

Cheshire Ecology Ltd.

**LAND OFF SUMMERHILL ROAD
GWERSYLLT, WREXHAM**

**TREE CONDITION AND BAT ACTIVITY SURVEY
REPORT**

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EXECUTIVE SUMMARY

Cheshire Ecology Ltd. has been commissioned to carry out a bat survey and tree condition survey of land near Summerhill Road, in Gwersyllt, Wrexham County Borough, henceforth referred to as 'the site'.

Moss Road forms the southern boundary of the site, to the east lies Summerhill Road, to the north Chestnut Court and to the west an agricultural field. The majority of the land to the east consists of residential housing. The area to the north, west and south consists of deciduous woodland and agricultural grassland.

The Castlemead Group Ltd. obtained outline-planning permission for 20 dwellings on 6th February 2015. The site was subsequently acquired by SG Estates Ltd., who have decided to re-apply for full detailed planning permission.

Cheshire Ecology Ltd. has carried out three bat activity surveys at the site, one in 2014 and two in 2015. After assessing the results we do not believe that the proposed development will have any impact upon the Conservation Status of bats in the area. The three activity surveys tend to suggest that the site has little value for bats, other than for foraging. We saw no evidence of roosting and the only noctules that were seen were commuting across the site.

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1 INTRODUCTION

1.1 Background

- 1.1.1 Cheshire Ecology Ltd. has been commissioned to carry out a bat survey and tree condition survey of land near Summerhill Road, in Gwersyllt, Wrexham County Borough, henceforth referred to as ‘the site’. Moss Road forms the southern boundary of the site, to the east lies Summerhill Road, to the north Chestnut Court and to the west an agricultural field. The majority of the land to the east consists of residential housing. The area to the north, west and south consists of deciduous woodland and agricultural grassland.
- 1.1.2 The Castlemead Group Ltd. obtained outline-planning permission for 20 dwellings on 6th February 2015. The site was subsequently acquired by SG Estates Ltd., who have decided to re-apply for full detailed planning permission. Condition 12 required the submission of two further bat surveys, as specified in the original version of this report (Cheshire Ecology, 2014). The original version of the report has been updated to take into account the result of the additional transects.
- 1.1.3 Tree Solutions Ltd. carried out a tree survey to BS5837: 2012 on 11th March 2014. There are a large number of deciduous trees growing along the western and southern boundaries of the site. These include a very large sweet chestnut *Castanea sativa*, twelve horse chestnuts *Aesculus hippocastanum*, four lime trees *Tilia x europaea*, an elm *Ulmus* sp., five oaks *Quercus* sp., a single wild cherry *Prunus avium*, an ash tree *Fraxinus excelsior*, six yews *Taxus baccata*, two beech trees *Fagus sylvatica* and a holly *Ilex aquifolium*. There are also a large number of self-sown sycamore trees *Acer pseudoplatanus*.

1.2 Site context

- 1.2.1 The centre of the site is located at OS Grid Reference SJ312531 and is approximately 1ha in extent. The site lies at an altitude of approximately 129m AOD.
- 1.2.2 The site was originally occupied by Gwersyllt Hill Hall, which was built in the late 18th century and demolished in 1982 (Wrexham History website, 2014). The most prominent trees were presumably planted in the late 18th century when the house was built, but a large number of self-sown sycamore trees have subsequently grown up in the gaps along the site boundary. A small number of small oak trees have survived along the western boundary. These are generally in poor condition, but may be survivors from the original hedgerows.
- 1.2.3 A disused railway tunnel is located 280m to the north of the site. The railway line originally ran between the former Westminster Colliery and Rhosrobin. The eastern end of the tunnel is apparently sealed, but part of the tunnel can still be accessed from the western end. The tunnel is apparently in a very poor

state of repair (<http://www.forgottenrelics.co.uk/tunnels/gallery/brymbo.html>).

- 1.2.4 The Moss Valley Country Park is located to the west of the site. The valley was originally the site of the Westminster Colliery at the northern end and the Gatewen Colliery at the southern. The valley is predominantly mesotrophic grassland, with deciduous woodland on the eastern slopes.

1.3 Existing records

- 1.3.1 Data was already available from the original Preliminary Ecological Assessment (Enzygo, 2014).
- 1.3.2 The data trawl produced several records of bats within 2km of the site boundary. This included seven records of common pipistrelle *Pipistrellus pipistrellus*; the closest of which was 1690m from the site. There were five records for lesser horseshoe bat *Rhinolophus hipposideros*, between 1997 and 2001. These were recorded at a distance of 1884m from the site and are believed to have come from a known roosting site. There was a single record for Daubenton's bat *Myotis daubentonii*, taken in 2010 from approximately 1690m from the site and finally two records for whiskered bat *M. mystacinus* from 1981 and recorded at a distance of 1931m from the site.

1.4 Legislation

- 1.4.1 All bats are protected under Schedule 2 of the Conservation of Habitats and Species (Amendment) Regulations 2012 (they are a 'European Protected Species' or EPS). They are also included in Schedule 5 of the Wildlife and Countryside Act 1981 and receive protection under Section 9 of the Act (as amended by the Countryside and Rights of Way Act 2000).
- 1.4.2 It is an offence to:
- Deliberately capture, injure or kill a bat;
 - Deliberately disturb in a way that would affect their local distribution or abundance, or affect their ability to survive, or raise young;
 - Intentionally or recklessly disturb a bat;
 - Intentionally or recklessly obstruct access to any structure or place that a bat uses for shelter or protection;
 - Damage or destroy a bat roost; and
 - To possess, control, transport, sell, exchange or offer for sale/exchange any live or dead bat or any part of a bat.

- 1.4.3 On August 21st 2007 new regulations for European Protected Species came into force. It is no longer a valid defence to show that the killing, capture or disturbance of a species covered by the legislation or the destruction or damage of their breeding site or resting place was the incidental and unavoidable result of an otherwise lawful act.
- 1.4.4 It is possible to apply for an EPS license in respect of development to permit activities that would otherwise be unlawful under the Conservation Regulations, providing that the following tests have been carried out:
- The development is for reasons of over-riding public interest;
 - There is no satisfactory alternative; and
 - The favourable status of the species concerned with be maintained or enhanced.
- 1.4.5 Seven bat species are UK BAP Priority Species. These are as follows:
- Barbastelle *Barbastella barbastellus*
 - Bechstein's *Myotis bechsteinii*
 - Brown long-eared *Plecotus auritus*
 - Greater horseshoe *Rhino ferrumequinum*
 - Lesser horseshoe *Rhinolophus hipposideros*
 - Noctule *Nyctalus noctula*
 - Soprano pipistrelle *Pipistrellus pygmaeus*
- 1.4.6 The lesser horseshoe bat is currently the only species of bat that is covered by a Species Action Plan (SAP) in Wrexham County Borough Council Local Biodiversity Action Plan (LBAP).

2 METHODS

2.1 Tree condition survey

- 2.1.1 Many bats roost in trees. Roosts are most likely to be found in holes or other cavities, left by decaying branches. Bats may also use the cracks between broken branches, crevices behind ivy, woodpecker holes and the gaps behind peeling bark.
- 2.1.2 All of the major trees on the site were inspected for their bat potential. The survey followed the guidelines in the Bat Conservation Trust publication *Bat Surveys: Good Practice Guidelines* (Hundt, 2012). This places trees in four categories (see Table 1). The results are shown in Appendix A.

Tree category	Description
Category 1*	A tree with multiple, highly suitable features capable of supporting a larger roost.
Category 1	A tree with definite bat potential, supporting fewer suitable features than a Category 1* tree or for the use of a single bat.
Category 2	A tree with no obvious potential, although the tree is of a size and age that suggests that cracks and crevices may be found, that have limited potential for bats.
Category 3	A tree with no bat potential.

Table 1: Protocol for visual inspection of trees for their bat potential

- 2.1.3 The trees were surveyed from the ground during daylight, using a pair of binoculars and a powerful torch (Cluson Clulite CB2). They were assessing using the features in Table 2 and classified according to the categories in Table 1. Where possible the trees were also photographed.

Feature used as a bat roost	Signs indicating possible use.
A hole. Woodpecker holes. Cracks or split in branches. Loose bark. Hollows or cavities. Dense epicormic growth. Heavy ivy cover.	Scratches around holes. Staining around entry point. Bat dropping near the entrance. Audible squeaking in warm weather. Flies around entry point. Smoothing of surfaces around hole. Distinctive smell.

Table 2: Features indicating potential use as a roost

- 2.1.4 The survey followed the numbering system adopted by Tree Solutions Ltd. (2014). This report should be read in conjunction with the Preliminary Tree Constraints Plan, included in that report.

