

# BAT SURVEY

## HIGH STOKOE FARM BARN



MARCH 2019  
FINAL

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UNLESS REQUESTED OTHERWISE, THE INFORMATION BELOW, RELATING TO THE LOCAL AREA, WILL BE PROVIDED TO THE LOCAL ENVIRONMENTAL RECORDS CENTRE					
SPECIES	RECORDER	DATE	LOCATION (4 FIG. NGR)	ABUNDANCE	COMMENT
Common pipistrelle	E3 Ecology	19.09.17	NY 73 86	11	Roost
Common pipistrelle	E3 Ecology	19.09.17	NY 73 86	--	Foraging, commuting
Myotis sp.	E3 Ecology	19.09.17	NY 73 86	--	Foraging, commuting
Myotis sp.	E3 Ecology	19.09.17	NY 73 86	2	Possible roost
Myotis sp.	E3 Ecology	04.06.18	NY 73 86	-	Roost

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## **CONTENTS**

<b>A.</b>	<b>SUMMARY.....</b>	<b>5</b>
<b>B.</b>	<b>INTRODUCTION.....</b>	<b>7</b>
<b>C.</b>	<b>PLANNING POLICY AND LEGISLATIVE CONTEXT .....</b>	<b>8</b>
C.1	NATIONAL PLANNING POLICY .....	8
C.2	RELEVANT LEGISLATION .....	10
C.3	WILDLIFE SITE POLICY AND LEGISLATION.....	11
C.4	PRIORITY SPECIES .....	11
<b>D.</b>	<b>METHODOLOGY .....</b>	<b>11</b>
D.1	SCOPE OF STUDY .....	11
D.2	DESK STUDY .....	12
D.3	PRELIMINARY FIELD STUDY METHODOLOGY .....	13
D.3.1	HABITAT SURVEY .....	13
D.3.2	DAYTIME BAT RISK ASSESSMENT (STRUCTURES).....	13
D.3.3	PRELIMINARY SURVEY - EQUIPMENT .....	14
D.3.4	PRELIMINARY SURVEY - ENVIRONMENTAL CONDITIONS .....	14
D.3.5	PRELIMINARY SURVEY - CONSTRAINTS .....	15
D.4	DETAILED SURVEY METHODOLOGY .....	15
D.4.2	DUSK EMERGENCE ACTIVITY SURVEY .....	15
D.4.3	DATA ANALYSIS .....	17
D.5	PERSONNEL .....	18
D.6	ASSESSMENT METHODOLOGY .....	18
<b>E.</b>	<b>RESULTS .....</b>	<b>20</b>
E.1	DESKTOP STUDY .....	20
E.1.1	PRE-EXISTING INFORMATION .....	20
E.2	DAYTIME RISK ASSESSMENT .....	21
E.2.1	HABITATS .....	21
E.2.2	BUILDINGS.....	22
E.3	OVERVIEW OF SITE SUITABILITY .....	24
E.4	ACTIVITY SURVEY.....	25
E.4.1	2017 DUSK EMERGENCE ACTIVITY SURVEY .....	25
E.4.2	2018 DUSK EMERGENCE SURVEY .....	26
E.5	ADDITIONAL SPECIES GROUPS.....	27
<b>F.</b>	<b>SITE ASSESSMENT .....</b>	<b>28</b>
F.1	ASSESSMENT OF SURVEY FINDINGS .....	28
F.2	POPULATION SIZE CLASS ASSESSMENT .....	28
F.3	LIMITATIONS AND CONSTRAINTS.....	28
<b>G.</b>	<b>IMPACT ASSESSMENT .....</b>	<b>29</b>
G.1	DIRECT DEVELOPMENT IMPACTS .....	29
G.2	INDIRECT IMPACTS ON LOCAL POPULATIONS .....	29
<b>H.</b>	<b>RECOMMENDATIONS .....</b>	<b>30</b>
H.1	FURTHER SURVEY .....	30
H.2	AVOIDANCE AND MITIGATION STRATEGY .....	30
H.2.1	SITE DESIGN .....	30
H.2.2	TIMING OF WORKS .....	30
H.2.3	WORKING METHODS AND BEST PRACTICE .....	30
H.3	COMPENSATION STRATEGY.....	31
H.4	MONITORING .....	31
H.5	ADDITIONAL ENHANCEMENT RECOMMENDATIONS .....	31

<b>APPENDIX 1.</b>	<b>STATUTORILY AND NON- STATUTORILY DESIGNATED SITES.....</b>	<b>32</b>
<b>APPENDIX 2.</b>	<b>BAT ECOLOGY .....</b>	<b>33</b>
<b>APPENDIX 3.</b>	<b>BATS AND DEVELOPMENT.....</b>	<b>36</b>
<b>APPENDIX 4.</b>	<b>RAW DATA DUSK EMERGENCE SURVEY .....</b>	<b>38</b>
<b>APPENDIX 5.</b>	<b>MITIGATION FIGURES – BAT ACCESS AT EAVES.....</b>	<b>41</b>

## **TABLES**

<b>TABLE 1: NATIONAL PLANNING POLICY FRAMEWORK: NATURAL ENVIRONMENT .....</b>	<b>8</b>
TABLE 2: GUIDELINES FOR ASSESSING THE POTENTIAL SUITABILITY OF PROPOSED DEVELOPMENT SITES FOR BATS, BASED ON PRESENCE OF HABITAT FEATURES WITHIN THE LANDSCAPE. ....	13
TABLE 3: GUIDELINES FOR ASSESSING THE POTENTIAL SUITABILITY OF PROPOSED DEVELOPMENT SITES FOR BATS, BASED ON PRESENCE OF ROOSTING HABITAT FEATURES (STRUCTURES).....	14
TABLE 4: DAYTIME SURVEY CONDITIONS.....	14
TABLE 5: RECOMMENDED NUMBER AND TIMING OF PRESENCE/ABSENCE SURVEY VISITS REQUIRED TO PROVIDE CONFIDENCE IN NEGATIVE PRELIMINARY ROOST ASSESSMENT RESULTS .....	15
TABLE 6: ACTIVITY SURVEY TIMINGS.....	15
TABLE 7: ACTIVITY SURVEY ENVIRONMENTAL CONDITIONS .....	17
TABLE 8: PIPISTRELLE SPECIES IDENTIFICATION PARAMETERS .....	17
TABLE 9: PERSONNEL .....	18
TABLE 10: ECOLOGICAL RECEPTOR VALUATION.....	18
TABLE 11: OVERVIEW OF SITE SUITABILITY FOR BATS .....	24

## **FIGURES**

FIGURE 1: SITE LOCATION .....	7
FIGURE 2: SITE BOUNDARY.....	12
FIGURE 3: SITE AND SETTING.....	12
FIGURE 4: BUILDING LOCATIONS.....	24
FIGURE 5: SUMMARY OF DUSK EMERGENCE SURVEY RESULTS .....	26
FIGURE 6: SUMMARY OF THE 4TH JUNE 2018 DUSK SURVEY .....	27

## A. SUMMARY

E3 Ecology Ltd was commissioned by Mr Dave Sinclair in September 2017 to undertake an updating daytime bat risk assessment and one dusk bat survey of High Stokoe Farm barns, Falstone following survey in 2013. A further updating dusk survey was undertaken in June 2018.

An initial site inspection in 2013 was followed by a dusk bat activity survey, which recorded three common pipistrelle bats emerging from the wall tops of the middle barn, building 2 in this report. Foraging and commuting activity of common pipistrelle and *Myotis* sp. bats was also recorded. The farmhouse has been renovated since the original bat risk assessment and survey of the buildings in 2013 under a separate planning application.

The proposed development comprises redevelopment of two traditional adjoining barns with byre into holiday accommodation and a hay store. An updated site inspection and dusk activity survey was undertaken on the 19<sup>th</sup> September 2017.

The site is situated in an area dominated by upland livestock farming. Kielder Dam is located 3.1km to the northwest and is surrounded by dense conifer plantation. The River North Tyne flows eastwards 345m to the south. Field boundaries are predominantly dry stone walls and tree cover is sporadic although forms a weak link from the site to the River North Tyne. A single other farm is present within 500m. Overall, the habitats present in the local area are of moderate suitability for use by foraging/commuting bats.

