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Roadside Farm, Harwood Dale

Bat Scoping Survey, December 2015.

- 8 FEB 2016

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Table of Contents.

1.0	EXECUTIVE SUMMARY	3
2.0	INTRODUCTION	4
3.0	BACKGROUND	5
4.0	ASSESSMENT METHODOLOGY	7
5.0	RESULTS	9
6.0	IMPACT ASSESSMENT	14
7.0	MITIGATION AND COMPENSATION	26
8.0	REFERENCES	23
9.0	APPENDICES	24

- 8 FEB 2016

1.0 EXECUTIVE SUMMARY

- 1.1 Bat feeding evidence and prey remains were discovered in the barn during the field survey and consequently, there is a risk of bats being present in the building at other times of year, especially during the summer months. **It is recommended that further dusk and dawn survey is undertaken on the studied barn at Roadside Farm between mid May – mid August.** This is to ensure bats are not roosting in the barn prior to building and roofing work.
- 1.2 **Bat roosts are protected throughout the year, whether bats are present or not.**
- 1.3 All bats and their roosts are fully protected under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000) and are further protected under the Conservation of Habitats and Species Regulations 2010. Should any bats or evidence of bats be found prior to or during development, work must stop immediately and Natural England contacted for further advice. This is a legal requirement under the aforementioned acts and applies to whoever carries out the work.
- 1.4 Habitat enhancement for bats should be implemented as outlined in section 7.0, in order to improve foraging opportunities to bats in the local area.
- 1.5 Species list within this report may be forwarded to the local biodiversity records centre to be included on their national database. No personal information will be sent. Please contact Wold Ecology if you do not wish the species accounts and six figure grid references to be shared.
- 1.6 Whilst the survey provided detailed information on bats, swallow *Hirundo rustica* nests were observed in the barn. Birds are afforded various levels of protection and levels of conservation status on a species by species basis. The most significant general legislation for British birds lies within Part 1 of the Wildlife and Countryside Act 1981 (as amended). Under this legislation it is an offence to, kill, injure or take any wild bird, take, damage or destroy the nest of any wild bird while that nest is in use or being built, take or destroy an egg of any wild bird. All nests should remain undisturbed and intact until after the breeding bird season – 1st March to 31st August. There was no evidence of barn owls *Tyto alba* roosting in the building.
- 1.7 The data collected to support the output of this report is valid for one year. This report is valid until **December 2016**. After this time, additional surveys need to be undertaken to confirm that the status of the building, as a bat roost, has not changed.

- 8 FEB 2016

2.0 INTRODUCTION

2.1 Background Information

2.1.1 In December 2015, Wold Ecology was commissioned by Mr S. Fry to undertake a bat survey at Roadside Farm. The site is located at approximate National Grid Reference SE 98059 95373 in North Yorkshire (see 5.5).

2.1.2 The Application Site comprises the following:

- Barn

2.1.3 The proposed development includes the conversion of the barn into a residential dwelling.

2.2 Survey Objectives

2.2.1 The site was visited and assessed on 23rd December 2015; this was to determine whether the buildings on site contained bat roosts. The work involved the following elements:

Survey objective	Yes/No	Comments
Determine presence/absence of roosting bats	Yes	A daytime, visual inspection for bat roosts and roosting bats. Internal inspection of all roof voids. An assessment of the on-site potential for bats and the likelihood of their presence. Desktop study.
Determine bat usage e.g.s maternity roost, summer roosts	Yes	An assessment of whether bats are a constraint to the development. Endoscope survey (where accessible) A bat activity survey has not been undertaken.
Identify swarming, commuting or mating sites	No	N/A
Other	Yes	The production of a non-technical summary of the legal implications behind bat presence. Report the findings of the field survey work and identify recommendations for a potential mitigation strategy.

