



Bat Survey Report (Winter Daytime Assessment)

Proposed Primary School Development Site at
Kishoge, Lucan, Co. Dublin

5-01-23

ecofact 

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1. INTRODUCTION

Ecofact were commissioned to undertake a bat survey at a proposed primary school development site at Kishoge, Lucan, Co. Dublin. The current survey comprised a daytime inspection during November 2022 and thus is outside the active bat season. This survey therefore includes a winter assessment of habitats on the site.

There is an application for a primary school at the site (Planning Reference No.: SDZ22A/0011) with South Dublin County Council. The proposed primary school will extend to c. 3,355 sqm and will be 2 storeys in height and will comprise 16 no. classrooms with an additional 2 classroom Special Educational Needs Unit; a General Purpose Hall and all ancillary teacher and pupil amenities and facilities. The proposed development also provides for hard and soft play areas, including 2 no. outdoor ball courts, bicycle parking, staff car parking, vehicle drop off and set down areas (Planning Reference No.: SDZ22A/0011). South Dublin County Council requested further information on the 26th of September 2022, which includes the requirement for a bat survey:

'Item 5: The applicant is requested to provide a comprehensive bat survey and an assessment of the lighting design by a suitably qualified bat expert.'

1.1 Legislation

Bats are strictly protected under both national and international law. The purpose of this legislation is to maintain and restore bat populations within their natural range. This implies that the habitats on which they rely and the ecology of their life cycles should not be compromised by human activities. Where activities have the potential to compromise bat populations, measures are required to be put in place to avoid impacts or compensate and mitigate for those impacts. The key legislation which provides protection to bats is outlined below.

1.1.1 Wildlife Act 1976

In the Republic of Ireland, all bats and their roosts are protected under Schedule 5 of the *Wildlife Act 1976* (amended 2000 and 2010). It is unlawful to disturb either without the appropriate Licence.

1.1.2 EU Habitats Directive

In addition to domestic legislation bats are also protected under the *EC Directive on the Conservation of Natural habitats and of Wild Fauna and Flora* (Habitats Directive 1992). This Directive seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All bat species are protected under Annex IV of the EU Habitats Directive, while the lesser horseshoe bat (*Rhinolophus hipposideros*) is listed under Annex II. Member states are required to designate Special Areas of Conservation for all species listed under Annex II in order to protect them. The EU Habitats Directive has been transposed into Irish law with the European Communities (Birds and Natural Habitats) Regulations 2011.

1.1.3 Bern and Bonn Conventions

Ireland has also ratified two international conventions which afford protection to bats amongst other fauna. These are known as the 'Bern' and 'Bonn' Conventions. *The Convention on the Conservation*



of *European Wildlife and Natural Habitats* (Bern Convention 1982), 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, which covers certain species of bat.

1.1.4 Derogation Licences

The destruction, alteration or evacuation of a known bat roost is a notifiable action and can only be carried out with a derogation licence from the National Parks and Wildlife Service. Any works that might interfere with bats or their roost sites can only be carried out under 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). Details with regards to Appropriate Assessments, procedures and parameters under which derogation licences may be obtained are outlined 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 the 16th of May 2007 on behalf of the Minister of the Environment, Heritage and Local Government.

