

**DixonBrosnan**  
environmental consultants

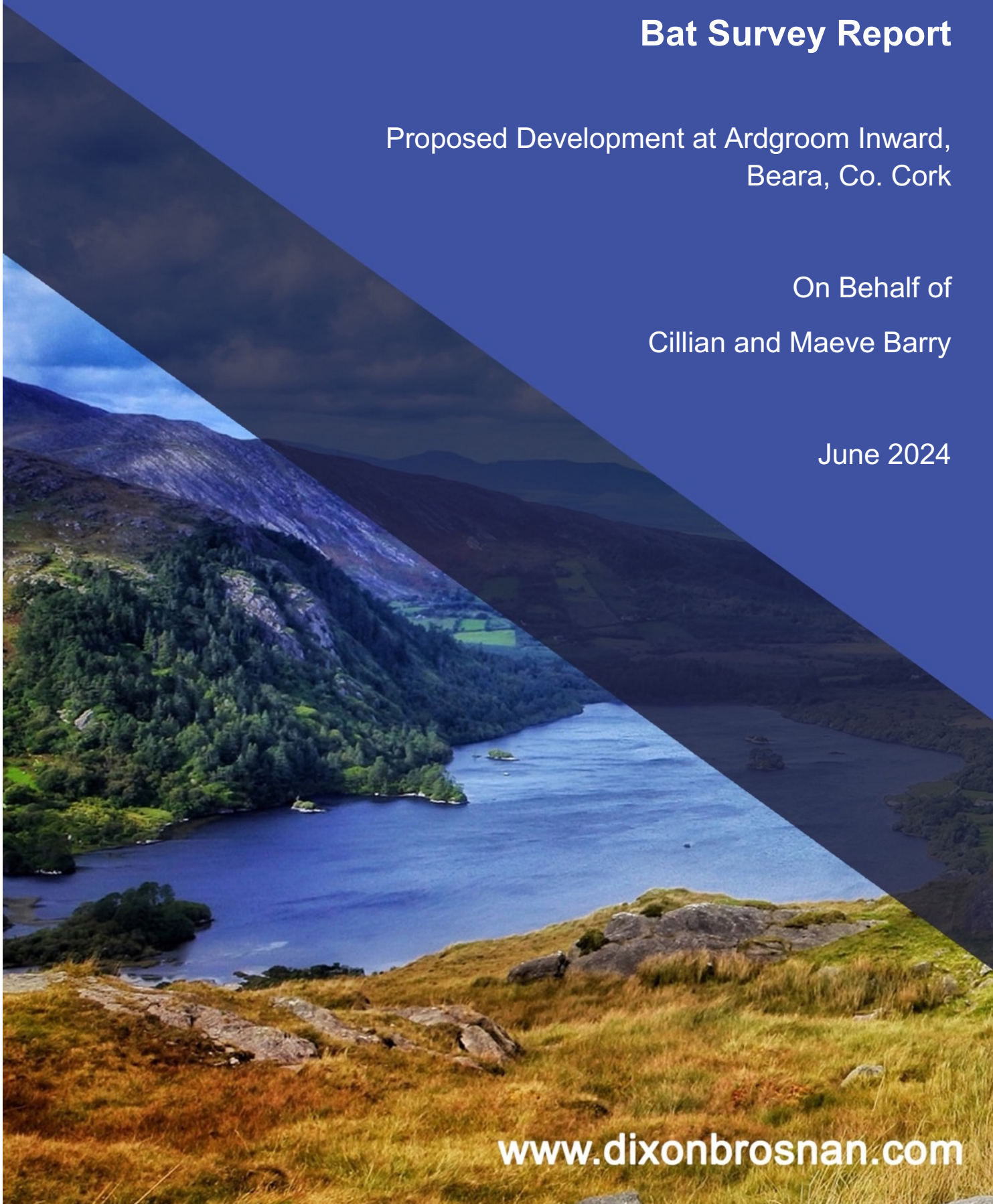
## **Bat Survey Report**

Proposed Development at Ardgroom Inward,  
Beara, Co. Cork

On Behalf of  
Cillian and Maeve Barry


June 2024

[www.dixonbrosnan.com](http://www.dixonbrosnan.com)



# DixonBrosnan

environmental consultants

<b>Project</b>	<b>Bat Survey Report at Ardgroom Inward, Beara, Co. Cork</b>	
Client	Cillian and Maeve Barry	
Project Ref.	24058	
Report No.	24059.01	
Client Ref.	-	
<b>Date</b>	<b>Revision</b>	<b>Prepared By</b>
25/06/24	Issue to client	Sorcha Sheehy PhD
		Carl Dixon MSc
DixonBrosnan Lios Ri Na hAoine, 1 Redemption Road, Cork.    <a href="http://www.dixonbrosnan.com">www.dixonbrosnan.com</a>		
This report and its contents are copyright of DixonBrosnan. It may not be reproduced without permission. The report is to be used only for its intended purpose. The report is confidential to the client, and is personal and non-assignable. No liability is admitted to third parties.		
©DixonBrosnan 2024.		

## Table of Contents

<b>1. Introduction .....</b>	<b>4</b>
<b>1.1 Background .....</b>	<b>4</b>
<b>1.2 Site Context.....</b>	<b>4</b>
<b>1.3 Report Authors.....</b>	<b>6</b>
<b>2. Protection of Bats in Ireland.....</b>	<b>7</b>
<b>3. Methodology .....</b>	<b>9</b>
<b>3.1 Desk Study .....</b>	<b>9</b>
<b>3.2 Assessment of Structures for Potential Bat Roosts.....</b>	<b>9</b>
<b>3.3 Bat Activity Surveys and emergence/re-entry surveys .....</b>	<b>14</b>
<b>3.4 Data Analysis.....</b>	<b>15</b>
<b>3.5 Daytime Inspection .....</b>	<b>16</b>
<b>4. Results .....</b>	<b>16</b>
<b>4.1 Bat Building/Site Survey .....</b>	<b>16</b>
4.1.1 Building 2 (Building relevant to proposed works) .....	16
4.1.2 Building 1 (Outside proposed development site) .....	18
4.1.3 Building 3 (Inside proposed development site boundary/Not included in proposed works) .....	21
4.1.4 Building 4 (Inside proposed development site boundary/Not included in proposed works) .....	22
<b>4.2 Bat activity/emergence survey .....</b>	<b>22</b>
<b>5. Mitigation.....</b>	<b>23</b>
<b>6. Conclusions .....</b>	<b>25</b>
<b>References .....</b>	<b>26</b>

# 1. Introduction

## 1.1 Background

DixonBrosnan were commissioned to undertake bat surveys at the site of the proposed development at Ardgroom Inward, Beara, Co. Cork. This report was commissioned following a request for further information received from Cork County Council regarding the proposed development.

