



Comhairle Chontae na Gaillimhe
Galway County Council

Galway County Council
Housing Development
Gort Uí Lochlainn & Coill Bhruchláin, Maigh Cuilinn, Co.
Ecology Report



Housing Development, Gort Uí Lochlainn & Coill Bhruchláin, Maigh Cuilinn, Co. Galway

Ecology Report

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1.0 INTRODUCTION

1.1 Background

This ecology report has been prepared to examine possible ecological impacts of the proposed construction of 30 no. housing units at Gort Uí Lochlainn & Coill Bhruchláin, Mountain Road, Maigh Cuilinn, Co. Galway, with regard to flora and fauna both within and surrounding the development site. Existing site conditions are presented, potential impacts are assessed, and mitigation measures are recommended.

1.2 Proposed Development

The proposed development is located near the centre of Maigh Cuilinn, north of the Mountain Road (L1320), approximately 300m west of the junction to the N59. It will involve the construction of 30 no. housing units. The area being developed for this project is approximately 1.8 hectares.

The units will primarily be of 2-storey type and the layout will be of terraced formats. The development is to have its own independent access off Mountain Road (L1320). Roadways within the site will be 6m in width and edged with precast concrete kerbs. The site will host public night-time security lighting. Lights will be located along the access road and in turning areas. The proposed lighting plan can be found in Appendix 1.

The existing site incorporates established woodland which will be predominately removed, with the exception of mature trees which will be retained along the east and south east boundary of the site. A landscape plan for the site is proposed and can be found in Appendix 2.

It is estimated that gardens will make up 3,100m² (0.31 ha) of the site and greens space/roadside verge and vegetation will make up approximately 10,000m² (1 ha) of the site. The largest green areas will be located to the west and south of the site and consist of amenity grassland. The exact landscaping regime for the site is not yet known.

Connections to the existing water network services (drinking and foul water services) will be located along the Mountain Road (L1320). It is proposed to discharge wastewater generated by the proposed development to the existing foul sewer network. This wastewater will be treated at Maigh Cuilinn Wastewater Treatment Plant (WwTP) (D0191-01) located approximately 500m from the proposed development.

2.0 METHODOLOGY

2.1 Legislation and Policy

Legislation and policy relevant to the ecological assessment and referenced herein are as follows:

- Wildlife Act, 1976 and Wildlife (Amendment) Act (2000) including all amendments. In this document, the legislation is referred to collectively as the Wildlife Acts;
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011; hereafter referred to as the Birds and Habitats Regulations);
- EC Birds Directive 79/409/EEC;

- EC Habitats Directive 92/43/EEC;
- Convention on the conservation of European wildlife and natural habitats (Bern Convention): Entry into force in Ireland 01/08/1982;
- (EIA) Regulations, including all amendments 1989-2019;
- Fisheries (Consolidation) Act 1959;
- Flora (Protection) Order, 2015;
- Planning and Development Act (2000) including all amendments;
- Planning and Development (Amendment) Act 2010; and
- National Biodiversity Plan, 2017-2021.

2.2 Desktop Study

The ecological desktop study completed for the proposed project comprised the following elements:

- Review of records of rare and protected flora and fauna including those obtained from the NPWS website¹, and those available from the National Biodiversity Data Centre (NBDC) website^{2,3};
- Review of Ordnance Survey maps and aerial photography in order to determine broad habitats that occur within the study area and identification of habitats suitable for protected species, including bats in the surrounding areas;
- Identification of European sites with links to the proposed development; and
- Review of any other relevant ecological reports and literature.

2.3 Field Studies

A walkover survey of the site was undertaken by an experienced TOBIN ecologist on the 23rd of May 2019. A habitat assessment was undertaken in accordance with The Heritage Council's "*Best Practice Guidance for Habitat Survey and Mapping*"⁴. Habitats were classified according to the Heritage Council's "*A Guide to Habitats in Ireland*"⁵ and following the EU Habitats interpretation Manual for Annex I Habitats⁶. Searches for evidence of protected species and/or presence of suitable habitats were also undertaken.

A Swift (*Apus apus*) survey was also undertaken on 23rd of May 2019 around the vicinity of the site while following the guidelines from Swift Conservation Ireland⁷. A return visit was undertaken on the 4th of July 2019 to carry out a second Swift survey as is common practice, and to conduct Bat surveys in accordance with "*Bat Surveys for Professional Ecologists: Good Practice Guidelines*"⁸.

¹ National Parks and Wildlife Service Website: www.npws.ie (Accessed: July 2019)

² National Biodiversity Data Centre Mapping Website: <https://maps.biodiversityireland.ie/Map> (Accessed: July 2019)

³ Biodiversity Maps: Available at <https://maps.biodiversityireland.ie/Map/Terrestrial/Species/119456> (Accessed: July 2019)

⁴ Smith, G.F., O'Donoghue, P., O'Hara, K., Delaney, E. (2011). *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council, Kilkenny.

⁵ Fossitt, J.A. (2000). *A Guide to Habitats in Ireland*. The Heritage Council, Kilkenny.

⁶ EU (2013). *Manual of European Union Habitats*, EU 28.

⁷ Swift Conservation Ireland: <http://www.swiftconservation.ie/wp-content/uploads/2019/03/Survey-Guidelines-2019.pdf> (Accessed: July 2019).

⁸ Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1

Bat surveys included a roost emergence survey and a walked transect within the vicinity of the Planning Application Boundary. The proposed development site and surrounding areas that were deemed likely to be of interest for bats were noted from desktop study before being assessed on the ground. Habitats on site were assessed for the favourability for bats including for potential roosts and for foraging areas.

Potential roosting areas were assessed during daylight hours. The presence of roosts is often shown by grease staining at the entrance, droppings and uneaten remains of prey such as moth or butterfly wings. An emergence survey was conducted at an area thought to have moderate to high suitability for a bat roost. The survey took place 30 minutes before sunset and for 1.5 hours after sunset. This survey was conducted on the 4th July 2019.

Two walked transects were also conducted through and surrounding the proposed development site during which all bat activity observed was recorded using heterodyne detectors and an Echo Meter Touch 2. The Echo Meter Touch 2 allows for real time visualisation of bat activity in the vicinity of the surveyor. The first walked transect survey was completed on the 4th of July 2019 (with heterodyne detector only) with a secondary survey being completed on the 19th August 2019 (with both a heterodyne detector and an Echo Meter Touch 2).

In order to gain greater coverage of bat activity throughout the site, SM4BAT ZC static detectors were deployed to investigate potential on site foraging grounds and commuting routes through the woodland. A static detector was deployed at a potential roosting site for one night on the 4th of July 2019. Two statics were deployed for five consecutive nights, from the 25th of July to the 30th of July 2019, one to the north of the site and the other to the south at the potential roosts site (Figure 3-2). Based on the results gained by the static detectors, two statics were then deployed into the central area of the proposed site, one to the east and one to the west to gain greater coverage of potential commuting routes within the site. The static detectors remained in-situ for a minimum of five consecutive nights from the 8th of August to the 13th of August 2019. From the desktop study and preliminary walkover survey on the 4th of July, a treeline coming from the southern section of the woodland site was identified as a potential commuting routes for bats travelling from the north through the woodland and to the southern landscape with minimal lighting effects. A static detector was deployed along the treeline and another on the opposite side of the road in a section of scrub. Both statics were deployed for a minimum of five consecutive nights from the 13th of August to the 19th of August 2019.

Bat activity in the area was recorded both by ultrasonic calls and flight observations as well through a computer software sound analysis of recorded echolocation and social calls collected on the static detectors (Wildlife Acoustics Kaleidoscope Viewer). All bat surveys were conducted in good weather conditions when insect prey would be more active. Surveys were not conducted under a temperature of 8° Celsius, when bats are unlikely to be active. Strong winds and heavy rainfall were also avoided on surveys. The microphone of one static detector, deployed to the east section of the site from the 8th of August to the 13th of August 2019, malfunctioned and the data could not be analysed conclusively. This was not considered to be a limitation in the assessment as there was sufficient information gathered in the areas surrounding the site where the static malfunctioned (data from a nearby walked transect and another static that was deployed approximately 50m away). Furthermore, the area where this static was deployed was found to have poor bat roost potential. The results for the bat surveys can be seen in Section 3.5 and Appendix 3.

2.4 Baseline Evaluation of Ecological Receptors

Ecological resources/ receptors are evaluated following National Roads Authority (NRA) Guidelines (now known as Transport Infrastructure Ireland [TII])⁹, which are consistent with the approach recommended in the Chartered Institute of Ecology and Environmental Management (CIEEM) "*Guidelines for Ecological Impact Assessment in the UK and Ireland*" (2018)¹⁰. The information gathered from desk studies and field surveys has been used to make an evaluation of ecological impacts of the proposed development upon the identified ecological features.

3.0 RECEIVING ENVIRONMENT

3.1 Site Description

The proposed development site is a wooded area, located close to the centre of Maigh Cuilinn, Co. Galway, on the Mountain Road (L1320), approximately 300m west to the junction of the N59, and approximately 12.4km northwest of Galway city. The site is surrounded by housing to its east and west with a regional road and retail units to the south. The woodland extends northwards from the northern boundary.

The area within the planning application boundary is approximately 1.8ha and consists of mainly (Mixed) Broadleaved woodland (WD1), with Exposed sand, gravel or till (ED1), and Recolonising bare ground (ED3) located to the south. A stone wall is located to the north of the site which is classified under habitats as Stone walls and other stonework (BL1). There were no ditches or water courses present within the planning application boundary.

In summary, four habitats were identified to be present within the site boundary and are further described below in Section 3.3.

3.2 Designated Conservation Sites

The site is not contained within, or adjacent to any National or European protected sites. The Maigh Cuilinn Bog Natural Heritage Area (NHA) (Site Code: 002364) is located approximately 0.9km to the southwest of the proposed site. NHAs are legally protected from damage from the date on which they are formally proposed for designation under the Wildlife (Amendment) Act 2000. There are no links between the proposed development site and the NHA.

The Lough Corrib Special Area of Conservation (SAC) (Site Code: 000297) is located 1.3km to the east, Lough Corrib Special Protection Area (SPA) (Site Code: 004042) is located approximately 2.8km to the northeast, the Ross Lakes and Woods SAC (Site Code: 001312) is located approximately 3km to the north, the Galway Bay Complex SAC (Site Code: 000268) is located 8.6km to the southeast, and the Inner Galway Bay SPA (Site Code: 004031) is located 9.5km to the southeast. European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. In Ireland, European sites include SACs and SPAs (collectively referred to as the Natura 2000 network).

⁹ NRA (now known as Transport Infrastructure Ireland) (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes. Rev 2.

¹⁰ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

An Appropriate Assessment Screening Report was completed for the proposed development to inform the Appropriate Assessment process, as required under Article 6 of the EU Habitats Directive. The AA Screening Report concluded that the proposed development was unlikely to result in significant effects on any European sites or their Qualifying Interests during the development and operation of the proposed development.¹¹

3.3 Habitats and Flora

Four habitat types based on Fossitt (2000) were identified on-site, as shown in Figure 3-1. The species composition of each of these habitats was assessed using the DAFOR scale¹². These habitats were as follows:

- (Mixed) Broadleaved Woodland (WD1)

The proposed development site is mainly composed of a Mixed Broadleaved Woodland with a canopy dominated by Sycamore (*Acer pseudoplatanus*), Hawthorn (*Crataegus monogyna*), Rowan (*Sorbus aucuparia*), Willow (*Salix* sp.). Beech (*Fagus sylvatica*) and Birch (*Betula pendula*) occurred occasionally.

The understory was diverse with Honeysuckle (*Lonicera periclymenum*), Bramble (*Rubus fruticosus*) and Bracken (*Pteridium aquilinum*) dominant and other species such as, Holly (*Ilex aquifolium*), Hazel (*Corylus avellana*), Gorse (*Ulex europaeus*), and Buddleja (*Buddleja davidii*) occurring less frequently.

The ground layer consisted of, Hard fern (*Blechnum spicant*), Wood sanicle (*Sanicula europaea*) and Woodrush (*Luzula campestris*) which occurred frequently. Ivy (*Hedera helix*), Foxglove (*Digitalis purpurea*), Primrose (*Primula vulgaris*), Pignut (*Conopodium majus*) were found to occur occasionally and Herb Robert (*Geranium robertianum*), Violet (*Viola odorata*), Yorkshire fog (*Holcus lanatus*), Lesser celandine (*Ficaria verna*) and Lords and ladies (*Arum maculatum*) were rare. The overall quality of this habitat was considered good considering the age of the canopy trees, the diversity of species located within it and the limited disturbance to the site.

There were large amounts of human activity throughout the site with lots of litter strewn in the understorey. This habitat is evaluated as being of local importance (higher value).

- Stone Walls and Other Stonework (BL1)

This category incorporates stone walls and most other built stone structures in rural and urban situations. An old stone wall was located along the northern perimeter of the proposed development area, adjacent to an existing house. The stone wall had a dominant cover of the bryophyte *Thuidium tamariscinum*, with abundant Bramble, Ivy, and Bracken. This habitat is evaluated as being of local importance (lower value). The low diversity of other bryophytes and other macrophytes and the overall length (approximately 40m) of this habitat determines this habitat of moderate quality.

¹¹ TOBIN Consulting Engineers (2019). Appropriate Assessment Screening Report: Housing Development, Gort Uí Lochlainn & Coill Bhrucláin, Maigh Cuilinn, Co. Galway.

¹² DAFOR: D= Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

- Exposed Sand, Gravel or Till (ED1)

This category includes natural or artificial exposures of unconsolidated coarse or mixed sediment. This habitat was recorded at the southern end of the site and included a works area with a stone surface. There were no species present. This habitat is evaluated as being of local importance (lower value).

- Recolonising Bare Ground (ED3)

This category refers to bare or disturbed ground which has been invaded by herbaceous plants. This habitat occurred between the ED1 and WD1 and hosted areas transitioning to scrub (WS1). The habitat was dominated by Bramble, Willow, Nettle (*Urtica dioecia*), Soft rush (*Juncus effuses*), and Buddleja. Other species included Yorkshire fog (*Holcus lanatus*), Birdsfoot trefoil (*Lotus corniculatus*), Ribwort plantain (*Plantago lanceolata*), Curly dock (*Rumex crispus*), *Equisetum* sp., Gorse, Sycamore, Alder (*Alnus glutinosa*), Dandelion (*Taraxacum officinale*), Fuchsia (*Fuchsia magellanica*), Coltsfoot (*Tussilago farfara*), Speedwell (*Veronica persica*), and Ox-eye daisy (*Leucanthemum vulgare*). This area is evaluated as being of local importance (lower value).

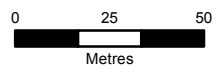


Legend

— Site Boundary

Habitats

- BL3 - Buildings and Artificial Surfaces
- ED1 - Exposed sand, gravel or till
- ED3 - Recolonising bare ground
- GA2 - Amenity grassland(improved)
- WD1 - (Mixed) broadleaved woodland
- BL1 - Stone walls and other stonework



NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

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 **Comhairle Chontae na Gaillimhe**
Galway County Council

Project:

Gort Uí Lochlainn & Coill Bruachláin,
Moycullen, Co. Galway
- 30 Housing units

Title:

Habitats Map

Scale @ A3: 1:2,000

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3.4 Protected and Invasive Flora

No protected flora was recorded on-site during field visits. A search of the database of the National Biodiversity Data Centre revealed no protected flora species within a 10km square radius (M23) of the proposed development site². It should be noted that the lack of recording does not mean that no protected species are present, rather that they have simply not been recorded and entered into the database.

The search did however note ten invasive flora species within the 10km square (M23) of the proposed development site². These were:

- New Zealand Flatworm (*Arthurdendyus triangulatus*),
- Zebra Mussel (*Dreissena polymorpha*),
- Brown Rat (*Rattus norvegicus*),
- Australian Flatworm (*Australoplana sanguinea*),
- Budapest Slug (*Tandonia budapestensis*),
- Common Garden Snail (*Cornu aspersum*),
- Jenkins' Spire Snail (*Potamopyrgus antipodarum*),
- Wrinkled Snail (*Candidula intersecta*),
- European Rabbit (*Oryctolagus cuniculus*), and

None of these species were recorded onsite during the times of surveying. However, Sycamore and Buddleja were recorded onsite. These species are rated as medium risk and are identified as species that could represent a significant impact on native species or habitats causing significant decline or loss; or species that could impact either/both Natura 2000 sites and the goals of the WFD¹³.

3.5 Protected Fauna

3.5.1 Bat Species

Desktop study results highlighted six Lesser Horseshoe bat (*Rhinolophus hipposideros*) roosting areas in the vicinity of the proposed development. Two roost locations were in the Ross Lake and Woods SAC approximately 6 km and 4 km north west of the proposed development^{14,15}. One roost located approximately 4km to the north east is situated in the Lough Corrib SAC¹⁵.

¹³ Invasive Species Ireland: <https://invasivespeciesireland.com/wp-content/uploads/wp-post-to-pdf-enhanced-cache/1/amber-list-recorded-species.pdf> (Accessed July 2019)

¹⁴ NPWS (2018) Conservation Objectives: Ross Lake and Woods SAC 001312. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht. Available online at: https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001312.pdf [Accessed July 2019].

¹⁵ National Biodiversity Data Centre Map viewer - <https://maps.biodiversityireland.ie/Map/Terrestrial/Species/119456> [Accessed July 2019].

The remaining three Lesser Horseshoe Bat roost sites/ populations within the greater area of the proposed development^{15,16}, varied in distance from less than 1km to over 8km. Approximately 900m from the proposed development a roost is located in a cave to the north east of Maigh Cuilinn village at Killarainy. This area also contains a known roost of the Natterer's Bat (*Myotis nattereri*). Approximately 1.6km from the proposed development, a roost in a building can be found close to the western shore of Ballyquirke lough (Ballyquirke lough is part of the Lough Corrib SAC). A large population of horseshoe bats and several roost sites could be found in the Menlough area approximately 8 km south east from the proposed development. These sites are not listed as SACs. Other Lesser Horseshoe Bat roost sites of importance were noted such as the large roost/population at Eborhall House (24 km north on northern shore of Lough Corrib) and the Menlo Castle population¹⁷, located approximately 18 km to the south. These distances would be regarded as beyond the normal core foraging range and commuting range of this species, except on exceptional occasions or over long periods of time¹⁸.

As noted in Section 2.3, Bat surveys were undertaken in July and August 2019. From these surveys, Bat species confirmed in the area included Common pipistrelle (*Pipistrellus pipistrellus*), Soprano pipistrelle (*Pipistrellus pygmaeus*), Natterer's bat (*Myotis nattereri*), Leisler's bat (*Nyctalus leisler*), Lesser Horseshoe bat (*Rhinolophus hipposideros*) and *Myotis* species. All bats are protected under the Wildlife Acts 1976 to 2000 (as amended) and Annex IV of the EU Habitats Directive (92/43/EEC), while the lesser horseshoe bat is listed under Annex II. No roosting sites were identified within the proposed planning application boundary.

3.5.1.1 Bat Activity Survey Results

The woodland is surrounded by residential housing on its east and western sides with the town of Maigh Cuilinn to the southeast. More woodland is located to the northwest.

The emergence survey conducted on the 4th July 2019 indicated that no roost was located in the area of moderate potential – the mature sycamore treeline at the south-eastern section of the proposed development. Bat activity in the vicinity of the emergence survey site was minimal with only seven distance Soprano Pipistrelle bats being recorded foraging or commuting. One unidentified *Myotis* species was also recorded commuting (Figure 3-2).

No bat activity was recorded during the walked transect on the 4th of July (using only heterodyne detectors), either within the cluttered woodland area or along the perimeter of the proposed development.

The second walked transect was conducted on the 19th of August 2019. An *echo Meter Touch 2* was used during this survey. There was not a significant amount of bat activity during this walked transect, with three Soprano Pipistrelle's, three Leisler's Bats and a single Natterer's Bat being recorded foraging on the perimeter of the proposed development site (Figure 3-2).

¹⁶ Galway County Council (2018), N6 Galway City Ring Road Environmental Impact Assessment Report – Chapter 8 – Biodiversity. Available online at: <http://www.n6galwaycityringroad.ie/media/N6%20EIAR%20-%20Chapter%208%20Biodiversity.pdf> [Accessed July 2019].

¹⁷ National Biodiversity Data Centre Map viewer - <https://maps.biodiversityireland.ie/Map/Terrestrial/Species/119456> [Accessed July 2019].

¹⁸ Bontadina, F., Schofield, H. and Naef-Daenzer, B. (2002) Radio-tracking reveals that lesser horseshoe bats (*Rhinolophus hipposideros*) forage in woodland. *Journal of Zoology* 258: 281–290. Available online at: <https://www.vwt.org.uk/wp-content/uploads/2015/04/bontadina-f-et-al-2002-radio-tracking-reveals-that-lesser-horseshoe-bats-forage-in-woodland.pdf> [Accessed July 2019]

All recorded bats were observed within the woodland or adjacent treelines.

3.5.1.2 Static Data

Static bat detectors can provide a considerably higher level of information about a site due to their continuous recording of bat calls over consecutive nights. A single SM4BAT ZC static detector was deployed on the site on the 4th of July to determine if there was the presence of additional bat species within the proposed site boundary. The results of this static showed significantly higher levels of activity than was recorded during the walked transect on the same night.