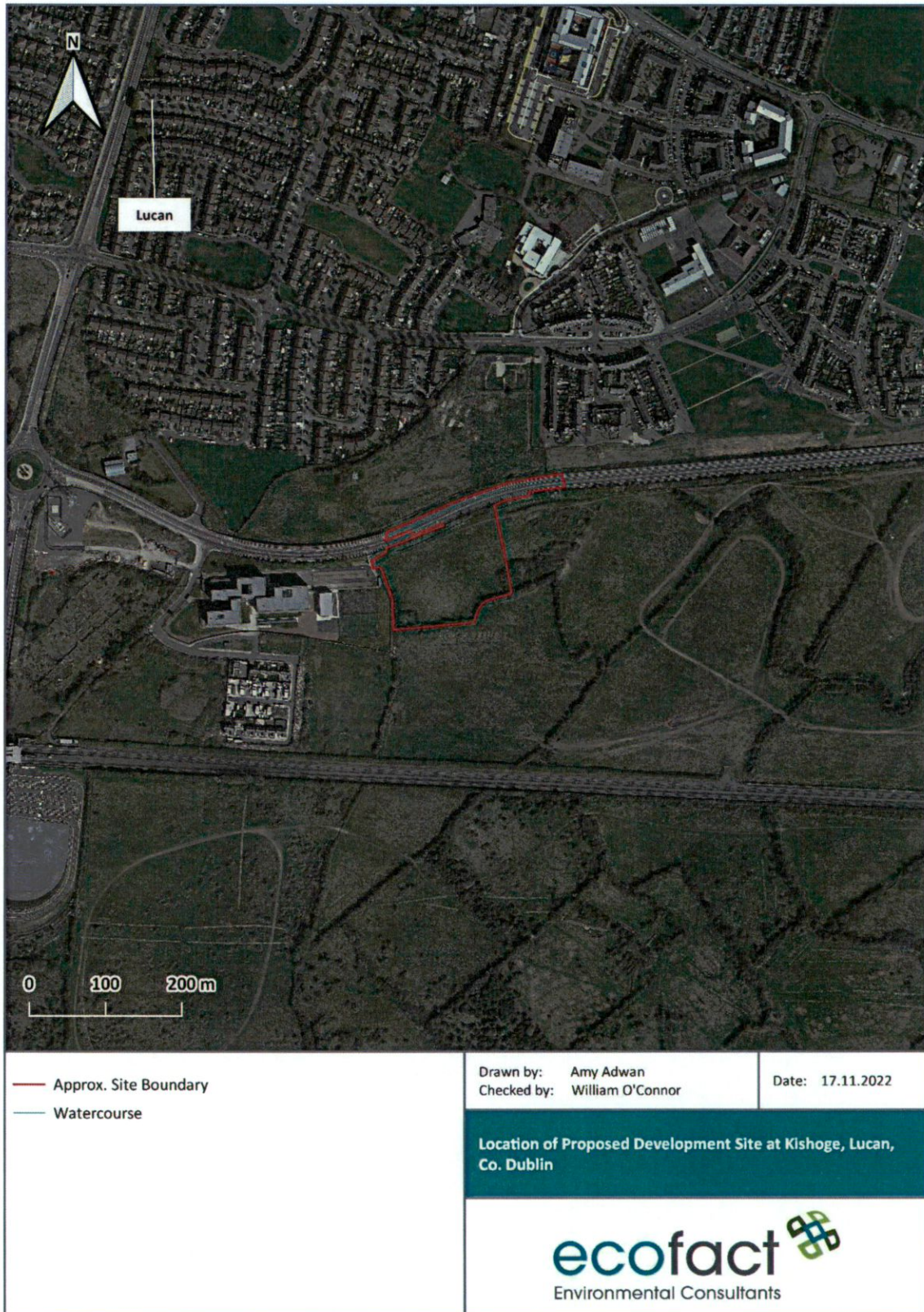


Figure 1 Location of Proposed Development Site at Kishoge, Lucan, Co. Dublin.



2. METHODOLOGY

2.1 Desk Study

The bat suitability of habitat in the study area for bats was obtained from the National Biodiversity Data Centre (NBDC) database. This map provides a picture of the broad scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species. The maps are a visualization 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 (Lundy *et al* 2011). The NBDC online National Bat Database of Ireland was accessed to review bat records in the study area.

2.2 Field Survey

2.2.1 Guidance

The survey had regard to the methodology outlined in:

- *Bat Mitigation Guidelines for Ireland v2* by Marnell *et al.*, (2022)
- *Bat Tree Habitat Key (BTHK)* by Andrews, H (2018).
- *Bat Surveys for Professional Ecologists: Best Practice Guidelines 3rd Edition* by Collins (2016)
- *Guidance on the strict protection of certain animal and plant species under the Habitats Directive in Ireland* by NPWS (2021)
- *Bat Workers' Manual 3rd Edition* by JNCC (2004) and
- *British Bat Calls: A Guide to Species Identification* (Russ, 2012).

The definition of bat roost types used in this report is adapted from Collins (2016).

Table 1 Definition of bat roost types adapted from Collins (2016).

Roost Type	Definition
Day Roost	A place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer.
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 individual on occasion or it could be used regularly by the whole colony.
Feeding Roost	A place where individual bats or a few individuals rest or feed during the night but are rarely present by day.
Transitional/occasional Roost	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.
Swarming Site	Where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites.
Mating Sites	Where mating takes place from late summer and can continue through winter.
Maternity Roost	Where female bats give birth and raise their young to independence.
Hibernation Roost	Where bats may be found individually or together during winter. They have a constant cool temperature and high humidity.
Satellite Roost	An alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season.



