BAT SURVEY REPORT

Land off Primrose Lane, Hightown, Liversedge

Jones Homes (Yorkshire) Ltd.

AES-LTD

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Field Investigations and Data

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Field Investigations and Data

Where field investigations have been carried out these have been restricted to a level of detail required to achieving the stated objectives of the work. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by AES-LTD for inaccuracies in the data supplied by any other party.

Data / Report Validity

The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary and no guarantee is given as to the possibility of changes in the environment of the site and surrounding area at differing times. The details within this report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

Note that the recommendations within this report should be reviewed (and reassessed if necessary) should there be any changes to the red line boundary or development proposals upon which this report was based on.

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Issue Status	**Prepared / Approved**	**Date**
Draft 1	Dr Caroline Hillier MCIEEM	17/10/2022
Client Issue	Charlotte Mercer M.SC, B.Sc (Hons)	04/04/2023

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EXECUTIVE SUMMARY

CONTENTS	SUMMARY
Site Location	Off Primrose Lane, Hightown, Liversedge, Kirklees, West Yorkshire. WF15 6QY
Approximate Central Grid Reference	SE 19695 24112
Proposals	Site clearance and construction of 67 new residential properties.
Scope of this Survey(s)	Bat activity surveys were undertaken to determine the presence/absence of bats within the site boundary, or in close proximity to the survey boundary, determine the species assemblage and to understand how they were using the site (e.g. roosting, foraging, commuting).
Designated Sites	There are no statutory sites of nature conservation interest within the 2km search area. There are no non-statutory sites of nature conservation interest within the 2km search area. The site partly lies within the Kirklees Wildlife Habitat Network. The woodland to the north and north-east of the survey area makes up part of the Wildlife Habitat Network. • The north western part of the woodland is within an area of Green Belt (Liverpool, Manchester & West Yorkshire Green Belt, Kirklees District [B]). This Green Belt covers an area of 2824.2ha in its entirety.
Recommendations for Further Survey	None, unless a significant period of time passes (2 years) between the application being accepted and works commencing
Recommendations	• A sensitive lighting strategy is recommended to reduce potential impacts on foraging and commuting bats; • All BAP habitats to be retained wherever possible to retain foraging and commuting habitat; • Placement of two bat boxes in mature trees; • Integrated bat boxes provided in 10% (~7no.) of the new build residential properties, and • Habitat enhancement/creation including and a sensitive planting scheme that enhances existing habitats and creates additional habitat that can be used by foraging and commuting bats.

1.0 INTRODUCTION

BACKGROUND

1.1 Applied Ecological Services Ltd. (AES-LTD) was commissioned by Jones Homes (Yorkshire) Ltd to undertake bat activity surveys at an area of land off Primrose Lane, Hightown, Liversedge, Kirklees, West Yorkshire, WF15 6QY. The bat surveys were carried out in accordance with current guidelines (Collins, 2016)[1].

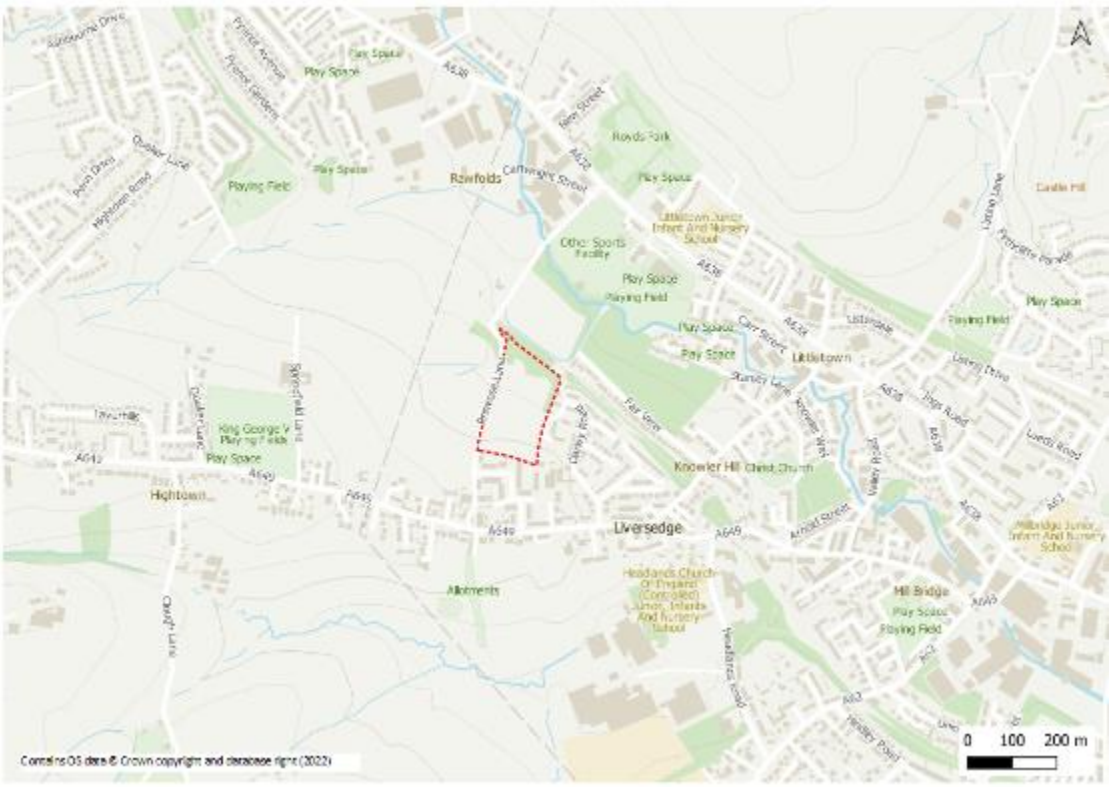
SITE DESCRIPTION

1.2 The site is located between Heckmondwike and Cleckheaton and is accessed from Halifax Road (A469). The site is within a semi-rural area approximately 0.5km south east of Cleckheaton. The approximate centre of the site is located at OS grid reference SE 19695 24112. Land use surrounding the site is primarily agricultural land, to the west, woodland and agricultural land to the north and residential areas to the south and east. The agricultural fields are delineated by a combination of fences, hedgerows and stone walls. The River Spen is located 0.16km to the north of the site boundary.

1.3 The survey area covers an area of 3.06ha (7.56 acres). The approximate central point of the site is at grid reference SE 19695 24112. The site location is illustrated on **Figure 1.**

[1] Collins J. (Ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

Figure 1: Site Location



PROPOSED WORKS

1.4 It is understood that an application is being made for the clearance of the site and construction of 67 new residential properties comprising 12 two bedroom apartments, eight semi-detached/Detached 3 bedroom properties and 47 detached properties (eight 5 bedroom & 39 4 bedroom), with associated infrastructure, hard and soft landscaping.

AIMS OF FIELD SURVEY

1.5 The objective of the survey was to determine the presence/absence of bats, if present where and how they were using the site (see **Figure 1**). The bat surveys were designed to collect the following information:

- The presence or absence of bats within the site boundary, or in close proximity to the survey boundary;
- The presence of roosts or potential roost locations, and
- The assemblage of bat species using the site.

2.0 METHODS

2.1 A daytime survey of the site was undertaken in order to investigate the potential of the habitats on site to support bats. In line with current guidance (Collins 2016), a suite of transect surveys and automated detector surveys were undertaken throughout the bat survey season.

PRE-SURVEY DATA SEARCH

2.2 In order to compile existing baseline information, relevant ecological information was requested from the following organisations which for the purposes of this report, included:

- West Yorkshire Ecological Services (WYES);
- Multi Agency Geographic Information for the Countryside (Magic) website.

2.3 A 2km radius was searched for sites within the National Site Network of International nature conservation importance, such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and RAMSAR sites. A 2km radius was searched for statutory sites of national, regional and local importance, such as Sites of Special Scientific Interest (SSSIs) or National Nature Reserves (NNR), Local Nature Reserves (LNRs), and a 2km radius for non-statutory designated sites such as Local Wildlife Sites (LWS) and also for records of protected and notable species.

2.4 Further inspection, using colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk), was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

SURVEYOR INFORMATION

2.5 The protected species walkover survey of the site was initially undertaken by Dr Caroline Hillier MCIEEM senior ecologist at AES-LTD, a member of Durham Bat Group and a licensed bat surveyor (2015-15581-CLS-CLS). Caroline has over 16 years' full-time experience as an ecologist carrying out bat risk assessments and activity surveys and has assisted with bat surveys since 1995. Caroline Hillier led the bat surveys and also compiled the bat risk assessment report. Other surveyors included Charlotte Mercer, Elizabeth Thompson, and Stephen Wharton, all experienced bat surveyors.

FIELD SURVEYS

Habitat Survey

2.6 An ecological appraisal of the site enables the classification of features within the site for their suitability for roosting, commuting and foraging bats. **Table 1** below is taken from Collins (2016) detailing what makes features on site more, or less suitable for bats.

Table 1: Potential Suitability of Proposed Development Sites.

Suitability	Description Roosting Habitats	Commuting and Foraging Habitat
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	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 a large number of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain potential roost features (PRF) but with none seen from the ground or features seen only with limited roosting potential.	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. Suitable but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in parkland situation) or a patch of scrub.
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 are 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).	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. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat	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. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaf woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

2.7 The surrounding habitat was assessed for its suitability as bat foraging or commuting habitat.

Activity surveys

2.8 A programme of five transect surveys were scheduled at the site as the development area is assessed as being of moderate foraging/commuting potential. The site has connectivity to good foraging/commuting habitat with excellent connectivity to the wider landscape, as the north western part of the woodland is within an area of Green Belt (Liverpool, Manchester & West Yorkshire Green Belt, Kirklees District [B]). The Kirklees green belt forms part of a larger interwoven area of Green Belt (covering an area of 2824.02ha) that spans West and South Yorkshire and encompasses the major Yorkshire conurbations of Leeds, Bradford, Huddersfield, Wakefield and Halifax.

2.9 For the transect surveys from sunset, surveyors, equipped with bat detectors, walked a pre-arranged route around the habitat features within the site so that foraging/commuting bats could be detected. Bats were counted and the species, time and location of detected bats were noted, as was their direction of flight.

2.10 AES-Ltd staff were equipped with Echo Meter Touch 2 pro detectors attached to iPad Mini 4 tablets to record the calls of bats on site, these bat calls were transferred to Kaleidoscope for processing and to BatSound 4.4 for analysis of species composition.

2.11 Static detectors (Elekon Bat logger A+ bat detectors) were deployed at two fixed monitoring locations within the site on a monthly basis for five consecutive nights on each survey occasion between May and September. Detectors were programmed to simultaneously and automatically activate and record ultrasonic activity 30 minutes before sunset and turn off 30 minutes after sunrise. This ensured that bat species which emerge early in the evening and return to roosts late, such as noctules, are included within the survey period. **Drawing 2** illustrates the route surveyors took during bat activity surveys, a summary of the bat activity recorded during the bat transect surveys and the location of the static bat detectors.

2.12 The surveys were carried out in early and late June, July, August and September 2022. Survey times are summarised in **Tables 2 and 3** and weather conditions for surveys undertaken summarised in **Tables 4 and 5** (figures in bold indicate sub-optimal weather conditions). A key for the Beaufort Scale is provided in **Table 6**.

Table 2: Transect Survey Times

Date	Sunset / Sunrise	Start Time	Finish Time
6th June, 2022	21:32	21:32	23:23
27th June 2022	21:41	21:41	23:32
28th July 2022	21:11	21:11	22:41
22nd August 2022	20:21	20:21	22:11
29th September 2022	18:49	18:49	20:19

Table 3: Automated Survey Times

Date	Sunset / Sunrise	Start Time	Finish Time
6th/7th June 2022	21:32/04:39	21:02	05:09
7th/8th June 2022	21:33/04:38	21:03	05:08
8th/9th June 2022	21:34/04:38	21:04	05:08
9th/10th June2022	21:34/04:37	21:04	05:07
10th/11th June 2022	21:35/04:36	21:05	05:06
27th/28th June 2022	21:41/04:38	21:11	05:08
28th/29th June 2022	21:41/04:39	21:11	05:09
29th/30th June 2022	21:40/04:40	21:10	05:10
30th June/1st July 2022	21:40/04:40	21:10	05:10
1st/2nd July 2022	21:40/04:41	21:10	05:10
28th/29h July 2022	21:10/05:16	20:40	05:46
29th/30th July 2022	21:09 05:18	20:39	05:48
30th/31st July 2022	21:07/05:19	20:37	05:49
31st July/1st August 2022	21:05/05:21	20:35	05:51
1st /2nd August 2022	21:03/05:23	20:33	05:53
22nd/23rdAugust 2022	20:20/05:59	19:50	06:29
23rd/24th August 2022	20:18/06:01	19:48	06:31
24th/25th August 2022	20:15/06:03	19:45	06:33
25th/26th August 2022	20:13/06:04	19:43	06:34
26th/27th August 2022	20:11/06:06	19:41	06:36
23rd/24th Sept 2022	19:03/06:55	18:33	07:25
24th/25th Sept 2022	19:00/06:57	18:30	07:27
25th/26th Sept 2022	18:58/06:59	18:28	07:29
26th/27th Sept 2022	18:55/07:01	18:25	07:31
27th/28th Sept 2022	18:53/07:03	18:23	07:33

