Planning and Environmental Consultants

Appendix 6-1 – Bat Survey Report

Taurbeg Wind Farm Extension of Operational Life

DOCUMENT DETAILS

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1. INTRODUCTION

This Bat Report has been prepared by MKO on behalf of Taurbeg Limited. Planning permission is sought for the continued operation of the existing Taurbeg Wind Farm, as permitted by Cork County Council (Pl. Reg. Ref: N/2002/3608), for a further period of 10 years from the date of the expiry of the current planning permission (2026) per Condition no. 7 of the consent issued. The 'Proposed Lifetime Extension' is described in detail in Chapter 4 of the Environmental Impact Assessment Report (EIAR).

This report provides details of the bat surveys undertaken at the Site including survey design, methods and results, and the assessment of potential effects of the Proposed Lifetime Extension on bats. The focus of this bat report is on the Taurbeg Wind Farm Site. Surveys carried out in 2024 in accordance with NatureScot, 2021[1], are used for the assessment of effects on bats. Where necessary, mitigation is prescribed to minimise any identified significant effects.

Bat surveys employed a combination of methods, including desktop study, habitat and landscape assessments, roost inspections, manual activity surveys and static detector surveys at ground level and at height. Surveys were based on the turbine layout of 11 turbines. In parallel of these surveys, carcass searches by trained conservation dogs were undertaken monthly from January in 2024 by the MKO dog team at Taurbeg Wind Farm. These surveys are not described in this report however, their results are used for data interpretation and mitigation measures regarding collision risk. Carcass survey results are provided in Appendix 7-6, Collision Monitoring Report of the EIAR.

The assessment and mitigation provided in this report has been designed in accordance with NatureScot 2021. Consideration was also given to the Northern Ireland Environment Agency (NIEA) Natural Environment Division (NED) Guidance [2], which was produced in August 2021 (amended March 2024).

As detailed in Section 1.1.1 in Chapter 1 of the EIAR, for the purposes of this Bat Report, the various project components are described and assessed using the following references: 'the Site', 'Proposed Project', 'Proposed Lifetime Extension', 'Proposed Offsetting Measures' and 'Proposed Offsetting Lands'.

1.1 Background

Wind energy provides a clean, sustainable alternative to fossil fuels in generating electricity. However, wind energy development can impact wildlife, directly through mortality and indirectly through disturbance and habitat loss. Bat fatalities have been reported at wind energy facilities around the world, raising concern about the cumulative impacts of such developments on bat populations (Arnett *et al.* 2016). No large-scale studies have been undertaken in Ireland to date. However, a study from the UK estimated bat fatalities at between 0 – 5.25 bats per turbine per month (Mathews *et al.* 2016). While these results are not directly applicable to Ireland due to differences in bat species and behaviour, Ireland shares more similarities with bat assemblages of Great Britain, when compared to those of mainland Europe.

Investigative research in North America and mainland Europe have revealed the mechanisms for bat mortality at wind turbines. Fatalities arise from direct collision with moving turbine blades (Horn *et al.* 2008, Cryand *et al.* 2014) and barotrauma (Baer Wald *et al.* 2008), i.e. internal injuries caused by air pressure changes. The reason why bats fly in the vicinity of wind turbines has been attributed to several

[1] *NatureScot published Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. Version: August 2021 (NatureScot, 2021).*
[2] *Northern Ireland Environment Agency Natural Environment Division (NED) published Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland (NIEA, 2021).*

different behavioural and environmental factors, e.g. habitat associations, weather conditions, and species ecology.

Survey design and analyses of results at the Site were undertaken with reference to the latest policy and legislation, scientific literature and industry guidelines. Any spatial, temporal or behavioural factors that may put bats at risk were fully considered.

1.2 Bat Survey and Assessment Guidance

Several guidelines for surveying bats at wind energy developments have been produced in Europe, the UK and Ireland.

At a European level, the Advisory Committee to the EUROBATS Agreement, to which Ireland is a signatory, have produced Guidelines for Consideration of Bats in Wind Farm Projects which outlines an approach for assessing the potential impacts of wind turbines on bats during planning, construction and operation phases (Rodrigues, 2015). However, these guidelines are based on continental scenarios and include more diverse species and behaviours than those typical of Ireland. As such, EUROBATS guidance may recommend a level of survey that may prove inappropriate in Irish scenarios. Nevertheless, the guidance is evidence-based and provides a useful European context, within which Member States are encouraged to produce specific national guidance, focusing on local circumstances.

Bat Conservation Ireland (BCI) produced *Wind Turbine/Wind Farm Development Bat Survey Guidelines* (BCI, 2012a). This document provides advice to practitioners and decision makers in Ireland on necessary qualifications for surveyors, health and safety considerations, pre-construction and post-construction survey methodologies and information to be included in a report. In the absence of comprehensive Irish research, these guidelines provide generalised methodology rather than detailed technical advice.

The second edition of the UK Bat Conservation Trust Bat Survey Good Practice Guidelines (Hundt, 2012) includes a chapter (Chapter 10) on survey methodologies for assessing the potential impacts of wind turbines on bats. The document provides technical guidance for consultants carrying out impact assessments. However, the recommendations are not based on any research findings specific to the UK. A third edition to the guidelines (Collins 2016), removed the chapter on surveying wind turbine developments. This change has been maintained in their fourth edition (Collins, 2023). Prior to the publication of the BCT guidelines, Natural England's *Bat and Onshore Wind Turbines: Interim Guidance* provided an interpretation of the EUROBATS recommendations, as applied to onshore wind energy facilities in the UK (Natural England, 2014). In addition, the Chartered Institute of Ecology and Environmental Management (CIEEM) publishes advice on best practice as well as updates on the current state of knowledge in *the Technical Guidance Series* and in the quarterly publication *In Practice*.

In August 2021, NatureScot (formerly Scottish Natural Heritage), published *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation* (NatureScot, 2021). The 2021 version supersedes the 2019 version of the guidance. The purpose of the guidance is to help planners, developers and ecological consultants to consider the potential effects of onshore wind energy developments on bats. The emphasis is on direct impacts such as collision mortality, but there is reference throughout to the need for a full impact assessment requiring wider consideration of other (indirect) effects. The Guidance replaces previous guidance on the subject; notably that published by Natural England and Chapter 10 of the Bat Conservation Trust publication, *Bat Surveys: Good Practice Guidelines (2nd edition),* (Hundt, 2012) and tailors the generic EUROBATS guidance on assessing the impact of wind turbines on European bats (Rodrigues *et al.*, 2014). The document guides the user through the key elements of survey, impact assessment and mitigation.

The NIEA (NED) recently published *Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland*. This new guidance follows and builds

upon the recently updated NatureScot 2021 guidance. The latter guidance has set the industry standard since its publication in 2019. The NED guidance does not aim to replace the NatureScot guidance, but it does provide additional clarifications and recommendations regarding survey requirements and impact assessment in an Irish context.

The survey scope and assessment provided in this report are in accordance with NatureScot 2021 Guidance.

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 2019. 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, 2019). Pressures and Threats are ranked from medium importance (M) to high importance (H) in the 2019 Article 17 report.

Bat Species	Conservation Status	Principal Pressures/Threats
Common pipistrelle *Pipistrellus pipistrellus*	Favourable	**A05** Removal of small landscape features for agricultural land parcel consolidation (M) **A14** Livestock farming (without grazing) [impact of anti-helminthic dosing on dung fauna] (M) **B09** Clear--cutting, removal of all trees (M) **F01** Conversion from other land uses to housing, settlement or recreational areas (M) **F02** Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas (M) **F24** Residential or recreational activities and structures generating noise, light, heat or other forms of pollution (M) **H08** Other human intrusions and disturbance not mentioned above (Dumping, accidental and deliberate disturbance of bat roosts (e.g. caving) (M) **L06** Interspecific relations (competition, predation, parasitism, pathogens) (M) **M08** Flooding (natural processes) **D01** Wind, wave and tidal power, including infrastructure (M)
Soprano pipistrelle *Pipistrellus pygmaeus*	Favourable	
Nathusius' pipistrelle *Pipistrellus nathusii*	Unknown	
Leisler's bat *Nyctalus leisleri*	Favourable	
Daubenton's bat *Myotis daubentoni*	Favourable	
Natterer's bat *Myotis nattereri*	Favourable	
Whiskered bat *Myotis mystacinus*	Favourable	
Brown long-eared bat *Plecotus auritus*	Favourable	
Lesser horseshoe bat *Rhinolophus hipposideros*	Inadequate	

1.4 Statement of Authority

MKO employs a dedicated bat unit within its Ecology team, who carry out scoping, surveys 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. MKO's Ecology team holds a bat derogation licence from NPWS. The licence is intended for professionals carrying out surveys with the potential to disturb roosting bats (i.e. roost inspections). Graduate and seasonal ecologist staff are covered under the conditional licence where they are accompanied by more experienced colleagues.

Scope development and project management was overseen by Aoife Joyce (BSc., MSc.). Bat surveys were conducted by MKO ecologists Nora Szijarto (B.Sc., M.Sc.), Sara Fissolo (B.Sc.), Stephanie Corkery (B.Sc., M.Sc.) and Cuan Feely (BSc.). Data analysis was undertaken Frederick Mosley (BA., MSc.), and results were compiled by Nathan Finn (B.Sc., M.Sc.), and Nora Szijarto. Impact assessment, the design of mitigation and final reporting was completed by Nora Szijarto, reviewed by Sara Fissolo 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.)	Project Director	BSc. (Hons) Environmental Science, University of Galway, Ireland. MSc. (Hons) Agribioscience, University of Galway, Ireland. Advanced Bat Survey Techniques – Trapping, biometrics, handling (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).
Sara Fissolo (B.Sc.)	Project Ecologist	B.Sc. (Hons) Ecology and Environmental Biology, University College Cork, Ireland. Advanced Bat Survey Techniques (BCI), Bat Impacts and Mitigation (CIEEM), Bats in Heritage Structures (BCI), Bat Care (BCT), Bats and Lighting (BCI), Kaleidoscope Pro Analysis (Wildlife Acoustics).
Nora Szijarto (B.Sc., M.Sc.)	Bat Ecologist	B.Sc. Biology, University of Lausanne, Switzerland M.Sc. Behaviour, Evolution and Conservation, University of Lausanne, Switzerland 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).
Stephanie Corkery (B.Sc., M.Sc.)	Ecologist	B.Sc. (Hons) Ecology and Environmental Biology, University College Cork M.Sc. Marine Biology, University College Cork (2020)

		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).
Cuan Feely (B.Sc.)	Graduate Ecologist	B.Sc. Environmental Science, National University of Ireland, Galway Experience in report writing, as well as the usage of various ecological survey methods such as habitat assessments, freshwater and terrestrial invertebrate surveys, bat surveys, vegetation surveys and small mammal surveys.
Frederick Mosley (B.A., M.Sc.)	Seasonal Bat Ecologist	B.A. (Hons) Biological and Biomedical Science Mod. Zoology, Trinity College, Dublin (2022) M.Sc. Marine Biology, University College Cork (2023) 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)

2. PROJECT DESCRIPTION

Planning permission is sought for the continued operation of the existing Taurbeg Wind Farm (Proposed Lifetime Extension), as permitted by Cork County Council (Pl. Reg. Ref: N/2002/3008), for a further period of 10 years from the date of the expiry of the current planning permission (March 2026) as per Condition no. 7 of the consent issued, with decommissioning of the wind farm at the end of the proposed extension period.

The Proposed Lifetime Extension does not comprise any alterations to the existing operational wind farm. The Applicant intends to submit an application to Cork County Council for the Proposed Lifetime Extension.

The Proposed Lifetime Extension comprises:

i. *11 no. existing wind turbines with a tip height of 108.2 metres and all associated foundations and hardstanding areas;*
ii. *1 no. existing onsite 38kV electrical substation including a control building, associated electrical plant and equipment, welfare facilities and a wastewater holding tank;*
iii. *1 no. existing meteorological mast with a height of 67m;*
iv. *All existing underground electrical and communications cabling connecting the existing wind turbines to the existing onsite 38kV Substation;*
v. *An existing gated site entrance and existing internal access tracks;*
vi. *Existing site drainage;*
vii. *Existing ancillary infrastructure, associated site fencing and signage.*

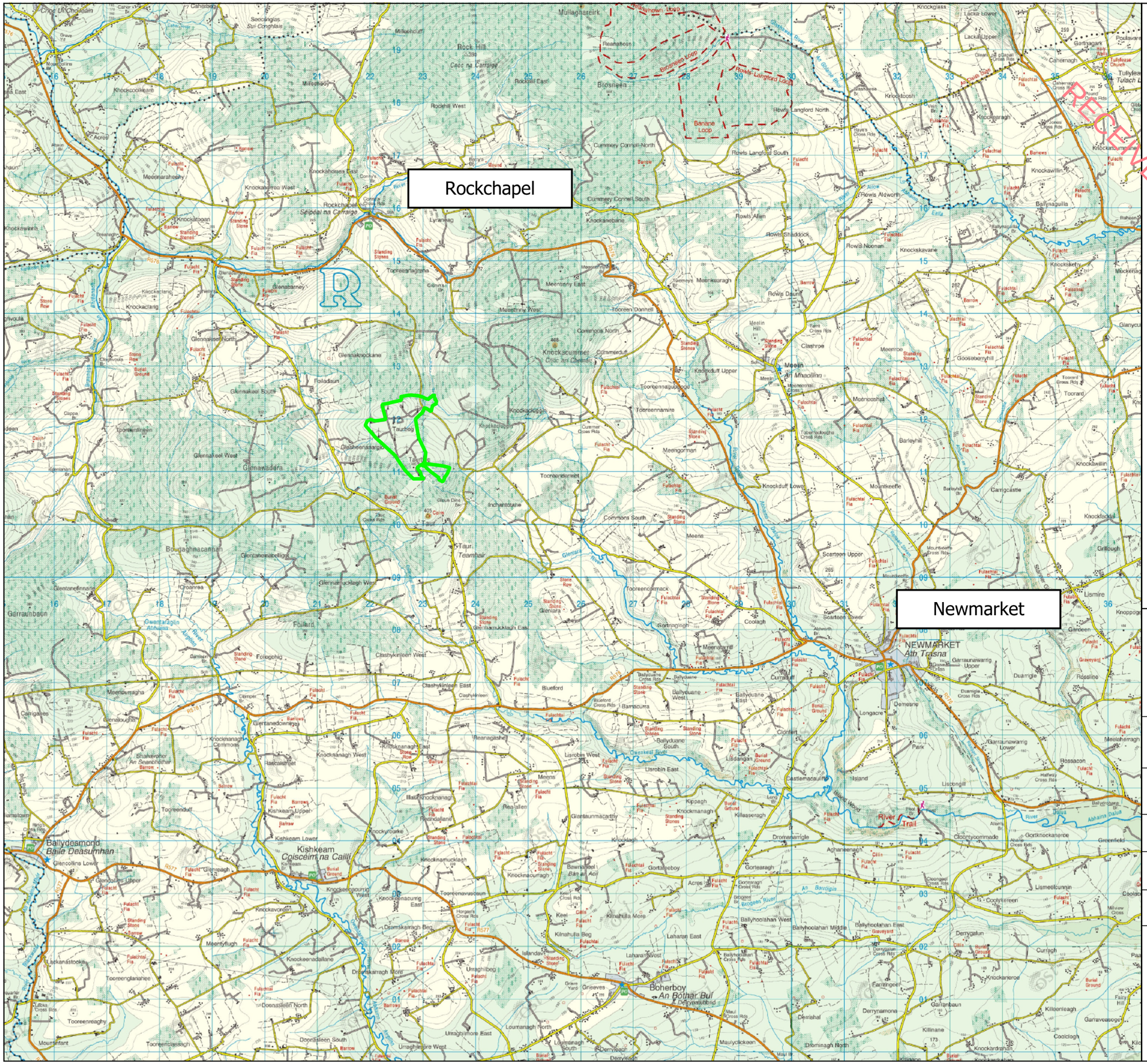
The Taurbeg Wind Farm is connected to the national electricity grid at the existing Glenlara 110kV Substation. A 38kV underground cable runs between the onsite substation and a mast at the south of the site. A 38kV overhead line runs from the mast to the existing Glenlara 110kV Substation. The grid connection does not form part of the current planning application.

The Proposed Lifetime Extension is expected to have significant negative effects on displacement of Hen Harrier. Proposed Offsetting Measures have been developed to offset these effects. The lands within which these measures are proposed are located c. 12km east of the Taurbeg Wind Farm Site in Co. Kerry. The Applicant intends to submit an application to Kerry County Council for the Proposed Offsetting Measures.

The Proposed Offsetting Measures comprise:

i. *Permanent removal of commercial forestry (deforestation) over an area of approx. 105.5 Ha and the restoration of open peatland and creation of scrub habitat within the felled area.*
ii. *Restoration of farmland habitat to good quality hen harrier foraging habitat through diversifying the range and extent of habitats over an area of approx. 17.7 Ha;*
iii. *All associated site development works including fencing.*

A full description of the Proposed Project for the purposes of the planning application and the additional elements that form part of the overall project, assessed in this EIAR, is outlined in Chapter 4 of this EIAR. Further details of the Proposed Offsetting Measures can also be found in Appendix 7-7 of the EIAR.



Map Legend

Taurbeg EIAR Site Boundary

Drawing Title

Site Location

Project Title

Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NS	EMcC
Project No.	Drawing No.
231030	Figure 2-1
Scale	Date
1:70,000	2024-11-07

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3. METHODS

3.1 Consultation

A scoping exercise was undertaken as part of the EIAR for the Proposed Lifetime Extension application. A Scoping Document, providing details of the Proposed Lifetime Extension, was prepared by MKO and circulated to consultees in February 2024. As part of this exercise, prominent Irish conservation groups were contacted, and Bat Conservation Ireland (BCI) and National Parks and Wildlife Service (NPWS), were specifically invited to comment on the potential of the Proposed Project to affect bats.

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

3.2 Desk Study

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

3.2.1 Previous reports

A search for documentation of previous ecological assessments within the site was carried out to inform the survey scope. A summary of relevant results from previous surveys is provided within the report.

3.2.2 Bat Records

The National Bat Database of Ireland holds records of bat observations received and maintained by BCI. These records include results of national monitoring schemes, roost records as well as ad-hoc observations. A search of the National Bat Database of Ireland was last carried out on the 11th March 2024 and examined bat presence and roost records within a 10 km radius of a central point in the Site (IG Ref: R 22484 11731) (BCI 2012, Hundt 2012, NatureScot 2021). A request of all available bat data was requested to the Bat Conservation Ireland (BCI) on the 18th October 2024.

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 April 2019, Ireland submitted the third assessment of conservation status for Annex-listed habitats and species, including all species of bats (NPWS, 2019).

The 2019 Article 17 Reports were reviewed for information on bat species' range and distribution in relation to the Site. The aim was to identify any high-risk species at the edge of their range (NatureScot 2021).

3.2.4 Designated Sites

The National Parks and Wildlife Service (NPWS) map viewer and website provides information on rare and protected species, sites designated for nature conservation and their conservation objectives. A search was undertaken of sites designated for the conservation of bats within a 10km radius of the Site

(BCI 2012, Hundt, 2012, NatureScot 2021). This included European designated sites, i.e. SACs, and nationally designated sites, i.e. NHAs and pNHAs.

3.2.5 Landscape Features

3.2.5.1 Ordnance Survey Mapping

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

3.2.5.2 Geological Survey Ireland

The Geological Survey Ireland (GSI) online mapping tool and University of Bristol Speleological Society (UBSS) Cave Database for the Republic of Ireland were consulted for any indication of natural subterranean bat sites, such as caves, within 10km of the Site (BCI, 2012) (last searched on the 11th March 2024). Furthermore, the archaeological database of national monuments was reviewed for any evidence of manmade underground structures, e.g. souterrains, that may be used by bats (last searched on the 11th March 2024).

3.2.5.3 National Biodiversity Data Centre Bat Landscape Mapping

The National Biodiversity Data Centre (NBDC) map viewer presents "Bat Landscape" maps for individual species and for all species combined. Lundy *et al.* (2011) used Maximum Entropy Models to examine the relative importance of bat landscape and habitat associations in Ireland. The resulting map provides a 5-point scale, ranging from highest habitat suitability index (presented in red) to lowest suitability index (presented in green). However, squares highlighted as less favourable may still have local areas of abundance.

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

3.2.5.4 Additional Wind Energy Projects in the Wider Landscape and Large-scale Developments

As detailed in Section 2.11 in Chapter 2 of the EIAR, a search for existing, permitted and proposed wind energy developments within 10km of the existing Taurbeg Wind Farm turbines was undertaken (NatureScot, 2021). The Wind Energy Ireland (WEI) interactive wind map (windenergyireland.com) was reviewed in conjunction with wind farm planning applications from Cork County Council and An Bord Pleanála. Other infrastructure large scale developments and proposals (e.g. roads) were also noted. Information on the location and scale of these developments was gathered to inform cumulative effects. More details on other infrastructure developments within the vicinity of the Proposed Lifetime Extension can be found in Chapter 2 of the EIAR.

3.2.6 Multidisciplinary Surveys

Multidisciplinary walkover surveys were undertaken in 2024 (Table 3-1). The Site was systematically and thoroughly walked in a ground-truthing exercise with the habitats on the Site assessed and

classified. During the static bat detector deployments and collections each season, any incidental records and bat habitat assessments were also carried out.

Multidisciplinary walkover surveys were undertaken within the Site on the following dates:

Table 3-1 Multidisciplinary Survey Effort

Multidisciplinary Survey	Dedicated Bat Survey
22nd February 2024	14th March 2024
2nd July 2024	2nd May 2024
	15th May 2024
	26th June 2024
	3rd July 2024
	23rd July 2024
	29th August 2024
	12th September 2024
	8th October 2024
	31st October 2024

3.3 Field Surveys

3.3.1 Bat Habitat Suitability Appraisal

A bat walkover survey was conducted on the Site by Sara Fissolo and Nora Szijarto on 14th March 2024 and the Proposed Offsetting Lands were visited on 20th January 2025 by three MKO ecologists, as outlined in Chapter 6 of the EIAR. During these surveys, habitats within the Site and Proposed Offsetting Lands were assessed for their suitability to support roosting, foraging and commuting bats. Connectivity with the wider landscape was also considered. Suitability was assessed according to Collins (2023) which provides a grading protocol for roosting habitats and for commuting and foraging areas. Suitability categories are divided into *High, Moderate, Low*, *Negligible*, *None* and are described fully in **Appendix 1**.

3.3.1.1 Daytime Roost Inspections

A search for roosts was undertaken within 200m plus the rotor radius (i.e. 41.2m) of the Site (NatureScot, 2021). The aim was to determine the presence of roosting bats and the need for further survey work or mitigation. The Site was visited in March, June, July, August September and October 2024. Multiple walkovers were carried out and all structures and trees were assessed for their potential to support roosting bats (see **Appendix 1** for criteria in assessing roosting habitats).

Any potential roost sites were subject to a preliminary roost assessment. One structure was identified as a potential roost structure within the Site in 2024 (IG Ref 22549 12024) this being the substation. It was subject to a roost assessment in March 2024. This comprised a detailed inspection of the interiors and exteriors to look for evidence of bat use, including live and dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises. The assessment was carried out with the use of an endoscope and binoculars.

