

Activity Survey for Bats

Holly House Farm, Cheddleton, Staffordshire
Moorlands,

Matthew James Haydock

August 2023

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 Holly House Farm, Cheddleton, Staffordshire Moorlands, ST13 7BH. Grid reference: SJ 96861 50991. 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 barn will be converted and extended.

The survey area is situated in a predominantly semirural location, within the rural area of Cheddleton, Staffordshire Moorlands. The application site is immediately bounded by agricultural land and farm properties. The site itself is dominated by hard standing.

One dusk survey was conducted on 17/07/2023 and a dawn re-entry on 01/08/2023. Minor bat activity was recorded throughout each survey period, although no bats were seen entering or exiting the building. confirmed bat species have been 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 common-site sites from the surrounding areas to forage. Pipistrelle bats are the most common species in the UK, with a widespread distribution, and are most commonly found in England and Wales.

The proposed works do not involve the loss of any bat-foraging habitat; therefore, no habitat mitigation measures are required, although planting wildlife-attracting plants around the site would 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 a Natural England Protected Species 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.

Nesting birds were observed in this case swallow nest, 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 the supervision of building redevelopment.

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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 Holly House Farm, Cheddleton, Staffordshire Moorlands, ST13 7BH. Grid reference: SJ 96861 5099.

Figure 1: Aerial view showing the site location of the building indicated by a green pin.

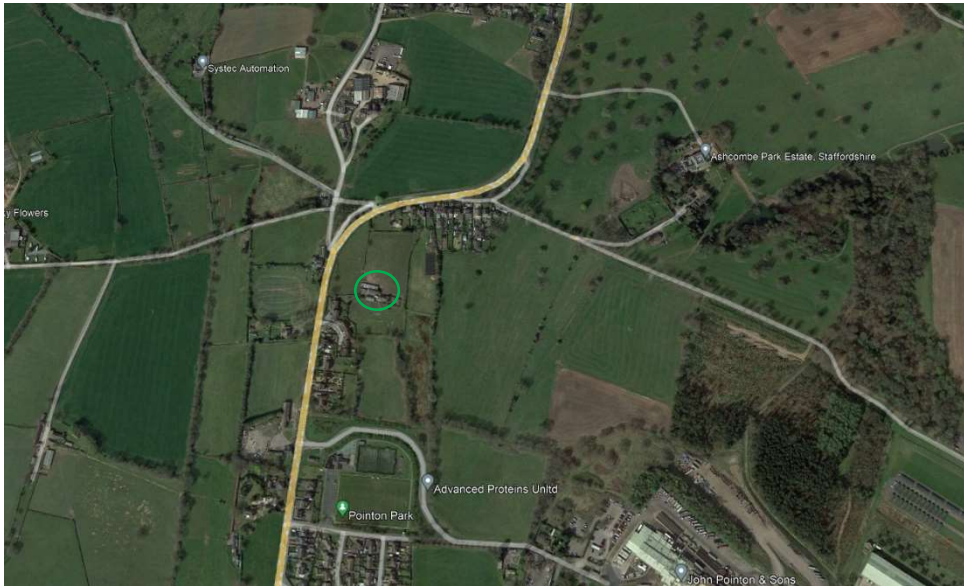


Figure 2: Aerial view showing site location by green pin



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 2016.

1.2. 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
• 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.

- 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	
•	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 (<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 (Zol) 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 Protected Species (PS) development license issued by Natural England (NE) may be required prior to any work taking place. If required, further presence/absence surveys should be undertaken and a mitigation strategy be implemented with Natural England and the Local Planning Authority.

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 Infrared camcorder such as the Canon XA11 to qualitatively record any evidence of bat activity external area of 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.

Roost habitat assessment criteria (BCT, 2016).

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions^a and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation^b). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.^c	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^a and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions ^a and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

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

Carrie Allcock: 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 practices, mitigation and compensation works relating to bats as may be required.

