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Planning and Development (Housing) and Residential Tenancies Act 2016

Planning and Development (Strategic Housing Development) Regulations 2017.

Bat Survey undertaken at Boycetown, Kilcock, Co. Kildare.

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1.0 Introduction

Artificial Light At Night has increasingly been a cause of concern for nocturnal wildlife. Bat Conservation Ireland has compiled a list of impacts Artificial Light at Night can have on bat species. Bats rely on echolocation during the hours of darkness however bats that emerge early are thought to use eye sight to fly from the roosting site to nearby treelines or hedgerows. Too much light can lead to bats becoming disorientated. Bats are thought to be more tolerant of white warm light or light in the red portion of the spectrum. Too much light at the entrance to a roost can delay emergence and result in the loss of peak feeding at dusk. Artificial Light At Night can attract night flying insects. Some Irish bat species such as Leisler's and Pipistrelle have been observed opportunistically feeding around light installations. Similarly, increased light may increase the possibility of bat predation. The majority of Irish bat species are light sensitive. Artificial Light can pose an obstacle to light sensitive bat species. To pass through a lit area it is thought the bats fly faster through the brighter area expending more energy which needs to be replaced through feeding. Flying insects migrating towards artificial light may reduce the foraging potential for light sensitive species (Bat Conservation Ireland Website).

There is much debate about the impact of Artificial Light At Night and the effect on the nocturnal environment. Installation of Artificial Light At Night has led to areas being subjected to unnatural intensities of light at night which differs from that of natural light sources including moonlight and starlight. Dark Sky Ireland have estimated that there has been a 60% increase in light levels at night in Ireland from 1995-2015.

2.0 Bat survey methodology at Boycetown, Kilcock, Co. Kildare

A bat survey was undertaken in late August to identify if:

1. Bats were present in the vicinity of the proposed development site
2. Identification of bat species and
3. Assess and evaluate the number of bat passes.

The survey environmental detail is adapted from the All Ireland Daubenton's Bat Waterway Survey Day time and Night-time Survey Form. A Day-time survey of the proposed development site identified that hay bales and sheep were present in the eastern section of the proposed development site. Horses were grazing the southwestern section of the site and the northwestern section was overgrown. For safety of egress in the dark it was decided to survey in front of St. Joseph's cemetery. A handheld device and a passive detector were used. The handheld frequency was manually moved up and down to get a positive identification of bat sounds. The passive detector was used as a control to detect the full spectrum of bat frequencies.

A night time survey was undertaken on the 24th August 2022. The static survey involved placing the Anabat monitor at a single location at the stile of the cemetery and a second location with the handheld heterodyne bat monitor. Based on the information collected it was decided to undertake a follow – up survey before sunset to identify bat activity prior to sunset. Activity prior to sunset may suggest that bats are roosting locally. A dawn survey was not undertaken. A dawn survey would allow a bat count to be undertaken for bats returning to

a roost. No roost location was identified during the February 2021 when trees were bare and trunks were visible. No roost location was identified during the night time surveys.

The new Musgrave development opposite to the site surveyed has led to the removal of hedgerow and installation of security lights around the building, lights on the car park area along with existing street lights.

Lights from the car park were observed reflected in the marble head stones in the cemetery.

Day Time Survey Form	
Project title	Bat survey for a proposed development at Boycetown, Kilcock, Co. Kildare
Habitat Description (Trees, hedgerow, other habitats)	The survey location was underneath the evergreen treeline in front of St. Joseph's Cemetery perimeter wall. Artificial surfaces such as tarmacadam dominated the area outside the cemetery wall and took the form of car parking and road surfaces.
Adjacent habitats	Other adjacent habitats included the garden surrounding St. Patrick's Church (former) with belfry. The proposed development site remained unchanged with hedgerows, treelines, agricultural grassland. The most western section of the proposed development site remained unmanaged, and the tall grasses dominated with thistles and ruderal species. A new Musgrave development opposite the north-western corner of the site survey has led to the removal of hedgerow and installation of security lights around the building, lights on the car park area along with existing street lights.

Table 1 Description of the surrounding environment adapted survey details.



