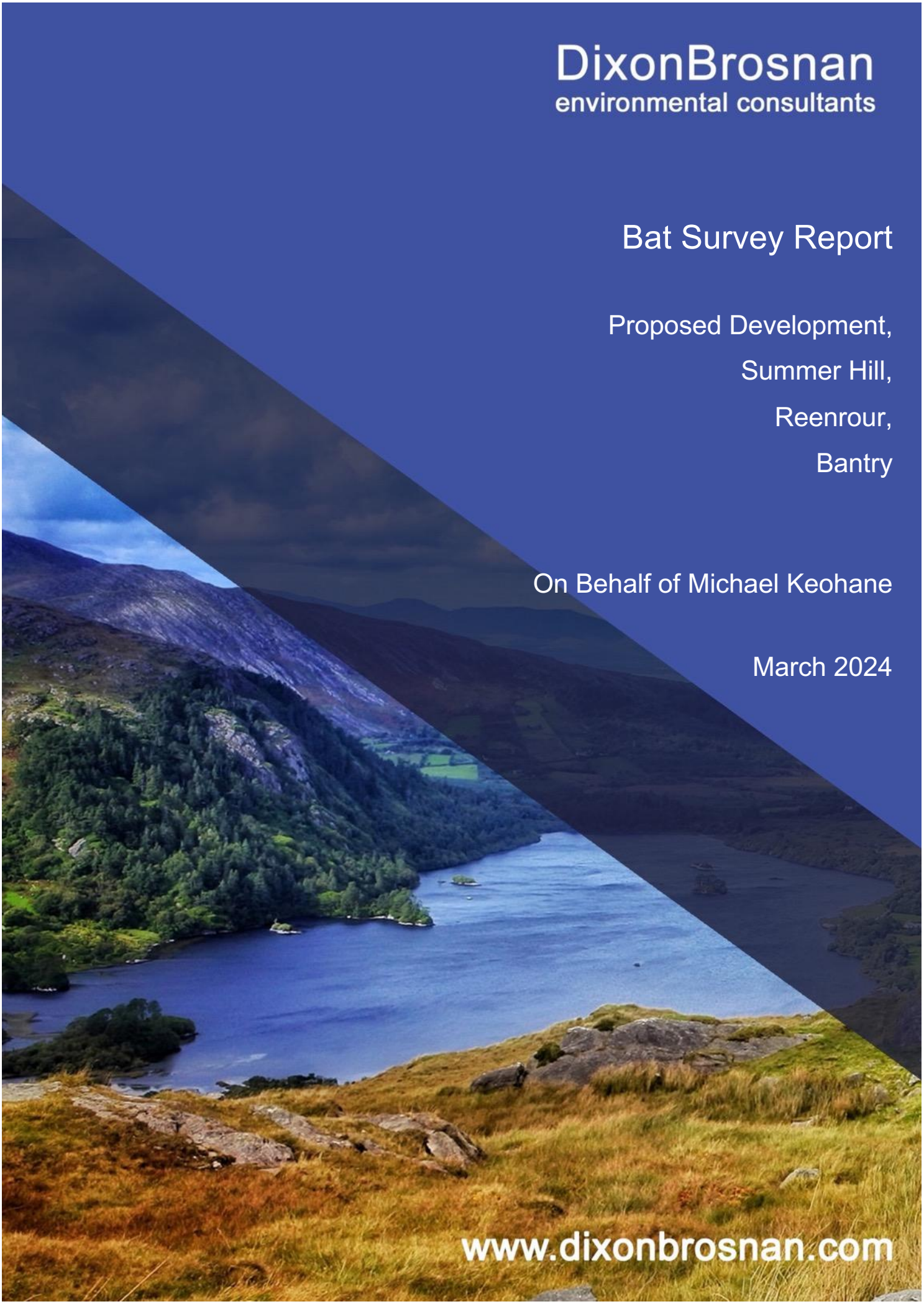
DixonBrosnan
environmental consultants

Bat Survey Report

Proposed Development,
Summer Hill,
Reenrour,
Bantry

On Behalf of Michael Keohane

March 2024



www.dixonbrosnan.com

DixonBrosnan

environmental consultants

Project	Bat Survey Report for Proposed Development at 44 Upper Cork Street, Brigown, Mitchelstown, Co. Cork	
Client	Michael Keohane	
Project Ref.	24027	
Report No.	24027	
Client Ref.	-	
Date	**Revision**	**Prepared By**
19/03/24	First Draft	Sorcha Sheehy PhD
26/03/2024	Issue to client	Carl Dixon MSc

DixonBrosnan Lios Ri Na hAoine, 1 Redemption Road, Cork.

Tel 086 851 1437| carl@dixonbrosnan.com | www.dixonbrosnan.com

Table of Contents

1. Introduction

1.1 Background

DixonBrosnan were commissioned to undertake a survey for bats at the site of the proposed development at Summerhill, Reenrour, Bantry, Co. Cork.

The aim of this survey and report is to:

- Identify any bat roosts located within the existing dwelling 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 on the northern edge of Bantry town on Summerhill in the townland of Reenrour. The site is located to the immediate west of the existing Marino Heights housing development. There is existing development to the south, east and west and farmland to the north.

