

Deerpark Adare Bat Report

Final Report

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Comhairle Cathrach
& Contae **Luimnigh**

Limerick City
& County Council

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This report describes work commissioned by Dereck McNamara, on behalf of Limerick City and County Council (LCCC), by a letter dated 11th October 2019. Hannah Mulcahy and Jean Hamilton of JBA Consulting carried out this work.

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Purpose

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Abbreviations

BCI	Bat Conservation Ireland
EC	European Community
EclA	Ecological Impact Assessment
LHB	Lesser Horseshoe Bat
NIS	Natura Impact Statement
NBDC.....	National Biodiversity Data Centre
NPWS	National Parks and Wildlife Services
NRA	National Roads Authority
N2000	Natura 2000
OPW	Office of Public Works
PRF.....	Potential Roost Feature
SAC.....	Special Area of Conservation

1 Introduction

1.1 Background

JBA Consulting Engineers and Scientists Ltd. (hereafter JBA) was commissioned by Limerick City and County Council (LCCC) to undertake a bat survey for a proposed housing development at a site (composed of two separate sub-sites) in Deerpark, Adare, Limerick. This report outlines the findings of the bat survey.

The objective of the survey is to identify any potential bat roosts in trees, commuting routes and feeding areas for bats within the proposed site. This information is required to carry out an ecological impact assessment of the proposed development, and to inform the design of appropriate mitigation measures.

This report used information from the following documents commissioned by Limerick CCC:

- *'Ecological Constraints Report for Housing Project in Adare, Limerick'* prepared by OPENFIELD Ecological Services on behalf of Limerick City and Council (2016).
- *'Screening Report for Appropriate Assessment for housing project in Adare, Limerick'* prepared by OPENFIELD Ecological Services on behalf of Limerick City and Council (2019)
- *Tree Survey Report for Deerpark, Adare* prepared by Arbor-care (Ltd) Professional Consulting Tree Service for Limerick City and County Council (2019)
- *Deerpark, Adare EIAR Screening Report* prepared by JBA Consulting for Limerick City and County Council (2019)

1.2 Legislative Context

All bats species in Ireland are afforded protection under the Wildlife Act (1976) and Wildlife [Amendment] Act (2000). As such this Bat Survey was commissioned by Limerick CCC, to inform the EIAR Screening for a planning application(s) on this site.

Under international legislation, bats are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

Also, the EC Directive on The Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats and requires that appropriate monitoring of populations be undertaken. All bat species are protected under Annex IV of the EU Habitats Directive, while the Lesser Horseshoe Bat (*Rhinolophus hipposideros*) is listed under Annex II. Member states are required to designate Special Areas of Conservation for all species listed under Annex II in order to protect them.

The constraints report (Openfield, 2016) identified the requirement for bat surveys, to determine the usage of the proposed development site by bats in view of the fact all bat species are protected under national, EU and international legislation.

1.3 Site location

The site is located in the west side of Adare, Co. Limerick, north of Killarney Road (N21). Refer to Figure 1-1 for the site location map. The proposed housing development will be over two separate areas on a greenfield site located on the southwestern approach to Adare town with each area being accessed independently off the N21.

Originally part of Deerpark, an established woodland, the southern site includes a stone-faced boundary wall and existing entrance point off the N21. The narrow plot to the North of the site extends from the Deerpark site proper to the N21 opposite the primary school, Scoil Naomh Iosaf. The land falls towards the eastern boundary, includes many mature oak trees spread intermittently throughout, and to the northern edge is in close proximity to a playing field, an existing small housing estate and an overgrown lime kiln.

1.3.1 Proposed development

The proposed development includes the provision of 31 no. units and 8 no. plots for affordable housing at two separate development locations. The housing typologies comprise:

- 7 no. single storey residential units, 18 no. 2 storey residential units, 6 no. apartment units and 8 no. plots for affordable housing. The unit mix comprises; 2 no. single bedroom units, 17 no. 2 bedroom units, 12 no. 3 bedroom units.
- New street connecting proposed scheme with Existing Deerpark Estate, new street connections to the N21, associated footpaths, the reconfiguration of the existing carpark (33 no. spaces) and the provision of new car parking (59 no. spaces);
- Hard landscaping including; homezone areas, bin stores, privacy strip to front gardens, rear garden walls and installation of street lighting;
- Soft landscaping including planting and trees;
- Construction of and / or remedial works to boundaries with adjacent sites;
- Construction of new watermain, new foul sewer connection, storm sewer and surface water drainage systems;
- Connection to public utilities;
- All associated site works.



