High Street, Shafton

Bat Transect Survey

Vistry Partnerships Yorkshire Limited and Homes England

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Executive Summary

Ecus Ltd (Ecus) was commissioned by Vistry Partnerships Yorkshire Limited, on behalf of themselves and Homes England in May 2020 to undertake bat transect surveys of land at High Street, Shafton (central Ordnance Survey National Grid Reference (OSNGR) SE 39386 10893), hereafter referred to as 'the Site'.

Current proposals indicate that the Site will be re-developed to provide 43 residential dwellings with associated landscaping and infrastructure. Existing woodland, hedgerow and grassland habitats at the Site will be lost to facilitate the construction of new dwellings within the footprint, whilst some boundary trees and hedgerows to the south-east and north-east will be retained.

Ecus conducted a Preliminary Ecological Appraisal (PEA) at the Site in June 2020; '*High Street, Shafton – Preliminary Ecological Appraisal*' ref: 15007, dated January 2021. This PEA and a previous survey report produced by Middleton Ecology in 2015 considered habitats at the Site to display low suitability for foraging and commuting bats. Further surveys were recommended accordingly to determine use of the Site by foraging and commuting bats.

During the PEA, two trees, a field maple (T2) and an apple tree (T10), were observed to have rot holes leading into potential upward leading cavities and were assessed as displaying up to moderate suitability for roosting bats. It was recommended that the two trees be subject to further endoscopic inspection to determine the presence/likely absence of rooting bats.

Bat transect surveys and static monitoring surveys were undertaken at the Site in May, July and September 2020. Foraging and commuting bat activity was considered to be moderate during the May survey with common pipistrelle being the most frequently recorded species. During the July and September surveys, common pipistrelle activity had reduced considerably although it continued to be the most frequently recorded species. Species diversity was considered to be moderate with up to six species recorded. The areas of woodland, trees and some of the hedgerows will be lost to the proposed development. It is recommended that loss of trees be compensated for by like for like replacement planting. A bat sensitive lighting scheme should be implemented at the Site.

The endoscopic inspection of T2 and T10 found the cavities to only extend upward for 15 cm with neither observed to support bats or evidence of bats. The suitability of these trees has therefore been downgraded to low. It is recommended that these trees be felled under Reasonable Avoidance Measures (RAM). In order to compensate for the loss of potential tree roost sites and to enhance the development for roosting bats, it is recommended that integrated bat boxes be incorporated into 30% of properties.

1. Introduction

1.1 Overview

1.1.1 Ecus Ltd (Ecus) was commissioned by Vistry Partnerships Yorkshire Limited, on behalf of themselves and Homes England in May 2020 to undertake bat transect surveys of land at High Street, Shafton (central Ordnance Survey National Grid Reference (OSNGR) SE 39386 10893), hereafter referred to as 'the Site'.

1.1.2 The Site comprises two semi-improved grassland fields, an area of semi-natural broadleaved woodland, and areas of scrub and tall ruderal vegetation. Additional habitats include a small area of poor semi-improved grassland, short perennial vegetation and scattered trees. Four hedgerows are present at the Site.

1.1.3 Current proposals indicate that the Site will be re-developed to provide 43 residential dwellings with associated landscaping and infrastructure. Existing woodland, hedgerow and grassland habitats at the Site will be lost to facilitate the construction of new dwellings within the footprint, whilst some boundary trees and hedgerows to the south-east and north-east will be retained.

1.2 Background

1.2.1 A Preliminary Ecological Site Appraisal (PESA) was undertaken by Middleton Ecological Consultancy (MEC) in January 2015 concluded that the Site offered suitable habitat for great crested newt, badger, nesting birds, bats and reptiles. As the PESA was carried out over five years ago, it was considered necessary to carry out an update PEA of the Site.

1.2.2 Ecus conducted a Preliminary Ecological Appraisal (PEA) of the Site in June 2020 ('*High Street, Shafton – Preliminary Ecological Appraisal*' (ref. 15007, January 2021)) at which time habitats and potential for protected species within the Site was recorded and the ecological value of the Site was assessed.

1.2.3 This report details the results of bat transect surveys with static monitoring and assesses the suitability of the Site to support foraging and commuting, and roosting bats only.

1.2.4 The Site was assessed for its suitability to support roosting, foraging and commuting bats in accordance with current Bat Conservation Trust (BCT) guidance (Collins, 2016).

1.2.5 During a review of a previous survey report (PESA, 2015) and of aerial imagery of the Site, conducted prior to the Ecus PEA being undertaken, habitats at the Site were considered to display low suitability for foraging and commuting bats therefore, in line with current guidance, it was recommended that three dusk ***activity transect surveys including static monitoring*** be conducted; one during each in spring, summer and autumn.

