Bat Survey and Assessment

Ballyvongane

Bealnamorive

Coachford

Co. Cork

Report prepared for Raymond O'Callaghan and Denise Murphy

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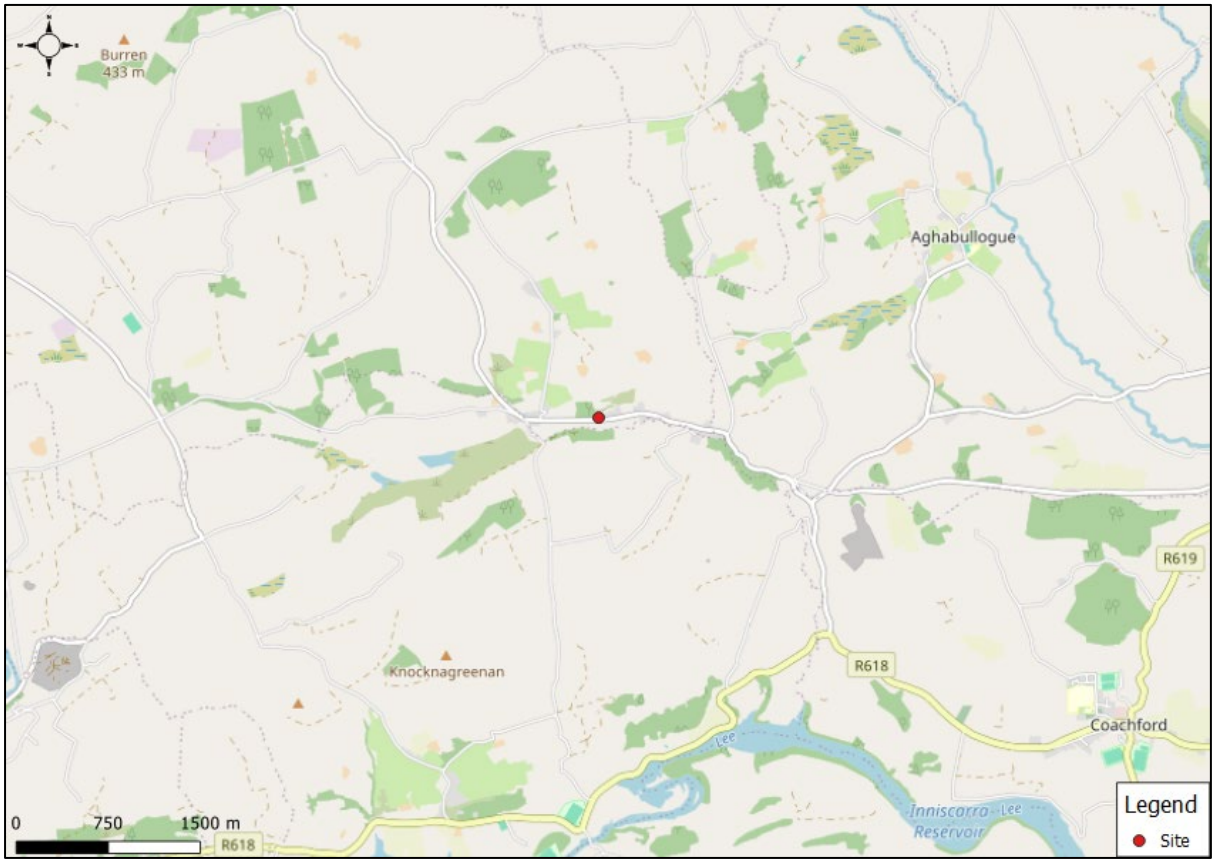
1 Introduction

This report has been prepared by Karen Banks, Greenleaf Ecology, at the request of Raymond O'Callaghan and Denise Murphy. Planning consent is being sought from Cork County Council for the extension and refurbishment of an existing dwelling at Ballyvongane, Bealnamorive, Coachford, Co. Cork.

A protected species survey of the proposed site, comprising a bat survey, was undertaken in response to request for further information number three from Cork County Council (Planning Ref: 246010).

The site is located in the townland of Ballyvongane, as illustrated in Figure 1.1.

Figure 1-1: Site Location Map



1.1 Description of the Proposed Project

Permission for 1) to construct ground floor extension to north/western side of dwelling , 2) to remove existing flat roof and pitched roof, 3) to construct first floor extension and new pitched roof, 4) elevational alterations to existing structure (front, rear and side elevations) 5) new vehicular entrance to eastern side of site and 6) to install a domestic wastewater treatment system and all associated site works at Ballyvongane, Bealnamorive, Coachford, Co. Cork.

1.2 Legislative Context

All Irish bats are protected under the Wildlife Acts. Also, the EU Habitats Directive, and Irish implementing legislation, seeks to protect rare species, including bats, and their habitats, and requires that appropriate monitoring of populations be undertaken. Moreover, the Convention on the

Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) exists to conserve all bat species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) protects migrant bat species across all European boundaries. Ireland has ratified both these conventions.

All bats are listed in Annex IV to the Habitats Directive (92/43/EC) and the Lesser Horseshoe bat is further listed under Annex II to the same Directive. Article 12 of the Directive requires Member States to establish a system of strict protection for animal species listed in Annex IV. Article 16 provides for derogation from the protection under Article 12 in certain circumstances. Articles 12 and 16 are transposed into Irish law by Regulations 51 and 54, respectively, of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended).