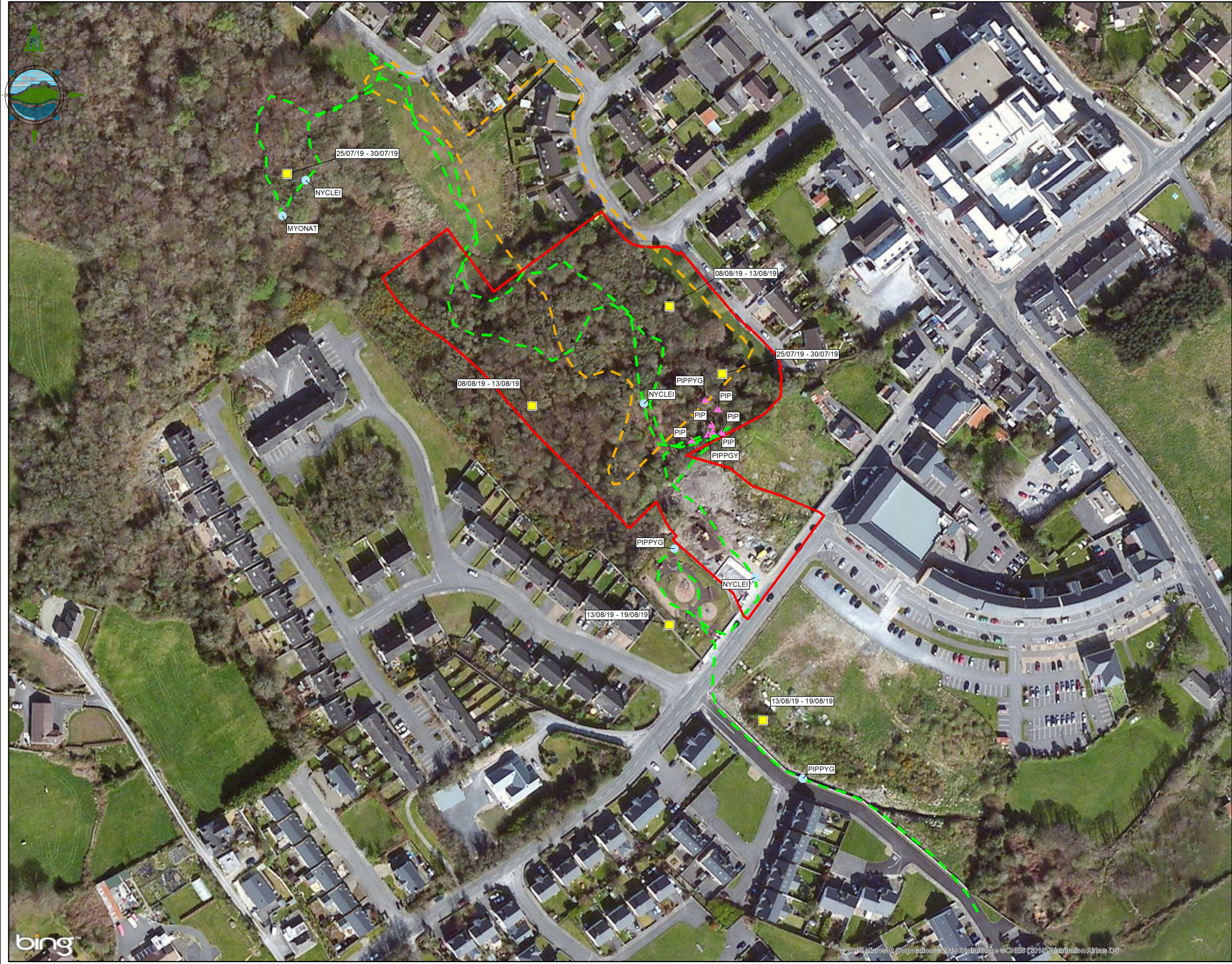
Two SM4BAT ZC static detectors were deployed for five consecutive nights on three occasions, the first from the 25th to the 30th of July 2019 and the second from the 8th to the 13th of August 2019 and the third from the 13th to the 19th of August 2019. The results of all the deployed static detectors and walked transects are recorded below in Table 3-1 and Appendix 3. All static locations can be viewed in Figure 3-2.

Soprano Pipistrelles showed the highest level of activity with 1,671 passes being recorded. Soprano Pipistrelles were recorded on every survey night within the study site. Distinguishing *Myotis* species such as the Natterer's Bat, Whiskered Bat (*Myotis mystacinus*) and Daubenton's Bat (*Myotis daubentonii*) from a ZC or zero-crossing static bat detector can be problematic and therefore many *Myotis* records were not identified to species level. However, given the locality of a known Natterer's Bat roost to the proposed development site³ and given the fact that Natterer's Bats were confirmed on both the walked transects and through the static detectors it is presumed that the vast majority of the 223 *Myotis* records were from commuting and foraging Natterer's Bats. A total of 198 Leisler's Bat passes were also recorded by the static detectors. This species forages in the open landscape over woodland or agricultural fields and scrub.

The discovery of the Lesser Horseshoe Bat both on and adjacent to the proposed development site and the sites location in relation to the nearby roost at Killarainy, Maigh Cuilinn, indicate that the site is infrequently being used as a foraging-grounds and a commuting route for these bats. Overall, a total of 18 Lesser Horseshoe Bat passes were recorded with the highest level of activity (11 passes) being recorded to the north of the proposed development in the adjacent woodland. This section of woodland is more open with a higher number of mature beech and sycamore trees and could be favoured by the Lesser Horseshoe Bats. Only one record of this species was recorded within the boundary of the proposed development site, in the southwestern corner along the mature sycamore treeline at the edge of the woodland. The static detectors at the treeline by the playground and across the L1320 road at an area of scrub, indicate that a small number of Lesser Horseshoe bats are commuting north and south and using the woodlands on the proposed development site as a commuting route. It is unclear if these bats are commuting south from the Killarainy roost (900m to the northeast) or commuting north from roost at Ballyquirke Lough (1.6 km to the southeast).

Table 3-1 Summary of bat calls recorded with static bat detectors (SM4BAT ZC).

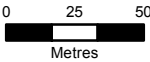
Location	Date		Species Recorded (Number of Passes)							
	Start	End	Common Pipistrelle	Soprano Pipistrelle	Natterer's Bat	Leisler's Bat	Lesser Horseshoe Bat	Myotis Spp.	Pipistrelle Spp.	Unknown
North of proposed site in adjacent woodland by stone wall	25/07/2019	30/07/2019	0	29	0	0	11	9	0	19
On-site southern mature sycamore treeline	25/07/2019	30/07/2019	1	1033	10	28	1	210	0	57
On-site central static	08/08/2019	13/08/2019	0	59	0	12	0	2	0	37
Playground	13/08/2019	19/08/2019	0	415	0	82	4	0	1	205
Scrub adjacent to road L1320	13/08/2019	19/08/2019	2	135	0	76	2	2	0	174
Total			3	1671	10	198	18	223	1	492



Legend

- Site Boundary
- Walked Transect 19th Aug 2019
- Walked Transect 4th July 2019
- Location of SM4BAT ZC Bat Static Detectors
- Bat Species Recorded on Walked Transect - 19th Aug 2019
- Bat Species Recorded During Emergence Survey - 4th July 2019

Code	Bat Species
PIPPG	Soprano Pipistrelle
MYONAT	Natterer's Bat
NYCLEI	Leislars Bat
PIP	Pipistrelle spp.



NOTES

- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
- ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
- ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
- ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

D01	Aug '19	Draft Issue	J.S.	A.B.
Issue	Date	Description	By	Chkd.

Client:

Project: Gort Uí Lochlainn & Coill Bruachláin, Moycullen, Co. Galway - 30 Housing units

Title: Walked transect routes and bat activity on the 4th of July and 19th of August 2019.

Scale @ A3: 1:2,750

Prepared by: J. Sherry	Checked: A. Booth	Date: August 2019
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Project Director: S.Tinnelly

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Draft: **D01**

Drawing No: **Figure 3-2**

3.5.1.3 Avian Fauna

With the exception of Herring gull (*Larus argentatus*), no bird species of high conservation concern (red listed)¹⁹ were noted during the surveys. Herring gull was recorded on the 23rd of May 2019, as they commuted into the town to the south of the proposed development. Bird species recorded onsite included: Magpie (*Pica pica*), Dunnock (*Prunella modularis*), Blackbird (*Turdus merula*), Chiffchaff (*Phylloscopus collybita*), Bluetit (*Cyanistes caeruleus*), Robin (*Erithacus rubecula*), Chaffinch (*Fringilla coelebs*), Blackcap (*Sylvia atricapilla*), Pheasant (*Phasianus colchicus*), Jackdaw (*Corvus monedula*), Wren (*Troglodytes troglodytes*), Song thrush (*Turdus philomelos*), Woodpigeon (*Columba palambus*), House sparrow (*Passer domesticus*), Pied wagtail (*Motacilla alba*), and Starling (*Sturnus vulgaris*). Of these, only Robin, House sparrow and Starling are of moderate conservation concern (amber listed)¹⁹. Overall, based on the extent of the site and the presence of habitats in the locality to support avifauna, the bird populations present are evaluated as being of local importance (lower value).

No Swifts were recorded during swift surveys carried out on the 23rd of May and 4th of July 2019.

3.5.2 Other Fauna

A Hedgehog (*Erinaceus europaeus*) was recorded within the Proposed Planning Application Boundary on the 4th of July 2019. Hedgehogs are a protected species under the Wildlife Acts. No other protected species were recorded during the field surveys.

A search of the National Biodiversity Data Centre database and NPWS database identified records of protected fauna within the 10km square (M23) within which the proposed development is located (Table 3-2)². The potential exists for these species to occur where suitable habitat exists within the proposed development site. It is noted that all species of bird are protected under the Wildlife Acts; therefore, individual species are not listed.

Table 3-2 Protected Fauna

Scientific Name	Common Name	Protected Status	Source NBDC ²
Amphibian			
<i>Lissotriton vulgaris</i>	Smooth Newt	Protected Species: Wildlife Acts	Amphibians and Reptiles of Ireland
<i>Rana temporaria</i>	Common Frog	Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts	Amphibians and Reptiles of Ireland
Bony Fish			
<i>Salmo salar</i>	Atlantic Salmon	Protected Species: EU Habitats Directive >> Annex II & V Threatened Species: OSPAR Convention Threatened Species: Vulnerable	Freshwater Fish in Irish Lakes
Insect- Butterfly			

¹⁹ Kingston, N. (2012) Checklist of protected & rare species in Ireland. Unpublished National Parks & Wildlife Service Report.

Scientific Name	Common Name	Protected Status	Source NBDC ²
<i>Euphydryas aurinia</i>	Marsh Fritillary	Protected Species: EU Habitats Directive >> Annex II Threatened Species: Vulnerable	Butterflies of Ireland
Reptile			
<i>Zootoca vivipara</i>	Common Lizard	Protected Species: Wildlife Acts	Amphibians and Reptiles of Ireland
Terrestrial Mammals			
<i>Erinaceus europaeus</i>	West European Hedgehog	Protected Species: Wildlife Acts	Mammals of Ireland 2016-2025
<i>Lutra lutra</i>	European Otter	Protected Species: EU Habitats Directive >> Annex II & IV Protected Species: Wildlife Acts	Mammals of Ireland 2016-2025
<i>Martes martes</i>	Pine Marten	Protected Species: EU Habitats Directive >> Annex II & V Protected Species: Wildlife Acts	Mammals of Ireland 2016-2025
<i>Meles meles</i>	Eurasian Badger	Protected Species: Wildlife Acts	Mammals of Ireland 2016-2025
<i>Myotis daubentonii</i>	Daubenton's Bat	Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts	National Bat Database of Ireland
<i>Myotis nattereri</i>	Natterer's Bat	Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts	National Bat Database of Ireland
<i>Nyctalus leisleri</i>	Lesser Noctule	Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts	National Bat Database of Ireland
<i>Pipistrellus pipistrellus sensu lato</i>	Pipistrelle	Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts	National Bat Database of Ireland
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts	National Bat Database of Ireland
<i>Plecotus auritus</i>	Brown Long-eared Bat	Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts	National Bat Database of Ireland
<i>Rhinolophus hipposideros</i>	Lesser Horseshoe Bat	Protected Species: EU Habitats Directive >> Annex II & IV Protected Species: Wildlife Acts	National Lesser Horseshoe Bat Database

Scientific Name	Common Name	Protected Status	Source NBDC ²
<i>Sciurus vulgaris</i>	Eurasian Red Squirrel	Protected Species: Wildlife Acts	The Irish Squirrel Survey 2007

**Under the Irish Wildlife Acts, all birds and their nests are protected during the bird breeding season – 1st of March to 31st of August, however exceptions do apply.*

There was no suitable habitat for wetland species recorded during the walkover surveys.

4.0 POTENTIAL IMPACTS

4.1 Impact Assessment Criteria

The assessment of potential impacts on flora and fauna is based on standard good practice including Environmental Protection Agency (EPA)²⁰, CIEEM¹⁰ and Transport Infrastructure Ireland (TII) series of guidelines²¹.

4.2 Overview of Impacts

The potential impacts of the project relate mainly to the construction and operational phase of the project. Construction phase potential impacts include habitat loss, habitat damage/disturbance, disturbance to species and pollution of surface waters.

Elements of the proposed works during the construction and operation phases, as detailed above, may give rise to the following indirect impacts:

- Loss of habitat used by wildlife for resting, foraging and commuting;
- Fragmentation of commuting corridors;
- Disturbance to wildlife from improper lighting; and
- Direct mortality.

One of the main sources of operational impacts would arise from the disturbance of bat species located in or around the proposed site, from the loss of woodland during the construction phase and inappropriately designed street lighting at the operation phase.

4.2.1 Designated Conservation Sites

As noted, the proposed development site is not located within any designated conservation site (SAC, SPA or NHA), therefore there are no potential direct impacts identified. The potential effects on European sites associated with these potential indirect impacts are considered in detail in the accompanying AA Screening this report.

²⁰ Environmental Protection Agency (EPA) (2017c). Guidelines on the information to be contained in Environmental Impact Assessment Reports. Draft, August 2017.

²¹ Transport Infrastructure Ireland website: <http://www.tii.ie/technical-services/environment/planning/>

4.2.2 Potential Impacts during Construction Phase

4.2.2.1 Habitats

Construction stage impacts will involve the removal of established mature mixed broadleaf woodland (WD1), with the exception of linear strips along the eastern and southern boundaries as well as the removal of the other smaller habitats located within or surrounding this woodland (BL1, ED1 and ED3). The impact level of this removal will be significant, permanent negative effect as the removed habitat will be replaced with a different land use dominated by (BL3).

4.2.2.2 Fauna

Disturbance to fauna will occur during the construction stage due to a significant loss of habitat, increase in human presence on-site, construction noise and lighting within the site. This leads to the evaluation that, depending on the species the potential for impacts affecting fauna range from low to medium significance in the local context.

Bats

Habitat Fragmentation

The majority of Irish bat species including; Natterer's Bat, Common Pipistrelle, Soprano Pipistrelle and the Lesser Horseshoe Bat use woodlands, hedgerows and treelines for foraging, commuting or roosting²². As noted, the construction of the housing development will involve the removal of the woodland for houses, access roads and pathway and will include street lighting. Tree removal will directly impact bats through a loss of commuting and foraging habitats and loss of potential tree roosts and resting places. The fragmentation of established flight paths may permanently or temporarily alter or deter bats from using existing commuting corridors and gaining access to foraging habitats²³. Without appropriate mitigation measures in place this could have a direct and likely significant negative effect on bats at a local level. The fragmentation of foraging habitats could also lead to a reduction of prey species abundance (i.e. reduced insect abundance due to loss of suitable habitat), reducing the amount of prey available for bats in an area causing them to travel further in search of food²⁴.

As mentioned in Section 4.2.2.1, the impacts of the removal of the existing woodland will have significant, permanent negative effect on this habitat and system. This habitat fragmentation is not expected to affect the population of bats recorded within the boundary of the proposed development as no roosts or significant numbers of bat were recorded during surveys. The removal of habitat is only expected to impact on the commuting and foraging of the bat species. For these reasons the removal of habitats will have a moderate impact on the bat species recorded within the proposed development site.

²² Stone, E. L. (2013). Bats and lighting: Overview of current evidence and mitigation guidance. Bats and Lighting Research Project, University of Bristol. Available from www.batsandlighting.co.uk. Accessed: 21 August 2019

²³ Entwistle, A. C., Harris, S., Hutson, A. M., Racey, P. A., Walsh, A., Gibson, S. D., Hepburn, I. & Johnston, J (2001). Habitat management for bats: A guide for land managers, landowners and their advisors. *Joint Nature Conservation Committee*. Available at http://jncc.defra.gov.uk/pdf/Habitat_Management_for_bats.pdf. Accessed: 21 August 2019.

²⁴ Hallmann, C.A., Sorg, M., Jongejans, E., Siepel, H., Hofland, N., Schwan, H, Stenmans W., Muller, A., Sumser, H., Horren, T., Goulson, D. & de Kroon, H. (2017). More than 75 percent decline over 27 years in total flying insect biomass in protected areas. *PLoS ONE* 12(10): e0185809.

Increased Disturbance

Construction activities and increased human presence during the Construction Phase may result in increased disturbance as a result of temporary light and noise pollution. Light pollution could have likely significant negative effects on bat species within the ZOI of the proposed project, particularly on the *Myotis* species and Lesser Horseshoe Bat. *Myotis* species such as the Whiskered Bat, Natterer's Bat and Daubenton's Bat all display an intolerance to light and will avoid areas illuminated with high wavelength light²⁵. Lesser Horseshoe Bats are significantly impacted by disturbance, including noise, lighting and physical disturbance. Studies have shown this group of bats will avoid commuting routes with low level Light Emitting Diode (LED) lighting of 3.7 lux (luminous flux per unit area)^{26,22}. Research has also shown that bats eyes work best in dim light²⁷. Thus, an increase in lighting could potentially disorientate some bat species causing them to abandon established flight lines and feeding grounds. This can reduce the amount of time spent foraging and can negatively affect body weight, reproduction rates and the capacity to survive hibernation²². During the construction phase, lighting impacts would be expected to have a low impact on commuting and foraging bat species, based on the fact construction activities are not expected to be conducted during optimal bat foraging hours.

Anthropogenic noise affects bats in a number of ways, namely; noise avoidance, a reduction of echolocation effectiveness, and/or reduced attention²⁸. Where construction is taking place in close proximity to an important commuting corridor or foraging area, works will cease before sunset so that construction noise will be reduced to ensure normal usage of the landscape by bats. Operational noise is not expected to be different to the surrounding urban area.

Overall impacts on bats are expected to be negative, low to moderate on a short to long-term basis on a local level.

Breeding Birds

There were no bird species of high conservation concern recorded from within the site boundary of the proposed development. During the Swift surveys undertaken on the 4th of July, three separate Herring gulls were observed to be commuting over Maigh Cuilinn village, the closest record for this species was approximately 10m from the southern boundary of the proposed development. Other bird species recorded on site during the walkover survey are recorded in Section 3.5.1.3

The removal of foraging and breeding habitat will have a long-term negative effect on bird species populations within the site boundary. This impact is assessed as being low to moderate at a local scale.

Other Fauna

²⁵ Rowse, E. G., Lewanzik, D., Stone, E. L., Harris, S. & Jones, G. (2015). Dark Matter: The Effects of Artificial Lighting on Bats. In: Voight, C, Kingston, T. (eds) Bats in the Anthropocene: Conservation of Bats in a Changing world. Springer, Cham

²⁶ Stone, E. L., Jones, G. & Harris, S (2012). Conserving energy at a cost to biodiversity? Impacts of LED lighting on bats. *Global Change Biology*, 18(8), 2458-2465

²⁷ Eklöf, J. (2003). 'Vision in Echolocation Bats' Doctoral thesis, Göteborg University, Sweden

²⁸ Lou, J., Clarin, B. M., Borissov, I. M. & Siemers, B. M. (2014) Are torpid bats immune to anthropogenic noise? *The Journal of experimental Biology*, 217, 1072-1078

The only other fauna recorded on site was a single European hedgehog (*Erinaceus europaeus*) on the 4th of July. The removal of existing habitats may potentially impact on this species. This impact is expected to be low to moderate on a local level based on the availability of other suitable habitat within the vicinity and the species ability to adapt to sub urban gardens/ rural village settings.

4.2.3 Potential Impacts during Operation Phase

4.2.3.1 Fauna

Bats

During the operation phase, the main issue of the proposed development is the potential to indirectly affect the local bat species due to the negative impacts caused by lighting. Light produced from high lux and incorrectly placed lamps will have the effect on disturbing the flight paths of foraging and commuting bat species, particularly Lesser Horseshoe bats²⁹. Lights which produce more UV light are known to attract more insects which bat species prey on³⁰. However as Lesser Horseshoe is less tolerant of light this puts them at a competitive disadvantage. This lack of tolerance to light will also affect the species commuting corridors, having the knock-on effect such as isolating populations and acting as a barrier, restricting access to roost sites. The impact is anticipated to be moderate negative, on the medium to long-term at a local level.

Birds

Disturbance is likely to be the most significant impact on bird species during the operational phase. The increase in people may lead to the greater displacement of some bird species which were recorded during surveys. However this disturbance is not expected to be out of the ordinary for the surrounding urban area and based on the mobile nature of bird species, the availability of other suitable habitat within the surrounding area and that some bird species will use garden and amenity spaces, the impact is likely to have a negative low effect on the medium to long term. During the operational phase of the proposed development

4.2.4 Potential Cumulative Impacts

The following developments were considered when assessing the potential for cumulative impacts:

- The proposed N6 Galway bypass is located approximately 8 km to the south of the proposed Maigh Cuilinn development. Construction is expected to commence in 2021 and expected to last for three years. In combination effects, impacting on bat species populations around Maigh Cuilinn are determined to be unlikely due to this distance between the developments. In the case of Lesser Horseshoe bats, it was determined

²⁹ Aughney, T., Kelleher, C. & Mullen, D. (2008) Bat Survey Guidelines: Traditional Farm Buildings Scheme. The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny. Bat Survey Guidelines: Traditional Farm Buildings Scheme Available online at: https://www.heritagecouncil.ie/content/files/bat_survey_guidelines_2008_11mb.pdf [Accessed July 2019].

³⁰ Bruce-White, C. and Shardlow, M. (2011). A Review of the Impact of Artificial Light on Invertebrates. Buglife: Peterborough. Available online at: https://www.buglife.org.uk/sites/default/files/A%20Review%20of%20the%20Impact%20of%20Artificial%20Light%20on%20Invertebrates%20docx_0.pdf [Accessed July 2019].

through the use of radio tracking and ringing, that the Lesser Horseshoe populations closer to the road development are not connected to the populations surrounding Maigh Cuilinn³¹.