Fig. 1 Eastern section of the proposed development site from the northern boundary

Night Time Survey Form – Night # 1	
Project title	Bat survey for a proposed development at Boycetown, Kilcock, Co. Kildare
Survey Type	Static survey. Results recorded in a single location.
Is the site in a SAC	No
Is the site in an NHA	No
Bat Model Detector used	Bat Box IIID hand held device Titley Anabat Express passive bat detector
Bat identification skills	Good to very good
Survey Date	24th August 2022.
Survey Location	Handheld outside St. Joseph's Cementary Gate at old cottage Anabat passive detector located inside the cemetery wall on the top step of the stile.
Start Time	20.40 hours (sunset as per All Ireland Daubenton's Bat Suvey, 20.31 hours).
Finish Time	22.00 hours bat activity had ceased and streetlights were on full.
Temperature ^{0}C	19^0C
Wind	Calm
Cloud	Clear (0-1/3) sky cover
Rain	Dry
Lights present	Lighting from new development to the north of the cemetery
Nocturnal wildlife	None. No midge or moths at the survey point.
Survey Findings	Pipistrelle and Leisler's activity. Pipistrelle bat sighting at 20.50

Table 2 Night time survey Night # 1 survey results.

Night Time Survey Form – Night # 2	
Project title	Bat survey for a proposed development at Boycetown, Kilcock, Co. Kildare
Survey type	Static survey. Results recorded in a single location. Survey was undertaken prior to sunset to evaluate whether there was a greater level of bat activity prior to lighting up.
Is the site in a SAC	No
Is the site in an NHA	No
Bat Model Detector used	Bat Box IIID hand held device Titley Anabat Express passive bat detector
Bat identification skills	Good to very good
Survey Date	27th August 2022.
Survey Location	Handheld outside St. Joseph's Cementary Gate at old cottage Anabat passive detector located inside the cemetery wall on the top step of the stile.
Start Time	20.10 hours
Finish Time	21.00 hours
Temperature ^{0}C	16^{0}C
Wind	Calm
Cloud	Clear (0-1/3) sky cover
Rain	Dry
Lights present	Lighting up time commenced 20.37 with all lights on at 20.45
Nocturnal wildlife	None. No midge or moths at the survey point
Survey Findings	**Hand held heterodyne.** Pipistrelle activity recorded (twittering sound). **Passive bat detector** Pipistrelle and Leisler's activity.

Table 3 Night time survey Night # 2 survey results.

3.0 Summary of Bat Activity

There are nine species of bat found in Ireland. Under Irish Law bats in the Republic of Ireland are afforded protection under the Wildlife Act 1976 and successive amendments. Under the Wildlife Act 1976 and the Wildlife (Northern Ireland) Order 1985,

it is an offence to intentionally disturb, injure or kill a bat or disturb its resting place and any work on a roost must be carried out with the advice of the National Parks and Wildlife Service in the Republic, or the Northern Ireland Environment Agency in Northern Ireland.

Bats are also protected in Europe under the Habitats Directive. The Lesser Horseshoe Bat is protected under Annex II and bat species are provided strict protection under Annex IV of the Habitats Directive. The EU Habitats Directive has been transposed into both Irish and Northern Irish law as the European Communities (Birds and Natural Habitats) Regulations 2011 and the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 as amended (Bat Conservation Ireland website).

The bat survey identified Leisler's bat, Pipistrelle species (possibly two species *Pipistrellus pipistrellus* and *Pipistrellus pygmaeus*). These bats are less sensitive to light than the other bat species found in Ireland and therefore more frequently observed in urban areas. The bat survey could not conclude if a roost was present locally, for example the belfry of St. Patrick's Church (former). The evergreen trees would not provide a suitable roosting habitat for bat species. The resin in the trees would not provide a dry hollow area for roosting bats. However, ivy clad trees and mature deciduous trees on the grounds of the former St. Patrick's Church would provide suitable habitat. Mature trees with hollows on the proposed development site may provide roosting places for bats. (Bat Conservation Ireland).

