

Activity Survey for Bats

**Location: Willowshaw Farm,
Cloudside,
Congleton,
CW12 3QQ**

Author: Sarah Higginson

September 2020

Notice to Readers

This report has been prepared by Absolute Ecology LLP with all reasonable skill, care and diligence, within the terms of the contract with the client. The actions of the surveyor on site and during the production of the report were undertaken in accordance with the Code of Professional Conduct for the chartered Institute of Ecology and Environmental Management (www.cieem.org.uk).

No part of this document may be reproduced without the prior written approval of Absolute Ecology LLP.

Executive Summary

Absolute Ecology was commissioned to undertake a bat survey for the bat roost potential at a site known as Willowshaw Farm, Cloudside, Congleton, CW12 3QQ. Grid ref: SJ91082 62205. 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 survey area is situated in a predominantly rural location, on the eastern outskirts of Congleton which is approximately 3 miles away. The site is immediately bounded by agricultural land to the north, south and east, and woodland to the west, with the wider landscape consisting of woodlands, agricultural land, residential properties and watercourses. The site itself consists of a farmhouse with farm buildings, set upon hardstanding and surrounded by managed semi-improved grassland. The site is predominantly bounded by dry-stone walling. The farmhouse and one of the farm buildings featured an enclosed loft space.

It has been proposed that the farmhouse and farm buildings will be converted into residential dwellings, and new properties will be constructed onsite. As the site is still within the design phase, there is currently no proposal plan.

A building inspection was undertaken 20th August 2020 followed by three activity surveys as summarised below;

- Survey 1 – dusk emergence 22/08/2020
- Survey 2 – dusk emergence 31/08/2020
- Survey 3 – dawn re-entry 16/09/2020

Bats were confirmed to be roosting within B1, B2 and B3 comprising of two species of bat;

- B1 – peak count of two common pipistrelle (*Pipistrellus pipistrellus*) and three brown long-eared (*Plecotus auritus*).
- B2/B3 – peak count of two common pipistrelle and two brown long-eared.

The results of the three bat activity surveys, which were conducted during the optimum survey period, has confirmed the presence of bats within B1, B2 and B3. 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 the proposed renovation of B1, B2 and B3 into residential use, which should provide a comprehensive mitigation strategy for potential loss summer day roosts for; common pipistrelle and brown long-eared bats. Some consideration of appropriate measures within such a mitigation strategy are provided in section 5.

Any works which may result in the disturbance/obstruction/destruction of a bat roost is a criminal offence.

Swallow (*Hirundo rustica*) were recorded nesting onsite in B2 and measures will need to be in place to avoid disturbing this species during the nesting season.

Contents

Notice to Readers

Executive Summary

Contents

- 1 Introduction**
- 2 Methods**
- 3 Results**
- 4 Assessment**
- 5 Recommendations and Mitigation**
- 6 Summary**
- 7 References**
- 8 Figures**

1. Introduction

Site Description

The survey area is situated in a predominantly rural location, on the eastern outskirts of Congleton which is approximately 3 miles away. The site is immediately bounded by agricultural land to the north, south and east, and woodland to the west, with the wider landscape consisting of woodlands, agricultural land, residential properties and watercourses. The site itself consists of a farmhouse with farm buildings, set upon hardstanding and surrounded by managed semi-improved grassland. The site is predominantly bounded by dry-stone walling. The farmhouse and one of the farm buildings featured an enclosed loft space.

Figure 1: Site location



Proposed Works

Proposals have been made to convert the farmhouse and farm buildings into residential dwellings and construct a number of new properties onsite. As the site is still within the design phase, there is currently no proposal plan.

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.

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	<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.

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 Cam™: 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.

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 ten years and has held a Level 1 bat licence for 8 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, Natural England Bat Survey Class License Registration Number: 2020-47903-CLS-CLS. 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.

Surveyor 3

Ian Millward - Natural England Bat Survey class Licence Number: 2018-37758-CLS-CLS. Ian has been working for ecological consultancies for over three years and 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 roost.

Field Surveys

Habitat Survey

A Preliminary Roost Assessment appraisal was conducted on 20th August 2020 and has been incorporated as part of this report.

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 20/08/2020 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 B1, B2, B3, B4, B5, B6 and B7. 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.

