

DixonBrosnan
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Bat Survey Report

Proposed Development at
Rathmore, Baltimore,
Co. Cork

On Behalf of
Tom Hegarty Architects

November 2022

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Project	Bat Survey Report for Proposed Development at Rathmore, Baltimore, Co. Cork	
Client	Tom Hegarty Architects	
Project Ref.	2301	
Report No.	2301.01	
Client Ref.	-	
Date	Revision	Prepared By
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1. Introduction

1.1 Background

DixonBrosnan were 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 letter from Cork County Council, dated the 28th of July 2022, requested the following:

3. The proposed development site has the potential to support bats. You are therefore requested to carry out and submit the findings of a bat survey. The purpose of the survey is to establish the level of usage of bats on site and to establish/identify potential bat roosts within any of the buildings on site. Likely impacts of the development (both during construction and ongoing) on bats identified to be using any building and significance of such impacts should be assessed and mitigation measures proposed where necessary. Mitigation proposals should be fully integrated into the design of the proposed development. Where the proposed works involve damage to or interference with a bat roost site, you will require a derogation license from the National Parks and Wildlife Service in order to be permitted to proceed. Please indicate whether any such license has been obtained or is in progress.

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

The proposed development included the refurbishment, alteration and extension of an existing dwelling house, the construction, alteration, reconstruction and extension of outbuildings to provide a home office and boat store and shed/garage, the demolition of an extension to the dwelling and of two sheds one of which is an open faced metal former hay barn, the construction of a new site vehicle entrance and driveway, and 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**.

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 21st 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	<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 *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
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre (NBDC)– 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) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd 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 (2016) 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.

3.4 Field Study

3.4.1 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 9th and 14th September and 15th October 2022. This included a ground-based external inspection around the buildings (and outbuildings) 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.

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 (2016) 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, trees and habitats for bats.

Suitability	Description	Commuting and foraging habitats
Roosting habitats		
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically.</p> <p>However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions^a 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).</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.</p>	<p>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.</p> <p>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.</p>
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	<p>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.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	<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>

Suitability	Description	Commuting and foraging habitats
Roosting habitats		
		Site is close to and connected to known roosts.

Source: Collins 2016

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**).

