



# BAT RISK ASSESMENT



## LOW LEAM FARM, WEST WOODBURN

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## SUMMARY

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E3 Ecology Ltd was commissioned by Mr John Scott to undertake a daytime bat risk assessment of a cottage at Low Leam Farm, West Woodburn in October 2014.

It is proposed to demolish a small single storey modern extension to the cottage and rebuild with a larger two-storey extension.

Initial site inspection was undertaken on 6<sup>th</sup> October 2014 and comprised a detailed inspection of the structure and the building that it is connected to.

The site is situated to the west of the main Low Leam farmstead within an area dominated by grazed pasture. The site is relatively exposed, with only limited tree cover present and has only moderate connectivity to areas of better quality foraging habitat. Overall, the habitats present within the local area would suggest that the site has low to moderate potential for supporting roosting.

The structure to be demolished comprises a modern single storey extension attached to a traditional stone cottage. The extension has a single pitch, corrugated metal roof, measuring approximately 5m x 2.5m. The extension walls have been rendered and support tightly fitted plastic bargeboards, offering limited opportunities for roosting bats. The structure is currently used for storage, though both the extension and the main cottage are currently empty. No evidence of bats was recorded within the structure and it is considered to have negligible potential for supporting roosts.

The structure is connected to a two storey stone built cottage. The cottage supports a pitched slate roof in good condition with a chimney on the eastern elevation, whilst the pointing of the cottage is also in very good condition. As such opportunities for bats are limited to small crevices associated with a gap on the southern elevation and an area of missing render at the ridgeline. In addition, the water tables are well sealed offering few perceptible opportunities for bats. The cottage has a loft that was also checked at the time of survey. Small sections of the western gable wall tops are exposed allowing potential access to the rubble filled gap. No evidence of bats was recorded from the structure and given its setting it is considered to have low potential for supporting roosting bats.

Overall, from the nature of the buildings and the surrounding habitat the risk of roosts being present in the extension to be demolished is considered negligible and very low within the area of the main cottage to be affected.

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

- Low potential of disturbing hibernating bats, should they be present within the rubble filled western gable wall.
- Very low potential for disturbing roosting bats should they be present in the area around the stones associated with the western water table, should they be present during the demolition.
- Negligible potential for disturbing individual day roosting bats, should they be present during the demolition.
- Low risk of disturbing hibernating bats should they be present within the rubble filled western gable at the time of survey.
- Low risk of disturbing birds nesting on the structure if works are undertaken during the breeding season.

Key mitigation measures include:

- Initial works to the water table will not be undertaken between mid-November and mid-March, should works start prior to this, the section will be made unsuitable for hibernation use.
- Works on the water table will be undertaken to the attached method statement (Appendix G.2).
- 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.
- Three bat slates installed within the new extension.
- Three bat boxes to be sited on trees within the farmstead.

The National Park 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 be incorporated into the master-planning documents.

*If you are assessing this report for the National Park 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.*

## A INTRODUCTION

E3 Ecology Ltd was commissioned by Mr John Scott to undertake a daytime bat risk assessment of a structure at Low Leam Farm, West Woodburn in October 2014.

As bats are small nocturnal species that can roost in inaccessible crevices only 16mm wide, it can be very hard to demonstrate that they are absent from a site, particularly given a limited number of visits during part of the year. As a result, assessment and development approaches are based on an informed risk assessment, and where appropriate a reasonable worst-case scenario, in order to ensure that bats are not recklessly harmed by the proposals.

### A.1 Background to development

The site is situated approximately 350m to the north west of the village of West Woodburn at a central grid reference of NY 87564 86139. Site location is illustrated below in Figure 1.

