

BAT AND BARN OWL SURVEY

LOW TOWN, GREENHEAD



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2016

DRAFT

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UNLESS REQUESTED OTHERWISE, THE INFORMATION BELOW, RELATING TO THE LOCAL AREA, WILL BE PROVIDED TO THE ENVIRONMENTAL RECORDS CENTRE FOR THE NORTH EAST (ERIC)

SPECIES	RECORDER	DATE	LOCATION (4 FIG. NGR)	ABUNDANCE	COMMENT
Soprano Pipistrelle	E3 Ecology Ltd	September 2015	NY68 66	1	Roost
Unknown Bat	E3 Ecology Ltd	September 2015	NY68 66	2	Roost
Common Pipistrelle	E3 Ecology Ltd	September 2015	NY68 66	3	Foraging
<i>Myotis Sp.</i>	E3 Ecology Ltd	September 2015	NY68 66	2	Foraging
Noctule	E3 Ecology Ltd	September 2015	NY68 66	2	Commuting
Barn Owl	E3 Ecology Ltd	September 2015	NY68 66	2	Breeding Site

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A. SUMMARY

E3 Ecology Ltd was commissioned by Land Factor in August 2015 to undertake a daytime bat and barn owl risk assessment and two dusk bat activity surveys of Low Town, Greenhead. Further survey, including a barn owl checking survey and single dusk activity survey were completed in May and June 2016. The proposed development involves the conversion of the property into a holiday let, with most of the buildings structure being retained and a small extension added to the western elevation.

Consultation with the Multi-Agency Geographic Information for the Countryside (MAGIC) website indicated that the site is within the Northumberland National Park. There are two nationally important sites within 2km of the site: Allolee to Walltown SSSI, 0.1km to the north and Tipalt Burn SSSI, 1.7km to the north-west. There are also five internationally important sites within 5km these are: the River Eden SAC, 4.7km to the north-west, Border Mires, Kielder-Butterburn SAC, 5km to the north, Tyne and Allen River Gravels SAC, 3.6km to the south, Irthinghead Mires Ramsar, 3.3km to the north and the North Pennines Moors SPA, 4.2km to the south. Due to the nature of the development, no impacts are anticipated on these protected sites. As a precaution any access route should avoid the Allolee to Walltown SSSI and any waste produced during the renovations should be stored away from the SSSI on the south side of the site.

Consultation with the Northumberland bat group identified the presence of 4 known roost locations from within 2km, one each of Whiskered/Brandt's bat, common pipistrelle, brown long eared bat and an unknown bat species.

Initial site inspection was undertaken on 20th August 2015 and comprised a detailed inspection of the structures on site. Dusk activity surveys for bats and barn owl were undertaken on the 20th August and the 10th September 2015 with a further dusk survey undertaken on the 14th June 2016.

The site is situated in an area dominated by upland pasture, with mature woodland 100m to the west, in the form of Walltown Wood. Foraging habitat on site is poor but woodland to the west provides excellent foraging habitat and there is good connectivity from the site to this woodland. Overall, the habitats present would suggest that there is a medium to high risk of bats of roosting, foraging and commuting in the local area.

The building to be renovated is stone built with a pitched slate roof and boarded windows. Detailed internal inspection of the interior was not possible due to the presence of breeding barn owl in 2015 and due to health and safety concerns in 2016. Pointing is in relatively poor condition externally, with numerous cracks in the stone work and cracks in the mortar, providing access routes into the fabric of the walls, particularly on the western elevation. Overall, as a result of the risk assessment, there is considered to be a medium to high risk of roosts being present. Two single storey lean-to type buildings were present on the western (Building A2) and eastern (Building A3) elevations of the building. Building A2 is of tin construction with a mono-pitched tin roof. Building A3 is of stone construction and is well sealed, with a corrugated asbestos, mono-pitched roof. Both buildings A2 and A3 are considered to have a negligible risk of supporting roosting bats,

An internal inspection of the ground floor was conducted prior to the second survey conducted on the 10th September 2016 as barn owl were not present on the ground floor on this occasion. Inspection of the first floor of the building was not possible due to health and safety reasons. Internal ground floor and limited first floor inspection was undertaken in May 2016, s barn owl were absent, however, rotted floor boards and staircase significantly limited first floor inspection. External inspection did not reveal any field signs.

Dusk survey on 20th of August 2015 recorded no emergences from the building but did record common pipistrelle, soprano pipistrelle, noctule, and *Myotis* spp. foraging and commuting activity, as well as confirming the presence of a barn owl breeding site within the building. Dusk survey on the 10th September 2015 recorded the **emergence of a soprano pipistrelle, a possible emergence of a common pipistrelle and two unidentified bats** from the south western corner of the building, through a crack in the wall just below the roof. Dusk survey on the 15th June 2016 recorded the **emergence of two common pipistrelle**, from the north western and north eastern corners of the building.

A checking survey in May 2016 for barn owl found that the access into the building had been sealed over the winter and subsequently the site is no longer considered to support barn owl. Should access be possible in the future, it is likely that the site will be reused.

From the lack of field signs and its disused/derelict nature the site is considered not to support a maternity colony, though the site is concluded to support the following roosts, commuting routes and foraging areas:

- Day roosts for small numbers of both common and soprano pipistrelle (1-3 bats). . Considered to be of local value.
- Local value foraging and commuting habitat for a number of bat species, including common and soprano pipistrelle and individuals of the *Myotis* genus.
- The site formerly supported breeding barn owl.
- Potential hibernation roosts within the stone walls.

As bat roosts are present within the site and will be affected by the proposed works, a Natural England licence will be required.

Potential impacts of the development in order of conservation significance are:

1. Harm/disturbance to bats roosting within the building at the time of works.
2. Harm/disturbance to barn owl breeding within the building at the time of works, should access be gained.
3. Loss of confirmed day roosts used by small numbers of soprano pipistrelle and common pipistrelle bats during the active season.
4. The loss of a former barn owl breeding site.
5. The loss of a moderate number of potential crevice roost sites within the fabric of the walls, within internal features of the building and under tiles.
6. The loss of a small number of potential hibernation roost sites within the fabric of the building.
7. Increased disturbance to foraging and commuting bats through increased lighting on site.
8. Increased disturbance to foraging barn owl through more frequent use of the site and increased lighting.

Mitigation on site will include:

- **Works on site will not commence until a Natural England development licence has been obtained.**
- 3 bat boxes (as detailed below) will be provided on site prior to works commencing to provide roosting opportunities during the works.
- Prior to works commencing a site induction meeting will be held, attended by the project ecologist and lead contractors.
- Works will not commence until a detailed inspection of the structure has taken place once scaffolding has been provided.
- The following key elements of work will not be completed during the hibernation period (mid-November to mid-March inclusive):
 - Demolition of stonework

- Re-structuring/re-pointing of existing stone
- Keying in of new build to existing stone/brickwork
- Removal of ridge tiles and slates
- Removal of roof timbers
- Exposing of the wall tops via roof stripping works
- No exclusion will be undertaken during the hibernation period (mid-November to mid-March inclusive).
- External lighting that may reduce bat use of the buildings will be avoided. High intensity security lights will be avoided as far as practical, and any lighting in areas identified as being important for bats will be low level (2m) and low lumin. Light spillage to areas used by foraging or commuting bats should be less than 2 lux. No lighting will be installed along the flyways between the roosts and adjacent trees, woodland and foraging areas. Where security lights are required, these will be of minimum practicable brightness, be set on a short timer and will be motion sensitive only to larger objects.
- Two barn owl boxes on poles will be erected in the wider landscaping adjacent to good quality foraging areas.
- Mitigation will be incorporated/retained in the converted building.

The local planning authority and Natural England are likely to require the means of delivery of the mitigation to be identified. It is recommended that mitigation and enhancement proposals are incorporated into the master-planning documents.

If you are assessing this report for a local planning authority and have any difficulties interpreting plans and figures from a scanned version of the report, E3 Ecology Ltd would be happy to email a PDF copy to you. Please contact us on 01434 230982.

B. INTRODUCTION

B.1 BACKGROUND TO DEVELOPMENT

E3 Ecology Ltd was commissioned by Land Factor in August 2015, to undertake a daytime bat and barn owl risk assessment and two dusk bat surveys of Low Town, Greenhead. Further survey, including a barn owl checking survey and single dusk activity survey were completed in May and June 2016.

The site is situated 2.5km to the north east of Greenhead and 2.8km to the north west of Haltwhistle at an approximate central grid reference of NY 683 662. Site location is illustrated below in Figure 1.

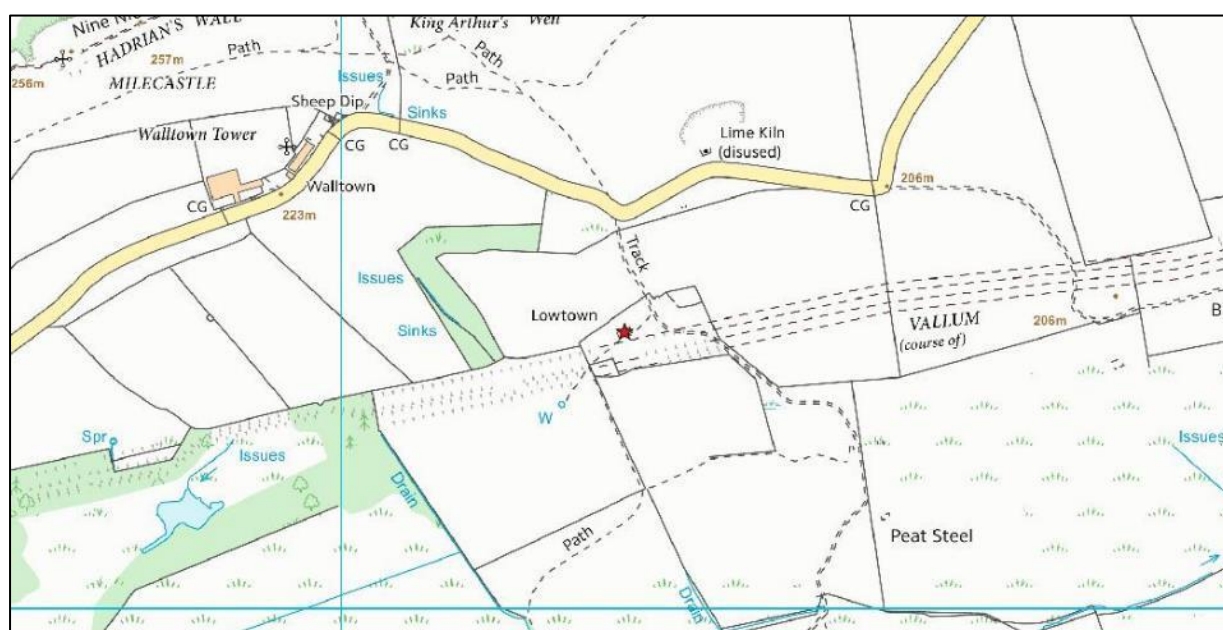


FIGURE 1 – SITE LOCATION
(Reproduced from the ordnance survey map under licence)

B.2 CURRENT DEVELOPMENT INFORMATION

It is currently proposed to renovate the property into a holiday let. A small extension will also be added to the western elevation of the building. No detailed development plans are currently available.