- 8 FEB 2016

3.0 BACKGROUND TO SPECIES

3.1 Ecological overview

- 3.1.1 There are eighteen species of bat that currently breed in the UK, seventeen of which are known to be breeding in the UK. There is a wide variety of roost type and ecological characteristics between species and for this reason it is necessary to determine the species of bat and the type of roost resident in a structure prior to development. Roosts are utilised by different species of bat, at different times of year for different purposes i.e. summer, breeding, hibernating and mating etc. (for more detailed information see section 9.0).
- 3.1.2 Bat populations have undergone a significant decline in the latter part of the 20th century; the main factors cited for causing loss and decline include:
- A reduction in insect prey abundance, due to high intensity farming practice and inappropriate riparian management.
 - Loss of insect-rich feeding habitats and flyways, due to loss of wetlands, hedgerows and other suitable prey habitats.
 - Loss of winter roosting sites in buildings and old trees.
 - Disturbance and destruction of roosts, including the loss of maternity roosts due to the use of toxic timber treatment chemicals.

3.2 Legal Framework

- 3.2.1 A bat survey is required prior to planning permission being granted for a development, in order to prevent the potential disturbance, injury and /or death of bats and the disturbance, obstruction and/or destruction of their roosting places. This is in compliance with the Conservation of Habitats and Species Regulations 2010, provision 41 states an offence is committed if a person:
- (a) Deliberately captures, injures or kills any wild animal of a European protected species (i.e. bats),
 - (b) Deliberately disturbs wild animals of any such species,
 - (c) Deliberately takes or destroys the eggs of such an animal, or
 - (d) Damages or destroys a breeding site or resting place of such an animal.
- 3.2.2 Section 9 of the Wildlife and Countryside Act (1981) states:
- It is an offence for anyone without a licence to kill, injure, disturb, catch, handle, possess or exchange a bat intentionally. It is also illegal for anyone without a licence to intentionally damage or obstruct access to any place that a bat uses for shelter or protection.
- 3.2.3 Bat roosts are protected throughout the year, whether or not bats are occupying a roost site.
- 3.2.4 In addition, the local authority has a duty to have regard to the purpose of conserving biodiversity in the exercise of their functions (Natural Environment and Rural Communities (NERC) Act 2006).

- 8 FEB 2016

3.3 Planning Policy Guidance

- 3.3.1 A bat survey is a requirement of the local authority planning department, as part of the planning application process. This is specified in the following legislation:
- Department for Communities & Local Government Circular 06/2005 Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System.
 - National Planning Policy Framework (NPPF): Biodiversity and Geological Conservation – national planning policy relation to biodiversity. NPPF Biodiversity and Geological Conservation gives further direction with respect to biodiversity conservation and land use change/development. NPPF states that not only should existing biodiversity be conserved, but importantly that habitats supporting such species should be enhanced or restored where possible. The policies contained within NPPF may be material to decisions on individual planning applications.
- 3.3.2 Planning authorities must determine whether the proposed development meets the requirements of Article 16 of the EC Habitats Directive before planning permission is granted (where there is a reasonable likelihood of European Protected Species being present). Therefore in the course of its consideration of a planning application, where the presence of a European protected species is a material consideration, the planning authority must satisfy itself that the proposed development meets three tests as set out in the Directive.
- 3.3.3 The Local Authority must be satisfied that the proposed development must meet a purpose of:
- a) ‘Preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment’.
- In addition the authority must be satisfied that:
- (b) ‘That there is no satisfactory alternative’
 - (c) ‘That the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range’.

3.4 Case Law - Woolley v Cheshire East Borough, 5th June 2009.

- 3.4.1 The ruling states that if it is clear or perhaps very likely that the requirements of the Directive cannot be met because there is a satisfactory alternative or because there are no conceivable “other imperative reasons of over-riding public interest” then the authority should act on that and refuse permission.”
- 3.4.2 In addition, the judgement also clarified that it was not sufficient for planning authorities to claim that they had discharged their duties by imposing a condition on a consent that requires the developer to obtain a licence from Natural England. Natural England considers it essential that appropriate survey information supports a planning application prior to the determination. Natural England does not regard the conditioning of surveys to a planning consent as an appropriate use of conditions.

