Planning and Environmental Consultants

Baseline Bat Report

Large-Scale Residential Development at Ballymoneen Road, Ballyburke, Galway

DOCUMENT DETAILS

Client:	**Cairn Homes Properties Ltd.**
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Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

Planning and Environmental Consultants

Rev	Status	Date	Author(s)	Approved By
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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 Ecological Impact Assessment (EcIA) for an application for planning permission of a proposed Strategic Housing Development, at Ballymoneen Road, Co. Galway (Grid Reference: M 25254 25488). 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 EcIA.

The report presents the ecological baseline recorded within the proposed development site in relation to bats. Surveys were carried out in June and July of 2024. Surveys included a suitability appraisal and inspection of the habitats and potential roosting features present on site. Manual activity surveys and roost surveys were carried out, as well as ground-level static detectors surveys. Three static detectors were deployed around the site for 19 nights.

Bat surveys in relation to this proposed development were also previously carried out by MKO in 2019, 2020 and 2022 within the site. The 2024 surveys form the core dataset for this application and the 2019-2022 results are included as supplementary information in the desk study.

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. Due to the number of surveys carried out over the years at the site, no seasonal scope was designed in 2024 as the information available was considered sufficient to undertake an assessment, in the interest of proportionality.

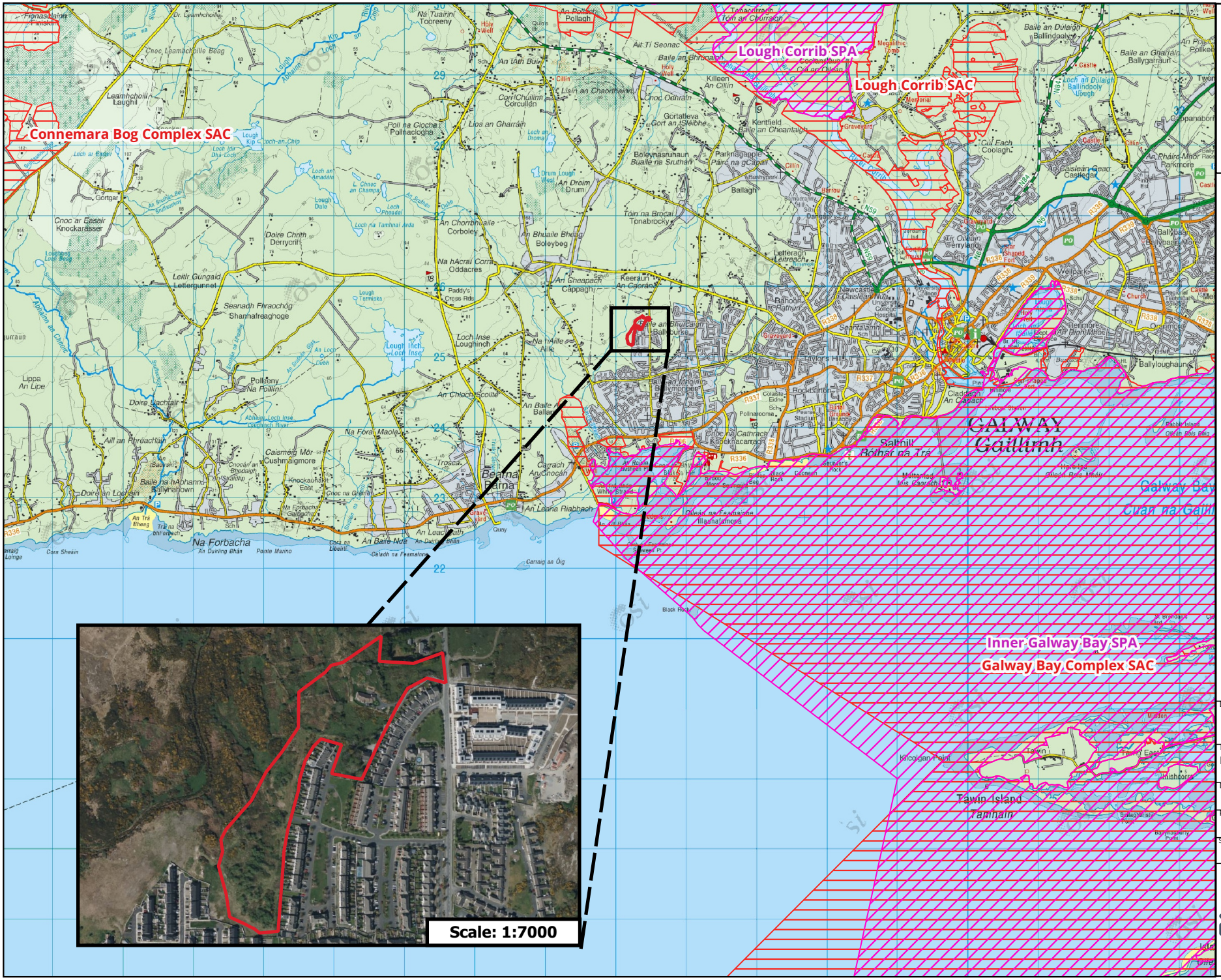
The bat survey and assessment were informed by a desk study and with reference to the following guidelines:

- *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 (3rd edn.) (Collins, 2016)*
- *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 Site Description

The Proposed Development site is located on the western side of Galway city within the townlands of Keeraun and Ballynahown East, Co. Galway. The site is accessed via the Ballymoneen Road.

The site comprised of a number of existing agricultural fields, dominated by large amounts of scrub, immature woodland, dense bracken and a small area of mixed broadleaf woodland and hedgerow. Two dwellings are also located within the site. The wider landscape is predominantly used for agriculture and urban development. A location map of the Proposed Development site is provided in Figure 1-1.



Map Legend

- Site boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)

Drawing Title

Site Location

Project Title: Lands at Ballymoneen Road, Keeraun, Ballynahown East, Galway	
Drawn By: KB	Checked By: KOD
Project No.: 220137	Drawing No.: Figure 1-1
Scale: 1:70,000	Date: 10.01.2024

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie

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).

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)

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.

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 LHB 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.