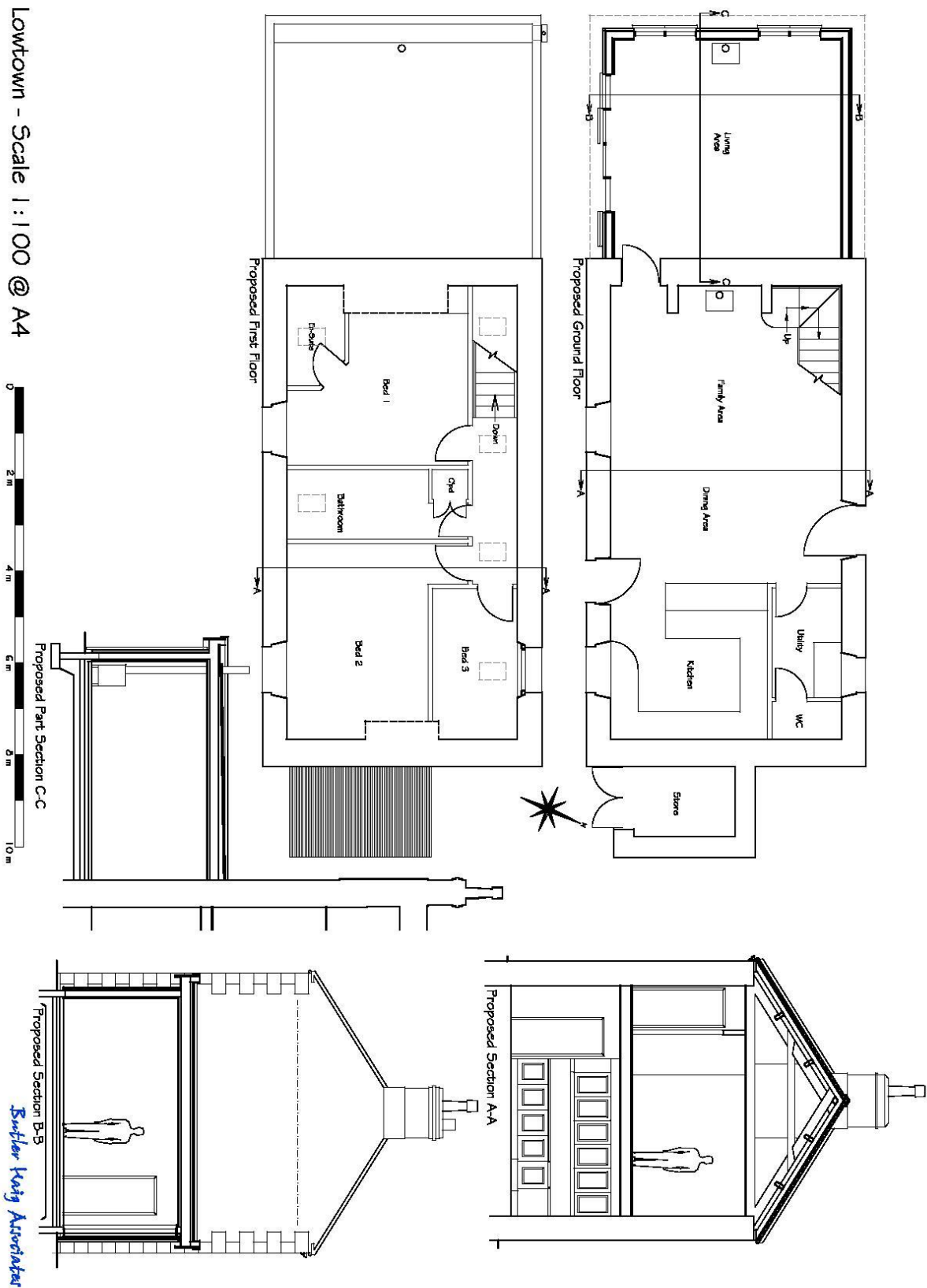


FIGURE 2 – SITE PROPOSALS

B.3 PLANNING POLICY AND LEGISLATIVE CONTEXT

B.3.1 NATIONAL PLANNING POLICY

TABLE 1 details the key paragraphs from the National Planning Policy Framework (NPPF)¹ relating to the natural environment:

TABLE 1: NATIONAL PLANNING POLICY FRAMEWORK: NATURAL ENVIRONMENT	
Statement	Paragraph
The planning system should contribute to and enhance the natural and local environment by: <ul style="list-style-type: none"> o Recognising the wider benefits of ecosystem services; o Minimising impacts on biodiversity and providing net gains in biodiversity where possible 	109
Planning policies and decisions should encourage the effective use of land by re-using land that has been previously developed (brownfield land), provided that it is not of high environmental value.	111
Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife sites will be judged. Distinctions should be made between the hierarchy of international, national and locally designated sites so that protection is commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks	113
To minimise impacts on biodiversity, planning policies should: <ul style="list-style-type: none"> o Promote the preservation, restoration and re-creation of priority habitats ecological networks and the protection and recovery of priority species populations, linked to national and local targets 	117
When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principals: <ul style="list-style-type: none"> o If significant harm resulting from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; o Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted; o Opportunities to incorporate biodiversity in and around developments should be encouraged; o Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees, found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss 	118
By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation	125

Section 40 of the Natural Environment and Rural Communities Act 2006, places a duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity.

Planning Practice Guidance² states:

- *'The National Planning Policy Framework is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution' (para. 007).*
- *'Information on biodiversity impacts and opportunities should inform all stages of development An ecological survey will be necessary in advance of a planning application if the type and location of development are such that the impact on biodiversity may be significant and existing information is lacking or inadequate' (para. 016).*
- *'Where an Environmental Impact Assessment is not needed it might still be appropriate to undertake an ecological survey, for example, where protected species may be present' (para. 016).*

¹ National Planning Policy Framework (March 2012), Department for Communities and Local Government,

² Planning Practice Guidance: Natural Environment (www.planningguidance.communities.gov)

- *'Local planning authorities should only require ecological surveys where clearly justified, for example if they consider there is a reasonable likelihood of a protected species being present and affected by development. Assessments should be proportionate to the nature and scale of development proposed and the likely impact on biodiversity' (para. 016).*
- *'Biodiversity enhancement in and around development should be led by a local understanding of ecological networks, and should seek to include:*
 - *habitat restoration, re-creation and expansion;*
 - *improved links between existing sites;*
 - *buffering of existing important sites;*
 - *new biodiversity features within development; and*
 - *securing management for long term enhancement' (para. 017).*

B.3.2 RELEVANT LEGISLATION

Within England all bat species are specially protected under the Conservation of Habitats and Species Regulations (2010).

As a result there is a requirement to consult with Natural England before undertaking any works that may disturb bats or their roost, and under the Conservation of Habitats and Species Regulations it is illegal to.

- Deliberately kill, injure or capture bats.
- Deliberately obstruct access to a bat roost.
- Damage or destroy a bat roost.
- Deliberately disturb bats; in particular any disturbance which is likely to impair their ability:
 - (i) to survive, to breed or reproduce, or to rear or nurture their young; or
 - (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
 - (iii) to affect significantly the local distribution or abundance of the species to which they belong.

Under the Wildlife and Countryside Act (1981) the above offence of disturbing bats includes low level disturbance and as such under this act it is also an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a roost.
- Intentionally or recklessly obstruct access to a roost.

Under the above legal protection, only the offences under the Conservation of Habitats and Species Regulations (2010) are strict liability offences; the remaining offences, under the Wildlife and Countryside Act (1981), are offences only where they are carried out "intentionally or recklessly".

Under the Countryside and Rights of Way Act 2000 (CROW Act) the offence in section 9(4) of the Wildlife and Countryside Act 1981 of disturbing bats is extended to cover reckless damage or disturbance.

The Hedgerow Regulations 1997 provide for the conservation of important hedgerows and their constituent trees. The presence of a protected species such as bats is a relevant consideration when assessing whether a hedgerow is important and may influence a local planning authority's decision on whether to approve removal of such hedges.

B.3.3 RELEVANT BIRD LEGISLATION

SCHEDULE 1 SPECIES

These are rare or threatened breeding UK birds, such as peregrine or corncrake, which are afforded special protection under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). In addition to the protection from killing or taking that all birds, their nests and eggs have under the Act, Schedule 1 birds and their young must not be disturbed at the nest.

These species are in general scarce breeders and will increase the ornithological value of the site in at least a district context.

B.3.4 WILDLIFE SITE POLICY AND LEGISLATION

Details of the legislation surrounding protected sites are provided in the appendices.

B.4 PERSONNEL

Survey work and reporting was undertaken by:

Name	Position	Professional Qualifications	Natural England Survey Licence Numbers
Mark Osborne	Associate Director	CEcol MCIEEM	2015-14412-CLS-CLS (Bats), 2015-14496-CLS-CLS (Bats), CL29/00185 (Barn Owl)
Amy McCallum	Ecologist	BSc MSc MCIEEM	2015-10168 -CLS-CLS (Bats) & CL29/00012 (Barn Owl)
Ben Crossman	Graduate Ecologist	BSc MRes	-

The project was checked by:

- Mark Osborne Btec CEcol MCIEEM **Natural England Bat Licence No.**
CLS 2015-14412 & 14496

Details of experience and qualifications are available at www.e3ecology.co.uk.

B.5 SCOPE OF STUDY

The survey area included all potential roost and nest sites for both bats and barn owls within the development area. In addition potential roosting locations adjacent to the survey area were also considered within the assessment. The level of survey effort employed at the site has taken account of the recommendations within the Bat Conservation Trust Good Practice Survey Guidelines³.

