



Activity Survey for Bats

Wingerworth, Chesterfield

June 2014

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Notice to Readers

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Executive Summary

Absolute Ecology LLP was commissioned to undertake a daytime inspection and bat activity survey for the bat roost potential of a single tree at a site known as land off Derby Road, Wingerworth, Chesterfield, Derbyshire.

Two surveys, one dusk and one dawn re-entry, were conducted on 2nd May and 5th June 2014, respectively. Minor bat activity was recorded throughout each survey period, although no bats were seen entering or exiting the tree. Three confirmed species of bat were recorded foraging and commuting across the site: Noctule, Brown Long-eared bat and Common Pipistrelle. Peak activity of *Pipistrellus* species tended to occur more frequently one hour after sunset, inferring that these bats had commuted on site from the surrounding areas to forage. Pipistrelle bats are the most common species of bat in the UK, with a widespread distribution, and are most commonly found in England and Wales.

During the activity survey, Brown Long-eared bats were recorded commuting and foraging through the site. The Brown Long-eared bat is a common species of bat in the UK, with a widespread distribution, and is most commonly found in England and Wales.

The internal inspection during the surveys revealed no bat signs; minor foraging and commuting over the site was recorded close to the woodland boundaries of the site, where tree cover was greatest. No bats were seen emerging or re-entering the tree during the survey periods.

No substantial evidence was recorded to indicate that a notable bat roost was in-situ during the survey period. Thus, the proposed activity is unlikely to result in an offence under Regulation 41 or 4, and no recommendations are made regarding an EPSL application. However, it is important that the development compensates for any potential long-term loss of habitat for bats and birds, and provides future sustainability for local biodiversity. As such, integration of a number of external bat and bird boxes within the application area or within the adjacent woodland are also recommended. No evidence of nesting birds was recorded.

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1. Introduction

1.1. Site Description

Absolute Ecology LLP was commissioned to undertake a daytime inspection and bat activity survey for the bat roost potential of a single tree at a site known as land off Derby Road, Wingerworth, Chesterfield, Derbyshire.

1.2. Proposed Works

It is proposed that the site will be used for a residential development that would cause the removal of a single tree, which showed bat roosting potential.

1.3. Best Practice Guidance

The scope of this survey has been determined in line with the proportional approach to ecological survey, assessment and subsequent recommendations for avoidance and mitigation of impacts, which is encouraged in the emerging 'BS 42020: Biodiversity – Code of practice for planning and development'. This report has been prepared with due consideration for various best-practice guidance and methodologies including those of the Chartered Institute of Ecology and Environmental Management (CIEEM, 2012), the emerging BS 42020 and the Bat Conservation Trust Best Practice Guidelines (Hundt, 2012).

1.4. Aims of the Survey

1.4.1 The aim of the Preliminary Roost Assessment and presence/absence activity surveys is to provide an ecological evaluation of the following species within the proposed application area:

Table 1. Aims of survey in relation to bats

Bats
<ul style="list-style-type: none">To assess the probability of bats and their roost sites being present at the proposed redevelopment site
<ul style="list-style-type: none">To assess the roost status
<ul style="list-style-type: none">To assess suitable food resources and habitat requirements
<ul style="list-style-type: none">If a roost site is found, to provide an impact assessment

1.4.2 A bat roost is interpreted as 'any structure or place, which any wild bat uses for shelter or protection'. Bats tend to show a high fidelity to roosts. Legal opinion therefore regards a roost to be protected whether or not the bats are present at the time. There are many types of roost used by temperate bats during their annual cycle: Any structures found having evidence of bats will be further evaluated to assess which of the following roost categories may be present onsite (if any):

Table 2. Bat roost status definitions

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Status	Description
Maternity / Nursery Roost	<i>Used by breeding bats, where pups are born and raised to independence (anecdotal evidence may support this prospect despite sub-optimal survey period)</i>
Hibernation Site	<i>Where bats may be found during the winter (this is assessed within the context of this report)</i>
Daytime Summer Roost	<i>Used by males and/or non-breeding females (seasonal limitations prevent robust analysis of this)</i>
Night Roost	<i>Where bats rest between feeding bouts during the night but are rarely present during the day</i>
Feeding Roost	<i>Where bats temporarily utilise feeding perches and stations to eat an item of prey</i>
Transitional (or Swarming) Site	<i>Where bats may be present during the spring or autumn (this cannot be assessed within the context of this report)</i>

