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APPENDIX 6-1

BASELINE BAT REPORT

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Baseline Bat Report

Kingston Stables, Knocknacarra West Proposed Large Scale Residential Development

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1. INTRODUCTION

1.1 Purpose of this Report

MKO was commissioned to complete a comprehensive assessment of the potential effects on bats, as part of an Environmental Impact Assessment Report (EIAR) for an application for planning permission of a proposed Large-scale Residential Development (LRD), at Knocknacarra, Co. Galway. This report provides details of the bat surveys undertaken, including survey design, methods and results, and recommendation to safeguard bats. An impact assessment based on the information contained in this report is carried out within the accompanying EIAR. The Proposed Development for which planning permission is being sought is a component of a larger residential development known as the Proposed Project. The Proposed Project involves the construction of more than 500 residential units and forms part of an overarching masterplan for a wider landholding referred to as the EIAR Study Area. It should be noted that the surveys and results outlined in this report cover the entire EIAR Study Area.

The report presents the ecological baseline recorded within the EIAR Study Area in relation to bats. Initial surveys were carried out in August 2023 to inform the project masterplan. Subsequent surveys were carried out between April and September 2024. An additional dusk emergence survey was carried out on the 11th May 2026. Surveys included a suitability appraisal and inspection of the habitats and potential roosting features present on site. Manual activity surveys and roost inspection surveys were carried out, as well as ground-level static detectors surveys. Ground levels static detectors were deployed at different locations across the site for a minimum of 10 nights during Autumn 2023 and Spring and Summer 2024.

The main objective of the surveys was to assess the site for its suitability for foraging and commuting bats, as well as assess and inspect any structures for potential roosts, including maternity roosts. The bat surveys were designed to establish the nature, scale and locations of potential bat activity within the site.

The bat survey and assessment were informed by a desk study and with reference to the following guidelines:

- *Bat Survey Guidelines: Traditional Farm Buildings Scheme. The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny (Aughney, T., Kelleher, C. & Mullen, D., 2008)).*
- *'Bat Workers' Manual' (3rd edn). JNCC, Peterborough (Mitchell-Jones, A.J. & McLeish, A.P. (eds) 2004).*
- *The Lesser Horseshoe Bat Conservation Handbook, Vincent Wildlife Trust (Schofield, HW., 2008).*
- *Bat Surveys for Professional Ecologists – Good Practice Guidelines (4th edn.) (Collins, 2023)*
- *Bat Roosts in Trees (Andrews, 2018)*
- *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA, 2006a)*
- *CIEEM (2013) Competencies for Species Surveys: Bats. Chartered Institute of Ecology and Environmental Management, Winchester.*
- *Guidelines for the Treatment of Bats during the Construction of National Road Schemes (NRA, 2006b)*
- *British Bat Calls: A Guide to Species Identification (Russ, 2012)*
- *Bat Mitigation Guidelines for Ireland – V2. Irish Wildlife Manuals, No. 134. (Marnell, Kelleher & Mullen 2022)*
- *UK Bat Mitigation Guidelines, (Reason, P. F. and Wray, S. 2023)*
- *Guidance Note 08/23: Bats and Artificial Lighting at Night (ILP, 2023)*
- *Lesser Horseshoe Bat Species Action Plan 2022-2026 (NPWS & VWT, 2022).*

1.2 Development Description

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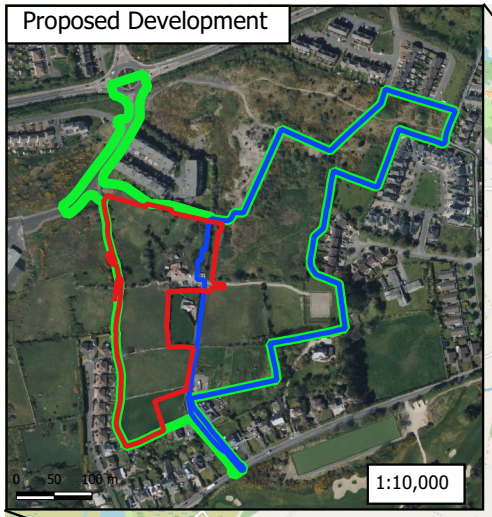
Planning permission is sought by Kingston Stables Ltd for development of a Large-Scale Residential Development (LRD) for a 10-year planning permission, on a site which extends to 2.9ha on lands located at Knocknacarra, Galway.

The Proposed Development will consist of the following:

- Provision of 133 no. residential units in 2 no. development areas with a mix of duplex and house types on a site area of 2.9 ha. The buildings range between 2 no. and 3 no. storeys in height. The development will comprise the following:
  - 51 no. 3-bed townhouses;
  - 6 no. 4-bed townhouses;
  - 1 no. 1-bed duplex apartments;
  - 1 no. 2-bed duplex houses;
  - 37 no. 2-bed ground floor duplex apartments;
  - 37 no. 3-bed duplex houses.
- Demolition of existing structures (388 m^2);
- Vehicular access to the Proposed Development from a permitted road (Planning Reference 24/60370 refers);
- Upgrades to the permitted road (Planning Reference 24/60370 refers);
- Pedestrian and cycle access to the adjacent Kingston Park (ACP Ref: 323873);
- Conversion and upgrade of an existing structure to a local centre (65.6 m^2);
- The provision of public open space;
- The provision of 192 no. bicycle parking spaces;
- The provision of 142 no. car parking spaces;
- Public lighting, bin stores, signage, services, 2 no. ground mounted substation kiosks, site landscaping and all ancillary site development and enabling works.

The proposed site lies in Galway city. The primary land use in the area is agriculture and husbandry. Previously cleared areas within the site are left unmanaged. The wider landscape consists of urban development and a golf course immediately to the south. A location map of the Proposed Development site is provided in Figure 1-1.

The Proposed Development described above for which planning permission is being sought is a component of a larger residential development known as the Proposed Project. The Proposed Project involves the construction of more than 500 residential units and forms part of an overarching masterplan for a wider landholding referred to as the EIAR Study Area. It should be noted that the surveys and results outlined in this report cover the entire EIAR Study Area.



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Map Legend

- EIAR Study Area Boundary
- Planning Application (red line) Boundary

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1:10,000,011.867952

0 1 2 km

Drawing Title: Site Location

Project Title: Kingston Knocknacarra LRD West

Drawn By	Checked By
NS	CK
Project No.	Drawing No.
251145	Fig 1-1
Scale	Date
1:100,000	02/07/2026

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1.3 Policy and Legislation

All Irish bats are protected under European legislation, namely the Habitats Directive (92/43/EEC). All Irish species are listed under Annex IV of the Directive, requiring strict protection for individuals, their breeding sites and resting places. The lesser horseshoe bat (*Rhinolophus hipposideros*) is further listed under Annex II of the Directive, requiring the designation of conservation areas for the species. Under this Directive, Ireland is obliged to maintain the favourable conservation status of Annex-listed species. This Directive has been transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011, as amended).

In addition, Irish species are further protected by national legislation (Wildlife Acts 1976, as amended). Under this legislation, it is an offence to intentionally disturb, injure or kill a bat or disturb its roost. Any work at a roost site must be carried out with the agreement of the National Parks and Wildlife Service (NPWS) and a derogation licence must be granted before works commence.

The NPWS monitors the conservation status of European protected habitats and species and reports their findings to the European Commission every 6 years in the form of an Article 17 Report. The most recent report for the Republic of Ireland was submitted in 2019. Table 1-1 summarises the current conservation status of Irish bat species and identified threats to Irish bat populations.

Table 1-1 Irish Bat Species Conservation Status and Threats (NPWS, 2019). Pressures and Threats are ranked from medium importance (M) to high importance (H) in the 2019 Article 17 report.

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

1.4 Bat Roosting Behaviour

Bats use a variety of natural and manmade structures as roosting or resting places. The type of roost and its level of use is determined by its function in the bat life cycle. Table 1-2 provides a summary of different types of bat roosts.

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Table 1-2 Bat Roost Types and Definitions

Roost Type	Definition
Day	Where individuals or small groups of male's rest/shelter in the day but are rarely found by night in summer.
Night	Where bats rest/shelter at night but are rarely found in the day.
Feeding	Where individuals rest/feed during the night but are rarely found during the day.
Transitional	Used by a few individuals for short periods of time prior to or following hibernation.
Swarming	Where large numbers gather in late summer to autumn. Important mating sites.
Mating	Where mating takes place in late summer to winter.
Maternity	Where females give birth and raise their young.
Hibernation	Where bats are found during winter (constant cool temperature and high humidity).
Satellite	An alternative roost found in close proximity to the main nursery colony.

There are currently no clear guidelines to determine the significance of a bat roost. All the largest roosts of lesser horseshoe bat in Ireland are of international importance and it is anticipated that all large Leisler's bat roosts (>100) would also have international significance (NRA, 2006). Table 1-3 provides some criteria for determining the significance of different building roosts, as determined by the Bat Expert Panel of the Heritage Council in 2003 (NRA, 2006).

Table 1-3 Level of Importance of Various Roosts

Species	Indicator	Significance
Lesser horseshoe bat	Special Area of Conservation	Very significant
	If present	Significant
Whiskered bat	>10	Very significant
	If present	Significant
Natterer's bat	>10	Very significant
	If present	Significant
Daubenton's bat	Maternity roost	Significant
Leisler's bat	Maternity roost	Significant
Common pipistrelle	Maternity roost	Significant
Soprano pipistrelle	Maternity roost	Significant
Brown long-eared bat	Maternity roost	Significant

The likelihood of detecting active roosts is determined by the timing of the roost survey. In general;

- April surveys may detect transitional roosts used by bats following hibernation and prior to summer roosting.

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- May-August surveys may detect maternity colonies and male/non-breeding female summer roosts.
- August surveys are best to determine maximum counts of adult and juvenile bats.
- August – October surveys may detect swarming and mating bats.
- September and October surveys may detect transitional roosts used by bats following the dispersal of maternity colonies and prior to hibernation.
- Day, night, feeding and satellite roosts may be found anytime between April and October.
- November – March surveys may detect hibernacula.

1.5 Statement of Authority

MKO employs a dedicated bat unit within its Ecology team, experienced in scoping, carrying out, and reporting on bat surveys, as well as producing impact assessments in relation to bats. MKO ecologists have relevant academic qualifications and are qualified in undertaking surveys to the levels required. MKO's Ecology team holds a bat derogation licence from NPWS. The licence is intended for professionals carrying out surveys with the potential to disturb roosting bats (i.e. roost inspections). Graduate and seasonal ecologist staff are included under the licence under condition of being accompanied by more experienced colleagues.

Survey scoping was prepared by Sara Fissolo. The daytime walkover survey and inspections were carried out by Sara Fissolo and David Culleton. Manual activity surveys were carried out by David Culleton, Kate Greaney, Laura McEntegert, Mairead Kavanagh, Fiona Killeen and Charlie Meehan. Data manual ID were carried out by David Culleton and Charlie Meehan. This report was prepared by David Culleton, was reviewed by Sara Fissolo, and was approved by Aoife Joyce. Staff's roles and relevant training are presented in Table 1-4 below.

Table 1-4 Project team qualifications and training.

