Activity Survey for Bats

Location: The Ashes Farm, Easing Lane, Thorncliffe, ST13 8UR

Author: Sarah Higginson

June 2019

Notice to Readers

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Executive Summary

Absolute Ecology was commissioned to undertake a bat survey for the bat roost potential at a site known as the Ashes Farm, Easing Lane, Thorncliffe, ST13 8UR. 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.

The site comprises a large detached, redundant barn which is solid stone in construction with a pitched tiled roof. It has been proposed the barn will be converted into residential accommodation (proposal plan shown in section 8.0). A building inspection was undertaken 20th November 2018 followed by three activity surveys as summarised below;

- Survey 1 – dusk emergence 01/02019
- Survey 2 – dawn re-entry 20/05/2019
- Survey 3 – dusk emergence 05/06/2019

The results of the three bat activity surveys, which were conducted during the optimum survey period, has confirmed the presence of bats within the barn. The surveys concluded that a common pipistrelle (*Pipistrellus pipistrellus*) summer day roost is present within the roof area of the barn (a peak count of three bats were recorded emerging from the roof) and a brown long-eared (*Plecotus auritus*) summer day roost is present (a peak count of two bats were recorded emerging). It is thought that the bats are roosting externally beneath the tiles, within the roof area and along the eaves. It is considered that all effort has been made to establish what negative impacts will occur to roosting bats, and these have been identified in section 4.

Application for an EPS licence from Natural England shall be required for the proposed renovation of the building, which should provide a comprehensive mitigation strategy for the loss of summer day roost for a low number of common pipistrelle bats and a low number of brown long-eared bats. Some consideration of appropriate measures within such a mitigation strategy are provided in section 5.

Swallows (*Hirundo rustica*) were recorded nesting onsite and measures will need to be in place to avoid disturbing this species during the nesting season.

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1. Introduction

Site Description

Absolute Ecology was commissioned to undertake a Preliminary Roost Assessment for the bat roost potential at a site known as The Ashes Farm, Leek, Staffordshire. Ordinance reference: SK0143057667.

Figure 1: Site location indicated in red.



Proposed Works

Proposals have been made to convert the redundant barn into residential accommodation.

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 du 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.

Aims of the Survey

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
• Probability of bats and their roost sites being present at the proposed redevelopment site.
• To assess the roost status.
• To assess suitable food resources and habitat requirements.
• If a roost site is found, to provide an impact assessment.

Table 1. Aims of survey in relation to bats.

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	*used by breeding bats, where pups are born and raised to independence (Anecdotal evidence may support this prospect despite sub-optimal survey period).*
Hibernation Site	*where bats may be found during the winter. (This is assessed within the context of this report).*
Daytime Summer Roost	*used by males and/or non-breeding females (Seasonal limitations prevent robust analysis of this).*
Night Roost	*where bats rest between feeding bouts during the night but are rarely present during the day.*
Feeding Roost	*where bats temporarily utilize feeding perches and stations to eat an item of prey.*
Transitional (or Swarming) Site	*where bats may be present during the spring or autumn (This can not be assessed within the context of this report).*

Table 2. Bat roost status definitions

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 3. Aims of survey in relation to birds.

Barn Owl (*Tyto alba)*
• 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.

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.

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

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.

Pre-Survey Data Search

Ecological data searches were conducted to establish whether any notable, protected bat or bird species have been recorded within a 1-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.

Surveyor Information

Surveyor 1

Helen Staton – BSc (Hons) ACIEEM, Natural England Bat Survey Class Licence Registration Number: 2015-14490-CLS-CLS. Helen has been working for ecological consultancies for over nine years and has held a Level 1 bat licence for over six years. Helen 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.

Surveyor 2

Sarah Higginson – QCIEEM, Sarah is a Qualifying Member of the Chartered Institute of Ecology & Environmental Management. Sarah has been working as an Assistant Ecologist for Absolute Ecology since January 2019 and has been carrying out bat surveys since August 2018. Sarah is competent with 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.