Infrared Camera

During the bat activity survey an Infrared camcorder such as the Canon XA11 was positioned on site where natural light was less prevalent to cover a wide angle of the building. The IR camera was recorded from the point of the start of the bat activity survey until the survey was completed, during the survey the camera was in view of the surveyor. All filming is analysed after each survey and all data is provided into the bat activity report.

IR Camera location throughout the activity surveys.



Surveyor location throughout the activity surveys.



2.4 Field Surveys

2.4.1. Habitat Survey

A Preliminary Roost Assessment (PRA) was undertaken on the 17th of July 2023. The survey area is situated in a predominantly rural location, within Cheddleton, Staffordshire. The application site is immediately bounded by agricultural land with a wider landscape including further agricultural land, woodlands and water courses. The site itself is dominated by hard standing.

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, and an update was on 17/07/2023 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 on 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 real-time recording devices (Wildlife Acoustics Echo Meter EM3, Elekon Batlogger Real-time recordings were subsequently analysed using Bat Explorer software. Canon XA11, with IR LED Illuminators to capture and record continuous bat activity.
3. All surveys were carried out during optimal weather conditions and periods for bat activity.

Table 6. Abiotic variables during survey 1: Dusk Emergence

Date: 17.07.2023

Temp Start	16.4 °C	Cloud Cover Start	70%
Temp Finish	13.4 °C	Cloud Cover Finish	70%
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: 01.08.2023

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

No designated or non-designated sites are located immediately adjacent or on-site.

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. A single Brown long-eared bat was recorded near the site in 2015 but no further details were provided by the Ecological Record Centre a further desktop study via the planning portal also provided no further information. The current surveys of 2022 found no bats roosting within the building which concluded that the building is not currently used by bats. All survey conducted followed the BCT Guidelines 3rd Edition.

UKBAP	Common name	Species	2 Km
☒	Brown long-eared bat	<i>Plecotus auritus</i>	☒
☒	Barbastelle bat	<i>Barbastella barbastellus</i>	☒
☒	Bechstein's bat	<i>Myotis bechsteinii</i>	☒
☒	Noctule	<i>Nyctalus noctula</i>	☒
☒	Greater horseshoe bat	<i>Rhinolophus ferrumequinum</i>	☒
☒	Lesser horseshoe bat	<i>Rhinolophus hipposideros</i>	☒
☒	Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	☒

UKBAP	Common name	Species	2 Km
☒	Natterer's bat	<i>Myotis Nattereri</i>	☒
☒	Daubenton's bat	<i>Myotis daubentonii</i>	☒
☒	Whiskered/ brandt bat	<i>Myotis mystacinus/brandtii</i>	☒
☒	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	☒

3.1. Field Surveys

3.2.1. Habitat Description

The survey area is situated in a rural location, on the south side of Cheadle Town. The immediate landscape consists of commercial and residential properties. The site is bounded by residential housing, and hedgerows. The habitat within the site boundary comprises amenity grassland, bare ground, hedgerow and building.

The wider landscape is dominated by farmland with trees, water courses and woodland areas.

3.2.2. Roost/Bird Surveys 17/07/2023

Building reference	External inspection	Roost assessment category
B1	Single detached barn with a section of a tinned roof shelter. Pitched roof with a few lifted tiles with a section of raised ridge tile. The roofing measured 10 meters in length and 4 meters in width with gable ends facing east to west. The brickwork is in good condition showing no cracks or crevices. All windows and the door are intact, and most of the windows are double-glazed. To the rear of the building is a tinned roof open-ended storage area which is used by farm animals and tractors the inspection found this to be of negligible potential for bats given the lack of suitable roosting areas. The internal inspection of the building found it to be open planned, which is currently used as a stable and storeroom, some areas of the brickwork did show some crevices that could be utilized by bats; however, these were inspected with the use of an endoscope to ascertain any bat evidence. The roofing area was partially felted and partially clear of any constraints showing the visible roofing tiles. The inspection investigated the floors and walls for signs of bat activity such as droppings the inspection did not find any such evidence. One active swallow nest was present during the inspection.	Moderate due to external roosting features in the roof where tiles are lifted or missing.