Staff	Role	Qualifications and Training
Aoife Joyce (B.Sc., M.Sc.) 6 years' experience	Project Director	B.Sc. (Hons) Environmental Science, University of Galway, Ireland. M.Sc. (Hons) Agribioscience, University of Galway, Ireland. Advanced Bat Survey Techniques – Trapping, biometrics, handling (BCI), Bat Impacts and Mitigation (CIEEM), Bat Tree Roost Identification and Endoscope Training (BCI), Bats in Heritage Structures (BCI), Bats and Lighting (BCI), Kaleidoscope Pro Analysis (Wildlife Acoustics).
Sara Fissolo (B.Sc.) 4 years' experience	Project Ecologist	B.Sc. (Hons) Ecology and Environmental Biology, University College Cork, Ireland. Advanced Bat Survey Techniques (BCI), Bat Impacts and Mitigation (CIEEM), Bats in Heritage Structures (BCI), Bat Care (BCT), Bats and Lighting (BCI), Kaleidoscope Pro Analysis (Wildlife Acoustics).
David Culleton (B.Sc., M.Sc.) 2 years' experience	Bat Ecologist	B.Sc. (Hons) Zoology, University College Cork, Ireland. M.Sc. (Hons) Conservation Behaviour, Atlantic Technological University, Galway, Ireland. Bat Detector and Survey Training (BCI), Kaleidoscope Pro Analysis (Internal), Endoscope Training (Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).
Charlie Meehan (B.Sc., M.Sc.)	Seasonal Bat Ecologist	B.A. History and Classical Studies, National University of Ireland, Galway

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		M.Sc., Sustainable Environments, National University of Ireland, Galway Kaleidoscope Pro Analysis (Wildlife Acoustics), Endoscope Training (Internal), Structure and Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal)
Laura McEntegert (B.Sc.) **3 years' experience**	Ecologist	B.Sc. (Hons) Botany and Plant Science, National university of Ireland, Galway Bat Handling Training Course (BCI), Bats: Assessing the Impact of Development on Bats, Mitigation & Enhancement - (CIEEM), Kaleidoscope Pro Analysis (Wildlife Acoustics). Endoscope Training (Internal), Emergence and Re-Entry Surveys (Internal) Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal).
Kate Greaney (B.Sc., M.Sc.) **2 years' experience**	Ecologist	B.Sc. (Hons) Botany and Plant Science National university of Ireland, Galway, M.Sc. (Hons) Climate Change, Agriculture, and Food Security (MScCCAFS) National university of Ireland, Galway Kaleidoscope Pro Analysis (Wildlife Acoustics). Endoscope Training (Internal), Emergence and Re-Entry Surveys (Internal) Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal)
Mairead Kavanagh (B.Sc.) **2 years' experience**	Ecologist	B.Sc. (Hons) Botany and Plant Science National university of Ireland, Galway AASR and NIS for applications for clearfelling, reforestation, thinning, CCF, and forest road licenses. Experienced in the undertaking of impact assessments, evaluating scope, habitat and species identification, conducting project research, in-field surveys, data analysis and scientific report writing. Plant identification and fieldwork skills. Fossitt habitat identification, including habitat assessments in a forestry setting. Internal training Bat Detector and Survey Training (Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).
Fiona Killeen (B.Sc.) **2 years' experience**	Ecologist	B.Sc. (Hons) Environmental Science, University of Galway, Ireland Internal training Bat Detector and Survey Training (Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).

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2. METHODOLOGY

2.1 Desktop Study

A desktop review of published material was undertaken to inform all subsequent field studies and assessments. The aim of the desktop review was to identify the presence of species of interest within the site and surrounding region.

The following list describes the sources of data consulted:

- *Review of online web-mappers: National Parks and Wildlife Service (NPWS) mapping.*
- *Review of NPWS Article 17 Report.*
- *Review of the publicly available National Biodiversity Data Centre web-mappers.*
- *Review of specially requested records from the NPWS Rare and Protected Species Database for the hectads which overlap with the study area.*
- *Adopted Galway County Development Plan 2022-2028*
- *Galway City Development Plan 2023 -2029 – Appropriate Assessment*
- *BCI Database*
- *Review of NPWS Lesser Horseshoe Bat national dataset*

2.1.1 Bat Species' Range

EU member states are obliged to monitor the conservation status of natural habitats and species listed in the Annexes of the Habitats Directive. Under Article 17, they are required to report to the European Commission every six years. In April 2019, Ireland submitted the third assessment of conservation status for Annex-listed habitats and species, including all species of bats (NPWS, 2019).

The 2019 Article 17 Reports were reviewed for information on bat species' range and distribution in relation to the location of the EIAR Study Area.

2.1.2 National Bat Database of Ireland

The National Bat Database of Ireland and the National Lesser Horseshoe Bat Database holds records of bat observations received and maintained by Bat Conservation Ireland. These records include results of national monitoring schemes, roost records as well as ad-hoc observations. The database was searched for bat presence and roost records within a 10km radius of the EIAR Study Area, as well as general landscape suitability for bats.

2.1.3 Designated Sites

The potential for the proposed works to impact on sites that are designated for nature conservation is considered in separate Ecological Impact Assessment (EcIA) and Appropriate Assessment Screening (AASR) reports. Special Areas of Conservation (SACs) are designated under EU Habitats Directive. The European Sites that are within the Zone of Likely Impact, with bats identified as Qualifying Interests, are listed in Section 3.1.3 below.

Natural Heritage Areas (NHAs) are designated under the Wildlife (Amendment) Act 2000, and their management and protection is provided by this legislation and planning policy. Proposed Natural Heritage Areas (pNHAs) were designated on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. Any identified NHAs and pNHAs designated for the protection of bats are presented in Section 3.1.3 and potential for impacts was fully considered.

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2.1.4 Habitat and Landscape

2.1.4.1 Ordnance Survey Mapping

Ordnance survey maps (OSI 1:5,000 and 1: 50,000) and aerial imagery (ortho-based maps) were reviewed to identify any habitats and features likely to be used by bats. Maps and images of the site and general landscape were examined for suitable foraging, commuting or roosting habitats including woodlands and forestry, hedgerows, tree lines and watercourses.

2.1.4.2 Geological Survey Ireland

The Geological Survey Ireland (GSI) online mapping tool and University of Bristol Speleological Society (UBSS) Cave Database for the Republic of Ireland were consulted for any indication of natural subterranean bat sites, such as caves, within 10km of the proposed site (BCI, 2012) (last searched on the 13th March 2024).

2.1.4.3 National Monuments

The archaeological database of national monuments was reviewed for any evidence of manmade underground structures, e.g. souterrains, that may be used by bats (last searched on the 13th March 2024).

2.1.5 Previous Surveys

MKO reviewed any documentation of previous ecological assessments carried out in proximity to the site to inform the survey scope and determine what species composition and bat activity has been recorded in the wider area. A summary of relevant results from previous surveys is provided within the report.

2.2 Field Study

2.2.1 Bat Habitat Appraisal

The bat surveys described below cover the entire EIAR Study Area as shown in Figure 1-1. An initial bat habitat appraisal was undertaken by two surveyors in August 2023, using the since updated Collins (2016) guidelines. A second walkover survey of the EIAR Study Area was carried out during daylight hours on the 20th March 2024. All bat habitat assessments have since been updated to adhere to the current (Collins, 2023) guidance as a result of the 2024 survey. The landscape features on the site were visually assessed for potential use as bat roosting habitats and commuting/foraging habitats using a protocol set out in BCT *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edn.) (Collins, 2023). The aim of the survey was to identify suitable bat habitats within the site.

Table 4.1 of the 2023 BCT Guidelines identifies a grading protocol for assessing structures, as well as commuting/foraging habitat for bats, which is summarised in Table 2-1. The protocol is divided into five Suitability Categories: *High, Moderate, Low*, *Negligible and None*. Table 4.2 of the 2023 BCT Guidelines identifies a grading protocol to assess trees, which is divided into three Suitability Categories: NONE (No suitability), FAR (Further Assessment Required), and PRF (Potential Roosting Feature present). This initial tree grading protocol can inform a preliminary roost assessment (PRA) to determine the available tree-roosting resource within the site, depending on whether a PRF could accommodate a small number of bats (PRF-I) or a larger roost, including maternity roosts (PRF-M). More information on PRAs is provided below.

Table 2-1 BCT protocol for bat habitat appraisals (Collins, 2023)

Assessment	Rationale
High	Structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat. Continuous, high-quality, well-connected habitats, connected to known roosts.
Moderate	A structure used by bats due to their size, shelter, protection, conditions and surrounding habitat, but are unlikely to support a roost of high conservation status, and suitable, connected habitats.
Low	Structures with one or more potential roost sites that could be used by an individual bat opportunistically, and suitable but isolated habitats that could be used by a small number of bats.
Negligible	No obvious features present, but a level of uncertainty remains.
None	No habitat features likely to be used by roosting, foraging or commuting bats.

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2.2.1.1 Preliminary Roost Assessment

A search for roosts was undertaken within the EIAR Study Area by three licenced ecologists to inspect any structures and to identify any potential roost features (PRFs).

The western section of the site was initially visited in August 2023 and all structures present were subject to an interior inspection. The site was re-visited in March and August 2024 and May 2026. All structures identified within the site were again assessed for their potential to support roosting bats. A systematic search of all accessible interiors, including all attic spaces, was undertaken. The exterior of each building was inspected first from ground level and included all accessible windowsills, walls, eaves, roof ridge and roof slates. Inspections were carried out with the aid of torches, a ladder, an endoscope, a thermal camera and binoculars, and searched for evidence of bat use, including live and dead specimens, droppings, feeding remains, urine splashes, fur oil staining and noises, as well as potential access points into the structure.

The EIAR Study Area contains a number of trees isolated or within treeline habitats. Roosting suitability was assessed at feature level, and areas were marked in accordance to BCT Guidance (Collins, 2023) during the initial walkover surveys to inform need for further surveys and assessment.

Trees present within the site/within the Proposed Development footprint were examined from ground level for the presence of rot holes, hazard beams, cracks and splits, partially detached bark, knot holes, gaps between overlapping branches and any other PRFs identified by Andrews (2018).

Ten structures and fourteen trees were assessed and are described in Section 3.2.1 below.

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2.3 Bat Activity Surveys

2.3.1 Presence/Absence and Night Bat Walkover Surveys

Manual activity surveys included presence/absence surveys focusing on features identified as having potential for roosting bats, as well as night-time bat walkovers (NBW). For each of the surveys, surveyors were equipped with active full spectrum bat detectors, Batlogger M (Elekon AG, Lucerne, Switzerland). Where possible, species identification was made in the field and any other relevant information was also noted, e.g., numbers, behaviour, features used, etc. All bat echolocation was recorded for subsequent analysis to confirm species identifications, as detailed in Section 2.4. The survey effort is summarised in Table 2-2 and presented in Figure 2-1.