Figure 1-1 Location of proposed development west of Adare, Co. Limerick

2 Methodology

2.1 Preliminary Appraisal - Habitat Assessment and Preliminary Ground Level Roost Assessment (PGRA)

A preliminary walkover of the proposed site was conducted by JBA Ecologists Hannah Mulcahy and Colm O'Leary to record (from ground level) the suitability of habitats for bats for foraging and commuting purposes, to identify and assess Potential Roost Features (PRFs) present on the proposed sites (north and south), and to assign a level of suitability to each, based on best practice guidance. The assigned level of suitability determined the amount of follow-up surveys required.

The survey encompasses both sites, however it was carried out before exact site boundaries were determined and therefore some of the features identified in Chapter 3 (Results) were not accounted for until after the surveys had been completed (e.g. the lime-kiln).

The potential suitability of the site for roosting and for commuting and foraging habitats is outlined in the table below.

Table 2-1: Guidelines for assessing the potential suitability of proposed development sites for bats based on the presence of habitat features within the landscape, to be applied using professional judgement (From: Collins, 2016)

Suitability	Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.</p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.</p> <p>Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.</p>
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, treelined watercourses and grazed parkland.</p> <p>Site is close to and connected to known roosts.</p>

2.2 Bat transect survey

This report uses survey methodology, guidelines, data and draws upon conclusions determined during multiple bat surveys and using the following documents:

- *Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25.* National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland (Kelleher and Marnell 2006);
- *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition).* Bat Conservation Trust (Collins 2016);
- *A conservation plan for Irish vesper bats, Irish Wildlife Manual No. 20.* National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland (McAney 2006);
- *The status of EU protected habitats and species in Ireland: Conservation status in Ireland of habitats and species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC.* National Parks and Wildlife Service, Department of Environment, Heritage and Local Government (NPWS 2019)
- *Bats and Appropriate Assessment Guidelines.* Bat Conservation Ireland (Bat Conservation Ireland 2012); and
- *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes.* National Roads Authority. (NRA n.d.).

A bat activity transect survey was carried out at the site on the evening of the 7th September 2019, by Jean Hamilton and Hannah Mulcahy. The weather conditions were optimal, with a mild, clear night, 14 degrees and a light breeze. The survey was conducted from sunset at 20:10 to 22:10 using two Magenta 5 Heterodyne bat detectors, one set at 110 KHz (to pick up Lesser Horseshoe Bats) and another was used between 20-60KHz to pick up other bat species. Recordings were referred to only as back up, where there were unidentified calls, to prevent duplication of results. Recordings were not relied on solely, as visual observations were noted throughout the survey to identify bat behaviour (commuting, foraging etc). The transect route was determined by walking close to the boundary of the field, to be close to edge of the treelines and woodlands, as this is where most bat activity will occur. The transect was walked three times during the survey, stopping at regular intervals.

Two static bat detectors (Anabat Express) were deployed at opposite sides of the site near the boundaries from the 2nd- 7th September (5 nights). Data from the static detectors was analysed in Analook W by Hannah Mulcahy, with all results checked for quality control by Jean Hamilton.