Table 3. Aims of survey in relation to birds

Birds
• Establish if birds are using the site
• Locate nest sites, if present
• Assess what types of activities were shown within the redevelopment site
• Assess suitable food resources and habitat requirements
• Provide an impact assessment, if nests are found

Table 4. Aims of survey in relation to Barn Owl

Barn Owl (<i>Tyto alba</i>)
• Establish presence onsite
• Establish potential nest sites (PNS)
• Locate any active roost sites (ARS)
• Locate any temporary roost sites (TRS)
• Assess potential feeding and dispersal habitats (PFH)
• Provide an impact assessment, should barn owl(s) be present

1.4.3 Assessment also considers potential effects on valued ecological receptors (VERs) and zones of influence (ZoI) during pre- and post-development, both onsite and offsite. The term Zone of Influence is used to describe the geographic extent of potential impacts of a proposed development. Should a likely significance of negative impacts be identified, further surveys, mitigation and enhancement measures will then be determined accordingly to prevent, offset or

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reduce the degree of impact that may occur should development commence.

- 1.4.4 Should bats be present onsite, then a European Protected Species (EPS) development licence issued by Natural England (NE) may be required prior to any works taking place. If required, further presence/absence survey should be undertaken and a mitigation strategy be implemented with Natural England and the Local Planning Authority. Should no further surveying effort be considered, then the PEA report will include full justification and evaluation.

2. Methods

2.1. Summary of Survey Methods

All bat species resident in the UK have been recorded using trees, buildings and built structures, e.g. bridges, at some time during the year (Hundt, 2012). Bats roost in natural holes, crevices and sheltered places. These features particularly tend to occur in mature trees. The most utilised types of tree are Oak spp., Ash, Beech and Scots Pine. Trees, especially when forming a linear feature, are also of value for navigation, foraging and as flight lines.

The trees were first visually inspected from the ground using binoculars and high-powered torches, where appropriate. Features were then inspected with an endoscope using a ladder for aerial tree climbing, when required.

The trees were assessed for their potential to support bat roosts. Signs of bat roosts in trees, according to the Bat Conservation Trust (BCT) (Hundt, 2012), are as follows. They typically include bat presence, droppings, feeding remains, urine stains and grease marks. Notes were made in accordance with the guidelines published by the BCT (Hundt, 2012) for the surveying of buildings and built structures: the trees present on site were evaluated to assess which of the following categories they fall into (Hundt, 2012):

- Known or confirmed roost
- 1* - Trees with multiple, highly suitable features capable of supporting larger roosts
- 1 - Trees with definite bat potential, with fewer suitable features than category 1* trees, or with potential for use by single bats
- 2 - Trees with no obvious potential, although the tree is of a size and age that means elevated surveys may result in cracks or crevices being found, or the tree supports some features which may have limited potential to support bats
- 3 - Trees with no potential to support bat roosts

The activity survey was performed in accordance with the guidelines published by the BCT (Hundt, 2012) for carrying out dusk and dawn activity surveys:

- Determine the presence/absence of species, i.e. the species present in a given area
- Determine the intensity of bat activity both spatially and temporally
- Determine the type of activity, most usually foraging (by feeding buzzes), commuting (by high directional pass rates), or mating (by mating social calls)
- Find roosts by tracking back bat flight paths or observing dawn flight activity at roosts

Where feasible, given the amount of evidence collected, any structures with evidence of bats have been evaluated to assess which of the following categories they fall into, if any (Hundt, 2012):

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- Maternity or Nursery Roost – used by breeding bats, where babies are born and raised to independence
- Hibernation Site – where bats may be found during the winter
- Daytime Summer Roost – used by males and/or non-breeding females
- Night Roost – where bats rest between feeding bouts during the night but are rarely present during the day
- Feeding Roost – where bats temporarily hang up to eat an item of prey
- Transitional (or Swarming) Site – where bats may be present during the spring or autumn.