Destruction, alteration or evacuation of a known bat roost is a notifiable action under current legislation and a derogation licence has to be obtained from the National Parks and Wildlife Service (NPWS) before works can commence. Any works interfering with bats and especially their roosts, may only be carried out under a Regulation 54 licence issued by the NPWS. The details with regards to appropriate assessments, the strict parameters within which derogation licences may be issued and the procedures by which and the order in relation to the planning and development regulations such licences should be obtained, are set out in NPWS Guidance Series 2 – "*Strict Protection of Animal Species: Guidance for Public authorities on the Application of Articles 12 and 16 of the EU Habitats Directive to development/works undertaken by or on behalf of a Public authority*" (Mullen et al., 2021).

1.3 Objectives

The objectives of the bat survey were to assess:

- The potential suitability of the existing dwelling for roosting bats;
- Whether or not bats are roosting within the building and how many bats these roosts support (i.e. size and importance);
- Make an assessment of the potential impacts of the proposed works on bats; and
- To provide appropriate mitigation measures to remove or reduce impacts.

2 Methodology

2.1 Desk Study

A pre-survey data search was conducted in order to collate existing information from the footprint of the site and its surrounding area on bat activity, roosts and landscape features that may be used by bats. The data search comprised the following information sources:

- Collation of known bat records from within a 4km radius[1] of the proposed site from the National Bat Database held by the National Biodiversity Data Centre (www.biodiversityireland.ie); and
- Review of Ordnance Survey mapping and aerial photography of the site and its environs.

2.2 Consultation

Mr Louis O'Sullivan and Ms Claire Deasy, National Parks and Wildlife Service visited the site with Ms Karen Banks and Mr Raymond O'Callaghan on 7th February. Mr O'Sullivan and Ms Deasy inspected the existing dwelling for evidence of bats during the site visit.

2.3 Field Survey

This bat survey and assessment was undertaken in accordance with the following guidelines:

- Andrews, H. (2018) Bat Roosts in Trees. A guide to identification and assessment for tree-care and ecology professionals. Pelagic Publishing.
- Bat Conservation Ireland (2010) G*uidance notes for Planners, Engineers, Architects, and Developers*;
- Collins, J. (ed.) (2023) *Bat Surveys for Professional ecologists: Good Practice Guidelines (4th ed.)*. The Bat Conservation Trust, London; and
- 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.

2.4 Surveyor Information

The survey was undertaken by Karen Banks, MCIEEM.

Karen is an ecologist with 18 years' experience in the field of ecological assessment. She holds a BSc in Environment and Development from Durham University and is a full member of the Chartered Institute of Ecology and Environmental Management. Karen is an experienced and skilled bat surveyor, first gaining a scientific licence to disturb bats from Natural England, UK in 2008. Karen is trained in bat handling and capture methods and currently holds a bat disturbance licence granted by the NPWS (Licence number: DER/BAT 2024-45 (survey licence)). Karen has undertaken bat survey and assessment for numerous projects, including bridge repair and replacement works, domestic dwelling repair and demolition works, wind farm developments and large-scale infrastructure projects such as flood relief schemes, road developments and pipeline schemes. Karen has also represented Cork County Council as an expert witness for bats at an Oral Hearing.

2.5 Bat Roost Inspection Survey

On 31st January 2025 the existing building at the site was surveyed for potential roost sites and signs of bats. The survey utilised a high-powered torch, close focussing binoculars and an endoscope

[1] A 4km radius search distance was selected to encompass records of bat roosts within Core Sustenance Zones (CSZ) of the study area for Irish species of bat. A CSZ refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the conservation status of the colony using the roost (Collins, 2016).

(Explorer Premium 8803 with 9mm camera) where required. The external inspection involved looking for bat droppings on the ground, stuck to walls, windowsills or in crevices in the stonework and recording suitable entry and exit points.

The internal inspection involved looking for features that may be suitable for roosting bats, such as joints and crevices in wood, holes or crevices between stonework in the walls and searching for bat droppings, urine stains and feeding signs on the floor.

On 7th February an internal inspection of the building, including the roof space, for signs of bats was undertaken by Ms Karen Banks, Mr Louis O'Sullivan and Ms Claire Deasy.

The following criteria were used to determine the potential suitability of the site for bats (Table 2-1)[2].

Table 2-1: Criteria for Assessing the Potential Suitability of the Site for Bats

Suitability	Description Roosting habitats in structures	Potential flight paths and foraging habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/ suitable shelter at all ground/ underground levels).	No habitat features on site likely to be used by any commuting or foraging bats at any time of the 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	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions 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 and not a classic cool/stable hibernation site, but could be used by individual hibernating bats).	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or un-vegetated 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 and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation- the categorisation described in this table are 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 flight paths 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.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight paths

[2] Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edn). The Bat Conservation Trust, London

	regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roosts e.g. maternity or classic cool/ stable hibernation site.	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, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

2.6 Bat Roost Emergence Survey

Dusk surveys of the dwelling were undertaken on 14th May 2025 and 9th June 2025 in order to watch and listen for bats exiting bat roosts to determine the presence or absence of bats at the time of survey. The dusk emergence surveys commenced approximately 15 minutes before sunset and ended approximately 90 minutes after sunset. The surveys were undertaken in suitable weather conditions (avoiding periods of very heavy rain, strong winds (> Beaufort Force 5), mists and dusk temperatures below (10°C)). Two people surveyed the structures (Karen Banks and Cathál MacPartholan), one surveyor was located on the southern elevation and one surveyor was located on the northern elevation.