Any potential tree roosts were examined for the presence of rot holes, hazard beams, cracks and splits, partially detached bark, knot holes, gaps between overlapping branches and any other Potential Roost Features PRFs identified by Andrews (2018). Locations of all PRFs are presented in Figure 3-1.

3.3.2 Manual Activity Surveys

Manual activity surveys were carried out throughout 2024 in the form of dusk emergence survey as well as walked transects. Weather conditions were suitable for carrying out bat activity surveys on all survey

dates. Surveyors were equipped with active full spectrum bat detectors, Batlogger M (Elekon AG, Lucerne, Switzerland). Where possible, species identification was made in the field and any other relevant information was also noted, e.g., numbers, behaviour, features used, etc. All bat echolocation was recorded for subsequent analysis to confirm species identifications, as detailed in Section 3.3.5.

Survey effort for 2024 is outlined in Table 3-2 and presented in Figure 3-1.

Table 3-2 2024 Survey Effort - Manual Activity Surveys

Date	Surveyors	Sunset/ Sunrise	Type	Weather	Transect (km)
15th May 2024	Nora Szijarto and Stephanie Corkery	21:26	Walked Transect	10-11˚C, dry, light breeze to moderate, moon visible, 10-20% cloud	6.06
25th June 2024	Sara Fissolo and Nora Szijarto	22:02	Walked Transect	10-13˚C, dry, calm to light breeze, no visible moon, 10-60% cloud	7.45
29th August 2024	Nora Szijarto and Cuan Feely	20:30	Dusk emergence and Walked Transect	11-13˚C, dry, light breeze, no moon, 0-30% cloud	7.13
Total 2024 Survey Effort					**20.64**

3.3.2.1 Walked Transects

Transect surveys were carried out on the 15th May, 25th July and 29th August 2024. The aim of the surveys was to observe bat species using the Site and visually assess bat behaviour and important features used by bats within and around the Site.

The transects were walked by two surveyors, recording bats in real time. The survey route was prepared to cover the entire site layout and followed existing tracks. Five-minute point counts (5MPCs) were performed along the route to sample the bat activity near turbine locations. The transect started at sunset and lasted 2-3 hours after sunset.

3.3.2.2 Dusk Emergence Survey

Manual activity surveys comprised a dusk emergence survey which focused on the two PRFs identified during the habitat appraisal. During the survey, two surveyors were equipped with Bat Logger M bat detectors (Elekon AG, Lucerne, Switzerland) and focused on the existing substation, where evidence of bat use was identified. Use of night vision aids was not considered necessary in this instance as the structure is illuminated by exterior lighting. During the survey, the thermal camera was used as a third surveyor to cover the potential roost opening identified on a chestnut tree near the entrance of the Site. The emergence surveys commenced at least 15 minutes before sunset and concluded 1 hour and 15 minutes after sunset.

3.3.2.2.1 *Night Vision Aids*

The use of NVAs is now considered standard best practice for bat activity surveys. MKO employs thermal camera equipment. The thermal camera (InfiRay Eye II V2.0), mounted on a tripod, was used during the emergence survey to identify potential roosting hotspots and monitor emergence activity.

Footage from NVAs was saved and reviewed in full, with any instances of emergence marked for future use. The location of the NVA is presented in Figure 3-1.

3.3.3 Static surveys

3.3.3.1 Ground Level Static Surveys

Eleven automated bat detectors were deployed for at least 10 nights of suitable weather in spring (April-May), 20 nights in summer (June-mid August) and 10 nights in autumn (mid-August-October, NatureScot, 2021). Detector locations were based at turbine locations. Figure 3-1 presents static detector locations in relation to turbine layout. Static detector locations are described in Table 3-3.

Table 3-3 Ground-level Static Detector Locations. Note that there is no Detector D04

ID	Location	Habitat	Linear Feature within 50m	Nearest Associated Turbine
D01	R 22704 11359	Wet grassland	Conifer edge	T1
D02	R 22475 11942	Wet grassland	Conifer Treeline	T2
D03	R 22306 12005	Wet grassland	None	T3
D05	R 22304 12183	Wet grassland	None	T5
D06	R 22658 12230	Wet grassland	Conifer edge	T6
D07	R 22909 12124	Wet grassland	Broadleaved trees	T7
D08	R 22368 11758	Scrub	Treeline	T8
D09	R 22907 11613	Scrub	Edge conifer	T9
D10	R 22924 10942	Wet grassland	Scrub	T10
D11	R 23018 11249	Wet grassland	Conifer	T11
D12	R 22475 11589	Wet grassland	Conifer edge	T12

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

Onsite weather monitoring was undertaken concurrently with static detector deployments. One Vantage Pro 2 (Davis Instruments, CA, UCS) was deployed each season and night-time hourly data was tracked remotely to ensure a sufficient number of nights (i.e. minimum 10 no.) with appropriate weather conditions were captured (i.e. dusk temperatures above 8˚C, wind speeds less than 5m/s and no less than 3.5 mm/h rainfall). Table 3-4 summarises survey effort achieved in 2024 for each of the 11 no. detector locations.

Table 3-4 Survey Effort - Ground-level Static Surveys

Season	Survey Period	Total Survey Nights per Detector Location	Nights with Appropriate Weather
Spring	2nd May – 15th May 2024	12	12
Summer	26th June – 23rd July 2024	27	20
Autumn	29th August - 12th September 2024	14	12
Total Survey Effort		**53**	**44**

3.3.3.2 Static Surveys at Height

Monitoring at height can provide useful information on bat activity. Surveying at ground level and at height was undertaken throughout 2024. One Song Meter SM3BAT (Wildlife Acoustics, Maynard, MA, USA) was installed on a meteorological mast within the Site (Grid Ref: R 22032 11808) for recordings in

Spring until mid-Summer. Battery power on the SM3 were not sufficient to cover long period of time during the bat season which is why it was replaced with two Song Meter SM4BAT (Wildlife Acoustics, Maynard, MA, USA) on the 3rd July 2024.

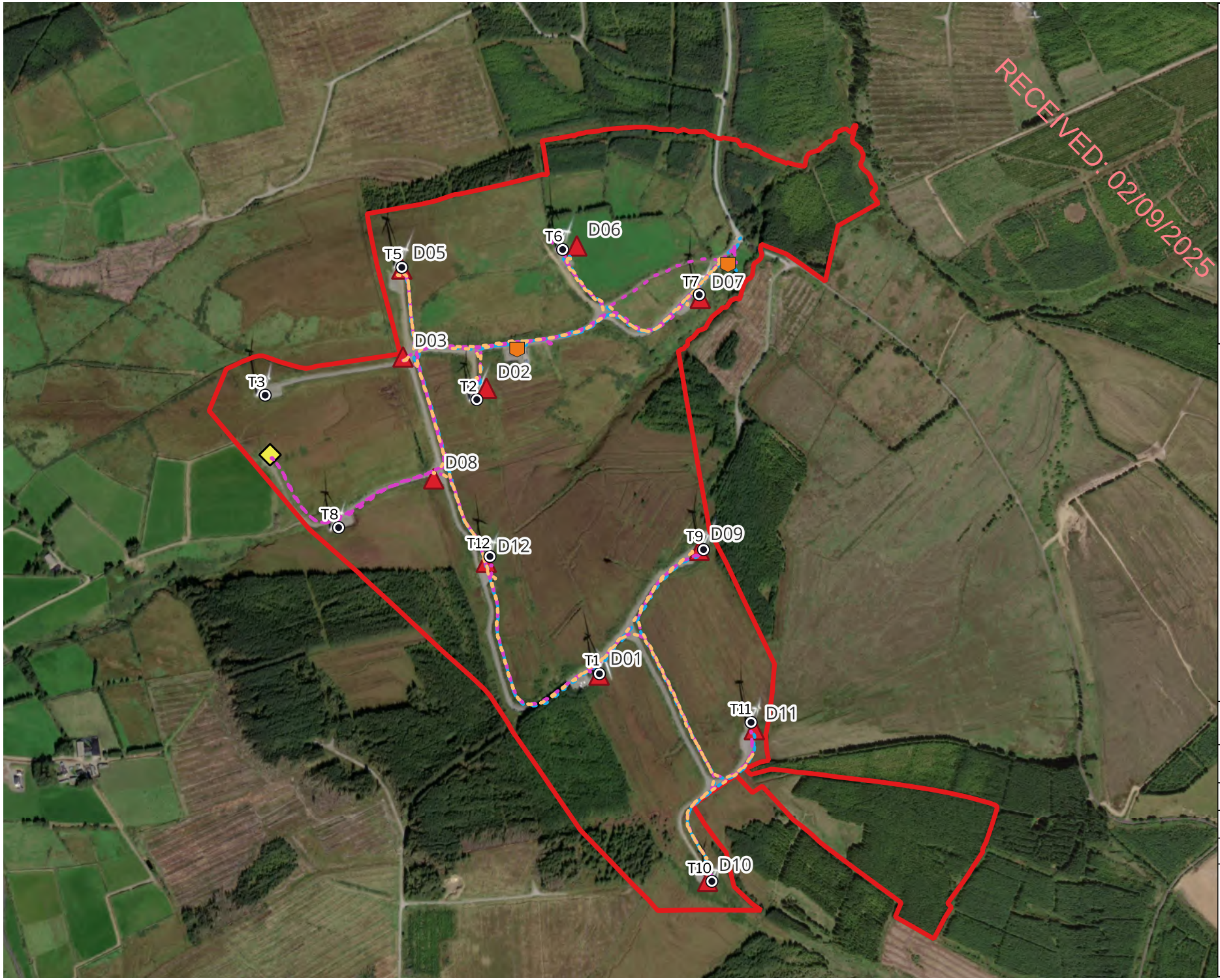
Microphones were of the type SMM-U1 which are especially resistant to wind and rain. They were placed at ground level (i.e.2m) and at height (i.e. 67m). Table 3-5 describes survey effort in relation to surveys at height and the location of the met mast is illustrated in Figure 3-1.

Table 3-5 2024 Survey Effort Timeline: Static surveys at height. The number of recording nights is presented per month and grey boxes corresponds to absence of recordings due to maintenance or end of battery life.

	May			June		July	August	September	October			Total nights surveyed
Ground level	11		11		5	30	31	30	31			149
At height	11		11		5	30	31	30		10		128
	SM3 Bat detector					SM4 Bat detector						

3.3.4 Dog-led Collision Monitoring

Dog-led collision monitoring surveys were carried out from January 2024 and are ongoing at the Site. These surveys use conservation detection dogs to locate bird and bat carcasses on the Site. More details of these surveys can be found in Appendix 7-6, Collision Monitoring Report.



Map Legend

- Taurbeg EIAR Site Boundary
- Turbines

Static Detectors

- At Ground Level
- At Height on the met mast
- Transect - 15.05.2024
- Transect - 25.06.2024
- Transect - 29.08.2024
- Potential Roosting Features

N

Drawing Title

Survey Effort

Project Title

Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NS	AJ
Project No.	Drawing No.
231030	Figure 3-1
Scale	Date
1:10,000	30.06.2025

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3.3.5 Bat Call Analysis

All recordings were later analysed using bat call analysis software Kaleidoscope Pro v.5.6.8 (Wildlife Acoustics, MA, USA). The aim of this was to identify, to a species or genus level, what bats were present at the Site. Bat species were identified using established call parameters, to create site-specific custom classifiers. All identified calls were also manually verified.

Echolocation signal characteristics (including signal shape, peak frequency of maximum energy, signal slope, pulse duration, start frequency, end frequency, pulse bandwidth, inter-pulse interval and power spectra) were compared to published signal characteristics for local bat species (Russ, 1999). *Myotis* species (potentially Daubenton's bat *(M. daubentonii),* whiskered bat *(M. mystacinus),* Natterer's bat *(M. nattereri)* were considered as a single group, due to the difficulty in distinguishing them based on echolocation parameters alone (Russ, 1999). The echolocation of soprano pipistrelle *(P. pygmaeus)* and common pipistrelle *(P. pipistrellus)* are distinguished by having distinct (peak frequency of maximum energy in search flight) peak frequencies of ~55 kHz and ~46 kHz respectively (Jones & van Parijs, 1993). Some overlapping is possible between these species: where no certainty could be achieved, calls were identified to genus level.

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. Due to the volume of bat activity data recorded, where multiple bat passes were recorded within the same registration, rarer or harder to record species were identified. Underreporting of common species is possible using this method and is accounted for within the assessment.

Echolocation calls by brown long-eared bats (*P. auritus*) are intrinsically quiet and hard to record by static equipment. All data collected, including Noise files and Auto ID files are checked to ensure all calls for this species have been captured. However, a level of underrepresentation is expected for this species and is accounted for in the assessment of activity levels.

Echolocation by lesser horseshoe bats (*R. hipposideros*) is directional and can be missed by detectors, particularly manual detectors. MKO employs omni-directional microphones to limit under-recording for the species.

3.4 Assessment of Bat Activity Levels

The online database tool Ecobat (mammal.org.uk) is recommended by NatureScot 2021 to assess bat activity levels within a proposed wind-farm site. This web-based interface, launched in August 2016, allows users to upload activity data and to contrast results with a comparable reference range, allowing objective interpretation. Uploaded data then contributes to the overall dataset to provide increasingly robust outputs. Ecobat generates a percentile rank for each night of activity and provides a numerical way of interpreting levels of bat activity in order to provide objective and consistent assessments. Table 3-6 defines bat activity levels as they relate to Ecobat percentile values (NatureScot, 2021).

Table 3-6. Ecobat Percentile Score and Categorised Level of Activity (NatureScot, 2021)

Ecobat Percentile	Bat Activity Level
81 to 100	High
61 to 80	Moderate to High
41 to 60	Moderate
21 to 40	Low to Moderate
0 to 20	Low

Ecobat was unavailable for a cross-site analysis of 2024 data as the platform has been undergoing maintenance since late 2022 with no proposed timeline of a relaunch. Therefore, data were assessed on a site-specific basis.

Following preliminary analysis and manual verification using Kaleidoscope Pro, statistical analysis and visualisation was performed using RStudio (version 2023.12.1+402.) and R (version 4.3.3). RStudio, an integrated development environment for the R programming language[3], was employed for data cleaning, exploration, and data visualisation. The 'ggplot2' R package was particularly instrumental in creating the data visualisations shown in the results section. Data was standardised into bat pass rates, calculated as bat passes per hour (total bat passes / night length) to account for seasonal changes in night length (Matthews *et al.* 2016). Activity is often variable between survey nights. Therefore, the median Nightly Pass Rate was used as the most appropriate measure of bat activity (Lintott & Mathews, 2018). During all calculations, data was rounded to at least three decimal places. When visualising the bat pass rates per season, survey effort was defined as detector hours (sum of recorded hours across all detectors). This was defined to circumvent any issues arising from differences in survey effort between detectors in a season.

The methodology used to assess activity levels across the Site was adapted from Mathews *et al.* (2016), where activity ranges of pipistrelle species were defined using an average of maximum nightly pass rates (in total passes during the survey period) across all detectors, divided into tertiles. In our methodology, widespread species (*P. pipistrellus, P. pygmaeus, N. leisleri*) activity ranges were determined using an average of maximum nightly pass rates (total passes / survey effort) across all detectors, divided into quartiles. For all other species groups, maximum nightly bat pass rate recorded across all detectors, divided into quartiles was used.

Activity levels were assessed separately for widespread pipistrelle species (*P. pipistrellus*, *P. pygmaeus*), noctules *(N. leisleri*), *Myotis* spp. and rare or hard to record species (*P. auritus, P. nathusii*). Median and maximum nightly activity (bpph) at each detector location were then categorized as Low, Medium, or High for each recorded season. Any figure below 25% of the maximum/average maximum nightly pass rate was considered Low activity, while figures above 75% were classified as High. Values falling between these two quartiles were defined as Medium. To prevent skewing the activity thresholds, any evident outliers recorded across the detectors were excluded (i.e. 55.7 bpph at D09 in Spring for *P. nathusii*).

The site-specific categories in Table 3-7 presents activity ranges per species group identified.

Table 3-7 Site-specific Activity Level Categories based on Maximum Bat Passes per Hour (bpph)

Assessment Level	Activity Threshold as Bat Passes per Hour (bpph) for Bat Species				
	P. pipistrellus* *P. pygameus	***N.leisleri***	***Myotis* spp.**	***P.auritus***	***P. nathusii***
Low	< 1.37	< 3.48	< 0.55	< 0.53	< 0.15
Medium	1.37 – 4.1	3.48 – 10.43	0.55 – 1.65	0.53 – 1.58	0.15 – 0.45
High	4.1 <	10.43 <	1.65 <	1.58 <	0.45 <

[3] *R Core Team (2024). R: A Language and Environment for Statistical Computing. R Foundation for Statistical Computing, Vienna, Austria. <https://www.R-project.org/>.*

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 3-8, an adapted assessment of vulnerability of wind turbine collision for Irish bat populations is provided. This adaptation of the NatureScot Guidance Table 2 was based on collision risk and species abundance of Irish bat populations. Species' collision risk follows those described in NatureScot (2021). Relative abundance for Irish species was determined in accordance with Wray *et al.* (2010) using population data available in the 2019 Article 17 reports (NPWS, 2019). Feeding and commuting behaviours, and habitat preferences for bat species in Ireland were also considered.

Table 3-8 Population Vulnerability of Irish Bat Species (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 development 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 3-9) i.e. Table 3a NatureScot (2021). Table 5-1 in the results section describes the criteria and site-specific characteristics used to determine an indicative risk level for the Site. All site assessment levels, as per NatureScot (2021) are presented in **Appendix 2**.

Table 3-9 Site-risk Level Assessment Matrix (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 assessment of risk was made by combining the site risk level (i.e. Low/Medium/High) and the population risk (i.e. Ecobat bat activity outputs), as shown in the overall risk assessment matrix table (Table 3-10) i.e. Table 3b (NatureScot (2021). The assessment was carried out for both median and maximum Ecobat activity categories in order to provide insight into typical bat activity (i.e. median

values) and activity peaks (i.e. maximum values). All site assessment levels, as per NatureScot (2021) are presented in **Appendix 3**.

Table 3-10 Overall Risk Assessment Matrix (Table 3b, NatureScot (2021).

	Ecobat 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)

This exercise was carried out for each high collision risk species. Plate 3-1 outlines high collision risk species. Overall risk assessments were also considered in the context of any potential impacts at the population level, particularly for species identified as having high population vulnerability (Plate 3-1).

3.6 Limitations

A comprehensive suite of bat surveys were undertaken at the Site. The surveys undertaken in accordance with BCT Guidance and NatureScot, provide the information necessary to allow a complete, comprehensive and robust assessment of the potential impacts of the Proposed Lifetime Extension on bats receptors.

Access limitations can relate to static deployments and roost inspections:

- No significant access issues were encountered with the Site during static deployments. Cattle were present in the fields near T08 and T03 during the first deployment in spring therefore, detectors D08 and D03 were deployed at a safe distance from the turbine bases, 200m and 300m respectively to prevent damage by livestock. They were deployed in a habitat similar and representative to the turbine locations.
- Access was gained throughout the Site for all seasons and within all structures identified for inspection.

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

- Good survey coverage of the Site has been achieved, with 11 detectors at ground level and 2 detectors on the met mast being deployed in across the Site covering all turbines present.
- MKO employs data storage redundancy methods to ensure no data is lost from the field to final analysis - no data was lost.
- SD card corruption or fill-up can prevent data from being collected during deployments – no issues with data on-site or data storage were encountered.
- Bat detector's microphones are checked before every season to ensure they have appropriate sensitivity for data collection, and detectors' software updates are installed as they become available - One issue related to equipment was encountered during the surveys at height as the one microphone temporarily displayed an error message. This was rectified and recording continued.
- Incidents during deployments, such as tampering or livestock interference, can prevent data from being collected effectively - no incidents were reported during the surveys.

Activity assessment limitations can relate to data analysis procedures and a lack of standardised and Ireland-based assessment methods:

- MKO's data analysis methods include manually checking of 100% of bat passes identified by Auto ID Software, as well as noise and no ID files. Where multiple species, or multiple individuals of the same species, are identified within the same call, only one is reported, prioritising hard to detect species. This is due to the large volumes of data collected. While this method is likely to introduce a bias, it is not believed to affect the overall conclusions of the assessment, as only commonly recorded species might be underreported.
- No activity threshold currently exists for Irish bat species to objectively assess bat activity within a certain habitat, and no standardised assessment method has been proposed across the country. Ecobat software recommended by existing guidelines was not available for use at the time of the assessment, as under maintenance. MKO's experience surveying habitats similar to those present within the Site aided with the assessment.

No significant limitations in the scope, scale or context of the assessment have been identified.

4. RESULTS

4.1 Consultation

4.1.1 Bat Conservation Ireland

No response has been received from Bat Conservation Ireland as of 14th January 2025.

4.1.2 Development Applications Unit - NPWS

A detailed scoping exercise was undertaken for the Proposed Lifetime Extension. The Development Applications Unit were invited to provide any feedback, comments or suggestions they might have relating to the Proposed Lifetime Extension. A reply was received on the 19th April 2024 and a meeting was held online between the Applicant, MKO and the NPWS on the 30th April 2024 to discuss the Proposed Lifetime Extension. A second meeting was held on the 29th of May 2025 to discuss the Proposed Offsetting Measures in particular. No concerns were raised in relation to bats at either meeting. The full details of the scoping and consultation exercise are described in the EIAR.

4.2 Desk Study

4.2.1 Previous reports

Bat surveys were carried out in 2015 as part of a previous application to extend the operational life of Taurbeg Wind Farm (Planning Ref: 166366). It included a bat habitat appraisal, seasonal dusk and dawn transect surveys, deployment of one static detector during a night, and two days of carcass search across the site in June 2015. No roosting place was discovered on site and foraging and commuting site were assessed with a low to medium value. The overall bat activity on Site was considered low with a peak of activity observed in September 2015, interpreted at the time, as a general movement of bats towards mating sites. Two bat species and one bat group were recorded on site including common and soprano pipistrelles and *Myotis* spp. The common pipistrelle was the most abundant species. Foraging activity was recorded between the turbines and in the vicinity of turbine T1. No bat carcasses were discovered on Site but limitations related to the effectiveness of survey were highlighted.

4.2.2 Bat Records

National Bat Database of Ireland

A review of the National Bat Database of Ireland on the 11th March 2024 yielded results of bats within a 10km hectad of the Site. The results of the NBDC database search are provided in Table 4-1 lists the bat species recorded within the hectad (R21) which pertains to the Site. A review of the NBDC bat landscape map provided a habitat suitability index of 15.67 (green). This indicates that the Site area has low habitat suitability for bat species.

