

Activity Survey for Bats

Location: Well Street Mill, Leek Staffordshire

Matthew James Haydock

June 2018

Notice to Readers

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Executive Summary

Absolute Ecology was commissioned to undertake a bat activity survey for the bat roost potential at a site known as Well Street Mill, Leek, Staffordshire, Grid reference: SJ 98912 56426. 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), BS 42020, and the Bat Conservation Trust Best Practice 3rd Edition 2016.

It is proposed that the single building will be re/developed into residential property.

One dusk survey was conducted 24/05/2018 and a dawn re-entry 08/06/2016. Minor bat activity was recorded throughout each survey period, although no bats were seen entering or exiting the building. Confirmed species of bat were recorded foraging and commuting across the site: 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.

No nesting birds were observed; however, it would be required that if works are conducted between March and September (Nesting season can vary year by year) a pre-site inspection would be required with supervision of building demolition.

The proposed works do not involve loss of any bat foraging habitat; therefore, no habitat mitigation measures are required, although the planting of wildlife-attracting plants around the site would serve to enhance the site for bats in future.

No bat species were visually recorded within the buildings at any time.

As no bat roosts were identified during the surveys, it will not be necessary to apply for an EPS licence and no further survey actions are considered necessary. However, where surveys have demonstrated a likely absence of bats in the building, it should be noted that it is possible that bats could begin using the building at any time, and any work should be undertaken with care and vigilance for bats. Should bats be found during development, then all works must cease and a qualified bat ecologist should be consulted. A number of recommendations to enhance the development area have been made in order to compensate for any loss of habitat and to benefit both bats and birds.

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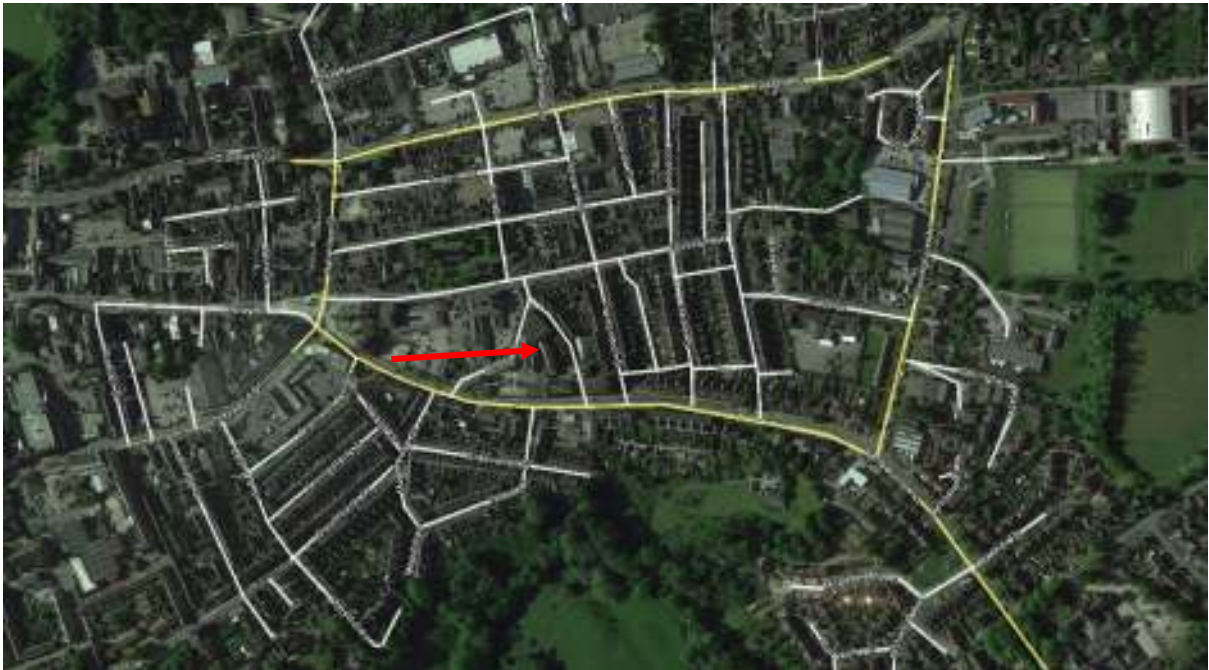
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1. Introduction

1.1. Site Description

Absolute Ecology was commissioned to undertake a Bat activity survey for the bat roost potential at a site known as Well Street Mill, Leek, Staffordshire, Grid reference: SJ 98912 56426.