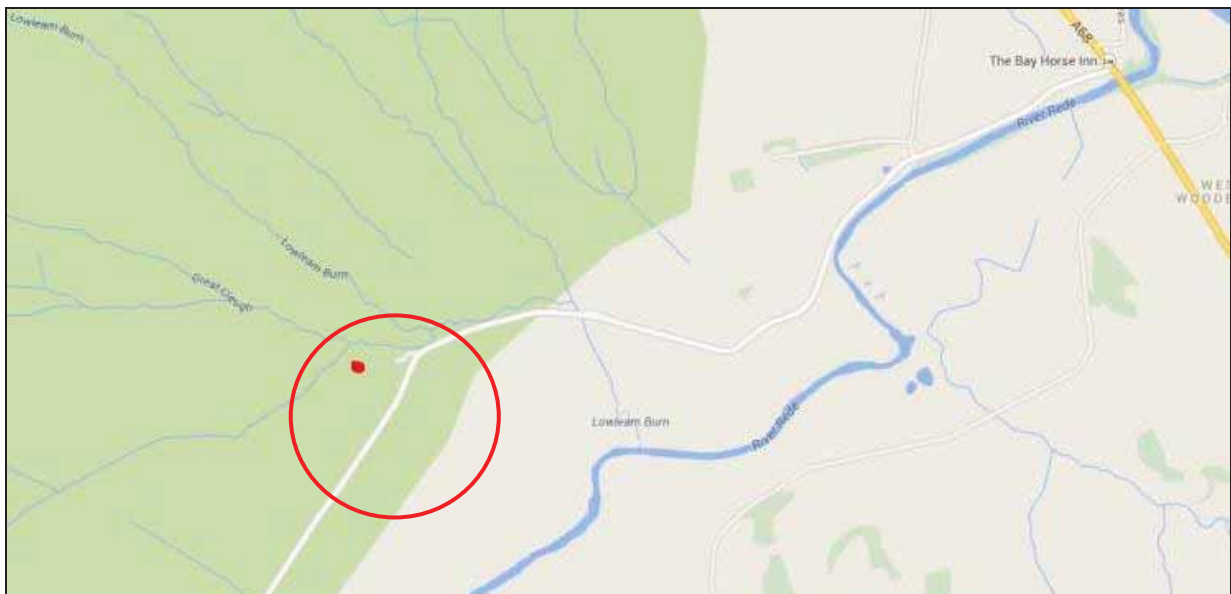


Figure 1 – Site Location  
(Reproduced from Google Earth under licence.)

The cottage is associated with Low Leam Farm, and is owned by Mr John Scott

It is proposed to demolish the modern single storey extension on the western elevation and replace it with a two-storey extension.

## **A.2 Personnel**

Survey work and reporting was undertaken by:

- Mark Osborne Btech (Hons) MCIEEM (Natural England licence No. CLS00863)

The project was checked by:

- Neil Beamsley BSc MCIEEM (Natural England Licence No. 2014-1798-CLS)

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

## **A.3 Objectives of study**

The objective of the study was to gain a sufficiently detailed picture of bat 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).

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 that may develop in a building in poor condition.

## B RELEVANT LEGISLATION AND PLANNING CONTEXT

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### B.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) states the following:

- Plan policies and planning decisions should be based upon up-to-date information about the natural environment (Paragraph 158 and 165).
- Plan policies should promote the preservation, restoration and recreation of priority habitats, ecological networks and the recovery of priority species (Paragraph 117).
- Local planning authorities should set out a strategic approach in their Plans, planning positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure. (Paragraph 114).
- When determining planning applications in accordance with the Local Plan and the presumption in favour of sustainable development local planning authorities should aim to conserve and enhance biodiversity by applying a number of principles, including 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. (Paragraph 118).

### B.2 Protected species legislation

#### *Bats*

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 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.
- Deliberately obstruct access to a bat roost.
- Damage or destroy a bat roost.

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".

Defences that were previously available under the Conservation (Natural Habitats, &c.) Regulations 1994, legislation which is superseded by the Conservation of Habitats and Species Regulations (2010), have now been removed. Specifically the 'dwelling-house' defence and the 'incidental result of a lawful operation' defence no longer apply. However the 'incidental result' defence persists within the Wildlife and Countryside Act and so disturbing bats or obstructing access to a roost and activities that cause low level disturbance may be able to rely on this defence.

Under the Countryside and Rights of Way Act 2000 (CROW Act) the offence in section 9(4) of the 1981 Act 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.