- 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 who scope, carry out, and report 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 an open 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 also covered 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 David Culleton accompanied by students Cormac Roberts and Andrew McCarthy. Manual activity surveys were carried out by David Culleton, Ryan Connors, Cormac Roberts, Andrew McCarthy and Cuan Feeney. Data manual ID was carried out by David Culleton. 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.)	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),
Sara Fissolo (B.Sc.)	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.)	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 (Wildlife Acoustics), Endoscope Training (Internal), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).
Ryan Connors (B.Sc., M.Sc.)	Bat Ecologist	B.Sc. (Hons) Zoology, University College Galway, Ireland. M.Sc. (Hons) Conservation Behaviour, Atlantic Technological University, Galway, Ireland.

		Surveying Trees for Bats (BRTS), Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal), Kaleidoscope Pro Analysis (Internal), Winter Tree Identification (Internal), Wintering Bird Surveying (Internal).
Cuan Feeney (B.Sc.)	Graduate Ecologist	BSc. (Hons) Environmental Science, University of Galway. Structure & Tree Inspection (Internal), Manual Transect Survey (Internal), Bat Habitat Appraisal (Internal), Emergence and Re-Entry Surveys (Internal).

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-mapper.*
- *Galway County Development Plan 2022-2028.*
- *BCI Database.*
- *Review of NPWS Lesser Horseshoe Bat national dataset.*
- *Published reports.*

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 proposed development.

2.1.2 National Bat Database of Ireland

The National Bat Database of Ireland 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 proposed site, 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 for 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.

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 Spelaeological 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 28/06/2024). Furthermore, 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 28th June 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 28/06/2024).

2.1.5 Previous Surveys and Public Reports

Bat surveys were previously undertaken at the Proposed Development site by MKO in 2019, 2020 and 2022. The results were not published and due to the time lapsed since the surveys, these were considered out of date and repeated in 2024.

Bat surveys in the vicinity of the site were also undertaken as a part of the Proposed N6 Galway City Ring Road Scheme between 2014 and 2018. The published EIA Report Biodiversity Chapter was reviewed. Relevant information gathered from the report is presented in Section 3.1.5.

2.2 Field Study

2.2.1 Bat Habitat Appraisal

A walkover survey of the Study Area was carried out during daylight hours on the 19th June 2024. 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 determine the presence of roosting bats within the proposed 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 proposed development 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.

2.2.1.1 Preliminary Roost Assessment

A search for roosts was undertaken within the boundary of the Proposed Development site by three licenced ecologists to identify any potential roost features (PRFs). The licence, issued by NPWS, is intended for professionals carrying out surveys with the potential to disturb roosting bats. The aim of the survey was to determine the presence of roosting bats, potential access points, roosting locations and the need for further survey work or mitigation.

The site was visited in June and July 2024 following surveys previously undertaken in 2019, 2020 and 2022, when no access into structures was allowed. All structures identified within the site were 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.

Trees present within the site 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). The proposed development site contains a number of trees within a small area of mixed broadleaf woodland. Three trees were identified and inspected using a ladder, an endoscope and a thermal camera.

Two structures and three trees were inspected and are described in Section 3.2.1. below.

2.3 Bat Activity Surveys

2.3.1 Manual Surveys

Manual activity surveys included roost surveys of any feature identified as a potential roost. For each of the surveys, surveyors were equipped with active full spectrum bat detectors, Batlogger M (Elekon AG,

Lucerne, Switzerland). Surveys commenced at least 15 minutes before sunset, and continued until two hours after sunset. 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.

Table 2-2 Bat Activity survey effort

Date	Surveyors	Type	Sunrise/ Sunset	Weather
19/06/2024	David Culleton, Cormac Roberts and Andrew McCarthy	Dusk Emergence	22:07	14-16˚C, Dry, Calm-Gentle Breeze
01/07/2024	David Culleton, Ryan Connors and Cuan Feely	Dusk Emergence	22:06	12-14˚C, Dry, Calm

2.3.1.1 Roost Surveys

Any structure identified during the bat habitat appraisal as having potential to host roosting bats was subject to presence/absence surveys in the form of emergence surveys. Rationale for survey effort was based on guidelines proposed by Collins in Tables 7.1 and 7.2 (Collins, 2023) and informed by previous surveys undertaken at the site by MKO. Two structures were identified within the site and were subject to roost surveys following the initial roost assessment and interior inspection.

Surveyors were located at various locations around each structure 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, aided the survey effort. Surveyor locations are presented in Figure 2-1.

Surveys were carried out in favourable weather conditions. Roost emergence surveys commenced at least 15 minutes before sunset and concluded between 1.5 and 2 hours after sunset.

2.3.1.2 Night Vision Aids

The use of NVAs is now considered standard best practice for bat activity surveys. MKO employs thermal camera equipment. The thermal camera (InfiRay Eye II V2.0), 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. The location of the NVAs is presented in Figure 2-1.

2.3.2 Static Detectors Surveys

Three full spectrum SM4 bat detectors (Wildlife Acoustics, Maynard, MA, USA), were deployed during static surveys to record bat activity for a minimum 2-week period. The detectors were deployed on 19th June and collected on 9th July 2024. The three locations of static detectors were selected to represent the range of habitats present within the site, including favourable bat habitats. The location choice was informed also by previous surveys undertaken at the site.

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

Detector ID	IG Reference	Habitat	Deployment	Collection
D01	M 25199 25193	Scrub	19/06/2024	03/07/2024
D02	M 25344 25400	Mixed broadleaf woodland	19/06/2024	03/07/2024
D03	M 25392 25580	Scrub	19/06/2024	03/07/2024