The buildings to be renovated are traditional barns with corrugated mono-pitched or pitched roofs. The larger barn (building 2) is divided internally with a walk through passage and storage area in the western third, and a traditional cattle byre present in the eastern two-thirds. The smaller barn (building 3) is open to the south and has provided animal housing. Both buildings are of random stone construction although building 2 has some later breezeblock and brick additions to the eastern and western elevations. There are large mortar gaps and access into the stonework suitable for use by crevice roosting bats associated with both buildings. The barns are considered of moderate suitability for supporting roosting bats. There is a low risk of the buildings being used by maternity colonies, particularly as the barns are in a poor state of repair and have deteriorated to such a state that the internal wall within building 2 has support props in place.

Dusk activity survey in 2017 recorded one common pipistrelle emerging from the southern elevation eaves of building 2, a similar roost location as determined in 2013, and 10 common pipistrelles emerging from three different roost locations within building 3. All of the roosts within building 3 were not previously recorded in 2013. Two remote detectors were placed within the separated unit of building 2 and recorded pipistrelle social calls, most likely from bats foraging from outside of the building. Two *Myotis* sp. bats were also observed flying out from the northern door of building 2 and as it could not be determined that these bats flew into the building, they are considered likely to have been roosting within the building. Updating survey work in June 2018 recorded evidence of a small *Myotis* sp day roost within building 3, with no roosts identified in building 2. No evidence of a maternity roost was recorded in either structure.

It is concluded that both buildings are used by small numbers of common pipistrelle, including the use of building 2 as a potential mating roost, and small numbers of *Myotis* bats. No evidence of a maternity roost was recorded. There is a risk that either building could be used for hibernation purposes.

Breeding birds were recorded within the barns, but no evidence of use by barn owl was observed.

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

1. Loss of confirmed bats roosts within buildings 2 and 3.
2. The loss of numerous potential crevice roost sites within both barns.
3. Disturbance or harm to a small number of bats that may be using the buildings at the time, potentially including hibernating bats if works are undertaken during the winter.
4. Increased levels of disturbance due to occupants of the properties and their pets, following on from the conversion.
5. Loss of open barn spaces used for light sampling and covered flight spaces before emergence.
6. Disturbance to breeding birds if present in the barns at the time of development.

Key mitigation measures include:

- **A Natural England licence (2018-35873-EPS-MIT) has already been granted for the re-roofing and structural renovation of the buildings and this will need to be modified to take account of the change of use.**
- Prior to re-roofing works commencing a site induction meeting was held, attended by the project ecologist and lead contractors.
- Prior to works commencing a detailed inspection of the structure took place once scaffolding or safe equivalent 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 any stonework
  - Re-structuring/re-pointing of existing stonework
- No exclusion was/will be undertaken during the hibernation period (mid-November to mid-March inclusive).
- The buildings will be re-inspected prior to conversion works commencing as bats may have returned following re-roofing/renovation works. 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 3 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).
- Retention/creation of external crevice roost sites and access into the hay store in building 2.
- Creation/retention of external crevice roost sites within building 3.

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.

**Before this report can be used to support a planning application it is recommended that:**

1. **Mitigation proposed in this report is incorporated into the architect's plans that support the planning application including design details of bat access routes.**

*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

E3 Ecology Ltd was commissioned by Mr D Sinclair in September 2017 to undertake an update to 2013 bat survey work, including a single dusk bat survey of two outbuilding barns at High Stokoe Farm. An updating dusk survey was undertaken in June 2018.

The purpose of this report is:

- To identify and describe all potentially significant effects on the local bat population associated with the proposed development
- To set out the mitigation measures required to ensure compliance with nature conservation legislation and to address any potentially significant effects
- To identify how mitigation measures will/could be secured
- To provide an assessment of the significance of any residual effects
- To identify appropriate enhancement measures
- To set out any requirements for post-construction monitoring

The site is situated near Falstone, Northumberland at an approximate central grid reference of NY 736 861. Site location is illustrated below in Figure 1.



**FIGURE 1: SITE LOCATION**  
(Reproduced under licence from Google Earth Pro)

It is proposed to convert building 2, to accommodate a hay store and also a one and a half storey holiday unit. Building 3, an existing barn, is to be converted into a single storey holiday unit. Both buildings are proposed to have photovoltaic cells on the southern elevations. No plans have been provided at this stage.

## C. PLANNING POLICY AND LEGISLATIVE CONTEXT

### C.1 NATIONAL PLANNING POLICY

The table below details the key paragraphs from the National Planning Policy Framework (NPPF)<sup>1</sup> relating to the natural environment:

TABLE 1: NATIONAL PLANNING POLICY FRAMEWORK: NATURAL ENVIRONMENT	
Statement	Paragraph
Planning policies and decisions should contribute to and enhance the natural and local environment by: a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate; d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.	170
Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework <sup>2</sup> ; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.	171
Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads <sup>3</sup> . The scale and extent of development within these designated areas should be limited. Planning permission should be refused for major development <sup>4</sup> other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of: a) the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy; b) the cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and c) any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated.	172
Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 172), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character.	173
To protect and enhance biodiversity and geodiversity, plans should:	174

<sup>1</sup> National Planning Policy Framework (July 2018), Department for Communities and Local Government,

<sup>2</sup> Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.

<sup>3</sup> English National Parks and the Broads: UK Government Vision and Circular 2010 provides further guidance and information about their statutory purposes, management and other matters.

<sup>4</sup> For the purposes of paragraphs 172 and 173, whether a proposal is 'major development' is a matter for the decision maker, taking into account its nature, scale and setting, and whether it could have a significant adverse impact on the purposes for which the area has been designated or defined.



<p>a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity<sup>5</sup>; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation<sup>6</sup>; and</p> <p>b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.</p>	
<p>When determining planning applications, local planning authorities should apply the following principles:</p> <p>a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts),</p> <p>b) adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;</p> <p>c) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;</p> <p>d) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons<sup>7</sup> and a suitable compensation strategy exists; and</p> <p>e) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.</p>	175
<p>The following should be given the same protection as habitats sites:</p> <p>a) potential Special Protection Areas and possible Special Areas of Conservation;</p> <p>b) listed or proposed Ramsar sites<sup>8</sup>; and</p> <p>c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.</p>	176
<p>The presumption in favour of sustainable development does not apply where development requiring appropriate assessment because of its potential impact on a habitats site is being planned or determined.</p>	177

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 Guidance<sup>9</sup> 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*

<sup>5</sup> Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

<sup>6</sup> Where areas that are part of the Nature Recovery Network are identified in plans, it may be appropriate to specify the types of development that may be suitable within them.

<sup>7</sup> For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.

<sup>8</sup> Potential Special Protection Areas, possible Special Areas of Conservation and proposed Ramsar sites are sites on which Government has initiated public consultation on the scientific case for designation as a Special Protection Area, candidate Special Area of Conservation or Ramsar site.

<sup>9</sup> Planning Practice Guidance: Natural Environment ([www.planningguidance.communities.gov](http://www.planningguidance.communities.gov))

*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).*
- *'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).*

## **C.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.

### **C.3 WILDLIFE SITE POLICY AND LEGISLATION**

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

### **C.4 PRIORITY SPECIES**

Although not afforded any legal protection, national priority species (species of principal importance, as listed in Section 41 of the NERC Act (2006)), and local and regional priority species, as detailed within the relevant biodiversity action plans, are material considerations in the planning process and as such have been assessed accordingly within this report.

The following bat species are listed as national priority species: Barbastelle bat, Bechstein's bat, noctule, soprano pipistrelle, brown long-eared bat, greater horseshoe bat and lesser horseshoe bat. 'Bats' as a species group is also listed on the relevant local biodiversity action plan for this site.

## **D. METHODOLOGY**

### **D.1 SCOPE OF STUDY**

The scope of the study, in terms of the survey area and the desk study area, is based on professional judgement. The scope has been determined based on the site's characteristics, the nature of the surrounding area, the development proposed at the time of reporting and the likely associated zone of influence.

For this site the survey area comprised the red line boundary as defined within Figure 3 with, in addition, a 50m buffer around the periphery appraised where access was available. The survey area included all potential roost sites within and adjacent to the survey area, which may be affected by the proposed development.

The desk study included an assessment of land-use in the surrounding area and a data search covering a 2km buffer zone (see below for further detail).

The level of survey effort employed at the site has taken account of the recommendations within the Bat Conservation Trust Good Practice Survey Guidelines<sup>10</sup>.

