

# Bat Survey

## 'Hawkrigg', Holmrook

8<sup>th</sup> June 2023

Report No. 0623/6

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## Executive Summary

'Hawkrigg' is a detached bungalow at the edge of Holmrook village. It is currently unoccupied, and in need of significant refurbishment. The owners wish to demolish the building and rebuild in its approximate footprint.

This report was commissioned to accompany a planning application, and involved an inspection of the property and desktop search to assess whether bats are using, or have used it for roosting purposes. An assessment is also made of the potential the building has to host bats, and whether this proposed development will have any negative impacts on individual bats, or the local bat population.

The building was inspected inside and outside for evidence of bat activity. There were no restrictions on access.

The building is constructed from concrete walls on mesh framework with external render or wood panelling. The main roof is pitched and covered by composite slates, with small felt covered flat roofs to the rear and sides. There were no potential roost sites identified, as there were no suitable gaps found- including around slates and wall tops.

Surrounding habitat is agricultural, with hedgerows, woodland and riparian areas. This provides moderate quality habitat for feeding and commuting bats.

The house is classed as having negligible scope to host bats - as no potential roost sites were found that are likely to be used. No dusk survey was necessary for this application.

No evidence of bats was found in the inspection, and there are no records from the property or its immediate surroundings.

'Hawkrigg' has negligible scope to host bats, and as damage to individual bats or the surrounding bat population by the proposed development is considered unlikely. No EPS licence is required for these proposals.

Nesting house sparrow were noted in the inspection using an old swallows nest, and there is scope for birds to use the rear lean-to to nest. Demolition should therefore be planned for the months outside the nesting season, unless a breeding bird check is carried out first and an absence of active nests confirmed.

Some enhancement measures have been recommended to encourage wildlife gains from this project. A minimum of three bat or bird boxes should be erected on the replacement house (or on suitable trees in the garden).

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# **1 Introduction**

## **1.1 *Site description***

Hawkrigg is a detached bungalow at the edge of Holmrook village. It is located at SD078 998 at approximately 10m AOD.

The property has not been occupied for several years, and is in poor general repair (though is broadly weatherproof). The exterior is partially rendered and partially covered by wood cladding, with a pitched roof covered by composite slates.

The bungalow is surrounded by gardens, other residences, woodland and agricultural land.

Figure 1 shows the location of 'Hawkrigg'. Satellite imagery of the surrounding habitat and the area immediately surrounding the property is presented in figure 2. Photographs of the building are included in the appendices to this report.

## **1.2 *Proposed works***

The owners wish to demolish the property and re-build in its approximate footprint.

There is no set timescale for the work.