In the absence of any evidence, trees and structures have been assigned a rating of suitability from negligible to high potential for supporting bats. The rating is based on the location of the structure in the surrounding landscape, the number and type of features suitable for use by bats and the surveyor's experience. For example, a structure with a high level of regular disturbance and few opportunities for access by bats that is in a highly urbanised area with few or no mature trees, parkland, woodland or wetland would have negligible potential. Conversely, a pre-20th-century or early 20th-century building with many features suitable for use by bats close to good foraging habitat would have high potential.

The survey methodology also utilised a number of passive monitoring techniques, including an infra-red night-vision camera (XLT Bushnell Trophy CamTM: USA) to record qualitatively any evidence of bat activity inside the building during surveying periods. Further equipment included a NVMT-12x24 night vision scope (Yukon: USA), a SeeSnake 2 video endoscope, a GPS eTrex Venture HC, a hand net and a CB2 Clubman Deluxe high-power lamp with filter.

2.2. Pre-Survey Data Search

Ecological data searches supplied by Derbyshire Biological Record Centre (DBRC) were acquired to establish whether any notable protected bat or bird species have been recorded within a 2-km radius of the proposed development area. Furthermore, a desktop study of the area using online resources was undertaken independently to corroborate the current overview of the site and its importance in the landscape. A number of electronic sources were consulted, including www.magic.gov.uk, www.naturalengland.org.uk and Google Earth.

2.3. Surveyor Information

Surveyor 1

Matthew Haydock – HND, ND, MIEEM, Natural England Bat Survey Class Licence CL18, Registration Number CLS01637. Matthew is an ecologist with four years' experience of environmental consultancy work. He holds a HND in Environmental Management with distinction. Matthew is an experienced bat surveyor with competency in activity surveys, dawn

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and dusk bat roost assessments, daytime surveys for bat field signs, assessments of trees as potential bat roosts and the production of reports providing advice on best practice, mitigation and compensation works relating to bats as may be required. Matthew holds a Natural England and Countryside Council for Wales licence, since 1997, to disturb bats for the purposes of science and education or conservation and has held Development Licences to permit development works affecting bats. Matthew has been an active bat group worker with the Staffordshire Bat Group since 1997, conducting various surveys throughout Staffordshire and Derbyshire. He also works alongside the Bat Conservation Trust with various projects such as the National Bat Monitoring Project, and is now a corporate member of the Bat Conservation Trust.

Surveyor 2

Lucy Ashley has been assisting Absolute Ecology for nearly two years as a bat surveyor. She has gained competency in activity surveys, dawn and dusk bat roost assessments, daytime surveys for bat field signs, assessments of trees as potential bat roosts and the production of reports providing advice on best practice, mitigation and compensation works relating to bats as may be required.

2.4 Field Surveys

2.4.1. Habitat Survey

In 2013 a Preliminary Ecological Appraisal was conducted, which identified the following habitats: a large arable field with a species-poor gappy hedgerow, fencing boundaries and individual trees.

2.4.2. Roost Surveys

Equipment used to aid the survey included low- and high-powered torches, ladders, binoculars and an endoscope. A preliminary bat and bird roost assessment of the tree was undertaken on 2nd May 2014. Such scoping exercises can be undertaken throughout the year. Other than when assessing trees, environmental factors such as the weather do not have an impact upon the overall assessment survey results (see Table 5).

Table 5. Annual survey optimality for bats

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Inspection of hibernation roosts – semi-optimal survey period		Limited activity – sub-optimal for surveys		Summer roost emergence & re-entry surveys – optimal survey period					Limited activity – sub-optimal survey period	Inspection of hibernation roosts – semi-optimal survey period	
Internal roost surveys are possible/trees are best surveyed during winter											

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The survey focused predominantly on the tree which is to be removed under the current planning application, with additional effort being given to the rear elevations of the main residential dwelling, within the Zone of Influence. Trees on site were assessed during a less than optimal survey period, although all trees are intended to be retained within the application area. The external inspection incorporated a visual assessment with the use of binoculars, torch, endoscope and ladders in full daylight to ascertain the following:

- Potential ingress points, cracks/splits, rot holes
- Any anecdotal evidence of bats, i.e. droppings, grease marks, feeding remains
- Any evidence of birds, i.e. nest material, droppings.