1.2.6 A number of trees are present at the Site. As part of the PEA, trees were subject to a ground based tree inspection for their suitability to support roosting bats. Two trees, a field maple (T2) and an apple tree (T10) which each had rot holes leading into potential upward cavities and were considered to display up to moderate suitability for roosting bats and it was recommended that they be subject to ***further endoscopic inspection*** to determine the presence or likely absence of roosting bats.

1.2.7 This report details the findings of the bat transect surveys and endoscopic inspection of T2 and T10 conducted at the Site between May and September 2020. Methodologies employed are described and an evaluation of the value of the Site for use by foraging, commuting and roosting bats is made. The need for further surveys

and/or mitigation measures are described where appropriate.

2. Methodology

2.1 Bat Transect Surveys and Static Monitoring

2.1.1 Walked dusk bat survey transects were undertaken across the Site in May, July and September 2020 in accordance with methodology recommended for sites displaying low suitability for commuting and foraging bats (Collins, 2016). Given the small size of the Site, a single transect route was walked by two surveyors walking in opposite directions i.e. two transects, to maximise coverage of the Site during each survey. The transect route totalled approximately 0.67 km in length and comprised eleven point counts (PC). Surveyors walked their transect stopping at each PC for up to five minutes to record any bats foraging or commuting over the Site.

2.1.2 The transect route was designed to ensure the Site was thoroughly covered on each transect survey occasion and taking into account habitat features likely to be of value to foraging and commuting bats. Survey details including date of survey, surveyor names and weather details are shown in Appendix 1. Transect routes and bat activity results are shown in Figures 1a-c and Appendix 1.

2.1.3 Bat transects commenced at sunset and continued until at least two hours after sunset.

2.1.4 The walked activity transects was coupled with remote static monitoring. Static monitoring devices were positioned adjacent to habitats considered to offer the greatest potential to support commuting and foraging bats. The units were deployed on the same visit as the bat activity transect and collected five nights later.

2.1.5 Two Anabat Swift static monitoring devices were installed at ground level at six locations across the Site for a period of five consecutive nights within May, July and September 2020. Different locations were selected for each survey in order to obtain data on bat activity across the Site. During the May surveys, the static detectors were sited in a sycamore within a woodland clearing at SE 39323 10877 (Location 1) and a field maple (T2) at SE 39386 10887 (Location 2). During the July surveys, the static detectors were sited in a tree on the southern boundary at SE 39374 10841 (Location 3) and on an ash tree towards the eastern boundary at SE 39445 10940 (Location 4). During the September surveys, the static detectors were sited on a small blackthorn tree adjacent the western boundary at SE 39323 10816 (Location 5) and on a wooden post adjacent the northern boundary at SE 39376 10925 (Location 6).

2.1.6 Analysis of sound files collected during the static monitoring survey period was undertaken using Kaleidoscope software with bat calls determined to species level or species group, where appropriate (Russ, 2012).

2.1.7 In order to aid comparison between data collected from different locations during different recording sessions, Bat Activity Indices (BAI) values were calculated using the formula below:

BAI = Bat sound files/ total number of night hours

2.1.8 Weather information for the Site during static monitoring recording periods was obtained from Brettas Park weather station (Ecowitt WH2551), located approximately 4.5 km south-west of the Site. Table A1.2 within Appendix 1 displays the locations, recording periods and weather details during each static monitoring survey period with static monitoring recording unit locations shown in Figures 1a-c.

2.2 Endoscopic Inspection of Trees

2.2.1 Ecus conducted a detailed endoscopic inspection survey of T2, a field maple, and T10, an apple, which were considered to display moderate suitability to support roosting bats and which are due to be impacted by the proposed development. In line with

current guidance (Collins, 2016) trees with moderate or high suitability for roosting bats should be subject to further survey. Given the low level of the features observed on T2 and T10, it was considered appropriate to conduct a ground-based endoscopic inspection.

2.2.2 The inspection was undertaken on 15th July 2020 by Assistant Ecologist Katie Smith under the guidance of licensed bat ecologist Daniel Best (Natural England Bat Licence Class 2 No. 2017-28168-CLS-CLS) in accordance with the recommended survey protocol (Collins, 2016).

2.2.3 Each feature was inspected using an endoscope (Ridgid CA-300). Any evidence of roosting bats, including live or dead bats, staining from fur oils, urine, or droppings was recorded.

2.3 Survey Limitations

2.3.1 The detection range of a bat detector can be affected by atmospheric factors (including ambient temperature, relative humidity and air pressure), the bat species recorded and habitat factors (as a result of sound absorption and bat/habitat interactions). Bats with high frequency, quiet or directional calls (such as long-eared bats) may sometimes only be detected at distances less than 5 m. Bats with low frequency and loud calls such as noctules may be detected as far away as 100 m or more.

