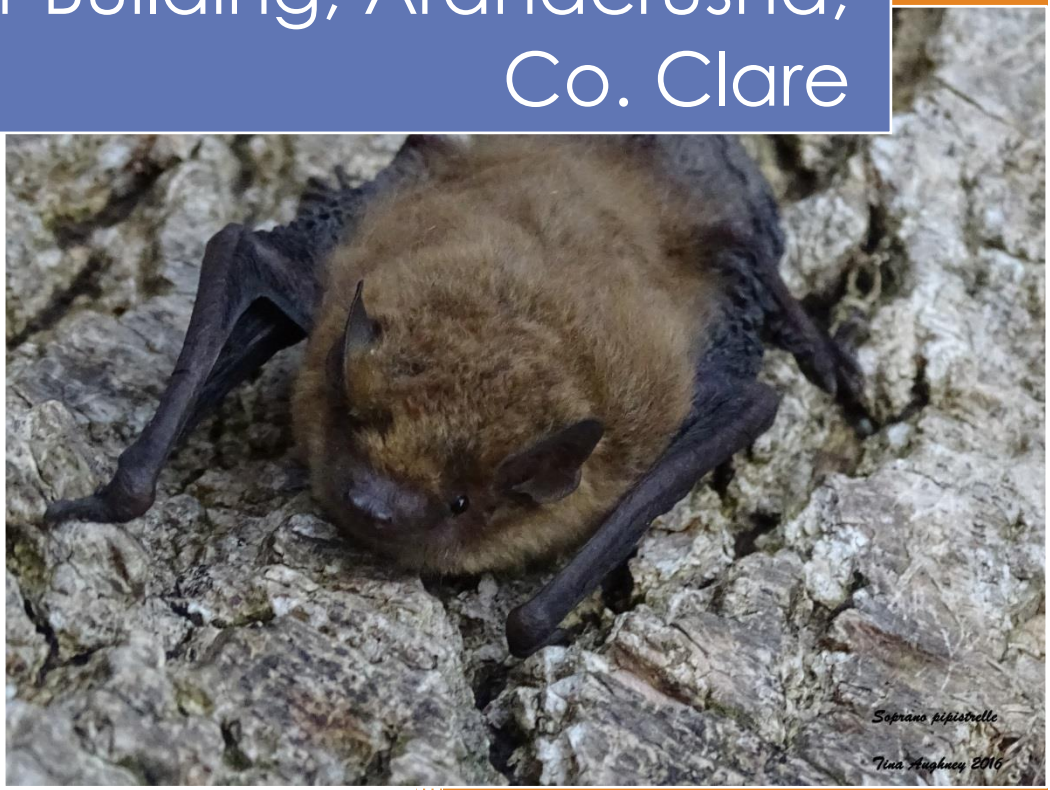
2024

# Lesser horseshoe bat roost, Transformer Building, Ardnacrusha, Co. Clare

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

**Statement of Authority:** Dr Aughney has worked as a Bat Specialist since 2000 and has undertaken extensive survey work for all Irish bat species including large scale development projects, road schemes, residential developments, wind farm developments and smaller projects in relation to building renovation or habitat enhancement. She was a monitoring co-ordinator and trainer for Bat Conservation Ireland for 20 years. She is a co-author of the 2014 publication *Irish Bats in the 21st Century.* This book received the 2015 CIEEM award for Information Sharing. Dr Aughney is a contributing author for the Atlas of Mammals in Ireland 2010-2015.

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

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

**Client:** ESB

**Project Name & Location:** Lesser horseshoe bat Roost, Transformer Building, Ardnacrusha, Co. Clare

**Report Revision History**

| Date of Issue | Draft Number | Issued To (process of issuing) |
|---|---|---|
| 7th November 2024 | Draft 1 | By email to ESB |
| 31st December 2024 | Final | Prepared for NPWS Derogation Licence |
| | | |

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

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

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

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

**Citation: Bat Eco Services (2024) Lesser horseshoe bat roost, Transformer Building, Ardnacrusha, Co. Clare. Supporting Information for Derogation Licence Application. Unpublished report prepared for ESB.**

# Contents

# 1. Introduction

Bat Eco Services was commissioned by ESB to undertake the bat surveys to determine the usage of the Transformer Building, Ardnacrusha, Co. Clare by Lesser horseshoe bats *Rhinolophus hipposideros,* an Annex II species under the EU Habitats Directive. In early 2024 it was noted that lesser horseshoe bats were roosting in the basement. As a consequence, ESB requested information on the extent of usage of the structure by this species of bat.

The aim of the project was:

- To determine the exit points for lesser horseshoe bats;
- To document the usage of the building by lesser horseshoe bats in 2024;
- To determine if other bat species are roosting in the building;
- To document commuting routes from the transformer building for lesser horseshoe bats;

Bat Eco Services designed a bat survey approach, principally, with reference to Marnell *et al.* (2022) and Collins (2023). An array of bat survey methods were used to compile data during bat surveys. This report presents the bat usage of the building during 2024.

## 1.1 Relevant Legislation & Bat Species Status

All Irish bat species are protected under the Wildlife Act (1976) and Wildlife Amendment Acts (2000 and 2010). Also, the EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All Irish bats are listed in Annex IV of the Habitats Directive and the lesser horseshoe bat *Rhinolophus hipposideros* is further listed under Annex II. Across Europe, they are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

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

Regulation 51(2) of the 2011 Regulations provides –

(“(2) Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a licence granted by the Minister under *Regulation 54,* a person who in respect of the species referred to in *Part 1* of the *First Schedule*—
(*a*) deliberately captures or kills any specimen of these species in the wild, (*b*) deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,
(*c*) deliberately takes or destroys eggs of those species from the wild,
(*d*) damages or destroys a breeding site or resting place of such an animal, or
(*e*) keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive, shall be guilty of an offence.”

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

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

There are eleven recorded bat species in Ireland, nine of which are considered resident on the island. Eight resident bat species and one of the vagrant bat species are vesper bats and all vespertilionid bats have a tragus (cartilaginous structure inside the pinna of the ear). Vesper bats are distributed throughout the island. Nathusius' pipistrelle *Pipistrellus nathusii* is a recent addition while the Brandt's bat has only been recorded once to-date (Only record confirmed by DNA testing, all other records has not been genetically confirmed). The ninth resident species is the lesser horseshoe bat *Rhinolophus hipposideros*, which belongs to the Rhinolophidea and has a complex nose leaf structure on the face, distinguishing it from the vesper bats. This species' current distribution is confined to the western seaboard counties of Mayo, Galway, Clare, Limerick, Kerry and Cork. The eleventh bat species, the greater horseshoe bat, was only recorded for the first time in February 2013 in County Wexford and is therefore considered to be a vagrant species. A total of 41 SACs have been designated for the Annex II species lesser horseshoe bat (1303), of which nine have also been selected for the Annex I habitat 'Caves not open to the public' (8310).

The following species list (Table 1a) identifies the range of bat species (resident and vagrant) whose presence has been confirmed in Ireland along with their current status. According to the Bat Conservation Ireland databases, all nine resident bat species have been recorded in Co. Limerick.

**Table 1a: Status of the Irish bat fauna (Marnell *et al.,* 2019 & NPWS, 2022).**

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

^ Roche *et al.,* 2014

### *1.1.1 NPWS Article 17 Reporting*

NPWS (2019) provides details on the conservation status for each of Ireland's bat species along with distribution maps (See appendices for such maps). The following table summarises the conclusions of Article 17 assessment of conservation status at the end of the most recent reporting period. Additional information for each of the bat species provides some clarifying notes in relation to the conservation status conclusions. Such information, where appropriate to the current project, will be drawn on in the project assessment section.

**Table 1b: NPWS Article 17 Conservation Status of Irish Bat Species (Adapted from NPWS, 2022).**

| | Range | Population | Habitat | Future Prospects | Conservation Status Assessment | Conservation Status Trend |
|---|---|---|---|---|---|---|
| **Lesser horseshoe bat** | Inadequate | Favourable | Inadequate | Inadequate | Inadequate | Deteriorating |
| **Common pipistrelle** | Favourable | Favourable | Favourable | Favourable | Favourable | Improving |
| **Soprano pipistrelle** | Favourable | Favourable | Favourable | Favourable | Favourable | Improving |
| **Nathusius' pipistrelle** | Unknown | Unknown | Favourable | Unknown | Unknown | Not applicable |
| **Natterer's bat** | Favourable | Favourable | Favourable | Favourable | Favourable | Stable |
| **Daubenton's bat** | Favourable | Favourable | Favourable | Favourable | Favourable | Improving |
| **Whiskered bat** | Favourable | Favourable | Favourable | Favourable | Favourable | Improving |
| **Brown long-eared bat** | Favourable | Favourable | Favourable | Favourable | Favourable | Improving |
| **Leisler's bat** | Favourable | Favourable | Favourable | Favourable | Favourable | Improving |

### *1.1.2 Irish Bat Monitoring Programme – Population Trends*

The Irish Bat Monitoring Programme provides information on monitoring schemes managed by Bat Conservation Ireland:

● Car-Based Bat Monitoring (All Ireland) – monitors common pipistrelle, soprano pipistrelle, Leisler's bats with limited information for Nathusius' pipistrelle and *Myotis* species.
● All Ireland Daubenton's Bat Waterway Monitoring
● Brown Long-eared Bat Roost Monitoring
● Lesser Horseshoe Bat Monitoring

This provides population trend data for seven bat species: common pipistrelle, soprano pipistrelle, Leisler's bat, Nathusius' pipistrelle, Daubenton'bat, brown long-eared bat and lesser horseshoe bat (some limited data for *Myotis* species). There is currently no systematic monitoring surveys for Natterer's bat and whiskered bat.

Annual reporting is undertaken and the most recent report (Aughney *et al.,* 2023) is referenced for this report. In summary, the population trends for each bat species are as follows:

- Trends of the three common bat species (common pipistrelle, soprano pipistrelle and Leisler's bat) continued to increase in 2022, although the yearly estimates of common

pipistrelle levelled out a little. Confidence intervals of these three bat species were all above their baseline indices indicating they each show a significantly increasing trend.

- Nathusius' pipistrelle trends are still unclear due to low encounter rates but decreased a little in 2022 compared to previous years.
- The yearly estimate for the *Myotis* spp. group steadied out a little but overall the smoothed trend for this group is still well below the baseline.
- Daubenton's bat numbers trend line appears to be fairly steady from year to year with error bars consistently encompassing the baseline.
- Brown long-eared bat shows a fluctuating trend around the baseline and is considered to be currently stable.
- Lesser horseshoe bat continue to increase in 2022 for the summer counts while low winter counts caused a slight downward trend in 2022. But overall, this species has increased over the last 20 years of monitoring.

### *1.1.3 Transformer Building*

The Transformer Building is the original structure built in the 1920s as part of the operation of the Ardnacrusha Hydroelectric Power Station. It is currently as disused building and is a large warehouse structure with a basement.


Figure 1: Location of the transformer building (Red Circle) with reference to the Ardnacrusha Hydroelectric Power Station, Co. Clare.