Table 2-2 Bat Activity survey effort

Date	Surveyors	Type	Sunrise/Sunset	Weather
03/08/2023	Ryan Connors & Laura Granicz	Roost Emergence & Walkover	22:43	15°C, Dry, Calm
24/04/2024	Laura McEntegert & Fiona Killeen	Night-time bat walkover	20:56	14°C, Dry, Calm
02/05/2024	David Culleton & Charlie Meehan	Roost Emergence	21:08	13°C, Drizzle, Calm
20/05/2024	David Culleton & Mairead Kavanagh	Roost Emergence	21:38	14-16°C, Dry, Light Breeze
06/06/2024	David Culleton & Kate Greaney	Night-time bat walkover	20:17	13°C, Dry, Light Breeze
03/07/2024	Laura McEntegert & Charlie Meehan	Roost Emergence	22:06	13°C, Dry, Light Breeze
04/09/2024	David Culleton & Kate Greaney	Roost Emergence	21:59	14°C, Dry, Light Breeze
11/05/2026	Deepali Mooloo Chandra Walters Jo Ruane	Roost Emergence	21:22	11 - 12°C; dry; calm - light breeze

2.3.1.1 Presence/Absence Surveys

Four structures identified during the bat habitat appraisal as having potential to host roosting bats were subject to presence/absence surveys in the form of dusk emergence surveys. Rationale for survey effort was based on guidelines proposed by Collins in Tables 7.1 and 7.2 (Collins, 2023).

Surveyors were located at various vantage points with a focus on potential access point and roosting features identified during the daylight walkover surveys. The purpose was to identify any bat species, numbers, access points and roosting locations within each the PRF structure. Night vision aids (NVAs), including a thermal camera and an infrared camera, aided the 2024 survey effort, as detailed below. Surveys were carried out in favourable weather conditions (Table 2-2). Roost emergence surveys commenced at least 15 minutes before sunset and concluded approximately 1.5 hours after sunset.

A dusk emergence survey was undertaken in May 2026 survey at the proposed structures to be demolished/modified, as part of the Proposed Development (i.e. Stone Shed 1 and Stone Shed 2). Three surveyors were present during the emergence survey. The aim of this survey was to identify bat species using the site and to gather any information on bat behaviour and important features used by bats. Bat activity was also monitored in the surrounding area. Surveyors were equipped with active full

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spectrum bat detectors, Batlogger M (Elekon AG, Lucerne, Switzerland). Surveyors were positioned surrounding the buildings with a clear view of the structures and associated linear features and habitats. Where possible, species identification was made in the field and any other relevant information was also noted, e.g. numbers, behaviour, features used, etc. The dusk survey commenced 15 minutes before sunset and was completed within 2 hours after sunset. Conditions were suitable for bat survey with no to light wind, dry and mild weather (see Table 2-2 for full details).

Night Vision Aids

The use of NVAs is now considered standard best practice for bat activity surveys. MKO employs thermal camera equipment (InfiRay Eye II V2.0 and Pixfra RANGER R625). The thermal camera, mounted on a tripod, was used during roost surveys to identify potential roosting hotspots and monitor emergence activity. The camera was fully monitored by a surveyor, who was equipped with a bat detector to record bat echolocation calls.

Footage from NVAs was saved and reviewed in office in full, with any instances of emergence marked for future use.

2.3.1.2 Night-time Bat Walkover

Manual activity surveys also comprised night-time bat walkovers at dusk, which were carried out on the 3rd August 2023, and on the 24th April and 6th June 2024. The aim of this survey was to observe bat species using the site and visually assess bat behaviour and important features used by bats within the site.

The walkovers were undertaken by two surveyors, recording bats in real time. Surveys commenced at sunset and were completed within 2 hours after sunset. Surveyors were equipped with one active full spectrum bat detector. The walkover routes were prepared with reference to the proposed layout, desktop and walkover survey results, as well as any health and safety considerations and access limitations. As such, they generally followed existing roads and tracks. The transect routes are presented in Figure 2-1.

2.3.2 Static Detectors Surveys

In 2023, five full spectrum SM4 bat detectors (Wildlife Acoustics, Maynard, MA, USA), were deployed during the main bat activity period to record bat activity for an extended period. The detectors were deployed on the 3rd August 2023 and collected on the 1st September 2023. The five locations of static detectors were selected to represent the range of habitats present within the areas of the site accessible at the time, and particularly suitable bat habitats. This data informed the scope for further survey effort in 2024.

In 2024, six full spectrum SM4 bat detectors were deployed across the site. Detectors were deployed on the 2nd of May 2024 and collected on the 20th May 2024. They were deployed in the same six locations on the 3rd July 2024 and collected on the 30th July 2024. The detector locations were spread out across the site, including areas not previously surveyed in 2023, and covered a range of seasons i.e. spring, summer, autumn.

Settings used were those recommended by the manufacturer for bats, with minor adjustments in gain settings and band pass filters to reduce background noise when recording. Detectors were set to record from 30 minutes before sunset until 30 minutes after sunrise. The Song Meter automatically adjusts sunset and sunrise times using the Solar Calculation Method when provided with GPS coordinates. Static detector locations are shown in Figure 2-1 and presented in Table 2-3.

Table 2-3 Static Detector Locations

Year	Detector ID	IG Reference	Habitat
2024	D01	M 26867 24816	Scrub
	D02	M 26822 24685	Hedgerow
	D03	M 26789 24589	Treeline, Scrub
	D04	M 26625 24463	Treeline, Stone wall
	D05	M 26638 24656	Stone wall, Hedgerow
	D06	M 26627 24765	Stone wall, Hedgerow
2023	D01A	M 26623 24467	Treeline
	D02A	M 26822 24691	Stone wall, Treeline
	D06A	M 26626 24760	Scrub, Stone wall
	D07A	M 26754 24793	Spoil
	D08A	M 26785 24962	Treeline, Stone wall

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2.4 Bat Call Analysis

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

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

Individual bats of the same species cannot be distinguished by their echolocation alone. Thus, 'bat passes' was used as a measure of activity (Collins, 2023). A bat pass was defined as a recording of an individual species/species group's echolocation containing at least two echolocation pulses and of maximum 15s duration. All bat passes recorded in the course of this study follow these criteria, allowing comparison. Due to the volume of bat activity data recorded, where multiple bat passes were recorded within the same registration, rarer or harder to record species were identified. Underreporting of common species is possible using this method, and is accounted for within the assessment.

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

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

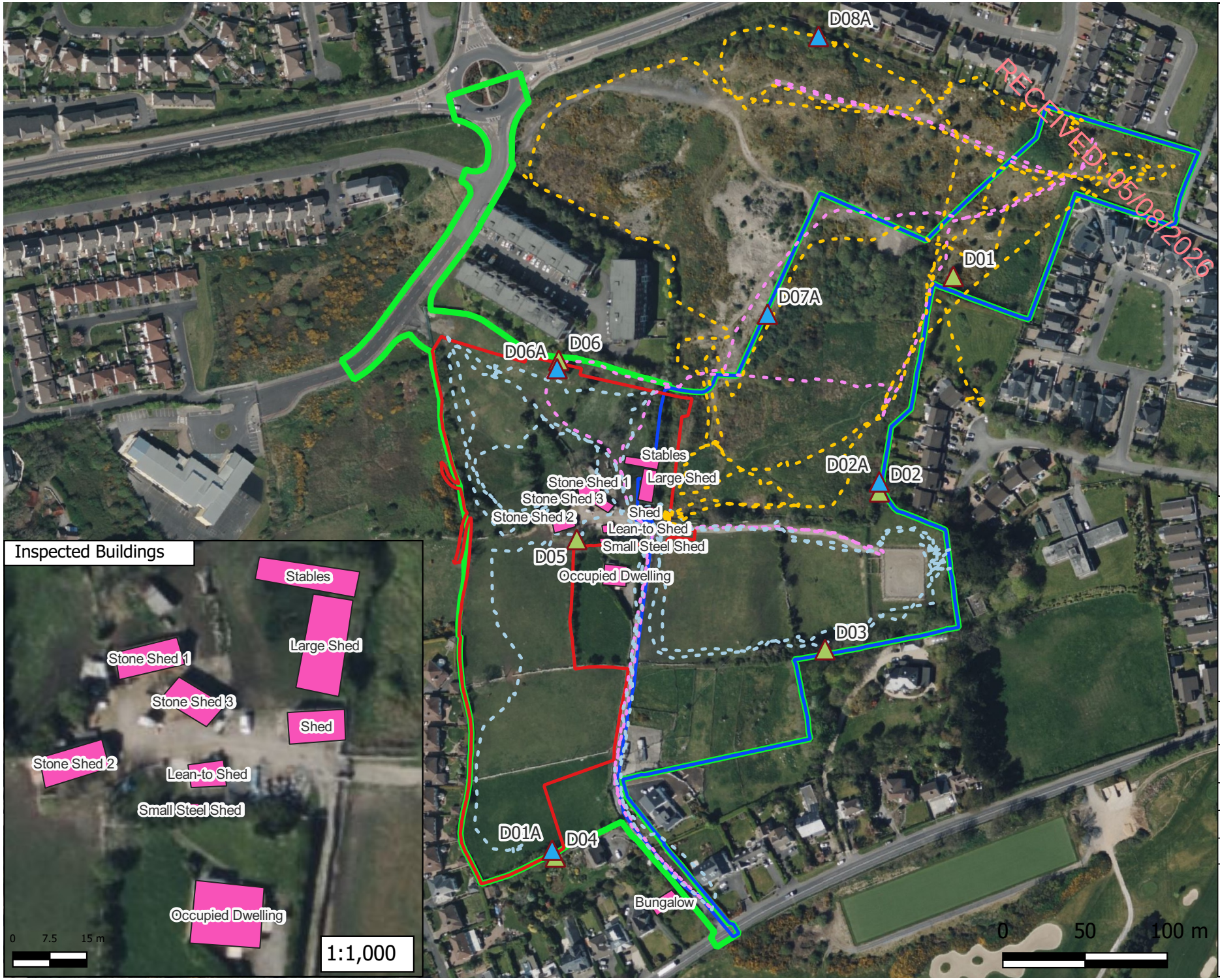
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2.5 Assessment of Bat Activity Levels

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

Ecobat was unavailable for a cross-site analysis of static data as the platform has been undergoing maintenance since late 2022 with no proposed timeline of a relaunch. Therefore, activity levels were assessed based on professional experience gained from performing bat surveys in a wide variety of Irish habitats.

All statistical analyses and graphical representations in this report were conducted using R (version 4.3.2), and RStudio (Version 2024.09.+375.). R is a powerful statistical programming language and provided the framework for data manipulation and statistical testing. To allow this, data were standardised into bat passes per hour. RStudio, as an integrated development environment for R, facilitated efficient coding, visualization, and reproducibility. The 'ggplot2' package in R was particularly instrumental in creating the detailed graphs presented in the results section.



Map Legend

- Planning application (red line) boundary
- LRD East boundary
- EIAR Study Area Boundary
- Inspected buildings
- Transect Route 03.08.2023
- Transect Route 24.04.2024
- Transect Route 06.06.2024

Static Detectors

- 2023
- 2024

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Drawing Title: Survey Effort

Project Title: Kingston Knocknacarra LRD West

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Scale	Date
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3. RESULTS

3.1 Desktop Study

3.1.1 Galway City Development Plan 2023 -2029

The Galway City development plan 2023-2029 – Appropriate Assessment was searched for references specific to the protection of bats. The objective in the following Table 3-1 was found.

