INCHAMORE WIND FARM, CO. CORK

VOLUME IV
APPENDICES

TABLE OF CONTENTS

FOLDER 2 OF 4

Appendix No.	Description
7.9	VP Winter 2020/2021 - Survey Details
7.10	Bird Survey VP Flight Line Data, Summer 2020 & Winter 2021
7.11	Hinterland Survey Data, 2020/2021
7.12	VP Summer 2021 Survey Details
7.13	Bird Survey VP Flight Line Data, Summer 2021
7.14	Hinterland Survey Data, Summer 2021
7.15	List of Birds Recorded within Inchamore Site During Surveys 2017-2021
7.16	Vantage Point Flight Lines for Surveys 2017 - 2021
7.17	Collision Risk Modelling Report
7.18	First Year Ornithological Surveys – Inchamore/Gortyrahilly Wind Farm Summer 2017 and Winter 2017 / 18. Prepared by Fehily Timoney & Company
7.19	Second Year of Ornithological Surveys – Inchamore/Gortyrahilly Wind Farm Summer 2018 and Winter 2018 / 19. Prepared by Fehily Timoney & Company
7.20	Baseline Ornithological Surveys – Inchamore Wind Farm Summer 2020 And Winter 2020/21. Prepared By Fehily Timoney & Company
8.1	Site Investigation Report - Stability and Geotechnical Assessment
9.1	Inchamore Wind Farm Site Specific Flood Risk Assessment
9.2	Inchamore Wind Farm Site Photographs
9.3	Hydrochemistry Database
9.4	SW Laboratory Certs
9.5	Safety Material Datasheet – Clearbore
9.6	Conceptual and Info Graphics

Inchamore Wind Farm, Co. Cork

Appendices

Chapter 5 – Terrestrial Ecology

May 2023

APPENDIX 5.1:

TOTAL PLANT SPECIES LIST FOR HABITATS ENCOUNTERED WITHIN THE SITE FOR THE PROPOSED WIND FARM

APPENDIX 5.1

Plant species list for habitats encountered within the Inchamore Wind Farm site.

Latin name	English name	Main habitat
Agrostis canina	Velvet bent grass	Dry-humid acid grassland
Agrostis capillaris	Common bent grass	Dry-humid acid grassland
Agrostis stolonifera	Creeping bent	Wet grassland
Anagallis tenella	Bog pimpernel	Poor flush
Anthoxanthum odoratum	Sweet vernal grass	Dry-humid acid grassland
Asplenium trichomanes	Maidenhair spleenwort	Rock outcrops
Aulacomium palustris	A moss	Poor flush
Bellis perennis	Daisy	Wet grassland
Betula pubescens	Downy birch	Conifer plantation margins
Blechnum spicant	Hard fen	Rock outcrops
Calluna vulgaris	Ling	Dry heath
Campylopus atrovirens	A moss	Blanket bog
Campylopus introflexus	A moss	Cutover bog
Carex echinata	Star sedge	Poor flush
Carex ovalis	Oval sedge	Wet grassland
Carex panicea	Carnation sedge	Blanket bog
Carx binervis	Green ribbed sedge	Dry humid acid grassland
Cirsium palustre	Marsh thistle	Wet grassland
Cladonia portentosa	A lichen	Blanket bog
Cladonia uncialis	A lichen	Blanket bog
Cynosurus cristatus	Crested Dogs tail	Wet grassland
Deschampsia flexuosa	Wavy hair grass	Dry heath
Dicranum scoparium	A moss	Dry heath
Drosera rotundifolia	Round-leaved sundew	Blanket bog
Dryopteris affinis	Scaly male fern	Rock outcrops
Dryopteris dilatata	Broad buckler fern	Rock outcrops
Erica cinerea	Bell heather	Dry heath
Erica tetralix	Cross-leaved heath	Wet heath
Eriophorum angustifolium	Common bog cotton	Blanket bog
Eriophorum vaginatum	Hare's tail bog cotton	Blanket bog
Eurhynchium praelongum	A moss	Conifer plantation
Festuca ovina	Sheep's fescue	Dry-humid acid grassland
Filipendula ulmaria	Meadowsweet	Wet grassland
Galium palustre	Marsh bedstraw	Wet grassland
Galium saxatile	Heath bedstraw	Dry-humid acid grassland
Hedera helix	Ivy	Rock outcrops
Holcus lanatus	Yorkshire fog	Wet grassland
Hylocomium splendens	A moss	Dry-humid acid grassland
Hymenophyllum tunbrigense	Tunbridge filmy fern	Rock outcrops
Hypericum puchrum	Heath St. Johns wort	Dry heath
Hypnum jutlandicum	A moss	Blanket bog
Juncus articulatus	Jointed rush	Cutover bog
Juncus conglomeratus	Compact rush	Wet grassland
Juncus effusus	Soft rush	Wet grassland
Juncus squarrosus	Heath rush	Cutover bog
Luzula multiflora	Heath woodrush	Dry heath
Luzula sylvatica	Great wood rush	Rock outcrops
Molinia caerulea	Purple moor-grass	Wet heath
Myrica gale	Bog myrtle	Blanket bog
Nardus stricta	Mat grass	Dry-humid acid grassland
Narthecium ossifragum	Bog asphodel	Blanket bog
Odontoschisma sphagni	A liverwort	Blanket bog
Picea sitchensis	Sitka spruce	Conifer plantation
Pinus contorta	Lodgepole pine	Conifer plantation
Pinguicula grandiflora	Large flowered butterwort	Wet heath
Plantago lanceolata	Ribwort plantain	Dry humid acid grassland

Latin name	English name	Main habitat
Pleurozia purpurea	A liverwort	Blanket bog
Pleurozium schreberi	A moss	Dry heath
Polygala serpyllifolia	Heath milkwort	Blanket bog
Polypodium vulgare	Common polypody	Rock outcrops
Polytrichum commune	A moss	Blanket bog
Potentilla erecta	Tormentil	Wet heath
Prunella vulgaris	Self heal	Wet grassland grassland
Pseudoscleropodium purum	A moss	Dry-humid acid grassland
Racomitrium lanuginosum	A moss	Blanket bog and wet heath
Ranunculus acris	Meadow buttercup	Wet grassland
Ranunculus flammula	Lesser spearwort	Wet grassland
Ranunculus repens	Creeping buttercup	Wet grassland
Rhynchospora alba	White beaked sedge	Blanket bog
Rhytidiadelphus loreus	A moss	Dry-humid acid grassland
Rhytidiadelphus squarrosus	A moss	Dry-humid acid grassland
Rubus fruticosus	Bramble	Conifer plantation
Rumex acetosa	Sorrel	Wet grassland
Rumex acetosella	Sheeps sorrel	Dry heath
Salix aurita	Eared willow	Stream banks
Saxifraga spathularis	St. Patricks cabbage	Rock outcrops
Schoenus nigricans	Black bog rush	Blanket bog
Sphagnum capillifolium	A moss	Blanket bog
Sphagnum cuspidatum	A moss	Blanket bog
Sphagnum fallax	A moss	Wet grassland
Sphagnum palustre	A moss	Conifer plantation
Sphagnum papillosum	A moss	Blanket bog
Sphagnum subnitens	A moss	Wet heath
Sphagnum tenellum	A moss	Blanket bog
Succisa pratensis	Devils bit scabious	Dry heath
Thuidium tamariscinum	A moss	Conifer plantation
Trichophorum germanicum	Deer grass	Wet heath and blanket bog
Trifolium repens	White clover	Wet grassland
Ulex europaeus	Common gorse	Conifer plantation margins
Ulex gallii	Western gorse	Dry heath
Vaccinium myrtillus	Bilberry	Dry heath
Viola riviniana	Common dog violet	Dry humid acid grassland

APPENDIX 5.2:

PLANT SPECIES LIST FOR HABITATS ENCOUNTERED ALONG FOREST TRACKS WITHIN THE GRID CONNECTION ROUTE

APPENDIX 5.2

Plant species list for habitats encountered along forest tracks within the grid connection route.

Agrostis stolonifera	Creeping bent
Bellis perennis	Daisy
Breutelia chrysocoma	A moss
Calliergonella cuspidata	A moss
Calluna vulgaris	Ling heather
Carex viridula subsp oedocarpa	Common yellow sedge
Catapodium rigidium	Fern grass
Cerastium fontanum	Common mouse-ear
Cirsium palustre	Marsh thistle
Cirsium vulgare	Spear thistle
Cynosurus cristatus	Crested dog's-tail
Epilobium brunnescens	New Zealand willowherb
Filago minima	Small cudweed
Holcus lanatus	Yorkshire fog
Hylocomium splendens	A moss
Hypochoeris radicata	Cat's ear
Juncus articulatus	Jointed rush
Juncus bufonius	Toad rush
Juncus effusus	Soft rush
Linum catharticum	Fairy flax
Lotus corniculatus	Bird's foot trefoil
Matricaria discoidea	Pineappleweed
Molinia caerulea	Purple moor-grass
Odontites vernus	Red bartsia
Plantago lanceolata	Ribwort plantain
Plantago major	Greater plantain
Poa annua	Annual meadow-grass
Prunella vulgaris	Self heal
Ranunculus repens	Creeping buttercup
Rhytidiadelphus loreus	A moss
Rumex acetosella	Sheeps sorrel
Sagina procumbens	Procumbent pearlwort
Senecio jacobea	Ragwort
Trifolium repens	White clover
Tussilago farfara	Colts foot
Veronica officinalis	Heath speedwell
Veronica serpyllifolia	Thyme-leaved speedwell

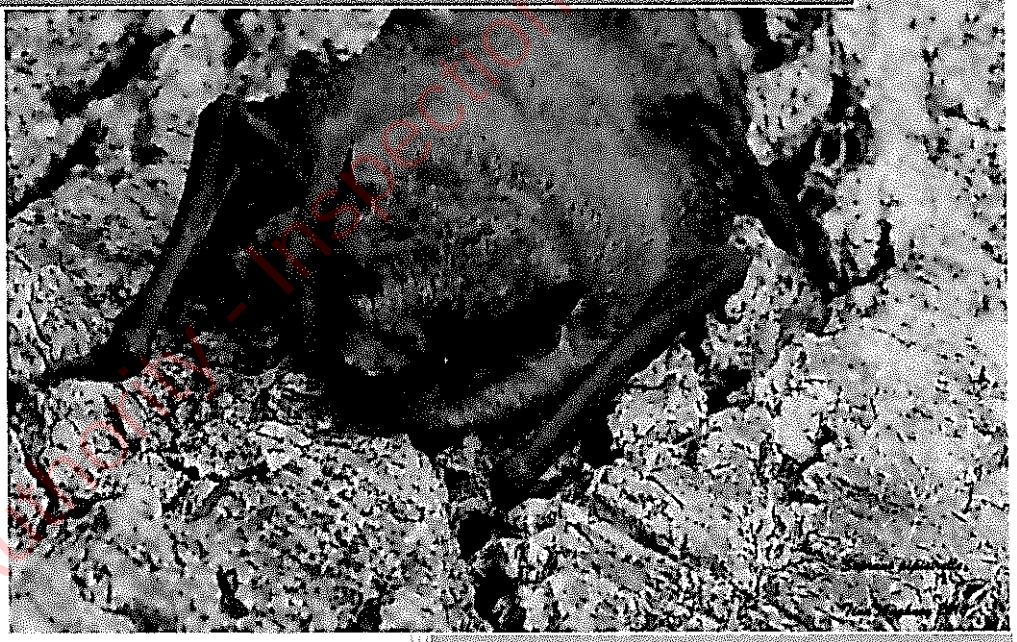
APPENDIX 5.3:

BAT REPORT: PROPOSED WIND FARM DEVELOPMENT AT INCHAMORE, CO. CORK.

BAT ECO SERVICES, 2023

2023

Bat Assessment: proposed wind farm development at Inchamore, Co. Cork



Dr Tina Aughney

Bat Eco Services

Client: Inchamore Wind DAC

Project Name & Location: Inchamore, Co. Cork.

Report Revision History

Date of Issue	Draft Number	Issued To (process of issuing)
31st January 2023	Draft 1	Issued by email
18th March 2023	Draft 2	Issued by email
30th March 2023	Draft 3	Issued by email
2nd May 2023	Draft 4	Issued by email

Purpose

This document has been prepared as a Report for Inchamore Wind DAC. Only the most up to-date report should be consulted. All previous drafts/reports are deemed redundant in relation to the named site.

Bat Eco Service accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

Carbon Footprint Policy

It is the policy of Bat Eco Services to provide documentation digitally in order to reduce carbon footprint. Printing of reports etc. is avoided, where possible.

Bat Record Submission Policy

It is the policy of Bat Eco Services to submit all bat records to Bat Conservation Ireland database one year post-surveying. This is to ensure that a high level bat database is available for future desktop reviews. This action will be automatically undertaken unless otherwise requested, where there is genuine justification.

Contents

1. Summary

Project Name & Location: Inchamore, Co. Cork.

Proposed work: Wind farm development.

This report provides the bat survey results completed for the proposed development. An array of bat surveys were completed and the following tables lists the bat species recorded and the bat survey duties completes.

Bat Survey Results - Summary

Bat Species	Roosts	Foraging	Commuting
Common pipistrelle *Pipistrellus pipistrellus*		√	√
Soprano pipistrelle *Pipistrellus pygmaeus*		√	√
Nathusius' pipistrelle *Pipistrellus nathusii*			
Leisler's bat *Nyctalus leisleri*		√	√
Brown long-eared bat *Plecotus auritus*	√	√	√
Daubenton's bat *Myotis daubentonii*		√	√
Natterer's bat *Myotis nattereri*	√	√	√
Whiskered bat *Myotis mystacinus*		√	√
Lesser horseshoe bat *Rhinolophus hipposideros*	√	√	√

Bat Survey Duties Completed (Indicated by red shading)

Tree PBR Survey	■	Daytime Building Inspection	■
Static Detector Survey	■	Daytime Bridge Inspection	○
Dusk Bat Survey	■	Dawn Bat Survey	○
Walking Transect	■	Driving Transect	■
Trapping / Mist Netting	○	IR Camcorder filming	○
Endoscope Inspection	■	Other	○

Please see main body of report for greater details on the methodologies deployed.

In summary, the proposed development area has a Low to Medium Landscape Favourability for Irish bat species.

During the night-time bat surveys completed the following bat species were recorded during dusk surveys and the transects: soprano pipistrelle, common pipistrelle, Leisler's bat, Natterer's bat, Daubenton's bat, *Myotis* species and brown long-eared bat. The level of bat activity recorded was considered to be Low.

Four static surveillance periods were completed in 2022 (one in each of the Spring and Summer periods and two in the Autumn period). The following bat species were recorded during the static surveillance: soprano pipistrelle, common pipistrelle, Leisler's bat, Natterer's bat, whiskered bat, Daubenton's bat, *Myotis* species, lesser horseshoe bat and brown long-eared bat. The data collected from the static surveillance was used to determine the potential impact of proposed turbine locations on local bat populations.

In summary, the total number of common pipistrelles bat passes recorded during all four static surveillance periods was 10,980 while soprano pipistrelles (720 bat passes) and Leisler's bats (650 bat passes) were the second and third most frequently recorded bat species, respectively. Overall, common pipistrelles accounted for 85% of the recordings from static units.

Using the EcoBat Tool and additional analysis, proposed turbine locations where a high value of bat activity for specific bat species were determined with specific reference to common pipistrelle activity. Over the course of the 2022 surveillance, the proposed turbine locations for T1, T4 and T5 were deemed to have a Low level of common pipistrelle bat activity. T3 was deemed to have a Medium level of common pipistrelle bat activity while T2 was deemed to have a High level of common pipistrelle bat activity.

Four buildings were inspected in relation to potential bat roosts. One set of buildings is located within the proposed development area and this was recorded as a bat roost (Night Roost) for three bat species: lesser horseshoe bat, Natterer's bat and brown long-eared bat (Building 2). However, all three bat species recorded roosting are considered to be Low Risk bat species in relation to wind farms and there is no proposed turbine or infrastructure adjacent to the buildings. None of the other buildings inspected were deemed to be suitable.

A daytime tree inspection survey was undertaken of trees located adjacent to the buildings within the proposed development site. None of the trees were deemed to have a Potential Bat Roost (PBR) value.

The mitigation measures recommended in this report require strict implementation to reduce the long-term impact of the proposed wind farm on local bat populations. The implementation of mitigation measures will reduce the impact on local bat populations.

Monitoring (including acoustic surveillance and carcass surveys) is essential to determine that mitigation measures recommended are reducing the potential impacts on local bat populations. The operation of the wind farm should be flexible to implement changes, if recommended, by the monitoring results.

Citation: Bat Eco Services (2023) Bat assessment of proposed wind farm development at Inchamore, Co. Cork. Unpublished report prepared for Inchamore Wind DAC.

2. Introduction

Bat Eco Services was commissioned by Inchamore Wind DAC to undertake a bat survey of Inchamore, Co. Cork. Bat surveys were completed in 2022 and 2023 and this comprised of static surveillance, daytime inspections, dusk surveys and walking/driving transects. Due to lack of availability for the Spring Surveillance Period by Bat Eco Services, the Spring Surveillance static units (6 units) were deployed by EirEcology while all other static units for the three remaining surveillance periods were deployed by Bat Eco Services. As a consequence, night-time surveys were completed by Bat Eco Services for the Summer and Autumn survey periods. Collation and analysis of audio files for all surveys was undertaken by Bat Eco Services.

2.1 Site Location & Description

The proposed wind farm is to be located within Inchamore along the Cork-Kerry border, an estimated 18 km south-east of the town of Killarney and 5 km west of the town of Ballyvourney.

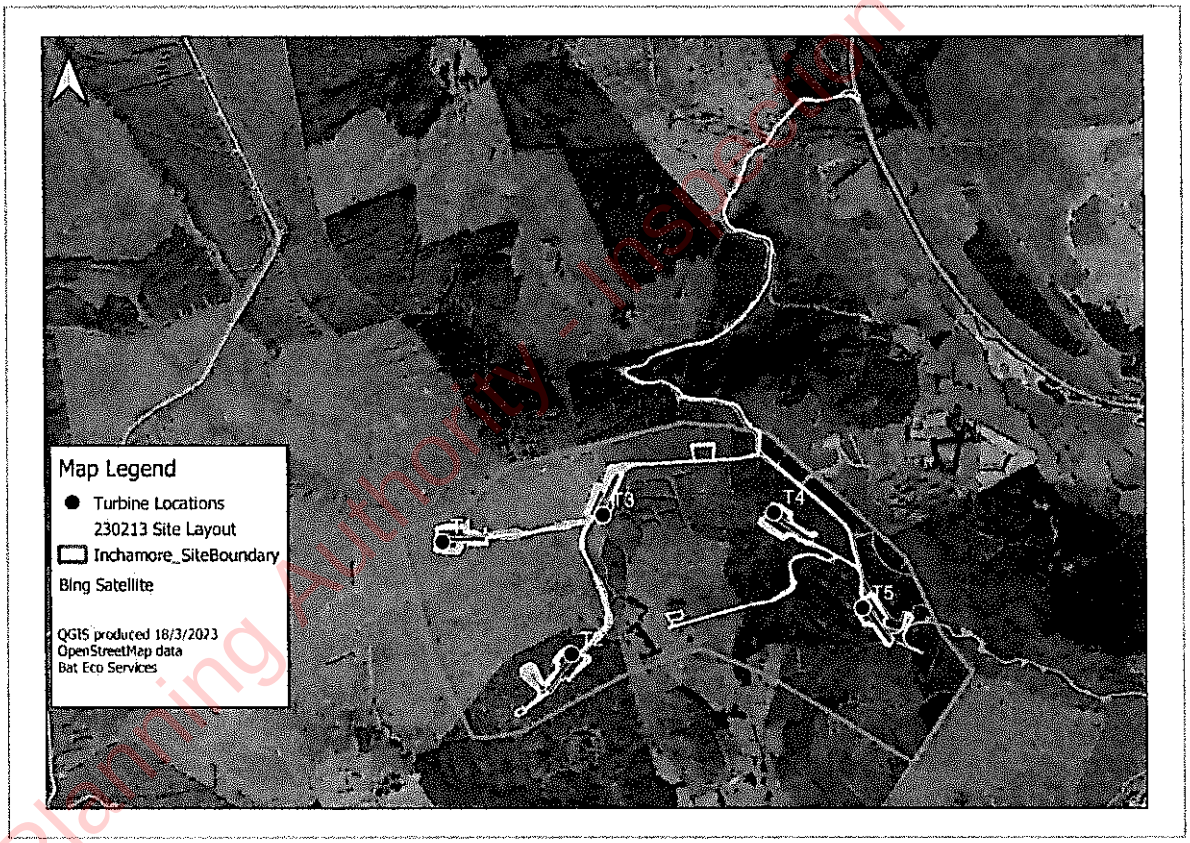


Figure 1: Proposed development area.

The main habitat within the survey area is conifer plantation along with some areas of wet heath (HH3), upland blanket bog (PB2) and cutover bog (PB4).

2.2 Details of the Proposed Development

Permission is being sought by the Developer for the construction of 5 No. Wind Turbines, an on-site substation and all ancillary works, a grid connection to Ballyvouskill 220kV substation, and works along the turbine delivery route.

The Development will consist of the following main components:

- Construction of five wind turbines with an overall ground to blade tip height ranging from 177 m to 185 m inclusive. The wind turbines will have a rotor diameter ranging from 149 m to 155 m inclusive and a hub height ranging from 102.5 m to 110.5 m inclusive.
- Construction of permanent turbine hardstands and turbine foundations.
- Construction of a temporary construction compound with associated temporary site offices, parking areas and security fencing.
- Installation of a (35-year life cycle) meteorological mast with a height of 110 m and a 4 m lightning pole on top.
- Development of an on-site borrow pit.
- Construction of new permanent internal site access roads and upgrade of existing internal site access to include passing bays and all associated drainage infrastructure.
- Development of an internal site drainage network and sediment control systems.
- Construction of a permanent 38 kV electrical substation including a control building with welfare facilities, all associated electrical plant and equipment, security fencing and gates, all associated underground cabling, wastewater holding tank, and all ancillary structures and works.
- All associated underground electrical and communications cabling connecting the wind turbines to the wind farm substation.
- Ancillary forestry felling to facilitate construction of the Development.
- All associated site development works including berms, landscaping, and soil excavation.
- Upgrade works on the Turbine Delivery Route to include the following:
    - Works at an entrance to an existing forest road off the N22 to include localised widening of the road and creation of a splayed entrance, removal of existing vegetation for visibility splays and removal of street furniture to facilitate the delivery of abnormal loads and turbine component deliveries.
    - The construction of a temporary access road off the N22 in the townland of Cummeenavrick to facilitate 180 degrees turning manoeuvre by construction vehicles.

A 10-year planning permission and 35-year operational life from the date of commissioning of the entire wind farm is being sought. This reflects the lifespan of modern-day turbines.

A permanent planning permission is being sought for the substation and all associated electrical plant, equipment cabling security fencing and gates, wastewater holding tank, and all ancillary structures and works as these will become an asset of the national grid under the management of ESB & EirGrid and will remain in place upon decommissioning of the wind farm.

The Inchamore Wind Farm 38kV substation will be connected to the existing Ballyvouskill 220kV substation via underground cabling (UGC). The UGC route is approximately 19.8 km in length and traverse in an east to south easterly direction from the existing Ballyvouskill 220kV substation to the Inchamore Wind Farm substation location utilising public local road networks, existing access tracks (1 km) and private forestry access tracks (18.3 km).

The underground cable route initially begins within the townland of Caherdowney, Co. Cork where from Ballyvouskil 220kV substation compound, the UGC departs the substation on the north-western boundary, converging onto a permanent access track to be constructed as part of this development within agricultural lands and traverses on an upward trajectory for approximately 950 m prior to entering into forested plantations propertied by Coillte.

The UGC will consist of 3 No. 110 mm diameter HDPE power cable ducts and 1 No. 110 mm diameter HDPE communications duct to be installed in an excavated trench, typically 600 mm wide by 1,220 mm deep, with variations on this design to adapt to bridge crossings, service crossings and watercourse crossings, etc. It has been determined that no more than 100 m section of trench will be excavated at a time and it is anticipated to take (1 no.) day to complete each 100 m excavation, installation of ducting and reinstatement of material. In its entirety, the UGC will have a total of 18 No. Cable Joint Bays (CJBs) and 115 No. identified culvert crossings. 3 No. identified bridge crossings which have insufficient clearance within each structure and will require a Horizontal Directional Drill method to cross. An additional HDD crossing will be required to cross the N22.

2.3 Purpose of this Report

The purpose of this bat survey report is to document the bat species and their utilisation of the proposed development area and to determine the potential impact of the proposed development on local bat populations.

2.4 Relevant Legislation & Bat Species Status in Ireland

The principal statutory provisions for the protection of animal species are under the Wildlife Act 1976 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. The Habitats Directive (Council Directive 92/43/EEC) are the legislative instruments which are transposed into Irish law, *inter alia,* by the European Communities (Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) ('the 2011' Regulations), as amended.

All Irish bat species are protected under the Wildlife Act (1976) and Wildlife Amendment Acts (2000 and 2010). Also, the EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All Irish bats are listed in Annex IV of the Habitats Directive and the lesser horseshoe bat *Rhinolophus hipposideros* is further listed under Annex II. Across Europe, they are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention

1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

There are eleven recorded bat species in Ireland, nine of which are considered resident on the island. Eight resident bat species and one of the vagrant bat species are vesper bats and all vespertilionid bats have a tragus (cartilaginous structure inside the pinna of the ear). Vesper bats are distributed throughout the island. Nathusius' pipistrelle *Pipistrellus nathusii* is a recent addition while the Brandt's bat has only been recorded once to-date (Only record confirmed by DNA testing, all other records has not been genetically confirmed). The ninth resident species is the lesser horseshoe bat *Rhinolophus hipposideros*, which belongs to the Rhinolophidea and has a complex nose leaf structure on the face, distinguishing it from the vesper bats.

Please see Appendices for more details.

3. Methods

3.1 Scope

The following is the scope of works:

- Document the level of bat usage and number of bat species within the proposed development site (i.e. the red line boundary as illustrated by Figure 1).
- Document the distribution of local bat species in a wider area surrounding the proposed development site as determined by safe accessible tracks and local roads for night-time surveying.
- Determine the level of bat activity of recorded bat species in vicinity of the proposed turbine locations through static surveillance over a minimum of three surveillance periods as per NaturScot (2021) guidelines.
- Complete bat surveys, where possible, according to Collins (2016) bat survey guidelines.
- Provide an assessment of the potential impact of the proposed development on local bat populations using the EcoBat Tool and according to NaturScot (2021) guidelines.
- Provide bat mitigation measures, where required, according to NaturScot (2021) and Marnell *et al.* (2022) guidelines.

3.2 Desk Study

3.2.1 Bat Conservation Ireland Database

Bat Conservation Ireland acts as the central depository for bat records for the Republic of Ireland. Its' bat database is comprised of >60,000 bat records. A 1km and 10km radius search was requested for the Irish Grid Reference W1403878722 in February 2023.

3.2.2 Bat Conservation Landscape Favourability

Bat Conservation Ireland produced a landscape conservation guide for Irish bat species using their database of species records collated during the 2000 - 2009 survey seasons. An analysis of the habitat and landscape associations of all bat species deemed resident in Ireland was undertaken and reported in Lundy *et al.*, 2011. The geographical area suitable for individual species was used to identify the core favourable areas of each species. This was produced as a GIS layer for local authorities and planners in order to provide a guide to the consideration of bat conservation. The island is divided into 5km squares and the landscape favourability of each 5km square for each species of bat was modelled. A caveat is attached to the model and it is that the model is based on records held on the BCIreland database, while core areas have been identified, areas outside the core area should not be discounted as unimportant as bats are a landscape species and can travel many kilometres between roosts and foraging areas nightly and seasonally. This model was used as part of the desktop study for this report.

3.2.3 Previous Survey Data

A full season bat survey was previously completed in 2019 and 2020 by Fehily Timoney. This report was in reference to Inchamore and a second proposed development site at Gortyrahilly, Co. Cork.

3.3 Bat Field Surveys

3.3.1 Daytime Inspections

3.3.1.1 Building & Structure Inspection

A small number of buildings were assessed for potential bat usage. Evidence of bat usage is in the form of actual bats (visible or audible), bat droppings, urine staining, grease marks (oily secretions from glands present on stonework) and claw marks. In addition, the presence of bat fly pupae (bat parasite) also indicated that bat usage of a crevice, for example, has occurred in the past. Inspections are undertaken visually with the aid of a strong torch beam (LED Lenser P14.2) and endoscope (General DC5660A Wet / Dry Scope). These structures were also assessed to determine their suitability as a bat roost and described using the parameters Negligible, Low, Medium or High suitability according to Collins (2016). Please see Appendix 2 for more information (Table B). Daytime inspections was completed on numerous dates in 2022 (Please see results section for more details).

3.3.1.2 Tree Potential Bat Roost (PBRs) Inspection

Deciduous trees located adjacent to buildings within the survey area were inspected (21/12/2022) to determine if they provide a roosting space for bats using the Bat Tree Habitat Key (BTHK, 2018) and the classification system adapted from Collins (2016). The Potential Roost Features (PRFs) listed in BTHK (2018) were used to determine the PBR value of trees. Evidence of bat usage is in the form of actual bats (visible or audible), bat droppings, urine staining, grease marks (oily secretions from glands present) and claw marks. In addition, the presence of bat fly pupae (bat parasite) also indicated that bat usage of a crevice, for example, has occurred in the past. A Phase 1 inspection was undertaken visually with the aid of a strong torch beam (LED Lenser P14.2) during the daytime searching for PRFs, if visible. Please see Appendix 8.2 for more information (Table C).

3.3.2 Bat Detector Surveys

3.3.2.1 Dusk Bat Surveys – Walking and Driving Transects

Dusk Surveys were completed from 10 minutes before sunset to at least 110 minutes post sunset. These dusk surveys were primarily completed by walking transects within the proposed development area along tracks and conifer plantation edges. There was limited areas within the proposed development area that were safe to walk during the hours of darkness.

- Dusk Survey on 21/7/2022 from 21:30 hrs to 23:20 hrs;
- Dusk Survey on 28/8/2022 from 21:20 hrs to 23:10 hrs.

Walking transects involved the surveyor(s) walking in survey area along tracks and safe accessible points, noting the time, location and bat species encountered. Mapping of bat encounters was undertaken using QGIS and an excel file produced for mapping purposes (ITM Irish grid reference co-ordinates). Validation of bat records was completed by the principal bat surveyor prior to mapping.

Driving transects were undertaken for large survey areas and were completed along large tracks and local road network in the greater area around the proposed development site. Bat Logger

M2 Spectrum Bat Detector was used for this survey type and was located outside on the passenger side of the vehicle. The vehicle was driven at 24 km/hr following Bat Conservation Ireland's car-based bat monitoring methodology (Aughney *et al.*, 2018). The time, location (grid reference) and bat species encountered were recorded. These recordings were mapped using QGIS and an excel file produced for mapping purposes (ITM Irish grid reference co-ordinates). Validation of bat records was completed by the principal bat surveyor prior to mapping.

Walking and Driving transects were undertaken to gather information on local bat populations within and adjacent to the proposed development area. Walking and Driving transects were undertaken on the following dates:

- Driving transect on 21/7/2022 from 22:00hrs to 00:00 hrs;
- Walking transect on 21/7/2022 from 23:20 hrs to 01:30 hrs;
- Walking transect on 29/8/2022 from 21:20 hrs to 02:00 hrs;
- Walking transect on 19/9/2022 from 20:30 hrs to 01:00 hrs.

All bat encounters were noted during surveys.

The following equipment was used:

- Surveyor 1 (Principal surveyor): Anabat Walkabout Full Spectrum Bat Detector and Petersson D200 Heterodyne Bat Detector.
- Surveyor 2: Bat Logger M2 Full Spectrum Bat Detector and Petersson D200 Heterodyne Bat Detector.

3.3.2.2 Passive Static Bat Detector Survey

A Passive Static Bat Surveys was the principal survey to document the bat usage of the proposed development site. This involved leaving a static bat detector unit (with ultrasonic microphone) in a specific location (erected on a 2m pole) and set to record from 30 minutes before sunset to 30 minutes after sunrise (i.e. a bat detector is left in the field, there is no observer present and bats which pass near enough to the monitoring unit are recorded and their calls are stored for analysis post surveying). The bat detector was effectively used as a bat activity data logger.

All audio recordings collected were analysed using Wildlife Acoustics Kaleidoscope Pro. The Auto-Id function was used for all sound files and manual verification was used to check 20% of positively identified audio files ensure the auto-id function was accurate. This is particularly important for less common bat species and cryptic bat species such as *Myotis* species. In addition, "Noise" and "Unidentified" sound files were also manually checked. Each sequence of bat pulses was noted as a bat pass to indicate level of bat activity for each species recorded. This data was prepared for EcoBat Tool analysis. In addition, all audio files auto-identified as Nathusius' pipistrelle were manually checked as low Common pipistrelle bat calls can be frequently misidentified. Only *Pipistrellus* species calls with a peak frequency of less than 40kHz were accepted as Nathusius' pipistrelle.

Audio files were a maximum of 15 seconds long and each audio file was taken as a bat pass (registration) for each bat species recorded within the audio file. Each bat pass does not equate

to the number of individuals of bats flying in vicinity of the recording device but is representative of bat activity levels.

Static Surveillance was undertaken in 2022. The location of static units was determined by the proposed location of turbines. The following static unit models were deployed during this static bat detector surveys. Additional statics were deployed to survey habitats in September in order to gather additional information as recommended by NaturScot, 2021 (i.e. paired habitat surveys).

Table 1: Static Bat Detectors deployed during Static Bat Detector Surveys.

Static Unit Code	Bat Detector Type	Recording Function	Microphone
SM4 Units 1-8	Wildlife Acoustics SongMeter 4 Bat FS	Passive Full Spectrum	SMM-U2, 4m cable
SM Mini Bat Units 1-12	Wildlife Acoustics SongMeter Mini Bat	Passive Full Spectrum	SMM-U2

Note: ultrasonic microphone were annually checked to ensure that their sensitivity was accurate for static surveillance.

3.3.3 Summary Statistics, Mapping & Analysis

Summary statistics of data collated from static surveillance, walking and driven transects and dusk and dawn surveys were completed. All data collected was collated into excel files for each bat species in order to produce distribution maps.

In addition, the nightly number of bat passes recorded per species on the statics units were analysed using the website based tool EcoBat (http://www.ecobat.org.uk/).

3.3.3.1 EcoBat Tool

This EcoBat tool was designed by the University of Exeter, UK and is hosted by the Mammal Society, UK. The following is taken from the "About " section of the website:

Using bat passes to assess the relative importance of a site for policymakers therefore requires practitioners to account for how these multiple factors may have influenced the number of bat passes recorded at a site. Although professional opinion is valuable, it can often be based on intuition, is context dependent and can vary considerably between practitioners (Hulme, 2014).

It is therefore likely that an assessment of the ecological value of a site (and the impacts of any proposed action) will vary between practitioners based upon their own level of experience and knowledge of the region and/or species.

EcoBat compares surveys submitted by the user with a national reference dataset and objectively quantifies bat activity levels. It offers a web-based interface for depositing data rapidly and securely, automatically generating a numerical indicator of the relative importance of a night's worth of activity, by contrasting with a comparable reference range. The output can

be used by ecologists to accurately quantify what bat activity means for use during ecological impact assessments.

EcoBat uses percentiles to provide a numerical representation of activity levels relative to the surrounding landscape for each night of surveying. Percentiles can then be assigned to activity categories (low, moderate, high) to provide a quantifiable measure of bat activity. Percentiles provide a numerical indicator of the relative importance of a nights' worth of bat activity by comparing it with a national database. For example, activity data in the 80th percentile would indicate that the recorded data were in the top 20% of activity for the reference range".

Table 2: Percentile score and categorised level of bat activity.

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

3.3.3.2 Bat Habitats & Bat Activity Analysis

All static recording locations sampled are also classed according to their favourability as a bat habitat within 200m radius of the static location. Four classifications are used:

- Open – for example, open peat bog. Typically, there is little tall vegetation in this category which is generally required for bat species to forage and commute along (exception to this is Leisler's bats). This category would be considered to have a low potential for the majority of bat species.
- Edge – for example, hedgerows, treelines and woodland edge. Bat species such as *Pipistrellus* species have a preference to fly along linear habitat features. This category would be considered to have a high potential for the majority of bat species.
- Closed – for example woodland. Bat species such a brown long-eared bats have a preference to foraging within woodland habitats. This category would be considered to have a high potential for the majority of bat species.
- Water – while an open habitat, due to the insect resource associated with water, these habitat types are often favoured by foraging bats, especially Daubenton's bat.

Roche *et al.* (2014) and Lundy *et al.* (2011) reported on the habitats consider favourable for each Irish bat species. Using the habitat maps (QGIS map layers) produced by Tobin examined to aid analysis for this report. Habitats deemed by the author, under guidance of Roche *et al.* (2014) and Lundy *et al.* (2011), as "Bat Habitat" are as follows:

- Mixed broad leaved woodland
- Water bodies
- Linear habitat
- Bog Woodland
- Mosaic

- Scrub
- Conifer plantation

As a consequence, the "Habitat" shapefile provided by Jennings O'Donovan & Partners Ltd Consulting Engineers was used to represent "Bat Habitats" for analysis.
Additional QGIS layers were created to aid analysis for this report. Each bat encounter was mapped and bat encounters within 1km of the proposed turbine locations was extracted to represent the bat encounters of the principal proposed development area. As bats echolocation calls can be detected some distance from where the actual bat is flying, a 50m fly zone was created around each bat encounter to represent the general area that individual bat recorded could be located at that point in time. This was named the ***"Buffered Bat Encounters"*** and represents the potential distance that bat echolocation calls can be detected by an ultrasonic microphone (i.e. bat detector zone). While this value varies greatly depending on the "loudness" of the echolocation call, the 50m value is representative of louder bats such as *Pipistrellus* bat species, Ireland's most common bat species.

To further facilitate analysis, all turbine locations were buffered to 200m (this 200m figure is taken from EUROBAT guidelines and represents the recommended distance from woodland habitats to locate wind turbines. It is an arbitrary figure used to determine what bat encounters were recorded within 200m radius around proposed wind turbine locations). This layer was named "Buffered Turbine Locations" and represents the potential area/zone directly around the turbine locations that may impact on local bat populations.

3.3.4 Internal Wind Farm Access Tracks

To facilitate the construction of the proposed wind turbines, internal wind farm access tracks are required. This may result in the removal of habitats and the potential impact of this is investigated using the ***"Habitat"*** layer, ***"Buffered bat Encounters"*** layer and the ***"Buffered Turbine Locations"*** layer produced.

3.3.5 Core Sustenance Areas

Bat Conservation Trust (BCT) defines Core Sustenance Zones (CSZs) for different bat species and this is based on an extensive literature review (www.bats.org.uk). A CSZ refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost. With reference to development, the CSZ could be used to indicate:

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

3.4 Project Team

Licensed Bat Specialist: Dr Tina Aughney
NPWS licence C17/2023 (Licence to handle bats, expires 23rd January 2026);
NPWS licence 27/2023 (Licence to photograph/film bats, expires 31st December 2024);
NPWS licence DER/BAT 2022-36 (Survey licence, expires 24th March 2025).

Statement of Authority: Dr Aughney has worked as a Bat Specialist since 2000 and has undertaken extensive survey work for all Irish bat species including large scale development projects, road schemes, residential developments, wind farm developments and smaller projects in relation to building renovation or habitat enhancement. She is a monitoring co-ordinator and trainer for Bat Conservation Ireland. She is a co-author of the 2014 publication *Irish Bats in the 21st Century*. This book received the 2015 CIEEM award for Information Sharing. Dr Aughney is a contributing author for the Atlas of Mammals in Ireland 2010-2015.

All analysis and reporting is completed by Dr Tina Aughney. Data collected and surveying is completed with the assistance of a trained field assistant.

Mr. Shaun Boyle (Field Assistant) NPWS licence DER/BAT 2022-37 (Survey licence, expires 24th March 2025).

3.5 Limitations

The proposed development area is primarily upland heath and conifer plantation with limited safe access points for night-time bat surveys. As a consequence, a larger area within vicinity of the proposed development area was surveyed to supplement the local bat population knowledge by walking and driving transects. Additional static surveillance was undertaken in September 2022 to gather data on bat usage of "paired habitats".

Two static units failed to recorded (one during Spring Static surveillance and one during Autumn Static surveillance). As a consequence, a static unit was deployed to compensate for this (different survey dates) while a full fourth static surveillance period was completed to compensate for the failed unit in the first autumn surveillance period.

Details of the one building, located within the proposed development area, was not received until the after the summer survey season. Therefore, a winter survey was completed using daytime inspections and an extended static surveillance period.

4. Results

4.1 Desk Review

4.1.1 Sites Designated for Nature Conservation

The southern boundary of the Special Area of Conservation designation Killarney National Park, Macgillycuddy's Reeks & Caragh River Catchment SAC (No. 000365) is located approximately 3.5km from the northern boundary of the proposed development area. One of the "Qualifying Interests" for this site designation is the Annex II bat species Lesser horseshoe bat. This species of bat was recorded during the bat surveys for the proposed development.

Kilgarvan Ice House SAC and pNHA (Site Code: 000364) is also designated for the presence of lesser horseshoe bats. This SAC is located c.12.3 km to the south-west of the proposed wind farm at Inchamore at its closest point.

Old Domestic Building, Curraglass Wood SAC and pNHA (Site Code: 002041), designated for the presence of lesser horseshoe bats, is located c.9.9 km to the north-west of the proposed wind farm at Inchamore.

4.1.2 Bat Conservation Ireland Database

A 1km and 10km radius search was requested for the Irish Grid Reference W1403878722 in February 2023. There were no records on the database for the 1km search while the records at a 10km search are presented on the map below. The nearest BCIreland database recorded is 2.5km from the boundary of the proposed development site.

Table 3a: BCIreland Bat Records for 10km radius search.

Bat Species	Records	Roost Records	Transect Records	Ad Hoc Records
Brown long-eared bat	8	5	0	3
Common pipistrelle	17	0	4	13
Daubenton's bat	6	0	0	6
Leisler's bat	10	0	1	9
Lesser horseshoe bat	7	5	0	2
Nathusius' pipistrelle	0	0	0	0
Natterer's bat	3	1	0	2
Soprano pipistrelle	13	0	1	12
Whiskered bat	4	0	0	4
Pipistrellus species	7	1	0	6

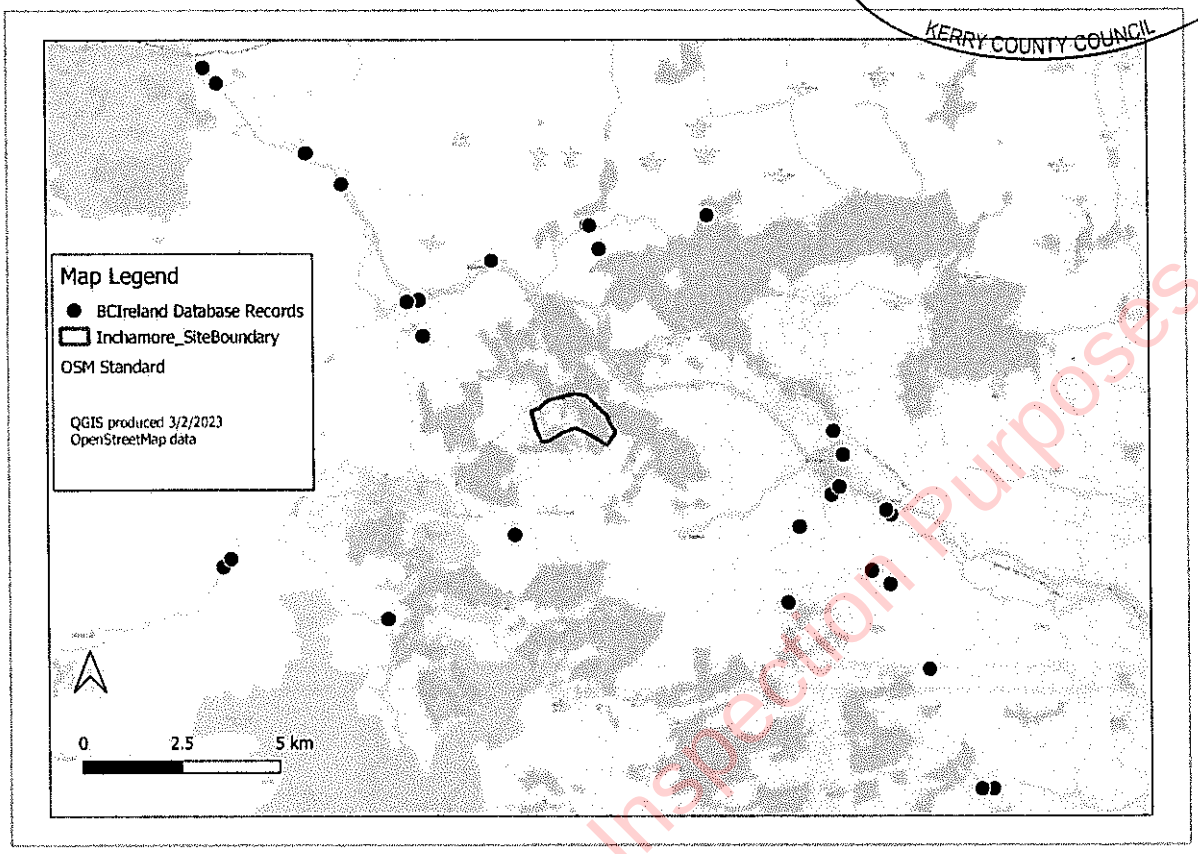


Figure 2a: Bat Conservation Ireland Database Records (10km radius).

4.1.3 Bat Conservation Landscape Favourability

Figure 2b depicts the BCIreland Bat Landscape Favourability Model (Lundy *et al.,* 2011) for all bat species (individual species values are presented in the table below). The county is divided into 5km squares and the darker the shading of the square, the higher favourability of the 5km square for bats. This GIS layer is hosted on the NBDC website www.biodiversityireland.ie.

The 5km square within which the proposed development is located has a Low to Medium favourability for bats. For the bat species recorded during this bat survey, the 5km square has a Low or Low to Medium favourability value for eight recorded bat species recorded during the surveys.

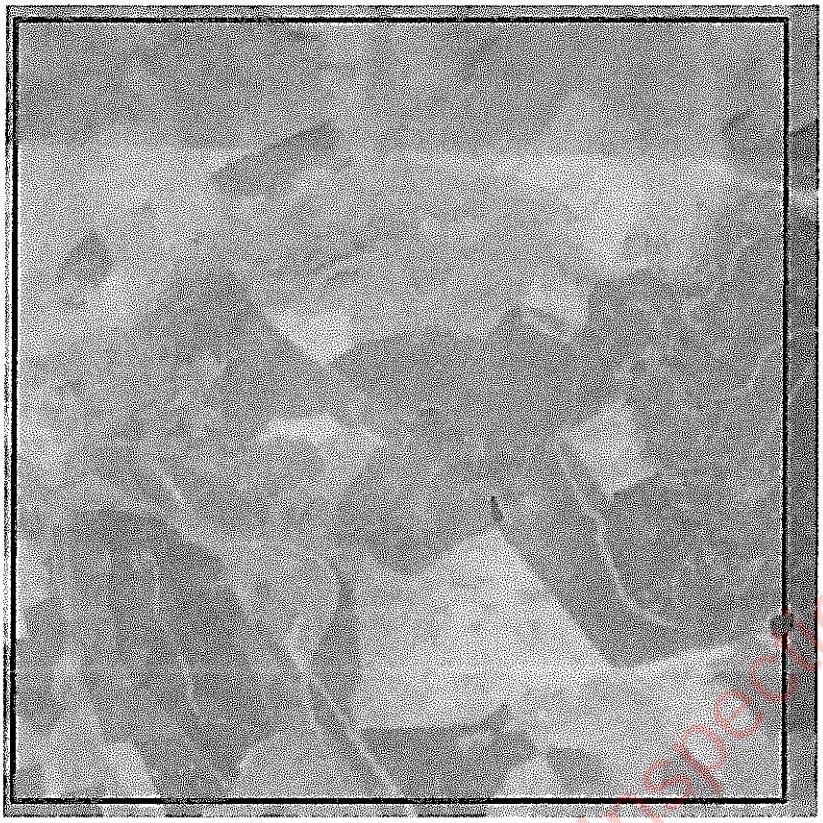


Figure 2b: Bat Landscape Favourability Model (All Bats) (Source: NBDC) – Blue Box = proposed development area.

Table 3b: Bat Conservation Ireland Bat Landscape Favourability Model – 5km Square value.

Bat species	5km Square
Common pipistrelle	26% Low to Medium)
Soprano pipistrelle	23% (Low to Medium)
Nathusius' pipistrelle	0% (Low)
Leisler's bat	17% (Low)
Brown long-eared bat	13% (Low)
Daubenton's bat	11% (Low)
Natterer's bat	17% (Low to Medium)
Whiskered bat	13% (Low to Medium)
Lesser horseshoe bat	5% (Low to Medium)

4.1.4 Previous Survey Data

A previous bat survey report include the proposed development area as part of their survey area:

Fehily Timoney (2020) Gortyrahilly and Inchamore Wind Farms Bat Survey 2019/2020 Report. Unpublished report prepared for SSE Renewables.

This bat survey completed the following bat survey elements:

- Spring Static Surveillance: 10 static units, 11 nights surveillance;
- Summer Static Surveillance: 10 static units, 10 nights surveillance;
- Autumn Static Surveillance: 10 static units, 26 nights surveillance;
- 1 extra static unit was deployed on 30/7/2019 for 24 nights;
- Daytime assessment of 4 buildings;
- Daytime assessment of trees;
- Dusk bat emergence surveys:
- Walking transects along pre-mapped routes.

This bat survey recorded all nine resident bat species during the surveys. The majority of the bat survey data was recorded by the static surveillance surveys. A total of 22,877 recordings over the 46 nights of surveys were recorded on the static units. The most commonly recorded species was common pipistrelle, followed by soprano pipistrelle and Nathusius' pipistrelle.

Table 3c: 2019 Static Surveillance Results (Calculations based on recordings over 46 nights).

Bat Species	No. of Recordings	Percentage	No. of Recordings/ Night
Brown long-eared bat	419	1.84%	9.11
Common pipistrelle	16,180	70.29%	616.09
Daubenton's bat	563	2.55%	22.33
Leisler's bat	872	3.84%	18.96
Lesser horseshoe bat	39	0.17%	0.85
Nathusius' pipistrelle	1,001	4.41%	21.76
Natterer's bat	174	0.89%	4.41
Soprano pipistrelle	3,219	14.17%	69.98
Whiskered bat	381	1.68%	8.28

4.2 Bat Species

The results of the different types of surveys are presented below and summarised at the end of the section. It is important that the whole section is read in order to gain a full impression of the potential bat value of the survey area.

4.2.1 Daytime Inspections

4.2.1.1 Building & Structure Inspection

Four sets of buildings were inspected, one set of buildings is located within the proposed development area, while the remaining three are located outside the proposed development area (Figure 2a). Daytime inspections were undertaken on 21/12/2022 and 6/1/2023 of the buildings and the results of these inspections are presented in the table below. In addition, static units were deployed in three of the buildings and left in-situ (recording from sunset to sunrise from 21/12/2022 to 6/1/2023).

Building 2, located within the proposed development area, was recorded as a bat roost for three species of bat: lesser horseshoe bat (bat droppings), Natterer's bat (bat droppings and audio files) and brown long-eared bat (audio files). The level of droppings and the number of audio files recorded (4 bat encounters, see Table 4b) indicates that this building is used as a night roost for these three species of bat.

Table 4a: Buildings / Structures inspection results.

