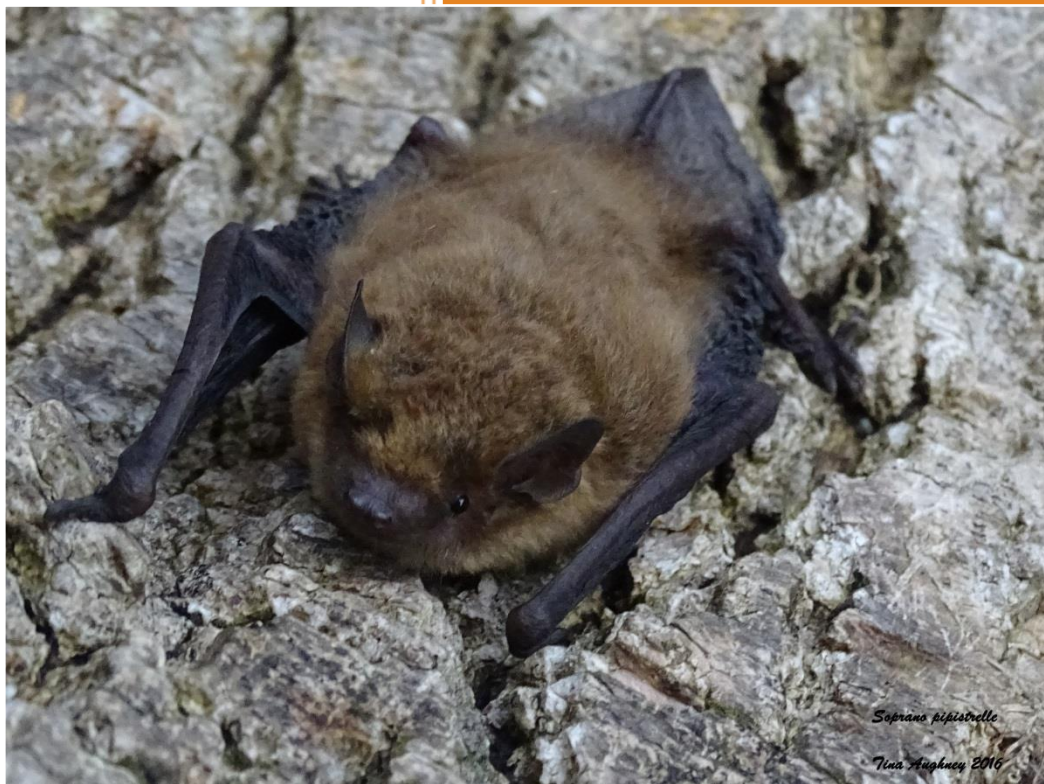


2019

Bat Assessment



Dr Tina Aughney
Bat Eco Services

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NPWS licence C30/2017 (Licence to handle bats, expires 31st December 2019)

NPWS licence 33/2017 (Licence to photograph/film bats, expires 31st December 2019)

NPWS licence DER/BAT 2017-09 (Licence to disturb a roost, expires 29th March 2020)

Client: Cairn Homes Properties Ltd.

Project Name & Location: Parkside 4, Parkside, Dublin 13.

Report Revision History

Date of Issue	Draft Number	Issued To (process of issuing)
25 th September 2019	Draft 1	Cairn Homes Properties Ltd.
2 nd October 2019	Draft 2	Cairn Homes Properties Ltd.
3 rd October 2019	Final	Cairn Homes Properties 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.

Executive Summary

Project Name & Location: Parkside 4, Parkside, Dublin 13

Proposed work: Residential development.

Bat Survey Results - Summary

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>			

Bat Survey Duties Completed (Indicated by red shading)

Tree PBR Survey	<input checked="" type="checkbox"/>	Daytime Building Inspection	<input type="checkbox"/>
Static Detector Survey	<input checked="" type="checkbox"/>	Daytime Bridge Inspection	<input type="checkbox"/>
Dusk Bat Survey	<input checked="" type="checkbox"/>	Dawn Bat Survey	<input type="checkbox"/>
Walking Transect	<input checked="" type="checkbox"/>	Driving Transect	<input type="checkbox"/>
Trapping / Mist Netting	<input type="checkbox"/>	IR Camcorder filming	<input type="checkbox"/>
Endoscope Inspection	<input type="checkbox"/>	Other	<input type="checkbox"/>

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1. Introduction

Bat Eco Services was commissioned by Cairn Home Properties Limited. To undertake a bat survey of lands located at Parkside 4, Parkside, Dublin 13.