Figure 1: Showing the Mill location indicated by red arrow



Proposed Works

It is intended that the client will redevelop the building to create, apartments.

1.2. 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)¹, the emerging BS 42020 and the Bat conservation Trust Best Practice 2016.

1.3. Aims of the Survey

- 1.3.1 The aims 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:

Bats
<ul style="list-style-type: none"> • 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.

Table 1. Aims of survey in relation to bats.

- 1.3.2 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. Subsequently, legal opinion 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):

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 utilize 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 can not be assessed within the context of this report).</i>

Table 2. Bat roost status definitions

Birds
<ul style="list-style-type: none"> • Establish if birds are using the site.
<ul style="list-style-type: none"> • Locate nest sites, if present.
<ul style="list-style-type: none"> • 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 3. Aims of survey in relation to birds.

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

Table 4. Aims of survey in relation to Barn Owl.

- 1.3.2 Assessment also considers potential effects on valued ecological receptors (VERs) and zones of influence (Zoi) during pre and post development, both onsite and off- site. 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 reduce the degree of impact that may occur should development commence.
- 1.3.3 Should bats be present onsite, then a European Protected Species (EPS) development license 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 (Bat Conservation Trust, 3rd edition 2016). The buildings were inspected externally and internally, where access was available, for signs of bat activity. These typically include bat presence, droppings, feeding remains, urine stains and grease marks. Notes were made on the following in accordance with the guidelines published by the BCT (3rd edition 2016) for the surveying of buildings and built structures:

- Type and age of building
- Type of construction
- Presence of potential roost features, e.g. hanging tiles, raised tiles, roof voids
- Information or evidence of work having been undertaken that could affect use of the structure by bats
- Amount and location of evidence of bats such as presence of live or dead bats, droppings, grease marks, urine stains, characteristic smell of bats.

The activity survey was performed in accordance with the guidelines published by the BCT (3rd edition 2016) 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); 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 (BCT, 3rd edition 2016):

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.

Survey methodology also utilized a number of passive monitoring techniques including an infra-red night-vision camera (XLT Bushnell Trophy CamTM: USA) to qualitatively record 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

3. Ecological data searches were conducted 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.

3.1. Surveyor Information

Surveyor 1

Matthew Haydock – HND, ND, MIEEM, Natural England Bat Survey Registration Number: 2015-12430-CLS-CLS. 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 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 assisted with various ecological consultancy within Staffordshire & Derbyshire 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.

Surveyor 3

Helen Staton: has assisted with various ecological consultancy work within Staffordshire & Derbyshire as a bat surveyor and holds a Natural England Class 1 Bat Licence. 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.

Surveyor 4

Laura Kershaw BSc (Hons) an experienced ecologist who is an Associate member of the Chartered Institute of Ecology & Environmental Management (CIEEM). Helen holds a Natural England Class 1 Bat Licence and Class.

2.4 Field Surveys

2.4.1. Habitat Survey

A Preliminary Roost Assessment (PRA) was undertaken 10h January 2018

2.4.2. Roost Surveys

Equipment used to aid the survey included low and high-powered torches, ladders, binoculars and an endoscope.

A scoping survey was undertaken on and an update on 10/01/2018 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											

The survey focused predominantly on the buildings which is to be re/developed with additional effort being given to the rear elevations of the main residential dwelling, within the zone of influence. The external inspection incorporated visual assessment with the use of binoculars, torch, endoscope and ladders in full daylight to ascertain the following:

- Potential ingress points cracks, raised roof tiles
- 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 ascertain the following:

- To locate 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

2. 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 & Bat Corder EcooB). Real-time recordings were subsequently analysed using Bat Explorer software. Cannon night shot plus, with IR LED Illuminators to capture and record continues bat activity.
3. All surveys were carried out during optimal weather conditions and period for bat activity.