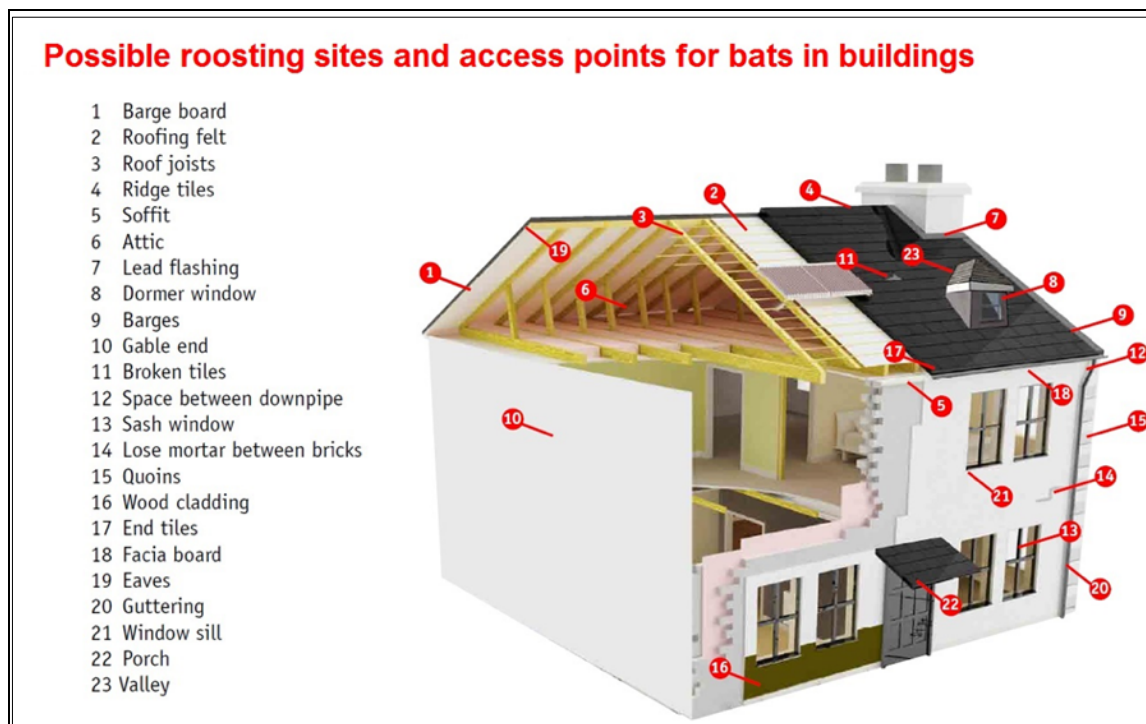


Figure 3. Possible roosting sites for bats in buildings.

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 *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.

3.4.2 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 set out in '*Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed)*' (Collins, 2016) on the 9th and 14th September and 15th October 2022.

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 (2016) 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 overlapping 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

N – not recorded in recent times, 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 use 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, 2016).

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 9th 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 14th September 2022.

The surveys followed the guidelines set out in '*Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*' (Collins, 2016). 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 Analoop 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 review of existing bat records within a 10km radius of the study site showed that the following Irish 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 daubentonii</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 (22/11/22)

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 22/11/22

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. 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**.

