Activity Survey for Bats & Birds

St Edwards Hospital Chapel, Cheddleton

August 2013

Notice to readers

This report has been prepared by Absolute Ecology 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 Institute of Ecology and Environmental Management (www.ieem.org.uk).

Capability

Surveyor 1

Matthew Haydock – HND, ND, MIEEM, Natural England Bat Survey Class Licence CL18, Registration Number CLS01637. Matthew is an ecologist with four years' experience of environmental consultancy work. He holds a HND in Environmental Management with distinction. Matthew is an experienced bat surveyor with competency in activity surveys, dawn and dusk bat roost assessments, daytime surveys for bat field signs, assessments of trees as potential bat roosts and the production of reports providing advice on best practice, mitigation and compensation works relating to bats as may be required. Matthew holds a Natural England and Countryside Council for Wales licence, since 1997, to disturb bats for the purposes of science and education or conservation and has held Development Licences to permit development works affecting bats. Matthew has been an active bat group worker with the Staffordshire Bat Group since 1997, conducting various surveys throughout Staffordshire and Derbyshire. He also works alongside the Bat Conservation Trust with various projects such as the National Bat Monitoring Project, and is now a corporate member of the Bat Conservation Trust.

Surveyor 2

Matt Hodgkinson – Natural England Licence Number 20122570. Matt has assisted with various ecological consultancy work and Staffordshire & Derbyshire bat group as a volunteer bat surveyor. He has gained competency in activity surveys, dawn and dusk bat roost assessments, daytime surveys for bat field signs, assessments of trees as potential bat roosts and the production of reports providing advice on best practice, mitigation and compensation works relating to bats as may be required.

Surveyor 3

Lucy Ashley has been assisting Absolute Ecology for nearly two years as a bat surveyor. She has gained competency in activity surveys, dawn and dusk bat roost assessments, daytime surveys for bat field signs, assessments of trees as potential bat roosts and the production of reports providing advice on best practice, mitigation and compensation works relating to bats as may be required.

Non-technical summary

Absolute Ecology was commissioned to undertake a daytime bat inspection, one dusk emergence survey and one dawn re-entry activity survey for the bat roost potential and bird activity at a building known as St Edwards Hospital Chapel, Birchtree Drive, Cheddleton, Staffordshire, ST13 7EB.

A dusk emergence survey was conducted on 28th August 2013 and dawn re-entry surveys were conducted on 3rd and 5th September 2013. Minor bat activity was recorded throughout each survey period, although four common pipistrelle bats were seen entering the building on both dawn surveys. Two confirmed species of bat were recorded foraging and commuting across the site: noctule and common pipistrelle. Peak activity of *Pipistrellus* species tended to occur more frequently one hour after sunset, inferring that these bats had commuted on site from surrounding areas to forage. Pipistrelle bats are the most common species of bat in the UK, with a widespread distribution, and are most commonly found in England and Wales.

Four common pipistrelle bats were visually recorded re-entering the south elevation; some ridge tiles adjacent to the bell tower were found to be missing during the inspection of the building. As the surveying periods were conducted during peak season, i.e. when females and pups can actively be found within maternity roosts and males can be found generally in smaller bachelor roosts, it can be concluded that a small male summer roost exists within the roof void of the building.

During the inspection of the building no active bird nests were identified. There was also no evidence that barn owls are nesting within or using the building for shelter, although barn owls were seen in the surrounding landscape. It is considered that the proposed development would have no impact on this species.

It has been established that the proposed redevelopment will not affect the roofing of the building and the reinstallation of missing ridge tiles will not alter or change the conditions of the existing roost and access will be maintained for bat emergence and re-entry. It has therefore been concluded that work can proceed without the need for a European Protected Species Licence, provided reasonable avoidance measures are implemented. Details of these are given.

Contents

1.0 Introduction

Background

1.1 Absolute Ecology was commissioned to undertake a daytime inspection coupled with an activity survey for the bat roost potential and bird activity of an existing building known as St Edwards Hospital Chapel, Birchtree Drive, Cheddleton, Staffordshire, ST13 7EB.

1.2 The surveys were undertaken by licensed bat ecologists who are also members of the Chartered Institute of Ecology & Environmental Management (CIEEM). One dusk emergence survey was conducted on 28th August 2013 and dawn re-entry surveys were conducted on 3rd and 5th September 2013. The objective of this report is to provide the client with information about the known and potential bat roosts and birds nesting within the building, and to outline recommendations for how to proceed with the works in a legal and ecologically sensitive manner, should bats and birds be present. Unless the client indicates to the contrary, information on the species found to be present on the site will be passed to the county biological records centre to update records held for the area.

