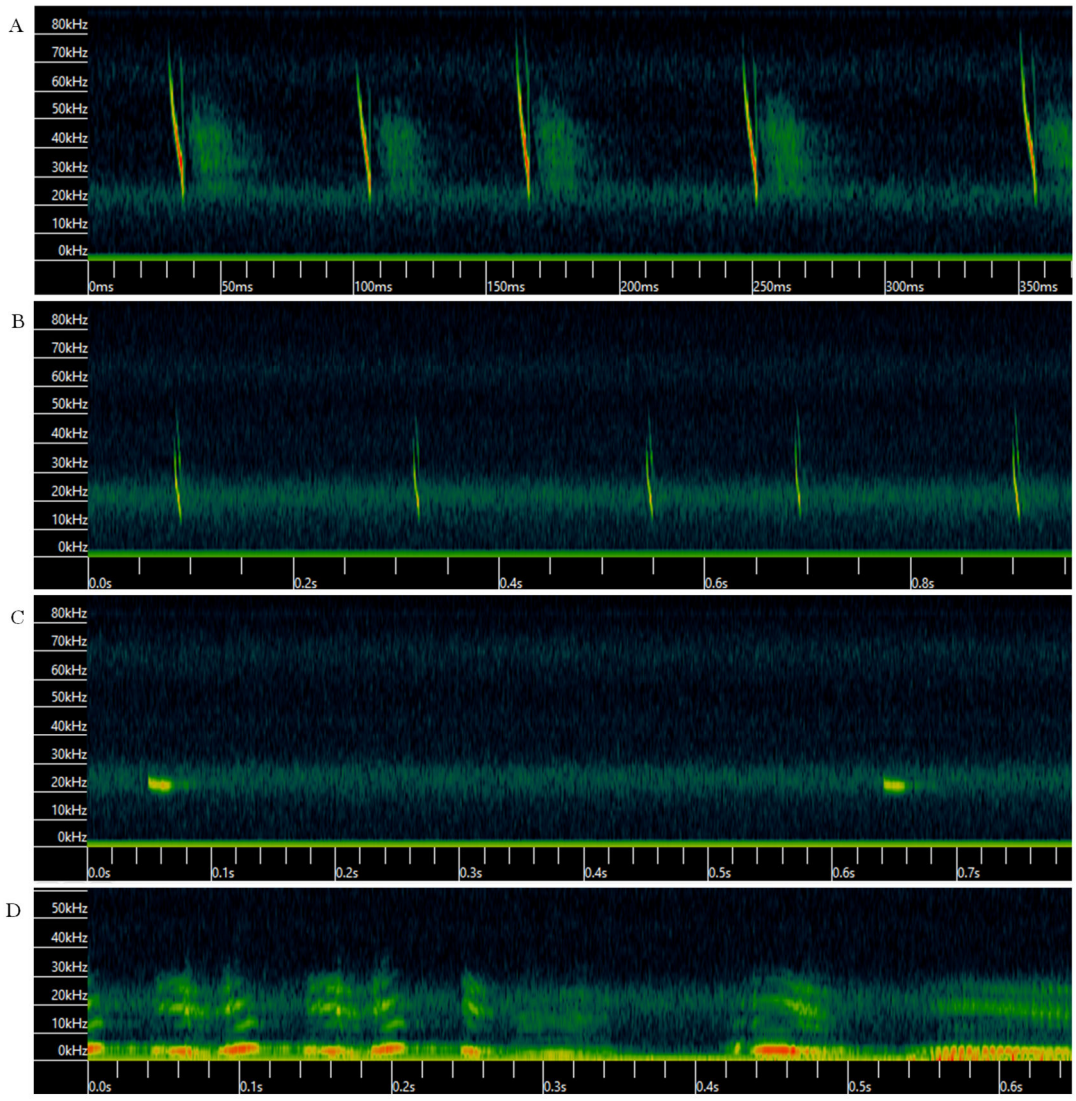


Plate 3-2 Spectrogram of typical echolocation pulses of (A) Myotis spp., *(B) Brown long-eared bat, (C) Leisler's bat and (D) typical non-bat sounds.*

Individual bats of the same species cannot be distinguished by their echolocation alone. Thus, 'bat passes' was used as a measure of activity (Collins, 2023). A bat pass was defined as a recording of an individual species/species group's echolocation containing at least two echolocation pulses and of maximum 15s duration. All bat passes recorded in the course of this study follow these criteria, allowing comparison. In some cases, more than one bat pass is within the same recording file, in such cases the final species identification of the file is assigned to the rarer or harder to record bat species of Ireland. This protocol minimises the risk of under-representing the less frequently encountered taxon in multi-bat pass recordings. This precautionary treatment ensures that activity indices are not biased toward more common, highly detectable species and supports a conservative interpretation of potential impacts within the Environmental Impact Assessment Report.

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

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

Table 3-7 Site-specific bat activity categories and thresholds expressed as bat passes per hour (bpph)

Activity level	Common and soprano pipistrelle	Leisler's bat	*Myotis* spp.	Brown long-eared bat
Low	<14.46	<1.08	<3.20	<0.30
Moderate	14.46–43.38	1.08–3.25	3.20–9.60	0.30–0.90
High	>43.38	>3.25	>9.60	>0.90

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

A weighted site-specific activity score was also calculated for each detector and season. This method integrates the relative contribution of *Low*, *Moderate* and *High* activity records using a weighted mean approach, where numeric weights of 1 (*Low*), 2 (*Moderate*) and 3 (*High*), were applied to the number of records falling within each activity class. The weighted mean score was then rescaled and converted into a five-tier ranked activity scale, as shown in Table 3-8. This approach ensures that detectors with a higher proportion of moderate and high activity records receive proportionately higher ranked scores, rather than relying solely on maximum values. This ranked system provides a five-class site-specific activity framework aligned in terminology with commonly used bat activity classifications but is derived entirely from absolute site-specific bpph values rather than from regional percentile comparison. These ranked scores are applied within the subsequent collision risk and impact assessment to provide a consistent and transparent basis for comparative risk evaluation across detector locations and seasons.

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

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

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

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

3.5 Assessment of Collision Risk

3.5.1 Population Risk

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

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

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

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

Low Population Vulnerability	Medium Population Vulnerability	High Population Vulnerability

3.5.2 Site Risk

The likely impact of a proposed wind farm on bats is related to site-based risk factors, including habitat and development features. The cross-tablature result of habitat risk and project size determines the site risk (i.e. Low, Medium or High) (Table 3-10) i.e. Table 3a (NatureScot, 2021). Table 6-1 in the results section describes the criteria and site-specific characteristics used to determine an indicative risk level for the Proposed Wind Farm. All site assessment levels, as per NatureScot (2021) are presented in **Appendix 2**.

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

	Project Size

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

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

3.5.3 Overall Risk Assessment

An overall collision-risk assessment was undertaken separately for each high-collision-risk species by combining the site-risk score with the site-specific ranked activity score, using the matrix presented in Table 3-11, adapted from Table 3b of NatureScot (2021). Median and maximum activity were assessed separately to characterise typical activity and activity peaks. The resulting risk scores were interpreted alongside species' population vulnerability, roost locations and spatial and seasonal activity patterns (**Appendix 3**).

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

	Site-specific ranked activity category					
Site Risk Level	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)

3.6 Limitations

A comprehensive suite of bat surveys was undertaken at the Proposed Wind Farm in 2025 with further habitat and roosting assessments undertaken in 2026 along the Proposed Grid Connection and within the TDR accommodation areas with reference to NatureScot (2021). Together, these surveys provide the information necessary to inform a comprehensive and robust assessment of the potential effects of the Proposed Project on bat receptors.

Concerns regarding the reliability of the on-site weather records, limited their use in assessing weather conditions during the static detector surveys. This was addressed by obtaining a complete dataset of hourly wind speed, temperature and rainfall observations from Met Éireann's Oak Park station, approximately 40 km from the Proposed Wind Farm. These observations enabled a consistent review of weather conditions across all recording periods. Differences in location and exposure mean that they provide an indication of conditions rather than direct measurements at the Site.

The extended deployment periods provided coverage across a range of weather conditions in spring, summer and autumn. All 11 detectors operated throughout these periods, with no detector failures recorded.

The information presented in this report describes the baseline environment, assesses the likely effects of the Proposed Project, prescribes mitigation where necessary and identifies the predicted residual effects. The limitation described above has been considered in interpreting the findings and assessing potential effects. Overall, a comprehensive assessment has been achieved.

4. RESULTS

4.1 Scoping and Consultation

4.1.1 Bat Conservation Ireland

No response was received from Bat Conservation Ireland (BCI) to the scoping exercise undertaken in May 2026.

4.1.2 National Parks and Wildlife Service

Written correspondence received on 12th May 2026 confirmed that the Development Applications Unit (DAU) had forwarded the scoping information to the National Parks and Wildlife Service (NPWS) for review. No further written scoping response was received.

An online consultation meeting was subsequently held with NPWS representatives on 9th June 2026 to discuss the Proposed Project, the ecological surveys undertaken and their key findings.

In relation to bats, NPWS noted that the closure of gaps in hedgerow canopies and the reinstatement of breaks in habitat connectivity following construction, where feasible, would benefit bat foraging activity. During the meeting, MKO outlined that the proposed hedgerow planting would seek to establish a connected network of linear habitat features, directing bat activity away from proposed turbine locations and towards lands to the west of the Proposed Wind Farm, where an established network of mature hedgerows is present.

4.1.3 An Coimisiún Pleanála

Pre-application consultation meetings were held with representatives of An Coimisiún Pleanála (ACP) on 22nd June and 15th September 2026. The following matters relevant to bats were raised:

- The potential effects of lighting on bats during both the construction and operational phases of the Proposed Project should be considered, alongside cumulative and in-combination effects.
- The potential fragmentation of an existing bat foraging route along a hedgerow by a proposed access road was discussed. ACP advised that the assessment should consider both short- and long-term effects on habitat connectivity, including an estimate of the time required for replacement hedgerow planting to achieve comparable height and coverage to the existing hedgerow.
- The potential creation of new edge habitats within conifer plantations as a result of construction activities, and the implications for bat activity and collision risk, should be considered in the assessment.
- ACP requested that all ecological surveys be undertaken in accordance with relevant best-practice guidance.

The ecological surveys were undertaken in accordance with relevant best-practice guidance, as described in Section 3 of this report. The other matters raised by ACP are addressed in the assessment of potential effects on bats in Section 5 and the mitigation and monitoring measures in Section 6.

4.2 Desk Study

4.2.1 Previous Baseline Survey (2022)

Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat, Nathusius' pipistrelle and *Myotis* spp. were recorded during manual and static detector surveys undertaken in 2022. Common

pipistrelle was the most frequently recorded species during both survey types, followed by soprano pipistrelle and Leisler's bat. *Myotis* spp., brown long-eared bat and Nathusius' pipistrelle were recorded less frequently.

The preliminary roost assessments identified five structures or structure groups with *Moderate* roosting suitability and two with *Low* suitability, following Collins (2016). Subsequent emergence and re-entry surveys confirmed roosts within the Farm Complex (K22A), the outbuildings adjacent to the Round Tower (K22C), and the inhabited dwelling (K22E). The findings are summarised in Table 4-1.

Table 4-1 Preliminary roost assessment and emergence/re-entry survey results for structures assessed in 2022

Structure ID	Description	Irish Grid Reference	Roosting Suitability (Collins, 2016)	Emergence / Re-entry Survey Date	Inspection and Emergence / Re-entry Results
K22A	Farm Complex – farmhouse, sheds and outbuildings	S 35658 65462	*Moderate*	27th July 2022 – Emergence Survey	A common pipistrelle roost was confirmed within the Farm Complex, with three individuals recorded during the emergence survey.
K22B	William's Old Farmhouse	S 35093 65999	*Low*	28th July 2022 – Re-entry Survey	No bat re-entry was observed and no roost was confirmed during the survey.
K22C	Round Tower and Outbuildings	Round Tower: S 36100 65075 Outbuildings: S 36094 65066	*Moderate*	Round Tower: 15th September 2022 – Emergence Survey Outbuildings: 27th July 2022 – Emergence Survey	No emergence observed from the Round Tower in September. No bats were observed emerging from the Round Tower during the September survey. A brown long-eared bat roost was confirmed within the adjacent outbuildings during the July survey, with four individuals recorded.
K22D	Derelict Stone Building	S 33651 67026	*Low*	27th July 2022 – Emergence Survey	No bat emergence was observed and no roost was confirmed during the survey.
K22E	Inhabited Dwelling	S 32318 63915	*Moderate*	28th July 2022 – Re-entry Survey	A common pipistrelle roost was confirmed within

					the dwelling, with two individuals recorded during the re-entry survey.
K22F	Derelict Farmhouse	S 32377 63960	*Moderate*	19th July 2022 – Emergence Survey	No bat emergence was observed and no roost was confirmed during the survey.
K22G	Unoccupied Dwelling	S 33926 64381	*Moderate*	1st June and 19th July 2022 – Emergence Surveys	No bat emergence was observed and no roost was confirmed during either survey.

Three roost locations were confirmed during the 2022 surveys: the Farm Complex (K22A), outbuildings adjacent to the Round Tower (K22C), and the dwelling at K22E. The proximity of the confirmed 2022 roost locations to relevant components of the current Proposed Project is presented in Table 4-2. These historical roost records are considered in the assessment of potential effects associated with the current Proposed Project.

Table 4-2 Confirmed roost locations recorded in 2022 and distances to current proposed project components

Structure ID	Confirmed Roost Location	Nearest Proposed Turbine	Distance to Turbine (m)	Other Relevant Project Component	Distance to Component (m)	EIAR Site Boundary Context
K22A	Farm Complex – farmhouse, sheds and outbuildings	T2	230	Access road	220	Within the Site
K22C	Round Tower and outbuildings group	T2	370	Access road	280	Outside of the Site
K22E	Inhabited Dwelling	T5	2,700	TDR accommodation works	130	Outside of the Site

4.2.2 Bat Records

Bat Conservation Ireland

Seven bat species were represented in the records, comprising common, soprano and Nathusius' pipistrelles, together with Leisler's, brown long-eared, Daubenton's and Natterer's bats. Additional records were identified only to genus level as *Myotis* spp. or *Pipistrellus* spp.

Two roost records were identified. A common pipistrelle roost at a private location was approximately 5 km from T5, while a Daubenton's bat roost at Lismaine Bridge was approximately 8 km from T2. These distances reflect the approximate locations provided by the 1 km grid references.

The roost records are presented in Table 4-3, with eight transect records and twenty ad-hoc records presented in Table 4-4.

Table 4-3 BCI roost records within the 10 km search area

Species	Irish Grid Reference	Nearest Relevant Project Component	Approximate Distance (km)
Common pipistrelle (*Pipistrellus pipistrellus*)	S 29000 64000	T5	5
Daubenton's bat (*Myotis daubentonii*)	S 44000 66000	T2	8

Records were supplied at 1 km grid-square precision. Distances are approximate and do not represent verified distances from the exact roost locations.

Table 4-4 BCI transect and ad-hoc records within the 10 km search area

Record Type	Species	Irish Grid Reference	Record Date	Location / Dataset
Transect	Daubenton's bat	S 44105 66004	-	Lismaine Bridge Transect
	Common pipistrelle, soprano pipistrelle, Leisler's bat, *Pipistrellus* spp.	S 39300 64700	-	S15 (1) 2005
	Common pipistrelle, *Pipistrellus* spp., Leisler's bat	S 32600 72500	-	S15 (19) 2005–2008
	Common pipistrelle, *Pipistrellus* spp., Leisler's bat, soprano pipistrelle, *Myotis* spp.	S 35400 62800	-	S15 (2) 2005
	Common pipistrelle, Leisler's bat	S 37200 74200	-	S15 (20) 2005–2008
	Common pipistrelle, soprano pipistrelle, *Pipistrellus* spp., Leisler's bat, brown long-eared bat, Nathusius' pipistrelle	S 35400 60000	-	S15 (3) 2005
	Common pipistrelle, Leisler's bat, *Pipistrellus* spp., soprano pipistrelle	S 34500 58200	-	S15 (4) 2005
	Common pipistrelle, Leisler's bat, *Myotis* spp., soprano pipistrelle, *Pipistrellus* spp.	S 28600 57100	-	S15 (7) 2005
Ad-hoc	Common pipistrelle, soprano pipistrelle, Leisler's bat, *Myotis* spp.	S 28000 63800	04/07/2009	BATLAS 2010
	Common pipistrelle, Leisler's bat	S 26900 58400	08/08/2009	BATLAS 2010
	Soprano pipistrelle, Leisler's bat	S 37700 56800	08/08/2009	BATLAS 2010
	Soprano pipistrelle, brown long-eared bat	S 32700 62100	08/08/2009	BATLAS 2010
	Common pipistrelle, soprano pipistrelle, Leisler's bat	S 35700 68600	08/08/2009	BATLAS 2010
	Common pipistrelle, soprano pipistrelle	S 41903 56312	22/09/2018	BATLAS 2020
	Common pipistrelle, soprano pipistrelle	S 41899 56353	22/09/2018	BATLAS 2020
	Common pipistrelle, soprano pipistrelle, Leisler's bat, Nathusius' pipistrelle	S 37715 56881	21/09/2018	BATLAS 2020
	Leisler's bat	S 34334 58436	21/09/2018	BATLAS 2020
	Common pipistrelle	S 34397 61996	11/08/2018	BATLAS 2020
	Common pipistrelle, brown long-eared bat, Natterer's bat	S 36893 63217	11/08/2018	BATLAS 2020
	Common pipistrelle	S 40581 64716	11/08/2018	BATLAS 2020
	Common pipistrelle, Leisler's bat	S 44904 70846	05/09/2018	BATLAS 2020
	Common pipistrelle, soprano pipistrelle, Leisler's bat, Daubenton's bat, brown long-eared bat	S 44407 70905	05/09/2018	BATLAS 2020

	Common pipistrelle	S 26900 58300	14/09/2019	BATLAS 2020
	Common pipistrelle, soprano pipistrelle, brown long-eared bat, Leisler's bat	S 43300 63350	29/05/2007	Consultancy Surveys
	Leisler's bat	S 25200 63500	01/06/2004	Consultancy Surveys
	Pipistrellus spp.	S 39200 66100	30/05/2021	National Biodiversity Data Centre Bat Records
	Daubenton's bat	S 44500 71100	14/06/2022	National Biodiversity Data Centre Bat Records
	Pipistrellus spp.	S 44600 71100	08/11/2021	National Biodiversity Data Centre Bat Records

National Biodiversity Data Centre

The NBDC records included six bat species, comprising common and soprano pipistrelles together with Leisler's, brown long-eared, Daubenton's and Natterer's bats. These records are summarised in Table 4-5.

Table 4-5 NBDC bat records from 10 km grid squares intersecting the search area

10 km Grid Square(s)	Species	Legal Protection
S36/S37/S27/S26/S46/S47	Common Pipistrelle (*Pipistrellus pipistrellus*)	HD Annex IV, WA
S37/S27/S26/S46/S47	Soprano Pipistrelle (*Pipistrellus pygmaeus*)	HD Annex IV, WA
S36/S37/S27/S26/S46/S47	Leisler's Bat (*Nyctalus leisleri*)	HD Annex IV, WA
S36/S37/S46/S47	Brown Long-eared Bat (*Plecotus auritus*)	HD Annex IV, WA
S37/S27/S26/S46/S47	Daubenton's Bat (*Myotis daubentonii*)	HD Annex IV, WA
S36/S46/S47	Natterer's Bat (*Myotis nattereri*)	HD Annex IV, WA

Source: National Bat Database of Ireland, accessed through NBDC. HD Annex IV = Annex IV of the EU Habitats Directive; WA = Wildlife Acts, as amended.

Lesser Horseshoe Bat Database

No lesser horseshoe bat roost records were identified within the 10 km search area.

4.2.3 Bat Species Range

The Proposed Wind Farm lies within the mapped ranges of common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat, Daubenton's bat and Natterer's bat (NPWS, 2025). It lies outside the mapped ranges of lesser horseshoe bat, Nathusius' pipistrelle and whiskered bat. The Proposed Wind Farm is not located at the edge of any of the mapped species' ranges.

