TOBIN

Limerick GAA Training Centre at Crecora, Co. Limerick

Bat Survey

BUILT ON KNOWLEDGE

Document Control Sheet	
Document Reference	Limerick GAA Training Centre
Client:	Limerick Gaelic Grounds Limited
Project Reference	12131

Rev	Description	Author	Date	Reviewer	Date	Approval	Date
A	First Issue	JC	20/11/2025	JF	01/12/2025		
B	Final	JC	15/12/2025	JF	10/12/2025	MC	10/12/2025

Table of Contents

Appendices

List of Tables

List of Figures

1 INTRODUCTION

Limerick Gaelic Grounds Limited proposes the construction of a sports training facility on a site approximately 39.54 hectares (97.7 acres) at Jockeyhall , Crecora, Co. Limerick, John Curtin (B.Sc. Hons), Consultant Ecologist with Éire Ecology, has prepared this report, which presents the findings of bat surveys conducted in 2025 at Jockeyhall, Crecora, Co. Limerick. The project location is shown in Figure 3-1 .

1.1 OBJECTIVE OF THE SURVEYS

This report aims to:

- Report baseline bat surveys conducted at the proposed project site.
- Identify bat roosts in buildings and trees.
- Assess potential impacts of bats by the proposed development.

1.2 STATEMENT OF AUTHORITY

John Curtin B.Sc. (Env.), Consultant Ecologist with Éire Ecology, designed and carried out bat surveys in 2025 at Jockeyhall, Crecora, Co. Limerick, The surveys undertaken are in line with recommendations of the Irish Wildlife Manual No. 134' (Marnell, 2022) while following elements of Bat Conservation Trust 'Good Practice Guidelines, 4th edition, (Collins, 2023), with the assessment of potential impacts carried out in accordance with national and international guidance.

John has over ten years' experience of carrying out bat surveys and has completed numerous surveys during this time. John has also completed the Bat Conservation Ireland, Bat Detector Workshop and Bat Handling Workshop which are the standard training for the carrying out of bat surveys in Ireland. He follows the Bat Conservation Ireland 'Good Practice Guidelines'(Aughney et al., 2008)'. In addition, John is a longtime active member of Bat Conservation Ireland, which monitor bat populations in Ireland, and facilitate the education of bat communities to the public. John holds the following licences:

Description	Licence No
Licence to capture protected wild animals for educational, scientific or other purposes (bats)	C014/2025
Roost disturbance (bats)	Der/Bat 2025-177
Licence to photograph / film wild animals (bats)	032/2025

2 BACKGROUND

2.1 LEGISLATIVE PROTECTION

There are two main pieces of legislation which cover wildlife protection in Ireland – the Wildlife Act and the Habitats Regulations. These are outlined below, with particular reference to the protection afforded to bat species in Ireland.

The Wildlife Acts 1976–2012 (as amended)

The primary pieces of national legislation for the protection of wildlife in Ireland are the Wildlife Act (1976) and the Wildlife [Amendment] Act (2000). All species of bats in Ireland are listed on Schedule 5 of the 1976 Act, and are therefore subject to the provisions of Section 23, which make it an offence to:

- Intentionally kill, injure or take a bat
- Possess or control any live or dead specimen or anything derived from a bat
- Wilfully interfere with any structure or place used for breeding or resting by a bat
- Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose

European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94/1997) (with subsequent amendments up to 2024).

The EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992) seeks to protect rare and vulnerable species and the habitats in which they are commonly found and requires that appropriate monitoring of populations be undertaken. All bat species found in Ireland are listed under Annex IV of the Directive, while the lesser horseshoe bat is afforded further protection under Annex II. The Habitats Directive has been transposed into Irish law by the European Communities (Natural Habitats) Regulations 1997. All bat species are listed on the First Schedule and Section 23 of the regulations makes it an offence to:

- Deliberately capture or kill a bat
- Deliberately disturb a bat
- Damage or destroy a breeding site or resting place of a bat

Provision is made in the Regulations for the Minister for Housing, Local Government and Heritage to grant, in strictly specified circumstances set out in that Regulation, a derogation license permitting any of the above activities "where there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range".

The Planning and Development Act 2000 (as amended): This Act integrates biodiversity considerations into the planning process and requires ecological assessments, including for bats, as part of Environmental Impact Assessments (EIAs).

2.2 SITE LOCATION

The proposed project site is located 15km south of Limerick City and 2.3km west of Crecora, Co. Limerick. The closest SAC designated for Lesser Horseshoe bats is the Curraghchase Woods (site code: 000174) found 10.1km from the western boundary of the proposed project site (see Section 4.1.1 below).

2.3 Reason for Survey

The client; Limerick Gaelic Grounds Limited proposes to the construction of a sports training facility on a site at Jockeyhall , Crecora, Co. Limerick. It includes the construction of a two-storey pavilion incorporating changing rooms, a gym, an auditorium, dining areas, and rooftop solar panels, as well as the refurbishment of the currently unoccupied residential building (Prospect Hall, an 18th-century demesne house) (for use as offices and study space. Facilities will feature multiple natural and synthetic pitches, an indoor training pitch, vehicle parking, internal roads, walking trails, and landscaped areas. Key ecological features will be retained and managed to protect wildlife. Infrastructure upgrades include road widening, improved access, a wastewater treatment plant with a wetland, and an energy centre. The site layout of the proposed project is shown in Figure 3-2. Bat surveys were carried out in order to assess impacts on the local bat population.

As such, a series a series of bat surveys of the proposed project site were undertaken to inform project design and ecological impact assessment for the planning application.

3 PROPOSED DEVELOPMENT

- A two-storey pavilion of 4,494m² gross internal area which includes the following accommodation:
    - Ground Floor Level
        - Changing Room Block incorporating 8no. changing rooms including welfare facilities.
        - Recovery/Physiotherapy Rooms incorporating sauna, ice baths, physio room, first aid and stores.
        - Referee Room and welfare facilities.
        - Backroom team tog off area.
        - Manage/Player meeting room.
        - Double height Multi-purpose Hall as Pre-game social space incorporating underage gym, storage and plant areas.
        - 115 person Auditorium including store.
        - Lounge and dining space.
        - Link corridor to existing building.
        - Commercial kitchen including plan room and service courtyard.
        - Covered area for drop off and collection.
    - First Floor Level
        - Gymnasium incorporating full size gym circa 1,150m² including office, storage and general horizontal and vertical circulation.
- Upgrade and conversion of an existing three storey 18th Century residential building measuring 255m² to include reception, board room, office and study space.
- The development will include for roof mounted solar PV panels to ensure compliance with the Irish Building Regulations TGD Part L Conversion of fuel and Energy – Building other than Dwellings and provide for 100kW Solar Array of circa 1,000m².
- External training facilities will include for:
    - 6no. full size GAA floodlit natural grass training pitches.
    - 2no. full sized GAA floodlit All-weather synthetic training pitches.
    - Re-purposing of existing wall garden to incorporate an All-weather synthetic sprint and warm up area.
    - Provision of new sod replacement pitch.
    - New 14,300m² indoor training pitch.
    - 4no. ball walls
    - Spectator fencing, goal posts, goal post netting and dug outs to all playing pitches.
    - Sports floodlighting to all playing pitches with maximum lux levels of 500 lux.
- A standalone Electrical Energy Centre consisting of the following internal spaces:
    - 1no. ESB MV substation building measuring 4m wide x 3.5m deep x 2.6m high.
    - 1no. Client MV switch room connected adjacent to the ESB MW measuring 2.6m wide x 3.5m deep x 3.2m high.
    - 1no. Client transformer room connected adjacent to the client MV switch room measuring 4.5m wide x 4.5m deep x 3.2m high.

    - 1no. Client LV switch room connected adjacent to the client transformer room measuring 5m wide x 4.5m deep x 3.2m high.
- Internal circulation roadways, footpaths and parking for circa 248no. cars of which 49no. are EV charging spaces and 13no. are universal access spaces, bicycles under a covered shelter, 10no, bus parking spaces and a vehicular set-down zone.
- Upgrade of existing vehicular entrance off L8002.
- Provision of a proprietary wastewater treatment plant and associated constructed wetland.
- A length walking/jogging trail within the perimeter of the site and associated landscaping and public lighting.
- Sustainable Urban Surface Water Drainage Systems.
- External maintenance shed measuring 12m x 10m and associated external storage compound located adjacent to the indoor training pitch.
- Site wide hard and soft landscaping.
- Boundary treatment along section of L8002 including the removal of circa 640mm of existing hedgerow to provide a minimum road width of 5.5m and construction of new deeper hedgerow and timber post and rail fence inside.
- General wayfinding signage within site
- Children's playground

In addition to the proposed development components listed above, the proposed project will also include

- Diversion of existing overhead ESB lines.
- Demolition works including:
    - General site clearance
    - Removal of selected hedgerows and trees
    - Demolition of an extension to the 18th Century house along with outhouse.
    - Demolition of 2no. sheds, freezer and slurry storage tank.

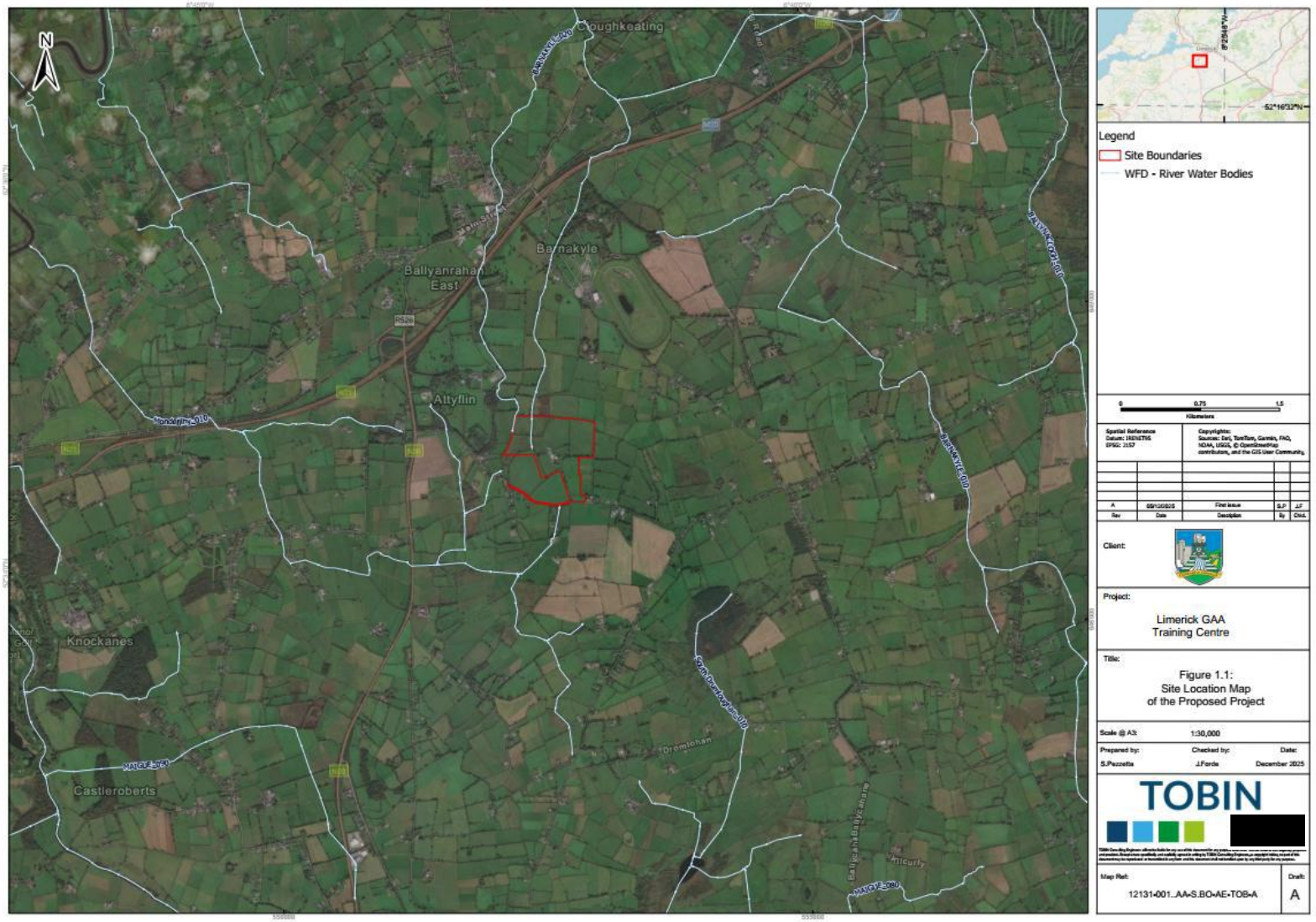


Figure 3-1 Site Location Map of the Proposed Project

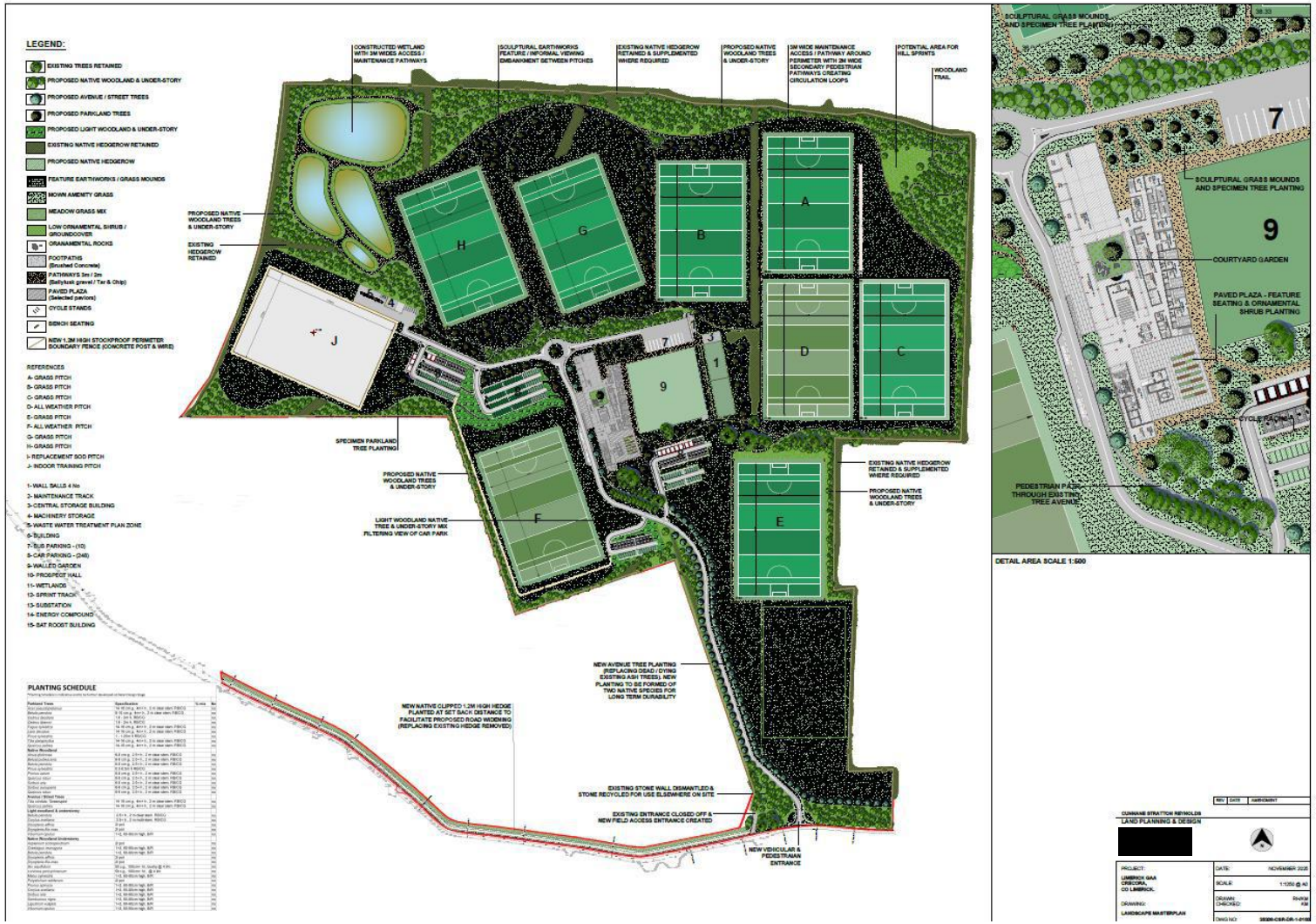


Figure 3-2 Site Layout

4 ECOLOGICAL SURVEY AND SITE ASSESSMENT

4.1 PRE-EXISTING INFORMATION ON SPECIES AT LOCATION AND ENVIRONS

4.1.1 Conservation Sites

A search was made for conservation sites of European and national importance within 10km of the proposed project site.

At the European level (in the context for bats, this refers to Special Areas for Conservation [SACs]). The Habitats Directive (Article 6) forms the basis for the designation of SACs.

At the national level, site of conservation importance included Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). NHAs and pNHAs may be identified as being of importance due to the presence of key bat and bat roosts

The NHA and pNHA site within 10 km of the proposed project site shown in Figure *4-1*

Three SACs can be found within 10km of the proposed project (see Table 4-1). None of these sites are designated for bat species. The closest SAC designated for Lesser Horseshoe bats is Curraghchase Woods SAC (Site Code 000174) located 10.1km to the west, and beyond the probable max core sustenance zone[1] (CSZ) of the bat species. Table 4-2 provides information on nationally designated sites within 10 km.

Table 4-1: SACs within 10km

Name	Site Code	Distance (km)	Designated for Lesser Horseshoe?
Tory Hill SAC	000439	3.19	No
Lower River Shannon SAC	002165	4.71	No
Askeaton Fen Complex SAC	002279	9.96	No

Table 4-2: Nationally designated sites within 10km

Name	Site Code	Distance (km)	Designated for bats	Has the site relevant connectivity
Tory Hill pNHA	000439	3.19	No. Although likely to provide good bat feeding habitat	Potential tenuous link via network of hedgerows intersected by roads.
Adare Woodlands pNHA	000429	3.64	No. Although likely to provide good bat feeding habitat	Potential tenuous link via network of hedgerows intersected by roads.
Loughmore Common Turlough pNHA	000438	4.79	No	N/A

[1] A core sustenance zone (CSZ), as applied to bats, refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost.

Name	Site Code	Distance (km)	Designated for bats	Has the site relevant connectivity
Inner Shannon Estuary - South Shore pNHA	000435	7.18	No	N/A
Fergus Estuary And Inner Shannon, North Shore pNHA	002048	8.09	No	N/A
Skoolhill pNHA	001996	9.01	No	N/A
Dromore & Bleach Loughs pNHA	001030	9.02	No	N/A

4.1.2 Bat Landscapes

Lundy, 2011 produced a landscape model by analysing data contained in the Irish National Bat Database, maintained by Bat Conservation Ireland and the National Lesser Horseshoe Bat database maintained by National Parks and Wildlife Service. The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The landscape model has been conducted for all of Irelands nine resident species.

