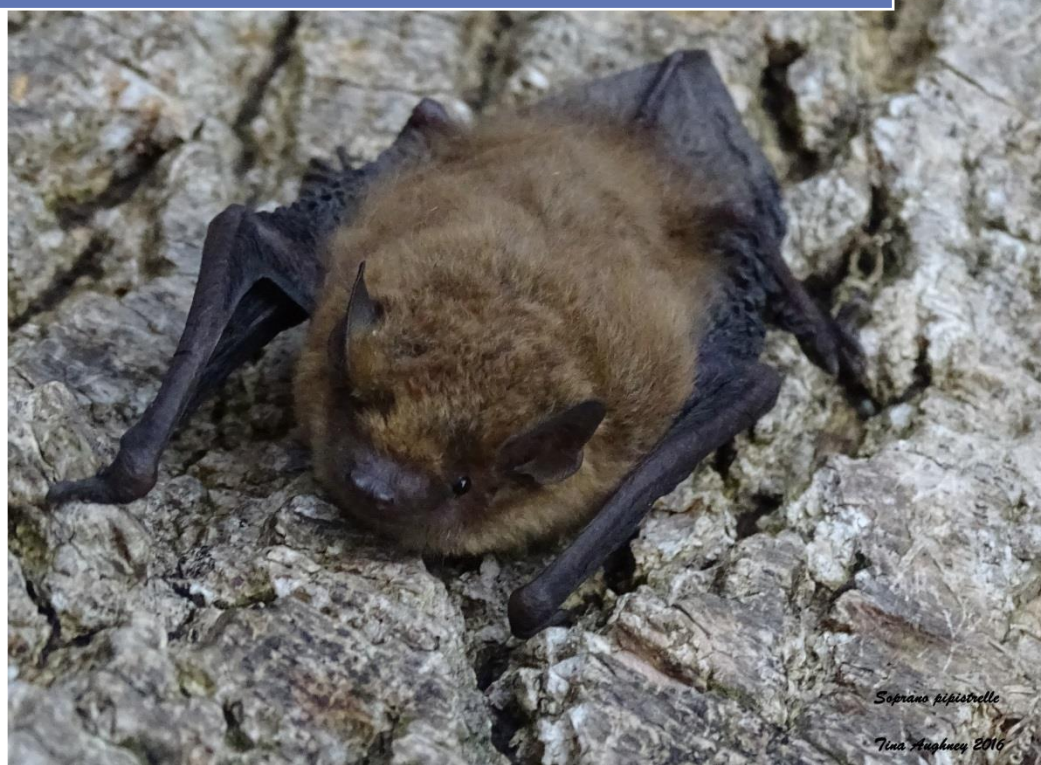


2022

Bat Assessment: Barrington Tower,  
Brennanstown Road, Dublin 18.



Dr Tina Aughney  
Bat Eco Services

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NPWS licence C13/2020 (Licence to handle bats, expires 31<sup>st</sup> December 2022);

NPWS licence 08/2020 (Licence to photograph/film bats, expires 31<sup>st</sup> December 2022) ;

NPWS licence DER/BAT 2022-36 (Survey licence, expires 24<sup>th</sup> March 2025).

**Statement of Authority:** Dr Aughney has worked as a Bat Specialist since 2000 and has undertaken extensive survey work for all Irish bat species including large scale development projects, road schemes, residential developments, wind farm developments and smaller projects in relation to building renovation or habitat enhancement. She is a monitoring co-ordinator and trainer for Bat Conservation Ireland. She is a co-author of the 2014 publication *Irish Bats in the 21<sup>st</sup> Century*. This book received the 2015 CIEEM award for Information Sharing. Dr Aughney is a contributing author for the Atlas of Mammals in Ireland 2010-2015.

All analysis and reporting is completed by Dr Tina Aughney. Data collected and surveying is completed with the assistance of a trained field assistant.

Mr. Shaun Boyle (Field Assistant) NPWS licence DER/BAT 2022-37 (Survey licence, expires 24<sup>th</sup> March 2025).

**Client:** Cairn Homes Properties Ltd.

**Project Name & Location:** Barrington Tower, Brennanstown Road, Dublin 18.

### Report Revision History

Date of Issue	Draft Number	Issued To (process of issuing)
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1 <sup>st</sup> April 2022	Draft 5	Emailed to McGill Planning Ltd.
5 <sup>th</sup> April 2022	Final	Emailed to McGill Planning Ltd.

### Purpose

This document has been prepared as a Report for Cairn Homes Properties Ltd. Only the most up to-date report should be consulted. All previous drafts/reports are deemed redundant in relation to the named site.

Bat Eco Service accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

### Carbon Footprint Policy

It is the policy of Bat Eco Services to provide documentation digitally in order to reduce carbon footprint. Printing of reports etc. is avoided, where possible.

### Bat Record Submission Policy

It is the policy of Bat Eco Services to submit all bat records to Bat Conservation Ireland database one year post-surveying. This is to ensure that a high level bat database is available for future desktop reviews. This action will be automatically undertaken unless otherwise requested, where there is genuine justification.

**Mapping** © OpenStreetMap contributors & GoogleMaps

## Executive Summary

**Project Name & Location:** Barrington Tower, Brennanstown Road, Dublin 18.

**Proposed work:** Residential development.

### Executive Summary

The following is a brief summary of the survey results and the bat survey duties completed.

#### Bat Survey Results – Brief Summary of Results (within survey area)

Bat Species	Roosts	Foraging	Commuting
Common pipistrelle <i>Pipistrellus pipistrellus</i>	√	√	√
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>		√	√
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>			
Leisler's bat <i>Nyctalus leisleri</i>		√	√
Brown long-eared bat <i>Plecotus auritus</i>	√	√	√
Daubenton's bat <i>Myotis daubentonii</i>	√	√	√
Natterer's bat <i>Myotis nattereri</i>			
Whiskered bat <i>Myotis mystacinus</i>			
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>			

This data was collated through a combination of the bat survey duties undertaken below:

#### Bat Survey Duties Completed (indicated by red)

Tree PBR Survey	●	Daytime Building Inspection	●
Static Detector Survey	●	Daytime Bridge Inspection	○
Dusk Bat Survey	●	Dawn Bat Survey	●
Walking Transect	●	Driving Transect	○
Trapping / Mist Netting	○	IR Camcorder filming	●
Endoscope Inspection	●	Other (Thermal Imagery)	●

**Citation: Bat Eco Services (2022) Bat assessment: Barrington Tower, Brennanstown Road, Dublin Unpublished report prepared for Cairns Home Properties Ltd.**

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# 1. Introduction

Bat Eco Services was commissioned by Cairn Homes Properties Ltd. to complete a bat assessment of the proposed planning application on a site located at Barrington Tower, Brennanstown Road, Dublin 18.

## 1.1 Relevant Legislation & Bat Species Status in Ireland

### 1.1.1 Irish Statutory Provisions

A small number of animals and plants are protected under Irish legislation (Nelson, *et al.*, 2019). The principal statutory provisions for the protection of animal and plant species are under the Wildlife Act 1976 (as amended) and the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. The Flora (Protection) Order 2015 (S.I. no. 356 of 2015) lists the plant species protected by Section 21 of the Wildlife Acts. See [www.npws.ie/legislation](http://www.npws.ie/legislation) for further information.

The codes used for national legislation are as follows:

- WA = Wildlife Act, 1976, Wildlife (Amendment) Act, 2000 and other relevant amendments
- FPO = Flora (Protection) Order, 2015 (S.I. No. 356 of 2015)

### 1.1.2 EU Legislation

The Birds Directive (Directive 2009/147/EC) and Habitats Directive (Council Directive 92/43/EEC) are the legislative instruments which are transposed into Irish law, *inter alia*, by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) ('the 2011' Regulations), as amended.

The codes used for the Habitats Directive (Council Directive 92/43/EEC) are:

- Annex II Animal and plant species listed in Annex II
- Annex IV Animal and plant species listed in Annex IV
- Annex V Animal and plant species listed in Annex V

The main aim of the Habitats Directive is the conservation of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status. These annexes list habitats (Annex I) and species (Annexes II, IV and V) which are considered threatened in the EU territory. The listed habitats and species represent a considerable proportion of biodiversity in Ireland and the Directive itself is one of the most important pieces of legislation governing the conservation of biodiversity in Europe.

Under Article 11 of the Directive, each member state is obliged to undertake surveillance of the conservation status of the natural habitats and species in the Annexes and under Article 17, to report to the European Commission every six years on their status and on the implementation of the measures taken under the Directive. In April 2019, Ireland submitted the third assessment of conservation status for 59 habitats and 60 species. There are three volumes with the third listing details of the species assessed.

Article 12 of the Habitats Directive requires Member States to take measures for the establishment of a strict protection regime for animal species listed in Annex IV(a) of the Habitats Directive within the whole territory of Member States. Article 16 provides for derogation from these provisions under defined conditions. These provisions are implemented under Regulations 51 and 54 of the 2011 Regulations.

### 1.1.3 IUCN Red Lists

The International Union for the Conservation of Nature (IUCN) coordinates the Red Listing process at the global level, defining the categories so that they are standardised across all taxa. Red Lists are also produced at regional, national and subnational levels using the same IUCN categories (IUCN 2012, 2019). Since 2009, Red Lists have been produced for the island of Ireland by the National Parks and Wildlife Service (NPWS) and the Northern Ireland Environment Agency (NIEA) using these IUCN categories. To date, 13 Red Lists have been completed. The Red Lists are an assessment of the risk of extinction of each species and not just an assessment of their rarity. Threatened species are those species categorised as Critically Endangered, Endangered or Vulnerable (IUCN, 2019) – also commonly referred to as ‘Red Listed’.

### 1.1.4 Irish Red List - Mammals

Red Lists in Ireland refer to the whole island, i.e. including Northern Ireland, and so follow the guidelines for regional assessments (IUCN, 2012, 2019). The abbreviations used are as follows:.

- RE Regionally Extinct
- CR Critically Endangered
- EN Endangered
- VU Vulnerable
- NT Near Threatened
- DD Data Deficient
- LC Least Concern
- NA Not Assessed
- NE Not Evaluated

There are 27 terrestrial mammals species in Ireland, which includes the nine resident bat species listed. The terrestrial mammal, according to Marnell *et al.*, 2019, list for Ireland consists of all terrestrial species native to Ireland or naturalised in Ireland before 1500. The IUCN Red List categories and criteria are used to assess that status of wildlife. This was recently completed for the terrestrial mammals of Ireland. Apart from the two following two mammal species (grey wolf *Canis lupus* (regionally extinct) and black rat *Rattus rattus* (Vulnerable)), the remaining 25 species were assessed as least concern in the most recent IUCN Red List publication by NPWS (Marnell *et al.*, 2019).

### 1.1.5 Irish Bat Species

All Irish bat species are protected under the Wildlife Act (1976) and Wildlife Amendment Acts (2000 and 2010). Also, the EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All Irish bats are listed in Annex IV of the Habitats Directive and the lesser horseshoe bat *Rhinolophus hipposideros* is further listed under Annex II. Across Europe, they 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 (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

Also, under existing legislation, the destruction, alteration or evacuation of a known bat roost is an offence. The most recent guidance document is “Guidance document on the strict protection of animal species of Community interest un the Habitats Directive (Brussels, 12.10.2021 C(2021) 7391 final”.

Regulation 51(2) of the 2011 Regulations provides –

*“(2) Notwithstanding any consent, statutory or otherwise, given to a person by a public authority or held by a person, except in accordance with a licence granted by the Minister under Regulation 54, a person who in respect of the species referred to in Part 1 of the First Schedule—*

*(a) deliberately captures or kills any specimen of these species in the wild, (b) deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration,*

*(c) deliberately takes or destroys eggs of those species from the wild,*

*(d) damages or destroys a breeding site or resting place of such an animal, or*

*(e) keeps, transports, sells, exchanges, offers for sale or offers for exchange any specimen of these species taken in the wild, other than those taken legally as referred to in Article 12(2) of the Habitats Directive,*

*shall be guilty of an offence.”*

The grant of planning permission does not permit the commission of any of the above acts or render the requirement for a derogation licence unnecessary in respect of any of those acts.

Any works interfering with bats and especially their roosts, may only be carried out under a derogation licence granted by National Parks and Wildlife Service (NPWS) pursuant to Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (which transposed the EU Habitats Directive into Irish law).

There are eleven recorded bat species in Ireland, nine of which are considered resident on the island. Eight resident bat species and one of the vagrant bat species are vesper bats and all vespertilionid bats have a tragus (cartilaginous structure inside the pinna of the ear). Vesper bats are distributed throughout the island. Nathusius' pipistrelle *Pipistrellus nathusii* is a recent addition while the Brandt's bat has only been recorded once to-date (Only record confirmed by DNA testing, all other records has not been genetically confirmed). The ninth resident species is the lesser horseshoe bat *Rhinolophus hipposideros*, which belongs to the Rhinolophidea and has a complex nose leaf structure on the face, distinguishing it from the vesper bats. This species' current distribution is confined to the western seaboard counties of Mayo, Galway, Clare, Limerick, Kerry and Cork. The eleventh bat species, the greater horseshoe bat, was only recorded for the first time in February 2013 in County Wexford and is therefore considered to be a vagrant species. A total of 41 SACs have been designated for the Annex II species lesser horseshoe bat (1303), of which nine have also been selected for the Annex I habitat 'Caves not open to the public' (8310).

Irish bat species list is presented in Table 1 along with their current status.



Table 1: Status of the Irish bat fauna (Marnell *et al.*, 2019).

Species: Common Name	Irish Status	European Status	Global Status
<b>Resident Bat Species ^</b>			
Daubenton's bat <i>Myotis daubentonii</i>	Least Concern	Least Concern	Least Concern
Whiskered bat <i>Myotis mystacinus</i>	Least Concern	Least Concern	Least Concern
Natterer's bat <i>Myotis nattereri</i>	Least Concern	Least Concern	Least Concern
Leisler's bat <i>Nyctalus leisleri</i>	Least Concern	Least Concern	Least Concern
Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	Least Concern	Least Concern	Least Concern
Common pipistrelle <i>Pipistrellus pipistrellus</i>	Least Concern	Least Concern	Least Concern
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	Least Concern	Least Concern	Least Concern
Brown long-eared bat <i>Plecotus auritus</i>	Least Concern	Least Concern	Least Concern
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	Least Concern	Least Concern	Least Concern
<b>Possible Vagrants ^</b>			
Brandt's bat <i>Myotis brandtii</i>	Data deficient	Least Concern	Least Concern
Greater horseshoe bat <i>Rhinolophus ferrumequinum</i>	Data deficient	Near threatened	Near threatened

^ Roche *et al.*, 2014

## 1.2 Relevant Guidance Documents

This report will draw on guidelines already available in Europe and will use the following documents:

- National Roads Authority (2006) Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes
- Collins, J. (Editor) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edition). Bat Conservation Trust, London
- McAney, K. (2006) A conservation plan for Irish vesper bats, Irish Wildlife Manual No. 20 National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- 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 (Version 1: Kelleher & Marnell, 2006).
- The status of EU protected habitats and species in Ireland: Conservation status in Ireland of habitats and species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government.
- Bat Conservation Trust (2018) Bats and artificial lighting in the UK: bats and the built environment series. Guidance Note 08/2019. BCT, London.
- Guidance document on the strict protection of animal species of Community interest un the Habitats Directive (Brussels, 12.10.2021 C(2021) 7391 final.
- EPA (2017) Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Collins (2016) is the principal document used to provide guidance in relation to bat survey effort required but the level of surveying is assessed on a case-by-case basis taking into consideration the historical bat records for the survey area, presence of built, structures and trees potentially suitable for roosting bats and the presence of suitable bat habitats for foraging and commuting. Additional reference is made to this document in relation to determining the value of buildings, trees etc. as bat roosts. The tables referred to from this document are described in the following section and in the section on methodology.

Marnell *et al.* (2022) is referred to for guidance in relation to survey guidance (timing and survey design), derogation licences and mitigation measures.

### *1.2.1 Bat Survey Requirements & Timing*

With reference to Collins (2016) and Marnell *et al.* (2022), the information presented in this section is used to determine the bat survey requirements for the proposed development site. Collins (2016) provides a trigger list in relation to determining if a bat survey is required and this is presented Appendix 3 (Figure B) for reference. In addition, Chapter 2 of Collins (2016) discusses that a bat survey is required when proposed activities are likely to impact on bats and their habitats. The level of surveying is to be determined by the ecologist and these are influenced by the following criteria:

- Likelihood of bats being present;
- Type of proposed activities;
- Scale of proposed activities;
- Size, nature and complexity of the site;
- Species concerned;
- No. of individuals.

Collins (2016) also provides the following table detailing when different survey components should be undertaken.

**Table 2.2 Recommended UK survey times for survey types described in these guidelines.**

Survey type	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Preliminary ecological appraisal - fieldwork												
Preliminary roost assessment - structures <sup>a</sup>												
Emergence/re-entry survey for maternity or summer roosts <sup>b</sup>												
Emergence/re-entry <sup>c</sup> survey for transitional roosts <sup>b</sup>												
Emergence survey for mating roosts <sup>b</sup>												
Hibernation survey - structures <sup>a</sup>												
Preliminary ground level roost assessment - trees <sup>d</sup>												
Potential roost feature (PRF) inspection survey - trees												
Ground level bat activity survey - transects and automated/static												
Pre-, during and post-hibernation - automated/static bat activity survey												
Swarming survey												
Back-tracking survey												
Trapping survey <sup>e</sup>												
Radio tagging and tracking survey <sup>e</sup>												

= 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 surveys are not acceptable in Scotland.

**Figure 1a:** Table 2.2 reproduced from Collins (2016).

### 1.2.1.1 Buildings

In Marnell *et al.* (2022), Table 3 (The applicability of survey methods) provides information on the type of surveys that can be undertaken according to the different seasons.

Marnell *et al.* (2022) states that it is more suitable to survey buildings in the summer months. The following is a summary of the principal points:

1. The presence of a significant bat roost (invariably a maternity roost) can normally be determined on a single visit at any time of year, provided that the entire structure is accessible and that any signs of bats have not been removed by others. However, a visit during the summer or autumn has the advantage that bats may be seen or heard.
2. Roosts used by a small number of bats, as opposed to maternity sites, can be particularly difficult to detect and may require extensive searching backed up (in summer) by bat detector surveys or emergence counts.
3. If the entire building is not accessible or signs of bats may have been removed by others, or by the weather, bat detector or exit count methodologies may be required to back up a limited search.

**Table 3.** The applicability of survey methods.

Season	Roost type	Inspection	Bat detectors and emergence counts
Spring (Mar – May)	Building	Suitable (signs, perhaps bats)	Limited, weather dependent
	Trees	Difficult (best for signs before leaves appear)	Rarely useful
	Underground	Suitable (signs only)	Static detectors may be useful
Summer (June- August)	Building	Suitable (signs and bats)	Suitable
	Trees	Difficult	Limited; use sunrise survey
	Underground	Suitable (signs only)	Rarely useful
Autumn (September –November)	Building	Suitable (signs and bats)	Limited, weather dependent
	Trees	Difficult	Rather limited weather dependent; use sunrise survey?
	Underground	Suitable (signs, perhaps bats)	Static detectors may be useful
Winter (December- February)	Building	Suitable (signs, perhaps bats)	Rarely useful
	Trees	Difficult (best for signs after leaves have gone)	Rarely useful
	Underground	Suitable (signs and bats)	Static detectors may be useful

**Figure 1b:** Table 3 reproduced from Marnell *et al.* (2022).

The following table is used to determine the level and timing of surveys for buildings/structures with reference to the surrounding habitat. Buildings are assessed to determine their suitability as a bat roost and are described using the parameters Negligible, Low, Medium or High suitability in view of Table 2 from Marnell *et al.* (2022). The level of suitability informs the level of surveying and timing of surveys required based on Table 7.3 of Collins, 2016 (Note: These two tables are presented in Appendix 1 but a summary is provided in the table below).

**Table 2a: Building Bat Roost Classification System & Survey Effort (Adapted from Collins, 2016 and Marnell *et al.*, 2022).**

Suitability Category	Description (examples of criteria)	Survey Effort (Timings)
<b>Negligible</b>	Building have no potential as a roost site Urban setting, heavily disturbed, building material unsuitable, building in poor condition etc.	No surveys required.
<b>Low</b>	Building has a low potential as a roost site. No evidence of bat usage (e.g. droppings)	One dusk or dawn survey.
<b>Medium</b>	Building with some suitable voids / crevices for roosting bats. Some evidence of bat usage Suitable foraging and commuting habitat present.	At least one survey in May to August, minimum of two surveys (one dusk and one dawn).
<b>High</b>	Building with many features deemed suitable for roosting bats. Evidence of bat usage. Largely undisturbed setting, rural, suitable foraging and commuting habitat, suitable roof void and building material.	At least two surveys in May to August, with a minimum of three surveys (at least one dusk survey and one dawn survey).

### 1.2.1.2 Trees

Marnell *et al.* (2022) recommends the following in relation to detecting roosts in trees:

- “The best time to carry out surveys for suitable cavities is between November and April, when the trunk and branches are not obscured by leaves. If inspection suggests that the tree has suitable cavities or roost sites, a bat detector survey at dusk or dawn during the summer may help to produce evidence of bats, though the nomadic nature of most tree-dwelling species means that the success rate is very low.
- It can also be difficult to pinpoint exactly which tree a bat emerged from. A dawn survey is more likely to be productive than a dusk one as swarming bats returning to the roost are much more visible than those leaving the roost. Because tree-dwelling bats move roosts frequently, a single bat-detector survey is unlikely to provide adequate evidence of the absence of bats in trees that contain a variety of suitable roosting places.
- Several dawn or dusk surveys spread over a period of several weeks from June to August will greatly increase the probability of detecting significant maternity roosts and is recommended where development proposals will involve the loss of multiple trees”.

As a consequence, the BTHK (2018) Potential Roost Features (PRFs) list and the classification system adapted from Collins (2016) is recommended as part of the daytime inspection of trees to determine their PBR or Potential Bat Roost value. Details of the methodology followed is presented in Section 3.2.2.

### 1.2.1.3 Underground Structures

Marnell *et al.* (2022) recommends the following in relation to underground structures:

1. Underground structures are used mainly for hibernation, so surveys should generally be carried out during the winter.

### 1.2.2 Evaluation & Assessment Criteria

Based on the information collected during the desktop studies and bat surveys, an ecological value is assigned to each bat species recorded based on its conservation status at different geographical scales (Table 2b). For example, a site may be of national ecological value for a given species if it supports a significant proportion (e.g. 5%) of the total national population of that species.

**Table 2b: The six-level ecological valuation scheme used in the CIEM Guidelines (2016) Ecological Value**

<b>Ecological Value</b>	<b>Geographical Scale of Importance</b>
<b>International</b>	International or European scale
<b>National</b>	The Republic of Ireland or the island of Ireland scale (depending on the bat species)
<b>Regional</b>	Province scale: Leinster
<b>County</b>	County scale: County Dublin
<b>Local</b>	Proposed development and immediate surroundings
<b>Negligible</b>	None, the feature is common and widespread


If bat roosts are recorded, their roost status is determined using Figure 20 from Marnell *et al.* (2022). This figure is presented below (Figure 1c). This figure is also used to determine the conservation significance of the roost in order to prepare appropriate bat mitigation measures.

Impacts on bats can arise from activities that may result in:

- Physical disturbance of bat roosts e.g. destruction or renovation of buildings
- Noise disturbance e.g. increase human presence, use of machinery etc.
- Lighting disturbance
- Loss of roosts e.g. destruction or renovation of buildings
- Modifications of commuting or foraging habitats
- Severance or fragmentation of commuting routes
- Loss of foraging habitats.

It is recognised that any development will have an impact on the receiving environment, but the significance of the impact will depend on the value of the ecological features that would be affected. Such ecological features will be those that are considered to be important and potentially affected by the proposed development.

The guidelines consulted recommend that the potential impacts of a proposed development on bats are assessed as early as possible in the design stage to determine any areas of conflicts. In particular the Table 4 (presented as Figure 1d below) and Figure 20 (presented as Figure 1c) from Marnell *et al.* (2022) are referenced during this process.

Low	<b>Roost status</b>	<b>Mitigation/compensation requirement (depending on impact)</b>
<b>Conservation significance</b> 	Feeding perches of common/rarer species	Flexibility over provision of bat-boxes, access to new buildings etc. No conditions about timing or monitoring
	Individual bats of common species	
	Small numbers of common species. Not a maternity site	
	Feeding perches of Annex II species	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
	Small numbers of rarer species. Not a maternity site	
	Hibernation sites for small numbers of common/rarer species	Timing constraints. More or less like-for-like replacement. Bats not to be left without a roost and must be given time to find the replacement. Monitoring for 2 years preferred.
	Maternity sites of common species	
	Maternity sites of rarer species	Timing constraints. Like-for-like replacement as a minimum. No destruction of former roost until replacement completed and usage demonstrated. Monitoring for at least 2 years.
	Significant hibernation sites for rarer/rarest species or all species assemblages	
	Sites meeting SAC guidelines	Oppose interference with existing roosts or seek improved roost provision. Timing constraints. No destruction of former roost until replacement completed and significant usage demonstrated. Monitoring for as long as possible.
<b>High</b>	Maternity sites of rarest species	

**Figure 20** Guidelines for proportionate mitigation. The definition of common, rare and rarest species requires regional interpretation.

**Figure 1c:** Figure 20 (p 46) Reproduced from Marnell *et al.* (2022).

**Table 4** The scale of main impacts at the site level on bat populations. [NB This is a general guide only and does not take into account species differences. Medium impacts, in particular, depend on the care with which any mitigation is designed and implemented and could range between high and low.]

Roost type	Development effect	Scale of impact		
		Low	Medium	High
Maternity	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside breeding season	✓		
	Post-development interference			✓
Major hibernation	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference			✓
Minor hibernation	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction, modification		✓	
	Modified management		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference		✓	
	Temporary destruction, then reinstatement	✓		
Mating	Destruction		✓	
	Isolation caused by fragmentation		✓	
	Partial destruction	✓		
	Modified management	✓		
	Temporary disturbance	✓		
	Post-development interference	✓		
	Temporary destruction, then reinstatement	✓		
Night roost	Destruction	✓		
	Isolation caused by fragmentation	✓		
	Partial destruction	✓		
	Modified management	✓		
	Temporary disturbance	✓		
	Post-development interference	✓		
	Temporary destruction, then reinstatement	✓		

**Figure 1d:** Table 4 (p 44) Reproduced from Marnell *et al.* (2022).



Different parameters are considered for the overall assessment of the potential impact(s) of a proposed development on local bat populations.

The overall impacts of the proposed project on local bat populations is assessed using the following criteria:

- Impact Quality using the parameters Positive, Neutral or Negative Impact (based on EPA, 2017)

**Table 2c: Criteria for assessing impact quality based on EPA, 2017,**

Quality of Effect	Criteria
<b>Positive</b>	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
<b>Neutral</b>	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
<b>Negative</b>	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

- Impact Significance of potential impact parameters on specific bat species in relation to particular elements (e.g. roosting sites, foraging area and commuting routes) are assessed with reference to the following:
  - o Table 4 of Marnell *et al.* (2022) (Figure 1a);
  - o the known ecology and distribution of the bat species in Ireland;
  - o bat survey results including type of roosts (if any recorded), pattern of bat usage of the survey area, level of bat activity recorded etc.
  - o and bat specialist experience.
- Impact Significance of the proposed development on local bat populations maybe determine, where applicable, using the parameters listed in Table 2d (based on EPA, 2017).

**Table 2d: Criteria for assessing significance of effects based on EPA, 2017,**

Significance of Effects	Definition
<b>Imperceptible</b>	An effect capable of measurement but without significant consequences.
<b>Not significant</b>	An effect which causes noticeable changes in the character of the environment but without significant consequences.
<b>Slight</b>	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
<b>Moderate</b>	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
<b>Significant</b>	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
<b>Very Significant</b>	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
<b>Profound</b>	An effect which obliterates sensitive characteristics

The following terms will be used, where possible and applicable, when quantifying the duration of the potential effects (selected from EPA, 2017):

- Temporary – effects lasting less than a year
- Short-term – effects lasting 1 to 7 years
- Medium term – effects lasting 7 to 15 years
- Long term – effects lasting 15 to 60 years
- Permanent – effects lasting over 60 years
- Reversible – effects that can be undone, for example through remediation or restoration

### 1.2.3 Bat Mitigation Measures

#### 1.2.3.1 Bat Houses & Bat Lofts

The NPWS Survey and Mitigation Guidelines (Marnell *et al.* 2022) provides some general guidelines in relation to the provision of alternative roosts but states that critical issues “are the size and suitability of the final roost and the disposition of the entrances and flight paths, including the location of any exterior lighting or vegetation”. As part of this development proposal, bat mitigation measures include the incorporation of a bat loft in Barrington Tower and the construction of a bat house. These have been designed to address the critical issues stated above with reference to the ecological needs of the bat species recorded roosting in Barrington Tower and scientific information available.

##### 1.2.3.1.1 Bat Houses & Bat Lofts – Effective Mitigation Measures

The principal bat species that the bat house is designed for is the brown long-eared bat and common pipistrelles as small satellite roost for these bat species was consistently recorded during the bat surveys. Provision is also made for the remaining bat species in the bat house (i.e. Daubenton’s bats). The bat loft, as it is a more limited space, is designed to provided bat roosting provision for bats, in general.

The design of the bat house and bat loft takes into consideration the results of “Roost Profile” analysis completed by Bat Conservation Ireland in relation to known brown long-eared bat roosts. The Brown Long-eared Bat Roost Monitoring Survey, managed by Bat Conservation Ireland as part of the Irish Bat Monitoring Programme, has reported that brown long-eared bats roosts are associated with buildings with natural stone walls and slate roosts (Aughney *et al.*, 2022 In press). As a consequence both the bat loft and bat house will have a slate roof with bituminous felt (this is a non-breathable felt and is recommended for bat roosts). Barrington Tower is a stone structure and the bat house will be externally cladded in natural stone.

