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2021

Bat Survey Report



**Swords Road,
Santry,
Dublin 9**



ASH Ecology & Environmental

Bat Survey Report – Swords Road, Santry, Dublin 9

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1. INTRODUCTION

1.1 Purpose of the Report

Ash Ecology and Environmental Ltd (AEE) was commissioned by Enviroguide Consulting to carry out a bat survey at a site located along Swords Road, Santry, Dublin 9; see Figures 1. An aerial photo of the site with surrounding habitats is shown as Figure 2 with a close up aerial shot as Figure 3. This is currently a live retail site with buildings that will require demolition to facilitate a proposed SHD housing development, see Figure 3. In that regard a bat survey was required to assess any bat usage on the site.

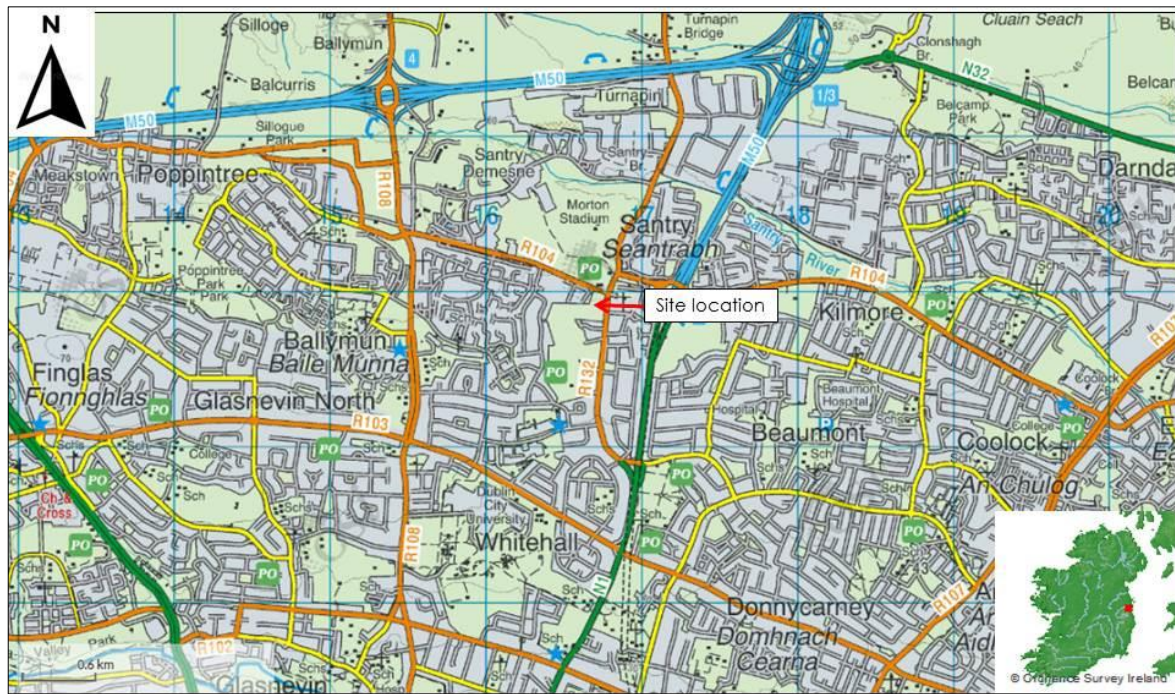


Figure 1 Site Location Map, red arrow



Figure 2 Aerial Photo of Site and Surrounds



Figure 3 Aerial Photo of Site

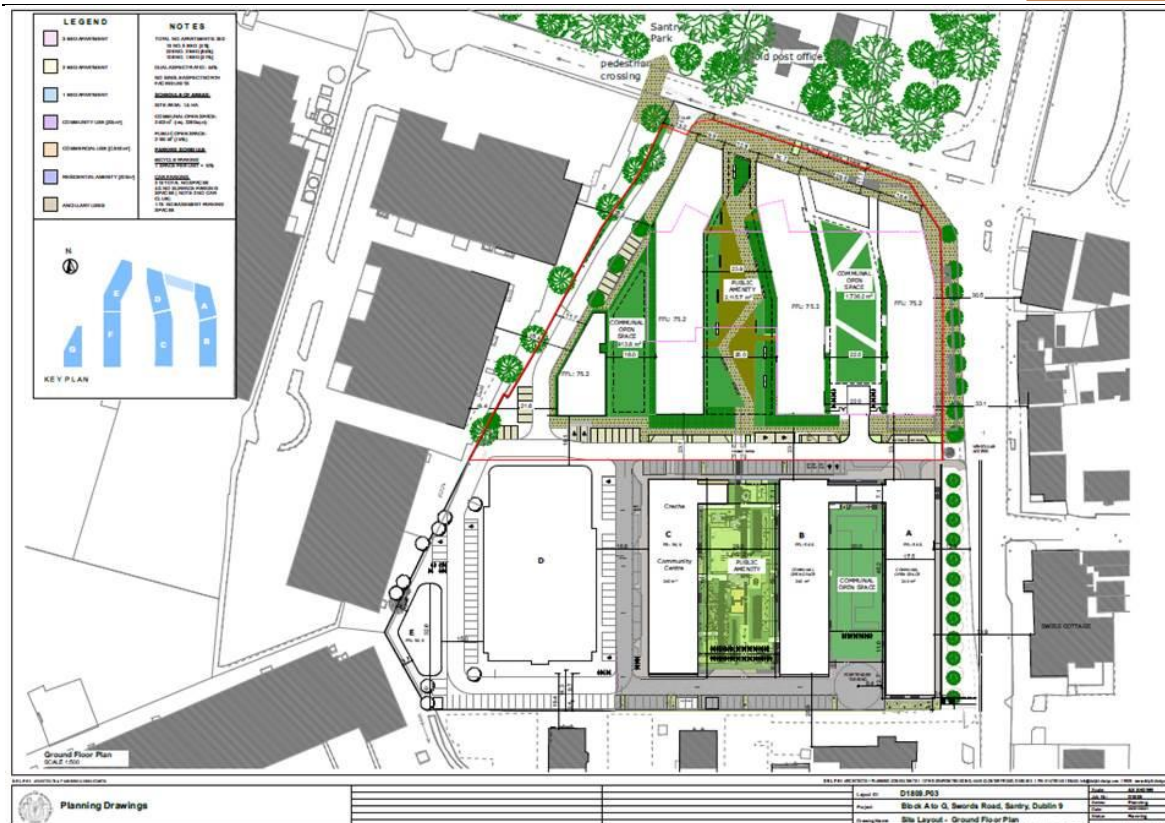


Figure 4 Proposed Site Layout

1.2 Competency of Assessor

This report has been prepared by Ash Ecology & Environmental Ltd (AEE) whose managing director and leading ecologist is Aisling Walsh who is a full member of the Chartered Institute of Ecological & Environmental Management (CIEEM) and whose qualifications include M.Sc. (Dist) in Biodiversity and Conservation (TCD) and B.Sc. (Hons) Zoology (NUIG). Aisling has over 14 years of experience providing environmental consultancy and environmental assessment services. Aisling has written numerous Ecological Impact Assessments (EclA), Screening for Appropriate Assessment Stage I and Stage II Natura Impact Statement, Environmental Impact Assessments/Statements, Badger Surveys, Bat Surveys, Habitat Surveys. She has also provided input and reviewed Ecological and Environmental assessments for several EIS and EIA Reports and conducted numerous noise surveys for EPA licensed facilities. AEE is listed as a Registered Practice by the CIEEM and a member of Bat Conservation Ireland. Aisling Walsh is a licenced bat ecologist (DER/BAT 2020 – 46 EUROPEAN, DER/BAT 2020 – 48 EUROPEAN).