- 8 FEB 2016

4.0

ASSESSMENT METHODOLOGY

4.1 Status of species present in Yorkshire

Bats	UK Status	UK Distribution	Yorkshire Distribution
Common Pipistrelle	Not threatened	Common & widespread	Common & widespread.
Soprano pipistrelle	Not threatened	Common & widespread	Less common than common pipistrelle but fairly widespread.
Nathusius's pipistrelle	Rare	Restricted. Throughout British Isles.	Scarce, bat detector records only.
Brown long-eared	Not threatened	Widespread	Widespread.
Daubenton's	Not threatened	Widespread	Widespread.
Natterer's	Not threatened	Widespread (except N & W Scotland)	Present
Brandt's	Endangered	England and Wales	Few confirmed records.
Whiskered	Endangered	England, Wales, Ireland & S Scotland.	Present.
Noctule	Vulnerable	England, Wales, S Scotland.	Widespread
Leisler	Vulnerable	Widespread throughout the British Isles, except N Scotland.	Rare (locally common in West Yorkshire).
Barbastelle	Rare	England.	No records since 1950's.

Source - <http://www.yorkbats.freeseve.co.uk/bats.htm>

4.2 Data Review and Desk Study

- 4.2.1 Currently, there is no pre-existing information on bats at the site. Data for the 10km grid square SE99 shows records of brown long-eared *Plecotus auritus* (NBN Gateway 2015).
- 4.2.2 Wold Ecology bat surveys in Harwood Dale (500 metres south west of the Application Site) have recorded roosting brown long-eared *Plecotus auritus*, Natterer's bat *Myotis nattereri*, common pipistrelle *Pipistrellus pipistrellus* and commuting/foraging noctule *Nyctalus noctule*. This included a common pipistrelle maternity roost within the farmhouse.

- 8 FEB 2016

4.2.3 Consultation with the North Yorkshire Bat Group identified the following bat records within 2km of Roadside Farm.

Species	Site	Grid ref.	Date	Comment
Unknown	Brooklands Farm, Harwood Dale	SE 966 963	17 Feb 2004	Bat flying in loft. Droppings.

4.3 Daytime and Visual Inspection

4.3.1 The daytime assessment identified whether the area had any signs of occupancy and/or bat usage. This took the form of a methodical search, both internally and externally, for actual roosting bats and their signs. Specifically, the visual survey involved:

- Assessment for droppings on walls, windowsills and in roof spaces
- Scratch marks and staining on beams, other internal structures and potential entrance and exit holes
- Wing fragments of butterfly and moth species underneath beams and other internal structures
- The presence of dense spider webs at a potential roost can often indicate absence of bats
- Assessment of crevices and cracks in the buildings to assess their importance for roosting bats
- The duration of the daytime, visual inspection was 45 minutes

4.3.2 Summary of daytime inspection and visual survey

Date of each survey visit	Structure reference/location	Equipment used	Weather
23/12/15	Barn	Binoculars, 1million candle power clu-lite torch, micro Dart endoscope, Dewalt DW03050 Laser Measure.	10°C, 100% cloud. Beaufort 0. Light rain.
Comments (to include # of surveyors used for each visit): 1 surveyor undertook the visual inspection.			

4.3.3 Personnel

Personnel	Experience	Licence No.
Daniel Lombard MCIEEM	Daniel has assisted with over 200 bat surveys for Wold Ecology since 2010 and is currently working towards his bat handling license.	CLS1634

- 8 FEB 2016

5.0 RESULTS

5.1 Site description

5.1.1 Roadside Farm is located 1.5km east of Harwood Dale village, in a rural location. The farm yard and associated buildings are less than 1ha in size and include an amenity garden, hard standing and agricultural buildings which also have potential to support roosting bats.

5.1.2 Adjacent Landscapes

5.1.2.1 The farm is located within the North York Moors National Park and is immediately surrounded by grazed pastures with a mosaic of woodland, forest and open countryside including moorland. Habitat connectivity and foraging opportunities is excellent and provided by woodland, shelterbelts, hedgerows and a mosaic of interconnecting habitats. Wold Ecology considers that the surrounding habitats within 2km of the Roadside Farm are excellent for foraging and commuting bats.