Collins *et al.* (2020) investigated the implementation and effectiveness of bat roost mitigation in building developments completed between 2006 and 2014 in England and Wales. The bat species studied were: common and soprano pipistrelle, brown long-eared bat and *Myotis* species, all of which are present in Ireland. A summary of the main points relating to the construction of bat roosts was that the internal height and internal volume was important for bat occupancy. The bat house proposed will provide an internal height of 5m and an internal volume of approximately 39m<sup>3</sup>. Schofield (2008) reported that the internal roost height ranged from 1.8 to 5.6m and internal volume of 40m<sup>3</sup> to 398m<sup>3</sup> for maternity roosts of lesser horseshoe bats. Lintott & Mathews (2018) reported that median internal volume of bat roosts used by brown long-eared bats was 37m<sup>3</sup> and for *Pipistrellus* species, it was 24m<sup>3</sup>. This bat house is catering for a satellite roost of brown long-eared bats and common pipistrelles and, therefore, these dimensions are considered suitable by the bat specialist. Pipistrelles were reported to be generally found in smaller volume roosts with lower

heights than brown long-eared bats because Pipistrelles need less internal space. Therefore the bat loft in Barrington Tower will be more suitable for common pipistrelles.

Lintott & Mathews (2018) reported that the greater number of bat access points, the greater the occupancy for both common pipistrelles and brown long-eared bats. As a consequence, both the bat loft in Barrington Tower and the bat house will have a number of bat access slates while the bat house will have an additional bat access vent in the external wall facing the adjacent woodland. The odds of brown long-eared bat presence within a bat roost increased by 21% with each additional roost entrance. The bat house will have 5 roost entrance points and the bat loft will have two roost entrance points.

The Brown Long-eared Bat Roost Monitoring Survey also reported that brown long-eared bats roosts in buildings are positively influenced by the amount of tall vegetation (i.e. treelines, woodland and forestry) is located within a 0.5km radius of the roost (Aughney *et al.*, 2022 In press). This is an important factor in relation to the provision of alternative roosting sites proposed as part of mitigation. Therefore the proposed location of the bat house is adjacent to the main woodland river valley that continues east with additional woodland habitat outside the 0.5km radius zone. This location will ensure that bats emerge directly into the adjacent woodland and coupled with lighting and landscaping plans, this area will be in darkness to increase bat usage. Aughney *et al.* (2021) reports on the successful renovation of an existing building for lesser horseshoe bats in Co. Galway. Monitoring of this structure by the author has demonstrated that the works completed were very successful and that this was primarily due to the fact that this building is located in prime foraging grounds of deciduous forest and that the extent of the renovation works completed were undertaken according to best practice reported in Schofield (2008).

Additional mitigation measures for the bat house include the incorporation of bat tubes in the external walls. These are to provide roosting features for Daubenton's bats. Daubenton's bats have a preference to roost in crevices which the bat tubes are designed to replicate. The author has previously used bat tubes to mitigate for the loss of crevices in natural stone bridges and the bat tubes were used by Daubenton's bats post works. It is also proposed to retain crevices in the stone work of the external walls of Barrington Tower which will be suitable for roosting Daubenton's bats. The crevices in the tower walls is considered to be similar to the crevices available in natural stone bridges. Shiel (1999) surveyed a number of bridges on a seasonal basis in Counties Leitrim and Sligo and found that 38% of structures had bats present.

The wall mounted bat boxes proposed for inside the bat house are specific for common pipistrelles which Collins *et al.* (2020) reported as the type of bat box preferred by this species.

The Lighting and Landscape plans have been designed to facilitate movement of bats to and from Barrington Tower and the bat house, according to the guidelines of Marnell *et al.* (2022).

The bat box scheme will also cater for the bat species mentioned above (See section on Bat Boxes for more information).

### 1.2.3.2 Bats & Lighting

All European bat species, including Irish bat species, are nocturnal. Light levels as low as typical full moon levels, i.e. around 0.1 LUX, can alter the flight activity of bats (Voigt *et al.* 2018). Any level of artificial light above that of moonlight can mask the natural rhythms of lunar sky brightness and, thus, can disrupt patterns of foraging and mating and might, for instance, interfere with entrainment of the circadian system.

Artificial light pollution is an increasing global problem (Rich and Longcore, 2006) and Artificial light at night (ALAN) is considered a major threat to biodiversity, especially to nocturnal species. As urbanisation expands into the landscape, the degree of street lighting also expands. Its ecological impacts can have a profound affect the behaviour of nocturnal animals including impacts on reproductive behaviours, orientation, predator-prey interaction and competition among others, depending on the taxon and ecosystem in question (Longcore and Rich 2004). It is considered by Hölker *et al.* (2010) to be a key biodiversity threat to biodiversity conservation. In relation to bats, the potential impacts of artificial night lighting can result in habitat fragmentation (Hanski, 1998), delay in roost emergence (Downs *et al.*, 2003) and a reduction in prey items.

In the context of behavioural ecology, lights can work to attract or repel certain animals. Many groups of insects, including moths, lacewings, beetles, bugs, caddisflies, crane flies, midges, hoverflies and wasps, can be attracted to artificial light (Eisenbeis and Hassel 2000; Frank 1988; Kolligs 2000). Attraction depends on the spectrum of light. In the context of street lights, white (mercury vapour) lamps emit a white light that includes ultraviolet. High pressure sodium lights (yellow) emit some ultraviolet, while low pressure sodium lamps (orange) emit no ultraviolet light (e.g. Rydell 2006). As a result of the attractiveness of lights to aerial invertebrates, swarms of insects often occur in and around street lights and, particular bat species such as aerial insect predators, can exploit the swarming insects to their advantage. Such attraction can also take prey items away from dark zones where light sensitive species are foraging, thus reducing their likelihood of feeding effectively.

Rydell (2006) divides bats into four categories in terms of their characteristic behaviours at street lamps. The four categories are based on bat size, wing morphology and echolocation call characteristics which were highlighted by Norberg and Rayner (1987) to determine flight speed, manoeuvrability, and prey detection capabilities of bats. Rydell (2006) stated that the large, fast flying bats, which are confined to open airspace, fly high over lit areas and are rarely observed near ground level. None of these, typically large free-tailed bats (e.g. large species of the family Molossidae), are found in Ireland. The second category are the medium-sized fast flying species, including the *Nyctalus* species, which patrol the street well above the lights and can be seen occasionally as they dive for prey into the light cone. This group includes the Leisler's bat, which is found in Ireland. Rydell's third category describes the small but fast flying bats that are manoeuvrable enough to forage around light posts or under the lights, and includes the small *Pipistrellus* species of the old world, three of which are found in Ireland. The fourth category includes broad-winged slow flyers, most of which are seldom or never observed at lights. Slow flying bat species may be more vulnerable to predation by diurnal birds of prey and this may restrict their exploitation of insects around artificially illuminated areas (e.g. Speakman 1991). There are also the concerns that some bat species are more light sensitive and therefore actively avoid lit up areas. This is particularly relevant for lesser horseshoe bats. Therefore from this, we can categorise the suite of Irish bats species as follows (please note that the sensitivity category is the author's description):

**Table 3: Potential light sensitivity of the Irish bat fauna using categories described by Rydell, 2006.**

<b>Species: Common Name</b>	<b>Rydell Category</b>	<b>Sensitivity</b>
<b>Daubenton's bat <i>Myotis daubentonii</i></b>	Category 4	Light sensitive
<b>Whiskered bat <i>Myotis mystacinus</i></b>	Category 4	Light sensitive
<b>Natterer's bat <i>Myotis nattereri</i></b>	Category 4	Light sensitive
<b>Leisler's bat <i>Nyctalus leisleri</i></b>	Category 2	Light tolerant
<b>Nathusius' pipistrelle <i>Pipistrellus nathusii</i></b>	Category 3	Semi-tolerant
<b>Common pipistrelle <i>Pipistrellus pipistrellus</i></b>	Category 3	Semi-tolerant
<b>Soprano pipistrelle <i>Pipistrellus pygmaeus</i></b>	Category 3	Semi-tolerant
<b>Brown long-eared bat <i>Plecotus auritus</i></b>	Category 4	Light sensitive
<b>Lesser horseshoe bat <i>Rhinolophus hipposideros</i></b>	Category 4	Light sensitive

The ability of different bat species to exploit insects gathered around street lights varies greatly. Gleaning species such as *Myotis* bats rarely forage around street lights (Rydell and Racey, 1995). The ecological effects of illuminating aquatic habitats are also poorly known. Moore *et al.* (2006) found that light levels in an urban lake, subject simply to sky glow and not direct illumination from lights, reached the same order of magnitude as full moonlight.

All European bat species, including Irish bat species, are nocturnal. As a consequence, the scientific literature provides evidence that artificial lighting does impacts on bats. The degree of impact depends on the light sensitivity of the bat species and the type of luminaire. Lesser horseshoe bats are light sensitive and therefore adversely effected by the presence of lighting in all aspects of their life strategies (e.g. foraging, commuting, drinking and roosting).

The potential impacts of street lighting can be summarised as follows:

- Attracting Prey Items

Lights can work to attract or repel certain animals. Many groups of insects can be attracted to artificial light and this attraction depends on the spectrum of light. As a result of the attractiveness of lights to aerial invertebrates, swarms of insects often occur in and around street lights. Such attraction can also take prey items away from dark zones where light sensitive species, such as lesser horseshoe bats, are foraging, thus reducing their likelihood of feeding effectively.

- Reducing Foraging Habitat

The research documents that there is less bat species diversity foraging in habitats lit up by artificial lighting. Only bat species considered to be light tolerant are generally able to exploit habitats with lighting present, but overall, all bat species activity tends to be less in lit up habitats compared to non-lit up habitats.

- Fragmenting The Landscape

Scientific evidence shows that lighting is a barrier to the movement of light sensitive bat species, such as lesser horseshoe bats. Light sensitive bat species will actively seek dark corridors to

commute along and therefore the presence of lighting in commuting habitats will restrict their movement of such species in the landscape.

- Reducing Drinking Sites

There is increasing evidence that drinking sites for bats is an essential component for local bat population survival and that the presence of artificial lighting at waterbodies prevents bats from availing of this resource.

Lighting, including street lights come in an array of different types but for street lights they typically include High Pressure Sodium, Low Pressure Sodium, Mercury Vapour and the more modern Light Emitting Diodes (LED). An array of field-based research has been undertaken to document the potential impact of lighting on bat flight activity. LED lighting is predicted to constitute 70% of the outdoor and residential lighting markets by 2020. While the use of LEDs promotes energy and cost savings relative to traditional lighting technologies, little is known about the effects these broad-spectrum “white” lights will have on wildlife, human health, animal welfare, and disease transmission. As a consequence, a large array of research has been undertaken recently on the potential impact of LED on bats.

Stone *et al.* (2012) undertook research in relation to “Cool” LED street lights on an array of local bat species in England. Overall the presence of LED street lights had a significant negative impact on lesser horseshoe bats and *Myotis* spp. for all light treatments investigated while there was no sign impact of light treatment type on *Pipistrellus pygmaeus* (soprano pipistrelle – a common Irish bat species) or *Nyctalus* (Leisler’s bats is part of this bat family and is a common Irish bat species)/*Eptesicus* species. This research paper also documented behavioural changes for the different bat species. Lesser horseshoe bats and *Myotis* spp. did not avoid lights by flying along the other side of the hedge but altered their commuting behaviour altogether. It was concluded that LEDs can fragment commuting routes causing bats to alter their behaviour with potentially negative conservation consequences. Lesser horseshoe bat activity was significantly lower during high intensity treatment than medium, but at all treatment levels (even as low as 3.6 LUX), activity was significantly lower than unlit control (LUX level measurements were taken at 1.7m at the hedge below the light).

Russo *et al.* (2017) investigated the impact of LED lighting on drinking areas for bats in Italy. Drinking sites are considered to be important components for the survival of local bat populations. Drinking sites were illuminated with a portable LED outdoor light emitting (48 high-power LEDs generated a light intensity of 6480 lm (4000–4500 K) at 25°C, two peaks of relative luminous flux at 450 and 590 nm). *Plecotus auritus* (brown long-eared bat – resident in Ireland), *Pipistrellus pygmaeus* (soprano pipistrelle – resident in Ireland) and *Rhinolophus hipposideros* (lesser horseshoe bat – resident in Ireland) did not drink when troughs were illuminated.

Rowse *et al.* (2018) researched the impacts of LED lights (portable lights, 97W 4250K LED on 10m high poles) in England on local bat populations. Treatments were either 100% light intensity; dimmed (using pulse width modulation) at 50% or 25% light intensity; and unlit. Sites were in suburban areas along busy roads but with vegetation and tree lines adjacent. High light levels (50% & 100% light treatments) increased activity of opportunistic *Pipistrellus pipistrellus* (common pipistrelle – resident in Ireland) but reduced activity of *Myotis* species group. Conversely 25% and unlit sites had no difference from each other. The research paper conclude that dimming could be an effective strategy to mitigate ecological impacts of street lights.

Wakefield *et al.* (2017) stated that an important factor to be aware of in relation to LED is the direction of the light projected. Therefore it is recommended that highly focused/shielded LEDs designed to

filter out short wavelengths of light may should be used as they attract relatively fewer insects. Less insects attracted to street lights means less insects leaving dark zones where light sensitive bat species primarily feed.

Martin *et al.* (2021) showed that LED street lights lead to a reduction in the total number of insects captured with light traps in a wide range of families. Coleoptera and Lepidoptera orders were the most sensitive groups to ecological light pollution in the study area. The paper suggested that LED was the least attractive light system for most of the affected groups both because of its very little emitted short-wavelength light and because of its lower light intensity. They also concluded that reduction in insect attraction to LED could be even larger with current LED technologies emitting warmer lights, since other research showed that LED emitting “warmer white” colour light (3000 K) involves significantly lower attraction for insects than “colder white” LED (6000 K).

Wilson *et al.* (2021) investigate the impact of LED on biting insects and concluded because LED is highly malleable with regard to spectral composition, they can be tailored to decrease or increase insect catches, depending on situation. Therefore this design control of LED could greatly assist in reducing impact of street lighting on local bat populations.

Stone *et al.* (2015) reviewed the impacts of ALAN on bat roosts and flight paths in order to provide recommendations in relation to street lighting. The principal recommendations were to avoid lighting places where bats are present and to ensure that there are interconnected light exclusion zones and variable light regimes with reduced intensity of light in specific areas (e.g. important foraging and commuting habitats) as responses to street lighting may vary between species. It recommends that there should be a 'light threshold'.

#### *1.2.3.2.1 Lighting Guidelines – Effective Mitigation Measures*

As a consequence of this extensive amount of research there are two principal guideline documents available for best practice for effective mitigation relating to outdoor lighting.

EUROBATS (2018) guidelines recommends the following:

- ALAN should be strictly avoided, and artificial lighting should be installed only where and when necessary coupled with the following:
  - o Dynamic lighting schemes, where possible.
  - o Use a minimal number of lighting points and luminaires on low positions in relation to the ground for minimising light trespass to adjacent bat habitats or into the sky.
  - o Use focused light, e.g. by using LED or shielded luminaires which limit the light flux only to the required areas and prevent light trespass into adjacent bat habitats.
  - o Create screens, either by erecting walls or by planting hedgerows or trees, to prevent light trespass, e.g. from illuminated roads, to surrounding bat habitats.
  - o Exits of bat roosts and a buffer zone around them should be protected from direct or indirect lighting to preserve the natural circadian rhythm of bats.

This BCT (2018) guidelines provides a list of recommendations in relation to luminaire design, which is based on the extensive research completed to-date on the potential impact of lighting on bats, and therefore provides best practice mitigation measures. These recommendations are the basis of mitigation measures pertaining to bats listed in this report and are summarised as follows:

- All luminaires used should lack UV/IR elements to reduce impact.
- A warm white spectrum (<2700 Kelvins should be used to reduce the blue light component of the LED spectrum).

- Luminaires should have a peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Only luminaires with an upward light ratio of 0% and with good optical control should be used.
- Luminaires should be mounted on the horizontal, i.e. no upward tilt.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
- Bollard lighting should be considered for pedestrian, parks and greenway areas, if deemed necessary.

### 1.2.3.3 Bat Box Schemes

Bat Boxes are frequently used as part of bat mitigation to retain local bat populations within an area proposed to be development. The NPWS Survey and Mitigation Guidelines (Marnell *et al.* 2022) considers that where roosts of low conservation significance (Figure 20, Marnell *et al.* (2022)) are to be lost due to a development, bat boxes may provide an appropriate form of mitigation and the effectiveness depends on the type of bat box provided, which should be appropriate to the bat species (Figure 1f).

Species	Summer/ maternity	Summer/non breeding	Hibernation*	Notes
<i>Rhinolophus hipposideros</i>	N/A	N/A	N/A	Horseshoe bats cannot use bat boxes
<i>Myotis daubentonii</i>	H	H		
<i>Myotis mystacinus</i>	H	H		
<i>Myotis nattereri</i>	H	?		
<i>Pipistrellus nathusii</i>	H	H		
<i>Pipistrellus pipistrellus</i>	C	C/H	C	H are rarely used as maternity roosts.
<i>Pipistrellus pygmaeus</i>	C	C/H	C	
<i>Nyctalus leisleri</i>	H	H	H?	
<i>Plecotus auritus</i>	H	H		Maternity roosts
<b>Key</b>				
* Large well-insulated hibernation boxes may be more successful				
N/A -not applicable; bat boxes should not be considered as replacement roosts				
H - tree hollow-type box, providing a void in which bats can cluster				
C - tree crevice-type box, with 25-35mm crevices				
? - few data on which to base an assessment				

Figure 1f: Table 7 (p 58) Reproduced from Marnell *et al.* (2022).

#### 1.2.3.3.1 Effectiveness of Bat Boxes as a Mitigation Measure

Two publications that provide good scientific advice in relation to the effectiveness of bat boxes are presented below. McAney & Hanniffy (2015) reviewed the use of bat boxes in Ireland in relation to the bat usage of the following bat box schemes: 62 Schwegler boxes of three models erected in Portumna Forest Park (Bat box scheme consisted of 30x 1FF design, 30x 2FN design and 2x 1FW design); 50 2FN boxes erected in Coole-Garryland Nature Reserve and 50 2FN boxes erected in Knockma Nature Reserve of which 40 were later transferred to Glengarriff Nature Reserve County



Cork. The bat box schemes were set up in March 1999 and data was collected up to 2015. Eight of the nine resident bat species were recorded roosting in bat boxes (lesser horseshoe bats cannot use bat boxes due to their need to fly, rather than crawl, into roosts). The main summary points are as follows:

- Leisler's, brown long-eared and *Pipistrellus* spp. were recorded in boxes at all three Galway woods, Daubenton's bat was only recorded in Garryland, Natterer's bat was only recorded in Glengarriff and whiskered/Brandt's was recorded just twice.
- There was a 31% chance of encountering a bat at Portumna Forest Park compared to 11.5% and 10% at Coole-Garryland Nature Reserve and Knockma Nature Reserve respectively.
- *Pipistrellus* spp. preferred 1FF boxes as this bat box design offer crevice-like roosting conditions. This species group also showed a seasonal preference with more bats present later in the season (visual observations confirmed the bats were using the boxes as mating roosts) and their numbers increased from the time that the bat box scheme was originally established.
- Brown long-eared bats preferred 2FN boxes that mimic holes in trees, the natural roosting sites for this species. This species also showed no seasonal pattern to their occurrence in the boxes. However one aspect of 2FN boxes that this report mentions is the high occupancy by birds which can be an issue in relation to nesting material reducing the availability of bat boxes for roosting bats.
- Leisler's bat showed no preference for box model but showed a seasonal preference with more bats present later in the season.
- Aspect was not a significant factor for occupancy but most boxes received dappled sunshine for part of the day.
- The other factor that proved significant was the length of time the boxes were in place, with occupancy rates increasing for all three species, although in the case of pipistrelles this increase appears to have stabilised. So, although the boxes were occupied very quickly, it took several years before they were regularly occupied and before clusters of bats were formed and breeding was confirmed.

Collins *et al.* (2020) investigated the implementation and effectiveness of bat roost mitigation, which included bat boxes, in building developments completed between 2006 and 2014 in England and Wales. The bat species studied were: common and soprano pipistrelle, brown long-eared bat and *Myotis* species, all of which are present in Ireland. A summary of the main points relating to bat boxes are as follows:

- Bat boxes were the most frequently deployed roosting provision (i.e. alternative roosts), being installed at 64% (n = 71) of sites surveyed as a compensation or enhancement measure.
- Box frequencies ranged from 1 to 41 at sites where they were installed, with an average of 6.6 boxes per site.
- Bats, or evidence of bats, were recorded in 20% of these bat boxes.
- Bat boxes mounted externally on buildings showed the highest occupation rate regardless of species while Common pipistrelle showed a preference for these over tree mounted boxes; the opposite was true for soprano pipistrelle.
- The four most popular bat box models used by consultants in the study were all Schwegler woodcrete bat boxes. Bat presence was highest in the 1FF bat box design (32%, n = 53) and lowest for birds (8%). The tree-mounted 2F and wall-integrated 1FR/2FR models both demonstrated similar bat presence rates of 23% (n = 43) and 25% (n = 32) respectively. The 2FN tree-mounted model showed the lowest presence rate for bats (11%, n = 19) and the highest for birds (58%). There were also 26 timber bat boxes, none of which were used by bats.

The author has also erected a number of bat box schemes and, where possible, has completed occasional monitoring visits. One such example is a bat box scheme erected in Kileshandra, Co. Cavan which consists of 8 Schwegler woodcrete bat boxes of various designs. The bat boxes were erected on mature trees located in a linear woodland adjacent to a river. This bat box scheme was erected in 2012 as part of mitigation for the demolition of a large derelict building where small satellite roosts were recorded for *Pipistrellus* spp. and Daubenton's bat. Two site visits have been completed since 2012 and during these visits the bat boxes were checked for evidence of bat usage. The first site visit was on 25/8/2015 and one bat box was occupied by a single Leisler's bat while the additional seven bat boxes had evidence of bat droppings (*Pipistrellus* spp. and *Myotis* spp.). During the second site visit (27/7/2019) four bat boxes were occupied by bats (Soprano pipistrelle x1 individual (adult male), Leisler's bat x1 individual (adult male) and two bat boxes with x16 Daubenton's bats and x10 Daubenton's bats respectively). Biometrics was recorded for the 12 of the bats (which included 10 of the Daubenton's bats recorded in the bat box with 16 individuals) and five of these Daubenton's bats were lactating females with the remaining five Daubenton's bats recorded as juveniles, thereby indicating that this bat box was used as a maternity roost. The remaining four bat boxes all had droppings within for *Pipistrellus* spp and Leisler's bats. This bat box scheme, while just one example, demonstrates that when bat boxes are erected in an area with good bat habitat (bat survey documented a high level of bat activity for the named bat species), a high level of occupancy of bat boxes will occur.

In relation to bat boxes, Marnell *et al.* (2022), a document that provides guidelines that are considered to be practical and effective based on past experience, recommends that the design life of potential bat boxes, including essential maintenance, should be about 10 years, as this would be comparable with the lifespan of the tree roosts that bat boxes are designed to mimic. The guidelines continue by stating that the "This lifespan can be achieved with good quality wooden boxes and exceeded by woodcrete bat boxes or other types of construction that ensure any softwoods are protected from the weather and attack by squirrels" (note – this includes woodstone bat boxes).

In relation to the number of bat boxes recommended to be erected, Lintott & Mathews (2018) found that the greater the number of bat boxes deployed, the greater the probability of at least one of the boxes becoming occupied and that the odds of bats occupying at least one box increased by approximately 7% with each additional bat box that was deployed. Bat boxes are erected, as part of this proposed development, to mitigate for the loss of potential roosts in trees. Therefore the number of bat boxes are calculated according to the number of trees with additional boxes added for greater bat conservation value.

Therefore Schwegler woodcrete bat boxes are recommended as a bat mitigation measure and the authors preference to use 1FF designs as this box is open at the bottom which reduces build-up of droppings (i.e. it is a self-cleaning bat box). Both McAney & Hannify (2015) and Collins *et al.* (2020) demonstrated that usage of this bat box design by bat species recorded in this survey report. This bat box is also less likely to be used by birds and therefore retaining it for bat usage between monitoring visits. To increase occupancy of bat boxes by bats it is important to erect bat boxes 4m or higher (to ensure that bat boxes are out of reach from disturbance by humans and predation by other mammals) and that they should be located where bats have been documented foraging and commuting. The aspect of the bat box is not an influencing factor in relation to occupancy. These recommendations have all been included in this report.

### 1.2.3.4 Landscaping For Bats

Bats depend on the landscape for foraging, roosting and commuting. Different bat species will travel different distances, to and from their principal roosting sites, depending on their morphology, life stage and preferred foraging areas. Bats in Ireland are insect eating mammals and feed on an array of insects, whose populations are ultimately supported by vegetation. Areas of rich vegetation habitat tend to support higher abundances of insect populations and therefore a higher abundance of bats. In addition, many bat species rely on continuous linear habitats (e.g. treelines and hedgerows) to commute along. As a consequence landscaping as part of a proposed development project is an important element to the goal of retaining local bat populations.

The Bat Conservation Trust publication “Landscape and Urban Design for bats and biodiversity” (Gunnell *et al.*, 2012) is a resource for planning landscape design in our urban areas. This resource encourages measures to enhance existing bat foraging habitat, create water features such as ponds (drinking sites for bats and as a source of emerging insects), manage species rich grassland and planting of tall vegetation to ensure that existing treelines and hedgerows are linked. It also recommends that use of landscaping as a means to creating dark zones or dark corridors for this mammal group to fly along in our lit urban areas. This is also support by the BCT Lighting Guidelines (BCT, 2018) where landscape design can be utilised to buffer potential light spillage from developments.

The above guidelines have been consulted in the design of landscaping for bats as part of this proposed development.

### 1.2.3.5 Seasonality of Bat Mitigation Measures

The NPWS Survey and Mitigation Guidelines (Marnell *et al.* 2022) provides best practice guidance in relation to the timing of bat mitigation measures. It states that the most common and effective method of avoiding potential harm to a bat is to carry out the work at an appropriate time of the year. The following table provides a summary of timings.

<b>Bat usage of site</b>	<b>Optimum period for carrying out works (some variation between species)</b>
Maternity	1 <sup>st</sup> October – 1 <sup>st</sup> May
Summer (not a proven maternity site)	1 <sup>st</sup> September – 1 <sup>st</sup> May
Hibernation	1 <sup>st</sup> May – 1 <sup>st</sup> October
Mating/swarming	1 <sup>st</sup> November – 1 <sup>st</sup> August

**Figure 1e:** Table 5 (p 50) Reproduced from Marnell *et al.* (2022).

Timing of bat mitigation measures is relevant to the proposed tree felling of Potential Bat Roosts (PBRs). Felling is recommended outside the principal maternity season and during mild weather conditions (to avoid cold weather that would encourage bats to hibernate). This coupled with dusk/dawn surveys and additional daytime inspections is best practice to ensure that tree felling is completed without causing harm to potentially roosting bats. The preferred tree felling months also avoids the bird nesting season.

## 1.3 Project Description

### 1.3.1 Site Location

The proposed planning application is for a site located on Barrington Tower, Brennanstown Road, Dublin 18.

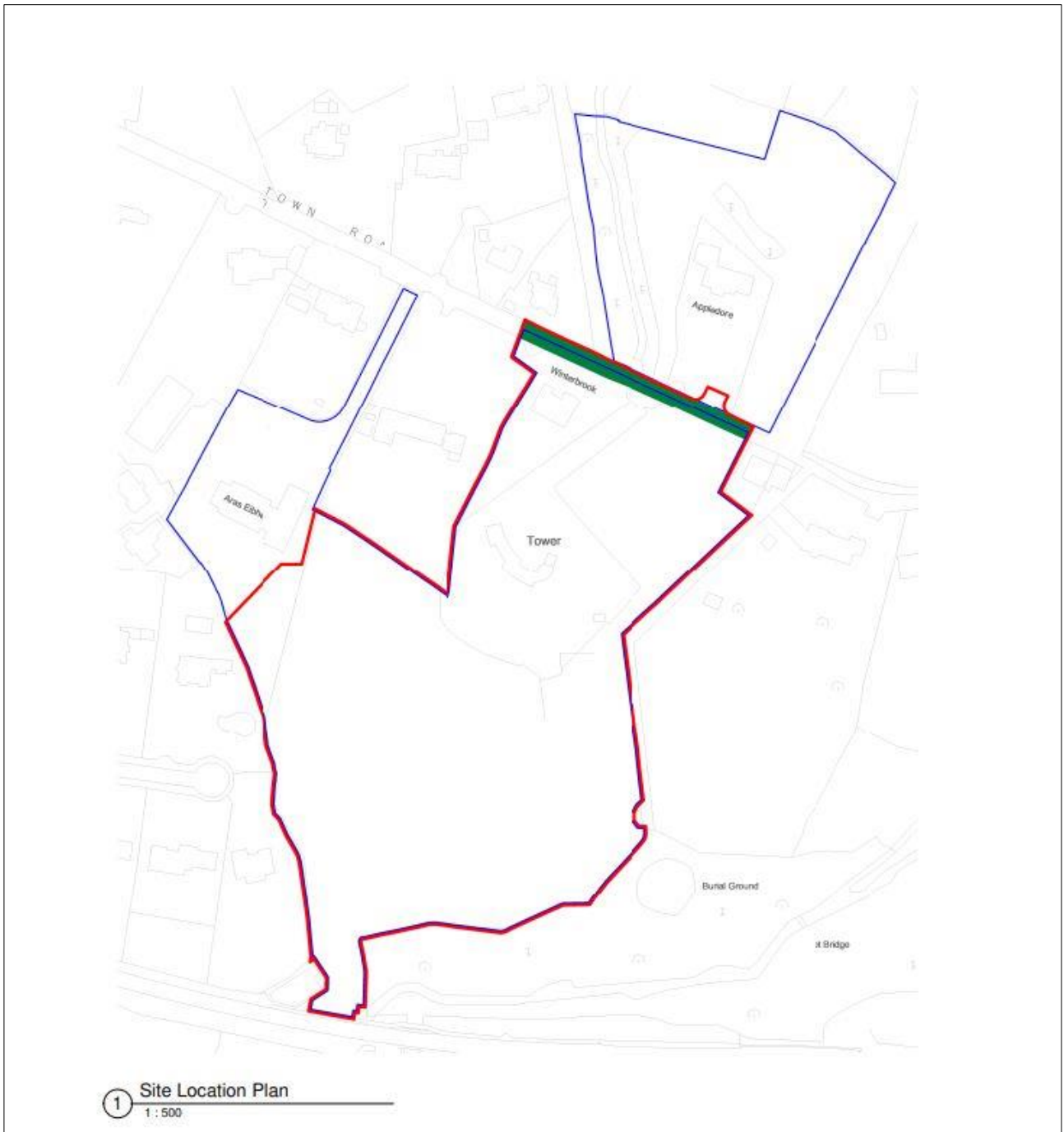


Figure 2: Location of the proposed development site (red line is an approximate outline of the proposed development site, blue line indicates additional areas surveyed and reported).

