

DYRICK HILL WIND FARM

Bat Survey Report

Prepared for:
EMPower



Date: June 2023

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

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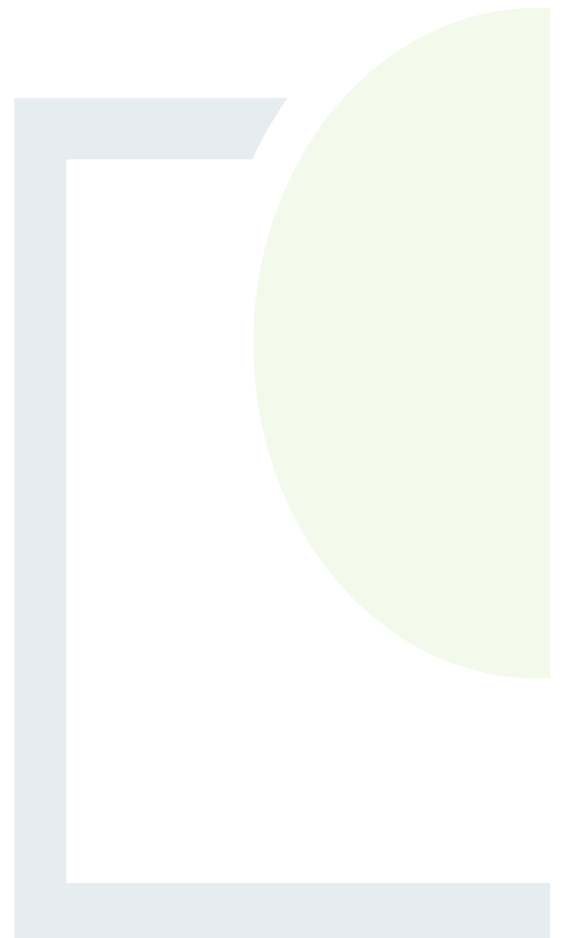


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1. INTRODUCTION

This report details the results of the bat surveys carried out at the development during 2021 and 2022. In addition to desktop study, the following surveys were undertaken within and adjacent to the development and grid connection:

- bat activity (walked transects and stream spot counts)
- static detector (proposed turbine locations for 2020 and 2021, met mast location 2022)
- roost surveys

All surveys adhered to SNH¹ (2019, 2021) guidelines at the time of survey.

Bat activity was recorded along predetermined walked transects in July, August, and September 2020, 2021 and 2022.

Static detector surveys were carried out between May and August 2020, May and October 2021 and May to July 2022.

The survey types were determined most appropriate to establish a baseline species assemblage, along with spatial and temporal distribution of species activity within the development.

1.1 Site Location

The Site, as shown in Figure 1-1, is located within an area of farmland, forestry, and upland heath, and is located within the townlands of Ballynaguilkee Upper, Broemountain, Corradoon, Dyrick, Lickoran, Lickoranmountain, Lisleagh, Lisleaghmountain, Lyrattin and Scartmountain. The Site is located 43km west of Waterford City, 55km northeast of Cork City, and 12.9km northwest of Dungarvan.

The proposed grid connection passes through the townlands of Broemountain, Lyrattin, Farnane Lower, Farnane Upper, Castlequarter, Mountaincastle South, Carrigaun (Mansfield), Langanoran, Sleadycastle, Knockaunnaglokee, Garryduff, Colligan More, Garryclone, Colliganwood, Ballymacmague North, Ballymacmague South and Killadangan.

Temporary works will be required to accommodate the delivery of the turbine components. These temporary works are included as part of this application and are assessed as part of this EIAR and are located in the townlands of Ballynaguilkee Lower, Kilcooney, and Lisleagh Gorteens, Kilmurry, Rathpatrick, Ballyduff East, Joulterspark and Burgery.

The redline boundary extends to 358.6ha, and comprises a mixture of farmland, forestry, and upland heath. Much of the lands are in private, third-party ownership, while a portion of the site is shared land (commonage).

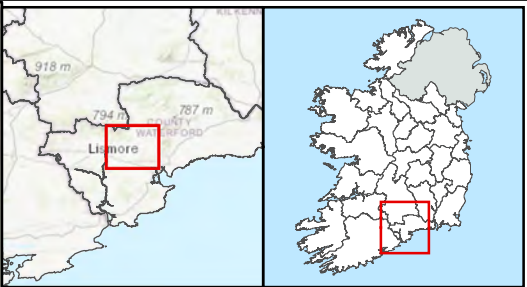
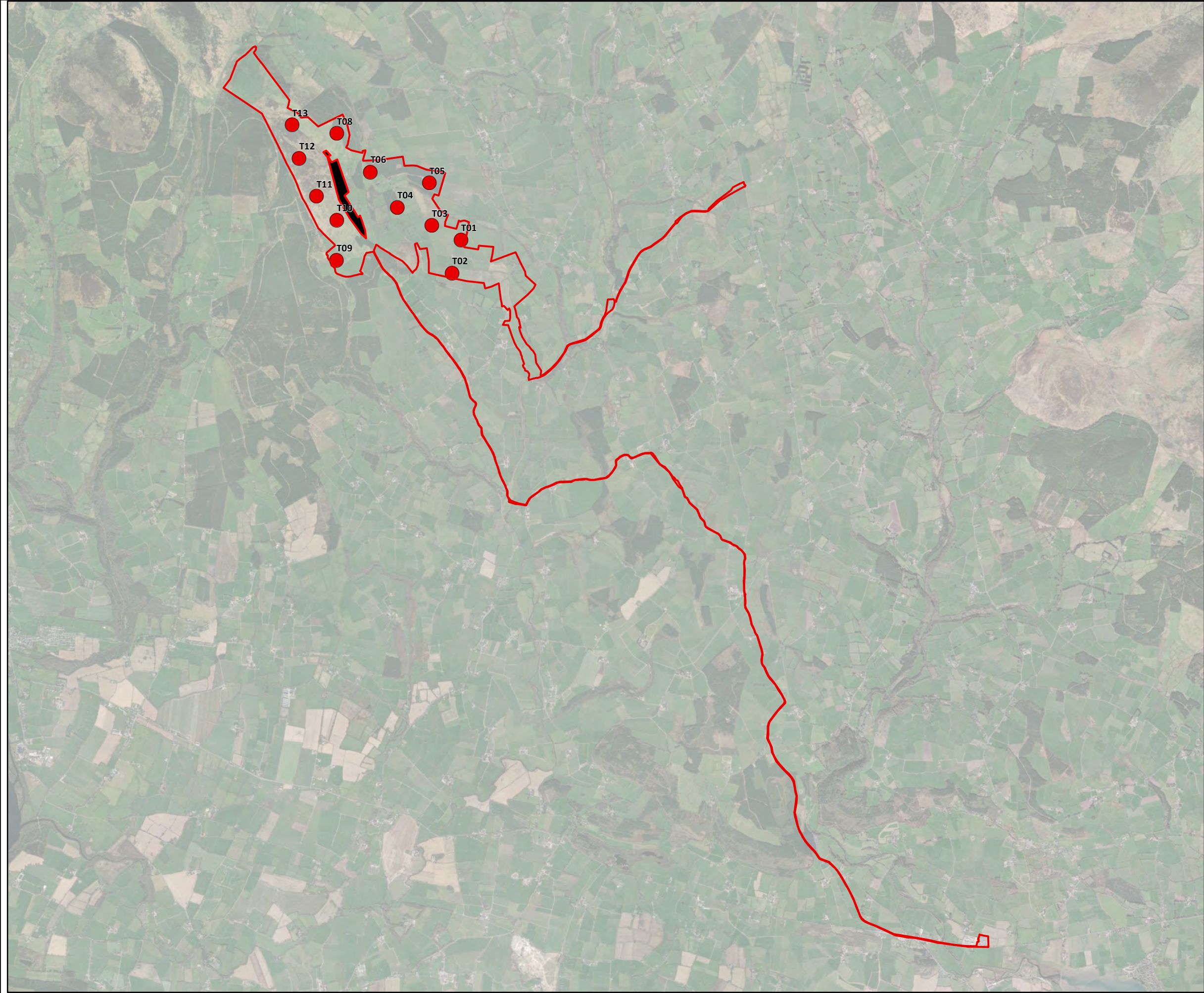
¹ Scottish Natural Heritage now called NatureScot. Name interchangeable in this report.






Surrounding habitats and land uses are described by Corine 2018² as: pastures (Code 231), coniferous forests (312), transitional woodland scrub (324) and peat bogs (412).

The main wind farm site is predominantly improved agricultural grassland (44.92%), as well as wet grassland (11.86%), dry acid grassland (9.92%), conifer plantation (9.75%), heath/grassland/bracken mosaic (7.85%), and dry heath (7.75%). Other habitats on site are dense bracken (2.49%), buildings and artificial surfaces (1.83%), scrub (1.62%), poor fen and flush (1.02%), broad-leaved woodland (0.63%), mixed woodland (0.32%), and recolonising bare ground (0.04%).

² <https://gis.epa.ie/EPAMaps/>. Accessed 06/04/23



-  Site Boundary
-  Excluded Coillte Lands
-  Turbine Layout

TITLE:		Site Location	
PROJECT:		Dyrick Hill Wind Farm	
FIGURE NO:		1-1	
CLIENT:		EMPower	
SCALE:	1:51538	REVISION:	0
DATE:	12/04/2023	PAGE SIZE:	A3



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:

- Vespertilionidae, which contains nine Irish species (Daubenton's bat, Natterer's bat, whiskered bat, Leisler's bat, brown long-eared bat, soprano pipistrelle, common pipistrelle and Nathusius's pipistrelle; and
- Rhinolophidae, which contain one Irish species, the lesser horseshoe bat.

See Appendix 2 for species details.

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. In 2020 an individual was also recorded in Glendalough, Co. Wicklow. Both were considered to be vagrants. The development is outside the distribution range for lesser horseshoe bat (Bat Conservation Ireland (BCI), 2020).

1.3 Legislation

1.3.1 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.

1.3.2 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.

1.3.3 International Legislation

Ireland has ratified two international wildlife laws pertaining to bats:

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.



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
- NRA (2006b). Guidelines for the Treatment of Bats during the Construction of National Road Schemes. National Roads Authority (now named Transport Infrastructure Ireland), Ireland.
- Aughney, T., Kelleher, C. & Mullen, D. (2008). Bat Survey Guidelines: Traditional Farm Buildings Scheme. The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny.
- BTHK (2018). Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-Care and Ecology Professionals. Pelagic Publishing, Exeter UK.
- European Commission (2021). Commission notice. Guidance document on the strict protection of animal species of Community interest under the Habitats Directive
- CIEEM (2021). Bat Mitigation Guidelines. A guide to impact assessment, mitigation and compensation for developments affecting bats. Beta version 1.0.
- NPWS (2022). Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134.

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. It is important to be aware of these publications to understand the recommended survey protocols and accepted bat mitigation measures implemented across Europe to address potential impacts of wind turbines on local bat populations.

These include:

- Bats and onshore wind turbines: Survey, Assessment and Mitigations. Scottish Natural Heritage January, 2019.
- Bats and onshore wind turbines - survey, assessment and mitigation. Scottish Natural Heritage. August 2021



- 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.
- Bat Conservation Ireland Guidelines for consideration of bats in wind farm projects - Revision 2014
- Wind Turbine/Wind Farm Development Bat Survey Guidelines (BCI, 2012);
- NIEA (2011). Bat survey – specific requirements for wind farm proposals. Northern Ireland Environment Agency, Department of the Environment, Belfast.
- European Commission (2020). Guidance document on wind energy developments and EU nature legislation. Brussels, 18.11.2020 C(2020) 7730 final.
- NIEA, Natural Environment Division (2021). Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland.

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 2020, 2021 and 2022 within the survey area:

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

All surveys adhered to SNH (2019, 2021) guidelines at the time of survey. The following is a brief description of main types of surveys completed in 2020, 2021 and 2022 for this report.

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. Spot counts can also be conducted along transect surveys.

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.

Roost surveys: The methods used in the bat roost survey include desktop searches, visual searches at potential roost structures, dusk emergence surveys, passive bat detector monitoring, and a search for Potential Roost Features in trees.



2. METHODOLOGY

2.1 Zone of influence (Zol)

In accordance with Collins (2016), the geographical extent of the desk study, as a minimum, should be carried out up to 2km from the development boundary (including all temporary works). However, the data search should be related to the scheme's Zol³ and consider the core sustenance zone (CSZs) of species likely to be present, and may need to extend up to 10km for larger projects.

2.2 Desktop Study

A desktop data search was conducted on 28/03/2023 in order to collate existing information 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 radius⁴ of the development site from the National Bat Database held by the National Biodiversity Data Centre (www.biodiversityireland.ie)⁵;
- Review of Ordnance Survey mapping and aerial photography of the development site boundaries and their environs (i.e. 200 m plus rotor radius of the boundary of the development⁶);
- Records of designated sites within a 15 km radius of the development 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 development 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 development 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.

2.2.1 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.

³ Zol is defined by CIEEM (2016) as 'the areas/resources that may be affected by the biophysical changes caused by activities associated with a project'.

⁴ A 4km radius search distance was selected to encompass records of bat roosts within Core Sustenance Zones (CSZ) of the study area for Irish species of bat. A CSZ refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the conservation status of the colony using the roost (Collins, 2016).

⁵ 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 deemed of high potential for bat roosts.

⁶ As per SNH (2021) guidance.



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 Bat Conservation Ireland 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.

2.2.2 Designated Sites

A search was made for designated sites within 15 km of the development 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 national 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

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 and are considered as fully designated sites in this assessment.

2.2.3 National and Local Biodiversity Plans

Consideration was taken of the following local and national biodiversity plans:

- Ireland's 3rd National Biodiversity Action Plan - 2017-2021.
- Waterford County Development Plan 2022 – 2028

2.3 **Survey Methodology**

A total of four no. bat activity surveys, and three no. of roost surveys were conducted in 2021 (refer to Table 2-1 for details). A total of four no. bat activity surveys, and three no. of roost surveys were conducted in 2021. These surveys followed the guidelines set out by the Bat Conservation Trust in Bat Surveys: Good Practice Guidelines (Hundt, 2012 and Collins, 2016) and SNH (2019 and 2021). Static detectors were placed at proposed turbine locations for three rounds in 2020 and 2021. An at height static detector was placed on the existing met mast in 2022. The locations of static detectors and methodology for static detector surveys followed the requirements of 'Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation' (NatureScot 2021).



Table 2-1: Bat Surveys 2020, 2021 and 2022

Survey Type	Survey Date	Surveyor
Static Detector Survey	2020	Analysed by FT
Activity Survey 1	28/07/2020	Tom O'Donnell
Activity Survey 2	18/08/2020	Tom O'Donnell
Activity Survey 3	03/09/2020	Tom O'Donnell
Static Detector Survey	2021	Analysed by FT
Activity Survey 4	24/07/2021	Dr Isobel Abbott
Roost Survey 1	24/07/2021	Dr Isobel Abbott
Activity Survey 5	30/07/2021	Dr Isobel Abbott
Roost Survey 2	30/07/2021	Dr Isobel Abbott
Roost Survey 3	11/08/2021	Dr Isobel Abbott
Activity Survey 6	25/08/2021	Dr Isobel Abbott
Activity Survey 7	15/09/2021	Dr Isobel Abbott
Roost Survey 4	23/03/2022	Dr Isobel Abbott
Roost Survey 5	28/03/2022	Dr Isobel Abbott
At Height Static Detector Survey	2022	Analysed by FT
Activity Survey 8	02/07/2022	Dr Isobel Abbott
Roost Survey 6	02/07/2022	Dr Isobel Abbott
Activity Survey 9	13/07/2022	Dr Isobel Abbott
Activity Survey 10	06/08/2022	Dr Isobel Abbott
Roost Survey 7	06/08/2022	Dr Isobel Abbott
Activity Survey 11	19/08/2022	Dr Isobel Abbott
Activity Survey 12	09/09/2022	Dr Isobel Abbott
Roost Survey 8	09/09/2022	Dr Isobel Abbott
Activity Survey 13	24/09/2022	Dr Isobel Abbott



2.3.1 Surveyor Information

All activity and roost surveys in 2021 and 2022 were undertaken by Dr Isobel Abbott (Principal Ecologist, Abbott Ecology): Isobel is an independent ecological consultant, specialising for >15 years in bat ecology, bat survey, assessment, and mitigation. She graduated first in class in Zoology from University College Cork in 2007, and subsequently obtained her PhD on the effectiveness of bat mitigation measures employed on Irish national road schemes in 2012. She has published a number of research papers on bat ecology in scientific journals. She has extensive experience of conducting bat surveys and other multi-disciplinary ecology surveys for Ecological Impact Assessments, Preliminary Ecological Appraisal, and Ecological Constraints and Appropriate Assessment Screening Reports. She has worked on a variety of projects including national bat monitoring programmes, wind farms, solar farms, road construction, bridge repairs, quarries, and residential and industrial developments. Isobel has designed bat mitigation measures and successfully applied for >50 bat derogation licenses from the National Parks and Wildlife Service associated with planning permission applications or research. She currently holds nationwide NPWS licenses to capture and handle bat species, and to disturb bat roosts for the purpose of ecological impact assessment.

Activity surveys in 2020 were conducted by Tom O'Donnell (BSc (Hons) MSc CEnv MCIEEM). Tom is a Chartered Environment Scientist (CEnv) and a full member of the Institute of Ecology and Environmental Management (MCIEEM). He has 14 years' experience in the environmental industry, in Ireland the UK and New Zealand. Tom has experience of numerous ecological and environmental projects including EIAR, EclA and AA/NIS reporting. Tom has significant experience in the ecological assessment of major projects such as wind farms and linear projects (incl. greenways, overhead lines, roads etc.). He has considerable experience of environmental management of construction projects, including over 3 years based on-site full-time. Tom is recognised for his skill and experience in stakeholder engagement and the design and delivery of meaningful and buildable ecological mitigation and enhancement measures. Tom lectures in Technological University Dublin (TUD) for the 'Environmental Accountability in Development' module

The 2020 static detector surveys deployment was analysed by Jason Guile. Jason has over 10 years' experience and holds a BSc in Marine Biology/Oceanography from the University of Wales, Bangor and a HND in Coastal Conservation with Marine Biology from Blackpool and Fylde College. He was the lead ecologist on a range of projects in the UK, including large scale infrastructural, such as HS2 phase 2b and Midland Mainline Electrification. Since moving to Ireland he has been lead ecologist / author (Environmental Impact Assessment Reports, Appropriate Assessment Screening reports and Natura Impact Statements) for a number of projects including urban planning applications and commercial regeneration sites. With FT, Jason is lead ecologist for a number of renewable energy projects including Smithstown Solar Farm and Croaghaun Wind Farm. Jason is an experienced bat surveyor, first gaining a class license to observe bats from Natural England in 2017 was, and currently is, licensed by NPWS for roost disturbance.

The 2021 static detector surveys deployment was carried out by Andrew Torsney and David Daly. Andrew Torsney. Andrew has over 10 years' experience as a professional ecologist. In this role he is responsible for all ecological works from project design and implementation to the preparation of reports. Interaction with key stake holder and statutory bodies such as the NPWS and the EPA is a vital part of this role. His role is diverse and complex working at both plan and project level. He has been the principal ecologist responsible for the preparation and co-ordination of AA and contributions towards the biodiversity elements of the SEA for many statutory land use plans; as well as EclAs, EIARs and AAs of Projects. David holds a BSc in Ecology from University College Cork and an MSc in Species Identification and Survey Skills from University of Reading. David has three years' experience in the ecology sector in both the UK and Ireland. He was the lead ecologist on several bat related projects, ranging from building renovations works to wind farm developments. He has been granted bat disturbance and derogation licences by NPWS for previous projects.



2.3.2 Bat activity surveys

The schedule of site surveys is shown in Table 2-1 and all transects were walked during suitable weather conditions. Bat detectors used for recording bat activity during transect surveys; Wildlife Acoustics EM3+ with attached Garmin GPS unit, with SM4BAT FS for back-up recordings. Recorded bat activity was manually analysed using Wildlife Acoustics Kaleidoscope Viewer Pro, specialist bat call analysis software.

Pipistrelle calls with an 'in-between' frequency of maximum energy, FMAXE, of c. 50kHz, cannot always be reliably assigned to either common pipistrelle (typical FMAXE of c. 45kHz) or Soprano Pipistrelle (typical FMAXE c. 55kHz), and were classified as '50kHz Pipistrelle'. The echolocation pulses of *Myotis* sp. (Daubenton's bat, Natterer's bat, whiskered bat) can be difficult to separate to species due to similarities in calls types, particularly if the pulses recorded are faint, only partially detected, or atypical. Where ambiguous, these were classified as *Myotis* sp.

Walked transect routes and a 10-minute spot count at a stream, as agreed with Fehily Timoney & Co., are shown in Figure 2-1. Bat activity was recorded along these transects in each of July, August, and September 2020, 2021 and 2022, with dates and weather conditions as shown in Table 2-1. Bat activity was recorded along both the outgoing walked transect and the return walked transect where the transect was not a circuit. The transects and 10-minute stream spot count were sampled in a random order in the hours after sunset, finishing no more than 4 hours after sunset (Table 2-1).

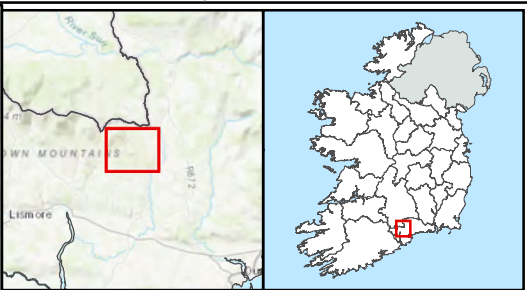
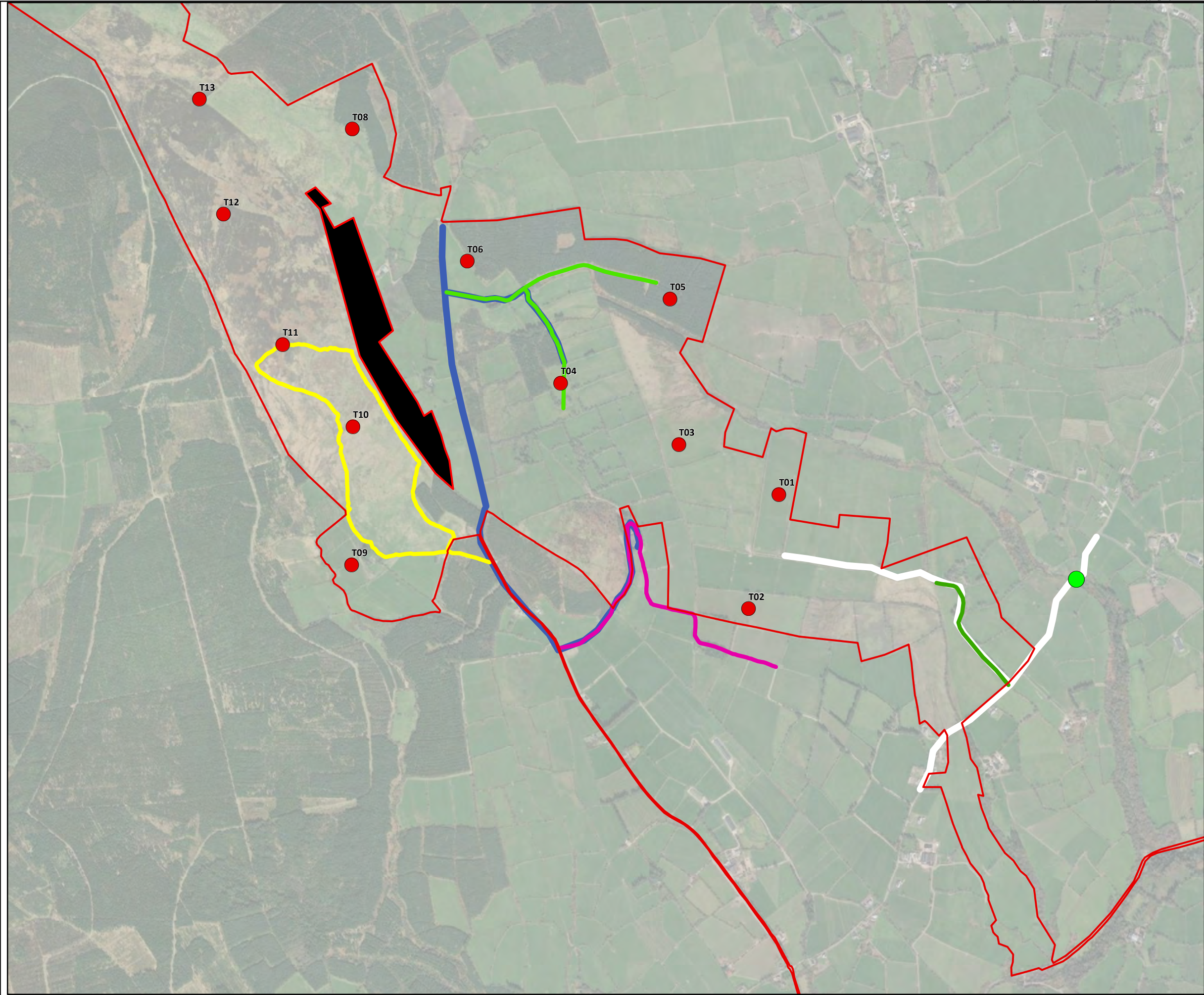
Bat activity is governed by the activity of their insect prey and insect abundance is in turn governed by weather conditions and climate. Insects, and therefore bats, are unlikely to be present at temperatures below 7°C or during periods of strong winds or heavy rainfall so survey in such conditions 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) (Aughney et al., 2008).

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.

Table 2-2: Transect Details

Transect Name	Transect Length (m)	Fossitt habitats along transect
A	3230 m	Conifer Plantation (WD4), Eroding/Upland Rivers (FW1), Improved Agricultural Grassland (GA1), Hedgerow (WL1)
B	2478 m	Woodland, Eroding/Upland Rivers (FW1), Improved Agricultural Grassland (GA1), Hedgerow (WL1), Buildings and Artificial Surfaces (BL3)
WT1	3,069 m*	Treelines (WL2), Hedgerow (WL1), Improved Agricultural Grassland (GA1)
WT2	2,834 m*	Conifer Plantation (WD4), Eroding/Upland Rivers (FW1), Improved Agricultural Grassland (GA1), Hedgerow (WL1)
WT3	3,222 m*	Improved Agricultural Grassland (GA1), Treelines (WL2), Conifer Plantation (WD4), Buildings and Artificial Surfaces (BL3)
WT4	1,114 m*	Treelines (WL2), Improved Agricultural Grassland (GA1)
SC1	NA (Spot Count)	Eroding/Upland Rivers (FW1), Buildings and Artificial Surfaces (BL3)

*Length of loop walked, or length of straight transect out and back



- Site Boundary
- Excluded Coillte Lands
- Turbine Layout
- Spot Count
- Transect**
- A
- B
- WT1
- WT2
- WT3
- WT4

TITLE:		Bat Activity Survey Transect Routes	
PROJECT:		Dyrick Hill Wind Farm	
FIGURE NO:		2-1	
CLIENT:		EMPower	
SCALE:	1:15000	REVISION:	0
DATE:	12/04/2023	PAGE SIZE:	A3





2.3.3 Static Detector Surveys

Passive Static Bat Surveys involve leaving a static bat detector unit (with ultrasonic microphone) in a specific location and set to record for a specified round of time (i.e., a bat detector is left in the field, there is no observer present and bats which pass 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 round 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. Full spectrum bat recorders were utilised for all the static surveys as recommended in the revised SNH (2021) guidelines. 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.

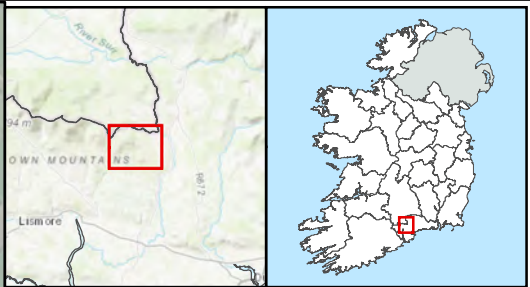
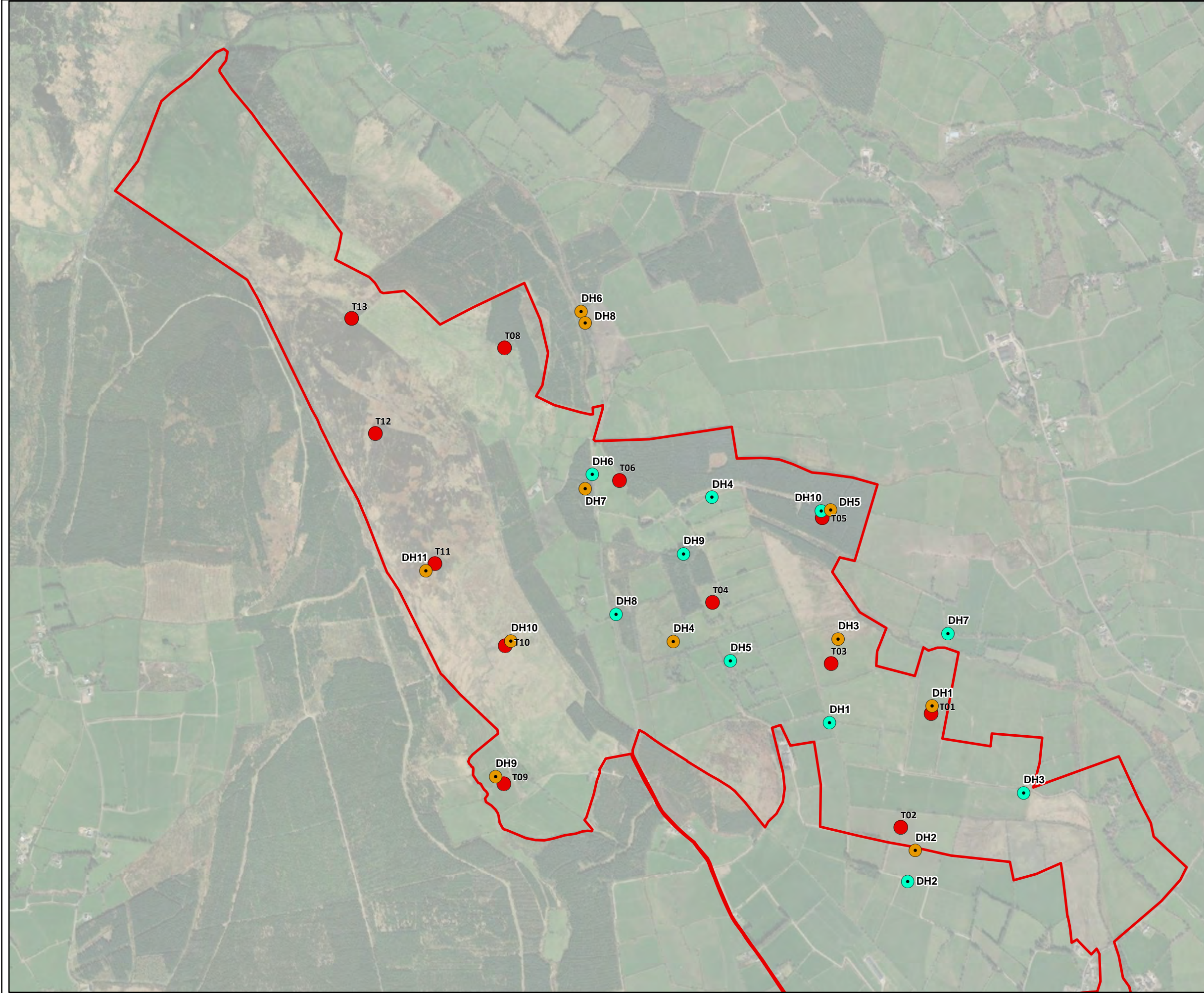
Per SNH 2019, and the updated NautreScot 2021 guidance, static units (Song Meter SM4BAT) were programmed to commence half an hour before sunset and finish half an hour after sunrise to ensure that bat species that emerge early in the evening and return to roosts late are recorded. Detectors were left out for a minimum of 10 consecutive nights across three survey rounds: spring (April-May), summer (June-mid-August) and autumn (mid-August-October).

NatureScot (2021) 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". Detectors were placed at the proposed turbine locations in 2020 (no.=10) and 2021 (no.=11), with one turbine being added between 2020 and 2021.

A stationary passive detector was affixed to a met mast on the survey site during the survey period 19th May to 4th July 2022 (a total of 46 nights) to assess the collision risk to bat species. It was placed at approximately within the rotor swept height. A met mast is a temporary tower equipped with meteorological instruments, installed on potential wind turbine sites for a period, to assess wind conditions and allows developers to determine if a site will generate enough power for a project to be economically viable. As the anemometers are mounted at a range of heights, it is a suitable place to affix a stationary passive detector to assess the potential impact on bat species flying within the rotor swept height.

The locations of the static detectors are presented in Figure 2-2 below.

The data was analysed with Kaleidoscope 5.3.9g software (Bats of Europe 5.2.1).



- Site Boundary**
- Turbine Layout**
- Static Detector Locations**
- Year**
- 2020
 - 2021

TITLE:		Static Detector Locations	
PROJECT:		Dyrick Hill Wind Farm	
FIGURE NO:		2.2	
CLIENT:		EMPower	
SCALE:	1:15000	REVISION:	0
DATE:	20/04/2023	PAGE SIZE:	A3



Data Analysis

All recordings were made in full spectrum, retaining all amplitude and harmonic information from the original bat call for subsequent analysis. Bat calls were analysed using Kaleidoscope Pro (5.3.9) Software. All files were split to a maximum duration of 15 seconds and automatically identified to species level, or genus level as appropriate, using auto-ID bat classifiers (Bats of Europe 5.2.1).

In order to determine appropriate quality assurance, files with pulse matches of 4 or less were manually checked (including NoID files).

2.3.4 Roost Surveys

The bat roost survey of the site was carried out in line with current industry guidance (Collins 2016; SNH, 2021). SNH (2021) recommends that key features that could support maternity roosts and significant hibernation and/or swarming sites (both of which may attract bats from numerous colonies from a large catchment) within 200m plus rotor radius of the boundary of the proposed development should be subject to further investigation. The search area may need to be extended if there is a high level of habitat connectivity in the surrounding area and this is considered likely to attract bats into the wind farm area from further afield. The survey should establish presence or absence of roosts and if bats are present the species, numbers (or estimated numbers), function of the roost and flight lines away from the roost.

Old maps (OSI historic 6-inch) and aerial photographs were searched for potential roost sites within the draft site boundary, and observations made in the field. The UBSS Cave Database for the Republic of Ireland, Ordnance Survey Ireland Karst Landscapes, National Monuments Service, and National Inventory of Architectural Heritage GIS layers were also checked to see if there were underground caves or monuments with roost potential in the area. Online National Biodiversity Data Centre (NBDC) maps were searched for previous public bat records for the area.

The overall schedule of roost site surveys is shown in Table 2-3.

Table 2-3 Roost survey schedule*

Date	Name	Survey	Times
24/07/2021	Roost Survey 1	<ul style="list-style-type: none"> Daytime search for roosts Dusk Emergence Survey Site 3A 	Dusk survey: 21:15-23:04 Sunset: 21:34
30/07/2021	Roost Survey 2	<ul style="list-style-type: none"> Daytime search for roosts Deploy passive detectors x 2 Dusk emergence survey Site 8A 	Dusk survey: 21:10-22:55 Sunset: 21:25
11/08/2021	Roost Survey 3	<ul style="list-style-type: none"> Daytime search for roosts Collect passive detectors x 2 Dusk emergence survey 1st of 2 at Site 1 	Dusk survey: 20:48-22:33 Sunset: 21:03
23/03/2022	Roost Survey 4	<ul style="list-style-type: none"> Winter-spring search for roosts Search for Potential Roost Features in trees Deploy passive bat detectors x 3. 	N/A



Date	Name	Survey	Times
28/03/2022	Roost Survey 5	<ul style="list-style-type: none"> • Winter-spring search for roosts • Search trees for Potential Roost Features • Collect passive detectors x 3. 	N/A
02/07/2022	Roost Survey 6	<ul style="list-style-type: none"> • Dusk emergence survey at 2A 	Dusk survey: 21:40-23:25 Sunset: 21:55
06/08/2022	Roost Survey 7	<ul style="list-style-type: none"> • Repeat dusk emergence survey at Site 3A. 	Dusk survey: 20:58-22:43 Sunset: 21:13
09/09/2022	Roost Survey 8	<ul style="list-style-type: none"> • Repeat dusk emergence at Site 12 	Dusk survey: 19:45-21:30 Sunset: 20:00

*Transect Surveys are also relevant to the results of the roost surveys.

2.3.4.1 Visual Survey for Potential Roost Sites (Buildings/Structures)

Visual inspections of structures were assisted with high powered directional torchlight, close-focusing binoculars, and an endoscope as needed. The interior (where possible) and exterior of potential roost structures were undertaken during the hours of daylight, searching for signs of bat roosting, including for example;

- Bats, dead or alive
- Bat droppings: these can accumulate under established roosting and access locations.
- Feeding remains: discarded insects parts such as moth wings under feeding perches.
- Fur oil/grease staining: natural oils in bats' fur rubs onto regularly used surfaces.
- Urine staining, or splashes on windows.
- Scratch marks: from bats movements in and out of perching/roosting locations.
- Lack of spider webs in holes and crevices: may indicate bats passing.
- Characteristic smells of bats may sometimes be detectable.
- Audible daytime roost bat chatter.

Potential roost sites were categorised with respect to their potential roosting suitability to bats (negligible, low, moderate, high) according to Table 2-4, taken from Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.) The Bat Conservation Trust, London.

Wherever a bat lives or rests is a bat roost. However bats need different roosting conditions at different times of the year, and they will often move around to find a roost that meets their needs. Summer maternity roosts, where females gather to give birth and rear pups, are of greater conservation significance than a night roost or an occasional roost used by a single or small number of bats. This survey also aimed to establish the type of roosts present, if any, using the roost definitions in Table 2-5 from the Collins (2016) survey guidelines.



Table 2-4: Categorisation of potential roost site suitability from Collins (2016) survey guidelines

Suitability	Description 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 ^a 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 ^b). 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. ^c	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^a 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 irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for 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 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 ^a 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.

^a For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

^b Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

^c This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

Table 2-5: Bat roost types from Collins (2016) survey guidelines

Roost type	NE definition
Day roost	A place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.
Night roost	A place where bats rest or shelter in the night but are rarely found in the day. May be used by a single individual on occasion or it could be used regularly by the whole colony.
Feeding roost	A place where individual bats or a few individuals rest or feed during the night but are rarely present by day.
Transitional/occasional roost	Used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.
Swarming site ^b	Where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites.
Mating sites ^c	Where mating takes place from late summer and can continue through winter.
Maternity roost ^d	Where female bats give birth and raise their young to independence.
Hibernation roost	Where bats may be found individually or together during winter. They have a constant cool temperature and high humidity.
Satellite roost	An alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season.

^a The table defines roost types for the purposes of consistency but it should be noted that not all of these sites are also breeding sites, resting places or places used for shelter or protection as described in the legislation. Judgements as to what is protected under law should be undertaken on a case-by-case basis (the term roost is not used in the legislation). The EU has provided guidance on this point in: Guidance on the strict protection of animal species of community interest (2007). Please also see Sections 1.2.1 and 1.2.2.

^b Roosting may occur alongside the swarming activity and it is the structures used for rest and shelter within the swarming site that are the roost.

^c Mating sites can include those where bats call for mates on the wing; however, these are also associated with a place that the mating takes place, which is the mating or harem roost.

^d In some species, males may also be present in the maternity roost.



2.3.4.2 *Visual Survey for Potential Roost Sites in Trees*

Potential tree roosts were surveyed from ground level with a torch, binoculars, and endoscope, searching for the presence of bats or bat evidence, and any Potential Roost Features (i.e. PRFs) identified by the Bat Tree Habitat Key Project (Andrews & BTHK 2020), such as rot holes, hazard beams, frost cracks and splits, partially detached bark, knot holes, tear outs, gaps between overlapping branches, and woodpecker holes. When assessing the suitability of a particular PRF to hold bats, a sliding scale of potentiality from low, through moderate, and up into high is sometimes used as recommended by Collins (2016) guidelines, but this is subjective between surveyors. Bats sometimes roost in very inconspicuous tree roosts (Andrews & BTHK 2020) and can be there one day and not the next. Leisler's bat are the Irish bat species for which the most tree roosts have been identified (Roche et al. 2014), and this species roosted an average of 19 m from the ground in tree roosts in a study in Poland for example (Ruczyński & Bogdanowicz 2005). A basic ground level search for PRFs is therefore a survey constraint.

2.3.4.3 *Dusk Emergence Surveys*

Six dusk emergence surveys were carried out during suitable weather conditions as detailed in the survey schedule in Table 2-3. Further details and photographs are provided for each site in the relevant results sections below.

Dusk emergence surveys were conducted from 15 minutes before sunset until 1.5 hours after sunset with two observers. Bat detectors (Batbox Duet, Wildlife Acoustics EM3+) were used to listen for bats in real time to aid observations during the surveys, and recordings were also made using one or two static detectors (Wildlife Acoustics Song Meter SM4BATFS with SMM U1 microphones) for later analyses. Recorded bat activity was manually analysed using Wildlife Acoustics Kaleidoscope Viewer Pro, specialist bat call analysis software.

2.3.4.4 *Automated/Passive Detector Monitoring*

Automated bat detectors (Wildlife Acoustics Song Meter SM4BATFS with SMM U1 or SMM U2 microphones) were used to record all-night bat activity during a number of consecutive nights during summer 2021 and spring 2022 at the locations and dates shown in Table 2-6. Detectors were set to automatically record from half an hour before sunset until half an hour after sunrise.

Passive monitoring involves leaving a suitable bat detector in position with no observer present, and bats which pass sufficiently close to the detector microphone are recorded and their calls are stored for later analysis. Recordings were made in full spectrum, retaining all amplitude and harmonic information from the original signal for subsequent analysis, and were stored in WAV format.

This passive monitoring was conducted in order to provide additional useful information to characterise the roosts of bat species which can be difficult to detect/observe during emergence surveys. The challenge of observing these bat species may arise from a combination of factors, including small numbers of bats roosting, low intensity echolocation, and typically later emergence times when it is darker. This passive monitoring allows a more long-term insight into bat activity at a roost, more than the 'snap-shot' of the roost obtained during an emergence survey, and can also allow insights into bats' night-roosting that may not be apparent during an emergence survey. Passive detectors were also used to record bat activity for later analyses during the dusk emergence surveys.



Bat sonograms are then manually analysed and identified to species level using specialist software, Wildlife Acoustics Kaleidoscope Viewer Pro, noting the time and date of bat registration files. Activity analysis of recorded bat echolocation was defined as registrations/contacts per species within a 15 s (maximum) file. Multiple passes/calls/pulses of the same species within a (maximum) 15 s file count as a single registration - two species within the same 15 s file count as two registrations. Feeding buzzes (indicating a prey capture attempt by a bat), and social calling of bats (used for communication rather than foraging or orientation) were also noted for the rarer bat species (not *Pipistrellus* sp.). A feeding buzz is a shortening of pulse durations and inter-pulse intervals as the bat homes in on prey.

Table 2-6: Automated Passive Detector Monitoring Schedule at Potential Roost Structures

Detector Reference	Location Notes	Dates Deployed	Nights Running	Nights Analysed
P1	Site 3A. Multi-species bat roost near plantation forestry track. Summer deployment.	30/07/2021 - 11/08/2021	12	5 fully & 12 scanned
P2	Site 12. Whiskered bat day roost, brown long-eared minor roost. Summer deployment	30/07/2021 - 07/08/2021	8	7
P3	Site 3A. Multi-species bat roost near plantation forestry track. Spring deployment.	23/03/2022 - 28/03/2022	5	5
P4	Site 7B. Old ruins with thick ivy through walls and bull. Spring deployment.	23/03/2022 - 28/03/2022	5	5
P5	Site 13. Stone bridge Lisleagh Stream. Spring deployment.	23/03/2022 - 28/3/2022	5	5

2.3.4.5 Walked Transects and Spot Counts

The previously described transects and spot counts also are of relevance for the roost surveys (Section 2.3.2).

2.4 Limitations

There was access permission to conduct a bat roost survey within the boundary of the proposed wind farm. However there was no access permission from the occupiers of a farmhouse and sheds in the middle of the proposed wind farm, Site 5 on Figure 2-1. Some of the buildings were in such a dilapidated and unsound state that a full internal visual survey was not possible, while some were locked, only allowing external surveys. These constraints are noted in the relevant sections below. As mentioned above, a ground level search for PRFs in trees is also a survey constraint. Weather conditions were favourable to bat activity during all surveys.

Some Irish bat species have much higher intensity of echolocation than others, and can thus be detected from greater distances, e.g. Leisler's bat (by far the loudest of all the Irish bat species), followed by relatively intense echolocation of common pipistrelle and soprano pipistrelle. Bat species with quieter echolocation, such as brown long-eared bat and Natterer's bat, must fly much closer to the microphone to be detected. Information taken from the UK Bat Conservation Trust's bat survey guidelines indicates that brown long-eared bat and Natterer's bat are among the most difficult to detect bat species. These differences in acoustic detectability are important for interpreting the results of passive detector monitoring.



There were very low levels of artificial night lighting in the site. There was only one strong security light which was triggered by motion sensors which would occasionally impact on potential roost structures 8A and 8B below. There may have also been occasional artificial night lighting in the modern farm sheds listed below.

Issues were experienced with the GPS logging on transect surveys on the night of 3rd September 2020.

It is not always possible to identify a bat call to species level due to the recorded call not being clear. Recorded files from automated detectors may contain only fragments of a call, or the bat may be calling from a distance (from the detector) in which case it may not be clear enough to assign the call to a specific species. In these cases, the call has been assigned to genus level for the 2020/2021 survey results;

Some caution must be taken when comparing activity levels between species, as bias can be shown towards those species with 'louder' or 'lower frequency' echolocation calls. For example, *Nyctalus* species have louder and low frequency echolocation calls which carry further than the quieter and more broad-band brown long-eared bat echolocation calls;

A bat contact is defined as a single detector file which contains at least one bat call. Multiple contacts at any given detector location do not necessarily indicate the presence of more than one bat and should therefore be interpreted as a level of activity rather than the number of bats recorded;

For the purposes of this analysis, if more than 1 species was present within the recorded files the prominent species was identified as the species for the Ecobat analysis, therefore some species numbers may be under recorded. However with the extent of surveys uptake a robust baseline of bat species within the study area is presented.

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. However, with the extent of surveys uptake a robust baseline of bat species within the study area is presented.

The location of units differed from those of the indicative turbine locations in the following scenarios:

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. This provides an overestimate of activity at the site of turbines currently however it better reflects the conditions if the turbine was in place which would require felling on the enclosed habitat to accommodate.

Ecobat is an online tool which makes assessments of bat activity levels by comparing data entered by the user with bat survey information from similar areas at the same time of year. Specifically, a median bat activity level is calculated which corresponds to a bat activity category. Ecobat was offline for essential maintenance at the time of this assessment and was not used. Therefore, a conservative interpretation of the activity levels within the site was provided as a prudent measure.

It is not considered that any of these survey specific constraints represent a significant limitation barrier or data gap to adequately assessing the impacts of the development on bat species within and surrounding the site.



2.5 Ecological Evaluation

2.5.1 Site Risk Assessment & Impact Assessment (Aughney, 2019):

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

1. Collision mortality, barotrauma and other injuries (although it is important to consider these in the context of other forms of anthropogenic mortality)
2. 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);
3. Loss of, or damage to, roosts;
4. Displacement of individuals or populations (due to wind farm construction or because bats avoid the wind farm area).

According to the SNH, 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
- Presence of protected sites
- Proximity of maternity roosts
- Key foraging areas
- Key flight lines
- Possible migration routes.

Using the SNH guidelines outlined in Table 2-7, a site risk assessment for the individual turbines in relation to each bat species recorded was completed using the following values:

- Project Size
- Habitat Risk



Table 2-7: Stage 1 - Initial site risk assessment (SNH, 2021)

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



2.5.2 Habitat Assessment

Habitats adjacent to the development may be considered in terms of extent, diversity, naturalness, rarity, fragility, typicalness, recorded history, position, potential value and intrinsic appeal (Regini, 2000). The potential of these habitats for bat fauna is considered in this framework also.

- Bats may use trees with heavy ivy growth as occasional roosts. Bats may use mature trees with tree holes etc., as roosting sites all year around. However, in general, there is a paucity of these two types of mature trees within the survey area. They are present in the adjacent landscape or within the blocks of agricultural land enclosed by the survey area.
- Foraging and commuting areas are available to bats adjacent to and within the development areas along scrub habitats, treeline tracks and riparian linear features. There is less foraging and commuting capacity over bare peat and similar low height vegetation habitats. The exception to this is Leisler's bats and Nathusius' pipistrelles, which are bat species that fly high over the landscape. They are not as reliant on linear habitats to traverse through the landscape.



3. RESULTS

3.1 Desktop Survey

The UBSS Cave Database for the Republic of Ireland, Ordnance Survey Ireland Karst Landscapes, National Monuments Service, and National Inventory of Architectural Heritage GIS layers did not indicate that there were underground caves or monuments with bat roost potential within or near the site.

The five 2km grid squares which encompass the site, S10N, S10L, S10M, S10R, and S10S, held no previous bat records (NBDC maps, most recent data search 28/03/2023).

The 10km grid square in which the site lies held records for Leisler's bat (2 records, most recent 29/05/2009), soprano pipistrelle (3 records, most recent 29/05/2009) and *Pipistrellus* sp. *sensu lato* (2 records, most recent 29/05/2009) (NBDC maps, most recent data search 28/03/2023).

Records in the NBDC maps reflect survey effort or data input into the maps, and do not necessarily reflect bat presence in a given area.

3.1.1 Bat Landscapes

Bat landscapes are plotted in 10.5 km grid square, of which two overlap the proposed development.

For the northern turbines (T03, T04, T05, T06, T08, T10, T11, T12, T13), the bat landscape association model (Lundy et al., 2011) suggests that the development is part of a landscape that is of low-moderate suitability for all bats. The northern turbines and their environs are moderate suitability for brown long-eared bat, and of low-moderate suitability for common and soprano pipistrelle, Leisler's, Daubenton's, whiskered and Natterer's bat. This area is of low suitability for Nathusius' pipistrelle and lesser horseshoe bat.

For the southern turbines (T01, T02, T03), the bat landscape is of moderate-high for all bats. The landscape is of high suitability for Natterer's bat, and of moderate-high suitability for brown long-eared bat and common pipistrelle. The landscape is of moderate suitability for soprano pipistrelle, Leisler's, Daubenton's and whiskered bat. The southern turbine landscape is of low-moderate suitability for lesser horseshoe bat, and of low suitability for Nathusius' pipistrelle.

3.1.2 Designated Sites

3.1.2.1 *European Sites*

There are no European sites designated for bats located within 15km of the proposed development site.

Table 3-1 shows the location of the designated sites in relation to the proposed development site.

3.1.2.2 *National Sites*

No sites of National Importance within a 15km radius that are designated for bats.



Table 3-1: Summary Special Areas of Conservation within 15 km of the development

Designated Site	Site code	Features of Interest	Approximate Distance (Km) from Site (at closest point)
Blackwater River (Cork/Waterford) SAC	002170	<p>Estuaries [1130]</p> <p>Mudflats and sandflats not covered by seawater at low tide [1140]</p> <p>Perennial vegetation of stony banks [1220]</p> <p><i>Salicornia</i> and other annuals colonising mud and sand [1310]</p> <p>Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330]</p> <p>Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</p> <p>Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p> <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0]</p> <p><i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</p> <p><i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]</p> <p><i>Petromyzon marinus</i> (Sea Lamprey) [1095]</p> <p><i>Lampetra planeri</i> (Brook Lamprey) [1096]</p> <p><i>Lampetra fluviatilis</i> (River Lamprey) [1099]</p> <p><i>Alosa fallax fallax</i> (Twait Shad) [1103]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p> <p><i>Trichomanes speciosum</i> (Killarney Fern) [1421]</p>	<p>200m to the west of the proposed wind farm site.</p> <p>Crossed by the grid connection route and the haul route.</p>
Lower River Suit SAC	002137	<p>Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330]</p> <p>Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</p>	<p>6km north of the proposed wind farm site.</p> <p>7km north of the haul route.</p>



Designated Site	Site code	Features of Interest	Approximate Distance (Km) from Site (at closest point)
		<p>Water courses of plain to montane levels with the <i>Ranunculus fluitans</i> and <i>Callitriche-Batrachium</i> vegetation [3260]</p> <p>Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]</p> <p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p> <p>Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0]</p> <p><i>Taxus baccata</i> woods of the British Isles [91J0]</p> <p><i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</p> <p><i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]</p> <p><i>Petromyzon marinus</i> (Sea Lamprey) [1095]</p> <p><i>Lampetra planeri</i> (Brook Lamprey) [1096]</p> <p><i>Lampetra fluviatilis</i> (River Lamprey) [1099]</p> <p><i>Alosa fallax fallax</i> (Twait Shad) [1103]</p> <p><i>Salmo salar</i> (Salmon) [1106]</p> <p><i>Lutra lutra</i> (Otter) [1355]</p>	11km north of the grid connection route.
Nier Valley Woodlands SAC	000668	<p>Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]</p>	<p>8km northeast of the proposed wind farm site.</p> <p>7km north of the haul route.</p> <p>11km north of the grid connection route.</p>
Comeragh Mountains SAC	001952	<p>Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</p> <p>Water courses of plain to montane levels with the <i>Ranunculus fluitans</i> and <i>Callitriche-Batrachium</i> vegetation [3260]</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</p>	<p>8km to the east of the proposed wind farm.</p> <p>5km to the east of the haul route.</p> <p>6km to the east of the grid connection route.</p>



Designated Site	Site code	Features of Interest	Approximate Distance (Km) from Site (at closest point)
		European dry heaths [4030] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani) [8110] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220] <i>Hamatocaulis vernicosus</i> (Slender Green Feather-moss) [6216]	
Glendine Wood SAC	002324	<i>Trichomanes speciosum</i> (Killarney Fern) [1421]	12.5km southeast of the proposed wind farm. 4.5km east of the grid connection route and the existing Dungarvan substation. 150m north of the N25 section of the haul route.

Table 3-2: Summary of National Sites within 15 km of the development

Designated Site	Site Code	Features of Interest	Approximate Distance (Km) from Site (at closest point)
Glenboy Wood pNHA	000952	Woodland	2.5km north of the proposed wind farm site. 6km north of the grid connection route. 8.5km northwest of the haul route.
Blackwater River And Estuary pNHA	000072	See SAC above	20km south of the proposed wind farm site. 19km to the southwest of the grid connection route. 19km to the southwest of the haul route.
Nier Valley Woodlands pNHA	000668	See SAC above	8km northeast of the proposed wind farm site. 7km north of the haul route. 11km north of the grid connection route



Designated Site	Site Code	Features of Interest	Approximate Distance (Km) from Site (at closest point)
Comeragh Mountains pNHA	001952	See SAC above	8km east of the proposed wind farm site. 5.5km east of haul route. 5.5km east of grid connection route.
Lismore Woods pNHA	000667	Woodland	8.5km west of proposed wind farm site. 10km west of grid connection route. 11.5km west of haul route.
Blackwater River Callows pNHA	000073	Birds, wetland and waterbirds	12km to the west of the proposed wind farm site. 12.5km to the west of the grid connection route. 13.5km to the west of the haul route.
Dungarvan Harbour pNHA	000663	Birds, wetland and waterbirds	11.5km southeast of proposed wind farm site. 0.8km southeast of grid connection route. 0.4km south of haul route.
Glenmore Wood pNHA	001933	Woodland	2.5km north of the proposed wind farm site. 6km north of the grid connection route. 8.5km northwest of the haul route.

3.2 Bat Activity Surveys

The results of the 13 no. bat activity surveys carried out at the development in 2020, 2021 and 2022 are presented below, and full results are detailed in Appendix 1.

Table 3-3: Bat activity survey conditions

Survey	Date	Times	Sunset	Weather Conditions
Activity Survey 1	28/07/2020	21:45-00:00	21:30	Temperature 14°C; Wind F2, Precipitation None
Activity Survey 2	18/08/2020	21:10-23:25	20:50	Temperature 15°C; Wind F1, Precipitation None
Activity Survey 3	03/09/2020	20:20-22:30	20:15	Temperature 12°C; Wind F2, Precipitation None
Activity Survey 4	24/07/2021	23:04-01:18	21:34	Temperature 17-15°C; Wind F0-F1, Cloud 1/8 Oktas, Precipitation None
Activity Survey 5	30/07/2021	22:55-00:37	21:25	Temperature 12°C; Wind F2, Cloud 8/8 Oktas, Precipitation None
Activity Survey 6	25/08/2021	21:15-00:09	20:34	Temperature 15-13°C; Wind F1, Cloud 4/8 Oktas, Precipitation None.



Survey	Date	Times	Sunset	Weather Conditions
Activity Survey 7	15/09/2021	20:20-23:20	19:46	Temperature 14-11°C; Wind F0, Cloud 7/8 to 3/8 Oktas, Precipitation None.
Activity Survey 8	02/07/2022	23:30-00:20	21:55	Temperature 11-10°C; Wind F2, Cloud 3/8 Oktas, Precipitation None.
Activity Survey 9	13/07/2022	22:00-00:24	21:47	Temperature 17-13°C; Wind F2-3, Cloud 2/8 Oktas, Precipitation None. Bright night due to super moon.
Activity Survey 10	06/08/2022	22:43-23:30	21:13	Temperature 13-12°C; Wind F1, Cloud 2/8 Oktas, Precipitation None.
Activity Survey 11	19/08/2022	20:48-23:10	20:47	Temperature 13-15°C (got warmer as clouds came in and wind slackened; Wind F2-F1, Cloud 3/8 to 7/8 Oktas, Precipitation None
Activity Survey 12	09/09/2022	21:34-23:25	20:00	Temperature 15-14°C; Wind F1, Cloud 3/8 Oktas, Precipitation None.
Activity Survey 13	24/09/2022	20:00-22:02	19:25	Temperature 11-9°C; Wind F1, Cloud 6/8 Oktas, Precipitation None.

3.2.1 July 2020 Transect Results

Common pipistrelle was most frequently recorded in July 2020, with 120 records. This was followed by 120 records of soprano pipistrelle. There was one record of brown long-eared bat. Unidentified pipistrelle were recorded on six occasions, five of which are potential Nathusius' pipistrelle.

3.2.2 August 2020 Transect Results

Common pipistrelle was again the most frequently recorded species during August 2020 (185 records), followed by soprano pipistrelle (136 records). Similar to July, there was one record of brown long-eared bat. Two social calls of unidentified pipistrelles were recorded. A total of 28 records were of Leisler's bat. There were five calls from *Myotis* sp., two from Daubenton's bat, and 2 from whiskered bat.

3.2.3 September 2020 Transect Results

Common pipistrelle was again the most frequently recorded species during September 2020 (141 records), followed by soprano pipistrelle (74 records). Similar to July and August, there was one record of brown long-eared bat. There were three records from a 50 kHz pipistrelle. A total of 16 records were of Leisler's bat. There was also seven recorded of whiskered bat.



3.2.4 July 2021 Transect Results

Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat and *Myotis* sp. (at least some of which were whiskered bat) were recorded during the July 2021 transects (Appendix 1). Leisler's Bat, despite its high acoustic detectability compared to other bat species, was not regularly recorded during the transects. Transect WT4 on 30-31/07/2021 allowed discovery of a whiskered bat and brown long-eared bat roost. There was least activity on transect WT1 which covered more open upland ground. There was however some common pipistrelle foraging activity on the upland acid grassland / heath area.

