AWE AWE Aldermaston

Hydrus Project

Aldermaston, Berkshire

Bat Report

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Summary

S.1 RPS was commissioned to conduct various bat surveys on land at the Hydrus project site at AWE Aldermaston in Berkshire.

S.2 A Phase 1 Habitat Survey (RPS, 2009) identified that the site provided suitable foraging and commuting habitat for bats and contained a veteran oak tree with HIGH potential to support roosting bats.

S.3 Two evening emergence surveys and one dawn swarming survey were carried out on the veteran oak tree. The surveys were carried out during June and July 2009 and were undertaken in accordance with the *Bat Surveys: Good Practice Guidelines* (BCT, 2007).

S.4 The objectives of the surveys were to; establish whether the veteran oak tree is currently used by roosting bats; establish which species are using the roost; and, establish an approximate number of bats of each species using the roost.

S.5 Visual observations were made of where bats emerged and bat detectors were used to detect bats emerging from the tree and hear echolocation calls. Recordings of bat calls were made and the data recorded was subsequently analysed on a PC using BatScan v.9 software.

S.6 No bats were directly observed emerging from or returning to the tree. Bat foraging activity around the tree was high.

S.7 Evening activity surveys were carried out across the habitats within the site boundary, in order to assess bat species assemblage and activity levels on the site.

S.8 A transect route was selected to include all habitats on the site and the features which had been assessed during preliminary surveys as having potential for use by foraging and commuting. The evening activity surveys were undertaken during June and July 2009.

S.9 The surveys involved three bat activity surveys lasting at least 2 hours and commencing at sunset. On each visit an ecologist walked the transect at a steady speed. Start points were varied for each survey so as to reduce bias associated with time of day/night.

S.10 Visual observations for bats were undertaken by scanning the skyline and trees, and bat detectors were used to listen to echolocation calls. Recordings of bat calls were made on portable mp3 players. For any bats encountered, notes were made on the location, species or species group (where this could be determined in the field), behavioural observations and activity heard. Data recorded during the evening bat activity surveys were subsequently analysed on a PC using BatScan v.9.

S.11 Bat activity was recorded on all surveys and the site was found to provide commuting and foraging habitat for at least two species of bat; common pipistrelle and soprano pipistrelle. Noctule was also recorded within the site during emergence surveys.

S.12 The site was assessed as having MEDIUM bat interest, however, when the site was assessed in more detail only the south east corner was found to have MEDIUM interest with the rest of the site being of relatively LOW bat interest.

S.13 The south east corner contained a variety of habitats which made it of value to foraging and commuting bats. Prolonged foraging activity was recorded in this area with nine contacts recorded during one survey. All three species of bat recorded on the site were found there.

1 Introduction

1.1 RPS was commissioned to conduct various bat surveys on land at the Hydrus project site at AWE Aldermaston in Berkshire.

1.2 The site covers approximately 8.5 hectares and is predominantly grassland, most which consists of neutral grassland which in places can be considered flower-rich with patches of acid grassland. This grassland has developed over aggregate and broken ground is effectively “brownfield” in nature. A small deciduous copse is located in the southeast corner of the site with a field layer which is dominated by bramble. There are scattered trees over the remainder of the site and a veteran oak is located adjacent to the copse. The site is bordered by roads to the north and west and by areas of managed grassland interspersed with deciduous woodland and parkland trees to the south and east.

1.3 A desk study (RPS, 2009) found that bats, including brown long-eared bats, pipistrelles, serotines, and natterers had been recorded within 3.5km of the site. A Phase 1 Habitat Survey (RPS, 2009) identified a veteran oak tree on the site with potential to support roosting bats.

1.5 Evening emergence and dawn swarming surveys were carried out on the veteran oak tree in order to identify whether it supported roosting bats. No other structures suitable for roosting bats, such as buildings, were present within the site boundary.

1.6 The objectives of the evening emergence and dawn swarming surveys were to:

- Establish whether the veteran oak tree is currently used by roosting bats;
- Establish which species are using the roost; and
- Establish an approximate number of bats of each species using the roost.

1.7 The Phase 1 Habitat Survey of the site also revealed that the site provided suitable foraging and commuting habitat for bats. Habitats that were highlighted as being of particular potential importance included a woodland copse, stand alone trees and a running wet ditch.

1.8 Evening activity surveys were carried out across the habitats within the site boundary, in order to assess bat species assemblage and activity levels on the site.