The letter from Cork County Council, dated the 14<sup>th</sup> of March 2024, requested the following:

*Dear Sir/Madam,*

*I refer to your planning application which was lodged with the Planning Authority on the 23/01/2024. It is considered that the information submitted with the application is not yet sufficient to enable the Planning Authority to make a decision in this case.*

*...2. Having regard to Chartered Institute of Ecology and Environmental Management (CIEEM) advice note on the lifespan of ecological reports and surveys (2019), given the known presence of bats, including a number of roost sites, you are requested to carry out and submit the findings of an up- to-date bat survey to the Planning Authority. The purpose of the survey is to establish the status of the roost previously identified within the building to be impacted by the proposal and to further establish if any subsequent new roosts have been formed in the intervening period. In the event that one or more bat roosts are found within building proposed to be modified, and where disturbance of any such roost cannot be avoided, it will be necessary for the applicants to seek and obtain a Wildlife Act Derogation License to permit works to continue. It is advised that a copy of any such license would be submitted as part of the further information response. It is advised that the survey would be completed in accordance with Bat Conservation Trust and NPWS Guidance – ‘Bat Surveys for the Professional Ecologists Good Practice Guidelines (4th edition)’ and ‘Bat Mitigation Guidelines for Ireland – vol. 2’.*

The aim of this survey and report to address the concerns raised by the planning authority regarding bat roosts within the building.

## 1.2 Site Context

The proposed development site is located at Ardgroom Inward, Beara, Co. Cork. The proposed development includes demolition of single storey rear extension, refurbishment of existing dwelling with new dormer windows to the rear roof and new photovoltaic panels to front roof, new window openings and external insulation, construction of a separate garden room / gym, a new wastewater treatment system to replace existing bio-cycle unit, and associated site works at dwelling house.

As part of the original planning application, four buildings were surveyed for bats, three of which are located within the proposed development site boundary. The results of this survey (completed in 2022), which was carried out by Dr. Tina Aughney of Bat Eco Services, recorded the following:

The bat survey undertaken for this proposed development site yielded a large amount of results. A total of six bat species were recorded: Lesser horseshoe bat, common pipistrelle, soprano pipistrelle, Leisler's bat, brown long-eared bat and Natterer's bat. All four buildings located within the survey area were recorded as bat roosts:

- *Building 1 (Farm house): Day roost for soprano and common pipistrelles and night roost for lesser horseshoe bat, soprano pipistrelles and common pipistrelles.*
- *Building 2 (Dormer bungalow): Maternity roost for common pipistrelles.*
- *Building 3 (Shed): Day roost and night roost for lesser horseshoe bat, soprano pipistrelles and common pipistrelles.*
- *Building 4 (Garage): Day roost for Natterer's bat and night roost for lesser horseshoe bat.*

The proposed development will be undertaken as two separate planning proposals. The current planning proposal relates to Building 1 (Farm house) and Building 4 (Garage). The renovation of these buildings will result in the loss of the following roosts:

- *Day roost for soprano and common pipistrelles and night roost for lesser horseshoe bat, soprano pipistrelles and common pipistrelles.*
- *Day roost for Natterer's bat and night roost for lesser horseshoe bat. The operation of the site will also increase human activity and therefore noise and lighting. This will also potentially impact on local bat populations.*

The operation of the site will also increase human activity and therefore noise and lighting. This will also potentially impact on local bat populations.

Therefore, the potential impact of the proposed development relating to Building 1 and Building 4, is, overall, considered to be Permanent Negative and to have a scale of impact of Slight impact on named bat species (according to criteria set out in Tables 2c and d, Section 1.2.2). This is primarily in relation to the fact that the roosts recorded are not important maternity sites (Building 2 and Building 3 are significantly more important for local bat populations) and to the lighting plan for the proposed development scheme and the presence of light-sensitive bat species.

The provision of Building 3 as a bat house will likely increase the roosting opportunities for lesser horseshoe bats, Natterer's bat and soprano pipistrelles while supporting the existing maternity roost for common pipistrelles in Building 2.

Additional mitigation measures, if implemented fully, will reduce the potential impact on local bat populations to Non-significant Permanent Negative.

The building which is focus of this report as request by Cork County Council is Building 2, the dormer bungalow which holds a maternity roost for Common Pipistrelle. There are no works proposed in the other buildings described above i.e. Building 1, Building 3 and Building 4 as part of the current application.