3.2.5 August 2021 Transect Results

Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat and *Myotis* sp. (at least some of which were whiskered bat) were again recorded during the August 2021 transects (Appendix 1). Leisler's bat, despite its high acoustic detectability compared to other bat species, was not regularly recorded during the transects.

3.2.6 September 2021 Transect Results

Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat and *Myotis* sp. (the majority of which were whiskered bat) were again recorded during the September 2021 transects. Leisler's bat, despite its high acoustic detectability compared to other bat species, was not regularly recorded during the transects.

3.2.7 July 2022 Transect Results

Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat and *Myotis* sp. (the majority of which were whiskered bat) were recorded during the July 2022 transects. Leisler's bat, despite its high acoustic detectability compared to other bat species, was not regularly recorded during the transects.

3.2.8 August 2022 Transect Results

Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat and *Myotis* sp. (the majority of which were whiskered bat) were recorded during the August 2022 transects. Leisler's bat, despite its high acoustic detectability compared to other bat species, was not regularly recorded during the transects.

3.2.9 September 2022 Transect Results

Common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat and *Myotis* sp. (the majority of which were whiskered bat) were recorded during the September 2022 transects. Leisler's bat, despite its high acoustic detectability compared to other bat species, was not regularly recorded during the transects. There were very high levels of whiskered bat activity along transect WT4 on 9/09/2022.

3.2.10 Results of Ten-Minute Stream Spot Counts

A small stone arch bridge over the Lisleagh Stream was the location where 10-minute spot counts of bat activity were conducted during each of July, August and September in both 2021 and 2022. Soprano pipistrelle dominated the recordings and observations at this bridge (83.2%, Table 3-4). *Myotis* sp. only comprised three bat registrations, while there were no records of other bat species, including Leisler's bat during the spot counts.



Table 3-4: Summary of total bat registrations for each species per month at 10-minute stream spot count

Month and Year	Date	Start time	Soprano Pipistrelle	Common Pipistrelle	<i>Myotis</i> sp.	Leisler's Bat
July 2021	31/07/2021	00:27	55	5	2	0
August 2021	26/08/2021	00:09	6	0	0	0
September 2021	15/09/2021	20:20	43	21	1	0
July 2022	14/07/2022	00:14	38	9	0	0
August 2022	19/08/2022	23:00	40	2	0	0
September 2022	09/09/2022	22:20	31	3	0	0
Totals			213	40	3	0
Percentages			83.2%	15.6%	1.2%	0.0%

3.3 Bat Static Detector Surveys

3.3.1 2020 Surveys

Table 3-5 below summarises the results, in relation to bat species, recorded on the static detectors deployed in 2020. Ten static units were deployed during each survey period. Overall, eight bat species were recorded (common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat, Natterer's bat, Daubenton's bat and whiskered bat).



Table 3-5: Summary results of Static Bat Detectors deployed during survey periods 1 to 3

Static Detector No., closest final turbine, and location habitats	Species detected during Round 1 07th May to 11th June	Species detected during Round 2 24th July to 05th August	Species detected during Round 3 21st to 31st August
DH1 T03 Agricultural grassland/ hedgerow	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Pipistrelle bat Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH2 T02 Agricultural grassland	Whiskered bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Pipistrelle bat Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH3 T01 Agricultural grassland/ hedgerow	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Whiskered bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH4 T04 Agricultural grassland/ forestry edge	Whiskered bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH5	Daubenton's bat	Daubenton's bat	Daubenton's bat



Static Detector No., closest final turbine, and location habitats	Species detected during Round 1 07th May to 11th June	Species detected during Round 2 24th July to 05th August	Species detected during Round 3 21st to 31st August
T04 Broadleaved woodland	Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Whiskered bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Whiskered bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH6 T06 Forestry edge	Daubenton's bat Whiskered bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH7 T01 Agricultural grassland/ hedgerow	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle
DH8 T04 Agricultural grassland/ hedgerow	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH9 T04 Agricultural grassland/ hedgerow	Daubenton's bat Whiskered bat Natterer's bat Myotis bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat	Daubenton's bat Whiskered bat Natterer's bat Myotis bat



Static Detector No., closest final turbine, and location habitats	Species detected during Round 1 07th May to 11th June	Species detected during Round 2 24th July to 05th August	Species detected during Round 3 21st to 31st August
	Leisler's bat Common pipistrelle Soprano pipistrelle Pipistrelle bat Brown long-eared bat	Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Pipistrelle bat Brown long-eared bat	Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH10 T05 Forestry	Daubenton's bat Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Whiskered bat Natterer's bat Myotis bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat

Common Pipistrelle

The total number of recordings for common pipistrelle at the development was 61,675 no. recordings; 61.92% of total recordings. These were recorded over 47 no. nights which gives an average of 1,312.23 no. recordings per night.

Soprano Pipistrelle

The total number of recordings of soprano pipistrelle recorded at the development was 29,080 no. recordings; 29.2% of total recordings. These were recorded over 47 no. nights. This gives an average of 618.72 no. recordings per night.

Leisler's Bat

The total number of recordings for Leisler's bat at the development was 3,149 no. recordings; 3.16% of total recordings. These were recorded over 47 no. nights which gives an average of 67 no. recordings per night.

Whiskered Bat

The total number of recordings for whiskered bat at the development was 1,648 no. recordings; 1.65% of total recordings. These were recorded over 47 no. nights which gives an average of 35.06 no. recordings per night.

Nathusius' Pipistrelle

The total number of recordings for Nathusius' pipistrelle at the development was 1,156 no. recordings; 1.16% of total recordings. These were recorded over 47 no. nights which gives an average of 24.6 no. recordings per night.



Brown Long-Eared Bat

The total number of recordings for brown long-eared bat at the development was 822 no. recordings; 0.83% of total recordings. These were recorded over 47 no. nights which gives an average of 17.49 no. recordings per night.

Natterer's Bat

The total number of recordings for Natterer's bat at the development was 704 no. recordings; 0.71% of total recordings. These were recorded over 47 no. nights which gives an average of 14.98 no. recordings per night.

Daubenton's Bat

The total number of recordings for Daubenton's bat at the development was 440 no. recordings; 0.44% of total recordings. These were recorded over 47 no. nights which gives an average of 9.36 no. recordings per night.

Genus level Bats

The total number of recordings for bats identified to Myotis level only (could not be identified to species level) at the development was 818 no. recordings; 0.82% of total recordings. These are likely a combination of whiskered bat, Daubenton's bat and Natterer's bat.

The total number of recordings for bats identified to Pipistrelle level only (could not be identified to species level) at the development was 105 no. recordings; 0.11% of total recordings. These are likely a combination of common, soprano and Nathusius' pipistrelle.

The graphs within Plate 3-1 to Plate 3-10 below show the number of bat passes (per species) recorded at each static detector location over the three surveillance periods.

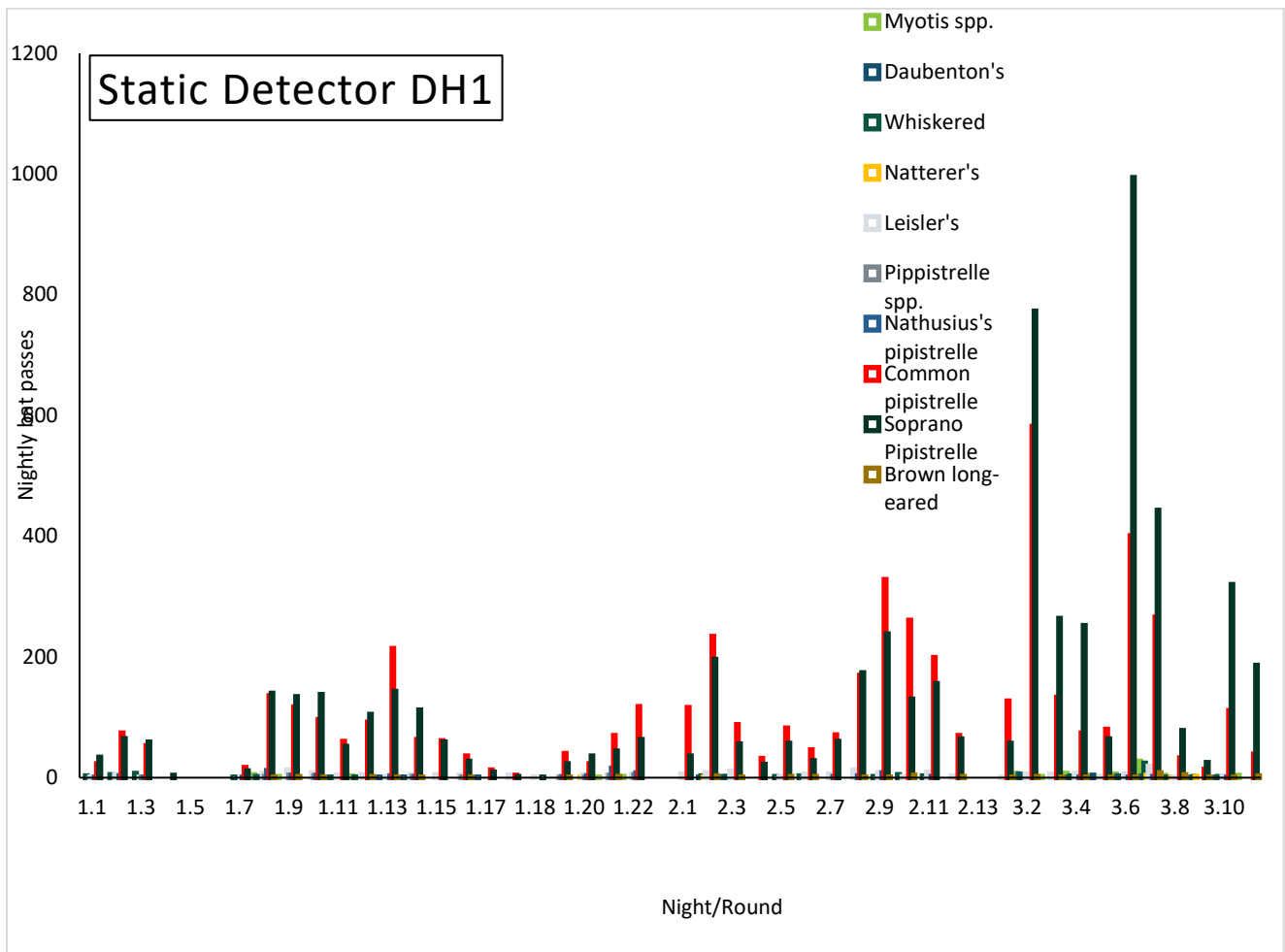


Plate 3-1: Total number of nightly passes recorded at static location DH1

The static unit DH1 recorded eight species of bat. A higher level of activity was recorded in period 2 (21st to 21st August 2020). Soprano pipistrelle had a spike in activity on night 6 of round 3 (26/08/2020) with 994 passes, while common pipistrelle spiked in activity on night 2 of round 3 (22/08/2020) with 582 passes. A much lower level of bat activity for all other bat species recorded was noted.



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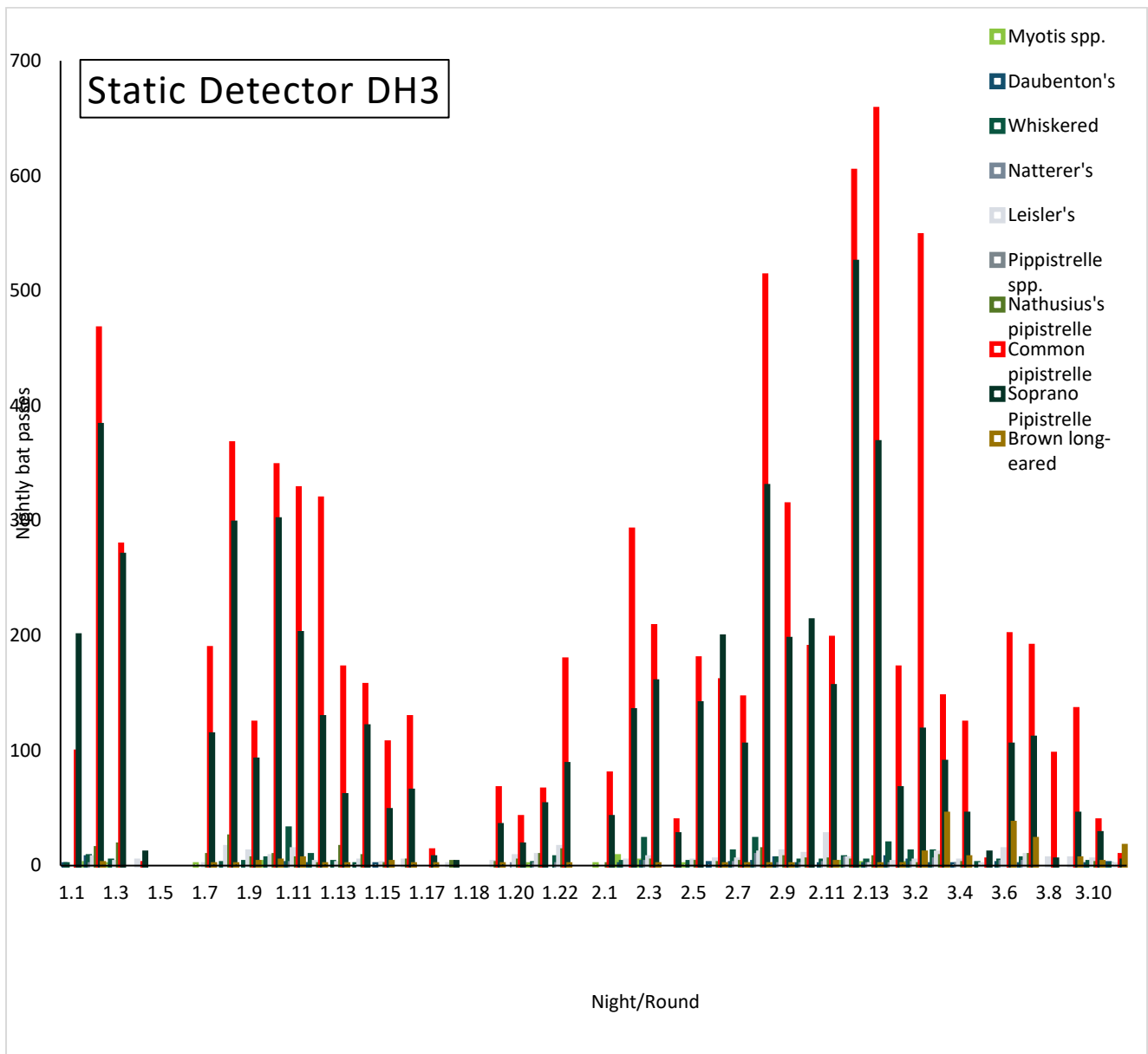


Plate 3-3: Total number of nightly passes recorded at static location DH3

The static unit DH3 recorded eight species of bat. A consistently high level of activity was recorded across all three periods. During period 3 a higher level of common and soprano pipistrelle were recorded. Common pipistrelle had a spike in activity on night 13 of round 2 (05/08/2021) with 658 passes. Soprano pipistrelle also spiked in activity on night 12 of round 2 with 525 passes. A much lower level of bat activity for all other bat species recorded was noted.

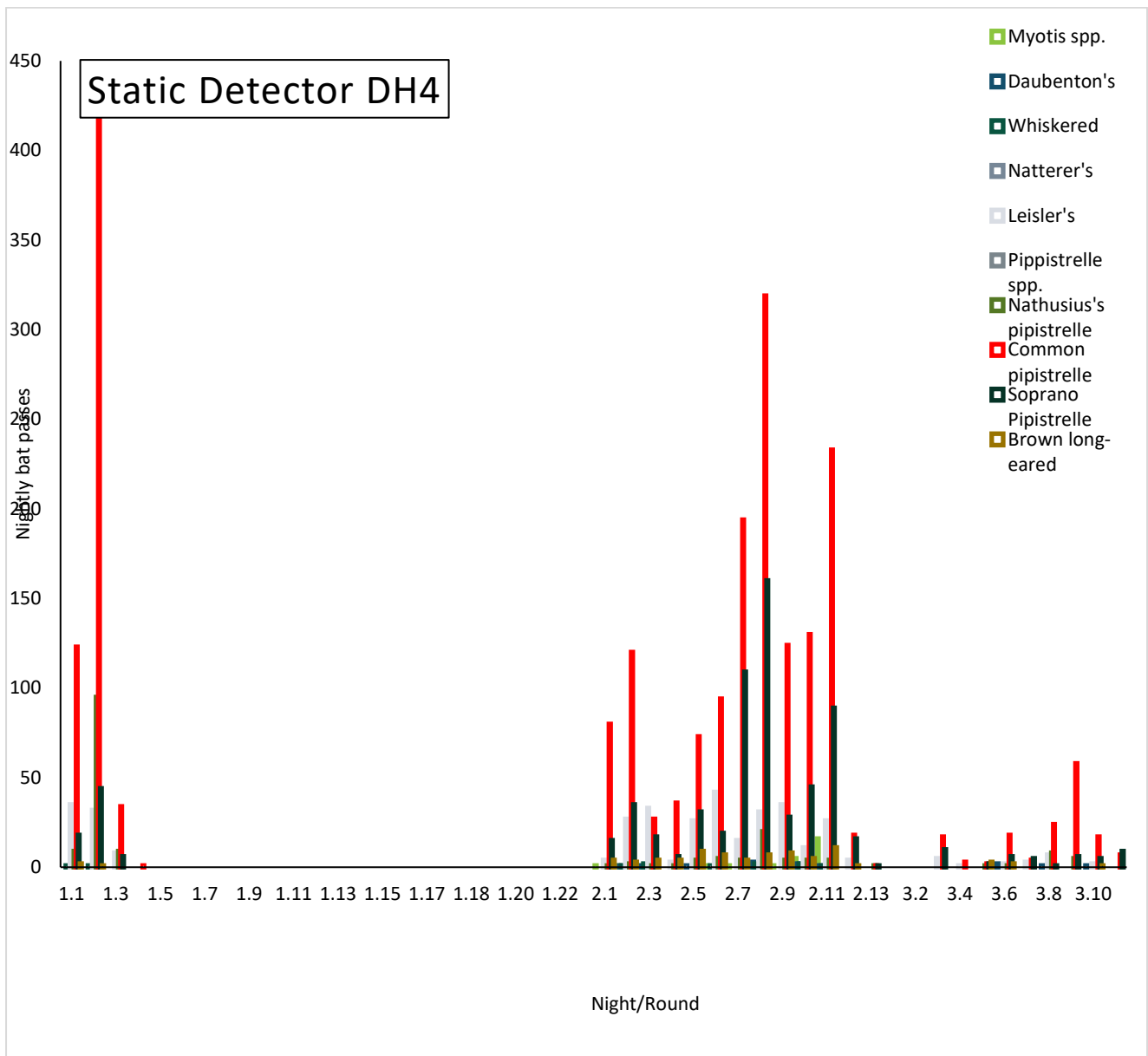


Plate 3-4: Total number of nightly passes recorded at static location DH4

The static unit DH4 recorded eight species of bat. A higher level of activity was recorded in period 2 (24th July - 05th August 2021) and. However, common pipistrelle had a peak in activity on night 2 of round 1 with 417 passes. Soprano pipistrelle had a spike in activity on night 8 of round 2 (31/08/2020) with 160 passes respectively.

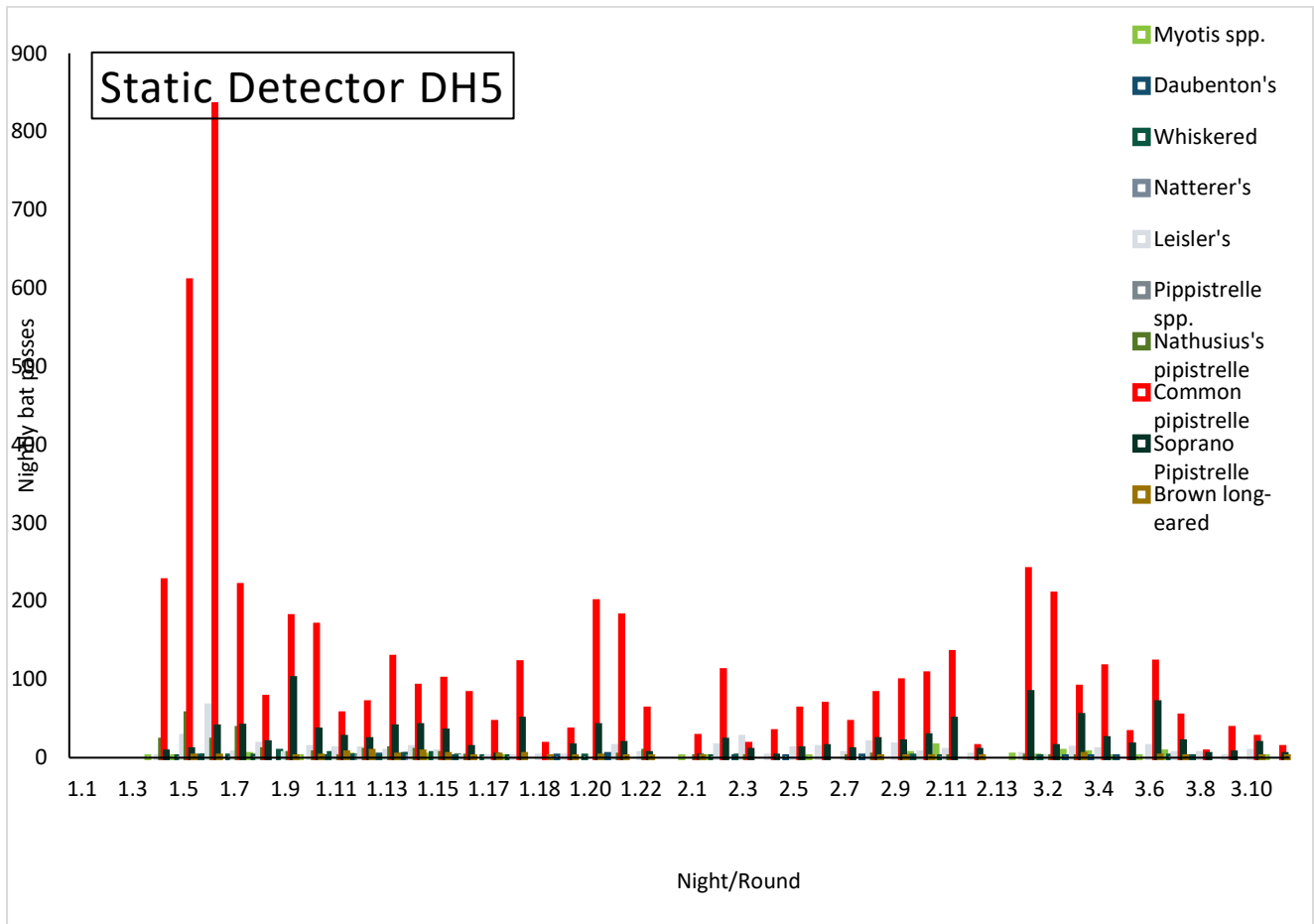


Plate 3-5: Total number of nightly passes recorded at static location DH5

The static unit DH5 recorded eight species of bat. During period 1 a higher level of common pipistrelle bat was recorded, which spiked in activity on night 6 (24/05/2020) with 834 passes. A much lower level of bat activity for all other bat species recorded was noted.

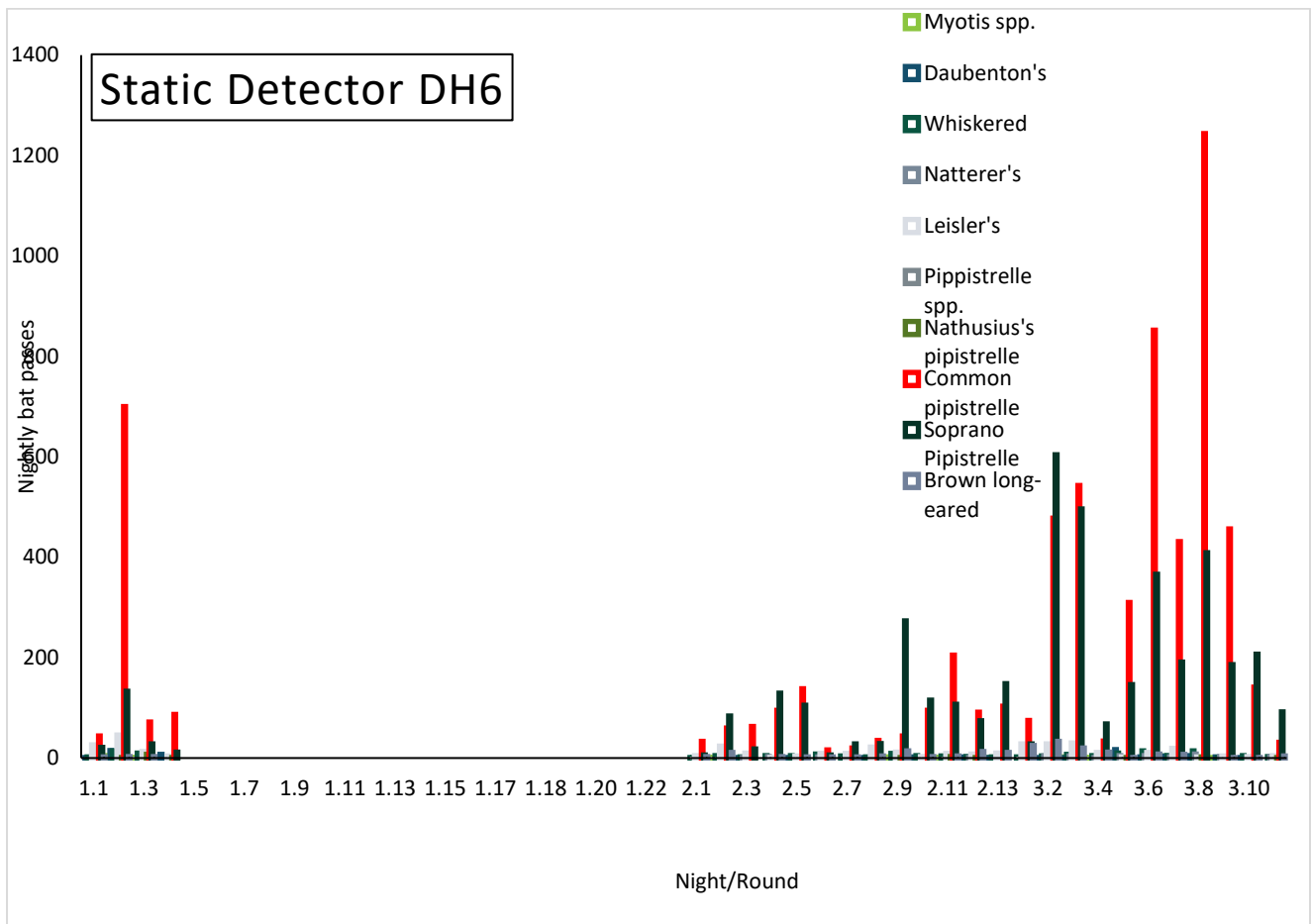


Plate 3-6: Total number of nightly passes recorded at static location DH6

The static unit DH6 recorded eight species of bat. A higher level of activity was recorded in period 3. During period 2 a higher level of common pipistrelle was recorded, with a spike in activity on night 8 (28/08/2020) with 1,244 passes. Soprano pipistrelle had a spike in activity on night 8 of round 3 (28/08/2020) with 604 passes. A much lower level of bat activity for all other bat species recorded was noted.

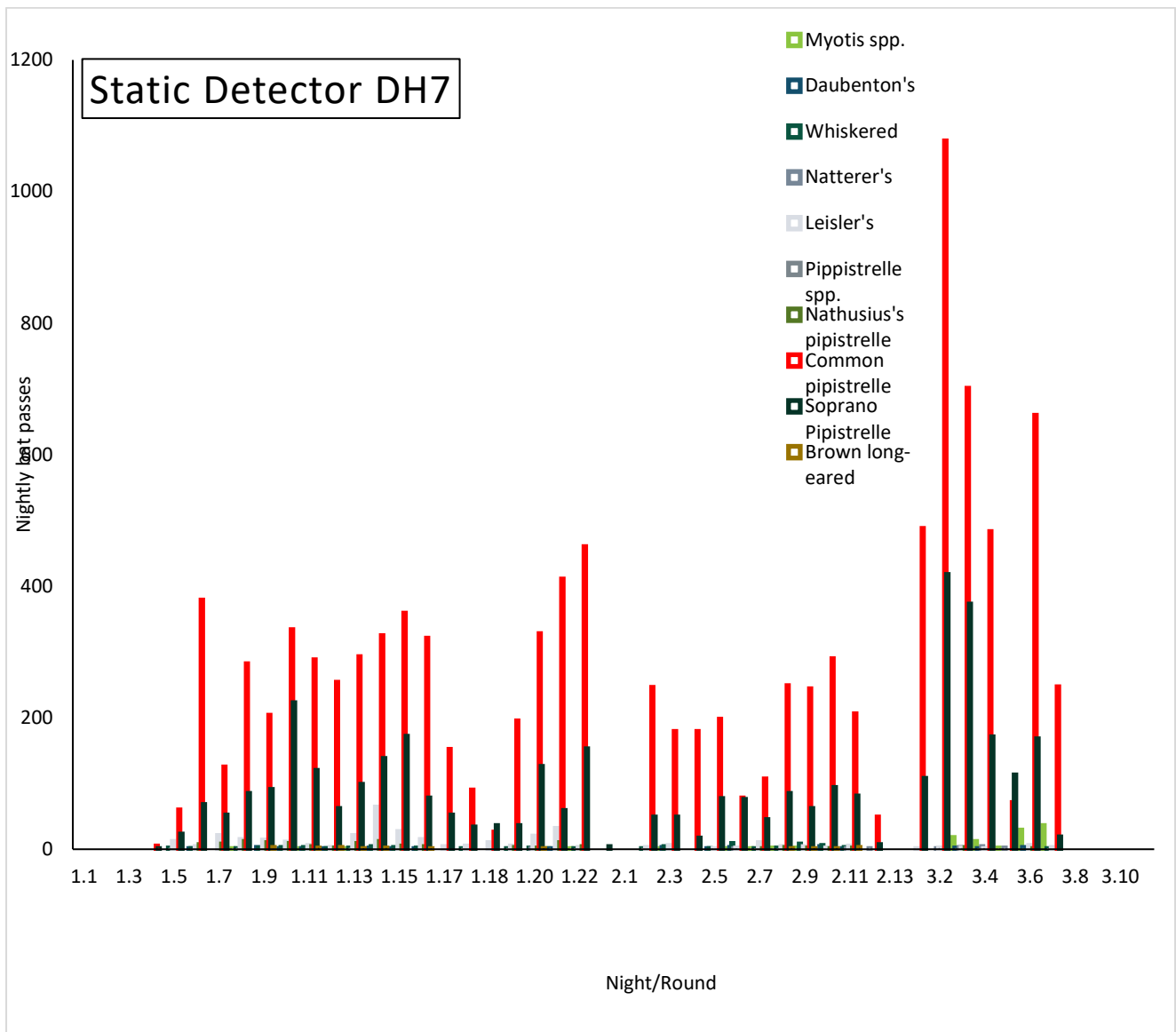


Plate 3-7: Total number of nightly passes recorded at static location DH7

The static unit DH7 recorded eight species of bat. A consistently high level of activity was recorded across all three periods. Common pipistrelle levels spiked on night 2 of round 3 (22/08/2020) 1,077 passes. Soprano pipistrelle levels spiked on the same night with 418 passes. A much lower level of bat activity for all other bat species recorded was noted.

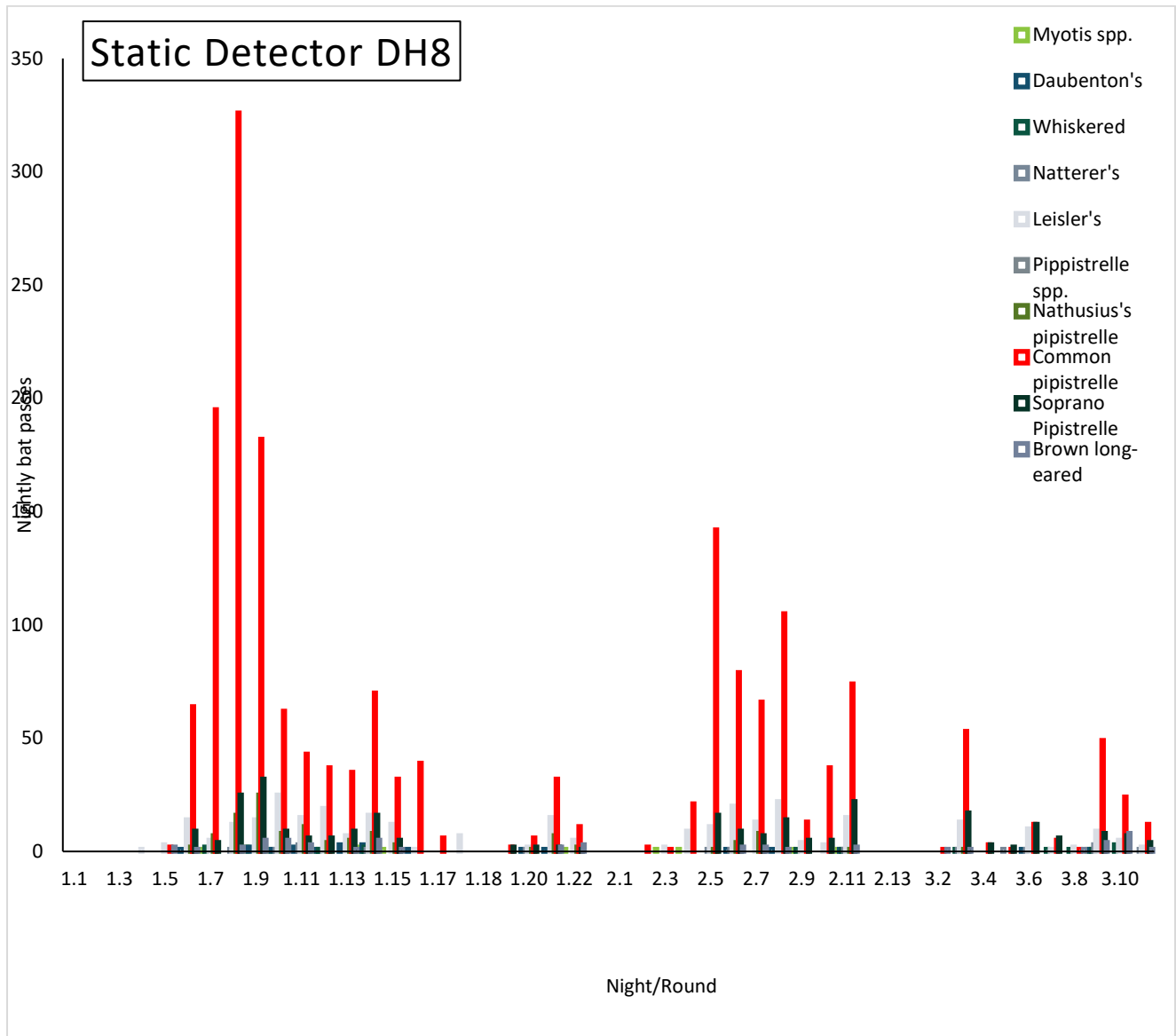


Plate 3-8: Total number of nightly passes recorded at static location DH8

The static unit DH8 recorded eight species of bat. A higher level of activity was recorded in period 1 (19th May to 11th June 2020) and period 2 (24th July to 05th August 2020) compared to period 3 (21st to 31st October 2020). Common pipistrelle had a spike in activity on night 8 of round 1 (26/05/2020) with 326 passes. A much lower level of bat activity for all other bat species recorded was noted.

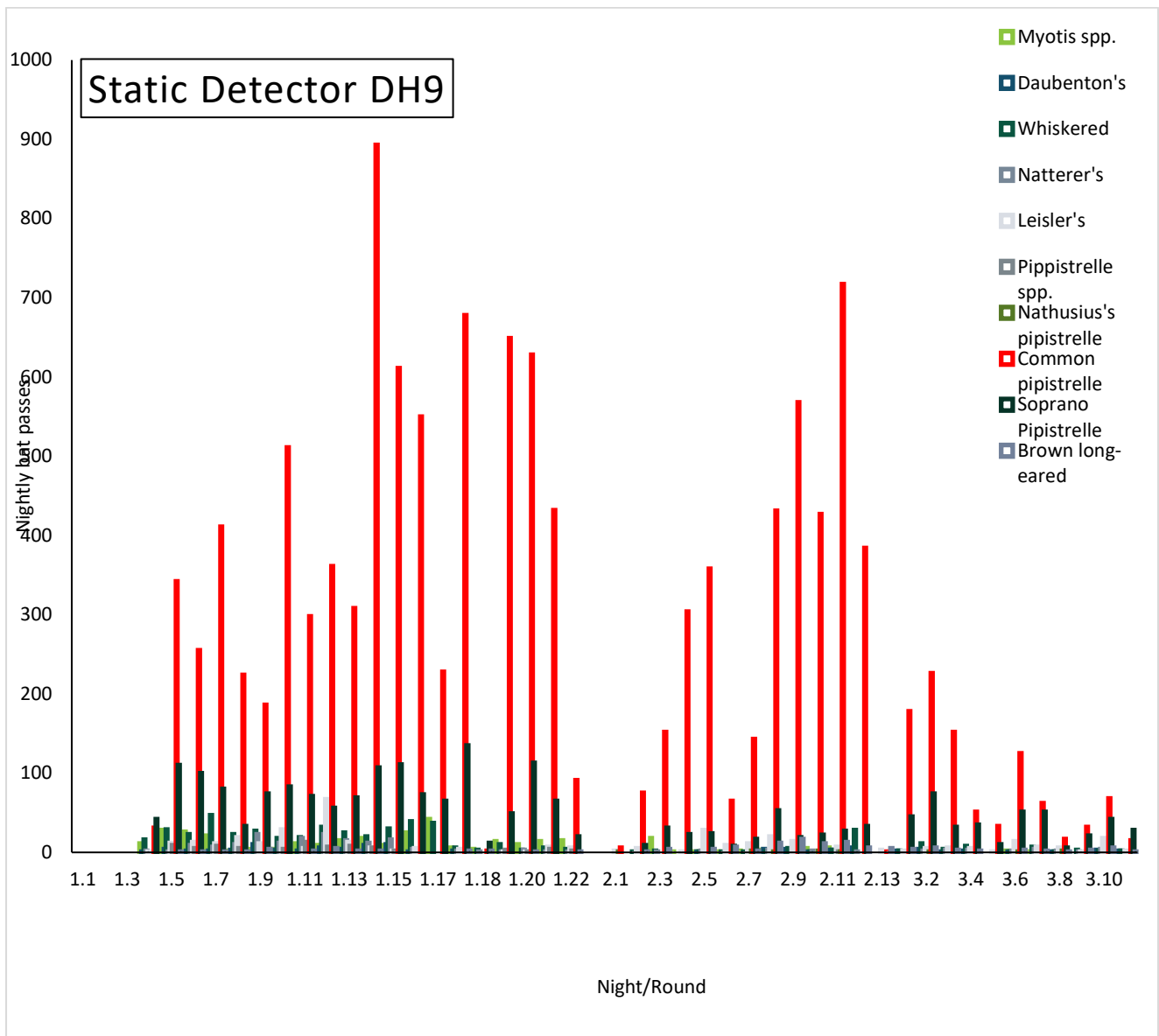


Plate 3-9: Total number of nightly passes recorded at static location DH9

The static unit DH9 recorded eight species of bat. A higher level of activity was recorded in period 1 (19th May to 11th June 2020) and period 2 (24th July to 05th August 2020) compared to period 3 (21st to 31st October 2020). Common pipistrelle had a spike in activity on night 14 of round 1 (01/06/2020) with 893 passes. Soprano pipistrelle also spiked in activity on night 18 of round 1 (05/06/2020) with 135 passes.

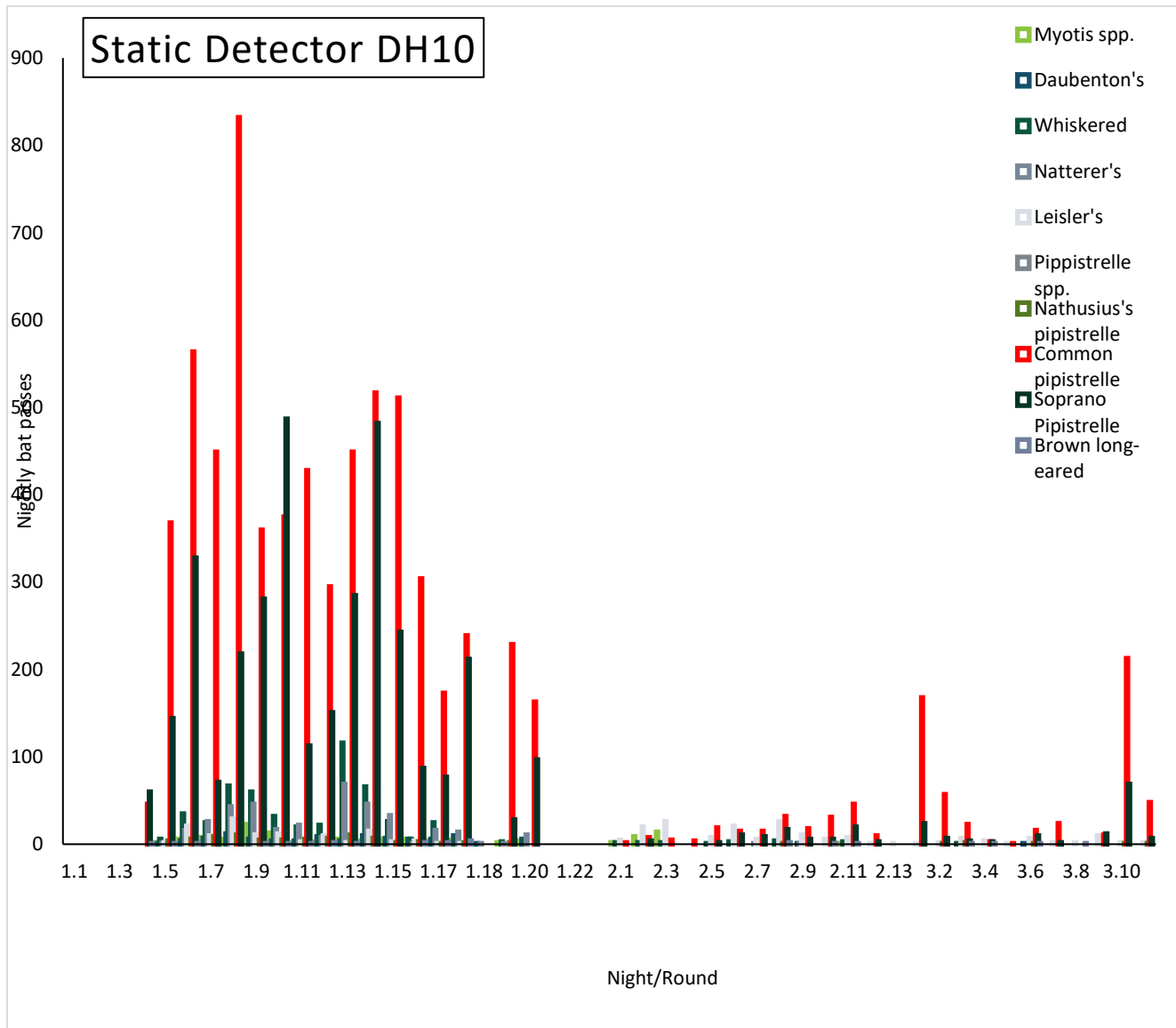


Plate 3-10: Total number of nightly passes recorded at static location DH10

The static unit DH10 recorded eight species of bat. A higher level of activity was recorded in period 1 (19th May to 11th June 2020). Common pipistrelle activity peaked on night 8 of round (26/05/2020) with 832 passes. Soprano pipistrelle peaked in activity on night 10 of round 1 (28/05/2020) with 487 passes. A much lower level of bat activity for all other bat species recorded was noted.

Eight species of bats were recorded during the three survey periods with a total of 99,597 recordings over the three survey periods. The most commonly recorded species was common pipistrelle, followed by soprano pipistrelle, then Leisler's bat. Lower levels of activity of brown long-eared bat, Daubenton's bat, Natterer's bat, and whiskered bat were detected. Brown long-eared bat is present on-site, but this species is very quiet and sometimes hunts without echolocating, therefore this species may be under-recorded by the static detectors.



The graphs within Plate 3-11 to Plate 3-14 show the number of passes for individual species (common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle and Leisler's bat) at each static detector location for the full survey period of 2020. Locations DH9 has the highest number of passes for common pipistrelle, Dh1 has the highest number of passes for soprano pipistrelle, DH3 has the highest number of passes of Nathusius' pipistrelle and DH5 had the highest levels for Leisler's bat.

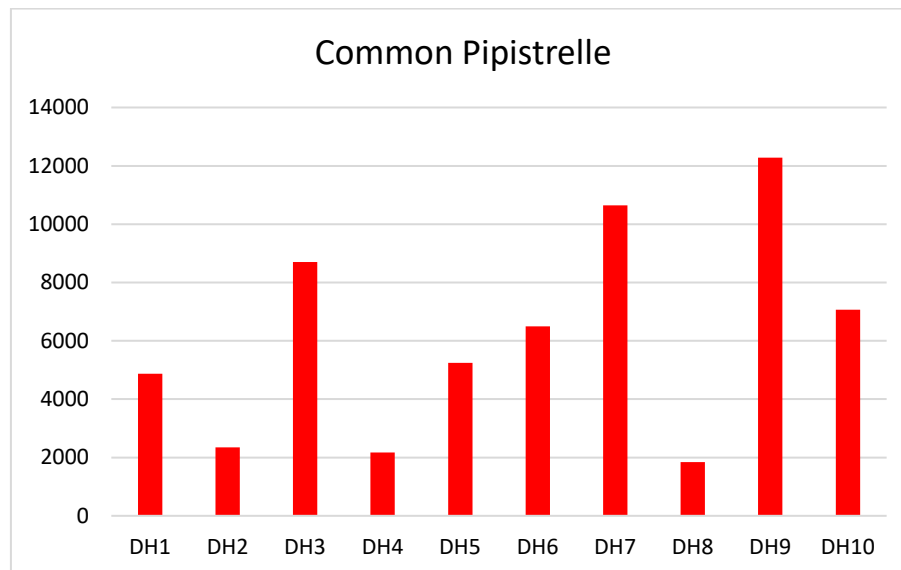


Plate 3-11: Total number of bat passes recorded for common pipistrelles at each of the static detector locations during 2020

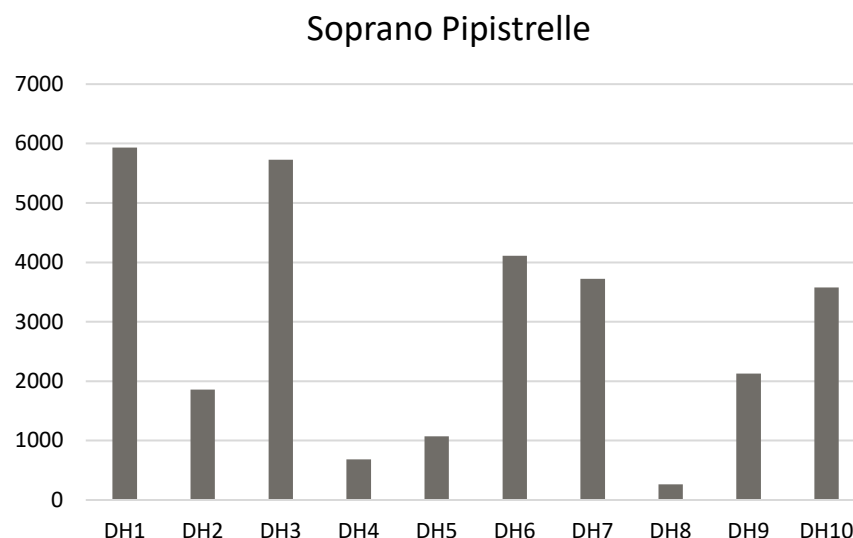


Plate 3-12: Total number of bat passes recorded for soprano pipistrelles at each of the static detector locations during 2020

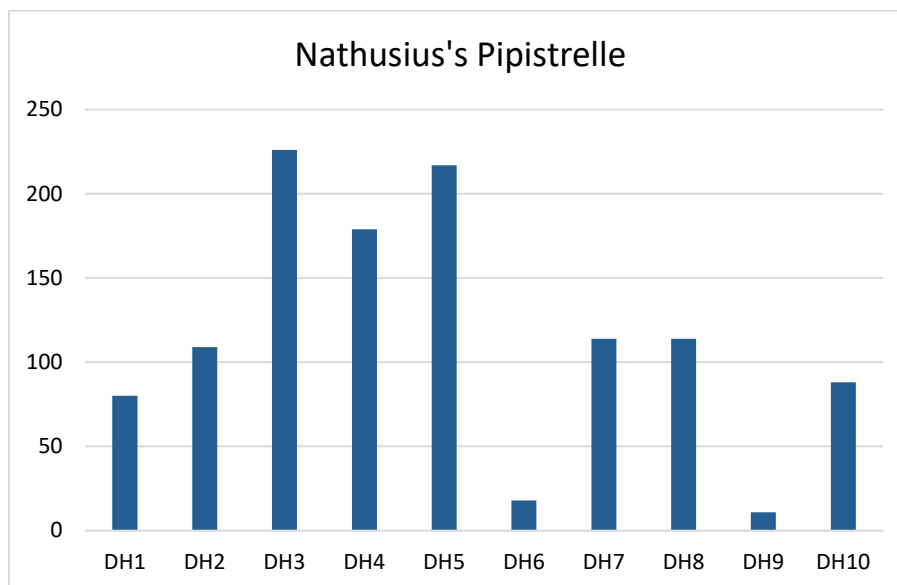


Plate 3-13: Total number of bat passes recorded for Nathusius' pipistrelle at each of the static detector locations during 2020

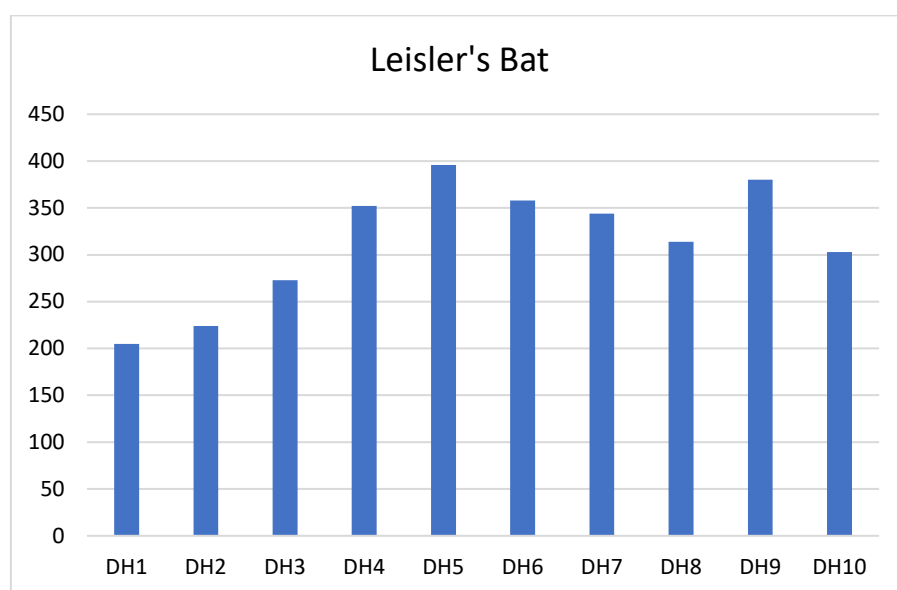


Plate 3-14: Total number of bat passes recorded for Leisler's bat at each of the static detector locations during 2020

Static location DH10 had the highest number of passes for whiskered bat, Natterer's bat and Daubenton's bat. DH9 had the highest number of passes for Myotis bat. DH6 had the highest number of passes for brown long-eared bat. DH3 had the highest number of passes for Nathusius pipistrelle. DH2 had the highest number of passes for pipistrelle bat. Refer to Plate 3-15 for all remaining bat species results.

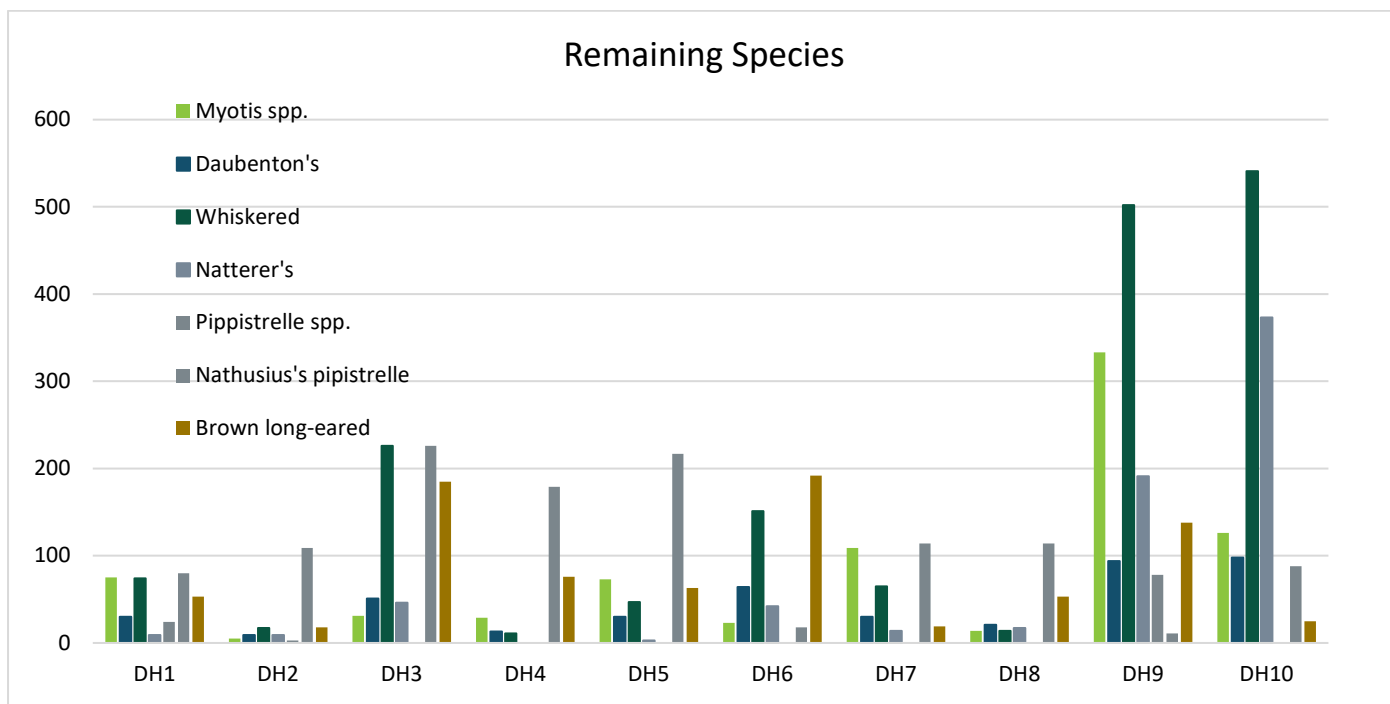


Plate 3-15: Total number of bat passes recorded for remaining bat species at each of the static detector locations in 2020

3.3.2 2021 Surveys

Table 3-6 below summarises the results, in relation to bat species, recorded on the static detectors deployed in 2021. Eleven static units were deployed during each survey period. Overall, eight bat species were recorded (common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat, Natterer's bat, Daubenton's bat and whiskered bat) as well as genus level identification of Pipistrelle bat and *Myotis* bat.

Table 3-6: Summary results of Static Bat Detectors deployed during survey periods 1 to 3

Static Detector No., associated final turbine, and location habitats	Species detected during Round 1 20th May to 02nd June	Species detected during Round 2 05th to 18th August	Species detected during Round 3 16th September to 08th October
DH1 T01 Agricultural grassland/ hedgerows	Daubenton's bat Whiskered bat <i>Myotis</i> bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Pipistrelle bat Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH2 T02	Daubenton's bat Leisler's bat Common pipistrelle	No data	Daubenton's bat Whiskered bat Natterer's bat



Static Detector No., associated final turbine, and location habitats	Species detected during Round 1 20th May to 02nd June	Species detected during Round 2 05th to 18th August	Species detected during Round 3 16th September to 08th October
Agricultural grassland/ hedgerows	Soprano pipistrelle Brown long-eared bat		<i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle
DH3 T03 Agricultural grassland/ hedgerows	Daubenton's bat Whiskered bat <i>Myotis</i> bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
DH4 T04 Agricultural grassland/ hedgerows	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH5 T05 Forestry	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
DH6 T08 Agricultural grassland/ hedgerows	Daubenton's bat Whiskered bat <i>Myotis</i> bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Pipistrelle bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat



Static Detector No., associated final turbine, and location habitats	Species detected during Round 1 20th May to 02nd June	Species detected during Round 2 05th to 18th August	Species detected during Round 3 16th September to 08th October
	Brown long-eared bat		
DH7 T06 Forestry	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
DH8 T08 Agricultural grassland/ hedgerows	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
DH9 T09 Agricultural grassland/ hedgerows	Daubenton's bat Whiskered bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
DH10 T10 Acid Grassland / Heath/ scrub	<i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
DH11 T11	<i>Myotis</i> bat Leisler's bat	Daubenton's bat Whiskered bat	Daubenton's bat Whiskered bat



Static Detector No., associated final turbine, and location habitats	Species detected during Round 1 20th May to 02nd June	Species detected during Round 2 05th to 18th August	Species detected during Round 3 16th September to 08th October
Acid Grassland / Heath/ scrub	Common pipistrelle Soprano pipistrelle Brown long-eared	Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Natterer's bat <i>Myotis</i> bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat

Common Pipistrelle

The total number of recordings for common pipistrelle at the development was 32,983 no. recordings; 58.28% of total recordings. These were recorded over 51 no. nights which gives an average of 646.73 no. recordings per night.

Soprano Pipistrelle

The total number of recordings of soprano pipistrelle recorded at the development was 16,533 no. recordings; 29.21% of total recordings. These were recorded over 51 no. nights. This gives an average of 324.18 no. recordings per night.

Leisler's Bat

The total number of recordings for Leisler's bat at the development was 2,644 no. recordings; 4.67% of total recordings. These were recorded over 51 no. nights which gives an average of 51.84 no. recordings per night.

Whiskered Bat

The total number of recordings for whiskered bat at the development was 1428 no. recordings; 2.52% of total recordings. These were recorded over 51 no. nights which gives an average of 28 no. recordings per night.

Brown Long-Eared Bat

The total number of recordings for brown long-eared bat at the development was 1021 no. recordings; 1.8% of total recordings. These were recorded over 51 no. nights which gives an average of 20.01 no. recordings per night.

Daubenton's Bat

The total number of recordings for Daubenton's bat at the development was 583 no. recordings; 1.03% of total recordings. These were recorded over 51 no. nights which gives an average of 11.43 no. recordings per night.

Natterer's Bat

The total number of recordings for Natterer's bat at the development was 480 no. recordings; 0.85% of total recordings. These were recorded over 51 no. nights which gives an average of 9.41 no. recordings per night.



Nathusius' Pipistrelle

The total number of recordings for Nathusius' Bat at the development was 2,45 no. recordings; 0.08% of total recordings. These were recorded over 51 no. nights which gives an average of 0.88 no. recordings per night.

Genus level Bats

The total number of recordings for bats identified to Myotis level only (could not be identified to species level) at the development was 845 no. recordings; 1.49% of total recordings. These are likely a combination of whiskered bat, Daubenton's bat and Natterer's bat.

The total number of recordings for bats identified to Pipistrelle level only (could not be identified to species level) at the development was 29 no. recordings; 0.05% of total recordings. These are likely a combination of common, soprano and Nathusius' pipistrelle.