2.4 Bat Call Analysis

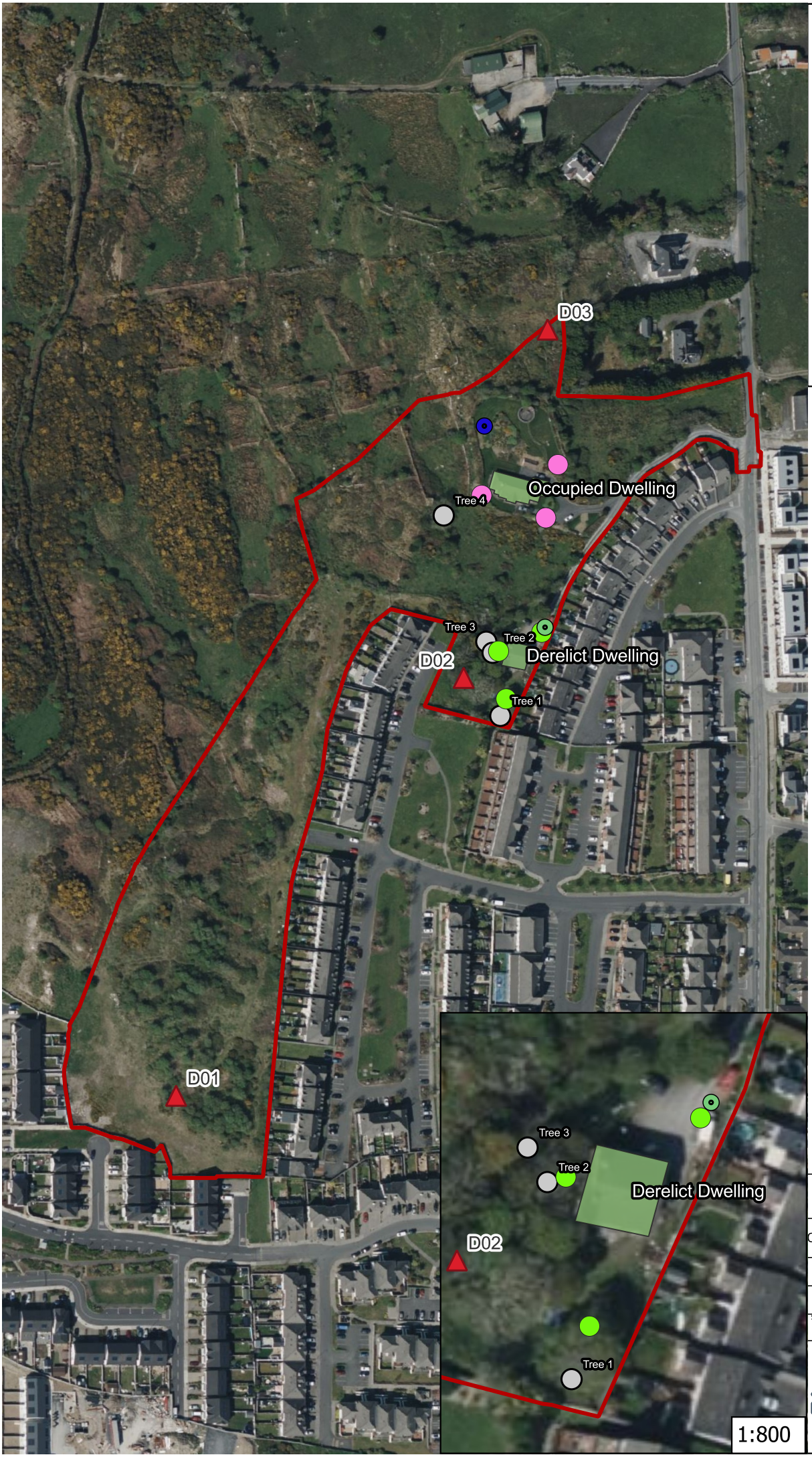
All recordings were later analysed using bat call analysis software Kaleidoscope Pro v.5.6.8 (Wildlife Acoustics, MA, USA). The aim of this was to identify, to a species or genus level, what bats were present at the proposed development site. Bat species were identified using established call parameters, 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.



Map Legend

- Red Line Boundary
- 2024 Static Detector Locations
- Structures within site boundary
- Tree Inspections

Surveyor Locations

- 01/07/2024
- 19/06/2024

NVAs

- 01/07/2024
- 19/06/2024

Drawing Title: 2024 Survey Effort

Project Title: Cairn Homes - Ballymoneen Road LRD

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Project No.	Drawing No.
220137	2-1
Scale	Date
1:2,500	26.08.2024

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie

3. RESULTS

3.1 Desktop Study

3.1.1 Galway Co. Development Plan

The Galway County Development Plan (2022-2028) 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.

3.1.2 National Biodiversity Data Centre

A review of the National Bat Database of Ireland on the 709 yielded results of bats within a 10km hectad of the proposed works. The search yielded 9 bat species within 10km, including the vagrant Brandt's bat. 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 30.89 (orange). This indicates that the proposed development area has moderate-high habitat suitability for bat species.

Table 3-1 NBDC Bat Records

Hectad	Species	Date	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	Common Pipistrelle (*Pipistrellus pipistrellus sensu stricto*)	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 Bat Database of Ireland	Annex II, IV
M22	Lesser Noctule (*Nyctalus leisleri*)	20/09/2022	National Bat Database of Ireland	Annex IV
M22	Nathusius's Pipistrelle (*Pipistrellus nathusii*)	30/05/2021	National Bat Database of Ireland	Annex IV
M22	Natterer's Bat (*Myotis nattereri*)	11/08/2021	National Bat Database of Ireland	Annex IV

M22	Pipistrelle (*Pipistrellus pipistrellus sensu lato*)	15/09/2021	National Bat Database of Ireland	Annex IV
M22	Soprano Pipistrelle (*Pipistrellus pygmaeus*)	20/09/2022	National Bat Database of Ireland	Annex IV

3.1.3 Designated Sites

Within Ireland, the Lesser horseshoe bat is the only bat species requiring the designation of Special Areas of Conservation (SACs). The site is situated within the current known range for this species and there is one SAC designated for its protection within 10km of the proposed works site.

One proposed Natural Heritage Area (pNHA) designated for the protection of bats was identified within 10km of the proposed works.

Table 3-2 shows the site designated for the protection of bats.

Table 3-2 European, National and proposed National Sites Designated to Bats

Designated Site	Distance to Site	Species	Roost Type
Lough Corrib SAC	3.5km	Lesser Horseshoe bat	Summer roost
Kilarainy Lodge pNHA	8.1km	Natterer's bat	Maternity

3.1.4 Habitat and Landscape

A review of mapping and photographs provided insight into the habitats and landscape features present at the Proposed Development site. In summary, the majority of the land within the proposed site boundary is unused scrub, immature woodland and dense bracken. Some agricultural grassland is also present within the proposed site. A small area of mixed broadleaf woodland is present at the eastern side of the site.