The site is situated in an overall moderate high suitability landscape (see Table 4-3).

Table 4-3: Landscape model for the site (green is low suitability for bats, red is high)

Overall Suitability; BCI		31.44
Pipistrellus pygmaeus	Soprano Pipistrelle	45
Plecotus auritus	Brown Long-eared bats	49
Pipistrellus pipistrellus	Common Pipistrelle	45
Rhinolophus hipposideros	Lesser Horseshoe	15
Nyctalus leisleri	Leisler's Bat	44
Myotis mystacinus	Whiskered Bat	15
Myotis daubentonii	Daubenton's Bat	32
Pipistrellus nathusii	Nathusius's Pipistrelle	5
Myotis nattereri	Natterer's Bat	33

4.1.3 Historical data – BCI Records

A review of historical data was conducted on 13/04/2025 and again on the 20/10/2025. In total 24 roosts have been recorded within 10km of the site with several containing more than one species. Six roosts have been recorded within 5km with all but one recorded in 1997. Many of the other records within 10km are also dated from 1997 when Niamh Roche conducted the VWT Lesser Horseshoe survey of County Limerick.

The closest roost is from a stable recorded 450m to the north-west. This is a very old and vague record, stating droppings were noted. There is connectivity between these sites via hedgerows and woodland strips.

A Soprano pipistrelle maternity roost was recorded in 2021 some 3.06km to the south-east, of the site just outside the CSZ for this species.

Figure *4-2* shows a rough location of surrounding roosts and designated sites in relation to the subject site. A full list of records can be found in Appendix A.

The closest cave (potential hibernaculum) recorded on the Irish Cave database is located 8.5km to the south-east called Poultallon however the record suggests this cave is based in Clare so it is possible the record is mis-located. At over 8km no impacts would be expected.

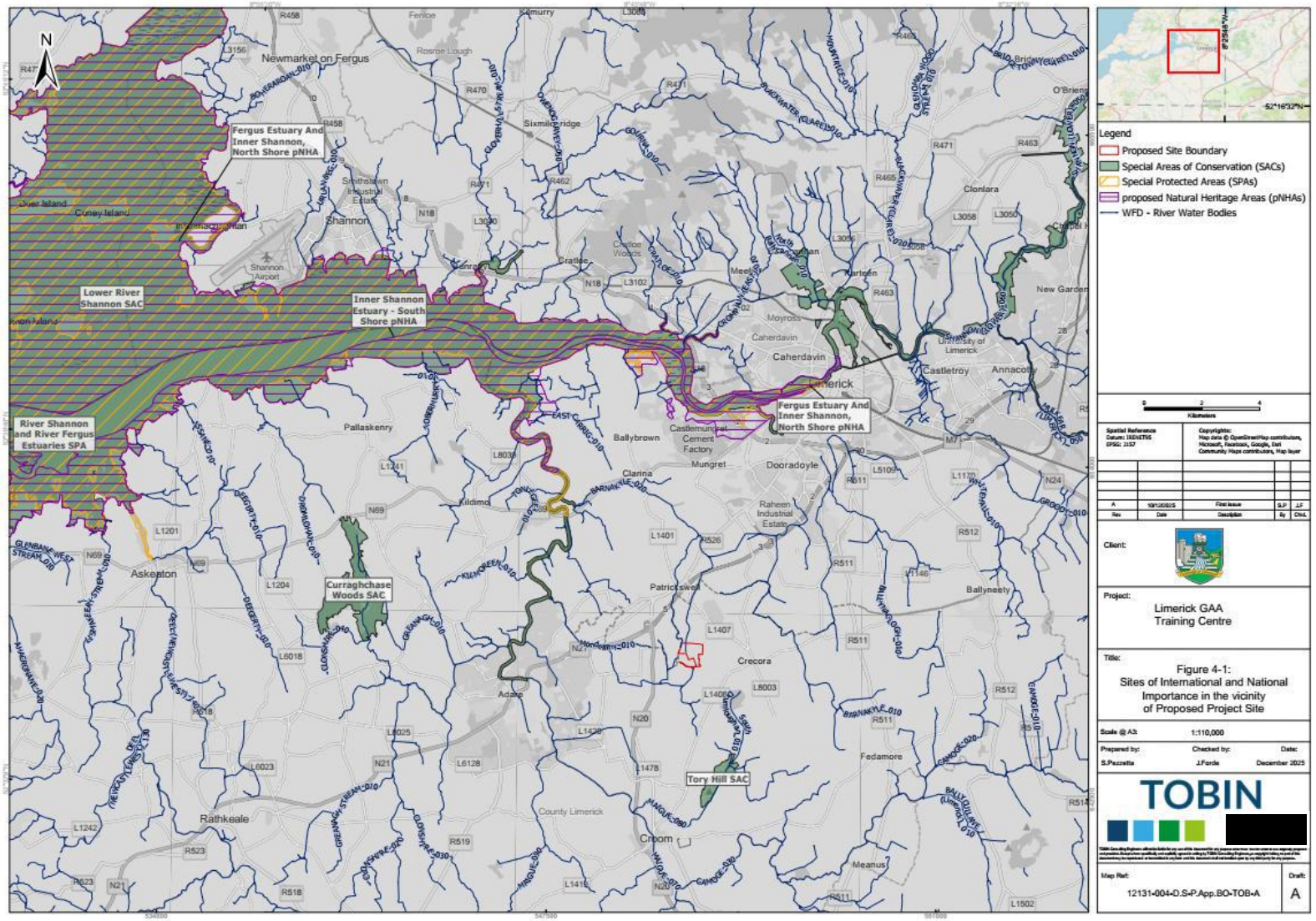


Figure 4-1: Sites of International and National Importance in the vicinity of Proposed Project Site

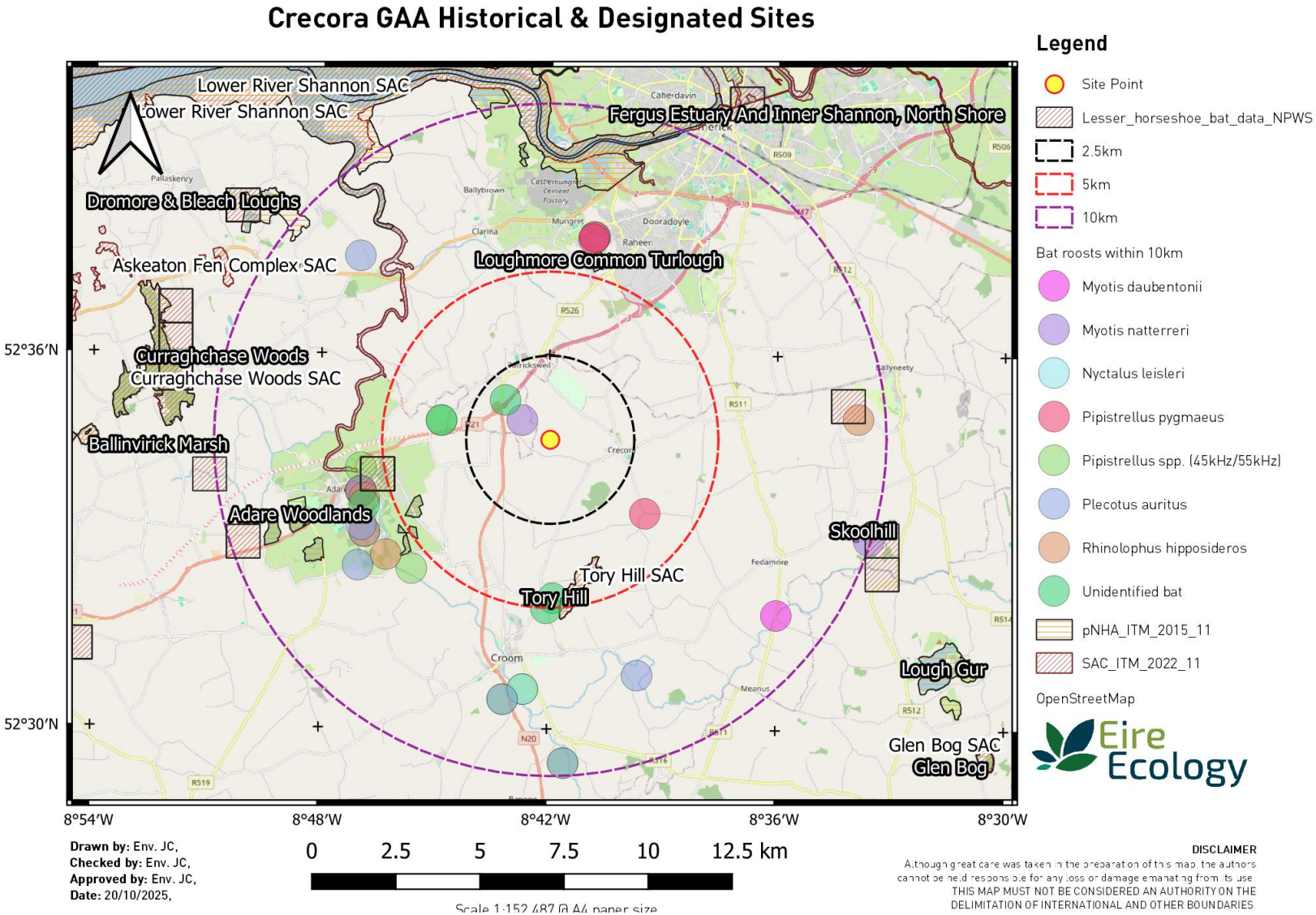


Figure 4-2: Roost records and designated sites

4.1.4 Lesser Horseshoe Bat (Rhinolophus hipposideros)

The proposed project site **does not** sit within the 2.5km core sustenance zone[2] (CSZ) of any SAC designated Lesser Horseshoe roost. The Lesser Horseshoe Bat: Wildlife Manuals No. 85 (Roche N. A., 2015) does show the proposed project site sits someway to the east of the Limerick summer range.

BCI (Fialas, 2025) research paper where an updated Lesser Horseshoe favourability map was produced for Ireland. The model used roost records and landscape features to estimate areas the species could expand into. The proposed project site sits in an area with pockets of moderate suitability for summer roosts and sitting north of a pocket of highly suitable habitat by Tory Hill located 3.3km to the south.

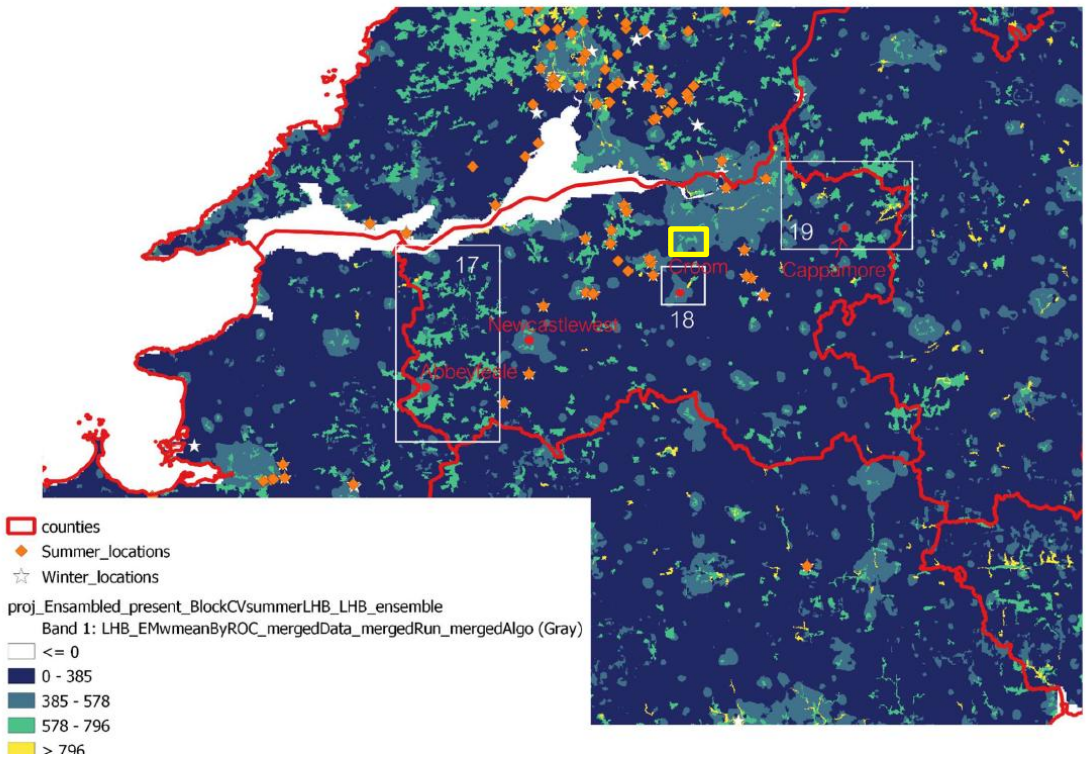


Figure 4-3: Extract from (Fialas, 2025). Subject site highlighted in yellow.

The Limerick Biodiversity action plan (2025-2030) Appendix 6H states "*It is an objective of the Council to require all developments in areas where there may be Lesser Horseshoe Bats, to submit an ecological assessment of the effects of the development on the species. The assessment shall include mitigation measures to ensure that feeding, roosting or hibernation sites for the species are maintained. The assessment shall also include measures to ensure that landscape features are retained and that the development itself will not cause a barrier or deterrent effect on the species.*"

[2] A core sustenance zone (CSZ), as applied to bats, refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost (BCT, 2020). (NPWS, 2018) provides a 2.5km CSZ for Lesser Horseshoe designated roosts.

The Lesser Horseshoe Bat Species Action Plan 2022-2026 (VWT, 2022) recommends;

- Existing linear landscape features should be retained within at least 2.5km but preferably 5km of lesser horseshoe bat roosts with 20 bats or more to counteract the documented genetic differential that has occurred within the species throughout its Irish distribution.
- No significant increase in artificial lighting adjacent to roosts of importance, or along commuting routes should occur within at least 2.5km of these roosts.

VWT (Finch, 2020), have conducted Circuitscape analysis attempting to identify pathways for the connection of Lesser Horseshoe roosts taking into account outdoor lighting, woodland and other landscape features. This report shows the area to which the proposed project site resides has limited functional connectivity for the species.

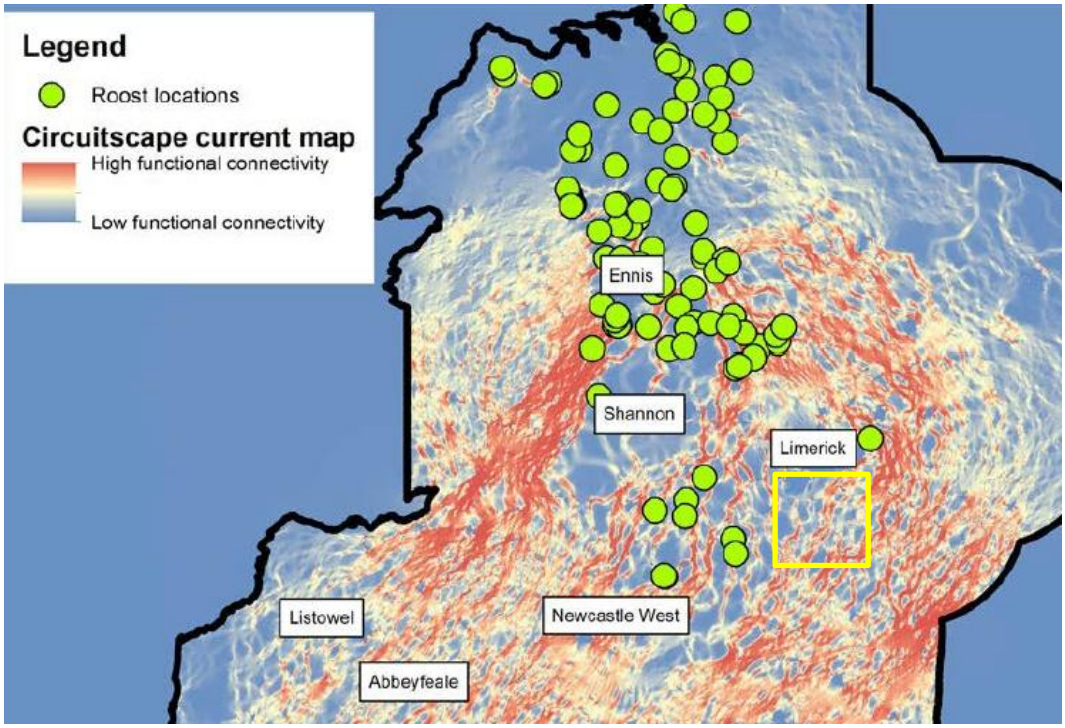


Figure 4-4: Extract (Finch, 2020), area surrounding site appears to have some connectivity

4.1.4.1 Preliminary Habitat Ranking

Much of the proposed project site consists of improved pasture with associated treelines and hedges, while the Patrickswell 24 (EPA Code: 24P10) springs in the west of the site, flowing north. In addition, the site contains roads, tracks and built lands. Hedgerows are typically well established and thick (approx. 8m) and are deemed good connective features with regards to bats. Bats use landscape features such as tree lines for commuting and feeding purposes. It should be noted that fields and buildings represent over 90% of the site.

A desktop analysis of existing landscape features within and on the boundary of the proposed project site is provided in Table 4-4.

Table 4-4: Habitat composition

Habitat	Length (m)	Width (m)	Area (m^2)	% of landscape
Narrow Hedge / treeline	1,553	3	4,659	1.2%
Thick Hedge / treeline	4,220	8	33,760	8.5%
Total landscape features (higher value)[3]			38,419	9.7%
Open pasture within site			397,208	90.3%

Notwithstanding the amount of open pasture, given the amount of historical bat roosts in the wider area and good connective features within the site, the proposed project site is provisionally assigned as a High risk site.

4.2 SURVEY METHODOLOGY

4.2.1 Survey Schedule

Bat surveys conducted on the site are detailed below.