The external inspection incorporated visual assessment with the use of torch, endoscope and ladders to undertake the following:

- To locate any potential roost/nest sites
- To listen for any bats and birds
- To examine floors, walls and structural elements for anecdotal evidence, i.e. droppings, urine stains, corpses and feeding remains.

2.4.3. Activity Surveys

Bat ultrasound data was gathered using a number of heterodyne (Batbox Duet and SSF Bat2) and real-time recording devices (Wildlife Acoustics Echo Meter EM3, Elekon Batlogger). Real-time recordings were subsequently analysed using Bat Explorer software. Cannon Night Shot plus, with IR LED illuminators, was used to capture and record continuous bat activity.

All surveys were carried out during the optimal weather conditions and periods for bat activity.

Table 6. Abiotic variables during survey 2: Dusk emergence			
Date: 02.05.2014			
Temp Start	12.4°C	Cloud Cover Start	80%
Temp Finish	11.1°C	Cloud Cover Finish	80%
Humidity Start	84.1%	Wind Speed Average	<4 mph
Humidity Finish	83.3%	Precipitation	Nil

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Table 7. Abiotic variables during survey 3: Dawn re-entry			
Date: 05.06.2013			
Temp Start	10.1°C	Cloud Cover Start	60%
Temp Finish	11.2°C	Cloud Cover Finish	60%
Humidity Start	69.2%	Wind Speed Average	Nil <1 mph
Humidity Finish	69.3%	Precipitation	Nil

3. Results

3.1. Pre-Survey Data Search

3.1.1. Designated Sites

There are no designated sites within 2 km of the site.

3.1.2. Protected Species.

Seven British bat species are currently given UK BAP (2007) Priority Species Status: eleven of the seventeen resident UK bat species occur in Derbyshire. Derbyshire Biological Records show two UK BAP species being recorded within 2 km of the proposed application area.

UKBAP	Common name	Species	Within 2 km
<input checked="" type="checkbox"/>	Brown Long-eared bat	<i>Plecotus auritus</i>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Barbastelle bat	<i>Barbastella barbastellus</i>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Bechstein's bat	<i>Myotis bechsteinii</i>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Noctule	<i>Nyctalus noctula</i>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Greater Horseshoe bat	<i>Rhinolophus ferrumequinum</i>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Lesser Horseshoe bat	<i>Rhinolophus hipposideros</i>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	<input checked="" type="checkbox"/>

UKBAP Bat species recorded within derbyshire.

3.2. Field Surveys

3.2.1. Habitat Description

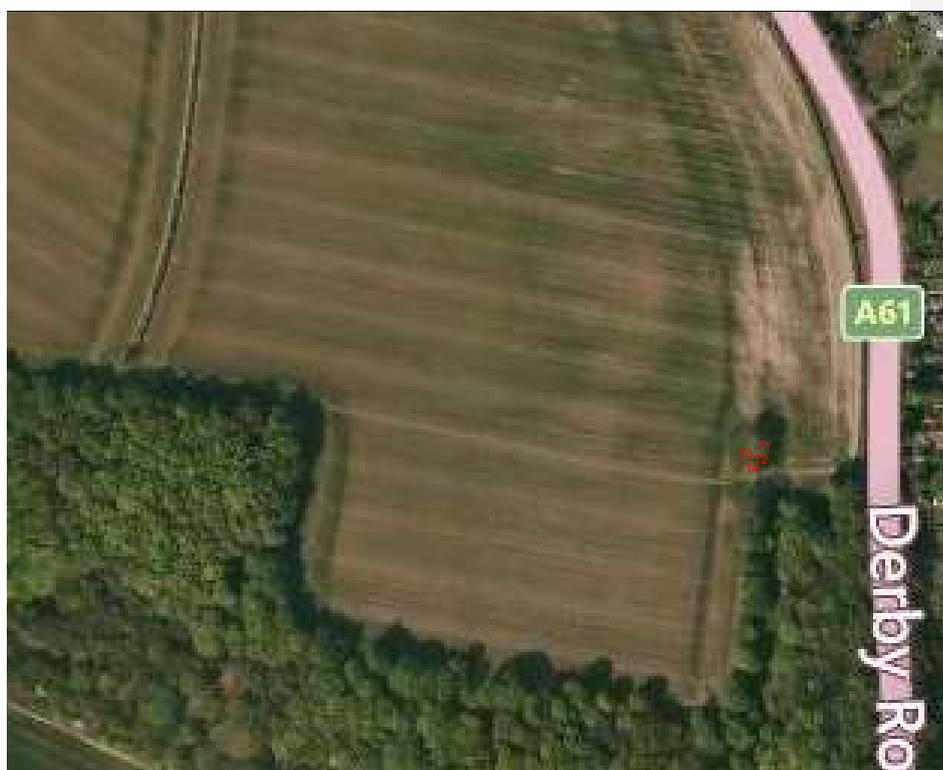
The site comprises a large arable field with species-poor gappy hedgerow and fencing boundaries. The residential estates of Wingerworth lie immediately to the north and the remaining landscape comprises mixed agricultural fields, woodland and a pond.

