

August
2025

Bat Survey & Report



Glean Caoin' Borrisoleigh, Co. Tipperary



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Bat Survey & Report – Glean Caoin', Borrisoleigh, Co. Tipperary

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1. INTRODUCTION

1.1 Purpose of the Report

Ash Ecology and Environmental Ltd (AEE) was commissioned to carry out a Bat Survey and Report for a Part VIII planning application for Tipperary County Council (TCC). The planning application is for a site at Glean Caoin', Borrisoleigh, Co. Tipperary. The application seeks permission for the construction of 28 No. social housing units on Council-owned lands.

The site comprises 1.42 hectares of greenfield land currently used as grassland, located on the edge of Borrisoleigh town. The site is bounded by Borrisoleigh Stream along the northern boundary, with the mature tree line along the stream located just outside the site boundary. Existing residential development lies to the south and southwest, a petrol station to the west/northwest, and agricultural fields to the north and east. An existing hedgerow along the eastern boundary will be retained. ESB overhead lines traverse the site.

The site location is shown as Figure 1 with the aerial view clearly demonstrating the site's edge-of-town setting and relationship to Borrisoleigh Stream as Figure 2. The proposed site layout for the 28 housing units, which incorporates green open spaces while retaining both the eastern boundary hedgerow and the tree line along Borrisoleigh Stream, is shown as Figure 3.

This bat survey report has been prepared to fulfil TCC's tender requirements and as part of the Part VIII planning application process to:

- Identify bat species utilising the site and quantify their activity levels
- Map flight paths and commuting routes across the site
- Assess the importance of site features (particularly the stream corridor and boundary vegetation) for bats
- Provide recommendations for conserving bat habitats while developing the site

This survey is in accordance with the requirements for ecological assessment under the Wildlife Acts 1976 to 2023 and the EU Habitats Directive, which aim to protect bats, their flight paths, commuting routes, and habitats. This report presents the findings of a bat activity survey conducted on August 6th 2025, and proposes appropriate conservation measures to ensure the development can proceed while maintaining the ecological functionality of the site for the local bat population.

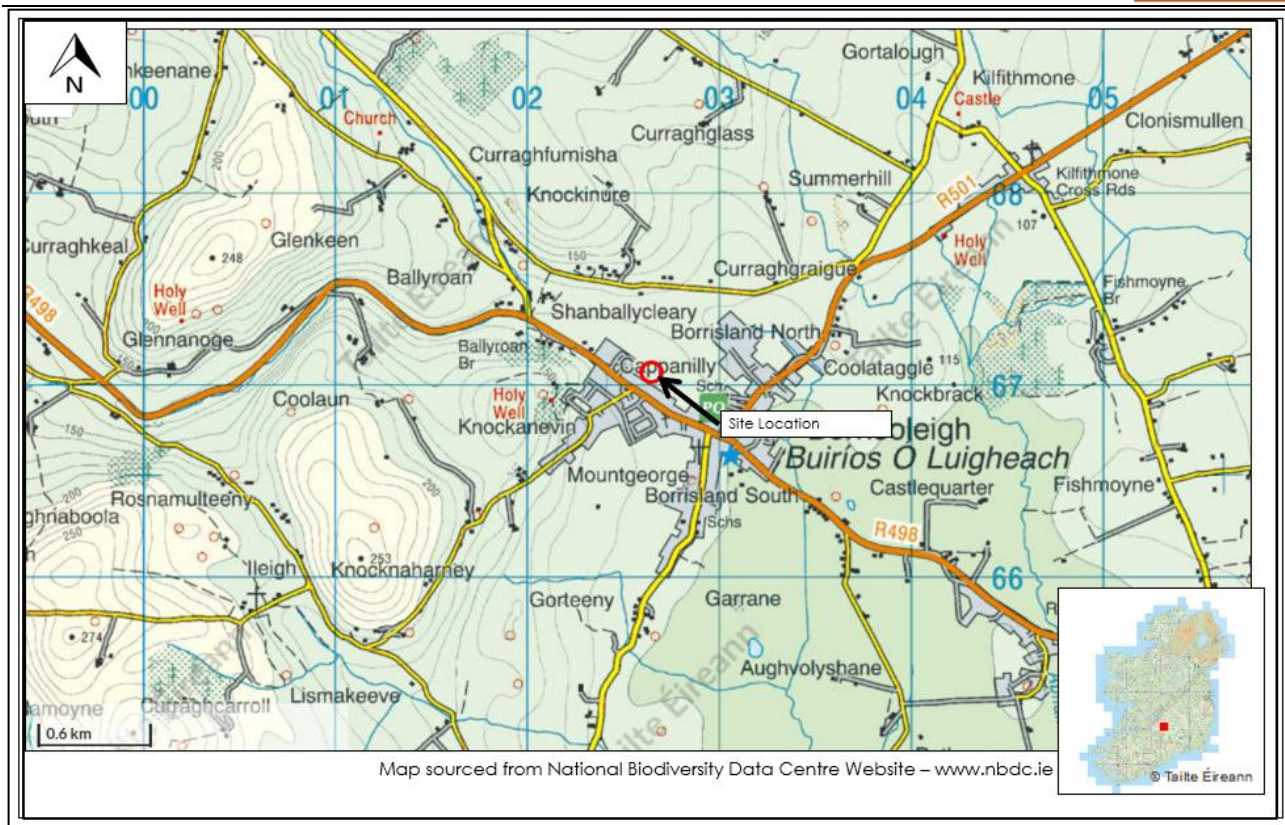


Figure 1 Site Location Map



Figure 2 Aerial Photo of Site showing existing and proposed layout with surrounding landscape