The graphs within Plate 3-16 to Plate 3-26 below show the number of bat passes (per species) recorded at each static detector location over the three surveillance periods.

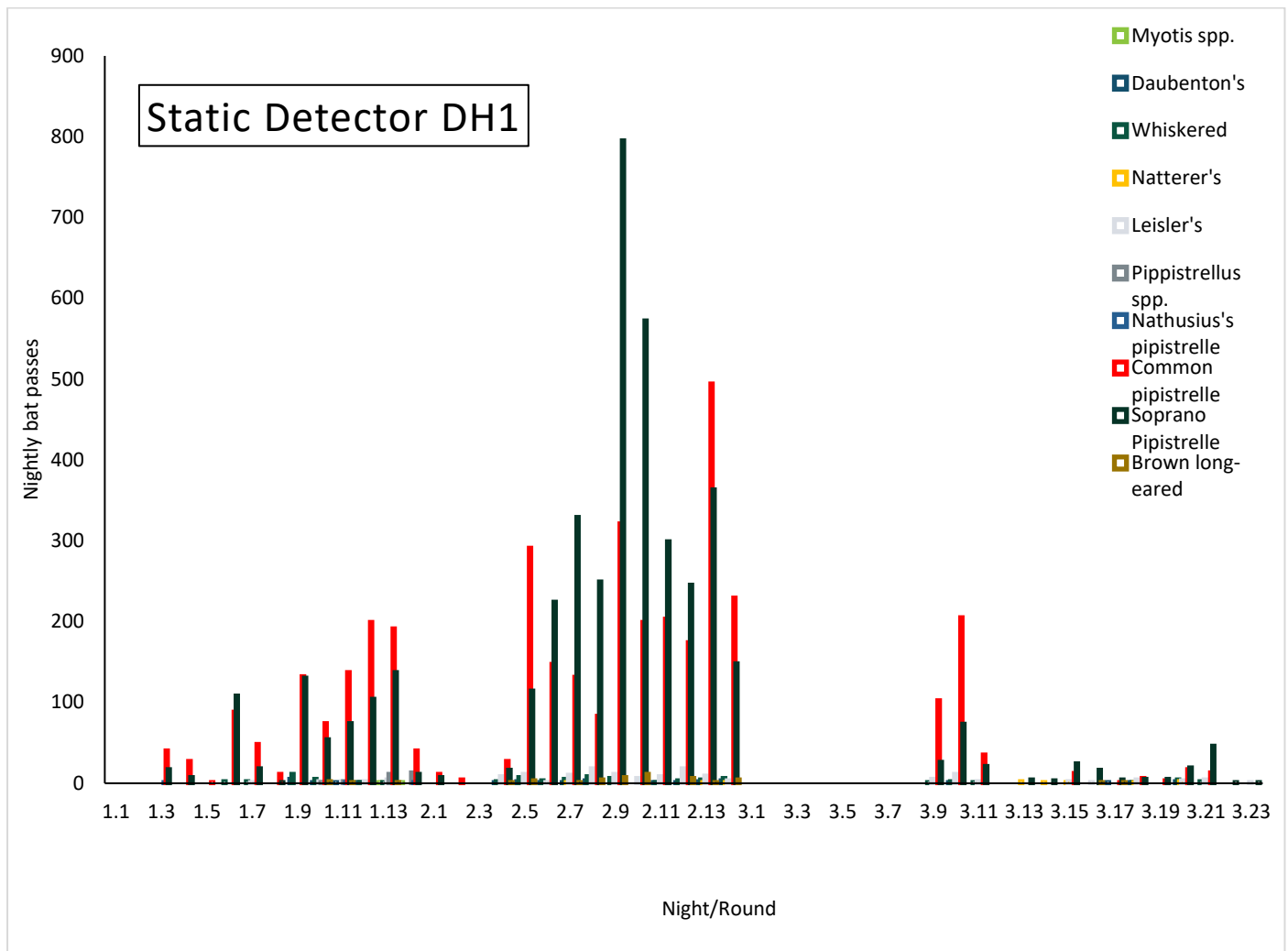


Plate 3-16: Total number of nightly passes recorded at static location DH1



The static unit DH1 recorded eight species of bat. A higher level of activity was recorded in period 2 (05th to 18th August 2021). Soprano pipistrelle had a spike in activity on night 9 of round 2 (13/08/2021) with 795 passes, while common pipistrelle spiked in activity on night 13 of round 2 (17/08/2021) with 494 passes. A much lower level of bat activity for all other bat species recorded was noted.

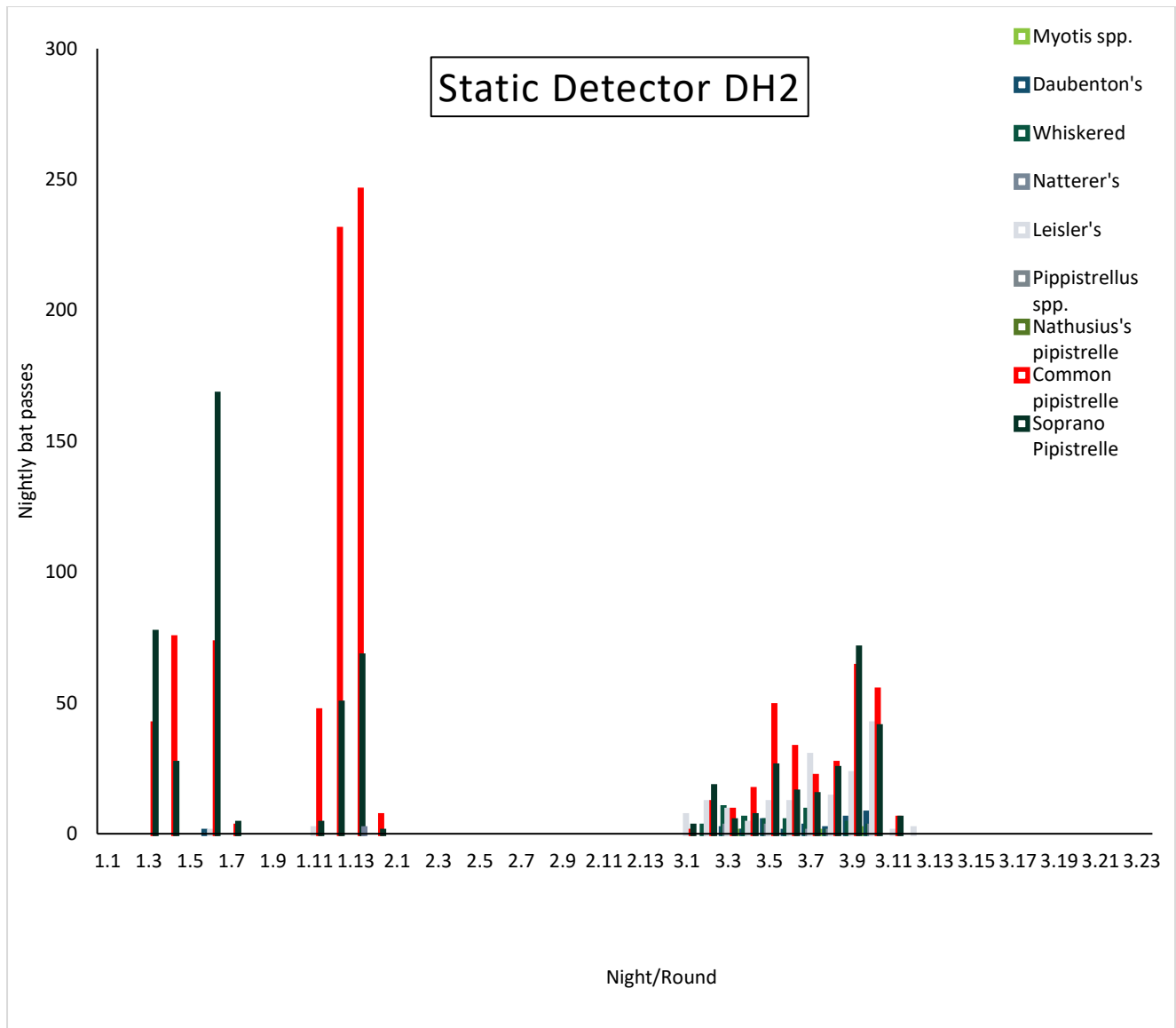


Plate 3-17: Total number of nightly passes recorded at static location DH2

The static unit DH2 recorded seven species of bat. A higher level of common pipistrelle and soprano pipistrelle activity was recorded in period 1 (20th May to 02nd June 2021), while period 3 (16th September to 08th October 2021) had higher activity for all other species. Common pipistrelle levels spiked on night 13 of round 1 (01/06/2021) with 246 passes. Common pipistrelle levels spiked on night 6 of round 1 (25/05/2021) with 168 passes. Leisler's bat levels spiked on night 10 of round 3 (25/09/2021) with 42 passes.

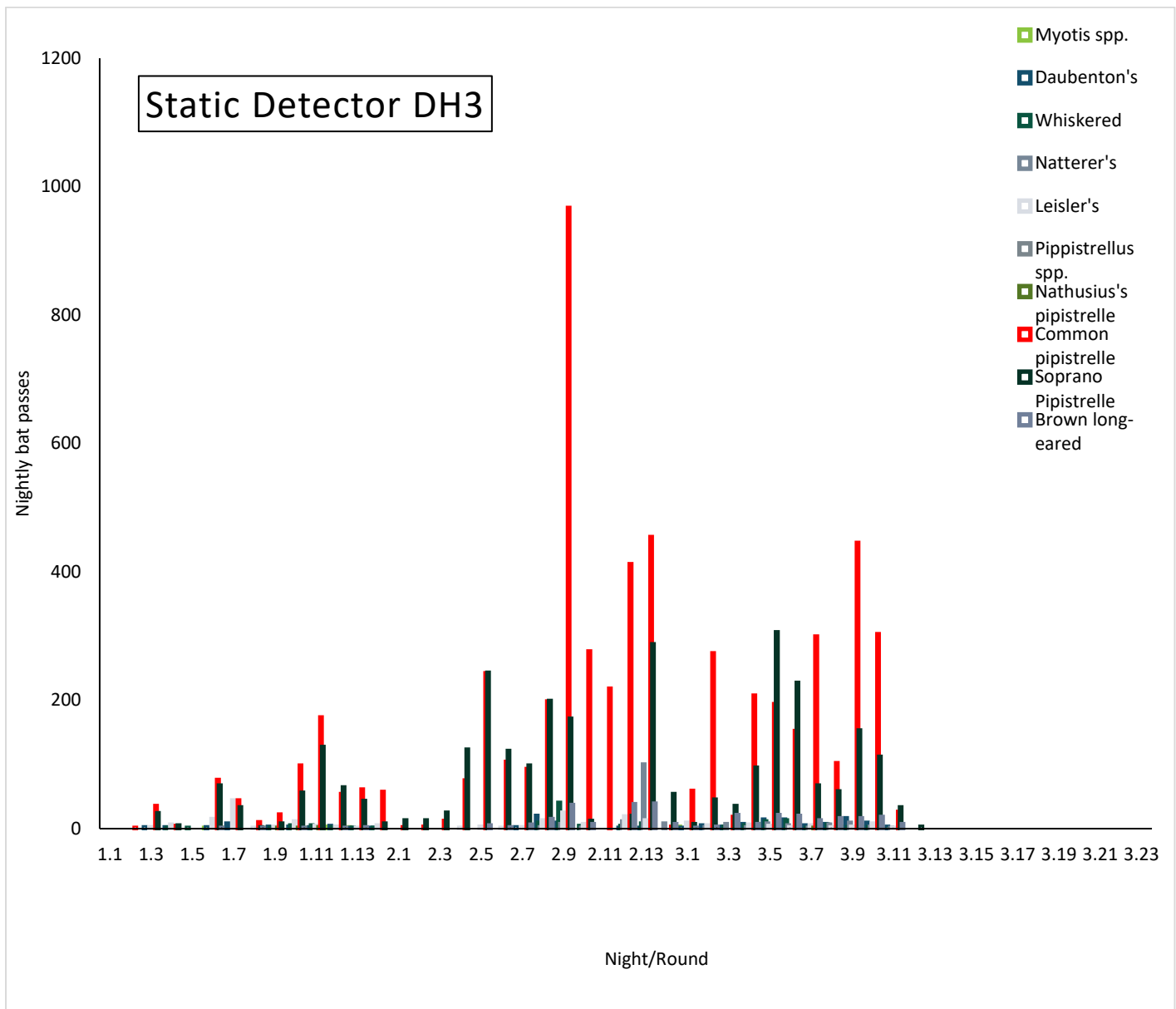


Plate 3-18: Total number of nightly passes recorded at static location DH3

The static unit DH3 recorded eight species of bat. A higher level of activity was recorded in period 2 (05th to 18th August 2021) and period 3 (16th September to 08th October 2021) compared to period 1 (20th May to 02nd June 2021). During period 1 and period 3 a higher level of common and soprano pipistrelle were recorded. Common pipistrelle had a spike in activity on night 9 of round 2 (13/08/2021) with 967 passes. Soprano pipistrelle also spiked in activity on night 5 or round 3 with 306 passes. A much lower level of bat activity for all other bat species recorded was noted.

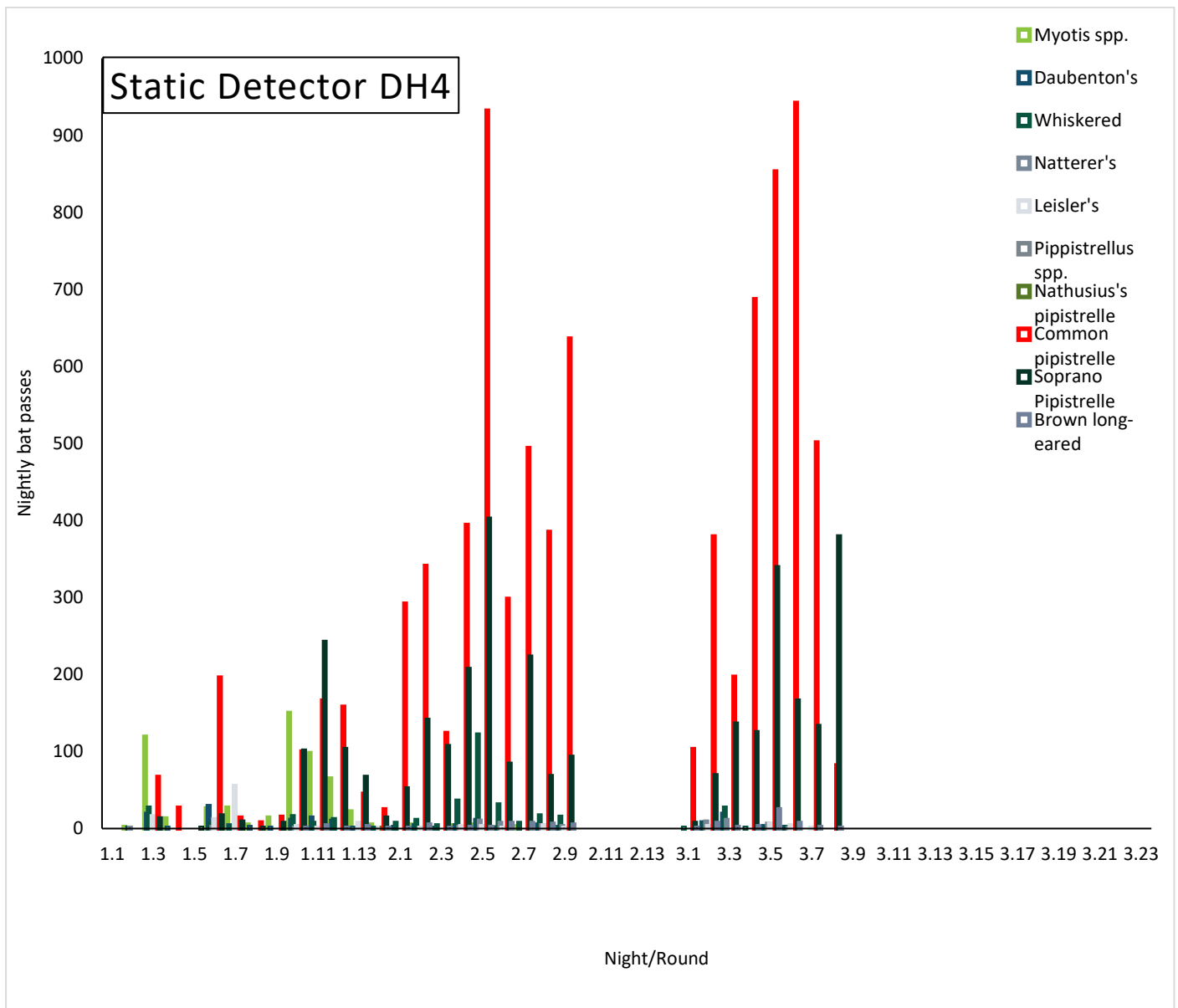


Plate 3-19: Total number of nightly passes recorded at static location DH4

The static unit DH4 recorded eight species of bat. A higher level of activity was recorded in period 2 (05th to 18th August 2021) and period 3 (16th September to 08th October 2021) compared to period 1 (20th May to 02nd June 2021). However, during period 1 a higher level of Myotis bat was with a peak in activity on night 10 (25/09/2021) with 150 passes. Common pipistrelle had a spike in activity on night 6 of round 3 and night 5 of round 2 (21/09/2021 and 09/08/2021) with 942 and 932 passes respectively.

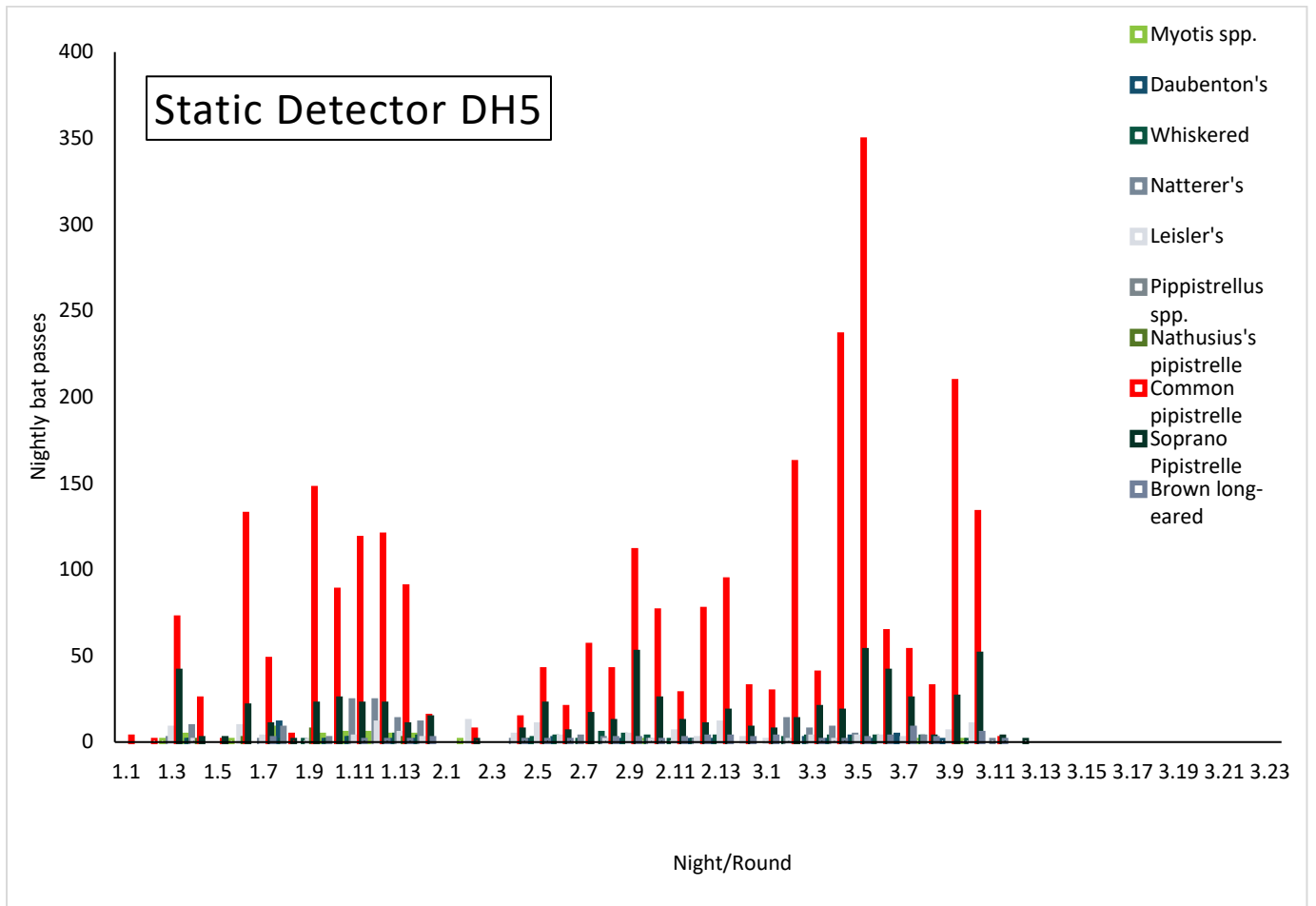


Plate 3-20: Total number of nightly passes recorded at static location DH5

The static unit DH5 recorded eight species of bat. During period 3 a higher level of common pipistrelle bat was recorded, which spiked in activity on night 5 or round 3 with 349 passes. A much lower level of bat activity for all other bat species recorded was noted.

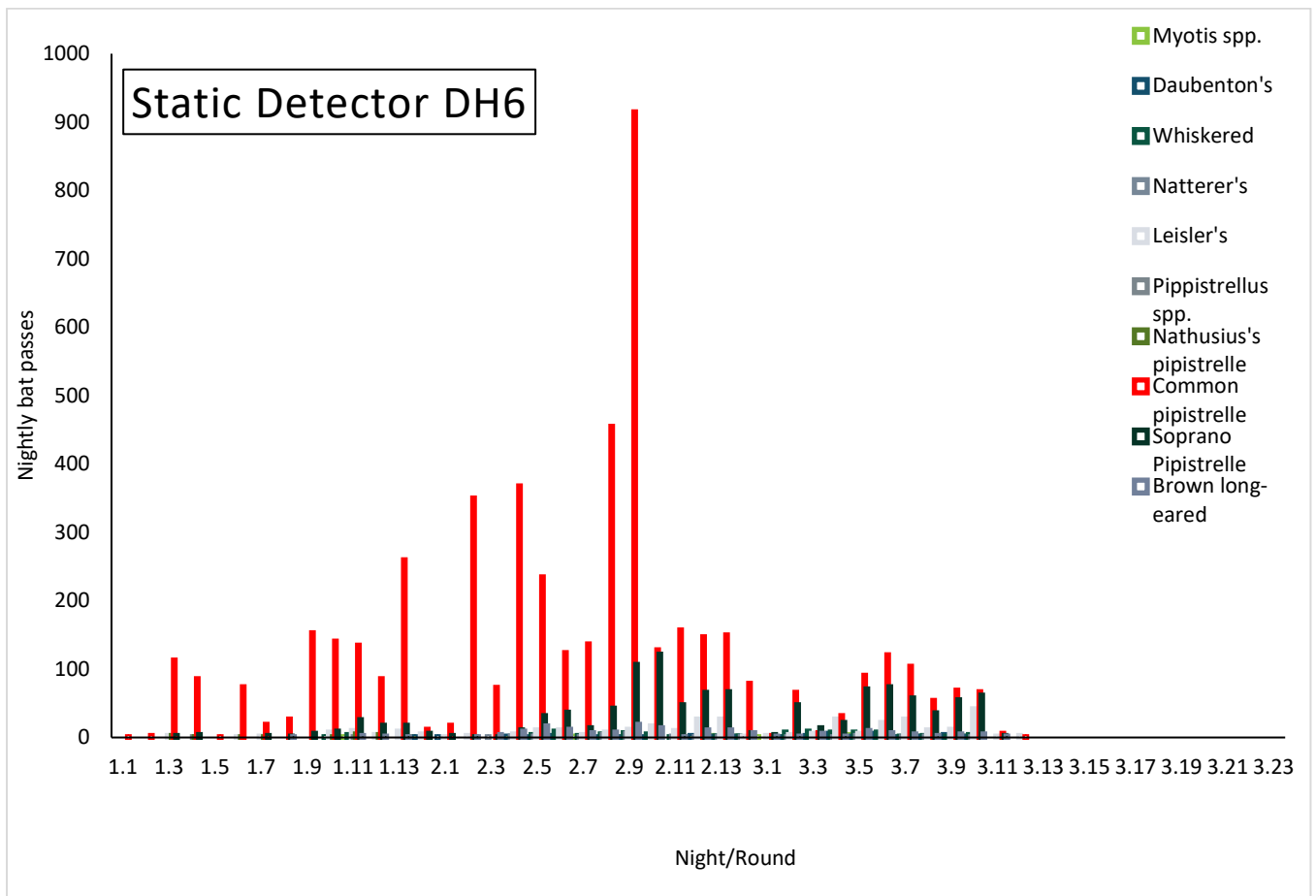


Plate 3-21: Total number of nightly passes recorded at static location DH6

The static unit DH6 recorded eight species of bat. A higher level of activity was recorded in period 2 (21st to 31st July 2020). During period 2 a higher level of common pipistrelle was recorded, with a spike in activity on night 9 (13/08/2021) with 915 passes. A much lower level of bat activity for all other bat species recorded was noted.

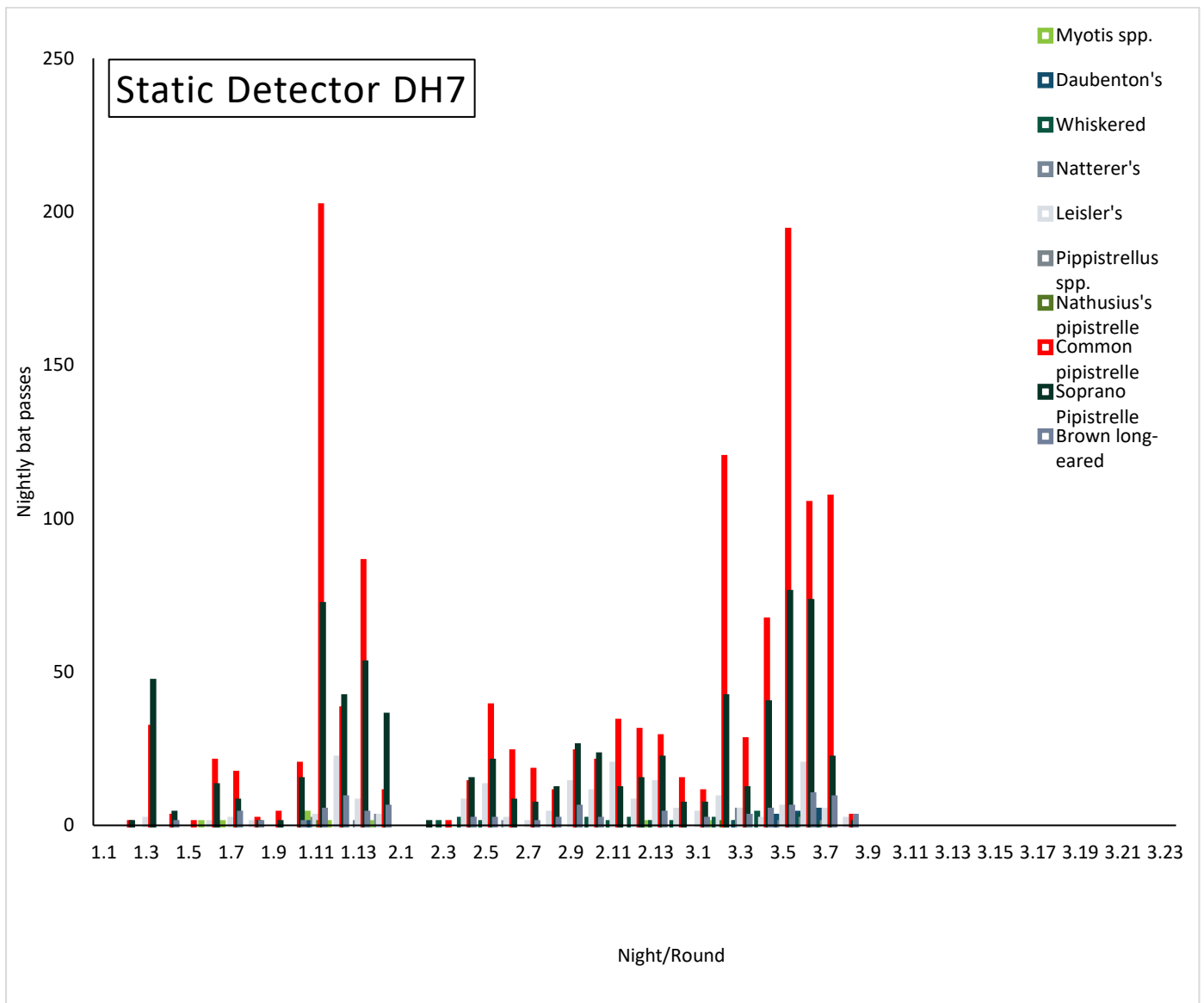


Plate 3-22: Total number of nightly passes recorded at static location DH7

The static unit DH7 recorded eight species of bat. A higher level of activity was recorded in period 1 (20th May to 02nd June 2021) and period 3 (16th September to 08th October 2021) compared to period 2 (05th to 18th August 2021). Common pipistrelle levels spiked on night 11 of round 1 and night 5 of round 3 (30/05/2021 and 20/09/2021) with 202 and 194 passes respectively. Soprano pipistrelle levels spiked on night 5 of round 3 (20/09/2021) with 76 passes. A much lower level of bat activity for all other bat species recorded was noted.

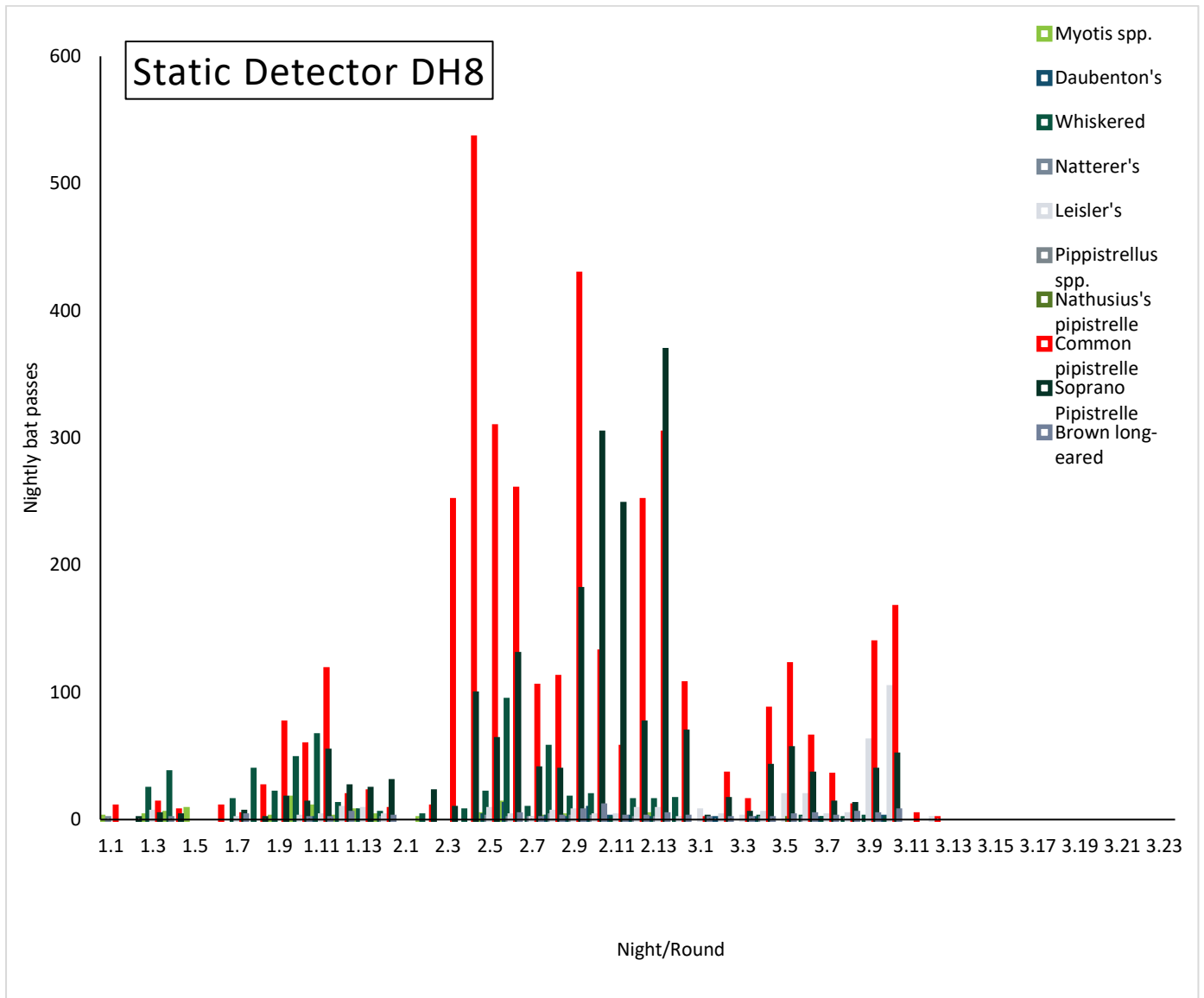


Plate 3-23: Total number of nightly passes recorded at static location DH8

The static unit DH8 recorded eight species of bat. A higher level of activity was recorded in period 2 (05th to 18th August 2021) compared to period 1 (20th May to 02nd June 2021) and period 3 (16th September to 08th October 2021). Common pipistrelle had a spike in activity on night 4 of round 2 (08/08/2021) with 536 passes. Soprano pipistrelle spiked in activity on night 13 of round 2 (17/08/2021) with 369 passes. A much lower level of bat activity for all other bat species recorded was noted.

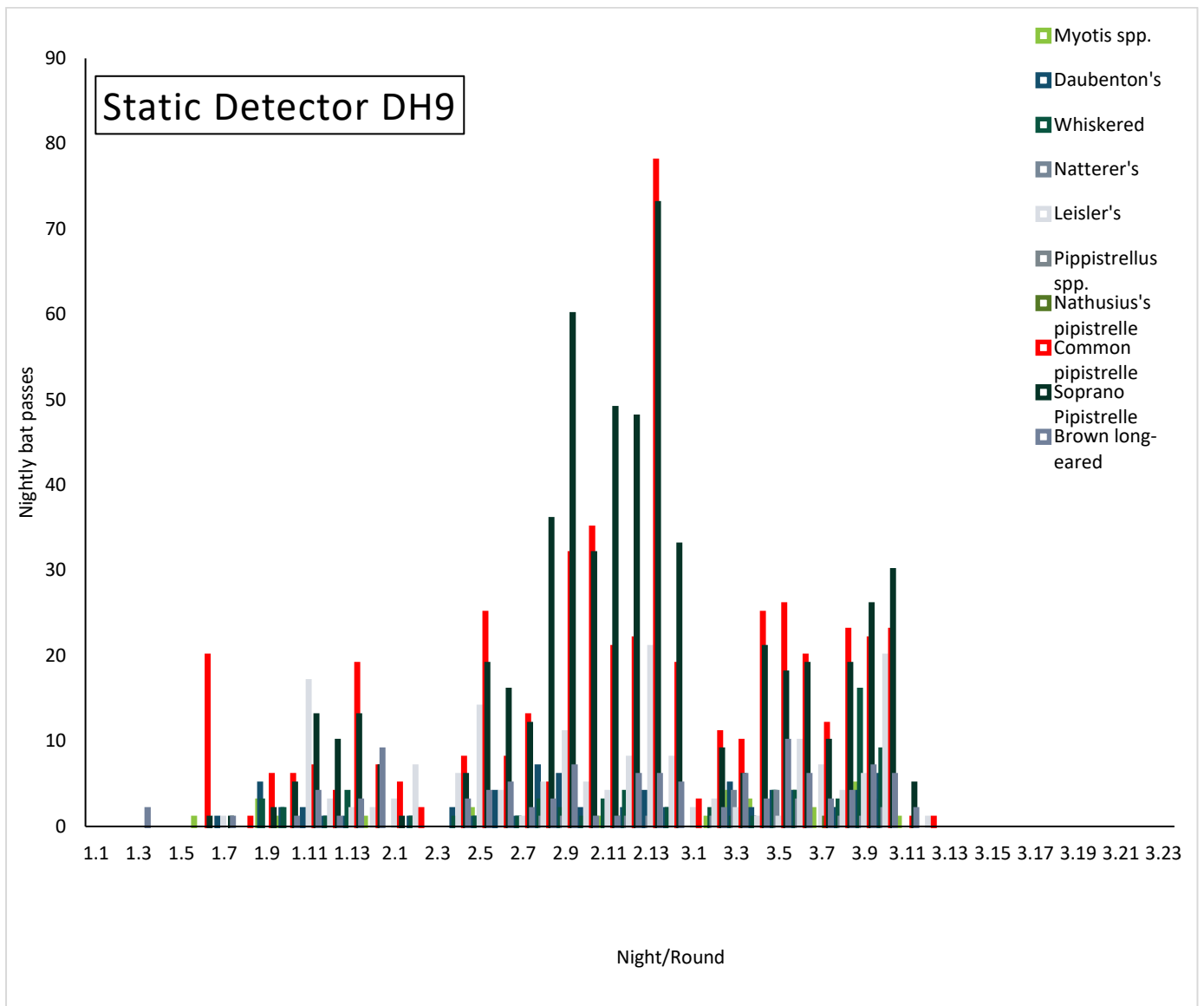


Plate 3-24: Total number of nightly passes recorded at static location DH9

The static unit DH9 recorded eight species of bat. A higher level of activity was recorded in period 2 (05th to 18th August 2021) compared to period 1 (20th May to 02nd June 2021) and period 3 (16th September to 08th October 2021). Common pipistrelle had a spike in activity on night 13 of round 2 (17/08/2021) with 78 passes. Soprano pipistrelle also spiked in activity on night 13 of round 2 with 73 passes.

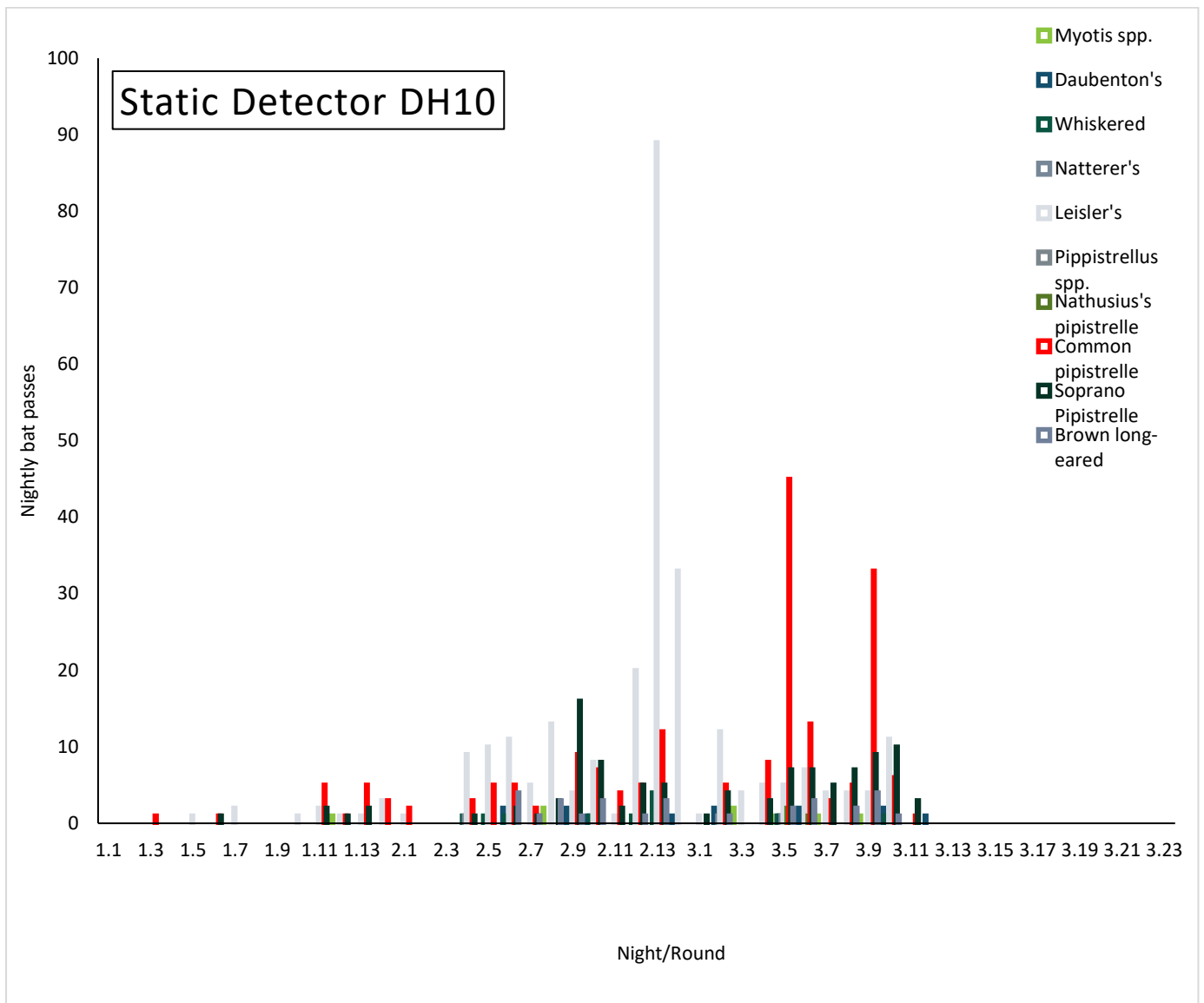


Plate 3-25: Total number of nightly passes recorded at static location DH10

The static unit DH10 recorded eight species of bat. A higher level of activity was recorded in period 2 (21st to 31st July 2020) and period 3 (15th September to 1st October 2020) compared to period 1 (23rd April to 5th May 2020). During period 2 Leisler's bat activity peaked on night 13 (17/08/2021) with 89 passes. Common pipistrelle peaked in activity on night 5 of round 3 (20/09/2021) with 45 passes. A much lower level of bat activity for all other bat species recorded was noted.

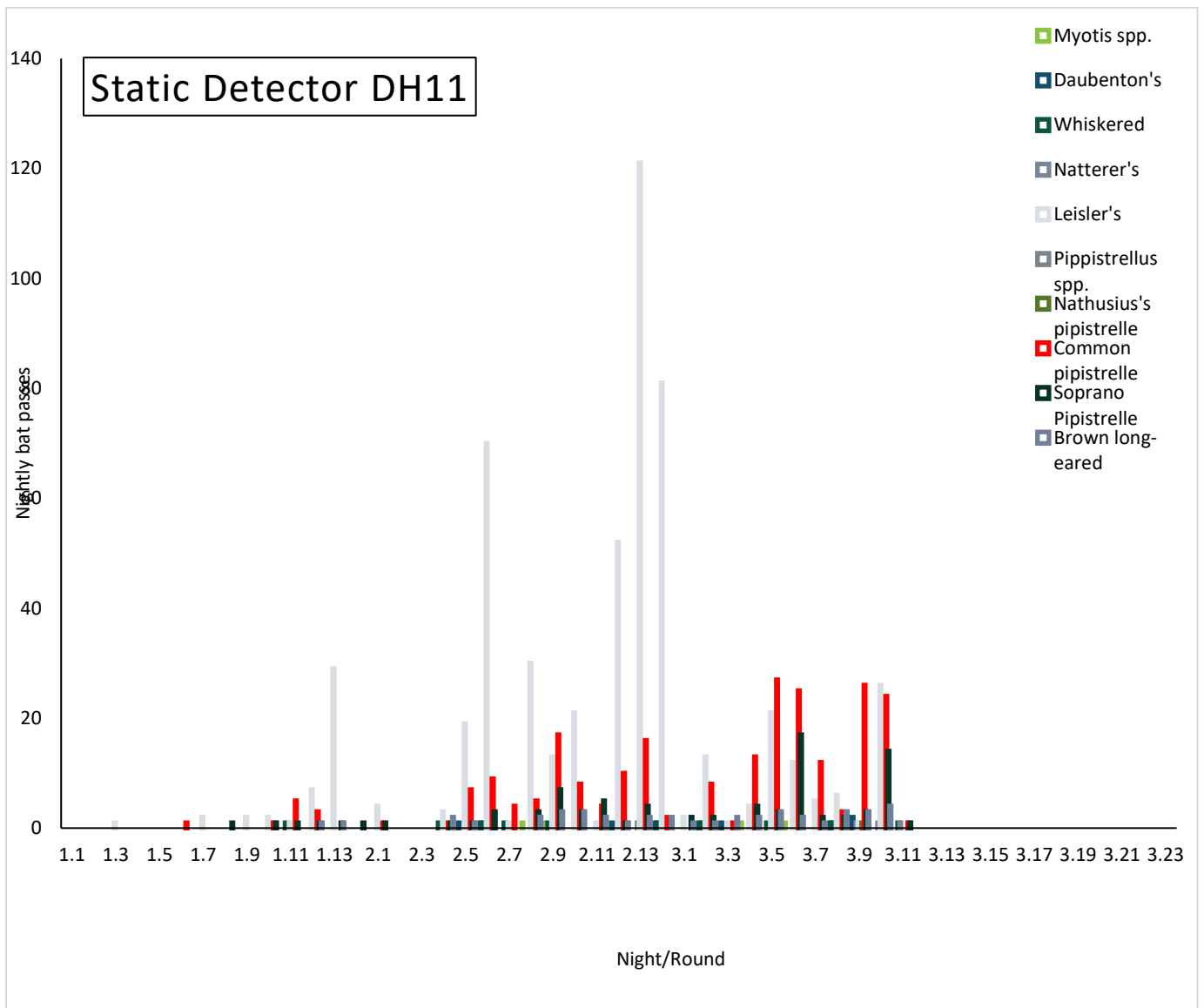


Plate 3-26: Total number of nightly passes recorded at static location DH11

The static unit DH11 recorded eight species of bat. A higher level of activity was recorded in period 2 (21st to 31st July 2020) and period 3 (15th September to 1st October 2020) compared to period 1 (23rd April to 5th May 2020). During period 2 Leisler's bat activity peaked on night 13 (17/08/2021) with 121 passes. A much lower level of bat activity for all other bat species recorded was noted.

Eight species of bats were recorded during the three survey periods with a total of 56,591 recordings over the three survey periods. The most commonly recorded species was common pipistrelle, followed by soprano pipistrelle, then Leisler's bat. Lower levels of activity of brown long-eared bat, Daubenton's bat, Natterer's bat, and whiskered bat were detected. Brown long-eared bat is present on-site, but this species is very quiet and sometimes hunts without echolocating, therefore this species may be under-recorded by the static detectors.



The graphs within Plate 3-27 to Plate 3-30 show the number of passes for individual species (common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle and Leisler's bat) at each static detector location for the full survey period of 2021. Locations DH4 have the highest number of passes for common pipistrelle, soprano pipistrelle, while DH11 has the highest number of passes of Leisler's bat and DH6 had the highest levels for Nathusius' pipistrelle.

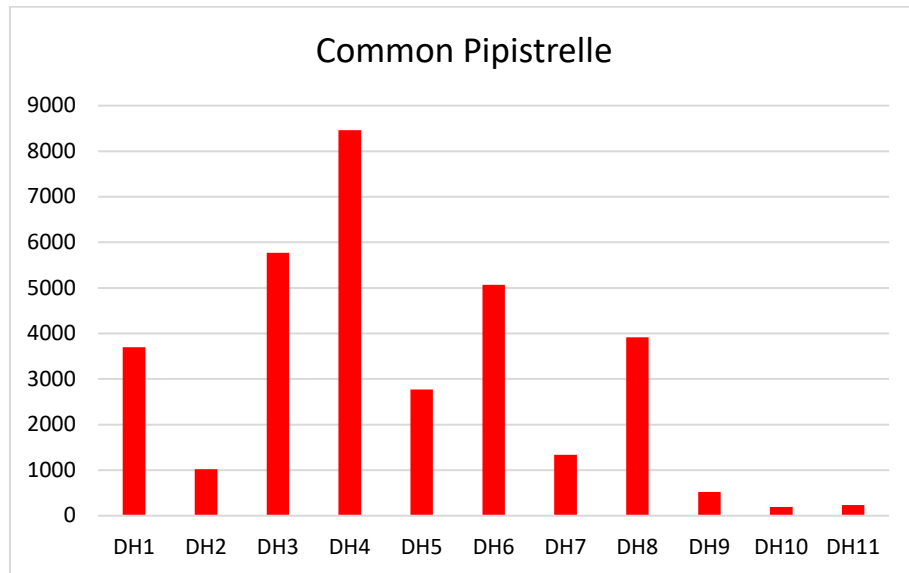


Plate 3-27: Total number of bat passes recorded for common pipistrelles at each of the static detector locations during 2021

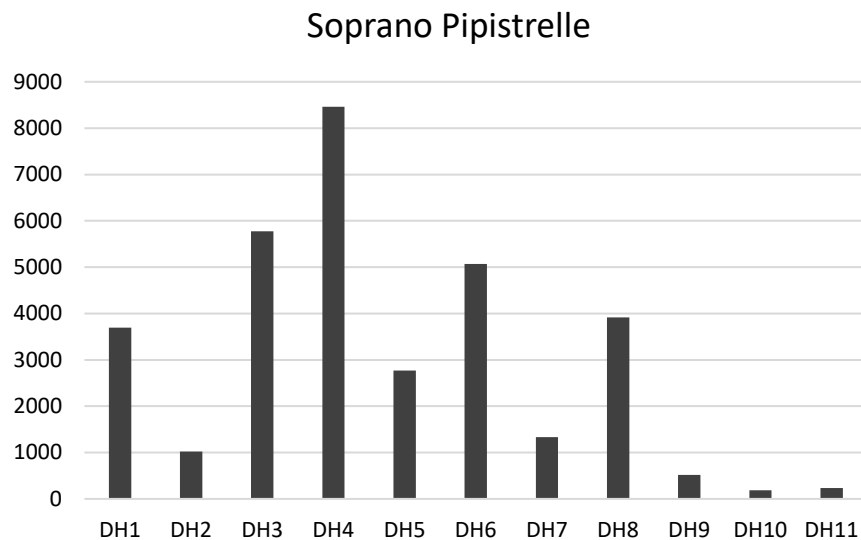


Plate 3-28: Total number of bat passes recorded for soprano pipistrelles at each of the static detector locations during 2021

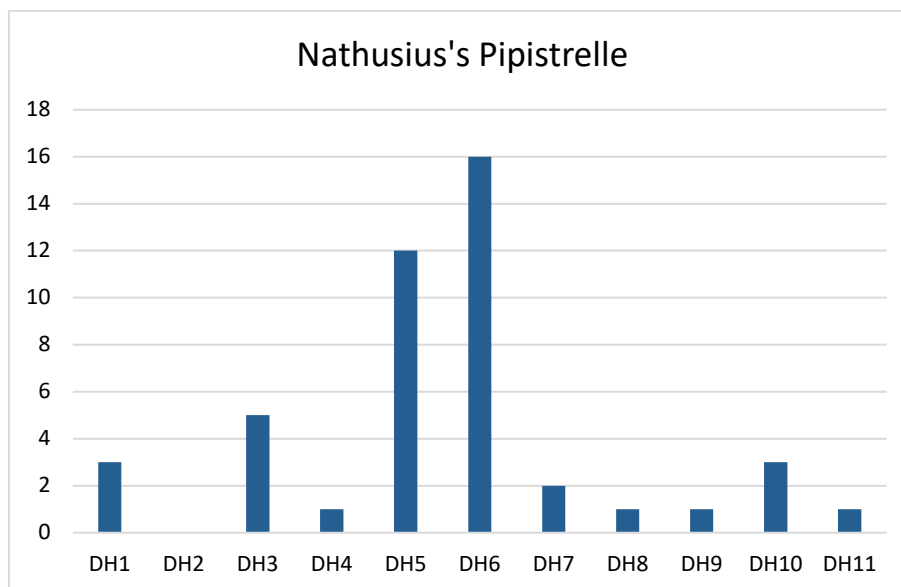


Plate 3-29: Total number of bat passes recorded for Nathusius' pipistrelle at each of the static detector locations during 2021

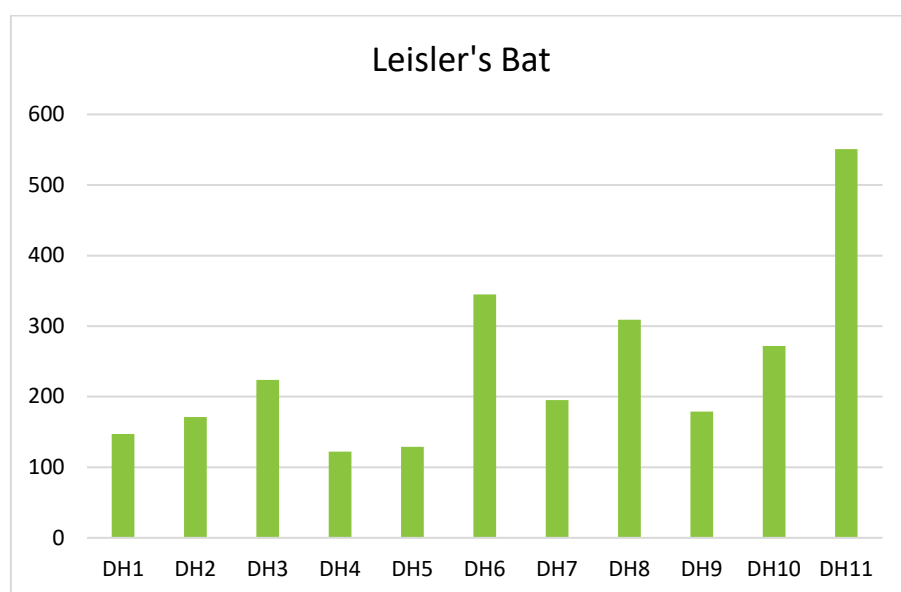


Plate 3-30: Total number of bat passes recorded for Leisler's bat at each of the static detector locations during 2021

Static location DH4 had the highest number of passes for Myotis bat and Daubenton's bat. DH3 had the highest number of passes for Natterer's bat, Daubenton's bat and brown long-eared bat. DH8 had the highest number of passes for pipistrelle bat. Refer to Plate 3-31 for all remaining bat species results.

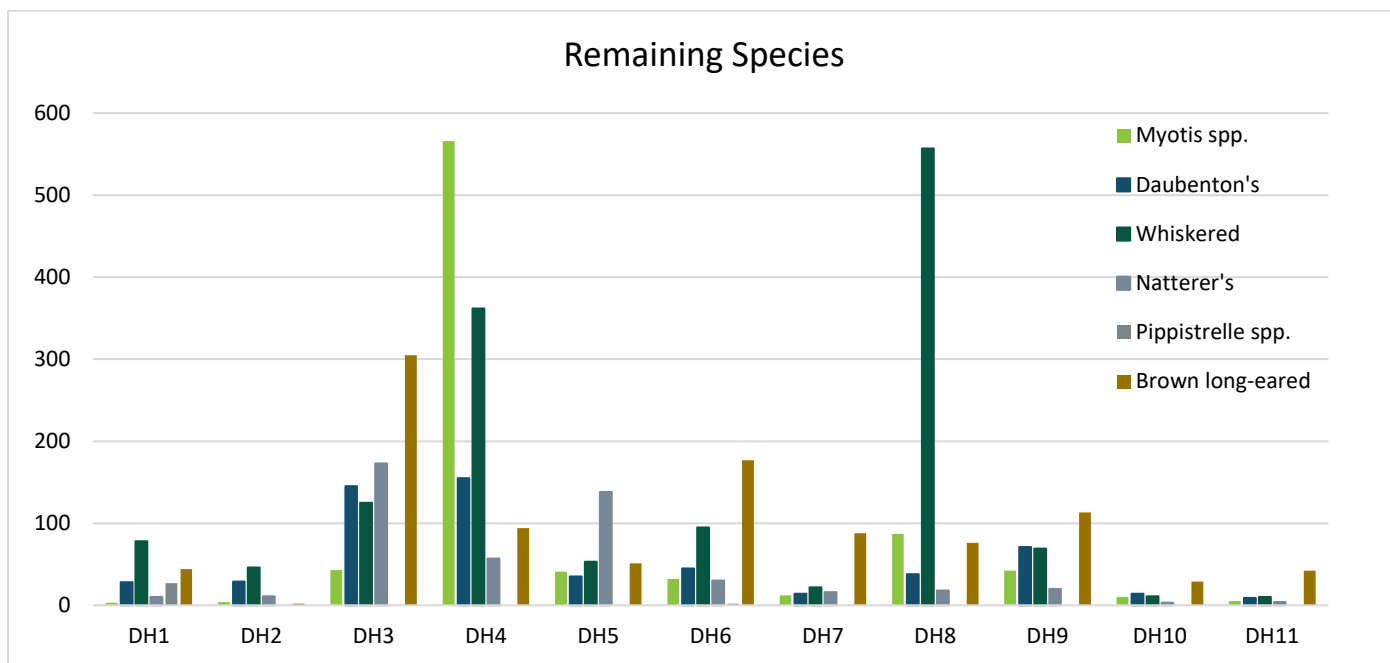


Plate 3-31: Total number of bat passes recorded for remaining bat species at each of the static detector locations in 2021

3.3.3 Survey at Height

During the survey period, six species were recorded. These were Leisler's, common pipistrelle and soprano pipistrelle. Leisler's was the most active species, with 736 calls, accounting for 84.1% of all calls during the survey period. Common pipistrelle and soprano pipistrelle were present in lower numbers, with 63 and 58 calls, accounting for 7.2% and 6.6% of calls, respectively. Limited numbers of brown long-eared bat (total nine calls), Nathuius pipistrelle (total two calls), and Natterer's bats (total one call) were recorded.

3.4 Roost Surveys

3.4.1 Roost Searches and Dusk Emergence Surveys at Structures

The findings below refer to potential roost sites in the structures (buildings/bridges/other structures) as labelled on the map in Figure 3-1, with associated site labels and details listed in Table 3-7. Individual sections below discuss the results of visual assessments of roost suitability/evidence, and of dusk emergence surveys and passive bat detector monitoring where applicable.