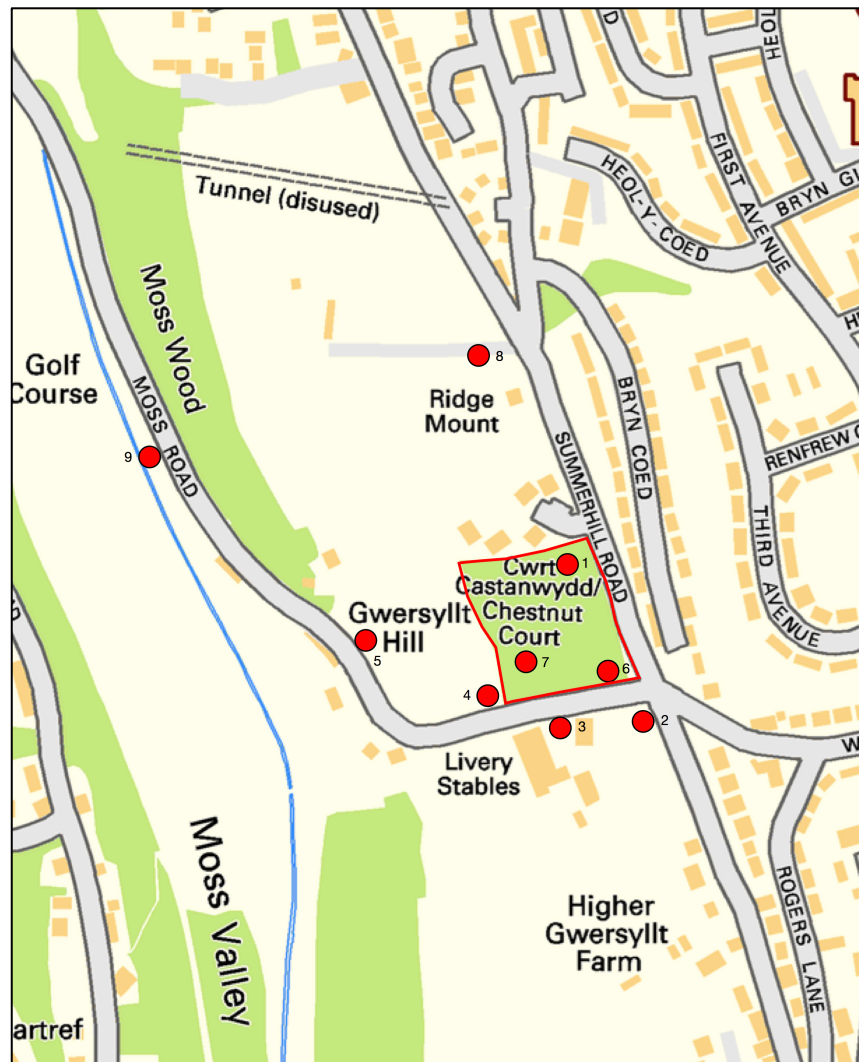


Figure 1: Location of recording stations

2.2 Bat survey

- 2.2.1 Three bat activity transect have been carried out to determine the extent of bat activity around the site. A total of nine recording stations were chosen to give an indication of flight lines and foraging activity. The survey started at the entrance to the site, continued down Moss Road as far as Moss Wood and then returned to the southern part of the site. The final recording was made approximately 150m to the north of the site. A five-minute recording was made of bat activity at nine locations ('recording stations'). Bat activity was also monitored between the recording stations using Batbox Duet and Batbox III detectors.

- 2.2.2 Recordings were made using a Batbox Baton detector and a Zoom H2N digital recorder. Bat calls were also recorded on a Wildlife Acoustics EM3+ and a Batbox III detector. The data was analysed using Batscan and Wildlife Acoustics' Kaleidoscope software (Version 2.0.5). Kaleidoscope includes the facility to automatically identify bat species, which is extremely useful when monitoring bat activity over an extended period of time. All automatic identifications were checked manually.
- 2.2.3 The EM3+ recorder was left recording continuously during the second survey. As a consequence there are a much larger number of records than with the first and third survey.
- 2.2.4 A total of nine recording stations were chosen for the survey.

Station	Description
1	Near the entrance to the site. This location gave a good view to the south over the majority of the site.
2	The junction of Moss Road and Summerhill Road. Gave a reasonable view along the southern and eastern boundaries of the site. Unfortunately this location was very noisy, due to the large amount of traffic.
3	Located near the entrance to the former livery stables. Provided a good view along the treeline line at the southern end of the site, but very noisy.
4	Located in a rather exposed location beside Moss Road. The location gave a good view of the western and southern boundary, but was rather dangerous and noisy.
5	This recording station was located at the bottom of an area of permanent pasture. The location gave a good view of the western boundary, but was too far from the site to see individual bats.
6	Located inside the site, near the southern and eastern boundaries. The station provided a good view to the north across the site.
7	Located near the large lime trees at the western end of the site.
8	This station was located in a short stretch of track-way, to the north of the property known as 'Ridge Mount'. The station provided a good view of the area to the north of the site.
9	The final station was located in Moss Valley, to the west of Moss Wood. The location provided a good view of Moss Valley.

Table 3: Location of recording stations

- 2.2.5 Martin Page BSC (Hons.) PhD FLS MCIEEM carried out the survey, with assistance from Mr Tim Green.

2.3 Limitations

- 2.3.1 The site was difficult to survey because of its proximity to the junction of two urban roads, Moss Road and Summerhill Road. Moss Road was particularly busy just after sunset and there was no footpath along the eastern end near the road junction. Recording station 4 was potentially the most useful location because it was sited at the southwestern corner of the site and there was a good view of the trees along the western and southern boundaries. However it was dangerous to linger at this location because of the passing traffic.
- 2.3.2 There was no access to the field immediately to the west of the site. It was therefore not possible to determine whether any bats were flying along western boundary of the site.

3 RESULTS

3.1 Tree condition survey

- 3.1.1 A large proportion of the trees within the site boundary are covered by extensive growth of ivy *Hedera helix*. This makes it very difficult to see any holes and may, in itself, provide cover for bats that are resting during the day. Several of the trees have very heavy ivy cover and were given a cautionary Category 1. Further survey may show that these trees are only worthy of a Category 2 or even 3.
- 3.1.2 Several of the trees could not be surveyed adequately from within the site boundary. It was difficult to see the single ash tree and the majority of the oak trees because they were obscured by sycamore foliage. Further observation from the adjacent field may allow these trees to be downgraded from Category 1 to Category 2. The adjacent field is private property and there was no access at the time of the survey.
- 3.1.3 The lime trees in particular have a lot of epicormic growth and were rated at Category 1. These trees should have dusk and a dawn surveys carried out if they will be directly affected by the development.
- 3.1.4 Depending upon the findings of the dusk/dawn surveys it may be possible to reduce many of the Category 1 trees to Category 2.
- 3.1.5 The survey identified 11 Category 1 trees, 26 Category 2 and 17 Category 3 (one group included five Category 3 trees). There were no Category 1* trees on site.

3.2 Bat activity survey

- 3.2.1 A total of three bat activity surveys were carried out. These took place on 28th June 2014, 22nd April 2015 and 9th June 2015. An autumn survey was not carried out after the original client (the Castlemead Group Ltd.) received outline planning permission.

Survey 1

- 3.2.2 A common pipistrelle bat was recorded on five occasions during the survey on 2th June 2014. A bat was seen foraging along Moss Road to south of the site and another (possibly the same individual) was seen flying along the line of trees at the western end of the site. A soprano pipistrelle bat *P. pygmaeus* was recorded on a single occasion. This latter animal was seen leaving Moss Wood, approximately 200m to the northwest. It then flew across the stream in a westerly direction.
- 3.2.3 No bat activity was recorded within the site boundary, other than noctules flying at height above the site. The EM3+ detector recorded noctules on two occasions during the 2014 survey.

Survey 2

- 3.2.4 The majority of the bat activity in April 2015 appeared to be concentrated along Moss Road. Several pipistrelles (both soprano and common pipistrelle) were seen foraging along Moss Road between 20.58 and 21.05hrs and heading towards the junction with Summerhill Road. The traffic appeared to be one way and more bats were seen flying in a west to east direction than the other way around. One bat flew in a circle near the sharp bend in the road (near the property known as 'The Cottage' and then headed in a southwards direction towards (we assume) the woodland along the eastern slope of Moss Valley.
- 3.2.5 No bat activity was recorded within the site boundary. Noctules were not recorded during the April 2015 survey.

Survey 3

- 3.2.6 The pattern of bat activity in June 2015 was very different from that in April. A noctule bat was seen commuting across the site at 21.44hrs, travelling from North to South. A few bats were seen foraging above the sycamore trees in the southeastern corner, but there was no indication that they were roosting there.
- 3.2.7 A common pipistrelle appeared to enter the upper part of the canopy of Tree 41, which was classified as a Category 2 tree in 2014.
- 3.2.8 No activity was recorded at locations 6 and 7 in the middle of the site. All of the activity appeared to be above the tree canopy near the road junction or along Moss Road. No bat activity was recorded after 22.17hrs, approximately 45minutes after sunset. The EM3+ detector recorded noctules on two occasions during the June 2015 survey.
- 3.2.9 Nathusius' pipistrelle *Pipistrellus nathusii* was identified on two occasions by the Kaleidoscope software (see Fig. 2 and Fig. 3). Nathusius' pipistrelle is a relatively rare species and there are no records for it from the Wrexham area. It is an aerial hawker and flies higher than the related common pipistrelle and soprano pipistrelle, roosting in the walls of traditional buildings, hollows in trees and fissures in rocks. The peak frequency for this species is 38khz (BCT, 2010), which is lower than for either of the related species. Both of the calls were recorded at Station 8, near the junction of Summerhill Road with Top Road and Bottom Road. This is approximately 150m to the north of the site.
- 3.2.10 The records should be treated with caution, but the first was recorded for 21 pluses and the second pass for 31 pulses and the result had a high level of confidence (0.86161 and 0.857544 respectively). Common pipistrelle and soprano pipistrelles do make calls with a lower peak frequency in a cluttered environment, but the later calls in Fig. 1 are below 40Khz, which would tend to support the idea that they are from Nathusius' pipistrelle (see Russ, 2012). Cheshire Ecology Ltd. will consult with other ecologists for confirmation of these findings.