As of October 1 2006, public authorities have a duty to conserve biodiversity under the Natural Environment and Rural Communities (NERC) Act 2006.

## C SURVEY AREA AND METHODOLOGY

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### C.1 Survey area

Figure 2 illustrates (in red) the site boundary whilst Figure 3 illustrates the broad habitats present on site and within an approximate 500m buffer zone.



Figure 2 – Aerial photograph illustrating the extent of the site with a redline boundary (Reproduced under licence from Google Earth Pro.)

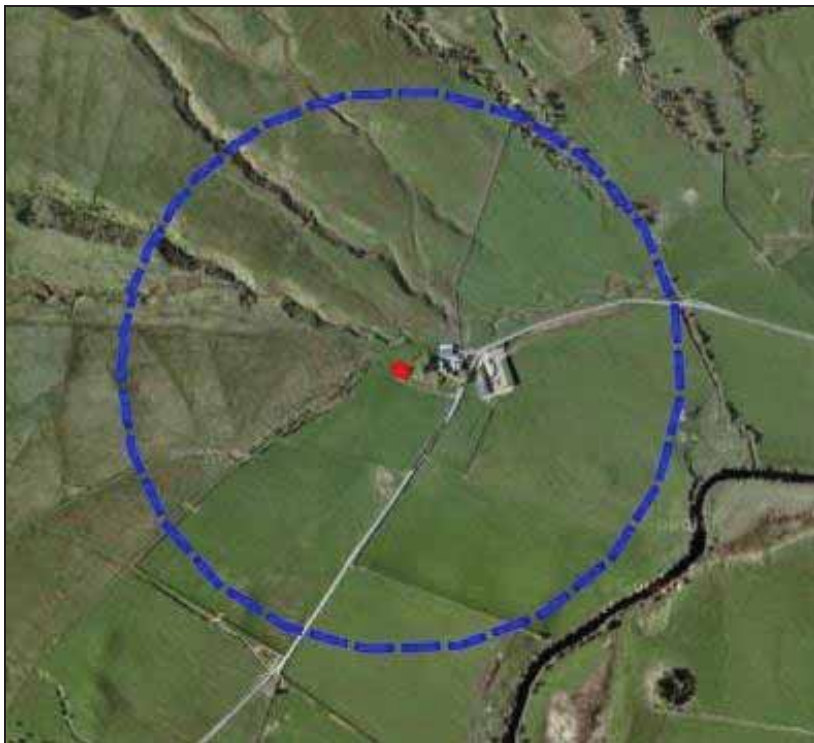


Figure 3 – Aerial photograph centred on the site with a 500m radius illustrating the setting and the habitats it supports (Reproduced under licence from Google Earth Pro.)

The study area includes the site and adjacent land to allow for possible secondary impacts in line with Natural England recommendations.

## C.2 Methodology

### C.2.1 Desktop study

Initially, the site was assessed from aerial photographs and 1:25000 OS plans. Following this, the MAGIC website was checked for any notable sites or habitat or species records.

### C.2.2 Survey equipment

The following items of equipment were utilised during survey work and analysis:

- Clulite CB2 high powered torch
- SeeSnake video borescope
- Duet bat detector
- RSPB HD 10x42 Binoculars

### C.2.3 Habitats and Structures

#### *Initial Inspection*

A daytime assessment was made of the structure 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.

Both 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 floor under potential roost sites, 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 being confirmed by recording bats at emergence and analysis of the calls.

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.

### C.2.4 Timing

Survey was undertaken on:

Date	Cloud cover	Precipitation	Wind	Temperature
06.10.14	10%	None	SE 2	10°C

A total of 1 hour was spent inspecting the structure.

## D RESULTS

### D.1 Desktop study

#### D.1.1 Pre-existing information

##### **OS map & aerial photographs**

Figures 1 (A1) and 3 (C1) show that the general land use in the surrounding area is dominated by grazed pasture, with field boundaries marked by post and wire fence lines and dry stone walls. The site is located to the west of the Low Leam farmstead in an upland area interspersed with mature trees in the wider area. The River Rede flows approximately 580m to the east of the site.