# 2. Methodology

## 2.1 Guidance Document

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

- Collins, J. (Editor) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). Bat Conservation Trust, London. *(Updated in September 2023)*
- NPWS & VWT (2022) Lesser Horseshoe Bat Species Action Plan 2022- 2026. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.
- Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland (Version 1: Kelleher & Marnell, 2006).
- 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.
- Bat Conservation Trust (2023) Bats and artificial lighting at night. Guidance Note GN08/23. BCT, London & Institution of Lighting Professionals (ILP), Warwickshire.
- Guidance document on the strict protection of animal species of Community interest un the Habitats Directive (Brussels, 12.10.2021 C(2021) 7391 final.
- EPA (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Collins (2023) was the principal document used to provide guidance in relation to bat survey effort required but the level of surveying is assessed on a case-by-case basis, by the principal surveyor, taking into consideration the historical bat records for the survey area, presence of built, structures and trees potentially suitable for roosting bats and the presence of suitable bat habitats for foraging and commuting. Additional reference is made to this document in relation to determining the value of buildings, trees etc. as bat roosts. The tables referred to from this document are described in the Appendices.

Marnell *et al.* (2022) is referred to for guidance in relation to survey guidance (timing and survey design), derogation licences and mitigation measures.

## 2.2 Daytime Inspections

### *2.2.1 Building Surveys*

The transformer building was inspected during the daytime for evidence of bat usage on various dates in February, March, April, May, August, September and December 2024. Evidence of bat usage is in the form of actual bats (visible or audible), bat droppings, urine staining, grease marks (oily secretions from glands present on stonework) and claw marks. In addition, the presence of bat fly pupae (bat parasite) also indicate that bat usage of a crevice, for example, has occurred in the past.

Inspections were undertaken of the transformer building visually with the aid of a strong torch beam (LED Lenser P14.2). The basement was inspected on each survey dates while access to the Transition Room was achieved for each survey date from the 3rd May 2024 while access to the Substation Rooms was permitted on three survey dates by ESB Networks staff.

## 2.3 Night-time Bat Surveys

An array of night-time bat surveys were completed. The methodology for each of these bat surveys is presented below. The following handheld bat detectors were used:

Surveyor 1: Anabat Walkabout Full Spectrum Bat Detector
Surveyor 2: Elekon Bat Logger M2 Full Spectrum Bat Detector

The Night Vision Aids (NVAs) were used to support dusk surveys. The following NVAs were used coupled with Anabat Scout Full Spectrum bat Detector (attached to thermal imagery scope) and Magenta 4 Heterodyne Bat Detector (attached to IR camera and tuned to 110 kHz to indicate the presence of lesser horseshoe bats):

A Guide TrackIR Pro25 thermal imagery scope
A Guide TrackIR Pro19 thermal imagery scope
Sony FDR camcorder with night-shot capability coupled with IR illuminator (Dedolight)

### *2.3.1 Dusk Bat Surveys*

Dusk surveys started by 15 minutes prior to sunset and were undertaken for a minimum of 2 hours of surveying. Surveys were completed during mild and dry weather conditions.

Preparation for dusk survey started 60 minutes prior to sunset and the following actions were undertaken:

- Re-inspection of building to be surveyed to determine surveyor and filming locations.
- Internal inspection of building to document any visible bats.
- Positioning of filming equipment and surveyors.
- Completion of dusk survey.
- Post surveys, a repeat internal inspection of the surveyed building was undertaken to document any visible bats within the structure.

All audio files recorded by full spectrum bat detectors were analysed using Wildlife Acoustics Kaleidoscope Pro and validation of bat records was completed by the principal bat surveyor prior to mapping. This data was then entered onto an Excel file for mapping. All filming was watched post surveys and any emerging bats were noted and compared to audio recordings also recorded by surveyors.

Dusk surveys were completed on the following dates:

- 6th March 2024
- 25th March 2024
- 9th April 2024;
- 3rd May 2024;
- 27th August 2024

### *2.3.2 Static Surveillance*

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

The microphone of the unit was positioned horizontally to reduce potential damage from rain. The static units deployed use Real Time recording as a technique to record bat echolocation calls and using specific software, the recorded calls are identified. It is these sonograms (2-d sound pictures) that are digitally stored on the SD card (or micro SD cards depending on the model) and downloaded for analysis. These results are depicted on a graph showing the number of bat passes per species per 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.

Recordings were analysed using Wildlife Acoustics Kaleidoscope Pro. Manual validation was undertaken by the principal bat specialist and the following rules were followed:

- Validation that the auto-id function was checked for at least 20% of *Pipistrellus* spp. and Leisler's bat calls apart from Nathusius' pipistrelle calls.
- All Nathusius' pipistrelles calls were manually verified. The reasoning for this is due to frequently misidentification of low 40kHz calls, by auto-id tools, as this species, which may in fact be low frequency common pipistrelle calls.
- All brown long-eared bat calls should be manually verified. The reasoning for this due to frequently misidentification of social calls of *Pipistrellus* spp. frequently identified as this bat species.
- Manual verification of *Myotis* spp., where possible, to species level in order to increase the accuracy of the dataset. Where such calls cannot be identified to species level, they are reported as *Myotis* spp.
- Manual validation was undertaken for all "Unidentified" calls and for approximately 20% proportion of "Noise" calls.

Each audio file was noted as a bat pass to indicate level of bat activity for each species recorded. This was expressed as the average number of bat passes per survey night (no. of nights was the total number successful nights of deployment).

The following static units were deployed during this static bat detector survey:

**Table 2a: Static Bat Detectors deployed during Static Bat Detector Surveys.**

| Static Unit Code | Bat Detector Type | Recording Function | Microphone |
|---|---|---|---|
| **SM4 Units** | Wildlife Acoustics SongMeter 4 Bat FS | Passive Full Spectrum | SMM-U2, 4m cable |
| **SM Mini Bat Units** | Wildlife Acoustics SongMeter Mini Bat FS | Passive Full Spectrum | SMM-U2 |
| **SM Mini Bat 2 units** | Wildlife Acoustics SongMeter Mini Bat 2 FS | Passive Full Spectrum | SMM-U2 |

The design of the static surveillance was determined by the following criteria:

- Units located in the basement were deployed to document lesser horseshoe bat activity within the basement and to determine if other bat species were present;
- Units located on trees around the perimeter of the transformer building were deployed to document commuting routes from the transformer building to adjacent habitats;
- Units located in the adjacent woodland were deployed to document foraging areas adjacent to the transformer building.
- Static units were set to start recording 30 minutes before sunset and end recording 30 minutes after sunrise as per Collins (2023).
- Static units were deployed for different periods of time depending on the goals of the static surveillance periods.

Static surveillance was undertaken as follows (please refer to Table 2b for details relating to the static units) :

- Basement, Transformer Building
    - Static 1 (dusk on 16th February to dawn on 4th March 2024)
    - Static 16 (dusk on 25th March to dusk survey on 9th April 2024)
    - Static 17 (dusk on 9th April to dawn on 18th April 2024)
    - Static 42 (dusk on 3rd December 2024 – still deployed)
- Ground Floor, Transformer Building
    - Static 2 (dusk on 16th February to dawn on 4th March 2024)
    - Static 9 & Static 10 (dusk survey on 25th March 2024)
- Commuting Routes
    - Static 11-15 (10-17 nights surveillance from 25th March 2024).
- Transition Room, Transformer Building
    - Static 41 (dusk on 3rd December 2024 – still deployed).
- Substation, Transformer Building
    - Static 40 (dusk on 3rd December 2024 – still deployed).

Additional static surveillance was undertaken in relation to foraging habitats within the adjacent woodlands, but the results of this study is presented in a separate report.

**Table 2b: Static Bat Detectors deployed during Static Bat Detector Surveys.**

| Static Code | Location | ITM Easting | ITM Northing | Deployment Date | No. of Nights |
|---|---|---|---|---|---|
| **Static 1** | Basement of transformer building | 558166 | 661899 | 16/02/2024 | 17 |
| **Static 2** | Ground floor of transformer building | 558173 | 661880 | 16/02/2024 | 17 |
| **Static 3** | Woodland Survey | 558234 | 661644 | 25/03/2024 | 1 |
| **Static 4** | Woodland Survey | 558176 | 661781 | 25/03/2024 | 1 |
| **Static 5** | Woodland Survey | 558180 | 661729 | 25/03/2024 | 1 |
| **Static 6** | Woodland Survey | 558119 | 661705 | 25/03/2024 | 1 |
| **Static 7** | Woodland Survey | 558205 | 661738 | 25/03/2024 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| **Static 8** | Woodland Survey | 558160 | 661804 | 25/03/2024 | 1 |
| **Static 9** | Ground floor of transformer building - on engine | 558179 | 661916 | 25/03/2024 | 1 |
| **Static 10** | Ground floor of transformer building - room of interest | 558161 | 661891 | 25/03/2024 | 1 |
| **Static 11** | Commuting Route Survey | 558173 | 661949 | 25/03/2024 | 10 |
| **Static 12** | Commuting Route Survey | 558130 | 661874 | 25/03/2024 | 10 |
| **Static 13** | Commuting Route Survey | 558154 | 661914 | 25/03/2024 | 10 |
| **Static 14** | Commuting Route Survey | 558139 | 661885 | 25/03/2024 | 10 |
| **Static 15** | Commuting Route Survey | 558188 | 661857 | 25/03/2024 | 17 |
| **Static 16** | Basement of transformer building | 558166 | 661899 | 25/03/2024 | 17 |
| **Static 17** | Basement of transformer building | 558166 | 661899 | 09/04/2024 | 8 |
| **Static 40** | Substation | 558158 | 661888 | 3/12/2024 | On-going |
| **Static 41** | Transition Room | 558163 | 661885 | 3/12/2024 | On-going |
| **Static 42** | Basement of transformer building | 558166 | 661899 | 3/12/2024 | On-going |

## 2.4 Mapping & Presentation of Bat Survey Results

All bat encounter data was collected in an Excel File and individual CSV files were prepared for mapping using QGIS. A shapefile of the red line boundary was provided by ESB to aid mapping and querying of the data.

## 2.5 Desktop Review

### *2.5.1 Bat Conservation Ireland Database*

Bat Conservation Ireland acts as the central depository for bat records for the Republic of Ireland. Its' bat database is comprised of >60,000 bat records. The database primarily contains bat records from the following datasets:

- Irish Bat Monitoring Programme
- BATLAS 2020 & 2010
- Ad Hoc Bat Records submitted by ecologist bat groups etc.

The Bat Conservation Ireland database was accessed on 12th April 2024 to collated bat records for a 10km radius of the survey area.

An important caveat to note is that the BCIreland dataset is dependent on records submit to populated the database. Therefore it is important to state that the absence of information does not necessarily imply that there are no bats or bat roosts present in the search area.

### *2.5.2 NPWS Lesser Horseshoe Bat Database*

The primary database for lesser horseshoe bat roost records is held by NPWS and managed by Bat Conservation Ireland. This database was checked for roosts recorded within a 10km radius of the survey area.

Please note that there is an overlap between the two databases.

# 3. Bat Survey Results

The results of the array of bat surveys are presented below.

## 3.1 Transformer Building Surveys

The transformer building was the principal location for bat surveys. This is a large building with a number of internal rooms (offices) and additional buildings attached to the western external wall (e.g. badminton court and associated rooms). The basement covers one small area of the ground floor of the building and there is stairwell access to this room from the main internal part of the building. This basement is located along the western side of the building and is approximately 24m long x 8m wide. There are two tunnels off the basement, one (hereafter known as the northern tunnel) is approximately 5m long while the second tunnel (hereafter known as the southern tunnel) is approximately 12m long.