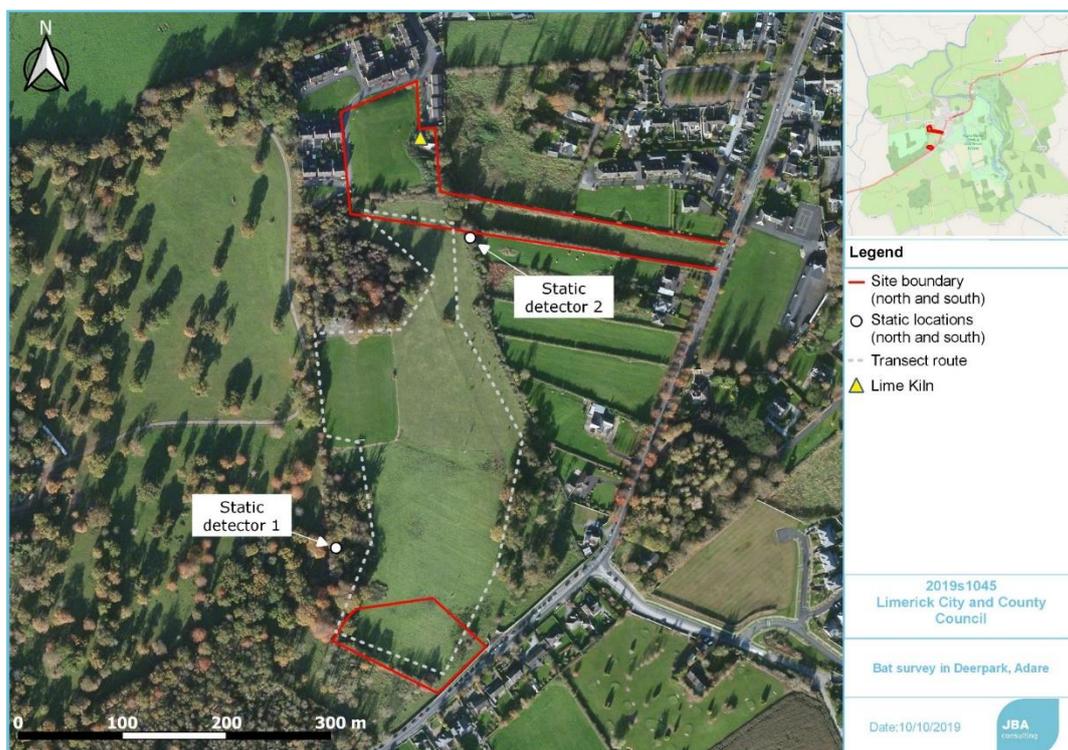


Figure 2-1 shows the transect route for the survey and the location of the static bat detectors.
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2.3 Desk Study

Supplementary data has been collected from:

- National Parks and Wildlife Service NPWS website (NPWS 2018)
- National Biodiversity Data Centre Biodiversity Maps (NBDC 2018)
- Bat Conservation Ireland (BCI 2018).

2.4 Limitations and constraints

The conclusion of this report necessarily relies on some assumptions and it is inevitably subject to some limitations. Most of the assumptions and limitations would not affect the conclusion but the following points are recorded and taken into consideration during the assessment to ensure the basis of the assessment is clear:

- In order to achieve the objectives of the report and surveys within the time period of the commissioning of work and the planning submission, assumptions are made as to the usage of the site by bats outside the survey period. At all times the precautionary principle is used. Therefore, the results of this assessment can be applied with confidence for September only;
- Weather conditions may affect bat activity, so to prevent this limiting survey results, weather forecasts were checked prior to surveys and surveys were not carried out in sub-optimal conditions.
- Over the 5 nights the static bat detectors were placed on site, the weather was dry but windy. The 4th night had a fresh breeze of over 30km/hr wind speeds, but mostly the wind speeds were optimal for bats to emerge.
- Transect surveys and emergence surveys are a snapshot in time and some species of bats can be flexible in their roosting habitats. Bat surveyors are in one location at any given time and could miss activity elsewhere.
- Bat detectors can only provide an index of activity rather than absolute numbers of bats;
- Visibility at night may not allow for completely accurate counting of number of bats present;
- Bat behaviour cannot be determined from recordings made by static bat detectors.
- Subjectivity of surveyors can limit consistency, repeatability and quantitative analysis;
- The Potential Roost Feature (PRF) assessment of trees was conducted from the ground, with the limitation that not all PRFs could be identified. A further limitation was the time of year; the trees were in full leaf and the foliage may have obscured potential roost features.
- Identification of separate species from the *Myotis* genus is difficult to ascertain from echolocation, and therefore any species in this genus is listed as *Myotis sp.*

The impact assessment and design of mitigation measures will take all the above limitations into consideration.