Table 4-1 National Bat Database of Ireland Records within 10km

Hectad	Species	Date	Database	Status
R21	Daubenton's Bat (*Myotis daubentonii*)	20/07/2008	National Bat Database of Ireland	Annex IV
R21	Pipistrelle (*Pipistrellus pipistrellus sensu lato*)	20/07/2008	National Bat Database of Ireland	Annex IV
R21	Soprano Pipistrelle (*Pipistrellus pygmaeus*)	20/07/2008	National Bat Database of Ireland	Annex IV

Bat Conservation Ireland

Available bat records were provided by BCI on the 6th November 2024. The search yielded all records of bat species within 10km around the Site. It included 5 transects and 15 ad-hoc observations but no roost was recorded within the area (See Table 4-2 and Table 4-3 below). At least seven of Ireland's nine resident bat species were recorded within 10 km of the Site including common, soprano and Nathusius' pipistrelle, Leisler's bat, brown long-eared bat, Daubenton's bat and Natterer's bat.

Table 4-2 BCI transect surveys within 10km of the Site

Name	Grid reference start	Grid ref easting start	Grid ref northing start	Species observed
Mountcollins Creamery Transect	R1575 018700	115750	118700	*Pipistrellus spp.* (45kHz/55kHz),Unidentified bat, *Myotis daubentonii*
V99 (10) 2006-	R1412 818391	114128	118391	*Pipistrellus nathusii*, Unidentified bat, *Pipistrellus pygmaeus, Pipistrellus spp.* (45kHz/55kHz),*Nyctalus leisleri, Pipistrellus pipistrellus* (45kHz)
V99 (7) 2006-	R1640 005100	116400	105100	*Pipistrellus pipistrellus* (45kHz),Unidentified bat, *Nyctalus leisleri, Pipistrellus pygmaeus, Pipistrellus spp.* (45kHz/55kHz)
V99 (8) 2006-	R1701 809907	117018	109907	*Myotis spp., Nyctalus leisleri, Pipistrellus pipistrellus* (45kHz),*Pipistrellus pygmaeus,* Unidentified bat
V99 (9) 2006-	R1693 214456	116932	114456	Unidentified bat, *Myotis spp., Pipistrellus spp.* (45kHz/55kHz),*Nyctalus leisleri, Pipistrellus pygmaeus, Pipistrellus pipistrellus* (45kHz)

Table 4-3 Ad-hoc observations from BCI within 10km of the Site

Survey	Grid reference	Grid ref easting	Grid ref northing	Date	Species observed
BATLAS 2010	R1515403768	115154	103768	28/07/2008	*Nyctalus leisleri, Pipistrellus pygmaeus, Pipistrellus pipistrellus* (45kHz)
BATLAS 2010	R2010	120000	110000	20/07/2008	*Myotis daubentonii,Pipistrellus pygmaeus,Pipistrellus pipistrellus* (45kHz)
BATLAS 2010	R221159	122100	115900	20/07/2008	*Myotis daubentonii*
BATLAS 2010	R3146407335	131464	107335	28/07/2008	*Nyctalus leisleri*
BATLAS 2010	R3043007781	130430	107781	28/07/2008	*Pipistrellus pygmaeus,Pipistrellus pipistrellus* (45kHz),*Myotis daubentonii*
BATLAS 2010	R2384607685	123846	107685	28/07/2008	*Myotis daubentonii*
BATLAS 2010	R2251108331	122511	108331	28/07/2008	*Pipistrellus pipistrellus* (45kHz)
BATLAS 2010	R2380808365	123808	108365	28/07/2008	*Nyctalus leisleri*
BATLAS 2010	R2109907118	121099	107118	28/07/2008	*Pipistrellus pipistrellus* (45kHz),*Pipistrellus pygmaeus*
BATLAS 2020	R1510003800	115100	103800	12/09/2019	*Myotis daubentonii,Pipistrellus pipistrellus* (45kHz)

National Biodiversity Data Centre Bat Records	R275204	127500	120400	25/04/2021	*Myotis daubentonii,Nyctalus leisleri*
National Biodiversity Data Centre Bat Records	R261065	126100	106500	14/09/2016	*Myotis natterreri,Myotis daubentonii,Pipistrellus pygmaeus,Pipistrellus pipistrellus* (45kHz),*Nyctalus leisleri*
National Biodiversity Data Centre Bat Records	R196064	119600	106400	14/09/2016	*Myotis natterreri,Pipistrellus pygmaeus,Pipistrellus pipistrellus* (45kHz),*Nyctalus leisleri*
National Biodiversity Data Centre Bat Records	R244065	124400	106500	14/09/2016	*Myotis natterreri,Myotis daubentonii,Pipistrellus pygmaeus,Pipistrellus pipistrellus* (45kHz)
National Biodiversity Data Centre Bat Records	R151037	115100	103700	19/09/2016	*Pipistrellus pipistrellus* (45kHz),*Pipistrellus pygmaeus,Myotis daubentonii*

4.2.3 Bat Species Range

The potential for negative impacts is likely to increase where there are high risk species at the edge of their range (NatureScot, 2021). Therefore, range maps presented in the 2019 Article 17 Reports (NWPS, 2019) were reviewed in relation to the location of the Site.

The Site is located outside the current known range for whiskered bat (*Myotis mystacinus*), Natterer's bat (*Myotis natterreri*), Nathusius' pipistrelle (*Pipistrellus nathusii*) and lesser horseshoe bat (*Rhinolophus hipposideros*). However, Nathusius' pipistrelle range border is less than 2km away from the Site and Natterer's bat range border is less than 1 km away from the Site. The Site is within range for all other bat species.

4.2.4 Designated Sites

Within Ireland, the Lesser horseshoe bat is the only bat species requiring the designation of Special Areas of Conservation (SACs). The Site is situated outside the current known range for this species and there are no SACs designated for its protection within 10km of the Site.

No Natural Heritage Areas (NHAs), or proposed NHAs, designated for the protection of bats were identified within 10km of the Site.

4.2.5 Landscape Features and Habitat Suitability

A review of mapping and photographs provided insight into the habitats and landscape features present at the Site. In summary, the primary land uses within the Site are cattle farming and forestry plantation with areas of bog areas left unused.

A review of the GSI online mapper did not indicate the presence of any subterranean sites within the Site, and a search of the National Monuments Database did not reveal the presence of any manmade subterranean sites within the Site.

A search of the UBSS Cave Database for the Republic of Ireland found no caves within the Site or within 10km of the Site. A review of the National Monuments Database revealed no national monuments within the Site.

4.2.6 Additional Wind Energy Projects in the Wider Landscape and Large-scale Developments

Table 4-4 provides an overview of wind farms within 10km of the Site.

Table 4-4 Wind Farm Developments within 10km of the Site

Wind farm name and location	No. Turbines	Status
Coolleagrean	7	Operating
Cordal 1 and II	28	Operating
Dromdeeveen	14	Operating
Glentane/ Glentanemacelligot	11	Operating
Knockacummer	29	Operating
Knockawarriga I and II	12	Operating
Gooseberry Hill	18	Pre-application

In addition to wind energy developments, no other EIA planning application was noted within 10km of the Site. However, the following large-scale development was noted within 10km:

- Solar PV energy development (PL04.249377) within a total site area of up 8ha. and associated site work.
- 6no. Wastewater Treatment Plants – Kiskeam, Boherbue & Environs, Mountcollins, Rockchapel, Meelin, Newmarket and Environs.

4.3 Field Surveys

4.3.1 Bat Habitat Appraisal

Wind Farm Site

The below habitats were recorded within the Site, including:

- Improved Agricultural Grassland (GA1)
- Wet Grassland (GS4)
- Dry-humid Acid Grassland (GS3)
- Upland Blanket Bog (PB2)
- Wet Heath (HH3)
- Montane Heath (HH4)
- Conifer Plantation (WD4)
- Spoil and Bare Ground (ED2)
- Scrub (WS1)
- Treeline (WL2)

- Wet Grassland (GS4)/Scrub (WS1)
- Wet Heath (HH3)/Montane Heath (HH4)
- Wet Heath (HH3)/Scrub (WS1)

The habitats within the Site are dominated by bogs and heaths with smaller areas of conifer plantation and scrub. Spoil and bare grounds are associated with a network of drainage ditches along the roads leading to the turbines. Chapter 6 of the EIAR details the habitats present within the Site.

The existing Taurbeg Wind Farm is located on exposed lands in the uplands of County Cork. With regard to foraging bats and flights-paths, the watercourse bordered by broadleaved mature treeline located near the entrance at the northern end of the Site is likely to be used regularly by bats and is connecting the Site north and south to the wider landscape therefore, it was considered of *Moderate* suitability (Plate 4-1). Conifer forestry edges and scrub areas were considered of *Moderate* suitability as they provide connectivity within the Site and to the wider landscape (Plate 4-2, Plate 4-3). Areas of bogs, heaths, open habitats and isolated treeline may be used by a small number of bats and are not very well connected to the wider landscape, they were considered of *Low* suitability (Plate 4-4).
With regards to roosting bats, a mature broadleaf tree was identified in proximity of Turbine 7 presenting PRF suitable for a potential maternity roost (PRF-M). The tree was characterised by branch damage potential roosting features suitable for opportunistic and regular roosting. The substation was assessed with a *Low* roosting potential. Conifer forestry was assessed with a *Negligible* roosting potential. More details on the preliminary roost assessments are presented below.

Plate 4-1 Horse chestnut tree located near T7 assigned with a PRF-M roosting potential and the next to the watercourse and broadleaved treeline assigned with a High suitability as flights paths and for foraging bats

Plate 4-2 Conifer plantation near T11 assigned with Negligible roosting potential and Moderate suitability as flights paths and for foraging bats

Plate 4-3 Scrub habitat near T10 assigned with a Moderate suitability as flights paths and for foraging bats

Plate 4-4 Bog and heat assigned with a Low suitability as flights paths and for foraging bats

Proposed Offsetting Lands

Detailed information on the Proposed Offsetting Lands is outlined in the EIAR, Chapter 6. The site consists of four distinct lands approximately 12 kilometres west of Taurbeg Wind Farm (Grid Ref: R 10491 09475, R 09701 09802, R 08800 10179, R 08323 11071). The three southern areas, Area 1, 2 and 4, consist of semi-mature/mature conifer plantation, with areas of failed forestry, while the most northern area, Area 3, is an agricultural grassland partially bordered by mature conifers and broadleaved woodland on its western side.

Area 1, 2 and 4 of conifer plantation were assessed as having *Negligible* roosting potential as conifer within forestry lacks appropriate roosting features. The plantation and woodland edge habitats, including fire breaks, presented *Moderate* suitability for foraging bats with *Moderate* to *High* suitability for commuting bats as they provide corridors and connectivity within the wider landscape.

Area 3 consists of largely open grassland habitats with *Low* value for foraging bats; however, the wooded-edges present *Moderate* to *High* suitability as commuting corridors, particularly the broadleaved woodland edge on the western boundary which is traversed by a river. No significant PRFs were identified within the northern site (Area 3); however, a derelict structure with roosting potential is located outside the site boundary (Grid Ref: R 08347 10907). No evidence of roosting bats was identified during the inspection (see Section 4.3.2). This structure is being avoided and retained as it is outside the boundary of the Proposed Offsetting Lands.

It is proposed to permanently remove conifer plantation trees within Area 1, 2 and 4 and retain areas of scrubs where possible. The cut timbers will remain on site and be stacked in linear wind rows where additional scrub species indigenous to the area are proposed to be planted. Each wind row will be approximately 50m apart, creating new linear features. The Proposed Offsetting Measures are intended to provide a positive effect on local hen harrier populations but will also indirectly provide enhanced habitat for commuting and foraging bat species. Further details are outlined in Chapter 6.

4.3.2 Roost Surveys

Following a search for roosts in 2024, the substation was the only structure containing potential suitable bat roost features identified within the Site. The structure was subject to interior and exterior inspections to search for evidence of bats. One chestnut tree was assessed as PRF-M and was inspected with an endoscope. Details of the inspection surveys are presented below.

Horse Chestnut Tree

The horse chestnut tree was identified at the entrance of the Site (Grid ref: R 22969 12189) and assessed as FAR on the bat habitat appraisal of the 15th of March 2024. The tree is located near Turbine 7 and is approx. 40m away from a watercourse and broadleaved treeline that provides good connectivity to the wider landscape. The area was considered likely to be regularly used by bats as it presents foraging opportunities.

The tree was then inspected with a ladder, a torch and an endoscope on the 25th June 2024. The tree had several PRFs including wounds, transverse snaps and knothole all located on tree limbs. Two PRFs were assessed as PRF-M (Plate 4-5, Plate 4-6). They were located at 3m and 4m above the ground. They both had an opening about 40 cm wide and about 40-50 cm deep, possibly deeper as the endoscope has a limited length. Woodlice and slugs were observed inside the cavities. No bat droppings were observed. Two knotholes were assessed as PRF-I they were about 30 cm deep and 10cm wide. An emergence survey was completed focusing on the tree on the 29th August 2024 (refer to Section 4.2.3 below).

Plate 4-5 Wound

Plate 4-6 Transverse snap

Substation

The substation (IG Ref: R 22548 12030, Plate 4-7) is located within the northern part of the Site. It is a concrete building with no external windows and a tile roof. No evidence of bats was recorded on the ground floor rooms. The attic was accessed via a ceiling trap. It is made of wooden frames, had underfelt lining covered by wooden boards and was insulated with glass wool (Plate 4-9). During nighttime, the substation is illuminated on the southern façade by white floodlights (Plate 4-8).

Potential entry points were suspected between the roof tiles and under the gutter, but no clear entrance was identified. Mosses were growing on some tiles possibly masking some entry point. An open vent providing potential access to the western gable of the structure provided the most suitable potential access for bats. A small number of bat droppings were discovered on the top western corner inside the attic (Plate 4-10) caught in a spider web adjacent to this vent. This indicated likely roosting by individual bats above the wooden boards, as access to this area was possible by crawling up the western wall of the attic.

No other evidence of bats was observed. Due to its location in an unsuitable and poorly connected environment, in proximity of working equipment and security lights, the substation was assessed with a *Low* potential for roosting bats, despite interior conditions being suitable to host larger colonies. An emergence survey was conducted on the 29th August 2024, no bats were observed emerging (refer to Section 4.2.3 below).

Plate 4-7 Substation – attic vent visible

Plate 4-8 Substation at night

Plate 4-9 Attic of the substation, insulation

Plate 4-10 Bat droppings found in the attic of the substation

Derelict house – Proposed Offsetting Lands

The house is located outside of the most northern area of the Proposed Offsetting Lands (Grid Ref: R 08347 10907). It is in a state of disrepair with a hole in the roof and missing, broken windows. Interior walls are partially plastered or made with stones (Plate 4-11). The house has a stoned chimney on the ground floor possibly providing some roosting space within cracks or crevices of the stack (Plate 4-12). The first floor is made of wooden frame covered by gappy wooden broads making the interspace between the boards a suitable roosting place (
Plate 4-13). No evidence of roosting bats was discovered during the inspection. The building was assessed as having Low potential due to its state of disrepair and limited potential for large roosting colonies.

Plate 4-11 Ground floor – High light conditions

Plate 4-12 Chimney stack – Possibly hiding cracks or crevices

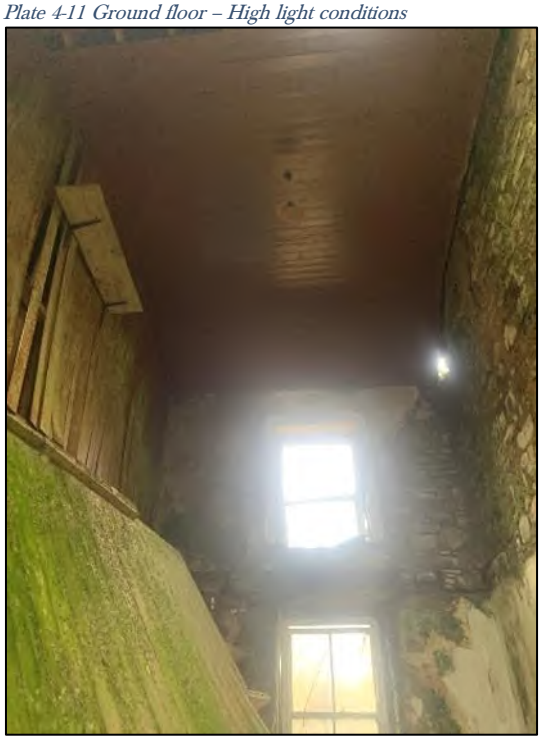


Plate 4-13 Ceiling view from the ground floor – Entry point to access the interspace between the wooden board on the top and right side of the picture.

4.3.3 Manual Activity Surveys

Manual activity surveys were undertaken in Spring, Summer and Autumn 2024 at the Taurbeg Wind Farm Site. Bat activity was recorded on all surveys, which included a roost emergence and transect surveys. In general, common pipistrelle (n=50) was recorded most frequently, followed by soprano pipistrelle (n=13) and Leisler's bat (n=11). Three instances of *Myotis spp.* and one of brown long-eared bat were recorded. Species composition across all manual surveys in 2024 is presented in Plate 4-14.

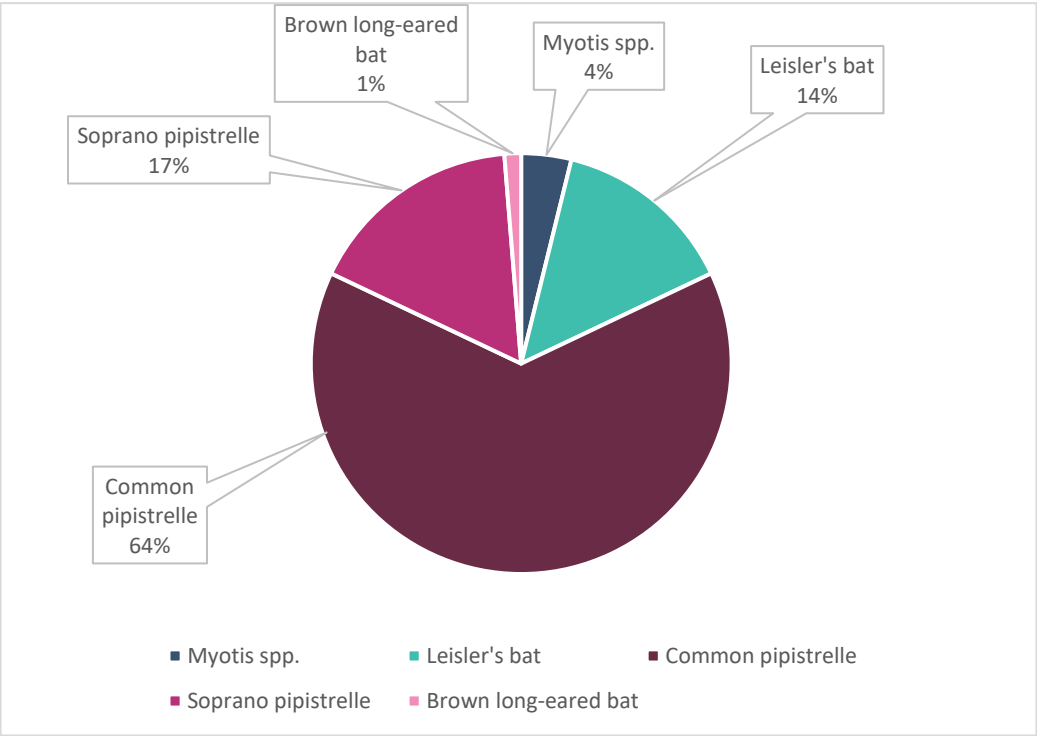


Plate 4-14 2024 Species composition for manual surveys in Spring, Summer, Autumn

4.3.3.1 Walked Transects

Transect surveys were either carried out as standalone surveys (Spring and Summer) or followed roost emergence surveys (Autumn). To account for differences in survey effort, survey results were calculated as bat passes per km surveyed (Plate 4-15). Activity was low during all surveys. Common pipistrelles were most frequently recorded. Five-minute point counts (5MPC) were completed along the transect to sample bat activity at turbine locations. On the night of the 15th of May 2024, eleven 5MPCs were carried out but only one recorded bat activity. A Leisler's bat was recorded commuting but was not seen at 22:43 at T12. On the night of the 25th June 2024, eight 5MPC were carried out and only one common pipistrelle was recorded commuting at T12 at 23:42 but was not observed in flight.

Most of the activity was observed in Autumn, on the night of the 29th August 2024. Foraging activity by common and soprano pipistrelles was observed at the substation and in the proximity of the chestnut tree at the entrance of the Site. Forestry edges at the southwestern part of the Site seemed to be used as flights-paths. Figures 4-1 to 4-3 present the spatial distribution of bat activity across the surveys for each survey season for 2024.