4.2.4 Designated Sites

Lesser horseshoe bat is the only bat species for which SACs are designated in Ireland. The Proposed Wind Farm lies outside its mapped range (NPWS, 2025). No SACs, NHAs or pNHAs designated for the conservation of bats were identified within the 10 km search area.

4.2.5 Landscape Features

The landscape within the Proposed Wind Farm is predominantly characterised by agricultural grassland and commercial conifer plantation. Hedgerows, treelines, woodland and forestry edges, scrub and watercourses provide potential commuting and foraging connections within the Site and to the wider landscape. Buildings, agricultural outbuildings and stone structures provide potential roosting opportunities. The findings of field assessments of these features are presented in Section 4.3.

The Proposed Grid Connection follows predominantly existing roads and agricultural land, with adjoining hedgerows, treelines, woodland and watercourses providing potential habitat connections. Similar linear features occur within and adjacent to the TDR accommodation areas. These features are relevant to the assessment of potential habitat loss, fragmentation and disturbance associated with the proposed works.

Underground Sites

The GSI mapping review did not identify subterranean features within the Proposed Wind Farm. However, the UBSS cave database identified a pothole approximately 40 m deep at Irish Grid Reference S 34095 65810 (O'Keefe et al., 1995). This was the only underground feature identified within the 10 km search area. The feature lies outside the EIAR Site Boundary, approximately 350 m from proposed turbine T5, the nearest component of the Proposed Project. Access to the feature was restricted by dense conifer plantation, and its suitability for roosting bats could not be established.

The National Monuments Database review did not identify artificial underground structures within the Proposed Wind Farm.

Dunmore Cave is located approximately 14.6 km from the Proposed Project, outside the 10 km desk-study search area. Available information identifies the cave as an important bat roosting and autumn swarming site, with Daubenton's bat, Natterer's bat and brown long-eared bat recorded. *Myotis* spp. and brown long-eared bat were also recorded during the project surveys; however, these records do not establish the origin of individual bats or demonstrate a connection with the cave. The potential relevance of Dunmore Cave is considered in the assessment, taking account of the species recorded, the intervening landscape and potential pathways for effects.

Bat Landscape Suitability

The combined bat landscape suitability indices ranged from 20.56 to 27.22 across the Proposed Wind Farm, indicating relatively lower modelled suitability within the national range. These modelled results provide landscape-scale context and do not exclude locally important roosting, commuting or foraging features.

4.2.6 Additional Projects in the Wider Landscape

Table 4-6 provides an overview of existing, permitted and proposed wind energy developments located within 15 km of the Proposed Turbines. These developments were identified to inform consideration of potential cumulative effects.

Table 4-6 Wind energy developments within 15 km of the Proposed Turbines

Wind Farm	Status	No. of Turbines	Turbine Tip Height (m)	Distance to Nearest Proposed Turbine (km) [1]
Within 5 km				
Gathabawn Wind Farm	Proposed	12	150–170	2.4
Lisdowney Wind Farm	Existing	4	121.5	4.5

Within 5–10 km				
Ballybay Wind Farm	Existing	6	110	8.4
Seskin Wind Farm	Proposed	8	175	8.9
Lisheen Wind Farm III	Existing	8	169	9.8
Foyle Wind Farm Extension	Permitted	3	121	9.9
Within 10–15 km				
An Cnoc Wind Farm	Existing	5	93.5–99.5	10.1
Foyle Wind Farm	Existing	4	121	10.4
Bruckana Wind Farm	Existing	14	150	10.6
Lisheen Wind Farm II	Existing	12	140	10.8
Briskalagh Wind Farm	Permitted	7	185	10.8
Lisheen Wind Farm I	Existing	18	139	11.5
Littleton Wind Farm	Proposed	11	200	13.3
Farranrory Wind Farm	Permitted	9	156.5	13.4
Gurteen Lower Single Wind Turbine	Existing	1	99.5	14.1
Ballynalacken Wind Farm	Permitted	12	142.5–155	14.7

[1]*Distances represent the minimum separation between a turbine within each listed development and the nearest Proposed Turbine.*

Additional projects with potential to contribute to cumulative effects on bats within 15 km of the Proposed Turbines

The wider cumulative project list identifies solar energy developments, quarrying and mining developments, industrial developments and associated infrastructure. Those identified within 15 km of the Proposed Turbines with potential to contribute to cumulative effects on bats are listed below. Related planning applications and associated records have been grouped under each development. Distances are approximate and measured to the nearest Proposed Turbine.

- **Planning References: 17669, 2360318 and 2360330** – Solar farm at Ballyconra, Ballyragget, Co. Kilkenny, including an extension of its operational lifespan and associated connection works – **8.02 km**.
- **Planning References: 22126 and 2360330** – Solar farm at Parksgrove and Ballyconra, Ballyragget, Co. Kilkenny, including associated connection works – **8.98 km**. Planning Reference 2360330 covers connection works associated with both this development and the Ballyconra solar farm listed above.
- **Planning Reference: 2360201** – Solar photovoltaic development at Tirlán, Ballyconra, Ballyragget, Co. Kilkenny – **8.73 km**.
- **Planning References: 16634, 2360329 and 2360334** – Solar farm at Talbots Inch and Keatingstown, Co. Kilkenny, including an extension of its operational lifespan and replacement electrical infrastructure – **13.30 km**.
- **Planning Reference: 211128** – Solar photovoltaic development at Cooleeny, Derryfadda and Killoran, Co. Tipperary – **10.54 km**.
- **Planning Reference: 2360097; EIA Portal Code: 2023037** – Continued operation and extension of the dimension stone quarry at Killaree, Threecastles, Co. Kilkenny – **10.28 km**.
- **Planning Reference: 2461036; EIA Portal Code: 2023081** – Extension and continued operation of the limestone quarry at Castletown, Moyne, Co. Tipperary – **12.64 km**.
- **Planning Reference: 21599; EPA Licence Reference: P1166-01** – Recommencement of underground mining and associated works at the former Galmoy Zinc and Lead Mine, including

the Garrylaun development, Co. Kilkenny and Co. Laois – **8.35 km**, based on the planning application location.

The potential for these developments to contribute to cumulative effects on bats is assessed in Section 6.6 of this report.

4.3 Field Surveys

4.3.1 Bat Habitat Suitability Appraisal

Proposed Wind Farm

The Proposed Wind Farm comprises a mosaic of agricultural grassland, commercial conifer plantation and associated habitats. Fourteen habitat types were recorded within the Proposed Wind Farm site:

- Conifer plantation (WD4)
- Improved agricultural grassland (GA1)
- Buildings and artificial surfaces (BL3)
- Wet grassland (GS4)
- Scrub (WS1)
- Hedgerows (WL1)
- Treelines (WL2)
- Stone walls and other stonework (BL1)
- Recolonising bare ground (ED3)
- Spoil and bare ground (ED2)
- Drainage ditches (FW4)
- Eroding/upland rivers (FW1)
- Exposed calcareous rock (ER2)
- Dry calcareous and neutral grassland (GS1)

Further details of the habitats recorded are provided in Chapter 6 of the EIAR. Habitat suitability categories are described in **Appendix 1**.

With regard to foraging and commuting bats, improved agricultural grassland, wet grassland, dry calcareous and neutral grassland, conifer plantation interiors, buildings and artificial surfaces, recolonising bare ground, spoil and bare ground, and exposed calcareous rock were assessed as having *Low* suitability. Improved agricultural grassland is illustrated in Plates 4-1 and 4-2. These habitats generally provide fewer sheltered flight-paths and foraging opportunities than adjoining vegetated boundaries and woodland edges.

Conifer plantation edges, scrub, hedgerows, treelines, stone walls, eroding/upland rivers and drainage ditches were assessed as having *Moderate* suitability for foraging and commuting bats, providing shelter, potential foraging opportunities and connections between habitats. Examples include the vegetated plantation edge in Plate 4-2, the broadleaved treeline in Plate 4-3, the vegetated watercourse corridor in Plate 4-4 and the hedgerows in Plates 4-5 and 4-6.

The conifer plantations primarily comprised Sitka spruce, with occasional Japanese larch. The stands were generally dense and even-aged, with relatively uniform tree structure and an absence of features typically associated with bat roosting, such as cavities, rot holes, lifted bark and splits. These plantations were assessed as having *Negligible* suitability for roosting bats.

No potential roosting features (PRFs) were identified in trees within the proposed bat felling buffers across the Proposed Wind Farm site. This included conifer plantation trees and broadleaved trees within hedgerows and treelines. Detailed tree assessment findings are presented in Section 4.3.2.

Five buildings or structure groups were assessed within and in the vicinity of the Proposed Wind Farm. Two were assessed as having *Moderate* roosting suitability and three as having *Negligible* suitability. Detailed descriptions and preliminary roost assessment findings are presented in Section 4.3.2.



Plate 4-1 Improved agricultural grassland (GA1) with adjoining vegetated field boundaries within the Proposed Wind Farm site.



Plate 4-2 Improved agricultural grassland (GA1) adjoining a conifer plantation (WD4), with broadleaved vegetation along the plantation edge.



Plate 4-3 Broadleaved treeline (WL2) along an agricultural field boundary within the Proposed Wind Farm site.



Plate 4-4 Dense bankside vegetation along the River Foyle, classified as eroding/upland river (FW1), within the Proposed Wind Farm site.



Plate 4-5 Hedgerow (WL1) separating agricultural grassland beside conifer plantation.



Plate 4-6 Hedgerow (WL1) adjoining an existing agricultural access track within the Proposed Wind Farm site.

Proposed Grid Connection

The Proposed Grid Connection comprises the Proposed 110kV Substation and approximately 12.6 km of underground electrical cabling connecting to the existing Ballyragget 110kV Substation at Moatpark, Co. Kilkenny. The underground cabling route predominantly follows existing public roads, with sections crossing agricultural land.

The roads were classified as Buildings and artificial surfaces (BL3), while agricultural fields crossed by the route were classified as Improved agricultural grassland (GA1). Habitats adjoining the route included Dry meadows and grassy verges (GS2), Hedgerows (WL1), Treelines (WL2), Stone walls and other stonework (BL1), Mixed broadleaved woodland (WD1) and Improved agricultural grassland (GA1). Examples of habitats along the route are presented in Plates 4-7 and 4-8.

The Proposed 110kV Substation is located within Improved agricultural grassland (GA1). At the River Nore crossing, the proposed western HDD compound is located within the hard shoulder of the N77, classified as Buildings and artificial surfaces (BL3), while the eastern compound is located within Improved agricultural grassland (GA1).

Road surfaces and improved agricultural grassland were assessed as having *Low* suitability for foraging and commuting bats. Adjoining grassy verges, hedgerows, treelines, woodland, stone walls and vegetated watercourse corridors were assessed as having *Moderate* suitability, providing potential foraging opportunities and connections through the surrounding landscape.

Road surfaces and improved agricultural grassland do not themselves provide roosting opportunities. Six watercourse crossing points were assessed for roosting suitability. Four were assessed as having *Negligible* suitability and two as having *None* suitability. Detailed assessment findings are presented in Section 4.3.2.



Plate 4-7 Existing road corridor (BL3) bordered by grassy verges (GS2) and hedgerows (WL1) along the Proposed 110kV Underground Cabling route.



Plate 4-8 Improved agricultural grassland (GA1) and adjoining hedgerow (WL1) along the Proposed 110kV Underground Cabling route.

Turbine Delivery Route Accommodation Areas

The TDR accommodation areas comprise existing roads and adjoining roadside, agricultural and amenity habitats. Habitats recorded included Buildings and artificial surfaces (BL3), Dry meadows and grassy verges (GS2), Hedgerows (WL1), Treelines (WL2) and Eroding/upland rivers (FW1), with adjoining agricultural and amenity grasslands. Further habitat descriptions are provided in Chapter 6 of the EIAR.

At Location 1, north of Mount Finn Drive in Urlingford, the accommodation area comprises public green space with trees. Location 2, at the L1857–R693 junction in Mountfinn, comprises the existing road corridor and adjoining verges, hedgerows and trees. Location 3, at the R693–R435 junction in Balief Lower and Balief Upper, comprises agricultural land, field boundaries, hedgerows and roadside verges.

Road surfaces and agricultural and amenity grasslands were assessed as having *Low* suitability for foraging and commuting bats. Hedgerows, treelines, grassy verges and vegetated watercourse corridors were assessed as having *Moderate* suitability, providing shelter, potential foraging opportunities and connectivity with the surrounding landscape.

Trees potentially affected by the TDR accommodation works were assessed for potential roosting features. No PRFs were identified in the trees requiring felling, pruning or trimming. Detailed tree assessment findings are presented in Section 4.3.2.

4.3.2 Roost Surveys

4.3.2.1 Preliminary Roost Assessment

Five buildings or structure groups were assessed within and in the vicinity of the Proposed Wind Farm during 2025. Two were assessed as having *Moderate* roosting suitability and three as having *Negligible* suitability. Their locations are shown in Figure 3-1, and the assessment findings are summarised in Table 4-7.

The Farm Complex (K22A) lies within the EIAR Site Boundary. The Round Tower and adjacent outbuildings (K22C) lie outside this boundary. All assessed buildings and structure groups will be retained as part of the Proposed Project.

Table 4-7 Preliminary roost assessment findings for buildings and structure groups assessed in 2025

Structure ID	Description	Irish Grid Reference	Nearest Proposed Turbine	Distance to turbine (m)	Roosting suitability	Preliminary roost assessment findings
K22A	Farm Complex comprising farmhouse, sheds and outbuildings	S 35658 65462	T2	230	*Moderate*	Gaps and crevices in stonework and at roof junctions provided potential roosting opportunities. No evidence of roosting bats recorded.
K22B	William's Old Farmhouse	S 35093 65999	T4	380	*Negligible*	Roofless ruins with exposed stonework and no suitable sheltered roosting features identified. No evidence of roosting bats recorded.
K22C	Round Tower and adjacent outbuildings	S 36100 65075	T2	370	*Moderate*	Crevices and cavities in the Round Tower provided roosting opportunities. Four brown long-eared bats were observed during the internal inspection.
K22D	Derelict Stone Building	S 33651 67026	T7	40	*Negligible*	Roofless, deteriorated building with exposed gaps and crevices offering insufficient shelter. No evidence of roosting bats recorded.
K25A	Farm Shed	S 35734 65742	T3	150	*Negligible*	Open-sided shed with limited enclosure and no

						suitable roosting features identified. No evidence of roosting bats recorded.

K22A – Farm Complex

The Farm Complex is located approximately 230 m from the nearest Proposed Turbine, T2, and approximately 220 m from the proposed access road. It comprises a farmhouse, stone sheds, modern agricultural sheds and ancillary outbuildings, presented as a single structure group.

The buildings vary in construction, including rendered walls, stone masonry, slate and corrugated roofing, and flat-roofed concrete structures. Examples of the buildings within the complex are shown in Plates 4-9 to 4-12.

Gaps and crevices in the stonework and at wall–roof junctions provided potential roosting opportunities. Open doorways and other openings provided access to building interiors. Other parts of the complex, including open agricultural sheds and exposed ancillary structures, offered fewer sheltered roosting opportunities.

The surrounding habitat comprises agricultural grassland, hedgerows and trees connecting the complex to the wider landscape. Taking account of the potential roosting features within its constituent buildings, the Farm Complex was assessed as having *Moderate* roosting suitability. Subsequent emergence survey findings are presented separately.



Plate 4-9 Farmhouse and adjoining shed within the Farm Complex (K22A).



Plate 4-10 Modern agricultural sheds within the Farm Complex (K22A).



Plate 4-11 Flat-roofed concrete outbuildings within the Farm Complex (K22A).



Plate 4-12 Stone shed adjoining the farmhouse within the Farm Complex (K22A).

K22B – William's Old Farmhouse

William's Old Farmhouse is located approximately 380 m from the nearest Proposed Turbine, T4. It comprises the remains of a stone building with no roof and partially collapsed walls. Substantial vegetation growth was present within and around the ruins (Plate 4-13).

Cracks and gaps were identified within the stonework, but these were exposed and did not provide suitable sheltered or enclosed roosting opportunities. No evidence of roosting bats was recorded during the inspection.

The surrounding habitat predominantly comprises improved agricultural grassland. The structure was assessed as having *Negligible* roosting suitability.



Plate 4-13 Exposed stonework of William's Old Farmhouse (K22B).

K22C – Round Tower and Adjacent Outbuildings

The Round Tower and adjacent outbuildings are located outside the EIAR Site Boundary, approximately 370 m from the nearest Proposed Turbine, T2, and approximately 280 m from the proposed access road.

The Round Tower is a free-standing cylindrical structure constructed of stone and mortar. Openings include a ground-level entrance, window openings and an open upper section. Ivy and other vegetation were present on and around the structure. The tower, internal stonework and surrounding walls are illustrated in Plates 4-14 to 4-17.

Internal and external inspection identified cracks, crevices and cavities within the stonework. Four brown long-eared bats were observed roosting in a cavity in the ceiling above the bottom of the stairs on 24th April 2025, confirming occupation of the Round Tower.

The surrounding habitat includes broadleaved woodland containing sycamore and ash. The structure group was assessed as having *Moderate* roosting suitability. The confirmed daytime roost was within the Round Tower. Subsequent emergence survey findings are presented separately.



Plate 4-14 Exterior of the Round Tower within structure group K22C.



Plate 4-15 Gaps and crevices within the Round Tower stonework (K22C).

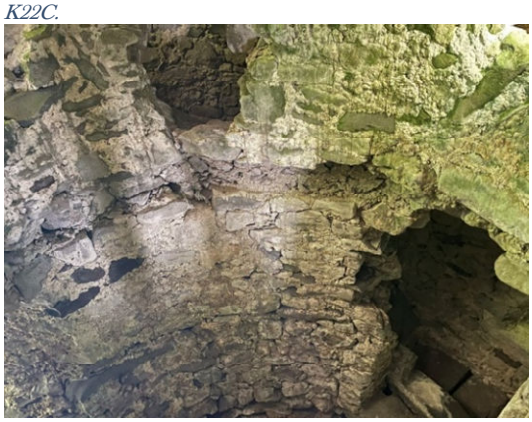


Plate 4-16 Interior of the Round Tower (K22C).



Plate 4-17 Stone walls surrounding the Round Tower (K22C).

K22D – Derelict Stone Building

The Derelict Stone Building is located approximately 40 m from the nearest Proposed Turbine, T7. It comprises the remains of a stone building and associated walls within conifer plantation. The roof is absent, and the remaining walls provide limited enclosure. Vegetation growth was present within and around the ruins (Plates 4-18 to 4-21).

Cracks and crevices were identified within the internal and external stonework. These were assessed as unsuitable for roosting bats because of their exposed nature and the absence of sufficiently sheltered roosting conditions. No evidence of roosting bats was recorded during the inspection.

The structure was assessed as having *Negligible* roosting suitability.



Plate 4-18 Ruinous condition of the Derelict Stone Building (K22D).



Plate 4-19 Exposed external stone walls of the Derelict Stone Building (K22D).



Plate 4-20 Exposed gaps and crevices in the stonework of the Derelict Stone Building (K22D).



Plate 4-21 Further exposed stonework and crevices within the Derelict Stone Building (K22D).

K25A – Farm Shed

The Farm Shed is located approximately 150 m from the nearest Proposed Turbine, T3. It is an open-sided agricultural shed with corrugated roofing and low masonry walls and appeared to be in regular agricultural use (Plate 4-22).

The open sides provided access to the interior but left much of the structure exposed. No suitable sheltered roosting features or evidence of roosting bats were identified during the inspection.

The surrounding habitat comprises improved agricultural grassland with hedgerows along field boundaries. The shed was assessed as having *Negligible* roosting suitability.



Plate 4-22 Open-sided agricultural shed with corrugated roofing and low masonry walls (K25A).

Watercourse Crossings

Six watercourse crossing points along the Proposed Grid Connection were assessed on 28th May 2026. These comprised five EPA-mapped watercourses and one unnamed water feature. The crossing points included bridges, culverts, a drain and the River Nore crossing, where no existing crossing structure was present. Examples of the crossing structures inspected are shown in Plate 4-23 (WC1) and Plate 4-24 (WC3). Assessment findings are summarised in Table 4-8.