1.3 The aim of the survey was to undertake an appraisal of the trees and buildings to establish the following:

- Presence/absence of bat roosts
- Status of roosts, if present
- Whether additional surveys are required
- Whether a European Protected Species (EPS) licence is required to ensure legal compliance
- Which type of mitigation measures would need to be employed.

Site Characteristics

1.4 The building under planning consideration is a moderate-sized brick construction. The chapel is immediately adjacent to Soils Wood, with River Churnet to the west of the site, at an altitude of ca. 500 m above sea level. The remainder of the surrounding environment comprises mixed-use agricultural land and scattered trees and woodland, with various streams and brooks. Field boundaries are generally hedgerows, which are characteristic of the local area. The surrounding landscape would appear to provide a range of suitable habitats for local bat populations.

2.0 Legislation and Status

2.1 All species of bat are listed in Schedule 5 of The Wildlife and Countryside Act (1981) and as such receive protection under Section 9 of this Act. This has been amended several times, most recently by the Countryside and Rights of Way Act 2000, which added 'or recklessly' to Section 9(4) (a) and (b). In summary, it is a criminal offence to:

- intentionally kill, injure or take a wild bat
- be in possession of, or control, any live or dead wild bat or part of, or anything derived from a wild bat
- intentionally or recklessly damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection
- intentionally or recklessly disturb any wild bat whilst it is occupying a structure or place that it uses for shelter or protection
- transport for sale or exchange, or offer for sale or exchange a live or dead bat or any part of a bat.

2.2 All species of bat are also listed in Schedule 2 of the Conservation (Natural Habitats, &c.) Regulations (known as the Habitats Regulations) and as such receive protection under Regulation 39 of these Regulations, making it an offence to:

- deliberately capture or kill a bat
- deliberately disturb a bat
- damage or destroy a breeding site or resting place of a bat
- keep, transport, sell or exchange, or offer for sale or exchange a live or dead bat or any part of a bat.

2.3 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.

2.4 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 when applying the requirements of PPS9 to maintain, restore and enhance species and habitats.

2.5 Seven British bat species are currently given UK BAP (2007) Priority Species Status: Staffordshire Ecological records show that 11 of the 17 resident UK bat species occur in the county, with two UK BAP species having been recorded within 2 km of the proposed application area.

UKBAP	Common name	Species
☑	Brown long-eared bat	*Plecotus auritus*
☑	Barbastelle bat	*Barbastella barbastellus*
☑	Bechstein's bat	*Myotis bechsteinii*
☑	Noctule	*Nyctalus noctula*
☑	Greater horseshoe bat	*Rhinolophus ferrumequinum*
☑	Lesser horseshoe bat	*Rhinolophus hipposideros*
☑	Soprano pipistrelle	*Pipistrellus pygmaeus*

2.6 A further four bat species that are not currently given UK BAP consideration have also been recorded within 2 km of the proposed application site:

UKBAP	Common name	Species	Recorded within 2km of site
☒	Natterer's bat	*Myotis Nattereri*	☑
☑	Noctule bat	*Nyctalus noctula*	☑
☒	Daubenton's bat	*Myotis daubentonii*	☑
☒	Whiskered/Brandt's bat	*Myotis mystacinus/brandtii*	☑
☒	Common pipistrelle	*Pipistrellus pipistrellus*	☑
☑	Soprano pipistrelle	*Pipistrellus pygmaeus*	☑

2.7 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 the 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 they are highly susceptible to habitat loss and fragmentation.

3.0 Methodology

Inspection & Activity Surveys

3.1 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, 2007 2nd edition 2012). 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. Equipment used to aid the survey included low and high-powered torches, ladders, binoculars and an endoscope.

3.2 Notes were made on the following in accordance with the guidelines published by the BCT (2007 2nd edition 2012) 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.

3.3 The activity survey was performed in accordance with the guidelines published by the BCT (2007 2nd edition 2012) 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.

3.4 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, 2007 2nd edition 2012):

- 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.

3.5 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.