2.3.2 Identification of bat calls to species level is not always possible, as calls may be faint, of poor quality or contain sound elements including echoes or ambient noise. It is frequently difficult to differentiate calls of different bat species within the same genus due to overlapping bat call parameters. In particular there is considerable overlap between echolocation calls of bat species in the *Myotis* genus. As such, in the most part it has only been possible to identify recordings of *Myotis* bats to genus level only. Where bats have been identified as indeterminate pipistrelle species, the echolocation call could not be confidently distinguished between common and soprano pipistrelle (i.e. not Nathusius' pipistrelle).

2.3.3 The suite of bat transect surveys undertaken at the Site during the 2020 bat activity season have been undertaken in accordance with best practice guidelines (Collins, 2016). It is considered that a thorough dataset of bat activity on the Site has been obtained enabling a robust assessment of the value of the Site to roosting, and foraging and commuting bats.

3. Findings and Evaluation

3.1 Bat Transect Surveys and Static Monitoring

Walked Bat Activity Transect Surveys

3.1.1 The results of the bat activity transect surveys are presented within Figures 1a-c with a description of activity recorded during each transect provided below.

28th May 2020

3.1.2 Bat activity was recorded across point counts (PC) 1, 4 - 6, and 8 - 10 on the transect route during this transect survey with bat activity recorded attributable to individual or low numbers of common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and noctule *Nyctalus noctula*. The only bats seen during the transect were observed along the southern boundary hedgerow between PC 4 and 5, and to the north-east of the Site at PC 7, 8, 9 and 10. In addition, bats were heard echolocating, but were not seen, along the southern, eastern and northern boundaries, and around the area of woodland to the north-west of the Site. Up to seven bat passes were recorded during any given point count or walked section, although generally only a single pass was recorded.

15th July 2020

3.1.3 Bat activity was recorded across PC 1, 2, 4, 5, 6, 7 and 8 on the transect route during this transect survey with bat activity recorded attributable to individual or low numbers of common pipistrelle, *Myotis* sp. and *Nyctalus* sp. The only bats seen were observed around the felled section of hedgerow at PC 7 and 8 and along the southern boundary between PC 5 and 6; these were all common pipistrelles. In addition, bats were heard echolocating, but were not seen, along the western boundary at PC 1 and 4, around the southern and eastern boundaries at PC 4 and 6. No more than two bat passes were recorded during any given point count or walked section, although generally only a single pass was recorded.

15th September

3.1.4 Bat activity was recorded across almost all point counts with the exception of PC 4, 9, 10 and 11 however bat activity was attributable to individual or low numbers of common pipistrelle, soprano pipistrelle, Myotis sp., noctule, potential Leisler's bat and a potential brown long-eared bat. A single common pipistrelle was seen during the transect survey at PC 5. Bats were heard echolocating along the western, southern and eastern boundaries, and down the centre of the Site along PC 2, 3, 7 and 8. Generally no more than 2 bat passes were recorded during any given point count or walked section, however up to 11 bat passes were recorded at PC 1.

Static Monitoring

3.1.5 The results of the static monitoring surveys are presented in Table A1.3 within Appendix 1 and summarised by location below. The locations of static monitoring devices are detailed in Figures 1a-c.

May 2020

3.1.6 Static Location 1 was on a mature sycamore within a clearing in the on-site woodland towards the north-west of the Site. Moderate levels of bat activity were recorded overall with 1269 bat sound files recorded during the five night recording period. Common pipistrelle comprises the most frequently recorded bat at Location 1 (969 sound files), followed by soprano pipistrelle (241 sound files) and *Myotis* sp. (56 files). Common pipistrelles were recorded during each night of the recording period with the first and last bat heard 20 minutes after sunset and 30 minutes prior to sunrise respectively.

Soprano pipistrelle was recorded during each night of the recording period, the first and last bat recorded at 24 minutes after sunset and 30 minutes before sunrise. *Myotis* sp. was also recorded during each night with the first and last bat recorded at 36 minutes after sunset and 52 minutes before sunrise. The number of passes recorded by common pipistrelle is considered to constitute moderate levels of bat activity. Three passes by a noctule across two separate nights comprised the remainder of activity recorded at Location 1.

3.1.7 Static Location 2 was on the mature field maple (T2) along the central hedgerow. Very low levels of bat activity were recorded overall with 51 bat sound files recorded during the five night recording period. The felling of the adjacent section of hedgerow, may have impacted upon foraging bats at this early stage in the year. Common pipistrelle comprises the most frequently recorded bat at Location 2 (39 sound files). Common pipistrelles were recorded during each night of the recording period with the first and last bat heard 28 minutes after sunset and 44 minutes prior to sunrise respectively. The number of passes recorded by common pipistrelle is considered to constitute very low levels of bat activity. Nine passes by soprano pipistrelle and three passes by *Myotis* sp., each across two separate nights comprised the remainder of activity recorded at Location 2.