**Table 3: Description of Transformer Building, Ardnacrusha, Co. Clare.**

| Building No. | Description | Survey Details | Survey Results |
|---|---|---|---|
| **Transformer Building** | Large warehouse type building of mixed construction and roofing materials | Series of daytime inspections, static surveillance and dusk surveys | Roosts for the following bat species:<br>Lesser horseshoe bats<br>Common pipistrelles<br>Natterer's bat |

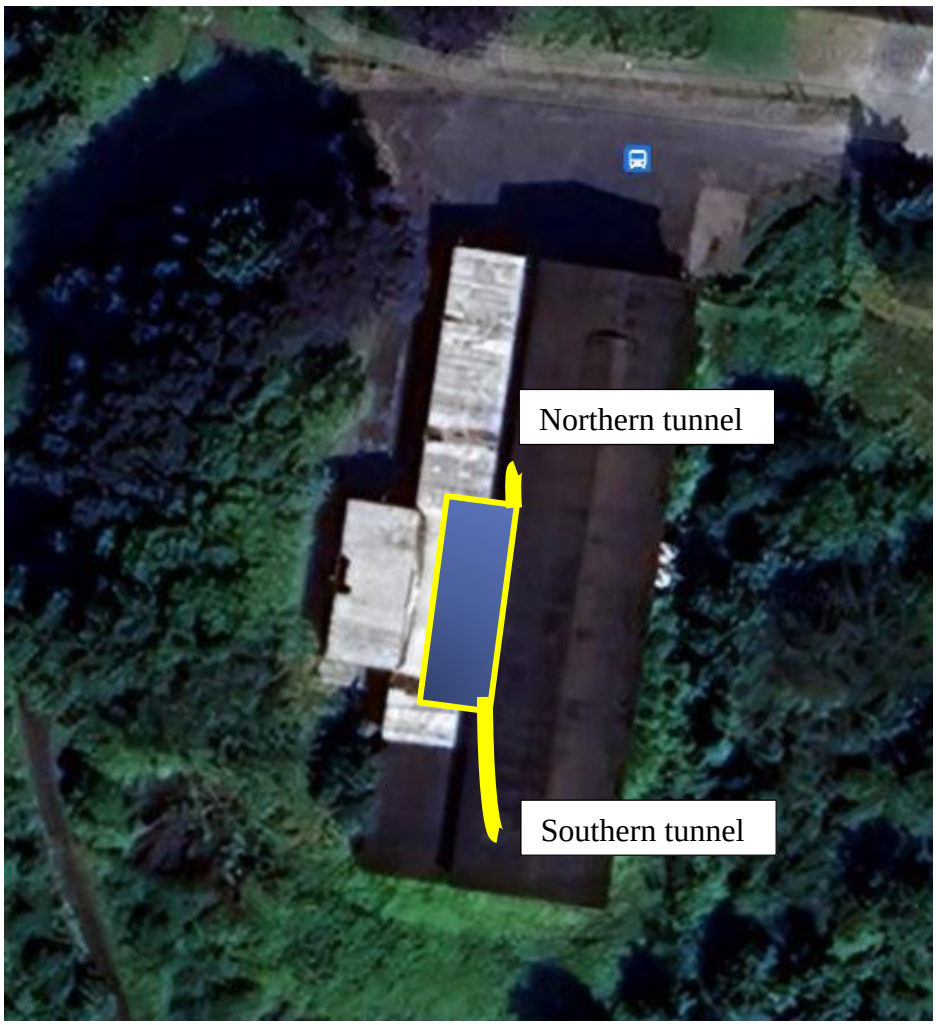


Figure 2: Transformer Building, Ardnacrusha, Co. Clare (approx. located of basement shown in yellow and blue with labels showing tunnel locations).

### *3.1.1 Daytime Inspections*

The number of lesser horseshoe bats counted in the basement during each site visit is presented in the table below. This species of bat was recorded during the majority of site visits. Access was provided to a room deemed as the "Transition Room" on the 3rd May 2024 and during this daytime inspection 7 lesser horseshoe bats were counted.

Due to greater numbers emerging from recorded exit point during dusk survey completed on the 3rd May 2024, it was identified that the substation rooms (adjacent to the transition room) may also be occupied by lesser horseshoe bats. Therefore access was permitted to this space on the 10th May 2024 by ESB Networks and 66 bats were recorded in the rafters (please note – the substation is two rooms. There is an internal wall with a gap of approximately 1.2m from the top of the wall to the rafters proving ease for the bats to move between the two rooms of the substation. It should also be noted that there is extensive evidence of bat droppings which may need to be managed as this is an active substation).

During this visit, the transition room was also accessed and 73 bats were recorded while no bats were observed in the basement. Therefore, during this daytime inspection, a total of 139 lesser horseshoe bats were recorded. This is a high number compared to Spring and Winter counts and reflects the maternity season and the onset of good weather.

During the July site visit (4/7/2024), access to the substation was not requested but the transition room and basement was checked. A much lower number of bats were visible in the transition room and therefore it is likely that the majority of the colony were within the substation rooms. As there is an active transformer in the substation (Room 1), there is heat generation by the transformer which is likely to provide ideal conditions for the maternity colony during the maternity season. However, two young bats were noted clinging to two adults visible in the rafters of the Transition Room and therefore it is confirmed that the colony is a maternity colony.

A site meeting with members of ESB staff was undertaken on the 14th August 2024 and during this time, the opportunity was taken to demonstrate how the bats are using the buildings. Only Room 1 of the Substation was accessible (the door was jammed and prevented access to Room 2) while the Transition Room was also checked. Total of 59 lesser horseshoe bats were counted during this visit.

It was recommended that temperature data loggers to be installed in the Room 1 (Substation) and the Transition Room. This is to check the temperature in the spaces as a result of the active transformer in Room 1 (Substation). This was undertaken on the 20th August 2024 at which time a full count was completed (n= 132 lesser horseshoe bats).

**Table 4: Visual counts of Lesser horseshoe bats in the basement, transition room and substation of the Transformer Building, Ardnacrusha, Co. Clare.**

**N/A – these rooms were not accessed during the listed dates.**

| No. | Date | Observed LHB in basement | Observed LHB in transition room | Observed LHB in substation rooms | Total |
|---|---|---|---|---|---|
| **1** | 16/02/2024 | 7 | N/A | N/A | 7 |
| **2** | 04/03/2024 | 46 | N/A | N/A | 46 |
| **3** | 06/03/2024 | 6 | N/A | N/A | 6 |
| **4** | 25/03/2024 | 1 | N/A | N/A | 1 |
| **5** | 09/04/2024 | 18 | N/A | N/A | 18 |
| **6** | 18/4/2024 | 0 | N/A | N/A | 0 |
| **7** | 3/5/2024 | 6 | 7 | N/A | 13 |
| **8** | 10/5/2024 | 0 | 73 | 66 (both Room 1 & Room 2) | 139 |
| **9** | 4/7/2024 | 1 | 8 | Not accessible | 9 |
| **10** | 14/8/2024 | 0 | 59 | Room 1 accessible only - 13 | 72^ |
| **11** | 20/8/2024 | 0 | 72 | Room 1 – 15, Room 2 - 45 | 132 |
| **12** | 3/12/2024 | 59 | 18 | 1 | 78 |

Note ^: incomplete count – Substation Room 2 was not accessible on this date.

Plate 1: Lesser horseshoe bats in torpor within the basement(4th March 2024).

### *3.1.2 Static Surveillance – Winter Surveillance*

Static 1 was located in the basement for a total of 17 nights of recording (dusk on 16th February to dawn on 4th March 2024). Lesser horseshoe bats echolocation calls were recorded on 15 nights of this surveillance period ranging from 1 call (17/2/2024) to 28 calls (24/2/2024). A graph is presented below to show the variation in activity levels from night to night during the surveillance period (Please note – each confirmed audio file is noted as a bat pass – it represents each time a bat flies by the microphone of the detector. It is not a measure of the number of bats). No other bat species were recorded roosting in the basement during this surveillance period.

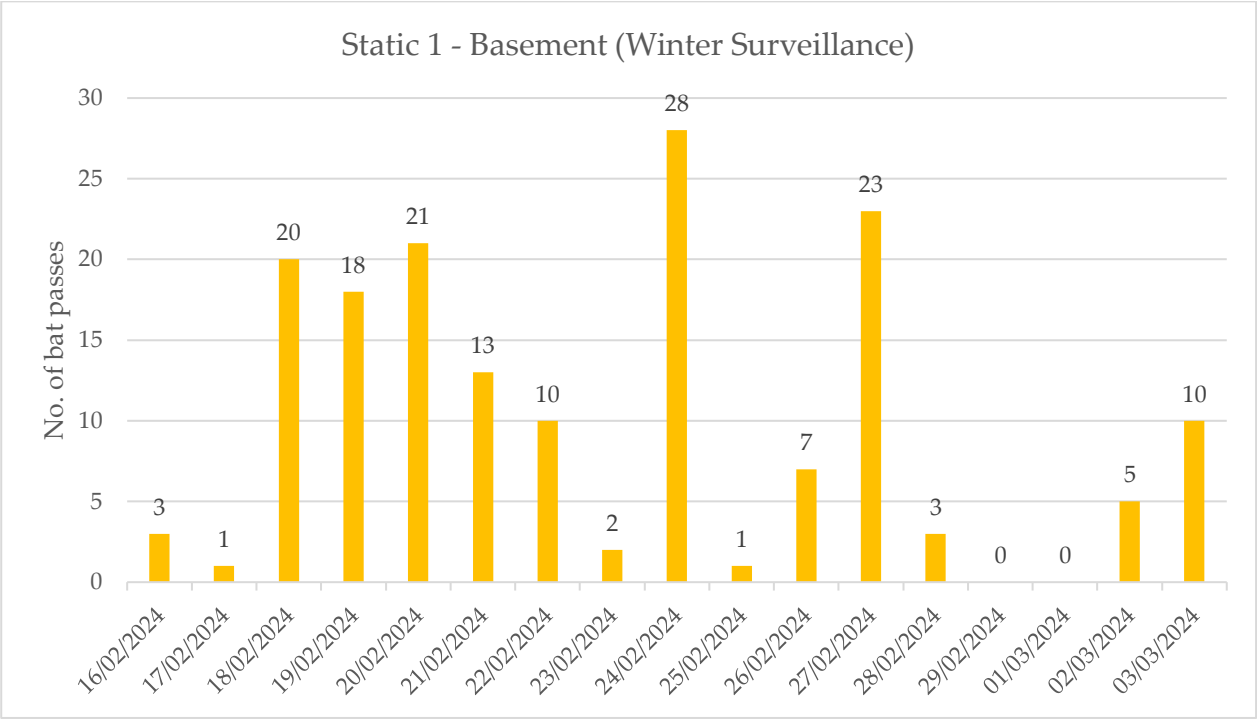


Figure 3a: Number of bat passes recorded on Static 1 during Winter Static Surveillance.

Static 2 was located in the main ground floor space for a total of 17 nights of recording (dusk on 16th February to dawn on 4th March 2024). No lesser horseshoe bats were recorded on this unit. However, common pipistrelles *Pipistrellus pipistrellus* (17 passes in total at various times on 16th, 17th and 28th February and 3rd March 2024 – Table 1) and Natterer's bats *Myotis nattereri* (2 passes at 22:36 hrs and 01:10 hrs on 3rd March 2024) were recorded on the detector indicating that individuals of these two bat species are also roosting in the building (ground floor section).