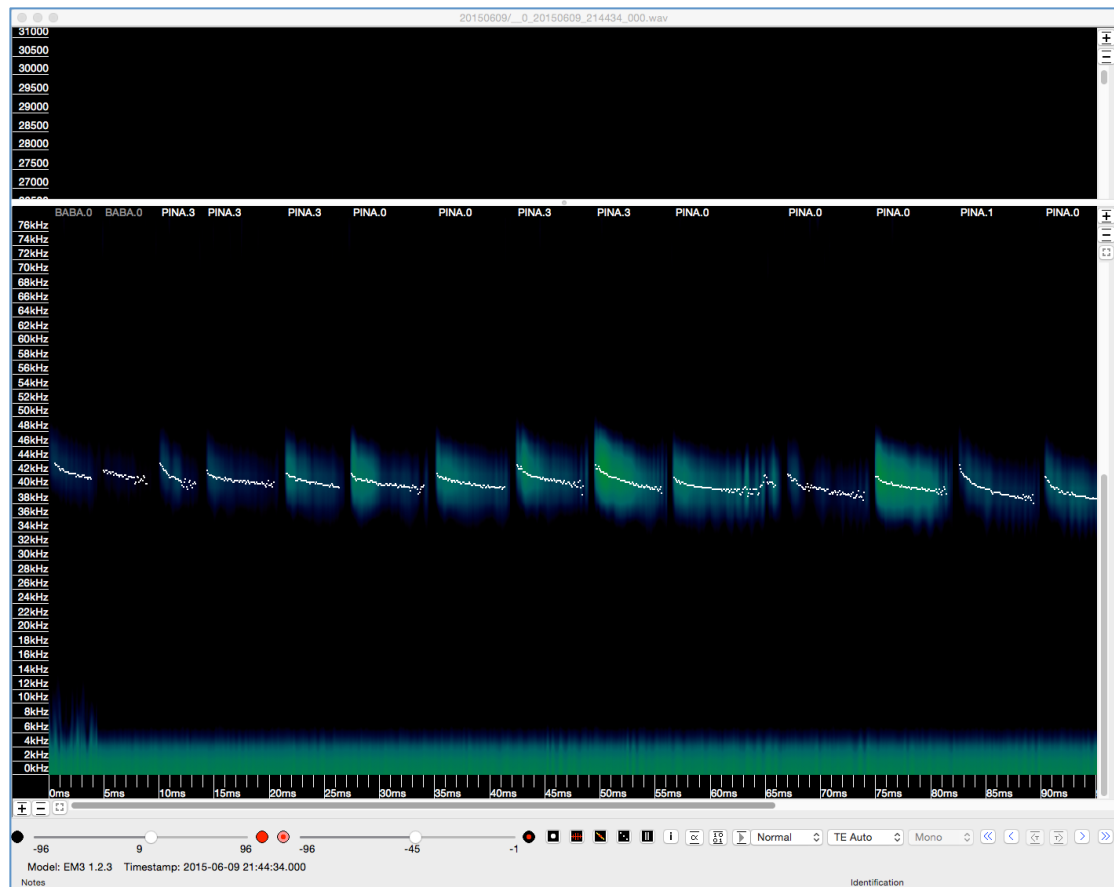


Figure 2: Potential recording of Nathusius' pipistrelle.

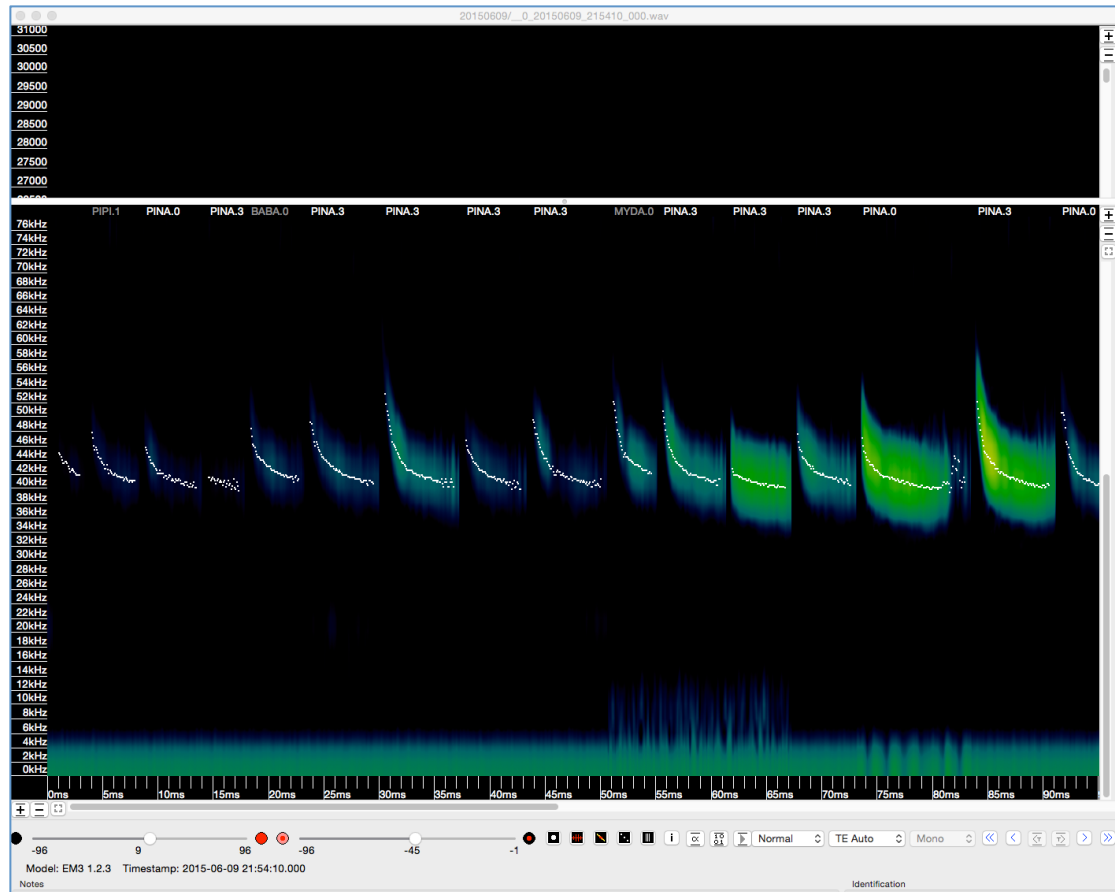


Figure 3: Potential recording of Nathusius' pipistrelle.

4 CONCLUSIONS

- 4.1.1 Bat activity seems very low for a site with apparently good foraging potential. There are a large number of trees surrounding the site and numerous self-sown sycamore trees. However very few flying insects were seen during any of the surveys, which might suggest that there are insufficient insects to attract bats.
- 4.1.2 Minimal bat activity was recorded within the site itself. There were extensive stands of Japanese knotweed in 2014, but most of this appeared to have been killed by stem injection when the site was visited in 2015. Large areas of the site were devoid of living vegetation in April 2015 and developing bramble scrub covered the remainder. None of the brambles were flowering and it seems likely that there were no insects to attract bats. Most bat activity seemed to be concentrated along the eastern end of Moss Road, with little activity along Summerhill Road.
- 4.1.3 Several of the trees around the margin of the site appear to have good bat potential. There are two mature lime trees, which are covered by very dense epicormic growth and several trees have dense ivy cover. Both of these scenarios would suggest bat potential and several of the trees were rated as Category 1 for bat roosting potential. However the activity transects showed no activity around these trees.
- 4.1.4 We are unable to make any judgement about the trees along the western boundary of the site. There was no access to the field and we were therefore unable to monitor bat activity along the tree line.
- 4.1.5 We suspect that the majority of the bats that were seen foraging along Moss Road probably originated from roosts in the woodland to the northwest (Moss Wood) and southwest of the site. In 2014 a soprano pipistrelle was seen to fly along the stream and directly into Moss Wood (Station 9).
- 4.1.6 We have carried out three bat activity surveys at the site, one in 2014 and two in 2015. The climatic conditions were ideal for the survey and the only significant limitation was our inability to access the line of trees that marks the western boundary of the site. After assessing the results we do not believe that the proposed development will have any impact upon the Conservation Status of bats in the area. The three activity surveys tend to suggest that the site has little value for bats, other than for foraging. We saw no evidence of roosting and the only noctules that were seen were commuting across the site.

5 RECOMMENDATIONS

- 5.1.1 The tree survey (Tree Solutions Ltd., 2014) recommended that two oak trees (trees T4 and T7) should be felled. There are four oak trees on site, including one sessile oak *Quercus petraea*, one hybrid oak *Q. x rosacea* and two unidentified oaks (both of these were obscured by sycamore and horse chestnut trees at the time of the survey). The oak trees are probably survivors from the original hedgerow that surrounded the site before Gwersyllt Hill Hall was built. We recommend that these trees are retained and the surrounding sycamore trees should be removed instead. The sycamore is an introduced species, while the oaks are native and have considerably greater value for wildlife.
- 5.1.2 However we do accept that the poor growing conditions have meant that these trees have deteriorated and may need felling for health and safety reasons. Depending upon their condition it would probably be necessary to conduct a dusk and dawn bat survey on each tree before they were felled.
- 5.1.3 Unfortunately we were unable to gain access to the western boundary. There are a number of Category 1 trees along this boundary and we would recommend that these be subjected to two dusk and one dawn survey before they are felled.