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

A search of the UBSS Cave Database for the Republic of Ireland found two caves within 10 km of the proposed site (Table 3-3).

No national monuments are reported within the site.

Table 3-3 Caves within 10km of the proposed site.

Cave	Distance to Site	Description
Terryland/Cooley's cave	4.1km	10m passage to collapsed chamber
Newry Hole	8.3km	Chamber with calcite and pool

3.1.5 Previous Surveys and Public Reports

MKO Bat Surveys – Summary of Previous Results

Previous bat surveys were undertaken by MKO in 2019, 2020 and 2022 to inform the proposed development's design and impact assessment (Table 3-4). Surveys included bat habitat appraisals,

manual transect surveys, dusk emergence surveys, dawn re-entry surveys and static surveys. One dusk emergence survey was carried out each year on the Derelict Dwelling, however no internal inspections were completed. No interior surveys were carried out on the occupied dwelling due to lack of access, however exterior assessments were carried out.

Table 3-4 Survey Effort 2019, 2020, 2022

Manual Surveys				
Date	**MKO Surveyor**	**Type**	**Sunrise/ Sunset**	**Weather**
31st July 2019	Luke Dodebier, Padraig Webb	Emergence and Dusk Transect	21:34	17°C, Dry, Calm, Moon not visible, 10% cloud cover
13th Aug 2020	Luke Dodebier, Rachel Walsh	Dusk Transect	21:07	14°C, Dry, Calm, Moon not visible, 80% cloud cover
4th Sept 2020	Rachel Walsh, Neansai O'Donovan	Dawn Transect	6:52	15°C, Dry, Light breeze, Moon not visible, 99% cloud cover
17th Sept 2020	Neil Campbell, Aoife Crowe	Emergence and Dusk Transect	19:46	18°C, Dry, Calm Moon not visible, 0% cloud cover
22nd June 2022	Keith Costello, Laura Granicz	Dusk Transect	22:08	16°C, Dry, Light breeze, Moon not visible, 90% cloud cover
6th July 2022	Keith Costello, Kieran Sugrue	Re-entry and Dawn Transect	05:10	13°C, Drizzle, Calm, Moon not visible, 60% cloud cover
20th July 2022	Stephanie Corkery, Laura Granicz	Emergence and Dusk Transect	21:50	17°C, Dry, Calm, Moon not visible, 95% cloud cover

Static Surveys						
Year	**Detector number**	**IG Ref**	**Deployed**	**Collected**	**Nights**	**Habitat**
2019	D01a	M 25287 25643	31st July 2019	8th August 2019	8	Scrub north of site.
	D02a	M 25199 25229	31st July 2019	8th August 2019	8	Scrub south of site.
2020	D03a	M 25350 25424	13st Aug 2020	4th September 2020	23	Mature trees patch by two-storey house PRF.
	D04a	M 25170 25593	13st Aug 2020	18th September 2020	37	Scrub north of site.
	D05a	M 25228 25223	4th September 2020	18th September 2020	14	Scrub south of site.
2022	D06a	M 25210 25218	22nd June 2022	6th July 2022	14	Scrub south of site.
	D07a	M 25351 25545	22nd June 2022	6th July 2022	14	Treeline/scrub by one-storey house PRF.
	D08a	M 25244 25365	6th July 2022	20th July 2022	15	Scrub and trees in centre of site.
	D09a	M 25368 25437	6th July 2022	20th July 2022	15	Mature trees by two-storey house PRF.

No roosting bats were observed emerging from the derelict dwelling in any of the previous surveys. In July 2022, a dawn re-entry survey was carried out on this dwelling, and no bats were observed re-entering the structure.

Static detectors were also deployed each year across the site, including the southern section of the site. During surveys, the majority of bat activity recorded in proximity of the two dwellings and to the south of the site. The majority of bat passes were identified as common pipistrelle. Five instances of lesser horseshoe bats were recorded in 2019 to the north of the site. Nathusius' pipistrelle were reported in 2022, but were not recorded during 2024 surveys.

N6 Galway City Ring Road – Summary of roost results

Bat surveys were previously undertaken by Geckoella Ltd. and Scott Cawley Ltd. between 2014 and 2018 as a part of an Ecological Impact Assessment for the Proposed N6 Galway City Ring Road. During these surveys, a transitional Brown long-eared and Soprano pipistrelle roost was identified in the immediate vicinity of the Proposed Development site. Two Lesser horseshoe roosts were also identified within 2km of the site.

3.2 Bat Habitat Appraisal

A detailed description of the habitats located within the Proposed Development site are presented in the accompanying Ecological Impact Assessment (EcIA). A bat walkover and inspection survey were conducted on the 19th of June 2024. During this survey, habitats within the study area were assessed for their suitability for bats to roost, forage and commute. Connectivity with the wider landscape was also considered to determine habitat suitability.

With regard to foraging and commuting bats, the proposed works site is considered of *Moderate* suitability due to the habitat diversity and presence of semi-natural woodland and hedgerows throughout. 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, the woodland area includes mature deciduous trees which present suitable roosting spaces for bats, in varying capacity. A thorough inspection of every tree with potential roosting features was carried out.

Details of the assessment of existing man-made structures for their suitability to host roosting bats are presented below. Trees within the proposed project footprint are also assessed in more detail.

3.2.1 Preliminary Roost Assessment

3.2.1.1 PRF Structures

Two structures were identified within the Proposed Development site and inspected as part of the roost assessment effort, a derelict dwelling, and an occupied dwelling. Both structures were also the subject of roost emergence surveys. The locations of the structures are presented in Figure 3-1. Details of the emergence surveys are presented in Section 3.3.1.

Derelict Dwelling

One structure was a two storey Derelict Dwelling with a slate roof (IG Ref: M 25373 25411) (Plate 3-1). The structure is located at the east of the site, and is surrounded by mixed broadleaf woodland and residential development. Within the structure, some aged feeding remains were found. However, no fresh droppings, fresh feeding remains, or other evidence of roosting bats were detected (Plate 3-4). A number of access points were discovered in the roof, and the upper floor windows were broken, providing further access (Plate 3-1 and 3-2). Much of the attic has been converted into a bedroom, and two open skylights cause it to be exposed and illuminated (Plate 3-5). Due to the exposed nature of the

attic, and lack of dark, warm areas, the Derelict dwelling was assigned a *Low* roosting potential. The dwelling was subject to a dusk emergence survey on the 19th June 2024, as detailed in Section 3.3.1.