Plate 1 Showing barn that is to be converted into a residential property.



Plate 2 Shows the rear section of the barn with potential bat access points.



Plate 3 Shows the rear section with a tinned roof extension.

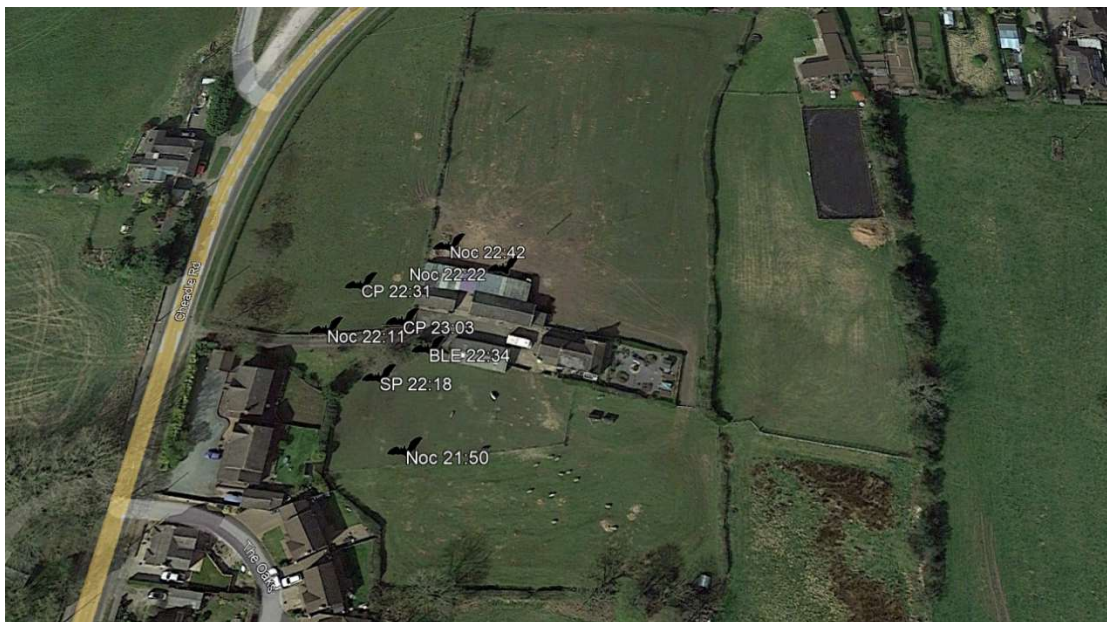


Plate 3 Shows internal area of the building that was inspected for bat and bird activity.

3.2.3. Activity Surveys

1st Survey: 1st dusk activity survey – 17/07/2023 Sunset: 21:22

Time	Species (common name)	Species (<i>Scientific name</i>)	Observed behaviour
21:50	Noctule	<i>Nyctalus noctula</i>	Commuting
22:11	Noctule	<i>Nyctalus noctula</i>	Foraging
22:18	soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Commuting
21:22	Noctule	<i>Nyctalus noctula</i>	Commuting
22:31	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Commuting in adjacent field 40 minutes Aprox
22:34	Brown Long-eared	<i>Plecotus auritus</i>	Commuting
22:42	Noctule	<i>Nyctalus noctula</i>	Commuting
23:03	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Commuting