5.1.3 Habitat Summary

5.1.3.1 A summary of the surrounding habitat is (radius of < 2km from the site):

- Buildings – farm buildings and residential properties.
- Hedgerow – fragmented.
- Mature trees and woodland.
- Cloughton Woods.
- Harwood Dale Forest.
- Broxa Forest.
- Tongue Field Plantation
- Hodson Moor Plantation
- Cockerill Plantation
- Standingstones Rigg
- Pits Wood.
- Cloughton Moor
- Arable.
- Ponds and watercourses.
- Brown Beck
- East Syme
- Thirley Beck
- Harwood Dale Beck and tributaries.
- Grazed pasture.

- 8 FEB 2016

5.1.4 Buildings

5.1.4.1 The bat survey and assessment targeted the following (see section 5.5):

- a. **Barn** - is currently used for storage and comprises local stone walls with a pitched roof covered in pan tiles and corrugated cement fibre boards. The roof is supported by smooth sawn timbers and is underdrawn with sarking and felt.

5.2 Visual inspection results

5.2.1 Following the visual inspection of the building, an assessment was made of the buildings potential to support roosting bats. The assessment criteria are contained in section 9.2.3.

5.2.2 **Barn** (see 5.5 plates 1 - 4) - the following roosting opportunities were present within the fabric of the building:

- Gaps beneath the ridge tiles where mortar has been displaced.
- Loose fitting pan tiles with gaps beneath.
- Missing/slipped pan tiles and gaps in missing mortar below gable tiles.
- Missing mortar in the stone work.
- Gaps above the eaves.
- Subsidence cracks.
- Gaps adjacent to timber doors and timber windows frames.
- Gaps above the internal wall plates.
- Gaps above the ridge beam.
- Gaps between timber slats/felt and pan tiles above.
- Gaps in the internal stonework.
- Gaps in the roof structure and mortice joints.
- Access into the building is provided by open doors and windows.
- The following evidence of bats was observed:
 - Peacock *Aglais io*, small tortoiseshell *Aglais urticae*, large yellow underwing *Noctua pronuba* and herald *Scoliopteryx libatrix* feeding remains below a feeding perch.
- The building has a HIGH POTENTIAL to support bats.

Table 5.2: Summary of surveys conducted in December 2015

Date	Type of survey	Results	Building Dimensions (m)		
			L	W	H*
23/12/15	Visual	<i>Barn</i> Has been assessed as having HIGH POTENTIAL to support bats, due to the presence of bat feeding remains and other features which have potential to provide roosting opportunities for bats (see 5.6 plates 1 - 4).	27	14	6

* Height from ground floor to ridge

5.3 Interpretation and Evaluation of Survey Results

5.3.1 Presence/absence

- 8 FEB 2016

5.3.1.1 The information collected to date is based on the findings of one visit to the site in December 2015. Evidence of feeding bats was observed during the survey.

5.3.1.2 From the current results, it is not possible to fully determine the species, number of bats or whether bats are currently using the barn, as a roost. The presence of bat feeding remains and the age and composition of the barn suggests that there is potential for bats to be present. These features include:

- Gaps beneath the ridge tiles where mortar has been displaced.
- Loose fitting pan tiles with gaps beneath.
- Missing/slipped pan tiles and gaps in missing mortar below gable tiles.
- Missing mortar in the stone work.
- Subsidence cracks.
- Gaps adjacent to timber doors and timber windows frames.
- Gaps above the internal wall plates.
- Gaps above the ridge beam.
- Gaps between timber slats/felt and pan tiles above.
- Gaps in the internal stonework.
- Gaps in the roof structure and mortice joints.

5.3.1.3 In addition, the local surrounding habitat composition and historical information suggests that there is an increased potential for bats to be present at some point during spring, summer or autumn months.

5.3.2 Site Status Assessment

5.3.2.1 The survey is based on one daytime survey conducted in December. During this time of year bats are usually in hibernation, therefore, bats are inactive. Consequently, it is not possible to fully determine the bat species, numbers of bats or whether bats are actually roosting in the barn. Due to the presence of feeding remains and features likely to support bats, the barn has been assessed as having a high probability of bat interest (see Section 9.2.4).