The most recent aerial photograph of the site (Figure 2, C1, December 2009) indicates that habitats on site are dominated by grazed grassland.

##### **MAGIC website**

Consultation with the government's Multi Agency Geographic Information for the Countryside website indicated that there are no statutorily protected sites within 2km of the proposed development.

##### **Bat log**

The National Bat Atlas holds records of pipistrelle species and brown long eared bat from within the 10km grid square.

#### D.1.2 Bat risk assessment

The following risk assessment is for the structure to be demolished.

	Risk of supporting roosting bats <sup>1</sup>			
	<i>Minimal</i>	<i>Low</i>	<i>Medium</i>	<i>High</i>
<b>Habitats and Setting</b>				
<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	Some semi-natural habitats, trees hedges etc	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

<sup>1</sup> This risk assessment technique has been audited through 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.

	Risk of supporting roosting bats <sup>1</sup>						
	<i>Minimal</i>		<i>Low</i>		<i>Medium</i>		<i>High</i>
<b>Setting</b>	Inner city		Urban with little green space		Build development with greenspace, wetland, trees		Rural Lowland with woodland and trees.
<b>Distance to water/marsh</b>	>1km		500m-1000m		200m-500m		<200m
<b>Distance to woodland/scrub</b>	>1km		500m-1000m		200m-500m		<200m
<b>Distance to species-rich grassland</b>	>1km		500m-1000m		200m-500m		<200m
<b>Commuting routes</b>	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
<b>Buildings</b>							
<b>Approximate age</b>	Modern well sealed		Post 1940's		1900-1940		Pre 20 <sup>th</sup> C
<b>Building/complex type</b>	Industrial complex of modern design		Single, small building		Several buildings, large old single structure		Set of traditional farm buildings, country house, castle, hospital
<b>Building - storeys</b>			Single storey		Multiple storeys		Multiple storeys, large roof voids
<b>Stone/brick work</b>	No detectable crevices		Well pointed		Some cracks and crevices		Poor condition, many crevices,
<b>Framework – timbers/steel</b>	Modern sheet materials, steel frame steel sheet cladding		Timber purlins, sheet asbestos		Timbers kingpost or similar		Large timbers traditional joints
<b>Roof void</b>	Fully sealed or flat roof		Small, cluttered void		Medium, relatively open		Large, open, interconnected
<b>Roof covering</b>	Modern sheet materials and Tightly sealed		Good condition, no gaps or very open not weatherproof modern sheet materials		Some potential access routes, slates, tiles		Uneven with gaps, not too open, stone slates
<b>Additional features</b>	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
<b>External lighting</b>	Extensive security lights covering much of the site		Widespread areas above 2 lux at night		Intermittent lights of low intensity		Minimal
<b>Building use</b>	Very noisy, dusty		Regular use		Intermittent use		Disused

It can be seen that the extension is a minimal to low risk site in a low to moderate location. However based on the well sealed state of the structure, it is considered to have a very low risk of supporting roosting bats and as such bats are considered unlikely to be present with the structure.

## D.2 Field survey

### D.2.1 Habitats

#### *Foraging habitats*

Foraging habitats are limited within the immediate vicinity of the site to a small number of trees associated with the farmstead. A small area of scrub is present to the west of the site, whilst the River Rede flows approximately 580m to the east.

#### *Commuting routes*

The site is surrounded by agricultural land bisected by fence lines and dry stone walls that provide only low quality commuting routes. A couple of small streams, including the Low Leam Burn link the site to the wider area, though are relatively exposed.

#### *Exposed/sheltered*

The structure is located within an exposed area of upland Northumberland, with very limited shelter present from the prevailing south-westerly winds.

### D.2.2 Built structures

#### *Extension to be demolished*

The structure comprises a small single storey extension, measuring approximately 5m x 2.5m, on the western elevation of a two-storey stone cottage. The structure supports a single pitch corrugated metal roof. The walls of the extension support plastic bargeboards and are concrete rendered offering no opportunities for roosting bats. The internal space is well sealed with no opportunities present for roosting bats. **No evidence of bats was recorded** from the structure.