Bat Conservation Ireland on their website note that bats that emerge early depend on their eyesight to commute across the landscape at dusk and as night falls use echolocation to find food. With this in mind, on emergence bats need unlit corridors or areas to travel along or through. Bright light can delay bat emergence or lead to confusion or disorientation. The treeline on the cemetery side (southern side of the trees) is an ideal corridor for bats to travel. The treeline has the advantage that it connects with other habitats for example the garden of the former church and treeline and hedgerow of the surrounding environment (Bat Conservation Ireland website).

Time (hours)	Description of activity
Handheld heterodyne device 24th August 2022	
8.50	Pipistrelle activity and a bat sighting flying along the lower branches of the cemetery trees in a westward direction.
21.16	Pipistrelle activity
20.21	Leisler's activity
21.30	Leisler's activity especially around the eastern boundary of the cemetery with boundary garden at the end of the bat survey.
Anabat monitor 24th August 2022.	
20.50	Leisler's activity
20.52	Pipistrelle activity
Handheld heterodyne device 27h August 2022	
Up to 20.21 20.21 20.40 20.53	A lot of low level activity (twittering type noise) coming across at 45Hz but pattern of calls Bat recorded at 55kHz – really loud clear signal Bat recorded at 55kHz Bat recorded at 45kHz
Anabat monitor 27th August 2022	
20.37	Leisler's activity
20.44	Pipistrelle activity (45 kHz)

Table 3 Night time survey results summary.



Fig. 2 Just after lighting up opposite north western section of the proposed development site,

The Night #1 survey observed a Pipistrelle bat flying in a westerly direction along the lower tree branches of the evergreen treeline. The flight detected was close to sunset, possibly suggesting the bats are roosting in the local environment. The sighting of the Common pipistrelle bat coincided with light up time. Leisler's bat frequency was also detected.

A second survey was undertaken Night #2 was undertaken to assess the presence of bat activity prior to sunset. Audible bat sounds could suggest the presence of roosting bats locally. On Night #2 the passive bat monitor was positioned in the same location as Night #1. The hand held bat monitor location changed slightly being east of the cemetery entrance. The concentration of Leisler's activity at the end of Night #1 survey was interesting and warranted a pre sunset survey.