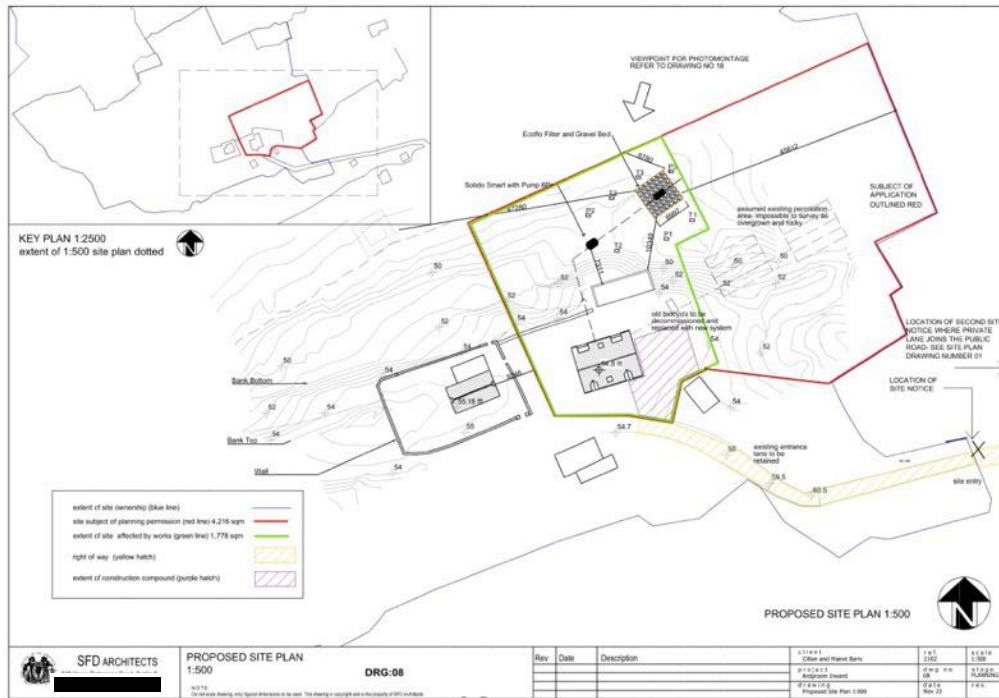


Figure 1. Site layout | Source SFD Architects

### 1.3 Report Authors

This report and survey work was completed by Carl Dixon MSc (Ecological Monitoring) and Dr. Sorcha Sheehy PhD (Ecology/ornithology).

Carl Dixon holds an Honours Degree (BSc) in Ecology and a Masters (MSc) in Ecological Monitoring from UCC. He is a senior ecologist who has over 25 years' experience in ecological assessment. Prior to setting up DixonBrosnan Environmental Consultants in 2000, Carl set up and ran Core Environmental Services which included REPS planning for landowners and ecological assessments. Carl has particular experience in freshwater ecology, including electrofishing fish stock assessments and water quality assessments. He also has considerable experience in habitat mapping and mammal ecology including survey work and reporting in relation to Badgers and bats. Other competencies include surveys for invasive species and bird surveys. Carl has extensive experience with regards to EIAR and NIS mitigation and impact assessment. He has experience in large-scale industrial developments with extensive experience in complex assessments as part of multi-disciplinary teams. Such projects include gas pipelines, incinerators, electrical cable routes, oil refineries and quarries.

Sorcha Sheehy PhD (Ecology/ornithology) is an ecologist and ornithologist who has worked for 15 years in environmental consultancy. She has worked on Screening/NISs for a range of small and large-scale projects with expertise in assessing impacts on birds. Sorcha's PhD research focused on bird behaviour at airports, where she studied bird avoidance behaviour and collision risk to aircraft. Her research involved field observations, post-mortem analysis and radar surveys. Sorcha has worked on bird collision risk assessments at airports throughout Ireland including Dublin airport, Cork airport, Shannon airport and Kerry airport. During her consultancy work Sorcha carried out field-based surveys and environmental reports including NIS, AA screening and EIARs. Notable projects include the Arklow Bank

Wind Park, Indaver Ireland Waste Management Facility at Ringaskiddy, Irving Oil Whitegate Refinery (IOWR), Shannon LNG and Greenlink Interconnector.

## 2. Protection of Bats in Ireland

All bat species are protected under the Wildlife Acts (1976 to 2000, as amended) which make it an offence to wilfully interfere with or destroy the breeding or resting place of all species; however, the Acts permit limited exemptions for certain kinds of development. All species of bats in Ireland are listed in Schedule 5 of the 1976 Act and are therefore subject to the provisions of Section 23 which make it an offence to:

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

All bats are listed on Annex IV of the EU Habitats Directive. The domestic legislation that implements this Directive gives strict protection to individual bats and their breeding and resting places. It should also be noted that any works interfering with bats and especially their roosts, including for instance, the installation of lighting in the vicinity of the latter, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by NPWS.

Furthermore, on 21<sup>st</sup> September 2011, the Irish Government published the European Communities (Birds and Natural Habitats) Regulations 2011 which include the protection of the Irish bat fauna and further outline derogation licensing requirements. All bat species found in Ireland are listed under Annex IV of the EC (Birds and Natural Habitats) Regulations 2011 – 2021 and as a result works which would capture or kill them, damage or destroy their roosts or disturb them at important parts of their life cycle cannot take place without first obtaining a Derogation Licence. **Table 1** summarises the protection given to bats by national and international legislation and conventions.

**Table 1. Legislative protection for bats in Ireland**

Legislation/Convention	Relevance to Irish bats
Wildlife Acts (1976 to 2018) as amended	It is an offence to wilfully interfere with or destroy the breeding or resting place of bats, (with some exemptions for certain kinds of construction development). Provides for the creation of NHAs.

Legislation/Convention	Relevance to Irish bats
EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Directive 92/43/EEC), commonly known as the 'Habitats Directive'	<p>Lists all the vesper bats in Annex IV as in need of strict protection and also encourages Member States to conserve landscape features such as river corridors, field boundaries, ponds and woodlands. It also requests that Member States establish a system to monitor the incidental capture and killing of the animals listed in Annex IV.</p> <p>The lesser horseshoe bat is further listed in Annex II of the EU Habitats Directive. The level of protection offered to lesser horseshoe bats effectively means that areas important for this species are designated as Special Areas of Conservation.</p>
The Convention on the Conservation of European Wildlife and Natural Habitats, commonly known as the 'Berne Convention'.	It obliges states to protect and conserve animals and their habitats, especially those listed as endangered or vulnerable. It also obliges parties to promote national policies for the conservation of wild fauna and natural habitats.
The Convention on the Conservation of Migratory Species of Wild Animals, commonly known as the 'Bonn Convention'.	This led to the European Bats Agreement (EUROBATS), which lists a wide range of objectives, including promoting research programmes relating to the conservation and management of bats, promoting bat conservation and public awareness of bats, and identifying and protecting important feeding areas of bats from damage and disturbance.

In Ireland, nine species of bat are currently known to be resident. These are classified into two Families: *Rhinolophidae* (Horseshoe bats) and *Vespertilionidae* (Common bats). The Lesser Horseshoe Bat *Rhinolophus hipposideros* is the only representative of the former Family in Ireland. All the other Irish bat species are of the latter Family and these include three pipistrelle species: Common *Pipistrellus pipistrellus*, Soprano *Pipistrellus pygmaeus* and Nathusius' *Pipistrellus nathusii*, four *Myotis*: Natterer's *Myotis nattereri*, Daubenton's *Myotis daubentonii*, Whiskered *Myotis mystacinus*, Brandt's *Myotis brandtii*, the Brown Long-eared *Plecotus auritus* and Leisler's *Nyctalus leisleri* bats.