Table 3-1 Galway City Development plan 2023 – 2029 – Appropriate Assessment

Policies and Objectives	Background recommendation	Recommendation
Policy 9.7.1 - Light Pollution	Lighting: Ensure that new developments meet the most up-to-date standards provided for lighting measures, including inclusion of dark zones, and sensor lighting and warmer spectrum lights. Bats and Lighting: Guidance Notes for: Planners, engineers, architects and developers (Bat Conservation Ireland, 2010) incorporates details of suitable lighting designs. Lighting on linear infrastructures can lead to disturbance or disruption along the route of an important ecological corridors, such as hedgerows and watercourses. Greenways and blue spaces often make amenity use of such linear features, and as such lighting should be carefully managed to ensure coherence of the supporting habitats of European sites, as outlined in Article 10 of the Habitats Directive.	Recommendation: Ensure the design of **external lighting minimises the incidence of light pollution, glare and spillage into the surrounding environment** and has due regard to the visual and residential amenities of surrounding areas and is so designed to mitigate adverse impacts on wildlife and ecosystems. Inclusion of **dark zones and sensor lighting** should be included where feasible. Lighting on linear infrastructures, including greenways and blueways, should be carefully managed to ensure the ecological coherence of the Natura 2000 network in accordance with Article 10 of the Habitats Directive.

3.1.2 Galway Co. Development Plan – 2022-2028

The adopted Galway County Development Plan was searched for references specific to the protection of bats. The following objective was found:

NHB 9 Protection of Bats and Bats Habitats
Seek to protect bats and their roosts, their feeding areas, flight paths and commuting routes. Ensure that development proposals in areas which are potentially important for bats, including areas of woodland, linear features such as hedgerows, stonewalls, watercourses and associated riparian vegetation which may provide migratory/foraging uses shall be subject to suitable assessment for potential impacts on bats. This will include an assessment of the cumulative loss of habitat or the impact on bat populations and activity in the area and may include a specific bat survey. Assessments shall be carried out by a suitably qualified professional and where development is likely to result in significant adverse effects on bat populations or activity in the area, development will be prohibited or require mitigation and/or compensatory measures, as appropriate. The impact of lighting on bats and their roosts and the lighting

up of objects of cultural heritage must be adequately assessed in relation to new developments and the upgrading of existing lighting systems.

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3.1.3 Bat Species' Range

The EIAR Study Area is within the range for all resident bat species in Ireland, as mapped in the Article 17 reporting.

3.1.4 National Bat Database of Ireland

A review of the National Bat Database of Ireland and National Lesser Horseshoe Bat Database on the 2nd July 2026 yielded results of bats within a 10km hectad of the EIAR Study Area. The search yielded 7 bat species within 10km. Table 3-1 lists the bat species recorded within the hectad which pertains to the proposed works site (M22).

A review of the NBDC bat landscape map provided a habitat suitability index of 37.44 (red). This indicates that the area within which the EIAR Study Area is located has high habitat suitability for bat species.

Table 3-2 NBDC Bat Records

Hectad	Species	Date of last record	Database	Status
M22	Brandt's bat (*Myotis brandtii*)	24/09/2015	National Bat Database of Ireland	Annex IV
M22	Brown Long-eared Bat (*Plecotus auritus*)	14/08/2021	National Bat Database of Ireland	Annex IV
M22	Daubenton's Bat (*Myotis daubentonii*)	23/08/2021	National Bat Database of Ireland	Annex IV
M22	Lesser Horseshoe Bat (*Rhinolophus hipposideros*)	02/06/2021	National Lesser Horseshoe Bat Database	Annex II, Annex IV
M22	Lesser Noctule (*Nyctalus leisleri*)	20/09/2022	Ireland's BioBlitz	Annex IV
M22	Natterer's Bat (*Myotis nattereri*)	11/08/2021	National Bat Database of Ireland	Annex IV
M22	Nathusius'pipistrelle (*Pipistrellus nathusii*)	30/05/2021	National Bat Database of Ireland	Annex IV
M22	Pipistrelle (*Pipistrellus pipistrellus* sensu lato)	15/09/2021	Ireland's BioBlitz	Annex IV
M22	Soprano Pipistrelle (*Pipistrellus pygmaeus*)	20/09/2022	Ireland's BioBlitz	Annex IV

3.1.5 Designated Sites

Within Ireland, the lesser horseshoe bat is the only bat species requiring the designation of Special Areas of Conservation (SACs). The EIAR Study Area is situated within the current known range for this species and there is one SAC designated for its protection within 10km of the EIAR Study Area. However, the roost for which the SAC is designated is located 33km away from the site (Table 3-3).

Table 3-3 Special Areas of Conservation within 10km designated for bats

Designated Site	Distance to Site	Approx. distance to the roost of the designated species	Species
Lough Corrib SAC	2.7km	33km	Lesser horseshoe bat

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One Natural Heritage Areas (NHAs), or proposed NHAs, designated for the protection of bats were identified within 10km of the EIAR Study Area (Table 3-4).

Table 3-4 European and National and proposed National Sites Designated to Bats

Designated Site	Distance to Site	Species	Roost Type
Killarainy Lodge, Moycullen	9.2km	Natterer's bat	Maternity

3.1.6 Habitat and Landscape

A review of mapping and photographs provided insight into the habitats and landscape features present within the EIAR Study Area. In summary, the primary land use within the EIAR Study Area is agriculture and animal husbandry.

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

A search of the UBSS Cave Database for the Republic of Ireland found three caves within 10km of the study area (Table 3-5).

Table 3-5 Caves within 10km of the EIAR Study Area

Name	Distance to Site	Description
Terryland/Coole's cave	2.9km	10m passage to collapsed chamber
Cooper's Cave	5.7km	3x1m opening to cave. Identified Lesser Horseshoe roost
Newry hole	6.8km	Chamber with calcite and pool

No national monuments are reported within the site.

3.1.6.1 Menlo Castle Restoration Project (2022)

Menlo Castle is a protected structure located approximately 3.5km from the EIAR Study Area, in the outskirts of Galway City. Regular monitoring has been conducted on Menlo Castle to record the number of roosting bats since the discovery of a lesser horseshoe bat maternity roost in 2000. Surveys have been conducted by consultants (including MKO) and the NPWS. A summary of results of previous surveys MKO conducted, along with surveys detailed in public reports are shown in Table 3-6.

Table 3-6 Number of species recorded roosting in Menlo Castle per survey year.

Year	Maximum count of roosting bats
2024	13 Lesser horseshoe bat
2023	6 Lesser horseshoe bat
2022	37 Lesser horseshoe bat 4 Soprano pipistrelles
2021	34 Lesser horseshoe bat
2018	20 Lesser horseshoe bat
2017	43 Lesser horseshoe bat
2016	35 Lesser horseshoe bat
2015	32 Lesser horseshoe bat
2014	35 Lesser horseshoe bat
2012	27 Lesser horseshoe bat
2009	38 Lesser horseshoe bat
2006	2 Lesser horseshoe bat
2005	5 – 10 Lesser horseshoe bat
2000	12+ Lesser horseshoe bat 20 Daubenton's bat 20+ Brown long-eared bat <30 Natterer's bat 1 Soprano pipistrelle

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3.1.7 Other Surveys

As part of the masterplan, surveys were conducted on a derelict bungalow located outside the southern boundary of the EIAR Study Area (IG Ref: M 26693 24436). Access was not granted for an interior inspection in 2023, but the structure was inspected in 2024. No evidence of roosting bats was found within structure during the interior inspection on 20th March 2024, however a small number of gaps potentially suitable for crevice dwelling bats was identified (Plate 3-29). It was assigned a *Low* roosting potential. Two Soprano pipistrelles were observed emerging from the structure during surveys in 2023. A demolition proposal for the bungalow has been granted in 2021 as part of a previous planning application. A derogation licence to remove the roost has been granted by NPWS on 25th April 2024 (DER-BAT-2024-103).

3.1.8 Conclusion of the Desktop Study

The desktop study has provided information about the existing bat activity up to 10km around the EIAR Study Area. The existing records showed the presence of nine bat species in the area including notably the Brandt's bat recorded in 2015 according to the NBDC records. The species is considered vagrant in Ireland. The lesser horseshoe bat was also present in the existing records.

Lough Corrib SAC is the only designated site for lesser horseshoe bat within the Zone of Influence of the EIAR Study Area. The EIAR Study Area is not within the core 2.5km foraging range of the roost for which the SAC is designated. The site is located within 3.3km of the lesser horseshoe bat populations recorded at Menlo castle and is therefore outside of the core foraging range of the species. Menlo castle not designated as an SAC; however, the population of lesser horseshoe bats associated with this roost are considered of National Importance.

3.2 Field Surveys

3.2.1 Bat Habitat Appraisal

The EIAR Study Area consists primarily of recolonising bare ground, scrub, grassland and buildings and artificial surfaces. Treelines and hedgerows are also present at each boundary, and throughout the

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southern section of the site. A detailed description of the habitats located onsite are presented in the Biodiversity Chapter of the accompanying Environmental Impact Assessment Report (EIAR).

With regard to foraging and commuting bats, the site is considered of *Moderate* suitability due to the large amount of scrub habitat, current lack of artificial lighting, access to roosting resources and network of treelines and hedgerows throughout the site. However, there is low habitat diversity and lack of connectivity to the wider landscape. Built and open areas, such as building yards and open grassland are considered of *Low* suitability; however, they are usually surrounded by linear habitats and do not limit connectivity within the site.

With regard to roosting bats, trees which include mature deciduous trees present some suitable roosting spaces for bats, in varying capacity. Where trees are proposed for felling, they were subject to a roost inspection which is described below. In general, habitats within the site were assessed as having *Low* suitability to host roosting bats. Structures on site contain multiple access points and potential roosting features with varying levels of suitability and are assessed further below.

3.2.1.1 Preliminary Roost Assessment

3.2.1.1.1 *PRF Structures*

Ten structures were identified as part of the roost assessment effort. Each building was subjected to an interior inspection, to detect potential evidence of bat use. The majority of the buildings are located in close proximity to each other, within a farmyard located in the centre of the EIAR Study Area. The locations of the buildings are shown in Figure 3-1.

Stone Shed 1

Stone Shed 1 is a derelict old stone dwelling with a corrugated roof located within the farmyard (IG Ref: M 26647 24686) (Plate 3-1). Multiple potential access points were identified within crevices in the stone walls, and in gaps in the roof and doorways (Plate 3-2). Evidence of feeding remains in the form of butterfly wings were found within the structure (Plate 3-3, Plate 3-4). It was assigned a *Moderate* roosting potential. The shed was subject to a dusk emergence survey on the 2nd of May and 4th September 2024 and the 11th May 2026, as detailed in Section 3.3. This structure is contained within the boundary of the Proposed Development site and will be affected by the proposed works.



Plate 3-1 Stone Shed 1 northern aspect



Plate 3-2 Access through the window



Plate 3-3 Feeding remains within Stone Shed 1



Plate 3-4 Stone Shed 1 interior

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Stone Shed 2

Stone Shed 2 is a derelict stone shed with a partially collapsed asbestos roof located to the southwest of Stone Shed 1 (IG Ref: M 26631 24667) (Plate 3-5 and 3-6). No evidence of roosting bats was found within the derelict shed during the inspection, however numerous potential access points and a number of gaps suitable for crevice dwelling bats were identified (Plate 3-7, Plate 3-8). Thus, it was assigned a *Moderate* roosting potential. The shed was subject to a dusk emergence survey on the 20th May and 3rd of July 2024 and 11th May 2026, as detailed in Section 3.3. This structure is contained within the boundary of the Proposed Development site and will be affected by the proposed works.