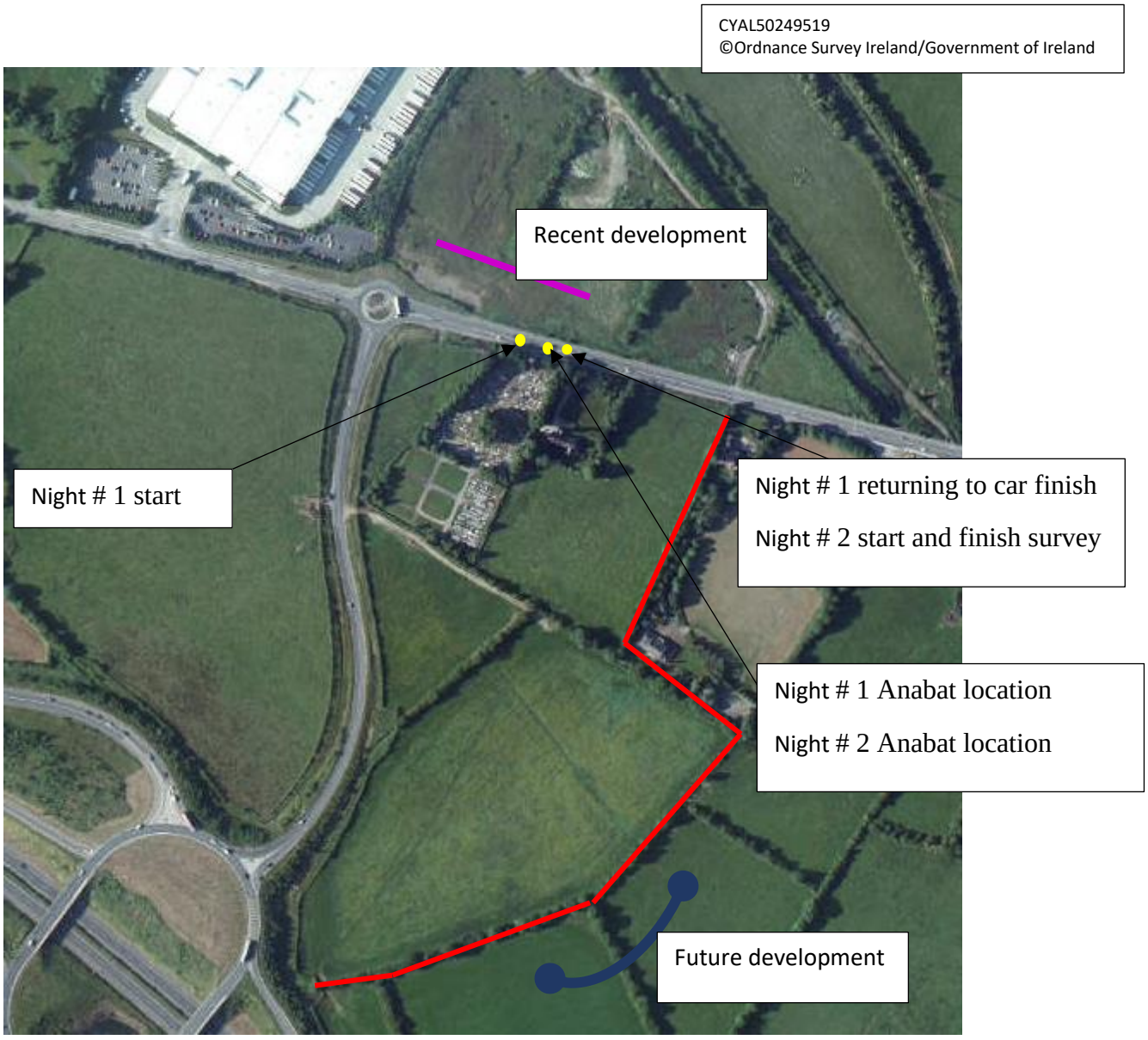

Fig. 3 Survey locations for bat surveying (OSI website).

4.0 Recommendation measures

The bat survey identified that bats are present locally. The survey showed that the bats have a preference for dark corridors that are not exposed to street lights. Mature tree canopies and ivy clad trees identified bat activity. The increase in street lights will impact on bat activity. It should be noted that the environs surrounding the proposed development site is a changing one. Planning has been granted for a development to the south east of the proposed development and there is a new development to the north of the proposed development site. Construction and landscaping post construction will lead to the creation of alternative habitats. The following recommendations therefore are provided to improve the nocturnal activity at the proposed development site:

- Lighting should provide security for humans but should be designed with nocturnal activity in mind. Lighting should consider location of light stands, creation of dark zones around tree canopies and hedgerows, use of appropriate light temperature for light fittings and implement dimming policies as undertaken by Local Authorities.

a) Lights should not be positioned that will lead to the lighting up of the tree canopy. Light spillage (categorised as light shines onto an unintended area), light glare (commonly associated with powerful lights such as flood lights making the illuminated area difficult to see) and sky glow (the orange light glow evident in the sky over towns and cities) should be minimised (Cork County Council, 2020).

- Prior to felling and tree maintenance by an Arborist, mature trees should be inspected for signs of bat activity, for example oil staining around hollows. Decaying or broken branches can be bat habitats.
- Rewilding of areas should be reviewed. The no mow May policy provides vital wildflowers to support wildlife however grass that grows too tall and too strong can crowd out later flowering wildflowers. No mow May should not extend to July and August. There needs to be a succession of flowering plants through the season.
- **On grant of planning cctv should be placed on the proposed development site to ensure that large mature trees are not felled (by others) prior to commencement of construction. Anecdotal evidence indicates some opportunistic felling of trees by unconnected parties on development sites prior to commencement of work on site. Treelines and hedgerow to be kept could be clearly identified that sections will be retained.**

5.0 Conclusion

Bat species were observed close to the proposed development site. The species are those commonly found in urban areas. Consideration of the recommendation measures identified should support bats locally.

References

Bat Conservation Ireland website https://www.batconservationireland.org/

Cork County Council Public Lighting Manual and Project Specification 2020. https://www.corkcoco.ie/sites/default/files/2020-07/cork-county-council-public-lighting-manual-and-product-specification-2020.pdf

Dark Sky Ireland website https://www.darksky.ie/

Ordnance Survey Ireland website https://webapps.geohive.ie/mapviewer/index.html