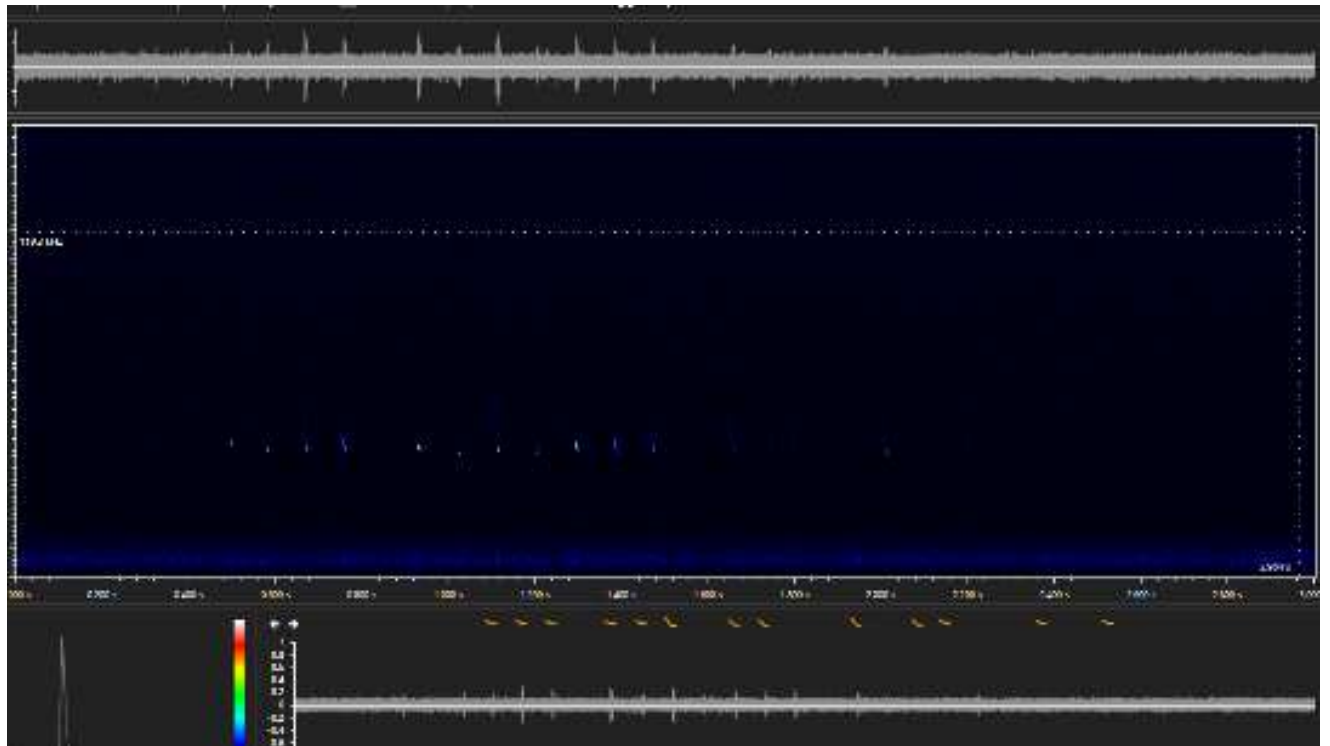


2nd Survey: 1st Dawn re-entry survey – 01/08/2022 Sunrise: 05:27

Time	Species (common name)	Species (<i>Scientific name</i>)	Observed behaviour
03:30	common pipistrelle	Pipistrellus pipistrellus	Commuting
03:37	Common pipistrelle	Pipistrellus pipistrellus	Commuting
04:08	Noctule	Nyctalus noctula	Commuting
04:19	Common pipistrelle	Pipistrellus pipistrellus	Commuting
04:32	Noctule	Nyctalus noctula	Commuting
04:40	Noctule	Nyctalus noctula	Commuting



Figure 1. Sonogram analysis showing commuting Common pipistrelle commuting recorded on 17/07/2023 with a peak frequency 43.8 KHz



4. Assessment

4.1. Constraints on Survey Information

All surveys were carried out during July/August 2023. 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 Application site will not have any impact on Designated or non-designated sites.

4.3.2. Roosts

No evidence of bats was found during the daytime inspection. No bats were detected emerging or re-entering 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.

4.3.2. Nesting Birds

Two active swallow nests were identified therefore protection measures need to be put in place with the accompanying compensation of nesting sites.