B.6 OBJECTIVES OF STUDY

The objective of the study was to gain a sufficiently detailed picture of bat and barn owl populations to allow an assessment of the likely impacts of the proposed development on these species, and where necessary to allow mitigation to be designed which minimises the risk of harm and maintains their conservation status in the local area (for example by ensuring that there is no net reduction in the number of available roost sites).

³ Hundt, L. 2012 Bat Surveys: Good Practice Guidelines. 2nd Edition. Bat Conservation Trust

C. SURVEY AREA AND METHODOLOGY

C.1 SURVEY AREA

Figure 2 illustrates the site location whilst Figure 3 illustrates the broad habitats present within an approximate 500m buffer zone.

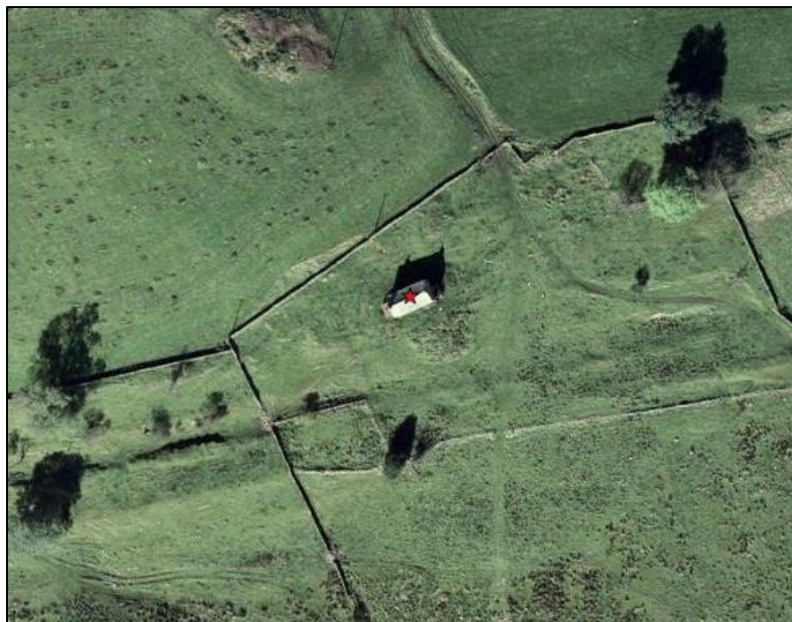


FIGURE 3— AERIAL PHOTOGRAPH OF THE SITE ILLUSTRATING ITS LOCATION WITHIN THE SURROUNDING HABITAT (Reproduced under licence from Google Earth Pro.)



FIGURE 4— AERIAL PHOTOGRAPH CENTRED ON THE SITE WITH A 500M RADIUS ILLUSTRATING THE SETTING AND THE HABITATS IT SUPPORTS (Reproduced under licence from Google Earth Pro.)

C.2 DESKTOP STUDY METHODOLOGY

Initially, the site was assessed from aerial photographs and 1:25000 OS plans. Following this, consultation was undertaken with, Northumberland Bat Group and the Multi Agency Geographic Information for the Countryside (MAGIC) website⁴ was checked for any notable sites relevant to this assessment.

C.3 PRELIMINARY FIELD STUDY METHODOLOGY

C.3.1 DAYTIME BAT RISK ASSESSMENT

A daytime assessment was made of all structures affected by the proposed development, in order to evaluate their potential for supporting bat roosts, and where present to record signs of use by bats.

Structures were inspected both externally and internally where access was available. Binoculars and extendable ladders were used to assist with the inspection for droppings and other field signs.

Where present, soffits, purlins and ridge boards were searched thoroughly, together with the walls and floor under potential roost sites and any mortise joints, particularly in the gable walls. Wherever practicable, roof spaces and attic areas were surveyed for signs of droppings which persist all year in dry conditions, food debris, entry points and bats themselves. Where bats were present, the survey was adapted to avoid disturbance, with identification of bats being confirmed by recording bats at emergence and analysing the calls.

Externally, the buildings were examined for potential bat roost access points indicated by clean crevices, urine marks, polished wood or stonework and droppings. Particular attention was given to sheltered areas under the eaves of buildings, window ledges and towards the tops of windows where droppings are less likely to have been washed off.

The bat risk assessment of the buildings was undertaken on the 20th August 2015 by Amy McCallum MCIEEM.

Note that comments on the state of the structures within the site relate solely to their potential use by bats and must not be taken as a professional assessment of the structural integrity or safety of the structures. For example, descriptions of walls and roofs being in 'good' or 'poor condition' relate to likely provision of roost sites for bats, potential access routes to roost sites, and likely persistence of field signs such as droppings and feeding remains, which will not persist in exposed conditions. Maternity roosts are less likely to be present in cool, exposed, damp and draughty locations which may develop in a building in poor condition.

C.3.2 DAYTIME BARN OWL RISK ASSESSMENT

A daytime assessment was made of all structures affected by the proposed development, in order to evaluate their potential for supporting breeding barn owl and where present to record signs of use by barn owls.

Structures were inspected both externally and internally where access was available. Binoculars and extendable ladders were used to assist with the inspection for pellets and other field signs.

⁴ Multi-Agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk

Wherever practicable, roof spaces and attic areas were surveyed for signs of droppings and pellets, which persist all year in dry conditions, food debris, entry points and barn owls themselves.

The barn owl risk assessment of the buildings was undertaken on the 20th August 2015 by Amy McCallum MCIEEM. Updating survey was completed by Mark Osborne in May 2016.

C.3.3 PRELIMINARY SURVEY - EQUIPMENT

- Clulite CB2 high powered torch.
- Zeiss 8x30 binoculars.

C.3.4 ENVIRONMENTAL CONDITIONS

DATE	TEMPERATURE	CLOUD COVER	PRECIPITATION	WIND CONDITIONS
20/08/2015	20°C	100%	Dry	Still

C.3.5 SURVEY CONSTRAINTS

Thorough internal inspection of the building was not possible during the initial risk assessment due to the presence of breeding barn owl. An internal inspection of the ground floor was conducted prior to the second survey conducted on the 10th September 2015 as barn owl were not present on the ground floor on this occasion. Inspection of the first floor of the building was not possible as this could not be confirmed as structurally sound. External inspection did not reveal any field signs.

C.4 DETAILED ACTIVITY SURVEY METHODOLOGY

C.4.1 DUSK EMERGENCE/DAWN SWARMING ACTIVITY SURVEY

C.4.1.1 SURVEY METHODS

Activity surveys were undertaken in suitably mild conditions when bats were active. Surveyor locations sought to box-in the site and give a good degree of confidence of whether bats were flying into or out of the survey area.

Surveyors were positioned to ensure coverage of all high-risk areas of the site, including any potential flight-lines from structures within the site to adjacent cover such as woodland blocks. If bats were recorded within the site before bats were seen in the wider area, or seen flying into the site, it is assumed that roosts are present within the site.

All surveyors used Batbox Duet bat detectors, listening through earphones to both heterodyne and frequency division signals to help ensure that all bats were detected. Anabat Express bat detectors were used to record bat activity at each surveyor location. Timings were recorded using synchronised clocks accurate to within a few seconds of each other. Data were recorded to allow confirmation of species identification through call analysis (using Batsounds and Analook software), and to capture brief echolocation calls that could not be reliably identified in the field. Field survey recorded numbers of bats detected, feeding activity, flight paths, species (as far as is practicable), and social calls. This technique helps to record both emerging or flying bats and their echolocation calls without any disturbance from the presence

of people. By cross-referencing times and external light levels, the likelihood of recorded bats roosting within the structures can be assessed.

A total of 6 person-nights work was undertaken. Figures provided within the results illustrate the approximate location of each surveyor and monitoring point.

Given good calls many species, including common and soprano pipistrelles, and noctule can be identified with a good degree of confidence. The *Myotis* genus of bats is much harder to separate reliably as their frequency modulated calls are very similar. For these species either slope analysis of Anabat calls or a combination of call loudness, frequency range, habitat and flight characteristics are used to report species as accurately as possible. Pipistrelle bats echo-locating at 50kHz or 40kHz could not be reliably assigned to a species and are noted as pips, those echo-locating below 40kHz are identified as Nathusius' pipistrelles. If the species name is given without qualification, the record was of good quality. If there is a degree of uncertainty this is indicated by a question mark, e.g.?brown long-eared. If identification to species is not practicable then just the genus or 'bats' is used.

Barn owl activity was also monitored through these surveys. Flight lines were mapped and the times of these recorded. Behaviours such as calling, foraging and the locations at which individuals left and entered the building were also noted.

Activity surveys were undertaken on the dates and times as detailed within the table below.

DATE	START TIME	END TIME	TIME OF SUNSET	NO. OF SURVEYORS	NO. OF REMOTE MONITORING POINTS
20/08/2015	20:10	22:00	20:30	2	0
10/09/2015	19:10	21:00	19:36	2	0
15/06/2016	21.30	22.28	21.47	2	0

The nature of the site is such that all high-risk buildings could be assessed with the resources used.

The table below details the environmental conditions for each activity survey.

DATE	TEMPERATURE START	TEMPERATURE END	CLOUD COVER	PRECIPITATION	WIND CONDITIONS
20/08/2015	20 °C	16 °C	80%	Dry	2 E
10/09/2015	15.6 °C	10 °C	10%	Dry	2-3 E
15/06/2016	14 °C	12 °C	95-100%	Heavy rain from 22.20	1-2 NE

C.4.1.2 SURVEY EQUIPMENT

- Duet bat detector
- Anabat Express
- Analook software

C.4.2 SURVEY CONSTRAINTS

There were no constraints to the first two activity surveys. Heavy rain began approximately 20 minutes after sunset during the third survey, and the survey was abandoned 30 minutes after sunset. Due to the nature of the building, considered to be of low suitability to support a maternity roost and the fact that bats had emerged at and around sunset, this is not considered to have adversely affected the assessment and has been discussed with the National Park's ecologist.

D. RESULTS

D.1 DESKTOP STUDY

D.1.1 PRE-EXISTING INFORMATION

ORDNANCE SURVEY MAPPING AND AERIAL PHOTOGRAPHY

Figures 1 (Section B.1), 2 and 3 (both Section C.1) show that the general land use in the surrounding area is dominated by pasture land, with extensive areas of woodland and scattered trees to the north-west and west. Field boundaries are made up of stone walls.