3.2.2. Roost Surveys

In terms of potential to support roosting bats please see table below and site plan of the tree location.

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Tree number	Species	Mature/Immature est. age	Girth (m)	Est. Height (m)	Features - yes/no	Description - type, height, aspect	Signs of Bats - droppings, smoothing, scratches, urine etc.	Inspected y/n	Category – 1*, 1, 2a, 2b, 3	Emergence Survey - yes/no
1	Oak	Mature	0.7	8	No	A single tree showing features identified such as cracks or crevices	No	Yes	1	Yes
2	Elder	Mature	0.4	8	No	No features identified such as cracks or crevices	No	Yes	3	No
3	Sycamore	Mature	0.3	8	No	No features identified such as cracks or crevices	No	Yes	3	No
4	Sycamore	Mature	0.4	8	No	No features identified such as cracks or crevices	No	Yes	3	No



Location of trees on site

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3.2.3. Activity Surveys



1st Survey: Dusk Activity Survey

The first survey (dusk emergence) was conducted on 2nd May 2014. Foraging activity by a low number of bats ($n < 21$) was recorded at the south elevation.

Only 21 ultrasound recordings were made over the entire evening, primarily from the same two Common Pipistrelle bats that were visually recorded foraging on the site. Peak activity occurred between 21:20 and 21:45: three species of bat were recorded. Calls were assigned to Common Pipistrelle, Noctule and Brown Long-eared bat. All were seen at any given time and recorded actively foraging in the garden before dispersing off the site into the wider landscape. Noctule bat was recorded commuting overhead during the survey. No bats were seen emerging from the oak tree.

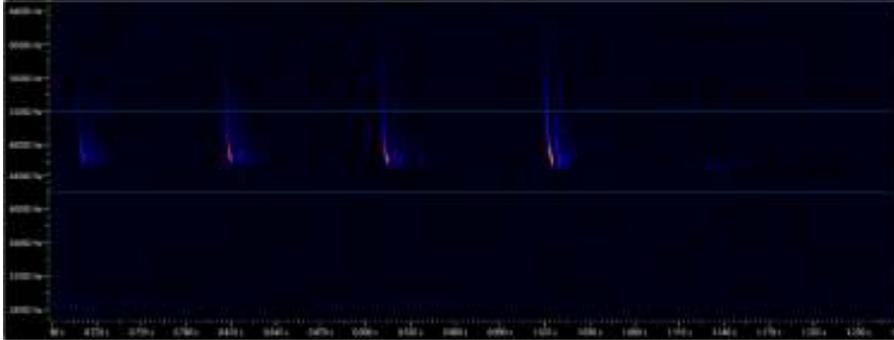


Figure 1. Recording of Common Pipistrelle commuting on site – peak frequency 46.3 KHz

2nd Survey: Dawn Activity Survey

The second survey (dawn re-entry) was conducted on 5th June 2014. The survey was conducted half an hour before sunrise until full daylight. The survey conditions were optimal for bat activity. Three calls were recorded, peaking at 48.6 KHz. Sound analysis confirmed that the calls were made by Common Pipistrelle bats.

Peak activity occurred between 03.39 and 04.10. No bats were seen entering the oak tree.

4. Assessment

4.1. Constraints on Survey Information

All surveys were conducted within the optimal period of bat activity and no constraints were identified.