#### *Stone Cottage*

##### *External*

The extension is connected to a two storey stone building associated with the farm. The building supports a pitched slate roof and a chimney on the eastern elevation. The rendering of the building is in very good condition offering very few opportunities for roosting bats. The windows and doors are well sealed and appear recently fitted. A section of lead flashing is present where the extension meets the main building, though this is also in good condition. The structure supports stones associates with the water table. These are the only section of the main building to be affected by the development. Small gaps are present on the ridge line and in the south western corner of the structure.



### *Internal*

The cottage supports a traditional timber roof structure. The roof slates are unlined and the void is open and uncluttered. The space is dry, free from perceptible draughts and warm leading to good conditions for the persistence of droppings, though none were recorded. The central ridge beam was heavily cobwebbed. The stone gables provide only a few opportunities for roosting bats, though all crevices were heavily cobwebbed.



**No evidence of bats was recorded** from the structure.

### D.2.3 Trees

No trees are to be impacted by the proposals.

### D.2.4 Other species

No recent evidence of other species using the site was recorded, though an historic swallow nest was present within the extension and this year's house martin nests were present on window frames on the northern elevation.

## E 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 Institute of Ecology and Environmental Management<sup>2</sup>.

Level of Value	Examples
<b>International</b>	<ul style="list-style-type: none"> <li>• An internationally designated site or candidate site.</li> <li>• A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole.</li> <li>• Any regularly occurring population of an internationally important species, which is threatened or rare in the UK.</li> <li>• Any regularly occurring, nationally significant population/number of any internationally important species.</li> </ul>
<b>National</b>	<ul style="list-style-type: none"> <li>• A nationally designated site.</li> <li>• A viable area of a priority habitat identified in the UK BAP, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole.</li> <li>• Any regularly occurring population of a nationally important species, which is threatened or rare in the region or county.</li> <li>• A regularly occurring regionally or county significant population/number of any nationally important species.</li> <li>• A feature identified as of critical importance in the UK BAP.</li> </ul>
<b>Regional</b>	<ul style="list-style-type: none"> <li>• Viable areas of key habitat identified in the Regional BAP or smaller areas of such habitat, which are essential to maintain the viability of a larger whole.</li> <li>• A regularly occurring, locally significant number of a regionally important species.</li> <li>• Bats: large maternity sites used by rare species in the region, including <i>Nathusius pipistrelle</i>, <i>Leislars</i> and <i>Brandts</i> bats.</li> </ul>
<b>County</b>	<ul style="list-style-type: none"> <li>• County designated sites.</li> <li>• A viable area of a habitat type identified in the County BAP.</li> <li>• Any regularly occurring, locally significant population of a species which is listed in a County "red data book" or BAP on account of its regional rarity or localisation.</li> <li>• A regularly occurring, locally significant number of a species important in a County context.</li> <li>• Bats: large maternity sites used by uncommon species in the region, including <i>Daubenton</i>, <i>Natterers</i>, <i>soprano pipistrelle</i>, <i>noctule</i>, <i>brown long eared</i> and <i>whiskered</i> bats; or small to moderate maternity roosts, hibernation and autumn swarming roosts used by rare species</li> </ul>
<b>District</b>	<ul style="list-style-type: none"> <li>• Areas of habitat identified in a District level BAP.</li> <li>• Sites designated at a District level.</li> <li>• Sites/features that are scarce within the District or which appreciably enrich the District habitat resource.</li> <li>• A population of a species that is listed in a District BAP because of its rarity in the locality.</li> <li>• Bats: 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 (<i>common pipistrelle</i>)</li> </ul>
<b>Parish</b>	<ul style="list-style-type: none"> <li>• Area of habitat considered to appreciably enrich the habitat resource within the context of the Parish.</li> <li>• Local Nature Reserves.</li> <li>• Bats: large hibernation, small-moderate maternity and autumn swarming roosts of common species; small numbers of uncommon species or occasional (1-4) roost of rare species</li> </ul>

<sup>2</sup> 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>.