3 Results

3.1 Desktop study

The historical records (National Biodiversity Data Centre) reveal that the following bat species populations have been recorded within a 10km square (R44) area around the site:

- Lesser Horseshoe Bat *Rhinolophus hipposideros*
- Brown Long-eared Bat *Plecotus auritus*
- Daubenton's Bat *Myotis daubentonii*
- Lesser Noctule *Nyctalus leisleri*
- Nathusius's Pipistrelle *Pipistrellus nathusii*
- Natterer's Bat *Myotis nattereri*
- Pipistrelle *Pipistrellus pipistrellus*
- Soprano Pipistrelle *Pipistrellus pygmaeus*

From the NBDC database, with data supplied by various sources included Bat Conservation Ireland BATLAS data, and the National Lesser Horseshoe Bat Database, Figure 3-1 shows records for Lesser Horseshoe Bats that have been recorded in close proximity to the site.



Figure 3-1 Lesser horseshoe bat records (from NBDC) near sites around Adare with nearby protected sites

3.2 Habitat Appraisal and Preliminary Ground Level Roost Assessment

The preliminary survey was conducted by JBA Ecologists Hannah Mulcahy and Colm O'Leary on the 26th August. The two sites are located in an area that has many mature trees and hedgerows. In particular there are many Oak trees that were noted for their Potential Roost Features (PRFs) in and around the two sites. These are cracks and crevices that have formed on the bark and branches of trees make potentially good roosting spots for many species of bats.

All trees surveyed during the ground assessment have been linked to the tree numbering system in the arborist survey in Appendix 1. The potential roost features and the score for roosting potential are described per tree. Refer to the map in the Arborist report (Arbor-care, 2019) for the location and description of these trees on site.

The map below (Figure 3-2) shows the location of the Lime kiln, which could be a potential roost for bats. There is a mature hawthorn hedgerow in the boundary of the north site, which could be a commuting feature for bats. There are three areas of woodland that have been identified to have PRFs in the trees (see Figure 3-3 to Figure 3-7 for examples of these PRFs). A solitary oak to the south of the north site has some PRFs (Figure 3-7). These features are potentially significant habitat for bats may require further investigation should they be destined for removal or disturbance in the scope of the proposed works.



Figure 3-2 Map of locations of PRFS identified from preliminary survey.



Figure 3-3 Knot holes in the trunks and branches of some trees on site may support roosting bats



Figure 3-4 Broken limbs on some of the trees may support roosting bats



Figure 3-5 This dead oak near to the south site (but not in the boundary) had the highest amount of PRFs.



Figure 3-6 split and broken branches on oaks are potentially suitable bat roost features



Figure 3-7 The solitary oak close to the North site had many PRFs, including this large knot hole (named solitary oak in Figure 3-2)



Figure 3-9 Aerial view of the north site, with the position of lime kiln and mature hawthorn hedgerow



Figure 3-8 Overgrown Lime-kiln on the north site, which could be a potential roost for bats

3.3 Bat Activity Survey

3.3.1 Walked Transect

A transect (see route in Figure 2-1) was carried out on 6th September from 20.10 to 22.10 by JBA Ecologists Hannah Mulcahy and Jean Hamilton. Sunset was at 20.10 and the weather conditions were mild, fair with no wind and 14 degrees, which is optimal for this survey.

Three species were noted during the walked transect:

- Leisler's Bat (*Nyctalus leisleri*)
- Common Pipistrelle (*Pipistrellus pipistrellus*)
- Soprano Pipistrelle (*Pipistrellus pygmaeus*)

The first bat, a soprano pipistrelle, was recorded at 20.35. Almost all bats recorded during the transect were seen or recorded to the west of the site, close to the large area of woodland and parkland, which is also away from any residential areas and more brightly lit areas. Notes from the transect are shown in Appendix B.