**Table 5a: Bat species (dates and time stamps) recorded on Static 2 during Winter Static Surveillance.**

| DATE | TIME | HOUR | AUTO ID | MANUAL ID |
|---|---|---|---|---|
| **16/02/2024** | 18:39:11 | 18 | PIPPIP | PIPPIP |
| **16/02/2024** | 18:39:21 | 18 | PIPPIP | PIPPIP |
| **16/02/2024** | 18:39:31 | 18 | PIPPIP | PIPPIP |
| **16/02/2024** | 18:39:41 | 18 | PIPPIP | PIPPIP |
| **16/02/2024** | 18:39:51 | 18 | PIPPIP | PIPPIP |
| **16/02/2024** | 18:40:02 | 18 | PIPPIP | PIPPIP |
| **16/02/2024** | 18:40:24 | 18 | PIPPIP | PIPPIP |
| **16/02/2024** | 22:00:55 | 22 | PIPPIP | PIPPIP |
| **16/02/2024** | 22:01:05 | 22 | PIPPIP | PIPPIP |
| **16/02/2024** | 22:01:16 | 22 | PIPPIP | PIPPIP |
| **16/02/2024** | 22:16:55 | 22 | PIPPIP | PIPPIP |
| **16/02/2024** | 22:17:05 | 22 | Noise | PIPPIP |

| | | | | |
|---|---|---|---|---|
| **17/02/2024** | 18:43:31 | 18 | PIPPIP | PIPPIP |
| **17/02/2024** | 18:48:17 | 18 | PIPPIP | PIPPIP |
| **17/02/2024** | 18:48:27 | 18 | PIPPIP | PIPPIP |
| **28/02/2024** | 21:08:34 | 21 | PIPPIP | PIPPIP |
| **28/02/2024** | 21:09:15 | 21 | PIPPIP | PIPPIP |
| **03/03/2024** | 01:10:12 | 1 | NoID | MYONAT |
| **03/03/2024** | 22:36:30 | 22 | NoID | MYONAT |

*Note: PIPPIP = common pipistrelle, MYONAT = Natterer's bat*

### *3.1.3 Static Surveillance – Spring Surveillance*

Static 16 was located in the basement for a total of 15 nights of recording (dusk on 25th March to dawn on 9th April 2024). Lesser horseshoe bats echolocation calls were recorded on all 15 nights of this surveillance period ranging from 4 calls (25/3/2024 and 2/4/2024) to 251 calls (28/3/2024). Static surveillance continued with Static 17 (9th April to dusk of 17th April 2024) and the results of this surveillance was combined with the results of Static 16. The number of nightly passes ranged from 3 passes (10/4/20240 to 90 passes (9/4/2024).

A graph is presented below to show the variation in activity levels from night to night during the Spring surveillance period (Please note – each confirmed audio file is noted as a bat pass – it represents each time a bat flies by the microphone of the detector. It is not a measure of the number of bats). Common pipistrelles and Natterer's bats were also recorded roosting in the basement during this surveillance period (Table 2).

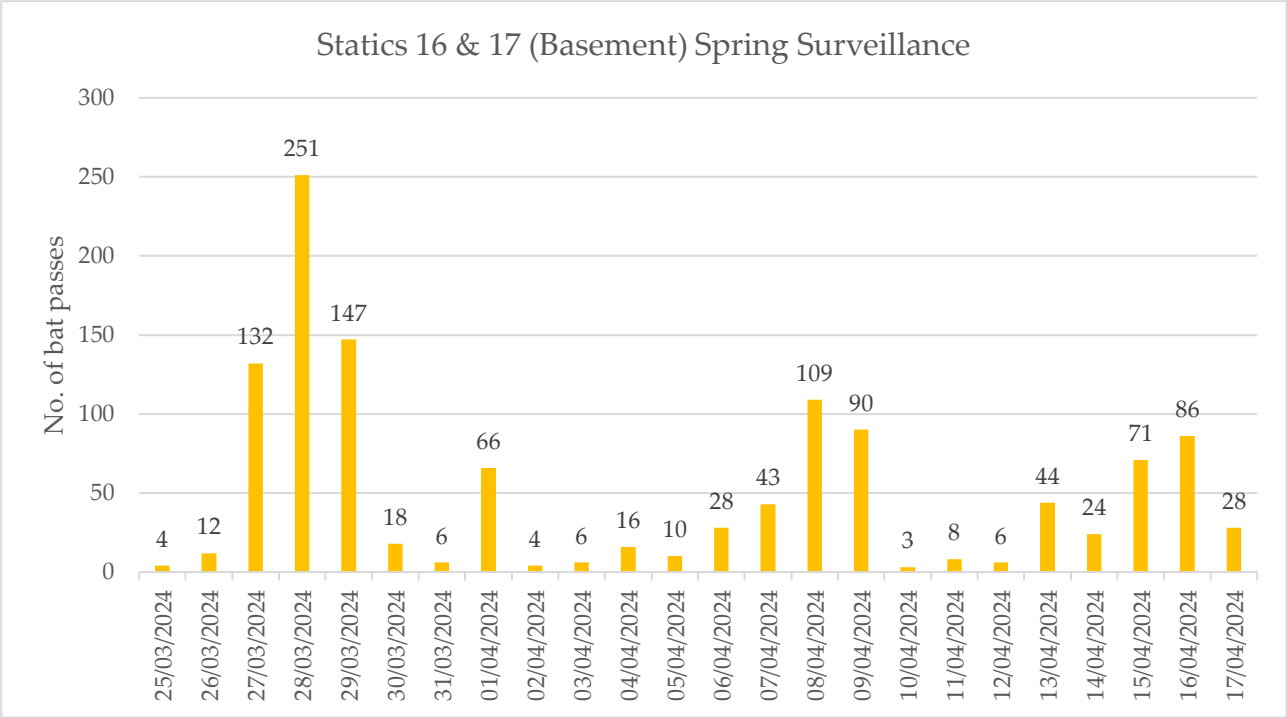


Figure 3b: Number of bat passes recorded on Static 16 & Static 17during Spring Static Surveillance.

**Table 5b: Common pipistrelles (dates and time stamps) recorded on Static 16 & Static 17 during Spring Static Surveillance.**

| DATE | TIME | HOUR | AUTO ID* | MANUAL ID |
|---|---|---|---|---|
| **25/03/2024** | 19:23:11 | 19 | PIPPIP | PIPPIP |
| **25/03/2024** | 20:31:52 | 20 | NoID | PIPPIP |
| **09/04/2024** | 20:23:10 | 20 | PIPPIP | PIPPIP |
| **09/04/2024** | 20:24:23 | 20 | NoID | PIPPIP |
| **09/04/2024** | 20:43:37 | 20 | PIPPIP | PIPPIP |
| **09/04/2024** | 20:43:44 | 20 | PIPPIP | PIPPIP |
| **09/04/2024** | 20:48:08 | 20 | NoID | PIPPIP |
| **09/04/2024** | 20:58:47 | 20 | PIPPIP | PIPPIP |
| **09/04/2024** | 21:02:24 | 21 | PIPPIP | PIPPIP |
| **09/04/2024** | 21:10:37 | 21 | PIPPYG | PIPPIP |
| **09/04/2024** | 21:12:15 | 21 | NoID | PIPPIP |
| **09/04/2024** | 21:12:31 | 21 | NoID | PIPPIP |

*Note: PIPPIP = common pipistrelle*

**Table 5c: Natterer's bat (dates and time stamps) recorded on Static 16 & Static 17 during Spring Static Surveillance.**

| DATE | TIME | HOUR | AUTO ID* | MANUAL ID |
|---|---|---|---|---|
| **02/04/2024** | 02:18:41 | 2 | Noise | MYONAT |
| **02/04/2024** | 20:06:00 | 20 | Noise | MYONAT |
| **08/04/2024** | 22:09:56 | 22 | Noise | MYONAT |
| **09/04/2024** | 01:25:48 | 1 | Noise | MYONAT |
| **12/04/2024** | 03:46:52 | 3 | Noise | MYONAT |
| **12/04/2024** | 03:50:01 | 3 | Noise | MYONAT |
| **12/04/2024** | 03:50:26 | 3 | Noise | MYONAT |
| **13/04/2024** | 23:23:54 | 23 | Noise | MYONAT |
| **13/04/2024** | 23:25:36 | 23 | Noise | MYONAT |
| **13/04/2024** | 23:28:29 | 23 | Noise | MYONAT |
| **14/04/2024** | 01:33:28 | 1 | Noise | MYONAT |
| **17/04/2024** | 00:32:56 | 0 | Noise | MYONAT |

*Note: MYONAT = Natterer's bat*

### *3.1.4 Dusk Bat Surveys*

A series of dusk surveys were undertaken in order to determine how roosting lesser horseshoe bats exit from the basement of the transformer building. The original opening identified by David Lyons (NPWS) back in 2012 was blocked with timber plywood in 2023 to prevent crows entering the building. As the bats are still using the building, it was deemed important to leave plywood in place in order to determine the current exit/entrance points.

**Dusk survey 4th March 2024** (Full cloud cover, breezy, 10oC with occasional rain showers), survey time - 18:00 hrs to 20:00 hrs.

Two thermal imagery scopes (19mm and 25mm) and one IR camcorder were deployed to determine potential exit points for lesser horseshoe bats. The dusk survey confirmed that the bats emerge from the basement via the door and stairwell and fly into the ground floor adjacent rooms. The exact exit point was not confirmed but lesser horseshoe bats were confirmed to emerge along the gable of the building facing the woodland (western gable wall). A total of 23 bat passes for this species were recorded along the gable side of the building. Common pipistrelles (22 bat passes) and soprano pipistrelles (11 bat passes) were also recorded during the dusk survey. Further surveying is required to confirm exit point(s) for lesser horseshoe bats.

**Dusk survey 25th March 2024** (Full cloud cover, calm, 10oC, dry), survey time - 18:35 hrs to 20:35 hrs.

Two thermal imagery scopes (19mm and 25mm) and one IR camcorder were deployed to determine potential exit points for lesser horseshoe bats. The thermal scopes were deployed potential exit points along the western external wall of the transformer building. The filming points did not record the exit points but indicated that bats were potentially emerging further north of the filmed areas. IR camera (located inside one the rooms that lesser horseshoe bats flew into on exiting the basement) was set to film the roof rafters where there was a potential exit points. This filming confirmed that it was not an exit point.

**Dusk Survey 9th April 2024** (Full cloud cover, calm, 12oC with occasional rain showers), survey time - 20:00 hrs to 22:20 hrs.

Two thermal imagery scopes (19mm and 25mm) and one IR camcorder were deployed to determine potential exit points for lesser horseshoe bats. The 19mm thermal imagery scope was located in the internal space to film along the rafters above the small office rooms while the 25mm thermal imagery scope was located externally to film the area deemed from previous surveys as the potential exit point. The IR camera was located at basement steps.

Lesser horseshoe bats flew from the basement to the main ground floor internal space. From here they flew through a gap in the wall at rafter level (Plate 2) into a room, hereafter known as the “transition room” (not accessible from the internal space of the building and the external door along the western wall of the transformer building is sealed). From this transition room the bats exited outside along 4 gaps at the rafters. These points are shown on the photographs below (Plate 3 and 4). The bats were recorded flying through the gap shown on the thermal imagery screenshot to enter a room (i.e. Transition Room) that is not accessible for the surveyors (Plate 2) at the time of the survey.