- A proposed development consisting of a community centre and playing fields has been granted planning permission approximately 350m to the northwest of the site. This proposed community centre would require the removal of an existing woodland which may also be used by bat species in the area (not confirmed). However, this development is unlikely to commence within the next five years due to a lack of funding³². It is unknown at the time of writing this report the lighting regime and extent of habitat removal required by this project.
- A three-story mixed-use building has been granted permission directly adjacent to the southern boundary of the proposed development. This development is unlikely to have impacts on the bat populations around Maigh Cuilinn as it will not require the removal of the woodland habitat that is utilised by the species. It is unknown at this time the lighting regime of this project.

The cumulative impact is not anticipated to result in significant effects due to the low number of developments in the rural area, the localised nature.

5.0 MITIGATION MEASURES

5.1.1 Woodland Removal

Commuting corridors which wildlife, including bats species rely on to travel and forage along need to be protected. While the majority of the existing woodland site is to be removed, the retention of existing trees and proposed planting of native species has been proposed as per the landscape plan in Appendix 2. Removal of only the woodland in the proposed development area will leave a corridor of woodland approximately 50 meter in width connecting the woodland to the north to the southern landscape. This corridor will remain intact to provide commuting bats a dark route in which to travel to foraging grounds and roosts.

The protection and creation of local habitat by planting trees in areas could enhance the foraging and commuting areas. Mature trees will be left around the margins of the development which will form part of the linear woodland corridors aimed at allowing bat species to commute to neighbouring sites to forage. The proposed commuting corridors are located at the edge of the proposed development, away from potential disturbances such as light and humans. Review of both the landscape plan and lighting plan simultaneously, allowed the plans to complement each other through cognisance of avoiding lighting in areas of planting.

³¹ Galway County Council (2018) *N6 Galway City Ring Road Environmental Impact Assessment Report* http://www.n6galwaycityringroad.ie/media/N6%20EIAR%20-%20Vol%202%20-%20Main%20Report_Full.pdf

³² Galway County Council (2018) – Application for Extension of Planning Permission for a Ionad Pobail, Páirc Imearthá, Cispheil agus Dhá Phairc Imearthá Uile-Aimsire a Thógail - <http://gccapps.galway.ie/viewexternaldocuments/ViewPDF?ref=2171301>

The use of native trees is required that are locally sourced and represent the tree species which will be removed from the woodland. The use of native species has been associated with more insect species which bats prey on³³. Planting of trees will be prioritised in areas where gaps larger than 10m exist, as some bat species will not cross these open areas³⁴. The excessive removal or pruning of vegetation must be avoided as be part of a management plan.

The spread and introduction of invasive species and noxious weeds will be avoided by adopting appropriate mitigation measures as per guidance issued by the NRA (now known as TII)³⁵. Any invasive plant material noted on site will be either treated onsite or removed off site and disposed of at appropriate licensed waste disposal facility. Any invasive species found to occur within 15m of working areas will require a specialist method statement for its eradication to avoid the spread of invasive species, this will ensure compliance with the European Communities (Birds and Natural Habitats) Regulations 2011 [S.I. No. 477 of 2011]. The presence of non-native species and the requirement for actions will be confirmed by a suitably qualified Ecologist.

To avoid direct mortality or injury to bats, all felled trees/shrub will be left in-situ for 24 hours prior to removal or cutting into smaller sections. Larger trees or branches should be brought to the ground in a supported fashion and left in-situ for 24 hours prior to removal or cutting into smaller sections This is to enable any bats that may be using the trees to escape.

5.1.2 Bats

If a time lag of over 2 years occurs between the 2019 survey and the clearance of vegetation, the mature sycamore treeline along the south-eastern edge of the woodland must be examined by a suitably qualified ecologist for any new roosts that have appeared since initial surveys were completed.

During the construction phase, works shall be completed during daylight hours, while bats are inactive and during summer months must stop after sunset. Where lighting is essential (Health and Safety purposes only), the overspill of light will be minimised through directional lighting (i.e. aimed directly onto the works and not the wider landscape) so as to leave some unilluminated areas in which bats can still commute. This will be done through the use of cowls, lighting hoods, or louvres fitted to the rear of luminaries, and/or shields to direct light in a downwards and inwards fashion to intended areas only. Lighting will be restricted to working hours, with no lights directed towards the commuting corridors to the west and east of the proposed site development. A bat worker will check the lighting pattern once assembled and will make recommendations regarding perimeter lux levels.

Bats, and in particular Lesser Horseshoe Bats are particularly prone to light disturbance. All proposed lighting for the proposed development should follow the guidelines set by the Bat

³³Forest Service, (2009), Bat and Forestry. Available online at: <https://www.agriculture.gov.ie/media/migration/forestry/publications/BatsAnd%20ForestryLeaflet040210.pdf> [Accessed September 2019].

³⁴ JNCC (2001) *Habitat management for bats. A guide for land managers, landowners and their advisors* Peterborough: Joint Nature Conservation Committee. Available online at: http://archive.jncc.gov.uk/pdf/habitat_management_for_bats.pdf [Accessed Sept 2019].

³⁵ NRA (now known as Transport Infrastructure Ireland) (2010). Guidelines on the Management of Noxious weeds and Non-Native Invasive Plant Species on National Roads. <https://www.tii.ie/technical-services/environment/construction/Management-of-Noxious-Weeds-and-Non-Native-Invasive-Plant-Species-on-National-Road-Schemes.pdf>

Conservation Trust³⁶. Lighting must be a warm white spectrum (ideally <2700Kelvin or alternative spectrum suitable to bats) to reduce the blue light component. This can be best achieved with the use of LEDs which are also more capable of directional lighting and produce less UV.

As part of this mitigation during the design phase, a review of the existing lighting plan resulted in the lux levels produced by the proposed lighting design being reduced from an initial figure of 4000K to 3000K with one street light reduced to 2200K at the road turning head close to a linear corridor. In addition to this, three lights were removed from the initial design, reducing the overall light levels within the site and light spill into the northwest and the southeast corners of the site. Additionally, the optic was changed to one that has a better light control around the boundaries; cowls for the lights at the boundary along the entrance road will be supplied. This will reduce the light levels behind the luminaire even further. Lighting Reality software, which is preferred by the local authority for residential projects, does not have the ability to model objects so the effect of a cowl on the light levels could not be modelled in the design, however it is taken that once properly installed light levels (back-lighting) will be further reduced. The outdoor lighting report for the proposed development, outline the locations and luminance area can be seen in Appendix 1.

Where excessive light is shining on commuting corridors/treelines, the overspill of light will be minimised through directional lighting so as to leave unilluminated areas in which bats can still commute. This will be done through the use of cowls, lighting hoods, or louvres fitted to the rear of luminaries, and/or shields to direct light in a downwards and inwards fashion to intended areas only. An experienced bat worker will check the lighting pattern once assembled and will make recommendations regarding perimeter lux levels.

Four Bat boxes will be used to enhance the roosting potential of the existing mature trees that are to be retained around the margins of the development. Bat boxes will be attached to suitable trees or buildings within the boundary of the proposed development. Bat boxes will be positioned away from artificial light sources and placed between 3 and 6m off the ground, where feasible boxes will be orientated either facing east or west, this will ensure box temperatures are not too warm or too cold. As different bat species prefer different types of bat boxes, a variety of suitable bat box types will be provided. It should be noted that Lesser Horseshoe Bats cannot use bat boxes.

Bat boxes recommended for the bat species recorded during surveys include: the '2FN Schwegler Bat Box', and the '1FF Schwegler Bat Box with Built-in Wooden Rear Panel' or of equivalent specification³⁷. These bat box will also require minimal upkeep and don't need to be inspected annually. However, inspection must be incorporated into the site management plan.

Bat boxes will be erected under the supervision of an experienced bat specialist. Suggested locations for these bat boxes can be seen in Figure 5-1. Seasonal inspection of bat boxes shall be undertaken (excluding mid-June to mid-August, the lactation period of females, where any disturbance at this time can be detrimental to survival of young) to monitor bat usage and in wintertime for general wear and tear and to remove droppings following use the previous summer. This shall be undertaken by a licensed bat-handler. If boxes are found to be inactive, they should be relocated to another location as suggested in Figure 5-1.

³⁶ Bat Conservation Trust (2018), *Bats and artificial lighting in the UK Bats and the Built Environment series*. Available at: <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>

³⁷ <https://www.nhbs.com/search?q=bat+box>

5.1.3 Birds

Where the trees within the woodland are to be removed, these works will be timed to avoid the breeding birds nesting season, 1st of March to 31st of August. This measure will be implemented primarily to avoid impacts on nesting birds which are protected under the Irish Wildlife Acts. Where the construction programme does not allow this time restriction to be observed, then these areas will be inspected by a qualified Ecologist for the presence of breeding birds prior to commencement of construction works.

A minimum of 4 no. bird boxes for passerines will be installed along the periphery of the site. High quality, long lasting boxes which require minimum maintenance are required such as 1B Schwegler Nest Box³⁸ must be used.

2 no. swift boxes, No. 17A Schwegler Swift Nest Box (Triple Cavity) or alternative high-quality swift boxes should be incorporated into the buildings of the proposed development to encourage swifts into the area (as they are declining). Suggested locations are included within Figure 5-1.

Annual cleaning of the boxes is required at the end of the breeding season, prior to the commencement of the next years breeding season. This requires incorporation into any site management scheme.

5.1.4 Other Fauna

Due to the potential for a lengthy time span to elapse between planning (if consented) and commencement of works, a pre-construction survey is recommended prior to the commencement of construction works. This is of particular importance with reference to protected faunal and bat species which may have developed dwellings or roosts within the proposed development site during the intervening period.

If any protected species or their resting places (e.g. bat roosts or badger setts etc.) are discovered during works, works within the area, work must be suspended and a qualified ecologist contacted immediately to liaise with the NPWS and assess potential requirements for derogation licenses to avoid contravention of legislation which protects such species and their dwellings.

³⁸ Bird Box: <https://www.nhbs.com/search?q=bird+box&qview=158587>



Legend

- Location of Swift Nest Boxes
- Location of Bat and Bird Boxes

0 5 10 20 30
Meters

NOTES

- FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
- ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
- ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
- ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

D01	Aug '19	Draft Issue	J.S.	A.B.
Issue	Date	Description	By	Chkd.

Client:

Comhairle Chontae na Gaillimhe
Galway County Council

Project:

Gort Uí Lochlainn & Coill Bruachláin,
Moycullen, Co. Galway
- 30 Housing units

Title:

Suggested locations for bird
and bat boxes

Scale @ A3: 1:800

Prepared by: J. Sherry
Checked: A. Booth
Date: August 2019

Project Director: S. Tinnelly

Tobin
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Consulting, Civil and Structural Engineers,
Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
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Drawing No: Figure 5-1

Draft: D01

Source: Esri,

5.2 Conclusion

Ecological desk and field studies were undertaken for the proposed Maigh Cuilinn Housing Development. Key ecological receptors identified with reference to the proposed development site include the protected sites of Lough Corrib SAC and Ross Lake and Woods SAC, the existing woodland on site, and protected faunal species including bats and birds. Mitigation measures for key ecological receptors are recommended and, once implemented, potential impacts overall are considered to be of low to moderate magnitude in the short to permanent term and therefore not considered significant. The exception however is the removal of woodland from the site to allow for the development. From a local context, due to the presence of large areas of woodland surrounding the site the impact of the removal of woodland from within the site will result in a permanent high-level impact.

Appendix 1 – Outdoor Lighting Report

DATE: 9 October 2019
DESIGNER: Dan Staunton
PROJECT No: 19-09-17-01C
PROJECT NAME: Moycullen, Co. Galway



Residential Development,
Moycullen, Co. Galway
EN13201:2015 / BS5489-1:2013
Class P4
S/P Ratio 1.2

Outdoor Lighting Report

Based On:
Lumen Output at 100,000 hours
Spot Lamp Replacement
Normal Environment
6 Year Cleaning Cycle
Ground is Level

PREPARED BY: Dan Staunton
Veelite Lighting Ltd
Waterford, Ireland
+353 (0)51 875399
design@light.ie
www.light.ie

Layout Report

General Data

Dimensions in Metres Angles in Degrees

Calculation Grids

ID	Grid Name	X	Y	X' Length	Y' Length	X' Spacing	Y' Spacing
1	Road	-0.28	5.56	180.75	271.82	1.49	1.49
2	Light Spill	4.72	10.56	180.75	271.82	1.49	1.49

Luminaires

Luminaire A Data

Supplier	
Type	Veelite Metro Streetlight 28w LED Street Optic R02
Lamp(s)	12LED 3000K
Lamp Flux (klm)	2.81
File Name	5MTA10LGA-R02.ies
Maintenance Factor	0.76
Lum. Int. Class	G3
Lamp S/P Ratio	1.20
No. in Project	9

Luminaire B Data

Supplier	
Type	Veelite Metro Streetlight 28w LED Forward Throw Optic
Lamp(s)	12LED 3000K
Lamp Flux (klm)	2.76
File Name	5MTA10LGA-FT.ies
Maintenance Factor	0.76
Lum. Int. Class	G1
Lamp S/P Ratio	1.20
No. in Project	4

Luminaire C Data

Supplier	
Type	Veelite Metro Streetlight 28w LED Forward Throw Optic
Lamp(s)	12LED 2200K
Lamp Flux (klm)	1.80
File Name	5MTA10LGA-FT.ies
Maintenance Factor	0.76
Lum. Int. Class	G1
Lamp S/P Ratio	1.20
No. in Project	1

Layout

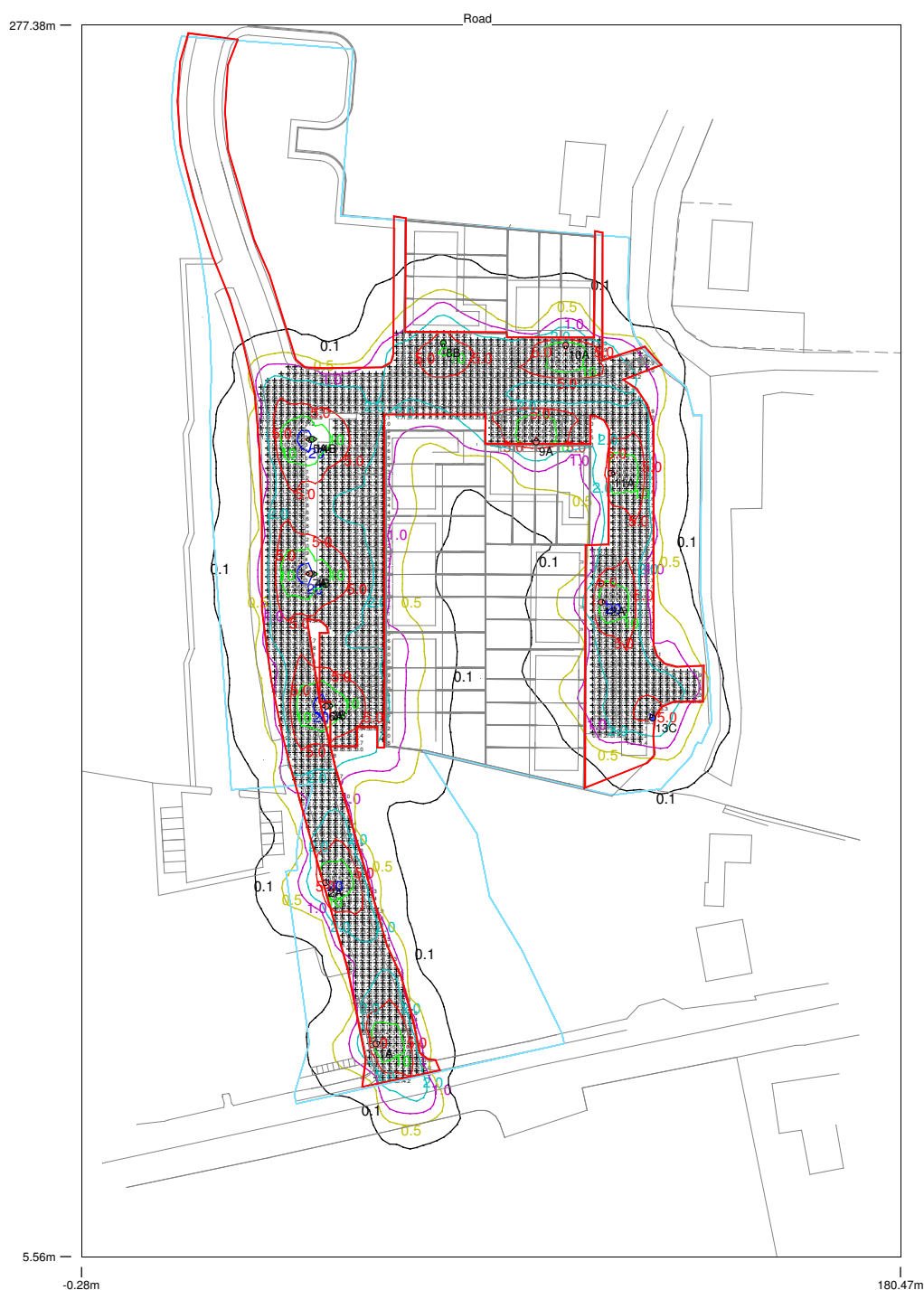
ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
1	A	64.68	52.58	6.00	16.00	0.00	0.00	0.50			
2	A	53.52	88.11	6.00	17.00	0.00	0.00	0.50			
3	B	54.29	127.11	6.00	0.00	0.00	0.00	0.50			
4	B	50.74	156.27	6.00	358.00	0.00	0.00	0.50			
5	A	50.17	185.94	6.00	189.00	0.00	0.00	0.50			
6	A	53.67	127.08	6.00	180.00	0.00	0.00	0.50			
7	A	50.12	156.29	6.00	180.00	0.00	0.00	0.50			
8	B	79.53	207.18	6.00	273.00	0.00	0.00	0.50			
9	A	100.04	185.38	6.00	90.00	0.00	0.00	0.50			

Layout Continued

ID	Type	X	Y	Height	Angle	Tilt	Cant	Out-reach	Target X	Target Y	Target Z
10	A	106.56	206.75	6.00	268.00	0.00	0.00	0.50			
11	A	116.53	178.50	6.00	0.00	0.00	0.00	0.50			
12	A	114.42	150.04	6.00	0.00	0.00	0.00	0.50			
13	C	125.67	124.46	6.00	120.00	0.00	0.00	0.50			
14	B	50.70	186.01	6.00	3.00	0.00	0.00	0.50			

Horizontal Illuminance (lux)

Road

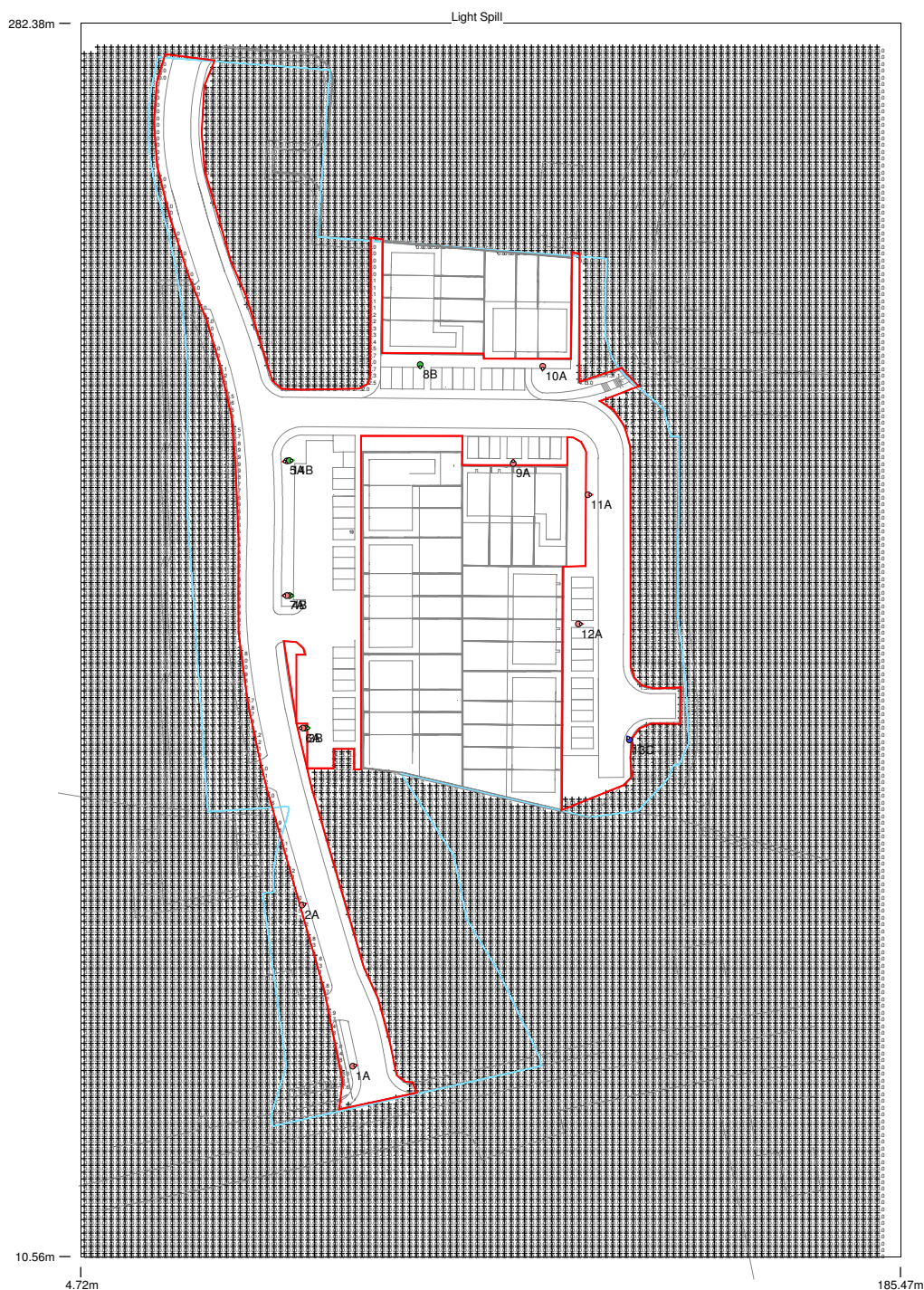


Results

Eav	4.69
Emin	0.83
Emax	24.72
Emin/Emax	0.03
Emin/Eav	0.18

Horizontal Illuminance (lux)

