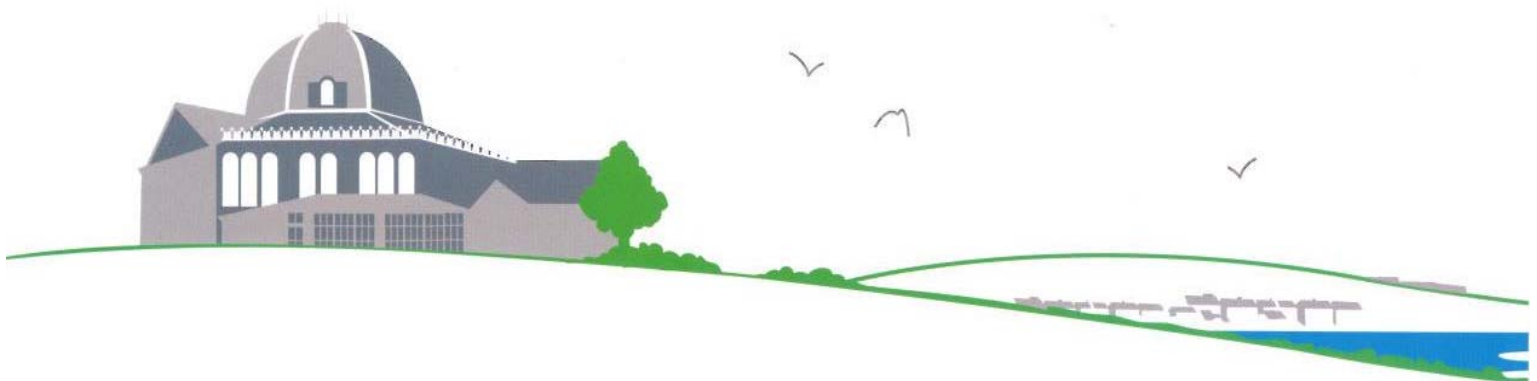




NORRIS JONES DEVELOPMENTS
LAND OFF HILLOCK LANE, GRESFORD
BAT SURVEY REPORT



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LAND OFF HILLOCK LANE, GRESFORD

BAT SURVEY REPORT

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This project has been undertaken in accordance with PAA policies and procedures on quality assurance.

A handwritten signature in dark ink, appearing to read 'Sarah Ross', written over a horizontal line.

Signed: _____

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1	Location of Trees Surveyed
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1	Site Photographs
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1. INTRODUCTION

Background

- 1.1 Penny Anderson Associates Ltd (PAA) was commissioned by Norris Jones Developments to carry out a survey to investigate presence/likely absence of roosting bats at a site off Hillock Lane, Gresford, Wrexham (hereafter referred to as the 'site'). The land is proposed for residential development.
- 1.2 Trees were inspected for bat roosts potential as part of a Phase 1 Habitat survey (PAA 2018) carried out in May 2018. Two trees were assessed as having bat roost potential: a mature pedunculate oak¹ (*Quercus robur*) T34 with a large cavity and knot hole (Appendix 1, Photo1) and a mature sycamore (*Acer pseudoplatanus*) T33 (Photo 2). Please see Figure 1 for location.
- 1.3 The assessment determined that there is suitable habitat on the site for commuting and foraging bats, with scrub, lines of trees and continuous recently-managed hedgerows on the site (Photos 3 and 4). The hedgerows present also provide connections to residential gardens with trees and clumps of woodland adjacent to the site.
- 1.4 As an element of the Phase 1 survey, data records for protected species held by Cofnod, the biological records centre for North Wales, was requested. This included records for bats within a 1km search area from the site. Records were returned for common pipistrelle (*Pipistrellus pipistrellus*) (ten records), soprano pipistrelle (*Pipistrellus pygmaeus*) (three records), brown long-eared bat (*Plecotus auritus*) (four records) and lesser horseshoe bat (*Rhinolophus hipposideros*) (one record).
- 1.5 The common pipistrelle is one of the UK's most common bat species, found in a wide range of habitats including suburban and urban habitats. Soprano pipistrelle is also widely distributed across the UK. Brown long-eared bat is found throughout the UK and is widespread in the rest of Europe. The lesser horseshoe bat is rare in the British Isles and is confined to Wales, western England and western Ireland.
- 1.6 This report details the results of a single dusk emergence survey of the sycamore tree assessed as having low roost potential and two dusk emergence and a single dawn re-entry survey for the oak tree which was assessed as having high bat roost potential. This is in keeping with best practice guidelines (Collins 2016).