Table 4-5: Bat Survey Effort Summary

Survey	Date	Survey type	Details
1	21/05/2025	PEA	Preliminary Ecological Assessment. Ground Level Tree Assessment and assessment of buildings.
2	21/05/2025 to 03/06/2025	Static Survey	Two statics were set, D1 in the open and D2 by a mature treeline to the east of the existing unoccupied residential building. 14 nights of static recording. D1 set in open failed after one day. It was reset on the pickup but again malfunctioned. Bat passes per hour while the two were recording together was broadly similar with somewhat higher activity by the treeline. Analysis of spring data (comparing first nightly recording to typical emergence) indicated the potential for a close by Common and Soprano pipistrelle roost
3	24/07/2025	Emergence survey	An emergence survey was conducted of the residential building using multiple NVA's. Results found several species roosting in the building including a small maternity roost of Soprano Pipistrelle.
4	24/07/2025 to 18/08/2025	Static Survey	Two statics were again deployed for a 22 night period in the same locations. season static survey conducted by dwelling within site. The eastern treeline had marked higher activity than in the open to the west of the residential building. D2 had a BpHr rate of 90.7 while D1 recorded 39.3. The majority of recordings by D2 were Common Pipistrelle. Of the combined 32820 recordings, 9 were confirmed Lesser Horseshoe bats.
5	29/09/2025	At-height assessment of trees	At-height potential roost feature survey conducted of all trees previously identified as having potential to host a bat roost. Tree number 8 was found to have a Common Pipistrelle roost (1 bat) in a PRF-I.
6	29/09/2025 to 09/10/2025	Static Survey	As the value of the eastern treeline was established by this point a new static location was chosen to the east by a mature hedge (D3). Activity throughout the site was lower than the summer (as would be expected) however still averaged

[3] Doesn't include walls / fences

Survey	Date	Survey type	Details
			19.8 BpHr. The eastern hedge had substantially higher Lesser Horseshoe recordings (21 compared to 7).
7	09/10/2025	Autumn roost check	The residential building and adjoining buildings were rechecked. Two Lesser Horseshoe bats were noted roosting in an attic space on a wing to the residential building.
8	26/11/2025	Winter roost check	No bats found

4.2.2 Preliminary Ecological Appraisal (PEA)

The proposed project will involve both the demolition of metal sheds, and an annex of the existing residential building as well as renovation to the residential building. In addition, a number of linear features including of hedgerow and treelines will be removed.

Inspection of structures and ground level assessment of trees was undertaken on the 04th of May 2025 to evaluate the potential their potential to host bat roosts. Structures such as buildings and sheds can offer shelter and breeding opportunities for bats, while trees are a highly important feature of landscapes that can provide roost sites throughout the year as well as being essential sources of insect prey. The removal of trees feature reduces the availability of shelter and feeding sites for bats (NRA 2005).

4.2.2.1 Structures.

Structures thought to be of high potential for bat roosts were identified onsite during desktop review and preliminary roost assessment by surveyors. The existing unoccupied residential building was found to have high bat roosting potential while adjacent metal sheds were recorded as having low potential. A stone shed with window and door openings had considerable light exposure and lacked crevices thus was considered low-moderate potential.

4.2.2.2 Trees – Ground Level Tree Assessment (GLTA)

The use of trees as roost sites by bats is well established, as they provide essential shelter, breeding sites, and hibernation refuges throughout the year. Roosting opportunities are typically associated with structural features such as cavities, cracks, splits, or areas of lifted bark. These features are collectively referred to as Potential Roost Features (PRFs). The discovery of such roosts can be established through a variety of methods, including bat detector surveys to record bat activity during emergence or return flights, as well as close visual inspection of crevices, cavities, and other PRFs for evidence of bat use (e.g., droppings, staining, or scratch marks). Trees most likely to serve as bat roosts are identified by a bat specialist from a walk-through of the route, from aerial photography or from directed tree surveys.

PRF's used by bats include;

- Knot-Holes – dead branch
- Flush-Cuts – chainsaw cut of branch
- Tear-Outs – wind or snow, often well below canopy
- Double-Leaders - 2 stems of equal diameter emerge from same spot, cavity is located below split. Increased chance of roost where entrance hole is small
- Wounds & Cankers - Rough edge, indistinct shape of entrance
- Butt-Rot - decay at the base of a tree
- Hazard-Beams - longitudinal splits in lateral limbs and (less frequently) upright stems allowing light to be seen through the gap typically found on Quercus, Salix and horse chestnut
- Subsidence, Shearing & Helical-Splits - typically on the convex side of a bend
- Lightning-Strikes – from crown to base.
- Impact-Shatters – branch hit by falling tree etc.
- Desiccation-Fissures – dead wood
- Transverse-Snaps – branch / stem snapped however still attached
- Lifting-bark
- Unions – 2 independent branches (or double leader) fuses. Frequently Beech and Scots Pine
- Ivy - typically where the root forms a mat against the tree – rare for bat usage.

Trees were categorized following (Collins, 2023).

Table 4-6: Tree category (according to Table 4.2 of (Collins J. , 2023)).

Tree Category	Description
PRF	A tree with at least one potential roost feature (PRF)
FAR	Further assessment required to establish if PRF's are present in the tree.
None	Trees have no potential.

4.2.3 Roost Surveys

4.2.3.1 Bat activity and emergence surveys

Bat detectors used during emergence surveys were Wildlife Acoustics Inc. (Echometer Pro 2's) which are triggered to record when a bat call is emitted louder than 18dB for 1sec. The detectors use full spectrum sampling; detecting all frequencies simultaneously, meaning that multiple bat calls can be recorded at the same time.

In addition to audio recording, multiple Night Vision Assist's (NVA's) were used to assist the onsite surveyors. These include:

- Track IR Guide Pro TK thermal imaging scope
- Canon XA10 night vision camcorder supplemented with two Nightfox IR torches

Video footage was reviewed afterwards. Each contact with a bat was recorded. Where possible, a positive identification to species level was made by comparing onsite observations, audio

recordings and night vision footage. Information on flight behaviour was also recorded where available.

A contact describes a bat observed by the surveyor. This contact can range from a commuter passing quickly to a foraging bat circling a feature lasting for several minutes. Some observations contain multiple bats. When several bats of the same species are encountered together, they are recorded under the one contact. A separate contact is recorded for each species. A contact finishes when the recorder assumes the bat is no longer present. It is likely that the same bat is recorded in several contacts throughout the night. This survey type cannot estimate abundance of bats, rather activity (i.e. the level of use bats make of a particular area or feature.

Bat activity is closely linked to the activity of their insect prey and abundance which 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 surveying in such conditions is not possible. All field surveys were undertaken within the active bat season and during good weather conditions (i.e. dry conditions and at temperatures of 8°C or greater).

Bats were identified by their ultrasonic calls coupled with behavioural and flight observations and by sound analysis of recorded echolocation and social calls with dedicated software (Wildlife Acoustic's Kaleidoscope Pro; version 5.6.8)[4].

4.2.3.2 At-height Tree Roost Survey

An at-height survey of trees previously identified either as FAR (further assessment required) and PRF (tree with a potential roost feature) was conducted by an arborist and ecologist team on the 29th of September 2025. The arborist climbed the tree and inspected features using a Wi-Fi enabled RIDGID ca350 inspection camera. With this device the ecologist was able to inspect each feature from ground level.

4.2.4 Static bat detector surveys

Two bat recorders (Song Meter Mini and SM4BAT Full spectrum) were deployed within the study area in spring, summer, and autumn. These were deployed at three locations: 1) along a treeline to the east, 2) in the open to the west of the existing residential building and 3) along a western hedgerow.

Detector locations were spread to encompass different habitat types as well as geographical areas. 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.

[4] The surveyor manually verified all calls rather than depending on auto identification. It is the surveyor's opinion that auto-id features frequently misidentify bat species

Table 4-7: Static Survey Locations

Detector	Habitat	Details	Long	Lat	Nights recorded
1	Open	In the Open in agricultural Grassland within 20m of steel sheds	52.5770082,	-8.6968960	35 nights
2	Edge	Along mature treeline to the east of the existing residential building	52.5770063,	-8.7007738	40 nights
3	Edge	Along a mature hedgerow	52.5771475,	-8.7053267	11 nights

Detectors 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.

The data was analysed with Wildlife Acoustic's Kaleidoscope Pro; version 5.6.8). This software identifies many of the calls made by Irish bats. **All calls were manually verified**. Static detector results presented below show some Myotis calls that the surveyor is confident are Natterer's bat. Distinguishing between Myotis species recordings is difficult (unless distinctive social calls are recorded thus several calls are recorded to genus level only). These could be either Whiskered, Daubenton's or Natterer's bat. Similarly, several Pipistrelle calls were recorded with a peak frequency of around 40kHz. These calls are lower than expected for Common Pipistrelle but higher than typical for Nathusius' Pipistrelle.

4.2.4.1 Static Survey and Analysis Limitations

- 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;
- 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 (for static surveys) 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;

4.3 Survey Findings

4.3.1 PEA Results

4.3.1.1 Structures

Searches were conducted of sheds and dwellings of highest potential for bat roosts that were within the proposed project site. Table 4-8 provide details from a preliminary search for bat roosts within buildings.

Table 4-8 Potential roost structures examined during daylight preliminary searches.

Location No.	Potential	Structure	Description	Latitude	Longitude
1	High	Dwelling	Large existing residential building with plastered walls and slated roof. A lean-to extension can be found to the south with an adjoining shed to the west. The existing residential building has multiple rooms with some soft furnishings such as curtains in place providing potential winter roost locations. The dwelling was used as an office space for the former meat factory. No signs of bats was found in the rooms however evidence of bat roosts was found in attic spaces. The residential building was examined at multiple points throughout the survey period. During an autumn search, two Lesser Horseshoe bats were found roosting in the southern wing attic. They gained access via an open attic hatch. Bat droppings were recorded in two of the other three top floor attic spaces. By the northern attic, Brown-long eared droppings were noted while unidentified droppings were noted in the southern upper floor attic. These attic spaces had multiple access points via attic hatches, and gaps where slates meet the wall plate.	52.57684	-8.70003
2	Low	Shed	Slatted shed. Block walls but not hollow-core blocks. No good potential	52.57701	-8.70025
3	Low	Shed	Slatted shed with block walls. Not hollow-core blocks	52.5777	-8.70068
4	Low	Shed	Slatted shed with block walls. Not hollow-core blocks	52.57736	-8.7006

Location No.	Potential	Structure	Description	Latitude	Longitude
5	Low Moderate	Shed	Stone shed with new roof. Bright inside with three open windows and door opening without door. Walls are mortared, no evidence of bats.	52.57721	-8.69873

4.3.1.2 Trees

In total 63 trees (and hedge clusters) were surveyed from ground level for their potential to host individual bats or a maternity roost. Of these, six trees were identified as having the potential to host a bat roost (PRF). A total of 13 trees were identified as requiring further assessment to identify the presence or absence of PRF, while the remaining 40 had no potential to support roosts.

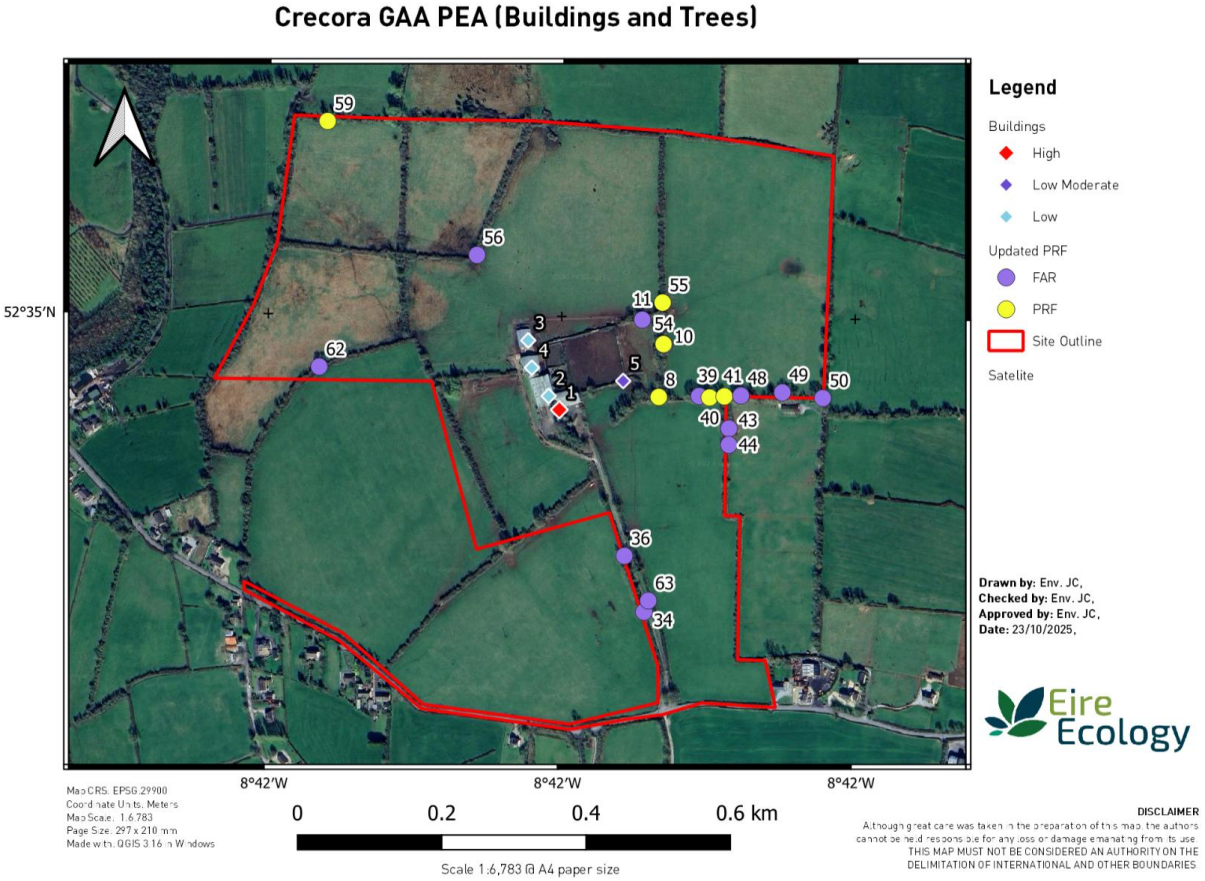


Figure 4-5: PEA Results (trees with no potential have been excluded).

4.3.2 Roost Survey Results

4.3.2.1 Structures – Emergence Survey

During the emergence survey conducted on the 24th of July 2025, a small maternity roost of Soprano Pipistrelle bats was identified alongside satellite roosts for Common Pipistrelle, Natterer's bat and unidentified Myotis (likely further Natterers bats), all emerging from the main buildings via multiple exits. Full details can be found in Appendix C.

Figure 4-6: Emergence Survey Location

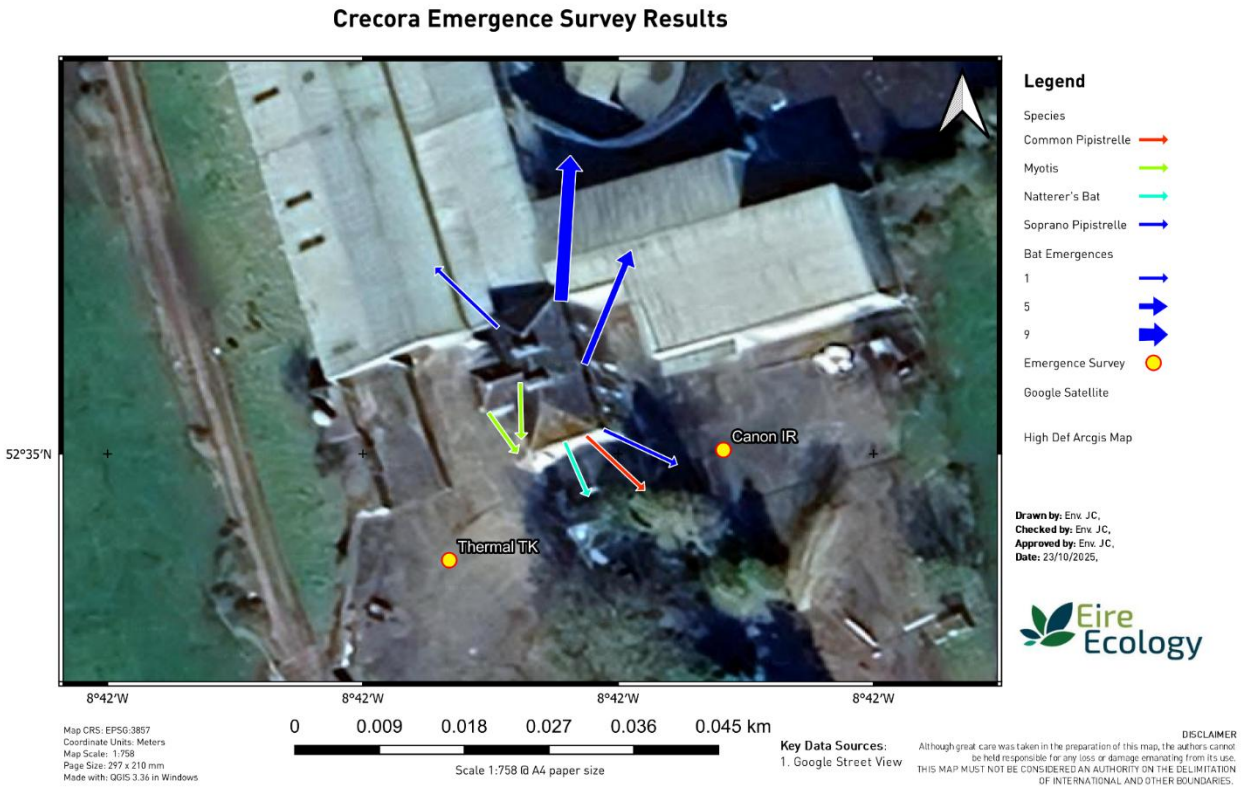


Figure 4-7: Emergence results

4.3.2.2 Trees - At-height

Results identified five PRF-I trees with potential to host single bats and two PRF-M trees capable of hosting maternity roosts. A single bat roost was confirmed during these searches where an ash tree containing two PRF-I's and one PRF-M was found to contain a single Common Pipistrelle bat. This bat was recorded within a PRF-I. Full details can be found in Appendix B.