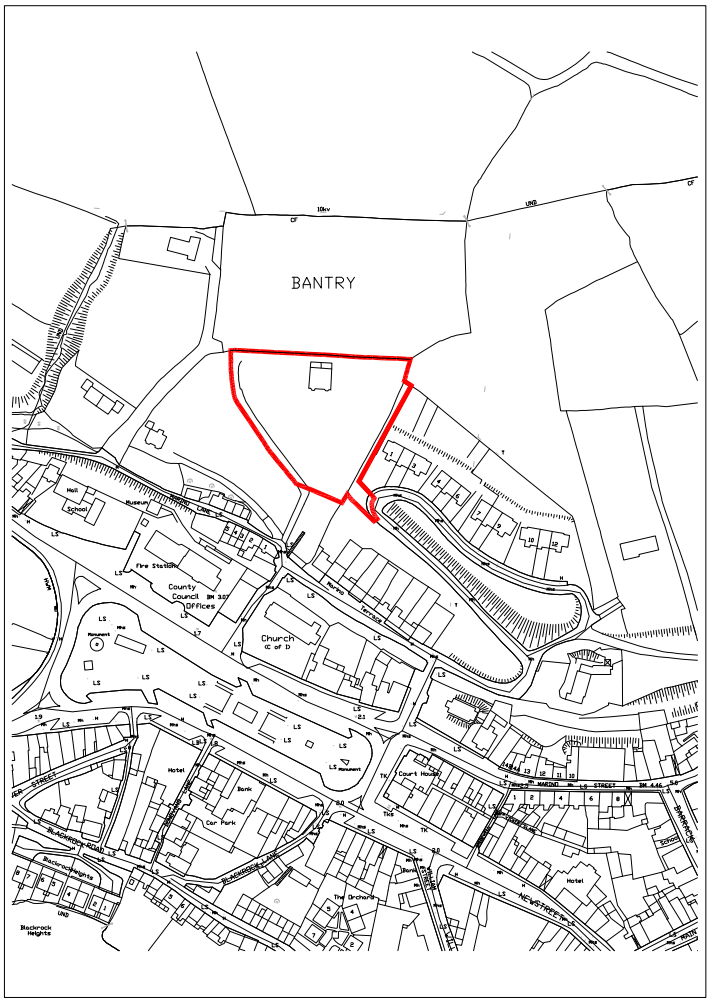


Figure 1. Site location (red line boundary) | Source Mark Gallagher Architect

The applicant is seeking permission for the demolition of 2 no. semi-detached dwelling houses, construction of 3 no. detached dwelling houses all associated site works (See **Figure 2**)

Figure 2. Site layout | Source Mark Gallagher Architect

1.3 Report Authors

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

Carl Dixon holds an Honours Degree (BSc) in Ecology and a Masters (MSc) in Ecological Monitoring from UCC. He is a senior ecologist who has over 25 years' experience in ecological assessment. Prior to setting up DixonBrosnan Environmental Consultants in 2000, Carl set up and ran Core Environmental Services which included REPS planning for landowners and ecological assessments. Carl has particular experience in bat and general mammal ecology as well as habitat mapping. Carl has considerable experience in freshwater ecology, including electrofishing fish stock assessments and water quality assessments. 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 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.

Legislation/Convention	Relevance to Irish bats
EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Directive 92/43/EEC), commonly known as the 'Habitats Directive	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 the Bantry area. 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 (2012) *Bat Surveys: Good Practice Guidelines, 2nd edition. Bat Conservation Trust.*
- Collins (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines, 4th Edition, Bat conservation Trust, London.*
- 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*
- Aughney *et al.* (2008) *Bat Survey Guidelines: Traditional Farm Buildings Scheme The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny.*
- National Road Authority NRA (TII), (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 (MEM)

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 National Biodiversity Data Centre's (NBDC) online database provides data on the distribution of species within 10km grid squares. 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

A preliminary bat roost assessment and activity/emergence surveys were carried out following relevant guidelines (Collins 2023, Aughney *et al.* 2008, Kelleher and Marnell 2006). Site surveys were carried out on the 12th and 13th of September 2023 and the 8th October 2023.

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. 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. 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 [b], 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[c]).	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[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).	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[b] 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 [b] and surrounding habitat. These structures have the potential to support high conservation status roosts e.g. maternity or classic cool/stable hibernation site.	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. 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. Site is close to and connected to known roosts.

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)

b. For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance

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.