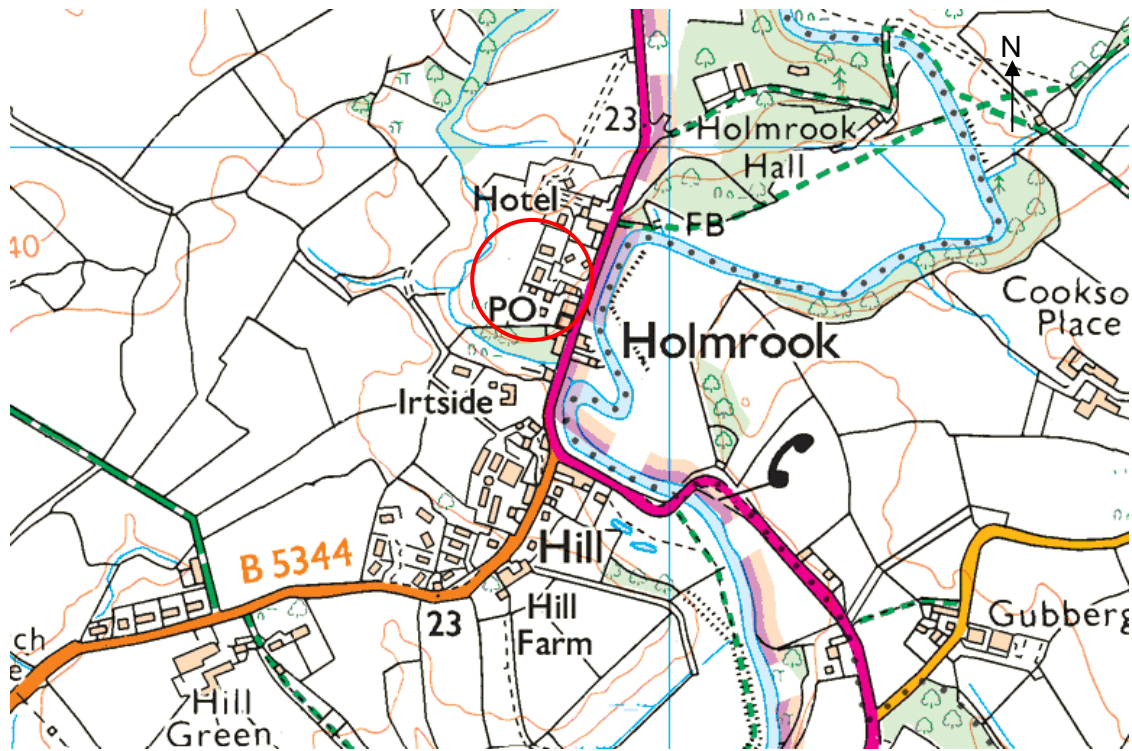
## **1.3 *Aims of survey***

This survey was commissioned to accompany a planning application to Cumberland Council.

The aim of the survey is to assess whether bats use, or have used, 'Hawkrigg'; and if so how it has been used. From this data an assessment will be made as to whether any particular roost and/or the surrounding bat population would be affected by the proposed development. If they are likely to be affected then appropriate mitigation proposals will be included in this report.

The inspection survey and ensuing report follow guidance and structure provided by Bat Conservation Trust (Bat Surveys Good Practice Guidelines, 3<sup>rd</sup> edition, 2016).

Figure 1. Location Map



Contains Ordnance Survey data © Crown copyright and database right copied under licence (No. 100055725)

Figure 2. Aerial photograph showing surrounding habitat



Red circle indicates location.

(Imagery date 2018)

## 2 Methods

### 2.1 Desktop data search

A search of current literature (including the Bat Conservation Trust publication 'The Distribution Atlas of Bats in Britain and Ireland', Cumbria Biodiversity Data Centre's Mammal Atlas and 'Mammals of the British Isles') was done, looking for bat records in the 10km gird square in which the property is situated.

An internet search was also carried out, noting any land with statutory designations within 5km of 'Hawkrigg'. Reasons for any relevant land designations were researched to check whether bats were important features. A search was also carried out for local EPS (European Protected Species) licenses for disturbance to bats (this will give further indication of species present in the area). Searches for statutory designations, and relevant citations were done on a DEFRA website [www.magic.defra.gov.uk](http://www.magic.defra.gov.uk).

A detailed search was commissioned from Cumbria Biodiversity Data Centre, providing records of bats and their roosts within 2km of the property.

### 2.2 Surveyor information

The inspection was undertaken by Tamsin Douglas MCIEEM, experienced ecologist (holds Natural England Bat Class Licence – registration number 2015-10308-CLS-CLS).

### 2.3 Field survey

#### 2.3.1 Daytime inspection

A daylight inspection of the building to identify possible roosting and nesting locations and access routes to these locations was carried out on 22<sup>nd</sup> May 2023 between 11.00 and 11.45 by Tamsin Douglas.

The external and internal inspection was carried out, where necessary, using ladders, 10 x 42 binoculars, endoscope (Vscope VOxx-10WW) and a 1 million candlepower torch. The weather was dry, mild and sunny.

The building inspection involves a detailed internal and external daylight search for evidence of current or past use of the building by bats. Outside, particular attention is paid to the ground and ledges under any potential access points, weather boarding, hanging tiles, eaves, cracks and crevices in walls, and under tiles/slates. Internal inspections focus on areas around and below any potential roosting spots, ledges and lintels, behind crumbling render, and on and around roof timbers.