Plate 3-5 Stone Shed 2 northern aspect



Plate 3-6 Stone Shed 2 southern aspect



Plate 3-7 Stone Shed 2 interior



Plate 3-8 Large crack in interior stonework

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Stone Shed 3

Stone Shed 3 is a plastered stone stable building with a corrugated roof southeast of Stone Shed 1 (IG Ref: M 26654 24678) (Plate 3-9, Plate 3-10, Plate 3-11). Gaps in the doors and a large crack in the north-facing wall provide potential access for bats to the interior (Plate 3-12). No evidence of roosting bats was found within the derelict shed during the inspection, and little roosting potential was identified. Therefore, it was assigned a *Low* roosting potential. The shed was subject to a dusk emergence survey on 2nd of May and 4th September 2024, as detailed in Section 3.3. This structure is contained within the boundary of the Proposed Development site and will be affected by the proposed works.



Plate 3-9 Stone Shed 3, southern aspect



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Plate 3-10 Stone Shed 3, northern aspect



Plate 3-11 Stone Shed 3, interior

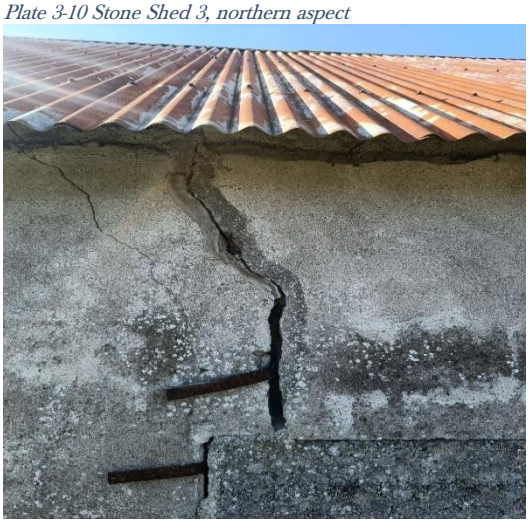


Plate 3-12 Large crack in stonework on northern wall

Large Shed

The Large Shed is a farm building currently used for storage and machinery (IG Ref: M 26680 24691) (Plate 3-13). The structure is located beyond the Proposed Development site boundary. It will be demolished as part of the adjacent proposed LRD East development (GCC Planning Ref. 25/60320; ACP Ref.-ACP 324237-26). No evidence of roosting bats was found within the structure during the inspection. Multiple potential access points were identified but no roosting features were present. It was therefore assigned a *Negligible* roosting potential.



Plate 3-13 Large Shed, western aspect



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Plate 3-14 Large Shed, interior

Shed

The Shed is a newly built, uninsulated concrete structure used for livestock and storage (IG Ref: M 26679 24676). The structure is open at the southern side, and has a corrugated roof (Plate 3-15 below). No evidence of roosting bats was found within during the inspection. It was therefore assigned a *Negligible* roosting potential. The structure is located beyond the Proposed Development site boundary. It will be demolished as part of the adjacent proposed LRD East development (GCC Planning Ref. 25/60320; ACP Ref.-ACP 324237-26).

Stables

The Stables are a newly built concrete structure with a corrugated iron roof located to the north of the Large Shed (IG Ref: M 26675 24699) (Plate 3-16 below). No evidence of roosting bats was found within the Stables, and no potential roost features were identified during the inspection. It was assigned a *Negligible* roosting potential. The structure is located beyond the Proposed Development site boundary. It will be demolished as part of the adjacent proposed LRD East development (GCC Planning Ref. 25/60320; ACP Ref.-ACP 324237-26).

Small Steel Shed

The Small Steel Shed is a newly constructed corrugated steel structure (IG Ref: M 26652 24660) (Plate 3-17 below). No evidence of roosting bats was found within the derelict shed. It was assigned a *Negligible* roosting potential. This structure is contained within the boundary of the Proposed Development site and will be demolished to facilitate the proposed works.



Plate 3-15 Shed, southern aspect



Plate 3-16 Stables, southern aspect

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Plate 3-17 Small Steel Shed, northern aspect

Lean-to Shed

The Lean-to Shed is a corrugated iron shed that is connected to a stone wall on its south and eastern sides (IG Ref: M 26659 24665) (Plate 3-18). The north face of the structure is completely open (Plate 3-19). Interior roof felt provides roosting potential within this structure (Plate 3-20), though no evidence of roosting bats was found. It was assigned a *Low* roosting potential. The Lean-to shed was subject to a dusk emergence survey on 3rd July of 2024. This structure is contained within the boundary of the Proposed Development site and will be demolished to facilitate the proposed works.



Plate 3-18 Northern aspect of lean-to shed



Plate 3-19 Lean-to shed interior



Plate 3-20 Interior roof felt



Plate 3-21 Gaps under corrugated roof

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Occupied House

The Occupied House (Plate 3-22 and 3-23) is located in the centre of the EIAR Study Area and outside the Proposed Development site boundary (IG Ref: M 26662 24635). The structure was inspected on the 20th August 2024. The roof of the structure has been newly renovated and the attic is currently in use (Plate 3-25). No evidence of roosting bats was found within the house and no access points for roosting bats were identified during the inspection. It was therefore assigned a *Negligible* roosting potential.



Plate 3-22 Occupied House, northern aspect



Plate 3-23 Occupied house, southwest aspect



Plate 3-24 Attic interior



Plate 3-25 Attic interior

3.2.1.1.2 PRF Trees

The site comprised a network of treelines and hedgerows bordering existing tracks and roads, as well as agricultural grassland. Deciduous trees identified throughout the Proposed Development boundary and EIAR Study Area were assessed for their potential to host roosting bats. The majority of linear features comprised hedgerows with sparse, immature trees with no potential roosting features. 14 trees were identified as having suitable Potential Roosting Features. Those trees identified as having suitable PRFs were further inspected to determine whether bats were present. Details of the assessment are presented in Table 3-5, with pictures in Plate 26. The location of the trees assessed is presented in Figure 3-1.

Table 3-7 Tree inspection results

#	Species	Potential	Notes	Inspection Results	IG Ref	Plate
1	*Fagus* sp.	PRF-I	Single mature tree along a hedgerow, some ivy cover.	No evidence	M 26726 24670	3-26-1
2	*Acer* sp.	PRF-I	Mature tree with vertical crack.	No evidence	M 26774 24669	3-26-2
3	*Fraxinus* sp.	PRF-I	Mature tree with heavy ivy cover.	No evidence	M 26679 24756	3-26-3

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4	*Fraxinus* sp.	PRF-I	Mature tree with rot hole and ivy cover.	No evidence	M 26689 24749	3-26-4
5	*Crataegus* sp.	PRF-I	Some ivy cover.	No evidence	M 26673 24744	3-26-5
6	*Fraxinus* sp.	PRF-I	Broken limbs.	No evidence	M 26668 24732	3-26-6
7	*Fraxinus* sp.	PRF-I	Light ivy cover.	No evidence	M 26660 24720	3-26-7
8	*Fraxinus* sp.	PRF-I	Ivy cover.	No evidence	M 26639 24703	3-26-8
9	*Fraxinus* sp.	PRF-I	Multiple pruning cuts and rot holes.	No evidence	M 26637 24659	3-26-9
10	*Fraxinus* sp.	PRF-I	Mature tree with potential features including rot holes and broken limbs.	No evidence	M 26641 24657	3-26-10
11	*Crataegus* sp.	PRF-I	Mature tree.	No evidence	M 26576 24656	3-26-11
12	*Fraxinus* sp.	PRF-I	Mature tree with shallow cracks.	No evidence	M 26572 24646	3-26-12
13	*Fraxinus* sp.	PRF-I	Small, shallow crack	No evidence	M 26583 24569	3-26-13
14	*Fraxinus sp.*	PRF-I	Some ivy cover.	No evidence	M 26969 24864	3-26-14



Tree # 1



Tree # 2



Tree # 3







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Tree # 4



Tree # 5



Tree # 6



Tree # 7



Tree # 8



Tree # 9



Tree # 10



Tree # 11

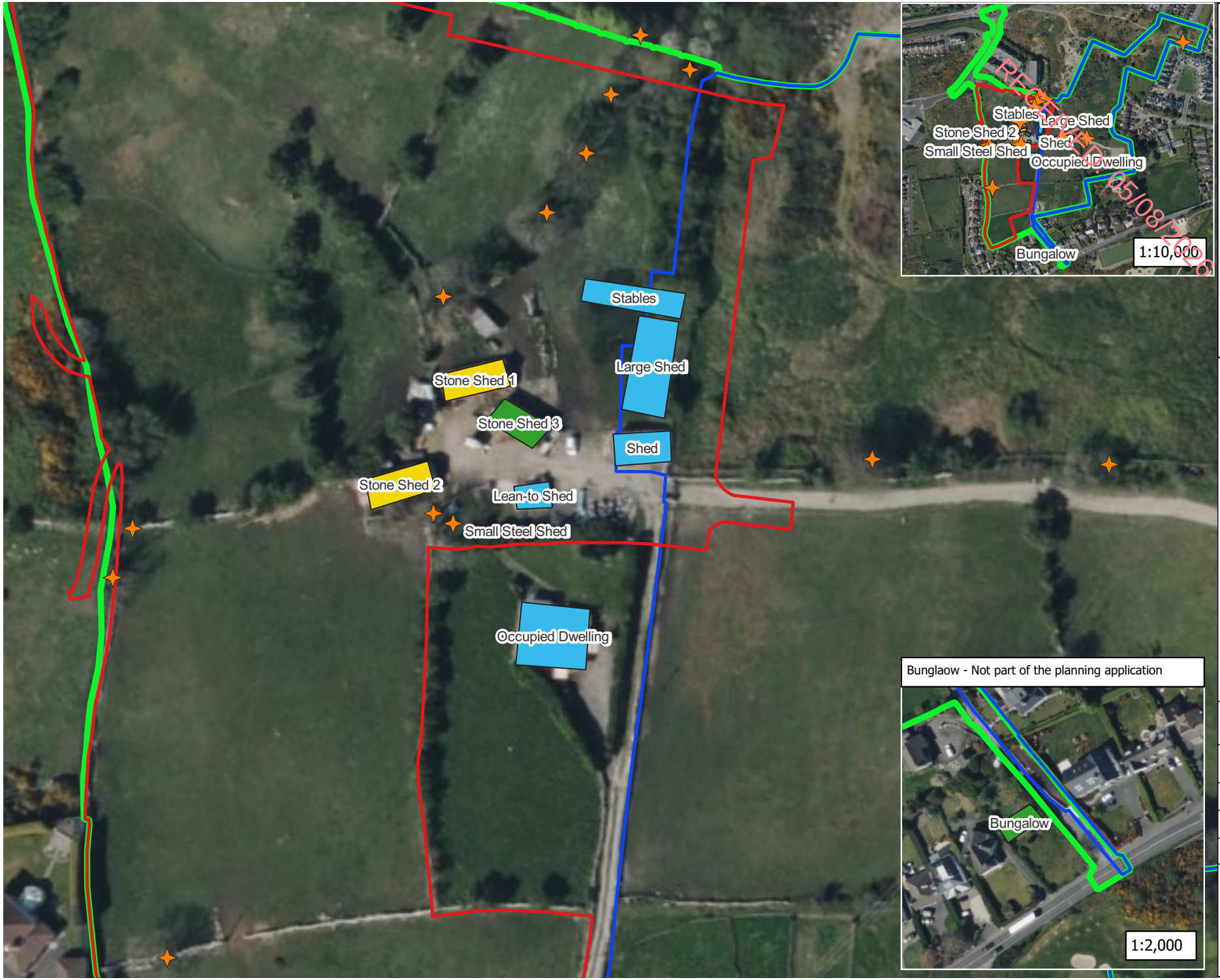


Tree # 12

Tree # 13

Tree # 14

Plate 3-26 Trees within the study area.