Anabat Walkabout detectors were utilised for the survey, which record bat echolocation calls directly on to an internal SD memory card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded. Data was then downloaded and all recordings were analysed by the Anabat Insight software analysis programme version 2.1.4-0.

2.7 Monitoring

In order to supplement the information gathered from the emergence survey, a passive monitoring system of bat detection was also deployed for this survey (i.e. a bat detector is left in the field, there is no observer present and bats which pass near enough to the monitoring unit are recorded and their calls are stored for later analysis). Passive monitoring was completed using 1 no. Anabat Swift bat monitor, which was positioned inside the dwelling. The monitor was set to record from approximately 30 minutes before sunset and were left recording for 26 nights in March 2025 and 27 nights in May 2023.

3 Results

3.1 Existing Bat Data

The review of existing records of bat species in the environs of the site indicates that seven of the ten known Irish species of bat have been recorded within a 4km radius of the study area (last checked February 2025). These bats include pipistrelle species (*Pipistrellus pipistrellus sensu lato*), common pipistrelle (*P. pipistrellus*) and soprano pipistrelle (*P. pygmaeus*), Leisler's bat (*Nyctalus leisleri*), brown long-eared bat (*Plecotus auritus*), Daubenton's bat (*Myotis daubentonii*), whiskered bat (*M. mystacinus*) and Natterer's bat (*M. nattereri*) as shown in Table 3-1 below. Of these species, soprano pipistrelle, pipistrelle species of bat, Leisler's, brown long-eared, whiskered bat and Natterer's bat have all been recorded roosting in a building located c.2.5km to the south of the site; Daubenton's bat has been recorded roosting in a building c.3.5km to the south of the site; and pipistrelle species have also been recorded roosting in buildings c.1.6km to the west and east of the site.

Table 3-1: NBDC bat records from within a 4km radius of the proposed development

Common Name	Scientific Name	Present (Y/N)	Known Roost (Y/N)	Date of Last Record
Pipistrelle sp.	*Pipistrellus pipistrellus sensu lato*	Y	Y	30/05/2021
Common Pipistrelle	*Pipistrellus pipistrellus*	Y	None	21/07/2016
Soprano Pipistrelle	*Pipistrellus pygmaeus*	Y	Y	21/07/2016
Nathusius's Pipistrelle	*Pipistrellus nathusii*	N	N/A	N/A
Leisler's Bat	*Nyctalus leisleri*	Y	Y	15/07/2001
Brown Long-eared Bat	*Plecotus auratus*	Y	Y	20/07/2001
Daubenton's Bat	*Myotis daubentoniid*	Y	Y	17/09/2000
Whiskered Bat	*Myotis mystacinus*	Y	Y	20/05/2008
Natterer's Bat	*Myotis nattereri*	Y	Y	15/07/2001
Lesser Horseshoe Bat	*Rhinolophus hipposideros*	N	N/A	N/A
Brandt's Bat	*Myotis brandtii*	N	N/A	N/A

Bat surveys undertaken to inform a planning application at Ballyhass, c.2.5km south-east of the site recorded nine species foraging and commuting at the site, namely soprano pipistrelle, common pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared, natterer's, whiskered, Daubenton's and lesser horseshoe bat (Greenleaf Ecology, 2022).

The bat landscape association model (Lundy *et al,* 2011) suggests that the site is part of a landscape that is of moderate to high suitability for bats including common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*), brown long-eared bat (*Plecotus auritus*), Leisler's (*Nyctalus leisleri*), whiskered bat (*M. mystacinus*) and Natterer's (*M. nattereri*); and low to moderate suitability for Daubenton's bat (*Myotis daubentonii*), Nathusius' pipistrelle (*P. nathusii*) and lesser horseshoe bat (*Rhinolophus hipposideros*).

3.2 Habitat Description

The subject of the survey is a single- storey dwelling with rendered walls and a slate tile roof with a single chimney and wooden soffits (Plate 3-1). There is a flat roof extension to the south of the dwelling.

Plate 3-1: Derelict dwelling at Ballyvongane

The grounds around the dwelling have been cleared of trees and comprise hardstanding and rock, with occasional conifer trees at the site boundary (Plate 3-1).

3.3 Bat Roost Inspection Survey

There are potential entry points for bats via a broken window (visible in Plate 3-1), gaps in the soffits and raised sections of roof membrane; there are also some slipped and missing tiles to the pitch roof (Plate 3-2 and Plate 3-3).

Plate 3-2: Suitable entry/exit point via gaps in soffits

Plate 3-3: Holes in soffits and raised and slipped tiles

Internally, there is a roof space (attic) within the pitch roof section of the dwelling and the tiles are lined with a membrane. The flat roof section is in bad condition in places allowing ingress of rain.

Potential roosting habitat for bats is present behind soffits, under roof tiles and ridge tiles, between the roof slates and membrane and within the roof space.