Table 4-8 Preliminary roost assessment results for watercourse crossing points along the Proposed Grid Connection

Crossing ID	Watercourse	Irish Grid Reference	Crossing description	Roosting suitability	Inspection findings	Proposed crossing method
WC1	Gorteenahilla	S 37072 68215	Stone culvert	*Negligible*	No suitable sheltered gaps, cavities or crevices were identified in the inspected surfaces. No evidence of roosting bats was recorded.	Flatbed formation over existing crossing
WC2	Ballyring Upper	S 37597 69020	Drain; no evidence of flow recorded	*Negligible*	No suitable sheltered gaps, cavities or crevices were identified in the inspected surfaces. No evidence of roosting bats was recorded.	Flatbed formation over existing crossing
WC3	Lisdowney	S 41455 70986	Stone arch bridge	*Negligible*	No suitable sheltered gaps, cavities or crevices were identified in the inspected surfaces. No evidence of roosting bats was recorded.	Flatbed formation over existing crossing

WC4	Unnamed water feature[1]	S 36786 67934	Culvert	*Negligible*	No suitable sheltered gaps, cavities or crevices were identified in the inspected surfaces. No evidence of roosting bats was recorded.	Flatbed formation over existing crossing
WC5	Ballyconra	S 42676 70623	Stone arch bridge	*None*	No features capable of supporting roosting bats were identified within the inspected structure. No evidence of roosting bats was recorded.	Horizontal Directional Drilling
WC6	River Nore	S 43986 71851	No existing crossing structure	*None*	No existing crossing structure was present to provide structural roosting opportunities.	Horizontal Directional Drilling



Plate 4-23 Stone culvert at WC1 on the Gorteenahilla watercourse.



Plate 4-24 Stone arch bridge at WC3 on the Lisdowney watercourse.

4.3.2.2 Ground-Level Tree Assessment

Trees affected by the Proposed Project predominantly comprised commercial conifer plantation trees, together with broadleaved trees within hedgerows and treelines. Felling is required to accommodate turbine foundations, hardstanding areas, access roads and the proposed bat felling buffers. Additional felling, pruning or trimming is required within the TDR accommodation areas.

The affected conifer plantation stands primarily comprised Sitka spruce, with occasional Japanese larch. The stands were generally dense and even-aged, with relatively uniform tree structure and an absence of features typically associated with bat roosting, such as cavities, rot holes, lifted bark and splits. These stands were assessed as having *Negligible* roosting suitability.

Limited sections of the proposed access roads cross hedgerows and treelines. No potential roosting features (PRFs) were identified in the affected broadleaved trees within these linear features. No PRFs were identified in conifer or broadleaved trees within the proposed bat felling buffers. Other wind farm infrastructure is predominantly located within improved agricultural grassland (GA1) and conifer plantation (WD4).

No PRFs were identified in trees affected by the Proposed Grid Connection or within the TDR accommodation areas at Urlingford, Mountfinn, Balief Lower and Balief Upper, Co. Kilkenny.

No PRFs were identified in trees requiring felling, pruning or trimming to facilitate the Proposed Project, including the proposed bat felling buffers, access infrastructure, other wind farm infrastructure, the Proposed Grid Connection and TDR accommodation works.

4.3.2.3 Emergence Surveys

Three dusk emergence surveys were undertaken at the Farm Complex (K22A), on 13th May, 1st July and 26th August 2025. A further dusk emergence survey was undertaken at the Round Tower (K22C) on 14th July 2025. Results are summarised in Table 4-9.

Three confirmed bat roosts were identified within the Farm Complex (K22A), comprising two stone sheds and a cattle shed. On 13th May, 50 soprano pipistrelles emerged from one stone shed, five soprano pipistrelles emerged from the second stone shed and two common pipistrelles emerged from the cattle shed, giving a total of 57 bats. On 1st July, 37 soprano pipistrelles emerged from the same stone shed that supported 50 individuals in May, while two common pipistrelles emerged from the cattle shed, giving a total of 39 bats. On 26th August, four soprano pipistrelles emerged from a stone shed, while four soprano pipistrelles and one Leisler's bat emerged from the cattle shed, giving a total of nine bats. The surveys confirmed repeated use of buildings within the complex across spring, summer and autumn.

The Round Tower supported a confirmed brown long-eared bat roost during the daytime inspection on 24th April 2025. The July emergence survey indicated mixed-species use, with approximately 20 bats estimated to be using the structure. The count is approximate because repeated emergence and re-entry prevented individual bats from being distinguished reliably. *Myotis* spp., soprano pipistrelle and common pipistrelle were considered likely to be using the tower, although their identification as roost occupants was less certain than the brown long-eared bats observed during the daytime inspection.

Table 4-9 Dusk emergence survey results for the Farm Complex and Round Tower in 2025

Date	Structure ID	Structure surveyed	Irish Grid Reference	Emergence survey findings
13th May 2025	K22A	Farm Complex	S 35658 65462	57 bats: 50 soprano pipistrelles from one stone shed, five soprano pipistrelles from a second stone shed and two common pipistrelles from the cattle shed.
1st July 2025	K22A	Farm Complex	S 35658 65462	39 bats: 37 soprano pipistrelles from the stone shed that supported 50 individuals in May, and two common pipistrelles from the cattle shed.
14th July 2025	K22C	Round Tower	S 36100 65075	Approximately 20 bats estimated, with repeated emergence and re-entry preventing a reliable individual count. Mixed-species use was indicated, with *Myotis* spp., soprano pipistrelle and common pipistrelle considered likely occupants. Brown long-eared bat was confirmed during the April daytime inspection.
26th August 2025	K22A	Farm Complex	S 35658 65462	Nine bats: four soprano pipistrelles from the stone shed, and four soprano pipistrelles and one Leisler's bat from the cattle shed.

4.3.3 Night-time Bat Walkover

Bat activity was recorded during all four survey visits undertaken in spring, summer and autumn 2025, with a total of 3,331 bat passes recorded during dusk emergence surveys and subsequent night-time bat walkovers. Common pipistrelle was recorded most frequently (n = 1,566), followed by soprano pipistrelle (n = 844), *Myotis* spp. (n = 562), Leisler's bat (n = 339) and brown long-eared bat (n = 20). Species composition across the surveys is presented in Plate 4-25, with results for individual surveys summarised in Table 4-10.

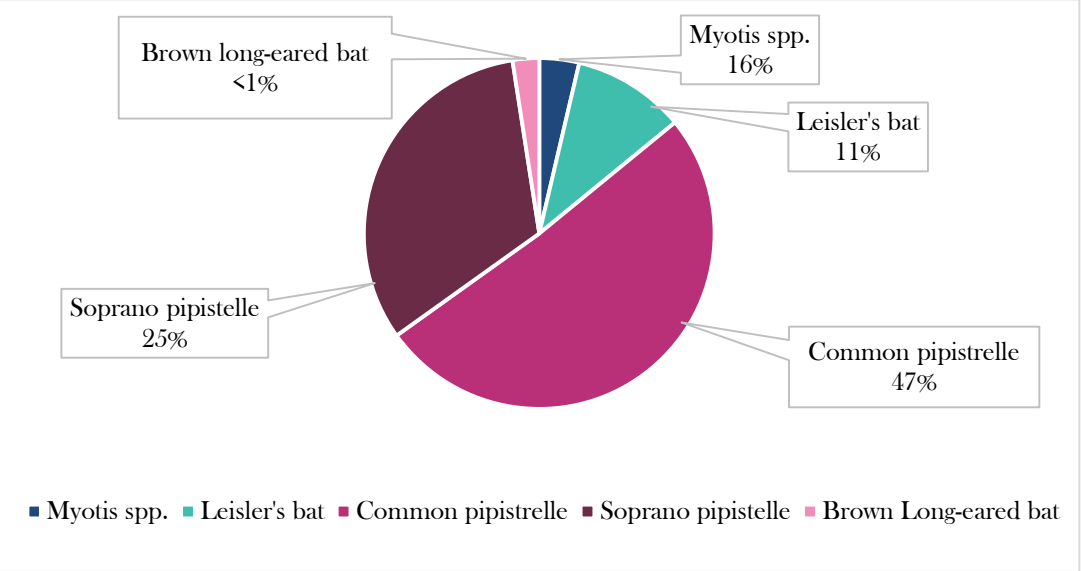


Plate 4-25 Species composition of bat passes recorded during dusk emergence surveys and night-time bat walkovers in 2025.

Table 4-10 Bat passes recorded during dusk emergence surveys and night-time bat walkovers in 2025.

Species/species group	Spring – 13th May	Summer – 1st July	Summer – 14th July	Autumn – 26th August	Total
Myotis spp.	18	60	470	14	562
Leisler's bat	51	16	2	270	339
Common pipistrelle	250	216	431	669	1,566
Soprano pipistrelle	159	33	552	100	844
Brown long-eared bat	12	2	6	0	20
Total	490	327	1,461	1,053	3,331

Species composition varied between surveys. Common pipistrelle accounted for the greatest number of passes in May, on 1st July and in August. Soprano pipistrelle was recorded most frequently on 14th July, when *Myotis* spp. also accounted for a substantial proportion of activity. Leisler's bat activity was greatest during the August survey, while brown long-eared bat was recorded during the spring and both summer surveys.

Recorded activity during night-time bat walkover surveys was associated with forestry tracks and edges, hedgerows and adjoining agricultural habitats. Common and soprano pipistrelles predominated overall, although the relative contribution of other species varied between survey dates. The spatial distribution of recorded activity is presented in Figures 4-1 to 4-3.

635000

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T10

T4

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T2

T2

0 250 500 m

635000

Map Legend

- EIAR Site Boundary
- Turbine Layout
- Spring NBW Route (13th May 2025)

Spring Manual Transect Results

- Myotis species
- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared bat

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

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N

SITE LOCATION - NOT TO SCALE

Drawing Title
Spring Manual Transect Results 2025

Project Title
Killoshulan Wind Farm, Co. Kilkenny

Project No.	Drawing No.	Scale
260172	4-1	1:7,500
Drawn By	Checked By	Date
AMcL	TM	27/10/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

635000

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T4

T3

T2

T2

0 280 560 m

Map Legend

- EIAR Site Boundary
- Turbine Layout
- Summer NBW Route (1st July 2025)
- Summer NBW Route (14th July 2025)

Summer Manual Transect Results

- Myotis species
- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared bat

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

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N

SITE LOCATION - NOT TO SCALE

Drawing Title
Summer Manual Transect Results 2025

Project Title
Killoshulan Wind Farm, Co. Kilkenny

Project No.	Drawing No.	Scale
260172	4-2	1:10,000
Drawn By	Checked By	Date
AMcL	TM	27/10/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

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0 250 500 m

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Map Legend

- EIAR Site Boundary
- Turbine Layout
- Autumn NBW Route (26th August 2025)

Autumn Manual Transect Results

- Myotis species
- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

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SITE LOCATION - NOT TO SCALE

Drawing Title
Autumn Manual Transect Results 2025

Project Title
Killoshulan Wind Farm, Co. Kilkenny

Project No.	Drawing No.	Scale
260172	4-3	1:9,000
Drawn By	Checked By	Date
AMcL	TM	27/10/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

4.3.4 Ground-level Static Surveys

In total, 293,884 bat passes were recorded during ground-level static detector surveys in 2025. Common pipistrelle was recorded most frequently (n = 225,460), followed by soprano pipistrelle (n = 40,278), Leisler's bat (n = 21,038), *Myotis* spp. (n = 6,474) and brown long-eared bat (n = 634). Species composition across all deployments is presented in Plate 4-26.

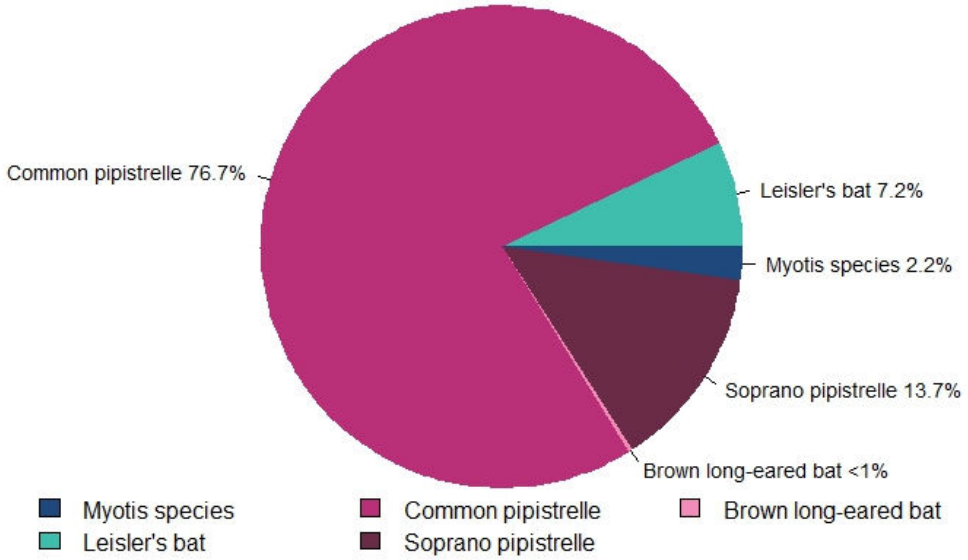


Plate 4-26 Species composition of bat passes recorded across all ground-level static detector deployments in 2025.

Seasonal totals comprised 84,788 bat passes in spring, 135,402 in summer and 73,694 in autumn. Common pipistrelle predominated in all three seasons, accounting for 63.2% of passes in spring, 82.0% in summer and 82.6% in autumn. Leisler's bat was the second most frequently recorded species in spring, whereas soprano pipistrelle was the second most frequently recorded species in summer and autumn. Brown long-eared bat was recorded least frequently in each season. Seasonal counts and species composition are summarised in Table 4-11.

Table 4-11 Bat passes and species composition recorded during ground-level static surveys in 2025

Species	Spring		Summer		Autumn	
	Bat passes	*Composition (%)*	*Bat passes*	*Composition (%)*	*Bat passes*	*Composition (%)*
Myotis spp.	2,688	3.2	2,213	1.6	1,573	2.1
Leisler's bat	15,281	18	3,314	2.4	2,443	3.3
Common pipistrelle	53,592	63.2	111,020	82	60,848	82.6
Soprano pipistrelle	12,964	15.3	18,671	13.8	8,643	11.7
Brown long-eared bat	263	0.3	184	0.1	187	0.3

After accounting for recording effort, overall activity was highest in summer at 55.35 bat passes per detector-hour, followed by spring at 45.67 and autumn at 27.19 (Plate 4-27; Table 4-12). Common pipistrelle activity followed the same seasonal pattern. Soprano pipistrelle activity was slightly higher in summer than spring, despite representing a smaller proportion of the summer recordings. Leisler's bat and *Myotis* spp. activity was highest in spring and lower in subsequent seasons.

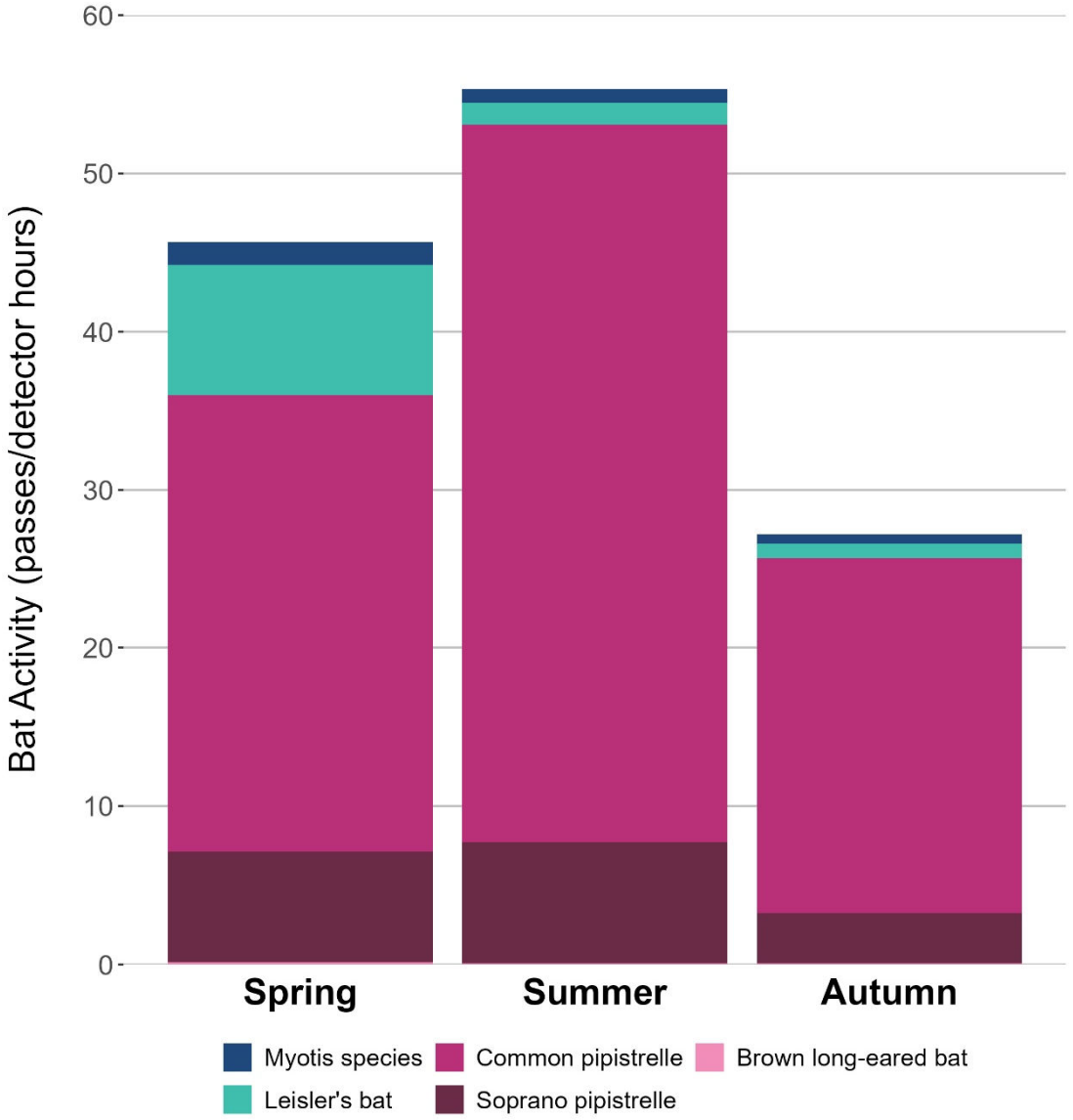


Plate 4-27 Seasonal bat activity recorded during ground-level static surveys in 2025, expressed as bat passes per detector-hour.

Table 4-12 Seasonal bat activity recorded during ground-level static surveys in 2025, expressed as bat passes per detector-hour

Total survey hours (per detector)	Spring	Summer	Autumn
	168.76 hours	*222.39 hours*	*246.43 hours*
Myotis spp.	1.45	0.90	0.58
Leisler's bat	8.23	1.35	0.90
Common pipistrelle	28.87	45.38	22.45
Soprano pipistrelle	6.98	7.63	3.19
Brown long-eared bat	0.14	0.08	0.07

Activity varied between detector locations and recording nights. Species-specific median nightly pass rates, including nights when a species was not detected, are presented by detector and season in Plate 4-29. A median of zero indicates that the species was not recorded on at least half of the recording nights; it does not necessarily indicate its absence throughout the deployment. Night-to-night variation across the detectors is illustrated in Plate 4-28 and separately for each season in Plates 4-30 to 4-32.

In spring, the greatest combined contribution of species-specific median activity was recorded at D11, followed by D08 and D05. Activity was also relatively elevated at D02, while D01, D03 and D10 recorded comparatively low values. Common pipistrelle made the greatest contribution at most locations. Leisler's bat contributed appreciably at D06, D08 and D09, while soprano pipistrelle was

particularly evident at D02 and D11. Nightly activity across the detectors peaked around 29th–30th April, with further peaks during May.

In summer, the spatial distribution of activity differed from that recorded in spring. D04 recorded the greatest combined contribution of species-specific median activity, followed by D11 and D08. These summer values at D04 were also the highest shown for any detector and season. Common pipistrelle predominated, while Leisler's bat contributed less than in spring. D01 and D10 continued to record comparatively low median activity. Nightly activity fluctuated throughout July, with pronounced peaks in early and mid-July, a reduction around 19th–20th July and renewed activity later in the deployment.