Field Surveys

Habitat Survey

A Preliminary Roost Assessment appraisal was conducted on the 20/11/2018 by Helen Staton and Sarah Higginson.

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 20/11/2018 and an updated on each survey visit. 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 ingression 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.

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 & 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.

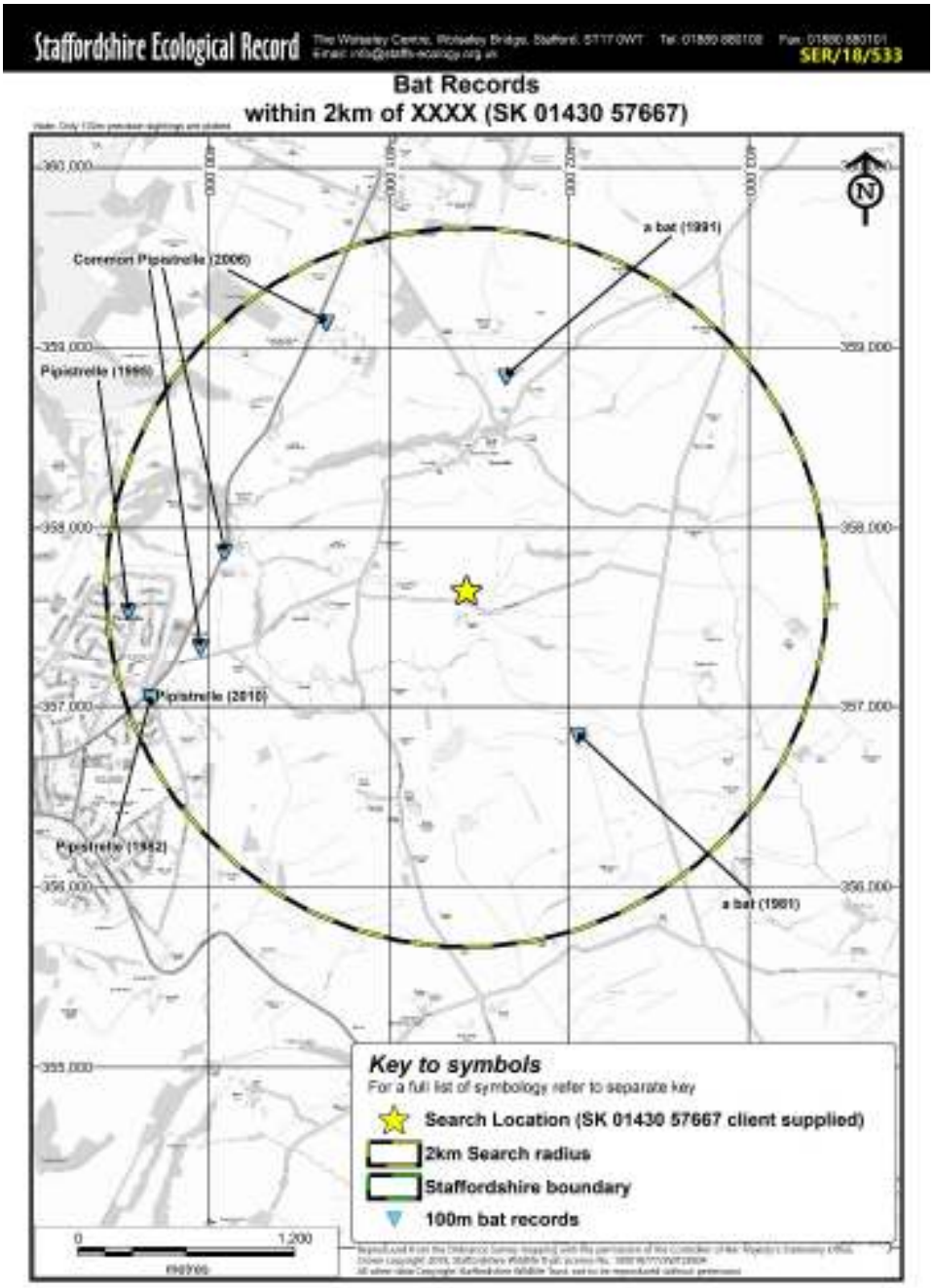
All surveys were carried out during optimal weather conditions and period for bat activity.