Level of Value	Examples
Local	<ul style="list-style-type: none"> <li>• Habitats and species that contribute to local biodiversity, could only be replicated in the medium term, but are common in the local area.</li> <li>• Loss of such habitats would ideally be mitigated if local biodiversity is to be conserved and enhanced.</li> <li>• Bats: small numbers of common species, feeding/individual roosts of uncommon species or feeding roosts of rare species.</li> </ul>
Low	<ul style="list-style-type: none"> <li>• Habitats of poor to moderate diversity such as established conifer plantations, species poor hedgerows and unintensively managed grassland that may support a range of Local BAP species but which are unexceptional, common to the local area and whose loss can generally be readily mitigated.</li> </ul>

### E.1 Assessment of survey findings

The structure to be demolished is disused and well sealed and provides few opportunities for roosting bats.

The small numbers of cavities that are present on the main building will be unaffected by the proposals though provide opportunities for roosting bats. A small gap is present within the stones associated with the water table to be affected by the proposals. Though it is west facing and likely to be exposed to the elements. No evidence of bats was recorded within either structure.

Based on the findings of the survey, the structure to be demolished is considered to have a negligible potential for supporting roosting bats and the area of the cottage to be affected is considered to have a very low potential.

### E.2 Impacts

Bats are most vulnerable to disturbance during June, July and August, when they are breeding, and between November and March when they are hibernating.

The potential to disturb roosting bats within extension is considered to be negligible.

As such impacts of the proposed development are considered to be limited to:

- Low potential of disturbing hibernating bats, should they be present within the rubble filled western gable wall.
- Very low potential for disturbing roosting bats should they be present in the area around the stones associated with the western water table, should they be present during the demolition.
- Negligible potential for disturbing individual day roosting bats, should they be present during the demolition.
- Low risk of disturbing hibernating bats should they be present within the rubble filled western gable at the time of survey.
- Low risk of disturbing birds nesting on the structure if works are undertaken during the breeding season.

### E.3 Constraints

There were no constraints associated with the risk assessment.

## **F MITIGATION AND RECOMMENDATIONS**

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### **F.1 Further survey**

Based on the nature of the structure to be demolished and the area of the house to be affected, no further surveys are recommended.

The BCT Bat Surveys, Good Practise Guidelines, state in 6.4.3 that if bat signs are not present and the building or built structure provides no suitable locations for roosting bats, then no further visits would normally be required as such, based on the areas to be affected, no further survey has been recommended.

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

### **F.2 Mitigation requirements**

#### *Working Methods*

- Initial works to the water table will not be undertaken between mid November and mid March, should works start prior to this, the section will be made unsuitable for hibernation use.
- Works associated with the western water table will be undertaken to the attached method statement (Appendix G.2).
- 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.
- Three bat slates installed within the new extension.
- Three bat boxes to be sited on trees within the farmstead.

## G APPENDICES

### G.1 Appendix 1: BAT ECOLOGY

#### **Habitat and roost preferences**

In their guidelines for bat surveys in the Northumbria Region, Natural England indicates the types of building and trees that are more or less likely to support bat roosts:

Presence of **built structures** which appear to have a high probability of use by bats:-

- Properties older than 1939, with multiple roofs within 200m of woodland or water.
- Properties older than 1914 within 200m of woodland or water.
- Listed buildings or monuments.
- Traditional ranges of farm buildings.

The risk of bat roosts being present will be higher where structures have:

- Pre-20<sup>th</sup> Century construction.
- A lowland rural setting.
- Woodland, mature trees, species-rich grassland and/or water nearby.
- Large dimension roof timbers with cracks, joints and holes.
- Numerous crevices in stonework and structures.
- Uneven roof covering with gaps, though not too draughty.
- Hanging tiles or roof cladding, especially on south-facing walls.
- Roof warmed by the sun.
- Disused or little used; largely undisturbed.