Table 6. Abiotic variables during survey 1: Dusk Emergence

Date: 24.05.2018

Temp Start	16.4 °C	Cloud Cover Start	40%
Temp Finish	13.4 °C	Cloud Cover Finish	40%
Humidity Start	64.1%	Wind Speed Average	<1 mph
Humidity Finish	72.1%	Precipitation	Nil

Table 7. Abiotic variables during survey 2: Dawn Re-entry

Date: 03.06.2018

Temp Start	12.4 °C	Cloud Cover Start	50%
Temp Finish	13.2 °C	Cloud Cover Finish	50%
Humidity Start	92.3%	Wind Speed Average	Nil <1 mph
Humidity Finish	91.4%	Precipitation	Nil

3. Results

3.1.1. Designated Sites

Lady Dale is approximately 250 metres to the south which is a mixed grassland, woodland and wetland habitat with Billington Wood 667 metres to the south of the mill

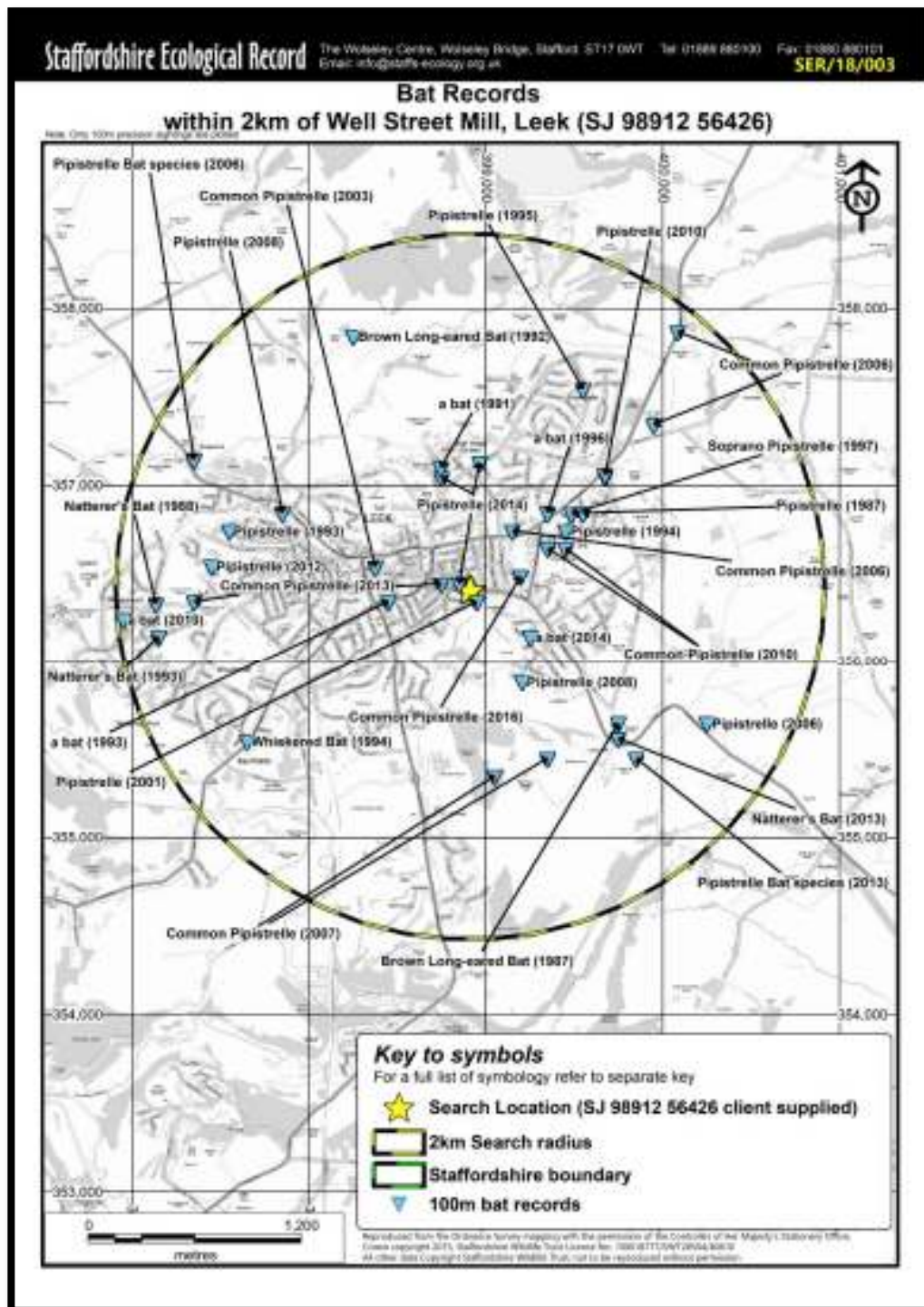
3.1.2. Protected Species.