Table 4: Transect Survey Weather Conditions

Date	Start Temp ˚C	Finish Temp ˚C	Wind speed / direction	Cloud cover %	Precipitation (mm)
6th June, 2022	14	12	B1:N	40	0.0
27th June 2022	14	13	B2:SW	30	0.0
28th July 2022	17	16	B2:NESE	100	0.0
22nd August 2022	19	18	B1:SSE	40	0.0
29th Sept 2022	13	11	B2:NE	5	0.0

2.13 There were insects flying during all surveys.

Table 5: Automated Survey Weather Conditions

Date	Temp ˚C		Wind speed		Precipitation (mm)
	Sunset	Sunrise	Sunset	Sunrise	
6th/7th June 2022	13	9	B2:NW	B2:NW	0.00
7th/8th June 2022	16	12	B2:ESE	B2:ESE	0.00
8th/9th June 2022	13	12	B3:S	B3:SW	0.00
9th/10th June2022	16	13	B3:SSW	B3:SW	0.00
10th/11th June 2022	15	12	**B4:SW**	**B4:SW**	0.00
27th/28th June 2022	12	12	B2:WSW	B3:S	0.00
28th/29th June 2022	16	14	B3:S	B3:SSE	0.00
29th/30th June 2022	18	15	B2:SE	B2:SSW	0.00
30th June/1st July 2022	18	15	B2:W	B2:SW	0.00
1st/2nd July 2022	13	12	B3:SW	**B6:SSW**	0.00
28th/29h July 2022	17	14	B3:E	B2:ESE	0.00
29th/30th July 2022	18	15	B2:SE	B2:SSW	0.00
30th/31st July 2022	18	15	B2:W	B2:SW	0.00
31st July/1st Aug 2022	18	11	B3:WSW	**B4:W**	0.00
1st /2nd August 2022	20	18	**B4:SSW**	**B4:SW**	0.00
22nd/23rdAug 2022	17	14	B2:S	B2:S	0.00
23rd/24th Aug 2022	21	17	B2:WSW	B2:SE	0.00
24th/25th Aug 2022	17	14	B3:WNW	B2:WNW	0.00
25th/26th Aug2022	13	11	B3:W	B2:W	0.00
26th/27th Aug 2022	16	13	B2:ENE	B1:Var	0.00
23rd/24th Sept 2022	12	10	B2:WNW	B2:NNW	0.00
24th/25th Sept 2022	12	7	B2:NNE	B2:W	0.00
25th/26th Sept 2022	12	11	B3:WSW	**B4:WNW**	0.00
26th/27th Sept 2022	10	7	B3:NW	B3:WNW	0.00
27th/28th Sept 2022	10	9	B2:W	B2 WNW	0.00

Table 6: Key for Beaufort Scale

Beaufort wind scale	Limits of wind speed Metres per second	Descriptive terms
0	<1	Calm
1	1-2	Light air
2	2-3	Light breeze
3	4-5	Gentle breeze
4	6-8	Moderate breeze
5	9-11	Fresh breeze
6	11-14	Strong breeze
7	14-17	Near gale
8	17-21	Gale
9	21-24	Severe gale
10	25-28	Storm
11	29-32	Violent storm
12	33+	Hurricane

Data analysis

2.14 The RAW files recorded by the Echometer Touch 2 pro connected to an iPad mini 4 were analysed using Wildlife Acoustics' Kaleidoscope post-processing software. This software can convert from WAC, WAV and Zero Crossing (ZC) formats whilst filtering out unwanted signals. Bat calls recorded in the field were analysed using BatSound 4.4 Analysis software. The output is recorded as WAC files which were analysed to produce sonograms and frequency spectra. The heterodyne channel also provided further audible verification of identity, especially for species with distinctive heterodyne calls. Calls recorded on Elekon Bat logger static bat detectors were processed and analysed using Bat explorer software.

3.0 RESULTS

PRE-SURVEY DATA SEARCH

3.1 Of the 17 resident breeding species of bats in the UK, the following ten species have been recorded in the West Yorkshire Area:-

- **Common Pipistrelle** *Pipistrellus pipistrellus*;
- **Soprano Pipistrelle** *Pipistrellus pygmaeus*;
- **Nathusius' Pipistrelle** *Pipistrellus nathusii*;
- **Whiskered bat** *Myotis mystacinus*;
- **Brandt's bat** *Myotis brandtii*;
- **Natterer's bat** *Myotis natterii*;
- **Daubenton's bat** *Myotis daubentonii*;
- **Brown Long-eared bat** *Plecotus auratus*;
- **Noctule** *Nyctalus noctula*, and
- **Leisler's bat** *Nyctalus leisleri*.

National Site Network

3.2 The desktop assessment indicates that there are no sites of Nature Conservation interest within 2km of the survey area.

3.3 There are no non-statutory sites of nature conservation interest within the 2km search area, such as Local Wildlife Sites.

3.4 The site partly lies within the Kirklees Wildlife Habitat Network. The woodland to the north and north east of the survey area makes up part of the Wildlife Habitat Network.

3.5 The north western part of the woodland is within an area of Green Belt (Liverpool, Manchester & West Yorkshire Green Belt, Kirklees District [B]). This Green Belt covers an area of 2824.2ha in its entirety.

Bat records

3.6 WYES provided 47 bat records within the 2km search area. Four of the records related to bat roosts, none of which were within 0.5km of the site. The nearest roost record was a colony of common pipistrelle 0.74km to the east south east in Mill Bridge. The other roosts are both

common pipistrelle bats and include two records at the same location 1.51km to the north and roost 1.61km to the north west. The remainder of the records are of bats, foraging or in flight and include records of **common pipistrelle**, **soprano pipistrelle**, **Leisler's bat**, **noctule**, and **Myotis bats** *Myotis spp*.

3.7 A search for granted European Protected Species licenses on Magic website no granted EPS licences relating to bats within the 2km search area.

FIELD SURVEYS

Activity Surveys

3.8 Bat activity across the site was low. Bats recorded during the surveys included **common pipistrelle** (PIPPIP), Nathusius' pipistrelle (PIPNAT), **noctule** (NYCNOC) and **whiskered/Brandt's bats** (MYOMYS/BRA). Sonograms of different bat species recorded throughout the surveys are included in **Appendix 2**. **Drawing 2** summarises bat activity recorded during the transect surveys.

Activity survey – 6th June, 2022

3.9 The first survey commenced at 21:32 under good weather conditions. The first bats recorded were three common pipistrelle and a whiskered/Brandt's bat[2] which were seen foraging around a tree on Primrose Lane and back and forth along the lane between 22:08 and 22:10, 36 minutes after sunset. Between 22:11 and 22:13 up to five common pipistrelle were seen foraging at the woodland edge and as surveyors walked along the woodland path at the northern boundary a common pipistrelle was heard at 22:16. A common pipistrelle was then heard at 22:19 in the north east corner of the site, then seen foraging around a the gardens of houses on Darley Road adjoining the western boundary at 22:20, then a common pipistrelle was heard at the southern end of the woodland at 22:21, then surveyors noted a common pipistrelle and a bat with calls characteristic of a Nathusius ' pipistrelle foraging over the grassland and around the woodland edge between 22:22 and 22:25. Between 22:26 and 22:27 a common pipistrelle was foraging over the gardens of the house near the south eastern corner of the site. At 22:31 a common pipistrelle flew south over the garden of properties near the south west corner of the site, then at 22:33 and 22:34 a common pipistrelle was heard as surveyors started to walk north up Primrose Lane. At 22:37 a common pipistrelle was seen

[2] The species encountered on this occasion, based on distribution, habitat and call structure fall into an area where whiskered or Brandt's bat are the most likely. These species cannot be diagnosed by call parameters alone as they are so similar. The inability to label this call does not impact upon the recommendations in this report.

foraging in a northern direction along Primrose Lane and at 22:41 a common pipistrelle was heard to the north of the unmanaged field, then at 23:02 a common pipistrelle was heard at 23:02 and 23:05 in the woodland to the north and at 23:07 at the south of the woodland near Denby Close. At 23:10 a common pipistrelle was heard at the southern end of Denby Close then another at 23:13 near the house in the south east corner. At 23:18 a common pipistrelle was heard constantly foraging between 23:18 and 23:22 as surveyors walked north up Primrose Lane. The survey ended at 23:23, one hour and 41 minutes after sunset in complete darkness. Moderate levels of bat activity were recorded with a maximum of five bats seen or heard by surveyors at any one time.

Activity survey – 27th June, 2022

3.10 The second bat activity survey commenced at 21:41 under good weather conditions. The first bat recorded was a noctule bat which was seen foraging in large circles above the south west corner of the site at 22:00, 19 minutes after sunset, as surveyors walked anticlockwise around the survey transect. The next bats recorded were two common pipistrelle foraging over Darley Road near the woodland edge at 22:09 with almost continuous foraging by up to three common pipistrelle as between and 22:17 as surveyors walked north westerly along the woodland path then south down Primrose Lane. As they approached the small unmanaged field at 22:20 two common pipistrelle and a noctule were heard and as surveyors continued south common pipistrelle were recorded foraging up and down the lane at 22:22, 22:25 and 22:25. At 22:28 a whiskered/Brandt's bat was heard in the south east corner of the site and between 22:29 and 22:30 common pipistrelle were heard. At 22:32 two common pipistrelle bats and a whiskered/Brandt's were recorded heard at Denby Close. Between 22:37 and 22:42 there was almost continuous foraging by common pipistrelle as surveyors walked north west along the woodland path. At 22:44 a common pipistrelle was heard near the gate to access the northern field and at 22:46 was seen foraging over the grassland, then a common pipistrelle was heard at 22:50 and 22:51 in the north east corner of the field and at 22:54 near the southern boundary of the field, near the gate at 22:58 common pipistrelle were seen foraging back and forth along Primrose Lane and were recorded doing so until 23:00, then between 23:01 and 23:06 a common pipistrelle was seen foraging over the grassland in the south west corner of the southern field. At 23:11 a common pipistrelle was heard foraging to the south of the woodland adjacent to Denby Close and at 23:13 and 23:15 at the north east corner of the woodland and between 23:18 and 23:20 common pipistrelle were recorded foraging within the woodland and up and down primrose lane between 22:18 and 23:24. The

last bat recorded was a common pipistrelle heard on Primrose Lane at 23:25. The survey finished at 23:32, one hour and 51 minutes after sunset. There were low levels of bat activity with no more than three bats heard or seen at any one time.

Activity survey – 28th July, 2022

3.11 The survey commenced at 21:11 under good weather conditions. Bats were recorded on 27 occasions throughout the survey and all bats recorded had calls characteristic of common pipistrelle. The first bat was recorded at 21:19, ten minutes after sunset, foraging between the woodland edge and Denby Close. Bats were then recorded foraging along the eastern woodland edge at 21:21, in the north east corner at 21:24 with two foraging in the woodland along the path at 21:26 and heard near the bridge in the north west corner at 21:30. Between 21:31 and 21:33 two and three common pipistrelle foraged on the western edge of the woodland and as surveyors walked south along Primrose lane between 21:34 and 21:38 up to four bats were seen foraging up and down the lane. Then at 21:43 a bat was foraging over the garden of the house near the south east corner of the site, then at 21:46 a bat was foraging to the south of the woodland strip and at 21:49 and 21:50 two were recorded foraging over the woodland clearing in the north east of the site. Between 21:52 and 21:56 as surveyors walked north west along the woodland path towards the bridge up to three bats foraged along the treetops. Whilst walking south down Primrose Lane between 21:58 and 22:06, from the gate at the northern field entrance to the south west corner of the site up to three common pipistrelle foraged back and forth along the lane. At 22:10 was seen foraging over the garden and horse paddock in the south east corner of the site then in the southern field within the site at 22:12 and to the south of the woodland strip at 22:14. Between 22:17 and 22:18 a bat was foraging in the woodland clearing to the north east of the site then a bat was heard but not seen near the bridge in the north west corner and then recorded on the lane at 22:25, 22:28 and 22:32. The survey finished at 21:41 one hour and 30 minutes after sunset. There were low levels of bat activity with no more than three bats heard or seen at any one time.

Activity survey – 22nd August 2022

3.12 The survey started at 20:21 with the weather dry and warm after earlier thunder showers. All bats recorded were common pipistrelle. The first bat recorded was heard, but not seen at 20:27, six minutes after sunset, as surveyors walked north up Primrose Lane towards the woodland edge. Common pipistrelle were seen foraging in the north west corner of the site at 20:29 and 20:31 and along the woodland path at 20:35 before being seen foraging over the

clearing in the north east corner of the site between 20:35 and 20:38. As surveyors walked south along the bridleway up to three bats were seen foraging around the gardens of the houses on Darley Road at 20:39, 20:40 and 20:40. At 20:44 a bat was foraging around the garden of the house in the south east corner of the site whilst also emitting 'Type D'[3] social calls, then at 20:49, 20:50 and 20:51 common pipistrelle were seen foraging in the south west corner of the site, then between 20:51 and 20:57 there was sporadic foraging activity along the length of Primrose Lane and in the north west corner of the site at 20:59. As surveyors walked south east along the woodland path, there was five passes made by foraging common pipistrelle bats. In the north east corner of the site a bat was heard but not seen at 21:07, 21:08 and 21:09 and as surveyors walked south along the peripheral bridleway a common pipistrelle was seen foraging between the site and the houses on Denby Close at 21:10. Between 20:13 and 20:14 a bat was foraging around the garden of the house in the south east corner of the site, analysed bat calls included both feeding buzzes and 'Type D' social calls. Between 21:18 and 21:28 as surveyors walked north up Primrose Lane there was sporadic foraging, then as they walked south east along the woodland path bats were heard at 21:31 and once again between 21:40 and 21:41, when up to two common pipistrelle were foraging around the garden of the house in the south east corner of the site whilst also emitting 'Type D' social calls. A common pipistrelle was then heard midway along the southern boundary at 21:43 and as surveyors walked north up the lane bats were heard at 21:44, 21:46, 21:47 and 21:50. The last bat recorded was heard but not seen near the gate to the northern field at 21:52 and was recorded for several minutes as surveyors walked towards the woodland edge. The survey finished at 22:11, one hour and 50 minutes after sunset.