In autumn, species-specific median activity was lower than in summer at most detector locations. D08 recorded the greatest combined contribution, followed by D02 and D09. Activity at D01, D03, D04, D06, D07 and D10 was comparatively low. Common pipistrelle remained predominant. Nightly activity varied during the deployment, with peaks in late August and early September and lower activity on several nights later in September.

Overall, the results demonstrate spatial and temporal variation in bat activity, with common pipistrelle predominating throughout the survey programme. Seasonal differences were evident in both recording rates and species composition, particularly the greater contribution of Leisler's bat in spring. The weather review identified 19 spring nights, 27 summer nights and 19 autumn nights with favourable conditions under the criteria described in Section 3.3.4. Weather conditions varied during each deployment and were considered alongside the activity results; the lower autumn activity cannot be attributed to weather alone.

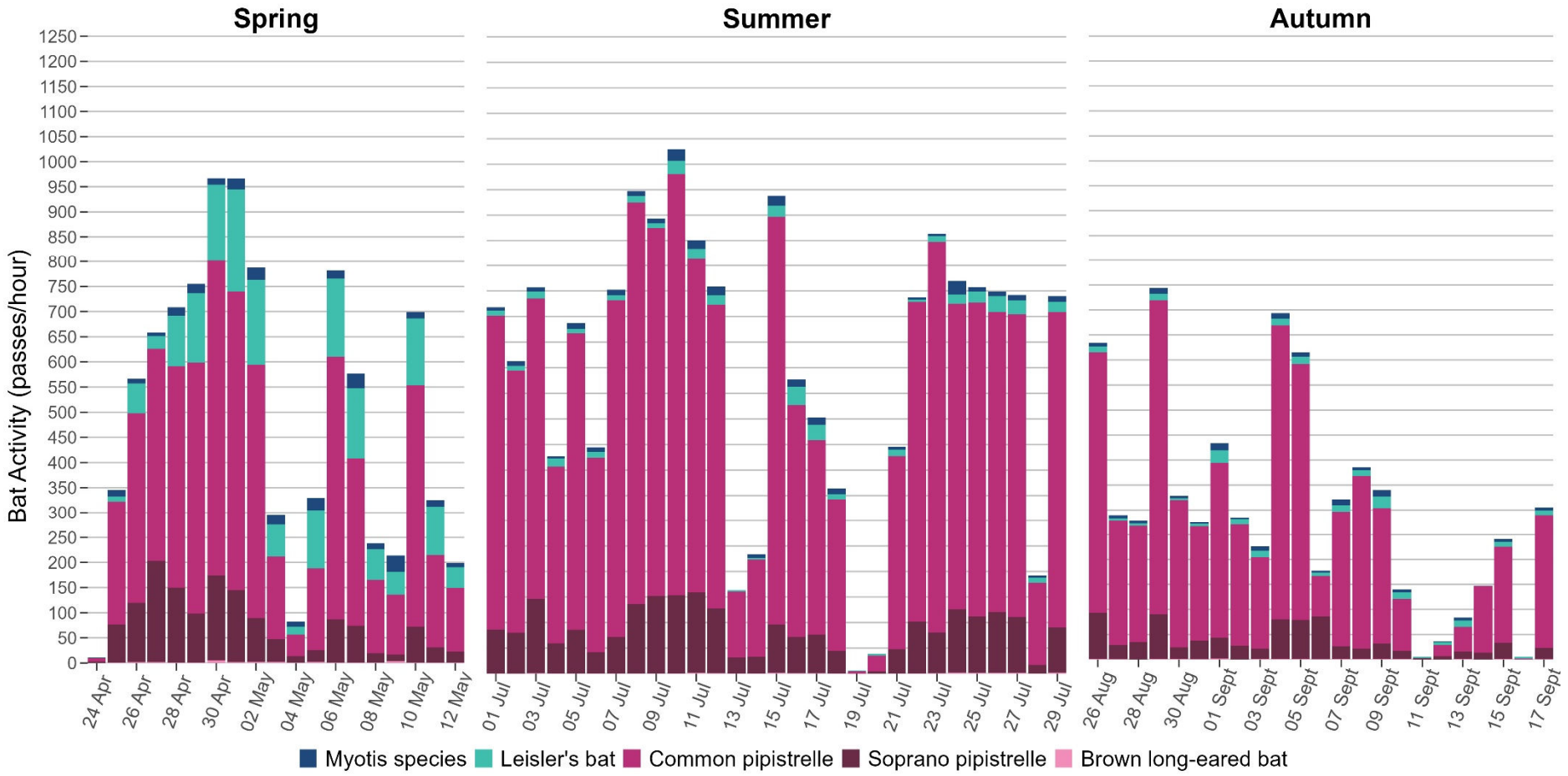


Plate 4-28 Nightly variation in species-specific bat activity across the ground-level static detectors during spring, summer and autumn 2025.

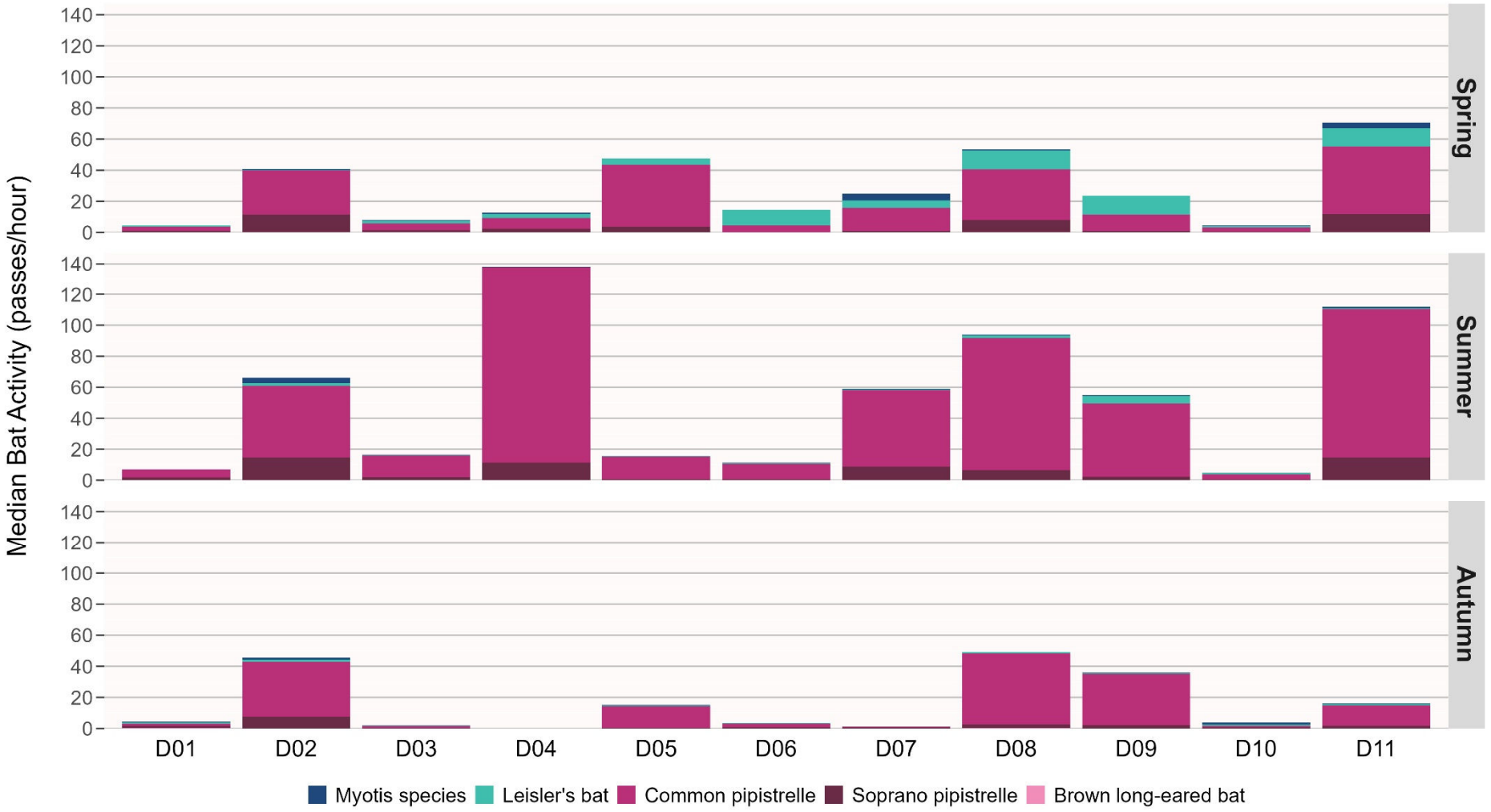


Plate 4-29 Species-specific median nightly bat activity at each detector during spring, summer and autumn 2025, including nights with no detections. A common vertical scale is used across seasons.

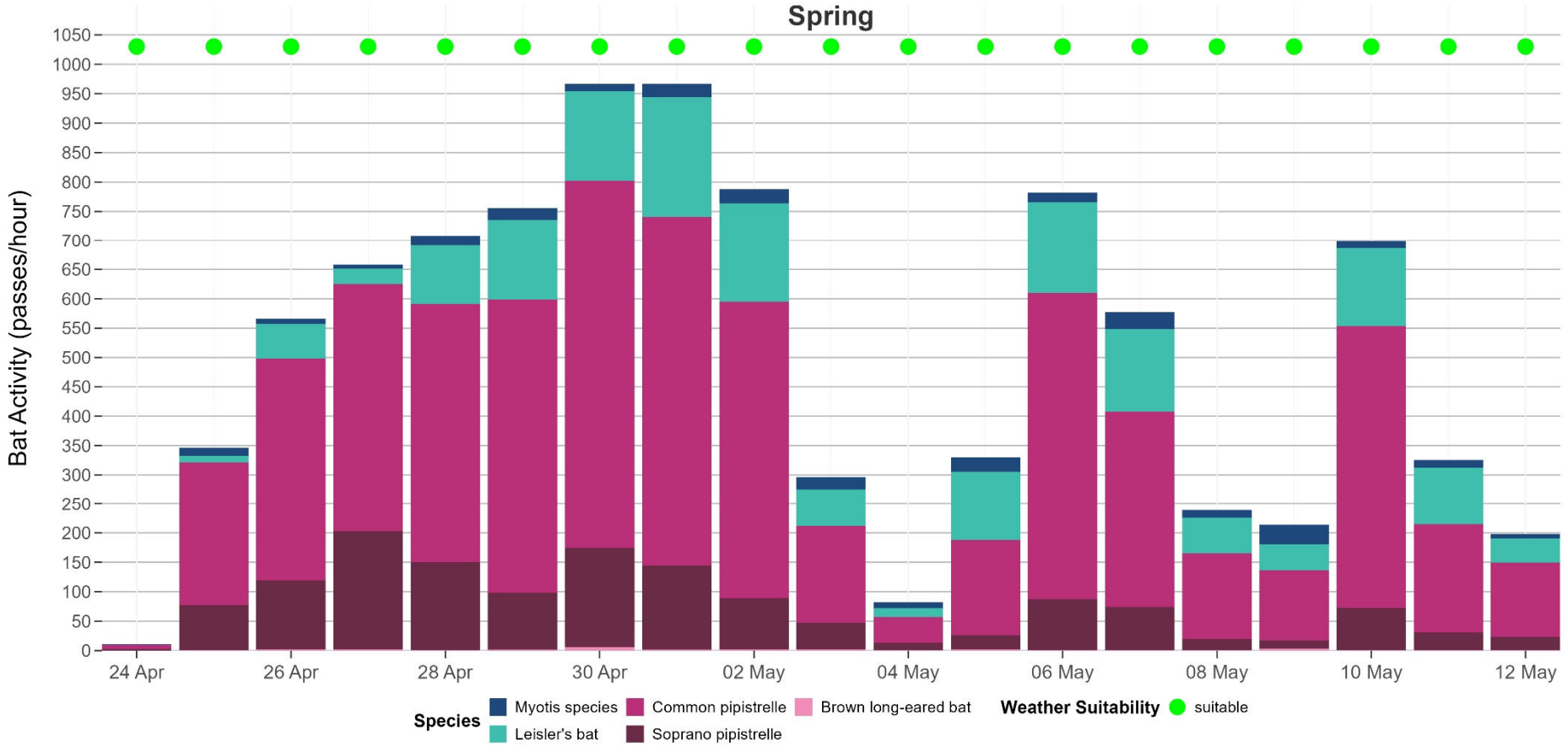


Plate 4-30 Nightly bat activity across the ground-level static detectors and weather suitability during spring 2025.

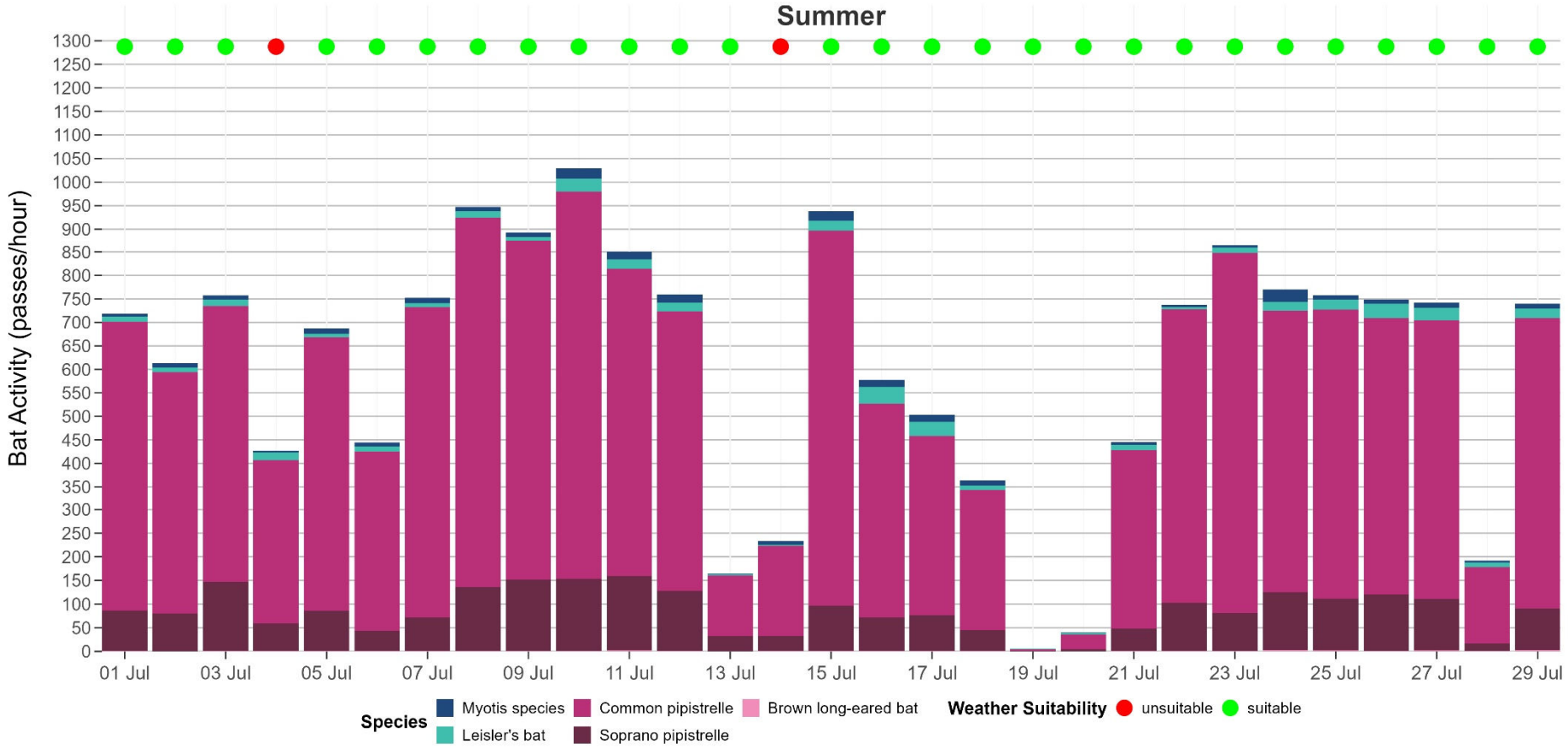


Plate 4-31 Nightly bat activity across the ground-level static detectors and weather suitability during summer 2025.

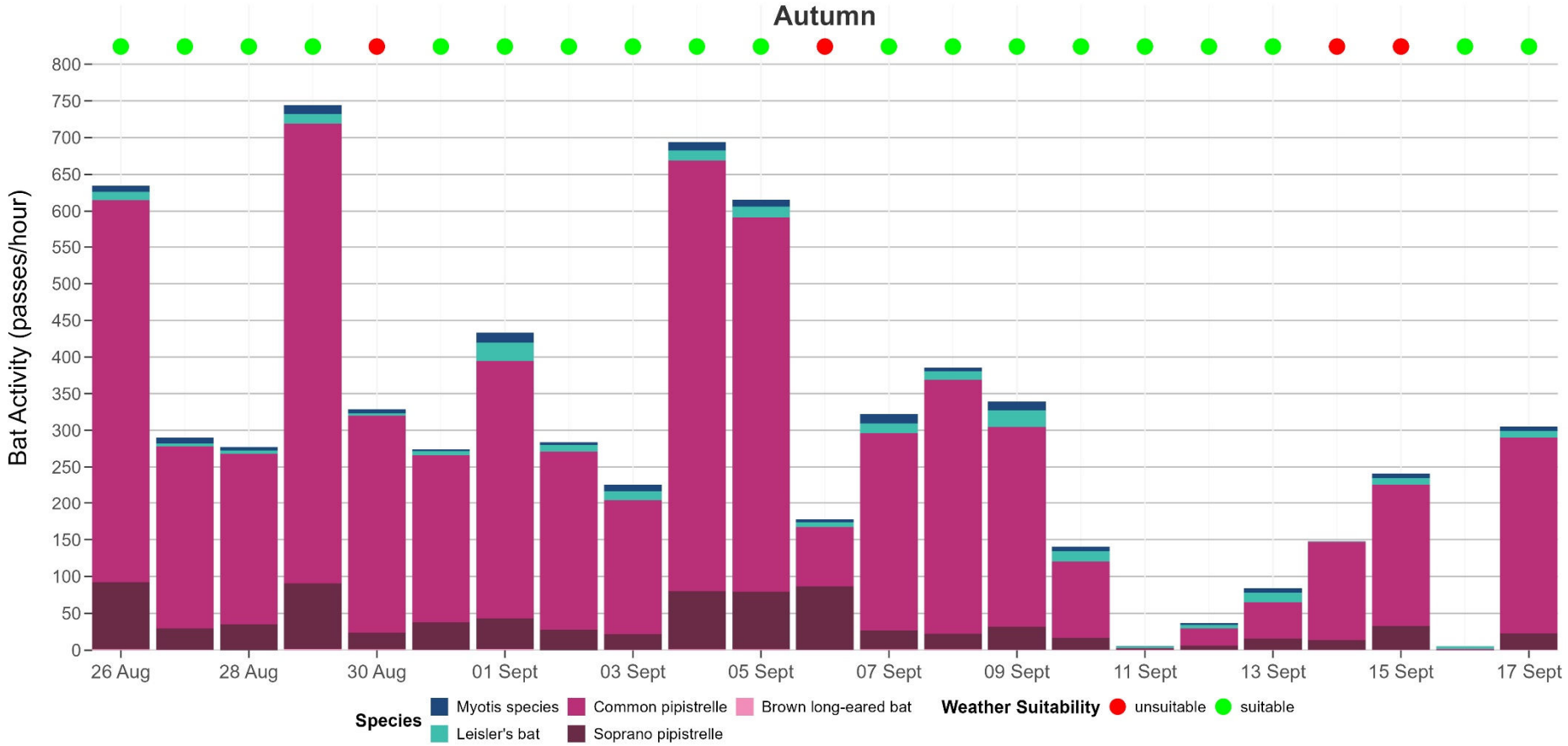


Plate 4-32 Nightly bat activity across the ground-level static detectors and weather suitability during autumn 2025.