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 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.
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

Lighting

- 1.1 Particular consideration should be given to potential light spill that can affect the foraging and commuting strategy of many species and should be avoided onto nearby habitats, in particular the adjacent woodland areas.
- 1.2 Where possible, any onsite 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 meters to further reduce any ecological impact of light pollution.
- 1.3 The Institution of Lighting Professionals and the Bat Conservation Trust produced a guidance note on 'Bats and Artificial Lighting in the UK' (2018) which can be viewed at [file:///C:/Users/User/Downloads/ilp-guidance-note-8-bats-and-artificial-lighting-oct-18-compressed%20\(1\).pdf](file:///C:/Users/User/Downloads/ilp-guidance-note-8-bats-and-artificial-lighting-oct-18-compressed%20(1).pdf) The guidance note is intended to raise awareness of the impacts of artificial lighting on bats, with mitigation suggestions included for various scenarios.

Scaffolding

- 1.4 As a further precautionary measure, it is recommended that no plastic sheeting or mesh be used on any scaffolding erection during the development, to prevent potential snaring and entanglement of volant bats.

Biodiversity enhancement

- 1.5 It is recommended that bat boxes are incorporated into the development, in order to provide additional roosting opportunities. Bat boxes can be fitted externally or integrated into the walls (see Table 6 for examples).
- 1.6 Further information of providing access for roosting bats can be found on: Bat Conservation Trust website: www.bats.org.uk/pages/new_build.html. The Nest Box Company: www.nestbox.co.uk/Improved-Treble-Crevise-Bat-Box.html NHBS: www.nhbs.com/schwegler_bat_boxes_eqcat_422.html

Table 6: Example bat features (Photos taken from www.nhbs.com)

Bat Feature Type			
Bat boxes installed external on walls	Beaumaris Woodstone Bat Box 	Schwegler 1FQ 	Vincent Pro Bat Box 
Bat boxes integrated into brick walls (i.e. new builds)	Habibat Bat Box 001 	Ibstock Enclosed bat Box 	Vivara Pro Build-In 
Bat boxes for trees	Schwegler 2F Bat Box 	Improved cavity Bat Box 	Schwegler 2FN 
Roof features	Bat Access Tile Set 	Habibat Bat Access Slate 	Vented/modified ridge tile 

Landscaping

- 1.7 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
- 1.8 Ideas to encourage bats include;
- Planting of night-scented flowers
 - Build a pond
 - Make a compost heap or log pile
 - Avoid use of pesticides
 - Letting your garden grow a little wild
 - Creating linear features i.e. hedgerow or tree line
 - Reduce or remove artificial light
 - Keep cats indoors at night
- 1.9 See Bat Conservation Trust Encouraging Bats leaflet for further information; https://cdn.bats.org.uk/pdf/Resources/Encouraging_Bats.pdf?mtime=20181101151549&focal=none

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 building 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.

The above paragraph covers any vegetation clearance such as trees, scrub and hedgerows as nests could be present and active.

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 swifts, 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 Vivara Pro Wood Stone Swift Nest boxes will be positioned on the existing/new buildings building and the wren nests will be positioned on existing or new trees.
- 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
	2 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

	4 x 10 Schwegler Swallow Nest	The swallow Nest boxes will attract swallow species. These should be incorporated into the proposed development proposed.
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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 as no roosting bats were evident.

6. Summary

During the surveys, low levels of common pipistrelle, Noctule, and Brown Long-eared activity was recorded on site, but no evidence that any of the buildings are used by roosting bats. Therefore, it is having been concluded that the buildings can be re/developed without the need for a Natural England Protected Species (PS) licence.

Two Swallow Nests were observed during the surveys; Therefore, the appropriate mitigation measures will be required.

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.

Plans

Proposed Re/development (No Plans To Date)

7 References

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

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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].

Wildlife and Countryside Act 1981 (and amendments) (c.69). London: HMSO.

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).