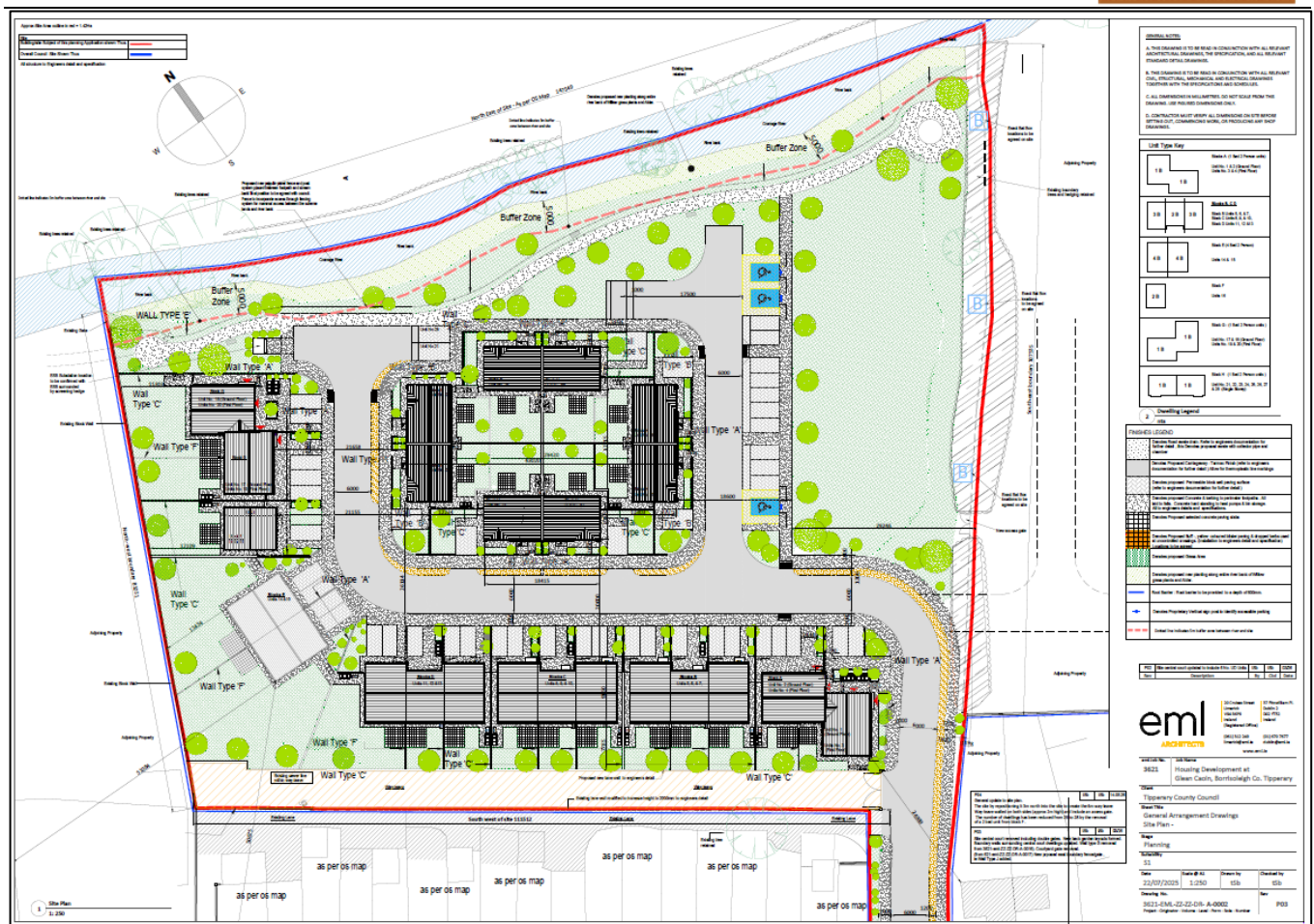


Figure 3 Proposed Site Layout - Schematic

1.2 Competency of Assessor

This report has been prepared by Ash Ecology & Environmental Ltd (AEE) whose managing director and leading ecologist is Aisling Walsh with 18 years' experience and a full member of the Chartered Institute of Ecological & Environmental Management (CIEEM) while the company, AEE, is a Registered Practice by the CIEEM.

Aisling's qualifications include M.Sc. (Dist) in Biodiversity and Conservation (TCD) and B.Sc. (Hons) Zoology (NUIG), a Diploma in Applied Aquatic Science (GMIT) and a Certificate in Applied Biology (GMIT).

Aisling is a licenced bat ecologist (example of recent: DER/BAT 2020 – 46 EUROPEAN, DER/BAT 2020 – 48 EUROPEAN, DER/BAT 2021 – 89 EUROPEAN, DER/BAT 2022 – 12 EUROPEAN, DER/BAT 2023 – 23 EUROPEAN, DER/BAT 2023 – 106 EUROPEAN, DER/BAT 2023 – 135 EUROPEAN, DER/BAT 2024 - 25 EUROPEAN, DER/BAT 2024 - 130 EUROPEAN, DER/BAT 2024 - 183 EUROPEAN, DER/BAT 2025 - 17 EUROPEAN and DER/BAT 2025 - 25 EUROPEAN) and a member of Bat Conservation Ireland and associate member of the Institute of Lighting Professionals (ILP).

1.3 Bat Legislation

All bat species are protected under the Wildlife Act 1976 to 2023 which make it an offence to wilfully interfere with or destroy the breeding or resting place of these species; however, the Acts permit limited exemptions for certain kinds of situations.

Section 23 of the Wildlife Act 1976 to 2023 contains several exemptions to the protection given to the species listed for protection on Schedule 5 (e.g. for agriculture or construction). In 2005 a further amendment through the European Communities (Natural Habitats) (Amendment) Regulations 2005 (S.I. No. 378 of 2005) removed all of the exemptions provided in Section 23(7) of the Wildlife Act 1976 to 2021 insofar as they relate to Annex IV species, including all species of bats. Those 2005 Regulations were revoked in 2011 except for Regulation 2 which brings about this strengthened protection for bats (and other Annex IV species). All species of bats in Ireland are listed on 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;
- Wilfully interfere with the breeding or resting place of a bat

The Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora ("the Habitats Directive") seeks to protect rare and vulnerable species, including all species of bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All species of bat found in Ireland are listed on Annex IV of the Directive. Member States are required to put in place a system of strict protection (as outlined in Article 12) for species listed on Annex IV ('European protected species'). The lesser horseshoe bat is further protected under Annex II. This Annex relates to the designation of Special Areas of Conservation (SACs). The Habitats Directive is transposed into Irish law by the European Communities (Birds & Natural Habitats Regulations) 2011 (S.I. No. 477 of 2011) ("the Habitats Regulations"). Under the Habitats Regulations (2011), all bat species are listed on the First Schedule and Regulation 51 makes it an offence to:

- Deliberately capture or kill a bat;
- Deliberately disturb a bat particularly during the period of breeding, hibernating or migrating;
- Damage or destroy a breeding site or resting place of a bat;
- Keep, sell, transport, exchange, offer for sale or offer for exchange any bat taken in the wild.

Across Europe, bats are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (CMS, Bonn Convention 1979) was instigated to protect migrant species across all European boundaries. EUROBATS (a daughter Agreement under CMS) is of particular relevance in relation to cooperation across international borders for the conservation of bats, many of which are known to migrate long distances. The Irish government has ratified both of these conventions as well as the EUROBATS Agreement.

Additionally, under the Wildlife (Amendment) Act 2023, public bodies including local authorities now have a statutory duty to have regard to biodiversity conservation when performing their functions. This requires public bodies to consider the National Biodiversity Action Plan (published January 2024) and report on measures adopted to promote biodiversity conservation. This reinforces the importance of appropriate ecological assessment and mitigation in planning applications to ensure developments contribute to, rather than detract from, biodiversity objectives.

1.4 Derogation licences

It is an offence, under Regulation 51 of the European Communities (Birds and Natural Habitats) Regulations, 2011 ('the 2011 Regulations') to:

- a) Deliberately capture or kill a bat in the wild;
- b) Deliberately disturb a bat particularly during the period of breeding, rearing, hibernation and migration;
- c) Damage or destroy a bat's breeding site or resting place, or;
- d) Keep, transport, sell, exchange, offer for sale or offer for exchange any bat taken in the wild, other than those taken legally before the Habitats Directive before the Habitats Directive was implemented.

A person may apply to the Minister under Regulation 54 of the 2011 Regulations for a derogation licence to carry out one or more of these prohibited activities. But, the Minister may only grant such a derogation licence if three criteria are met.

Firstly the Minister may only grant a derogation licence if it is for one of the following specified reasons listed in Regulation 54:

- a) In the interests of protecting wild fauna and flora and conserving natural habitats;
- b) To prevent serious damage, in particular to crops, livestock, forests, fisheries and water and other types of property;
- c) In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and the beneficial consequences of primary importance for the environment;
- d) For the purpose of research and education, of repopulating and introducing these species and for the breeding operations necessary for these purposes, including the artificial propagation of plants, or;
- e) To allow, under strictly supervised conditions, on a selective basis and to a limited extent, the taking or keeping of bats.

Secondly, the Minister may only issue a derogation if there is no alternative to carrying out the prohibited activity. The first aim of the developer, whether from a private company or a public authority, working with professional advice, should be to entirely avoid any potential impact of a proposed development on bats and their breeding and resting places. Alternatives may involve redesigning a development so that bat roosts, and associated commuting routes and feeding areas are kept intact and that bats are not disturbed, for example by inappropriate lighting. It should be noted that the European Commission has a specific understanding of satisfactory alternative solution. "An alternative solution cannot be deemed unsatisfactory merely because it would cause greater inconvenience or compel a change in behaviour" (European Commission, 2021,

page 13)¹. Decisions about what solution is satisfactory must be science-based and should solve the problem of how to strictly protect the bats in light of the development.