Plate 3-1 Derelict dwelling, southern aspect.

Plate 3-2 Gaps in the roof on western aspect of the dwelling.

Plate 3-3 Dark sections present in the attic.

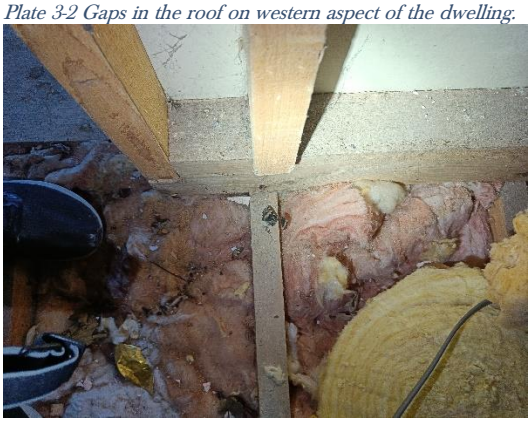

Plate 3-4 Aged feeding remains were found within.

Plate 3-5 Converted and exposed attic.

Plate 3-6 Access between first floor and attic.

Occupied Dwelling

A two storey Occupied Dwelling with a tiled roof (IG Ref: M 25372 25496) is also present within the site boundary (Plate 3-7). The structure is located at the north of the site, and is surrounded by a tended garden and hedgerows at all sides. The attic of the dwelling is heavily insulated and warm. The attic is in use by the occupant for storage purposes and lights are present (Plate 3-9). A small accumulation of droppings were observed within the attic, beneath a loose section of roof felt (Plate 3-10). A small number of access points were discovered in the roof. As the attic is in constant use, is often illuminated, and access is limited, the Occupied Dwelling was assigned a *Low* roosting potential. The dwelling was subject to a dusk emergence survey on the 1st July 2024, as detailed in Section 3.3.1.

Plate 3-7 Occupied Dwelling, northern aspect.

Plate 3-8 Small gaps present in the roof tiles.

Plate 3-9 Illuminated, insulated attic.

Plate 3-10 Small accumulation of droppings.

3.2.1.2 PRF Trees

Three trees located within the mixed broadleaf woodland to the east of the site were inspected using a ladder, thermal camera and an endoscope. A fourth tree to the north of the site was also assessed for bat roosting potential. The details of the inspections are presented in Table 3-5, with pictures in Plates 3-11 to 3-16. The location of the trees assessed has been presented in Figure 2-1.

Table 3-5 Tree inspection results

#	Species	Potential	Notes	Plate
1	*Acer* sp.	PRF-M	Large tear-out in semi-mature sycamore. No bats identified within.	3-11, 3-12
2	*Acer* sp.	PRF-I	Shallow tear-out in immature tree. No bats identified within.	3-13, 3-14
3	*Acer* sp.	PRF-I	Shallow rot hole and shallow knot-hole present. No bats roosting within.	3-15, 3-16
4	*Fraxinus* sp.	PRF-I	Identified as PRF-I during previous surveys	n/a

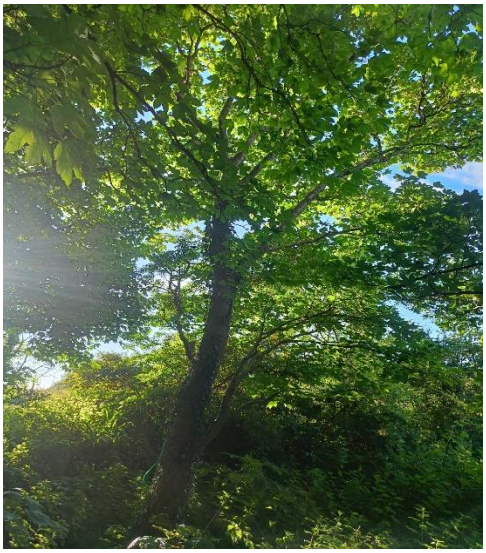
Plate 3-11 Tree 1; Semi-mature sycamore.

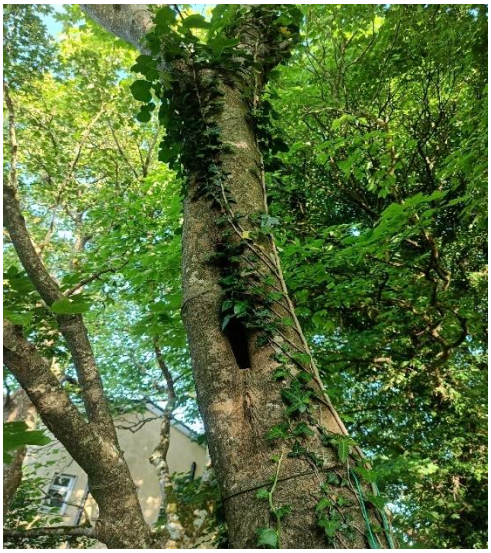
Plate 3-12 Tree 1; Tear-out within trunk.

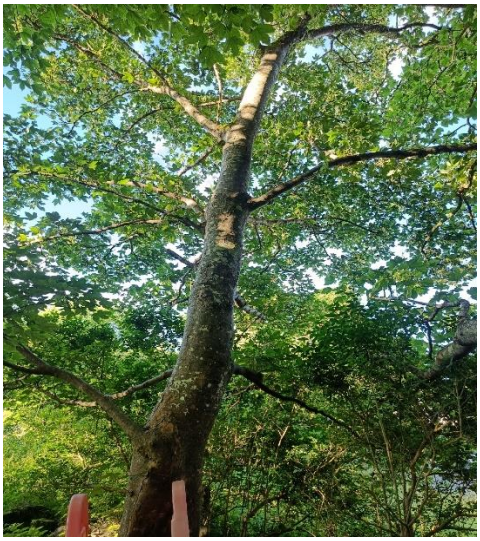
Plate 3-13 Tree 2.


Plate 3-14 Tree 2; Shallow tear-out in trunk.