6 REFERENCES

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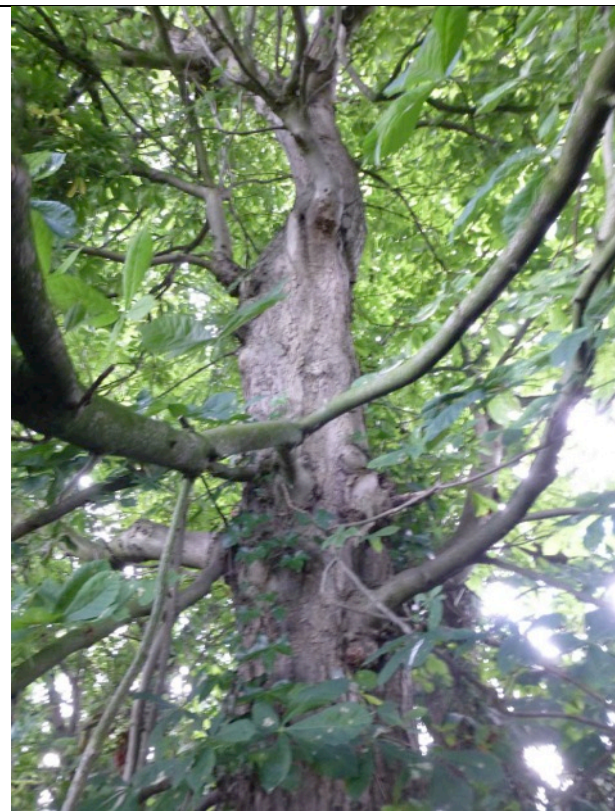
**APPENDIX A
TREE CONDITION SURVEY**

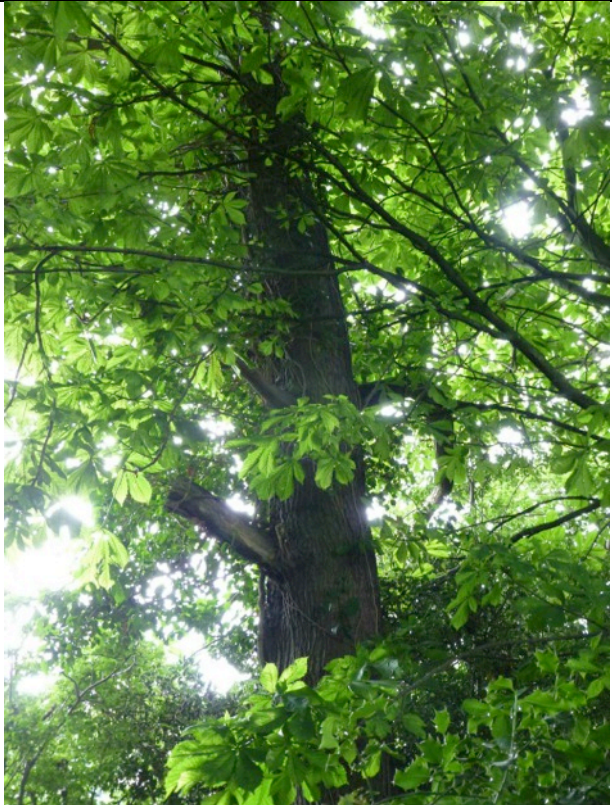
	Species	Description	Category	Photograph
T1	<i>Aesculus hippocastanum</i>	Mature horse chestnut in adjacent garden. One small hole in the trunk. Not threatened by proposed development, but the tree may need to be checked with an endoscope for evidence of bats.	2	No photograph.
T2	<i>Aesculus hippocastanum</i>	Mature horse-chestnut tree with moderate ivy cover. One small branch has a hole. Another broken branch is rotting at the end. Check with ladder before felling.	2	