Evidence from a search which would indicate presence of bats includes-

- Roosting bats
- Corpses
- Droppings and urine staining on and around potential roosting areas (further evidence derived from amount and freshness of droppings)
- Droppings, staining and/or scratch marks at potential roost entrances
- Cleaner areas of woodwork, areas free of cobwebs suggesting bat activity such as crawling or flying
- Feeding detritus- such as moth wings

- Chattering or squeaking noise from roosting bats.

A general assessment is also made of the suitability of the surrounding habitat for bats, and connectivity to other areas of good quality foraging and commuting habitat.

Direct evidence of bats can be hard to detect and, as such, during the preliminary roost assessment the building is also appraised for its potential to host roosting bats. This potential is based on several factors:

- Presence of suitable internal or external features for roosting bats, and good access routes to these features
- Number of bats that these features could support
- Suitable conditions for roosting either in active season or for hibernation (humidity, temperature, exposure)
- Surrounding foraging and commuting habitat, connectivity to good habitat features
- Proximity to known roosts (especially for hibernation of species such as pipistrelles)

The need to undertake a roost emergence/ re-entry survey or hibernation survey (to provide further evidence as to whether bats use the building affected by these proposals) was determined by the results of this inspection.

### **2.3.2 Roost surveys**

If deemed necessary following the inspection survey, between one and three roost surveys may be carried out. During the dusk or dawn roost survey, all suitable elevations of the property are observed for a standard period before and after sunrise or sunset. Surveys are carried out between May and September, when bats are most active. Surveyors watch all potential roosting locations to see if any bats emerge. Bat detectors (personal and static), digital recording devices and night-vision monoculars are used to aid detection and identification of any emerging bats.

A hibernation survey typically involves a detailed inspection of possible roosting sites using torch, mirror and endoscope, and can involve deploying static bat detectors. The survey is carried out in mid-winter, typically in January and February. The exact parameters of the survey depend on the nature of the site.

## 3 Results

### 3.1 Desktop search

#### 3.1.1 Designated sites

There is a large amount of designated land within 5km of 'Hawkrigg', and also within 2km of the property.

A total of three SSSIs, one NNR (National Nature Reserve), one LNR (Local Nature Reserve), one SPA (Special Protection Area), and one SAC (Special Area of Conservation) are found within 5km of the property. The closest site is Drigg Holme SSSI, designated for its botanical interest 700m from the property. Although these sites may support bat populations, none of them detail bats in the supporting citations.

The property is located just outside of the boundaries of the Lake District National Park.

#### 3.1.2 Protected species

Eight species of bat are currently known to breed in Cumbria, with a further two species that have been recorded within the county. All species of bat in the UK are fully protected under UK and European law.

**Table 1. Status of bats in Cumbria**

Species	Status in Cumbria
Whiskered bat <i>Myotis mystacinus</i>	Widespread, but uncommon. Maternity and hibernation roosts recorded.
Brandt's bat <i>M.brandtii</i>	Widespread, but uncommon. Maternity and hibernation roosts recorded.
Natterer's bat <i>M.nattereri</i>	Widespread. Maternity and hibernation roosts recorded.
Daubenton's bat <i>M.daubentonii</i>	Widespread. Strongly associated with still or slow moving water. Maternity and hibernation roosts recorded.
Noctule <i>Nyctalus noctula</i>	Widespread, but uncommon. Rarely associated with buildings. Breeding roosts recorded.
Leisler's bat <i>N.leisleri</i>	Rare. Only a confirmed bat detector record in Cumbria.
Common pipistrelle <i>Pipistrellus pipistrellus</i>	Widespread. Roosts often associated with modern buildings, forages in a variety of habitats. Maternity and hibernation roosts recorded.
Soprano pipistrelle <i>P.pygmaeus</i>	Widespread. Only recently separated as a species from common pipistrelle, often associated with waterbodies, though forages in wide range of habitats. Maternity and hibernation roosts recorded.
Nathusius' pipistrelle <i>P.nathusii</i>	Rare. Recently added to Cumbria's list of bats. No confirmed breeding roosts recorded yet.
Brown long-eared bat <i>Plecotus auritus</i>	Widespread, but uncommon. Often associated with older buildings with good roof space. Maternity and hibernation roosts recorded.