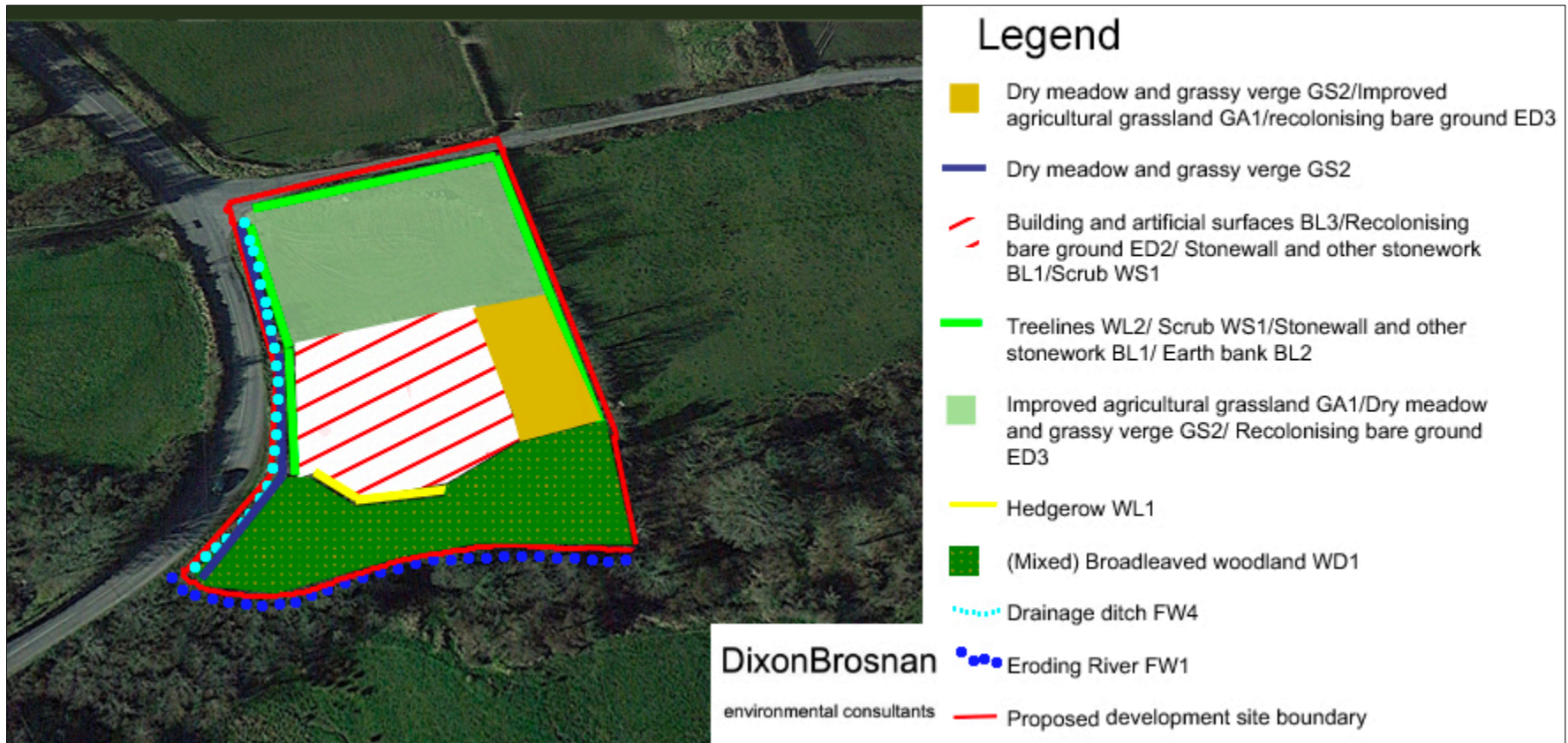


Figure 4. Habitats recorded at the proposed development site (Fossitt 2000).