Whiskered and Natterer's bats are listed as 'Threatened in Ireland', while the other species are listed as 'Internationally Important' in the Irish Red Data Book 2: Vertebrates (Whilde, 1993). The population status of both Whiskered and Natterer's bats was considered 'indeterminate' because of the small numbers known of each, a few hundred and approximately a thousand respectively. Ireland is considered to be an international stronghold for Leisler's bat, whose global status is described as being at 'low risk, near threatened' (LR; nt) by the IUCN (Hutson, *et al.*, 2001).

Near threatened status is applied to those taxa that are close to being listed as vulnerable (facing a high risk of extinction in the wild in the medium-term future on the basis of a range of criteria defined by the IUCN). The Irish population of the Lesser Horseshoe Bat is estimated at 14,000 individuals and is considered of International Importance because it has declined dramatically and become extinct in many other parts of Europe. Data collected shows that the species increased significantly between from the early 1990s to present.

## 3. Methodology

### 3.1 Desk Study

A desktop study was carried out to identify features of ecological value occurring within the proposed development site and in close proximity to it. A desktop review also allows the key ecological issues to be identified early in the appraisal process and facilitates the planning of surveys. Sources of information utilised for this report include the following:

- National Parks & Wildlife Service (NPWS) - [www.npws.ie](http://www.npws.ie)
- Environmental Protection Agency (EPA) – [www.epa.ie](http://www.epa.ie)
- National Biodiversity Data Centre (NBDC)– [www.biodiversityireland.ie](http://www.biodiversityireland.ie)
- Cork County Biodiversity Action Plan 2009-2016;
- Cork County Development Plan 2022;
- Hundt, L. (2012) Bat Surveys: Good Practice Guidelines, 2nd edition. Bat Conservation Trust.
- Collins, J. (ed) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines, 4<sup>th</sup> Edition, Bat conservation Trust, London.
- Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland
- Aughney, T., Kelleher, C. & Mullen, D. (2008) Bat Survey Guidelines: Traditional Farm Buildings Scheme The Heritage Council, Áras na hOidhreacht, Church Lane, Kilkenny.
- National Road Authority NRA, (2006) Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes
- National Parks and Wildlife Service (2006), Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25
- NRA (2005). Guidelines for treatment of Bats During Construction of National Road Schemes.

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

### 3.2 Assessment of Structures for Potential Bat Roosts

A detailed building inspection was carried out by Carl Dixon MSc, looking for potential access points and ‘potential roosting features (PRFs)’ that bats could use and any evidence indicating the presence of bats using the building, such as rub marks, staining or droppings on the 11<sup>th</sup> and 13<sup>th</sup> of May 2024. This included a ground-based external inspection around the buildings and internal inspection of any enclosed loft spaces or roof voids, where safe access was possible. During the surveys, all structures within the proposed development site were surveyed to assess their ability to support roosting bats using a torch to inspect any suitable features. Inspections are undertaken using a torch and endoscope as required.

In Marnell *et al.* (2022), **Figure 2** (Table 3) (The applicability of survey methods) provides information on the type of surveys that can be undertaken according to the different seasons. Marnell *et al.* (2022) states that it is more suitable to survey buildings in the summer months. The following is a summary of the principal points:

1. The presence of a significant bat roost (invariably a maternity roost) can normally be determined on a single visit at any time of year, provided that the entire structure is accessible and that any signs of bats have not been removed by others. However, a visit during the summer or autumn has the advantage that bats may be seen or heard.
2. Roosts used by a small number of bats, as opposed to maternity sites, can be particularly difficult to detect and may require extensive searching backed up (in summer) by bat detector surveys or emergence counts.
3. If the entire building is not accessible or signs of bats may have been removed by others, or by the weather, bat detector or exit count methodologies may be required to back up a limited search.

**Table 3.** The applicability of survey methods.

Season	Roost type	Inspection	Bat detectors and emergence counts
Spring (Mar – May)	Building	Suitable (signs, perhaps bats)	Limited, weather dependent
	Trees	Difficult (best for signs before leaves appear)	Rarely useful
	Underground	Suitable (signs only)	Static detectors may be useful
Summer (June- August)	Building	Suitable (signs and bats)	Suitable
	Trees	Difficult	Limited; use sunrise survey
	Underground	Suitable (signs only)	Rarely useful
Autumn (September –November)	Building	Suitable (signs and bats)	Limited, weather dependent
	Trees	Difficult	Rather limited weather dependent; use sunrise survey?
	Underground	Suitable (signs, perhaps bats)	Static detectors may be useful
Winter (December- February)	Building	Suitable (signs, perhaps bats))	Rarely useful
	Trees	Difficult (best for signs after leaves have gone)	Rarely useful
	Underground	Suitable (signs and bats)	Static detectors may be useful

**Figure 2. Table 3 from Marnell et al. (2022)**

Roosting sites for bats can be found within structures such as buildings, cellars, churches, stone masonry, bridges, tunnels, mines, caves. The value of buildings as potential bat roosts was classified using the criteria specified in Collins (2023) to assess the potential value of structures as bat roosts (Potential Roost Features (PRF)), which is summarised in **Table 2**. Evidence of bat activity associated with potential roost sites includes bat droppings, urine staining, feeding remains and dead/alive bats. Indicators that potential roost locations and access points are likely to be inactive include the presence of cobwebs and general detritus within the apertures.

**Table 2. Guidelines for assessing the potential suitability of structures and habitats for bats.**

Potential Suitability	Description	
	Roosting habitats	Commuting and foraging habitats
None	No habitat features on site likely to be used by any roosting bats at any time of year (i.e. a complete absence of suitable crevices/suitable shelter at all ground/underground levels)	No habitat features onsite likely to be used by any commuting/foraging bats at any time of year (i.e. no habitats that provide continuous lines of shade/protection for flight-lines, or generate/shelter insect populations available to foraging bats)
Negligible	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions <sup>b</sup> , and/or suitable surrounding habitat to be used on a regularly basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a classic cool/stable hibernation site but could be used by individual hibernating bats <sup>c</sup> ).	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.  Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically.  However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions <sup>a</sup> and / or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.  Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions <sup>b</sup> and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only such as hibernation or maternity, the categorization described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.  Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.