A low number of bat droppings (c.6) were present on an old kitchen counter behind the broken window on the southern elevation of the building and c.30 old droppings were present on the floor below the pitched roof (Plate 3-4). During the internal inspection of the roof space undertaken on 7th February 2025 with Mr Louis O'Sullivan and Ms Claire Deasy, a relatively low number of scattered lesser horseshoe bat droppings were observed. No piles of droppings, such as those found in a maternity roost, were present. Most of the droppings were old, but a small number of fresh droppings were present. A dead bat was also observed within a tank in the roof space; the bat was too decomposed to allow identification. No live bats were present at the time of survey.

Plate 3-4: Droppings present below roof space

Bat dropping samples were taken on 31st January 2025 and sent off for DNA analysis. Droppings that were characteristic of lesser horseshoe bat in appearance were sampled, as were dropping that were not as characteristic in appearance. The DNA analysis results from both samples indicate that the droppings were all from lesser horseshoe bat (Appendix B).

3.4 Roost Emergence Survey

No bats were recorded emerging from the dwelling during the dusk surveys conducted on 14th May 2025 and 9th June 2025.

While no bats were recorded emerging from the dwelling, three bat species were recorded commuting/ foraging at the proposed site. Common pipistrelle and soprano pipistrelle were recorded flying into the site from the east and briefly foraged at the site boundary before flying out of the site in a westerly direction. Leisler's bat was recorded commuting overhead.

3.5 Monitoring

A total of six species of bat were recorded during the passive monitoring: soprano pipistrelle, common pipistrelle, Leisler's bat, lesser horseshoe bat, natterer's bat and brown long-eared bat.

The passive monitor left within the building in March 2025 recorded soprano pipistrelle, common pipistrelle, Leisler's bat, lesser horseshoe bat, Natterer's bat and brown long-eared bat. Most of the activity recorded in March was from brown long-eared bat and lesser horseshoe bat. Lesser horseshoe bat was recorded on 13 of the 26 nights of monitoring. The earliest lesser horseshoe bat call recorded was 68 minutes after sunset, however the calls were predominantly recorded during the middle of the night (between midnight and 4am). Brown long-eared bat calls, including social calls, were recorded throughout the night across the monitoring period, the earliest call recorded was 32 minutes after sunset. A low amount of soprano pipistrelle and common pipistrelle activity was recorded during the monitoring at various times of the night. Leisler's bat was recorded between 3 and 4 hours after sunset on two nights and Natterer's bat was recorded in the middle of the night on three nights of the monitoring.

A lower level of activity was recorded within the dwelling during the monitoring undertaken in May 2025. Three species were recorded: common pipistrelle, lesser horseshoe bat and brown long-eared bat. A low amount of common pipistrelle activity was recorded, predominantly in the middle of the night. Lesser horseshoe bat was recorded on 4 of the 27 nights of monitoring completed. The earliest call recorded was 68 minutes after sunset and all the calls recorded were between 22:30 and 01:00. Brown long-eared bat was recorded on 15 of the 27 nights of monitoring. Brown long-eared bat was recorded 40 minutes after sunset on one occasion, however the calls were predominantly recorded between 01:00 and 04:30.

A summary of bat passes recorded during the monitoring completed in March and May 2025 is provided in Table 3-2

Table 3-2: Dwelling at Ballyvongane: passive monitoring results 2025

Species	PM1: Recording 06/03/2025-31/03/2025	PM2: Recording 01/05/2025-27/05/2025
Soprano pipistrelle	14	0
Common pipistrelle	60	14
Pipistrelle species	1	0
Leisler's bat	10	0
Lesser horseshoe bat	512	120
Natterer's bat	18	0
Brown Long-eared bat	412	261
No ID	1	2
Total	1,028	397

3.6 Significance of the Structure for Bats

The landscape surrounding the proposed site predominantly comprises agricultural grassland bound by hedgerows and treelines, with parcels of forestry and small areas of scrub. Lough Gal is located c.1.3km to the south-west and the Glashagarriff stream is c.100m to the south. Potential foraging and commuting habitat is present along hedgerows, treelines, streams and woodland edges.

The results of the DNA analysis and bat roost inspection survey conducted in January and February 2025 suggested that the dwelling is likely used as a roost by small numbers of lesser horseshoe bat. A relatively low number of fresh and old droppings were present, indicating likely ongoing opportunistic use of the dwelling by small numbers of bats during the winter. No live bats were present at the time of survey.

The results of the passive monitoring undertaken within the dwelling in spring (March) 2025 indicate occasional opportunistic use of the dwelling during the night by soprano and common pipistrelle, Leisler's and Natterer's bat. Lesser horseshoe bat was recorded on 13 of the 26 nights of monitoring, predominantly in the middle of the night. Brown long-eared bat was recorded within the dwelling across the monitoring period, including social calls and calls close to sunset. A lower level of activity from three species was recorded within the dwelling in May. A small number of common pipistrelle bat calls were recorded in the middle of the night, lesser horseshoe bat was recorded between 10:30 and 01:00 on 4 nights of the monitoring and brown long-eared bat was recorded on 15 of the 27 nights of monitoring, predominantly in the middle of the night.