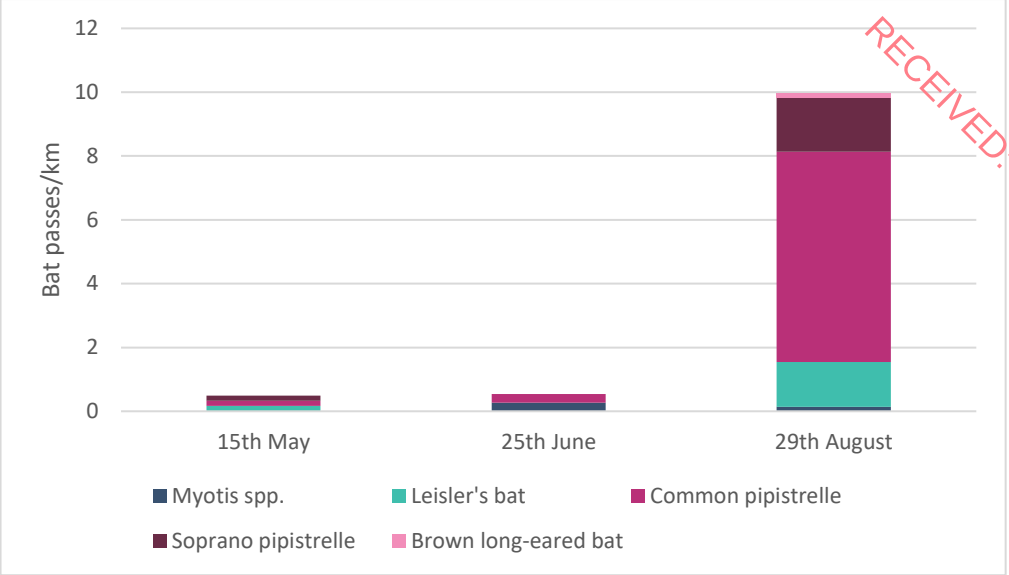
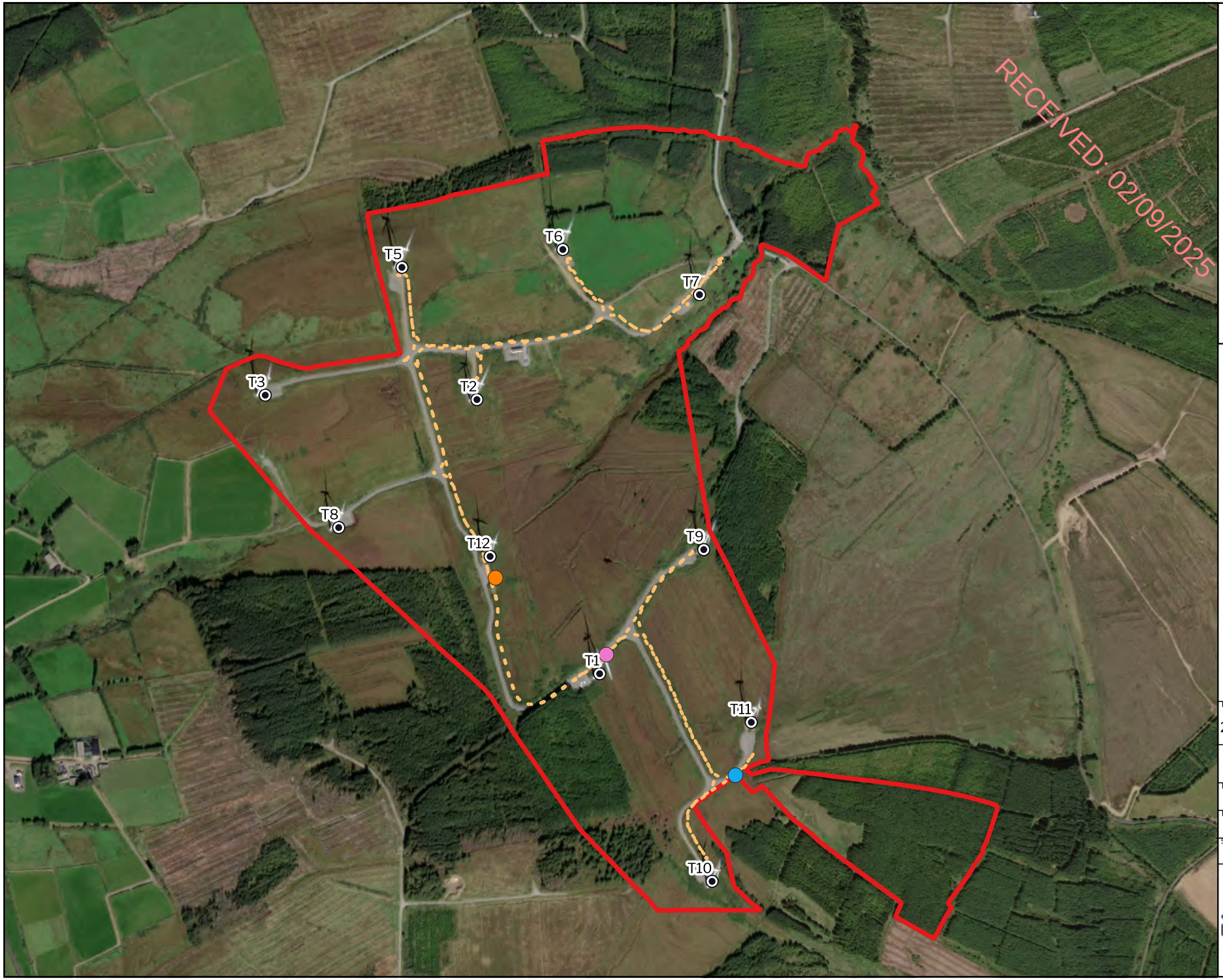


Plate 4-15 2024 Manual Results – Species Composition Per Survey Period

4.3.3.2 Dusk Emergence Survey

An emergence survey was carried out in August 2024. It focused on the horse chestnut tree assigned with a *High* suitability for roosting bats and on the substation assigned with a *Low* suitability for roosting bats and where droppings were found in the attic. Two surveyors focused on the substation and a thermal camera was placed on the PRFs of the tree. No bats were observed emerging from the building or from the tree. However, foraging activity around the tree foliage was captured by the camera footage about an hour after sunset and was also noted around the substation when the lights were on during the transect survey.



Map Legend

- Taurbeg EIAR Site Boundary
- Turbines
- Transect - 15.05.2024

Manual Results

- Leisler's bat
- Common pipistrelle
- Soprano Pipistrelle

N

Drawing Title: 2024 Spring Manual Results

Project Title: Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NS	AJ
Project No.	**Drawing No.**
231030	Figure 4-1
Scale	**Date**
1:10,000	30.06.2025

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Website: ww.mkoireland.ie

Map Legend

- Taurbeg EIAR Site Boundary
- Turbines
- Transect - 15.05.2024

Manual Results

- Myotis spp.
- Common pipistrelle

N

Drawing Title: 2024 Summer Manual Results

Project Title: Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NS	AJ
Project No.	Drawing No.
231030	Figure 4-2
Scale	Date
1:10,000	30.06.2025

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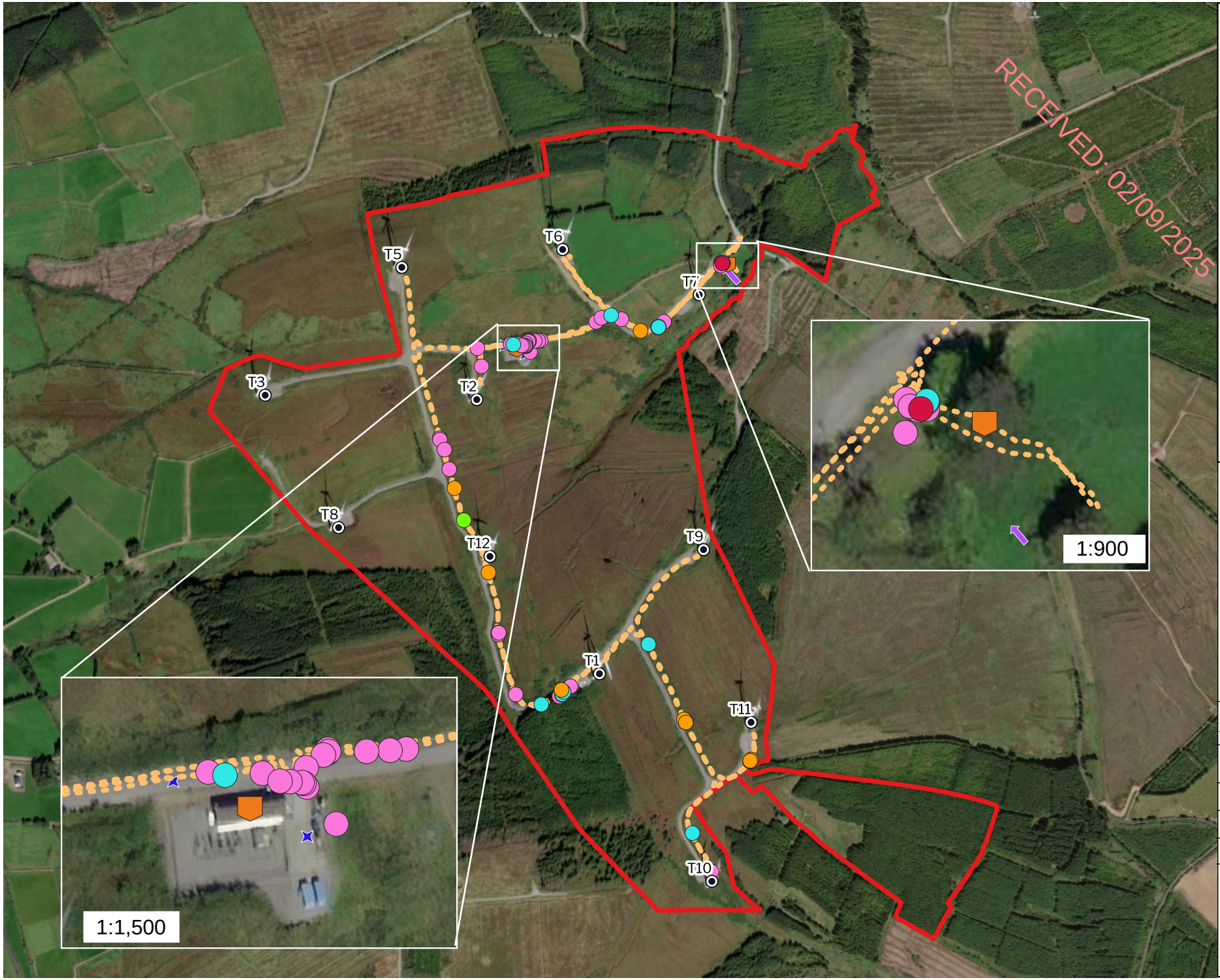

Map Legend

- Taurbeg EIAR Site Boundary
- Turbines
- Potential Roosting Features

Emergence Survey - 29.08.2024

- Surveyor
- Thermal camera
- Transect - 29.08.2024

Manual Results

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

N

Drawing Title: 2024 Autmn Manual Results

Project Title: Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
NS	AJ
Project No.	**Drawing No.**
231030	Figure 4-3
Scale	**Date**
1:10,000	30.06.2025

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4.3.4 Static Detector Surveys

4.3.4.1 Ground Level Static Surveys

In total, 16,921 bat passes were recorded in 2024 at the Site. Common pipistrelle (n=9,126) were the dominant species, followed by Leisler's bat (n=4,198) and *Myotis* spp. (n=1,255). Nathusius' pipistrelle (n=932), soprano pipistrelle (n=881) and brown long-eared bat (n=529) were less recorded. These Nathusius' pipistrelle records are outside of the species current known range (Article 17). Plate 4-16 presents relative species composition across all ground-level static detector surveys.

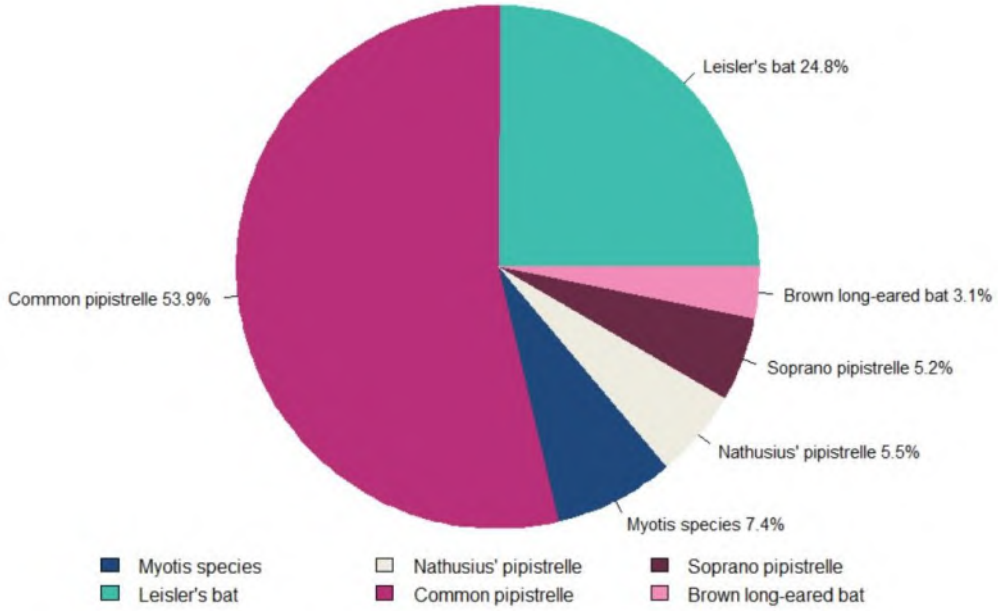

Plate 4-16 2024 Static Detector Surveys: Species Composition Across All Deployments at ground level (Total Bat Passes)

Bat activity was calculated as total Bat Passes Per Hour (bpph) of total recordings per season (Plate 4-17) to account for any bias in survey effort, resulting from varying night lengths between seasons. Autumn presented the highest bat activity, followed by Spring and Summer. Species recorded at Site tended to differ in proportion and composition across the seasons. Nathusius' pipistrelles were recorded almost exclusively in Spring. The proportion of common pipistrelle and Leisler's bat activity tended to double in Autumn. *Myotis* spp. and soprano pipistrelles were recorded across all seasons in various proportions and brown long-eared bats passes were mostly observed in Autumn.

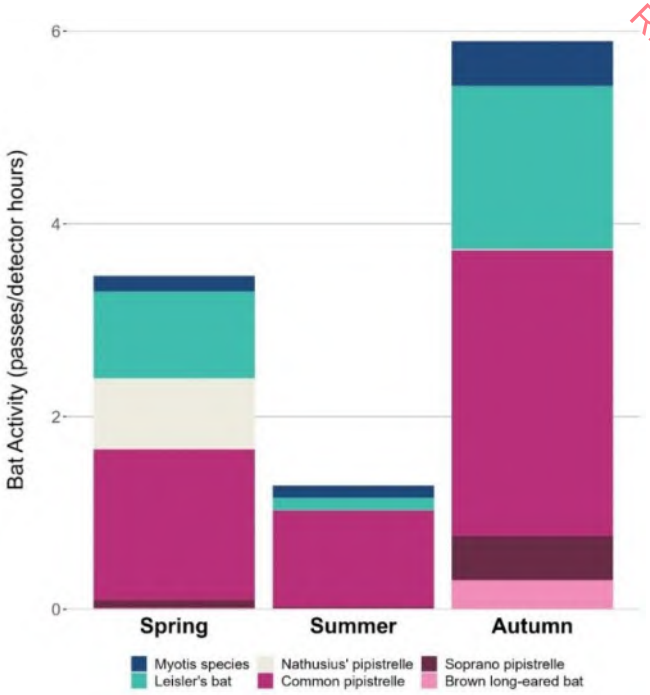

Plate 4-17 2024 Static Detector Surveys: Species Composition Across All Deployments (Total Bat Passes per hours of recordings)

The Nightly Pass Rate (i.e. total bat passes per hour, per night) was used to determine typical bat activity at the Site (Plate 4-18). Median Nightly Pass Rate was also used to assess bat activity, as it has been identified as a more appropriate measure (Lintott & Mathews, 2018). Plate 4-19 below illustrates the Median Nightly Pass Rate per species per deployment in 2024. Zero data, when a species was not detected on a night, was also included.

The Nightly Pass Rate tended to vary in proportion and species composition. Common pipistrelle, Leisler's bat and *Myotis* spp. were recorded during almost every night surveyed. Instances of soprano pipistrelles have also been recorded throughout the survey nights. Nathusius' pipistrelles were recorded almost exclusively from the 3rd to the 6th May 2024 only. Brown long-eared bats were recorded mostly in Autumn. Summer had the highest number of nights with bat activity close to zero. Peak bat activity was reached in autumn, on the night of 2nd of September, where bat passes per hour exceeded 150.

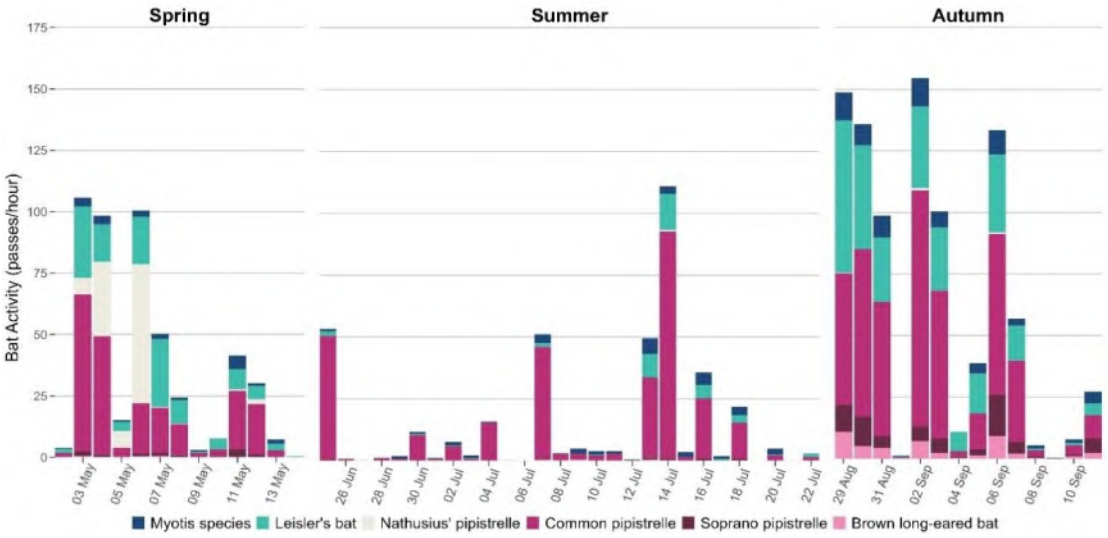

Plate 4-18 Bat activity (passes per hour) across the nights surveyed.

Median bat passes per detector was used to assess the level of activity per location and per season. A median of zero does not necessarily mean that was no bat activity at the detector location. Table 4-5

below gives the total number of bat passes per detector per season and shows where zero bat passes was recorded on a detector. It should be used to interpret the median values and overall results. The total number of bat passes by the Nathusius' pipistrelles in Spring at D09 was much higher compared to other detectors locations. Interpretation of these results is discussed further in Section 4.4.3. The plates below illustrate the median bat passes per detector across the seasons with varied y-axis (Plate 4-19) and same y-axis (Plate 4-20) allowing for comparison.

Table 4-5 Total number of bat passes per detector per season

	D01	D02	D03	D05	D06	D07	D08	D09	D10	D11	D12
Spring											
Myotis spp.	11	11	14	18	23	76	13	15	7	5	7
Leisler's bat	107	63	107	64	64	61	122	178	91	178	80
Nathusius' pipistrelle	0	0	1	0	2	0	2	893	8	1	1
Common pipistrelle	77	50	41	30	250	295	230	768	96	39	58
Soprano pipistrelle	8	4	5	2	18	35	6	9	3	2	5
Brown long-eared bat	1	1	9	0	0	1	1	0	0	2	1
Summer											
Myotis spp.	35	14	17	21	30	27	44	83	11	1	10
Leisler's bat	31	37	1	20	49	23	38	20	40	12	34
Nathusius' pipistrelle	0	0	0	1	0	0	0	0	4	0	0
Common pipistrelle	98	76	24	67	1061	197	99	269	299	63	74
Soprano pipistrelle	6	3	1	3	0	1	14	4	0	0	3
Brown long-eared bat	2	0	0	0	6	4	4	2	2	0	0
Autumn											
Myotis spp.	92	37	49	22	43	125	73	90	77	50	104
Leisler's bat	284	248	125	99	110	166	365	251	304	319	507
Nathusius' pipistrelle	1	0	2	1	0	3	1	3	2	6	0
Common pipistrelle	397	176	168	130	365	846	1241	644	299	163	436
Soprano pipistrelle	88	36	47	41	58	73	101	132	63	53	57
Brown long-eared bat	60	31	39	36	25	67	51	55	34	32	63

In spring, the highest median activity was reached at D06 and D07 (median=1.5) with common pipistrelles. The sum of median Leisler's bat passes was the second highest (median=5.9) behind common pipistrelles (median=7.2) with most of the passes occurring at D08, D09 and D11. *Myotis* spp. median activity was the highest at D07 (median=0.5) followed by D02, D06 and D09. A median value above zero was calculated at D09 for Nathusius' pipistrelle and at D07 for soprano pipistrelles.

In summer, most of the median calculated were zero except at D06, D07 and D10 for common pipistrelles and at D08 and D09 for *Myotis* spp.

In autumn, the overall median bat activity tended to double in comparison to spring. The highest median value was calculated at D07 (median = 5.1) for common pipistrelle, followed by D08 (median= 2.55) for Leisler's bat. *Myotis* spp. median values were the highest at D01, D07 and D12 (median ≥ 0.6). Brown long-eared bats had median values above zero only in autumn and at all detector locations, the highest value was at D08 (median = 0.4).

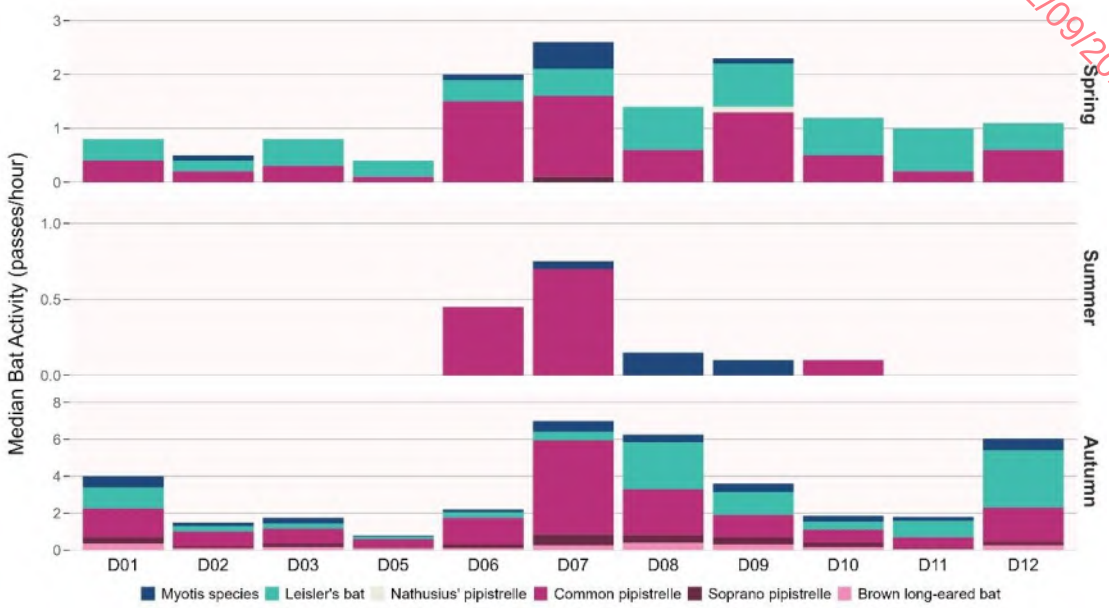

Plate 4-19 Median Nightly Pass Rate per detector with varied y-axis.

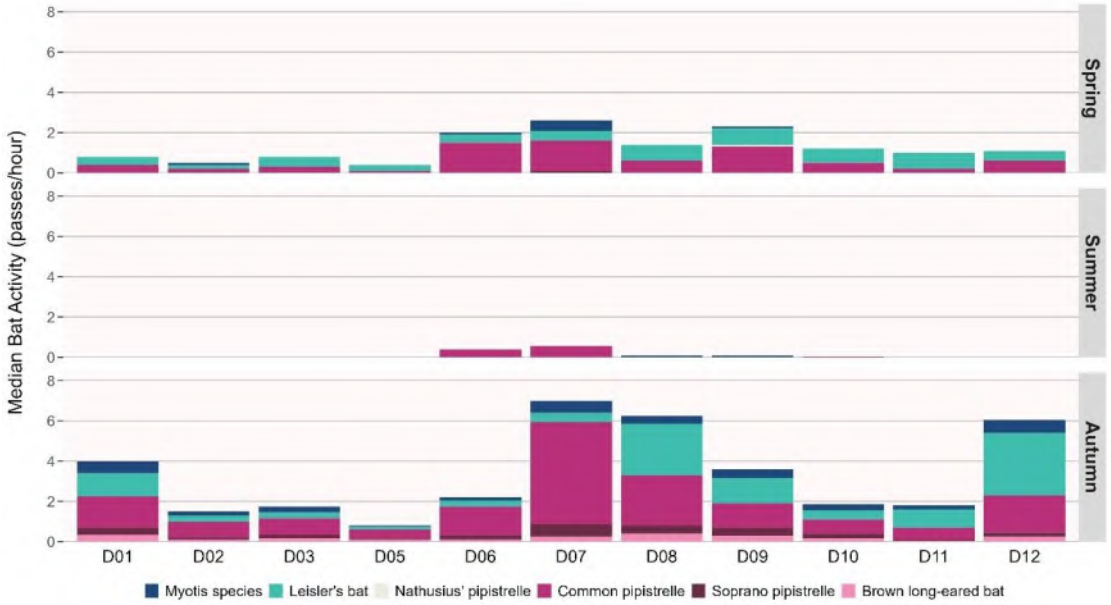

Plate 4-20 Median Nightly Pass Rate per detector with same y-axis.