Potential Suitability	Description	
	Roosting habitats	Commuting and foraging habitats
High	A 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 <sup>b</sup> and surrounding habitat. These structures have the potential to support high conservation status roosts e.g. maternity or classic cool/stable hibernation site.	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, treelined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>
<p>a. Negligible is defined as 'so small or unimportant as to be not work considering, insignificant'. This category may be used where there are places that a bat could roost or forage (due to one attribute) but it is likely that they actually would (due to another attribute)</p> <p>b. For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance</p> <p>c. Evidence from the Netherlands shows mass swarming events on common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in the urban environments. Common pipistrelle swarming has been observed in the UK and winter hibernation of number of his species have been detected at Seaton Delaval Hall in Northumberland.</p>		

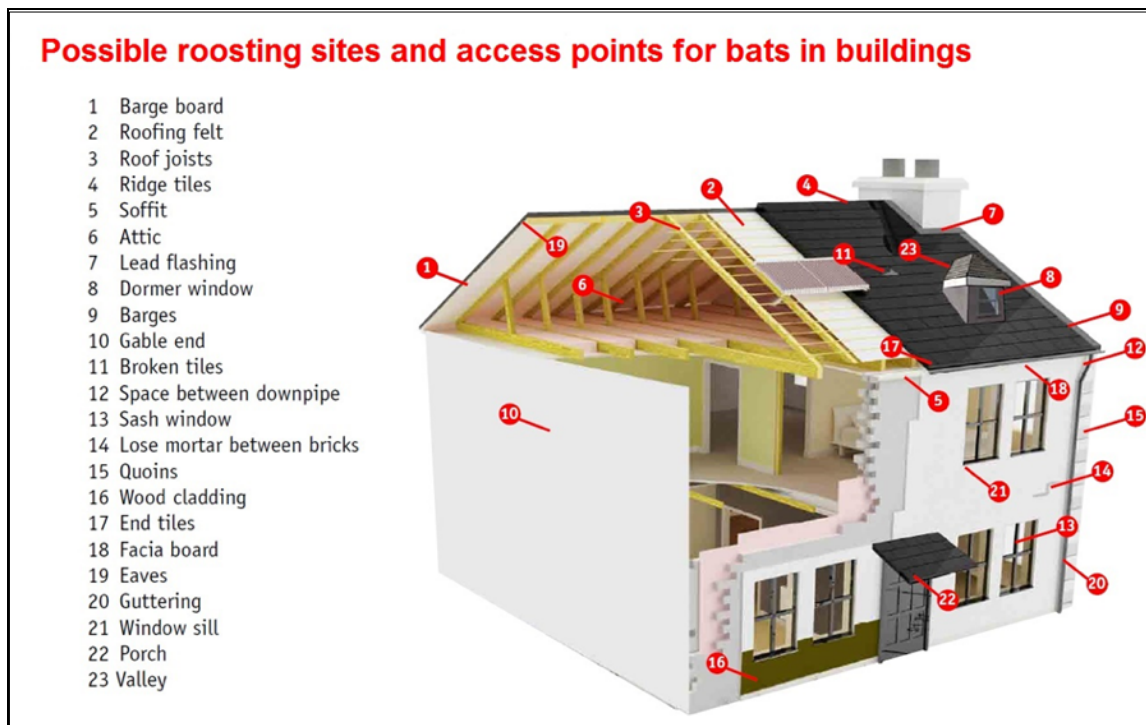
Source: Collins 2023

Bats that use buildings can generally be divided into four categories, although there is regional variation, and some species can occupy more than one category.

- Crevice-dwelling bats (which tend to be hidden from view) include the common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Brandt's Bat and Whiskered Bat.
- Roof-void dwelling bats (that may be visible on roof timbers) are Leisler's bat and Daubenton's bat.
- Bats that need flight space in certain types of roost are Natterer's Bat, and Brown Long-Eared Bat.
- Bats that need flight space and flying access into the roost include the lesser horseshoe bat.

Bats generally require a variety of elements, that need to be taken into consideration when roosting within a building, these range from temperature and humidity regime within the roost, aspect and orientation of the roost, size of roost, access points, lighting, materials and perching points. Important roosting sites for bats in buildings include crevices in stonework of old and modern structures, crevices in brick work of chimneys, attics of buildings – old and

modern buildings – often behind roofing felt, under ridge tiles or in wall cavities and underground structures associated with older buildings (**Figure 3**).



**Figure 3. Possible roosting sites for bats in buildings.**

To maximise warmth, maternity roosts for example are often located on the south and west of houses or close to sources of heat such as chimneys and boilers. Most species prefer to roost in quite small spaces and are not usually found in open draughty areas like barns. Common and Soprano Pipistrelles for example are generally found in the inaccessible parts of the roof structure and around its edges and rarely enter the loft space. Where bats are seen in buildings during the winter, they tend to be alone or in small, scattered groups, hidden in crevices or under slates and away from sources of heat.

An inspection of the buildings was conducted to look for suitable roosting habitat, possible emergence points and bat presence. The presence of bats is often shown by grease staining, droppings, urine marks, corpses, feeding signs such as invertebrate prey remains and/or the presence of bat fly *Nycteriidae* spp. pupae, although direct observations are also occasionally made. Bat droppings are often identifiable to species-level based on their size, shape and content for example brown long-eared and lesser horseshoe bats, are very distinctive and unmistakable. A search of the accessible areas of the interior and exterior of the buildings on site was carried out to assess the potential value of the site for roosting bats and to survey for signs such as droppings, staining and prey remains.

### **3.3 Bat Activity Surveys and emergence/re-entry surveys**

Dusk bat activity surveys were carried out in the proposed development site during suitable weather conditions on the 11<sup>th</sup> May 2024 and 23<sup>rd</sup> May 2024 (sunset temperatures above 10°C, no rain and no strong wind). The following equipment was used: EchoMeter Touch 2 PRO bat detectors, Elekon Batloggers and a Pulsar Halion thermal imaging camera. An EchoMeter Touch 2 PRO bat detector left in situ from the 11<sup>th</sup> to 13<sup>th</sup> of May 2024.