3.6 Bat ultrasound data was gathered using a number of heterodyne (Batbox Duet and SSF Bat2) and real-time recording devices (Wildlife Acoustics Echo Meter EM3, Pettersson tranquillity detector). Real-time recordings were subsequently analysed using BatSound v4.03 software.

3.7 Survey methodology also utilized a number of passive monitoring techniques including an infra-red night-vision camera (XLT Bushnell Trophy CamTM: USA) to qualitatively record any evidence of bat activity inside the building during surveying periods. Further equipment included a NVMT-1 2x24 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.

Limitations of the survey

3.8 All survey effort was undertaken during August and September 2013. This is considered an optimal time of the year to fully evaluate the presence or absence of bats in buildings, as many bats are established in maternity or male summer roosts. Due to the height of the roof, an internal inspection for any evidence of bats was not possible.

<table>
<tr><th>Jan</th><th>Feb</th><th>March</th><th>April</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sept</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td colspan="3">Inspection of hibernation roosts – semi-optimal survey period</td><td>Limited activity – sub-optimal survey period</td><td colspan="5">Summer roost emergence & re-entry surveys – optimal survey period</td><td>Limited activity – sub–optimal survey period</td><td colspan="2">Hibernation roosts – semi-optimal survey period</td></tr>
<tr><td colspan="12">Internal roost surveys are possible/Trees are best surveyed during winter</td></tr>
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4.0 Results

Inspection Survey

Surrounding landscape

4.1 The site and surroundings provide potential foraging habitat for a number of bat species. The adjacent gardens could be used by foraging bats. The surrounding landscape comprises residential buildings and gardens and is likely to support a large number of bats; hedgerows and residential gardens are all potential feeding and commuting areas for bats.

Figure 1. Red circle indicates chapel location

4.2 No constraints were encountered during the site survey.

Building 1 internal & external survey

4.3 The chapel is located to the north of Birchtree Drive. It is a grade 2 listed building built c 1895-99. It is a brick structure with sandstone dressings and sandstone pinnacles and has three gable ends aligned north to south. It is proposed that this building be redeveloped into a dwelling. The chapel is 40 m long x 15 m wide. The brickwork and stonework is in fairly good condition, providing little in the way of crevices for bats and birds to utilize. Some windows have small breakages which are sufficient for bats and birds to use as possible entry points. The remainder of the doors and windows are intact. The roofing of the chapel, which is pitched and slated, has some raised or dislodged slates which bats could potentially climb

under. No external evidence of bats was found, but it should be noted that evidence can be removed by the external environment.

4.4 The interior of the chapel is a large open space to the rafters, with five smaller rooms including a former WC and porches. The nave has a hammer-beam king post roof, and the chancel has a king post roof. The plain rendered walls with stone dressings, which are all in good condition, provide limited roosting opportunities. It was impossible to inspect between the roofing slates and the rafters due to the height. The main open-planned chapel room is ideal for preflight emergence, although it is pitted with daylight from the large windows. As bats prefer dark, secluded areas, this may discourage them from using the rooms for roosting. Until recently, the chapel has been used by nesting feral pigeons (*Columba palumbus*). Thus, there is a substantial deposit of bird guano on the floor and timber regions, suggesting that this area has been occupied by this species for a number of seasons. A thorough inspection revealed no presence or evidence of bats, and it is highly probable that bats may have been displaced by the presence of *Columba palumbus* and the subsequent accumulation of bird detritus. The building is considered to have depreciated in its conservation value for bats.

Cellar

4.5 The cellar was also inspected for bat potential. There is no evidence of access points leading to the exterior. The walls are brick and have very few crevices for bats. The crevices that were identified were checked for any physical signs of bats, but none were found. The cellar was identified as having low to moderate hibernacula potential for bats due to the limiting climatic variations and limited access.

Activity Surveys

Environmental variables

Environmental Variable	Dusk Emergence Survey	1st Dawn Re-Entry Survey	2nd Dawn Re-Entry Survey
Temp Start	16 °C	13 °C	14.3 °C
Temp Finish	15 °C	14 °C	15.1 °C
Humidity Start	90%	92%	91%
Humidity Finish	88%	90%	87%
Cloud Cover Start	50%	80%	50%
Cloud Cover Finish	50%	80%	50%
Wind Speed Average	7 mph	4 mph	4 mph
Precipitation	Dry	Dry	Dry

1st Survey: Dusk Activity Survey

- The dusk emergence survey was conducted on 28th August 2013. The survey was conducted half an hour before sunset and two hours thereafter. Survey conditions were optimal with a mean ambient temperature of 16 °C. Foraging activity by a low number of bats (n=<24) was recorded across the rear amenity grassland area, and predominantly along the northern boundary hedgerow.