Please note that the survey area for the bat survey included the Blue Line areas for the properties named Aras Eibhear and Appledore. The results of these are presented within the report.

### *1.3.2 Proposed Project*

The development will include the demolition of an existing habitable dwelling Winterbrook, and the derelict, former dwelling attached Barrington Tower (RPS No. 1729). The protected structure 'Barrington Tower' will be retained, restored and reused.

The development will provide a 'Build to Rent' (BTR) apartment development consisting of 8 no. blocks ranging in height up to 10 storeys (including lower ground floor) providing 534 no. apartments. This will comprise in the delivery of:

- 30 no. studio, 135 no. 1 -beds, 318 no. 2-beds & 51 no. 3-beds. All residential units provided with associated private balconies/terraces to the north/south/east/west elevations.
- Resident Support Facilities & Resident Services & Amenities (total floor area c. 1,496 sq.m) including flexible spaces including entertainment rooms, meeting rooms, parcel rooms, media rooms, lounge and workspaces, gyms and studio, chef's kitchen and dining area.
- A creche (c. 356.5 sq.m), and a retail unit (c. 336.8 sq.m).
- Car and cycle parking at basement (2 levels) and at ground level. This will provide 419 no. car parking spaces, 1,266 no. cycle parking spaces and 17 no. motorcycle spaces.
- All associated site development works, open spaces, landscaping, boundary treatments, plant areas, waste management areas, cycle parking areas, and services provision (including ESB substations).

## 2. Bat Survey Methodology

The following provides some general non-specific information on the different components of a bat survey as well as specific information on what was completed as part of the bat survey methodology for this proposed development. This is background information to provide context to survey results presented in Section 3.

### 2.1 Daytime Inspections

One purpose of daytime inspections is to determine the potential of bat roosts within the survey area. Due to the transient nature of bats and their seasonal life cycle, there are a number of different types of bat roosts. Where possible, one of the objectives of the surveys is to be able to identify the types of roosts present, if any. However, the determination of the type of roost present depends on the timing of the survey and the number of bat surveys completed. Consequently, the definition of roost types, in this report, will be based on the following:

**Table 5a: Bat Roost Types (Collins 2016).**

Roost Type	Definition	Time of Survey
<b>Day Roost</b>	A place where individual bats or small groups of males, rest or shelter in the daytime but are rarely found by night in the summer.	Anytime of the year
<b>Night Roost</b>	A place where bats rest or shelter in the night but are rarely found in the day. May be used by a single bat on occasion or it could be used regularly by the whole colony.	Anytime of the year
<b>Feeding Roost</b>	A place where individual bats or a few bats rest or feed during the night but are rarely present by day.	Anytime of the year
<b>Transitional Roost</b>	A place used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.	Outside the main maternity and hibernation periods.
<b>Swarming Site</b>	Where large numbers of males and females gather. Appear to be important mating sites.	Late summer and autumn
<b>Mating Site</b>	Where mating takes place.	Late summer and autumn
<b>Maternity Site</b>	Where female bats give birth and raise their young to independence.	Summer months
<b>Hibernation Site</b>	Where bats are found, either individually or in groups in the winter months. They have a constant cool temperature and humidity.	Winter months in cold weather conditions
<b>Satellite Roost</b>	An alternative roost found in close proximity to the main nursery colony and is used by a few individuals throughout the breeding season.	Summer months

### 2.1.1 Building & Structure Inspection

There are five buildings located within the proposed development site and all of these were inspected annually during the daytime for evidence of bat usage. Evidence of bat usage is in the form of actual bats (visible or audible), bat droppings, urine staining, grease marks (oily secretions from glands present on stonework) and claw marks. In addition, the presence of bat fly pupae (bat parasite) also indicated that bat usage of a crevice, for example, has occurred in the past. Inspections were undertaken visually with the aid of a strong torch beam (LED Lenser P14.2) and endoscope (General DC5660A Wet / Dry Scope).

### 2.1.2 Tree Potential Bat Roost (PBRs) Inspection

Trees that may provide a roosting space for bats were examined using the Bat Tree Habitat Key (BTHK, 2018) and the classification system reported in Collins (2016). The Potential Roost Features (PRFs) listed in the BTHK are used to determine the PBR value of trees. Trees identified as Potential Bat Roosts (PBRs) were inspected during the daytime, where possible, for evidence of bat usage. Evidence of bat usage is in the form of actual bats (visible or audible), bat droppings, urine staining, grease marks (oily secretions from glands present on stonework), bat pupae and claw marks.

A Phase 1 inspection was undertaken on the 25/8/2019 in order to make a list of trees within the proposed development site that may be suitable as roosting sites for bats. Inspections were undertaken visually with the aid of a strong torch beam (LED Lenser P14.2) during the daytime searching for PRFs. Phase 2 inspections were completed for Category 1 & 2 trees identified during the Phase 1 inspection. This was undertaken, at height, by a tree climber under supervision by the bat specialist on the 17/1/2020. This allowed a closer inspection of PRFs and to determine if these showed evidence of bat usage.

**Table 5b: Tree Bat Roost Category Classification System (Collins, 2016).**

<b>Tree Category</b>	<b>Description</b>
<b>1</b>	Trees with multiple, highly suitable features (Potential Roosting Features = PRFs) capable of supporting larger roosts
<b>2</b>	Trees with definite bat potential but supporting features (PRFs) suitable for use by individual bats;
<b>3</b>	Trees have no obvious potential although the tree is of a size and age that elevated surveys may result in cracks or crevices being found or the tree supports some features (PRFs) which may have limited potential to support bats;
<b>4</b>	Trees have no potential.

### 2.1.3 Bat Habitat & Commuting Routes Mapping

The survey site was assessed during daytime on 25/8/2019 where a walkabout survey was completed to document potential bat foraging habitat and potential bat commuting routes. Aerial photographs were also examined to assist this step. Bat habitats and commuting routes were also identified in the wider landscape to determine landscape connectivity for local bat populations through the examination of aerial photographs.

## 2.2 Night-time Bat Detector Surveys

The following bat surveys were completed and methodology for these are described below.

Dusk Survey 19/8/2018 (Weather conditions: patchy cloud cover, dry, calm and 14oC)

- Surveyor 1: Barrington Tower, external

Dawn Survey 20/8/2018 (Weather conditions: full cloud cover, dry, calm and 11oC)

- Surveyor 1: House & Pool House

Dusk Survey 22/8/2018 (Weather conditions: patchy cloud cover, dry, light breeze and 13oC)

- Surveyor 1: Bungalow A

Walking Transects 19/8/2019 & 24/8/2019

Dusk Survey 25/8/2019 (Weather conditions: patchy cloud cover, dry, calm and 18oC)

- Surveyor 1: Barrington Tower, external
- Surveyor 2: Bungalow (adjacent to Barrington Tower)
- Surveyor 3: House & Pool House
- Infra-red filming: Barrington Tower courtyard

Dawn Survey 26/8/2019 (Weather conditions: patchy cloud cover, dry, calm and 16oC)

- Surveyor 1: Barrington Tower, external
- Surveyor 2: Barrington Tower (rear section adjacent to treeline)
- Surveyor 3: Bungalow
- Infra-red filming: Barrington Tower upstairs windows (external)

Dusk Survey & Walking Transect 13/7/2020 (Weather conditions: full cloud cover, dry, light breeze and 16oC)

- Surveyor 1: Barrington Tower, external
- Surveyor 2: Rear of House & Pool House
- Surveyor 3: Front of House & Pool House

Dusk Survey 18/7/2020 (Weather conditions: full cloud cover, dry, calm and 17oC)

- Surveyor 1: Barrington Tower, external
- Surveyor 2: Bungalow B (Appledore)
- Surveyor 3: Bungalow A
- Infra-red filming: Barrington Tower upstairs windows (external)

Dusk Survey & Walking Transect 23/7/2021 (Weather conditions: full cloud cover, dry, calm and 15oC)

- Surveyor 1: House & Pool House
- Surveyor 2: Barrington Tower, external
- Surveyor 3: Bungalow A
- Thermal Imagery: Barrington Tower (external)



### *2.2.1 Dusk & Dawn Bat Surveys, Walking Transects*

Dusk emergence surveys were completed from 10 minutes before sunset to 90-110 minutes post sunset. The surveyors position themselves adjacent to the buildings/trees to be surveyed to determine if bats are roosting within the buildings and visible trees in order to record the location of roosts, number of bats, bat species present.

The Dawn surveys were completed from 80-100 minutes prior to sunset to 10-20 minutes post sunset. The survey team surveyed buildings and treelines in order to document any swarming bats to indicate tree roosts.

Walking transects were completed post dusk surveys. These involved the survey team walking a predetermined route, noting the time, location and bat species encountered. The geo-referenced calls were mapped using QGIS. Validation of bat records was completed by the principal bat surveyor prior to mapping.

Surveys were completed during mild and dry weather conditions with air temperature of 8°C or greater. All bat encounters were noted during surveys.

The following equipment was used:

Surveyor 1: (Principal surveyor): Anabat Walkabout Full Spectrum Detector, Wildlife Acoustics Echo Meter Touch (Generation 1, Apple IOS) connected to iPad 2 (32 GB storage) and Petersson D200 Heterodyne Bat Detector.

Surveyor 2: Elekon M2 Full Spectrum Bat Detector, Wildlife Acoustics Echo Meter Touch2 Pro (Android) connected to Samsung Galaxy Tab S3 and Petersson D200 Heterodyne Bat Detector.

Surveyor 3: Wildlife Acoustics Echo Meter Touch (Generation 1, Apple IOS) connected to iPad 2 (32 GB storage), Anabat Scout Full Spectrum Bat Detector and Petersson D200 Heterodyne Bat Detector.

A Guide TrackIR Pro25 thermal imagery scope filming and Infra-red filming was also deployed to assist potential detection of roosts in buildings. Filming was watched post-filming.

### 2.2.2 Passive Static Bat Detector Survey

A Passive Static Bat Surveys involves leaving a static bat detector unit (with ultrasonic microphone) in a specific location and set to record for a specified period of time (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 analysis post surveying). The bat detector is effectively used as a bat activity data logger. This results in a far greater sampling effort over a shorter period of time. Bat detectors with ultrasonic microphones are used as the ultrasonic calls produced by bats cannot be heard by human hearing.

The microphone of the unit was position horizontally to reduce potential damage from rain. Wildlife Acoustics Song Meter SM4 Bat Full Spectrum Units use Real Time recording as a technique to record bat echolocation calls and using specific software, the recorded calls are identified. It is these sonograms (2-d sound pictures) that are digitally stored on the SD card) and downloaded for analysis. These results are depicted on a graph showing the number of bat passes per species per night. Each bat pass does not correlate to an individual bat but is representative of bat activity levels. Some species such as the pipistrelles will continuously fly around a habitat and therefore it is likely that a series of bat passes within a similar time frame is one individual bat. On the other hand, Leisler's bats tend to travel through an area quickly and therefore an individual sequence or bat pass is more likely to be indicative of individual bats not unless the individual is foraging above a tree canopy. The structure of the bat echolocation calls also provide evidence if a bat is flying inside a building or outside it by the length and width of the CF/FM components of the call.

The 2021 and 2020 recordings were analysed using Wildlife Acoustics Kaleidoscope Pro. The recordings from previous years were analysed using various software: BatClassifyIreland and Wildlife Acoustics Kaleidoscope Pro. Each sequence of bat pulses are noted as a bat pass to indicate level of bat activity for each species recorded. This is either expressed as the number of bat passes per hour or per survey night. The following static units were deployed during this static bat detector survey:

**Table 5c: Static Bat Detectors deployed during Static Bat Detector Surveys.**

Static Unit Code	Bat Detector Type	Recording Function	Microphone
<b>SM4 Units 1-5</b>	Wildlife Acoustics SongMeter 4 Bat FS	Passive Full Spectrum	SMM-U2, 4m cable
<b>SM Mini Bat Units 1,2,3,4 and 9</b>	Wildlife Acoustics SongMeter Mini Bat FS	Passive Full Spectrum	SMM-U2
<b>SM2 Units 1, 5</b>	Wildlife Acoustics SongMeter 2 Bat FS	Passive Full Spectrum	SMX-U1 (connected directly to unit)

## **2.3 Desktop Review**

### *2.3.1 Bat Conservation Ireland Database*

Bat Conservation Ireland acts as the central depository for bat records for the Republic of Ireland. Its' bat database is comprised of >60,000 bat records. The database primarily contains bat records from the following datasets:

- Irish Bat Monitoring Programme

The Irish Bat Monitoring Programme is comprised of four surveys (Car-based Bat Monitoring Scheme (2003-), All Ireland Daubenton's Bat Waterways Survey (2006-), Brow Long-eared Bat Roost Monitoring Scheme (2007-) and Lesser Horseshoe Bat Monitoring Scheme (1980s-). Apart from the latter survey, all monitoring data is stored on the BCIREland database.

- BATLAS 2020 & 2010

BCIREland has undertaken two all-Ireland species distribution surveys (2008-2009 for BATLAS 2010 and 2016-2019 for BATLAS 2020) of four target bat species (Common and soprano pipistrelle, Leisler's bats and Daubenton's bat).

- Ad Hoc Bat Records

Ad hoc bat records from national bat groups, ecological consultants and BCIREland members are also stored on the BCIREland database.

- Roost Records

These records are only report at a 1km level to protect the location of private dwellings and to protect such important bat records.

A 1km radius of the Irish grid Reference O2261924217 was requested.

### *2.3.2 Bat Conservation Landscape Favourability*

Bat Conservation Ireland produced a landscape conservation guide for Irish bat species using their database of species records collated during the 2000 - 2009 survey seasons. An analysis of the habitat and landscape associations of all bat species deemed resident in Ireland was undertaken and reported in Lundy *et al.*, 2011. The geographical area suitable for individual species was used to identify the core favourable areas of each species. This was produced as a GIS layer for local authorities and planners in order to provide a guide to the consideration of bat conservation. The island is divided into 5km squares and the landscape favourability of each 5km square for each species of bat was modelled. A caveat is attached to the model and it is that the model is based on records held on the BCIREland database, while core areas have been identified, areas outside the core area should not be discounted as unimportant as bats are a landscape species and can travel many kilometres between roosts and foraging areas nightly and seasonally. This model was used as part of the desktop study for this report.

## **2.4 Photographic Record**

A photographic record was completed for the survey and is presented throughout the report.

### 3. Bat Survey Results

#### 3.1 Daytime Inspections

A total of 5 buildings were surveyed on various dates in 2018, 2019, 2020 and 2021. Please note that three of these buildings (i.e. Aras Eibhear (x2 buildings) and Appledore) are not within the boundary of the current development proposal. But the survey results are provided for these additional buildings. The surveys undertaken were as follows:

- Daytime inspections
- Dusk (emergence) surveys
- Dawn surveys
- Static surveillance
- Night-time inspection
- IR & Thermal Imagery Filming

For ease of presentation of results, the following table summarises the results of each survey for each building within the proposed development site.

**Table 6: Building Survey Results.**

Building No.	Survey Details	Survey Results
<b>Building No. 1</b> <b>Barrington Tower</b> Large 2-storey house (no roof, fire damage) with intact tower.	2018 Summer Survey  Dusk Survey (19/8/2018) – 1 surveyor (located at front of building) and IR filming (courtyard).	Dusk Survey: CP x3 individuals and BLE x1 individual emerged from tower.  Foraging in trees: Leis, CP, SP
	2019 Summer Survey  Daytime inspection of internal space of tower and ladder accessible rooms of upper floors of main section of building (25/8/2019).  Dusk Survey (25/8/2019) – 1 surveyor (located at front of building) and IR filming (courtyard).  Dawn Survey (26/8/2019) – 2 surveyors, IR Filming (of Daubenton’s bat exit point recorded during Dusk Survey of 25/8/2019) and internal inspection of tower.  Static Surveillance (19/8/2019 to 20/8/2019 - 2 nights).	Daytime inspection: no bat droppings or evidence of bat usage was recorded in the accessible internal rooms of the house. BLE droppings recorded in tower (ground floor).  Dusk Survey: DAUB x11 individuals emerged from upstairs window. CP x4 individuals emerged from tower.  Dawn Survey: No bats recorded returning to roost in upstairs window (as per Dusk Survey results). BLE recorded swarming tower window. Internal inspection recorded a cluster of 7 individuals roosting in tower (ground floor).  Filming – no bats returned to building through this window.  Static Surveillance: bat species recorded on static unit located in tower (ground floor): BLE, SP, CP.
	2020 Summer Survey  Daytime inspection of internal space of tower and ladder accessible rooms of upper floors of main section of building (13/7/2020).  Dusk Survey (13/7/2020) – 1 surveyor (located at front of building)	Daytime inspection: no bat droppings or evidence of bat usage was recorded in the accessible internal rooms of the house. BLE droppings recorded in tower (ground floor) and 2 individuals noted roosting.  Dusk Survey (13/7/2020): BLE x3 individuals and CP x2 individuals emerged from tower.

	<p>Dusk Survey (28/7/2020) – 1 surveyor and IR filming (upstairs window).</p> <p>Static Surveillance (13/7/2020 to 17/7/2020 - 4 nights).</p> <p>*Note: additional bat species recorded on static unit (e.g. SP and Leis) were indicative of bats flying outside building by the structure of their calls.</p>	<p>Dusk Survey (28/7/2020): BLE x1 individual and CP x3 individuals emerged from tower. No bats detected emerging on IR film.</p> <p>Static Surveillance: bat species recorded on static unit located in tower (ground floor adjacent to corridor and open section modern extension): BLE, SP*, CP, <i>Myotis</i> spp. and Leis*.</p>
	<p>2021 Summer Survey</p> <p>Daytime inspection of internal space of tower and ladder accessible rooms of upper floors of main section of building (23/7/2021).</p> <p>Dusk Survey (23/7/2021) – 1 surveyor (located at front of building) and Thermal Imagery filming (upstairs window).</p> <p>Static Surveillance (28/7/2021 to 30/7/2021 - 2 nights).</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the accessible internal rooms of the house. BLE droppings recorded in tower (ground floor) and 2 individuals noted roosting.</p> <p>Dusk Survey (23/7/2021): BLE x2 individuals and CP x2 individuals emerged from tower. No bats detected emerging on Thermal Imagery film.</p> <p>Static Surveillance: bat species recorded on static unit located in tower (ground floor): BLE only.</p>
<p><b>Building No. 2</b>  <b>Large House (Aras Eibhear)</b>  2-storey house with large attic space.    This structure is not within the current development proposal.</p>	<p>2018 Summer Survey</p> <p>Dawn Survey (20/8/2018) – 1 surveyor</p>	<p>No bats recorded returning to building or foraging/commuting within the garden of this building.</p>
	<p>2019 Summer Survey</p> <p>Daytime inspection of internal rooms and attic space (25/8/2019)</p> <p>Dusk Survey (25/8/2019) – 1 surveyor</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space or the internal rooms of the house.</p> <p>Dusk Survey: no bats detected emerging from the house.</p>
	<p>2020 Summer Survey</p> <p>Daytime inspection of internal rooms and attic space (13/7/2020)</p> <p>Dusk Survey (13/7/2020) – 2 surveyors</p> <p>Static Surveillance (13/7/2020 to 17/7/2020 - 4 nights).</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space or the internal rooms of the house.</p> <p>Dusk Survey: no bats detected emerging from the house.</p> <p>Static Surveillance: no bats recorded on static unit located within the attic space.</p>
	<p>2021 Summer Survey</p> <p>Daytime inspection of internal rooms and attic space (23/7/2021)</p> <p>Dusk Survey (23/7/2021) – 1 surveyor</p> <p>Static Surveillance (23/7/2021 to 27/7/2021 - 4 nights) – 1 unit located in the attic space and a 2<sup>nd</sup> unit located in the garden.</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space or the internal rooms of the house.</p> <p>Dusk Survey: no bats detected emerging from the house.</p> <p>Static Surveillance: no bats recorded on static unit located within the attic space. No bats recorded foraging/commuting in the garden.</p>
<p><b>Building No. 3</b></p>	<p>2018 Summer Survey</p> <p>Dawn Survey (20/8/2018) – 1 surveyor</p>	<p>No bats recorded returning to building or foraging/commuting within the garden of this building.</p>

<p><b>Pool House (Aras Eibhear)</b> Single storey building with large attic space.</p> <p>This structure is not within the current development proposal.</p>	<p>2019 Summer Surveys</p> <p>Daytime inspection of internal rooms and attic space (25/8/2019)</p> <p>Dusk Survey (25/8/2019) – 1 surveyor</p> <p>Static Surveillance (19/8/2019 to 20/8/2019 - 2 nights).</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space or the internal rooms of the pool house.</p> <p>Dusk Survey: no bats detected emerging from the pool house.</p> <p>Static Surveillance: no bats recorded on static unit located within the attic space.</p>
	<p>2020 Summer Survey</p> <p>Daytime inspection of internal rooms and attic space (13/7/2021)</p> <p>Dusk Survey (13/7/2020) – 2 surveyors</p> <p>Static Surveillance (13/7/2020 to 17/7/2020 - 4 nights).</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space or the internal rooms of the house.</p> <p>Dusk Survey: no bats detected emerging from the pool house.</p> <p>Static Surveillance: no bats recorded on static unit located within the attic space.</p>
	<p>2021 Summer Surveys</p> <p>Daytime inspection of internal rooms and attic space (23/7/2021)</p> <p>Dusk Survey (23/7/2021) – 1 surveyor</p> <p>Static Surveillance (23/7/2021 to 27/7/2021 - 4 nights) – 1 unit located in the attic space and a 2<sup>nd</sup> unit located in the garden (This second unit was located in the garden to determine the bat activity levels in vicinity of the 2-storey house and pool house).</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space. A single dead bat (Common pipistrelle) was collected from the room where the pool is – dues to the extensive “no bat results” recorded by the array of annual surveys, it is deemed that this was a once-off incident of a bat entering the space and becoming trapped internally and dying. A number of dead birds were also noted within the pool room.</p> <p>Dusk Survey: no bats detected emerging from the pool house.</p> <p>Static Surveillance: no bats recorded on static unit located within the attic space. No bats recorded on the static unit and therefore no foraging/commuting in the garden.</p>
<p><b>Building No. 4 Bungalow A</b> Single storey building with large attic space.</p>	<p>2018 Summer Survey</p> <p>Dusk Survey (22/8/2018) – 1 surveyor</p>	<p>No bats recorded emerging from building. CP recorded foraging/commuting within the garden of this building, along treeline boundary of Barrington Tower.</p>
	<p>2019 Summer Survey</p> <p>Daytime inspection of internal rooms and attic space (25/8/2019)</p> <p>Dusk Survey (25/8/2019) – 1 surveyor</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space or the internal rooms of the attic.</p> <p>Dusk Survey: no bats detected emerging from the building.</p>
	<p>2020 Summer Survey</p> <p>Daytime inspection of internal rooms and attic space (13/7/2020)</p> <p>Dusk Survey (18/7/2020) – 1 surveyor</p> <p>Static Surveillance (13/7/2020 to 17/7/2020 - 4 nights).</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space or the internal rooms of the attic.</p> <p>Dusk Survey: no bats detected emerging from the building.</p> <p>Static Surveillance: no bats recorded on static unit located within the attic space.</p>

	<p>2021 Summer Surveys</p> <p>Daytime inspection of internal rooms and attic space (23/7/2021)</p> <p>Dusk Survey (23/7/2021) – 1 surveyor</p> <p>Static Surveillance (23/7/2021 to 27/7/2021 - 4 nights).</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space or the internal rooms of the attic.</p> <p>Dusk Survey: no bats detected emerging from the building.</p> <p>Static Surveillance: no bats recorded on static unit located within the attic space.</p>
<p><b>Building No. 5</b></p> <p><b>Bungalow B</b> <b>(Appledore)</b></p> <p>Single storey building with large attic space.</p> <p>This structure is not within the current development proposal.</p>	<p>2019 Summer Survey</p> <p>Daytime inspection of internal rooms and attic space (25/8/2019)</p> <p>Dawn Survey (26/8/2019) – 1 surveyor</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space of building.</p> <p>Dawn Survey: no bats detected swarming potential points of entry.</p>
	<p>2020 Summer Survey</p> <p>Daytime inspection of internal rooms and attic space (13/7/2020)</p> <p>Dawn Survey (18/7/2020) – 1 surveyor</p> <p>Static S Surveillance (13/7/2020 to 17/7/2020 – attic space</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space of building.</p> <p>Dawn Survey: no bats detected swarming potential points of entry.</p> <p>Static Surveillance: no bats recorded on static unit located within the attic space.</p>
	<p>2021 Summer Survey</p> <p>Daytime inspection of internal rooms and attic space (23/7/2021)</p> <p>Static Surveillance – attic space</p> <p>Static Surveillance – to rear of building</p>	<p>Daytime inspection: no bat droppings or evidence of bat usage was recorded in the attic space of building.</p> <p>No bats recorded on both static units.</p>

Note: Leis = Leisler's bat, CP = common pipistrelle, SP = soprano pipistrelle, BLE = brown long-eared bat, Daub = Daubenton's bat.



Plate 1: Barrington Tower, Brennanstown Rd. Dublin 18.



Plate 2: Barrington Tower, Brennanstown Rd. Dublin 18.



### 3.1.1 Tree Potential Bat Roost (PBRs) Inspection

There are a large number of trees adjacent to Barrington Tower deemed to be suitable as bat roosts. A Phase 1 survey (25/8/2019) recorded that a large number of the Monterey Cypress trees were Category 2 trees as well as one additional tree (Tree Tag 2665 – Ornamental Cheery). A Phase 2 (17/1/2020) survey, with the assistance of a tree climber under the supervision of the bat ecologist, did not recorded any bat evidence within the trees examined.

Bat surveys in vicinity of the Monterey Cypress trees were undertaken on 25/6/2019 (dusk), 26/8/2019 (dawn), 13/7/2020 (dusk) and 23/7/2021 (dusk) and not bats were recorded emerging / or swarming around the trees.

Trees, within the Barrington section, identified as PBRs are listed in the table below (22 trees), all of which are Category 2 PBRs. In relation to the Quality value assigned by the Tree Survey and Arboricultural Report, the majority of the PBR trees are Quality C2 trees.

**Table 7: Static Bat Detectors deployed during Static Bat Detector Surveys.**

Tree Tag No.	Tree Species	PRFs	PBR Category	Quality Category
2665	Ornamental Cherry	Dead wood	Category 2	Quality U
2691	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2700	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2703	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2728	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2729	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2733	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2735	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2742	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2745	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2747	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2748	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2755	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2756	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2761	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2762	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2764	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2771	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2783	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2785	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2786	Monterey Cypress	Dead wood, splits	Category 2	Quality C2
2790	Monterey Cypress	Dead wood, splits	Category 2	Quality C2

The Tree Survey and Arboricultural Report lists the trees proposed to be felled as part of the proposed development (Figure 3a). This list all 22 trees identified as PBRs.

<b>Barrington Tower</b>	
<b>Category A</b>	None
<b>Category B</b>	2669, 2676, 2677, 2679, 2680, 2702, 2812, 2813 and 2743,
<b>Category C</b>	2664, 2668, 2671, 2672, 2675, 2678, 2681, 2682, 2683, 2684, 2685, 2686, 2691 to 2700, 2701, 2701a, 2702b, 2703 to 2742, 2744 to 2810, 2808,
<b>Category U</b>	2665, 2666, 2670, 2675, 2829, 2830 and 2831,
<b>Groups/Hedges</b>	Hedge 1, Hedge 2, Hedge 3, Hedge 4, Hedge 5, Hedge 6, Hedge 7, Hedge 8, Hedge 9 and Hedge 10, group 2815, Tree Line A, Cypress Group A,
<b>Winterbrook</b>	
<b>Category A</b>	None
<b>Category B</b>	2, C, D, J, K, M, O, P, Q, R, S and T.
<b>Category C</b>	3, A, B, E, F, G, H, I, L, N, U, V, W, X, Y, Z, 8, 10 and 12
<b>Category U</b>	None
<b>Groups/Hedges</b>	Tree Line 1

Table 2, Itemised Tree Loss List

Figure 3a: Table 2 from The Tree Survey and Arboricultural Report list the trees proposed to be felled.

The following is the Tree Impacts Plan (Figure 3b) and details where tree loss is proposed. This is principally around the location of Barrington Tower. The eastern and south-eastern boundaries as well as sections of the western boundary will remain, which is important for connectivity to the main foraging resource of the adjacent woodland river valley.



Figure 3b: Tree Impacts Plan (Source: The Tree File).