The surveys followed the guidelines set out in '*Bat Surveys for Professional Ecologists: Good Practice Guidelines (4<sup>th</sup> end*)' (Collins, 2023). Surveyors walked around the perimeter of buildings and around works area concentrating on areas which might support bats, and structures/habitats which might be affected by the proposed works. The surveys were carried out 15 minutes before sunset (dusk survey) until 2 hours after sunset in order to ascertain their use as bat roosts.

With reference to Collins (2023) and Marnell et al. (2022), the information presented in this section is used to determine the bat survey requirements for the proposed development site. Collins (2023) provides a trigger list in relation to determining if a bat survey is required.

The level of surveying is to be determined by the ecologist and these are influenced by the following criteria:

- Likelihood of bats being present;
- Type of proposed activities;
- Scale of proposed activities;
- Size, nature and complexity of the site;
- Species concerned;
- No. of individuals.

### **3.4 Data Analysis**

Batlogger data collected during bat activity surveys (transects, and automated surveys) was downloaded and analysed using Kaleidoscope and Anlook software where relevant Each time-stamped bat file was analysed. A single sound file can have bat passes from more than one species as well as calls from more than one bat of the same species. Where this occurs a bat pass was noted for each species (e.g., two species identified in a time-stamped file).

Each bat sequence (series of echolocation pulses starting with a search phase and ending with the catch phase) is noted as a bat pass. Each bat pass does not correlate to an individual bat but is representative of bat activity levels. Some species such as the pipistrelles will continuously fly around a habitat, and therefore, it is possible that a series of bat passes within a similar time frame is one individual bat. On the other hand, Leisler's bats tend to travel through an area quickly and therefore an individual sequence or bat pass, is more likely to be indicative of individual bats.

The sound files collected were analysed using Kaleidoscope software. This software can automatically sort sound files that contain only non-bat 'noise' from sound files that contain bat passes. The software can also 'tag' each call with a potential identification, according to similarities in call shape to archetypal call clusters within the database. This approach allows identification of bats to genus level for *Myotis* species, and to species level for other bats found in Ireland. Separation of *Myotis* species is complicated by the high degree of overlap between call characteristics.

Following Kaleidoscope download, the bat tags were then checked using Analook software, and confirmed or corrected manually, since automatic classification is not yet accurate enough to rely upon in isolation for most species (Waters and Barlow, 2013).

The manual identification was carried out by comparison with call parameters as set out in Russ (2012) and Barataud (2015).

### 3.5 Daytime Inspection

One purpose of daytime inspections is to determine the potential of bat roosts within the survey area. Due to the transient nature of bats and their seasonal life cycle, there are a number of different type of bat roosts. Where possible, one of the objectives of the surveys is to be able to identify the types of roosts present, if any. However, the determination of the type of roost present depends on the timing of the survey and the number of bat surveys completed. Consequently, the definition of roost types, in this report, is based on the following:

**Table 3. Bat roost types (from Collins 2023)**

Table 3.1. Bat roost types. (Definitions written by the NE Earned Recognition Project).	
Roost type	NE definition
Day roost	A place where individual bats, or small groups, rest or shelter in the day during the summer.
Night roost	A place where bats rest or shelter in the night but are not found in the day. May be used by a single individual on occasion or it could be used regularly by the whole colony.
Feeding roost	A place where individual bats, or a few individuals, rest or feed for short periods during the night but are not present by day.
Transitional roost	A place used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.
Maternity roost	A place where female bats give birth and raise their young to independence. In some species males may also be present in the maternity roost.
Hibernation roost	A place where bats may be found individually or together during winter. They have a constant cool temperature and high humidity.
Satellite roost	An alternative roost found in close proximity to the main nursery colony used by a few individuals to small groups of breeding females throughout the breeding season.

## 4. Results

### 4.1 Bat Building/Site Survey

Internal and external surveys of all buildings within the site boundary were carried out. Existing structures within the site are described below.

#### 4.1.1 Building 2 (Building relevant to proposed works)

Building 2 is a modern two-storey dormer bungalow with a tiled roof and associated roof felting. A search of the attic recorded a number of scattered pipistrelle droppings. Some droppings were also recorded on the exterior roof slates close to the dormer window where this species was previously recorded during the 2022 survey. Three dead pipistrelle bats were recorded in the downstairs sinks. It is noted that the hatch to the attic was open during the surveys allowing bats to move into the main building from the attic space. The upstairs rooms, including the area behind the roof where the bat roost is located, is in good condition. The plaster is intact and there are no signs of bats within the upstairs rooms.



**Plate 1. Building 2.**



**Plate 2. Front elevation of dormer windows facing south. Prominent flashing from which bats are emerging**



**Plate 3. Pipistrelle droppings on insulation near chimney breast east side of building**

#### **4.1.2 Building 1 (Outside proposed development site)**

Building 1 is a two storey old farmhouse with slate roof and concrete walls located to the west of Building 2. Lesser Horseshoe droppings were recorded in small storage rooms which are accessed from the upstairs landing. One Lesser Horseshoe Bat was recorded roosting at this location during the daytime survey on the 11<sup>th</sup> of May. Staining on the walls and droppings in the western upstairs bedroom indicate usage by pipistrelle bats. A static detector (Elekon Batlogger) was left in situ from the 11<sup>th</sup> to the 13<sup>th</sup> of May. It recorded sporadic signals for Lesser Horseshoe bat throughout the survey period. The results indicate that this older traditional dwelling continues to be used as a night-time roost by this species. The presence of one Lesser Horseshoe bat during the day, on one of the survey days, suggests temporary usage as a day roost. The presence of droppings and staining indicates that this building continues to be used as a pipistrelle roost. This building will not be affected by the proposed development and no significant changes in usage patterns were identified by the 2024 surveys.



**Plate 4. Building 1**



**Plate 5. Upstairs room at eastern gable of building 1 with small cloakroom. Extensive droppings and one lesser horseshoe bat recorded hanging from wooden panelling on ceiling**



**Plate 6. Storage room on landing top of stairs. Droppings indicate probable usage by Leslie horseshoe bat as a roost droppings a pair fresh. This is where our bats were recorded during Aughney 2022 survey**



**Plate 7. Bedroom to West extensive horseshoe droppings but relatively widely scattered. Extensive staining on western Gable probably indicative of location of Pipistrelle roost.**



**Plate 8. Building 3**



**Plate 9. Lesser horseshoe droppings within building 3**

#### **4.1.3 Building 3 (Inside proposed development site boundary/Not included in proposed works)**

Building 3 is an old stone shed with a slate roof and natural stone walls. While this building is located within the proposed development site, there are no works proposed to this building. The windows and doorway of this building are open. A small number of Lesser Horseshoe droppings were recorded close to the southern gable however none appeared fresh. It is probable that this building will continue to be used sporadically as a night roost site. Likewise a small number of old pipistrelle droppings were recorded indicating sporadic usage. No bats were detected during an endoscope survey.