2.2.2 Daytime Inspection

A survey of the site took place on the 14th of November 2022. This survey involved a daytime inspection of the subject site during daylight hours to assess the habitats present on the site and their potential importance for bats. There are no structures on the proposed development site. Weather conditions during the survey were noted to be bright, sunny and cold with a slight breeze. Mature trees were inspected for their potential to have bats, using visual observations to examine the trees for knotholes, dense ivy coverage, woodpecker holes, damaged limbs, lifting bark or impact shatters. Trees were checked from the ground only. Any Potential Roost Features (PRFs) were recorded. The rest of the site was inspected for suitable bat foraging habitat and potential commuting routes. Any other features relevant to the usage by bats including existing lighting was recorded.

3. DESCRIPTION OF PROJECT CHARACTERISTICS

The proposed primary school will extend to c. 3,355 sqm and will be 2 storeys in height and will comprise 16 no. classrooms with an additional 2 classroom Special Educational Needs Unit; a General Purpose Hall and all ancillary teacher and pupil amenities and facilities. The proposed development also provides for hard and soft play areas, including 2 no. outdoor ball courts, bicycle parking, staff car parking, vehicle drop off and set down areas. Photovoltaic Panels (PV) are proposed on roofs in addition to EV charging points and a packaged biomass heating plant. The proposed development also provides for all landscaping and boundary treatments and all associated site development works. Access to the site will be via a new junction on Thomas Omer Way. The new access road will run south off Thomas Omer Way and then west into the site. The proposed access road is in accordance with the Clonburris Strategic Development Zone (SDZ) Planning Scheme and incorporates public lighting, footpaths and cycle tracks. A further pedestrian / cycle only connection to Thomas Omer Way is also proposed along the western green corridor, west of the proposed school building (Planning Reference No.: SDZ22A/0011).

There is a landscaping plan submitted as part of the proposal. This was carried out by Casey Planning & Landscape Consultancy (2022). The proposed tree planting species include: Whitebeam *Sorbus aria*, Himalayan birch *Betula jacqueomintii multistemmed*, Ornamental pear *Pyrus calleryana 'Redspire'*, Turkish hazel *Corylus colurna*, Rowan *Sorbus aucuparia*, Snowy Mespilus *Amelanchier lamarckii*. The proposed hedge planting species include Hawthorn *Crataegus monogyna* and Portuguese laurel *Prunus lusitanica*. Proposed shrub planting species include: Shrubby veronica *Hebe raikiensis*, English lavender *Lavandula angustifolia*, Purpletop vervain *Verbene bonariensis*, Shrubby cinquefoil *Potentilla fruticosa Abbotswood*, Cranesbill geranium *Geranium 'Johnsons Blue'*, *Sedum spectabile*, *Pittosporum tom thumb*, Bloody cranesbill *Geranium sanguineum* and Laurustinus *Viburnum tinus*. Proposed bulb planting includes Daffodil *Narcissus 'February Gold'* and Late tulip *Tulipa tarda*. The landscaping plan notes that no toxic chemicals should be used, but roundup is approved. The landscaping plan should the existing hedgerow to the west and south to be protected and retained (Casey Planning & Landscape Consultancy (2022)).

A lighting plan was prepared for the proposed development by AFEC International (2022). Three different luminaires are proposed to be used and all are LEDs. The height of all the luminaires is 6m. Much of the proposed lighting will be along the access road and south of the proposed school. The plan shows an expected lux of maximum 27.72 and 31.79lux in the car park, with an average lux ranging from 4.91 to 15.79lux (AFEC International, 2022).



4. RESULTS

4.1 Desk Study

The National Biodiversity Data Centre (NBDC) maps landscape suitability for 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. Table 1 below gives the suitability of the study area for the bat species found in Ireland (based on NBDC) along with their Irish Red List Status (from Marnell et al., 2009). The overall assessment of bat habitats for the current study area is given as 26.67, which is considered to be low.

Table 2 Suitability of the study area for the bat species previously recorded in the Kishoge, Lucan area (based on the NBDC data). Irish Red list status also indicated (based on Marnell *et al.*, 2009).