Building Code	Description	Grid Reference (ITM)	Daytime Inspection	Static Unit Results
Building 1	2-storey dwelling and 5 single storey sheds. Natural stone walls, mixed roofs (slate and corrugated iron). No evidence of bat usage.	514755, 578855	No bat evidence recorded during daytime inspection Suitability: Low to Medium level	No bats recorded on static unit
Building 2	2-storey derelict house, slate roof, timber fascia, small lean-too shed with corrugated roof	513562, 578539	Small number of bat droppings on ground floor room (Lesser horseshoe bat) and in lean-to shed (Myotis spp.). Suitability: Medium to High level	Static Recordings - Main House: Natterer's bat and Brown long-eared bat. Lean-to: Natterer's bat.
Building 3	2-storey derelict dwelling (slate roof in poor condition) and	514338, 577982	No bat evidence recorded during daytime inspection	Unknown - permission refused to collect static unit

	numerous stonewall ruins.		Suitability: Low to Medium level	
Building 4	Single storey shed.	514703, 578897	No bat evidence recorded during daytime inspection Suitability: Low level	Not applicable

Plate 1: Building 2 (front view).

Plate 2: Building 2 along with lean-to structure (rear view).

Table 4b: Static unit results of winter surveillance of Building 2.

Date	Time	Bat Species	Survey Type	Bat Detector Model
21/12/2022	23:52:00	Natterer's bat	Statics in buildings	Mini Bat
27/12/2022	16:57:00	Brown long-eared bat	Statics in buildings	Mini Bat
28/12/2022	20:57:00	Natterer's bat	Statics in buildings	Mini Bat
29/12/2022	19:29:00	Natterer's bat	Statics in buildings	Mini Bat

Figure 3a: Location of buildings surveyed.

4.2.2 Tree Potential Bat Roost (PBRs) Inspection

There is an area of mature trees surrounding Building 2 within the proposed development area (Figure 3a). All of the trees within this located were inspected on 21/12/2022 for features such as tree holes, spilt limbs etc. that can provided roosting features for bats. The majority of trees in this area are conifer trees and therefore do not have a Potential Bat Roost or PBR value for local bat populations.

Plate 3: Mature trees located around Building 2.

4.3 Bat Detector Surveys

4.3.1 Dusk Bat Surveys, Walking & Driving Transects

The bat encounters recorded for these surveys (completed on 21/7/2022, 28/8/2022, 29/8/2022 and 19/9/2022) are reported as part of overall summary maps for each of the bat species. The following bat species were recorded during dusk surveys and the transects: soprano pipistrelle, common pipistrelle, Leisler's bat, Natterer's bat, Daubenton's bat, *Myotis* species and brown long-eared bat. This information provides distribution results for the bat species recorded which are presented in Section 4.3.3. Full breakdown of the nightly data is provided in the appendices.

4.3.2 Passive Static Bat Detector Survey

The following tables summarises the results recorded on the static units deployed over four surveillance periods. The information collated by the static surveillance is analysed using the EcoBat Tool (Please see note on p. 42) and therefore will be discussed in greater detail under that section of the report. Figures are provided to show the location of each of the static units in relation to the proposed turbine locations. The principal location of static units was determined by the proposed location of turbines while additional units were deployed to sample specific habitats within the proposed development area. All static units were deployed for a minimum of 10 days and therefore meet the level of surveillance recommended by guidance documents.

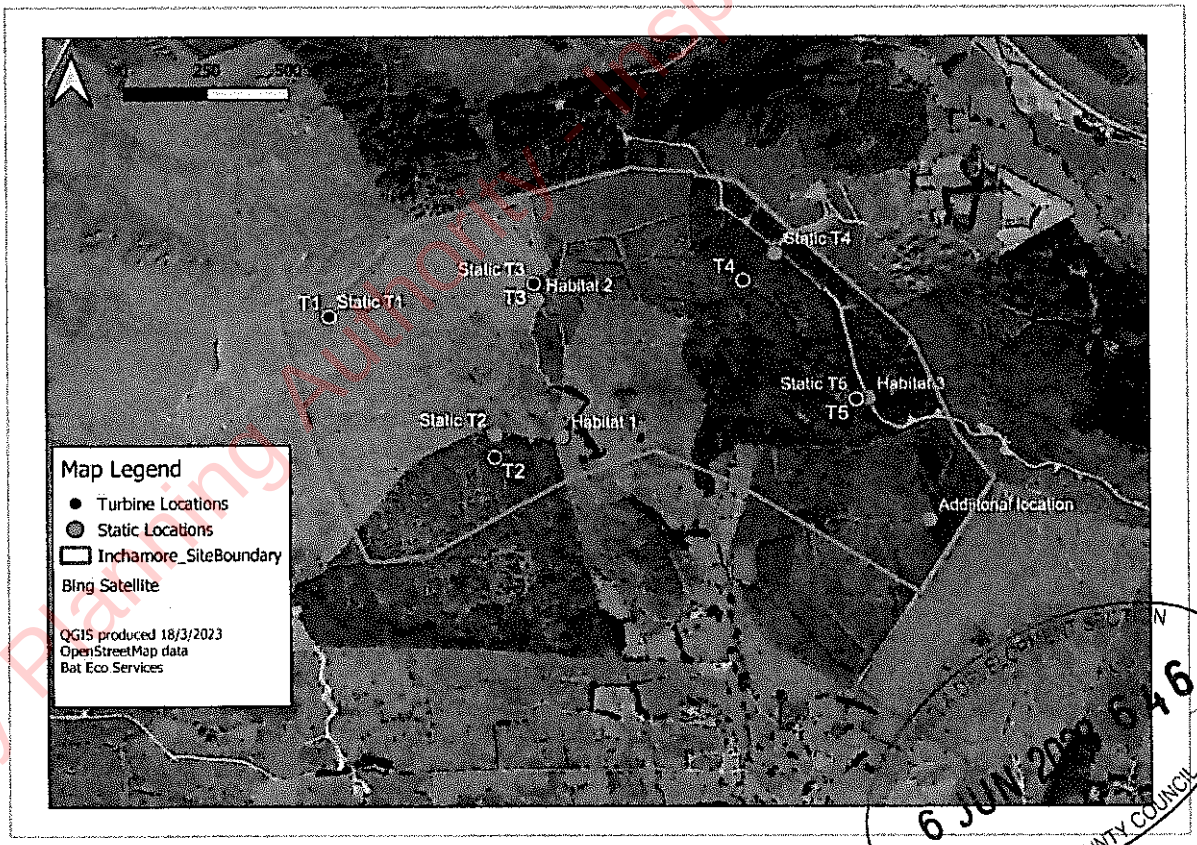


Figure 3b: Location of static units deployed during static surveillance relative to proposed turbine locations.

The following bat species were recorded during the static surveillance: soprano pipistrelle, common pipistrelle, Leisler's bat, Natterer's bat, whiskered bat, Daubenton's bat, *Myotis* species, lesser horseshoe bat and brown long-eared bat. These records were also used to prepared distribution maps for the individual bat species recorded.

Table 5a: Results of Static Bat Detectors deployed during Spring 2022.

Static Code	Grid Reference (ITM)	Closest Turbine No.	Survey Period	Bat Species
Spring 1 – Static T1	512354, 578942	T1	27/5/2022 to 9/6/2022 (13 nights)	Common pipistrelle
Spring 2 – Static T2	512855, 578583	T2	27/5/2022 to 9/6/2022 (13 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species
Spring 3 – Static T3	512973, 579040	T3	27/5/2022 to 9/6/2022 (13 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species
Spring 4 – Static T4	513709, 579132	T4	27/5/2022 to 9/6/2022 (13 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Natterer's bat Daubenton's bat Myotis species
Spring 5 – Static T5	513950, 578692	T5	27/5/2022 to 9/6/2022 (13 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Daubenton's bat Whiskered bat
Spring 6 – Additional location	514167, 578324	Not applicable	Failed first attempt. Re-deployed on 6/6/2022 for 15 nights	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species

Table 5b: Results of Static Bat Detectors deployed during Summer 2022.

Static Code	Grid Reference (ITM)	Closest Turbine No.	Survey Period	Bat Species
Summer 1 – Static T1	512354, 578942	T1	21/7/2022 to 1/8/2022 (11 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat
Summer 2 – Static T2	512855, 578583	T2	21/7/2022 to 1/8/2022 (11 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Whiskered bat
Summer 3 – Static T3	512973, 579040	T3	21/7/2022 to 1/8/2022 (11 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species
Summer 4 – Static T4	513709, 579132	T4	21/7/2022 to 1/8/2022 (11 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat
Summer 5 – Static T5	513950, 578692	T5	21/7/2022 to 1/8/2022 (11 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species
Summer 6 – Additional location	514167, 578324	Not applicable	21/7/2022 to 1/8/2022 (11 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Whiskered bat

Table 5c: Results of Static Bat Detectors deployed during 1st Autumn 2022 period.

Static Code	Grid Reference (ITM)	Closest Turbine No.	Survey Period	Bat Species
Autumn 1 – Static T1	512354, 578942	T1	Failed to record	Failed to record
Autumn 2 – Static T2	512855, 578583	T2	24/8/2022 to 3/9/2022 (10 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species
Autumn 3 – Static T3	512973, 579040	T3	24/8/2022 to 3/9/2022 (10 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species Lesser horseshoe bat
Autumn 4 – Static T4	513709, 579132	T4	24/8/2022 to 3/9/2022 (10 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Myotis species
Autumn 5 – Static T5	513950, 578692	T5	24/8/2022 to 3/9/2022 (10 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species
Autumn 6 – Additional location	514167, 578324	Not applicable	24/8/2022 to 3/9/2022 (10 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species

Table 5d: Results of Static Bat Detectors deployed during 2nd Autumn 2022 period.

Static Code	Grid Reference (ITM)	Closest Turbine No.	Survey Period	Bat Species
Autumn 7 – Static T1	512354, 578942	T1	19/9/2022 to 2/10/2022 (13 nights)	Common pipistrelle Brown long-eared bat Daubenton's bat
Autumn 8 – Static T2	512855, 578583	T2	19/9/2022 to 2/10/2022 (13 nights)	Common pipistrelle Soprano pipistrelle Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat
Autumn 9 – Static T3	512973, 579040	T3	19/9/2022 to 2/10/2022 (13 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species
Autumn 10 – Static T5	513950, 578692	T5	19/9/2022 to 2/10/2022 (13 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species
Autumn 11 – Habitat 1	513056, 578577	Paired habitat with T2	19/9/2022 to 2/10/2022 (13 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat
Autumn 12 – Habitat 2	512983, 578991	Paired habitat with T3	19/9/2022 to 2/10/2022 (13 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species Lesser horseshoe bat
Autumn 13 – Habitat 3	513984, 578693	Paired habitat with T5	19/9/2022 to 2/10/2022 (13 nights)	Common pipistrelle Soprano pipistrelle Leisler's bat Brown long-eared bat Natterer's bat Daubenton's bat Whiskered bat Myotis species

In summary, the total number of common pipistrelles bat passes recorded during all four static surveillance periods was 10,980 while soprano pipistrelles (720 bat passes) and Leisler's bats (650 bat passes) were the second and third most frequently recorded bat species, respectively. However, overall, common pipistrelles accounted for 85% of the recordings.

In relation to distribution across the static unit locations and during all surveillance periods, common pipistrelle was the most frequently recorded bat species (i.e. recorded on all static units deployed) . The highest level of common pipistrelle bat passes was recorded on the static located adjacent to "Additional Location" during the Spring Surveillance. All other bat species were recorded at a lower level of bat passes and less frequently across static surveillance locations. These totals included the three additional static units deployed in the second Autumn Surveillance.

In order to compare with Table 3 in Section 4.2.1, only data from the static units deployed at the proposed turbine locations are used for the following summary table. Apart from the common pipistrelles and Leisler's bats, the level of recordings detected was less in 2022 compared to 2019 for all other bat species noted. No Nathusius' pipistrelles were recorded in the 2022 static surveillance.

Table 5e: 2022 Static Surveillance Results at propose turbine locations only (250 nights / 6 static units = mean of 42 nights).

Bat Species	No. of Recordings	Percentage	No. of Recordings/ Night
Brown long-eared bat	86	0.81%	2.05
Common pipistrelle	9,061	84.94%	215.74
Daubenton's bat	75	0.7%	1.79
Leisler's bat	636	5.96%	15.14
Lesser horseshoe bat	1	0.01%	0.02
Natterer's bat	75	0.7%	1.79
Soprano pipistrelle	584	5.47%	13.9
Whiskered bat	47	0.44%	1.12
Myotis species	103	0.97	2.45

NOTE: The behaviour of bats during commuting and foraging greatly influences the level of bat passes recorded on static units. The number of bat passes do not equate to the number of bats flying past the static unit. Pipistrellus species tend to foraging as they commute and therefore are regularly observed flying up and down a treeline or hedgerow before moving on in the landscape. Leisler's bats fly high in the sky and therefore can be observed flying fast through the landscape, occasionally foraging over treetops as they commute. As a consequence, Pipistrellus species bat activity tends to result in a higher number of bat passes recorded on static units compared to Leisler's bats. In relation to other bat species recorded, as they tend to be less common in the landscape compared to common pipistrelles, soprano pipistrelles and Leisler's bats, their recorded presence is notable. .

Four static surveillance periods was undertaken in 2022. This was a total of 2,688 hours of surveillance. In order to provide an overall visual in relation to the total level of bat activity recorded at the static units the following graphs were prepared.

The bat species were divided into two groups:

- Common bat species: common pipistrelle, soprano pipistrelle and Leisler's bat;
- Less Common bat species: all remaining Irish bat species.

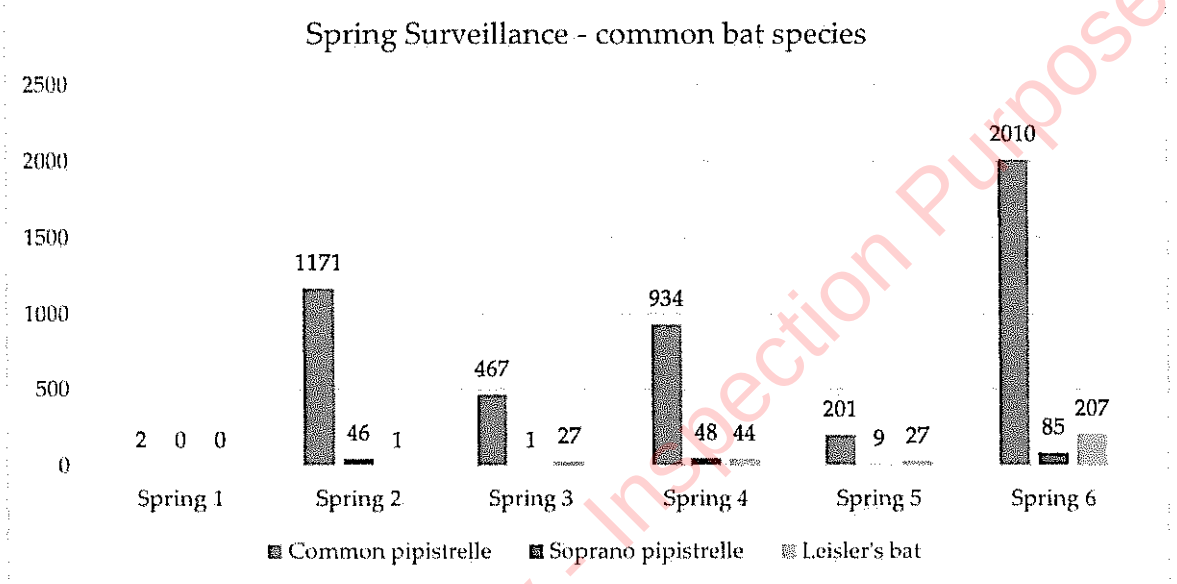


Figure 4a: Total number of bat passes for common bat species recorded during the Spring Static Surveillance.

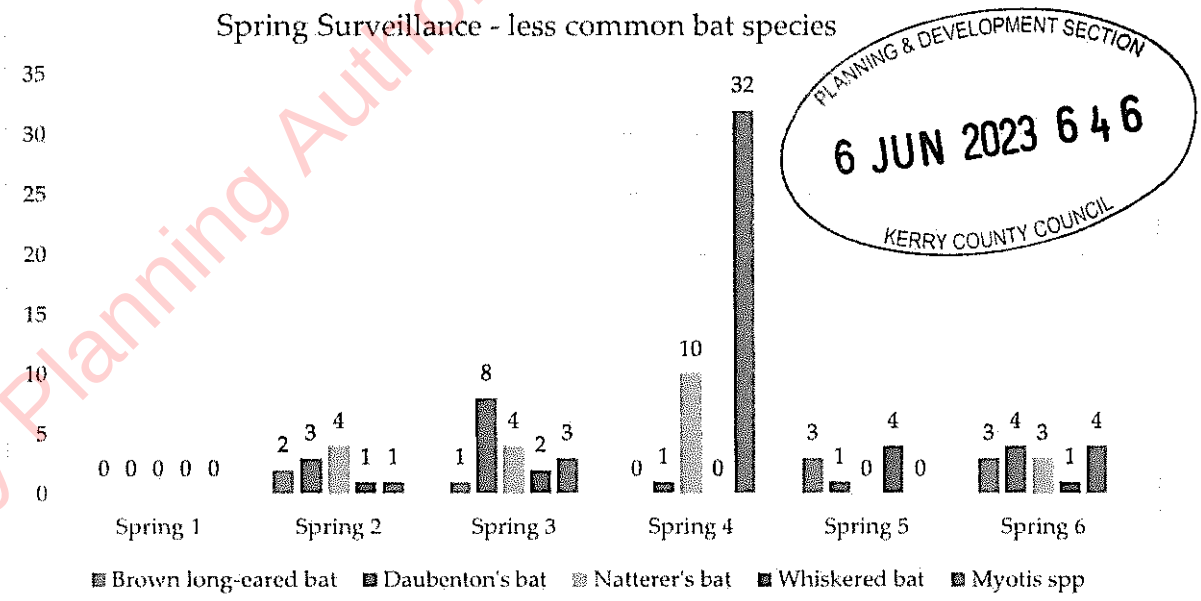


Figure 4b: Total number of bat passes for less common bat species recorded during the Spring Static Surveillance.

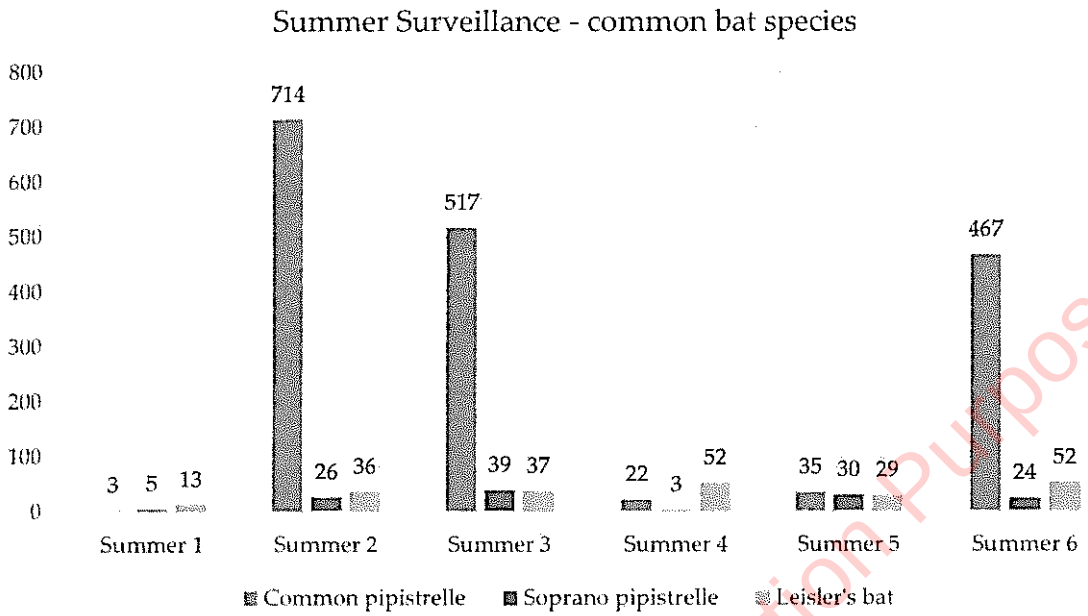


Figure 4c: Total number of bat passes for common bat species recorded during the Summer Static Surveillance.

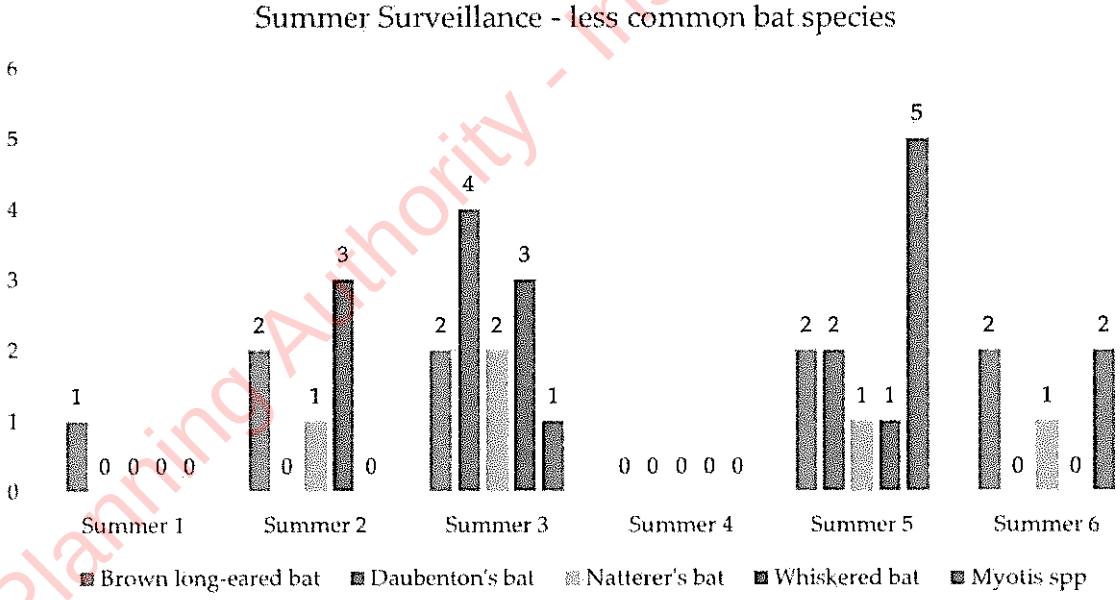


Figure 4d: Total number of bat passes for less common bat species recorded during the Summer Static Surveillance.

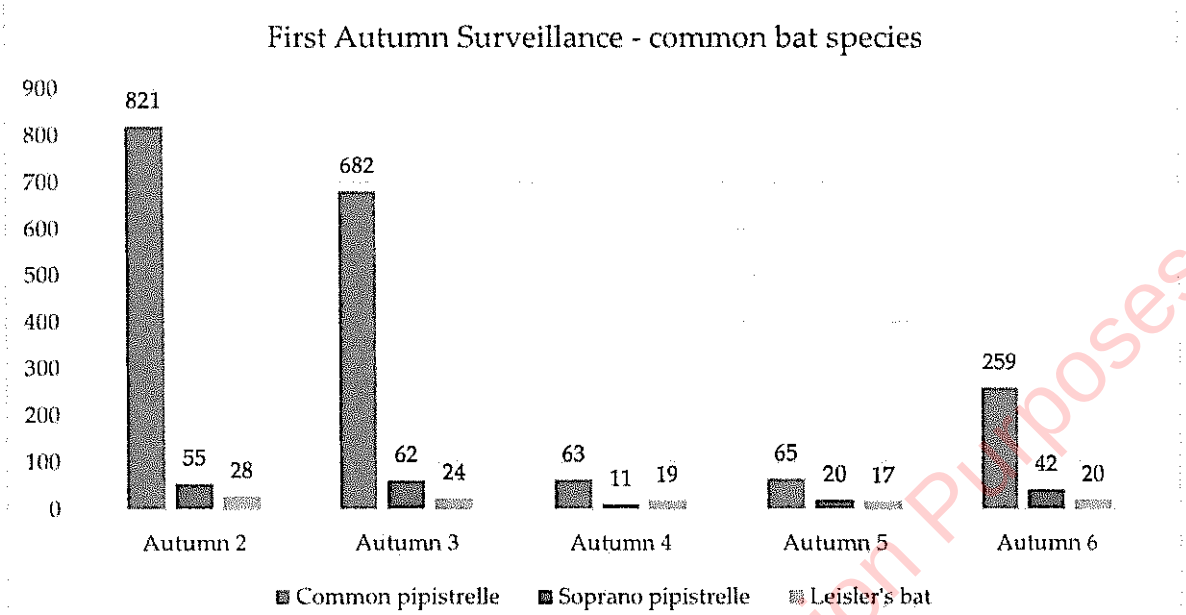


Figure 4e: Total number of bat passes for common bat species recorded during the first Autumn Static Surveillance (Please Note: Autumn 1 failed to record).

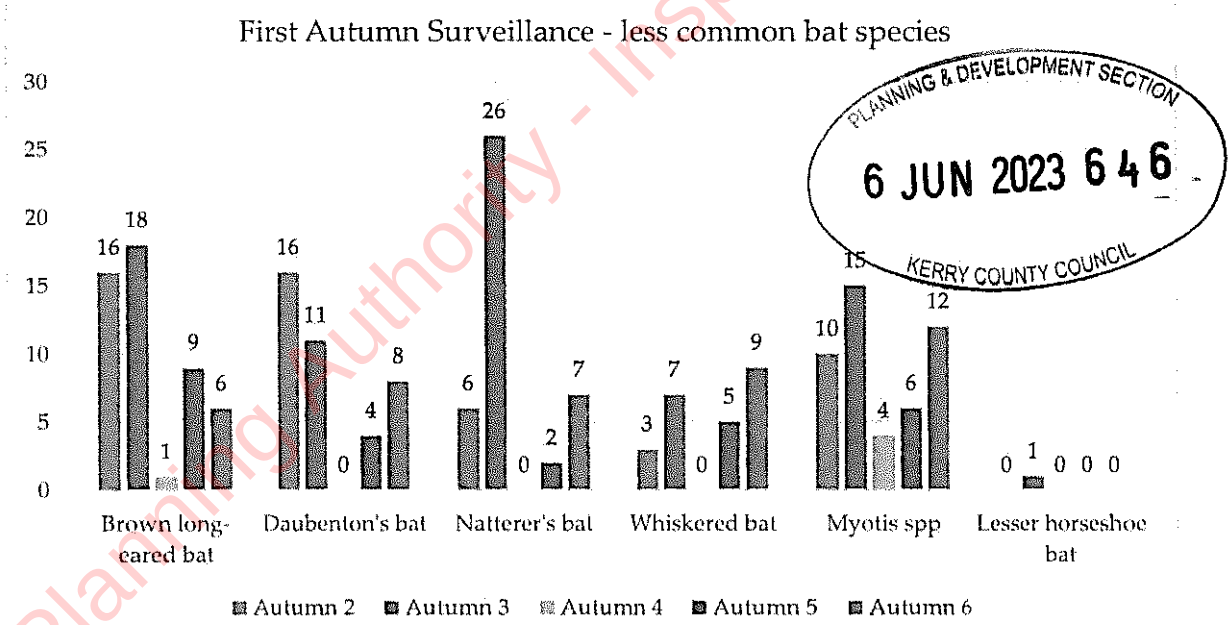


Figure 4f: Total number of bat passes for less common bat species recorded during the first Autumn Static Surveillance (Please Note: Autumn 1 failed to record).

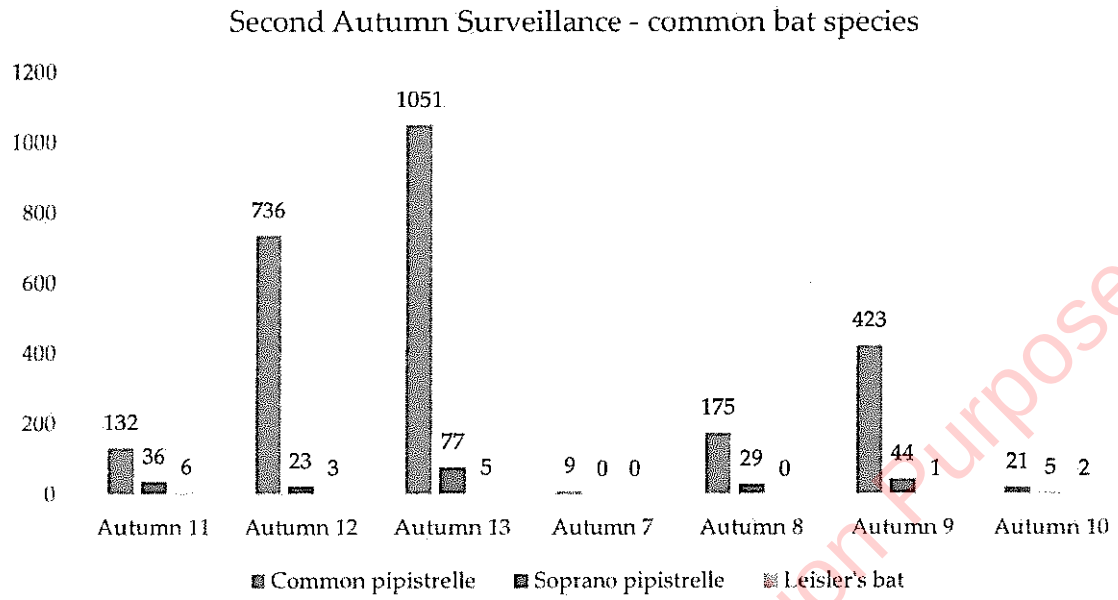


Figure 4g: Total number of bat passes for common bat species recorded during the second Autumn Static Surveillance.

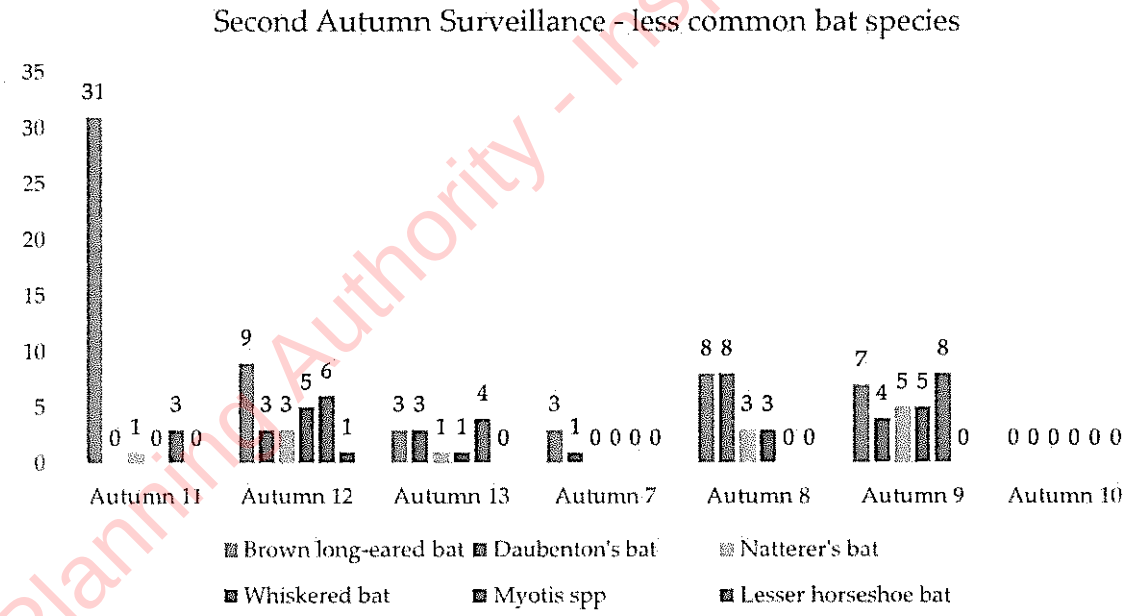


Figure 4h: Total number of bat passes for less common bat species recorded during the second Autumn Static Surveillance.

The principal summary points from the graphs above are as follows:

- Common pipistrelles were consistently recorded across the survey site in medium to high bat activity levels during all four static surveillance periods but particularly high levels were recorded during the spring surveillance.
- Common pipistrelle bat activity levels was highest at the location of additional static unit deployed during the first three surveillance periods (Spring 6, Summer 6 and Autumn 6). This was located in the south-east of the proposed development site and is not located in vicinity of a proposed turbine location.
- During the 2nd Autumn Surveillance, common pipistrelle bat activity levels was higher on the static located adjacent to one of the 'habitat' sites surveyed. This 'habitat' was the road access through the conifer plantations and therefore is indicative of commuting individuals along the open roads through a generally cluttered environment.
- Generally, Leisler's bat activity levels recorded was low and therefore are likely to indicate commuting individuals through the landscape. The highest level of bat activity for this species was recorded at the location of additional static unit deployed during the first three surveillance periods (Spring 6, Summer 6 and Autumn 6). This unit was located in the south-east of the proposed development site and is not located in vicinity of a proposed turbine location. This high level of Leisler's bat activity was recorded during the Spring surveillance.
- Soprano pipistrelle bat activity levels was consistently low during all static surveillance period at all proposed turbine locations.
- T1 was not an important location for the less common bat species and this is primarily a reflection of the habitats at this location (i.e. no tall tree vegetation). For all other turbine locations, the level of bat activity for the less common bat species was consistent during each of the surveillance periods in generally low levels of activity.
- Habitat 1 (mature deciduous treeline) was particularly important for brown long-eared bats during the 2nd Autumn Static Surveillance.

4.3.3 Bat Survey Results - Summary

The following figures illustrate the location of bat encounters recorded during all of the bat surveys completed. A total of eight bat species were recorded within the proposed development site. The only Irish resident bat species not recorded during these surveys was Nathusius' pipistrelle. While the Auto-Id function of the audio file analysis reported the presence of this bat species, manual inspection of such files confirmed such calls as low-echolocating common pipistrelles.

While a large array of night-time surveys were undertaken, an overall low level of bat activity was recorded during dusk and dawn surveys and walking/driving transects. For less common bat species, the bat encounters recorded were primarily on static units as these were left in the "field" for a minimum of 10 days and therefore provide a greater opportunity to record these bat species.

4.3.3.1 Soprano pipistrelle

A total of 75 geo-reference bat encounters were recorded for this species of bat during the array of bat surveys completed. As shown on Figure 5a, this bat species was recorded throughout the survey area and the majority of this species was recorded on a walking and driving transects covering a greater survey area and primarily to the south of the proposed development area.

Figure 5a: Location of soprano pipistrelle bat encounters within the proposed development area and at a wider survey area

4.3.3.2 Common pipistrelle

A total of 56 geo-reference bat encounters were recorded for this species of bat during the array of bat surveys completed. As shown on Figure 5b, this bat species was recorded throughout the survey area but with the majority of the bat encounters to the south of the proposed development area.

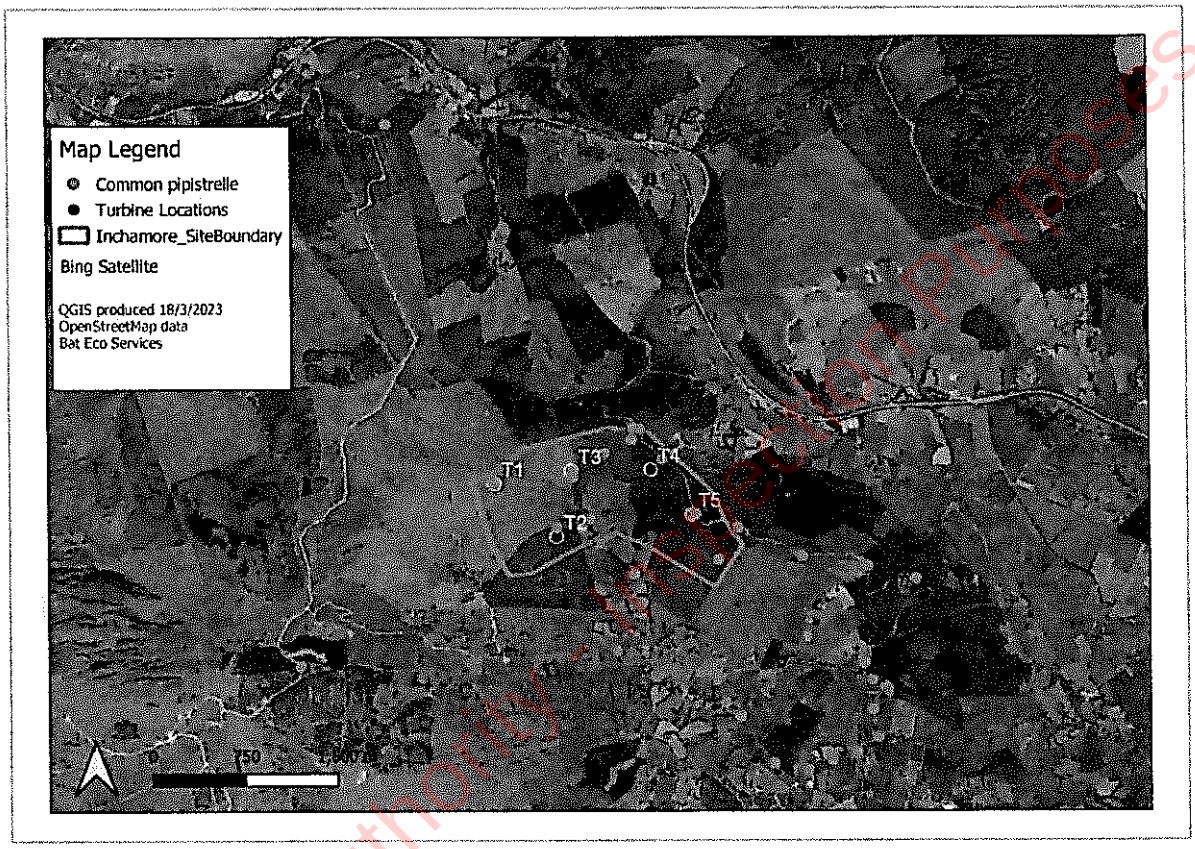


Figure 5b: Location of common pipistrelle bat encounters within the proposed development area and at a wider survey area.

4.3.3.3 Leisler's bat

A total of 33 geo-reference bat encounters were recorded for this species of bat during the array of bat surveys completed. As shown on Figure 5c, this bat species was recorded throughout the survey area primarily during the driving transects to the south of the proposed development area.

Figure 5c: Location of Leisler's bat encounters within the proposed development area and at a wider survey area.

4.3.3.4 Daubenton's bat

A total of 16 geo-reference bat encounters were recorded for this species of bat during the array of bat surveys completed. As shown on Figure 5d, this bat species was only recorded within the proposed development on the static units deployed. The level of encounter rate was low.

Figure 5d: Location of Daubenton's bat encounters within the proposed development area and at a wider survey area.

4.3.3.5 Lesser horseshoe bat

Three geo-reference bat encounters were recorded for this species of bat during the array of bat surveys completed. As shown on Figure 5e, this species was only recorded on two static units and in Building 2 (i.e. bat droppings). The level of encounter rate was low.

Figure 5e: Location of lesser horseshoe bat encounters within the proposed development area and at a wider survey area.

4.3.3.6 Natterer's bat

A total of 23 geo-reference bat encounters were recorded for this species of bat during the array of bat surveys completed. As shown on Figure 5f, this bat species was primarily recorded within the proposed development area on the static surveillance units. The level of encounter rate was low.

Figure 5f: Location of Natterer's bat encounters within the proposed development area and at a wider survey area.

4.3.3.7 Whiskered bat

A total of 15 geo-reference bat encounters were recorded for this species of bat during the array of bat surveys completed. As shown on Figure 5g, this bat species was only recorded within the proposed development area on the static surveillance units. The level of encounter rate was low.

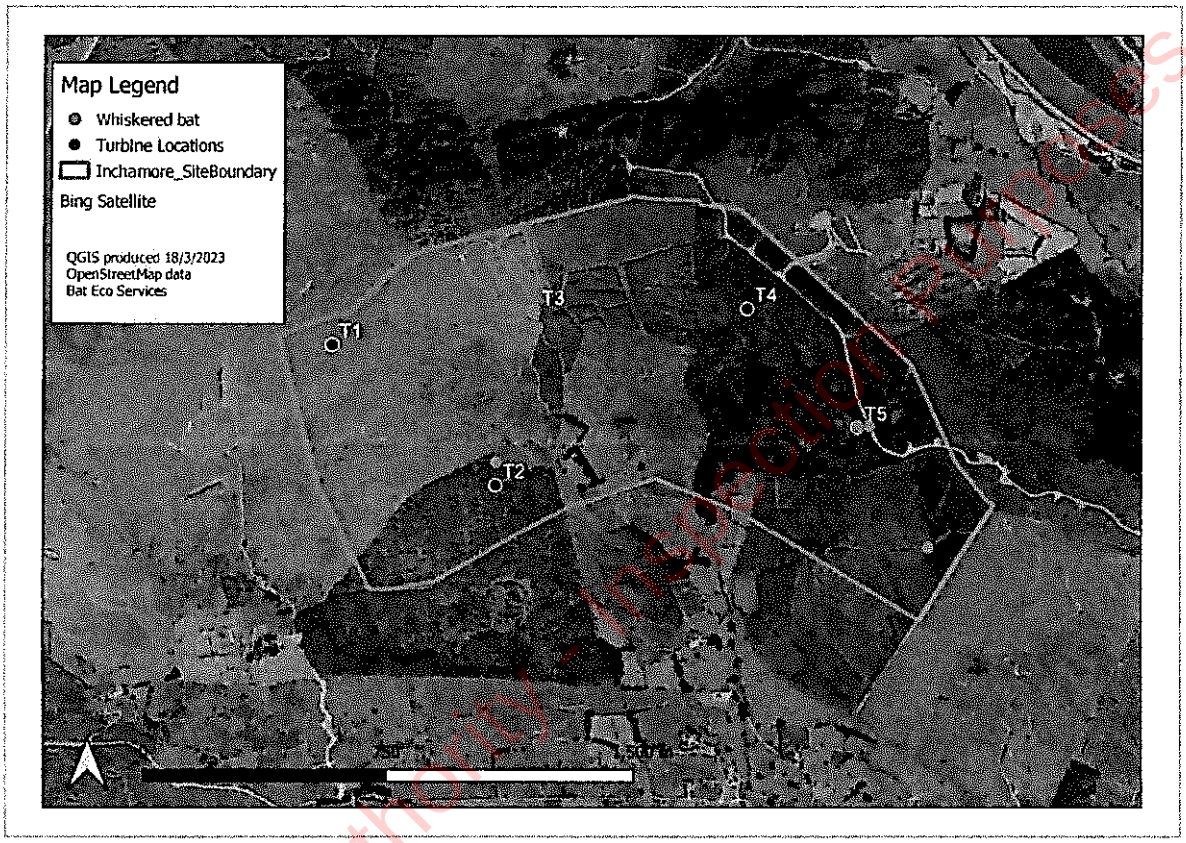


Figure 5g: Location of Whiskered bat encounters within the proposed development area and at a wider survey area.

4.3.3.8 Brown long-eared bat

A total of 26 geo-reference bat encounters were recorded for this species of bat during the array of bat surveys completed. As shown on Figure 5h, this bat species was recorded primarily within the proposed development area on the static unit locations. The level of encounter rate was low.

Figure 5h: Location of Brown long-eared bat encounters within proposed development area and at a wider survey area.

4.4 EcoBat Tool Results

Static surveillance results were entered into the "Per Night" forms and submitted for analysis using the EcoBat tool.

The reference range datasets were stratified to include:

- Only records from within 30 days of the survey date.
- Only records from within 100km^2 of the survey location.
- Records using any make of bat detector.

The EcoBat tool provides are series of summary tables to enable analysis of the bat activity level at each static location. These are presented below and categorisation of activity level is based on the following table (presented earlier in the report):

Table 6a: Percentile score and categorised level of bat activity.

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

Additional figures are presented in the appendices which provide information on the spread of nightly activity according to the five percentile ranges in table above.

Note: The EcoBat tool has been offline since November 2022. Only four of the six static units for the summer surveillance data were analysed prior to this. The analysis carried out for the present assessment was carried out in line with the EcoBat tool using the professional judgment of the bat specialist. Please see Section 4.4.2 for more details.

4.4.1 Summer Surveillance 2022 – Preliminary EcoBat Tool Analysis

Bat surveys were conducted at Summer 5 (located at proposed location of T5), Summer 6 (Additional Static Unit Location named as Additional Location), Summer 1 (located at proposed location of T1), Summer 4 (located at proposed location of T4), for 11 nights between 2022-07-21 and 2022-07-31, using Wildlife Acoustics static bat detectors. The maximum of passes recorded in a single night was 111 passes, and 8 species were recorded.
The reference range dataset was stratified to include:

- Only records from within 30 days of the survey date.
- Only records from within 100km^2 of the survey location.
- Records using any make of bat detector.

Only one species had a High level of bat activity according to the Median Percential value (highlight in table below).

Table 6b: Summary table showing the number of nights recorded bat activity fell into each activity band for each bat species.

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile
Summer 1	*Nyctalus leisleri*	0	0	1	2	8	9
Summer 1	*Pipistrellus pipistrellus*	0	0	0	1	10	0
Summer 1	*Pipistrellus pygmaeus*	0	0	0	1	10	0
Summer 1	*Plecotus auritus*	0	0	0	0	11	0
Summer 4	*Nyctalus leisleri*	0	2	2	1	6	9
Summer 4	*Pipistrellus pipistrellus*	0	0	1	3	7	9
Summer 4	*Pipistrellus pygmaeus*	0	0	0	1	10	0
Summer 5	*Myotis*	0	0	1	1	9	0
Summer 5	*Myotis daubentonii*	0	0	0	0	11	0
Summer 5	*Myotis mystacinus*	0	0	0	0	11	0
Summer 5	*Myotis nattereri*	0	0	0	0	11	0
Summer 5	*Nyctalus leisleri*	0	0	3	1	7	9
Summer 5	*Pipistrellus pipistrellus*	0	1	1	3	6	9
Summer 5	*Pipistrellus pygmaeus*	0	1	1	2	7	0
Summer 5	*Plecotus auritus*	0	0	0	0	11	0
Summer 6	*Myotis*	0	0	0	1	10	0
Summer 6	*Myotis nattereri*	0	0	0	0	11	0
Summer 6	*Nyctalus leisleri*	0	1	4	2	4	32
Summer 6	*Pipistrellus pipistrellus*	6	0	0	0	5	84
Summer 6	*Pipistrellus pygmaeus*	0	0	2	4	5	24
Summer 6	*Plecotus auritus*	0	0	0	0	11	0

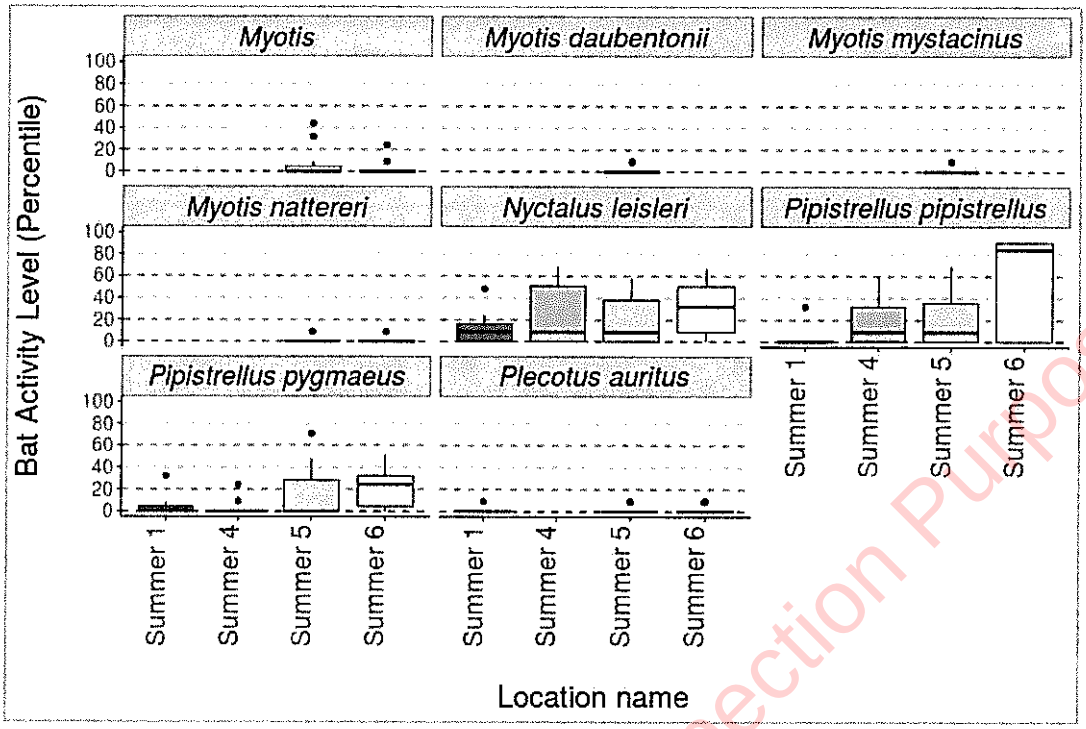


Figure 6. Differences in bat activity between static detector locations. The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity)

Differences in activity between static detector locations split by species and location is presented in the figure below. The centre line indicates the median activity level whereas the box represents the interquartile range (therefore the spread of the middle 50% of nights of activity). The plots indicate that, in general, the level of bat activity varied greatly from static location and that there was not a consistent of species activity from night to night.

4.4.2 Static Surveillance 2022 – Analysis

The EcoBat Tool analysis presented in Section 4.4.1 demonstrated that levels of bat activity is reported as "High" when the number of nightly passes is greater than 40. Therefore, using this information, all of the static surveillance data collected in 2022 for each individual bat species recorded was examined to complete analysis in absence of the EcoBat Tool. Only the nightly bat activity level of common pipistrelles consistently exceeded this criteria and therefore, as this bat species is deemed as a "High Risk", this species was used to determine the assessment of the proposed location of the turbines and their potential impact on local bat populations.

The number of nights when the number of nightly passes was greater than 40 for common pipistrelles was calculated (summary of data and raw data are presented in the appendices). Over the course of the 2022 surveillance, at the proposed turbine locations for T1, T4 and T5 were deemed to have a Low level of bat activity. T3 was deemed to have a Medium level of bat activity while T2 and "Additional Location" were deemed to have a High level of bat activity.

Table 6c: Summary table showing the number of nights recorded bat activity fell into High activity band for common pipistrelles only.

Turbine No.	No. of Nights >40 bat passes	No. of Nights of Surveillance	Percentage	Activity Level
T1	0 nights	37 nights	0%	Low
T2	23 nights	47 nights	49%	High
T3	18 nights	47 nights	38%	Medium
T4	1 night	34 nights	3%	Low
T5	2 nights	34 nights	6%	Low
Additional Location	21 nights	37 nights	57%	High

5. Discussion / Interpretation

5.1 Bat Species Recorded & Sensitivity

Eight species of bat and additional records for *Myotis* species group were recorded during the 2022 bat surveys. This represents eight of the nine bat species known to be resident in County Kerry/Cork. The ninth bat species, Nathusius' pipistrelle, was recorded in previous bat surveys completed in 2019/2020 but not during this current set of bat surveys.

The table below provides an ecological valuation of each the nine bat species and the collision risk factor in relation to wind farms. Three of the bat species recorded is considered to be High risk.

Table 7: Evaluation of the bat species recorded during the bat survey.

Using CIEM (2016) Guidelines for ecological value, "Bat Risk" in relation to Wind Turbines (NaturScot, 2021) and with reference to Wray et al., 2010 (Table 2 in NaturScot, 2021) in relation to level of potential vulnerability of populations extrapolated for Irish bat species, Irish status according to Marnell et al., 2019 and population numbers and core area from Roche et al., 2014.

