



**DixonBrosnan**  
environmental consultants

## Bat Survey Report

Proposed Development at  
Rathmore, Baltimore,  
Co. Cork


On Behalf of  
Tom Hegarty Architects

November 2024

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# DixonBrosnan

environmental consultants

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# 1. Introduction

## 1.1 Background

DixonBrosnan Ecological Consultants commissioned by Tom Hegarty Architects to undertake a survey for bats at the site of the proposed development at Rathmore, Baltimore, Co. Cork. This report was commissioned following a request for further information received from Cork County Council regarding the proposed development.

The aim of this survey and report is to:

- Identify any bat roosts located within the existing site structure and/or trees and
- Identify areas and buildings within the proposed development site that are being used by bats (including flight paths/commuting routes and foraging areas).

## 1.2 Site Context

The proposed development site is located in the townland of Rathmore, Baltimore, approximately 1.5km northeast of Baltimore village (**Figure 1**). The site, which includes an existing farm dwelling and other outbuildings, is located to the immediate east of the regional route R595 Skibbereen to Baltimore Road. A small local road runs along the northern boundary of the site. This area is rural in nature, with small farm holdings and one-off dwellings focused along the local and regional routes. Roaringwater Bay is located approximately 280m west of the site and the topography slopes gently west towards the bay. The site is located in a quiet rural setting with passing traffic on the adjacent routes.



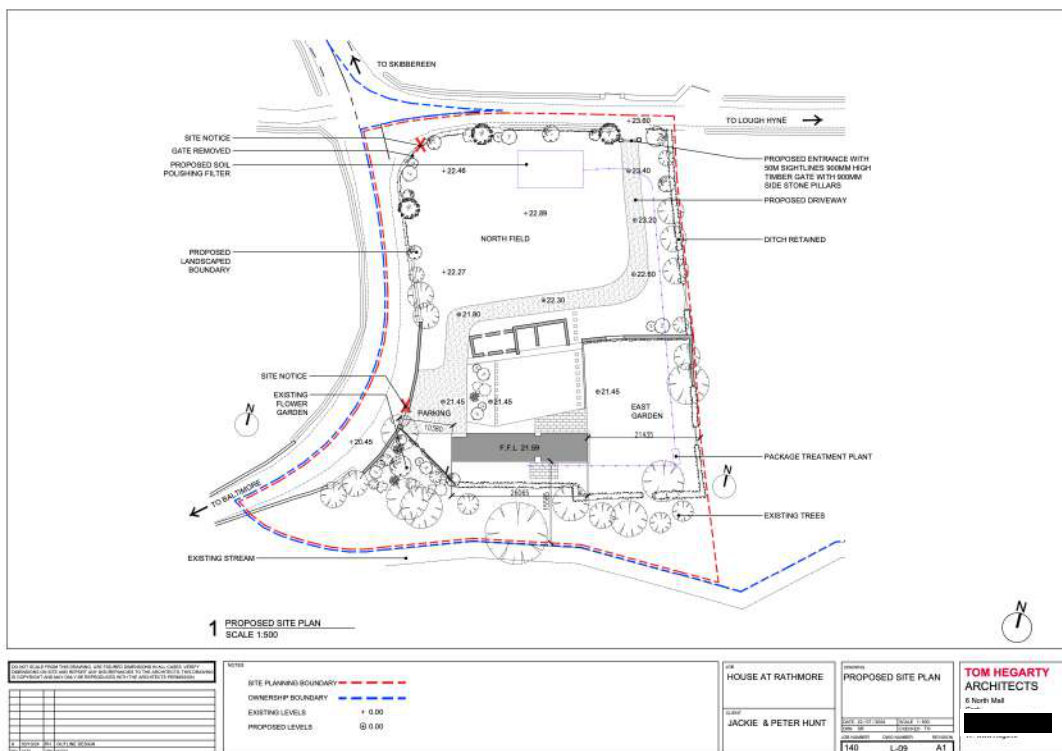
**Figure 1. Site location | Source OSI**

### 1.3 Proposed Development

Planning Permission is sought for the following:

- 1] the refurbishment, alteration and extension of an existing dwelling house,
- 2] the demolition of an extension to the dwelling and of two sheds one of which is attached to the house and the other a separate open faced metal former hay barn,
- 3] the construction of a new site vehicle entrance and driveway and
- 4] associated site works and services connections including a new foul treatment package and percolation area to replace an existing septic tank.

An overview of the proposed development is shown in **Figure 2**.



**Figure 2. Site layout | Source Tom Hegarty Architects**

### 1.4 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. **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.
EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Directive 92/43/EEC), commonly known as the 'Habitats Directive	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.  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.
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 *Myotids*: 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 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);
- *Kerry County Development Plan 2022-2028*;
- 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 hOidhreachta, 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*.

### 3.2 National Biodiversity Centre

The NBDC online map viewer includes an interactive layer which displays geographical areas in terms of a 'habitat suitability' index for bats as per Lundy *et al* (2011). This shows the relative importance of landscape and habitat associations across Ireland. Maximum Entropy Models (MEM) were constructed for each bat species using records from the National Bat Database from 2000-2009. This method allows species' records that have not been collected in a systematic survey to be analysed. The results help explain patterns of species' occurrence and predict where species might occur. Landcover (CORINE), topography, climate, soil pH, riparian habitat and human bias factors were incorporated into the models. The analyses provide a picture of the broad scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species. This also provides a 'habitat suitability' index. The index ranges from 0 to 100, with 0 being least favourable and 100 most favourable for bats.

### 3.3 Identification of Known Roosts

The NBDC database was consulted to identify any known bat roosts within the vicinity of the proposed development.

### 3.4 Habitat Assessment

An assessment of the potential suitability of the habitats within the site and surrounding area for bats was undertaken as part of the initial desktop study and a walkover of the proposed development area prior to the survey commencing. This included an assessment using the guidelines set out in the Collins (2023) and Marnell *et al.* (2022). It is important to note that an absence of potential commuting routes or 'good quality' foraging areas around a site cannot be used to confirm the absence of bats from a site. Bats are highly mobile animals which will use different habitats at different times of the year, therefore an appropriate level of additional survey work must be carried out in order to determine if and how bats utilise a particular site.