1.9 The objectives of the evening activity surveys were to:

- Identify areas of bat activity and describe bat movements on and around the site;
- Determine species or species groups of bats present on and around the site; and
- Identify type of activity to determine foraging areas or commuting routes/flight paths.

1.10 This report includes a description of the survey methods employed, results obtained, and conclusions concerning the use of the site by bats.

2 Methodology

2.1 All species of bat and their roosts are protected under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000) and The Conservation (Natural Habitats, &c.) Regulations 1994.

2.2 The bat surveys were undertaken in June and July 2009, when bats are fully active. The surveys were conducted to the UK recognised survey standards set by the Bat Conservation Trust 'Bat Surveys – Good Practice Guidelines', July 2007.

2.3 The bat surveys were undertaken by a licensed bat worker and experienced assistant ecologists and covered the whole of the site and surrounding habitats for foraging and commuting bats.

2.4 The following paragraphs describe the methodology used to carry out the bat surveys.

Evening emergence and dawn swarming survey

2.5 Two evening emergence surveys and one dawn swarming survey were carried out on a veteran oak tree which was identified as having high bat roost potential. The surveys were undertaken on the 22nd June, 2nd July 2009 and 14th July 2009. Each survey was undertaken in accordance with the *Bat Surveys: Good Practice Guidelines* (BCT, 2007). The location of the veteran oak tree is shown on Figure 1.

2.6 Evening emergence surveys involved a 2.25 hour survey commencing 15 minutes before sunset and the dawn swarming survey involved a 2 hour survey commencing 2 hours before dawn. Each survey involved 2 surveyors observing the tree for the duration of the survey. Visual observations were made of where bats emerged and in what direction they flew after emergence. Bat detectors were used to detect bats emerging from the trees and hear echolocation calls. Bat Box Duet (frequency division) bat detectors were used and recordings of bat calls were made on portable mp3 players. Notes were made on the species (where this could be determined), behavioural observations (e.g. direction of flight), activity heard (e.g. feeding buzzes, social calls) and any behaviour that could be seen including point of exit from the tree. Observations were made for any bats encountered (bats commuting/foraging in the vicinity of the surveyed tree) as well as bats emerging from tree.

2.7 Data recorded were subsequently analysed on a PC using BatScan v.9. This allows the display of sonograms and power spectra of bat calls, which, together with the measurement of call parameters such as peak call frequency, pulse length and repetition rate, assist in identifying calls to species or species groups. Identification was guided by information provided in Russ (1999).

Bat activity survey

2.8 Evening bat activity surveys were carried out by suitably experienced ecologists in accordance with the *Bat Surveys: Good Practice Guidelines* (BCT, 2007).

2.9 A transect route was chosen to cover all habitats within the site and to include features which had been assessed during preliminary surveys as having potential for use by foraging and commuting bats, including the woodland copse, wet ditch and stand alone trees. The route is shown on Figure 2. The transect was surveyed twice during each survey.

2.10 Survey visits were conducted on the 16th June and the 7th and 30th July 2009.

2.11 Each visit involved a bat activity survey lasting at least 2 hours, commencing at sunset. On each survey two ecologists walked the transect at a steady speed. Listening station stops lasting 5 minutes each were incorporated along the route at particular features of interest. On each visit start points were varied so as to reduce bias associated with time of day/night.

2.12 Visual observations for bats were undertaken by scanning the skyline and trees, and bat detectors were used to listen to echolocation calls. Bat Box Duet (frequency division) and Pettersson D240x (time expansion) bat detectors were used and recordings of bat calls were made on portable mp3 players. For any bats encountered, notes were made on the location, species or species group (where this could be determined in the field), behavioural observations (e.g. direction of flight, habitat) and activity heard (e.g. feeding buzzes, social calls).

2.13 Data recorded were subsequently analysed on a PC using BatScan v.9

2.14 Following analysis, the transect was assigned to one of three bat interest categories: LOW, MEDIUM and HIGH.

2.15 Areas of LOW bat interest are those for which:

- Three or fewer bat species were detected; and
- These were present at a low density (<3 contacts in a given location).

2.16 Areas of MEDIUM bat interest are those for which there were either:

- More than three bat species present at a low density; or
- Fewer than three species present, but one or more of these present at a high density (>5 contacts in a given location).

