Bat Survey at 'The Hearse House', St. Michael's Church, Dalston, Carlisle, Cumbria, CA5 7LN

2014

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1. Introduction

1.1 BATS AND THEIR REQUIREMENTS

1.1.1 In the UK there are eighteen species of bats, seventeen of which are known to be breeding. Each bat species utilises a variety of roost types and has certain ecological requirements. To determine which bat species are on site it is necessary to identify the species, are there bat roosts, the nature of the roost and how bats are using the site. This information will allow informed decision making on the potential impact to bats and provide a baseline for project planning, timing of works and potential mitigation/protection measures.

1.1.2 A bat roost is defined as “any place that a wild bat uses for shelter or protection” (The Wildlife and Countryside Act 1981; as amended). Bats usually choose roosts close to good feeding areas and these feeding areas are where there is a good abundance of ‘prey’ insects. All British bats are insectivorous and each bat species eats a range of insect species. Bats will fly some distance to forage the ‘best’ areas and this can sometimes create the situation where the roost is up to 1km or more from foraging areas. Bats are also affected by climatic conditions with poor weather affecting insects and their ability to hunt them.

1.2 BATS AND THE LAW

1.2.1 As population numbers have fallen, all bats and their roosts are protected under The Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010. It is illegal to:

- deliberately capture (or take), injure or kill a bat;
- intentionally or recklessly disturb a group of bats; where the disturbance is likely to significantly affect the ability of any significant group of animals of that species to survive, breed or rear or nurture their young or likely to significantly affect the local distribution or abundance of the species, whether in a roost or not;
- damage or destroy the breeding or resting place (roost) of a bat;
- possess a bat (alive or dead), or any part of a bat;
- intentionally or recklessly obstruct access to a bat roost;
- sell (or offer for sale) or exchange bats (alive or dead), or parts of bats.

1.2.2 If the proposed works should result in the damage to or destruction of a roost or the disturbance of bats, then a licence must be acquired from Natural England (NE), to derogate from the Regulations. The licence must be applied for by a qualified ecological consultant. The licence is processed by NE and places conditions on the proposed development.

1.3 BACKGROUND TO ACTIVITY

1.3.1 This report relates to a bat survey carried out at 'The Hearse House', St. Michael's Church, Dalston, Carlisle, Cumbria, CA5 7LN (National Grid Ref. NY 37065 50264). It is understood that a proposal to partly demolish the Hearse House and re-use existing walls to form part of a memorial wall for burial/interment of cremated remains is being considered by Dalston Parish Council. The plans are currently in the early stages and no detailed or indicative site plan has been provided.

1.3.2 The bat survey will aim to determine if bats are likely to be currently using the buildings for roosting purposes or the surrounding habitat for any purpose.

1.4 FULL DETAILS OF PROPOSED WORKS ON SITE

1.4.1 See Figure 1. No indicative or detailed proposed plans have been provided.

Figure 1: ***Indicative Site Plan (as existing): St Michael's Church, Dalston. Hearse House identified via red line.***

2. Survey and site assessment

2.1 PRE-EXISTING INFORMATION ON SPECIES AT SITE

2.1.1 A data search was not commissioned for this survey.

2.2 STATUS OF SPECIES IN THE LOCAL/REGIONAL AREA

Species	Local Status	Habitat
Noctule *Nyctalus noctula*	Widespread but uncommon; mobile populations; breeding roosts recorded.	Tree dweller; predominantly in lowlands. Occupies woodpecker and rot holes. Seldom in buildings. Will utilise bat boxes. Feeds over deciduous woodland, parkland, pasture, water and forest edges.
Daubenton's bat *Myotis daubentonii*	Widespread; hibernacula and breeding roosts recorded.	Bridges, tunnels, caves, mines, stone buildings and trees. Has been found hibernating underground at high altitude (550m). Feeds over rivers, canals and other water bodies. Will forage in riparian woodland.
Natterer's bat *Myotis nattereri*	Widespread; hibernacula and breeding roosts recorded. Less common than Daubenton's.	Similar to Daubenton's and can be found together; bridges, old buildings, barns, trees and underground sites. Feeds in woodland and parkland. Has recently been recorded in some upland areas, mainly using riparian habitats.
Whiskered bat *Myotis mystacinus*	Widespread but uncommon; breeding roosts and hibernacula recorded.	Older, mainly stone buildings, churches, trees and often in bat boxes. Feeds mainly in deciduous woodland
Brandt's bat *Myotis brandtii*	Widespread but uncommon; hibernacula and breeding roosts recorded. "Swarming" sites recorded.	Similar to whiskered.
Brown long-eared bat *Plecotus auritus*	Widespread and common; hibernacula and breeding roosts recorded.	Old buildings, churches, barns (often with trees close by), underground sites and trees. Often found in bat boxes. Feeds in deciduous and coniferous woodland often within the canopy; around parkland trees, gardens, along hedgerows.
Common pipistrelle *Pipistrellus pipistrellus* (45kHz)	Widespread and common; breeding roosts recorded but species recognition only recently recorded.	Wide age range of buildings; favours modern structures, trees occasionally and bat boxes. Feeds over diverse habitats; rural and urban gardens, woodland, farmland, or near water.