Common name	Scientific name	Suitability index	Irish red list status
All bats	-	26.67	
Common pipistrelle	<i>Pipistrellus pipistrellus</i>	41	Least Concern
Leisler's bat	<i>Nyctalus leisleri</i>	41	Near Threatened
Natterer's bat	<i>Myotis nattererii</i>	26	Least Concern
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	35	Least Concern
Brown long-eared bat	<i>Plecotus auritus</i>	40	Least Concern
Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	0	Least Concern
Whiskered bat	<i>Myotis mystacinus</i>	19	Least Concern
Daubenton's bat	<i>Myotis daubentonii</i>	19	Least Concern
Nathusius's pipistrelle	<i>Pipistrellus nathusii</i>	19	Least Concern

4.1.1 Previous Records

According to the National Bat Database of Ireland as viewed on the National Biodiversity Data Centre, the closest bat record is c. 100m from the site. These records are from the 1km grid square immediately west of the site. There are records of Common pipistrelle *Pipistrellus pipistrellus sensu lato*, Daubenton's bat *Myotis daubentonii*, Leisler's bat *Nyctalus leisleri*, Soprano pipistrellus *Pipistrellus pygmaeus* and Brown long-eared bat *Plecotus auritus*.

4.2 Field Survey

4.2.1 Daytime Inspection

The site was visited on the 14th of November 2022. The site was found to be well sealed with fencing around any access points, as well as a double fence on the boundary to the north. The site is located immediately south of the Thomas Omer Way road, and east of Kishoge Community College. The site is c. 2.8km south-east of Lucan town. There are no watercourses on the site. The R136 is located c. 500m the west. There is a significant area of residential housing north of the site, but the surrounding land use outside the school and roads, comprises fields with treelines and hedgerows as field boundaries. There is a railway line located c. 180m to the south. Upon visiting the site, no livestock were noted. However, there is a break in the southern hedgerow leading into the next field, and horses were observed here.



The north of the site comprises a palisade fence, leading to a dyke and then another fence with blockwork and iron bars leading on to the pathway along Thomas Omer Way. It was not clear if water was present in the ditch due to a lack of visibility. There is a low semi-mature treeline in between both fences. Species such as Hazel *Corylus avellana* and other non-native species including conifers. There were no mature trees in this area that were deemed suitable for bat roosting. No Potential Roost Features (PRFs) were observed here and the trees were found to be in good condition. There is a trail to the north of the site which leads east. The site itself comprises rough grassland, with thistles evident throughout and grazed grass. Further east, there is an area of scrub which is inaccessible, but was viewed from above a hill along the trail. This area comprises a mix of brambles and nettles. There is another treeline located to the south of the site. This is more established than the northern treeline, but mainly comprises shrub like species. Again no mature trees were noted along this treeline that had PRFs. No trees showed any potential for bat roosting habitat. Species present included willows *Salix* sp. as well as some hawthorn *Crataegus monogyna*. Growth was wide and thin trunks were observed. To the western boundary some disturbed earth was noted which may have been from horses or other mammals. The western boundary also comprises a treeline, and another trail leading south to the field with the horses present. Again this treeline was noted to have no potential for roosting bats.

There are no structures on the site and no trees on the site that are considered suitable for bat roosting. In general, the habitat on the site is assessed as having potential to be used for foraging and commuting purposes by bats. The most optimal habitat is considered to be present to the south-east, over the scrub habitat, as well as the linear treeline features to the south and west. To the north, street lighting is present along the road. It is likely that these lights result in light spill on to the site due to the lack of barriers created by the low growing treeline to the north. Due to the surrounding landscape, it is likely that the southern treeline is the least affected by light spill. The school car park area to the west also has some lighting present. Taking into account the surrounding habitat and records in the area, it is considered likely the site is used by Soprano pipistrelle, Common pipistrelle and Leisler's bat.

4. IMPACTS

4.1 Roost Habitat Loss

There are no structures on the site. There are no mature trees on the site that have PRFs or potential to be used by roosting bats. Due to the general lack of roosting habitat, no roost habitat loss impacts are envisaged to arise. There are no nearby structures outside of the site boundary that would be expected to be used by bats.

4.2 Foraging Habitat Loss

The site is likely to provide some foraging and commuting habitat for bats given the surrounding land use. This is likely to be limited due to the location and adjacent street lighting noted, but the southern treeline is expected to be used by bats. The current daytime assessment has noted that the common species Soprano pipistrelle, Common pipistrelle and Leisler's bats are expected to be found on the site. The desk study revealed records of Common pipistrelle, Leisler's bat, Soprano pipistrelle, Daubenton's bat and Brown long-eared bats closeby. The proposed primary school will result in a loss of foraging habitat on the site. It is expected that the western and southern treeline will be retained, as noted in the landscaping plan (Casey Planning & Landscape Consultancy, 2022). However, even if these areas are retained, if significant light spill affects this area, this will still result in a loss of foraging habitat as this area will be avoided by most species. In general, the rest of the site is limited in terms of bat habitat.