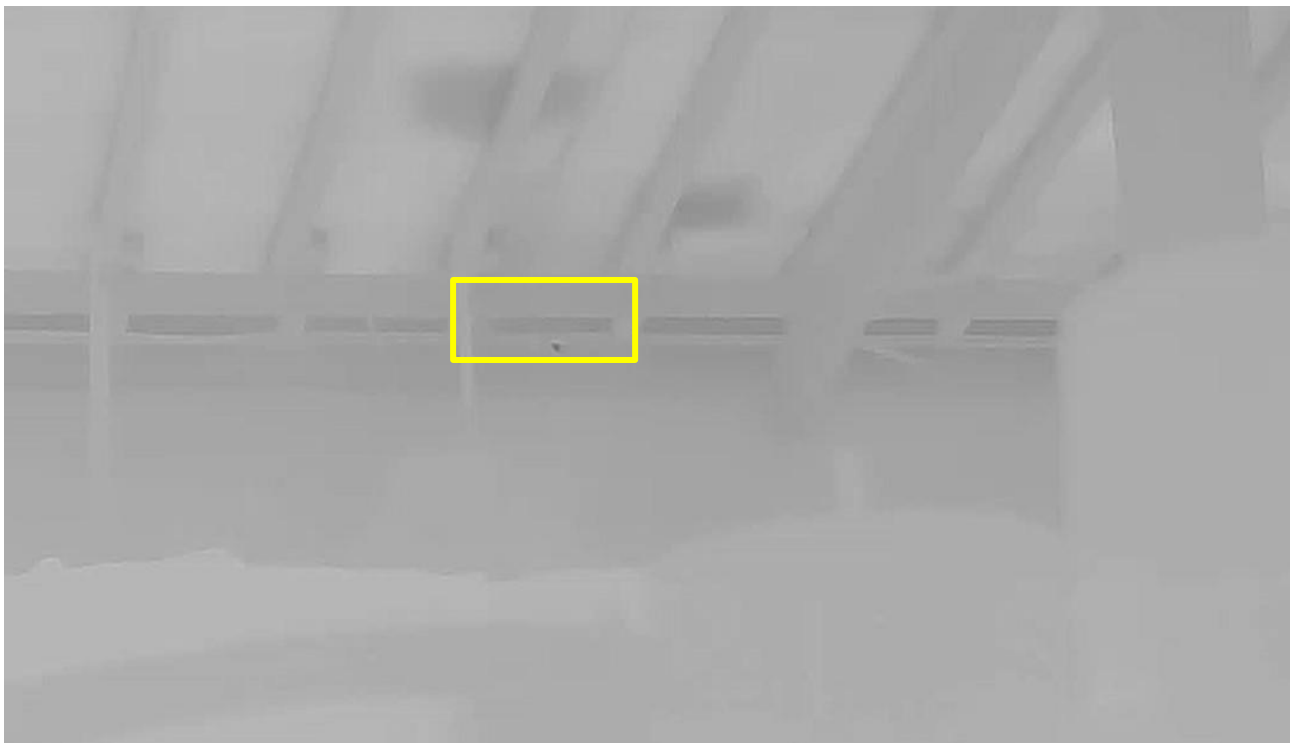

Plate 2: Point  (Yellow box) where lesser horseshoe bats leave the internal space of the transformer building to enter the Transition Room before exiting the building fully (19mm thermal imagery scope).

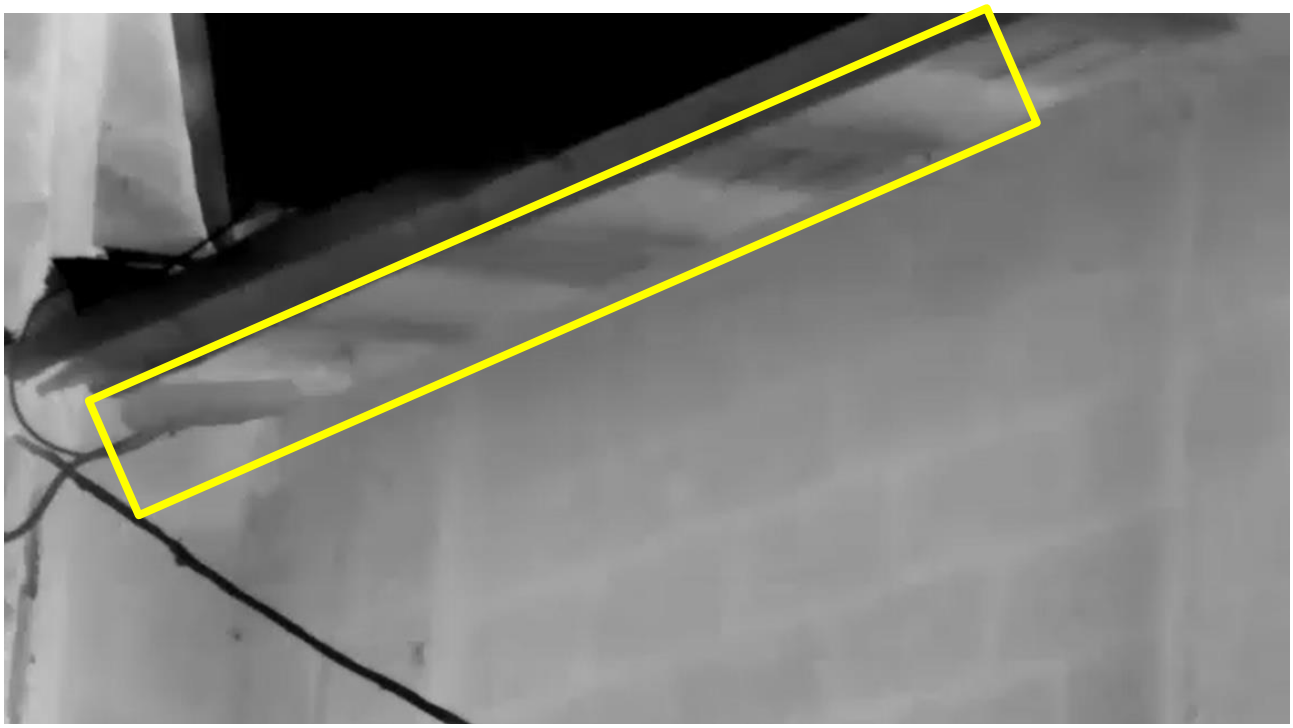

Plate 3: Lesser horseshoe bat exit point thermal imagery screen shot – 25mm thermal imagery scope) along the external (western) wall of the transformer building shown by yellow box.

**Dusk Survey 3rd May 2024** (Full cloud cover, calm, 11oC, dry), survey time - 20:45 hrs to 22:30 hrs.

Two thermal imagery scopes (19mm and 25mm) and one IR camcorder were deployed to determine potential exit points for lesser horseshoe bats and other roosting bats. The IR camera was located externally to film the previously recorded exit points from the transition room. Surveyor 1 was also located here in order to count emerging lesser horseshoe bats and common pipistrelles. The thermal imagery scopes were located on other sections of the transformer building to determine other potential exit points now that the maternity season has started (i.e. May to August).

A total of 38 lesser horseshoe bats and 6 common pipistrelles were recorded exiting from the transition room exit points. As a result of the greater number of emerging lesser horseshoe bats compared to the visually counted number during the daytime inspection (i.e. 13 individuals), it was deemed that there is another roost present. An inspection of the transition room indicates that bats are accessing the substation rooms adjoining the main transformer building. These substation rooms were not accessible to the surveyors on the night of the dusk survey and therefore, an additional daytime inspection is required to confirm this.

**Dusk Survey 4th July 2024** (patchy cloud cover, calm, 16oC, dry), survey time - 21:44 hrs to 22:45 hrs.

A visual count, with the aid of the IR camera, was undertaken. The first emerging lesser horseshoe bat was noted as 22:12 hrs. A total of 115 individuals were recorded emerging during the survey. The transition room was checked post survey and 4 adults and 2 pups were noted in the rafters. Therefore a total of 119 adult lesser horseshoe bats were counted on this date during the dusk survey.

**Dusk Survey 28th August 2024** (Full cloud cover, calm, 16oC, dry, but rained half way through survey), survey time - 20:00 hrs to 21:15 hrs.

A visual count of emerging lesser horseshoe bats was undertaken. The first bat emerged at 20:29 hrs and total of 77 lesser horseshoe emerged before it started to rain (21:09 hrs). The survey was stopped as lesser horseshoe bats started to return to the roost due to rain shower.

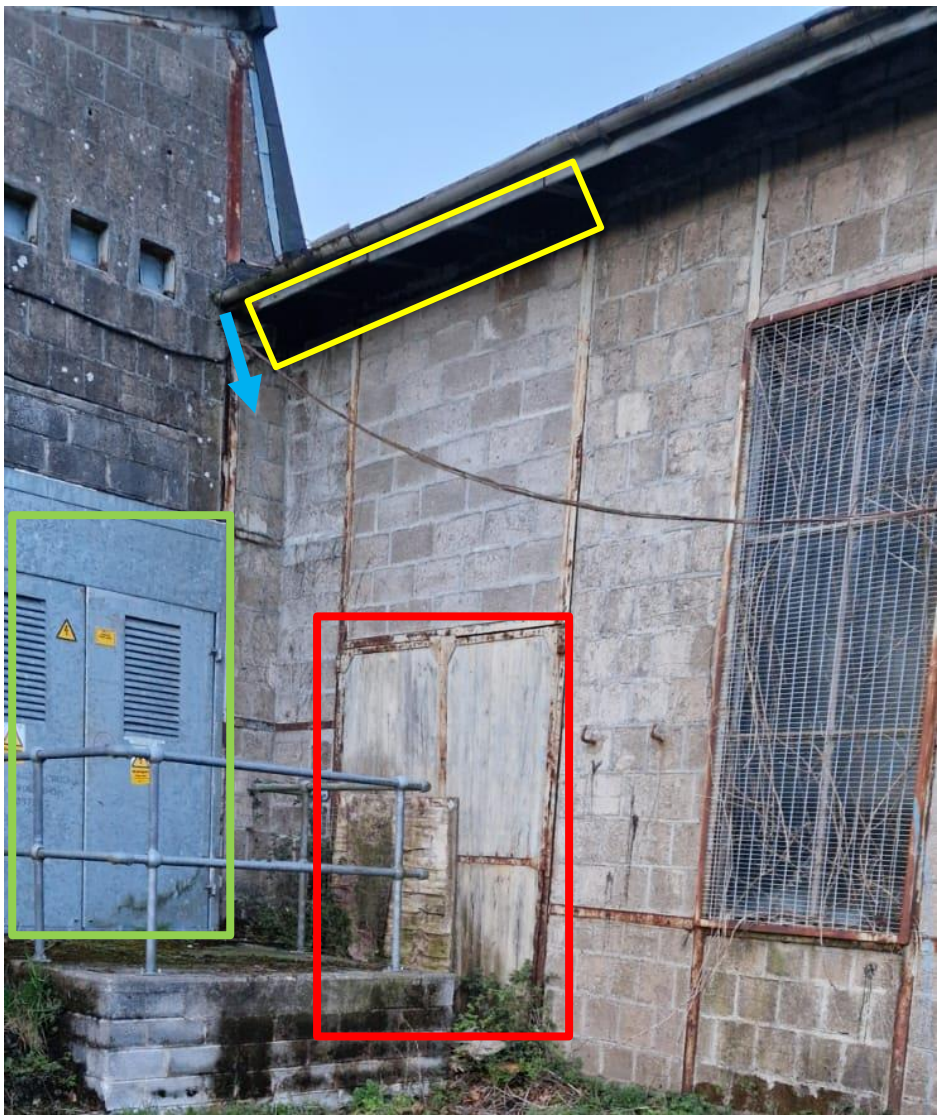

Plate 4: Lesser horseshoe bat exit point (daytime photograph – Yellow box) along the external (western) wall of the transformer building. Blue arrow is the common pipistrelles exit point. The transition room is behind the door marked by Red box. Also depicts the steel door entrance to Substation Room (Part C – marked by Green box).