The most recent aerial photograph of the site available (Figure 2, 2007) indicates that habitats on site are dominated by pasture. Historic imagery suggests that this habitat has not changed since at least 2001.

MULTI AGENCY GEOGRAPHIC INFORMATION FOR THE COUNTRYSIDE WEBSITE (WWW.MAGIC.GOV.UK)

Consultation with the Multi-Agency Geographic Information for the Countryside website indicated that the site is within the Northumberland National Park. The following nationally important sites lie within 2km of the site:

- Allotee to Walltown SSSI, 0.1km to the north at its nearest point.
- Tipalt Burn SSSI, 1.7km to the north west at its nearest point.

And the following internationally important sites are within 5km:

- River Eden SAC, 4.7km to the north west at its nearest point.
- Border Mires, Kielder-Butterburn SAC, 5km to the north at its nearest point.
- Tyne and Allen River Gravels SAC, 3.6km to the south at its nearest point.
- Irthinghead Mires Ramsar, 3.3km to the north at its nearest point.
- North Pennines Moors SPA, 4.2km to the south at its nearest point.

Allotee to Walltown SSSI is designated for its wide range of grasslands and uncommon plant species associated with the soils of the Whin Sill. Tipalt Burn SSSI is designated for the presence of Lower Carboniferous rock which has a high fossil content. The site lies within the Allotee to Walltown SSSI impact risk zone but as the development is so small no impacts are envisioned.

The River Eden SAC is designated for three Annex 1 habitats including oligotrophic and mesotrophic standing water, water courses with *Ranunculion fluitantis* and *Callitriche-Batachion* and alluvial forests. Annex 2 species found in these habitats include white-clawed crayfish, sea lamprey, brook lamprey, river lamprey, Atlantic salmon, bullhead and otter.

Border Mires, Kielder-Butterburn SAC is designated for two Annex 1 habitats: Blanket bogs and transitional mires.

The Tyne and Allen River Gravels SAC is designated for its Calaminarian grassland and represents the largest area of this habitat in the UK.

Irthinghead Mires Ramsar is an area blanket mire which supports internationally important blanket mire habitats, populations of breeding waders and a rare spider.

Due to the nature of the development no impacts are anticipated on these protected sites. As a precaution any access route should avoid the Allotee to Walltown SSSI and any waste

produced during the renovations should be stored away from the SSSI on the south side of the site.

The North Pennines Moors is designated for internationally important populations of breeding curlew and nationally important populations of breeding golden plover, hen harrier, merlin, peregrine falcon and dunlin.

Priority habitats in the local area include broadleaf woodland 150m and 300m to the west (Walltown Wood) and areas of upland heath 250m and 450m to the south and west (Haltwhistle Common).

D.1.2 CONSULTATION

LOCAL BAT GROUP

Consultation with the Northumberland bat group showed the presence of 4 known roost locations from within 2km, one each of Whiskered/Brant's bat, common pipistrelle, brown long eared bat and an unknown bat species. There were also non-roost records of common pipistrelle and soprano pipistrelle. The closest roost identified was that of a single unidentified pipistrelle, located 1.3km west, the other side of Walltown wood.

Species	Date	Distance from site	Comment
Whiskered/Brandt's	2010	1.6km	1 count, roost
Common Pipistrelle	2010	1.6km	3 count, roost
Brown Long-eared Bat	2008	2.1km	37 count, roost
Bat	1988	2.5km	42 count, roost
<i>Pipistrellus</i> sp.	2013	1.3km	1 count
Soprano Pipistrelle	2010	1.4km	2 count

D.2 DAYTIME RISK ASSESSMENT

D.2.1 HABITATS

FORAGING HABITATS

Foraging habitat surrounding the building itself is poor, with the habitat consisting of semi-improved grassland and scattered trees. However there are extensive areas of broadleaf woodland to the west, the nearest block of woodland being just over 100m away, which will provide excellent foraging habitat. The habitats to the north east and south consist of open grass and moorland, including SSSI grassland, providing some foraging potential, along with the stone walls dividing the fields.



COMMUTING ROUTES

A steep bank and stone wall provide a commuting route between the building and the woodland 100m to the west. This woodland then connects to Walltown Wood further west.

SHELTERED FLIGHT AREAS

Building sections A2 and A3 provide some limited shelter for light sampling but are too small to provide sheltered flight areas.

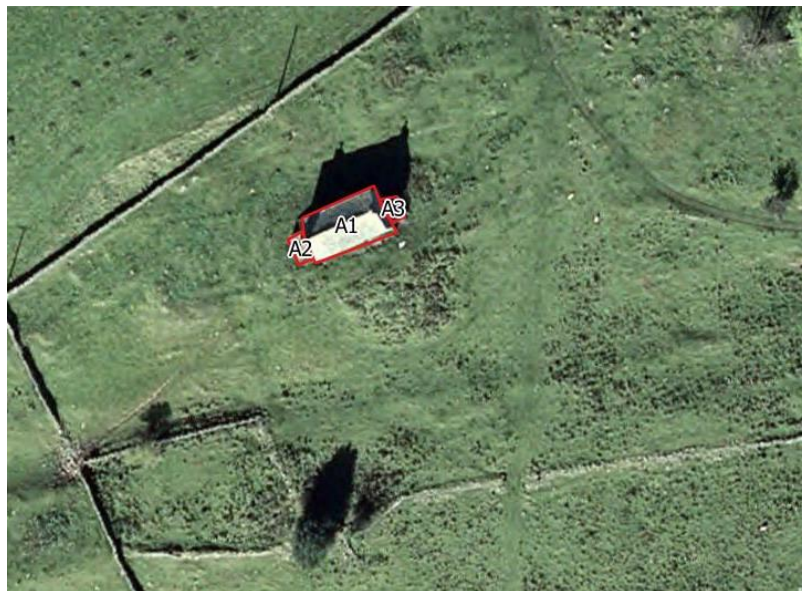


ALTERNATIVE ROOST LOCATIONS

There are very few alternative roost locations in the surrounding area. The nearest buildings are Walltown Farm located 400m to the north west. The only other buildings in the landscape are Allolee Farm 600m to the north east and Fell end farm 900m to the south, to which connectivity is poor. There may be some roosting opportunities within the woodland to the west.

D.2.2 BUILDINGS

Figure 4 below shows a building section plan.



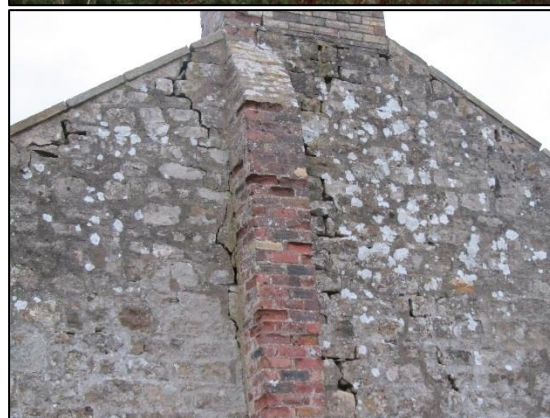
**FIGURE 5– AERIAL PHOTOGRAPH CENTRED ON THE SITE
WITH A 500M RADIUS ILLUSTRATING THE SETTING AND THE
HABITATS IT SUPPORTS
(Reproduced under licence from Google Earth Pro.)**

Building features which have the potential to support roosting bats or barn owl are underlined, whilst field signs that confirm bat use are in bold.

BUILDING SECTION A1- MAIN BUILDING

Two storey stone building with pitched tiled roof and gable ends.

- Many gaps and cracks in the stonework.
- Large areas of crumbled and missing mortar.
- The roof is in poor condition with many slipped and missing slates.
- Windows boarded up with wood, gaps between wooden boards and stone work.
- Large cracks in the stone and brickwork of the chimney on the western elevation.
- Cracks in stone work and missing mortar on the gable ends, eastern elevation in better condition than western elevation.
- No soffits, fascias, bargeboards or flashing present.
- No bat field signs found.
- **A Schedule 1 species, barn owl, was observed within the building in 2015.**
- **Survey in 2016 found that the door had been sealed, preventing access for barn owl.**
- Jackdaw were recorded using the chimney and within the upper floor.



This building is considered to have a **moderate-high risk** of supporting roosting bats and **supported nesting barn owl in 2015.**

BUILDING SECTION A2 - TIN LEAN-TO

Single story lean-to on the western elevation of building section A1 used as storage space and constructed of a wooden frame and corrugated tin, with a mono-pitched roof.

- No roof void
- No field signs
- No gaps that would provide a potential roost location.
- Some potential to be used for light sampling



Considered to have a **negligible risk** of supporting roosting bats.

BUILDING SECTION A3-STONE LEAN-TOO

Single story lean-to on the eastern elevation of building section A1 used as storage space and constructed of stone with a mono-pitched corrugated asbestos roof.

- No roof void
- No field signs
- Stone work generally well-sealed with no gaps.
- Some potential to be used for light sampling.



Considered to have a **negligible to low risk** of supporting roosting bats.