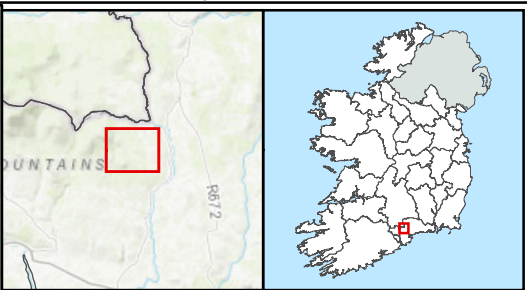
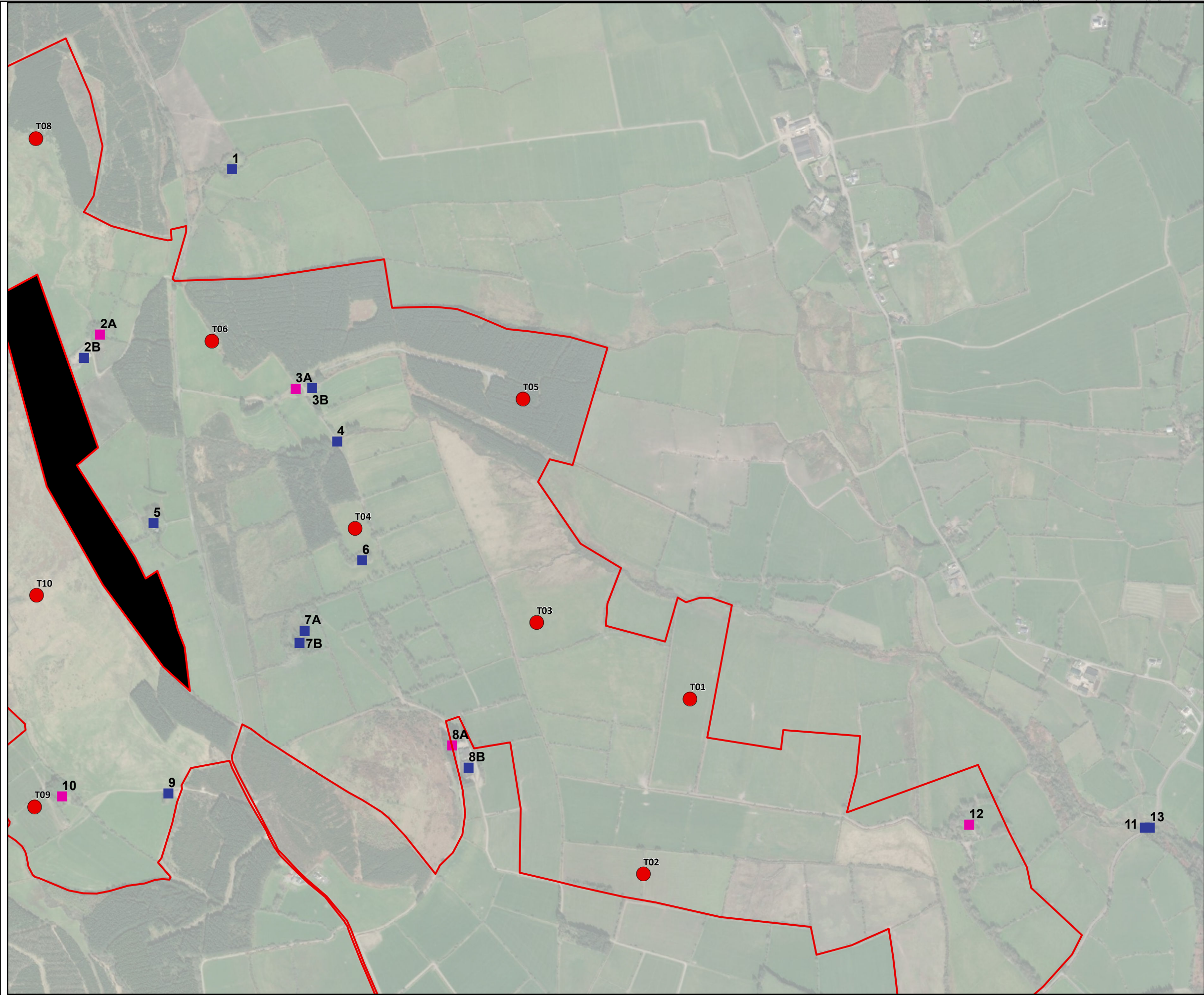


Table 3-7: Locations/details of potential (and confirmed*) roost sites as labelled in Figure 3-1.

Map/text ref.*	Notes	Dusk survey date(s)	Passive detector deployment dates	Roost suitability category*
1	Ruin of old stone house with no roof north perimeter of site	-	-	Low
2A*	Derelict house with small brown long-eared bat minor day roost and night roost	02/07/2022	-	Confirmed
2B	Large farm sheds/hay sheds	-	-	Low
3A*	Ruin of old stone house with multi-species bat roost. Brown long-eared bat summer maternity roost and night roost. Whiskered small regular day roost and night roost. Soprano pipistrelle regular minor day roost. Common pipistrelle occasional minor day roost	24/07/2021 & 06/08/2022	30/07/2021-11/08/2021 & 23/03/2022-28/03/2022	Confirmed
3B	Modern farm shed open walls	-	-	Low
4	Low culvert over Lisleagh Stream	-	-	Negligible
5	Occupied farmhouse and sheds	-	-	Moderate
6	Ruin of old stone house with no roof in middle of fields	-	-	Low
7A	Small concrete block shed with corrugated iron roof. Bull in field	-	-	Low
7B	Old stone ruins of house, no roof. Bull in field	-	23/03/2021-28/03/2021	Moderate
8A*	Derelict 2-storey house beside modern farm sheds. Probable minor day roosts of brown long-eared bat and common pipistrelle.	30/07/2021	-	Confirmed
8B	Large modern farm sheds beside derelict 2-storey house	-	-	Low
9	Modern farm shed	-	-	Low
10*	Ruin of small old stone house near upland transect. Brown long-eared bat night roost.	-	-	Confirmed
11	Stone arch bridge over Lisleagh Stream		23/03/2021-28/03/2021	Moderate
12*	Ruin of old stone house and sheds with courtyard. Whiskered bat summer roost & brown long-eared bat important night roost and probably day roost.	11/08/2021 & 09/09/2022	31/07/2022-07/08/2022	Confirmed

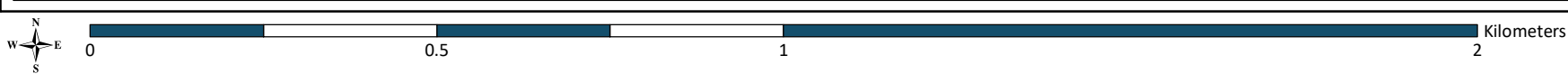


Map/text ref.*	Notes	Dusk survey date(s)	Passive detector deployment dates	Roost suitability category*
13	Stone face of small quarry	-	-	Low



- Site Boundary
- Excluded Coillte Lands
- Roost Status**
- Confirmed
- Potential
- Turbine Layout

TITLE:		Potential and Roost Structures	
PROJECT:		Dyrick Hill Wind Farm	
FIGURE NO:		3-1	
CLIENT:		EMPower	
SCALE:	1:9780	REVISION:	0
DATE:	12/04/2023	PAGE SIZE:	A3





3.4.2 Potential Roost Site 1

Ruins of stone cottage, northern perimeter of site

No bat signs were found at the old stone ruins of a house here, and it was considered to have low roost potential. There was no roof left on the building to shelter bats (Figure 3-2). While there were some crevices in the stonework of the walls that may potentially provide shelter to bats, they were too open to ingress of daylight and inclement weather to provide very suitable areas.



Figure 3-2: No bat signs and low roost suitability in this ruined stone cottage

3.4.3 Potential Roost Site 2A* (Brown Long-eared Bat Roost)

Derelict farm house with one inaccessible upstairs room.

This old stone house with a slate roof had moderate roost potential (Figure 3-3). It had cover of mature trees within close proximity, favouring roosting by bats. Visual searches revealed Brown Long-eared droppings inside this building were very sparse, indicating at least a night roost of this species. It had a relatively intact slate roof where the lime mortar underlay had mostly fallen away, as shown in Figure 3-3. It provided ideal conditions for night-roosting, and less ideal conditions for day-roosting due to the ingress of light. There was an inaccessible upstairs room in the roof with a roof light to the north gable of the building, as shown in Figure 3-3, due to a collapsing stairs. There may have been a darker area in the upstairs room where bats could day-roost. Indeed the roof light here was one of the emergence points of a brown long-eared bat during the dusk survey.



3.4.3.1 Dusk Emergence Survey Site 2A 2/07/2022

Two brown long-eared bats emerged during a dusk survey in ideal weather conditions. The first brown long-eared bat emerged at 32 minutes past sunset from the small broken roof window as shown by a red arrow in Figure 3-3. It dropped low (<2m from ground) and flew directly eastward where it was quickly lost to sight among trees. The second brown long-eared bat emerged at 40 minutes after sunset through the partly open/broken downstairs window (as shown by a red arrow in Figure 3-3) and also flew eastward toward tree cover, low to the ground (<1.5m flight height). No further bats were observed emerging from the building. However, brown long-eared bat individuals returned to the house at 22:45, 22:49, and 23:00 from north and east directions, and they flew around close to both observers and around the house and entered to night roost there through the downstairs window. They were not social calling (which would be louder than their echolocation calls) and their echolocation intensity was very low, with only some of it detectable on detectors from close range. Soprano pipistrelle and common pipistrelle were recorded foraging near the trees around the site during the dusk survey, but not emerging from the building. They generally had higher flight heights than brown long-eared bat, c. 5-15m.

Confirmed Bat Roost Summary Site 2A:

- Brown Long-eared Bat minor summer day roost of estimated 2 individuals
- Brown Long-eared Bat night roost of estimated 3 individuals



Figure 3-3: Minor summer day roost and night roost of Brown Long-eared Bat showing exit points through windows

3.4.4 Potential Roost Site 2B

Large modern farm sheds

As can be seen in Figure 3-4, the modern farm sheds here had corrugated iron roofs supported on steel struts, and concrete and corrugated iron walls. The sheds were open to ingress of daylight and were assessed as having low roost potential. The concrete walls did not appear to have cavities in them where bats could potentially shelter. No bat signs were found.



Figure 3-4: Large modern farm sheds with low bat roost potential

3.4.5 Potential Roost Site 3A* (Multi-species Bat Roost)

Ruin of old stone house near plantation forestry track.

The old ruined stone cottage here was in a very dilapidated state, but still had a good part of its slate roof intact. Some of the slate roof had fallen in and some had been replaced with corrugated iron sheeting (Figure 3-5). There was cover of mature tree lined tracks, plantation forestry and grass fields in its immediate surroundings. The interior also had some felt remaining under the slates in places, and timber ceiling sheeting behind which bats could shelter. There were plenty of potential dark and sheltered roost crevices within the house, and plenty of roost access points (Figure 3-5) and it was assessed of having moderate roost potential despite being quite open to daylight and weather. During visual inspections a sparse scattering of brown long-eared bat droppings, and a sparse scattering of *Pipistrellus* sp. and an unknown bat species droppings were found in various locations. The building was not fully accessible to visual inspection due to a fallen stairs and rotten suspended timber floors and collapsing walls and ceilings (see interior views in Figure 3-7). Dusk emergence surveys and passive bat monitoring were used to further investigate roosting patterns here.

3.4.5.1 Dusk Emergence Survey Site 3A, 1st of 2, 24/07/2021

During the first dusk emergence survey it was observed that there was a day roost of brown long-eared bat, and that it would require further survey effort to characterise the roost and estimate numbers more accurately. One soprano pipistrelle emerged at 18 minutes after sunset through an open window at the south, and flew along the treeline to the east. One whiskered bat was also recorded emerging at 30 minutes after sunset, suggesting a day roost of this species also (flight direction not observed). Common pipistrelle was also active foraging around the area from 26 minutes after sunset, but was not observed emerging from the building. Due to the difficulty of making roost observations with so many bat species present, passive bat detector monitoring from inside the roost building and a further dusk emergence survey were under-taken to characterise this multi-species roost more fully, as described below.



Figure 3-5: Front and back view of this multi-species bat roost (brown long-eared bat, whiskered bat, soprano pipistrelle), with red arrow showing the position of the window in the east gable where most bats emerged.

3.4.5.2 Dusk Emergence Survey Site 3A, 2nd of 2, 06/08/2022 (sunset 21:13):

During a transect on 02/07/2022 a brown long-eared bat was observed emerging from the east gable window so observers had a better idea of where to watch for this quiet species during the second dusk emergence survey. This time the following bat species and counts emerged, noting their exit points from the roost;

- Soprano pipistrelle x 2, one out open window at front (north), and one out open door at back (south)
- Whiskered bat x 2 - both flew out through the eastern gable window
- Brown long-eared bat x 18 - all flew out through the eastern gable window

The first soprano pipistrelle emerged at just 12 minutes after sunset and flew quickly eastward down the tree-lined forestry track along the edge of the plantation forestry, at a flight height of about 5-10m. The second soprano pipistrelle emerged also while it was still bright at 15 minutes after sunset and flew in the same direction and flight height.

Surprisingly, the first whiskered bat emerged at just 22 minutes after sunset, while it was still quite bright, and this is an unusually early emergence time for this species (Andrews & Pearson 2022). It emerged from the east gable window (red arrow Figure 3-5) and dropped to a low flight height <2m, flew northwards crossing the track to a birch tree at the edge of the plantation forestry where it flew slowly for a while before quickly disappearing from view. The second whiskered bat emerged at 32 minutes after sunset and flew south-eastwards down a track with some hedgerow and some mature trees, again at <2m from the ground.



The first brown long-eared bat emerged at just 25 minutes after sunset and the 18th one emerged at 43 minutes after sunset. Two brown long-eared bats also returned into the roost through the east gable window at 57 and 58 minutes after sunset, probably night roosting or suckling young, and they seemed to arrive from the farm track to the SE of the building. As described in the results of passive monitoring inside the roost, brown long-eared bat were active coming and going throughout every night suckling young or night roosting. All brown long-eared bat seemed to fly at heights of c. 1-3m from the ground, and they were observed heading off in all directions from the roost, not just one direction. No social calling of this species was recorded during the emergence survey, even though plenty of social calling of this species was recorded by the passive detector recording inside the building in 2021.

Other bat species incidentally recorded during this dusk emergence survey included common pipistrelle and Leisler's bat. Common pipistrelle (at least four separate individuals) arrived at the site from just 24 minutes after sunset, apparently from a roost elsewhere but close-by, and stayed foraging at the site during the remainder of the survey and were seen flying along all of the tracks close to the building. One flew in to the building but flew back out again a minute later. Leisler's bat was only recorded three times briefly flying over the site.

3.4.5.3 Passive Bat Detector Recording Analyses Site 3A:

As discussed above, this was a multi-species roost, and passive recording was used to assess whether it was a regular roost of all of the bat species that were recorded during the emergence surveys. Passive monitoring gives good insights into roosting behaviour of bats in a non-invasive way over a longer time-frame.

The total registrations of each species or species groups for a subset of 5 out of 12 consecutive nights are presented in Table 3-8. Note that all Leisler's bat and many of the common pipistrelle and soprano pipistrelle would have been detected whilst flying outside the building because the openings in the roof and windows allowed the microphone to easily detect these louder species. brown long-eared bat comprised the majority of the bat registration files.

Table 3-8: Total bat registration per bat species/group for a subset of 5 full nights 30/7/2021 - 4/08/2021 recorded from inside the multi-species bat roost at Site 3A

Bat species/group	Total	Percentage	Notes on species' acoustic detectability
Soprano Pipistrelle	309	13.0%	Many detected from outside, but also roosting - see text
Common Pipistrelle	898	37.7%	Many detected from outside, but also roosting - see text
Leisler's Bat	20	0.8%	All detected whilst flying outside (species has very loud echolocation)
<i>Myotis</i> sp.	74	3.1%	Vast majority from roost inside (species has quiet echolocation)
Brown Long-eared Bat	1083	45.4%	Vast majority from roost inside (species has quiet echolocation)
Total	2384	100.0%	



3.4.5.4 Brown Long-eared Bat Maternity Roost

It was evident from a count of at least 18 individuals emerging, and from the consistently high levels of acoustic activity of this species recorded every night during 31/07/2021 to 11/08/2021, that this building is a maternity roost of brown long-eared bat. Appendix 3 Table A.1 details the results of monitoring for this species for the first five (out of 12) consecutive nights. It can clearly be seen that it was active near sunset and sunrise every night, and also active throughout much of the night, every night. There was a very high prevalence of so-called 'social calling' on all nights (example sonogram in Figure 3-6). brown long-eared bat has low acoustic detectability with its normal flight echolocation pulses. However, its social calls are much more intense (Figure 3-6), and it does tend to emit a lot of social calls around its roosts (pers. obs., and (Furmankiewicz 2016)). Social calls of bats have their main role in communication, rather than echolocation for orientation and prey hunting. brown long-eared bat use the type of social call, or contact call, in the sonogram in Figure 3-6 for communication among roost mates in their maternity roosts (Furmankiewicz & Jones, 2022). There was also so-called daytime 'roost bat chatter' recorded. Unlike pipistrelles, which can form maternity roosts containing 100s or even 1000s of individuals, Brown Long-eared Bat maternity colonies tend to involve 30-50 individuals or less (Entwistle, Racey & Speakman 2000; Furmankiewicz 2016). The majority of known roosts of brown long-eared bat in Ireland contain 5 bats or fewer (Roche et al. 2014).

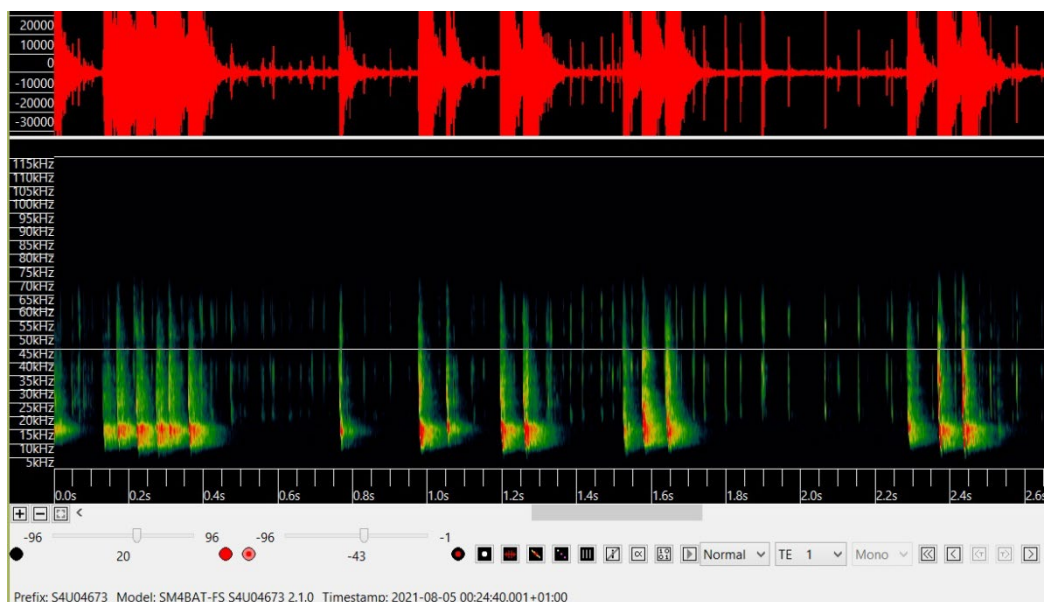


Figure 3-6: Sonogram showing flight pulses and louder social calls of brown long-eared bat from roost 3A

3.4.5.5 Whiskered bat regular minor day roost and night roost

Myotis sp. including whiskered bat were recorded every night of the 12 nights of the deployment, but with less than a tenth of the number of registrations of brown long-eared bat, for comparison. Table A.2 in Appendix 3 details the results of monitoring for *Myotis* sp. for the first five (out of 12) consecutive nights, with further registrations noted around sunset and sunrise for the remaining 7 nights of monitoring. Activity was recorded 16, 25, 26, 31, and 33 minutes after sunset, and last registrations of the night at 24, 38, 40, 41, and 42 minutes before sunrise (Table A2, Appendix 3). When compared to typical emergence and return times for *Myotis* sp. (Andrews & Pearson 2022) these times show that whiskered bat is day-roosting there regularly. Combined with the emergence surveys, where one or two whiskered bat were observed emerging, this shows that it is a regular, but minor, summer day roost of a small number of whiskered bat, and is unlikely to be a maternity roost. The number of bat registrations would be a lot higher if it were a maternity roost. The registrations in the middle of the nights indicate that one or a small number of whiskered bat also uses building 3A as a night roost.



3.4.5.6 *Soprano pipistrelle regular minor day roost and night roost*

Just one or two soprano pipistrelle were observed emerging during dusk surveys. The passive detector monitoring results show that the building is actually used every day as a day roost by a small number of this species. Table 3-9 shows that it began flying soon after sunset (2 - 17 minutes) and was even flying before sunset on three evenings. It also returned to the roost close to sunrise, from 2 - 26 minutes before sunrise (Table 3-9), again confirming daily day-roosting. Some registrations from inside during the middle of the night also indicate night roosting. It is not a maternity roost of this species, which tend to involve many individuals.

3.4.5.7 *Common pipistrelle occasional minor day roost and night roost*

Common pipistrelle arrived early to site 3A during the emergence surveys, but were thought to be arriving from an unknown nearby roost. The passive detector monitoring revealed that this species actually also has a minor day roost in the building, at least sporadically, if not every day. For example, it started flying <10 minutes after sunset on 3/8/2021, 9/8/2021 and 10/8/2021 (Table 3-9). Some registrations from inside during the middle of the night also indicate night roosting. It is not a maternity roost of this species. The results from walked transect suggest that this is by far the most widespread and abundant bat species on the site, so there is a maternity roost of this species somewhere nearby, but which was not discovered during these surveys.

Table 3-9: Timing of nightly onset/cessation of soprano and common pipistrelle that provide evidence of minor day roosts of these species inside roost 3A (nights 1 -5 fully analysed, nights 6- 12 scanned near sunset/rise)

Night	Date 1	Date 2	Soprano Pipistrelle: Onset/cessation of recorded acoustic activity		Common Pipistrelle: Onset/cessation of recorded acoustic activity	
			Minutes after sunset	Minutes before sunrise	Minutes after sunset	Minutes before sunrise
1	30-Jul-21	31-Jul-21	-16 (before sunset)	17	22	25
2	31-Jul-21	1-Aug-21	13	22	N/A >30 mins	N/A >30 mins
3	1-Aug-21	2-Aug-21	2	3	N/A >30 mins	N/A >30 mins
4	2-Aug-21	3-Aug-21	7	14	22	19
5	3-Aug-21	4-Aug-21	3	8	4	N/A >30 mins
6	4-Aug-21	5-Aug-21	6	15	17	28
7	5-Aug-21	6-Aug-21	17	26	16	N/A >30 mins
8	6-Aug-21	7-Aug-21	2	7	N/A >30 mins	N/A >30 mins
9	7-Aug-21	8-Aug-21	-11 (before sunset)	14	N/A >30 mins	N/A >30 mins
10	8-Aug-21	9-Aug-21	5	22	17	N/A >30 mins
11	9-Aug-21	10-Aug-21	5	20	9	N/A >30 mins
12	10-Aug-21	11-Aug-21	-6 (before sunset)	21	7	28



3.4.5.8 *Leisler's Bat Not Frequent*

It's noteworthy that Leisler's bat only accounted for 0.8% of the registrations (Table 3-8), despite being acoustically detectable over much longer distances than the other bat species due to its loud echolocation. It often emerges earlier in the evenings and returns later in the mornings while it is still bright, owing to its powerful and fast flight compared to other bat species (Jones & Rydell 1994). There were no instances of it being in the direct vicinity of site 3A close to sunset or sunrise during this passive detector deployment.

3.4.5.9 *Spring deployment of passive detector at Site 3A 23/03/2022 - 28/03/2022:*

The total registrations of each species or species groups for five consecutive nights in March 2022 are presented in Table 3-10. Brown long-eared bat was only detected twice in the spring deployment, compared to 1083 registrations in summertime (both periods of five full nights). Most springtime registrations were in the early part of the night, and very few later in the night. The timing of registrations after sunset for both common pipistrelle and soprano pipistrelle suggest that both of these species have minor spring day roosts in the building. Leisler's bat was not recorded at all at Site 3A during the March 2022 deployment, but it was recorded during the same 5 nights at Site 7B.

3.4.5.10 *Natterer's bat exploring inside roost.*

A new piece of information from this deployment was the presence of Natterer's bat flying inside the roost briefly on three nights in the middle of the night, possibly night-roosting, or just exploring. This species was rarely recorded during these surveys. Some of the other *Myotis* sp. registration had pulses which were too faint to identify with certainty.

Table 3-10: Total bat registration per bat species/group for a subset of 5 full nights 23/03/2022 - 28/03/2022 recorded from inside the multi-species bat roost at Site 3A

Bat species/group	Total	Percentage	Notes on species' acoustic detectability
Soprano Pipistrelle	33	10.2%	Many detected from outside, but also roosting - see text
Common Pipistrelle	277	85.2%	Many detected from outside, but also roosting - see text
Leisler's Bat	0	0%	-
<i>Myotis</i> sp.	13	4.0%	-
Brown Long-eared Bat	2	0.6%	-
Total	325	100.0%	-



Figure 3-7: Interior views of Site 3A which hosts roosts of four bat species; brown long-eared bat (maternity roost), and more minor roosts of whiskered bat, soprano pipistrelle, and common pipistrelle

Confirmed Bat Roost Summary Site 3A (roost of 4 bat species):

- Brown long-eared bat summer maternity roost of at least 18 individuals.
- Brown long-eared bat regular night roost.
- Whiskered bat regular summer minor day roost of estimated 2 individuals.
- Whiskered bat regular night roost.
- Soprano pipistrelle regular minor day roost of estimated 2 individuals.

3.4.6 Potential Roost Site 3B

Modern farm shed



As can be seen in Figure 3-8, the modern farm shed here had a corrugated iron roof supported on timber beams, and concrete and corrugated iron walls. The shed was open to ingress of daylight and was assessed as having low roost potential. The concrete walls did not have cavities in them where bats could potentially shelter. No bat signs were found.



Figure 3-8: Modern farm shed with low bat roost suitability.

3.4.7 Potential Roost Site 4

Low culvert pipe along Lisleagh Stream

This culvert pipe had negligible bat roost potential due to the small size of the pipe (Figure 3-9).



Figure 3-9: Negligible bat roost potential in small culvert pipe over Lisleagh Stream

3.4.8 Potential Roost Site 5

Occupied farm house with no access permission for bat surveys



The occupiers of this house (Figure 3-10) did not grant permission to survey the buildings. From afar, it was estimated to have moderate roost suitability due to its age and slate roof, although it cannot be said without assessing the potential bat access points from a closer viewpoint. Visual and dusk/dawn surveys are also recommended at this site in the future.



Figure 3-10: Farmhouse with estimated moderate bat roost suitability with no permission to survey.

3.4.9 3.1.8 Potential Roost Site 6

Ruins of stone house with no roof in middle of fields

This site had good cover of mature trees in its vicinity, and good habitat connectivity which generally favour bat roosting. However, there was low bat roost potential in this old stone ruin of a cottage because there was no roof left, and there were no suitably sheltered crevices left in the stonework of the walls (Figure 3-11). No evidence of bat roosting was found during a visual search.



Figure 3-11: Low roost potential in this ruins of a stone cottage due to no roof or suitable crevices in stonework

3.4.10 Potential Roost Site 7A

Small concrete block shed with corrugated iron roof



This shed had a corrugated iron roof and concrete block walls (Figure 3-12). The concrete blocks did not appear to be cavity blocks (where bats could potentially roost inside cavities). Bats could night roost along the roof timbers, but the building is unlikely to host more significant bat roosts, and was assessed as having low roost potential. No evidence of bat roosting was found during a visual search.



Figure 3-12: Small concrete block shed with low bat roost suitability



3.4.11 Potential Roost Site 7B

Old overgrown ruins of stone house with no roof

This old ruins of a stone cottage (Figure 3-13) also had good cover of mature trees and good habitat connectivity, generally favouring bat roosting. Despite having little of its former slate roof remaining, it was assessed as having moderate roost potential due to the availability of suitably sheltered crevices in its stonework where bats could shelter. There was also extremely thick cover of ivy in parts of the building that could also create shelter between the ivy and the stonework (Figure 3-14). The stonework crevices could for example provide winter hibernation crevices for a small number of bats in the same way that stone bridges can provide such roosts. It was not possible to conduct a summer dusk survey here due to the presence of a bull with cows and calves in the fields.

3.4.11.1 Passive Detector Monitoring Site 7B:

To assess possible winter/spring roosting here, a passive bat detector was left monitoring just outside the door of this building during 23 - 28 March 2022. The total registrations of each species or species groups for five consecutive nights in March 2022 are presented in Table 3-11. There was little to suggest roosting at this location at this time of year, although it can't be ruled out for soprano pipistrelle as it was detected at just 10 minutes after sunset on one evening.

Table 3-11: Total bat registration per bat species/group for a subset of 5 full nights 23/3/2022 - 28/3/2022 recorded from just outside of the old roofless stone ruins of a house at Site 7B

Bat species/group	Total	Percentage
Soprano Pipistrelle	170	26.9%
Common Pipistrelle	439	69.6%
Leisler's Bat	11	1.7%
<i>Myotis</i> sp.	8	1.3%
Brown Long-eared Bat	3	0.5%
Total	325	100.0%



Figure 3-13: Overgrown stone ruins of a stone cottage with no roof remaining



Figure 3-14: Thick ivy cover on the walls and crevices in stonework provide shelter for minor roosting opportunities

3.4.12 Potential Roost Site 8A* (Minor Bat Roost of Common Pipistrelle and Brown Long-eared Bat)

Derelict 2-storey house and older sheds beside modern farm sheds

No external signs of bat roosting were visible on the old unoccupied house and farm sheds shown in Figure 3-15 and Figure 3-16, and internal surveys were not possible because they were locked. The house had bat access through an open window and some loose slates, and had cover of tall trees and shelter provided by Dyrick Hill adjacent to this farmyard. It was estimated to have moderate roost suitability, and a dusk survey was carried out.



3.4.12.1 Dusk Emergence Survey Site 8A 30.7.2021

Common pipistrelle was observed at just 11 minutes after sunset, and probably emerged from the roof behind the chimney. One brown long-eared bat was also recorded flying in front of the house at just 36 minutes after sunset and is thought to have emerged but the exit point was not observed. Other common pipistrelle arrived on site from elsewhere during the survey and foraged in the farmyard. Other bat species recorded incidentally during the survey include whiskered bat, soprano pipistrelle, and Leisler's bat (just 2 registrations and not near sunset).

Confirmed Bat Roost Summary Site 8A:

- Brown long-eared bat minor day roost of one or small number of individuals
- Common pipistrelle minor day roost of one or small number of individuals



Figure 3-15: Derelict 2-storey farmhouse with probable minor roosts of Brown Long-eared Bat and Common Pipistrelle



Figure 3-16: Old sheds beside the above derelict farmhouse with low bat roost potential



3.4.13 Potential Roost Site 8B

Modern farm sheds beside derelict 2-storey house above

There was cover of tall trees and shelter provided by Dyrick Hill adjacent to this farmyard. However, these very large modern farm sheds (Figure 3-17) were assessed as having low roost potential. They had corrugated iron and Perspex roofs supported by largely a metal frame, and concrete and corrugated iron/Perspex walls. They were open to ingress of daylight and did not offer suitable roosting crevices. Bats could however use it for a shelter or night roost or foraging area during poor weather conditions for example. There were always a concentration of bats foraging at this farmyard during the walked transects.



Figure 3-17: Modern farm sheds with low bat roost potential.

3.4.14 Potential Roost Site 9

Modern farm shed on way to uplands

The modern farm shed in Figure 3-18 had low bat roost suitability and no evidence of roosting bats was found.



Figure 3-18: Modern farm shed with low bat roost suitability

3.4.15 Potential Roost Site 10*, (Brown Long-eared Bat Night Roost)

Ruins of small house near upland transect

There was no day-roosting evidence of bats at this ruins of a stone house with partial remains of a slate roof. One gable wall was entirely fallen down (Figure 3-19). There were some remains of lime mortar under the slates, and an area remaining with timber ceilings slats (Figure 3-19). It was easy to search for bat roosting evidence visually for this particular structure because it was small and accessible. There were only a small number of sparse droppings of brown long-eared bat stuck to the wall and behind a section of remaining timber ceiling sheeting, as shown in Figure 3-19, and the droppings were in different places during various site visits. This confirms that it is a minor night roost for one or a small number of brown long-eared bat. There would have been more droppings and feeding remains if it was a regular night roost. The building is not dark and sheltered enough to provided day-roosting opportunities for bats.

Confirmed Bat Roost Summary Site 10:

- Brown long-eared bat minor night roost of one or small number of individuals



Figure 3-19: Night roost of Brown Long-eared Bat showing section of timber ceiling sheeting in the back room

3.4.16 Potential Roost Site 11

Stone arch bridge over Lisleagh Stream

This single stone arch bridge over the Lisleagh Stream (Figure 3-20) was assessed as having moderate roost suitability due to the presence of some suitable crevices in the stonework of the arch which could potentially provide shelter to roosting bats. It would be suitable as a minor summer roost, transition roost, or as a minor hibernation roost for a small number of bats for example. However no bats or evidence of bat roosting was found during visual searches in summer, autumn, or spring. Bat droppings, if they were present, would however have fallen into the stream and been washed away so passive detector monitoring was undertaken to further investigate potential roosting here.

This bridge was also the location where 10-minute spot counts of bat activity were conducted during each of July, August and September in both 2021 and 2022. Soprano Pipistrelle dominated the recordings and observations at this bridge (83.2%, Table 3-4). *Myotis* sp. only comprised 3 bat registrations, while there were no records of other bat species, including Leisler's Bat during the spot counts (Table 3-4).



Figure 3-20: Some limited suitable roost crevices under the stone arch of the bridge. No bats found.



3.4.17 Potential Roost Site 12* (Whiskered Bat Summer Roost and Brown Long-eared Bat Roost)

Ruins of stone house and sheds in a farm courtyard.

This is a fairly large cluster of ruins of stone sheds and a house shaped into a courtyard, surrounded in cover of mature trees (Figure 3-21). There were a myriad of opportunities for bats to roost in crevices in the old house and sheds (and trees, see next section), although because the roofs were mostly missing or falling, there was not the highest of potential to support bat roosts. Sparse droppings were found of *Pipistrellus* sp. on window panes, and brown long-eared bat and another unknown bat species droppings on the ground, but not in sufficient concentration or numbers to indicate exactly where bats could be roosting. Some of the sheds were locked so a close-up internal survey could not be conducted in all sheds. The house was also too dilapidated and in a dangerous condition to conduct a full internal inspection. Therefore both dusk emergence surveys and passive bat detection were used to further assess the roosting situation (below).



Figure 3-21: Derelict farmhouse and farm sheds, with red arrow showing position of passive detector microphone which confirmed roosts of whiskered bat and brown long-eared bat

3.4.17.1 Passive Bat Detector Recordings Site 12, 30/7/2021 - 6/8/2021:

While conducting the walked transect WT4 on 30/7/2021, which goes past the courtyard here, high levels of brown long-eared bat and whiskered bat activity were observed in the courtyard, despite these species being relatively difficult to detect acoustically. It was therefore considered highly likely that there would be a roost of both of these species here. This prompted the deployment of a passive bat detector from 30/7/2021 to 7/8/2021 to investigate further. The microphone was positioned facing into the farm courtyard from a gap above a locked gate on a coach house on the east side of the courtyard (red arrow in Figure 3-22).



The analyses of this deployment confirmed that the courtyard sheds or house host both a roost of whiskered bat and a roost of brown long-eared bat, with high levels of these species recorded on every night, at levels that would generally only occur where there are roosts. Full details of the recordings for these species for 7 nights are presented in Table B1 in Appendix 3 (excluding registrations of soprano pipistrelle, common pipistrelle, and Leisler's bat which were also recorded in the farmyard). This site was confirmed as a summer day roost of whiskered bat during dusk emergence surveys (described below). It is at least an important regular night roost of brown long-eared bat, and probably a day roost of brown long-eared bat given that this species was consistently there every night, quite often within an hour of sunset or sunrise (Appendix 3B) (and this despite its low acoustic detectability).

The total registrations of each species or species groups for a subset of three consecutive nights are presented in Table 3-12. There was no evidence of roosting of Leisler's bat evident during the dusk emergence surveys, or from the timestamps of the Leisler's activity on the passive detectors. It was not usually recorded within typical emergence or roost return periods for this species, except for one morning there was brief activity recorded at two minutes to sunrise and another morning with brief activity at 10 minutes to sunrise. This species tends to fly in brighter conditions than the other bat species, and so this does not necessarily mean it was roosting nearby.

Table 3-12: Total bat registration per bat species/group for a subset of 3 full nights 31/7/2021-3/8/2021 recorded in the farm courtyard at Site 8A

Bat species/group	Total	Percentage
Soprano Pipistrelle	421	32.9%
Common Pipistrelle	331	25.9%
Leisler's Bat	175	13.7%
Brown Long-eared Bat	176	13.8%
<i>Myotis</i> sp.	177	13.8%
Total	1280	100.0%

3.4.17.2 Dusk Emergence Survey Site 12, 1st of 2, 11/8/2021:

A count of ten whiskered bat were observed emerging from the southeast corner of the house ruins between 30 minutes and 50 minutes after sunset. This confirms a summer day roost of this species, and possibly a maternity roost given the number of individuals. A soprano pipistrelle was observed at 17 minutes after sunset but was not seen emerging from the buildings. Common pipistrelle, Leisler's bat and Daubenton's bat were also incidentally recorded during the emergence surveys but were not observed emerging from the buildings. Brown long-eared bat was not recorded during this emergence survey despite its prevalence on the passive detector recordings.



Figure 3-22: Front (south) of the house (left photo) and back of the house (right), showing most of the roof gone. Red arrow indicates area where 10 x whiskered bat observed during dusk emergence survey

3.4.17.3 Dusk Emergence Survey Site 12, 2nd of 2, 9/9/2022:

An estimated count of just four whiskered bat were observed at the southeast corner of the house ruins, but this time they seemed to appear from either a shed or a tree beside the house rather than the house. The first was recorded but not visually seen at just 30 minutes after sunset, with this early emergence time again confirming the day roost. There were other *Myotis* sp. recordings after this but because there was constant flying of common pipistrelle and soprano pipistrelle around the buildings during this survey, the quieter species were not discernible on the night. Soprano pipistrelle was active foraging constantly on the site from just 16 minutes after sunset, and common pipistrelle from 21 minutes after sunset. The pipistrelles were not observed emerging from the buildings. Note that there are also trees with PRFs adjacent to this farmyard that could support bat roosts (next section). Brown long-eared bat was recorded and observed 8 times during the survey starting from 51 minutes after sunset, but it did not prove possible to see where it had come from and whether it emerged from buildings at the site or arrived to the site from elsewhere. It is probably a day roost of brown long-eared bat at the site given that it is consistently there every night, quite often within an hour of sunset or sunrise (Appendix 3A).

Note that there were unusually high levels of whiskered bat activity along much of the tree-lined lane leading southwards from the roost site to the road after the dusk emergence survey above. There seemed to be many of them flying and foraging.

This site was confirmed as a summer day roost of whiskered bat (possibly a maternity roost) during dusk emergence surveys, and backed up by passive detector monitoring. The exact roosting space of the whiskered bat could not be found visually. The site is also at least an important regular night roost of brown Long-eared bat, and is probably also a day roost of brown long-eared bat given that this species was consistently there every night of passive detector monitoring, quite often within an hour of sunset or sunrise (Table B1, Appendix 3). Brown long-eared bat was also observed on site several times during the second dusk emergence survey, but it did not prove possible to find its exact roosting location somewhere in this farmyard.

Confirmed Bat Roost Summary Site 12:

- Whiskered bat summer day roost, possibly maternity roost of estimated 10 individuals
- Brown long-eared bat important regular night roost



Figure 3-23: Photographs from the farm courtyard at Site 8.

3.4.17.4 Potential Roost Site 13

Rock face of small stone quarry

Bats can sometimes roost in crevices in quarries and rock faces, including in winter. This rock face was visually assessed for suitably deep and sheltered crevices and none were found. It was assessed as having low roost suitability.



Figure 3-24: Rock face of small quarry had low bat roost potential

3.5 Assessment of Winter Roost Site Suitability

As mentioned, there were no known underground caves, mines or cellars within or near the site boundary, and these are places where bats often tend to have hibernation roosts. The stone arch bridge, a quarry rock face, and all accessible cracks and crevices in the stonework of the ruins on site were assessed for winter hibernation suitability, and also searched for roosting bats, in March 2022. No bats themselves or bat signs such as droppings were physically found during these searches. No potential major hibernation sites were identified. There was minor hibernation potential in the stonework of ruins at sites 1, 2A, 3A, 6, 7B, 12, under the bridge at Lisleagh Stream, and also in some PRFs noted in trees.

3.6 Potential Roost Features (PRFs) in Trees

The following Potential Roost Features (PRFs) were noted in trees on site, labelled 1-18 in Table 3-13, and on the map in Figure 3-25 (tree numbers sorted by latitude). Corresponding photographs showing tree and PRFs are numbered in the same way in Table 3-14.


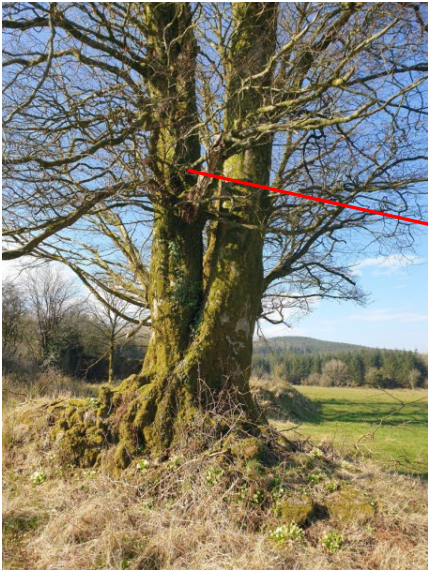






Table 3-13: Trees on site with Potential Roost Features (PRFs)







Label	Tree species	Latitude	Longitude	Roost potential	PRF notes
1	Scots Pine and other trees here	52.204146	-7.781153	Low	Wooden bat boxes and bird boxes attached to group of trees here
2	Beech	52.198888	-7.770748	Low	Mature beech forked stems. Rot hole
3	Sycamore	52.198701	-7.770725	Low	Crevice behind thick ivy stem
4	Sycamore	52.198599	-7.771209	Low	Rot hole
5	Patch of woodland	52.196954	-7.770167	Unknown	Not accessible
6	Scots Pine	52.193130	-7.782903	Low	Mature tree with dense ivy, split beam
7	Ash	52.192803	-7.747631	Moderate	Mature tree with dense ivy. Knot hole. Split branch. Hollow.
8	Beech	52.192619	-7.748378	Moderate	Two large tear out hollows. Bird nesting material visible
9	Ash	52.191141	-7.747662	Low	Very mature ash tree with thick old dense ivy cover, near gate to field
10	Not noted - group of two trees	52.191141	-7.747662	Low	Hollows in trunks of group of two trees. Also tree with thick ivy cover beside east gable of house ruin at Site 12
11	Ash	52.191141	-7.747662	Low	Thick ivy cover. Tree against back wall of eastern sheds in farm courtyard. Site 12.
12	Beech	52.191088	-7.748044	Moderate	Very mature beech in patch of woodland with holes in trunk - rot holes maybe
13	Ash	52.190543	-7.747970	Low	Dense ivy on ash near farm gate
14	Beech	52.189271	-7.746124	Low	Rot hole
15	Beech	52.189271	-7.746124	Moderate	Split limb. Knot holes. Compression forks. Fluting in trunk. Tear out.
16	Beech	52.189271	-7.746124	Low	Tear out
17	Conifer	52.189181	-7.745934	Low	Dense ivy cover
18	Beech	52.188902	-7.745560	Moderate	Double leader PRF. Mature beech with large vertical cavity between compression fork of two trunks








Table 3-14: Corresponding photographs of trees and PRFs labelled below photograph with tree numbers from Table 3-13.

		
1	2a	2b
		
3	4a	4b



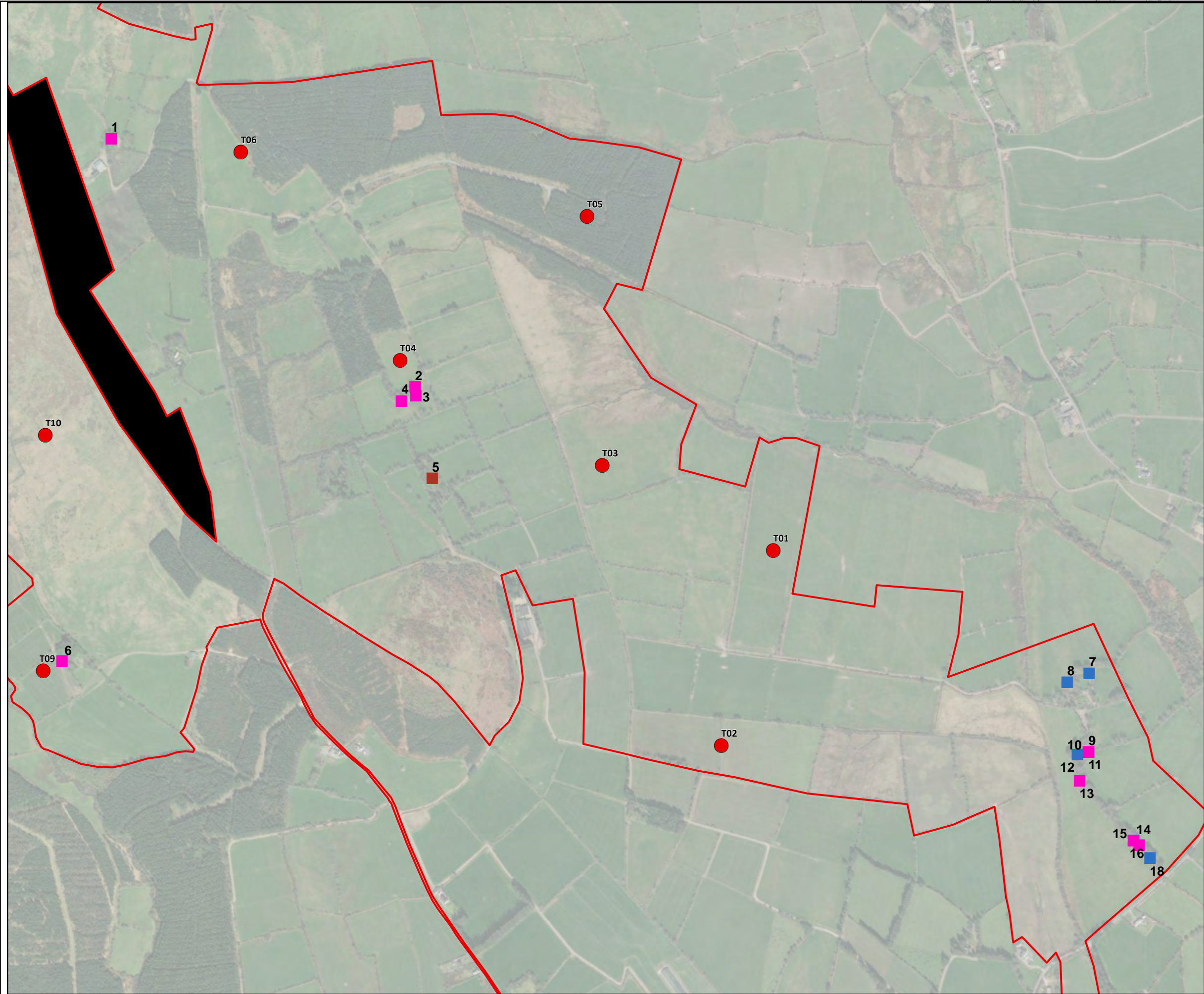
		
6	7a	7b
		
8a	8b	8c



		
9	10	11
		
12a	12b	13



		
14	15	16a
		
16b	17	18



- Site Boundary
- Excluded Coillte Lands
- Turbine Layout
- Roost Potential**
- Low
- Moderate
- Unknown

TITLE:	
Trees with potential roost features (PRFs)	
PROJECT:	
Dyrick Hill Wind Farm	
FIGURE NO:	3-25
CLIENT:	EMPower
SCALE:	1:8782
DATE:	12/04/2023
REVISION:	0
PAGE SIZE:	A3



3.7 Summary of the results of 2021 and 2022 bat surveys

Table 3-15 provides a summary of the bat assessment. It outlines whether a bat species identified for the desktop study was subsequently recorded within the development and grid application during the bat surveys that took place in 2020-2022.

Table 3-15: Bat Survey Summary Results

Bat Species	Desktop Study	Roost Surveys	Activity Surveys	Static Detectors
Pipistrelle bat	Yes			Yes
Myotis bat			Yes	Yes
Common pipistrelle		Yes	Yes	Yes
Soprano pipistrelle	Yes	Yes	Yes	Yes
Nathusius' pipistrelle				Yes
Leisler's bat	Yes		Yes	Yes
Daubenton's bat				Yes
Whiskered bat		Yes		Yes
Natterer's bat				Yes
Brown long-eared bat		Yes		Yes



4. ECOLOGICAL EVALUATION

4.1 Bat species recorded and Sensitivity

Eight species of bat were recorded during the bat surveys at the development. The table below provides an ecological valuation of each bat species and the collision risk factor in relation to wind farms. Four of the bat species recorded are considered to be High risk.

Table 4-1: Ecological evaluation of the bat species recorded during the bat survey (CIEEM Guidelines, 2019) and “Bat Risk” in relation to Wind Turbines (SNH, 2019 and 2021).

Ecological Value	Geographical Scale of Importance	Bat Risk
International	Leisler’s bat	High
Regional	Nathusius’ pipistrelle	High
	Brown long-eared bat	Low
	Natterer’s bat	Low
Local	Soprano pipistrelle	High
	Common pipistrelle	High
	Whiskered bat	Low
	Daubenton’s bat	Low

Using the SNH guidelines outlined in Table 2-7, the following risk assessment for the individual turbines in relation to each bat species recorded was completed using the following values:

- Project Size = **Medium** (>10 turbines, other wind energy developments within 10km)
- Habitat Risk = **Moderate** (Suitable foraging habitat and connectivity to the wider landscape via linear features)

Therefore, a Site Risk Assessment score value of 3 was applied to the Site as a whole.

4.2 Impact Assessment

As all detector locations had several nights of high activity (>100 passes per species per night) for the high collision risk species, as well as the proximity to confirmed bat roosts, it is considered that all proposed turbine locations have a High Risk Factor for bats, in the absence of mitigation.

4.3 Habitat Assessment

Improved agricultural grassland (GA1), and Wet grassland (GS4)

This habitat along the boundaries may offer valuable commuting and foraging habitat for common bat species especially common pipistrelle and Leisler’s bat. Low-Medium ecological value for bats.



Scrub (WS1), and Recently-felled woodland (WS5)

May provide foraging areas for bats with some commuting potential. Low-Medium ecological value for bats.

Dry heath / Acid Grassland (HH1/GS3).

These areas provide little foraging habitat for bats and are not suitable for commuting for the majority of bat species, excluding Leisler's bats which do not rely on linear landscape features to commute from roosting site to foraging habitats. Low ecological value for bats.

Hedgerow (WL1), Treeline (WL2), and access tracks (Buildings and artificial surfaces (BL3), and Recolonising bare ground (ED3)).

These provide wildlife corridors and foraging areas for many bat species. These linear habitats are essential for commuting bats. High ecological value for bats.

Conifer Plantation(WD4), Riparian Woodland (WN5)

These habitat types, especially along the edge of such, can provide foraging areas for bats with some commuting potential. Its importance is higher when associated with treelines/hedgerows connecting in the landscape. High Ecological value for bats (edge habitat only for WD4).

Eroding/upland rivers (FW1) and Drainage ditches - FW4

There is a large array of riparian ditches in the survey area, rivers, and a small number of areas of open water. Where these are located adjacent to scrub, hedgerows/treelines, their value to bats is higher and creates an area of medium ecological value for commuting and foraging bats. Medium Local value for bats.



4.4 Discussion

As per Nature Scot (2021) guidance, wind farms present four potential risks to bats: (i) Collision mortality, barotrauma and other injuries, (ii) Loss or damage to commuting and foraging habitat, (iii) Loss of, or damage to, roosts (iv) Displacement of individuals or populations

In total, five sites within the proposed wind farm boundary were confirmed to host bat roosts of single species or multiple species of bat. Bat roosts involve the following four bat species; Brown Long-eared Bat, Whiskered Bat, Soprano Pipistrelle, and Common Pipistrelle. There were no bat roosts found of the Irish bat species which are at the highest risk of death by collision/barotrauma at windfarms, namely Leisler's Bat and Nathusius' Pipistrelle (Nature Scot, 2021). These species habitually forage and commute in open airspace and at the heights of the rotor swept area of wind turbines. There were relatively few encounters with Leisler's Bat throughout the surveys, despite it having much higher acoustic detectability than the other bat species. There were no records of Nathusius' Pipistrelle.

Soprano Pipistrelle and Common Pipistrelle are identified as being the next most vulnerable group of bats to collision fatality at wind farms in Ireland (Nature Scot, 2021). A minor but regular day roost of Soprano Pipistrelle and a minor roost of Common Pipistrelle (estimates of a small number of individuals) was found at the multi-species bat roost at the ruined cottage at site 3A. There are relatively low numbers of pipistrelles roosting in these locations, and the roosts do not have as high of conservation significance as maternity roosts for example. These species are widespread and common in Ireland, and will generally be recorded at sites throughout the country. Their status as widespread species with a high risk of collision mortality puts them in the category of species with medium population vulnerability to wind farms (Nature Scot, 2021). As the roosts of these species are minor day roosts, and not maternity roosts, the proposed wind turbines are not anticipated to have a negative impact on roost populations.

A bat roost survey of the farm house and sheds at Site 5 needs to be undertaken, as there was no access permission during the present surveys.

Day and night roosts of some of the bat species which are considered to be at the lowest risk of collision fatality at wind farms as per Nature Scot (2021), namely Whiskered Bat and Brown Long-eared Bat were found at sites 2A, 3A, 8A, 10, and 12. There is a maternity roost of Brown Long-eared Bat (at least 18 bats) and a regular minor day roost of Whiskered Bat (estimate 2 bats) at Site 3A. There is a summer day roost, which is probably a maternity roost, of Whiskered Bat (at least 10 bats), and a regular night roost and probable day roost of Brown Long-eared Bat at Site 12. Maternity roosts are roost types with a high conservation significance because this is where mothers gather to give birth and rear their pups (Marnell, Kelleher & Mullen 2022). The regular summer day roosts/likely maternity roost at Site 12, and the regular minor day roost at 3A of Whiskered Bat represent bat roosts of relatively high conservation significance on a regional scale because Whiskered Bat is one of Ireland's rarest bat species, and there remain many knowledge gaps about its roosts (Roche et al. 2014). The minor night roost of Brown Long-eared Bat at Site 10 would have the lowest conservation status of all of the roosts of this species on the site, because it is only occasionally used at night.



All of the confirmed roost buildings are outside of the direct footprint of the proposed turbines, and will be left intact during wind farm construction and operation. Brown Long-eared Bat and Whiskered Bat have typically low flight heights and low collision risk, the construction and operation of the proposed turbines is not anticipated to have a long-term negative effect on the confirmed day roosts (including and likely maternity roosts). Although not as a result of the proposed wind farm, all of the roosts in the area are in an advanced stage of dilapidation. It would provide long-term mitigation for the bat populations if portions of some of the stone ruins could be re-roofed for bats. This could be done for sections of buildings, if not all the building. A pitched slate roof over type 1F bitumen felt underlaid with roof timbers leaving an uncluttered roof void would be ideal. Sections of the roof should also have timber ceiling slats, like those still remaining in part of the ceiling at Site 3A. The advice of a suitably qualified ecologist should be sought in relation to the design of roost improvement measures.

Eighteen trees with Potential Roost Features were identified on site via a basic ground level tree survey. There is a probability that some of these trees would require felling if the wind farm is granted permission. This may result in the loss of potential or actual bat roosting (and foraging) opportunities. Best practice in tree-felling with respect to protection of potential bat roosts should be employed, including hiring a climbing specialist with bat training and licensing to check roost features with an endoscope for bats where necessary. If bat roosts are confirmed, then it would be necessary to apply for a bat roost destruction derogation license from the National Parks and Wildlife Service. Bat boxes should be erected on suitable trees on site to compensate for the loss of potential natural tree roosting opportunities. Compensatory planting of native tree species, including many Oaks, should be carried out on site to eventually compensate for any loss of trees. Many more trees should be planted than are felled because of the fact that it will take many years for planted trees to gain the ecological functionality of mature trees that may need to be felled.

Opportunities to improve the overall landscape connectivity of the site via the planting of native trees and native hedgerows wherever feasible should be explored. This would be beneficial to all bat species present, and of particular benefit to Brown Long-eared Bat and Whiskered Bat. The advice of a suitably qualified ecologist should be sought in relation to the design of connective elements and the species composition of native trees and shrubs.

Lighting Restrictions: Brown Long-eared Bat and Whiskered Bat are highly averse to artificial night lighting. Artificial night lighting should be avoided throughout the site. If lighting is needed it should be motion-sensor (without being triggered by bats or owls) be downward directed minimising light spill beyond the task area, and be automatically switched off after a short time. The advice of a suitably qualified ecologist should be sought in relation to the lighting design, but the main aim needs to be avoiding light.

All bats recorded are classified as 'Least Concern' on the Irish Red List and protected under the EU Habitats Directive Annex IV and Wildlife Acts.

There is a potential High impact to bat species for all turbine locations in the absence of mitigation.

4.5 Constraints

As detailed earlier, all Irish bats are protected under the Wildlife Act (Revised). Destruction, alteration, or evacuation of a known bat roost is a notifiable action under current legislation and a derogation licence must be obtained from the National Parks and Wildlife Service (NPWS) before works can commence.

In addition, it should be noted that any works interfering with bats and especially their roosts, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by the NPWS.



4.6 Potential Impacts

As outlined by NatureScot (2021), wind farms can affect bats in the following ways:

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

Furthermore, as indicated in Richardson et al (2021) common pipistrelle bats may be attracted to wind turbines. The study showed common pipistrelle activity was 37% higher at turbines than at control locations. Soprano pipistrelle shows no increase in activity between the turbine and control locations. The study further discussed, the observed higher levels of activity could be because there are more bats around turbines, or because animals spend more time in these locations relative to controls, even if the number of individual common pipistrelles remains the same. We cannot distinguish between these possibilities using acoustic data. However, either way, higher levels of activity around turbines is likely to increase fatality risks and help to explain why fatality rates are often not predicted by acoustic surveys for common pipistrelle activity conducted prior to facility construction.



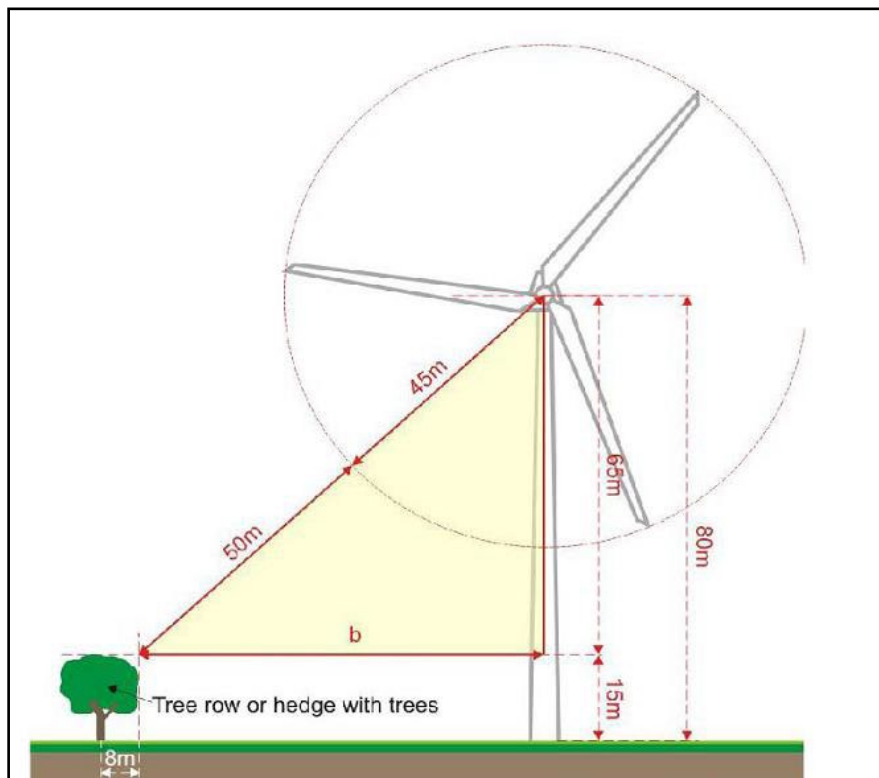
5. MITIGATION

5.1 Mitigation during Construction Phase

According to SNH (2021) guidance:

“The Eurobats guidance recommends a 200m buffer around woodland areas. There is, however, currently no scientific evidence to support this distance in the UK and it is recommended that a distance of 50m between turbine blade tip and nearest woodland (or other key habitat features such as wetlands etc.) is adequate mitigation in most, lower risk situations. Exceptionally, larger buffers may be appropriate, e.g. near major swarming and hibernation sites. The longevity of wind farms should also be taken into account and the maximum growth, or management, of woodland and other relevant habitat features considered in their planning.