1.3 Bat Legislation

In view of their sensitive status across Europe, all species of bat have been listed on Annex IV of the EC 'Habitats and Species Directive' and some, such as the lesser horseshoe bat, are given further protection and listed on Annex II of this Directive. This Directive was transposed into Irish law as the European Communities (Natural Habitats) Regulations, 1997, and combined with the Wildlife Acts (1976 to 2018), ensures that individual bats and their breeding sites and resting places are fully protected. This has important implications for those who own or manage sites where bats occur.

All bat species are protected under the Wildlife Acts 1976-2018 which make it an offence to wilfully interfere with or destroy the breeding or resting place of these species; however, the Acts permit limited exemptions for certain kinds of development.

All species of bats in Ireland are listed on Schedule 5 of the 1976 Act, and are therefore subject to the provisions of Section 23, which make it an offence to:

1. *Intentionally kill, injure or take a bat,*
2. *Possess or control any live or dead specimen or anything derived from a bat,*
3. *Wilfully interfere with any structure or place used for breeding or resting by a bat,*
4. *Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose.*

1.4 Derogation licences

In order to obtain a licence to allow the destruction of bat roosts etc., in advance of any otherwise legitimate development which may impact on the favourable conservation status of bats, Section 25 of the Habitats Regulations must be satisfied. It must therefore be demonstrated by the applicant that all reasonable steps have been taken to minimise the impact and that any remaining damage will be adequately compensated for. The first aim of the developer, working with professional advice, should be to entirely avoid or minimise the potential impact of a proposed development on bats and their breeding and resting places.

Current NPWS advice is that there should be no net loss in local bat population status, taking into account factors such as population size, viability and connectivity. Hence, when it is unavoidable that a development will affect a bat population, the mitigation should aim to maintain a population of equivalent status in the area.

One of the key aims of the Directive is to encourage member states to maintain at, or restore to, favourable conservation status those species of community interest (Article 2(2)). 'Favourable conservation status' is defined in the Habitats and Species Directive (Article 1(i)). Conservation status is defined as "the sum of the influences acting on the species concerned that may affect the long term distribution and abundance of its population within the territory." It is assessed as favourable when: "population dynamics data on the species concerned indicate that it is maintaining itself on a long term basis as a viable component of its natural habitats, and the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, or will probably continue to be, a sufficiently large habitat to maintain its populations on a long term basis." Note that even though there is apparent overlap between the Wildlife Acts and the Habitats Regulations, they run concurrently. No action in relation to bats that would not be permitted under the Habitats Regulations may be licensed under the Wildlife Acts.

Derogation licences granted under the Regulations include reference to the relevant provisions of the Wildlife Acts to ensure that all requirements for licensing

are covered in the one document. It should also be noted that a licence only allows what is permitted within its terms and conditions; it does not legitimise all actions related to bats at a given site.¹

2. METHODOLOGY

2.1 Information Sources

A desk-based review of information sources was completed. Information contained on the websites of the National Parks and Wildlife Service (NPWS)² and the National Biodiversity Data Centre (NBDC)³ was reviewed.

The following publications and websites were also reviewed and consulted:

In addition, the following publications and websites were also reviewed and consulted:

- Ordnance Survey of Ireland mapping and aerial photography available from www.heritagemaps.ie;
- Online data available on European sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie;
- Information on the status of EU protected habitats and species in Ireland (National Parks & Wildlife Service, 2013a and 2013b)⁴
- Clare County Development Plan 2017-2023
- McAney, K & Hanniffy, R (2015) The Vincent Wildlife Trust's Irish bat box schemes
- Bat Conservation Ireland <https://www.batconservationireland.org/>
- Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals (2018)
- Andrews H & Gardener M 2016. Bat Tree Habitat Key – Database Report 2016. AEcol, Bridgwater.
- Bat Conservation Trust (2018) Bats and artificial lighting in the UK Bats and the Built Environment series
- 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.
- Mitchell-Jones, A.J, & McLeish, A.P. (eds). 2004., 3rd Edition Bat Workers' Manual, JNCC, Peterborough, ISBN 1 86107 558 8
- Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition

¹ 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.