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

UKBAP	Common name	Species	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"/>

Activity Survey for Bats

UKBAP	Common name	Species	2 Km
<input checked="" type="checkbox"/>	Natterer's bat	<i>Myotis Nattereri</i>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Daubenton's bat	<i>Myotis daubentonii</i>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Whiskered/ brandt bat	<i>Myotis mystacinus/brandtii</i>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	<input checked="" type="checkbox"/>



3.2. Field Surveys

3.2.1. Habitat Description

The mill is a large three storeys with ground floor, which brick structured building with pitched and clad in tiles with a hard-standing car park. The mill is situated close to the town of leek. The area around the mill consists of residential and commercial properties

3.2.2. Roost Surveys

Building	Description	Evidence found or potential for bats
B1 External	<p>The redundant mill is a rectangle building at the front of mill Street with three floors and ground floor. The mill is constructed with brick, with some sections of sandstone, which was found to be in good condition with little or no cracks or crevices suitable for bats. The roofing of the building consists of a hipped roof with two gable ends which are aligned north to south with approx. measurement of 23 meters' length and 8 meters' width. The roofing tiles were possible investigated by ground observation using binoculars to identify raised or dislodged tiles, it was found that roofing showed a number of raised tiles which could possibly provide access points for bats to enter the interior of the building.</p> <p>All the door and window were tightly fitted preventing any potential access.</p>	<p>No evidence of bats found, although access for inspection is limited due to the structure of the roof. The building is assessed to have moderate potential for roosting bats.</p> <p>No Change from previous survey</p>
B1 Internal	<p>The internal inspection identified a single roof void which has been petitioned of creating two roof void spaces both were found to be dark and clean with a approx. 2 meters from the floor to the roof and the length of each void 11.5-meter approx. which provided potential pre-flight emergence opportunities, the voids did show some potential crevices for bats these were inspected were possible,</p> <p>The roofing was of rafters and purling with the roof voids being internal roofing felt which prevented a full inspection, the roof ridges were moderately covered in cobwebs and dust. The inspection also looked at the floors and wall for bat activity no evidence was found though due to some repair work disturbance has occurred which may have removed evidence of bats.</p>	<p>No evidence of bats found, although access for inspection is limited due to the structure of the roof e.g. roofing felt. The building is assessed to have moderate potential for roosting bats.</p> <p>No Change from previous survey</p>