### 3.5 Field Study

#### 3.5.1 Assessment of Structures for Potential Bat Roosts

A detailed building inspection was carried out, 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 9<sup>th</sup> and 14<sup>th</sup> September 2022 and 15<sup>th</sup> October 2022. Additional surveys of the buildings were carried out on the 21<sup>st</sup> October 2024. This included a ground level and/or interior search of all buildings onsite.

Roosting sites for bats can be found within structures such as buildings, cellars, churches, stone masonry, bridges, tunnels, mines, caves. In addition, a number of bat species can be found roosting in suitable features within trees.

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>		

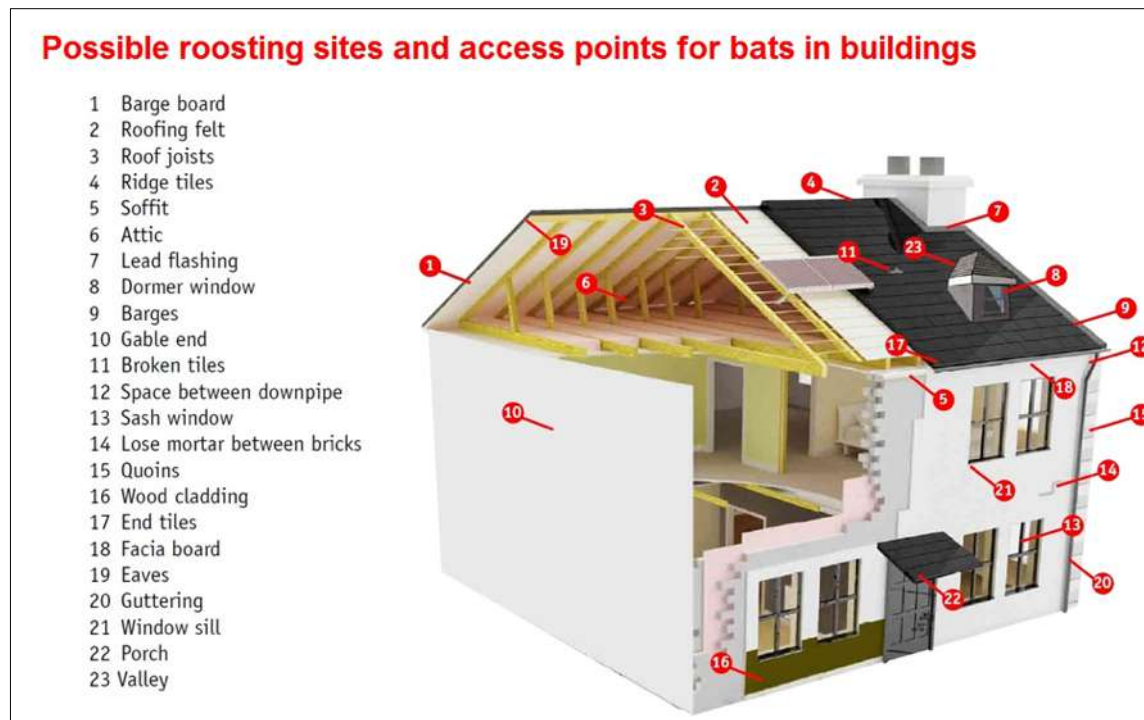
Source: Collins 2023

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 6**).



**Figure 6. 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 *Nycteribiidae* 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.

### **3.5.2 Assessment of Trees for Potential Bat Roosts**

A detailed preliminary roost assessment was carried at ground level on all trees earmarked for removal within the study area, with binoculars used where required utilising guidelines as set out in '*Bat Surveys for Professional Ecologists: Good Practice Guidelines (4<sup>th</sup> ed)*' (Collins, 2023) on 9<sup>th</sup> and 14<sup>th</sup> September 2022, 15<sup>th</sup> October 2022 and 21<sup>st</sup> October 2024.

Evidence indicating bat presence within trees, includes dark stains running below holes or cracks, bat droppings, odours, or scratch marks. PRFs that can occur in trees as detailed in Collins (2023) include the following:

- rot holes
- hazard beams
- other vertical or horizontal cracks and splits (such as frost cracks) in stems or branches
- partially detached platey bark
- knot holes arising from naturally shed branches, or branches previously pruned back to the branch collar
- man-made holes (e.g cavities that have developed from flush cuts) or cavities created by branches tearing from the parent stems
- cankers (caused by localised bark death) in which cavities have developed
- other hollows or cavities including butt rot
- double-leaders forming compression forks which included bark and potential cavities
- gaps between over lapping stems or branches
- partially detached ivy with stem diameters in excess of 50mm
- bat or bird boxes.
- Kelleher and Marnell (2006), uses the following classification scheme to classify usage of trees and buildings and maternity and hibernation roosts by these species (**Table 3**).

**Table 3. Bat Species Roost Classification Scheme (Kelleher and Marnell (2006))**

Species	Trees		Buildings	
	Maternity	Hibernation	Maternity	Hibernation
Common pipistrelle <i>Pipistrellus pipistrellus</i>	M	M	H	H
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	M	M	H	H
Leisler's bat <i>Nyctalus leisleri</i>	M	M	H	L
Brown long-eared bat <i>Plecotus auritus</i>	H	H	H	H
Lesser Horseshoe Bat <i>Rhinolophus hipposideros</i>	L	L	H	M
Daubenton's bat <i>Myotis daubentonii</i>	M?	L?	M	L
Whiskered bat <i>Myotis mystacinus</i>	M?	M?	H	L

Natterer's bat <i>Myotis nattereri</i>	M?	M?	H	L
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- L – low dependence; unusual, but has been recorded, M – some usage recorded, though perhaps not the most important type of site, H – the most frequently recorded type of site for this species/activity

Soprano Pipistrelle and Common Pipistrelle show preferential use of buildings for maternity and hibernation roosts. Leisler's Bat show preferential use of buildings for maternity roosts. For Brown Long-eared buildings and trees are classed as equally utilised for maternity and hibernation roosts.