Thirdly the Minister may only grant a derogation if it is not detrimental to the maintenance of the populations of bats at a favourable conservation status (FCS) in their natural range. There is case law from the Court of Justice of the European Union (CJEU) to back this up. One example is the Finnish Wolf Case C-674/17. The ruling establishes that the Member State must “clearly and precisely” identify in the derogation what the objectives of the derogation are. It must also establish that the derogation is capable of achieving those objectives and demonstrate that there is no satisfactory alternative. Cumulative effects of derogations must be taken into account when issuing derogations. The maximum number of all derogations must not be detrimental to the maintenance or restoration of the population at FCS. Consideration must be given to other human causes of mortality. Any risk to FCS must be ruled out by detailed conditions based on the level of population, its conservation status and its biological characteristics. The conditions must be precisely defined and they must be monitored to ensure they are implemented.

If any of these three criteria are not satisfied, the Minister cannot issue a derogation licence. It must never be assumed that a derogation licence will automatically be granted.

In summary, it is clear that a developer must first look to avoid all impacts on bats. This may mean looking at alternative solutions and redesigning the project accordingly. If this is not possible, the developer needs to check whether there are grounds to apply for a derogation licence, based on the reasons given in Regulation 54 of the Habitats Regulations. When applying for a derogation licence the developer must clearly state the reason and describe in detail all alternative solutions which were given serious consideration. Any mitigation intended to ensure that there is no impact or minimal impact on the bats must be clearly described in detail, giving examples of how it worked in other places.

If a derogation licence has been refused by the Minister, any aspect of the development for which the derogation licence was sought, must not go ahead, no matter what other permissions are in place.

A derogation licence is required when on the basis of survey information and specialist knowledge, it appears that:

- The site in question is a breeding site or resting place for bats and/or;
- The proposed activity could impact on a breeding site or resting place of a bat.

No licence is required if the proposed activity is unlikely to result in an offence. The advice given in this document (and see also Mullen et al. 2021)² should assist the proponent, or those acting on their behalf, in arriving at a decision on this matter, though it must be

¹ <https://op.europa.eu/en/publication-detail/-/publication/bbc7ace0-27e2-11ec-bd8e-01aa75ed71a1/language-en>

² Mullen, E., Marnell, F & Nelson, B. (2021) 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. Unpublished Report, National Parks and Wildlife Service. Department of Housing, Local Government and Heritage, Dublin. <https://npws.ie/sites/default/files/files/article-12- guidance-final.pdf>

recognised that determining whether a particular site is used as a breeding or resting place can be problematic for such mobile animals as bats.

Determining whether an activity undertaken near to a roost might impact on that roost (e.g. by removing important flight lines or foraging areas) will also require specialist assessment. Note that if the proposed activity can be timed, organised and carried out so as to avoid committing an offence then no licence is required.

Examples of works that are likely to need a licence because they may result in the destruction of a breeding or resting place and/or disturbance of bats include:

- Demolition of buildings known to be used by bats;
- Conversion of barns or other buildings known to be used by bats;
- Restoration of ruined or derelict buildings;
- Maintenance and preservation of heritage buildings;
- Introduction of artificial lighting inside a roost or near a roost entrance;
- Change of use of buildings resulting in increased ongoing disturbance;
- Removal of trees known to be used by bats;
- Significant alterations to roof voids known to be used by bats.

Examples of works that, if carefully planned, may not need a licence include:

- Works near to or at roosts (e.g. re-roofing) if carried out while bats are not present and the access points and roosting area are not affected;
- Remedial timber treatment, carried out with the correct (non-toxic to bats) chemicals while bats are not present.

2. METHODOLOGY

2.1 Information Sources

A desk-based review of information sources was completed. Information contained on the websites of the National Parks and Wildlife Service (NPWS)³ and the National Biodiversity Data Centre (NBDC)⁴ was reviewed. The following publications and websites were also reviewed and consulted:

Bat Guidance

- Bat Conservation Trust (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th edition
- Bat Conservation Trust and Institution of Lighting Professionals (2023) Guidance Note 8/23 Bats and Artificial Lighting⁵
- Reason, P.F. and Wray, S. (2023). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Chartered Institute of Ecology and Environmental Management (CIEEM), Ampfield.
- 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.
- Mullen, E., Marnell, F & Nelson, B. (2021) 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. Unpublished Report, National Parks and Wildlife Service. Department of Housing, Local Government and Heritage, Dublin.
<https://npws.ie/sites/default/files/files/article-12- guidance-final.pdf>
- Bat Conservation Ireland <https://www.batconservationireland.org/>
- Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals (2018)
- Bat Conservation Trust (2018) Bats and artificial lighting in the UK Bats and the Built Environment series⁶
- Mitchell-Jones, A.J. & McLeish, A.P. (eds). 2004., 3rd Edition Bat Workers' Manual, JNCC, Peterborough, ISBN 1 86107 558 8
- Bat Conservation Ireland (2012) Bats and Appropriate Assessment Guidelines, Version 1, December 2012. Bat Conservation Ireland, www.batconservationireland.org⁷
- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (National Roads Authority, 2005).
- Guidelines for the Treatment of Bats during the Construction of National Road Schemes (National Roads Authority, 2005).
- Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2011).
- McAney, K & Hanniffy, R (2015) The Vincent Wildlife Trust's Irish bat box schemes
- Bat Conservation Ireland <https://www.batconservationireland.org/>

³ The National Parks and Wildlife Services map viewer <http://webgis.npws.ie/npwsviewer/>

⁴ The National Biodiversity Data Centre www.NBDC.ie

⁵ <https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/>

⁶ <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>

⁷ https://www.batconservationireland.org/wp-content/uploads/2013/09/BCIreland-AA-Guidelines_Version1.pdf

- Andrews H & Gardener M (2016) Bat Tree Habitat Key – Database Report 2016. AEcol, Bridgwater.
- Aughney, T., Kelleher, C. & Mullen, D. (2008) Bat Survey Guidelines: Traditional Farm Buildings Scheme. The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny.

2.2 Desk Study

2.2.1 Species Background

Ireland had ten known bat species until February 2013, when a single live greater horseshoe bat (*Rhinolophus ferrumequinum*) was found roosting in Co. Wexford⁸. On 8th June 2020, a single audio recording was confirmed in the Glendaough area, Co. Wicklow. It was found on two more occasions in the same area in early July 2020 (Bat Conservation Ireland, July 2020).

The ten species (excluding the greater horseshoe) are briefly described overleaf. For a more comprehensive overview see McAney, 2006.⁹

The dependence of Irish bat species on insect prey has left them vulnerable to habitat destruction, land drainage, agricultural intensification and increase use of pesticides. Also, their reliance on buildings as roosting sites has made them particularly vulnerable to renovation works and the use of timber chemical treatment. Buildings are highly important as roosting sites for bats and all Irish bat species use buildings for all roost types. Most significant in terms of roosts in houses are maternity roosts, but cellars and even attics may serve as hibernation sites for bats. Roosts within buildings can far exceed the numbers encountered in trees, bridges, caves or cliffs and roosts of over 1,000 bats have been recorded in buildings.¹⁰

2.2.1.1 Family Vespertilionidae:

Common pipistrelle *Pipistrellus pipistrellus*

This species was only recently separated from its sibling, the soprano or brown pipistrelle *P. pygmaeus*¹¹, which is detailed below. 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.

⁸ National Biodiversity Data Centre <http://www.biodiversityireland.ie/new-bat-species-found-in-ireland/>

⁹ McAney, K. (2006) *A Conservation Plan for Irish Vesper Bats*. Irish Wildlife Manual No.20. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government.