Figure 3 illustrates the site boundary whilst, to provide context, Figure 4 illustrates the broad habitats present on site and within an approximate 500m buffer zone.

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<sup>10</sup> Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> Edition). Bat Conservation Trust



**FIGURE 2: SITE BOUNDARY**  
(Reproduced under licence from Google Earth Pro.)



**FIGURE 3: SITE AND SETTING**  
(Reproduced under licence from Google Earth Pro.)

## **D.2 DESK STUDY**

In 2013, E3 Ecology was commissioned to conduct the original bat risk assessment of the farmhouse and outbuildings with a single dusk survey completed in order to support a planning application for the renovation of the farmhouse.



The site was assessed from aerial photographs and 1:25,000 Ordnance Survey maps. In addition, a search was made of the Multi Agency Geographic Information for the Countryside (MAGIC) website<sup>11</sup> for all statutorily protected sites for nature conservation within 2km of the survey area.

### D.3 PRELIMINARY FIELD STUDY METHODOLOGY

#### D.3.1 HABITAT SURVEY

The potential suitability of the habitats within the survey area in relation to commuting and foraging bats was classified as negligible, low, moderate or high, based on guidelines provided by the Bat Conservation Trust<sup>12</sup> and detailed within Table 2.

<b>TABLE 2: GUIDELINES FOR ASSESSING THE POTENTIAL SUITABILITY OF PROPOSED DEVELOPMENT SITES FOR BATS, BASED ON PRESENCE OF HABITAT FEATURES WITHIN THE LANDSCAPE.</b> (TO BE APPLIED USING PROFESSIONAL JUDGEMENT, TABLE 4.1 BAT SURVEY GUIDELINES)	
<b>Suitability</b>	<b>Commuting and foraging habitats</b>
Negligible	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.  Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.  Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.  High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland tree lined watercourses and grazed parkland.  Site is close to and connected to known roosts.

#### D.3.2 DAYTIME BAT RISK ASSESSMENT (STRUCTURES)

A daytime assessment was made of both of the barns 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. The farmhouse was excluded from the survey as renovation works are complete.

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

<sup>11</sup> Multi Agency Geographic Information for the Countryside ([www.magic.gov.uk](http://www.magic.gov.uk))

<sup>12</sup> Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> Edition). Bat Conservation Trust

were present the survey was adapted to avoid disturbance, with identification being confirmed either by recording bats at emergence and analysing the calls or through undertaking DNA analysis of droppings.

Externally, the buildings were examined for potential 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.

Structures were categorised as having negligible, low, moderate or high suitability to be used by roosting bats, based on guidelines provided by the Bat Conservation Trust<sup>13</sup> and detailed within Table 3.

<b>TABLE 3: GUIDELINES FOR ASSESSING THE POTENTIAL SUITABILITY OF PROPOSED DEVELOPMENT SITES FOR BATS, BASED ON PRESENCE OF ROOSTING HABITAT FEATURES (STRUCTURES)</b> (TO BE APPLIED USING PROFESSIONAL JUDGEMENT, TABLE 4.1 BAT SURVEY GUIDELINES)	
<b>Suitability</b>	<b>Roosting Habitats</b>
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure with one or more potential roost site that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

The bat risk assessment of the structures was originally undertaken on 6<sup>th</sup> March 2013 with an updating risk assessment focussed on the barns was undertaken on 19<sup>th</sup> September 2017.

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.

#### D.3.3 PRELIMINARY SURVEY - EQUIPMENT

- Clulite CB2 high powered torch
- Zeiss 8x30 binoculars
- Digital camera

#### D.3.4 PRELIMINARY SURVEY - ENVIRONMENTAL CONDITIONS

<b>TABLE 4: DAYTIME SURVEY CONDITIONS</b>				
<b>DATE</b>	<b>TEMPERATURE</b>	<b>CLOUD COVER</b>	<b>PRECIPITATION</b>	<b>WIND CONDITIONS</b>
19.09.17	12°	10%	Dry	Still

<sup>13</sup> Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> Edition). Bat Conservation Trust



#### D.3.5 PRELIMINARY SURVEY - CONSTRAINTS

There were no constraints to the bat risk assessment.

### D.4 DETAILED SURVEY METHODOLOGY

#### D.4.1.1 SURVEY EFFORT

The level of survey effort recommended has taken account of the guidance provided by the Bat Conservation Trust (BCT)<sup>14</sup> and summarised within Table 5.

TABLE 5: RECOMMENDED NUMBER AND TIMING OF PRESENCE/ABSENCE SURVEY VISITS REQUIRED TO PROVIDE CONFIDENCE IN NEGATIVE PRELIMINARY ROOST ASSESSMENT RESULTS (FROM TABLE 7.1 AND TABLE 7.3 BCT GUIDELINES)			
	Low Roost Suitability*	Moderate Roost Suitability	High Roost Suitability
Recommended minimum number of survey visits for presence/absence survey to give confidence in a negative result	One survey visit. One dusk emergence or dawn re-entry survey (structures).  For trees with low roost suitability, no further surveys required.	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey.	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn.
Recommended timings for presence/absence surveys	May to August	May to September with at least one of the surveys between May and August	May to September with at least two of the surveys between May and August
* If a structure is classified as having low suitability for bats an ecologist should make a professional judgement on how to proceed based on all of the evidence available. If sufficient areas of a structure have been inspected and no evidence found (and is unlikely to have been removed by weather or cleaning or be hidden), then further surveys may not be appropriate.			
<b>Note:</b> Where a roost is confirmed as being present, further surveys may be required to fully characterise the roost			

The recommendations provided above are guidelines and it is recognised by BCT that 'the number of visits could be adjusted (up or down) if necessary by the ecologist, bearing in mind the site-specific circumstances'.

In 2013, bat roosts were confirmed within Building 2 and a single updating survey was completed in 2017. The National Park Planning Authority was consulted in regards to the survey effort completed and, whilst the number of surveys was not completed to guidance, it was agreed that adequate survey effort was achieved when combined with the 2013 survey data to support a planning application. A further characterisation survey was undertaken in June 2018.

#### D.4.2 DUSK EMERGENCE ACTIVITY SURVEY

Activity surveys were undertaken on the dates and times as detailed within Table 6.

TABLE 6: ACTIVITY SURVEY TIMINGS					
DATE	START TIME	END TIME	TIME OF SUNRISE/ SUNSET	NO. OF SURVEYORS	NO. OF REMOTE MONITORING POINTS
21.05.13	2110	2238	2118	3	1
19.09.17	1900	2045	1915	2	2
04.06.18	21.18	23.10	21.36	2	3

<sup>14</sup> Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> Edition). Bat Conservation Trust

#### D.4.2.1 SURVEY METHODS

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

Light levels were recorded at 5 minute intervals, using a light meter, located in an open area and directed upwards to ensure a standard baseline. Light levels generally provide a more reliable indicator of the likely times for bat emergence than minutes past sunset and this approach is recommended by BCT<sup>15</sup>. There is significant variation in emergence times, but hundreds of surveys by E3 in northern England over recent years have indicated that pipistrelles are likely to start emerging around 70 lux, noctule at a similar level or earlier, *Myotis* bats generally start to emerge below 10 lux, with most *Myotis* activity and brown long-eared emergence below 2 lux. Bats are rarely recorded above 150 lux, and as light levels go below 0.5 lux bat activity in the vicinity of the roosts tends to decrease as bats disperse across the wider countryside. Bat emergence will start at higher light levels when there is good cover close to the roost. For example *Myotis* bats have been recorded emerging in light conditions above 50 lux when there is a short flight line from the roost site to dense woodland. If a species is recorded when light levels are close to expected emergence light levels, then the likelihood that a roost is nearby is greatly increased.

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.

In 2013, surveyors used both Batbox Duet bat detectors coupled with MP3 recorders to listen for and record bats and Anabat SD2 detectors for remote monitoring.

In 2017 and 2018 all surveyors used both Batbox Duet bat detectors to listen for bats and Anabat Express detectors, at each surveyor location, to record and better identify bat species. Listening through earphones to both heterodyne and frequency division signals helps ensure that all bat species were detected<sup>16</sup>, whilst recording all bat activity using the Express removes the risk of surveyor error in timings and species ID.