3.2.3. Activity Surveys

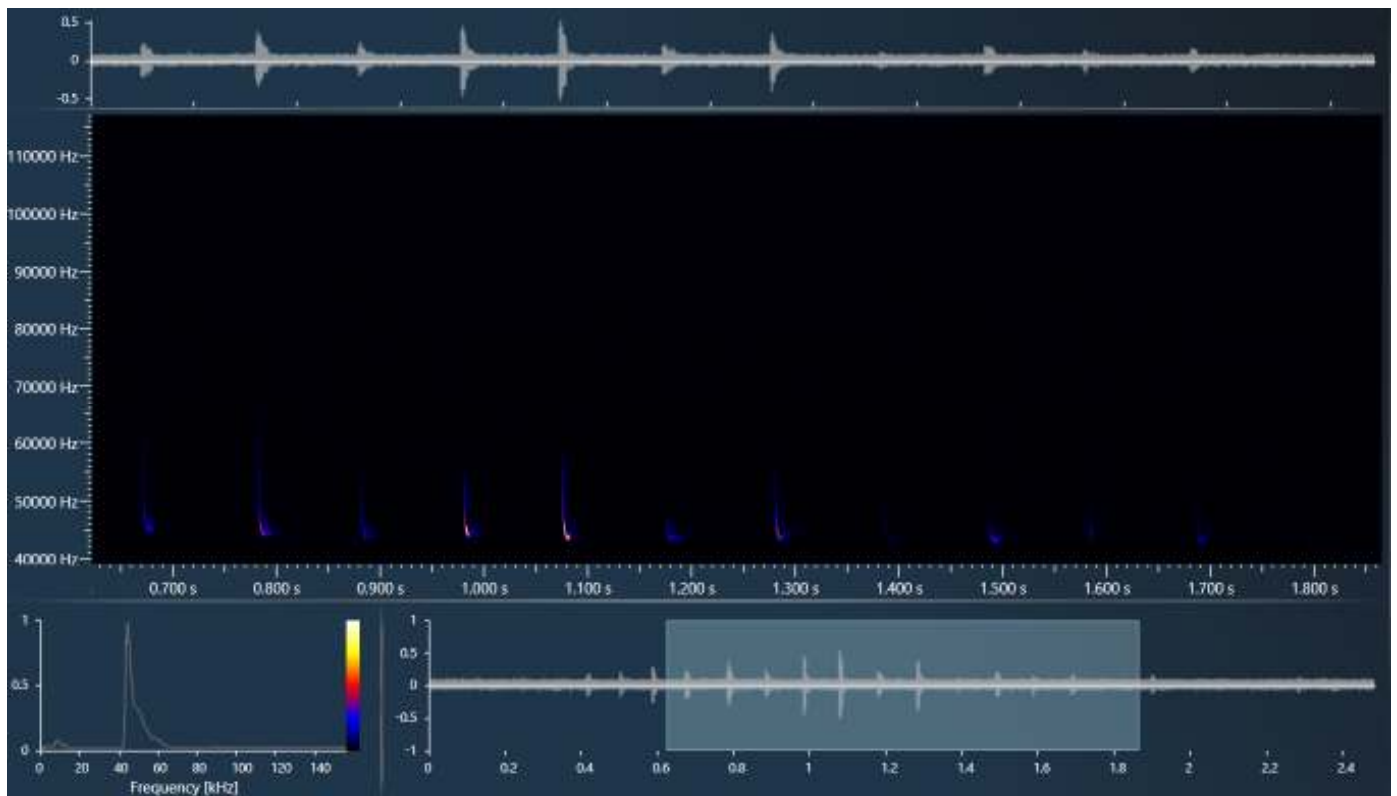
1st Survey: 1st dusk activity survey – 24/05/2018 Sunset: 21:11

Time	Species (common name)	Species (<i>Scientific name</i>)	Observed behaviour
22:00	Common pipistrelle	Pipistrellus pipistrellus	commuting
22:18	Common pipistrelle	Pipistrellus pipistrellus	Commuting
22:34	Common pipistrelle	Pipistrellus pipistrellus	Commuting

2nd Survey: 1st Dawn re-entry survey – 08/06/2018 Sunrise: 04:48

Time	Species (common name)	Species (<i>Scientific name</i>)	Observed behaviour
03:11	common pipistrelle	Pipistrellus pipistrellus	Commuting
03:29	Common pipistrelle	Pipistrellus pipistrellus	Commuting
03:46	Common pipistrelle	Pipistrellus pipistrellus	Commuting
04:09	Common pipistrelle	Pipistrellus pipistrellus	Commuting
04:21	Common pipistrelle	Pipistrellus pipistrellus	Commuting
04:29	Common pipistrelle	Pipistrellus pipistrellus	Commuting