1.1 Relevant Legislation & Bat Species Status in Ireland

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 a notifiable action and a derogation licence has to be obtained from the *National Parks and Wildlife Service* before works can commence. Any works interfering with bats and especially their roosts, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997 and Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (which transposed the EU Habitats Directive into Irish law). The details with regards to appropriate assessments, the strict parameters within which derogation licences may be issued and the procedures by which and the order in relation to the planning and development regulations such licences should be obtained, are set out in Circular Letter NPWS 2/07 "*Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 - strict protection of certain species/applications for derogation licences*" issued on behalf of the Minister of the Environment, Heritage and Local Government on the 16th of May 2007.

There are eleven recorded bat species in Ireland, nine of which are considered resident. 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.

Irish bat species list (please see Appendices for more information in individual bat species) is presented in Table 1. The current status of the known bat species occurring in Ireland is given in the Table 1 below.

Table 1: Status of the Irish bat fauna (Marnell *et al.*, 2009).

Species: Common Name			Irish Status	European Status	Global Status
Resident Bat Species ^					
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>			Near threatened	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	Near threatened	Least Concern
Possible Vagrants ^					
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 (3rd 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.
- 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.
- 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

Based on the information collected during the desktop studies and bat surveys, the bat ecologist assigns, where possible, an ecological value to each bat species recorded based on its conservation status at different geographical scales (Table 2). 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 2: The six-level ecological valuation scheme used in the CIEM Guidelines (2016) Ecological Value

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

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.

1.3 Project Description

1.3.1 Site Location

The proposed development site is located off Balgriffith Park and Balmayne and was the location of the temporary school buildings (as shown in figure below). Following the relocation of the schools to their permanent location the temporary buildings were removed. The bat survey was completed post removal of the temporary buildings.

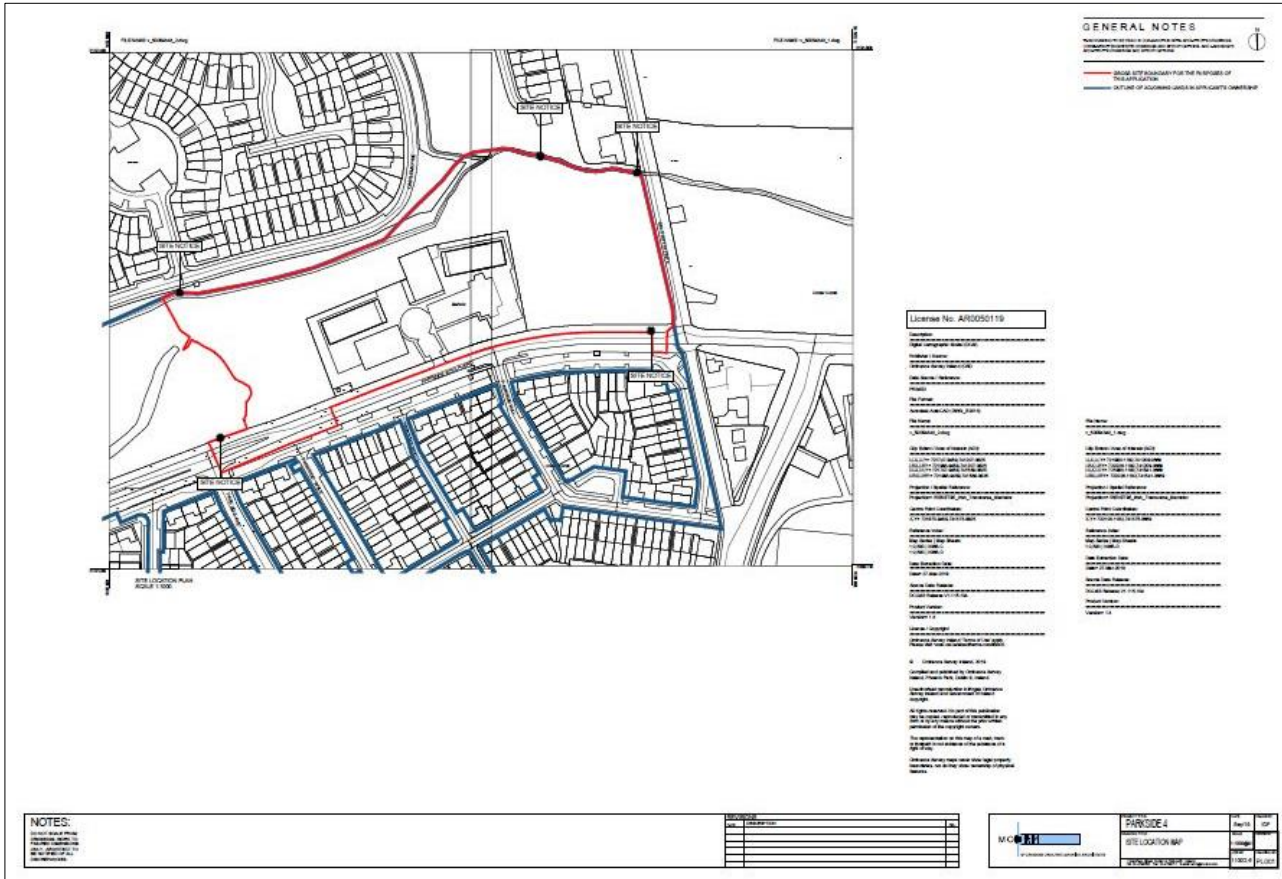


Figure 1: Site layout prior to removal of buildings at Parkside 4, Parkside, Dublin 13.