Timings for observations of key bat activity such as emergence, first records of each species and commuting routes were recorded using radio-wave synchronised clocks. All data were recorded using the Anabat Express for future reference and to allow confirmation of species identification through call analysis (using Analook software), and to capture brief echolocation calls that could not be reliably identified in the field<sup>17</sup>. Field survey recorded numbers of bats detected, feeding activity, flight paths, species (as far as is practicable), and social calls.

Remote monitoring was undertaken with an Anabat Express detector. This technique helps to record both emerging or flying bats and their echolocation calls without any disturbance from

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<sup>15</sup> [http://www.bats.org.uk/pages/recording\\_light\\_level\\_data.html](http://www.bats.org.uk/pages/recording_light_level_data.html)

<sup>16</sup> Listening to frequency division calls as well as heterodyne significantly increases the detection rate of *Nyctalus* species

<sup>17</sup> Reviewing data recorded by surveyors using Duet detectors and the Anabat data indicated that reliable *Myotis* records increased through Anabat use, particularly once conditions were too dark for visual cues to assist in identification, when there was a lot of bat activity, and with bats in clutter. It also reduces errors where pipistrelles in clutter can be mis-identified as *Myotis* bats.

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 2 person-nights work was undertaken in 2017 and direct observation was reinforced by remote recording of bat activity adding 2 monitoring points; one within each of the barns. In 2018 a total of 2 person-nights work was undertaken and reinforced with remote monitoring in three locations; one in each section of the barns. Figures provided within the results section of this report illustrate the approximate location of each surveyor and monitoring point.

#### D.4.2.2 DUSK EMERGENCE– ENVIRONMENTAL CONDITIONS

Table 7 details the environmental conditions for each activity survey.

TABLE 7: ACTIVITY SURVEY ENVIRONMENTAL CONDITIONS								
DATE	TEMPERATURE (°C)		CLOUD COVER (%)		PRECIPITATION		WIND CONDITIONS (BEAUFORT SCALE)	
	START	END	START	END	START	END	START	END
21.05.13	17.6°C	11°C	90		0	0	0	0
19.09.17	12°C	8°C	10	0	0	0	0	0
04.06.18	16.8°C	12.7°C	100	100	0	0	1	1

#### D.4.2.3 SURVEY EQUIPMENT

- Duet bat detectors
- Anabat Expresses
- Light meter

#### D.4.3 DATA ANALYSIS

All bat calls were analysed using Analook, with calls identified to species where possible, referencing call parameters as detailed within Russ (2012)<sup>18</sup> and Middleton et al (2014)<sup>19</sup>.

Species from the *Myotis* genus of bats produce frequency modulated calls with overlapping call parameters and cannot be reliably distinguished to species level on call alone. As such, within this report, *Myotis* calls are identified as '*Myotis ?species*', with the most likely species identified through an assessment of a combination of call slope, loudness, frequency range, habitat and, where the bat was observed in flight, flight characteristics. Where insufficient information is available, calls are simply identified as '*Myotis sp.*'.

Bats from the pipistrelle genus also produce calls with overlapping parameters and the call criteria used to differentiate between species of this genus, based on peak frequencies, are detailed within Table 8.

TABLE 8: PIPISTRELLE SPECIES IDENTIFICATION PARAMETERS	
Species	Call Peak Frequency Range (KHz)
Common pipistrelle	>42 and <49
Soprano pipistrelle	≥51
Nathusius' pipistrelle	<40
Common or soprano pipistrelle ('50KHz pip')	≥49 and <51
Common or Nathusius' pipistrelle ('40KHz pip')	≥40 and ≤42

Similarly, bats of the *Nyctalus* genus produce calls with overlapping call parameters. Where calls are obtained in an open environment, the two *Nyctalus* species found in this region can be

<sup>18</sup> Russ, J. (2012) British Bat Calls: A Guide to Species Identification. Pelagic Publishing

<sup>19</sup> Middleton, N., Froud, A. and French, K. (2014) Social Calls of the Bats of Britain and Ireland. Pelagic Publishing

differentiated and calls will be identified as noctule or Leisler's bat. Where there is doubt, calls are noted as *Nyctalus sp.*.

Within this report, for all species, if the species name is given without qualification, the record was of good quality and fell within recognised parameters with no potential overlap with other species present in the region. 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 where possible calls are identified to genus.

## D.5 PERSONNEL

The table below details the personnel who undertook the survey work.

TABLE 9: PERSONNEL			
Name	Position	Professional Qualifications	Natural England Bat Survey Licence Number
Elizabeth Ross	Graduate Ecologist	BSc MSc	20130073
Jessica Wilson	Assistant Ecologist	BSc MSc	2015-10881-CLS-CLS
Mary Martin	Director	BSc MCIEEM	2015-12822-CLS-CLS

Further details of experience and qualifications are available at [www.e3ecology.co.uk](http://www.e3ecology.co.uk).

## D.6 ASSESSMENT METHODOLOGY

The relative value of the ecological receptors (habitats, species and designated sites) was assessed using a geographical frame of reference. For designated sites this is generally a straightforward process with the assigned designation generally being indicative of a particular value, e.g. Sites of Special Scientific Interest are designated under national legislation and are therefore generally considered to be receptors of national value. The assignment of value to non-designated receptors is less straightforward and as recognised by the Guidelines for Ecological Impact Assessment produced by the Chartered Institute of Ecology and Environmental Management<sup>20</sup>, is a complex and subjective process and requires the application of professional judgement.

When assessing the value of species and habitats, relevant documents and legislation are considered including the lists of species and habitat of principal importance annexed to the NERC Act (2006) and those provided within relevant local Biodiversity Action Plans. Data provided through consultation is also considered. These data sources can provide context at a local, regional and national scale.

The table below provides examples of receptors of value at different geographical scales.

TABLE 10: ECOLOGICAL RECEPTOR VALUATION	
Level of Value	Examples
International	An internationally designated site or candidate site.
	A site meeting criteria for international designation.
	The site is of functional importance* to a species population with internationally important numbers (i.e. >1% of the biogeographic population)
National	A nationally designated site.
	The site is of functional importance* to a species population with nationally important numbers (i.e. >1% of the national population)
Regional	The site is of functional importance* to a species population with regionally important numbers (i.e. >1% of the regional population)

20 Chartered Institute for Ecology and Environmental Management (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater and Coastal

TABLE 10: ECOLOGICAL RECEPTOR VALUATION	
Level of Value	Examples
<b>County</b>	A Local Wildlife Site (LWS) or equivalent, designated at a County level
	The site is of functional importance* to a species population of county value (i.e. >1% of the county population)
<b>District</b>	A Local Wildlife Site (LWS) or equivalent, designated at a District level
	The site is of functional importance* to a species population of district value (i.e. >1% of the district population)
<b>Parish</b>	A species population considered to appreciably enrich the nature conservation resource within the context of the parish.
	Local Nature Reserves
<b>Local</b>	A species population that contributes to local biodiversity but are not exceptional in the context of the parish.
<b>Low</b>	Habitats that are unexceptional and common to the local area.
* Functional importance defined as 'a feature which, based on professional judgement, is of importance to the day to day functioning of the population, the loss of which would have a detectable adverse effect on that population'.	

Higher quality sites for bats are likely to have a good number of bats and range of species, particularly species that are scarcer in the region and require higher habitat quality such as whiskered/Brandt's, Natterer's, brown long-eared bat and Nathusius. Sites with over five species regularly recorded will generally be of above average quality.

## E. RESULTS

### E.1 DESKTOP STUDY

#### E.1.1 PRE-EXISTING INFORMATION

##### **ORDNANCE SURVEY MAPPING AND AERIAL PHOTOGRAPHY**

Figures 1 (B) and 4 (D1) show that the general land use in the surrounding area is upland pasture to all directions. The River North Tyne is present within 500m to the south and Low Stokoe Farm lies to the east.

The most recent aerial photograph of the site (Figure 1, D1, 2009) indicates that habitats are dominated by amenity gardens and upland pasture. Historic imagery suggests that the site has remained largely unchanged within the recent years; however, the owner's knowledge indicates that the farm suffered extensive fire damage and was later rebuilt though not to the buildings' original specifications.

##### **MULTI AGENCY GEOGRAPHIC INFORMATION FOR THE COUNTRYSIDE WEBSITE<sup>21</sup>**

The Multi-Agency Geographic for the Countryside indicated that the following protected sites are present within 2km:

- Three areas of Ancient and Semi-natural woodland: 520m southeast; 1.2km southeast and 1.5km northeast.
- The site is situated within Northumberland National Park.
- The nearest Site of Special Scientific Interest is over 2.4km distant to the west and is Falstone Moss Nature Reserve and Kielder Mires SSSI. The SSSI is designated for its mire habitats.