Activity survey – 29h September 2022

3.13 The survey started at 18:49 under good weather conditions and all bats recorded had call characteristic of common pipistrelle. The first bat was heard but not seen at 19:03 as surveyors walked north up Primrose Lane towards the woodland edge. There was then sustained foraging between 19:04 – 19:06 as they walked north up the lane through the woodland and at 19:07, 19:08, 19:09 and 19:10 as surveyors travelled south east along the woodland path. Then between 19:14 and 19:16 a bat was seen foraging over the triangular clearing to the north east of the site. At 19:18 and 19:19 two common pipistrelle bats were heard near Darley Road, then up to three bats were heard foraging over the garden of the property near the

[3] Type D social calls are thought to be associated with repelling conspecifics (e.g. food patch defence) and during song flights to attract females and repel competing males.

south eastern corner of the site. As surveyors walked towards the south west corner of the site bats were heard but not seen at 19:25, 19:27, 19:28 and 19:29, then as surveyors turned to walk north up Primrose Lane a bat was seen foraging along the lane at 19:30 and 19:31 and at times was just emitting 'Type D' social calls and between 19:32 and 19:33 there were two bats seen foraging over the lane and adjacent field edges with two bat. Between the unmanaged field and the woodland edge (between 19:35 and 19:40) there was a period of sustained foraging by three common pipistrelle bats and this continued between 19:40 and 19:53 with almost continuous foraging activity and social calling by three bats as surveyors walked south east along the woodland path. In the north east corner of the site a bat was heard at 19:56 and as surveyors walk along the edge of Darley Road bats were heard twice at 21:59. At 20:07 a common pipistrelle was social calling midway along the southern boundary of the site then as surveyors walked north up the lane common pipistrelle were heard at 20:14 and 20:16 with the last bat recorded at 20:17. The survey finished at 20:19, one hour and 30 minutes after sunset.

Automated survey

3.14 Static detectors were deployed each month (June – September) at two fixed monitoring points. Detector A was placed in a goat willow located at OS grid reference SE 19678 24162, Detector B was placed at the woodland edge to the north east of the site at OS grid reference SE 19763 24191. The location of the static bat detectors is illustrated on **Drawing 2**. Bats calls characteristic of the following species were recorded throughout the course of the surveys: **common pipistrelle** (PIPPIP), **soprano pipistrelle** (PIPPYG) and **Daubenton's bat** (MYODAU).

3.15 **Table 7** summarises the data obtained from each detector and **Figure 2** illustrates the number of bat passes in total each month for each detector.

Table 9: Summary Data from Automated Surveys

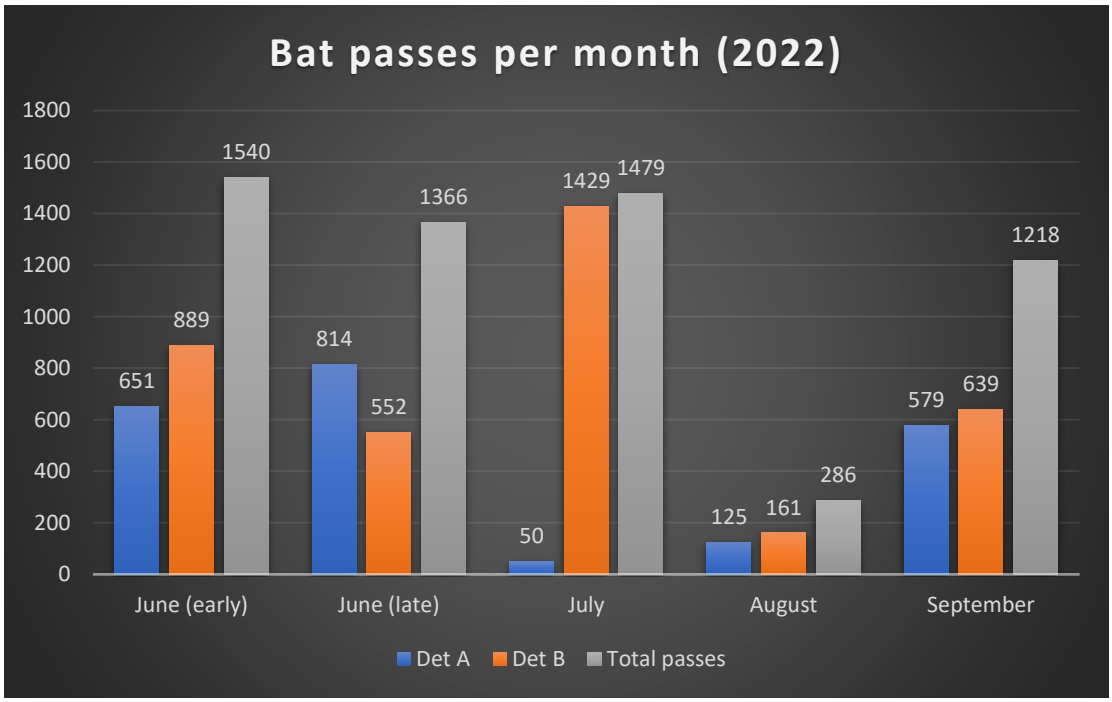
Date	Detector	No. of Bat passes			Sunset	Minutes after sunset first bat recorded	Sunrise	Minutes before sunrise last bat recorded	Total No of bat passess per night per detector	Total number of bat passes per night
	ID	PIPPIP	PIPPYG	MYODAU						
6th/7th June	A	-	-	-	21:32	-	04:39	-	-	4
	B	4	0	0		364		50	4	
7th/8th June	A	15	0	0	21:33	24	04:38	49	15	171
	B	156	0	0		18		44	156	
8th/9th June	A	380	0	0	21:34	39	04:38	61	380	710
	B	330	0	0		28		40	330	
9th/10th June	A	166	0	0	21:34	43	04:37	51	166	405
	B	239	0	0		30		33	239	
10th/11th June	A	90	0	0	21:35	40	04:36	77	90	250
	B	160	0	0		33		53	160	
27th/28th June	A	30	0	0	21:41	364	04:38	24	30	208
	B	178	0	0		15		34	178	
28th/29th June	A	204	0	0	21:41	26	04:39	43	204	232
	B	28	0	0		15		186	28	
29th/30th June	A	178	0	0	21:40	21	04:40	49	178	494
	B	316	0	0		20		30	316	
30th June/1st July	A	109	0	0	21:40	58	04:40	48	109	109
	B	-	-	-		-		-	-	
1st/2nd July	A	293	0	0	21:40	33	04:41	7	293	293
	B	-	-	-		-		-	-	
28th/29th July	A	50	0	0	21:10	96	05:16	23	50	308
	B	257	1	0		-11		29	258	

Date	Detector	No. of Bat passes			Sunset	Minutes after sunset first bat recorded	Sunrise	Minutes before sunrise last bat recorded	Total No of bat passess per night per detector	Total number of bat passes per night
	ID	PIPPIP	PIPPYG	MYODAU						
29th/30th July	A	-	-	-	21:09	-	05:18	-	-	110
	B	110	0	0		11		12	110	
30th /31st July	A	-	-	-	21:07	-	05:19	-	-	248
	B	248	0	0		8		21	248	
31st July/1st August	A	-	-	-	21:05	-	05:21	-	-	418
	B	418	0	0		15		39	418	
1st/2nd Aug	A	-	-	-	21:03	-	05:23	-	-	395
	B	395	0	0		18		31	395	
22nd/23rd August	A	29	0	0	20:20	25	05:59	34	29	48
	B	19	0	0		31		40	19	
23rd/24th August	A	37	0	0	20:18	26	06:01	36	37	85
	B	46	0	2		25		31	48	
24th/25th August	A	19	0	0	20:15	51	06:03	36	19	52
	B	33	0	0		69		47	33	
25th/26th August	A	23	0	0	20:13	37	06:04	390	23	30
	B	7	0	0		32		374	7	
26th/27th August	A	17	0	0	20:11	17	06:06	259	17	71
	B	54	0	0		21		210	54	
23rd/24th September	A	71	0	27	19:03	37	06:55	158	98	352
	B	251	0	3		6		71	254	
24th/25th September	A	13	0	20	19:00	30	06:57	44	33	103
	B	60	0	10		13		30	70	
25th/26th September	A	431	0	0	18:58	23	06:59	35	431	472

Date	Detector	No. of Bat passes			Sunset	Minutes after sunset first bat recorded	Sunrise	Minutes before sunrise last bat recorded	Total No of bat passess per night per detector	Total number of bat passes per night
	ID	PIPPIP	PIPPYG	MYODAU						
	B	41	0	0		33		32	41	
26th/27th September	A	12	0	2	18:55	59	07:01	322	14	231
	B	216	0	1		15		323	217	
27th/28th September	A	3	0	0	18:53	24	07:03	260	3	60
	B	57	0	0		22		304	57	

3.16 **Figure 2** Illustrates that the highest number of bat passes were recorded in early June and during the July 2022 survey period, despite Detector A making no recordings after the first overnight survey in July). With the exception of late June, Detector B to the east of the site located at the woodland edge recorded the most bat passes.

Figure 2: Bat passes recorded each month and per each detector early June – September 2022



Automated survey – 6th June to 11th June, 2022

3.22 During the early May automated surveys all of the 1540 bat passes bat passes **(Figure 2)** recorded across the two detectors were made by bats with calls characteristic of common pipistrelle (100.0%). Common pipistrelle were recorded on four of the five evenings on Detector A and Detector B, Detector A made no recordings characteristic of bat calls on the overnight survey period of 6th/7th June. The first bats recorded on both detectors had calls characteristic of common pipistrelle. The earliest bat recorded was a common pipistrelle at 21:49, 18 minutes after sunset, on Detector B on 7th June. The latest bat recorded was a common pipistrelle bat on Detector B at 04:04, 33 minutes before sunrise on 10th June. A mean of 308 bat passes per night were recorded throughout the early June survey period.

Automated survey – 27th June to 2nd July, 2022

3.23 During the late June automated surveys all of the 1336 bat passes **(Figure 2)** recorded across both detectors were made by bats with calls characteristic of common pipistrelle (100.0%).

Common pipistrelle were recorded during each survey occasion on Detector A but no bat passes were recorded on Detector B on the overnight periods 30th June/ 1st July and 1st July/2nd July. The earliest bat recorded throughout the late June survey was a common pipistrelle recorded at 21:56 on 27th June and 21:56 on 28th June, 15 minutes after sunset on Detector B. The last bat recorded was a common pipistrelle on Detector B, at 04:10 thirty minutes before sunrise on 30th June. A mean of 267.2 bat passes per night were recorded throughout the June survey period.

Automated survey – 28th July to 2nd August, 2022

3.24 During the July automated surveys the majority of the 1479 bat passes **(Figure 2)** recorded across both detectors were made by bats with calls characteristic of common pipistrelle (99.9%). Detector A only made recordings on the first overnight survey occasion 28th/29th July, recording 50 common pipistrelle (100.0%). Common pipistrelle were recorded during each survey occasion on Detector B and their calls represent 99.93% of bat passes on Detector B. One soprano pipistrelle was recorded on 28th/29th July, representing 0.07% of bat passes. The earliest bat recorded throughout the July survey was a common pipistrelle recorded on Detector B on 28th July 20:59, 11 minutes before sunset. The latest bat recorded was a common pipistrelle on Detector B, at 05:06, twelve minutes before sunrise on 30th July. A mean of 357.4 bat passes per night were recorded throughout the July survey period.

Automated survey – 22nd August to 27th August, 2022

3.25 During the August automated surveys all of the 286 bat passes **(Figure 2)** recorded across both detectors were made by bats with calls characteristic of common pipistrelle (100.0%). Common pipistrelle were recorded during each survey occasion on both static detectors. The first bats recorded on Detectors A and B were characteristic of common pipistrelle on all overnight survey periods. The earliest bat recorded throughout the August survey was a common pipistrelle recorded on Detector A on 26th of August at 20:28, 17 minutes after sunset. The latest bat recorded was a common pipistrelle on Detector B, at 05:30, 30 minutes before sunrise on 24thh August. A mean of 57.2 bat passes per night were recorded throughout the August survey period.

Automated survey – 23rd September to 28th September, 2022

3.26 During the September automated surveys the majority of the 1218 bat passes **(Figure 2)** recorded across both detectors were made by bats with calls characteristic of common

pipistrelle (94.8%). Common pipistrelle were recorded during each survey occasion on both static detectors and their calls represent 91.54% and 97.81% of bat passes on Detectors A and B, respectively. Bats with calls characteristic of Daubenton's bats were also recorded on both Detectors on the overnight survey periods of 23rd/24th, 24th/25th and 26th/27th September 2022 and represent 7.67% and 2.19% of bat passes recorded on Detector A and Detector B, respectively. The first bats recorded on Detectors A and B were characteristic of common pipistrelle on all overnight survey periods. The earliest bat recorded throughout the September survey was a common pipistrelle recorded on Detector B on 23rd September, 22 minutes after sunset. The latest bat recorded was a common pipistrelle on Detector B, at 06:27, thirty minutes before sunrise. A mean of 243.6 bat passes per night were recorded throughout the September survey period.

