A bat and badger assessment of Stocking Wood Grove, Stocking Avenue, Ballycullen, Co. Dublin

For

Lagan Homes

By Wildlife Surveys Ireland Ltd

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Summary of report

Bats

Despite moderate bat activity in the dusk survey of 2024, no roosting behaviour was observed throughout the night. The strong winds and rain of the storm during the morning survey may have deterred bat activity although more than one bat was still observed commuting across the site indicating not all bats had been deterred by the unfavourable weather conditions at dawn.

Activity was seen to increase by 70.3% in the 2024 survey compared to the 2020 survey, however less bat species diversity was recorded with only 3 species recorded in 2024 and 2017 as opposed to 4 in 2020.

Bat species found roosting

None

Bat species found feeding and commuting

Common pipistrelle – *Pipistrellus pipistrellus*
Soprano pipistrelle – *Pipistrellus pygmaeus*
Leisler's bat – *Nyctalus leisleri*
Natterer's bat *Myotis nattereri* (2020 only)

Badgers

There are no badger setts within the site and there was no evidence of badgers within the site or the immediate adjoining hedgerows. There were no signs of badger foraging within the site. There is suitable badger habitat to the south of the site. The main mammal evidence was sika deer, and deer were seen during the bat and badger surveys. Rabbit burrows were noted within the site and in neighbouring lands. There are also rodent signs within the site including grey squirrel and brown rat.

The following mammals were noted within the site:

Sika deer *Cervus nippon*
Rabbit *Oryctolagus cuniculus*
Fox *Vulpes vulpes*
Grey squirrel *Sciurus carolinensis*
Brown rat *Rattus norvegicus*

Mitigation Measures

Bats

All trees shall be checked for the presence of bats prior to felling

All trees within the site shall be examined for the presence of bats prior to felling by a bat specialist. Should bats be noted in any tree, it is a protected structure, and a derogation must be sought.

Lighting

Lighting must be controlled to avoid light pollution of green areas and should be targeted to areas of human activity and for priority security areas. The following measures are proposed to reduce the impacts of lighting:

• Motion-activated sensor lighting is preferable to reduce light pollution.

• None of the remaining mature trees or trees proposed for planting shall be illuminated. • Dark corridor for movement of bats along the grounds of the site.

• Lighting should be directed downwards away from the treetops.

• All luminaires shall lack UV elements when manufactured and shall be LED • A warm white spectrum (ideally <2700 Kelvin) shall be adopted to reduce blue light component

• Luminaires shall feature peak wavelengths higher than 550 nm

• Tree crowns shall remain unilluminated

• Planting shall provide areas of darkness suitable for bats to feed and commute through the site.

• Lighting shall be kept to a minimum around the trees (see below). No light shall fall directly on the trees from street lighting or private houses.

Guidelines from Bat Conservation Ireland and Bat Conservation Trust have been provided above for considering how to avoid light pollution of the hedgerow to allow for feeding, commuting, and roosting.

Incorporation of six bat boxes (Schwegler types 2F or 2FN or equivalent) Six 2F or 2FN Schwegler bat boxes are proposed for the site as well as a Schwegler 1WI into the wall of one of the new buildings. The box is built into the wall and is almost invisible from ground level once painted in the same style as the building. This must be unlit and should be at least 2.5 metres above ground height and preferably 3 metres or higher.

The remaining bat boxes shall be installed on trees with easy access. An ideal substrate for the attachment of bat boxes has a clear bark, straight bough, and overall ease of access for bats exiting and returning to boxes. Three boxes shall be attached to each of two trees unless there are better opportunities created by modifying this arrangement according to the bat specialist.

Planting of vegetation

Where there is an opportunity to provide vegetative cover, native and local plant species should be employed including typical plants such as oak (the greatest value for most wildlife), hawthorn, blackthorn, elder, gorse, bramble, in addition to other species such as dog rose with an encouragement of species such as *Clematis* and other species attractive to moths.

Badgers

Speed restriction in the new housing estate of 30 kmph past the mature trees

No vehicles shall travel in excess of 30 kmph over the new road through the trees to ensure that any wildlife moving here are not killed.

Culvert under the new road to provide mammal access

Any drainage system under the road shall provide a diameter of no less than 300 mm to allow badgers to pass under the road to avoid traffic.

Introduction

Most of Ireland's mammals enjoy protection under the Wildlife Act (1976) and the more recent updating of this legislation (Wildlife (Amendment) Act 2000, S.I. No. 94 of 1997, S.I. No. 378 of 2005, European Communities (Natural Habitats) (Amendment) Regulations, 2005) and consolidated by S.I. No. 477 of 2011 European Communities (Birds And Natural Habitats) Regulations 2011. In conjunction with the enactment of the Habitats Directive into Irish legislation, all native mustelid species (badger, stoat, pine marten and otter) are protected with further protection given to otters.

Determining the mammal fauna of an area may involve a high level of assessment if the aim of the survey is to catalogue all mammals but this is too detailed for the aim of creating mitigation for the proposed construction in the lands at Stocking Avenue, Ballycullen, County Dublin. This assessment is specific to the presence of bats and their roosts and feeding and commuting areas and badgers and their setts within lands proposed for the construction of housing in addition to an examination of the site for other ground mammals. Bat biology has some specific elements that create risks for bats that must be addressed differently to many other mammal species (see Appendix I), but which also allows a study of bats within a site in a specialised and unique way.

This report addresses the main issues affecting the protected mammal fauna considered in this assessment and created by the necessary activities associated with house construction and the preparation of a site and subsequent human occupancy and actions.

Construction activities and the subsequent daily activity of housing and the associated new roads create a number of significant short-term and long-term risks for the resident bat population, in addition to impacts upon other vertebrates and invertebrates. The construction itself may involve the removal of key features of the surrounding environment and of the habitats of bats such as trees, hedgerow lines and grassland in which to feed. The most damaging operation is the potential for the accidental exclusion or killing of bats roosting within trees or within any buildings altered by the proposal upon the site.

The surveys undertaken within the site allows a targeting of mitigation measures to the appropriate or most efficient sites to prevent accidental death or injury and to determine if it would be possible to develop a site without impact upon the conservation status of badgers in the area.

Fieldwork for the current report on badger distribution was carried out by Brian Keeley, an ecologist with over a third of a century of fieldwork experience. Fieldwork to determine the bat fauna was undertaken by two experienced surveyors employed by Wildlife Surveys Ireland with a minimum of 10 years of field experience. This report addresses the main issues that would affect the bat and ground mammal fauna of this area considered in this assessment and created by construction and the presence of a new buildings and associated services and increased human activity.

Construction activities and subsequent occupancy / usage of buildings and the associated new lanes, tracks or roads create a number of significant short-term and long-term risks for resident badger populations, in addition to impacts upon other vertebrates and invertebrates.