3.3.2 Static Detector Survey

Two Anabat Express static bat detectors were placed in the north site (static 2) and south site (static 1) boundary of the site (see locations in Figure 2-1), for 5 nights in total, from 2nd September to 6th September. Over the 5 nights the static bat detectors were placed on site, the weather was dry but windy. The 4th night had a fresh breeze of over 30km/hr wind speeds, but mostly the wind speeds were optimal for bats to emerge.

Note on that the static detectors were collected on the night of the transect survey (6th September), and therefore were only recording until the end of the survey (approximately 22:10).

Overall the static detector 1, placed on the south western boundary, picked up the most bat calls (5 species, while static detector 2 picked up less than a quarter of the calls from only 3 species (Table 3-1).

The three species of bats that were recorded during the transect, Leisler's bat, Soprano Pipistrelle and Common Pipistrelle were also picked up every night on the static detector 1. Leisler's bat was the most recorded with 468 calls in total from detector 1 and 83 calls from detector 2. Soprano Pipistrelle was the second most recorded bat on site. This result is reflected by the walked transect

On the fourth night (5th and 6th of September) a Lesser Horseshoe bat was recorded at 21:46 and again at 01:10 by detector 1. Also on this night an unconfirmed Myotis bat species was recorded, possibly Daubenton's bat, also from detector 1.

Table 3-1 Calls per species per night from the two static detectors placed on site from 2nd-6th September

Static	Bats	2nd	3rd	4th	5th	6th	Total
South (detector 1)	Common Pipistrelle	9	7	15	12	9	52
	Soprano Pipistrelle	26	50	42	30	36	184
	Leisler's bat	72	180	50	102	64	468
	Lesser Horseshoe bat				1	1	2
	Myotis sp.				1		1
	Total		107	237	107	146	111
North (detector 2)	Common Pipistrelle		4	3	1		8
	Soprano Pipistrelle			4	2		6
	Leisler's bat	6	38	32	5	2	83
	Total	6	42	39	8	2	97
	Grand Total	113	279	146	154	113	805

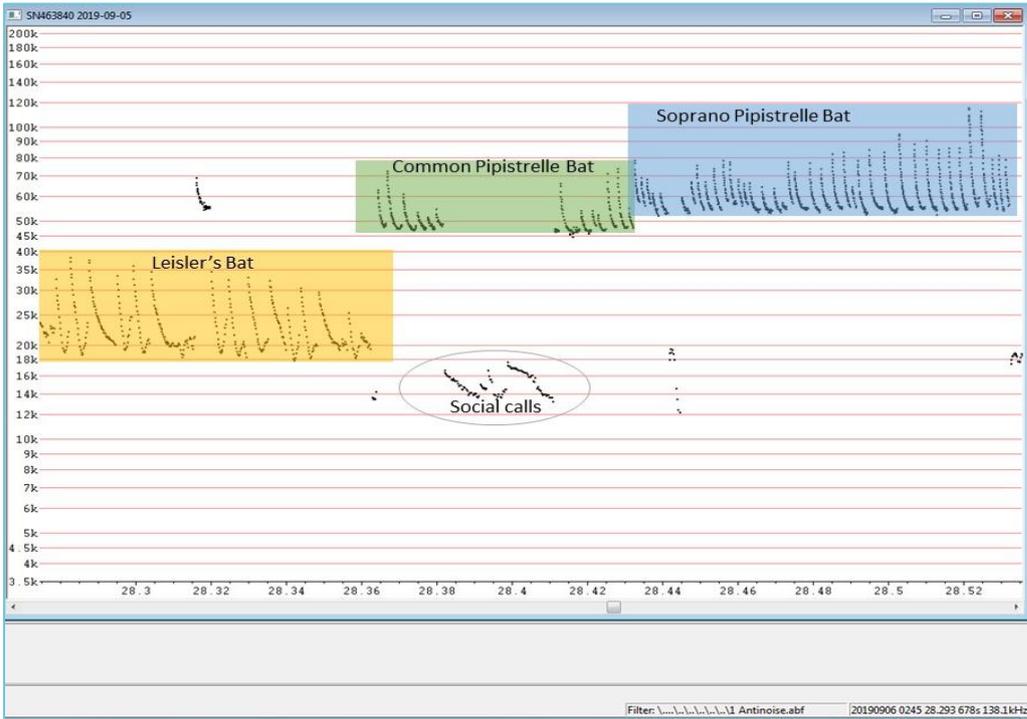


Figure 3-10 Calls on static detector 1 from Liesler's bat, Common pip, and Soprano pip, including social calls from Common pip.