These distances were taken into account during the design phase of the development. The following formula was used to calculate the required felling buffer for each turbine (taking into account the height of surrounding woodland/plantations at each turbine location):



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

where: b = the distance on the ground
between the edge of the canopy and the turbine (m)

bl = blade length (m)

hh = hub height (m)

Note: fh for each turbine location is detailed in Table 5-1 below



Each of the locations of the eleven turbines was surveyed and the bat activity findings recorded informed the application of the 96.12 m or 85.8 m blade tip buffer at turbine locations, dependant on the surrounding habitat. Surrounding habitats, height of surrounding trees and felling buffer calculated using the above equation are included in Table 5-1 below.

To minimize risk to bat populations, a buffer zone is recommended around any treeline, hedgerow, woodland feature, into which no part of the turbine should intrude. The buffers recommended for each turbine is presented in Table 5-1.

Table 5-1: Assessment of potential turbine/bat conflict zones (based on turbine blade length 162m)

Turbine number	Habitats Requiring Felling	Surrounding Tree/Hedgerow Height (fh/m)	Felling Buffer Radius (m)
T01	Hedgerows	5	85.8
T02	Hedgerows	5	85.8
T03	Hedgerows	5	85.8
T04	Conifer Plantation	15	96.12
T05	Conifer Plantation	15	96.12
T06	Conifer Plantation	15	96.12
T07	Hedgerows	5	85.8
T08	N/A	N/A	N/A
T09	Hedgerows	5	85.8
T10	N/A	N/A	N/A
T11	N/A	N/A	N/A
T12	N/A	N/A	N/A
T13	N/A	N/A	N/A

Existing trees / scrub will be cleared around eight turbines, T01, T02, T03, T04, T05, T06, T07 and T09 to provide a vegetation-free buffer zone around each turbine. The minimum distance has been taken into consideration for felling of conifer plantation around wind turbines. All buffers will be maintained throughout the lifetime of the wind farm.

The following mitigation measures for bats are recommended:

5.1.1.1 Supervision of vegetation clearance

An ecologist/ECOW will supervise areas where vegetation, scrub and hedgerow removal will occur prior to and during construction as appropriate (e.g., ecologist may be required during some clearance works of areas where vegetation is too dense to check beforehand). This will ensure that any site-specific issues in relation to wildlife not currently present (e.g., Bat roost locations) on site will be discovered prior to commencement of works to allow appropriate mitigation measures to be put in place. In the event that an issue arises, the NPWS will be informed and the relevant guidelines will be implemented as appropriate (e.g. NRA guidelines).



5.1.1.2 Diversion from turbines via Hedgerow and Treelines

Linear features such as hedgerows and treelines serve as commuting corridors for bats (and other wildlife). Vegetation buffer clearance around turbines will alter commuting and foraging routes associated with existing hedgerows and woodland edges to avoid bats entering the rotor sweep zone of turbines. Hedgerow and treeline planting will be carried out for the Proposed Development. This will reinstate or replace linear habitat loss to ensure no net loss of these habitats occurs.

Where hedgerows and treelines are affected by turbine clearance buffers, bats will be directed away from tree-free buffers along an alternative commuting route. Where bat buffers are applied, the surrounding hedgerows and treelines should act as commuting corridors, leading bats away from the turbine location, and these hedgerows should not end abruptly at the bat buffer zones. This will be achieved by planting new pollinator-friendly hedgerows, connecting existing hedgerows onsite, around the bat buffers. Willow and Alder will also be included in these hedgerows due to their rapid growth. It is proposed to create double lines of hedgerow, with Willow on one side, and pollinator-friendly hedgerow species listed below on the other. Planting of these species will be staggered to prevent excessive shading and aid establishment of the hedgerows.

All hedgerow planting is required to use plants of native provenance. The landscaping contractor is required to be informed well in advance to allow the acquisition of suitable native stock. 2–3-year-old alder and willow trees are required for hedgerows to help accelerate establishment. These will be supplemented with planting of whips.

The following fast-growing damp tolerant species are to be planted along the inner edges of these hedgerows: grey willow *Salix cinerea* and alder *Alnus glutinosa*. The following native fruiting hedgerow species are to be planted along the outer edges of these hedgerows: whitethorn *Crataegus monogyna*, elder, Holly *Ilex aquifolium* and rowan *Sorbus aucuparia*.

Tightly cut hedgerows with flat tops provide little benefit to wildlife, taller and bulky hedgerows are required as this provides more shelter for wildlife. When the hedgerows are maintained, stems will be cut a little above the last cut as cutting back to the exact same point depletes the energy of the hedgerow, forms a build-up of scar tissue which discourages new growth.

Light annual cutting of hedgerows is not good for wildlife as it limits the production of flowers and fruit. The sites hedgerows will be cut every three to four years in rotation if cutting is required, as this will leave areas of undisturbed hedgerows. Cutting equipment used will be sharp so as not to shatter or fray the hedge. Shattering and fraying allows for disease to enter plants and can lead to decay and weaken the vigour of the hedgerow. A finger-bar cutter is recommended as the most appropriate tool to minimise fraying and smashing of branches (Heritage Council, 2017). A flail-type hedge cutter is unsuitable for hedge trimming in situations where hedgerow health is a priority.

Hedgerow maintenance will not be carried out between the 1st of March and 31st of August as this is the nesting period for birds and any maintenance at this time will disturb breeding; this is in keeping with the Wildlife Act 1976 (as amended).

5.1.1.3 Lighting restrictions

In general, artificial light creates a barrier to bats so lighting should be avoided where possible. Construction operations within the wind farm site will take place during the hours of daylight where possible to minimise disturbances to faunal species at night. Where lighting is required, directional lighting (i.e. lighting which only shines on work areas and not nearby countryside) will be used to prevent overspill.



This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only.

It is understood that flashing red aviation lights will be provided on perimeter turbines. These will not negatively impact bats (Bennett and Hale, 2014).

5.1.1.4 Pre-construction Survey

If three years lapse from between planning-stage surveys in 2021 and installation of the wind turbines, it will be necessary to repeat one season of surveys during the activity period. Future survey work will be completed according to best practice guidelines available (SNH, 2019/ 2021; Hundt, 2012 & Collins, 2016).

5.1.1.5 Enhancement of roost site 3A

The old ruined stone cottage at roost site 3A was in a very dilapidated state, but still had a good part of its slate roof intact. Some of the slate roof had fallen in and some had been replaced with corrugated iron sheeting (Figure 3-5). The roost was noted as a day roost for brown long-eared bat on the 24th of July 2021. During a follow up emergence survey on the 6th of August 2022 the following species and counts emerged, noting their exit points from the roost:

- Soprano pipistrelle x 2, one out open window at front (north), and one out open door at back (south).
- Whiskered bat x 2 - both flew out through the eastern gable window.
- Brown long-eared bat x 18 - all flew out through the eastern gable window.

No evidence of roosting bats were observed during the winter hibernation period. However, there was minor hibernation potential in the stonework of ruins at the site.

The NPWS bat mitigation guidelines (2022) notes the following roost requirement for these three species

Table 5-2: Species-specific roost types (NPWS, 2022).

Species	Summer/maternity roosts	Hibernation sites
Brown long-eared bat (<i>Plecotus auritus</i>)	Hole dwellers. Readily fly within roof voids. Often in crevices by day, although sometimes in the open and clustered against ridge beams.	Found in tree holes, roofs and underground
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	Crevice dweller, but sometimes enters roof voids. Does not normally require light-sampling areas	Hibernates in a variety of places, which may be quite exposed. Frequently in cavities in buildings, rarely underground.
Natterer's bat (<i>Myotis nattereri</i>)	Crevice/hole dweller; may require lightsampling areas. Frequent in crevices in timbers in old barns.	Found hibernating underground, though most individuals probably elsewhere.



Proposed enhancement works

The proposed enhancement works will consist of the following:

- Careful restoration of the existing roof and walls (if required) of the building to ensure its structural integrity in the future.
- Maintenance of all existing openings, cracks and crevices used by bats within the structure to ensure the continued use of the site by all three species.
- Maintenance of existing access to roosting site within the building including access to the attic space.
- Maintenance of existing treelines/hedgerows surrounding the building and enhancement of these feature through the planting of native broadleaved trees in gaps.
- Ivy and other vegetation on the building will be left in situ to ensure the current natural conditions are maintained.

All proposed enhancement works will be carried out under the full supervision of an experience bat specialist and under the conditions of a derogation licence. Works will be undertaken during daylight hours with the use of artificial lighting during the hours of darkness to be prohibited. A preconstruction survey shall be carried out prior to any works being completed to re-confirm the findings of the assessment and account of any likely time lag between the surveys completed to date and the timing of works.

Temperature

The building will be designed so as to provide a suitable thermal regime (42°C is optimum). For maternity sites, this is likely to require a fairly steeply pitched roof with one pitch facing south, so as to achieve high temperatures (up to 50°C maximum) in summer but with a choice of roosting temperatures. Dark-coloured roof coverings, such as black slates, will help to produce high temperatures.

Timing of works

The most common and effective method of avoiding disturbing bat roosting within a building is to carry out the work at an appropriate time of the year. The great majority of roosts are used only seasonally, so there is usually some period when bats are not present. Although there are differences between species, maternity sites are generally occupied between May and September and hibernation sites between October and March, depending on the weather. Brown long-eared, tend to remain in summer sites until well into autumn or even winter, so care will need to be taken when scheduling the proposed enhancement works.

The presence of scaffolding during the active bat season may hamper bat access and therefore this will need to be removed to ensure access is maintained during the activity season. The best times for enhancement works are during the spring and autumn. At these times of the year the bats will be able to feed on most nights and may be active or torpid during the day, depending on weather conditions, but will not have begun giving birth. Active bats will usually keep out of the way of any operations, but torpid bats may need to be gently moved to a safe place, preferably without causing them to fly out in daylight. Wherever possible, the objective should be to persuade bats to move of their own accord and they should be physically moved only as a last resort. Repeated disturbance to bats during the winter can seriously deplete their food reserves, but, unless significant numbers of bats are known to be hibernating in a building, there is no advantage in requesting a deferment of scheduled works. Any moving or handling of bats requires a licence.



Remedial timber treatment

Repair and restoration of old or derelict buildings often requires remedial timber treatment against infestations of wood-boring insects. Although most treatment chemicals now in general use are safe once dry, the application of products must be avoided when bats are present. In most cases, this is a matter of timing the work so as to avoid the summer months, but there may be occasions where small numbers of bats must be persuaded to move away.

Breathable membranes

Modern roof linings and breathable membranes that are composed of fibres have been shown to trap and ensnare bats causing mortality. These are commonly called “Non-bitumen coated roofing membranes”. The use of these materials will not be prohibited for the proposed enhancement works. Older linings such as mineral felt or rough timber will be used to facilitate bat roosting.

5.1.2 Mitigation during Operational Phase

Turbines will operate in a manner which restricts the rotation of the blades as far as is practicably possible below the manufacturer’s specified cut-in speed (SNH 2021). This is usually achieved by feathering the blades during low wind speeds; the angle of the blades is rotated to present the slimmest profile possible towards the wind, ensuring they do not rotate or ‘idle’ when not generating power.

Turbine blades spinning in low wind can kill bats, however bats cannot be killed by feathered blades which are not spinning (Horn et al., 2008). The feathering of turbine blades combined with increased cut-in speeds have been shown to reduce bat fatalities by up to 50% (SNH 2021). As such, the feathering of blades to prevent ‘idling’ during low wind speeds is proposed for all turbines.

5.1.2.1 *Cut-in Speeds/Curtailment*

Increasing the cut-in speed above that set by the manufacturer can reduce the potential for bat/turbine collisions. A study by Arnett et al. (2011) showed a 50% decrease in bat fatality can be achieved by increasing the cut-in speed by 1.5 m/s.

Species with elevated risk of collision (Leisler’s bat, soprano and common pipistrelle) in particular would benefit from increasing the cut-in speed of turbines, as dictated on a case-by case basis depending on the activity levels recorded at each turbine.

Cut-in speeds should be increased during the bat activity season (April-October) or where temperatures are optimal for bat activity to 5.5 m/s from 30 minutes prior to sunset and to 30 minutes after sunrise at turbines where surveillance shows high bat activity levels for High and Medium-Risk species and/or if bat carcasses are recorded.

The duration required depends on the level of mitigation required for each individual turbine i.e. a full bat activity season or only spring and autumn (duration will be determined by the first year of surveillance).



Cut-in speeds restrictions will be operated according to specific weather conditions:

- When the air temperature is greater than 7°C (as bat activity does not usually occur below this temperature).
- Generally, bat activity peaks at low wind speeds (<5.5m/s). As such, it has been shown that curtailing the operations of wind turbines at low wind speeds can reduce bat mortality dramatically, particularly during late summer and the early autumn months.

Due to the considerable unnecessary down time resulting from the proposed “blanket curtailment” (above) and the advances in smart curtailment a focused curtailment regime is further proposed from the year two of operation.

This will focus on times and dates, corresponding with periods when the highest level of bat activity occur within the Site. This includes the use of the SCADA (Supervisory Control and Data Acquisitions) operating system (or equivalent) to only pause/feather the blades below a specified wind speed and above a specified temperature within specified time periods.

Post-construction surveys will be undertaken for the first three years of operation to confirm if blanket curtailment restrictions can be amended in line with post-construction activity levels. The post construction surveys will be used to update the current curtailment regime (blanket curtailment) designed around the values for the key weather parameters and other factors that are known to influence collision risk. This will include 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)

5.1.2.2 *Post Construction surveys*

Monitoring will take place for at least 3 years after construction, providing sufficient data to detect any significant change in bat activity relative to pre-construction levels. It will assess changes in bat activity patterns and the efficacy of mitigation to inform any changes to curtailment.

During years one to three of operation (under blanket curtailment restrictions) bat activity will be measured continuously between April and mid-October at each turbine location, in combination with carcass surveys. In addition, wind speed and temperature data will be continuously recorded at the nacelle height of each turbine.

Modern remotely-operated wind turbines as proposed here allow cut-in speeds to be controlled centrally/automatically, facilitating an operation regime designed to minimise harmful impacts to bats.

The feathering of turbine blades combined with increased cut-in speeds have been shown to reduce bat fatalities from 30% to 90% (Adams et al., 2021, Arnett et al., 2011, 2013; Baerwald et al., 2009). The most recent of studies showed a 63% decrease in fatalities (Adams et al., 2021).



5.1.2.3 *Monitoring Curtailment*

If, following the initial 3 years of post-construction surveys, bat activity increases above the baseline and/or remains consistently high and carcass searches indicate fatalities are occurring (refer below), increased cut-in speeds will continue. This will subsequently be monitored in years 5, 10 and 15 with further review after each monitoring period.

Alternatively, if it is found that the results of bat activity surveys and fatality searches confirm that the level of bat activity at turbine locations is reduced (to low) then consent will be sought from Carlow County Council (in consultation with NPWS) for the cessation in the requirement for these cut-in speeds / curtailment measures, or a reduction on the timing restrictions for these measures.

Where post construction acoustic surveys are undertaken, they will utilise full spectrum automatic detectors deployed, as a minimum, for one complete bat activity season.

Acoustic monitoring will be supplemented with thermal imaging cameras etc. to provide more detailed information on bat activity in the vicinity of turbines.

An assessment of static data gathered during operational surveillance will be completed using the online analysis tool Ecobat as recommended by SNH (2021) as a minimum, or other equivalent guidance as dictated by up-to date standards and practices.

5.1.2.4 *Buffer zones*

The vegetation-free buffer zones around the identified turbines will be managed and maintained during the operational life of the development.

Due to mitigation by design, turbines will be sited at a suitable separation distance from trees and trees or vegetation are to be removed to ensure a woodland-free buffer zone.

The immediate surroundings of individual turbines will be managed and maintained so that they do not attract insects (i.e. the concentration of insects in the wind turbine vicinity should be reduced as much as possible, but not such that insect abundancies affected elsewhere on the site). This should be achieved through physical management of habitats without the use of toxic substances.

The radius of each buffer zone as determined by the height of surrounding vegetation is listed below in Table 5-1 above. If the turbine blade length is reduced, felling buffers may decrease in accordance with the formula presented in section 5.1.2.4.

5.1.2.5 *Monitoring of mitigation measures*

The success of the implemented mitigation measures for bats on the project should be monitored for a period of no less than three years post construction and appropriate measures taken to enhance these if and where required. A recommended schedule for monitoring is given in Table 5-3 below.



5.1.2.6 Bat fatality monitoring

Whilst no significant residual effects on bats are predicted, the development could provide an opportunity to gain baseline data on bat/turbine interaction and it is recommended that the scheme be monitored for bat fatalities for the first three years of operation (post construction surveys) and subsequently in years 5, 10 and 15 as part of the additional curtailment monitoring schedule. A comprehensive onsite fatality monitoring programme is to be undertaken following published best practice (e.g. SNH 2021 or equivalent at the time of operation).

The primary components of the mortality programme are outlined below:

1. Carcass removal trials to establish levels of predator removal of possible fatalities. This should be done following best recommended practice and with due cognisance of published effects such as predator swamping, whereby excessive placement of carcasses increases predator presence and consequently skews results. No turbines which are used for carcass removal trials should be used for subsequent fatality monitoring.
2. Turbine searches for fatalities should be undertaken following best practice in terms of search area (focusing on hard standing) and at intervals selected to effectively sample fatality rates as determined by carcass removal trials in (a) above. 7
3. A standardised approach with a possible control group and/or variation in search techniques such as straight line transects/ randomly selected spiral transects/ dog searches will be undertaken. This will provide a means of robustly estimating the post construction collision fatality impact (if any).
4. Recorded fatalities should be calibrated against known predator removal rates to provide an estimate of overall fatality rates.

Table 5-3: Monitoring schedule recommended for bat mitigation measures

Mitigation measure	Monitoring required	Description	Duration
Bat boxes / tubes and bat roosts	Monitor bat use	Bat boxes and tubes to be placed at locations removed from wind farm as determined by project ecologist/ECOW at least 1 season before construction start. These shall be examined by a licensed bat specialist according to NPWS recommendations. Records should be submitted to Bat Conservation Ireland for inclusion in its bat distribution database. Re-site if necessary. Annual cleaning required if well used by bats or if used by birds. Replacement if damaged/lost.	From mounting to 3 years post construction.
Mortality study	Fatality monitoring	Corpse searches beneath turbines to assess the impact of operation on bats.	From initial operation conducted during years 1, 2, 3, 5, 10, and 15 post construction.

⁷ Suitably trained dogs with handlers are significantly more efficient and faster than humans in locating carcasses and should preferably be used to achieve more robust results. Dog searches are, however, resource-demanding and may not always be necessary to identify if a problem exists.



Table 5-4: Summary of Operational-phase Mitigation Measures for Bats

Moderate and Moderate-High Level Bat Mitigation Applies to XX Turbines
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).
Put in a monitoring programme for the first year of operation to ensure that bat activity is at a low level in vicinity of these turbines. Review monitoring results to determine if further bat mitigation measures are required.
Continue monitoring for 3 years post operation of the wind farm to determine whether a higher cut-in speed of the blades is required. The requirement for the continuation of monitoring for three more year (5, 10, and 15) will be reviewed in consultation with NPWS.
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. The requirement for the continuation of monitoring for three more years (5, 10, and 15) will be reviewed in consultation with NPWS.
Clear and maintain buffer zone free of woodland/trees within 50m of turbine blade tips.
Maintain immediate area around the wind turbines in a manner that does not attract insects.

5.1.3 Mitigation Measures during Decommissioning

The same mitigation measures will apply for the decommissioning phase as for the construction phase.



6. RESIDUAL EFFECTS

The turbines are to be located within or close to existing tree—dominated vegetation but providing a 85.8 m to 96.12 m vegetation-free buffer zone (96.12 m from turbine blade tip to top of surrounding conifer plantation trees and 85.8 m from turbine blade tip to hedgerows) around relevant turbines will reduce the risk of collision and/or barotrauma to foraging and/or commuting species such as pipistrelles. Post construction bat fatality monitoring will also be undertaken at the subject site.

The adjudged worst-case scenario is that, during operation, the turbines may possibly cause injury or death to a few individual specimens of Leisler's bat as it is a high-flying species (10m to 70m+). However, the amount of time spent hunting at the upper height limit cannot be assessed accurately due to the maximum distance (60m to 80m) of detection of this species by ultrasound detectors but most activity and time can be expected to occur in the mid-region of the species hunting altitude i.e. 40m.

The resulting effect of the development on local bat populations, with implemented mitigation measures, is considered to be a Slight to Imperceptible Residual Negative Reversible Effect and in the Local Context with the favourable conservation status (FCS) of bat species being unaffected and all species confirmed or expected on or near the study areas are predicted to persist.



7. CONCLUSION

In general, the landscape that the development is a part of, is of low to moderate suitability for bats where the turbines are located in the upland areas. The landscape is of moderate to high suitability for bats where the turbines are located in the lowland agricultural areas.

Eight species of bats have been recorded as present at the development during the bat surveys. All are listed as 'Least Concern' on the Irish Red List, and Annex IV of the EU Habitats Directive.

Mitigation measures such as providing a buffering distance (85.8 m and 96.12 m) from turbine blade tip to key habitat features should be implemented during construction and operation of the development.



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APPENDIX 1

Activity Survey Results

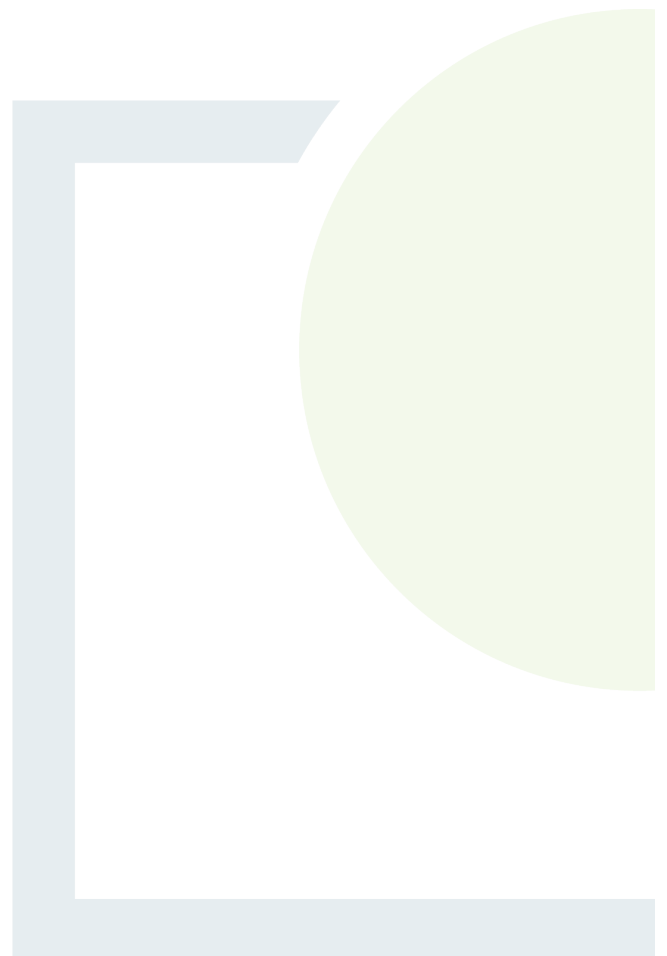


Table B. Bat activity recorded during 2020 transects

Date	Time	Species	Latitude	Longitude
28/07/2020	23:34:14	50 kHz Pipistrelle	52.19117	-7.74769
28/07/2020	22:41:38	Nathusius' Pipistrelle Likely	52.19218	-7.76732
28/07/2020	22:42:13	Nathusius' Pipistrelle Likely	52.19126	-7.76827
28/07/2020	23:36:11	Nathusius' Pipistrelle Likely	52.19236	-7.75175
28/07/2020	23:36:26	Nathusius' Pipistrelle Likely	52.19252	-7.75231
28/07/2020	23:45:18	Nathusius' Pipistrelle Likely	52.19204	-7.74782
29/07/2020	00:00:34	Common Pipistrelle	52.17778	-7.75965
29/07/2020	00:00:41	Common Pipistrelle	52.17754	-7.76023
28/07/2020	21:52:57	Common Pipistrelle	52.17732	-7.76064
28/07/2020	21:55:31	Common Pipistrelle	52.18203	-7.75165
28/07/2020	21:56:29	Common Pipistrelle	52.18402	-7.75081
28/07/2020	21:56:35	Common Pipistrelle	52.18411	-7.75077
28/07/2020	22:37:34	Common Pipistrelle	52.19084	-7.76876
28/07/2020	22:38:41	Common Pipistrelle	52.19129	-7.7683
28/07/2020	22:38:53	Common Pipistrelle	52.19161	-7.76814
28/07/2020	22:39:03	Common Pipistrelle	52.1919	-7.76753
28/07/2020	22:40:23	Common Pipistrelle	52.19444	-7.76714
28/07/2020	22:40:56	Common Pipistrelle	52.19361	-7.76729
28/07/2020	22:41:14	Common Pipistrelle	52.19289	-7.76718
28/07/2020	22:42:28	Common Pipistrelle	52.19108	-7.76842
28/07/2020	22:46:11	Common Pipistrelle	52.19699	-7.77633
28/07/2020	22:47:12	Common Pipistrelle	52.19764	-7.7766

Date	Time	Species	Latitude	Longitude
28/07/2020	22:47:27	Common Pipistrelle	52.19775	-7.77664
28/07/2020	22:47:31	Common Pipistrelle	52.19797	-7.77673
28/07/2020	22:47:37	Common Pipistrelle	52.19842	-7.77696
28/07/2020	22:47:57	Common Pipistrelle	52.19876	-7.77711
28/07/2020	22:48:12	Common Pipistrelle	52.19932	-7.77734
28/07/2020	22:48:27	Common Pipistrelle	52.19984	-7.7775
28/07/2020	22:48:42	Common Pipistrelle	52.20033	-7.77763
28/07/2020	22:49:06	Common Pipistrelle	52.20117	-7.7778
28/07/2020	22:49:21	Common Pipistrelle	52.2019	-7.77787
28/07/2020	22:51:24	Common Pipistrelle	52.20658	-7.77758
28/07/2020	22:52:46	Common Pipistrelle	52.20802	-7.77781
28/07/2020	22:54:30	Common Pipistrelle	52.20802	-7.77781
28/07/2020	22:55:59	Common Pipistrelle	52.20802	-7.77781
28/07/2020	22:56:14	Common Pipistrelle	52.20802	-7.77781
28/07/2020	22:56:30	Common Pipistrelle	52.20802	-7.77781
28/07/2020	22:56:36	Common Pipistrelle	52.20802	-7.77781
28/07/2020	22:57:09	Common Pipistrelle	52.20802	-7.77781
28/07/2020	22:57:36	Common Pipistrelle	52.20802	-7.77781
28/07/2020	22:58:24	Common Pipistrelle	52.20802	-7.77781
28/07/2020	23:00:41	Common Pipistrelle	52.20256	-7.77629
28/07/2020	23:03:01	Common Pipistrelle	52.20267	-7.77377
28/07/2020	23:03:52	Common Pipistrelle	52.20269	-7.77321
28/07/2020	23:07:15	Common Pipistrelle	52.20095	-7.77147

Date	Time	Species	Latitude	Longitude
28/07/2020	23:07:32	Common Pipistrelle	52.20068	-7.77133
28/07/2020	23:08:16	Common Pipistrelle	52.20014	-7.77103
28/07/2020	23:09:19	Common Pipistrelle	52.20014	-7.77103
28/07/2020	23:14:48	Common Pipistrelle	52.20209	-7.77259
28/07/2020	23:17:16	Common Pipistrelle	52.20244	-7.77464
28/07/2020	23:19:43	Common Pipistrelle	52.20272	-7.77793
28/07/2020	23:19:53	Common Pipistrelle	52.20272	-7.77793
28/07/2020	23:20:35	Common Pipistrelle	52.20264	-7.77803
28/07/2020	23:21:57	Common Pipistrelle	52.20026	-7.77765
28/07/2020	23:22:57	Common Pipistrelle	52.19807	-7.77692
28/07/2020	23:24:21	Common Pipistrelle	52.19562	-7.77586
28/07/2020	23:24:31	Common Pipistrelle	52.19521	-7.77571
28/07/2020	23:26:28	Common Pipistrelle	52.19234	-7.77465
28/07/2020	23:26:43	Common Pipistrelle	52.19111	-7.77302
28/07/2020	23:32:00	Common Pipistrelle	52.19	-7.7715
28/07/2020	23:32:38	Common Pipistrelle	52.18907	-7.74575
28/07/2020	23:32:50	Common Pipistrelle	52.18926	-7.7461
28/07/2020	23:34:29	Common Pipistrelle	52.19152	-7.74769
28/07/2020	23:34:47	Common Pipistrelle	52.19198	-7.74799
28/07/2020	23:35:07	Common Pipistrelle	52.19217	-7.74898
28/07/2020	23:35:24	Common Pipistrelle	52.19245	-7.74982
28/07/2020	23:35:33	Common Pipistrelle	52.19259	-7.75009
28/07/2020	23:35:45	Common Pipistrelle	52.19254	-7.75057

Date	Time	Species	Latitude	Longitude
28/07/2020	23:35:56	Common Pipistrelle	52.19247	-7.75107
28/07/2020	23:36:39	Common Pipistrelle	52.19268	-7.75295
28/07/2020	23:37:09	Common Pipistrelle	52.19277	-7.75434
28/07/2020	23:37:29	Common Pipistrelle	52.19292	-7.75511
28/07/2020	23:37:42	Common Pipistrelle	52.19291	-7.75572
28/07/2020	23:38:09	Common Pipistrelle	52.19304	-7.7569
28/07/2020	23:38:33	Common Pipistrelle	52.19315	-7.75797
28/07/2020	23:38:46	Common Pipistrelle	52.1932	-7.75843
28/07/2020	23:39:01	Common Pipistrelle	52.1932	-7.75843
28/07/2020	23:39:16	Common Pipistrelle	52.1932	-7.75843
28/07/2020	23:39:31	Common Pipistrelle	52.19316	-7.75798
28/07/2020	23:39:46	Common Pipistrelle	52.1931	-7.75749
28/07/2020	23:40:54	Common Pipistrelle	52.19282	-7.75472
28/07/2020	23:41:00	Common Pipistrelle	52.19281	-7.75454
28/07/2020	23:41:31	Common Pipistrelle	52.1927	-7.75304
28/07/2020	23:42:01	Common Pipistrelle	52.19244	-7.75204
28/07/2020	23:42:17	Common Pipistrelle	52.19236	-7.75139
28/07/2020	23:42:59	Common Pipistrelle	52.19233	-7.74962
28/07/2020	23:43:51	Common Pipistrelle	52.192	-7.74791
28/07/2020	23:44:01	Common Pipistrelle	52.19204	-7.74778
28/07/2020	23:44:21	Common Pipistrelle	52.1922	-7.74764
28/07/2020	23:44:46	Common Pipistrelle	52.1922	-7.74764
28/07/2020	23:45:00	Common Pipistrelle	52.19212	-7.74772

Date	Time	Species	Latitude	Longitude
28/07/2020	23:46:50	Common Pipistrelle	52.19001	-7.74721
28/07/2020	23:47:03	Common Pipistrelle	52.18967	-7.74675
28/07/2020	23:47:27	Common Pipistrelle	52.18913	-7.74585
28/07/2020	23:52:10	Common Pipistrelle	52.19567	-7.73831
28/07/2020	23:52:32	Common Pipistrelle	52.19509	-7.73874
28/07/2020	23:52:53	Common Pipistrelle	52.19438	-7.73924
28/07/2020	23:53:10	Common Pipistrelle	52.19386	-7.73999
28/07/2020	23:53:23	Common Pipistrelle	52.19329	-7.74054
28/07/2020	23:55:49	Common Pipistrelle	52.18767	-7.74657
28/07/2020	23:56:27	Common Pipistrelle	52.18673	-7.74881
28/07/2020	23:58:02	Common Pipistrelle	52.18287	-7.75139
28/07/2020	23:58:19	Common Pipistrelle	52.1821	-7.7516
28/07/2020	23:58:35	Common Pipistrelle	52.18147	-7.75199
28/07/2020	23:58:52	Common Pipistrelle	52.18074	-7.75242
28/07/2020	23:59:03	Common Pipistrelle	52.1805	-7.75282
28/07/2020	23:59:15	Common Pipistrelle	52.18	-7.75368
28/07/2020	23:41:46	Common Pipistrelle	52.19259	-7.75244
28/07/2020	23:41:46	Soprano Pipistrelle	52.19259	-7.75244
29/07/2020	00:00:09	Soprano Pipistrelle	52.1784	-7.75766
28/07/2020	21:54:38	Soprano Pipistrelle	52.17989	-7.75386
28/07/2020	22:39:14	Soprano Pipistrelle	52.19311	-7.76723
28/07/2020	22:40:34	Soprano Pipistrelle	52.19431	-7.76737
28/07/2020	22:55:54	Soprano Pipistrelle	52.20802	-7.77781

Date	Time	Species	Latitude	Longitude
28/07/2020	23:05:44	Soprano Pipistrelle	52.20149	-7.77198
28/07/2020	23:05:58	Soprano Pipistrelle	52.20149	-7.77187
28/07/2020	23:06:04	Soprano Pipistrelle	52.20149	-7.77187
28/07/2020	23:06:12	Soprano Pipistrelle	52.20149	-7.77187
28/07/2020	23:19:19	Soprano Pipistrelle	52.2027	-7.77744
28/07/2020	23:19:28	Soprano Pipistrelle	52.20271	-7.77761
28/07/2020	23:19:35	Soprano Pipistrelle	52.20272	-7.77777
28/07/2020	23:21:43	Soprano Pipistrelle	52.20039	-7.77769
28/07/2020	23:33:44	Soprano Pipistrelle	52.19036	-7.74772
28/07/2020	23:46:29	Soprano Pipistrelle	52.1905	-7.7478
28/07/2020	23:47:43	Soprano Pipistrelle	52.18872	-7.74523
28/07/2020	23:52:24	Soprano Pipistrelle	52.19539	-7.73849
28/07/2020	23:53:38	Soprano Pipistrelle	52.19252	-7.74077
28/07/2020	23:55:33	Soprano Pipistrelle	52.18811	-7.7457
28/07/2020	23:56:41	Soprano Pipistrelle	52.18613	-7.74952
28/07/2020	21:55:39	Soprano Pipistrelle	52.18239	-7.75153
28/07/2020	22:40:08	Soprano Pipistrelle	52.19431	-7.76738
28/07/2020	22:40:40	Soprano Pipistrelle	52.19402	-7.76734
28/07/2020	22:41:58	Soprano Pipistrelle	52.19172	-7.76783
28/07/2020	22:43:36	Soprano Pipistrelle	52.19457	-7.77573
28/07/2020	22:47:47	Soprano Pipistrelle	52.19876	-7.77711
28/07/2020	22:48:47	Soprano Pipistrelle	52.20053	-7.77769
28/07/2020	23:06:21	Soprano Pipistrelle	52.20149	-7.77187

Date	Time	Species	Latitude	Longitude
28/07/2020	23:21:26	Soprano Pipistrelle	52.2015	-7.77786
28/07/2020	23:22:12	Soprano Pipistrelle	52.20026	-7.77765
28/07/2020	23:22:27	Soprano Pipistrelle	52.19886	-7.77721
28/07/2020	23:22:42	Soprano Pipistrelle	52.19846	-7.77704
28/07/2020	23:32:55	Soprano Pipistrelle	52.18942	-7.7463
28/07/2020	23:34:36	Soprano Pipistrelle	52.19172	-7.74778
28/07/2020	23:36:54	Soprano Pipistrelle	52.19273	-7.75365
28/07/2020	23:42:28	Soprano Pipistrelle	52.19241	-7.75089
28/07/2020	23:42:43	Soprano Pipistrelle	52.19262	-7.75028
28/07/2020	23:45:45	Soprano Pipistrelle	52.19154	-7.7477
28/07/2020	21:55:39	Common Pipistrelle	52.18239	-7.75153
28/07/2020	22:40:08	Common Pipistrelle	52.19431	-7.76738
28/07/2020	22:40:40	Common Pipistrelle	52.19402	-7.76734
28/07/2020	22:41:58	Common Pipistrelle	52.19172	-7.76783
28/07/2020	22:43:36	Common Pipistrelle	52.19457	-7.77573
28/07/2020	22:47:47	Common Pipistrelle	52.19876	-7.77711
28/07/2020	22:48:47	Common Pipistrelle	52.20053	-7.77769
28/07/2020	23:06:21	Common Pipistrelle	52.20149	-7.77187
28/07/2020	23:21:26	Common Pipistrelle	52.2015	-7.77786
28/07/2020	23:22:12	Common Pipistrelle	52.20026	-7.77765
28/07/2020	23:22:27	Common Pipistrelle	52.19886	-7.77721
28/07/2020	23:22:42	Common Pipistrelle	52.19846	-7.77704
28/07/2020	23:32:55	Common Pipistrelle	52.18942	-7.7463

Date	Time	Species	Latitude	Longitude
28/07/2020	23:34:36	Common Pipistrelle	52.19172	-7.74778
28/07/2020	23:36:54	Common Pipistrelle	52.19273	-7.75365
28/07/2020	23:42:28	Common Pipistrelle	52.19241	-7.75089
28/07/2020	23:42:43	Common Pipistrelle	52.19262	-7.75028
28/07/2020	23:45:45	Common Pipistrelle	52.19154	-7.7477
28/07/2020	23:04:02	Brown Long-eared Bat	52.20259	-7.7732
44061	0.910602	Daubenton's Bat	52.18896	-7.74567
44061	0.909398	Whiskered Bat	52.18988	-7.74704
44061	0.946366	Whiskered Bat	52.19065	-7.76902
44061	0.967269	<i>Myotis</i> sp.	52.2002	-7.77105
44061	0.946447	<i>Myotis</i> sp.	52.19057	-7.76911
44061	0.946505	<i>Myotis</i> sp.	52.1905	-7.76923
44061	0.966759	<i>Myotis</i> sp.	52.20075	-7.77133
44061	0.967118	<i>Myotis</i> sp.	52.20039	-7.77113
44061	0.946447	Common Pipistrelle	52.19057	-7.76911
44061	0.946505	Common Pipistrelle	52.1905	-7.76923
44061	0.966759	Common Pipistrelle	52.20075	-7.77133
44061	0.967118	Common Pipistrelle	52.20039	-7.77113
44061	0.891319	Leisler's Bat	52.19268	-7.7529
44061	0.893646	Leisler's Bat	52.19294	-7.75588
44061	0.894433	Leisler's Bat	52.19317	-7.75815
44061	0.914676	Leisler's Bat	52.19494	-7.73889
44061	0.918183	Leisler's Bat	52.18748	-7.74697

Date	Time	Species	Latitude	Longitude
44061	0.935174	Leisler's Bat	52.19015	-7.77005
44061	0.935266	Leisler's Bat	52.19021	-7.76992
44061	0.947292	Leisler's Bat	52.19005	-7.77058
44061	0.948553	Leisler's Bat	52.18989	-7.7713
44061	0.954861	Leisler's Bat	52.20071	-7.77779
44061	0.956227	Leisler's Bat	52.19684	-7.77635
44061	0.956296	Leisler's Bat	52.19684	-7.77635
44061	0.969248	Leisler's Bat	52.19988	-7.7708
44061	0.954688	Leisler's Bat	52.20128	-7.77784
44061	0.954688	Daubenton's Bat	52.20128	-7.77784
44061	0.954688	Common Pipistrelle	52.20128	-7.77784
44061	0.887106	Common Pipistrelle	52.1921	-7.74775
44061	0.919306	Common Pipistrelle	52.18429	-7.75066
44061	0.921875	Common Pipistrelle	52.17698	-7.76122
44061	0.926516	Common Pipistrelle	52.18817	-7.74564
44061	0.955694	Common Pipistrelle	52.19748	-7.77663
44061	0.887106	Leisler's Bat	52.1921	-7.74775
44061	0.919306	Leisler's Bat	52.18429	-7.75066
44061	0.921875	Leisler's Bat	52.17698	-7.76122
44061	0.926516	Leisler's Bat	52.18817	-7.74564
44061	0.955694	Leisler's Bat	52.19748	-7.77663
44061	0.886528	Leisler's Bat	52.19218	-7.74768
44061	0.886701	Leisler's Bat	52.1921	-7.74775

Date	Time	Species	Latitude	Longitude
44061	0.923449	Leisler's Bat	52.17883	-7.75637
44061	0.955799	Leisler's Bat	52.19707	-7.77645
44061	0.956123	Leisler's Bat	52.19684	-7.77635
44061	0.886528	Soprano Pipistrelle	52.19218	-7.74768
44061	0.886701	Soprano Pipistrelle	52.1921	-7.74775
44061	0.923449	Soprano Pipistrelle	52.17883	-7.75637
44061	0.955799	Soprano Pipistrelle	52.19707	-7.77645
44061	0.956123	Soprano Pipistrelle	52.19684	-7.77635
44061	0.953299	Pipistrelle Sp Social	52.20191	-7.77798
44061	0.971771	Pipistrelle Sp Social	52.20245	-7.77305
44061	0.887269	Common Pipistrelle	52.19205	-7.74789
44061	0.887442	Common Pipistrelle	52.1921	-7.74818
44061	0.887708	Common Pipistrelle	52.19216	-7.74864
44061	0.887882	Common Pipistrelle	52.19218	-7.74879
44061	0.890463	Common Pipistrelle	52.19249	-7.75221
44061	0.894248	Common Pipistrelle	52.19314	-7.75782
44061	0.894653	Common Pipistrelle	52.19319	-7.75846
44061	0.897419	Common Pipistrelle	52.19333	-7.75984
44061	0.89765	Common Pipistrelle	52.19333	-7.75984
44061	0.898032	Common Pipistrelle	52.19317	-7.75843
44061	0.901262	Common Pipistrelle	52.1928	-7.75451
44061	0.901609	Common Pipistrelle	52.19276	-7.75388
44061	0.902303	Common Pipistrelle	52.19267	-7.75282

Date	Time	Species	Latitude	Longitude
44061	0.902593	Common Pipistrelle	52.19257	-7.75238
44061	0.904178	Common Pipistrelle	52.19259	-7.75035
44061	0.904375	Common Pipistrelle	52.19258	-7.75007
44061	0.905266	Common Pipistrelle	52.19218	-7.74908
44061	0.90537	Common Pipistrelle	52.19218	-7.74893
44061	0.905509	Common Pipistrelle	52.19218	-7.74878
44061	0.905694	Common Pipistrelle	52.19212	-7.74848
44061	0.90588	Common Pipistrelle	52.19205	-7.74819
44061	0.906597	Common Pipistrelle	52.19207	-7.74776
44061	0.906921	Common Pipistrelle	52.1918	-7.74781
44061	0.906968	Common Pipistrelle	52.1918	-7.74781
44061	0.907141	Common Pipistrelle	52.19162	-7.74772
44061	0.907211	Common Pipistrelle	52.19162	-7.74772
44061	0.907442	Common Pipistrelle	52.19133	-7.74767
44061	0.907951	Common Pipistrelle	52.19105	-7.74774
44061	0.908137	Common Pipistrelle	52.19098	-7.74783
44061	0.908171	Common Pipistrelle	52.1909	-7.74793
44061	0.912569	Common Pipistrelle	52.1891	-7.74415
44061	0.913438	Common Pipistrelle	52.19149	-7.74236
44061	0.913576	Common Pipistrelle	52.19195	-7.74195
44061	0.914803	Common Pipistrelle	52.19547	-7.73848
44061	0.915394	Common Pipistrelle	52.19627	-7.73782
44061	0.917083	Common Pipistrelle	52.1902	-7.74295

Date	Time	Species	Latitude	Longitude
44061	0.917153	Common Pipistrelle	52.19002	-7.74319
44061	0.920347	Common Pipistrelle	52.18036	-7.75312
44061	0.921354	Common Pipistrelle	52.17792	-7.75935
44061	0.9214	Common Pipistrelle	52.17783	-7.75963
44061	0.921528	Common Pipistrelle	52.17773	-7.75994
44061	0.922326	Common Pipistrelle	52.1766	-7.76181
44061	0.922569	Common Pipistrelle	52.1771	-7.76095
44061	0.92265	Common Pipistrelle	52.17725	-7.76072
44061	0.922755	Common Pipistrelle	52.17759	-7.76022
44061	0.923924	Common Pipistrelle	52.17998	-7.75377
44061	0.924016	Common Pipistrelle	52.18031	-7.75324
44061	0.924259	Common Pipistrelle	52.18107	-7.75222
44061	0.925058	Common Pipistrelle	52.18413	-7.75078
44061	0.925336	Common Pipistrelle	52.1851	-7.75
44061	0.926319	Common Pipistrelle	52.18775	-7.74646
44061	0.926794	Common Pipistrelle	52.18857	-7.74499
44061	0.926968	Common Pipistrelle	52.18857	-7.74499
44061	0.934236	Common Pipistrelle	52.18995	-7.77123
44061	0.934421	Common Pipistrelle	52.18997	-7.77107
44061	0.936065	Common Pipistrelle	52.19078	-7.76883
44061	0.936227	Common Pipistrelle	52.19093	-7.76864
44061	0.936412	Common Pipistrelle	52.19117	-7.76839
44061	0.937743	Common Pipistrelle	52.1923	-7.76726

Date	Time	Species	Latitude	Longitude
44061	0.938877	Common Pipistrelle	52.19352	-7.76731
44061	0.939051	Common Pipistrelle	52.19371	-7.76736
44061	0.939491	Common Pipistrelle	52.19419	-7.7674
44061	0.939838	Common Pipistrelle	52.19428	-7.76745
44061	0.943449	Common Pipistrelle	52.19374	-7.76732
44061	0.943495	Common Pipistrelle	52.19363	-7.7673
44061	0.943669	Common Pipistrelle	52.19343	-7.7673
44061	0.945718	Common Pipistrelle	52.19128	-7.7683
44061	0.94588	Common Pipistrelle	52.19113	-7.76851
44061	0.94897	Common Pipistrelle	52.1908	-7.77245
44061	0.949039	Common Pipistrelle	52.19094	-7.77272
44061	0.949294	Common Pipistrelle	52.19142	-7.77359
44061	0.950602	Common Pipistrelle	52.19569	-7.77591
44061	0.950787	Common Pipistrelle	52.19683	-7.77638
44061	0.950961	Common Pipistrelle	52.19761	-7.77672
44061	0.951215	Common Pipistrelle	52.19875	-7.77715
44061	0.951319	Common Pipistrelle	52.19917	-7.77732
44061	0.951968	Common Pipistrelle	52.2017	-7.77791
44061	0.952535	Common Pipistrelle	52.20191	-7.77798
44061	0.953356	Common Pipistrelle	52.20486	-7.77819
44061	0.954236	Common Pipistrelle	52.2027	-7.77802
44061	0.955995	Common Pipistrelle	52.19684	-7.77635
44061	0.956597	Common Pipistrelle	52.19387	-7.776

Date	Time	Species	Latitude	Longitude
44061	0.956817	Common Pipistrelle	52.19319	-7.77545
44061	0.957153	Common Pipistrelle	52.1919	-7.77429
44061	0.957697	Common Pipistrelle	52.19038	-7.77183
44061	0.957836	Common Pipistrelle	52.19	-7.77151
44061	0.962627	Common Pipistrelle	52.20252	-7.77596
44061	0.963102	Common Pipistrelle	52.20251	-7.77518
44061	0.96331	Common Pipistrelle	52.20251	-7.77487
44061	0.963565	Common Pipistrelle	52.20245	-7.77442
44061	0.963634	Common Pipistrelle	52.20248	-7.77428
44061	0.963958	Common Pipistrelle	52.20266	-7.77392
44061	0.965405	Common Pipistrelle	52.202	-7.77251
44061	0.965787	Common Pipistrelle	52.2017	-7.77217
44061	0.965949	Common Pipistrelle	52.20153	-7.77199
44061	0.966829	Common Pipistrelle	52.20067	-7.7713
44061	0.967002	Common Pipistrelle	52.20047	-7.77119
44061	0.968113	Common Pipistrelle	52.1995	-7.77066
44061	0.969433	Common Pipistrelle	52.20005	-7.77095
44061	0.969606	Common Pipistrelle	52.20023	-7.77105
44061	0.969931	Common Pipistrelle	52.20059	-7.77124
44061	0.970868	Common Pipistrelle	52.20155	-7.77195
44061	0.972477	Common Pipistrelle	52.20267	-7.77385
44061	0.972778	Common Pipistrelle	52.20246	-7.77439
44061	0.972836	Common Pipistrelle	52.20246	-7.77455

Date	Time	Species	Latitude	Longitude
44061	0.97294	Common Pipistrelle	52.20247	-7.77471
44061	0.973113	Common Pipistrelle	52.20253	-7.77502
44061	0.973287	Common Pipistrelle	52.20251	-7.77533
44061	0.973426	Common Pipistrelle	52.20247	-7.77563
44061	0.9736	Common Pipistrelle	52.20251	-7.77595
44061	0.973773	Common Pipistrelle	52.20255	-7.77642
44061	0.973947	Common Pipistrelle	52.20263	-7.7767
44061	0.913773	Common Pipistrelle	52.19226	-7.74125
44061	0.921794	Common Pipistrelle	52.17714	-7.76097
44061	0.925752	Common Pipistrelle	52.18651	-7.74923
44061	0.940359	Common Pipistrelle	52.19428	-7.76745
44061	0.913773	Soprano Pipistrelle	52.19226	-7.74125
44061	0.921794	Soprano Pipistrelle	52.17714	-7.76097
44061	0.925752	Soprano Pipistrelle	52.18651	-7.74923
44061	0.940359	Soprano Pipistrelle	52.19428	-7.76745
44061	0.913773	Leisler's Bat	52.19226	-7.74125
44061	0.921794	Leisler's Bat	52.17714	-7.76097
44061	0.925752	Leisler's Bat	52.18651	-7.74923
44061	0.940359	Leisler's Bat	52.19428	-7.76745
44061	0.881319	Soprano Pipistrelle	52.18918	-7.74592
44061	0.882245	Soprano Pipistrelle	52.18979	-7.74689
44061	0.882292	Soprano Pipistrelle	52.18987	-7.747
44061	0.882465	Soprano Pipistrelle	52.18994	-7.74708

Date	Time	Species	Latitude	Longitude
44061	0.882639	Soprano Pipistrelle	52.19008	-7.74727
44061	0.882674	Soprano Pipistrelle	52.19008	-7.74727
44061	0.882813	Soprano Pipistrelle	52.19015	-7.74735
44061	0.882986	Soprano Pipistrelle	52.19029	-7.74756
44061	0.883067	Soprano Pipistrelle	52.19037	-7.74765
44061	0.88397	Soprano Pipistrelle	52.19102	-7.74783
44061	0.884444	Soprano Pipistrelle	52.19128	-7.74765
44061	0.884525	Soprano Pipistrelle	52.19128	-7.74765
44061	0.884745	Soprano Pipistrelle	52.19146	-7.74768
44061	0.884954	Soprano Pipistrelle	52.19155	-7.74769
44061	0.88566	Soprano Pipistrelle	52.19192	-7.74784
44061	0.885833	Soprano Pipistrelle	52.19209	-7.74774
44061	0.885984	Soprano Pipistrelle	52.19217	-7.74767
44061	0.886377	Soprano Pipistrelle	52.19226	-7.74761
44061	0.886875	Soprano Pipistrelle	52.1921	-7.74775
44061	0.889769	Soprano Pipistrelle	52.19245	-7.75116
44061	0.890729	Soprano Pipistrelle	52.19264	-7.7526
44061	0.891424	Soprano Pipistrelle	52.19268	-7.7529
44061	0.892384	Soprano Pipistrelle	52.19279	-7.75451
44061	0.89294	Soprano Pipistrelle	52.19289	-7.75544
44061	0.89412	Soprano Pipistrelle	52.19294	-7.75588
44061	0.894537	Soprano Pipistrelle	52.19318	-7.75831
44061	0.895613	Soprano Pipistrelle	52.19333	-7.75984

Date	Time	Species	Latitude	Longitude
44061	0.896539	Soprano Pipistrelle	52.19333	-7.75984
44061	0.896609	Soprano Pipistrelle	52.19333	-7.75984
44061	0.898565	Soprano Pipistrelle	52.19317	-7.75814
44061	0.901493	Soprano Pipistrelle	52.19277	-7.75405
44061	0.901782	Soprano Pipistrelle	52.19274	-7.75374
44061	0.901933	Soprano Pipistrelle	52.19272	-7.75343
44061	0.9125	Soprano Pipistrelle	52.18881	-7.74457
44061	0.913692	Soprano Pipistrelle	52.19214	-7.74158
44061	0.913889	Soprano Pipistrelle	52.19255	-7.74077
44061	0.916192	Soprano Pipistrelle	52.19333	-7.74051
44061	0.916319	Soprano Pipistrelle	52.19261	-7.74069
44061	0.917824	Soprano Pipistrelle	52.18829	-7.74544
44061	0.918484	Soprano Pipistrelle	52.18683	-7.74867
44061	0.918611	Soprano Pipistrelle	52.1866	-7.74912
44061	0.92206	Soprano Pipistrelle	52.17653	-7.76192
44061	0.922234	Soprano Pipistrelle	52.17653	-7.76193
44061	0.923021	Soprano Pipistrelle	52.17816	-7.75865
44061	0.923252	Soprano Pipistrelle	52.17867	-7.75728
44061	0.924722	Soprano Pipistrelle	52.1829	-7.75141
44061	0.924931	Soprano Pipistrelle	52.18374	-7.75099
44061	0.925544	Soprano Pipistrelle	52.1858	-7.74963
44061	0.934722	Soprano Pipistrelle	52.19002	-7.77062
44061	0.934965	Soprano Pipistrelle	52.19006	-7.77033

Date	Time	Species	Latitude	Longitude
44061	0.936609	Soprano Pipistrelle	52.19135	-7.76827
44061	0.936829	Soprano Pipistrelle	52.19152	-7.76816
44061	0.937847	Soprano Pipistrelle	52.19238	-7.7672
44061	0.938044	Soprano Pipistrelle	52.19257	-7.76716
44061	0.938449	Soprano Pipistrelle	52.19305	-7.76724
44061	0.942106	Soprano Pipistrelle	52.19421	-7.76689
44061	0.94287	Soprano Pipistrelle	52.19411	-7.76739
44061	0.944931	Soprano Pipistrelle	52.19198	-7.76751
44061	0.944977	Soprano Pipistrelle	52.19198	-7.76751
44061	0.949433	Soprano Pipistrelle	52.19173	-7.77403
44061	0.951065	Soprano Pipistrelle	52.198	-7.77689
44061	0.964398	Soprano Pipistrelle	52.20282	-7.77328
44061	0.966227	Soprano Pipistrelle	52.20128	-7.77179
44061	0.966481	Soprano Pipistrelle	52.20104	-7.77154
44061	0.97059	Soprano Pipistrelle	52.20131	-7.77171
44061	0.970694	Soprano Pipistrelle	52.2014	-7.77177
44061	0.971944	Soprano Pipistrelle	52.20262	-7.77317
44061	0.885313	Common Pipistrelle	52.19173	-7.74777
44061	0.885498	Common Pipistrelle	52.19183	-7.74781
44061	0.898368	Common Pipistrelle	52.19319	-7.75829
44061	0.900347	Common Pipistrelle	52.19291	-7.75559
44061	0.906771	Common Pipistrelle	52.19198	-7.74781
44061	0.917338	Common Pipistrelle	52.18955	-7.74364

Date	Time	Species	Latitude	Longitude
44061	0.918252	Common Pipistrelle	52.18729	-7.74738
44061	0.919838	Common Pipistrelle	52.18214	-7.75155
44061	0.920012	Common Pipistrelle	52.1814	-7.75204
44061	0.922396	Common Pipistrelle	52.17673	-7.76158
44061	0.923356	Common Pipistrelle	52.17871	-7.7569
44061	0.924514	Common Pipistrelle	52.18197	-7.75172
44061	0.925995	Common Pipistrelle	52.18703	-7.74799
44061	0.938623	Common Pipistrelle	52.19324	-7.7673
44061	0.938704	Common Pipistrelle	52.19334	-7.76728
44061	0.939144	Common Pipistrelle	52.1938	-7.76738
44061	0.939317	Common Pipistrelle	52.19399	-7.76738
44061	0.939664	Common Pipistrelle	52.19428	-7.76745
44061	0.940012	Common Pipistrelle	52.19428	-7.76745
44061	0.940185	Common Pipistrelle	52.19428	-7.76745
44061	0.940532	Common Pipistrelle	52.19428	-7.76745
44061	0.940718	Common Pipistrelle	52.19428	-7.76745
44061	0.940891	Common Pipistrelle	52.19428	-7.76745
44061	0.941065	Common Pipistrelle	52.19428	-7.76745
44061	0.941238	Common Pipistrelle	52.19428	-7.76745
44061	0.941412	Common Pipistrelle	52.19434	-7.76734
44061	0.941586	Common Pipistrelle	52.19444	-7.76707
44061	0.941759	Common Pipistrelle	52.1944	-7.76693
44061	0.941933	Common Pipistrelle	52.1943	-7.76692

Date	Time	Species	Latitude	Longitude
44061	0.942176	Common Pipistrelle	52.19412	-7.76685
44061	0.94235	Common Pipistrelle	52.1943	-7.76693
44061	0.942523	Common Pipistrelle	52.19432	-7.76719
44061	0.942697	Common Pipistrelle	52.1943	-7.76735
44061	0.942917	Common Pipistrelle	52.19411	-7.76738
44061	0.943102	Common Pipistrelle	52.19402	-7.76734
44061	0.943275	Common Pipistrelle	52.19393	-7.76735
44061	0.949086	Common Pipistrelle	52.19107	-7.77299
44061	0.951597	Common Pipistrelle	52.20031	-7.77767
44061	0.951701	Common Pipistrelle	52.20075	-7.77781
44061	0.952639	Common Pipistrelle	52.20191	-7.77798
44061	0.953472	Common Pipistrelle	52.20456	-7.7782
44061	0.953889	Common Pipistrelle	52.20366	-7.77818
44061	0.954063	Common Pipistrelle	52.20312	-7.77807
44061	0.954421	Common Pipistrelle	52.20222	-7.77796
44061	0.955521	Common Pipistrelle	52.19818	-7.77693
44061	0.957292	Common Pipistrelle	52.19151	-7.77367
44061	0.962685	Common Pipistrelle	52.20248	-7.77582
44061	0.96287	Common Pipistrelle	52.20247	-7.77549
44061	0.96316	Common Pipistrelle	52.20253	-7.77502
44061	0.966053	Common Pipistrelle	52.20145	-7.77192
44061	0.969074	Common Pipistrelle	52.19969	-7.7707
44061	0.969757	Common Pipistrelle	52.2004	-7.77114