4.2. Constraints on Equipment Used

During the assessment and activity survey no equipment constraints were encountered.

4.3. Potential Impacts of Development

4.3.1. Designated Sites

There are no designated sites adjacent to the site or within a 2-km radius, and therefore no impacts would occur.

4.3.2. Roosts

The mature oak tree provided potential to support roosting bats due to the depth of crevices identified. However, during the activity survey no bats were seen to emerge or re-enter the tree during the peak activity season, and it is concluded that no impact would occur.

4.3.3. Foraging and Commuting Habitat

Please refer to the Bat Transect Report for the site of June 2014

4.4. Legislation and Policy Guidance

Unlike many smaller mammals, bats have low fecundity with a long and complex life cycle, which is played out over a large spatial landscape. Bats show a strong fidelity to different types of roosts throughout their annual cycle i.e. hibernacula, maternity, bachelor, satellite roosts and feeding perches. Linear features within the landscape such as hedgerows and tree lines are often used by bats for commuting, predator avoidance and foraging. Bats are highly social animals and loss of a single habitat alone can have a serious impact on populations. The status of many bat populations is tentative, being based on relatively few records and are highly susceptible to habitat loss and fragmentation. As such bats are given protected consideration within the following legislation and policy guidelines:

Policy guidelines

PAS 2010	The published 'PAS 2010' 'Planning to halt the loss of biodiversity' which is the government's new policy aimed at all authorities and developers involved in the planning process in the UK to halt biodiversity decline by 2010 and deliver net biodiversity gains as part of the green infrastructure provisions.
National Planning Policy Framework, Section 11:	The recently published framework in 2012, replaces the previous Planning Policy Statement 9. Section 11: Conserving and enhancing the natural environment, reaffirms the Government's commitment to maintaining green belt protections and preventing urban sprawl, retains the protection of designated sites and preserves wildlife, aims to improve the quality of the natural environment, and halt declines in species and habitats, protects and enhances biodiversity and promotes wildlife corridors.
Article 10 of the EC Habitats Directive:	The published Article requires government to develop features such as 'stepping stones' on the landscape, such as clusters of ponds, tracts of rough grassland or scrubland and vegetated railway line embankments.
Wildlife and Countryside Act 1981:	All species of bat are fully protected under the Wildlife and Countryside Act 1981, the European Conservation (Natural Habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000. This legislation makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a bat while it is occupying a structure or place which it uses for that purpose.
Conservation of Habitats and Species Regulations (2010)	The Conservation of Habitats and Species Regulations 2010 consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994, in respect of England and Wales. It is an offence to possess, sell or offer, or transport for sale any European species of bat or any part derived from such a species. These Regulations also remove the 'incidental result defence'. In other words, it is no longer a defence to show that the killing, capture or disturbance of a species covered by the Regulations or the destruction or damage of their breeding sites or resting places was the incidental and unavoidable result of a lawful activity. Natural England can grant European Protected Species (EPS) licences in respect of development to permit activities that would otherwise be unlawful.
Natural Environment and Rural Communities Act (2006)	Under Section 40 of the Natural Environment and Rural Communities Act (2006), public bodies, including Local and Regional Planning Authorities, have a duty to 'have regard' to the conservation of biodiversity in England when carrying out their normal functions, which includes consideration of planning applications. In compliance with Section 41 of the Act, the Secretary of State has published a list of species considered to be of principal importance for conserving biodiversity in England. This is known as The England Biodiversity List, all of which make up the UK BAP Priority Species. Regional Planning Bodies and Local Planning Authorities will use it to identify the species that should be afforded priority to maintain, restore and enhance species and habitats.
Bird legislation	Most resident nesting birds are protected under the Wildlife and Countryside Act 1981, which protects birds, nests, eggs and nestling's. Some rarer species, such as barn owls, are afforded extra protection.

Please note: If bat species are present at the site, the purpose of this report will only summarize the potential requirements for a bat mitigation package or project. A separate mitigation report or project will include the necessary compensation measures to maintain the conservation status of a European Protected Species.

5. Recommendations and Mitigation

5.1. Further Surveys

As sufficient information has been recorded and analysed it would not be required to carry out further surveys, though if planning is delayed by two years, further surveys would be required.