Site Description

- 1.7 The site is south of Gresford, bounded to the north by Hillock Lane with residential gardens backing onto the site. The majority of the area is very gently sloping fields of lush, improved cattle-grazed pastures, with perennial rye-grass (*Lolium perenne*), rough meadow-grass (*Poa trivialis*), white clover (*Trifolium repens*) and dandelion (*Taraxacum officinale* agg.) being prominent components of the sward.

¹ Plant names follow Stace 2019

Bat Biology

- 1.8 There are 17 species of native bats known to be resident (i.e. breed) in the British Isles. British bats feed entirely on insects and have developed a complex sonar system, known as echolocation, which enables them to find prey and navigate around their environment at night.
- 1.9 Habitat requirements vary widely, both on an individual and species level, although certain features, such as woodland, parkland, traditional pasture, marshes and areas of freshwater, are often focal points for foraging, as insects are plentiful in these areas (Mitchell-Jones 2004). Bats use linear features such as rivers, hedgerows, roads and woodland edges as landmarks in order to commute from one location to another (Schofield and Mitchell-Jones 2003).
- 1.10 Bats utilise different roosts at different times of the year. Between late October and March, bats hibernate; this requires an unexposed roost with a stable temperature, typically a cave, cellar or tunnel. Around March, the bats emerge and gradually move to their summer roosts, typically within man-made structures or suitable crevices in trees. During the spring and summer period female bats gather together at maternity roosts to give birth and rear their young. Most births occur between late June and mid-July, with the young able to fly within three to five weeks (Altringham 2003; Waters and Warren 2003). By the end of August, most of the young bats are independent and the colony begins to break up (Schofield and Mitchell-Jones 2003). Mating takes place between August and December, either at the winter hibernation site or at autumn breeding sites. The numbers of bats utilising these roosts can vary from single bats to hundreds of bats in a nursery colony or hibernation site (Altringham 2003).
- 1.11 Bats play an important role in many environments around the world, including pollination and insect control. In the UK, bats can tell us a lot about the state of the environment because they are top predators of common nocturnal insects and are extremely sensitive to changes in their surroundings, e.g. climate, landscape, agricultural intensification, development and habitat fragmentation. Populations of British bats have suffered severe declines in the past century, influenced by these factors.

Legislative Context

- 1.12 All wild species of bat are protected under the Wildlife and Countryside Act (WCA) 1981, which has also been amended by later legislation, including the Countryside and Rights of Way (CROW) Act 2000 and the Conservation of Habitats and Species Regulations 2017, and this legislation is applicable to England and Wales. Bats are listed on Schedule 5 of the WCA and are therefore subject to some the provisions of Section 9 which, with the amendments, make it an offence to:
 - Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection (S9:4b).
 - Intentionally or recklessly obstruct access to any structure or place used for shelter or protection by a bat (S9:4c).
- 1.13 There are additional offences in relation to buying and selling (S9:5) any live or dead animal of this species or anything derived from them.
- 1.14 Bat species are also listed under Annexes IIa and IVa of the EC Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the 'Habitats Directive'. Inclusion on Annex IVa means they are consequently identified as European Protected Species (EPS) and protected under the Conservation of Habitats and Species Regulations 2017.
- 1.15 The Conservation of Habitats and Species Regulations 2017 state that a person commits an offence if they:
 - (a) deliberately capture, injure or kill any wild animal of a European protected species,