5.3.2.2 Although December is a sub-optimum time of year to conduct hibernation bat surveys, it is extremely difficult to detect bats as they are usually tucked away deep in wall cavities and crevices where winter temperatures are more stable or located at heights unsafe for the field surveyor to access. The conditions needed by bats for hibernation require the maintenance of a relatively stable, low temperature (2 – 6°C). Suitable sites include; old trees, caves, cellars, tunnels, and icehouses, however species such as pipistrelle bats are likely to be detected in deep crevices on the sheltered external walls of buildings at higher winter temperatures.

5.3.2.3 Based on the evidence collected to date, it is possible that the studied barn at Roadside Farm could support individual or significant numbers of bats. These roosts could be:

- Maternity.
- Summer.
- Night.
- Transition.
- Lekking (mating).

- 8 FEB 2016

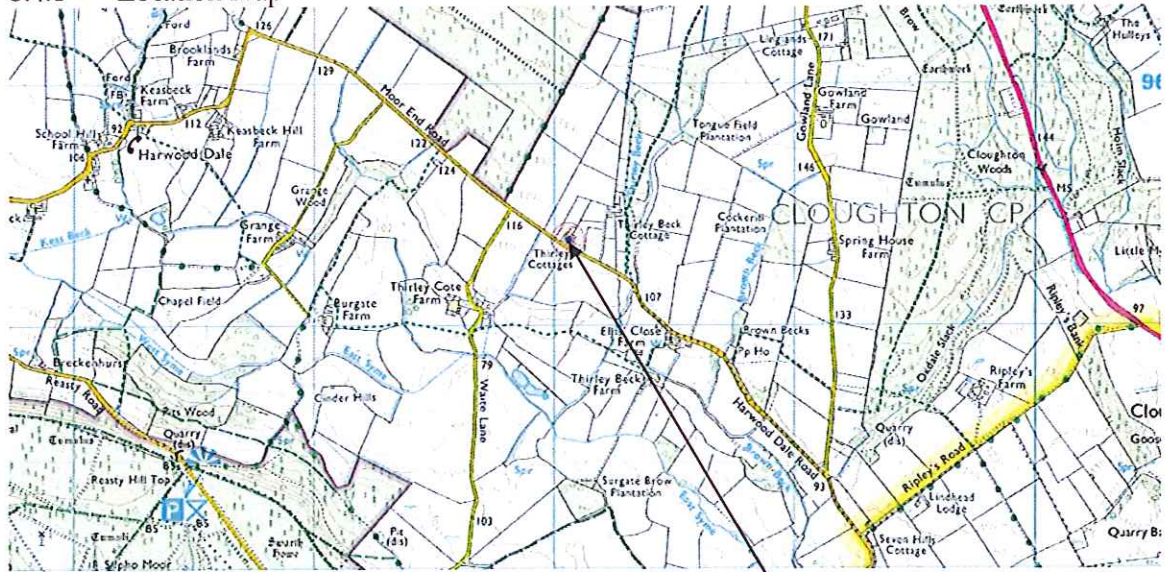
5.3.3 Constraints

5.3.3.1 Evidence of bats may have been removed by winter and autumn weather conditions.

5.3.3.2 An emergence survey between the months of May and August has not been undertaken.

5.4 Maps of the survey area

5.4.1 Location Map



Roadside Farm

5.4.2 Aerial Photograph



- 8 FEB 2016

5.5 Photographs of key features

Plate 1 –Internal roof structure



Plate 2 –Internal roof structure



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Plate 3 – Undisturbed, sheltered, unlit, light sampling habitat



Plate 4 – North gable and ease elevation.



6.0 IMPACT ASSESSMENT – in the absence of mitigation

6.1 The studied barn at Roadside Farm has been assessed as having a high potential of bat interest (see 9.2.4). This has been determined by the presence of bat droppings and features likely to support a number of roosting bats (see section 5.2). These features include:

- Gaps beneath the ridge tiles where mortar has been displaced.
- Loose fitting pan tiles with gaps beneath.
- Missing/slipped pan tiles and gaps in missing mortar below gable tiles.
- Missing mortar in the stone work.
- Gaps above the eaves.
- Subsidence cracks.
- Gaps adjacent to timber doors and timber windows frames.
- Gaps above the internal wall plates.
- Gaps above the ridge beam.
- Gaps between timber slats/felt and pan tiles above.
- Gaps in the internal stonework.
- Gaps in the roof structure and mortice joints.