### 3.1.2 Bat Habitat & Commuting Routes Mapping

There are extensive hedgerows, dense treelines and linear woodland within northern section and along the boundaries of the proposed development site. The central area of the southern half of the proposed development site is open grassland. The Carrickmines Stream and wooded valley is located along the southern boundary of the proposed development site. The habitat types, with reference to Fossit (2000) were recorded both within the survey area and adjacent to the survey area.

**Table 8a: Habitat types present within survey area.**

Habitat	Yes	Habitat	Yes	Habitat	Yes	Habitat	Yes
Cultivated land		Salt marshes		Exposed rock		Fens/flushes	
Built land	√	Brackish waters		Caves		Grasslands	√
Coastal structures		Springs		Freshwater marsh		Scrub	√
Shingle/gravel		Swamps		Lakes/ponds		Hedges/treelines	√
Sea cliffs/islets		Disturbed ground	√	Heath		Conifer plantation	
Sand dunes		Watercourse		Bog		Woodland	

**Table 8b: Habitat types present adjacent to survey area.**

Habitat	Yes	Habitat	Yes	Habitat	Yes	Habitat	Yes
Cultivated land		Salt marshes		Exposed rock		Fens/flushes	
Built land	√	Brackish waters		Caves		Grasslands	√
Coastal structures		Springs		Freshwater marsh		Scrub	√
Shingle/gravel		Swamps		Lakes/ponds		Hedges/treelines	√
Sea cliffs/islets		Disturbed ground	√	Heath		Conifer plantation	
Sand dunes		Watercourse	√	Bog		Woodland	√

## 3.2 Night-time Bat Detector Surveys

### 3.2.1 Walking Transects

Walking transects were undertaken post dusk survey to determine the potential foraging and commuting habitats within the proposed development.

#### 3.2.1.1 2018 Walking Transect

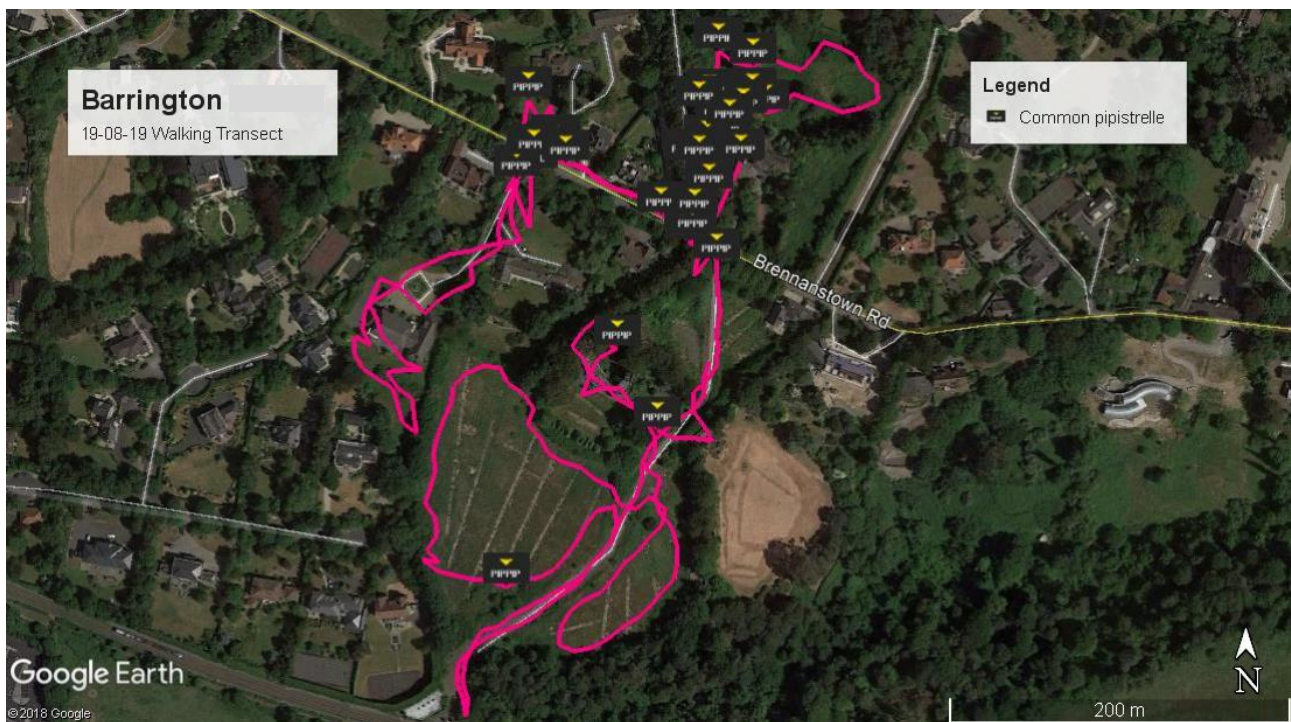
The walking transect completed (19/8/2018) was primarily around Barrington House towards the river / Luas line and around the garden of the 2-storey House and Pool House. No bats were detected in the latter garden while common pipistrelles and Leisler's bats were detected foraging and/or commuting around the trees adjacent to Barrington Tower. A low level of bat activity was recorded during the walking transect.

#### 3.2.1.2 2019 Walking Transects

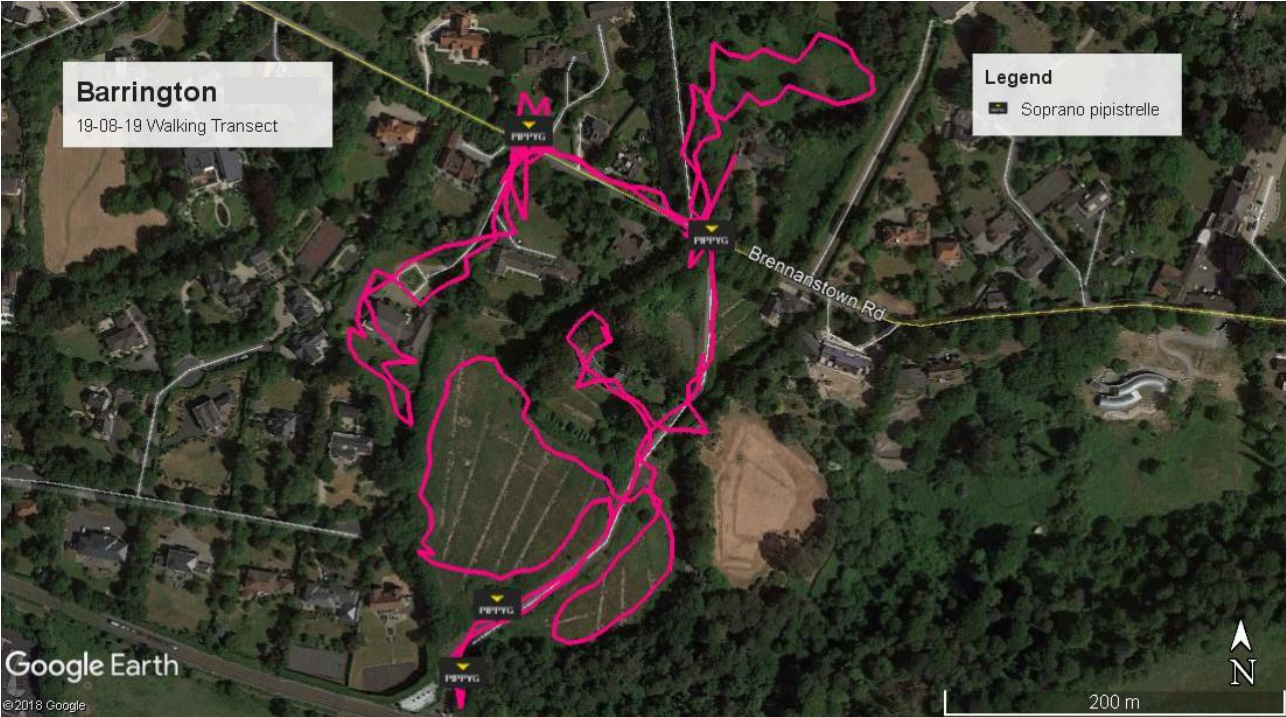
Two extensive walking transects were completed in 2019 (19/8/2019 and 24/8/2019). The following maps provide details of the walking route and the bat species recorded. A total of four species of bat was recorded on 19/8/2019: common pipistrelle, soprano pipistrelle, Leisler's bat and brown long-eared bat. Common pipistrelle was the most frequently recorded bat and this was primarily recorded north of Brennanstown Road. Low levels of bat encounters were recorded for the remaining three bat species.

Figure 4a: Results of walking transect completed on 19/8/2019 (Pink line is walking route).

#### a) Common pipistrelle



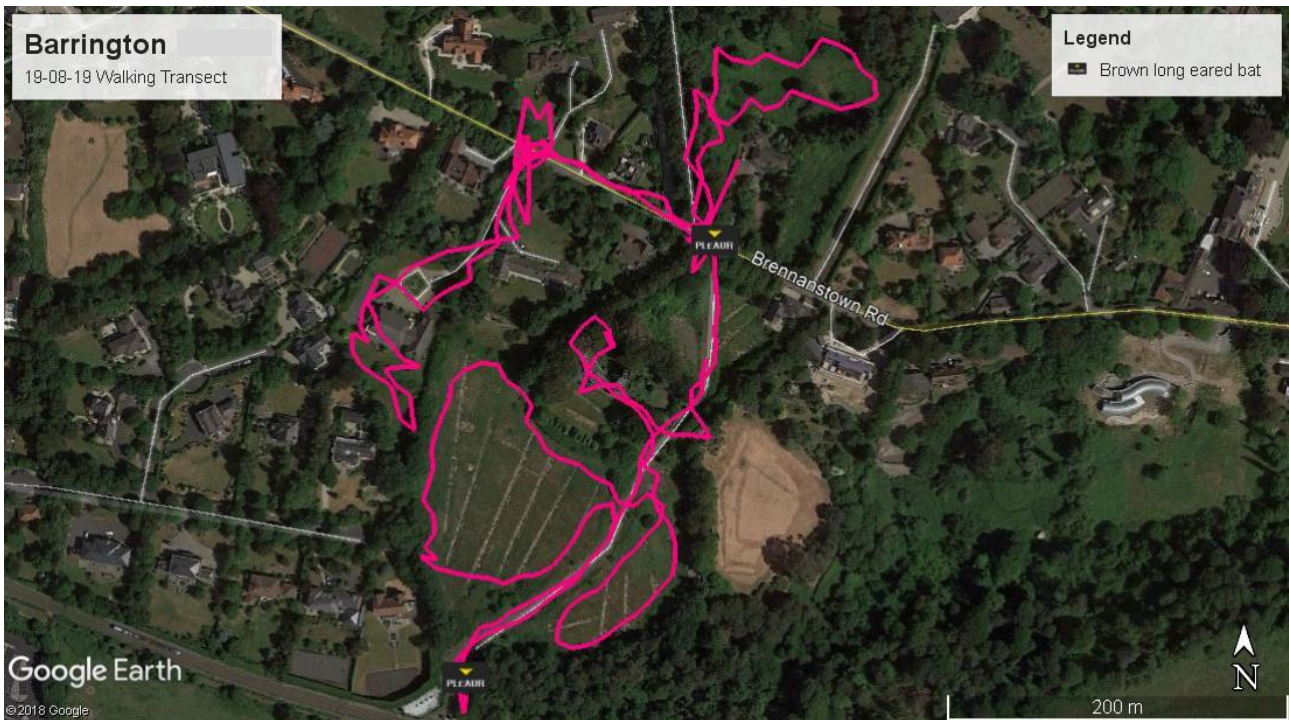
b) Soprano pipistrelle



c) Leisler's bat



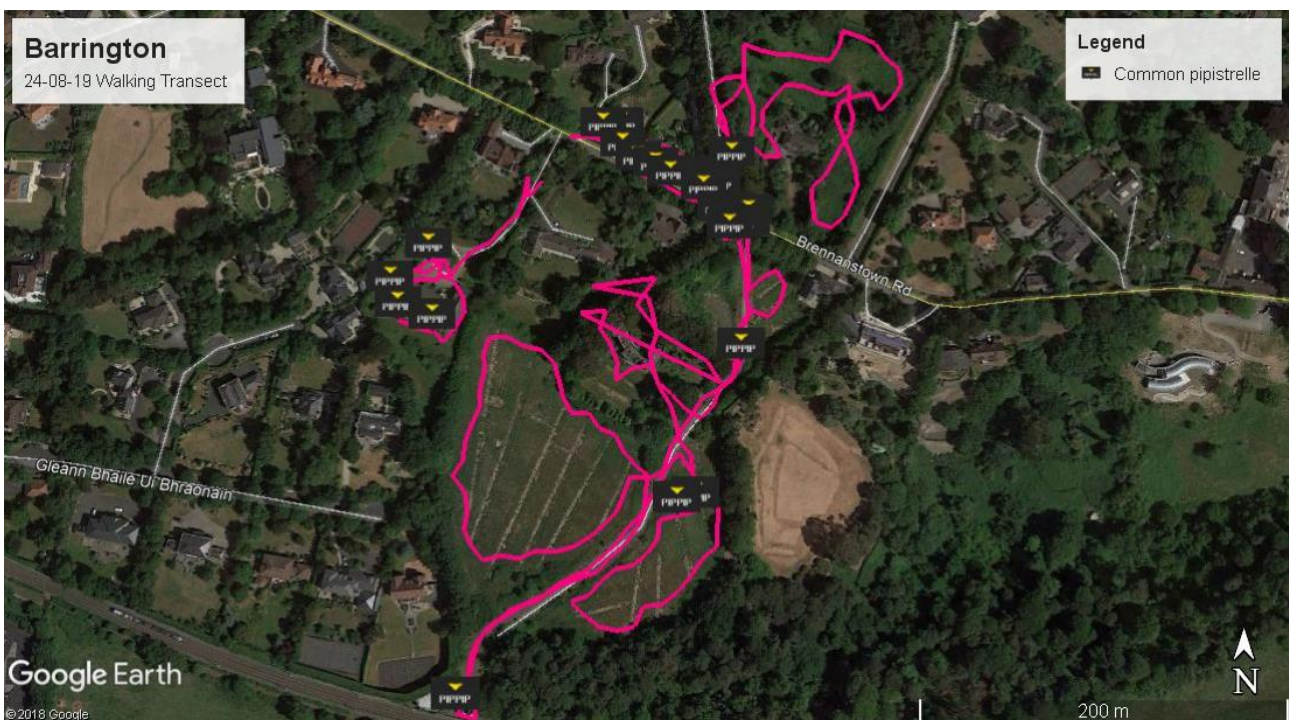
d) Brown long-eared bat



The following maps provide details of the walking route and the bat species recorded during the second walking transect. A total of five species of bat was recorded on 24/8/2019: common pipistrelle, soprano pipistrelle, Leisler's bat, *Myotis* species and brown long-eared bat. Common pipistrelle was the most frequently recorded bat and this was primarily recorded north of Brennanstown Road. Low levels of bat encounters were recorded for the remaining four bat species.

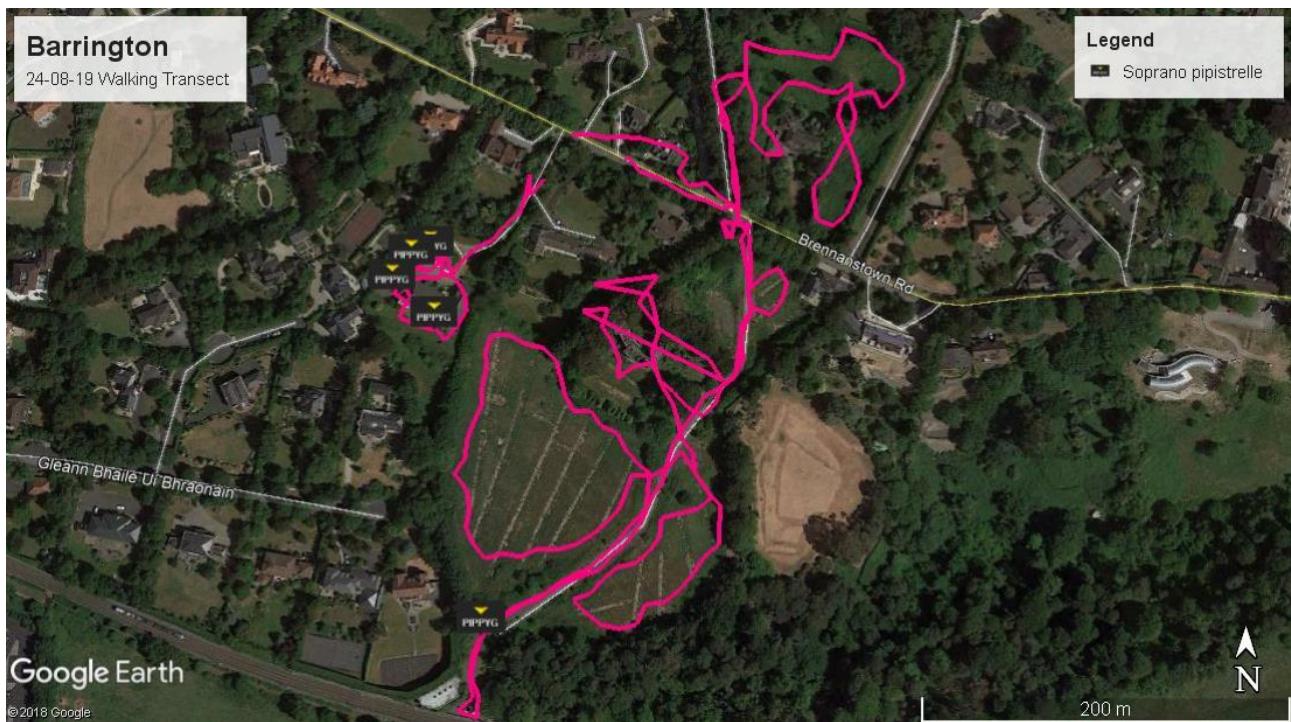
Figure 4b: Results of walking transect completed on 24/8/2019 (Pink line is walking route).

a) Common pipistrelle

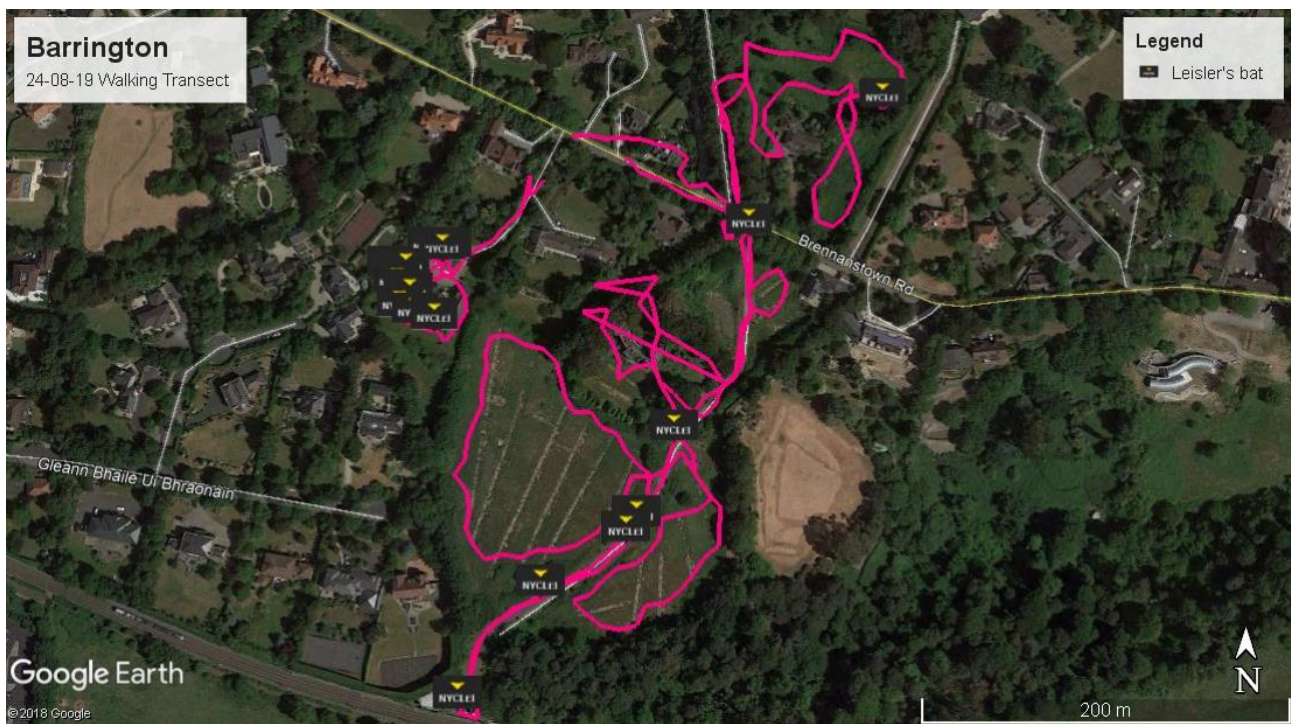


During this transect, soprano pipistrelles and Leisler's were recorded foraging in the garden of the 2-storey house / pool house. This pattern of activity was rarely recorded in this area in 2018 or additional surveys completed in 2020 and 2021.

b) Soprano pipistrelle



c) Leisler's bat





These two species were recorded in low levels and *Myotis* species was only recorded at the river located along the southern boundary of the proposed development site.

d) Brown long-eared bat



e) *Myotis* species



### 3.2.1.3 2020 & 2021 Walking Transects

The walking transect completed (13/7/2020) was primarily around Barrington House towards the river / Luas line and around the garden of the 2-storey House (Aras Eibhear) and Pool House (Aras Eibhear). No bats were detected in the latter garden while common pipistrelles and Leisler's bats were detected foraging and/or commuting around the trees adjacent to Barrington Tower, along the treeline leading to the river / Luas line. A low level of bat activity was recorded during the walking transect.

The walking transect completed (23/7/2021) was primarily around Barrington House towards the river / Luas line and around the garden of the 2-storey House (Aras Eibhear) and Pool House (Aras Eibhear). No bats were detected in the latter garden while common pipistrelles, soprano pipistrelles and Leisler's bats were detected foraging and/or commuting around the trees adjacent to Barrington Tower. A low level of bat activity was recorded during the walking transect. The following maps details the location of bat encounters. Common pipistrelles were the most frequently recorded bat species.

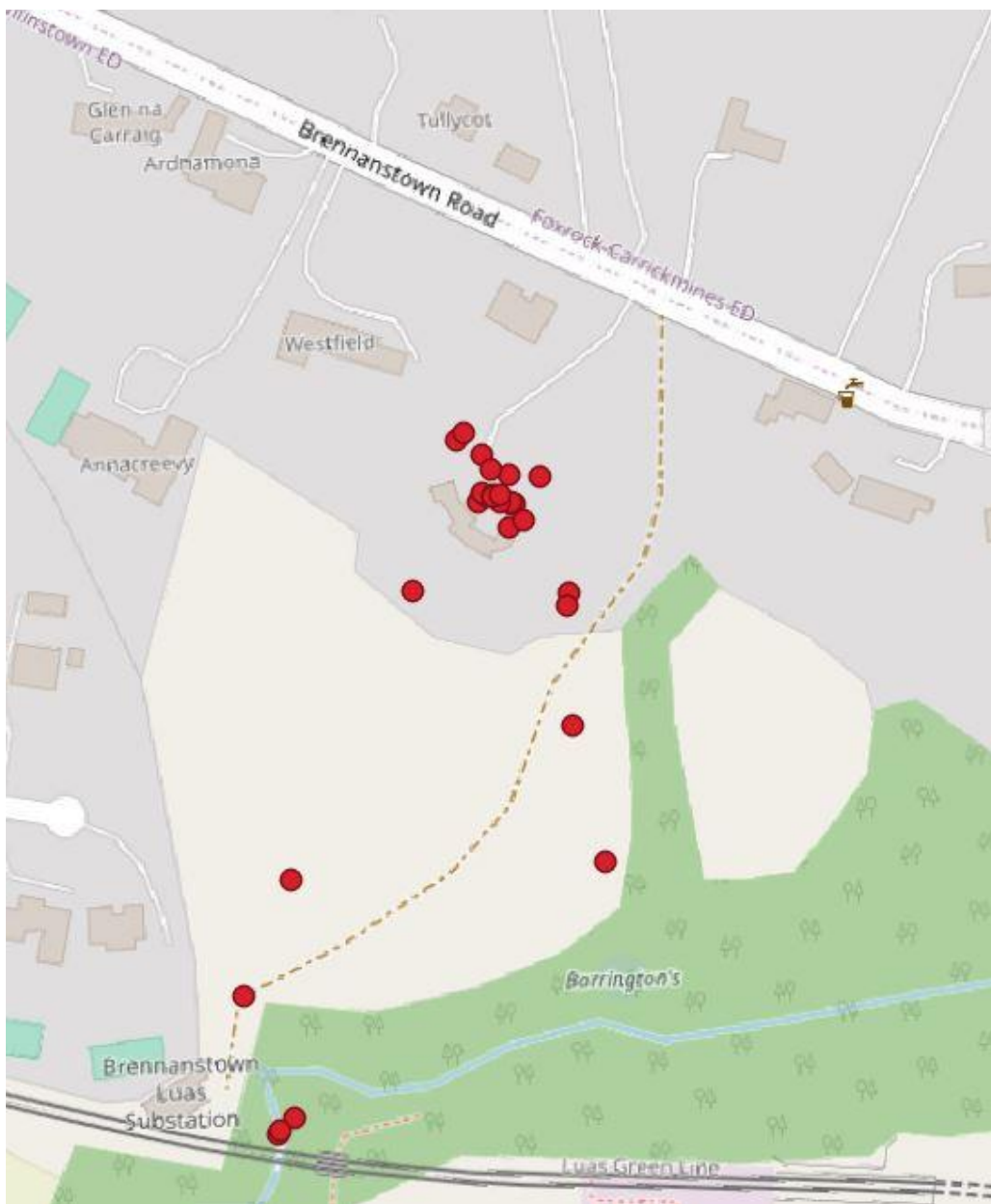


Figure 5a: Common pipistrelles bat encounters: 2021 walking transect.

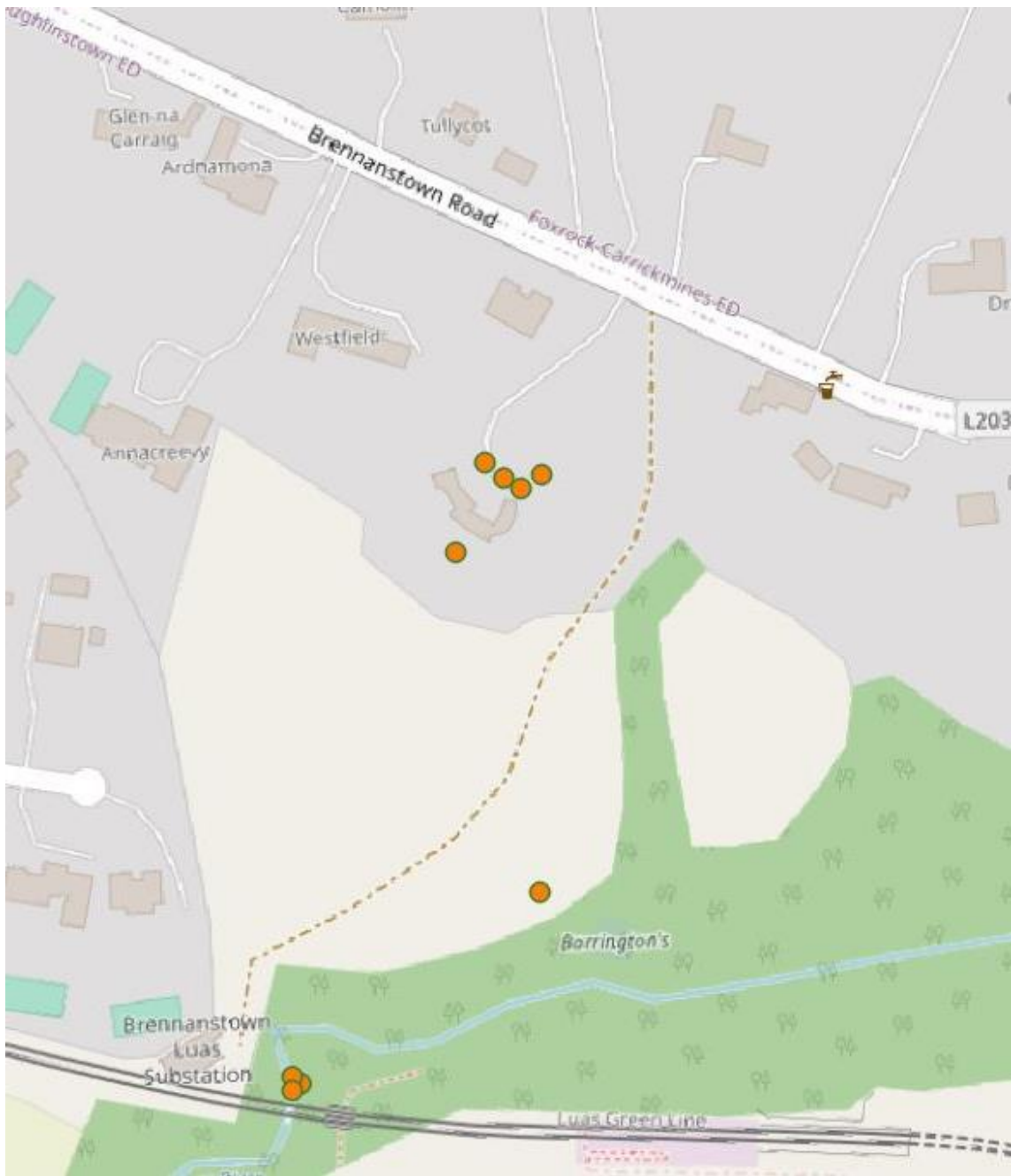


Figure 5b: Soprano pipistrelles bat encounters: 2021 walking transect.