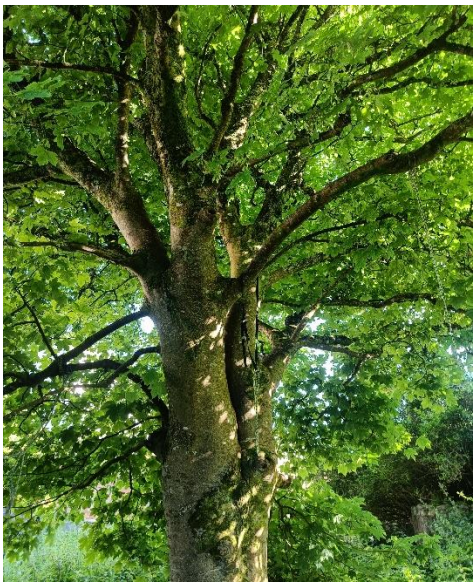
Plate 3-15 Tree 3; Mature Sycamore.

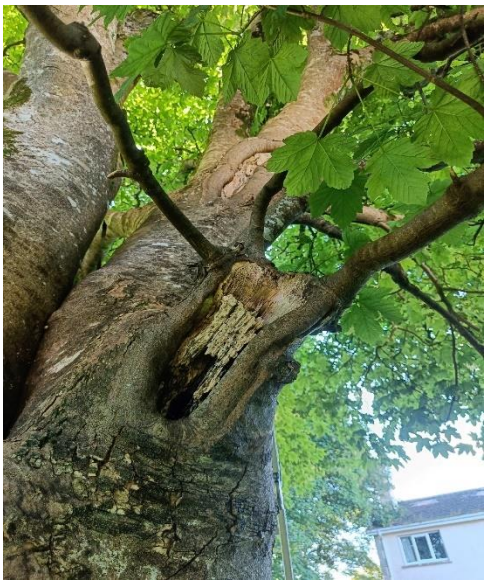
Plate 3-16 Tree 3; Rote hole.

3.3 Bat Activity Surveys

3.3.1 Manual Surveys

3.3.1.1 Dusk Emergence Surveys

Two structures with roosting potential were identified within the Proposed Development site. Table 3-6 summarises the survey effort in relation to dusk emergence surveys carried out to identify potential roosts. Individual surveys are described below.

Table 3-6 Manual activity surveys at PRFs.

PRF	IG Ref.	Date	Survey Type	Results
Derelict Dwelling	M 25374 25412	19th June 2024	Dusk Emergence	No roosting bats.
Occupied Dwelling	M 25372 25496	1st July 2024	Dusk Emergence	No roosting bats.

Derelict Dwelling

A dusk emergence survey was carried out by three surveyors at the derelict dwelling located at the east of the site. No bats were observed emerging during the emergence survey, either by surveyors or Night Vision Aids. Common pipistrelles were observed consistently foraging in the garden of the house to the south, and in the mixed broadleaf woodland to the south and west. A small number of Soprano pipistrelles and Leisler's bats were also observed commuting and foraging during the manual survey.

Occupied Dwelling

A dusk emergence survey was conducted on the 1st July, by three surveyors. No bats were observed emerging from the dwelling. Activity was low during the survey. Common pipistrelles were seen foraging along the hedgerows to the west and south of the dwelling. Small numbers of Leisler's bat and Soprano pipistrelles were also observed during the survey. A single Common pipistrelle was consistently observed foraging along the western hedgerow.

3.3.2 Static Detectors Surveys

Three SM4 static detectors were deployed on the site for 19 nights at various locations across the Proposed Development site. The detectors were deployed at D01, D02 and D03 on the 19th June 2024 and were collected on the 9th July. These detectors allowed a specified look into species composition, commuting and foraging activities within the site. Locations were chosen to represent areas of likely bat activity.

D01 was an area of scrub and immature woodland at the south of the site; D02 was placed in the mixed broadleaf woodland to the west of the Derelict Dwelling; D03 was located at the north of the site, in an area of dry-humid acid grassland. The location of the static detectors is shown in Figure 2-1.

In total 22,629 bat passes were recorded. Analysis of the detector recordings positively identified five bats to species level with *Myotis* genus also present. Common pipistrelle (*Pipistrellus pipistrellus*) made up the vast majority of the activity recorded within the site (n=17,732), followed by Soprano pipistrelle *(Pipistrellus pygmaeus*) (n=4,142) and Leisler's bat (s bat (*Nyctalus leisleri*) (n=636). *Myotis* spp. (n=60) and Brown long-eared bat (n=58) were less frequently recorded. A single instance of lesser horseshoe bat was recorded at the site. The Site is located within the current known range for this species.

D02 recorded the vast majority of bat passes (n=16,544). D01 and D03 recorded similar activity levels. Common pipistrelle was the most recorded species at all detector locations. *Myotis* spp. passes were highest at D03. Brown long-eared bats were recorded only at location D03 while the only instance of Lesser horseshoe bat was recorded at D01. **Error! Reference source not found.**11 shows total bat passes per detector, which are summarised in Table 3-7.

Table 3-7 Static detector results, total bat passes per detector.

Detector	Myotis spp.	Leiser's bat	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Lesser horseshoe bat
D01	2	26	1866	1120	-	1
D02	-	462	13247	2835	-	-
D03	58	148	2619	187	58	-