1.3.2 Proposed Project

A residential scheme of 282 apartments in 4 no. blocks ranging in heights from 3 to 7 storeys over a basement. The development includes residential amenities, car parking, cycle parking, and bin stores. The proposed development will also deliver a central section of the Mayne River Linear Park. A full development description is contained with the statutory planning notices.

1.3.3 Bat Survey Aims

The aims of the bat survey at the proposed project site are as follows:

- Collect robust data following good practice guidelines to allow an assessment of the potential impacts of the proposed project on local bat populations, both on and off-site (where possible);
- Facilitate the design of mitigation, enhancement and monitoring strategies for local bat populations recorded;
- Provide baseline information with which the results of post-construction monitoring surveys can be compared to, where appropriate;
- Provide information to enable NPWS and planning authorities to reach robust decisions with definitive required outcomes;
- Assist clients in meeting their statutory obligations;
- Facilitate the conservation of local bat populations.

Surveys are comprised of many different types and may differ from site to site depending on the aims of the survey. The following is a brief description of main types of surveys that can be completed. The surveys deemed suitable for a particular project are determined on a case-by-case basis.

- Emergence (dusk) surveys: surveying of buildings or structures to determine whether such building/structure is a bat roost. Undertaken from 10 minutes prior to sunset to 90 minutes after sunset.
- Walking transect: bat surveys completed on-foot where the surveyor(s) walk the survey site from 10 minutes prior to sunset to at least 110 minutes after sunset. Often this survey is completed post an emergence survey and therefore may be undertaken for a longer period of time after sunset.
- Driving transect: bat survey completed in a car and undertaken according to a strict survey protocol. Surveying is completed from 40 minutes after sunset till the end of the planned survey route. This is only undertaken for large survey area with a well-defined public road structure. Routes are planned and mapped prior to surveying.
- Dawn surveys: surveying of buildings or structures to determine whether such building/structure is a bat roost. Undertaken from 90 minutes prior to sunrise to 10 minutes after sunrise.
- Static surveys: placement of automated recording devices within the survey area. The units are set up during the daylight hours and left in place to record during the hours of darkness.
- Additional surveys required may include trapping / netting of bats. But this type of surveying is only undertaken where specific information is required (e.g. to determine if a roost is a maternity colony).

2. Bat Survey Methodology

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 3: Bat Roost Types (Collins 2016).

Roost Type	Definition	Time of Survey
Day Roost	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
Night Roost	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
Feeding Roost	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
Transitional Roost	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.
Swarming Site	Where large numbers of males and females gather. Appear to be important mating sites.	Late summer and autumn
Mating Site	Where mating takes place.	Late summer and autumn
Maternity Site	Where female bats give birth and raise their young to independence.	Summer months
Hibernation Site	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
Satellite Roost	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

Structures, buildings and other likely places that may provide a roosting space for bats are inspected 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 are 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 are classified using the Bat Tree Habitat Key (BTHK, 2018) and the classification system used is from Collins (2016). The Potential Roost Features (PRFs) listed in this guide are used to determine the PBR value of trees.

Trees identified as PBRs are 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) 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.

A series of inspections are undertaken. Phase 1 inspections aims to make a list of trees within the proposed development site that may be suitable as roosting sites for bats. Inspections are undertaken visually with the aid of a strong torch beam (LED Lenser P14.2) during the daytime searching for PRFs, if visible. To aid this Phase 1 inspection, tree reports, if available, are consulted to supplement that data collected.

Phase 2 inspections are, generally, recommended once a complete list of trees that have been identified as PBRs, and are mark for felling in order for the proposed development to be undertaken. The Phase 2 inspection will generally involve a closer examination of individual trees using a strong torch beam (LED Lenser P14.2) and endoscope (General DC5660A Wet / Dry Scope) and where required (and/or possible), height surveys are completed using a ladder. If a tree is deemed to be a roost site then further surveying involving dusk and dawn surveys of the actual trees may be recommended to determine what bat species are present etc.

Table 4: Tree Bat Roost Category Classification System (Collins, 2016).

Tree Category	Description
1	Trees with multiple, highly suitable features (Potential Roosting Features = PRFs) capable of supporting larger roosts
2	Trees with definite bat potential but supporting features (PRFs) suitable for use by individual bats;
3	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;
4	Trees have no potential.