D.2.3 BAT RISK SUMMARY

TABLE 7 – RISK OF SUPPORTING ROOSTING BATS				
HABITATS AND SETTING ⁵				
	MINIMAL	LOW	MEDIUM	HIGH
HABITATS AND COVER WITHIN 200M	City Centre	Open, exposed arable, amenity grass or pasture	Walls and trees linking site to wider countryside	Excellent cover with mature trees and/or good hedges
HABITATS WITHIN 1KM	City Centre	Little tree cover, few hedges, arable dominated	Small areas of woodland and other areas of semi-natural habitat	Good network of woods, wetland and hedges
ALTERNATIVE ROOSTS WITHIN 1KM	City centre	Numerous alternative roost sites of a similar nature	A number of similar buildings in the local area	Few alternative buildings and site of good quality for roosts
SETTING	Inner city	Urban with little green space	Rural upland with woodland, grassland and moorland.	Rural Lowland with woodland and trees.
DISTANCE TO WATER/ MARSH	>1km	500m-1000m	200m-500m	<200m
DISTANCE TO WOODLAND/ SCRUB	>1km	500m-1000m	200m-500m	<200m
DISTANCE TO SPECIES-RICH GRASSLAND	>1km	500m-1000m	200m-500m	<200m
COMMUTING ROUTES	Isolated by development, major roads, large scale agriculture	No potential flyways linking site to wider countryside	Some potential commuting routes to and from site	Site is well connected to surrounding area with multiple flyways
BUILDINGS ²				
	MINIMAL	LOW	MEDIUM	HIGH
AGE (APPROX.)	Modern	Post 1940's	1900-1940	Pre 20 th C
BUILDING/ COMPLEX TYPE	Industrial complex of modern design	Single, small building	Several buildings, large old single structure	Traditional farm buildings, country house, hospital
BUILDING - STOREYS	N/A	Single storey	Multiple storeys	Multiple storeys with large roof voids
STONE/BRICK WORK	No detectable crevices	Well pointed	Some cracks and crevices	Poor condition, many crevices, thick walls
FRAMEWORK – TIMBERS/STEEL	Unknown			
ROOF VOID	Unknown			
ROOF COVERING	Modern sheet materials and tightly sealed	Good condition or very open not weatherproof modern sheet materials	Some potential access routes, slates, tiles	Uneven with gaps, not too open, stone tiles
ADDITIONAL FEATURES	Very well maintained and tightly sealed	No features with potential access	Some features with potential access	Hanging tiles, cladding, barge boards, soffits with access gaps
EXTERNAL LIGHTING	Extensive security lights covering much of the site	Widespread areas above 2 lux at night	Intermittent lights of low intensity	Minimal
BUILDING USE	Very noisy, dusty	Regular use	Intermittent use	Disused

⁵ Building and habitat risk assessment technique audited in a research project with York University which compared the risk assessment scoring with the results of detailed field assessment for over 100 sites. Statistically significant associations were found between habitat setting and building features and the presence of absence of different bat species. For example habitat connections and nearby woodland were significant for brown long-eared bats and the presence of species-rich grassland is important for many species.

Overall, the building at Low Town is considered of medium-high risk of supporting bats. The building is stone built with rubble filled walls. There are multiple potential roost features, such as slipped and missing tiles, cracks in the stone work and missing mortar that all provide access to the internal space and to the cavity wall. Due to the derelict and exposed nature of the structure it is considered unsuitable to support a maternity colony.

The woodland to the west provides potential foraging habitat for bats and there are potential commuting routes from the site, in the form a steep bank and stone wall, which leads to the woodland to the west. There are few alternative roost locations in the area, with scattered farms providing the only similar roosting habitat in the surrounding area. Overall, the habitats present would suggest that there is a medium-high risk of bats of roosting, foraging and commuting in the local area.

D.3 ACTIVITY SURVEY

D.3.1 DUSK EMERGENCE ACTIVITY SURVEY

Emergence survey 20/08/15

No emergences from the building were recorded. Most bat activity was heard but not seen, especially from around 21:30 due to low light levels. At least four species of bat were recorded: common pipistrelle, soprano pipistrelle, noctule, and *Myotis* spp. (probable WAB and Natterer's bats). Foraging mainly occurred on the south side of the building. At least one barn owl was observed during the survey.

Surveyor locations and a summary of bat activity and barn owl activity are shown in Figure 5 below.



FIGURE 6– BAT AND BARN OWL ACTIVITY 20.08.15

Emergence survey 10/09/15

Again four bat species were recorded: common pipistrelle, soprano pipistrelle, noctule, and *Myotis* spp. (probable WAB). Emergences of soprano pipistrelle, a possible common pipistrelle and two unidentified bats were recorded from the south western corner of the building, through a crack in the wall just below the roof. A single unidentified bat was the first to emerge at 19:55:05, 19 minutes after sunset, followed by a second unidentified bat at 20:06. Bats could not subsequently be identified using Analook as no echolocations were recorded at these times, however, given the timing, it is considered these are likely to be pipistrelle bats. A single soprano pipistrelle then emerged at 20:11 followed by a possible emergence of a single common pipistrelle at 20:32. Common pipistrelle and individuals of the *Myotis* genus were recorded foraging around the western side of the site as well as commuting through the site and noctule were heard but not seen on several occasions by both surveyors. The first bat recorded was a noctule, heard but not seen, at 19:54, 18 minutes after sunset. The first common pipistrelle was heard at 20:19, 43 minutes after sunset, with *Myotis* being recorded much later. Barn owl also observed entering and leaving the south western corner of the building.

Surveyor locations and a summary of bat activity and barn owl activity are shown in Figure 6 below.

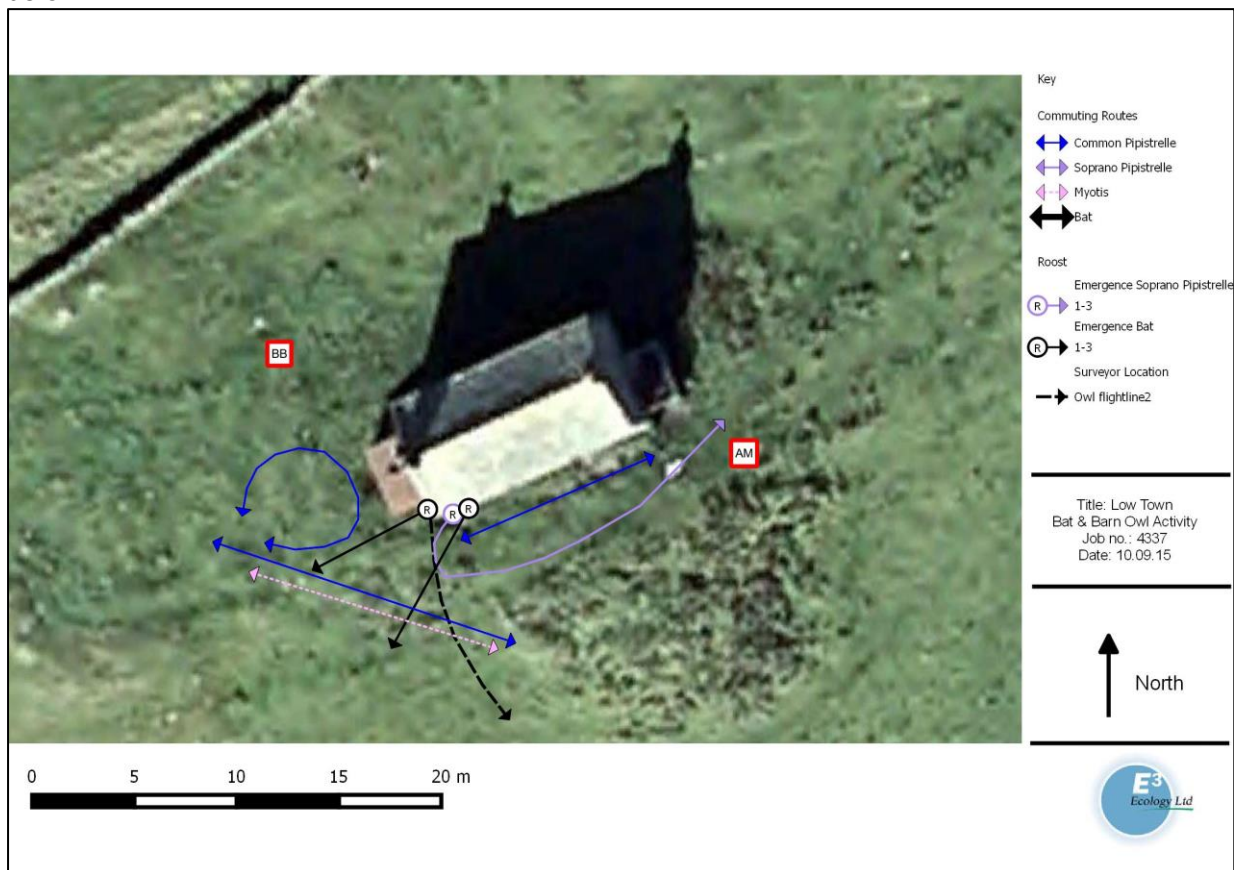


FIGURE 7– BAT AND BARN OWL ACTIVITY 10.09.15



FIGURE 8— BAT ROOST LOCATION

Emergence survey 15/06/16

The survey in June 2016 recorded two species: common pipistrelle and soprano pipistrelle. Emergences of two common pipistrelle were recorded from the water tables of both gables on the northern elevation of the building. The first bat was recorded at 22.14 with the second at 22.15. The two bats then foraged around the structure. A soprano pipistrelle was recorded foraging in the wider area. Light rain began at approximately 22.20 and the survey was abandoned at 22.30 when it became torrential. No further emergences were recorded during the light rain and no bats were recorded returning.

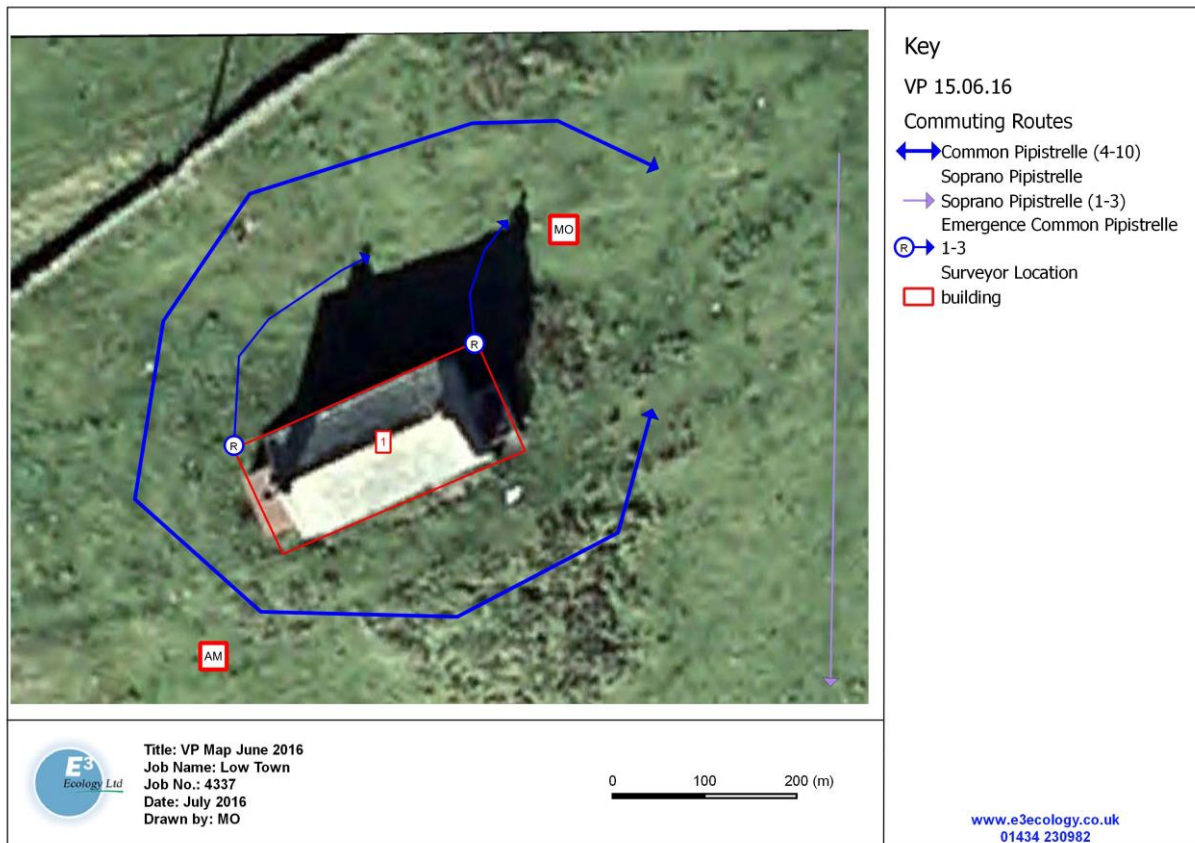


FIGURE 9 – BAT ACTIVITY 15.06.16

Full survey data are provided in Appendix 4.