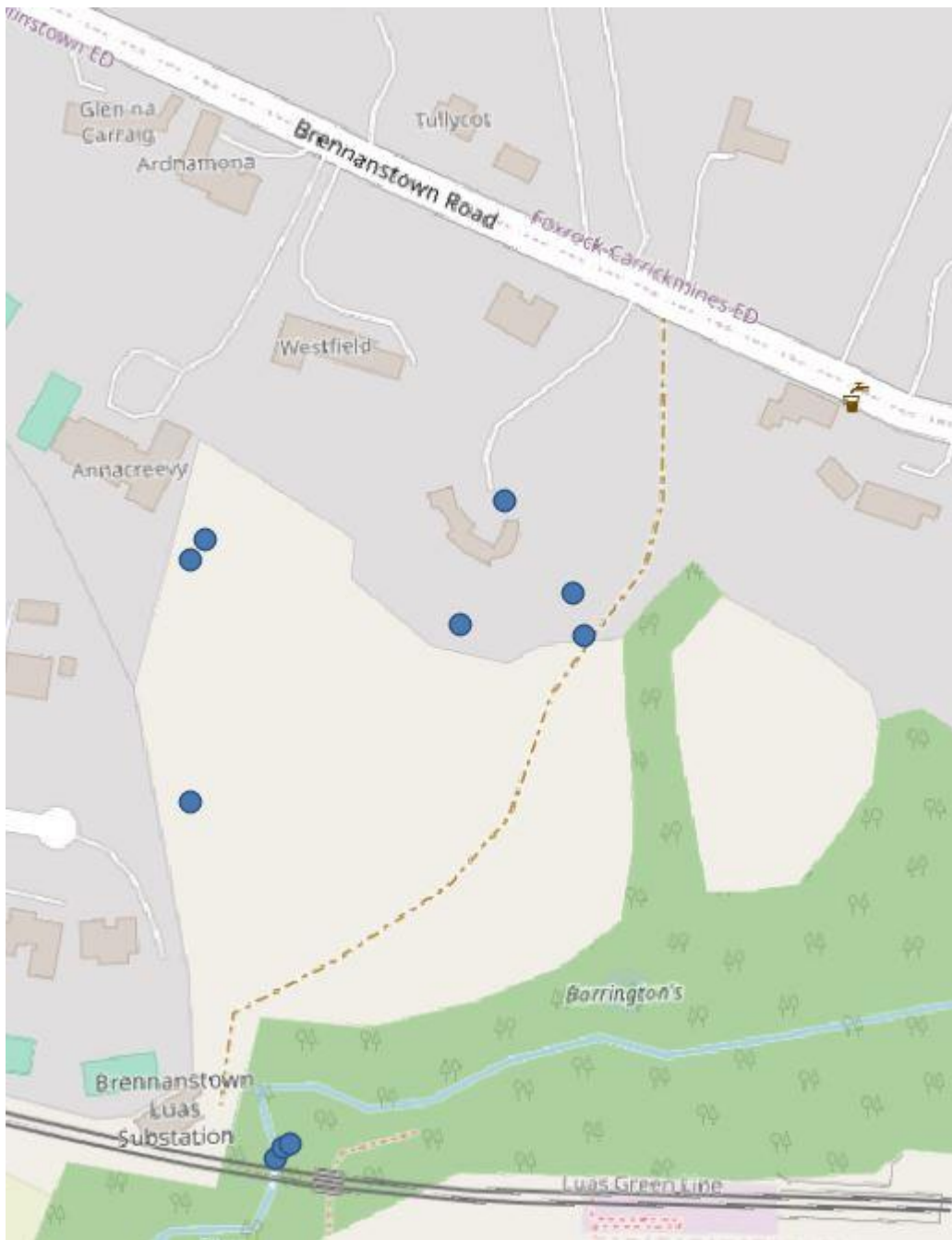
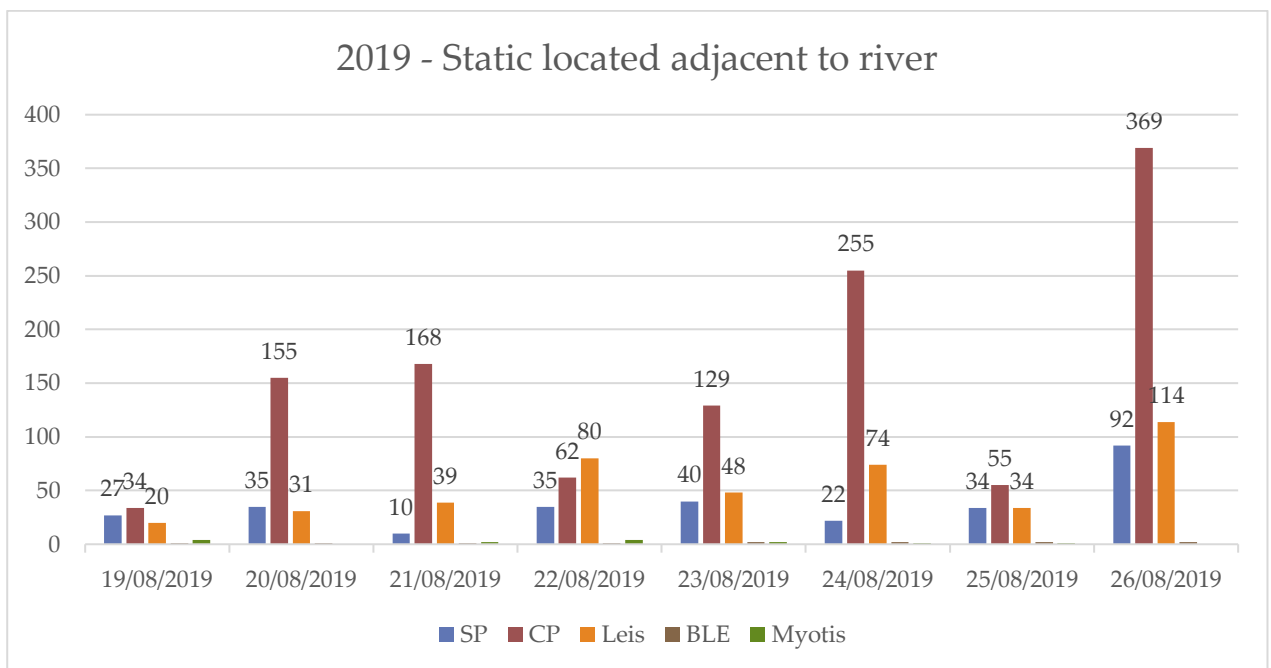
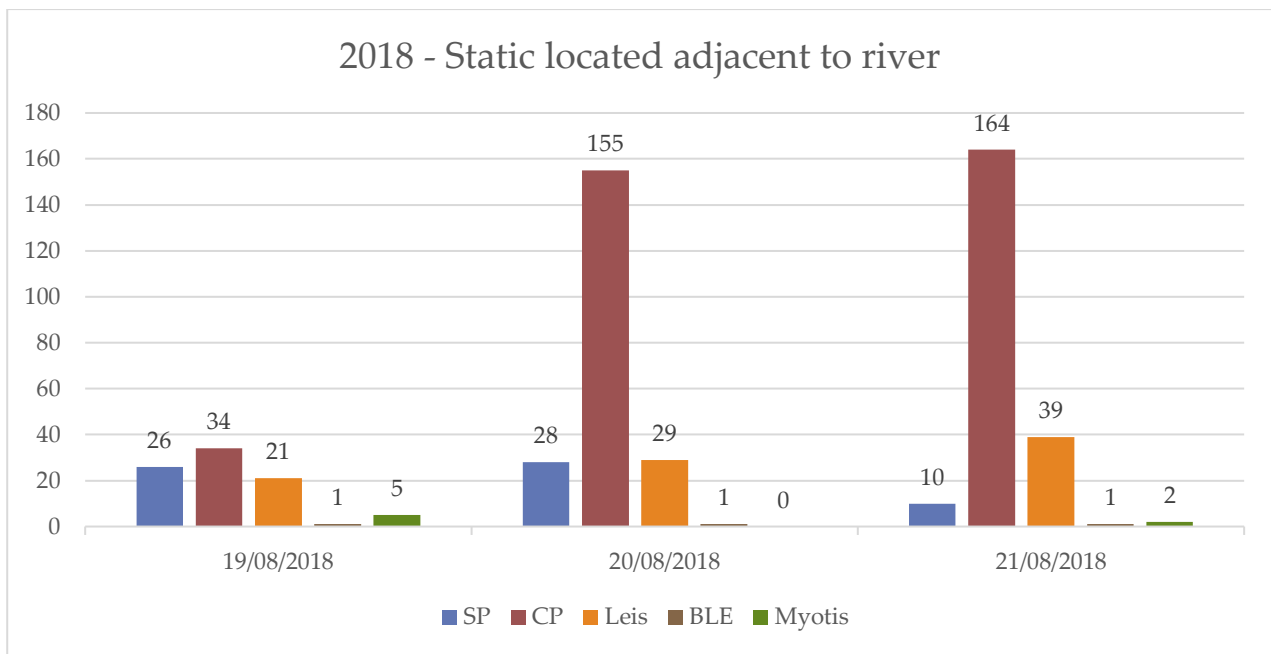


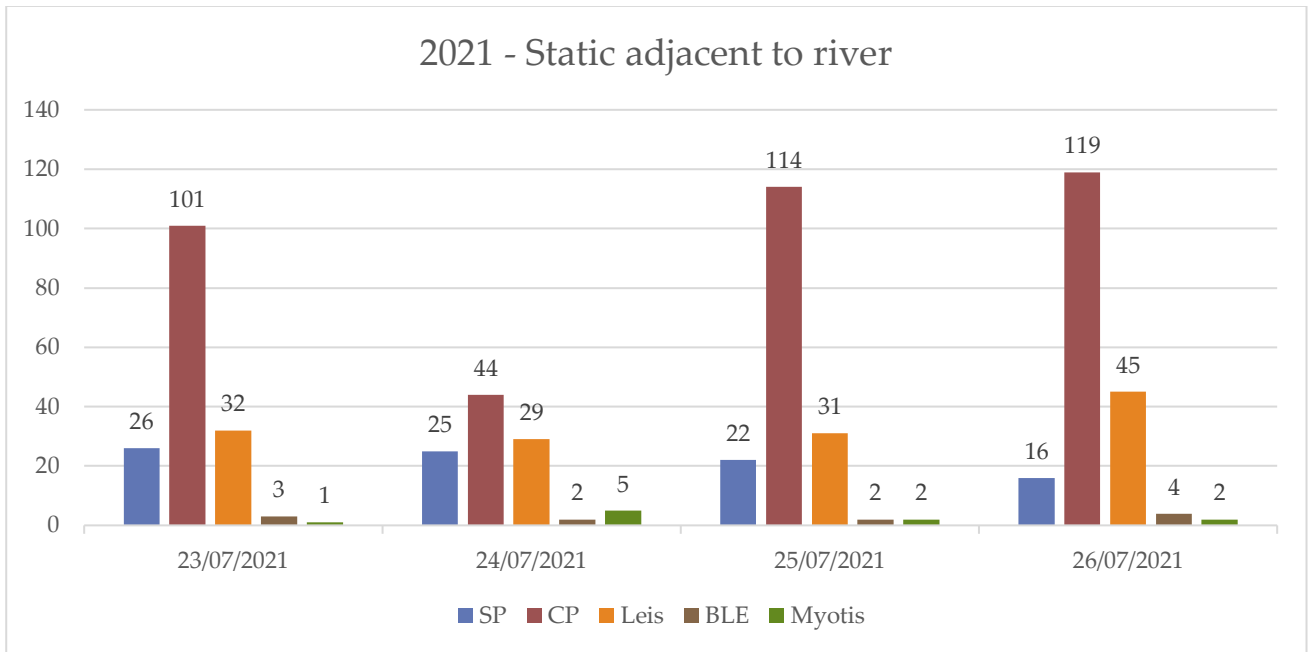
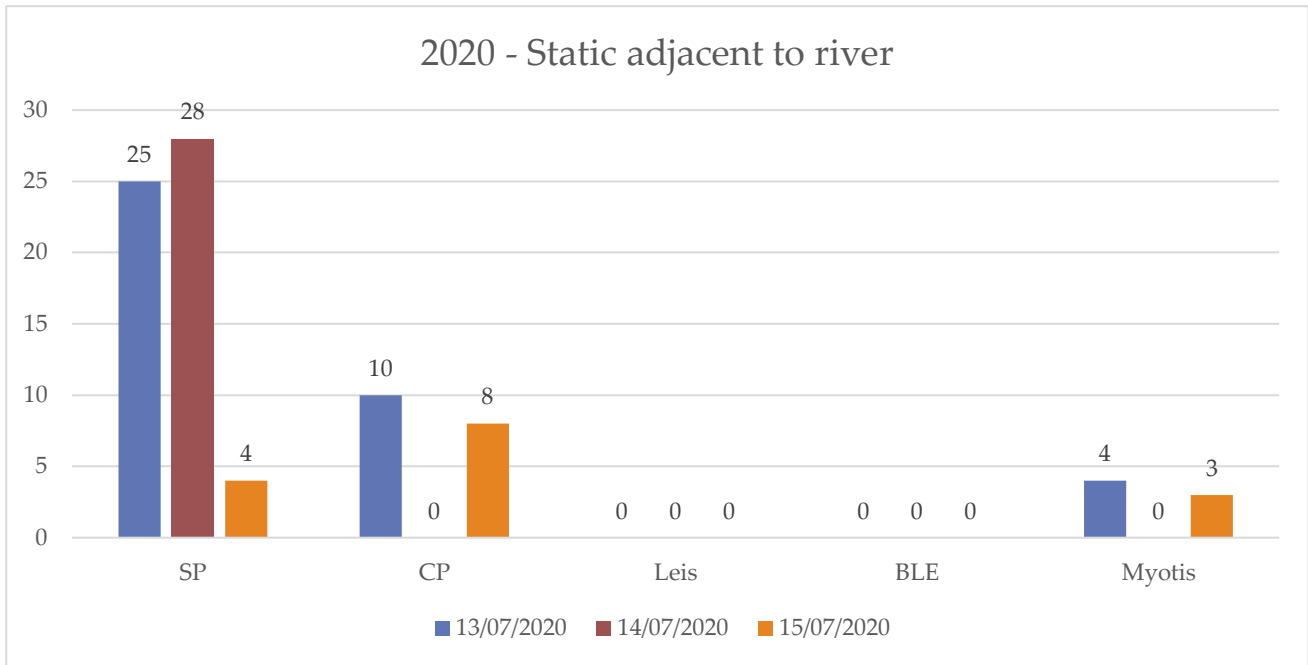
Figure 5c: Leisler's bat encounters: 2021 walking transect.

### 3.2.2 Passive Static Bat Detector Survey

Static units were located adjacent to the river (Carrickmines Stream) and occasionally along the laneway north of Brennanstown Road to provide a baseline in relation to potential bat activity of habitats deemed suitable for foraging and commuting bats. The following graphs provided an annual comparison of the bat activity levels adjacent to the river located along the southern boundary of the proposed development site. A total of five bat species were recorded annually at this location and common pipistrelle was the most frequently recorded. Some of the *Myotis* species bat passes were confirmed as Daubenton's bats, particularly those calls recorded adjacent to the river along the southern boundary. This is highly likely as this species of bat has a preference for foraging over water.

Figure 6a: Total number of bat passes per species recorded nightly during the 2018, 2019, 2020 and 2021 static surveillance of river location along southern boundary of the proposed development site.





As a general guide, activity level is determined as follows: Low = <10 bat passes/hr; Medium = >10 - <50 bat passes/hr; High = >50 bat passes/hr). The static units recorded for approximately 8 hours per night. Therefore the activity levels for each bat species (presented in Table 9) is as follows:

- Common pipistrelle: Low to Medium
- Soprano pipistrelle: Low
- Leisler's bat: Low
- *Myotis* spp.: Low
- Brown long-eared bat: Low

*NOTE: The behaviour of bats during commuting and foraging greatly influences the level of bat passes recorded on static units. The number of bat passes do not equate to the number of bats flying past the static unit. Pipistrellus species tended to foraging as they commute and therefore are regularly observed flying up and down a treeline or hedgerow before moving on in the landscape. Leisler's bats fly high in the sky and therefore can be observed flying fast through the landscape, occasionally foraging over treetops as they*

commute. As a consequence, *Pipistrellus* species bat activity tends to result in a higher number of bat passes recorded on static units compared to *Leisler's* bats. In relation to other bat species recorded, as they tend to be less common in the landscape compared to common pipistrelles, soprano pipistrelles and *Leisler's* bats, their recorded presence is notable. Exceptions to this would include *Daubenton's* bats on a waterway or a static located adjacent to a known bat roost.

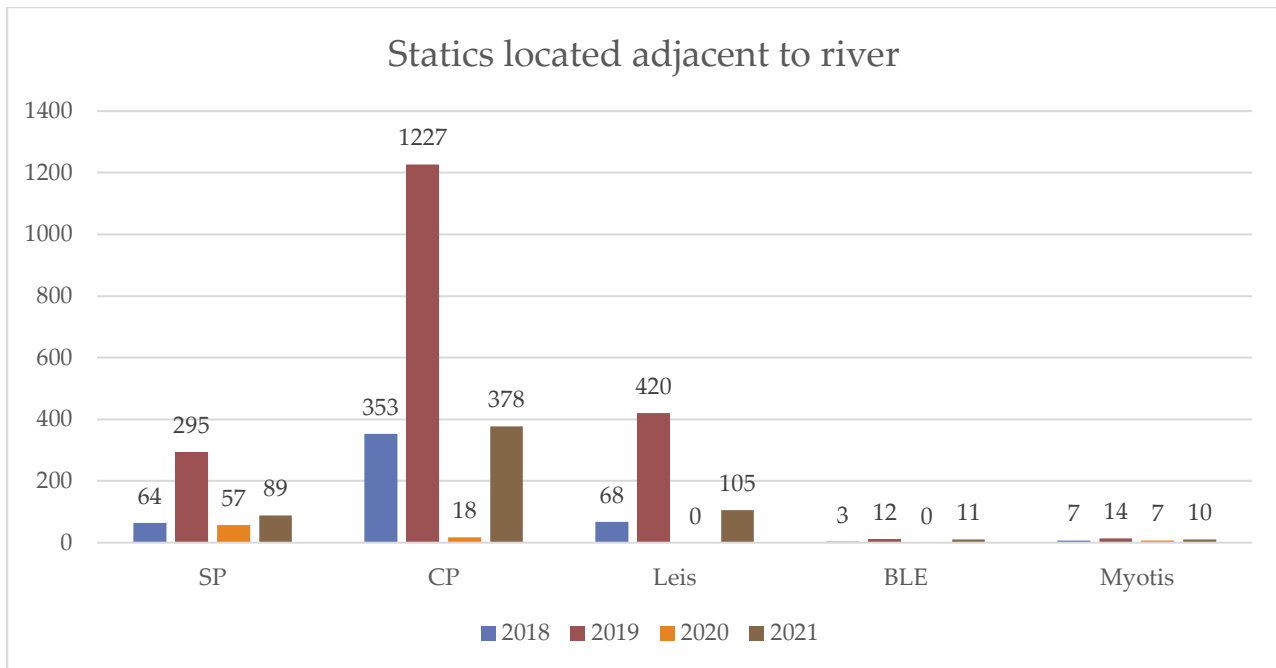


Figure 6b: Total number of bat passes per species recorded in the 2018, 2019, 2020 and 2021 Static surveillance of river location along southern boundary of the proposed development site.

Table 9: Bat activity levels for each of the bat species recorded on annual static surveillance at the river.

Date	SP	Level	CP	Level	Leis	Level	BLE	Level	Myotis	Level
2018 (3)	64	3	353	15	68	3	3	0.1	7	0.3
2019 (8)	295	5	1227	19	420	7	12	0.2	14	0.2
2020 (3)	57	2	18	1	0	0	0	0	7	0.3
2021 (4)	89	3	378	12	105	3	11	0.3	10	0.3

### 3.3 Summary of Results

The following are the principal results recorded:

- Barrington tower is a roost for brown long-eared bats and common pipistrelle bats and occasionally for *Daubenton's* bats.
- No bats were recorded roosting in the remaining four buildings located within the proposed development site.
- A total of five species of bat was recorded foraging and commuting with the proposed development site.
- The principal habits for foraging bats were the mature trees associated with the river along the southern boundary, mature trees around Barrington Tower, laneway adjacent to Appledore and occasionally the boundary of the 2-storey house (*Aras Eibhear*). Please note that the latter two areas are not in the current development proposal.

- 22 trees were identified as PBRs but not bats were recorded roosting within the trees during Phase 1 and Phase 2 surveys and dusk and dawn surveys completed.

### 3.4 Desktop Review

#### 3.4.1 Bat Conservation Ireland Database

Data for a 1km radius of the Irish grid Reference O2261924217 was received from Bat Conservation Ireland. The county records for each species is depicted on maps in Section 9.

The results are as follows:

There are eleven Ad Hoc bat detector records

- Eleven consultancy surveys recorded *Myotis* spp., Natterer's bat, Daubenton's bat, brown long-eared bat, soprano pipistrelles, common pipistrelles and Leisler's bats.

#### 3.4.2 Bat Conservation Landscape Favourability

Figure 7 depicts the Bat Conservation Ireland Landscape Favourability Model (Lundy *et al.*, 2011). The county is divided into 5km squares and the different colouring of the square, indicates the favourability of the 5km square for bats. This GIS layer is hosted on the NBDC website [www.biodiversityireland.ie](http://www.biodiversityireland.ie). The proposed development site is approximately location in the Blue Box. This 5km square has an overall High favourability for bats, in general. The percentage favourability for each bat species is presented in the table below. The 5km square has High favourability for the three of the five species of bat recorded during the surveys: common pipistrelle, soprano pipistrelle and Leisler's bat and a Medium favourability for the remaining bat species recorded: brown long-eared bat and Daubenton's bat.

**Table 10: 5km Square Landscape Favourability value for individual bat species (Source: [www.biodiversityireland.ie](http://www.biodiversityireland.ie)).**

Bat species	5km Square
Common pipistrelle	49% (High)
Soprano pipistrelle	48% (High)
Nathusius' pipistrelle	10% (Medium)
Leisler's bat	50% (High)
Brown long-eared bat	34% (Medium)
Daubenton's bat	22% (Medium)
Natterer's bat	37% (Medium to High)
Whiskered bat	38% (Medium to High)
Lesser horseshoe bat	0% (Not suitable)





Figure 7: Bat Landscape Favourability Model (All Bats) (Source: NBDC). Blue square – approximate location of proposed development.

### 3.5 Survey Constraints & Survey Summary

The following is a summary of the surveying completed for this project:

**Table 11: Survey Summary.**

<b>Category</b>	<b>Discussion</b>
<b>Timing of surveys</b>	Summer surveys – during appropriate bat activity months of July and August  Winter surveys – January 2020: appropriate survey month
<b>Weather conditions</b>	Activity surveys – good weather conditions
<b>Survey effort</b>  <b>Total Hours of night-time surveys, annual daytime inspections and winter survey:</b>  SUB-TOTAL = 62 hours  <b>Total hours of static surveillance</b>  SUB-TOTAL = 616 hours  <b>TOTAL = 678 hrs</b>	Summer Surveys 2018 – 2 dusk, 1 dawn surveys (1 surveyor) and walking transect 2019 – 2 walking transects, 1 dusk (3 surveyors), 1 dawn (3 surveyors) and filming 2020 – 2 dusk surveys (3 surveyors) and filming 2021 – 1 dusk survey (3 surveyors), 1 walking transect and filming  Winter Surveys 2020 – Tree surveys  Static Surveillance 2018 – 1 unit (3 nights) 2019 - 5 units (1-8 nights) 2020 – 7 units (3-4 nights) 2021 – 8 units (2-4 nights)
<b>Equipment</b>	Detector in Barrington Tower during 2021 survey failed to record. So additional static surveillance was undertaken. All other units were in good working order.
<b>Access</b>	Limited access to the internal space of Barrington Tower due to fire damage and therefore safety precautions. However, additional filming and static surveillance was undertaken to gather information on bat usage. All other buildings were fully accessed for daytime inspections.

There were some survey constraints in relation fully undertaking an internal inspection of Barrington Tower, but additional night-time survey works provides sufficient information to undertaken the bat assessment.

A large volume of bat surveying was undertaken for this bat assessment. Surveying was completed according Collins, 2016.

This bat report addresses Item 6 of An Bord Pleanála's Opinion which requires completion of 'an up to date ecological impact assessment, inclusive of a Bat Survey. A full EclA has been completed by Altamar.

It is therefore deemed that the survey work completed is adequate in order to complete the aims of the bat survey.

## 4. Bat Ecological Evaluation

### 4.1 Bat Species Recorded

Five bat species were recorded in total by the array of bat surveys completed for this survey site.

Three of the bat species recorded were common pipistrelle, Leisler's bat and soprano pipistrelle and these are the three most common bat species in Ireland.

Common pipistrelle was the most frequently encountered bat species and consistently recorded roosting in Barrington Tower in low numbers. This is likely to be a satellite roost. According to Figure 20 of Marnell *et. al* (2022), the conservation significance of this roost is deemed to be Low - "Small numbers of common species. Not a maternity roost". A low to medium level of bat activity was recorded for this species of bat within the proposed development site.

Leisler's bats were recorded commuting into the survey area from a northerly direction towards the southern boundary of the proposed development. A low level of bat activity was recorded for this species of bat within the proposed development site.

While soprano pipistrelles were recorded foraging and commuting within the survey area, the timing of their encounters indicated that they travelled some distance before arriving to forage and therefore the roosting sites are not within the proposed development site or immediately adjacent to it. A low level of bat activity was recorded for this species of bat within the proposed development site.

The remaining two bat species are considered to be less common in Ireland.

*Myotis* spp. calls were recorded during static surveillance and walking transects. Daubenton's bat were confirmed roosting in the Barrington Tower during one dusk survey and due to the fact that this species was recorded roosting on one occasion during the four years of the surveys, it is likely to have been a day roost. According to Figure 20 of Marnell *et. al* (2022), the conservation significance of this roost is deemed to be Medium - "Small numbers of rarer species. Not a maternity roost". This species was also recorded on the Carrickmines Stream and overall a low level of bat activity was recorded for this species of bat within the proposed development site.

Brown long-eared bat was also occasionally recorded during the walking transect and on the static surveillance. A small roost was consistently recorded in the tower (ground floor) of Barrington Tower and this roost is likely to be a satellite roost. According to Figure 20 of Marnell *et. al* (2022), the conservation significance of this roost is deemed to be Medium - "Small numbers of rarer species. Not a maternity roost". A low level of bat activity was recorded for this species of bat within the proposed development site.

#### Leisler's bat

- Leisler's bat is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national Leisler's bat population is considered to be significantly increasing (Aughney *et al.*, 2021).
- The modelled Core Area for Leisler's bats is a relatively large area that covers much of the island of Ireland (52,820km<sup>2</sup>). The Bat Conservation Ireland Irish Landscape Model indicated that the Leisler's bat habitat preference has been difficult to define in Ireland. Habitat modelling for Ireland shows an association with riparian habitats and woodlands (Roche *et al.*, 2014). The landscape model emphasised that this is a species that cannot be defined by habitats preference at a local scale compared to

other Irish bat species but that it is a landscape species and has a habitat preference at a scale of 20.5km.

### **Common pipistrelle**

- Common pipistrelle is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national common pipistrelle population is considered to be significantly increasing (Aughney *et al.*, 2021).
- The modelled Core Area for common pipistrelle is a relatively large area that covers much of the island of Ireland (56,485km<sup>2</sup>). The Bat Conservation Ireland Irish Landscape Model indicated that the common pipistrelle selects areas with broadleaf woodland, riparian habitats and low density urbanization (<30%) (Roche *et al.*, 2014).

### **Soprano pipistrelle**

- Soprano pipistrelle is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national soprano pipistrelle population is considered to be significantly increasing (Aughney *et al.*, 2021).
- The modelled Core Area for soprano pipistrelle is a relatively large area that covers much of the island of Ireland (62,020km<sup>2</sup>). The Bat Conservation Ireland Irish Landscape Model indicated that the soprano pipistrelle selects areas with broadleaf woodland, riparian habitats and low density urbanisation (Roche *et al.*, 2014).

### **Brown long-eared bat**

- Brown long-eared bat is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national brown long-eared bat population is considered to be stable (Aughney *et al.*, 2021).
- The modelled Core Area for brown long-eared bat is a relatively large area that covers much of the island of Ireland (49,929 km<sup>2</sup>). The Bat Conservation Ireland Irish Landscape Model indicated that the brown long-eared bat habitat preference is for areas with broadleaf woodland and riparian habitats on a small scale of 0.5km emphasising the importance of local landscape features for this species (Roche *et al.*, 2014).

### **Daubenton's Bat**

- Daubenton's bat is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national Daubenton's bat population is considered to be stable (Aughney *et al.*, 2021).
- The modelled Core Area for Daubenton's bat is (41,285 km<sup>2</sup>) reflecting the distribution of sizeable river catchments. The Irish Landscape Model indicated that the Daubenton's bat habitat preference is for areas with broadleaf woodland, riparian habitats and low density urbanisation (Roche *et al.*, 2014).

No Annex II bat species are known to occur in County Dublin (i.e. lesser horseshoe bat) and were not recorded within the survey.

## **4.2 Potential Bat Roosts (PBRs) in Trees**

There is a large number of mature trees within the proposed development site, 22 of which have been classified as having a PBR value, all Category 2 trees. Phase 1 and Phase 2 inspections as well as three dusk surveys and one dawn survey were completed in vicinity of the trees. None of these surveys recorded any bats roosting in the trees. However, due to the transient nature of roosting bats, these trees are deemed to be Potential Bat Roosts (PBRs) for bats. All 22 PBR trees are proposed to be felled.