2.17 Areas of HIGH bat interest are those for which there were either:

- More than four species present;
- Confirmed roost site present; or

- Rarer species present.

2.18 In some cases (particularly where bat density was intermediate), borderline categories of LOW/MEDIUM and MEDIUM/HIGH were used.

2.19 A similar approach, but at a discrete geographical area level, was used to assess bat interest at a finer spatial scale. This approach gives some indication of the relative levels of bat interest within the areas that were surveyed.

2.20 It should be noted that the numbers of bats recorded during surveys of this nature are likely to represent only a proportion of the actual number of bats present. However, they do give a useful indication of bat density, distribution and behaviour.

3 Results

Evening emergence and dawn swarming survey

3.1 The results from the evening emergence and dawn swarming surveys are described in the paragraphs that follow and shown on Figure 1. The full results from the surveys are included in Appendix 1.

Evening emergence survey 1 – 22/06/09

3.2 Fourteen bat contacts were recorded during the first evening emergence survey. The contacts comprised 8 common pipistrelles *Pipistrellus pipistrellus*, 2 soprano pipistrelles *Pipistrelle pygmaeus*, 1 noctule *Nyctalus noctula*, 2 unidentified large bats and 1 unidentified bat.

3.3 Most contacts were of bats foraging around or near to the tree and a few were of commuting bats. Some contacts were too brief or faint to determine behaviour. Two unidentified large bats were recorded at approximately the same time as a noctule was recorded and may have been from the same bat.

3.4 No bats were observed emerging from the tree.

Evening emergence survey 2 – 02/07/09

3.5 Thirteen bat contacts were recorded during the second evening emergence survey. The contacts comprised, 11 common pipistrelle contacts, 1 soprano pipistrelle contact and one unidentified bat, which had a call too faint/brief to analyse. On two occasions a common pipistrelle contact comprised two or more bats.

3.6 Most contacts were of bats foraging although two early contacts were too faint or brief to determine behaviour.

3.7 No bats were observed emerging from the tree.

Dawn swarming survey – 14/07/09

3.8 Two bat contacts were recorded during the dawn swarming survey. Each contact was of a common pipistrelle; one was observed foraging and the other contact was too brief to determine behaviour.

3.9 No bats were observed swarming around the tree or entering it.

Bat activity survey

Site overview

3.10 The site can be broadly classified as grassland, much of which is flower-rich. Much of the site can be considered brown field and comprises grassland re-established over rubble left from the sites of demolished buildings. A small deciduous copse and a small ditch are situated in the south-east corner of the site and there are numerous stand alone trees ranging from young silver birch to a large veteran oak tree.

3.11 Much of the habitat on the site to the south and east of the site is similarly composed of grassland with scattered trees and small areas of woodland. A larger strip of woodland lies to the north off site where there is a further area of grassland and scattered trees. A number of other veteran trees are located nearby. Buildings and roads lie to the west of the site. The areas to the north, south and west of the site are well lit by street lights. Several ponds lie in close proximity to the site.

3.12 The surveys were conducted in weather conditions appropriate for bat activity surveys (i.e. no rain or strong wind).

3.13 The results of the survey visits are given in the tables and paragraphs that follow. The activity patterns are shown on Figure 3.

Activity survey 1 – 16/06/09

Table 1. Results of bat activity survey 1.

Start time: 21:20pm Finish time: 23:40pm Sunset: 21:20pm

Weather: Still, clear night, 14C

Time	Location	Observation	Species
22.10 – 22.20	C	2+ bats foraging around the vicinity of the veteran oak, maple tree and woodland edge. Sustained foraging for at least 10mins	Common Pipistrelle Soprano Pipistrelle
22.40	G	3+ bats foraging around stand alone oak trees	Common Pipistrelle Soprano Pipistrelle
22.55	B	Bat briefly heard but not seen near to ditch.	Common Pipistrelle
22.57	B	Bat briefly heard again near ditch but not seen.	Common Pipistrelle
23.02 –	C	>1 bat foraging around veteran oak. Less	Common Pipistrelle

Time	Location	Observation	Species
23.08		sustained activity than at 10.10	
23.10	E	Bat foraging along woodland edge.	Common Pipistrelle
23.14	E	Bat commuting along woodland edge	Unidentified Pipistrelle
23.25	F	Bat briefly heard but not seen, possibly commuting.	Common Pipistrelle
23.32	C	Bat foraging in vicinity of veteran oak	Common Pipistrelle

3.14 During the first survey, a total of 11 bat contacts were recorded. Eight of these were of common pipistrelles, two were of soprano pipistrelles and one was of an unidentified pipistrelle bat. Most contacts were of bats foraging in the south east corner of the site around the veteran tree and along the woodland edge. Three bats were also recorded foraging around a group of oak trees in the North West corner of the site. Three contacts were of bats near to the ditch and centre of the site that were only briefly heard and not seen. These bats are likely to have been commuting across the site.