Yellow = low population vulnerability
Orange = medium population vulnerability
Red = high population vulnerability

Bat Species	Ecological Value / Geographical Scale of Importance	Irish Status	Bat Risk	Population Numbers / Core Area
Leisler's bat	International	Least Concern	High	Common
Natterer's bat	County	Least Concern	Low	Widespread
Whiskered bat	Regional	Least Concern	Low	Rare
Nathusius' pipistrelle	Regional	Least Concern	High	Rare
Daubenton's bat	County	Least Concern	Low	Common
Brown long-eared bat	County	Least Concern	Low	Widespread
Common pipistrelle	Local	Least Concern	High	Common
Soprano pipistrelle	Local	Least Concern	High	Common
Lesser horseshoe bat	National	Least Concern	Low	Rare

5.2 EcoBat Tool Evaluation

The static surveillance data collected 2022 was partially analysed using the EcoBat Tool but this partial analysis was used to form an analysis to continue the evaluation process. This identified locations where a high value of bat activity for specific bat species was recorded. Over the course of the 2022 surveillance, at the proposed turbine locations for T1, T4 and T5 were deemed to have a Low level of common pipistrelle bat activity. T3 was deemed to have a Medium level of common pipistrelle bat activity while T2 was deemed to have a High level of common pipistrelle bat activity.

Therefore, in summary, the following proposed turbine locations are considered to be important in relation to level of bat activity recorded during static surveillance and their potential impact on local bat populations:

- T2, T3.

5.3 QGIS Analysis

To facilitate the construction of the proposed wind turbine, internal wind farm access tracks are required. This may result in the removal of habitats and the potential impact of this is investigated using the ***"Habitats"*** layer, **"Buffered Bat Encounters"** layer and the **"Buffered Turbine Locations"** layer produced (See Section 3.3.3 for a greater explanation of this process).

- "Habitats" layer – using aerial photograph
- "Buffered Bat Encounters" = all bat encounters within 1km of turbine locations (to represent the primary proposed development area) was extracted from full bat dataset. This new dataset was named "Bat Encounters within boundary" and each of these bat encounters were buffered to 50m.
- "Buffered Turbine Locations" = all turbine locations were buffered to 200m to aid analysis.

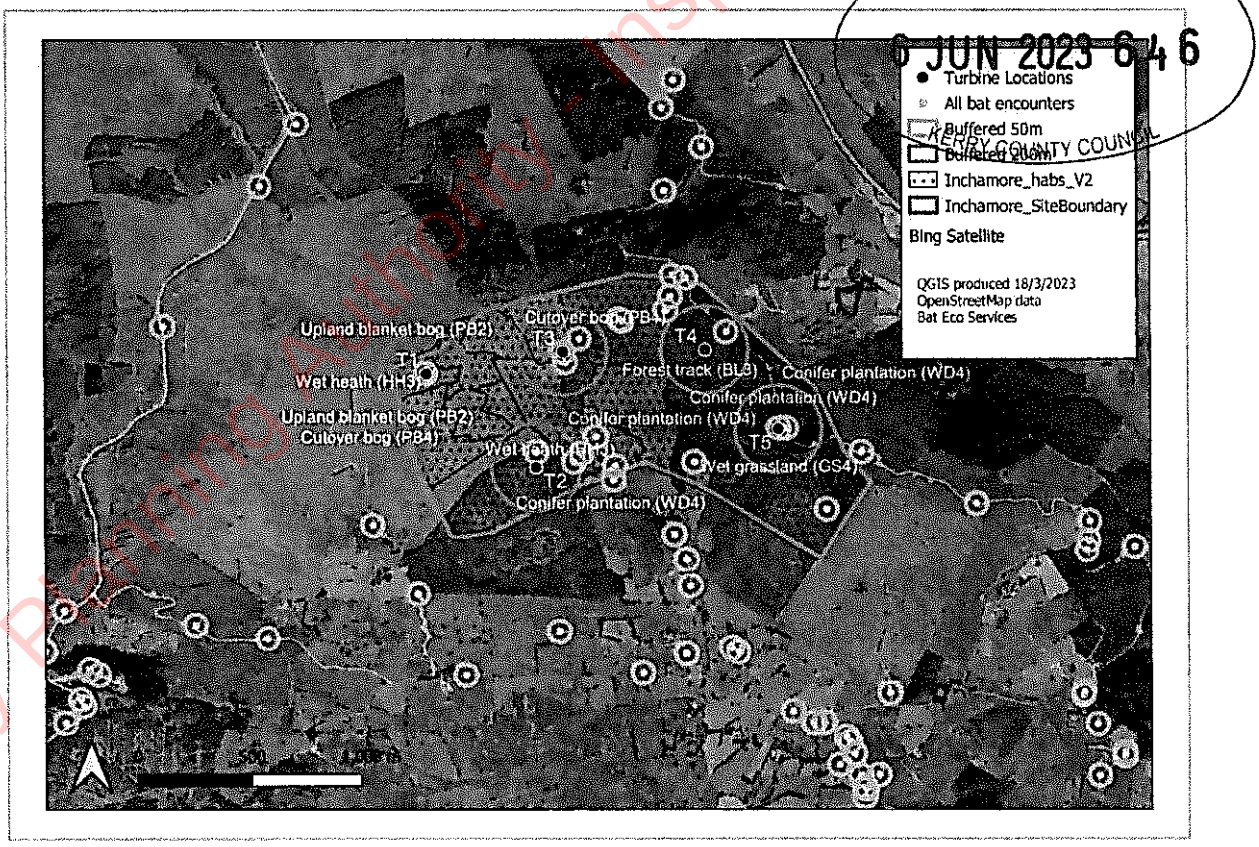


Figure 7a: QGIS analysis of bat encounters within 200m of turbine locations and habitats shapefile.

The predominant habitat type for each proposed turbine location is as follows:

T1: Wet heath
T2: Conifer plantation and cut-over bog
T3: Conifer plantation and cut-over bog
T4: Conifer plantation
T5: Conifer plantation
Additional location: Conifer plantation and forest tracks.

The supporting infrastructure for the proposed development travels south to the proposed development area. In vicinity of the tracks, the following bat species were recorded: common pipistrelle, soprano pipistrelle, Leisler's bats, brown long-eared bats, Natterer's bats, Daubenton's bats, whiskered bats and lesser horseshoe bats.

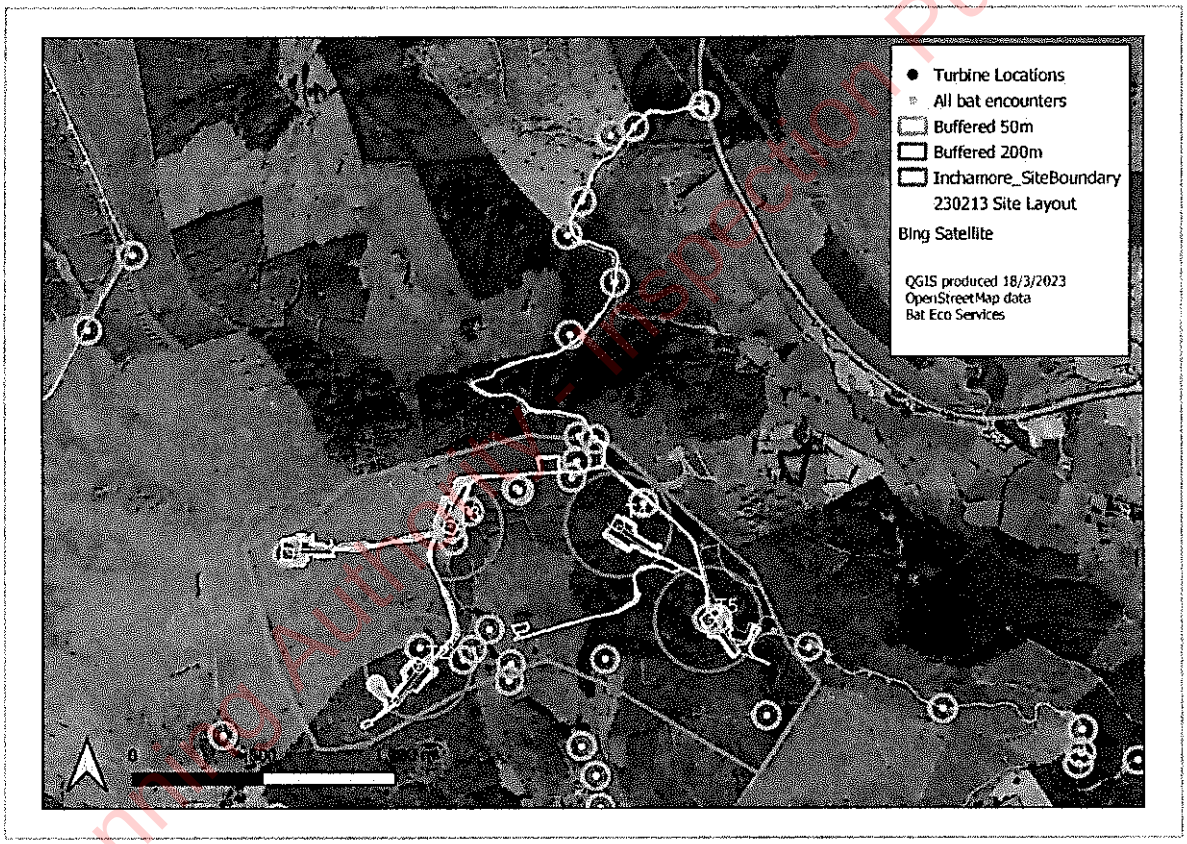


Figure 7b: QGIS analysis of bat encounters 50m buffers and proposed infrastructure.

5.4 Site Risk Assessment

The Site Risk Assessment is calculated according to NaturScot, 2021 (See Appendix 8.3 for details of how this is calculated).

The assessment value (i.e. Turbine Risk value) is compared to the ranges below:

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

While Leisler's bat can be considered as common in Ireland, its status as an "Internationally Important" population, ranks it higher than the two common *Pipistrellus* species. However, both the bat activity level of Leisler's bat and soprano pipistrelle was low during the 2022 surveillance while the majority of bat passes recorded was identified as common pipistrelle. Therefore, the Risk Assessment were completed for this bat species only (i.e. for common pipistrelle).

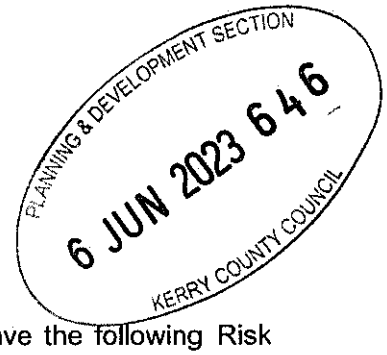
5.4.1 Common pipistrelle

With reference to the nightly bat activity at each of the static locations, T1, T4 and T5 were deemed to have a Low level of common pipistrelle bat activity. T3 was deemed to have a Medium level of common pipistrelle bat activity while T2 was deemed to have a High level of common pipistrelle bat activity. In order to complete the table below, the Bat Activity Category (using similar values as per EcoBat Tool) is valued as follows:

Low = 1 point
Medium = 3 points
High = 5 points

Table 8: Risk assessment for each proposed turbine location for local bat populations using Common pipistrelle bat activity levels.

Turbine No.	Site Risk Value	Bat Activity Category	Turbine Risk
			Site Risk x Bat Activity Category
1	3	1	3
2	3	5	15
3	3	3	9
4	3	1	3
5	3	1	3



In summary, for common pipistrelles, the propose turbine locations have the following Risk Factor:

Low: T1, T4, T5
Medium: T3
High: T2

5.5 Impact Assessment

The impact assessment takes into consideration the following:

- Eight bat species were recorded during the 2022 and 2023 bat surveys of the proposed development site.
- Three of these species are considered to be High Risk bat species in relation to wind turbines: Leisler's bat, common pipistrelle and soprano pipistrelle.
- The remaining five species are Low Risk: Natterer's bat, Daubenton's bat, whiskered bat, lesser horseshoe bat and brown long-eared bat.
- Partial EcoBat Tool Analysis results highlighted turbine locations with High Risk and Medium Risk for common pipistrelle, as this bat species were recorded at High levels of bat activity during static surveillance.
- Spread of bat encounter records within the proposed development site, particularly, in relation to infrastructure.
- Bat habitats present within 200m of turbine locations and along infrastructure routes.

5.5.1 Core Sustenance Areas

One set of buildings within the proposed development area was recorded as a bat roosts: lesser horseshoe bat, Natterer's bat and brown long-eared bat (Building 2). The CSZ for brown long-eared bat is 3km, for lesser horseshoe bat is 2km and for Natterer's bat is 4km. Therefore, the proposed development is located inside the CSZ for the known bat roosts recorded within Building 2. However, all three bat species recorded roosting are considered to be Low Risk bat species in relation to wind farms.

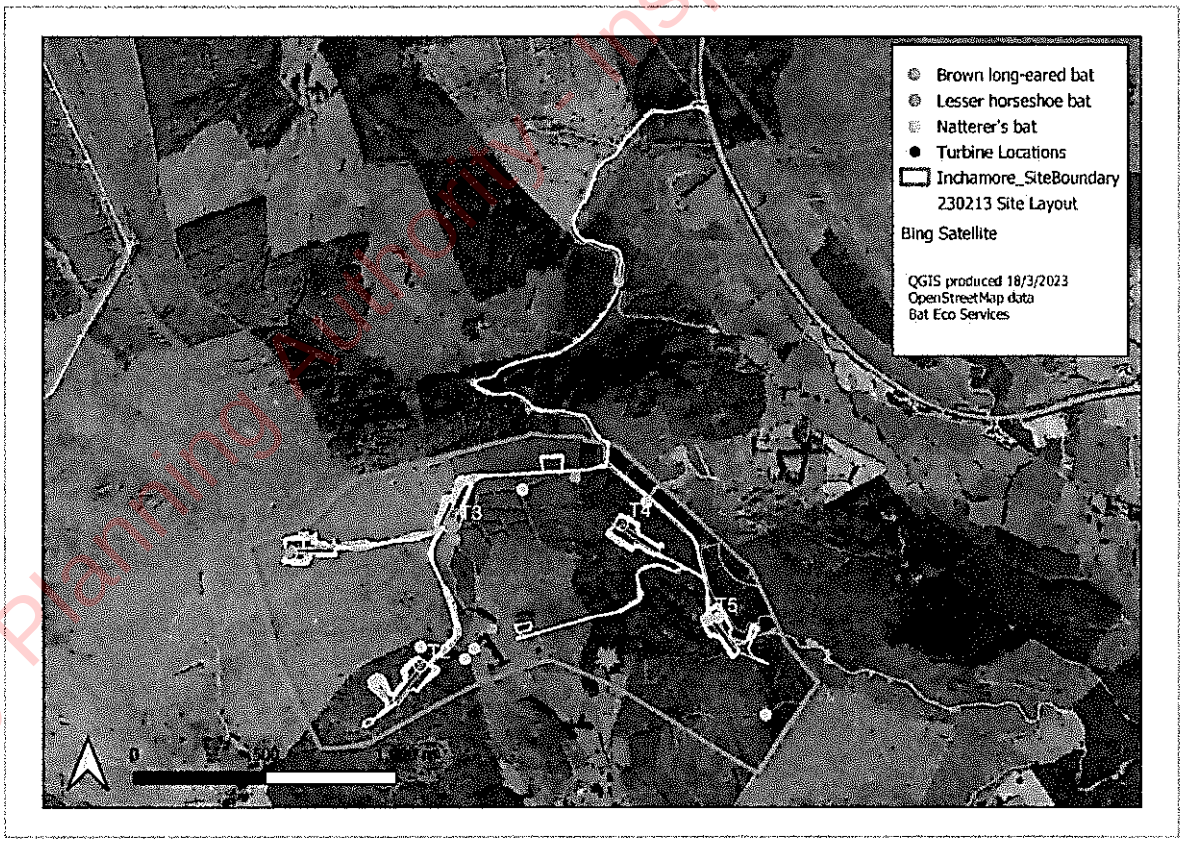


Figure 7c: QGIS analysis of Building 2 and specific bat species encounters with reference to proposed development. Red star represents the location of Building 2.

5.5.2 *Potential Impact on Local Bat Populations*

One set of buildings is located within the proposed development area and this was recorded as a bat roost for three bat species: lesser horseshoe bat, Natterer's bat and brown long-eared bat (Building 2). However, all three bat species recorded roosting are considered to be Low Risk bat species in relation to wind farms and there is no proposed turbine or infrastructure adjacent to the buildings.

The following table summarises the result of the impact assessment for each of the turbine locations. If no mitigation measures are implemented, there is one High Risk turbine (T2) and one Medium Risk turbine (T3).

Table 9: Summary table showing the number of nights recorded bat activity fell into High activity band for common pipistrelles only.

Turbine No.	Risk Assessment: Common pipistrelle	Other bat species recorded within 200m of turbine	If no mitigation is applied, what is the potential impact level?
T1	Low	SP, BLE, Leis, Daub	Low
T2	High	SP, BLE, Leis, Daub, Natt, Whis	High
T3	Medium	SP, BLE, Leis, Daub, LHB, Natt, Whis	Medium
T4	Low	SP, BLE, Leis, Daub, Natt	Low
T5	Low	SP, BLE, Leis, Daub, Natt, Whis	Low

The following table summarises the result of the impact assessment for each of the turbine locations. If no mitigation measures are implemented, there is one High Risk turbine (T2) and one Medium Risk turbine (T3).

5.5.3 *Cumulative Impacts of Existing Forestry Operations*

Forestry operations will continue within sections of the proposed development site during the construction phase and throughout the life span of the proposed development. Such operations include clear felling and new planting. The cumulative impact of these forestry operations in combination with the proposed development will not cause a significant increase to potential impacts of the proposed development identified above.

5.5.4 *Cumulative Impacts of Additional Wind Farm Applications*

There are 26 wind farms within 20 km[1] of the Inchamore proposed development (an area of 1,256 km^2 - Please consult Chapter 5 for more information). Of the 26, 18 no. are operational (175 turbines total), 6 no. are permitted (25 turbines), 1 no. is at pre-planning stage (17 turbines) and 1 no. is proposed (14 turbines).

Using the Core Sustenance Zone radius of 4km (this is the CSZ for Natterer's bat, the widest zone value for the eight bat species recorded during the surveys and for the three bat species recorded roosting in Building 2), a buffer of 4km was created from the proposed wind farm site boundary of the proposed development site.

The nearest operational wind farms to the Inchamore site is Coomagearlaghy, Kilgarvan Wind Farm (15 turbines), which is located 2.7 km to the south-west, and Inchee, Poulbatha & Foilgreana (6 turbines), which is located 3.3 km to the south-west. The permitted Gortnakilla, Clonkeen, Killarney Wind Farm is located 1.87 km to the west of the Inchamore site. Most of the remainder wind farms are clustered to the north-east, south and south-west of the Inchamore site and are outside the 4km radius. The Inchamore project will add a further 5 turbines to the total of 231 turbines which represents an additional 2.2%. It is considered that there is a potential for cumulative impacts of additional planning applications to local bat populations. This increases the importance of strict implementation of the bat mitigation measures presented in this report.

5.6 Mitigation Measures

In order to reduce the potential impact of the proposed development on local bat populations the following mitigation is recommended.

5.6.1 Construction Phase

Mitigation is best achieved through avoidance especially in relation to bat fauna. It is proposed that the following measures be put in place to avoid or lessen the degree of impacts on local bat populations.

5.6.1.1 Minimum Buffer Zone

To minimize risk to bat populations, a buffer zone is recommended around any forestry, treeline, hedgerow, woodland feature, into which no part of the turbine should intrude. Using the formula quoted below (NaturScot, 2021), the minimum distances of wind turbines for bat mitigation are calculated for each of the potential turbine models (information supplied by TOBIN).

formula: $Buffer\ distance = \sqrt{(50 + b1)^2 - (hh - fh)^2}$
where bl = blade length, hh = hub height, fh = feature height (all in meters)

The dimensions of the potential wind turbine models proposed to be used are provided in the table below. Feature height is 25m (typical conifer plantation height, the predominant habitat type present within the survey area). Dimensions of Blade length and Hub height were provided and the calculation is as follows:

$Buffer\ distance = \sqrt{(50 + 77.5)^2 - (102.5 - 25)^2}$
Buffer distance = 101.24m

Providing alternative foraging areas outside the wind farm zone has been shown to reduce the presence of bats within cleared zones around individual wind turbines (i.e. bats are attracted to

the more favourable foraging habitats). Therefore compensatory habitat is recommended and, where possible, such planting should include deciduous woodland.

5.6.1.2 Construction Phase Bat Mitigation Measures

Following the formula in the above section, ensure that the required minimum distance from tall vegetation is achieved.

Table 10: Bat Mitigation Measures recommended during the Construction Phase.

High Level Turbine Locations This applies to T2	**EcoBat Tool Medium Level Turbine Locations** This applies to T3 This also applies to remaining Internal Road Network	**EcoBat Tool Low Level Turbine Locations** This applies to T1, T4 & T5
Ensure that wind turbine is 101.2m away from plantation edge.	Ensure that wind turbine is 101.2m away from plantation edge.	Ensure that wind turbine is 101.2m away from plantation edge.
A zone of 100m around the wind turbines (from the tip of the blade) should be cleared of tall vegetation (shrubs, trees, scrub etc.) to reduce favourability of this zone for foraging and commuting bats. A low level of vegetation should be maintained for the entire operational phase. This should be monitored to ensure that scrub vegetation does not develop within the zone around the turbines.	A zone of 50m around the wind turbines (from the tip of the blade) should be cleared of tall vegetation (shrubs, trees, scrub etc.) to reduce favourability of this zone for foraging and commuting bats. A low level of vegetation should be maintained for the entire operational phase. This should be monitored to ensure that scrub vegetation does not develop within the zone around the turbines.	A zone of 50m around the wind turbines (from the tip of the blade) should be cleared of tall vegetation (shrubs, trees, scrub etc.) to reduce favourability of this zone for foraging and commuting bats. A low level of vegetation should be maintained for the entire operational phase. This should be monitored to ensure that scrub vegetation does not develop within the zone around the turbines.
Complete clearance work at least 6 months prior to installation of wind turbines. Studies have shown that bats are attracted to clear felled forestry areas due to increase insect loading. This has been shown to occur for a period of 3-6 months before the insect loading reduces to pre-cleared felled levels.	Complete clearance work at least 6 months prior to installation of wind turbines. Studies have shown that bats are attracted to clear felled forestry areas due to increase insect loading. This has been shown to occur for a period of 3-6 months before the insect loading reduces to pre-cleared felled levels.	Complete clearance work at least 6 months prior to installation of wind turbines. Studies have shown that bats are attracted to clear felled forestry areas due to increase insect loading. This has been shown to occur for a period of 3-6 months before the insect loading reduces to pre-cleared felled levels.
Building 2 and mature trees surrounding the building will not be removed during construction of the proposed development. This area will be protected from any construction works proposed to be undertaken in vicinity of this area. This area will also be protected during the operation of the proposed development.		

5.6.2 Operational Phase

5.6.2.1 Feathering of blades

The operation of the turbines should be in a manner that will restrict the rotation of turbine blades as much as possible below the manufacturer's cut-in speed (e.g. by feathering the blades during low wind levels - changes in blade feathering by altering the angle of the blade and therefore preventing the blades from rotating during low wind situations). This would prevent freewheeling or idling of the blades.

Therefore ensure that blades of turbines are prevented from freewheeling (idling/spinning). Feathering of the blades during low wind conditions are recommended for all turbines.

5.6.2.2 Turbine Cut-in Speeds

There are a number of bat mitigation measures available in relation to wind farms to reduce fatalities. One successful measure applied to wind farms in Europe is to increase the cut-in speeds of the individual turbines. This is important in order to protect High Risk species (Leisler's bat, soprano and common pipistrelle) foraging/commuting in vicinity of turbine locations.

Increasing the cut-in speed to 5.5 m/s from 30 minutes prior to sunset and to 30 minutes after sunrise to reduce bat collisions with turbines should be employed where required (i.e. at turbine locations where surveillance recorded high bat activity levels for High Risk and Medium Risk bat species and/or bat carcasses were recorded). The duration required depends on the level of bat mitigation required for individual turbine sites (i.e. full bat activity season or confined to spring & autumn months – this will be determine by first year surveillance). A risk assessment should be undertaken using the surveillance data and analysed using best practice e.g. assessment of static data should be completed using the online tool *EcoBat* (http://www.mammal.org.uk/science-research/ecostat/) as recommended by NaturScot, 2021 or other equivalent tool depending on most up to-date recommendations at the time of monitoring.

Where cut-in speeds are required, they should be operated according to specific weather conditions. In a previous bat survey (on different site location) undertaken by the author, static units were erected on an anemometer at 4m and 50m level. The number of bat passes recorded on the static units was analysed according to temperature and wind speed recorded at similar height levels. During this survey, it was determined that:

1. The vast majority of bat passes were recorded at the temperatures of 8ºC and greater. Therefore, when the air temperature was less than 7ºC there was no bat activity recorded below this temperature during the surveys completed.
2. In general, bat activity was highest at low wind speeds (<5.5m/s). It has been shown that curtailing the operations of wind turbines at low wind speeds can reduce bat mortality dramatically, especially during the late summer and early autumn months.
3. NaturScot (2021) recommend that curtailment is implemented for 10ºC and above.

Reducing fatalities can be reduced by changing the speed trigger or cut-in speeds of the turbines (i.e. meaning that the turbine is not operational during low wind speeds) or by changing the

turbine blades angles which will mean that higher wind speeds are needed to start the wind turbine blades moving. Modern remotely operated wind turbines allow such cut-in speeds to be controlled centrally and automatically.

Due to the high levels of bat activity, cut-in speeds is required at T2. As a precautionary, cut-in speeds is also recommended at T3. This is due to the research by (Lintott *et al.* (2016) and Richardson *et al.* (2021) which reported that ecological impact assessments have failed to reduce the risk of wind farms on local bat populations and that the bat activity levels recorded during pre-construction bat surveys may not accurately reflect the bat activity levels during wind farm operation.

It is recommended that surveillance is undertaken at the High (T2) and Medium Risk turbines (T3) over a period of three years (first three years of operation, but an annual review is required to determine if the cut-in speeds should be implemented after 1 year of operation). If the Common pipistrelle activity remains moderate to high at the T3 Medium Risk turbine after the first year of surveillance then the cut-in speeds (coupled with carcass search results) should be put in place immediately. High and Medium Risk turbines surveillance will continue to review the situation at each individual turbine location for the remaining two years. This will allow refinement of the curtailment regime.

For all other turbines, operation without cut-in speeds coupled with 3 years of surveillance (according to NaturScot, 2021 guidelines) to determine if cut-in speeds are required at these turbine locations.

As recommended by SNH, 2019 if curtailment is put into operation, *"then the effectiveness of curtailment needs to be monitored in order to determine (a) whether it is working effectively (i.e. the level of bat mortality is considered to be incidental), and (b) whether the curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties".*

"Where the need for curtailment has been identified, a curtailment regime should be developed and presented as a part of the supporting Environmental Statement for the project. The proposed operating regime should specify, and be designed around the values for the key weather parameters and other factors that are known to influence collision risk which may include any or all of the following:

- *Wind speed in m/s (measured at nacelle height)*
- *Time after sunset*
- *Month of the year*
- *Temperature (°C)*
- *Precipitation (mm/hr) "*

Post construction acoustic surveys provide additional information which, when used in conjunction with appropriate carcass search data, can support any proposed changes to pre-application predictions concerning the need for curtailment or adjustments to an agreed curtailment regime.

This surveillance and annual review should be carried out by an independent experienced bat ecologist and all reports should be issued to the Local Authority and NPWS for review.

Table 11: Bat Mitigation Measures recommended during the Operational Phase.

EcoBat Tool High Level Turbine Locations This applies to T2	**EcoBat Tool Medium Level Turbine Locations** This applies to T3 This also applies to remaining Internal Road Network	**EcoBat Tool Low Level Turbine Locations** This applies to T1, T4 & T5
Operate the wind turbines in a manner that reduces the movement of the blades below the cut-in speed (e.g. by feathering the blades).	Operate the wind turbines in a manner that reduces the movement of the blades below the cut-in speed (e.g. by feathering the blades).	Operate the wind turbines in a manner that reduces the movement of the blades below the cut-in speed (e.g. by feathering the blades).
Operate the wind turbine from 30 minutes prior sunset to 30 minutes after sunrise at a cut-in speed of 5.5 m/s during specified weather conditions and during the active bat season (April to October) when air temperatures are 10°C or more at the nacelle height. Undertake monitoring the first three years of operation to determine bat activity levels post construction. Review the results of monitoring at individual High Risk turbines after Year 1. Operate wind farm with specific cut-in speeds from Day 1 of Year 2, if required, and review after surveillance/monitoring is completed.	Operate the wind turbine from 30 minutes prior sunset to 30 minutes after sunrise at a cut-in speed of 5.5 m/s during specified weather conditions and during the active bat season (April to October) when air temperatures are 10°C or more at the nacelle height. Undertake monitoring the first three years of operation to determine bat activity levels post construction. Review the results of monitoring at individual High Risk turbines after Year 1. Operate wind farm with specific cut-in speeds from Day 1 of Year 2, if required, and review after surveillance/monitoring is completed.	
Undertake a carcass search for 3 years post operation of the wind farm to determine whether a higher cut-in speed of the blades is required. Review after Year 1 along with bat activity monitoring.	Undertake a carcass search for 3 years post operation of the wind farm to determine whether a higher cut-in speed of the blades is required. Review after Year 1 along with bat activity monitoring.	Undertake a carcass search for 3 years post operation of the wind farm.
Annual inspection of each buffer zone around each turbine will be undertaken and any regenerating trees or tall shrubs will be cut back.	Annual inspection of each buffer zone around each turbine will be annually inspected and any regenerating trees or tall shrubs will be cut back.	Annual inspection of each buffer zone around each turbine will be annually inspected and any regenerating trees or tall shrubs will be cut back.

Bat mitigation measures during the Operational Phase can be reviewed by implementing a strict surveillance programme for the first three years of operation of the wind farm in order to identify if there exists a substantial risk at a particular turbine location or during a particular time-period (3 yrs - as per recommendation of NaturScot, 2021 guidelines). This surveillance should then be repeated at Year 10 and Year 20 of the operation of the wind farm to ensure that sufficient mitigation is being implemented. This surveillance required is as follows:

a) Bat activity surveillance
   The level of bat activity should be monitoring for a minimum of 10 nights at each turbine location (ground level) during three of the eight month activity period (March/April to October/November). The surveillance periods should be divided into three survey periods to represent the three main periods where bat collisions have been documented: Spring (April/May); Summer (June/July) and Autumn (August/September).
b) Carcass search
   During the surveillance periods of specific wind turbines, carcass search is required for a minimum of 1 morning per turbine (i.e. 3/4 mornings in total over the 1 year surveillance, i.e. one per surveillance period). For each turbine, the search area should be 100m radius after ideal bat foraging weather conditions (mild, calm and dry weather and greater than 10°C). A scavenger trial is required to facilitate analysis (as per NaturScot, 2021 guidelines).
c) For exact protocols consult most up-date best practice guidelines from current research publications / guidelines (e.g. SNH, 2021).
d) Assessment of static data should be completed using the online tool *EcoBat Tool* (http://www.mammal.org.uk/science-research/ecostat/) as recommended by NaturScot, 2021 or other equivalent tool depending on most up to-date recommendations at the time of monitoring.

5.6.3 Bat Surveys – Age of Data

It is recommended that if three years lapse from between pre-construction surveys and the construction of the wind turbines, it may be necessary to repeat the pre-construction surveys (Rodrigues *et al.*, 2015). Surveys completed for this report concluded in early 2023. Therefore, a review should be undertaken no later than Spring 2025. Future survey work should be completed according to best practice guidelines available.

6. Conclusions

The survey area is deemed to have a Low to Medium landscape favourability for Irish bat species.

During bat surveys eight species of bat were recorded within the survey area and this is a high level of bat biodiversity. The level of bat activity recorded in 2022 was, in general, Low but some Moderate to High levels were recorded on specific static units during surveillance, particularly for common pipistrelle.

Five turbines are proposed as part of this wind farm development. Bat activity was recorded at all or in vicinity of the proposed turbine locations. Additional bat activity was recorded along much of the walking and driven transect routes while a lower level was recorded in open areas of bog. But this is also a reflection of restricted survey locations during the hours of darkness.

One set of buildings located within the proposed development site was recorded as a Night Roost for three species of bat: lesser horseshoe bat, Natterer's bat and brown long-eared bat. However, all three of these bat species are considered to be Low Risk in relation to potential impact from wind turbines.

The location of wind turbines is important in relation to their potential impact on local bat populations. To reduce impact on High Risk species such as common pipistrelle, it is important to ensure that turbines are not located adjacent to the linear habitat features and habitat considered important for foraging bats. The proposed development will impact on local bat populations and this is primarily due to the moderate to high levels of bat activity of common pipistrelle. This bat species are considered to be High Risk species in relation to wind farms. As a consequence bat mitigation measures are required.

The mitigation measures recommended in this report require strict implementation to reduce the long-term impact of the proposed wind farm on local bat populations. The proposed wind farm is likely to have an overall Moderate impact on local bat populations. The implementation of mitigation measures will potentially reduce this to a Low Impact on local bat populations.

Monitoring (including acoustic surveillance and carcass surveys) is essential to determine that mitigation measures recommended are reducing the potential impacts on local bat populations. The operation of the wind farm should be flexible to implement changes, if recommended, by the monitoring results.

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8. Appendices

Appendix I:
Static Surveillance Bat Survey Data

Table A: Summary of the total number of bat passes recorded for each bat species on each static unit during static surveillance.

P.pip = Common pipistrelle *Pipistrellus pipistrellus;* P.pyg = Soprano pipistrelle *P. pygmaeus*, N.leis – Leisler's bat *Nyctalus leisleri*, P.aur = Brown long-eared bat *Plecotus auritus*, M.daub = Daubenton's bat *Myotis daubentonii*, M.natt = Natterer's bat *M. nattereri*, M.mys = Whiskered bat *M. mystacinus*, Myotis = Myotis species, R.hip = Lesser horseshoe bat *Rhinolophus hipposideros*

Turbine	EcoBat Code	Date Deployed	No. Nights	P.pip	P.pyg	N.leis	P.aur	M.daub	M.natt	M.mys	Myotis	R.hip	Total
T1	Spring 1	27/05/2022	13	2	0	0	0	0	0	0	0	0	2
T2	Spring 2	27/05/2022	13	1171	46	1	2	3	4	1	1	0	1229
T3	Spring 3	27/05/2022	13	467	1	27	1	8	4	2	3	0	513
T4	Spring 4	27/05/2022	13	934	48	44	0	1	10	0	32	0	1069
T5	Spring 5	27/05/2022	13	201	9	27	3	1	0	4	0	0	245
Additional Location	Spring 6	06/07/2022	15	2010	85	207	3	4	3	1	4	0	2317

Turbine	EcoBat Code	Date Deployed	No. Nights	P.pip	P.pyg	N.leis	P.aur	M.daub	M.natt	M.mys	Myotis	R.hip	Total
T1	Summer 1	21/07/2022	11	3	5	13	1	0	0	0	0	0	22
T2	Summer 2	21/07/2022	11	714	26	36	2	0	1	3	0	0	782
T3	Summer 3	21/07/2022	11	517	39	37	2	4	2	3	1	0	605
T4	Summer 4	21/07/2022	11	22	3	52	0	0	0	0	0	0	77
T5	Summer 5	21/07/2022	11	35	30	29	2	2	1	1	5	0	105
Additional Location	Summer 6	21/07/2022	11	467	24	52	2	0	1	0	2	0	548

Turbine	EcoBat Code	Date Deployed	No. Nights	P.pip	P.pyg	N.leis	P.aur	M.daub	M.natt	M.mys	Myotis	R.hip	Total
T1	Autumn 1	24/08/2022	10	0	0	0	0	0	0	0	0	0	0
T2	Autumn 2	24/08/2022	10	821	55	28	16	16	6	3	10	0	955
T3	Autumn 3	24/08/2022	10	682	62	24	18	11	26	7	15	1	846
T4	Autumn 4	24/08/2022	10	63	11	19	1	0	0	0	4	0	98

T5	Autumn 5	24/08/2022	10	65	20	17	9	4	2	5	6	0	128
Additional Location	Autumn 6	24/08/2022	10	259	42	20	6	8	7	9	12	0	363
T1	Autumn 7	19/09/2022	13	9	0	0	3	1	0	0	0	0	13
T2	Autumn 8	19/09/2022	13	175	29	0	8	8	3	3	0	0	226
T3	Autumn 9	19/09/2022	13	423	44	1	7	4	5	5	8	0	497
T5	Autumn 10	19/09/2022	13	21	5	2	0	0	0	0	0	0	28
Habitat 1	Autumn 11	19/09/2022	13	132	36	6	31	0	1	0	3	0	209
Habitat 2	Autumn 12	19/09/2022	13	736	23	3	9	3	3	5	6	1	789
Habitat 3	Autumn 13	19/09/2022	13	1051	77	5	3	3	1	1	4	0	1145

Table B: Nightly data for each bat species recorded on each static unit during Spring Surveillance 2022

Location name	Location of bat detector (geographic coordinates)	Spatial Reference System	Date of bat survey	Species	Passes per night
Spring 3	51.95662686,-9.26621797	Latitude and Longitude	27/05/2022	Myotis	0
Spring 3	51.95662686,-9.26621798	Latitude and Longitude	28/05/2022	Myotis	0
Spring 3	51.95662686,-9.26621799	Latitude and Longitude	29/05/2022	Myotis	0
Spring 3	51.95662686,-9.26621800	Latitude and Longitude	30/05/2022	Myotis	0
Spring 3	51.95662686,-9.26621801	Latitude and Longitude	31/05/2022	Myotis	0
Spring 3	51.95662686,-9.26621802	Latitude and Longitude	01/06/2022	Myotis	0
Spring 3	51.95662686,-9.26621803	Latitude and Longitude	02/06/2022	Myotis	0
Spring 3	51.95662686,-9.26621804	Latitude and Longitude	03/06/2022	Myotis	0
Spring 3	51.95662686,-9.26621805	Latitude and Longitude	04/06/2022	Myotis	3
Spring 3	51.95662686,-9.26621806	Latitude and Longitude	05/06/2022	Myotis	0
Spring 3	51.95662686,-9.26621807	Latitude and Longitude	06/06/2022	Myotis	0
Spring 3	51.95662686,-9.26621808	Latitude and Longitude	07/06/2022	Myotis	0
Spring 3	51.95662686,-9.26621809	Latitude and Longitude	08/06/2022	Myotis	0
Spring 4	51.95680764,-9.256896514	Latitude and Longitude	27/05/2022	Myotis	0
Spring 4	51.95680764,-9.256896515	Latitude and Longitude	28/05/2022	Myotis	4
Spring 4	51.95680764,-9.256896516	Latitude and Longitude	29/05/2022	Myotis	17
Spring 4	51.95680764,-9.256896517	Latitude and Longitude	30/05/2022	Myotis	0
Spring 4	51.95680764,-9.256896518	Latitude and Longitude	31/05/2022	Myotis	0
Spring 4	51.95680764,-9.256896519	Latitude and Longitude	01/06/2022	Myotis	11
Spring 4	51.95680764,-9.256896520	Latitude and Longitude	02/06/2022	Myotis	0
Spring 4	51.95680764,-9.256896521	Latitude and Longitude	03/06/2022	Myotis	0
Spring 4	51.95680764,-9.256896522	Latitude and Longitude	04/06/2022	Myotis	0

Spring 4	51.95680764,-9.256896523	Latitude and Longitude	05/06/2022	Myotis	0
Spring 4	51.95680764,-9.256896524	Latitude and Longitude	06/06/2022	Myotis	0
Spring 4	51.95680764,-9.256896525	Latitude and Longitude	07/06/2022	Myotis	0
Spring 4	51.95680764,-9.256896526	Latitude and Longitude	08/06/2022	Myotis	0
Spring 6	51.95017242,-9.248534998	Latitude and Longitude	06/07/2022	Myotis	0
Spring 6	51.95017242,-9.248534999	Latitude and Longitude	07/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535000	Latitude and Longitude	08/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535001	Latitude and Longitude	09/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535002	Latitude and Longitude	10/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535003	Latitude and Longitude	11/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535004	Latitude and Longitude	12/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535005	Latitude and Longitude	13/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535006	Latitude and Longitude	14/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535007	Latitude and Longitude	15/07/2022	Myotis	2
Spring 6	51.95017242,-9.248535008	Latitude and Longitude	16/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535009	Latitude and Longitude	17/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535010	Latitude and Longitude	18/07/2022	Myotis	0
Spring 6	51.95017242,-9.248535011	Latitude and Longitude	19/07/2022	Myotis	1
Spring 6	51.95017242,-9.248535012	Latitude and Longitude	20/07/2022	Myotis	1
Spring 3	51.95662686,-9.26621758	Latitude and Longitude	27/05/2022	Myotis daubentonii	0
Spring 3	51.95662686,-9.26621759	Latitude and Longitude	28/05/2022	Myotis daubentonii	2
Spring 3	51.95662686,-9.26621760	Latitude and Longitude	29/05/2022	Myotis daubentonii	1
Spring 3	51.95662686,-9.26621761	Latitude and Longitude	30/05/2022	Myotis daubentonii	2
Spring 3	51.95662686,-9.26621762	Latitude and Longitude	31/05/2022	Myotis daubentonii	0
Spring 3	51.95662686,-9.26621763	Latitude and Longitude	01/06/2022	Myotis daubentonii	1
Spring 3	51.95662686,-9.26621764	Latitude and Longitude	02/06/2022	Myotis daubentonii	1
Spring 3	51.95662686,-9.26621765	Latitude and Longitude	03/06/2022	Myotis daubentonii	1
Spring 3	51.95662686,-9.26621766	Latitude and Longitude	04/06/2022	Myotis daubentonii	0
Spring 3	51.95662686,-9.26621767	Latitude and Longitude	05/06/2022	Myotis daubentonii	0
Spring 3	51.95662686,-9.26621768	Latitude and Longitude	06/06/2022	Myotis daubentonii	0
Spring 3	51.95662686,-9.26621769	Latitude and Longitude	07/06/2022	Myotis daubentonii	0
Spring 3	51.95662686,-9.26621770	Latitude and Longitude	08/06/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896488	Latitude and Longitude	27/05/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896489	Latitude and Longitude	28/05/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896490	Latitude and Longitude	29/05/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896491	Latitude and Longitude	30/05/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896492	Latitude and Longitude	31/05/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896493	Latitude and Longitude	01/06/2022	Myotis daubentonii	0

Spring 4	51.95680764,-9.256896494	Latitude and Longitude	02/06/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896495	Latitude and Longitude	03/06/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896496	Latitude and Longitude	04/06/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896497	Latitude and Longitude	05/06/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896498	Latitude and Longitude	06/06/2022	Myotis daubentonii	1
Spring 4	51.95680764,-9.256896499	Latitude and Longitude	07/06/2022	Myotis daubentonii	0
Spring 4	51.95680764,-9.256896500	Latitude and Longitude	08/06/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947816	Latitude and Longitude	27/05/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947817	Latitude and Longitude	28/05/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947818	Latitude and Longitude	29/05/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947819	Latitude and Longitude	30/05/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947820	Latitude and Longitude	31/05/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947821	Latitude and Longitude	01/06/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947822	Latitude and Longitude	02/06/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947823	Latitude and Longitude	03/06/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947824	Latitude and Longitude	04/06/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947825	Latitude and Longitude	05/06/2022	Myotis daubentonii	1
Spring 5	51.95361514,-9.251947826	Latitude and Longitude	06/06/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947827	Latitude and Longitude	07/06/2022	Myotis daubentonii	0
Spring 5	51.95361514,-9.251947828	Latitude and Longitude	08/06/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534953	Latitude and Longitude	06/07/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534954	Latitude and Longitude	07/07/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534955	Latitude and Longitude	08/07/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534956	Latitude and Longitude	09/07/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534957	Latitude and Longitude	10/07/2022	Myotis daubentonii	1
Spring 6	51.95017242,-9.248534958	Latitude and Longitude	11/07/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534959	Latitude and Longitude	12/07/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534960	Latitude and Longitude	13/07/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534961	Latitude and Longitude	14/07/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534962	Latitude and Longitude	15/07/2022	Myotis daubentonii	1
Spring 6	51.95017242,-9.248534963	Latitude and Longitude	16/07/2022	Myotis daubentonii	1
Spring 6	51.95017242,-9.248534964	Latitude and Longitude	17/07/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534965	Latitude and Longitude	18/07/2022	Myotis daubentonii	1
Spring 6	51.95017242,-9.248534966	Latitude and Longitude	19/07/2022	Myotis daubentonii	0
Spring 6	51.95017242,-9.248534967	Latitude and Longitude	20/07/2022	Myotis daubentonii	0
Spring 3	51.95662686,-9.26621771	Latitude and Longitude	27/05/2022	Myotis mystacinus	0
Spring 3	51.95662686,-9.26621772	Latitude and Longitude	28/05/2022	Myotis mystacinus	0
Spring 3	51.95662686,-9.26621773	Latitude and Longitude	29/05/2022	Myotis mystacinus	1

Spring 3	51.95662686,-9.26621774	Latitude and Longitude	30/05/2022	Myotis mystacinus	0
Spring 3	51.95662686,-9.26621775	Latitude and Longitude	31/05/2022	Myotis mystacinus	0
Spring 3	51.95662686,-9.26621776	Latitude and Longitude	01/06/2022	Myotis mystacinus	0
Spring 3	51.95662686,-9.26621777	Latitude and Longitude	02/06/2022	Myotis mystacinus	1
Spring 3	51.95662686,-9.26621778	Latitude and Longitude	03/06/2022	Myotis mystacinus	0
Spring 3	51.95662686,-9.26621779	Latitude and Longitude	04/06/2022	Myotis mystacinus	0
Spring 3	51.95662686,-9.26621780	Latitude and Longitude	05/06/2022	Myotis mystacinus	0
Spring 3	51.95662686,-9.26621781	Latitude and Longitude	06/06/2022	Myotis mystacinus	0
Spring 3	51.95662686,-9.26621782	Latitude and Longitude	07/06/2022	Myotis mystacinus	0
Spring 3	51.95662686,-9.26621783	Latitude and Longitude	08/06/2022	Myotis mystacinus	0
Spring 5	51.95361514,-9.251947829	Latitude and Longitude	27/05/2022	Myotis mystacinus	0
Spring 5	51.95361514,-9.251947830	Latitude and Longitude	28/05/2022	Myotis mystacinus	1
Spring 5	51.95361514,-9.251947831	Latitude and Longitude	29/05/2022	Myotis mystacinus	0
Spring 5	51.95361514,-9.251947832	Latitude and Longitude	30/05/2022	Myotis mystacinus	0
Spring 5	51.95361514,-9.251947833	Latitude and Longitude	31/05/2022	Myotis mystacinus	0
Spring 5	51.95361514,-9.251947834	Latitude and Longitude	01/06/2022	Myotis mystacinus	0
Spring 5	51.95361514,-9.251947835	Latitude and Longitude	02/06/2022	Myotis mystacinus	0
Spring 5	51.95361514,-9.251947836	Latitude and Longitude	03/06/2022	Myotis mystacinus	0
Spring 5	51.95361514,-9.251947837	Latitude and Longitude	04/06/2022	Myotis mystacinus	1
Spring 5	51.95361514,-9.251947838	Latitude and Longitude	05/06/2022	Myotis mystacinus	0
Spring 5	51.95361514,-9.251947839	Latitude and Longitude	06/06/2022	Myotis mystacinus	0
Spring 5	51.95361514,-9.251947840	Latitude and Longitude	07/06/2022	Myotis mystacinus	1
Spring 5	51.95361514,-9.251947841	Latitude and Longitude	08/06/2022	Myotis mystacinus	1
Spring 6	51.95017242,-9.248534968	Latitude and Longitude	06/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534969	Latitude and Longitude	07/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534970	Latitude and Longitude	08/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534971	Latitude and Longitude	09/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534972	Latitude and Longitude	10/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534973	Latitude and Longitude	11/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534974	Latitude and Longitude	12/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534975	Latitude and Longitude	13/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534976	Latitude and Longitude	14/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534977	Latitude and Longitude	15/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534978	Latitude and Longitude	16/07/2022	Myotis mystacinus	1
Spring 6	51.95017242,-9.248534979	Latitude and Longitude	17/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534980	Latitude and Longitude	18/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534981	Latitude and Longitude	19/07/2022	Myotis mystacinus	0
Spring 6	51.95017242,-9.248534982	Latitude and Longitude	20/07/2022	Myotis mystacinus	0

Spring 3	51.95662686,-9.26621784	Latitude and Longitude	27/05/2022	Myotis nattereri	0
Spring 3	51.95662686,-9.26621785	Latitude and Longitude	28/05/2022	Myotis nattereri	0
Spring 3	51.95662686,-9.26621786	Latitude and Longitude	29/05/2022	Myotis nattereri	0
Spring 3	51.95662686,-9.26621787	Latitude and Longitude	30/05/2022	Myotis nattereri	1
Spring 3	51.95662686,-9.26621788	Latitude and Longitude	31/05/2022	Myotis nattereri	0
Spring 3	51.95662686,-9.26621789	Latitude and Longitude	01/06/2022	Myotis nattereri	0
Spring 3	51.95662686,-9.26621790	Latitude and Longitude	02/06/2022	Myotis nattereri	0
Spring 3	51.95662686,-9.26621791	Latitude and Longitude	03/06/2022	Myotis nattereri	0
Spring 3	51.95662686,-9.26621792	Latitude and Longitude	04/06/2022	Myotis nattereri	1
Spring 3	51.95662686,-9.26621793	Latitude and Longitude	05/06/2022	Myotis nattereri	0
Spring 3	51.95662686,-9.26621794	Latitude and Longitude	06/06/2022	Myotis nattereri	0
Spring 3	51.95662686,-9.26621795	Latitude and Longitude	07/06/2022	Myotis nattereri	1
Spring 3	51.95662686,-9.26621796	Latitude and Longitude	08/06/2022	Myotis nattereri	1
Spring 4	51.95680764,-9.256896501	Latitude and Longitude	27/05/2022	Myotis nattereri	0
Spring 4	51.95680764,-9.256896502	Latitude and Longitude	28/05/2022	Myotis nattereri	0
Spring 4	51.95680764,-9.256896503	Latitude and Longitude	29/05/2022	Myotis nattereri	4
Spring 4	51.95680764,-9.256896504	Latitude and Longitude	30/05/2022	Myotis nattereri	1
Spring 4	51.95680764,-9.256896505	Latitude and Longitude	31/05/2022	Myotis nattereri	0
Spring 4	51.95680764,-9.256896506	Latitude and Longitude	01/06/2022	Myotis nattereri	5
Spring 4	51.95680764,-9.256896507	Latitude and Longitude	02/06/2022	Myotis nattereri	0
Spring 4	51.95680764,-9.256896508	Latitude and Longitude	03/06/2022	Myotis nattereri	0
Spring 4	51.95680764,-9.256896509	Latitude and Longitude	04/06/2022	Myotis nattereri	0
Spring 4	51.95680764,-9.256896510	Latitude and Longitude	05/06/2022	Myotis nattereri	0
Spring 4	51.95680764,-9.256896511	Latitude and Longitude	06/06/2022	Myotis nattereri	0
Spring 4	51.95680764,-9.256896512	Latitude and Longitude	07/06/2022	Myotis nattereri	0
Spring 4	51.95680764,-9.256896513	Latitude and Longitude	08/06/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534983	Latitude and Longitude	06/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534984	Latitude and Longitude	07/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534985	Latitude and Longitude	08/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534986	Latitude and Longitude	09/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534987	Latitude and Longitude	10/07/2022	Myotis nattereri	1
Spring 6	51.95017242,-9.248534988	Latitude and Longitude	11/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534989	Latitude and Longitude	12/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534990	Latitude and Longitude	13/07/2022	Myotis nattereri	1
Spring 6	51.95017242,-9.248534991	Latitude and Longitude	14/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534992	Latitude and Longitude	15/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534993	Latitude and Longitude	16/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534994	Latitude and Longitude	17/07/2022	Myotis nattereri	1