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 Touch & Elekon Batlogger). 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: 20/08/2020			
Sunset: 20:24			
Temp Start	17.9°C	Cloud Cover Start	50%
Temp Finish	17°C	Cloud Cover Finish	70%
Wind Speed Average	10mph	Precipitation	1%
Table 7: Abiotic variables during survey 2: Dusk Emergence			
Date: 31/08/2020			
Sunset: 19:58			
Temp Start	13 °C	Cloud Cover Start	50%
Temp Finish	11 °C	Cloud Cover Finish	50%
Wind Speed Average	4 mph	Precipitation	3%
Table 8. Abiotic variables during survey 3: Dawn Re-entry			
Date: 16/09/2020			
Sunrise: 06:42			
Temp Start	13 °C	Cloud Cover Start	50%
Temp Finish	14°C	Cloud Cover Finish	50%
Wind Speed Average	5 mph	Precipitation	4%

3. Results

Field Surveys

Habitat Survey

The site is located within a predominantly rural setting, within the hamlet of Cloudside. The site is immediately bounded by woodland and farmland/countryside a short distance away. Within the wider landscape are features beneficial for foraging/commuting bats including water bodies, water courses, mature hedgerows and woodland.

Roost Survey

Figure 2: Surveyed buildings (outlined in red)



The buildings were inspected internally and externally and assessed in terms of their bat roosting potential with results shown within Table 9;

Table 9: Building inspection results

Building reference	External inspection	Internal inspection	Roost assessment category

B1	Two-storey farmhouse. Solid stone, pitched tiled roof. All windows and doors are intact. Potential roosting features (PRF's) across the roof under lifted tiles and ridge tiles. Gaps under wooden fascias around building provide potential roosting features for bats.	Loft space – lined with felt. No gaps/ no daylight coming through. Approx. 300 scattered droppings.	High due to the amount of bat droppings found in the loft space.
B2 & B3	Solid stone in construction, stone work in good condition. Pitched roof with potential roosting features across, under lifted tiles. Ridge tiles all intact.	Loft space of B2 & B3 connected – scattered droppings through-out. B2 lined with felt, B3 not lined. Open hay door, allowing ease of access for bats. Feeding remnants located on the loft floor; butterfly wings. Old swallow nests	High due to potential roosting features and bat droppings found.
B4	Constructed out of breeze blocks. Pitched tiled roof, occasional lifted tiles presenting PRF's.	Lined, but lining has ripped and is coming away. 2 x skylights and two large open doors allow lots of light to enter, which could deter bats from roosting here.	High due to amount of PRF's found externally
B5	Solid stone in construction. Pitched tiled roof, occasional lifted tiles presenting PRF's. Windows intact and sealed. Currently used for storage.	Voidable loft space.	High due to amount of PRF's found externally.
B6	Modern garage, plastic roof. Breeze block in construction.	No access internally.	Low
B7	Two large agricultural buildings.	No access internally.	Low

	Breeze block in construction, with asbestos sides and roof.		
--	---	--	--

The site as a whole offers good bat foraging opportunities, especially in conjunction with neighboring habitats.

Activity Surveys

Figure 3: Surveyor locations – indicated by the yellow stars.



Table 11: Dusk emergence activity survey – 20/08/2020 – Sunset 20:24

Time	Species (common name)	Species (Scientific name)	Observed behaviour
20:42	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Emergence - Flew from above ridge tiles of B1. Did not echo locate. Flew towards woodlands.
20:54	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Heard not seen (HNS) Faint call
20:55	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Emergence - Flew from B2/3 to woodland
21:04	Noctule	<i>Nyctalus noctula</i>	Commuting – flew overhead (HNS)
21:05	Whiskered	<i>Myotis mystacinus</i>	Foraging – in woodlands
21:15	Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging – briefly around woodland edge
21:16	Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging – in woodlands
21:23	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging – around woodland edge
21:34	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Commuting – flew from south to north over site (HNS)
21:39	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging – around woodland edge
21:46 x2	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging – around woodland edge

Internal

Throughout the survey, regular checks were made internally;

Internal check at 20:40 no bats were recorded

Internal check at 21:00 no bats were recorded

Internal check at 21:20 no bats were recorded

Internal check at 21:55 no bats were recorded

No bats were seen internally during any of the four internal building checks. Scattered bat droppings were found in the loft area of B1 and B2 and B3.