Source: Collins 2023

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

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

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

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

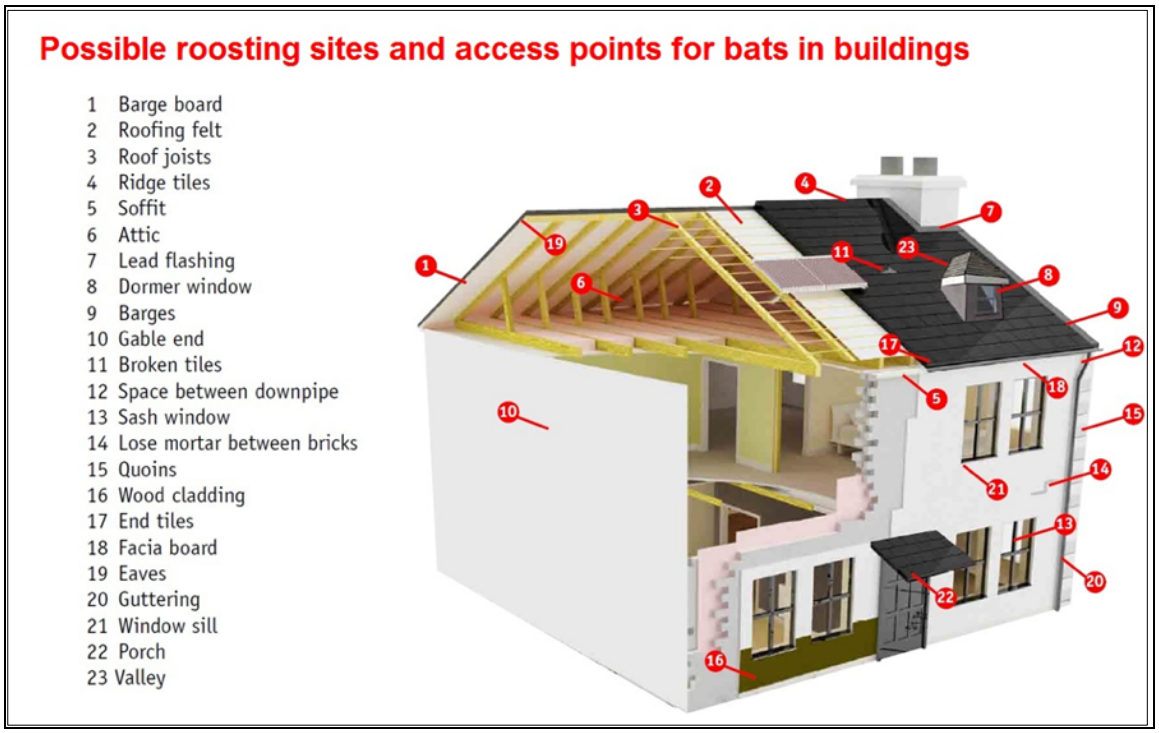


Figure 3. Possible roosting sites for bats in buildings.

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

An inspection of the buildings was conducted to look for suitable roosting habitat, possible emergence points and bat presence. The presence of bats is often shown by grease staining, droppings, urine marks, corpses, feeding signs such as invertebrate prey remains and/or the presence of bat fly *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 proposed development site. This survey followed the guidelines set out in '*Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th ed)'* (Collins, 2023).

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) otr 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 *Pipistrellus pipistrellus*	M	M	H	H
Soprano pipistrelle *Pipistrellus pygmaeus*	M	M	H	H
Leisler's bat *Nyctalus leisleri*	M	M	H	L
Brown long-eared bat *Plecotus auritus*	H	H	H	H
Daubenton's bat *Myotis daubentoniid*	M?	L?	M	L
Lesser Horseshow Bat *Rhinolophus hipposideros*	L	L	H	M

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, 2023). Lesser Horseshoe Bat show a strong preference for buildings as maternity roosts. However, as noted above this species does not occur in the vicinity of Little Island and would be highly unlikely to occur at the proposed development site. Daubenton's Bat typically hibernate in underground sites, which are absent from the proposed development site.

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 proposed development site is located within the 10km national grid square V94. A review of existing bat records within V94 (NBDC) showed that the six bat species listed in **Table 4** have been recorded. The remaining Irish bat species have not been recorded in the local area to date i.e. Daubenton's Bat *Myotis daubentoniid*, Whiskered Bat *Myotis mystacinus* and Nathusius's Pipistrelle *Pipistrellus nathusii*. However, it is noted that Whiskered Bat and Daubenton's Bat are relatively common within the Irish countryside and could potentially occur.

Table 4. Presence of Irish bat species within grid square V94

Common name	Scientific name	Present/Absent
Lesser Noctule	*Nyctalus leisleri*	Present
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	Present
Soprano Pipistrelle	*Pipistrellus pygmaeus*	Present
Daubenton's Bat	*Myotis daubentonii*	Absent
Natterer's Bat	*Myotis nattereri*	Present
Brown Long-eared Bat	*Plecotus auritus*	Present
Whiskered Bat	*Myotis mystacinus*	Absent

Common name	Scientific name	Present/Absent
Lesser Horseshoe	*Rhinolophus hipposideros*	Present
Nathusius's Pipistrelle	*Pipistrellus nathusii*	Absent

NBDC 19/03/24

Glengarriff Harbour and Woodland SAC, located c.7.7km northwest of the proposed development site, is of international importance for both summer and winter roosts of Lesser Horseshoe Bat. Lesser Horseshoe Bat normally travel short distances (approximately 2km) between roosts and foraging grounds. The closest record of Lesser Horseshoe bat is located approximately 900m east of the proposed development site near Bantry House. The most notable of these records is a roost recorded in 1999 and 45 individuals in 2010 (NBDC 2020).

Two Brown Long-eared Bat roosts have been recorded within Bantry town. Both were recorded in 2008. One was recorded c.500m south of the proposed development site and the other c.600m southwest of the proposed development site. There is limited detail on the nature of these roosts. However, the most recent records date from 2013.

The habitat indices for all Irish bats for the landscape around the proposed development site is shown in **Table 5** (Lundy *et. al* 2011). These indices that Common Pipistrelle, Soprano Pipistrelle, Brown-long eared Bat, Leisler's Bat are likely to occur in proximity of Little Island.