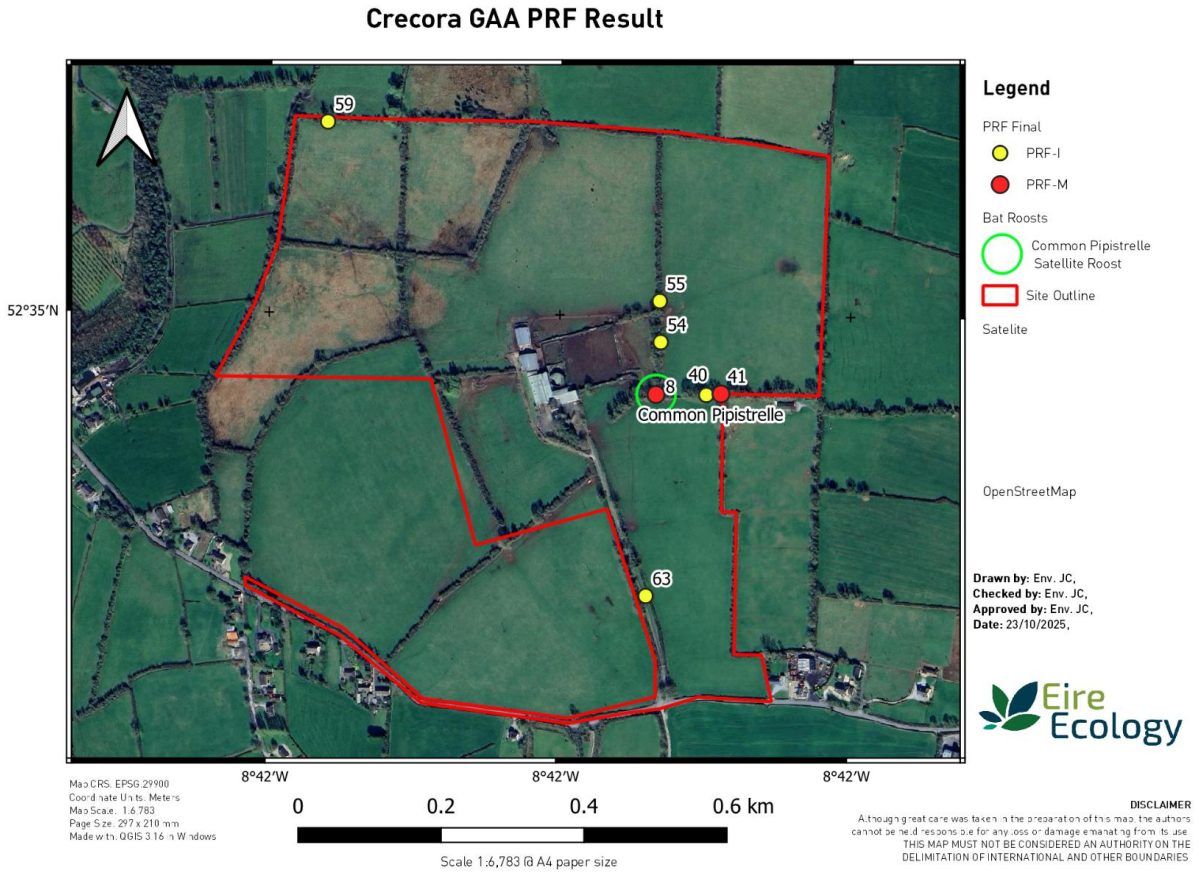


Figure 4-8: PRF Results including location of tree roost

4.3.3 Static bat detector surveys

Overall, seven bat species were recorded (Common Pipistrelle, Soprano Pipistrelle, Nathusius' pipistrelle, Leisler's bat, Brown Long-eared bat, Natterer's bat, and Lesser Horseshoe). In addition, several Myotis calls were identified only to the genus level where more precise classification was not possible.

Table 4-9 provides a breakdown of recording per species from all detectors and seasons. In total 38,309 registrations were recorded. Table 4-10 provides a breakdown per detector. A bat passes per hour (BpHr) has also been provided. Figure 4-8 shows variations of activity over time and Figure 4-9 provide a visual representation of activity at each static location by graduating the size of the circle based on BpHr.

Table 4-9: Static Results

Common Name	Latin Name	No. of Recordings	%	BpHr
Leisler's Bat	*Nyctalus leisleri*	5,117	13	4.7
Common Pipistrelle	*Pipistrellus pipistrellus*	24,463	64	22.6
Soprano Pipistrelle	*Pipistrellus pygmaeus*	11,525	30	10.6
Nathusius Pipistrelle	*Pipistrellus nathusii*	14	0.04	0.013
Pipistrelle 40 kHz	*Pipistrellus nathusii or P. pipistrellus*	36	0.09	0.033
Brown Long-eared	*Plecotus auritus*	349	0.9	0.3
Lesser Horseshoe bat	*Rhinolophus hipposideros*	38	0.10	0.04
Natterer's Bat	*Myotis nattereri*	51	0.13	0.05
Unidentified Myotis species		338	0.9	0.31
Total		**38,309**		**35.3**

Common and Soprano Pipistrelle were the most frequently recorded species within the proposed project site followed by Leisler's bat. All other species were recorded in lower numbers.

Comparisons with static locations should be viewed primarily on a season-by-season basis as these detectors were deployed at the same time thus environmental factors potentially influencing activity will be the same. During spring, detector 1 stopped recording after 1 night. In summer, Detector 2 placed by the eastern treeline had highest common pipistrelle activity, likely due to the presence of the common pipistrelle tree roost found 65m to the west. Detector 1 located in the open but close to sheds had significantly higher Brown Long-eared activity as well as marginally higher Natterers and unidentified Myotis.

For the autumn period it was decided to move the position of detector 2 (by this time the importance of the eastern tree line was established and a roost identified). The detector was repositioned to a western hedgerow (renamed D3) as hedges in this location are proposed to be removed. D3 showed reduced activity in comparison to D2 however this is in part due to time of year. Leisler's bats in particular reduce activity substantially in Autumn, typically due to lowering temperatures.

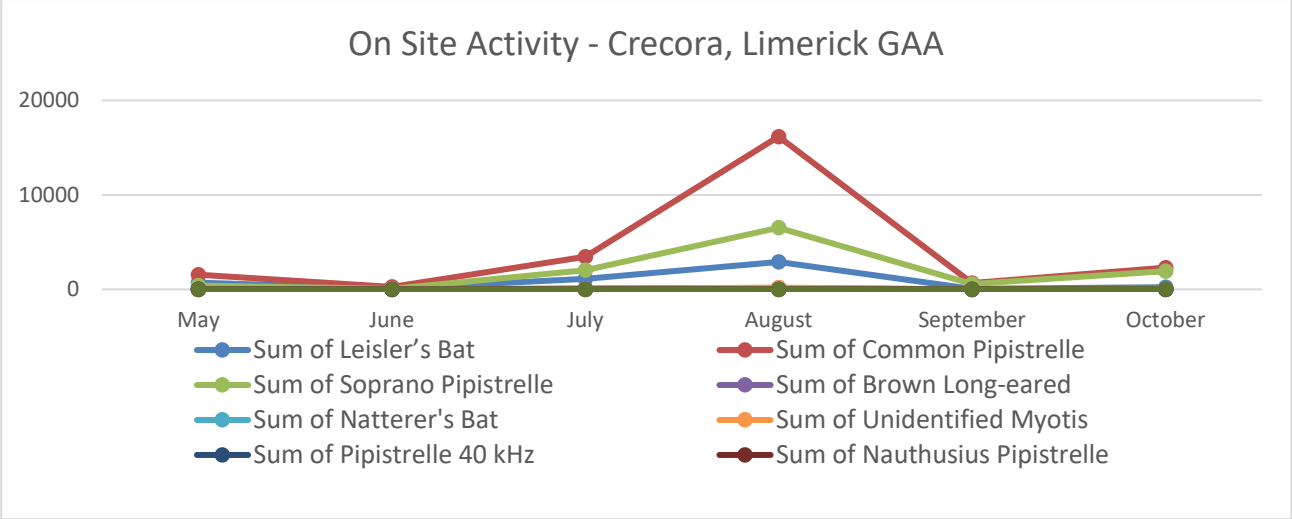
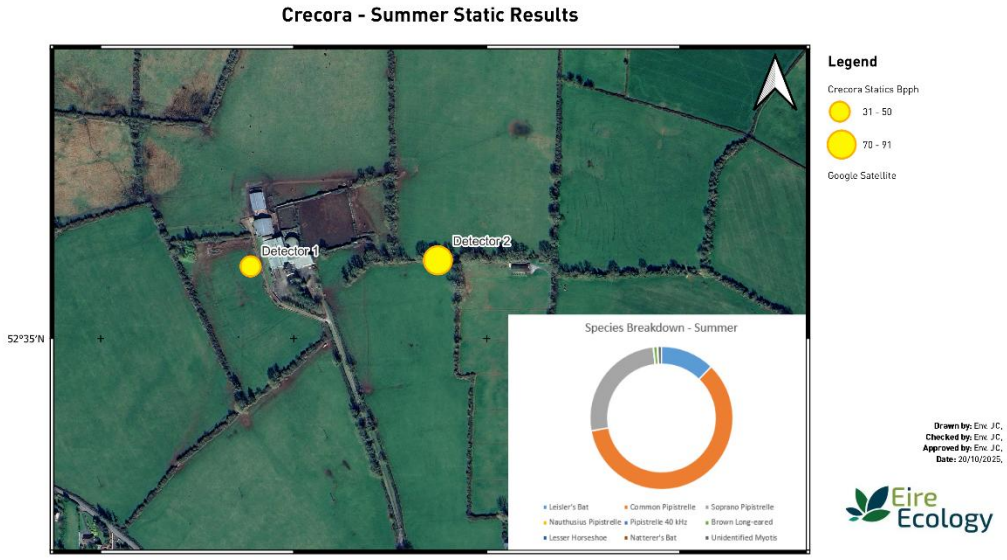


Figure 4-9: Seasonal variation in activity (recordings)



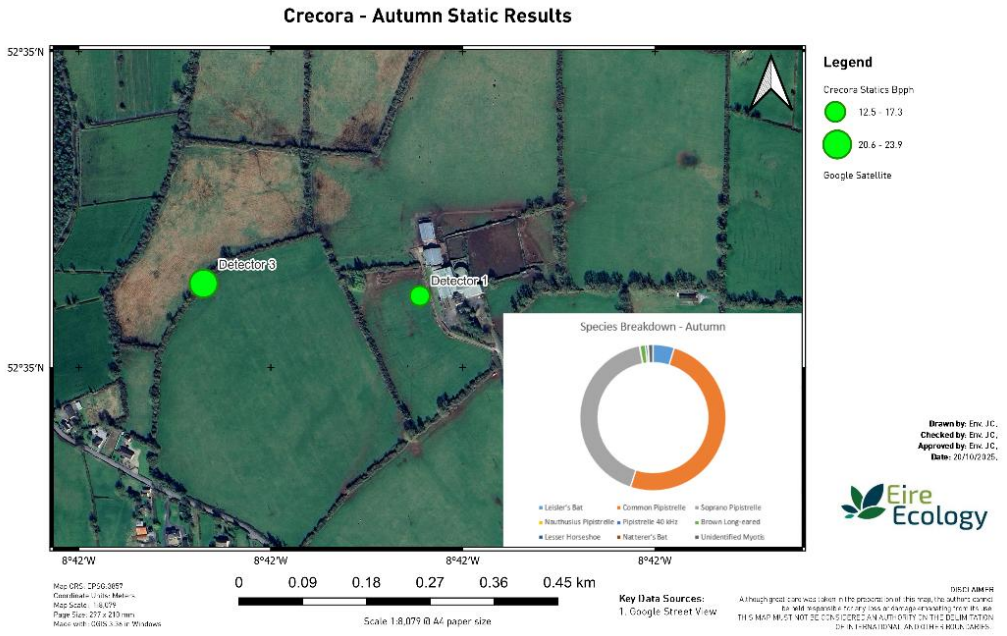


Figure 4-10: Static results with size of circle graduated to BpHr

Table 4-10: Static results per season

Detector	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Nathusius Pipistrelle	Pipistrelle 40 kHz	Brown Long-eared	Lesser Horseshoe	Natterer's Bat	Unidentified Myotis	Total	Minutes recorded	Bat passes per hour
Spring												
1 – west of sheds[5]	30	65	19	0	1	0	0	0	0	115	330	20.9
2 - eastern treeline	775	1,753	439	6	20	0	1	3	12	3,009	7,179	25.1
Total	805	1,818	458	6	21	0	1	3	12	3,124	7,509	**25.0**
Bat passes per hour	6.4	14.5	3.7	0.05	0.2	0	0.01	0.02	0.1			
Summer												
1 – west of sheds	2,423	4,705	2,340	3	4	268	4	25	139	9,911	15,148	39.3
2 - eastern treeline	1,605	14,931	6,211	1	10	7	5	15	124	22,909	15148	90.7
Total	4,028	19,636	8551	4	14	275	9	40	263	32,820	30,296	**65.0**
Bat passes per hour	8.0	38.9	16.9	0.01	0.03	0.5	0.02	0.1	0.5			
Autumn												
1 - west of sheds	190	1,539	513	4	0	66	7	7	39	2,365	9,093	15.6
3 – western hedgerow	94	1,470	2,003	0	1	8	21	1	24	3,622	9,093	23.9
Total	284	3,009	2,516	4	1	74	28	8	63	5,987	18,186	**19.8**
Bat passes per hour	0.9	9.9	8.3	0.01	0.003	0.24	0.1	0.03	0.21			

[5] Detector 1 failed after a short period during spring deployment

4.3.3.1 Lesser Horseshoe Recordings

During the surveys, 38 Lesser Horseshoe registrations were recorded, with recordings at each location. Highest activity was recorded during the autumn period to the west. Figure 4-10 shows the rates of Lesser Horseshoe activity. Activity increased over the seasons with highest activity was recorded to the west.

Figure 4-11: Lesser Horseshoe bat recordings per location; size of circle denotes level of activity (BpHr)

4.4 POPULATION SIZE CLASS ASSESSMENT

Figure 20 of (Marnell, 2022) provides information on the conservation significance of the identified roosts.

Table 4-11: Roost Significance

Roost No.	Species	Location	Roost Status	Significance (Marnell 2023)
1	Soprano Pipstrelle	Existing residential building	Small maternity (16)	Moderate
2	Lesser Horseshoe		Satellite (2)	Moderate
3	Brown Long-eared		Satellite (droppings)	Low moderate
4	Myotis species		Satellite (2)	Low moderate
5	Natterers bat		Satellite (1)	Low moderate
6	Common Pipistrelle		Satellite (1)	Low
7	Common Pipistrelle	Tree	Satellite (1 bat)	Low

4.4.1 Population size and status

The Common Pipistrelle population ranges between approximately 1.9 and 4.2 million individuals, with an increase of 139.83% observed over the past two decades (Roche, 2024). Soprano Pipistrelle is also widespread (between 1.2 and 2.7m).

The Lesser Horseshoe Bat is rarer with an estimated population of 15,000 (Roche., 2024). The population trend from 1999 to 2023 estimates a 2.36% yearly increase in summer numbers (74.93% cumulatively).

The Brown Long-eared Bat is present throughout Ireland, including County Limerick, but its population is generally considered stable and less abundant than pipistrelle species. (Roche N. &., 2024) provides an estimated population of between 65,000 and 102,000. '*Modelled population trend indicates that the species has increased annually by 1.5% since the inception of the Brown Long-eared Bat Roost Monitoring Scheme in 2007, although this increase has not been significant.*'

Estimations of the Natterers bat are as yet unknown however BCI have commenced the All-Ireland Woodland Bat Monitoring Scheme. Over time data from these surveys will provide trend lines on the Natterer's bat population. At present the stuts of Natterer's bat is favourable (NPWS Data Manager, 2019), (NPWS, 2019)

Table 4-12: Status of species found roosting within site.

Species	Located within the known Range? (Article 17)	Located within the known Distribution? (Article 17)	Conservation Status
Soprano Pipstrelle	Yes	Yes	Favourable
Lesser Horseshoe	Yes	No	Favourable
Brown Long-eared	Yes	No	Favourable
Natterers bat	No	No	Favourable
Common Pipistrelle	Yes	Yes	Favourable

4.5 Discussion

Seven of the nine resident Irish bat species were found within the site; Common Pipistrelle, Soprano Pipistrelle, Nathusius' pipistrelle, Leisler's bat, Brown Long-eared bat, Natterer's bat and Lesser Horseshoe.

Bats utilise the site for roosting and feeding purposes. The existing residential building was found to contain multiple bat roosts including a Soprano Pipistrelle maternity roost, Common Pipistrelle, Natterer's bat, Lesser Horseshoe bat, Brown Long-eared bat and unidentified Myotis satellite roosts. In addition, a Common Pipistrelle tree roost was recorded.

5 EVIDENCE TO SUPPORT THE DEROGATION TESTS

5.1 TEST 1 - REASON FOR DEROGATION:

C. In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment.

The proposed development will provide a state-of-the-art training centre for Limerick GAA for academy and senior groups from U14 to Senior including Hurling, Camogie and Ladies Gaelic Football. This will encourage and assist all age groups and players in participation and development of GAA both personally and as a county. The development will provide a meaningful avenue for increased health and wellbeing for people throughout the county.

In addition, there will be a significant benefit to the local community including community walkways and other facilities including playing pitches, Ball Wall and use of Main Pavillion Building for various functions.

It will also bring economic benefit to the local community.

The Limerick County development plan Objective SCSI O20 – Protection of Sports Grounds/Facilities aims to "***ensure new developments provide enough playing fields, protect existing sports grounds****, and promote integrated, accessible community recreation by linking with sports clubs and schools, enhancing community health, and maximizing facility use for all ages, often through shared facilities and active travel access.*" The proposed development fulfils this objective.

The design has considered all environmental aspects and provides a parkland type setting with significant landscaping and biodiversity enhancement. The mitigation measures proposed will ensure that any negative impacts on the affected bat populations are reduced to negligible levels. In this context, and with appropriate safeguards in place, the project's public benefits can be achieved without compromising the conservation interests of the bat species.

5.2 TEST 2 - ABSENCE OF ALTERNATIVE SOLUTIONS

5.2.1 Do-nothing Solution

The "do nothing" option would not deliver the permitted development or meet policy objectives for sustainable development in Limerick.

The existing residential building, Prospect Hall, is currently unoccupied. Although Lesser Horseshoe Bats were recorded on one occasion, the roost is considered highly vulnerable, as any future securing of the building would remove access to the roost. Under a do-nothing scenario, the roost would remain at risk of loss, and the social and economic benefits associated with the proposed project would not be realised.

5.2.2 Removal of roost in main existing residential building and replacement with purpose- built bat roost building

Bat boxes are not a viable alternative roost space for Lesser Horseshoe bats and are typically, unattractive to Brown Long-eared bats, two species found roosting within the existing

residential building. In addition bat boxes have rarely been documented to be effective maternity roosts for Pipistrelle bats.

5.2.3 Retention of roosts in existing residential building and tree

The proposed project will see an increase of lighting close to the existing roosts. Some treelines and hedges will be lost during the construction phase however significant woodland creation is proposed in other sections of the site as well as the creation of wetland ponds. If the existing roosts were retained only, it is highly likely woodland species such as Brown Long-eared, Myotis and Lesser Horseshoe bats will find the site less favourable as a roost site.

5.2.4 Retention of roosts and creation of purpose built bat roost building.

The unoccupied residential building within the site contains several roosts within attics that will be viable post construction with some modifications including the instillation of bat access slates and bitumen felt membrane after roof repairs have been carried out. It is the surveyors experience that despite these efforts, given the increased human activity in the area, it is likely that woodland bats such as Brown Long-eared, Myotis and Lesser Horseshoe bats will not find the site as attractive. As such a purpose- built bat roost building will be constructed to the northwest in an area close to the proposed wetland ponds, woodland in a dark zone. It is likely that Pipistrelle species will persist in the original roosts given these species are less impacted by light.

5.3 Test 3: Impacts of a derogation licence on Conservation status

5.3.1 Details of the population at the appropriate geographic scale and an evaluation of how the proposed activity will affect the conservation status both before and after mitigation measures have been applied.

As stated in section 4.4.1 the estimated **Soprano Pipistrelle** population is 1.2-2.7million in the Republic of Ireland with a substantial increase in population over the previous 20 years. The number of Soprano Pipistrelle using the existing residential building was 16. As such the roost state is noted as a small maternity roost, with a value of "local higher value". Without mitigation, works at the building could result in the mortality of a number of breeding Soprano Pipistrelle bat, if timed inappropriately. This would result in an adverse effect on the conservation status of the local population of Soprano Pipistrelle bat but would not be significant on a national or regional scale.