**Plate 10. Building 4**



**Plate 11. Green shed has all stone walls with two to three lesser horseshoe bat droppings appear old**

#### **4.1.4 Building 4 (Inside proposed development site boundary/Not included in proposed works)**

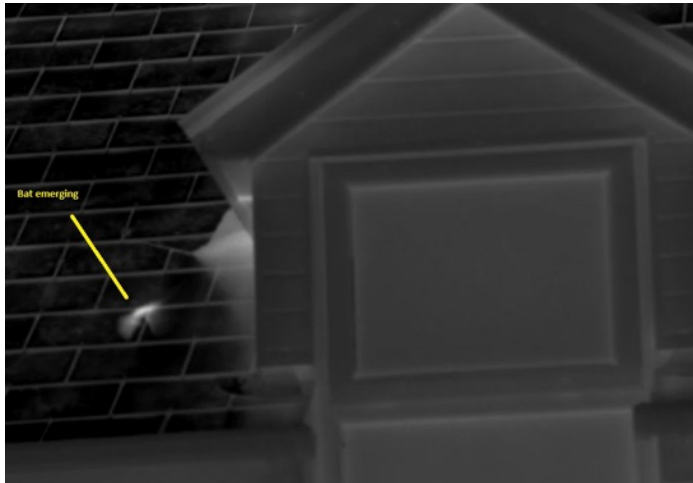
Building 4, within the proposed development site boundary has a corrugated iron roof and natural stone walls. Small number of Lesser Horseshoe droppings were detected. No bats were detected during an endoscope survey.

#### **4.2 Bat activity/emergence survey**

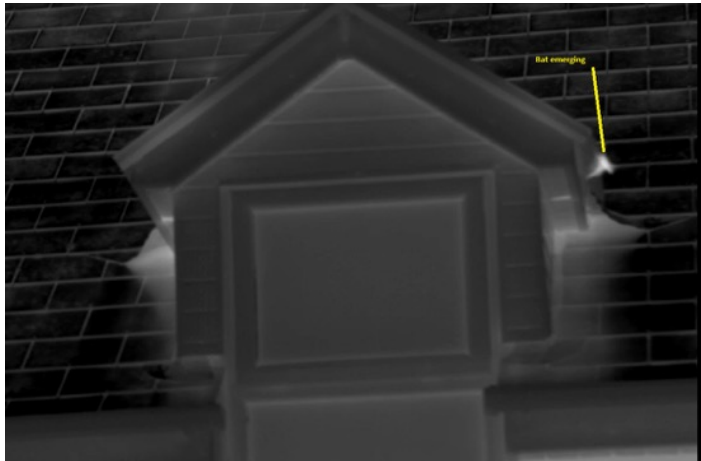
Night-time emergence/activity surveys were carried out within the site boundary on the 11<sup>th</sup> and 23<sup>rd</sup> May 2024. The survey was carried out during dry sunny weather with mild temperatures and during the emergence period. The survey was carried out using two Eco touch, two bat loggers and a Pulsar Helion thermal imaging camera. The primary focus of the emergence/activity survey was Building 2 as no works are proposed for the other buildings within the study area.

The previous bat surveys at Building 2 recorded a Common Pipistrelle maternity roost (44 individuals). The entry/exit point for this roost was a single gap in the roof/flashing adjacent to a dormer window at the front of the building. During the 2024 survey, emergence was recorded from this gap (see Plate 12) as well as another area on the other side of the dormer window (See Plate 13). A total of 57 Common pipistrelle were recorded exiting from the western side of the dormer structure and 16 were recorded emerging from the eastern side on thermal imaging camera. The results indicate that Building 2 continues to be used as a maternity roost by a relatively large number of Common Pipistrelle bats. The survey did not record any other bats emerging from this house and no signals for Lesser Horseshoe bat were recorded.

Sporadic signals for Leisler's Bat were recorded early in the survey period indicating some foraging by this species in the wider landscape. One brief signal for Natterers Bat was recorded within the emergence window and it is considered probable that this emerged from Building 4 where a roost for this species was previously identified during the 2022 survey. Overall the surveys indicate that patterns of usage have not changed significantly since the previous surveys and Building 2 for which works are proposed continues to function as a maternity roost for Common Pipistrelle.



**Plate 12. Bat emerging left of dormer window**



**Plate 13. Bat emerging from right of dormer window.**

## 5. Mitigation

The bat mitigation measures described below take into consideration Marnell et al. (2022) as well as best practice guidelines from Collins (2023) and BCT (2018). The measures described are those considered to be practical and effective based on past experience of the principal bat specialist, for the proposed development site. Measures are also reflective to published scientific research, where available and applicable to Irish bat populations. As stated by Marnell et. Al. (2022) "Any mitigation intended to ensure that there is no impact or minimal

impact on the bats must be clearly described in detail, giving examples of how it worked in other places”.

Works for the proposed development are confined to Building 2. There are no works proposed within the attic space, the roof around the dormer window or the attic space behind the dormer window where the maternity roost is located. There will be no change to the flashing, fascias or soffits around the dormer window. While roof mounted solar panels will be installed, no works are required within the attic space. However, as a precautionary measure the installation of solar panels will take place between the 1<sup>st</sup> of October and the 1<sup>st</sup> of May to avoid any potential disturbance to the bat roost.

There will be no direct impacts to roosting bats, no disturbance to the bat roost and no change to the entry/exit points for these roosts within Building 2. Access to the roost will be maintained during and following the proposed works. Therefore, a derogation licence is not required for the proposed development.