Within-night activity patterns

Bat activity varied through the night and between seasonal survey periods (Figure 4-4). Activity was recorded from around sunset through to dawn, with the timing and intensity of activity differing between species.

Leisler's bat activity was greatest during spring, with elevated activity during the early part of the night and further activity towards dawn. Summer and autumn activity was lower overall, with concentrations following sunset and towards sunrise, alongside more scattered records during intervening hours (Figure 4-5).

Common pipistrelle activity occurred throughout much of the night during spring and summer. Autumn activity was more strongly concentrated in the period following sunset, although records continued later in the night (Figure 4-6). Soprano pipistrelle also showed activity throughout the night, with distinct concentrations during spring and summer and comparatively lower activity during autumn (Figure 4-7).

These patterns demonstrate variation in the timing of activity between species and seasons and inform the seasonal and nightly curtailment measures described in Section 6.3.

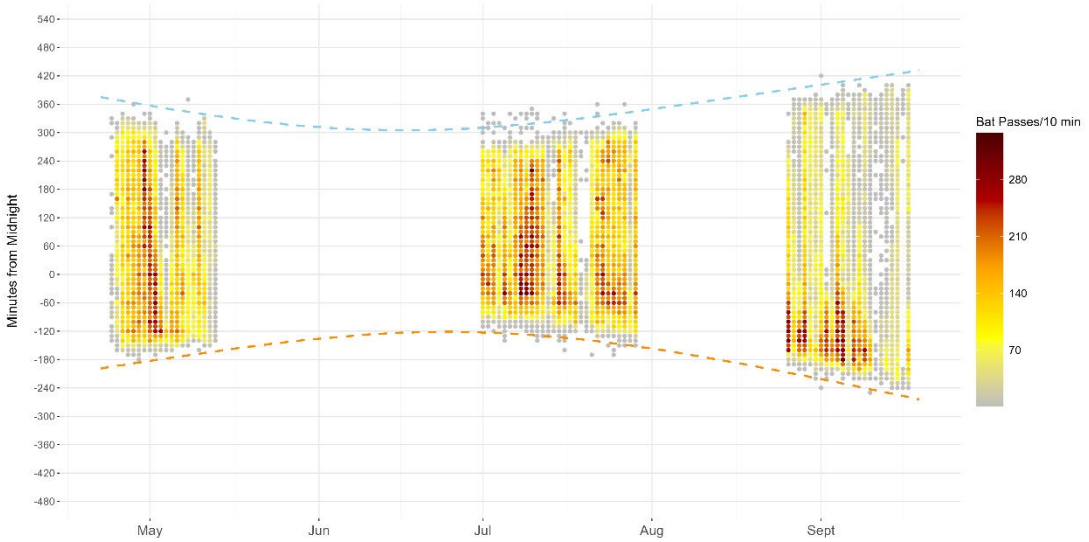


Plate 4-33 Within-night distribution of all bat species activity during the 2025 static detector surveys, expressed as bat passes per 10-minute interval. Dashed lines indicate sunset and sunrise.

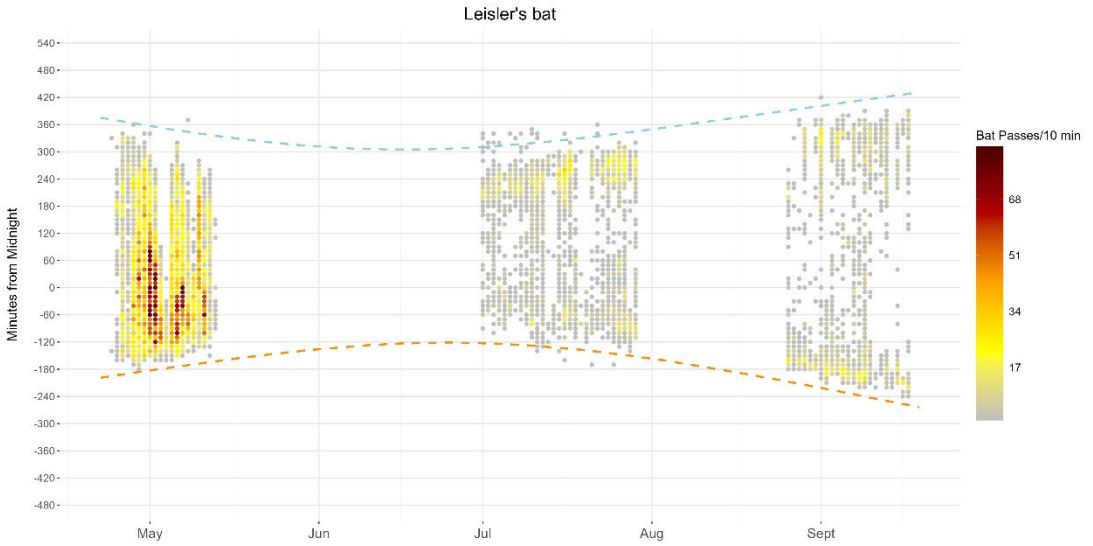


Plate 4-34 Within-night distribution of Leisler's bat activity during the 2025 static detector surveys, expressed as bat passes per 10-minute interval. Dashed lines indicate sunset and sunrise.

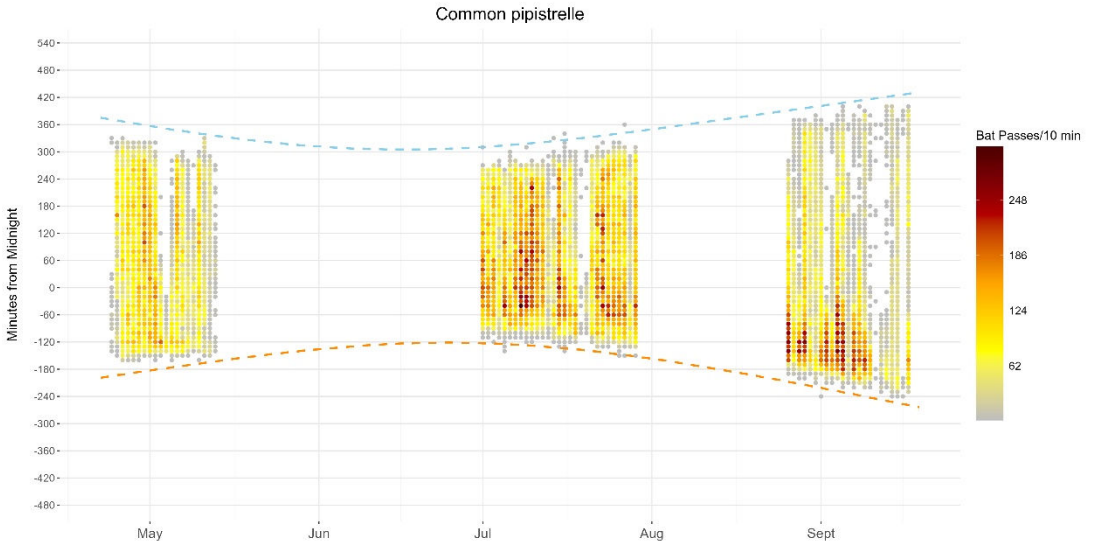


Plate 4-35 Within-night distribution of common pipistrelle activity during the 2025 static detector surveys, expressed as bat passes per 10-minute interval. Dashed lines indicate sunset and sunrise.

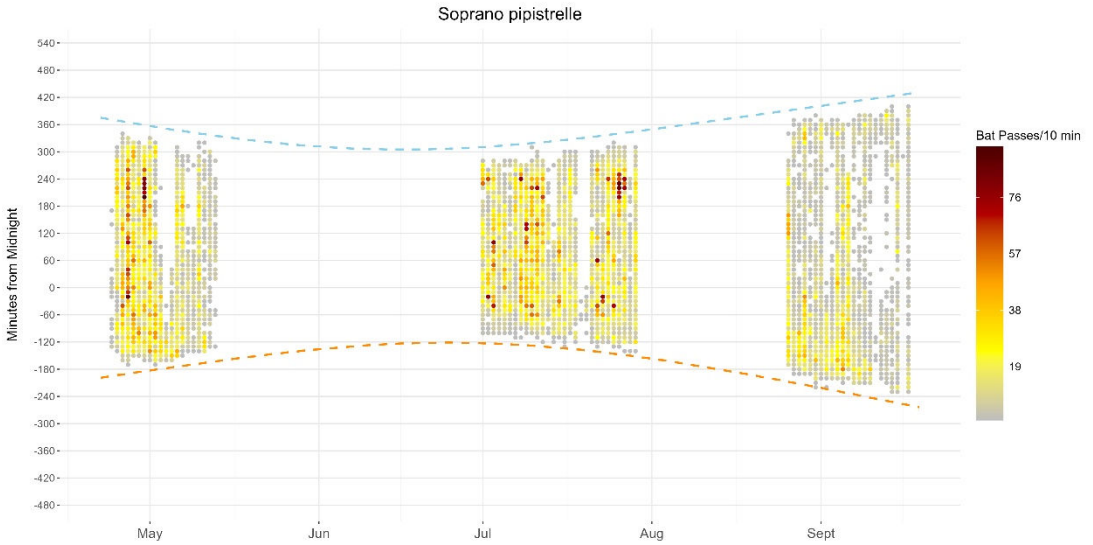


Plate 4-36 Within-night distribution of soprano pipistrelle activity during the 2025 static detector surveys, expressed as bat passes per 10-minute interval. Dashed lines indicate sunset and sunrise.

Relationships with weather conditions

The relationship between recorded bat activity and regional weather conditions was examined using observations from Met Éireann's Oak Park station. Approximately 92.2% of the activity included in the analysis occurred at temperatures of approximately 11.9°C or above (Figure 4-8), while approximately 90.1% occurred at wind speeds up to 3.9 m/s (Figure 4-9).

These distributions indicate that most recorded activity coincided with relatively warm, low-wind conditions. The percentages describe separate relationships and do not represent the proportion of activity occurring when both conditions were met simultaneously. They also reflect the weather conditions encountered during the sampled survey periods, rather than establishing absolute limits to bat activity.

As the observations were obtained from a regional weather station, they may differ from conditions at individual detector locations and do not directly represent wind conditions at turbine hub height. The results provide context for the selection of operational mitigation parameters, alongside published guidance and the recorded seasonal and within-night activity patterns.

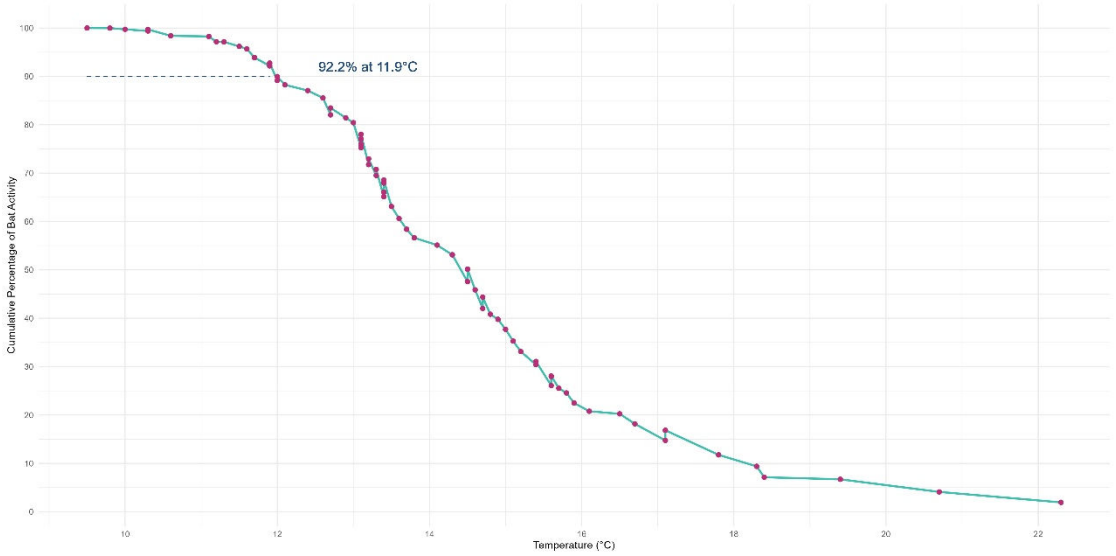


Plate 4-37 Cumulative proportion of recorded bat activity in relation to regional temperature during the 2025 static detector surveys. Reference annotations indicate 92.2% of activity at temperatures of approximately 11.9°C or above.

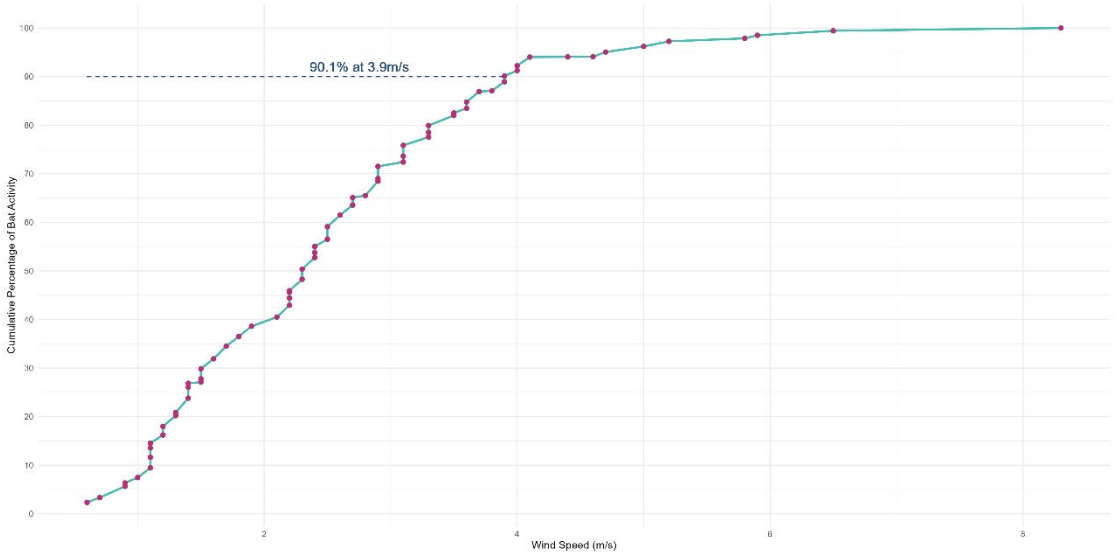


Plate 4-38 Cumulative proportion of recorded bat activity in relation to regional wind speed during the 2025 static detector surveys. Reference annotations indicate 90.1% of activity at wind speeds up to 3.9 m/s.

4.4 Assessment of Bat Activity Levels

4.4.1 Adapted Site-specific Ranges

Low, *Moderate* and *High* activity categories were assigned to median and maximum nightly bat pass rates (bpph) recorded during the spring, summer and autumn survey periods, using the site-specific thresholds presented in Table 3-7 and the methodology described in Section 3.4.1. The results are presented in Table 4-13.

Median nightly activity describes typical recorded activity at each detector location, while maximum nightly activity identifies peaks within each survey period. These results inform the impact assessment alongside the findings of the desktop study, habitat suitability appraisal and roost surveys.

Leisler's bat

Leisler's bat median activity was highest during spring, when *High* activity was recorded at six detectors: D05, D06, D07, D08, D09 and D11. The highest median was recorded at D09 (12.3 bpph), followed by D08 (12.1 bpph), D11 (11.7 bpph) and D06 (10.1 bpph). *Moderate* median activity was recorded at D03 and D04, with *Low* median activity at the remaining detectors.

Median activity declined during summer, with *High* activity recorded only at D09 (5.0 bpph) and *Moderate* activity at D02 and D08. During autumn, median activity was *Moderate* at D02 and *Low* at all remaining detectors.

Maximum nightly activity was *High* at all detectors except D02 during spring, reaching 82.8 bpph at D09 and 75.4 bpph at D06. *High* maximum activity was recorded at five detectors during summer and four during autumn. These results indicate that, although typical activity declined after spring, occasional peaks continued during the later survey periods.

Common pipistrelle

Common pipistrelle median activity was highest during summer. *High* median activity was recorded at D02, D04, D07, D08, D09 and D11, with the highest value at D04 (126.5 bpph), followed by D11 (95.8

bpph) and D08 (85.2 bpph). D05 recorded *Moderate* median activity, while the remaining detectors recorded *Low* median activity.

During spring, *High* median activity was recorded at D11 (43.4 bpph), with *Moderate* activity at D02, D05, D07 and D08. During autumn, *High* median activity was recorded at D08 (45.6 bpph), while D02 and D09 recorded *Moderate* activity. Median activity was *Low* at the remaining detectors.

Maximum nightly activity was *High* at eight detectors during spring, nine during summer and seven during autumn. The highest maximum was recorded at D04 during summer (201.4 bpph). Elevated maximum activity also occurred during autumn, particularly at D09 (174.3 bpph), D08 (158.8 bpph) and D02 (143.9 bpph), despite lower median activity across most locations.

Soprano pipistrelle

Soprano pipistrelle median activity was *Low* at all detector locations during spring and autumn. During summer, *Moderate* median activity was recorded at D02 (14.5 bpph) and D11 (14.7 bpph), with *Low* activity at the remaining detectors. No *High* median activity was recorded for this species.

Maximum nightly activity was more variable. During spring, *High* maximum activity was recorded at D02, D05, D08 and D10, with the highest value at D02 (63.8 bpph). During summer, *High* maximum activity was recorded at D02, D04 and D08, reaching 55.6 bpph at D08. During autumn, *High* maximum activity was recorded only at D02 (77.1 bpph). The remaining autumn maxima were *Low* or *Moderate*.

Myotis spp.

Myotis spp. median activity was predominantly *Low*. *Moderate* median activity was recorded at D07 (4.4 bpph) and D11 (3.7 bpph) during spring, and at D02 (3.6 bpph) during summer. Median activity was *Low* at all detector locations during autumn. No *High* median activity was recorded.

High maximum nightly activity was recorded at D05, D07, D08 and D11 during spring, with the highest value at D07 (20.2 bpph). During summer, *High* maximum activity was recorded at D02 and D04, reaching 17.2 bpph at D04. Autumn maximum activity was *Moderate* at D02 and D10 and *Low* at the remaining detectors.

Brown long-eared bat

Brown long-eared bat median activity was *Low* at all detector locations throughout the survey periods, with median values ranging from zero to 0.2 bpph.

Maximum nightly activity reached the species-specific *High* category at D09 (2.1 bpph), D10 (1.0 bpph) and D11 (1.2 bpph) during spring, and at D02 (1.1 bpph) during summer. Autumn maximum activity was *Low* or *Moderate* at all detectors. These classifications reflect the relatively low species-specific thresholds; the recorded pass rates remained substantially lower than those of the pipistrelle species.

Overall, the assessment identified spatial and seasonal variation in typical activity and occasional peaks. *High* median activity was most widespread for Leisler's bat during spring and common pipistrelle during summer. Soprano pipistrelle and *Myotis* spp. generally recorded *Low* median activity, with *Moderate* activity at a small number of locations, while brown long-eared bat median activity remained *Low* throughout.