Table 6. Abiotic variables during survey 1: Dusk Emergence			
Date: 01/05/2019 **Sunset: 20:36**			
Temp Start	9 °C	**Cloud Cover Start**	100%
Temp Finish	7 °C	**Cloud Cover Finish**	100%
Wind Speed Average	Nil <10 mph	**Precipitation**	Nil
Table 7: Abiotic variables during survey 2: Dawn re-entry			
Date: 20/05/2019 **Sunrise: 05:04**			
Temp Start	7 °C	**Cloud Cover Start**	90%
Temp Finish	8 °C	**Cloud Cover Finish**	90%
Wind Speed Average	<10 mph	**Precipitation**	Nil
Table 8. Abiotic variables during survey 3: Dusk Emergence			
Date: 005/06/2019 **Sunset: 21:28**			
Temp Start	12 °C	**Cloud Cover Start**	20%
Temp Finish	11 °C	**Cloud Cover Finish**	20%
Wind Speed Average	<5 mph	**Precipitation**	Nil

3. Results

Pre-Survey Data Search

Staffordshire Ecological Record (SER) was commissioned to undertake a desk study within 2km of the site to search for bat records.



Field Surveys

Habitat Description

The Ashes Farm is located within a predominantly rural location, immediately surrounded by agricultural farmland. Within the wider area are habitats of high value to bats including water courses, tree lines, and hedgerows. Using aerial imagery, the site is reasonably well connected to areas of high value habitat. The site and surrounding area are considered to be of high value for foraging/ roosting/ commuting bats, offering a variety of habitats which would attract a range of bat species to the area.

Roost Survey

External Inspection

Building 1

The surveyed barn is single storey with a mezzanine level. The walls are solid stone in construction and the roof is tiled and pitched. The building has four-part double-glazed windows and two wooden stable style doors, all intact. There are two open ventilation slits on the eastern elevation which would allow bat and bird access into the building.

The stonework is in good general condition with no cracks/ crevices noted. Some superficial damage to the stone is present where the stone faces have worn. The building was reroofed 18 years ago and is part lined with plaster resulting in minimal gaps. It is a pitched tile roof with gable ends, and is intact with no obvious gaps. All ridge tiles are present.

Building 2

B2 is an open plan modern barn, with single skin corrugated walls and roof. The southern elevation is open with no walls/doorway allowing ease of access for foraging bats and birds.

Internal Inspection

Building 1

Internally the main part of the building is open plan, with a mezzanine level, and one small room located on the northern end. A new floor was put in 18 years ago a long with the roof and is clean and free of debris. Where the roof joins gable ends, gaps are present. Above the window lintels

crevices are present. The room on the northern end is open with no doorway present. The roof above this section is capped off with wooden boards and is inaccessible for inspection. A roof void is present.

Three clusters of bat droppings were recorded internally within the main section, one cluster on the ground floor towards the southern gable end and two clustered on the mezzanine level.

Also found together with the droppings were several feeding remnants, including butterfly wings.

No bird droppings were found and no nests.

Building 2

Internally the building is open plan with the exception of a small platform accessed via a ladder. The roof and walls are not lined and no suitable bat roosting features were recorded internally.

No evidence of nesting birds was recorded internally.