Date	Time	Species	Latitude	Longitude
44061	0.970104	Common Pipistrelle	52.20077	-7.77134
44061	0.970278	Common Pipistrelle	52.20096	-7.77143
44061	0.970405	Common Pipistrelle	52.20114	-7.77157
44061	0.974086	Common Pipistrelle	52.20266	-7.777
44061	0.974259	Common Pipistrelle	52.20269	-7.77732
44061	0.974433	Common Pipistrelle	52.20272	-7.77761
44061	0.974549	Common Pipistrelle	52.20274	-7.77778
44061	0.885313	Soprano Pipistrelle	52.19173	-7.74777
44061	0.885498	Soprano Pipistrelle	52.19183	-7.74781
44061	0.898368	Soprano Pipistrelle	52.19319	-7.75829
44061	0.900347	Soprano Pipistrelle	52.19291	-7.75559
44061	0.906771	Soprano Pipistrelle	52.19198	-7.74781
44061	0.917338	Soprano Pipistrelle	52.18955	-7.74364
44061	0.918252	Soprano Pipistrelle	52.18729	-7.74738
44061	0.919838	Soprano Pipistrelle	52.18214	-7.75155
44061	0.920012	Soprano Pipistrelle	52.1814	-7.75204
44061	0.922396	Soprano Pipistrelle	52.17673	-7.76158
44061	0.923356	Soprano Pipistrelle	52.17871	-7.7569
44061	0.924514	Soprano Pipistrelle	52.18197	-7.75172
44061	0.925995	Soprano Pipistrelle	52.18703	-7.74799
44061	0.938623	Soprano Pipistrelle	52.19324	-7.7673
44061	0.938704	Soprano Pipistrelle	52.19334	-7.76728
44061	0.939144	Soprano Pipistrelle	52.1938	-7.76738

Date	Time	Species	Latitude	Longitude
44061	0.939317	Soprano Pipistrelle	52.19399	-7.76738
44061	0.939664	Soprano Pipistrelle	52.19428	-7.76745
44061	0.940012	Soprano Pipistrelle	52.19428	-7.76745
44061	0.940185	Soprano Pipistrelle	52.19428	-7.76745
44061	0.940532	Soprano Pipistrelle	52.19428	-7.76745
44061	0.940718	Soprano Pipistrelle	52.19428	-7.76745
44061	0.940891	Soprano Pipistrelle	52.19428	-7.76745
44061	0.941065	Soprano Pipistrelle	52.19428	-7.76745
44061	0.941238	Soprano Pipistrelle	52.19428	-7.76745
44061	0.941412	Soprano Pipistrelle	52.19434	-7.76734
44061	0.941586	Soprano Pipistrelle	52.19444	-7.76707
44061	0.941759	Soprano Pipistrelle	52.1944	-7.76693
44061	0.941933	Soprano Pipistrelle	52.1943	-7.76692
44061	0.942176	Soprano Pipistrelle	52.19412	-7.76685
44061	0.94235	Soprano Pipistrelle	52.1943	-7.76693
44061	0.942523	Soprano Pipistrelle	52.19432	-7.76719
44061	0.942697	Soprano Pipistrelle	52.1943	-7.76735
44061	0.942917	Soprano Pipistrelle	52.19411	-7.76738
44061	0.943102	Soprano Pipistrelle	52.19402	-7.76734
44061	0.943275	Soprano Pipistrelle	52.19393	-7.76735
44061	0.949086	Soprano Pipistrelle	52.19107	-7.77299
44061	0.951597	Soprano Pipistrelle	52.20031	-7.77767
44061	0.951701	Soprano Pipistrelle	52.20075	-7.77781

Date	Time	Species	Latitude	Longitude
44061	0.952639	Soprano Pipistrelle	52.20191	-7.77798
44061	0.953472	Soprano Pipistrelle	52.20456	-7.7782
44061	0.953889	Soprano Pipistrelle	52.20366	-7.77818
44061	0.954063	Soprano Pipistrelle	52.20312	-7.77807
44061	0.954421	Soprano Pipistrelle	52.20222	-7.77796
44061	0.955521	Soprano Pipistrelle	52.19818	-7.77693
44061	0.957292	Soprano Pipistrelle	52.19151	-7.77367
44061	0.962685	Soprano Pipistrelle	52.20248	-7.77582
44061	0.96287	Soprano Pipistrelle	52.20247	-7.77549
44061	0.96316	Soprano Pipistrelle	52.20253	-7.77502
44061	0.966053	Soprano Pipistrelle	52.20145	-7.77192
44061	0.969074	Soprano Pipistrelle	52.19969	-7.7707
44061	0.969757	Soprano Pipistrelle	52.2004	-7.77114
44061	0.970104	Soprano Pipistrelle	52.20077	-7.77134
44061	0.970278	Soprano Pipistrelle	52.20096	-7.77143
44061	0.970405	Soprano Pipistrelle	52.20114	-7.77157
44061	0.974086	Soprano Pipistrelle	52.20266	-7.777
44061	0.974259	Soprano Pipistrelle	52.20269	-7.77732
44061	0.974433	Soprano Pipistrelle	52.20272	-7.77761
44061	0.974549	Soprano Pipistrelle	52.20274	-7.77778
44061	0.964468	Soprano Pipistrelle	52.20282	-7.77329
44061	0.964468	Brown Long-eared Bat	52.20282	-7.77329
03/09/2020	21:40:42	Whiskered Bat	52.18857	-7.74499

Date	Time	Species	Latitude	Longitude
03/09/2020	21:43:29	Whiskered Bat	52.18956	-7.74671
03/09/2020	22:02:52	Whiskered Bat	52.19283	-7.75456
03/09/2020	22:13:21	Whiskered Bat	52.19283	-7.75456
03/09/2020	22:17:09	Whiskered Bat	52.19283	-7.75456
03/09/2020	22:17:09	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	21:29:24	Whiskered Bat	52.1859	-7.74964
03/09/2020	21:36:14	Whiskered Bat	52.19281	-7.74061
03/09/2020	21:29:24	Soprano Pipistrelle	52.1859	-7.74964
03/09/2020	21:36:14	Soprano Pipistrelle	52.19281	-7.74061
03/09/2020	21:29:24	Common Pipistrelle	52.1859	-7.74964
03/09/2020	21:36:14	Common Pipistrelle	52.19281	-7.74061
03/09/2020	20:55:19	Leisler's Bat	52.19217	-7.76736
03/09/2020	20:56:09	Leisler's Bat	52.19303	-7.7672
03/09/2020	21:10:15	Leisler's Bat	52.19434	-7.76729
03/09/2020	22:20:07	Leisler's Bat	52.19283	-7.75456
03/09/2020	22:20:38	Leisler's Bat	52.19283	-7.75456
03/09/2020	22:20:54	Leisler's Bat	52.19283	-7.75456
03/09/2020	20:50:02	Leisler's Bat	52.19393	-7.77605
03/09/2020	20:54:37	Leisler's Bat	52.19157	-7.76816
03/09/2020	21:11:26	Leisler's Bat	52.19434	-7.76729
03/09/2020	21:12:34	Leisler's Bat	52.19434	-7.76729
03/09/2020	21:13:05	Leisler's Bat	52.19434	-7.76729
03/09/2020	22:20:22	Leisler's Bat	52.19283	-7.75456

Date	Time	Species	Latitude	Longitude
03/09/2020	20:50:02	Common Pipistrelle	52.19393	-7.77605
03/09/2020	20:54:37	Common Pipistrelle	52.19157	-7.76816
03/09/2020	21:11:26	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:12:34	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:13:05	Common Pipistrelle	52.19434	-7.76729
03/09/2020	22:20:22	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:07:02	Leisler's Bat	52.19283	-7.75456
03/09/2020	22:07:02	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	20:53:51	50 kHz Pipistrelle	52.19077	-7.76885
03/09/2020	21:04:46	50 kHz Pipistrelle	52.19434	-7.76729
03/09/2020	21:45:22	50 kHz Pipistrelle	52.18956	-7.74671
03/09/2020	20:36:54	Common Pipistrelle	52.20164	-7.77213
03/09/2020	20:46:26	Common Pipistrelle	52.20073	-7.77773
03/09/2020	20:56:26	Common Pipistrelle	52.19333	-7.7673
03/09/2020	20:56:41	Common Pipistrelle	52.19362	-7.76735
03/09/2020	20:57:06	Common Pipistrelle	52.19414	-7.76739
03/09/2020	20:57:16	Common Pipistrelle	52.19434	-7.7674
03/09/2020	20:57:49	Common Pipistrelle	52.19433	-7.76722
03/09/2020	20:58:06	Common Pipistrelle	52.19442	-7.76718
03/09/2020	20:58:48	Common Pipistrelle	52.19437	-7.76718
03/09/2020	20:58:54	Common Pipistrelle	52.19437	-7.76718
03/09/2020	20:59:19	Common Pipistrelle	52.19441	-7.76761
03/09/2020	20:59:33	Common Pipistrelle	52.19441	-7.76761

Date	Time	Species	Latitude	Longitude
03/09/2020	20:59:51	Common Pipistrelle	52.19435	-7.76749
03/09/2020	21:00:01	Common Pipistrelle	52.19435	-7.76749
03/09/2020	21:00:07	Common Pipistrelle	52.19435	-7.76749
03/09/2020	21:00:19	Common Pipistrelle	52.19435	-7.76749
03/09/2020	21:00:26	Common Pipistrelle	52.19435	-7.76749
03/09/2020	21:00:40	Common Pipistrelle	52.19435	-7.76749
03/09/2020	21:00:53	Common Pipistrelle	52.19427	-7.76739
03/09/2020	21:01:38	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:01:51	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:02:01	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:02:33	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:02:47	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:02:56	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:03:13	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:03:23	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:03:48	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:03:58	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:04:13	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:05:26	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:05:30	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:08:32	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:11:14	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:12:50	Common Pipistrelle	52.19434	-7.76729

Date	Time	Species	Latitude	Longitude
03/09/2020	21:14:01	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:14:26	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:22:12	Common Pipistrelle	52.17749	-7.7604
03/09/2020	21:22:52	Common Pipistrelle	52.17607	-7.76253
03/09/2020	21:23:07	Common Pipistrelle	52.17566	-7.76326
03/09/2020	21:23:23	Common Pipistrelle	52.17593	-7.76274
03/09/2020	21:24:09	Common Pipistrelle	52.17696	-7.76124
03/09/2020	21:24:50	Common Pipistrelle	52.178	-7.75914
03/09/2020	21:25:44	Common Pipistrelle	52.17888	-7.75624
03/09/2020	21:27:05	Common Pipistrelle	52.18099	-7.75232
03/09/2020	21:27:19	Common Pipistrelle	52.18151	-7.75203
03/09/2020	21:27:34	Common Pipistrelle	52.18203	-7.75168
03/09/2020	21:28:13	Common Pipistrelle	52.18359	-7.75109
03/09/2020	21:28:26	Common Pipistrelle	52.18403	-7.75088
03/09/2020	21:28:49	Common Pipistrelle	52.1847	-7.75029
03/09/2020	21:29:56	Common Pipistrelle	52.18688	-7.7485
03/09/2020	21:32:46	Common Pipistrelle	52.19205	-7.74177
03/09/2020	21:33:55	Common Pipistrelle	52.19446	-7.73916
03/09/2020	21:34:24	Common Pipistrelle	52.19555	-7.73836
03/09/2020	21:34:33	Common Pipistrelle	52.19582	-7.73817
03/09/2020	21:34:47	Common Pipistrelle	52.19582	-7.73818
03/09/2020	21:34:58	Common Pipistrelle	52.19557	-7.73841
03/09/2020	21:35:03	Common Pipistrelle	52.19547	-7.73845

Date	Time	Species	Latitude	Longitude
03/09/2020	21:35:17	Common Pipistrelle	52.19501	-7.73882
03/09/2020	21:37:14	Common Pipistrelle	52.19174	-7.74213
03/09/2020	21:38:11	Common Pipistrelle	52.18935	-7.74382
03/09/2020	21:38:57	Common Pipistrelle	52.18857	-7.74499
03/09/2020	21:43:51	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:47:25	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:47:42	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:48:03	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:48:18	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:48:46	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:49:09	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:49:20	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:49:42	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:49:56	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:50:11	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:50:35	Common Pipistrelle	52.19242	-7.75109
03/09/2020	21:50:47	Common Pipistrelle	52.1924	-7.75123
03/09/2020	21:57:25	Common Pipistrelle	52.19306	-7.75718
03/09/2020	21:57:40	Common Pipistrelle	52.19306	-7.75718
03/09/2020	21:59:24	Common Pipistrelle	52.19306	-7.75718
03/09/2020	21:59:39	Common Pipistrelle	52.19306	-7.75718
03/09/2020	22:05:56	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:06:22	Common Pipistrelle	52.19283	-7.75456

Date	Time	Species	Latitude	Longitude
03/09/2020	22:07:28	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:08:18	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:08:24	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:08:29	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:08:59	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:09:14	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:09:29	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:09:44	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:09:59	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:10:14	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:11:00	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:11:07	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:11:19	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:14:49	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:16:04	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:18:23	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:18:36	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:18:54	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:19:37	Common Pipistrelle	52.19283	-7.75456
03/09/2020	21:02:12	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:02:12	Soprano Pipistrelle	52.19434	-7.76729
03/09/2020	21:02:12	Leisler's Bat	52.19434	-7.76729
03/09/2020	21:08:15	Leisler's Bat	52.19434	-7.76729

Date	Time	Species	Latitude	Longitude
03/09/2020	21:08:15	Common Pipistrelle	52.19434	-7.76729
03/09/2020	20:45:04	Soprano Pipistrelle	52.20363	-7.77811
03/09/2020	20:45:20	Soprano Pipistrelle	52.20112	-7.77782
03/09/2020	20:45:30	Soprano Pipistrelle	52.20093	-7.7778
03/09/2020	20:47:43	Soprano Pipistrelle	52.19838	-7.77702
03/09/2020	20:53:13	Soprano Pipistrelle	52.19035	-7.76969
03/09/2020	20:53:57	Soprano Pipistrelle	52.19077	-7.76885
03/09/2020	20:58:24	Soprano Pipistrelle	52.1944	-7.76702
03/09/2020	21:07:14	Soprano Pipistrelle	52.19434	-7.76729
03/09/2020	21:08:44	Soprano Pipistrelle	52.19434	-7.76729
03/09/2020	21:13:44	Soprano Pipistrelle	52.19434	-7.76729
03/09/2020	21:15:11	Soprano Pipistrelle	52.19434	-7.76729
03/09/2020	21:21:34	Soprano Pipistrelle	52.17834	-7.75821
03/09/2020	21:22:32	Soprano Pipistrelle	52.1767	-7.76158
03/09/2020	21:23:41	Soprano Pipistrelle	52.17626	-7.76227
03/09/2020	21:25:21	Soprano Pipistrelle	52.17859	-7.7573
03/09/2020	21:30:02	Soprano Pipistrelle	52.187	-7.74803
03/09/2020	21:33:16	Soprano Pipistrelle	52.19289	-7.74059
03/09/2020	21:39:20	Soprano Pipistrelle	52.18857	-7.74499
03/09/2020	21:41:53	Soprano Pipistrelle	52.18857	-7.745
03/09/2020	21:44:05	Soprano Pipistrelle	52.18956	-7.74671
03/09/2020	21:44:17	Soprano Pipistrelle	52.18956	-7.74671
03/09/2020	21:44:34	Soprano Pipistrelle	52.18956	-7.74671

Date	Time	Species	Latitude	Longitude
03/09/2020	21:44:49	Soprano Pipistrelle	52.18956	-7.74671
03/09/2020	21:45:02	Soprano Pipistrelle	52.18956	-7.74671
03/09/2020	21:45:52	Soprano Pipistrelle	52.18956	-7.74671
03/09/2020	21:51:17	Soprano Pipistrelle	52.19236	-7.75185
03/09/2020	21:51:24	Soprano Pipistrelle	52.19236	-7.75185
03/09/2020	21:51:47	Soprano Pipistrelle	52.19236	-7.75186
03/09/2020	21:51:59	Soprano Pipistrelle	52.19236	-7.75185
03/09/2020	21:55:21	Soprano Pipistrelle	52.19236	-7.75186
03/09/2020	21:55:42	Soprano Pipistrelle	52.19236	-7.75186
03/09/2020	21:55:57	Soprano Pipistrelle	52.19236	-7.75186
03/09/2020	21:56:12	Soprano Pipistrelle	52.19305	-7.75702
03/09/2020	21:56:48	Soprano Pipistrelle	52.19306	-7.75718
03/09/2020	21:56:54	Soprano Pipistrelle	52.19306	-7.75718
03/09/2020	21:59:07	Soprano Pipistrelle	52.19306	-7.75718
03/09/2020	22:00:14	Soprano Pipistrelle	52.19306	-7.75718
03/09/2020	22:04:21	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:04:37	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:16:59	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	20:56:54	Soprano Pipistrelle	52.19392	-7.76738
03/09/2020	21:02:28	Soprano Pipistrelle	52.19434	-7.76729
03/09/2020	21:13:29	Soprano Pipistrelle	52.19434	-7.76729
03/09/2020	21:21:46	Soprano Pipistrelle	52.17804	-7.759
03/09/2020	21:23:54	Soprano Pipistrelle	52.17653	-7.76184

Date	Time	Species	Latitude	Longitude
03/09/2020	21:25:33	Soprano Pipistrelle	52.17871	-7.75684
03/09/2020	21:31:29	Soprano Pipistrelle	52.18924	-7.74393
03/09/2020	21:33:01	Soprano Pipistrelle	52.19239	-7.74093
03/09/2020	21:36:29	Soprano Pipistrelle	52.19238	-7.74092
03/09/2020	21:36:44	Soprano Pipistrelle	52.19238	-7.74093
03/09/2020	21:41:28	Soprano Pipistrelle	52.18857	-7.745
03/09/2020	21:45:36	Soprano Pipistrelle	52.18956	-7.74671
03/09/2020	21:46:18	Soprano Pipistrelle	52.18956	-7.74671
03/09/2020	21:46:34	Soprano Pipistrelle	52.18956	-7.74671
03/09/2020	21:49:27	Soprano Pipistrelle	52.18956	-7.74671
03/09/2020	21:51:04	Soprano Pipistrelle	52.19237	-7.75154
03/09/2020	21:51:35	Soprano Pipistrelle	52.19236	-7.75185
03/09/2020	22:03:37	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:04:01	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:06:07	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:07:43	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:08:03	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:08:44	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:11:30	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:11:34	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:14:06	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:14:17	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	22:15:04	Soprano Pipistrelle	52.19283	-7.75456

Date	Time	Species	Latitude	Longitude
03/09/2020	22:18:40	Soprano Pipistrelle	52.19283	-7.75456
03/09/2020	20:56:54	Common Pipistrelle	52.19392	-7.76738
03/09/2020	21:02:28	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:13:29	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:21:46	Common Pipistrelle	52.17804	-7.759
03/09/2020	21:23:54	Common Pipistrelle	52.17653	-7.76184
03/09/2020	21:25:33	Common Pipistrelle	52.17871	-7.75684
03/09/2020	21:31:29	Common Pipistrelle	52.18924	-7.74393
03/09/2020	21:33:01	Common Pipistrelle	52.19239	-7.74093
03/09/2020	21:36:29	Common Pipistrelle	52.19238	-7.74092
03/09/2020	21:36:44	Common Pipistrelle	52.19238	-7.74093
03/09/2020	21:41:28	Common Pipistrelle	52.18857	-7.745
03/09/2020	21:45:36	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:46:18	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:46:34	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:49:27	Common Pipistrelle	52.18956	-7.74671
03/09/2020	21:51:04	Common Pipistrelle	52.19237	-7.75154
03/09/2020	21:51:35	Common Pipistrelle	52.19236	-7.75185
03/09/2020	22:03:37	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:04:01	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:06:07	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:07:43	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:08:03	Common Pipistrelle	52.19283	-7.75456

Date	Time	Species	Latitude	Longitude
03/09/2020	22:08:44	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:11:30	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:11:34	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:14:06	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:14:17	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:15:04	Common Pipistrelle	52.19283	-7.75456
03/09/2020	22:18:40	Common Pipistrelle	52.19283	-7.75456
03/09/2020	21:10:20	Brown Long-eared Bat	52.19434	-7.76729
03/09/2020	21:10:20	Leisler's Bat	52.19434	-7.76729
03/09/2020	21:12:00	Common Pipistrelle	52.19434	-7.76729
03/09/2020	21:31:15	Common Pipistrelle	52.18888	-7.74455

Table B. Bat activity recorded during July 2021 transects

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	24/07/2021	23:03:33	52.202855	-7.773442	Common Pipistrelle	Site 3A	
WT2	24/07/2021	23:04:02	52.202927	-7.773282	Brown Long-eared Bat	Flying westward across gate from forestry track back to roost	
WT2	24/07/2021	23:06:36	52.203016	-7.773212	Common Pipistrelle	Foraging	
WT2	24/07/2021	23:09:58	52.203395	-7.771639	Soprano Pipistrelle		
WT2	24/07/2021	23:10:15	52.203467	-7.771392	Soprano Pipistrelle		
WT2	24/07/2021	23:10:38	52.203474	-7.771210	Soprano Pipistrelle	Foraging	
WT2	24/07/2021	23:11:50	52.203474	-7.771049	Soprano Pipistrelle		
WT2	24/07/2021	23:12:33	52.203507	-7.770824	Soprano Pipistrelle	Foraging	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	24/07/2021	23:12:54	52.203540	-7.770599	Soprano Pipistrelle		
WT2	24/07/2021	23:14:50	52.203573	-7.769151	Common Pipistrelle	Foraging	
WT2	24/07/2021	23:15:17	52.203553	-7.768786	Soprano Pipistrelle	Foraging	
WT2	24/07/2021	23:15:51	52.203448	-7.768432	Common Pipistrelle	Foraging in circles along lane below tree height 15m	
WT2	24/07/2021	23:16:07	52.203422	-7.768175	Soprano Pipistrelle	Simultaneous with CP	
WT2	24/07/2021	23:16:07	52.203422	-7.768175	Common Pipistrelle	simultaneous with SP	
WT2	24/07/2021	23:16:41	52.203343	-7.767660	Common Pipistrelle	Foraging	
WT2	24/07/2021	23:17:07	52.203310	-7.767488	Soprano Pipistrelle	Foraging	
WT2	24/07/2021	23:23:11	52.203599	-7.769709	Common Pipistrelle	On way back. Quiet at end of forestry dead-end track	
WT2	24/07/2021	23:24:04	52.203606	-7.769977	Common Pipistrelle	Foraging. At least 2 bats	
WT2	24/07/2021	23:24:35	52.203606	-7.770202	Common Pipistrelle		
WT2	24/07/2021	23:25:15	52.203547	-7.770588	Common Pipistrelle		
WT2	24/07/2021	23:26:12	52.203422	-7.771350	Common Pipistrelle		
WT2	24/07/2021	23:27:06	52.203343	-7.772165	Common Pipistrelle		
WT2	24/07/2021	23:28:11	52.203231	-7.772948	Common Pipistrelle		
WT2	24/07/2021	23:29:12	52.202935	-7.773388	Common Pipistrelle	Back across gate to 3A	
WT2	24/07/2021	23:34:12	52.202442	-7.773023	<i>Myotis</i> sp.	Going down lane towards Site 6. Low flight height	
WT2	24/07/2021	23:38:30	52.201265	-7.771789	Common Pipistrelle		
WT2	24/07/2021	23:39:01	52.201100	-7.771638	Common Pipistrelle		
WT2	24/07/2021	23:39:17	52.200975	-7.771531	Common Pipistrelle	Foraging beat up and down along edge of conifer plantation	
WT2	24/07/2021	23:40:07	52.200554	-7.771284	Common Pipistrelle		
WT2	24/07/2021	23:41:05	52.200232	-7.771102	Common Pipistrelle	Foraging	
WT2	24/07/2021	23:41:47	52.200074	-7.771038	Common Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	24/07/2021	23:42:26	52.199614	-7.770759	Common Pipistrelle		
WT2	24/07/2021	23:50:06	52.200311	-7.771177	Common Pipistrelle	Quiet all around walk past site 6 and back on lane again now	
WT2	24/07/2021	23:52:19	52.201278	-7.771735	Common Pipistrelle		
WT2	24/07/2021	23:52:45	52.201626	-7.771917	Common Pipistrelle		
WT2	24/07/2021	23:54:32	52.202238	-7.772754	Common Pipistrelle	Foraging	
WT1	25/07/2021	00:25:50	52.193339	-7.776982	Common Pipistrelle		y
WT1	25/07/2021	00:25:50	52.193339	-7.776982	Leisler's Bat	Brief pass, going north, c. 50m height	y
WT1	25/07/2021	00:27:01	52.193348	-7.777787	Common Pipistrelle		
WT1	25/07/2021	00:30:15	52.193063	-7.781396	Brown Long-eared Bat		
WT1	25/07/2021	00:33:32	52.193497	-7.782124	Common Pipistrelle		
WT1	25/07/2021	00:35:47	52.193921	-7.783056	Soprano Pipistrelle		
WT1	25/07/2021	00:50:42	52.200941	-7.786625	Common Pipistrelle	Out foraging on the open heath away from all trees	
WT1	25/07/2021	00:56:00	52.200797	-7.784305	Common Pipistrelle	Foraging in open heath	
WT1	25/07/2021	01:06:24	52.195851	-7.779840	Soprano Pipistrelle	Getting back close to plantation edge	
WT1	25/07/2021	01:13:58	52.193294	-7.777414	Brown Long-eared Bat	Back to track to car. Foraging along track	
WT1	25/07/2021	01:14:44	52.193240	-7.777044	Common Pipistrelle	Foraging along track back to car	
WT1	25/07/2021	01:16:27	52.193049	-7.775701	Common Pipistrelle	Foraging along track back to car	
WT3	30/07/2021	22:55:01	52.194472	-7.767051	Brown Long-eared Bat	In farmyard	
WT3	30/07/2021	22:55:14	52.194334	-7.766854	Common Pipistrelle	In farmyard	
WT3	30/07/2021	22:56:44	52.193903	-7.766570	Leisler's Bat	In farmyard	
WT3	30/07/2021	22:57:05	52.193439	-7.766768	Common Pipistrelle	Foraging at south of trees south of farmyard	
WT3	30/07/2021	23:12:34	52.190714	-7.760438	Leisler's Bat	Foraging c. 60m over open fields near end of transect turn-back point	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT3	30/07/2021	23:13:26	52.189280	-7.758796	Common Pipistrelle	End of track at turn back point	
WT3	30/07/2021	23:17:25	52.189931	-7.762283	Common Pipistrelle	Foraging near patch of tall conifers in cattle fields	
WT3	30/07/2021	23:25:06	52.193345	-7.766570	Leisler's Bat	Nearing farmyard again	
WT3	30/07/2021	23:25:19	52.193575	-7.766720	Common Pipistrelle		
WT3	30/07/2021	23:25:29	52.193733	-7.766559	Leisler's Bat		y
WT3	30/07/2021	23:25:29	52.193733	-7.766559	Common Pipistrelle		y
WT3	30/07/2021	23:25:59	52.193963	-7.766698	Leisler's Bat	Foraging over farm sheds	y
WT3	30/07/2021	23:25:59	52.193963	-7.766698	Common Pipistrelle	Foraging over farm sheds	y
WT3	30/07/2021	23:26:08	52.194187	-7.766859	Common Pipistrelle		
WT3	30/07/2021	23:26:27	52.194187	-7.766859	Common Pipistrelle		y
WT3	30/07/2021	23:26:27	52.194187	-7.766859	Leisler's Bat		y
WT3	30/07/2021	23:27:10	52.194483	-7.766998	Leisler's Bat	Only one Leisler in view at any one time	
WT3	30/07/2021	23:27:40	52.194522	-7.767309	Soprano Pipistrelle		y
WT3	30/07/2021	23:27:40	52.194522	-7.767309	Common Pipistrelle		y
WT3	30/07/2021	23:28:33	52.194509	-7.767395	Leisler's Bat		
WT3	30/07/2021	23:28:54	52.194338	-7.767288	Common Pipistrelle		
WT3	30/07/2021	23:29:29	52.194358	-7.767503	Soprano Pipistrelle		y
WT3	30/07/2021	23:29:29	52.194358	-7.767503	Common Pipistrelle		y
WT3	30/07/2021	23:29:29	52.194358	-7.767503	Leisler's Bat		y
WT3	30/07/2021	23:32:29	52.194154	-7.767417	Common Pipistrelle		
WT3	30/07/2021	23:34:29	52.192579	-7.767168	Common Pipistrelle		
WT3	30/07/2021	23:35:00	52.191704	-7.767898	Common Pipistrelle		
WT3	30/07/2021	23:35:36	52.190994	-7.768628	Common Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT3	30/07/2021	23:37:09	52.189961	-7.771385	Soprano Pipistrelle		
WT4	30/07/2021	23:48:55	52.188665	-7.745238	Common Pipistrelle	Foraging near road gate	
WT4	30/07/2021	23:49:37	52.188737	-7.745391	Common Pipistrelle		
WT4	30/07/2021	23:50:11	52.188915	-7.745370	Soprano Pipistrelle	Foraging near road gate	
WT4	30/07/2021	23:50:36	52.188948	-7.745617	Soprano Pipistrelle		
WT4	30/07/2021	23:51:12	52.189053	-7.745832	Soprano Pipistrelle	Feeding buzz	
WT4	30/07/2021	23:51:34	52.189185	-7.745929	Soprano Pipistrelle	Feeding buzz	
WT4	30/07/2021	23:52:04	52.189290	-7.746101	Common Pipistrelle	Foraging	
WT4	30/07/2021	23:52:17	52.189329	-7.746187	Soprano Pipistrelle		
WT4	30/07/2021	23:53:17	52.189750	-7.746810	Soprano Pipistrelle		
WT4	30/07/2021	23:53:40	52.189987	-7.747110	Soprano Pipistrelle		
WT4	30/07/2021	23:54:16	52.190151	-7.747410	Soprano Pipistrelle	Foraging	
WT4	30/07/2021	23:55:03	52.190414	-7.747700	Soprano Pipistrelle		
WT4	30/07/2021	23:55:28	52.190559	-7.747915	Common Pipistrelle		
WT4	30/07/2021	23:55:45	52.190789	-7.748033	Soprano Pipistrelle		
WT4	30/07/2021	23:56:48	52.191144	-7.747797	Soprano Pipistrelle	Foraging - all of them are	
WT4	30/07/2021	23:57:49	52.191512	-7.747668	Soprano Pipistrelle		
WT4	30/07/2021	23:58:50	52.192084	-7.748172	Soprano Pipistrelle		y
WT4	30/07/2021	23:58:50	52.192084	-7.748172	Common Pipistrelle		y
WT4	30/07/2021	23:59:30	52.192333	-7.749536	Common Pipistrelle		
WT4	30/07/2021	23:59:59	52.192524	-7.749858	Soprano Pipistrelle	Turn-back point flooded track	
WT4	31/07/2021	00:00:01	52.192471	-7.749901	Soprano Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	31/07/2021	00:01:12	52.192359	-7.749590	Common Pipistrelle		
WT4	31/07/2021	00:01:40	52.192221	-7.749021	Soprano Pipistrelle		
WT4	31/07/2021	00:02:04	52.192182	-7.748517	Common Pipistrelle		
WT4	31/07/2021	00:02:18	52.192149	-7.748324	Soprano Pipistrelle		
WT4	31/07/2021	00:02:32	52.192083	-7.748131	Common Pipistrelle		
WT4	31/07/2021	00:02:49	52.192086	-7.747765	Brown Long-eared Bat	Clear flight pulses	
WT4	31/07/2021	00:03:12	52.192196	-7.747668	Soprano Pipistrelle		
WT4	31/07/2021	00:03:16	52.192293	-7.747563	Brown Long-eared Bat		
WT4	31/07/2021	00:03:57	52.192406	-7.747601	Brown Long-eared Bat		y
WT4	31/07/2021	00:03:57	52.192406	-7.747601	<i>Myotis</i> sp.		y
WT4	31/07/2021	00:04:44	52.192403	-7.747735	Brown Long-eared Bat	Set up passive at farm courtyard here - roost suspected BLE and <i>Myotis</i>	
WT4	31/07/2021	00:05:20	52.192354	-7.747604	Brown Long-eared Bat		
WT4	31/07/2021	00:09:38	52.192476	-7.747628	<i>Myotis</i> sp.	Whiskered Bat likely	
WT4	31/07/2021	00:10:17	52.192422	-7.747628	<i>Myotis</i> sp.	Whiskered Bat likely	
WT4	31/07/2021	00:12:45	52.192246	-7.747558	<i>Myotis</i> sp.		
WT4	31/07/2021	00:15:29	52.192146	-7.747472	<i>Myotis</i> sp.	Whiskered Bat likely	
WT4	31/07/2021	00:16:09	52.192199	-7.747681	Common Pipistrelle	On way back again now	
WT4	31/07/2021	00:16:59	52.192107	-7.747818	Common Pipistrelle	Foraging	
WT4	31/07/2021	00:18:17	52.191754	-7.747662	Soprano Pipistrelle		
WT4	31/07/2021	00:18:51	52.191523	-7.747724	Soprano Pipistrelle	Foraging	
WT4	31/07/2021	00:19:14	52.191293	-7.747799	Soprano Pipistrelle		
WT4	31/07/2021	00:20:34	52.190523	-7.747778	Soprano Pipistrelle		y
WT4	31/07/2021	00:20:34	52.190523	-7.747778	Common Pipistrelle		y

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	31/07/2021	00:21:32	52.190010	-7.747048	Soprano Pipistrelle		
WT4	31/07/2021	00:22:48	52.189418	-7.746286	Common Pipistrelle	Feeding buzz	
WT4	31/07/2021	00:23:10	52.189254	-7.746082	Common Pipistrelle	Foraging	
WT4	31/07/2021	00:23:21	52.189083	-7.745857	Soprano Pipistrelle	Feeding buzz	y
WT4	31/07/2021	00:23:21	52.189083	-7.745857	Common Pipistrelle		y

Table C. Bat activity recorded during August 2021 transects

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT1	25/08/2021	21:15:32	52.193150	-7.776221	Common Pipistrelle		
WT1	25/08/2021	21:19:47	52.193312	-7.780776	Common Pipistrelle	Track in open fields, commuting west c. 4m height	
WT1	25/08/2021	21:20:04	52.193134	-7.781455	Common Pipistrelle		
WT1	25/08/2021	21:28:39	52.195317	-7.783504	Leisler's Bat		
WT1	25/08/2021	21:45:14	52.200809	-7.787659	Soprano Pipistrelle	Feeding buzz. Foraging in open ground towards uplands	
WT1	25/08/2021	21:46:23	52.201079	-7.786661	Soprano Pipistrelle		
WT1	25/08/2021	21:47:19	52.200877	-7.786696	Soprano Pipistrelle	Feeding buzz. Foraging over open heathland	
WT1	25/08/2021	21:48:34	52.201324	-7.785237	Soprano Pipistrelle	Feeding buzz	
WT1	25/08/2021	21:56:22	52.197905	-7.780956	Leisler's Bat	Foraging over open heathland at heights c. 20-50m	
WT1	25/08/2021	22:00:41	52.196905	-7.779486	Common Pipistrelle		
WT1	25/08/2021	22:03:05	52.194721	-7.779271	Soprano Pipistrelle		
WT1	25/08/2021	22:05:23	52.193983	-7.777733	Common Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT1	25/08/2021	22:06:18	52.193388	-7.777875	Soprano Pipistrelle	Back at gate to track to car. With social calls	y
WT1	25/08/2021	22:06:18	52.193388	-7.777875	Common Pipistrelle		y
WT1	25/08/2021	22:07:15	52.193208	-7.776591	Soprano Pipistrelle	Foraging along forestry track to road	
WT2	25/08/2021	22:16:21	52.202823	-7.773529	Soprano Pipistrelle		
WT2	25/08/2021	22:16:25	52.202847	-7.773453	Common Pipistrelle		
WT2	25/08/2021	22:19:32	52.203567	-7.770668	Common Pipistrelle		
WT2	25/08/2021	22:21:56	52.203567	-7.768565	Soprano Pipistrelle		
WT2	25/08/2021	22:23:27	52.203248	-7.766626	Leisler's Bat	Towards dead-end of forestry track	
WT2	25/08/2021	22:25:07	52.203343	-7.766481	Soprano Pipistrelle	On way back west toward roost	
WT2	25/08/2021	22:26:53	52.203542	-7.768619	Soprano Pipistrelle		y
WT2	25/08/2021	22:26:53	52.203542	-7.768619	Common Pipistrelle		y
WT2	25/08/2021	22:28:05	52.203639	-7.769956	Common Pipistrelle		
WT2	25/08/2021	22:31:44	52.202622	-7.773110	Common Pipistrelle		
WT2	25/08/2021	22:32:24	52.202407	-7.772921	Soprano Pipistrelle		
WT2	25/08/2021	22:33:12	52.201865	-7.772200	Common Pipistrelle		y
WT2	25/08/2021	22:33:12	52.201865	-7.772200	Soprano Pipistrelle		y
WT2	25/08/2021	22:33:30	52.201358	-7.771836	Soprano Pipistrelle		
WT2	25/08/2021	22:34:45	52.200915	-7.771466	Common Pipistrelle		
WT2	25/08/2021	22:35:08	52.200617	-7.771315	Common Pipistrelle		
WT2	25/08/2021	22:36:34	52.200206	-7.771074	Common Pipistrelle		
WT2	25/08/2021	22:38:53	52.199078	-7.770390	Soprano Pipistrelle		
WT2	25/08/2021	22:39:05	52.198849	-7.770447	Common Pipistrelle		
WT2	25/08/2021	22:39:14	52.198748	-7.770661	Common Pipistrelle		y

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	25/08/2021	22:39:14	52.198748	-7.770661	Soprano Pipistrelle		y
WT2	25/08/2021	22:39:45	52.198643	-7.770956	<i>Myotis</i> sp.	Possible Whiskered Bat	y
WT2	25/08/2021	22:40:20	52.198621	-7.771083	Soprano Pipistrelle		
WT2	25/08/2021	22:40:33	52.198529	-7.771505	Common Pipistrelle		
WT2	25/08/2021	22:41:48	52.198599	-7.771555	Soprano Pipistrelle		
WT2	25/08/2021	22:42:36	52.198761	-7.771786	Common Pipistrelle		
WT2	25/08/2021	22:43:37	52.199077	-7.771868	Common Pipistrelle		
WT2	25/08/2021	22:44:12	52.199210	-7.771799	Common Pipistrelle		y
WT2	25/08/2021	22:44:12	52.199210	-7.771799	Soprano Pipistrelle		y
WT2	25/08/2021	22:46:23	52.200328	-7.771162	Brown Long-eared Bat		
WT2	25/08/2021	22:46:23	52.200328	-7.771162	Common Pipistrelle		
WT2	25/08/2021	22:48:12	52.201914	-7.772357	<i>Myotis</i> sp.	Possible Whiskered Bat	
WT2	25/08/2021	22:48:20	52.202151	-7.772694	Soprano Pipistrelle	With social calls	
WT2	25/08/2021	22:50:59	52.202789	-7.773253	Soprano Pipistrelle		
WT2	25/08/2021	22:51:46	52.202872	-7.773431	Common Pipistrelle		
WT2	25/08/2021	22:53:20	52.202455	-7.774377	Common Pipistrelle		
WT3	25/08/2021	22:59:28	52.189900	-7.771349	Common Pipistrelle	Flying southward along road hedge	
WT3	25/08/2021	23:00:56	52.190584	-7.769246	Brown Long-eared Bat	Flying low along track going east towards farmyard	
WT3	25/08/2021	23:01:15	52.191156	-7.768488	Common Pipistrelle		
WT3	25/08/2021	23:01:26	52.191389	-7.768300	Common Pipistrelle	One bat foraging	
WT3	25/08/2021	23:01:51	52.191751	-7.767933	Common Pipistrelle	Another CP foraging	y
WT3	25/08/2021	23:01:51	52.191751	-7.767933	Soprano Pipistrelle		y

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT3	25/08/2021	23:01:51	52.191751	-7.767933	Leisler's Bat	Flying high c. 100m	y
WT3	25/08/2021	23:02:24	52.194096	-7.767400	Soprano Pipistrelle	At farmyard now, always lots of bats foraging	y
WT3	25/08/2021	23:02:24	52.194096	-7.767400	Common Pipistrelle		y
WT3	25/08/2021	23:02:56	52.194565	-7.767322	Common Pipistrelle	All three SP CP L foraging over farmyard	y
WT3	25/08/2021	23:02:56	52.194565	-7.767322	Soprano Pipistrelle	All three SP CP L foraging over farmyard	y
WT3	25/08/2021	23:02:56	52.194565	-7.767322	Leisler's Bat	All three SP CP L foraging over farmyard	y
WT3	25/08/2021	23:03:20	52.194262	-7.766861	Common Pipistrelle	All three SP CP L foraging over farmyard	y
WT3	25/08/2021	23:03:20	52.194262	-7.766861	Soprano Pipistrelle	All three SP CP L foraging over farmyard	y
WT3	25/08/2021	23:03:20	52.194262	-7.766861	Leisler's Bat	All three SP CP L foraging over farmyard	y
WT3	25/08/2021	23:03:43	52.194304	-7.767072	Common Pipistrelle	Still farmyard area	y
WT3	25/08/2021	23:03:43	52.194304	-7.767072	Soprano Pipistrelle		y
WT3	25/08/2021	23:03:43	52.194304	-7.767072	Leisler's Bat		y
WT3	25/08/2021	23:05:41	52.194053	-7.766963	Common Pipistrelle	Farmyard all three foraging CP in modern farm sheds	y
WT3	25/08/2021	23:05:41	52.194053	-7.766963	Soprano Pipistrelle		y
WT3	25/08/2021	23:05:41	52.194053	-7.766963	Leisler's Bat		y
WT3	25/08/2021	23:11:32	52.191158	-7.763720	Soprano Pipistrelle	Open farm track low hedge getting to tall conifers. With social calls	
WT3	25/08/2021	23:12:09	52.190604	-7.763449	Soprano Pipistrelle	Foraging along treeline	
WT3	25/08/2021	23:13:25	52.190073	-7.763085	Soprano Pipistrelle	Foraging patch of tall conifers	
WT3	25/08/2021	23:17:50	52.189531	-7.760141	Soprano Pipistrelle	On way back up from turning point in transect	
WT3	25/08/2021	23:17:59	52.189694	-7.761007	Common Pipistrelle		
WT3	25/08/2021	23:19:51	52.189849	-7.762163	Soprano Pipistrelle	Still foraging at tall conifer patch	
WT3	25/08/2021	23:20:34	52.190027	-7.762662	Whiskered Bat	Also on track beside tall conifer patch	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT3	25/08/2021	23:20:41	52.190082	-7.762962	Soprano Pipistrelle		y
WT3	25/08/2021	23:20:41	52.190082	-7.762962	<i>Myotis</i> sp.	Faint	y
WT3	25/08/2021	23:21:04	52.190479	-7.763437	<i>Myotis</i> sp.		
WT3	25/08/2021	23:21:07	52.190479	-7.763437	<i>Myotis</i> sp.	Probably Whiskered. Stopped to try and get good <i>Myotis</i> recording but a bit far away	
WT3	25/08/2021	23:21:11	52.190479	-7.763437	<i>Myotis</i> sp.		
WT3	25/08/2021	23:24:18	52.191452	-7.766012	Leisler's Bat		
WT3	25/08/2021	23:26:54	52.193352	-7.766656	Common Pipistrelle	Getting back to farmyard again	
WT3	25/08/2021	23:27:19	52.193352	-7.766656	Common Pipistrelle		
WT3	25/08/2021	23:27:44	52.193966	-7.766663	Soprano Pipistrelle	Foraging	y
WT3	25/08/2021	23:27:44	52.193966	-7.766663	Common Pipistrelle	Foraging	y
WT3	25/08/2021	23:28:23	52.194443	-7.767078	Common Pipistrelle		
WT3	25/08/2021	23:28:55	52.194389	-7.767257	Common Pipistrelle	Constant foraging at farmyard 3 or 4 CPs	
WT3	25/08/2021	23:30:55	52.193847	-7.767345	Soprano Pipistrelle		
WT3	25/08/2021	23:31:57	52.192452	-7.767259	Common Pipistrelle		
WT3	25/08/2021	23:32:51	52.191278	-7.768227	Common Pipistrelle		
WT4	25/08/2021	23:39:33	52.188664	-7.745186	Soprano Pipistrelle	Both CP SP foraging along tree-lined lane	y
WT4	25/08/2021	23:39:33	52.188664	-7.745186	Common Pipistrelle	Both CP SP foraging along tree-lined lane	y
WT4	25/08/2021	23:39:56	52.188797	-7.745412	Common Pipistrelle		
WT4	25/08/2021	23:40:32	52.188979	-7.745613	Soprano Pipistrelle		
WT4	25/08/2021	23:40:52	52.189391	-7.746229	Common Pipistrelle		
WT4	25/08/2021	23:41:04	52.189612	-7.746573	Soprano Pipistrelle		
WT4	25/08/2021	23:44:36	52.191217	-7.747646	Common Pipistrelle	Unusually not constant bat activity on this lane	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	25/08/2021	23:45:02	52.191994	-7.747968	Common Pipistrelle		
WT4	25/08/2021	23:45:12	52.192088	-7.747998	Soprano Pipistrelle		
WT4	25/08/2021	23:46:17	52.192293	-7.749428	Soprano Pipistrelle	SP CP foraging flooded laned	y
WT4	25/08/2021	23:46:17	52.192293	-7.749428	Common Pipistrelle	SP CP foraging flooded laned	y
WT4	25/08/2021	23:47:15	52.192112	-7.748026	Soprano Pipistrelle	Foraging gateway to farm courtyard	y
WT4	25/08/2021	23:47:15	52.192112	-7.748026	Common Pipistrelle	Foraging gateway to farm courtyard	y
WT4	25/08/2021	23:47:58	52.191559	-7.747769	Soprano Pipistrelle		
WT4	25/08/2021	23:48:10	52.191298	-7.747665	Soprano Pipistrelle		
WT4	25/08/2021	23:49:45	52.190693	-7.747965	<i>Myotis</i> sp.	Faint pulses. CP too	y
WT4	25/08/2021	23:49:45	52.190693	-7.747965	Common Pipistrelle	Faint pulses	y
WT4	25/08/2021	23:50:33	52.189903	-7.747021	Common Pipistrelle		
WT4	25/08/2021	23:51:19	52.189482	-7.746206	Soprano Pipistrelle		
WT4	25/08/2021	23:51:56	52.189192	-7.745820	Common Pipistrelle		
WT4	25/08/2021	23:52:07	52.188823	-7.745434	Common Pipistrelle		
WT4	25/08/2021	23:54:02	52.188504	-7.745022	Soprano Pipistrelle	Foraging at start of lane on road	

Table D. Bat activity recorded during September 2021 transects

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	15/09/2021	20:34:46	52.188572	-7.745140	Common Pipistrelle		
WT4	15/09/2021	20:35:19	52.188706	-7.745094	Soprano Pipistrelle		
WT4	15/09/2021	20:36:26	52.188972	-7.745607	Soprano Pipistrelle	With social calls	
WT4	15/09/2021	20:36:39	52.189163	-7.745777	Soprano Pipistrelle	Feeding buzz	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	15/09/2021	20:37:03	52.189178	-7.746097	Soprano Pipistrelle		
WT4	15/09/2021	20:37:23	52.189402	-7.746178	Soprano Pipistrelle	Feeding buzz	
WT4	15/09/2021	20:37:31	52.189618	-7.746548	Soprano Pipistrelle		
WT4	15/09/2021	20:37:59	52.189883	-7.746927	Soprano Pipistrelle		
WT4	15/09/2021	20:38:31	52.190092	-7.747276	Common Pipistrelle		
WT4	15/09/2021	20:39:11	52.190237	-7.747365	Soprano Pipistrelle		
WT4	15/09/2021	20:39:27	52.190528	-7.747746	Common Pipistrelle		
WT4	15/09/2021	20:40:16	52.190975	-7.747899	Soprano Pipistrelle	Feeding buzz	
WT4	15/09/2021	20:40:35	52.191065	-7.747739	Common Pipistrelle		
WT4	15/09/2021	20:41:08	52.191790	-7.747811	Soprano Pipistrelle	Feeding buzz	
WT4	15/09/2021	20:41:30	52.192056	-7.748107	50kHz Pipistrelle		
WT4	15/09/2021	20:41:41	52.192115	-7.748213	Common Pipistrelle		
WT4	15/09/2021	20:46:15	52.192329	-7.747701	Common Pipistrelle	Foraging farm courtyard Site 12. About 3 CPs	
WT4	15/09/2021	20:47:29	52.192119	-7.747717	Whiskered Bat	Definitely a roost here	
WT4	15/09/2021	20:47:51	52.191940	-7.747750	Soprano Pipistrelle		
WT4	15/09/2021	20:48:14	52.191719	-7.747793	Common Pipistrelle		
WT4	15/09/2021	20:48:31	52.191447	-7.747753	Soprano Pipistrelle		
WT4	15/09/2021	20:48:44	52.191182	-7.747764	Common Pipistrelle		
WT4	15/09/2021	20:50:38	52.190987	-7.748004	Soprano Pipistrelle		y
WT4	15/09/2021	20:50:38	52.190987	-7.748004	Whiskered Bat	Feeding buzz. Foraging along bend in tree-lined lane at small woodland patch	y
WT4	15/09/2021	20:50:51	52.190871	-7.747992	Soprano Pipistrelle		y
WT4	15/09/2021	20:50:51	52.190871	-7.747992	Common Pipistrelle		y
WT4	15/09/2021	20:51:15	52.190920	-7.747846	Common Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	15/09/2021	20:51:23	52.190920	-7.747846	Whiskered Bat	Still foraging at lane beside little woodland patch - stayed to observe	
WT4	15/09/2021	20:51:27	52.191021	-7.748172	Common Pipistrelle		
WT4	15/09/2021	20:51:32	52.190804	-7.747984	Whiskered Bat	One bat I think. Still foraging at lane beside little woodland patch - stayed to observe	y
WT4	15/09/2021	20:51:32	52.190804	-7.747984	Common Pipistrelle		y
WT4	15/09/2021	20:51:54	52.190359	-7.747670	Common Pipistrelle		
WT4	15/09/2021	20:52:24	52.190043	-7.747026	Common Pipistrelle		
WT4	15/09/2021	20:52:39	52.189490	-7.746382	50kHz Pipistrelle		
WT3	15/09/2021	21:01:56	52.190405	-7.769563	Common Pipistrelle	Lane on way to farmyard	
WT3	15/09/2021	21:02:36	52.192530	-7.767155	Common Pipistrelle		
WT3	15/09/2021	21:02:51	52.193311	-7.767321	Common Pipistrelle		
WT3	15/09/2021	21:06:26	52.194470	-7.767209	Soprano Pipistrelle	Farmyard	
WT3	15/09/2021	21:10:14	52.191550	-7.766050	Soprano Pipistrelle	Open fields low hedge only	
WT3	15/09/2021	21:17:23	52.191339	-7.764763	Leisler's Bat	Brief pass flying from NW to SE c. 30m height. Quiet otherwise for all the way past tall conifers and back again to here	
WT3	15/09/2021	21:23:29	52.193568	-7.766831	Common Pipistrelle	CP foraging back at farmyard	
WT3	15/09/2021	21:24:29	52.194275	-7.766816	Common Pipistrelle		
WT3	15/09/2021	21:24:59	52.194444	-7.767370	Common Pipistrelle		
WT3	15/09/2021	21:25:33	52.194338	-7.767399	Common Pipistrelle		
WT3	15/09/2021	21:27:16	52.193927	-7.767408	Common Pipistrelle		
WT3	15/09/2021	21:28:14	52.192322	-7.767365	Common Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT1	15/09/2021	21:34:29	52.193134	-7.776281	<i>Myotis</i> sp.	Probably Whiskered Bat. Commuting along forestry lane near roadway at start of transect	
WT1	15/09/2021	21:50:17	52.199486	-7.782567	Soprano Pipistrelle	Out on open heath area	
WT1	15/09/2021	22:11:16	52.199486	-7.782567	Soprano Pipistrelle	Upland but close to conifer plantation edge	
WT1	15/09/2021	22:22:47	52.199486	-7.782567	Common Pipistrelle	Back near gate at modern shed behind conifers	
WT2	15/09/2021	22:32:33	52.202773	-7.778089	Common Pipistrelle	CP foraging road at start. 11 degrees at start of transect	
WT2	15/09/2021	22:36:27	52.202865	-7.773423	Common Pipistrelle	Near roost 3A. Low activity here for a change	
WT2	15/09/2021	22:39:49	52.201757	-7.772249	Soprano Pipistrelle	Foraging at conifer edge along track southward to Site 6	
WT2	15/09/2021	22:40:34	52.201167	-7.771659	Soprano Pipistrelle	Ditto	
WT2	15/09/2021	22:41:09	52.200930	-7.771530	Soprano Pipistrelle	Ditto	
WT2	15/09/2021	22:41:59	52.200377	-7.771144	Soprano Pipistrelle	Ditto	
WT2	15/09/2021	22:44:33	52.199175	-7.770761	Soprano Pipistrelle	Middle of field but short gap between tall trees. With social calls	
WT2	15/09/2021	22:44:39	52.198738	-7.770670	<i>Myotis</i> sp.	Probably Whiskered Bat. At big sycamore near ruin at Site 6	
WT2	15/09/2021	22:45:20	52.198618	-7.770896	Whiskered Bat	Just south of ruin at Site 6 - one bat	
WT2	15/09/2021	22:45:28	52.198618	-7.770896	Whiskered Bat	Just south of ruin at Site 6 - one bat	
WT2	15/09/2021	22:45:40	52.198666	-7.771238	Whiskered Bat	Just south of ruin at Site 6 - this might be a second individual	
WT2	15/09/2021	22:48:59	52.199099	-7.771951	Soprano Pipistrelle		y
WT2	15/09/2021	22:48:59	52.199099	-7.771951	Common Pipistrelle		y
WT2	15/09/2021	22:49:34	52.199330	-7.771671	Common Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	15/09/2021	22:50:41	52.200022	-7.771043	Soprano Pipistrelle	3 foraging around corner of planation at farm track	
WT2	15/09/2021	22:51:04	52.200325	-7.771136	Soprano Pipistrelle		
WT2	15/09/2021	22:52:05	52.201090	-7.771659	Soprano Pipistrelle		
WT2	15/09/2021	22:52:37	52.201261	-7.771803	Common Pipistrelle		
WT2	15/09/2021	22:55:00	52.202747	-7.773228	Brown Long-eared Bat	Lots of BLE action around roost 3A - night roosting and also travelling down track to east where plantation forestry is	
WT2	15/09/2021	22:55:57	52.202928	-7.773278	Brown Long-eared Bat	Flying low to ground - goes through bars of gate to track eastward	
WT2	15/09/2021	22:56:07	52.203035	-7.772902	Brown Long-eared Bat		
WT2	15/09/2021	22:56:18	52.203240	-7.772310	Brown Long-eared Bat	Foraging along track or curious	
WT2	15/09/2021	22:56:21	52.203303	-7.772051	Soprano Pipistrelle	Quiet for the rest of track to dead end	
WT2	15/09/2021	23:05:27	52.203408	-7.768024	Soprano Pipistrelle	Going back west	
WT2	15/09/2021	23:09:48	52.203592	-7.771157	Common Pipistrelle	Foraging	
WT2	15/09/2021	23:11:34	52.202875	-7.773366	Soprano Pipistrelle	Back at roost 3A. With social calls	
WT2	15/09/2021	23:13:49	52.202423	-7.774269	Soprano Pipistrelle	11 degrees at end	

Table E. Bat activity recorded during July 2022 transects

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	02/07/2022	23:30:15	52.202755	-7.777862	Common Pipistrelle	2 bats. Flying along track to Site 3A 3m height	
WT2	02/07/2022	23:33:47	52.202483	-7.775509	Soprano Pipistrelle	1 bat. Foraging at tall trees beside track	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	02/07/2022	23:33:58	52.202483	-7.774905	Soprano Pipistrelle	1 bat. Foraging at tall trees beside track	
WT2	02/07/2022	23:34:27	52.202443	-7.774406	Soprano Pipistrelle	A different one. Foraging at trees along lane	
WT2	02/07/2022	23:34:43	52.202524	-7.774159	Common Pipistrelle	2 bats. Commuting along lane uphill westward	
WT2	02/07/2022	23:35:09	52.202705	-7.773775	Soprano Pipistrelle	Foraging near Site 3A building	
WT2	02/07/2022	23:35:27	52.202868	-7.773405	Soprano Pipistrelle	Foraging near Site 3A building	
WT2	02/07/2022	23:35:45	52.202799	-7.773410	Brown Long-eared Bat	BLE observed flying out east gable window of house at Site 3A	
WT2	02/07/2022	23:36:46	52.203029	-7.772992	Common Pipistrelle	1 bat. Foraging c. 5m high at trees on forestry track	
WT2	02/07/2022	23:40:27	52.203433	-7.768104	<i>Myotis</i> sp.	Probably Whiskered Bat - along forestry track close to detector	
WT2	02/07/2022	23:43:02	52.203150	-7.766344	Common Pipistrelle	One CP foraging near end of forestry track	
WT2	02/07/2022	23:43:09	52.203150	-7.766344	Soprano Pipistrelle		
WT2	02/07/2022	23:43:30	52.203288	-7.767160	Common Pipistrelle		
WT2	02/07/2022	23:44:29	52.203400	-7.767793	Common Pipistrelle		
WT2	02/07/2022	23:45:30	52.203617	-7.769413	Common Pipistrelle		
WT2	02/07/2022	23:45:47	52.203584	-7.770143	Common Pipistrelle		
WT2	02/07/2022	23:47:43	52.203499	-7.770583	Soprano Pipistrelle		
WT2	02/07/2022	23:48:04	52.203453	-7.770980	Soprano Pipistrelle		
WT2	02/07/2022	23:48:38	52.203387	-7.771431	Common Pipistrelle		
WT2	02/07/2022	23:48:51	52.203229	-7.772139	Common Pipistrelle	Also BLE at same time	y
WT2	02/07/2022	23:48:51	52.203229	-7.772139	Brown Long-eared Bat	Also CP at same time	y