3.1.8 July 2020

3.1.9 Static Location 3 was on the southern boundary of the Site within the boundary hedgerow. Very low levels of bat activity were recorded overall with only 49 bat sound files recorded during the five night recording period. Common pipistrelle comprises the most frequently recorded bat at Location 3 (23 sound files), closely followed by noctule (21 sound files). Common pipistrelles were recorded during each of the recording nights with the first and last bat heard 23 minutes after sunset and 32 minutes prior to sunrise respectively. Noctule was recorded during each night of the recording period with the first and last bat recorded at 10 minutes after sunset and 25 minutes before sunrise. The number of passes recorded by common pipistrelle and noctule is considered to constitute very low levels of bat activity. Three passes by a brown long-eared bat and two passes by Myotis sp., each over two separate nights, comprised the remainder of activity recorded at Location 3.

3.1.10 Static Location 4 was on a mature ash tree towards the eastern boundary of the Site. A total of 417 bat sound files were recorded which is considered to comprise low levels of activity. Common pipistrelle comprises the most frequently recorded bat at Location 4 (370 sound files), followed by noctule (29 sound files). Common pipistrelles were recorded during each of the recording nights with the first and last bat heard 20 minutes after sunset and 29 minutes prior to sunrise respectively. Noctule was also recorded during each night of the recording period with the first and last bat recorded at 10 minutes after sunset and 1 minute before sunrise. The number of passes recorded by common pipistrelle and noctule is considered to constitute low levels of bat activity. Nine passes by a *Nyctalus* species over one night, seven passes by *Myotis* sp. over four nights and a single pass by soprano pipistrelle and brown long-eared bat, each over a single night, comprised the remainder of activity recorded at Location 4.

September 2020

3.1.11 Static Location 5 was on a blackthorn tree adjacent the south-western boundary of the Site. Very low levels of bat activity were recorded overall with only 17 bat sound files recorded during the five night recording period. Common pipistrelle comprises the most frequently recorded bat at Location 5 (15 sound files), followed by noctule (2 sound files). Common pipistrelles were recorded during each of the recording nights with the first and last bat heard 29 minutes after sunset and 8 hours 18 minutes prior to sunrise respectively. Noctule was recorded during two nights with the first and last bat recorded at 2 hours 25 minutes after sunset and 8 hours 18 minutes before sunrise. The number

of passes recorded by common pipistrelle and noctule is considered to constitute very low levels of bat activity. No other bats were recorded at Location 5 during the recording period.

3.1.12 Static Location 6 was on a tree within an area of trees located adjacent to the southern boundary of the Site. A total of 222 bat sound files were recorded which is considered to comprise low levels of activity. Common pipistrelle comprises the most frequently recorded bat at Location 6 (144 sound files), followed by *Myotis* sp. (43 sound files) and noctule (32 sound files). Common pipistrelles were recorded during each of the recording nights with the first and last bat heard 25 minutes after sunset and 50 minutes prior to sunrise respectively. *Myotis* sp. was also recorded during each night of the recording period with the first and last bat recorded at 35 minutes after sunset and 1 hour 52 minutes before sunrise. Noctule was recorded during four of the recording nights with the first and last bat recorded at 16 minutes before sunset and 50 minute before sunrise. The number of passes recorded by common pipistrelle, Myotis sp. and noctule is considered to constitute low levels of bat activity. Three passes by a brown long-eared bat over three nights comprised the remainder of activity recorded at Location 6.

3.2 Endoscopic Inspection of Trees

3.2.1 The cavities in T2 and T10 were each found to extend to only 15 cm. No bats or evidence of bats were recorded and the features were considered to display low suitability for roosting bats. As such the suitability of these trees has been downgraded to low.

4. Assessment and Mitigation

4.1 Proposals

4.1.1 The proposed development comprises a total of circa. 43 residential dwellings with associated landscaping and infrastructure as detailed in the *Proposed Site Layout Option 3'* (ref. 0812-EA-A-P202-A, October 2020) produced by Edward Architecture. Existing areas of woodland, grassland, tall ruderal herbs, scattered trees and hedgerows will be lost to facilitate the development. Areas of retained habitat include a small number of mature trees along the northern boundary and the hedgerow adjacent the eastern boundary.

4.2 Legislation

Bats

4.2.1 All species of bat occurring within the UK are included in Schedule 2 of the Conservation of Habitats and Species Regulations 2019. Under regulation 43 bats are protected from deliberate capture, injury or killing, from deliberate disturbance and from deliberate damage or destruction of a breeding site or resting place (roost)[1].

4.2.2 All UK bats are also included on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended)[1] where it is an offence to intentionally or recklessly disturb bats while they are occupying a structure or place used for shelter or protection, or to obstruct access to any such place.