Table 4-13 Median and maximum nightly bat activity (bpph) by species, season and detector location in 2025, classified using the site-specific thresholds in Table 3-7 - Low, Moderate, High, No Activity Recorded

Species	Season	Bat activity (bpph)	D01	D02	D03	D04	D05	D06	D07	D08	D09	D10	D11
Myotis spp.	Spring	Median	0.0	0.6	0.5	0.7	0.2	0.2	4.4	0.6	0.0	0.2	3.7
		Maximum	0.2	7.1	1.6	3.5	12.8	0.5	20.2	11.5	0.3	4.9	15.1
	Summer	Median	0.1	3.6	0.3	0.3	0.0	0.1	0.4	0.4	0.5	0.1	1.0
		Maximum	0.6	14.2	1.0	17.2	0.6	0.7	3.0	6.0	1.1	1.6	3.4
	Autumn	Median	0.7	1.4	0.0	0.0	0.5	0.1	0.1	0.1	0.1	1.3	0.4
		Maximum	2.5	3.5	0.7	0.2	2.3	0.7	2.1	0.4	1.4	6.4	1.9
Leisler's bat	Spring	Median	0.6	0.4	1.7	2.7	4.0	10.1	4.9	12.1	12.3	1.0	11.7
		Maximum	3.8	2.7	4.5	21.9	58.4	75.4	40.8	31.5	82.8	7.3	38.0
	Summer	Median	0.1	1.5	0.4	0.0	0.6	0.4	0.4	1.8	5.0	1.0	0.5
		Maximum	0.7	6.5	3.2	3.1	2.5	2.6	2.0	5.2	22	3.4	4.7
	Autumn	Median	0.5	1.4	0.3	0.0	0.5	0.5	0.0	0.9	0.7	0.7	0.8
		Maximum	1.7	6.1	1.7	0.6	2.8	1.8	2.6	8.4	5.7	4.1	2.9
Common pipistrelle	Spring	Median	2.8	28.2	4.3	6.9	39.9	4.2	14.9	32.6	10.7	2.6	43.4
		Maximum	37.4	171	34.9	86.5	145.3	35.9	68.4	102.2	103	58.9	156.5
	Summer	Median	5.0	46.4	14	126.5	14.5	10.1	49.3	85.2	47.2	3.2	95.8
		Maximum	40.6	98.2	76.1	201.4	114.2	137.9	136.1	185	115.2	12.7	159.9
	Autumn	Median	1.4	35.2	1.2	0.0	13.7	1.9	0.6	45.6	32.8	1.0	13.3
		Maximum	62.4	143.9	16.9	3.1	77.2	38.8	87.6	158.8	174.3	21.1	72.6
Soprano pipistrelle	Spring	Median	1.0	11.5	1.4	2.4	3.5	0.2	0.9	7.9	0.8	0.5	11.7
		Maximum	25	63.8	5.9	22.8	53.5	3.1	15.5	47.7	2.8	47.8	41.9
	Summer	Median	1.8	14.5	1.9	11.4	0.7	0.6	8.8	6.6	2.2	0.4	14.7
		Maximum	8.0	51.5	9.4	53.3	36.5	6.8	22	55.6	10.8	3.5	41.8
	Autumn	Median	1.6	7.6	0.4	0.0	0.4	1.0	0.6	2.5	2.3	0.7	1.6
		Maximum	23.8	77.1	2.2	1.2	2.6	14.7	33	20.3	13.6	4.9	4.7
Brown long-eared bat	Spring	Median	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1
		Maximum	0.3	0.3	0.7	0.6	0.5	0.2	0.2	0.6	2.1	1.0	1.2
	Summer	Median	0.0	0.1	0.0	0.0		0.0	0.0	0.0	0.0	0.1	0.0
		Maximum	0.1	1.1	0.3	0.1		0.4	0.1	0.4	0.4	0.8	0.6
	Autumn	Median	0.2	0.0	0.0		0.0	0.0	0.0	0.2	0.0	0.0	0.0
		Maximum	0.9	0.4	0.4		0.4	0.2	0.1	0.6	0.2	0.4	0.4

4.5 Importance of Bat Population Recorded at the Proposed Wind Farm

The ecological evaluation follows the geographical framework set out in Chapter 3 of the *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (TII, 2009). This considers the importance of the recorded bat population and the habitats supporting it within the wider landscape.

The Proposed Wind Farm supports a regularly occurring bat assemblage comprising common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat and *Myotis* spp. Activity was recorded along hedgerows, treelines, forestry edges and tracks, with spatial and seasonal variation. Common pipistrelle predominated overall, while Leisler's bat activity was greatest during spring.

Three confirmed roosts were identified within the Farm Complex (K22A) in 2025, comprising two stone sheds and a cattle shed. The stone sheds supported soprano pipistrelles, with maximum emergence counts of 50 and five individuals respectively. The cattle shed supported two common pipistrelles during both spring and summer, and four soprano pipistrelles and one Leisler's bat during autumn. A common pipistrelle roost supporting three individuals was previously confirmed within K22A in 2022, demonstrating use of the complex in both survey years.

At the Round Tower within K22C, outside the Proposed Wind Farm, four brown long-eared bats were confirmed roosting in April 2025. The July survey indicated mixed-species use by an estimated 20 bats, with *Myotis* spp., soprano pipistrelle and common pipistrelle considered likely additional occupants. Repeated emergence and re-entry prevented a reliable individual count. In 2022, four brown long-eared bats were recorded roosting in the adjacent K22C outbuildings, rather than the tower.

A further common pipistrelle roost supporting two individuals was confirmed at the inhabited dwelling K22E, outside the Proposed Wind Farm near the TDR accommodation works, in 2022.

Taking account of the regularly occurring bat assemblage, the confirmed and historical roosts, and the supporting commuting and foraging habitats, the bat population associated with the Proposed Wind Farm and its surroundings is assessed as being of ***Local Importance (Higher Value)***. Bats are therefore included as a Key Ecological Receptor in the assessment of potential effects of the Proposed Project.

5. RISK AND IMPACT ASSESSMENT

The risk and impact assessment has been informed by NatureScot (2021), which identifies four principal ways in which wind farm developments may affect bats:

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

The assessment considers the survey findings, recorded roosts, habitat suitability and spatial and seasonal patterns of bat activity to identify potential effects arising from the construction, operation and decommissioning of the Proposed Project. It addresses the Proposed Wind Farm, Proposed Grid Connection and TDR accommodation works, as relevant to each potential effect.

5.1 Collision Mortality

5.1.1 Assessment of Site-Risk

The potential site risk was assessed with reference to Table 3a of NatureScot (2021), taking account of the habitats, roost records, landscape connectivity and characteristics of the Proposed Wind Farm. The guidance categories are indicative and require interpretation in the context of site-specific conditions.

Table 5-1 Site-risk assessment for the Proposed Wind Farm, informed by Table 3a of NatureScot (2021).

Criteria	Site-specific evaluation	Assessment
Habitat risk	The Proposed Wind Farm predominantly comprises improved agricultural grassland and commercial conifer plantation. Plantation interiors and open agricultural habitats were assessed as having *Low* suitability for foraging and commuting bats, while plantation edges, hedgerows, treelines and watercourses provide *Moderate* suitability and connections to the wider landscape. Three roosting buildings were confirmed within the Farm Complex (K22A) in 2025. Two stone sheds supported soprano pipistrelles, with maximum emergence counts of 50 and five individuals respectively. The cattle shed supported two common pipistrelles during spring and summer, and four soprano pipistrelles and one Leisler's bat during autumn. At the nearby Round Tower (K22C), four brown long-eared bats were observed roosting in April 2025, while approximately 20 bats were estimated to be using the tower during July, with repeated emergence and re-entry limiting count accuracy. Historical surveys in 2022 confirmed three common pipistrelles within K22A, four brown long-eared bats within the adjacent K22C outbuildings and two common pipistrelles at dwelling K22E near the TDR accommodation works. These counts relate to separate surveys and are not additive. The confirmed roosts represent elevated-risk features requiring specific consideration, particularly in relation to Turbine 2, approximately 230 m from the Farm Complex (K22A) and 370 m from the Round Tower structure group (K22C). Taking account of the predominantly modified habitats and the distribution of suitable habitat and roosts, overall habitat risk is assessed as *Moderate*, with localised areas of greater sensitivity.	Moderate

Project size	The Proposed Wind Farm comprises 10 turbines with a maximum tip height of 185 m. The turbine height corresponds to a higher-risk development characteristic, while the number of turbines is at the lower end of the Medium development category. Two other wind farm developments occur within 5 km of the nearest Proposed Turbine, comprising the operational Lisdowney Wind Farm and proposed Gathabawn Wind Farm. The cumulative project list identifies six wind farm developments within 10 km and sixteen within 15 km, including existing, permitted and proposed developments. On balance, a *Medium* project-size category is adopted, taking account of the 10-turbine layout, the proposed turbine height of 185 m and the presence of other wind farm developments in the surrounding landscape.	Medium
Overall site risk	Cross-tabulation of *Moderate* habitat risk and *Medium* project size gives a site-risk score of 3.	Medium (3)

The Proposed Wind Farm is therefore assigned an indicative **Medium site-risk score (3)** for use in the species-specific collision-risk assessments. This site-wide classification does not diminish the sensitivity of individual roost locations or areas recording elevated bat activity. These are considered separately when interpreting collision risk and determining mitigation, particularly in relation to the Farm Complex and Turbine 2.

5.1.2 Assessment of Collision Risk

Three species classified as having high collision risk were recorded during the surveys:

- Leisler's bat,
- Common pipistrelle,
- Soprano pipistrelle,

An overall collision-risk assessment was undertaken separately for each species by combining the *Medium* site-risk score (3) with the site-specific ranked activity scores, using the matrix adapted from Table 3b of NatureScot (2021), presented in **Appendix 3**.

Median and maximum activity were assessed separately to characterise typical activity and activity peaks. Both were considered when interpreting collision risk, alongside species' population vulnerability, spatial and seasonal activity patterns, and the locations of confirmed roosts. Site-wide scores were also considered alongside detector-level results to ensure that localised areas of elevated activity were taken into account.

Myotis spp. and brown long-eared bat, which are classified as having low collision risk, were also recorded. Separate overall collision-risk matrices were not prepared for these species. Their median activity was predominantly *Low*, although occasional higher activity was recorded at individual detectors. Taking account of their low collision susceptibility and the recorded activity patterns, significant collision-related effects on these species are not anticipated. Potential effects on their roosts and commuting and foraging habitats are assessed separately.

Operational monitoring will include all recorded species and will inform the review and, where necessary, adjustment of mitigation measures.

5.1.2.1 Leisler's bat

Leisler's bat was recorded during all four night-time bat walkover surveys and all three seasonal static detector deployments. The species is classified as having *High* collision risk and *High* population vulnerability in the adapted Irish assessment presented in Table 3-9.

Combining the site-risk score of *Medium* (3) with the ranked activity scores resulted in *Medium* typical collision risk during spring and summer and *Low* typical risk during autumn. Peak collision risk was *High* during spring and *Medium* during summer and autumn (Table 5-2).

Spring represented the period of greatest concern, with *High* median activity recorded at D05, D06, D07, D08, D09 and D11. Although activity generally declined thereafter, *High* median activity persisted at D09 during summer, and occasional activity peaks occurred during both summer and autumn. These spatial and seasonal patterns, together with the species' high population vulnerability, inform the operational mitigation and monitoring requirements.

Table 5-2 Leisler's bat – overall collision-risk assessment using the site-specific ranked activity scores and the matrix adapted from Table 3b of NatureScot (2021).

Survey period	Site risk	Typical activity (median)	Typical risk assessment	Peak activity (maximum)	Peak risk assessment
Spring 2025	Medium (3)	Moderate–High (4)	Medium (12)	High (5)	High (15)
Summer 2025	Medium (3)	Low–Moderate (2)	Medium (6)	Moderate–High (4)	Medium (12)
Autumn 2025	Medium (3)	Low (1)	Low (3)	Moderate–High (4)	Medium (12)

5.1.2.2 Soprano pipistrelle

Soprano pipistrelle was recorded during all four night-time bat walkover surveys and all three seasonal static detector deployments. The species is classified as having *High* collision risk and *Medium* population vulnerability in the adapted Irish assessment presented in Table 3-9.

Combining the site-risk score of *Medium* (3) with the ranked activity scores resulted in *Low* typical collision risk and *Medium* peak collision risk across all three seasons (Table 5-3). Median activity was predominantly *Low*, with *Moderate* activity recorded at D02 and D11 during summer.

The site-wide scores must also be considered alongside the confirmed soprano pipistrelle roosts within the Farm Complex (K22A), approximately 230 m from Turbine 2. Two stone sheds supported maximum emergence counts of 50 and five soprano pipistrelles respectively, while four soprano pipistrelles emerged from the cattle shed during autumn. Repeated use of the complex across the survey seasons identifies a localised sensitivity that is not fully represented by the site-wide activity scores.

The proximity of Turbine 2 to these roosts warrants targeted operational mitigation from the commencement of operation, supported by monitoring of bat activity and mortality. The matrix-derived assessment remains *Low* for typical activity and *Medium* for peak activity; the additional roost-related risk informs the turbine-specific mitigation requirements.

Table 5-3 Soprano pipistrelle – overall collision-risk assessment using the site-specific ranked activity scores and the matrix adapted from Table 3b of NatureScot (2021).

Survey period	Site risk	Typical activity (median)	Typical risk assessment	Peak activity (maximum)	Peak risk assessment
Spring 2025	Medium (3)	Low (1)	Low (3)	Moderate (3)	Medium (9)

Summer 2025	Medium (3)	Low (1)	Low (3)	Moderate (3)	Medium (9)
Autumn 2025	Medium (3)	Low (1)	Low (3)	Low–Moderate (2)	Medium (6)

5.1.2.3 Common pipistrelle

Common pipistrelle was recorded during all four night-time bat walkover surveys and all three seasonal static detector deployments and accounted for the greatest proportion of recorded bat activity. The species is classified as having *High* collision risk and *Medium* population vulnerability in the adapted Irish assessment presented in Table 3-9.

Combining the site-risk score of *Medium* (3) with the ranked activity scores resulted in *Medium* typical and peak collision risk across all three seasons (Table 5-4). Typical activity was greatest during summer, when *High* median activity was recorded at D02, D04, D07, D08, D09 and D11. *High* median activity was also recorded at D11 during spring and D08 during autumn, demonstrating localised elevated activity outside the summer period.

Common pipistrelle roosting was confirmed within the cattle shed at the Farm Complex (K22A), with two individuals emerging during both spring and summer. The proximity of this roost to Turbine 2, together with the spatial and seasonal activity patterns, informs the targeted operational mitigation and monitoring requirements.

Table 5-4 Common pipistrelle – overall collision-risk assessment using the site-specific ranked activity scores and the matrix adapted from Table 3b of NatureScot (2021).

Survey period	Site risk	Typical activity (median)	Typical risk assessment	Peak activity (maximum)	Peak risk assessment
Spring 2025	Medium (3)	Low–Moderate (2)	Medium (6)	Moderate–High (4)	Medium (12)
Summer 2025	Medium (3)	Moderate (3)	Medium (9)	Moderate–High (4)	Medium (12)
Autumn 2025	Medium (3)	Low–Moderate (2)	Medium (6)	Moderate–High (4)	Medium (12)

5.1.3 Collision Risk Summary

The species-specific assessments identified *Low* to *Medium* collision risk at typical activity levels. Peak collision risk was *High* for Leisler's bat during spring and *Medium* for the remaining species and survey periods. Both typical activity and activity peaks inform the mitigation requirements, together with detector-level activity patterns and the locations of confirmed roosts.

High median activity was recorded for Leisler's bat at six detector locations during spring and at D09 during summer. Common pipistrelle recorded *High* median activity at six detector locations during summer, with additional records at D11 during spring and D08 during autumn (Table 5-5). The highest median activity was recorded for common pipistrelle at D04 during summer (126.5 bpph). No *High* median activity was recorded for soprano pipistrelle.

The Farm Complex (K22A), approximately 230 m from Turbine 2, supports confirmed soprano pipistrelle, common pipistrelle and Leisler's bat roosts. The nearby Round Tower structure group (K22C), approximately 370 m from Turbine 2, also supports a confirmed bat roost. These roost locations represent localised sensitivities additional to those described by the site-wide activity scores. Targeted curtailment at Turbine 2 will therefore be implemented from the commencement of operation to reduce collision risk during periods when bats are most likely to be active. Operational monitoring will assess bat activity and mortality across the Proposed Wind Farm, with particular attention to

Turbine 2 and locations recording elevated activity. Monitoring findings will inform the review of mitigation and the implementation of additional or revised curtailment where required.

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

Detector ID	Corresponding/nearest Proposed Turbine	Species	Survey period with High median activity
D05	T04	Leisler's bat	Spring 2025
D06	T05	Leisler's bat	Spring 2025
D07	T06	Leisler's bat	Spring 2025
D08	T07	Leisler's bat	Spring 2025
D09	T08	Leisler's bat	Spring and summer 2025
D11	T10	Leisler's bat	Spring 2025
D02	T02	Common pipistrelle	Summer 2025
D04	T04	Common pipistrelle	Summer 2025
D07	T06	Common pipistrelle	Summer 2025
D08	T07	Common pipistrelle	Summer and autumn 2025
D09	T08	Common pipistrelle	Summer 2025
D11	T10	Common pipistrelle	Spring and summer 2025

5.2 Loss of, or Damage to, Commuting and Foraging Habitat

The Proposed Project has the potential to result in the loss or modification of habitats used by bats for commuting and foraging. Effects may arise through vegetation clearance, fragmentation of linear features and disturbance associated with the construction of turbine foundations, hardstands, access roads, the Proposed Grid Connection and TDR accommodation works. Vegetation clearance required to establish the proposed bat felling buffers will also alter existing habitats.

The Proposed Wind Farm predominantly comprises improved agricultural grassland and commercial conifer plantation. Agricultural grassland and closed-canopy plantation interiors were assessed as having *Low* suitability for commuting and foraging bats. Hedgerows, treelines, scrub, plantation edges, stone walls, watercourses and drainage ditches were assessed as having *Moderate* suitability, providing sheltered flight paths, foraging opportunities and connections to the wider landscape.

Habitat loss will primarily affect grassland and conifer plantation, including approximately 14.6 ha of conifer plantation. Although plantation interiors generally offer fewer opportunities for commuting and foraging bats, clearance will alter existing edges and create new edge habitat that may be used by bats. The proposed bat felling buffers will maintain a minimum separation of 50 m between turbine blade tips and surrounding forestry edges, reducing the potential for bats using these features to encounter rotating blades.

Within the Proposed Wind Farm, approximately 1,281 m of hedgerow (WL1) and 59 m of treeline (WL2) will be permanently removed. These losses represent approximately 9.8% of the combined hedgerow and treeline resource recorded within the Proposed Wind Farm Site, as detailed in Chapter 6 of the EIAR. Removal of these features may interrupt established flight paths and reduce shelter and local foraging opportunities, particularly where access roads cross existing field boundaries. Retained linear features will continue to provide connections through the surrounding landscape, although localised reductions in connectivity may occur.

To facilitate the Proposed Grid Connection and TDR accommodation works, approximately 270 m of hedgerow (WL1) and 20 m of treeline (WL2) will require removal or cutting back. TDR accommodation works at Urlingford, Mountfinn, Balief Lower and Balief Upper will affect trees, hedgerows and field boundaries. Affected features will be reinstated, replanted or allowed to regrow following construction, as appropriate.

These works may temporarily interrupt sheltered flight paths and reduce local foraging opportunities. Although the affected habitats will be restored, replacement planting will require time to establish, resulting in a period of reduced habitat function.

In the absence of mitigation, the removal and interruption of linear features could reduce the suitability of affected areas for commuting and foraging bats. These effects are expected to be localised, given the extent of retained habitats within and around the Proposed Project.

The proposed habitat measures include management and bolstering of approximately 3.4 km of existing hedgerow and approximately 225 m of new native hedgerow planting, as detailed in the Biodiversity Enhancement and Management Plan (BEMP), Appendix 6-4. Native species appropriate to the locality will be used. Planting will be undertaken at the earliest practicable stage to minimise the period of reduced habitat function.

These measures are intended to strengthen retained habitat corridors and compensate for reductions in habitat quality and connectivity. Bolstering will improve the condition of existing features, while new planting and reinstatement will support the restoration of connections at affected locations. However, these measures will not immediately replace the ecological function of established vegetation, and a short- to medium-term reduction in local habitat function is anticipated.

Taking account of the retained habitat network, reinstatement and the planting and management measures specified in the BEMP, no significant residual effects on bat commuting and foraging habitat are predicted.

5.3 Loss of, or Damage to, Roosts

The Proposed Project has the potential to affect bat roosts through the removal or alteration of buildings, structures and trees, or through disturbance associated with nearby construction works. The assessment considers confirmed and historical roost records alongside the findings of the structure inspections and tree assessments.

Three confirmed roosting buildings were identified within the Farm Complex (K22A) during the 2025 surveys, comprising two stone sheds and a cattle shed. The stone sheds supported soprano pipistrelles, with maximum emergence counts of 50 and five individuals respectively. The cattle shed supported two common pipistrelles during spring and summer, and four soprano pipistrelles and one Leisler's bat during autumn. Common pipistrelle roosting was also confirmed within the complex in 2022, when three individuals were recorded. The Farm Complex is approximately 230 m from the nearest proposed turbine, T02.