Light Spill



Results

Eav	0.07
Emin	0.00
Emax	4.83
Emin/Emax	0.00
Emin/Eav	0.00

Horizontal Illuminance (lux)

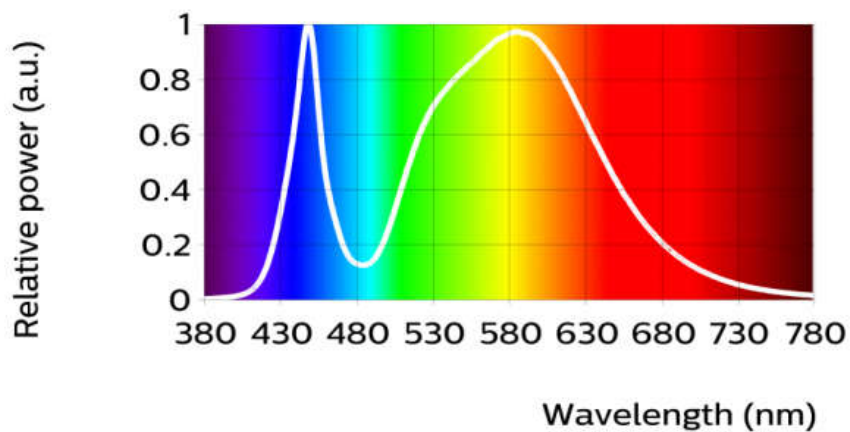
Light Spill



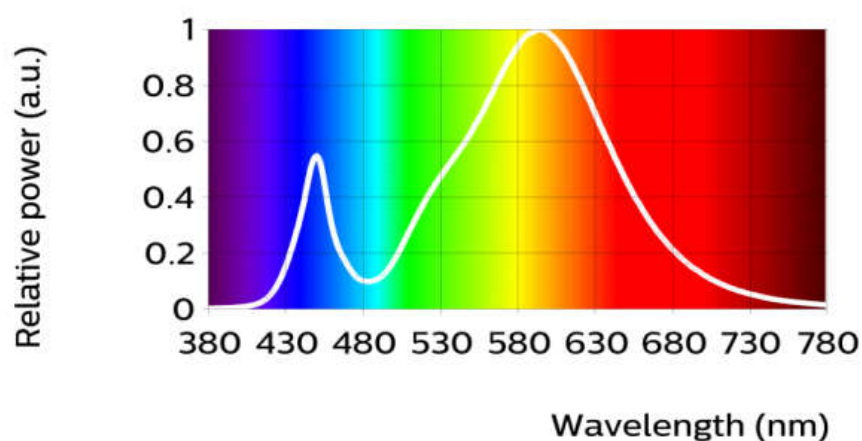
Results

Eav	0.07
Emin	0.00
Emax	4.83
Emin/Emax	0.00
Emin/Eav	0.00

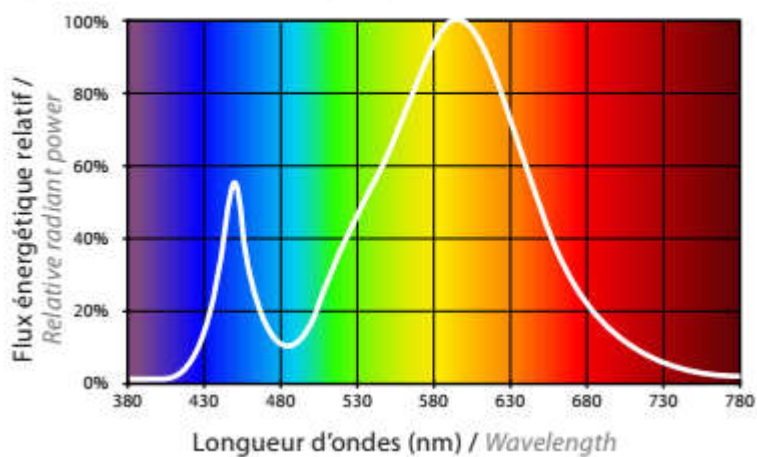
4000K - RELATIVE FLUX – 100%



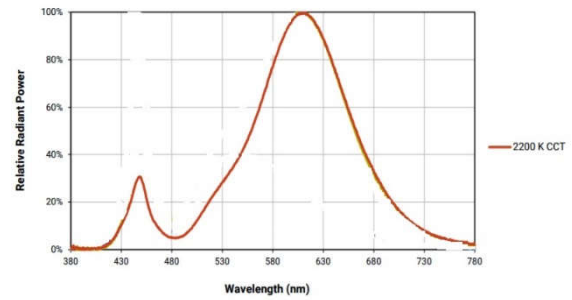
3000K - RELATIVE FLUX – 93%



2700K - RELATIVE FLUX – 80%

Spectre lumineux / Light spectrum

2200K - RELATIVE FLUX – 60%



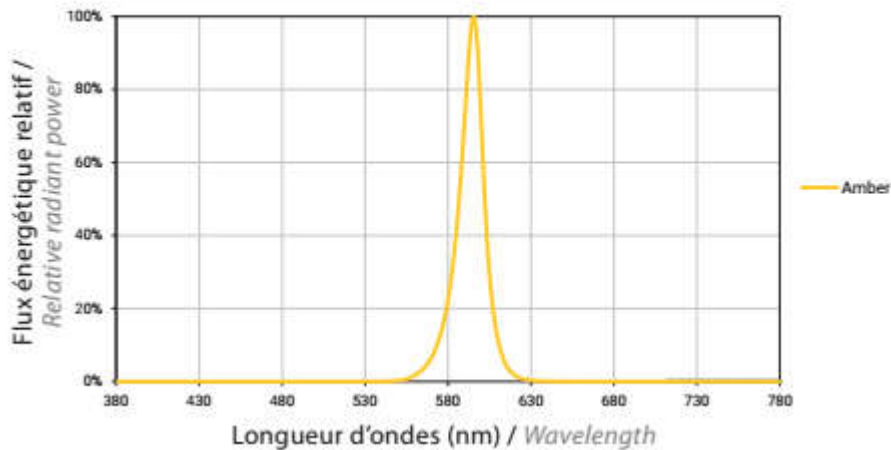
3000K

2200K (Similar to HPS)



AMBER (Approx 1700K)- RELATIVE FLUX – 69%

Spectre lumineux / Light spectrum



FROM ILP GUIDANCE NOTE 8

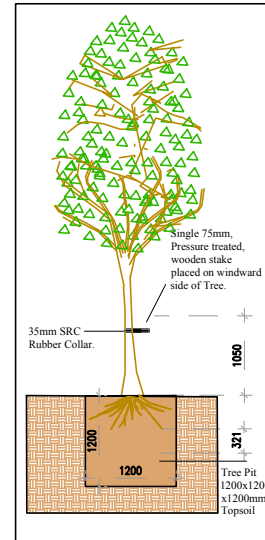
(BATS AND ARTIFICIAL LIGHTING)

- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light component.
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).
- Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill. (See figure overleaf.)

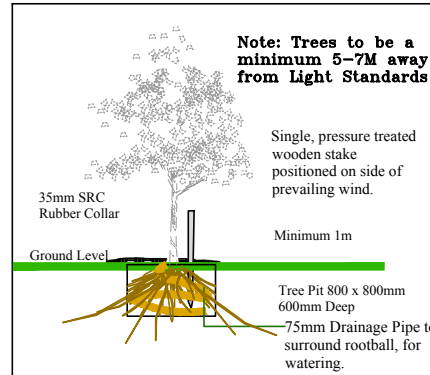
Appendix 2 – Landscape plan



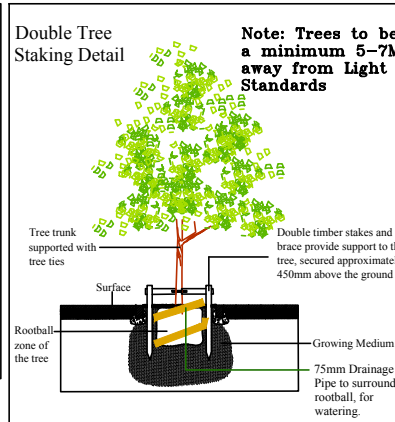
Tree Pit Detail



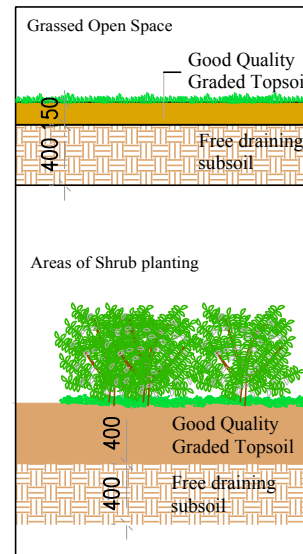
Tree Staking Detail



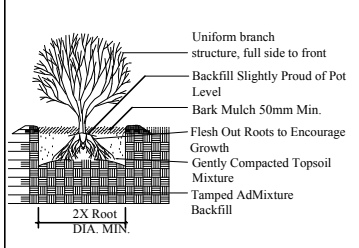
Trees In Excess of 12-14cm



Minimum soil depths



Shrub Planting Detail



Proposed Trees

Name	Size
Birch (silver) (Betula pendula)	14-16cm
Oak (Quercus robur)	16-18cm
Scots Pine (Pinus sylvestris)	20-25cm
Holly (Ilex aquifolium)	200cm
Mountain ash (Sorbus aucuparia)	400cm
Cherry (Prunus avium)	250cm
Yew (Taxus baccata)	300cm

Legend:



GENERAL LANDSCAPE NOTES:

It is strongly recommended that all plant suggestions made on this drawing are assessed at detail planting design stage to ensure satisfactory location and combinations of plants in the completed scheme.

Trees would range in size from Standards of 10-12cm girth to Extra Heavy Standards of 14-16cm girth

Shrubs would range in size from 300-900mm in height from the ground and be planted at between 2 and 4 no. per metre squared

All standard and semi-mature trees to be protected with spiral tree guards selected as appropriate to tree size. All standard and semi-mature trees to be staked

All existing hedgerows and trees are to be retained, managed and maintained as an existing planting matrix for the proposed development

Positions of trees in open spaces to be agreed at later stage

All positions of planting/lawn areas to be interchangeable

All areas for bin storage are subject to agreement.

All plants shall be of high quality stock & checked by the Landscape Architect before & after planting.

Trees/shrubs to be purchased from suitable nursery and to be planted in accordance with nursery specifications.

The contractor, on a seasonal basis, shall check plants for two years after planting. Any trees or shrubs that die due to natural causes shall be replaced. (This does not include vandalism or theft).

NOTE:

- All trees to be 5 - 7m from light standards.
- Trees selected for grass margins to road to be shallow rooting Birch - to avoid services and ducts.
- Trees selected for grass margins to road not to impede visual line of cars and pedestrians.

NOTE:

Dense underplanting to consist of the following extensive dense native planting groups - providing necessary all year round screening, colour and interest, while maintaining and enhancing the existing natural habitat of the area.

Suggested Palette of Ground Cover :
To be native to the area



Comhairle Chontae na Gaillimhe
Galway County Council

VINCENT HANNON ARCHITECTS CHARTERED ARCHITECTS, SURVEYORS & PROJECT MANAGERS ABBEY STREET, SLIGO. T: 01 91 510022 UNIT 2A, DEERPARK BUSINESS CENTRE, ORANMORE, GALWAY. T: 01 48 9534 e-mail: info@vha.ie website: www.vha.ie			
Rev	Description	By	Date
1	Client / job description: SITE AT MOYCULLEN, CO. GALWAY FOR GALWAY COUNTY COUNCIL	drawn by:	SB
2	drawing title: LANDSCAPING PLAN	checked by:	BF
scale: 1:500 @ A1	date: 15/10/2019	drawing no:	180901-03-102
rev:	project stage: SKETCH DESIGN		

Appendix 3 - Bat Data

Table 1 - Scrub adjacent to road L1320

Date	Time	Bat Species
13/08/2019	21:48	Soprano Pipistrelle
13/08/2019	22:08	Soprano Pipistrelle
13/08/2019	22:43	Soprano Pipistrelle
13/08/2019	22:48	Leisler's Bat
13/08/2019	22:57	Soprano Pipistrelle
13/08/2019	22:59	Soprano Pipistrelle
13/08/2019	23:00	Soprano Pipistrelle
13/08/2019	23:04	Soprano Pipistrelle
13/08/2019	23:08	Soprano Pipistrelle
13/08/2019	23:10	Soprano Pipistrelle
13/08/2019	23:11	Leisler's Bat
13/08/2019	23:11	Leisler's Bat
13/08/2019	23:13	Leisler's Bat
13/08/2019	23:19	Soprano Pipistrelle
13/08/2019	23:22	Leisler's Bat
13/08/2019	23:22	Leisler's Bat
13/08/2019	23:23	Leisler's Bat
13/08/2019	23:23	Leisler's Bat
13/08/2019	23:24	Leisler's Bat
13/08/2019	23:25	Leisler's Bat
13/08/2019	23:25	Soprano Pipistrelle
13/08/2019	23:34	Soprano Pipistrelle
13/08/2019	23:35	Soprano Pipistrelle
13/08/2019	23:36	Soprano Pipistrelle
13/08/2019	23:41	Soprano Pipistrelle
13/08/2019	23:42	Soprano Pipistrelle
13/08/2019	23:42	Soprano Pipistrelle
13/08/2019	23:43	Leisler's Bat
13/08/2019	23:43	Leisler's Bat
13/08/2019	23:43	Leisler's Bat
13/08/2019	23:45	Leisler's Bat
13/08/2019	23:46	Soprano Pipistrelle
13/08/2019	23:47	Leisler's Bat
13/08/2019	23:47	Leisler's Bat
13/08/2019	23:52	Leisler's Bat
13/08/2019	23:54	Leisler's Bat
13/08/2019	23:55	Soprano Pipistrelle
13/08/2019	23:56	Leisler's Bat
13/08/2019	23:56	Leisler's Bat
13/08/2019	23:56	Soprano Pipistrelle
13/08/2019	23:58	Leisler's Bat
14/08/2019	00:00	Leisler's Bat
14/08/2019	00:08	Leisler's Bat
14/08/2019	00:08	Leisler's Bat

Date	Time	Bat Species
14/08/2019	00:08	Leisler's Bat
14/08/2019	00:08	Soprano Pipistrelle
14/08/2019	00:09	Soprano Pipistrelle
14/08/2019	00:15	Soprano Pipistrelle
14/08/2019	00:16	Soprano Pipistrelle
14/08/2019	00:18	Soprano Pipistrelle
14/08/2019	00:19	Leisler's Bat
14/08/2019	00:20	Leisler's Bat
14/08/2019	00:20	Leisler's Bat
14/08/2019	00:20	Leisler's Bat
14/08/2019	00:21	Leisler's Bat
14/08/2019	00:21	Leisler's Bat
14/08/2019	00:21	Leisler's Bat
14/08/2019	00:21	Leisler's Bat
14/08/2019	00:24	Soprano Pipistrelle
14/08/2019	00:24	Leisler's Bat
14/08/2019	00:35	Soprano Pipistrelle
14/08/2019	00:39	Soprano Pipistrelle
14/08/2019	00:42	Soprano Pipistrelle
14/08/2019	00:46	Soprano Pipistrelle
14/08/2019	01:00	Soprano Pipistrelle
14/08/2019	01:01	Soprano Pipistrelle
14/08/2019	01:03	Soprano Pipistrelle
14/08/2019	01:04	Soprano Pipistrelle
14/08/2019	01:08	Leisler's Bat
14/08/2019	01:08	Leisler's Bat
14/08/2019	01:08	Leisler's Bat
14/08/2019	01:17	Leisler's Bat
14/08/2019	01:17	Leisler's Bat
14/08/2019	01:17	Leisler's Bat
14/08/2019	01:17	Leisler's Bat
14/08/2019	01:17	Leisler's Bat
14/08/2019	01:20	Leisler's Bat
14/08/2019	01:30	Soprano Pipistrelle
14/08/2019	02:04	Soprano Pipistrelle
14/08/2019	02:04	Soprano Pipistrelle
14/08/2019	02:10	Soprano Pipistrelle
14/08/2019	02:29	Soprano Pipistrelle
14/08/2019	02:30	Soprano Pipistrelle
14/08/2019	02:40	Soprano Pipistrelle
14/08/2019	02:42	Soprano Pipistrelle
14/08/2019	03:05	Soprano Pipistrelle
14/08/2019	03:10	Leisler's Bat
14/08/2019	03:10	Leisler's Bat
14/08/2019	03:10	Leisler's Bat
14/08/2019	03:12	Leisler's Bat
14/08/2019	03:12	Leisler's Bat

Date	Time	Bat Species
14/08/2019	03:14	Leisler's Bat
14/08/2019	03:14	Leisler's Bat
14/08/2019	03:18	Leisler's Bat
14/08/2019	03:27	Soprano Pipistrelle
14/08/2019	03:36	Leisler's Bat
14/08/2019	03:37	Leisler's Bat
14/08/2019	04:14	Soprano Pipistrelle
14/08/2019	04:15	Leisler's Bat
14/08/2019	04:15	Leisler's Bat
14/08/2019	04:15	Leisler's Bat
14/08/2019	04:15	Leisler's Bat
14/08/2019	05:12	Leisler's Bat
14/08/2019	05:12	Leisler's Bat
14/08/2019	05:17	Leisler's Bat
14/08/2019	05:17	Leisler's Bat
14/08/2019	05:17	Leisler's Bat
14/08/2019	22:44	Leisler's Bat
14/08/2019	23:11	Soprano Pipistrelle
14/08/2019	23:50	Soprano Pipistrelle
15/08/2019	00:04	Soprano Pipistrelle
15/08/2019	00:08	Soprano Pipistrelle
15/08/2019	00:16	Soprano Pipistrelle
15/08/2019	00:22	Soprano Pipistrelle
15/08/2019	00:44	Soprano Pipistrelle
15/08/2019	00:59	Soprano Pipistrelle
15/08/2019	01:02	Soprano Pipistrelle
15/08/2019	01:48	Soprano Pipistrelle
15/08/2019	01:48	Soprano Pipistrelle
15/08/2019	02:28	Soprano Pipistrelle
15/08/2019	02:38	Soprano Pipistrelle
15/08/2019	02:59	Soprano Pipistrelle
15/08/2019	03:02	Common Pipistrelle
15/08/2019	03:11	Soprano Pipistrelle
15/08/2019	03:15	Soprano Pipistrelle
15/08/2019	04:19	Soprano Pipistrelle
15/08/2019	04:59	Soprano Pipistrelle
15/08/2019	21:40	Soprano Pipistrelle
15/08/2019	21:40	Soprano Pipistrelle
15/08/2019	21:40	Soprano Pipistrelle
15/08/2019	21:40	Soprano Pipistrelle
15/08/2019	21:56	Soprano Pipistrelle
15/08/2019	22:52	Soprano Pipistrelle
15/08/2019	22:53	Leisler's Bat
15/08/2019	22:53	Leisler's Bat
15/08/2019	22:53	Leisler's Bat
15/08/2019	23:01	Soprano Pipistrelle

Date	Time	Bat Species
15/08/2019	23:04	Soprano Pipistrelle
15/08/2019	23:09	Soprano Pipistrelle
15/08/2019	23:10	Soprano Pipistrelle
15/08/2019	23:13	Soprano Pipistrelle
15/08/2019	23:15	Soprano Pipistrelle
15/08/2019	23:17	Soprano Pipistrelle
15/08/2019	23:17	Soprano Pipistrelle
15/08/2019	23:23	Soprano Pipistrelle
15/08/2019	23:28	Soprano Pipistrelle
15/08/2019	23:31	Soprano Pipistrelle
15/08/2019	23:37	Soprano Pipistrelle
15/08/2019	23:39	Soprano Pipistrelle
15/08/2019	23:46	Soprano Pipistrelle
15/08/2019	23:51	Soprano Pipistrelle
17/08/2019	00:01	Soprano Pipistrelle
17/08/2019	00:24	Soprano Pipistrelle
17/08/2019	00:34	Soprano Pipistrelle
17/08/2019	00:54	Soprano Pipistrelle
17/08/2019	01:45	Soprano Pipistrelle
17/08/2019	02:12	Soprano Pipistrelle
17/08/2019	03:03	Soprano Pipistrelle
17/08/2019	04:17	Soprano Pipistrelle
17/08/2019	04:46	Soprano Pipistrelle
17/08/2019	23:00	Soprano Pipistrelle
17/08/2019	23:59	Soprano Pipistrelle
18/08/2019	00:22	Soprano Pipistrelle
18/08/2019	01:04	Soprano Pipistrelle
18/08/2019	01:09	Soprano Pipistrelle
18/08/2019	01:17	Soprano Pipistrelle
18/08/2019	02:57	Soprano Pipistrelle
18/08/2019	03:42	Soprano Pipistrelle
18/08/2019	05:10	Soprano Pipistrelle
18/08/2019	05:11	Soprano Pipistrelle
18/08/2019	22:02	Soprano Pipistrelle
18/08/2019	22:40	Myotis Spp.
18/08/2019	22:42	Leisler's Bat
18/08/2019	22:46	Myotis Spp.
18/08/2019	22:46	Soprano Pipistrelle
18/08/2019	22:50	Leisler's Bat
18/08/2019	23:01	Soprano Pipistrelle
18/08/2019	23:01	Soprano Pipistrelle
18/08/2019	23:07	Soprano Pipistrelle
18/08/2019	23:12	Soprano Pipistrelle
18/08/2019	23:12	Soprano Pipistrelle
18/08/2019	23:13	Lesser Horseshoe Bat
18/08/2019	23:14	Common Pipistrelle