		Found hibernating behind wooden cladding on buildings, in soffits, behind fascia boarding and in gaps in wooden window frames, also hibernates in trees.
Soprano pipistrelle *Pipistrellus pygmaeus* (55kHz)	Widespread and common; breeding roosts recorded but species recognition only recently recorded.	As common pipistrelle. Favours riparian habitat, and roosts in larger maternity colonies than the common pipistrelle. Found hibernating behind wooden cladding on buildings, in soffits, behind fascia boarding and in gaps in wooden window frames, also hibernates in trees
Nathusius' pipistrelle *Pipistrellus nathusii*	Rare. Three UK breeding sites known. A single bat-detector record of a night roost in Cumbria, and several foraging records.	Tree dweller; hollow trees, cracks, bat boxes and buildings. Sometimes shares nursery roost with pipistrelle or Brandt's bats. Feeds mainly around riparian and woodland edge habitats.
Leisler's bat *Nyctalus leisleri*	Rare. Unconfirmed bat detector record for Cumbria. Present in adjacent counties (Yorkshire and Dumfries and Galloway).	Woodland bat, similar to noctule but will roost in buildings. Feeds in open deciduous and coniferous woodland, over water bodies, parkland and around street lamps in suburban areas.

Figure 2: ***Local status and habitat of Cumbrian bat species, adapted from the Cumbria Wildlife Trust BAP report.***

2.3 OBJECTIVE OF SURVEY

2.3.1 The objective of the survey were to assess the potential for bats to roost within the Hearse House and ascertain whether there were any signs of use of the building or the surrounding habitat by bats. Should any specific potential for bats or signs of bats be seen, the survey should then identify the species of bat and the nature of the roost or the purpose for which they are using the site.

2.4 SURVEY AREA

2.4.1 A daytime site inspection of the Hearse House was conducted to identify any potential for or evidence of bats. This incorporated the interior and exterior of the building. Surrounding habitat was also assessed.

2.5 HABITAT DESCRIPTION

2.5.1 St. Michael's Church in Dalston is a red sandstone church with a chancel that dates from the 13th Century. The current building was erected in 1750 and restored in 1850. St. Michael's is part of the Church of England United Benefice.

2.5.2 The church is located on the western bank of the River Caldew in the centre of Dalston village. The church grounds surround the church building and currently consist of 'formal' and 'informal' areas. To the west and north of the church building grass is mown and a short sward is maintained. Areas towards the south of the church yard are less intensively managed with a reduced mowing regime. The western bank of the River Caldew is essentially un-managed. A range of native and ornamental tree species exist throughout the church yard.

2.5.3 Grassland within the church yard is generally species rich. Clearly the mown areas are somewhat less species rich than the longer grassland. The site is shaded from the east by a row of large mature trees on the western bank of the River Caldew.

2.5.4 The surrounding habitat offers high quality foraging habitat for bats. The church grounds generally and the Hearse House specifically are located on the bank of the River Caldew, which is lined with trees at this point. This represents highly suitable foraging habitat and offers a highly suitable commuting corridor for bats. The surrounding habitat is deemed to be suitable for all species of bat known to occur in Cumbria and roosting opportunities for all species occur in the surrounding area.