The main area is open, providing no linear features for commuting which is generally favoured by bats. Leisler's bats do forage in open spaces however again due to the location this is unlikely to be of any significant importance.

4.3 Disturbance / Displacement

If significant light spill comes from the proposed development, this can affect areas inside and outside the red line boundary. It has been determined that there is no roosting habitat for bats on the proposed development site. However, the site is likely used by common local bat species for foraging and commuting. This is unlikely to be of significant importance, but disturbance and displacement impacts are likely. Lighting can result in knock on effects on bats resulting in avoidance behaviours. This can cause further habitat fragmentation, excessive energy expenditure travelling to foraging grounds as well as a reduction in prey availability and food. Species such as Soprano pipistrelle, Common pipistrelle and Leisler's bat are considered to be adaptable and less sensitive to such disturbance, but this still is likely to occur to some degree. There will also be a land use change from agriculture to an educational development, which will displace any bat species using the site. Again this will result in habitat fragmentation.

5. MITIGATION

5.1 License Requirements

Further surveys are required to be undertaken in order to provide a 'comprehensive bat survey' of the proposed development site. The current surveys were undertaken during winter when bats are not active, with the active season generally running from May to September each year. However, the current winter daytime inspection has revealed that there are no structures on the site, and none of the trees present show any potential to be used by bats. There are no structures immediately adjacent to the site that would be expected to be used by bats. For this reason, it is likely that no derogation licence would be required for the proposed development. Regardless, further surveys are required and mitigation is proposed below to offset impacts on bats.

5.2 Lighting

A lighting plan was prepared for the proposed development by AFEC International (2022). Three different luminaires are proposed to be used and all are LEDs. The height of all the luminaires is 6m. Much of the proposed lighting will be along the access road and south of the proposed school. The plan shows an expected lux of maximum 27.72 and 31.79lux in the car park, with an average lux ranging from 4.91 to 15.79lux (AFEC International, 2022).

Light spill should be minimised insofar as possible, and only used where absolutely necessary for security etc, in the interest of local bat species and nocturnal fauna. Any up-lighting will be avoided by the use of louvres, shields etc. LED lighting does have a greater impact on bats when compared with other lighting such as low-pressure sodium. As LED lights are being used as part of the current project, colours other than white may be considered to lessen potential light spill impacts. Warmer colour wavelengths between 2700 and 3000 Kelvin seem to have less impacts on wildlife (Marnell *et al.*, 2022; Bat Conservation Trust & Institute of Lighting Professionals 2018). Consideration should be given to restrictions during dark hours, such as reducing light levels, or turning off lights, during late hours of the night. Motion sensor lighting could also be considered. Bat Conservation Trust & Institute of Lighting



Professionals (2018) guidance may also be followed, as well as Bat Conservation Ireland's *Bats & Lighting: Guidance Notes for Planners, Engineers, Architects and Developers* (2010).

Regarding the lighting plan prepared, as the southern and western treelines will be retained, these are the areas likely used by bats and light spill in on these habitats should be minimised. AFEC International (2022) show lighting along the cycle path to the west and south-west of the site. These lights are shown on the diagram to be directional, towards the cycle path and facing away from the hedgerows / treelines. The maximum lux along these lights is noted to be 9.35lux. For comparison, 0.2lux is considered to be the equivalent to moonlight, and many bats such as Daubenton's would prefer light levels of less than 1 lux (Bat Conservation Ireland, 2010). It is recommended that the LEDs in this area use the warmer colour wavelengths from 2700 to 3000K, and these lux levels be automatically reduced during dark hours between the sensitive months of May-September. It may also be considered where possible that these lights also be motion sensed, or at least be set at a low lux level until motion is detected. For the lighting along the roundabout and the eastern boundary, again it should be considered that warmer colour wavelengths be used and lighting reduced during dark hours of sensitive months for bat species. Further recommendations may be necessary depending on the outcome of active bat surveys.

5.3 Landscaping

A landscaping plan was submitted as part of the proposal. This was carried out by Casey Planning & Landscape Consultancy (2022). It is noted that the western and southern treelines will be retained. Native supplemental planting with trees species local to the area should be included to ensure this is enhanced. Additional planting proposed for the site includes a mix of native and non-native species and cultivars. It should be endeavoured to favour native species over non-natives and hybrids. A wildflower meadow area is proposed to the north. This, as well as any other additional planting, should follow the All-Ireland Pollinator Plan (National Biodiversity Data Centre, 2021). Night-scented plants should be used wherever possible which would benefit bats in the local area. The landscaping plan notes that no toxic chemicals should be used, but roundup is approved. It must be noted that roundup is toxic to wildlife. Any fertiliser or chemicals used on the site should be ecologically safe.