None of the above sites will be affected by the proposed development.

##### *Bat Log*

The National Bat Atlas holds records of pipistrelle, whiskered, Brandt's, Daubenton's, Brown-long-eared, noctule and Natterer's bats within the 10km grid square containing the site.

##### *E3 Ecology Ltd Records*

E3 Ecology have previously recorded common and soprano pipistrelle as well as Natterer's, whiskered/Brandt's and brown long-eared bats in the local area. In 2013, common pipistrelle were recorded roosting within building 2 of High Stokoe Farm.

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<sup>21</sup> Multi Agency Geographic Information for the Countryside (MAGIC) [www.magic.gov.uk](http://www.magic.gov.uk)





In 2018 roof replacement and structural works to the barns were carried out under a Natural England licence – 2018-35873-EPS-MIT. The roofs of the barns were removed under supervision on the 1<sup>st</sup> October 2018.

## E.2 DAYTIME RISK ASSESSMENT

### E.2.1 HABITATS

The site comprises a recently renovated farmhouse with original barn outbuildings within an upland setting.

The River North Tyne within 350m is likely to provide a key habitat for bats in the area being treed along its length and likely to provide an abundance of invertebrate prey items.

#### FORAGING HABITATS

Habitats on site are of limited foraging value, lacking hedgerows or well developed tree cover. Pasture fields will provide some limited quality foraging however are generally lacking high quality vegetated commuting routes.



### COMMUTING ROUTES

The river corridor is likely to provide the key commuting route in the area within tree cover generally absent elsewhere. There is a loose tree corridor (150m south) which connects the river to the neighbouring farm and the site. In addition, a small woodland pocket associated with a stream is present 150m to the north but this area lacks connectivity to wider habitats.



### SHELTERED FLIGHT AREAS

The site is relatively sheltered within the valley floor.

The barns, particularly the most eastern barn, will provide sheltered flight areas for bats as they are open to the southern elevation.



### ALTERNATIVE ROOST LOCATIONS

Potential roosting locations are limited within 500m. Only a single other farm adjacent to the east (180m) of the site provides potential building roost locations. The village of Falstone is 1.8km northwest.

#### E.2.2 BUILDINGS

Building descriptions are provided below and the location of each structure is illustrated within Figure 4. Building features which have the potential to support roosting bats are underlined, whilst, where recorded, field signs that confirm bat use are in bold. The building numbers have remained the same as the initial 2013 bat report for consistency.

##### **BUILDING 1**

- Renovated farmhouse excluded from this report. The 2013 bat report also produced by E3 Ecology was used to support the planning application granted for the renovation of the farmhouse.

##### **BUILDING 2**

- Barn and traditional cattle byre.
- The building is 1.5 storeys in height at the northern elevation and slopes to single storey at the southern elevation.

- Adjacent to the east of the farmhouse but separated by a stone walkway.
- Construction is largely random stone however brick and breezeblock has been added to the structure to create the roof pitch.
- The roof is corrugated asbestos material and is ill-fitted.
- Internally the space is divided into two areas; a small store to the west and a larger traditional byre housing cattle stalls to the east.
- Mortar gaps internally and externally provide a range of crevices suitable for use by bats during the summer months and potentially over-winter.
- Building has deteriorated in condition with support props in place internally at the northern elevation
- **Common pipistrelle roost confirmed in 2013 survey at southern elevation.**



### BUILDING 3

- Traditional barn.
- Building 3 abuts the eastern end of building 2.
- It is a traditional random stone barn open to the south.
- The roof is supported on large timber beams and constructed of ill-fitting corrugated asbestos sheeting.
- There is no ridge cover present and therefore the space is open to the elements along the length of the ridge.
- Walls, both internal and externally, support a range of gaps and crevices which may support day roosting and potentially hibernating bats.
- The building is of lower height than building 2







**FIGURE 4: BUILDING LOCATIONS**  
(Reproduced under licence from Google Earth Pro.)

### E.3 OVERVIEW OF SITE SUITABILITY

**TABLE 11: OVERVIEW OF SITE SUITABILITY FOR BATS**

HABITATS AND SETTING <sup>22</sup>				
	NEGLIGIBLE	LOW	MODERATE	HIGH
<b>HABITATS AND COVER WITHIN 200M</b>	City Centre	Open, exposed arable, amenity grass or pasture	Hedges and trees linking site to wider countryside	Excellent cover with mature trees and/or good hedges
<b>HABITATS WITHIN 1KM</b>	City Centre	Little tree cover, few hedges, arable dominated	Semi-natural habitats e.g. trees, hedgerows	Good network of woods, wetland and hedges
<b>ALTERNATIVE ROOSTS WITHIN 1KM</b>	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
<b>SETTING</b>	Inner city	Urban with little green space	Build development with green-space, wetland, trees	Rural Lowland with woodland and trees.

<sup>22</sup> 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.

TABLE 11: OVERVIEW OF SITE SUITABILITY FOR BATS				
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 <sup>2</sup>				
	MINIMAL	LOW	MEDIUM	HIGH
AGE (APPROX.)	Modern	Post 1940s	1900-1940	Pre 20 <sup>th</sup> 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	Modern metal frame with sheet cladding	Timber purlins, sheet asbestos	Timbers kingpost or similar	Large timbers traditional joints
ROOF VOID	Fully sealed or flat roof	Small, cluttered void	Medium, relatively open	Large, open, interconnected
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 slates
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

Based on the above, the barns are considered to be of moderate suitability for supporting roosting bats. Since the initial 2013 survey work, the barns have deteriorated due to water influx which has created more access gaps into the stonework, though with an increased opportunity for draughty and wet weather conditions to permeate the barns.