Weather Data

Weather (rainfall, windspeed and temperature) at night during deployments are presented below (Plate 4-21). Spring had the highest level of rainfall per nights while windspeed was the highest during summer.

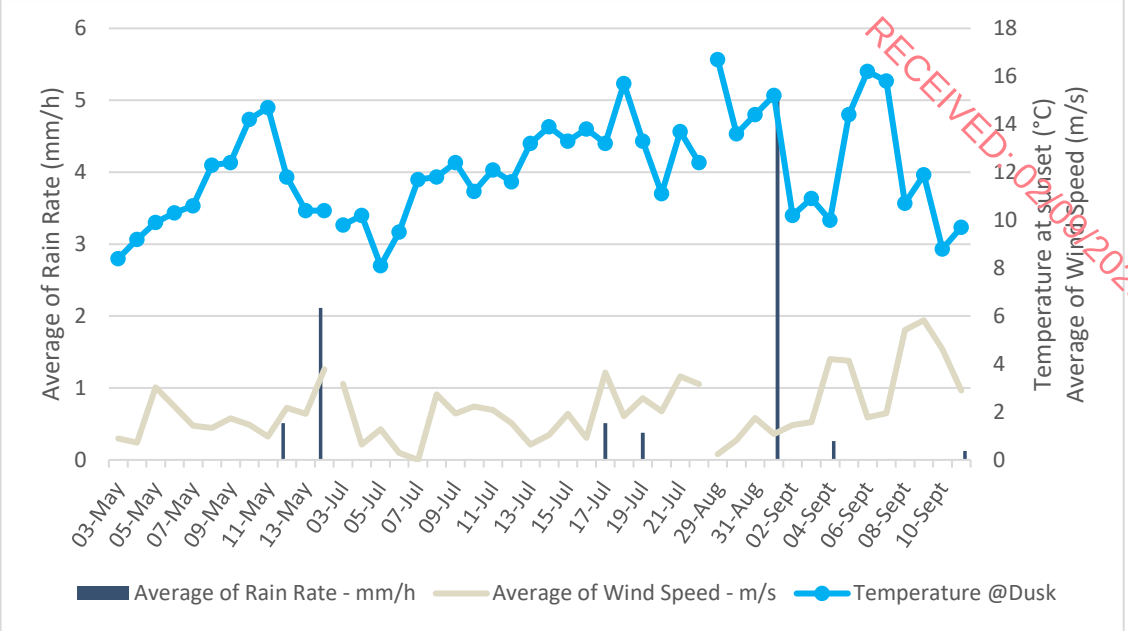

Plate 4-21 Nightly weather conditions across the Site 2024

4.3.4.2 Static Surveys at Height

In 2024, survey at height took place on the met mast located west of the Site, in an open habitat approx. 250 away from the nearest forestry. A SM3 bat detector was used for the first part of the survey until the 3rd July and two SM4 bat detectors were used for the second period. Simultaneous recordings from SM3 bat detector creates a sound file at ground level and at height therefore, if a bat is detected by both microphones it will be counted as two bat passes but if it is only detected by one microphone it will be possible to differentiate the flight height of that same bat. However, recordings coming from the SM4 bat detectors don't allow simultaneous recordings therefore, it is not possible to know if a same individual bat was picked up simultaneously on both microphones or not. Thus, results from SM3 bat detectors are presented separately from the results from the SM4 bat detectors. All individual bat records arising from SM3 static detector monitoring at height are appended to this report as **Appendix 4**.

In total, 149 nights of bat monitoring at ground level and 128 nights at height was achieved. A total of 349 bat passes were recorded by the SM3 and 2,553 by the SM4 bat detector. The bat activity was overall higher at ground level compared to activity at height (Plate 4-22, Plate 4-23). Species diversity was higher at ground level with 6 bats species (including *Myotis* spp.) recorded against 3 bat species at height. Leisler's bats passes (n=276) were predominantly recorded at height with small numbers of common pipistrelle (n=19) also present and rare soprano pipistrelle (n=3).

Level of activity and species composition of the nightly bat activity tended to vary across the survey and per microphone height level (Plate 4-24, Plate 4-25, Plate 4-26, Plate 4-27). At ground level, the highest number of recordings was on the night of the 18th of August 2024 with more than 400 passes. The number of passes tended to be constant throughout the season with a slight increase at the end of August and September. At height, the highest number of recordings happened on the 15th of September with 20 passes of Leisler's bat and 4 passes of common pipistrelles.

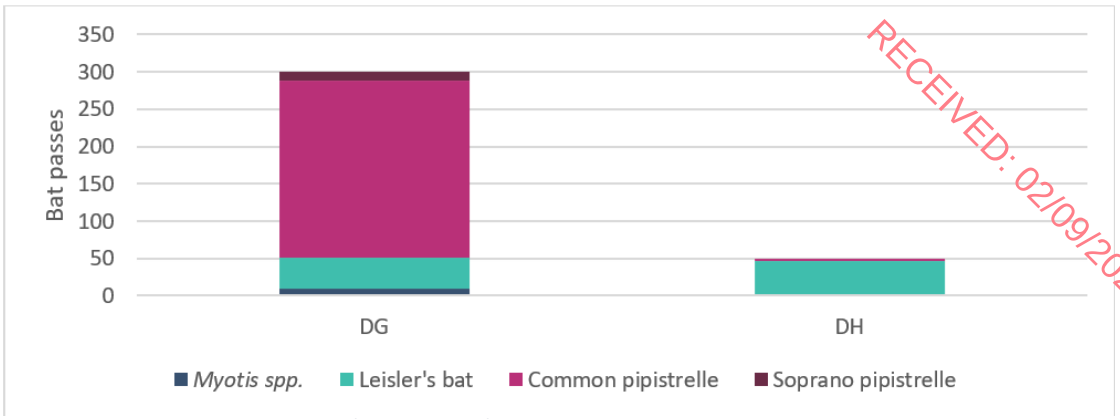

Plate 4-22 Surveys at Height from the 2nd May to the 2nd July 2024 recorded on a SM3 bat detector: Overall Species Composition recorded at ground level (DG) and at height (DH)

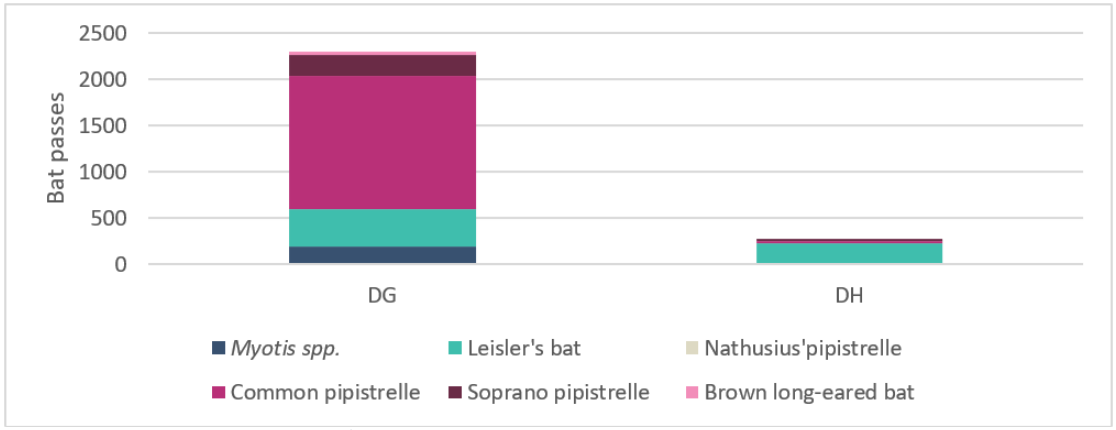

Plate 4-23 Surveys at Height from the 3rd July to the 31st October 2024 recorded on a SM4 bat detector: Overall Species Composition recorded at ground level (DG) and at height (DH)

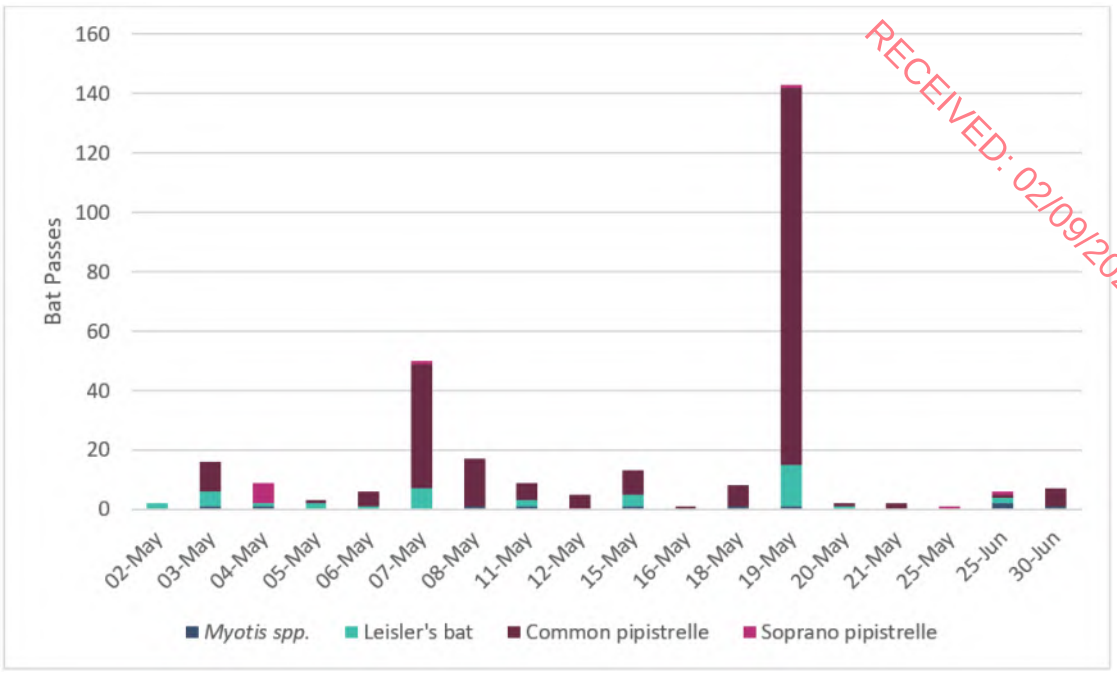

Plate 4-24 Nightly bat activity at ground level recorded on a SM3 bat detector. Note the y-axis scale difference between Plate 4-21 and Plate 4-22

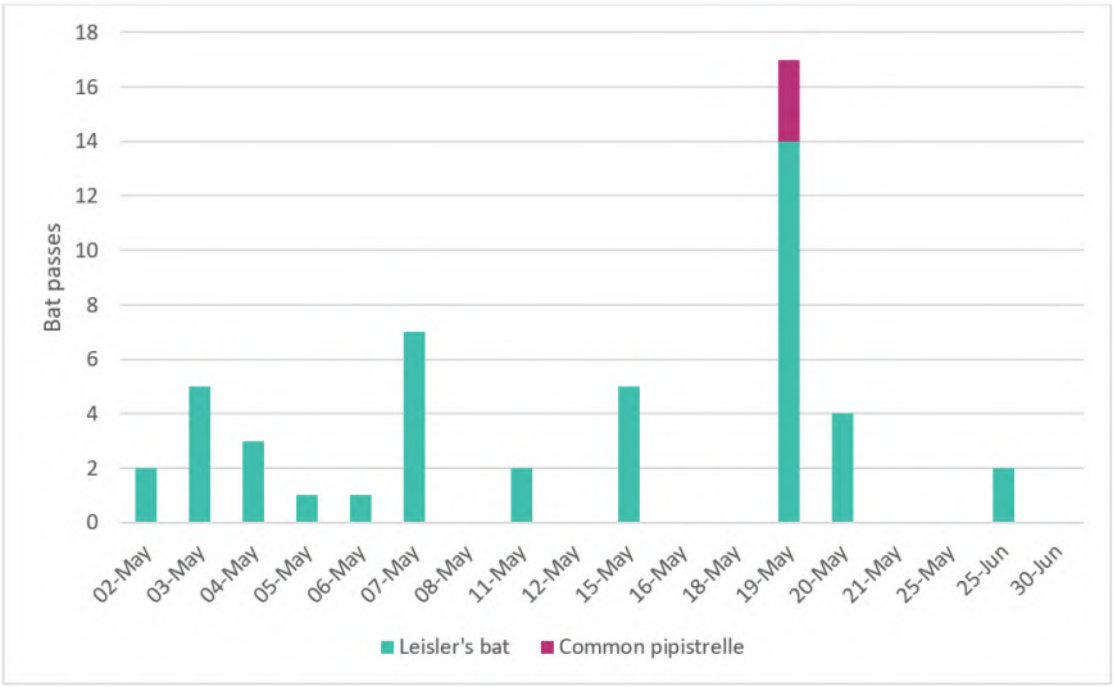

Plate 4-25 Nightly bat activity at height recorded on a SM3 bat detector.

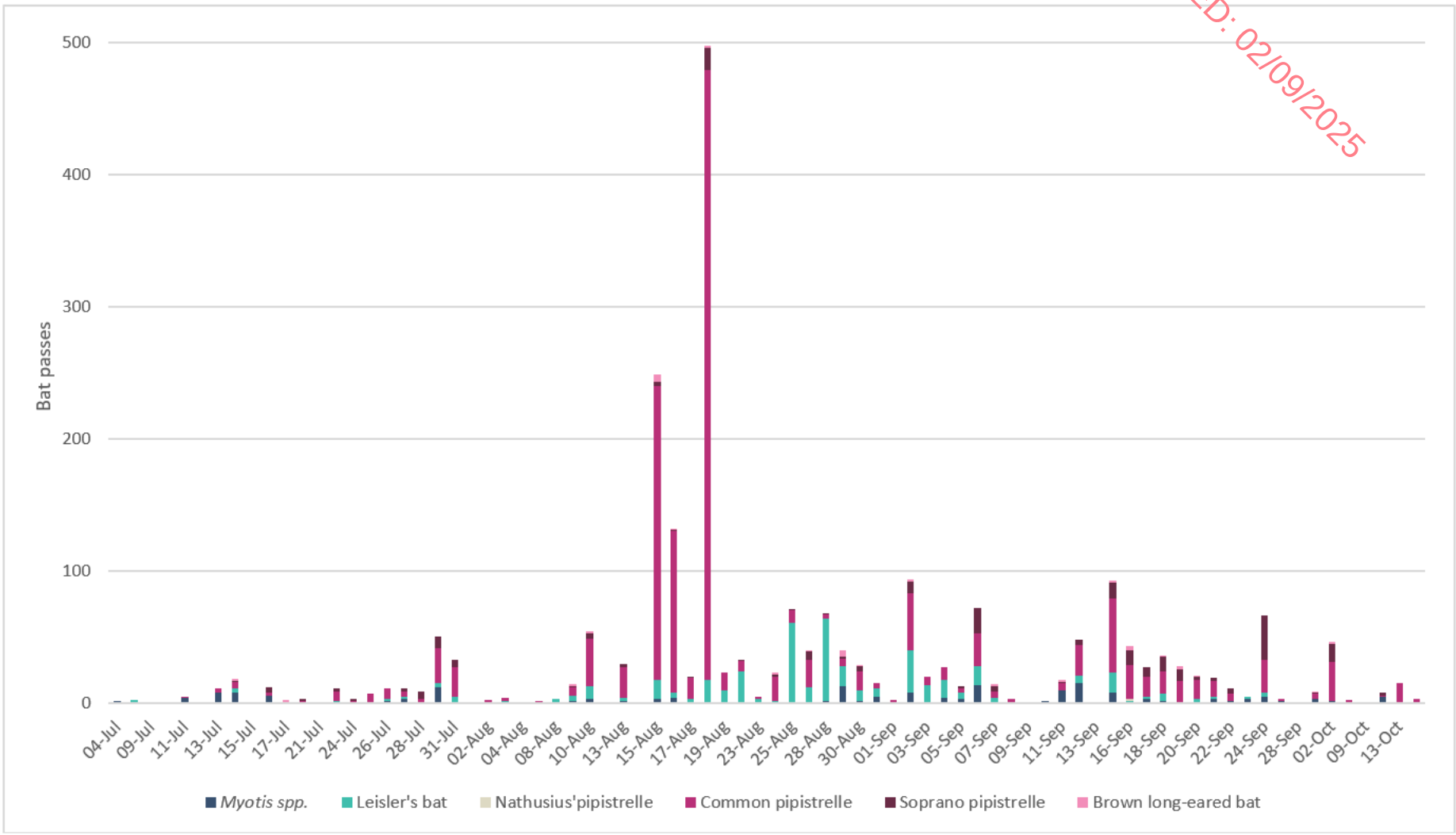

Plate 4-26 Nightly bat activity at ground level recorded on a SM4 bat detector.

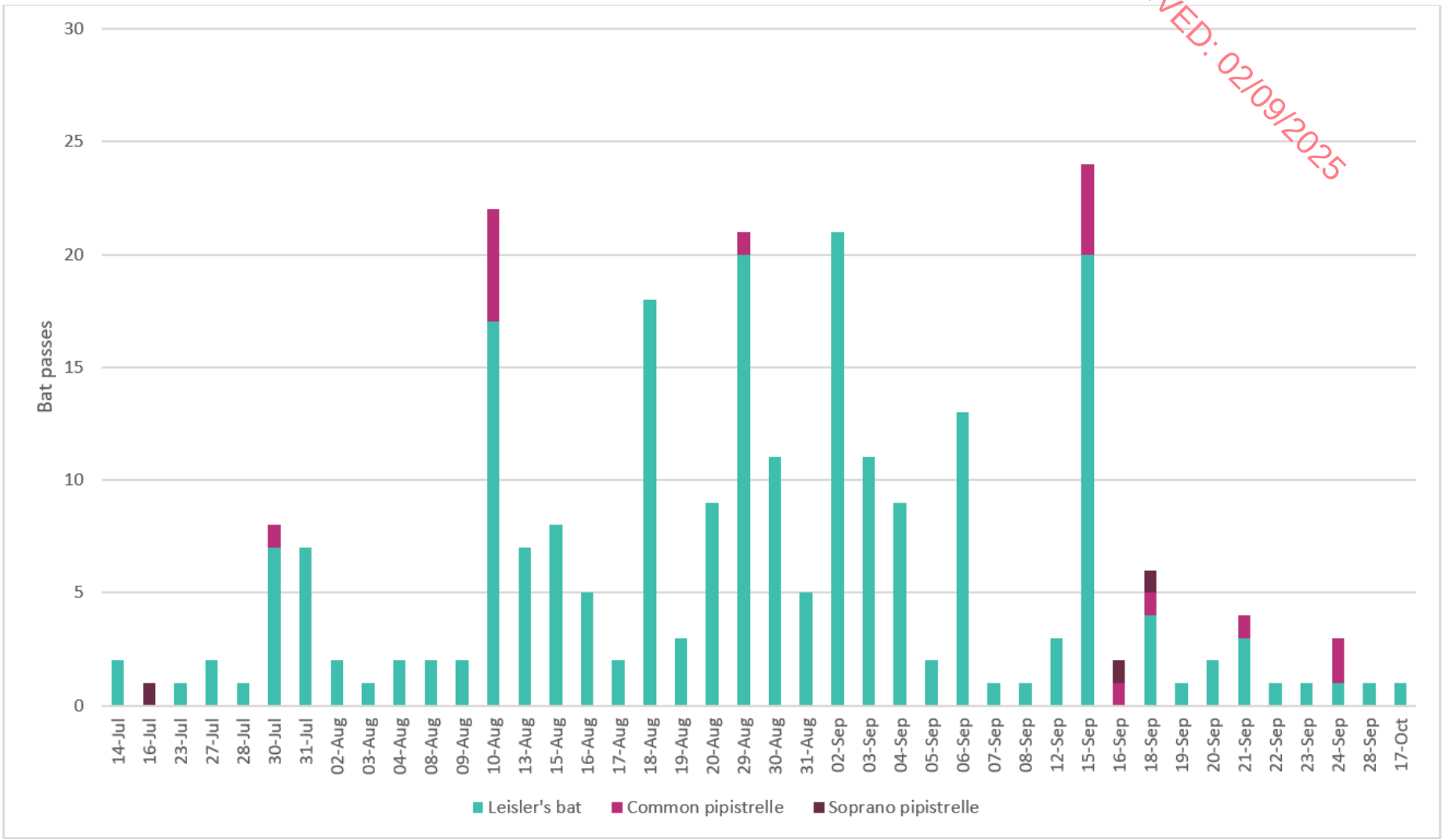

Plate 4-27 Nightly bat activity at height recorded on a SM4 bat detector.

4.3.5 Dog-led Collision Monitoring

Carcass searches, to monitor and record bat fatalities, were conducted at Taurbeg Wind Farm. Surveys were undertaken monthly starting in January 2024 and are currently ongoing. Monthly searches allowed for results to be gathered for bird and bat casualties year-round. This included searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. Surveys covered all activity seasons, and the use of a trained dog detection team was carried out to ensure maximum efficiency. A detailed report of findings is presented in Appendix 7-6 – Collision Monitoring Report. No bat carcasses have been discovered.

4.4 Assessment of Bat Activity Levels

4.4.1 Adapted Site-specific Ranges

Low, Medium, and High Activity levels were assigned to Median and Maximum pass rates (bpph) identified during Spring, Summer and Autumn at the detectors deployed across the Site, as adapted from Mathews *et al.* (2016). Table 4-6 shows the results of the site-level assessment. D07 is located in a wet grassland in close proximity to a scrub habitat, a river, a mature treeline and a tree assessed as PRF-M. D06 is connected to the forestry to the north of the Site by treeline and scrub. D01, D09, D10, D11 and D12 are all near forestry edge. D08 was located near scrub in an open habitat.

Leisler's bat Median Bat Activity was recorded as Low in all seasons at all detectors' location. Maximum Activity peaked at D10 and D11 in Autumn 2024 as High.

Common pipistrelle Median Activity was recorded as High in Autumn at D07, as Moderate at D06 and D07 in Spring and at D01, D06, D08 and D12 in Autmn. It was Low at all other detector locations and seasons. The highest Maximum Bat Activity was observed at D06 in Summer.

Soprano pipistrelle Median Bat Activity was recorded as Low in all seasons at all detector locations. Maximum Bat Activity peaked at D09 in Autumn as High.

***Myotis* spp.** recorded Moderate Median Activity at D01, D07 and D12 in Autumn and was Low at all other detectors throughout the seasons. The highest Maximum Bat Activity occurred at D09 in Summer.