## **4.3 Bat Foraging Habitat & Commuting Routes**

The proposed development site is comprised of linear woodland, treelines and hedgerows in a well-connected landscape. The Carrickmines Stream and river valley is located along the southern boundary of the proposed development.

## **4.4 Zone of Influence – Bat Landscape Connectivity**

The proposed development site is comprised of linear woodland, treelines and hedgerows in a well-connected landscape. The Carrickmines Stream and river valley is located along the southern boundary of the proposed development.

## **4.5 Bat Ecological Evaluation Results**

According to Marnell *et al.*, 2019, the Irish status of the bat species recorded are all of “Least Concern” (Table 1, Section 1.1.5).

In view of Tables 2a, Section 1.2 and criteria used for evaluation of the roosts etc., the bat ecological evaluation of the proposed development site was completed. Due to the medium-high bat biodiversity and presence of a roost for three species of bats, the proposed development site is considered to be of Local Importance for local bat species.

The Conservation Significance, in relation to roosts recorded, according Marnell *et al.* (2022), as also assessed. Barrington Tower was recorded as a satellite roost for two species of bat: brown long-eared bat and common pipistrelle and a day roost for Daubenton’s bat. According to Figure 20 of Marnell *et al.* (2022), the conservation significance of these roost are deemed to be Medium in relation to brown long-eared bat and Daubenton’s bat - “Small numbers of rarer species. Not a maternity roost” and the conservation significance of the common pipistrelle roost is deemed to be Low - “Small numbers of common species. Not a maternity roost”.

The Conservation Significance according Marnell *et al.* (2022), determines the bat mitigation measures required. In relation to the roosts in Barrington Tower the Mitigation/Compensation Requirement is at least “Provision of new roost facilities, where possible. Need not be exactly like-for-like, but should be suitable, based on species’ requirements. Minimal timing constrains or monitoring requirements”.

The Brown Long-eared Bat Roost Monitoring Survey, managed by Bat Conservation Ireland as part of the Irish Bat Monitoring Programme, has reported that brown long-eared bats roosts in buildings are positively influenced by the amount of tall vegetation (i.e. treelines, woodland and forestry) is located within a 0.5km radius of the roost (Aughney *et al.*, 2022 In press). This is an important factor in relation the provision of alternative roosting sites proposed as part of mitigation. A 0.5km buffer encompasses 77.28 hectares of land. The total amount of “Tall Vegetation” was calculated of 0.5km radius of the proposed location of the bat house to facilitate brown long-eared bats. A total of 20.12 hectares of “Tall Vegetation” was digitised and this represented 26.04% of the total area (Figure 8). On average, 17.46 hectares (22.59%) of the buffer was deemed “Tall Vegetation” for the 44 roosts

monitored by the Brown Long-eared Bat Roost Monitoring Survey. Therefore there is sufficient “Tall Vegetation” within a 0.5km of the proposed location of the bat house. The proposed location of the bat house is also adjacent to the main woodland river valley that continues east with additional woodland habitat outside the 0.5km radius zone.

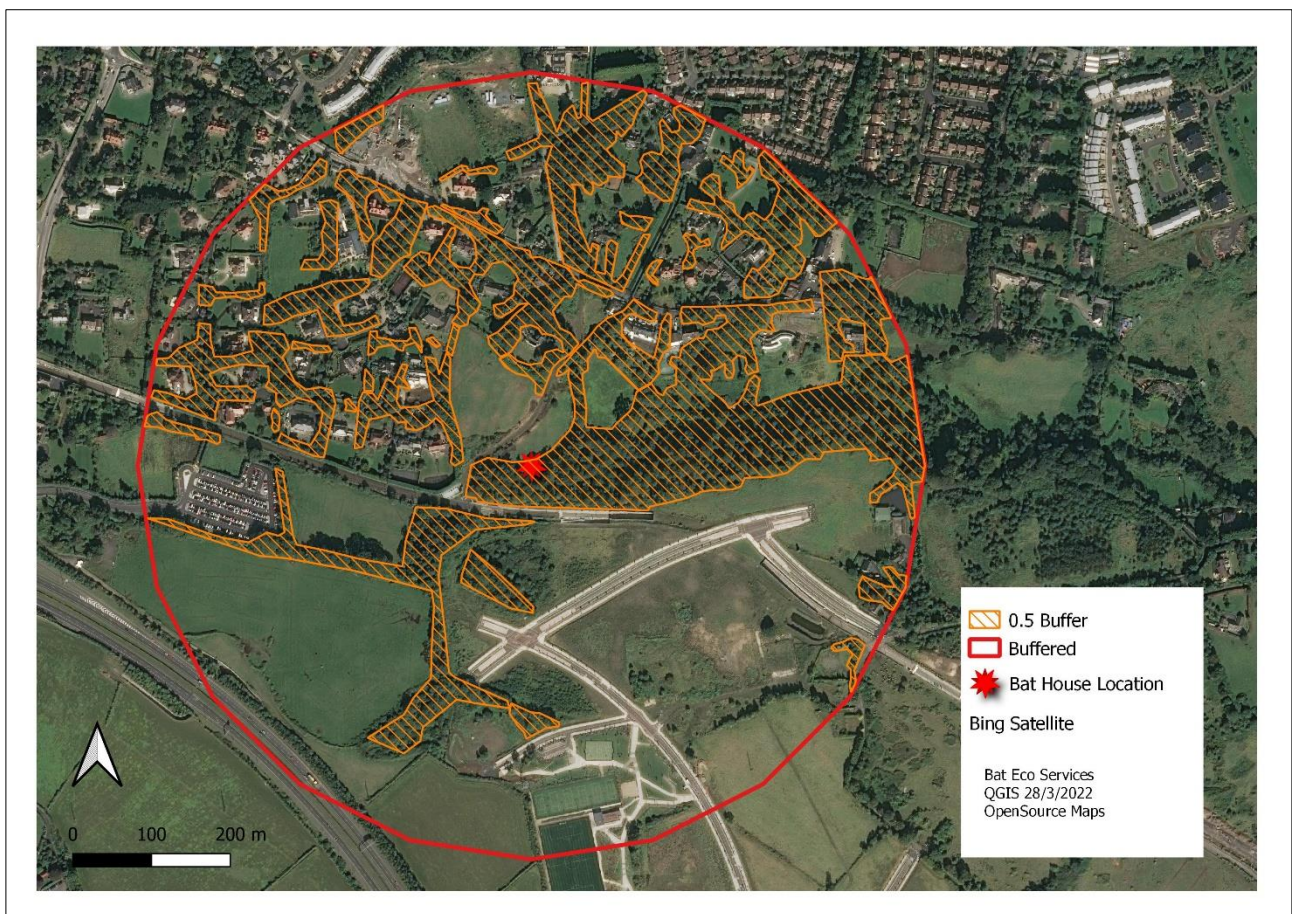


Figure 8: Approximate location of proposed bat house, 0.5 km buffer and digitised “Tall Vegetation”.

#### 4.6 BCT Core Sustenance Zones (CSZs)

Bat Conservation Trust (BCT) has been working on defining Core Sustenance Zones (CSZs) for different bat species through an extensive literature review ([www.bats.org.uk](http://www.bats.org.uk)). A CSZ refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost. With reference to development, the CSZ could be used to indicate:

- The area surrounding a communal roost within which development work may impact the commuting and foraging habitat of bats using that roost.
- The area within which it may be necessary to ensure no net reduction in the quality and availability of foraging habitat for the colony.

Bat roosts were recorded within the proposed development zone and this was for three species of bat (brown long-eared bat, Daubenton’s bat and common pipistrelle) and these were all located within Barrington Tower. The CSZ zone for these species ranges from 2 to 3km (See Section 10). It is recommended that the primary habitats, which are those these species rely on most, need to be available within the CSZ in increased quantities and (where currently poor quality) improved condition to achieve net gain. Secondary habitats are also of importance to the species. Where

possible these should also be available within the CSZ in increased quantities and improved condition to achieve net gain.

In relation to common pipistrelle, the BCT states that the primary habitat for this species is “managed grazed pasture and deciduous woodland”. The Bat Conservation Ireland Irish Landscape Model indicated that the common pipistrelle, in Ireland, selects areas with broadleaf woodland, riparian habitats and low density urbanization (<30%) (Roche *et al.*, 2014).

In relation to brown long-eared bat, the BCT states that the primary habitat for this species is “is strongly associated with trees, particularly broadleaved preferring woodland with a cluttered understorey”. The Bat Conservation Ireland Irish Landscape Model indicated that the brown long-eared bat, in Ireland, has a habitat preference is for areas with broadleaf woodland and riparian habitats on a small scale of 0.5km emphasising the importance of local landscape features for this species (Roche *et al.*, 2014).

In relation to Daubenton’s bat, the BCT states that the primary habitat for this species is “large waterways with abundant woodland in the local environment and, at least in upland riverine environments, it appears to select locations with trees on both banks”. The Bat Conservation Ireland Irish Landscape Model indicated that the Daubenton’s bat, in Ireland, habitat preference is for areas with broadleaf woodland, riparian habitats and low density urbanisation (Roche *et al.*, 2014).

Therefore, bat mitigation measures in relation to location of alternative roosts requires such locations to be adjacent or within such habitats types and that landscaping measures should include the enhancement of habitats and planting of vegetation in order to provide connectivity to such habitats within the immediate landscape. Landscaping should also include planting that will develop into native woodland in order to increase such habitats within the development zone.

## **5. Assessment of Potential Impact**

The following bat species were recorded during this bat survey: common pipistrelle, soprano pipistrelle, Leisler's bat, Daubenton's bat and brown long-eared bat. This represents five of the nine resident bat species known to Ireland. Barrington tower is a roost for brown long-eared bats and common pipistrelle bats and occasionally for Daubenton's bats. There is a low to medium level of bat activity within the proposed development area.

### **5.1 Assessment of Potential Impact - Loss of bat roosts**

A roost for three bat species was recorded in Barrington Tower. As part of the masterplan for the proposed development site, it is proposed to retain Barrington Tower while the modern extension is to be demolished. The tower is to be retained as a stand-alone structure and it is to be at the centre of the primary public open space and acts as a focal element, around which the scheme orbits. The conservation works planned for this structure will result in the loss of bats roosts.

In consultation with the Conservation Architects, it is proposed to provide a roosting space in the top of the tower (slate roof, non-breathable roofing felt, bat slates for exit/entry) as well as the retention of a selection of crevices on the external walls of the tower during proposed conservation works. However the conservation works proposed for the Barrington Tower will result in the temporary loss of bat roosts for three bat species until works are completed. An NPWS Derogation Licence will be required to allow the temporary loss of these roosts. However bat mitigation measures will be provided "Like-for-like" alternative roosting sites in Barrington Tower post conservation works and additional roosting in a new purpose-built bat house will also be provided.

Twenty-two PBR trees are proposed to be felled. This will reduce potential roosting sites for local bat populations.

### **5.2 Assessment of Potential Impact – Loss of bat foraging and commuting habitat**

Twenty-two PBR trees are proposed to be felled as well as a large number of additional trees and hedges. This will reduce potential foraging and commuting habitats for local bat populations.

### **5.3 Assessment of Potential Impact - Construction and Operation of residential development**

The construction and operation of the proposed residential development will potentially increase the degree of light (both street and residential lighting) spilling onto the treeline and woodland habitats within the survey area.

### **5.4 Assessment of Potential Impact - Overall**

Without bat mitigation measures, the proposed development will have an overall Moderate impact on local bat populations. Moderate impact is "An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends". Current national population trends for both brown long-eared bats and Daubenton's bat are "Stable" while the national population trend for the three remaining bat species recorded (common pipistrelle, soprano pipistrelle and Leisler's bats) are "Increasing" (Aughney *et al.*, 2021). Without bat mitigation measures, the proposed works will reduce roosting resource for three species. The Moderate impact is unlikely in relation to common pipistrelles as the national population of this species is doing well and it is more adaptable to urban areas. Brown long-eared bats and Daubenton's bats are more sensitive to urban development and, while the current national population is stable, the proposed development is likely to reduce the roosting, foraging and commuting resource in the immediate area of the proposed development site.



- Roost loss of Barrington Tower during conservation works for common pipistrelles, brown long-eared bat and Daubenton's bat are assessed as **Temporary Moderate Negative Effect**.
- Habitat loss (potential roosting/foraging/ commuting habitat) effects on all bat species are assessed as **Permanent Slight to Moderate Negative Effect**.
- Roost loss of PBRs on all bat species are assessed a **Permanent Slight to Moderate Negative Effect**.
- Disturbance and/or displacement effects on all bat species during the construction phase are assessed as **Short-term Slight Negative Effect**.
- Disturbance and/or displacement effects on all bat species during the operation phase are assessed as **Permanent Moderate Negative Effect**.

**Table 12: Potential impact of the proposed development on the different bat species recorded during survey work.**

Works	SP	CP	Leis	BLE	Daub
<b>Lighting of development area</b>	Slight	Slight	Slight	Moderate	Slight - Moderate
<b>Conservation works of Barrington Tower</b>	None	Slight	None	Moderate	Slight - Moderate
<b>Removal of modern section of Barrington Tower</b>	None	None	None	None	None
<b>Removal of other linear habitats</b>	Slight - Moderate	Slight - Moderate	Minor	Moderate	Slight - Moderate
<b>Removal of individual trees (potential tree roosts)</b>	Slight - Moderate	Slight - Moderate	Slight - Moderate	Slight - Moderate	Slight - Moderate
<b>Operation of the development site</b>	Slight	Slight	Slight	Slight - Moderate	Slight - Moderate
<b>Infrastructure</b>	Slight	Slight	Slight	Slight - Moderate	Slight - Moderate

SP = soprano pipistrelle, CP = common pipistrelle, Leis = Leisler's bat, BLE = brown long-eared bat, Daub = Daubenton's bat.

## 6. Bat Mitigation Measures

Bat mitigation measures will be required to reduce the impact potential of the proposed development on local bat populations, to protect local bat populations during proposed works and to conserve local bat populations post development.

The bat mitigation measures described below take into consideration Marnell *et al.* (2022) as well as best practice guidelines from Collins (2016) and BCT (2018). The measures described are those considered to be practical and effective based on past experience of the principal bat specialist and for the proposed development site. Measures are also reflective of published scientific research, where available and applicable to Irish bat populations (Please see Section 1.2.3 for more information).

### 6.1.1 Conservation Works on Barrington Tower

A roost for three bat species was recorded in Barrington Tower. As part of the masterplan for the proposed development site, it is proposed to retain Barrington Tower while the modern extension is to be demolished. The tower is to be retained as a stand-alone structure and it is to be at the centre of the primary public open space and acts as a focal element, around which the proposed development scheme orbits.

However during conservation works on the tower and demolition of modern extension, the tower will not be available as a roosting site for bats during conservation works. As a consequence, an NPWS Derogation Licence will be required to allow such disturbance.

#### 6.1.1.1 Derogation Licence Application

A NPWS Derogation Licence is required for conservation works as this structure was recorded as a roosting site for three species of bat: brown long-eared bat (satellite roost), common pipistrelle bat (satellite roost) and Daubenton's bat (day roost). As a derogation licence will be required for the temporary loss of the bat roosts while the structural integrity works are being carried out to Barrington Tower, a draft derogation licence application is appended to this report. This is appended for information purposes, so that all information relevant to this impact is provided. The derogation licence application will not be submitted until prior to when construction is due to commence.

The following two questions are taken from the draft derogation licence application in order to provide information requested to allow NPWS to undertake an assessment of the licence application (Please see draft application form appended to the end of this report).

**10. Please tick which reason below explains How this Application Qualifies under Regulation 54(2)(A-E) of the European Communities (Birds and Natural Habitats) Regulations:**

<b>a.</b>	In the interests of protecting wild flora and fauna and conserving natural habitats	<input checked="" type="checkbox"/>
<b>b.</b>	To prevent serious damage, in particular to crops, livestock, forests, fisheries and water and other types of property	<input type="checkbox"/>
<b>c.</b>	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 beneficial consequences of primary importance for the environment	<input type="checkbox"/>
<b>d.</b>	For the purpose of research and education, of re-populating and re-introducing these species and for the breeding operations necessary for these purposes, including artificial propagation of plants	<input type="checkbox"/>

e.	To allow, under strictly supervised conditions, on a selective basis and to a limited extent, the taking or keeping of certain specimens of the species to the extent specified therein, which are referred to in the First Schedule	<input type="checkbox"/>
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The following table requires detailed information, which this bat survey report provides. Some of this information is presented as part of the table below while other sections within the report (as directed) are required to be consulted.

**11. Report Checklist: Please append a detailed report to support this application and ensure that it contains the following information:**

11.1	Explanation as to why the derogation licence sought is the only available option for works and no suitable alternative exists as per Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations.	<input checked="" type="checkbox"/>
	<p>Explanation:</p> <ul style="list-style-type: none"> <li>a) Brown long-eared bat (satellite roost), common pipistrelle bat (satellite roost) and Daubenton's bat (day roost). – to ensure that the conservation works of Barrington Tower are undertaken in manner to prevent any harm to potential roosting bats.</li> <li>b) The proposed development will provide much needed housing as well as access to Luas station which will be of benefit to the wider public in terms of traffic and pedestrian safety. The conservation work of Barrington Tower will ensure its integrity for future years.</li> </ul> <p>Discussions were undertaken with the interdisciplinary team and conservation works are necessary for Barrington Tower to ensure the structural integrity of the building both for conservation heritage and on Health &amp; Safety grounds.</p> <p>However, the conservation needs of the bats roosts were strongly taken on board. This resulted in a change in structural plans for the tower to include a roosting space to be constructed within the roof of the tower and to facilitate the retention of crevices on the external walls of the tower.</p> <p>An additional bat conservation measure was also agreed and this the construction of a bat house with specific designs to meet the roosting requirements of all three bat species.</p>	
11.2	Evidence that actions permitted by a derogation licence will not be detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range as is required under Section 54(2) of the European Communities (Birds and Natural Habitats) Regulations.	<input checked="" type="checkbox"/>
	<p>The following information provides evidence on the status of the national populations of the bat species listed, the conservation status of the roosts recorded and additional information relating to their conservation status.</p> <p>A) Brown long-eared bats</p> <p>Brown long-eared bats were occasionally recorded during the walking transect and on the static surveillance surveys. A small roost was consistently recorded in the tower (ground floor) of Barrington Tower and this roost is likely to be a satellite roost. Overall, a low level of bat activity was recorded for this species of bat within the proposed development site.</p> <p>Brown long-eared bat is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national brown long-eared bat population is considered to be stable (Aughney <i>et al.</i>, 2021).</p>	

The modelled Core Area for brown long-eared bat is a relatively large area that covers much of the island of Ireland (49,929km<sup>2</sup>) with preferred suitable areas in the southern half of the island. The Bat Conservation Ireland Irish Landscape Model indicated that the Brown long-eared bat habitat preference is for areas with broadleaf woodland and riparian habitats on a small scale of 0.5km emphasising the importance of local landscape features for this species (Roche *et al.*, 2014).

According to Figure 20 of Marnell *et al.* (2022), the conservation significance of this roost is deemed to be Medium - "Small numbers of rarer species. Not a maternity roost".

The Conservation Significance according to Marnell *et al.* (2022) results determines the bat mitigation measures required. In relation to the satellite roost recorded for brown long-eared bat, the mitigation requirement is "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".

Analysis of the "Tall Vegetation" habitat within a 0.5km radius of the proposed bat house was undertaken to determine if there is sufficient suitable habitat present. This work is based on "Roost Profile" analysis completed as part of the Brown Long-eared Bat Roost Monitoring Scheme (Under the Irish Bat Monitoring Programme). Please see section 4.5 for more details. Analysis indicates that there sufficient "Tall Vegetation" within the 0.5km buffer around the proposed bat house location and that this is connected to greater woodland riparian zone east of the proposed development. While there is tree felling required as part of the proposed development, the "Bat Conservation Strategy" under the Landscape Plan will ensure that there is extensive planting of trees, shrubs and wildlife flower meadow to provide bat foraging and commuting habitat.

Therefore it is considered that the temporary loss of a satellite roost will not impact on the favourable conservation status in their natural range and will not have a detrimental effect on the local bat population of brown long-eared bats.

#### b) Common pipistrelle

Common pipistrelle was the most frequently encountered bat species and consistently recorded roosting in Barrington Tower in low numbers. This is likely to be a satellite roost. A low to medium level of bat activity was recorded for this species of bat within the proposed development site.

Common pipistrelle is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national common pipistrelle population is considered to be significantly increasing (Aughney *et al.*, 2021).

The modelled Core Area for common pipistrelle is a relatively large area that covers much of the island of Ireland (56,485km<sup>2</sup>). The Bat Conservation Ireland Irish Landscape Model indicated that the common pipistrelle selects areas with broadleaf woodland, riparian habitats and low density urbanization (<30%) (Roche *et al.*, 2014).

Conservation Significance (Marnell *et al.* (2022) of this tree roosts is "Small numbers of common species. Not a maternity roost". The Conservation Significance according to Marnell *et al.* (2022) results determines the bat mitigation measures required. In relation to the satellite roost recorded for common pipistrelles, the mitigation requirement is "Flexibility over provision of bat boxes, access to new buildings etc. No conditions about timing or monitoring".

Therefore it is considered that the temporary loss of a satellite roost will not impact on the favourable conservation status in their natural range and will not have a detrimental effect on the local bat population of common pipistrelles.

	<p>c) Daubenton's bat</p> <p><i>Myotis</i> spp. calls were recorded during static surveillance and walking transects. Daubenton's bat were confirmed roosting in the Barrington Tower during one dusk survey and due to the fact that this species was recorded roosting on only one occasion during the four years of the surveys, it is likely to have been a day roost. This species was also recorded on the Carrickmines Stream and overall a low level of bat activity was recorded for this species of bat within the proposed development site.</p> <p>Daubenton's bat is an Annex IV bat species under the EU Habitats Directive. The status of this bat species is listed as Least Concern. The national common pipistrelle population is considered to be stable (Aughney <i>et al.</i>, 2021).</p> <p>The modelled Core Area for Daubenton's bats is a relatively large area that covers much of the island of Ireland (41,285km<sup>2</sup>) reflecting the distribution of sizeable river catchments. The Irish Landscape Model indicated that the Daubenton's bat habitat preference is for areas with broadleaf woodland, riparian habitats and low density urbanisation (Roche <i>et al.</i>, 2014).</p> <p>According to Figure 20 of Marnell <i>et. al.</i> (2022), the conservation significance of this roost is deemed to be Medium - "Small numbers of rarer species. Not a maternity roost". The Conservation Significance according to Marnell <i>et. al.</i> (2022) results determines the bat mitigation measures required. In relation to the day roost recorded for Daubenton's bats, the mitigation requirement is "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".</p> <p>Therefore it is considered that the temporary loss of a day roost will not impact on the favourable conservation status in their natural range and will not have a detrimental effect on the local bat population of Daubenton's bats.</p>	
11.3	<p>Details of any mitigation measures planned for the species affected by the derogation at the location, along with evidence that such mitigation has been successful elsewhere.</p>	☒
	<p>A summary of the proposed bat mitigation measures are provided as part of this table but these are described in greater detail as part of Section 6.</p> <p>A bat house will be constructed with provision for brown long-eared bats, common pipistrelle and Daubenton's bat. This will be in place prior to the conservation works on the tower and therefore will ensure that there is alternative roosting sites present during conservation works on Barrington Tower. Post conservation works, a roosting space (i.e. bat loft) will be constructed in the roof of the tower thereby reinstating bat roosting features. Landscape and lighting plans have been sensitively designed to ensure that there is foraging and commuting habitat adjacent to the tower and connected to treeline boundaries.</p> <p>The design of the bat house and bat loft took in consideration the ecological requirements of the three bat species (Roche <i>et al.</i>, 2014) results from the Irish bat monitoring reports e.g. Aughney <i>et. al.</i>, 2021), scientific evidence in relation to effective bat mitigation (e.g. Collins <i>et. al.</i>, 2020, McAney &amp; Hannify, 2015) and best practice guidelines (Marnell <i>et. al.</i>, 2022, Schofield, 2007). Please consult Section 1.2.3 for information on effective bat mitigation measures.</p>	
11.4	<p>As much information as possible to allow a decision to be made on this application.</p>	☒

Please consult Section 1.2.3 for information on effective bat mitigation measures. Details of bat mitigation measures are presented below in detail. Particularly please consult Section 6.1.1.2 in relation to the bat house design and Section 6.1.1.3 in relation to bat loft design and bat mitigation measures required for Barrington Tower post conservation works. Additional bat mitigation measures are described in relation to bat boxes, lighting and landscaping.	
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### 6.1.1.2 Bat House

To ensure that there is a roosting resource available during conservation works of Barrington Tower, a “Bat House” is to be constructed to accommodate the three bat species recorded roosting in Barrington Tower. This will be constructed prior to proposed works on Barrington Tower and it will be located close to woodland and the Carrickmines Stream in order to provide connectivity to suitable foraging and commuting routes. Landscaping and lighting plans adjacent to the proposed location of the “Bat House” has also been sensitively designed to prevent disturbance to roosting bats during the operation of the proposed development site. The bat house will be constructed to facilitate roosting sites brown long-eared bat, common pipistrelle and Daubenton’s bat. This will be located along the south-eastern boundary of the proposed development site which is adjacent to the woodland associated with the Carrickmines Stream.

Bat House Design (basic requirements – Figure 9) are as follows:

- 3m x 3m (internal floor space) 1½ storey (internal height of 5m from floor level to highest point of roof space) building will be constructed from concrete block clad with natural stone (insulation between the two walls).
- A-roof will be constructed with natural slate and 1F bituminous felt (no modern breathable felt is to be used in the bat house) will cover timber joists (9 x 2 inch joists).
- Single entrance point will be inserted into the wall facing the woodland edge (gable wall, at 4m height). This will be an open window of 40cm wide by 15cm high (window slit). This will have “Pine Marten” proofing externally (e.g. smooth lead sheeting fixed around the base (window sill) and sides of the window slit to prevent Pine Marten climbing into the space).
- In addition, 4 “bat slates” will be inserted in the roof to provide alternative access points (this is particularly required for brown long-eared bats as this species prefers to have a number of entry options (Collins *et. al.*, 2020)).
- The ground floor entrance will be a solid door on opposite gable wall to bat entrance point (locked).

Internally, the following is recommended:

- The floor of the building will be a layer of crushed stone (2/3 inch down) (minimum use of concrete is recommended in order to reduce the negative impact of this material on the thermal conditions of the building) with an upper layer of 804 Clause (crushed) stone.
- A partition box (one side of which is open to allow bats to fly into the loft space) internally around the window slit will be constructed (marine ply) to reduce light penetrating the loft space. This will be inspected by the bat specialist.

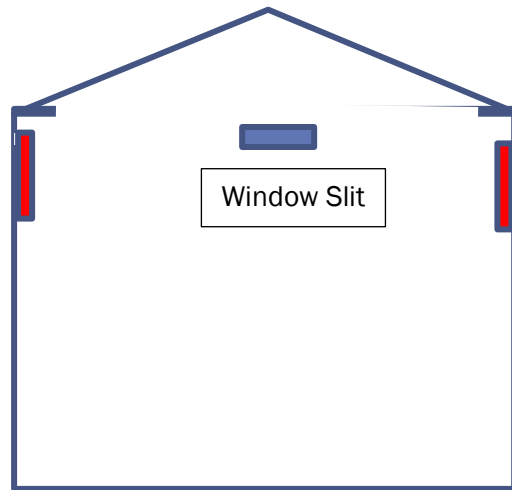


Figure 9a: Basic layout of the proposed Bat House (bats will be free to fly between the two floors).

#### Additional roosting within the Bat House

- External walls

Six Bat Tubes will be inserted into the external walls to provide roosting sites for Daubenton's bats. These will be inserted at a minimum of 3m height (Please see Appendices for an example of a case study where this was implemented).

- Internal walls

Six units of Integrated Woodstone Bat Box (Please see appendices for more information), at least 3m off the ground (Red rectangles on design Figure 9a) will be hung inside the bat house. These wall mounted bat boxes will provide roosting sites for common pipistrelles.

This Bat House is to be constructed prior to the conservation works on Barrington Tower in order to provide alternative roosting.

- Landscaping

Mature trees (native species) and native hedgerow will be planted around the bat house to buffer from potential human activity and to provide shelter and bat commuting habitat immediately adjacent to the structure and to ensure that it is connected to the adjacent woodland and treelines. Fast growing tree species (e.g. alder and birch) will be planted to ensure that the new landscaping is established quickly.

- Fascia & Soffit

Timber fascia and soffit will be used (timber treated with mammal friendly timber treatment).

This bat house has been designed based on scientific evidence. Brown long-eared bats have a preference to roost in loft spaces of natural stone buildings (Aughney *et al.*, 2022). Access will be provided by a post-box entrance in the wall of the bat house facing the woodland and there will also be four bat access slates. A review of mitigation measures by Collins *et al.* (2020) reported that this species occupied mitigation roosts where two or more access points were available. Daubenton's bats have a preference to roost in crevices which the bat tubes are designed to replicate. The author has previously used bat tubes to mitigate for the loss of crevices in natural stone bridges and the bat

tubes were used by Daubenton's bats post works. The wall mounted bat boxes proposed for inside the bat house are specific for common pipistrelles which Collins *et al.* (2020) reported as the type of bat box preferred by this species. The location of the bat house is also important to ensure that bats emerge directly into suitable bat foraging habitat. Aughney *et al.* (2021) concluded that the success of a renovated building for lesser horseshoe bats was primarily due to the fact that the building was located in prime foraging grounds of deciduous forest, where this species of bat was known to forage.

Based on the information presented above, the following architectural drawing was produced by Cairn Homes Properties Ltd.