4.0 SITE ASSESSMENT

CONSTRAINTS ON SURVEY INFORMATION

4.1 The site was accessible throughout the season, and all survey work was led by suitably qualified/licensed ecologists during the optimum season for recording bat activity, and was undertaken within recommended weather parameters (BCT, 2011). This avoided (where possible) periods of heavy rain, strong winds (maximum strong breeze on 2nd July 2022) and dusk temperatures below 8°C (minimum dusk starting temperature 10°C on 26th and 27th September), pre-dawn temperatures did only fell below the recommended 8°C on two occasions (7°C on 25th and 27th September). With the exception of 2nd July the maximum wind speeds throughout the surveys were B4, a moderate breeze (13-18mph).

CONSTRAINTS ON EQUIPMENT USED

4.2 The static detectors did not record bat calls for the duration of the full survey period on three occasions. Detector A made no recordings on the survey period of 6th/7th June, but made recordings on the four proceeding survey occasions, it is anticipated that there was no bat activity in the vicinity of the detector on that survey occasion. Detector A only recorded on the first survey occasion in July (28th/29th) but made no subsequent recordings. Detector B did not make any recording during the last two overnight survey periods of the late June/early July survey (30th June/1st July and 1st/2nd July).

POTENTIAL IMPACTS OF THE DEVELOPMENT

National Site Network

4.3 The desktop assessment indicates that there are no international or national sites of Nature Conservation interest that form part of the National Site Network within 2km of the survey area.

4.4 There are no non-statutory sites of nature conservation interest within the 2km search area, such as Local Wildlife Sites.

4.5 There is no anticipated impact on any sites within the National Site Network as a result of the proposed housing development.

4.6 The site partly lies within the Kirklees Wildlife Habitat Network. The woodland to the north and north-east of the survey area makes up part of the Wildlife Habitat Network.

4.7 The north-western part of the woodland is within an area of Green Belt (Liverpool, Manchester & West Yorkshire Green Belt, Kirklees District [B]). This Green Belt covers an area of 2824.2ha in its entirety. The Kirklees green belt forms part of a larger interwoven area of Green Belt (covering an area of 2824.02ha) that spans West and South Yorkshire and encompasses the major Yorkshire conurbations of Leeds, Bradford, Huddersfield, Wakefield and Halifax. It serves to prevent these cities and large towns from merging both with each other and with the greater Manchester metropolitan area to the west. The proposed development therefore retains the area of Green Belt, in line with National Planning Policy, which attaches great importance to protecting green belt land so no negative impact is anticipated. There is likely to be a minor negative impact on woodland habitat as 0.057ha of broadleaved plantation woodland (dominated by sycamore *Acer pseudoplatanus*) will be permanently lost to provide access from Darley Road. A water pipe will be installed through the woodland along an existing desire line used by the general public. The remaining woodland (0.593ha) will be enhanced to bring it into good condition by improving the structural diversity and sub-canopy. This will include managing the area where the waterpipe will be laid and associated easement area as a woodland ride with shade tolerant species-rich grassland and underplanting with mixed scrub typical of woodland edge to compliment the woodland and hedgerow habitats being retained and to provide habitat continuity around the site. Any enhancements of the woodland would be a minor positive impact on the Liverpool, Manchester & West Yorkshire Green Belt and the Kirklees Wildlife Habitat Network and maintain and enhance habitat for foraging and commuting bats by maintaining habitat continuity across the landscape.

BAT RECORDS

4.8 WYES provided 47 bat records within the 2km search area. Four of the records related to bat roosts, none of which were within 0.5km of the site. The nearest roost record was a colony of common pipistrelle 0.74km to the east south east in Mill Bridge. The other roosts are both common pipistrelle bats and include two records at the same location 1.51km to the north and roost 1.61km to the north west. The remainder of the records are of bats, foraging or in flight and include records of common pipistrelle, soprano pipistrelle, Leisler's bat, noctule, and

Myotis bats Myotis spp. A search for granted European Protected Species licenses on Magic website no granted EPS licences relating to bats within the 2km search area.

Roosts

4.9 There are no buildings within the survey area and there are no mature trees within the site that have any roosting opportunities for bats. There are no 'known' roosts within the site. A common pipistrelle was recorded on each survey occasion foraging around the property off site to the south east, and later in the season 'Type D' social calls were often recorded when the bat was in flight and on several occasions just social calls, indicating the individual may have been perched on the building advertising for females. It is likely that this property is a summer day roost and mating roosting for an individual, or small number of male bats.

Foraging and commuting habitat

4.10 There were generally low levels of foraging and commuting activity across the site. **Drawing 2** shows a summary of bat activity across all of the transect surveys. This shows that, although activity levels were low, there was some consistent foraging activity associated with the woodland edges, both east west and along the woodland path to the north, along Primrose Lane and associated with the property outside of the application boundary to the south east. There was also sporadic foraging and/or commuting activity associated with the bridleway to the south, the residential streets to the east and over the grasslands. The results of the automated detector surveys also illustrate this, as with the exception of late June, Detector B to the east of the site located at the woodland edge recorded the most bat passes.

4.11 Throughout the static bat detector surveys the majority of bats recorded were common pipistrelle. Bats calls characteristic of soprano pipistrelle and Daubenton's bats were also recorded during the course of the surveys. The highest number of bat passes were recorded in early June (1540), 2022.

4.12 Bats recorded during the transect surveys included common pipistrelle, Nathusius' pipistrelle, noctule and whiskered/Brandt's bats.

4.13 The illustrative masterplan for the proposed development includes the retention of existing habitats wherever possible and creates and enhances habitats to maintain suitable habitat for foraging and commuting bats.

4.14 A plan is not yet available indicating the anticipated or modelled illuminance (lux) levels across the site as a result of the proposed lighting regime. It is known (BCT & ILE 2018)[4] that illumination of bat roosts, especially the roost access point and lighting of foraging and commuting routes causes disturbance to bats and can affect the normal behavior of bats causing them to emerge later, reducing the time available for foraging and can affect their feeding/drinking behaviour and cause changes to their normal foraging patterns. It is therefore important to avoid any impact on the foraging and commuting patterns of the common pipistrelle bat(s) that may roost in the property outside of the application site boundary to the south east, by ensuring that there is no additional light spill towards this property as a result of the residential development

4.15 It is stated that if any of the following habitats occur on a proposed development site, and are adjacent to, or connected with any of these habitats on or off-site, it is possible that newly proposed lighting may impact local bat populations:

- Woodland or mature trees;
- Hedgerows and scrub;
- Ponds and lakes;
- Ditches, streams, canals and rivers;
- Infrequently managed grassland, and
- Buildings – pre 1970 or in disrepair.

4.20 In the absence of mitigation it is therefore anticipated that any additional lighting is more than likely going to have a negative impact on local foraging and commuting bats due to the presence of woodland or mature trees, hedgerows and scrub within the application site.

[3] Institute of Lighting Professionals/Bat Conservation Trust (2018) Guidance Note 08/18. *Bats and artificial lighting in the UK. Bats and the Built Environment Series.*

5.0 RECOMMENDATIONS AND MITIGATION

FURTHER SURVEY

5.1 No further survey is required unless a significant period of time passes between the surveys and the work commencing (>2 years), or if the development plans change.

MITIGATION MEASURES

Mitigation for roosting habitat

5.2 No roosting habitat is being lost due to the development. Regardless of this, it is good practice to enhance/introduce roosting opportunities for bats in new developments. It is therefore recommended that roosting opportunities are introduced on mature trees within the retained woodland and on a proportion of the new build residential properties.

Proposed mitigation for foraging and commuting habitat

5.3 To minimise impact on foraging and commuting bats a sympathetic lighting strategy which avoids strong illumination of the hedgerows, trees, scrub/woodland habitat and any newly created suitable habitat is recommended. The Institute of Lighting Engineers and The Bat Conservation Trust (BCT & ILE 2018)[5] have produced guidance, the aim of which is to inform how to minimise and mitigate for the impact on bats as a result of lighting. The following mitigation is recommended.

- Avoid lighting any key habitats and features altogether. This particularly applies to flightpaths used by foraging and commuting bats along woodland edge habitat to the north, west and east where the woodland habitat and hedgerows are being retained.

5.4 Voight *et al*. (2018) [6] state that key habitats and features shoud not be lit if at all possible, i.e. only when artificial light at night (ALAN) is needed for safety reasons or to comply with the legal framework. Through careful consideration prior to development of new infrastructure it is often possible to avoid illumination of bat habitats without putting human safety at risk. This is important as the protection of dark refuges is essential for bats.

[3] Institute of Lighting Professionals/Bat Conservation Trust (2018) Guidance Note 08/18. *Bats and artificial lighting in the UK. Bats and the Built Environment Series.*

[5] Voight *et al*. (2018) *Guidelines for consideration of bats in lighting projects*. EUROBATS publication Series No. 8. UNEP/EUROBATS Secretariet, Bonn, Germany, 62pp.

Habitat Enhancement

5.5 The illustrative masterplan for the proposed development provides inbuilt mitigation for potential impacts of the development on species such as bats. Habitats are retained where possible including woodland and hedgerow habitat at the periphery and habitat enhancement will be undertaken to improve the woodland. The soft landscaping scheme includes species rich grassland and tree planting (51 trees), hedgerows and scrub which will create good foraging and commuting habitat for bats and increase the biodiversity interest of the site. In addition gardens are also an important foraging and commuting habitat utilised by species such as common pipistrelle. A sensitive lighting regime is recommended and will be implemented.

Bat boxes

5.6 An excellent way to enhance habitat for bats is to introduce new roosting habitat into the new builds. It is recommended that bat roosting opportunities are integrated into 10% (~7) of the properties of suitable aspect. Drawing 3 illustrates the proposed site layout and where the proposed roosting opportunities can be implemented within the scheme. An ideal integrated bat box would be the PRO UK Build-in WoodStone Bat Box manufactured by Vivara Pro (NHBS - Pro UK Build-in Woodstone bat box). This bat box has been specifically designed to fit into the cavity of house walls, with the entrance sitting flush with the outside bricks. It has been redesigned since older iterations to match the standard brick size in the UK (see **Figure 3**). Manufactured from hard-wearing WoodStone and plywood with removable wooden side panels so that several boxes can be placed side by side to create one large chamber, the Woodstone Bat Box is a great choice for new-builds and renovations. Thanks to the sloping entrance ramp, droppings will fall out of the box, creating a maintenance-free habitat for a variety of bat species. Position the box at least 3.0m above ground level and away from artificial light sources. WoodStone is a mixture of sawdust from FSC wood sources and concrete, and it is designed to last for years. It is breathable so there will be no problems with condensation and Woodstone maintains a consistent temperature inside, providing excellent insulation for roosting bats.

5.7 The dimensions of the product are as follows:

Bottom section: 14cm x 21cm x 15cm

Top section: 50cm x 21cm x 5cm

Specification - Total Height: 640mm, Total Width: 210mm, Total Depth: 150mm, Weight: 6.7kg, Material: woodstone.

Figure 3: PRO UK Build-in WoodStone Bat Box

5.8 Habitat enhancement can also be introduced by the provision of two bat boxes in trees including one Nestbox Company large colony bat boxes, ideal for small crevice dwelling bats such as common and soprano pipistrelle during the maternity season and one Miramare bat box, which have been designed to replicate a natural roost within a hollow tree and have four internal roosting compartments (woodstone insulated boxes). These are ideal for species such as noctule and brown long-eared bats (see Figure 4). All bat boxes should be erected on sturdy trees at a height of between 3 and 5m and be facing a southern or western aspect in an unlit area.

Figure 4: Left - Nestbox Company large colony bat box. Right - Miramare bat box.

MITIGATION LICENCES

5.9 A Natural England bat mitigation licence is not required.

6.0 SUMMARY

6.1 The survey area covers an area of 2.95ha (7.29 acres). The approximate central point of the site is at grid reference SE 19695 24112. The site is located between Heckmondwike and Cleckheaton and is accessed from Halifax Road (A469). The site is within a semi-rural area approximately 0.5km south east of Cleckheaton. Land use surrounding the site is primarily agricultural land, to the west, woodland and agricultural land to the north and residential areas to the south and east. The agricultural fields are delineated by a combination of fences, hedgerows and stone walls. The River Spen is located 0.16km to the north of the site boundary.

6.2 The site comprises improved pasture (modified grassland) grazed by horses and ponies to the north and cut for hay in the south, broadleaved plantation woodland, a native hedgerow with hedgerow trees and a field of grassland which is not actively managed and is now dominated by tall herb and dense scrub. Fields within the site are divided by post and wire fences and mobile horse fencing whilst the periphery is delineated by a combination of post and wire fences, stone walls, a retaining stone wall and post and rail fence together.

6.3 It is understood that an application is being made for the clearance of development area and construction of 67 new residential properties associated services and infrastructure.

6.4 The desktop assessment indicates that there are no international or national sites of Nature Conservation interest that form part of the National Site Network within 2km of the survey area.

6.5 There are no non-statutory sites of nature conservation interest within the 2km search area, such as Local Wildlife Sites.

6.6 There is no anticipated impact on any sites within the National Site Network as a result of the proposed housing development.