Spring 6	51.95017242,-9.248534995	Latitude and Longitude	18/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534996	Latitude and Longitude	19/07/2022	Myotis nattereri	0
Spring 6	51.95017242,-9.248534997	Latitude and Longitude	20/07/2022	Myotis nattereri	0
Spring 2	51.951872,-9.26782946	Latitude and Longitude	27/05/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782947	Latitude and Longitude	28/05/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782948	Latitude and Longitude	29/05/2022	Nyctalus leisleri	1
Spring 2	51.951872,-9.26782949	Latitude and Longitude	30/05/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782950	Latitude and Longitude	31/05/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782951	Latitude and Longitude	01/06/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782952	Latitude and Longitude	02/06/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782953	Latitude and Longitude	03/06/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782954	Latitude and Longitude	04/06/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782955	Latitude and Longitude	05/06/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782956	Latitude and Longitude	06/06/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782957	Latitude and Longitude	07/06/2022	Nyctalus leisleri	0
Spring 2	51.951872,-9.26782958	Latitude and Longitude	08/06/2022	Nyctalus leisleri	0
Spring 3	51.95662686,-9.26621706	Latitude and Longitude	27/05/2022	Nyctalus leisleri	0
Spring 3	51.95662686,-9.26621707	Latitude and Longitude	28/05/2022	Nyctalus leisleri	0
Spring 3	51.95662686,-9.26621708	Latitude and Longitude	29/05/2022	Nyctalus leisleri	0
Spring 3	51.95662686,-9.26621709	Latitude and Longitude	30/05/2022	Nyctalus leisleri	1
Spring 3	51.95662686,-9.26621710	Latitude and Longitude	31/05/2022	Nyctalus leisleri	0
Spring 3	51.95662686,-9.26621711	Latitude and Longitude	01/06/2022	Nyctalus leisleri	0
Spring 3	51.95662686,-9.26621712	Latitude and Longitude	02/06/2022	Nyctalus leisleri	1
Spring 3	51.95662686,-9.26621713	Latitude and Longitude	03/06/2022	Nyctalus leisleri	0
Spring 3	51.95662686,-9.26621714	Latitude and Longitude	04/06/2022	Nyctalus leisleri	1
Spring 3	51.95662686,-9.26621715	Latitude and Longitude	05/06/2022	Nyctalus leisleri	0
Spring 3	51.95662686,-9.26621716	Latitude and Longitude	06/06/2022	Nyctalus leisleri	0
Spring 3	51.95662686,-9.26621717	Latitude and Longitude	07/06/2022	Nyctalus leisleri	0
Spring 3	51.95662686,-9.26621718	Latitude and Longitude	08/06/2022	Nyctalus leisleri	24
Spring 4	51.95680764,-9.256896449	Latitude and Longitude	27/05/2022	Nyctalus leisleri	0
Spring 4	51.95680764,-9.256896450	Latitude and Longitude	28/05/2022	Nyctalus leisleri	3
Spring 4	51.95680764,-9.256896451	Latitude and Longitude	29/05/2022	Nyctalus leisleri	3
Spring 4	51.95680764,-9.256896452	Latitude and Longitude	30/05/2022	Nyctalus leisleri	0
Spring 4	51.95680764,-9.256896453	Latitude and Longitude	31/05/2022	Nyctalus leisleri	0
Spring 4	51.95680764,-9.256896454	Latitude and Longitude	01/06/2022	Nyctalus leisleri	0
Spring 4	51.95680764,-9.256896455	Latitude and Longitude	02/06/2022	Nyctalus leisleri	0
Spring 4	51.95680764,-9.256896456	Latitude and Longitude	03/06/2022	Nyctalus leisleri	0
Spring 4	51.95680764,-9.256896457	Latitude and Longitude	04/06/2022	Nyctalus leisleri	0

Spring 4	51.95680764,-9.256896458	Latitude and Longitude	05/06/2022	Nyctalus leisleri	0
Spring 4	51.95680764,-9.256896459	Latitude and Longitude	06/06/2022	Nyctalus leisleri	35
Spring 4	51.95680764,-9.256896460	Latitude and Longitude	07/06/2022	Nyctalus leisleri	1
Spring 4	51.95680764,-9.256896461	Latitude and Longitude	08/06/2022	Nyctalus leisleri	2
Spring 5	51.95361514,-9.251947764	Latitude and Longitude	27/05/2022	Nyctalus leisleri	0
Spring 5	51.95361514,-9.251947765	Latitude and Longitude	28/05/2022	Nyctalus leisleri	2
Spring 5	51.95361514,-9.251947766	Latitude and Longitude	29/05/2022	Nyctalus leisleri	4
Spring 5	51.95361514,-9.251947767	Latitude and Longitude	30/05/2022	Nyctalus leisleri	0
Spring 5	51.95361514,-9.251947768	Latitude and Longitude	31/05/2022	Nyctalus leisleri	0
Spring 5	51.95361514,-9.251947769	Latitude and Longitude	01/06/2022	Nyctalus leisleri	1
Spring 5	51.95361514,-9.251947770	Latitude and Longitude	02/06/2022	Nyctalus leisleri	4
Spring 5	51.95361514,-9.251947771	Latitude and Longitude	03/06/2022	Nyctalus leisleri	1
Spring 5	51.95361514,-9.251947772	Latitude and Longitude	04/06/2022	Nyctalus leisleri	2
Spring 5	51.95361514,-9.251947773	Latitude and Longitude	05/06/2022	Nyctalus leisleri	2
Spring 5	51.95361514,-9.251947774	Latitude and Longitude	06/06/2022	Nyctalus leisleri	2
Spring 5	51.95361514,-9.251947775	Latitude and Longitude	07/06/2022	Nyctalus leisleri	0
Spring 5	51.95361514,-9.251947776	Latitude and Longitude	08/06/2022	Nyctalus leisleri	8
Spring 6	51.95017242,-9.248534893	Latitude and Longitude	06/07/2022	Nyctalus leisleri	0
Spring 6	51.95017242,-9.248534894	Latitude and Longitude	07/07/2022	Nyctalus leisleri	0
Spring 6	51.95017242,-9.248534895	Latitude and Longitude	08/07/2022	Nyctalus leisleri	5
Spring 6	51.95017242,-9.248534896	Latitude and Longitude	09/07/2022	Nyctalus leisleri	45
Spring 6	51.95017242,-9.248534897	Latitude and Longitude	10/07/2022	Nyctalus leisleri	39
Spring 6	51.95017242,-9.248534898	Latitude and Longitude	11/07/2022	Nyctalus leisleri	5
Spring 6	51.95017242,-9.248534899	Latitude and Longitude	12/07/2022	Nyctalus leisleri	29
Spring 6	51.95017242,-9.248534900	Latitude and Longitude	13/07/2022	Nyctalus leisleri	0
Spring 6	51.95017242,-9.248534901	Latitude and Longitude	14/07/2022	Nyctalus leisleri	1
Spring 6	51.95017242,-9.248534902	Latitude and Longitude	15/07/2022	Nyctalus leisleri	22
Spring 6	51.95017242,-9.248534903	Latitude and Longitude	16/07/2022	Nyctalus leisleri	46
Spring 6	51.95017242,-9.248534904	Latitude and Longitude	17/07/2022	Nyctalus leisleri	4
Spring 6	51.95017242,-9.248534905	Latitude and Longitude	18/07/2022	Nyctalus leisleri	3
Spring 6	51.95017242,-9.248534906	Latitude and Longitude	19/07/2022	Nyctalus leisleri	8
Spring 6	51.95017242,-9.248534907	Latitude and Longitude	20/07/2022	Nyctalus leisleri	0
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	27/05/2022	Pipistrellus pipistrellus	0
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	28/05/2022	Pipistrellus pipistrellus	1
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	29/05/2022	Pipistrellus pipistrellus	0
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	30/05/2022	Pipistrellus pipistrellus	0
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	31/05/2022	Pipistrellus pipistrellus	0
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	01/06/2022	Pipistrellus pipistrellus	0

Spring 1	51.95563163,-9.27513818	Latitude and Longitude	02/06/2022	Pipistrellus pipistrellus	0
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	03/06/2022	Pipistrellus pipistrellus	0
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	04/06/2022	Pipistrellus pipistrellus	0
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	05/06/2022	Pipistrellus pipistrellus	0
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	06/06/2022	Pipistrellus pipistrellus	1
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	07/06/2022	Pipistrellus pipistrellus	0
Spring 1	51.95563163,-9.27513818	Latitude and Longitude	08/06/2022	Pipistrellus pipistrellus	0
Spring 2	51.951872.-9.26782959	Latitude and Longitude	27/05/2022	Pipistrellus pipistrellus	7
Spring 2	51.951872.-9.26782960	Latitude and Longitude	28/05/2022	Pipistrellus pipistrellus	322
Spring 2	51.951872.-9.26782961	Latitude and Longitude	29/05/2022	Pipistrellus pipistrellus	190
Spring 2	51.951872.-9.26782962	Latitude and Longitude	30/05/2022	Pipistrellus pipistrellus	29
Spring 2	51.951872.-9.26782963	Latitude and Longitude	31/05/2022	Pipistrellus pipistrellus	20
Spring 2	51.951872.-9.26782964	Latitude and Longitude	01/06/2022	Pipistrellus pipistrellus	66
Spring 2	51.951872.-9.26782965	Latitude and Longitude	02/06/2022	Pipistrellus pipistrellus	74
Spring 2	51.951872.-9.26782966	Latitude and Longitude	03/06/2022	Pipistrellus pipistrellus	55
Spring 2	51.951872.-9.26782967	Latitude and Longitude	04/06/2022	Pipistrellus pipistrellus	7
Spring 2	51.951872.-9.26782968	Latitude and Longitude	05/06/2022	Pipistrellus pipistrellus	1
Spring 2	51.951872.-9.26782969	Latitude and Longitude	06/06/2022	Pipistrellus pipistrellus	74
Spring 2	51.951872.-9.26782970	Latitude and Longitude	07/06/2022	Pipistrellus pipistrellus	18
Spring 2	51.951872.-9.26782971	Latitude and Longitude	08/06/2022	Pipistrellus pipistrellus	308
Spring 3	51.95662686.-9.26621719	Latitude and Longitude	27/05/2022	Pipistrellus pipistrellus	4
Spring 3	51.95662686.-9.26621720	Latitude and Longitude	28/05/2022	Pipistrellus pipistrellus	68
Spring 3	51.95662686.-9.26621721	Latitude and Longitude	29/05/2022	Pipistrellus pipistrellus	54
Spring 3	51.95662686.-9.26621722	Latitude and Longitude	30/05/2022	Pipistrellus pipistrellus	7
Spring 3	51.95662686.-9.26621723	Latitude and Longitude	31/05/2022	Pipistrellus pipistrellus	0
Spring 3	51.95662686.-9.26621724	Latitude and Longitude	01/06/2022	Pipistrellus pipistrellus	2
Spring 3	51.95662686.-9.26621725	Latitude and Longitude	02/06/2022	Pipistrellus pipistrellus	58
Spring 3	51.95662686.-9.26621726	Latitude and Longitude	03/06/2022	Pipistrellus pipistrellus	19
Spring 3	51.95662686.-9.26621727	Latitude and Longitude	04/06/2022	Pipistrellus pipistrellus	3
Spring 3	51.95662686.-9.26621728	Latitude and Longitude	05/06/2022	Pipistrellus pipistrellus	0
Spring 3	51.95662686.-9.26621729	Latitude and Longitude	06/06/2022	Pipistrellus pipistrellus	149
Spring 3	51.95662686.-9.26621730	Latitude and Longitude	07/06/2022	Pipistrellus pipistrellus	25
Spring 3	51.95662686.-9.26621731	Latitude and Longitude	08/06/2022	Pipistrellus pipistrellus	78
Spring 4	51.95680764,-9.256896462	Latitude and Longitude	27/05/2022	Pipistrellus pipistrellus	2
Spring 4	51.95680764,-9.256896463	Latitude and Longitude	28/05/2022	Pipistrellus pipistrellus	34
Spring 4	51.95680764,-9.256896464	Latitude and Longitude	29/05/2022	Pipistrellus pipistrellus	31
Spring 4	51.95680764,-9.256896465	Latitude and Longitude	30/05/2022	Pipistrellus pipistrellus	6
Spring 4	51.95680764,-9.256896466	Latitude and Longitude	31/05/2022	Pipistrellus pipistrellus	1

Spring 4	51.95680764,-9.256896467	Latitude and Longitude	01/06/2022	Pipistrellus pipistrellus	0
Spring 4	51.95680764,-9.256896468	Latitude and Longitude	02/06/2022	Pipistrellus pipistrellus	0
Spring 4	51.95680764,-9.256896469	Latitude and Longitude	03/06/2022	Pipistrellus pipistrellus	2
Spring 4	51.95680764,-9.256896470	Latitude and Longitude	04/06/2022	Pipistrellus pipistrellus	5
Spring 4	51.95680764,-9.256896471	Latitude and Longitude	05/06/2022	Pipistrellus pipistrellus	0
Spring 4	51.95680764,-9.256896472	Latitude and Longitude	06/06/2022	Pipistrellus pipistrellus	0
Spring 4	51.95680764,-9.256896473	Latitude and Longitude	07/06/2022	Pipistrellus pipistrellus	0
Spring 4	51.95680764,-9.256896474	Latitude and Longitude	08/06/2022	Pipistrellus pipistrellus	853
Spring 5	51.95361514,-9.251947777	Latitude and Longitude	27/05/2022	Pipistrellus pipistrellus	4
Spring 5	51.95361514,-9.251947778	Latitude and Longitude	28/05/2022	Pipistrellus pipistrellus	90
Spring 5	51.95361514,-9.251947779	Latitude and Longitude	29/05/2022	Pipistrellus pipistrellus	65
Spring 5	51.95361514,-9.251947780	Latitude and Longitude	30/05/2022	Pipistrellus pipistrellus	14
Spring 5	51.95361514,-9.251947781	Latitude and Longitude	31/05/2022	Pipistrellus pipistrellus	0
Spring 5	51.95361514,-9.251947782	Latitude and Longitude	01/06/2022	Pipistrellus pipistrellus	0
Spring 5	51.95361514,-9.251947783	Latitude and Longitude	02/06/2022	Pipistrellus pipistrellus	5
Spring 5	51.95361514,-9.251947784	Latitude and Longitude	03/06/2022	Pipistrellus pipistrellus	7
Spring 5	51.95361514,-9.251947785	Latitude and Longitude	04/06/2022	Pipistrellus pipistrellus	3
Spring 5	51.95361514,-9.251947786	Latitude and Longitude	05/06/2022	Pipistrellus pipistrellus	1
Spring 5	51.95361514,-9.251947787	Latitude and Longitude	06/06/2022	Pipistrellus pipistrellus	1
Spring 5	51.95361514,-9.251947788	Latitude and Longitude	07/06/2022	Pipistrellus pipistrellus	2
Spring 5	51.95361514,-9.251947789	Latitude and Longitude	08/06/2022	Pipistrellus pipistrellus	9
Spring 6	51.95017242,-9.248534908	Latitude and Longitude	06/07/2022	Pipistrellus pipistrellus	6
Spring 6	51.95017242,-9.248534909	Latitude and Longitude	07/07/2022	Pipistrellus pipistrellus	114
Spring 6	51.95017242,-9.248534910	Latitude and Longitude	08/07/2022	Pipistrellus pipistrellus	67
Spring 6	51.95017242,-9.248534911	Latitude and Longitude	09/07/2022	Pipistrellus pipistrellus	116
Spring 6	51.95017242,-9.248534912	Latitude and Longitude	10/07/2022	Pipistrellus pipistrellus	306
Spring 6	51.95017242,-9.248534913	Latitude and Longitude	11/07/2022	Pipistrellus pipistrellus	198
Spring 6	51.95017242,-9.248534914	Latitude and Longitude	12/07/2022	Pipistrellus pipistrellus	287
Spring 6	51.95017242,-9.248534915	Latitude and Longitude	13/07/2022	Pipistrellus pipistrellus	89
Spring 6	51.95017242,-9.248534916	Latitude and Longitude	14/07/2022	Pipistrellus pipistrellus	190
Spring 6	51.95017242,-9.248534917	Latitude and Longitude	15/07/2022	Pipistrellus pipistrellus	143
Spring 6	51.95017242,-9.248534918	Latitude and Longitude	16/07/2022	Pipistrellus pipistrellus	266
Spring 6	51.95017242,-9.248534919	Latitude and Longitude	17/07/2022	Pipistrellus pipistrellus	104
Spring 6	51.95017242,-9.248534920	Latitude and Longitude	18/07/2022	Pipistrellus pipistrellus	38
Spring 6	51.95017242,-9.248534921	Latitude and Longitude	19/07/2022	Pipistrellus pipistrellus	70
Spring 6	51.95017242,-9.248534922	Latitude and Longitude	20/07/2022	Pipistrellus pipistrellus	16
Spring 2	51.951872,-9.26782972	Latitude and Longitude	27/05/2022	Pipistrellus pygmaeus	13
Spring 2	51.951872,-9.26782973	Latitude and Longitude	28/05/2022	Pipistrellus pygmaeus	25

Spring 2	51.951872.-9.26782974	Latitude and Longitude	29/05/2022	Pipistrellus pygmaeus	2
Spring 2	51.951872.-9.26782975	Latitude and Longitude	30/05/2022	Pipistrellus pygmaeus	0
Spring 2	51.951872.-9.26782976	Latitude and Longitude	31/05/2022	Pipistrellus pygmaeus	0
Spring 2	51.951872.-9.26782977	Latitude and Longitude	01/06/2022	Pipistrellus pygmaeus	0
Spring 2	51.951872.-9.26782978	Latitude and Longitude	02/06/2022	Pipistrellus pygmaeus	4
Spring 2	51.951872.-9.26782979	Latitude and Longitude	03/06/2022	Pipistrellus pygmaeus	0
Spring 2	51.951872.-9.26782980	Latitude and Longitude	04/06/2022	Pipistrellus pygmaeus	0
Spring 2	51.951872.-9.26782981	Latitude and Longitude	05/06/2022	Pipistrellus pygmaeus	0
Spring 2	51.951872.-9.26782982	Latitude and Longitude	06/06/2022	Pipistrellus pygmaeus	0
Spring 2	51.951872.-9.26782983	Latitude and Longitude	07/06/2022	Pipistrellus pygmaeus	0
Spring 2	51.951872.-9.26782984	Latitude and Longitude	08/06/2022	Pipistrellus pygmaeus	2
Spring 3	51.95662686.-9.26621732	Latitude and Longitude	27/05/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621733	Latitude and Longitude	28/05/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621734	Latitude and Longitude	29/05/2022	Pipistrellus pygmaeus	1
Spring 3	51.95662686.-9.26621735	Latitude and Longitude	30/05/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621736	Latitude and Longitude	31/05/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621737	Latitude and Longitude	01/06/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621738	Latitude and Longitude	02/06/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621739	Latitude and Longitude	03/06/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621740	Latitude and Longitude	04/06/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621741	Latitude and Longitude	05/06/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621742	Latitude and Longitude	06/06/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621743	Latitude and Longitude	07/06/2022	Pipistrellus pygmaeus	0
Spring 3	51.95662686.-9.26621744	Latitude and Longitude	08/06/2022	Pipistrellus pygmaeus	0
Spring 4	51.95680764,-9.256896475	Latitude and Longitude	27/05/2022	Pipistrellus pygmaeus	1
Spring 4	51.95680764,-9.256896476	Latitude and Longitude	28/05/2022	Pipistrellus pygmaeus	2
Spring 4	51.95680764,-9.256896477	Latitude and Longitude	29/05/2022	Pipistrellus pygmaeus	3
Spring 4	51.95680764,-9.256896478	Latitude and Longitude	30/05/2022	Pipistrellus pygmaeus	0
Spring 4	51.95680764,-9.256896479	Latitude and Longitude	31/05/2022	Pipistrellus pygmaeus	0
Spring 4	51.95680764,-9.256896480	Latitude and Longitude	01/06/2022	Pipistrellus pygmaeus	1
Spring 4	51.95680764,-9.256896481	Latitude and Longitude	02/06/2022	Pipistrellus pygmaeus	0
Spring 4	51.95680764,-9.256896482	Latitude and Longitude	03/06/2022	Pipistrellus pygmaeus	1
Spring 4	51.95680764,-9.256896483	Latitude and Longitude	04/06/2022	Pipistrellus pygmaeus	0
Spring 4	51.95680764,-9.256896484	Latitude and Longitude	05/06/2022	Pipistrellus pygmaeus	0
Spring 4	51.95680764,-9.256896485	Latitude and Longitude	06/06/2022	Pipistrellus pygmaeus	0
Spring 4	51.95680764,-9.256896486	Latitude and Longitude	07/06/2022	Pipistrellus pygmaeus	0
Spring 4	51.95680764,-9.256896487	Latitude and Longitude	08/06/2022	Pipistrellus pygmaeus	40
Spring 5	51.95361514,-9.251947790	Latitude and Longitude	27/05/2022	Pipistrellus pygmaeus	1

Spring 5	51.95361514,-9.251947791	Latitude and Longitude	28/05/2022	Pipistrellus pygmaeus	1
Spring 5	51.95361514,-9.251947792	Latitude and Longitude	29/05/2022	Pipistrellus pygmaeus	6
Spring 5	51.95361514,-9.251947793	Latitude and Longitude	30/05/2022	Pipistrellus pygmaeus	0
Spring 5	51.95361514,-9.251947794	Latitude and Longitude	31/05/2022	Pipistrellus pygmaeus	0
Spring 5	51.95361514,-9.251947795	Latitude and Longitude	01/06/2022	Pipistrellus pygmaeus	0
Spring 5	51.95361514,-9.251947796	Latitude and Longitude	02/06/2022	Pipistrellus pygmaeus	0
Spring 5	51.95361514,-9.251947797	Latitude and Longitude	03/06/2022	Pipistrellus pygmaeus	0
Spring 5	51.95361514,-9.251947798	Latitude and Longitude	04/06/2022	Pipistrellus pygmaeus	1
Spring 5	51.95361514,-9.251947799	Latitude and Longitude	05/06/2022	Pipistrellus pygmaeus	0
Spring 5	51.95361514,-9.251947800	Latitude and Longitude	06/06/2022	Pipistrellus pygmaeus	0
Spring 5	51.95361514,-9.251947801	Latitude and Longitude	07/06/2022	Pipistrellus pygmaeus	0
Spring 5	51.95361514,-9.251947802	Latitude and Longitude	08/06/2022	Pipistrellus pygmaeus	0
Spring 6	51.95017242,-9.248534923	Latitude and Longitude	06/07/2022	Pipistrellus pygmaeus	0
Spring 6	51.95017242,-9.248534924	Latitude and Longitude	07/07/2022	Pipistrellus pygmaeus	0
Spring 6	51.95017242,-9.248534925	Latitude and Longitude	08/07/2022	Pipistrellus pygmaeus	1
Spring 6	51.95017242,-9.248534926	Latitude and Longitude	09/07/2022	Pipistrellus pygmaeus	23
Spring 6	51.95017242,-9.248534927	Latitude and Longitude	10/07/2022	Pipistrellus pygmaeus	32
Spring 6	51.95017242,-9.248534928	Latitude and Longitude	11/07/2022	Pipistrellus pygmaeus	6
Spring 6	51.95017242,-9.248534929	Latitude and Longitude	12/07/2022	Pipistrellus pygmaeus	1
Spring 6	51.95017242,-9.248534930	Latitude and Longitude	13/07/2022	Pipistrellus pygmaeus	0
Spring 6	51.95017242,-9.248534931	Latitude and Longitude	14/07/2022	Pipistrellus pygmaeus	5
Spring 6	51.95017242,-9.248534932	Latitude and Longitude	15/07/2022	Pipistrellus pygmaeus	2
Spring 6	51.95017242,-9.248534933	Latitude and Longitude	16/07/2022	Pipistrellus pygmaeus	4
Spring 6	51.95017242,-9.248534934	Latitude and Longitude	17/07/2022	Pipistrellus pygmaeus	4
Spring 6	51.95017242,-9.248534935	Latitude and Longitude	18/07/2022	Pipistrellus pygmaeus	2
Spring 6	51.95017242,-9.248534936	Latitude and Longitude	19/07/2022	Pipistrellus pygmaeus	4
Spring 6	51.95017242,-9.248534937	Latitude and Longitude	20/07/2022	Pipistrellus pygmaeus	1
Spring 2	51.951872.-9.26782985	Latitude and Longitude	27/05/2022	Plecotus auritus	0
Spring 2	51.951872.-9.26782986	Latitude and Longitude	28/05/2022	Plecotus auritus	0
Spring 2	51.951872.-9.26782987	Latitude and Longitude	29/05/2022	Plecotus auritus	0
Spring 2	51.951872.-9.26782988	Latitude and Longitude	30/05/2022	Plecotus auritus	0
Spring 2	51.951872.-9.26782989	Latitude and Longitude	31/05/2022	Plecotus auritus	0
Spring 2	51.951872.-9.26782990	Latitude and Longitude	01/06/2022	Plecotus auritus	0
Spring 2	51.951872.-9.26782991	Latitude and Longitude	02/06/2022	Plecotus auritus	1
Spring 2	51.951872.-9.26782992	Latitude and Longitude	03/06/2022	Plecotus auritus	1
Spring 2	51.951872.-9.26782993	Latitude and Longitude	04/06/2022	Plecotus auritus	0
Spring 2	51.951872.-9.26782994	Latitude and Longitude	05/06/2022	Plecotus auritus	0
Spring 2	51.951872.-9.26782995	Latitude and Longitude	06/06/2022	Plecotus auritus	0

Spring 2	51.951872,-9.26782996	Latitude and Longitude	07/06/2022	Plecotus auritus	0
Spring 2	51.951872,-9.26782997	Latitude and Longitude	08/06/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621745	Latitude and Longitude	27/05/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621746	Latitude and Longitude	28/05/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621747	Latitude and Longitude	29/05/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621748	Latitude and Longitude	30/05/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621749	Latitude and Longitude	31/05/2022	Plecotus auritus	1
Spring 3	51.95662686,-9.26621750	Latitude and Longitude	01/06/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621751	Latitude and Longitude	02/06/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621752	Latitude and Longitude	03/06/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621753	Latitude and Longitude	04/06/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621754	Latitude and Longitude	05/06/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621755	Latitude and Longitude	06/06/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621756	Latitude and Longitude	07/06/2022	Plecotus auritus	0
Spring 3	51.95662686,-9.26621757	Latitude and Longitude	08/06/2022	Plecotus auritus	0
Spring 5	51.95361514,-9.251947803	Latitude and Longitude	27/05/2022	Plecotus auritus	0
Spring 5	51.95361514,-9.251947804	Latitude and Longitude	28/05/2022	Plecotus auritus	0
Spring 5	51.95361514,-9.251947805	Latitude and Longitude	29/05/2022	Plecotus auritus	0
Spring 5	51.95361514,-9.251947806	Latitude and Longitude	30/05/2022	Plecotus auritus	0
Spring 5	51.95361514,-9.251947807	Latitude and Longitude	31/05/2022	Plecotus auritus	0
Spring 5	51.95361514,-9.251947808	Latitude and Longitude	01/06/2022	Plecotus auritus	0
Spring 5	51.95361514,-9.251947809	Latitude and Longitude	02/06/2022	Plecotus auritus	0
Spring 5	51.95361514,-9.251947810	Latitude and Longitude	03/06/2022	Plecotus auritus	0
Spring 5	51.95361514,-9.251947811	Latitude and Longitude	04/06/2022	Plecotus auritus	1
Spring 5	51.95361514,-9.251947812	Latitude and Longitude	05/06/2022	Plecotus auritus	0
Spring 5	51.95361514,-9.251947813	Latitude and Longitude	06/06/2022	Plecotus auritus	1
Spring 5	51.95361514,-9.251947814	Latitude and Longitude	07/06/2022	Plecotus auritus	1
Spring 5	51.95361514,-9.251947815	Latitude and Longitude	08/06/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534938	Latitude and Longitude	06/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534939	Latitude and Longitude	07/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534940	Latitude and Longitude	08/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534941	Latitude and Longitude	09/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534942	Latitude and Longitude	10/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534943	Latitude and Longitude	11/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534944	Latitude and Longitude	12/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534945	Latitude and Longitude	13/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534946	Latitude and Longitude	14/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534947	Latitude and Longitude	15/07/2022	Plecotus auritus	1

Spring 6	51.95017242,-9.248534948	Latitude and Longitude	16/07/2022	Plecotus auritus	1
Spring 6	51.95017242,-9.248534949	Latitude and Longitude	17/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534950	Latitude and Longitude	18/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534951	Latitude and Longitude	19/07/2022	Plecotus auritus	0
Spring 6	51.95017242,-9.248534952	Latitude and Longitude	20/07/2022	Plecotus auritus	1

Table C: Nightly data for each bat species recorded on each static unit during Summer Surveillance 2022

Location name	Location of bat detector (geographic coordinates)	Spatial Reference System	Date of bat survey	Species	Passes per night
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	21/07/2022	Myotis	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	22/07/2022	Myotis	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	23/07/2022	Myotis	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	24/07/2022	Myotis	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	25/07/2022	Myotis	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	26/07/2022	Myotis	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	28/07/2022	Myotis	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	29/07/2022	Myotis	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	30/07/2022	Myotis	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	31/07/2022	Myotis	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	21/07/2022	Myotis	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	22/07/2022	Myotis	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	23/07/2022	Myotis	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	24/07/2022	Myotis	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	25/07/2022	Myotis	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	28/07/2022	Myotis	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	29/07/2022	Myotis	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	31/07/2022	Myotis	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	21/07/2022	Myotis	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	22/07/2022	Myotis	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	23/07/2022	Myotis	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	24/07/2022	Myotis	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	25/07/2022	Myotis	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	26/07/2022	Myotis	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	27/07/2022	Myotis	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	30/07/2022	Myotis	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	31/07/2022	Myotis	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	27/07/2022	Myotis	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	26/07/2022	Myotis	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	30/07/2022	Myotis	1

Summer 6	51.95017242,-9.248535012	Latitude and Longitude	28/07/2022	Myotis	1
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	29/07/2022	Myotis	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	27/07/2022	Myotis	3
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	22/07/2022	Myotis daubentonii	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	23/07/2022	Myotis daubentonii	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	25/07/2022	Myotis daubentonii	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	27/07/2022	Myotis daubentonii	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	29/07/2022	Myotis daubentonii	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	30/07/2022	Myotis daubentonii	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	31/07/2022	Myotis daubentonii	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	21/07/2022	Myotis daubentonii	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	22/07/2022	Myotis daubentonii	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	23/07/2022	Myotis daubentonii	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	24/07/2022	Myotis daubentonii	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	25/07/2022	Myotis daubentonii	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	28/07/2022	Myotis daubentonii	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	29/07/2022	Myotis daubentonii	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	30/07/2022	Myotis daubentonii	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	31/07/2022	Myotis daubentonii	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	21/07/2022	Myotis daubentonii	1
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	24/07/2022	Myotis daubentonii	1
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	26/07/2022	Myotis daubentonii	1
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	28/07/2022	Myotis daubentonii	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	26/07/2022	Myotis daubentonii	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	27/07/2022	Myotis daubentonii	1
Summer 2	51.951872,-9.26782997	Latitude and Longitude	21/07/2022	Myotis mystacinus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	22/07/2022	Myotis mystacinus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	23/07/2022	Myotis mystacinus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	24/07/2022	Myotis mystacinus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	25/07/2022	Myotis mystacinus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	26/07/2022	Myotis mystacinus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	30/07/2022	Myotis mystacinus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	31/07/2022	Myotis mystacinus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	21/07/2022	Myotis mystacinus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	23/07/2022	Myotis mystacinus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	24/07/2022	Myotis mystacinus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	25/07/2022	Myotis mystacinus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	26/07/2022	Myotis mystacinus	0

Summer 3	51.95662686,-9.26621809	Latitude and Longitude	27/07/2022	Myotis mystacinus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	28/07/2022	Myotis mystacinus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	30/07/2022	Myotis mystacinus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	31/07/2022	Myotis mystacinus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	21/07/2022	Myotis mystacinus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	22/07/2022	Myotis mystacinus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	23/07/2022	Myotis mystacinus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	24/07/2022	Myotis mystacinus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	25/07/2022	Myotis mystacinus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	26/07/2022	Myotis mystacinus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	28/07/2022	Myotis mystacinus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	29/07/2022	Myotis mystacinus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	30/07/2022	Myotis mystacinus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	31/07/2022	Myotis mystacinus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	27/07/2022	Myotis mystacinus	1
Summer 2	51.951872,-9.26782997	Latitude and Longitude	28/07/2022	Myotis mystacinus	1
Summer 2	51.951872,-9.26782997	Latitude and Longitude	29/07/2022	Myotis mystacinus	1
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	22/07/2022	Myotis mystacinus	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	27/07/2022	Myotis mystacinus	1
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	29/07/2022	Myotis mystacinus	2
Summer 2	51.951872,-9.26782997	Latitude and Longitude	21/07/2022	Myotis nattereri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	22/07/2022	Myotis nattereri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	23/07/2022	Myotis nattereri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	24/07/2022	Myotis nattereri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	26/07/2022	Myotis nattereri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	27/07/2022	Myotis nattereri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	28/07/2022	Myotis nattereri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	29/07/2022	Myotis nattereri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	30/07/2022	Myotis nattereri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	31/07/2022	Myotis nattereri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	21/07/2022	Myotis nattereri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	22/07/2022	Myotis nattereri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	23/07/2022	Myotis nattereri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	24/07/2022	Myotis nattereri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	25/07/2022	Myotis nattereri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	27/07/2022	Myotis nattereri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	28/07/2022	Myotis nattereri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	29/07/2022	Myotis nattereri	0

Summer 3	51.95662686,-9.26621809	Latitude and Longitude	31/07/2022	Myotis nattereri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	21/07/2022	Myotis nattereri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	22/07/2022	Myotis nattereri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	23/07/2022	Myotis nattereri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	24/07/2022	Myotis nattereri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	25/07/2022	Myotis nattereri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	27/07/2022	Myotis nattereri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	28/07/2022	Myotis nattereri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	29/07/2022	Myotis nattereri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	30/07/2022	Myotis nattereri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	31/07/2022	Myotis nattereri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	21/07/2022	Myotis nattereri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	22/07/2022	Myotis nattereri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	23/07/2022	Myotis nattereri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	24/07/2022	Myotis nattereri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	25/07/2022	Myotis nattereri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	26/07/2022	Myotis nattereri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	27/07/2022	Myotis nattereri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	28/07/2022	Myotis nattereri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	30/07/2022	Myotis nattereri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	31/07/2022	Myotis nattereri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	25/07/2022	Myotis nattereri	1
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	26/07/2022	Myotis nattereri	1
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	30/07/2022	Myotis nattereri	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	26/07/2022	Myotis nattereri	1
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	29/07/2022	Myotis nattereri	1
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	23/07/2022	Nyctalus leisleri	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	24/07/2022	Nyctalus leisleri	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	25/07/2022	Nyctalus leisleri	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	28/07/2022	Nyctalus leisleri	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	30/07/2022	Nyctalus leisleri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	21/07/2022	Nyctalus leisleri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	23/07/2022	Nyctalus leisleri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	24/07/2022	Nyctalus leisleri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	25/07/2022	Nyctalus leisleri	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	30/07/2022	Nyctalus leisleri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	21/07/2022	Nyctalus leisleri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	23/07/2022	Nyctalus leisleri	0

Summer 3	51.95662686,-9.26621809	Latitude and Longitude	24/07/2022	Nyctalus leisleri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	25/07/2022	Nyctalus leisleri	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	30/07/2022	Nyctalus leisleri	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	21/07/2022	Nyctalus leisleri	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	23/07/2022	Nyctalus leisleri	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	24/07/2022	Nyctalus leisleri	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	25/07/2022	Nyctalus leisleri	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	30/07/2022	Nyctalus leisleri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	24/07/2022	Nyctalus leisleri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	25/07/2022	Nyctalus leisleri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	30/07/2022	Nyctalus leisleri	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	31/07/2022	Nyctalus leisleri	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	30/07/2022	Nyctalus leisleri	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	21/07/2022	Nyctalus leisleri	1
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	29/07/2022	Nyctalus leisleri	1
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	31/07/2022	Nyctalus leisleri	1
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	31/07/2022	Nyctalus leisleri	1
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	31/07/2022	Nyctalus leisleri	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	21/07/2022	Nyctalus leisleri	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	23/07/2022	Nyctalus leisleri	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	28/07/2022	Nyctalus leisleri	1
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	25/07/2022	Nyctalus leisleri	1
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	27/07/2022	Nyctalus leisleri	1
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	31/07/2022	Nyctalus leisleri	1
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	22/07/2022	Nyctalus leisleri	2
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	26/07/2022	Nyctalus leisleri	2
Summer 2	51.951872,-9.26782997	Latitude and Longitude	22/07/2022	Nyctalus leisleri	2
Summer 2	51.951872,-9.26782997	Latitude and Longitude	31/07/2022	Nyctalus leisleri	2
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	28/07/2022	Nyctalus leisleri	3
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	29/07/2022	Nyctalus leisleri	3
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	21/07/2022	Nyctalus leisleri	3
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	24/07/2022	Nyctalus leisleri	3
Summer 2	51.951872,-9.26782997	Latitude and Longitude	29/07/2022	Nyctalus leisleri	4
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	29/07/2022	Nyctalus leisleri	4
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	28/07/2022	Nyctalus leisleri	4
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	27/07/2022	Nyctalus leisleri	5
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	22/07/2022	Nyctalus leisleri	5
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	29/07/2022	Nyctalus leisleri	5

Summer 1	51.95563163,-9.27513818	Latitude and Longitude	27/07/2022	Nyctalus leisleri	6
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	28/07/2022	Nyctalus leisleri	6
Summer 2	51.951872,-9.26782997	Latitude and Longitude	28/07/2022	Nyctalus leisleri	7
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	27/07/2022	Nyctalus leisleri	7
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	29/07/2022	Nyctalus leisleri	7
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	26/07/2022	Nyctalus leisleri	8
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	23/07/2022	Nyctalus leisleri	8
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	26/07/2022	Nyctalus leisleri	8
Summer 2	51.951872,-9.26782997	Latitude and Longitude	26/07/2022	Nyctalus leisleri	10
Summer 2	51.951872,-9.26782997	Latitude and Longitude	27/07/2022	Nyctalus leisleri	10
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	26/07/2022	Nyctalus leisleri	10
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	27/07/2022	Nyctalus leisleri	10
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	22/07/2022	Nyctalus leisleri	14
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	26/07/2022	Nyctalus leisleri	16
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	22/07/2022	Nyctalus leisleri	16
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	22/07/2022	Nyctalus leisleri	17
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	21/07/2022	Pipistrellus pipistrellus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	22/07/2022	Pipistrellus pipistrellus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	23/07/2022	Pipistrellus pipistrellus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	24/07/2022	Pipistrellus pipistrellus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	25/07/2022	Pipistrellus pipistrellus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	27/07/2022	Pipistrellus pipistrellus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	28/07/2022	Pipistrellus pipistrellus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	29/07/2022	Pipistrellus pipistrellus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	30/07/2022	Pipistrellus pipistrellus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	31/07/2022	Pipistrellus pipistrellus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	25/07/2022	Pipistrellus pipistrellus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	30/07/2022	Pipistrellus pipistrellus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	23/07/2022	Pipistrellus pipistrellus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	25/07/2022	Pipistrellus pipistrellus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	30/07/2022	Pipistrellus pipistrellus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	31/07/2022	Pipistrellus pipistrellus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	23/07/2022	Pipistrellus pipistrellus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	24/07/2022	Pipistrellus pipistrellus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	25/07/2022	Pipistrellus pipistrellus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	30/07/2022	Pipistrellus pipistrellus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	31/07/2022	Pipistrellus pipistrellus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	23/07/2022	Pipistrellus pipistrellus	0

Summer 5	51.95361514,-9.251947841	Latitude and Longitude	24/07/2022	Pipistrellus pipistrellus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	25/07/2022	Pipistrellus pipistrellus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	30/07/2022	Pipistrellus pipistrellus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	24/07/2022	Pipistrellus pipistrellus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	25/07/2022	Pipistrellus pipistrellus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	30/07/2022	Pipistrellus pipistrellus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	31/07/2022	Pipistrellus pipistrellus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	31/07/2022	Pipistrellus pipistrellus	1
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	21/07/2022	Pipistrellus pipistrellus	1
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	28/07/2022	Pipistrellus pipistrellus	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	21/07/2022	Pipistrellus pipistrellus	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	31/07/2022	Pipistrellus pipistrellus	1
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	23/07/2022	Pipistrellus pipistrellus	1
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	26/07/2022	Pipistrellus pipistrellus	3
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	22/07/2022	Pipistrellus pipistrellus	3
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	26/07/2022	Pipistrellus pipistrellus	3
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	29/07/2022	Pipistrellus pipistrellus	3
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	22/07/2022	Pipistrellus pipistrellus	3
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	29/07/2022	Pipistrellus pipistrellus	3
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	28/07/2022	Pipistrellus pipistrellus	4
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	26/07/2022	Pipistrellus pipistrellus	6
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	24/07/2022	Pipistrellus pipistrellus	8
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	27/07/2022	Pipistrellus pipistrellus	11
Summer 2	51.951872,-9.26782997	Latitude and Longitude	23/07/2022	Pipistrellus pipistrellus	13
Summer 2	51.951872,-9.26782997	Latitude and Longitude	24/07/2022	Pipistrellus pipistrellus	13
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	27/07/2022	Pipistrellus pipistrellus	17
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	22/07/2022	Pipistrellus pipistrellus	28
Summer 2	51.951872,-9.26782997	Latitude and Longitude	29/07/2022	Pipistrellus pipistrellus	32
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	29/07/2022	Pipistrellus pipistrellus	41
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	22/07/2022	Pipistrellus pipistrellus	43
Summer 2	51.951872,-9.26782997	Latitude and Longitude	28/07/2022	Pipistrellus pipistrellus	44
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	21/07/2022	Pipistrellus pipistrellus	45
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	21/07/2022	Pipistrellus pipistrellus	54
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	27/07/2022	Pipistrellus pipistrellus	54
Summer 2	51.951872,-9.26782997	Latitude and Longitude	21/07/2022	Pipistrellus pipistrellus	72
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	29/07/2022	Pipistrellus pipistrellus	77
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	27/07/2022	Pipistrellus pipistrellus	85
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	26/07/2022	Pipistrellus pipistrellus	106

Summer 2	51.951872,-9.26782997	Latitude and Longitude	26/07/2022	Pipistrellus pipistrellus	109
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	28/07/2022	Pipistrellus pipistrellus	111
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	26/07/2022	Pipistrellus pipistrellus	157
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	28/07/2022	Pipistrellus pipistrellus	175
Summer 2	51.951872,-9.26782997	Latitude and Longitude	27/07/2022	Pipistrellus pipistrellus	192
Summer 2	51.951872,-9.26782997	Latitude and Longitude	22/07/2022	Pipistrellus pipistrellus	238
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	22/07/2022	Pipistrellus pygmaeus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	23/07/2022	Pipistrellus pygmaeus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	24/07/2022	Pipistrellus pygmaeus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	25/07/2022	Pipistrellus pygmaeus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	26/07/2022	Pipistrellus pygmaeus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	27/07/2022	Pipistrellus pygmaeus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	29/07/2022	Pipistrellus pygmaeus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	30/07/2022	Pipistrellus pygmaeus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	23/07/2022	Pipistrellus pygmaeus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	24/07/2022	Pipistrellus pygmaeus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	25/07/2022	Pipistrellus pygmaeus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	28/07/2022	Pipistrellus pygmaeus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	21/07/2022	Pipistrellus pygmaeus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	23/07/2022	Pipistrellus pygmaeus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	24/07/2022	Pipistrellus pygmaeus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	25/07/2022	Pipistrellus pygmaeus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	30/07/2022	Pipistrellus pygmaeus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	21/07/2022	Pipistrellus pygmaeus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	22/07/2022	Pipistrellus pygmaeus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	23/07/2022	Pipistrellus pygmaeus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	24/07/2022	Pipistrellus pygmaeus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	25/07/2022	Pipistrellus pygmaeus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	26/07/2022	Pipistrellus pygmaeus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	28/07/2022	Pipistrellus pygmaeus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	29/07/2022	Pipistrellus pygmaeus	0
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	30/07/2022	Pipistrellus pygmaeus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	21/07/2022	Pipistrellus pygmaeus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	23/07/2022	Pipistrellus pygmaeus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	24/07/2022	Pipistrellus pygmaeus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	25/07/2022	Pipistrellus pygmaeus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	26/07/2022	Pipistrellus pygmaeus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	29/07/2022	Pipistrellus pygmaeus	0

Summer 5	51.95361514,-9.251947841	Latitude and Longitude	30/07/2022	Pipistrellus pygmaeus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	21/07/2022	Pipistrellus pygmaeus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	23/07/2022	Pipistrellus pygmaeus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	25/07/2022	Pipistrellus pygmaeus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	21/07/2022	Pipistrellus pygmaeus	1
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	28/07/2022	Pipistrellus pygmaeus	1
Summer 2	51.951872,-9.26782997	Latitude and Longitude	21/07/2022	Pipistrellus pygmaeus	1
Summer 2	51.951872,-9.26782997	Latitude and Longitude	30/07/2022	Pipistrellus pygmaeus	1
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	27/07/2022	Pipistrellus pygmaeus	1
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	24/07/2022	Pipistrellus pygmaeus	1
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	30/07/2022	Pipistrellus pygmaeus	1
Summer 2	51.951872,-9.26782997	Latitude and Longitude	26/07/2022	Pipistrellus pygmaeus	2
Summer 4	51.95680764,-9.256896526	Latitude and Longitude	31/07/2022	Pipistrellus pygmaeus	2
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	28/07/2022	Pipistrellus pygmaeus	2
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	26/07/2022	Pipistrellus pygmaeus	2
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	27/07/2022	Pipistrellus pygmaeus	2
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	31/07/2022	Pipistrellus pygmaeus	3
Summer 2	51.951872,-9.26782997	Latitude and Longitude	31/07/2022	Pipistrellus pygmaeus	3
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	31/07/2022	Pipistrellus pygmaeus	3
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	31/07/2022	Pipistrellus pygmaeus	3
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	29/07/2022	Pipistrellus pygmaeus	3
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	31/07/2022	Pipistrellus pygmaeus	3
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	22/07/2022	Pipistrellus pygmaeus	4
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	26/07/2022	Pipistrellus pygmaeus	4
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	29/07/2022	Pipistrellus pygmaeus	4
Summer 2	51.951872,-9.26782997	Latitude and Longitude	27/07/2022	Pipistrellus pygmaeus	5
Summer 2	51.951872,-9.26782997	Latitude and Longitude	29/07/2022	Pipistrellus pygmaeus	5
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	22/07/2022	Pipistrellus pygmaeus	5
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	27/07/2022	Pipistrellus pygmaeus	6
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	28/07/2022	Pipistrellus pygmaeus	7
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	28/07/2022	Pipistrellus pygmaeus	7
Summer 2	51.951872,-9.26782997	Latitude and Longitude	22/07/2022	Pipistrellus pygmaeus	9
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	27/07/2022	Pipistrellus pygmaeus	17
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	22/07/2022	Pipistrellus pygmaeus	19
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	21/07/2022	Plecotus auritus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	23/07/2022	Plecotus auritus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	24/07/2022	Plecotus auritus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	25/07/2022	Plecotus auritus	0

Summer 1	51.95563163,-9.27513818	Latitude and Longitude	26/07/2022	Plecotus auritus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	27/07/2022	Plecotus auritus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	28/07/2022	Plecotus auritus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	29/07/2022	Plecotus auritus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	30/07/2022	Plecotus auritus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	31/07/2022	Plecotus auritus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	21/07/2022	Plecotus auritus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	22/07/2022	Plecotus auritus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	23/07/2022	Plecotus auritus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	24/07/2022	Plecotus auritus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	25/07/2022	Plecotus auritus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	28/07/2022	Plecotus auritus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	29/07/2022	Plecotus auritus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	30/07/2022	Plecotus auritus	0
Summer 2	51.951872,-9.26782997	Latitude and Longitude	31/07/2022	Plecotus auritus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	21/07/2022	Plecotus auritus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	22/07/2022	Plecotus auritus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	23/07/2022	Plecotus auritus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	24/07/2022	Plecotus auritus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	25/07/2022	Plecotus auritus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	27/07/2022	Plecotus auritus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	29/07/2022	Plecotus auritus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	30/07/2022	Plecotus auritus	0
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	31/07/2022	Plecotus auritus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	21/07/2022	Plecotus auritus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	22/07/2022	Plecotus auritus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	23/07/2022	Plecotus auritus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	24/07/2022	Plecotus auritus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	25/07/2022	Plecotus auritus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	28/07/2022	Plecotus auritus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	29/07/2022	Plecotus auritus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	30/07/2022	Plecotus auritus	0
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	31/07/2022	Plecotus auritus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	21/07/2022	Plecotus auritus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	22/07/2022	Plecotus auritus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	23/07/2022	Plecotus auritus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	24/07/2022	Plecotus auritus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	25/07/2022	Plecotus auritus	0

Summer 6	51.95017242,-9.248535012	Latitude and Longitude	27/07/2022	Plecotus auritus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	29/07/2022	Plecotus auritus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	30/07/2022	Plecotus auritus	0
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	31/07/2022	Plecotus auritus	0
Summer 1	51.95563163,-9.27513818	Latitude and Longitude	22/07/2022	Plecotus auritus	1
Summer 2	51.951872,-9.26782997	Latitude and Longitude	26/07/2022	Plecotus auritus	1
Summer 2	51.951872,-9.26782997	Latitude and Longitude	27/07/2022	Plecotus auritus	1
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	26/07/2022	Plecotus auritus	1
Summer 3	51.95662686,-9.26621809	Latitude and Longitude	28/07/2022	Plecotus auritus	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	26/07/2022	Plecotus auritus	1
Summer 5	51.95361514,-9.251947841	Latitude and Longitude	27/07/2022	Plecotus auritus	1
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	26/07/2022	Plecotus auritus	1
Summer 6	51.95017242,-9.248535012	Latitude and Longitude	28/07/2022	Plecotus auritus	1

Table D: Nightly data for each bat species recorded on each static unit during Autumn Surveillance 2022

Location name	Location of bat detector (geographic coordinates)	Spatial Reference System	Date of bat survey	Species	Passes per night
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	24/08/2022	Myotis	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	25/08/2022	Myotis	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	26/08/2022	Myotis	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	27/08/2022	Myotis	2
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	28/08/2022	Myotis	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	29/08/2022	Myotis	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	30/08/2022	Myotis	3
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	31/08/2022	Myotis	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	01/09/2022	Myotis	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	02/09/2022	Myotis	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	24/08/2022	Myotis	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	25/08/2022	Myotis	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	26/08/2022	Myotis	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	27/08/2022	Myotis	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	28/08/2022	Myotis	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	29/08/2022	Myotis	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	30/08/2022	Myotis	5
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	31/08/2022	Myotis	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	01/09/2022	Myotis	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	02/09/2022	Myotis	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	24/08/2022	Myotis	1
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	25/08/2022	Myotis	0

Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	26/08/2022	Myotis	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	27/08/2022	Myotis	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	28/08/2022	Myotis	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	29/08/2022	Myotis	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	30/08/2022	Myotis	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	31/08/2022	Myotis	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	01/09/2022	Myotis	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	02/09/2022	Myotis	3
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	24/08/2022	Myotis	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	25/08/2022	Myotis	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	26/08/2022	Myotis	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	27/08/2022	Myotis	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	28/08/2022	Myotis	3
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	29/08/2022	Myotis	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	30/08/2022	Myotis	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	31/08/2022	Myotis	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	01/09/2022	Myotis	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	02/09/2022	Myotis	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	24/08/2022	Myotis	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	25/08/2022	Myotis	2
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	26/08/2022	Myotis	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	27/08/2022	Myotis	3
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	28/08/2022	Myotis	2
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	29/08/2022	Myotis	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	30/08/2022	Myotis	2
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	31/08/2022	Myotis	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	01/09/2022	Myotis	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	02/09/2022	Myotis	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	24/08/2022	Myotis daubentonii	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	25/08/2022	Myotis daubentonii	2
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	26/08/2022	Myotis daubentonii	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	27/08/2022	Myotis daubentonii	8
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	28/08/2022	Myotis daubentonii	2
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	29/08/2022	Myotis daubentonii	2
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	30/08/2022	Myotis daubentonii	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	31/08/2022	Myotis daubentonii	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	01/09/2022	Myotis daubentonii	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	02/09/2022	Myotis daubentonii	1

Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	24/08/2022	Myotis daubentonii	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	25/08/2022	Myotis daubentonii	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	26/08/2022	Myotis daubentonii	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	27/08/2022	Myotis daubentonii	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	28/08/2022	Myotis daubentonii	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	29/08/2022	Myotis daubentonii	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	30/08/2022	Myotis daubentonii	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	31/08/2022	Myotis daubentonii	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	01/09/2022	Myotis daubentonii	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	02/09/2022	Myotis daubentonii	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	24/08/2022	Myotis daubentonii	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	25/08/2022	Myotis daubentonii	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	26/08/2022	Myotis daubentonii	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	27/08/2022	Myotis daubentonii	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	28/08/2022	Myotis daubentonii	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	29/08/2022	Myotis daubentonii	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	30/08/2022	Myotis daubentonii	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	31/08/2022	Myotis daubentonii	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	01/09/2022	Myotis daubentonii	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	02/09/2022	Myotis daubentonii	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	24/08/2022	Myotis daubentonii	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	25/08/2022	Myotis daubentonii	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	26/08/2022	Myotis daubentonii	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	27/08/2022	Myotis daubentonii	3
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	28/08/2022	Myotis daubentonii	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	29/08/2022	Myotis daubentonii	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	30/08/2022	Myotis daubentonii	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	31/08/2022	Myotis daubentonii	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	01/09/2022	Myotis daubentonii	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	02/09/2022	Myotis daubentonii	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	24/08/2022	Myotis mystacinus	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	25/08/2022	Myotis mystacinus	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	26/08/2022	Myotis mystacinus	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	27/08/2022	Myotis mystacinus	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	28/08/2022	Myotis mystacinus	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	29/08/2022	Myotis mystacinus	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	30/08/2022	Myotis mystacinus	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	31/08/2022	Myotis mystacinus	0

Autumn 2	51.951872,-9.26782997	Latitude and Longitude	01/09/2022	Myotis mystacinus	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	02/09/2022	Myotis mystacinus	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	24/08/2022	Myotis mystacinus	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	25/08/2022	Myotis mystacinus	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	26/08/2022	Myotis mystacinus	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	27/08/2022	Myotis mystacinus	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	28/08/2022	Myotis mystacinus	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	29/08/2022	Myotis mystacinus	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	30/08/2022	Myotis mystacinus	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	31/08/2022	Myotis mystacinus	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	01/09/2022	Myotis mystacinus	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	02/09/2022	Myotis mystacinus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	24/08/2022	Myotis mystacinus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	25/08/2022	Myotis mystacinus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	26/08/2022	Myotis mystacinus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	27/08/2022	Myotis mystacinus	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	28/08/2022	Myotis mystacinus	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	29/08/2022	Myotis mystacinus	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	30/08/2022	Myotis mystacinus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	31/08/2022	Myotis mystacinus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	01/09/2022	Myotis mystacinus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	02/09/2022	Myotis mystacinus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	24/08/2022	Myotis mystacinus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	25/08/2022	Myotis mystacinus	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	26/08/2022	Myotis mystacinus	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	27/08/2022	Myotis mystacinus	2
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	28/08/2022	Myotis mystacinus	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	29/08/2022	Myotis mystacinus	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	30/08/2022	Myotis mystacinus	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	31/08/2022	Myotis mystacinus	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	01/09/2022	Myotis mystacinus	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	02/09/2022	Myotis mystacinus	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	24/08/2022	Myotis nattereri	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	25/08/2022	Myotis nattereri	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	26/08/2022	Myotis nattereri	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	27/08/2022	Myotis nattereri	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	28/08/2022	Myotis nattereri	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	29/08/2022	Myotis nattereri	0

Autumn 2	51.951872,-9.26782997	Latitude and Longitude	30/08/2022	Myotis nattereri	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	31/08/2022	Myotis nattereri	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	01/09/2022	Myotis nattereri	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	02/09/2022	Myotis nattereri	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	24/08/2022	Myotis nattereri	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	25/08/2022	Myotis nattereri	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	26/08/2022	Myotis nattereri	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	27/08/2022	Myotis nattereri	5
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	28/08/2022	Myotis nattereri	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	29/08/2022	Myotis nattereri	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	30/08/2022	Myotis nattereri	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	31/08/2022	Myotis nattereri	5
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	01/09/2022	Myotis nattereri	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	02/09/2022	Myotis nattereri	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	24/08/2022	Myotis nattereri	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	25/08/2022	Myotis nattereri	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	26/08/2022	Myotis nattereri	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	27/08/2022	Myotis nattereri	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	28/08/2022	Myotis nattereri	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	29/08/2022	Myotis nattereri	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	30/08/2022	Myotis nattereri	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	31/08/2022	Myotis nattereri	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	01/09/2022	Myotis nattereri	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	02/09/2022	Myotis nattereri	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	24/08/2022	Myotis nattereri	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	25/08/2022	Myotis nattereri	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	26/08/2022	Myotis nattereri	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	27/08/2022	Myotis nattereri	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	28/08/2022	Myotis nattereri	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	29/08/2022	Myotis nattereri	2
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	30/08/2022	Myotis nattereri	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	31/08/2022	Myotis nattereri	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	01/09/2022	Myotis nattereri	2
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	02/09/2022	Myotis nattereri	2
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	24/08/2022	Nyctalus leisleri	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	25/08/2022	Nyctalus leisleri	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	26/08/2022	Nyctalus leisleri	3
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	27/08/2022	Nyctalus leisleri	7

Autumn 2	51.951872,-9.26782997	Latitude and Longitude	28/08/2022	Nyctalus leisleri	8
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	29/08/2022	Nyctalus leisleri	2
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	30/08/2022	Nyctalus leisleri	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	31/08/2022	Nyctalus leisleri	2
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	01/09/2022	Nyctalus leisleri	5
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	02/09/2022	Nyctalus leisleri	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	24/08/2022	Nyctalus leisleri	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	25/08/2022	Nyctalus leisleri	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	26/08/2022	Nyctalus leisleri	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	27/08/2022	Nyctalus leisleri	10
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	28/08/2022	Nyctalus leisleri	4
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	29/08/2022	Nyctalus leisleri	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	30/08/2022	Nyctalus leisleri	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	31/08/2022	Nyctalus leisleri	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	01/09/2022	Nyctalus leisleri	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	02/09/2022	Nyctalus leisleri	1
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	24/08/2022	Nyctalus leisleri	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	25/08/2022	Nyctalus leisleri	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	26/08/2022	Nyctalus leisleri	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	27/08/2022	Nyctalus leisleri	14
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	28/08/2022	Nyctalus leisleri	3
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	29/08/2022	Nyctalus leisleri	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	30/08/2022	Nyctalus leisleri	1
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	31/08/2022	Nyctalus leisleri	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	01/09/2022	Nyctalus leisleri	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	02/09/2022	Nyctalus leisleri	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	24/08/2022	Nyctalus leisleri	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	25/08/2022	Nyctalus leisleri	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	26/08/2022	Nyctalus leisleri	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	27/08/2022	Nyctalus leisleri	8
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	28/08/2022	Nyctalus leisleri	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	29/08/2022	Nyctalus leisleri	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	30/08/2022	Nyctalus leisleri	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	31/08/2022	Nyctalus leisleri	3
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	01/09/2022	Nyctalus leisleri	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	02/09/2022	Nyctalus leisleri	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	24/08/2022	Nyctalus leisleri	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	25/08/2022	Nyctalus leisleri	0

Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	26/08/2022	Nyctalus leisleri	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	27/08/2022	Nyctalus leisleri	7
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	28/08/2022	Nyctalus leisleri	8
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	29/08/2022	Nyctalus leisleri	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	30/08/2022	Nyctalus leisleri	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	31/08/2022	Nyctalus leisleri	3
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	01/09/2022	Nyctalus leisleri	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	02/09/2022	Nyctalus leisleri	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	24/08/2022	Pipistrellus pipistrellus	65
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	25/08/2022	Pipistrellus pipistrellus	60
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	26/08/2022	Pipistrellus pipistrellus	56
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	27/08/2022	Pipistrellus pipistrellus	198
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	28/08/2022	Pipistrellus pipistrellus	95
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	29/08/2022	Pipistrellus pipistrellus	53
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	30/08/2022	Pipistrellus pipistrellus	78
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	31/08/2022	Pipistrellus pipistrellus	121
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	01/09/2022	Pipistrellus pipistrellus	76
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	02/09/2022	Pipistrellus pipistrellus	19
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	24/08/2022	Pipistrellus pipistrellus	27
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	25/08/2022	Pipistrellus pipistrellus	19
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	26/08/2022	Pipistrellus pipistrellus	31
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	27/08/2022	Pipistrellus pipistrellus	166
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	28/08/2022	Pipistrellus pipistrellus	103
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	29/08/2022	Pipistrellus pipistrellus	38
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	30/08/2022	Pipistrellus pipistrellus	96
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	31/08/2022	Pipistrellus pipistrellus	102
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	01/09/2022	Pipistrellus pipistrellus	97
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	02/09/2022	Pipistrellus pipistrellus	3
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	24/08/2022	Pipistrellus pipistrellus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	25/08/2022	Pipistrellus pipistrellus	12
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	26/08/2022	Pipistrellus pipistrellus	4
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	27/08/2022	Pipistrellus pipistrellus	21
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	28/08/2022	Pipistrellus pipistrellus	8
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	29/08/2022	Pipistrellus pipistrellus	2
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	30/08/2022	Pipistrellus pipistrellus	2
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	31/08/2022	Pipistrellus pipistrellus	5
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	01/09/2022	Pipistrellus pipistrellus	8
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	02/09/2022	Pipistrellus pipistrellus	1

Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	24/08/2022	Pipistrellus pipistrellus	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	25/08/2022	Pipistrellus pipistrellus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	26/08/2022	Pipistrellus pipistrellus	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	27/08/2022	Pipistrellus pipistrellus	31
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	28/08/2022	Pipistrellus pipistrellus	17
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	29/08/2022	Pipistrellus pipistrellus	4
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	30/08/2022	Pipistrellus pipistrellus	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	31/08/2022	Pipistrellus pipistrellus	4
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	01/09/2022	Pipistrellus pipistrellus	5
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	02/09/2022	Pipistrellus pipistrellus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	24/08/2022	Pipistrellus pipistrellus	2
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	25/08/2022	Pipistrellus pipistrellus	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	26/08/2022	Pipistrellus pipistrellus	51
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	27/08/2022	Pipistrellus pipistrellus	62
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	28/08/2022	Pipistrellus pipistrellus	40
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	29/08/2022	Pipistrellus pipistrellus	17
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	30/08/2022	Pipistrellus pipistrellus	49
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	31/08/2022	Pipistrellus pipistrellus	25
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	01/09/2022	Pipistrellus pipistrellus	11
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	02/09/2022	Pipistrellus pipistrellus	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	24/08/2022	Pipistrellus pygmaeus	7
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	25/08/2022	Pipistrellus pygmaeus	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	26/08/2022	Pipistrellus pygmaeus	2
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	27/08/2022	Pipistrellus pygmaeus	20
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	28/08/2022	Pipistrellus pygmaeus	12
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	29/08/2022	Pipistrellus pygmaeus	4
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	30/08/2022	Pipistrellus pygmaeus	5
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	31/08/2022	Pipistrellus pygmaeus	2
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	01/09/2022	Pipistrellus pygmaeus	3
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	02/09/2022	Pipistrellus pygmaeus	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	24/08/2022	Pipistrellus pygmaeus	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	25/08/2022	Pipistrellus pygmaeus	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	26/08/2022	Pipistrellus pygmaeus	5
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	27/08/2022	Pipistrellus pygmaeus	10
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	28/08/2022	Pipistrellus pygmaeus	16
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	29/08/2022	Pipistrellus pygmaeus	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	30/08/2022	Pipistrellus pygmaeus	10
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	31/08/2022	Pipistrellus pygmaeus	5

Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	01/09/2022	Pipistrellus pygmaeus	12
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	02/09/2022	Pipistrellus pygmaeus	1
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	24/08/2022	Pipistrellus pygmaeus	1
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	25/08/2022	Pipistrellus pygmaeus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	26/08/2022	Pipistrellus pygmaeus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	27/08/2022	Pipistrellus pygmaeus	3
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	28/08/2022	Pipistrellus pygmaeus	4
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	29/08/2022	Pipistrellus pygmaeus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	30/08/2022	Pipistrellus pygmaeus	1
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	31/08/2022	Pipistrellus pygmaeus	2
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	01/09/2022	Pipistrellus pygmaeus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	02/09/2022	Pipistrellus pygmaeus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	24/08/2022	Pipistrellus pygmaeus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	25/08/2022	Pipistrellus pygmaeus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	26/08/2022	Pipistrellus pygmaeus	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	27/08/2022	Pipistrellus pygmaeus	7
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	28/08/2022	Pipistrellus pygmaeus	4
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	29/08/2022	Pipistrellus pygmaeus	3
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	30/08/2022	Pipistrellus pygmaeus	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	31/08/2022	Pipistrellus pygmaeus	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	01/09/2022	Pipistrellus pygmaeus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	02/09/2022	Pipistrellus pygmaeus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	24/08/2022	Pipistrellus pygmaeus	2
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	25/08/2022	Pipistrellus pygmaeus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	26/08/2022	Pipistrellus pygmaeus	3
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	27/08/2022	Pipistrellus pygmaeus	7
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	28/08/2022	Pipistrellus pygmaeus	13
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	29/08/2022	Pipistrellus pygmaeus	4
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	30/08/2022	Pipistrellus pygmaeus	8
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	31/08/2022	Pipistrellus pygmaeus	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	01/09/2022	Pipistrellus pygmaeus	3
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	02/09/2022	Pipistrellus pygmaeus	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	24/08/2022	Plecotus auritus	3
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	25/08/2022	Plecotus auritus	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	26/08/2022	Plecotus auritus	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	27/08/2022	Plecotus auritus	5
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	28/08/2022	Plecotus auritus	0
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	29/08/2022	Plecotus auritus	2

Autumn 2	51.951872,-9.26782997	Latitude and Longitude	30/08/2022	Plecotus auritus	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	31/08/2022	Plecotus auritus	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	01/09/2022	Plecotus auritus	1
Autumn 2	51.951872,-9.26782997	Latitude and Longitude	02/09/2022	Plecotus auritus	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	24/08/2022	Plecotus auritus	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	25/08/2022	Plecotus auritus	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	26/08/2022	Plecotus auritus	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	27/08/2022	Plecotus auritus	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	28/08/2022	Plecotus auritus	2
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	29/08/2022	Plecotus auritus	4
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	30/08/2022	Plecotus auritus	3
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	31/08/2022	Plecotus auritus	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	01/09/2022	Plecotus auritus	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	02/09/2022	Plecotus auritus	3
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	24/08/2022	Plecotus auritus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	25/08/2022	Plecotus auritus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	26/08/2022	Plecotus auritus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	27/08/2022	Plecotus auritus	1
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	28/08/2022	Plecotus auritus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	29/08/2022	Plecotus auritus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	30/08/2022	Plecotus auritus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	31/08/2022	Plecotus auritus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	01/09/2022	Plecotus auritus	0
Autumn 4	51.95680764,-9.256896526	Latitude and Longitude	02/09/2022	Plecotus auritus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	24/08/2022	Plecotus auritus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	25/08/2022	Plecotus auritus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	26/08/2022	Plecotus auritus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	27/08/2022	Plecotus auritus	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	28/08/2022	Plecotus auritus	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	29/08/2022	Plecotus auritus	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	30/08/2022	Plecotus auritus	2
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	31/08/2022	Plecotus auritus	0
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	01/09/2022	Plecotus auritus	1
Autumn 5	51.95361514,-9.251947841	Latitude and Longitude	02/09/2022	Plecotus auritus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	24/08/2022	Plecotus auritus	1
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	25/08/2022	Plecotus auritus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	26/08/2022	Plecotus auritus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	27/08/2022	Plecotus auritus	3

Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	28/08/2022	Plecotus auritus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	29/08/2022	Plecotus auritus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	30/08/2022	Plecotus auritus	2
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	31/08/2022	Plecotus auritus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	01/09/2022	Plecotus auritus	0
Autumn 6	51.95017242,-9.248535012	Latitude and Longitude	02/09/2022	Plecotus auritus	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	24/08/2022	Rhinolophus hipposideros	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	25/08/2022	Rhinolophus hipposideros	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	26/08/2022	Rhinolophus hipposideros	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	27/08/2022	Rhinolophus hipposideros	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	28/08/2022	Rhinolophus hipposideros	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	29/08/2022	Rhinolophus hipposideros	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	30/08/2022	Rhinolophus hipposideros	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	31/08/2022	Rhinolophus hipposideros	1
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	01/09/2022	Rhinolophus hipposideros	0
Autumn 3	51.95662686,-9.26621809	Latitude and Longitude	02/09/2022	Rhinolophus hipposideros	0

Table E: Summary of Common pipistrelle bat passes recorded on static units during static surveillance (used for analysis)

Spring 2022 Surveillance - highlights cells = >40 bat passes

Turbine	Static Code	27/05/2022	28/05/2022	29/05/2022	30/05/2022	31/05/2022	01/06/2022	02/06/2022	03/06/2022	04/06/2022	05/06/2022
T1	Spring 1	0	1	0	0	0	0	0	0	0	0
T2	Spring 2	7	322	190	29	20	66	74	55	7	1
T3	Spring 3	4	68	54	7	0	2	58	19	3	0
T4	Spring 4	2	34	31	6	1	0	0	2	5	0
T5	Spring 5	4	90	65	14	0	0	6	7	3	1

Turbine	Static Code	06/06/2022	07/06/2022	08/06/2022
T1	Spring 1	1	0	0
T2	Spring 2	74	18	308
T3	Spring 3	149	25	78
T4	Spring 4	0	0	853
T5	Spring 5	1	2	9

Turbine	Static Code	06/07/2022	07/07/2022	08/07/2022	09/07/2022	10/07/2022	11/07/2022	12/07/2022	13/07/2022	14/07/2022	15/07/2022

T6	Spring 6	6	114	67	116	306	198	287	89	190	143

Turbine	Static Code	16/07/2022	17/07/2022	18/07/2022	19/07/2022	20/07/2022
T6	Spring 6	266	104	38	70	16

Summer 2022 Surveillance - highlights cells = >40 bat passes

Turbine	Static Code	21/07/2022	22/07/2022	23/07/2022	24/07/2022	25/07/2022	26/07/2022	27/07/2022	28/07/2022	29/07/2022	30/07/2022	31/07/2022
T1	Summer 1	0	0	0	0	0	3	0	0	0	0	0
T2	Summer 2	72	238	13	13	0	109	192	44	32	0	1
T3	Summer 3	54	28	0	8	0	157	54	175	41	0	0
T4	Summer 4	1	3	0	0	0	3	11	1	3	0	0
T5	Summer 5	1	3	0	0	0	6	17	4	3	0	1
T6	Summer 6	45	43	1	0	0	106	85	111	77	0	0

Autumn 2022 1st Surveillance - highlights cells = >40 bat passes

Turbine	Static Code	24/08/2022	25/08/2022	26/08/2022	27/08/2022	28/08/2022	29/08/2022	30/08/2022	31/08/2022	01/09/2022	02/09/2022
T2	Autumn 2	65	60	56	198	95	53	78	121	76	19
T3	Autumn 3	27	19	31	166	103	38	96	102	97	3
T4	Autumn 4	0	12	4	21	8	2	2	5	8	1
T5	Autumn 5	1	0	1	31	17	4	2	4	5	0
T6	Autumn 6	2	1	51	62	40	17	49	25	11	1

Autumn 2022 2nd Surveillance - highlights cells = >40 bat passes

Turbine	Static Code	19/09/2022	20/09/2022	21/09/2022	22/09/2022	23/09/2022	24/09/2022	25/09/2022	26/09/2022	27/09/2022	28/09/2022
T1	2nd Autumn 7	7	0	0	0	0	0	0	0	0	0
T2	2nd Autumn 8	69	43	15	3	0	3	1	0	0	0
T3	2nd Autumn 9	230	18	0	126	2	14	2	0	0	3
T5	2nd Autumn 10	0	0	0	4	1	2	0	0	0	0

Turbine	Static Code	29/09/2022	30/09/2022	01/10/2022
T1	2nd Autumn 7	1	0	1

T2	2nd Autumn 8	40	1	0
T3	2nd Autumn 9	111	1	14
T5	2nd Autumn 10	14	0	1

Appendix II: Relevant Legislation

Relevant Legislation & Bat Species Status in Ireland

Irish Statutory Provisions

A small number of animals and plants are protected under Irish legislation (Nelson, *et al.,* 2019). The principal statutory provisions for the protection of animal and plant species are under the Wildlife Act 1976 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. The Flora (Protection) Order 2015 (S.I. no. 356 of 2015) lists the plant species protected by Section 21 of the Wildlife Acts. See www.npws.ie/ legislation for further information.

The codes used for national legislation are as follows:

- WA = Wildlife Act, 1976, Wildlife (Amendment) Act, 2000 and other relevant amendments
- FPO = Flora (Protection) Order, 2015 (S.I. No. 356 of 2015)

EU Legislation

The Birds Directive (Directive 2009/147/EC) and Habitats Directive (Council Directive 92/43/EEC) are the legislative instruments which are transposed into Irish law, *inter alia,* by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) ('the 2011' Regulations), as amended.

The codes used for the Habitats Directive (Council Directive 92/43/EEC) are:

- Annex II Animal and plant species listed in Annex II
- Annex IV Animal and plant species listed in Annex IV
- Annex V Animal and plant species listed in Annex V

The main aim of the Habitats Directive is the conservation of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status. These annexes list habitats (Annex I) and species (Annexes II, IV and V) which are considered threatened in the EU territory. The listed habitats and species represent a considerable proportion of biodiversity in Ireland and the Directive itself is one of the most important pieces of legislation governing the conservation of biodiversity in Europe.

Under Article 11 of the Directive, each member state is obliged to undertake surveillance of the conservation status of the natural habitats and species in the Annexes and under Article 17, to report to the European Commission every six years on their status and on the implementation of the measures taken under the Directive. In April 2019, Ireland submitted the third assessment of conservation status for 59 habitats and 60 species. There are three volumes with the third listing details of the species assessed.

Article 12 of the Habitats Directive requires Member States to take measures for the establishment of a strict protection regime for animal species listed in Annex IV(a) of the Habitats Directive within the whole territory of Member States. Article 16 provides for derogation from these provisions under defined conditions. These provisions are implemented under Regulations 51 and 54 of the 2011 Regulations.

IUCN Red Lists

The International Union for the Conservation of Nature (IUCN) coordinates the Red Listing process at the global level, defining the categories so that they are standardised across all taxa. Red Lists are also produced at regional, national and subnational levels using the same IUCN categories (IUCN 2012, 2019). Since 2009, Red Lists have been produced for the island of Ireland by the National Parks and Wildlife Service (NPWS) and the Northern Ireland Environment Agency (NIEA) using these IUCN categories. To date, 13 Red Lists have been completed. The Red Lists are an assessment of the risk of extinction of each species and not just an assessment of their rarity. Threatened species are those species categorised as Critically Endangered, Endangered or Vulnerable (IUCN, 2019) – also commonly referred to as 'Red Listed'.

Irish Red List - Mammals

Red Lists in Ireland refer to the whole island, i.e. including Northern Ireland, and so follow the guidelines for regional assessments (IUCN, 2012, 2019). The abbreviations used are as follows:.

- RE Regionally Extinct
- CR Critically Endangered
- EN Endangered
- VU Vulnerable
- NT Near Threatened
- DD Data Deficient
- LC Least Concern
- NA Not Assessed
- NE Not Evaluated

There are 27 terrestrial mammals species in Ireland, which includes the nine resident bat species listed. The terrestrial mammal, according to Marnell *et al.,* 2019, list for Ireland consists of all terrestrial species native to Ireland or naturalised in Ireland before 1500. The IUCN Red List categories and criteria are used to assess that status of wildlife. This was recently completed for the terrestrial mammals of Ireland. Apart from the two following two mammal species (grey wolf *Canis lupus* (regionally extinct) and black rat *Rattus rattus* (Vulnerable)), the remaining 25 species were assessed as least concern in the most recent IUCN Red List publication by NPWS (Marnell *et al.*, 2019).

Irish Bat Species

All Irish bat species are protected under the Wildlife Act (1976) and Wildlife Amendment Acts (2000 and 2010). Also, the EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All Irish bats are listed in Annex IV of the Habitats Directive and the lesser horseshoe bat *Rhinolophus hipposideros* is further listed under Annex II. Across Europe, they are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention

1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

Also, under existing legislation, the destruction, alteration or evacuation of a known bat roost is an offence. The most recent guidance document is "Guidance document on the strict protection of animal species of Community interest un the Habitats Directive (Brussels, 12.10.2021 C(2021) 7391 final".

Regulation 51(2) of the 2011 Regulations provides –

("*(2) Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a licence granted by the Minister under Regulation 54, a person who in respect of the species referred to in Part 1 of the First Schedule—*

(a) deliberately captures or kills any specimen of these species in the wild, (b) deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,

(c) deliberately takes or destroys eggs of those species from the wild,

(d) damages or destroys a breeding site or resting place of such an animal, or

(e) keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive,

shall be guilty of an offence."

The grant of planning permission does not permit the commission of any of the above acts or render the requirement for a derogation licence unnecessary in respect of any of those acts.

Any works interfering with bats and especially their roosts, may only be carried out under a derogation licence granted by National Parks and Wildlife Service (NPWS) pursuant to Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (which transposed the EU Habitats Directive into Irish law).

There are eleven recorded bat species in Ireland, nine of which are considered resident on the island. Eight resident bat species and one of the vagrant bat species are vesper bats and all vespertilionid bats have a tragus (cartilaginous structure inside the pinna of the ear). Vesper bats are distributed throughout the island. Nathusius' pipistrelle *Pipistrellus nathusii* is a recent addition while the Brandt's bat has only been recorded once to-date (Only record confirmed by DNA testing, all other records has not been genetically confirmed). The ninth resident species is the lesser horseshoe bat *Rhinolophus hipposideros*, which belongs to the Rhinolophidea and has a complex nose leaf structure on the face, distinguishing it from the vesper bats. This species' current distribution is confined to the western seaboard counties of Mayo, Galway, Clare, Limerick, Kerry and Cork. The eleventh bat species, the greater horseshoe bat, was only recorded for the first time in February 2013 in County Wexford and is therefore considered to be a vagrant species. A total of 41 SACs have been designated for

the Annex II species lesser horseshoe bat (1303), of which nine have also been selected for the Annex I habitat 'Caves not open to the public' (8310).

Irish bat species list is presented in Table A along with their current status.

Table A: Status of the Irish bat fauna (Marnell *et al.*, 2019).

Species: Common Name	Irish Status	European Status	Global Status
Resident Bat Species ^			
Daubenton's bat *Myotis daubentonii*	Least Concern	Least Concern	Least Concern
Whiskered bat *Myotis mystacinus*	Least Concern	Least Concern	Least Concern
Natterer's bat *Myotis nattereri*	Least Concern	Least Concern	Least Concern
Leisler's bat *Nyctalus leisleri*	Least Concern	Least Concern	Least Concern
Nathusius' pipistrelle *Pipistrellus nathusii*	Least Concern	Least Concern	Least Concern
Common pipistrelle *Pipistrellus pipistrellus*	Least Concern	Least Concern	Least Concern
Soprano pipistrelle *Pipistrellus pygmaeus*	Least Concern	Least Concern	Least Concern
Brown long-eared bat *Plecotus auritus*	Least Concern	Least Concern	Least Concern
Lesser horseshoe bat *Rhinolophus hipposideros*	Least Concern	Least Concern	Least Concern
Possible Vagrants ^			
Brandt's bat Myotis brandtii	Data deficient	Least Concern	Least Concern
Greater horseshoe bat *Rhinolophus ferrumequinum*	Data deficient	Near threatened	Near threatened

^ Roche *et al.*, 2014

Appendix III:
Bat Survey Data – Dusk Surveys, Walking & Driving Transects

Table A: Bat Survey Results & Weather Data

Survey Date	21/07/2022
Type of Survey	Dusk Survey, Walking Transects & Driving Transects
Weather Data	14oC, light wind, dry, patchy cloud cover
Bat Species	**Dusk Survey & Walking Transect**
Common pipistrelle	5 bat encounters
Soprano pipistrelle	6 bat encounters
Leisler's bat	3 bat encounters
Natterer's bat	2 bat encounters
Daubenton's bat	
Whiskered bat	
Myotis species	2 bat encounters
Brown long-eared bat	2 bat encounters
Nathusius' pipistrelle	
Lesser horseshoe bat	
Bat Species	**Driving Transect**
Common pipistrelle	19 bat encounters
Soprano pipistrelle	33 bat encounters
Leisler's bat	4 bat encounters
Natterer's bat	
Daubenton's bat	
Whiskered bat	
Brown long-eared bat	
Nathusius' pipistrelle	
Lesser horseshoe bat	
Survey Date	28/08/2022
Type of Survey	Dusk Survey
Weather Data	16oC, light wind, dry, full cloud cover
Bat Species	**Walking Transect**
Common pipistrelle	4 bat encounters
Soprano pipistrelle	1 bat encounter
Leisler's bat	1 bat encounter
Natterer's bat	1 bat encounter
Daubenton's bat	
Whiskered bat	
Myotis species	
Brown long-eared bat	1 bat encounter
Nathusius' pipistrelle	
Lesser horseshoe bat	
Survey Date	29/08/2022
Type of Survey	Walking Transect
Weather Data	15oC, breezy, dry, full cloud cover
Bat Species	**Walking Transect**
Common pipistrelle	2 bat encounters
Soprano pipistrelle	7 bat encounters
Leisler's bat	4 bat encounters
Natterer's bat	
Daubenton's bat	
Whiskered bat	
Myotis species	1 bat encounter
Brown long-eared bat	1 bat encounter
Nathusius' pipistrelle	
Lesser horseshoe bat	

Survey Date	19/09/2022
Type of Survey	Walking Transect
Weather Data	13oC, light wind, dry, full cloud cover
Bat Species	**Walking Transect**
Common pipistrelle	2 bat encounters
Soprano pipistrelle	6 bat encounters
Leisler's bat	
Natterer's bat	
Daubenton's bat	
Whiskered bat	
Myotis species	
Brown long-eared bat	1 bat encounter
Nathusius' pipistrelle	
Lesser horseshoe bat	

Appendix IV: Additional Information

Tables from Collins (2016) and Marnell *et al.* (2022)

Table A: Building Bat Roost Classification System & Survey Effort (Adapted from Collins, 2016 and Marnell *et al.*, 2022).

Suitability Category	Description (examples of criteria)	Survey Effort (Timings)
Negligible	Building have no potential as a roost site Urban setting, heavily disturbed, building material unsuitable, building in poor condition etc.	No surveys required.
Low	Building has a low potential as a roost site. No evidence of bat usage (e.g. droppings)	One dusk or dawn survey.
Medium	Building with some suitable voids / crevices for roosting bats. Some evidence of bat usage Suitable foraging and commuting habitat present.	At least one survey in May to August, minimum of two surveys (one dusk and one dawn).
High	Building with many features deemed suitable for roosting bats. Evidence of bat usage. Largely undisturbed setting, rural, suitable foraging and commuting habitat, suitable roof void and building material.	At least two surveys in May to August, with a minimum of three surveys (at least one dusk survey and one dawn survey).

Table B: Tree Bat Roost Category Classification System (adapted from Collins, 2016).

Tree Category	Description
1 High	Trees with multiple, highly suitable features (Potential Roosting Features = PRFs) capable of supporting larger roosts
2 Moderate	Trees with definite bat potential but supporting features (PRFs) suitable for use by individual bats;
3 Low	Trees have no obvious potential although the tree is of a size and age that elevated surveys may result in cracks or crevices being found or the tree supports some features (PRFs) which may have limited potential to support bats;
4 Negligible	Trees have no potential.

Site Risk Assessment & Impact Assessment (NaturScot, 2021)

According to NaturScot, 2021 wind farms can affect bats in the following ways:

- Collision mortality, barotrauma and other injuries (although it is important to consider these in the context of other forms of anthropogenic mortality)
- Loss or damage to commuting and foraging habitat, (wind farms may form barriers to commuting or seasonal movements, and can result in severance of foraging habitat);
- Loss of, or damage to, roosts;
- Displacement of individuals or populations (due to wind farm construction or because bats avoid the wind farm area).

According to the NaturScot, 2021 to ensure that bats are protected by minimising the risk of collision, an assessment of impact at a site requires an appraisal of:

- The level of activity of all bat species recorded at the site assessed both spatially and temporally.
- The risk of turbine-related mortality for all bat species recorded at the site during bat activity surveys.
- The effect on the species' population status if predicted impacts are not mitigated.

In addition, it is recommended to consider the relevant factors in the assessment process:

- Is the bat species at the edge of its range
- Cumulative effects
- Presents of protected sites
- Proximity of maternity roosts
- Key foraging areas
- Key flight lines
- Possible migration routes.

Using Table 3 (See Appendices for details) in the SNH (2021) guidelines the following risk assessment for the individual turbines in relation to each bat species recorded was completed using the following values:

- Project Size = Medium (6 turbines);
- Habitat Risk = Low;
- Proposed tall wind turbines.

Therefore a value of 3 is applied to this proposed development site (Stage 1 Site Risk Assessment) and this is multiplied by the EcoBat value for the three most common bat species recorded which are also High Risk species (i.e. Leisler's bat, common pipistrelle and soprano pipistrelle) for two separate value categories. However as there is a large array of static surveillance units located across the proposed development area, a table was produced to determine which static unit results are used to assess each proposed turbine location (Please see Appendices for this table).

The overall value of the site is based on a summary of Tables ?? as presented in Appendices.

- Highest Ecobat activity category recorded;
- Most frequent activity category (i.e. median value).

Overall assessment value (i.e. Turbine Risk value) is then compared to the ranges below:

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

Bat Species Profile

Leisler's bat

Ireland's population is deemed of international importance and the paucity of knowledge of roosting sites, makes this species vulnerable. However, it is considered to be widespread across the island. The modelled Core Area for Leisler's bats is a relatively large area that covers much of the island of Ireland (52,820km^2). The Bat Conservation Ireland Irish Landscape Model indicated that the Leisler's bat habitat preference has been difficult to define in Ireland. Habitat modelling for Ireland shows an association with riparian habitats and woodlands (Roche *et al.,* 2014). The landscape model emphasised that this is a species that cannot be defined by habitats preference at a local scale compared to other Irish bat species but that it is a landscape species and has a habitat preference at a scale of 20.5km. In addition, of all Irish bat species, Leisler's bats have the most specific roosting requirements. It tends to select roosting habitat with areas of woodland and freshwater.

Irish Status	Near Threatened
European Status	Least Concern
Global Status	Least Concern
Irish Population Trend	2003-2013 ↑
Estimated Irish Population Size	73,000 to 130,000 (2007-2013) Ireland is considered the world stronghold for this species
Estimate Core Area (Lundy *et al. 2011)*	52,820 km^2

Taken from Roche *et al.,* 2014, Lysaght & Marnell, 2016 & Marnell *et al.*, 2019

The principal concerns for Leisler's bats are poorly known in Ireland but those that are relevant for this survey area are as follows:

- Selection of maternity sites is limited to specific habitats;
- Relative to the population estimates, the number of roost sites is poorly recorded;
- Tree felling, especially during autumn and winter months; and
- Increasing urbanisation.

Common pipistrelle

This species is generally considered to be the most common bat species in Ireland. The species is widespread and is found in all provinces. The modelled Core Area for common pipistrelles is a large area that covers much of the island of Ireland (56,485km^2) which covers primarily the east and south east of the area (Roche *et al.,* 2014). The Bat Conservation Ireland Irish Landscape Model indicated that the Common pipistrelle selects areas with broadleaf woodland, riparian habitats and low density urbanization (<30%) (Roche *et al.,* 2014).

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Irish Population Trend	2003-2013 ↑
Estimated Irish Population Size	1.2 to 2.8 million (2007-2012)
Estimate Core Area (km^2) (Lundy *et al. 2011)*	56,485

Taken from Roche *et al.,* 2014, Lysaght & Marnell, 2016 & Marnell *et al.*, 2019

Principal concerns for Common pipistrelles in Ireland that are relevant for this survey area are as follows:

- Lack of knowledge of roosting requirements
- This species has complex habitat requirements in the immediate vicinity of roosts. Therefore, careful site specific planning for this species is required in order to ensure all elements are maintained.
- Renovation or demolition of derelict buildings.
- Tree felling
- Increasing urbanisation (e.g. increase in lighting)

Soprano pipistrelle

This species is generally considered to be the second most common bat species in Ireland. The species is widespread and is found in all provinces, with particular concentration along the western seaboard. The modelled Core Area for soprano pipistrelle is a large area that covers much of the island of Ireland (62,020km^2). The Bat Conservation Ireland Irish Landscape Model indicated that the soprano pipistrelle selects areas with broadleaf woodland, riparian habitats and low density urbanisation (Roche *et al.*, 2014).

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Irish Population Trend	2003-2013 ↑
Estimated Irish Population Size	0.54 to 1.2 million (2007-2012)
Estimate Core Area (km^2) (Lundy *et al. 2011)*	62,020

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & Marnell *et al.*, 2019

Principal concerns for Soprano pipistrelles in Ireland that are relevant for this survey area are as follows:

- Lack of knowledge of roosts;
- Renovation or demolition of structures;
- Tree felling; and
- Increasing urbanisation (e.g. increase in lighting).

Brown long-eared Bat

This species is generally considered to be widespread across the island. The modelled Core Area for Brown long-eared bats is a relatively large area that covers much of the island of Ireland (52,820km^2) with preference suitable areas in the southern half of the island. The Bat Conservation Ireland Irish Landscape Model indicated that the Brown long-eared bat habitat preference is for areas with broadleaf woodland and riparian habitats on a small scale of 0.5km emphasising the importance of local landscape features for this species (Roche *et al.*, 2014).

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Irish Population Trend	2008-2013 Stable
Biographical Range	km^2
Estimate Core Area (Lundy *et al. 2011)*	49,929 km^2

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & Marnell *et al.*, 2019

Principal concerns for brown long-eared bats are poorly known in Ireland, but those that are relevant for this survey area are as follows:

- Selection of maternity sites is limited to specific habitats;
- Lack of knowledge of winter roosts;
- Loss of woodland, scrub and hedgerows;
- Tree surgery and felling;
- Increasing urbanisation; and
- Light pollution.

Natterer's bat

There are three species included in the *Myotis* species family and their echolocation calls are very similar across these three species. The modelled Core Area for Natterer's bats is a relatively large area that covers much of the island of Ireland (52,864km^2). The Bat Conservation Ireland Irish Landscape Model indicated that the Natterer's bat selects areas with broadleaf woodland, riparian habitats and areas with larger scale provision of mixed forest (Roche *et al.*, 2014). Therefore, it is likely that this species is more widespread within the survey area.

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Irish Population Trend	Unknown
Estimated Irish Population Size	Unknown
Estimate Core Area (Lundy *et al. 2011)*	52,864

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & Marnell *et al.*, 2019

Principal concerns for Natterer's bats in Ireland that are relevant for this survey area are as follows:

- Lack of knowledge of roosting requirements;
- This species has complex habitat requirements in the immediate vicinity of roosts. Therefore careful site specific planning for this species is required in order to ensure all elements are maintained;
- Tree felling; and
- Increasing urbanisation (e.g. increase in lighting).

Daubenton's bat

The modelled Core Area for Daubenton's bats is a relatively large area that covers much of the island of Ireland (41,285km^2) reflecting the distribution of sizeable river catchments. The Irish Landscape Model indicated that the Daubenton's bat habitat preference is for areas with broadleaf woodland, riparian habitats and low density urbanisation (Roche *et al.*, 2014).

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Irish Population Trend	2008-2013 Stable
Estimated Irish Population Size	81,000 to 103,000 (2007-2012)
Estimate Core Area (km^2) (Lundy *et al. 2011)*	41,285

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & Marnell *et al.*, 2019

Principal concerns for Daubenton's bats are poorly known in Ireland but those that are relevant for this survey area are as follows:

- Potential roost loss due to bridge maintenance;

- Loss of woodland and forest clearance;
- Loss of woodland, scrub and hedgerows;
- Tree surgery and felling;
- Increasing urbanisation; and
- Light pollution.

Whiskered bat

The modelled Core Area for whiskered bats is a relatively small area (29,222 km2) compared to the other two resident *Myotis* bat species. The range is restricted to southern and eastern areas of Ireland. The Irish Landscape Model indicated that the whiskered bat habitat preference is for areas of woodland cover, small areas of pasture, urban and scrub habitat (Roche *et al.*, 2014).

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Irish Population Trend	Unknown
Estimated Irish Population Size	Unknown
Estimate Core Area (km²) (Lundy *et al. 2011)*	29,222

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & Marnell *et al.*, 2019

Principal concerns for whiskered bats are poorly known in Ireland but those that are relevant for this survey area are as follows:

- Lack of knowledge of roosting requirements, swarming sites
- Riparian habitat loss
- Loss of woodland and forest clearance
- Loss of woodland, scrub and hedgerows
- Tree surgery and felling
- Increasing urbanisation
- Light pollution

Nathusius' pipistrelle

The modelled Core Area for Nathusius' pipistrelle is a relatively restricted area (13,543km^2) and these areas are primarily associated with large water bodies such as Lough Neagh and the Lough Erne complex. The Bat Conservation Ireland Irish Landscape Model indicated that the Nathusius' pipistrelle habitat preference is large waterbodies (Roche *et al.*, 2014). But due to the paucity of information on this species, the knowledge of this species preference in Ireland is limited, any records recorded for this species is important.

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Irish Population Trend	2003-2013 (limited data, probably stable
Estimated Irish Population Size	10,000 to 18,000 (2007-2013)
Estimate Core Area (km²) (Lundy *et al. 2011)*	13,543

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & Marnell *et al.*, 2019

The principal concerns for Nathusius' pipistrelle is the fact that roosting sites are poorly known in the Republic of Ireland:

- Lack of knowledge of winter sites and whether migration occurs;

- Renovation or demolition of derelict buildings and structures may cause undocumented roost losses; and
- Water pollution may be a threat to this species because it is particularly associated with lakes.

Please note that there is a greater number of bat species resident in the UK compared to Ireland and therefore some of the species listed below are not resident in Ireland.

Table 1. Core Sustenance Zone sizes calculated for UK bat species

Species	CSZ radius (km)
Greater horseshoe bat *Rhinolophus ferrumequinum*	3
Lesser horseshoe bat *Rhinolophus hipposideros*	2
Barbastelle *Barbastella barbastellus*	6
Brown long-eared bat *Plecotus auritus*	3
Grey long-eared bat *Plecotus austriacus*	3
Daubenton's bat *Myotis daubentonii*	2
Natterer's bat *Myotis nattereri*	4
Whiskered/Brandt's/Alcathoe bat *Myotis mystacinus/brandtii/ alcathoe*	1
Bechstein's bat *Myotis bechsteinii*	3**
Common pipistrelle *Pipistrellus pipistrellus*	2
Soprano pipistrelle *Pipistrellus pygmaeus*	3
Nathusius pipistrelle *Pipistrellus nathusii*	3
Noctule *Nyctalus noctula*	4
Leisler's bat *Nyctalus leisleri*	3
Serotine *Eptesicus serotinus*	4

** Note: There may be justification with Annex II and other rare species to increase the CSZ to reflect use of the landscape by all bats in a population. We suggest increasing the CSZ of Bechstein's bat to at least 3km, reflecting its very specific habitat requirements.

Extracted from Bat-Species-Core-Sustenance-Zones-and-Habitats-for-Biodiversity-Net-Gain.pdf (bats.org.uk)

APPENDIX 5.4:

INCHAMORE WIND FARM: KERRY SLUG SURVEY.

PREPARED BY WETLANDS SURVEY IRELAND,

SEPTEMBER 2021

INCHAMORE WINDFARM, KERRY SLUG SURVEYS

September 2021

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Wetland Surveys Ireland					

CONTENTS

LIST OF FIGURES

LIST OF TABLES

.

1 INTRODUCTION

Wetland Surveys Ireland Ltd. were commissioned by BioSphere Environmental Services to undertake a survey for the presence of Kerry Slug (*Geomalacus maculosus*) within a proposed wind farm site at Inchamore, County Cork. The extent of the proposed site is ca 170.1 ha and occurs and straddles the County Cork and Kerry boundary approximately 6km to the west of Ballyvourney, Co. Cork. The survey was undertaken to inform the assessment of potential ecological impacts of the proposed wind farm and devise appropriate mitigation as may be required.

The occurrence of the wind farm within the known range of Kerry Slug (*Geomalacus maculosus*) together with the presence of suitable habitat throughout the site suggested the likely presence of the species.

1.1 KERRY SLUG

The Kerry slug (*Geomalacus maculosus*) is protected by the Wildlife (Amendment) Act 2000. It is listed under Annex II of the Habitats Directive and seven Special Areas of Conservation (SACs) have been designated for the species with a combined total area of approximately 95,337 hectares. The Kerry slug is also listed in Annex IV of the Habitats Directive and as such is strictly protected from injury, or disturbance / damage to their breeding or resting place wherever it occurs.

Historically, the Kerry Slug has been considered to be restricted to Devonian Old Red Sandstone areas of Kerry and West Cork where it occurs most commonly in either of three distinct habitats:

- deciduous woodlands in particular those with rocky outcrops or boulders;
- rock outcrops associated with heath or blanket bog; and
- lake shores

Within these habitats, the species tends to only be present if there is outcropping Devonian Old Red Sandstone, humid conditions and lichen, liverwort and / or mosses in which the species shelters and feeds (Platts and Speight 1988).

However, the species has also been recently discovered on both granite outcrops within blanket bog and from a Conifer plantation in County Galway (Kearney 2010). Further records of the species from Conifer Plantations suggest that this may also be a suitable habitat for the species (McDonnell *et al.* 2013). A possible explanation put forward to explain the recent discovery of the species in County Galway is an inadvertent introduction (during forestry operations) (McDonnell *et al.* 2013). However this has not yet been determined (Reich *et al.* 2012).

Like many slug species, Kerry Slug is a crepuscular animal and it takes refuge in crevices under rocks or bark (in woodlands) during daylight hours. The species are also known to be diurnal during and after periods of rain and in saturated conditions. Adult slugs vary in colour from black and white spots to brown with cream spots, brown individuals tend to occur in woodland habitats. The black form is found in open habitat such as bogs and heathland. Studies have shown that the species can be abundant on conifer trees and can recolonise boulder habitat when the wood is clearfelled.

The overall conservation status of the species has been reported as 'favourable and improving' and it is not currently considered threatened within its range (NPWS 2019).

A review of data held by the National Biodiversity Data Centre (September 2021) confirms that the species has previously been reported from the 10km square that the site intersects (W17). The proposed wind farm is not located within any site designated for nature conservation. The nearest site designate for the protection of Kerry Slug is the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (NPWS Site Code: 0365).

Based on the habitats recorded during the ecological assessment of the proposed wind farm the following potentially suitable habitats have been identified:

- wet heath and rock outcrop habitat present throughout much of the site.

2 STUDY AREA

The study area is confined to an upland site proposed for wind energy development. From an initial review of habitats present in the area it was determined that there was a high probability of Kerry Slug occurrence. This conclusion was based on the geography of the site, habitat types present, and the known Kerry Slug distribution (NPWS 2019). A brief summary of the study area is presented in the following section.

2.1 INCHAMORE PROPOSED WIND FARM

The Inchamore site occurs approximately 6km west of Ballyvourney in west Cork. The site is accessed by a private road that occurs within the southern section of the site. The main habitats within the proposed development site include conifer forestry (WD4), wet heath (HH3), and acid grassland (GS3) which is grazed by cattle and sheep. Much of the conifer forestry within the site comprises mature stands of sitka spruce (*Picea sitchensis*) which mostly occur within the eastern, western, and southern sections of the site. Wet heath with frequent rock outcropping (ER1) occurs within the central and northern sections of the site. The wet heath and outcropping rock provide high value habitat to Kerry Slug. Mature conifer forestry may provide limited opportunities for Kerry Slug. The extent of the Inchamore site boundary is illustrated in

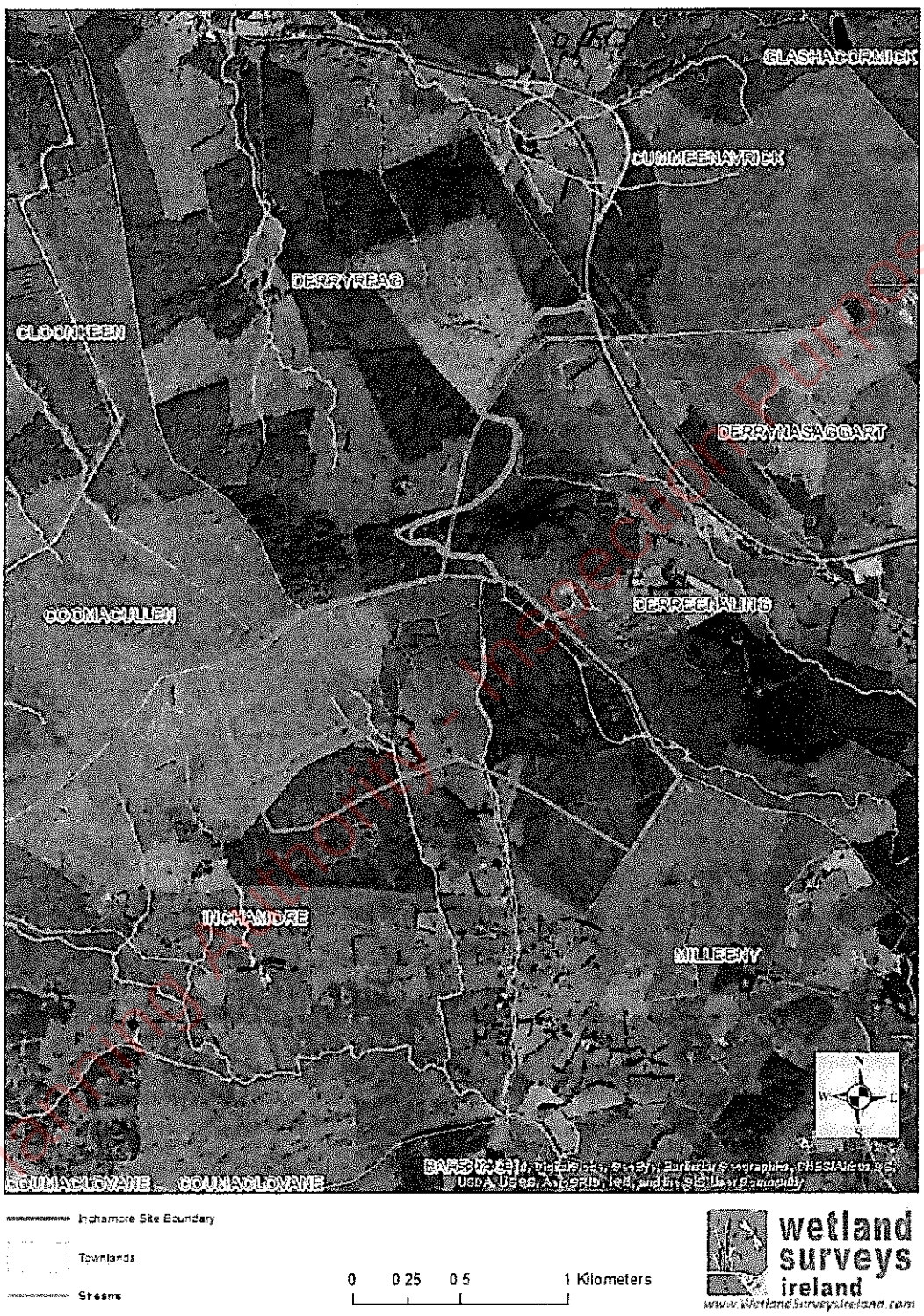

Figure 1: Inchamore site boundary overlain on aerial imagery.