In summary, a relatively low number of lesser horseshoe bat droppings were recorded within the dwelling on 31st January and 7th February 2025, some of which were fresh. Lesser horseshoe bat was recorded within the dwelling on half of the monitoring nights in March 2025 and on 4 nights in May 2025, predominantly in the middle of the night. Brown long-eared bat was recorded within the dwelling throughout the monitoring period in March 2025 and on approximately half of the monitoring nights in May 2025. Common pipistrelle, soprano pipistrelle, Leisler's bat and Natterer's bat were recorded roosting occasionally in low numbers in March 2025 and common pipistrelle was also recorded roosting occasionally in the building in low numbers in May 2025.

As detailed in Table 3-3, the roost is of low to moderate conservation significance (in accordance with the *Bat Mitigation Guidelines for Ireland*).

Table 3-3: Dwelling at Ballyvongane: summary of roost type and conservation importance

Species	Roost Type	Conservation Importance
Soprano pipistrelle	Spring night roost	Low
Common pipistrelle	Spring and summer night roost	Low
Leisler's bat	Spring night roost	Low
Lesser horseshoe bat	Spring and summer night roost	Low - medium
Natterer's bat	Spring night roost	Low
Brown Long-eared bat	Spring day and night roost & summer night roost	Medium

The bat species recorded at the site are of Least Concern (Marnell et al., 2019). The conservation status of lesser horseshoe bat is categorised as being of Inadequate conservation status (NPWS, 2019).

4 Potential Impacts

It is proposed to extend and refurbish the existing dwelling, to include replacement of the roof. The dwelling is a spring night roost for soprano pipistrelle, Leisler's bat and Natterer's bat; a spring and summer night roost for common pipistrelle; and a spring day and night roost and summer night roost for brown long-eared bat. The dwelling is also a winter, spring and summer night roost for lesser horseshoe bat. There is potential for disturbance to these roosts should the proposed extension and refurbishment works be undertaken while bats are present.

5 Mitigation Measures

Soprano pipistrelle, common pipistrelle, Leisler's bat, lesser horseshoe bat and brown long-eared roost within existing dwelling, therefore, safeguards are recommended to ensure the safety of these animals during works.

Application for a derogation licence

NB: Work on a known bat roost is a notifiable action under current legislation and a derogation licence has to be obtained from the National Parks and Wildlife Service before works on the roost can commence. Such a licence is required for the proposed works to the existing dwelling at the proposed site and no works should be undertaken to the roof of the existing dwelling before the licence is granted by the NPWS.

This application for derogation qualifies under Regulation 54(2)(C) of the European Communities (Birds and Natural Habitats) Regulations as the proposed development is required to fulfil a housing need and, as such, is of social and economic importance.

Alternative solutions considered included not renovating the dwelling. However, that option is not feasible as the dwelling is not fit for habitation in its current condition. The proposed development will require replacement of the roof in order to make the dwelling habitable, to raise the elevation of the building and also to comply with the Building Regulations 1997 to 2022; there is no suitable alternative to the proposed works. With the implementation of the mitigation measures outlined below, the proposed development and actions outlined within this report will not be detrimental to the maintenance of populations of bat species at favourable conservation status in their natural range (as required under Section 54(2) of the European Communities (Birds and Natural Habitats) Regulations.

In accordance with Marnell *et al* (2022), the dwelling at Ballyvongane supports a bat roost considered to be of low to moderate conservation significance. As stated in Figure 20, page 46, this necessitates:

"Provision of new roost facilities where possible. Need not be exactly like-for-like, but should be suitable, based on species' requirements. Minimal timing constraints or monitoring requirements"

The assessment for mitigation requirement for pipistrelle species, Leisler's bat, Natterer's bat and brown long-eared bat is less because they are common species. Therefore, the provision of an alternative roost for lesser horseshoe bat, a rarer Annex II species, will be the priority.

Measure 1: provision of a compensatory bat roost

An alternative bat roost is required to be constructed. It is recommended that this is undertaken as soon as possible in order to have this roost in place prior to works on the dwelling.

The Marnell *et al* (2022) and Schofield (2008) publications have been consulted to design an alternative bat roosting site for lesser horseshoe bat, with provisions for pipistrelle, Natterer's bat, Leisler's bat and brown long-eared bat. Design principles followed include:

- The compensatory roost will be located as close to the existing roost as possible- it is proposed to locate the roost at the north-east boundary of the site.
- The compensatory roost shall be located adjacent to an existing treeline. This will provide some cover and a flight line from the roost. However, the treeline contains gaps therefore additional tree planting will ensure an unbroken link between the roost and existing trees

along the site boundary and will connect to existing vegetation to the west of the proposed site.

- The design takes into consideration the requirements of the species concerned:
    - The design of the roost is informed by Schofield (2008) and, in addition to lesser horseshoe bat, includes provisions for pipistrelle, Leisler's bat and brown long-eared bat, based on their roosting preferences.
    - Suitable thermal regimes shall be provided by the inclusion of a hot box and a variety of roosting opportunities will be provided.

The roost plans are as follows:

- 2m x 1.6m internal floor space, single storey building with an internal height of 3m from floor to highest point of roof space.
- Building shall be constructed of block with a timber frame with insulation between the timber frame and block walls.
- An A-frame roof shall be provided with natural slate and 1F bituminous felt on timber joists. There will be a loft space with an open trap door measuring 50cm x 50cm to allow bats to fly up into the roof space.
- An entrance point shall be inserted into the gable wall facing north at c.2m height. The entrance shall be an opening measuring 50cm wide x 20cm high. The entrance will require smooth lead sheeting to be fixed around the base and sides to prevent Pine Marten climbing into the roost.
- A solid door (locked) shall be provided on the opposite gable end to the entrance.