Survey 1 summary

- No bats were recorded inside the buildings. Scattered bat droppings were found in the loft of B1 and B2 and B3 before the survey began.
- 1 x Common Pipistrelle emerged from B1 ridge tiles
- 1 x Common Pipistrelle emerged from B2/B3 roof.

Table 12: Dusk emergence– 31/08/2020– sunset – 19:58

Time	Species (common name)	Species (Scientific name)	Observed behaviour
20:19	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Very faint call (HNS)
20:23	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging - Close by but could not see (HNS)
20:25	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Emergence x2 – from southwest elevation of B1
20:34	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging x3 – on the woodlands edge
20:36	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging – Flew from the road, towards driveway, and then back towards road
20:40	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Emergence x2 – one from the ridge tiles on B2 and one from the second vent from the left on the north west elevation.
20:41	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging x4 – on the woodlands edge
20:42	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging – down driveway and courtyard around B2 & B3
20:46	Brown Long-eared	<i>Plecotus auritus</i>	BLE recorded flying inside B2/B3
20:48	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging x2 – flying around courtyard
21:50	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Constant foraging around courtyard, road and woodland edge
21:05	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging - around courtyard
<i>Internal</i> Throughout the survey, regular checks were made internally. One bat was recorded internally; Internal check at 20:23 no bats were recorded Internal check at 20:46 one Brown Long-eared bat was recorded flying inside of the loft area of B2 and B3. Internal check at 21:08 no bats were recorded inside			

Survey 2 summary

- One Brown Long-eared bat (*Plecotus auratus*) was recorded flying inside of the loft area of B2 and B3. No new fresh bat droppings were recorded since the last site visit.
- 2 x Common Pipistrelle emerging from southwest elevation wall of B1.
- 1 x Common Pipistrelle emerging from ridge tiles of B2.
- 1 x Common Pipistrelle emerging from second vent from the left on north west elevation of B2.

Table 14: Dawn re-entry– 16/09/2020– sunrise – 16:42

Time	Species (common name)	Species (Scientific name)	Observed behaviour
05:30	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging along road and woodland edge
05:38	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging x2 – along road and woodland edge
05:39	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Flew to roof of barn, then away again
05:43	Brown Long-eared	<i>Plecotus auritus</i>	Flew onto site from woodland – towards gable end of barn
05:46	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Commuting – Heard not seen
05:52	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Flew over B1 towards woodland
05:55	Brown Long-eared	<i>Plecotus auritus</i>	Re-entry – B1 roof
05:58	Pipistrelle species	<i>Pipistrellus species</i>	Commuting – down road
06:00	Brown Long-eared	<i>Plecotus auritus</i>	Re-entry – inside B2 and B3, first floor ridge
06:01	Unknown	<i>Unknown</i>	Commuting – flew over to barn from south. No echo location.
06:08	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Foraging – along the woodland edge
06:11	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Re-entry – into crack on wall on south west elevation of B1
06:11	Brown Long-eared	<i>Plecotus auritus</i>	Commuting - Flew over barn to courtyard
06:11	Pipistrelle species	<i>Pipistrellus species</i>	Commuting – flew up road
06:12	Brown Long-eared	<i>Plecotus auritus</i>	Circled chimney of the farm house a few times then flew off towards north
06:19	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Re-entry – into crack on wall on south west elevation of B1
06:19	Common pipistrelle	<i>Pipistrellus pipistrellus</i>	Re-entry – into crack on wall on south west elevation of B1
<i>Internal</i> Throughout the survey, regular checks were made internally. One bat was recorded internally; Internal check at 05:40, no bats recorded, farmer had put internal light on inside B2 and B3. Internal check at 06:00, one bat recorded in the loft area of B2 and B3 Internal check at 06:15 no bats recorded			