3 METHODOLOGY

3.1 DESKTOP REVIEW

A desktop assessment including a review of previous records of Kerry Slug within and surrounding the study area was undertaken, the results of which are presented in Section 2.1 above.

3.2 FIELD SURVEYS

There are three main survey approaches that are used to survey for Kerry Slug. These include hand searching techniques (diurnal or nocturnal) and live refuge trapping (metric traps). The method used during the current survey is live refuge trapping as recommended for use by McDonnell *et al.* (2013). This method is favoured over other techniques because it enables quantitative sampling (McDonnell and Gormley 2011a,b). In addition, it removes the requirement of undertaking searches during wet weather (in the case of diurnal searches), and the health and safety risks associated with nocturnal searches in remote locations. The metric trap method involves the following:

- Metric traps. This is a refuge trap technique. The metric traps (0.25 m^2), manufactured by De Sangosse (Pont du Casse, France), are made up of absorbent material covered with a reflective upper surface and a black perforated plastic on the underside. They are wetted in advance of being laid out and are baited with Carrot. Traps are secured to rock outcrops (outcrop metric traps) or on surface vegetation (in the case of heath) using stones, tent pegs, or nails as appropriate. They can also be wrapped around tree trunks (banded metric traps) when undertaking surveys at wooded sites (not relevant to current survey). Traps are checked weekly for a period of up to six weeks. If required, traps are re-wetted during site visits using a watering can.

In addition to checking the metric traps, incidental observations of Kerry Slug were recorded during each site visit following hand searches amongst suitable habitat. A summary of the dates, methods, and weather conditions of each site visit undertaken are presented in Table 1.

Table 1: Survey effort at Inchamore.

Date	Site	Survey	Weather
23/07/2020	Inchamore	Hand searches and set traps	Light rain, wet conditions on site.
30/07/2020	Inchamore	Hand searches and check traps	Light persistent rain. Mild and calm.
13/08/2020	Inchamore	Hand searches and check traps	Light rain. Warm
20/08/2020	Inchamore	Hand searches and remove traps	Heavy showers, bouts of strong wind.

After an initial site walkover, the occurrence of suitable Kerry Slug habitat was identified and seven metric traps (Plate 1 below) were deployed amongst wet heath and outcropping rock. The traps were deployed on the 23rd of July 2020 and subsequently checked on three separate occasions with at least a weekly interval before being removed four weeks later. The location of each trap is summarised in Table 2 and illustrated in Figure 2 below.

Plate 1: Slug trap on rock outcrop.

Table 2: Trap locations and habitats at Inchamore.

Trap	Location (ITM)	Habitat
Trap 1	512468, 578335	Rock outcrop (ER1) in wet heath (HH3) adjacent to a stone wall.
Trap 2	5124181, 578354	Rock outcrop (ER1) in wet heath (HH3) adjacent to a stone wall.
Trap 3	512460, 578537	Rock outcrop (ER1) in wet heath (HH3)
Trap 4	512405, 578583	Rock outcrop (ER1) in wet heath (HH3)
Trap 5	512406, 578594	Halved on wet heath (HH3) and rock outcrop (ER1)
Trap 6	512331, 578672	Halved on wet heath (HH3) and rock outcrop (ER1)
Trap 7	512482, 578615	Rock outcrop (ER1) in wet heath (HH3)

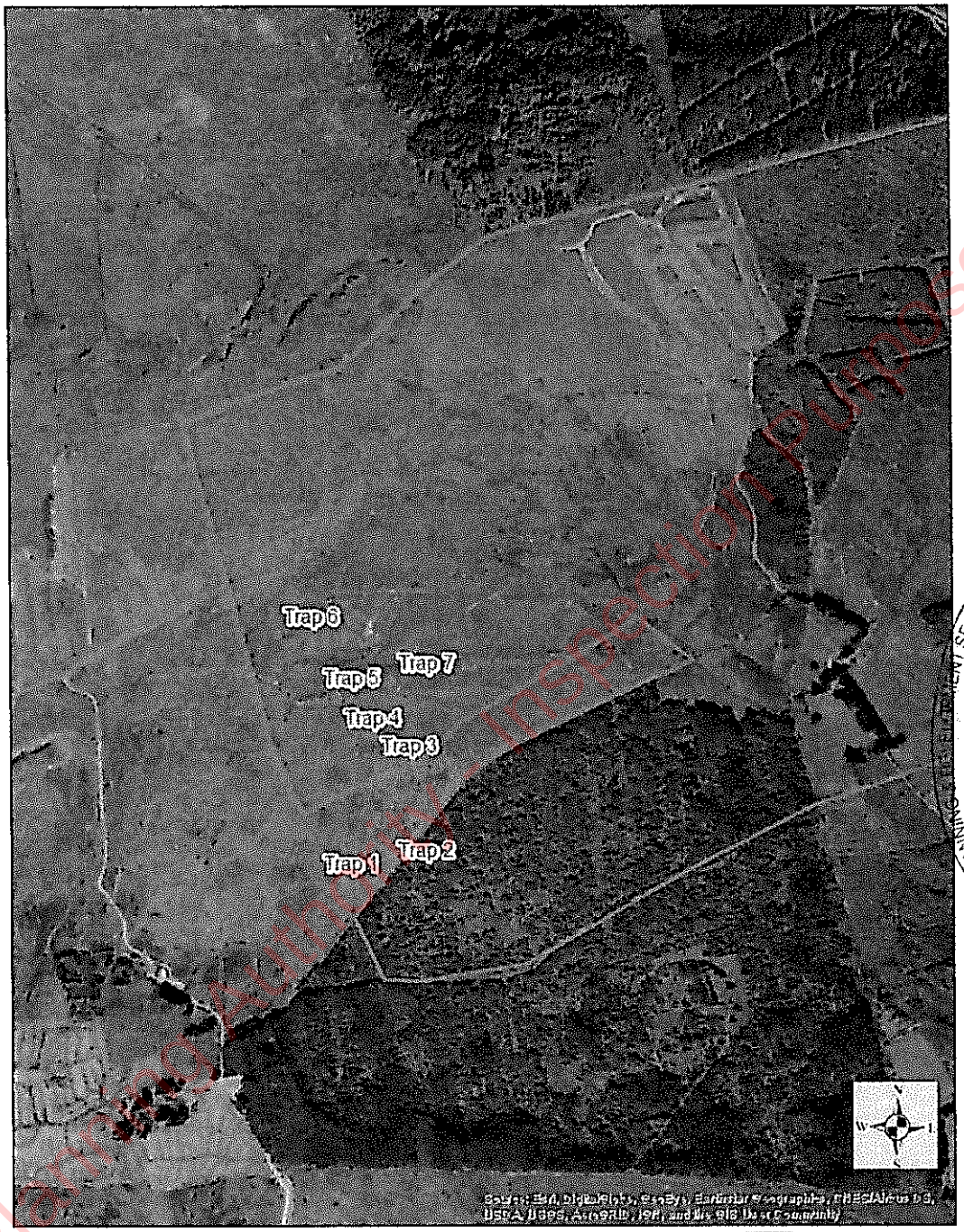

Figure 2: Slug trap locations at Inchamore.

4 RESULTS

Kerry Slug were regularly recorded amongst suitable habitat during each visit. Kerry Slug numbers recorded within slug traps were relatively low with just 19 records in seven traps over the four week period. Individuals were also recorded along a traditional stone wall that occurs along the southern boundary of the heath and adjacent mature conifer forestry. Kerry Slug were frequently recorded within suitable habitat during targeted hand searches. Slugs were most commonly encountered from exposed rock during hand searches, with most hand search observations made during wet weather (see Plate 2). A summary of all records observed at the site is presented in Table 3. The individuals recorded were largely confined to rock outcrops within wet heath. The total number of slugs recorded at the site was 149 individuals, 130 of which were from hand searches.

Table 3: Results of metric trap surveys and targeted hand searches at Inchamore.

Date	Task	Trap 1	Trap 2	Trap 3	Trap 4	Trap 5	Trap 6	Trap 7	Hand Searches	Total
23/07/20	Set Traps	NA	NA	NA	NA	NA	NA	NA	32	32
30/07/20	Check Traps	5	4	2	0	0	0	3	80	94
13/08/20	Check Traps	1	2	2	0	0	0	0	14	19
20/08/20	Check & remove	0	0	0	0	0	0	0	4	4
Total		**6**	**6**	**4**	**0**	**0**	**0**	**3**	**130**	**149**

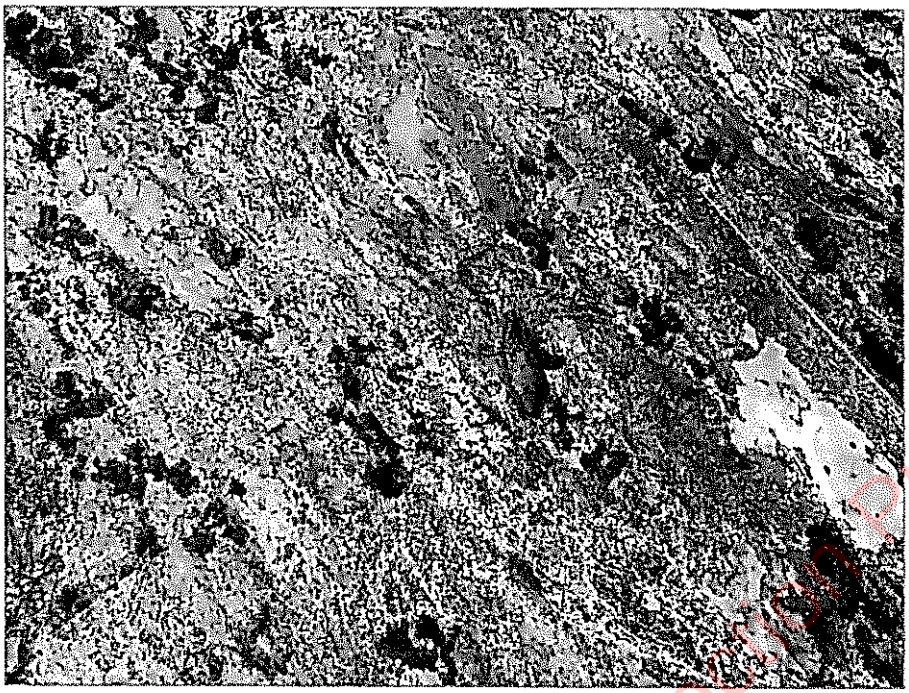

Plate 2: Kerry Slug recorded during targeted hand searches.

5 DISCUSSION AND RECOMMENDATIONS

Results from the current survey confirm the presence of Kerry Slug within the proposed wind farm site. These results also suggest a notable preference for exposed siliceous rock. This is in line with previous surveys undertaken amongst similar habitat complexes (McDonnell and Gormley 2011a). The species is thought to be widespread throughout suitable habitat within its known range (NPWS 2019).

The development of the wind farm could potentially impact on the local population of Kerry Slug due to loss and disturbance of suitable habitat. Based on the likely extent of habitat loss throughout the wind farm site, this impact is likely to be minor and localised as only a very small proportion of suitable Kerry Slug habitat within the site will be impacted. During construction, works could also result in the death of low numbers of Kerry Slug due to machinery movements in areas of suitable habitat.

The following measures are recommended to minimise the above potential impacts on the local Kerry Slug population:

- Areas of suitable habitat that occur outside of the footprint of the development should be avoided during the course of construction thereby minimising the loss and disturbance of Kerry Slug habitat.

- Immediately prior to undertaking works in areas of suitable habitat, the project ecologist will check for the presence of Kerry Slug. Should slugs be discovered then they will be transferred to suitable habitat in the surroundings. Similar on-going monitoring of suitable habitat within works areas should continue throughout the construction phase. Such monitoring should be undertaken during periods of wet weather when slugs are most active and feeding on the surface and therefore at greater risk of impacts by movement of machinery.
- Due to the unavoidable disturbance to Kerry Slug habitat, a derogation license will be sought from the NPWS prior to the commencement of construction. Works will be carried out in compliance with any conditions set by such the license.

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APPENDIX 5.5:

PROPOSED WIND FARM DEVELOPMENT AT INCHAMORE, CO, CORK: HABITAT ENHANCEMENT PLAN. PREPARED BY BIOSPHERE ENVIRONMENTAL SERVICES, 2023.

PROPOSED WIND FARM
AT INCHAMORE, CO. CORK

HABITAT ENHANCEMENT PLAN

FINAL : 25th MAY 2023

Prepared for

INCHAMORE WIND DAC

by

BIOSPHERE ENVIRONMENTAL SERVICES
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BES

CONTENTS

1 INTRODUCTION

As part of the planning application for the proposed Inchamore Wind Farm, a Habitat Enhancement Plan has been prepared to mitigate for the ecological effect of habitat loss as a result of the proposed project. In particular, it is estimated that the wind farm project will result in the loss of approximately 2.62 ha of wet heath and blanket bog habitat. An additional 1.53 ha of cutover bog will also be lost.

The Plan is focused on the rehabilitation of an area of blanket bog habitat (10.81 ha) close to the site which has been subject to overgrazing and subsequent peat erosion (see Figure 1).

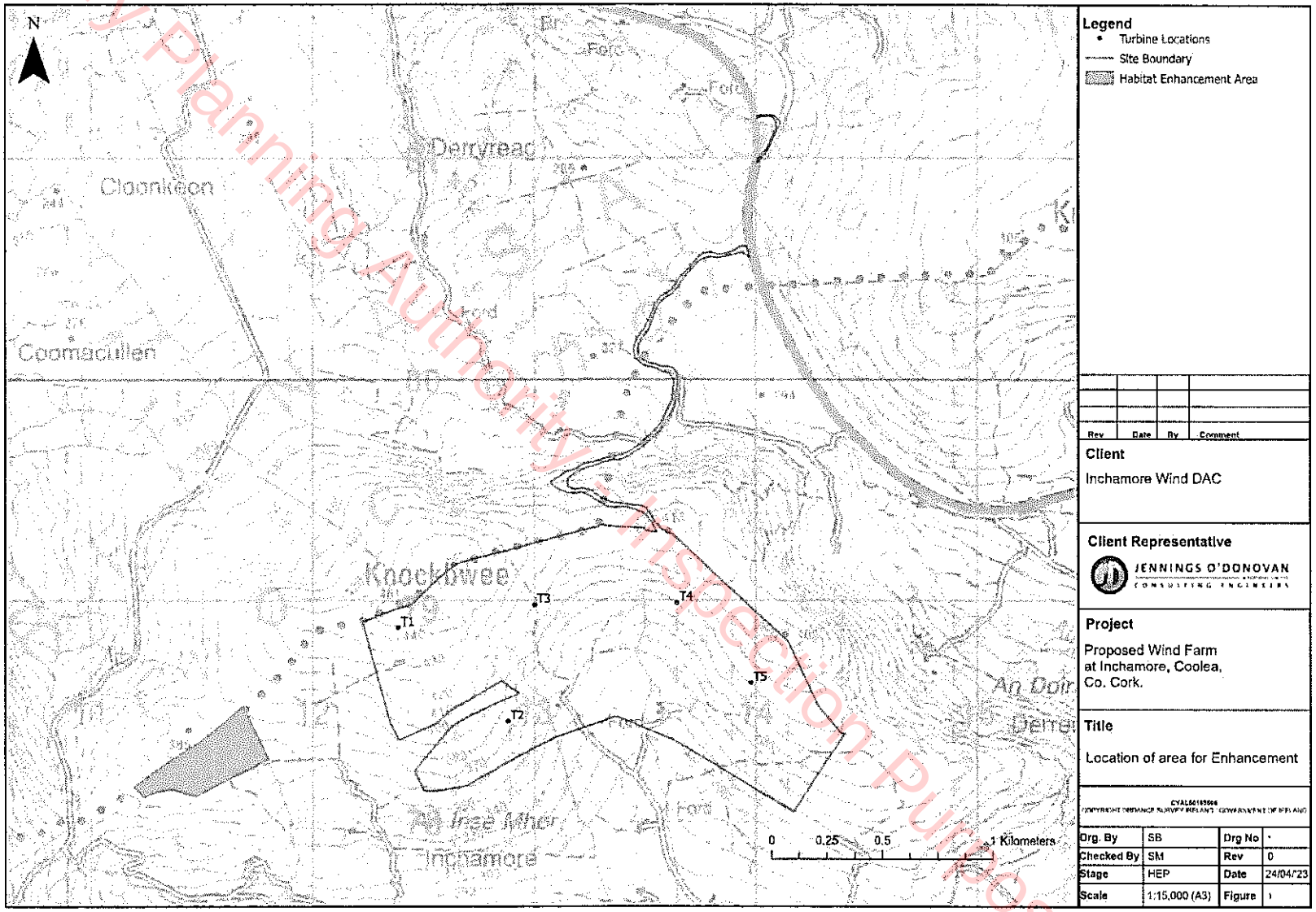

Figure 1. Location of area for Enhancement Plan

1.1 Plan Objectives

Objectives - primary

- To enhance existing area of blanket bog (Annex I habitat) which is subject to ongoing erosion.
- To increase the vegetation cover in areas of cutover blanket bog which have been intensively grazed by livestock in the recent past.

Objectives - secondary

- To enhance existing habitats for peatland associated species such as Red Grouse, (Red-listed), Snipe (Red-listed), Meadow Pipit (Red-listed) and the Irish Hare.

1.2 Plan Ownership

A co-ordinating group will be established to oversee the implementation of the Plan for the lifetime of the project. This will comprise relevant stakeholders (such as wind farm owner / operator). An independent ecologist with experience in peatland ecosystems and habitat management will report to the group on the progress of the Plan in achieving the objectives.

2 PLAN DETAILS

2.1 Plan Area location

The location of the plan area lies within the townland of Inchamore centred at approximately Irish Transverse Mercator (ITM) grid coordinates 511518 578327 (see Figure 1). The plot is marked by the county boundary along the northern boundary, a fenceline along the eastern boundary, a trackway along the southern boundary, and forestry to the west.

The total area for the Plan is approximately 10.81 ha, which can be further divided into the following habitat types:

Table 1. Division of Plan area into categories of bog type (after Fossitt 2000).

Habitat	Area (ha)
Largely intact upland blanket bog (PB3)	2.72
Severely eroded upland blanket bog (PB5)	3.95
Heavily grazed cutover bog (PB4)	4.14
Total	10.81

2.2 Description of the Plan Area

The following are the principal habitat types (after Fossitt 2000) present within the plan area (see Figure 2).

Figure 2 a. Distribution of habitat types within Site and Plan area.

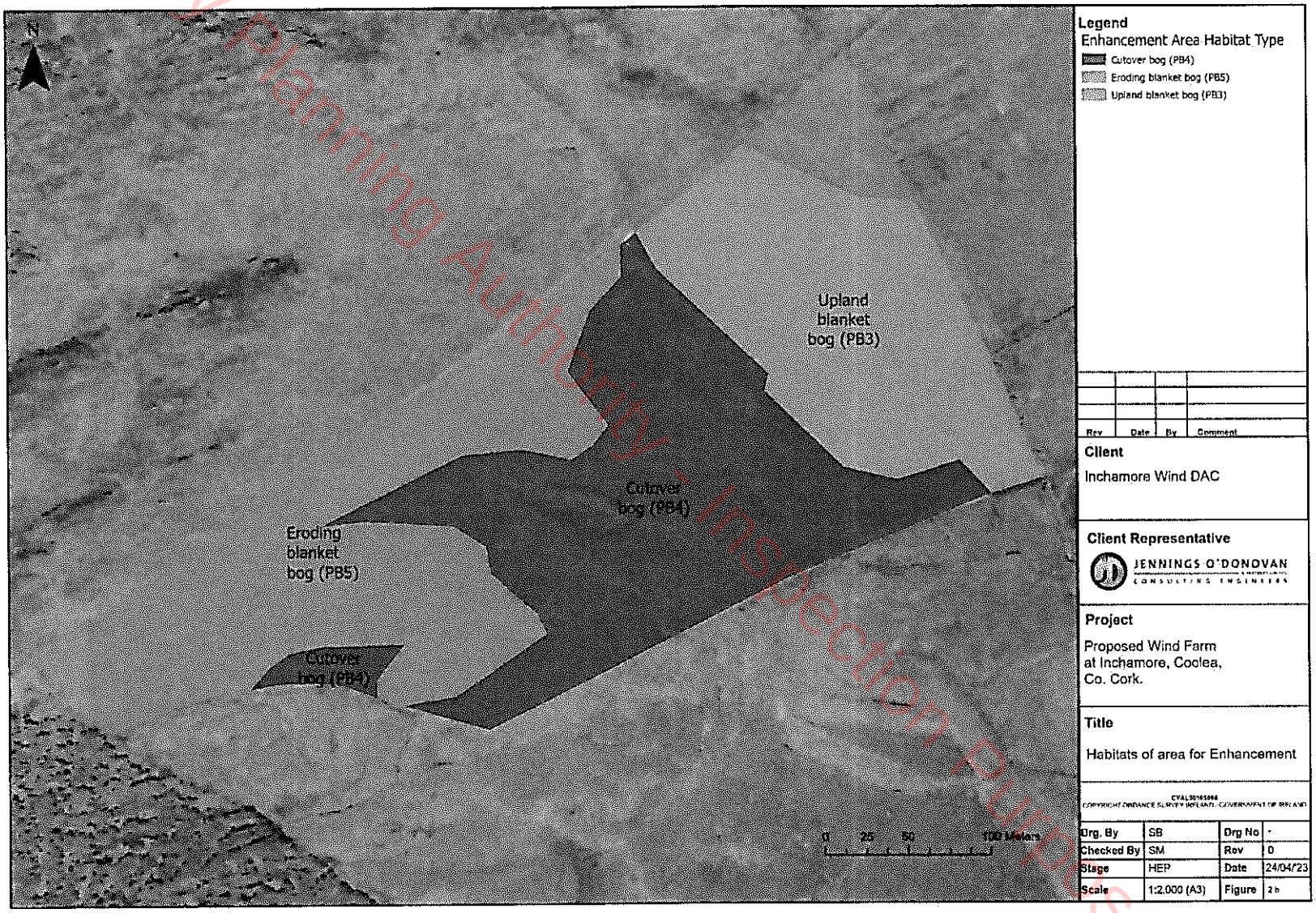

Figure 2 b. Distribution of habitat types within Plan area.

Largely intact upland blanket bog

In the north-east of the Plan area there is approximately 2.6 hectares of intact upland blanket bog which occurs on deep, wet peat, *i.e.* >2 metres deep. The main plant species in the vegetation are deer grass (*Trichophorum cespitosum*), purple moor-grass (*Molinia caerulea*) and many-flowered bog cotton (*Eriophorum angustifolium)*, with frequent cross-leaved heath (*Erica tetralix*), carnation sedge (*Carex panicea*) and bog asphodel (*Narthecium ossifragum*). The moss layer is generally well-developed with frequent *Racomitrium lanuginosum, Sphagnum papillosum* and *Sphagnum capillifolium*. The cover of Sphagnum is locally high, i.e. >50% cover. At present this area of bog is lightly grazed by sheep during the summer months and there is no indication of significant peat erosion. A couple of drains occur the southern half of the intact bog area.

Equivalent EU Annex 1 Habitat – Blanket bog (7130)

Present ecological value: High

Plate 1. View of deep, wet blanket bog on flat ground in the north-east of the plan area. Photograph taken in December 2022.

Heavily eroded upland blanket bog (PB5)

The northern and western sections of the plan area contain areas of eroding blanket bog which are dominated by eroding/bare peat (Plate 2). The cover of vegetation in these areas is typically less than 30% with *Eriophorum angustifolium*, mat grass (*Nardus stricta*), heath rush (*Juncus squarrosus*) and the moss *Racomitrium lanuginosum* providing the bulk of the vegetative cover. This erosion is due to intensive sheep grazing in recent decades.

Equivalent EU Annex 1 Habitat – Heavily eroded Blanket bog (7130)

Present ecological value: Low

Plate 2. View of eroding blanket bog dominated by bare peat along the northern boundary of the plan area. Fence marking county boundary is visible in photograph. (December 2022).

Cutover bog (PB4)

The southern portion of the Plan area is dominated by old cutover peat surfaces which generally have a very shallow (<20 cm), cover of peat remaining, with a stony subsoil visible in places. In general, the cover of bare peat/subsoil is in the range of 5 to 20%. The vegetation is generally dominated by mat grass (*Nardus*

stricta) with frequent heath rush (*Juncus squarrosus*), many-flowering bog-cotton, deer grass (*Trichophorum germanicum*) and velvet bent (*Agrostis canina*).

Present ecological value: Low

2.3 Management Prescriptions

The following management prescriptions outline the work that will be required for implementation of the Plan and will be in effect for the lifetime of the project.

It is noted that the following activities will be prohibited throughout the area of the Plan:

- Peat cutting
- Grazing (unless agreed as vegetation recovers during life of Plan)
- Insertion of new drains

2.3.1 Prescription no. 1: Fencing to exclude grazing

In order to facilitate the recovery of the bog habitats and vegetation types, the entire Plan area will be fenced to exclude livestock. There is an existing fence along parts of the Plan area boundary and this will be inspected to see if it requires upgrade or repair. Standard sheep wire will be sufficient to exclude grazers and the fence will be inspected at regular intervals to ensure that it is stockproof. The exclusion of grazing animals has been shown to facilitate the recovery of eroded blanket bog areas in the west of Ireland (Bleasdale, 1995).

2.4 Monitoring

A programme for monitoring to ensure that the objectives of the Plan are being achieved is an essential component of the Plan.

2.4.1 Monitoring for bog vegetation

Prior to the fencing of the site, a series of permanent quadrats will be set up for the purposes of monitoring of vegetation change over time. The location of these quadrats will be marked using wooden pegs and the grid reference will be recorded using GPS. Approximately ten quadrats will be described and they will be large (at least 5m x 5m) to take into account the scale of the Plan area. The occurrence and cover of vascular plant and moss species will be recorded in these

quadrats along with a number of other important parameters such as the height of vegetation, cover of bare peat, flowering of plant species etc. This survey will take place in early July of each year. Photographs of the monitoring quadrats will also be taken.

Monitoring will take place in Years 1, 2, 3 & 5 of Plan implementation, with Year 1 being the base year at the time the works are carried out. After Year 5, a review of the progress will be conducted in light of the Plan objectives, and a programme will be developed for the next 5-Year period of the Plan (and so on for the lifetime of the project).

2.4.2 Monitoring for birds

A transect will be established through the Plan area to survey for breeding birds. This will be walked on 3 occasions between April and July following standard survey methods.

As with the other aspects of monitoring, bird monitoring will take place in Years 1, 2, 3 & 5 of Plan implementation.

2.5 Time Period for Plan Implementation

Year 1 of the Plan will include all physical measures required, namely the erection of the boundary fence.

Year 1 will coincide with the completion of wind farm construction works.

Year 2 and subsequent years

Throughout the lifetime of the Plan the boundary fence will be checked at regular intervals, i.e. monthly, in order to check that it is stockproof.

3 OVERVIEW

The Habitat Enhancement Plan for the Inchamore Wind Farm project will restore and enhance an area of blanket bog and cutover bog habitats that has been degraded by sheep grazing over time and is now prone to erosion. This will provide mitigation for the loss of heath and bog habitats on site as a result of wind farm construction.

It is anticipated that various important species of flora and fauna will utilise the area as the habitats develop and/or improve in quality.

The objectives for the Plan are achievable, as similar bog revegetation projects have been carried out successfully at various eroded blanket bog sites throughout Ireland.

The Plan will be underwritten by a detailed monitoring programme, which will allow for modifications to ensure that the objectives are being achieved.

4 REFERENCES

Bleasdale, A. J. (1995) *The Vegetation and Ecology of the Connemara Uplands, with Particular Reference to Sheep Grazing*. Ph.D. thesis (National University of Ireland). University College Galway.

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Fossitt, J. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

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APPENDIX 5.6:

GORTYRAHILLY AND INCHAMORE WIND FARMS, BAT SURVEY 2019/2020 REPORT.

PREPARED BY FEHILY TIMONEY CONSULTING ENGINEERS

FEHILY TIMONEY
30 YEARS

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

Gortyrahilly and Inchamore Wind Farms Bat Survey 2019/2020 Report

Prepared for: SSE Renewables

SSE Renewables

Date: **April 2020**

NOTE: THIS REPORT CONTAINS SENSITIVE INFORMATION ON LOCATIONS OF BAT ROOSTS

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Gortyrahilly and Inchamore Wind Farms Bat Survey 2019/2020 Report

User is responsible for Checking the Revision Status of This Document

Rev. No.	Description of Changes	Prepared by:	Checked by:	Approved by:	Date:
A	Draft for Review	KB/JCD/SC/CF	JK	DMcH	06/04/2020

Client: SSE Renewables

Keywords: Bat Surveys, Wind Farm, Gortyrahilly, Inchamore

Abstract: The following report details the results of the 2019/2020 bat surveys undertaken within the proposed Inchamore and Gortyrahilly Wind Farms, Co. Cork. This bat report is required to assess the impacts of the proposed development on bat species within and surrounding the sites. This development is to consist of 30 no. wind turbines split across the townlands of Gortyrahilly and Inchamore.

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES

EXECUTIVE SUMMARY

The landscape that the proposed wind farm sites are a part of is of low to moderate suitability for common pipistrelle, soprano pipistrelle, brown long-eared bat, Leisler's bat, Daubenton's bat, Natterer's bat, whiskered bat and lesser horseshoe bat. The landscape is of low suitability for Nathusius' bat.

The methodology for the 2019/2020 bat survey at Gortyrahilly and Inchamore wind farms adhered to SNH (2019) guidance for assessing the impact of proposed wind farm developments on local bat species. Monthly activity surveys were undertaken between May to September. Three rounds of static detectors were also deployed during this time period, for at least ten nights per round per detector. Roost surveys were also conducted including preliminary ecological appraisal, bat roost inspection and emergence surveys. The latter were conducted in August 2019 and February 2020.

During activity surveys, a total of four species of bats were recorded: common pipistrelle, soprano pipistrelle, Leisler's bat and Natterer's bat. Across all activity surveys common pipistrelle was recorded the most frequently across both sites and Natterer's bat the least.

During static detector surveys, a total of nine species of bat were recorded. The same four species already recorded during activity surveys were present. In addition, Nathusius' bat, Daubenton's bat, whiskered bat, brown long-eared bat and lesser horseshoe bat were also recorded. During static detector surveys, common pipistrelle was recorded the most frequently across both sites and lesser horseshoe bat the least.

The Ecobat analysis showed six out of 14 detectors recorded at least one night of high bat activity in round one (spring), ten out of 18 detectors recorded at least one night of high bat activity in round two (summer) and eleven out of 17 detectors recorded at least one night of high bat activity in round three (autumn) at Gortyrahilly. Similarly, for Inchamore, it showed five out of 10 detectors recorded at least one night of high bat activity in round one (spring), seven out of 10 detectors recorded at least one night of high bat activity in round two (summer) and five out of 11 detectors recorded at least one night of high bat activity in round three (autumn).

All bats recorded during surveys are classified as 'Least Concern' on the Irish Red List and protected under the EU Habitats Directive Annex IV and Wildlife Acts. Only one species was listed as Annex II under the EU Habitats Directive: lesser horseshoe bat.

During August roost surveys, a total of seven potential roosts were identified. Of these, there were only three confirmed roosts. Three species were recorded during emergence surveys: common pipistrelle, soprano pipistrelle and Natterer's bat.

No confirmed bat roosts were identified at the Inchamore site following inspection of trees and buildings (only one low potential outbuilding was present in the south east of the site).

At Gortyrahilly, of the six potential roosts, three were confirmed via emergence surveys. These included a disused house and derelict house present in the north east of the site. The disused house was classified as being of high suitability for bats and was confirmed as a minor summer roost site for male common pipistrelle, soprano pipistrelle and Natterer's bat. The derelict house was classified as being of moderate suitability for bats and was confirmed as a minor summer roost site for male common and soprano pipistrelle bats. The final confirmed summer roost was in the south west of the Gortyrahilly site and was a high suitability dwelling that acted as a maternity roost for common and soprano pipistrelles. A low potential oak tree, moderate potential ash tree and moderate potential double-arched stone culvert were discounted as roosts at Gortyrahilly following surveys.

During winter roost surveys, no evidence of winter roosting bats was recorded either at Gortyrahilly or Inchamore. While the buildings recorded during the summer roost surveys (disused house and derelict house) at Gortyrahilly are unlikely to provide the consistent cool conditions required by hibernating bats, the presence of low numbers of bats within these structures cannot be excluded.

No trees or structures of potential use as winter roosts were recorded at Inchamore.

There is potential for low-level cumulative impacts to a minor roost of common pipistrelle located 0.7 km south of the Gortyrahilly recorded during surveys for Derragh wind farm. Damage and disturbance to these roosts should be avoided. Mitigation measures such as providing a 50 m buffering distance from turbine blade to key habitat features should be implemented during construction and operation of the proposed wind farm sites.

1. INTRODUCTION

This report details the results of the bat surveys carried out at the proposed Gortyrahilly and Inchamore winds farm during 2019 and 2020. In addition to desktop study, the following surveys were undertaken within and near to the boundary of the proposed wind farm:

- bat activity (walked and driven transects);
- roost surveys (summer and winter); and
- static detector (three survey periods).

All surveys adhered to SNH (2019) guidelines.

Monthly activity surveys were conducted from May to September 2019 along predetermined walked and driven transects. Static detector surveys were carried out between May to September 2019 in three rounds. These two surveys were used to determine the species assemblage and spatial and temporal distribution of bat activity.

Roost surveys were carried out in summer 2019 and February 2020, with preliminary ecological appraisal and bat roost inspection conducted first. The aim was to identify key features that could support maternity roosts and significant hibernation and/or swarming sites within 200 m plus rotor radius of the boundary of the proposed development. Subsequent emergence surveys were then conducted in August 2019 outside of structures considered to have high bat roosting potential. Further roost surveys were also conducted in February 2020.

1.1 Site Location

The proposed Inchamore – Gortyrahilly wind farms are within and surrounds the townlands of Inchamore and Gortyrahilly. The first wind farm is to be located within Inchamore along the Cork-Kerry border, an estimated 18 km south-east of the town of Killarney and 5 km west of the town of Ballyvourney. The second wind farm is to be located further to the south within Gortyrahilly, located approximately 3.2 km north of Ballingeary.

Surrounding Corine 2012 habitats and land uses are: 'Forest' and 'semi-natural areas with transitional woodland scrub and Conifer Plantation' (324 & 314), 'Wetlands' (412) and 'Agricultural Areas' (243). Figure 1-1 displays the site location.

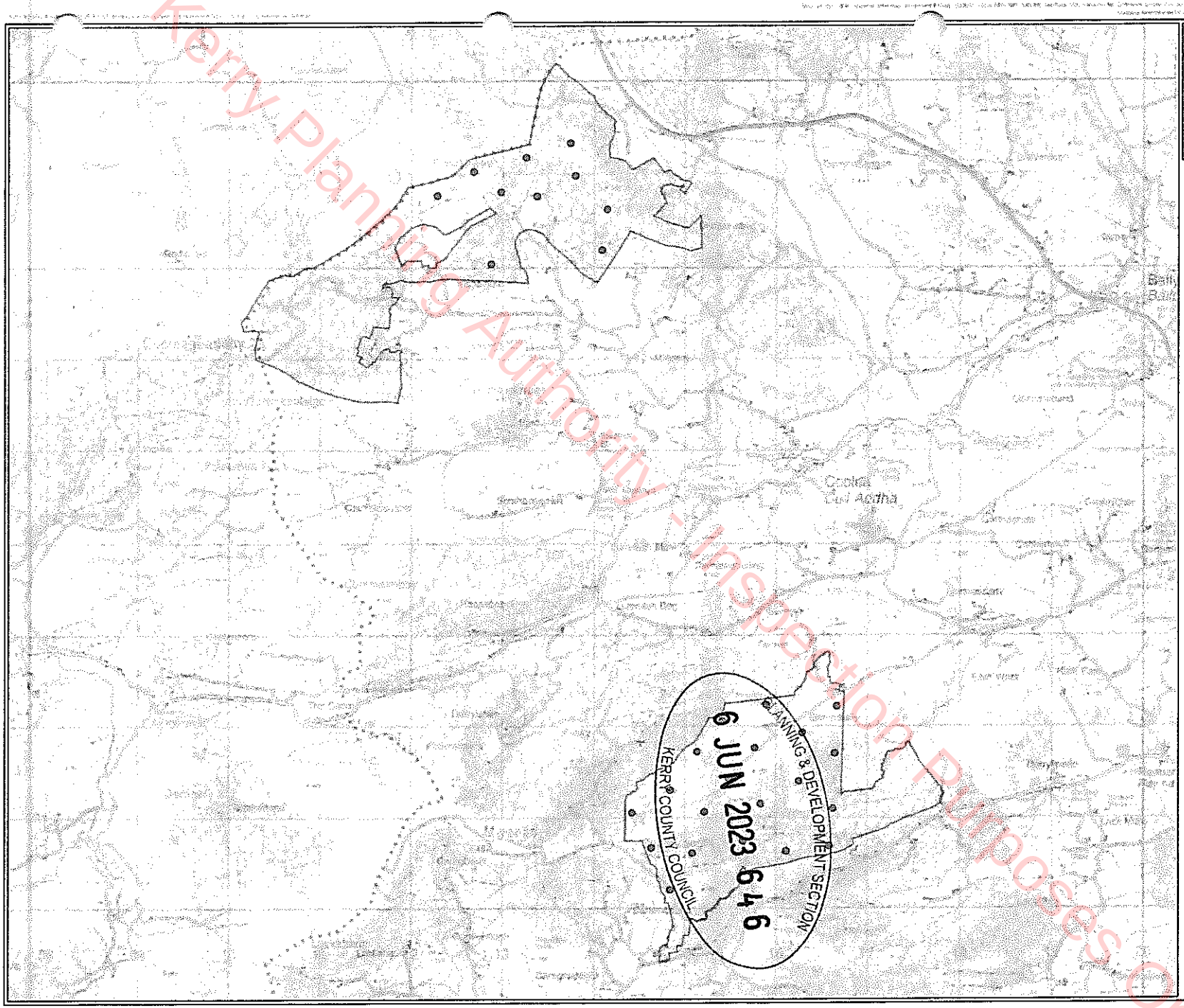
During site surveys, habitats such as heath (HH), peatlands (PB), conifer plantation (WD4) and agricultural lands (GA/GS) were recorded (Fossitt, 2000).

Areas of heath (HH), dominant in Heather (Ling *Calluna vulgaris* and Bell Heather *Erica cinerea*) were identified throughout the site, particularly around turbine number 1. Areas of degraded heath were also present.

Areas of conifer plantation (WD4) are widespread throughout the site, with crops largely consisting non-native pine species (*Pinus* sp.). This habitat appears to be largely planted upon areas of degraded bog (PB) and heath (HH).

Upland blanket bog (PB2) along with degraded areas of cutover bog (PB4) habitat were also present throughout the site. Areas of bog and flush (PB/PF) habitat were present to the west of turbine number 4.

Cultivated (BC) and built land (BL3) is present throughout the site with dwellings and agricultural sheds being most prominent. Areas of agricultural grassland (GA1) are particularly dominant throughout the lowland areas within and surrounding the site. Wet grassland areas (GS4) were also identified at the edges of such agricultural areas.



TITLE:	Site Location
PROJECT:	Gortyrahilly and Inchamore Wind Farms Bat Survey 2019/2020
FIGURE NO:	1.1
CLIENT:	SSE Renewables
SCALE: 1:40000	REVISION: 0
DATE: 31/03/2020	PAGE SIZE: A3

FEHILY TIMONEY www.fehilytimoney.ie

1.2 Bat Species

Bats belong to the Order Chiroptera and to date, nine species are recorded as resident in Ireland. These nine species are divided into two families:

1. Vespertilionidae, which contains nine Irish species (Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis nattereri*, whiskered bat *Myotis mystacinus*, Leisler's bat *Nyctalus leisleri*, brown long-eared bat *Plecotus auritus*, soprano Pipistrelle *Pipistrellus pygmaeus*, common pipistrelle *Pipistrellus pipistrellus* and Nathusius's pipistrelle *Pipistrellus nathusii*); and
2. Rhinolophidae, which contain one Irish species, the lesser horseshoe bat *Rhinolophus hipposideros*.

Brandt's bat *Myotis brandii* has only been recorded once in Ireland from a site in Co. Wicklow and is classified as a vagrant. In 2013, a single male greater horseshoe bat *Rhinolophus ferrumequinum* was recorded in Co. Wexford. This bat was also considered to be a vagrant. Gortyrahilly and Inchamore wind farms are within the distribution range for lesser horseshoe bat (NPWS, 2019).

1.3 Legislation

The serious decline in bat populations both in Ireland and across Europe has led to conservation measures and appropriate legislation being drawn up and implemented in an attempt to stabilise population numbers. It is estimated that bat populations across Europe have decreased by up to 60% in the last 30 years. As they are highly specialised animals, bats serve as biological indicators and are often amongst the first animal species to show signs of population change due to the activities of man. Destruction of roosts and foraging areas, coupled with the widespread use of pesticides, are the key reasons for the decline in bat numbers in Ireland. Efforts should be made to retain known bat colonies and methods to lessen disturbance to these animals should be incorporated into any development.

Bats' dependency on insects has left them vulnerable to habitat destruction, land drainage, agricultural intensification and increased pesticide use. Their reliance on buildings has also made them vulnerable to building repairs and the use of chemicals for timber treatment.

Roosting or hibernation sites in trees and disused buildings are also often lost to development.

Irish Legislation

In the Republic of Ireland, under Schedule 5 of the Wildlife Acts 1976 to 2019, all bats and their roosts are protected by law. It is an offence to disturb either without the appropriate licence. This Act was further strengthened by the Wildlife Amendment Act 2000.

E.U. Legislation

Under the Habitats Directive 1992 (EEC 92/43), each member state of the E.U. was requested to identify habitats of national importance and priority species of flora and fauna. These habitats are now designated as Special Areas of Conservation (SAC).

In Ireland, all bat species are classified as Annex IV species under the Habitats Directive. Annex IV species are species in need of strict protection. Lesser horseshoe bat is also classified as an Annex II species (Priority Species). Annex II species require the designation of Special Areas of Conservation specifically for their protection.

All species of bat in Ireland are strictly protected under the Habitats Directive to include deliberate disturbance of these species, particularly during the periods of breeding, rearing and hibernation. It also specifies deterioration or destruction of breeding or resting places.

International Legislation

Ireland has ratified two international wildlife laws pertaining to bats:

a) The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention, 1982) – part of this convention stipulates that all bat species and their habitats are to be conserved.
b) The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, Enacted 1983). This was instigated to protect migrant species across all European boundaries.

1.4 Relevant Guidance Documents

This report will draw on guidelines already available in Europe and will use the following documents:

- National Roads Authority (2006) Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes
- Collins, J. (Editor) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust, London
- McAney, K. (2006) A conservation plan for Irish vesper bats, Irish Wildlife Manual No. 20 National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- The status of EU protected habitats and species in Ireland: Conservation status in Ireland of habitats and species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government

1.4.1 Relevant Wind Farm Guidance Documents

A large array of publications has been produced to date on the potential impact of wind turbines on bats. As a consequence, there are a number of guidelines that this report draws from in order to provide recommendations and mitigation measures. It is important to be aware of these publications in order to understand the survey protocol, the large degree of bat surveying completed and to address potential impacts of wind turbines on local bat populations. This literature review also provides evidence for accepted bat mitigation measures implemented across Europe.

The following wind farm specific guidance documents were consulted:

- Bats and onshore wind turbines: Survey, Assessment and Mitigations. Scottish Natural Heritage January, 2019.
- UNEP/EUROBATS: Guideline for consideration of bats in wind farm projects, Publication Series No. 3.
- Natural England Technical Information Note TIN051: Bats and onshore wind turbines – Interim Report
- Guide to Turbines and Wind Farms. Bat Conservation Ireland 2012.

1.5 Bat Survey Aims

This bat survey report is a stand-alone document and aims to provide the following information on bat activity in 2019/20 within the survey area:

- Bat species list for the proposed development area;
- Location of bat presence within the proposed development area;
- Bat activity levels within the proposed development area;
- Recommendations and mitigation measures to reduce the potential impact of the proposed development on local bat fauna.

The 2019/20 bat surveys were undertaken according to the survey recommendations of the Bats and onshore wind turbines: Survey, Assessment and Mitigations (January 2019) Scottish Natural Heritage, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter.

Surveys are comprised of many different types. The following is a brief description of main types of surveys completed in 2019/20 for this report.

- Emergence (dusk) surveys: surveying of buildings or structures to determine whether each building/structure is a bat roost. Undertaken from 10 minutes prior to sunset to 90 minutes after sunset.
- Walking transect bat surveys completed on-foot where the surveyor(s) walk the survey site from 10 minutes prior to sunset to at least 110 minutes after sunset. Often this survey is completed post an emergence survey and therefore may be undertaken for a longer period of time after sunset.
- Driving transect bat survey completed in a car and undertaken according to a strict survey protocol. Surveying is completed from 40 minutes after sunset till the end of the planned survey route. This is only undertaken for large survey area with a well-defined public road structure. Routes are planned and mapped prior to surveying.

Static surveys: placement of automated recording devices within the survey area. The units are set up during the daylight hours, commence recording 30 minutes before sunset and stop recording 30 minutes after sunrise.

2. METHODOLOGY

2.1 Desktop Study

A pre-roost survey data search was conducted on 21/10/2019 in order to collate existing information from the footprint of the proposed development sites and the surrounding area at each site on bat activity, roosts and landscape features that may be used by bats. The data search comprised the following information sources:

- Collation of known bat records within a 4 km radius of the proposed sites from the National Bat Database held by the National Biodiversity Data Centre (www.biodiversityireland.ie)[1];
- Review of Ordnance Survey mapping and aerial photography of the proposed wind farm boundaries and their environs (i.e. 200 m plus rotor radius of the boundary of the proposed development[2]);
- Records of designated sites within a 15 km radius of the proposed sites where bats form part or all of the reason for designation (https://www.npws.ie/protected-sites);
- Collation of lesser horseshoe bat records within a 15 km radius of the proposed sites from the National Parks and Wildlife Service lesser horseshoe bat database (https://www.npws.ie);
- Collation of data on known caves within a 4 km radius of the proposed sites from the Cave Database for the Republic of Ireland, compiled by Trinity College (http://www.ubss.org.uk/search_irishcaves.php); and
- Review of bat survey data from Ecological Impact Assessments from proposed and permitted developments within the wider environs of the site.

2.1.1 Bat Landscapes

Bat Conservation Ireland produced a landscape conservation guide for Irish bat species using their database of species records collated during the 2000-2009 survey seasons. An analysis of the habitat and landscape associations of all bat species deemed resident in Ireland was undertaken and reported in Lundy *et al.*, 2011.

The degree of favourability ranges from 0 – 100, with 0 being least favourable and 100 most favourable for bats. The values of the grid squares represent the range of habitat suitability values the bat species can tolerate within each individual square

A caveat is attached to the model and it is that the model is based on records held on the BCIreland database, while core areas have been identified, areas outside the core area should not be discounted as unimportant as bats are a landscape species and can travel many kilometres between roosts and foraging areas nightly and seasonally.

2.1.2 Designated Sites

A search was made for designated sites within 15 km of the proposed wind farm site boundary. These included sites designated at the European level (in the context for bats, this refers to Special Areas for Conservation or SACs) and the Irish level (Natural Heritage Areas or NHAs and proposed Natural Heritage Areas or pNHAs). The Habitats Directive (Article 6) forms a basis for the designation of SACs. Further information on the context of SACs for bats is given in section 1.3.

[1] A specific data request was not made to Bat Conservation Ireland because they regularly update NBDC with their records and it is only judged to provide an additional useful source of data if a location is deigned of high potential for bat roosts.
[2] As per SNH (2019) guidance.

NHAs are areas considered important for the habitats present or which holds species of plants and animals whose habitat needs protection. Under the Wildlife Amendment Act (2000), NHAs are legally protected from damage from the date they are formally proposed for designation.

All pNHAs were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. These sites are of significance for wildlife and habitats. All pNHAs are subject to limited protection in the form of agri-environmental farm planning schemes, NPWS approval prior to afforestation grants on pNHA lands and recognition of ecological value of pNHAs by Planning and Licencing authorities.

Both NHAs and pNHAs may be designated due to the presence of bats.

2.2 2019 / 2020 Surveys

A total of five no. bat activity and static detector surveys were carried out during 2019 and 2020 (refer to Table 2-1 for details). These surveys followed the specific guidelines set out by the Bat Conservation Trust in Bat Surveys: Good Practice Guidelines (Hundt, 2012 and Collins, 2016).

Table 2-1 Bat Surveys 2019/2020

Survey Type	Survey Date	Surveyor
Bat Activity Survey 1 - Dusk	20/05/2019	Karen Banks (BSc, MCIEEM)
Bat Activity Survey 2 – Dusk	27/06/2019	Karen Banks (BSc, MCIEEM)
Bat Activity Survey 3 – Dusk	26/07/2019	Karen Banks (BSc, MCIEEM)
Bat Activity Survey 4 – Dusk	15/08/2019	Karen Banks (BSc, MCIEEM)
Bat Activity Survey 5 - Dusk	22/09/2019	Karen Banks (BSc, MCIEEM)
Static Detector Survey	09/05/2019 – 01/10/2019 (full details are given in Table 2-3)	Jonathon Dunn (BSc, MSc, PhD) and Sinead Clifford (BSc, CIEEM graduate)
Roost Survey	Preliminary appraisal and summer inspection = throughout August 2019; emergence = 16/08/2019, 17/08/2019. Winter inspection = 27/02/2020.	Karen Banks (BSc, MCIEEM) and Cathál MacPartholan (general operative)

2.2.1 Surveyor Information

The activity and roost surveys were undertaken by Karen Banks, MCIEEM.

Karen is an ecologist with 13 years' experience in the field of ecological assessment. She holds a BSc in Environment and Development from Durham University, and is a full member of the Chartered Institute of Ecology and Environmental Management. Karen is an experienced and skilled bat surveyor, first gaining a scientific licence to disturb bats from Natural England, UK in 2008. Karen is trained in bat handling and capture methods and currently holds a bat disturbance licence granted by the NPWS. Karen has undertaken bat survey and assessment for numerous projects, including bridge repair and replacement works, domestic dwelling repair and demolition works, wind farm developments and large-scale infrastructure projects such as flood relief schemes, road developments and pipeline schemes. Karen has also represented Cork County Council as an expert witness for bats at an Oral Hearing.

The static detector surveys were carried out by Dr Jonathon Dunn and the recordings analysed by Sinead Clifford (CIEEM graduate).