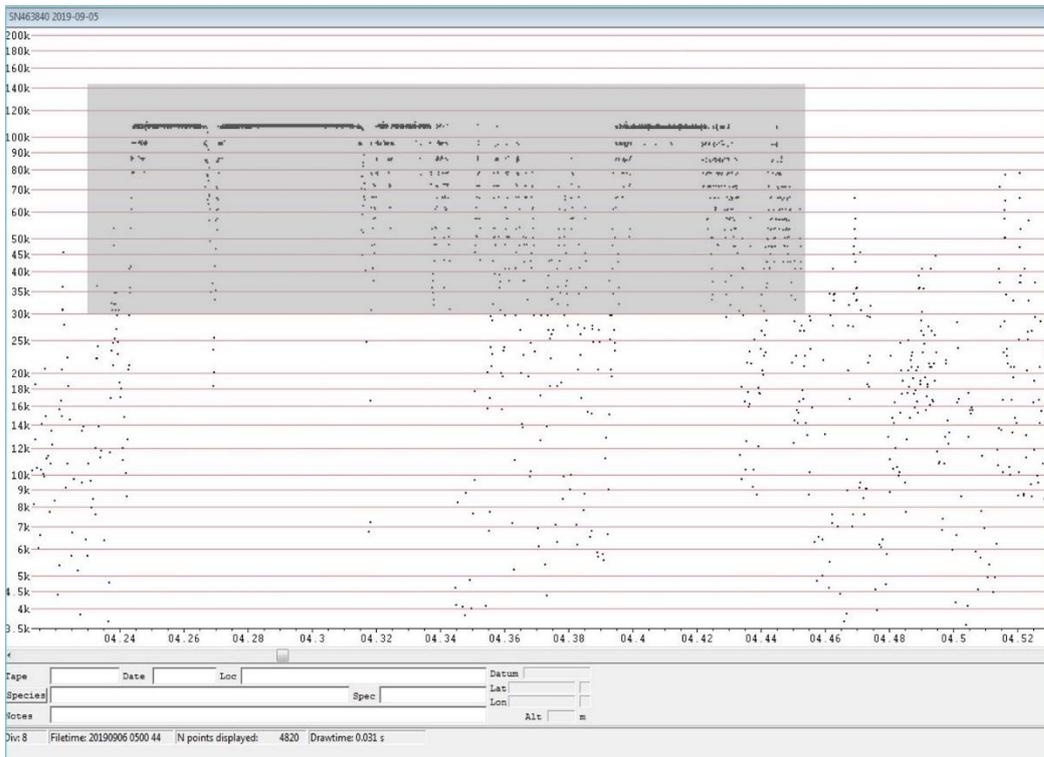


Figure 3-11 The distinct call of a Lesser horseshoe bat (110Khz), recorded on the 5th September at 21:46.