Bunglaow - Not part of the planning application

Map Legend

- Planning application (red line) boundary
- LRD East boundary
- EIAR Study Area Boundary
- Trees assessed as PRF-I

Buildings Suitability

- Low
- Moderate
- Negligible
- None

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Drawing Title: Roost assessment

Project Title: Kingston Knocknacarra LRD West

Drawn By	Checked By
NS	SF
Project No.	Drawing No.
251145	Fig 3-1
Scale	Date
1:1,000	02/07/2026

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3.2.2 Bat Activity Surveys

3.2.2.1 Manual Surveys

3.2.2.1.1 *Presence/Absence Surveys*

Nine structures with roosting potential were identified within the EIAR Study Area during surveys carried out at early design stages. Four of the structures within the EIAR Study Area with roosting potential were subjected to dusk emergence surveys. In addition, one structure with a confirmed roost located outside the EIAR Study Area was assessed. Table 3-6 summarises the results of the completed dusk surveys. Individual surveys are described below.

Table 3-8 Dusk emergence surveys at PRFs.

PRF	Suitability	IG Ref.	Date	Results
Stone Shed 1	Moderate	M 26647 24686	2nd May 2024	No emerging bats
			4th September 2024	4 Soprano pipistrelles observed emerging.
			11th May 2026	No emerging bats
Stone Shed 2	Moderate	M 26630 24667	20th May 2024	1 Soprano pipistrelle observed emerging
			3rd July 2024	No roosting bats.
			11th May 2026	No emerging bats
Lean-to shed	Low	M 26658 24665	3rd July 2024	No roosting bats.
Stone Shed 3	Low	M 26656 24677	2nd May 2024	No roosting bats.
			4th September 2024	No roosting bats.
Bungalow (outside of the site boundary)	Low	M 26694 24436	3rd August 2023	2 soprano pipistrelles emerging

Stone Shed 1

During the first presence/absence survey, a low level of soprano and common pipistrelle foraging activity was recorded in the mature trees to the north of the structure but no bats were observed emerging from the structure during either of the surveys. During the second presence/absence survey, four soprano pipistrelles were observed emerging from the structure. Three individuals emerged from the southern aspect, while one emerged from a gap between the roof and stone wall at the northern side. During the survey, constant foraging activity was recorded in the trees to the north. During the 2026 duck emergence survey no emerging bats were recorded.

Stone Shed 2

One bat was observed emerging from the structure during the 20th May emergence survey. There was foraging activity along the treeline to the west of the structure. No bats emerged from the structure during the second survey on the 3rd of July. Some low foraging and commuting pipistrelle activity was recorded from the southeast, flying towards the north and west. During the 2026 duck emergence survey no emerging bats were recorded.

Stone Shed 3

No bats were observed emerging from the structure during either of the surveys.

Lean-to shed

No bats were observed emerging from the structure during the survey.

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Bungalow

The structure is not part of the planning application. Two soprano pipistrelles were observed emerging from the structure. The roost is likely opportunistic.

3.2.2.1.2 *Night-time Bat Walkovers*

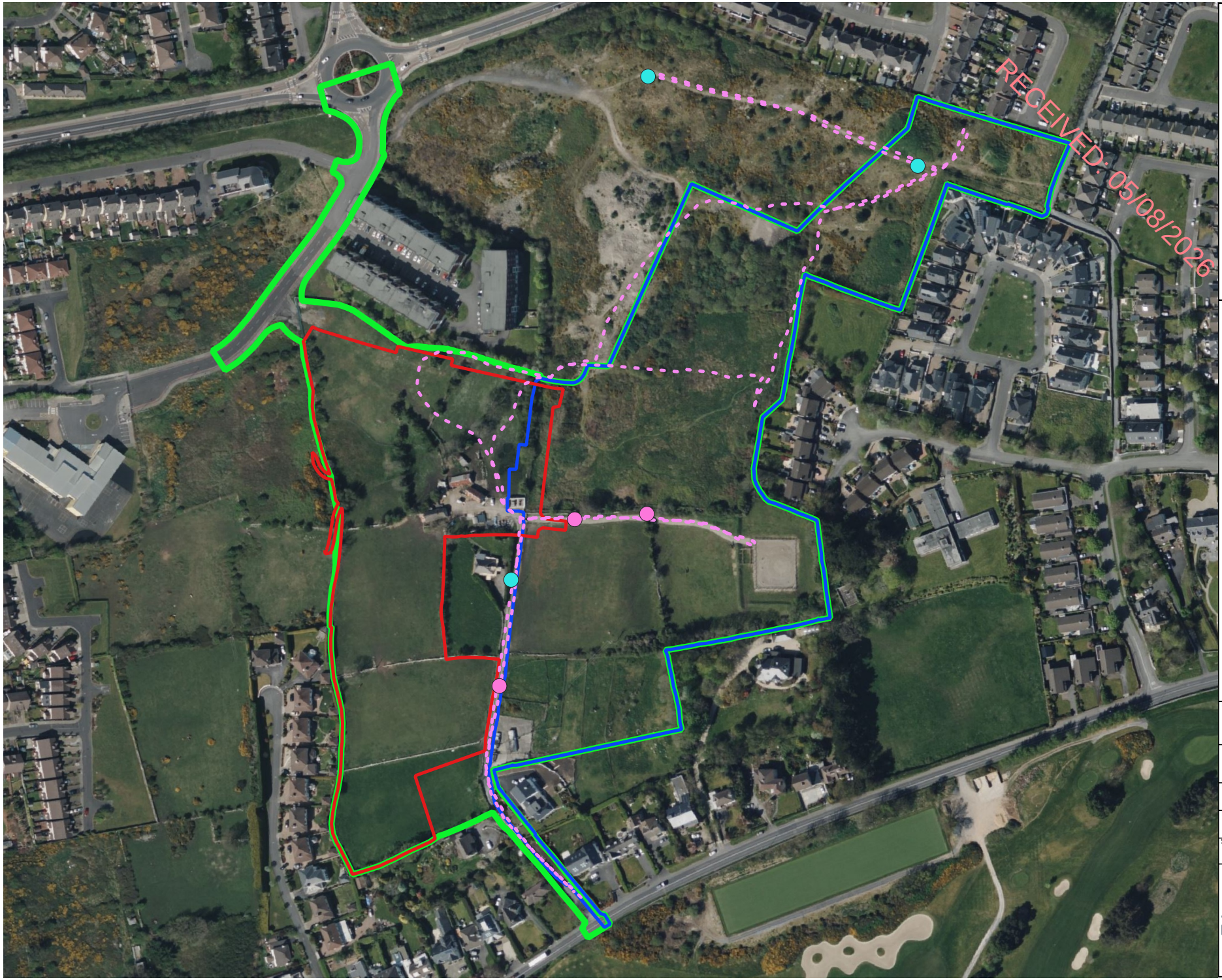
Manual activity surveys also comprised night-time bat walkovers at dusk. The survey effort for both 2023 and 2024 is presented in Table 3-7 below.

Table 3-9 Night Walkover survey results

Date	Km	Common pipistrelle	Soprano pipistrelle	Leisler's bat
03/08/2023	2.2km	3	3	-
24/04/2024	2.4km	39	64	4
06/06/2024	3.1km	2	24	1

Walkover surveys focused on the use of linear features and other habitats within the site by bats. The April survey included the northern section of the EIAR Study Area, while the June survey was undertaken within the central and southern area of the EIAR Study Area. Bat activity was dominated by soprano pipistrelles, with most of this taking place along the mature treeline outside of the eastern border of the EIAR Study Area. Common pipistrelle and Leisler's bats were also recorded to a lesser extent.

Figure 3-2 to Figure 3-4 present the spatial distribution of bat activity across the presence/absence and night walkover surveys.



Map Legend

- Planning application (red line) boundary
- LRD East boundary
- EIAR Study Area Boundary
- Transect Route 03.08.2023

Species Results

- Common pipistrelle
- Soprano pipistrelle

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Drawing Title
Manual transect results
3rd of August 2023

Project Title
Kingston Knocknacarra LRD West

Drawn By	Checked By
NS	CK
Project No.	Drawing No.
251145	Fig 3-2
Scale	Date
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Map Legend

- Planning application (red line) boundary
- LRD East boundary
- EIAR Study Area Boundary
- Transect Route 24.04.2024

Species Results

- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle

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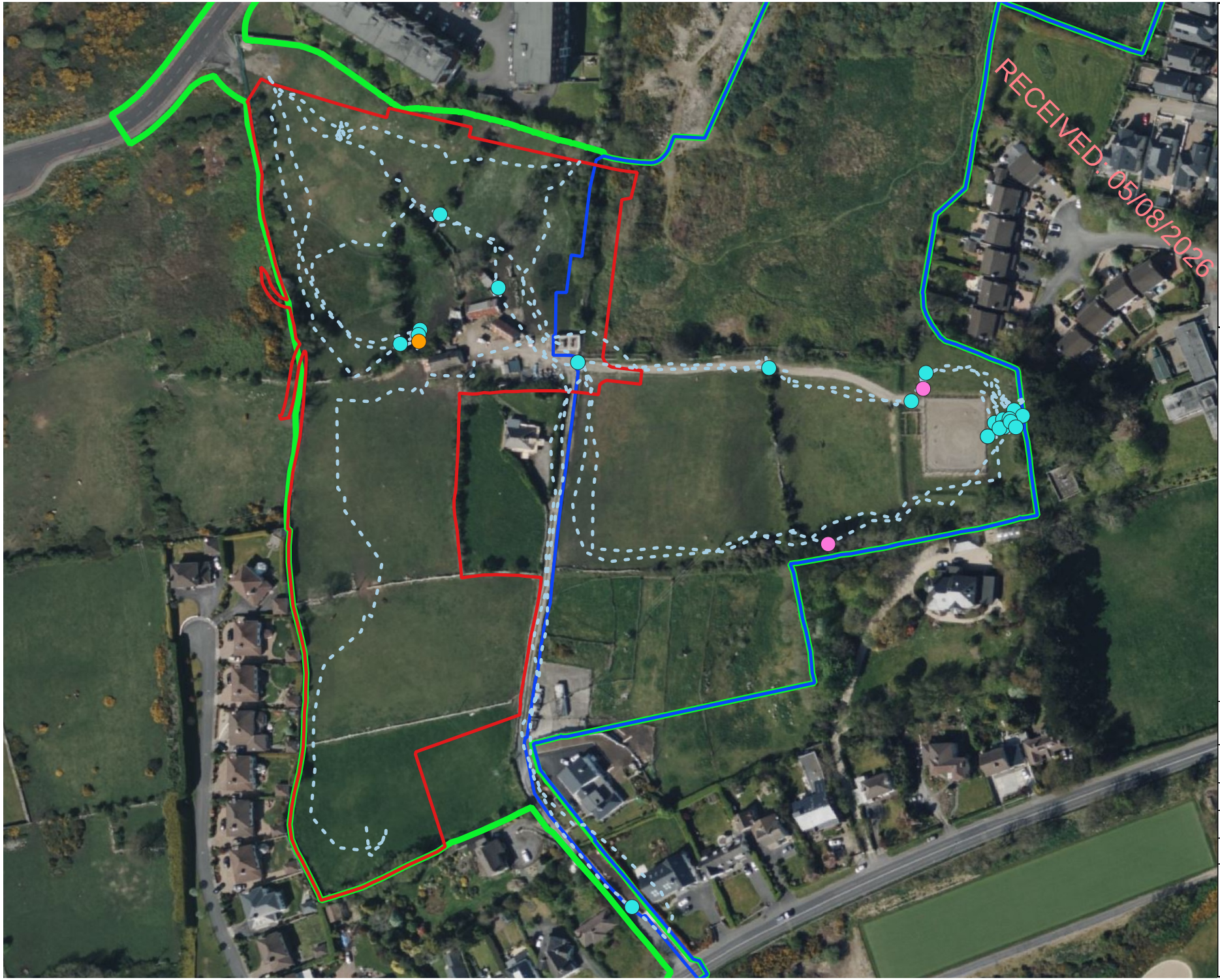
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Drawing Title
Manual transect results
24th of April 2024