Please note – the Common pipistrelle exit is separate to the lesser horseshoe bat exit point. The Common pipistrelles exited from gap along the lead flashing and not through the open space below the facia/soffit.

### *3.1.5 Summary – How is the Transformer Building used by lesser horseshoe bats?*

As a result of dusk surveys, additional lesser horseshoe bat individuals were confirmed to be roosting within the transformer building (Table 6) and these are in the Transition Room and Substation Rooms. Access to the Transition Room on the 3rd and 10th May 2024 and access to the Substation Rooms on the 10th May 2024 has provided greater knowledge of the number of bats roosting in the transformer building.

In addition, the use of Night-Vision Aids (NVAs – i.e. thermal scopes and IR camera) allowed the survey team to confirm how the lesser horseshoe bats are entering and accessing the different spaces in the Transformer Building. Lesser horseshoe morphology means that this bat species cannot land or crawl but requires a "post box" entrance to be able to directly fly into a potential roosting space. This reduces the ability for this species to roost in buildings but if such a "post box" entrance is available, they are highly mobile and can fly acrobatically to avail of such roosting spaces through such "post box" entrances. This was greatly demonstrated by the colony of lesser horseshoe bats roosting in a number of spaces in the transformer building recorded during this series of surveys.

**Table 6: Total number of Lesser horseshoe bats roosting in the Transformer Building, Ardnacrusha, Co. Clare from Daytime Inspections (i.e. Observed LHB) and Dusk Surveys (i.e. Additional LHB).**

| No. | Date | Observed LHB | Additional LHB | Total LHB | Notes |
|---|---|---|---|---|---|
| **1** | 16/02/2024 | 7 | 0 (no dusk survey completed) | 7 | |
| **2** | 04/03/2024 | 46 | 0 (no dusk survey completed) | 46 | |
| **3** | 06/03/2024 | 6 | 4 | 10 | |
| **4** | 25/03/2024 | 1 | 3 | 4 | |
| **5** | 09/04/2024 | 18 | 12+ | 30+ | |
| **6** | 18/4/2024 | 0 | 0 (no dusk survey completed) | 0 | Only basement checked |
| **7** | 3/5/2024 | 13 | 25 | 38 | |
| **8** | 10/5/2024 | 139 | 0 (no dusk survey completed) | 139 | |
| **9** | 4/7/2024 | 9 | Dusk survey – 119 adults | 119 | 2 pups* |
| **10** | 14/8/2024 | 72 | 0 (no dusk survey completed) | 72 | Incomplete count |
| **11** | 20/8/2024 | 132 | 0 (no dusk survey completed) | 132 | |
| **12** | 28/8/2024 | | Dusk survey – 77 adults^ | 77 | |
| **13** | 3/12/2024 | 78 | 0 (no dusk survey completed) | 78 | |

NOTE *: after emergence survey on 4/7/2024, surveyor entered the Transition Room to determine if this colony was a maternity one. Two pups were observed in the rafters thereby confirming that the colony used the Transformer Building as a maternity roost.
NOTE (14/8/2024) – only Transition Room and Substation Room 1 was accessible during this survey.
NOTE ^: dusk survey was interrupted by rain and therefore an incomplete count is reported.

The approximate location of each of the spaces used by the lesser horseshoe bats is presented on the aerial photograph below.

- As previously stated, the basement is approximately represented by the Blue Rectangle (outlined in yellow).
- The Transition Room (two connecting rooms) is presented by Red Rectangle (outline in black).
- Substation Rooms (two connecting rooms) is represented by Green Rectangles (outline in darker green).
- Both the Transition Room and Substation Room are open to the rafters approximately 4-4.75m high from the floor level (sloping roof). There are no windows in these two sets of rooms and therefore they are in darkness and highly suitable for roosting bats.

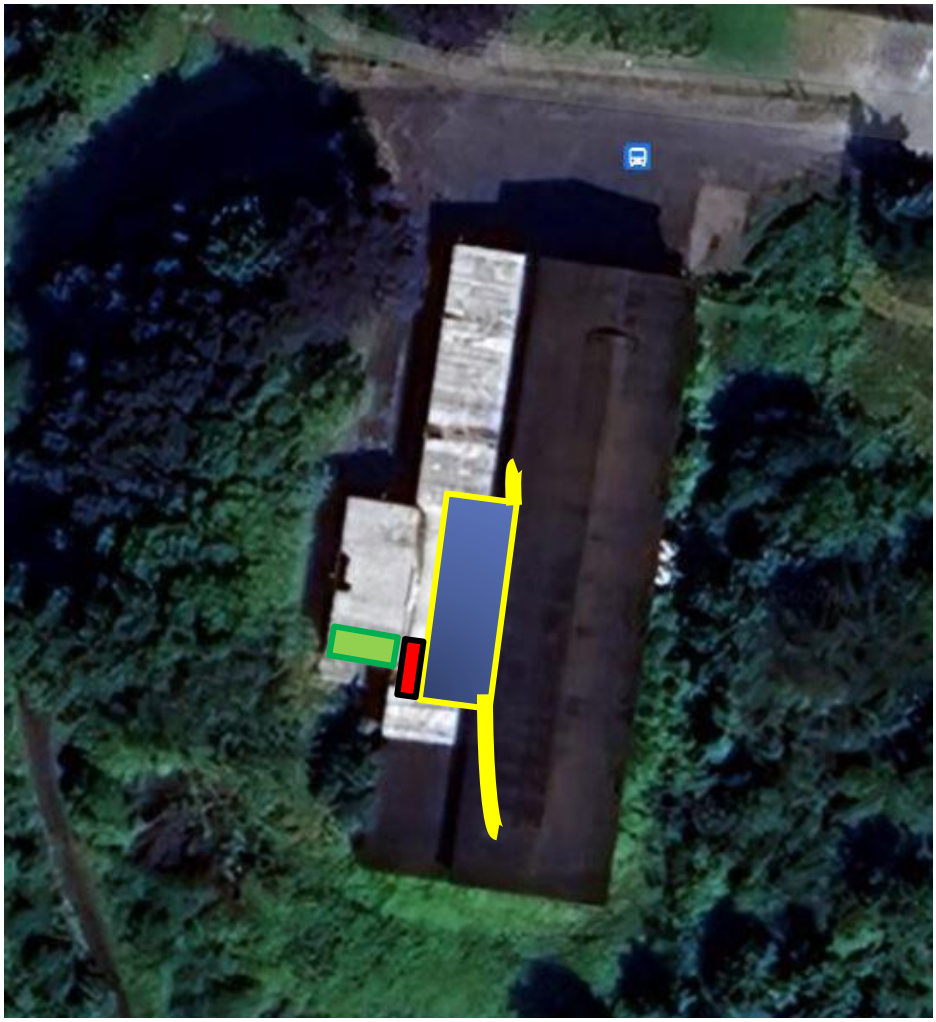

Figure 4: Transformer Building, Ardnacrusha, Co. Clare (approx. located of basement shown in blue and yellow). Transition Room (Red outlined in black) and Substation (Green) also represented.

To further describe the Transition Room (please see drawing below – Figure 5a), this space is in fact two rooms with an internal wall partially separating the space (Red Line). For the surveyor to access the room, the ply wood currently (Plate 4 – shows old ply wood cover of entrance into this space) attached to the external doors is removed and the surveyor climbs through a porthole (Red Arrow). There are one step down into Part A of the Transition Room and then three steps up into Part B of the Transition Room. There is equipment and shelves in these rooms.

The Substation Room is also two Rooms (Part C and Part D). External access for surveyors is via a steal doorway for each room (access only permitted under supervision of ESB Networks – Blue arrows).

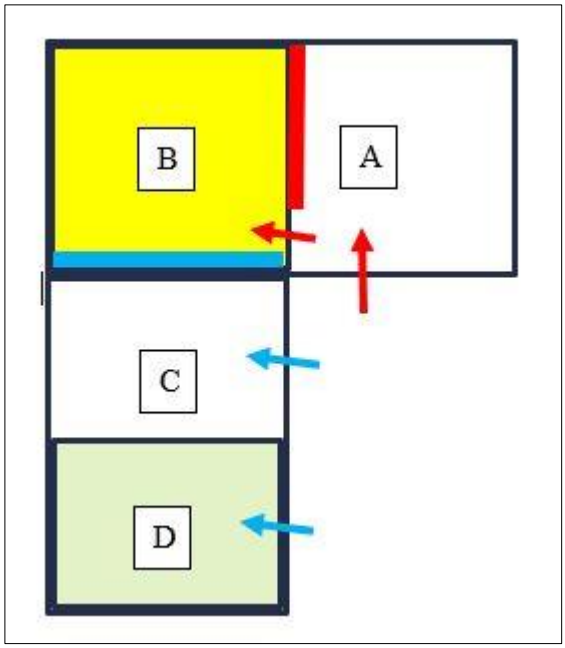

Figure 5a: Drawing of Surveyor access points into Transition Room (Red arrows) and Substation Room (Blue arrows).

Therefore, the pattern of access by lesser horseshoe bats into the Transformer Building, as documented by the series of surveys completed since February 2024, is as follows (please see arrows on Figure 5b):

- The bats enter the Transformer Building through gaps along the wall plate (facia/soffit area – external wall) of the Transition Room (Part A) via the Red Arrows shown on the figure below (Figure 5b). Please see Plate 3 and Plate 4 (Yellow Rectangle) in previous section for images of this facia/soffit area. Bats were recorded roosting in Part B during both daytime inspections completed to-date (3rd and 10th May 2024).
- To access the Basement, the bats fly through a “post box” entrance at the rafters/wall plate following the Purple arrows (Please see Plate 2 in previous section) in Part A of Transition Room. This brings the bats into the main space of the transformer building (Please see Plate 2 – thermal imagery of the access point).
- To access the Basement, the bats fly from the main space of the Transformer Building, down the steps to the basement and into the basement via an open door.
- To access the Substation Room, the bats fly from the Transition Room and fly through gaps along the wall plate via the Blue Arrows from Transition Room (Part B) in Substation Room (Part C). The majority of the bats recorded during the daytime inspection on the 10th May 2024 were roosting in Part C of the Substation Room.
- To exit the Transformer Building, the bats return along the same routes as described above for accessing the various spaces named. Upon exiting, the bats fly in a direct line to the boundary fence of the Transformer Building as described by the Orange Arrow on Figure 6 presented in Section 3.2.

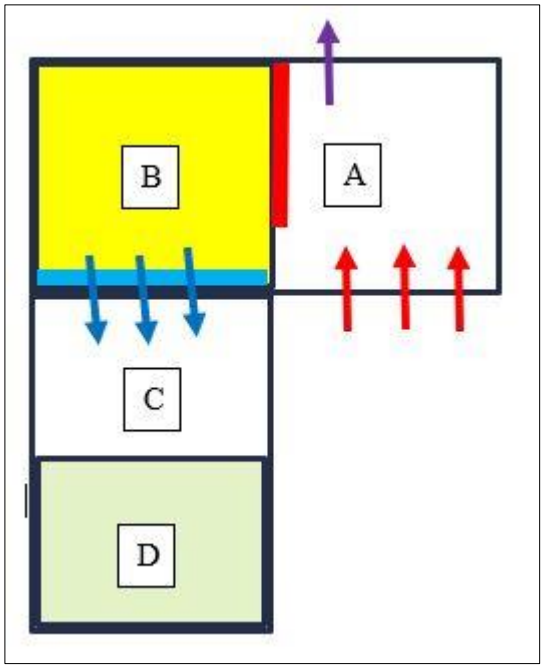


Figure 5b: Drawing of Bat access points into Transition Room (Red arrows), Substation Room (Blue arrows) and main space of the Transformer Building (Purple arrow).