Therefore although it is noted that bat roosts in trees may be under-recorded, Leisler's Bat, Soprano Pipistrelle and Common Pipistrelle are more likely to used buildings than low suitability trees. Radio-tracking has shown that bats are very variable in the distances that they travel from their roosts to forage. For example, at some roost sites for Daubenton's, bats activity took place within 2km of the roost whereas at other roosts some individuals travelled up to 19km to forage. Brown Long-eared Bats appear to be a relatively sedentary species, with few individuals travelling more than 2km whereas other species such as Leisler's Bat will frequently travel more than 5km from their roost sites (Kelleher and Marnell 2006).

For Brown Long-eared Bat, no preference is recorded for trees or buildings for maternity and hibernation roosts. This species is strongly associated with tree cover, prefers woodland with cluttered understorey including native species, particularly deciduous and also forages in mixed woodland edge and among conifers (Collins, 2023).

The Lesser Horseshoe Bat clearly has the strongest affinity with underground sites. In winter, it is rarely found in any other type of site and the species has even been recorded breeding underground, though the great majority of maternity sites are now in the roof voids of buildings.

### 3.4.3 Bat Activity Surveys and emergence/re-entry surveys

Dusk and dawn bat activity/emergence surveys were carried out in the proposed development site during suitable weather conditions (sunset temperatures above 10°C, no rain and no strong wind). Dusk bat activity/emergence surveys were carried out on the 9<sup>th</sup> of September 2022 using Elekon Batloggers, EchoMeter Touch 2 PRO bat detectors. As there was bat activity recorded during the emergence period, a dawn survey in close proximity to the existing dwelling a dawn re-entry survey was carried out on the 14<sup>th</sup> September 2022. The surveys followed the guidelines set out in '*Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edn)*' (Collins, 2016).

Additional survey of the proposed development site was carried out on the 18<sup>th</sup> of September 2024. The following equipment was used: EchoMeter Touch 2 PRO bat detectors, Elekon Batloggers and a Pulsar Halion thermal imaging camera. The surveys followed the guidelines set out in '*Bat Surveys for Professional Ecologists: Good Practice Guidelines (4<sup>th</sup> edn)*' (Collins, 2023).

Surveyors walked around the perimeter of buildings and around the yard 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) and approximately an hour before dawn (dawn survey) in order to ascertain their use as bat roosts.

### 3.4.3 Data Analysis

All data collected during bat activity surveys (transects, and automated surveys) was downloaded and analysed using Kaleidoscope and Analook software. 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 & Barlow, 2013).

The manual identification was carried out by comparison with call parameters as set out in Russ (2012) and Barataud (2015). Species identification of recordings was determined independently, by a minimum of two observers, if calls were not characteristic, and easily identifiable.

## 4. Results

### 4.1 Bat Background Data

The National Biodiversity Data Centre's (NBDC) online database provides data on the distribution of species within 10km grid squares. The site of the proposed development lies within 10km grid square (hectad) W02 of Ordnance Survey Ireland's National Grid System. The review of existing bat records within W02 showed that five species of bat species have been recorded locally (**Table 4**).

**Table 4. Presence of Irish bat species within a 10km radius (W02)**

Common name	Scientific name	Presence	Date of last record
Lesser Noctule	<i>Nyctalus leisleri</i>	Present	01/08/2006
Pipistrelle	<i>Pipistrellus pipistrellus sensu lato</i>	Present	01/08/2006
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Present	01/08/2006
Daubenton's Bat	<i>Myotis daubentoniid</i>	Absent	n/a
Natterer's Bat	<i>Myotis nattereri</i>	Absent	n/a
Brown Long-eared Bat	<i>Plecotus auratus</i>	Present	01/08/2006
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	Present	11/12/1985
Whiskered Bat	<i>Myotis mystacinus</i>	Absent	n/a
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>	Absent	n/a

Source: NBDC (29/10/24)

The closest record of Lesser Horseshoe Bat is located at Cunnamore, approximately 4km northwest of the proposed development site (Source NBDC). Lesser Horseshoe bats normally forage in woodlands/scrub within 2.5km of their roosts (Bontadina *et al.* 2002); Consequently, in order to link roosting and foraging sites, linear features such as hedgerows, treelines and stone walls provide vital connectivity for this species, most importantly within 2.5km around each roost (Schofield, 2008). However, this roosting site is separated from the proposed development site by an area of open water and there is no significant connectivity between these area. Thus Lesser Horseshoe Bat are unlikely to forage at the proposed development site.

Although not recorded by the NBDC, Whiskered Bats could occur within W02 as these species are widespread in the Irish countryside. Brandt's Bat are rarer Irish species, which are less likely to occur. The proposed development site, with its quiet rural setting and absence of significant lighting, could potentially provide foraging or roosting habitat for *Myotis* species (i.e., Daubenton's Bat, Whiskered Bat and Natterer's bat) due to the existing levels of lighting and disturbance.

Lighting deters some bat species from foraging. Studies have shown that illumination levels as low as 0.06 lux can have an effect on the behaviour of bats. Even a full moon night (0.02 lux) can reduce bat activity to more sheltered, darker wildlife corridors and foraging areas (e.g. woodlands). The slower flying broad-winged species (Natterer's bats, Daubenton's bats, whiskered bats, Brandt's bats, Lesser Horseshoe Bats and Brown Long-eared bats) have been shown to avoid streetlights. In a study of a roost in Suffolk, UK, the numbers of Natterer's bats, whiskered bats, Daubenton's bats and Brown Long-eared bats fell after the installation of streetlights adjacent to the roost being monitored.

The habitat indices for all Irish bats for the landscape around the proposed development site is shown in **Table 5** (Lundy *et. al* 2011).