Figure 1. Sonogram analysis showing commuting Common pipistrelle recorded on 24/05/2018 with a peak frequency 44.1 KHz



4. Assessment

4.1. Constraints on Survey Information

All surveys were carried out during May & June 2018. This period is considered as being an optimal survey period, albeit depreciating, in order to evaluate the presence or absence of bats.

4.2. Constraints on Equipment Used

No constraints were present with regards to the equipment used during the scoping effort (i.e. bat detectors, endoscope, ladders and high powered binoculars).

4.3. Potential Impacts of Development

4.3.1. Designated Sites

The development is within 2Km of designated sites. However, given the size of the development and the physical distances between them, and considering the geographical features that also separate those, including open farmland, built development and roads, it is very unlikely that the proposed development would affect any of these areas.

4.3.2. Roosts

No evidence of bats was found during the daytime inspection. No bats were detected emerging from any of the buildings at any time during the activity surveys. Therefore, it is considered that all effort has been made to establish that no negative impact will occur to roosting bats.

4.3.3. Foraging and Commuting Habitat

The site provides some food for bats little activity was evident during the activity surveys. Although the buildings will be replaced, flowering and tree features will be created which will maintain foraging for bats.

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 Governments 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

It is considered that a reasonable amount of survey effort has been applied, thus no further surveys are required. However, further surveys would be considered necessary if no redevelopment has commenced within two years of this report.

5.2. Mitigation Measures



5.2.1. Proposed Site Enhancements

Bat Boxes

The development will incorporate a total of two 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 1FR, are installed onto a selection of housing or on the existing building in a south facing position, with one Schwegler 2F boxes attached to existing buildings, the installed bat boxes will be sited at least 7–8 metres above the ground.

- Two Schwegler 1FR bat boxes will be installed to provide summer and hibernation opportunities, and Schwegler 2F bat boxes will be installed for regular and mixed use.
- 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 to current guidance and legislation.

Table 1: Bat box to be incorporated into the new development

Bat boxes	Type and Quantity	Location
	2 x 1FR Schwegler Bat Tube	The 1 FR Bat Roost The 1FR Bat Tube is designed to be installed on the external walls of buildings, either flush or beneath a rendered surface.
	1 x 2F Bat Box	This can be hung from a tree branch near the trunk, or fixed to a trunk or attached to existing building. 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.

Birds

Where possible, habitats suitable for nesting and foraging birds should be retained, enhanced or created within any new development. The tree habitats and buildings within the site are likely to be the most valuable to nesting birds, and should be retained as far as possible.



Nesting birds were identified within the buildings bird breeding season March to September inclusive (seasonal variations to be considered), If re/development is planned during these months, a prior check for nesting birds should be undertaken by an ecologist. Any active nests that are found must not be moved until fledglings have dispersed.

It would be of conservation benefit to install a variety of nesting boxes for different bird species within the site in future (buildings and trees where suitable) to enhance the site for nesting birds and encourage bird diversity. Information on bird nesting boxes can be found at <http://www.rspb.org.uk/advice/helpingbirds/nestboxes/>. Enhancing existing hedgerows or planting new hedgerows and shrubs within any new development can benefit birds if a wide range of native species are used.

Similar to bats, bird habitats, including nesting and roosting sites, are diminishing or have disappeared altogether due to changes in the landscape, environment and building techniques. Consequently, the provision of boxes for birds will provide supplementary nesting sites that are relatively safe from predators, close to feeding areas, and give essential winter protection for roosting birds. A range of designs are available to suit most species, including garden species, birds of prey and colonial nesting species, for both trees and buildings. Colonial nesting species, such as House Sparrows, which are currently facing a dramatic decline, suffer from a lack of suitable buildings in which to nest. Moulded woodcrete boxes can be used to form a network of contiguous boxes favoured by the species. Additionally, nesting baskets can be used to encourage birds of prey to areas where they have not previously nested. Health risks from breeding birds generally relate to Feral Pigeons and Starlings, and require direct contact with nesting material, dried faeces etc., within confined spaces. Consequently, the public health risk relating to encouraging nesting birds on the new housing development is considered to be negligible.