Plate 5: Rafter space in Part C, Substation Room (Lesser horseshoe bats visible – highlighted in yellow).

Plate 6: Bat droppings on substation floor (Part D).

Plate 7: Extent of old bat droppings present on the substation floor (Part C).

Plate 8: Internal wall in between the two rooms (Part C and Part D) of Substation Room. (Yellow Circle).

Plate 9: Lesser horseshoe bats in Part B of Transition Room on the 10th May 2024.

Plate 10: Light entering Part A, Transition Room – exit/entrance point for Lesser horseshoe bats from the Transformer Building.

Plate 11: Internal space of Part A, Transition Room (depicting the wall shared with the main space of the Transformer Building. Entrance/Exit into the main space of the Transformer Building is at the rafter level highlighted by the Red Torch.

Plate 12: Internal space of Part B, Transition Room – primary space for roosting lesser horseshoe bats roosting in this room.

## 3.2 Commuting Routes

Static surveillance was set up to determine the potential commuting routes of lesser horseshoe bats. Of the five static locations (Figure 6), lesser horseshoe bats were recorded on three of the units (Static 12, Static 14 and Static 15). These three units were located adjacent to the southern half of the transformer building. There is no outdoor lighting in this area and this provides direct commuting (i.e. a dark corridor) into the adjoining woodlands.

The orange arrow (Figure 6) represents the primary commuting route of emerging bats from the transformer building. Lesser horseshoe bats fly directly into tall vegetation cover located along the boundary fence of the survey site and into the woodland area.

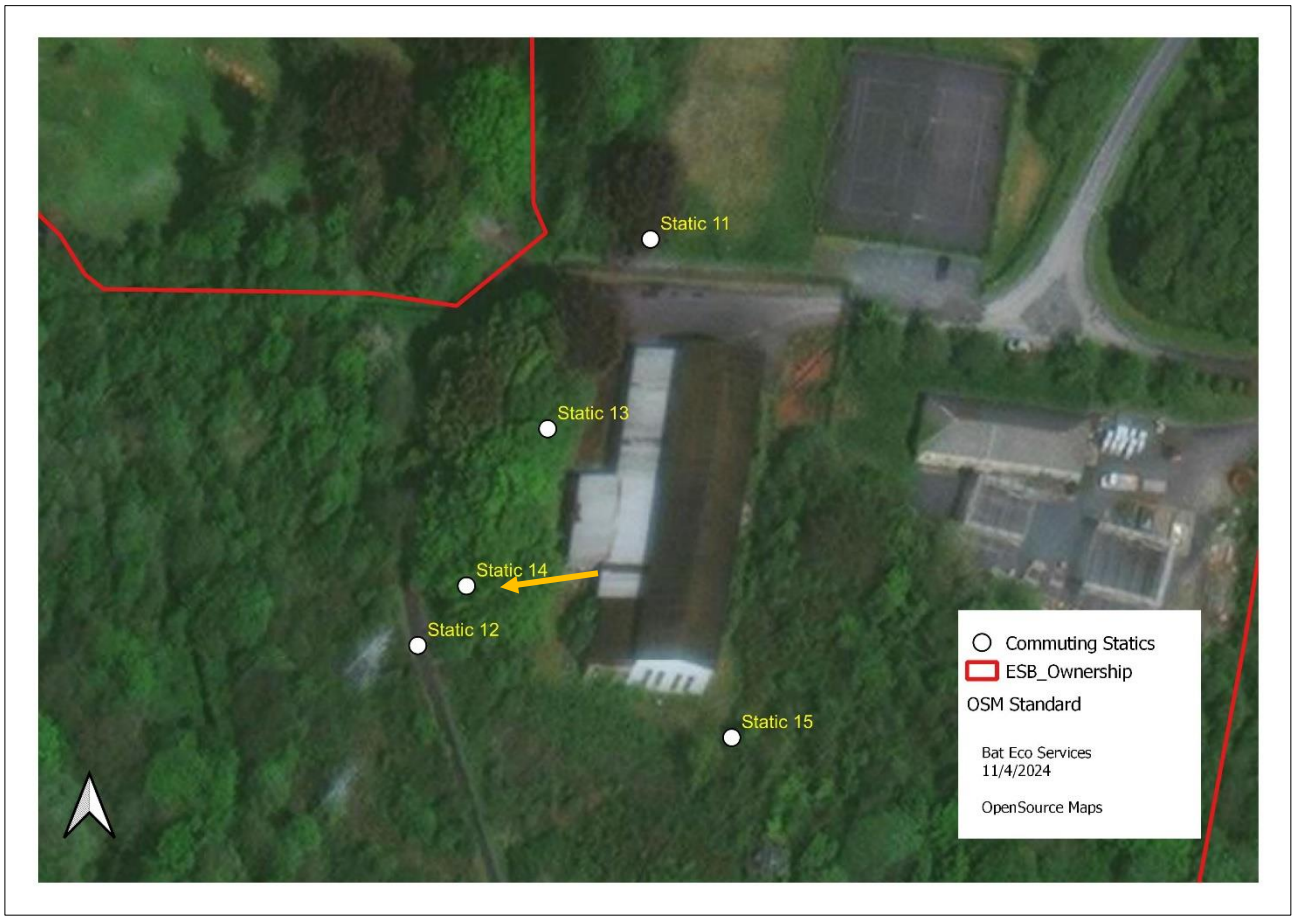


Figure 6: Location of static units around the perimeter of transformer building, Ardnacrusha, Co. Clare (Orange Arrow – exit point recorded for lesser horseshoe bats).

## 3.3 Other Bat Species

During the extensive surveying of the Transformer Building, it was confirmed that the structure is also a roost for common pipistrelle (satellite roost – most bats recorded emerging was on 3rd May 2024 = x6 individuals) and Natterer's bat (satellite roost – most bats recorded emerging was on 27th August 2024 = x5 individuals).

## 3.4 Desktop Review

### *3.4.1 Lesser Horseshoe Bat Status in Ireland*

The lesser horseshoe bat is mainly found in counties on Ireland's western seaboard (Mayo, Galway, Clare, Limerick, Kerry and Cork) and its strongholds are found in County Kerry, west Cork and County Clare. A single animal has also been recorded in Co. Roscommon in 2004 (B. Keeley, pers. comm.) and bat droppings were recorded in Tubercurry, Co. Sligo (C. Kelleher, pers. comm.). A single bat (male) was also recorded in Ballina, Co. Tipperary in 2015 (pers. comm, Dr Áine Lynch, NPWS). The lesser horseshoe bat is Ireland's only Annex II-listed bat species (EU Habitats Directive [92/43/EU]). As a consequence, a roost monitoring scheme is operated by NPWS and managed by Bat Conservation Ireland (BCIreland). BCIreland carried out analysis of the lesser horseshoe bat database in 2012, and concerns were expressed about the state of deterioration of many of its roosting sites (McAney, 2014; Roche *et al.*, 2015) as well as the finding that there are genetically distinct clusters within the Irish population (Dool *et al.*, 2013) that are likely to have arisen due to landscape connectivity constraints.

In Roche *et al*. (2015), the status of the roosting resource of the lesser horseshoe bat was closely examined and the results highlighted a number of locations in Ireland where clusters of roosts or hibernacula appear to have declined, including in parts of Co. Limerick. Figures 8a and 8b, below, are taken from the monitoring report from BCIreland (Aughney *et al.,* 2018) and illustrate the changes in winter and summer roosts monitored annually by NPWS.

The modelled Core Area for lesser horseshoe bat s is a relatively small area is restricted to the Counties on the western seaboard (5,993km$^2$). Given this small range, significant impacts on this species may occur even with small levels of habitat modification or changes to roost availability (Roche *et al,* 2014).

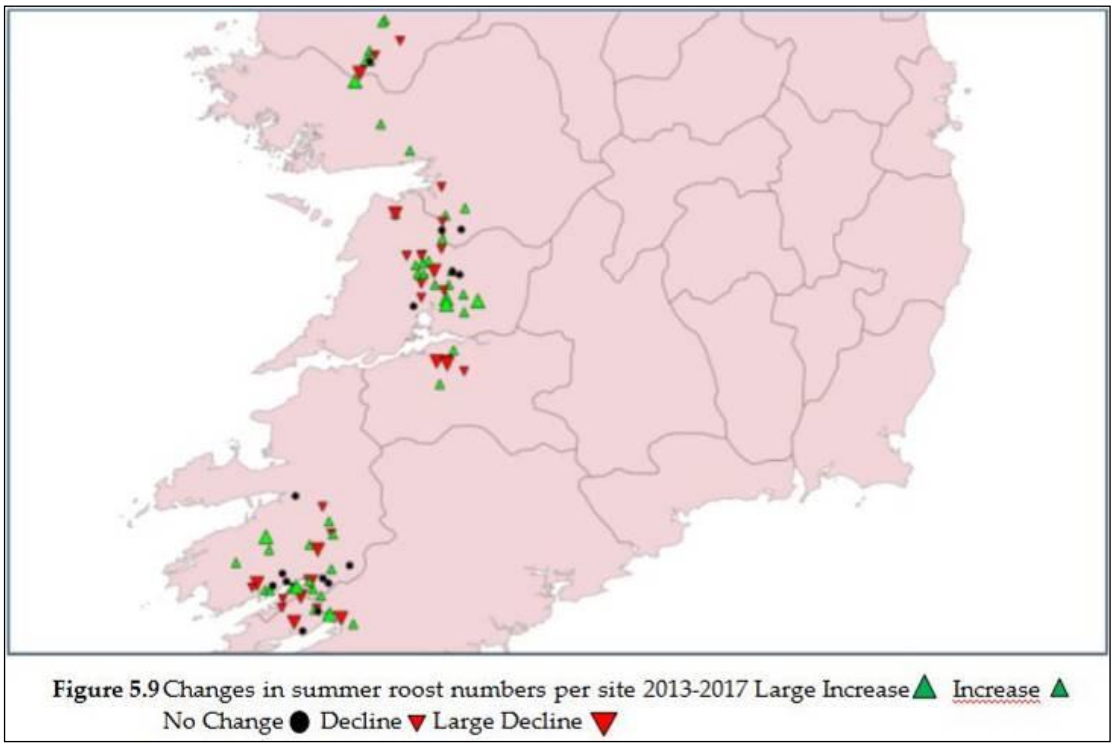


Figure 8a: Changes in Lesser horseshoe bat summer roost numbers (Aughney *et al.,* 2018).