The clearance of woodland, treelines or hedgerow poses the risk of the removal of the badgers' home burrow and the associated burrows (all of which are known as setts) that are used seasonally or occasionally throughout the year. In winter, this is especially risky if the sett is not identified before hedgerow removal operations, as this is the time when badger cubs are born. In the classification used in this report, setts are considered to fall into four categories, which are best elaborated by long-term studies but can be interpreted to a relatively good accuracy in terms of status based on basic observations.

Bats

A speedy and productive means of determining the bat fauna within a site is to examine the entire site concerned through night-time and daytime assessments, paying attention to all buildings and trees affected and all hedgerow, woodland, watercourses, fence lines, paths etc. with the aid of an ultrasonic receiver ("bat detector"). Bats may be affected through roost loss, loss of feeding and interruption to their ability to exploit different roosts and different feeding areas. A full bat survey of any site involves an evaluation of the existing roosts within the site, the feeding availability within the site and the means by which bats utilise the existing habitats to feed and commute between roosts and feeding areas. This evaluation updates previous examinations of the site undertaken by Wildlife Surveys Ireland.

Badgers

In relation to badgers, the clearance of scrub poses the risk of the removal of the badgers' setts. Using the most traditional description of badger ecology, the basic sett type within which badgers are typically present throughout the year is the main sett. This is almost always the sett within which cubs are born. Bedding outside the entrance to these setts often identifies their use as such and paw prints and dung pits or latrines nearby also assist in their categorisation. There are typically a number of entrances to a main sett, some of which may be disused. Paths leading from the main sett are often very easy to trace for some distance.

Annexe setts are similar in construction to main setts and are typically accessed by a number of entrances. They are often discernibly connected to a main sett by well-worn paths, which is within 150 metres of the annexe sett. Badgers do not necessarily use this type of sett throughout the year, and they may be inactive at the time of any short-term study.

Subsidiary setts are again not always active throughout the year. There may be a number of entrances to the sett, and they are not clearly associated with any other sett.

The last type of sett, the outlier sett, may only have one entrance and has no path leading to it. This type of sett is only sporadically used and may even be in areas subject to flooding or seasonally unsuitable to badger use. These setts may be overlooked if they have remained inactive for several weeks.

Setts may be under threat from construction if they lie directly in the line of a proposed building or a new lane or road. Setts outside of this land take area may also be threatened with damage from the normal activities of the heavy plant equipment required to build the house. For example, if a badger sett entrance were located outside of the land take of housing but led to a system of tunnels that lay under the working area of the heavy plant, there is a clear risk that the tunnels would be crushed under the repeated movement of equipment.

These tunnels may typically go as deep as two to three metres underground but are also liable to surface to shallower depth to avoid rocky substrate or water. In long established setts, tunnels may be as deep as 6 metres in Britain, but this is not reported for Ireland.

Thus, badger setts may be affected by the immediate impact upon them from the excavation and removal of the soil within which they are established or by the indirect destruction of tunnels that lie under the construction corridor of roads or buildings.

Areas where agriculture is of less intensity may provide safer conditions for badgers in terms of state control measures, but urban areas such as Kells create a high road risk as well as risk of interference that may be more persistent than in rural areas. Nonetheless, badgers survive in many areas close to human activities including farmland, gardens, along the rivers even in built-up areas or in the grounds of schools, colleges, convents, factories etc.

Desktop Survey of the existing environment

Distribution data

- No additional data found within 1km of site.

See Appendix II for bat data within 10km of the site

Habitat Classification (Fossitt 2000)

WD1 (Mixed broadleaved woodland – highly modified / non-native) WL1 (Hedgerow) GAI (Grassland)

Date: 26/8/24

Temperature and weather conditions

Sunset 17°C Dry, 81: humidity. 23 km/h wind.

Sunrise 18°C Intermittent light rain, stormy conditions. 39 km/h wind

Lux levels 0 lux in fields. 0 lux at trees.
Sunrise/ Sunset 06:27/20:25

Complexity of lands and ability to cover ground during surveys

–All areas were accessible.

Survey constraints

(1) Mobility of bats – Bat species are mobile and can move from roost to roost, depending on roost availability, feeding availability and weather conditions. They may move to roosts which have not been identified in this report in order to hibernate or create mating or feeding perches. A bat survey is a snapshot of bat activity over the survey time.

(2) Identification of bats- It can be difficult to differentiate *Myotis* species. For this reason, sound files are included within the report. Brown long eared bats are very quiet, and their presence can be overlooked in bat surveys as they may not register on bat detectors.

(3) Storm- The ongoing storm for the dawn survey likely reduced the number of bats feeding and commuting around this site.

Methodology – Bats

Trees were examined for evidence of bat usage and for their potential as bat roosts in August (26th and 27th) and in November (12th) 2024. The trees were considered in terms of the following categories:

Description 1 *Trees with multiple, highly suitable features (Potential Roosting Features = PRFs) capable of supporting larger roosts*

Description 2 *Trees with definite bat potential but supporting features (PRFs) suitable for use by individual bats;*

Description 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;*

Bat Activity Survey - Equipment

Exide Lamps, Head torch

Two Song Meter Mini Bat remote detectors with Kaleidoscope Pro sound analysis

One thermal imager

Two handheld Echometer Touch 2 Pro bat detectors

Surveys are designed with reference to the recognised documents below:

- Heritage Council's Bat Survey Guidelines for the Traditional Farm Buildings Scheme
- National Parks and Wildlife's Bat Mitigation Guidelines for Ireland
- Bat Surveys: Surveying Buildings (Including Bat Identification) Developed on behalf of the Bat Conservation Trust
- English Nature's Bat Mitigation Guidelines
- - Bat surveys for Professional Ecologists - good practice guidelines; fourth edition (2023); Bat Conservation Trust; London.
- - A conservation plan for Irish Vesper Bats, Irish Wildlife Manual No. 20; National Parks and Wildlife Service; Department of Environment, Heritage and Local Government. - The status of E.C. Protected Habitats and Species in Ireland - Conservation status in Ireland of habitats and species listed in the European Council directories on Conservation of Habitats; Flora and Fauna 92/43/EFC. (Department of Environment, Heritage and Local Government) –
- Bat Mitigation Guidelines for Ireland (Irish Wildlife Manual no.25) Department of Environment, Heritage and Local Government.

Other references for this assessment are:
A bat assessment of the trees at Stocking Wood Grove, Stocking Avenue Ballycullen, Knocklyon Co. Dublin. (2017 and again in 2020, Wildlife Surveys Ireland).
In 2024, the survey was undertaken by 2 surveyors on 26th August 2024 up to sunrise of 27th August 2024. Each surveyor monitored trees to each side of the woodland band both prior to and after sunset for over 1.5 hours and prior to sunrise for 1.5 hours. The bat activity survey results were combined with visual observations of the trees and the desktop survey that included data from surveys in 2017 and 2020 on the same site.