Nathusius' pipistrelle bat recorded Low Median Activity at all detectors in all seasons. High Max Activity Nathusius' pipistrelle occurred at D09 and D10 in Spring and at D10 in Summer. D09 in Spring was particularly high compared to all other recordings and was considered an outlier for the calculation of the activity assessment table threshold.

Brown long-eared bat Median Bat Activity was as Low in all seasons at all detector locations. The highest Maximum Bat Activity was recorded at D05 during the Autumn.

Table 4-6 Assessment of activity levels Low, Moderate, High

Species	Season	Bat activity (bpph)	Detector										
			D01	*D02*	*D03*	*D05*	*D06*	*D07*	*D08*	*D09*	*D10*	*D11*	*D12*
Myotis spp.	Spring	Median	0	0.1	0	0	0.1	0.5	0	0.1	0	0	0
		Maximum	0.7	0.3	0.6	0.9	0.6	2.2	0.4	0.7	0.3	0.5	0.5
	Summer	Median	0	0	0	0	0	0	0.1	0.1	0	0	0
		Maximum	1	0.5	0.5	1.2	1	0.5	0.8	2.3	0.9	0.1	0.2
	Autumn	Median	0.6	0.2	0.3	0.05	0.15	0.6	0.4	0.45	0.3	0.2	0.65
		Maximum	1.8	1.2	1	0.7	1.1	2	1.3	1.8	1.7	1.4	1.7
Leisler's bat	Spring	Median	0.4	0.2	0.5	0.3	0.4	0.5	0.8	0.8	0.7	0.8	0.5
		Maximum	3.6	2	3.9	1.6	2.3	2	4	7.4	2.1	5	3.8
	Summer	Median	0	0	0	0	0	0	0	0	0	0	0
		Maximum	2.6	1.8	0.1	0.8	4.1	1	1.6	1	2.6	1.2	1.3
	Autumn	Median	1.15	0.3	0.3	0.15	0.3	0.45	2.55	1.25	0.45	0.9	3.1
		Maximum	5.4	10.4	2.6	3.1	2.8	4.1	6.6	7.6	10.5	13.9	9.5
Nathusius' pipistrelle	Spring	Median	0	0	0	0	0	0	0	0.1	0	0	0
		Maximum	0	0	0.1	0	0.1	0	0.1	55.7	0.6	0.1	0.1
	Summer	Median	0	0	0	0	0	0	0	0	0	0	0
		Maximum	0	0	0	0.1	0	0	0	0	0.5	0	0
	Autumn	Median	0	0	0	0	0	0	0	0	0	0	0
		Maximum	0.1	0	0.2	0.1	0	0.2	0.1	0.3	0.1	0.4	0
Common pipistrelle	Spring	Median	0.4	0.2	0.3	0.1	1.5	1.5	0.6	1.3	0.5	0.2	0.6
		Maximum	2.7	2.4	1.2	1	7.1	18.1	17.6	40.2	2.9	0.9	1.6
	Summer	Median	0	0	0	0	0.4	0.55	0	0	0.05	0	0
		Maximum	4.7	3.9	0.9	5.6	33.4	3.4	2.3	15.4	27.7	4.2	2.6
	Autumn	Median	1.55	0.8	0.8	0.45	1.45	5.1	2.5	1.2	0.7	0.6	1.85
		Maximum	8.8	3.8	4.9	2.6	7.2	22	36.6	18.8	11.8	4.8	11.2
Soprano pipistrelle	Spring	Median	0	0	0	0	0	0.1	0	0	0	0	0
		Maximum	0.3	0.1	0.1	0.1	0.6	1.3	0.3	0.7	0.2	0.1	0.3
	Summer	Median	0	0	0	0	0	0	0	0	0	0	0
		Maximum	0.3	0.1	0.1	0.1	0	0.1	0.5	0.3	0	0	0.1
	Autumn	Median	0.35	0.1	0.2	0.05	0.2	0.6	0.4	0.4	0.25	0.05	0.2
		Maximum	2.7	0.9	1.3	1.3	1.8	1.1	2.9	5	2	2	1.8
Brown long-eared bat	Spring	Median	0	0	0	0	0	0	0	0	0	0	0
		Maximum	0.1	0.1	0.6	0	0	0.1	0.1	0	0	0.2	0.1
	Summer	Median	0	0	0	0	0	0	0	0	0	0	0
		Maximum	0.1	0	0	0	0.5	0.3	0.3	0.1	0.1	0	0
	Autumn	Median	0.35	0.1	0.15	0.1	0.1	0.25	0.4	0.3	0.15	0.05	0.25
		Maximum	1.1	1	1	2.1	1	1.7	0.7	1.6	0.9	1.3	1.4

4.4.2 Importance of Bat Population Recorded at the Site

Ecological evaluation within this section follows a methodology that is set out in Chapter three of the '*Guidelines for Assessment of Ecological Impacts of National Roads Schemes'* (NRA, 2009).

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976, as amended. No bat roosts were identified within the footprint of the Taurbeg Wind Farm. Bats as an Ecological Receptor have been assigned ***Local Importance (Higher value)*** on the basis that the habitats within the Site are utilized by a regularly occurring bat population of Local Importance.

A small number of bat droppings (approx. 10) were discovered at the substation on Site; however, no bats were observed emerging from the building on the 29th of August during the emergence survey. No roosting bats were identified during the surveys and no roosting site of National Importance (i.e. site greater than 100 individuals) was recorded within the Site; however, the substation is likely used opportunistically by individual bats. The Site was not found to host a roosting site of ecological significance and is considered unlikely to support one.

4.4.3 Discussion and Interpretation of the Results

The overall bat activity on Site was *Low* however, some peaks in activity across the seasons and for certain species were recorded. Similar seasonal patterns in the level of activity were discovered matching the 2016 the results (see Section 4.1.1) with activity levels higher in Autumn compared to Spring and Summer.

The Nathusius' pipistrelle total count of bat passes in Spring at D09 tended to be high compared to the general trend of the species at Site (see Table 4-5). The timestamp of bat passes shows that most of the recordings occurred on the nights of the 4th, 5th and 6th of May 2024. It also shows the occurrence of bats passes was spread along the full nights and not only around sunset or sunrise time. Therefore, it is suspected that these recordings came from a number of individuals foraging in the vicinity of the detector. The species is migratory and can fly more than 2000km between their summer and winter ranges (Alcalade *et al.*, 2021) but this is not yet verified in the Irish context. Nathusius' pipistrelle populations in Ireland are under recorded and it is not known if the species migrates, and, if so, when and to what extent. The Site is located approximately 2km away from the known Article 17 species range and no roost was recorded within 10km of the Site according to BCI datasets. The origin of the Nathusius' pipistrelle peak of activity at the Site in Spring is not known.

Leisler's bats were recorded across the Site at all turbines locations and across all seasons with peak of activity recorded in Autumn at D10 and D11. Both turbines are located nearby wooded edge. The species was also the most recorded species flying at height (top of the met mast 67m) making it a higher collision risk potential.

Common pipistrelle were the most abundant species recorded onsite. Peaks of activity were recorded in Summer and Autumn. Detectors D06 and D10 showed the highest peaks in activity in Summer and D07, D08 and D09 in Autumn. All of these detectors are located in close proximity to conifer-edge habitats and are within suitable foraging and commuting grounds for bats.

The Site roosting suitability varied from *Negligible* to *Low*, including a horse-chestnut tree assessed with a PRF-M (refer to Section 4.2.2 above). The tree is located on the most suitable identified bat habitat across the Site and within approximately 80m of Turbine T7. The treeline that joins the tree connects two blocks of conifer forestry which provides some connectivity to the wider site, away from the turbine. Bats were observed commuting and foraging around the tree assessed as PRF-M during the surveys. If any bats were to use the tree as a roost resource, they would likely utilise the neighbouring treeline which provide a flight path and foraging resource.

5. RISK AND IMPACT ASSESSMENT

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

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

For each of these four risks, the detailed knowledge of bat distribution and activity within the Site has been utilized to predict the potential effects of the Proposed Lifetime Extension on bats.

5.1 Collision Mortality

5.1.1 Assessment of Site-Risk

The likely impact of the Proposed Lifetime Extension on bats is related to site-based risk factors, including habitat and development features. The Site risk assessment, as per Table 3a of the NatureScot guidance (Appendix 2), is provided in Table 5-1 below.

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

Criteria	Site-specific Evaluation	Site Assessment
Habitat Risk	Evidence of one opportunistic roost, likely hosting an individual bat, was identified within the substation at the Site. Additionally, a tree assessed as PRF-M showed potential for roosting bats; however, no other evidence of roosts was identified. The habitats within the Site provide overall Low-quality commuting and foraging habitat that could be used by small numbers of bats. It is an isolated Site, not well connected to the wider landscape by prominent linear features. Despite the presence of some sparse commuting features such as treelines, river or forestry edge it does not provide a habitat that could be used extensively by foraging bats or meet any of the criteria of a Moderate or High risk Site as set out in Table 3a of NatureScot, 2021.	Low
Project Size	Medium scale development (11 no. turbines). 3 other wind energy development within 5km. 4 other wind energy development within 10km. Comprising turbines >100 m in height	Medium
Site Risk Assessment		**Low Site Risk (2)**

The Site is located in a mosaic of heath, bog and wet grasslands, partially surrounded by conifer forestry plantation. As per table 3a of the Naturescot Guidance (2021), it has a *Low* habitat risk score. As per Table 3a, the Proposed Lifetime Extension is a Medium project (11 no. turbines). The cross tabulation of a *Medium* project on a *Low* risk site results in an overall risk score of **Low** (NatureScot Table 3a).

5.1.2 Assessment of Collision Risk

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

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

The Overall Risk Assessment for high collision risk species is provided in the sections below. Overall Risk was determined, in accordance with Table 3b of NatureScot guidance (**Appendix 3**), by a cross-tablature of the site risk level (i.e. Low) bat activity outputs for each species. The assessment was carried out for both median and maximum activity categories in order to provide insight into typical bat activity (i.e. median values) and activity peaks (i.e. maximum values). NatureScot recommends that most appropriate activity level (i.e. median or maximum) be utilised to determine the overall risk assessment for a species. As per NatureScot guidance there is no requirement to complete an Overall Risk Assessment for low-risk species.

During the extensive suite of surveys undertaken the following low-risk species were recorded:

- *Myotis spp.*
- Brown long-eared bat

Overall activity levels were mostly low for the above species, with moderate levels reported in Autumn 2024 for *Myotis* spp. An adaptive monitoring and mitigation strategy has been devised for the Proposed Lifetime Extension in line with the case study example provided in Appendix 5 of the NatureScot Guidance and is detailed in Section 6. Activity levels for these species will continue to be assessed during operational monitoring following the implementation of best practice and mitigations provided. Further mitigation will be implemented after Year 1 if deemed necessary.

5.1.2.1 Leisler's bat

This Site is within the current range of the Leisler's bat (NPWS, 2019). Leisler's bats are classed as a rarer species of a high population vulnerability which have a high collision risk (Plate 3-1). Leisler's bats were recorded during activity surveys across the Site. When assessed in the context of the identified site risk and in line with Table 3b (NatureScot, 2021) overall activity risk for Leisler's bat was found to be ***Low*** for all seasons at typical activity levels and ***Low*** for Summer, ***Medium*** for Spring and Autumn at peak activity levels (Table 5-2).

Based on site visits and survey data, including walked transects, it is determined that the Typical Activity (i.e. Median) is reflective of the nature of the Site, which is a mosaic of heath, bog and wet grasslands, partially surrounded by conifer forestry plantation, with low levels of bat activity recorded during the walked transects undertaken.

Thus, there is *Low* collision risk level assigned to the local population of Leisler's bat in all seasons.

Table 5-2 Leisler's bat – Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table 3b NatureScot 2021)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring 2024		Low (1)	Typical Risk is Low (2)	Moderate (3)	Peak Risk is Medium (6)

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

5.1.2.2 Soprano pipistrelle

This Site is within the current range of the soprano pipistrelle bat (NPWS, 2019). soprano pipistrelle bats are classed as a common species of a medium population risk which have a high potential collision risk (Plate 3-1). Soprano pipistrelle was recorded during activity surveys across the Site. When assessed in the context of the identified site risk and in line with Table 3b (NatureScot, 2021) overall activity risk for soprano pipistrelle was found to be ***Low*** for Spring, Summer and Autumn at typical activity levels. At peak activity levels, risk was as assessed as ***Low*** for Spring and Summer and ***Medium*** for Autumn (See Table 5-3 below).

Based on site visits and survey data, including walked transects, it is determined that the Typical Activity (i.e. Median) is reflective of the nature of the Site, which is a mosaic of heath, bog and wet grasslands, partially surrounded by conifer forestry plantation, with low levels of bat activity recorded during the walked transects undertaken.

Thus, there is *Low* collision risk level assigned to the local population of soprano pipistrelle bat in Spring, Summer and Autumn.

Table 5-3 Soprano pipistrelle – Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table 3b NatureScot 2021)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring 2024	Low (2)	Low (1)	Typical Risk is Low (2)	Low (1)	Peak Risk is Low (2)
Summer 2024		Low (1)	Typical Risk is Low (2)	Low (1)	Peak Risk is Low (2)
Autumn 2024		Low (1)	Typical Risk is Low (2)	Moderate (3)	Peak Risk is Medium (6)

5.1.2.3 Common pipistrelle

This Site is within the current range of the common pipistrelle bat (NPWS, 2019). Common pipistrelle bats are classed as a common species of a medium population risk which have a high collision risk (Plate 3-1). Common pipistrelles were recorded during activity surveys across the Site. When assessed in the context of the identified site risk and in line with Table 3b (NatureScot, 2021) overall activity risk for common pipistrelle was found to be ***Low*** at typical activity levels in Spring and Summer and ***Medium*** in Autumn. The risk for peak activity levels were assessed as ***High*** for Spring, Summer and Autumn. (See Table 5-4 below).

Based on site visits and survey data, including walked transects, it is determined that the Typical Activity (i.e. Median) is reflective of the nature of the Site, which is a mosaic of heath, bog and wet grasslands, partially surrounded by conifer forestry plantation, with low levels of bat activity recorded during the walked transects undertaken.

Thus, there is *Medium* collision risk level assigned to the local population of common pipistrelle in Autumn and a *Low* risk in Spring and Summer.

Table 5-4 Common pipistrelle – Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table NatureScot 2021)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring 2024	Low (2)	Low (1)	Typical Risk is Low (2)	High (5)	Peak Risk is Medium (10)
Summer 2024		Low (1)	Typical Risk is Low (2)	High (5)	Peak Risk is Medium (10)
Autumn 2024		Moderate (3)	Typical Risk is Medium (6)	High (5)	Peak Risk is Medium (10)

Detector locations with High median common pipistrelle activity levels

A summary of bat activity results, as shown in Table 4-6, provides key metrics for common pipistrelle recorded, per detector, per survey period. Detector D07 registered *High* median common pipistrelle activity levels in Autumn. This detector corresponds to turbine T7. No other detectors recorded High levels of median common pipistrelle activity across any other season. The average bat passes per hour showed that most of the bat activity occurred on nights with windspeed under 3m/s (Table 5-5) which is below the current cut-in speed (i.e. between 3-4 m/s) of the turbine. Therefore, there is limited potential for collision risk as turbine activity is restricted during low wind speeds.

Table 5-5 Common pipistrelle bat passes per hour, per night and weather data in Autumn 2024 at Turbine 7.

	29-Aug	30-Aug	31-Aug	01-Sep	02-Sep	03-Sep	04-Sep	05-Sep	06-Sep	07-Sep	08-Sep	09-Sep	10-Sep	11-Sep
Common pipistrelle	5.8	7.4	4.4	0	13.8	22	0.5	6.2	7.3	7.9	0.7	0	2.5	1.6
Weather data														
Average of Rain Rate - mm/h	0	0	0	5.00	0	0	0.26	0	0	0	0	0	0	0.12
Temperature at dusk °C	16.7	13.6	14.4	15.2	10.2	10.9	10	14.4	16.2	15.8	10.7	11.9	8.8	9.7
Average of Wind Speed - m/s	0.24	0.83	1.75	1.08	1.45	1.57	4.21	4.13	1.78	1.95	5.42	5.82	4.62	2.90

However, given that high median activity levels were recorded near turbine T7, an adaptive monitoring and mitigation strategy has been devised for the Site in line with the case study example provided in Appendix 5 of the NatureScot Guidance. Further details on proposed mitigation measures can be found in Section 6 below.

5.1.2.4 Nathusius' pipistrelle

The Site is not within the current range of the Nathusius' pipistrelle bat (NPWS, 2019) and is approximately 2km away from the known range. Nathusius' pipistrelle bats are classed as a rarer species of a high population risk which have a high collision risk (Plate 3-1). Nathusius' pipistrelle bats were recorded during activity surveys across the Site. When assessed in the context of the identified site risk and in line with Table 3b (NatureScot, 2021) overall activity risk for Nathusius' pipistrelle bats was found to be ***Low*** at typical activity levels across all seasons and ***Low*** in all seasons at peak activity levels (See Table 5-7 below).

Based on site visits and survey data, including walked transects, it is determined that the Typical Activity (i.e. Median) is reflective of the nature of the Site, which is a mosaic of heath, bog and wet grasslands, partially surrounded by conifer forestry plantation, with low levels of bat activity recorded during the walked transects undertaken. A peak of activity was recorded on the nights of the 4th, 5th and

6th of May 2024 at D09 (Turbine 9). The data showed that the bats were flying below the cut-in speed of the turbine (Table 5-6). The total number of bat passes of Nathusius' pipistrelle in Spring was close to 900 whereas at other detector locations the number of bat passes was below 10 or equalled zero. The data at D09 in Spring were therefore, considered as an outlier and were excluded from the calculation of the threshold for the overall risk assessment, as outlined in Section 3.3 above.

Table 5-6 Nathusius' pipistrelle bat passes per nights in Spring 2024

	03-May	04-May	05-May	06-May	07-May	08-May	09-May	10-May	11-May	12-May	13-May	14-May
D01	-	-	-	-	-	-	-	-	-	-	-	-
D03	-	-	-	1	-	-	-	-	-	-	-	-
D05	-	-	-	-	-	-	-	-	-	-	-	-
D06	-	-	-	-	-	1	-	-	1	-	-	-
D07	-	-	-	-	-	-	-	-	-	-	-	-
D08	-	1	-	-	-	1	-	-	-	-	-	-
D09	59	266	60	487	1	-	-	-	4	16	-	-
D10	1	-	-	5	2	-	-	-	-	-	-	-
D11	-	-	-	1	-	-	-	-	-	-	-	-
D12	-	1	-	-	-	-	-	-	-	-	-	-
Weather Data												
Average of Rain Rate - mm/h	0	0	0	0	0	0	0	0	0	0.51	0	2.11
Temperature at Dusk °C	8.40	9.20	9.90	10.30	10.60	12.30	12.40	14.20	14.70	11.80	10.40	10.40
Average of Wind Speed - m/s	0.89	0.72	3.03	2.22	1.42	1.33	1.73	1.47	0.98	2.18	1.92	3.78

Thus, there is *Low* collision risk level assigned to the local population of Nathusius' pipistrelle bat.

Table 5-7 Nathusius' Pipistrelle – Overall Risk Assessment

Survey Period	Site Risk	Typical Activity (Median)	Typical Risk Assessment (as per Table 3b NatureScot 2021)	Activity Peaks (Maximum)	Peak Risk Assessment (as per Table 3b NatureScot 2021)
Spring 2024	Low (2)	Low (1)	Typical Risk is Low (2)	Low (1)	Peak Risk is Low (2)
Summer 2024		Low (1)	Typical Risk is Low (2)	Low (1)	Peak Risk is Low (2)
Autumn 2024		Low (1)	Typical Risk is Low (2)	Low (1)	Peak Risk is Low (2)

5.1.3 Collision Risk Summary

Site-level collision risk for high collision risk bat species was typically *Low,* with the exception of common pipistrelle which had a *Medium* risk level in Autumn. Overall bat activity levels were typical of the nature of the Site, which is predominantly a mosaic of heath, bog and wet grasslands, partially surrounded by conifer forestry plantation, with low levels of bat activity recorded during the static detector surveys as well as the walked transects undertaken.

Significantly higher levels of Nathusius' pipistrelle activity were recorded within the site across three nights in May 2024, with an important amount of all activity recorded within the site occurring between the 4th, 5th and 6th of May. Further assessment will be required during operational monitoring to assess the nature of this peak in activity, and whether it is related to mating, swarming or, potentially migratory

activity. Due to the concentrated nature of the activity peak, particular focus is recommended for T9 during the operational monitoring period. Further details are outlined in Section 6.2 below.

Following per detector median calculation, Detectors D07 recorded high median activity levels of high-risk species in autumn (Table 4-6). Taking a precautionary approach and given the potential for high collision risk was recorded at median activity levels, an adaptive monitoring and mitigation strategy has been devised for the Proposed Project.

A monitoring and mitigation strategy has been devised for the Proposed Lifetime Extension, in line with the case study example provided in Appendix 5 of the NatureScot 2021 Guidance and based on the site-specific data. Turbines will undergo activity monitoring and carcass searches. Further details are outlined in Section 6 below.

5.1.3.1 Dog-led Collision Monitoring Results

Dog-led collision monitoring surveys were conducted to monitor any potential bat related fatalities at the Site, and to provide an estimate of potential turbine collision related mortality associated with the continued operation of the Site.

Surveys were undertaken from January 2024 and are ongoing at the site. No bat carcasses were found on site during the surveys. Further details can be found in Appendix 7-6, Collision Monitoring Report.

5.2 Loss or Damage to Commuting and Foraging Habitat

Taurbeg Wind Farm has been operational since March 2006 and the operational life would be extended to 2036 as part of the Proposed Lifetime Extension. Taurbeg Wind Farm is predominantly located within upland blanket bogs, wet grassland and conifer forestry with limited commuting features such as treelines, hedgerows, river or forestry edges. No changes in the surrounding habitat will occur by extending the lifespan of the wind farm. Given the extensive area of habitat that will remain undisturbed throughout the site, no significant effects with regard to loss of commuting and foraging habitat are anticipated.

The Proposed Offsetting Lands will see the removal of dense conifer plantation and failed forestry, with relatively limited commuting or foraging potential. It is proposed to create linear habitat features in these clearfell areas by stacking felled timbers along windrows. In addition, scrub will be retained in Area 2 with new scrub patches planted throughout Areas 1 and 4. Area 3 will undergo farmland restoration and there will be no deforestation in this area. Given the extensive area of enhanced bat habitat that will be created throughout the Proposed Offsetting Lands, no significant effects with regard to loss of commuting and foraging habitat are anticipated.

5.3 Loss of, or Damage to, Roosts

Structures

One structure was identified as providing potential suitable habitat to host roosting bats within the Site, this being the substation. A small amount of bat droppings were discovered within the attic but no bats were seen emerging from the structure during the emergence survey. The structure will remain in use as part of the Proposed Lifetime Extension thus, no loss or damage to identified or potential roosts is anticipated.

A derelict structure with roosting potential is located outside the boundary of Area 3 of the Proposed Offsetting Lands. This structure is being retained and avoided as part of the Proposed Offsetting Measures; therefore, no loss or damage to potential roosts is anticipated.