6.7 WYES provided 47 bat records within the 2km search area. Four of the records related to common pipistrelle bat roosts, none of which where within 0.5km of the site. The remainder of the records are of bats, foraging or in flight and include records of common pipistrelle, soprano pipistrelle, Leisler's bat, noctule, and Myotis bats Myotis spp. A search for granted

European Protected Species licenses on Magic website no granted EPS licences relating to bats within the 2km search area.

6.8 There are no buildings or mature trees within the survey area that have roosting opportunities for bats.

6.9 No further survey required, unless a significant amount of time (2 years) passes between the bat surveys and the development commencing, or if the development plan changes in which case additional checks may be required.

6.10 There were generally low levels of foraging and commuting activity across the site, although there was some consistent foraging activity associated with the woodland edges, both east west and along the woodland path to the north, along Primrose Lane and associated with the property outside of the application boundary to the south-east. There was also sporadic foraging and/or commuting activity associated with the bridleway to the south, the residential streets to the east and over the grasslands.

6.11 Throughout the static bat detector surveys the majority of bats recorded were common pipistrelle. Bats calls characteristic of soprano pipistrelle and Daubenton's bats were also recorded during the course of the surveys, with the highest number of bat passes recorded in early June, 2022.

6.12 Bats recorded during the transect surveys included common pipistrelle, Nathusius' pipistrelle, noctule and whiskered/Brandt's bats.

6.13 The illustrative masterplan for the proposed development will include habitat creation to achieve the requisite 10% biodiversity net gain. The habitat creation has been created with thought given to habitats suitable for a variety of protected and priority species, including bats.

6.14 As per the most recent guidance, a sensitive lighting strategy was recommended to avoid impacting on foraging and commuting bats.

6.15 In line with best practice, recommendations are made to enhance roosting habitat for bats as part of the development of the site. It is recommended that long-term tree roosting opportunities are provided within mature trees within the peripheral woodland habitat and that seven integrated bat boxes are included within the residential properties.

7.0 REFERENCES

Andrews, H. (2018) *Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals*. Pelagic Publishing, Exeter.

Collins J. (Ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

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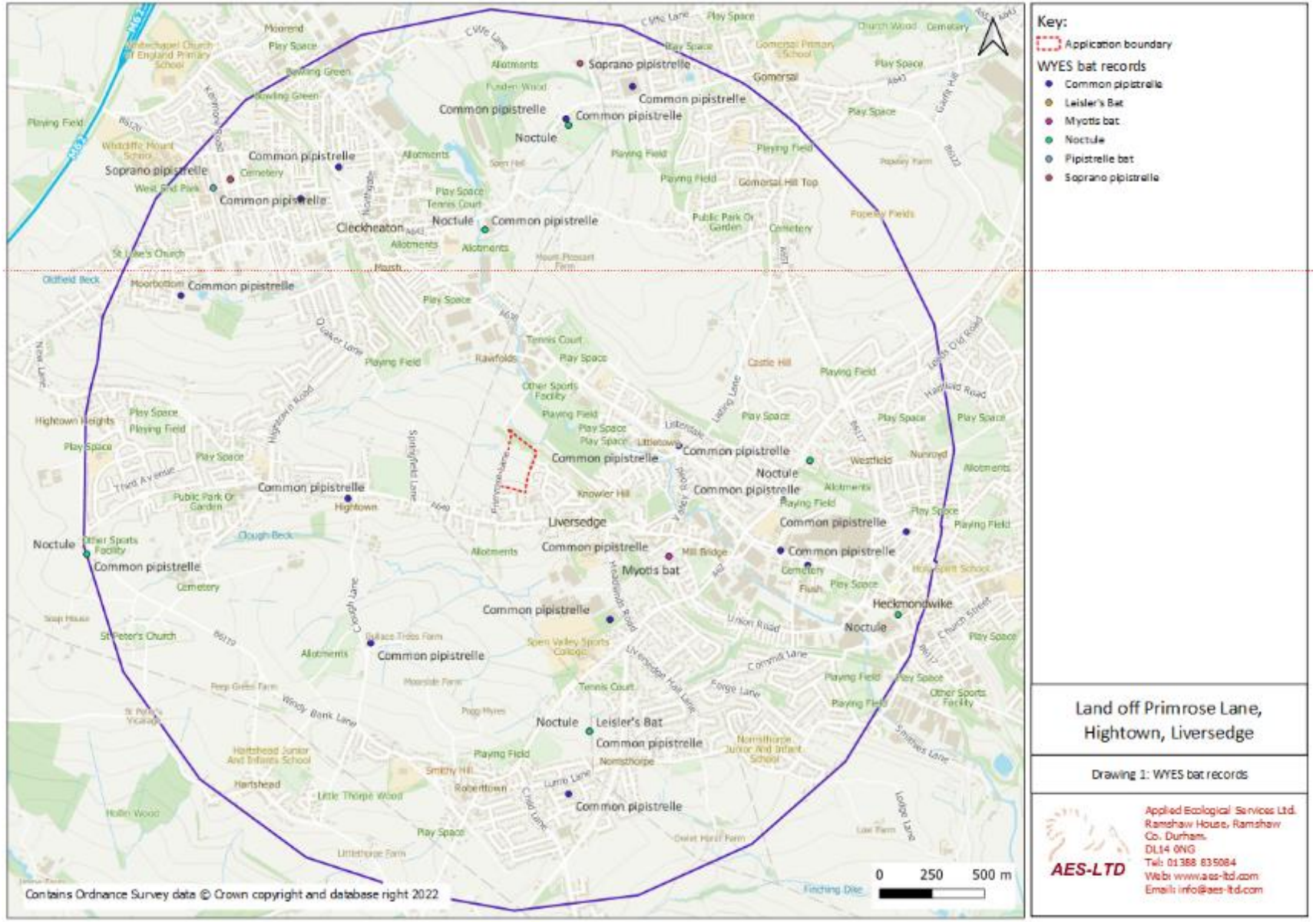
Voight, C.C, Azam, C., Dekker, J., Ferguson, J., Fritze, M., Gazaryan, F., Holker, F., Jones, G., Leader, N., Lewanzik, D., Limpens, H.J.G.A., Mathews, F., Rydell, J., Schofield, H., Spoelstra and K., Zagmajster (2018): *Guidelines for consideration of bats in lighting projects*. EUROBATS publication Series No. 8. UNEP/EUROBATS Secretariet, Bonn, Germany, 62pp.


Key:
Application boundary
WYES bat records
Common pipistrelle
Leisler's Bat
Myotis bat
Noctule
Pipistrelle bat
Soprano pipistrelle
Land off Primrose Lane,
Hightown, Liversedge
Drawing 1: WYES bat records
AES-LTD
Applied Ecological Services Ltd.
Ramshaw House, Ramshaw
Co. Durham.
DL14 0NG
Tel: 01388 835084
Web: www.aes-ltd.com
Email: info@aes-ltd.com
0 250 500 m
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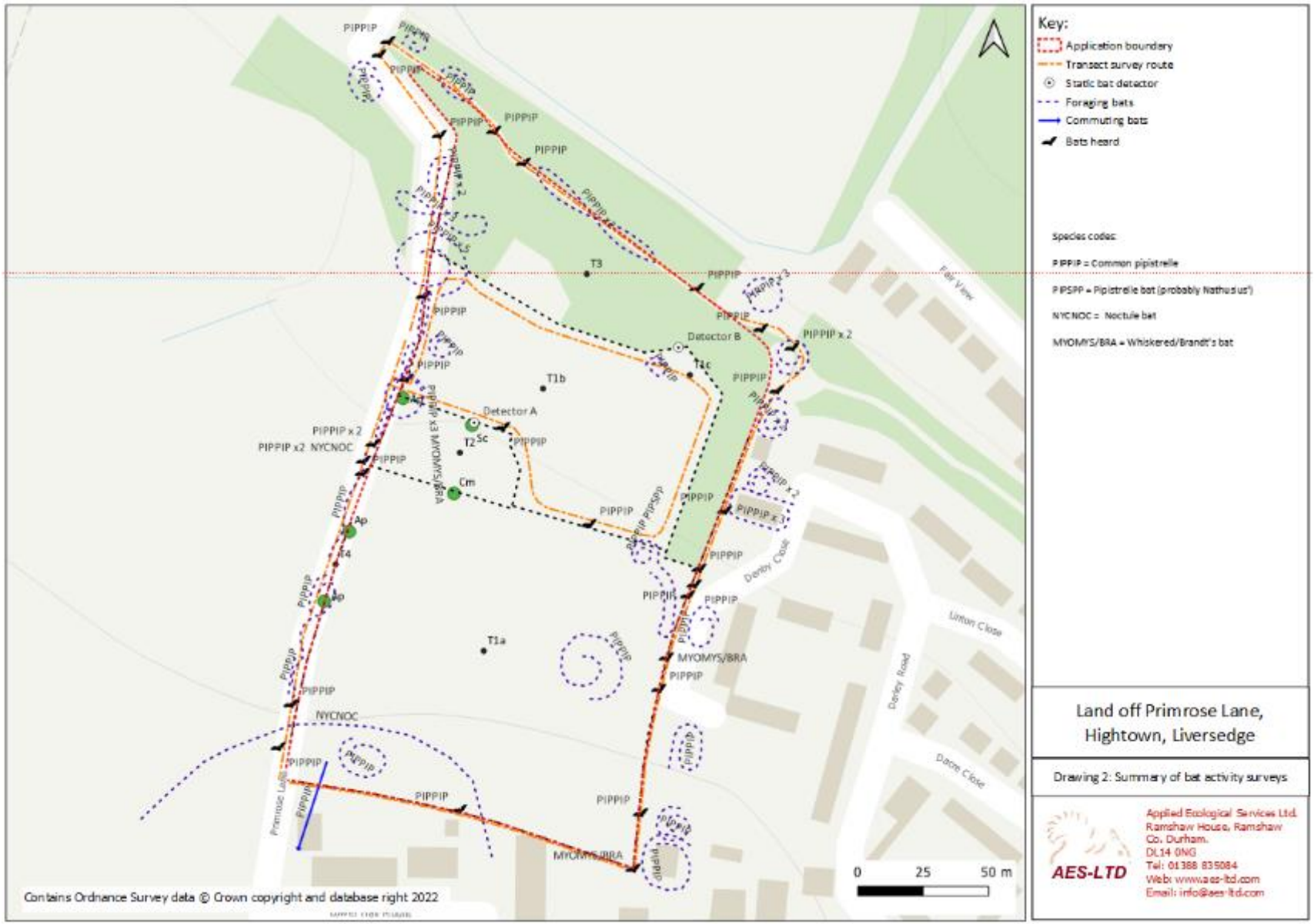
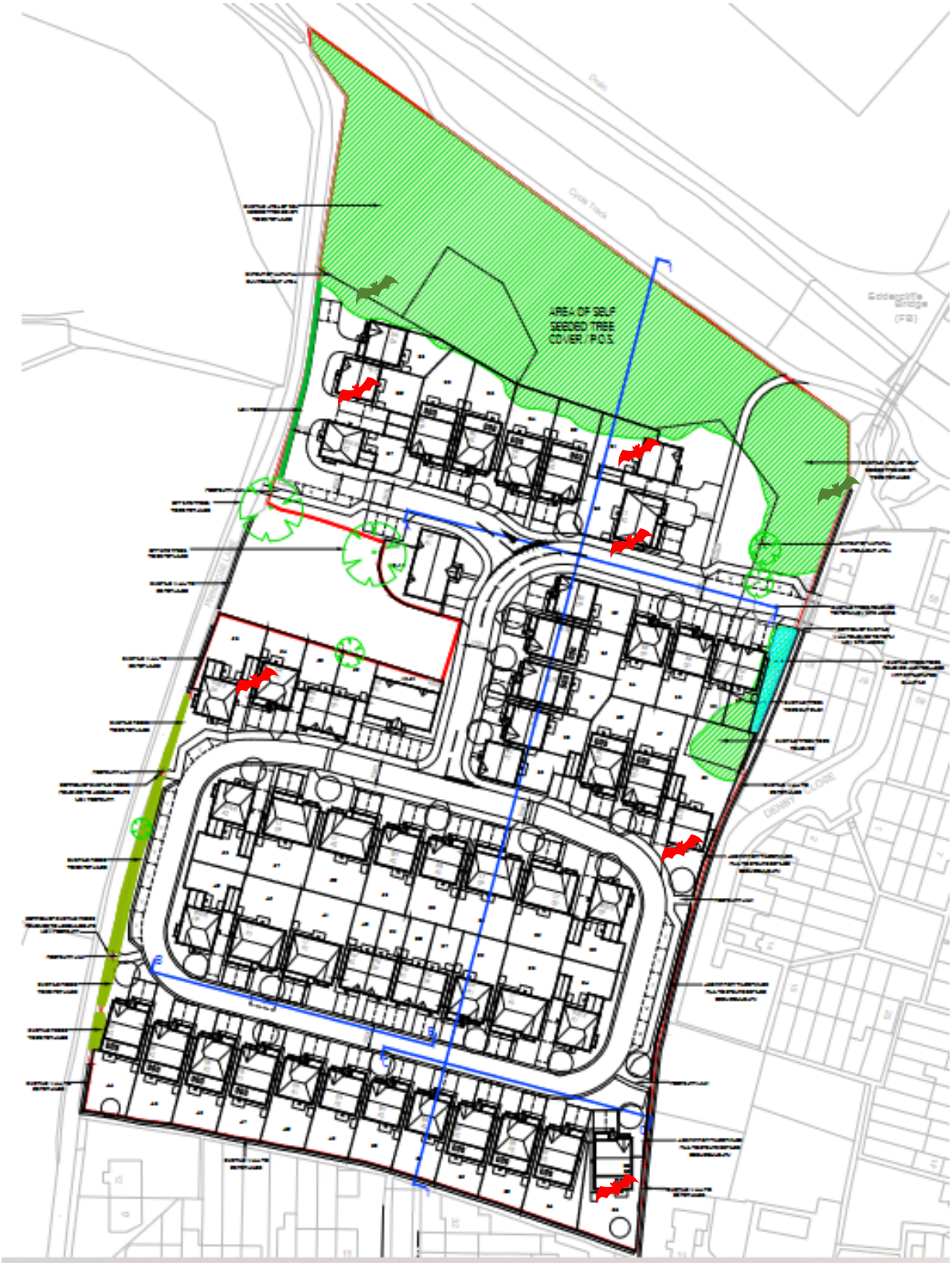