4.2.3 Barbastelle (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), brown long-eared, greater horseshoe (*Rhinolophus ferrumequinum*), lesser horseshoe (*Rhinolophus hipposideros*), noctule and soprano pipistrelle bats are included as priority species within Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006[1].

4.3 Assessment and Mitigation

Foraging Habitat

4.3.1 The Site supports foraging and commuting activity by a minimum of six bat species including common pipistrelle, soprano pipistrelle, noctule, Leisler's bat, brown long-eared bat and *Myotis* sp. However, pipistrelle bats account for the vast majority (91%) of all bat echolocation calls recorded during the static monitoring surveys, with common pipistrelle being recorded six times more frequently than soprano pipistrelle. All other species were recorded at low levels and this is also supported by the results of the walked activity transects. Even pipistrelle bats were typically recorded at low levels during the static monitoring and walked transects conducted in July and September.

4.3.2 Bat activity was fairly ubiquitous across the Site, likely given the small size of the Site and the general suitability of Site habitats for foraging and commuting bats. Low levels of activity recorded along the tree and hedgerow lined Site boundaries and over the grassland fields towards the centre of the Site. The mature trees and hedgerows, and to a lesser extent woodland edge habitats, are the most valuable habitats at the Site for foraging and commuting bats, with the greatest number of bat passes recorded in these areas and the most ball calls recorded on the static detector at Location 2. Artificial light on the Site is fairly limited and comprises street lighting from High Street to the west and some, limited, security lighting from adjacent properties to the north

[1] See *www.legislation.gov.uk* for full legislative details

and west, which may explain why low numbers of light avoiding species, namely brown long-eared and *Myotis* sp. have been recorded at the Site. Boundary trees and hedgerows along the southern and eastern boundaries and along the woodland edge habitats were not subject to light spillage, maintaining valuable dark corridors for bats.

4.3.3 A moderate diversity of bat species has been recorded at the Site and predominantly low levels of activity have been recorded although moderate activity was recorded during the May transect survey. The proposed development will result in the loss of woodland habitat, scattered trees and a number of the hedgerows. Mature trees along the northern boundary and the eastern boundary hedgerow will be retained, maintain foraging habitat along these boundaries. Where trees are to be lost, it is recommended that they be replaced on a like-for-like basis, at a rate no less than one tree planted for every one lost. Where practicable, Hedgerow 3 along the southern boundary should be retained as some of the highest levels of bat activity were recorded in this area. This would maintain foraging and commuting habitat for bats at the Site.

4.3.4 To maintain the value of the retained and new habitats to commuting and foraging bats in the long term post-construction, a sensitive lighting scheme will be designed which avoids any direct lighting of these boundary features and of new habitat to be created on Site including the two attenuation areas. Any light spill onto boundary features and retained and new habitat will be limited to a maximum of 3 lux as far as is practicable (Guidance Note 08/18, BCT ILP). In addition, direct lighting of any new bat boxes will also be avoided. The lighting strategy should be developed by a lighting engineer in close consultation with an ecologist at an early stage in the design.

Trees

4.3.5 Following the endoscopic inspection, T2 and T10 are considered to display low suitability to support roosting bats. In line with the recommendations made within the 2020 PEA, trees which display low suitability for roosting bats should be felled under Reasonable Avoidance Measures (RAMs) involving a precautionary approach to felling.

4.3.6 Where practicable and safe to do so, the trees will be felled with their branches cushioning the impact. If this is not possible, trees will be felled sensitively, avoiding cross cutting through potential features. The trees/tree sections will be left in situ for 24 hours with any cavities facing upwards to allow any bats within the tree to disperse.

4.3.7 In order to compensate for the loss of mature trees and potential roost sites, and to enhance the development for roosting bats, it is recommended that a range of bat roosting provision be incorporated into the development. Suitable provision should include building incorporated Habibat 3S bat boxes and tree mounted Schwegler 2F bat boxes (or similar. A total of 15 bat boxes is recommended in order to provide bat roosting provision on 30% of properties at the Site. The bat boxes should be placed at a minimum height of 4 m in a number of locations facing different aspects to maximise the chances of occupation.