The risk of bat roosts being present will be lower where structures have:

- Urban setting with little greenspace.
- Heavy disturbance.
- Small, cluttered roof void (particularly for brown long-eared).
- Modern construction with few gaps or crevices that bats can fly or crawl through (though pipistrelles may still be present).
- Prefabricated of steel or sheet materials
- Active industrial premises

Habitats that increase the risk of bats being present include:

- Presence of trees with a high probability of bat use, including ancient woodland or parkland, large trees with complex growth form, and trees with cavities, visible damage and loose bark (Coniferous plantation and young trees are less likely to support roosts). It can be extremely difficult to be certain of the presence or absence of bat roosts in trees meeting the above criteria.
- Recent or historical records of bats on the site, or bat roosts in the general area.
- Presence of underground structures such as abandoned mines, tunnels, kilns, cellars or fortifications which provide appropriate hibernation conditions.
- Where a development has a significant habitat impact on woods, hedgerows with field trees, parkland, diverse grassland and wetland habitats potential impacts on tree roosts, foraging habitats and flight-lines should be considered.

#### **Species information and population estimates**

Pipistrelle maternity colonies generally consist of 25 to 100 individuals, but colonies numbering up to 1000 are not uncommon<sup>3</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>4</sup>.

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<sup>3</sup> Roberts, G.M. & Hutson, A.M. 2000. *Pipistrelle*. British Bats No. 6. The Bat Conservation Trust, London

<sup>4</sup> Corbet, G.B & Southern, H.N., 1964. The handbook of British Mammals).

Maternity colonies of brown long-eared bats are generally small, consisting of 10 to 20 adults<sup>5,6</sup> (although numbers are likely to be underestimated, due to present in inaccessible areas of the roost). The largest colony recorded was located in northwest England and contained 150 individuals<sup>7</sup>.

Natterer's bats roost within crevices and cavities, typically within hollow trees, old buildings, caves and tunnels<sup>8</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>9</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>10</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>11</sup>.

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>10</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>10</sup>.

Maternity roosts are critical to the long-term survival of a colony, and disturbance can lead to the young being abandoned to die. Bats that are disturbed and escape in the winter use up a lot of energy, which they cannot replace, as there are few insects about as food.

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<sup>5</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>6</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>7</sup> Billington, G., 1993. *Bat Groups*. No. 7. Bat Conservation Trust, London).

<sup>8</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.

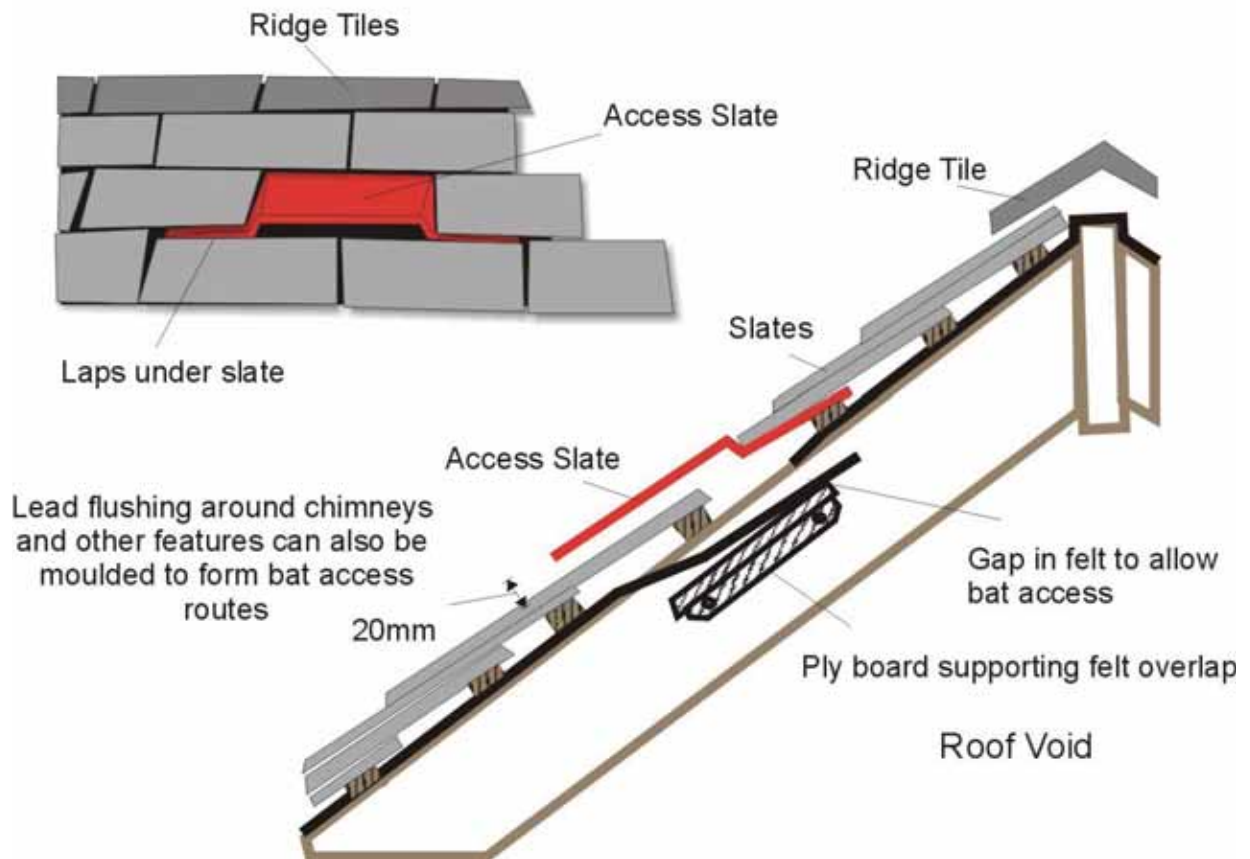
<sup>9</sup> Swift, S. M. 1997 Roosting and foraging behaviour of Natterer's bats (*Myotis Nattereri*) close to the northern border of their distribution. *J. Zool. (Lond)* **242**: 375-384.