¹⁰ NRA (2005) Guidelines for the Treatment of Bats Prior to the Construction of National Road Schemes. National Roads Authority, Dublin

¹¹ Barratt, E. M., Deauville, R., Burland, T. M., Bruford, M. W., Jones, G., Racey, P. A., & Wayne, R. K. (1997) *DNA Answers the Call of Pipistrelle Bat Species*. *Nature* 387: 138 - 139.

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.

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 Down¹² and also in Fermanagh, Longford and Cavan. It has also recently been recorded in Counties Cork and Kerry.¹³ However, the known resident population is enhanced in the autumn months by an influx of animals from Scandinavian countries. The status of the species has not yet been determined.

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, caddisflies 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. This species is uncommon in Europe and as Ireland holds the largest national population the species is considered as Near Threatened here.

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.

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, caddisflies 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.

¹² Richardson, P. (2000) *Distribution Atlas of Bats in Britain and Ireland 1980 - 1999*. The Bat Conservation Trust, London, England.

¹³ Kelleher, C. (2005) *International Bat Fieldcraft Workshop*, Killarney, Co. Kerry. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government.

Daubenton's bat *Myotis daubentonii*

This bat species feeds close to the surface of 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.

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 whiskered bat is one of our least studied species and further work is required to establish its status in Ireland.

Brandt's bat *Myotis brandtii*

This species is known from five specimens found in Counties Wicklow (Mullen, 2007), Cavan, and Clare in 2003, a specimen in Kerry in 2005¹⁴ and another in Tipperary in 2006.¹⁵ No maternity roosts have yet been found. It is very similar to the whiskered bat and cannot be separated by the use of detectors. Its habits are similar to its sibling.

2.2.1.2 Family *Rhinolophidae*:

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.

¹⁴ Kelleher, C. 2006a *Nathusius pipistrelle* *Pipistrellus nathusii* and Brandt's Bat *Myotis brandtii* - New Bat Species to Co. Kerry – Irish Naturalists' Journal 28: 258.

¹⁵ Kelleher, C. 2006b Brandt's Bat *Myotis brandtii*, New Bat Species to Co. Tipperary. Irish Naturalists' Journal 28: 345.

2.2.2 Previous Records & Landscape Suitability for Bats

The National Biodiversity Data Centre (NBDC) maps landscape suitability bats based on Lundy *et al.* (2011). The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. On average for all bat species the highest range is between 36.44 - 58.56. The overall assessment of bat habitats for the current study area is given as '30.22', deemed 'Moderate' by the author.

Bat species (4) have previously been recorded in the 10km² grid square S06 (according to data on the NBDC, accessed August 2025) include:

- Common Pipistrelle (*Pipistrellus pipistrellus*)
- Daubenton's Bat (*Myotis daubentonii*)
- Leisler's Bat (*Nyctalus leisleri*)
- Soprano Pipistrelle (*Pipistrellus pygmaeus*)

Table 1 gives the suitability of the study area for the bat species found in the study area (based on NBDC) along with their Irish Red List Status (from Marnell *et al.*, 2019).¹⁶

Table 1 Suitability of the study area for the bat species found in the Borrisoleigh area (based on the NBDC data) with Irish Red list status indicated.

Common name	Scientific name	Suitability index	Irish red list status
All bats	-	30.22	Least Concern
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	44	Least Concern
Brown long-eared bat	<i>Plecotus auritus</i>	38	Least Concern
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	49	Least Concern
Lesser-horseshoe bat	<i>Rhinolophus hipposideros</i>	3	Least Concern
Leisler's bat	<i>Nyctalus leisleri</i>	44	Least Concern
Whiskered bat	<i>Myotis mystacinus</i>	20	Least Concern
Daubenton's bat	<i>Myotis daubentonii</i>	34	Least Concern
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>	4	Least Concern
Natterer's bat	<i>Myotis nattereri</i>	36	Least Concern

While the table above shows habitat suitability indices for all nine bat species regularly found in Ireland, only four species have been previously recorded in the 10km² grid square S06. The species with very low suitability indices (e.g., Lesser-horseshoe bat with an index of 3, and Nathusius' pipistrelle with an index of 4) are highly unlikely to occur in the Borrisoleigh area. The nearest confirmed Lesser-horseshoe bat records are from Castleconnell, Co. Limerick, approximately 35km away, reflecting this species' preference for more suitable habitat in the western counties.

2.2.3 Bat Roosts

Bats were originally cave and tree dwelling animals but many now find buildings just as suitable for their needs. Bats are social animals and most species congregate in large colonies during summer. These colonies consist mostly of females of every reproductive

¹⁶ Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

class, with some juvenile males from the previous year. Male bats normally roost individually or in small groups meeting up with the females in the late autumn-early winter, when it is time to mate. In summer, bats seek warm dry buildings in which they can give birth and suckle their young. In winter, they seek out places with a constant low temperature and high humidity where they can become torpid and hibernate during adverse weather conditions. However, bats do not hibernate continuously during winter and will awake and hunt during mild nights when there are insects available, and it is energetically advantageous to forage.

2.2.3.1 Maternity Roosts

Maternity roosts are the most significant roosts and they are predominantly all-female aggregations that are formed from late May onwards and remain as a relatively cohesive unit until mid to late August. Not all female bats give birth annually. These females that do bear young in a given year avail of a suitable building, tree and sometimes cave (or equivalent). The young are flightless for several weeks and hence are vulnerable to dangers such as tree felling and restoration, reinforcement or demolition of structures such as buildings and bridges.

2.2.3.2 Mating Roosts

Most bat species mate in autumn but pregnancy does not occur until the following spring. During this time males will take possession of a cavity in a building, tree, bridge, cave or mine and attract females to these sites to establish a harem. Male bats call both from a perch and in flight in much the same manner that male birds sing.

2.2.3.3 Hibernation Roosts

Bats have a high metabolic rate and in temperate countries, such as Ireland, flying insects are not available in sufficient numbers during winter to sustain bats. Therefore, bats hibernate during winter. In hibernation sites, bats are often completely inactive for several days and are extremely vulnerable to disturbance by human activities due to the time taken for them to become sufficiently active to allow escape. Hibernation may extend from November to the end of March, during which time bat activity will take place sporadically.

2.2.3.4 Night Roosts

These are roosts which are used as resting places for bats between foraging bouts. They also provide retreats for bats from predators or during inclement weather conditions. They also function as feeding perches and may be important for socialising.

2.3 Bat Activity Survey Methodology

Bat activity surveys are typically recommended between May-September¹⁷ to observe bats foraging and commuting at dusk when insect prey is most abundant. The survey was

¹⁷ 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.

conducted during favorable weather conditions as per the Bat Conservation Trust guidelines (see Table 2).

Table 2 Recommended Survey Times for Survey Types (BCT Guidelines, 2023)

Survey type	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Daytime Bat Walkover (DBW)												
PRA – structures												
Emergence survey for maternity or summer roosts ^b												
Emergence survey for transitional/occasional roosts ^b												
Re-entry surveys ^c												
Emergence survey for mating roosts ^b												
Hibernation survey – structures ^a												
GLTA ^d												
PRF inspection survey – trees												
Ground-level bat activity survey – night-time walkover surveys and automated/static												
Pre-, during and post-hibernation – automated/static bat activity survey												
Swarming survey ^e												
Back-tracking survey												
Trapping and radio-tagging survey ^f												

= optimal period
 = sub-optimal period

= weather or location dependent (i.e. may not be suitable due to spring and autumn conditions in any one year or in more northerly latitudes). Note that October emergence surveys are not acceptable in Scotland.