Methodology – Badgers

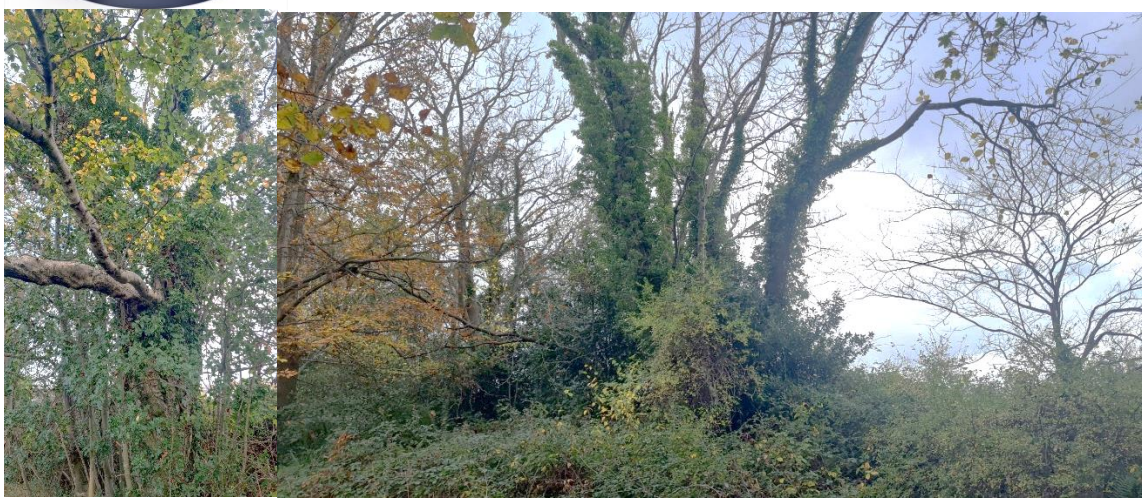
The survey for the presence of badgers and other ground mammals within the site was undertaken on November 12th 2024. The area in question was checked for the presence of badgers within the site and the entire area of scrub and tree cover and the open field were checked for any fresh signs of badgers. Each tree base, area of scrub and the field area were examined in sequence working in an approximately counter-clockwise direction from the entrance. Typical signs sought in this assessment were badger setts, badger paw prints and tracks, scratch marks on walls or concrete, badger latrines and dung pits, badger snuffle holes and digging and badger hairs.

Data was sought on the National Biodiversity Data Centre database and is included in Appendix II of this report.

RESULTS

Bats **Tree evaluations**

The trees of highest potential (varying from Description 1-3) were in the tree line in the centre of the site along the river. A number of trees in this woodland showed suitability for bat roosting, particularly the trees most central to the site. The trees above all qualify for Description 1. Other trees within this wooded area have no roost potential while some are Description 2 or 3.



Description 1 and Description 3 trees within or on the edge of the road proposed through the site

A single free-standing tree within the hedgerow on the northern boundary offers roost potential and is considered to meet Description 1 parameters. No bats were noted to emerge from this tree during any survey or to return prior to sunrise.

Tree on the proposed school hedgerow boundary towards the northwest of the site. This tree is Description 1.

Bat Survey Activity assessment

Bat activity was consistent particularly along either side of the woodland. Common pipistrelle activity began at 20:55 hours, followed by soprano pipistrelle activity across on the other side of the trees. On the eastern side of the treeing both soprano and common pipistrelle activity continued feeding along the treeline. Leisler's activity commenced a few minutes later on the same side and continued until 21:41.

Activity was quieter in the western field although consistent feeding was recorded throughout the night. Predominantly common and soprano pipistrelle activity was recorded (intermittently) throughout the night in the western field, with one pass of a Leisler's bat which was social calling across the site continuing to the west. Soprano pipistrelle and Leisler's bat activity continued until 21:41.

In the morning only one Leisler's bat pass was recorded by surveyors although the Song Meter Mini recorded four passes by a common pipistrelle over this period.

No evidence of bat roosting was found onsite despite low-moderate foraging and commuting activity throughout the night. Bat activity was recorded for three bat species throughout the night across the span of this site.

This shows a decrease in bat diversity onsite since the 2020 survey which found an additional bat species, Natterer's bat feeding on the site. This may be temporal in nature and longer-term evaluations may increase the species list.

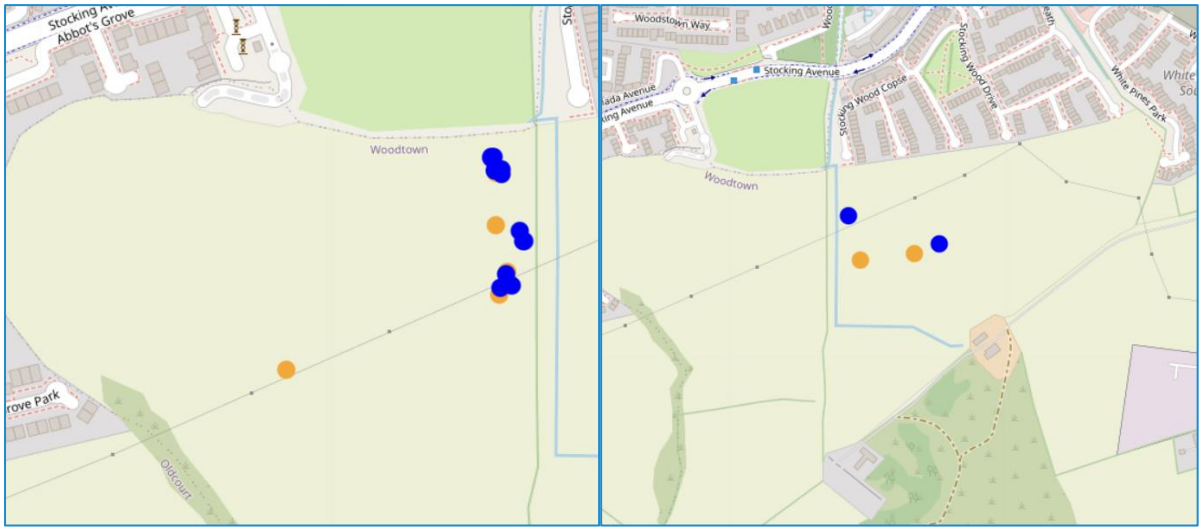
Bat species found feeding and commuting
Common pipistrelle – *Pipistrellus pipistrellus*
Soprano pipistrelle – *Pipistrellus pygmaeus*
Leisler's bat – *Nyctalus leisleri*

Bat activity within the site August 2024
Blue-Common Pipistrelle Red-Soprano Pipistrelle Yellow-Leisler's bat