2.1.3 Bat Habitat & Commuting Routes Mapping

The survey site is assessed during daytime walkabout surveys, in relation to potential bat foraging habitat and potential bat commuting routes. Such habitats are classified according to Fossit, 2000 (Appendix 1, Table 1.B) while hedgerows are classified according to BATLAS 2020 classification (Bat Conservation Ireland, 2015) (Appendix 1, Table 1.A). Bat habitats and commuting routes identified are considered in relation to the wider landscape to determine landscape connectivity for local bat populations through the examination of aerial photographs.

2.2 Night-time Bat Detector Surveys

2.2.1 Dusk & Dawn Bat Surveys

Dusk surveys are completed from 10 minutes before sunset to at least 120 minutes post sunset (extended survey period times occur if walking transects and driving transects are included). If the focus of this survey is to determine whether a structure is a bat roost (i.e. An Emergence Survey is deemed necessary), the surveyors then position themselves adjacent to the building / structure to be surveyed to determine if bats are roosting within, location of roost, number of bats, bat species etc. Surveying is completed for 100 mins, starting 10 mins before sunset.

The following equipment is generally used:

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

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

Walking transects involve the surveyor(s) walking the survey area, noting the time, location and bat species encountered. If the mapping facility is used on the Wildlife Acoustics Echo Meter Touch2 Pro (Android) connected to Samsung Galaxy Tab S3, this is mapped using Google Earth with a KLM file produced for mapping purposes. Validation of bat records is completed by the principal bat surveyor prior to mapping. Otherwise, Irish Grid references are recorded and an excel file of bat record locations is produced for mapping.

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. Bat Logger A+ units and Wildlife Acoustics Song Meter SM2, SM2 BAT+ SM4 Bat FS and SM3 BAT Platform 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 (or micro SD cards depending on the model) and downloaded for analysis. These results are depicted on a graph showing the number of bat passes per species per hour/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

The recordings are analysed using various software. Recordings made by SongMeter SM2 (Unit 2) is analysed using SongScope, SongMeter SM2Bat+ (Unit 4, 5), Song Meter Bat FS (Units 1-5) and SongMeter 3 recordings are analysed using BatClassifyIreland and Wildlife Acoustics Kaleidoscope Pro. Elekon BatLogger A+ units are analysed using BatExplorer. 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 5: Static Bat Detectors deployed during Static Bat Detector Surveys.

Static Unit Code	Bat Detector Type	Recording Function	Microphone
SM2 Unit 2	Wildlife Acoustics SongMeter 2 Bat+	Passive Full Spectrum	SMX-US (connected directly to unit)
SM2 Unit 5			SMX-U1 (connected directly to unit)

2.3 Desktop Review

2.3.1 Bat Conservation Ireland Database

A 1km search was requested for the Irish Grid Reference: O219413.

2.4 Survey Constraints

The following assessment has been completed in relation to Survey Constraints:

Table 6: Survey Constraint Assessment Results.

Category	Discussion
Timing of surveys	2019: Sept – during the later end of the bat activity season.
Weather conditions	2019: Good weather conditions.
Survey effort	2019: 2 dusk surveys (walking transects), 2 static units (2 nights)
Equipment	All in good working order.

The number of surveys complies with best practice as per bat guidelines and therefore it is deemed that the survey work completed is appropriate in order to meet the aims of the bat survey and that no particular survey constraints were encountered.

3. Bat Survey Results

3.1 Daytime Inspections

3.1.1 Building & Structure Inspection

There are no buildings located within the proposed development site.

3.1.2 Tree Potential Bat Roost (PBRs) Inspection

There are no trees within the proposed development site. There are trees along the Mayne River boundary but these are outside the proposed development site.

3.1.3 Bat Habitat & Commuting Routes Mapping

The survey area is comprised of disturbed ground with no tall vegetation. The northern boundary of the proposed development site is treeline / hedgerow along Mayne River but this is outside the proposed development area. This northern boundary represents the only area within or directly adjacent to the proposed development site that has potential bat commuting and foraging habitat.