Survey 4 summary

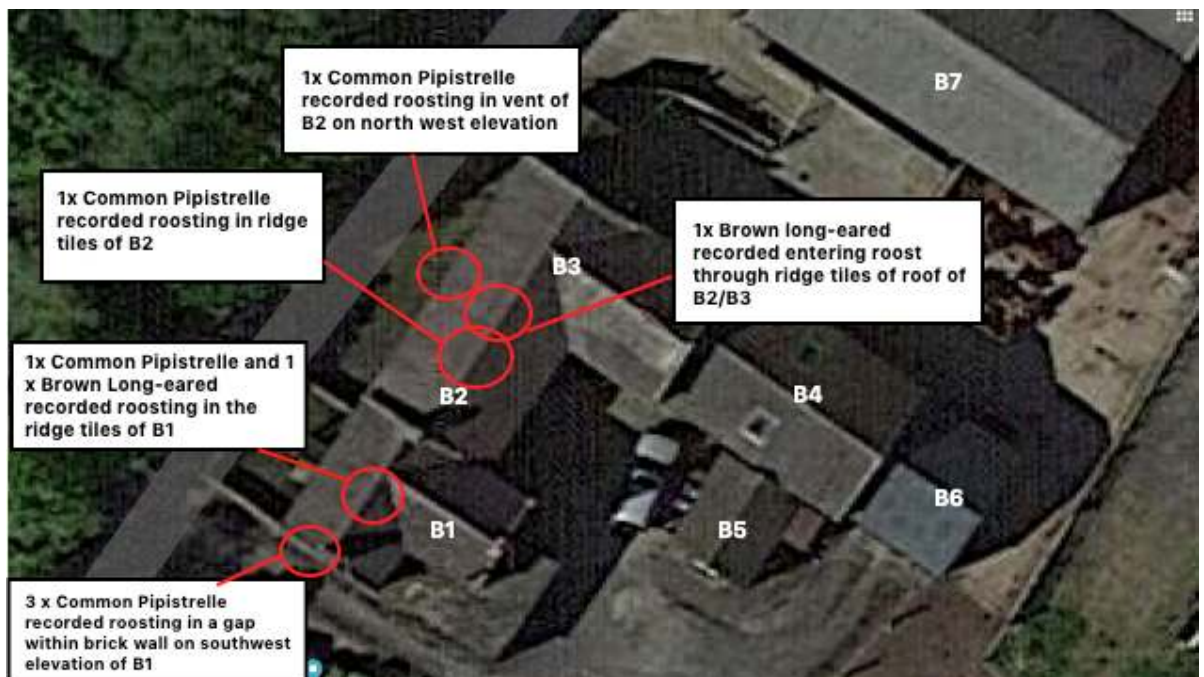
- One Brown Long-eared bat (*Plecotus auratus*) was recorded flying inside of the loft area of B2 and B3.

- 3 x Common Pipistrelle recorded re-entering roost on south west elevation of B1 within a crack in the wall.
- 1 x Brown Long-eared bat recorded re-entering a roost in roof of B1
- 1 x Brown Long-eared bat recorded re-entering roost inside B2/B3 along ridge.

Summary of Activity Results

The dusk emergence and dawn re-entry surveys carried out in August and September 2020 have confirmed the current presence of bats roosting within B1, B2 and B3.

Figure 4: Summary of the results showing roost points/entry/exit points



Photograph 1 – North west elevation of B1, B2, B3, and B7, and south west elevation of B1.

Red outline of roosting points recorded.



Photograph 2: North west elevation, showing second vent from the left on B2.



Photograph 3: Showing north west and south west elevation of B7.



Photograph 4: Internal loft space of B1



Photograph 5: Cluster of bat droppings in B1



Photograph 6: Open loft hatch on south west elevation of B3



Photograph 7: Internal loft space of B2



Photograph 8: Internal loft space of B3



Photograph 9: Scattered bat droppings in B2/B3.



Photograph 10: Access into B3 through holes in ridge and roof.



Photograph 11: Showing south east elevation of B2 and south west elevations of B3,B4 and B5.



Photograph 12: Showing south of B1



Photograph 13: Roost of 2 x Common Pipistrelle located on south west elevation of B1 within crack on wall.



Photograph 8: Showing south west elevation of B6.



4. Assessment

Constraints on Survey Information

All activity surveys were carried out in August and September 2020. This period is considered as being an optimal survey period in order to evaluate the presence or absence of bats.

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

Low numbers of common pipistrelle and brown long-eared bats were recorded emerging and re-entering B1, B2 and B3 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; common pipistrelle and brown long-eared.