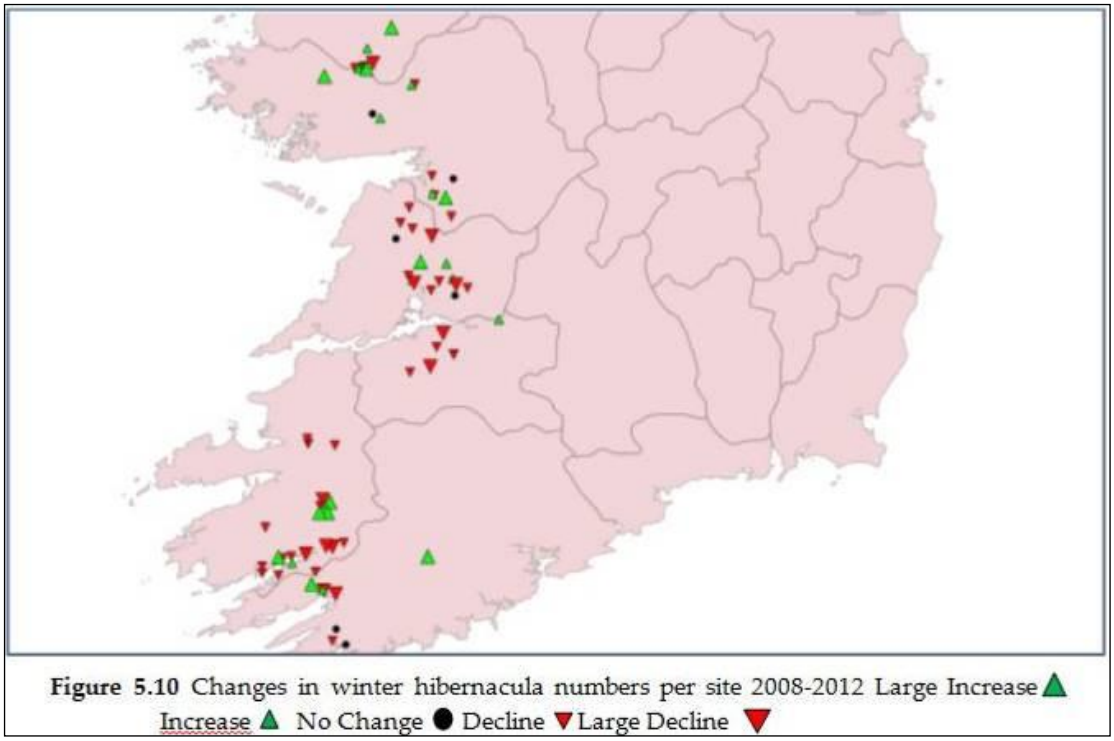


Figure 8b: Changes in Lesser horseshoe bat winter roost numbers (Aughney *et al.*, 2018).

According to Roche *et al, (*2014) the primary concerns for this species is as follows:

- Increased urbanisation;
- Mono cultural landscape (e.g. large swathes of coniferous forestry and high intensity farmed landscapes);
- Roost loss due to deterioration, demolition or renovations;
- Street lighting;
- Recreational cave visits etc to hibernation sites;
- Natural flooding of underground site.

Additional research present by Dr Andrew Harrington on the population genetics of lesser horseshoe bat in Ireland (Dr Harrington's Ph.D. thesis Title: The Development of Non-Invasive Genetic Methods for Bats of the British Isles, July 2018) examined the lesser horseshoe bat's range across Ireland with DNA samples from 21 colonies examined. This was to determine the level of interbreeding and possible risk of inbreeding within this population.

Harrington *et al. (*2019) at All Ireland Mammal Symposium (AIMS) stated that maintaining the gene flow within the Irish population is essential to "prevent the future risk of inbreeding depression or local extinctions". His research work showed that the Irish lesser horseshoe population was further sub-divided than previously thought with evidence of isolated subpopulations in Cork-Kerry (Southern), Limerick, Clare-South Galway (Central) and North Galway-Mayo (Northern). As a consequence, this means that this species is in serious risk of negative effects of operations that increase barriers to dispersal to these current sub-populations. The study further identified that the point separating the North Galway-Mayo population from the Clare-South Galway population is an area to the south-east of Galway City (the Galway Gap).

One aspect of the study was to determine the sex ratio of colonies examined (Harrington *et al.,* 2017). Previously, it was assumed that 25% of the maternity roost colonies was comprised of 25% males. However, Dr Harrington's work showed that in reality the percentage of males can be much higher with a range of 14.2% to 74.3% recorded. As a result the estimated population of lesser

horseshoes in Ireland is considered to be lower than previously reported (14,010 individuals as reported by Roche *et al.,* 2012).

Article 17 reporting (NPWS, 2019) for this species of bat concluded the following:

- Range = Inadequate
- Population = Favourable
- Habitat for species = Inadequate
- Overall Assessment of Conservation Status = Inadequate

### *3.4.2 Bat Conservation Ireland & NPWS Databases*

There are 4 lesser horseshoe bat roosts and one lesser horseshoe bat detector records currently on the BCIreland database for the database search area (10km buffer of ESB owned lands). An additional 2 roosts records are available from the NPWS database. A total of seven geo-referenced lesser horseshoe bat records were available. The nearest record to the boundary of the ESB owned lands is St. Patrick's Church, Parteen, Co. Clare which is located 272m away from the red line boundary but is located 1.1km from the transformer building. This church was recorded as satellite roost for lesser horseshoe bats. A hibernation roost was also recently documented in the basement of ruins on St Thomas Island (pers. comm. David Lyons, NPWS). This is 1.7km south of the transformer building and considering the excellent woodland and river habitats, there is suitable connectivity between the structures listed and the survey area. A total of 18 individuals was recorded in this roost on 18th January 2024 (pers. comm. Jamie Durrant, NPWS). Mr Lyons (NPWS) also surveyed the transformer building in 2012 when 12 lesser horseshoe bats were noted.


Figure 9a: Bat records for 10km radius of ESB, Ardnacrusha, Co. Clare for all bat species (Source: Bat Conservation Ireland database and NPWS LHB database).

### *3.4.3 Lesser Horseshoe Bat SACs*

A total of 41 SACs have been designated for the Annex II species lesser horseshoe bat (1303), of which nine have also been selected for the Annex I habitat 'Caves not open to the public' (8310). The nearest Co. Clare SAC is Ratty River Cave SAC which is located 12km north of the survey area. The nearest Co. Limerick SAC is Curraghchase Wood SAC which is located 20km south-west of the survey area.

There are 17 SACs designed for lesser horseshoe bats in Co. Clare while there is only one SAC for this bat species in Co. Limerick. There is also concern that the Co. Limerick populations is increasingly isolated (both geographically and genetically) in relation to the Co. Clare and Co. Kerry populations as a result of habitat loss in the landscape of the county. As a result, the recording of the roost in the Ardnacrusha area provides a potential transitional area between south Co. Clare and north Co. Limerick lesser horseshoe populations. Therefore it is considered that the roost recorded in the Transformer Building, Ardnacrusha is an important lesser horseshoe bat roost.

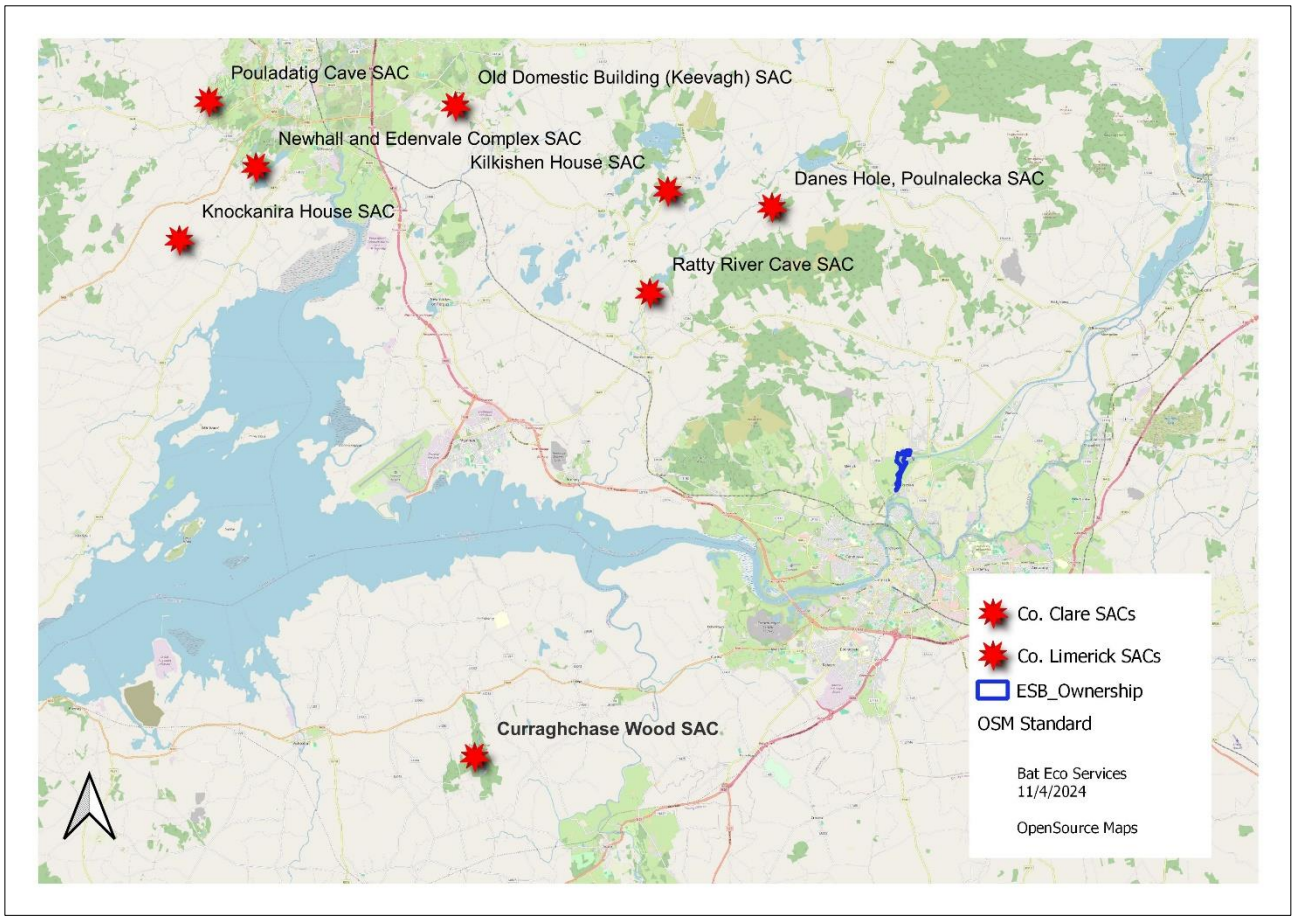


Figure 9b: Location of SACs in Co. Clare and Co. Limerick with reference to ESB, Ardnacrusha, Co. Clare (i.e. ESB ownership).

## 4. Discussion & Site Evaluation

Primary Points from Results:

1. Transformer Building is an important Lesser horseshoe bat roost and it likely provides roosting all year around. Winter roosting is located in the basement while there is additional roosting in the Transition Room and the Substation. The latter two locations provide roosting during the maternity and are occasionally used outside the hibernation and maternity season. Therefore, there is likely to be a temperature gradient that determines where individuals of the colony roost at different times of the year and as a consequence there is a great amount of movement between the three locations where the bats have been recorded roosting in 2024. The temperature data loggers will provide more detail on this once they are retrieved.
2. The number of individuals counted on the 10th May 2024 was 139 bats, this is >100 which is the number deemed required for SAC (Special Area of Conservation) status for maternity site (maternity site was confirmed in latter surveys when young bats were noted).
3. The most counted in typical Winter months was 59 individuals recorded on 3rd December 2024 which meets the status for SAC Hibernation roosts (i.e. 50 individuals or more is needed to meet SAC status for a hibernation site).
4. Its importance is greatly increased by the fact that there is excellent foraging habitat in the immediate area (River Shannon and associated woodland habitats). Static surveillance (reported separately but not included in this application) of the adjacent woodlands provided evidence that lesser horseshoe bats commute and foraging in the adjacent woodlands.
5. Two additional bat species were recorded roosting in the building – Common pipistrelle and Natterer's; bat but the numbers, to-date, indicate Satellite Roost and Day Roost, respectively.

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