Jonathon is an ecologist with over seven years' experience in the environmental sector and holds a BA (Hons) in Natural Sciences (Zoology) from the University of Cambridge, an MSc in Ecology, Evolution and Conservation from Imperial College London and a PhD in Avian Ecology from Newcastle University. Sinead Clifford is an ecologist with 1.5 years' experience in the environmental sector and holds a BA (Hons) from Institute of Technology Tralee and a Certificate in Ecological Consultancy from Acorn Ecology and is fully trained in sound analysis of bat calls.

2.2.2 Bat activity surveys

Transects through bat favourable habitats within the proposed Gortyrahilly and Inchamore wind farms were either walked (transect 4S) or surveyed from a vehicle driven at 15 kph with a detector mounted on the hedge-side of the vehicle (transects 2N, 3N, 4N and 1S). Bat activity was recorded using an Anabat Walkabout detector. The order in which transects were surveyed was randomised to ensure transect number was not confounded with time of day. Transects were undertaken once a month between May to September 2019 (Table 2-1).

Surveys targeted a range of foraging and commuting habitats present within the study area, those associated with linear features such as roadside margins, woodland plantation edges, hedgerows, treelines and waterbodies. A sample of stream corridors within study areas was sampled for Daubenton's bats (streams were near the start/end of transect 4S and to the north of transect 2N). Full details of transects are shown in Figure 2-1 and Table 2-2 below.

The Anabat Walkabout detectors record bat ultrasonic calls on a continuous basis and stores the information onto an internal SD memory card. The detectors offer the choice between heterodyne, time expansion, frequency division or pitch shift outputs. The detector can convert the inaudible bat echolocation calls to audible sounds.

The bat detectors used a Full Spectrum Analysis to make the real-time recorded calls visible for display purposes. It is these sonograms (2-d sound pictures) that are digitally stored on an SD card and downloaded for analysis. Each time a bat is detected, an individual time and GPS stamped (date and time to the second) file is recorded.

Bat activity is governed by the activity of their insect prey and insect abundance is in turn governed by weather conditions and climate. Insects, and therefore bats, are unlikely to be present at temperatures below 6°C or during periods of strong winds or heavy rainfall so survey in such conditions is not possible. All field surveys were undertaken within the active bat season and during good weather conditions (dry conditions and temperature at 8°C and greater).

Nocturnal bat activity is mainly bi-modal taking advantage of increased insect numbers on the wing in the periods after dusk and before dawn, with a lull in activity in the middle of the night. This is particularly true of 'hawking' species – i.e. bats which capture prey in the open air. However, 'gleaning' species remain active throughout the night as prey is available on foliage for longer periods. Gleaning is the term for taking prey from foliage or the ground.

Bats were identified by their ultrasonic calls coupled with behavioural and flight observations and on computer by sound analysis of recorded echolocation and social calls with dedicated software (Anabat Insight spectrogram sound analysis software Version 1.9).

Table 2.2: Transect Details[3]

Transect Name	Mode of survey	Transect length (m)	Fossitt habitats along transect
2N	Driven	1,309	Conifer plantation (WD4), drainage ditches (FW4), recently-felled woodland (WS5), scrub (WS1), buildings and artificial surfaces (BL3)
3N	Driven	729	Conifer plantation (WD4), drainage ditches (FW4), recently-felled woodland (WS5), scrub (WS1), buildings and artificial surfaces (BL3)
4N	Driven	623	Buildings and artificial surfaces (BL3), scrub (WS1), conifer plantation (WD4), Treelines (WL2)
1S	Driven	1,538	Conifer plantation (WD4), drainage ditches (FW4), buildings and artificial surfaces (BL3)
4S	Walked	1,240	Conifer plantation (WD4), buildings and artificial surfaces (BL3), drainage ditches (FW4), eroding/upland rivers (FW1), heath (HH), bog (PB)

[3] Note that the naming of transects comes from those used for separate bird surveys. Not all transects used in the bird surveys were included in the bat surveys, owing to changes in site layout and boundaries. However, the names were retained to ensure comparability.

2.2.3 Static Detector Surveys

A Passive Static Bat Surveys involves leaving a static bat detector unit (with ultrasonic microphone) in a specific location and set to record for a specified period of time (i.e. a bat detector is left in the field, there is no observer present and bats which pass near enough to the monitoring unit are recorded and their calls are stored for analysis post surveying). The bat detector is effectively used as a bat activity data logger. This results in a far greater sampling effort over a shorter period of time. Bat detectors with ultrasonic microphones are used as the ultrasonic calls produced by bats cannot be heard by human hearing.

Song Meter SM4BAT Full spectrum bat recorders use Real Time recording as a technique to record bat echolocation calls and using specific software, the recorded calls are identified. It is these sonograms (2-d sound pictures) that are digitally stored on the SD card (or micro SD cards depending on the model) and downloaded for analysis. These results are depicted on a graph showing the number of bat passes per species per hour/night. Each bat pass does not correlate to an individual bat but is representative of bat activity levels. Some species such as the pipistrelles will continuously fly around a habitat and therefore it is likely that a series of bat passes within a similar time frame is one individual bat. On the other hand, Leisler's bats tend to travel through an area quickly and therefore an individual sequence or bat pass is more likely to be indicative of individual bats.

As per SNH (2019) guidance, static units (Song Meter SM4BAT) were programmed to commence half an hour before sunset and finish half an hour after sunrise to ensure that bat species that emerge early in the evening and return to roosts late are recorded. Detectors were left out for a minimum of 10 consecutive nights across three survey periods in 2019: spring (April to May), summer (June-mid to August) and autumn (mid-August to October). At Gortyrahilly, this corresponded to 14 detectors for round one, 18 for round two and 16 for round three. At Inchamore, this corresponded to 10 detectors for rounds one and two and 11 for round three. Across all rounds, detectors were left out for a mean of 33 days per turbine for Gortyrahilly and 46 days per turbine for Inchamore. See Table 2-3 for further details.

Static units were located in vicinity of the proposed locations of the turbines. Where possible, units were deployed in the exact turbine locations (SNH, 2019). The location of units differed from those of the indicative turbine locations in the following scenarios:

- Where livestock were present, units were sited back from the indicative turbine location in nearby safe areas to prevent damage to units.
- Where indicative turbine locations were adjacent to public footpaths or roads, units were moved to a more discrete location nearby to reduce the risk of theft.
- Where the densely closed nature of the habitat (e.g. mature conifer plantation) immediately surrounding the indicative turbine location prevented access for surveyors or bats, units were moved to the edge of the closed habitat nearest to the turbine location.

SNH (2019) guidance states that "*Detectors should be placed at all known turbine locations at wind farms containing less than ten proposed turbines. Where developments have more than ten turbines, detectors should be placed within the developable area at ten potential turbine locations plus a third of additional potential turbine sites up to a maximum of 40 detectors for the largest developments*".

Thus, for the Inchamore subsite, detectors were placed at or close to the locations of all ten indicative turbine locations, with one additional detector placed to the north of the site near to a stream. For the Gortyrahilly subsite, 20 indicative turbine locations are present. Thirteen detectors were placed around the site, with an additional six placed in different locations, thus *exceeding* the survey effort required by SNH (2019). The selection of locations for these additional turbines were distributed to represent different habitats and topographical features at the proposed wind farm site.

The data was analysed with Kaleidoscope 5.1.9g software (Bats of Europe 5.1.0 S/A: 0). The location of the static detectors is presented in Figure 2-2 below

Table 2.3. Details of Static Detector Deployment

Site	Box location	Habitat types	Notes	First recording (Spring)		Second recording (Summer)		Third recording (Autumn)	
				Date deployed	Number of nights deployed[4]	Date deployed	Number of nights deployed	Date deployed	Number of nights deployed
Gortyrahilly	G1	Heath/Bog		09/05/2019	11	28/06/2019	10	17/09/2019	13
Gortyrahilly	G2	Heath/Bog		09/05/2019	11	01/07/2019	10	17/09/2019	13
Gortyrahilly	G3	Heath/Bog		09/05/2019	12	28/06/2019	10	21/08/2019	26
Gortyrahilly	G4	Heath/Bog		09/05/2019	12	28/06/2019	10	21/08/2019	26
Gortyrahilly	G5	Margin of conifer plantation		09/05/2019	12	01/07/2019	10	21/08/2019	26
Gortyrahilly	G6	Heath/Bog		21/05/2019	14	01/07/2019	10	NA	NA
Gortyrahilly	G7	Heath/Bog		21/05/2019	14	01/07/2019	10	17/09/2019	13
Gortyrahilly	G8	Heath/Bog		21/05/2019	14	01/07/2019	10	NA	NA
Gortyrahilly	G9	Margin of conifer plantation	G9 location inside of inaccessible conifer plantation, so placed detector as close to turbine location as possible.	21/05/2019	14	01/07/2019	10	17/09/2019	13
Gortyrahilly	G10	Heath/Bog		21/05/2019	14	01/07/2019	10	17/09/2019	13
Gortyrahilly	G11	Heath/Bog		05/06/2019	12	01/07/2019	10	17/09/2019	13
Gortyrahilly	G12	Margin of conifer plantation		20/05/2019	15	28/06/2019	10	17/09/2019	13
Gortyrahilly	G13	Margin of conifer plantation		20/05/2019	15	01/07/2019	10	17/09/2019	13
Gortyrahilly	G14	Heath/Bog		21/05/2019	14	28/06/2019	10	17/09/2019	13

[4] Note that data will be recorded for the morning on the date of collection. Thus, if a detector was left out on 09/05/2019 and collected on 20/05/2019, the detector will have been left out for a total of 11 complete nights. However, there will be 12 unique dates where data was (potentially) recorded. Ecobat automatically includes every distinct date as a night and so reports one more night than is actually recorded.

Site	Box location	Habitat types	Notes	First recording (Spring)		Second recording (Summer)		Third recording (Autumn)	
				Date deployed	Number of nights deployed[4]	Date deployed	Number of nights deployed	Date deployed	Number of nights deployed
Gortyrahilly	G15	Margin of conifer plantation		NA	NA	11/07/2019	19	17/09/2019	13
Gortyrahilly	G16	Heath/Bog		NA	NA	11/07/2019	19	NA	NA
Gortyrahilly	G17	Heath/Bog		NA	NA	11/07/2019	19	17/09/2019	13
Gortyrahilly	G18	Margin of conifer plantation	G18 location inside of inaccessible conifer plantation, so placed detector as close to turbine location as possible.	NA	NA	11/07/2019	19	17/09/2019	13
Gortyrahilly	G19		Extra detector	NA	NA	NA	NA	30/07/2019[5]	30
Inchamore	I1	Heath/Bog among very small immature conifer plantation		09/05/2019	11	28/06/2019	10	21/08/2019	26
Inchamore	I2	Heath/Bog		09/05/2019	11	28/06/2019	10	21/08/2019	26
Inchamore	I3	Heath/Bog		09/05/2019	11	28/06/2019	10	21/08/2019	26
Inchamore	I4	Margin of conifer plantation		09/05/2019	11	28/06/2019	10	21/08/2019	26
Inchamore	I5			09/05/2019	11	28/06/2019	10	21/08/2019	26
Inchamore	I6	Margin of conifer plantation	Coillte machines operating in I6 location, so moved detector to edge of road away from works.	05/06/2019	12	28/06/2019	10	21/08/2019	26

[5] Note that the dates this detector was deployed covered both summer and autumn survey periods. Here it is included in the autumn survey period.

Site	Box location	Habitat types	Notes	First recording (Spring)		Second recording (Summer)		Third recording (Autumn)	
				Date deployed	Number of nights deployed[4]	Date deployed	Number of nights deployed	Date deployed	Number of nights deployed
Inchamore	I7	Margin of conifer plantation	I7 location inside of inaccessible conifer plantation, so placed detector as close to turbine location as possible.	20/05/2019	15	28/06/2019	10	21/08/2019	26
Inchamore	I8	Margin of conifer plantation		20/05/2019	15	28/06/2019	10	21/08/2019	26
Inchamore	I9	Margin of conifer plantation		20/05/2019	15	28/06/2019	10	21/08/2019	26
Inchamore	I10	Margin of conifer plantation	I10 location inside of inaccessible conifer plantation, so placed detector as close to turbine location as possible.	20/05/2019	15	28/06/2019	10	21/08/2019	26
Inchamore	I11		Extra detector	NA	NA	NA	NA	30/07/2019[6]	24

[6] Note that the dates this detector was deployed covered both summer and autumn survey periods. Here it is included in the autumn survey period.

2.2.4 Bat Roost Surveys

Habitats within the facility were assessed for their favourability for bats. All structures were surveyed for bat presence either externally via bat detector, or internally by visual inspection or by a combination of both. All structures / suitable trees were inspected for bats and/or their signs using powerful torches.

The presence of bats is often shown by grease staining, droppings, urine marks, corpses, feeding signs such as invertebrate prey remains and/or the presence of bat fly *Nycteribiidae* pupae, although direct observations are also occasionally made. Bat droppings are often identifiable to species-level based on their size, shape and content and those of certain species, for example brown long-eared *Plecotus auritus* and lesser horseshoe *rhinolophus hipposideros* bats, are very distinctive and unmistakable.

2.2.4.1 Preliminary Ecological Appraisal

Walkover surveys of areas identified as potential roosting habitats during the desk top study were undertaken in August 2019 and February 2020. The proposed site was walked and habitats of potential value to bats were noted and marked on a map. The value of each feature was noted according to its potential for use by bats for roosting. The value of habitat features for bats was defined in accordance with Bat Surveys: Good Practice Guidelines publication (Collins, 2016), as shown in Table 2-4.

Table 2-4: Potential Suitability of Habitats for Bats (Collins, 2016)

Suitability	Description of Roosting Habitats	Commuting and Foraging Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or un-vegetated 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 or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only- the assessments in this table are made	Continuous habitat connected to the wider landscape that could be used by bats for commuting 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

Suitability	Description of Roosting Habitats	Commuting and Foraging Habitats
	irrespective of species conservation status, which is established after presence is confirmed).	foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats 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.

2.2.4.2 Bat Roost Inspection Survey

Trees

Detailed inspection of the exterior of trees was undertaken in August 2019 and February 2020 to look for features that bats could use for roosting (Potential Roost Features, or PRFs) from ground level. The aim of the surveys was to determine the actual or potential presence of bats and the need for further survey and/or mitigation.

A detailed inspection of each potential tree roost within the site was undertaken. The inspection was carried out in daylight hours from ground level, and information was compiled on the tree, PRFs and evidence of bats. All trees surveyed were numbered and marked on a map and a description of each PRF observed was recorded. PRFs that may be used by bats include:

- Rot holes;
- Hazard beams;
- Other horizontal or vertical cracks or splits (e.g. frost cracks) in stems or branches;
- Lifting bark;
- Knotholes arising from naturally shed branches or branches previously pruned back to the branch collar;
- Man-made holes (e.g. flush cuts) or cavities created by branches tearing out from parent stems;
- Cankers in which cavities have developed;
- Other hollows or cavities;
- Double leaders forming compression forks with included bark and potential cavities;
- Gaps between overlapping stems or branches;
- Partially detached ivy with stem diameters in excess of 50mm; and
- Bat or bird boxes.

Signs of a bat roost (excluding the actual presence of bats), include:

- Bat droppings in, around or below a PRF;
- Odour emanating from a PRF;
- Audible squeaking at dusk or in warm weather; and
- Staining below the PRF.

It should be noted that bats or bat droppings are the only conclusive evidence of a roost and many roosts have no external signs. Therefore, this survey and evaluation was relatively basic as only those PRFs at ground level could be inspected closely to ascertain their true potential to support roosting bats. Trees were categorised according to the highest suitability PRF present.

Structures

Derelict/disused buildings and bridges within the proposed wind farm site boundaries were subject to a visual inspection for evidence of, and potential for, bats in August 2019 and February 2020. The exterior of the structures were visually assessed for potential bat access points and evidence of bat activity using binoculars, a high-powered torch and an endoscope (Explorer Premium 8803 with 9 mm camera). Features such as crevices and small gaps in the bridge or building structure, such as between the brick or stonework, beneath roofing material, at eaves and around window frames which had potential as bat access points into the buildings were inspected. Evidence that these features/ access points were actively being used by bats includes staining within the gaps, urine staining and bat droppings. Indicators that potential access points are not actively used by bats include general detritus and cobwebs within the access point. A note of potential features used by bats was made where present.

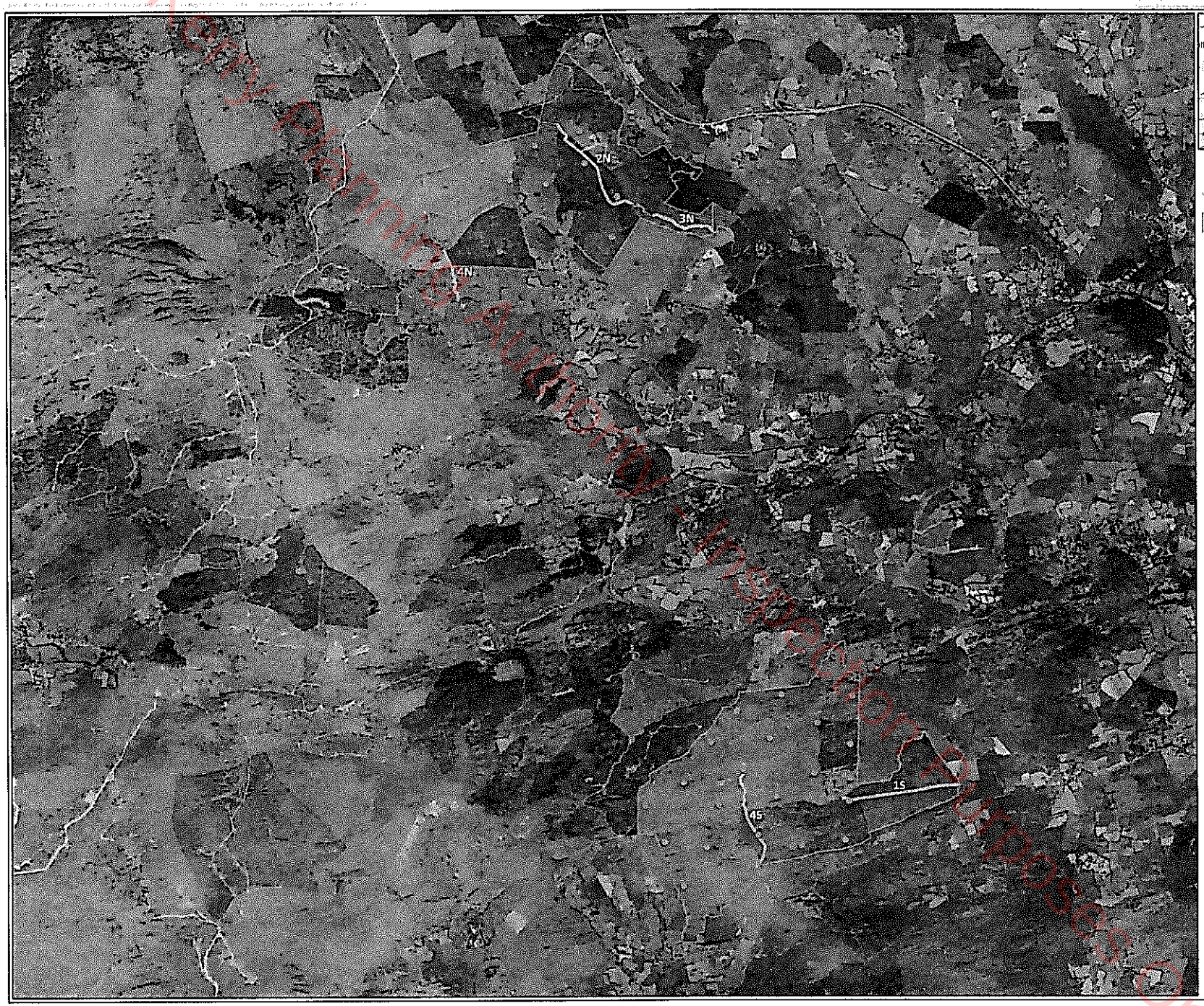
Where possible, internal inspections of these structures was undertaken. Internal inspections involved looking for features that may be suitable for roosting bats, such as joints and crevices in wood, holes or crevices between stonework in the walls and searching for bat droppings, urine stains and feeding signs on the floor.

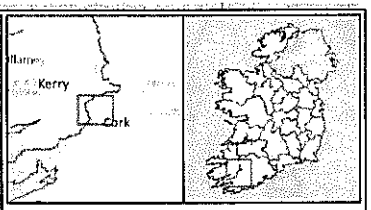
2.2.4.3 Emergence Roost Survey

Dusk surveys were undertaken in August 2019 for structures identified as being of moderate to high potential for bats during the roost inspection surveys. The purpose of the surveys was to watch and listen for bats exiting from bat roosts to determine the presence or absence of bats at the time of survey. The dusk emergence surveys commenced approximately 15 minutes before sunset and ended approximately 90 minutes after sunset. The surveys were undertaken in suitable weather conditions (avoiding periods of very heavy rain, strong winds (> Beaufort Force 5), mists and dusk temperatures below 12°C). A pair of ecologists surveyed the structures.

An Anabat Walkabout detector was utilised for the survey, which records bat echolocation calls directly on to an internal SD memory card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded. Data were then downloaded and all recordings were analysed using the Anabat Insight spectrogram sound analysis software Version 1.9. A Batbox Duet detector was also utilised for the survey.

In order to supplement the information gathered from the emergence survey undertaken at the cluster of buildings present within the site boundary in the townland of Gortyrahilly, a passive monitoring system of bat detection was also deployed (i.e. a bat detector is left in the field; there is no observer present and bats which pass near enough to the monitoring unit are recorded and their calls are stored for later analysis). Passive monitoring was completed using the Anabat Swift bat monitor, which records bat ultrasonic calls on a continuous basis and stores the information onto an internal SD card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded. Data were then downloaded and bat echolocation calls were later analysed by Anabat Insight spectrogram sound analysis software. One bat monitor was positioned on a fence post to the south of the disused house.





Indicative Turbine Locations

Transect Routes

Site Boundary

TITLE:	Bat Activity Survey Transect Routes		
PROJECT:	Gortyrahilly and Inchamore Wind Farms Bat Survey 2019/2020		
FIGURE NO:	2.1		
CLIENT:	SSE Renewables		
SCALE:	1:40000	REVISION:	0
DATE:	31/03/2020	PAGE SIZE:	A3

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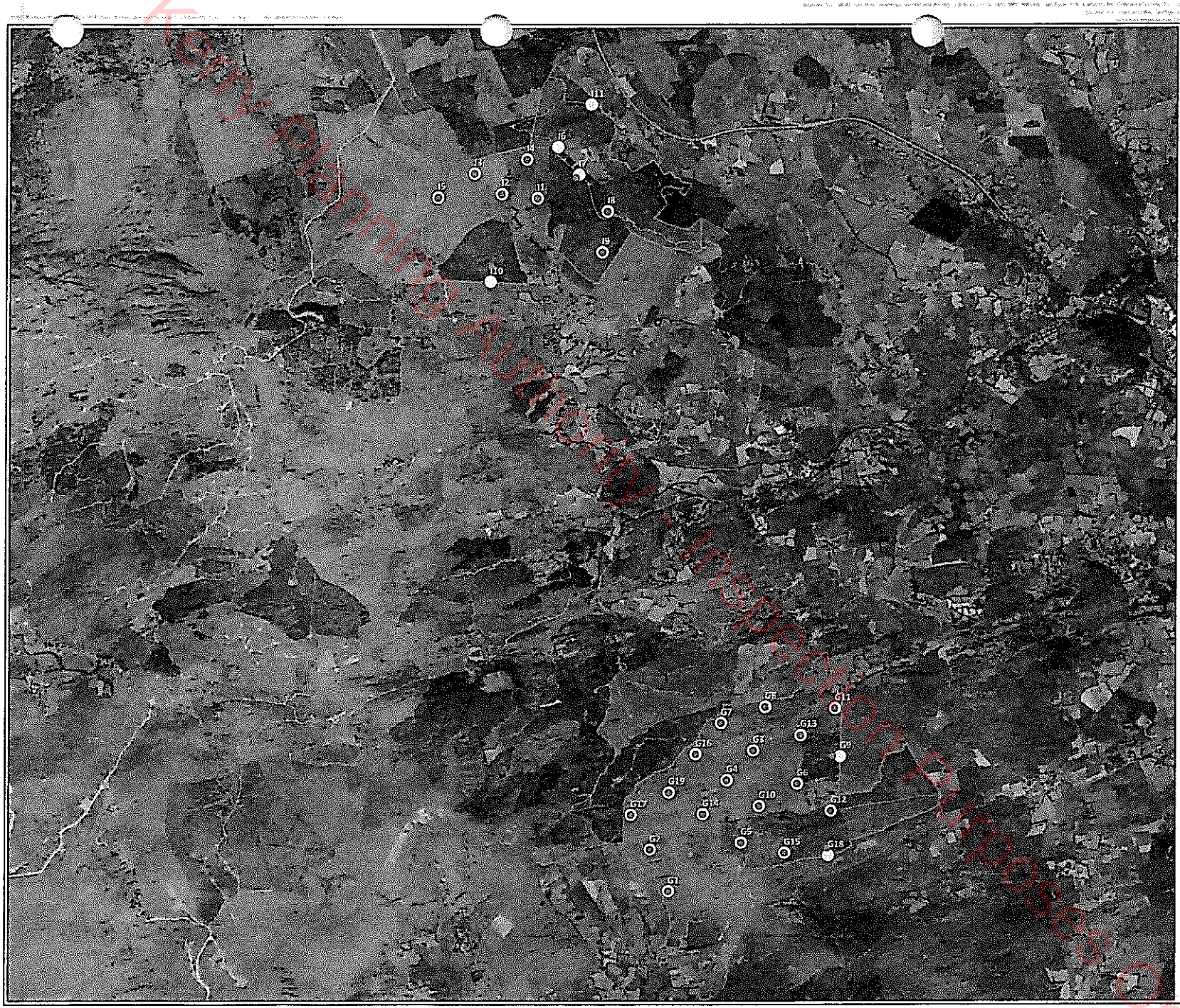
0.5 1 2 Kilometers



TITLE:	Static Detector Locations
PROJECT:	Gortyrahilly and Inchamore Wind Farms Bat Survey 2019-2020
FIGURE NO:	2.2
CLIENT:	SSE Renewables
SCALE:	1:40000
REVISION:	0
DATE:	31/03/2020
PAGE SIZE:	A3

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3. RESULTS

3.1 Desktop Survey

The review of existing records of bat species in the area of the sites indicates that seven of the ten known Irish species of bat have been recorded within a 4 km radius of the proposed site. These bats include pipistrelle species (*Pipistrellus pipistrellus sensu lato*), soprano pipistrelle (*P. pygmaeus*) and Nathusius' pipistrelle (*Pipistrellus nathusii*), Leisler's bat (*Nyctalus leisleri*), brown long-eared bat (*Plecotus auritus*), Daubenton's bat (*Myotis daubentonii*) and lesser horseshoe bat (*Rhinolophus hipposideros*) as shown in Table 3-1. Two species have been recorded as roosting within a 4 km radius of the proposed sites: brown long-eared bat, which has been recorded roosting in the summer at Gortnascarty, c2.1 km north-east of the proposed site at Gortyrahilly; and lesser horseshoe bat, which has been recorded roosting in Cummeenavrick, c.2.3 km north of the proposed site at Inchamore.

The Cave Database for the Republic of Ireland does not hold any records of caves within a 4 km radius of the proposed site.

Table 3-1: Desktop Results of NBDC and NPWS Bat Records within the 4km radius of the Proposed Sites

Bat Species	Legal Protection	Conservation Status (Marnell *et al.* 2019)	Date of Last Record	Known Roost
Brown long-eared bat (*Plecotus auritus)*	EU Habitats Directive Annex IV, Wildlife Acts	Least Concern	25/07/2013	Yes
Common pipistrelle (*Pipistrellus Pipistrellus sensu lato*)	EU Habitats Directive Annex IV, Wildlife Acts	Least Concern	28/07/2014	No
Daubenton's bat (*Myotis daubentonii*)	EU Habitats Directive Annex IV, Wildlife Acts	Least Concern	13/07/2009	No
Leisler's bat (*Nyctalus leisleri*)	EU Habitats Directive Annex IV, Wildlife Acts	Least Concern	28/07/2014	No
Lesser horseshoe bat (*Rhinolophus hipposideros*)	EU Habitats Directive Annex II and Annex IV, Wildlife Acts	Least Concern	14/07/2003	Yes
Nathusius's pipistrelle (*Pipistrellus nathusii*)	EU Habitats Directive Annex IV, Wildlife Acts	Least Concern	27/07/2010	No
Soprano pipistrelle (*Pipistrellus pygmaeus*)	EU Habitats Directive Annex IV, Wildlife Acts	Least Concern	28/07/2014	No

3.1.1 Bat Landscapes

The bat landscape association model (Lundy *et al,* 2011) suggests that the proposed wind farm sites are part of a landscape that is of low to moderate suitability for bats including common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle, brown long-eared, Leisler's, Daubenton's, Natterer's (*Myotis nattereri*), whiskered bat (*M. mystacinus*) and lesser horseshoe bat. The proposed site and its environs are of low suitability for Nathusius' Pipistrelle.

Bat activity surveys undertaken for the permitted Cleanrath Wind Farm (Ref: PL04.246742), located c.6 km to the east of the proposed wind farm at Gortyrahilly recorded five species of bat, namely common pipistrelle, soprano pipistrelle, Leisler's and brown long-eared bat and one potential lesser horseshoe bat (unconfirmed due to poor quality of call recorded). No bat roosts were recorded in the study area for this development[7].

Bat activity surveys undertaken for the permitted Derragh Wind Farm (Planning ref: 125270) recorded common pipistrelle, soprano pipistrelle and Leisler's bat[8] foraging within the study area. Pre-construction survey undertaken for Derragh Wind Farm confirmed that an abandoned dwelling (c.0.7 km to the south of the proposed wind farm at Gortyrahilly at Grid ref: W 15698 70859) supported a minor roost for common pipistrelle.

3.1.2 Designated Sites

The following European sites and nationally designated sites located within a 15 km radius of the proposed wind farms include bats as a Qualifying Interest (QI):

- Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and pNHA (Site Code: 000365) is located c.3.1 km north-west of the proposed wind farm at Inchamore. Lesser horseshoe bat is a Qualifying Interest (QI) of this SAC. The lesser horseshoe bat roost included as a QI for this SAC that is closest to the proposed wind farm is located c.24.8 km to the north-west[9].
- Kilgarvan Ice House SAC and pNHA (Site Code: 000364) is designated for the presence of three lesser horseshoe bat roosts. This SAC is located c.12.3 km to the south-west of the proposed wind farm at Inchamore at its closest point.
- Old Domestic Building, Curraglass Wood SAC and pNHA (Site Code: 002041), designated for the presence of lesser horseshoe bats, is located c.9.9 km to the north-west of the proposed wind farm at Inchamore.

In 2016, the Bat Conservation Trust (BCT) carried out a review of literature pertaining to mean and maximum bat foraging distances[10]. In their review, a Core Sustenance Zone (CSZ) refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost. The weighted average maximum foraging distance for lesser horseshoe bats was 2.02 km. However, as noted in the National Parks and Wildlife Service (NPWS) document *Conservation objectives supporting document – lesser horseshoe bat (Rhinolophus hipposideros)*[11], some researchers have found that lesser horseshoe bats normally forage in woodlands/scrub within 2.5 km of their roosts, therefore, as specified for the purpose of current site specific conservation objective (SSCO) targets for this species, a 2.5 km zone is considered an appropriate distance to foraging areas for each roost. The proposed wind farm sites do not overlap with the CSZ of the lesser horseshoe bat populations of any SAC.

[7] MKOS (2015) Environmental Impact Statement: Proposed Wind Farm Development at Cleanrath North and Adjacent Townlands, Co. Cork. McCarthy Keville O'Sullivan.
[8] Fehily Timoney & Co. (2015) Revised Environmental Impact Statement for Derragh Wind Farm Development, Co. Cork.
[9] NPWS (2017) Conservation Objectives: Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC 000365. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.
[10] Collins, J. (ed.) (2016). *Bat Surveys for Professional ecologists: Good Practice Guidelines* (3rd ed.). The Bat Conservation Trust, London
[11] NPWS (2018) Conservation objectives supporting document – lesser horseshoe bat (*Rhinolophus hipposideros*) Version 1. Conservation Objectives Supporting Document Series. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Dublin, Ireland.

3.2 Bat Activity Surveys 2019

The results of the five no. bat activity surveys carried out at the proposed Gortyrahilly and Inchamore wind farms in 2019 are presented below.

3.2.1 Survey Visit 1 (20/05/2019)

Dusk survey conditions were as follows:

- Sunset: 21:30
- Cloud cover: 70%
- Wind: Beaufort F2
- Rain: None
- Temperature at sunset: 12 °C

Table 3-2: Analysis Analbat Walkabout Data – Survey 1 Results 20/05/2019

Species	No. of Recordings	% Total Recordings
Common pipistrelle	29	74.3
Soprano pipistrelle	6	15.4
Leisler's bat	3	7.7
Natterer's bat	1	2.6
Total	**39**	**100**

3.2.2 Survey Visit 2 (27/06/2019)

Dusk survey conditions were as follows:

- Sunset: 21:57
- Cloud cover: 15%
- Wind: Beaufort F5
- Rain: None
- Temperature at sunset: 19 °C

Table 3-3: Analysis Anabat Walkabout Data – Survey 2 Results 27/06/2019

Species	No. of Recordings	% Total Recordings
Common pipistrelle	13	92.9
Soprano pipistrelle	1	7.1
Leisler's bat	0	0
Natterer's bat	0	0
Total	**14**	**100**

3.2.3 Survey Visit 3 (26/07/2019)

Dusk survey conditions were as follows:

- Sunset: 21:33
- Cloud cover: 40%
- Wind: Beaufort F3
- Rain: None
- Temperature at sunset: 15 °C

Table 3-4: Analysis Anabat Walkabout Data – Survey 3 Results 26/07/2019

Species	No. of Recordings	% Total Recordings
Common pipistrelle	17	50
Soprano pipistrelle	9	26.5
Leisler's bat	8	23.5
Natterer's bat	0	0
Total	**34**	**100**

3.2.4 Survey Visit 4 (15/08/2019)

Dusk survey conditions were as follows:

- Sunset: 21:01
- Cloud cover: 80%
- Wind: Beaufort F4
- Rain: Light shower
- Temperature at sunset: 15 °C

Table 3-5: Analysis Anabat Walkabout Data – Survey 4 Results 15/08/2019

Species	No. of Recordings	% Total Recordings
Common pipistrelle	10	100
Soprano pipistrelle	0	0
Leisler's bat	0	0
Natterer's bat	0	0
Total	**10**	**100**

3.2.5 Survey Visit 5 (22/09/2019)

Dusk survey conditions were as follows:

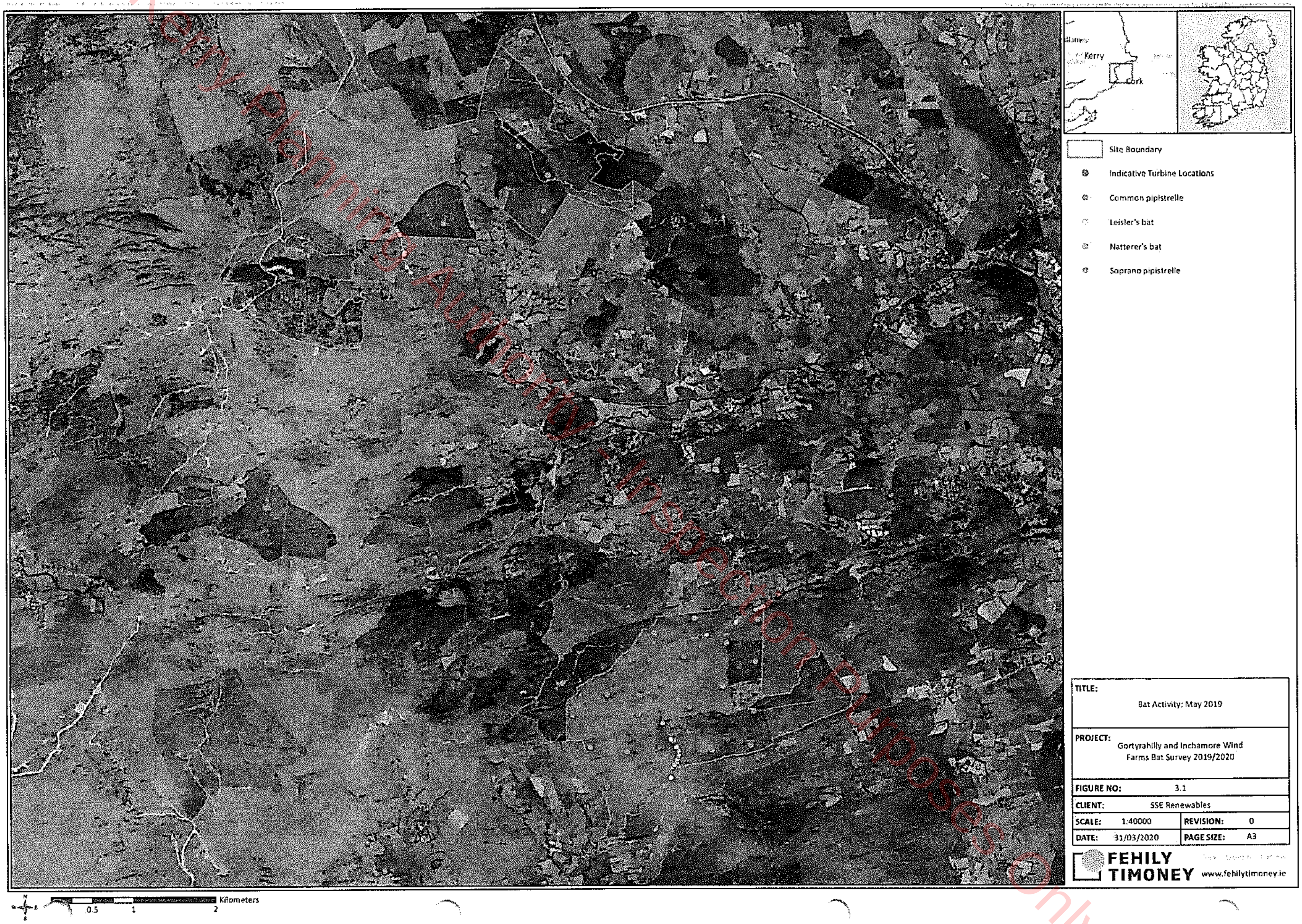
- Sunset: 19:36
- Cloud cover: 70%
- Wind: Beaufort F3
- Rain: None
- Temperature at sunset: 13 °C

Table 3-6: Analysis Anabat Walkabout Data – Survey 5 Results 22/09/2019

Species	No. of Recordings	% Total Recordings
Common pipistrelle	29	87.9
Soprano pipistrelle	2	6.1
Leisler's bat	1	3
Natterer's bat	1	3
Total	**33**	**100**

Bat activity during the 2019 surveys is presented in Figure 3-1 to 3-5 for the months of May to September.

Figure 3-1: Bat Activity May 2019



TITLE:	Bat Activity: May 2019
PROJECT:	Gortyrahilly and Inchamore Wind Farms Bat Survey 2019/2020
FIGURE NO:	3.1
CLIENT:	SSE Renewables
SCALE:	1:40000
REVISION:	0
DATE:	31/03/2020
PAGE SIZE:	A3

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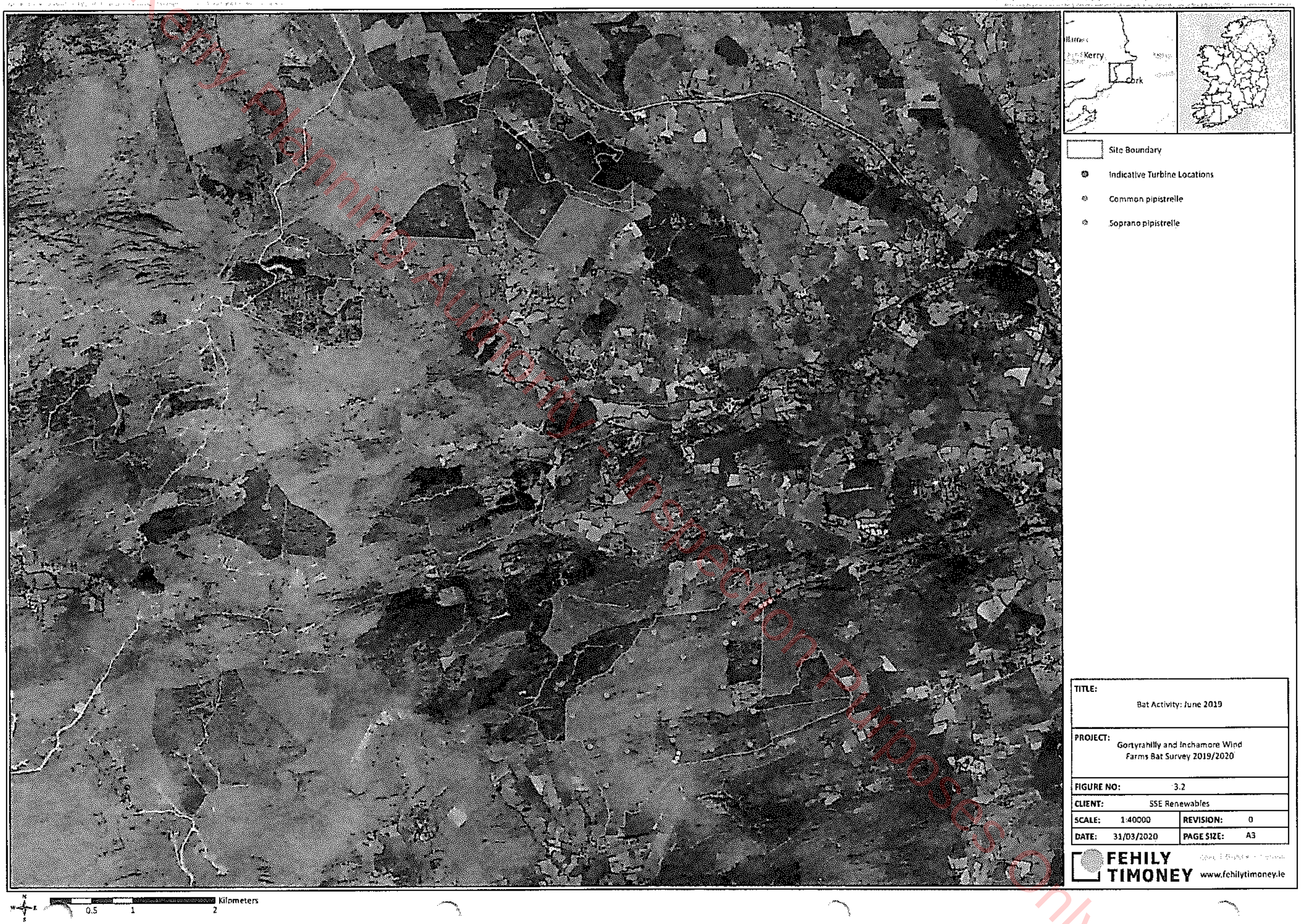
Figure 3-21 Bat Activity June 2019



TITLE:	Bat Activity: June 2019
PROJECT:	Gortyrahilly and Inchamore Wind Farms Bat Survey 2019/2020
FIGURE NO:	3.2
CLIENT:	SSE Renewables
SCALE:	1:40000
REVISION:	0
DATE:	31/03/2020
PAGE SIZE:	A3

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Figure 3-3 Bat Activity July 2019

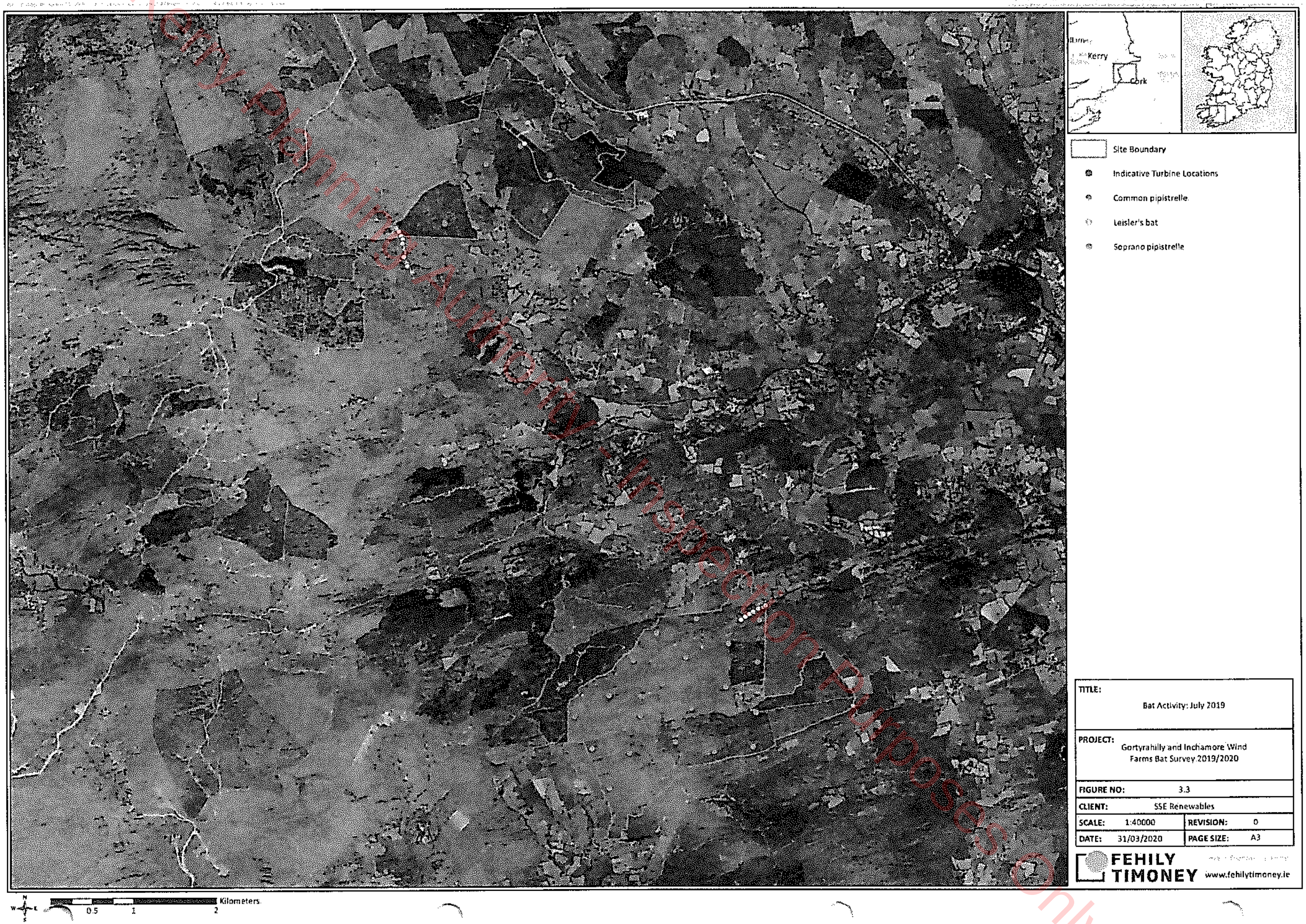
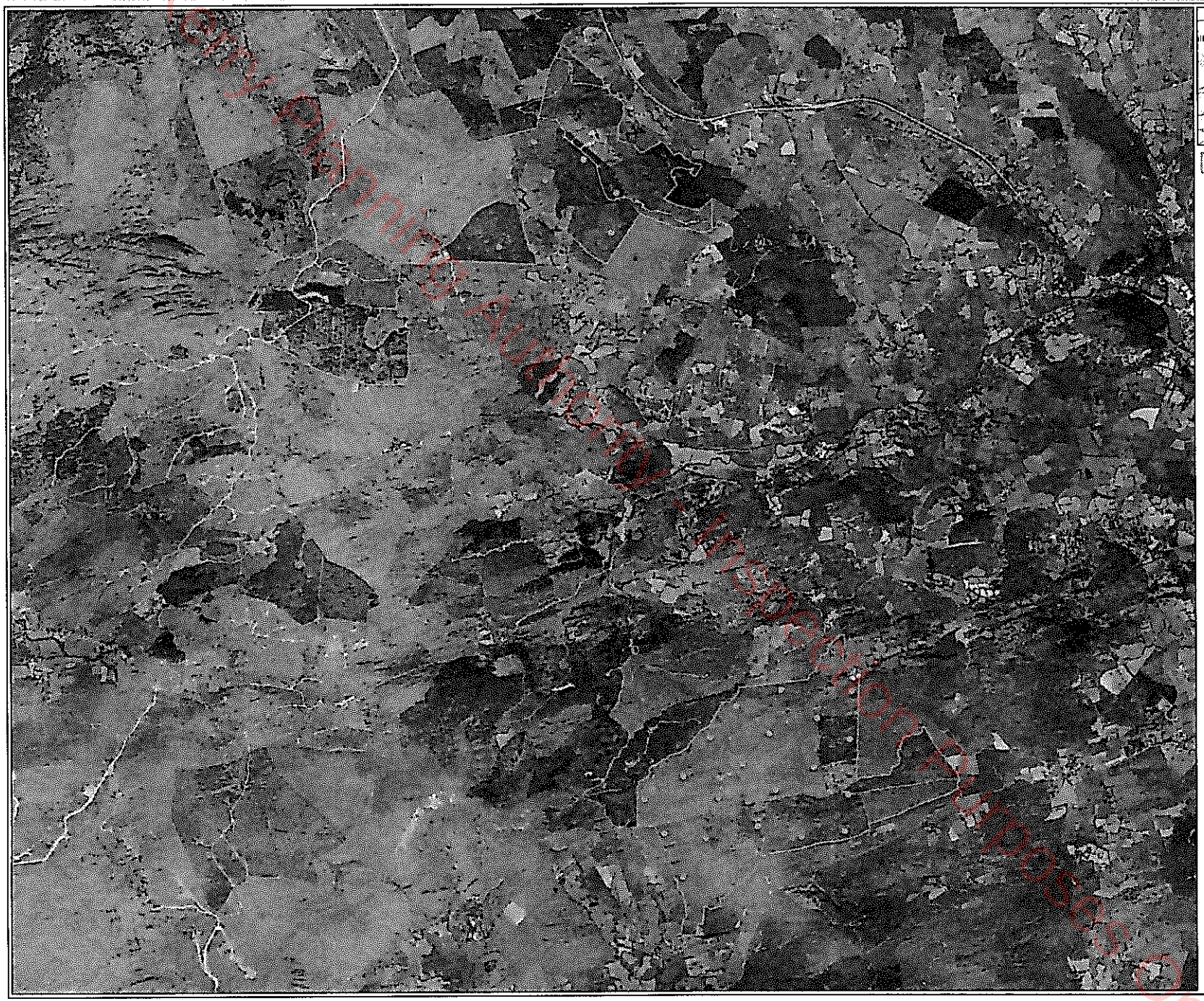
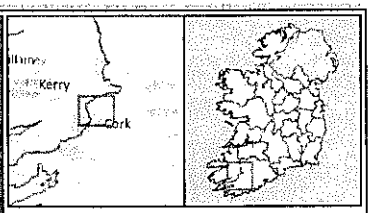


Figure 3-4: Bat Activity August 2019





Site Boundary

Indicative Turbine Locations

Common pipistrelle

TITLE:	Bat Activity: August 2019		
PROJECT:	Gortyrahilly and Inchamore Wind Farms Bat Survey 2019/2020		
FIGURE NO:	3.4		
CLIENT:	SSE Renewables		
SCALE:	1:40000	**REVISION:**	0
DATE:	31/03/2020	**PAGE SIZE:**	A3

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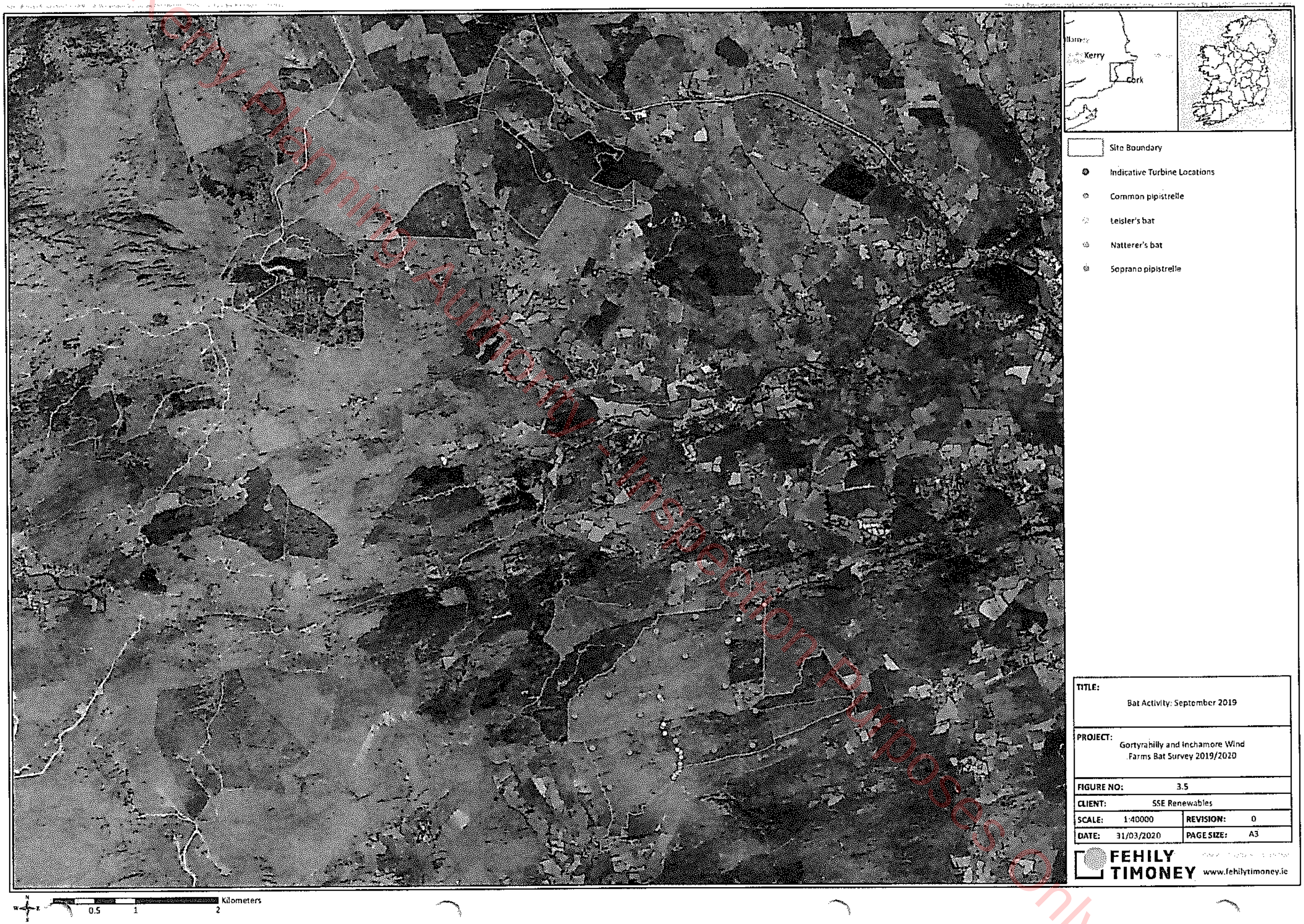
Kilometers
0.5 1 2

Figure 3-5 Bat Activity September 2019



TITLE:	Bat Activity: September 2019
PROJECT:	Gortyrahilly and Inchamore Wind Farms Bat Survey 2019/2020
FIGURE NO:	3.5
CLIENT:	SSE Renewables
SCALE: 1:40000	REVISION: 0
DATE: 31/03/2020	PAGE SIZE: A3

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3.3 Bat Static Detector Surveys 2019

The results of the static detector surveys deployed over three rounds (spring, summer and autumn) in 2019 are shown below.