D.4 BARN OWL ASSESSMENT

A single barn owl and chick were recorded using the interior of the house during the risk assessment and the adult was seen flying to and from the building during both activity surveys in 2015. Survey in 2016 found that the door, used for access, had been blocked over the winter. As such the site is considered to have previously been a breeding site, though no evidence was recorded in 2016. It is likely that the nearby pasture land is still used as a foraging resource.

E. SITE ASSESSMENT

The value and significance of the habitats and species found was assessed against the following criteria developed from the Guidelines for Ecological Impact Assessment produced by the Chartered Institute of Ecology and Environmental Management⁶.

TABLE 8- ECOLOGICAL IMPACT ASSESSMENT VALUATION	
LEVEL OF VALUE	EXAMPLES
International	<ul style="list-style-type: none"> An internationally designated site or candidate site with annex 2 listed bat species as a reason for the designation (SACs).
National	<ul style="list-style-type: none"> A nationally important site designated as a result of bat populations. A nationally important bat roost due to size, type, species present, assemblage or location.
Regional	<ul style="list-style-type: none"> Large maternity, mating or hibernation sites used by rare species in the region, including Nathusius' pipistrelle, Leisler's and Brandt's bats.
County	<ul style="list-style-type: none"> Large maternity, mating or hibernation sites used by uncommon species in the region, including Daubenton's, Natterer's, soprano pipistrelle, noctule, brown long eared and whiskered Small to moderate maternity roosts, hibernation and autumn swarming roosts used by rare species; Species assemblage of at least 6 species.
District	<ul style="list-style-type: none"> Small numbers of non-breeding rare species (5+); Small-moderate maternity or hibernation roosts used by uncommon species; Large maternity roost of common species to the region (common pipistrelle); Species assemblage comprising at least 4 species.
Parish	<ul style="list-style-type: none"> Hibernation, small-moderate maternity and autumn swarming roosts of common species; Small numbers of uncommon species; Occasional (1-4 bats) roost of rare species.
Local	<ul style="list-style-type: none"> Small numbers of common species; Feeding/individual roosts of uncommon species; Feeding roosts of rare species.
Low	<ul style="list-style-type: none"> No roosts recorded, habitats unlikely to support foraging behaviour of local population.

E.1 ASSESSMENT OF SURVEY FINDINGS

Bats

Following the initial risk assessment, the building to be affected was concluded to have moderate-high potential to support roosting bats, though concluded to be unsuitable to support a maternity colony, with multiple features with the potential to be used by roosting bats, including access points into the building's interior. The wider landscape also provides good quality foraging habitat in the form of woodland to the west, with stone walls connecting the building to this habitat.

Three dusk activity surveys were then carried out in August and September 2015 and June 2016. The second and third surveys confirmed the presence of low numbers of day roosting pipistrelle bats within the structure, four bats were recorded emerging through a crack in the wall just below the roof during the second survey and two bats were recorded emerging from the wall tops in the third. These were identified as both common and soprano pipistrelle with two silent bats considered likely to also be a pipistrelle species given the time of emergence.

⁶ Chartered Institute for Ecology and Environmental Management (2006) Guidelines for Ecological Impact Assessment in the United Kingdom (Version 7 July 2006). <http://www.ieem.org.uk/ecia/index.html>.

Due to the structure of the building and its disused nature there is also considered to be a moderate risk that the site provides hibernation opportunities between mid-November and mid-March (inclusive).

A Natural England licence will need to be applied for and attained before building works can begin. Overall the site is considered to be of local value, supporting small numbers of day roosting pipistrelle bats. There is also potential for the property to support hibernating bats.

Common pipistrelle and individuals of the *Myotis* genus were recorded foraging and commuting through the site in low numbers and small numbers of noctule were recorded as heard not seen, likely to be commuting over the site.

Barn Owl

Building section A1 was identified as an active barn owl (a Schedule 1⁷ species) breeding site in 2015. Survey in 2016 indicated that the site is no longer used by the species as the access to the building has been blocked.

E.2 LIMITATIONS AND CONSTRAINTS

Thorough internal inspection of the building was not possible during the initial risk assessment due to the presence of breeding barn owl. An internal inspection of the ground floor was conducted prior to the second survey conducted on the 10th September as barn owl were not present on the ground floor on this occasion. Inspection of the first floor of the building was not possible as this could not be confirmed as structurally sound. External inspection did not reveal any field signs. The overall assessment of the risk of a bat roost being present is thought to have been impacted upon by this limitation and subsequent activity surveys were therefore recommended.

Survey completed at the site will provide reasonably typical data for the likely active season. Assessment of the bat use of the site at other times of year and the potential impacts of the proposed development is based on professional judgement.

⁷ Schedule 1 species: These are rare or threatened breeding UK birds, such as peregrine or corncrake, which are afforded special protection under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). In addition to the protection from killing or taking that all birds, their nests and eggs have under the Act, Schedule 1 birds and their young must not be disturbed at the nest.

F. IMPACT ASSESSMENT

The impact assessment is based on Natural England's 'Table 6.1 – The scale of main impacts at the site level on bat populations'.⁸ A copy is provided in the appendix 3 for reference.

F.1 DIRECT DEVELOPMENT IMPACTS

- Harm/disturbance to bats roosting within the building at the time of works.
- Harm/disturbance to barn owl breeding within the building at the time of works, should access be gained.
- Loss of confirmed day roosts used by small numbers of soprano pipistrelle and common pipistrelle during the active season.
- The loss of a former barn owl breeding site.
- The loss of a moderate number of potential crevice roost sites within the fabric of the walls, within internal features of the building and under tiles.
- The loss of a small number of potential hibernation roost sites within the fabric of the building.

F.2 INDIRECT IMPACTS ON LOCAL POPULATIONS

- Increased disturbance to foraging and commuting bats through increased lighting on site.
- Increased disturbance to foraging barn owl through increased use of the site and increased lighting.

G. RECOMMENDATIONS

The recommendations have been based upon survey effort to date and may evolve with future findings.

The mitigation strategy aims to minimise effects on biodiversity by:

- avoiding significant negative impacts where possible through good design;
- developing approaches to mitigate any remaining unavoidable impacts; and
- proposing compensation for any significant residual impacts on biodiversity.

This approach is in-line with CIEEM recommendations.

G.1 FURTHER SURVEY

As bat roosts are present within the site and will be affected by the proposed works, a Natural England licence will be obtained prior to works commencing on site.

If development does not happen within 12 months of this report, an updating survey will be required, ideally to be undertaken between May and August.

⁸ Mitchell-Jones A. J., 2004, Bat Mitigation Guidelines, Table 6.1 The scale of main impacts at the site level on bats, p37, English Nature

G.2 AVOIDANCE AND MITIGATION STRATEGY

G.2.1 SITE DESIGN

- External lighting that may reduce bat use of the buildings will be avoided. High intensity security lights will be avoided as far as practical, and any lighting in areas identified as being important for bats will be low level (2m) and low lumin. Light spillage to areas used by foraging or commuting bats should be less than 2 lux. No lighting will be installed along the flyways between the roosts and adjacent trees, woodland and foraging areas. Where security lights are required, these will be of minimum practicable brightness, be set on a short timer and will be motion sensitive only to larger objects.

G.2.2 TIMING OF WORKS

- **Works on site will not commence until a Natural England development licence has been obtained.**
- 3 bat boxes (as detailed below) will be provided on site prior to works commencing to provide roosting opportunities during the works.
- Prior to works commencing a site induction meeting will be held, attended by the project ecologist and lead contractors.
- Works will not commence until a detailed inspection of the structure has taken place once scaffolding has been provided.
- The following key elements of work will not be completed during the hibernation period (mid-November to mid-March inclusive):
 - Demolition of stonework
 - Re-structuring/re-pointing of existing stone
 - Keying in of new build to existing stone/brickwork
 - Removal of ridge tiles and slates
 - Removal of roof timbers
 - Exposing of the wall tops via roof stripping works
- No exclusion will be undertaken during the hibernation period (mid-November to mid-March inclusive).

G.2.3 WORKING METHODS AND BEST PRACTICE

- A copy of the relevant Natural England licence method statement will be provided to contractors prior to the induction process at the start of works. The project ecologist will review all key points with contractors during the induction and provide all necessary training.
- A detailed method statement and training will be provided to contractors as part of the induction process at the start of works.
- Once scaffolding is in place the project ecologist will carry out a detailed inspection of the structures and mark up crevice roost sites and access points to be retained.
- Where evidence of current use is recorded, the project ecologist will install standard one-way exclusion valves. If one-way valves are used these will be left in place for a minimum of 2 nights when temperatures remain higher than 10°C for at least one hour after dusk. No exclusion will be undertaken during the hibernation period (mid-November to mid-March inclusive).
- Old slates, coping stones, ridge tiles will be removed carefully by hand, being aware that bats may be present beneath slates or ridge tiles, within mortise joints, cavity walls, between loose stones, between lintels and in gaps around window frames and in sash windows.