The estimated **Common Pipistrelle** population is 1.9-4.2 million in the Republic of Ireland with a substantial increase in population over the previous 20 years. The number of roosting Common Pipistrelle using the existing residential building was 2, with another roost found in an ash tree (1 bat). As such the roost state are noted as satellite roosts, with a value of "local higher value". Without mitigation, the renovation of the building could result in the mortality of a small number of non-breeding Common Pipistrelle bat, if timed inappropriately. This would result in an adverse effect on the conservation status of the local population of Common Pipistrelle bat but would not be significant on a national or regional scale.

The estimated **Brown Long-eared** population is 65,000 to 102,000 in the Republic of Ireland with a 26% increase in population over the previous 16 years. No live brown long-eared bats were observed however an accumulation of droppings indicate a small satellite roost for this

species in one of the upper attic spaces of the main residential building, with a value of "local higher value". Without mitigation, the works at the building could result in the mortality of a small number of non-breeding Brown Long-eared bats, if timed inappropriately. This would result in an adverse effect on the conservation status of the local population of Brown Long-eared bat but would not be significant on a national or regional scale.

The estimated **Natterers bat** population is unknown in the Republic of Ireland. The NPWS state the population is secure. BCI are currently carrying out a new woodland monitoring scheme aiming to monitor the population trends of Natterers and Whiskered bat. It will take several more years before trends emerge on the condition of these species. The number of Natterers bat using the existing residential building was 1, however another 2 Myotis species were also observed and these are likely also Natterer's bats. These numbers equate to a satellite roost, with a value of "local higher value". Without mitigation, the works at the building could result in the mortality of a small number of non-breeding Natterers bat, if timed inappropriately. This would result in an adverse effect on the conservation status of the local population of Natterers bat but would not be significant on a national or regional scale.

The **Lesser Horseshoe** summer population in 2023 is estimated as 14,975 with a cumulative increase in population from 2017 to 2023 of 17.09%. The number of Lesser Horseshoe found using the existing residential building was 2, with other surveys showing no roosting bats. As such the roost state is noted as a satellite roost, with a value of "county value". Without mitigation, the works at the building could result in the mortality of a small number of non-breeding Lesser Horseshoe bat, if timed inappropriately. This would result in an adverse effect on the conservation status of the local population of Lesser Horseshoe bat but would not be significant on a national or regional scale.

The proposed development will see a high level of change within the site. Multiple pitches are proposed, all utillising floodlights. Several sections of existing well-established hedgerow are proposed to be removed. Disturbance will likely see negative impacts on all roosts within the site boundary. The scale of loss lies towards the mid-point of bat conservation significance as stated in figure 20, p46 of (Marnell, 2022).

The following guidance documents have been reviewed to inform design of proposed roof structure; (Collins J. R., 2020), (Garland, 2017), (Lintott, 2018), (Marnell, 2022), (Wright, 2022), (Richardson, 2009), (Reason, 2023).

5.3.2 Loss of Roosting Habitat

Table 5-1 Assessment of Potential Impacts on Roosting Bats

Describing the Significance of Effects	All trees and hedge species within the site were first assessed from ground level prior to an at-height survey on trees with some potential to host a bat roost. A single Common Pipistrelle bat roost was found in the eastern treeline. The residential building was found to contain multiple roost features from five species as well as two Myotis species of bats. While the redevelopment will see the renovation of the residential building, many of the roost features will be retained (potentially modified) rather than destroyed. Realistically the Lesser Horseshoe roost will not be viable as this species flew into the attic space via an open attic hatch and into the building via a window. Other species emergence locations were from fascia and upper floor open windows with a Natterer's bat emerging from crevice in the wall at approximately 3m. Bat exit points within attics will need to be changed thus addition of bat access slates will be required. Neither the identified tree roost or any of the trees marked as PRF will be felled as part of the development. ▪ Direct impacts including the destruction of roosts and potential bat mortality (where construction and demolition occurs unsupervised). ▪ Indirect impacts such as disturbance to roosting bats during the proposed works, through increased noise, lighting and human activity.
Characterisation of unmitigated effect	The construction of the proposed development has the potential to have a long term, significant effect on all roosts. The proposed development will result in a significant increase in lighting, likely to dissuade bats from roosting in the tree roost and the existing residential building. Pipistrelle species are less impacted by lighting and may persist, but *Myotis* and *Plecotus* bat species will likely move, and the Lesser Horseshoe roost will be lost.
Assessment of Importance prior to mitigation	This has the potential to have a significant effect on six roosts of Local Importance (High Value) and a roost of County Importance (Lesser Horseshoe). Given the distance to SAC's designated for Lesser Horseshoe bats and lack of connectivity, the Lesser Horseshoe roost should not be considered associated with any particular SAC, rather a standalone but nevertheless important county roost record.
Mitigation	**Derogation Licence** A derogation licence will be required for the NPWS for the destruction, modification and disturbance to roosts. **Purpose-Built Bat Roost Building** While efforts will be put in place to protect existing roosts, the level of proposed lighting will likely see rarer woodland bats move from the central building (see *Figure 5-2*). As an alternative and following Marnel 2022 a new purpose-built bat roost building is proposed to be built in the north-west corner of the site (see Figure 5-1. This structure needs to be of sufficient size to host bat roosts from multiple species including Pipistrelles, Lesser Horseshoe bats, Natterers and Brown Long-eared. Brown Long-eared bats in particular require a large void. The proposed bat roost should be sufficient to host maternity colonies for both void and crevice dwelling bats and also have space for hibernating and individually roosting bats. This can be achieved by complying with the following conditions; ▪ A rectangular building constructed of double skin cavity block, minimum of 4m x 5m (internal dimensions) and minimum of 5m high (this sized space is required to host the void dwelling bats (Brown long-eared). ▪ A-frame roof without roof trusses to include Natural slate roof, untreated timber and bitumen felt. ▪ Walls consisting of 215mm block, 100m Kingspan insulation and 100mm internal block. Externally rendered. ▪ Two bat access slates to be installed in roof.

	▪ Instillation of 5 x woodcrete bat boxes in internal wall and 9 x integrated bat tubes installed on external face of southern gable (at a height of 3m). These units have through passages which should provide access into the wall cavity. ▪ 4 winter bat boxes installed on northern gable at a minimum height of 3.2m ▪ Bat entry point to be developed in southern gable which is inaccessible to predators (tilt tray). ▪ Additional bat entrance points will be provided along the facia and soffit. ▪ Sealed access door into roost building to allow access by licenced bat worker. Bottom of door should be raised off the ground to 1m and have a width of 1m to discourage others from using the building for other purposes. ▪ The building needs to be within a zone of 0 lux and have connective features also not impacted by lighting. **Existing roost at the residential building.** All works with the potential to impact on areas of roosting bats will require input and oversight from a licenced bat worker in collaboration with the local conservation ranger. ▪ Following Marnel 2022, destruction / modification to this roost will have timing constraints **and cannot occur until after the new roost structure has been built**. ▪ Ensuring the safe removal of Lesser Horseshoe bats will be relatively straightforward. The attic spaces will be repeatedly checked until such time as Lesser horseshoe bats are not present. After this time the attic hatch will be re-inserted thus ensuring no more potential occupancy. ▪ The only other roost probably required to be removed is a crevice in the back wall where a Natterer's bat was found to emerge at approx. 3m in height. This will require a one way door to be left in place until such time as all bats have exited (installation at appropriate time of year). ▪ Other bat roosts may be impacted by works to the attics and roof. Should works on the attic be required, these will need to be timed to occur from January to March under supervision of a licenced bat worker. Should a membrane be proposed for the roof this should be bitumen felt. Bat access slates should be installed (2 per roof void). **Trees** One tree with bat roosting potential is proposed to be felled as part of the proposed development; tree no 63 (ash tree marked as T461 in arborists report) (see *Figure 5-2*). While no bat was found roosting here, further checks will be required prior top felling to ensure no new occupancy occurs. Should evidence of a roost be found, a derogation license will be required. In all cases, the tree needs to checked directly before felling, or at least ensure the cavity is blocked so that no bats are harmed during felling. All trees should be re-evaluated prior to felling.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant residual effects are predicted as a result of the construction works.

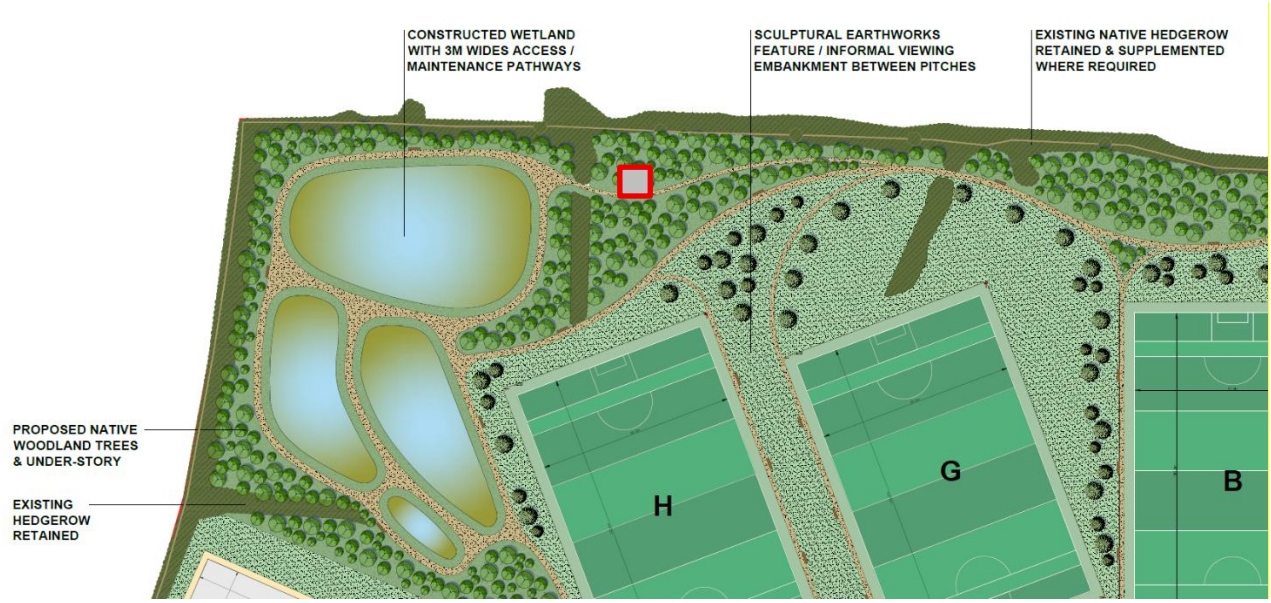


Figure 5-1: Location of new roost structure (red outline)

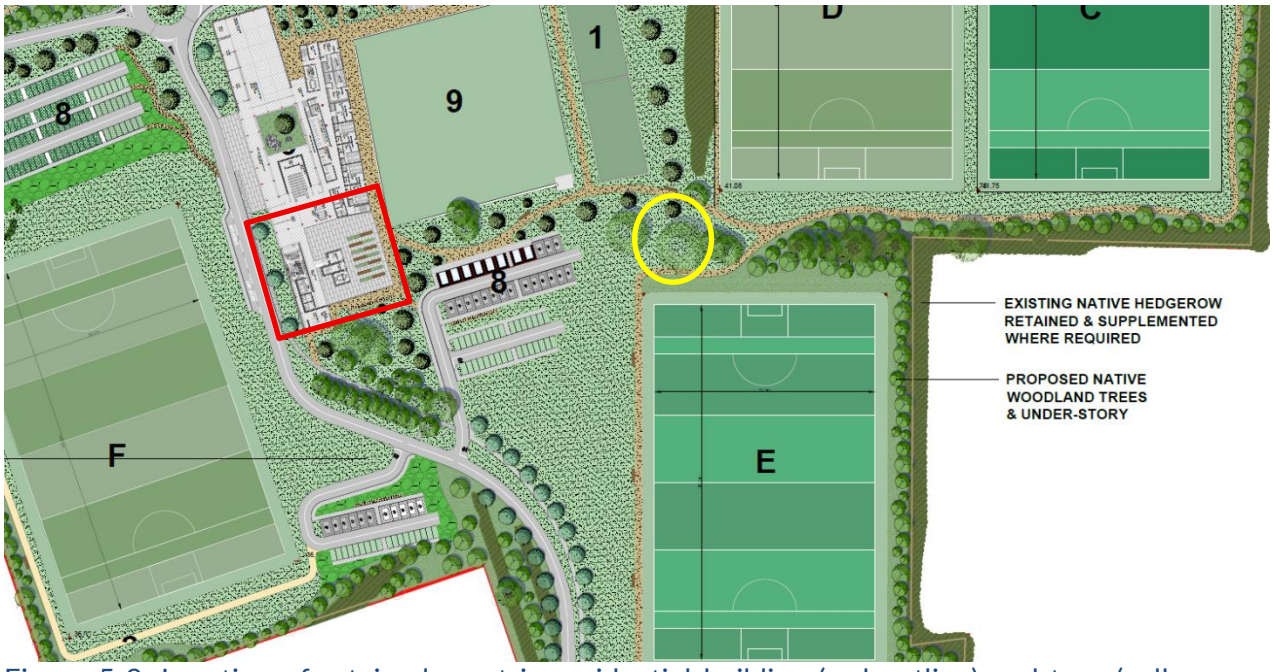


Figure 5-2: Location of retained roost in residential building (red outline) and tree (yellow outline)

5.3.3 Loss of Foraging and Commuting Habitat

Describing the Significance of Effects	Surveys demonstrate bat activity occurs more frequently in areas close to landscape features such as treelines and hedges (Detector 2 consistently recorded less activity (BpHr) than the other locations). While efforts have been made to retain features, 2.634 acres of hedgerows treelines will be impacted. The southern roadway alone will require the setback of 750m of hedgerow. Within the site several sections of mature hedges, particularly to the northeast will be removed. The loss of these features will result in the loss of feeding and commuting habitats for the local bat population. When looking at the connectivity of the site to the surrounds (Figure *5-3* below), the highest quality features can be found to the north and west of the site where woodland, scrub and thick hedges provide connectivity to sites previously identified as roosts.
Characterisation of unmitigated effect	Without mitigation, there would be a loss of some feeding habitat for bats close to the location of multiple bat roosts.
Assessment of Importance prior to mitigation	This is a moderate effect on receptors of Local Importance (Higher Value) and moderate effect on a receptor of county importance.
Mitigation	**Planting of Compensatory Woodland** The proposed development will see the site recontoured thus requiring considerable earthworks. As part of the relandscaping several sections of woodland will be created along with hedgerow and treeline planting. In other areas such as the existing driveway, existing features will be strengthened with additional planting to one side. In total, over twice as much area of woodland, treelines and hedges will be planted compared to lost. All hedge and trees will be native Irish and of Irish provenance. Figure 5-3 below shows where hedgerows will be lost and new features created. Planting for the proposed development will ensure there will be no barrier to connectivity in the wider landscape. This measure aligns with Appendix 6H: Limerick City & Co Co. Biodiversity Objectives (Council, 2022) which states "*It is an objective of the Council to require all developments in areas where there may be Lesser Horseshoe Bats, to submit an ecological assessment of the effects of the development on the species. The assessment shall include mitigation measures to ensure that feeding, roosting or hibernation sites for the species are maintained. The assessment shall also include measures to ensure that landscape features are retained and that the development itself will not cause a barrier or deterrent effect on the species.*" The following measures on hedgerow and woodland planting will be followed: ▪ As soon as all required approvals are in place for the proposed development, the first step of construction will be the planting of new hedgerows and woodlands. This will allow time for these features to establish prior to the loss of existing features. ▪ Given that hedgerows take several years to fully establish into usable landscape features by bats, plywood backed hoarding will be placed along routes so that bats can continue to commute from the existing residential building to the edges of the site. ▪ Hedgerow and woodland will consist of native Irish species from Irish genetic stock. ▪ Hedgerows will be planted in double row strips 1.5m wide with a spacing of 20-30cm of 60—90cm high 'whips'. Hedgerows will consist of a variety of species including

	50% Hawthorn, 20% holly, 10% Hazel, 10% Elder, 2% Wild Privet, 2% Spindle, 2% guelder rose, 2 % dog rose and 2% Alder buckthorn. ▪ Tall trees will be planted at 15-30m intervals and consist of sessile oak, whitebeam with alder and willows where close to streams. **Creation of wetland ponds** A series of wetland pond swill be created in the north-west corner of the site. This will be treelined to the north and west. The pond will not be kept with aesthetic features, rather be landscaped so as to avoid lighting and anthropic disturbance. The pond should have gentle slopes particularly to the southeast and should not be stocked with fish or any non-native water plants, thus increasing invertebrate food source for bats. Care is required to avoid invasive plants occupying the lake. **Timing of removal** It is essential new features are installed and planting at the earliest opportunity so that the existing roost is still viable.
Residual Effect following Mitigation	With the implementation of the prescribed mitigation measures, no significant residual effects are predicted as a result of the construction works. Short term slight effects on foraging and commuting are anticipated due to the temporary loss of vegetation during the construction phases though these effects will reduce as the woodland matures.

Figure 5-3: Landscape features lost and proposed

5.3.4 Disturbance.

Describing the Significance of Effects	**Disturbance** - Works associated with development or building work are likely to lead to an increase in human presence at the site, extra noise and changes in the site layout and local environment. **Lighting effects on feeding and commuting bats** Guidance on bat impacts to Ireland is informed by NPWS mitigation guidance, NGO guidance (Bat Conservation Ireland) (BCI, 2010) and Dark Sky Ireland (DSI, 2024). supplemented by the recent ILP / Bat Conservation Trust technical guidance (BCT, 2023) and EUROBATS (Voigt, 2018). Lighting can alter the behaviour of bats and the insects they prey on. Night flying insects can be attracted to lights particularly sources that emit an ultraviolet component or have a high blue spectral content. Whilst some species of bat such as Leisler's and Pipistrelle species can take advantage of this occurrence, other species such as Daubenton's bat and brown long-eared avoid such areas. Lighting can create barriers for bat species both entering roosts and using commuting routes such as rivers, treelined roads and woodland edges. For effective mitigation to be implemented, there needs to be a collaborative effort by an ecologist in conjunction with engineers, planners and when deemed necessary by the ecologist, there should also be input from a lighting specialist and landscape designer. The guideline was designed for the UK where more bat species are concerned however there are aspects of the guideline that apply to Irish bat species. The guidelines recommend a baseline bat survey is conducted and the following areas should have no ALAN ▪ Roosting and swarming sites for all species ▪ Foraging or commuting habitat for highly light-averse species (lesser horseshoe, brown long-eared and some Myotis) ▪ Foraging or commuting habitat used by large numbers of bats ▪ Foraging or commuting habitat for rare species (Lesser horseshoe) (Bat Conservation Trust, 2018)
Characterisation of unmitigated effect	Without sufficient care, lighting could have a significant impact on all roosts and the future capacity of bats to hunt and commute within the site.
Assessment of Importance prior to mitigation	This is assessed as a long-term Significant effect on a receptor of Local Importance (Higher Value) and on a feature of County Importance.
Mitigation	**Construction** Where lighting is unavoidable during construction, low-intensity lighting and motion sensors will be used to limit illumination. Exterior lighting, during construction, will be designed to minimize light spillage, thus reducing the effect on areas outside the proposed development, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the site boundary and woodland areas to minimize disturbance to bats. Directional accessories will be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands. **Operation** A lighting plan has been created by Don O'Malley and Partners. Lux diagrams have been created separately for pitch floodlighting (1), walkway bollards (2) and driveways (3). **Pitch floodlighting** In order to assess impacts at various heights on features of interest relating to bats, the lighting specialist has calculated lux levels, not only from 0m but also at 5m, 10, 15, and 20m. Drawing 1842 E104 shows these results. **These calculations do not take into account the blocking effect of trees thus can be viewed as a worst case scenario.** The areas of highest concern are the NW woodland and location of the proposed new bat building (North of pitches H and G – Assessment EV4). This assessment shows below 1 lux at the woodland south of the proposed roost. The bat roost location will not be impacted by floodlights.