= it is not acceptable to trap bats when they are heavily pregnant and have dependent pups. Mothers need to optimise foraging due to the physiological demands of pregnancy and lactation, and pups need to be regularly fed. Interrupting these activities could potentially have an impact on breeding success in the year in question. The timing of birth can vary between years – it may be as early as the end of May or as late as the start of August, therefore caution should be exercised and local information gained on birth dates before trapping activities are carried out during the summer months. Any information gained and decisions made should be kept as a record.

a Not including trees.
b Please see Chapter 7 for recommended timings for surveys to give confidence in a negative result. For sites assessed as having low suitability, a survey should be carried out between May and August. For sites with moderate and high suitability, a proportion of the surveys should be carried out between May and August (to detect maternity roosts if present) but some of the surveys may be carried out later in the year in order to detect transitional and mating roosts. The survey season for presence/likely absence surveys is defined as May to September. Roost characterisation surveys may be appropriate in April and/or October depending on the need to characterise transitional/occasional roosts at these times.
c The time that bats return to their roosts is very variable and therefore re-entry surveys are no longer recommended as a standard approach. If they are carried out the constraints should be recognised.
d GLTAs can be sub-optimal in the spring, summer and autumn due to foliage obscuring parts of the tree. If all parts of the tree are visible then the survey can be carried out at any time. If parts of the tree are obscured by foliage then it is not possible to carry out a thorough survey and this limitation should be recognised and the impact on the results acknowledged. Please refer to Chapter 6 for more information.
e Different species show a peak in swarming activity at different times, e.g. Daubenton's bat activity tends to peak in August whilst Natterer's bat activity tends to peak in September (Tomlinson, 2020) and therefore surveying across the swarming season is likely to be important.
f Trapping and tagging in cooler conditions can make release of bats difficult, which should be a consideration if trapping is carried out in spring and autumn. Tagging of bats in April and sometimes early May should be avoided following a poor spring, if bats are in poor condition. Tagging of newly volant pups should be avoided. Tagging of bats should be avoided in October due to the risk that bats will enter hibernation with the tag still attached (bats will groom less often as they enter torpor more frequently). If a tag falls off during hibernation this could leave a bald patch if the fur has been clipped, which could have negative impacts for the hibernating bat. Please refer to Chapter 9 for more information.

The bat activity survey was undertaken between 20:47 and 23:17 on August 6th 2025 (sunset at 21:17). The survey ended due to the onset of drizzle.

The survey covered the entire 1.42ha greenfield site proposed for 28 social housing units. The equipment used included 1 x Elekon Bat Logger M and 1 x Elekon Bat Logger M2 detector. Two surveyors conducted the survey, with results combined and duplicates removed to ensure accurate pass counts. Surveyors walked transects across the site to ensure comprehensive coverage of all habitat features.

Visual observations were taken with the aid of powerful L.E.D. torches. Particular attention was paid to the tree lines along both the northern boundary (Borrisoleigh Stream) and eastern boundary hedgerow, as these linear features typically serve as important commuting routes and foraging areas for bats. The GPS location of each bat pass was recorded and plotted on aerial maps (see Plates in Appendix A).

Extra attention was given to a couple of mature trees identified in the northwest corner of the site during the preliminary assessment. These trees, located on the far side of Borrisoleigh Stream boundary, showed low bat roost potential due to heavy ivy cover. However, their proximity to the illuminated petrol station on the other side of the northwest boundary wall likely reduces their suitability for light-sensitive bat species. These trees are outside the development footprint and will be retained.

The survey followed the 2023 BCT Guidelines. Weather conditions were damp throughout with a constant temperature of 15°C. The site has relatively dark conditions along the eastern and northern boundaries, though the western portion experiences light spill from the adjacent petrol station. High levels of bat activity were recorded along both tree lines, with concentrated activity in the northeast corner where Borrisoleigh Stream creates a wider corridor. The 2023 BCT guidelines were followed for habitat assessment rating and classification, which is shown as Table 3. Photos of the site and survey conditions are contained in Appendix A.

Table 3 Guidelines for assessing the potential suitability of development sites for bats (BCT Guidelines, 2023)

Potential 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 ^a	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 behavior.

Potential suitability	Description Roosting habitats in structures	Potential flight-paths and foraging habitats
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^b 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^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.
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 maternity and hibernation – the categorisation 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 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 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 bats for flight-paths 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.

Potential suitability	Description	Potential flight-paths and foraging habitats
	Roosting habitats in structures	
	a Negligible is defined as 'so small or unimportant as to be not worth 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 unlikely 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 of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten <i>et al.</i>, 2016 and Jansen <i>et al.</i>, 2022). Common pipistrelle swarming has been observed in the UK (Bell, 2022 and Tomlinson, 2020) and winter hibernation of numbers of this species has been detected at Seaton Delaval Hall in Northumberland (National Trust, 2018). This phenomenon requires some research in the UK, but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in prominent buildings in the landscape, urban or otherwise.	

The site comprises primarily open grassland with high-quality linear features along the boundaries. Individual bats were estimated by analysing the temporal clustering of passes. Following established methodology (Hundt, 2012)¹⁸, individual bats were estimated based on the principle that a foraging pipistrelle typically passes a given point every 20-30 seconds when circuit feeding, while Leisler's bats have longer intervals of 2-5 minutes between passes. This approach, combined with adjusted activity indices for linear habitats, provided the basis for estimating 5-9 individual bats regularly using the site.

2.4 Landscape Evaluation

The ecological survey results were evaluated to determine the significance of identified features within the study area for bat habitats. The evaluation was based on an adapted importance scale that considers factors such as roosting potential, foraging areas, commuting routes, and the conservation status of bat species.

The criteria used to assess the ecological value and assign importance to the identified features for bats are as follows:

International Importance:

Sites or features that support significant populations of bat species listed in Annex II of the EU Habitats Directive or are designated as Special Areas of Conservation (SACs) for bats.

National Importance:

Sites or features that support nationally significant populations of bat species, are designated as Natural Heritage Areas (NHAs) or proposed NHAs for bat conservation, or contain maternity roosts or hibernacula of rare or threatened bat species.

County Importance:

¹⁸ Hundt, L. (2012) Bat Surveys: Good Practice Guidelines, 2nd edition, Bat Conservation Trust.

Sites or features that support resident or regularly occurring populations of bat species listed in Annex IV of the EU Habitats Directive, provide important foraging areas or commuting routes for bats, or contain roosts of county-level significance.

Local Importance (Higher Value):

Sites or features containing suitable roosting habitats (e.g., mature trees, buildings with high potential), diverse foraging areas, or well-connected commuting routes that are likely to support a variety of bat species, including those of conservation concern.

Local Importance (Lower Value):

Sites or features with limited roosting potential, fragmented foraging areas, or commuting routes that may support common bat species but are less likely to be used by rare or threatened species.

When evaluating the landscape for bats, factors such as the presence of suitable roosting sites, the quality and diversity of foraging habitats, and the connectivity of commuting routes were taken into account. The evaluation also considered the wider ecological context of the site, including its proximity to the Lower River Suir SAC (~3.1km south) and the presence of known bat roosts in the wider area.

3. RESULTS

3.1 Bat Activity Survey

A comprehensive bat activity survey was conducted on August 6th 2025 across the 1.42ha greenfield site proposed for 28 social housing units. The survey aimed to assess bat species diversity, activity levels, and use of the site for foraging and commuting.

During the survey, the site exhibited moderate to high levels of bat activity despite damp conditions (15°C throughout, survey ending at 23:17 due to drizzle). Two Elekon Bat Logger detectors (M and M2) were used by two surveyors walking transects across the site. The survey revealed the presence of three bat species: Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Leisler's Bat (*Nyctalus leisleri*), with a total of 55 passes recorded after duplicate removal.