Date	Time	Bat Species
18/08/2019	23:14	Soprano Pipistrelle
18/08/2019	23:25	Soprano Pipistrelle
18/08/2019	23:38	Lesser Horseshoe Bat
18/08/2019	23:43	Soprano Pipistrelle
18/08/2019	23:43	Soprano Pipistrelle
18/08/2019	23:46	Soprano Pipistrelle
18/08/2019	23:49	Soprano Pipistrelle
19/08/2019	00:05	Soprano Pipistrelle
19/08/2019	00:08	Soprano Pipistrelle
19/08/2019	00:23	Soprano Pipistrelle
19/08/2019	00:31	Soprano Pipistrelle
19/08/2019	00:33	Soprano Pipistrelle
19/08/2019	00:36	Soprano Pipistrelle
19/08/2019	00:40	Soprano Pipistrelle
19/08/2019	00:40	Soprano Pipistrelle
19/08/2019	00:46	Soprano Pipistrelle
19/08/2019	00:48	Soprano Pipistrelle
19/08/2019	00:48	Soprano Pipistrelle
19/08/2019	00:59	Soprano Pipistrelle
19/08/2019	01:02	Leisler's Bat
19/08/2019	01:02	Leisler's Bat
19/08/2019	01:02	Leisler's Bat
19/08/2019	01:02	Leisler's Bat
19/08/2019	01:34	Soprano Pipistrelle
19/08/2019	01:58	Soprano Pipistrelle
19/08/2019	02:06	Soprano Pipistrelle
19/08/2019	03:04	Soprano Pipistrelle
19/08/2019	03:57	Leisler's Bat
19/08/2019	03:57	Leisler's Bat
19/08/2019	03:57	Leisler's Bat
19/08/2019	03:58	Leisler's Bat
19/08/2019	03:58	Leisler's Bat
19/08/2019	04:08	Soprano Pipistrelle
19/08/2019	05:23	Soprano Pipistrelle
19/08/2019	05:42	Soprano Pipistrelle

Table 2 – Static data for north of proposed site in adjacent woodland by stone wall

Date	Time	Bat Species
25/07/2019	21:55	Soprano Pipistrelle
25/07/2019	23:51	Soprano Pipistrelle
25/07/2019	23:51	Soprano Pipistrelle
25/07/2019	23:51	Soprano Pipistrelle
25/07/2019	23:53	Lesser Horseshoe Bat

Date	Time	Bat Species
26/07/2019	22:27	Myotis Spp.
26/07/2019	22:31	Myotis Spp.
26/07/2019	22:41	Myotis Spp.
26/07/2019	23:03	Myotis Spp.
26/07/2019	23:20	Myotis Spp.
26/07/2019	23:52	Myotis Spp.
26/07/2019	23:53	Myotis Spp.
26/07/2019	04:59	Soprano Pipistrelle
26/07/2019	05:32	Soprano Pipistrelle
26/07/2019	21:32	Soprano Pipistrelle
26/07/2019	21:34	Soprano Pipistrelle
26/07/2019	21:34	Soprano Pipistrelle
26/07/2019	21:34	Soprano Pipistrelle
26/07/2019	21:34	Soprano Pipistrelle
26/07/2019	21:34	Soprano Pipistrelle
26/07/2019	21:34	Soprano Pipistrelle
26/07/2019	21:35	Soprano Pipistrelle
26/07/2019	21:35	Soprano Pipistrelle
26/07/2019	21:35	Soprano Pipistrelle
26/07/2019	21:35	Soprano Pipistrelle
26/07/2019	21:35	Soprano Pipistrelle
26/07/2019	21:36	Soprano Pipistrelle
26/07/2019	21:36	Soprano Pipistrelle
26/07/2019	21:40	Soprano Pipistrelle
26/07/2019	21:40	Soprano Pipistrelle
26/07/2019	21:41	Soprano Pipistrelle
26/07/2019	21:44	Soprano Pipistrelle
26/07/2019	04:10	Lesser Horseshoe Bat
27/07/2019	01:29	Myotis Spp.
27/07/2019	00:01	Soprano Pipistrelle
27/07/2019	00:52	Soprano Pipistrelle
28/07/2019	00:20	Myotis Spp.
28/07/2019	23:31	Soprano Pipistrelle
28/07/2019	01:01	Lesser Horseshoe Bat
28/07/2019	04:34	Lesser Horseshoe Bat
29/07/2019	00:01	Soprano Pipistrelle
29/07/2019	21:34	Soprano Pipistrelle
29/07/2019	04:32	Lesser Horseshoe Bat
29/07/2019	04:33	Lesser Horseshoe Bat
29/07/2019	04:35	Lesser Horseshoe Bat
30/07/2019	03:18	Lesser Horseshoe Bat
30/07/2019	03:25	Lesser Horseshoe Bat
30/07/2019	03:27	Lesser Horseshoe Bat
30/07/2019	04:27	Lesser Horseshoe Bat

Table 3 - On-site - Southeast Boundary

Date	Time	Bat Species
04/07/2019	23:01	Myotis Spp.
04/07/2019	22:28	Soprano Pipistrelle
04/07/2019	22:28	Soprano Pipistrelle
04/07/2019	22:33	Soprano Pipistrelle
04/07/2019	22:37	Soprano Pipistrelle
04/07/2019	23:07	Soprano Pipistrelle
04/07/2019	23:15	Soprano Pipistrelle
04/07/2019	23:16	Soprano Pipistrelle
04/07/2019	23:30	Soprano Pipistrelle
04/07/2019	23:31	Soprano Pipistrelle
04/07/2019	23:31	Soprano Pipistrelle
05/07/2019	00:51	Myotis Spp.
05/07/2019	03:25	Myotis Spp.
05/07/2019	03:25	Myotis Spp.
05/07/2019	03:31	Myotis Spp.
05/07/2019	03:34	Myotis Spp.
05/07/2019	03:36	Myotis Spp.
05/07/2019	03:37	Myotis Spp.
05/07/2019	03:42	Myotis Spp.
05/07/2019	03:42	Myotis Spp.
05/07/2019	03:48	Myotis Spp.
05/07/2019	03:53	Myotis Spp.
05/07/2019	03:53	Myotis Spp.
05/07/2019	04:06	Myotis Spp.
05/07/2019	03:30	Natterer's Bat
05/07/2019	03:34	Natterer's Bat
05/07/2019	03:37	Natterer's Bat
05/07/2019	03:53	Natterer's Bat
05/07/2019	00:26	Soprano Pipistrelle
05/07/2019	00:46	Soprano Pipistrelle
05/07/2019	00:46	Soprano Pipistrelle
05/07/2019	00:53	Soprano Pipistrelle
05/07/2019	00:54	Soprano Pipistrelle
05/07/2019	00:54	Soprano Pipistrelle
05/07/2019	01:14	Soprano Pipistrelle
05/07/2019	01:14	Soprano Pipistrelle
05/07/2019	01:19	Soprano Pipistrelle
05/07/2019	01:19	Soprano Pipistrelle
05/07/2019	01:19	Soprano Pipistrelle
05/07/2019	01:25	Soprano Pipistrelle
05/07/2019	01:26	Soprano Pipistrelle
05/07/2019	01:26	Soprano Pipistrelle
05/07/2019	01:26	Soprano Pipistrelle

Date	Time	Bat Species
05/07/2019	01:31	Soprano Pipistrelle
05/07/2019	01:32	Soprano Pipistrelle
05/07/2019	01:32	Soprano Pipistrelle
05/07/2019	01:40	Soprano Pipistrelle
05/07/2019	01:52	Soprano Pipistrelle
05/07/2019	01:56	Soprano Pipistrelle
05/07/2019	02:04	Soprano Pipistrelle
05/07/2019	02:16	Soprano Pipistrelle
05/07/2019	02:16	Soprano Pipistrelle
05/07/2019	02:17	Soprano Pipistrelle
05/07/2019	02:22	Soprano Pipistrelle
05/07/2019	02:22	Soprano Pipistrelle
05/07/2019	02:23	Soprano Pipistrelle
05/07/2019	02:23	Soprano Pipistrelle
05/07/2019	02:24	Soprano Pipistrelle
05/07/2019	02:25	Soprano Pipistrelle
05/07/2019	02:44	Soprano Pipistrelle
05/07/2019	03:48	Soprano Pipistrelle
05/07/2019	04:34	Soprano Pipistrelle
05/07/2019	04:39	Soprano Pipistrelle

Table 4 - On-site central static

Date	Time	Bat Species
08/08/2019	22:49	Myotis Spp.
08/08/2019	21:48	Soprano Pipistrelle
08/08/2019	21:54	Soprano Pipistrelle
08/08/2019	21:54	Soprano Pipistrelle
08/08/2019	22:17	Soprano Pipistrelle
09/08/2019	04:32	Leisler's Bat
09/08/2019	04:32	Leisler's Bat
09/08/2019	22:20	Leisler's Bat
09/08/2019	22:20	Leisler's Bat
09/08/2019	22:21	Leisler's Bat
09/08/2019	03:18	Soprano Pipistrelle
09/08/2019	03:22	Soprano Pipistrelle
09/08/2019	05:38	Soprano Pipistrelle
09/08/2019	05:39	Soprano Pipistrelle
09/08/2019	05:44	Soprano Pipistrelle
09/08/2019	05:49	Soprano Pipistrelle
09/08/2019	05:49	Soprano Pipistrelle
09/08/2019	05:50	Soprano Pipistrelle
09/08/2019	21:32	Soprano Pipistrelle
09/08/2019	23:09	Soprano Pipistrelle

Date	Time	Bat Species
09/08/2019	23:44	Soprano Pipistrelle
10/08/2019	22:53	Leisler's Bat
10/08/2019	22:53	Leisler's Bat
10/08/2019	00:06	Soprano Pipistrelle
10/08/2019	00:52	Soprano Pipistrelle
10/08/2019	01:25	Soprano Pipistrelle
10/08/2019	01:33	Soprano Pipistrelle
10/08/2019	01:49	Soprano Pipistrelle
10/08/2019	01:50	Soprano Pipistrelle
10/08/2019	03:56	Soprano Pipistrelle
10/08/2019	05:47	Soprano Pipistrelle
10/08/2019	05:48	Soprano Pipistrelle
10/08/2019	05:52	Soprano Pipistrelle
10/08/2019	05:52	Soprano Pipistrelle
10/08/2019	05:53	Soprano Pipistrelle
10/08/2019	05:53	Soprano Pipistrelle
10/08/2019	05:55	Soprano Pipistrelle
10/08/2019	05:59	Soprano Pipistrelle
10/08/2019	21:23	Soprano Pipistrelle
10/08/2019	21:31	Soprano Pipistrelle
10/08/2019	22:59	Soprano Pipistrelle
10/08/2019	23:11	Soprano Pipistrelle
11/08/2019	01:19	Leisler's Bat
11/08/2019	00:01	Soprano Pipistrelle
11/08/2019	00:06	Soprano Pipistrelle
11/08/2019	00:17	Soprano Pipistrelle
11/08/2019	00:28	Soprano Pipistrelle
11/08/2019	00:29	Soprano Pipistrelle
11/08/2019	01:25	Soprano Pipistrelle
11/08/2019	01:30	Soprano Pipistrelle
11/08/2019	01:30	Soprano Pipistrelle
11/08/2019	01:43	Soprano Pipistrelle
11/08/2019	01:54	Soprano Pipistrelle
11/08/2019	02:04	Soprano Pipistrelle
11/08/2019	02:29	Soprano Pipistrelle
11/08/2019	02:49	Soprano Pipistrelle
11/08/2019	04:14	Soprano Pipistrelle
11/08/2019	06:06	Soprano Pipistrelle
11/08/2019	06:07	Soprano Pipistrelle
11/08/2019	21:22	Soprano Pipistrelle
12/08/2019	00:17	Leisler's Bat
12/08/2019	03:53	Leisler's Bat
12/08/2019	22:51	Leisler's Bat
12/08/2019	00:05	Soprano Pipistrelle
12/08/2019	01:38	Soprano Pipistrelle
12/08/2019	02:59	Soprano Pipistrelle

Date	Time	Bat Species
12/08/2019	23:22	Soprano Pipistrelle
13/08/2019	01:17	Myotis Spp.
13/08/2019	01:37	Leisler's Bat
13/08/2019	00:47	Soprano Pipistrelle
13/08/2019	01:24	Soprano Pipistrelle
13/08/2019	01:38	Soprano Pipistrelle
13/08/2019	04:06	Soprano Pipistrelle

Table 5- On-site southern mature sycamore treeline

Date	Time	Bat Species
25/07/2019	22:02	Soprano Pipistrelle
25/07/2019	22:03	Soprano Pipistrelle
25/07/2019	22:03	Soprano Pipistrelle
25/07/2019	22:03	Soprano Pipistrelle
25/07/2019	22:03	Soprano Pipistrelle
25/07/2019	22:03	Soprano Pipistrelle
25/07/2019	22:03	Soprano Pipistrelle
25/07/2019	22:03	Soprano Pipistrelle
25/07/2019	22:05	Soprano Pipistrelle
25/07/2019	22:05	Soprano Pipistrelle
25/07/2019	22:05	Soprano Pipistrelle
25/07/2019	22:05	Soprano Pipistrelle
25/07/2019	22:07	Soprano Pipistrelle
25/07/2019	22:07	Soprano Pipistrelle
25/07/2019	22:08	Soprano Pipistrelle
25/07/2019	22:08	Soprano Pipistrelle
25/07/2019	22:09	Soprano Pipistrelle
25/07/2019	22:09	Soprano Pipistrelle
25/07/2019	22:10	Soprano Pipistrelle
25/07/2019	22:10	Soprano Pipistrelle
25/07/2019	22:10	Soprano Pipistrelle
25/07/2019	22:11	Soprano Pipistrelle
25/07/2019	22:11	Soprano Pipistrelle
25/07/2019	22:11	Soprano Pipistrelle
25/07/2019	22:11	Soprano Pipistrelle
25/07/2019	22:11	Soprano Pipistrelle
25/07/2019	22:11	Soprano Pipistrelle
25/07/2019	22:13	Soprano Pipistrelle
25/07/2019	22:13	Soprano Pipistrelle
25/07/2019	22:13	Soprano Pipistrelle
25/07/2019	22:14	Soprano Pipistrelle
25/07/2019	22:14	Soprano Pipistrelle
25/07/2019	22:14	Soprano Pipistrelle
25/07/2019	22:14	Soprano Pipistrelle
25/07/2019	22:20	Soprano Pipistrelle

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Date	Time	Bat Species
25/07/2019	23:36	Soprano Pipistrelle
25/07/2019	23:36	Soprano Pipistrelle
25/07/2019	23:38	Soprano Pipistrelle
25/07/2019	23:38	Soprano Pipistrelle
25/07/2019	23:38	Soprano Pipistrelle
25/07/2019	23:38	Soprano Pipistrelle
25/07/2019	23:39	Soprano Pipistrelle
25/07/2019	23:39	Soprano Pipistrelle
25/07/2019	23:39	Soprano Pipistrelle
25/07/2019	23:39	Soprano Pipistrelle
25/07/2019	23:39	Soprano Pipistrelle
25/07/2019	23:39	Soprano Pipistrelle
25/07/2019	23:40	Soprano Pipistrelle
25/07/2019	23:40	Soprano Pipistrelle
25/07/2019	23:40	Soprano Pipistrelle
25/07/2019	23:40	Soprano Pipistrelle
25/07/2019	23:41	Soprano Pipistrelle
25/07/2019	23:42	Soprano Pipistrelle
25/07/2019	23:42	Soprano Pipistrelle
25/07/2019	23:42	Soprano Pipistrelle
25/07/2019	23:42	Soprano Pipistrelle
25/07/2019	23:43	Soprano Pipistrelle
25/07/2019	23:43	Soprano Pipistrelle
25/07/2019	23:43	Soprano Pipistrelle
25/07/2019	23:43	Soprano Pipistrelle
25/07/2019	23:44	Soprano Pipistrelle
25/07/2019	23:44	Soprano Pipistrelle
25/07/2019	23:44	Soprano Pipistrelle
25/07/2019	23:45	Soprano Pipistrelle
25/07/2019	23:45	Soprano Pipistrelle
25/07/2019	23:46	Soprano Pipistrelle
25/07/2019	23:46	Soprano Pipistrelle
25/07/2019	23:46	Soprano Pipistrelle
25/07/2019	23:47	Soprano Pipistrelle
26/07/2019	00:23	Myotis Spp.
26/07/2019	01:18	Myotis Spp.
26/07/2019	01:21	Myotis Spp.
26/07/2019	01:32	Myotis Spp.
26/07/2019	01:50	Myotis Spp.
26/07/2019	01:50	Myotis Spp.
26/07/2019	02:19	Myotis Spp.
26/07/2019	02:21	Myotis Spp.
26/07/2019	02:36	Myotis Spp.
26/07/2019	02:37	Myotis Spp.
26/07/2019	02:39	Myotis Spp.
26/07/2019	02:52	Myotis Spp.

Date	Time	Bat Species
26/07/2019	02:58	Myotis Spp.
26/07/2019	03:00	Myotis Spp.
26/07/2019	03:24	Myotis Spp.
26/07/2019	04:31	Myotis Spp.
26/07/2019	04:31	Myotis Spp.
26/07/2019	04:32	Myotis Spp.
26/07/2019	04:32	Myotis Spp.
26/07/2019	04:35	Myotis Spp.
26/07/2019	04:40	Myotis Spp.
26/07/2019	04:45	Myotis Spp.
26/07/2019	04:45	Myotis Spp.
26/07/2019	04:45	Myotis Spp.
26/07/2019	04:47	Myotis Spp.
26/07/2019	04:48	Myotis Spp.
26/07/2019	04:50	Myotis Spp.
26/07/2019	04:50	Myotis Spp.
26/07/2019	04:51	Myotis Spp.
26/07/2019	05:07	Myotis Spp.
26/07/2019	22:34	Myotis Spp.
26/07/2019	22:35	Myotis Spp.
26/07/2019	22:35	Myotis Spp.
26/07/2019	23:03	Myotis Spp.
26/07/2019	23:03	Myotis Spp.
26/07/2019	23:04	Myotis Spp.
26/07/2019	23:20	Myotis Spp.
26/07/2019	23:20	Myotis Spp.
26/07/2019	23:21	Myotis Spp.
26/07/2019	23:26	Myotis Spp.
26/07/2019	23:27	Myotis Spp.
26/07/2019	23:27	Myotis Spp.
26/07/2019	23:41	Myotis Spp.
26/07/2019	23:41	Myotis Spp.
26/07/2019	23:41	Myotis Spp.
26/07/2019	23:41	Myotis Spp.
26/07/2019	23:45	Myotis Spp.
26/07/2019	23:52	Myotis Spp.
26/07/2019	23:03	Natterer's Bat
26/07/2019	00:00	Soprano Pipistrelle
26/07/2019	00:00	Soprano Pipistrelle
26/07/2019	00:01	Soprano Pipistrelle
26/07/2019	00:01	Soprano Pipistrelle
26/07/2019	00:01	Soprano Pipistrelle
26/07/2019	00:01	Soprano Pipistrelle
26/07/2019	00:01	Soprano Pipistrelle
26/07/2019	00:02	Soprano Pipistrelle
26/07/2019	00:02	Soprano Pipistrelle

Date	Time	Bat Species
26/07/2019	00:02	Soprano Pipistrelle
26/07/2019	00:02	Soprano Pipistrelle
26/07/2019	00:02	Soprano Pipistrelle
26/07/2019	00:02	Soprano Pipistrelle
26/07/2019	00:02	Soprano Pipistrelle
26/07/2019	00:03	Soprano Pipistrelle
26/07/2019	00:03	Soprano Pipistrelle
26/07/2019	00:04	Soprano Pipistrelle
26/07/2019	00:04	Soprano Pipistrelle
26/07/2019	00:05	Soprano Pipistrelle
26/07/2019	00:05	Soprano Pipistrelle
26/07/2019	00:07	Soprano Pipistrelle
26/07/2019	00:07	Soprano Pipistrelle
26/07/2019	00:09	Soprano Pipistrelle
26/07/2019	00:10	Soprano Pipistrelle
26/07/2019	00:10	Soprano Pipistrelle
26/07/2019	00:10	Soprano Pipistrelle
26/07/2019	00:10	Soprano Pipistrelle
26/07/2019	00:10	Soprano Pipistrelle
26/07/2019	00:11	Soprano Pipistrelle
26/07/2019	00:12	Soprano Pipistrelle
26/07/2019	00:16	Soprano Pipistrelle
26/07/2019	00:16	Soprano Pipistrelle
26/07/2019	00:17	Soprano Pipistrelle
26/07/2019	00:17	Soprano Pipistrelle
26/07/2019	00:18	Soprano Pipistrelle
26/07/2019	00:48	Soprano Pipistrelle
26/07/2019	00:48	Soprano Pipistrelle
26/07/2019	00:48	Soprano Pipistrelle
26/07/2019	00:56	Soprano Pipistrelle
26/07/2019	00:56	Soprano Pipistrelle
26/07/2019	01:00	Soprano Pipistrelle
26/07/2019	01:14	Soprano Pipistrelle
26/07/2019	01:34	Soprano Pipistrelle
26/07/2019	01:35	Soprano Pipistrelle
26/07/2019	01:39	Soprano Pipistrelle
26/07/2019	01:39	Soprano Pipistrelle
26/07/2019	01:49	Soprano Pipistrelle
26/07/2019	01:49	Soprano Pipistrelle
26/07/2019	02:19	Soprano Pipistrelle
26/07/2019	02:19	Soprano Pipistrelle
26/07/2019	02:23	Soprano Pipistrelle
26/07/2019	02:27	Soprano Pipistrelle
26/07/2019	02:47	Soprano Pipistrelle
26/07/2019	02:48	Soprano Pipistrelle
26/07/2019	02:54	Soprano Pipistrelle