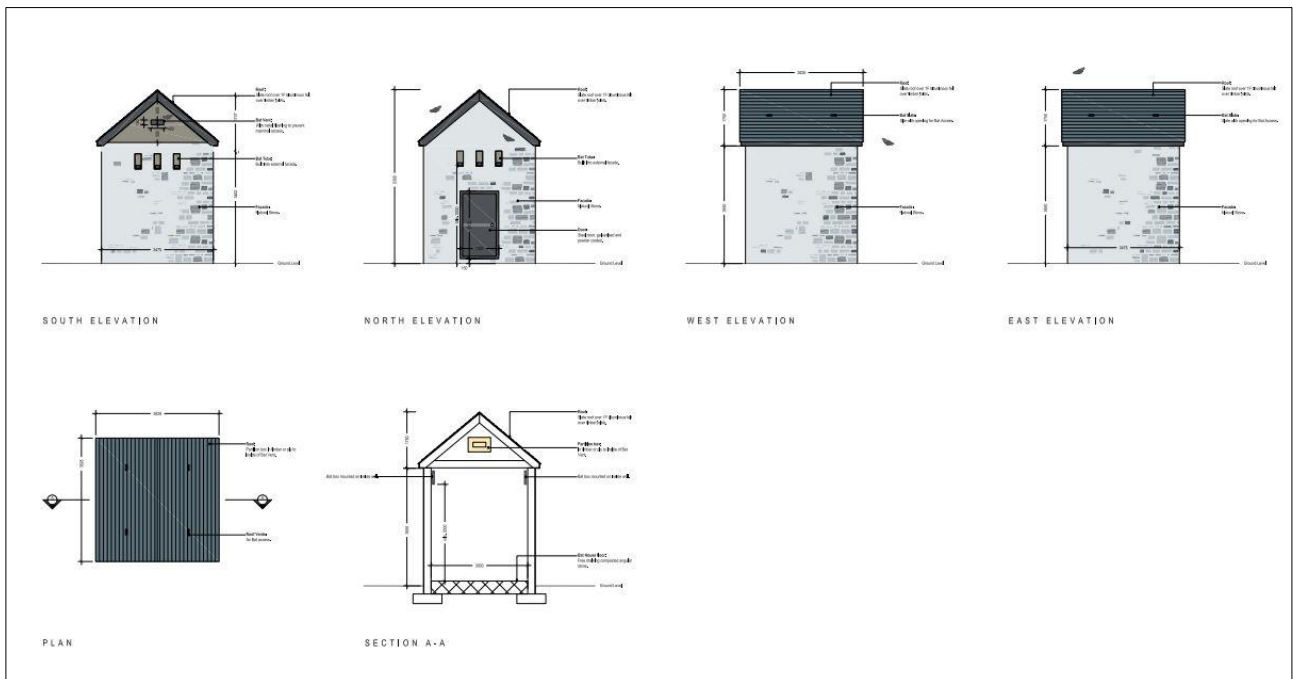


Figure 9b: Bat House design (Source: Carin Homes Properties Ltd.).

The following is an example of a Bat House (4m x 4m internal space) constructed for another project to cater for whiskered bats, brown long-eared bats and Daubenton's bats.



Plate 3: Example of bat house constructed in 2021 (Internal space 4mx4m).





Plate 4: Close up of Bat Tubes inserted in external walls of bat house constructed in 2021.



Plate 5: Example of predator proofing on external wall around entrance point of bat house.

### **6.1.1.3 Conservation Works of Barrington Tower**

Prior to proposed conservation works on Barrington Tower, it will be important to ensure that no bats are present. Therefore the following is recommended to achieve this:

- The conservation works will be planned for March/April prior to the principal bat activity season.
- The building will be surveyed to determine spring usage by bats (dusk and dawn surveys coupled with thermal imagery filming).
- Once the building is deemed bat free, the internal floors will be removed to reduce bat roosting conditions and this will be completed under supervision by the bat specialist.
- A daytime examination of the crevices of internal walls will be undertaken with a high power torch and endoscope and if bat free, the entry points will be blocked to allow works to be undertaken within the tower, without bats being present.
- In consultation with the Conservation Architect team, crevices in the external walls of the tower will be identified, check for bat usage and a selection will be retained for bat roosts post conservation works.
- Prior to any filling of crevices in the external walls of Barrington Tower, the crevices will be checked by the bat specialist using a high power torch and endoscope. Bat free crevices will be temporarily blocked using bubble wrap to prevent bat usage during conservation works. A facility will be required (e.g. scaffolding or cherry picker) to survey crevices at height. Where necessary, this daytime inspection will be supplemented with dusk and dawn surveys coupled with thermal imagery filming.
- In relation to the bat loft proposed for Barrington Tower (located in the Orange Rectangle, Figure 10), a pitch roof (natural slate and 1F bituminous felt (no modern breathable felt is to be used in the bat loft)) will be inserted into the upper part of the tower with two bat slates for bat access (facing mature trees and dark zone) to create a bat loft. This will be a replacement bat roost space post-conservation works. The floor of bat loft will be have a sheet of marine ply-wood (3/4 inch) internally.

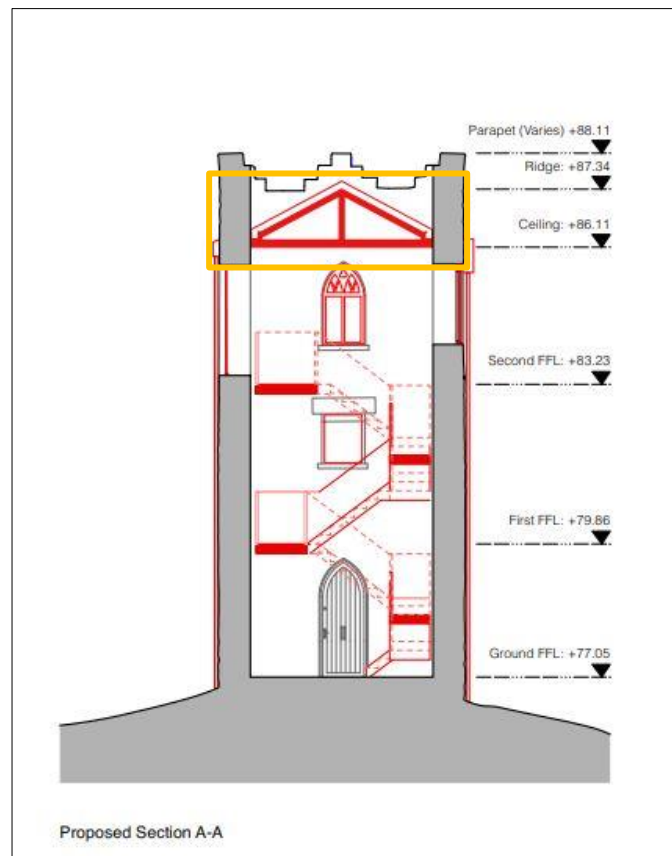


Figure 10: Proposed Pitch Roof Option for Barrington Tower (Source: Howley Hayes Cooney Architecture).

### 6.1.2 Lighting Plan

It is important that any proposed lighting for the proposed development is wildlife friendly and that there is a provision for continued dark zones to facilitate movement of light sensitive bat species such as brown long-eared bats and Daubenton's bats. The Site Lighting Report has taken into consideration the "Bats and artificial lighting in the UK: bats and the built environment series. Guidance Note 09/2018". This BCT (2018) guidelines provides a list of recommendations in relation to luminaire design, which is based on the extensive research completed to-date on the potential impact of lighting on bats and therefore provides best practice mitigation measures.

Nocturnal mammals are impacted by lighting. Therefore it is important that lighting installed within the proposed development site is completed with sensitivity for local wildlife while still providing the necessary lighting for human usage. It is also important that developments reduce their impact on the night sky and reduce sky glow. The "Dark Sky" principal should be followed – i.e. no upward lighting to reduce light pollution. The following principles will be followed:

- Luminaire design for any street lighting or lighting on buildings 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, 2018).
  - o All luminaires used will lack UV/IR elements to reduce impact.
  - o LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and have dimming capability.
  - o A warm white spectrum (2700 & 2200 Kelvins will be used to reduce the blue light component of the LED spectrum). The following text is taken from the Site Lighting Report: "2700K colour temperature luminaires are proposed throughout the site except in the West boundary of the site. In the West boundary which is stated as BAT path in the Ecological report, in order to reduce the impact on the BAT life 2200K luminaries are proposed in that area".
  - o Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
  - o Column heights will be carefully considered to minimise light spill. The shortest column height allowed will be used and these will either be 5m or 4m columns along pathways. 4m columns will be used in bat sensitive areas. Bollard lighting will be used for pedestrian areas and 1m bollards will be used.
  - o Only luminaires with an upward light ratio of 0% and with good optical control will be used.
  - o Luminaires will be mounted on the horizontal, i.e. no upward tilt.
  - o Any external security lighting will be set on motion-sensors and short (1min) timers. The intensity of external lighting should be limited to ensure that skyglow does not occur in order to reduce light pollution.
  - o Accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

In addition the Site Lighting Report states that "Minimum lux level to be used or as required by Health & Safety especially along the perimeters."

- "It is proposed to provide 8m high column-type light fittings roadways to achieve 15lux average illumination levels.

- It is proposed to install 5m and 4m column light fitting and 1m bollards to illuminate the pathways around the development to achieve 5 LUX average. The luminaire will be installed with a DALI ballast and Eco Step Dim controller to reduce the LUX level during no human presence.

This lighting design will ensure that a LUX level of 0 will be provided within 5m of the proposed site boundary to ensure that there is no spillage onto surrounding landscape. These LUX levels coupled with the design of the luminaires will reduce the potential impact of the outdoor lighting plan on local bat populations. This design will also ensure that there are Dark zones around the boundary of the proposed development site.

The bat house will be located in a dark area along the south-eastern boundary of the site with tree planting to buffer if from light spill from adjacent apartment blocks.

### *6.1.3 Landscape Plan*

The Landscape Plan has taken into consideration the biodiversity needs of the proposed development site (Please see Landscape Design Statement for more information). In summary, as the site is bounded by mature treelines and vegetation, this will be protected and enhanced to ensure that there is a retention of bat commuting and foraging habitat post development. Enhancement works will included the planting of new wildlife corridors which will be link Barrington Tower to the western boundary. This will ensure the there is a commuting route for bats roosting in the bat loft of the tower to foraging habitat in the landscape.

The Landscape Plan incorporates a specific section for “Bat Conservation Strategy” which will incorporate the following recommendation into the landscape plan:

- Dark Corridor: planting to protect and maintain a dark corridor.
- Tree planting will be used to buffer potential light spill from apartment, particularly close to the boundaries of the proposed development site. Tree species to be planted will include poplars and birches.
- Planting will be undertaken to encourage insects as a bat foraging resource. Bat planting will include willows, Guelder roses, Holly, Silver birch, Alder, hawthorn and Wild Rose.
- Approximately 150 trees will be planted as part of the Bat Conservation Strategy while approximately 200 trees will be completing as part of the general landscaping for the proposed development site. These will be planted as 4-5m stands and will reach a mature in 20-30 years
- Additional planting includes approximately 7000 sq.m. of native wildlife meadow.
- Shrubs and hedging will around 1m in height when planted and will reach a mature height in 5-10 years.
- Bat House: the bat house will be located along the south-eastern boundary adjacent to the woodland riparian valley. To protect the bat house from potential light spill from adjacent apartments, planting will be undertaken to act as a buffer between the apartments and bat house.

#### **6.1.3.1 Tree Felling Procedure**

The proposed works will require a number of trees to be removed. Twenty-two PBR trees (all Category 2 trees) are proposed to be felled. A Phase One and Phase Two surveys of trees was undertaken and trees considered to have a bat roosting value were identified as PBRs but no bat roosts were confirmed. Dusk and dawn surveys were also undertaken in the vicinity of such trees to determine if there were roosting bats and none were recorded. However, due to the transient nature of bats, it is recommended that a second Phase Two PBR survey is required for all PBR trees

proposed to be felled. This is a precautionary step and if a bat roost is recorded, then an NPWS Derogation Licence is required to be applied where the existence of any tree roost is confirmed. This Phase Two survey should be undertaken at least one month prior to tree felling in order to propose a tree felling plan in conjunction with tree contractors.

A bat scheme will be erection to mitigation for the removal of trees. These will be erected prior 6 months to tree felling to allow local bat populations to become aware of it prior to removal of the structure.

- a. Summer Bat Boxes (1FF Schwegler woodcrete or similar design) – 12 bat boxes will be erected on mature trees within the proposed development site. Twelve boxes have been calculated in relation to the number of PBR trees proposed to be felled with 1 box for every 3x Category 2 PBRs plus an additional 4 boxes as good conservation practice.

Bat boxes will be erected prior to tree felling. Some general points that will be followed include:

- Straight limb trees (or telegraph pole) with no crowding branches or other obstructions for at least 3 metres above and below position of bat box will be used.
- Diameter of tree will be wide and strong enough to hold the required number of boxes.
- Locate bat boxes in areas where bats are known to forage or adjacent to suitable foraging areas. Locations will be sheltered from prevailing winds.
- Bat boxes will be erected at a height of 4-5 metres to reduce the potential of vandalism and predation of resident bats.
- It is recommended to erect a number of bat boxes on one tree at an array of aspects. South facing boxes will receive the warmth of the sun, which is necessary for maternity colonies. In large bat box scheme it is generally recommended to have three bat boxes arranged at the same height facing North, South-East and South-West. This ensures a range of temperatures are available all day. If the South facing boxes become warm, bats can safely remove to the cooler North facing box.
- Locations for bat boxes will be selected to ensure that the lighting plan for the proposed site does not impact on the bat boxes.

Trees proposed to be removed, will be felled on mild days during the autumn months of September, October or November or Spring month of February (felling during the spring or autumn months avoids the periods when the bats are most active).

The procedure to fell the PBR trees is as follows:

- Category 2: Trees with roosting features (dead wood, tree holes etc.) will be checked prior to felling by physically checking the features (using an endoscope and high power torch) and/or a dusk/dawn surveys will be completed to determine if bats are roosting within. A tree felling plan will be required in consultation with the tree surgeons. A bat box scheme will be erected prior to felling and in consultation with the bat specialist. Any trees showing crevices, hollows, *etc.*, will be removed while a bat specialist is present to deal with any bats found. Such animals should be retained in a box until dusk and released on-site. Large mature trees will be felled carefully, essentially by gradual dismantling of larger limbs by tree surgeons, under supervision of a bat specialist. Care will be taken when removing branches as removal of loads may cause cracks or crevices to close, crushing any animals within.

- Category 2: Any ivy covered trees which require felling will be left to lie for 24 hours after cutting to allow any bats beneath the cover to escape.

#### *6.1.4 Removal of Building*

The modern extension of Barrington Tower is proposed to be demolished. Prior to demolition, a bat survey will be undertaken to ensure that it is bat free. These works will be undertaken in the following months: September, October, November, February, March and April, which are outside the main maternity and hibernation periods for bats.

#### *6.1.5 Monitoring*

Monitoring is recommended post-construction works. This monitoring will involve the following aspects:

- In relation to the bat house, monitoring is required for a total of 3 years. A temperature data logger will be installed and maintained for a total of 3 years. Monitoring will involve winter checks (1 per year) summer surveys (2 internal surveys and 1 emergence survey per summer) to determine the level of bat usage of the Bat House.
- The bat loft in Barrington Tower will be surveyed within one year of completion. Register bat loft with Bat Conservation Ireland. This surveying will be undertaken for a minimum of 2 years and will involve two emergence surveys (coincide with bat house monitoring).
- Inspection of bat boxes will be undertaken within one year of erection of bat box scheme. Register bat box scheme and additional roosts with Bat Conservation Ireland. This inspection will be undertaken for a minimum of 2 years.

With bat mitigation measures the proposed development will reduce its impact on local bat populations. If bat mitigation measures are strictly applied, the potential impact of the proposed development will be Permanent Slight Negative impact. Therefore the Residual Impact of the proposed development will be Permanent Slight Negative impact.

## 7. Bat Assessment Conclusions

This report provides information on the bat usage of the proposed development site. A total of five bat species were recorded: common pipistrelle, Leisler's bat, soprano pipistrelle, Daubenton's bat and brown long-eared bat.

Three of the bat species recorded were common pipistrelle, Leisler's bat and soprano pipistrelle and these are the three most common bat species in Ireland.

Common pipistrelle was the most frequently encountered bat species and consistently recorded roosting in Barrington Tower in low numbers. This is likely to be a satellite roost. According to Figure 20 of Marnell *et. al* (2022), the conservation significance of this roost is deemed to be Low - "Small numbers of common species. Not a maternity roost". A low to medium level of bat activity was recorded for this species of bat within the proposed development site.

Leisler's bats were recorded commuting into the survey area from a northerly direction towards the southern boundary of the proposed development. A low level of bat activity was recorded for this species of bat within the proposed development site.

While soprano pipistrelles were recorded foraging and commuting within the survey area, the timing of their encounters indicated that they travelled some distance before arriving to forage and therefore the roosting sites are not within the proposed development site or immediately adjacent to it. A low level of bat activity was recorded for this species of bat within the proposed development site.

The remaining two bat species are considered to be less common in Ireland.

*Myotis* spp. calls were recorded during static surveillance and walking transects. Daubenton's bat were confirmed roosting in the Barrington Tower during one dusk survey and due to the fact that this species was recorded roosting on one occasion during the four years of the surveys, it is likely to have been a day roost. According to Figure 20 of Marnell *et. al* (2022), the conservation significance of this roost is deemed to be Medium - "Small numbers of rarer species. Not a maternity roost". This species was also recorded on the Carrickmines Stream and overall a low level of bat activity was recorded for this species of bat within the proposed development site.

Brown long-eared bat was also occasionally recorded during the walking transect and on the static surveillance. A small roost was consistently recorded in the tower (ground floor) of Barrington Tower and this roost is likely to be a satellite roost. According to Figure 20 of Marnell *et. al* (2022), the conservation significance of this roost is deemed to be Medium - "Small numbers of rarer species. Not a maternity roost". A low level of bat activity was recorded for this species of bat within the proposed development site.

The Tree Inspection surveys resulted in the identification of 22 PBR trees but no bats were recorded roosting in suitable features during the Phase 2 surveys. All 22 PBR trees are proposed to be felled as part of the proposed development.

Without bat mitigation measures the proposed development will potentially result in a Permanent Moderate Negative Effect. Therefore bat mitigation measure are provided to reduce the impact of the proposed development on local bat populations. There will be a temporary loss of roosting sites in Barrington Tower. An NPWS Derogation Licence will be applied for the temporary loss of roosting sites in Barrington Tower. A bat house will be constructed, prior to any conservation works on Barrington Tower and will to provide an alternative bat roosting structure. Additional bat roosting measures will be provided in Barrington Tower post conservation works in the form of a bat loft and retention of crevices in the external walls of the structure. Additional bat mitigation measures are

provided in relation to the design and location of outdoor lighting to ensure that there are “dark zones” to allow local bat populations to forage and commute around the proposed development site post-construction. The Landscape Masterplan will retain as many trees, as possible, while there will be extensive additional planting of trees, shrubs and plants. This will provide habitats for foraging and commuting bats. Phase 1 and Phase 2 PBR tree surveys were completed and these identified trees within the proposed development site that have potential bat roosting features. Bat mitigation measures have been provided to complete further surveys of PBR trees prior to felling and tree felling procedures will be undertaken sensitively to ensure that no bats are harmed during the process. In addition, a bat box scheme will provide alternative roosting sites for local bat populations to replace the loss of potential roosting sites recorded in trees.

With bat mitigation measures the proposed development will reduce its impact on local bat populations. If bat mitigation measures are strictly applied, the potential impact of the proposed development will be Permanent Slight Negative impact. Therefore the Residual Impact of the proposed development will be Permanent Slight Negative impact.



## 8. Bibliography

- Abbott, I. M., Butler, F. And Harrison, S. (2012) When flyways meet highways – the relative permeability of different motorway crossing sites to functionality diverse bat species. *Landscape and Urban Planning* 106 (4): 293-302.
- Abbott, I. M., Berthinessen, A., Stone, E., Booman, M., Melber, M. and Altringham, J. (2015) Bats and Roads, Chapter 5, pp/ 290-299. In: *Handbook of Road Ecology*. Editors: R. Van der Ree., D. J. Smidt and C. Grilo. Wiley Blackwell.
- Altringham, J. D. (2013) *British Bats*. Collins New Naturalist Library, Volume 93. Haper Collins, London.
- Altringham, J. And Kerth, G. (2016) Bats and Roads, Chapter 3. In: *Bats in the Anthropocene: Conservation of Bats in a Changing World*. Editors: C. C. Voigt and T. Kingston. Springer Open.
- Aughney, T., Roche, N., & Langton, S. (2018) The Irish Bat Monitoring Programme 2015-2017. *Irish Wildlife Manuals*, No. 103. National Parks and Wildlife Service, Department of Cultural heritage and the Gaeltacht, Ireland.
- Aughney, T., Roche., N., & Langton, S. (2021) Irish Bat Monitoring Schemes: Annual Report for 2020. [www.batconservationireland.org](http://www.batconservationireland.org).
- Aughney, T., Stephens, R. and Roche, N. (2021) Monthly roost counts of Lesser Horseshoe Bats (*Rhinolophus hipposideros* (Bechstein)) in a purpose-renovated building in Co. Galway. *Irish Naturalists' Journal* 37 (2):137-141.
- Aughney, T., Roche, N. and Langton, S. (2022) Irish Bat Monitoring Programme 2018-2021. *Irish Wildlife Manuals*, No. XXX. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland. In Press.
- 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.
- Bat Conservation Ireland (2015) BATLAS 2020 Pilot Project 2015: Volunteer Survey Manual. Version 01. [www.batconservationireland.org](http://www.batconservationireland.org).
- Bat Conservation Trust (2018) Bats and artificial lighting in the UK: bats and the built environment series. Guidance Note 08/2019. BCT, London.
- Bharddwaj, M., Soaner, K., Straka, T., Lahoz-Monfort, J., Lumsden, L. F. and van der Ree, R. (2017) Differential use of highway underpasses by bats. *Biological Conservation* 212: 22-28.
- Billington, G. E. & Norman, G. M. (1997). A report on the survey and conservation of bat roosts in bridges in Cumbria, Kendal. English Nature.
- BTHK (2018) *Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-Care and Ecology Professionals*. Exeter: Pelagic Publishing.
- CIEEM (2016) *Guidelines for Ecological impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (2<sup>nd</sup> Edition)*. CIEEM, Winchester.
- Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> Edition)*. The Bat Conservation Trust, London.
- Collins, J.H., Ross, A.J., Ferguson, J.A., Williams, C.D. & Langton, S.D. (2020) The implementation and effectiveness of bat roost mitigation and compensation measures for *Pipistrellus* and *Myotis* spp. and brown long-eared bat (*Plecotus auritus*) included in building development projects completed between 2006 and 2014 in England and Wales. *Conservation Evidence*: 17, 19-26.
- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1982.

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979.
- Dietz, C., Helversen, O. and Dietmar, N. (2011) *Bats of Britain, Europe & Northwest Africa*. A&C Black, London.
- EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive) 1992.
- Gunnell, K., Grant, G. and Williams, C (2012) *Landscape and urban design for bats and biodiversity*. The Bat Conservation Trust, London.
- Hundt, L. (2012) *Bat Surveys: Good Practice Guidelines (2<sup>nd</sup> Edition)*. The Bat Conservation Trust, London.
- Kelleher, C. & Marnell, F. (2006) *Bat Mitigation Guidelines for Ireland*. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Lintott, P. & Mathews, F. (2018) *Reviewing the evidence on mitigation strategies for bats in buildings: informing best-practice for policy makers and practitioners*.
- Lundy, M.G., Montgomery, I.W., Roche, N. & Aughney, T. (2011). *Landscape Conservation for Irish Bats & Species Specific Roosting Characteristics* (Unpublished). Bat Conservation Ireland, Cavan, Ireland.
- Lysaght, L. and Marnell, F. (eds) (2016) *Atlas of Mammals in Ireland 2010-2015*, National Biodiversity Data Centre, Waterford.
- Marnell, F., Kingston, N. & Looney, D. (2009) *Ireland Red List No. 3: Terrestrial Mammals*, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- 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.
- 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.
- Martín, B.; Pérez, H.; Ferrer, M. Light-Emitting Diodes (LED): A Promising Street Light System to Reduce the Attraction to Light of Insects. *Diversity* **2021**, *13*, 89. <https://doi.org/10.3390/d13020089>.
- Mathews, F., Roche, N., Aughney, T., Jones, N, M Day, J., Baker, J. and Langton, S. (2015) Barriers and benefits: implications of artificial night-lighting for the distribution of common bats in Britain and Ireland. *Philosophical Transactions of the Royal Society of London B* **370** (1667), doi: 10.1098/rstb.2014.0124.
- McAney, K. (2006) *A conservation plan for Irish vesper bats*, Irish Wildlife Manual No. 20 National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland. McAney, K. (2014). An overview of *Rhinolophus hipposideros* in Ireland (1994-2014). *Vespertilio* **17**, 115–125.
- McAney, K., O'Mahony, C., Kelleher, C., Taylor, A. & Biggane, S. (2013). *The Lesser Horseshoe Bat in Ireland: Surveys by The Vincent Wildlife Trust*. Belfast, Northern Ireland: Irish Naturalists' Journal.
- McAney, K. and Hannify, R. (2015) *The Vincent Wildlife Trust's Irish Bat Box Schemes*. VWT.
- Mullen, E. (2007). *Brandt's Bat Myotis brandtii* in Co. Wicklow. Irish Naturalists' Journal **28**: 343.
- O'Sullivan, P. (1994). *Bats in Ireland*. Special supplement to the Irish Naturalists' Journal.
- Richardson, P. (2000). *Distribution atlas of bats in Britain and Ireland 1980 - 1999*. The Bat Conservation Trust, London, UK.
- Roche, N., Aughney, T. & Langton, S. (2015). *Lesser Horseshoe Bat: population trends and status of its roosting resource* ( No. 85). , Irish Wildlife Manuals. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

- Roche, N., Langton, S. & Aughney, T. (2012). *Lesser Horseshoe Bat: Population, Trends and Threats 1986 to 2012* (Unpublished). Bat Conservation Ireland, Cavan, Ireland.
- Roche, N., Aughney, T., Marnell, F. & Lundy, M. (2014). *Irish Bats in the 21<sup>st</sup> Century*. Bat Conservation Ireland, Cavan, Ireland.
- Rowse EG, Harris S, Jones G. 2018 Effects of dimming light-emitting diode street lights on light-opportunistic and light-averse bats in suburban habitats. *R.Soc. open sci.* **5**: 180205. <http://dx.doi.org/10.1098/rsos.180205>
- Russ, J. (2012) *British Bat Calls: A guide to species identification*. Pelagic Publishing, Exeter.
- Russo, D., Cistrone, L., Libralato, N., Korine, C., Jones, G. & Ancillotto, L. (2017). Adverse effects of artificial illumination on bat drinking activity. *Anim. Conserv.* **20**, 492–501. <https://doi.org/10.1111/acv.12340>.
- Schofield, H. (2008). *The Lesser Horseshoe Bat Conservation Handbook*. Herefordshire, England: The Vincent Wildlife Trust.
- Shiel, C. (1999) *Bridge usage by bats in County Leitrim and County Sligo*. The Heritage Council, Rothe House, Kilkenny City.
- Stebbing, R. E. & Walsh, S. T. (1991) *Bat Boxes: A guide to the history, function, construction and use in the conservation of bats*. The Bat Conservation Trust, 1991.
- Stone, E. L., Jones, G., and Harris, S. (2012). Conserving energy at a cost to biodiversity? Impacts of LED lighting on bats. *Global Change Biology* **18**, 2458–2465. doi:10.1111/j.1365-2486.2012.02705.x
- Stone EL, Harris S, Jones G. 2015 Impacts of artificial lighting on bats: a review of challenges and solutions. *Mammal. Biol.* **80**, 213–219. (doi:10.1016/j.mambio.2015.02.004)
- Voigt, C.C, C. Azam, J. Dekker, J. Ferguson, M. Fritze, S. Gazaryan, F. Hölker, G. Jones, N. Leader, D. Lewanzik, H.J.G.A. Limpens, F. Mathews, J. Rydell, H. Schofield, K. Spoelstra, M. Zagamajster (2018): Guidelines for consideration of bats in lighting projects. EUROBATS Publication Series No. 8. UNEP/EUROBATS Secretariat, Bonn, Germany, 62 pp.
- Wakefield, A., Broyles, M., Stone, E.L., Jones, G. & Harris, S. (2016). Experimentally comparing the attractiveness of domestic lights to insects: Do LEDs attract fewer insects than conventional light types? *Ecol. Evol.* **6**, 8028–8036. <https://doi.org/10.1002/ece3.2527>.
- Whilde, A. (1993). *Threatened mammals, birds, amphibians and fish in Ireland. Irish Red Data Book 2: Vertebrates*. Belfast: HMSO.
- Wildlife Act 1976 and Wildlife [Amendment] Act 2000. Government of Ireland.
- Wilson, R., Wakefield, A., Roberts, N. and Jones, G. (2021) Artificial light and biting flies: the parallel development of attractive light traps and unattractive domestic lights. *Parasite & Vectors*. <https://doi.org/10.1186/s13071-020-04530-3>.

## 9. Appendices

### 9.1 Appendix 1 Bat Assessment Tables

Table 4.1 Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement.		
Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions<sup>a</sup> and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation<sup>b</sup>).</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.<sup>c</sup></p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.</p> <p>Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.</p>
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions <sup>a</sup> and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions <sup>a</sup> and surrounding habitat.	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>

<sup>a</sup> For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

<sup>b</sup> 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 *et al.*, 2015). 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 large buildings in highly urbanised environments.

<sup>c</sup> This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

Figure A: Table 4.1 (p 35) Reproduced from Collins (2016).