Key:
Application boundary
Transect survey route
Static bat detector
Foraging bats
Commuting bats
Bats heard
Species codes:
PIPPIP = Common pipistrelle
PIPSPP = Pipistrelle bat (probably Nathusius')
NYCNOC = Noctule bat
MYOMYS/BRA = Whiskered/Brandt's bat
Land off Primrose Lane, Hightown, Liversedge
Drawing 2: Summary of bat activity surveys
Applied Ecological Services Ltd.
Ramshaw House, Ramshaw
Co. Durham.
DL14 0NG
Tel: 01388 835084
Web: www.aes-ltd.com
Email: info@aes-ltd.com
AES-LTD
Detector A
Detector B
T1a
T1b
T1c
T2
T3
T4
T5
Ap
Cm
Sc
PIPPIP
PIPPIP x2
PIPPIP x2 NYCNOC
PIPPIP x3 MYOMYS/BRA
NYCNOC
MYOMYS/BRA
Primrose Lane
Fair View
Derby Close
Linton Close
Derby Road
Dacre Close
0
25
50 m
Contains Ordnance Survey data © Crown copyright and database right 2022

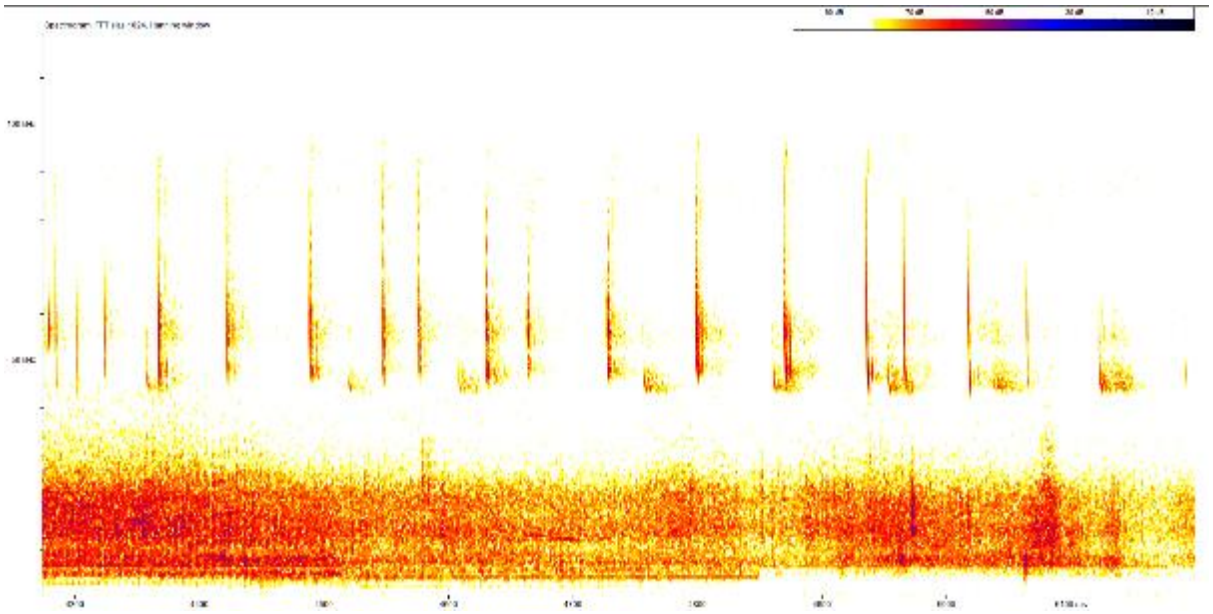
DRAWING 3: DEVELOPMENT PROPOSALS (March 2023)



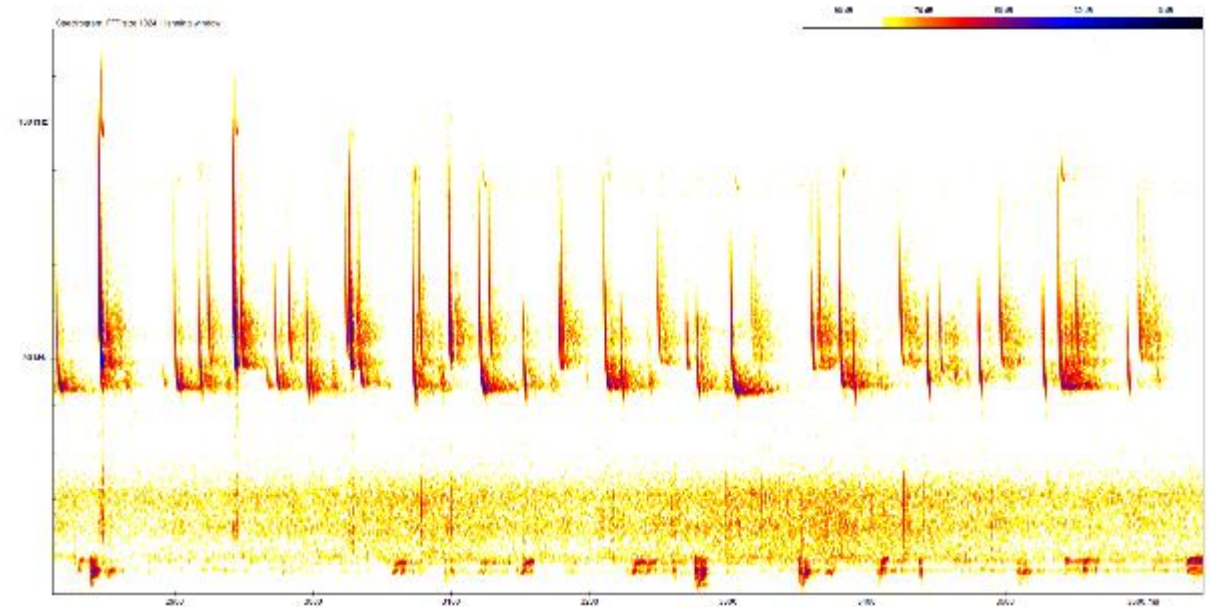
= Potential integrated bat roost location.

= Potential tree mounted bat box location.

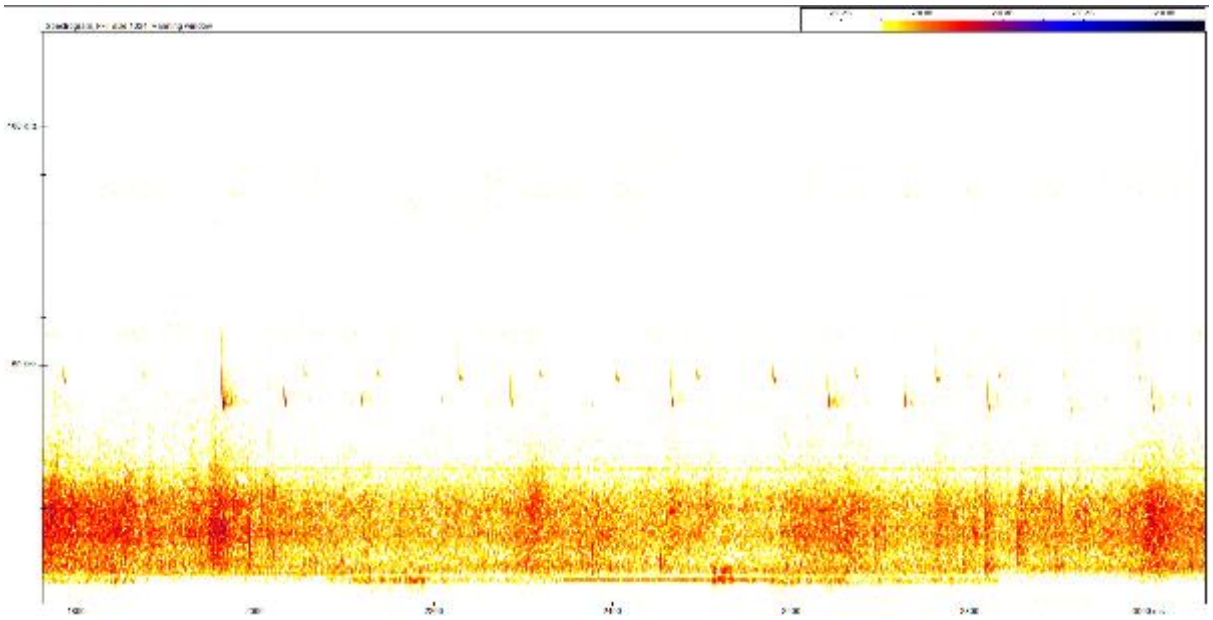
APPENDIX 1: SONOGRAMS



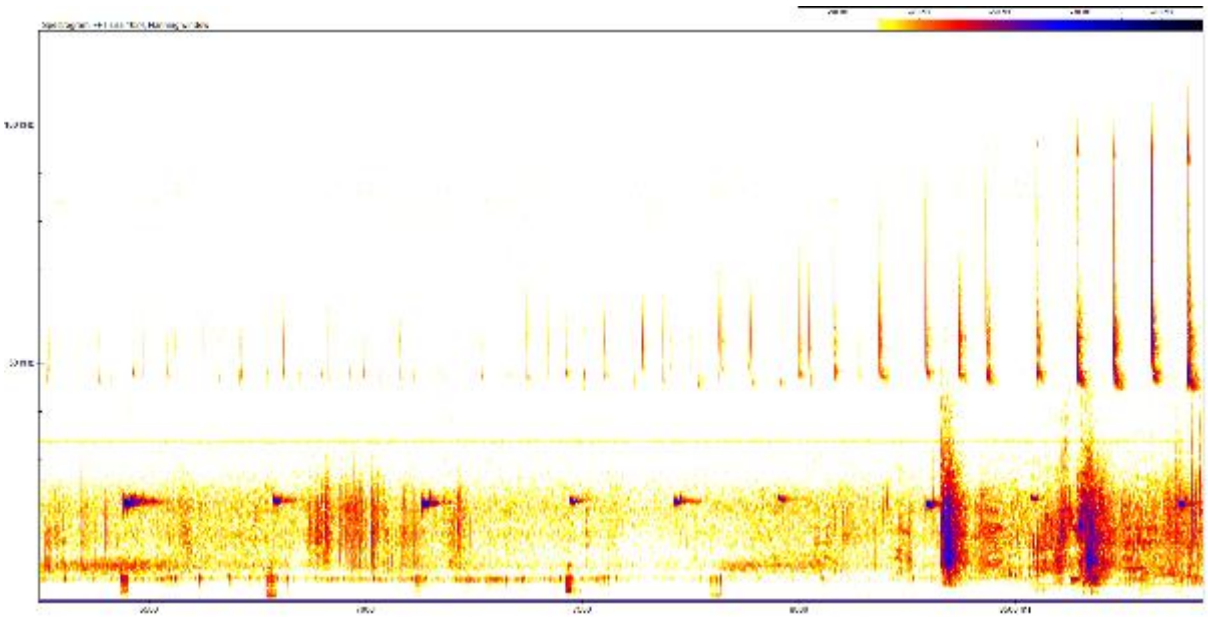
Sonogram 1: Common pipistrelle (and feeding buzz) and whiskered/Brandt's bat recorded foraging on Primrose Lane at 22:08 on 6th June, 2022.



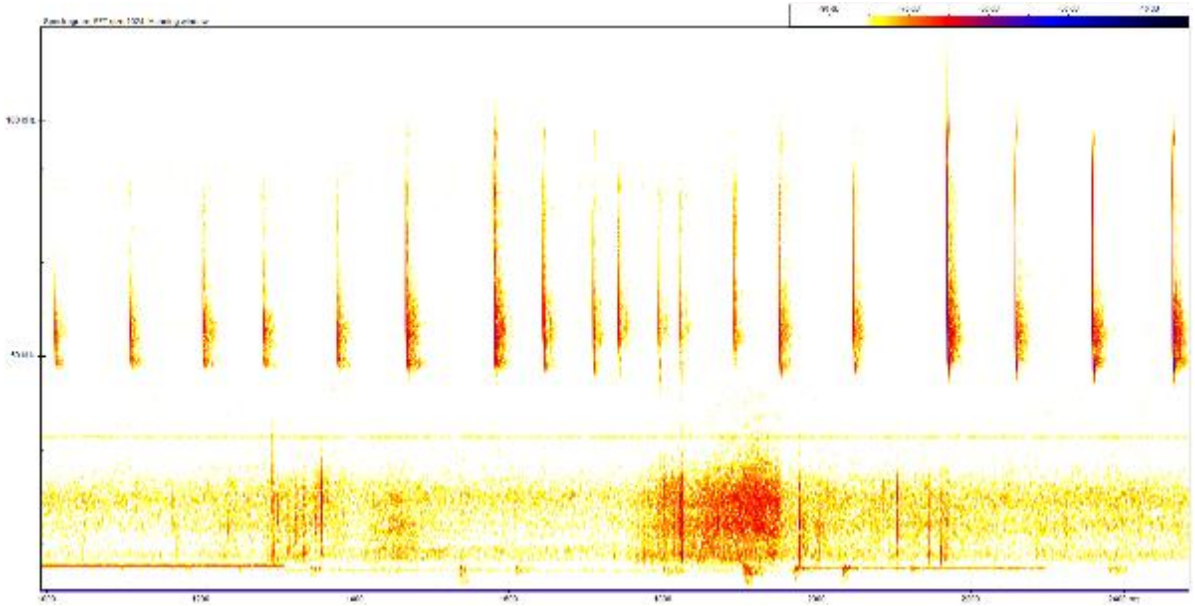
Sonogram 2: Up to five common pipistrelle foraging back and forth along Primrose Lane at 22:11 on 6th June 2022.