- (b) deliberately disturb wild animals of any such species, in such a way as –
 - (i) to impair their ability to survive, to breed or reproduce, or to rear their young, or
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate, or
 - (iii) to affect significantly the local distribution or abundance of the species to which they belong;
 - (c) deliberately take or destroy the eggs of such an animal, or
 - (d) damage or destroy a breeding site or resting place of such an animal.
- 1.16 Under these Regulations it is an offence to damage or destroy a breeding site or resting place whether the animal is in occupation or not, and protection extends to all life stages of the animal in question. There are additional offences relating to possession, control and sale of a live or dead bat or part of such an animal.
- 1.17 In addition, seven native British bat species, including the soprano pipistrelle and the brown long-eared bat, that are frequently found in buildings, are listed as a 'Priority Species' under the under the 2011 biodiversity strategy for England, *Biodiversity 2020: A strategy for England's wildlife and ecosystem services*, under the 2012 UK Post-2010 UK Biodiversity Framework. These Priority Species are also referred to as 'species of principal importance' for the conservation of biodiversity in England and Wales within Section 74 of the CRoW Act 2000, and Sections 41 (England) and 42 (Wales) of the Natural Environment and Rural Communities (NERC) Act 2006.
- 1.18 Section 15 of the National Planning Policy Framework (NPPF 2019) states that the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible. The NPPF also includes the requirement to contribute to the Government's commitment to halt the overall decline in biodiversity and to promote the reservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets. Reference is made to Circular 06/2005 *Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System* in respect of statutory obligations for biodiversity and geodiversity conservation.
- 1.19 Local authorities in England are required to ensure that where significant harm resulting from development cannot be avoided (through locating on alternative sites with less harmful impacts), adequately mitigated or, as a last resort, compensated for, planning permission is refused. The commitment to preserving, restoring or enhancing biodiversity is further emphasised for England and Wales in Section 40 of the NERC Act 2006.
- 1.20 *Please note: the above text provides a brief summary of the legislation in relation to bats in England and Wales and the original Acts, Regulations and any amendments should be referred to for the precise wording.*

2. METHODS

Dusk Emergence Surveys

- 2.1 The survey programme was carried out by PAA ecologists (detailed in the table below) following current good practice guidelines published by The Bat Conservation Trust (Collins 2016). Each member of the survey team was appropriately qualified for their assigned tasks based on the CIEEM (Chartered Institute of Ecology and Environmental Management) competency framework (CIEEM 2013).

Table 1 Survey Team

Name	Appropriate Qualification
Gerard Hawley (GJH)	Principal Environmental Scientist MCIEEM
Caroline Boffey (CBo)	Ecologist ACIEEM
Beth Howes (BH)	Assistant Ecologist

- 2.2 Two surveyors carried out the surveys positioned to observe the potential roost features that had been identified. Each surveyor was equipped with a Batbox duet to aid detection of calls in the field and an Anabat SD1 to record calls for sonogram analysis and confirmation of species identification. Emergence surveys commenced no later than 15 minutes prior to sunset and continued for approximately 1.5 to 2 hours. The dawn re-entry survey began one hour before sunrise and ended a short while afterwards.
- 2.3 Weather conditions were recorded at the start and end of each survey. Temperature and humidity were measured using a hygro-thermometer (810-190 www.etiltd.com). Wind strength was estimated using the Beaufort Wind Force Scale, ranging from 0 calm to 5 moderate breeze (NB while the scale extends to force 12 hurricane, 6 or higher would be unsuitable conditions for surveys). Cloud cover was estimated where 0% is a completely clear sky and 100% is completely overcast. The timings, dates and conditions for each survey are provided in the Table 2.

Table 2 Timings and Conditions of Surveys

Date	Survey Type	Team	Start Time	Sunset /rise Time	End Time	Weather Conditions
05/08/19	Dusk Emergence	CBo BH	20:45	21:00	22:35	Dry and light wind. Temperature 18.0°C, decreasing to 17.0°C by the end of survey. Relative humidity 71%, increasing to 73%. Cloud cover 5% decreasing to 0%.
23/08/19	Dusk Emergence	CBo BH	19:55	20:23	21:53	Dry with light wind. Temperature 22.8°C decreasing to 18.4°C by the end of survey. Relative humidity 60%, increasing to 76%. Cloud cover 50% increasing to 100%.
25/09/19	Dawn re-entry	CBo GJH	06:01	07:02	07:04	Dry and calm. Temperature 14.8°C increasing to 15.3°C by the end of survey. Relative humidity 69%, increasing to 71%. Cloud cover 100% throughout.