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	02/07/2022	23:49:03	52.203196	-7.772525	Common Pipistrelle	CP SP BLE all at same time	y
WT2	02/07/2022	23:49:03	52.203196	-7.772525	Brown Long-eared Bat	CP SP BLE all at same time	y
WT2	02/07/2022	23:49:03	52.203196	-7.772525	Soprano Pipistrelle	CP SP BLE all at same time	y
WT2	02/07/2022	23:49:17	52.203005	-7.773104	Common Pipistrelle	Also BLE at same time	y
WT2	02/07/2022	23:49:17	52.203005	-7.773104	Brown Long-eared Bat	Also CP at same time	y
WT2	02/07/2022	23:49:23	52.202827	-7.773286	Common Pipistrelle	Also BLE at same time	y
WT2	02/07/2022	23:49:23	52.202827	-7.773286	Brown Long-eared Bat	Also CP at same time	y
WT2	02/07/2022	23:50:09	52.202807	-7.773232	Common Pipistrelle		
WT2	02/07/2022	23:52:38	52.202741	-7.773296	Common Pipistrelle		
WT2	02/07/2022	23:53:40	52.202741	-7.773296	Common Pipistrelle		
WT2	02/07/2022	23:54:18	52.202451	-7.773017	Common Pipistrelle		
WT2	02/07/2022	23:55:36	52.202155	-7.772641	Common Pipistrelle		
WT2	02/07/2022	23:56:21	52.201951	-7.772394	Soprano Pipistrelle	Foraging	
WT2	02/07/2022	23:56:57	52.201478	-7.771954	Soprano Pipistrelle		
WT2	02/07/2022	23:58:30	52.200301	-7.771117	Common Pipistrelle		
WT2	02/07/2022	23:58:49	52.199788	-7.770892	Soprano Pipistrelle		
WT2	02/07/2022	23:59:09	52.199347	-7.770602	Common Pipistrelle		
WT2	02/07/2022	23:59:25	52.199077	-7.770409	Soprano Pipistrelle		
WT2	02/07/2022	23:59:45	52.198577	-7.770012	Common Pipistrelle		
WT2	03/07/2022	00:00:53	52.198755	-7.770645	Common Pipistrelle		
WT2	03/07/2022	00:03:23	52.199130	-7.772136	Common Pipistrelle		
WT2	03/07/2022	00:05:07	52.200162	-7.771149	Soprano Pipistrelle		
WT2	03/07/2022	00:06:58	52.200629	-7.771364	Common Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	03/07/2022	00:07:17	52.201306	-7.771793	<i>Myotis</i> sp.	Very faint pulses only detected	
WT2	03/07/2022	00:07:26	52.201622	-7.772115	Common Pipistrelle		
WT2	03/07/2022	00:08:06	52.202036	-7.772576	Common Pipistrelle		
WT2	03/07/2022	00:11:48	52.202529	-7.774185	Soprano Pipistrelle		
WT2	03/07/2022	00:12:37	52.202595	-7.776685	Common Pipistrelle		
WT2	03/07/2022	00:17:00	52.202746	-7.778005	Brown Long-eared Bat	BLE on road at 1.5 m height at end of transect	
WT1	13/07/2022	22:44:34	52.194362	-7.778529	Leisler's Bat	Quiet on upland transect. Supermoon. Long-eared owls x 2 heard and seen lower sections	
WT1	13/07/2022	22:48:47	52.190814	-7.768864	Common Pipistrelle	Back on forestry lane	
WT1	13/07/2022	22:51:37	52.193172	-7.776279	Common Pipistrelle	Back on forestry lane	
WT3	13/07/2022	22:59:36	52.190814	-7.768864	Common Pipistrelle		
WT3	13/07/2022	23:01:24	52.193092	-7.767304	Soprano Pipistrelle		
WT3	13/07/2022	23:04:27	52.194422	-7.767311	Common Pipistrelle	Farmyard 8A	
WT3	13/07/2022	23:05:18	52.194336	-7.766939	Common Pipistrelle	Farmyard 8A	
WT3	13/07/2022	23:06:23	52.194091	-7.766790	Soprano Pipistrelle	Farmyard 8A	
WT3	13/07/2022	23:06:38	52.194026	-7.766950	Common Pipistrelle		
WT3	13/07/2022	23:13:50	52.191290	-7.764375	Soprano Pipistrelle		
WT3	13/07/2022	23:15:59	52.191106	-7.763474	Soprano Pipistrelle		
WT3	13/07/2022	23:22:35	52.193341	-7.766629	Common Pipistrelle	Quiet on track - activity much higher as usual at farmyard	
WT3	13/07/2022	23:25:22	52.193800	-7.766658	Common Pipistrelle	Foraging at farmyard	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT3	13/07/2022	23:26:05	52.194168	-7.766887	Common Pipistrelle	4-5 separate CPs all foraging around farmyard and surrounding trees	
WT3	13/07/2022	23:27:36	52.194403	-7.767595	Common Pipistrelle		
WT3	13/07/2022	23:28:22	52.194046	-7.767358	Common Pipistrelle		
WT3	13/07/2022	23:31:41	52.192082	-7.767447	Soprano Pipistrelle		
WT3	13/07/2022	23:32:26	52.191171	-7.768450	Common Pipistrelle		
WT4	13/07/2022	23:44:02	52.188585	-7.745067	Common Pipistrelle	Both CP and SP foraging at road gate	y
WT4	13/07/2022	23:45:01	52.188585	-7.745067	Soprano Pipistrelle	Both CP and SP foraging at road gate	y
WT4	13/07/2022	23:45:57	52.189135	-7.745727	Common Pipistrelle		
WT4	13/07/2022	23:46:25	52.189672	-7.746714	Soprano Pipistrelle		
WT4	13/07/2022	23:46:53	52.189864	-7.746923	Soprano Pipistrelle	Social calls	
WT4	13/07/2022	23:47:47	52.190164	-7.747532	<i>Myotis</i> sp.	Faint pulses	
WT4	13/07/2022	23:48:15	52.190821	-7.748000	Common Pipistrelle		
WT4	13/07/2022	23:48:52	52.191139	-7.747709	Brown Long-eared Bat		
WT4	13/07/2022	23:49:14	52.191819	-7.747803	Common Pipistrelle		y
WT4	13/07/2022	23:49:14	52.191819	-7.747803	Soprano Pipistrelle		y
WT4	13/07/2022	23:52:31	52.192247	-7.747994	Soprano Pipistrelle		
WT4	13/07/2022	23:52:49	52.192367	-7.747945	Common Pipistrelle		
WT4	13/07/2022	23:53:18	52.192335	-7.747613	Brown Long-eared Bat	Flying around courtyard Site 12	
WT4	13/07/2022	23:55:22	52.192169	-7.748803	Soprano Pipistrelle		
WT4	13/07/2022	23:56:04	52.192229	-7.749279	Soprano Pipistrelle		
WT4	13/07/2022	23:57:46	52.192307	-7.749581	Soprano Pipistrelle		
WT4	13/07/2022	23:58:19	52.191505	-7.747732	Soprano Pipistrelle	Way back to road	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	14/07/2022	00:01:06	52.190534	-7.747743	Common Pipistrelle		
WT4	14/07/2022	00:02:28	52.190117	-7.747400	Soprano Pipistrelle		
WT4	14/07/2022	00:04:31	52.189433	-7.746241	Soprano Pipistrelle		
WT4	14/07/2022	00:06:15	52.189064	-7.745597	Soprano Pipistrelle		
WT4	14/07/2022	00:08:13	52.188801	-7.745340	Common Pipistrelle		
WT4	14/07/2022	00:10:42	52.188671	-7.744873	Soprano Pipistrelle	Stream spot count next	

Table F. Bat activity recorded during August 2022 transects

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	06/08/2022	22:43:10	52.201227	-7.771639	Common Pipistrelle	Foraging around gate to forestry track. BLE also	y
WT2	06/08/2022	22:43:10	52.201227	-7.771639	Brown Long-eared Bat	CP also. BLE coming back to roost from Site 6 direction	y
WT2	06/08/2022	22:43:41	52.202731	-7.773208	Common Pipistrelle	Foraging around gate to forestry track	
WT2	06/08/2022	22:46:09	52.202645	-7.773154	Common Pipistrelle		
WT2	06/08/2022	22:47:12	52.202119	-7.772628	Common Pipistrelle		
WT2	06/08/2022	22:48:11	52.201665	-7.772210	Common Pipistrelle		
WT2	06/08/2022	22:48:50	52.201106	-7.771631	Common Pipistrelle		
WT2	06/08/2022	22:49:25	52.200869	-7.771416	Common Pipistrelle	Lots of foraging along edge of plantation on way to Site 6	
WT2	06/08/2022	22:51:24	52.200185	-7.771116	Common Pipistrelle		
WT2	06/08/2022	22:52:05	52.200021	-7.771041	Common Pipistrelle		
WT2	06/08/2022	22:52:30	52.199600	-7.770741	Common Pipistrelle		
WT2	06/08/2022	22:53:17	52.199080	-7.770698	Common Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	06/08/2022	22:53:57	52.198646	-7.770913	Common Pipistrelle	Around side of Site 6	
WT2	06/08/2022	22:55:58	52.199087	-7.771986	Common Pipistrelle		
WT2	06/08/2022	22:56:18	52.199376	-7.771825	Common Pipistrelle		
WT2	06/08/2022	22:58:51	52.200639	-7.771331	Common Pipistrelle		
WT2	06/08/2022	22:59:45	52.201227	-7.771639	Whiskered Bat	Quite good recording	
WT2	06/08/2022	23:01:42	52.201227	-7.771639	Leisler's Bat	Brief pass, not observed visually	
WT2	06/08/2022	23:05:09	52.201227	-7.771639	Soprano Pipistrelle	Foraging along track on way down forestry dead-end track	
WT2	06/08/2022	23:17:41	52.203713	-7.769164	Common Pipistrelle	Quiet for the way down track, busy from here on way back	
WT2	06/08/2022	23:18:13	52.203595	-7.769904	Common Pipistrelle		
WT2	06/08/2022	23:21:00	52.203043	-7.772500	Common Pipistrelle	Foraging at deciduous trees south side	
WT2	06/08/2022	23:22:25	52.202833	-7.773144	Common Pipistrelle	3 bats foraging near BLE roost 3A	
WT2	06/08/2022	23:22:34	52.202800	-7.773337	Brown Long-eared Bat		
WT2	06/08/2022	23:22:43	52.202846	-7.773637	Soprano Pipistrelle		
WT2	06/08/2022	23:22:57	52.202761	-7.773734	Common Pipistrelle		
WT2	06/08/2022	23:23:23	52.202643	-7.773627	Common Pipistrelle		
WT2	06/08/2022	23:23:45	52.202643	-7.773906	Common Pipistrelle		
WT2	06/08/2022	23:24:21	52.202544	-7.773863	Brown Long-eared Bat	Seen not detected acoustically	
WT2	06/08/2022	23:25:14	52.202518	-7.774185	Soprano Pipistrelle		
WT2	06/08/2022	23:25:21	52.202452	-7.774400	Common Pipistrelle		
WT2	06/08/2022	23:25:38	52.202524	-7.774915	Common Pipistrelle		
WT2	06/08/2022	23:25:53	52.202537	-7.775655	Soprano Pipistrelle	Foraging near tall trees on track back to road gate	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	06/08/2022	23:26:01	52.202668	-7.776921	Soprano Pipistrelle		
WT2	06/08/2022	23:30:30	52.202819	-7.778219	Brown Long-eared Bat	Roadway back at car	
WT1	19/08/2022	21:05	52.200022	-7.785999	Leisler's Bat	One Leisler foraging for about 1 minute. Went NW. Height estimate 50-80m	
WT1	19/08/2022	21:08	52.200022	-7.785999	Leisler's Bat	The same individual I think back foraging 30-80m heights	
WT1	19/08/2022	21:12	52.200636	-7.785493	Leisler's Bat	Definitely the same one foraging	
WT1	19/08/2022	21:17	52.199778	-7.782886	Leisler's Bat	The same individual I think - foraging 30m height estimate	
WT1	19/08/2022	21:26	52.194205	-7.778097	Common Pipistrelle	Foraging in open field c. 5m height	
WT1	19/08/2022	21:29	52.193489	-7.777807	Common Pipistrelle		
WT1	19/08/2022	21:33	52.193489	-7.777807	Common Pipistrelle	Foraging beat up and down lane. Just one bat	
WT3	19/08/2022	21:39:12	52.193489	-7.777807	Common Pipistrelle	21:38 start at road	
WT3	19/08/2022	21:39:35	52.190090	-7.770349	Common Pipistrelle		
WT3	19/08/2022	21:41:34	52.192812	-7.767299	Leisler's Bat	Brief pass	
WT3	19/08/2022	21:44:29	52.194285	-7.766859	Soprano Pipistrelle	Foraging at farmyard 8A	
WT3	19/08/2022	21:44:34	52.194252	-7.766956	Common Pipistrelle		
WT3	19/08/2022	21:44:45	52.194114	-7.766752	Soprano Pipistrelle	Foraging at farmyard 8A	
WT3	19/08/2022	21:44:55	52.194068	-7.766655	Common Pipistrelle	Foraging at farmyard 8A	
WT3	19/08/2022	21:45:15	52.193943	-7.766752	Common Pipistrelle	Foraging at farmyard 8A	
WT3	19/08/2022	21:47:13	52.192654	-7.766269	Soprano Pipistrelle		
WT3	19/08/2022	21:47:21	52.192568	-7.766366	Common Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT3	19/08/2022	21:49:13	52.191522	-7.766044	Common Pipistrelle	Laneway to cattle field with low hedge only	
WT3	19/08/2022	21:50:08	52.191305	-7.764799	Soprano Pipistrelle	No tree cover on lane - cattle seem to be the foraging attraction	
WT3	19/08/2022	21:50:22	52.191233	-7.764187	Soprano Pipistrelle	Two bats flying together. Different CF frequencies. Cattle	
WT3	19/08/2022	21:53:24	52.190016	-7.762567	Leisler's Bat	At tall conifers near transect turn-back point. Brief pass. Not visually observed	
WT3	19/08/2022	21:53:42	52.189937	-7.762234	Soprano Pipistrelle	At tall conifers near transect turn-back point. Foraging	
WT3	19/08/2022	21:54:03	52.189825	-7.761805	Common Pipistrelle	Foraging. Good bat night	
WT3	19/08/2022	21:54:08	52.189825	-7.761558	Soprano Pipistrelle		
WT3	19/08/2022	21:56:34	52.190226	-7.763403	Common Pipistrelle	On way back	
WT3	19/08/2022	21:56:51	52.190417	-7.763467	Brown Long-eared Bat	Clear recording EM3. Really fluttering around observer	
WT3	19/08/2022	21:58:47	52.191298	-7.764765	Soprano Pipistrelle	Back at the cattle	
WT3	19/08/2022	21:58:58	52.191318	-7.764947	Whiskered Bat	Feeding buzz. 1.5m height really close to observer on track - cattle following	
WT3	19/08/2022	21:59:11	52.191371	-7.765215	Brown Long-eared Bat	Faint. Cattle beside lane	
WT3	19/08/2022	21:59:23	52.191417	-7.765440	Whiskered Bat	Good recording. Cattle must be a foraging attraction	
WT3	19/08/2022	21:59:31	52.191430	-7.765644	Whiskered Bat	Good recording. Seems like at least two Whiskered involved here	
WT3	19/08/2022	22:03:36	52.193988	-7.766717	Common Pipistrelle	Back at the farmyard - first heard barn owls x 2	
WT3	19/08/2022	22:03:48	52.194218	-7.766856	Common Pipistrelle	Lots of foraging around farmyard - 3 or 4 bats	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT3	19/08/2022	22:04:17	52.194507	-7.767296	Common Pipistrelle	2 bats at same time. Farmyard. Barn owls too	
WT3	19/08/2022	22:22:43	52.193106	-7.767275	Common Pipistrelle		
WT3	19/08/2022	22:23:06	52.191235	-7.768465	Soprano Pipistrelle		
WT3	19/08/2022	22:23:39	52.190209	-7.769988	Soprano Pipistrelle	Nearly back at road	
WT4	19/08/2022	22:35:22	52.188581	-7.745133	Soprano Pipistrelle	At road gate to tree-lined lane	
WT4	19/08/2022	22:35:38	52.188705	-7.745259	Soprano Pipistrelle	Foraging. 2 bats	
WT4	19/08/2022	22:36:14	52.188744	-7.745474	Soprano Pipistrelle		
WT4	19/08/2022	22:36:56	52.188961	-7.745656	Soprano Pipistrelle		
WT4	19/08/2022	22:37:33	52.189506	-7.746449	Soprano Pipistrelle	CP also	y
WT4	19/08/2022	22:37:33	52.189506	-7.746449	Common Pipistrelle	SP also	y
WT4	19/08/2022	22:37:52	52.189631	-7.746653	Common Pipistrelle	SP also	y
WT4	19/08/2022	22:37:52	52.189631	-7.746653	Soprano Pipistrelle	CP also	y
WT4	19/08/2022	22:38:22	52.189947	-7.747147	Soprano Pipistrelle		
WT4	19/08/2022	22:38:27	52.190118	-7.747308	Common Pipistrelle		
WT4	19/08/2022	22:39:05	52.190559	-7.747844	Soprano Pipistrelle		
WT4	19/08/2022	22:39:17	52.190769	-7.748016	Common Pipistrelle	CP SP Whiskered all at same time	y
WT4	19/08/2022	22:39:17	52.190769	-7.748016	Soprano Pipistrelle	CP SP Whiskered all at same time	y
WT4	19/08/2022	22:39:17	52.190769	-7.748016	Whiskered Bat	CP SP Whiskered all at same time	y
WT4	19/08/2022	22:39:36	52.191065	-7.747769	Common Pipistrelle		
WT4	19/08/2022	22:40:02	52.191137	-7.747951	Soprano Pipistrelle		
WT4	19/08/2022	22:40:21	52.191242	-7.747812	Common Pipistrelle		
WT4	19/08/2022	22:40:23	52.191242	-7.747812	Soprano Pipistrelle	near 60kHz CF	

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	19/08/2022	22:40:42	52.191406	-7.747726	Common Pipistrelle	2 bats flying together interacting	
WT4	19/08/2022	22:40:54	52.191597	-7.747672	Soprano Pipistrelle		
WT4	19/08/2022	22:41:59	52.191972	-7.747962	Common Pipistrelle	Foraging. 2 bats	
WT4	19/08/2022	22:42:46	52.192294	-7.747576	Leisler's Bat	Brief pass	
WT4	19/08/2022	22:42:46	52.192433	-7.747657	Brown Long-eared Bat	In 8A roost courtyard	
WT4	19/08/2022	22:42:46	52.192408	-7.747799	<i>Myotis</i> sp.	Faint pulses only. In courtyard 8A	
WT4	19/08/2022	22:44:45	52.192130	-7.748327	Soprano Pipistrelle		
WT4	19/08/2022	22:45:55	52.192255	-7.749384	Soprano Pipistrelle		
WT4	19/08/2022	22:46:01	52.192477	-7.749875	<i>Myotis</i> sp.		
WT4	19/08/2022	22:46:08	52.192668	-7.749993	Common Pipistrelle		
WT4	19/08/2022	22:46:50	52.192582	-7.750261	Soprano Pipistrelle	CP too	y
WT4	19/08/2022	22:46:50	52.192582	-7.750261	Common Pipistrelle	SP also	y
WT4	19/08/2022	22:47:31	52.192424	-7.749671	Soprano Pipistrelle	On way back to road	
WT4	19/08/2022	22:48:35	52.192108	-7.748255	Soprano Pipistrelle	Feeding buzz	
WT4	19/08/2022	22:49:30	52.191641	-7.747772	Common Pipistrelle	Two bats interacting in flight	
WT4	19/08/2022	22:50:02	52.191200	-7.747858	Common Pipistrelle	Foraging. 2 or 3	
WT4	19/08/2022	22:50:27	52.191022	-7.747997	Soprano Pipistrelle	With social calls	
WT4	19/08/2022	22:50:50	52.190884	-7.748061	Common Pipistrelle		
WT4	19/08/2022	22:51:12	52.190766	-7.747986	Soprano Pipistrelle	2 bats differing CF s	y
WT4	19/08/2022	22:51:12	52.190766	-7.747986	<i>Myotis</i> sp.	Faint pulse behind SPs	y
WT4	19/08/2022	22:51:42	52.190608	-7.747814	Soprano Pipistrelle	2 bats	
WT4	19/08/2022	22:52:07	52.190358	-7.747696	Soprano Pipistrelle		
WT4	19/08/2022	22:52:37	52.190194	-7.747481	Common Pipistrelle		

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	19/08/2022	22:53:11	52.189622	-7.746558	Common Pipistrelle		y
WT4	19/08/2022	22:53:11	52.189622	-7.746558	Soprano Pipistrelle		y
WT4	19/08/2022	22:53:51	52.189464	-7.746290	Soprano Pipistrelle	Feeding buzz	
WT4	19/08/2022	22:54:13	52.189201	-7.745968	Soprano Pipistrelle	With social calls	
WT4	19/08/2022	22:54:29	52.189043	-7.745786	Common Pipistrelle		
WT4	19/08/2022	22:54:56	52.188543	-7.745174	Soprano Pipistrelle	Back at road gate. SP still foraging	

Table G. Bat activity recorded during September 2022 transects

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	09/09/2022	21:34:55	52.192357	-7.747632	Common Pipistrelle		
WT4	09/09/2022	21:35:29	52.192228	-7.747617	Common Pipistrelle		
WT4	09/09/2022	21:36:00	52.192055	-7.747857	Common Pipistrelle		y
WT4	09/09/2022	21:36:00	52.192055	-7.747857	50kHz Pipistrelle		y
WT4	09/09/2022	21:36:34	52.192102	-7.748276	Common Pipistrelle		
WT4	09/09/2022	21:36:49	52.192162	-7.748549	<i>Myotis</i> sp.	Faint but Whiskered like	
WT4	09/09/2022	21:37:02	52.192222	-7.748851	Whiskered Bat	High end freqs >30kHz and much more intensity concentrated into 78-97kHz	
WT4	09/09/2022	21:37:47	52.192230	-7.749209	Common Pipistrelle	Foraging constantly	
WT4	09/09/2022	21:38:46	52.192265	-7.749460	Common Pipistrelle		y
WT4	09/09/2022	21:38:46	52.192265	-7.749460	Soprano Pipistrelle		y
WT4	09/09/2022	21:39:46	52.192642	-7.750170	Common Pipistrelle		
WT4	09/09/2022	21:40:34	52.192654	-7.750306	Soprano Pipistrelle	At turning back area beyond flooded bit of track	y
WT4	09/09/2022	21:40:34	52.192654	-7.750306	Common Pipistrelle		y

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	09/09/2022	21:40:59	52.192440	-7.749851	Soprano Pipistrelle	2 bats flying together	y
WT4	09/09/2022	21:40:59	52.192440	-7.749851	Common Pipistrelle	CP is 3rd bat	y
WT4	09/09/2022	21:41:39	52.192283	-7.749502	Common Pipistrelle		
WT4	09/09/2022	21:41:54	52.192253	-7.749334	Soprano Pipistrelle		
WT4	09/09/2022	21:42:43	52.192177	-7.748892	Common Pipistrelle		y
WT4	09/09/2022	21:42:43	52.192177	-7.748892	Soprano Pipistrelle		y
WT4	09/09/2022	21:43:09	52.192176	-7.748635	Common Pipistrelle		y
WT4	09/09/2022	21:43:09	52.192176	-7.748635	Whiskered Bat		y
WT4	09/09/2022	21:44:45	52.191807	-7.747844	Whiskered Bat	Lots of Whiskered activity - 2 or 3 bats	
WT4	09/09/2022	21:45:33	52.191327	-7.747662	Common Pipistrelle		
WT4	09/09/2022	21:45:48	52.191144	-7.747683	Whiskered Bat	On track beside woodland patch	
WT4	09/09/2022	21:46:09	52.191063	-7.747862	Common Pipistrelle		
WT4	09/09/2022	21:47:19	52.190931	-7.748024	Common Pipistrelle	Still at woodland patch	y
WT4	09/09/2022	21:47:19	52.190931	-7.748024	Soprano Pipistrelle	s	y
WT4	09/09/2022	21:47:46	52.190907	-7.747840	Soprano Pipistrelle	2 individuals varying CFs	
WT4	09/09/2022	21:48:05	52.190907	-7.747840	Common Pipistrelle		
WT4	09/09/2022	21:48:45	52.190831	-7.747928	Soprano Pipistrelle		y
WT4	09/09/2022	21:48:45	52.190831	-7.747928	Whiskered Bat	Lots of Whiskered activity - 2 or 3 bats	y
WT4	09/09/2022	21:49:27	52.190547	-7.747882	Soprano Pipistrelle		y
WT4	09/09/2022	21:49:27	52.190547	-7.747882	Whiskered Bat	Lingered to get recordings - not included until start moving along again	y
WT4	09/09/2022	21:51:24	52.190355	-7.747698	Soprano Pipistrelle		y
WT4	09/09/2022	21:51:24	52.190355	-7.747698	Whiskered Bat		y
WT4	09/09/2022	21:53:01	52.190269	-7.747573	Whiskered Bat		y

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT4	09/09/2022	21:53:01	52.190269	-7.747573	Common Pipistrelle		y
WT4	09/09/2022	21:53:51	52.190211	-7.747503	Whiskered Bat	Lingered to get recordings - not included until start moving along again	
WT4	09/09/2022	21:53:56	52.190211	-7.747503	Soprano Pipistrelle		
WT4	09/09/2022	22:05:16	52.190039	-7.747150	Soprano Pipistrelle	SP CP Whiskered all together	y
WT4	09/09/2022	22:05:16	52.190039	-7.747150	Common Pipistrelle	SP CP Whiskered all together	y
WT4	09/09/2022	22:05:16	52.190039	-7.747150	Whiskered Bat	SP CP Whiskered all together	y
WT4	09/09/2022	22:08:52	52.189803	-7.746807	Whiskered Bat	Good example. SP CP Whiskered all together	y
WT4	09/09/2022	22:08:52	52.189803	-7.746807	Soprano Pipistrelle	Good example. SP CP Whiskered all together	y
WT4	09/09/2022	22:08:52	52.189803	-7.746807	Common Pipistrelle	Good example. SP CP Whiskered all together	y
WT4	09/09/2022	22:09:42	52.189513	-7.746397	Whiskered Bat		y
WT4	09/09/2022	22:10:01	52.189513	-7.746397	Soprano Pipistrelle		y
WT4	09/09/2022	22:10:01	52.189513	-7.746397	Common Pipistrelle		y
WT4	09/09/2022	22:10:14	52.189232	-7.745957	Brown Long-eared Bat	Very faint	
WT4	09/09/2022	22:10:16	52.189134	-7.745859	Soprano Pipistrelle	Good example. SP CP Whiskered all together	y
WT4	09/09/2022	22:10:16	52.189134	-7.745859	Whiskered Bat	Good example. SP CP Whiskered all together	y
WT4	09/09/2022	22:10:16	52.189134	-7.745859	Common Pipistrelle	Good example. SP CP Whiskered all together	y
WT4	09/09/2022	22:10:44	52.188957	-7.745611	Soprano Pipistrelle		y
WT4	09/09/2022	22:10:44	52.188957	-7.745611	Whiskered Bat	Phenomenon of Whiskered Bat along lane - all the way nearly to the road	y
WT4	09/09/2022	22:11:21	52.188614	-7.745185	Soprano Pipistrelle		y
WT4	09/09/2022	22:11:21	52.188614	-7.745185	Common Pipistrelle		y
WT3	09/09/2022	22:42:48	52.189942	-7.771396	Common Pipistrelle		
WT3	09/09/2022	22:43:25	52.190100	-7.770530	Common Pipistrelle		y

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT3	09/09/2022	22:43:25	52.190100	-7.770530	Soprano Pipistrelle		y
WT3	09/09/2022	22:43:46	52.190292	-7.769779	Common Pipistrelle		
WT3	09/09/2022	22:44:44	52.191791	-7.767934	Soprano Pipistrelle		
WT3	09/09/2022	22:44:52	52.191870	-7.767805	Common Pipistrelle		
WT3	09/09/2022	22:46:22	52.194450	-7.767253	Common Pipistrelle	Foraging in farmyard 8A	
WT3	09/09/2022	22:47:34	52.194429	-7.767137	Soprano Pipistrelle	Foraging in farmyard 8A	
WT3	09/09/2022	22:48:19	52.194348	-7.766949	Common Pipistrelle	2 individuals varying CFs	
WT3	09/09/2022	22:49:37	52.194023	-7.766726	Common Pipistrelle		
WT3	09/09/2022	22:51:32	52.193458	-7.766691	Common Pipistrelle		
WT3	09/09/2022	22:52:10	52.193204	-7.766599	Common Pipistrelle		
WT3	09/09/2022	22:54:05	52.191852	-7.766287	Whiskered Bat	Faint but clear enough. Open farm lane no tree cover, low hedge	
WT3	09/09/2022	22:54:36	52.191741	-7.766231	Soprano Pipistrelle		
WT3	09/09/2022	23:00:49	52.190083	-7.763098	Soprano Pipistrelle	Foraging edge of tall conifer patch	
WT3	09/09/2022	23:01:07	52.189977	-7.762583	Common Pipistrelle	Foraging edge of tall conifer patch	
WT3	09/09/2022	23:04:55	52.190601	-7.763460	Soprano Pipistrelle		
WT3	09/09/2022	23:09:13	52.192232	-7.766335	Soprano Pipistrelle		
WT3	09/09/2022	23:11:11	52.193652	-7.766678	Common Pipistrelle	Lots of constant CP activity back in farmyard	
WT3	09/09/2022	23:13:04	52.194434	-7.767409	Common Pipistrelle	2 individuals varying CFs	
WT3	09/09/2022	23:13:48	52.194462	-7.767129	Common Pipistrelle	3 individuals varying CFs	
WT3	09/09/2022	23:14:54	52.194248	-7.767416	Soprano Pipistrelle		y
WT3	09/09/2022	23:14:54	52.194248	-7.767416	Common Pipistrelle		y
WT3	09/09/2022	23:17:34	52.193657	-7.767386	Soprano Pipistrelle		y
WT3	09/09/2022	23:17:34	52.193657	-7.767386	Common Pipistrelle		y

Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT3	09/09/2022	23:18:36	52.191884	-7.767691	Common Pipistrelle		
WT3	09/09/2022	23:19:02	52.191252	-7.768506	Common Pipistrelle		
WT2	24/09/2022	20:14:07	52.202792	-7.778025	Whiskered Bat	At road top of lane at start	
WT2	24/09/2022	20:14:20	52.202792	-7.778025	Whiskered Bat		
WT2	24/09/2022	20:20:08	52.202535	-7.774555	Soprano Pipistrelle		
WT2	24/09/2022	20:20:42	52.202750	-7.773643	Soprano Pipistrelle		
WT2	24/09/2022	20:24:49	52.200935	-7.771583	Soprano Pipistrelle		
WT2	24/09/2022	20:25:57	52.200060	-7.771048	Brown Long-eared Bat		
WT2	24/09/2022	20:27:10	52.199065	-7.770868	Common Pipistrelle	Foraging	
WT2	24/09/2022	20:28:15	52.198642	-7.770699	Soprano Pipistrelle		
WT2	24/09/2022	20:29:10	52.198526	-7.771513	Soprano Pipistrelle		
WT2	24/09/2022	20:29:51	52.199033	-7.771990	Soprano Pipistrelle	With social calls	
WT2	24/09/2022	20:31:29	52.199509	-7.771647	Soprano Pipistrelle		
WT2	24/09/2022	20:39:52	52.203401	-7.771561	Common Pipistrelle		
WT2	24/09/2022	20:40:30	52.203611	-7.770574	Common Pipistrelle		
WT2	24/09/2022	20:41:25	52.203663	-7.769544	Common Pipistrelle		
WT2	24/09/2022	20:42:37	52.203505	-7.768257	Common Pipistrelle		
WT2	24/09/2022	20:44:54	52.203136	-7.765682	Common Pipistrelle		
WT2	24/09/2022	20:45:51	52.203083	-7.766240	Common Pipistrelle		
WT2	24/09/2022	20:47:57	52.203503	-7.768214	Common Pipistrelle		
WT2	24/09/2022	20:48:52	52.203634	-7.769201	Common Pipistrelle		
WT2	24/09/2022	20:49:40	52.203791	-7.769888	Common Pipistrelle		
WT2	24/09/2022	20:54:07	52.203317	-7.772291	Common Pipistrelle		

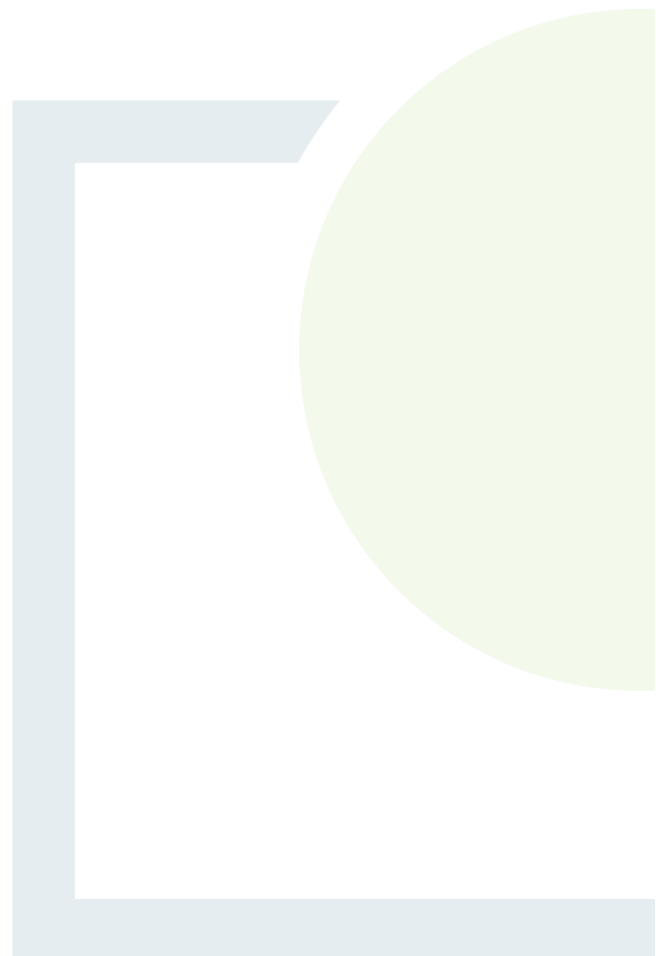
Transect	Date	Time	Latitude	Longitude	Species	Notes	Overlap
WT2	24/09/2022	20:55:09	52.203020	-7.773064	Soprano Pipistrelle	With social calls	
WT2	24/09/2022	21:00:08	52.202704	-7.776841	Common Pipistrelle		
WT1	24/09/2022	21:08:55	52.193093	-7.775901	Daubenton's Bat	Start on forestry track tall conifers	
WT1	24/09/2022	21:09:39	52.193356	-7.777703	Common Pipistrelle	Start on forestry track tall conifers	
WT1	24/09/2022	21:11:49	52.193303	-7.778862	Soprano Pipistrelle		
WT1	24/09/2022	22:02:24				Finish 22:02 no more bats on WT1	



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APPENDIX 2

DESCRIPTION OF IRISH BAT SPECIES



Ireland has ten known bat species from two distinct families. Each is briefly described below. For a more comprehensive overview see Roche et al (2014). The conservation status of each species is derived from NPWS (2013).

Vespertilionidae:

Common pipistrelle (*Pipistrellus pipistrellus*)

This species was only recently separated from its sibling, the soprano or brown pipistrelle *P. pygmaeus*, which is detailed below (Barratt et al, 1997). The common pipistrelle's echolocation calls peak at 45 kHz. The species forages along linear landscape features such as hedgerows and treelines as well as within woodland. The conservation status of this species is Favourable.

Soprano pipistrelle (*Pipistrellus pygmaeus*)

The soprano pipistrelle's echolocation calls peak at 55 kHz, which distinguishes it readily from the common pipistrelle on detector. The pipistrelles are the smallest and most often seen of our bats, flying at head height, and taking small prey such as midges and small moths. Summer roost sites are usually in buildings but tree holes and heavy ivy are also used. Roost numbers can exceed 1,500 animals in mid-summer. The conservation status of this species is Favourable.

Nathusius' pipistrelle (*Pipistrellus nathusii*)

Nathusius' pipistrelle is a recent addition to the Irish fauna and has mainly been recorded from the north-east of the island in Counties Antrim and Down (Richardson, 2000) and also in Fermanagh, Longford and Cavan. It has also been recorded in Counties Cork and Kerry (Kelleher, 2005). However, the known resident population is enhanced in the autumn months by an influx of animals from Scandinavian countries. The conservation status of this species is Favourable.

Leisler's bat (*Nyctalus leisleri*)

This species is Ireland's largest bat, with a wingspan of up to 320mm; it is also the third most common bat, preferring to roost in buildings, although it is sometimes found in trees and bat boxes. It is the earliest bat to emerge in the evening, flying fast and high with occasional steep dives to ground level, feeding on moths, caddis-flies and beetles. The echolocation calls are sometimes audible to the human ear being around 15 kHz at their lowest. The audible chatter from their roost on hot summer days is sometimes an aid to location. The conservation status of this species is Favourable.

Brown long-eared bat (*Plecotus auritus*)

This species of bat is a 'gleaner', hunting amongst the foliage of trees and shrubs, and hovering briefly to pick a moth or spider off a leaf, which it then takes to a sheltered perch to consume. They often land on the ground to capture their prey. Using its nose to emit its echolocation, the long-eared bat 'whispers' its calls so that the insects, upon which it preys, cannot hear its approach (and hence, it needs oversize ears to hear the returning echoes). As this is a whispering species, it is extremely difficult to monitor in the field as it is seldom heard on a bat detector. Furthermore, keeping within the foliage, as it does, it is easily overlooked. It prefers to roost in old buildings. The conservation status of this species is Favourable.

Natterer's bat (*Myotis nattereri*)

This species has a slow to medium flight, usually over trees but sometimes over water. It usually follows hedges and treelines to its feeding sites, consuming flies, moths, caddis-flies and spiders. Known roosts are usually in old stone buildings but they have been found in trees and bat boxes. The Natterer's bat is one of our least studied species and further work is required to establish its status in Ireland. The conservation status of this species is Favourable.

Daubenton's bat (*Myotis daubentonii*)

This bat species prefers feeding close to the surface of smooth water, either over rivers, canals, ponds, lakes, or reservoirs but it can also be found foraging in woodlands. Flying at 15 kilometres per hour, it gaffs insects with its over-sized feet as they emerge from the surface of the water - feeding on caddis flies, moths, mosquitoes, midges etc. It is often found roosting beneath bridges or in tunnels and also makes use of hollows in trees. The conservation status of this species is Favourable.

Whiskered bat (*Myotis mystacinus*)

This species, although widely distributed, has been rarely recorded in Ireland. It is often found in woodland, frequently near water. Flying high, near the canopy, it maintains a steady beat and sometimes glides as it hunts. It also gleans spiders from the foliage of trees. Whiskered bats prefer to roost in buildings, under slates, lead flashing or exposed beneath the ridge beam within attics. However, they also use cracks and holes in trees and sometimes bat boxes. The whiskered bat is one of our least studied species and further work is required to establish its status in Ireland.

Brandt's bat (*Myotis brandtii*)

According to NPWS (2013), whiskered and Brandt's bats are cryptic species and can only be told apart using DNA techniques. Brandt's bat has been confirmed only once from Ireland; a single specimen found in 2003 in Wicklow (Mullen, 2006). Following this discovery, an intensive re-survey, involving DNA testing, was undertaken of all known whiskered bat roosts in Ireland, by the Centre for Irish Bat Research. Woodland mist-netting was also conducted for the species. Despite the extensive survey-work, no further Brandt's bats were identified. The most recent Red Data List for Irish Mammals (Marnell et al. 2009) lists Brandt's bat as data deficient. There is no evidence of any roosts for this species in the country and at present the single record for the species is considered an anomaly. Boston et al (2010) concluded that "M. brandtii cannot currently be considered a resident species. This species is now considered a vagrant to the country and consequently, a detailed assessment has not been carried out.

Rhinolophidae:

Lesser horseshoe bat (*Rhinolophus hipposideros*)

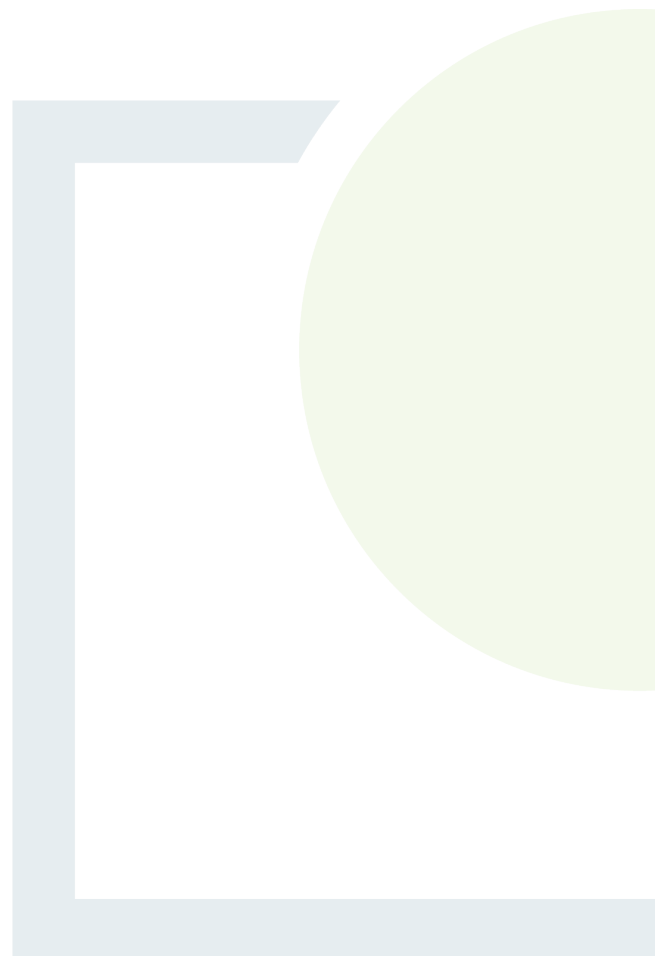
This species is the only representative of the Rhinolophidae or horseshoe bat family in Ireland. It differs from our other species in both habits and looks, having a unique nose leaf with which it projects its echolocation calls. It is also quite small and, at rest, wraps its wings around its body. Lesser horseshoe bats feed close to the ground, gleaning their prey from branches and stones. It often carries its prey to a perch to consume, leaving the remains beneath as an indication of its presence. The echolocation call of this species is of constant frequency and, on a heterodyne bat detector, sounds like a melodious warble. The species is confined to six counties along the Atlantic seaboard: Mayo, Galway, Clare, Limerick, Kerry, and Cork. The current Irish national population is estimated at 12,500 animals. This species is listed on Annex II of the EC Habitats Directive and 41 Special Areas of Conservation have been designated in Ireland for its protection. Where it occurs, it is often found roosting within farm buildings. The conservation status of this species is Favourable.



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APPENDIX 3

PASSIVE DETECTOR
MONITORING RESULTS FOR
ROOSTS



Appendix 3A: Passive Detector Monitoring Results for Roost Site 3A

Table A.1 Brown Long-eared Bat recordings extracted from overall recordings from inside roost 3A - analyses shown for first 5 of 12 consecutive nights.
Other bat species recorded from inside the roost not included here.

Site	Date	Time	Species	Notes	Overlap	Night
3A	30/07/2021	22:31:33	Brown Long-eared Bat	66 mins after sunset		1
3A	30/07/2021	22:33:09	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	22:35:14	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	22:36:23	Brown Long-eared Bat		y	1
3A	30/07/2021	22:36:58	Brown Long-eared Bat	Both flight calls and social calls		1
3A	30/07/2021	22:49:18	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	22:49:56	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	22:57:17	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	22:58:33	Brown Long-eared Bat	Both flight calls and social calls		1
3A	30/07/2021	23:09:07	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	23:16:49	Brown Long-eared Bat	Both flight calls and social calls		1
3A	30/07/2021	23:23:50	Brown Long-eared Bat	Both flight calls and social calls		1
3A	30/07/2021	23:25:20	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	23:32:11	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	23:32:26	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	23:32:31	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	23:32:51	Brown Long-eared Bat	Both flight calls and social calls		1
3A	30/07/2021	23:34:14	Brown Long-eared Bat	Social calls		1
3A	30/07/2021	23:34:57	Brown Long-eared Bat	Social calls	y	1
3A	30/07/2021	23:35:04	Brown Long-eared Bat	both flight calls and social calls		1

Site	Date	Time	Species	Notes	Overlap	Night
3A	30/07/2021	23:35:30	Brown Long-eared Bat	Both flight calls and social calls		1
3A	30/07/2021	23:35:37	Brown Long-eared Bat	Both flight calls and social calls		1
3A	30/07/2021	23:46:47	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	00:09:32	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	00:19:05	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	00:19:51	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	00:20:02	Brown Long-eared Bat	Social calls		1
3A	31/07/2021	00:20:23	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	00:28:18	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	00:30:27	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	00:45:19	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	00:54:49	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	00:54:58	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	00:55:39	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:03:35	Brown Long-eared Bat			1
3A	31/07/2021	01:23:34	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:23:50	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:24:04	Brown Long-eared Bat	Social calls		1
3A	31/07/2021	01:24:13	Brown Long-eared Bat	Social calls		1
3A	31/07/2021	01:24:24	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:24:37	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:24:58	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:39:56	Brown Long-eared Bat	More than one individual flying simultaneously		1

Site	Date	Time	Species	Notes	Overlap	Night
3A	31/07/2021	01:40:08	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:40:16	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:41:40	Brown Long-eared Bat			1
3A	31/07/2021	01:41:52	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:42:05	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:42:32	Brown Long-eared Bat			1
3A	31/07/2021	01:42:38	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:43:01	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:43:27	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:58:38	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:59:05	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:59:19	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	01:59:52	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:00:27	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:00:47	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:02:54	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:03:50	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:04:13	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:04:49	Brown Long-eared Bat		y	1
3A	31/07/2021	02:07:30	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:10:03	Brown Long-eared Bat		y	1
3A	31/07/2021	02:10:42	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:28:31	Brown Long-eared Bat	Both flight calls and social calls	y	1

Site	Date	Time	Species	Notes	Overlap	Night
3A	31/07/2021	02:29:26	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:39:00	Brown Long-eared Bat			1
3A	31/07/2021	02:40:12	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:40:28	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:40:37	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:41:13	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:41:25	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:41:31	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:43:41	Brown Long-eared Bat	Social calls		1
3A	31/07/2021	02:44:22	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:52:36	Brown Long-eared Bat	Social calls		1
3A	31/07/2021	02:59:27	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:59:48	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	02:59:59	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	03:00:06	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	03:00:19	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	03:00:39	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	03:01:35	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	03:07:13	Brown Long-eared Bat	Both flight calls and social calls	y	1
3A	31/07/2021	03:15:33	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	03:15:49	Brown Long-eared Bat	Social calls		1
3A	31/07/2021	03:16:18	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	03:16:28	Brown Long-eared Bat	Both flight calls and social calls		1

Site	Date	Time	Species	Notes	Overlap	Night
3A	31/07/2021	03:16:46	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	03:24:55	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	03:26:50	Brown Long-eared Bat		y	1
3A	31/07/2021	03:53:00	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	05:13:10	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	05:21:11	Brown Long-eared Bat		y	1
3A	31/07/2021	05:24:50	Brown Long-eared Bat	Both flight calls and social calls		1
3A	31/07/2021	05:25:49	Brown Long-eared Bat		y	1
3A	31/07/2021	05:26:00	Brown Long-eared Bat		y	1
3A	31/07/2021	05:28:09	Brown Long-eared Bat	23 minutes before sunrise 5:51. Day-roosting	y	1
3A	31/07/2021	21:34:06	Brown Long-eared Bat	Social calls, 11 minutes after sunset 21:23. Day-roosting		2
3A	31/07/2021	21:34:49	Brown Long-eared Bat	Social calls. 11 minutes after sunset		2
3A	31/07/2021	21:35:05	Brown Long-eared Bat	Social calls		2
3A	31/07/2021	21:46:35	Brown Long-eared Bat		y	2
3A	31/07/2021	21:52:34	Brown Long-eared Bat	CP also	y	2
3A	31/07/2021	22:29:00	Brown Long-eared Bat		y	2
3A	31/07/2021	22:39:21	Brown Long-eared Bat		y	2
3A	31/07/2021	22:39:36	Brown Long-eared Bat	Social calls		2
3A	31/07/2021	22:47:37	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	22:47:54	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	22:48:03	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	22:52:59	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	22:53:32	Brown Long-eared Bat	Both flight calls and social calls	y	2

Site	Date	Time	Species	Notes	Overlap	Night
3A	31/07/2021	22:53:45	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	22:54:37	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	31/07/2021	22:55:07	Brown Long-eared Bat			2
3A	31/07/2021	22:55:13	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	22:55:33	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	22:55:56	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	22:56:08	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	22:56:20	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	22:58:00	Brown Long-eared Bat	CP also	y	2
3A	31/07/2021	23:01:11	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	23:06:13	Brown Long-eared Bat	Social calls		2
3A	31/07/2021	23:11:42	Brown Long-eared Bat	Social calls		2
3A	31/07/2021	23:12:45	Brown Long-eared Bat			2
3A	31/07/2021	23:12:50	Brown Long-eared Bat		y	2
3A	31/07/2021	23:12:58	Brown Long-eared Bat	CP also	y	2
3A	31/07/2021	23:13:45	Brown Long-eared Bat		y	2
3A	31/07/2021	23:14:00	Brown Long-eared Bat		y	2
3A	31/07/2021	23:15:58	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	23:19:56	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	23:20:12	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	23:20:20	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	23:20:26	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	31/07/2021	23:20:59	Brown Long-eared Bat	Both flight calls and social calls	y	2

Site	Date	Time	Species	Notes	Overlap	Night
3A	31/07/2021	23:21:29	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	31/07/2021	23:22:07	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	31/07/2021	23:22:16	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	31/07/2021	23:22:30	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	31/07/2021	23:23:44	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	31/07/2021	23:24:32	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	31/07/2021	23:24:57	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	31/07/2021	23:25:02	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	31/07/2021	23:25:22	Brown Long-eared Bat	Both flight calls and social calls		2
3A	31/07/2021	23:28:45	Brown Long-eared Bat			2
3A	31/07/2021	23:30:36	Brown Long-eared Bat	Social calls		2
3A	31/07/2021	23:30:42	Brown Long-eared Bat	Social calls		2
3A	31/07/2021	23:30:49	Brown Long-eared Bat	Social calls		2
3A	31/07/2021	23:39:13	Brown Long-eared Bat		y	2
3A	31/07/2021	23:42:21	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:07:22	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:24:13	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:35:46	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:36:31	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:36:45	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:37:00	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:37:10	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:37:30	Brown Long-eared Bat	Both flight calls and social calls		2

Site	Date	Time	Species	Notes	Overlap	Night
3A	01/08/2021	00:38:16	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:40:43	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:41:13	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	00:44:55	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:48:38	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	00:58:32	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	01:02:08	Brown Long-eared Bat			2
3A	01/08/2021	01:04:11	Brown Long-eared Bat		y	2
3A	01/08/2021	01:05:03	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	01:05:43	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	01:05:57	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	01:08:30	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	01:08:58	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	01:09:54	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	01:10:21	Brown Long-eared Bat			2
3A	01/08/2021	01:33:14	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	01:45:04	Brown Long-eared Bat			2
3A	01/08/2021	02:05:22	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	02:08:03	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:08:26	Brown Long-eared Bat	Social calls	y	2
3A	01/08/2021	02:08:35	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	02:08:57	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:09:37	Brown Long-eared Bat			2

Site	Date	Time	Species	Notes	Overlap	Night
3A	01/08/2021	02:09:44	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:09:54	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	02:10:13	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:10:19	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:10:25	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:10:51	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:12:30	Brown Long-eared Bat	Social calls	y	2
3A	01/08/2021	02:12:50	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	01/08/2021	02:13:16	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	02:13:43	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:13:59	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:14:30	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:15:02	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:15:11	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:15:19	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:19:46	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:21:16	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:40:06	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	02:40:55	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	02:42:13	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	02:52:31	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	02:54:11	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	02:56:06	Brown Long-eared Bat	Social calls		2

Site	Date	Time	Species	Notes	Overlap	Night
3A	01/08/2021	02:56:34	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:19:53	Brown Long-eared Bat	Roost bat chatter		2
3A	01/08/2021	03:20:10	Brown Long-eared Bat	Roost bat chatter		2
3A	01/08/2021	03:20:24	Brown Long-eared Bat	Roost bat chatter		2
3A	01/08/2021	03:21:03	Brown Long-eared Bat	Roost bat chatter		2
3A	01/08/2021	03:21:16	Brown Long-eared Bat	Roost bat chatter		2
3A	01/08/2021	03:21:24	Brown Long-eared Bat	Roost bat chatter		2
3A	01/08/2021	03:21:46	Brown Long-eared Bat	Roost bat chatter		2
3A	01/08/2021	03:22:03	Brown Long-eared Bat	Roost bat chatter		2
3A	01/08/2021	03:23:56	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:27:14	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	03:29:04	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	03:30:15	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	03:30:55	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	03:35:01	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:35:10	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:35:30	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	03:35:47	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	03:36:05	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:36:23	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:37:20	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:37:36	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:38:08	Brown Long-eared Bat	Social calls		2

Site	Date	Time	Species	Notes	Overlap	Night
3A	01/08/2021	03:39:30	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:39:42	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:40:17	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	03:58:04	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	04:07:34	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	04:10:06	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	04:10:54	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	04:12:13	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	04:13:40	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	04:16:28	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	04:16:39	Brown Long-eared Bat			2
3A	01/08/2021	04:21:44	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	04:22:30	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	04:22:44	Brown Long-eared Bat	Both flight calls and social calls		2
3A	01/08/2021	04:23:10	Brown Long-eared Bat	Social calls		2
3A	01/08/2021	05:14:57	Brown Long-eared Bat	Both flight calls and social calls	y	2
3A	01/08/2021	05:22:12	Brown Long-eared Bat		y	2
3A	01/08/2021	05:24:33	Brown Long-eared Bat			2
3A	01/08/2021	05:24:51	Brown Long-eared Bat	29 minutes before sunrise 5:53. Day-roosting	y	2
3A	01/08/2021	05:34:20	Brown Long-eared Bat	19 minutes before sunrise 5:53. Roost bat chatter		2
3A	01/08/2021	05:34:45	Roost bat chatter	60 registrations of roost bat chatter between 5:34 and 5:49		2
3A	01/08/2021	05:49:56	Roost bat chatter	4 minutes before sunrise 5:53. Roost bat chatter		2
3A	01/08/2021	21:17:01	Roost bat chatter	4 minutes BEFORE sunset 21:21. Roost bat chatter		3

Site	Date	Time	Species	Notes	Overlap	Night
3A	01/08/2021	21:17:08	Roost bat chatter	10 registrations of roost bat chatter between 21:17 and 21:21 = sunset		3
3A	01/08/2021	21:46:23	Brown Long-eared Bat	24 mins after sunset 21:21	y	3
3A	01/08/2021	22:24:34	Brown Long-eared Bat		y	3
3A	01/08/2021	22:27:40	Brown Long-eared Bat	Both flight calls and social calls		3
3A	01/08/2021	22:46:46	Brown Long-eared Bat	Social calls		3
3A	01/08/2021	22:55:14	Brown Long-eared Bat	Low freq flight calls		3
3A	01/08/2021	23:17:53	Brown Long-eared Bat	Both flight calls and social calls		3
3A	01/08/2021	23:26:07	Brown Long-eared Bat	Both flight calls and social calls		3
3A	01/08/2021	23:31:19	Brown Long-eared Bat	Social calls		3
3A	01/08/2021	23:31:26	Brown Long-eared Bat	Social calls		3
3A	01/08/2021	23:31:35	Brown Long-eared Bat	Social calls		3
3A	01/08/2021	23:33:02	Brown Long-eared Bat		y	3
3A	01/08/2021	23:33:21	Brown Long-eared Bat	Both flight calls and social calls		3
3A	01/08/2021	23:47:05	Brown Long-eared Bat		y	3
3A	01/08/2021	23:52:58	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	00:05:28	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:06:33	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:07:10	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:07:47	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	00:08:02	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:08:08	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:25:10	Brown Long-eared Bat	and SP also	y	3
3A	02/08/2021	00:25:50	Brown Long-eared Bat	Both flight calls and social calls		3

Site	Date	Time	Species	Notes	Overlap	Night
3A	02/08/2021	00:26:10	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	00:26:40	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	00:27:32	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	00:32:19	Brown Long-eared Bat	and SP also	y	3
3A	02/08/2021	00:35:17	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:36:11	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:36:38	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:36:48	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	00:37:04	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	00:37:31	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:38:35	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:39:36	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	00:39:43	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	00:39:48	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	00:39:55	Brown Long-eared Bat	Both flight calls and social calls	y	3
3A	02/08/2021	00:40:08	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:07:02	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:07:35	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:09:47	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:09:57	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:10:03	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:10:14	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:10:31	Brown Long-eared Bat	Both flight calls and social calls		3

Site	Date	Time	Species	Notes	Overlap	Night
3A	02/08/2021	01:10:42	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:11:45	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:12:46	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:13:18	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:13:32	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:13:48	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:13:57	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:14:02	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:14:29	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:14:36	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:15:06	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:16:33	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:16:59	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:17:10	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:17:15	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:17:33	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:18:58	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:19:18	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:19:23	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:20:37	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:20:52	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:21:40	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:22:08	Brown Long-eared Bat	Both flight calls and social calls		3

Site	Date	Time	Species	Notes	Overlap	Night
3A	02/08/2021	01:22:17	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:23:29	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:24:04	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:30:23	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:32:32	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:40:11	Brown Long-eared Bat	and SP also	y	3
3A	02/08/2021	01:41:24	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:42:02	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	01:42:14	Brown Long-eared Bat	and SP also	y	3
3A	02/08/2021	01:42:31	Brown Long-eared Bat	and SP also	y	3
3A	02/08/2021	01:42:48	Brown Long-eared Bat	and SP also	y	3
3A	02/08/2021	01:43:18	Brown Long-eared Bat	and SP also	y	3
3A	02/08/2021	01:44:41	Brown Long-eared Bat	and SP also	y	3
3A	02/08/2021	01:45:15	Brown Long-eared Bat	Both flight calls and social calls	y	3
3A	02/08/2021	01:46:30	Brown Long-eared Bat	Both flight calls and social calls	y	3
3A	02/08/2021	01:48:27	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:02:56	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:05:51	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:12:08	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:12:16	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:12:31	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:13:41	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:13:47	Brown Long-eared Bat	Both flight calls and social calls		3

Site	Date	Time	Species	Notes	Overlap	Night
3A	02/08/2021	02:13:55	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:36:03	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:36:14	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:38:17	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:38:28	Brown Long-eared Bat	Social calls		3
3A	02/08/2021	02:52:08	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:53:28	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:53:59	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:54:20	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:54:27	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:54:44	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:55:12	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:55:24	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	02:57:02	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:03:07	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:09:16	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:09:44	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:10:23	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:10:48	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:10:54	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:11:01	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:11:13	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:14:24	Brown Long-eared Bat	Both flight calls and social calls		3

Site	Date	Time	Species	Notes	Overlap	Night
3A	02/08/2021	03:16:42	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:40:50	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:44:08	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:44:44	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:45:13	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:45:34	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:45:41	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:46:10	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:47:07	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	03:50:29	Brown Long-eared Bat		y	3
3A	02/08/2021	03:57:46	Brown Long-eared Bat	Both flight calls and social calls		3
3A	02/08/2021	05:19:11	Brown Long-eared Bat		y	3
3A	02/08/2021	05:19:32	Brown Long-eared Bat	inside	y	3
3A	02/08/2021	05:20:23	Brown Long-eared Bat		y	3
3A	02/08/2021	05:26:38	Brown Long-eared Bat	28 minutes before sunrise 5:54. Day-roosting		3
3A	02/08/2021	05:51:33	Roost bat chatter	50 registrations of roost bat chatter between 5:51 and 6:04		3
3A	02/08/2021	06:04:18	Roost bat chatter	10 minutes AFTER sunrise 5:54. Roost bat chatter		3
3A	02/08/2021	22:22:52	Brown Long-eared Bat	62 minutes after sunset. Social calls		4
3A	02/08/2021	22:23:58	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	22:24:15	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	22:35:24	Brown Long-eared Bat		y	4
3A	02/08/2021	22:46:29	Brown Long-eared Bat	Social calls		4
3A	02/08/2021	23:10:41	Brown Long-eared Bat	Both flight calls and social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	02/08/2021	23:13:33	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:13:56	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:15:01	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:21:34	Brown Long-eared Bat	Social calls		4
3A	02/08/2021	23:21:53	Brown Long-eared Bat		y	4
3A	02/08/2021	23:22:13	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:22:31	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:22:42	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:22:48	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:22:57	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:23:10	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:23:16	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:23:38	Brown Long-eared Bat	Social calls		4
3A	02/08/2021	23:23:50	Brown Long-eared Bat	Social calls	y	4
3A	02/08/2021	23:24:02	Brown Long-eared Bat	Social calls	y	4
3A	02/08/2021	23:25:52	Brown Long-eared Bat		y	4
3A	02/08/2021	23:26:51	Brown Long-eared Bat	Social calls	y	4
3A	02/08/2021	23:27:00	Brown Long-eared Bat	Social calls	y	4
3A	02/08/2021	23:29:46	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:29:53	Brown Long-eared Bat	Both flight calls and social calls		4
3A	02/08/2021	23:37:41	Brown Long-eared Bat			4
3A	02/08/2021	23:41:52	Brown Long-eared Bat			4
3A	03/08/2021	00:02:34	Brown Long-eared Bat	Social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	00:02:46	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	00:10:20	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	00:30:20	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	00:34:14	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	00:35:06	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	00:37:03	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	00:37:20	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	00:37:37	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	00:37:44	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	00:38:38	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	00:38:49	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	00:39:07	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	00:39:15	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	00:39:22	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	00:39:34	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	00:39:41	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	00:39:54	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	00:40:03	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	00:40:09	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	00:59:26	Brown Long-eared Bat		y	4
3A	03/08/2021	01:00:04	Brown Long-eared Bat			4
3A	03/08/2021	01:00:13	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:00:24	Brown Long-eared Bat	Both flight calls and social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	01:00:38	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	01:01:15	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:01:58	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	01:02:32	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	01:03:23	Brown Long-eared Bat		y	4
3A	03/08/2021	01:03:45	Brown Long-eared Bat	both flight calls and social calls	y	4
3A	03/08/2021	01:04:01	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:04:25	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:04:33	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:04:40	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:04:58	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:06:14	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	01:16:52	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:17:03	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:17:11	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:18:23	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:18:50	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:18:57	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:19:07	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:19:17	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:19:43	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:20:12	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:20:42	Brown Long-eared Bat	Social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	01:21:22	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:24:05	Brown Long-eared Bat		y	4
3A	03/08/2021	01:24:12	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	01:24:22	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:24:44	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:24:59	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:25:04	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	01:29:43	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:30:03	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	01:30:14	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	01:31:33	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	01:31:57	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	01:43:21	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:43:31	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:43:42	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	01:43:50	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	01:44:26	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	01:58:38	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:58:51	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:58:58	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:59:07	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:59:21	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	01:59:29	Brown Long-eared Bat	Both flight calls and social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	01:59:43	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:00:15	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:01:33	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:02:39	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:02:48	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:03:01	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:04:52	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:06:20	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:06:28	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:06:50	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:08:36	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	02:08:44	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:09:47	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	02:10:08	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:10:23	Brown Long-eared Bat	Social calls	y	4
3A	03/08/2021	02:10:39	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:10:45	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:11:09	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:11:30	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:11:35	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:14:23	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:16:44	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:18:26	Brown Long-eared Bat	Social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	02:18:41	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:19:30	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	02:19:41	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:20:25	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:20:36	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:20:58	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:25:52	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:26:17	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:29:11	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:29:17	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:29:27	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:29:33	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:29:45	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:30:03	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:30:14	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:31:17	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:31:34	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:31:51	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:33:12	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:33:32	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:33:57	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:34:09	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:34:30	Brown Long-eared Bat	Both flight calls and social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	02:34:44	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	02:34:52	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:35:00	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:35:08	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:35:22	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:35:30	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:35:52	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:35:58	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:36:08	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:36:18	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:36:28	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:37:41	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:37:48	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:38:03	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:38:11	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:38:39	Brown Long-eared Bat		y	4
3A	03/08/2021	02:38:46	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:39:05	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:39:17	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:39:32	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:39:39	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:40:01	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	02:40:23	Brown Long-eared Bat	Both flight calls and social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	02:40:35	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:40:43	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:41:00	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:41:14	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:41:20	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:41:35	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:46:27	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:47:00	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:47:12	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:47:28	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:47:47	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:47:55	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:48:09	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:48:51	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:49:04	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:49:18	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:49:42	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:49:51	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:50:01	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:50:09	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:50:24	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:50:31	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:50:37	Brown Long-eared Bat	Both flight calls and social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	02:50:55	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:51:01	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:52:08	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:52:14	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:54:18	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:54:55	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:55:14	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:55:19	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:55:36	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:55:47	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:55:52	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:56:04	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:56:13	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:57:37	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:58:29	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	02:59:02	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:59:08	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:59:28	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:59:39	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:59:46	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	02:59:58	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:00:09	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:00:17	Brown Long-eared Bat	Social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	03:00:33	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:00:53	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:01:39	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	03:01:47	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	03:03:03	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:03:20	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:03:52	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:04:18	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:04:24	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:05:07	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:05:35	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:07:19	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:07:40	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:08:30	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:08:43	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:10:21	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:11:17	Brown Long-eared Bat		y	4
3A	03/08/2021	03:11:54	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:12:08	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:12:28	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:12:58	Brown Long-eared Bat			4
3A	03/08/2021	03:13:11	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	03:13:37	Brown Long-eared Bat	Social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	03:13:45	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:13:53	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:14:19	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:14:41	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:15:07	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:15:41	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:18:31	Brown Long-eared Bat		y	4
3A	03/08/2021	03:24:35	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	03:24:53	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:25:03	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:25:32	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:25:42	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:25:57	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:26:24	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:26:42	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:26:49	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:27:21	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:27:36	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:27:59	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:28:25	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:28:32	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:28:44	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:28:55	Brown Long-eared Bat	Both flight calls and social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	03:29:12	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:29:30	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:29:42	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:30:26	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:30:37	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:30:43	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:31:25	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:33:08	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	03:35:53	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:36:02	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:36:18	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:36:56	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:37:15	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:37:23	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	03:37:43	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:38:02	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:38:59	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:39:20	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:42:21	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:42:29	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:42:43	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:43:20	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:43:35	Brown Long-eared Bat	Both flight calls and social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	03:43:54	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:44:13	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:45:49	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:47:18	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:47:51	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:48:02	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:48:29	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:48:38	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:48:55	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:49:21	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:49:55	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:50:02	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	03:50:56	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	04:12:05	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	04:12:21	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	04:12:45	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	04:12:52	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	04:13:07	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	04:13:12	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	04:13:30	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	04:21:32	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	05:13:09	Brown Long-eared Bat		y	4
3A	03/08/2021	05:15:42	Brown Long-eared Bat	Both flight calls and social calls		4

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	05:16:24	Brown Long-eared Bat	Both flight calls and social calls	y	4
3A	03/08/2021	05:18:36	Brown Long-eared Bat	Both flight calls and social calls		4
3A	03/08/2021	05:22:44	Brown Long-eared Bat	Social calls		4
3A	03/08/2021	05:24:23	Brown Long-eared Bat	31 minutes before sunrise 2:55. Day-roosting. Social calls		4
3A	03/08/2021	21:40:07	Brown Long-eared Bat	22 minutes after sunset. Day-roosting	y	5
3A	03/08/2021	22:18:25	Brown Long-eared Bat	Both flight calls and social calls		5
3A	03/08/2021	22:29:32	Brown Long-eared Bat			5
3A	03/08/2021	22:34:49	Brown Long-eared Bat			5
3A	03/08/2021	22:46:44	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:49:12	Brown Long-eared Bat	Flight calls. CP too.		5
3A	03/08/2021	22:50:37	Brown Long-eared Bat	Flight calls. CP too.		5
3A	03/08/2021	22:54:52	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:55:12	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:55:40	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:55:54	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:56:07	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:56:53	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:57:12	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:57:43	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:58:06	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:58:31	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:58:42	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	22:59:43	Brown Long-eared Bat	Social calls		5

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	22:59:51	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	23:00:00	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	23:00:32	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	23:00:39	Brown Long-eared Bat	Social calls	y	5
3A	03/08/2021	23:00:54	Brown Long-eared Bat	Both flight calls and social calls		5
3A	03/08/2021	23:01:12	Brown Long-eared Bat	Both flight calls and social calls		5
3A	03/08/2021	23:01:31	Brown Long-eared Bat	Both flight calls and social calls		5
3A	03/08/2021	23:01:45	Brown Long-eared Bat	social calls		5
3A	03/08/2021	23:02:02	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	23:02:42	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	23:07:41	Brown Long-eared Bat	Both flight calls and social calls		5
3A	03/08/2021	23:08:57	Brown Long-eared Bat	Both flight calls and social calls		5
3A	03/08/2021	23:09:08	Brown Long-eared Bat	Both flight calls and social calls		5
3A	03/08/2021	23:09:23	Brown Long-eared Bat	Both flight calls and social calls		5
3A	03/08/2021	23:09:41	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	23:09:47	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	23:09:55	Brown Long-eared Bat	Both flight calls and social calls		5
3A	03/08/2021	23:14:17	Brown Long-eared Bat	Social calls		5
3A	03/08/2021	23:18:28	Brown Long-eared Bat	Flight calls		5
3A	03/08/2021	23:30:56	Brown Long-eared Bat	Not noting whether social calls from here on		5
3A	03/08/2021	23:33:47	Brown Long-eared Bat	289 Brown Long-eared Bat registrations between 23:33 and 5:35		5
3A	...	...	...	...		...
3A	289 Brown Long-eared Bat registrations between 23:33 and 5:35 not listed here					...