5. References

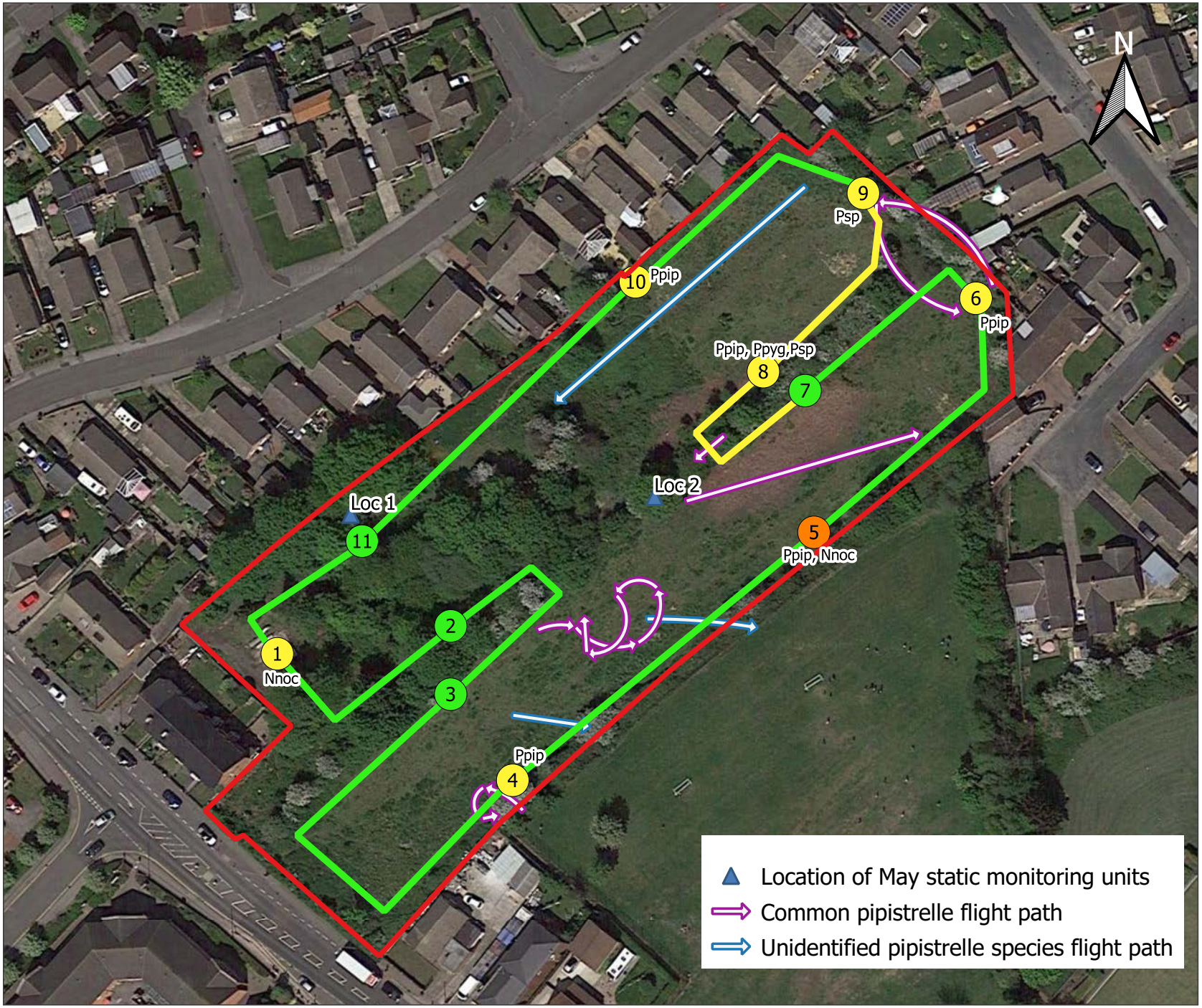
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Figure 1: Bat Activity Transect Surveys and Static Monitoring



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Legend

Site Boundary

May Transect Points and Activity Level

- 0 passes
- 1-5 passes
- 6-10 passes

May Walked Section and Activity Level

- 0 passes
- 1-5 passes

Species codes:
Nnoc - Noctule
Ppip - common pipistrelle
Ppyg - soprano pipistrelle
Psp - unidentified pipistrelle species

Transect times
Start: 21:20
End: 23:20
Sunset:21:20

0 10 20 m

Vistry Partnerships Limited
High Street, Shafton

Figure 1a
May Walked Bat Transect and Static Detector Locations

Brook Holt 3 Blackburn Road Sheffield s61 2DW
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Date: September 2020 | Scale 1:1862 @A3 | Drg.Ref: KT/15007/F1a



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Legend

Site Boundary

July Transect Points and Activity Level

0 passes

1-5 passes

July Walked Section and Activity Level

0 passes

1-5 passes

Species codes:
Myo sp. - unidentified myotis species
Nlei - Leisler's bat
Ppip - common pipistrelle
Psp. - unidentified pipistrelle species