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

Bat species	Common Name	Habitat indices
All Bats		28.33
Pipistrellus pygmaeus	Soprano pipistrelle	40
Plecotus auritus	Brown long-eared bat	49
Pipistrellus pipistrellus	Common pipistrelle	40
Rhinolophus hipposideros	Lesser horseshoe	9
Nyctalus leisleri	Leisler's bat	31
Myotis mystacinus	Whiskered bat	12
Myotis daubentonii	Daubenton's bat	33
Pipistrellus nathusii	Nathusius' pipistrelle	8
Myotis nattereri	Natterer's bat	38

Source: NBDC 19/03/24

4.2 Bat Building/Tree Survey

Internal surveys of the building were carried out on the 12th and 13th September 2023 and on the 8th October 2023.

The building survey results are listed below in **Table 6**. The building is located on the northern edge of Bantry town and is accessed via an existing track (through the Marino Heights Housing

estate). There is existing development to the south, east and west and farmland to the north. To the front of the existing derelict dwelling, there is the remnants of the old gardens which are now overgrown with a mixture of coarse grassland and scattered non-native shrubs/trees.

The existing building is located close to the northern boundary which consists of a treeline on a raised earth bank. The building has suffered extensive fire damage and is now in a very dangerous condition. The roof and floor of the second story have collapsed. The stairs is very badly damaged and windows and doors are now broken or removed. In general, the main period dwelling is draughty, cold and fire damaged. This building provides negligible roosting potential for bats.

To the rear of the existing dwelling is a newer extension which still has a largely intact roof, even though the ceiling has been badly damaged with large open sections. A small number of Lesser Horseshoe Bat droppings were recorded within the remaining floored sections of the attic, implying some limited usage. Daytime searches did not record any bats and it is considered probable that this is a small night-time roost which is used sporadically.

Overall, the extension to the rear has some functionality as a night-time roost, but the main structure, which is open, draughty and fire damaged is of negligible potential roosting value for bats. This structure is not sustainable in its current condition and is creating a significant health and safety issue.

No trees with significant value as bat roosts are present within the proposed development. The garden at the front of the property is overgrown with a number of semi-mature trees, most of which are non-native. No trees of significant potential value for bats were recorded. While this area provides potential foraging habitat, there are no trees with significant PRF's which could provide significant roosting habitat for bats.

Table 6. Building survey results

Photographs of building

Plate 1. Western gable with windows broken

Plate 2. Windows and doors open with graffiti evident.

Plate 3. Eastern gable. Windows open and roof generally absent., Some ivy growth but not dense. Eucalyptus and willow in close proximity.

Plate 4. Interior to front. Badly fire damaged.

Plate 5. Interior room in poor condition

Plate 6. Stairs badly fire damaged and in dangerous condition

Plate 6. Modern extension to rear with intact attic where small numbers of Lesser Horseshoe Bat dropping were recorded.

4.3 Bat Activity/Emergence Survey Results

A dusk bat emergence/activity survey was carried out on the 12th and 13th of September 2023 with a particular focus on the main building and extension (See **Table 6** for further detail). No trees with significant value as bat roosts are present within the proposed development site.

A dusk bat emergence/activity survey was carried out in the proposed development site during suitable weather conditions (sunset temperatures above 10°C, no rain and no strong wind) on the 12th of September using Elekon Batloggers, EchoMeter Touch 2 PRO bat detectors and a thermal imaging camera Pulsar Helion 2 XP50 Pro. A static detector was left in the attic space overnight and collected on the 13th September 2023. A static detector was also left in place from the 13th September to the 8th October 2023 along the southern section of the existing entrance track in to the site.

On the 12th of September 2023, Soprano Pipistrelle, Common Pipistrelle, Myotis bat (species unidentified) Leisler's Bat and Brown Long-eared Bat were recorded within the proposed development site with sporadic levels of activity. The most common species were the two pipistrelle species with some patchy signals for Brown Long-eared which is probably indicative of localised foraging. Only occasional sporadic signals for Leisler's Bat were recorded. Sporadic signals for an unidentified Myotis bat were indicative of a foraging activity within the overall site. Possible opportunistic use of the existing structure as a feeding perch by these species could occur.

Occasional brief signals for Lesser Horseshoe Bat were recorded on the 12th of September (west of existing dwelling at 20.34 ; 20.35), from a detector to east of existing dwelling (20.46, 20.35) and from a detector in the attic space in the period overnight from the 12th to 13th September via static detector (5.53, 5.52, 5.10, 5.09, 5.08, 5.07, 5.06, 4.59, 3.50, 2.08, 00.20,

00.19, 23.36,23.34, 23.06,23.02, 22.59, 22.38, 22.37,21,18, 21,02, 21,00, 20.30, 20.29,20.28,20.26, 20.25, 20.54, 20.23, 20.22, 20.21, 20.20, 20.19, 20.18, 20.17, 20.16. 20.15). A daytime search of the building did not record any roosting bats.

To assess usage patterns in the southern section of the site and to identify possible commuting from roosts within Bantry town, a static detector (Song Meter Mini) was positioned on an existing tree close to the southern entrance point. The detector remained *in situ* from the 13th of September 2023 to the 8th October 2023.

Five species of bat were recorded on the static detector, namely Common pipistrelle, Soprano pipistrelle, Leisler's bat, Brown Long-Eared bat and an unidentified Myotis bat. The most common species, as expected, were the two pipistrelle species with foraging ongoing throughout the survey period. It is considered probable that the other three species of bats detected were also foraging within the proposed development site, although activity levels were lower. No Lesser Horseshoe Bat signals were detected which indicates that there is no significant commuting routes from Bantry town to the southern section of the proposed development site. Survey results suggest that activity is confined to the northern section of the proposed development site.