Analysis of temporal clustering and activity indices suggests the following individual bat numbers:

Common Pipistrelle: Thirty-seven passes were recorded throughout the survey period. Given pipistrelles typically pass a location every 20-30 seconds when foraging in circuits, and applying adjusted activity indices for linear habitats (6.5 passes/hr/individual), this likely represents 2-4 individual bats using the site.

Soprano Pipistrelle: Sixteen passes were recorded with activity concentrated along the boundary features. Using adjusted activity indices for linear habitats (5.5 passes/hr/individual) and temporal clustering analysis, this pattern suggests 2-3 individual bats foraging in the area.

Leisler's Bat: Two passes were recorded at 21:49:32 and 22:11:44, with the 22-minute interval suggesting these may represent 1-2 individual bats passing through the site.

The timing of first detection in relation to sunset (21:17) is significant: First bat activity (Common Pipistrelle) was recorded at 21:34:43, approximately 17 minutes after sunset, typical emergence timing suggesting bats were emerging from roosts in the vicinity and using the site boundaries as commuting routes.

Spatial analysis revealed that bat activity was heavily concentrated along:

- The northern boundary tree line along Borrisleigh Stream (highest activity)
- The eastern boundary hedgerow (secondary flight path)
- The northeast corner where the stream corridor widens (peak foraging area)

The open grassland areas showed minimal bat activity, confirming the critical importance of the boundary features for local bat populations. The relatively dark conditions along these boundaries (despite light spill from the western petrol station) and proximity to Borrisleigh Stream provide excellent foraging habitat.

Table 4 presents a summary of the bat passes for each species from the survey. Detailed survey data can be found in Appendix B and activity distribution is shown on Figure 4.

Table 4 Bat Results Summary Data – August 6th 2025

Species Name - Common	Species Name - Latin	Passes	Estimated Individuals	Peak Frequency (kHz)
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	37	2-4	44.2-48.9
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	16	2-3	54.2-56.2
Leisler's Bat	<i>Nyctalus leisleri</i>	2	1-2	21.0-26.5
Total		55	5-9	

Note: Individual bat estimates derived from temporal clustering analysis (Hundt, 2012) and adjusted activity indices for linear habitats.



Figure 4 Bat Activity Results – 6th August 2025

3.2 Landscape Evaluation

The broader landscape surrounding the site at Glean Caoin', Borrisoleigh, Co. Tipperary is considered to have 'Moderate' suitability for bats, with an NBDC habitat suitability index of 30.22. This rating reflects the site's edge-of-town location and the agricultural landscape of north Tipperary, which includes farmland, hedgerows, the Borrisoleigh Stream corridor, and the town's residential areas. The site is located approximately 3.1km north of the Lower River Suir SAC (Site Code: 002137).

The landscape provides ecological connectivity through the Borrisoleigh Stream corridor and associated riparian vegetation, along with a network of hedgerows and treelines that support the three bat species recorded during the survey. The stream corridor is particularly important as it creates a dark commuting route linking various foraging areas.

Based on the ecological evaluation criteria, the landscape surrounding the site is assessed as being of **Local Importance (Higher Value)** for bats. This assessment takes into account:

- The moderate NBDC suitability rating for the area (30.22)
- The presence of three bat species confirmed during the survey
- The Borrisoleigh Stream corridor providing high-quality foraging habitat and connectivity
- The network of hedgerows and treelines supporting commuting bats
- The relatively dark conditions along the stream corridor
- The proximity to Lower River Suir SAC (3.1km)

The site itself is considered to be of **Local Importance (Higher Value)** as a foraging and commuting habitat for bats. This assessment is based on:

- The moderate to high bat activity recorded during the survey (55 passes)
- The use of the site by three bat species
- The site's function as regular foraging habitat for an estimated 5-9 individual bats
- The critical importance of boundary features (stream corridor and hedgerow) for bat activity
- The concentration of activity along linear features confirming their value as commuting routes
- The relatively dark conditions along the northern and eastern boundaries

The NBDC suitability indices for the recorded species in this area are favorable for pipistrelle species (Common Pipistrelle: 49, Soprano Pipistrelle: 44) and Leisler's Bat (44), which aligns with the survey findings. The concentration of bat activity along the boundary features, with minimal activity over the open grassland, confirms the critical importance of retaining these linear landscape elements.

The timing of first bat activity (21:34, approximately 17 minutes after sunset) represents typical emergence timing, suggesting bats roost in the vicinity and actively use the site boundaries as commuting routes to access foraging areas along Borrisoleigh Stream and the wider landscape.

In conclusion, while the wider landscape has moderate suitability for bats based on NBDC data, the specific site boundaries have higher ecological value due to the presence of Borrisoleigh Stream and mature vegetation. The site functions as an important component of the local ecological network, providing commuting routes

and foraging habitat for the local bat population. The retention of boundary features is therefore critical to maintaining this ecological functionality.

4. MITIGATION

The following mitigation measures are proposed to maintain and enhance the ecological functionality of the site for bats while allowing the development to proceed. These measures follow best practice guidelines (Marnell et al., 2022; BCT, 2023). Example guidance is attached as Appendix C.

4.1 Habitat Enhancement and Compensation

While no bat roosts were identified within the development footprint, the following measures are recommended to enhance roosting opportunities and maintain the site's value for the 5-9 individual bats recorded:

Bat Box Provision:

- Install 3 bat boxes on suitable trees along the eastern boundary hedgerow within the development site (locations shown in Figure 4)
- Use a variety of box types to cater for different species:
 - 2 × Schwegler 1FF or similar crevice boxes for pipistrelle species
 - 1 × Schwegler 1FW or similar larger box suitable for Leisler's bats
- Mount boxes at 4-5m height on tree trunks, avoiding branches that may obstruct access
- Orient boxes between SE and SW to receive morning/early afternoon sun
- Ensure clear flight paths to box entrances

Retention of Key Features:

- The mature tree line along Borrisleigh Stream (northern boundary) must be retained and protected during construction
- The eastern boundary hedgerow must be retained and enhanced where possible
- Implement tree protection zones using protective fencing during construction as per BS 5837:2012

Habitat Enhancement:

- Plant native species along internal boundaries to create additional commuting routes within the development
- Include bat-friendly plants in landscaping (e.g., night-scented flowers to attract moths)
- Create wildflower areas in open spaces to support invertebrate prey populations

4.2 Timing Restrictions

To avoid potential impacts on bats and other wildlife, the following timing restrictions apply:

Vegetation Clearance:

- Any removal of scrub vegetation within the site must occur between September 1st and February 28th (outside bird nesting season), if required.

- Although no bat roosts were identified, any tree work should preferably occur in September-October or February-March to avoid both breeding and hibernation periods

Construction Activities:

- No restrictions on general construction timing as no roosts are present
- However, noisy works near boundaries should avoid dawn and dusk periods during May-September when bat activity is highest

Monitoring:

- If construction is delayed more than 12 months from the survey date, a pre-construction bat activity survey should be undertaken to confirm continued absence of tree roosts

In the unlikely event that bats are discovered during construction works, activities must halt immediately and a licensed bat ecologist consulted. Any works affecting bats would require a derogation licence from NPWS before proceeding.

4.3 Lighting for Bats

Ireland is home to nine resident bat species, all of which are nocturnal. Throughout their life cycle, bats engage in various activities such as hibernation during winter, swarming in autumn, and giving birth in summer. Artificial Light at Night (ALAN) can significantly disrupt the natural behaviour of bats, affecting their roosting, commuting, and foraging habits. Bats are naturally accustomed to low lighting levels provided by moonlight, starlight, and twilight. Exposure to light levels higher than those encountered during natural dusk and night conditions can have detrimental effects on bat behaviour.