Activity survey 2 – 07/07/09

Table 2. Results of bat activity survey 2.

Start time: 21:15pm Finish time: 23:25pm Sunset: 21:20pm

Weather: 100% high cloud, following heavy showers and storms, light/no breeze, 14C.

Time	Location	Observation	Species
22:00	G	Bat commuting in a NE direction from area of 2 oak trees away from site.	Common Pipistrelle
22:10 – 22: 13	A	Bat briefly and faintly heard on several occasions but not seen. Direction of contacts suggests bat is likely to be foraging around trees south of site boundary.	Unidentified Pipistrelle
22:25	D	Bat heard several times foraging near woodland edge/veteran tree and then leaving site over site boundary before returning again	Common Pipistrelle
22:30	E	Bat foraging along woodland edge.	Common Pipistrelle

3.15 During the second survey visit a total of 4 bat contacts were recorded. Three of these were of common pipistrelles and one was of an unidentified pipistrelle bat. Three of the contacts were of bats foraging in the south east corner of the site and from just beyond the southern site boundary. One contact was of a bat commuting across the site.

Activity survey 3 – 07/07/09

Table 3. Results of bat activity survey 3.

Start time: 20:55pm Finish time: 23:00pm Sunset: 20:58pm

Weather: Mainly clear, 25% thin high cloud, light breeze, 12C.

Time	Location	Observation	Species
21.30	A	Bat briefly and faintly heard on 2 occasions, not seen.	Unidentified (recording too faint)
21:35	A	Bat foraging along southern site boundary (out side of site)	Common Pipistrelle
21:50	C	Bat briefly heard but not seen	Common Pipistrelle
22:00	D	Bat foraging for several minutes near site boundary close to woodland edge and veteran oak.	Common Pipistrelle
22:07 – 22:15	E	Sustained foraging of >1 bat for >5mins around woodland edge at eastern site boundary.	Common Pipistrelle

3.16 During the third survey visit a total of five bat contacts were recorded. Four of these were of common pipistrelles and one was unidentifiable to species level. Activity was greatest along the woodland edge in the south east corner of the site where bats were recorded foraging for prolonged periods. A bat was also recorded foraging just beyond the site boundary to the south of the site.

Overview of results

3.17 Bats were recorded during all survey visits. Common pipistrelles were most frequently recorded with soprano pipistrelles recorded occasionally. One recording was too faint to identify to species level and it was not possible to determine which species of pipistrelle had been recorded on two recordings.

3.18 Bats were most frequently detected in the south east corner of the site where they were found foraging along the woodland edge and around stand alone trees. Three distinct areas of

foraging were noted; 1 – around the veteran oak tree and the sycamore tree next to it, 2 – along the southern side of the veteran tree to a cluster of silver birch trees and along the woodland edge continuing along the woodland edge outside of the site, and 3 – along the eastern edge of the woodland. Two bats were also briefly recorded near to the ditch and these were likely to be bats commuting across the site.

3.19 Bats were detected foraging just outside of the southern boundary and around a cluster of oak trees in the North West corner of the site. A commuting bat was briefly detected in the centre of the site.

3.20 Sonograms of a common pipistrelle and a soprano pipistrelle from the site, as viewed in BatScan, are provided in Appendix 2.

Bat interest categories

Transects

3.21 At least two bat species were recorded within the site during the bat activity surveys. These species were common pipistrelle and soprano pipistrelle. Noctule was also identified within the site during the emergence surveys. At least nine bats were recorded foraging in the south east corner of the site during the first activity survey

3.22 This indicates that the site is of MEDIUM bat interest.

3.23 The site can be further divided into areas of bat interest by identifying the level of activity at different locations. Table 4 below shows the bat interest for different locations within the Hydrus site due to the activity recorded in these areas.

Table 4. Bat interest locations within the site.