Data Analysis

- 2.4 Recorded bat calls from each of the survey visits were analysed using specialist sound analysis software Analook W. Based on parameters such as peak frequency and call duration, each call was assigned to a particular bat species or species group.

Limitations to Survey Techniques

- 2.5 Bat detectors have a range of approximately 20m. Some bat species, such as noctule (*Nyctalus noctula*), have very loud echolocation calls that can travel over long distances and, therefore, may be detected at greater range, whilst others, such as brown long-eared bats, typically have very quiet calls that are often only detected at close range.
- 2.6 Visual observation of bat activity is constrained by light levels. While surveyors may be able to see bats silhouetted against the sky, individuals flying against a background of dark buildings or trees are much more difficult to spot. The use of bat detectors to hear echolocation calls helps to ensure that activity is not missed. However, in low light conditions it is not always possible to ascertain details such as direction of flight.
- 2.7 Both survey visits were carried out on days when weather conditions were suitable. The site was fully accessible during each of the survey visits. No significant limitations were encountered and the results of the survey are considered to be robust.

3. RESULTS

Dusk Emergence Survey T33 and T34: 5th August 2019

- 3.1 A surveyor was positioned at each of the trees to record bat activity. The first bat recorded at the sycamore tree T34 was of a commuting common pipistrelle at 21:42, approximately 42 minutes following sunset. During the course of the survey both common and soprano pipistrelle were recorded commuting and foraging along the hedgeline and in the adjacent field. Between 22:15 and 22:35 a single brown long-eared bat was foraging close to the tree in the adjoining field. No bats were seen emerging from the tree although the general level of bat activity was high.
- 3.2 The first record of bat activity at the pedunculate oak tree T33 was of a common pipistrelle at 21:25, 25 minutes after sunset. Activity levels were generally high, the majority of which were soprano pipistrelle with smaller numbers of common pipistrelle. Subsequent Analook data analysis (automatic recording) confirmed the majority of the records to be that of soprano pipistrelle and there were frequent calls of a *Myotis* species, possibly a whiskered (*Myotis mystacinus*) or Brant's (*M. brandtii*) bat (it is difficult to distinguish these species even with sonogram analysis and these two species were only separated in 1970). A single noctule bat was recorded briefly commuting across the site. No bats were seen emerging from the potential roost feature of the tree.

Dusk Emergence Survey T33: 23rd August 2019

- 3.3 The earliest record of bat activity was of a commuting soprano pipistrelle at 20:54, 31 minutes after sunset. As before the activity levels were by and large high with earlier activity predominantly of commuting bats but at approximately 45 minutes following sunset foraging activity was recorded around and close by the tree, which continued to the end of the survey. Species recorded included common pipistrelle and smaller numbers of noctule but subsequent Analook analysis showed that soprano bats were most common and a *Myotis* species was recorded frequently. No bats were recorded emerging from the tree.

Dawn Re-entry Survey T33: 25th September 2019

- 3.4 At the start of the survey a single soprano pipistrelle was feeding around the tree for approximately 12 minutes, making numerous passes and clearly feeding with a number of feeding buzzes recorded. At 06:30, 32 minutes before sunrise a single bat made four passes and although flying close by, it was not registered on the hand-held recorder or subsequently recorded on the Anabat. This suggests the species to be a brown long-eared bat, which makes very faint calls. Other species recorded were soprano pipistrelle although activity levels were generally lower than on earlier surveys. No bats were seen re-entering the potential roost feature.