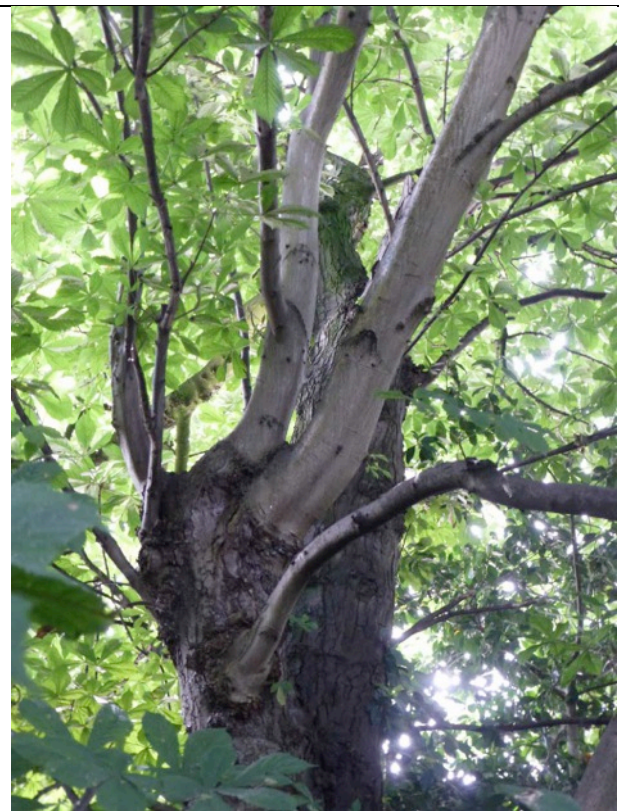
T3	<i>Acer pseudoplatanus</i>	Sycamore with moderate ivy cover. One lower branch has been ripped off.	2	
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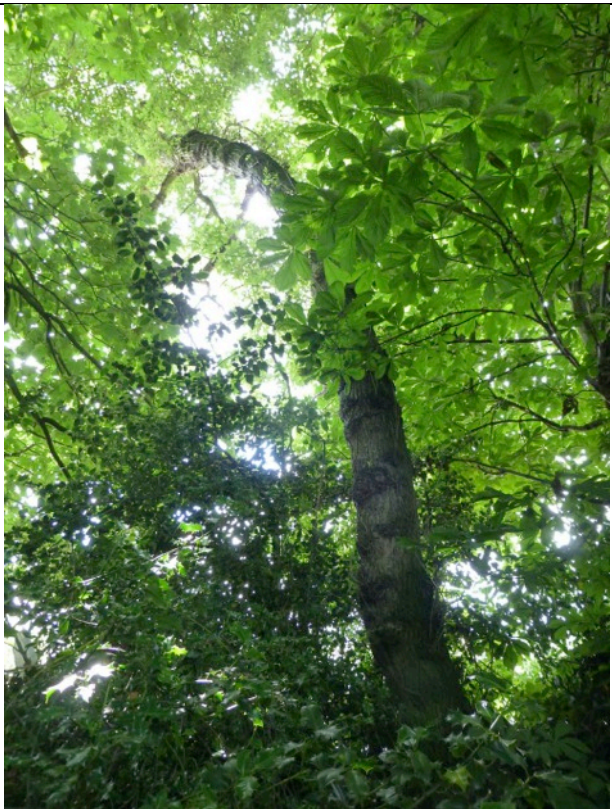
T4	<i>Quercus petraea.</i>	Small sessile oak. Very difficult to see due to the surrounding trees, but the top appears to be missing. Category 1 due to heavy ivy cover.	1	
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T5	<i>Acer pseudoplatanus</i>	A sycamore tree with extremely heavy ivy cover.	1	
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T6	<i>Aesculus hippocastanum</i>	Horse chestnut. The tree has had several smaller branches removed, leaving holes where the cut wood has decayed. There is no ivy cover. The holes are approximately 2.5m above ground level. Check with endoscope and soft fell.	2	
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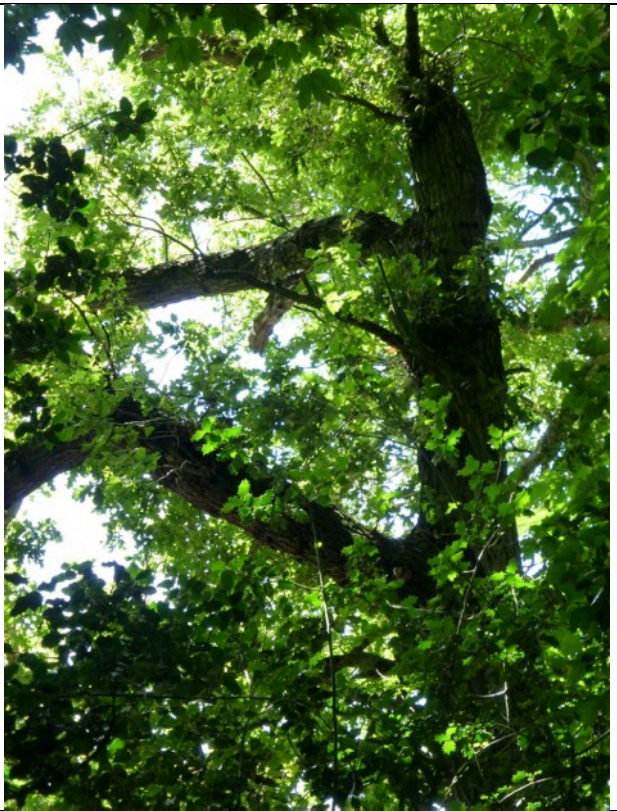
T7	<i>Quercus sp.</i>	Standard oak tree. One of the lower branches has been removed, leaving jagged timber. Some ivy cover. Difficult to see the top of the tree due to surrounding trees. Retain if possible and removing surrounding sycamores. Cautionary Category 1 due to access problems. Needs further inspection, preferably from adjacent field.	1	
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T8	<i>Aesculus hippocastanum</i>	Horse chestnut with epicormic growth. Some of the upper branches have been lost and could have cavities. However, these are facing upwards and are probably full of water. The tree needs to be climbed to determine whether the holes are dry or filled with water. Check with a ladder.	2	
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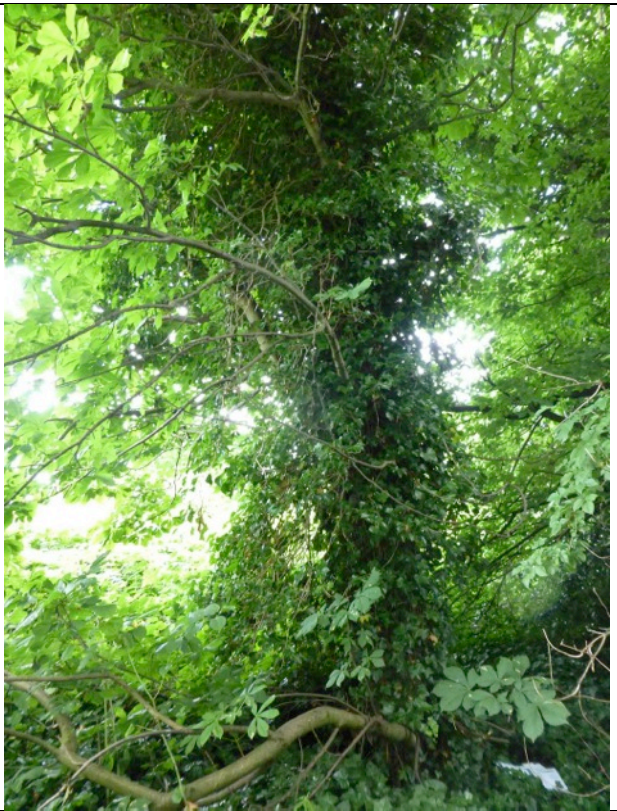
T9	<i>Quercus sp.</i>	Small, weak-growing oak tree. Again probably a former hedgerow tree. No obvious sign of holes, but it was difficult to tell with all of the sycamore foliage. This tree should be retained if possible.	2	
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T10	<i>Acer pseudoplatanus</i>	A large mature sycamore with dense ivy cover. One branch has a hole, but it may not be deep enough to be useful to a bat.	2	
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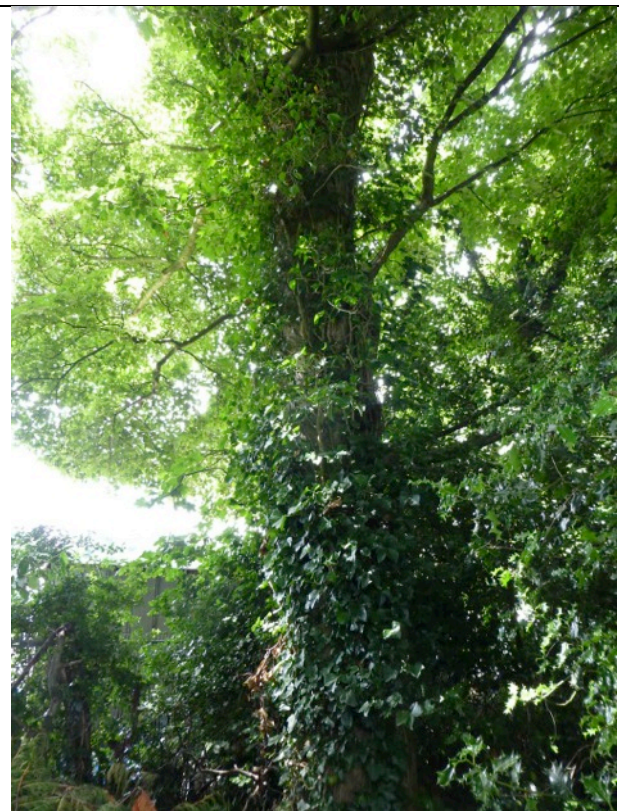
T11	<i>Acer pseudoplatanus</i>	Standard sycamore with small amount of ivy cover. No bat potential.	3	
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T12	<i>Quercus sp.</i>	Senescent oak with missing upper branches and rotting timber. The oak is probably one of the original hedgerow trees and should be preserved if possible. The adjacent sycamores should be felled to increase the amount of light available. Difficult to see due to the surrounding vegetation, but there appear to be woodpecker holes one of the upper branches. Requires further investigation before it is felled.	1	
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T13	<i>Acer pseudoplatanus</i>	Sycamore tree with split trunk, forming a y-shape. The tree has quite a lot of ivy cover but no sign of holes or missing branches.	2	
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T14	<i>Aesculus hippocastanum</i>	Standard horse chestnut with many lower branches and dense ivy cover. Not possible to see holes in the trunk due to the extensive growth of Japanese knotweed on the site and the dense ivy cover.	2	
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T15	<i>Ulmus sp.</i>	Coppiced elm tree. No bat potential.	3	
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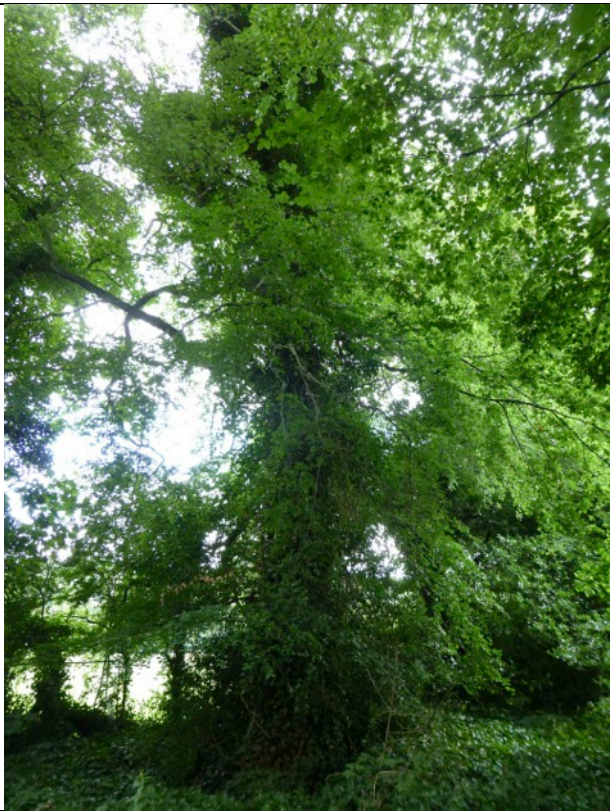
T16	<i>Acer pseudoplatanus</i>	A healthy sycamore tree with some ivy cover.	2	
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T17	<i>Acer pseudoplatanus</i>	Standard sycamore with heavy ivy cover. No obvious holes or broken branches. The arboricultural report states that there is dead wood in the crown.	2	
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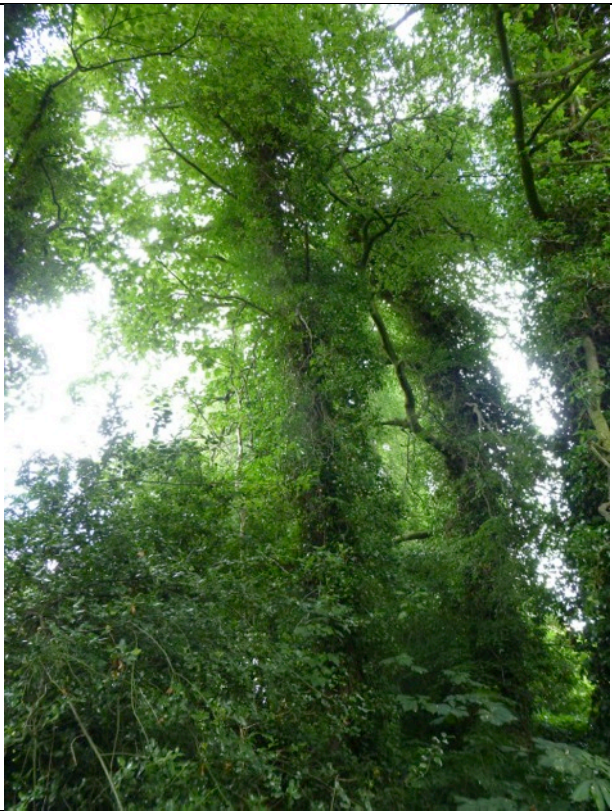
T18	<i>Acer pseudoplatanus</i>	Standard sycamore tree with some ivy cover. There are no obvious holes.	2	
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T19	<i>Acer pseudoplatanus</i>	Standard sycamore tree with ivy cover on the trunk. Difficult to tell whether there are any holes in the trunk due to the ivy cover. No broken branches apparent.	2	
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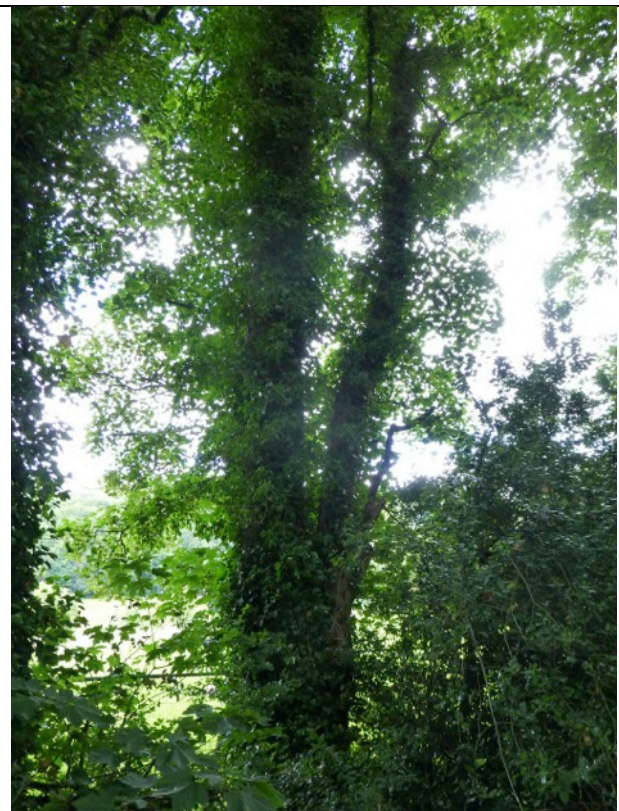
T20	<i>Fraxinus excelsior</i>	Poorly grown ash tree with a badly bent trunk. The tree has a number of branches that extend into the site. Some of the smaller branches are broken and have decaying wood. Difficult to assess because of all the ivy cover and the fact that it was not possible to see the tree from the western side. Cautionary Category 1.	1	
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T21	<i>Fagus sylvatica</i>	Large standard beech tree with plenty of ivy cover on the trunk. The ivy appears to extend to the canopy. No obvious holes or broken branches, but these would be hidden by the ivy cover.	1	
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T22	<i>Fagus sylvatica</i>	A large, standard, ivy-clad beech tree. The dense foliage and ivy cover makes it difficult to see the top of the tree trunk. No obvious holes, but classed as Category 1 due to the ivy cover.	1	
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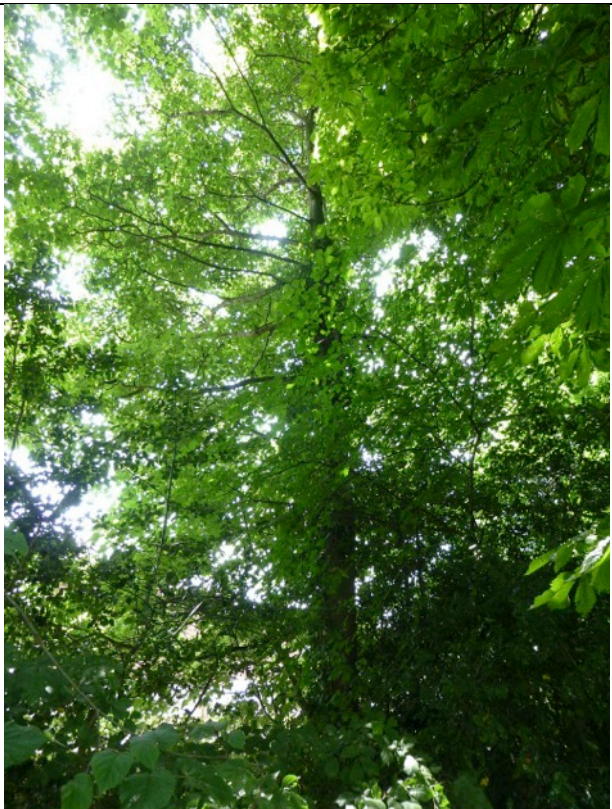
T23	<i>Acer pseudoplatanus</i>	A standard sycamore tree, which is leaning toward the adjacent field. The tree is heavily covered with ivy. No obvious broken branches, nor any holes.	2	
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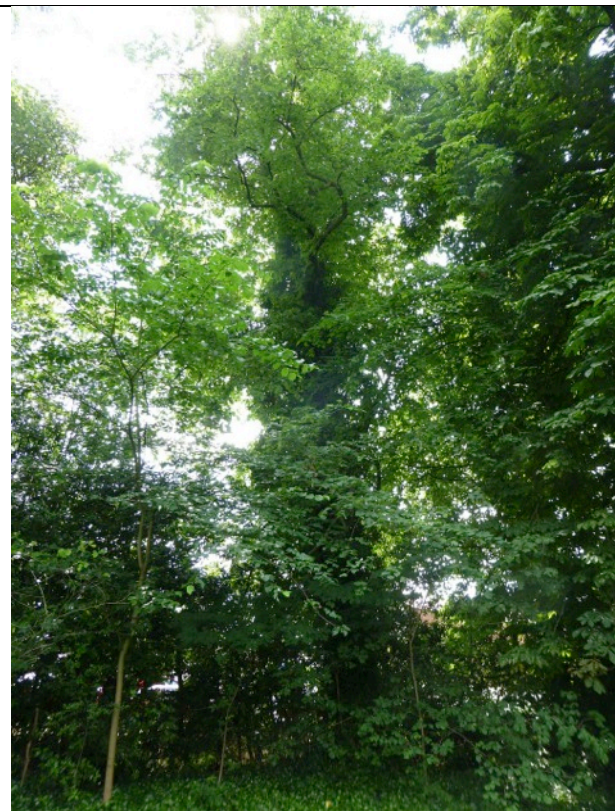
T24	<i>Quercus x rosacea</i>	A large, standard oak tree with some broken lower branches. The entire stem is clad by ivy. One upper branch is missing and jagged wood remains. No obvious holes, but the tree is partially senescent and holes could be hidden by ivy.	1	
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T25	<i>Acer pseudoplatanus</i>	A sycamore tree with a y-shaped trunk. Most of the trunk is covered with ivy, which extends to the top of the tree. No obvious holes.	2	
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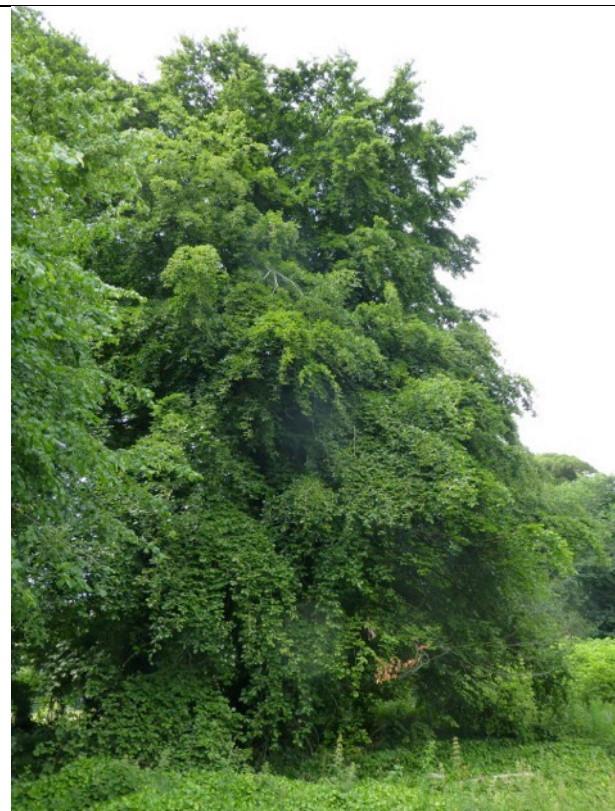
T26	<i>Acer pseudoplatanus</i>	Standard sycamore with ivy growth on the trunk. More extensive than T27 and appears to extend to the top of the canopy.	2	
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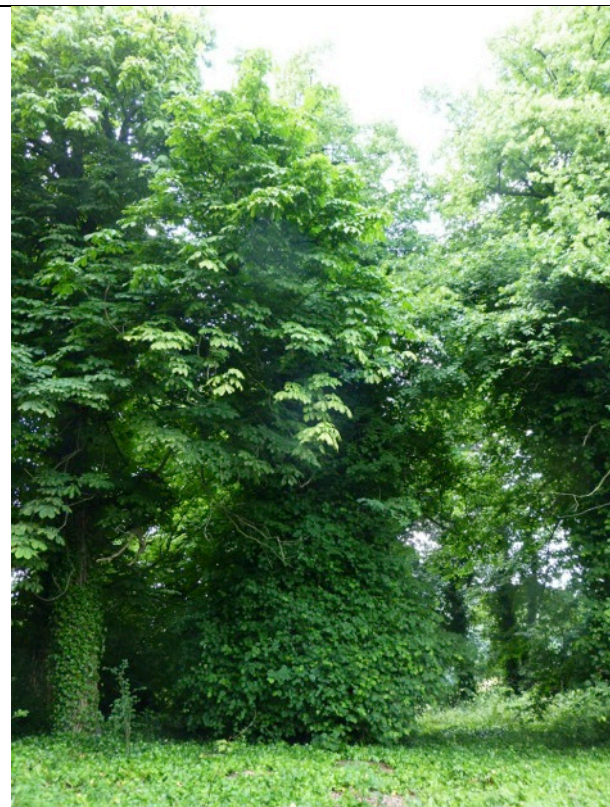
T27	<i>Acer pseudoplatanus</i>	Standard sycamore with some ivy cover on the main trunk. The trunk diverges at approximately 6m above the ground. Some smaller branches are missing, but holes are blind. No obvious sign so bat potential.	2	
T28	<i>Acer pseudoplatanus</i>	Sycamore tree with some ivy cover.	2	