Activity Surveys

Figure 3: Surveyor locations (two surveyors per survey) indicated by the yellow stars



Table 9: Dusk activity survey – 01/05/2019 – Sunset 22:06

Time	Species (common name)	Species (*Scientific name*)	Observed behaviour
20:50	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging around car park
20:52	Noctule	*Nyctalus noctula*	Foraging and commuting over site
20:56	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging around tree & green shed on north east of site
20:58	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging around the site x2
20:59	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging in and out of neighbouring barn to the north west
21:00	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging around barn
21:01	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging and commuting between barns to the west of the site
21:02	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging and commuting from east to west around barn
21:04	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging in and out of neighbouring barn to the north west

21:05	Common pipistrelle	*Pipistrellus pipistrellus*	**Emergence** from roof
21:06	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging around barn from north to south
21:06	Common pipistrelle	*Pipistrellus pipistrellus*	**Emergence** from north east of roof
21:08	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging up and down north elevation of the barn
21:11	Common pipistrelle	*Pipistrellus pipistrellus*	Social Calling x2 around barn
21:12	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging x3 around barn & courtyard
21:15	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging back and forth around north elevation
21:23	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging back and forth around north elevation
21:29	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging around barn from north to south
21:30	Noctule	*Nyctalus noctula*	Heard not seen
21:35	Common Pipistrelle	*Pipistrellus pipistrellus*	Commuting overhead
21:45	Myotis	*Myotis*	Heard not seen
21:45	Noctule	*Nyctalus noctula*	Heard not seen
21:47	Myotis	*Myotis*	Heard not seen
21:54	Noctule	*Nyctalus noctula*	Heard not seen
21:54	Common Pipistrelle	*Pipistrellus pipistrellus*	Heard not seen
Survey ended at 22:36			

Internal

Throughout the survey, regular checks were made internally.

21:05 - internal check was made and no bats were recorded.

21:20 – internal check was made and no bats were recorded.

21:40 – internal check was made and no bats were recorded.

Survey 1 summary

- Common pipistrelle – peak count of two bats recorded emerging.
- Noctule – a population of this species are present in the area.
- Myotis – a population of this species are present in the area.

Table 10: Dawn re-entry – 20/05/2019 – sunrise 05:04

Time	Species (common name)	Species (*Scientific name*)	Observed behaviour
03:43	Myotis	*Myotis*	Commuting flew overhead past barn
04:24	Common pipistrelle	*Pipistrellus pipistrellus*	Commuting flew past building towards farm house
04:24	Common pipistrelle	*Pipistrellus pipistrellus*	Heard not seen

Internal

Throughout the survey regular checks were made internally and no bats were seen.

Survey 2 summary

- Common pipistrelle – a population of this species are using the site to commute.
- Myotis – a population of this species are using the site to commute.

Table 11: Dusk emergence – 05/06/2019 – sunset 21:28

Time	Species (common name)	Species (*Scientific name*)	Observed behaviour
21:48	Common pipistrelle	*Pipistrellus pipistrellus*	Flew onto the site from a easterly direction
21:52	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging around the garden and farmhouse to the south of the barn
21:54	Common pipistrelle	*Pipistrellus pipistrellus*	X 2 emergence from the barn to the south of the surveyed barn
21:54	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging around the eastern side of the barn
21:59	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging
22:00	Common pipistrelle	*Pipistrellus pipistrellus*	**Emerged** from the open doorway on the east elevation
22:00	Common pipistrelle	*Pipistrellus pipistrellus*	Foraging around the west side before flying on a westerly direction
22:03	Common pipistrelle	*Pipistrellus pipistrellus*	**Emerged** from eaves area on west elevation
22:03	Common pipistrelle	*Pipistrellus pipistrellus*	**Emerged** from southern gable end
22:04	Common pipistrelle	*Pipistrellus pipstrellus*	Foraging