4. EVALUATION AND RECOMMENDATIONS

- 4.1 There are a number of trees, gardens and open greenspaces in the vicinity of the site and relatively high levels of commuting and foraging was observed, particularly during the emergence surveys. No bats were seen to be roosting in the trees but at least four species were recorded using the site.
- 4.2 No further bat surveys are considered necessary. However, in line with current good practice, if development has not begun within two years of this report then the value of the site for bats should be reassessed to ensure that the impact assessment and recommendations remain relevant to the proposals.
- 4.3 Surveys have followed current good practice standards for having confidence in a negative result and, therefore, the results are considered to be robust. As there is no evidence of use by roosting bats, a licence application to Natural England is not thought necessary. Should evidence of use by roosting bats be identified at a later stage then further advice should be sought on the need for a licence.
- 4.4 Although there is no evidence that the trees surveyed have bat roosts, the habitat quality and the feeding opportunities for bats it presents are good. The proposed development of residential properties at the site is likely to change bat behaviour and reduce foraging opportunities. However, many bat species readily use buildings and built structures for roosting. Whereas human development has encroached on woodland and other wild spaces, so bats have adapted to roost in buildings. New buildings tend not to have the features that are suitable for roosting and it is recommended that provision is made to provide artificial roosting opportunities (see Table 3).

Lighting

- 4.5 Artificial lighting can be disturbing to wildlife, particularly species such as bats that are nocturnal and adapted to forage in low-light conditions. Even if no roost is present on site, it is good practice to adopt a sensitive lighting scheme to maximise biodiversity value post-development, with consideration given to the following points:
- Directing lamps where they are needed to avoid unnecessary light spillage;
 - Use of narrow spectrum light sources with low ultra-violet, blue or white wavelength component to minimise insect attraction at lamps;
 - Avoiding illumination of features and habitats that are likely to have greatest value to bats, such as tree canopies; and
 - Use of timers and/or motion sensors to limit periods of illumination to essential times only.
- 4.6 Further guidance on lighting specifications is provided in publications available via the Bat Conservation Trust website www.bats.org.uk, such as the impacts of different types of lighting (RCEP 2009), effects of artificial lighting on bat behaviour (Stone 2013) and guidelines for mitigation (BCT 2014) and the Institution of Lighting Professionals and Bat Conservation Trust (2018).

Ecological Enhancement

- 4.7 National Planning policy requires that opportunities for ecological enhancement are sought within all development proposals, moving towards the aim of 'biodiversity net gain'. To achieve this, projects must be considered on an individual basis to ensure that new features, planting and management regimes are suitable for the conditions on site and thus likely to be successful

in the longer term. Some potential options are presented for consideration in the table below with specific reference to bats.