Trees

One tree was identified at the Site during the roost surveys as having potential to host roosting bats. This tree is located in proximity of T7 (i.e. approx. 82m away from the turbine). No evidence of bat use was identified during daytime inspection and emergence survey of the tree. No tree felling is planned around the turbine and a mitigation and monitoring programme is recommended for T7; therefore, no loss or damage to identified or potential roosts is anticipated.

Overall, no change in habitats within the Site is anticipated as a result of the Proposed Lifetime Extension. Area 3 will undergo farmland restoration and there will be no deforestation in this area. Areas 1, 2 and 4 of the Proposed Offsetting Lands consist largely of dense conifer plantation, which is proposed for deforestation. The plantation forestry does not provide suitable roosting habitat of significance for bats.

No potential for significant effect with regard to the loss of, or damage to, roosting habitat as a result of the Proposed Lifetime Extension or Proposed Offsetting Measures is anticipated.

5.4 Displacement of Individuals or Populations

Taurbeg Wind Farm has been operational since March 2006. The Site will remain as it is, and all linear features and forestry will be retained. There will be no net loss of linear landscape features for commuting and foraging bats and there will be no loss of any roosting site of ecological significance. The habitats on the Site will remain suitable for bats and no displacement of individuals or populations is anticipated as a result of the continued operation.

Additionally, the Proposed Offsetting Lands will indirectly provide additional new linear habitat features for local bat populations. Therefore, no significant displacement of individuals or populations is anticipated.

6. BEST PRACTICE AND MITIGATION MEASURES

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

6.1 Standard Best Practice Measures

6.1.1 Noise Restrictions

The Proposed Lifetime Extension will not result in any changes to the wind farm infrastructure. Existing land practices within the Site will continue. No change in existing noise levels are anticipated as a result of the Proposed Lifetime Extension.

6.1.2 Lighting Restrictions

No additional lighting or changes in the lighting within the Site is planned for the Proposed Lifetime Extension. Therefore, no significant effects of lighting on bats are anticipated; however, if in the course of the proposed post-consent monitoring, any potential for significant effects on bats is identified, specific measures will be implemented to avoid any such impacts.

6.1.3 Blade Feathering

NIEA Guidelines also recommend that, all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021).

Currently, with a blade pitch of zero degrees, the revolutions per minute (rpm) are below 2rpm when wind speeds are below the cut-in speed and the turbines are idling; therefore, blade feathering is not proposed at this stage. However, should an impact be identified during operational monitoring, the mitigation strategy will be adjusted accordingly.

6.1.4 Bat Felling Buffers

NatureScot and NIEA Guidance recommends a minimum 50m buffer to all habitat features used by bats (e.g., hedgerows, tree lines etc.) to be applied to the siting of all wind turbines. EUROBATS recommends a greater buffer distance up to 200m for higher quality habitat. The Site consists predominantly of low-quality conifer plantation.

Carcass searches were undertaken at the site in August 2024, around the time of the peak in Common pipistrelle activity and no bat fatalities were recorded. As no bat carcasses were discovered on Site across 2024 and as high median activity was recorded only at T7 in Autumn, it is proposed that the current turbines buffer are appropriate as they are. These buffers are smaller than the recommended buffers as Taurbeg Wind Farm was built before European guidelines were published; however, the survey results to date did not reveal evidence that a significant impact on bats is occurring and no bat fatalities have been recorded. Should an impact be identified during operational monitoring, the buffers will be adjusted accordingly.

6.2 Bat Mitigation and Monitoring Plan

Overall risk levels for high collision risk bat species were typically ***Low*** with a ***Medium*** risk in Autumn for common pipistrelles. This risk level is reflective of the nature of the Site, which comprises a mosaic of heath, bog and wet grasslands, partially surrounded by conifer forestry plantation. Low levels of bat activity were recorded during the walked transects undertaken.

However, taking a precautionary approach and given that high collision risk was recorded at median and peak activity levels, an adaptive monitoring and mitigation strategy has been devised for the Proposed Lifetime Extension in line with the case study example provided in Appendix 5 of the NatureScot (2021) Guidance and based on the site-specific data.

Based on the surveys carried out, there is no evidence to suggest that the existing turbines are having a significant impact on bats; however, high peaks in activity were noted at T7 in Autumn. Therefore, on a precautionary basis, it is recommended to carry out monitoring, including carcass searches across the Site as a standard.

6.2.1 Operational Monitoring

To assess the effects of the Proposed Lifetime Extension on bat activity, at least 3 years of post-consent monitoring is proposed. This will include static detector surveys, walked survey transects and dog-led carcass searching to record any bat fatalities resulting from potential collision.

The results of post-consent monitoring will be utilised to assess any potential changes in bat activity patterns and to monitor the implementation of the mitigation strategy. Results of Year 1 surveys will assess whether adaptations to the monitoring plan are required, and further mitigations such as curtailment will be considered. If a further curtailment requirement is identified, a programme can be devised around key activity periods and weather parameters, as well as a potential increase in buffers.

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

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

6.2.1.1 Monitoring Year 1

Bat activity surveys

Surveys for the Proposed Lifetime Extension will be carried out. Static monitoring shall take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). Full spectrum recording detectors shall be utilised for the same duration as during pre-application surveys and at the same density (NatureScot, 2021). As described in Section 3 above, the assessment of bat activity levels will follow the pre-application methodology, allowing uploaded activity data to be contrasted with a comparable reference range, allowing objective and robust interpretation. A specific focus will be required at turbine 9 in Spring and turbine 7 in Autumn. The static surveys at these two specific turbines will be of 20 days starting during the last week of April at T9 and in Autumn at T7 starting mid-August. Seasonal walked survey transects will also be conducted.

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

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

Carcass searches

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

6.2.1.2 Monitoring Years 2 & 3

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

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

6.3 Residual Impacts

No Significant Effect

Taking into consideration the existing infrastructure, the proposed best practice and adaptive mitigation measures; significant residual effects on bats with regard to 1) Collision mortality, barotrauma and other injuries, 2) Loss or damage to commuting and foraging habitat, 3) Loss of, or damage to, roosts and 4) Displacement of individuals or populations are not anticipated.

6.4 Cumulative Effects

The Proposed Lifetime Extension was considered in combination with other plans, existing and approved projects and planning applications pending a decision, in the surrounding area that could result in cumulative impacts on bats. This included a review of online Planning Registers and served to identify past, present and future plans and projects, their activities and their predicted environmental effects. The plans and projects considered are detailed in Section 2.11 in Chapter 2 of the EIAR: Background of the Proposed Project.

Following the detailed assessment provided in the preceding sections, it is concluded that, the Proposed Lifetime Extension will not result in any residual adverse effects on bats, when considered on its own. There are 7 existing, permitted or proposed wind farm sites, one solar PV energy development and 6 wastewater treatment plants located within 10km of the Proposed Lifetime Extension.

In the review of the projects that was undertaken, no connection, that could potentially result in additional or cumulative impacts was identified. Neither was any potential for different (new) impacts resulting from the combination of the various projects and plans in association with the Proposed Lifetime Extension.

Taking into consideration the reported residual impacts from other plans and projects in the area and the predicted impacts with the current proposal, no residual cumulative impacts have been identified regarding bats.

Therefore, no potential for the Proposed Lifetime Extension to contribute to any cumulative adverse effects on any bat populations was identified when considered in-combination with other plans and projects.

7. CONCLUSION

This report provides a full and comprehensive assessment of the potential for impact on bat populations at the Proposed Lifetime Extension. Following consideration of the residual effects (post mitigation) it is noted that the Proposed Lifetime Extension will not result in any significant effects on bats.

Provided that the Proposed Lifetime Extension is operated in accordance with the design, best practice and mitigation that is described within this report, significant effects on bats are not anticipated at any geographic scale.

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APPENDIX 1

BAT HABITAT SUITABILITY APPRAISAL

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).

Suitability	Roosting Habitats	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

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

* 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 RISK ASSESSMENT

Table 3b: Stage 2 – Overall Risk Assessment

Site Risk Level (from Table 3a)	**Ecobat 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

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).

APPENDIX 4

SURVEY AT HEIGHT RESULTS 2024 – SM3 RECORDINGS

APPENDIX 4 – SURVEY AT HEIGHT RESULTS 2024 SM3 RECORDINGS

Date - 12	Time	Mic. Level	Species
02/05/2024	22:40:02	Ground	Leisler's bat
02/05/2024	22:40:02	Height	Leisler's bat
02/05/2024	23:55:17	Ground	Leisler's bat
02/05/2024	23:55:17	Height	Leisler's bat
03/05/2024	00:32:46	Ground	Common pipistrelle
03/05/2024	00:32:46	Height	Noise
03/05/2024	00:37:22	Height	Noise
03/05/2024	00:37:22	Ground	Myotis spp.
03/05/2024	01:29:44	Ground	Leisler's bat
03/05/2024	01:29:44	Height	Leisler's bat
03/05/2024	01:29:52	Ground	Leisler's bat
03/05/2024	01:29:52	Height	Leisler's bat
03/05/2024	01:43:54	Ground	Leisler's bat
03/05/2024	01:43:54	Height	Leisler's bat
03/05/2024	01:53:12	Ground	Common pipistrelle
03/05/2024	01:53:12	Height	Noise
03/05/2024	01:57:54	Ground	Common pipistrelle
03/05/2024	01:57:54	Height	Noise
03/05/2024	01:59:56	Ground	Common pipistrelle
03/05/2024	01:59:56	Height	Noise
03/05/2024	01:59:58	Ground	Common pipistrelle
03/05/2024	01:59:58	Height	Noise
03/05/2024	02:14:25	Ground	Common pipistrelle
03/05/2024	02:14:25	Height	Noise
03/05/2024	02:19:25	Ground	Leisler's bat
03/05/2024	02:19:25	Height	Leisler's bat
03/05/2024	02:25:31	Ground	Common pipistrelle
03/05/2024	02:25:31	Height	Noise
03/05/2024	03:54:05	Ground	Common pipistrelle
03/05/2024	03:54:05	Height	Noise
03/05/2024	04:16:25	Ground	Common pipistrelle
03/05/2024	04:16:25	Height	Noise
03/05/2024	22:25:17	Height	Leisler's bat
03/05/2024	22:25:17	Ground	Leisler's bat
03/05/2024	22:32:31	Ground	Common pipistrelle
03/05/2024	22:32:31	Height	Noise
04/05/2024	01:09:10	Height	Noise
04/05/2024	01:09:10	Ground	Myotis spp.
04/05/2024	03:21:16	Ground	Noise
04/05/2024	03:21:16	Height	Noise
04/05/2024	22:14:35	Ground	Noise
04/05/2024	22:14:35	Height	Leisler's bat
04/05/2024	22:14:40	Ground	Noise
04/05/2024	22:14:40	Height	Leisler's bat
04/05/2024	22:53:51	Height	Leisler's bat
04/05/2024	22:53:51	Ground	Leisler's bat
04/05/2024	23:01:20	Ground	Soprano pipistrelle
04/05/2024	23:01:20	Height	Noise
04/05/2024	23:01:32	Ground	Soprano pipistrelle
04/05/2024	23:01:32	Height	Noise
04/05/2024	23:01:40	Ground	Soprano pipistrelle
04/05/2024	23:01:40	Height	Noise
04/05/2024	23:01:56	Ground	Soprano pipistrelle
04/05/2024	23:01:56	Height	Noise
04/05/2024	23:02:00	Ground	Soprano pipistrelle
04/05/2024	23:02:00	Height	Noise
04/05/2024	23:02:16	Ground	Soprano pipistrelle
04/05/2024	23:02:16	Height	Noise
04/05/2024	23:02:25	Ground	Soprano pipistrelle
04/05/2024	23:02:25	Height	Noise
05/05/2024	00:39:41	Height	Leisler's bat
05/05/2024	00:39:41	Ground	Leisler's bat
05/05/2024	00:39:56	Height	Noise
05/05/2024	00:39:56	Ground	Leisler's bat
05/05/2024	23:19:02	Ground	Common pipistrelle
05/05/2024	23:19:02	Height	Noise
06/05/2024	02:28:21	Ground	Common pipistrelle
06/05/2024	02:28:21	Height	Noise
06/05/2024	02:31:29	Ground	Common pipistrelle
06/05/2024	02:31:29	Height	Noise
06/05/2024	03:59:42	Height	Noise
06/05/2024	03:59:42	Ground	Common pipistrelle
06/05/2024	22:09:30	Ground	Common pipistrelle
06/05/2024	22:09:30	Height	Noise
06/05/2024	23:10:07	Height	Leisler's bat
06/05/2024	23:10:07	Ground	Leisler's bat
06/05/2024	23:16:56	Ground	Common pipistrelle
06/05/2024	23:16:56	Height	Noise
07/05/2024	00:06:21	Ground	Common pipistrelle
07/05/2024	00:06:21	Height	Noise
07/05/2024	00:08:00	Ground	Common pipistrelle
07/05/2024	00:08:00	Height	Noise
07/05/2024	00:11:25	Height	Leisler's bat
07/05/2024	00:11:25	Ground	Leisler's bat
07/05/2024	00:11:41	Height	Leisler's bat
07/05/2024	00:11:41	Ground	Leisler's bat
07/05/2024	00:40:19	Ground	Common pipistrelle
07/05/2024	00:40:19	Height	Noise
07/05/2024	00:45:13	Ground	Common pipistrelle
07/05/2024	00:45:13	Height	Noise
07/05/2024	00:46:18	Ground	Common pipistrelle
07/05/2024	00:46:18	Height	Noise
07/05/2024	00:46:23	Ground	Common pipistrelle
07/05/2024	00:46:23	Height	Noise
07/05/2024	00:46:36	Ground	Common pipistrelle
07/05/2024	00:46:36	Height	Noise
07/05/2024	00:47:59	Ground	Common pipistrelle
07/05/2024	00:47:59	Height	Noise
07/05/2024	00:48:17	Ground	Common pipistrelle
07/05/2024	00:48:17	Height	Noise
07/05/2024	00:49:01	Ground	Common pipistrelle

Date - 12	Time	Mic. Level	Species
07/05/2024	00:49:01	Height	Noise
07/05/2024	00:49:48	Ground	Common pipistrelle
07/05/2024	00:49:48	Height	Noise
07/05/2024	00:50:49	Ground	Common pipistrelle
07/05/2024	00:50:49	Height	Noise
07/05/2024	00:51:01	Ground	Common pipistrelle
07/05/2024	00:51:01	Height	Noise
07/05/2024	00:51:53	Ground	Common pipistrelle
07/05/2024	00:51:53	Height	Noise
07/05/2024	00:52:37	Ground	Common pipistrelle
07/05/2024	00:52:37	Height	Noise
07/05/2024	00:54:39	Ground	Common pipistrelle
07/05/2024	00:54:39	Height	Noise
07/05/2024	00:56:08	Ground	Common pipistrelle
07/05/2024	00:56:08	Height	Noise
07/05/2024	00:56:34	Ground	Common pipistrelle
07/05/2024	00:56:34	Height	Noise
07/05/2024	00:57:18	Ground	Common pipistrelle
07/05/2024	00:57:18	Height	Noise
07/05/2024	00:58:07	Ground	Common pipistrelle
07/05/2024	00:58:07	Height	Noise
07/05/2024	01:00:08	Ground	Common pipistrelle
07/05/2024	01:00:08	Height	Noise
07/05/2024	01:00:41	Ground	Common pipistrelle
07/05/2024	01:00:41	Height	Noise
07/05/2024	01:00:59	Ground	Common pipistrelle
07/05/2024	01:00:59	Height	Noise
07/05/2024	01:04:53	Ground	Common pipistrelle
07/05/2024	01:04:53	Height	Noise
07/05/2024	01:06:00	Ground	Common pipistrelle
07/05/2024	01:06:00	Height	Noise
07/05/2024	01:06:57	Ground	Common pipistrelle
07/05/2024	01:06:57	Height	Noise
07/05/2024	01:07:13	Ground	Common pipistrelle
07/05/2024	01:07:13	Height	Noise
07/05/2024	01:08:06	Ground	Common pipistrelle
07/05/2024	01:08:06	Height	Noise
07/05/2024	01:16:14	Ground	Common pipistrelle
07/05/2024	01:16:14	Height	Noise
07/05/2024	01:16:18	Ground	Common pipistrelle
07/05/2024	01:16:18	Height	Noise
07/05/2024	01:17:29	Height	Leisler's bat
07/05/2024	01:17:29	Ground	Leisler's bat
07/05/2024	01:17:44	Ground	Noise
07/05/2024	01:17:44	Height	Noise
07/05/2024	02:14:06	Ground	Common pipistrelle
07/05/2024	02:14:06	Height	Noise
07/05/2024	02:18:39	Ground	Common pipistrelle
07/05/2024	02:18:39	Height	Noise
07/05/2024	02:19:22	Ground	Common pipistrelle
07/05/2024	02:19:22	Height	Noise
07/05/2024	02:35:01	Height	Noise

Date - 12	Time	Mic. Level	Species
07/05/2024	02:35:01	Ground	Common pipistrelle
07/05/2024	03:59:17	Ground	Common pipistrelle
07/05/2024	03:59:17	Height	Noise
07/05/2024	22:27:07	Ground	Soprano pipistrelle
07/05/2024	22:27:07	Height	Noise
07/05/2024	22:38:25	Ground	Common pipistrelle
07/05/2024	22:38:25	Height	Noise
07/05/2024	22:38:28	Ground	Common pipistrelle
07/05/2024	22:38:28	Height	Noise
07/05/2024	22:40:43	Height	Leisler's bat
07/05/2024	22:40:43	Ground	Leisler's bat
07/05/2024	22:42:06	Ground	Common pipistrelle
07/05/2024	22:42:06	Height	Noise
07/05/2024	22:45:04	Ground	Common pipistrelle
07/05/2024	22:45:04	Height	Noise
07/05/2024	22:45:09	Ground	Common pipistrelle
07/05/2024	22:45:09	Height	Noise
07/05/2024	23:08:22	Ground	Common pipistrelle
07/05/2024	23:08:22	Height	Noise
07/05/2024	23:08:28	Ground	Common pipistrelle
07/05/2024	23:08:28	Height	Noise
07/05/2024	23:10:09	Height	Leisler's bat
07/05/2024	23:10:09	Ground	Leisler's bat
07/05/2024	23:26:13	Ground	Leisler's bat
07/05/2024	23:26:13	Height	Leisler's bat
07/05/2024	23:55:59	Height	Leisler's bat
07/05/2024	23:55:59	Ground	Leisler's bat
08/05/2024	00:25:23	Ground	Common pipistrelle
08/05/2024	00:25:23	Height	Noise
08/05/2024	00:25:53	Ground	Common pipistrelle
08/05/2024	00:25:53	Height	Noise
08/05/2024	00:39:17	Height	Noise
08/05/2024	00:39:17	Ground	Myotis spp.
08/05/2024	22:31:06	Ground	Common pipistrelle
08/05/2024	22:31:06	Height	Noise
08/05/2024	22:34:37	Ground	Common pipistrelle
08/05/2024	22:34:37	Height	Noise
08/05/2024	22:34:58	Ground	Common pipistrelle
08/05/2024	22:34:58	Height	Noise
08/05/2024	22:35:51	Ground	Common pipistrelle
08/05/2024	22:35:51	Height	Noise
08/05/2024	22:36:07	Ground	Common pipistrelle
08/05/2024	22:36:07	Height	Noise
08/05/2024	22:36:47	Ground	Common pipistrelle
08/05/2024	22:36:47	Height	Noise
08/05/2024	22:37:04	Ground	Common pipistrelle
08/05/2024	22:37:04	Height	Noise
08/05/2024	22:37:43	Ground	Common pipistrelle
08/05/2024	22:37:43	Height	Noise
08/05/2024	22:37:45	Ground	Common pipistrelle
08/05/2024	22:37:45	Height	Noise
08/05/2024	22:38:20	Ground	Common pipistrelle

Date - 12	Time	Mic. Level	Species
08/05/2024	22:38:20	Height	Noise
08/05/2024	22:38:53	Ground	Common pipistrelle
08/05/2024	22:38:53	Height	Noise
08/05/2024	22:38:58	Ground	Common pipistrelle
08/05/2024	22:38:58	Height	Noise
08/05/2024	22:39:22	Ground	Common pipistrelle
08/05/2024	22:39:22	Height	Noise
08/05/2024	22:40:01	Ground	Common pipistrelle
08/05/2024	22:40:01	Height	Noise
11/05/2024	00:26:11	Ground	Myotis spp.
11/05/2024	00:26:11	Height	Noise
11/05/2024	00:44:31	Ground	Common pipistrelle
11/05/2024	00:44:31	Height	Noise
11/05/2024	01:19:25	Height	Leisler's bat
11/05/2024	01:19:25	Ground	Leisler's bat
11/05/2024	02:04:39	Ground	Common pipistrelle
11/05/2024	02:04:39	Height	Noise
11/05/2024	02:34:48	Ground	Common pipistrelle
11/05/2024	02:34:48	Height	Noise
11/05/2024	02:34:58	Ground	Common pipistrelle
11/05/2024	02:34:58	Height	Noise
11/05/2024	03:19:38	Ground	Common pipistrelle
11/05/2024	03:19:38	Height	Noise
11/05/2024	03:19:44	Ground	Common pipistrelle
11/05/2024	03:19:44	Height	Noise
11/05/2024	23:37:51	Height	Leisler's bat
11/05/2024	23:37:51	Ground	Leisler's bat
12/05/2024	22:36:55	Ground	Common pipistrelle
12/05/2024	22:36:55	Height	Noise
12/05/2024	22:52:46	Ground	Common pipistrelle
12/05/2024	22:52:46	Height	Noise
12/05/2024	22:58:50	Ground	Common pipistrelle
12/05/2024	22:58:50	Height	Noise
12/05/2024	23:28:02	Ground	Common pipistrelle
12/05/2024	23:28:02	Height	Noise
12/05/2024	23:28:04	Ground	Common pipistrelle
12/05/2024	23:28:04	Height	Noise
15/05/2024	00:21:48	Ground	Common pipistrelle
15/05/2024	00:21:48	Height	Noise
15/05/2024	00:28:12	Height	Leisler's bat
15/05/2024	00:28:12	Ground	Leisler's bat
15/05/2024	00:32:22	Ground	Leisler's bat
15/05/2024	00:32:22	Height	Leisler's bat
15/05/2024	00:32:30	Ground	Leisler's bat
15/05/2024	00:32:30	Height	Leisler's bat
15/05/2024	02:28:58	Height	Noise
15/05/2024	02:28:58	Ground	Common pipistrelle
15/05/2024	02:29:04	Height	Noise
15/05/2024	02:29:04	Ground	Common pipistrelle
15/05/2024	02:54:53	Height	Noise
15/05/2024	02:54:53	Ground	Common pipistrelle
15/05/2024	02:54:56	Height	Noise