3.2 Night-time Bat Detector Surveys

3.2.1 Dusk Bat Survey

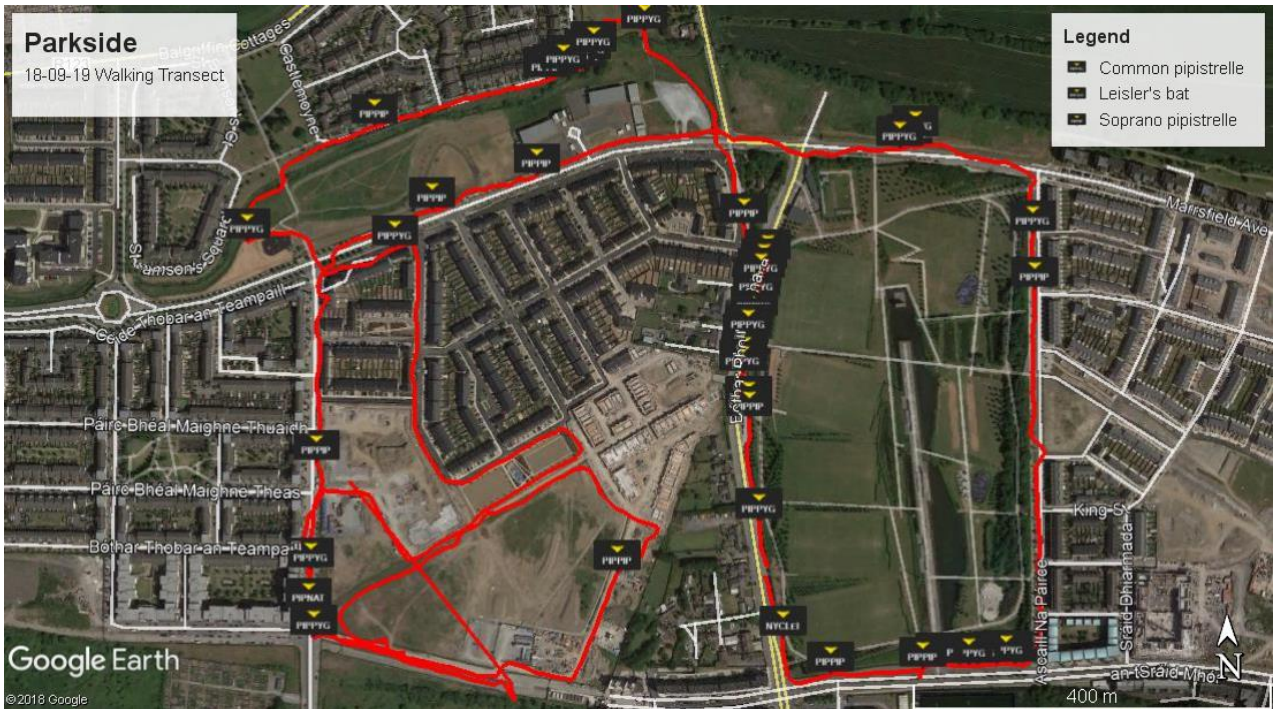
There are no buildings within the proposed development site. Therefore dusk surveying was completed by walking transect for approximately 4 hours each night. Due to the exposed nature of the proposed development site, the area surveyed was greater in order to document local bat populations around Father Collins Park. There is also the Mayne River, located along the northern boundary of the proposed development site, and this boundary was walked as part of the walking transects.

Walking transects were also completed 18th and 19th September 2019. During the walking transect completed on the 18th September 2019 (Weather conditions: Dry, calm, 15-17°C and clear skies), three species of bat was encountered: common pipistrelle, soprano pipistrelle and Leisler's bat.

Four common pipistrelle bat encounters were recorded along the boundary of the proposed development site while a higher level of activity was recorded in Father Collins Park. Soprano pipistrelle bat encounters were more frequent and these were concentrated along the Mayne River habitat of the northern boundary of the proposed development site. An overall higher bat encounter rate was recorded along the western boundary of Father Collins Park. Only one Leisler's bat encounter was recorded during the survey and this was along the western boundary of Father Collins Park.

Figure 2: bat encounters recorded during walking transect: 18/9/2019

A: All bat encounters (Red line = walking route).



B: Common pipistrelle bat encounters (Red line = walking route).



C: Soprano pipistrelle bat encounters (Red line = walking route).



D: Leisler's bat encounters (Red line = walking route).



During the walking transect completed in the 19th September 2019 (Weather conditions: Dry, calm, 16°C and patchy cloud cover), a higher level of bat activity was recorded but only two species of bat was recorded during this walking transect: common pipistrelle and soprano pipistrelle. A higher level of common pipistrelle bat encounters was recorded compared to soprano pipistrelle. While a small number of common pipistrelle bat encounters was recorded along the boundary of the proposed development site, the majority of activity was along the western boundary of Father

Collins Park. Within the proposed development site, soprano pipistrelle activity was again recorded along the Mayne River habitat and along the boundary of Father Collins Park.

Figure 3: bat encounters recorded during walking transect: 19/9/2019

A: Common pipistrelle bat encounters (Pink line = walking route).



B: Soprano pipistrelle bat encounters (Pink line = walking route).



3.2.2 *Passive Static Bat Detector Survey*

The following table summarises the results recorded on the static units deployed in September 2019. Two units were deployed in 2019.

Only two species of bat was recorded on the static units. Due to the fact that one of the static units was located along the stream habitat, a higher level of soprano pipistrelle bat activity was recorded compared to common pipistrelle bat activity. Only one bat pass was recorded on the unit located within the proposed development site. Overall, a low level of bat activity was recorded.

Table 8: Results of Static Bat Detectors deployed during Static Bat Detector Surveys.