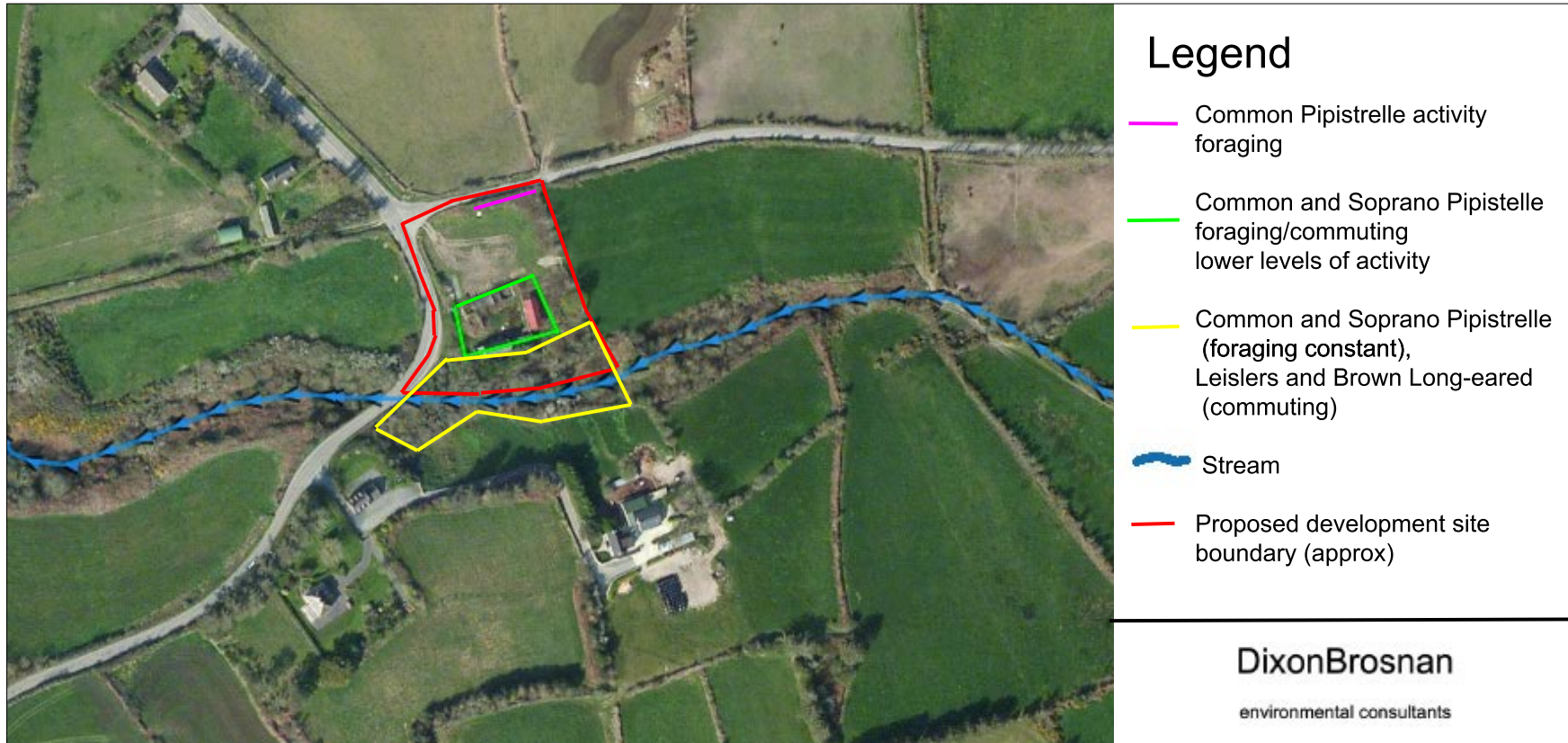


Figure 5. Bat activity recorded at the proposed development site

4.3 Bat Activity/Emergence Survey Results

A bat survey was carried out on the 9th 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 survey and no evidence of bat usage was recorded.

The survey 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 14th 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 survey did not detect any re-entry into the dwelling or stone shed (See **Figure 5**).

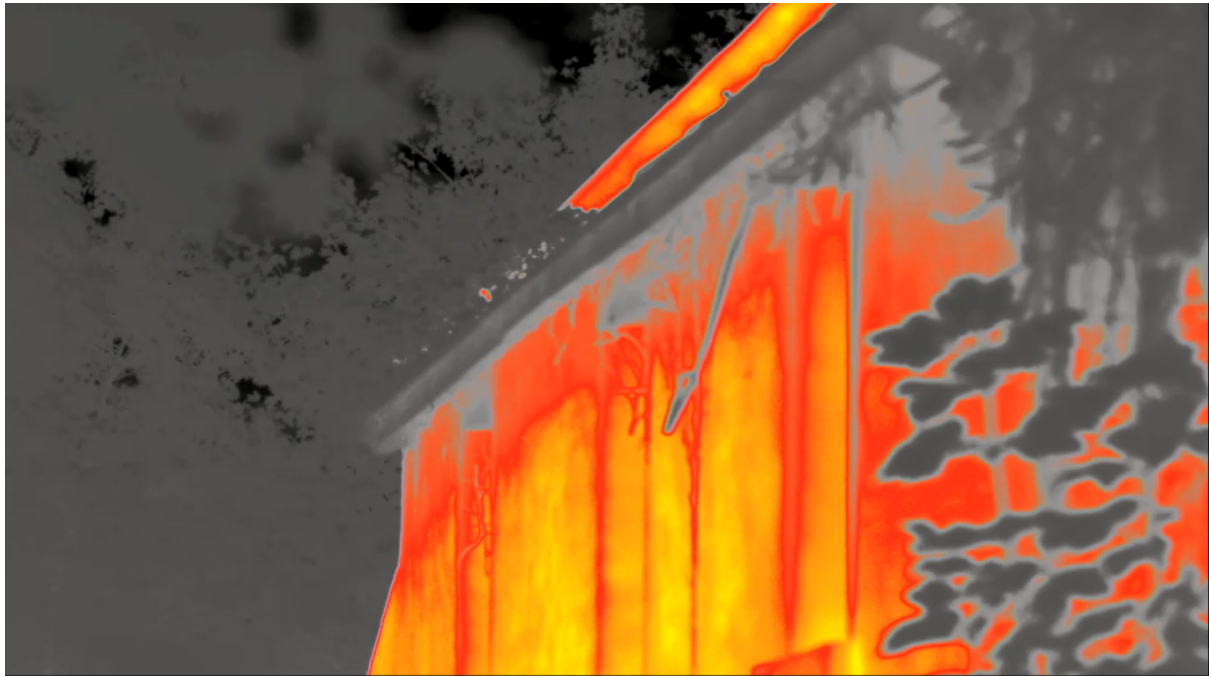





Plate 1. Image from thermal imaging camera at rear of dwelling during dawn re-entry survey (no bats visible).