The presence of artificial light near bat roosts can lead to several negative consequences. For instance, it may delay the emergence time of bats after dusk, cause abandonment of roosts when exits are illuminated at night, and potentially reduce reproductive success (Stone, 2013)¹⁹. Foraging areas that become artificially lit may be abandoned, resulting in increased energy expenditure for bats and potentially lower reproductive success at the population level (Schofield, 2008²⁰; Stone, 2013).

Table 5 presents the potential light sensitivity of Irish bat species based on the categories described by Rydell (2006). The species recorded at the site show varying light sensitivity: Common Pipistrelle and Soprano Pipistrelle are classified as semi-tolerant to light, while Leisler's Bat is light-tolerant. However, all species benefit from dark corridors for commuting and foraging, particularly along linear features.

Table 5 Potential light sensitivity of the Irish Bat Species

Species: Common Name	Rydell Category	Sensitivity
Daubenton's bat <i>Myotis daubentonii</i>	Category 4	Light sensitive
Whiskered bat <i>Myotis mystacinus</i>	Category 4	Light sensitive
Natterer's bat <i>Myotis nattereri</i>	Category 4	Light sensitive
Leisler's bat <i>Nyctalus leisleri</i>	Category 2	Light tolerant
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	Category 3	Semi-tolerant

¹⁹ Stone, E. L. (2013). Bats and lighting: Overview of current evidence and mitigation guidance. University of Bristol.

²⁰ Schofield, H. W. (2008). The lesser horseshoe bat conservation handbook. Vincent Wildlife Trust.

Species: Common Name	Rydell Category	Sensitivity
Common pipistrelle <i>Pipistrellus pipistrellus</i>	Category 3	Semi-tolerant
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	Category 3	Semi-tolerant
Brown long-eared bat <i>Plecotus auritus</i>	Category 4	Light sensitive
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	Category 4	Light sensitive

Given the concentration of bat activity along the site boundaries and the importance of maintaining dark corridors, the following lighting strategy is essential:

During Construction:

- Minimise night-time working to reduce the need for temporary lighting
- Any essential security lighting should use warm white ($\leq 2700\text{K}$) LEDs
- Direct all temporary lighting downward and away from boundaries
- Use motion sensors with short (1-minute) timers
- No illumination of boundary vegetation or adjacent mature trees

Post-Construction Lighting Design:

The Institution of Professional Lighting and Bat Conservation Trust (IPL and BCT, 2023) guidelines provide recommendations for luminaire design based on extensive research on the potential impact of lighting on bats. These recommendations form the basis of the mitigation measures:

Technical Specifications:

- All external lighting must use warm white LEDs ($\leq 2700\text{K}$) with no UV component
- Luminaires must be fully shielded with 0% upward light ratio
- Maximum mounting height of 4m for pedestrian areas
- Use of accessories such as baffles, hoods, or louvres to direct light only where needed

Critical Dark Zones:

- Northern boundary along Borrisleigh Stream - NO lighting permitted
- Eastern boundary hedgerow - NO lighting within 5m
- Areas around bat boxes - maintain complete darkness
- Western edge requires careful design due to existing petrol station illumination

Adaptive Controls:

- Central management system for all external lighting
- Curfews on non-essential lighting (off by 23:00)
- Motion sensors for security lighting with maximum 2-minute activation
- Dimming controls to reduce intensity during late evening

Housing Estate Lighting:

- Street lighting columns positioned centrally within roads, away from boundaries
- House-mounted security lights must be PIR-activated and directed downward
- No decorative uplighting of trees or landscape features

-
- Encourage residents through covenant to maintain wildlife-friendly lighting

The current relatively dark conditions along the boundaries support 5-9 individual bats. The lighting design must ensure these favourable conditions are maintained post-development. A detailed lighting plan should be submitted with the planning application demonstrating compliance with these requirements.

Failure to implement appropriate lighting mitigation could result in abandonment of commuting routes and loss of foraging habitat, potentially affecting the favourable conservation status of local bat populations.

5. CONCLUSION

The bat survey conducted at Glean Caoin', Borrisoleigh, Co. Tipperary on August 6th 2025 determined the level of bat activity and habitat use across this 1.42ha greenfield site proposed for 28 social housing units.

The survey revealed moderate to high levels of bat activity with three species present: Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), and Leisler's Bat (*Nyctalus leisleri*), with a total of 55 passes recorded despite damp conditions that ended the survey early.

The assessment confirmed that bat activity was heavily concentrated along the boundary features - particularly the northern tree line along Borrisoleigh Stream and the eastern hedgerow. These linear features serve as critical commuting routes and foraging areas. The open grassland showed minimal bat activity, confirming that retention of boundary features is essential. No bat roosts were identified within the development footprint, and the mature trees with low roost potential are located outside the site boundary along Borrisoleigh Stream.

Analysis of bat activity patterns suggests the site regularly supports approximately 5-9 individual bats across all three species, with peak activity in the northeast corner where Borrisoleigh Stream creates a wider corridor. The timing of first detection (21:34, approximately 17 minutes after sunset) indicates typical emergence patterns, with bats using the site boundaries as commuting routes from nearby roosts.

The site is situated within a landscape of 'Moderate' suitability for bats (NBDC index 30.22), approximately 3.1km north of the Lower River Suir SAC. Despite the moderate landscape rating, the site boundaries have higher ecological value due to Borrisoleigh Stream and associated vegetation. The site is assessed as being of Local Importance (Higher Value) for bats due to its function as an important component of the local ecological network.

To conserve and enhance bat habitats while developing the site, measures have been recommended including:

- Installation of 3 bat boxes along the eastern boundary hedgerow to enhance roosting opportunities
- Complete retention and protection of boundary features (stream corridor and hedgerow)
- Native planting within the development to create additional commuting routes

- Implementation of a sensitive lighting strategy maintaining dark corridors along all boundaries
- Timing restrictions for vegetation clearance to avoid bird nesting season (September-February only)
- Pre-construction checks if works are delayed beyond 12 months

The proposed development, with appropriate conservation measures, will maintain the site's ecological functionality for bats while providing much-needed social housing. The retention of all boundary features and implementation of bat-friendly lighting design will ensure continued use by the local bat population. The provision of bat boxes will enhance the site's value by adding roosting opportunities where none currently exist within the development area.

Based on the survey results and proposed mitigation measures, a Bat Derogation Licence is not required as no roosts will be impacted and all key habitat features are being retained. The overall impact of the proposed development on bats is expected to be neutral, with potential for enhancement through the measures outlined. This approach ensures compliance with Tipperary County Council's obligations under the Wildlife Acts and the EU Habitats Directive while meeting the objectives of the Part VIII planning application.

APPENDICES

APPENDIX A



Plate 1 View into the site from the R498, facing northeast.



Plate 2 The Mature Hedgerow/Treeline along the southeast boundary, facing northeast.



Plate 3 The Mature Hedgerow/Treeline along the north boundary with the Borrisoleigh Stream flowing alongside, facing west.



Plate 4 The Mature Hedgerow/Treeline along the southeast boundary, facing southeast.



Plate 5 The row of houses behind a boundary wall (facing the R498) along the southwest boundary, facing southwest.



Plate 6 High levels of illumination beyond the northwest boundary wall. Facing northwest.



Plate 7 Trees with 'Low' bat roost potential with high ivy coverage towards the northwest boundary. No bat emergence was noted however.



Plate 8 Highest levels of bat activity was found at the northeast corner of site where the Borrisoleigh Stream widens any presumably had the highest levels of flies for foraging bats at this corner .