**Table 5. Model Predicted Habitat suitability indices for All Irish bat species**

Bat species	Common Name	Habitat indices
All Bats		25
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	39
<i>Plecotus auratus</i>	Brown long-eared bat	44
<i>Pipistrellus pipistrellus</i>	Common pipistrelle	34
<i>Rhinolophus hipposideros</i>	Lesser horseshoe	12
<i>Nyctalus leisleri</i>	Leisler's bat	34
<i>Myotis mystacinus</i>	Whiskered bat	17
<i>Myotis daubentoniid</i>	Daubenton's bat	22
<i>Pipistrellus nathusii</i>	Nathusius' pipistrelle	2
<i>Myotis nattereri</i>	Natterer's bat	21

Source: NBDC 29/10/24

## 4.2 Habitat Assessment

The existing site consists of an old dwelling within complex of modern and old stone buildings. There is also an open corrugated iron farm building within the site boundary. The 2024 surveys found that the buildings have deteriorated further since the 2022 survey. Within the site the land consists primarily of grassland and disturbed ground habitats. The grassland to the north of the farm building complex supports a relatively broad range of grassland and herbaceous species. The field to the west of the existing farmyard has been previously disturbed and has a mixture of common grasses and herbaceous species. This semi-natural grassland provides potential foraging habitat for bats. The boundaries of the site include treelines or grassy verge with widely spaced trees of which are insufficient age and lack the necessary structural elements (i.e., cracks, crevices, dense mature Ivy) to be of value for bats. There are small sections of low stonewall along the site boundaries. The southern section of the landholding is located on a relatively steep embankment with dense woodland with Sycamore, immature Elm with occasional Ash, Hawthorn, Alder and Elder. This woodland is located between the higher flatter ground, on which the existing farm complex is located, and a fast-flowing river which runs along the southern boundary of the site. The combination of a watercourse and relatively dense woodland on the periphery of the proposed development site creates high value habitat for bats in a local context. An overview of the site is provided below in **Figure 4** and further detail on the buildings included in **Table 6**.

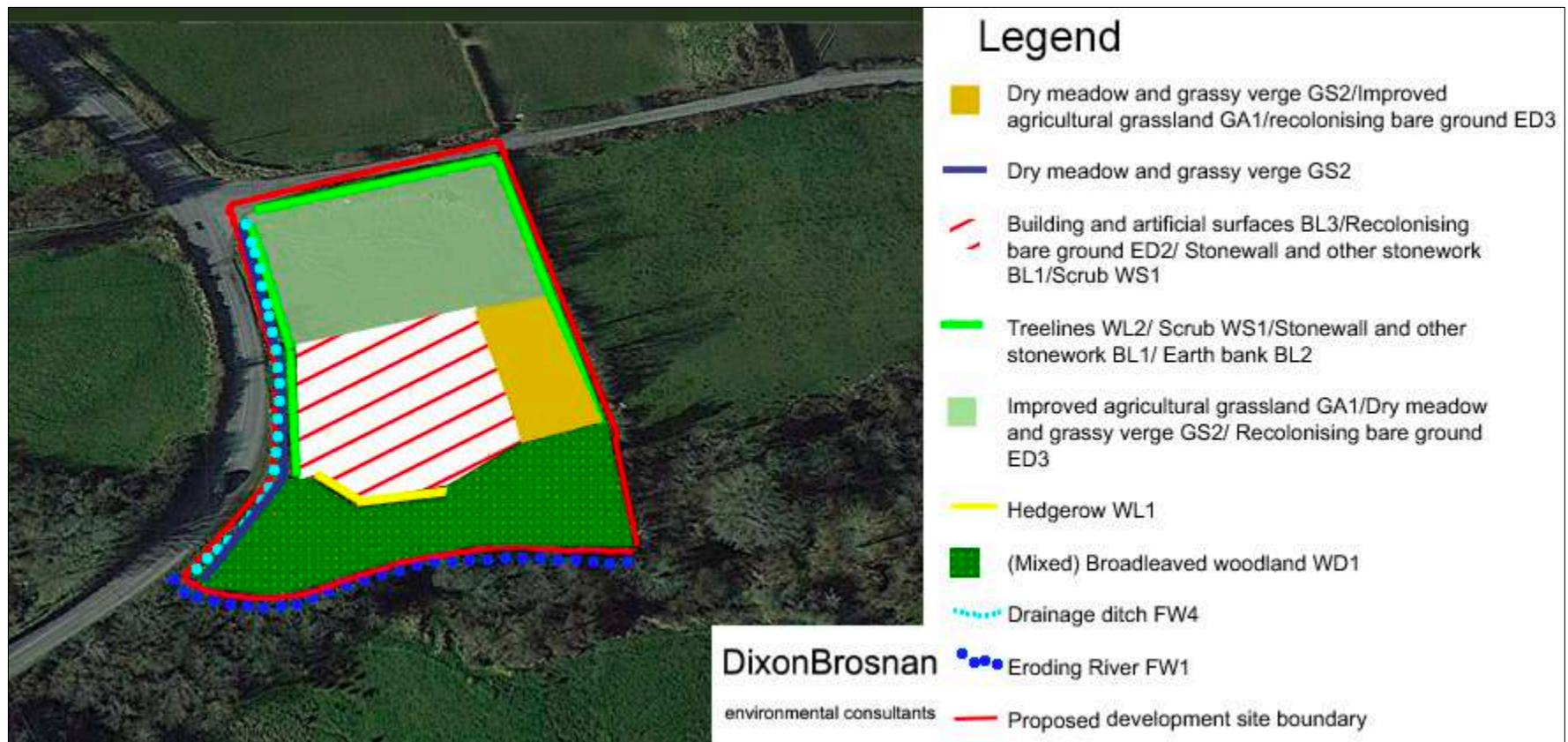


Figure 4. Habitats recorded at the proposed development site (Fossitt 2000).