Bat flight pattern August 2024

Blue-Soprano Pipistrelle Red-Common Pipistrelle Yellow-Leisler's bat

Bat activity August 26th to 27th 2024



Surveyor 1 *Surveyor 2*

Blue-Common pipistrelle *Yellow-Leisler's bat*

Song Meter Mini Results – static monitor recordings 26th August 2024

Species	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**Total**
Leisler's Bat		18	65	4							87
Common Pipistrelle	1	2	8	3	12	1		1	5		33
Soprano Pipistrelle			8	4	25	6	1	2	2	4	52
Grand Total	**1**	**20**	**81**	**11**	**37**	**7**	**1**	**3**	**7**	**4**	**172**

Echo Meter touch 2 results

Species	8	9	5	Grand Total
Leisler's Bat		3	1	4
Common Pipistrelle	1	3		4
Grand Total	**1**	**6**	**1**	**8**

2020 Survey

Bat species	Hour	19	20	21	22	23	12	3	04	5	6	Total
Common Pipistrelle		2	5	10	8	4	2	1	3	1	7	43
Leisler's Bat		1	1	2	2					1	1	8
Soprano Pipistrelle		4	7	8	6	5	3			3	6	42
Myotis			1	2	1				1		3	8
Total		**7**	**14**	**22**	**17**	**9**	**5**	**1**	**4**	**5**	**17**	**101**

2024 Survey data from static monitor – see Appendix III for a full breakdown of data

Species	8	9	10	11	12	1	2	3	4	5	Total
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Grand Total	1	20	81	11	37	7	1	3	7	4	172

Species of bat feeding within the site in 2020

Soprano pipistrelle *Pipistrellus pygmaeus*
Common pipistrelle *Pipistrellus pipistrellus*
Leisler's bat *Nyctalus leisleri*
Natterer's bat *Myotis nattereri*

Bat species noted in 2017

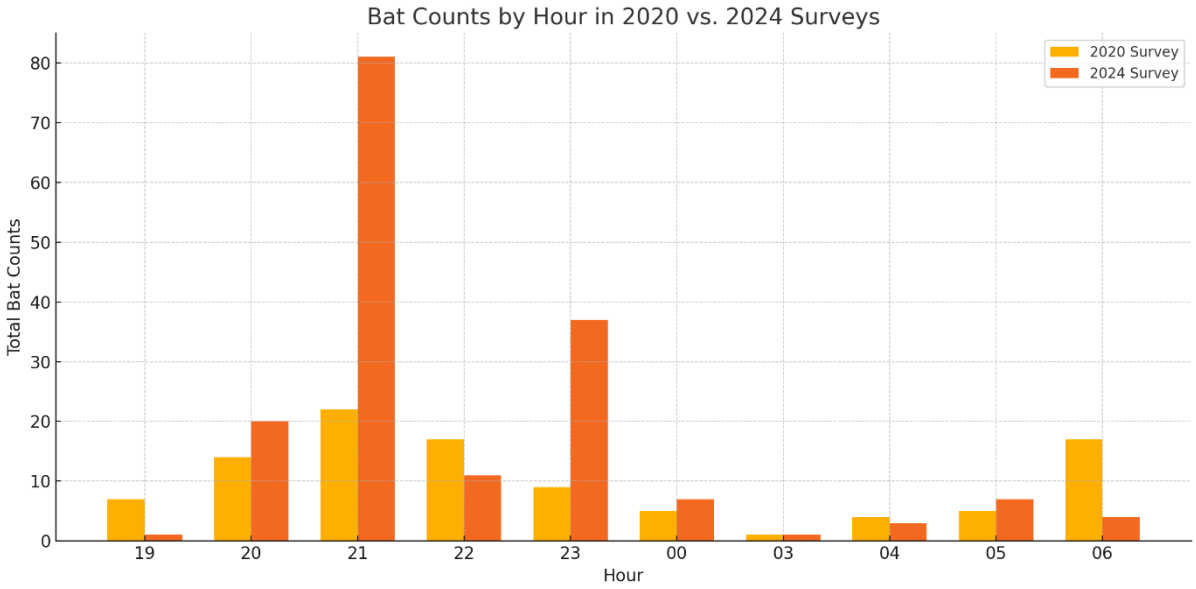
Common pipistrelle – *Pipistrellus pipistrellus*
Soprano pipistrelle – *Pipistrellus pygmaeus*
Leisler's bat – *Nyctalus leisleri*

In 2017, wind was noted to be an issue within the site for bats. Depending on the direction of approach of the wind, bats chose to feed on the opposite side of the woodland band. This is most probably mirroring the activity and distribution of their insect prey which seeks cover to protect it from crosswinds. The trees are clearly a benefit for bats within the area both as roost potential but also as a sheltered area to catch insects.

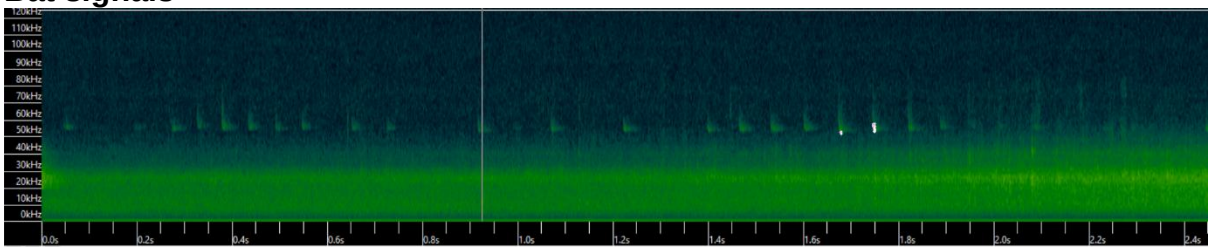
Bat activity increased in 2024 by 70.3% over the 2020 level. There was one additional species noted in 2020 that was absent in the surveys in 2017 and 2024. Over a long survey period, more species would be expected to be encountered.

This increase in feeding onsite could be attributed to slightly warmer conditions of 17°C at dusk in 2024 as opposed to 13°C in 2020. Both temperatures are favourable to bat activity meaning there is a possibility of increased bat reliance on this site.

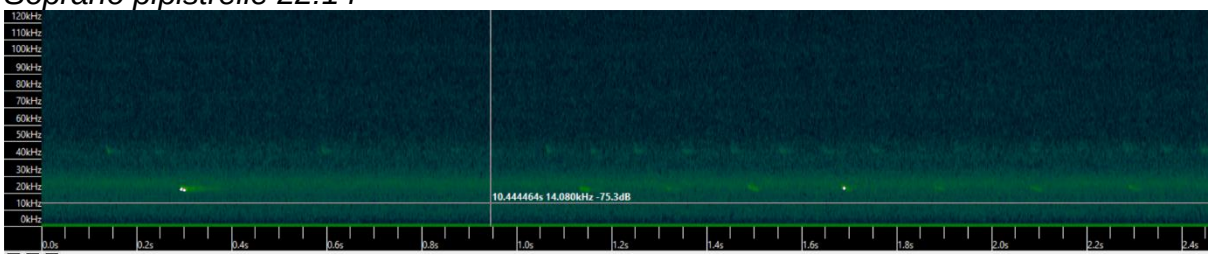
Due to the storm in the morning of 2024 activity reduced significantly at 6 am.