	Grid EV1 shows light levels by the ponds. This shows a max of 0.35lux on or above the water similar to moonlight. Regarding the dome (structure J) separate lux levels have been computed assessing light spill on the ponds and woodlands from the internal lights as well as from the floodlights at pitch H. When considering worst case lux levels, these show a max lux of 0.4 lux by the western boundary (Ev2 and EV1). **Walkway bollards** Rather than 6m columns the client has agreed to instal 0.988m bollards along footpaths with a colour of 2200k. This colour lacks a blue component known to be attractive to invertebrates. Drawing 1842 E107 shows lux level projections for bollards. Similar to the pitch lighting, projections for 5m, 10m, 15m and 20m from the wetlands have been calculated. The highest projected lux level is 0.17lux. (Moonlight is between 0.1 to 0.3 lux) thus this level is acceptable. As previously mentioned, the existing residential building roost for Pipistrelles will be retained. The proposed route for bats from this building will be north, between pitches D and E where the existing treeline will be retained. The projected lux levels here at a height above 5m which Pipistrelles typically fly is a max of 1.9, within and southwest. It should also be noted lights will have a turn off time of 22:30 thus large parts of the night will be considerably darker. The projected lux level by the Pipistrelle tree roost is less than 0.5 thus acceptable to allow Pipistrelles to continue using the entrance. Proposed lights will fall into three broad types; pitch floodlighting, access lights (along roads and car parks) and pathway lights (bollards). The aim of the lighting plan is to create three lighting zones; a dark zone (not impacted by lights), a low lux zone and a standard lit area. *Dark zone* The ponds, western, northern and north-eastern woodlands should be dark. This will allow bat connectivity for species roosting within and outside the site. **Low light zone** This area covers connective features between the dark zones and the existing residential building roost and the tree roost. This includes pathways and some carparking where bollard lighting is proposed. Bollards have a colour temp off 2200k and are darksky approved fittings. Efforts have been made to keep these areas as dark as possible. Figure 5-4 below simplifies map 1842 E107 lux spill for all lights excluding floodlights. It shows that zones will be available for bats to access routes to feeding grounds outside the existing roosts. **Pitches** Measures provided in DSI's Environmentally Friendly Lighting Guide suggest a range of measures including adding baffles and shields, angle the lights down, switch the lights off when the field is not used and use a warm colour temperature <3000k. According to the lighting engineer, a colour of 4000k is the lowest colour temperature they can use that will sufficiently provide correct performance on the pitches as at lower temperatures there is less contrast between players, the ball, and the pitch and it is harder to track fast-moving objects. 4000k is still towards the lowest end of sports floodlighting (typically 5700k). **Entrance roads and parking** The existing residential building, entrance driveway and car parking are considered standard areas where lighting is required. In these areas a light colour of <2200 will be used. Lights will have baffles. Lux diagrams have been produced showing projections on areas of interest not only at ground level but also at heights of 2m ,5m, 10m, 20m.
Residual Effect following Mitigation	No significant residual effects on bats are expected at a county, national or international level.

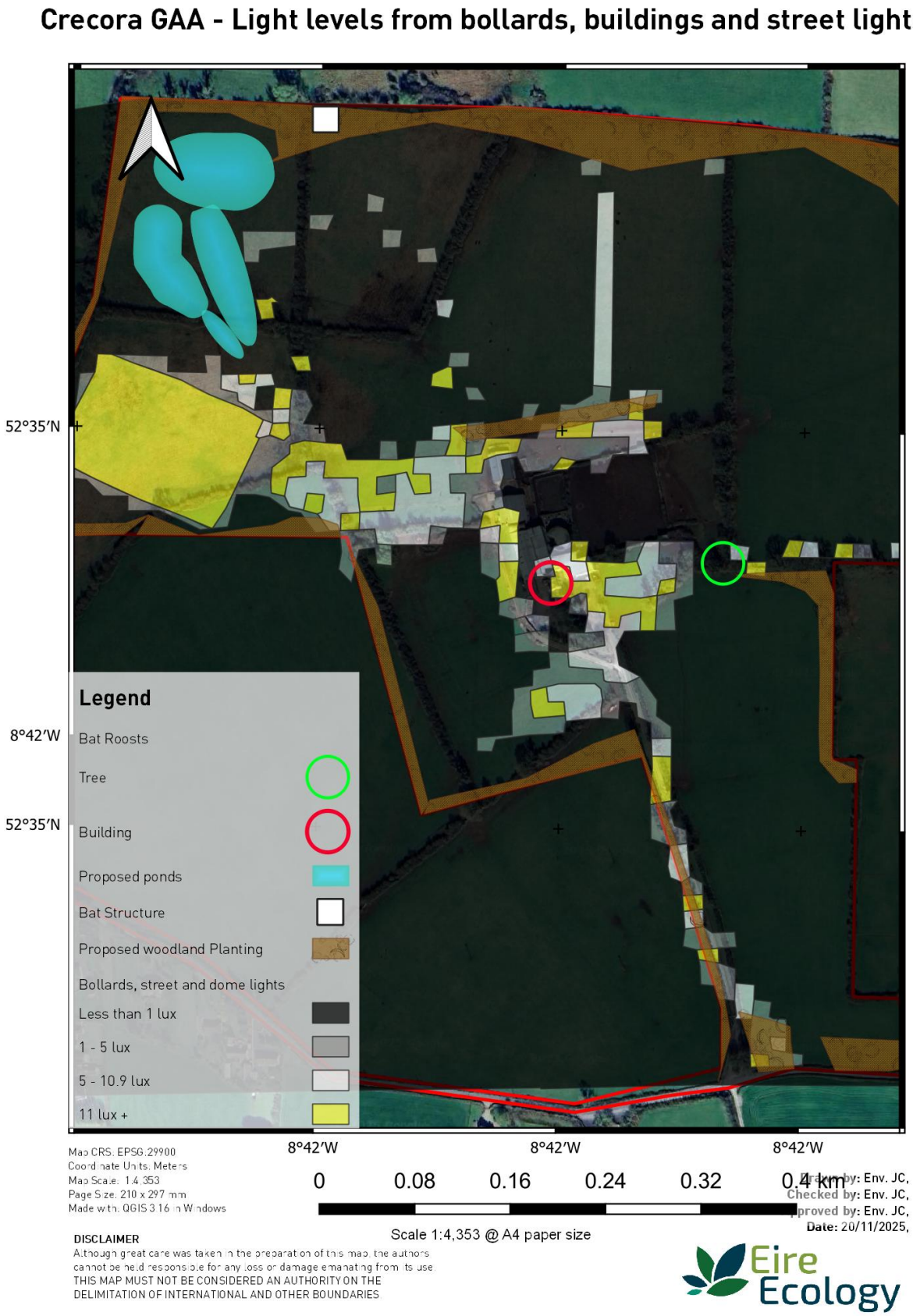


Figure 5-4: Lighting zones from bollards, buildings and streetlights

5.4 Residual Impacts

As long as the mitigation measures above are implemented, impacts on the local bat populations will be negligible. As per Marnell (2022) post construction monitoring will be undertaken to provide insights into the effectiveness of mitigation.

6 MONITORING

As noted in (Marnell, 2022), monitoring is required post construction for a duration of two years.

- Lux surveys should be conducted once lights are installed and these surveys should demonstrate that proposed low light levels have been achieved. If zones are brighter than those originally proposed measures need to be enacted to rectify the problem. A compliance report demonstrating light zones have been achieved should be sent to the local authority and NPWS prior to the operational phase.
- Monitoring should be conducted at all roost structures and along dark zones to establish if bats can continue to utilise commuting corridors and feeding grounds. The use of thermal and static detectors may assist in carrying out this work
- Static monitoring should be carried out at location D1, D2 and at new woodland sections to the NW and ponds to the NE in order to assess activity compared to the baseline. It is hoped the ponds in particular will provide excellent feeding grounds for bats.
- Annual monitoring report to be submitted to Limerick County Council and the NPWS for two years post construction.
- Should occupancy lower than the baseline, measures will be required to rectify the situation.

7 CONCLUSION

Seven of the nine resident Irish bat species were found within the site. Seven bat roosts were found located in two structures; the existing unoccupied residential building and an ash tree. In addition the site is utilised for feeding and commuting purposes by a range of bat species. The site is located in Co. Limerick. Common Pipistrelle was the primary species utilising the site, with Soprano and Leisler's Bats also present in moderate numbers. This is expected given these are the most populous species found in Ireland. Lower numbers of rarer species were also recorded.

The unoccupied residential building, a three storey manor type building, was found to contain multiple roosts; a Soprano Pipistrelle maternity roost (16), satellite roost for Common Pipistrelle (1), Natterers bat (1), Brown Long-eared (droppings noted), Lesser Horseshoe bat (2) and unidentified Myotis (2). A bat roost was also found on the eastern treeline containing a single Comm on Pipistrelle.

An assessment of impacts concluded that although efforts will be made to retain the roots located in the existing residential building, the overall plan will likely see Myotis, Plecotus and Rhinolophus move offsite. As such it is necessary to create an alternative space where these species can roost in a dark zone.

Mitigation has been implemented by way of compensatory woodland and planting, creation of ponds, construction of bat roost structure and limiting lighting to zones.

After mitigation, no significant long term residual impacts will occur to roosting and commuting bats. It is possible that there will be a slight long-term impact on feeding bats though compensatory measures will ensure that ample opportunities are available for bats after the construction phase is completed.

8 REFERENCES

BCI. (2010). *Bats & Lighting. Guidance Notes for planners, engineers, architects and developers.* Noticenature.

BCT. (2018). *Bats and artificial lighting in the UK Guidance Note 08/18.* ILP.

BCT. (2023). *Bats and artifical lighting at night.* Warwickshire: Institution of Lighting Professionals and Bat Conservation Trust.

Collins, J. (2023). *Bat Surveys for Professional Eccologists: Good Practice Guidelines (4th edition).* London: BCT.

Collins, J. R. (2020). The implementation and effectiveness of bat roost mitigation andcompensation measures for Pipistrellus and Myotis spp. and brown long-earedbat (Plecotus auritus) included in building development projects completedbetween 2006 and 2014 in England and Wales. *onservation Evidence 17*, 19-26.

DSI. (2024). *Environmentally Friendly Lighting Guide.* Dark Sky Ireland.

Fialas, P. R. (2025). *Using Species Distributon Models to Identfy Potental New Roost Sites of the Lesser Horseshoe Bat in Ireland.* Dublin: Bat Conservaton Ireland.

Finch, D. M. (2020). *Using Circuitscape to identify potential landscape corridors for the lesser horseshoe bat in Ireland .* Ireland: Vincent Wildlife Trust.

Garland, L. W. (2017). Performance of artificial maternity bat roost structures near Bath, UK.Conservation Evidence, 14,. *Conservation Evidence, 14,*, 44-51.

Hoeh JPS, B. G. (2018). In artificial roost comparison, bats show preference for rocket box style. *PLoS ONE 13(10).*

Lintott, P. a. (2018). *Reviewing the evidence on mitigation strategies for bats in buildings: informing best-practice for policy makers and practitioners.*

Lundy, M. A. (2011). *Landscape conservation for Irish bats & species specific roosting characteristics.* Bat Conservation Ireland.

Mackintosh, M. (2016). *Bats and Licensing: A report on the success of maternity roost compensation measures.* NatureScot No. 928.

Marnell, F. K. (2022). *Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. .* Dublin: NPWS.

NPWS. (2019). *The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments .* Unpublished NPWS report.

NPWS Data Manager, S. U. (2019). *Article 17 Reporting 2013-2018 (Species) - Natterer's bat (Myotis nattereri) (1322).* Dublin: NPWS.

Reason, P. a. (2023). *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1.* Ampfield.: Chartered Institute of Ecology and Environmental Management,.

Richardson, H. J. (2009). *Bats in Traditional Buildings.* National Trust and Natural England: © English Heritage.

Roche, N. &. (2024). *Population estimates, trends and background information for six Irish bat species. Article 17 reporting 2018-2023: Supporting document.* Unpublished report to National Parks & Wildlife Service. .

Roche, N. A. (2015). *Lesser horseshoe bat: population trends and status of its roosting resource. Irish Wildlife Manuals, No. 85.* Ireland: National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Roche., N. (2024). *Lesser Horseshoe Bat Population Estimate 2024.* Bat Conservation Ireland / NPWS.

Smallwood, K. S. (2010). Novel Scavenger Removal Trials Increase Wind Turbine-Caused Avian Fatality Estimates. *The Journal of Wildlife Management, Vol 74.*, 1089-1097.

Voigt, C. C. (2018). *Guidelines for consideration of bats in lighting projects. EUROBATS Publication Series No. 8.* Bonn, Germany, 62 pp.: UNEP/EUROBATS Secretariat.

VWT, N. &. (2022). *Lesser Horseshoe Bat Species Action Plan 2022-2026.* Ireland: National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Wright, P. K. (2022). Effect of roost management on populations trends of Rhinolophus hipposideros and Rhinolophus ferrumequinum in Britain and Ireland. *Conservation Evidence Journal*, 21-26.

Appendix A HISTORICAL RECORDS WITHIN 10KM

Species	Distance	Last record	Details	Designation	Potential connectivity with subject site (for roost records)
Myotis daubentonii	8km	2023	Single bat recorded in crevice of bridge	EU Habitats Directive Annex IV Protected Species: Wildlife Acts	Well outside the CSZ for this species
Myotis natterreri	450m	1997	Droppings noted on floor of stables		Very old record from daylight assessment. The site has connectivity.
	8.45km	1997	Very large accumulation of dropping indicative of maternity roost		Very old record but of a substantial roost. Located well outside the 4km CSZ for this species.
Nyctalus leisleri	6.9km	1997	Dead bat spotted in basement		Very old record located well outside the CSZ for this species.
Pipistrellus pygmaeus	5.2km	2005	Vague record stating "visual" but no indication of numbers. Within 1.5km of the Adare Woods pNHA		Old record located outside the CSZ for this species (3km).
	5.7km	2017	Single bat recorded entering roost		Satellite, minor roost. Subject site lies well outside the CSZ for this species (3km)
	3.06km	2021	Maternity roost recorded (130 bats)		Located just outside the CSZ with roost found to the SE. Some treelines and hedges connect the sites.
	5.7km	2017	Single bat recorded entering roost		Satellite, minor roost. Subject site lies well outside the CSZ for this species (3km)
Pipistrellus spp. (45kHz/55kHz)	6.9km	1997	Vague record stating "visual" but no indication of numbers		Very old record located well outside the CSZ for this species.
	9.1km	1997	Maternity roost recorded.		Old record, with site lying well outside the CSZ for this species.
	7.2km	1997	Vague record stating "visual" but no indication of numbers		Old vague record. Subject site lies well outside the CSZ for this species
	2.8km	1997	Droppings noted.		If it was Soprano Pipistrelle the subject site would be within the CSZ of this roost. There is connectivity via treelines and hedgerows but the record is old and vague.
	5.05km	1997	Droppings noted.		Old vague record. Subject site lies well outside the CSZ for this species
	5.2km	2005	Vague record stating "visual" but no indication of numbers. Within 1.5km of the Adare Woods pNHA		Old record located outside the CSZ for this species (2-3km).
Plecotus auritus	5.7km	2017	1 bat recorded however possibly more present. Given droppings recorded in several attic spaces.		Satellite, minor roost. Subject site lies well outside the CSZ for this species (3km)

Species	Distance	Last record	Details	Designation	Potential connectivity with subject site (for roost records)
	5.5km	2010	6 records dating from 1997. Earlier records noted Brown Long-eared droppings.		Old vague record. Subject site lies well outside the CSZ for this species
	9.1km	1997	Maternity roost recorded.		
	7.2km	1997	Droppings noted but no indication of amount.		Old vague record. Subject site lies well outside the CSZ for this species
	7.0km	1997	Droppings noted but no indication of amount.		Old vague record. Subject site lies well outside the CSZ for this species
	7.2km	1997	8 or 9 bats recorded		Old vague record. Subject site lies well outside the CSZ for this species
	5.3km	2002	Vague record stating satellite roost.		Old vague record. Subject site lies well outside the CSZ for this species
	6.2km	1997	Droppings noted but no indication of amount.		Old vague record. Subject site lies well outside the CSZ for this species
	5.6km	2002	Tree roost. Record lacks details.		Old vague record. Subject site lies well outside the CSZ for this species
Unidentified bat	2.8km	1997	Either Leislers or Natterers droppings		Subject site lies within the CSZ of this roost. There is connectivity via treelines and hedgerows but the record is old and vague.
	5.2km	1997	Droppings noted from unidentified bat		Old vague record.
	4.1km	1997	Droppings noted from unidentified bat in empty water tank		Old vague record.
	1.22km	1997	Natterers/Long-eared on ground floor. Small amounts - probably satellite roost.		Old vague record. While there is connectivity via woodlands and hedgerows the M20 does split the sites.
	4.5km	1997	Droppings noted from unidentified bat		Old vague record.
Rhinolophus hipposideros	5.2km	2005	Droppings noted but no indication of amount. Within 1.5km of the Adare Woods pNHA	EU Habitats Directive Annex IV Protected Species: Wildlife Acts	Outside the CSZ for this species. Twenty year old record.
	5.5km	2010	6 records dating from 1997. Lat record in 2010 recorded highest numbers of this species (4 bats). Used as a satellite roost in both summer and winter.		Subject site lies well outside the CSZ for this species (2.5km)
	8.7km	2009	5 records dating from 1997 (3 recorded). In February 2008 100 bats were recorded. Later records have no information recording numbers.		Sone of the easternmost records in Co. Limerick with numbers demonstrates the extent of the species range. The subject site lies well outside this roosts CSZ (2.5km)
	5.2km	2006	Two records (1997 & 2006) but no details on either.		Subject site lies well outside the CSZ for this species (2.5km)