Table 3 Potential Enhancement Measures for Consideration

Bat roost features	Bat boxes mounted on buildings or trees. It is best to have two or three boxes facing in different directions to provide a range of temperature conditions • Those facing south-east to south-west allow the sun to fall on each box for part of the day. On very hot days a south-facing box may overheat, but the other boxes should have some shade • The height should be at least 3m above the ground • The number of boxes should be maximised to provide a good range of roosting options • An experienced bat ecologists should be consulted during the bat box installation to advise on the most suitable locations and type of bat box.
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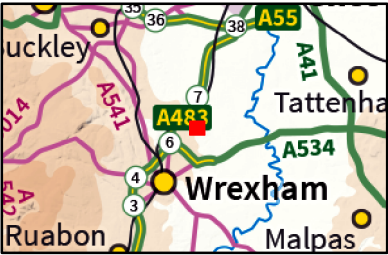
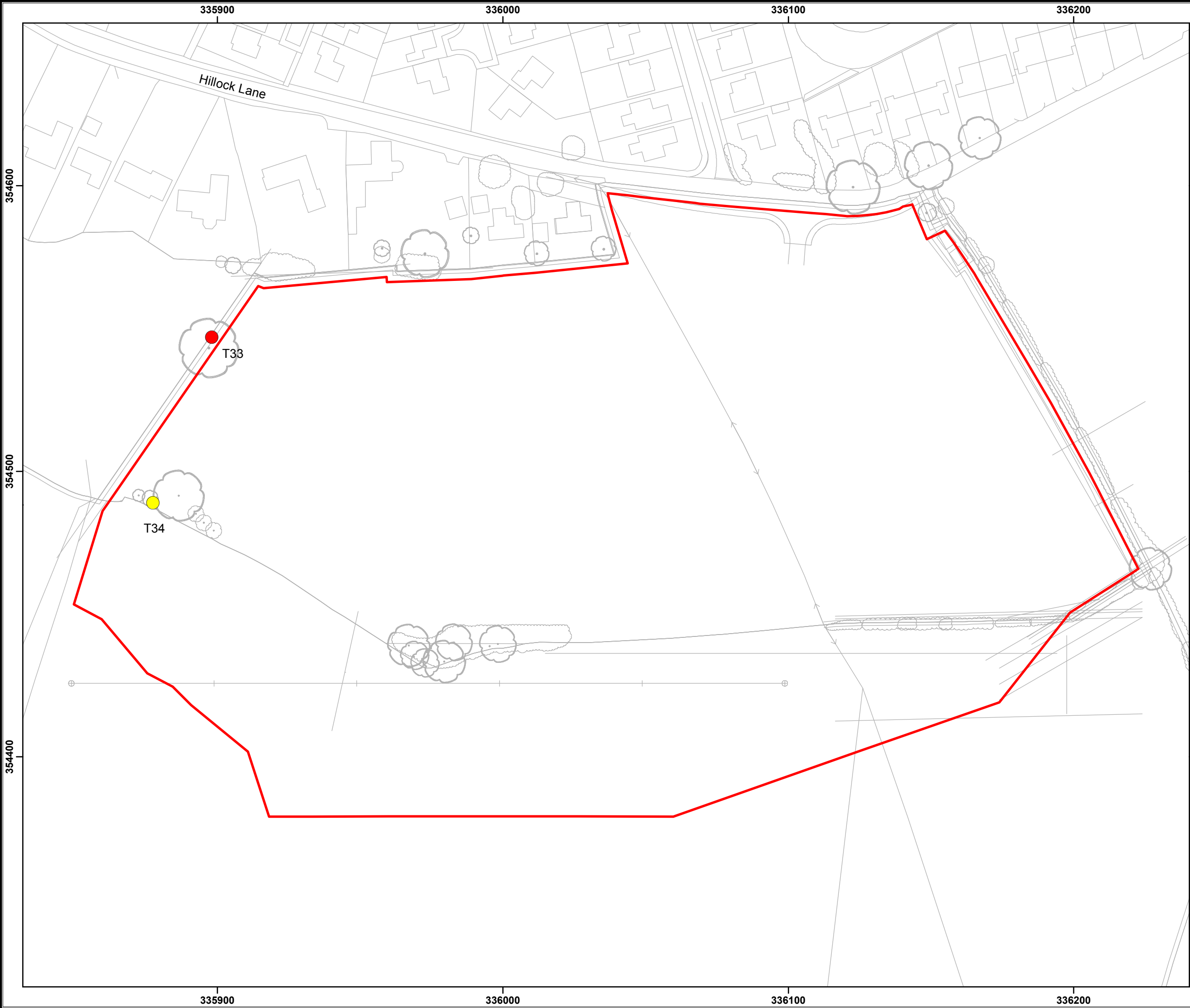
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6. ABBREVIATIONS

- BCT Bat Conservation Trust
- CIEEM Chartered Institute of Ecology and Environmental Management
- CRoW Countryside Rights of Way
- EPS European Protected Species
- NERC Natural Environment and Rural Communities
- NPPF National Planning Policy Framework
- PAA Penny Anderson Associates Ltd
- WCA Wildlife and Countryside Act

FIGURE



Legend

- Proposed development site
- High bat roost potential
- Low bat roost potential

British National Grid
Projection: Transverse Mercator
False Easting: 400000.000000
False Northing: 100000.000000
Central Meridian: 2.000000
Scale Factor: 0.999601
Latitude Of Origin: 49.000000