4.4 Bat Building Survey



Internal surveys of the buildings within the site boundary were carried out on the 9th and 14th September and 15th October 2022. Existing structures within the site are described below in **Table 6** which also provides an assessment of their potential value as bat roosts (Collins 2016).


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.</p> 	<p>Moderate</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>

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.</p>	<p>Low</p> <p>Open and draft assessed of low value as a potential bat roost.</p>

Building	Description	Value as potential value for bats (Collins 2016)
		
3	<p>Small concrete extension to the existing building.</p> 	<p>Low</p> <p>Of modern construction and considered of low to negligible value as a potential bat roost.</p>
4	<p>Concrete cattle shed with corrugated iron roof attached to existing dwelling. Open and draughty</p>	<p>Negligible</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)
		
5	<p>Large open barn of corrugated iron construction and without side walls</p> 	<p>Negligible</p> <p>Negligible value as a potential bat roost</p>
6.	<p>Ruins of other buildings occur within the farm complex as sections of old stonewalls without roofs</p>	<p>Negligible</p> <p>Negligible value as a potential bat roost</p>




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


4.5 Tree Survey

Tree surveys within the site boundary were carried out on the 9th and 14th September and 15th October 2022. Notable trees within the site are described below in **Table 7** which also provides an assessment of their potential value as bat roosts (Collins 2016).

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

Trees	Description	Value as potential value for bats
1	Trees to be removed including immature alder. No significant ivy or cracks/crevices	Negligible Negligible value as a potential bat roost

Trees	Description	Value as potential value for bats
		
2	<p>Taller trees on external boundaries which will be retained.</p>  	<p>Low to Negligible</p> <p>Generally of low to negligible value for bats</p>

Trees	Description	Value as potential value for bats
3	<p data-bbox="357 286 767 315">Woodland and stream. To be retained</p> 	<p data-bbox="1091 286 1362 315">Low to moderate value</p> <p data-bbox="1091 344 1393 591">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

It is noted that the existing dwelling will not be demolished, but it will be refurbished. A pre-construction bat survey will be carried out prior to commencement of works in the dwelling house. Contractors will also be vigilant for the presence of bats throughout construction works within the dwelling. If bats are recorded by the bat specialist within the building, no works will proceed without a relevant derogation licence from the NPWS.

Demolition of the stone shed and extension to the dwelling should 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. If this is not possible, a pre-construction survey will be carried out immediately prior to demolition works.

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.

Linear native planting which has been specified in Cunnane Stratton Reynolds Drawing 22349-2-101 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 22349-2-101) 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.

The primary mitigation which will be implemented for this project relates to bats as these are considered the most sensitive species in relation to night-time lighting. It is noted however that the mitigation proposed will also lessen in the impact in relation other nocturnal species such as otter.

- 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 to 3,000K, 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

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 evidence of bat usage was recorded in any of the building surveys. Overall, it has been concluded that the buildings within the site are not utilized as bat roosts. However, given that the existing dwelling has been classified as moderate potential for roosting bats, during the site works, 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 (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.

No trees of potential value as bat roosts will be removed by the proposed development.

The woodland and stream habitats, which will not be affected by the proposed development, are considered of moderate value for foraging bats. The complex of buildings provides sheltered conditions and is 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.

Overall, the proposed development area is unlikely to be a critical resource for foraging bats and is considered of limited, local value for foraging bats. Retention of woodland and vegetation along external boundaries will minimise the impact on bats and the residual impact on bats will not be significant.

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