- Only 24 ultrasound recordings were made over the entire evening, with peak activity occurring between 20.32 and 21.20. Four species of bat were recorded. All calls were assigned to common pipistrelle. *Pipistrellus* sp. were recorded actively foraging in the garden before dispersing off site into the wider landscape. No bats were seen emerging from the building itself.

Figure 1: Location of bat activity during the first survey visit.

2nd Survey: 1st Dawn Activity Survey

- The first dawn re-entry survey was conducted on 3rd September 2013. The survey was conducted half an hour before sunrise until full daylight. The survey conditions were optimal for bat activity. Four bats were seen re-entering the ridge of the roof on the south elevation where missing ridge tiles adjacent to the bell tower had been identified. Eleven calls were recorded, peaking at 45 KHz. Sound analysis confirmed that the calls were made by common pipistrelle bats.

- Peak activity occurred between 05.20 and 05.45.

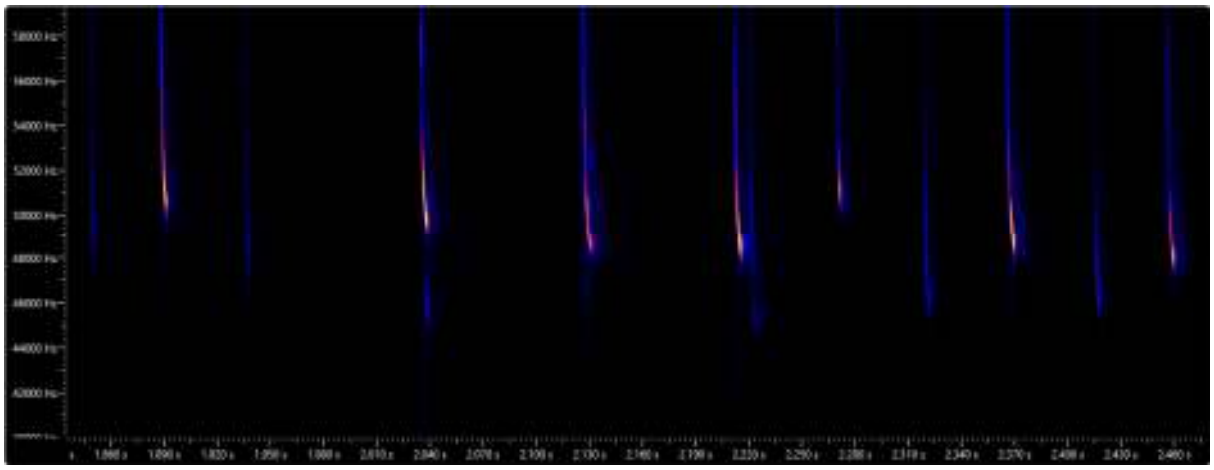


Figure 2: Recording of foraging common pipistrelle, which was the most dominant bat in the area; peak call 48.9 KHz.

3rd Survey: 2nd Dawn Activity Survey

- The second dawn re-entry survey was conducted on 5th September 2013. The survey was conducted half an hour before sunrise until full daylight. The survey conditions were optimal for bat activity. Four bats were seen re-entering the ridge of the roof on the south elevation where missing ridge tiles adjacent to the bell tower had been identified. Fifteen calls were recorded, peaking at 48.1 KHz. Sound analysis confirmed that the calls were made by common pipistrelle bats.

- Peak bat activity occurred between 05.40 and 06.00.