5.2. Mitigation Measures

5.2.1. Proposed Mitigation for Roost Sites

As no roosts were identified no further action would be required in terms of an EPS Licence.

Bat Boxes

The development could incorporate a total of eight bat boxes: where possible, developments should include small access points suitable for bat access and/or wall-mounted bat boxes ('1FQ' style bat boxes), positioned onto the new housing. Further information about providing access for roosting bats can be found on the Bat Conservation Trust website at http://www.bats.org.uk/pages/new_build.html. It is recommended that bat boxes, such as the Schwegler 1WQ, are installed onto a selection of housing in a south-facing position, with six Schwegler 2F boxes attached to existing mature trees within adjacent woodland to the west (see bat box location plan). The installed bat boxes will be sited at least 7–8 metres above the ground.

- Eight Schwegler 2F bat boxes will be installed for regular and mixed use within the adjacent woodland.
- Boxes will not be placed in an overly exposed position on the new builds. Crucially, the box entrances should face south-west to south-east.
- Checks for droppings or observations at dusk during the summer for emerging bats will indicate if they are being used.
- If a box is not used after two years, it will be relocated to an alternative situation.
- Once discovered, a bat roost is protected by law and must not be disturbed.
- It is envisaged that bat box monitoring should be undertaken by the site owners who will require a licensed bat worker to inspect the boxes in order to conform with current guidance and legislation.

Commented [AS2]: There doesn't appear to be a bat box location plan in the text – is it a separate document?

Table 1: Bat boxes to be incorporated into the new road development

Bat boxes	Type and Quantity	Location
	8 x 2F Bat Box	This can be hung from a tree branch near the trunk, or fixed to a trunk. The 2F is the most popular general purpose box, and is particularly attractive to the smaller British bats. It has a simple design with a narrow entrance slit on the front.

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5.2.2. Proposed Mitigation for Foraging and Commuting Habitat

5.3. Mitigation Licences

No Natural England licence is considered necessary, as no roosting bats were identified during the surveys.

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6. Summary

The site comprised a single mature oak tree which showed potential roosting opportunities for bats.

During the surveys, low activity levels for Common Pipistrelle and Noctule bats were recorded on site, but no evidence that the oak tree is used by roosting bats was found. Therefore, it is concluded that the tree can be removed without the need for a European Protected Species (EPS) licence.

Recommendations to minimise disturbance to bats which feed on the site and possible ways of enhancing the site for bats and birds have been suggested.

7. References

- Biodiversity Action Reporting System (2010). *Biodiversity Action in Staffordshire*. BARS. [Online]. Available at: http://ukbap-reporting.org.uk/plans/map_county.asp?X=%7BD7D87E4F%2D9520%2D48D6%2D93E0%2DD2698BA05B9D%7D&CTRY=%7B7C884413%2D1AC7%2D48B6%2DADCD%2D23CBA1482CD6%7D&WES= [accessed on 20th October 2010].
- BSBI (2008). *BSBI 2007 List*. [Online]. Available at: <http://www.bsbi.org.uk/html/database.html> [accessed on 20th October 2010].
- Conservation of Habitats and Species Regulations 2010*. SI 2010/490. HMSO: London.
- Conservation (Natural Habitats, &c.) (Amendment) Regulations 2007*. SI 2007/1843. HMSO: London.
- Countryside and Rights of Way Act 2000* (c.37). HMSO: London.
- Hundt L (2012). *Bat Surveys: Good Practice Guidelines*, 2nd edition. Bat Conservation Trust: London.
- Office of the Deputy Prime Minister (2005). *Planning Policy Statement 9: Biodiversity and Geological Conservation*. The Stationery Office: Norwich.
- UK Biodiversity Action Plan (2007). *UK List of Priority Species*. Joint Nature Conservation Committee. [Online]. Available at: <http://www.ukbap.org.uk/NewPriorityList.aspx> [accessed on 20th October 2010].
- Wildlife and Countryside Act 1981 (as amended) (c.69). HMSO: London.

Appendix 1 Photographs



Plate 1. Oak tree with splits providing potential roosting opportunity for individual bats rather than a maternity roost.



Plate 2. Oak tree with deeper crevice which also has potential support for roosting bats.