**(1) Conversion, modification, demolition or removal of buildings (including hotels, schools, hospitals, churches, commercial premises and derelict buildings) which are:**

- agricultural buildings (e.g. farmhouses, barns and outbuildings) of traditional brick or stone construction and/or with exposed wooden beams;
- buildings with weather boarding and/or hanging tiles that are within 200m of woodland and/or water;
- pre-1960 detached buildings and structures within 200m of woodland and/or water;
- pre-1914 buildings within 400m of woodland and/or water;
- pre-1914 buildings with gable ends or slate roofs, regardless of location;
- located within, or immediately adjacent to woodland and/or immediately adjacent to water;
- Dutch barns or livestock buildings with a single skin roof and board-and-gap or Yorkshire boarding if, following a preliminary roost assessment, the site appears to be particularly suited to bats.

**(2) Development affecting built structures:**

- tunnels, mines, kilns, ice-houses, adits, military fortifications, air-raid shelters, cellars and similar underground ducts and structures; unused industrial chimneys that are unlined and brick/stone construction;
- bridge structures, aqueducts and viaducts (especially over water and wet ground).

**(3) Floodlighting of:**

- churches and listed buildings, green space (e.g. sports pitches) within 50m of woodland, water, field hedgerows or lines of trees with connectivity to woodland or water;
- any building meeting the criteria listed in (1) above.

**(4) Felling, removal or lopping of:**

- woodland;
- field hedgerows and/or lines of trees with connectivity to woodland or water bodies;
- old and veteran trees that are more than 100 years old;
- mature trees with obvious holes, cracks or cavities, or that are covered with mature ivy (including large dead trees).

**(5) Proposals affecting water bodies:**

- in or within 200m of rivers, streams, canals, lakes, reed beds or other aquatic habitats.

**(6) Proposals located in or immediately adjacent to:**

- quarries or gravel pits;
- natural cliff faces and rock outcrops with crevices or caves and swallets.

**(7) Proposals for wind farm developments of multiple wind turbines and single wind turbines (depending on the size and location) (NE TIN 051 – undergoing updates at the time of writing).**

**(8) All proposals in sites where bats are known to be present<sup>1</sup>**

This may include proposed development affecting any type of buildings, structures, feature or location.

**Notes:**

1. Where sites are of international importance to bats, they may be designated as SACs. Developers of large sites 5–10km away from such SACs may be required to undertake a HRA.

Figure B: Reproduced from Collins (2016) – page 13.

**Table 2** Factors affecting the probability of bats being present.

<b>Factors affecting the probability of a building being used by bats in summer</b>	
Increased probability	Disused or little used; largely undisturbed Large roof void with unobstructed flying spaces Large dimension roof timbers with cracks, joints and holes Uneven roof covering with gaps, though not too draughty Entrances that bats can fly in through Hanging tiles or wood cladding, especially on south-facing walls Rural setting Close to woodland and/or water Pre-20 <sup>th</sup> century or early 20 <sup>th</sup> century construction Roof warmed by the sun Within the distribution area of horseshoe bats
Decreased probability	Highly urbanised area with few feeding places Small or cluttered roof void (esp. for brown long-eared bat) Heavily disturbed Modern construction with few gaps around soffits or eaves (but be aware these may be used by pipistrelles in particular) Prefabricated with steel and sheet materials Active industrial premises Roof shaded from the sun
<b>Factors affecting the probability of trees being used by roosting bats</b>	
Increased probability	In ancient woodland or parkland Large trees with complex growth form Species that typically form cavities, such as beech, willow, oak or ash Visible damage caused by rot, wind, lightning strike <i>etc.</i> Loose bark providing cavities
Decreased probability	Coniferous plantation with no specimen trees Young trees with simple growth form and little damage
<b>Factors affecting the probability of underground sites being used by roosting bats</b>	
Increased probability	Large enough to develop stable temperature in winter High humidity Undisturbed Close to woodland or water (but note that bats will also use upland sites) Many cracks and crevices suitable for bats
Decreased probability	Small and draughty Heavily disturbed In urbanised areas Smooth surfaces with few roosting opportunities

Figure C: Table 2 Reproduced from Marnell *et al.* (2022).

## 9.2 Appendix 2 - Static Surveillance Results

Date	SP	CP	Leis	BLE	Myotis
19/08/2018	26	34	21	1	5
20/08/2018	28	155	29	1	0
21/08/2018	10	164	39	1	2
SM2 Unit 1	<b>64</b>	<b>353</b>	<b>68</b>	<b>3</b>	<b>7</b>

Adherent to river

Date	SP	CP	Leis	BLE	Myotis
19/08/2019	6	18	0	8	0
20/08/2019	3	8	0	5	0
SM4U2	<b>9</b>	<b>26</b>	<b>0</b>	<b>13</b>	<b>0</b>

Inside Barrington Tower

Date	SP	CP	Leis	BLE	Myotis
19/08/2019	0	0	0	0	0
20/08/2019	0	0	0	0	0
SM4U3	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Inside attic space of house (with pool)

Date	SP	CP	Leis	BLE	Myotis
24/08/2019	23	127	36	0	1
25/08/2019	17	262	39	1	0
SM4U5	<b>40</b>	<b>389</b>	<b>75</b>	<b>1</b>	<b>1</b>

On tree long laneway

Date	SP	CP	Leis	BLE	Myotis
19/08/2019	27	34	20	1	4
20/08/2019	35	155	31	1	0
21/08/2019	10	168	39	1	2
22/08/2019	35	62	80	1	4
23/08/2019	40	129	48	2	2
24/08/2019	22	255	74	2	1
25/08/2019	34	55	34	2	1
26/08/2019	92	369	114	2	0
SM4U1	<b>295</b>	<b>1227</b>	<b>420</b>	<b>12</b>	<b>14</b>

On tree adjacent to river

Date	SP	CP	Leis	BLE	Myotis
26/08/2019	21	1	0	0	0
SM4U2	<b>21</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

On tree adjacent to Appledore

Date	SP	CP	Leis	BLE	Myotis
13/07/2020	0	0	0	0	0
14/07/2020	0	0	0	0	0
15/07/2020	0	0	0	0	0
16/07/2020	0	0	0	0	0
17/07/2020	0	0	0	0	0
SM2 Unit 5	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Attic of bungalow

Date	SP	CP	Leis	BLE	Myotis

Attic of Appledore

13/07/2020	0	0	0	0	0
14/07/2020	0	0	0	0	0
15/07/2020	0	0	0	0	0
16/07/2020	0	0	0	0	0
17/07/2020	0	0	0	0	0
SM4U1	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Date	SP	CP	Leis	BLE	Myotis
13/07/2020	25	10	0	0	4
14/07/2020	28	0	0	0	0
15/07/2020	4	8	0	0	3
SM4U2	<b>57</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>7</b>

Adhacent to river

Date	SP	CP	Leis	BLE	Myotis
13/07/2020	19	13	24	5	2
14/07/2020	17	24	10	1	0
15/07/2020	21	35	24	1	0
16/07/2020	20	12	7	0	1
SM4U3	<b>77</b>	<b>84</b>	<b>41</b>	<b>7</b>	<b>3</b>

Barrington Tower – grd floor adjacent to corridor and open area of extension

Date	SP	CP	Leis	BLE	Myotis
13/07/2020	0	0	0	0	0
14/07/2020	0	0	0	0	0
15/07/2020	0	0	0	0	0
16/07/2020	0	0	0	0	0
SM4U4	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Attic of large 2-storey house

Date	SP	CP	Leis	BLE	Myotis
13/07/2020	0	0	0	0	0
14/07/2020	0	0	0	0	0
15/07/2020	0	0	0	0	0
16/07/2020	0	0	0	0	0
SM4U5	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

Attic of pool house

Date	SP	CP	Leis	BLE	Myotis
13/07/2020	61	294	23	3	2
14/07/2020	582	68	6	1	1
15/07/2020	193	335	15	1	5
16/07/2020	5	51	15	0	1
Mini 10	<b>841</b>	<b>748</b>	<b>36</b>	<b>5</b>	<b>9</b>

Laneway adjacent to Appledore

Date	SP	CP	Leis	BLE	Myotis
23/07/2021	0	0	0	0	0
24/07/2021	0	0	0	0	0
25/07/2021	0	0	0	0	0
26/07/2021	0	0	0	0	0

O2273724368 - behind 2-storey house



Mini 1	0	0	0	0	0
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Date	SP	CP	Leis	BLE	Myotis
23/07/2021	0	0	0	0	0
24/07/2021	0	0	0	0	0
25/07/2021	0	0	0	0	0
26/07/2021	0	0	0	0	0
Mini 2	0	0	0	0	0

O2258924299 - behind Appledore

Date	SP	CP	Leis	BLE	Myotis
23/07/2021	0	0	0	0	0
24/07/2021	0	0	0	0	0
25/07/2021	0	0	0	0	0
26/07/2021	0	0	0	0	0
Mini 3	0	0	0	0	0

Attic of bunbalow A

Date	SP	CP	Leis	BLE	Myotis
23/07/2021	0	0	0	0	0
24/07/2021	0	0	0	0	0
25/07/2021	0	0	0	0	0
26/07/2021	0	0	0	0	0
Mini 4	0	0	0	0	0

Attic of Appledore

Date	SP	CP	Leis	BLE	Myotis
23/07/2021	26	101	32	3	1
24/07/2021	25	44	29	2	5
25/07/2021	22	114	31	2	2
26/07/2021	16	119	45	4	2
Mini 9	89	378	105	11	10

Adjacent to river

Date	SP	CP	Leis	BLE	Myotis
23/07/2021	0	0	0	0	0
24/07/2021	0	0	0	0	0
25/07/2021	0	0	0	0	0
26/07/2021	0	0	0	0	0
SM4 U5	0	0	0	0	0

Attic of 2-storey house

Date	SP	CP	Leis	BLE	Myotis
23/07/2021	0	0	0	0	0
24/07/2021	0	0	0	0	0
25/07/2021	0	0	0	0	0
26/07/2021	0	0	0	0	0
SM4 U6	0	0	0	0	0

Attic of pool house

Date	SP	CP	Leis	BLE	Myotis
28/07/2021	0	0	0	15	0
29/07/2021	0	0	0	4	0

Barrington Tower

Mini 9	0	0	0	19	0
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### 9.3 Appendix 3 - Core Sustainance Zones ([www.bats.org.uk](http://www.bats.org.uk))

Please note that there is a greater number of bat species resident in the UK compared to Ireland and therefore some of the species listed below are not resident in Ireland.

**Table 1. Core Sustainance Zone sizes calculated for UK bat species**

Species	CSZ radius (km)
Greater horseshoe bat <i>Rhinolophus ferrumequinum</i>	3
Lesser horseshoe bat <i>Rhinolophus hipposideros</i>	2
Barbastelle <i>Barbastella barbastellus</i>	6
Brown long-eared bat <i>Plecotus auritus</i>	3
Grey long-eared bat <i>Plecotus austriacus</i>	3
Daubenton's bat <i>Myotis daubentonii</i>	2
Natterer's bat <i>Myotis nattereri</i>	4
Whiskered/Brandt's/Alcathoe bat <i>Myotis mystacinus/brandtii/alcathoe</i>	1
Bechstein's bat <i>Myotis bechsteinii</i>	3**
Common pipistrelle <i>Pipistrellus pipistrellus</i>	2
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	3
Nathusius pipistrelle <i>Pipistrellus nathusii</i>	3
Noctule <i>Nyctalus noctula</i>	4
Leisler's bat <i>Nyctalus leisleri</i>	3
Serotine <i>Eptesicus serotinus</i>	4

\*\* Note: There may be justification with Annex II and other rare species to increase the CSZ to reflect use of the landscape by all bats in a population. We suggest increasing the CSZ of Bechstein's bat to at least 3km, reflecting its very specific habitat requirements.

Extracted from [Bat-Species-Core-Sustainance-Zones-and-Habitats-for-Biodiversity-Net-Gain.pdf](http://www.bats.org.uk) ([bats.org.uk](http://www.bats.org.uk))

## 9.4 Appendix 6 – Alternative Bat Roosts

### Appendix 1

#### A) Supplementary Bat Roosts - Internal walls of bat house

It is recommended to insert integrated bat boxes into the Bat House. The Woodstone Integrated Bat Box is as follows (Source: [www.nhbs.com](http://www.nhbs.com)):



### About this product

The Vivara Pro Interconnecting Bat Box has a slim, mountable design with removable panels that allow multiple boxes to be connected together. The internal compartment is designed for crevice roosting bats such as the common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Brandt's bat, whiskered bat and Barbastelle's. The box has a depth of 20mm and a rough interior to provide lots of grip for bats to cling to. The box is made from WoodStone - a robust material composed of concrete and wood fibres, which has excellent insulating properties and provides protection from predators. This box is ideal for installation directly under a roof edge, gutter or under a bridge or dam. The box can easily be connected to another by removing the connecting pieces on either side and then placing the cabinets tightly against each other. This can be repeated with multiple boxes as required, creating an ever larger area for the bats. The bats can then crawl from one box to the other

The box should be installed at a height of 3m or above, fixings supplied.

### Specification

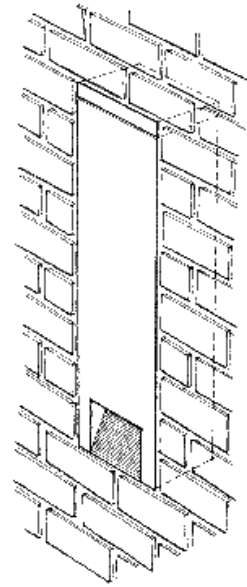
**Dimensions:** Height 50cm x Width 30cm x Depth 7.5cm

**Weight:** 5.6kg

**Material:** WoodStone

## B) Alternative Bat Roosts – external walls of bat house

It is recommended to insert bat tubes into the parapet walls of River Claddy Bridge (x 6 units) and into the external walls of the Bat House (x9 units). The Bat Tubes is as follows (Source: [www.nhbs.com](http://www.nhbs.com)):



[www.nhbs.com](http://www.nhbs.com)

## About this product

The 1FR Bat Tube is designed to be installed on the external walls of buildings, either flush or beneath a rendered surface. This makes it ideal for situations where you wish the box to be discrete as only the entrance hole will be visible. It can also be painted to match your building with an air permeable paint if desired.

The 1FR is specifically designed to meet the characteristic behavioural requirements of the types of bats that inhabit buildings. It has an integrated wooden panel onto which bats can cling and a ridged entrance slope which makes it easy for them to enter and leave the box safely. The design maintains excellent climatic conditions inside providing bats with a safe and stable environment in which to roost and it requires no maintenance because droppings fall out of the entrance ramp.

To allow access into existing cavities in buildings use the [2FR Bat Tube](#).

## Specification

- \* Material: Woodcrete with integrated wooden panel
- \* Height: 47.5cm
- \* Width: 20cm
- \* Depth: 12.5cm
- \* Entrance dimensions: 15 x 9 x 2cm
- \* Weight: 9.8kg

C) Woodcrete Bat Boxes – to be erected on trees



## 10. Species Profiles

### 10.1 Leisler's bat

This bat species was recorded commuting through the proposed development site. Ireland's population is deemed of international importance and the paucity of knowledge of roosting sites, makes this species vulnerable. However, it is considered to be widespread across the island. The modelled Core Area for Leisler's bats is a relatively large area that covers much of the island of Ireland (52,820km<sup>2</sup>). The Bat Conservation Ireland Irish Landscape Model indicated that the Leisler's bat habitat preference has been difficult to define in Ireland. Habitat modelling for Ireland shows an association with riparian habitats and woodlands (Roche *et al.*, 2014). The landscape model emphasised that this is a species that cannot be defined by habitats preference at a local scale compared to other Irish bat species but that it is a landscape species and has a habitat preference at a scale of 20.5km. In addition, of all Irish bat species, Leisler's bats have the most specific roosting requirements. It tends to select roosting habitat with areas of woodland and freshwater.

Irish Status	Near Threatened
European Status	Least Concern
Global Status	Least Concern
Biographical Range	km <sup>2</sup>
Irish Population Trend	2003-2013 ↑
Estimated Irish Population Size	73,000 to 130,000 (2007-2013) Ireland is considered the world stronghold for this species
Estimate Core Area (Lundy <i>et al.</i> 2011)	52,820 km <sup>2</sup>

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & NPWS, 2019

The principal concerns for Leisler's bats are poorly known in Ireland but those that are relevant for this survey area are as follows:

- Selection of maternity sites is limited to specific habitats;
- Relative to the population estimates, the number of roost sites is poorly recorded;
- Tree felling, especially during autumn and winter months; and
- Increasing urbanisation.

### 10.2 Common pipistrelle

This species was the most recorded species along the proposed development site and it generally considered to be the most common bat species in Ireland. The species is widespread and is found in all provinces. The modelled Core Area for common pipistrelles is a large area that covers much of the island of Ireland (56,485km<sup>2</sup>) which covers primarily the east and south east of the area (Roche *et al.*, 2014). The Bat Conservation Ireland Irish Landscape Model indicated that the Common pipistrelle selects areas with broadleaf woodland, riparian habitats and low density urbanization (<30%) (Roche *et al.*, 2014).

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Biographical Range	km <sup>2</sup>
Irish Population Trend	2003-2013 ↑
Estimated Irish Population Size	1.2 to 2.8 million (2007-2012)
Estimate Core Area (km <sup>2</sup> ) (Lundy <i>et al.</i> 2011)	56,485

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & NPWS, 2019

Principal concerns for Common pipistrelles in Ireland that are relevant for this survey area are as follows:

- Lack of knowledge of roosting requirements
- This species has complex habitat requirements in the immediate vicinity of roosts. Therefore, careful site specific planning for this species is required in order to ensure all elements are maintained.
- Renovation or demolition of derelict buildings.
- Tree felling
- Increasing urbanisation (e.g. increase in lighting)

### 10.3 Soprano pipistrelle

This species was the second most recorded species along the proposed development site and it generally considered to be the second most common bat species in Ireland. The species is widespread and is found in all provinces, with particular concentration along the western seaboard. The modelled Core Area for soprano pipistrelle is a large area that covers much of the island of Ireland (62,020km<sup>2</sup>). The Bat Conservation Ireland Irish Landscape Model indicated that the soprano pipistrelle selects areas with broadleaf woodland, riparian habitats and low density urbanisation (Roche *et al.*, 2014).

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Biographical Range	km <sup>2</sup>
Irish Population Trend	2003-2013 ↑
Estimated Irish Population Size	0.54 to 1.2 million (2007-2012)
Estimate Core Area (km <sup>2</sup> ) (Lundy <i>et al.</i> 2011)	62,020

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & NPWS, 2019

Principal concerns for Soprano pipistrelles in Ireland that are relevant for this survey area are as follows:

- Lack of knowledge of roosts;
- Renovation or demolition of structures;
- Tree felling; and
- Increasing urbanisation (e.g. increase in lighting).

### 10.4 Brown long-eared Bat

This species is generally considered to be widespread across the island, but only a few records are known for County Limerick. The modelled Core Area for Brown long-eared bats is a relatively large area that covers much of the island of Ireland (49,929 km<sup>2</sup>) with preference suitable areas in the southern half of the island. The Bat Conservation Ireland Irish Landscape Model indicated that the Brown long-eared bat habitat preference is for areas with broadleaf woodland and riparian habitats on a small scale of 0.5km emphasising the importance of local landscape features for this species (Roche *et al.*, 2014).

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Biographical Range	km <sup>2</sup>
Irish Population Trend	2008-2013 Stable
Biographical Range	km <sup>2</sup>
Estimate Core Area (Lundy <i>et al.</i> 2011)	49,929 km <sup>2</sup>

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & NPWS, 2019

Principal concerns for brown long-eared bats are poorly known in Ireland, but those that are relevant for this survey area are as follows:

- Selection of maternity sites is limited to specific habitats;
- Lack of knowledge of winter roosts;
- Loss of woodland, scrub and hedgerows;
- Tree surgery and felling;
- Increasing urbanisation; and
- Light pollution.

### 10.5 Daubenton's bat

The modelled Core Area for Daubenton's bats is a relatively large area that covers much of the island of Ireland (41,285km<sup>2</sup>) reflecting the distribution of sizeable river catchments. The Irish Landscape Model indicated that the Daubenton's bat habitat preference is for areas with broadleaf woodland, riparian habitats and low density urbanisation (Roche *et al.*, 2014).

Irish Status	Least Concern
European Status	Least Concern
Global Status	Least Concern
Biographical Range	km <sup>2</sup>
Irish Population Trend	2008-2013 Stable
Estimated Irish Population Size	81,000 to 103,000 (2007-2012)
Estimate Core Area (km <sup>2</sup> ) (Lundy <i>et al.</i> 2011)	41,285

Taken from Roche *et al.*, 2014, Lysaght & Marnell, 2016 & NPWS, 2019

Principal concerns for Daubenton's bats are poorly known in Ireland but those that are relevant for this survey area are as follows:

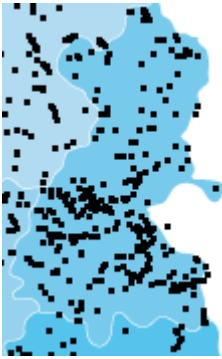
- Potential roost loss due to bridge maintenance;
- Loss of woodland and forest clearance;
- Loss of woodland, scrub and hedgerows;
- Tree surgery and felling;
- Increasing urbanisation; and
- Light pollution.

### 10.6 Species maps: Co. Dublin

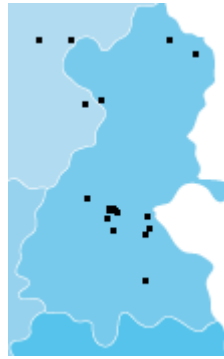
Source: [www.batconservationireland.org](http://www.batconservationireland.org)



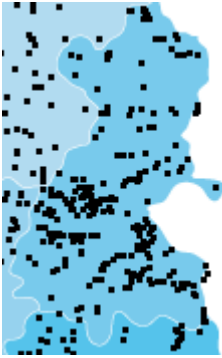
Bat records for County Dublin (Source: [www.batconservationireland.org](http://www.batconservationireland.org))



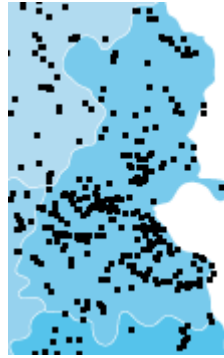
Common pipistrelle



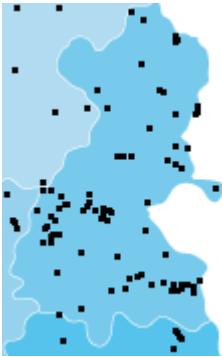
Nathusius' pipistrelle



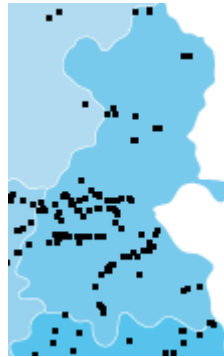
Soprano pipistrelle



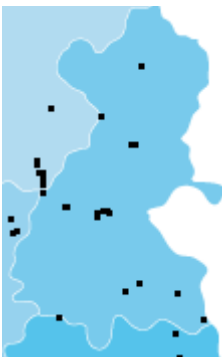
Leisler's bat



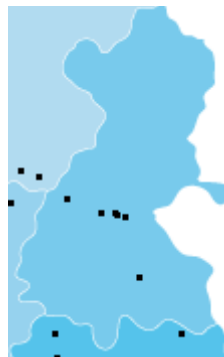
Brown long-eared bat



Daubenton's bat



Natterer's bat



Whiskered bat



Lesser horseshoe bat

## 11. Photographic Record



Plate A: These are demonstration photographs of the Thermal Imagery scope set up with Anabat Scout Full Spectrum bat detector and camcorder coupled with IR illuminator.



An Roinn Tithíochta,  
Rialtais Áitiúil agus Oidhreachta  
Department of Housing,  
Local Government and Heritage

# **Application for Derogation Licence**

## **Under the European Communities (Birds and Natural Habitats) Regulations 2011 – 2021**

- This form is to be used by any person applying for a derogation licence under Regulation 54 or by the Minister under Regulation 54(A)
- Please ensure that you answer questions fully in order to avoid delays
- If you experience any problems filling in this form, please contact the Wildlife Licensing Unit;

Wildlife Licensing Unit,

Department of Housing, Local Government and Heritage

National Parks and Wildlife Service

Wildlife Licensing Unit, R. 2.03

90 North King Street

Smithfield

Dublin 7 D07 N7CV

Email: [wildlifelicence@housing.gov.ie](mailto:wildlifelicence@housing.gov.ie)

**Part A. The Applicant: Personal Details**

These questions relate to the person responsible for any proposed works and who will be the **named licensee**. As the licensee you will be responsible for ensuring compliance with the licence and its conditions, even though you may employ another person to act on your behalf.

If this application is being submitted on behalf of a third party please also complete Part B below.

**1. (a) Name of Applicant**

Title (Mr/Mrs/Miss/Ms/Dr)	Forename(s)	Surname
(b) Address Line 1		
Address Line 2		
Town		
County		
Eircode		
(c) Contact number		
(d) Email address		
(e) Address where works are to be carried out if different from (b) above.		
Address Line 1		
Address Line 2		
Town		
County		
Eircode		

**Part B. Details of Person Submitting Application on Behalf of Applicant/Licensee**

Information relating to the person (e.g. ecologist) responsible for submitting the application on behalf of the applicant/licensee should be entered below:

**1. (a) Name of Person/Ecologist**

Title (Mr/Mrs/Miss/Ms/Dr)	Forename(s)	Surname
Dr	Tina	Aughney
(b) Company Name	Bat Eco Services	
Address Line 1	Ulex House, Drumheel	
Address Line 2	Lisduff	
Town	Virginia	
County	Cavan	
Eircode	A82XW62	
(c) Contact number	086 4049468	
(d) Email address	tina@batecoservices.com	
(e) Relationship to Applicant	Contracted bat specialist	

**Part C. The Application**

1. **Species of Animal:** Please indicate which species is affected by the proposed works:

- Bat
- Otter
- Kerry Slug
- Natterjack Toad
- Dolphin
- Whale
- Turtle
- Porpoise

2. Please detail the exact species (scientific name): Plecotus auritus, Myotis daubentonii and Pipistrellus pipistrellus \_\_\_\_\_

3. Please provide the maximum number of individuals affected\* Plecotus auritus – 7 (max no. recorded), Myotis daubentonii – 11 (only recorded in 2019) and Pipistrellus pipistrellus – 4 (max. no. recorded) \_\_\_\_\_

4. Please provide the maximum number of breeding or resting sites affected\* 3 roosts in one structure

5. Please provide the maximum number of eggs to be taken\* N/A

6. Please provide the maximum number of eggs to be destroyed\* N/A

\*If no figures can be provided for the maximum number of individuals, breeding sites, resting places and eggs to be covered by the derogation please provide reasons why.

Please note that bat surveys were undertaken annually from 2018 to 2021. The numbers listed above is the maximum number of bats recorded roosting/emerging during surveys.

7. **Species of Plant:** Please indicate which species is affected by the proposed works:

- Killarney Fern
- Slender Naiad
- Marsh Saxifrage

8. If you previously received a derogation for any species of animal or plant please state licence number and confirm that you have made a return to NPWS on the numbers actually affected by that licence

This is the first licence application for this project.

Yes – numerous licenses have been received for other projects and returns have been completed for projects where works were undertaken.

9. **Proposed Dates for Works:** Please indicate the timeframe that you propose to carry out works. Dates set by NPWS may differ from dates proposed here.

Start Date: 

TBC
-----

  
 End Date: 

TBC
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**10. Please tick which reason below explains How this Application Qualifies under Regulation 54(2)(A-E) of the European Communities (Birds and Natural Habitats) Regulations:**

<b>f.</b>	In the interests of protecting wild flora and fauna and conserving natural habitats	<input checked="" type="checkbox"/>
<b>g.</b>	To prevent serious damage, in particular to crops, livestock, forests, fisheries and water and other types of property	<input type="checkbox"/>
<b>h.</b>	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 beneficial consequences of primary importance for the environment	<input type="checkbox"/>
<b>i.</b>	For the purpose of research and education, of re-populating and re-introducing these species and for the breeding operations necessary for these purposes, including artificial propagation of plants	<input type="checkbox"/>
<b>j.</b>	To allow, under strictly supervised conditions, on a selective basis and to a limited extent, the taking or keeping of certain specimens of the species to the extent specified therein, which are referred to in the First Schedule	<input type="checkbox"/>

**11. Report Checklist: Please append a detailed report to support this application and ensure that it contains the following information:**

<b>11.1</b>	Explanation as to why the derogation licence sought is the only available option for works and no suitable alternative exists as per Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations.	<input checked="" type="checkbox"/>
<b>11.2</b>	Evidence that actions permitted by a derogation licence will not be detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range as is required under Section 54(2) of the European Communities (Birds and Natural Habitats) Regulations.	<input checked="" type="checkbox"/>
<b>11.3</b>	Details of any mitigation measures planned for the species affected by the derogation at the location, along with evidence that such mitigation has been successful elsewhere.	<input checked="" type="checkbox"/>
<b>11.4</b>	As much information as possible to allow a decision to be made on this application.	<input checked="" type="checkbox"/>

**Part D. Declaration**

I declare that all of the foregoing particulars are, to the best of my knowledge and belief, true and correct. I understand that the deliberate killing, injuring, capturing or disturbing of protected species, or damage or destruction of their breeding sites or resting places or the deliberate taking or destroying of eggs is an offence without a licence and that it is a legal requirement to comply with the conditions of any licence I may be granted following this application. I understand that NPWS may visit to check compliance with a licence.

Please note that under Regulation 5 of the European Communities (Birds and Natural Habitats) Regulations 2011-2021 an authorised officer may enter and inspect any land or premises for the purposes of performing any of his or her functions under these Regulations or for obtaining any information which he or she may require for such purposes.

**Signature of the Applicant**



**Date**

4/4/2022



Name in **BLOCK LETTERS**

Dr Tina Aughney

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**PRIVACY STATEMENT**

**Please note that under Data Protection legislation Department staff may only discuss licence applications with the applicant, and not with any third party. See Privacy Statement at [www.npws.ie/licences](http://www.npws.ie/licences)**

[npws.ie](http://npws.ie)