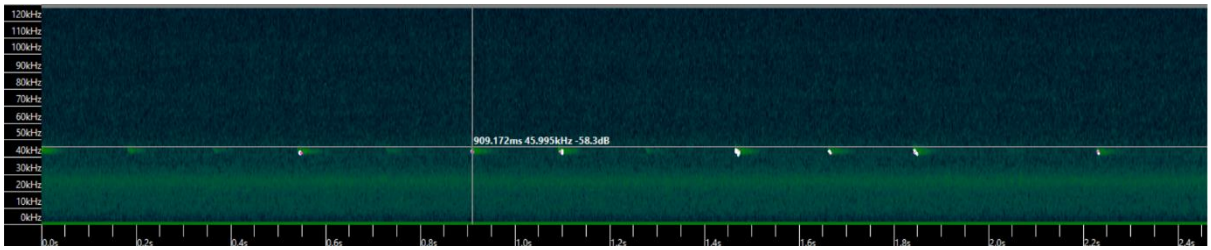
Bat signals



Soprano pipistrelle 22:14



Leisler's bat 22:01



Common pipistrelle 22:31

RESULTS

Badgers

No badger signs were noted within the site. There were no paw prints, tracks, digging, dung pits or latrines, badger setts or any clear evidence of badger activity. There are certainly no badger setts within the site and there was no evidence of badgers or badger setts within the immediate adjoining hedgerows. There were no clear signs of badger foraging within the site. It is possible that some signs were obscured by the level of deer activity within the site. There were several tracks leading from the site to the south but only deer signs were confirmed for these tracks. Other tracks were attributable to fox activity and rabbits. There is suitable badger habitat to the south of the site. The main mammal evidence was sika deer, and deer were seen during the bat and badger surveys. Rabbit burrows were noted within the site and in neighbouring lands. There are also rodent signs within the site including grey squirrel and brown rat. There is also a small herd of horses within the eastern field. These would also destroy badger paw prints or other foraging signs. It is certain that badgers are not breeding within the site and that there are setts in evidence. There is the possibility that badgers enter the site to feed and that the activity of deer and horses have covered these signs. See Appendix IV for images from the field surveys.

The following mammals were noted within the site:

Sika deer	*Cervus nippon*
Rabbit	*Oryctolagus cuniculus*
Fox	*Vulpes vulpes*
Grey squirrel	*Sciurus carolinensis*
Brown rat	*Rattus norvegicus*

Project Description

The proposed development is for a large-scale residential development of c.500 dwellings in a mix of houses & apartments from two to four storeys in height and a creche including all associated services, roads, car parking, landscaping, boundary treatments and public lighting. Site development works associated with the proposal include regrading of the site and any necessary retaining structures. Overhead ESB cables will be rerouted underground. There will be two vehicular entrances to the development proposed from Stocking Avenue 1) via Abbots Grove Avenue and 2) via Stocking Wood Drive.

Road proposed through the woodland

Predicted Impacts Before Mitigation

(1) Loss of feeding and commuting habitat as there will be vegetation loss including tree removal. There will be a loss of foraging due to changes in land use, increased construction within the lands, increased lighting, reduced vegetation. While badgers were not noted within the site, there is suitable habitat potential to the south and north and badgers may pass through the site. This would be interrupted by new houses and the new road.

(2) Loss of roosting habitat – Any tree removal will reduce roost potential for the site. Should bats be present at the time of felling, this would place bats at risk of injury or death. There will be a mild long term negative effect on roosting bats.

(3) Light Pollution – There will be an increase in light levels to facilitate access and for safety reassurance. There will be a mild negative long term residual effect on individual bats.

Mitigation and Habitat Enhancement Measures

All trees shall be checked for the presence of bats prior to felling

All trees within the site shall be examined for the presence of bats prior to felling by a bat specialist. Should bats be noted in any tree, it is a protected structure, and a derogation must be sought.

Lighting

Lighting must be controlled to avoid light pollution of green areas and should be targeted to areas of human activity and for priority security areas. The following measures are proposed to reduce the impacts of lighting:

• Motion-activated sensor lighting is preferable to reduce light pollution.

• None of the remaining mature trees or trees proposed for planting shall be illuminated. • Dark corridor for movement of bats along the grounds of the site.

• Lighting should be directed downwards away from the treetops.

• All luminaires shall lack UV elements when manufactured and shall be LED • A warm white spectrum (ideally <2700 Kelvin) shall be adopted to reduce blue light component

• Luminaires shall feature peak wavelengths higher than 550 nm

• Tree crowns shall remain unilluminated

• Planting shall provide areas of darkness suitable for bats to feed and commute through the site.

• Lighting shall be kept to a minimum around the trees (see below). No light shall fall directly on the trees from street lighting or private houses.

Guidelines from Bat Conservation Ireland and Bat Conservation Trust have been provided above for considering how to avoid light pollution of the hedgerow to allow for feeding, commuting, and roosting.

Incorporation of six bat boxes (Schwegler types 2F or 2FN or equivalent) Six 2F or 2FN Schwegler bat boxes are proposed for the site. This must be unlit and should be at least 2.5 metres above ground height and preferably 3 metres or higher. The bat boxes shall be installed on trees with easy access. An ideal substrate for the attachment of bat boxes has a clear bark, straight bough, and overall ease of access for bats exiting and returning to boxes. Two boxes shall be attached to each of three trees.

Planting of vegetation

Where there is an opportunity to provide vegetative cover, native and local plant species should be employed including typical plants such as oak (the greatest value for most wildlife), hawthorn, blackthorn, elder, gorse, bramble, in addition to other

species such as dog rose with an encouragement of species such as *Clematis* and other species attractive to moths.

Speed restriction in the new housing estate of 30 kmph past the mature trees

No vehicles shall travel in excess of 30 kmph over the new road through the trees to ensure that any wildlife moving here are not killed.

Culvert under the new road to provide mammal access

Any drainage system under the road shall provide a diameter of 30 cm to allow badgers to pass under the road to avoid traffic.

Predicted Impacts After Mitigation

There is a predicted slight negative impact on bat life from this development as there are a number of mature trees affected on this site that provide ample opportunity for bat roosting as well as functioning as a wind barrier and providing the vegetation that allows insect breeding. Some trees would be removed while other trees may require surgery. This means a reduction in roosting areas, feeding areas and increased light pollution. With appropriate native planting as discussed in the mitigation, after a number of years there will be sufficient restored foliage to create a new wind barrier, making the area more hospitable for bat activity.

APPENDIX I

Bat Biology

Female bats gather in groups known as maternity roosts in summer to have their young. They generally have one baby each year, so are slow to reproduce, and disturbance of a maternity roost can be catastrophic.