Location on site	Species recorded	Max no. of contacts per survey	Bat interest category
South east corner	Common pipistrelle, soprano pipistrelle and noctule	9	MEDIUM
North west corner	Common pipistrelle and soprano pipistrelle	3	LOW/MEDIUM
Southern boundary	Common pipistrelle and unidentified pipistrelle	2	LOW
Rest of site	Common pipistrelle	1	LOW

3.24 The south east corner of the site was found to be the area of most value to bats on the site being of MEDIUM interest. It is comprised of woodland copse, veteran oak tree and other

stand alone trees, a small ditch and flower-rich grassland which provides a variety of habitats for bats to forage and commute. The rest of the site is of relatively LOW interest to bats.

4 Conclusions and Recommendations

Evening emergence and dawn swarming survey

4.1 No bats were directly identified emerging or returning to the veteran oak tree during the evening emergence or dawn swarming survey. High levels of bat activity were recorded around the tree during these surveys and activity surveys.

4.2 Tree cavities including splits and under bark, can be used throughout the year by a variety of species and certain bats are known to move unpredictably between roosts. The bat roost potential of the tree should therefore remain high because of the quantity and variety of features it has for roosting bats. Any works directly affecting this tree should be avoided where possible.

4.3 Due to the veteran oak trees age, ecological, landscape and heritage value the tree is to be retained as part of the Hydrus project redevelopment proposals. If these proposals are changed and the tree is to be felled, then consultation would be required with the local planning authority's Tree Preservation Officer and an experienced ecologist.

Bat activity survey

4.4 Bat activity was recorded on all surveys and the site was found to provide commuting and foraging habitat for at least three species of bat; common pipistrelle, soprano pipistrelle and noctule. Common pipistrelles and soprano pipistrelles are relatively widespread and common throughout Britain. Noctules are widespread and fairly common.

4.5 The site was initially assessed as having MEDIUM bat interest, however, when the site was assessed in more detail only the south east corner was found to have MEDIUM interest with the rest of the site being of relatively LOW bat interest.

4.6 The south east corner contained a variety of habitats which made it of value to foraging and commuting bats. Prolonged foraging activity was recorded in this area and all three species of bat recorded on the site were found here.

4.7 Three distinct areas of foraging were noted in this area around the stand alone trees and along the woodland edge. One extended across the site boundary along an adjoining area of woodland and trees to the south of the site.

4.8 A cluster of stand alone oak trees in the North West corner of the site was found to be of LOW/MEDIUM bat interest. Three pipistrelles (common and soprano) were recorded foraging around them during the first activity survey and one common pipistrelle was recorded commuting away from them during the second activity survey.

4.9 The remaining areas of the site were found to be of LOW bat interest as few bats were recorded in other areas. Common pipistrelles were recorded on two occasions foraging just outside of the southern boundary and a common pipistrelle was recorded commuting in the centre of the site.

4.10 The trees, grassland and woodland on the Hydrus project site have been identified as important bat foraging and commuting routes. The landscape proposals for the Hydrus redevelopment should aim to maintain the current level of insect diversity on the site, thus providing a sufficient food source for the different species of bats currently utilising the site.

4.11 In addition, further mitigation measures could include the provision of new planting using bat friendly species. The planting selected should aim to attract a diversity of insects, thus provide an additional food source.

4.12 Dependent on the final proposals for the Hydrus project, any new lighting on the site should be designed to the specifications set out in the Bat Conservation Trust 'Bats and Lighting in the UK' 2008 guidelines. Thus any bats that are currently foraging and commuting on the site would be subjected to a minimised impact as part of any future development proposals.

5 References

Bat Conservation Trust. 2007. *Bat Surveys – Good Practice Guidelines.* Bat Conservation Trust, London.

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Russ, J (1999). The Bats of Britain and Ireland *'Echolocation Calls, Sound Analysis and Species Identification'*. Alana Ecology Ltd

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Figures

Figure 1

Bat Evening Emergence and Dawn Swarming Survey Results

Figure 2

Bat Activity Survey Transect Route

Figure 3

Bat Activity Survey Results

Appendices

Appendix 1

Evening Emergence and Dawn Swarming Surveys: Full Results

Emergence 1

Start time: 21:10pm Finish time: 23:20pm Sunset: 21:20pm

Weather: 50% high cloud, still, warm, 16C.