2.6 CURRENT SITE DESCRIPTION

2.6.1 The Hearse House is a small, detached building located within the church grounds. The building was presumably formerly used to store the church hearse, when this vehicle was horse drawn. A double cart door-way exists on the north western elevation and this is the only opening in the building. The building seems to been adapted over the years, with at least two distinct building styles / techniques employed. The northern and eastern walls are constructed on red sand stone, with the southern and eastern walls being constructed of red brick. A wooden lintel supports the western gable above the double door. The roof is timber framed and clad in slate with a dilapidated lime parging lining within. This parging has extensively fallen away leaving the majority of the roof essentially unlined.

2.6.2 The building is somewhat dilapidated and does have a number of structural cracks in the external walls. It does not appear to be currently unstable or in imminent danger of collapse. The roof is in a poor state of repair with some slipped roof slates and vegetation starting to grow through the eaves.

2.6.3 The Hearse House is constructed on a slope towards the river and therefore the western gable wall is significantly shorter than the eastern gable wall. The eastern gable wall is also shaded by the adjacent woodland which abuts the building and lines the river to the north and south of the Hearse House. The building is therefore effectively located within a distinct linear habitat feature (woodland edge) which is likely to be used by foraging and commuting bats.

2.6.4 The Hearse House is considered to offer low potential for bats to roost. Gaps and crevices do exist, in the roof, external walls and within the rotten wooden lintel above the cart door. As the building is very small and of relatively simple construction, roost potential cannot be moderate or high, but the fact that it is situated in high quality foraging habitat, within a distinct linear habitat feature, mean that it cannot be considered to offer negligible roost potential either.

3. Field survey

3.1 METHODS

3.1.1 The building was surveyed internally and externally for signs of bats using a high-powered torch (Clulite CB2, 1M candle power). Signs of bats include: droppings, feeding remains (in association with droppings), wear marks on potential egress points, staining on stone, clear areas in cobwebs, the smell of bats, audible signs of bats or the presence of bats.

3.1.2 All crevices were examined for bats using a high-powered torch, telescopic inspection mirrors and a video endoscope. The grounds surrounding the buildings were examined for droppings that may have collected beneath roost sites. Areas that were inaccessible but which had potential for bats were noted. Inaccessible areas were inspected using an AG80 20x- 60x spotting scope.

3.1.3 A single emergence survey was conducted at a time of year when bats were active using two surveyors, equipped with a Wildlife Acoustics Echo Meter 3 (EMS) Real Time Expansion bat detector and Batbox Duet heterodyne/frequency division bat detectors. Sonograms were viewed in the field in real time and recordings were made using the EM3 and later analysed using BatSound 4.

3.2 EQUIPMENT

Equipment Item	Make / Model / Spec.
Optics	Equinox HP 8x42 Binocular RSPB AG80 20x- 60x Spotting Scope
Camera	Canon EOS 1100D Digital SLR Camera
GPS	Garmin eTrex H GPS Receiver
Torches	Cluson / Clulite CB2 Clubman Rechargeable Spot-light Torch 1M Candle Power Petzl Tikka Plus 2 Head Torch: 50 LUMENS
Lux Meter	HoldPeak HP-881A Digital Lux Meter
Distance Estimator	Stanley 0-77-018 Intellimeasure Ultrasonic Distance Estimator
Endoscope	Video Inspection Borescope Endoscope 2.4 LCD Camera
Anemometer	Digital Anemometer Beaufort Scale / MPH
Thermometers; ▪ Air ▪ Surface	 Bosmere Mercury free MAX/MIN Infrared DT-380 Thermometer (-50°C - 380°C)
Bat Detectors	Wildlife Acoustics EM3 Real Time Expansion Bat Detector Batbox Duet Heterodyne/Frequency Division Bat Detector
Recording	Roland Edirol MP3 / WAV recorder
Software	BatSound 4

Table 1: *Equipment used during survey*

3.3 TIMING

3.3.1 The site inspection was conducted on May 21st 2014 during the afternoon. The emergence survey was conducted on 21st May 2014 between 21:00hrs and 23:00hrs (sunset 21:17hrs).

3.4 WEATHER CONDITIONS

Date	Activity	Weather conditions				
		Temp (°C)	Humidity (%)	Wind (Beaufort scale)	Cloud (%)	Precipitation
21/05/14	Site inspection	12	76	0	0	None
21/05/14	Emergence survey	12	83	0	0	None

Figure 3: *Weather conditions.*

3.5 PERSONNEL

3.5.1 The site inspection was conducted by Sam Griffin BSc ACIEEM. The emergence survey was conducted by Sam Griffin as lead ecologist, assisted by Emily Hesketh.