Internal design:

- The floor of the building shall be a layer of crushed stone, a minimal layer of concrete is recommended to reduce its negative impact on the thermal properties of the building. The floor of the roof space shall be constructed from timber joists and will be sheeted with marine ply leaving the timber joists exposed underneath the ply sheets for roosting space. A 50cm x 50cm trap door shall be provided in the middle of the roof space.
- A partition box shall be provided around the entrance point to reduce light entering the roof space. The box shall be 75cm square and shall be open at the bottom to allow bats to enter the box and fly down. A hot box shall be constructed in the roof space to provide additional roosting space.
- Additional roosting space shall be provided by 2 woodstone/woodcrete[3] bat boxes on the wall in the ground floor (as high as possible).

An example of a compensatory bat roost for lesser horseshoe bats using similar dimensions and entrance design as those proposed here is illustrated in Plate 5-1. The proposed location of the compensatory roost is illustrated in Figure 5-2 and Plate 5-2.

Landscaping:

- The existing treeline at the north and east of the site boundary shall be enhanced with native tree and shrub species from Irish stock to provide foraging and commuting habitat for bats, to provide a link between the roost entrance and existing trees and to connect with other suitable foraging habitat in the wider landscape.

[3] For example: Beaumaris Bat Box with heat-absorbing WoodStone® - CJ Wildlife

A bat specialist shall be consulted to ensure that works are located and completed correctly.

Plate 5-1: Example of bat house designed for lesser horseshoe bats illustrating entrance

Figure 5-1: Proposed compensatory roost location

Plate 5-2: Approximate location of compensatory roost marked in red

Measure 2: timing of works

In accordance with the *Bat Mitigation Guidelines for Ireland*, where the structure is used throughout the year, the optimum time for works of all types is likely to lie outside the main breeding season and the main hibernation season to avoid times when disturbance may impact on survival or bats may not be sufficiently active to get out of the way. Spring and autumn generally provide the optimum period for such operations. However, it is also noted on p51 of *Bat Mitigation Guidelines for Ireland* that unless significant numbers of bats are known to be hibernating in a building, there is no advantage in requesting a deferment of scheduled works. Survey results indicate that the dwelling does not support a maternity roost or a hibernation roost.

Refurbishment and extension works shall only proceed under licence.

Measure 3: extension to and refurbishment of the existing dwelling

Passive monitoring will be undertaken to determine that no bats are present prior to the proposed works.

Prior to commencement of works the bat specialist will brief the contractor on the possible presence of bats on the site, the subsequent need to take appropriate care and attention whilst carrying out the works and the steps to take should bats be discovered at the site at any time (i.e. stop works and inform the bat specialist). Active bats will usually keep out of the way of any operations, but torpid bats may need to be gently temporarily placed in a box until dusk and released on site.

The roof will be stripped by hand under the supervision of a suitably qualified bat ecologist until the roof is no longer suitable to support roosting bats. This will include removal of ridge tiles, soffits and enough of the roof slates to render the roof space unsuitable for bats, as guided by the bat ecologist.

Once the structure is deemed to be free of bats and no longer suitable as a roosting site, the proposed works may proceed.

Measure 4: lighting

Lighting within the proposed development site shall be installed with sensitivity for local wildlife while still providing the necessary lighting for human usage. This is particularly important for the compensatory bat roost and bat foraging/commuting habitat at the site boundary.

The following general principals will be followed in relation to the overall lighting plan for the proposed development site:

- Lighting design will be flexible and be able to fully take into account the presence of protected species. Therefore, appropriate lighting shall be used within the proposed development with more sensitive lighting regimes deployed in wildlife sensitive areas.
- Dark buffer zones will be used to separate habitats or features from lighting by forming a dark perimeter around them. This shall be used for the compensatory bat roost and retained and planted vegetation at the site boundary (foraging/commuting habitat).
- Buffer zones will be used to protect dark buffer zones and rely on ensuring light levels (levels of illuminance measured in lux) within a certain distance of a feature do not exceed certain defined limits. The buffer zone can be further subdivided into zones of increasing illuminance limit radiating away from the feature or habitat that requires to be protected.

Luminaire design is extremely important to achieve an appropriate lighting regime. Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following will be considered when choosing luminaires. This is taken from the most recent BCT Lighting Guidelines (BCT, 2023).

- All luminaires used will lack UV elements to reduce impact.
- LED luminaires will be used due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins) is recommended to reduce the blue light component.
- Light sources shall feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges.
- Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered - See ILP GN01.
- Luminaires shall always be mounted horizontally, with no light output above 90° and/or no upward tilt.
- Where appropriate, external security lighting shall be set on motion sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1 or 2 minute timer is likely to be appropriate.
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites. Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues.
- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely.

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A: Description of Irish Bat Species

Ireland has ten known bat species from two distinct families. Each is briefly described below. For a more comprehensive overview see Roche *et al* (2014). The conservation status of each species is derived from NPWS (2019).

Vespertilionidae:

Common pipistrelle (*Pipistrellus pipistrellus*)

This species was only recently separated from its sibling, the soprano or brown pipistrelle *P. pygmaeus*, which is detailed below (Barratt et al, 1997). The common pipistrelle's echolocation calls peak at 45 kHz. The species forages along linear landscape features such as hedgerows and treelines as well as within woodland. The conservation status of this species is Favourable.