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. All onsite 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 Government's commitment to maintaining green belt protections and preventing urban sprawl, retains the protection of designated sites and preserves wildlife, aims to improve the quality of the natural environment, and halt declines in species and habitats, protects and enhances biodiversity and promotes wildlife corridors.
Article 10 of the EC Habitats Directive:	The published Article requires government to develop features such as 'stepping stones' on the landscape, such as clusters of ponds, tracts of rough grassland or scrubland and vegetated railway line embankments.
Wildlife and Countryside Act 1981:	All species of bat are fully protected under the Wildlife and Countryside Act 1981, the European Conservation (Natural Habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000. This legislation makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a bat while it is occupying a structure or place which it uses for that purpose.
Conservation of Habitats and Species Regulations (2010)	The Conservation of Habitats and Species Regulations 2010 consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994, in respect of England and Wales. It is an offence to possess, sell or offer, or transport for sale any European species of bat or any part derived from such a species. These Regulations also remove the 'incidental result defence'. In other words, it is no longer a defence to show that the killing, capture or disturbance of a species covered by the Regulations or the destruction or damage of their breeding sites or resting places was the incidental and unavoidable result of a lawful activity. Natural England can grant European Protected Species (EPS) licences in respect of development to permit activities that would otherwise be unlawful.

Natural Environment and Rural Communities Act (2006)	Under Section 40 of the Natural Environment and Rural Communities Act (2006), public bodies, including Local and Regional Planning Authorities, have a duty to 'have regard' to the conservation of biodiversity in England when carrying out their normal functions, which includes consideration of planning applications. In compliance with Section 41 of the Act, the Secretary of State has published a list of species considered to be of principal importance for conserving biodiversity in England. This is known as The England Biodiversity List, all of which make up the UK BAP Priority Species. Regional Planning Bodies and Local Planning Authorities will use it to identify the species that should be afforded priority to maintain, restore and enhance species and habitats.
Bird legislation	Most resident nesting birds are protected under the Wildlife and Countryside Act 1981, which protects birds, nests, eggs and nestling's. Some rarer species, such as barn owls, are afforded extra protection.

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

5. Recommendations and Mitigation

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 for the proposed works on B1, B2 and B3, which should provide a comprehensive mitigation strategy for potential loss of;

- Common pipistrelle summer day roost (peak count 4 bats)
- Brown long-eared summer day roost (peak count 5 bats)

Proposals and licensable works

B1, B2 and B3 will be converted into residential accommodation. A Natural England European Protected Species Licence will be required which will pertain to the loss of summer day roosts for two species of bat.

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 – re-roofing and first floor internal works will need to be carried out under the supervision of a qualified bat ecologist, when bats are least likely to be present (between October and 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.

Retention of roosts – as all buildings are to be converted into residential accommodation, it will not be possible to retain roosts.

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

- Raised or vented ridge tiles should be installed across the roofs of B1, B2 and B3 to act as replacement roosting features, six in total.
- 6 x Habibat Access Tiles should be installed on the roofs of B1, B2 and B3. These will create roosting features for the pipistrelle bats <http://www.habibat.co.uk/category/bat-access-tiles/habibat-access-tile-clay>
- The roof should be lined with a bitumen type felt, not a modern white breathable (which creates an entanglement risk for bats);
- A bat box should be installed on the south west gable end of B1. The box needs to be suitable for brown long-eared bats and an example includes the Vincent Pro Bat Box <https://www.wildcare.co.uk/vincent-pro-bat-box-10651.html>
- Integrated bat boxes should be installed on new properties such as the Habibat Bat Box 001 <http://www.habibat.co.uk/category/bat-boxes/habibat-001-bat-box-bespoke-facing>
- A Schwegler 1FW large colony box should be fitted on a nearby tree (which will also act as a receptor site during the supervision works).

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 light below the horizontal plane to minimize upward light spill.

Nesting birds

Inactive swallow nest were recorded within the loft space of B2. Swallows are 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 buildings are to be completely converted into residential accommodation, they will be unsuitable receptors for artificial nests.

However should the development include the construction of any garages/outbuildings, these can be used as an alternative providing they are open fronted and/or an opening can be left during the nesting season (i.e window). Artificial nests can be installed internally such as the No. 10

Schwegler Swallow Nest <https://www.nhbs.com/search?q=swallow&qtview=158625>

6. Summary

Evidence of bats within B1, B2 and B3 was found during the internal inspection. A small number of; common pipistrelle and brown long-eared bats were detected emerging/re-entering 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 B1, B2 and B3 which should provide a comprehensive mitigation strategy for the loss of a summer day roosts for two species of bat. Some consideration of appropriate measures within such a mitigation strategy are provided in section 5.