22:05	Brown long eared	*Plecotus auritus*	**Emerged** from north gable end
22:07	Common pipistrelle	*Pipistrellus pipistrellus*	2 x bats foraging to the west of the surveyed barn
22:11	Common pipistrelle	*Pipistrellus pipistrellus*	2 x bats foraging east side of the barn
22:20	Common pipistrelle	*Pipistrellus pipistrellus*	Flew past north side of barn
22:25	Common pipistrelle	*Pipistrellus pipistrellus*	X 2 bats foraging within the metal barn to the west of the building
22:26	Brown long eared	*Plecotus auritus*	**Emerged** form the ridge of the roof on the eastern side
22:27	Common pipistrelle	*Pipistrellus pipstrellus*	X 1 bat flew into the open doorway on the eastern elevation then flew out approx. 22:28
22:30	Common pipistrelle	*Pipistrellus pipistrellus*	X 2 bats foraging in the metal barn to the west
22:33	Brown long eared	*Plecotus auritus*	Flew past north gable end from an easterly direction

Internal

Throughout the survey, regular checks were made internally at 22:20, 22:40 and 22:55. No bats were recorded inside the barn.

Survey 3 summary

- Common pipistrelle - a peak count of three recorded emerging
- Brown long-eared – a peak count of two recorded emerging

Summary

Two species of bats are roosting within the building – a peak count of three common pipistrelle were recorded emerging form the building and a peak count of two brown long-eared bats. Low numbers indicate the presence of two summer day roosts (maternity roosts for this species tend to be much larger). Photographic plates shown below.

Bats were also recorded roosting within the barn located to the south west of the surveyed barn (see figure 2) with a count of two confirmed emergences of common pipistrelle bats. However, this number may be an underestimate as the barn was not the focus of the surveys. Additionally, fresh droppings, indicative in shape in size of brown long-eared/*Myotis* species, were recorded.

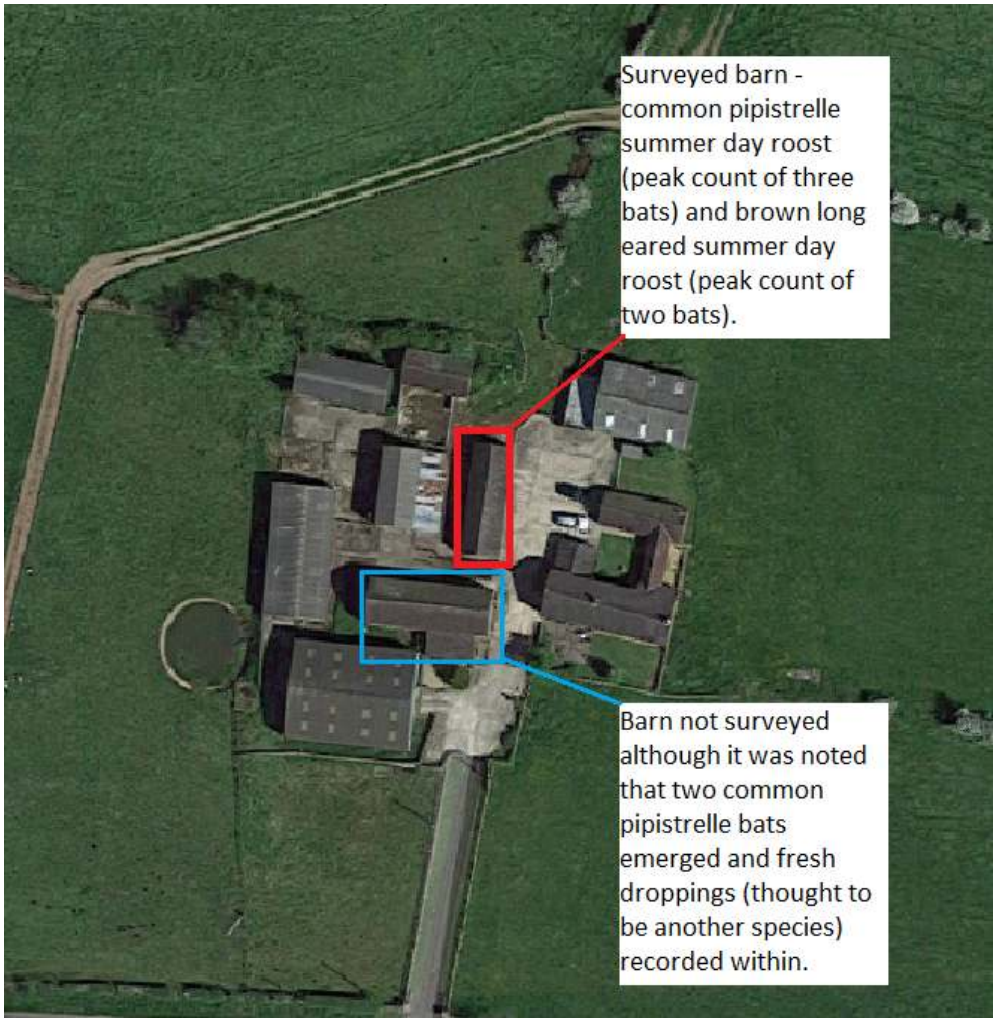
Photograph 1 – View of the south and west elevations showing roost locations