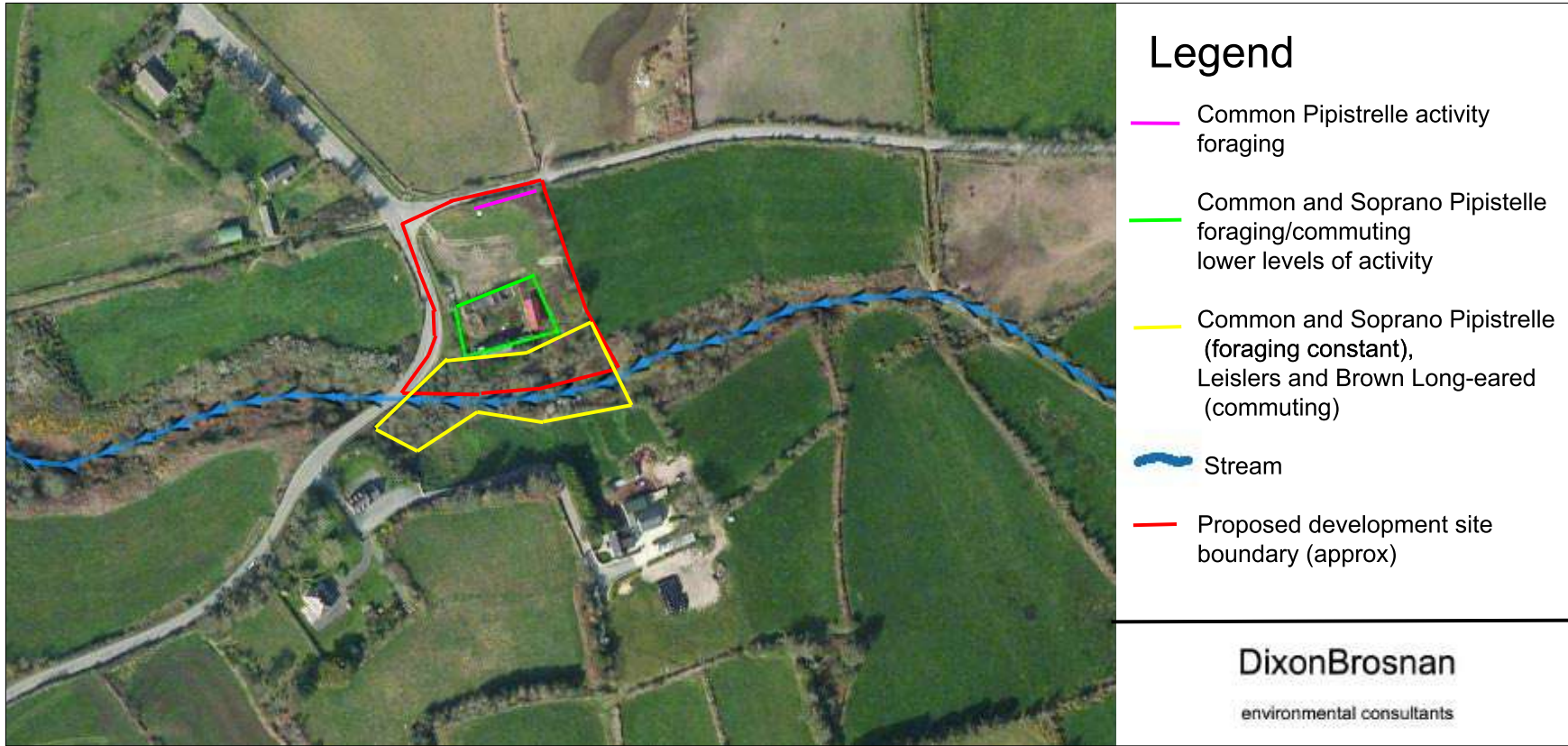


Figure 5. Patterns of bat activity recorded at the proposed development site (During 2022 and 2024 surveys)

### 4.3 Bat Activity/Emergence Survey Results

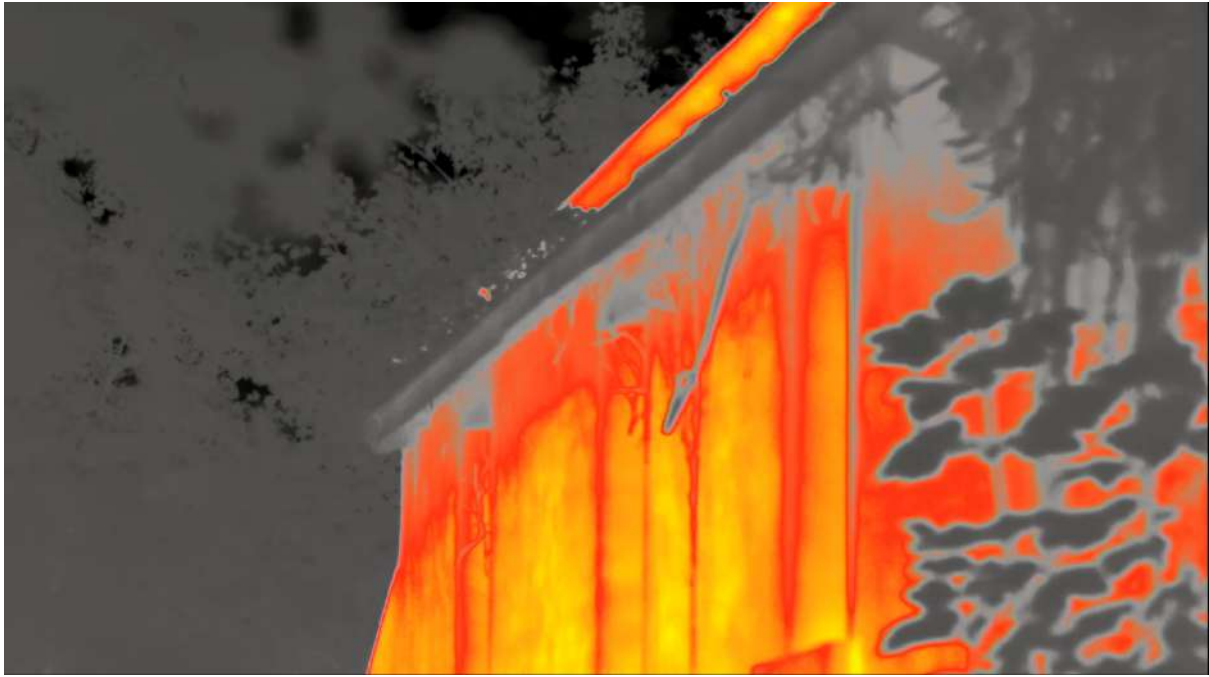
Bat activity/emergence surveys were carried out on the 9<sup>th</sup> and 14<sup>th</sup> of September 2022 with a particular focus on the two structures considered of potential value as bat roosts, namely the existing dwelling and old stone shed within the existing farm complex (See **Table 6** for further detail). As described in **Section 4.5** below, no trees with significant value as bat roosts will be removed by the proposed development and the woodland area in the southern section of the site will be retained. No bats were recorded emerging from either structure during the 2022 surveys and no evidence of bat usage of the buildings was recorded.