5. Impact assessment

5.1 Common and Soprano Pipistrelle, Brown Long-eared, Leisler's and *Myotis* sp.

In the absence of management, the proposed development site has become quite overgrown and this facilitates foraging by a number of species including Common and Soprano Pipistrelle, Brown long-eared, Leisler's and Myotis bat. In general, due to its abandonment, the value of this site has increased for some bat species and it is now considered of local value. There is no evidence to indicate the buildings provide roosting habitat for these species, although occasional usage of perches within the building(s) cannot be altogether precluded. However there will be a nett loss of foraging habitat for these bat species.

5.2 Lesser Horseshoe Bat

Lesser Horseshoe Bat is confined to six counties along the Atlantic seaboard: Mayo, Galway, Clare, Limerick, Kerry and Cork. Summer roosts are typically in derelict rural buildings. Lesser Horseshoe bat is listed on Annex II of the Habitats Directive and 41 SACs have been designated in Ireland for its protection.

Patterns of roost use by Lesser Horseshoe Bat can be complex (Marnell *et al.* 2022) but a basic starting point is to consider whether bat usage of a site falls clearly into one or more of the following categories:

- Maternity site, where pups are born and raised to independence;
- Hibernation site, where bats may be found during the winter;
- Mating site, where males and females gather during the autumn;
- Feeding site (night roost), where bats rest between feeding bouts during the night but are rarely present by day;

- Transitional (or swarming) site, where bats may be present during the spring or autumn;
- Satellite roost, used by males and non-breeding females.

During the 2023 surveys, all of Lesser Horseshoe bat records were during night time activity surveys. A light scattering of droppings were recorded within the attic space, however on bats were found. It is therefore considered probable that the buildings are used as a night roost by a small number of Lesser Horseshoe Bats. It is noted that this complex of buildings is generally in a derelict state and is unlikely to remain viable as a night roost as its condition continues to deteriorate.

The closest recorded Lesser Horseshoe Bat near Bantry House, c. 900m from the proposed development site. 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).

According to NPWS & VWT (2022) maintaining the genetic diversity of the Lesser horseshoe bat in Ireland is crucial for its long- term survival. The retention of existing linear landscape features within at least 2.5km but preferably 5km of Lesser Horseshoe Bat roosts with 20 bats or more is essential to counteract the documented genetic differentiation that has already occurred within the species throughout its Irish distribution.

Lesser horseshoe bats preferentially feed in woodlands close to the ground (Marnell *et al.* 2022)) a habitat which is absent from the proposed development site boundary. An assessment of habitat preference based on a land class assessment in the UK, (Schofield 2008) notes that Lesser horseshoe bats preferred areas of deciduous woodland, whilst avoiding urban areas, dense shrub cover and sea.

Overall, it has been concluded that the extension to the rear of the dwelling provides a night roost for Lesser Horseshoe Bat and is therefore of ecological value at a local level for this species. Survey results indicate that activity levels were confined to the northern section of the site and that the linear treeline along the northern boundary may be important in facilitating east-west connectivity within the wider landscape. There is no evidence that the building is used as a maternity roost. It is noted that it is in very poor condition and it is not sustainable to retain it in the long term. In absence of development this building is expected to deteriorate rapidly and does not provide sustainable roosting habitat for bats.

6. Mitigation

As noted above, there is no evidence to indicate that the existing building is used as a maternity roost. However, activity levels and the presence of a small number of Lesser Horseshoe Bat droppings indicate that it has some local value as a night roost. It is also considered probable that this species commutes along the northern boundary. Therefore to minimise potential impacts on Lesser Horseshoe Bats and other bat species the following is mitigation measures are proposed:

6.1 Lighting, Commuting/foraging routes and Foraging habitat

Foraging behaviours of bats and their prey (such as moths – see Macgregor *et a*l., 2015) may be affected by artificial lighting. Impacts vary between species in accordance with their relative sensitivity to light. Most bat species have been recorded commuting along linear features that are dark and sheltered from wind, such as hedgerows, treelines, woodland edge habitat and waterways (Entwistle *et al.,* 2001). These features also tend to attract or 'trap' (concentrate) invertebrate prey, providing a foraging resource and the dark conditions render bats less vulnerable to predation (Finch, Schofield & Mathews, 2020a). Fragmentation of bat habitat resulting from removal, obstruction or disturbance of commuting routes can result in bats being isolated from a roost or important foraging grounds, or from seasonal resources such as swarming and hibernation sites. Faster flying species are less inhibited by light (e.g. Pipistrelles and Leisler's bat), and indeed have been recorded feeding around white metal halide streetlights that attract insects (Blake et al., 1994; Rydell & Racey, 1995); however, bats taking advantage of swarming insects around such lighting may be more prone to collision with traffic (Voigt & Kingston, 2016). Conversely, slower flying species tend to avoid street lights and light generally (e.g. Long-eared bats, Myotis species and Lesser Horseshoe Bats) (Stone, Jones & Harris, 2009, 2012; Stone et al., 2015b; Finch, Schofield & Mathews, 2020b), and consequently are put at a competitive disadvantage, being less able to forage successfully and efficiently. There is evidence that insects attracted from dark areas to well-lit areas can result in a reduction in abundance and a so-called 'vacuum effect' (Eisenbeis, 2006) that may negatively affect more light-sensitive species (From CIEEM 2023).