- The wren nest boxes and the 10 Schwegler swallow nest boxes will be positioned on the existing building or within any new trees planted.
- All the bird boxes will be positioned at least 4 metres high, or more.

Table 1: Bird boxes to be incorporated into the new development

Bird Boxes	Type and Quantity	Information
	1 x 1ZA Wren Nest box	The 1ZA will attract wrens, These should be incorporated onto any new tree planted or on the existing building within the proposed development or if possible to new development
	2 x No. 10 Schwegler Swallow Nest	The No. 10 Schwegler Swallow Nest will attract swallow species. These should be incorporated onto retained buildings within the proposed development.

Any lighting design around the new development should be considered at an early stage. Light spill can affect the foraging and commuting strategy of many species and should be avoided onto nearby trees and hedges/shrubs, and should not exceed 200 lumens (150 watts). Any security lighting should be on a timer setting and faced down to prevent spillage onto nearby habitats. The height of any lighting columns around the development should not exceed eight metres to reduce further any ecological impact of light pollution. Low-pressure sodium lamps (SOX) fitted with hoods are recommended to direct light below the horizontal plane to minimize upward light spill.

5.3. Mitigation Licences

No Natural England license would be required and no roosting bats were evident.

6. Summary

During the surveys, low levels of common pipistrelle activity was recorded on site, but no evidence that any of the buildings are used by roosting bats was found. Therefore, it is having been concluded that the buildings can be re/developed without the need for a European Protected Species (EPS) licence.

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

7. References

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Appendix 1 Annual cycle of a temperate bat

January



February



March



Jan: Bats spend most of the winter hibernating, a state of inactivity characterised by lower body temperature, slower breathing, and lower metabolic rate. **Feb:** Bats are still hibernating. They have little fat left to live off of now. They may leave the roost on warmer nights to find food and a drink of water. **March:** Bats may begin to emerge and signs of limited activity can be seen. There are small numbers feeding as it gets warmer. In bad weather, they may become torpid.

April



May



June



April: Bats have mainly come out of hibernation and are hungry and active, feeding on most nights. They may be moving between several roost sites. They may become torpid (cool and inactive) again when cold. **May:** Bats are fully active and feeding. Females start forming maternity colonies and looking for suitable nursery sites, such as buildings or trees. Males will roost on their own or in small groups. **June:** Female bats usually give birth to a single pup, which they feed on their milk. Young bats are very small (less than an inch) with thin, slightly grey fur. Adult bats will catch thousands of insects each in a night.

July



August



September



July: Mothers continue to suckle young. Some young are growing fast and almost full-size; others are still very small. At around three weeks old, young bats are sometimes found on the ground as they learn to fly. **Aug:** At six weeks old, the young bats begin to catch insects for themselves and no longer need their mothers' milk. The summer maternity colonies begin to disperse and bats may move to mating roosts. **Sept:** Mating season begins, with males of most species using special mating calls to attract females, which can include purrs, clicks, and buzzing. Bats are also concentrating on building up fat stores for the coming months.

Activity Survey for Bats

October



November



December



Oct: More mating is taking place, and building up fat reserves is becoming crucial to survive the winter season. Bats are seeking suitable hibernation sites, and beginning periods of torpor. **Nov:** Periods of torpor are lasting longer. Some begin hibernation, to save energy over the colder months, when insects are harder to find. They are using stored fat as fuel. **Dec:** Bats are hibernating. They may roost on their own or in small groups, often in cool, quiet places like disused buildings, old trees or caves, where they hopefully won't be disturbed. (Source: Bat Conservation Trust).