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].

The Conservation of Habitats and Species Regulations 2010. SI 2010/490.

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

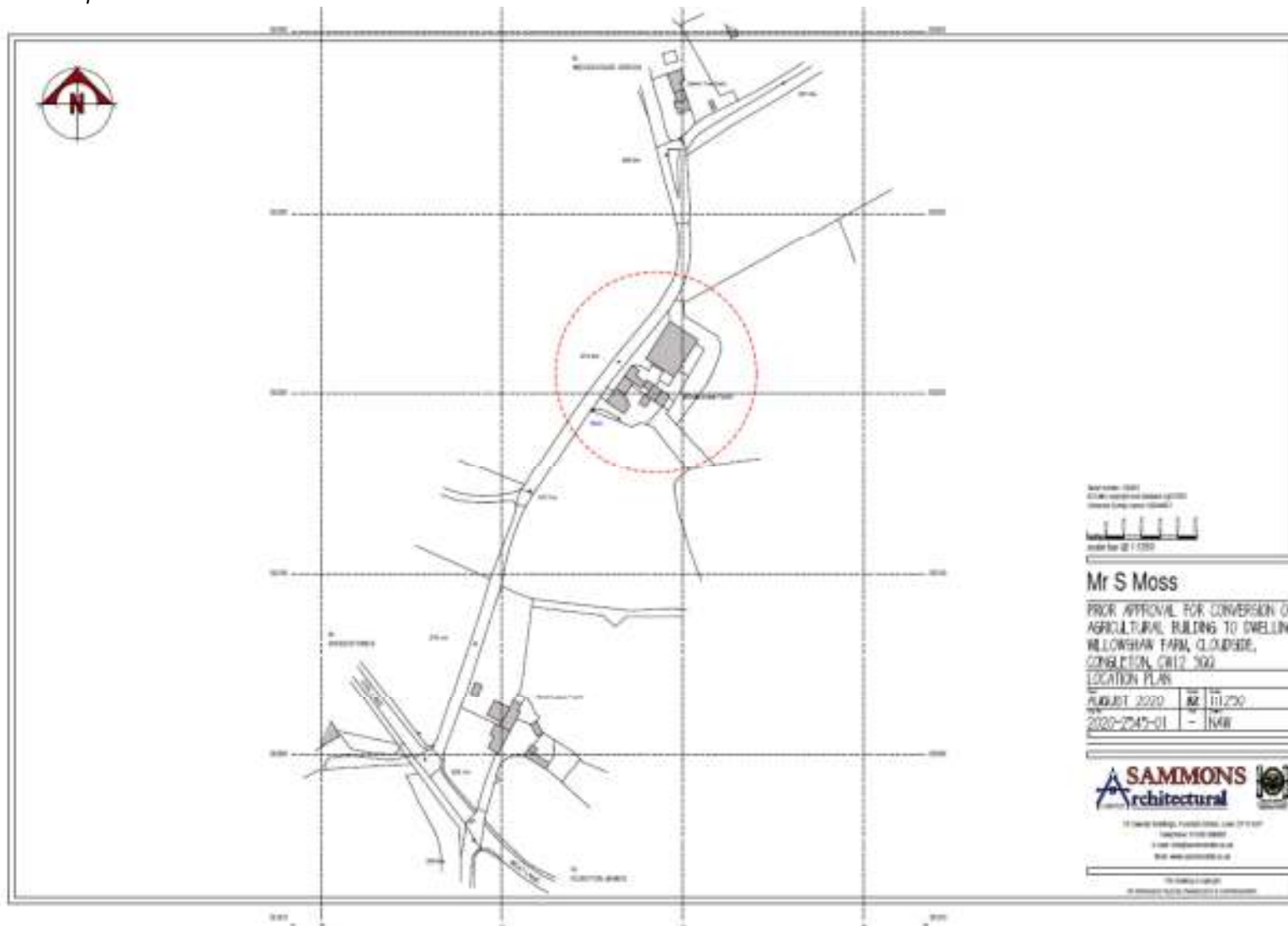
Countryside and Rights of Way Act 2000 (c.37). London: HMSO.

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].

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

8. Figures

Location plan



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).