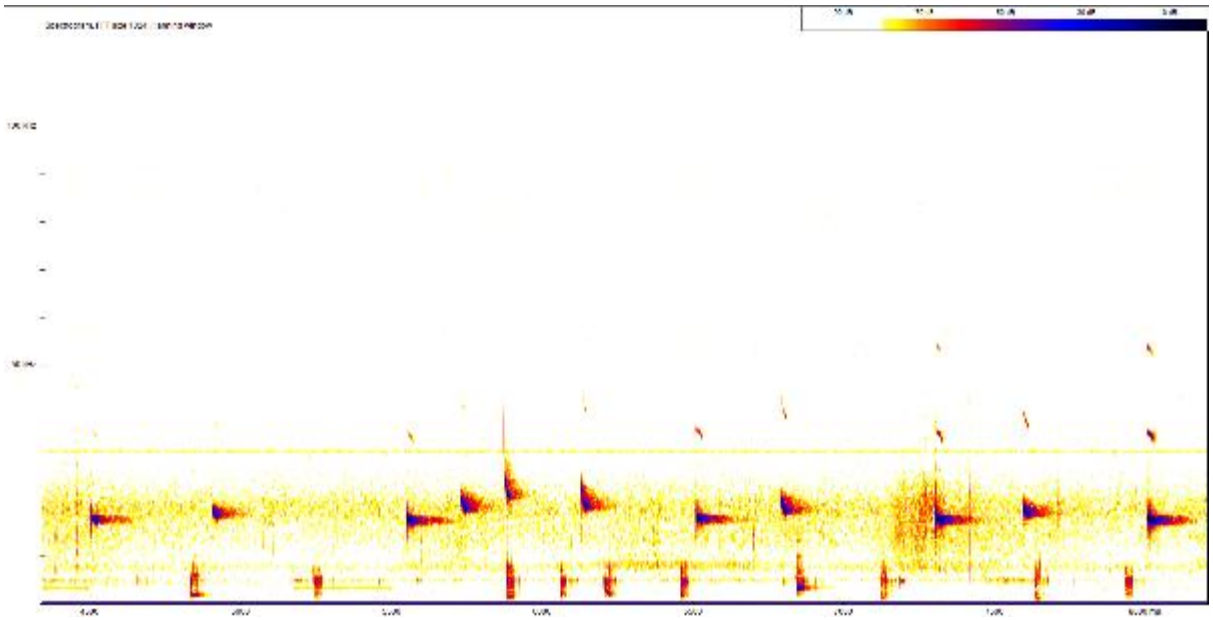
Sonogram 3: Common pipistrelle and Pipistrelle sp. (probably Nathusius' pipistrelle) recorded foraging around house to south east of the site.



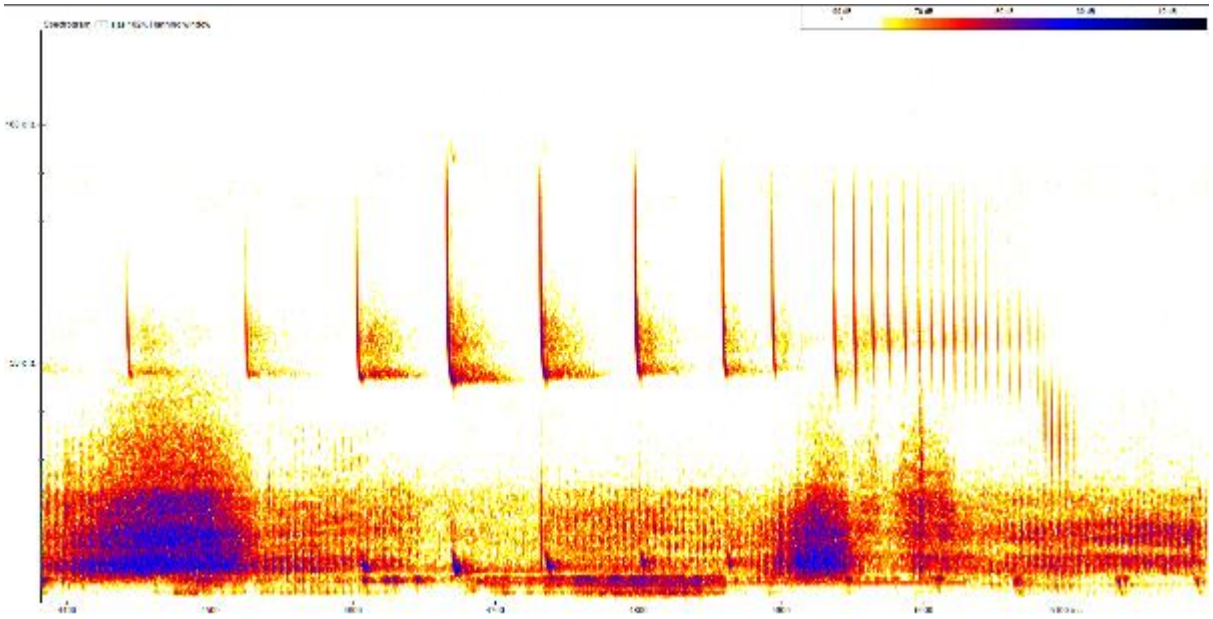
Sonogram 4: Two common pipistrelle and a noctule recorded on 27th June 2022 at 22:20.



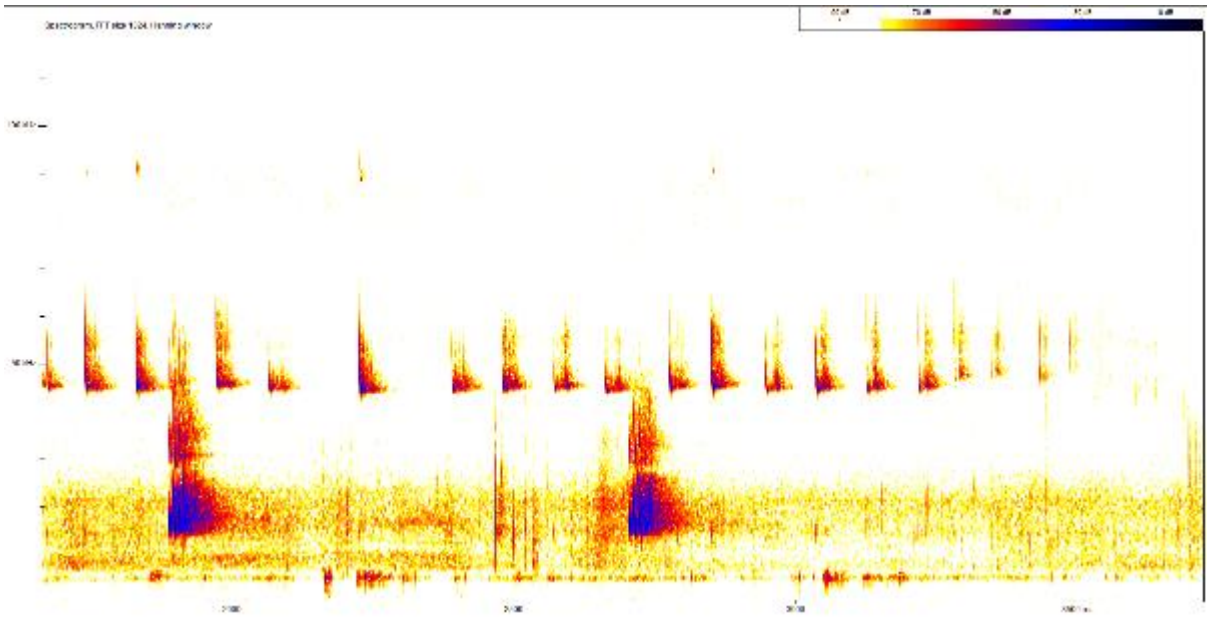
Sonogram 5: Whiskered/brandt's bat recorded on 27th June, 2022 at 22:28.



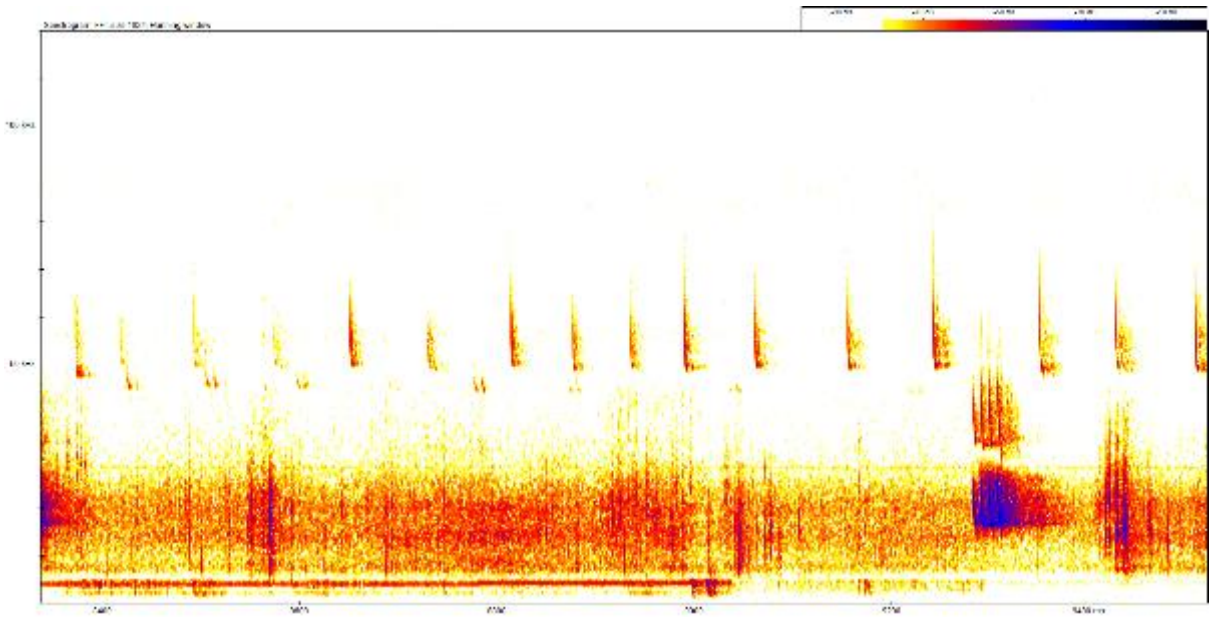
Sonogram 6: Noctule recorded foraging on 27th June, 2022 at 22:00.



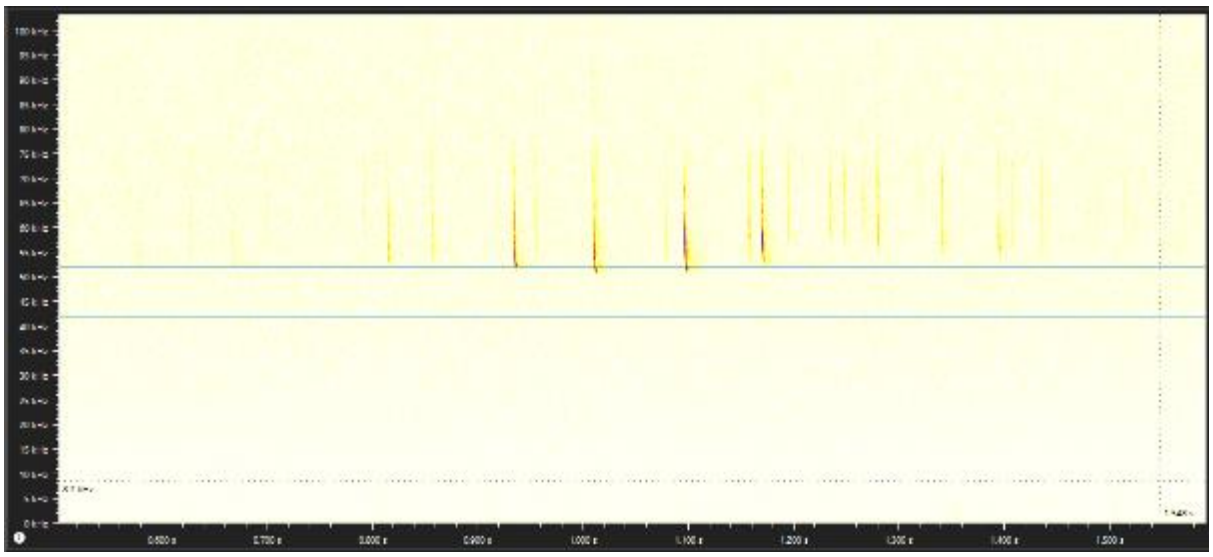
Sonogram 7: Common pipistrelle foraging in woodland on 28th July, 2022 at 21:26. A feeding buzz is illustrated to the right of the sonogram.