Static Code	Grid Reference	Survey Period	Bat Species
SM2 Unit 2	Along stream	18 th to 20 th September 2019 (2 nights)	Night 1: Soprano pipistrelle (21 passes); Common pipistrelle (2 passes). Night 2: Common pipistrelle (3 passes), Soprano pipistrelle (33 passes)
SM2 Unit 5	Open bare section of land	18 th to 20 th September 2019 (2 nights)	Night 1: No bat activity recorded. Night 2: Common pipistrelle (1 pass)

3.3 Desktop Review

3.3.1 *Bat Conservation Ireland Database*

A 1km search was requested for the Irish Grid Reference: O219413 and it yielded one historical record: one soprano pipistrelle roost.

4. Bat Ecological Evaluation

4.1 Bat Species Recorded & Sensitivity

Three bat species were recorded during all bat surveys: common pipistrelle, Leisler's bat and soprano pipistrelle. These three species are the three most common bat species recorded in Ireland.

A low-medium level of soprano pipistrelle and common pipistrelle bat activity was recorded while a low level of bat activity was recorded for Leisler's bat but much of the bat activity was recorded along the boundary of Father Collins Park

A higher level of bat activity was recorded along the boundary stream habitat but overall a low level of bat activity was recorded for the proposed development area.

In relation to the bat evidence collected by this report, it is deemed, according to Table 2, that the bat populations recorded within the survey area are of negligible value.

Leisler's bat

This species was the least frequently recorded bat species. Ireland's population is deemed of international importance and 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 (52,820 km²). 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
Estimated Irish Population Size	73,000 to 130,000 (2007-2013) Ireland is considered the world stronghold for this species
Irish Population Trend	2003-2013 ↑
Estimate Core Area (km²) (Lundy <i>et al.</i> 2011)	52,820

Taken from Roche *et al.*, 2014

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

- Tree felling
- Increasing urbanisation

Common pipistrelle

This species was the second most recorded species within the survey area 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 (56,485 km²) 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
Estimated Irish Population Size	1.2 to 2.8 million (2007-2012)
Irish Population Trend	2003-2013 ↑
Estimate Core Area (km²) (Lundy <i>et al.</i> 2011)	56,485

Taken from Roche *et al.*, 2014

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

- Renovation or demolition of derelict buildings.
- Tree felling
- Increasing urbanisation (e.g. increase in lighting)

Soprano pipistrelle

This species was the most recorded species within the survey area 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 (62,020 km²). 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
Estimated Irish Population Size	0.54 to 1.2 million (2007-2012)
Irish Population Trend	2003-2013 ↑
Estimate Core Area (km²) (Lundy <i>et al.</i> 2011)	62,020

(Taken from Roche *et al.*, 2014)

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

- Renovation or demolition of structures
- Tree felling
- Increasing urbanisation (e.g. increase in lighting)

4.2 Bat Foraging Habitat & Commuting Routes

The boundary treeline/hedgerow and stream to the north of the proposed development site are commuting and foraging habitats for local bat populations.

4.3 Zone of Influence – Bat Landscape Connectivity

As stated above, the boundary treeline/hedgerow and Mayne River to the north of the proposed development site is a commuting and foraging habitats for local bat populations. These provide connectivity to Father Collins Park. As a consequence, it is important to retain the connectivity

within the survey area to allow local bat populations to continue to commuting and foraging post-construction of the proposed development.

4.4 Landscape Plan

The Landscape Plan proposed to undertaken planting of:

- Semi-mature trees;
- Native tree planting in clumps along the external boundaries of the buildings and along the pathway adjacent to the river;
- Standard trees.

This planting will decrease the potential impact of the proposed development on the northern boundary and increase potential foraging habitat and commuting routes for local bat populations.



Figure 4: Proposed landscape plan for Parkside 4, Parkside, Dublin 13.

4.5 Lighting Plan

The Lighting Plan proposes no lighting to the rear of the proposed development site and therefore there is no lighting proposed along the northern boundary treeline/hedgerow and Mayne River area. As this is the principal area where bats were recorded, this will ensure that the local bat population can continue to forage and commute along this boundary habitat.