The following mitigation is therefore proposed:

- Positioning of the proposed dwellings further south to minimise impacts on the treeline along the northern boundary and create a dark, bat protection corridor.
- Use of a 2m high timber screen fence along the northern boundary, to protect the bat commuting route/foraging area from inadvertent light spillage or direct damage. This will be erected prior to the commencement of site works and signage will be erected denoting this area as a Bat Protection Corridor. Signage will be visible to the designated contractor who will receive a briefing from the supervising ecologist on measures necessary to prevent impacts on bats (See **Figure 4**).
- Low level lighting to private access driveways to prevent light spillage and maintain the dark zone within the Bat protection corridor.
- Infill planting of native species along northern boundary and large green areas within the proposed development site. Native species have been specified within the planting scheme.
- Tree removal minimised to maintain connectivity.
- 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. There will be no floodlights or spotlights used at the rear of the properties.

- 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.

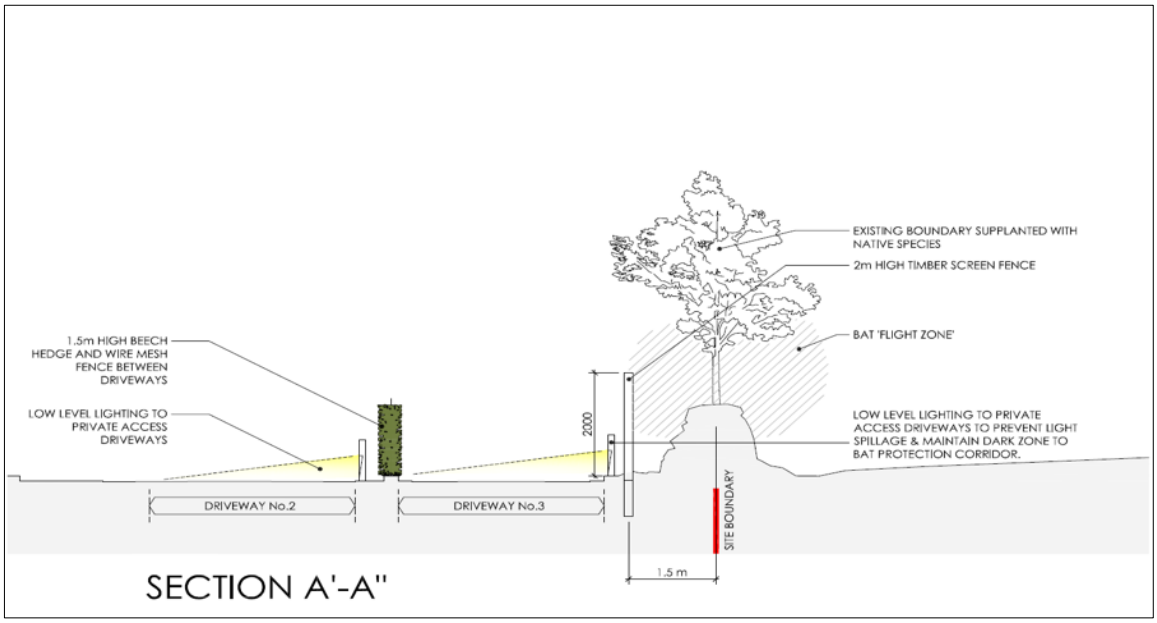


Figure 4. Bat protection corridor and proposed fencing/lighting

Plate 7. Treeline along northern boundary to maintained.

Plate 10. Treeline along northern boundary of the site in area where replacement night roost is proposed.

6.2 Roosting sites

Simon *et al.* (2004) state that not only should existing roosts be preserved where possible, but that it is essential to create new roosting opportunities to replace those being lost from the roost resource. New opportunities created by ageing/weathering will not be enough to compensate for the likely rate of attrition, and therefore the provision of additional roosts (what might be considered 'enhancement' but is really compensation on a landscape scale) is required, along with landscape-scale habitat improvements (Mackintosh, 2016).

Marnell (2022), notes that the aim of the consultant and developer should be to seek to achieve one of the following outcomes, in decreasing order of preference.

- Avoidance of impact; no negative impact on bat populations or existing roosts and hence bat populations
- On-site mitigation; compensation by the improvement of existing roosts or the provision of new roost opportunities within the site or building
- Off-site compensation; where on-site mitigation is not possible, the creation of new roosts of an appropriate type in an appropriate nearby location.

In this instance the proposed development is likely to result in a loss of a probable night roost for Lesser Horseshoe Bat and possible feeding perch for Myotis bat. As detailed below (**Figure 5**) mitigation should be appropriate to the potential impact. In this instance therefore the provision of a structure suitable for use by Lesser Horseshoe Bat as a night roost is considered appropriate mitigation.

The provision of roosting sites for other bat species provides additional ecological value and is therefore considered an enhancement measure.