4. Results

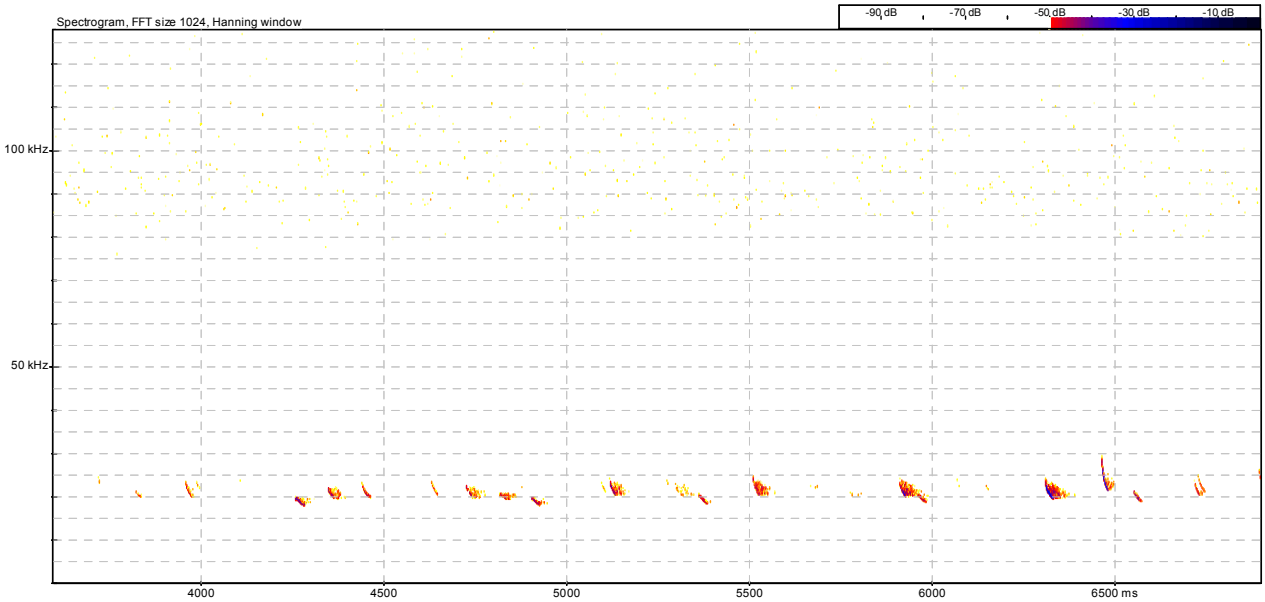

Figure 4: ***Showing sonogram of Noctule bat seen foraging above the site from 21:35hrs onwards.***