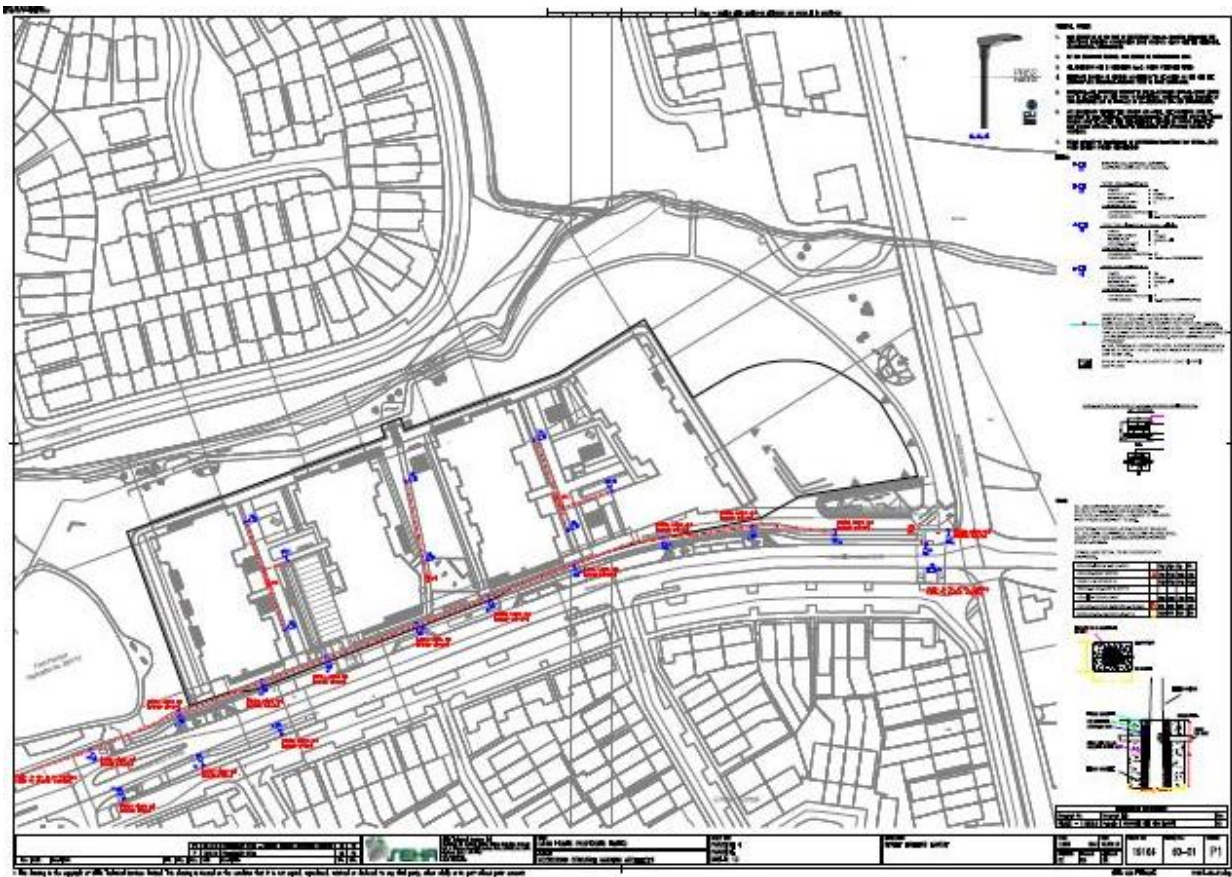


Figure 5: Proposed lighting plan for Parkside 4, Parkside, Dublin 13.

5. Impact Assessment & Mitigation

The following bat species have been recorded during this bat survey: common pipistrelle, soprano pipistrelle, Leisler's bat. This represents the three of the nine residence bat species known to Ireland, all of which are common Irish bat species.

All bat species recorded during this Bat Survey are Annex IV species under the EU Habitats Directive and all have a Favourable Status in Ireland.

The presence of bats was given consideration at the design phases of the proposed development.

For this ecological assessment, the habitats adjacent to the proposed development may be considered in terms of extent, diversity, naturalness, rarity, fragility, typicalness, recorded history, position, potential value and intrinsic appeal (Regini, 2000). The potential of these habitats for bat fauna is considered in this framework also.

- Little foraging and commuting areas were recorded within the proposed development site with foraging primarily recorded along the northern boundary of the proposed development site, particularly for soprano pipistrelles.

1 *Grasslands/disturbed ground.*

This is the principal habitat within the survey area and is associated hedgerows/treeline along the northern boundary. May be considered as Low ecological value.

2 *hedgerow and treeline boundaries, River Mayne.*

These habitat types are present along the northern boundary of the survey area. Such provides limited wildlife corridors and foraging areas for bat species recorded. May be considered as Medium ecological value.

Bat fauna within the survey area will be affected by both the construction phase and operational phase of the proposed development. The impact assessment and mitigation will be undertaken in relation to the two bat species recorded within the proposed development area: common pipistrelle, soprano pipistrelle.

Principal impacts of the proposed development, in general, on bat fauna may be summarised as follows:

1. There is limited habitat within the proposed development area. The loss of areas of grassland within the proposed development area will have a negligible impact on bats. This is considered as a negligible Negative impact.

In addition the operation of the proposed development is likely to entail the following:

- a) Lighting of the general area (street lighting, residential lighting etc.).