T29	<i>Acer pseudoplatanus</i>	A young standard sycamore tree, with a small amount of ivy cover.	3	
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T30	<i>Tilia x europaea</i>	A standard lime tree, without any epicormic growth on the trunk. Some ivy cover.	2	
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T31	<i>Aesculus hippocastanum</i>	Standard horse chestnut tree with rotting wood at the base of the trunk. The tree has some ivy cover, but not enough to make it suitable for bats. No obvious holes or broken branches above ground level. Some smaller lower branches are rotting.	3	
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T32	<i>Tilia x europaea</i>	A large lime tree with extensive epicormic growth around the base of the trunk. The profuse foliage makes it difficult to see whether there are any holes.	1	
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T33	<i>Tilia x europaea</i>	A large, well-grown lime tree with dense epicormic growth on the lower part of the trunk. The dense epicormic growth and other foliage hide the trunk. It was not possible to see any holes, even if they were present.	1	
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T34	<i>Ilex aquifolium</i>	Coppiced holly tree with rather tangled, strongly growing secondary growth. It is difficult to see within the tree due to the prickly foliage. No obvious holes, but Category 2 as it may offer cover for bats.	2	
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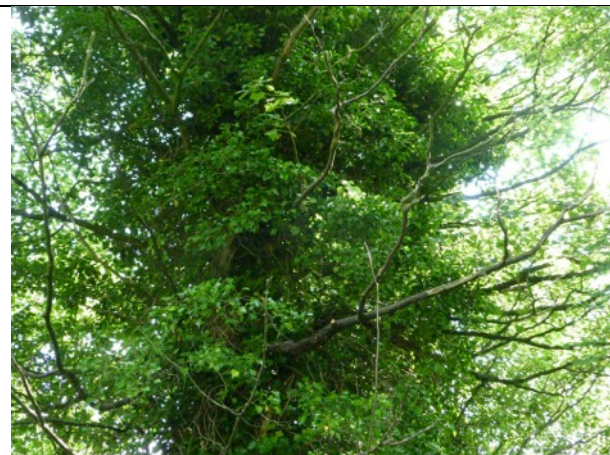
T35	<i>Taxus baccata</i>	A coppiced, or multi-stemmed yew tree. There are no obvious holes, but the tree has some epicormic growth on the branches and at least one branch has decay where a side branch has been removed. Part of another branch is rotting.	3	
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T36	<i>Prunus avium</i>	Standard wild cherry, with medium amount of ivy cover. One of the lower branches near the ground has been removed. No obvious holes.	3	
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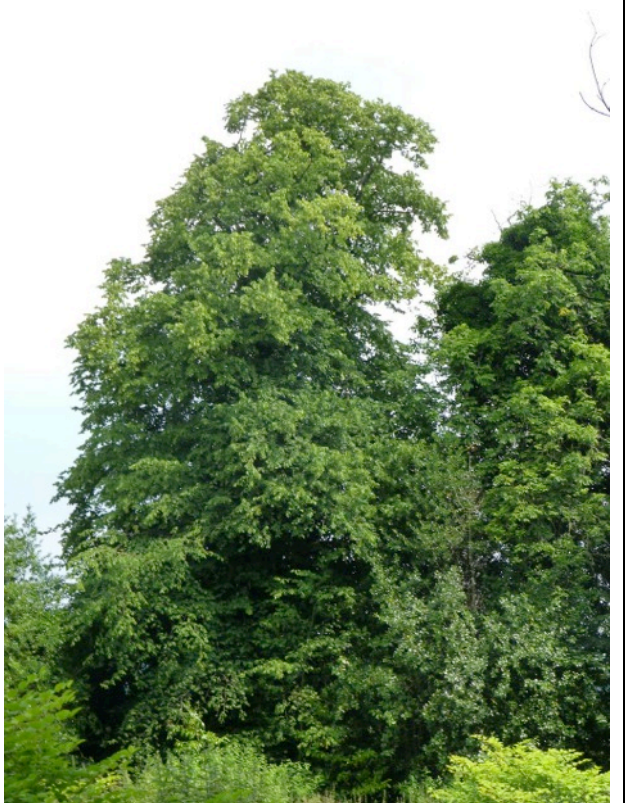
T37	<i>Castanea sativa</i>	Very large sweet horse chestnut. The tree is in good condition, although some of the smaller branches are decaying at the tips. Some woodpecker holes higher up. There are couple of locations where branches have fallen off or have been removed. These seem to be blind and there was no evidence of staining or claw marks around the holes. The lower part of the trunk has ivy cover.	2	
T38	<i>Acer pseudoplatanus</i>			