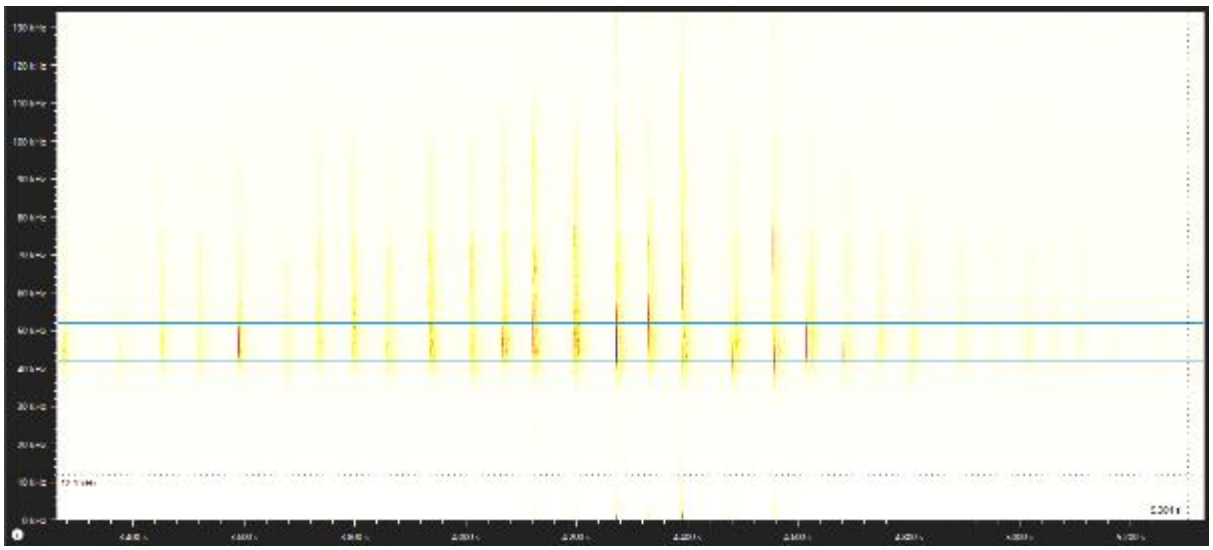
Sonogram 8: Two common pipistrelle recorded on 22nd August, 2022 at 21:41 foraging (see feeding buzz to right of sonogram) and emitting 'Type D' social calls.



Sonogram 9: Two common pipistrelle foraging on 29th September, 2022 with 'Type D' social calls being emitted.



Sonogram 10: Soprano pipistrelle recorded on Static Detector B on 29th July, 2022 at 04:23.



Sonogram 11: Daubenton's bat recorded on Static Detector A on 23rd September, 2022 at 21:42.

APPENDIX 2 LEGISLATION AND POLICY

LEGISLATION

Habitat Regulations

The Conservation of Habitats and Species Regulations 2017 has been amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The 2017 Regulations are one of the pieces of domestic law that transposed the land and marine aspects of the Habitats Directive (Council Directive 92/43/EEC) and certain elements of the Wild Birds Directive (Directive 2009/147/EC (known as the Nature Directives) in England and Wales.

The main changes to the 2012 regulations in relation to bats are as follows:

- an amended process for the designation of Special Areas of Conservation (SACs);
- arrangements for reporting on the implementation of the Regulations, given that the UK no longer provides reports to the European Commission;
- arrangements replacing the European Commission's functions with regard to the imperative reasons of overriding public interest (IROPI) test where a plan or project affects a priority habitat or species;
- arrangements for amending the schedules to the Regulations and the annexes to the Nature Directives that apply to the UK.

The 2017 Regulations (Regulation 9(1)), as amended by the 2019 Regulations, require the Secretary of State and Welsh Ministers to secure compliance with the requirements of the Nature Directives. Any new powers in the 2019 Regulations must be exercised in line with the Directives and retained EU case law up to 1 January 2021.

It is an offence to deliberately capture, kill or disturb[7] wild animals listed under Schedule 2 of the Regulations (Schedule 2 lists those species of animals listed in Annex IV(a) to the Habitats Directive which have a natural range which includes any area in Great Britain, such as all bat species and great crested newts). It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time). The prohibited methods of capturing and killing wild animals, which are listed in the main body of the Regulations, are transferred into new schedules to allow for future amendments. Any proposed changes will be subject to public consultation and will be made using statutory instruments.

[7] Disturbance, as defined by the Conservation of Habitats and Species Regulations 2010, includes in particular any action which impairs the ability of animals to survive, breed, rear their young, hibernate or migrate (where relevant); or which affects significantly the local distribution or abundance of the species.

Changes to Annex IV of the Habitats Directive and Schedules 2 (list of European Protected Species of animal) or 5 (list of European Protected Species of plant) of the Regulations will require an affirmative statutory instrument and be debated by Parliament or Senedd Cymru. This will ensure appropriate scrutiny of the changes and replicates procedures formerly undertaken by the European Commission.

All bats are listed on Annex IV of the Directive and some are also listed on Annex II. The latter annex relates to the designation of Special Areas of Conservation (SACs) and covers greater and lesser horseshoe bats, barbastelle and Bechstein's bat. Inclusion on Annex IV ('European protected species') means that member states are required to put in place a system of strict protection as outlined in Article 12; this is done through inclusion on Schedule 2 of the Regulations. Regulation 43 makes it an offence to:

- Deliberately capture or kill a bat [Regulation 43(1)(a)]
- Deliberately disturb a bat [R. 43 (1)(b)]
- Damage or destroy a breeding site or resting place of a bat [R. 43(1)(d)]
- Disturb wild animals of any such species [for the purposes of R. 43 (1)(b)], disturbance of animals includes in particular any disturbance which is likely
  (a) To impair their ability-
    i. To survive, to breed or reproduce, or to rear or nurture their young; or
    ii. In the case of animals hibernating or migratory species, to hibernate or migrate; or
  (b) To affect significantly the local distribution or abundance of the species to which they belong.
- Keep, transport, sell or exchange, or offer for sale or exchange [R. 43(3)(a-d)] a live or dead bat or any part of a bat which has been taken from the wild, and which is of a species or sub-species listed in Annex IV(a) to the Habitats Directive, and anything derived from such an animal or part of such an animal [R. 43(4)(a,b)].

A person guilty of an offence under this regulation is liable on summary conviction to imprisonment for a term not exceeding six months or to a fine, or to both.

Licences permit otherwise unlawful activities, and can only be granted for certain purposes.

Wildlife & Countryside Act

The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act (CRoW) 2000 and the Natural Environment and Rural Communities Act (NERC) 2006, consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), making it an offence to:

- Intentionally kill, injure or take any wild animal listed under Schedule 5 to the Act; intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act; intentionally or recklessly disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection; and
- Pick or uproot any wild plant listed under Schedule 8 of the Act. Sites of Special Scientific Interest (SSSI) are designated under this Act.

The Bern Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. It is a binding international legal instrument for nature conservation that covers the natural heritage of the European continent and some African states.

The principal aims of the Convention are to ensure conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase co-operation between contracting parties, and to regulate the exploitation of migratory species listed in Appendix III. To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1,000 wild animal species.

All bat species except the Common and Soprano Pipistrelles on Appendix II of the Bern Convention. Two bat species (Lesser and/or Greater Horseshoe Bats) are also cited in Annex II, which includes animals and plant whose conservation requires the designation of Special Areas of Conservation.

Bonn Convention

The Convention on the Conservation of Migratory Species of Wild Animals (also known as CMS or Bonn Convention11) aims to conserve terrestrial, aquatic and avian migratory species throughout their range. It is an intergovernmental treaty concluded under the aegis of the United Nations Environment Programme (UNEP). As the only global convention specialising in the conservation of migratory species, their habitats and migration routes, CMS complements and co-operates with

a number of other international organisations, NGOs and partners in the media as well as in the corporate sector.

Migratory species threatened with extinction are listed in the Appendix I to the Convention whereas migratory species that need or would significantly benefit from international co-operation are listed in the Appendix II. All European bats are mentioned in the Appendix II (apart from *R. aegyptiacus* which is nevertheless taken into consideration by EUROBATS – see below). The Convention encourages Range States to conclude global or regional Agreements. The Agreements may range from legally binding treaties (called Agreements) to less formal instruments, such as Memoranda of Understanding, and can be adapted to the requirements of particular regions.

In December 1991, an Agreement was concluded on the Conservation of Populations of European Bats (EUROBATS[8]). The Agreement aims to protect all European bat species[9] - whether migratory or not - through legislation, education, conservation measures and international co-operation. As of January 2016, 36 of 63 Range States are Parties to this Agreement, which entered into force on 16th January 1994. In the EU, Austria, Greece and Spain have not joined but contribute to the common work which is described in Annex 1. EUROBATS has also developed a Conservation and Management Plan, which is the key instrument for the implementation of the Agreement (see also Annex I).

POLICY

National Planning Policy Framework

The Government revised the National Planning Policy Framework (NPPF) in July 2021. This revised document replaces the previous National Planning Policy Framework published in March 2012 and revised in July 2018 and 19th February 2019. This sets out new guidance for local authorities, focusing on helping to produce planning policies that are clear and easier to understand. The NPPF is effective immediately; however, the local plans are still valid, for the time being, even if they have been produced prior to the revised NPPF. There is emphasis on the need for economic growth through designing planning policies which are in favour of development but this will not be achieved in isolation from social and environmental development.

Policies pertinent to bats are as follows:

[8] www.eurobats.org

[9] www.eurobats.org/about_eurobats/protected_bat_species

Section 15 (para 174-182) sets out the requirements for conserving and enhancing the natural environment. The NPPF asks that valued landscapes are protected and enhanced. Sites of biodiversity or geological value and soils are protected commensurate with their statutory status or identified quality in the local development plan. The document also requires the recognition of the intrinsic character and beauty of the countryside, maintaining the character of the undeveloped coast whilst improving public access to it where appropriate and most importantly minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures. It also asks that new and existing development is prevented from contributing to, or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air water or noise pollution or land instability. It is demanded that development should wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans. Finally, it requires that where appropriate remediating and mitigation of despoiled, degraded, derelict, contaminated and unstable land is carried out.

The Framework is guidance for local planning authorities on the content of their Local Plans but is also a material consideration in determining planning applications. The NPPF and revised NPPF has replaced much existing planning policy guidance, including Planning Policy Statement 9: Biological and Geological Conservation. However, the government circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and their Impact within the Planning System, which accompanied PPS9 remains valid.

Biodiversity Action Plans / Biodiversity 2020

The UK Biodiversity Action Plan (UKBAP) (Anon, 1995) was organised to fulfil the Rio Convention on Biological Diversity in 1992, to which the UK is a signatory. A list of national priority species and habitats has been produced with all listed species/habitats having specific action plans defining the measures required to ensure their conservation. Regional and local BAPs have also been organised to develop plans for species/habitats of nature conservation importance at regional and local levels.

The 'UK Post-2010 Biodiversity Framework', published in July 2012, succeeds the UK BAP and 'Conserving Biodiversity – the UK Approach', and is the result of a change in strategic thinking following the publication of the CBD's 'Strategic Plan for Biodiversity 2011–2020' and its 20 'Aichi Biodiversity Targets', at Nagoya, Japan in October 2010, and the launch of the new EU Biodiversity Strategy (EUBS) in May 2011. The Framework demonstrates how the work of the four countries and

the UK contributes to achieving the Aichi Biodiversity Targets, and identifies the activities required to complement the country biodiversity strategies in achieving the targets. The UKBAP is no longer an active strategy, and has been replaced by biodiversity strategies in England, Northern Ireland, Scotland and Wales. While the UKBAP is no longer an active policy, species listed on the UKBAP have been incorporated into the new biodiversity strategies for each country. In England under Biodiversity 2020: A strategy for England's wildlife and ecosystem services and undersection 41 of The Natural Environment and Rural Communities (NERC) Act 2006, where UKBAP species were recognised as of principal importance for the conservation of biodiversity. Section 40 of the NERC Act 2006 requires all public bodies to have regard for biodiversity conservation when carrying out their function. This is commonly referred to as the 'biodiversity duty'.

National BAP species of bat are barbastelle bat *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat *Rhinolophus hipposideros*. The Yorkshire and Humber Biodiversity Action Plan Species Audit indicated that three species of that have previously occurred or are known to occur in Yorkshire are Priority Species. These are: Barbastelle bat, greater horseshoe bat, lesser horseshoe bat and pipistrelle bat.

Local Development Plans

County, District and Local Councils have Structure Plans and other policy documents that include targets and policies which aim to maintain and enhance biodiversity. These are used by Planning Authorities to inform planning decisions.

Natural Environment and Rural Communities (NERC) Act (2006)

Public authorities have a duty to conserve biodiversity under the Natural Environment and Rural Communities (NERC) Act, which came into force in 2006. This states that 'any public body or statutory undertaker in England and Wales must have regard to the purpose of conservation of biological diversity in the exercise of their function and that decisions of public bodies work with the grain of nature and not against it' (Part 3, Paragraph 60). The Act also includes a range of measures to strengthen the protection of wildlife and habitats.