The property is close the edge of hectad (10km square) SD09, so the adjacent hectad NY00 was also searched for records. The literature search provided records of summer roosts for 4 species of bats (natterer's bat, daubenton's bat, pipistrelle and brown long-eared bat) within the hectad NY00, and none in SD09. The CBDC Mammal Atlas had recent (post-2000) confirmed records in SD09 for natterer's bat, noctule, daubenton's bat and pipistrelle, and additional records of whiskered bat and brown long-eared bat in NY00.



The internet search looking at nearby granted EPS (European Protected Species) licenses for bats produced several records. The closest license was for disturbance to a soprano pipistrelle maternity roost within 1km of 'Hawkrigg'. Other species identified on licenses within 5km of the property include common pipistrelle and brown long eared bat.

The detailed site search carried out by Cumbria Biodiversity Data Centre produced just 6 records, and only one named species- common pipistrelle. Two of the records were of roosts, the others were auditory records or grounded bats. Records were from 1996 to 2011. None came from the property – the nearest record was of a roost 400m away.

Bats are generally an under-recorded group, and as such biological records such as those above can only be used as a guide to illustrate potential distributions in the area, and are not definitive.

## 3.2 Field survey

### 3.2.1 Habitat assessment

'Hawkrigg' is located at the edge of the village, adjacent to other residential properties with gardens. Immediately west is grazed pasture and some scrubby woodland, linking in to more extensive woodland to the north. River Irt is within 100m to the east, and this has scrub and trees along the banks leading on to more extensive woodland to the north-east. Most of the other surrounding land is pasture or silage fields, and many have hedgerow boundaries.

Bats can fly several kilometres to their feeding grounds, often following linear features such as hedgerows. Sheltered areas, particularly around water, tend to have greater amounts of invertebrate prey, and as such are sought out by foraging bats.

The habitat around the property offers good feeding and commuting habitat for bats, and is relatively dark and sheltered.

### 3.2.2 Roosting assessment

**Table 2: Factors affecting the probability of a building being used by bats in summer**

Factors increasing probability	<ul style="list-style-type: none"> <li>Disused or little used; largely undisturbed</li> <li>Large roof void with unobstructed flying spaces</li> <li>Large dimension roof timbers with cracks, joints and holes</li> <li>Uneven roof covering with gaps, though not too draughty</li> <li>Entrances that bats can fly in through</li> <li>Hanging tiles or wood cladding, especially on south-facing walls</li> <li>Rural setting</li> <li>Close to woodland and/or water</li> <li>Pre-20th century or early 20th century construction</li> <li>Roof warmed by the sun</li> </ul>
Factors decreasing probability	<ul style="list-style-type: none"> <li>Urban setting or highly urbanised area with few feeding places</li> <li>Small or cluttered roof void (esp. for Plecotus)</li> <li>Heavily disturbed</li> <li>Modern construction with few gaps around soffits or eaves (but be aware these may be used by pipistrelles in particular)</li> <li>Prefabricated with steel and sheet materials</li> <li>Active industrial premises</li> <li>Roof shaded from the sun</li> </ul>

(Taken from A. Mitchell-Jones, 2004)

Building construction

'Hawkrigg' has an unusual construction, being built of concrete walls reinforced by wire mesh. These are thin and have no insulative properties. Externally these walls are rendered or covered by wood-panelling.

The roof is pitched and covered by composite slates, with a flat roofed area to the rear (covered by roofing felt). Underneath the slates is wood panelling, which has been boarded over on the southern elevation where the half of the loft void has been opened up into the living space (vaulted ceiling). The remaining roof void is well sealed, with no potential access routes identified.