Time	Surveyor	Observation	Species
21:50	LM	Faint bat calls heard and bat briefly seen flying from direction of wood (commuting).	Unknown (no recording)
21:53	LM	Bat heard foraging around tree for several minutes	Common Pip
21:58	LM	Bat heard foraging around tree	Common Pip
22:00	PH	Bat faintly heard	Common Pip
22:02	LM	Bat heard and seen foraging around tree	Soprano Pip
22:04	PH	Bat faintly heard	Soprano Pip
22:10	LM&PH	Bat heard foraging around tree	Common Pip
22:12	PH	Bat heard near by	Common Pip
22:13	LM	Bat heard foraging around tree	Common Pip
22:15	PH	Bat faintly heard	Common Pip
22:20	LM	Bat briefly heard on two occasions	Common Pip
22:35	PH	Bat seen flying east beside the tree	Noctule
22:37	LM	Bat briefly heard, possibly commuting	Large bat species
22:40	LM	Bat briefly heard – as above	Large bat species

Emergence 2

Start time: 20:55pm Finish time: 23:15pm Sunset: 21:24pm

Weather: Mostly clear, 20% high cloud, light breeze, warm and humid, 22C.

Time	Surveyor	Observation	Species
21:50	LM	Bat faintly and briefly heard close to tree but not seen.	Common Pip
21:52	LM	Bat heard and seen foraging around veteran oak	Soprano Pip

Time	Surveyor	Observation	Species
21:53	PH	Bat faintly heard. Not seen but not thought to have emerged from tree.	Unidentified – contact too faint
21:55	LM&PH	Bat heard foraging around veteran oak	Common Pip
21:56	LM	Bat heard and seen foraging in circuit between fence line, woodland, veteran oak and silver birch trees	Common Pip
22:00	LM	>1 bat heard foraging nearby but not seen	Common Pip
22:05	LM	Bat briefly heard foraging but not seen	Common Pip
22:08	LM	On several occasions bat briefly heard foraging but not seen. Probably following same circuit, possibly same bat as above	Common Pip
22:10	LM	x2 bats foraging between veteran oak and fence line then flying over fence and away from site. Returned and repeated regularly, likely to be same bats following circuit that were heard at 22:05 and 22:08.	Common Pip
22:12	PH	Bat seen and heard foraging to the west of veteran oak before flying off to the north.	Common Pip
22:15	PH	Bat seen and heard flying from north towards veteran tree and foraging to west of tree. Likely to be same bat as above.	Common Pip
22:30	LM	Bat briefly heard foraging but not seen	Common Pip
22:40	LM	Bat seen and heard foraging between fence veteran oak and silver birch trees	Common Pip

Dawn 1

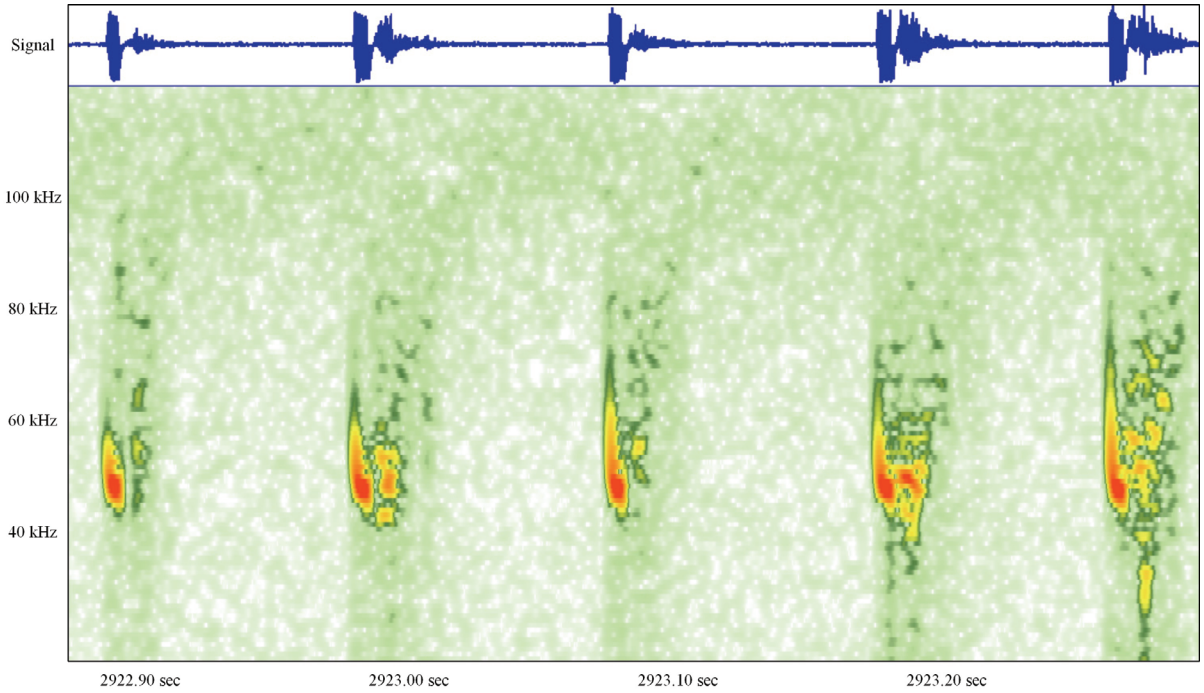
Start time: 03:15am Finish time: 05:00am Sunrise: 05:05am