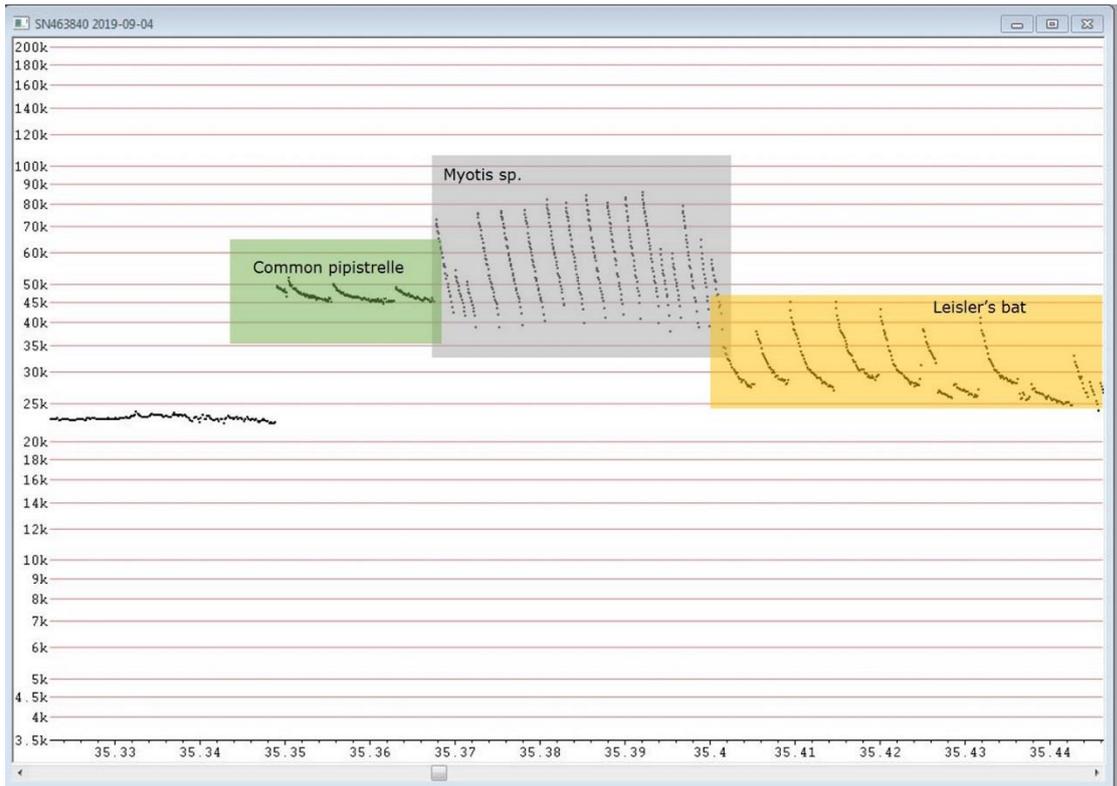


Figure 3-12 Myotis sp. Call (80-40Khz), with Common pipistrelle and Leisler's bat calls.

4 Conclusions

The west of the site showed the most bat activity, both during the transect and from the Anabat Express static data. Bat species recorded within the site during the surveys were:

- Leisler's Bat (*Nyctalus leisleri*)
- Common Pipistrelle (*Pipistrellus pipistrellus*)
- Soprano Pipistrelle (*Pipistrellus pygmaeus*)
- Lesser Horseshoe bat (*Rhinolophus hipposideros*)
- Myotis species (*Myotis sp.*)

From the data gathered from the preliminary habitat and roost survey, and from the transect and static bat detector data, it is determined that the suitability of the trees on this site for roosting bats is moderate and the suitability of this site for foraging and commuting bats is high.

The transect survey data and data from Static detector location 1 showed that the treelines that border the western boundary, which includes many mature trees, provide excellent foraging and commuting opportunities for bats. The western boundary is adjacent to the pNHA Adare Woodlands, a protected woodland, and open parkland field, both of which provide a suitable habitat for bats.

Fewer bats were recorded during the transect and from Static detector location 2 at the north-eastern end of the site. This is likely due to higher amount of light from residential area and roads, and less opportunities for feeding as there a fewer mature trees. It was noted that at night the site is quite brightly lit to the east and south of the site due to the street lighting from the N21 Killarney Road, and from the existing residential areas.

Note that some areas of the northern site were not fully surveyed. The area that was not surveyed includes a lime-kiln structure and a mature hawthorn hedgerow, which could have features suitable for roosting and foraging bats, as described from the results. Further surveys may be required if disturbance of these features is envisaged.

Many of the mature, dying and dead trees on or near the site have potential roost features (PRFs). It is recommended that these trees are retained within the development. If they are to be removed, further surveys will be required to determine the presence of roosting bats; if presence of roosting bats is found, a derogation licence will be required for their removal. The advisory services of an ecologist should be sought regarding tree removal to enable an adequate mitigation plan to be put in place in advance of works.