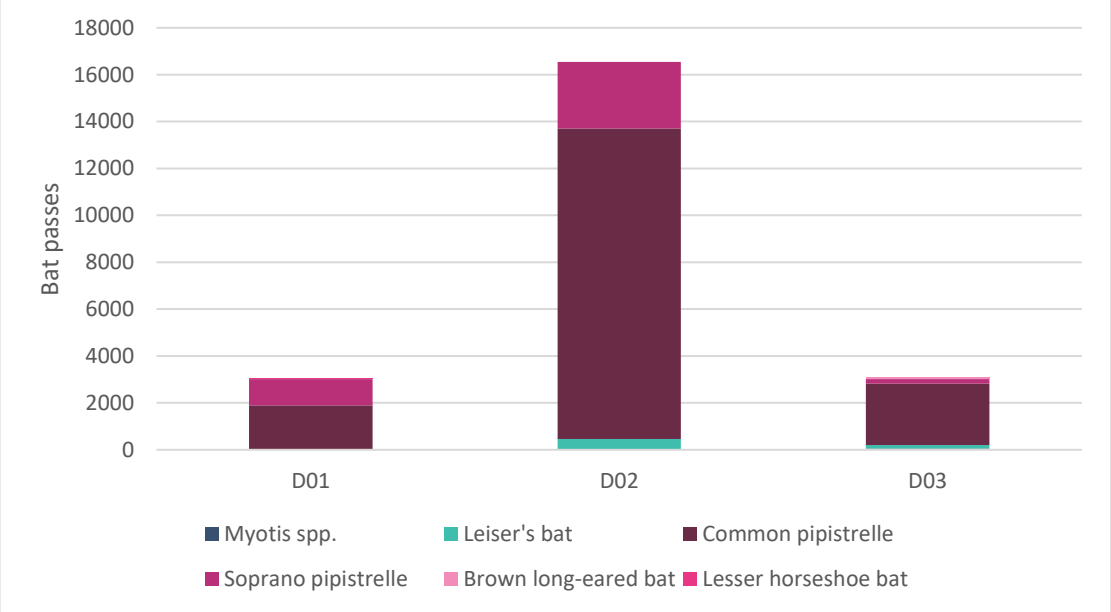

Plate 3-17 Total bat passes per species, per detector

Analysis of the detector recordings also highlighted the total bat passes per night, per detector. Species composition per night is shown in **Error! Reference source not found.**12. Activity varied between locations and between nights during the two deployments, but species composition was always dominated by Common pipistrelle. Occasional increases in activity were recorded for all other species. Leisler's bat activity was highest at D02 on the 20th June and 9th July, at the beginning and the end of the deployment. Brown long-eared bat activity was highest on the 9th July at D03, on the last day of the deployment. Soprano pipistrelle activity varied throughout the deployment but at D01, the highest activity for this species occurred on the 22nd June. The highest overall activity was recorded on the 1st July at D02, with over 1,300 passes.

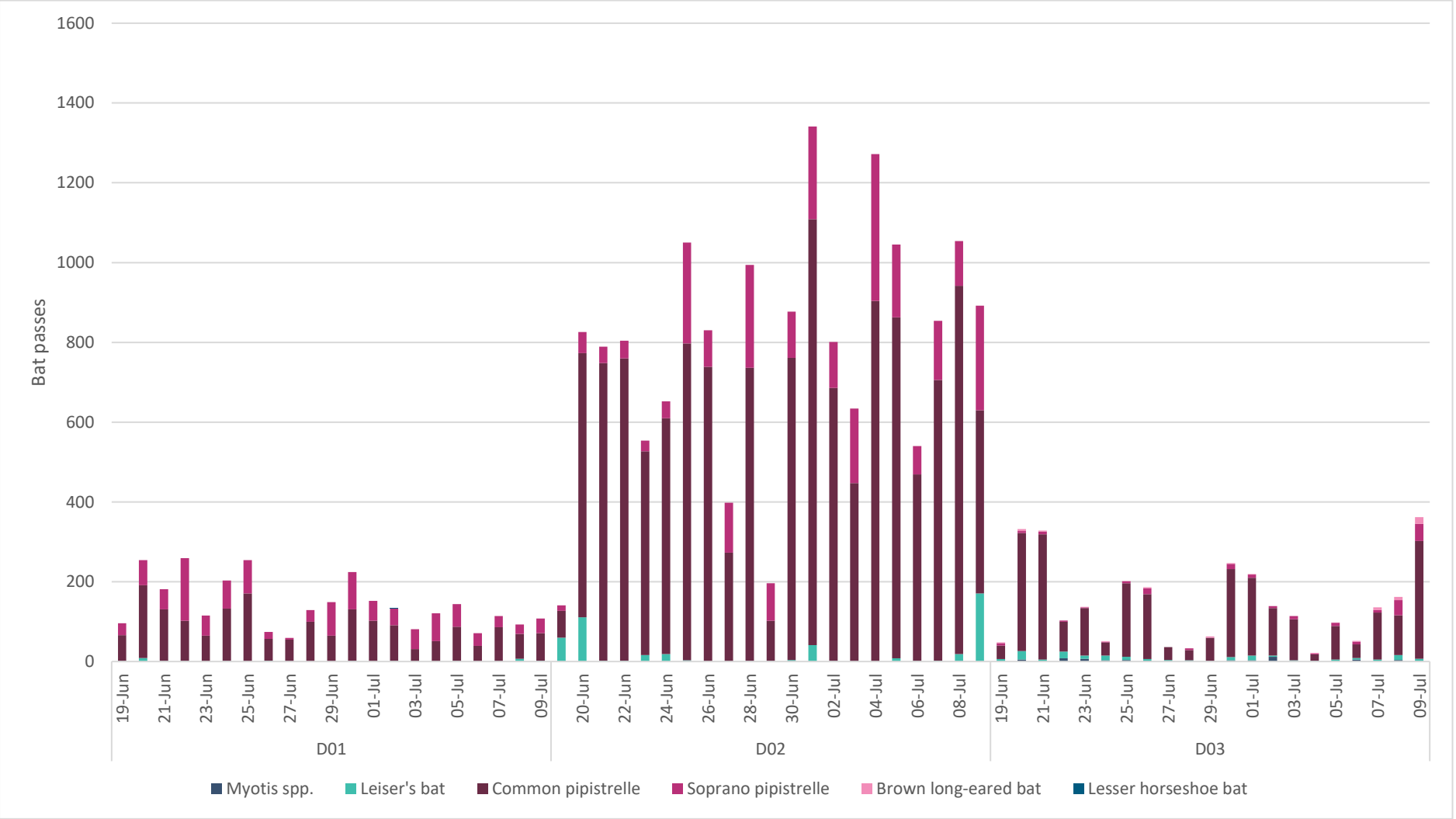

Plate 3-18 Species passes per detector, per night

4. DATA EVALUATION

4.1.1 Discussion and Interpretation

The Proposed Development site is located within the known range of all nine species of Irish bats. Bats were recorded using the site during every day of the static deployment, and during each manual survey. Common pipistrelle activity was higher than any other species throughout the site. Soprano pipistrelle activity was higher at the south of the site than the north. Brown long-eared bats were recorded only at the north of the site, at D03. Leisler's bat activity was higher at the north of the site than at the south. Bat activity from Leisler's bats was recorded 27 minutes before sunset at D03 on the 24th June. Common pipistrelle activity was recorded as early 20 minutes before sunset on the 28th June at the same location. During the manual survey carried out on the 19th June, the earliest bat activity recorded was a foraging Common pipistrelles 18 minutes after sunset. The first bat activity recorded during the survey on July 9th was a Leisler's bat 29 minutes after sunset, while a Common pipistrelle was observed flying from south to north near the Occupied Dwelling.