² The National Parks and Wildlife Services map viewer <http://webgis.npws.ie/npwsviewer/>

³ The National Biodiversity Data Centre www.NBDC.ie

⁴ NPWS (2013a). The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 2, Version 1.1. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

NPWS (2013b). The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

- Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (National Roads Authority, 2005).
- Guidelines for the Treatment of Bats during the Construction of National Road Schemes (National Roads Authority, 2005).
- Aughney, T., Kelleher, C. & Mullen, D. (2008) Bat Survey Guidelines: Traditional Farm Buildings Scheme. The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny.
- Bat Conservation Ireland <https://www.batconservationireland.org/>
- Bat Conservation Trust (2018) Bats and artificial lighting in the UK Bats and the Built Environment series⁵
- Bat Conservation Ireland (2012) Bats and Appropriate Assessment Guidelines, Version 1, December 2012. Bat Conservation Ireland, www.batconservationireland.org⁶
- Bat Conservation Ireland (2010) Bats & Lighting Guidance Notes for: Planners, engineers, architects and developers⁷
- Bats and Lighting in the UK – Bats and the Built Environment Series (Institute of Lighting Professionals, September 2011
- Guidance Notes for the Reduction of Obtrusive Light GN01 (Institute of Lighting Professionals, 2011.
- Bats and Lighting – Guidance Notes for Planners, Engineers, Architects and Developers (Bat Conservation Ireland);
- The Eurobats Mitigation of Lighting Document

2.2 Desk Study

2.2.1 Previous Records

A desktop review was carried out to identify the previous records of Bat species within the Proposed Development Site and its environs. The study area occurs in 10km² Grid Square O13. The website the NBDC (www.nbdc.ie) was accessed on 22/04/2021 to establish any previous bat records and shown below in Table 1.

Table 1 Historical Bat Records in 10km² Grid Square O13 (NBDC website www.nbdc.ie accessed 22/04/2021)

Species Name - Common	Species Name - Latin	Last Documented Record O13
Brown Long-eared Bat	<i>Plecotus auritus</i>	25/07/2013
Daubenton's Bat	<i>Myotis daubentonii</i>	11/08/2014
Lesser Noctule	<i>Nyctalus leisleri</i>	28/05/2016
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	15/09/2010
Natterer's Bat	<i>Myotis nattereri</i>	30/09/2016
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	03/08/2013
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	30/09/2016
Whiskered Bat	<i>Myotis mystacinus</i>	13/08/2007

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

⁶ https://www.batconservationireland.org/wp-content/uploads/2013/09/BCIreland-AA-Guidelines_Version1.pdf

⁷ https://www.batconservationireland.org/wp-content/uploads/2013/09/BCIrelandGuidelines_Lighting.pdf

2.2.2 Species Background

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

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

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

2.2.2.1 Family Vespertilionidae:

Common pipistrelle *Pipistrellus pipistrellus*

This species was only recently separated from its sibling, the soprano or brown pipistrelle *P. pygmaeus*¹¹, which is detailed below. The common pipistrelle's echolocation calls peak at 45 kHz. The species forages along linear landscape features such as hedgerows and treelines as well as within woodland.

Soprano pipistrelle *Pipistrellus pygmaeus*

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

Nathusius' pipistrelle *Pipistrellus nathusii*

Nathusius' pipistrelle is a recent addition to the Irish fauna and has mainly been recorded from the north-east of the island in Counties Antrim and Down¹² and also

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

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

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

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

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

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

Leisler's bat *Nyctalus leisleri*

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

Brown long-eared bat *Plecotus auritus*

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

Natterer's bat *Myotis nattereri*

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

Daubenton's bat *Myotis daubentonii*

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

Whiskered bat *Myotis mystacinus*

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

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

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

Brandt's bat *Myotis brandtii*

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

2.2.2.2 Family *Rhinolophidae*:

Lesser horseshoe bat *Rhinolophus hipposideros*

This species is the only representative of the *Rhinolophidae* or horseshoe bat family in Ireland. It differs from our other species in both habits and looks, having a unique nose leaf with which it projects its echolocation calls. It is also quite small and, at rest, wraps its wings around its body. Lesser horseshoe bats feed close to the ground, gleaning their prey from branches and stones. It often carries its prey to a perch to consume, leaving the remains beneath as an indication of its presence.