Lesser horseshoe bat (LHB) was recorded once on the static bat detector (location 1, in Figure 2-1) that was recording on site for 5 nights. It is likely this species is foraging in the area, particularly as they are known to roost around the town of Adare, but there are no roosting opportunities for LHB on this site as this species only roost in buildings or caves, not in trees. LHB is a special feature of the nearby Curraghchase Woods SAC (c. 5km away) and there are other roosts for this species located in and around Adare (Figure 3-1). This species is very sensitive to light and, as they forage close to or possibly in the area, any future lighting scheme should be designed to avoid impacting on this bat species.

It is important to note that this report is based on limited survey evidence and that subsequent survey prior to construction should be carried out to rule-out bat roosting in any features destined for removal (eg: building structure, trees, lime kiln). Likewise, further surveys should be undertaken to more fully determine the level of usage of the site by bats at other times of the year.

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Appendices

A Preliminary survey for Potential Roost Features

Appendix 1 Table of Potential Roost Feature survey of trees on site. Link to the tree numbering scheme in the Arborist survey is in column 2 (arb. tree no.)

JBA tree no.	Arb. tree no.	Species	Condition	PRF score	PRF types
1	T5717	Oak	Alive	Medium	branches cracking, peeling bark, boughs split
2	T5718	Oak	Alive	Medium	branches cracking, peeling bark, boughs split, ivy on trunk
3	T5719	Oak	Alive	Medium	branches cracking, peeling bark, boughs split
4	T5720	Oak	Alive	Medium	Broken branch, peeling bark, ivy
5	T5722	Beech	Alive	Low	ivy
6	T5725	Oak	Alive	Low-medium	Holes, cracks
7	T5721	Beech	Alive	Low-medium	Fluting, broken branches
8	(hedge)	Willow	Alive	Low-medium	Split and broken branches, ivy
9	T2372	Oak	Dead	High	Holes, peeling bark, cracked limbs, boughs split
10	T2370	Sycamore	Alive	Low	ivy
11	T2369	Oak	alive	Low-medium	Ivy, bark crevices
12	T2371	Oak	alive	Low-medium	Ivy, bark crevices
13	T2364	Oak	dead	Medium	ivy, peeling bark
14	T2364	Oak	dead	Medium	pollarded tree- hollow inside, cracks and crevice's, ivy
15	T2365A	Oak	dead	medium-high	pollarded tree- hollow inside, cracks and crevice's, ivy
16	T2362	Oak	alive	low	ivy, small crevices in trunk
17	T2360	Beech	alive	Low	2361 tag
18	T2361	Beech	alive	Low	2330 tag, stem holes, ivy
19	T2358	Oak	alive	low-medium	cracked branches,
20 (around 18 trees)	T5596- T5714	oak	alive	Low-medium	broken branches, small holes. This applies to all oak trees in south eastern woodland of site (around 18-20 trees). All 1-2m DBH, mature, but low number of PRFs
21	T5715	Oak	alive	Medium	large hole, lots of small cracks and crevices

B Bat transect recording form

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Bat Survey Recording Form

Name	Hannah & Jean	Temp	Start: 14 °C	Finish: °C
Date	6/9/19	Start time	8.10 pm	
Site	Adore	End time		
Survey point		Weather	Mild, fair 6 octas Wind: 2	
Type of survey	Transect.			

I magenta at 110KHz

No.	Time	KHz	Comments (e.g., species, Commuting/Foraging/Emerging)
1	8.35		SNH 11
2	8.40	55	leclint? 2 bats chasing each other
3	8.44	55	2 SPiP.
4	8.50	45	CPiP 11 foraging + SPiP (55) 11
5	8.55	45	CPiP.
6	9.25	55	SPiP.
7	9.26	40	Lieser?
8	9.28	45	CPiP.
9	9.43	55	SPiP
10	9.52	55	SPiP.
11			
12			
13			
14			
15			
16			
17			
18			

hanging around tree. SE woods.

Sport field

Near main road (SE woods)

Sports field.

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