### ***Lighting Plan***

This element of the proposed planning application is important aspect in relation to local bat populations, particularly in relation to lesser horseshoe bats. All European bat species, including Irish bat species, are nocturnal. They usually hide in roosts during the daytime, while fly to feeding areas or drinking sites using commuting routes during the night. Annually bats will hibernate in the winter, swarm in the autumn and give birth in the summer months. In all aspects of the bat lifestyle, Artificial Light at Night (ALAN) may significantly change their natural behaviour in relation to roosting, commuting and feeding. While bats are naturally exposed only to very low lighting levels produced by moonlight, starlight and low intensity twilight, light levels greater than natural light levels can impact on the lifestyle of bats.

Bats are light sensitive species, hence their nocturnal activities. Three bat species recorded commuting and foraging within the survey area are Light Tolerant or Semi-tolerant bat species (Leisler’s bat, common pipistrelle and soprano pipistrelle). However, the remaining bat species are all light sensitive and therefore the outdoor lighting plan should be designed for these bat species. It is important that strict lighting guidelines are required to reduce the potential impact of the proposed development on local bat populations as standard best practice. In relation to lesser horseshoe bats, it is a conservation objective to ensure that there is no increase of outdoor lighting within the foraging area.

There will be no lighting directional lighting on the entry/exit points around the dormer window/maternity roost access. It is recommended that there is no lighting of the garden area of the proposed development site and to limit the amount of lighting spilling from the interior of the buildings when in operation.

Luminaire design is extremely important to achieve an appropriate lighting regime. Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires. This is taken from the most recent BCT Lighting Guidelines (BCT, 2018). Consultation was undertaken with the lighting specialists to reduce the potential impact on local bat populations.

- All luminaires used will lack UV/IR elements to reduce impact.

- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (2200 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

Any external lighting for the proposed development should strictly follow the above guidelines and these should be strictly implemented during construction and operation phase of the proposed development. It is highly recommended that the conservation objectives for lesser horseshoe bats (i.e. no outdoor lighting that may impact on bat foraging and commuting habitat) are incorporated into the Lighting Plan.

If works do not proceed within 2 years of this survey, then a repeat survey should be carried out.

During the works, it is important there is no disturbance to the other buildings within the proposed development site i.e. Building 3 and Building 4 (or building 1 outside the proposed development site). These buildings will not be used for material storage and there should be no works to the interior or exterior of these buildings.

Three Vincent Pro bat boxes will be installed on mature trees within the proposed development site. This box features three vertical chambers of different sizes, providing ideal roosting space for a variety of species. Beneath the crevice entrances is a ladder which provides a rough surface for bats to land. Limited cleaning is required for these boxes as the droppings will fall out of the bottom of the chambers. The front and top of the box are black which helps the box to absorb heat. This bat box can be used by Leisler's, Common Pipistrelle, Soprano Pipistrelle, Brown long-eared, Natterer's and Whiskered Bat.

## 6. Conclusions

Whilst Building 2 continues to be used as a maternity roost for Common Pipistrelle, with a total 73 individuals recorded during the DixonBrosnan 2024 survey, the use of the building has changed slightly. While the main roosting area continues to be in a space behind the dormer window, there is also evidence of pipistrelle use within the main attic space. Droppings were recorded here, but no bat roost was recorded within the attic space. The scattered dropping

recorded are likely to indicate that bats are moving around this area. It is noted that from the main attic, bats can access the remainder of the dwelling via the open attic stairs. The original entry/exit point on the flashing continues to be used. There is also now a second entry/exit point on the side of the dormer window.

The proposed development relates to Building 2. However, the renovation works will be largely confined to the rear of the building and there are no works proposed to the area where the maternity roost is located i.e. dormer attic space, roof around dormer window and main attic space. The installation of solar PV panels on the front roof will be carried out between the 1<sup>st</sup> of October and the 1<sup>st</sup> of May to avoid any potential disturbance to bats roosts on this side of the building. Therefore, there will be no direct impact to the maternity roost and no derogation licence is required for the development. Based on the above it is predicted that the building will continue to be used as a Common Pipistrelle maternity roost following the proposed works.

Lighting mitigation measures and the provision of bat boxes will reduce the impact on disturbance of local bat populations during operation.

## References

- Altringham J 2003. British Bats. Collins New Naturalist Series No 93, Harper Collins, London
- Andrews H & Gardener M 2016. Bat Tree Habitat Key – Database Report 2016. AEcol, Bridgwater.
- Bat Conservation Ireland (2010) Bats & Lighting; Guidance Notes for: Planners, engineers, architects and developers.
- Bat Conservation Trust (2018) Bats and artificial lighting in the UK. Guidance Note 08/18. Bats and the Built Environment series
- Bontadina, F., Schofield, H. and Naef-Daenzer, B. (2002) Radio-tracking reveals that lesser horseshoe bats (*Rhinolophus hipposideros*) forage in woodland. *Journal of Zoology* 258: 281–290.
- Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4<sup>th</sup> edn).
- Downs, N. C. et al (2003) The effects of illuminating the roost entrance on the emergence behaviour of *Pipistrellus pygmaeus*. *Biological Conservation* 111, 247-252
- Entwistle A, Racey P & Speakman J 1997. Roost selection by the brown long-eared bat (*Plecotus auritus*). *Journal of Applied Ecology*
- Harris S & Yalden D (eds.) 2008. Mammals of the British Isles: Handbook 4th Edition. The Mammal society, London
- Hutterer R, Ivanova T, Meyer-Cords C & Rodrigues L 2005. Bat Migrations in Europe: A Review of Banding Data and Literature. Federal Agency for Nature Conservation, Bonn
- Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. *Irish Wildlife Manuals*, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Lintott P, Bunnefeld N, Fuentes-Montemayor E, Minderman J, Mayhew R, Olley L & Park K 2014. City life makes females fussy: sex differences in habitat use of temperate bats in urban areas.

Lundy MG, Aughney T, Montgomery WI, Roche N (2011) Landscape conservation for Irish bats & species specific roosting characteristics. Bat Conservation Ireland.

Marnell, F., Kelleher, C. & Mullen, E. (2022) Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

McAney, K. (2006) A conservation plan for Irish vesper bats. Irish Wildlife Manuals, No. 20. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Murphy S, Greenaway F & Hill D 2012. Patterns of habitat use by female brown long-eared bats presage negative impacts of woodland conservation management. Journal of Zoology.

NPWS (2015) Conservation Objectives: Glengarriff Harbour and Woodland SAC 000090. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Outen, A.R. (1998) The possible ecological implications of artificial lighting. Hertfordshire Biological Records centre.