The echolocation call of this species is of constant frequency and, on a heterodyne bat detector, sounds like a melodious warble. The species is confined to six counties along the Atlantic seaboard: Mayo, Galway, Clare, Limerick, Kerry and Cork. The current Irish national population is estimated at 12,500 animals. This species is listed on Annex II of the EC Habitats Directive and 41 Special Areas of Conservation have been designated in Ireland for its protection. Where it occurs, it is often found roosting within farm buildings.

2.2.3 Landscape Suitability

The National Biodiversity Data Centre (NBDC) maps landscape suitability bats based on Lundy *et al.* (2011). The maps are a visualisation of the results of the analyses based on a 'habitat suitability' index. The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The average overall for the higher suitability is 36.4-58.6. The average assessment of bat habitats in the current study area is mainly 18.89– low. It is a higher score just inside the northern boundary of the site 25.89 possibly due to the close proximity of Santry Park with wooded areas. Table 2 gives the suitability of the study area for the bat species found in the study area (based on NBDC) along with their Irish Red List Status (from Marnell *et al.*, 2019).¹⁶

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

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

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

Table 2 Suitability of the study area for the bat species found in the Santry area containing the site (based on the NBDC data) with Irish Red list status indicated.

Common name	Scientific name	Suitability index	Irish red list status
All bats	-	18.89	Least Concern
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	29	Least Concern
Brown long-eared bat	<i>Plecotus auritus</i>	17	Least Concern
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	40	Least Concern
Lesser-horseshoe bat	<i>Rhinolophus hipposideros</i>	0	Least Concern
Leisler's bat	<i>Nyctalus leisleri</i>	33	Least Concern
Whiskered bat	<i>Myotis mystacinus</i>	11	Least Concern
Daubenton's bat	<i>Myotis daubentonii</i>	9	Least Concern
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>	16	Least Concern
Natterer's bat	<i>Myotis nattereri</i>	15	Least Concern

2.2.4 Bat Roosts

Bats were originally cave and tree dwelling animals but many now find buildings just as suitable for their needs. Bats are social animals and most species congregate in large colonies during summer. These colonies consist mostly of females of every reproductive class, with some juvenile males from the previous year. Male bats normally roost individually or in small groups meeting up with the females in the late autumn-early winter, when it is time to mate. In summer, bats seek warm dry buildings in which they can give birth and suckle their young. In winter, they seek out places with a constant low temperature and high humidity where they can become torpid and hibernate during adverse weather conditions. However, bats do not hibernate continuously during winter and will awake and hunt during mild nights when there are insects available, and it is energetically advantageous to forage.

2.2.4.1 Maternity Roosts

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

2.2.4.2 Mating Roosts

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

2.2.4.3 Hibernation Roosts

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

2.2.4.4 Night Roosts

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

2.3 General Activity Survey

A general bat activity survey was also undertaken on the 28th April 2021 from 20.00 to 22.20 (sunset was 20.49) by walking the Site boundary and around all structures onsite. The weather was optimal for a bat survey with temperatures on the night 10°C in calm conditions. Bat activity and emergence surveys are best carried out mid-March to end of September in suitable weather conditions¹⁷ which this survey was. The equipment used for the bat activity surveys included the Elekon Bat Logger M detector. Visual observations were taken with the aid of a powerful L.E.D. torch (AP Pros-Series 220 Lumens High Performance Spotlight).

2.4 Buildings Assessment Methodology

A bat potential assessment of the buildings onsite using a Seek Thermal Reveal Pro High-Resolution Thermal Imaging Camera along with a RIDGID 36848 Micro CA-150 Hand-Held Borescope for inspection of any crevices (where accessible). This piece of equipment is fitted with a camera and allows visibility of confined spaces and narrow passages potentially used by hibernating/roosting bats. It allows spaces up to 3m from ground level to be inspected. The BCT guidelines were followed.¹⁸

Buildings were classified using Table 4.1 of the BCT guidelines (2016) and shown overleaf as Table 3. Plates are shown as Appendix A.