Date - 12	Time	Mic. Level	Species
15/05/2024	02:54:56	Ground	Common pipistrelle
15/05/2024	02:55:01	Height	Noise
15/05/2024	02:55:01	Ground	Common pipistrelle
15/05/2024	02:58:18	Height	Noise
15/05/2024	02:58:18	Ground	Common pipistrelle
15/05/2024	03:28:54	Ground	Myotis spp.
15/05/2024	03:28:54	Height	Noise
15/05/2024	22:37:16	Height	Leisler's bat
15/05/2024	22:37:16	Ground	Noise
15/05/2024	23:18:01	Height	Leisler's bat
15/05/2024	23:18:01	Ground	Leisler's bat
15/05/2024	23:33:55	Height	Noise
15/05/2024	23:33:55	Ground	Common pipistrelle
16/05/2024	21:26:22	Ground	Noise
16/05/2024	21:26:22	Height	Noise
16/05/2024	21:26:37	Ground	Noise
16/05/2024	21:26:37	Height	Noise
16/05/2024	22:16:11	Ground	Noise
16/05/2024	22:16:11	Height	Noise
16/05/2024	22:17:20	Ground	Noise
16/05/2024	22:17:20	Height	Noise
16/05/2024	22:22:35	Ground	Noise
16/05/2024	22:22:35	Height	Noise
16/05/2024	22:42:14	Ground	Noise
16/05/2024	22:42:14	Height	Noise
16/05/2024	22:49:21	Height	Noise
16/05/2024	22:49:21	Ground	Common pipistrelle
17/05/2024	21:54:36	Ground	Noise
17/05/2024	21:54:36	Height	Noise
18/05/2024	01:59:42	Height	Noise
18/05/2024	01:59:42	Ground	Common pipistrelle
18/05/2024	01:59:49	Height	Noise
18/05/2024	01:59:49	Ground	Common pipistrelle
18/05/2024	02:01:39	Height	Noise
18/05/2024	02:01:39	Ground	Common pipistrelle
18/05/2024	02:02:21	Height	Noise
18/05/2024	02:02:21	Ground	Common pipistrelle
18/05/2024	02:02:34	Height	Noise
18/05/2024	02:02:34	Ground	Common pipistrelle
18/05/2024	02:03:51	Height	Noise
18/05/2024	02:03:51	Ground	Common pipistrelle
18/05/2024	02:39:32	Ground	Myotis spp.
18/05/2024	02:39:32	Height	Noise
18/05/2024	22:30:04	Ground	Common pipistrelle
18/05/2024	22:30:04	Height	Noise
19/05/2024	00:31:52	Height	Noise
19/05/2024	00:31:52	Ground	Common pipistrelle
19/05/2024	00:32:01	Height	Noise
19/05/2024	00:32:01	Ground	Common pipistrelle
19/05/2024	00:32:16	Height	Noise
19/05/2024	00:32:16	Ground	Common pipistrelle
19/05/2024	00:32:32	Height	Noise

Date - 12	Time	Mic. Level	Species
19/05/2024	00:32:32	Ground	Common pipistrelle
19/05/2024	00:32:48	Height	Noise
19/05/2024	00:32:48	Ground	Common pipistrelle
19/05/2024	00:36:14	Height	Noise
19/05/2024	00:36:14	Ground	Common pipistrelle
19/05/2024	00:36:16	Height	Noise
19/05/2024	00:36:16	Ground	Common pipistrelle
19/05/2024	00:36:28	Height	Noise
19/05/2024	00:36:28	Ground	Common pipistrelle
19/05/2024	00:36:36	Height	Noise
19/05/2024	00:36:36	Ground	Common pipistrelle
19/05/2024	00:36:50	Height	Noise
19/05/2024	00:36:50	Ground	Common pipistrelle
19/05/2024	00:36:58	Height	Noise
19/05/2024	00:36:58	Ground	Common pipistrelle
19/05/2024	00:37:08	Height	Noise
19/05/2024	00:37:08	Ground	Common pipistrelle
19/05/2024	00:37:13	Height	Noise
19/05/2024	00:37:13	Ground	Common pipistrelle
19/05/2024	00:37:20	Height	Noise
19/05/2024	00:37:20	Ground	Common pipistrelle
19/05/2024	00:37:30	Height	Noise
19/05/2024	00:37:30	Ground	Common pipistrelle
19/05/2024	00:37:46	Height	Noise
19/05/2024	00:37:46	Ground	Common pipistrelle
19/05/2024	00:37:53	Height	Noise
19/05/2024	00:37:53	Ground	Common pipistrelle
19/05/2024	00:38:25	Height	Noise
19/05/2024	00:38:25	Ground	Common pipistrelle
19/05/2024	00:38:33	Height	Noise
19/05/2024	00:38:33	Ground	Common pipistrelle
19/05/2024	00:42:06	Height	Noise
19/05/2024	00:42:06	Ground	Common pipistrelle
19/05/2024	00:43:49	Height	Noise
19/05/2024	00:43:49	Ground	Common pipistrelle
19/05/2024	00:44:56	Height	Noise
19/05/2024	00:44:56	Ground	Common pipistrelle
19/05/2024	00:45:03	Height	Noise
19/05/2024	00:45:03	Ground	Common pipistrelle
19/05/2024	00:45:07	Height	Noise
19/05/2024	00:45:07	Ground	Common pipistrelle
19/05/2024	00:45:48	Height	Noise
19/05/2024	00:45:48	Ground	Common pipistrelle
19/05/2024	00:46:13	Height	Noise
19/05/2024	00:46:13	Ground	Common pipistrelle
19/05/2024	00:46:18	Height	Noise
19/05/2024	00:46:18	Ground	Common pipistrelle
19/05/2024	00:46:51	Height	Noise
19/05/2024	00:46:51	Ground	Common pipistrelle
19/05/2024	00:48:20	Height	Noise
19/05/2024	00:48:20	Ground	Common pipistrelle
19/05/2024	00:48:35	Height	Noise

Date - 12	Time	Mic. Level	Species
19/05/2024	00:48:35	Ground	Common pipistrelle
19/05/2024	00:48:46	Height	Noise
19/05/2024	00:48:46	Ground	Common pipistrelle
19/05/2024	00:49:25	Ground	Common pipistrelle
19/05/2024	00:49:25	Height	Noise
19/05/2024	00:50:08	Height	Noise
19/05/2024	00:50:08	Ground	Common pipistrelle
19/05/2024	00:52:06	Ground	Common pipistrelle
19/05/2024	00:52:06	Height	Noise
19/05/2024	00:52:20	Height	Noise
19/05/2024	00:52:20	Ground	Common pipistrelle
19/05/2024	00:52:24	Height	Noise
19/05/2024	00:52:24	Ground	Common pipistrelle
19/05/2024	00:52:32	Height	Noise
19/05/2024	00:52:32	Ground	Common pipistrelle
19/05/2024	00:52:51	Ground	Common pipistrelle
19/05/2024	00:52:51	Height	Noise
19/05/2024	00:53:06	Height	Noise
19/05/2024	00:53:06	Ground	Common pipistrelle
19/05/2024	00:53:12	Height	Noise
19/05/2024	00:53:12	Ground	Common pipistrelle
19/05/2024	00:53:26	Height	Noise
19/05/2024	00:53:26	Ground	Common pipistrelle
19/05/2024	00:53:40	Height	Noise
19/05/2024	00:53:40	Ground	Common pipistrelle
19/05/2024	00:53:45	Height	Noise
19/05/2024	00:53:45	Ground	Common pipistrelle
19/05/2024	00:53:59	Height	Noise
19/05/2024	00:53:59	Ground	Common pipistrelle
19/05/2024	00:54:09	Height	Noise
19/05/2024	00:54:09	Ground	Common pipistrelle
19/05/2024	00:54:20	Height	Noise
19/05/2024	00:54:20	Ground	Common pipistrelle
19/05/2024	00:54:31	Height	Common pipistrelle
19/05/2024	00:54:31	Ground	Common pipistrelle
19/05/2024	00:55:31	Height	Noise
19/05/2024	00:55:31	Ground	Common pipistrelle
19/05/2024	00:55:41	Height	Noise
19/05/2024	00:55:41	Ground	Common pipistrelle
19/05/2024	00:55:57	Height	Noise
19/05/2024	00:55:57	Ground	Common pipistrelle
19/05/2024	00:56:10	Height	Noise
19/05/2024	00:56:10	Ground	Common pipistrelle
19/05/2024	00:56:26	Height	Noise
19/05/2024	00:56:26	Ground	Common pipistrelle
19/05/2024	00:56:42	Height	Noise
19/05/2024	00:56:42	Ground	Common pipistrelle
19/05/2024	00:56:52	Height	Noise
19/05/2024	00:56:52	Ground	Common pipistrelle
19/05/2024	00:57:08	Height	Noise
19/05/2024	00:57:08	Ground	Common pipistrelle
19/05/2024	00:57:24	Height	Noise

Date - 12	Time	Mic. Level	Species
19/05/2024	00:57:24	Ground	Common pipistrelle
19/05/2024	00:57:40	Height	Noise
19/05/2024	00:57:40	Ground	Common pipistrelle
19/05/2024	00:57:54	Ground	Leisler's bat
19/05/2024	00:57:54	Height	Leisler's bat
19/05/2024	00:59:30	Ground	Leisler's bat
19/05/2024	00:59:30	Height	Leisler's bat
19/05/2024	00:59:37	Height	Leisler's bat
19/05/2024	00:59:37	Ground	Noise
19/05/2024	01:00:44	Height	Noise
19/05/2024	01:00:44	Ground	Common pipistrelle
19/05/2024	01:00:49	Height	Noise
19/05/2024	01:00:49	Ground	Common pipistrelle
19/05/2024	01:01:06	Height	Noise
19/05/2024	01:01:06	Ground	Common pipistrelle
19/05/2024	01:10:56	Height	Noise
19/05/2024	01:10:56	Ground	Common pipistrelle
19/05/2024	01:11:09	Height	Noise
19/05/2024	01:11:09	Ground	Common pipistrelle
19/05/2024	01:11:19	Height	Noise
19/05/2024	01:11:19	Ground	Common pipistrelle
19/05/2024	01:11:25	Height	Noise
19/05/2024	01:11:25	Ground	Common pipistrelle
19/05/2024	01:11:31	Height	Noise
19/05/2024	01:11:31	Ground	Common pipistrelle
19/05/2024	01:12:45	Height	Noise
19/05/2024	01:12:45	Ground	Common pipistrelle
19/05/2024	01:12:51	Height	Noise
19/05/2024	01:12:51	Ground	Common pipistrelle
19/05/2024	01:22:44	Ground	Leisler's bat
19/05/2024	01:22:44	Height	Leisler's bat
19/05/2024	01:33:35	Ground	Common pipistrelle
19/05/2024	01:33:35	Height	Noise
19/05/2024	01:35:00	Height	Noise
19/05/2024	01:35:00	Ground	Common pipistrelle
19/05/2024	01:35:44	Height	Noise
19/05/2024	01:35:44	Ground	Common pipistrelle
19/05/2024	01:35:53	Height	Noise
19/05/2024	01:35:53	Ground	Common pipistrelle
19/05/2024	01:36:38	Ground	Common pipistrelle
19/05/2024	01:36:38	Height	Noise
19/05/2024	01:37:10	Height	Noise
19/05/2024	01:37:10	Ground	Common pipistrelle
19/05/2024	01:37:46	Height	Noise
19/05/2024	01:37:46	Ground	Common pipistrelle
19/05/2024	01:37:59	Height	Noise
19/05/2024	01:37:59	Ground	Common pipistrelle
19/05/2024	01:38:33	Height	Noise
19/05/2024	01:38:33	Ground	Common pipistrelle
19/05/2024	01:38:55	Ground	Common pipistrelle
19/05/2024	01:38:55	Height	Noise
19/05/2024	01:40:08	Height	Noise

Date - 12	Time	Mic. Level	Species
19/05/2024	01:40:08	Ground	Common pipistrelle
19/05/2024	01:40:22	Height	Noise
19/05/2024	01:40:22	Ground	Common pipistrelle
19/05/2024	01:40:37	Ground	Common pipistrelle
19/05/2024	01:40:37	Height	Noise
19/05/2024	01:40:42	Height	Noise
19/05/2024	01:40:42	Ground	Common pipistrelle
19/05/2024	01:40:50	Ground	Common pipistrelle
19/05/2024	01:40:50	Height	Noise
19/05/2024	01:41:03	Height	Noise
19/05/2024	01:41:03	Ground	Common pipistrelle
19/05/2024	01:41:48	Height	Noise
19/05/2024	01:41:48	Ground	Common pipistrelle
19/05/2024	01:44:07	Height	Leisler's bat
19/05/2024	01:44:07	Ground	Leisler's bat
19/05/2024	01:44:22	Ground	Noise
19/05/2024	01:44:22	Height	Noise
19/05/2024	01:49:19	Height	Noise
19/05/2024	01:49:19	Ground	Common pipistrelle
19/05/2024	01:50:26	Height	Noise
19/05/2024	01:50:26	Ground	Common pipistrelle
19/05/2024	01:51:50	Height	Noise
19/05/2024	01:51:50	Ground	Common pipistrelle
19/05/2024	01:53:28	Height	Noise
19/05/2024	01:53:28	Ground	Common pipistrelle
19/05/2024	02:05:40	Ground	Leisler's bat
19/05/2024	02:05:40	Height	Leisler's bat
19/05/2024	02:07:14	Height	Noise
19/05/2024	02:07:14	Ground	Common pipistrelle
19/05/2024	02:07:22	Height	Noise
19/05/2024	02:07:22	Ground	Common pipistrelle
19/05/2024	02:14:44	Height	Noise
19/05/2024	02:14:44	Ground	Common pipistrelle
19/05/2024	02:15:05	Height	Noise
19/05/2024	02:15:05	Ground	Common pipistrelle
19/05/2024	02:15:18	Height	Noise
19/05/2024	02:15:18	Ground	Common pipistrelle
19/05/2024	02:15:28	Height	Noise
19/05/2024	02:15:28	Ground	Common pipistrelle
19/05/2024	02:15:35	Height	Noise
19/05/2024	02:15:35	Ground	Common pipistrelle
19/05/2024	02:15:45	Height	Noise
19/05/2024	02:15:45	Ground	Common pipistrelle
19/05/2024	02:15:56	Height	Noise
19/05/2024	02:15:56	Ground	Common pipistrelle
19/05/2024	02:16:11	Height	Noise
19/05/2024	02:16:11	Ground	Common pipistrelle
19/05/2024	02:16:21	Height	Noise
19/05/2024	02:16:21	Ground	Common pipistrelle
19/05/2024	02:16:38	Height	Noise
19/05/2024	02:16:38	Ground	Common pipistrelle
19/05/2024	02:16:44	Height	Noise

Date - 12	Time	Mic. Level	Species
19/05/2024	02:16:44	Ground	Common pipistrelle
19/05/2024	02:16:48	Height	Noise
19/05/2024	02:16:48	Ground	Common pipistrelle
19/05/2024	02:16:57	Height	Noise
19/05/2024	02:16:57	Ground	Common pipistrelle
19/05/2024	02:17:08	Height	Noise
19/05/2024	02:17:08	Ground	Common pipistrelle
19/05/2024	02:17:33	Height	Noise
19/05/2024	02:17:33	Ground	Common pipistrelle
19/05/2024	02:17:46	Height	Noise
19/05/2024	02:17:46	Ground	Common pipistrelle
19/05/2024	02:18:00	Height	Noise
19/05/2024	02:18:00	Ground	Common pipistrelle
19/05/2024	02:18:05	Height	Noise
19/05/2024	02:18:05	Ground	Common pipistrelle
19/05/2024	02:18:18	Height	Noise
19/05/2024	02:18:18	Ground	Common pipistrelle
19/05/2024	02:18:25	Height	Noise
19/05/2024	02:18:25	Ground	Common pipistrelle
19/05/2024	02:18:37	Height	Noise
19/05/2024	02:18:37	Ground	Common pipistrelle
19/05/2024	02:18:42	Height	Noise
19/05/2024	02:18:42	Ground	Common pipistrelle
19/05/2024	02:18:50	Height	Noise
19/05/2024	02:18:50	Ground	Common pipistrelle
19/05/2024	02:18:55	Height	Noise
19/05/2024	02:18:55	Ground	Common pipistrelle
19/05/2024	02:19:01	Height	Noise
19/05/2024	02:19:01	Ground	Common pipistrelle
19/05/2024	02:19:45	Height	Noise
19/05/2024	02:19:45	Ground	Common pipistrelle
19/05/2024	02:20:14	Ground	Noise
19/05/2024	02:20:14	Height	Common pipistrelle
19/05/2024	02:20:28	Ground	Noise
19/05/2024	02:20:28	Height	Common pipistrelle
19/05/2024	02:51:22	Ground	Leisler's bat
19/05/2024	02:51:22	Height	Leisler's bat
19/05/2024	03:07:17	Height	Leisler's bat
19/05/2024	03:07:17	Ground	Leisler's bat
19/05/2024	03:21:22	Height	Noise
19/05/2024	03:21:22	Ground	Common pipistrelle
19/05/2024	03:24:34	Height	Noise
19/05/2024	03:24:34	Ground	Soprano pipistrelle
19/05/2024	03:35:18	Height	Noise
19/05/2024	03:35:18	Ground	Common pipistrelle
19/05/2024	03:35:20	Height	Noise
19/05/2024	03:35:20	Ground	Common pipistrelle
19/05/2024	03:42:38	Ground	Myotis spp.
19/05/2024	03:42:38	Height	Noise
19/05/2024	03:44:20	Height	Noise
19/05/2024	03:44:20	Ground	Common pipistrelle
19/05/2024	04:21:41	Ground	Leisler's bat

Date - 12	Time	Mic. Level	Species
19/05/2024	04:21:41	Height	Leisler's bat
19/05/2024	04:25:35	Ground	Leisler's bat
19/05/2024	04:25:35	Height	Leisler's bat
19/05/2024	04:25:40	Ground	Leisler's bat
19/05/2024	04:25:40	Height	Leisler's bat
19/05/2024	22:36:04	Height	Noise
19/05/2024	22:36:04	Ground	Common pipistrelle
19/05/2024	22:49:58	Height	Noise
19/05/2024	22:49:58	Ground	Common pipistrelle
19/05/2024	22:59:24	Height	Leisler's bat
19/05/2024	22:59:24	Ground	Noise
19/05/2024	23:02:56	Height	Noise
19/05/2024	23:02:56	Ground	Common pipistrelle
19/05/2024	23:07:42	Height	Noise
19/05/2024	23:07:42	Ground	Common pipistrelle
19/05/2024	23:07:48	Height	Noise
19/05/2024	23:07:48	Ground	Common pipistrelle
19/05/2024	23:08:24	Ground	Leisler's bat
19/05/2024	23:08:24	Height	Noise
19/05/2024	23:08:26	Ground	Leisler's bat
19/05/2024	23:08:26	Height	Noise
19/05/2024	23:21:07	Height	Noise
19/05/2024	23:21:07	Ground	Common pipistrelle
19/05/2024	23:25:12	Ground	Leisler's bat
19/05/2024	23:25:12	Height	Leisler's bat
19/05/2024	23:34:57	Height	Noise
19/05/2024	23:34:57	Ground	Common pipistrelle
19/05/2024	23:44:52	Height	Leisler's bat
19/05/2024	23:44:52	Ground	Leisler's bat
20/05/2024	00:29:36	Height	Noise
20/05/2024	00:29:36	Ground	Common pipistrelle
20/05/2024	00:43:06	Height	Leisler's bat
20/05/2024	00:43:06	Ground	Noise
20/05/2024	00:43:10	Height	Leisler's bat
20/05/2024	00:43:10	Ground	Leisler's bat
20/05/2024	04:52:16	Ground	Noise
20/05/2024	04:52:16	Height	Noise
20/05/2024	05:30:08	Ground	Noise
20/05/2024	05:30:08	Height	Noise
20/05/2024	06:01:18	Ground	Noise
20/05/2024	06:01:18	Height	Noise
20/05/2024	23:25:53	Height	Leisler's bat
20/05/2024	23:25:53	Ground	Noise
20/05/2024	23:25:58	Height	Leisler's bat
20/05/2024	23:25:58	Ground	Noise
21/05/2024	04:17:59	Height	Noise
21/05/2024	04:17:59	Ground	Common pipistrelle
21/05/2024	04:18:09	Height	Noise
21/05/2024	04:18:09	Ground	Common pipistrelle
22/05/2024	21:08:59	Ground	Noise
22/05/2024	21:08:59	Height	Noise
22/05/2024	21:09:14	Ground	Noise

Date - 12	Time	Mic. Level	Species
22/05/2024	21:09:14	Height	Noise
22/05/2024	21:09:29	Ground	Noise
22/05/2024	21:09:29	Height	Noise
22/05/2024	21:37:00	Ground	Noise
22/05/2024	21:37:00	Height	Noise
22/05/2024	22:41:30	Ground	Noise
22/05/2024	22:41:30	Height	Noise
22/05/2024	22:41:45	Ground	Noise
22/05/2024	22:41:45	Height	Noise
25/05/2024	00:48:18	Height	Noise
25/05/2024	00:48:18	Ground	Soprano pipistrelle
25/06/2024	00:33:21	Ground	Leisler's bat
25/06/2024	00:33:21	Height	Leisler's bat
25/06/2024	00:49:59	Ground	Myotis spp.
25/06/2024	00:49:59	Height	Noise
25/06/2024	01:16:34	Ground	Myotis spp.
25/06/2024	01:16:34	Height	Noise
25/06/2024	01:37:34	Ground	Leisler's bat
25/06/2024	01:37:34	Height	Leisler's bat
25/06/2024	03:12:01	Height	Noise
25/06/2024	03:12:01	Ground	Soprano pipistrelle
25/06/2024	03:57:05	Height	Noise
25/06/2024	03:57:05	Ground	Common pipistrelle
25/06/2024	21:55:43	Ground	Noise
25/06/2024	21:55:43	Height	Noise
26/06/2024	02:16:30	Ground	Noise
26/06/2024	02:16:30	Height	Noise
26/06/2024	21:34:09	Ground	Noise
26/06/2024	21:34:09	Height	Noise
26/06/2024	21:34:25	Ground	Noise
26/06/2024	21:34:25	Height	Noise
26/06/2024	21:34:36	Ground	Noise
26/06/2024	21:34:36	Height	Noise
26/06/2024	21:34:43	Ground	Noise
26/06/2024	21:34:43	Height	Noise
30/06/2024	00:44:45	Ground	Myotis spp.
30/06/2024	00:44:45	Height	Noise
30/06/2024	22:51:26	Height	Noise
30/06/2024	22:51:26	Ground	Common pipistrelle
30/06/2024	23:00:11	Height	Noise
30/06/2024	23:00:11	Ground	Common pipistrelle
30/06/2024	23:00:21	Height	Noise
30/06/2024	23:00:21	Ground	Common pipistrelle
30/06/2024	23:03:07	Height	Noise
30/06/2024	23:03:07	Ground	Common pipistrelle
30/06/2024	23:03:11	Height	Noise
30/06/2024	23:03:11	Ground	Common pipistrelle
30/06/2024	23:03:27	Height	Noise
30/06/2024	23:03:27	Ground	Common pipistrelle
02/07/2024	03:38:48	Ground	Noise
02/07/2024	03:38:48	Height	Noise