Proposed lighting of the proposed development will potentially impact on bat species in relation to commuting and foraging potential. The main impact on bats that may arise is the potential lighting impact on the northern boundary of the proposed development area which is used by pipistrelles. Common pipistrelles and soprano pipistrelles will tolerate low levels of lighting.

Therefore the lighting of the proposed development is likely to have a Minor Negative impact.

a) Operational post-development

The operation of the proposed development site as a housing estate will increase human usage of the site and as a consequence potential disturbance due to increased noise levels and lighting. However, as the proposed development site is not widely used by local bat populations and results show that the northern boundary is primarily used as a commuting and foraging area for common bat species. The proposed landscaping plan and lighting plan will reduce this impact and therefore the operational impact.

This proposed development is considered to have an overall potential Minor Negative impact on local bat populations if no mitigation measures were implemented.

Table 9: Potential impact of the proposed development on the different bat species recorded during survey work prior to the implementation of mitigation measures.

Works	SP	CP
Lighting of development area	Minor	Minor
- Reduced foraging		
- Reduced commuting		
Operation of the development site	Minor	Minor
Infrastructure	Minor	Minor

SP = soprano pipistrelle, CP = common pipistrelle

5.1 Mitigation Measures

The following mitigation measures are recommended to reduce the potential impact of the proposed development on local bat populations from Minor to Negligible Negative impact:

5.1.1 Lighting plan

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. This is particularly important for the northern boundary along the Mayne River. There is no lighting proposed to the rear of the proposed development site and the following principals will be followed in relation to the overall lighting plan for the proposed development site:

- Lighting design will be flexible and be able to fully take into account the presence of protected species. Therefore, appropriate lighting should be used within a proposed development and adjacent areas with more sensitive lighting regimes deployed in wildlife sensitive areas.
- Dark buffer zones will be used as a good way to separate habitats or features from lighting by forming a dark perimeter around them. This could be used for habitat features noted as foraging areas for bats.
- Buffer zones will be used to protect Dark buffer zones and rely on ensuring light levels (levels of illuminance measured in lux) within a certain distance of a feature do not exceed certain defined limits. The buffer zone can be further subdivided in to zones of increasing illuminance limit radiating away from the feature or habitat that requires to be protected.
- Luminaire design is extremely important to achieve an appropriate lighting regime. Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following will be considered when choosing luminaires. This is taken from the most recent BCT Lighting Guidelines (BCT, 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 dimming capability.
 - o A warm white spectrum (<2700 Kelvins is recommended to reduce the blue light component of the LED spectrum).
 - o Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
 - o The use of specialist bollard or low-level downward directional luminaires should be considered in bat sensitive areas to retain darkness above.
 - o Column heights will be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
 - o Only luminaires with an upward light ratio of 0% and with good optical control will be used.
 - o Luminaires will always 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.
 - o As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

5.1.2 Landscaping plan

It is important to ensure that the northern boundary of the proposed development site is retained and enhanced, where possible. The landscaping will incorporate:

- Semi-mature trees planting;
- Native tree planting in clumps along the external boundaries of the buildings and along the pathway adjacent to the river;
- Standard trees planting.

In addition, the following will be implemented:

- Any semi-natural habitats should be protected from potential damage construction phase and post-construction.
- Avoid the use of chemicals (weed killers, *etc.*) within the development zone.
- Any gaps should be planted along the new boundary of the proposed development. The shrub / tree mixture should be native plant species replication what already exists in the landscape: hawthorn, ash and oak.

Table 10: Potential impact of the proposed development on the different bat species recorded during survey work if bat mitigation measures are fully implemented.

Works	SP	CP
Lighting of development area	Negligible	Negligible
<ul style="list-style-type: none"> - Reduced foraging - Reduced commuting 		
Operation of the development site	Negligible	Negligible
Infrastructure	Negligible	Negligible

SP = soprano pipistrelle, CP = common pipistrelle

6. Survey Conclusions

This report provides information on the bat usage of the proposed development site. Three bat species were recorded during these bat surveys: common pipistrelle, Leisler's bat and soprano pipistrelle.

The level of bat activity could be considered as Low level. In relation to the bat evidence collected by this report, it is deemed that the bat populations recorded within the survey area are of Negligible importance in relation to Table 2.

The proposed development will likely have a Minor Negative impact on local bat populations.

A number of mitigation measures have been provided and incorporated into the design of the proposed development, and strict adherence to these will reduce the overall impact level to Negligible Negative impact.

The proposed development area will not result in the loss of a number of foraging habitats while additional trees and treelines will be replanted as part of the Landscape Plan.

The proposed development will increase the degree of lighting. However, the lighting plan is designed to reduce lighting spillage onto external hedgerows/treelines which will allow their continued usage by commuting and foraging bats. There is no lighting proposed for the rear of the proposed development site where the principal commuting and foraging area along the Mayne River was recorded.

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