Transect times
Start: 21:27
End: 23:27
Sunset: 21:27

0 10 20 m

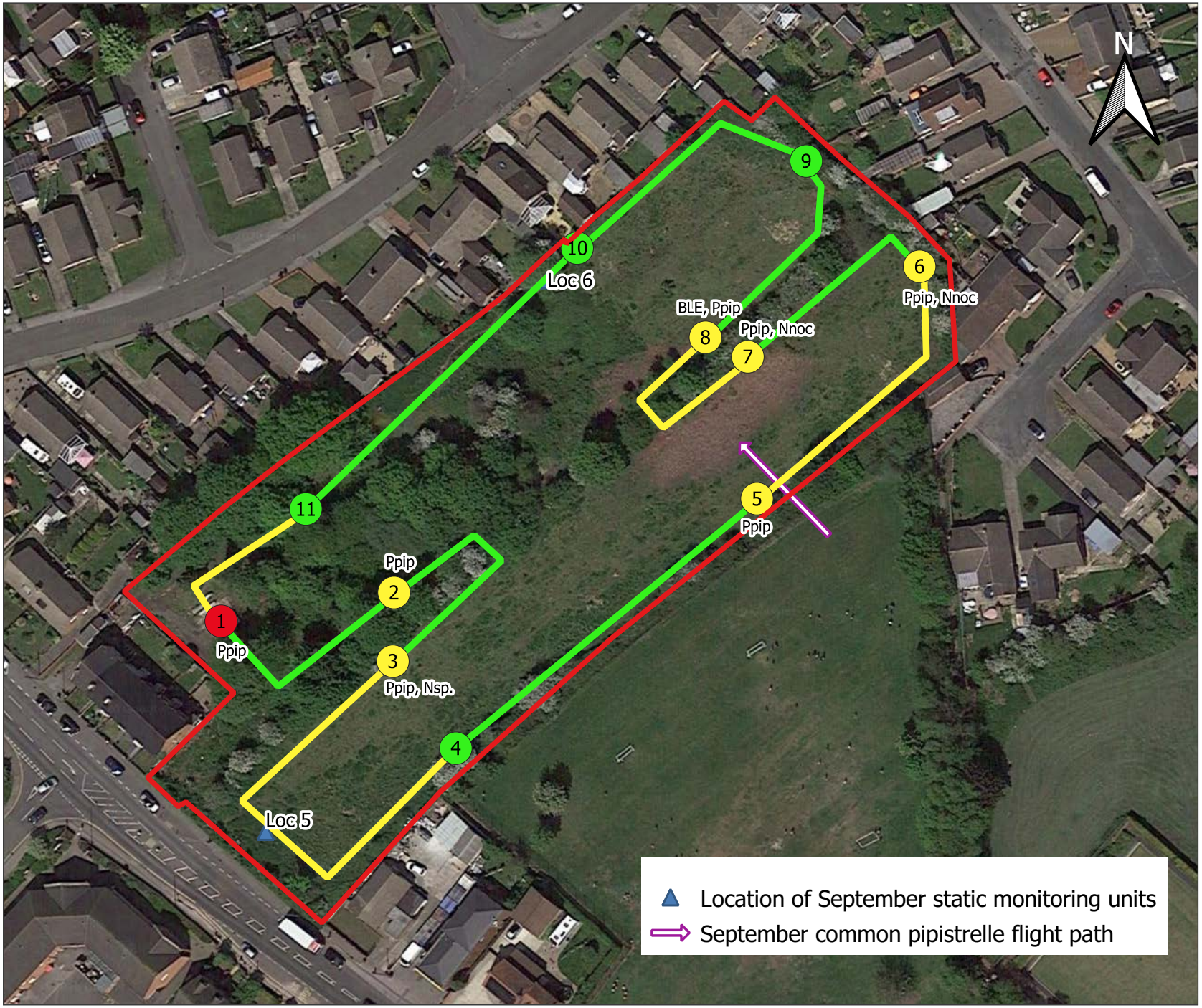
Vistry Partnership Limited
High Street, Shafton

Figure 1b
July Walked Bat Transect and Static Detector Locations

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Legend

Site Boundary

September Transect Points and Activity Level

- 0 passes
- 1-5 passes
- 11+ passes

September Walked Section and Activity Level

- 0 passes
- 1-5 passes

Species codes:
BLE - brown long-eared
Nnoc - noctule
Nsp. - unidentified nyctalus species
Ppip - common pipistrelle

Transect times
Start: 19:23
End: 21:23
Sunset: 19:23

0 10 20 m

Vistry Partnerships Limited
High Street, Shafton

Figure 1c
September Walked Bat Transect and Static Detector Locations

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Date: September 2020 | Scale 1:1862 @A3 | Drg.Ref: KT/15007/F1c

Appendix 1. Bat Activity Transects and Static Monitoring

Table A2.1. Details of Transect Survey

Date & Time	Survey Type	Weather Conditions
28.05.2020 Sunset: 21:20 Start: 21:20 End: 23:20	Dusk transect	Beaufort scale: 2, Temp: 16 ^{o}C, Rain: 0, Cloud cover: 0%
15.07.2020 Sunset: 21:27 Start: 21:27 End: 21:27	Dusk transect	Beaufort scale: 3, Temp: 15 ^{o}C, Rain: 0, Cloud cover: 100%
14.09.2020 Sunset: 19:23 Start: 19:23 End: 21:23	Dusk transect	Beaufort scale: 0, Temp: 21 °C, Rain: 0, Cloud cover: 0%