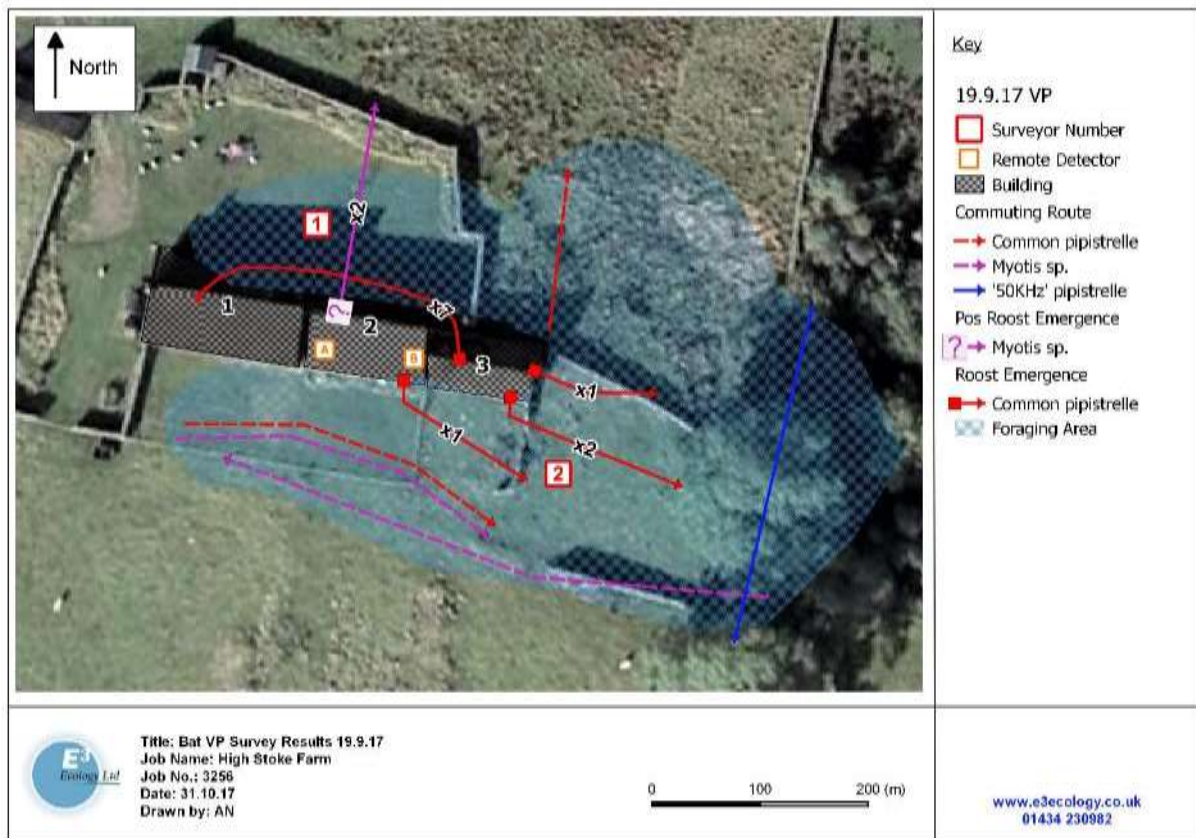
## E.4 ACTIVITY SURVEY

### E.4.1 2017 DUSK EMERGENCE ACTIVITY SURVEY

Numerous roost locations were observed within buildings 2 and 3 during the activity survey. In building 2, one common pipistrelle was observed emerging from a roost at the southern elevation eaves, in similar roost location to the 2013 survey. Two *Myotis* sp. bats were observed flying out from the northern door of building 2 and a remote detector placed within the building recorded *Myotis* sp. activity a couple minutes after the observed emergence. As it could not be concluded that these *Myotis* sp. bats flew through the building from the southern elevation, it is considered likely that a potential roosting site for *Myotis* sp. bats is also within the building. In building 3, seven

common pipistrelle were observed emerging from the central roof ridge, 2 common pipistrelle were observed emerging from the southern elevation eaves and one common pipistrelle was observed emerging from the gable end roof apex. As there are no roosting opportunities within the roof, it is likely the bats observed emerging from the central roof ridge were roosting within the internal stonework of the building.

Key survey data are provided in Appendix 4. Figure 5 provides a summary of the results of dusk emergence surveys.



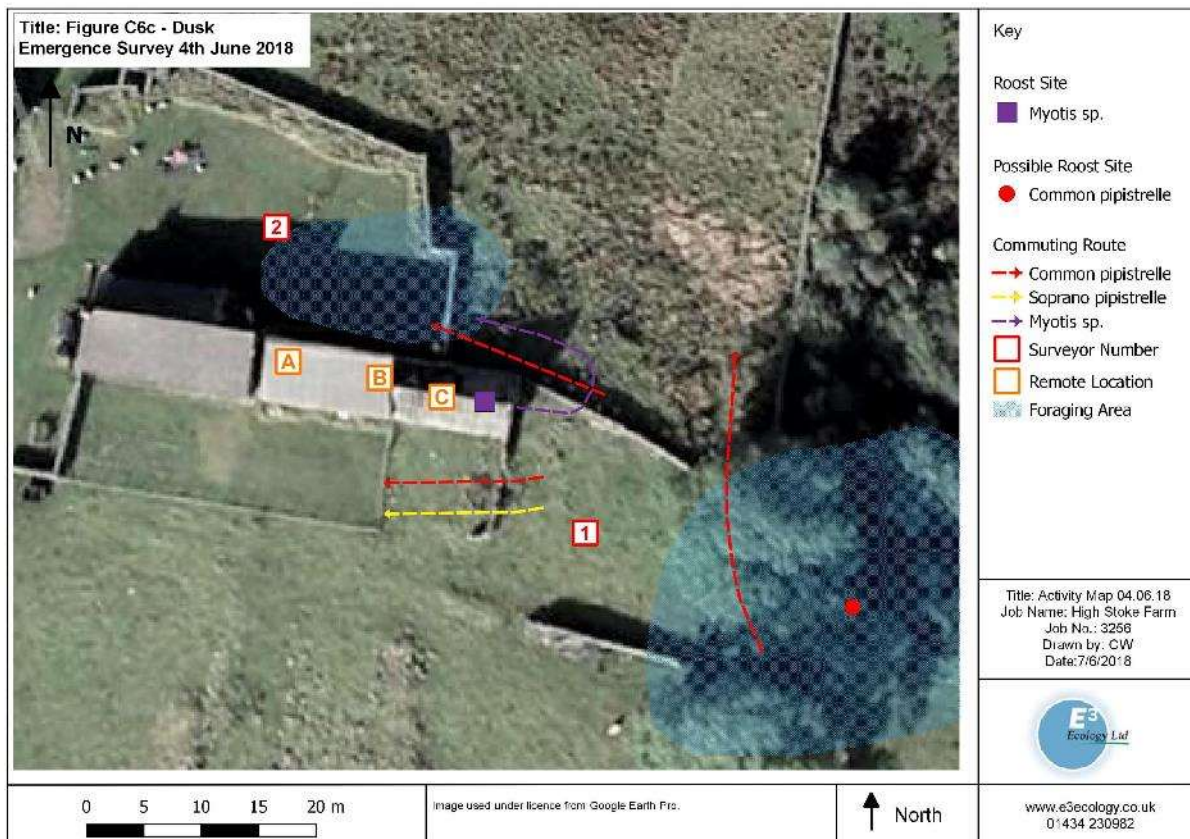
**FIGURE 5: SUMMARY OF DUSK EMERGENCE SURVEY RESULTS**

(Reproduced under licence from Google Earth Pro.)

#### E.4.2 2018 DUSK EMERGENCE SURVEY

The remote detector placed within the eastern most section of building 3 recorded *Myotis* sp calls prior to any bats recorded by the surveyors indicating a roost within this area. The exact point of the emergence for this species was not seen however *Myotis* sp were observed around the eastern elevation of the barns within close time proximity to the calls recorded within the eastern most barn. Overall activity was low. The first bat record was a brief soprano pipistrelle call at 21.52 (approximately 16 minutes after sunset, lux ~24.8) considered to be in the trees to the south, and then there were occasional brief soprano calls during the survey. A possible tree roost was identified to the south of the site, with up to 3 common pipistrelle appearing from around this location (first at 21.58, lux ~17.5). The majority of activity was from common pipistrelle, around the trees/field to the south of the site, with bats then extending their foraging area into the site. Up to two *Myotis* bats were heard late in the survey (22.47, lux ~0.5, 1 hour 11 minutes after sunset). A summary of the survey results is shown in the figure below.





**FIGURE 6: SUMMARY OF THE 4TH JUNE 2018 DUSK SURVEY  
(REPRODUCED UNDER LICENCE FROM GOOGLE EARTH PRO.)**

## E.5 ADDITIONAL SPECIES GROUPS

A check for nesting barn owls was also completed prior to the 2017 survey and no evidence of current barn owl use was found. Anecdotal evidence from the homeowner indicates that barn owl have previously used building 3 but have not been observed for a few years. A tawny owl was heard during the 2017 bat survey to the south of the site.

## **F. SITE ASSESSMENT**

### **F.1 ASSESSMENT OF SURVEY FINDINGS**

No field signs were found within the barns; however, detection was made difficult by debris present on the barn floors. Both barns support day roosting common pipistrelle bats. A single common pipistrelle day roost was recorded in building 2 at the southern elevation, with results similar to the 2013 survey. The building is also considered likely to support roost(s) of *Myotis* sp. bats. No bats were recorded emerging from this building in 2018.

In 2017 building 3 was found to support multiple common pipistrelle day roosts including at the gable end, at the southern eaves and at the northern roof elevation. These are roosts that were not previously found in 2013. Updating survey in 2018 recorded the presence of a *Myotis* sp roost within the eastern most section of building 3.

As such, given the limited alternative roosting opportunities in the surrounding area, both buildings are deemed to be of parish value to bats.

2018 survey was conducted during the maternity season with no evidence of a maternity roost recorded.

As there are a large number of access points into the stone walls, there is a risk of hibernating bats using the barns.

In addition, both barns have the potential to be used as sheltered foraging or light sampling areas for local bats.

### **F.2 POPULATION SIZE CLASS ASSESSMENT**

From the field survey, it is concluded that the buildings are used by a small number of bats, up to 15, at intervals through the year. The buildings are used as non-breeding day roost sites and perhaps a hibernation site.

### **F.3 LIMITATIONS AND CONSTRAINTS**

Survey completed at the site will provide reasonably typical data for the summer/ autumn period, and internal field signs are likely to reflect activity over the preceding two or three months. 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.