The 2022 surveys recorded four species of bat namely Brown Long-eared Bat, Soprano Pipistrelle, Common Pipistrelle and Leisler's Bats within the proposed development site. One signal for Brown Long-eared bat (1 individual approx.) was recorded to the south of the existing dwelling within the emergence period (at 20.18). No prolonged foraging was recorded and the species may have been commuting or foraging along the band of woodland/river in the southern section of the site. Two brief signals for Leisler's Bat (2 individuals approx.) were also recorded within the emergence period (20.19-20.20) and were also likely to be commuting from a roost to a foraging area in the wider landscape.

Common Pipistrelle and Soprano Pipistrelle activity was relatively constant from within the potential emergence period for these species to the end of the survey (20:20 onwards), Most of the activity was recorded along band of woodland in close proximity to the rear of the existing dwelling with occasional overflying bats within the farmyard complex and some sporadic foraging along the northern boundary. Estimating numbers was problematic as bats foraged within the woodland on a steep embankment to the rear of the dwelling was consistent with more sporadic foraging within and in proximity to the farmyard complex. Overall it considered probable that approximately 4-5 Common and Soprano Pipistrelle were using the southern section of the site (farmyard complex and woodland) for foraging with one Common Pipistrelle foraging along the northern boundary.

No bats were recorded emerging from the site buildings i.e. the old stone building or dwelling identified as being of some potential value for roosting bats. However, foraging activity was recorded in close proximity to the rear of the dwelling during the emergence period. Therefore it was considered prudent to carry out a dawn re-entry survey on the 14<sup>th</sup> of September 2022 using a thermal imaging camera (Pulsar Helion 2 XP50 Pro) and standard bat detectors (Elekon Batloggers and EchoMeter Touch 2 PRO) to identify possible bat roosts. The focus of the survey was the rear of the existing dwelling in particular and the stone shed.

Common and Soprano activity was recorded along the boundary of the woodland to the rear of the dwelling and there was some sporadic commuting activity through the site. The 2022 surveys did not detect any re-entry into the dwelling or stone shed (See **Figure 5**).

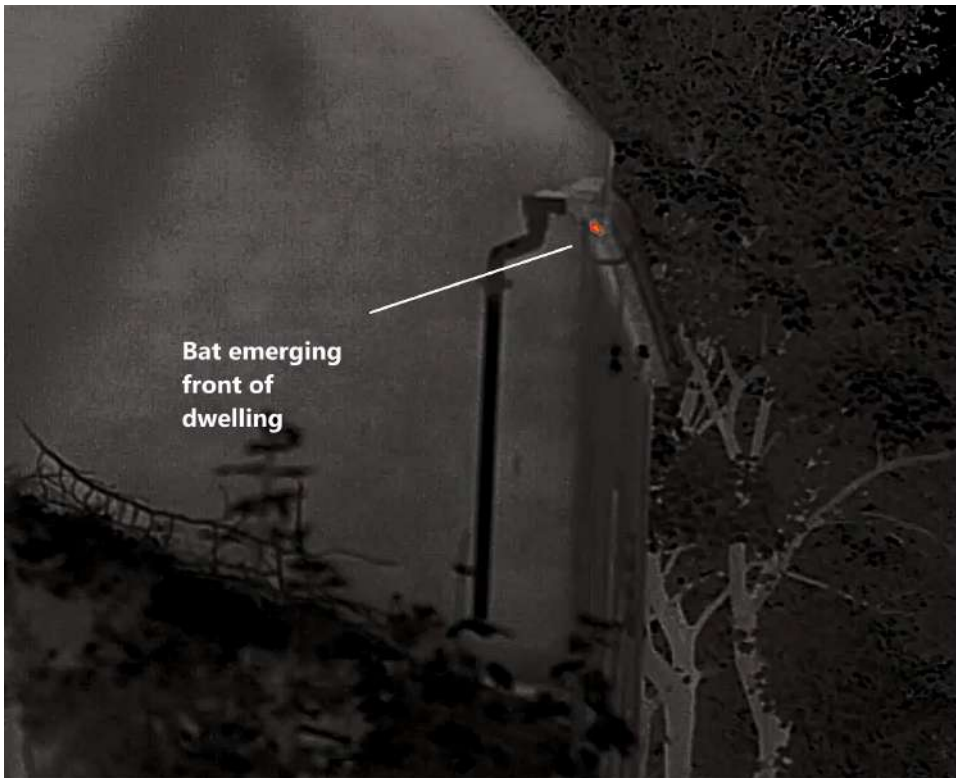


**Plate 1. Image from 2022 thermal imaging camera at rear of dwelling during dawn re-entry survey (no bats visible).**

An additional activity survey was carried out on the 18<sup>th</sup> of September 2024. In general activity patterns were generally similar to those recorded during the previous survey. The treeline and river to the south of the proposed development provide habitat for foraging bats. Low levels of foraging activity were recorded throughout the survey period. The dominant species were Soprano and Common Pipistrelle, which were observed foraging above and along the woodland with some limited foraging by the same species in the courtyard to the front. One brief signal for Leisler's Bat was recorded and was probably indicative of one bat foraging in the wider landscape. As with the previous survey a brief signal for Brown Long Eared Bat was recorded on the periphery of the woodland area to the south of the dwelling. Only one brief signal was recorded. One signal for an unidentified Myotis bat was also recorded in the woodland area to the south of the dwelling and was probably indicative one foraging bat.