ISO A3

Metres
0 12 4 6 8

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Project Name
Gresford, Wrexham

Discipline
Ecology

Title:
Location of trees surveyed

Scale 1:1,250	Drawing No. Figure 1
Drawn By MDM	Originator CBo
PAA Ref. G:\NOJ001_Gresford_Wrexham\Maps\	Date 22/10/2019
	Revision 1.0

APPENDIX 1

Photographs



Photo 1

Pedunculate oak T33 with large cavity and knot hole assessed as having high bat roost potential

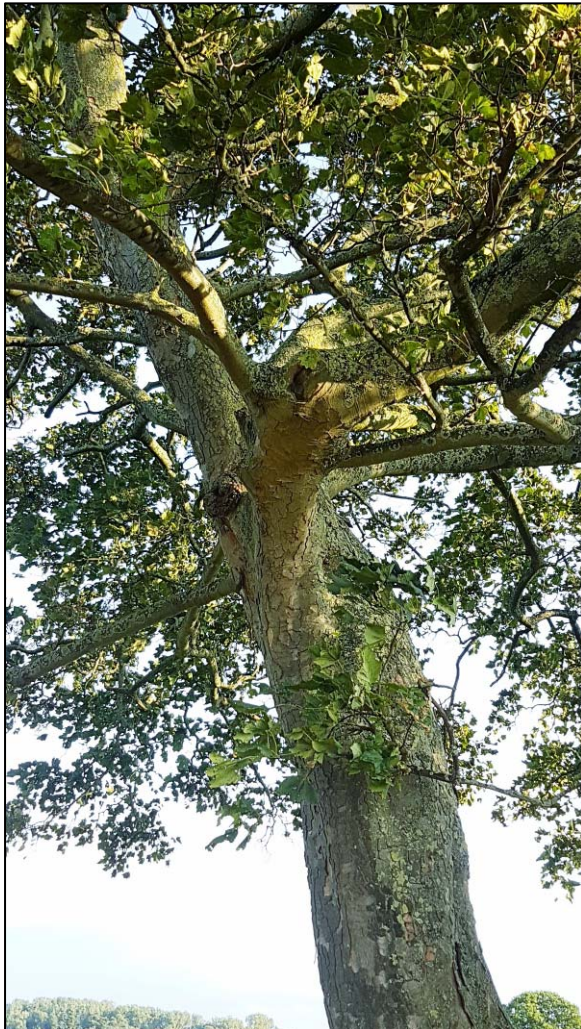


Photo 2

Mature sycamore T34 assessed as having low bat roost potential

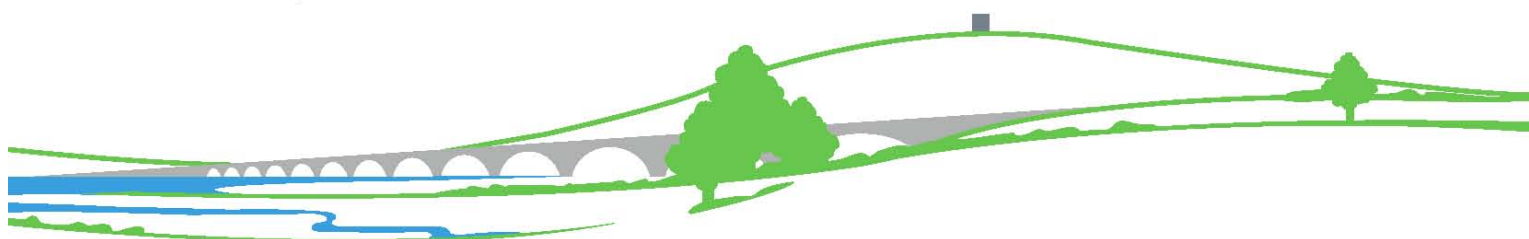


Photo 3
Typical habitat with tree lined hedgerows providing good foraging habitat



Photo 4
Trees and hedges – linear features in the landscape used by bats to navigate and commute

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