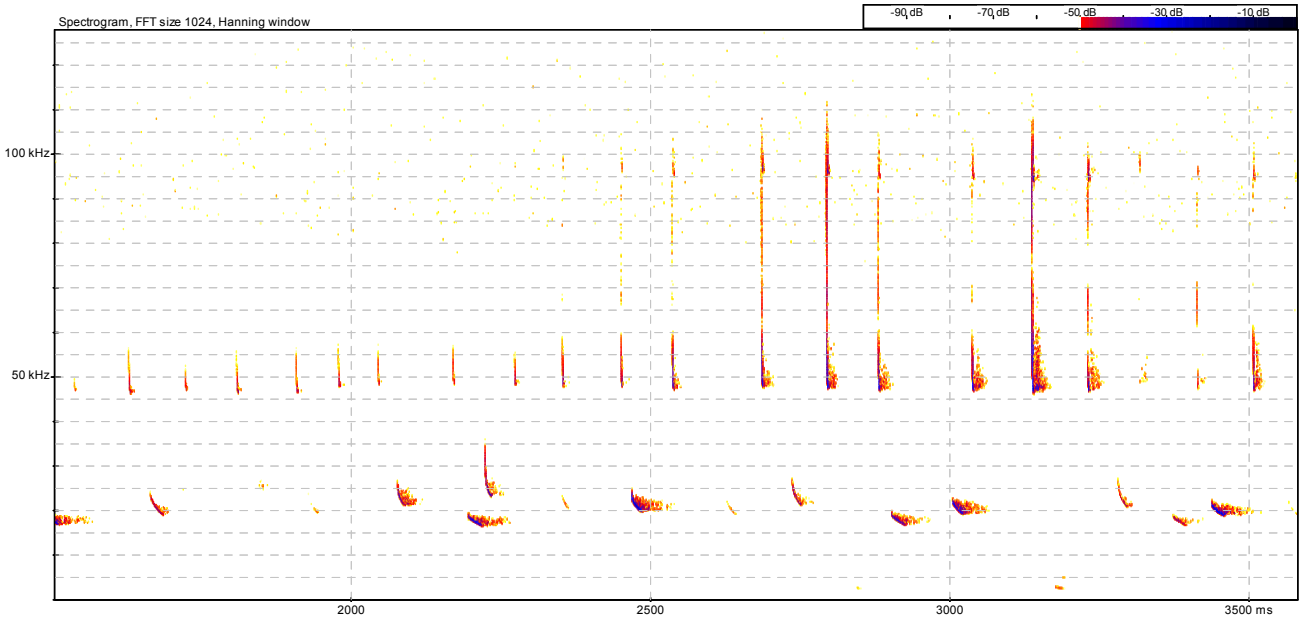

Figure 5: ***Showing sonogram of Noctule and common pipistrelle bat foraging over the site.***

Figure 6: ***Showing sonogram of soprano pipistrelle bat foraging over the site.***

4.1.1 During the site inspection no evidence of bats was discovered anywhere within or around the building. No droppings or feeding remains were identified in any of the crevices inspected and no other evidence of bats was found on site.

4.1.2 During the emergence survey noctule bats (*Nyctalus noctula*) were observed foraging above the building and church grounds from 21:35hrs onwards. A minimum of 6no. individuals were seen foraging at any one time, which – considered alongside the time at which they appeared – strongly suggests that noctule bats are roosting somewhere very close to the site. Noctule bats only roost in trees in Cumbria, and have never been found roosting in buildings. It is likely that there is a roost of noctule bats in a large mature tree (likely using a woodpecker or rot hole) either in the church grounds or immediately adjacent the church grounds.

4.1.3 Common pipistrelle bats (*Pipistrellus pipistrellus*) appeared on site at approximately 21:43hrs and foraged along the woodland edge and within the woodland. Soprano pipistrelle bats (*Pipistrellus pygmaeus*) were also recorded flying within the woodland although in lower numbers than the common pipstrelle bats.

4.1.4 No bats were seen to emerge from or enter the Hearse House, but foraging activity was heavy and sustained throughout the duration of the emergence survey.

4.1.5 From the evidence collected during the emergence survey it is concluded that bats are not currently roosting within the Hearse House but that the woodland edge is heavily used by foraging bats.

5. Interpretation and evaluation

5.1 PRESENCE / LIKELY ABSENCE

5.1.1 Based on the information collected during the survey bats are not currently roosting within the Hearse House.

5.2 POPULATION SIZE CLASS ASSESSMENT

5.2.1 N/A

5.3 SITE STATUS ASSESSMENT

5.3.1 The surrounding habitat offers high quality foraging habitat and is well connected to good quality habitats in the wider area. The Hearse House offers low potential for roosting bats and is not currently being used by roosting bats. The Hearse House itself is unlikely to be of any significance for bats in the wider area but the surrounding habitat is likely to be highly significant to a number of species.

5.4 CONSTRAINTS

5.4.1 No significant constraints to the survey were encountered.

6. Cross referenced photographs of key habitat features

Figure 7: ***Showing the interior of the Hearse House.***

Figure 8: ***Showing the northern and western elevations with woodland edge beyond.***