Nine species of bats were recorded on both SM4 Songmeters.

Nine species were recorded at Gortyrahilly with a total of 28,953 recordings over the 33 nights of surveys[12]. The most commonly recorded species was common pipistrelle, followed by soprano pipistrelle, and Nathusius' pipistrelle.

Nine species were recorded at Inchamore, with a total of 22,877 recordings over the 46 nights of surveys. The most commonly recorded species was common pipistrelle, followed by soprano pipistrelle, and Nathusius' pipistrelle.

Much lower levels of activity of lesser horseshoe bat, brown long-eared bat, Natterer's bat, and Whiskered Bat were detected on both songmeters. Brown long-eared bat is present on-site, but this species is very quiet and sometimes hunts without echolocating, so it may be under-recorded by the static detectors.

Table 3-7: Results from 2019 Static Detector Recordings

Common Name	Species	No. of recordings (Gortyrahilly)	No. of recordings (Inchamore)
Brown long-eared bat	*Plecotus auritus*	269	419
Common pipistrelle	*Pipistrellus pipistrellus*	20,331	16,180
Daubenton's bat	*Myotis daubentonii*	737	563
Leisler's bat	*Nyctalus leisleri*	1,661	872
Lesser horseshoe bat	*Rhinolophus hipposideros*	51	39
Nathusius' pipistrelle	*Pipistrellus nathusii*	2,176	1,001
Natterer's bat	*Myotis nattereri*	174	203
Soprano pipistrelle	*Pipistrellus pygmaeus*	3,364	3,219
Whiskered bat	*Myotis mystacinus*	190	381
Total		28,953	22,877

Brown Long-Eared Bat

The total number of recordings for brown long-eared bat at Gortyrahilly was 269 no. recordings; 0.93% of total recordings. These were recorded over 33 no. nights which gives an average of 8.15 no. recordings per night.

[12] Calculated as the mean number of nights deployed per turbine per total survey season. i.e. the total number of nights each detector was deployed for spring, summer and autumn was summed. Then this figure was divided by the maximum number of detectors (or turbine locations) in total across the whole survey season. E.g. for the entire season (spring, summer and autumn), detectors were left out for a total of 629 nights at Gortyrahilly. The maximum number of detector locations was 19 (although 19 detectors were not always deployed simultaneously). The mean number of nights deployed per detector at Gortyrahilly was calculated as 629 / 19 = 33 nights. For Inchamore it was 514 nights / 11 = 46 nights.

The total number of recordings for brown long-eared bat at Inchamore was 419 no. recordings; 1.84% of total recordings. These were recorded over 46 no. nights which gives an average of 9.11 no. recordings per night.

Common Pipistrelle

The total number of recordings for common pipistrelle at Gortyrahilly was 20,331 no. recordings; 70.29% of total recordings. These were recorded over 33 no. nights which gives an average of 616.09 no. recordings per night.

The total number of recordings for common pipistrelle at Inchamore was 16,180 no. recordings; 71.23% of total recordings. These were recorded over 46 no. nights which gives an average of 351.74 no. recordings per night.

Daubenton's Bat

The total number of recordings for Daubenton's bat at Gortyrahilly was 737 no. recordings; 2.55% of total recordings. These were recorded over 33 no. nights which gives an average of 22.33 no. recordings per night.

The total number of recordings for Daubenton's bat at Inchamore was 563 no. recordings; 2.48% of total recordings. These were recorded over 46 no. nights which gives an average of 12.24 no. recordings per night. Moderate levels of Daubenton's bat were recorded on both Songmeters.

Leisler's Bat

The total number of recordings for Leisler's bat at Gortyrahilly was 1,661 no. recordings; 5.74% of total recordings. These were recorded over 33 no. nights which gives an average of 50.33 no. recordings per night.

The total number of recordings for Leisler's bat at Inchamore was 872 no. recordings; 3.84% of total recordings. These were recorded over 46 no. nights which gives an average of 18.96 no. recordings per night.

Lesser Horseshoe Bat

The total number of recordings for lesser horseshoe bat at Gortyrahilly was 51 no. recordings; 0.18% of total recordings. These were recorded over 33 no. nights which gives an average of 1.55 no. recordings per night.

The total number of recordings for lesser horseshoe bat at Inchamore was 39 no. recordings; 0.17% of total recordings. These were recorded over 46 no. nights which gives an average of 0.85 no. recordings per night.

Nathusius' Bat

The total number of recordings for Nathusius' bat at Gortyrahilly was 2,176 no. recordings; 7.52% of total recordings. These were recorded over 33 no. nights which gives an average of 65.94 no. recordings per night.

The total number of recordings for Nathusius' Bat at Inchamore was 1,001 no. recordings; 4.41% of total recordings. These were recorded over 46 no. nights which gives an average of 21.76 no. recordings per night.

Nathusius's bat has been previously recorded within the 10 km Biodiversity Ireland grid square (W17) that contains the proposed Gortyrahilly and Inchamore wind farm sites (record from 2010).

Natterer's Bat

The total number of recordings for Natterer's bat at Gortyrahilly was 174 no. recordings; 0.60% of total recordings. These were recorded over 33 no. nights which gives an average of 5.27 no. recordings per night.

The total number of recordings for Natterer's bat at Inchamore was 203 no. recordings; 0.89% of total recordings. These were recorded over 46 no. nights which gives an average of 4.41 no. recordings per night.

Soprano Pipistrelle

The total number of recordings of soprano pipistrelle recorded at Gortyrahilly was 3,364 no. recordings; 11.63% of total recordings. These were recorded over 33 no. nights. This gives an average of 101.94 no. recordings per night. This is a very low level of recordings. On a good site for soprano pipistrelles over 1,000 no. recordings per night would be typical (Caroline Shiel, Bat Conservation Ireland pers comm, 2019).

The total number of recordings for soprano pipistrelle at Inchamore was 3,219 no. recordings; 14.17% of total recordings. These were recorded over 46 no. nights which gives an average of 69.98 no. recordings per night, which again is extremely low.

Whiskered Bat

The total number of recordings for whiskered bat at Gortyrahilly was 190 no. recordings; 0.66% of total recordings. These were recorded over 33 no. nights which gives an average of 5.76 no. recordings per night.

The total number of recordings for whiskered bat at Inchamore was 381 no. recordings; 1.68% of total recordings. These were recorded over 46 no. nights which gives an average of 8.28 no. recordings per night.

3.4 Ecobat

The static data, as per tables listed in Appendices, was uploaded and analysed using the Ecobat tool. This analysis was undertaken for each survey period separately. Where groups of detectors were deployed for different dates within a survey period, those that were deployed for the same dates were analysed together (details are provided for each survey period below). The reference range datasets were stratified to include:

- Only records from within 30 days of the survey date.
- Only records from within 100 km^2 of the survey location.
- Records using any make of bat detector.

The Ecobat tool provides are series of summary tables to enable analysis of the bat activity level at each static location. These are presented below, and categorisation of activity level is based on the following table:

Table 3-6: Percentile Score and Categorised Level of Bat Activity

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

Raw data upon which the Ecobat analyses were based is presented in Appendix C.

3.4.1 Survey Period 1

3.4.1.1 Gortyrahilly

A summary table showing the number of nights recorded bat activity fell into each activity band for each species is presented below. Recordings were split into five groups depending on the dates deployed: group 1 (turbines 1, 2 and 4), group 2 (turbines 3 and 5), group 3 (turbines 6, 7, 8, 9, 10 and 14), group 4 (turbine 11) and group 5 (turbines 12 and 13). Each group was analysed in Ecobat separately but is presented collectively in this report.

The maximum number of recordings for a single night across all detectors combined was 1,470 recordings on 23/05/2019 where eight species were recorded.

Six of the fourteen static locations had at least one night of High Activity during the survey period. No bats were recorded at T8 during this survey.

The following Turbine locations are deemed to have a High Bat Activity (for specific bat species) level based on the Percentile Median value: T5 (Leisler's bat), T6 (common pipistrelle), T7 (Daubenton's bat and common pipistrelle), T8 (Nathusius' bat and common pipistrelle), T12 (common pipistrelle) and T13 (Leisler's bat, Nathusius' bat and common pipistrelle).

Table 3-9: Summary of Ecobat Analysis Tool for Static Detectors Deployed at Gortyrahilly during Survey Period 1. G = Gortyrahilly and number = Turbine Location, so G1 = Turbine 1 at Gortyrahilly

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G1	*Myotis daubentonii*	0	1	0	0	11	0	Low
G1	*Myotis mystacinus*	0	0	0	0	12	0	Low
G1	*Myotis nattereri*	0	0	0	0	12	0	Low
G1	*Nyctalus leisleri*	3	4	0	0	5	70	Moderate to High
G1	*Pipistrellus nathusii*	0	1	0	0	11	0	Low
G1	*Pipistrellus pipistrellus*	3	3	0	0	6	35	Low to Moderate
G1	*Pipistrellus pygmaeus*	0	1	0	0	11	0	Low
G1	*Plecotus auritus*	0	1	0	0	11	0	Low
G1	*Rhinolophus hipposideros*	0	0	0	0	12	0	Low
G2	*Myotis daubentonii*	0	1	0	0	11	0	Low
G2	*Myotis mystacinus*	0	2	0	0	10	0	Low
G2	*Myotis nattereri*	0	1	0	0	11	0	Low
G2	*Nyctalus leisleri*	6	3	0	0	3	78	Moderate to High
G2	*Pipistrellus nathusii*	0	1	0	0	11	0	Low
G2	*Pipistrellus pipistrellus*	2	5	0	0	5	70	Moderate to High
G2	*Pipistrellus pygmaeus*	1	3	0	0	8	0	Low
G2	*Plecotus auritus*	0	2	0	0	10	0	Low
G2	*Rhinolophus hipposideros*	0	0	0	0	12	0	Low
G3	*Myotis daubentonii*	0	1	0	0	12	0	Low
G3	*Myotis mystacinus*	0	1	0	0	12	0	Low
G3	*Myotis nattereri*	0	0	0	0	13	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G3	*Nyctalus leisleri*	6	6	0	0	1	79	Moderate to High
G3	*Pipistrellus nathusii*	2	1	0	0	10	0	Low
G3	*Pipistrellus pipistrellus*	5	3	0	0	5	79	Moderate to High
G3	*Pipistrellus pygmaeus*	3	1	0	0	9	0	Low
G3	*Plecotus auritus*	0	0	0	0	13	0	Low
G3	*Rhinolophus hipposideros*	0	0	0	0	13	0	Low
G4	*Myotis daubentonii*	0	1	0	0	12	0	Low
G4	*Myotis mystacinus*	0	0	0	0	13	0	Low
G4	*Myotis nattereri*	0	0	0	0	13	0	Low
G4	*Nyctalus leisleri*	4	0	0	0	9	0	Low
G4	*Pipistrellus nathusii*	0	1	0	0	12	0	Low
G4	*Pipistrellus pipistrellus*	1	4	0	0	8	0	Low
G4	*Pipistrellus pygmaeus*	1	2	0	0	10	0	Low
G4	*Plecotus auritus*	0	0	0	0	13	0	Low
G4	*Rhinolophus hipposideros*	0	0	0	0	13	0	Low
G5	*Myotis daubentonii*	0	0	0	0	13	0	Low
G5	*Myotis mystacinus*	0	0	0	0	13	0	Low
G5	*Myotis nattereri*	0	0	0	0	13	0	Low
G5	*Nyctalus leisleri*	9	2	0	0	2	90	High
G5	*Pipistrellus nathusii*	0	0	0	0	13	0	Low
G5	*Pipistrellus pipistrellus*	6	3	0	0	4	79	Moderate to High
G5	*Pipistrellus pygmaeus*	0	2	0	0	11	0	Low
G5	*Plecotus auritus*	0	0	0	0	13	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G5	*Rhinolophus hipposideros*	0	0	0	0	13	0	Low
G6	*Myotis daubentonii*	0	1	0	0	14	0	Low
G6	*Myotis mystacinus*	0	0	0	0	15	0	Low
G6	*Myotis nattereri*	0	0	0	0	15	0	Low
G6	*Nyctalus leisleri*	2	5	0	0	8	0	Low
G6	*Pipistrellus nathusii*	3	4	0	0	8	0	Low
G6	*Pipistrellus pipistrellus*	8	5	0	0	2	89	High
G6	*Pipistrellus pygmaeus*	1	3	0	0	11	0	Low
G6	*Plecotus auritus*	0	0	0	0	15	0	Low
G6	*Rhinolophus hipposideros*	0	4	0	0	11	0	Low
G7	*Myotis daubentonii*	8	2	0	0	5	85	High
G7	*Myotis mystacinus*	0	1	0	0	14	0	Low
G7	*Myotis nattereri*	0	1	0	0	14	0	Low
G7	*Nyctalus leisleri*	7	2	0	0	6	77	Moderate to High
G7	*Pipistrellus nathusii*	4	5	0	0	6	68	Moderate to High
G7	*Pipistrellus pipistrellus*	11	1	0	0	3	89	High
G7	*Pipistrellus pygmaeus*	5	4	0	0	6	68	Moderate to High
G7	*Plecotus auritus*	0	3	0	0	12	0	Low
G7	*Rhinolophus hipposideros*	0	0	0	0	15	0	Low
G8	*Myotis daubentonii*	0	1	0	0	14	0	Low
G8	*Myotis mystacinus*	0	0	0	0	15	0	Low
G8	*Myotis nattereri*	0	0	0	0	15	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G8	*Nyctalus leisleri*	6	3	0	0	6	68	Moderate to High
G8	*Pipistrellus nathusii*	9	1	0	0	5	89	High
G8	*Pipistrellus pipistrellus*	11	0	0	0	4	94	High
G8	*Pipistrellus pygmaeus*	6	3	0	0	6	77	Moderate to High
G8	*Plecotus auritus*	0	3	0	0	12	0	Low
G8	*Rhinolophus hipposideros*	0	0	0	0	15	0	Low
G9	*Myotis daubentonii*	0	1	0	0	14	0	Low
G9	*Myotis mystacinus*	0	0	0	0	15	0	Low
G9	*Myotis nattereri*	0	0	0	0	15	0	Low
G9	*Nyctalus leisleri*	4	4	0	0	7	68	Moderate to High
G9	*Pipistrellus nathusii*	0	3	0	0	12	0	Low
G9	*Pipistrellus pipistrellus*	5	5	0	0	5	68	Moderate to High
G9	*Pipistrellus pygmaeus*	0	1	0	0	14	0	Low
G9	*Plecotus auritus*	0	0	0	0	15	0	Low
G9	*Rhinolophus hipposideros*	0	0	0	0	15	0	Low
G10	*Myotis daubentonii*	0	1	0	0	14	0	Low
G10	*Myotis mystacinus*	0	0	0	0	15	0	Low
G10	*Myotis nattereri*	0	0	0	0	15	0	Low
G10	*Nyctalus leisleri*	5	3	0	0	7	68	Moderate to High
G10	*Pipistrellus nathusii*	0	3	0	0	12	0	Low
G10	*Pipistrellus pipistrellus*	5	5	0	0	5	68	Moderate to High
G10	*Pipistrellus pygmaeus*	0	1	0	0	14	0	Low
G10	*Plecotus auritus*	0	0	0	0	15	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G10	*Rhinolophus hipposideros*	0	0	0	0	15	0	Low
G11	*Myotis daubentonii*	1	0	0	0	12	0	Low
G11	*Myotis mystacinus*	0	0	0	0	13	0	Low
G11	*Myotis nattereri*	0	0	0	0	13	0	Low
G11	*Nyctalus leisleri*	1	0	0	0	12	0	Low
G11	*Pipistrellus nathusii*	1	0	0	0	12	0	Low
G11	*Pipistrellus pipistrellus*	1	1	0	0	11	0	Low
G11	*Pipistrellus pygmaeus*	0	1	0	0	12	0	Low
G11	*Plecotus auritus*	0	3	0	0	10	0	Low
G11	*Rhinolophus hipposideros*	0	0	0	0	13	0	Low
G12	*Myotis daubentonii*	0	4	0	0	12	0	Low
G12	*Myotis mystacinus*	0	2	0	0	14	0	Low
G12	*Myotis nattereri*	0	1	0	0	15	0	Low
G12	*Nyctalus leisleri*	6	6	0	0	4	77	Moderate to High
G12	*Pipistrellus nathusii*	4	4	0	0	8	34	Low to Moderate
G12	*Pipistrellus pipistrellus*	15	0	0	0	1	97	High
G12	*Pipistrellus pygmaeus*	6	5	0	0	5	68	Moderate to High
G12	*Plecotus auritus*	4	5	0	0	7	68	Moderate to High
G12	*Rhinolophus hipposideros*	0	4	0	0	12	0	Low
G13	*Myotis daubentonii*	1	3	0	0	12	0	Low
G13	*Myotis mystacinus*	1	2	0	0	13	0	Low
G13	*Myotis nattereri*	0	0	0	0	16	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G13	*Nyctalus leisleri*	10	2	0	0	4	84	High
G13	*Pipistrellus nathusii*	11	3	0	0	2	90	High
G13	*Pipistrellus pipistrellus*	13	0	0	0	3	97	High
G13	*Pipistrellus pygmaeus*	7	3	0	0	6	77	Moderate to High
G13	*Plecotus auritus*	0	1	0	0	15	0	Low
G13	*Rhinolophus hipposideros*	1	3	0	0	12	0	Low
G14	*Myotis daubentonii*	0	0	0	0	15	0	Low
G14	*Myotis mystacinus*	0	0	0	0	15	0	Low
G14	*Myotis nattereri*	0	0	0	0	15	0	Low
G14	*Nyctalus leisleri*	4	0	0	0	11	0	Low
G14	*Pipistrellus nathusii*	1	2	0	0	12	0	Low
G14	*Pipistrellus pipistrellus*	4	0	0	0	11	0	Low
G14	*Pipistrellus pygmaeus*	0	0	0	0	15	0	Low
G14	*Plecotus auritus*	0	1	0	0	14	0	Low
G14	*Rhinolophus hipposideros*	0	0	0	0	15	0	Low

Differences in activity between static detector locations split by species and location is presented in Figure 3-6 below. The centre line indicates the median activity level whereas the box represents the interquartile range (therefore the spread of the middle 50% of nights of activity). The plot for common pipistrelle shows that the activity level for both T12 and T13 was consistently high.

The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity). The dots indicate outlier values. Note: *Myotis daubentonii* = Daubenton's bat, *Myotis mystacinus* = whiskered bat, *Myotis nattereri* = Natterer's bat, *Nyctalus leisleri* = Leisler's bat, *Pipistrellus nathusii* = Nathusius' bat, *Pipistrellus pipistrellus* = common pipistrelle, *Pipistrellus pygmaeus* = soprano pipistrelle, *Plecotus auritus* = brown long-eared bat and *Rhinolophus hipposideros* = lesser horseshoe bat. G = gortyrahilly and number = turbine location, so G1 = turbine 1 at Gortyrahilly.

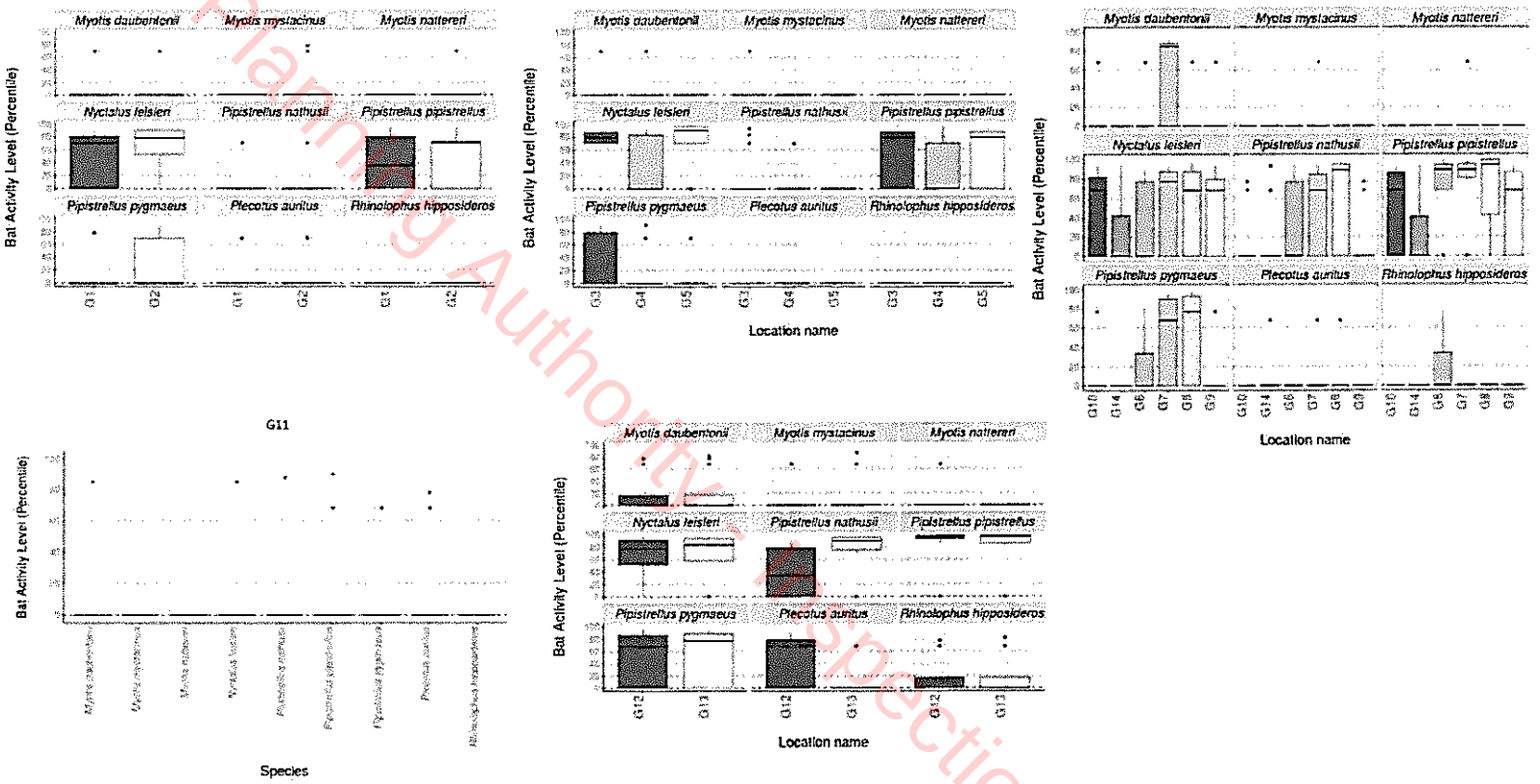

Figure 3-9: Differences in Activity between Static Detector Locations, split by Species and Locations during Survey Period 1 at Gortyrahilly

3.4.1.2 *Inchamore*

A summary table showing the number of nights recorded bat activity fell into each activity band for each species is presented below. Recordings were split into three groups depending on the dates deployed: group 1 (turbines 1, 2, 3, 4 and 5), group 2 (turbines 7, 8, 9 and 10) and group 3 (turbine 6). Each group was analysed in Ecobat separately but is presented collectively in this report.

The maximum of recordings for a single night across all detectors combined on 21/05/2019 was 606 recordings where eight species were recorded.

Five of the ten static locations had at least one night of High Activity during the survey period.

The following Turbine locations are deemed to have a High Bat Activity (for specific bat species) level based on the Percentile Median value: T2 (Leisler's bat), T4 (Leisler's bat), T8 (common pipistrelle), T9 (Nathusius' bat, common pipistrelle and soprano pipistrelle) and T10 (common pipistrelle and soprano pipistrelle).

Table 3.10: Summary of Ecobat Analysis Tool for Static Detectors deployed at Inchamore during Survey Period 1. I = Inchamore and number = Turbine Location so I1 = Turbine 1 at Inchamore

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
I1	*Myotis daubentonii*	2	4	0	0	6	33	Low to Moderate
I1	*Myotis mystacinus*	0	0	0	0	12	0	Low
I1	*Myotis nattereri*	0	1	0	0	11	0	Low
I1	*Nyctalus leisleri*	4	4	0	0	4	72	Moderate to High
I1	*Pipistrellus nathusii*	0	2	0	0	10	0	Low
I1	*Pipistrellus pipistrellus*	4	2	0	0	6	33	Low to Moderate
I1	*Pipistrellus pygmaeus*	3	4	0	0	5	66	Moderate to High
I1	*Plecotus auritus*	0	3	0	0	9	0	Low
I1	*Rhinolophus hipposideros*	0	0	0	0	12	0	Low
I2	*Myotis daubentonii*	0	0	0	0	12	0	Low
I2	*Myotis mystacinus*	0	0	0	0	12	0	Low
I2	*Myotis nattereri*	0	0	0	0	12	0	Low
I2	*Nyctalus leisleri*	7	3	0	0	2	82	High
I2	*Pipistrellus nathusii*	2	1	0	0	9	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
I2	*Pipistrellus pipistrellus*	6	1	0	0	5	77	Moderate to High
I2	*Pipistrellus pygmaeus*	0	1	0	0	11	0	Low
I2	*Plecotus auritus*	0	0	0	0	12	0	Low
I2	*Rhinolophus hipposideros*	0	0	0	0	12	0	Low
I3	*Myotis daubentonii*	0	0	0	0	12	0	Low
I3	*Myotis mystacinus*	0	0	0	0	12	0	Low
I3	*Myotis nattereri*	0	1	0	0	11	0	Low
I3	*Nyctalus leisleri*	4	0	0	0	8	0	Low
I3	*Pipistrellus nathusii*	0	0	0	0	12	0	Low
I3	*Pipistrellus pipistrellus*	0	1	0	0	11	0	Low
I3	*Pipistrellus pygmaeus*	0	1	0	0	11	0	Low
I3	*Plecotus auritus*	0	0	0	0	12	0	Low
I3	*Rhinolophus hipposideros*	0	0	0	0	12	0	Low
I4	*Myotis daubentonii*	1	5	0	0	6	33	Low to Moderate
I4	*Myotis mystacinus*	0	1	0	0	11	0	Low
I4	*Myotis nattereri*	0	0	0	0	12	0	Low
I4	*Nyctalus leisleri*	8	2	0	0	2	90	High
I4	*Pipistrellus nathusii*	2	3	0	0	7	0	Low
I4	*Pipistrellus pipistrellus*	6	1	0	0	5	74	Moderate to High
I4	*Pipistrellus pygmaeus*	2	2	0	0	8	0	Low
I4	*Plecotus auritus*	3	6	0	0	3	66	Moderate to High
I4	*Rhinolophus hipposideros*	0	0	0	0	12	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
I5	*Myotis daubentonii*	0	0	0	0	12	0	Low
I5	*Myotis mystacinus*	0	0	0	0	12	0	Low
I5	*Myotis nattereri*	0	0	0	0	12	0	Low
I5	*Nyctalus leisleri*	1	4	0	0	7	0	Low
I5	*Pipistrellus nathusii*	0	0	0	0	12	0	Low
I5	*Pipistrellus pipistrellus*	0	4	0	0	8	0	Low
I5	*Pipistrellus pygmaeus*	0	0	0	0	12	0	Low
I5	*Plecotus auritus*	0	0	0	0	12	0	Low
I5	*Rhinolophus hipposideros*	0	0	0	0	12	0	Low
I6	*Myotis daubentonii*	0	4	0	0	9	0	Low
I6	*Myotis mystacinus*	0	0	0	0	13	0	Low
I6	*Myotis nattereri*	0	0	0	0	13	0	Low
I6	*Nyctalus leisleri*	2	3	0	0	8	0	Low
I6	*Pipistrellus nathusii*	1	2	0	0	10	0	Low
I6	*Pipistrellus pipistrellus*	4	2	0	0	7	0	Low
I6	*Pipistrellus pygmaeus*	1	3	0	0	9	0	Low
I6	*Plecotus auritus*	0	1	0	0	12	0	Low
I6	*Rhinolophus hipposideros*	0	0	0	0	13	0	Low
I7	*Myotis daubentonii*	0	2	0	0	14	0	Low
I7	*Myotis mystacinus*	0	0	0	0	16	0	Low
I7	*Myotis nattereri*	0	0	0	0	16	0	Low
I7	*Nyctalus leisleri*	0	1	0	0	15	0	Low
I7	*Pipistrellus nathusii*	1	2	0	0	13	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
I7	*Pipistrellus pipistrellus*	7	2	0	0	7	68	Moderate to High
I7	*Pipistrellus pygmaeus*	2	3	0	0	11	0	Low
I7	*Plecotus auritus*	0	0	0	0	16	0	Low
I7	*Rhinolophus hipposideros*	0	0	0	0	16	0	Low
I8	*Myotis daubentonii*	0	2	0	0	14	0	Low
I8	*Myotis mystacinus*	3	4	0	0	9	0	Low
I8	*Myotis nattereri*	0	0	0	0	16	0	Low
I8	*Nyctalus leisleri*	7	3	0	0	6	73	Moderate to High
I8	*Pipistrellus nathusii*	3	9	0	0	4	73	Moderate to High
I8	*Pipistrellus pipistrellus*	12	3	0	0	1	92	High
I8	*Pipistrellus pygmaeus*	6	4	0	0	6	68	Moderate to High
I8	*Plecotus auritus*	0	8	0	0	8	34	Low to Moderate
I8	*Rhinolophus hipposideros*	0	1	0	0	15	0	Low
I9	*Myotis daubentonii*	1	2	0	0	13	0	Low
I9	*Myotis mystacinus*	0	2	0	0	14	0	Low
I9	*Myotis nattereri*	0	0	0	0	16	0	Low
I9	*Nyctalus leisleri*	5	5	0	0	6	73	Moderate to High
I9	*Pipistrellus nathusii*	14	2	0	0	0	93	High
I9	*Pipistrellus pipistrellus*	15	0	0	0	1	98	High
I9	*Pipistrellus pygmaeus*	13	1	0	0	2	91	High
I9	*Plecotus auritus*	0	3	0	0	13	0	Low
I9	*Rhinolophus hipposideros*	0	5	0	0	11	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
I10	*Myotis daubentonii*	1	7	0	0	8	34	Low to Moderate
I10	*Myotis mystacinus*	0	0	0	0	16	0	Low
I10	*Myotis nattereri*	0	0	0	0	16	0	Low
I10	*Nyctalus leisleri*	0	7	0	0	9	0	Low
I10	*Pipistrellus nathusii*	3	6	0	0	7	68	Moderate to High
I10	*Pipistrellus pipistrellus*	15	0	0	0	1	95	High
I10	*Pipistrellus pygmaeus*	9	3	0	0	4	82	High
I10	*Plecotus auritus*	0	1	0	0	15	0	Low
I10	*Rhinolophus hipposideros*	0	6	0	0	10	0	Low

Differences in activity between static detector locations split by species and location is presented in the figure below. The centre line indicates the median activity level whereas the box represents the interquartile range (therefore the spread of the middle 50% of nights of activity). The plot for common pipistrelle shows that the activity level for both T10, T18 and T19 was consistently high. Similarly, the plot for soprano pipistrelle shows that the activity level for T19 was consistently high. Finally, the plot for Nathusius' bat shows that the activity level for T19 was consistently high.

The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity). The dots indicate outlier values. Note: *Myotis daubentonii* = Daubenton's bat, *Myotis mystacinus* = whiskered bat, *Myotis nattereri* = Natterer's bat, *Nyctalus leisleri* = Leisler's bat, *Pipistrellus nathusii* = Nathusius' bat, *Pipistrellus pipistrellus* = common pipistrelle, *Pipistrellus pygmaeus* = soprano pipistrelle, *Plecotus auritus* = brown long-eared bat and *Rhinolophus hipposideros* = lesser horseshoe bat. I = Inchamore and number = turbine location, so I1 = turbine 1 at Inchamore.

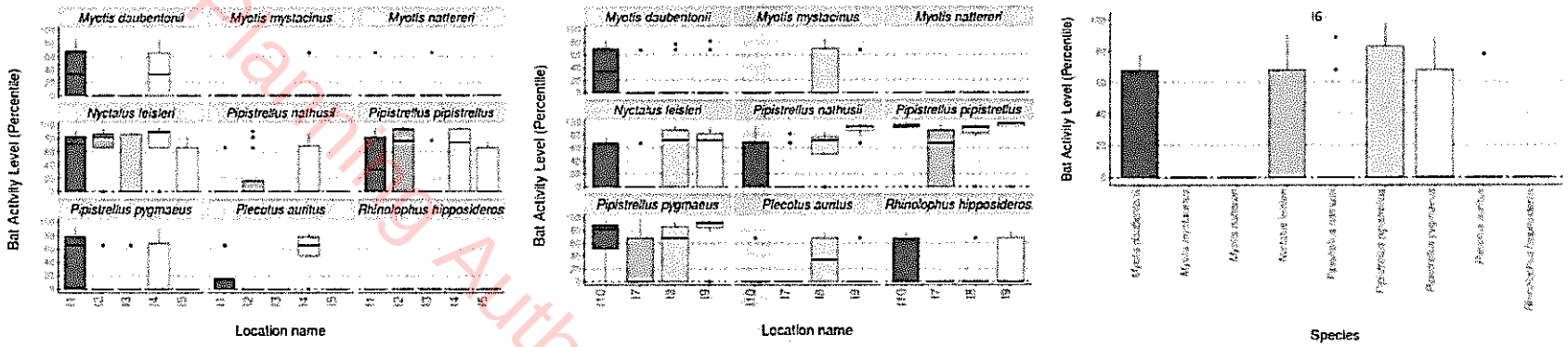

Figure 3-7: Differences in Activity between Static Detector Locations, split by Species and Locations during Survey Period 1 at Inchamore

3.4.2 Survey Period 2

3.4.2.1 Gortyrahilly

A summary table showing the number of nights recorded bat activity fell into each activity band for each species is presented below. Recordings were split into three groups depending on the dates deployed: group 1 (turbines 1, 3, 4, 12 and 14), group 2 (turbines 2, 5, 6, 7, 8, 9, 10, 11 and 13) and group 3 (turbines 15, 16, 17 and 18). Each group was analysed in Ecobat separately but is presented collectively in this report.

The maximum of recordings for a single night across all detectors combined on 03/07/2019 was 1,984 recordings where nine species were recorded.

Ten of the eighteen static locations had at least one night of High Activity during the survey period.

The following Turbine locations are deemed to have a High Bat Activity (for specific bat species) level based on the Percentile Median value: T1 (common pipistrelle), T5 (common pipistrelle), T7 (Daubenton's bat, whiskered bat, Nathusius' bat, common pipistrelle and soprano pipistrelle), T9 (Nathusius' bat, common pipistrelle and soprano pipistrelle), T10 (common pipistrelle), T11 (common pipistrelle), T12 (common pipistrelle and soprano pipistrelle), T13 (Nathiusius' bat, common pipistrelle and soprano pipistrelle), T16 (common pipistrelle) and T17 (common pipistrelle).

Table 3-11: Summary of Ecobat Analysis Tool for static detectors deployed at Gortyrahilly during survey period 2. G = gortyrahilly and number = turbine location, so G1 = turbine 1 at Gortyrahilly.

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G1	*Myotis daubentonii*	0	2	0	0	9	0	Low
G1	*Myotis mystacinus*	0	2	0	0	9	0	Low
G1	*Myotis nattereri*	0	2	0	0	9	0	Low
G1	*Nyctalus leisleri*	1	1	0	0	9	0	Low
G1	*Pipistrellus nathusii*	4	3	0	0	4	68	Moderate to High
G1	*Pipistrellus pipistrellus*	8	2	0	0	1	90	High
G1	*Pipistrellus pygmaeus*	1	1	0	0	9	0	Low
G1	*Plecotus auritus*	0	1	0	0	10	0	Low
G1	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G2	*Myotis daubentonii*	0	1	0	0	10	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G2	*Myotis mystacinus*	0	0	0	0	11	0	Low
G2	*Myotis nattereri*	0	0	0	0	11	0	Low
G2	*Nyctalus leisleri*	0	1	0	0	10	0	Low
G2	*Pipistrellus nathusii*	1	1	0	0	9	0	Low
G2	*Pipistrellus pipistrellus*	4	2	0	0	5	78	Moderate to High
G2	*Pipistrellus pygmaeus*	1	2	0	0	8	0	Low
G2	*Plecotus auritus*	0	0	0	0	11	0	Low
G2	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G3	*Myotis daubentonii*	0	3	0	0	8	0	Low
G3	*Myotis mystacinus*	0	0	0	0	11	0	Low
G3	*Myotis nattereri*	0	2	0	0	9	0	Low
G3	*Nyctalus leisleri*	2	5	0	0	4	68	Moderate to High
G3	*Pipistrellus nathusii*	0	4	0	0	7	0	Low
G3	*Pipistrellus pipistrellus*	2	3	0	0	6	0	Low
G3	*Pipistrellus pygmaeus*	0	3	0	0	8	0	Low
G3	*Plecotus auritus*	0	0	0	0	11	0	Low
G3	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G4	*Myotis daubentonii*	1	3	0	0	7	0	Low
G4	*Myotis mystacinus*	0	3	0	0	8	0	Low
G4	*Myotis nattereri*	0	3	0	0	8	0	Low
G4	*Nyctalus leisleri*	3	5	0	0	3	68	Moderate to High
G4	*Pipistrellus nathusii*	0	3	0	0	8	0	Low
G4	*Pipistrellus pipistrellus*	5	2	0	0	4	68	Moderate to High

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G4	*Pipistrellus pygmaeus*	1	1	0	0	9	0	Low
G4	*Plecotus auritus*	0	2	0	0	9	0	Low
G4	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G5	*Myotis daubentonii*	0	4	0	0	7	0	Low
G5	*Myotis mystacinus*	0	1	0	0	10	0	Low
G5	*Myotis nattereri*	0	1	0	0	10	0	Low
G5	*Nyctalus leisleri*	1	2	0	0	8	0	Low
G5	*Pipistrellus nathusii*	1	4	0	0	6	0	Low
G5	*Pipistrellus pipistrellus*	10	0	0	0	1	96	High
G5	*Pipistrellus pygmaeus*	5	2	0	0	4	68	Moderate to High
G5	*Plecotus auritus*	0	1	0	0	10	0	Low
G5	*Rhinolophus hipposideros*	0	2	0	0	9	0	Low
G6	*Myotis daubentonii*	0	4	0	0	7	0	Low
G6	*Myotis mystacinus*	0	1	0	0	10	0	Low
G6	*Myotis nattereri*	0	0	0	0	11	0	Low
G6	*Nyctalus leisleri*	1	2	0	0	8	0	Low
G6	*Pipistrellus nathusii*	2	2	0	0	7	0	Low
G6	*Pipistrellus pipistrellus*	4	5	0	0	2	78	Moderate to High
G6	*Pipistrellus pygmaeus*	2	2	0	0	7	0	Low
G6	*Plecotus auritus*	0	0	0	0	11	0	Low
G6	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G7	*Myotis daubentonii*	10	0	0	0	1	96	High

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G7	*Myotis mystacinus*	6	2	0	0	3	83	High
G7	*Myotis nattereri*	7	2	0	0	2	83	High
G7	*Nyctalus leisleri*	1	4	0	0	6	0	Low
G7	*Pipistrellus nathusii*	4	2	0	0	5	68	Moderate to High
G7	*Pipistrellus pipistrellus*	9	1	0	0	1	94	High
G7	*Pipistrellus pygmaeus*	8	1	0	0	2	91	High
G7	*Plecotus auritus*	3	4	0	0	4	68	Moderate to High
G7	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G8	*Myotis daubentonii*	0	3	0	0	8	0	Low
G8	*Myotis mystacinus*	0	1	0	0	10	0	Low
G8	*Myotis nattereri*	0	1	0	0	10	0	Low
G8	*Nyctalus leisleri*	3	2	0	0	6	0	Low
G8	*Pipistrellus nathusii*	3	1	0	0	7	0	Low
G8	*Pipistrellus pipistrellus*	5	1	0	0	5	68	Moderate to High
G8	*Pipistrellus pygmaeus*	4	0	0	0	7	0	Low
G8	*Plecotus auritus*	0	3	0	0	8	0	Low
G8	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G9	*Myotis daubentonii*	0	4	0	0	7	0	Low
G9	*Myotis mystacinus*	0	2	0	0	9	0	Low
G9	*Myotis nattereri*	0	0	0	0	11	0	Low
G9	*Nyctalus leisleri*	3	2	0	0	6	0	Low
G9	*Pipistrellus nathusii*	7	1	0	0	3	86	High
G9	*Pipistrellus pipistrellus*	9	0	0	0	2	95	High

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G9	*Pipistrellus pygmaeus*	6	2	0	0	3	86	High
G9	*Plecotus auritus*	0	2	0	0	9	0	Low
G9	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G10	*Myotis daubentonii*	1	3	0	0	7	0	Low
G10	*Myotis mystacinus*	0	0	0	0	11	0	Low
G10	*Myotis nattereri*	0	2	0	0	9	0	Low
G10	*Nyctalus leisleri*	1	1	0	0	9	0	Low
G10	*Pipistrellus nathusii*	0	3	0	0	8	0	Low
G10	*Pipistrellus pipistrellus*	6	1	0	0	4	86	High
G10	*Pipistrellus pygmaeus*	1	4	0	0	6	0	Low
G10	*Plecotus auritus*	0	3	0	0	8	0	Low
G10	*Rhinolophus hipposideros*	0	1	0	0	10	0	Low
G11	*Myotis daubentonii*	0	4	0	0	7	0	Low
G11	*Myotis mystacinus*	0	2	0	0	9	0	Low
G11	*Myotis nattereri*	0	1	0	0	10	0	Low
G11	*Nyctalus leisleri*	2	2	0	0	7	0	Low
G11	*Pipistrellus nathusii*	3	3	0	0	5	68	Moderate to High
G11	*Pipistrellus pipistrellus*	9	1	0	0	1	88	High
G11	*Pipistrellus pygmaeus*	2	7	0	0	2	68	Moderate to High
G11	*Plecotus auritus*	0	6	0	0	5	68	Moderate to High
G11	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G12	*Myotis daubentonii*	0	1	0	0	10	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G12	*Myotis mystacinus*	0	4	0	0	7	0	Low
G12	*Myotis nattereri*	1	3	0	0	7	0	Low
G12	*Nyctalus leisleri*	2	0	0	0	9	0	Low
G12	*Pipistrellus nathusii*	2	4	0	0	5	68	Moderate to High
G12	*Pipistrellus pipistrellus*	11	0	0	0	0	97	High
G12	*Pipistrellus pygmaeus*	10	1	0	0	0	88	High
G12	*Plecotus auritus*	0	2	0	0	9	0	Low
G12	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G13	*Myotis daubentonii*	4	5	0	0	2	78	Moderate to High
G13	*Myotis mystacinus*	0	3	0	0	8	0	Low
G13	*Myotis nattereri*	0	6	0	0	5	68	Moderate to High
G13	*Nyctalus leisleri*	3	4	0	0	4	68	Moderate to High
G13	*Pipistrellus nathusii*	6	2	0	0	3	83	High
G13	*Pipistrellus pipistrellus*	10	0	0	0	1	96	High
G13	*Pipistrellus pygmaeus*	8	2	0	0	1	90	High
G13	*Plecotus auritus*	3	5	0	0	3	68	Moderate to High
G13	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G14	*Myotis daubentonii*	0	1	0	0	10	0	Low
G14	*Myotis mystacinus*	0	0	0	0	11	0	Low
G14	*Myotis nattereri*	0	1	0	0	10	0	Low
G14	*Nyctalus leisleri*	3	2	0	0	6	0	Low
G14	*Pipistrellus nathusii*	3	1	0	0	7	0	Low
G14	*Pipistrellus pipistrellus*	5	2	0	0	4	78	Moderate to High

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G14	*Pipistrellus pygmaeus*	1	1	0	0	9	0	Low
G14	*Plecotus auritus*	0	2	0	0	9	0	Low
G14	*Rhinolophus hipposideros*	0	0	0	0	11	0	Low
G15	*Myotis daubentonii*	0	2	0	0	18	0	Low
G15	*Myotis mystacinus*	0	1	0	0	19	0	Low
G15	*Myotis nattereri*	0	1	0	0	19	0	Low
G15	*Nyctalus leisleri*	6	2	0	0	12	0	Low
G15	*Pipistrellus nathusii*	1	3	0	0	16	0	Low
G15	*Pipistrellus pipistrellus*	10	2	0	0	8	75	Moderate to High
G15	*Pipistrellus pygmaeus*	1	3	0	0	16	0	Low
G15	*Plecotus auritus*	0	1	0	0	19	0	Low
G15	*Rhinolophus hipposideros*	0	0	0	0	20	0	Low
G16	*Myotis daubentonii*	1	6	0	0	13	0	Low
G16	*Myotis mystacinus*	0	2	0	0	18	0	Low
G16	*Myotis nattereri*	0	4	0	0	16	0	Low
G16	*Nyctalus leisleri*	2	6	0	0	12	0	Low
G16	*Pipistrellus nathusii*	3	1	0	0	16	0	Low
G16	*Pipistrellus pipistrellus*	13	3	0	0	4	86	High
G16	*Pipistrellus pygmaeus*	6	9	0	0	5	65	Moderate to High
G16	*Plecotus auritus*	0	4	0	0	16	0	Low
G16	*Rhinolophus hipposideros*	0	0	0	0	20	0	Low
G17	*Myotis daubentonii*	1	4	0	0	15	0	Low

Location	Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity
G17	*Myotis mystacinus*	2	6	0	0	12	0	Low
G17	*Myotis nattereri*	0	4	0	0	16	0	Low
G17	*Nyctalus leisleri*	3	9	0	0	8	65	Moderate to High
G17	*Pipistrellus nathusii*	5	6	0	0	9	65	Moderate to High
G17	*Pipistrellus pipistrellus*	18	1	0	0	1	97	High
G17	*Pipistrellus pygmaeus*	9	6	0	0	5	76	Moderate to High
G17	*Plecotus auritus*	0	5	0	0	15	0	Low
G17	*Rhinolophus hipposideros*	0	1	0	0	19	0	Low
G18	*Myotis daubentonii*	0	3	0	0	17	0	Low
G18	*Myotis mystacinus*	0	0	0	0	20	0	Low
G18	*Myotis nattereri*	0	0	0	0	20	0	Low
G18	*Nyctalus leisleri*	0	0	0	0	20	0	Low
G18	*Pipistrellus nathusii*	0	2	0	0	18	0	Low
G18	*Pipistrellus pipistrellus*	3	3	0	0	14	0	Low
G18	*Pipistrellus pygmaeus*	0	0	0	0	20	0	Low
G18	*Plecotus auritus*	0	0	0	0	20	0	Low
G18	*Rhinolophus hipposideros*	0	0	0	0	20	0	Low

Differences in activity between static detector locations split by species and location is presented in the figure below. The centre line indicates the median activity level whereas the box represents the interquartile range (therefore the spread of the middle 50% of nights of activity). The plot for common pipistrelle shows that the activity level for both T5, T7, T9, T11, T12, T13 and T17 was consistently high. Similarly, the plot for soprano pipistrelle shows that the activity level for both T7, T12 and T13 was consistently high. Finally, the plot for Daubenton's bat shows that the activity level for T7 was consistently high.

The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity). The dots indicate outlier values. Note: *Myotis daubentonii* = Daubenton's bat, *Myotis mystacinus* = whiskered bat, *Myotis nattereri* = Natterer's bat, *Nyctalus leisleri* = Leisler's bat, *Pipistrellus nathusii* = Nathusius' bat, *Pipistrellus pipistrellus* = common pipistrelle, *Pipistrellus pygmaeus* = soprano pipistrelle, *Plecotus auritus* = brown long-eared bat and *Rhinolophus hipposideros* = lesser horseshoe bat. G = gortyrahilly and number = turbine location, so G1 = turbine 1 at Gortyrahilly.