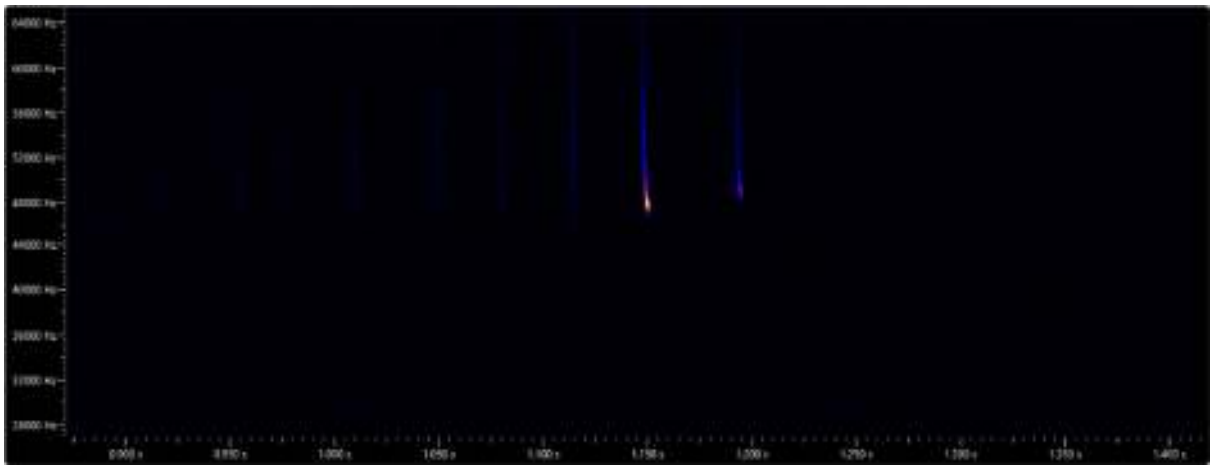


Figure 3: Recording of common pipistrelle, which was the most dominant bat in the area; peak call 48.8 KHz located just outside roost entrance.

5.0 Evaluation

5.1 The initial assessment of the building and surrounding features strongly supports the potential presence of bats. The main area of the chapel is of a substantial and accommodating size for bats, particularly those species that perform pre-emergent flight behaviour, such as the brown long-eared bat. However, on closer scrutiny, the building's interior is pitted with shafts of daylight from a number of windows.

5.2 The weather conditions during the surveys were favourable. The majority of bat activity during the dusk surveys was recorded along the hedgerow to the east of the site, with low activity recorded throughout the remainder of the site.

5.3 During the dusk emergence survey and the dawn re-entry surveys, four common pipistrelle bats were seen entering the south-facing external roofing section where missing ridge tiles had been identified. Although bats were identified re-entering the chapel via the section of missing ridge tiles, it is considered that the proposed redevelopment will not impact the bat roost between the roofing tiles and the internal roofing panels, as the internal roofing panels will be retained with no alterations. Re-roofing will not be carried out, as the roof is in good repair, apart from the small section of missing ridge tiles through which the bats re-entered the building. The works will be carried out in late autumn when bats are unlikely to be present, and all access points and internal/external conditions will replicate those prior to the works. It is considered that the site is likely to continue to function as a summer roost, breeding site or resting place for common pipistrelle; therefore, the redevelopment is unlikely to have an impact on the conservation status of the species provided appropriate precautionary measures are put in place.

5.4 Pipistrelle bats are the most common species of bat in the UK, with a widespread distribution, and are most commonly found in England and Wales. Pipistrelle bats exploit a wide range of habitats, including those associated with built-up areas (BCT, 2010, 2010a). Both common and soprano pipistrelles are Local BAP Priority Species, and soprano pipistrelles are a UK BAP Priority Species; however, no roosting bats were discovered on site and the low level of activity by just a few individuals suggests that the site is of low conservation significance for the species.

6.0Impacts and Recommendations

Impacts

6.1 The chapel is to be redeveloped into a dwelling. The following potential impacts have therefore been identified:

- Part of the roof, including missing ridge tiles, is to be renewed. This will involve re-establishing new ridge tiles to stop rain from entering the building. In the absence of any mitigation, the following potential impacts have been identified:
- Disturbance of roosting bats within the roof tiles.
- The proposed re/development will not have a negative impact on bats, as no roofing alterations will occur.

Legal Compliance

6.2 The Wildlife and Countryside Act 1981 as amended by The CRoW Act 2000 and The Conservation of Habitats and Species Regulations 2010 makes it illegal to recklessly damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection, whether the bat is occupying the shelter at the time or not.

6.3 A European Protected Species Licence from Natural England can be obtained to permit an action that is otherwise unlawful such as demolition or conversion of buildings, or significant alterations to roof voids known to be used by bats.

6.4 A licence is not required where an offence is unlikely to be committed, an example being carefully planned re-roofing works, carried out while bats are not present and the access points and roosting area are not affected (Mitchell-Jones, 2004).