**Plate 2. First Common Pipistrelle emerging front of dwelling during 2024 survey**



**Plate 3. Second Common Pipistrelle emerging front of dwelling during 2024 survey**



**Plate 4. Bat passing gable end of house during 2024 survey**

As noted above a Pulsar Halion thermal imaging camera was used for the 2024 survey. The thermal imaging camera recorded two Common Pipistrelle bats emerging from the front of the dwelling as shown below in Plate 2 and Plate 3.

A daytime survey of the interior and exterior of the dwelling house found no staining or droppings at the emergence point, which was on a fascia at the northeast of the dwelling house (See **section 4.4**). An interior search of the building did not record any signs of bat roosts. Therefore taking a worst case scenario approach the site has been assessed a potential small maternity roost for a small number of Common Pipistrelle. These are likely to be roosting behind the fascia at the front of the building.








**Plate 5. Section from which roosting bats emerged**

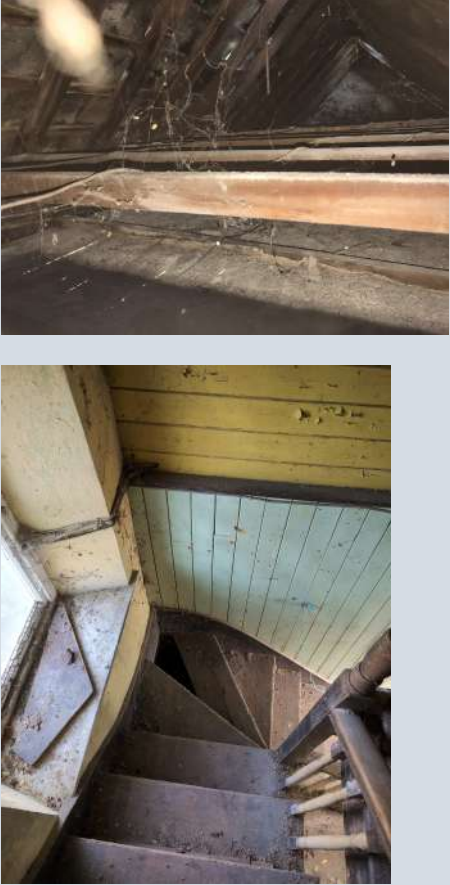

**4.4 Bat Building Survey**



Internal surveys of the buildings within the site boundary were carried out on the 9<sup>th</sup> and 14<sup>th</sup> September 2022, 15<sup>th</sup> October 2022 and 21<sup>st</sup> October 2024. Existing structures within the site are described below in **Table 6** which also provides an assessment of their potential value as bat roosts (Collins 2023).



**Table 6. Building survey results**

Building	Description	Value as potential value for bats (Collins 2016)
1	<p>Existing disused farmhouse with some entry points. Slate roof with some gaps. The interior of the building has deteriorated since the 2022 surveys.</p> 	<p><b>Moderate</b></p> <p>Given that this is an old dwelling with potential access points and given its proximity to woodland/watercourse habitats this building was assessed as being of moderate value as a potential bat roost.</p> <p><b>During the 2024 survey, 2 Common Pipistrelle were recorded emerging from the fascia at the front (north) of the dwelling</b></p>

Building	Description	Value as potential value for bats (Collins 2016)
	   	

Building	Description	Value as potential value for bats (Collins 2016)
		
2	<p>Old stone shed in poor state for repair used for storing hay. Open door. Poor state of repair. Has deteriorated significantly since the 2022 survey.</p> 	<p><b>Low</b></p> <p>Open and draft assessed of low value as a potential bat roost.</p>
3	<p>Small concrete extension to the existing building.</p>	<p><b>Low</b></p> <p>Of modern construction and considered of low to negligible value as a potential bat roost.</p>



Building	Description	Value as potential value for bats (Collins 2016)
		
4	<p>Concrete cattle shed with corrugated iron roof attached to existing dwelling. Open and draughty</p> 	<p><b>Negligible</b></p> <p>Of modern construction and considered of low to negligible value as a potential bat roost.</p>
5	<p>Large open barn of corrugated iron construction and without side walls</p>	<p><b>Negligible</b></p> <p>Negligible value as a potential bat roost</p>



Building	Description	Value as potential value for bats (Collins 2016)
		
6.	<p>Ruins of other buildings occur within the farm complex as sections of old stonewalls without roofs</p> 	<p><b>Negligible</b></p> <p>Negligible value as a potential bat roost</p>



#### 4.5 Tree Survey

Tree surveys within the site boundary were carried out on the 9<sup>th</sup> and 14<sup>th</sup> September 2022, 15<sup>th</sup> October 2022 and 21<sup>st</sup> of October 2024. Notable trees within the site are described below in **Table 7** which also provides an assessment of their potential value as bat roosts (Collins 2023).

**Table 7. Preliminary ground roost assessment of trees within the proposed development site**

Trees	Description	Value as potential value for bats
1	<p>Trees to be removed including immature alder. No significant ivy or cracks/crevices</p> 	<p><b>Negligible</b></p> <p>Negligible value as a potential bat roost</p>
2	<p>Taller trees on external boundaries which will be retained.</p> 	<p><b>Low to Negligible</b></p> <p>Generally of low to negligible value for bats</p>

Trees	Description	Value as potential value for bats
		
3	<p data-bbox="359 891 766 918">Woodland and stream. To be retained</p> 	<p data-bbox="1090 891 1362 918"><b>Low to moderate value</b></p> <p data-bbox="1090 949 1391 1196">Trees within the woodland generally lack the structural elements to provide high value bat roosts. Some older mature trees close to the river of low to moderate potential value. This woodland will be retained.</p>

Trees	Description	Value as potential value for bats
	 	

## 5. Mitigation

During the construction of the proposed development, general mitigation measures for bats will follow the National Road Authority's 'Guidelines for the Treatment of Bats during the Construction of National Road Schemes' NRA (2005) and Marnell *et al* (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). These documents outline the requirements that should be met in the pre-construction and construction phases of developments to minimise negative impacts on roosting bats, or prevent avoidable impacts resulting from significant alterations to the immediate landscape.