## **G. IMPACT ASSESSMENT**

Potential impacts of the development include:

### **G.1 DIRECT DEVELOPMENT IMPACTS**

- The loss of numerous potential crevice roost sites within the fabric of the walls within both barns.
- Disturbance or harm to a small number of bats that may be using the buildings at the time, potentially including hibernating bats if works are undertaken during the winter.
- Increased levels of disturbance due to occupants of the properties and their pets, following on from the conversion.
- Loss of open barn spaces used for light sampling and covered flight spaces before emergence.
- Disturbance to breeding birds if present in the barns at the time of development.

### **G.2 INDIRECT IMPACTS ON LOCAL POPULATIONS**

The development is likely to result in the indirect impact of disturbing local foraging and roosting bats through increased lighting.

## H. RECOMMENDATIONS

### H.1 FURTHER SURVEY

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.

### H.2 AVOIDANCE AND MITIGATION STRATEGY

#### H.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.

#### H.2.2 TIMING OF WORKS

- **A Natural England licence (2018-35873-EPS-MIT) has already been granted for the re-roofing and structural renovation of the buildings and this will need to be modified to take account of the change of use.**
- Prior to re-roofing works commencing a site induction meeting was held, attended by the project ecologist and lead contractors.
- Prior to works commencing a detailed inspection of the structure took place once scaffolding or safe equivalent 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 stonework
- No exclusion was/will be undertaken during the hibernation period (mid-November to mid-March inclusive).

#### H.2.3 WORKING METHODS AND BEST PRACTICE

- A copy of the relevant Natural England licence method statement has been provided to contractors prior to the induction process at the start of works. The project ecologist reviewed all key points with contractors during the induction and provide all necessary training.
- The buildings will be re-inspected prior to conversion works commencing as bats may have returned following re-roofing/renovation works. 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 3 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).
- Works will be undertaken 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. Re-mortaring works will be undertaken once gaps have been inspected (and if required exclusion works completed) by a licenced bat ecologist.
- 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.

- No conversion works will be undertaken during the nesting bird season (March to August inclusive) unless a checking survey by a suitably experienced ornithologist confirms the absence of active nests.

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](http://www.jncc.gov.uk/pdf/batwork_manualpt4.pdf)).

### **H.3 COMPENSATION STRATEGY**

The following compensation strategy is proposed:

#### **H.3.1.1 CREVICE ROOST SITES**

Previous mitigation as part of the Natural England licence for the site (2018-35873-EPS-MIT) included the retention of crevice roost site around the exterior and interior of the barns along with access points being retained at the wall tops. This mitigation will be retained where possible however the proposed crevice roost locations within the internal of building 3 walls will no longer be viable due to renovation works to create holiday let accommodation. In place of the 4 proposed internal crevice roost locations a 2FE Schwegler bat box will be mounted on the eastern external wall of building 3.

The following previously agreed mitigation will still be incorporated into the renovated barns:

A total of eight external crevice roost sites, four on building 2 and four on building 3, two on the north and two on the south elevation of each building within the stone walls. Access will be retained/created through careful repointing (see Appendix 5 for an illustrated example; full details to be provided in architectural drawings). 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.

Internally, the hay store element of building 2 will have at least three crevice roosts retained/created within the stone walls on the north and the south elevation. Internal access to the hay store will be provided through the provision of three bat access gaps through the stone wall on the northern newly renovated roof elevation (Appendix 5). Such gaps will be from 15-20mm wide and run through the depth of the stone wall to allow access to the retained/recreated crevice roost sites within the internal walls of the hay store.

### **H.4 MONITORING**

The site will be monitored in accordance with any conditions of the Natural England licence.

### **H.5 ADDITIONAL ENHANCEMENT RECOMMENDATIONS**

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

- Provision of two bird nesting boxes

## **APPENDIX 1. STATUTORILY AND NON- STATUTORILY DESIGNATED SITES**

### **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.

### **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

### BAT LIFECYCLE

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

BAT LIFECYCLE AS IT RELATES TO SURVEY TIMING <sup>23</sup>												
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 ROOST USE THROUGH THE YEAR												
Day Roost												
Night Roost												
Feeding Roost												
Transitional/ Occasional Roost												
Swarming Site												
Mating Site												
Maternity Roost												
Hibernation Roost												
Satellite Roost												

<sup>23</sup> Based on information provided within Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> Edition). Bat Conservation Trust

## BAT ROOST TYPES

Bat Roost Types	
Roost Type	Definition
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.

## SPECIES SPECIFIC ECOLOGY

Pipistrelle maternity colonies generally consist of 25 to 100 individuals, but colonies numbering up to 1000 are not uncommon<sup>24</sup>. 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 roosts<sup>25</sup>.

Maternity colonies of brown long-eared bats are generally small, consisting of 10 to 20 adults<sup>26,27</sup> (although numbers are likely to be underestimated, due to presence in inaccessible areas of the roost). In exceptional circumstances, colonies can reach 200+ bats.

Natterer's bats roost within crevices and cavities, typically within hollow trees, old buildings, caves and tunnels<sup>28</sup>. 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 Scotland<sup>29</sup>. 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 bats<sup>30</sup>. 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 used<sup>31</sup>.

<sup>24</sup> Roberts, G.M. & Hutson, A.M. 2000. *Pipistrelle*. British Bats No. 6. The Bat Conservation Trust, London

<sup>25</sup> Corbet, G.B & Southern, H.N., 1964. The handbook of British Mammals).

<sup>26</sup> 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

<sup>27</sup> 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

<sup>28</sup> Stebbings, R.E. 1991. Natterer's bat *Myotis nattereri*. In The handbook of British Mammals. 3<sup>rd</sup> Edition Corbet, G.B. & Harris, S. (Eds) Oxford: Blackwell Scientific.

<sup>29</sup> 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.

<sup>30</sup> Altringham, J.D. 2003. British Bats. The New Naturalist. Pub. Harper Collins.

<sup>31</sup> 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.

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 crevices<sup>30</sup>.

Brandt's bat is thought to have similar roosting behaviour and foraging ecology to the whiskered bat, however, further research is needed to clarify this<sup>30</sup>.

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

## APPENDIX 3.BATS AND DEVELOPMENT

A list of development types likely to affect bats where they impact on particular features is provided within the table below.

PLANNING AND DEVELOPMENT TRIGGER LIST FOR BAT SURVEYS <sup>32</sup>	
NATURE OF WORK	TYPE OF BUILDING OR FEATURE
<b>Conversion, modification, demolition or removal of buildings (including hotels, schools, hospitals, churches, commercial premises and derelict buildings)</b>	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
<b>Any development works</b>	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
<b>Floodlighting</b>	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
<b>Felling, removal or lopping</b>	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)
<b>Any development works</b>	Within 200m of rivers, streams, canals, lakes, reedbeds or other aquatic habitats
<b>Any development works</b>	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
<b>Any single or multiple wind turbine construction</b>	N/A – although for single turbines this can depend on size and location
<b>Any development works</b>	Sites where bats are known to be present

<sup>32</sup> Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> Edition). Bat Conservation Trust

A summary of the likely scale of impact at a site level in relation to various bat features and development effects is provided below.

<b>SUMMARY OF MAIN IMPACTS AT SITE LEVEL</b>				
<b>Habitat Feature</b>	<b>Development Effect</b>	<b>Scale of impact</b>		
		<b>Low</b>	<b>Medium</b>	<b>High</b>
<b>Maternity Roost</b>	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside breeding season	✓		
	Post-development interference			✓
<b>Major Hibernation</b>	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference			✓
<b>Minor Hibernation</b>	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Modified management		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference		✓	
	Temporary destruction then reinstatement	✓		
<b>Mating</b>	Destruction		✓	
	Isolation caused by fragmentation		✓	
	Partial destruction; modification	✓		
	Modified management	✓		
	Temporary disturbance outside hibernation season	✓		
	Post-development interference	✓		
	Temporary destruction then reinstatement	✓		
<b>Night Roost</b>	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. RAW DATA DUSK EMERGENCE SURVEY

Raw data dusk emergence survey 19.09.17					
Start Temp:	End Temp:	Cloud Cover:	Precipitation:	Wind:	Sunset:
12°C	8°C	10%	0	0	19:15