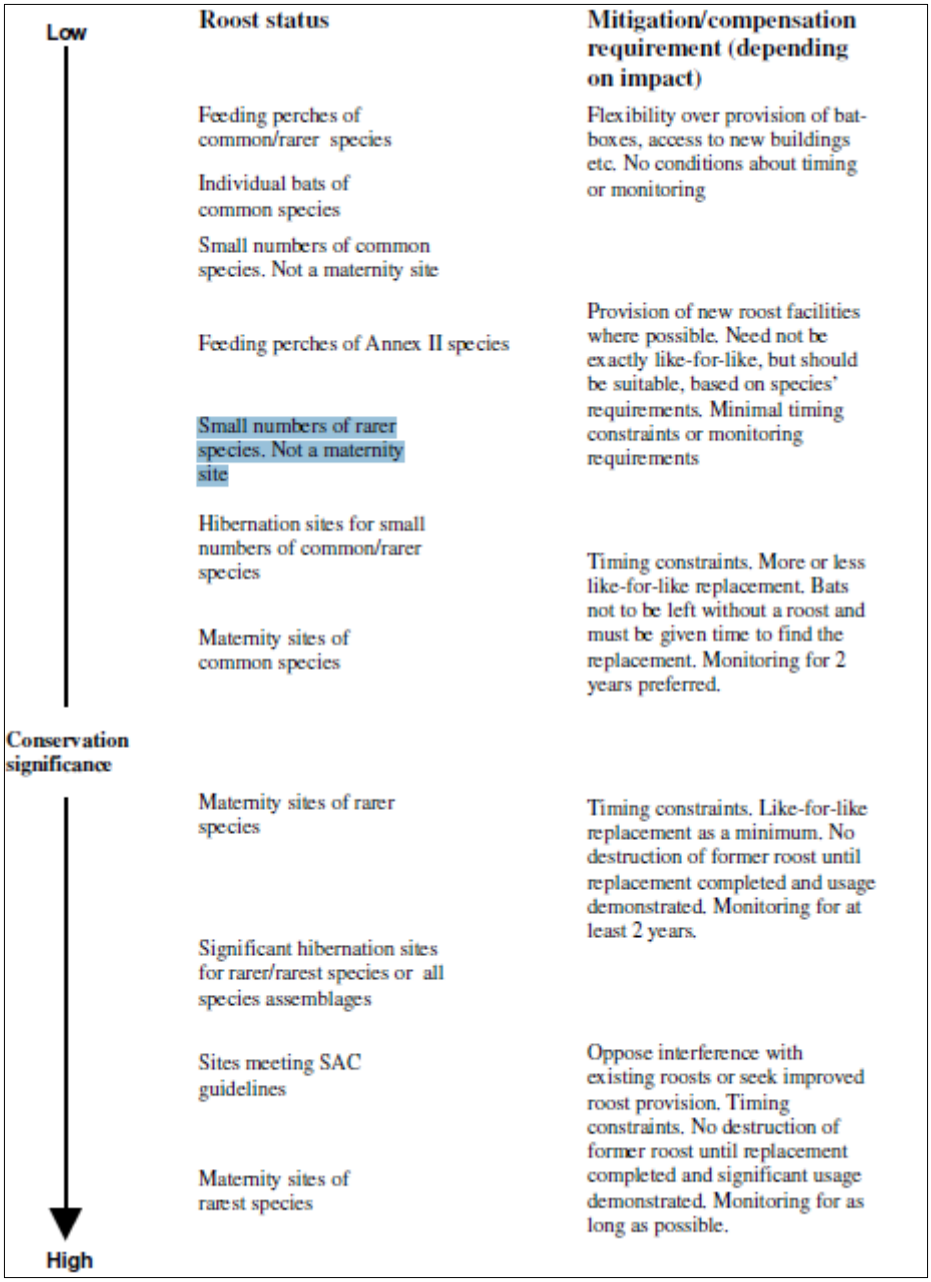


Figure 5. Mitigation in relation to bat feature and value

The key requirements for a night roost are to maintain access and provide perching places. Light levels are not an issue at night; the bats are active and alert, and predation and disturbance are less of a problem. The space required by the bats is also less important. Higher temperatures will aid the bats, especially during cooler times of the year. Schofield 2008, notes that providing Lesser Horseshoe Bats with additional or replacement night roosts can be straightforward.

It needs to be weatherproof and approximately 1m wide by 2m deep and 2.5m in height. They can be made from a timber frame covered in weatherboard (ideally this should be sealed on the inside with a breathable membrane). Alternatively, a more substantial and long-lasting

structure can be built with rendered blockwork. In this instance it is proposed that a blockwork structure will be provided.

The roof will be pitched and covered in a waterproofing layer (roofing felt, metal, tiles or slates); the timbers on the underside of the roofing material will provide perches for the bats. A ceiling will be incorporated with a hatch leading to the small roof void. A 50 X 50cm gap will be created in a side wall to provide suitable access. This gives rise to a dry, draught-free night roost.

Horseshoe bats tend to use larger roost entrances and unobstructed, demarcated flight-lines to allow direct flight into the roost. This exact location and final specification will be agreed with the supervising ecologist and appointed contractor. The roost will be locked to prevent outside interference. A keypad or similar will be provided to allow access to the supervising ecologist, NPWS etc for inspection purposes.

Figure 6. Night roost example

6.3 Other bat boxes

It is proposed that bat boxes suitable for other species will be provided within the proposed development. These will be located on trees along the northern boundary with the bat protection area. One of each of the four box types described below will be provided.

Vincent Pro Bat Box

Vincent Pro bat boxes will be provided. This box features three vertical chambers of different sizes, providing ideal roosting space for a variety of species. Beneath the crevice entrances is a ladder which provides a rough surface for bats to land. Limited cleaning is required for these boxes as the droppings will fall out of the bottom of the chambers. The front and top of the box are black which helps the box to absorb heat.