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Date	Time	Bat Species
26/07/2019	03:39	Soprano Pipistrelle
26/07/2019	03:39	Soprano Pipistrelle
26/07/2019	03:39	Soprano Pipistrelle
26/07/2019	03:42	Soprano Pipistrelle
26/07/2019	03:45	Soprano Pipistrelle
26/07/2019	03:47	Soprano Pipistrelle
26/07/2019	03:47	Soprano Pipistrelle
26/07/2019	03:48	Soprano Pipistrelle
26/07/2019	03:48	Soprano Pipistrelle
26/07/2019	03:50	Soprano Pipistrelle
26/07/2019	03:54	Soprano Pipistrelle
26/07/2019	03:54	Soprano Pipistrelle
26/07/2019	04:04	Soprano Pipistrelle
26/07/2019	04:07	Soprano Pipistrelle
26/07/2019	04:07	Soprano Pipistrelle
26/07/2019	04:08	Soprano Pipistrelle
26/07/2019	04:08	Soprano Pipistrelle
26/07/2019	04:09	Soprano Pipistrelle
26/07/2019	04:09	Soprano Pipistrelle
26/07/2019	04:15	Soprano Pipistrelle
26/07/2019	04:15	Soprano Pipistrelle
26/07/2019	04:16	Soprano Pipistrelle
26/07/2019	04:16	Soprano Pipistrelle
26/07/2019	04:21	Soprano Pipistrelle
26/07/2019	04:21	Soprano Pipistrelle
26/07/2019	04:21	Soprano Pipistrelle
26/07/2019	04:21	Soprano Pipistrelle
26/07/2019	04:21	Soprano Pipistrelle
26/07/2019	04:23	Soprano Pipistrelle
26/07/2019	04:24	Soprano Pipistrelle
26/07/2019	04:25	Soprano Pipistrelle
26/07/2019	04:25	Soprano Pipistrelle
26/07/2019	04:25	Soprano Pipistrelle
26/07/2019	04:25	Soprano Pipistrelle
26/07/2019	04:25	Soprano Pipistrelle
26/07/2019	04:25	Soprano Pipistrelle
26/07/2019	04:25	Soprano Pipistrelle
26/07/2019	04:25	Soprano Pipistrelle
26/07/2019	04:25	Soprano Pipistrelle
26/07/2019	04:26	Soprano Pipistrelle
26/07/2019	04:26	Soprano Pipistrelle
26/07/2019	04:26	Soprano Pipistrelle
26/07/2019	04:26	Soprano Pipistrelle
26/07/2019	04:26	Soprano Pipistrelle
26/07/2019	04:26	Soprano Pipistrelle
26/07/2019	04:26	Soprano Pipistrelle
26/07/2019	04:27	Soprano Pipistrelle

[illegible]

Date	Time	Bat Species
26/07/2019	04:42	Soprano Pipistrelle
26/07/2019	04:42	Soprano Pipistrelle
26/07/2019	04:42	Soprano Pipistrelle
26/07/2019	04:42	Soprano Pipistrelle
26/07/2019	04:42	Soprano Pipistrelle
26/07/2019	04:43	Soprano Pipistrelle
26/07/2019	04:43	Soprano Pipistrelle
26/07/2019	04:43	Soprano Pipistrelle
26/07/2019	04:43	Soprano Pipistrelle
26/07/2019	04:43	Soprano Pipistrelle
26/07/2019	04:44	Soprano Pipistrelle
26/07/2019	04:44	Soprano Pipistrelle
26/07/2019	04:44	Soprano Pipistrelle
26/07/2019	04:44	Soprano Pipistrelle
26/07/2019	04:44	Soprano Pipistrelle
26/07/2019	04:44	Soprano Pipistrelle
26/07/2019	04:44	Soprano Pipistrelle
26/07/2019	04:48	Soprano Pipistrelle
26/07/2019	04:48	Soprano Pipistrelle
26/07/2019	22:03	Soprano Pipistrelle
26/07/2019	22:03	Soprano Pipistrelle
26/07/2019	22:04	Soprano Pipistrelle
26/07/2019	22:05	Soprano Pipistrelle
26/07/2019	22:24	Soprano Pipistrelle
26/07/2019	22:24	Soprano Pipistrelle
26/07/2019	22:24	Soprano Pipistrelle
26/07/2019	22:25	Soprano Pipistrelle
26/07/2019	22:25	Soprano Pipistrelle
26/07/2019	22:26	Soprano Pipistrelle
26/07/2019	22:26	Soprano Pipistrelle
26/07/2019	22:26	Soprano Pipistrelle
26/07/2019	23:49	Soprano Pipistrelle
26/07/2019	23:50	Soprano Pipistrelle
26/07/2019	23:50	Soprano Pipistrelle
26/07/2019	23:51	Soprano Pipistrelle
26/07/2019	23:51	Soprano Pipistrelle
26/07/2019	23:51	Soprano Pipistrelle
26/07/2019	23:51	Soprano Pipistrelle
26/07/2019	23:53	Soprano Pipistrelle
26/07/2019	23:53	Soprano Pipistrelle
26/07/2019	23:54	Soprano Pipistrelle
26/07/2019	23:54	Soprano Pipistrelle
26/07/2019	23:54	Soprano Pipistrelle
26/07/2019	23:55	Soprano Pipistrelle
26/07/2019	23:55	Soprano Pipistrelle
27/07/2019	00:17	Myotis Spp.

Date	Time	Bat Species
27/07/2019	00:50	Myotis Spp.
27/07/2019	01:07	Myotis Spp.
27/07/2019	01:09	Myotis Spp.
27/07/2019	01:09	Myotis Spp.
27/07/2019	01:27	Myotis Spp.
27/07/2019	01:36	Myotis Spp.
27/07/2019	01:49	Myotis Spp.
27/07/2019	01:54	Myotis Spp.
27/07/2019	01:56	Myotis Spp.
27/07/2019	01:57	Myotis Spp.
27/07/2019	02:01	Myotis Spp.
27/07/2019	02:01	Myotis Spp.
27/07/2019	02:22	Myotis Spp.
27/07/2019	02:31	Myotis Spp.
27/07/2019	04:07	Myotis Spp.
27/07/2019	04:08	Myotis Spp.
27/07/2019	04:08	Myotis Spp.
27/07/2019	04:15	Myotis Spp.
27/07/2019	04:23	Myotis Spp.
27/07/2019	04:32	Myotis Spp.
27/07/2019	23:10	Myotis Spp.
27/07/2019	00:17	Natterer's Bat
27/07/2019	00:18	Natterer's Bat
27/07/2019	01:54	Natterer's Bat
27/07/2019	01:56	Natterer's Bat
27/07/2019	02:57	Leisler's Bat
27/07/2019	02:57	Leisler's Bat
27/07/2019	02:57	Leisler's Bat
27/07/2019	02:58	Leisler's Bat
27/07/2019	23:04	Leisler's Bat
27/07/2019	00:10	Soprano Pipistrelle
27/07/2019	00:10	Soprano Pipistrelle
27/07/2019	00:12	Soprano Pipistrelle
27/07/2019	00:12	Soprano Pipistrelle
27/07/2019	00:13	Soprano Pipistrelle
27/07/2019	00:13	Soprano Pipistrelle
27/07/2019	00:15	Soprano Pipistrelle
27/07/2019	00:15	Soprano Pipistrelle
27/07/2019	00:15	Soprano Pipistrelle
27/07/2019	00:15	Soprano Pipistrelle
27/07/2019	00:18	Soprano Pipistrelle
27/07/2019	00:19	Soprano Pipistrelle
27/07/2019	00:20	Soprano Pipistrelle
27/07/2019	00:32	Soprano Pipistrelle
27/07/2019	00:32	Soprano Pipistrelle
27/07/2019	00:33	Soprano Pipistrelle
27/07/2019	00:44	Soprano Pipistrelle

[illegible]

Date	Time	Bat Species
27/07/2019	23:29	Soprano Pipistrelle
27/07/2019	23:30	Soprano Pipistrelle
27/07/2019	23:30	Soprano Pipistrelle
27/07/2019	23:30	Soprano Pipistrelle
27/07/2019	23:30	Soprano Pipistrelle
27/07/2019	23:30	Soprano Pipistrelle
27/07/2019	23:30	Soprano Pipistrelle
27/07/2019	23:30	Soprano Pipistrelle
27/07/2019	23:30	Soprano Pipistrelle
27/07/2019	23:30	Soprano Pipistrelle
27/07/2019	23:31	Soprano Pipistrelle
27/07/2019	23:31	Soprano Pipistrelle
27/07/2019	23:31	Soprano Pipistrelle
27/07/2019	23:32	Soprano Pipistrelle
27/07/2019	23:32	Soprano Pipistrelle
27/07/2019	23:32	Soprano Pipistrelle
27/07/2019	23:32	Soprano Pipistrelle
27/07/2019	23:32	Soprano Pipistrelle
27/07/2019	23:32	Soprano Pipistrelle
27/07/2019	23:32	Soprano Pipistrelle
27/07/2019	23:36	Soprano Pipistrelle
27/07/2019	23:37	Soprano Pipistrelle
27/07/2019	23:41	Soprano Pipistrelle
27/07/2019	23:41	Soprano Pipistrelle
27/07/2019	23:44	Soprano Pipistrelle
27/07/2019	23:45	Soprano Pipistrelle
27/07/2019	23:45	Soprano Pipistrelle
27/07/2019	23:45	Soprano Pipistrelle
27/07/2019	23:45	Soprano Pipistrelle
27/07/2019	23:45	Soprano Pipistrelle
27/07/2019	23:50	Soprano Pipistrelle
27/07/2019	23:50	Soprano Pipistrelle
27/07/2019	23:50	Soprano Pipistrelle
27/07/2019	23:50	Soprano Pipistrelle
27/07/2019	23:51	Soprano Pipistrelle
27/07/2019	23:51	Soprano Pipistrelle
28/07/2019	01:28	Myotis Spp.
28/07/2019	22:47	Myotis Spp.
28/07/2019	22:47	Myotis Spp.
28/07/2019	22:54	Myotis Spp.
28/07/2019	22:54	Myotis Spp.
28/07/2019	22:54	Myotis Spp.
28/07/2019	22:55	Myotis Spp.
28/07/2019	22:55	Myotis Spp.
28/07/2019	22:55	Myotis Spp.
28/07/2019	22:55	Myotis Spp.
28/07/2019	22:56	Myotis Spp.

Date	Time	Bat Species
28/07/2019	22:56	Myotis Spp.
28/07/2019	22:57	Myotis Spp.
28/07/2019	22:57	Myotis Spp.
28/07/2019	22:57	Myotis Spp.
28/07/2019	22:57	Myotis Spp.
28/07/2019	22:57	Myotis Spp.
28/07/2019	23:04	Myotis Spp.
28/07/2019	23:04	Myotis Spp.
28/07/2019	23:06	Myotis Spp.
28/07/2019	23:06	Myotis Spp.
28/07/2019	23:06	Myotis Spp.
28/07/2019	23:07	Myotis Spp.
28/07/2019	23:07	Myotis Spp.
28/07/2019	23:09	Myotis Spp.
28/07/2019	23:09	Myotis Spp.
28/07/2019	23:09	Myotis Spp.
28/07/2019	00:40	Leisler's Bat
28/07/2019	23:51	Common Pipistrelle
28/07/2019	00:06	Soprano Pipistrelle
28/07/2019	00:08	Soprano Pipistrelle
28/07/2019	00:09	Soprano Pipistrelle
28/07/2019	00:09	Soprano Pipistrelle
28/07/2019	00:11	Soprano Pipistrelle
28/07/2019	00:27	Soprano Pipistrelle
28/07/2019	00:39	Soprano Pipistrelle
28/07/2019	00:47	Soprano Pipistrelle
28/07/2019	00:47	Soprano Pipistrelle
28/07/2019	01:02	Soprano Pipistrelle
28/07/2019	01:15	Soprano Pipistrelle
28/07/2019	01:19	Soprano Pipistrelle
28/07/2019	01:29	Soprano Pipistrelle
28/07/2019	01:29	Soprano Pipistrelle
28/07/2019	01:29	Soprano Pipistrelle
28/07/2019	01:29	Soprano Pipistrelle
28/07/2019	01:29	Soprano Pipistrelle
28/07/2019	01:29	Soprano Pipistrelle
28/07/2019	01:29	Soprano Pipistrelle
28/07/2019	01:31	Soprano Pipistrelle
28/07/2019	01:37	Soprano Pipistrelle
28/07/2019	01:50	Soprano Pipistrelle
28/07/2019	01:54	Soprano Pipistrelle
28/07/2019	01:55	Soprano Pipistrelle
28/07/2019	01:55	Soprano Pipistrelle
28/07/2019	01:55	Soprano Pipistrelle
28/07/2019	01:56	Soprano Pipistrelle
28/07/2019	01:57	Soprano Pipistrelle

[illegible]

Date	Time	Bat Species
28/07/2019	02:09	Soprano Pipistrelle
28/07/2019	02:10	Soprano Pipistrelle
28/07/2019	02:10	Soprano Pipistrelle
28/07/2019	02:11	Soprano Pipistrelle
28/07/2019	02:12	Soprano Pipistrelle
28/07/2019	02:12	Soprano Pipistrelle
28/07/2019	02:13	Soprano Pipistrelle
28/07/2019	02:13	Soprano Pipistrelle
28/07/2019	02:13	Soprano Pipistrelle
28/07/2019	02:13	Soprano Pipistrelle
28/07/2019	02:22	Soprano Pipistrelle
28/07/2019	02:23	Soprano Pipistrelle
28/07/2019	02:27	Soprano Pipistrelle
28/07/2019	02:27	Soprano Pipistrelle
28/07/2019	02:28	Soprano Pipistrelle
28/07/2019	02:28	Soprano Pipistrelle
28/07/2019	02:31	Soprano Pipistrelle
28/07/2019	02:35	Soprano Pipistrelle
28/07/2019	02:37	Soprano Pipistrelle
28/07/2019	02:37	Soprano Pipistrelle
28/07/2019	02:37	Soprano Pipistrelle
28/07/2019	02:38	Soprano Pipistrelle
28/07/2019	02:38	Soprano Pipistrelle
28/07/2019	02:38	Soprano Pipistrelle
28/07/2019	02:38	Soprano Pipistrelle
28/07/2019	02:39	Soprano Pipistrelle
28/07/2019	02:39	Soprano Pipistrelle
28/07/2019	02:39	Soprano Pipistrelle
28/07/2019	02:40	Soprano Pipistrelle
28/07/2019	02:42	Soprano Pipistrelle
28/07/2019	02:42	Soprano Pipistrelle
28/07/2019	02:43	Soprano Pipistrelle
28/07/2019	02:43	Soprano Pipistrelle
28/07/2019	02:43	Soprano Pipistrelle
28/07/2019	02:43	Soprano Pipistrelle
28/07/2019	02:46	Soprano Pipistrelle
28/07/2019	02:46	Soprano Pipistrelle
28/07/2019	02:46	Soprano Pipistrelle
28/07/2019	02:48	Soprano Pipistrelle
28/07/2019	02:49	Soprano Pipistrelle
28/07/2019	02:49	Soprano Pipistrelle
28/07/2019	02:49	Soprano Pipistrelle
28/07/2019	02:50	Soprano Pipistrelle
28/07/2019	02:50	Soprano Pipistrelle
28/07/2019	02:51	Soprano Pipistrelle

Date	Time	Bat Species
28/07/2019	02:51	Soprano Pipistrelle
28/07/2019	02:52	Soprano Pipistrelle
28/07/2019	02:57	Soprano Pipistrelle
28/07/2019	03:00	Soprano Pipistrelle
28/07/2019	03:03	Soprano Pipistrelle
28/07/2019	03:03	Soprano Pipistrelle
28/07/2019	03:06	Soprano Pipistrelle
28/07/2019	03:07	Soprano Pipistrelle
28/07/2019	03:12	Soprano Pipistrelle
28/07/2019	03:12	Soprano Pipistrelle
28/07/2019	03:12	Soprano Pipistrelle
28/07/2019	03:12	Soprano Pipistrelle
28/07/2019	03:12	Soprano Pipistrelle
28/07/2019	03:12	Soprano Pipistrelle
28/07/2019	03:12	Soprano Pipistrelle
28/07/2019	03:13	Soprano Pipistrelle
28/07/2019	03:13	Soprano Pipistrelle
28/07/2019	03:17	Soprano Pipistrelle
28/07/2019	03:18	Soprano Pipistrelle
28/07/2019	03:19	Soprano Pipistrelle
28/07/2019	03:20	Soprano Pipistrelle
28/07/2019	03:20	Soprano Pipistrelle
28/07/2019	03:22	Soprano Pipistrelle
28/07/2019	03:24	Soprano Pipistrelle
28/07/2019	03:28	Soprano Pipistrelle
28/07/2019	03:30	Soprano Pipistrelle
28/07/2019	03:30	Soprano Pipistrelle
28/07/2019	03:31	Soprano Pipistrelle
28/07/2019	03:32	Soprano Pipistrelle
28/07/2019	03:32	Soprano Pipistrelle
28/07/2019	03:32	Soprano Pipistrelle
28/07/2019	03:32	Soprano Pipistrelle
28/07/2019	03:35	Soprano Pipistrelle
28/07/2019	03:36	Soprano Pipistrelle
28/07/2019	03:36	Soprano Pipistrelle
28/07/2019	03:42	Soprano Pipistrelle
28/07/2019	03:43	Soprano Pipistrelle
28/07/2019	03:43	Soprano Pipistrelle
28/07/2019	03:44	Soprano Pipistrelle
28/07/2019	03:45	Soprano Pipistrelle
28/07/2019	03:45	Soprano Pipistrelle
28/07/2019	03:45	Soprano Pipistrelle
28/07/2019	03:46	Soprano Pipistrelle
28/07/2019	03:50	Soprano Pipistrelle
28/07/2019	03:50	Soprano Pipistrelle
28/07/2019	03:51	Soprano Pipistrelle
28/07/2019	03:51	Soprano Pipistrelle
28/07/2019	03:51	Soprano Pipistrelle

Date	Time	Bat Species
28/07/2019	03:51	Soprano Pipistrelle
28/07/2019	03:52	Soprano Pipistrelle
28/07/2019	03:56	Soprano Pipistrelle
28/07/2019	03:56	Soprano Pipistrelle
28/07/2019	03:56	Soprano Pipistrelle
28/07/2019	03:57	Soprano Pipistrelle
28/07/2019	03:57	Soprano Pipistrelle
28/07/2019	03:59	Soprano Pipistrelle
28/07/2019	04:00	Soprano Pipistrelle
28/07/2019	04:00	Soprano Pipistrelle
28/07/2019	04:00	Soprano Pipistrelle
28/07/2019	04:01	Soprano Pipistrelle
28/07/2019	04:01	Soprano Pipistrelle
28/07/2019	04:02	Soprano Pipistrelle
28/07/2019	04:02	Soprano Pipistrelle
28/07/2019	04:02	Soprano Pipistrelle
28/07/2019	04:02	Soprano Pipistrelle
28/07/2019	04:02	Soprano Pipistrelle
28/07/2019	04:02	Soprano Pipistrelle
28/07/2019	04:02	Soprano Pipistrelle
28/07/2019	04:02	Soprano Pipistrelle
28/07/2019	04:03	Soprano Pipistrelle
28/07/2019	04:16	Soprano Pipistrelle
28/07/2019	04:30	Soprano Pipistrelle
28/07/2019	04:30	Soprano Pipistrelle
28/07/2019	04:30	Soprano Pipistrelle
28/07/2019	04:30	Soprano Pipistrelle
28/07/2019	04:32	Soprano Pipistrelle
28/07/2019	04:32	Soprano Pipistrelle
28/07/2019	04:33	Soprano Pipistrelle
28/07/2019	04:33	Soprano Pipistrelle
28/07/2019	04:33	Soprano Pipistrelle
28/07/2019	04:33	Soprano Pipistrelle
28/07/2019	04:33	Soprano Pipistrelle
28/07/2019	04:33	Soprano Pipistrelle
28/07/2019	04:36	Soprano Pipistrelle
28/07/2019	05:06	Soprano Pipistrelle
28/07/2019	05:20	Soprano Pipistrelle
28/07/2019	05:20	Soprano Pipistrelle
28/07/2019	21:49	Soprano Pipistrelle
28/07/2019	21:49	Soprano Pipistrelle
28/07/2019	21:49	Soprano Pipistrelle
28/07/2019	21:49	Soprano Pipistrelle
28/07/2019	22:05	Soprano Pipistrelle
28/07/2019	23:07	Soprano Pipistrelle
28/07/2019	23:08	Soprano Pipistrelle
28/07/2019	23:08	Soprano Pipistrelle
28/07/2019	23:09	Soprano Pipistrelle

[illegible]

Date	Time	Bat Species
28/07/2019	23:34	Soprano Pipistrelle
28/07/2019	23:42	Soprano Pipistrelle
28/07/2019	23:44	Soprano Pipistrelle
28/07/2019	23:46	Soprano Pipistrelle
28/07/2019	23:48	Soprano Pipistrelle
28/07/2019	23:48	Soprano Pipistrelle
28/07/2019	23:49	Soprano Pipistrelle
28/07/2019	23:55	Soprano Pipistrelle
29/07/2019	04:43	Myotis Spp.
29/07/2019	04:44	Myotis Spp.
29/07/2019	04:44	Myotis Spp.
29/07/2019	04:44	Myotis Spp.
29/07/2019	04:48	Myotis Spp.
29/07/2019	04:49	Myotis Spp.
29/07/2019	04:50	Myotis Spp.
29/07/2019	04:50	Myotis Spp.
29/07/2019	04:53	Myotis Spp.
29/07/2019	04:58	Myotis Spp.
29/07/2019	04:58	Myotis Spp.
29/07/2019	04:59	Myotis Spp.
29/07/2019	04:59	Myotis Spp.
29/07/2019	04:59	Myotis Spp.
29/07/2019	05:00	Myotis Spp.
29/07/2019	05:00	Myotis Spp.
29/07/2019	05:02	Myotis Spp.
29/07/2019	05:02	Myotis Spp.
29/07/2019	05:03	Myotis Spp.
29/07/2019	22:18	Myotis Spp.
29/07/2019	22:18	Myotis Spp.
29/07/2019	22:18	Myotis Spp.
29/07/2019	22:20	Myotis Spp.
29/07/2019	22:20	Myotis Spp.
29/07/2019	22:20	Myotis Spp.
29/07/2019	22:21	Myotis Spp.
29/07/2019	22:21	Myotis Spp.
29/07/2019	22:24	Myotis Spp.
29/07/2019	22:26	Myotis Spp.
29/07/2019	22:55	Myotis Spp.
29/07/2019	22:55	Myotis Spp.
29/07/2019	22:58	Myotis Spp.
29/07/2019	22:58	Myotis Spp.
29/07/2019	22:59	Myotis Spp.
29/07/2019	22:59	Myotis Spp.
29/07/2019	22:59	Myotis Spp.
29/07/2019	23:00	Myotis Spp.
29/07/2019	23:00	Myotis Spp.