In winter bats move to old stonework, trees, and caves to hibernate. They are also found in modern buildings during building work or demolition. They are especially vulnerable here as they are slow to awaken, and if tree felling is carried out without checking for bats, they can easily be killed.

In late summer and autumn, most bat species mate and males establish territories and defend them by calling and fighting and by attracting females to a roost or perch to mate. This may occur at other times for some species such as the brown long-eared bat. Mating may occur in or on trees, within buildings or within caves, tunnels or cellars depending on the species concerned. Bats are rarely noted to form such large day roost numbers as during the breeding season or in winter (for some species in Ireland, winter roosts are extremely under-reported and throughout Europe the same species are known to form large roosts in buildings or caves).

Bats are most active shortly after sunset and for up to 2 hours and for longer for some species or individuals. Bats may also be active prior to sunrise and at this time, may repeatedly encircle or touch against a site before entering either in small numbers or in much greater numbers such as at maternity roosts ("swarm"). This is a highly suitable time to identify roost sites.

Recent advances in thermal imagery have allowed for the identification of roost sites in buildings or trees based on the heat emitted by the bat as it enters, or leaves and heat may even be detected within a structure as the bat warms up to emerge or as the bat returns to a roost. In conjunction with the use of ultrasonic receivers that detect the range of frequencies used by bats to navigate, hunt and communicate, it is possible to identify bat species and even gender and to pinpoint good feeding areas, roost sites and commuting routes.

Legislation

Bats are protected under the 1996 Wildlife Act, the 2000 Wildlife (Amendment) Act, Stat Ist 94 of 1997, Stat Ist 378 of 2005, The Habitats Directive, The Bonn and Bern Convention, and the Euro bats agreement.

The European Community (Natural Habitats) Regulations S.I. No 94 of 1997 states:

23(1) The Minister shall take the requisite measures to establish a system of strict protection for the fauna consisting of the animal species set out in Part 1 of the First Schedule prohibiting –

a) All forms of deliberate capture or killing of specimens of those species in the wild.

1. The deterioration or destruction of breeding sites or resting places of those species.

The EU Habitats Directive

Article 12(1) of the 'Council Directive 92/43/EEC on the conservation of natural habitats and wild fauna and flora (Habitats Directive) states:

"Member States shall take the requisite measures to establish a system of strict protection for the animal species listed in Annex IV(a) and their natural range, prohibiting:

a) all forms of deliberate capture or killing of specimens of these species in the wild.

b) deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation, and migration.

c) deliberate destruction or taking of eggs from the wild.

d. deterioration or destruction of breeding sites or resting places."

The EU Habitats Directive (92/43/EEC) lists all Irish bat species in Annex IV and one Irish species, the lesser horseshoe bat (Rhinolophus hipposideros), in Annex II.

Annex II includes animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation (SACs) because they are endangered, rare, vulnerable, or endemic. Annex IV includes various species that require strict protection. Article 11 of the Habitats Directive requires member states to monitor all species listed in the Habitats Directive and Article 17 requires States to report to the EU on the findings of monitoring schemes.

The Bern and Bonn Conventions

Ireland is also a signatory to a number of conservation agreements pertaining to bats such as the Bern and Bonn Conventions. The European Bats Agreement (EUROBATS) is an agreement under the Bonn Convention. Ireland and the UK are two of the 31 signatories. The Agreement has an Action Plan with priorities for implementation. Devising strategies for monitoring of populations of selected bat species in Europe is among the resolutions of EUROBATS.

1.3.1 The Bern Convention

Article 6 of the "Convention on the Conservation of European Wildlife and Natural Habitats' (Bern Convention) reads:

"Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the special protection of the wild fauna species specified in Appendix II. The following will in particular be prohibited for these species:

a) all forms of deliberate capture and keeping and deliberate killing.

b) the deliberate damage to or destruction of breeding or resting sites.

c) the deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation, insofar as disturbance would be significant in relation to the objectives of this Convention; ...

Appendix II lists strictly protected fauna species and this list includes "Microchiroptera, all species except Pipistrellus pipistrelles".

The EUROBATS Agreement

The 'Agreement on the Conservation of Populations of European Bats' (EUROBATS) was negotiated under the 'Convention for the Conservation of Migratory Wild Species' (Bonn Convention) and came into force in January 1994. The legal protection of bats and their habitats are given in Article III as fundamental obligations:

"1. Each Party shall prohibit the deliberate capture, keeping or killing of bats except under permit from its competent authority.

2. Each Party shall identify those sites within its own area of jurisdiction which are important for the conservation status, including for the shelter and protection, of bats. It shall, taking into account as necessary economic and social considerations,

protect such sites from damage or disturbance. In addition, each Party shall endeavour to identify and protect important feeding areas for bats from damage or disturbance."

The Agreement covers all European bat species.

APPENDIX II

Desktop survey

BCI Data

BCIreland data: search results 23 Sep 2024		
Search parameters: Roosts with observations of all species within 10000m of O115257		
Roosts		
Name	Grid reference	Species observed
11 Pembroke Cottages	O1929	Nyctalus leisleri
139 Stillorgan Rd	O1830	Unidentified bat
2 Louvain	O1829	Unidentified bat,Nyctalus leisleri
23 Woodbrook Park	O1228	Nyctalus leisleri
3 Castles	O0116	Pipistrellus pygmaeus
33 Inchicore Rd	O1234	Unidentified bat
4 Crookshare	O0125	Unidentified bat
60 Cremore	O1227	Unidentified bat
7 Stirling Park	O1530	Unidentified bat
71 Forest Hill	O0226	Unidentified bat
Airlie Stud Stable Block, Adamstown, Co. Dublin	O0233	Unidentified bat
Bailiff\\\'s/Superintendent\\\'s Lodge	O1035	Pipistrellus pygmaeus
Barnacullia	O1724	Unidentified bat
Boland\\\'s Mill	O1733	Pipistrellus pipistrellus (45kHz),Nyctalus leisleri
Castleknock D	O0935	Pipistrellus pygmaeus
Cheeverstown house	O1228	Pipistrellus pygmaeus
Church at St. Mary\\\'s Hospital	O1034	Plecotus auritus
Church of the Nativity of the Blessed Mary	O0326	Plecotus auritus
Deerfield House, Phoenix Park	O1135	Plecotus auritus
Dublin Electricity Generating Station building	O2033	Pipistrellus pipistrellus (45kHz)
Esker House	O0334	Pipistrellus spp. (45kHz/55kHz),Plecotus auritus
Former Pathology Building	O1533	Pipistrellus pygmaeus
Grange Hill	O1625	Myotis nattereri, Pipistrellus pipistrellus
Industrial buildings, Former Paper Mills	O1730	Pipistrellus pipistrellus (45kHz)
Kingsfurze	O0835	Unidentified bat
Knockmary Hill Lodge	O1034	Pipistrellus spp. (45kHz/55kHz)
Laundry Gate Lodge	O1235	Pipistrellus pygmaeus
Lucan Spa Hotel Roost	O0235	Pipistrellus spp. (45kHz/55kHz)
Mc Kee Barracks	O1335	Myotis mystacinus
National Concert Hall	O1532	Pipistrellus pygmaeus