Table A2.2. Remote Static Monitoring Basic Details

Start Date	End Date	Location Ref and OSGR	Mean Wind Speed (mph)	Min Temp (°C)	Max Temp (°C)	Mean Temp (°C)	Total Rain (mm)
28.05.20	02.06.20	1 - SE 39323 10877	13	7	23	15	7
28.05.20	02.06.20	2 - SE 39386 10886	13	7	23	15	7
15.07.20	20.07.20	1 - SE 39374 10841	17	8	23	15.5	5
15.07.20	20.07.20	2 - SE 39445 10940	17	8	23	15.5	5
14.09.20	19.09.20	1 - SE 39323 10816	6	8	24	16	3
14.09.20	19.09.20	2 - SE 39376 10925	6	8	24	16	3

Table A2.3. Remote Static Monitoring Survey Data

Location reference	Start date	End date	Static unit location Grid Reference (ten figure)	Bat species	Number of sound files	Number of nights recorded	Time of first bat (h)	Time of last bat (h)	Sunset (h)	Sunrise (h)	Bat Activity Index (Sound files/night)	Bat Activity Index (Sound files/hour)
Location 1	28.05.2020	02.06.2020	SE3932210887	Common Pipistrelle	969	5	21:42	04:13	21:22	04:43	193.8	27.37
Location 1	28.05.2020	02.06.2020	SE3932210887	Soprano Pipistrelle	241	5	21:46	04:13	21:22	04:43	48.2	6.81
Location 1	28.05.2020	02.06.2020	SE3932210887	Myotis species	56	5	21:58	03:51	21:22	04:43	11.2	1.58
Location 1	28.05.2020	02.06.2020	SE3932210887	Noctule	3	2	00:30	04:17	21:22	04:43	1.5	0.21
Location 2	28.05.2020	02.06.2020	SE3938610886	Common Pipistrelle	39	5	21:50	03:59	21:22	04:43	7.8	1.10
Location 2	28.05.2020	02.06.2020	SE3938610886	Soprano Pipistrelle	9	2	00:13	03:55	21:22	04:43	4.5	0.64
Location 2	28.05.2020	02.06.2020	SE3938610886	Myotis species	3	2	23:46	03:51	21:22	04:43	1.5	0.21
Location 3	15.07.2020	20.07.2020	SE3937410841	Common Pipistrelle	23	5	21:47	04:28	21:24	05:00	4.6	0.61
Location 3	15.07.2020	20.07.2020	SE3937410841	Noctule	21	5	21:34	04:35	21:24	05:00	4.2	0.55
Location 3	15.07.2020	20.07.2020	SE3937410841	Brown Long-eared	3	2	23:21	03:32	21:24	05:00	1.5	0.20
Location 3	15.07.2020	20.07.2020	SE3937410841	Myotis species	2	1	02:08	02:16	21:24	05:00	2	0.26
Location 4	15.07.2020	20.07.2020	SE3944510940	Common Pipistrelle	370	5	21:44	04:31	21:24	05:00	74	9.74
Location 4	15.07.2020	20.07.2020	SE3944510940	Noctule	29	5	21:34	04:59	21:24	05:00	5.8	0.76
Location 4	15.07.2020	20.07.2020	SE3944510940	Nyctalus species	9	1	00:52	00:54	21:24	05:00	9	1.18
Location 4	15.07.2020	20.07.2020	SE3944510940	Myotis species	7	4	21:52	02:01	21:24	05:00	1.75	0.23
Location 4	15.07.2020	20.07.2020	SE3944510940	Soprano Pipistrelle	1	1	00:07	00:07	21:24	05:00	1	0.13
Location 4	15.07.2020	20.07.2020	SE3944510940	Brown Long-eared	1	1	03:24	03:24	21:24	05:00	1	0.13
Location 5	14.09.2020	19.09.2020	SE3932310816	Common Pipistrelle	15	5	19:45	22:26	19:16	06:44	3	0.26
Location 5	14.09.2020	19.09.2020	SE3932310816	Noctule	2	2	21:41	22:26	19:16	06:44	1	0.09
Location 6	14.09.2020	19.09.2020	SE3937610925	Common Pipistrelle	144	5	19:41	05:54	19:16	06:44	28.80	2.50
Location 6	14.09.2020	19.09.2020	SE3937610925	Myotis species	43	5	19:51	04:52	19:16	06:44	8.60	0.75
Location 6	14.09.2020	19.09.2020	SE3937610925	Noctule	32	4	19:00	05:34	19:16	06:44	8	0.70
Location 6	14.09.2020	19.09.2020	SE3937610925	Brown Long-eared	3	3	21:24	05:34	19:16	06:44	1	0.09