Photograph 2: Photograph of the north and east elevations showing approximate roost locations



Figure 2: Aerial view of the buildings showing roosts



4. Assessment

Constraints on Survey Information

All activity surveys were carried out during May/early June 2018 during the optimal survey period, therefore there were no survey constraints.

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).

Potential Impacts of Development

Roosts

Brown long-eared and common pipistrelle bats were recorded emerging and re-entering during the activity surveys. It is considered that all effort has been made to establish what negative impacts will occur to roosting bats, and these have been identified below.

Short-term impacts: Disturbance Annexe [High Negative]
Without mitigation including sensitive timing of works, the short-term impact to bats would be the potential for individuals / group(s) of bats to be disturbed, killed or injured during construction work throughout the year.

Long-term impacts: Roost modification [High Negative]
Potential long term loss of a summer roosts for a brown long-eared (peak count of two) and common pipistrelle bats (peak count of three).

Long-term impacts: Roost loss [High Negative]
The long-term impact of loss of roosts upon bat populations is poorly understood and difficult to study. There is variation of impact depending on species of bat, whereby some species are more sensitive to disturbance than other species. Thus the impact of roost loss for the local populations of common pipistrelle and brown long-eared bats is deemed more severe should the development continue without mitigation. Both species are considered common and widespread, although have declined in Britain due to changing land use, including the conversion of barns and other buildings, which have resulted in the loss of suitable feeding and roosting habitats.

Long-term impacts: Fragmentation and isolation annexe [Low potential]

No impacts on adjacent habitats. All trees/hedgerows onsite are to be retained, maintaining linear features used by commuting and foraging bats.

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

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.

Mitigation Measures

Application for an EPS licence from Natural England shall be required, which should provide a comprehensive mitigation strategy for potential loss of a common pipistrelle summer day roost (peak count of three bats) and a brown long-eared summer day roost (peak count of two bats).

The bats are utilising various features across the building including around the eaves/under tiles and across gable ends. These features also seem to be used sporadically by the bats, possibly in conjunction with features on neighbouring barns/buildings.

Proposals and licensable works

The whole of the building will be converted into residential accommodation. Therefore, a Natural England European Protected Species Licence will be required which will pertain to the loss of two summer day roosts for; brown long –eared and common pipistrelle bats.

Mitigation

A mitigation strategy will need to be devised to maintain the population status of both species onsite and likely mitigation will include the following:

Time avoidance measures – any re-roofing works will need to be carried out under the supervision of a qualified bat ecologist, when bats are least likely to be present (October – March). Should any bats be inadvertently discovered during this, or any other works then all work must cease immediately until further consultation is made. If necessary, the use of standard capture and exclusion methods may be deployed to prevent harm to any bats found, which may then be relocated to a suitable safe area should natural dispersal not occur. Thus the EPS licence application should detail a suitable receptor site, in the event that bats may be discovered.

Replacement of roosts – to mitigate for the loss of two summer day roosts for low numbers of brown long-eared and common pipistrelle bats, bat boxes and roosting features should be incorporated into the development.