<sup>10</sup> Altringham, J.D. 2003. *British Bats*. The New Naturalist. Pub. Harper Collins.

<sup>11</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.

## G.2 Appendix 2: BAT ACCESS SLATE

### 'Bat Slate'



### G.3 Appendix 3: METHOD STATEMENT FOR SITE CONTRACTORS

#### METHOD STATEMENT FOR CONTRACTORS – LOW LEAM FARM, WEST WOODBURN

This method statement contains information regarding:

- bat legal status
- and site working methods

*We have read and fully understood this method statement and all key aspects have been explained to the site operatives.*

	Print Name	Signature	Date
Supervisor:			
Operative:			
Operative:			
Operative:			
Operative:			

#### **Relevant Legislation**

All bat species are specially protected under the Conservation of Habitats and Species Regulations (2010) and under Schedule 5 of the Wildlife and Countryside Act of 1981. As a result it is illegal to:

- Deliberately kill, injure or capture bats.
- Deliberately or recklessly disturb bats.
- Deliberately or recklessly obstruct access to a bat roost.
- Damage or destroy a bat roost.

Fines of up to £5000 *per bat* affected and confiscation of vehicles used can be imposed for deliberate or reckless disturbance of bats or damage to a roost site.

### ***Bat Roost Sites***

Bat roost sites in buildings and stone structures can be difficult to locate. British bats vary in size, the smallest being the crevice roosting pipistrelle with a body the size of a matchbox. The small size of these animals means that they can roost within the smallest cracks or crevices.

Common locations for crevice roosting bats within buildings include beneath slates or tiles, within mortise joints, rubble fill and cavity walls and between loose stones. It is possible that small colonies may be present within the fabric of a building yet no external signs are visible. Therefore care is needed when works affect such features.



### ***Working Methods***

Working methods to minimise the risk to bats and avoid causing reckless damage or disturbance must include the following:

- **The stones associated with the water table will be removed by hand, being aware that bats may be present between loose stones.**
- **If bats are found during works the ecological consultant will be contacted.**

If bats are found at any time during the development work, E<sup>3</sup> Ecology Ltd (01434 230982) must be contacted immediately. If it is necessary to move the bats, gloves should be worn and the bats should be carefully placed into a cardboard box and either kept in a quiet place or moved to a part of the building that will not be affected by the construction work and released after dark, close to the roost site.

**If works risk recklessly harming bats then the police can order all construction/renovation work to cease until the issue is properly addressed.**