T39	<i>Acer pseudoplatanus</i>	A small sycamore. No ivy cover and no obvious holes. One of the lower branches is decaying.	3	
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T40	<i>Taxus baccata</i>	Young yew tree, with single, well-grown vertical trunk. Very small amount of ivy cover. One small hole at approximately 4m above the ground. No staining and some cobwebs block the hole.	3	
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T41	<i>Acer pseudoplatanus</i>	Large sycamore with heavy ivy cover. No obvious holes or broken branches. Crevices behind branches could be used by pipistrelles.	2	
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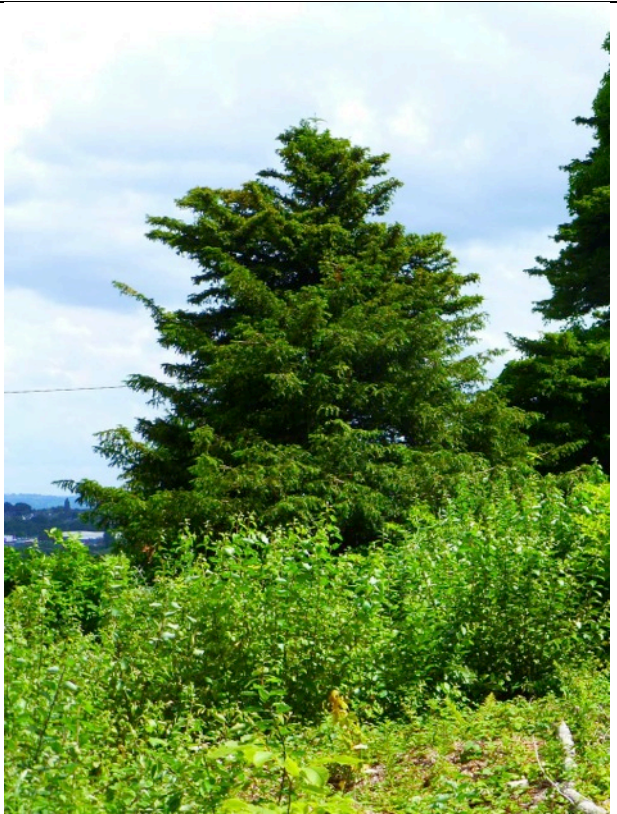
T42	<i>Aesculus hippocastanum</i>	Standard horse chestnut tree with dense ivy cover. No obvious holes, but plenty of crevices for bats to shelter.	2	
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T43	<i>Tilia x europaea</i>	A mature lime tree with dense epicormic growth on the lower 5m of the trunk. The tree is branched at the base and at least one branch is broken. There are no obvious holes on the trunk. The tree has a dense clump of shoots at the base, which suggests that it may have been coppiced in the past. The tree could offer cover to bats, but there are better alternatives a short distance away. Predators such as domestic cats can probably reach the lower branches and the epicormic growth may offer little protection in the winter.	2	
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T44	<i>Acer pseudoplatanus</i>	A mature standard sycamore tree with dense ivy cover on the trunk. The ivy covers the entire trunk and it is therefore impossible to tell whether there are any holes or broken branches that may have bat potential. Hence cautionary Category 1.	1	
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T45	<i>Taxus baccata</i>	Yew tree. No bat potential.	3	
T46	<i>Taxus baccata</i>	Yew tree. No bat potential.	3	

T47	<i>Taxus baccata</i>	Yew tree. No bat potential.	3	
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T48	<i>Taxus baccata</i>	Yew tree. No bat potential.	3	
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G1	<i>Aesculus hippocastanum</i>	A small group of five horse chestnut trees. All of the trees are of a similar age and have presumably been planted. Most have occasional branches missing. One has some ivy cover and others have flaking bark. No obvious holes though.	3	
G2	<i>Acer pseudoplatanus</i>	Coppiced sycamore tree. No bat potential.	3	

The above trees have been assessed for their potential to support bat roosts according to the guidelines on pages 59-60 in *Bat Surveys: Good Practice Guidelines* (Hundt, 2012).

The tree numbering follows that in the arboricultural report by Tree Solutions Ltd. (2014).

References

Hundt, L. (2012). *Bat Surveys: Good Practice Guidelines*. Second Edition. Bat Conservation Trust.

Tree Solutions Ltd. (2014) *Phase 1 Tree Survey and Preliminary Tree Constraints/Impact Assessment Plan. Land off Summerhill Road, Gwersyllt, Wrexham.*

APPENDIX B
BAT SURVEY RECORDS
(BATBOX BATON AND ZOOM H2N)

Location	Summerhill, Wrexham			
Surveyors	Martin Page and Tim Green			
Survey	Activity transect		Date	28.06.2014
Sunrise	04.49		Sunset	21.42
Weather	Calm, with occasional drizzle.			
Location	Recording	Time	Species	Activity
		21.46	CP	Detected, not seen.
1	45.wav	21.48	-	-
2	46.wav	22.03	-	-
3	48.wav	22.12	-	-
4	51.wav	22.29	-	-
		22.30	CP	Brief pass.
		22.33	CP	Brief pass.
5	52.wav	22.43	CP	-
		22.43	CP	Between stations 2 and 3. Foraging along tree line.
6	53.wav	22.51	-	-
7	60.wav	23.04	-	-
8	61.wav	23.22	-	-
9	63.wav	22.30	-	-
		23.36	SP	Flew over stream and into Moss Wood.

[illegible]

Baton with Zoom H2n Digital recorder

Wildlife Acoustics EM3+

Location	Summerhill, Wrexham			
Surveyors	Martin Page and Tim Green			
Survey	Activity transect		Date	9.6.2015
Sunrise	04.45		Sunset	21.36
Weather	Dry, calm.			
Location	Recording	Time	Species	Activity
1	21.41	03.wav		
	21.44		Noctule	Commuting. Flew straight across site from north to south. Height approximately 50m.
2	21.53	04.wav		
	21.55		SP	Flew across tree in SE corner of site. Impossible to tell whether it was foraging or not.
	21.56		CP	Appeared to fly from top of tree in southeastern corner of the site.
3	21.58	05.wav		
	22.11		CP	Foraging.
	22.12		CP	Foraging.
	22.13		CP	Foraging.
4	22.17	07.wav		No bats recorded.
5	22.26	15.wav		No bats recorded.
6	22.38	16.wav		No bats recorded.
7	22.47	17.wav		No bats recorded.
8	23.02	18.wav		No bats recorded.
9	23.14	19.wav		No bats recorded.

All recordings are approximately 5 minutes long.				
Baton with Zoom H2n Digital recorder				
Wildlife Acoustics EM3+				

APPENDIX C
BAT SURVEY RECORDS
(EM3+)

FOLDER	IN FILE	CHANNEL	OFFSET	DURATION	OUT FILE	DATE	TIME	HOUR	DATE-12	TIME-12	HOUR-12	AUTO ID	PULSES	MATCHING	MARGIN	FILES	MANUAL ID
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	N_20140622	0	0	1.49	N_0_201406	22/06/2014	01:19:07		1	21/06/2014	13:19:07	13	PIPY	6	5	0.390667	1
	N_20140622	0	0	1.004	N_0_201406	22/06/2014	01:19:34		1	21/06/2014	13:19:34	13	PIPY	2	2	0.152768	1
	N_20140622	0	0	2.331	N_0_201406	22/06/2014	01:28:49		1	21/06/2014	13:28:49	13	NoId	0	0	0	1
	__20140622_	0	0	2.278	__0_201406	22/06/2014	01:03:09		1	21/06/2014	13:03:09	13	NoId	0	0	0	1
	__20140622_	0	0	2.373	__0_201406	22/06/2014	01:18:12		1	21/06/2014	13:18:12	13	NoId	0	0	0	1
	__20140622_	0	0	1.731	__0_201406	22/06/2014	01:18:25		1	21/06/2014	13:18:25	13	PIPY	4	4	0.433878	1
	__20140622_	0	0	2.316	__0_201406	22/06/2014	01:18:28		1	21/06/2014	13:18:28	13	PIPY	7	7	0.592377	1
	__20140622_	0	0	1.593	__0_201406	22/06/2014	01:22:43		1	21/06/2014	13:22:43	13	PIPY	4	4	0.588234	1