- If bats are found during works, works will stop in that area and the ecological consultant will be contacted immediately. If it is necessary to move the bats for their safety, this will be undertaken by a licensed bat handler.

The following measures should be included as general good working practice:

- Timber treatments that are toxic to mammals will be avoided. If required, timber treatment will be carried out in the spring or autumn. Both pre-treated timbers and timber treatments will use chemicals classed as safe for use where bats may be present (see http://www.jncc.gov.uk/pdf/batwork_manualpt4.pdf).

G.3 COMPENSATION STRATEGY

The following compensation strategy is proposed:

G.3.1.1 *BAT BOXES*

In advance of the start of works 3 bat boxes will be erected in adjacent trees, within the site owners landholding, to provide alternative roost sites. Boxes will be erected as high as possible, ideally at a minimum height of 4m.

Boxes will include 1 suitable for hibernation use by small numbers of bats.

G.3.1.2 *CREVICE ROOST SITES*

A total of 6 external crevice roost sites, 2 on each elevation, within the stone walls will be marked up and access retained/created through careful repointing. Such gaps will be from 15-20mm wide and 40-80mm long, or repointed to create such a gap by using a roll of newspaper 20mm in diameter angled upwards into the gap, applying the mortar around, and then removing the paper before the mortar is fully cured to leave a weather-proof access route for bats.

Access to the underside of the ridge tiles will be provided in 3 locations through 20mm diameter gaps in the pointing. Access between ridge tiles will be provided through gaps in the mortar joints.

With the implementation of the above mitigation strategy it is not anticipated that there will be any significant adverse residual effects on bats from the proposed development. As such, a compensation strategy is not required.

G.4 MONITORING

No further monitoring is recommended.

G.5 ADDITIONAL ENHANCEMENT RECOMMENDATIONS

The following additional enhancement measures are recommended in order to further enhance the site for biodiversity:

- Two barn owl boxes on poles will be erected in the wider landscaping adjacent to good quality foraging areas.

APPENDIX 1. STATUTORILY AND NON- STATUTORILY DESIGNATED SITES

A1.i STATUTORILY DESIGNATED SITES

Ramsar Sites

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. The Convention recognizes wetlands as important ecosystems and includes a range of wetland types from marsh to both fresh and salt water habitats. The wetlands can also include additional areas adjacent to the main water-bodies such as river banks or coastal areas where appropriate.

Special Protection Areas (SPAs)

SPAs are classified by the UK Government under the EC Birds Directive and comprise areas which are important for both rare and migratory birds.

Special Areas of Conservation

SACs are designated under the EC Habitats Directive and are areas which have been identified as best representing the range and variety of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the Conservation of Habitats and Species Regulations 2010 (as amended) unless they are offshore.

Sites of Special Scientific Interest

SSSIs are designated as sites which are examples of important flora, fauna, or geological or physiographical features. They are notified under the Wildlife and Countryside Act 1981 with improved provisions introduced by the Countryside and Rights of Way Act 2000. They are often components of larger SACs or SPAs.

National Nature Reserves (NNRs)

NNRs are designated by Natural England under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 and support important ecosystems which are managed for conservation. They may also provide important opportunities for recreation and scientific study.

Country Parks

Country Parks are statutorily designated and managed by local authorities in England and Wales under the Countryside Act 1968. They do not necessarily have any nature conservation importance, but provide opportunities for recreation and leisure near urban areas.

A1.ii NON-STATUTORILY DESIGNATED SITES

Local Nature Reserves (LNRs)

LNRs are designated under the National Parks and Access to the Countryside Act 1949 by local authorities in consultation with Natural England. They are managed for nature conservation and used as a recreational and educational resource.

Non-Governmental Organisation Property

These are sites of biodiversity importance which are managed as reserves by a range of NGOs. Examples include sites owned by the RSPB, the Woodland Trust and the Wildlife Trusts

Local Wildlife Sites (LWSs)

These are sites defined within the local plans under the Town and Country Planning system and are material considerations of any planning application determination. They are designated by the local authority although criteria can vary between authorities.

APPENDIX 2. BAT ECOLOGY

A2.i PROPOSALS LIKELY TO AFFECT BATS

A list of development types likely to affect bats where they impact on particular features is provided below:

TABLE 9 – PLANNING AND DEVELOPMENT TRIGGER LIST FOR BAT SURVEYS⁹

REFERENCE	NATURE OF WORK	TYPE OF BUILDING OR FEATURE
1	Conversion, modification, demolition or removal of buildings (including hotels, schools, hospitals, churches, commercial premises and derelict buildings)	Agricultural buildings e.g. farmhouses, barns and outbuildings) of traditional brick or stone construction and/or with exposed wooden beams
		Buildings with weather boarding and/or hanging tiles that are within 200m of woodland and/or water
		Pre-1960 detached buildings and structures within 200m of woodland and/or water
		Pre-1914 buildings within 400m of woodland and/or water
		Pre-1914 buildings with gable ends or slate roofs, regardless of location
		Buildings located within, or immediately adjacent to woodland and/or immediately adjacent to water
		Dutch barns or livestock buildings with a single skin roof and board and gap or Yorkshire boarding if following a preliminary roost assessment, the building appears particularly suited to bats
2	Any development works	Any underground duct or structure including tunnels, mines, kilns, ice houses, adits, military fortifications, air raid shelters, cellars
		Unused industrial chimneys that are lined and of brick/stone construction
3	Floodlighting	Churches and listed buildings, green space (e.g. sports pitches) within 50m of woodland, water, field hedgerows or lines of trees with connectivity to woodland or water
		Any building listed in reference 1
4	Felling, removal or lopping	Woodland
		Field hedgerows and/or lines of trees with connectivity to woodland or water bodies
		Old and veteran trees that are more than 100 years old
		Mature trees with obvious holes, cracks or cavities or which are covered with mature ivy (including dead trees)
5	Any development works	Within 200m of rivers, streams, canals, lakes, reedbeds or other aquatic habitats
6	Any development works	Within or immediately adjacent to quarries or gravel pits
		Immediately adjacent to or affecting natural cliff faces and rock outcrops with crevices or caves and sinkholes
7	Any single or multiple wind turbine construction	N/A – although for single turbines this can depend on size and location
8	Any development works	Sites where bats are known to be present

⁹ Hundt L. (2012) Bat Surveys: Good Practice Guidelines 2nd Edition, Bat Conservation Trust. Box 2.1 Planning and development trigger list for bat surveys, p9

A2.ii BAT LIFECYCLE

Bat survey timings are based on the lifecycle of bats which is varied throughout the calendar year. The table below illustrates survey timings and how they relate to the bat lifecycle:

TABLE 10 – BAT LIFECYCLE AS IT RELATES TO SURVEY EFFORT ¹⁰												
SURVEY TYPE	J	F	M	A	M	J	J	A	S	O	N	D
Roost Inspection												
Mating/Swarming Survey												
Hibernation Survey												
Tree survey from the ground												
Tree roost activity survey												
Building roost activity survey												
Dark grey are optimal timings, light grey suboptimal.												
BAT ACTIVITY THROUGH THE YEAR												
Day Roost												
Night Roost												
Feeding Roost												
Transitional/Occasional Roost												
Swarming Site												
Mating Site												
Maternity Roost												
Hibernation Roost												
Satellite Roost												

¹⁰ Based on Hundt L (2012) Bat Surveys: Good Practice Guidelines, 2nd Edition, Bat Conservation Trust p27

A2.iii BAT ROOST TERMS

DAY ROOST

A place where individual bats or small groups of males, rest or shelter in the day but are rarely found by night in the summer.

NIGHT ROOST

A place where bats rest or shelter in the night but are rarely found in the day. May be used by a single individual on occasion or could be used regularly by the whole colony.

FEEDING ROOST

A place where individual bats or a few individuals rest or feed during the night but are rarely present by day.

TRANSITIONAL/OCCASIONAL ROOST

Used by a few individuals or occasionally small groups for generally short periods of time on waking from hibernation or in the period prior to hibernation.

SWARMING SITE

Where large numbers of males and females gather during late summer to autumn. Appear to be important mating sites.

MATING SITE

Sites where mating takes place from late summer and can continue through winter.

MATERNITY ROOST

Where female bats give birth and raise their young to independence. Females typically give birth to a single pup per year, therefore these roosts are critical to the long-term survival of a colony. Disturbance of maternity roosts can lead to abandonment and death of young.

HIBERNATION ROOST

Where bats may be found individually or together during winter. They have a constant cool temperature and high humidity. Bats are particularly vulnerable to disturbance during the hibernation period as, once roused, they may be unable to replace energy lost due to a lack of sufficient available insect prey at this time.

SATELLITE ROOST

An alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season.

A2.iv SPECIES SPECIFIC ECOLOGY

Pipistrelle maternity colonies generally consist of 25 to 100 individuals, but colonies numbering up to 1000 are not uncommon¹¹. Adult females often form large maternity roosts, occupied between May and August, and frequently number around 300 individuals. Males are often solitary or in small groups during the summer, later congregating with the females at winter hibernation roosts¹².

Maternity colonies of brown long-eared bats are generally small, consisting of 10 to 20 adults^{13,14} (although numbers are likely to be underestimated, due to presence in inaccessible areas of the roost). In exceptional circumstances, colonies can reach 200+ bats.

¹¹ Roberts, G.M. & Hutson, A.M. 2000. *Pipistrelle*. British Bats No. 6. The Bat Conservation Trust, London

¹² Corbet, G.B & Southern, H.N., 1964. The handbook of British Mammals).

¹³ Speakman, J. R. *et al.*, 1991. Minimum summer populations and densities of bats in NE Scotland, near the northern borders of their distributions. *J. Appl. Ecol.*,225: 327-345

¹⁴ Entwistle, A.C., 1994. Roost ecology of the brown long-eared bat *Plecotus auritus* in north-east Scotland. Unpublished PhD thesis, University of Aberdeen, UK

Natterer's bats roost within crevices and cavities, typically within hollow trees, old buildings, caves and tunnels¹⁵. Maternity colonies comprising up to 200 adult females can be found in buildings during the summer months while bachelor roosts comprising up to 28 males have been recorded during the summer months in Scotland¹⁶. Maternity roosts are not exclusively female, with both adult and immature males comprising up to 25% of the colony. Male only colonies have been found with up to 30 bats¹⁷. Foraging individuals will perch during the night at roosts near to foraging areas, not used as day roosts. Mostly these roosts are trees or shrubs but barns will also be used¹⁸.