Project Title
Kingston Knocknacarra LRD West

Drawn By	Checked By
NS	CK
Project No.	Drawing No.
251145	Fig 3-3
Scale	Date
1:2,000	02/07/2026

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Map Legend

- Planning application (red line) boundary
- LRD East boundary
- EIAR Study Area Boundary
- Transect Route 06.06.2024

Species Results

- Leisler's bat
- Common pipistrelle
- Soprano pipistrelle

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N

Drawing Title
Manual transect results
6th of June 2024

Project Title
Kingston Knocknacarra LRD West

Drawn By	Checked By
NS	CK
Project No.	Drawing No.
251145	Fig 3-4
Scale	Date
1:2,000	02/07/2026

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3.2.2.2 Static Detectors Surveys

In total 67,852 bat passes were recorded across 2023 and 2024 surveys. Analysis of the detector recordings positively identified six bats to species level with *Myotis* genus also present. Soprano pipistrelle (*Pipistrellus pygmaeus*) made up the vast majority of the activity recorded within the site (n=47,469), followed by common pipistrelle (*Pipistrellus pipistrellus*) (n=14,665). Leisler's bat *(Nyctalus leisleri*) (n=4,016) and brown long-eared bat (*Plecotus auritus*) (n=1,525). *Myotis* spp. (n=137) and Nathusius' pipistrelle (*Pipistrellus nathusii*) (n=40). No instances of lesser horseshoe bat were recorded at the site. Plate 3-27 shows total bat species composition recorded at the site.

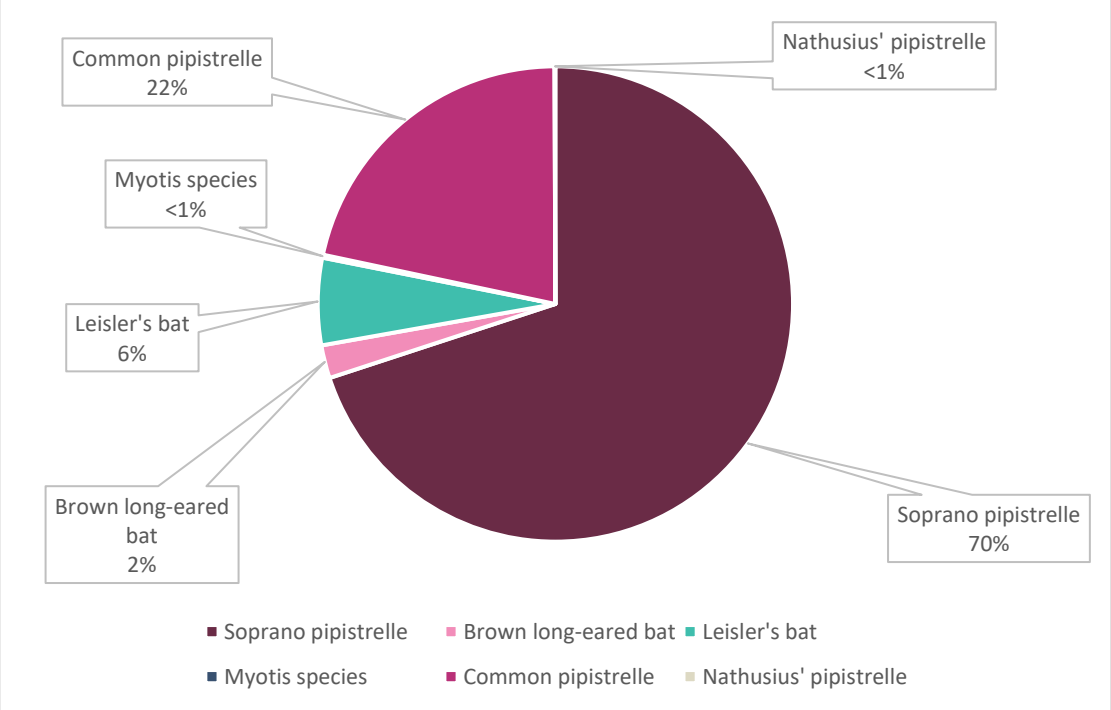
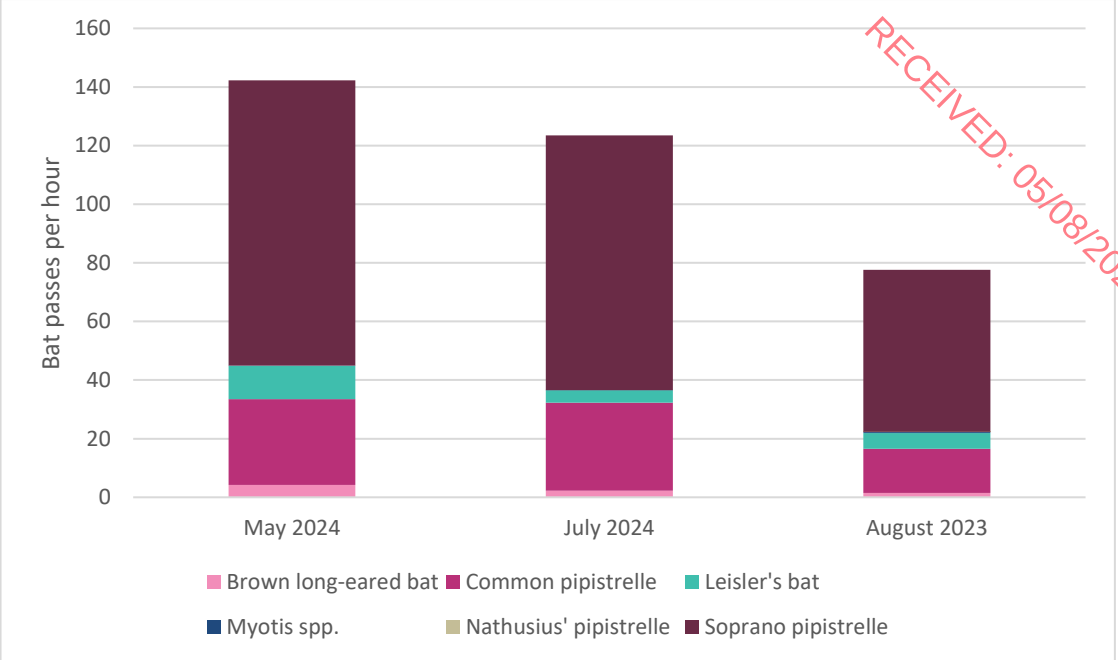


Plate 3-27 Total bat species composition

Plate 3-28 shows total bat passes per hour, per species per season. Overall bat activity was lowest during August 2023. However, while *Myotis* spp. and Nathusius' pipistrelle activity was low overall, the majority of their activity occurred during the August period. May and July 2024 recorded similar activity and species composition, though Leisler's bat activity was much higher in Spring than in Summer. Brown long-eared bat activity was also highest in the May 2024 season.



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Plate 3-28 Total bat passes per hour per season.

Plate 3-29 shows the nightly bat activity (bat passes per hour per night). The highest single night activity was recorded on the 23rd July 2024, with over 280 bat passes per hour. Activity was higher during the 2024 surveys (May and July) than that of the 2023 (August) survey. Activity on all nights was dominated by soprano pipistrelle, with common pipistrelle and Leisler's bat also present on all nights surveyed. Brown long-eared bat activity was highest during the May 2024, specifically between the 8th and 11th May 2024. *Myotis* spp. activity was low throughout the months surveyed. Nathusius' pipistrelle activity was low throughout, though the majority of activity was recorded during the Autumn 2023 survey.

Analysis of the detector recordings also highlighted the median bat passes per hour, per species, per detector, per month surveyed (Plate 3-30). The median bat passes per hour were higher in the May 2024 than during the July 2024 at all detectors, with the exception of D04. The median bat activity varied greatly between May and July 2024 at D02. Species composition was similar at all detectors, with soprano pipistrelle dominant at all detectors in all seasons. Brown long-eared bat activity was highest at D03 in May and July 2024. August 2023 had low brown long-eared bat activity.

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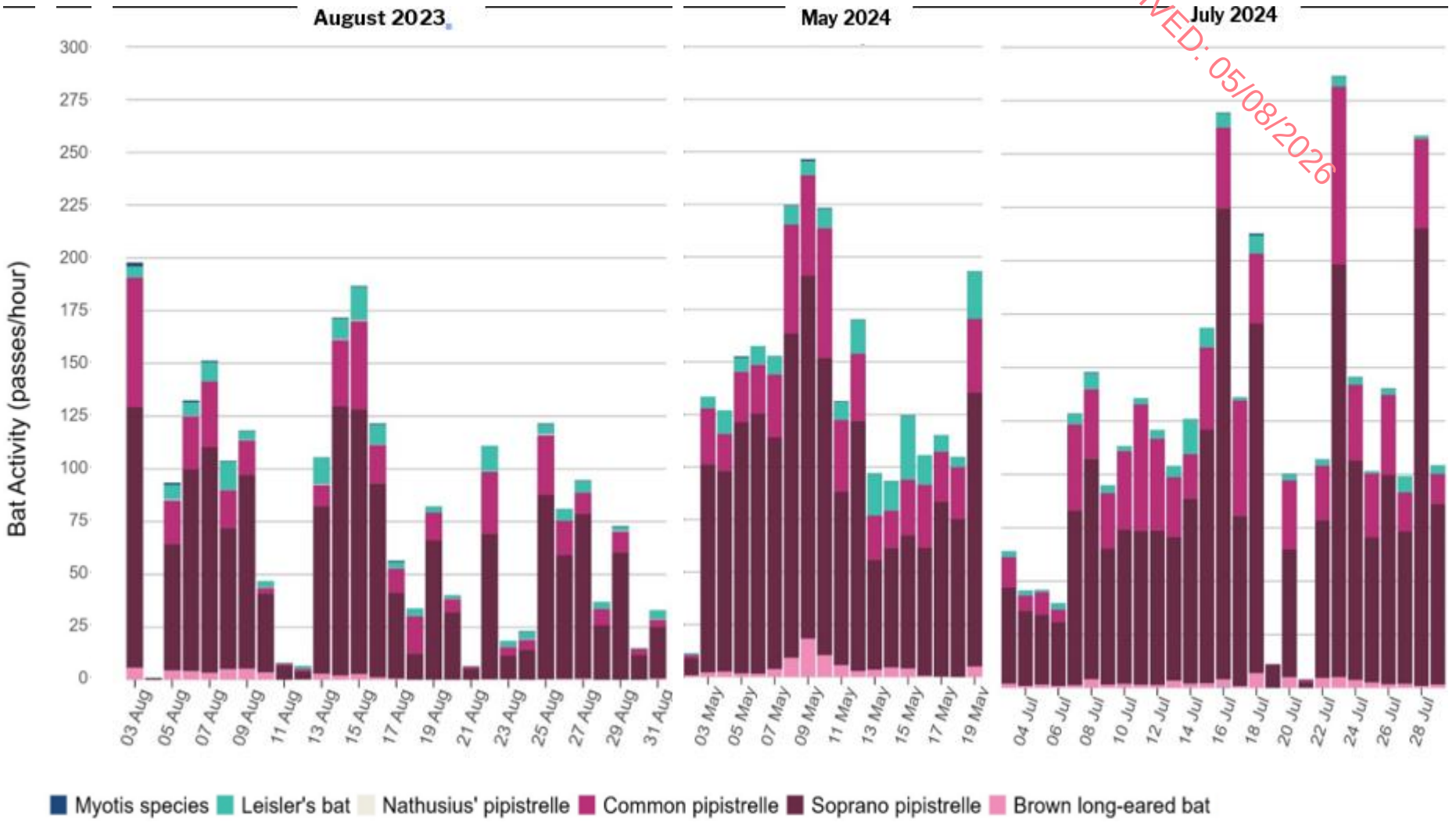