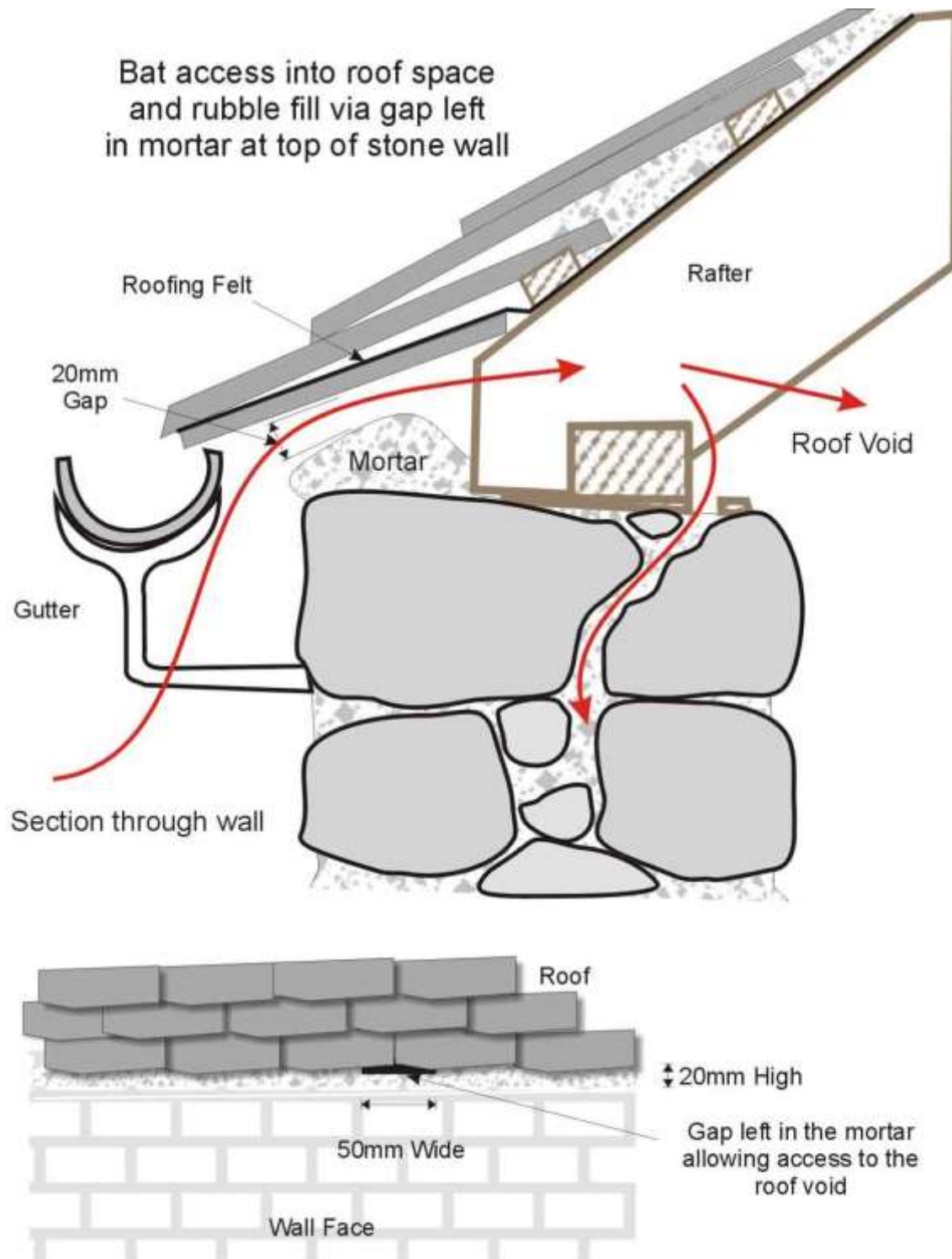
  

Summary of Survey:					
<p>Numerous roost locations within buildings 2 and 3. In building 2, one common pipistrelle was observed emerging from a roost at the southern elevation eaves and 2 Myotis sp. bats were observed flying out from the northern door. In building 3, seven common pipistrelle were observed emerging from the central roof ridge, 2 common pipistrelle were observed emerging from the southern elevation eaves and one common pipistrelle was observed emerging from the gable end roof apex.</p>					
Activity Table:					
Time	Lux	Surveyor 1	Surveyor 2	Remote A	Remote B
18:55					
19:00					
19:05					
19:10					
19:15					
19:20	92.6				
19:25	90	19:29 45 C N.	19:28 45 x1 possible emergence from farmhouse		
19:30	42.6		19:32 45 x2 Emerged from S side of bldng 3, within bldng. 19:33 45 x1 Emerged from bldng 2 on S side from eaves		19:33 - 20:01 45. 20:01 Myo.
19:35	10.6	19:37 - 45 x4 Emerged from under bldng 2 roof 19:41 - 45 x3 Emerged from under bldng 2 roof	19:35 45 x1 Emerged from gable end near roof apex. 19:36 - 19:37 45 F around bldngs. 19:39 45 x1 C E along bldngs.		
19:40	1.3	19:43 - 19:56			
19:45		45 (up to 3 indivs) F		20:48 pip social call .	

19:50		around bldgs.	19:49 50 pip C S.		
19:55		19:58 Myo Possible emergence from door of bldng 2.	19:56 45 C&F around bldng.		
20:00		20:00 45 HNS. 20:03 45 F around bldng 1.	20:00 - 20:06 Myo C E & W along bldng.		
20:05					
20:10		20:13 - 20:40 intermittent 45 and Myo HNS calls.	20:14 45 x1 F & C around bldngs.		20:14 - 20:44 pip social calls. 20:19 Myo.
20:15			20:18 Myo HNS call. 20:19 45 F around bldng.		
20:20			20:20 - 20:39 Myo and 45 HNS intermittent calls.		
20:25					
20:30					
20:35					
20:40					
20:45					
Surveyor		Simone Mordue	Jessica Wilson	Anabat Express	Anabat Express
	Sunset				
45 – common pipistrelle 55- soprano pipistrelle Noc – Noctule BLE - brown long-eared bat Myo - Myotis sp. ? 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:	High Stoke Farm				Start	Finish				
Start Time:	21:18	End Time:	23:10	Precipitation:	Nil	Nil	Number of Surveyors	2		
Sunset Temp °C:	16.8	End Temp:	12.7	Wind:	F1	F1	Number of Remotes:	3		
Sunset:	21:36			Cloud Cover %:	100	100				
Roosts				Commuting			Foraging			
Myotis Roost (Myo), recorded internally within the Eastern section of the survey building				Common pipistrelle (45)			Common pipistrelle (45)			
				Soprano pipistrelle (55)			Soprano pipistrelle (55)			
				Myotis (Myo)			Myotis (Myo)			
Time	Light Level (Lux)	Surveyor 1	Surveyor 2	No Activity Recorded		Remote A	Remote B	Remote C		
21:15	200+									
21:20	187									
21:25	165									
21:30	103.4									
21:35	76.3									
21:40	55.9									
21:45	44.6									
21:50	30.5	55 - First Rec (21:52)					55 - First Rec (21:52)			
21:55	24.8	45 - Potential Roost, Ash Trees to South. First Rec (21:59). Plus 45 & 55 Forage								
22:00	17.5									
22:05	10.7	45	45							
22:10	7.4									
22:15	4.8									
22:20	3.1	45, Myo - First Rec (22:20)	45				45 - First Rec (22:20)	Myo Roost Internal - First Rec (22:20), 45 activity recorded also (22:21)		
22:25	1.7									
22:30	1.2									
22:35	0.8									
22:40	0.5									
22:45	0.5	Myo	55 - First Rec (22:45), Myo - First Rec (22:49)				45 - First Rec (22:48)			
22:50	0.4									
22:55	0	45								
23:00	0									
23:05	0									
23:10	0									
Sunset		Times given above detail emergence/possible emergence & first record of each species for each surveyor								
Emergence										
Potential Emergence										
Foraging/commuting										
Surveyors					Bat Key					
1	Mary Martin			Common pipistrelle	45	Daubenton's	Daub			
2	Barry Bickerton			Soprano pipistrelle	55	Noctule	Noc			
A	Westen building section (internal)			Nathusius pipistrelle	39	Serotine	Ser			
B	Central building section (internal)			Natter's	Nat	Leisler's	Nat			
C	Eastern building section (internal)			Whiskered/Alcathoe's/Brandts	WAB	Brown Long Eared	BLE			
				Unknown	?	Myotis	Myo			
Other Species Recorded	Swallow, Curlew (offsite)									

## APPENDIX 5.MITIGATION FIGURES – BAT ACCESS AT EAVES



Elevation of eaves