Whiskered bats roost in trees and buildings. Nursery roosts can number over 100 bats, and are almost exclusively female bats. This species hibernates singly in caves, hanging on the open wall or in crevices¹⁷.

Brandt's bat is thought to have similar roosting behaviour and foraging ecology to the whiskered bat, however, further research is needed to clarify this¹⁷.

A third small *Myotis* species, the Alcatheo bat has recently been confirmed within the UK.

¹⁵ Stebbings, R.E. 1991. Natterer's bat *Myotis nattereri*. In The handbook of British Mammals. 3rd Edition Corbet, G.B. & Harris, S. (Eds) Oxford: Blackwell Scientific.

¹⁶ Swift, S. M. 1997 Roosting and foraging behaviour of Natterer's bats (*Myotis Nattereri*) close to the northern border of their distribution. J. Zool. (Lond) **242**: 375-384.

¹⁷ Altringham, J.D. 2003. British Bats. The New Naturalist. Pub. Harper Collins.

¹⁸ Smith, P.G. & Racey, P.A. 2005. The itinerant Natterer: physical and thermal characteristics of summer roosts of *Myotis nattereri* (Mammalia: Chiroptera) J. Zool. Lond. 266: 171-180.

APPENDIX 3. SUMMARY OF MAIN IMPACTS AT SITE LEVEL

TABLE 11– SUMMARY OF MAIN IMPACTS AT SITE LEVEL				
Habitat Feature	Development Effect	Scale of impact		
		Low	Medium	High
Maternity Roost	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside breeding season	✓		
	Post-development interference			✓
Major Hibernation	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference			✓
Minor Hibernation	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Modified management		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference		✓	
	Temporary destruction then reinstatement	✓		
Mating	Destruction		✓	
	Isolation caused by fragmentation		✓	
	Partial destruction; modification	✓		
	Modified management	✓		
	Temporary disturbance outside hibernation season	✓		
	Post-development interference	✓		
	Temporary destruction then reinstatement	✓		
Night Roost	Destruction	✓		
	Isolation caused by fragmentation	✓		
	Partial destruction; modification	✓		
	Modified management	✓		
	Temporary disturbance outside hibernation season	✓		
	Post-development interference	✓		
	Temporary destruction then reinstatement	✓		

N.B. This is a general guide only and does not take into account species differences. Medium impacts in particular depend on the care with which any mitigation is designed and implemented and could range between high and low.

APPENDIX 4. DETAILED SURVEY RESULTS

Site:	Date:	Start Time:	End Time:	Number of Surveyors:	Number of Remote Recording Points:
4337 Low Town, Greenhead	20/08/2015	20:10	22:00	2	0

Start Temp:	End Temp:	Cloud Cover:	Precipitation:	Wind:	Sunset/Sunrise:
19.9°C	16°C	80%	0	2 E	20:20

Summary of Survey:

No emergencies from the building were noted. Most bat activity was heard but not seen, especially from around 21:30 due to low light levels. At least four species of bat were recorded: common pipistrelle, soprano pipistrelle, noctule, and *Myotis* spp. (probable WAB and Natterer's bat). Foraging mainly occurred on the south side of the building. *At least two barn owls were observed during the survey. The text in italics, below, indicates barn owl activity. Flightlines were recorded in addition to a possible nest within the entrance of the building.*

Activity Table:

Time	Light Level (Lux)	Surveyor 1	Surveyor 2
20:10			
20:15		<i>20:19:57 Barn owl, screeching only until 20:35</i>	
20:20			
20:25			
20:30			
20:35		20:37:50 ?Noc HNS	
20:40		<i>20:40:29 Barn owl appeared at top of roof and may have possibly flown over. 20:42:58 45 HNS; 20:44:08 Same owl appeared on top of roof before landing in small tree south of field boundary.</i>	
20:45		20:45:57 45, 55 HNS	
20:50		<i>20:51:59 Owl landed in open doorway and began calling again.</i>	
20:55		20:58:20 Myotis	20:57 Bat HNS
21:00			21:04 45 C from south to north on far west-side of the building

21:05		21:06:40 45 F b/w AM and building before flying west around short-side; 21:07:00 45 flying north to south around short-side of western end of building; 21:09:20 Noc BPx2 C flew from south to north around western, short-side of building. <i>Also owl left property but calling continued - definitely a min. of 2 barn owl near entrance and stairs.</i>	21:05:29 45 from west to east in front of surveyor; 21:08:29 45 HNS; 21:11:02 45 F
21:10		21:11:08 Myotis (probable WAB and Natterer's bat) HNS; 21:14:12 <i>Calling continues.</i>	
21:15		21:17:20 45 HNS	
21:20			
21:25			
21:30		21:32:20 ?Myotis HNS; 21:34:50 45 HNS	21:33:04 45 F and C from south to north on western side of building
21:35			
21:40		21:40:20 45 HNS; 21:44:00 Noc HNS	
21:45			
21:50			
21:55			
22:00			
Surveyor		AM	JM
Sunset			
Light levels low enough for Pipistrelle emergence/open flight			
Light levels low enough for Myotis emergence/open flight			
<p>45 – common pipistrelle 55- soprano pipistrelle Noc – Noctule BLE - brown long-eared bat Nat – Natterer's WB – Whiskered/Brandt's. ? before a name indicates uncertain identification due to poor sonogram or closely related species. BP – bat passes. Records in bold indicate roost present. HNS – heard not seen, generally bat is behind the surveyor or hidden by trees/building. F – foraging C- commuting SC – social call</p>			

Site:	Date:	Start Time:	End Time:	Number of Surveyors:	Number of Remote Recording Points:
4337 Low Town, Greenhead	10/09/2015	19:10	21:00	2	0

Start Temp:	End Temp:	Cloud Cover:	Precipitation:	Wind:	Sunset/Sunrise:
15.6°C	10.0°C	10%	0	2 - 3 E	19:36

Summary of Survey:
Three bat species were recorded: common pipistrelle, soprano pipistrelle, noctule, and Myotis spp. (probable WAB). Emergences were recorded from the south western corner of the building, through a crack in the wall just below the roof. <i>Barn owl also observed. Nesting in</i>

south western corner of the building.

Activity Table:			
Time	Light Level (Lux)	Surveyor 1	Surveyor 2
19:10			
19:15			
19:20	1		
19:25			
19:30			
19:35			
19:40			
19:45			
19:50		19:54:28 Noc HNS	19:54:40 Noc HNS
19:55	33.3		19:55:05 Bat E from crack on western end of building
20:00			
20:05	6.7	20:06:15 Bat E from crack in stone work to left of upper floor western most window on southern aspect	
20:10		20:11:20 55 E; 20:12:06 Barn owl flies from south west corner of building south	
20:15		20:19:35 45 F to west on short side of building	20:19:35 45 F to west on short side of building
20:20		20:21:49 Noc C HNS	20:21:49 Noc C HNS
20:25		20:23:00 Bat SNH F to west on short side of building	20:23:08 45 F to west on short side of building
20:30		20:32:00 45 C possibly E from concentration of roosts to the south west of the building	
20:35		20:38 SNH C from west to east parallel to southern long-edge of building	20:38:30 45 HNS
20:40		20:42 Myotis F to south west of building, over tall ruderal vegetation	20:44:50 WAB HNS
20:45		20:48 Myotis HNS	20:48:14, 20:48:47 WAB HNS
20:50			
20:55		20:56 Barn owl re-enters barn and calls from entrance	
21:00			
	Surveyor	AM	BB
	Sunset		
	Light levels low enough for Pipistrelle emergence/open flight		
	Light levels low enough for Myotis emergence/open flight		
45 – common pipistrelle 55- soprano pipistrelle Noc – Noctule BLE - brown long-eared bat Nat – Natterer’s WB – Whiskered/Brandt’s. ? before a name indicates uncertain identification due to poor sonogram or closely related species. BP – bat passes. Records in bold indicate roost present. HNS –			

heard not seen, generally bat is behind the surveyor or hidden by trees/building. F – foraging C-commuting SC – social call

Site:	Date:	Start Time:	End Time:	Number of Surveyors:	Number of Remote Recording Points:
4337 Low Town, Greenhead	15/06/2016	21.30	22.30	2	0

Start Temp:	End Temp:	Cloud Cover:	Precipitation:	Wind:	Sunset/Sunrise:
14°C	12°C	95-100%	Heavy rain after 22.30	1-2 NE	21.47

Summary of Survey:

Two bat species were recorded: common pipistrelle and soprano pipistrelle. Emergences were recorded from the water tables of the northern elevation. A single soprano pipistrelle pass was recorded. No barn owls were recorded.
Light rain fell from 22.20, the survey was abandoned at 22.30 when this became torrential.

Activity Table:

Time	Light Level (Lux)	Surveyor 1	Surveyor 2
21:30	68.8		-
21:35	49.1		-
21:40	33.8		-
21:45	25.8		-
21:50	20.1		-
21:55	13.6	-	-
22:00	09.2	-	-
22:05	10.6		-
22:10	06.1	22.14.24 – 45 emerged from beneath water table at north western corner.	22.14.30 – 45 HNS
22:15	02.7	22.15.35 – 45 emerged from beneath water table at south western corner. 22.16.15 – 45 foraging around the structure 22.18.05 – 55 pass 22.18.17 – 45 pass 22.18.26 – 45 pass	22.15.35 – 45 foraging around the structure until 22.18 22.19.10 – 45 foraging as 22.15

22:20	02.1		22.20 – light rain 22.24.45 – 45 foraging around building
22:25	01.2		22.27.19 – 45 occasional passes
22:30	01.1	22.30 – Survey abandoned as rain became torrential	
Surveyor		MO	AM
	Sunset		
	Light levels low enough for Pipistrelle emergence/open flight		
	Light levels low enough for Myotis emergence/open flight		
45 – common pipistrelle 55- soprano pipistrelle Noc – Noctule BLE - brown long-eared bat Nat – Natterer's WB – Whiskered/Brandt's. ? before a name indicates uncertain identification due to poor sonogram or closely related species. BP – bat passes. Records in bold indicate roost present. HNS – heard not seen, generally bat is behind the surveyor or hidden by trees/building. F – foraging C-commuting SC – social call			