The Round Tower within structure group K22C, approximately 370 m from T02 and outside the Proposed Wind Farm, supported four brown long-eared bats during the April 2025 inspection. The July survey indicated mixed-species use by an estimated 20 bats, although repeated emergence and re-entry limited count accuracy. A separate brown long-eared bat roost, supporting four recorded individuals, was confirmed within the adjacent K22C outbuildings in 2022. A further historical common pipistrelle roost supporting two individuals was recorded at dwelling K22E, near the TDR accommodation works, in 2022.

The historical roost records identified through the desk study have been considered irrespective of whether occupancy was reconfirmed in 2025. All assessed buildings and structures will be retained, and no demolition or works to the confirmed or historically recorded roost buildings are proposed. No direct loss of these roosts is therefore anticipated.

The Farm Complex and Round Tower structure group lie near the south-eastern edge of the Proposed Wind Farm. No removal of surrounding hedgerows, treelines or other connecting linear features is proposed, including clearance to establish bat felling buffers around T02. Existing connections between

these roosts and the wider landscape will therefore be maintained, and no severance of their adjoining commuting routes is anticipated. Construction activity and lighting will nevertheless require management to avoid disturbance and maintain roost access and functionality, as detailed in the mitigation section. Operational collision risk associated with T02 is assessed separately in Section 5.1.

The remaining assessed structure groups, comprising William's Old Farmhouse (K22B), the Derelict Stone Building (K22D) and Farm Shed (K25A), were assessed as having *Negligible* roosting suitability in 2025. No bats or evidence of roosting bats were identified during their inspections. All will be retained, including K22D within the proposed bat felling buffer. Historical surveys did not confirm roosts at K22B or K22D, or at the additional surveyed dwellings K22F and K22G.

Tree removal, pruning and trimming will be required to accommodate turbine foundations, hardstands, access roads, other project infrastructure, bat felling buffers and TDR accommodation works. Affected trees predominantly comprise commercial conifer plantation, with some broadleaved trees within hedgerows and treelines. The conifer stands were assessed as having *Negligible* roosting suitability. No potential roosting features (PRFs) were identified in trees requiring removal, pruning or trimming to facilitate the Proposed Project, including the Proposed Grid Connection and TDR accommodation works. No direct loss of identified tree roosts is therefore anticipated.

The Proposed Grid Connection includes the on-site substation and approximately 12.6 km of underground cabling, predominantly within existing road corridors and agricultural fields. No bat roosts were identified within its construction footprint. Six watercourse crossing locations were assessed, with four assigned *Negligible* roosting suitability and two assigned *None*. No evidence of roosting bats was recorded at the inspected crossing structures, and no loss of an identified roost is anticipated from these works.

TDR accommodation works at Urlingford, Mountfinn, Balief Lower and Balief Upper will involve localised tree and hedgerow removal or trimming. No PRFs were identified in affected trees. The historical roost at K22E will be retained, with potential disturbance from nearby works addressed through the mitigation measures.

Dunmore Cave, approximately 14.6 km from the Proposed Project, is an important roosting and autumn swarming site. Daubenton's bat, Natterer's bat and brown long-eared bat were recorded during swarming events there in September 2024 (Bat Conservation Ireland, 2025). Swarming movements can extend considerably beyond routine foraging ranges. Parsons and Jones (2003) recorded Daubenton's and Natterer's bats up to 26.7 km and 24.8 km respectively from a swarming site, while Rivers, Butlin and Altringham (2006) demonstrated seasonal movements of Natterer's bats between summer colonies and swarming caves within a catchment extending at least 60 km. Consequently, a potential connection with Dunmore Cave cannot be excluded solely on the basis of distance.

Although *Myotis* spp. and brown long-eared bat were recorded during the project surveys, these records do not establish the origin of individual bats or demonstrate movements to Dunmore Cave. No works are proposed at the cave or its immediate surroundings, and no direct loss, damage or construction-related disturbance to the cave roost is anticipated. The position of K22A and K22C near the south-eastern edge of the Proposed Wind Farm provides access to the wider landscape towards Dunmore Cave to the east, without necessarily requiring bats to cross the turbine array. The adjoining linear habitat connections will be retained.

Elsewhere, retention of the surrounding habitat network, reinstatement of affected linear features, hedgerow planting and bolstering, and measures controlling lighting will support continued movement through the landscape. Taking account of these measures and the habitat and collision-risk assessments, no significant effects on bats associated with Dunmore Cave are predicted.

On the basis of the survey findings and proposed works, no direct loss of a confirmed or historically recorded bat roost is anticipated. With implementation of measures protecting retained roosts from

disturbance and maintaining their access and functionality, no significant residual effects on identified bat roosts are predicted.

Having regard to the survey findings, the proposed development design and the avoidance and mitigation measures specified in this report, no damage or destruction of identified breeding sites or resting places, or deliberate disturbance of roosting bats, is anticipated. A project-specific derogation licence under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended, is therefore not considered necessary in relation to the assessed roost effects, and no such licence is required to accompany the planning application on that basis. This conclusion has been informed by *Applications for Regulation 54 Derogations for Annex IV Species: Guidance for Applicants*, Version 2 (DHLGH, 2026).

5.4 Displacement of Individuals or Populations

Displacement may occur where bats reduce or cease their use of roosting, commuting or foraging areas in response to habitat changes or disturbance associated with the Proposed Project. Potential sources include vegetation clearance, construction activity, artificial lighting and the presence and operation of turbines. The assessment considers the recorded activity patterns, affected habitats, retained connections and proximity of identified roosts.

Improved agricultural grassland and conifer plantation interiors were assessed as having *Low* suitability for commuting and foraging bats. Hedgerows, treelines, scrub, plantation edges, stone walls, watercourses and drainage ditches were assessed as having *Moderate* suitability. Surveys recorded spatial and seasonal variation in activity, with elevated activity at particular detector locations, especially during spring and summer. These findings indicate that displacement effects could vary between locations and species.

Vegetation clearance for project infrastructure and bat felling buffers will alter existing habitat structure and may cause bats to change their commuting routes or foraging areas. Permanent removal of hedgerows and treelines may result in localised displacement, while construction activity may temporarily reduce the suitability of adjoining habitats. The availability of alternative habitat does not necessarily prevent these effects, particularly where established flight paths are interrupted. Retained habitat connections, reinstatement and the BEMP measures will support continued use of the wider landscape, although replacement vegetation will require time to establish.

Temporary construction lighting could cause light-sensitive bats to avoid otherwise suitable habitats where illumination extends onto roost entrances, hedgerows, treelines, watercourses or woodland edges. Construction noise and activity may also cause localised disturbance, particularly near occupied roosts. The extent of these effects will depend on the location, timing and duration of works. Lighting controls and management of works near retained roosts are therefore required to maintain access and adjoining dark habitat connections.

Operational lighting associated with the substation, maintenance and security activities could similarly affect habitat use if light spills onto retained vegetation or roost access points. Lighting will be controlled through the measures specified in the mitigation section.

Three roosting buildings were confirmed within the Farm Complex (K22A), approximately 230 m from T02, with a further confirmed roost in the Round Tower within K22C, approximately 370 m from T02. All assessed structures will be retained. No removal of connecting linear features or vegetation clearance for bat felling buffers is proposed around T02, maintaining the adjoining connections between these roosts and the wider landscape. These retained features also provide outward connections towards the landscape east of the Proposed Wind Farm, potentially supporting seasonal movements towards Dunmore Cave, although such movements have not been demonstrated.

The historical roosts within the K22C outbuildings and dwelling K22E will also be retained. Measures controlling lighting and construction disturbance will apply where works could affect these locations. Along the Proposed Grid Connection and at TDR accommodation works areas, vegetation removal or trimming and construction activity may temporarily alter habitat use. Reinstatement, replacement planting and lighting controls will reduce the duration and extent of these effects.

Overall, localised displacement may occur during construction and following changes to habitat structure. Retention of roosts and adjoining habitat connections, implementation of lighting and disturbance controls, and the habitat measures specified in the BEMP will limit these effects. Taking account of these measures, no significant residual displacement effects on the local bat population are predicted.

6. BEST PRACTICE AND MITIGATION MEASURES

This section sets out the standard best practice and site-specific mitigation measures that will be implemented to avoid and reduce potential effects on bats during construction, operation and decommissioning of the Proposed Project. The measures address protection of roosts, maintenance of commuting and foraging habitats, control of lighting and disturbance, and reduction of collision risk. Operational monitoring will assess the effectiveness of mitigation and inform any necessary adjustments.

6.1 Standard Best Practice Measures

6.1.1 Noise Restrictions

During the construction phase, all plant and equipment will be operated in accordance with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001, as amended). Plant machinery will be switched off when not in use, and works will be managed to minimise unnecessary noise generation. Methodology and mitigation outlined in Chapter 12: '*Noise and Vibration'* will be followed to minimise noise and vibration during construction. Operational noise associated with the Proposed Project will arise principally from the wind turbines.

All wind turbine and electrical infrastructure associated with the Proposed Project will be specified, installed and maintained in accordance with relevant standards and manufacturer guidance to minimise unnecessary noise generation.

These measures have been incorporated into the assessment presented in Section 5.4 and will reduce the potential for operational noise to result in disturbance, displacement or behavioural effects on bats.

6.1.2 Lighting Restrictions

In accordance with the Institution of Lighting Professionals Note 08/23 (ILP, 2023), lighting associated with the Proposed Project will be designed to maintain dark commuting corridors and minimise light spill onto woodland, scrub, treelines, hedgerows, and other habitats used by bats. Lighting will not illuminate retained bat roost entrances or their adjoining habitat connections.

During the construction phase, lighting requirements will be temporary and limited to areas where required for health, safety and security purposes, including temporary construction compounds and works associated with the proposed substation. Where works are required during hours of darkness, lighting will be directed away from retained woodland, treelines, hedgerows, and bat commuting or foraging habitats. Directional accessories, including baffles, hoods, cowls and louvres, will be used where appropriate to reduce light spill and focus illumination only where required. The same restrictions will apply during decommissioning.

During the operational phase, lighting associated with the Proposed Project will be kept to the minimum necessary for operation, maintenance, safety and security purposes. Turbines will not be continuously illuminated, other than where aviation lighting is required.

All permanent lighting (excluding aviation lighting) will utilise warm-spectrum LED sources with a correlated colour temperature of 3000K or less. Lighting will be designed and operated to maintain dark commuting corridors along retained habitat features and avoid fragmentation of bat commuting routes. A buffer of dark, unlit habitat will be maintained between the proposed substation fence line and the nearest retained treeline or hedgerow.

The lighting measures will also follow Dark Sky Ireland principles by ensuring that lighting is used only where necessary, appropriately directed and maintained at the minimum intensity required for operational and safety purposes.

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 be carried out (as outlined below) to assess any potential changes in bat activity patterns and collision risk. Significant effects as a result of lighting are not anticipated. If monitoring identifies adverse effects associated with lighting, the lighting arrangements will be reviewed and appropriate corrective measures implemented.

6.2 Habitat Mitigation and Enhancement

Approximately 1,281 m of hedgerow (WL1) and 59 m of treeline (WL2) will be permanently removed within the Proposed Wind Farm. A further approximately 270 m of hedgerow and 20 m of treeline will require removal or cutting back to facilitate the Proposed Grid Connection and TDR accommodation works. These latter features will be reinstated, replanted or allowed to regrow following construction, as appropriate.

To mitigate habitat loss and strengthen retained habitat connections, approximately 225 m of new native hedgerow will be planted, alongside management, bolstering and infilling of approximately 3.38 km of existing hedgerow. These measures are detailed in the Biodiversity Enhancement and Management Plan (BEMP), Appendix 6-4, and illustrated in Figure 3-1 of that plan.

The planting and bolstering areas are located to the west and south-west of the Farm Complex (K22A) and west of the Round Tower structure group (K22C). Their placement is intended to strengthen habitat connections and encourage commuting and foraging away from Turbine 2. Existing connecting features around both roost locations will be retained, maintaining access to the wider landscape.

Planting will comprise locally appropriate native species, predominantly hawthorn (approximately 75%), with the remaining proportion comprising at least four other native species selected from hazel, blackthorn, rowan, elder, goat willow and grey willow. A combination of whips and advanced nursery stock will be used to promote structural diversity. Planting will be undertaken during the dormant season, between November and March, at the earliest practicable stage to minimise the period of reduced habitat function.

The following management measures will apply:

- Fertilisers, slurry, herbicides and pesticides will be avoided within the managed hedgerows and associated margins.
- Ivy will be retained where possible, and grassy margins will be maintained to support invertebrates and other wildlife.
- Hedgerows will be managed to achieve an approximate height of 2.5 m with an ‘A’-shaped profile.
- Trimming will be undertaken on a two- or three-year rotation between November and January.
- Stockproof fencing and tree guards will protect establishing vegetation, as specified in the BEMP.

A qualified ecologist will monitor the planted and enhanced hedgerows at six months and annually during Years 1 to 5. Dead or dying plants will be replaced and gaps replanted where necessary. At the end of Year 5, the Project Ecologist will review the need for further monitoring with the wind farm operator.

Approximately 11.7 ha of existing dry calcareous and neutral grassland (GS1) will also be managed to promote greater floral diversity, with the objective of developing habitat corresponding to Annex I

habitat 6210. These measures may increase the availability of invertebrate prey and provide additional foraging opportunities for bats.

The combined retention, reinstatement, planting and management measures will support habitat connectivity and improve the condition of retained habitats. New planting will require time to establish, and bolstering represents improvement of existing habitat rather than replacement habitat on an equivalent length basis. Management will continue in accordance with the BEMP throughout the operational lifespan of the Proposed Wind Farm.

6.3 Collision Risk Mitigation Measures

6.3.1 Bat Felling Buffers

In accordance with NatureScot (2021), NIEA (2021) and BCI (2026), a minimum 50 m buffer is applied between turbine blade tips and habitat features used by bats (e.g. hedgerows, treelines and woodland edges), in order to reduce the risk of bat activity occurring within the rotor-swept zone.

While larger buffers (100–200 m) have been recommended in Eurobats Publication No. 6 and NIEA guidance for woodland habitats, these are not currently supported by consistent empirical evidence in the UK and Ireland and are therefore not applied as standard.

A minimum separation of 50 m between turbine blade tips and relevant habitat features is adopted as the standard buffer requirement, based on the turbine specification (blade length: 81.5 m; hub height: 103.5 m; tip height: 185 m), subject to the site-specific exception at Turbine 2 described below. These buffers were calculated using the Natural England formula (Plate 6-1) and have been incorporated into the turbine layout.

The application of these buffers forms a key embedded mitigation measure to reduce collision risk, particularly for high-risk species such as pipistrelle species. Maintaining separation from these features reduces the likelihood of bats moving through the rotor-swept zone during commuting movements.

To facilitate these buffers, areas of conifer plantation and other vegetation will be removed within the Proposed Wind Farm. These areas will be maintained as vegetation-free (i.e. less than 2 m in height) throughout the operational life of the Proposed Project. This ensures that no new edge habitats or linear features develop within the buffer zone that could attract bat activity towards turbine locations.

In accordance with BCI (2026), linear features within the buffer zone will be removed or managed such that they do not function as commuting or foraging corridors for bats. This includes the removal or reduction of vegetation associated with treelines, hedgerows and woodland edges, and the management of other features, such as stone walls, where necessary, to ensure they do not provide continuous linear guidance or enhanced foraging opportunities for bats within the turbine risk zone.

This approach ensures that habitat features which could otherwise attract bat activity are not present within the rotor-swept area, thereby reducing the likelihood of bat–turbine interactions.

It is necessary to calculate the distance between the edge of the habitat feature and the centre of the turbine (b), using the following formula:

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

Where, bl = blade length, hh = hub height, fh = feature height all in metres.

An example calculation is provided below, where b = 69.3 m (Plate 6-1).

In the case of the Proposed Wind Farm, the required bat felling buffer equates to approximately 93 m from the turbine base to the nearest conifer plantation, and approximately 84 m from the turbine base to the nearest hedgerow or treeline with a feature height below 2 m. Bat buffers meeting these requirements will be established and maintained around all proposed turbines, with the exception of Turbine 2 (T2).

Due to the proximity of T2 to the confirmed bat roosts within the Farm Complex, existing linear habitat features surrounding this turbine will be retained to the north-west and south-east to maintain connectivity between the identified roosts and suitable commuting and foraging habitats within the wider landscape. The retention of these features is intended to avoid the severance of established commuting routes and minimise potential disturbance to bats associated with the roosts. This site-specific approach seeks to maintain the ecological functionality of the surrounding habitat, with additional operational mitigation proposed at T2 to address the associated collision risk.

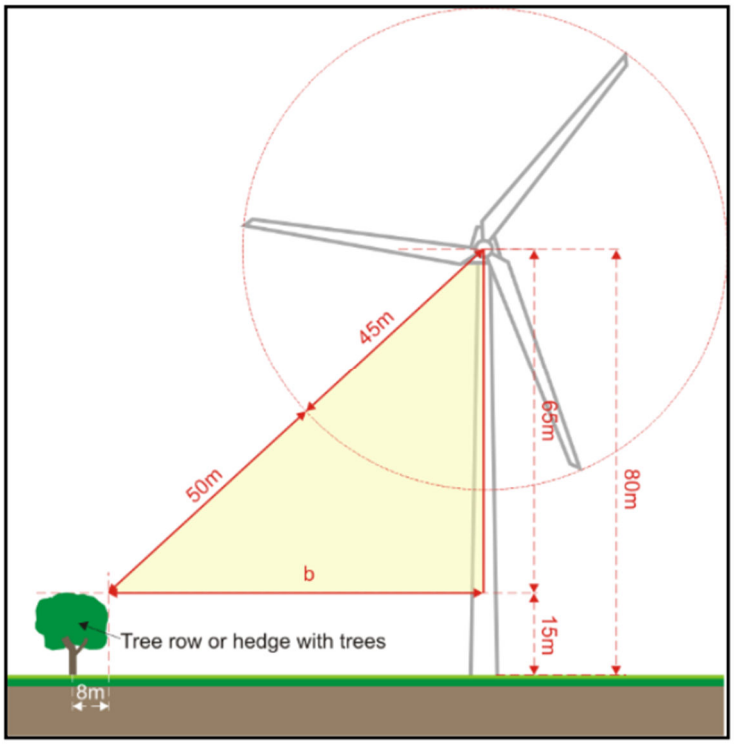


Plate 6-1 - Calculation of buffer distances (NatureScot, 2021)

6.3.2 Blade Feathering

Blade feathering will be implemented across all turbines as a standard operational mitigation measure throughout the operational life of the Proposed Wind Farm in accordance with current best practice guidance (NatureScot, 2021; NIEA, 2021; BCI, 2026). When wind speeds fall below the applicable turbine cut-in speed, blades will be pitched parallel to the wind to minimise rotation and reduce collision risk during periods when turbines might otherwise idle.

Feathering will apply below both the standard manufacturer cut-in speed and the increased cut-in speed specified under the curtailment protocols. The control settings will be configured with the turbine manufacturer to minimise blade rotation under these conditions.

6.3.3 Site-wide Curtailment for Leisler's Bat

Site-wide curtailment will be implemented from the commencement of operation to reduce collision risk to Leisler's bat. The assessment identified *Medium* typical collision risk during spring and summer, *High* peak risk during spring, and *Medium* peak risk during summer and autumn. *High* median activity was recorded at six detector locations during spring and at D09 during summer, while the species was recorded across all detector locations and seasons.

These findings, together with the species' capacity for long-distance movements and use of open airspace, support mitigation across the Proposed Wind Farm rather than at individual turbines alone. Habitat buffers and planting measures cannot adequately address this risk because Leisler's bats are not confined to following vegetated edges. Curtailment is therefore required at all turbines.

The seasonal and within-night activity patterns for Leisler's bat presented in Plate 4-34 inform the proposed curtailment schedule. Full-night curtailment will apply during April and May, corresponding to the period of greatest recorded Leisler's bat activity. During summer and autumn, curtailment will target the first two hours after sunset and the final two hours before sunrise, informed by the principal activity peaks identified in the baseline data.
The following protocol will apply at all turbines when both the wind-speed and temperature triggers are met:

Table 6-1 Site-wide curtailment protocol for Leisler's bat, specifying seasonal operating windows and environmental triggers.