Specific mitigation measures are required to protect the on-site bat populations and a derogation licence will be necessary from NPWS to legally allow such works to proceed. The application for this derogation licence has been submitted to the NPWS.

The following mitigation is proposed:

- Prior to the commencement of construction works a repeat survey will be carried out to obtain up to date information on the bat roosting within the site. It is noted that works will take place to the roof of the dwelling house and fascia where bats were detected and thus a derogation licence is required.
- Disturbance/removal the north-eastern gable (where the roost was recorded) will take place outside the bat breeding season (i.e. 1<sup>st</sup> October-31<sup>st</sup> March). However, works would ideally not commence before October 15<sup>th</sup>. It is also noted that works cannot proceed until a derogation licence has been received. It is noted that exact date for the commencement of site works is not known at this time and therefore no works can commence before the supervising ecologist has consulted with the contractor.
- Care must be taken when dismantling or working on roof of the dwelling house to ensure that bats are no longer present. Structures will be examined immediately prior to the commencement of roof dismantling works by the supervising ecologist to ensure there are no signs of bat activity.
- If bats are discovered during the works process then they will be safely removed by the qualified bat expert and the NPWS will be informed.
- Prior to the commencement of construction works, bat boxes will be erected under ecological supervision to provide alternative roosting habitat prior. The location of the bat boxes will take into account both the short-term requirements of bats during construction the longer-term requirement to maintain a viable bat population within the overall site. As a biodiversity enhancement measure four bat boxes (<https://www.wildcare.co.uk/vincent-pro-bat-box-10651.html> or similar) will be placed on mature trees within the woodland area to provide potential roosting sites for bats. It is noted that the supervising ecologist will specify the exact locations and type of bat boxes to be used based on up to date survey data and in consultation with the building contractor.

- To prevent bats re-entering dwelling house, if works within the roosting area are incomplete by March 31<sup>st</sup> bubble wrap may be necessary to block potential entrance points. This will be carried out under ecological supervision.

Although no bats were recorded within these buildings, demolition of the stone shed and extension to the dwelling will be undertaken in the period September to late October/early November. During this period bats are capable of flight and may avoid the risks of demolition works if proper measures are undertaken.

Linear native planting which has been specified in Cunnane Stratton Reynolds Drawing 22349-2-102 will provide additional foraging habitat for bats and enhance existing linear features at the site. Retained trees in the vicinity of the works area will be fenced off during construction work, as outlined in the landscape plan, to ensure there is no damage to potential bat roosting habitat, albeit of low value. The retention and management of the existing semi-natural grassland and the provision of a wildflower meadow at the site (Cunnane Stratton Reynolds Drawing 22349-2-102) will retain foraging habitat for bats. These landscape design measures will mean there is an overall nett gain in foraging habitat for bats.

Lighting at the site will be confined to the curtilage of the dwelling and driveway. There will be no floodlights or spotlights used on the other retained buildings or external areas of the site. There will be no lighting of the woodland and/or stream along the southern boundary of the site and no lighting in the vicinity of the bat box locations. Where lighting is required, the lighting scheme will take into account best practice, as published by the UK Bat Conservation Trust (2018), Marnell *et al.* (2022) and Bat Conservation Ireland (2010), in respect of mitigation strategies, to minimise the impact of outdoor lighting upon bat populations.

- Where external lighting LED type lanterns, of the Warm White type, have been specified, with a Colour Temperature of 2,700K, as is considered least disruptive to the emergence of bats from roosts at dusk, and subsequent movement from habitats to foraging locations.
- LED lanterns do not emit any ultraviolet or infra-red radiation, this again being a desirable feature in relation to impact upon bats, in terms of causing spatial exclusion from artificially lit areas.
- Lanterns are of the fully cut off type with no light output above the horizontal plane.
- Height of lights will be kept as low as possible
- As noted above, screening by existing trees on the southern boundary of the site will be retained.

## 6. Conclusions

The existing dwelling house currently supports a small maternity roost of Common Pipistrelle. Two bats were recorded emerging from the dwelling house during the September 2024 survey. These bats appear to be roosting on the external fascia at the northeast of the building. No signs of roosting bats were recorded within the interior of the dwelling house. No signs of bats were recorded within any of the other site structure within the proposed development site.

A range of mitigation measures have been specified to ensure there will be no significant effect on local bat populations as a result of the proposed development. It is noted that a derogation licence must be issued by the NPWS before the works can commence. Mitigation measures

for bats will follow the National Road Authority's '*Guidelines for the Treatment of Bats during the Construction of National Road Schemes*' NRA (2005c) and '*Bat mitigation guidelines for Ireland v2*'. Marnell *et al.* 2022). These documents outline the requirements that will be met in the pre-construction stage to minimise negative effects on roosting bats, or prevent avoidable effects resulting from significant alterations to the immediate landscape.

Based on the survey results, it is concluded that the removal of a small number of immature trees will not have a significant impact on local bat populations in the context of numerous buildings in the wider landscape that provide potential roosting habitat. It is also noted that bat boxes will be provided within the woodland habitat which will provide bat roosting habitat likely of higher value for bats than that provided by the trees to be removed. No trees of potential value as bat roosts will be removed by the proposed development.

The woodland and stream which will not be affected by the proposed development are considered of moderate value for foraging bats. The complex of farm buildings around the dwelling house provide sheltered conditions and are considered of low value for foraging bats. Lighting at the site will be confined to the curtilage of the dwelling. There will be no floodlights or spotlights used in the external buildings or yard. There will be no lighting of the woodland and/or stream along the southern boundary of the site. The retention of the woodland habitat in this area will ensure that dark areas for foraging are retained along this section of the site, which has the highest value foraging habitat within the proposed development site boundary.

The proposed mitigation measures as well as provision of alternative roosting sites for bats within the proposed development site will ensure there are no significant effects on local bat populations. Retention of woodland and vegetation along external boundaries alongside new native planting will increase potential foraging habitats for bats in the medium to long term.

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