Date	Time	Bat Species
29/07/2019	23:02	Myotis Spp.
29/07/2019	23:02	Myotis Spp.
29/07/2019	23:02	Myotis Spp.
29/07/2019	23:02	Myotis Spp.
29/07/2019	23:02	Myotis Spp.
29/07/2019	23:02	Myotis Spp.
29/07/2019	23:02	Myotis Spp.
29/07/2019	23:03	Myotis Spp.
29/07/2019	23:03	Myotis Spp.
29/07/2019	23:10	Myotis Spp.
29/07/2019	23:11	Myotis Spp.
29/07/2019	23:11	Myotis Spp.
29/07/2019	23:11	Myotis Spp.
29/07/2019	23:12	Myotis Spp.
29/07/2019	23:14	Myotis Spp.
29/07/2019	23:14	Myotis Spp.
29/07/2019	23:15	Myotis Spp.
29/07/2019	23:15	Myotis Spp.
29/07/2019	23:18	Myotis Spp.
29/07/2019	23:25	Myotis Spp.
29/07/2019	23:25	Myotis Spp.
29/07/2019	23:26	Myotis Spp.
29/07/2019	23:26	Myotis Spp.
29/07/2019	23:36	Myotis Spp.
29/07/2019	23:37	Myotis Spp.
29/07/2019	23:45	Myotis Spp.
29/07/2019	23:50	Myotis Spp.
29/07/2019	04:50	Natterer's Bat
29/07/2019	01:28	Leisler's Bat
29/07/2019	01:53	Leisler's Bat
29/07/2019	01:53	Leisler's Bat
29/07/2019	01:53	Leisler's Bat
29/07/2019	01:55	Leisler's Bat
29/07/2019	01:56	Leisler's Bat
29/07/2019	01:57	Leisler's Bat
29/07/2019	01:57	Leisler's Bat
29/07/2019	01:58	Leisler's Bat
29/07/2019	02:08	Leisler's Bat
29/07/2019	02:11	Leisler's Bat
29/07/2019	02:11	Leisler's Bat
29/07/2019	02:13	Leisler's Bat
29/07/2019	02:22	Leisler's Bat
29/07/2019	02:22	Leisler's Bat
29/07/2019	02:22	Leisler's Bat
29/07/2019	02:25	Leisler's Bat
29/07/2019	03:23	Leisler's Bat

Date	Time	Bat Species
29/07/2019	22:47	Leisler's Bat
29/07/2019	23:21	Leisler's Bat
29/07/2019	23:31	Leisler's Bat
29/07/2019	00:02	Soprano Pipistrelle
29/07/2019	00:02	Soprano Pipistrelle
29/07/2019	00:18	Soprano Pipistrelle
29/07/2019	00:23	Soprano Pipistrelle
29/07/2019	00:32	Soprano Pipistrelle
29/07/2019	00:32	Soprano Pipistrelle
29/07/2019	00:51	Soprano Pipistrelle
29/07/2019	00:53	Soprano Pipistrelle
29/07/2019	00:55	Soprano Pipistrelle
29/07/2019	01:02	Soprano Pipistrelle
29/07/2019	01:06	Soprano Pipistrelle
29/07/2019	01:07	Soprano Pipistrelle
29/07/2019	01:11	Soprano Pipistrelle
29/07/2019	01:19	Soprano Pipistrelle
29/07/2019	01:27	Soprano Pipistrelle
29/07/2019	01:28	Soprano Pipistrelle
29/07/2019	01:30	Soprano Pipistrelle
29/07/2019	01:30	Soprano Pipistrelle
29/07/2019	01:33	Soprano Pipistrelle
29/07/2019	01:38	Soprano Pipistrelle
29/07/2019	01:40	Soprano Pipistrelle
29/07/2019	01:40	Soprano Pipistrelle
29/07/2019	01:40	Soprano Pipistrelle
29/07/2019	01:41	Soprano Pipistrelle
29/07/2019	01:43	Soprano Pipistrelle
29/07/2019	01:44	Soprano Pipistrelle
29/07/2019	01:49	Soprano Pipistrelle
29/07/2019	01:54	Soprano Pipistrelle
29/07/2019	01:56	Soprano Pipistrelle
29/07/2019	01:57	Soprano Pipistrelle
29/07/2019	01:57	Soprano Pipistrelle
29/07/2019	01:57	Soprano Pipistrelle
29/07/2019	02:00	Soprano Pipistrelle
29/07/2019	02:01	Soprano Pipistrelle
29/07/2019	02:21	Soprano Pipistrelle
29/07/2019	02:21	Soprano Pipistrelle
29/07/2019	02:28	Soprano Pipistrelle
29/07/2019	02:40	Soprano Pipistrelle
29/07/2019	02:40	Soprano Pipistrelle
29/07/2019	02:41	Soprano Pipistrelle
29/07/2019	02:41	Soprano Pipistrelle
29/07/2019	02:43	Soprano Pipistrelle
29/07/2019	02:55	Soprano Pipistrelle

Date	Time	Bat Species
29/07/2019	02:56	Soprano Pipistrelle
29/07/2019	02:57	Soprano Pipistrelle
29/07/2019	03:00	Soprano Pipistrelle
29/07/2019	03:01	Soprano Pipistrelle
29/07/2019	03:07	Soprano Pipistrelle
29/07/2019	03:21	Soprano Pipistrelle
29/07/2019	03:21	Soprano Pipistrelle
29/07/2019	03:31	Soprano Pipistrelle
29/07/2019	03:32	Soprano Pipistrelle
29/07/2019	03:34	Soprano Pipistrelle
29/07/2019	03:36	Soprano Pipistrelle
29/07/2019	03:37	Soprano Pipistrelle
29/07/2019	03:41	Soprano Pipistrelle
29/07/2019	03:45	Soprano Pipistrelle
29/07/2019	03:52	Soprano Pipistrelle
29/07/2019	03:56	Soprano Pipistrelle
29/07/2019	03:57	Soprano Pipistrelle
29/07/2019	03:58	Soprano Pipistrelle
29/07/2019	03:58	Soprano Pipistrelle
29/07/2019	03:59	Soprano Pipistrelle
29/07/2019	03:59	Soprano Pipistrelle
29/07/2019	04:02	Soprano Pipistrelle
29/07/2019	04:10	Soprano Pipistrelle
29/07/2019	04:16	Soprano Pipistrelle
29/07/2019	04:16	Soprano Pipistrelle
29/07/2019	04:16	Soprano Pipistrelle
29/07/2019	04:16	Soprano Pipistrelle
29/07/2019	04:43	Soprano Pipistrelle
29/07/2019	04:43	Soprano Pipistrelle
29/07/2019	04:47	Soprano Pipistrelle
29/07/2019	05:03	Soprano Pipistrelle
29/07/2019	05:03	Soprano Pipistrelle
29/07/2019	05:03	Soprano Pipistrelle
29/07/2019	05:04	Soprano Pipistrelle
29/07/2019	05:04	Soprano Pipistrelle
29/07/2019	05:04	Soprano Pipistrelle
29/07/2019	05:05	Soprano Pipistrelle
29/07/2019	05:05	Soprano Pipistrelle
29/07/2019	05:13	Soprano Pipistrelle
29/07/2019	05:13	Soprano Pipistrelle
29/07/2019	05:13	Soprano Pipistrelle
29/07/2019	05:14	Soprano Pipistrelle
29/07/2019	05:17	Soprano Pipistrelle
29/07/2019	05:19	Soprano Pipistrelle
29/07/2019	21:45	Soprano Pipistrelle
29/07/2019	21:47	Soprano Pipistrelle

Date	Time	Bat Species
29/07/2019	21:47	Soprano Pipistrelle
29/07/2019	21:47	Soprano Pipistrelle
29/07/2019	21:48	Soprano Pipistrelle
29/07/2019	21:48	Soprano Pipistrelle
29/07/2019	21:50	Soprano Pipistrelle
29/07/2019	21:50	Soprano Pipistrelle
29/07/2019	22:10	Soprano Pipistrelle
29/07/2019	22:30	Soprano Pipistrelle
29/07/2019	22:30	Soprano Pipistrelle
29/07/2019	22:30	Soprano Pipistrelle
29/07/2019	22:30	Soprano Pipistrelle
29/07/2019	22:57	Soprano Pipistrelle
29/07/2019	23:04	Soprano Pipistrelle
29/07/2019	23:04	Soprano Pipistrelle
29/07/2019	23:04	Soprano Pipistrelle
29/07/2019	23:04	Soprano Pipistrelle
29/07/2019	23:04	Soprano Pipistrelle
29/07/2019	23:04	Soprano Pipistrelle
29/07/2019	23:04	Soprano Pipistrelle
29/07/2019	23:04	Soprano Pipistrelle
29/07/2019	23:05	Soprano Pipistrelle
29/07/2019	23:05	Soprano Pipistrelle
29/07/2019	23:05	Soprano Pipistrelle
29/07/2019	23:05	Soprano Pipistrelle
29/07/2019	23:05	Soprano Pipistrelle
29/07/2019	23:05	Soprano Pipistrelle
29/07/2019	23:05	Soprano Pipistrelle
29/07/2019	23:05	Soprano Pipistrelle
29/07/2019	23:05	Soprano Pipistrelle
29/07/2019	23:05	Soprano Pipistrelle
29/07/2019	23:06	Soprano Pipistrelle
29/07/2019	23:06	Soprano Pipistrelle
29/07/2019	23:15	Soprano Pipistrelle
29/07/2019	23:15	Soprano Pipistrelle
29/07/2019	23:16	Soprano Pipistrelle
29/07/2019	23:16	Soprano Pipistrelle
29/07/2019	23:16	Soprano Pipistrelle
29/07/2019	23:16	Soprano Pipistrelle
29/07/2019	23:16	Soprano Pipistrelle
29/07/2019	23:20	Soprano Pipistrelle
29/07/2019	23:27	Soprano Pipistrelle
29/07/2019	23:27	Soprano Pipistrelle
29/07/2019	23:28	Soprano Pipistrelle
29/07/2019	23:28	Soprano Pipistrelle
29/07/2019	23:35	Soprano Pipistrelle
29/07/2019	23:35	Soprano Pipistrelle
29/07/2019	04:00	Lesser Horseshoe Bat

Date	Time	Bat Species
30/07/2019	00:02	Myotis Spp.
31/07/2019	00:02	Myotis Spp.
01/08/2019	00:02	Myotis Spp.
02/08/2019	00:03	Myotis Spp.
03/08/2019	00:03	Myotis Spp.
04/08/2019	00:03	Myotis Spp.
05/08/2019	00:03	Myotis Spp.
06/08/2019	00:04	Myotis Spp.
07/08/2019	00:12	Myotis Spp.
08/08/2019	00:13	Myotis Spp.
09/08/2019	00:13	Myotis Spp.
10/08/2019	00:16	Myotis Spp.
11/08/2019	00:17	Soprano Pipistrelle
12/08/2019	00:17	Soprano Pipistrelle
13/08/2019	00:17	Soprano Pipistrelle
14/08/2019	00:17	Myotis Spp.
15/08/2019	00:18	Soprano Pipistrelle
16/08/2019	00:19	Soprano Pipistrelle
17/08/2019	00:19	Soprano Pipistrelle
18/08/2019	00:19	Soprano Pipistrelle
19/08/2019	00:19	Soprano Pipistrelle
20/08/2019	00:19	Soprano Pipistrelle
21/08/2019	00:19	Soprano Pipistrelle
22/08/2019	00:19	Soprano Pipistrelle
23/08/2019	00:19	Soprano Pipistrelle
24/08/2019	00:19	Soprano Pipistrelle
25/08/2019	00:20	Soprano Pipistrelle
26/08/2019	00:20	Soprano Pipistrelle
27/08/2019	00:20	Myotis Spp.
28/08/2019	00:20	Soprano Pipistrelle
29/08/2019	00:24	Myotis Spp.
30/08/2019	00:26	Myotis Spp.
31/08/2019	00:26	Myotis Spp.
01/09/2019	00:26	Myotis Spp.
02/09/2019	00:32	Soprano Pipistrelle
03/09/2019	00:39	Soprano Pipistrelle
04/09/2019	01:17	Soprano Pipistrelle
05/09/2019	01:22	Soprano Pipistrelle
06/09/2019	02:00	Soprano Pipistrelle
07/09/2019	02:08	Soprano Pipistrelle
08/09/2019	02:08	Soprano Pipistrelle
09/09/2019	02:34	Soprano Pipistrelle
10/09/2019	02:42	Soprano Pipistrelle
11/09/2019	02:43	Soprano Pipistrelle
12/09/2019	02:55	Soprano Pipistrelle
13/09/2019	03:02	Soprano Pipistrelle

Date	Time	Bat Species
14/09/2019	03:30	Soprano Pipistrelle
15/09/2019	03:30	Soprano Pipistrelle
16/09/2019	03:38	Soprano Pipistrelle
17/09/2019	03:39	Soprano Pipistrelle
18/09/2019	03:40	Soprano Pipistrelle
19/09/2019	03:47	Soprano Pipistrelle
20/09/2019	03:53	Leisler's Bat
21/09/2019	03:56	Soprano Pipistrelle
22/09/2019	03:56	Soprano Pipistrelle
23/09/2019	04:07	Soprano Pipistrelle
24/09/2019	04:14	Soprano Pipistrelle
25/09/2019	04:18	Myotis Spp.
26/09/2019	04:32	Soprano Pipistrelle
27/09/2019	04:32	Soprano Pipistrelle
28/09/2019	04:32	Soprano Pipistrelle
29/09/2019	04:33	Soprano Pipistrelle
30/09/2019	04:33	Soprano Pipistrelle
01/10/2019	04:33	Soprano Pipistrelle
02/10/2019	04:33	Myotis Spp.
03/10/2019	04:33	Myotis Spp.
04/10/2019	04:34	Myotis Spp.
05/10/2019	04:35	Myotis Spp.
06/10/2019	04:36	Myotis Spp.
07/10/2019	04:36	Myotis Spp.
08/10/2019	04:37	Myotis Spp.
09/10/2019	04:37	Myotis Spp.
10/10/2019	04:38	Myotis Spp.
11/10/2019	04:38	Myotis Spp.
12/10/2019	04:38	Myotis Spp.
13/10/2019	04:39	Myotis Spp.
14/10/2019	04:39	Myotis Spp.
15/10/2019	04:39	Myotis Spp.
16/10/2019	04:40	Myotis Spp.
17/10/2019	04:45	Soprano Pipistrelle
18/10/2019	05:38	Soprano Pipistrelle

Table 6 – Results for static located at the playground

Date	Time	Bat Species
13/08/2019	21:55	Leisler's Bat
13/08/2019	22:46	Leisler's Bat
13/08/2019	22:47	Leisler's Bat
13/08/2019	22:54	Leisler's Bat
13/08/2019	23:01	Leisler's Bat
13/08/2019	23:10	Leisler's Bat
13/08/2019	23:10	Leisler's Bat

Date	Time	Bat Species
13/08/2019	23:10	Leisler's Bat
13/08/2019	23:22	Leisler's Bat
13/08/2019	23:42	Leisler's Bat
13/08/2019	23:42	Leisler's Bat
13/08/2019	23:42	Leisler's Bat
13/08/2019	23:42	Leisler's Bat
13/08/2019	23:46	Leisler's Bat
13/08/2019	23:51	Leisler's Bat
13/08/2019	23:53	Leisler's Bat
13/08/2019	23:59	Leisler's Bat
13/08/2019	23:59	Leisler's Bat
13/08/2019	21:43	Soprano Pipistrelle
13/08/2019	21:54	Soprano Pipistrelle
13/08/2019	21:54	Soprano Pipistrelle
13/08/2019	21:59	Soprano Pipistrelle
13/08/2019	22:07	Soprano Pipistrelle
13/08/2019	22:08	Soprano Pipistrelle
13/08/2019	22:40	Soprano Pipistrelle
13/08/2019	22:48	Soprano Pipistrelle
13/08/2019	22:51	Soprano Pipistrelle
13/08/2019	22:52	Soprano Pipistrelle
13/08/2019	22:52	Soprano Pipistrelle
13/08/2019	22:56	Soprano Pipistrelle
13/08/2019	22:58	Soprano Pipistrelle
13/08/2019	22:58	Soprano Pipistrelle
13/08/2019	22:59	Soprano Pipistrelle
13/08/2019	23:03	Soprano Pipistrelle
13/08/2019	23:03	Soprano Pipistrelle
13/08/2019	23:08	Soprano Pipistrelle
13/08/2019	23:09	Soprano Pipistrelle
13/08/2019	23:10	Soprano Pipistrelle
13/08/2019	23:11	Soprano Pipistrelle
13/08/2019	23:14	Soprano Pipistrelle
13/08/2019	23:18	Soprano Pipistrelle
13/08/2019	23:23	Soprano Pipistrelle
13/08/2019	23:23	Soprano Pipistrelle
13/08/2019	23:24	Soprano Pipistrelle
13/08/2019	23:24	Soprano Pipistrelle
13/08/2019	23:31	Soprano Pipistrelle
13/08/2019	23:33	Soprano Pipistrelle
13/08/2019	23:39	Soprano Pipistrelle
13/08/2019	23:40	Soprano Pipistrelle
13/08/2019	23:41	Soprano Pipistrelle
13/08/2019	23:42	Soprano Pipistrelle
13/08/2019	23:44	Soprano Pipistrelle
13/08/2019	23:44	Soprano Pipistrelle

Date	Time	Bat Species
13/08/2019	23:44	Soprano Pipistrelle
13/08/2019	23:45	Soprano Pipistrelle
13/08/2019	23:46	Soprano Pipistrelle
13/08/2019	23:48	Soprano Pipistrelle
13/08/2019	23:50	Soprano Pipistrelle
13/08/2019	23:50	Soprano Pipistrelle
13/08/2019	23:54	Soprano Pipistrelle
13/08/2019	23:54	Soprano Pipistrelle
13/08/2019	23:54	Soprano Pipistrelle
13/08/2019	23:54	Soprano Pipistrelle
13/08/2019	23:54	Soprano Pipistrelle
13/08/2019	23:55	Soprano Pipistrelle
13/08/2019	23:55	Soprano Pipistrelle
13/08/2019	23:55	Soprano Pipistrelle
14/08/2019	00:02	Leisler's Bat
14/08/2019	00:07	Leisler's Bat
14/08/2019	00:07	Leisler's Bat
14/08/2019	00:07	Leisler's Bat
14/08/2019	00:15	Leisler's Bat
14/08/2019	00:15	Leisler's Bat
14/08/2019	00:16	Leisler's Bat
14/08/2019	00:16	Leisler's Bat
14/08/2019	00:16	Leisler's Bat
14/08/2019	00:17	Leisler's Bat
14/08/2019	00:17	Leisler's Bat
14/08/2019	00:18	Leisler's Bat
14/08/2019	00:19	Leisler's Bat
14/08/2019	00:20	Leisler's Bat
14/08/2019	00:21	Leisler's Bat
14/08/2019	00:21	Leisler's Bat
14/08/2019	00:21	Leisler's Bat
14/08/2019	00:23	Leisler's Bat
14/08/2019	03:09	Leisler's Bat
14/08/2019	03:09	Leisler's Bat
14/08/2019	03:09	Leisler's Bat
14/08/2019	03:09	Leisler's Bat
14/08/2019	03:10	Leisler's Bat
14/08/2019	03:11	Leisler's Bat
14/08/2019	03:11	Leisler's Bat
14/08/2019	03:11	Leisler's Bat
14/08/2019	03:11	Leisler's Bat
14/08/2019	03:11	Leisler's Bat
14/08/2019	03:13	Leisler's Bat
14/08/2019	03:13	Leisler's Bat
14/08/2019	03:17	Leisler's Bat
14/08/2019	03:17	Leisler's Bat