Parameter	Site-wide curtailment requirement
Spring: 1st April to 31st May	Sunset to sunrise
Summer: 1st June to 15th August	Sunset to two hours after sunset, and two hours before sunrise to sunrise
Autumn: 16th August to 31st October	Sunset to two hours after sunset, and two hours before sunrise to sunrise
Wind speed	Below **6.0 m/s**, measured at hub height
Temperature	Above **10°C**, measured on site

Regional weather analysis indicated that approximately 90.1% of the bat activity represented in the analysis occurred at wind speeds up to 3.9 m/s (Plate 4-38), while approximately 92.2% occurred at temperatures of approximately 11.9°C or above (Plate 4-37). These separate relationships are consistent with increased activity under warm, low-wind conditions.

The weather observations were obtained from the nearby weather station and do not directly represent conditions at turbine hub height. They have therefore been used to contextualise the recorded activity rather than directly determine the operational wind-speed threshold. A hub-height threshold of 6.0 m/s and an on-site temperature threshold above 10°C have been selected with reference to BCI (2026). The seasonal and nightly operating windows have been informed by the site-specific activity patterns.

During the prescribed periods, the cut-in speed will be increased to 6.0 m/s when the temperature trigger is met. Blades will be feathered below this adjusted threshold, as described in Section 6.3.2. The protocol will be programmed into the turbine control system, with sunset and sunrise times adjusted automatically through the season. Turbine operating records will document the environmental conditions, activation of curtailment and blade rotational speed.

Although primarily directed at Leisler's bat, the site-wide regime will also reduce collision risk to other bats active during the same periods and environmental conditions.

Operational acoustic and fatality monitoring will assess the effectiveness of the regime. Monitoring results will be reviewed following the first year of operation and throughout the monitoring programme.

Where the findings identify risk not adequately addressed by the existing protocol, the seasonal coverage, nightly windows or environmental thresholds will be strengthened. Any subsequent relaxation of the regime will require a documented ecological assessment supported by monitoring evidence. Technological solutions such as bat deterrent devices may also be considered in either scenario where the ongoing monitoring suggests a change to the curtailment protocol should be considered.

6.3.4 Specific Curtailment Protocol for Turbine 2

An additional site-specific curtailment protocol will apply at Turbine 2 from the commencement of operation, addressing its proximity to confirmed roosts and the retention of connecting habitat features.

The Farm Complex (K22A), approximately 230 m from T02, supports three confirmed roosting buildings used by soprano pipistrelle, common pipistrelle and Leisler's bat. The Round Tower structure group (K22C), approximately 370 m from T02, also supports a confirmed roost. No vegetation clearance for bat felling buffers is proposed around T02, allowing existing connections between these roosts and the wider landscape to be retained. Common and soprano pipistrelle activity was recorded across a broad nightly period (Plates 4-35 and 4-36), providing further support for full-night curtailment at T02.

To reduce collision risk associated with the nearby roosts and retained features, T02 will be subject to full-night curtailment throughout April to October, when both environmental triggers are met:

Table 6-2 Turbine 2 curtailment protocol, specifying full-night coverage and environmental triggers from April to October.

Parameter	T02 curtailment requirement
Season	1st April to 31st October inclusive
Nightly period	Sunset to sunrise
Wind speed	Below 6.0 m/s, measured at hub height
Temperature	Above 10°C, measured on site

During these conditions, the cut-in speed will be increased to 6.0 m/s and blades feathered below that threshold. This protocol provides additional protection through the middle of the night during summer and autumn, when the site-wide regime targets the periods following sunset and preceding sunrise. During spring, both protocols provide full-night coverage.

The T02 protocol will be programmed into the turbine control system and its implementation documented through operating records. Operational monitoring will give particular attention to T02 and the retained habitat connections around K22A and K22C. The curtailment can be reviewed with the benefit of the monitoring information and may be refined where the evidence demonstrates that effective protection of bats will be maintained. Technological solutions such as bat deterrent devices may also be considered in either scenario where the ongoing monitoring suggests a change to the curtailment protocol should be considered.

6.4 Post-Construction Bat Monitoring Plan

A programme of post-construction monitoring (PCM) will be implemented to assess the effects of the Proposed Wind Farm on bat activity and collision mortality, and to evaluate the effectiveness of the mitigation measures described above, including blade feathering and site-specific curtailment.

The primary objective of the monitoring programme is to evaluate the effectiveness of the mitigation strategy and to ensure that the *Favourable Conservation Status* of local bat populations is maintained, as required under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended).

The monitoring programme has been designed in accordance with NatureScot (2021), NIEA (2021) and BCI (2026) guidance and will follow an adaptive management approach.

In accordance with NatureScot (2021) and BCI (2026), PCM will comprise two integrated components:

- **Fatality monitoring (carcass searches)** to quantify collision mortality; and
- **Acoustic monitoring** to assess bat activity patterns and potential displacement or attraction effects.

6.4.1 Fatality Monitoring

Carcass searches will be undertaken to quantify bat mortality associated with turbine operation.

In accordance with NatureScot (2021) and BCI (2026), professionally trained canine search teams will be utilised as the primary method of carcass detection. This reflects the reduced efficiency of human-led searches in Irish upland and vegetated landscapes.

Searches will be undertaken at all turbines within a radius of **92.5 m from the turbine base**, equivalent to half the turbine tip height (185 m), in accordance with best practice guidance.

Search frequency will be as follows:

- **Peak season (mid-August to October):** weekly searches,
- **Standard season (April to mid-August):** fortnightly searches.

Carcass persistence (scavenger removal) trials and searcher efficiency (SEEF) trials will be undertaken to allow robust estimation of collision mortality.

- **Carcass persistence trials:** A minimum of 10 trial carcasses will be deployed and monitored (e.g. using camera traps or regular checks) to determine mean persistence time.
- **Searcher efficiency trials:** Searcher efficiency trials will be undertaken to quantify the probability of carcass detection. These trials will involve the placement of trial carcasses within the search area and subsequent assessment of detection rates by the survey team. The results will be used to derive site-specific correction factors for the estimation of collision mortality.

These data will be used to correct observed carcass counts and calculate realistic estimates of bat mortality.

6.4.2 Acoustic Monitoring

Post-construction acoustic monitoring will be undertaken to assess bat activity patterns and to validate the effectiveness of the curtailment strategy.

Static detectors will be deployed at ground level in accordance with the pre-construction survey design to allow direct comparison with baseline conditions.

In addition, if practical to do so **four turbines one of which will be T2, will be fitted with nacelle-mounted ultrasonic detectors**, in accordance with BCI (2026) guidance (minimum one detector per three turbines). The remaining locations will be selected to represent the spatial distribution of recorded activity and turbine habitat settings. These detectors will record bat activity at rotor height.

Nacelle-level activity will be compared with baseline and ground-level data to assess bat activity in relation to turbine operation.

Analysis will focus on:

- seasonal patterns of activity,
- within-night activity (particularly sunset and sunrise periods), and
- activity in relation to weather conditions and turbine operation.

6.4.3 Roost Monitoring

Roost monitoring will be undertaken annually during the initial three-year post-construction monitoring programme, focusing on the Farm Complex (K22A) and Round Tower structure group (K22C). Monitoring will include the three confirmed roosting buildings within K22A, the Round Tower and the historically recorded brown long-eared bat roost within the adjacent K22C outbuildings.

Daytime inspections, where appropriate and accessible, and dusk emergence surveys supported by thermal imaging and acoustic recording will be undertaken. Three seasonal survey visits will be completed each year, covering spring, summer and autumn. Survey coverage and timing will be consistent with the baseline surveys where practicable, allowing comparison of occupancy, species composition and emergence counts.

Monitoring will also record the condition of roost entrances and adjoining habitat connections, including any changes in vegetation, artificial lighting or other potential sources of disturbance.

Roost monitoring results will be interpreted alongside ground-level and nacelle acoustic monitoring, fatality estimates and turbine operating records, particularly for T02. Changes in counts or occupancy will be investigated in the context of seasonal variation, survey conditions and other potential influences, rather than automatically attributed to turbine operation. Where findings identify project-related disturbance or deterioration of roost access or habitat connections, appropriate corrective measures will be implemented and monitoring extended as necessary.

6.4.4 Mortality Threshold and Adaptive Management

Collision mortality will be estimated using corrected carcass search data, accounting for carcass persistence and searcher efficiency.

For the purposes of this assessment, a threshold of **greater than one bat per turbine per year** is defined as a level at which collision mortality may be considered significant, in line with NIEA (2021) guidance.

The results of post-construction monitoring will be reviewed annually.

- Where monitoring demonstrates that collision mortality remains below this threshold and that mitigation measures are effective, the existing curtailment strategy will be maintained.

- Where mortality exceeds this threshold, curtailment measures will be strengthened. This may include extending the seasonal curtailment period, increasing the duration of nightly curtailment, or adjusting wind speed and temperature thresholds.

6.4.5 Monitoring Duration and Reporting

Post-construction monitoring will be undertaken for a minimum of three years following commissioning of the Proposed Wind Farm.

At the end of Year 3, a synthesis report incorporating fatality monitoring, ground-level and nacelle acoustic monitoring, and roost monitoring results will be prepared and submitted to the Planning Authority by the appointed bat ecologist on behalf of the wind farm operator. Where mortality remains below the defined threshold and monitoring demonstrates that mitigation is effective, the curtailment regime in place at that time will be maintained. Additional monitoring may be undertaken at five-year

intervals from Year 5 onwards, subject to the initial findings and agreement with the relevant authorities. The scope of subsequent roost surveys will be informed by recorded occupancy, emergence counts and any changes to roost access or adjoining habitat connections.

Where mortality exceeds the threshold, curtailment measures will be strengthened, and monitoring will be extended for a further two years.

An annual monitoring report will be prepared and submitted to the Planning Authority and relevant statutory consultees. Each report will include:

- bat activity data and analysis,
- observed fatalities and corrected mortality estimates,
- roost occupancy, species composition and emergence counts, including any changes to roost access and adjoining habitat connections;
- assessment of mitigation effectiveness, and
- recommendations for any required adjustments to the mitigation strategy.

Transition to Smart Curtailment (Optional Optimisation Pathway)

At the end of Year 3, and subject to the outcomes of post-construction monitoring, the Applicant may submit a **Mitigation Review Report** to the Planning Authority and the National Parks and Wildlife Service (NPWS), in accordance with BCI (2026) guidance.

Where monitoring demonstrates that collision mortality remains below the defined significance threshold and confirms that periods of elevated risk are confined to specific temporal or environmental conditions, the curtailment strategy may be refined to more accurately reflect the site-specific risk profile.

In this context, the Applicant may elect to implement a **Smart Curtailment system**, whereby turbine operation is dynamically controlled based on real-time detection of bat activity at rotor height (e.g. using nacelle-mounted detectors integrated with turbine control systems). Under such a system, turbines would curtail or shut down only when bats are detected within, or approaching, the rotor-swept zone, thereby directly targeting periods of actual collision risk.

This approach allows curtailment to be focused and responsive, rather than applied across broad seasonal or nightly windows, and may therefore reduce unnecessary turbine downtime while maintaining effective protection for bats.

In accordance with BCI (2026), implementation of Smart Curtailment must be supported by a minimum of three years of robust post-construction monitoring data demonstrating that refinement of the mitigation strategy is appropriate.

The additional site-specific curtailment measures proposed for Turbine 2, as detailed in Section 6.3.4, will remain in place following any transition to a **Smart Curtailment System**, due to the nearby confirmed roosts and the retention of surrounding linear habitat features. Any proposed refinement will require a documented assessment supported by the post-construction monitoring results.

Where Smart Curtailment is implemented, a **post-implementation re-validation audit** will be undertaken at intervals of approximately five years, including fatality monitoring, ground-level acoustic monitoring and nacelle monitoring. Roost surveys will also be included, with their scope informed by the initial roost monitoring findings and any subsequent changes to roosts or surrounding habitats. The audit will assess whether the mitigation remains effective and identify any necessary adjustments.

6.5 Residual Effects

No Significant Residual Effects

Taking account of the design of the Proposed Project and implementation of the specified mitigation measures, no significant residual effects on bats are predicted.

For collision mortality and barotrauma, habitat separation at turbines other than T02, blade feathering, site-wide curtailment for Leisler's bat and the additional full-night curtailment at T02 will reduce collision risk. These measures will apply from the commencement of operation. Acoustic, fatality and roost monitoring will assess their effectiveness, with mitigation strengthened where necessary. Subject to implementation of these commitments, no significant residual collision-related effects on local bat populations are predicted.

All assessed structures will be retained, and no direct loss of confirmed or historically recorded roosts is anticipated. Connecting habitat features around the Farm Complex (K22A) and Round Tower structure group (K22C) will remain unaffected. With the specified controls on lighting and construction disturbance, no significant residual effects on identified roosts are predicted.

Permanent removal of some hedgerows and treelines will result in localised habitat loss. Reinstatement of features affected by the Proposed Grid Connection and TDR accommodation works, new hedgerow planting, bolstering of retained hedgerows and grassland management will compensate for reductions in habitat function and strengthen retained connections. These measures represent habitat creation and quality enhancement rather than a net increase in linear habitat length.

A short- to medium-term reduction in local commuting and foraging habitat function is anticipated while replacement vegetation establishes. Retained habitat connections will continue to provide opportunities for bats during this period. Taking account of the extent of retained habitats and implementation of the BEMP, this residual effect is predicted to be localised and not significant.

Retention of roost access and adjoining habitat connections, lighting restrictions and habitat management will also limit displacement. No significant residual displacement effects on the local bat population are predicted.

Overall, with implementation and maintenance of the mitigation measures and the associated monitoring and adaptive management programme, the Proposed Project is not predicted to adversely affect the conservation status of local bat populations.

6.6 Cumulative Effects

A review of publicly available information identified nine existing wind farm sites within 15 km of the Proposed Turbines: Lisdowney, Ballybay, Lisheen I, Lisheen II, Lisheen III, An Cnoc, Foyle, Bruckana and Gurteen Lower Single Wind Turbine. Three proposed wind farms, Gathabawn, Seskin and Littleton, and four permitted wind farms, Foyle Wind Farm Extension, Briskalagh, Farranrory and Ballynalacken, were also identified within this area. The Proposed Wind Farm therefore lies within a landscape containing an existing concentration of wind energy infrastructure, with further developments permitted or proposed. The projects considered are detailed in Section 4.2.6 of this report and Section 2.8 of Chapter 2 of the EIAR. The cumulative assessment also considers the solar farms, quarrying and mining projects identified in the desktop review.

The principal cumulative pathway is collision mortality where bats encounter more than one wind farm during commuting, foraging or seasonal movements. This is particularly relevant to Leisler's bat, given its wide-ranging movements, use of open airspace and high collision susceptibility. Additional pathways include combined habitat loss, fragmentation, lighting and displacement associated with wind energy and other developments.

The mapped distribution of surrounding turbines indicates that wind energy infrastructure is concentrated mainly to the north-east, around the wider Proposed Grid Connection corridor, and to the west within approximately 5 to 15 km. Substantial areas around the Proposed Wind Farm remain free of turbines. No other mapped turbines occur between the Proposed Wind Farm and Dunmore Cave to the east. This provides an area through which bats could undertake seasonal movements without encountering an intervening turbine array, although the surveys have not established specific flight paths or movements between the Proposed Wind Farm and the cave.

The Farm Complex (K22A) and Round Tower structure group (K22C) lie near the south-eastern edge of the Proposed Wind Farm. Their adjoining linear habitat connections will be retained, with no vegetation clearance for bat felling buffers proposed around T02. Bats travelling east towards Dunmore Cave would not necessarily need to cross the Proposed Wind Farm turbine array. These design characteristics reduce the potential for the Proposed Project to interrupt outward habitat connections, while the wider habitat network remains relevant to potential movements towards other developments.

Collision risk arising from the Proposed Wind Farm will be reduced through blade feathering at all turbines, habitat separation at turbines other than T02, site-wide curtailment for Leisler's bat and additional full-night curtailment at T02. These measures will apply from the commencement of operation. They address the Proposed Project's contribution to cumulative mortality risk without assuming that equivalent controls are implemented at surrounding wind farms.

Solar developments, quarrying and mining projects may contribute to cumulative changes in commuting and foraging habitats through vegetation removal, disturbance and lighting. The Proposed Project will retain all assessed structures and the habitat connections surrounding the identified roosts near T02. Reinstatement of features affected by the Proposed Grid Connection and TDR accommodation works, together with new hedgerow planting, bolstering and grassland management, will support continued habitat use and connectivity. Lighting controls will reduce the potential for additional fragmentation of dark commuting routes.

The assessment recognises that the absence of direct works to shared roosts or confirmed flight paths does not exclude cumulative effects, and that ground-level activity records cannot quantify mortality across the surrounding wind farm network. Nevertheless, taking account of the distribution of developments, retained landscape connections and the mitigation specified for the Proposed Project, no significant residual cumulative effects on bats are predicted.

7. CONCLUSION

This report assesses the potential effects of the Proposed Project on bats, including the Proposed Wind Farm, Proposed Grid Connection and TDR accommodation works. NatureScot (2021) provided the principal framework for the 2025 survey programme and collision-risk assessment, with additional reference to NIEA (2021; amended 2024). BCI (2026) informed interpretation of the findings and development of mitigation and post-construction monitoring proposals.

Collision risk will be reduced through habitat separation at turbines other than T02, blade feathering at all turbines, site-wide curtailment for Leisler's bat and additional full-night curtailment at T02. These operational measures will apply from the commencement of operation. Acoustic, fatality and roost monitoring will assess their effectiveness and inform adaptive management, with mitigation strengthened where necessary.

Habitat measures include approximately 225 m of new native hedgerow, management and bolstering of approximately 3.38 km of existing hedgerow, and management of approximately 11.7 ha of grassland to promote greater floral diversity. These measures will improve retained habitat quality and support connectivity. Existing habitat connections around the Farm Complex (K22A) and Round Tower structure group (K22C) will remain unaffected. Although permanent habitat loss and a short- to medium-term reduction in local habitat function are anticipated, retained habitats, reinstatement and implementation of the BEMP will limit the resulting effects.

All assessed structures will be retained, including confirmed and historically recorded roost buildings. No direct loss of identified roosts is anticipated. Lighting restrictions and construction management measures will protect roost access and reduce disturbance. On the basis of the assessed roost effects and specified avoidance measures, a project-specific derogation licence is not considered necessary in relation to those effects.

Provided that the Proposed Project is constructed, operated and decommissioned in accordance with the design and mitigation commitments described in this report, no significant residual adverse effects on bats are predicted. Subject to implementation of these measures and the monitoring and adaptive management programme, the Proposed Project is not predicted to adversely affect the conservation status of local bat populations.

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APPENDIX 1

BAT HABITAT SUITABILITY ASSESSMENT

BAT HABITAT SUITABILITY ASSESSMENT

Guidelines for assessing the potential suitability of a site for bats, based on the presence of habitat features within the landscape (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

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	Small number of potential roost features, of low quality. Low quality foraging habitat that could be used by small numbers of foraging bats. Isolated site not connected to the wider landscape by prominent linear features.
Moderate	Buildings, trees or other structures with moderate-high potential as roost sites on or near the site. Habitat could be used extensively by foraging bats. Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.
High	Numerous suitable buildings, trees (particularly mature ancient woodland) or other structures with moderate-high potential as roost sites on or near the site, and/or confirmed roosts present close to or on the site. Extensive and diverse habitat mosaic of high quality for foraging bats. Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows. At/near edge of range and/or on an important flyway. Close to key roost and/or swarming site.

Project Size	Description
Small	Small scale development (≤10 turbines). No other wind energy developments within 10km. Comprising turbines <50m in height.
Medium	Larger developments (between 10 and 40 turbines). May have some other wind developments within 5km. Comprising turbines 50-100m in height.
Large	Largest developments (>40 turbines) with other wind energy developments within 5km. Comprising turbines >100m in height.

APPENDIX 3

OVERALL SITE RISK ASSESSMENT

OVERALL SITE RISK ASSESSMENT

Table 3b: Stage 2 – Overall Risk Assessment

Site Risk Level (from Table 3a)	Ecobat activity category (or equivalent justified categorisation)					
Site Risk Level	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

Overall assessment

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

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.

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).