Windows and doors are mostly made of PVC and frames are well sealed. The external walls are very well sealed, with no gaps at the wall tops. One small gap was noted in the south-west corner where the wood had rotted (and it was being collected by bees for use in nest construction).

There are no gaps between slates or ridge slates, they are very tightly aligned.

There is a block-built lean-to at the rear of the house (west elevation). The roof is covered by corrugated plastic sheets, but these are partially degraded and the area is not weatherproof.

Suitability for bats

The property offers negligible scope for roosting bats, as there are no crevices or gaps present that are likely to be used.

Evidence of bats

No evidence of bats was found at the property.

**3.2.3 Summary of suitability of site for bats**

Based on the evidence above, and using published guidance (summarised below) 'Hawkrigg' is assessed as having negligible potential for roosting bats, and surrounding habitat has moderate suitability for commuting and foraging bats.

The property was assessed as having negligible potential to host hibernating bats, based on type and exposure of roosting features present, connectivity of habitat and proximity of known roosts.

As a result of this assessment no further roost survey work is required.

**Table 3:** Summary of site suitability for bats.

Suitability	Roosting habitat-summer	Commuting/ foraging habitat
<b>Negligible</b>	No features found that are likely to be used	No features found that are likely to be used
<b>Low</b>	A structure with one or more potential roost sites, suitable for opportunistic use. Unlikely to be used by large numbers of bats or on a regular basis.	Habitat that could be used by small numbers of commuting or foraging bats, but isolated and not well connected to other suitable features.

<b>Moderate</b>	Structure with one or more potential roost sites, that could be used by bats – but unlikely to support roost of high conservation status.	Continuous habitat connected to wider landscape that could be used by bats for foraging and/ or commuting.
<b>High</b>	Structure with one or more roost sites that are obviously suitable for larger numbers of bats on a more regular basis or for a longer period of time.	Continuous high-quality habitat that is well connected to the wider landscape and likely to be used regularly by foraging and/or commuting bats. Site near to and well connected to known bat roosts.

*Table based on Table 4.1 of 'Bat Surveys for Professional Ecologists', BCT 2016*

### **3.3 Roost surveys**

No roost surveys are required for this application.

### **3.4 Other species**

House sparrows were nesting in an old swallow nest on the front (east) elevation of the house. No other protected species (such as nesting birds) were present. It is possible for birds to nest in the open lean-to at the rear of the building, and so the area should be checked if demolition is planned for the spring/ early summer.

## **4 Assessment**

### ***4.1 Constraints on survey information***

This scoping visit was carried out in May when external evidence of bat activity (such as droppings) should be visible under regularly used roost entrances.

Close access was possible to the all the lower external walls and eaves. The endoscope was used to inspect all cracks and crevices within reach, which the high power torch could not illuminate. The roof could only be inspected using high power torch and binoculars.

There were no restrictions on access. The roof void was open and easy to inspect.

These constraints are not considered to affect the results of the inspection survey, but have been used to guide the need for any additional survey work or precautionary measures at the building.

### ***4.2 Constraints on equipment used***

The conditions during the surveys were suitable for survey purposes and for the equipment used.

### ***4.3 Potential impacts of the development***

#### ***4.3.1 Designated sites***

The proposed development will not have any negative impacts on nearby designated sites.

#### ***4.3.2 Roosts***

No confirmed current bat roost will be lost or damaged by the proposed development.

The building is not considered to have reasonable roosting potential for bats as there are no suitable gaps or crevices. As such there are no anticipated impacts on individual bats or the local bat population.

#### ***4.3.3 Commuting and foraging habitat***

The area surrounding 'Hawkrigg' is a good foraging location for bats with good connections to adjacent areas of high quality habitat. The proposed development is highly unlikely to have a detrimental impact on the quality of the foraging habitat for bats.

## ***4.4 Legislation and Policy guidance***

Bats have declined in numbers dramatically across the UK and Western Europe in recent decades. Key factors linked to their decline are loss of roosting places due to building works and woodland destruction. Other factors implicated in their decline are changes in the countryside resulting in habitat loss and greater fragmentation of foraging habitats, and severing of commuting flightlines due to transport developments and hedgerow destruction.