Species	Distance	Last record	Details	Designation	Potential connectivity with subject site (for roost records)
	5.3km	2015	Recorded on a passive detector rather than roost record.		Subject site lies well outside the CSZ for this species (2.5km)

Appendix B POTENTIAL ROOST FEATURES – TREES

No.	Species	GLTA	GLTA description	PRF Results (for trees previously identified as PRF / FAR)	Final Category	Lat	Lon	Impacted by development?
1	Beech	None	No ivy. No knot holes. Big mature tree	N/A	None	52.57666	-8.6999	Retained
2	Beech	None	Non mat forming ivy. Mature tree		None	52.57661	-8.69984	Retained
3	Conifers, sycamore, rowan	None	Rest of the area has smaller trees all with no potential		None	52.57651	-8.6998	Felled
4	Poplar + sycamore	None	Treeline. Trees are too small to have any good potential		None	52.57638	-8.69988	Retained
5	Sycamore	None	Freestanding tree. No good features		None	52.57705	-8.6993	Retained
6	Conifers	None	Treeline. All have no good features		None	52.57683	-8.69869	Felled
7	Sycamore	None	Mature freestanding tree. No good features		None	52.57704	-8.6984	Retained
8	Ash	PRF	Mature tree. Has non mat forming ivy. Has knot holes. Suitable for single bat	All PRF's face south towards pitch E. Tear off at 8m. Had PRF-I20cm. Nice but empty. 7m cavity on small branch. 20cm. PRF-I. Common pipistrelle. PRF-M on trunk. 50cm. Dry. Slight downward slope. Empty and no signs Southeast limb cavity is only 5cm not big enough.	PRF-M	52.57701	-8.698	Retained (T490)
9	Ash	None	No good features	N/A	None	52.57715	-8.69793	Felled (T500)
10	Ash	FAR	Mature treeline. Very tall trees. Hard to see if there are good features because of ivy cover	All checked, no potential.	None	52.57766	-8.69789	Retained
11	Ash	FAR	Mature tree but too much ivy to see if it has good features	Checked, no potential.	None	52.57797	-8.69835	Felled
12	Ash + hawthorn	None	Hedgerow with no good features	N/A	None	52.57909	-8.6979	Retained

No.	Species	GLTA	GLTA description	PRF Results (for trees previously identified as PRF / FAR)	Final Category	Lat	Lon	Impacted by development?
13	Hawthorn	None	Hedgerow with no good features	N/A	None	52.58034	-8.69931	Retained
14	Ash + hawthorn	None	Hedgerow with no good features		None	52.57962	-8.70113	Mostly removed
15	Sally + ash	None	Treeline with no potential		None	52.58037	-8.7012	Retained
16	Sally + ash	None	Hedgerow with no potential		None	52.58045	-8.70239	Retained
17	Hawthorn	None	Hedgerow with no potential		None	52.57957	-8.70319	Partially removed
18	Hawthorn	None	Hedgerow with no potential		None	52.5787	-8.70249	Removed
19	Ash + hawthorn	None	Hedgerow with ash trees in it		None	52.57822	-8.70325	Removed
20	Ash	None	Non mat forming ivy		None	52.57743	-8.70279	Removed
21	Ash	None	Non mat forming ivy		None	52.57729	-8.70266	Removed
22	Ash	None	Treeline with no good features		None	52.57725	-8.70178	Removed
23	Poplar	None	Treeline with no good features		None	52.57705	-8.70202	Removed
24	Hawthorn	None	Hedgerow with no good features		None	52.5766	-8.70215	Removed
25	Ash	None	Mature tree with no good features		None	52.57515	-8.70104	Retained
26	Ash + hawthorn	None	Hedgerow with no good features		None	52.5747	-8.70187	Retained
27	Hawthorn	None	Hedgerow with no good features		None	52.57411	-8.70288	Retained
28	Conifers	None	5 trees with no potential		None	52.57371	-8.7038	Removed
29	Conifers	None	Treeline with no good features		None	52.57451	-8.70608	Removed
30	Beech	None	Treeline with mature trees but no good features		None	52.57494	-8.70645	Retained
31	Ash + hawthorn	None	Hedgerow with trees in it with no good features		None	52.57572	-8.70643	Retained
32	Ash	None	No good features. Non mat forming ivy		None	52.57295	-8.69963	Removed
33	Sycamore	None	Too small to have potential		None	52.57375	-8.69789	Removed

No.	Species	GLTA	GLTA description	PRF Results (for trees previously identified as PRF / FAR)	Final Category	Lat	Lon	Impacted by development?
34	Ash	FAR	Mature big tree. Some knot holes visible but too much ivy to see if it has high potential	Checked, no potential.	None	52.57434	-8.69826	Removed
35	Ash	None	Treeline with no good features	N/A	None	52.57471	-8.69842	Removed
36	Ash	FAR	Massive tree with lots of ivy. Should be checked	Checked, no potential.	None	52.57503	-8.69867	Removed
37	Ash	None	No good features	N/A	None	52.57571	-8.69908	Removed
38	Ash + hawthorn + elder flower	None	Hedgerow with no potential		None	52.57565	-8.70002	Retained
39	Ash	FAR	Treeline should be checked. All look to have good potential.	Tear off doesn't go in.	None	52.57703	-8.69717	Retained
40	Sycamore	PRF	Excellent potential	To SW. Cavity is downward sloping approx. 50cm. Dry but mucky at bottom. No bats.	PRF-I	52.57701	-8.69696	Retained
41	Ash	PRF	Non mat forming ivy. Has knot holes with good potential	Cavity on west branch with entrance to south branch. 1m. Very move. Twists. No bats. Large truck cavity. 1.5m	PRF-M	52.57703	-8.69666	Retained
42	Sycamore	None	No-good features. 4 trees	N/A	None	52.57683	-8.69654	Retained
43	Ash	FAR	Massive trees with good features	Checked, no potential.	None	52.57663	-8.69656	Retained
44	Ash	FAR	Knot hole with potential	Checked, no potential.	None	52.57642	-8.69656	Retained
45	Ash + hawthorn	None	Hedgerow with no good features	N/A	None	52.57607	-8.69662	Retained
46	Ash + hawthorn	None	Hedgerow with no good features		None	52.57463	-8.69634	Retained
47	Poplar	None	No good features		None	52.57324	-8.69763	Retained
48	Ash	FAR	Should be climbed	Checked, no potential.	None	52.57704	-8.69632	Retained
49	Ash	FAR	Treeline with good potential	Checked, no potential.	None	52.57708	-8.69547	Retained
50	Ash	FAR	Large tree with good features	Checked, no potential.	None	52.57702	-8.69465	Retained
51	Ash + hawthorn	None	Hedgerow + trees with no good features	N/A	None	52.57774	-8.69451	Retained
52	Hawthorn	None	Hedgerow with no good features		None	52.57876	-8.69452	Retained

No.	Species	GLTA	GLTA description	PRF Results (for trees previously identified as PRF / FAR)	Final Category	Lat	Lon	Impacted by development?
53	Hawthorn	None	Hedgerow with no good features		None	52.58016	-8.69633	Retained
54	Ash	PRF	Potential feature on trunk.	PRF-I Nice feature 1.5m facing east. 40cm deep.	PRF-I	52.57767	-8.69791	Retained
55	Elder	PRF	Needs a check, some small features.	PRF-I for small features possibly but empty	PRF-I	52.57819	-8.69794	Retained
56	Ash	FAR	Check	Downward facing but no potential	None	52.57876	-8.70174	Felled
57	Willow	None		N/A	None	52.58049	-8.70345	Retained
58	Ash	None			None	52.58039	-8.70454	Retained
59	Ash	PRF	Practical dead ash.	Has PRF that cannot be reached. Nothing to anchor to. So small it would be a PRF-I	PRF-I	52.5804	-8.70482	Retained
60	Ash	None		N/A	None	52.58048	-8.7054	Retained
61	Ash	None			None	52.57879	-8.70458	Retained
62	Ash	FAR	Canker	Some canker but not cavity forming	None	52.57735	-8.70495	Retained
63	Ash	FAR	Tear off by road.	Two x PRF-I behind rotting sapwood. No bats	PRF-I	52.57448	-8.69817	Felled

Plate 8-1: Tree No: 8 (T490): Common Pipistrelle found in PRF-I on side branch.

Appendix C EMERGENCE SURVEY RESULTS

Table 8-1: Emergence results

Contact number	Date	Time	Species	Details	NVA
1	24/07/2025	21:52	Soprano Pipistrelle	3 seen emerging from roof	Canon IR
2		21:54	Soprano Pipistrelle	Emerges and flies west	
3		21:58	Soprano Pipistrelle	Emerges from centre roof, flies north	
4		22:04	Soprano Pipistrelle	Emerges from centre roof	
5		22:11	Soprano Pipistrelle	Emerges from centre roof	
6		22:14	Pipistrelle	2 emerges from North end, over packing plant	
		Bats to the north, multiple circling, difficult to determine emerging from this angle			
7		22:15	Soprano Pipistrelle	2 Emerge from northern roof	
8		22:16	Soprano Pipistrelle	Emerges from centre roof	
9		22:21	Soprano Pipistrelle	Emerges from Southern Roof, flies west	
10		22:24	Soprano Pipistrelle	2 Emerge from roof	
11		22:29	Common Pipistrelle	Emerges from Southern roof, flies North-West	
16 emerging; 15 SP and 1 CP					
Contact number	Date	Time	Species	Details	NVA
	24/07/2025	21:36	Soprano Pipistrelle	Bats foraging in yard	Thermal TK
2		22:09	Soprano Pipistrelle	Emerges from Northern Roof	
3		22:23	Unknown	Low flying bat <5m	
4		22:28	Myotis	Emerges from Southern Roof, flies west	
5		22:29	Myotis	Emerges from crevice on wall	
6		22:33	Natterers	Emerges from crevice on wall	
4 Emerging; 3 Myotis (1 Natterer) and 1 SP					

Plate 8-2: Exit points to front of building (red circle shows emergence locations while yellow box refers to Lesser Horseshoe roost space)

Plate 8-3: Exit points to rear of existing residential building

Table 8-2: Bat detector recordings during emergence surveys

Location 1 - 24/07/2025 Canon IR Farmhouse			location 2 - 24/07/2025 Thermal TK		
Number	Time	Species	Number	Time	Species
1	21:51	Common Pipistrelle	1	21:36	Leisler's Bat
2	21:53	Common Pipistrelle	2	21:51	Common Pipistrelle
3	21:58	Soprano Pipistrelle	3	21:51	Common Pipistrelle
4	21:59	Soprano Pipistrelle	4	21:52	Common Pipistrelle
5	22:00	Soprano Pipistrelle	5	21:53	Common Pipistrelle
6	22:02	Common Pipistrelle	6	21:53	Common Pipistrelle
7	22:03	Common Pipistrelle	7	21:54	Common Pipistrelle
8	22:03	Common Pipistrelle	8	21:55	Common Pipistrelle
9	22:04	Leisler's Bat	9	21:55	Common Pipistrelle
10	22:04	Soprano Pipistrelle	10	21:55	Common Pipistrelle
11	22:05	Leisler's Bat	11	21:58	Soprano Pipistrelle
12	22:05	Soprano Pipistrelle	12	21:58	Common Pipistrelle
13	22:07	Soprano Pipistrelle	13	21:59	Leisler's Bat
14	22:07	Soprano Pipistrelle	14	21:59	Leisler's Bat Soprano Pipistrelle
15	22:07	Soprano Pipistrelle	15	22:00	Common Pipistrelle
16	22:08	Common Pipistrelle	16	22:01	Soprano Pipistrelle
17	22:08	Common Pipistrelle	17	22:02	Common Pipistrelle Soprano Pipistrelle
18	22:09	Common Pipistrelle	18	22:02	Common Pipistrelle
19	22:09	Common Pipistrelle	19	22:03	Common Pipistrelle Soprano Pipistrelle
20	22:10	Soprano Pipistrelle	20	22:04	Leisler's Bat Common Pipistrelle
21	22:11	Soprano Pipistrelle	21	22:04	Leisler's Bat Common Pipistrelle
22	22:11	Soprano Pipistrelle	22	22:05	Leisler's Bat Common Pipistrelle
23	22:11	Soprano Pipistrelle	23	22:05	Soprano Pipistrelle
24	22:11	Soprano Pipistrelle	24	22:07	Leisler's Bat Common Pipistrelle
25	22:13	Leisler's Bat	25	22:08	Soprano Pipistrelle
26	22:13	Leisler's Bat	26	22:09	Common Pipistrelle Soprano Pipistrelle
27	22:14	Common Pipistrelle	27	22:09	Soprano Pipistrelle
28	22:14	Soprano Pipistrelle	28	22:10	Soprano Pipistrelle
29	22:14	Soprano Pipistrelle	29	22:10	Soprano Pipistrelle
30	22:14	Soprano Pipistrelle X2	30	22:10	Leisler's Bat
31	22:15	Soprano Pipistrelle	31	22:11	Common Pipistrelle
32	22:15	Soprano Pipistrelle	32	22:11	Common Pipistrelle
33	22:15	Soprano Pipistrelle	33	22:12	Common Pipistrelle
34	22:15	Leisler's Bat Soprano Pipistrelle	34	22:13	Common Pipistrelle
35	22:16	Leisler's Bat Soprano Pipistrelle	35	22:13	Soprano Pipistrelle
36	22:16	Soprano Pipistrelle	36	22:13	Leisler's Bat
37	22:16	Common Pipistrelle Soprano Pipistrelle	37	22:13	Common Pipistrelle
38	22:17	Soprano Pipistrelle	38	22:13	Common Pipistrelle
39	22:17	Soprano Pipistrelle	39	22:14	Soprano Pipistrelle
40	22:17	Soprano Pipistrelle	40	22:14	Leisler's Bat
41	22:17	Soprano Pipistrelle	41	22:15	Soprano Pipistrelle
42	22:18	Soprano Pipistrelle	42	22:15	Soprano Pipistrelle
43	22:18	Soprano Pipistrelle	43	22:15	Soprano Pipistrelle
44	22:18	Common Pipistrelle Soprano Pipistrelle	44	22:16	Leisler's Bat Common Pipistrelle Soprano Pipistrelle
45	22:18	Soprano Pipistrelle	45	22:16	Leisler's Bat Common Pipistrelle Soprano Pipistrelle
46	22:19	Common Pipistrelle Soprano Pipistrelle	46	22:16	Soprano Pipistrelle
47	22:19	Common Pipistrelle Soprano Pipistrelle	47	22:16	Common Pipistrelle Soprano Pipistrelle
48	22:19	Soprano Pipistrelle	48	22:18	Leisler's Bat
49	22:19	Common Pipistrelle Soprano Pipistrelle	49	22:19	Common Pipistrelle Soprano Pipistrelle

Location 1 - 24/07/2025 Canon IR Farmhouse			location 2 - 24/07/2025 Thermal TK		
Number	Time	Species	Number	Time	Species
50	22:20	Common Pipistrelle Soprano Pipistrelle	50	22:20	Common Pipistrelle
51	22:20	Soprano Pipistrelle	51	22:22	Common Pipistrelle
52	22:20	Soprano Pipistrelle	52	22:25	Soprano Pipistrelle
53	22:20	Soprano Pipistrelle	53	22:25	Common Pipistrelle
54	22:21	Common Pipistrelle Soprano Pipistrelle	54	22:26	Brown Long Eared Bat
55	22:21	Soprano Pipistrelle	55	22:27	Soprano Pipistrelle
56	22:21	Soprano Pipistrelle	56	22:27	Soprano Pipistrelle
57	22:21	Soprano Pipistrelle	57	22:28	Soprano Pipistrelle
58	22:22	Soprano Pipistrelle	58	22:29;09	Myotis Sp.
59	22:22	Soprano Pipistrelle	59	22:29	Leisler's Bat Myotis Sp.
60	22:22	Soprano Pipistrelle	60	22:31	Common Pipistrelle
61	22:22	Common Pipistrelle Soprano Pipistrelle	61	22:32	Common Pipistrelle
62	22:23	Soprano Pipistrelle	62	22:32	Soprano Pipistrelle
63	22:23	Soprano Pipistrelle	63	22:33	Natterer's Bat
64	22:23	Soprano Pipistrelle	64	22:34	Common Pipistrelle
65	22:24	Common Pipistrelle Soprano Pipistrelle	65	22:34	Common Pipistrelle
66	22:24	Soprano Pipistrelle	66	22:35	Common Pipistrelle Soprano Pipistrelle
67	22:24	Soprano Pipistrelle	67	22:36	Common Pipistrelle Soprano Pipistrelle
68	22:24	Soprano Pipistrelle	68	22:37	Soprano Pipistrelle
69	22:25	Soprano Pipistrelle	69	22:37	Soprano Pipistrelle
70	22:25	Soprano Pipistrelle	70	22:37	Leisler's Bat
71	22:25	Soprano Pipistrelle	71	22:37	Leisler's Bat Soprano Pipistrelle
72	22:25	Soprano Pipistrelle	72	22:37	Soprano Pipistrelle
73	22:26	Common Pipistrelle	73	22:38	Soprano Pipistrelle
74	22:27	Soprano Pipistrelle	74	22:38	Common Pipistrelle Soprano Pipistrelle
75	22:27	Common Pipistrelle Soprano Pipistrelle	75	22:39	Myotis Sp. Common Pipistrelle
76	22:27	Common Pipistrelle	76	22:39	Common Pipistrelle
77	22:28	Common Pipistrelle	77	22:39	Common Pipistrelle
78	22:29	Common Pipistrelle	78	22:39	Common Pipistrelle Soprano Pipistrelle
79	22:29	Common Pipistrelle	79	22:40	Common Pipistrelle
80	22:29	Leisler's Bat	80	22:41	Soprano Pipistrelle
81	22:30	Common Pipistrelle	81	22:42	Soprano Pipistrelle
82	22:30	Common Pipistrelle	82	22:42	Common Pipistrelle Soprano Pipistrelle
83	22:31	Common Pipistrelle	83	22:42	Common Pipistrelle Soprano Pipistrelle
84	22:32	Common Pipistrelle	84	22:44	Common Pipistrelle
85	22:32	Common Pipistrelle	85	22:45	Common Pipistrelle
86	22:32	Common Pipistrelle	86	22:46	Common Pipistrelle
87	22:32	Common Pipistrelle	87	22:46	Common Pipistrelle
88	22:33	Common Pipistrelle	88	22:48	Common Pipistrelle
89	22:33	Common Pipistrelle Soprano Pipistrelle	89	22:49	Common Pipistrelle
90	22:33	Common Pipistrelle Soprano Pipistrelle	90	22:50	Common Pipistrelle
91	22:33	Common Pipistrelle Soprano Pipistrelle	91	22:50	Common Pipistrelle
92	22:34	Common Pipistrelle	92	22:50	Leisler's Bat
93	22:34	Soprano Pipistrelle	93	22:51	Leisler's Bat Common Pipistrelle
94	22:35	Common Pipistrelle	94	22:51	Common Pipistrelle
95	22:35	Common Pipistrelle	95	22:51	Leisler's Bat Common Pipistrelle
96	22:35	Common Pipistrelle X2	96	22:51	Leisler's Bat
97	22:35	Common Pipistrelle	97	22:52	Common Pipistrelle
98	22:36	Soprano Pipistrelle	98	22:52	Common Pipistrelle
99	22:36	Common Pipistrelle Soprano Pipistrelle	99	22:52	Common Pipistrelle
100	22:36	Myotis Sp. and Soprano Pipistrelle	100	22:52	Common Pipistrelle X1