APPENDIX B

06/08/2025	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature [°C]	Latitude [WGS84]	Longitude [WGS84]
21:34:43	Common Pipistrelle	11	41.4	45.1	40.5	8	90	15	52.75469	-7.9598
21:35:45	Common Pipistrelle	12	41.3	50.3	40.7	6	96	15	52.75475	-7.96019
21:35:54	Common Pipistrelle	2	43.5	48	42.9	2.7	1327	15	52.75432	-7.9598
21:35:57	Common Pipistrelle	3	44.4	52.1	43.8	2.8	251	15	52.75475	-7.96024
21:38:34	Common Pipistrelle	7	53.3	58.9	52.4	5	70	15	52.75467	-7.95977
21:39:33	Common Pipistrelle	23	42.4	48.5	41.5	4	80	15	52.75466	-7.95973
21:40:20	Common Pipistrelle	33	45.2	55.3	44.5	4	90	15	52.75429	-7.95965
21:40:20	Common Pipistrelle	2	52.6	56.4	52	3.9	77	16	52.75468	-7.95976
21:40:25	Soprano Pipistrelle	53	54	81.5	53	4	65	15	52.75397	-7.96024
21:40:39	Soprano Pipistrelle	5	55.1	64.7	54.5	3	123	15	52.75466	-7.95962
21:40:41	Soprano Pipistrelle	63	54.5	92.3	53.2	5	65	15	52.75436	-7.95977
21:40:56	Soprano Pipistrelle	62	54.6	92.2	53.4	4	60	15	52.75466	-7.9595
21:41:10	Common Pipistrelle	84	53.6	93.7	52.8	5	75	15	52.75466	-7.95949
21:41:21	Common Pipistrelle	19	44.1	64.7	43.4	5	90	15	52.75468	-7.95974
21:41:25	Common Pipistrelle	95	53.8	93.1	52.8	5	80	15	52.75467	-7.95939
21:41:26	Common Pipistrelle	2	46.7	55.1	45.8	2.6	979	15	52.75467	-7.95975
21:41:40	Common Pipistrelle	53	53.5	88.6	52.7	5	80	15	52.75468	-7.95941
21:41:54	Common Pipistrelle	51	53.7	84.5	52.8	5	76	15	52.75467	-7.95944
21:42:56	Soprano Pipistrelle	12	55.8	92.7	55.2	5	70	15	52.75466	-7.95947
21:42:59	Common Pipistrelle	1	44.2	47	43.9	3.3	0	15	52.75478	-7.96031
21:43:07	Soprano Pipistrelle	2	55.9	57.9	55.5	5.1	76	15	52.75406	-7.95998
21:44:47	Common Pipistrelle	1	45.1	52.5	44.5	3.3	0	15	52.75491	-7.96092
21:44:57	Common Pipistrelle	2	45.4	48.3	44.4	2.6	521	15	52.75493	-7.96093
21:45:06	Common Pipistrelle	1	44.5	50.9	43.9	3.3	0	15	52.75494	-7.96096
21:45:08	Common Pipistrelle	2	49.6	54	49	2.3	81	15	52.75495	-7.96098
21:45:13	Soprano Pipistrelle	19	55.5	66.1	54.8	6	84	15	52.75466	-7.95961
21:45:21	Common Pipistrelle	3	47.8	57.9	47.1	4.1	83	15	52.75466	-7.95963
21:45:51	Common Pipistrelle	3	53.8	58.5	52.9	3	468	15	52.75498	-7.96111
21:46:23	Common Pipistrelle	3	44.4	49	43	5	242	15	52.75498	-7.96105
21:48:47	Leisler's Bat	2	21.4	26.8	19.5	7.5	493	15	52.75429	-7.9601
21:49:32	Soprano Pipistrelle	8	54.8	60.8	54.1	5	80	15	52.755	-7.96104
21:50:11	Soprano Pipistrelle	2	55.1	59	53.8	4.3	83	15	52.75473	-7.95979

06/08/2025	Species Text	Calls [#]	Mean Peak Frequency [kHz]	Mean Max Frequency [kHz]	Mean Min Frequency [kHz]	Mean Call Length [ms]	Mean Call Distance [ms]	Temperature [°C]	Latitude [WGS84]	Longitude [WGS84]
21:51:36	Common Pipistrelle	14	45.2	56.4	44.5	4	110	15	52.75468	-7.95954
21:52:16	Common Pipistrelle	11	50.6	58.5	49.9	5	80	15	52.75461	-7.95936
21:54:04	Soprano Pipistrelle	11	59.3	66.4	57.5	3	213	15	52.75461	-7.9594
21:54:18	Common Pipistrelle	7	47.8	88.3	47.3	4	125	15	52.75407	-7.96011
21:54:33	Common Pipistrelle	6	46.8	60.9	45.9	6	97	15	52.75464	-7.95931
21:55:08	Leisler's Bat	4	23.7	24.5	22.9	10	579	15	52.75469	-7.95997
22:11:08	Common Pipistrelle	5	52.3	57.3	51.8	3.6	92	15	52.75484	-7.96048
22:11:44	Common Pipistrelle	34	46.1	68.8	45.2	4	100	15	52.75464	-7.95946
22:12:34	Common Pipistrelle	3	46.4	56.4	45.9	4.6	260	15	52.75483	-7.96047
22:19:06	Common Pipistrelle	7	44.9	50.7	43.4	4	404	15	52.75442	-7.95942
22:19:12	Soprano Pipistrelle	4	56.4	62.4	55.3	3.6	64	15	52.75499	-7.96109
22:19:27	Common Pipistrelle	7	43.6	49.2	43	3	125	15	52.75499	-7.96105
22:27:06	Common Pipistrelle	6	53.3	56.1	52	4	280	15	52.75479	-7.96029
22:27:52	Common Pipistrelle	41	48.1	87	47.2	4	100	15	52.75488	-7.96077
22:28:40	Common Pipistrelle	3	53.5	56.9	52	4.6	522	15	52.75481	-7.96033
22:48:09	Soprano Pipistrelle	4	58.2	62.3	57.1	3.9	116	15	52.75486	-7.96052
22:50:00	Soprano Pipistrelle	9	58.9	63.3	57.6	2	307	15	52.75462	-7.95946
22:50:11	Soprano Pipistrelle	13	57.9	63.9	56.1	4	331	15	52.75461	-7.95937
22:50:27	Common Pipistrelle	14	47.8	68.1	46.8	4	94	15	52.75463	-7.95933
23:06:09	Common Pipistrelle	9	47.8	62.5	46.4	2	80	15	52.75473	-7.95995
23:06:18	Common Pipistrelle	1	42.7	46.1	42.1	3.3	0	15	52.75499	-7.96106
23:07:09	Soprano Pipistrelle	8	56	82.8	54.2	3	101	15	52.75401	-7.96022
23:07:25	Soprano Pipistrelle	20	56.5	94.5	55.4	4	64	15	52.75467	-7.95946

APPENDIX C



**2F Schwegler Bat Box
(General Purpose)**



**PRO UK Build-in
WoodStone Bat Box**



Maternity Bat Box



**4m Pole Mounted Large
Colony Bat Box**

Available on link below with fitting instructions on website

<https://www.nhbs.com/search?q=bat+boxes>



Bat Slates -

<https://beddoesproducts.com/products/bat-access-slate>





1. Use warm white LED lights (2700K or lower) to reduce impact on bats.
2. Install downward-facing, shielded fixtures on walls and low-level bollards (max 1m height) for pathways.
3. Set timers to switch off lights between 11pm and 5am when bats are most active.
4. Maintain a 5m wide dark corridor along property boundaries and near vegetation.
5. Implement motion sensors with short duration settings (1-2 minutes) for essential lighting.

For more detailed guidance, refer to: Bat Conservation Trust and Institution of Lighting Professionals. (2023). Guidance Note 8/23 Bats and Artificial Lighting.