As a consequence of these significant declines, bats and their roosts are protected under British and European law.

All bats are listed under Annexe IV of the EU Habitats Directive, and some under Annexe II. This law is transposed into English law into the Conservation of Habitats and Species Regulations (2010).

Bats are also protected in the UK under the Wildlife and Countryside Act 1981 (as amended).

As a result of the above legislation it is an offence to;

- Deliberately capture, injure or kill a bat,
- Disturb a bat such that their survival, reproductive capacity, or the well being of the local population is affected
- Intentionally or recklessly disturb a roosting bat, or block access to its roost.

If the proposed works were assessed as likely to commit an offence under the above legislation, then a European Protected Species (EPS) mitigation licence would need to be sought.

Based on the evidence gathered from the inspection and desktop search, and the experience of the surveyor, it is unlikely that an offence will be committed by the proposed development under the above legislation, and as such no EPS licence will need to be obtained.

## **5 Recommendations and mitigation**

### **5.1 Further survey**

No further survey work is required for these proposals.

The findings of this inspection report are valid provided that work commences within 12 months of the date of this report.

### **5.2 Avoidance and mitigation measures**

#### **5.2.1 Proposals for roost sites and potential roost sites**

No avoidance measures or mitigation are proposed for this project, as it is deemed very unlikely that bats will be encountered during the building works.

In the unlikely event that a bat is discovered during building works, all work must cease immediately. Contact must be made with South Lakes Ecology (or if unavailable, the Bat Conservation Trust helpline on 0345 1300 228) to ensure that no harm comes to the bat(s) and to provide advice such that that work can proceed without further risk to bats.

#### **5.2.2 Proposals for foraging and commuting habitat**

No mitigation for foraging and commuting habitat is required for this development.

### **5.3 Mitigation licenses**

As stated in section 4.4, based on the evidence gained from the surveys, it is considered that the proposed building works at 'Hawkrigg', as described in section 1.2, do not require an EPS licence.

### **5.4 Other species**

House sparrows are actively nesting on the front elevation of the house in an old swallows nest. It is possible that birds could nest in the rear lean-to, though no evidence of this was seen during the inspection.

Birds and their nests are protected under British and European law, and no work should take place which would displace breeding birds. The main breeding bird season is from 1<sup>st</sup> March until mid-August (occasionally later for house martin and swallows as they can have multiple broods).

If the building is to be demolished in the bird nesting season, a precautionary check should be carried out before works commence – with the demolition of that area delayed if breeding birds are present.

### **5.5 Enhancement measures**

Following local planning guidance, measures to encourage a net gain of biodiversity should be included for all new developments. As impacts of the proposals at 'Hawkrigg' on biodiversity are minimal, the provision of some artificial bat or bird boxes would be proportional. It is recommended that at least 3 bird or bat boxes are installed.

Bat boxes could be installed on the south or west elevations at a height of above 3m. Bird nesting boxes (such as a sparrow terrace, robin box or tit box) could be installed on the north or east elevations between 2 and 4m high on the external walls. All boxes should be installed in areas where they will not be exposed to predators such as cats. If the design of the property allows it would be good to leave some deep eaves suitable for nesting house martin or swallows on the eastern elevation.

Boxes can be bought or built from scratch. Full guidance can be found on Bat Conservation Trust website <https://www.bats.org.uk/our-work/buildings-planning-and-development/bat-boxes> or RSPB website <https://www.rspb.org.uk/fun-and-learning/for-families/family-wild-challenge/activities/build-a-birdbox/> . If boxes are to be bought, it is recommended that woodcrete style boxes are used for bats as they are longer lasting than wooden boxes.

## 6 Summary

A desktop search and thorough daylight inspection were carried out to assess whether bats use, or have recently used 'Hawkrigg', Holmrook. An assessment was also made regarding the potential of this building to host bats, and whether the proposed development was likely to harm bats, or have an adverse impact on the local bat population.