Soprano pipistrelle (*Pipistrellus pygmaeus*)

The soprano pipistrelle's echolocation calls peak at 55 kHz, which distinguishes it readily from the common pipistrelle on detector. The pipistrelles are the smallest and most often seen of our bats, flying at head height and taking small prey such as midges and small moths. Summer roost sites are usually in buildings but tree holes and heavy ivy are also used. Roost numbers can exceed 1,500 animals in mid-summer. The conservation status of this species is Favourable.

Nathusius' pipistrelle (*Pipistrellus nathusii*)

Nathusius' pipistrelle is a recent addition to the Irish fauna and has mainly been recorded from the north-east of the island in Counties Antrim and Down (Richardson, 2000) and also in Fermanagh, Longford and Cavan. It has also been recorded in Counties Cork and Kerry (Kelleher, 2005). However, the known resident population is enhanced in the autumn months by an influx of animals from Scandinavian countries. The conservation status of this species is Favourable.

Leisler's bat (*Nyctalus leisleri*)

This species is Ireland's largest bat, with a wingspan of up to 320mm; it is also the third most common bat, preferring to roost in buildings, although it is sometimes found in trees and bat boxes. It is the earliest bat to emerge in the evening, flying fast and high with occasional steep dives to ground level, feeding on moths, caddis-flies and beetles. The echolocation calls are sometimes audible to the human ear being around 15 kHz at their lowest. The audible chatter from their roost on hot summer days is sometimes an aid to location. The conservation status of this species is Favourable.

Brown long-eared bat (*Plecotus auritus*)

This species of bat is a 'gleaner', hunting amongst the foliage of trees and shrubs, and hovering briefly to pick a moth or spider off a leaf, which it then takes to a sheltered perch to consume. They often land on the ground to capture their prey. Using its nose to emit its echolocation, the long-eared bat 'whispers' its calls so that the insects, upon which it preys, cannot hear its approach (and hence, it needs oversize ears to hear the returning echoes). As this is a whispering species, it is extremely difficult to monitor in the field as it is seldom heard on a bat detector. Furthermore, keeping within the foliage, as it does, it is easily overlooked. It prefers to roost in old buildings. The conservation status of this species is Favourable.

Natterer's bat (*Myotis nattereri*)

This species has a slow to medium flight, usually over trees but sometimes over water. It usually follows hedges and treelines to its feeding sites, consuming flies, moths, caddis-flies and spiders. Known roosts are usually in old stone buildings but they have been found in trees and bat boxes. The Natterer's bat is one of our least studied species and further work is required to establish its status in Ireland. The conservation status of this species is Favourable.

Daubenton's bat (*Myotis daubentonii*)

This bat species prefers feeding close to the surface of smooth water, either over rivers, canals, ponds, lakes or reservoirs but it can also be found foraging in woodlands. Flying at 15 kilometres per hour, it gaffs insects with its over-sized feet as they emerge from the surface of the water - feeding on caddis flies, moths, mosquitoes, midges etc. It is often found roosting beneath bridges or in tunnels and also makes use of hollows in trees. The conservation status of this species is Favourable.

Whiskered bat (*Myotis mystacinus*)

This species, although widely distributed, has been rarely recorded in Ireland. It is often found in woodland, frequently near water. Flying high, near the canopy, it maintains a steady beat and sometimes glides as it hunts. It also gleans spiders from the foliage of trees. Whiskered bats prefer to roost in buildings, under slates, lead flashing or exposed beneath the ridge beam within attics. However, they also use cracks and holes in trees and sometimes bat boxes. The conservation status of this species is Favourable.

Brandt's bat (*Myotis brandtii*)

According to NPWS (2013), whiskered and Brandt's bats are cryptic species and can only be told apart using DNA techniques. Brand't bat has been confirmed only once from Ireland; a single specimen found in 2003 in Wicklow (Mullen, 2006). Following this discovery, an intensive re-survey, involving DNA testing, was undertaken of all known whiskered bat roosts in Ireland, by the Centre for Irish Bat Research. Woodland mist-netting was also conducted for the species. Despite the extensive survey-work, no further Brandt's bats were identified. The most recent Red Data List for Irish Mammals (Marnell *et al*. 2009) lists Brandt's bat as data deficient. There is no evidence of any roosts for this species in the country and at present the single record for the species is considered an anomaly. Boston et al (2010) concluded that "M. brandtii …. cannot currently be considered a resident species. This species is now considered a vagrant to the country and consequently, a detailed assessment has not been carried out.

<u>Rhinolophidae:</u>

Lesser horseshoe bat (*Rhinolophus hipposideros*)

This species is the only representative of the Rhinolophidae or horseshoe bat family in Ireland. It differs from our other species in both habits and looks, having a unique nose leaf with which it projects its echolocation calls. It is also quite small and, at rest, wraps its wings around its body. Lesser horseshoe bats feed close to the ground, gleaning their prey from branches and stones. It often carries its prey to a perch to consume, leaving the remains beneath as an indication of its presence. The echolocation call of this species is of constant frequency and, on a heterodyne bat detector, sounds like a melodious warble. The species is confined to six counties along the Atlantic seaboard: Mayo, Galway, Clare, Limerick, Kerry and Cork. The current Irish national population is estimated at 12,500 animals. This species is listed on Annex II of the EC Habitats Directive and 41 Special Areas of

Conservation have been designated in Ireland for its protection. Where it occurs, it is often found roosting within farm buildings. The conservation status of this species is Inadequate.