Weather: Clear night, still, dry, 10C.

Time	Surveyor	Observation	Species
03:40	LM	Bat heard briefly but not seen	Common Pip
04:02	LM	Bat briefly heard foraging but not seen	Common Pip

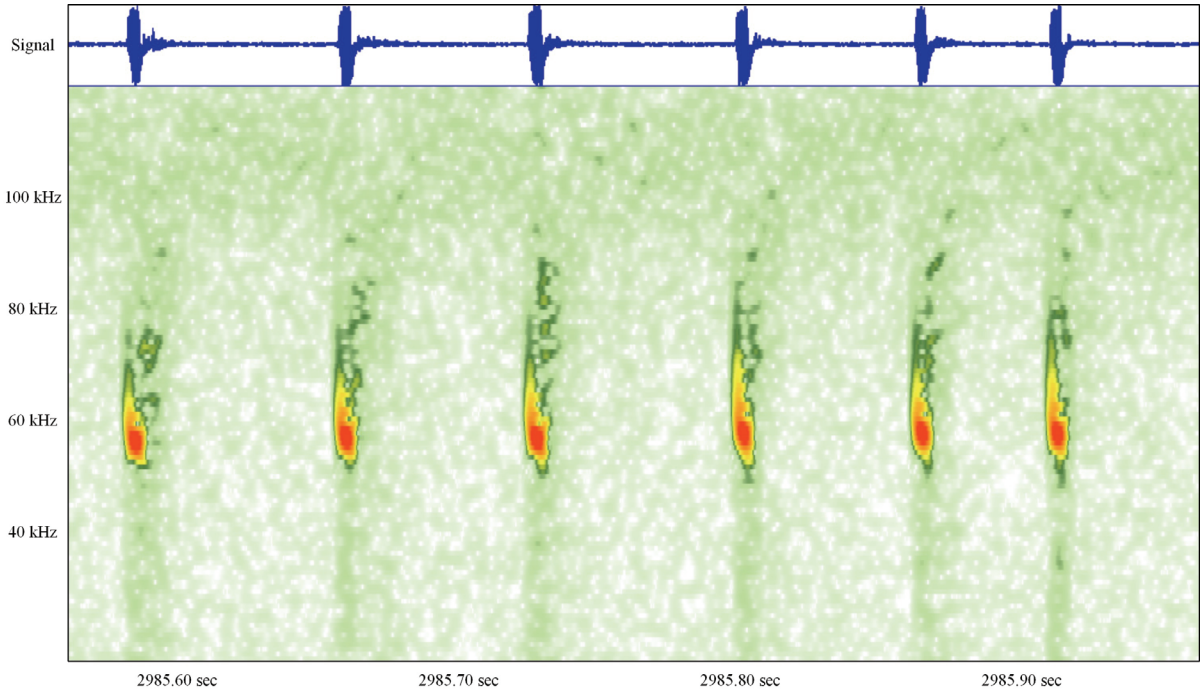
Appendix 2

Bat Call Sonograms



Common pipistrelle *Pipistrellus pipistrellus* – shown in frequency division

16th June 2009. Foraging around veteran oak tree



Soprano pipistrelle *Pipistrellus pygmaeus* – shown in frequency division

16th June 2009. Foraging around veteran oak tree.