Location 1 - 24/07/2025 Canon IR Farmhouse			location 2 - 24/07/2025 Thermal TK		
Number	Time	Species	Number	Time	Species
101	22:36	Soprano Pipistrelle	101	22:53	Common Pipistrelle
102	22:36	Soprano Pipistrelle	102	22:53	Common Pipistrelle
103	22:37	Soprano Pipistrelle	103	22:54	Common Pipistrelle
104	22:37	Common Pipistrelle Soprano Pipistrelle	104	22:54	Common Pipistrelle
105	22:37	Soprano Pipistrelle	105	22:54	Common Pipistrelle
106	22:37	Soprano Pipistrelle	106	22:54	Common Pipistrelle Soprano Pipistrelle
107	22:37	Soprano Pipistrelle	107	22:54	Common Pipistrelle
108	22:38	Common Pipistrelle	108	22:55	Common Pipistrelle
109	22:39	Soprano Pipistrelle	109	22:55	Soprano Pipistrelle
110	22:40	Soprano Pipistrelle X2	110	22:55	Common Pipistrelle
111	22:40	Soprano Pipistrelle	111	22:55	Common Pipistrelle
112	22:40	Common Pipistrelle	112	22:56	Common Pipistrelle
113	22:40	Common Pipistrelle	113	22:57	Common Pipistrelle
114	22:41	Common Pipistrelle	114	22:57	Common Pipistrelle
115	22:41	Common Pipistrelle	115	22:58	Soprano Pipistrelle
116	22:42	Soprano Pipistrelle	116	22:59	Common Pipistrelle Soprano Pipistrelle
117	22:42	Common Pipistrelle Soprano Pipistrelle	117	22:59	Common Pipistrelle
118	22:42	Common Pipistrelle Soprano Pipistrelle	118	23:00	Common Pipistrelle Soprano Pipistrelle
119	22:42	Common Pipistrelle Soprano Pipistrelle	119	23:00	Leisler's Bat
120	22:42	Common Pipistrelle Soprano Pipistrelle	120	23:01	Brown Long Eared Bat Common Pipistrelle
121	22:43	Common Pipistrelle Soprano Pipistrelle	121	23:01	Common Pipistrelle
122	22:43	Common Pipistrelle Soprano Pipistrelle	122	23:01	Common Pipistrelle Soprano Pipistrelle
123	22:43	Leisler's Bat Soprano Pipistrelle	123	23:02	Common Pipistrelle
124	22:44	Leisler's Bat Common Pipistrelle	124	23:02	Common Pipistrelle
125	22:44	Common Pipistrelle	125	23:02	Common Pipistrelle
126	22:44	Common Pipistrelle	126	23:02	Common Pipistrelle
127	22:44	Soprano Pipistrelle	127	23:02	Common Pipistrelle
128	22:45	Soprano Pipistrelle	128	23:02	Common Pipistrelle
129	22:45	Leisler's Bat Soprano Pipistrelle	129	23:03	Common Pipistrelle
130	22:45	Leisler's Bat	130	23:03	Common Pipistrelle
131	22:46	Leisler's Bat	131	23:03	Leisler's Bat Common Pipistrelle
132	22:46	Common Pipistrelle	132	23:03	Common Pipistrelle
133	22:46	Common Pipistrelle	133	23:04	Common Pipistrelle
134	22:46	Common Pipistrelle	134	23:04	Common Pipistrelle Soprano Pipistrelle
135	22:47	Common Pipistrelle	135	23:05	Leisler's Bat Common Pipistrelle
136	22:47	Common Pipistrelle	136	23:05	Common Pipistrelle
137	22:47	Common Pipistrelle	137	23:06	Common Pipistrelle Soprano Pipistrelle
138	22:47	Common Pipistrelle	138	23:06	Common Pipistrelle
139	22:48	Common Pipistrelle	139	23:06	Common Pipistrelle
140	22:48	Common Pipistrelle	140	23:07	Common Pipistrelle
141	22:48	Common Pipistrelle	141	23:07	Common Pipistrelle
142	22:49	Common Pipistrelle	142	23:07	Common Pipistrelle
143	22:49	Common Pipistrelle Soprano Pipistrelle	143	23:08	Common Pipistrelle
144	22:51	Common Pipistrelle	144	23:08	Common Pipistrelle
145	22:51	Leisler's Bat	145	23:08	Common Pipistrelle
146	22:52	Common Pipistrelle	146	23:08	Common Pipistrelle Soprano Pipistrelle
147	22:53	Soprano Pipistrelle	147	23:09	Leisler's Bat
148	22:53	Soprano Pipistrelle	148	23:12	Leisler's Bat Common Pipistrelle
149	22:54	Soprano Pipistrelle	149	23:12	Brown Long Eared Bat
150	22:54	Common Pipistrelle	150	23:13	Common Pipistrelle
151	22:55	Common Pipistrelle	151	23:13	Soprano Pipistrelle

Location 1 - 24/07/2025 Canon IR Farmhouse			location 2 - 24/07/2025 Thermal TK		
Number	Time	Species	Number	Time	Species
152	22:55	Common Pipistrelle	152	23:14	Common Pipistrelle
153	22:55	Common Pipistrelle	153	23:14	Common Pipistrelle
154	22:55	Common Pipistrelle	154	23:15	Leisler's Bat Soprano Pipistrelle
155	22:55	Common Pipistrelle	155	23:15	Common Pipistrelle
156	22:56	Common Pipistrelle	156	23:15	Common Pipistrelle
157	22:57	Common Pipistrelle	157	23:15	Common Pipistrelle
158	22:58	Soprano Pipistrelle	158	23:16	Soprano Pipistrelle
159	22:58	Common Pipistrelle Soprano Pipistrelle	159	23:16	Common Pipistrelle
160	22:58	Common Pipistrelle Soprano Pipistrelle	160	23:16	Common Pipistrelle Soprano Pipistrelle
161	22:58	Common Pipistrelle	161	23:17	Common Pipistrelle
162	22:59	Common Pipistrelle	162	23:17	Soprano Pipistrelle
163	22:59	Common Pipistrelle	163	23:19	Soprano Pipistrelle
164	22:59	Soprano Pipistrelle	164	23:20	Soprano Pipistrelle
165	23:00	Leisler's Bat	165	23:20	Common Pipistrelle
166	23:00	Common Pipistrelle	166	23:20	Common Pipistrelle
167	23:00	Leisler's Bat	167	23:20	Natterer's Bat Soprano Pipistrelle
168	23:00	Leisler's Bat Soprano Pipistrelle	168	23:21	Soprano Pipistrelle
169	23:01	Common Pipistrelle	169	23:21	Common Pipistrelle Soprano Pipistrelle
170	23:01	Common Pipistrelle	170	23:22	Common Pipistrelle
171	23:01	Leisler's Bat Soprano Pipistrelle	171	23:22	Soprano Pipistrelle
172	23:03	Leisler's Bat	172	23:23	Soprano Pipistrelle
173	23:03	Soprano Pipistrelle	173	23:24	Soprano Pipistrelle
174	23:04	Soprano Pipistrelle	174	23:24	Common Pipistrelle
175	23:05	Common Pipistrelle	175	23:25	Soprano Pipistrelle
176	23:05	Common Pipistrelle	176	23:25	Common Pipistrelle Soprano Pipistrelle
177	23:05	Common Pipistrelle	177	23:28	Common Pipistrelle
178	23:05	Common Pipistrelle	178	23:28	Soprano Pipistrelle
179	23:06	Common Pipistrelle X2	179	23:30	Soprano Pipistrelle
180	23:06	Common Pipistrelle	180	23:31	Common Pipistrelle
181	23:06	Common Pipistrelle	181	23:32	Soprano Pipistrelle
182	23:06	Common Pipistrelle	182	23:33	Common Pipistrelle
183	23:07	Common Pipistrelle	183	23:33	Common Pipistrelle
184	23:07	Common Pipistrelle	184	23:34	Soprano Pipistrelle
185	23:07	Common Pipistrelle	185	23:34	Leisler's Bat
186	23:07	Common Pipistrelle	186	23:35	Leisler's Bat
187	23:09	Common Pipistrelle	187	23:35	Soprano Pipistrelle
188	23:09	Soprano Pipistrelle	188	23:36	Leisler's Bat
189	23:09	Common Pipistrelle	189	23:36	Leisler's Bat Common Pipistrelle
190	23:09	Leisler's Bat	190	23:36	Leisler's Bat
191	23:09	Soprano Pipistrelle	191	23:37	Leisler's Bat Common Pipistrelle Soprano Pipistrelle
192	23:10	Brown Long Eared Bat	192	23:37	Leisler's Bat
193	23:11	Common Pipistrelle	193	23:37	Leisler's Bat
194	23:12	Leisler's Bat	194	23:37	Leisler's Bat
195	23:13	Common Pipistrelle	195	23:38	Leisler's Bat
196	23:13	Common Pipistrelle	196	23:38	Leisler's Bat
197	23:14	Leisler's Bat Common Pipistrelle	197	23:38	Leisler's Bat Soprano Pipistrelle
198	23:15	Common Pipistrelle	198	23:38	Soprano Pipistrelle
199	23:15	Common Pipistrelle	199	23:38	Leisler's Bat
200	23:15	Common Pipistrelle	200	23:39	Soprano Pipistrelle
201	23:15	Common Pipistrelle Soprano Pipistrelle	201	23:39	Leisler's Bat
202	23:16	Common Pipistrelle Soprano Pipistrelle	202	23:39	Leisler's Bat

Location 1 - 24/07/2025 Canon IR Farmhouse			location 2 - 24/07/2025 Thermal TK		
Number	Time	Species	Number	Time	Species
203	23:16	Common Pipistrelle Soprano Pipistrelle	203	23:39	Leisler's Bat
204	23:16	Soprano Pipistrelle	204	23:40	Leisler's Bat Soprano Pipistrelle
205	23:18	Common Pipistrelle	205	23:40	Leisler's Bat
206	23:18	Common Pipistrelle	206	23:40	Soprano Pipistrelle
207	23:19	Soprano Pipistrelle	207	23:41	Common Pipistrelle
208	23:20	Soprano Pipistrelle	208	23:42	Common Pipistrelle
209	23:22	Common Pipistrelle	209	23:42	Common Pipistrelle
210	23:22	Soprano Pipistrelle			
211	23:23	Common Pipistrelle			
212	23:24	Common Pipistrelle			
213	23:25	Soprano Pipistrelle			
214	23:25	Soprano Pipistrelle			
215	23:25	Soprano Pipistrelle			
216	23:26	Common Pipistrelle			
217	23:27	Common Pipistrelle			
218	23:30	Soprano Pipistrelle			
219	23:30	Common Pipistrelle			
220	23:32	Soprano Pipistrelle			
221	23:34	Common Pipistrelle			
222	23:34	Leisler's Bat			
223	23:35	Leisler's Bat			
224	23:35	Leisler's Bat			
225	23:35	Leisler's Bat			
226	23:35	Soprano Pipistrelle			
227	23:37	Leisler's Bat Common Pipistrelle			
228	23:38	Soprano Pipistrelle			
229	23:38	Soprano Pipistrelle			
230	23:39	Soprano Pipistrelle			
231	23:40	Leisler's Bat			
232	23:40	Soprano Pipistrelle			
233	23:41	Common Pipistrelle			
234	23:42	Common Pipistrelle			
235	23:42	Common Pipistrelle			
236	23:43	Common Pipistrelle			
237	23:44	Common Pipistrelle			
238	23:45	Common Pipistrelle			
239	23:46	Soprano Pipistrelle			

Appendix D STATIC DATA

Table 8-3: Static detector results – nightly breakdown

Detector	Date	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Nathusius Pipistrelle	Pipistrelle 40 kHz	Brown Long-eared	Lesser Horseshoe	Natterer's Bat	Unidentified Myotis	Total
1	21st May	19	2	3	0	1	0	0	0	0	25
1	4th June	11	63	16	0	0	0	0	0	0	90
1	24th July	61	129	65	0	1	12	2	2	5	277
1	25th July	96	113	42	0	0	16	0	2	9	278
1	26th July	76	146	49	0	0	11	0	1	6	289
1	27th July	47	63	31	0	0	7	0	3	6	157
1	28th July	126	43	28	0	0	16	0	2	5	220
1	29th July	86	95	51	0	0	17	0	2	10	261
1	30th July	75	100	94	0	0	20	0	0	5	294
1	31st July	60	261	87	0	0	9	1	4	5	427
1	1st Aug	83	136	58	0	0	14	0	2	3	296
1	2nd Aug	32	12	16	0	0	8	0	0	1	69
1	3rd Aug	11	7	4	0	0	0	0	0	0	22
1	4th Aug	69	57	24	0	0	24	0	0	6	180
1	5th Aug	109	182	62	0	0	5	0	0	6	364
1	6th Aug	75	47	30	0	0	11	0	1	2	166
1	7th Aug	127	149	42	0	0	12	0	1	4	335
1	8th Aug	87	94	29	0	0	16	0	0	3	229
1	9th Aug	66	208	0	0	0	8	0	1	5	288
1	10th Aug	130	264	308	0	0	9	0	0	10	721
1	11th Aug	87	302	205	0	0	7	0	2	4	607
1	12th Aug	133	211	112	0	1	14	0	1	6	478
1	13th Aug	189	193	113	0	0	6	0	0	7	508
1	14th Aug	189	285	141	1	0	10	0	1	8	635

Detector	Date	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Nathusius Pipistrelle	Pipistrelle 40 kHz	Brown Long-eared	Lesser Horseshoe	Natterer's Bat	Unidentified Myotis	Total
1	15th Aug	68	350	174	0	1	6	0	0	7	606
1	16th Aug	141	324	180	0	0	5	1	0	4	655
1	17th Aug	86	380	219	2	1	1	0	0	3	692
1	18th Aug	114	554	176	0	0	4	0	0	9	857
1	29th Sept	4	119	56	0	0	1	1	0	4	185
1	30th Sept	6	15	13	0	0	0	0	0	2	36
1	1st Oct	9	37	33	0	0	9	0	0	0	88
1	2nd Oct	10	97	14	0	0	4	0	0	2	127
1	3rd Oct	0	8	2	0	0	2	0	1	0	13
1	4th Oct	8	67	14	0	0	14	2	0	1	106
1	5th Oct	107	180	112	0	0	15	0	2	4	420
1	6th Oct	17	91	66	0	0	2	2	0	5	183
1	7th Oct	27	182	37	1	0	2	0	0	6	255
1	8th Oct	0	268	81	1	0	9	1	2	8	370
1	9th Oct	2	475	85	2	0	8	1	2	7	582
2	21st May	67	112	46	0	0	0	0	0	1	226
2	22nd May	59	122	42	0	0	0	0	2	2	227
2	23rd May	129	56	48	0	0	0	0	0	1	234
2	24th May	41	55	12	0	0	0	0	0	2	110
2	25th May	20	69	6	0	0	0	0	0	0	95
2	26th May	74	101	40	0	0	0	0	0	0	215
2	27th May	52	79	17	0	1	0	0	0	1	150
2	28th May	20	240	33	0	1	0	0	0	0	294
2	29th May	69	169	35	0	1	0	0	0	0	274
2	30th May	102	320	76	6	12	0	0	1	3	520
2	31st May	61	228	41	0	1	0	0	0	0	331
2	1st June	35	59	5	0	3	0	1	0	0	103

Detector	Date	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Nathusius Pipistrelle	Pipistrelle 40 kHz	Brown Long-eared	Lesser Horseshoe	Natterer's Bat	Unidentified Myotis	Total
2	2nd June	3	69	16	0	0	0	0	0	0	88
2	3rd June	43	74	22	0	1	0	0	0	2	142
2	24th July	95	248	115	0	0	0	0	1	3	462
2	25th July	59	290	159	0	1	2	0	1	2	514
2	26th July	44	105	83	0	0	0	0	2	3	237
2	27th July	34	256	86	0	0	1	0	0	1	378
2	28th July	45	272	183	0	0	1	0	1	3	505
2	29th July	85	325	307	0	0	0	0	1	3	721
2	30th July	60	167	171	0	0	1	0	0	3	402
2	31st July	71	848	477	0	4	0	0	0	5	1405
2	1st Aug	67	404	220	0	0	0	1	0	5	697
2	2nd Aug	121	1047	160	1	0	0	0	1	3	1333
2	3rd Aug	27	862	259	0	2	0	0	1	0	1151
2	4th Aug	47	471	454	0	0	0	0	1	3	976
2	5th Aug	56	276	114	0	0	0	0	0	2	448
2	6th Aug	55	856	201	0	0	0	0	0	2	1114
2	7th Aug	123	777	198	0	0	0	2	0	8	1108
2	8th Aug	99	1348	523	0	0	0	0	1	4	1975
2	9th Aug	84	774	0	0	0	0	0	1	7	866
2	10th Aug	88	1175	462	0	0	2	0	3	57	1787
2	11th Aug	88	266	304	0	1	0	1	0	4	664
2	12th Aug	46	46	45	0	0	0	0	0	1	138
2	13th Aug	37	132	80	0	0	0	0	0	1	250
2	14th Aug	37	165	111	0	0	0	0	0	0	313
2	15th Aug	57	983	447	0	1	0	1	0	1	1490
2	16th Aug	31	686	189	0	1	0	0	1	0	908
2	17th Aug	23	1325	505	0	0	0	0	0	1	1854

Detector	Date	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Nathusius Pipistrelle	Pipistrelle 40 kHz	Brown Long-eared	Lesser Horseshoe	Natterer's Bat	Unidentified Myotis	Total
2	18th Aug	26	827	358	0	0	0	0	0	2	1213
3	29th Sept	32	499	346	0	0	1	2	0	3	883
3	30th Sept	19	59	167	0	0	0	0	1	3	249
3	1st Oct	24	154	244	0	1	0	0	0	0	423
3	2nd Oct	2	79	87	0	0	0	1	0	1	170
3	3rd Oct	0	2	60	0	0	0	0	0	0	62
3	4th Oct	4	81	172	0	0	1	5	0	1	264
3	5th Oct	2	78	205	0	0	0	0	0	5	290
3	6th Oct	2	105	309	0	0	0	0	0	4	420
3	7th Oct	6	134	168	0	0	1	4	0	0	313
3	8th Oct	1	65	122	0	0	1	3	0	2	194
3	9th Oct	2	214	123	0	0	4	6	0	5	354