¹⁷ 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.

¹⁸ *Bat Surveys for Professional Ecologists, Good Practice Guidelines (2016)*

Table 3 Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of roost 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	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions ^a and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation ^b). 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. ^c	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^a 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).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
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 ^a and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

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

^b 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.

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

2.5 Bat Potential Tree Assessment

Trees onsite were assessed to determine the presence of the Potential Roost Features listed below and, to assess whether the trees may be used as important commuting and foraging routes.

- Natural holes (e.g., knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar.
- Man-made holes (e.g., cavities that have developed from flush cuts or cavities created by branches tearing out from parent stems).
- Cracks/splits in stems or braches (horizontal and vertical).
- Partially detached or loose bark plates.
- Cankers (caused by localised bark death) in which cavities have developed.
- Other hollows or cavities, including butt rots.
- Compression of forks with included bark, forming potential cavities.
- Crossing stems or branches with suitable roosting space between.

- Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk).
- Bat or bird boxes.
- Other suitable places of rest or shelter.

Certain factors such as orientation of the feature, height from the ground, the direct surroundings and its location in respect to other features may enhance or reduce the potential value.

Trees were then classified into general bat roost potential groups based upon the presence of these features. An evaluation table is shown as Table 4.

Table 4 Classification and Survey Requirements for Bats in Trees¹⁹

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey Work / Actions
Confirmed Roost	Evidence of roosting bats in the form of live / dead bats, droppings, urine staining, mammalian fur oil staining, etc.	<p>A National Parks and Wildlife (NPWS) derogation licence application will be required if the tree or roost site is affected by the development or proposed arboricultural works. This will require a combination of aerial assessment by roped access bat workers (where possible, health and safety constraints allowing) and nocturnal survey during appropriate periods (e.g. nocturnal survey - May to August) to inform on the licence.</p> <p>Works to tree undertaken under supervision in accordance with the approved good practice method statement provided within the licence.</p> <p>However, where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may be possible.</p>

¹⁹ Bat Surveys for Professional Ecologists: Good Practice Guidelines (J., Collins (Bat Conservation Trust), 2016¹⁹).

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey Work / Actions
High Potential	<p>A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc.) and surrounding habitat. Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.</p>	<p>Aerial assessment by roped access bat workers (if appropriate) and / or nocturnal survey during appropriate period (May to August).</p> <p>Following additional assessments, tree may be upgraded or downgraded based on findings.</p> <p>If roost sites are confirmed and the tree or roost is to be affected by proposals a licence from the NPWS will be required.</p> <p>After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.</p>
Moderate Potential	<p>A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc.) and surrounding habitat but unlikely to support a roost of high conservation status (i.e., larger roost, irrespective of wider conservation status). Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.</p>	<p>A combination of aerial assessment by roped access bat workers and / or nocturnal survey during appropriate period (May to August).</p> <p>Following additional assessments, tree may be upgraded or downgraded based on findings.</p> <p>After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.</p> <p>If a roost site/s is confirmed a licence from the NPWS will be required.</p>
Low Potential	<p>A tree of sufficient size and age to contain Potential Roosting Features</p>	<p>No further survey required but a precautionary</p>

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey Work / Actions
	<p>but with none seen from ground or features seen only very limited potential.</p> <p>Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.</p>	<p>working method statement may be appropriate.</p>
Negligible/No potential	Negligible/no habitat features likely to be used by roosting bats	None.

2.6 Landscape Evaluation

Ecological survey results were evaluated to determine the significance of identified features located in the study area on an importance scale ranging from international-national-county-local (from NRA, 2009) The local scale is approximately equivalent to one 10km square but can be operationally defined to reflect the character of the area of interest. Because most sites will fall within the local scale, this is sub-divided into two categories: local importance (higher value) and local importance (lower value).