FOLDER	IN FILE	CHANNEL	OFFSET	DURATION	OUT FILE	DATE	TIME	HOUR	DATE-12	TIME-12	HOUR-12	AUTO ID	PULSES	MATCHING	MARGIN	FILES	MANUAL ID
	__20150422_	0	0	2.434	__0_201504_	22/04/15	19:40:53		19	22/04/15	07:40:53	7 PINA	8	5	0.380348	1	
	__20150422_	0	0	2.316	__0_201504_	22/04/15	19:41:41		19	22/04/15	07:41:41	7 Nold	0	0	0	1	
	__20150422_	0	0	3.102	__0_201504_	22/04/15	19:53:23		19	22/04/15	07:53:23	7 PIPY	5	5	0.440599	1	
	__20150422_	0	0	2.072	__0_201504_	22/04/15	19:55:00		19	22/04/15	07:55:00	7 Nold	0	0	0	1	
	__20150422_	0	0	8.259	__0_201504_	22/04/15	19:55:53		19	22/04/15	07:55:53	7 PIPI	5	4	0.199758	1	
	__20150422_	0	0	10	__0_201504_	22/04/15	19:56:05		19	22/04/15	07:56:05	7 PIPI	13	11	0.540991	1	
	__20150422_	0	0	1.5	__0_201504_	22/04/15	19:56:16		19	22/04/15	07:56:16	7 PIPI	4	4	0.212986	1	
	__20150422_	0	0	5.056	__0_201504_	22/04/15	19:56:38		19	22/04/15	07:56:38	7 PIPI	18	14	0.647748	1	
	__20150422_	0	0	5.614	__0_201504_	22/04/15	19:56:51		19	22/04/15	07:56:51	7 PIPI	8	8	0.493034	1	
	__20150422_	0	0	6.855	__0_201504_	22/04/15	19:56:59		19	22/04/15	07:56:59	7 PIPY	22	6	0.309045	1	
	__20150422_	0	0	9.011	__0_201504_	22/04/15	19:57:10		19	22/04/15	07:57:10	7 PIPI	9	7	0.400269	1	
	__20150422_	0	0	3.488	__0_201504_	22/04/15	19:57:28		19	22/04/15	07:57:28	7 PIPI	20	20	0.77606	1	
	__20150422_	0	0	4.239	__0_201504_	22/04/15	19:57:33		19	22/04/15	07:57:33	7 PIPI	8	8	0.460199	1	
	__20150422_	0	0	5.74	__0_201504_	22/04/15	19:57:38		19	22/04/15	07:57:38	7 BABA	10	7	0.476076	1	
	__20150422_	0	0	10	__0_201504_	22/04/15	19:57:51		19	22/04/15	07:57:51	7 PIPI	19	16	0.669767	1	
	__20150422_	0	0	4.348	__0_201504_	22/04/15	19:58:06		19	22/04/15	07:58:06	7 PIPI	19	17	0.694779	1	
	__20150422_	0	0	2.946	__0_201504_	22/04/15	19:58:12		19	22/04/15	07:58:12	7 Nold	0	0	0	1	
	__20150422_	0	0	5.418	__0_201504_	22/04/15	19:58:17		19	22/04/15	07:58:17	7 PIPI	14	10	0.51603	1	
	__20150422_	0	0	7.785	__0_201504_	22/04/15	19:58:25		19	22/04/15	07:58:25	7 PIPI	33	24	0.750688	1	
	__20150422_	0	0	4.982	__0_201504_	22/04/15	19:58:40		19	22/04/15	07:58:40	7 PIPI	28	27	0.813331	1	
	__20150422_	0	0	3.296	__0_201504_	22/04/15	19:58:48		19	22/04/15	07:58:48	7 PIPI	8	5	0.279122	1	
	__20150422_	0	0	10	__0_201504_	22/04/15	19:58:52		19	22/04/15	07:58:52	7 PIPI	23	20	0.749749	1	
	__20150422_	0	0	4.237	__0_201504_	22/04/15	19:59:07		19	22/04/15	07:59:07	7 PIPI	14	14	0.661476	1	
	__20150422_	0	0	7.914	__0_201504_	22/04/15	19:59:15		19	22/04/15	07:59:15	7 PIPI	15	10	0.535872	1	
	__20150422_	0	0	3.315	__0_201504_	22/04/15	19:59:26		19	22/04/15	07:59:26	7 PIPI	7	6	0.350066	1	
	__20150422_	0	0	4.408	__0_201504_	22/04/15	19:59:37		19	22/04/15	07:59:37	7 PIPI	8	7	0.409781	1	
	__20150422_	0	0	10	__0_201504_	22/04/15	19:59:47		19	22/04/15	07:59:47	7 PIPI	11	7	0.375345	1	
	__20150422_	0	0	6.835	__0_201504_	22/04/15	19:59:58		19	22/04/15	07:59:58	7 PIPI	15	14	0.67026	1	
	__20150422_	0	0	2.065	__0_201504_	22/04/15	20:00:07		20	22/04/15	08:00:07	8 PIPI	7	7	0.499885	1	
	__20150422_	0	0	2.628	__0_201504_	22/04/15	20:00:13		20	22/04/15	08:00:13	8 Nold	0	0	0	1	
	__20150422_	0	0	2.833	__0_201504_	22/04/15	20:00:24		20	22/04/15	08:00:24	8 PIPI	2	2	0.068854	1	
	__20150422_	0	0	2.627	__0_201504_	22/04/15	20:01:43		20	22/04/15	08:01:43	8 PIPI	4	3	0.097418	1	
	__20150422_	0	0	2.073	__0_201504_	22/04/15	20:04:05		20	22/04/15	08:04:05	8 PIPI	3	3	0.210151	1	
	__20150422_	0	0	3.99	__0_201504_	22/04/15	20:04:13		20	22/04/15	08:04:13	8 PIPI	8	7	0.423434	1	
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	__20150422_	0	0	1.674	__0_201504_	22/04/15	20:04:55		20	22/04/15	08:04:55	8 Nold	0	0	0	1	
	__20150422_	0	0	3.716	__0_201504_	22/04/15	20:05:03		20	22/04/15	08:05:03	8 PIPI	17	12	0.58418	1	
	__20150422_	0	0	1.79	__0_201504_	22/04/15	20:12:13		20	22/04/15	08:12:13	8 PIPI	3	3	0.209455	1	
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	__20150422_	0	0	7.517	__0_201504_	22/04/15	20:15:07		20	22/04/15	08:15:07	8 PIPI	6	6	0.369606	1	
	__20150422_	0	0	3.671	__0_201504_	22/04/15	20:16:57		20	22/04/15	08:16:57	8 Nold	0	0	0	1	
	__20150422_	0	0	3.919	__0_201504_	22/04/15	20:17:24		20	22/04/15	08:17:24	8 PIPI	2	2	0.06042	1	
	__20150422_	0	0	2.401	__0_201504_	22/04/15	20:34:24		20	22/04/15	08:34:24	8 PIPI	6	5	0.200551	1	
	__20150422_	0	0	2.235	__0_201504_	22/04/15	20:35:06		20	22/04/15	08:35:06	8 PIPY	2	2	0.239182	1	
	__20150422_	0	0	3.698	__0_201504_	22/04/15	20:53:58		20	22/04/15	08:53:58	8 Nold	0	0	0	1	

FOLDER	IN FILE	CHANNEL	OFFSET	DURATION	OUT FILE	DATE	TIME	HOUR	DATE-12	TIME-12	HOUR-12	AUTO ID	PULSES	MATCHING	MARGIN	FILES	MANUAL ID
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	__20150609_	0	0	6.47	__0_2015060	09/06/15	21:54:10		21	09/06/15	09:54:10	9 PINA	31	26	0.857544		1
	__20150609_	0	0	2.31	__0_2015060	09/06/15	21:55:55		21	09/06/15	09:55:55	9 BABA	6	3	0.089383		1
	__20150609_	0	0	1.448	__0_2015060	09/06/15	21:55:59		21	09/06/15	09:55:59	9 PIPI	2	2	0.125395		1
	__20150609_	0	0	7.501	__0_2015060	09/06/15	21:56:41		21	09/06/15	09:56:41	9 NYNO	9	8	0.650785		1
	__20150609_	0	0	2.8	__0_2015060	09/06/15	21:57:19		21	09/06/15	09:57:19	9 PIPI	9	9	0.631751		1
	__20150609_	0	0	3.312	__0_2015060	09/06/15	21:58:22		21	09/06/15	09:58:22	9 PIPI	9	9	0.580755		1
	__20150609_	0	0	3.732	__0_2015060	09/06/15	21:59:26		21	09/06/15	09:59:26	9 PIPI	6	3	0.10285		1
	__20150609_	0	0	4.75	__0_2015060	09/06/15	22:05:15		22	09/06/15	10:05:15	10 PIPI	18	13	0.576933		1
	__20150609_	0	0	6.093	__0_2015060	09/06/15	22:10:22		22	09/06/15	10:10:22	10 PIPI	40	36	0.846956		1
	__20150609_	0	0	7.292	__0_2015060	09/06/15	22:10:45		22	09/06/15	10:10:45	10 PIPI	32	28	0.776281		1
	__20150609_	0	0	4.189	__0_2015060	09/06/15	22:12:16		22	09/06/15	10:12:16	10 PIPI	19	16	0.688618		1
	__20150609_	0	0	5.155	__0_2015060	09/06/15	22:12:34		22	09/06/15	10:12:34	10 PIPI	22	20	0.721785		1
	__20150609_	0	0	2.301	__0_2015060	09/06/15	23:07:19		23	09/06/15	11:07:19	11 NYNO	2	2	0.171016		1