6. CONCLUSIONS

The current survey involved a winter daytime inspection outside of the active bat survey season, which generally runs from May to September. South Dublin County Council requested further information for the proposed primary school which included a comprehensive bat survey and assessment of the lighting plan. A comprehensive bat survey could not be completed as this is outside the active bat survey season. However, habitats on the site were assessed in November 2022 for their potential to be used by roosting, foraging and commuting bats. An assessment of the lighting plan is provided.

There are no structures on the site. There are no mature trees on the site that have PRFs of features that could be used by roosting bats. At best, the site provides limited foraging and commuting opportunities. It is likely the site is used by common species such as Soprano and Common pipistrelle, and Leisler's bat. The site itself comprises rough grassland and is grazed by horses, with thistles common throughout. There is a small area of scrub habitat to the east. The northern treeline with double fence is sparse and low with no mature trees. There also appears to be extensive street lighting here. The treeline to the south and west provide the most optimal foraging habitat. These treelines are likely not as affected by lighting from the north, are overgrown and wide so would provide nice linear features for foraging and commuting. It is likely that no derogation licence will be required due to the lack of roosting habitat on the site and surrounds. Impacts relating to habitat loss and displacement are likely to arise but are not expected to be significant taking into account the habitats present and the surrounding land use. Mitigation is provided for lighting and landscaping, but again further surveys during the active season are required to provide a comprehensive bat survey.



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PLATES



Plate 1 Proposed development site as viewed from the west.

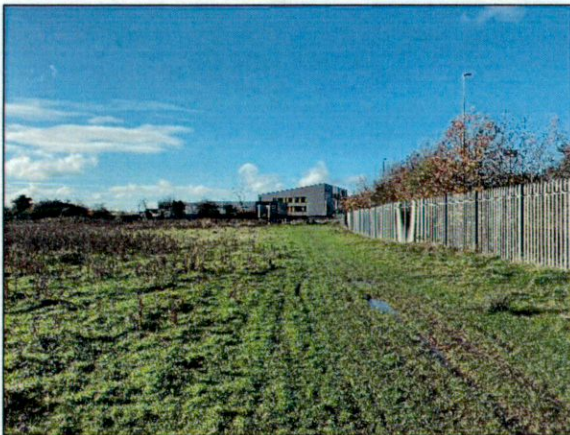


Plate 2 Kishoge Community college west of the site.



Plate 3 Tall palisade fencing to the north.

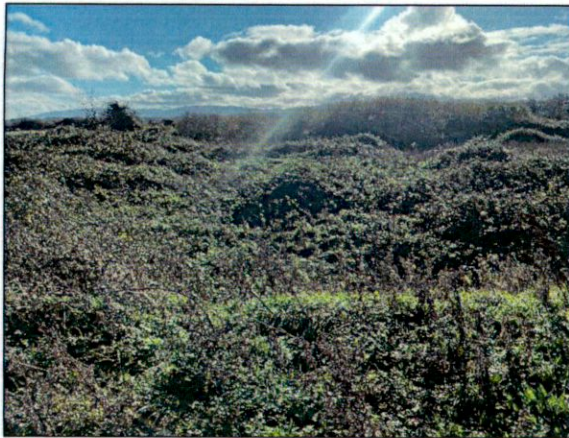


Plate 4 Scrub area to the south-east.



Plate 5 Site comprises mostly rough grassland with thistles.

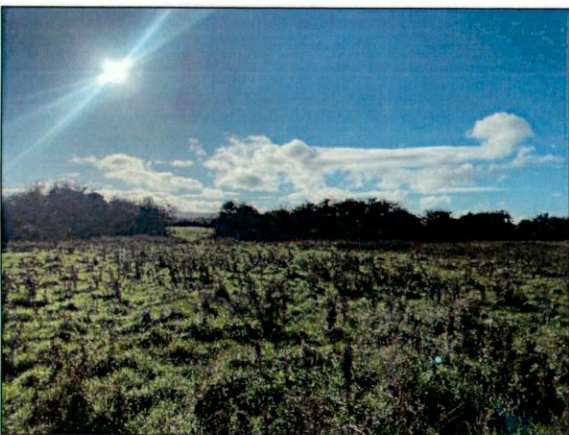


Plate 6 Southern treeline on the proposed development site.