This bat box can be used by Leisler's, Common Pipistrelle, Soprano Pipistrelle, Brown long-eared, Natterer's and Whiskered Bat.

Improved Roost-Maternity Bat Box

Improved Roost-Maternity Bat Box will be provided. This box is suitable for larger roosts or maternity groups of the small crevice-dwelling bats such as pipistrelles. This has three separate crevices, each with different temperature characteristics and a wide entrance with accurately sized opening. Ideal for Pipistrelles and deters unwelcome birds etc. Internal ceramic heat sinks ensure improved temperature stability in crevices.

Bat Box 1FD

Bat Box 1FD will be provided. Suitable for Pipistrelle and Nathusius' Pipistrelle Bats as well as Daubenton's Bats and Long-Eared Bats. This is especially in mixed bat zones and for initial settlement attempts. The front panel can be removed for inspection and cleaning.

Bat Colony Box 1FS universal

Bat Colony Boxes (1FS Universal) will be provided. This type of box is readily used for forming large colonies, by Daubenton's Bats and Brown Long-Eared Bats. Nursery roosts with between 70 and 100 animals are common. Thanks to the large interior and the integrated clinging options, for large numbers of individuals, this type of box is very attractive for forming nursery roosts and for rearing young. The box is suitable as a summer and temporary roost.

Vincent pro bat box	**Improved Roost-Maternity Bat Box**
	

Bat Box 1FD	Bat Colony Box 1FS universal
	

7. Conclusions

As the site has not been actively managed in recent times, the former gardens are now dominated by scrub and taller grassland. This habitat provides foraging habitat for Common and Soprano Pipistrelle, Brown Long-eared, Leisler's and Myotis bat (species unidentified).

The old building which is located in the northern section of the site is in extremely poor condition and has been badly fire damaged. It does not provide potential maternity roosting habitat for bats. A more modern extension to the rear of the dwelling is still intact. Although in poor condition, this was found to support a small night roost of Lesser Horseshoe Bat. The treeline along the northern boundary is also considered of potential value as a commuting foraging route for this species.

As the building is not sustainable in its current condition, it will be removed in its entirety and an alternative night roost will be provided along with conventional bat boxes in a linear bat protection zone along the northern boundary of the site. Light levels within this bat protection zone along the northern boundary will be minimised the area be securely fenced.

The habitats within in the proposed development boundary are unlikely to provide high-value foraging habitats for Lesser Horseshoe but are utilised by a number of bat species. Therefore, there will be a nett loss of potential foraging habitat in the short to medium term. The landscape plan focuses on native species and has incorporated large green areas which will provide some replacement foraging habitat as the proposed planting matures.

Overall there will be a nett short-term to medium term loss of foraging habitat for all of the bat species recorded. This impact will reduce over time as planting matures (i.e. in the long term). The provision of bat boxes will provide new potential roosting sites for a range of common bat species and an alternative night roost (structure) will be provided for Lesser Horseshoe Bat. There will no disturbance of the northern boundary treeline which will be incorporated into a

bat protection area and levels of light spillage on this treeline will be minimised. The overall impact on bats is likely to be minor and long-term.

References

Altringham J 2003. British Bats. Collins New Naturalist Series No 93, Harper Collins, London

Andrews H & Gardener M 2016. Bat Tree Habitat Key – Database Report 2016. AEcol, Bridgwater.

Bat Conservation Ireland (2010) Bats & Lighting; Guidance Notes for: Planners, engineers, architects and developers.

Bat Conservation Trust (2018) Bats and artificial lighting in the UK. Guidance Note 08/18. Bats and the Built Environment series

Bontadina, F., Schofield, H. and Naef-Daenzer, B. (2002) Radio-tracking reveals that Lesser Horseshoe Bats (Rhinolophus hipposideros) forage in woodland. Journal of Zoology 258: 281–290.

CIEEM (2023). UK Bat Mitigation Guidelines A guide to impact assessment, mitigation and compensation for developments affecting bats

Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn).

Downs, N. C. et al (2003) The effects of illuminating the roost entrance on the emergence behaviour of Pipistrellus pygmaeus. Biological Conservation 111, 247-252

Entwistle A, Racey P & Speakman J 1997. Roost selection by the brown long-eared bat (Plecotus auritus). Journal of Applied Ecology

Harris S & Yalden D (eds.) 2008. Mammals of the British Isles: Handbook 4th Edition. The Mammal society, London

Hutterer R, Ivanova T, Meyer-Cords C & Rodrigues L 2005. Bat Migrations in Europe: A Review of Banding Data and Literature. Federal Agency for Nature Conservation, Bonn

Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. *Irish Wildlife Manuals*, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

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

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

Mackintosh, M. (2016) Bats and Licensing: A report on the success of maternity roost compensation measures. https://www.nature.

scot/doc/naturescot-commissioned-report-928-bats-and-licensing-report-success-maternity-roost-compensation.

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

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

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

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

Simon, M., Hüttenbügel, S. & Smit-Viergutz, J. (2004) Ecology and conservation of bats in villages and towns: results of the scientific part of the testing & development project ‘Creating a network of roost sites for bat species inhabiting human settlement’. Schriftenrei- he für Landschaftspflege und Naturschutz Heft 77. Bonn, Bundesamt für Naturschutz. https://www.eurobats.org/node/2563.