As brown long-eared bats were recorded roosting beneath tiles (along the ridge and on the gable end), replacement features should be incorporated into the roof. Three raised or vented ridge tiles should be installed across the roof to act as replacement roosting features, suitable for both brown long-eared and common pipistrelle. The roof should then be lined with a bitumen type felt, not a modern white breathable (which creates an entanglement risk for bats).

To replace the common pipistrelle roosts, gaps along the roof verges should be left and/or modified ridge tiles/bat access tiles.

Bat boxes should be either installed externally or built into the walls. Examples of suitable boxes include;

- Schwegler 1FQ which can be fitted externally to the building,
- Schwegler 1FR Bat tube which can be built into the walls
- Habibat boxes which can be built into the walls,
- Schwegler 1FS large colony box which can be fitted to a tree or external walls,
- Schwegler 2FN which can be fitted to trees.

It is recommended that to proportionately mitigate and to compensate that at least two boxes are installed onto the building, and two within trees/buildings (on or near the site). Exact locations/bat box type are dependent on the proposal plans which have yet to be designed. Examples of the aforementioned bat boxes can be seen at https://www.nhbs.com/equipment/bat-boxes?hPP=30&idx=titles&p=0&dFR%5Bpublisher.name%5D%5B0%5D=Schwegler&hFR%5Bsubjects_equipment.lvl1%5D%5B0%5D=Nest%20Boxes%2C%20Habitats%20and%20Feeders%20%3E%20Bat%20Boxes&is_v=1

Site enhancements - It is encouraged that any landscaping relating to the proposed development should encompass native tree and shrub species to encourage foraging potential for species. No plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 should be planted during any landscaping within this development. For further details of Schedule 9 plants visit the Defra website: www.defra.gov.uk/wildlife-pets/non-native.
To further enhance the value of the site for roosting bats, bat boxes should be installed around the site, externally on buildings and trees where appropriate.

Lighting design - Any lighting design installed during pre and post 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). Where possible, any security lighting should be on a timer setting and

faced down to prevent spillage onto nearby habitats. Height of any lighting columns around the development should not exceed eight metres to further reduce any ecological impact of light pollution. Low-pressure sodium lamps (SOX) fitted with hoods are recommended to direct l light below the horizontal plane to minimize upward light spill.

Nesting birds

Swallows nests were recorded nesting within the building. This species is known to return to the same nest sites and the conversion of the building into a residential dwelling will result in the loss of nesting opportunities.

Re-roofing and internal renovation works should be carried out avoiding the nesting season which runs March – August. As the building is to be completely converted into residential accommodation, no suitable artificial nests locations will be present.

6. Summary

Evidence of bats was found during the daytime inspection. Common pipistrelle and brown long-eared bats were detected emerging during the activity surveys. Therefore, it is considered that all effort has been made to establish what negative impacts will occur to roosting bats, and these have been identified in section 4.

Application for an EPS licence from Natural England shall be required for any works affecting the building, which should provide a comprehensive mitigation strategy for the loss of a summer roosts for brown long-eared and common pipistrelle bats. Some consideration of appropriate measures within such a mitigation strategy are provided in section 5.

Bats were also recorded roosting in an adjacent building (see Figure 2). Under current proposals this building (and other buildings onsite) will remain unaffected. However, should any future works be required i.e. re-roofing, maintenance to the walls/roof, conversion works etc. ecological advice should be sought.

7. References

Bat Conservation Trust (2016). *Bat Surveys – Good Practice Guidelines*. Bat Conservation Trust: London.

BSBI (2008). *BSBI 2007 List.* [Online]. Available at: http://www.bsbi.org.uk/html/database.html [accessed on 20th October 2010].

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The Conservation (Natural Habitats, &c.) (Amendment) Regulations 2007. SI 2007/1843, London: HMSO.

Countryside and Rights of Way Act 2000 (c.37). London: HMSO.

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].

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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



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).**