Old Industrial Site	O1434	Pipistrellus pipistrellus (45kHz)	
Old shower block	O1234	Pipistrellus spp.	
Open fronted industrial unit	O1730	Pipistrellus pipistrellus, Pipistrellus pygmaeus	
OPW Storage Areas	O1235	Plecotus auritus	
Private Residence, Tobermaclugg Lane, Lucan, Co. Dublin	O0124	Nyctalus leisleri, Pipistrellus pipistrellus (45kHz)	
Rathcoole House	O0126	Unidentified bat	
Saw Mill Building, Powerscourt Estate	O2016	Unidentified bat	
Shed at Deerkeeper's\'s Lodge	O1134	Plecotus auritus	
St John the Baptist Cloghleagh	O0416	Plecotus auritus, Pipistrellus spp.	
St Marys	O1533	Nyctalus leisleri	
St Marys	O1335	Nyctalus leisleri	
St Pius	O1533	Unidentified bat	
Tandy's Lane Farmhouse, Adamstown, Co. Dublin	O0233	Unidentified bat, Plecotus auritus	
Tibradden Stable yard, Tibradden House, Rathfarnham, Dublin 16	O1424	Pipistrellus spp. (45kHz/55kHz)	
Two storey house, Balgarra	O1824	Pipistrellus pipistrellus (45kHz)	
Two storey house, Grasslands	O1824	Plecotus auritus, Pipistrellus pipistrellus (45kHz)	
US Ambassador's residence and outbuildings	O1035	Plecotus auritus	
Viking Components Europe	O1533	Unidentified bat	
Whitechurch Church of Ireland	O1425	Plecotus auritus	
Transects			
Name	Grid reference start	Species observed	
Ad-hoc observations			
Survey	Grid reference	Date	Species observed

Data from NBDC Species list for O1125 (west)

Common Pipistrelle	3 records	23/07/2021	Protected Species: EU Habitats Directive Annex IV Wildlife Acts
Fox (Vulpes vulpes)	1	16/05/2017	
Hedgehog (Erinaceus europaeus)	3	21/07/2023	Protected Species: Wildlife Acts

Data from NBDC Species list for O1125 (east)

Grey Squirrel (Sciurus carolinensis)	1 record	03/07/2022	Invasive Species: EU Regulation No. 1143/2014 Regulation S.I. 477
Fox (Vulpes vulpes)	1	29/01/2012	
Hedgehog (Erinaceus europaeus)	4	01/10/2021	Protected Species: Wildlife Acts

Data from NBDC Species list for O12

There are 70 records of badgers on the database within the 10 km square

APPENDIX III

Songmeter Mini Bat data from 26th August 2024

Date	Time	Pulses	Manual Id
26/08/2024	21:20:01	19	Leisler's Bat
26/08/2024	22:35:09	21	Leisler's Bat
26/08/2024	22:30:49	16	Leisler's Bat
26/08/2024	22:29:42	16	Leisler's Bat
26/08/2024	22:02:16	15	Leisler's Bat
26/08/2024	22:12:52	15	Leisler's Bat
26/08/2024	22:39:21	13	Leisler's Bat
26/08/2024	22:27:59	12	Leisler's Bat
26/08/2024	22:29:59	13	Leisler's Bat
26/08/2024	22:29:25	14	Leisler's Bat
26/08/2024	22:04:01	16	Leisler's Bat
26/08/2024	22:32:00	11	Leisler's Bat
26/08/2024	22:33:46	11	Leisler's Bat
26/08/2024	22:38:56	11	Leisler's Bat
26/08/2024	23:14:41	13	Leisler's Bat
26/08/2024	22:26:27	10	Leisler's Bat
26/08/2024	22:38:26	10	Leisler's Bat
26/08/2024	22:02:54	9	Leisler's Bat
26/08/2024	22:36:26	9	Leisler's Bat
26/08/2024	22:29:52	9	Leisler's Bat
26/08/2024	22:00:45	8	Leisler's Bat
26/08/2024	22:11:07	8	Leisler's Bat
26/08/2024	22:37:48	8	Leisler's Bat
26/08/2024	21:11:48	9	Leisler's Bat
26/08/2024	22:38:43	11	Leisler's Bat
26/08/2024	22:28:49	7	Leisler's Bat
26/08/2024	22:36:02	7	Leisler's Bat
26/08/2024	22:01:18	8	Leisler's Bat
26/08/2024	21:04:43	10	Leisler's Bat
26/08/2024	21:03:15	6	Leisler's Bat
26/08/2024	22:02:33	5	Leisler's Bat
26/08/2024	22:08:09	5	Leisler's Bat
26/08/2024	22:12:41	5	Leisler's Bat
26/08/2024	22:17:14	5	Leisler's Bat
26/08/2024	22:28:26	5	Leisler's Bat
26/08/2024	22:10:41	4	Leisler's Bat
26/08/2024	22:00:20	4	Leisler's Bat
26/08/2024	22:13:42	4	Leisler's Bat
26/08/2024	22:29:04	4	Leisler's Bat
26/08/2024	22:37:58	4	Leisler's Bat
26/08/2024	23:19:49	4	Leisler's Bat

26/08/2024	21:44:03	5	Leisler's Bat
26/08/2024	22:24:23	5	Leisler's Bat
26/08/2024	21:32:26	3	Leisler's Bat
26/08/2024	21:49:33	3	Leisler's Bat
26/08/2024	22:02:26	3	Leisler's Bat
26/08/2024	22:12:25	3	Leisler's Bat
26/08/2024	22:28:14	3	Leisler's Bat
26/08/2024	22:29:35	3	Leisler's Bat
26/08/2024	22:39:31	3	Leisler's Bat
26/08/2024	21:12:51	4	Leisler's Bat
26/08/2024	22:01:03	4	Leisler's Bat
26/08/2024	22:18:33	4	Leisler's Bat
26/08/2024	22:33:56	5	Leisler's Bat
26/08/2024	21:20:11	2	Leisler's Bat
26/08/2024	21:25:49	2	Leisler's Bat
26/08/2024	21:46:22	2	Leisler's Bat
26/08/2024	22:27:42	2	Leisler's Bat
26/08/2024	22:31:15	2	Leisler's Bat
26/08/2024	22:34:09	2	Leisler's Bat
26/08/2024	23:08:32	2	Leisler's Bat
26/08/2024	21:22:59	2	Leisler's Bat
26/08/2024	21:54:53	2	Leisler's Bat
26/08/2024	22:14:32	9	Soprano Pipistrelle
26/08/2024	22:00:55	3	Leisler's Bat
26/08/2024	22:25:13	2	Leisler's Bat
26/08/2024	22:23:48	3	Leisler's Bat
26/08/2024	22:31:35	7	Leisler's Bat
26/08/2024	22:30:09	2	Leisler's Bat
26/08/2024	22:26:11	3	Soprano Pipistrelle
26/08/2024	22:34:40	3	Leisler's Bat
26/08/2024	22:50:11	9	Leisler's Bat
26/08/2024	22:55:21	3	Soprano Pipistrelle
26/08/2024	23:53:55	2	Soprano Pipistrelle
26/08/2024	22:55:04	3	Soprano Pipistrelle
27/08/2024	00:05:43	2	Soprano Pipistrelle
27/08/2024	00:33:51	3	Soprano Pipistrelle
26/08/2024	23:54:54	3	Soprano Pipistrelle
27/08/2024	00:13:10	2	Soprano Pipistrelle
27/08/2024	00:40:49	2	Soprano Pipistrelle
27/08/2024	00:47:15	4	Soprano Pipistrelle
27/08/2024	00:07:33	3	Soprano Pipistrelle
27/08/2024	00:43:00	3	Soprano Pipistrelle
27/08/2024	00:43:31	2	Soprano Pipistrelle
27/08/2024	01:31:40	2	Soprano Pipistrelle
27/08/2024	01:20:55	4	Soprano Pipistrelle