3. RESULTS

3.1 General Activity Survey

The results of bat survey carried out April 28th 2021 using the Elekon Batlogger M detector yielded no results i.e. no bats were detected during the survey despite ambient weather and the appropriate time of year. The site does however lack commuting and foraging routes (with no mature trees) to more suitable habitat and is well illuminated (see Plates, Appendix A) as it is a live retain site which would discourage most bats.

3.2 Buildings Assessment Survey

The buildings onsite were inspected as per the methodology set out in Section 2.4. The buildings were visually examined externally for signs of bats, or evidence of bat activity, using a torch where necessary. Cracks, crevices etc. were investigated for ingress / egress points and evidence of bat habitation, such as smearing lines, droppings, and staining. No sign of bat usage was noted.

No bat emergence was detected or observed from any buildings onsite during the survey on 28th April 2021. The buildings (which form one block, see Figure 3) were all 'Negligible' for bat potential.

3.3 Bat Potential Tree Assessment

The trees onsite, a row of ~5 small cherry trees near the front entrance, had no/negligible potential for roosting bats; see Table 4, Section 2.5 assessment classification.

3.4 Landscape Evaluation

The landscape is considered of local importance (Lower value) for bats due to the location within a highly urbanised location. In addition it has been assigned a low landscape suitability score for bats, see Section 2.2.3. There is negligible commuting and foraging routes for bats in and around the site that would connect it to more suitable habitats. Santry Park is across the road from the site however it is unlikely any bats would leave this area to forage on the site that lacks mature trees and is well illuminated.

4. RECOMMENDATIONS

4.1 Tree Assessment

No bat potential trees (being used as roosts) were found during survey. Any future planting should include some native tree species.

4.2 Lighting for Bats

In order to minimise disturbance to bats utilising the site in general, the lighting and layout of the proposed development should be designed to minimise light-spill onto habitats used by the local bat population foraging or commuting. This can be achieved by ensuring that the design of lighting accords with guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers 'Bats and Lighting in the UK - Bats and Built Environment Series', the Bat Conservation Trust 'Artificial Lighting and Wildlife Interim Guidance' and the Bat Conservation Trust 'Statement on the impact and design of artificial light on bats'. Therefore, where possible, the lighting scheme should include the following:

- The avoidance of direct lighting of proposed areas of habitat creation / landscape planting, or on existing trees to be retained
- Unnecessary light spill controlled through a combination of directional lighting and hooded / shielded luminaires or strategic planting to provide screening vegetation.
- Lights should be of low intensity. It is better to use several low intensity lights than one strong light spilling light across the entire area.
- Narrow spectrum lighting should be used with a low UV component. Glass also helps reduce the UV component emitted by lights.
- The colour rendering of the selected light fitting should be 3000k making the LED fittings a warmer light, helping to further minimize the impact on the local wildlife

4.3 Demolition Works

All buildings on the site (one block) were deemed Negligible for bat roost suitability therefore no further surveys are required.

A series of 5+ bat boxes should be erected on trees around the Site during the operational phase to provide future roosting opportunities for bats. The type recommended is the 2F Schwegler Bat Box.²⁰

²⁰ Available here: <https://www.nhbs.com/search?q=bat+boxes&qtview=158629>

5. CONCLUSION

There was an absence of bat activity onsite during the survey despite the ambient weather conditions on the night.

The Site itself is considered to be of Lower Importance for bats for the following reasons:

- No bats were recorded during a bat survey carried out in ambient weather conditions during the appropriate time of year.
- The site is well illuminated due to the fact it is a live retail site (likely to deter bats).
- The site lacks mature trees and therefore commuting and foraging routes to other more suitable habitats.
- All buildings occupying the site lacked roosting suitability for bats.

On the basis of the findings of the survey works completed in April 2021 it is concluded that the overall impact on bats, arising from the Proposed Development, will be most likely negligible if the general recommendations and specific lighting mitigation measures are implemented from Section 4.0 i.e. lighting mitigation for bats, landscaping with native tree species, and future roosting opportunities via bat boxes integrated into the final design.