Figure 9: ***Showing the southern elevation.***

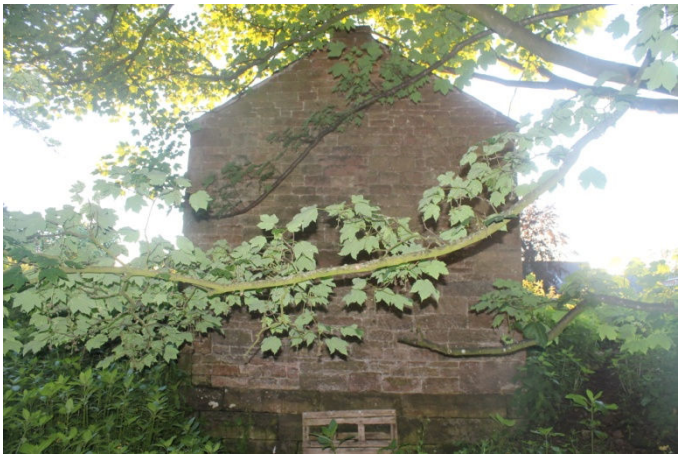

Figure 10: ***Showing eastern elevation.***

Figure 12: ***Showing the northern elevation.***

Figure 11: ***Showing example of gaps at the wall top where cement packing has fallen away at the verges.***

Figure 14: ***Showing example of gaps associated with the rotten wooden lintel.***

Figure 13: ***Showing example of wall top gaps.***

7. Impact assessment

7.1 PRE- AND MID- ACTIVITY IMPACTS

7.1.1 Bats have not been found to be roosting within the Hearse House and therefore no bat roosts will be affected by work to this building.

7.1.2 Evidence suggests that a roost of Noctule bats may exist in a mature tree on site. Any trees which may be felled and / or pruned to facilitate works should be subject to further bat survey effort.

7.2 LONG-TERM IMPACTS

7.2.1 No long term impacts to bats in the area are anticipated, however as the site is heavily used by foraging bats, care must be taken to ensure the quality of this habitat is not affected. The proposed burial/interment wall should not be illuminated at night.

7.3 POST ACTIVITY INTERFERENCE IMPACTS

7.3.1 No post activity impacts are anticipated. See Section 7.2.1 (above)

7.4 OTHER IMPACTS

7.4.1 None anticipated.

7.5 SUMMARY OF IMPACTS AT THE SITE LEVEL

7.5.1 No impacts to roosting bats are anticipated.

7.6 SUMMARY OF IMPACTS IN A WIDER CONTEXT

7.6.1 None.

8. Mitigation

8.1 MITIGATION STRATEGY

8.1.1 The general good working practices for built structures with low potential for bats out lined below will be followed at all times;

- This report will be made available to any contractor working on site.
- If bats are discovered at any time prior to or during works, all work must stop and the acting consultant contacted immediately. If this unlikely event does occur a European Protected Species licence will be sought.
- The work will be completed as quickly as possible once started. Any gaps created within stone or brick work during the course of the works will be left open for the minimum possible period. Where possible gaps will not be left open over night to avoid the possibility of bats opportunistically roosting in gaps which will later be blocked.

8.2 TIMING, EFFORT, METHODS, CAPTURE/EXCLUSION METHODS

8.2.1 As bats have not been found to be roosting within any of the building, no timing constraints are necessary.

8.2.2 Although no nesting birds were seen to be using the building at the time of the survey, it should be borne in mind that all breeding birds are protected by law whilst nesting or attending to dependant young. No work likely to affect breeding birds should occur during the breeding season (March to September inclusive).

9. Summary

9.1 SUMMARY OF DEVELOPMENT AND MITIGATION

9.1.1 This report relates to a bat survey carried out at 'The Hearse House', St. Michael's Church, Dalston, Carlisle, Cumbria, CA5 7LN (National Grid Ref. NY 37065 50264). It is understood that a proposal to partly demolish the Hearse House and re-use existing walls to form part of a memorial wall for burial/interment of cremated remains is being considered by Dalston Parish Council. The plans are currently in the early stages and no detailed or indicative site plan has been provided.

9.1.2 Based on the information collected during the survey bats are not currently roosting within the Hearse House.

9.1.3 The general good working practices for built structures with low potential for bats out lined below will be followed at all times;

- This report will be made available to any contractor working on site.
- If bats are discovered at any time prior to or during works, all work must stop and the acting consultant contacted immediately. If this unlikely event does occur a European Protected Species licence will be sought.
- The work will be completed as quickly as possible once started. Any gaps created within stone or brick work during the course of the works will be left open for the minimum possible period. Where possible gaps will not be left open over night to avoid the possibility of bats opportunistically roosting in gaps which will later be blocked.

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