The property is a detached bungalow on the edge of the village. The walls are cement with external render or wood panelling, and the pitched roof is covered by composite slates. The house has not been occupied for several years, and is in poor general repair (especially internally). The roof and walls are all very well sealed, with only one small gap identified.

Surrounding habitat is sheltered, and includes woodland, gardens and agricultural fields with hedgerow boundaries. The River Irt passes within 100m of the house.

The property is classed as having negligible potential to host bats, as no potential roosting sites were found that are likely to be used. Surrounding habitat is of moderate quality for feeding and commuting bats.

No evidence of bats was found during the inspection. There are no records of bats from the property, or its immediate vicinity.

There were no constraints on the survey conditions or equipment used that are considered to compromise the validity of the findings of this report.

The surrounding habitat and gardens provide good quality foraging habitat for bats, and these will not be impacted by the proposed development.

No evidence of bats currently using these buildings was found, and it is considered highly unlikely that any individual bats, or the local bat population will be impacted by these proposals. As such this development does not require an EPS licence.

Nesting house sparrows were evident on the front elevation where they are using an old swallows nest. Demolition works should be timed to happen outside of the bird nesting season (March- mid-August) if possible. If not, a pre-works check for breeding birds should be carried out, and demolition delayed if there are active nests present.



## 7 References

Altringham, J.D. (2003) *British Bats* HarperCollins New Naturalist, London.

Bat Conservation Trust (2000) *Bat Atlas 2000- Distribution Atlas of Bats in Britain and Ireland*. Bat Conservation Trust, London.

Bat Conservation Trust (2016) *Bat Surveys - Good Practice Guidelines* 3<sup>rd</sup> edition. Bat Conservation Trust, London

Gunnel K., Murphy B. and Williams C. (2013) *Designing for Biodiversity: A technical guide for new and existing buildings*. RIBA Publishing, London

Korsten E. et al (2018) *Swarm and switch: on the trail of the hibernating common pipistrelle*. Bat News. No. 110 (Summer 2016). p. 8-10. Bat Conservation Trust. London

Middleton N (2019) *Assessing Sites for Hibernation Potential. A Practical Approach, including a Proposed Method & Supporting Notes*. Unpublished course notes.

Mitchell-Jones, A.J. & McLeish, A.P. (2004) *The Bat Workers' Manual* 3<sup>rd</sup> edition JNCC, Peterborough.

Mitchell-Jones, A.J. (2004) *Bat Mitigation Guidelines* English Nature, Peterborough

Russ, J (2012) *British Bat Calls* Pelagic Publishing, Exeter

Bat Conservation Trust [www.bats.org.uk](http://www.bats.org.uk)

JNCC, Bat habitat management pages <http://jncc.defra.gov.uk/page-2465>

Details on the work done regarding issues with bats and non-bitumen roofing membranes [www.batsandbrms.co.uk](http://www.batsandbrms.co.uk)

Details on status of bats in Cumbria <http://www.cumberlandbatgroup.org.uk>

Cumbria Biodiversity Data Centre, Cumbria Mammal Atlas <http://www.cbdc.org.uk/wildlife-in-cumbria/cumbria-mammal-atlas/>

## Appendices

### i) Photographs



**Image 1.** Front (East) and side (north) elevation of property.



**Image 2.** Front elevation showing the well sealed wall tops and composite slate roof.



**Image 3.** Rear flat roof area and partially collapsed roof of lean-to.

No gaps in slates or wood panelling.



**Image 4.**  
South elevation with wood panelling and small flat roof porch.



**Image 5.**  
Showing the flat roof and western pitch of the main roof.  
No gaps between slates- all very tight fitted.



**Image 6.**  
No gaps at the wall tops.



**Image 7.**  
Interior, looking south, showing boarded underside to the roof.



**Image 8.**  
Interior of the roof space on the northern half of the dwelling.  
  
No daylight or gaps seen in the wood panelling under the slates.