27/08/2024	01:55:46	2	Soprano Pipistrelle
27/08/2024	03:53:24	6	Soprano Pipistrelle
27/08/2024	03:52:51	2	Soprano Pipistrelle
27/08/2024	04:45:28	3	Soprano Pipistrelle
27/08/2024	05:05:38	16	Soprano Pipistrelle
27/08/2024	05:04:06	2	Soprano Pipistrelle
27/08/2024	05:08:19	34	Soprano Pipistrelle
26/08/2024	21:01:37		Leisler's Bat
26/08/2024	21:57:32		Leisler's Bat
26/08/2024	21:48:49		Leisler's Bat
26/08/2024	22:00:09		Leisler's Bat
26/08/2024	21:50:07		Leisler's Bat
26/08/2024	21:57:13		Leisler's Bat
26/08/2024	22:16:08		Leisler's Bat
26/08/2024	22:28:09		Leisler's Bat
26/08/2024	22:30:59		Leisler's Bat
26/08/2024	22:34:25		Leisler's Bat
26/08/2024	22:38:05		Leisler's Bat
26/08/2024	22:21:47		Leisler's Bat
26/08/2024	22:53:59		Leisler's Bat
26/08/2024	22:38:36		Common Pipistrelle
26/08/2024	22:51:24		Leisler's Bat
26/08/2024	22:50:38		Common Pipistrelle
26/08/2024	22:55:31		Common Pipistrelle
26/08/2024	23:14:51		Common Pipistrelle
26/08/2024	22:39:06		Leisler's Bat
26/08/2024	22:50:21		Common Pipistrelle
26/08/2024	22:35:19		Leisler's Bat
26/08/2024	23:58:03		Leisler's Bat
27/08/2024	00:07:19		Common Pipistrelle
26/08/2024	22:37:42		Common Pipistrelle
27/08/2024	00:08:38		Common Pipistrelle
26/08/2024	23:57:19		Common Pipistrelle
27/08/2024	00:05:34		Common Pipistrelle
27/08/2024	00:15:31		Common Pipistrelle
27/08/2024	00:33:40		Common Pipistrelle
27/08/2024	00:09:30		Common Pipistrelle
27/08/2024	00:34:33		Soprano Pipistrelle
26/08/2024	23:59:20		Soprano Pipistrelle
27/08/2024	00:42:04		Soprano Pipistrelle
27/08/2024	00:02:50		Soprano Pipistrelle
26/08/2024	23:55:04		Soprano Pipistrelle
27/08/2024	00:45:03		Soprano Pipistrelle
27/08/2024	00:07:24		Soprano Pipistrelle
27/08/2024	00:34:18		Soprano Pipistrelle

27/08/2024	00:01:03		Soprano Pipistrelle
27/08/2024	00:49:18		Soprano Pipistrelle
27/08/2024	00:49:38		Soprano Pipistrelle
27/08/2024	00:49:48		Soprano Pipistrelle
27/08/2024	00:59:57		Common Pipistrelle
27/08/2024	00:46:05		Common Pipistrelle
27/08/2024	00:46:15		Common Pipistrelle
27/08/2024	01:23:34		Soprano Pipistrelle
27/08/2024	01:18:25		Soprano Pipistrelle
27/08/2024	00:49:02		Soprano Pipistrelle
27/08/2024	00:49:12		Soprano Pipistrelle
27/08/2024	01:41:46		Common Pipistrelle
27/08/2024	03:54:46		Common Pipistrelle
27/08/2024	04:01:38		Common Pipistrelle
27/08/2024	04:32:31		Common Pipistrelle
27/08/2024	04:44:34		Common Pipistrelle
27/08/2024	04:40:08		Common Pipistrelle
27/08/2024	04:32:22	13	Common Pipistrelle
27/08/2024	00:54:48	9	Common Pipistrelle
26/08/2024	21:22:43	8	Common Pipistrelle
26/08/2024	20:59:16	11	Common Pipistrelle
27/08/2024	00:44:35	8	Common Pipistrelle
26/08/2024	22:25:48	6	Common Pipistrelle
26/08/2024	22:09:59	4	Common Pipistrelle
26/08/2024	21:43:43	2	Common Pipistrelle
27/08/2024	00:55:33	2	Common Pipistrelle
26/08/2024	23:07:56	4	Common Pipistrelle
26/08/2024	22:13:02	3	Common Pipistrelle
27/08/2024	05:06:10	35	Soprano Pipistrelle
26/08/2024	22:34:15	31	Soprano Pipistrelle
26/08/2024	22:35:26	16	Soprano Pipistrelle
26/08/2024	22:51:14	15	Soprano Pipistrelle
27/08/2024	00:00:53	6	Soprano Pipistrelle
27/08/2024	02:30:40	4	Soprano Pipistrelle
26/08/2024	22:18:04	6	Soprano Pipistrelle
27/08/2024	01:18:42	6	Soprano Pipistrelle
27/08/2024	00:41:29	3	Soprano Pipistrelle
27/08/2024	00:13:21	3	Soprano Pipistrelle
27/08/2024	00:34:26	2	Soprano Pipistrelle
27/08/2024	00:02:09	3	Soprano Pipistrelle
27/08/2024	04:46:04	4	Soprano Pipistrelle

Appendix IV - Plates

Northern hedge with tracks

Western edge where there are tracks leading into the next field – no badger evidence

Tracks showing mainly deer activity in addition to fox at the northwestern hedge (top). A rabbit burrow was noted within this hedge (middle left) A deer carcase was at the woodland edge within the site in a gap in this hedge (middle right and bottom).

Rabbit burrow west of site just at the boundary

Various mammal tracks at the edge of the site – primarily deer but also fox, dog and horse