The habitat of the Proposed Development site is dominated by scrub, immature woodland and dense bracken, with some areas of grassland present and a small area of mixed broadleaf trees. The eastern side of the site is bordered by residential development. Linear features within the site include hedgerows surrounding the Occupied Dwelling, and a conifer treeline to the north of the site. The scrub habitat provides low foraging suitability for bat populations, while the mixed broadleaf woodland habitat provides high quality foraging habitat. This woodland contained the majority of bat activity recorded during the static surveys. During the manual survey undertaken on the 19th June, bats were observed foraging among the woodland. A single Common pipistrelle was also observed consistently foraging along the hedgerow located to the west of the Occupied Dwelling.

Overall, bat activity was moderate across the site and mainly synanthropic bats were recorded during the surveys, with the exception of a small number of *Myotis* spp. and Brown long-eared bats. Similar habitats located to the west of the site provide alternative foraging opportunities for these bat populations, and no bat roosts are present within the site.

A single Lesser horseshoe bat pass was recorded in the south of the site at D01 during the static surveys. Though the Proposed Development site is located within the known range of Lesser horseshoe bats and previous surveys have identified this species roosting within 2km of the site, the single recording indicates that the Proposed Development site is not regularly used by this species. Previous surveys also indicate sporadic use, with no records of the species over the four weeks of static deployments in 2022.

Brown long-eared bats are often under recorded during manual and static surveys. This is due to their quiet echolocation calls. It is likely that there is a higher level of activity for this species in the area. However, this species is sensitive to light pollution and not normally associated with urban habitats, as such it is likely that the suitable scrub and woodland within the site provide marginal habitat for this species.

4.1.2 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.

There is potential roosting opportunities for local bat populations within the site, in the form of two structures and four trees. However, 2024 surveys and previous surveys undertaken in 2019, 2020 and 2022 have not identified a roost within the site. No evidence of large roosts was found within the inspected structures and no roosting bat was observed emerging the structures during the surveys carried out in 2024. No roosts were recorded in previous years. While the structures present a suitable roost resource for bats, they are not regularly in use and likely only provide opportunistic shelter.

4.1.3 Survey limitations

A comprehensive suite of bat surveys were undertaken at the Proposed Development site. 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 the 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 deployed where intended.
- Access was gained throughout the site and within all structures identified in 2024.

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 three detectors being deployed in 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 data 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 activity threshold currently exists for Irish bat species to objectively assess bat activity within a certain habitat, and no standardised assessment method has been proposed across the country. Ecobat software recommended by existing guidelines was not available for use at the time of the assessment, as under maintenance. MKO experience surveying habitats similar to those present within the site aided with the assessment.

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

5. CONCLUSION & RECOMMENDATIONS

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 proposed works site during the bat surveys carried out in June and July 2024, including soprano pipistrelle, common pipistrelle, Leisler's bat, brown long-eared bat and lesser horseshoe bat. Nathusius' pipistrelles were also recorded at the site in 2022.
- The existing landscape occurring within the site provides moderate habitats for commuting and foraging bats.
- The buildings surveyed have the potential to support bat roosts. Old droppings or feeding remains were found within both structures and within the coach house. However, no dropping accumulations indicative of large active roosts were found. The old accumulations of bat droppings and feeding remains recorded suggest that the structures on site could still support use by bats. Access points available to bats suggest opportunistic use is likely.
- No active roosts were recorded.
- No large permanent or maternity roosts were recorded.

A full assessment of the potential impacts on bats as a result of the proposed development is presented in the EcIA which will accompany the planning application. Consideration should be given to the following measures to mitigate for potential impacts:

- Although no roosting bats were identified in any of the buildings surveyed, as the buildings show some potential for roosting bats and old small accumulations of droppings were identified, a pre-commencement survey is recommended 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 June and July 2024.
- As the structures were identified as having been used historically by bats, on a precautionary basis, a bat derogation licence will be obtained from NPWS for their demolition.
- On a highly precautionary basis, demolition works will not be carried out during the bat activity season (April-September).
- Any potential felling of trees with suitable roosting features will be carried out with the assumption that bats may be present:
    - Trees with suitable potential roost features proposed for felling will be checked by a suitably qualified ecologist at the time of felling.
    - Any tree felling will be undertaken at an appropriate time of year, as deemed by the project ecologist.
- Alternative new roosting locations will be provided as part of the proposed works. Three no. 2FN Woodcrete bat boxes will be erected on mature trees throughout the site to provide additional roosting opportunities. Bat boxes should have a southerly orientation and be positioned at least 2m from the ground (ideally 3m), away from artificial lighting. They will be placed adjacent to retained vegetation features such as treelines and hedgerows to ensure they are close to existing flight paths and can avoid wide open spaces (Collins, 2023). The exact location of the bat boxes will be determined by a qualified ecologist, however they will be placed within the south-eastern area of the site where tree loss is expected.
- The lighting plan for the operational phase of the proposed works, will be 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 Bat Conservation Trust (Guidance Note

08/23 Bats and Artificial Lighting at Night (ILP, 2023), to minimise light spillage, thus reducing any potential disturbance to bats.

- Landscaping favourable to bats will involve the retention and enhancement of linear features and woodland habitats. Artificial lighting towards these features will be avoided or kept to a minimum, with unavoidable light spill topping at 1Lux. The small mixed broadleaf woodland was identified as a significant feature for foraging bats, and it is recommended that this is retained during the Proposed Development.

The surveys undertaken provide a good understanding of the use of the buildings and surrounding habitats by bats and the report provides an overview with regard to the likely challenges faced and constraints associated with the proposed works.

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