Plate 3-29 Bat passes per hour per species per night in 2024 and 2023

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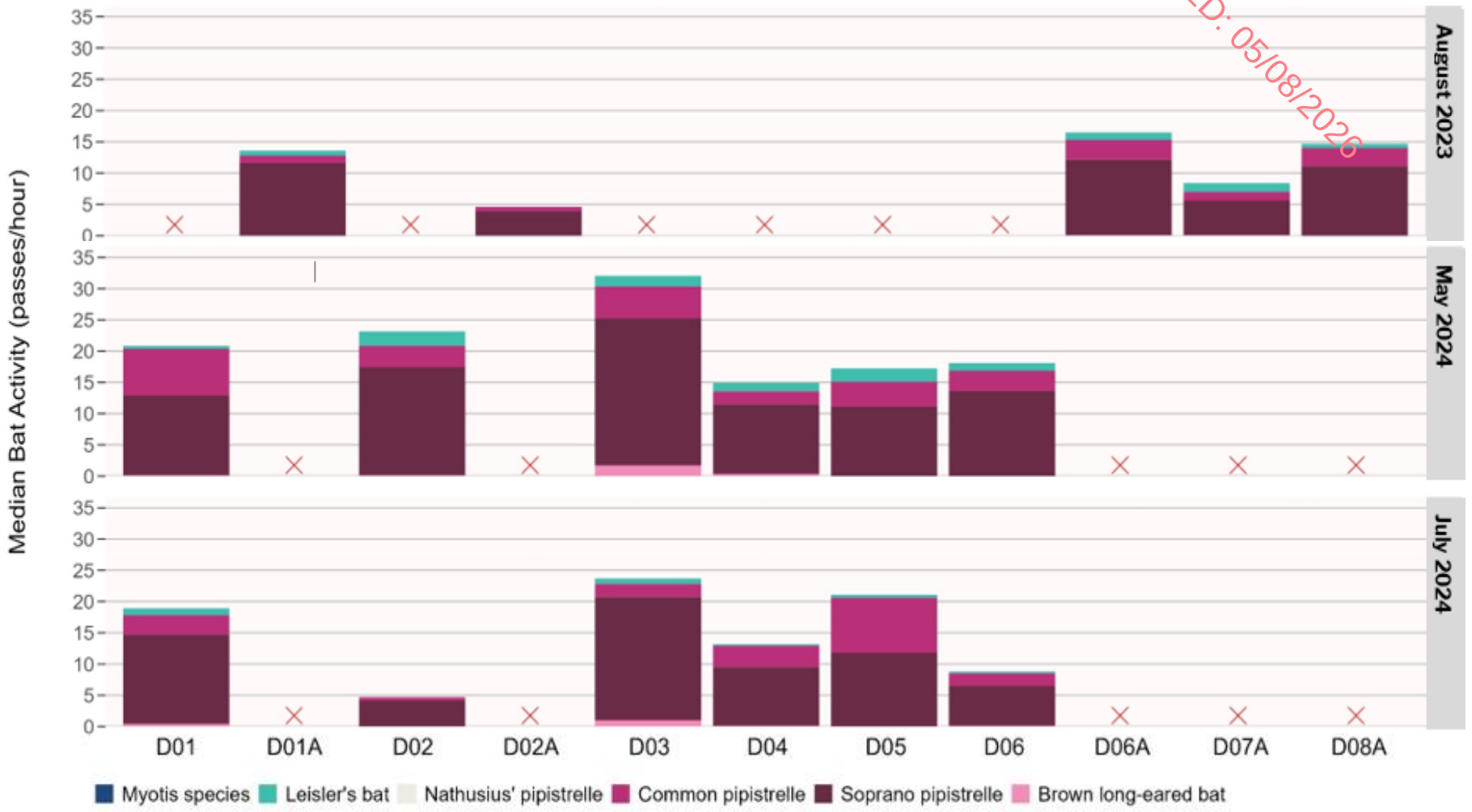


Plate 3-30 Median bat passes per hour per species per detector per season in 2024 and 2023. X denotes an area where no static detector was deployed during the period.

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4. DATA EVALUATION

4.1.1 Importance of Bat Population Recorded at the Site

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

All bat species in Ireland are protected under the Bonn Convention (1992), Bern Convention (1982) and the EU Habitats Directive (92/43/EEC). Additionally, in Ireland bat species are afforded further protection under the Birds and Natural Habitats Regulations (2011) and the Wildlife Acts 1976 (as amended). Bats as an Ecological Receptor have been assigned ***Local Importance (Higher value)*** on the basis that the habitats within the study area are utilized by a regularly occurring bat population of Local Importance.

The site does not have the potential to support a roosting site of ecological significance, and no evidence of large roosts was found within the inspected structures during the surveys. Small numbers of roosting bats (soprano pipistrelle) were observed emerging from two structures during the surveys carried out in 2023 and 2024. No roosting site of National Importance (i.e. site greater than 100 individuals) was recorded within the site. No lesser horseshoe bat was recorded on site during the surveys.

4.1.2 Survey limitations

A comprehensive suite of bat surveys were undertaken of the EIAR Study Area. The surveys undertaken in accordance with BCT Guidance, provide the information necessary to allow a complete, comprehensive and robust assessment of the potential impacts of Proposed Development on bats receptors.

Access limitations can relate to static deployments and roost inspections:

- No significant access issues were encountered with the site during static deployments, as the detectors were deployment where intended.
- Access was gained throughout the site and within all structures identified. Where health and safety prevented full inspections to be completed, particularly into higher sections of the derelict buildings, the subsequent dusk surveys ensured no significant information was missed.

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

- Good survey coverage of the site has been achieved, with five and six detectors being deployed in 2023 and 2024 respectively across the site covering the range of habitats present at the site.
- MKO employs data storage redundancy methods to ensure no data is lost from the field to final analysis - no data was lost.
- SD card corruption or fill-up can prevent data from being collected during deployments – no issues with on-site data storage were encountered.
- Bat detector's microphones are checked before every season to ensure they have good sensitivity for data collection, and detectors' software updates are installed as soon as they become available - no issues related to equipment were encountered during the surveys.
- Incidents during deployments, such as tampering or livestock interference, can prevent data from being collected effectively - no incidents were reported during the surveys.

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

- MKO's data analysis methods include manually checking of 100% of bat passes identified by Auto ID Software, as well as noise and no ID files. Where multiple species, or multiple individuals of the same species, are identified within the same call, only one is reported, prioritising hard to detect species. This is due to the large volumes of data collected. While this method is likely to introduce a bias, it is not believed to affect the overall conclusions of the assessment, as only commonly recorded species might be underreported.

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

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5. CONCLUSION & RECOMMENDATIONS

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The following points set out the main conclusions following the completion of the surveys described above:

- Five bat species, as well as Myotis sp. were recorded commuting and foraging across the EIAR Study Area during the bat surveys carried out in 2023 and 2024, including soprano pipistrelle, common pipistrelle, Leisler's bat, brown long-eared bat, and Nathusius' pipistrelle.
- The existing landscape occurring within the EIAR Study Area provides Moderate quality habitats for commuting and foraging bats.
- Nine structures within the EIAR Study Area underwent detailed inspection. Two buildings were assessed with a Moderate roosting suitability, two with a Low suitability and five with a Negligible suitability.
- Two small active soprano pipistrelle roosts (4 individuals and 1 individual., respectively) were recorded during the 2024 surveys in Stone Shed 1 and Stone Shed 2, which are included within the boundary of the current application and as such will be affected by the construction of the Proposed Development.
- No large permanent or maternity roosts were recorded within the Proposed Development site boundary.
- No lesser horseshoe bat was recorded.

The following measures are recommended to safeguard bats and mitigate for potential impacts:

- Two buildings within the EIAR Study Area were found to be active bat roosts. As such, a derogation licence from the NPWS is required in order to restore/demolish buildings where evidence of bats was identified. The derogation licence was received on the 8th July 2026 and is included as Appendix 6-5 of Chapter 6 of the EIAR.
- A pre-commencement survey is recommended on each of the roost structures to assess the buildings prior to any works. The requirement for a pre-commencement survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the survey in 2023, 2024 and 2026.
- 14 trees were identified as PRF-I across the wider EIAR Study Area. Eleven of these trees are proposed for removal under the current planning application. A pre-commencement survey, at the appropriate time of year, will be undertaken on trees to be felled/pruned with suitable potential roost features, by a qualified ecologist to ensure no changes in the baseline have occurred. The requirement for a pre-commencement survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. If a bat roost is identified within any of the trees to be removed/pruned, a bat derogation licence will be obtained from the NPWS, prior to felling and the felling activity will be supervised by a qualified ecologist.
- The lighting plan for the operational phase of the Proposed Development has been designed with consideration of the following guidelines: Bat Conservation Ireland guidelines; Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) and the Guidance Note 08/23: Bats and Artificial Lighting at Night (ILP, 2023), to minimise light spillage, thus reducing any potential disturbance to bats.
- The landscape and lighting plan have both been designed in collaboration with project ecologists to avoid significant effects on wildlife by design and to mitigate any unavoidable impacts. A dark corridor has been incorporated into the design of the Proposed Development to maintain suitable foraging and commuting habitat.

Artificial lighting towards these features will be avoided or kept to a minimum, with unavoidable light spill being limited to between 1-2 lux.

The surveys undertaken provide a good understanding of the use of the buildings and surrounding habitats by bats and the report provides recommendations to safeguard bats as part of the Proposed Development.

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