Date	Time	Bat Species
14/08/2019	03:35	Leisler's Bat
14/08/2019	03:36	Leisler's Bat
14/08/2019	04:14	Leisler's Bat
14/08/2019	05:11	Leisler's Bat
14/08/2019	05:16	Leisler's Bat
14/08/2019	05:16	Leisler's Bat
14/08/2019	00:00	Soprano Pipistrelle
14/08/2019	00:11	Soprano Pipistrelle
14/08/2019	00:12	Soprano Pipistrelle
14/08/2019	00:12	Soprano Pipistrelle
14/08/2019	00:14	Soprano Pipistrelle
14/08/2019	00:16	Soprano Pipistrelle
14/08/2019	00:25	Soprano Pipistrelle
14/08/2019	00:29	Soprano Pipistrelle
14/08/2019	00:33	Soprano Pipistrelle
14/08/2019	00:41	Soprano Pipistrelle
14/08/2019	00:55	Soprano Pipistrelle
14/08/2019	00:55	Soprano Pipistrelle
14/08/2019	00:55	Soprano Pipistrelle
14/08/2019	02:06	Soprano Pipistrelle
14/08/2019	02:27	Soprano Pipistrelle
14/08/2019	02:41	Soprano Pipistrelle
14/08/2019	03:28	Soprano Pipistrelle
14/08/2019	03:30	Soprano Pipistrelle
14/08/2019	03:38	Soprano Pipistrelle
14/08/2019	04:07	Soprano Pipistrelle
14/08/2019	04:38	Soprano Pipistrelle
14/08/2019	04:46	Soprano Pipistrelle
14/08/2019	05:03	Soprano Pipistrelle
14/08/2019	05:31	Soprano Pipistrelle
14/08/2019	21:45	Soprano Pipistrelle
14/08/2019	21:47	Soprano Pipistrelle
14/08/2019	22:18	Soprano Pipistrelle
14/08/2019	22:50	Soprano Pipistrelle
14/08/2019	22:50	Soprano Pipistrelle
14/08/2019	22:56	Soprano Pipistrelle
14/08/2019	23:10	Soprano Pipistrelle
14/08/2019	23:13	Soprano Pipistrelle
14/08/2019	23:27	Soprano Pipistrelle
15/08/2019	22:52	Leisler's Bat
15/08/2019	00:17	Soprano Pipistrelle
15/08/2019	00:21	Soprano Pipistrelle
15/08/2019	00:31	Soprano Pipistrelle
15/08/2019	00:31	Soprano Pipistrelle
15/08/2019	00:31	Soprano Pipistrelle
15/08/2019	00:31	Soprano Pipistrelle

Date	Time	Bat Species
15/08/2019	00:50	Soprano Pipistrelle
15/08/2019	00:50	Soprano Pipistrelle
15/08/2019	00:50	Soprano Pipistrelle
15/08/2019	00:50	Soprano Pipistrelle
15/08/2019	00:54	Soprano Pipistrelle
15/08/2019	00:57	Soprano Pipistrelle
15/08/2019	00:58	Soprano Pipistrelle
15/08/2019	00:58	Soprano Pipistrelle
15/08/2019	01:01	Soprano Pipistrelle
15/08/2019	01:03	Soprano Pipistrelle
15/08/2019	01:13	Soprano Pipistrelle
15/08/2019	01:13	Soprano Pipistrelle
15/08/2019	01:13	Soprano Pipistrelle
15/08/2019	01:13	Soprano Pipistrelle
15/08/2019	01:13	Soprano Pipistrelle
15/08/2019	01:27	Soprano Pipistrelle
15/08/2019	01:27	Soprano Pipistrelle
15/08/2019	01:30	Soprano Pipistrelle
15/08/2019	01:34	Soprano Pipistrelle
15/08/2019	01:36	Soprano Pipistrelle
15/08/2019	01:37	Soprano Pipistrelle
15/08/2019	01:42	Soprano Pipistrelle
15/08/2019	01:43	Soprano Pipistrelle
15/08/2019	01:45	Soprano Pipistrelle
15/08/2019	01:47	Soprano Pipistrelle
15/08/2019	01:47	Soprano Pipistrelle
15/08/2019	01:48	Soprano Pipistrelle
15/08/2019	01:52	Soprano Pipistrelle
15/08/2019	02:00	Soprano Pipistrelle
15/08/2019	02:00	Soprano Pipistrelle
15/08/2019	02:01	Soprano Pipistrelle
15/08/2019	02:03	Soprano Pipistrelle
15/08/2019	02:03	Soprano Pipistrelle
15/08/2019	02:14	Soprano Pipistrelle
15/08/2019	02:21	Soprano Pipistrelle
15/08/2019	02:24	Soprano Pipistrelle
15/08/2019	02:34	Soprano Pipistrelle
15/08/2019	02:35	Soprano Pipistrelle
15/08/2019	02:37	Soprano Pipistrelle
15/08/2019	02:48	Soprano Pipistrelle
15/08/2019	02:49	Soprano Pipistrelle
15/08/2019	02:53	Soprano Pipistrelle
15/08/2019	02:55	Soprano Pipistrelle
15/08/2019	02:55	Soprano Pipistrelle
15/08/2019	02:55	Soprano Pipistrelle
15/08/2019	02:59	Soprano Pipistrelle

Date	Time	Bat Species
15/08/2019	02:59	Soprano Pipistrelle
15/08/2019	03:02	Soprano Pipistrelle
15/08/2019	03:05	Soprano Pipistrelle
15/08/2019	03:06	Soprano Pipistrelle
15/08/2019	03:10	Soprano Pipistrelle
15/08/2019	03:14	Soprano Pipistrelle
15/08/2019	03:42	Soprano Pipistrelle
15/08/2019	03:44	Soprano Pipistrelle
15/08/2019	03:50	Soprano Pipistrelle
15/08/2019	04:02	Soprano Pipistrelle
15/08/2019	04:13	Soprano Pipistrelle
15/08/2019	04:17	Soprano Pipistrelle
15/08/2019	04:18	Soprano Pipistrelle
15/08/2019	05:21	Soprano Pipistrelle
15/08/2019	05:29	Soprano Pipistrelle
15/08/2019	05:42	Soprano Pipistrelle
15/08/2019	21:43	Soprano Pipistrelle
15/08/2019	21:46	Soprano Pipistrelle
15/08/2019	21:55	Soprano Pipistrelle
15/08/2019	22:51	Soprano Pipistrelle
15/08/2019	22:56	Soprano Pipistrelle
15/08/2019	22:57	Soprano Pipistrelle
15/08/2019	22:57	Soprano Pipistrelle
15/08/2019	22:57	Soprano Pipistrelle
15/08/2019	22:57	Soprano Pipistrelle
15/08/2019	22:58	Soprano Pipistrelle
15/08/2019	22:58	Soprano Pipistrelle
15/08/2019	22:58	Soprano Pipistrelle
15/08/2019	22:59	Soprano Pipistrelle
15/08/2019	22:59	Soprano Pipistrelle
15/08/2019	22:59	Soprano Pipistrelle
15/08/2019	22:59	Soprano Pipistrelle
15/08/2019	22:59	Soprano Pipistrelle
15/08/2019	23:02	Soprano Pipistrelle
15/08/2019	23:03	Soprano Pipistrelle
15/08/2019	23:03	Soprano Pipistrelle
15/08/2019	23:03	Soprano Pipistrelle
15/08/2019	23:03	Soprano Pipistrelle
15/08/2019	23:03	Soprano Pipistrelle
15/08/2019	23:05	Soprano Pipistrelle
15/08/2019	23:06	Soprano Pipistrelle
15/08/2019	23:06	Soprano Pipistrelle
15/08/2019	23:07	Soprano Pipistrelle
15/08/2019	23:07	Soprano Pipistrelle
15/08/2019	23:07	Soprano Pipistrelle
15/08/2019	23:07	Soprano Pipistrelle
15/08/2019	23:08	Soprano Pipistrelle

Date	Time	Bat Species
15/08/2019	23:08	Soprano Pipistrelle
15/08/2019	23:08	Soprano Pipistrelle
15/08/2019	23:08	Soprano Pipistrelle
15/08/2019	23:09	Soprano Pipistrelle
15/08/2019	23:09	Soprano Pipistrelle
15/08/2019	23:09	Soprano Pipistrelle
15/08/2019	23:09	Soprano Pipistrelle
15/08/2019	23:09	Soprano Pipistrelle
15/08/2019	23:10	Soprano Pipistrelle
15/08/2019	23:10	Soprano Pipistrelle
15/08/2019	23:11	Soprano Pipistrelle
15/08/2019	23:12	Soprano Pipistrelle
15/08/2019	23:14	Soprano Pipistrelle
15/08/2019	23:15	Soprano Pipistrelle
15/08/2019	23:16	Soprano Pipistrelle
15/08/2019	23:17	Soprano Pipistrelle
15/08/2019	23:17	Soprano Pipistrelle
15/08/2019	23:18	Soprano Pipistrelle
15/08/2019	23:18	Soprano Pipistrelle
15/08/2019	23:18	Soprano Pipistrelle
15/08/2019	23:20	Soprano Pipistrelle
15/08/2019	23:20	Soprano Pipistrelle
15/08/2019	23:21	Soprano Pipistrelle
15/08/2019	23:21	Soprano Pipistrelle
15/08/2019	23:22	Soprano Pipistrelle
15/08/2019	23:22	Soprano Pipistrelle
15/08/2019	23:26	Soprano Pipistrelle
15/08/2019	23:26	Soprano Pipistrelle
15/08/2019	23:26	Soprano Pipistrelle
15/08/2019	23:26	Soprano Pipistrelle
15/08/2019	23:26	Soprano Pipistrelle
15/08/2019	23:27	Soprano Pipistrelle
15/08/2019	23:27	Soprano Pipistrelle
15/08/2019	23:29	Soprano Pipistrelle
15/08/2019	23:29	Soprano Pipistrelle
15/08/2019	23:29	Soprano Pipistrelle
15/08/2019	23:30	Soprano Pipistrelle
15/08/2019	23:30	Soprano Pipistrelle
15/08/2019	23:34	Soprano Pipistrelle
15/08/2019	23:35	Soprano Pipistrelle
15/08/2019	23:38	Soprano Pipistrelle
15/08/2019	23:40	Soprano Pipistrelle
15/08/2019	23:40	Soprano Pipistrelle
15/08/2019	23:40	Soprano Pipistrelle
15/08/2019	23:40	Soprano Pipistrelle
15/08/2019	23:42	Soprano Pipistrelle

Date	Time	Bat Species
15/08/2019	23:42	Soprano Pipistrelle
15/08/2019	23:42	Soprano Pipistrelle
15/08/2019	23:43	Soprano Pipistrelle
15/08/2019	23:43	Soprano Pipistrelle
15/08/2019	23:50	Soprano Pipistrelle
15/08/2019	23:52	Soprano Pipistrelle
15/08/2019	23:52	Soprano Pipistrelle
15/08/2019	23:53	Soprano Pipistrelle
15/08/2019	23:57	Soprano Pipistrelle
15/08/2019	03:01	Pipistrelle Spp.
16/08/2019	00:10	Leisler's Bat
16/08/2019	00:25	Soprano Pipistrelle
16/08/2019	00:25	Soprano Pipistrelle
16/08/2019	00:26	Soprano Pipistrelle
16/08/2019	00:27	Soprano Pipistrelle
16/08/2019	00:28	Soprano Pipistrelle
16/08/2019	00:28	Soprano Pipistrelle
16/08/2019	00:28	Soprano Pipistrelle
16/08/2019	00:29	Soprano Pipistrelle
16/08/2019	00:29	Soprano Pipistrelle
16/08/2019	00:29	Soprano Pipistrelle
16/08/2019	00:29	Soprano Pipistrelle
16/08/2019	00:29	Soprano Pipistrelle
16/08/2019	00:29	Soprano Pipistrelle
16/08/2019	00:30	Soprano Pipistrelle
16/08/2019	00:30	Soprano Pipistrelle
16/08/2019	00:30	Soprano Pipistrelle
16/08/2019	00:55	Soprano Pipistrelle
16/08/2019	01:03	Soprano Pipistrelle
16/08/2019	04:36	Soprano Pipistrelle
16/08/2019	04:39	Soprano Pipistrelle
16/08/2019	04:39	Soprano Pipistrelle
16/08/2019	04:39	Soprano Pipistrelle
16/08/2019	04:58	Soprano Pipistrelle
16/08/2019	05:01	Soprano Pipistrelle
16/08/2019	05:01	Soprano Pipistrelle
16/08/2019	05:01	Soprano Pipistrelle
16/08/2019	05:07	Soprano Pipistrelle
16/08/2019	05:07	Soprano Pipistrelle
16/08/2019	05:16	Soprano Pipistrelle
16/08/2019	23:06	Soprano Pipistrelle
16/08/2019	23:14	Soprano Pipistrelle
16/08/2019	23:22	Soprano Pipistrelle
16/08/2019	23:49	Soprano Pipistrelle
16/08/2019	23:49	Soprano Pipistrelle
17/08/2019	00:26	Soprano Pipistrelle
17/08/2019	01:03	Soprano Pipistrelle

Date	Time	Bat Species
17/08/2019	01:15	Soprano Pipistrelle
17/08/2019	01:39	Soprano Pipistrelle
17/08/2019	02:10	Soprano Pipistrelle
17/08/2019	02:12	Soprano Pipistrelle
17/08/2019	02:29	Soprano Pipistrelle
17/08/2019	02:49	Soprano Pipistrelle
17/08/2019	02:50	Soprano Pipistrelle
17/08/2019	02:52	Soprano Pipistrelle
17/08/2019	03:02	Soprano Pipistrelle
17/08/2019	03:02	Soprano Pipistrelle
17/08/2019	03:05	Soprano Pipistrelle
17/08/2019	03:17	Soprano Pipistrelle
17/08/2019	03:20	Soprano Pipistrelle
17/08/2019	03:20	Soprano Pipistrelle
17/08/2019	03:21	Soprano Pipistrelle
17/08/2019	03:22	Soprano Pipistrelle
17/08/2019	03:28	Soprano Pipistrelle
17/08/2019	03:28	Soprano Pipistrelle
17/08/2019	03:36	Soprano Pipistrelle
17/08/2019	03:36	Soprano Pipistrelle
17/08/2019	03:40	Soprano Pipistrelle
17/08/2019	03:55	Soprano Pipistrelle
17/08/2019	04:02	Soprano Pipistrelle
17/08/2019	04:08	Soprano Pipistrelle
17/08/2019	04:25	Soprano Pipistrelle
17/08/2019	04:33	Soprano Pipistrelle
17/08/2019	04:35	Soprano Pipistrelle
17/08/2019	04:43	Soprano Pipistrelle
17/08/2019	05:01	Soprano Pipistrelle
17/08/2019	05:10	Soprano Pipistrelle
17/08/2019	05:42	Soprano Pipistrelle
17/08/2019	22:38	Soprano Pipistrelle
17/08/2019	22:57	Soprano Pipistrelle
17/08/2019	23:09	Soprano Pipistrelle
17/08/2019	23:10	Soprano Pipistrelle
17/08/2019	23:10	Soprano Pipistrelle
17/08/2019	23:17	Soprano Pipistrelle
17/08/2019	23:23	Soprano Pipistrelle
17/08/2019	23:23	Soprano Pipistrelle
17/08/2019	23:40	Soprano Pipistrelle
17/08/2019	23:42	Lesser Horseshoe Bat
18/08/2019	00:19	Leisler's Bat
18/08/2019	02:21	Leisler's Bat
18/08/2019	02:22	Leisler's Bat
18/08/2019	22:49	Leisler's Bat
18/08/2019	22:49	Leisler's Bat

Date	Time	Bat Species
18/08/2019	22:49	Leisler's Bat
18/08/2019	00:31	Soprano Pipistrelle
18/08/2019	00:34	Soprano Pipistrelle
18/08/2019	01:07	Soprano Pipistrelle
18/08/2019	01:07	Soprano Pipistrelle
18/08/2019	01:07	Soprano Pipistrelle
18/08/2019	01:07	Soprano Pipistrelle
18/08/2019	01:07	Soprano Pipistrelle
18/08/2019	01:07	Soprano Pipistrelle
18/08/2019	01:08	Soprano Pipistrelle
18/08/2019	01:08	Soprano Pipistrelle
18/08/2019	01:08	Soprano Pipistrelle
18/08/2019	01:18	Soprano Pipistrelle
18/08/2019	01:29	Soprano Pipistrelle
18/08/2019	03:41	Soprano Pipistrelle
18/08/2019	03:41	Soprano Pipistrelle
18/08/2019	03:41	Soprano Pipistrelle
18/08/2019	05:09	Soprano Pipistrelle
18/08/2019	05:10	Soprano Pipistrelle
18/08/2019	05:10	Soprano Pipistrelle
18/08/2019	05:10	Soprano Pipistrelle
18/08/2019	05:11	Soprano Pipistrelle
18/08/2019	05:17	Soprano Pipistrelle
18/08/2019	23:10	Soprano Pipistrelle
18/08/2019	23:11	Soprano Pipistrelle
18/08/2019	23:21	Soprano Pipistrelle
18/08/2019	23:23	Soprano Pipistrelle
18/08/2019	23:23	Soprano Pipistrelle
18/08/2019	23:25	Soprano Pipistrelle
18/08/2019	23:28	Soprano Pipistrelle
18/08/2019	23:29	Soprano Pipistrelle
18/08/2019	23:31	Soprano Pipistrelle
18/08/2019	23:32	Soprano Pipistrelle
18/08/2019	23:34	Soprano Pipistrelle
18/08/2019	23:37	Soprano Pipistrelle
18/08/2019	23:40	Soprano Pipistrelle
18/08/2019	23:41	Soprano Pipistrelle
18/08/2019	23:42	Soprano Pipistrelle
18/08/2019	23:44	Soprano Pipistrelle
18/08/2019	23:45	Soprano Pipistrelle
18/08/2019	23:46	Soprano Pipistrelle
18/08/2019	23:53	Soprano Pipistrelle
18/08/2019	23:58	Soprano Pipistrelle
19/08/2019	00:15	Leisler's Bat
19/08/2019	01:01	Leisler's Bat
19/08/2019	01:02	Leisler's Bat

Date	Time	Bat Species
19/08/2019	01:26	Leisler's Bat
19/08/2019	01:26	Leisler's Bat
19/08/2019	02:06	Leisler's Bat
19/08/2019	02:06	Leisler's Bat
19/08/2019	02:06	Leisler's Bat
19/08/2019	02:06	Leisler's Bat
19/08/2019	02:06	Leisler's Bat
19/08/2019	03:56	Leisler's Bat
19/08/2019	03:56	Leisler's Bat
19/08/2019	03:56	Leisler's Bat
19/08/2019	03:56	Leisler's Bat
19/08/2019	03:57	Leisler's Bat
19/08/2019	03:57	Leisler's Bat
19/08/2019	03:57	Leisler's Bat
19/08/2019	05:34	Leisler's Bat
19/08/2019	00:05	Soprano Pipistrelle
19/08/2019	00:09	Soprano Pipistrelle
19/08/2019	00:30	Soprano Pipistrelle
19/08/2019	00:33	Soprano Pipistrelle
19/08/2019	00:40	Soprano Pipistrelle
19/08/2019	00:41	Soprano Pipistrelle
19/08/2019	00:42	Soprano Pipistrelle
19/08/2019	00:42	Soprano Pipistrelle
19/08/2019	00:43	Soprano Pipistrelle
19/08/2019	00:44	Soprano Pipistrelle
19/08/2019	01:04	Soprano Pipistrelle
19/08/2019	01:09	Soprano Pipistrelle
19/08/2019	01:44	Soprano Pipistrelle
19/08/2019	01:51	Soprano Pipistrelle
19/08/2019	01:53	Soprano Pipistrelle
19/08/2019	01:53	Soprano Pipistrelle
19/08/2019	02:00	Soprano Pipistrelle
19/08/2019	02:05	Soprano Pipistrelle
19/08/2019	02:06	Soprano Pipistrelle
19/08/2019	02:18	Soprano Pipistrelle
19/08/2019	02:19	Soprano Pipistrelle
19/08/2019	02:21	Soprano Pipistrelle
19/08/2019	02:22	Soprano Pipistrelle
19/08/2019	02:31	Soprano Pipistrelle
19/08/2019	02:52	Soprano Pipistrelle
19/08/2019	02:52	Soprano Pipistrelle
19/08/2019	03:02	Soprano Pipistrelle
19/08/2019	03:09	Soprano Pipistrelle
19/08/2019	03:12	Soprano Pipistrelle
19/08/2019	03:24	Soprano Pipistrelle
19/08/2019	03:33	Soprano Pipistrelle

Date	Time	Bat Species
19/08/2019	03:37	Soprano Pipistrelle
19/08/2019	03:37	Soprano Pipistrelle
19/08/2019	03:37	Soprano Pipistrelle
19/08/2019	03:37	Soprano Pipistrelle
19/08/2019	03:38	Soprano Pipistrelle
19/08/2019	03:40	Soprano Pipistrelle
19/08/2019	03:41	Soprano Pipistrelle
19/08/2019	03:45	Soprano Pipistrelle
19/08/2019	03:45	Soprano Pipistrelle
19/08/2019	03:45	Soprano Pipistrelle
19/08/2019	03:46	Soprano Pipistrelle
19/08/2019	03:46	Soprano Pipistrelle
19/08/2019	03:51	Soprano Pipistrelle
19/08/2019	04:08	Soprano Pipistrelle
19/08/2019	04:08	Soprano Pipistrelle
19/08/2019	04:09	Soprano Pipistrelle
19/08/2019	04:10	Soprano Pipistrelle
19/08/2019	04:10	Soprano Pipistrelle
19/08/2019	04:12	Soprano Pipistrelle
19/08/2019	04:12	Soprano Pipistrelle
19/08/2019	04:12	Soprano Pipistrelle
19/08/2019	04:15	Soprano Pipistrelle
19/08/2019	04:36	Soprano Pipistrelle
19/08/2019	05:36	Soprano Pipistrelle
19/08/2019	05:36	Soprano Pipistrelle
19/08/2019	05:47	Soprano Pipistrelle
19/08/2019	05:48	Soprano Pipistrelle
19/08/2019	05:48	Soprano Pipistrelle
19/08/2019	05:50	Soprano Pipistrelle
19/08/2019	05:51	Soprano Pipistrelle
19/08/2019	05:51	Soprano Pipistrelle
19/08/2019	05:51	Soprano Pipistrelle
19/08/2019	00:09	Lesser Horseshoe Bat
19/08/2019	00:09	Lesser Horseshoe Bat
19/08/2019	02:29	Lesser Horseshoe Bat

Table 7 – Results from walked transects

Date	Time	Bat
19/08/2019	22:17	Natter's Bat
19/08/2019	22:16	Leisler's Bat
19/08/2019	22:26	Leisler's Bat
19/08/2019	22:30	Leisler's Bat
19/08/2019	22:31	Soprano Pipistrelle
19/08/2019	22:33	Soprano Pipistrelle
19/08/2019	22:48	Soprano Pipistrelle

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