Appendix B DNA Analysis Results

Folio No:	37-2025
Purchase Order:	202501
Contact:	Greenleaf Ecology
Issue Date:	11.02.2025
Received Date:	04.02.2025

Biological Report

Technical Report

SureScreen Scientifics

Folio No: 37-2025
Purchase Order: 202501
Contact: Greenleaf Ecology
Issue Date: 11.02.2025
Received Date: 04.02.2025

SureScreen Scientifics

Biological Sample Analysis

Summary

Most biological materials (tissue, feces, hair, blood, etc.) contain small amounts of DNA from the organism of which it originated. Using molecular methods such as PCR (polymerase chain reaction) and DNA sequencing, SureScreen Scientifics are able to analyze an unknown sample to determine which species the sample originates from our methods are optimized for the detection of species including bats (over 92% of bat species worldwide can be identified including all 18 UK bat species), mammals; bees, wasps & hornets; birds; fish; plants (from roots, leaves, stem and even dried wood) and many more species.

Results

Lab ID	Site Name	OS Reference	Sample Type	Species Name	Match(%)
B4380	Ballyvongane - 1	W41536 75808	Bat Dropping	Lesser horseshoe bat (Rhinolophus hipposideros)	97.47
	Genetic Sequence GATGCTATTATAATTGGAGGCTTTGGCAACTGACTGGTTCCCTTGATAATCGGTGCACCCGACATATCATTCCCACG TATGAACAATATAAGCTTCTGACTCCTACCCCCCTCTTTCCTACTTCTATTGGCCTCATCTATGGTTGAATCTGGTG CTGGAACCGGCTGAACTGTTTACCCCCCTTTAGCGGGAAATCTTGCACATGCTGGAGA				
B4381	Ballyvongane - 2	W41536 75808	Bat Dropping	Lesser horseshoe bat (Rhinolophus hipposideros)	98.51
	Genetic Sequence TAATTGGGAAGGGCTTTGGCCAACTGACTGGTTCCCTTGATAATCGGTGCACCCGACATAGCATTCCCACGTATGA ACAATATAAGCTTCTGACTCCTACCCCCCCTCTTTCCTACTTCTATTGGCCTCATCTATGGTTGAATCTGGTGCTGG AACCGGCTGAACTGTTTACCCCCCTTTAGCGGGAAACCTTGCATCACGCTGGAGAGAGGT				

Matters affecting result: none
Reported by: Lauryn Jewkes

Approved by: Lauryn Jewkes

Folio No:	37-2025
Purchase Order:	202501
Contact:	Greenleaf Ecology
Issue Date:	11.02.2025
Received Date:	04.02.2025

SureScreen Scientifics

Methodology

Once samples have arrived in the laboratory, the DNA is isolated using a commercial DNA extraction kit. Using PCR, DNA (if present within the sample) is amplified using universal molecular markers designed to amplify a short fragment of the DNA of the target species group (i.e. mammal, fish, arthropod, reptile, plant etc.). If amplification is successful, the resulting DNA sequence is revealed using a process known as Sanger Sequencing in order to obtain the genetic sequence of the mitochondrial gene within the sample. The sequence results are aligned against a library of known reference sequences using bioinformatics software, which enables us to determine which species the DNA sequence from the sample matches with, informing the species identity and sequence similarity (match %).

If the initial analysis is unsuccessful, the entire process is repeated up to two additional times with a fresh reserve sample (if available) in order to obtain a species identification. If no DNA is detected after three attempts, then we can be confident that any further analysis of the sample will likely also fail to result in species identification.

Interpretation of Results

Sample Type:

The sample you send to us can come from a variety of sources. Fecal, dropping, urine, hair, blood, carcass (skin, flesh, bone), gamete, plant matter or unknown biological material all contain DNA that we can test for in order to identify the species of origin.

Genetic Sequence:

The unique DNA sequence obtained from the sample.

Match (%):

How closely matched the DNA sequence from your sample is to the sequences within our reference database. This can be interpreted as a score of result accuracy, with the maximum score of 100% indicating an exact match of the sample to the indicated species' reference sequence. Lower scores (80-99%) indicate some variation between the sample and reference sequence, likely due to natural variation between individual genetic sequences and/or systematic variations generated through the sequencing process. Scores below 80% similarity should be interpreted with care and can indicate part degraded or part contaminated samples.

Inconclusive Result:

Degraded sample:

DNA is degraded and we are unable to determine species identification due to degradation of sample DNA. This can happen either before sample collection (old samples, exposure to UV etc.) or after sample collection if stored for long periods before analysis or not handled correctly.

Inhibited/contaminated sample:

We are unable to determine species identity due to contamination or the suspected presence of large quantities of PCR inhibitors. Contamination sources can originate from other species which could have come into contact with the samples, or human contamination during sample collection.

Alternative Result:

Sometimes, for targets such as bat dropping analysis, other mammalian species such as rodents are detected. We find this to be a common occurrence as some bat droppings can be similar in appearance to rodent droppings. Although sometimes unexpected, repeat analyses in these cases would likely return the same results.