6.5 The proposed roofing works will not impact on the continued ecological functionality of the adjacent roost, as the roost will remain unaltered by the works and any materials on the roof will be replaced while leaving sufficient gaps under the ridge tiles to maintain the existing access point for bats. Provided works take place during the period specified below then disturbance to roosting bats is unlikely.

Further Surveys

6.6 During the activity surveys, which conform to the BCT guidelines (2007 2nd edition 2012), all effort was made to establish if a roost is present or not.

6.7 The optimum period for carrying out works is 1st October – 1st April when bats are least likely to be present. Works should therefore take place during this time. Surveys carried out to date have demonstrated that bats were absent at the time of the surveys and it unlikely that bats will return until spring.

Exclusion and Pre-works Survey

6.8 It will not be necessary to exclude bats from the roof space prior to the commencement of works or carry out a pre-works survey. Any works will take place during a time when bats are likely to be absent from the adjacent roof space.

Care and Vigilance during Works

6.9 It is normally recommended that features housing bats or with the potential to house bats on the structure are removed under the supervision of an ecologist licensed to handle bats and disturb roosts. Contractor(s) should be advised to carry out all work with care and vigilance for bats.

6.10 The contractor should be advised to adhere to the following procedures in the event bats are found during works:

- If the roost is still in the structure and bats are not injured, stop work and contact a licensed ecologist. If help is not available, allow bats to fly out of harm's way.
- If material containing a roost has been removed, the roost is not exposed and the bats are not injured, temporarily seal and isolate the roost, stop work and seek advice from a licensed ecologist. If advice is not readily available, re-open it and allow bats to relocate of their own accord.
- If the roost has been exposed, and especially if bats have been injured, stop work, collect bats in a secure box or bag (using a glove) and contact a licensed ecologist.

Biodiversity Enhancement

6.11 Recommendations are given to enhance the site for nesting birds in future, including the provision of bird boxes.

Further details regarding birds can be found at the following websites:

http://www.rspb.org.uk/wildlife/birdguide/name/s/swallow/encouraging.aspx

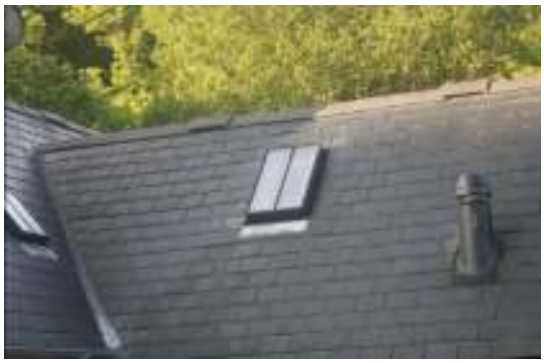
http://www.rspb.org.uk/advice/helpingbirds/roofs/internal_boxes.aspx

6.12 It is recommended that the development should incorporate a number of bat boxes; where possible, developments should include small access points suitable for bat access and/or wall mounted bat boxes ('1FQ' style bat box), rendered into new buildings. Further information for providing access to roosting bats can be found on the Bat Conservation Trust website at http://www.bats.org.uk/pages/new_build.html. It is recommended that bat boxes, such as the Schwegler 2F-DFP, are installed within trees surrounding the site.

6.13 Any landscaping relating to the proposed development should also take into consideration bats and other wildlife and it is recommended that only native tree and shrub species are planted. In particular, no plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 should be planted during the landscaping of this development. For further details of Schedule 9 plants, visit the Defra website: www.defra.gov.uk/wildlife-pets/non-native.

6.14 Any lighting design around the new development should be considered at an early stage. Light spill can affect the foraging and commuting strategy of many species and should be avoided onto nearby trees and hedges/shrubs, and should not exceed 200 lumens (150 watts). Any security lighting should be on a timer setting and faced down to prevent spillage onto nearby habitats. The height of any lighting columns around the development should not exceed eight metres to reduce further any ecological impact of light pollution. Low-pressure sodium lamps (SOX) fitted with hoods are recommended to direct light below the horizontal plane to minimize upward light spill.

6.15 Ridge tile access features must be free of obstruction from any insulation materials. The raised tiles will allow bats access into the existing roost area. The ridge gaps should measure approximately 30 mm x 100 mm to maintain the existing access.



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8.0 Plans

Building Location Plan

9.0 Photographic Plates

Plate 1: Potential bat roosting opportunity within the main area of the chapel.

Plate 2: Dislodged roofing slates provide potential access for bats.

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Location of missing ridge tiles and roost access.