Site	Date	Time	Species	Notes	Overlap	Night
3A	...	...	...	...		...
3A	04/08/2021	05:35:17	Brown Long-eared Bat	22 minutes before sunrise 5:57. Day-roosting		5
Note that high levels of Brown Long-eared roost activity continued as above for the remaining 7 of 12 nights of monitoring to 11 August 2021						

Table A.2 Whiskered bat and *Myotis* sp. recordings extracted from overall recordings from inside roost 3A - analyses shown for first 5 of 12 consecutive nights. Other bat species recorded from inside the roost not included here.

Site	Date	Time	Species	Notes	Overlap	Night
3A	31/07/2021	00:13:06	Whiskered Bat		y	1
3A	31/07/2021	00:30:38	Whiskered Bat			1
3A	31/07/2021	00:58:45	Whiskered Bat			1
3A	31/07/2021	23:04:47	Whiskered Bat		y	2
3A	31/07/2021	23:41:57	<i>Myotis</i> sp.			2
3A	31/07/2021	23:44:36	<i>Myotis</i> sp.			2
3A	31/07/2021	23:45:18	Whiskered Bat			2
3A	31/07/2021	23:45:26	Whiskered Bat	Other social calls - maybe BLE		2
3A	31/07/2021	23:50:42	<i>Myotis</i> sp.			2
3A	01/08/2021	00:36:08	<i>Myotis</i> sp.	Whiskered not likely - faint but Natt or Daub	y	2
3A	01/08/2021	00:46:51	<i>Myotis</i> sp.		y	2
3A	01/08/2021	00:47:16	Whiskered Bat			2
3A	01/08/2021	00:47:21	<i>Myotis</i> sp.			2
3A	01/08/2021	00:47:33	Whiskered Bat		y	2
3A	01/08/2021	00:57:56	Whiskered Bat		y	2
3A	01/08/2021	02:46:47	Whiskered Bat			2

Site	Date	Time	Species	Notes	Overlap	Night
3A	01/08/2021	04:17:58	<i>Myotis</i> sp.	Whiskered maybe		2
3A	01/08/2021	05:01:13	Whiskered Bat			2
3A	01/08/2021	05:03:27	Whiskered Bat			2
3A	01/08/2021	05:03:51	Whiskered Bat			2
3A	01/08/2021	05:04:19	Whiskered Bat			2
3A	01/08/2021	05:04:49	Whiskered Bat			2
3A	01/08/2021	05:06:12	Whiskered Bat			2
3A	01/08/2021	05:07:25	Whiskered Bat			2
3A	01/08/2021	05:07:34	Whiskered Bat			2
3A	01/08/2021	05:07:49	Whiskered Bat		y	2
3A	01/08/2021	05:08:15	Whiskered Bat		y	2
3A	01/08/2021	05:08:43	Whiskered Bat			2
3A	01/08/2021	05:08:56	Whiskered Bat		y	2
3A	01/08/2021	05:13:28	Whiskered Bat	40 minutes before sunrise 5:53. Day-roosting	y	2
3A	01/08/2021	21:38:52	Whiskered Bat	16 mins after sunset. Day-roosting		3
3A	01/08/2021	22:18:49	<i>Myotis</i> sp.			3
3A	01/08/2021	22:18:56	<i>Myotis</i> sp.			3
3A	01/08/2021	22:19:01	<i>Myotis</i> sp.			3
3A	01/08/2021	22:37:14	Whiskered Bat		y	3
3A	01/08/2021	22:37:19	Whiskered Bat		y	3
3A	01/08/2021	23:10:02	<i>Myotis</i> sp.			3
3A	02/08/2021	00:57:26	Whiskered Bat			3
3A	02/08/2021	03:50:29	Whiskered Bat		y	3

Site	Date	Time	Species	Notes	Overlap	Night
3A	02/08/2021	03:57:16	Whiskered Bat			3
3A	02/08/2021	04:53:58	Whiskered Bat			3
3A	02/08/2021	04:54:32	Whiskered Bat			3
3A	02/08/2021	04:54:37	Whiskered Bat			3
3A	02/08/2021	04:57:02	Whiskered Bat			3
3A	02/08/2021	04:57:07	Whiskered Bat	57 minutes before sunrise 5:54		3
3A	02/08/2021	21:45:57	Whiskered Bat	25 mins after sunset 21:20. Day-roosting		4
3A	02/08/2021	22:19:05	Whiskered Bat			4
3A	02/08/2021	23:45:40	<i>Myotis</i> sp.			4
3A	02/08/2021	23:46:19	<i>Myotis</i> sp.			4
3A	02/08/2021	23:49:45	Whiskered Bat		y	4
3A	02/08/2021	23:50:07	Whiskered Bat		y	4
3A	02/08/2021	23:52:12	Whiskered Bat		y	4
3A	03/08/2021	00:13:49	<i>Myotis</i> sp.			4
3A	03/08/2021	00:35:35	<i>Myotis</i> sp.		y	4
3A	03/08/2021	00:35:58	<i>Myotis</i> sp.		y	4
3A	03/08/2021	02:18:03	Whiskered Bat			4
3A	03/08/2021	05:12:40	Whiskered Bat			4
3A	03/08/2021	05:12:57	Whiskered Bat			4
3A	03/08/2021	05:13:09	Whiskered Bat	42 minutes before sunrise 5:55. Day-roosting	y	4
3A	03/08/2021	05:13:19	Whiskered Bat	42 minutes before sunrise 5:55. Day-roosting		4
3A	03/08/2021	05:14:21	Whiskered Bat	41 minutes before sunrise 5:55. Day-roosting	y	4
3A	03/08/2021	21:44:35	<i>Myotis</i> sp.	26 minutes after sunset 21:18. Day-roosting		5

Site	Date	Time	Species	Notes	Overlap	Night
3A	03/08/2021	22:12:24	<i>Myotis</i> sp.	Faint. Natterer's Bat possible		5
3A	03/08/2021	23:46:31	Whiskered Bat		y	5
3A	03/08/2021	23:53:07	Whiskered Bat			5
3A	04/08/2021	00:29:07	<i>Myotis</i> sp.			5
3A	04/08/2021	01:00:14	<i>Myotis</i> sp.	Whiskered Bat likely		5
3A	04/08/2021	01:48:43	<i>Myotis</i> sp.	Whiskered Bat likely	y	5
3A	04/08/2021	02:58:40	<i>Myotis</i> sp.			5
3A	04/08/2021	05:18:15	Whiskered Bat			5
3A	04/08/2021	05:18:27	Whiskered Bat		y	5
3A	04/08/2021	05:18:33	Whiskered Bat			5
3A	04/08/2021	05:18:52	Whiskered Bat	39 minutes before sunrise 5:57. Day-roosting. Good example	y	5
3A	04/08/2021	05:19:06	Whiskered Bat	38 minutes before sunrise 5:57. Day-roosting	y	5
3A	Nights 6 - 12 were not fully analysed due to time constraints but the following information re <i>Myotis</i> sp. was extracted close to sunset and sunrise times to provide extra information about the day roost status for Whiskered Bat					
3A	05/08/2021	04:58:59	Whiskered Bat	1 hr. 1 min before sunrise 5:59		6
3A	05/08/2021	22:14:21	<i>Myotis</i> sp.	1 hr. after sunset. Daubenton's Bat, faint could be outside		7
3A	06/08/2021	05:16:13	Whiskered Bat		y	7
3A	06/08/2021	05:18:10	Whiskered Bat	42 minutes before sunrise 6am. Day-roosting	y	7
3A	06/08/2021	23:09:54	Whiskered Bat			8
3A	07/08/2021	05:38:41	<i>Myotis</i> sp.	Whiskered Bat likely. 24 minutes before sunrise 6:02. Day-roosting	y	8
3A	08/08/2021	01:33:05	<i>Myotis</i> sp.			9
3A	08/08/2021	05:20:39	Whiskered Bat			9
3A	08/08/2021	05:20:59	Whiskered Bat			9

Site	Date	Time	Species	Notes	Overlap	Night
3A	08/08/2021	22:36:24	Whiskered Bat			10
3A	09/08/2021	21:40:43	<i>Myotis</i> sp.	33 minutes after sunset 21:07. Day-roosting		11
3A	09/08/2021	22:23:21	Whiskered Bat			11
3A	09/08/2021	22:32:39	Whiskered Bat			11
3A	10/08/2021	21:36:03	<i>Myotis</i> sp.	31 minutes after sunset 21:05. Day-roosting		12
3A	11/08/2021	04:32:55	<i>Myotis</i> sp.	Whiskered likely		12
3A	11/08/2021	04:33:14	<i>Myotis</i> sp.	Whiskered likely		12

Appendix 3B. Passive Detector Monitoring at Farm Courtyard Roost Site 12

Table B1. Brown Long-eared Bat and *Myotis* sp. recordings from overall recordings in the farmyard at Site 12.

Site	Date	Time	Species	Notes	Overlap	Night
12	31/07/2021	00:03:26	Brown Long-eared Bat	Deployment only starts during 30th-31.7.2021 transect WT4		0
12	31/07/2021	00:04:59	Brown Long-eared Bat		y	0
12	31/07/2021	00:05:45	Whiskered Bat		y	0
12	31/07/2021	00:05:45	Brown Long-eared Bat		y	0
12	31/07/2021	00:06:08	Whiskered Bat			0
12	31/07/2021	00:06:57	Whiskered Bat	Good example		0
12	31/07/2021	00:07:15	Brown Long-eared Bat			0
12	31/07/2021	00:08:26	Brown Long-eared Bat		y	0
12	31/07/2021	00:09:25	Brown Long-eared Bat			0
12	31/07/2021	00:10:24	Brown Long-eared Bat		y	0
12	31/07/2021	00:10:39	Brown Long-eared Bat		y	0

Site	Date	Time	Species	Notes	Overlap	Night
12	31/07/2021	00:11:35	Brown Long-eared Bat			0
12	31/07/2021	00:11:56	Brown Long-eared Bat			0
12	31/07/2021	00:14:09	Brown Long-eared Bat			0
12	31/07/2021	00:16:08	Brown Long-eared Bat	With social calls		0
12	31/07/2021	00:16:29	Brown Long-eared Bat	With social calls		0
12	31/07/2021	00:21:45	Brown Long-eared Bat			0
12	31/07/2021	00:22:38	Whiskered Bat	Good example		0
12	31/07/2021	00:23:12	Brown Long-eared Bat			0
12	31/07/2021	00:23:19	<i>Myotis</i> sp.	No pulses lower than 30kHz		0
12	31/07/2021	00:23:41	<i>Myotis</i> sp.	No pulses lower than 30kHz		0
12	31/07/2021	00:25:02	Brown Long-eared Bat			0
12	31/07/2021	00:44:43	<i>Myotis</i> sp.	Whiskered not below 33kHz		0
12	31/07/2021	00:46:13	<i>Myotis</i> sp.	Whiskered not below 33kHz		0
12	31/07/2021	00:51:46	Whiskered Bat	Feeding buzz		0
12	31/07/2021	00:52:38	Whiskered Bat			0
12	31/07/2021	00:53:24	Whiskered Bat			0
12	31/07/2021	00:54:00	Whiskered Bat			0
12	31/07/2021	01:21:37	Whiskered Bat			0
12	31/07/2021	01:33:21	Brown Long-eared Bat		y	0
12	31/07/2021	01:33:28	Brown Long-eared Bat		y	0
12	31/07/2021	01:33:39	Brown Long-eared Bat		y	0
12	31/07/2021	01:35:36	Whiskered Bat	Goodish example		0
12	31/07/2021	01:36:10	Whiskered Bat			0

Site	Date	Time	Species	Notes	Overlap	Night
12	31/07/2021	01:41:12	<i>Myotis</i> sp.	Faint		0
12	31/07/2021	01:49:17	Whiskered Bat			0
12	31/07/2021	01:50:19	Whiskered Bat			0
12	31/07/2021	02:18:49	Brown Long-eared Bat		y	0
12	31/07/2021	02:22:12	Brown Long-eared Bat			0
12	31/07/2021	02:23:11	Brown Long-eared Bat			0
12	31/07/2021	02:25:20	Brown Long-eared Bat			0
12	31/07/2021	02:31:00	Brown Long-eared Bat			0
12	31/07/2021	02:31:09	Brown Long-eared Bat			0
12	31/07/2021	02:35:11	Brown Long-eared Bat			0
12	31/07/2021	02:41:39	Brown Long-eared Bat		y	0
12	31/07/2021	02:42:35	Brown Long-eared Bat			0
12	31/07/2021	02:43:10	Brown Long-eared Bat		y	0
12	31/07/2021	02:48:33	Brown Long-eared Bat	With social calls	y	0
12	31/07/2021	02:49:17	Brown Long-eared Bat			0
12	31/07/2021	02:49:50	Brown Long-eared Bat			0
12	31/07/2021	03:13:02	Brown Long-eared Bat			0
12	31/07/2021	03:13:41	Brown Long-eared Bat	Very clear		0
12	31/07/2021	03:16:14	Brown Long-eared Bat			0
12	31/07/2021	03:19:17	Brown Long-eared Bat			0
12	31/07/2021	03:19:38	Brown Long-eared Bat			0
12	31/07/2021	03:21:58	Brown Long-eared Bat	With social calls		0
12	31/07/2021	03:24:00	Brown Long-eared Bat			0

Site	Date	Time	Species	Notes	Overlap	Night
12	31/07/2021	03:26:23	Brown Long-eared Bat	With social calls		0
12	31/07/2021	03:26:33	Brown Long-eared Bat	With social calls		0
12	31/07/2021	03:26:45	Brown Long-eared Bat			0
12	31/07/2021	03:28:03	Brown Long-eared Bat	With social calls		0
12	31/07/2021	03:32:16	Whiskered Bat	Goodish example	y	0
12	31/07/2021	03:32:16	Brown Long-eared Bat	With social calls	y	0
12	31/07/2021	03:35:34	Whiskered Bat			0
12	31/07/2021	03:36:17	Whiskered Bat			0
12	31/07/2021	03:51:50	Brown Long-eared Bat			0
12	31/07/2021	03:54:28	Brown Long-eared Bat			0
12	31/07/2021	04:10:47	Brown Long-eared Bat			0
12	31/07/2021	04:13:41	Brown Long-eared Bat			0
12	31/07/2021	04:22:07	Daubenton's Bat			0
12	31/07/2021	04:26:04	<i>Myotis</i> sp.	Faint		0
12	31/07/2021	05:04:15	Brown Long-eared Bat	47 mins before sunrise 5:51		0
12	31/07/2021	21:57:26	<i>Myotis</i> sp.	34 minutes after sunset 21:23. Faint		1
12	31/07/2021	21:58:28	<i>Myotis</i> sp.	Faint. 35 mins after sunset		1
12	31/07/2021	21:58:35	<i>Myotis</i> sp.	Faint. 35 mins after sunset		1
12	31/07/2021	21:58:42	<i>Myotis</i> sp.	Faint. 35 mins after sunset		1
12	31/07/2021	21:59:17	<i>Myotis</i> sp.	Faint. 36 mins after sunset		1
12	31/07/2021	21:59:27	Whiskered Bat			1
12	31/07/2021	21:59:57	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:00:07	<i>Myotis</i> sp.	Faint	y	1

Site	Date	Time	Species	Notes	Overlap	Night
12	31/07/2021	22:00:24	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:00:31	Whiskered Bat			1
12	31/07/2021	22:03:44	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:04:03	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:04:22	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:04:33	<i>Myotis</i> sp.			1
12	31/07/2021	22:04:41	<i>Myotis</i> sp.			1
12	31/07/2021	22:04:54	<i>Myotis</i> sp.			1
12	31/07/2021	22:05:10	<i>Myotis</i> sp.			1
12	31/07/2021	22:05:33	<i>Myotis</i> sp.			1
12	31/07/2021	22:07:11	<i>Myotis</i> sp.	Daubenton's Bat probably		1
12	31/07/2021	22:11:20	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:15:11	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:23:53	<i>Myotis</i> sp.	Daubenton's Bat probably		1
12	31/07/2021	22:25:22	Whiskered Bat			1
12	31/07/2021	22:25:33	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:30:30	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:35:56	<i>Myotis</i> sp.	Daubenton's Bat probably		1
12	31/07/2021	22:39:34	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:41:52	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:42:03	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	22:43:33	<i>Myotis</i> sp.	SP too. Daubenton's Bat probably	y	1
12	31/07/2021	22:46:47	Whiskered Bat			1

Site	Date	Time	Species	Notes	Overlap	Night
12	31/07/2021	22:47:41	Whiskered Bat			1
12	31/07/2021	22:51:19	Whiskered Bat			1
12	31/07/2021	22:54:50	Whiskered Bat			1
12	31/07/2021	22:57:30	Brown Long-eared Bat			1
12	31/07/2021	23:04:58	Whiskered Bat			1
12	31/07/2021	23:12:09	Whiskered Bat			1
12	31/07/2021	23:12:56	Whiskered Bat			1
12	31/07/2021	23:14:35	Whiskered Bat		y	1
12	31/07/2021	23:23:31	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	23:23:40	<i>Myotis</i> sp.	Faint		1
12	31/07/2021	23:29:39	<i>Myotis</i> sp.	Faint - possibly Natterer's Bat	y	1
12	31/07/2021	23:55:07	Brown Long-eared Bat			1
12	01/08/2021	00:00:28	Whiskered Bat			1
12	01/08/2021	00:01:22	<i>Myotis</i> sp.			1
12	01/08/2021	00:07:25	<i>Myotis</i> sp.			1
12	01/08/2021	00:20:16	Whiskered Bat			1
12	01/08/2021	00:34:54	<i>Myotis</i> sp.			1
12	01/08/2021	00:58:05	Brown Long-eared Bat			1
12	01/08/2021	01:01:11	<i>Myotis</i> sp.			1
12	01/08/2021	01:08:24	Whiskered Bat			1
12	01/08/2021	01:09:13	<i>Myotis</i> sp.			1
12	01/08/2021	01:09:50	Whiskered Bat			1
12	01/08/2021	01:10:11	Whiskered Bat			1

Site	Date	Time	Species	Notes	Overlap	Night
12	01/08/2021	01:13:45	Brown Long-eared Bat			1
12	01/08/2021	01:24:52	Brown Long-eared Bat			1
12	01/08/2021	01:32:33	Brown Long-eared Bat			1
12	01/08/2021	01:46:44	Brown Long-eared Bat			1
12	01/08/2021	01:47:29	Brown Long-eared Bat			1
12	01/08/2021	01:48:27	Brown Long-eared Bat			1
12	01/08/2021	01:48:47	Brown Long-eared Bat			1
12	01/08/2021	01:53:46	Brown Long-eared Bat			1
12	01/08/2021	01:54:03	Brown Long-eared Bat			1
12	01/08/2021	01:57:05	Brown Long-eared Bat		y	1
12	01/08/2021	01:58:57	Brown Long-eared Bat			1
12	01/08/2021	02:01:23	Brown Long-eared Bat			1
12	01/08/2021	02:01:47	Brown Long-eared Bat			1
12	01/08/2021	02:04:01	Brown Long-eared Bat			1
12	01/08/2021	02:04:13	Brown Long-eared Bat		y	1
12	01/08/2021	02:04:26	Brown Long-eared Bat		y	1
12	01/08/2021	02:04:36	Brown Long-eared Bat			1
12	01/08/2021	02:08:38	Brown Long-eared Bat			1
12	01/08/2021	02:09:26	Brown Long-eared Bat			1
12	01/08/2021	02:09:50	Brown Long-eared Bat			1
12	01/08/2021	02:11:23	Brown Long-eared Bat	With social calls		1
12	01/08/2021	02:12:42	Brown Long-eared Bat			1
12	01/08/2021	02:15:55	<i>Myotis</i> sp.			1

Site	Date	Time	Species	Notes	Overlap	Night
12	01/08/2021	02:17:53	Brown Long-eared Bat			1
12	01/08/2021	02:18:12	Brown Long-eared Bat			1
12	01/08/2021	02:18:24	Brown Long-eared Bat	With social calls		1
12	01/08/2021	02:19:37	Brown Long-eared Bat		y	1
12	01/08/2021	02:21:47	Brown Long-eared Bat			1
12	01/08/2021	02:22:17	Brown Long-eared Bat			1
12	01/08/2021	02:23:27	Brown Long-eared Bat	2 individuals		1
12	01/08/2021	02:24:08	Brown Long-eared Bat			1
12	01/08/2021	02:24:24	Brown Long-eared Bat			1
12	01/08/2021	02:24:43	Brown Long-eared Bat			1
12	01/08/2021	02:25:14	Whiskered Bat	Simultaneous with BLE	y	1
12	01/08/2021	02:25:14	Brown Long-eared Bat	Simultaneous with Whiskered	y	1
12	01/08/2021	02:25:22	Brown Long-eared Bat			1
12	01/08/2021	02:25:58	Brown Long-eared Bat		y	1
12	01/08/2021	02:26:32	Brown Long-eared Bat			1
12	01/08/2021	02:26:57	Brown Long-eared Bat			1
12	01/08/2021	02:27:21	Brown Long-eared Bat			1
12	01/08/2021	02:31:13	Brown Long-eared Bat			1
12	01/08/2021	02:33:40	Brown Long-eared Bat			1
12	01/08/2021	02:35:26	Brown Long-eared Bat			1
12	01/08/2021	02:36:57	Brown Long-eared Bat			1
12	01/08/2021	02:44:28	Brown Long-eared Bat			1
12	01/08/2021	02:44:58	Brown Long-eared Bat		y	1

Site	Date	Time	Species	Notes	Overlap	Night
12	01/08/2021	02:45:53	Whiskered Bat			1
12	01/08/2021	02:46:30	Whiskered Bat			1
12	01/08/2021	02:55:08	Whiskered Bat			1
12	01/08/2021	02:55:49	Brown Long-eared Bat			1
12	01/08/2021	02:56:01	Brown Long-eared Bat		y	1
12	01/08/2021	02:58:45	Brown Long-eared Bat			1
12	01/08/2021	02:59:38	Brown Long-eared Bat		y	1
12	01/08/2021	03:00:24	Brown Long-eared Bat			1
12	01/08/2021	03:00:41	Brown Long-eared Bat			1
12	01/08/2021	03:00:58	Brown Long-eared Bat			1
12	01/08/2021	03:01:15	Brown Long-eared Bat			1
12	01/08/2021	03:04:08	Brown Long-eared Bat	With social calls		1
12	01/08/2021	03:04:26	Brown Long-eared Bat			1
12	01/08/2021	03:04:48	Brown Long-eared Bat			1
12	01/08/2021	03:07:54	<i>Myotis</i> sp.	Faint	y	1
12	01/08/2021	03:14:18	Whiskered Bat			1
12	01/08/2021	03:17:48	<i>Myotis</i> sp.	Faint pulses		1
12	01/08/2021	03:20:16	Whiskered Bat			1
12	01/08/2021	03:20:42	Whiskered Bat	Good example		1
12	01/08/2021	03:21:57	Whiskered Bat			1
12	01/08/2021	03:22:13	Whiskered Bat			1
12	01/08/2021	03:24:19	Whiskered Bat			1
12	01/08/2021	03:24:34	Whiskered Bat			1

Site	Date	Time	Species	Notes	Overlap	Night
12	01/08/2021	03:24:43	Whiskered Bat			1
12	01/08/2021	03:25:40	Whiskered Bat			1
12	01/08/2021	03:26:00	Whiskered Bat			1
12	01/08/2021	03:26:27	Whiskered Bat			1
12	01/08/2021	03:26:48	<i>Myotis</i> sp.	Faint		1
12	01/08/2021	03:27:01	Whiskered Bat			1
12	01/08/2021	03:34:23	Whiskered Bat			1
12	01/08/2021	03:35:30	Whiskered Bat			1
12	01/08/2021	03:36:46	Whiskered Bat			1
12	01/08/2021	03:37:21	Whiskered Bat			1
12	01/08/2021	03:37:38	Whiskered Bat	Good example		1
12	01/08/2021	03:38:40	Whiskered Bat	Good example		1
12	01/08/2021	03:39:07	Whiskered Bat	Good example		1
12	01/08/2021	03:39:31	Brown Long-eared Bat			1
12	01/08/2021	03:39:44	Whiskered Bat			1
12	01/08/2021	03:40:30	Brown Long-eared Bat			1
12	01/08/2021	03:40:48	Brown Long-eared Bat	With social calls		1
12	01/08/2021	03:41:48	Brown Long-eared Bat			1
12	01/08/2021	03:42:27	Brown Long-eared Bat			1
12	01/08/2021	03:43:20	Brown Long-eared Bat			1
12	01/08/2021	03:53:31	<i>Myotis</i> sp.	Faint	y	1
12	01/08/2021	03:53:31	Brown Long-eared Bat	Social calls	y	1
12	01/08/2021	03:53:51	Brown Long-eared Bat	Social calls		1

Site	Date	Time	Species	Notes	Overlap	Night
12	01/08/2021	03:54:54	Whiskered Bat	Clear	y	1
12	01/08/2021	03:55:17	Brown Long-eared Bat			1
12	01/08/2021	03:56:14	Whiskered Bat			1
12	01/08/2021	03:56:34	<i>Myotis</i> sp.	Faint		1
12	01/08/2021	04:02:38	Brown Long-eared Bat	With social calls	y	1
12	01/08/2021	04:02:59	Brown Long-eared Bat			1
12	01/08/2021	04:05:29	Brown Long-eared Bat		y	1
12	01/08/2021	04:07:01	Brown Long-eared Bat			1
12	01/08/2021	04:08:22	Whiskered Bat	Good example		1
12	01/08/2021	04:09:00	Whiskered Bat	Feeding buzz. Good example		1
12	01/08/2021	04:09:33	Whiskered Bat			1
12	01/08/2021	04:10:22	<i>Myotis</i> sp.	Faint		1
12	01/08/2021	04:10:34	<i>Myotis</i> sp.	Faint and probably Natterer's Bat		1
12	01/08/2021	04:16:22	Whiskered Bat			1
12	01/08/2021	04:23:07	Brown Long-eared Bat			1
12	01/08/2021	04:23:36	Brown Long-eared Bat			1
12	01/08/2021	04:23:49	Brown Long-eared Bat	With social calls		1
12	01/08/2021	04:24:06	Brown Long-eared Bat			1
12	01/08/2021	04:27:49	Brown Long-eared Bat			1
12	01/08/2021	04:28:30	Brown Long-eared Bat		y	1
12	01/08/2021	04:32:37	<i>Myotis</i> sp.	Daubenton's Bat likely		1
12	01/08/2021	04:32:58	<i>Myotis</i> sp.	Daubenton's Bat likely		1
12	01/08/2021	04:33:21	<i>Myotis</i> sp.	Daubenton's Bat likely		1

Site	Date	Time	Species	Notes	Overlap	Night
12	01/08/2021	04:37:43	Brown Long-eared Bat			1
12	01/08/2021	04:38:53	<i>Myotis</i> sp.	Faint	y	1
12	01/08/2021	04:40:03	<i>Myotis</i> sp.	Faint	y	1
12	01/08/2021	04:42:00	<i>Myotis</i> sp.	Faint		1
12	01/08/2021	04:44:17	<i>Myotis</i> sp.	faint		1
12	01/08/2021	04:44:31	Brown Long-eared Bat		y	1
12	01/08/2021	04:44:48	Brown Long-eared Bat		y	1
12	01/08/2021	04:48:49	Brown Long-eared Bat	With social calls		1
12	01/08/2021	04:49:06	Brown Long-eared Bat			1
12	01/08/2021	04:49:47	Brown Long-eared Bat	2 individuals		1
12	01/08/2021	04:50:00	Brown Long-eared Bat		y	1
12	01/08/2021	04:50:26	Brown Long-eared Bat	With social calls		1
12	01/08/2021	04:50:43	Brown Long-eared Bat			1
12	01/08/2021	04:52:44	Brown Long-eared Bat	2 individuals. With social calls		1
12	01/08/2021	04:53:58	Brown Long-eared Bat		y	1
12	01/08/2021	04:54:56	Brown Long-eared Bat			1
12	01/08/2021	04:55:16	Brown Long-eared Bat		y	1
12	01/08/2021	04:56:17	Brown Long-eared Bat			1
12	01/08/2021	04:56:39	Brown Long-eared Bat			1
12	01/08/2021	04:56:51	Brown Long-eared Bat	With social calls	y	1
12	01/08/2021	04:57:08	Brown Long-eared Bat		y	1
12	01/08/2021	04:57:25	Brown Long-eared Bat		y	1
12	01/08/2021	05:02:39	Brown Long-eared Bat	Loud social calls		1

Site	Date	Time	Species	Notes	Overlap	Night
12	01/08/2021	05:02:52	Brown Long-eared Bat	Loud social calls		1
12	01/08/2021	05:03:06	Brown Long-eared Bat	Loud social calls. 49 minutes before sunrise. Probably day roost.		1
12	01/08/2021	05:03:59	<i>Myotis</i> sp.	faint		1
12	01/08/2021	05:04:36	<i>Myotis</i> sp.	faint	y	1
12	01/08/2021	05:06:28	<i>Myotis</i> sp.	faint		1
12	01/08/2021	05:07:31	<i>Myotis</i> sp.	faint		1
12	01/08/2021	05:14:37	<i>Myotis</i> sp.	38 mins before sunrise 5:52. Day roost. Faint calls		1
12	01/08/2021	05:15:05	<i>Myotis</i> sp.	37 mins before sunrise 5:52. Day roost. Faint calls		1
12	01/08/2021	22:14:15	Whiskered Bat	52 mins after sunset 21:22		2
12	01/08/2021	22:15:16	Brown Long-eared Bat	53 mins after sunset 21:22		2
12	01/08/2021	22:17:24	<i>Myotis</i> sp.	faint		2
12	01/08/2021	22:19:32	<i>Myotis</i> sp.	faint	y	2
12	01/08/2021	22:19:56	Whiskered Bat			2
12	01/08/2021	22:22:55	<i>Myotis</i> sp.	Daubenton's Bat likely		2
12	01/08/2021	22:26:12	Whiskered Bat	Feeding buzz		2
12	01/08/2021	22:26:48	<i>Myotis</i> sp.			2
12	01/08/2021	22:26:54	Whiskered Bat			2
12	01/08/2021	22:30:35	<i>Myotis</i> sp.		y	2
12	01/08/2021	22:36:53	Whiskered Bat			2
12	01/08/2021	22:37:12	Whiskered Bat			2
12	01/08/2021	22:37:36	Brown Long-eared Bat	Also GWTS		2
12	01/08/2021	22:41:20	Whiskered Bat	*		2
12	01/08/2021	22:42:12	Whiskered Bat			2

Site	Date	Time	Species	Notes	Overlap	Night
12	01/08/2021	22:43:10	Brown Long-eared Bat			2
12	01/08/2021	22:43:43	<i>Myotis</i> sp.		y	2
12	01/08/2021	22:43:59	Whiskered Bat		y	2
12	01/08/2021	22:47:03	Whiskered Bat		y	2
12	01/08/2021	22:48:30	Whiskered Bat			2
12	01/08/2021	22:48:50	Whiskered Bat			2
12	01/08/2021	22:49:14	Whiskered Bat			2
12	01/08/2021	22:49:36	Whiskered Bat			2
12	01/08/2021	22:50:11	Whiskered Bat			2
12	01/08/2021	22:50:34	Whiskered Bat			2
12	01/08/2021	22:51:56	<i>Myotis</i> sp.	Faint but probably Natterer's Bat		2
12	01/08/2021	22:57:14	<i>Myotis</i> sp.	Daubenton's Bat likely		2
12	01/08/2021	22:58:40	Whiskered Bat			2
12	01/08/2021	22:59:30	Whiskered Bat			2
12	01/08/2021	23:09:58	Whiskered Bat	feeding buzz		2
12	01/08/2021	23:10:48	<i>Myotis</i> sp.	faint		2
12	01/08/2021	23:10:56	<i>Myotis</i> sp.	faint		2
12	01/08/2021	23:11:17	Whiskered Bat		y	2
12	01/08/2021	23:11:38	Whiskered Bat		y	2
12	01/08/2021	23:12:17	Whiskered Bat		y	2
12	01/08/2021	23:16:29	Whiskered Bat		y	2
12	01/08/2021	23:17:18	Whiskered Bat			2
12	01/08/2021	23:17:41	Whiskered Bat		y	2

Site	Date	Time	Species	Notes	Overlap	Night
12	01/08/2021	23:18:39	Whiskered Bat		y	2
12	01/08/2021	23:18:51	Brown Long-eared Bat			2
12	01/08/2021	23:18:59	Brown Long-eared Bat			2
12	01/08/2021	23:23:33	Whiskered Bat			2
12	01/08/2021	23:23:59	<i>Myotis</i> sp.	Faint		2
12	01/08/2021	23:24:21	Whiskered Bat			2
12	01/08/2021	23:24:39	Whiskered Bat			2
12	01/08/2021	23:25:09	Whiskered Bat			2
12	01/08/2021	23:27:04	Whiskered Bat		y	2
12	01/08/2021	23:27:57	Whiskered Bat			2
12	01/08/2021	23:29:32	Brown Long-eared Bat			2
12	01/08/2021	23:30:25	Brown Long-eared Bat		y	2
12	01/08/2021	23:31:17	Whiskered Bat			2
12	01/08/2021	23:31:49	Whiskered Bat		y	2
12	01/08/2021	23:33:07	Whiskered Bat		y	2
12	01/08/2021	23:33:39	Whiskered Bat			2
12	01/08/2021	23:34:12	Whiskered Bat			2
12	01/08/2021	23:37:38	Brown Long-eared Bat			2
12	01/08/2021	23:42:36	Brown Long-eared Bat			2
12	01/08/2021	23:42:44	Brown Long-eared Bat			2
12	01/08/2021	23:45:35	Brown Long-eared Bat			2
12	01/08/2021	23:48:09	Brown Long-eared Bat			2
12	02/08/2021	00:09:34	Whiskered Bat			2

Site	Date	Time	Species	Notes	Overlap	Night
12	02/08/2021	00:10:21	Whiskered Bat			2
12	02/08/2021	00:16:23	<i>Myotis</i> sp.			2
12	02/08/2021	00:39:44	Brown Long-eared Bat			2
12	02/08/2021	00:40:46	Brown Long-eared Bat			2
12	02/08/2021	00:41:28	Brown Long-eared Bat			2
12	02/08/2021	00:42:42	Brown Long-eared Bat			2
12	02/08/2021	00:47:28	Brown Long-eared Bat			2
12	02/08/2021	00:50:03	Brown Long-eared Bat			2
12	02/08/2021	00:51:15	Brown Long-eared Bat			2
12	02/08/2021	00:52:01	Brown Long-eared Bat			2
12	02/08/2021	00:53:38	Brown Long-eared Bat			2
12	02/08/2021	00:59:52	Brown Long-eared Bat			2
12	02/08/2021	01:01:21	Brown Long-eared Bat			2
12	02/08/2021	01:02:05	Brown Long-eared Bat			2
12	02/08/2021	01:02:23	Brown Long-eared Bat			2
12	02/08/2021	01:03:03	<i>Myotis</i> sp.		y	2
12	02/08/2021	01:03:03	Brown Long-eared Bat		y	2
12	02/08/2021	01:04:50	Brown Long-eared Bat			2
12	02/08/2021	01:09:48	Brown Long-eared Bat			2
12	02/08/2021	01:11:08	Brown Long-eared Bat			2
12	02/08/2021	01:26:12	Brown Long-eared Bat	With social calls		2
12	02/08/2021	01:27:20	Brown Long-eared Bat			2
12	02/08/2021	01:29:17	Brown Long-eared Bat			2

Site	Date	Time	Species	Notes	Overlap	Night
12	02/08/2021	01:30:10	Brown Long-eared Bat			2
12	02/08/2021	01:30:31	Brown Long-eared Bat			2
12	02/08/2021	01:30:44	Brown Long-eared Bat			2
12	02/08/2021	01:31:13	Brown Long-eared Bat			2
12	02/08/2021	01:32:42	Brown Long-eared Bat			2
12	02/08/2021	01:33:45	Brown Long-eared Bat			2
12	02/08/2021	01:34:12	Brown Long-eared Bat			2
12	02/08/2021	01:34:49	Brown Long-eared Bat			2
12	02/08/2021	01:35:49	Brown Long-eared Bat			2
12	02/08/2021	01:36:29	Brown Long-eared Bat			2
12	02/08/2021	01:37:38	Brown Long-eared Bat			2
12	02/08/2021	01:38:17	Brown Long-eared Bat			2
12	02/08/2021	01:38:49	Brown Long-eared Bat			2
12	02/08/2021	02:16:09	Brown Long-eared Bat			2
12	02/08/2021	02:16:59	Brown Long-eared Bat			2
12	02/08/2021	02:19:29	Brown Long-eared Bat			2
12	02/08/2021	02:19:55	Brown Long-eared Bat			2
12	02/08/2021	02:23:10	Brown Long-eared Bat			2
12	02/08/2021	02:24:56	Brown Long-eared Bat			2
12	02/08/2021	02:28:06	Brown Long-eared Bat			2
12	02/08/2021	03:05:41	Brown Long-eared Bat			2
12	02/08/2021	03:06:46	Brown Long-eared Bat			2
12	02/08/2021	03:09:01	Brown Long-eared Bat	Social calls		2

Site	Date	Time	Species	Notes	Overlap	Night
12	02/08/2021	03:09:46	Brown Long-eared Bat			2
12	02/08/2021	03:10:27	Brown Long-eared Bat	With social calls		2
12	02/08/2021	03:12:30	Brown Long-eared Bat	With social calls		2
12	02/08/2021	03:13:03	Brown Long-eared Bat			2
12	02/08/2021	03:19:29	Brown Long-eared Bat			2
12	02/08/2021	03:21:41	Brown Long-eared Bat			2
12	02/08/2021	03:22:49	Brown Long-eared Bat	With social calls		2
12	02/08/2021	03:29:19	Brown Long-eared Bat			2
12	02/08/2021	03:30:05	Brown Long-eared Bat			2
12	02/08/2021	03:45:50	Brown Long-eared Bat			2
12	02/08/2021	04:04:43	<i>Myotis</i> sp.	Daubenton's Bat likely		2
12	02/08/2021	04:40:06	Brown Long-eared Bat	With social calls		2
12	02/08/2021	04:44:51	Brown Long-eared Bat	With social calls		2
12	02/08/2021	04:45:36	Brown Long-eared Bat			2
12	02/08/2021	04:46:33	Brown Long-eared Bat			2
12	02/08/2021	05:03:12	Brown Long-eared Bat	51 mins before sunrise 5:54. Probably day roost.		2
12	02/08/2021	22:27:51	<i>Myotis</i> sp.	1 hr. 7 mins after sunset 21:20. Daubenton's Bat likely		3
12	02/08/2021	22:28:29	<i>Myotis</i> sp.	Daubenton's Bat likely		3
12	02/08/2021	22:28:43	<i>Myotis</i> sp.	Daubenton's Bat likely		3
12	02/08/2021	22:28:49	<i>Myotis</i> sp.	Daubenton's Bat likely		3
12	02/08/2021	23:07:30	Brown Long-eared Bat			3
12	02/08/2021	23:21:34	Brown Long-eared Bat			3
12	02/08/2021	23:28:03	Whiskered Bat		y	3

Site	Date	Time	Species	Notes	Overlap	Night
12	02/08/2021	23:30:49	<i>Myotis</i> sp.			3
12	02/08/2021	23:31:25	<i>Myotis</i> sp.			3
12	02/08/2021	23:35:19	Whiskered Bat	Feeding buzz		3
12	02/08/2021	23:35:32	Whiskered Bat			3
12	02/08/2021	23:38:40	Whiskered Bat			3
12	02/08/2021	23:39:03	Whiskered Bat	Feeding buzz		3
12	02/08/2021	23:39:54	Whiskered Bat			3
12	02/08/2021	23:41:31	Whiskered Bat			3
12	02/08/2021	23:42:12	Whiskered Bat		y	3
12	02/08/2021	23:42:30	<i>Myotis</i> sp.		y	3
12	02/08/2021	23:49:30	<i>Myotis</i> sp.	Faint		3
12	02/08/2021	23:57:25	<i>Myotis</i> sp.	Faint		3
12	03/08/2021	00:10:30	<i>Myotis</i> sp.	Faint		3
12	03/08/2021	00:11:04	Whiskered Bat			3
12	03/08/2021	02:54:44	Brown Long-eared Bat			3
12	03/08/2021	03:14:56	Brown Long-eared Bat			3
12	03/08/2021	03:25:35	Brown Long-eared Bat			3
12	03/08/2021	03:34:33	Brown Long-eared Bat			3
12	03/08/2021	03:37:21	<i>Myotis</i> sp.			3
12	03/08/2021	03:47:15	Brown Long-eared Bat			3
12	03/08/2021	04:04:40	<i>Myotis</i> sp.	Faint		3
12	03/08/2021	04:14:42	Brown Long-eared Bat			3
12	03/08/2021	04:54:52	<i>Myotis</i> sp.	1 hr. 1 min before sunrise 5:55. Faint		3

Site	Date	Time	Species	Notes	Overlap	Night
12	03/08/2021	22:13:37	<i>Myotis</i> sp.	55 mins after sunset 21:18. Faint		4
12	03/08/2021	22:16:01	<i>Myotis</i> sp.	Faint		4
12	03/08/2021	22:23:06	Daubenton's Bat			4
12	03/08/2021	22:23:24	<i>Myotis</i> sp.	Faint		4
12	03/08/2021	22:36:12	<i>Myotis</i> sp.	Faint		4
12	03/08/2021	22:37:08	<i>Myotis</i> sp.	Daub high or Whiskered		4
12	03/08/2021	23:21:16	Daubenton's Bat			4
12	03/08/2021	23:26:56	Daubenton's Bat			4
12	04/08/2021	00:04:32	Whiskered Bat			4
12	04/08/2021	00:05:00	Whiskered Bat			4
12	04/08/2021	00:07:56	Brown Long-eared Bat			4
12	04/08/2021	00:08:24	Brown Long-eared Bat			4
12	04/08/2021	03:30:48	Brown Long-eared Bat			4
12	04/08/2021	03:32:05	Brown Long-eared Bat			4
12	04/08/2021	04:05:29	Brown Long-eared Bat			4
12	04/08/2021	04:50:04	<i>Myotis</i> sp.	Daubenton's Bat probably		4
12	04/08/2021	04:53:48	Brown Long-eared Bat			4
12	04/08/2021	04:54:27	<i>Myotis</i> sp.	Faint		4
12	04/08/2021	04:54:54	<i>Myotis</i> sp.	1 hr. 3 mins before sunrise 5:57		4
12	04/08/2021	05:01:57	Brown Long-eared Bat	56 mins before sunrise 5:57		4
12	04/08/2021	22:03:57	<i>Myotis</i> sp.	47 mins after sunset. Faint		5
12	04/08/2021	22:11:32	<i>Myotis</i> sp.			5
12	04/08/2021	22:28:56	Brown Long-eared Bat			5

Site	Date	Time	Species	Notes	Overlap	Night
12	04/08/2021	22:39:50	<i>Myotis</i> sp.			5
12	04/08/2021	22:55:13	Brown Long-eared Bat			5
12	04/08/2021	22:59:28	<i>Myotis</i> sp.			5
12	04/08/2021	23:23:21	<i>Myotis</i> sp.	Faint		5
12	04/08/2021	23:24:50	Whiskered Bat			5
12	04/08/2021	23:27:23	Whiskered Bat			5
12	04/08/2021	23:33:32	Brown Long-eared Bat			5
12	04/08/2021	23:33:46	Brown Long-eared Bat			5
12	04/08/2021	23:35:55	Brown Long-eared Bat		y	5
12	04/08/2021	23:36:17	Brown Long-eared Bat		y	5
12	04/08/2021	23:37:01	Brown Long-eared Bat			5
12	04/08/2021	23:37:10	Brown Long-eared Bat			5
12	04/08/2021	23:37:50	Whiskered Bat			5
12	04/08/2021	23:41:18	Brown Long-eared Bat		y	5
12	04/08/2021	23:41:31	Whiskered Bat		y	5
12	04/08/2021	23:41:31	Brown Long-eared Bat		y	5
12	04/08/2021	23:41:45	<i>Myotis</i> sp.	Faint		5
12	04/08/2021	23:41:56	<i>Myotis</i> sp.	Faint		5
12	05/08/2021	00:01:02	Brown Long-eared Bat			5
12	05/08/2021	00:01:10	Whiskered Bat			5
12	05/08/2021	00:21:46	Brown Long-eared Bat			5
12	05/08/2021	00:22:21	Brown Long-eared Bat	With social calls	y	5
12	05/08/2021	00:22:21	Whiskered Bat		y	5

Site	Date	Time	Species	Notes	Overlap	Night
12	05/08/2021	00:34:52	Whiskered Bat			5
12	05/08/2021	00:36:00	<i>Myotis</i> sp.	Faint		5
12	05/08/2021	00:47:44	<i>Myotis</i> sp.	Faint		5
12	05/08/2021	01:10:15	Brown Long-eared Bat		y	5
12	05/08/2021	01:17:12	<i>Myotis</i> sp.	Faint	y	5
12	05/08/2021	01:32:42	Brown Long-eared Bat			5
12	05/08/2021	01:33:16	Brown Long-eared Bat			5
12	05/08/2021	01:38:37	Brown Long-eared Bat		y	5
12	05/08/2021	01:39:43	Brown Long-eared Bat			5
12	05/08/2021	01:40:00	<i>Myotis</i> sp.	Faint		5
12	05/08/2021	01:40:56	Brown Long-eared Bat			5
12	05/08/2021	01:41:10	Brown Long-eared Bat	Rain noise after this		5
12	05/08/2021	05:17:03	Whiskered Bat	42 mins before sunrise. Day-roost. Rain noise all along between this and the last recorded BLE		5
12	05/08/2021	21:41:49	<i>Myotis</i> sp.	Faint. 27 minutes after 21:14 sunset. Day-roost		6
12	05/08/2021	22:15:04	Whiskered Bat			6
12	05/08/2021	22:33:00	<i>Myotis</i> sp.	Daubenton's Bat possible		6
12	05/08/2021	22:35:06	<i>Myotis</i> sp.		y	6
12	05/08/2021	22:35:06	Brown Long-eared Bat		y	6
12	05/08/2021	22:46:21	Whiskered Bat			6
12	05/08/2021	22:49:47	<i>Myotis</i> sp.	Faint		6
12	05/08/2021	22:50:31	Whiskered Bat			6
12	05/08/2021	23:43:15	Whiskered Bat			6
12	05/08/2021	23:48:53	<i>Myotis</i> sp.	Faint	y	6

Site	Date	Time	Species	Notes	Overlap	Night
12	05/08/2021	23:50:58	Brown Long-eared Bat			6
12	05/08/2021	23:54:59	Brown Long-eared Bat		y	6
12	06/08/2021	00:07:32	Brown Long-eared Bat			6
12	06/08/2021	00:09:04	Brown Long-eared Bat			6
12	06/08/2021	00:16:41	Brown Long-eared Bat		y	6
12	06/08/2021	00:17:23	Brown Long-eared Bat	With social calls	y	6
12	06/08/2021	00:23:20	Whiskered Bat	Good example		6
12	06/08/2021	00:26:37	Brown Long-eared Bat	With social calls		6
12	06/08/2021	00:30:42	Brown Long-eared Bat			6
12	06/08/2021	00:31:55	Brown Long-eared Bat			6
12	06/08/2021	01:15:13	<i>Myotis</i> sp.	Faint		6
12	06/08/2021	01:40:54	Brown Long-eared Bat			6
12	06/08/2021	01:42:40	Brown Long-eared Bat	Raining too		6
12	06/08/2021	01:43:00	Brown Long-eared Bat			6
12	06/08/2021	01:43:13	Brown Long-eared Bat		y	6
12	06/08/2021	01:44:12	Brown Long-eared Bat		y	6
12	06/08/2021	02:02:17	Brown Long-eared Bat			6
12	06/08/2021	02:02:30	Brown Long-eared Bat			6
12	06/08/2021	02:03:33	Brown Long-eared Bat			6
12	06/08/2021	02:06:14	Brown Long-eared Bat		y	6
12	06/08/2021	02:06:14	<i>Myotis</i> sp.	Faint	y	6
12	06/08/2021	02:08:49	<i>Myotis</i> sp.	Faint		6
12	06/08/2021	02:18:10	Brown Long-eared Bat		y	6

Site	Date	Time	Species	Notes	Overlap	Night
12	06/08/2021	02:18:26	Brown Long-eared Bat		y	6
12	06/08/2021	02:23:32	Brown Long-eared Bat			6
12	06/08/2021	02:23:57	Brown Long-eared Bat			6
12	06/08/2021	02:25:29	Brown Long-eared Bat			6
12	06/08/2021	02:27:34	Brown Long-eared Bat		y	6
12	06/08/2021	02:27:48	Brown Long-eared Bat			6
12	06/08/2021	02:29:20	Brown Long-eared Bat		y	6
12	06/08/2021	02:31:24	Brown Long-eared Bat			6
12	06/08/2021	02:33:55	Brown Long-eared Bat	With social calls		6
12	06/08/2021	02:34:29	Brown Long-eared Bat	With social calls		6
12	06/08/2021	02:34:45	Brown Long-eared Bat	Rain starts, ends soon		6
12	06/08/2021	02:39:29	Brown Long-eared Bat			6
12	06/08/2021	02:40:07	<i>Myotis</i> sp.	Faint		6
12	06/08/2021	02:41:24	Brown Long-eared Bat			6
12	06/08/2021	02:46:19	Brown Long-eared Bat			6
12	06/08/2021	02:46:55	Brown Long-eared Bat	Faint, CP too	y	6
12	06/08/2021	02:46:55	<i>Myotis</i> sp.	Whiskered likely	y	6
12	06/08/2021	02:47:40	Brown Long-eared Bat			6
12	06/08/2021	02:48:59	Brown Long-eared Bat	With social calls		6
12	06/08/2021	02:51:41	Brown Long-eared Bat			6
12	06/08/2021	02:52:18	Brown Long-eared Bat			6
12	06/08/2021	02:52:48	Brown Long-eared Bat			6
12	06/08/2021	02:53:00	Brown Long-eared Bat			6

Site	Date	Time	Species	Notes	Overlap	Night
12	06/08/2021	02:55:21	Brown Long-eared Bat		y	6
12	06/08/2021	02:55:40	Brown Long-eared Bat	With social calls		6
12	06/08/2021	02:56:05	Brown Long-eared Bat			6
12	06/08/2021	02:58:09	Brown Long-eared Bat			6
12	06/08/2021	02:59:29	Brown Long-eared Bat		y	6
12	06/08/2021	03:00:02	Brown Long-eared Bat		y	6
12	06/08/2021	03:03:01	Brown Long-eared Bat			6
12	06/08/2021	03:06:56	Brown Long-eared Bat			6
12	06/08/2021	03:24:51	Brown Long-eared Bat			6
12	06/08/2021	03:48:07	Brown Long-eared Bat			6
12	06/08/2021	04:11:02	Brown Long-eared Bat			6
12	06/08/2021	04:41:50	<i>Myotis</i> sp.	Faint		6
12	06/08/2021	04:51:21	Brown Long-eared Bat			6
12	06/08/2021	04:54:37	Brown Long-eared Bat			6
12	06/08/2021	04:59:52	Brown Long-eared Bat			6
12	06/08/2021	05:00:22	Brown Long-eared Bat			6
12	06/08/2021	05:11:05	Brown Long-eared Bat	49 mins before sunrise 6am. Probably day roost. Raining lightly		6



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