- 8 FEB 2016

6.2 **Initial impacts: disturbance** (human presence, noise, vibration, dust, lighting, access obstruction due to scaffolding and plastic sheeting etc.)

- The construction of scaffolding against the barn which will cause an obstruction to the access points - minor negative at a site level.
- Re roofing could kill/injure bats if they are resting between tiles and the contractor steps on the tiles to gain higher access = major negative at a site level.

6.3 Long-term impacts: roost modification

6.3.1 The long term impacts of potential roost modification are unknown until further activity surveys are completed.

6.4 Long-term impacts: roost loss

6.4.1 The long term impacts of potential roost losses are unknown until further activity surveys are completed.

6.5 Long term impacts: fragmentation and isolation of roost

6.5.1 There are no plans to alter the habitat on site and consequently, there will be no fragmentation and isolation during the development as the surrounding, supporting habitat will not be affected.

6.6 Post development: interference impacts

6.6.1 The interference impacts are unknown until further activity surveys are completed.

6.7 Predicted scale of impacts

6.7.1 The current information obtained is based on a desk top study, visual inspection and a daytime assessment survey conducted in December.

6.7.2 In order to prevent any potential impacts occurring to bats present, it is recommended a further dusk (emergent) and dawn (swarming) survey is completed in spring/summer (May to August). This will provide further information on bats at the site and should target all elevations of the barn.

- 8 FEB 2016

7.0 MITIGATION & COMPENSATION

7.1 Legal Protection

7.1.1 Bat roosts are protected throughout the year, whether bats are present or not.

7.1.2 Legal obligations towards bats are generally concerned with roost protection. All developments, known to contain bat roosts, require a licence from Natural England. Under Section 9 of the Wildlife and Countryside Act (1981) (as amended by the Countryside and Rights of Way Act 2000) and Conservation of Habitats and Species Regulations 2010, provision 41, it is an offence for anyone without a licence to kill, injure, disturb, catch, handle, possess or exchange a bat intentionally. It is also illegal for anyone without a licence to intentionally damage or obstruct access to any place that a bat uses for shelter or protection. **Additional bat activity survey work between May and August will be required to determine the impact on bat populations. This will result in one of the following ways forward with the proposed development. The bat activity surveys should target the barn.**

7.1.3 If a bat roost is identified and the proposed development activity will result in destruction or disturbance to the roost, it will be necessary to consult with Natural England and a Natural England development licence will be required. The licence application process currently requires the input of a qualified bat ecologist/consultant and includes:

- Three bat activity surveys between May and September to support the license application. The submission of a licence to capture, disturb and/or destroy the roosts or resting places of bats.
- A walk over survey/check must be undertaken within 3 months prior to the Natural England application submission to ensure that conditions have not changed since the most recent survey was undertaken. Details of any changes to conditions and habitats and/or structures on site since the surveys were undertaken will be documented.
- The production of a detailed Method Statement to support the application. **This will include a proposed work programme. One copy will be sent to a Natural England wildlife adviser for assessment. It should be noted that the Method Statement will be appended to any licence granted. The Method Statement will include the necessary mitigation required of the development. This will include:**
 - A work timetable which must be followed. This will include completing works when bats are not present in their roost (winter) or when bats are less vulnerable to disturbance (spring/autumn).
 - A suitable mitigation plan allowing bats to be able to roost in a like for like replacement for any closed roost (this can be allowing bats back into the roof void).
 - Additional bat boxes placed as habitat improvement.
 - Bats must not be left without a roost during the active season (April to September inclusive).
- The production of a Reasoned Statement of Application to support the application. This will provide a rational and reasoned justification as to why the proposed activity meets the requirements of the Conservation of

- 8 FEB 2016

Habitats and Species Regulations 2010, Regulations 53(2)(e-g) and 53(9)(a-b).

- The usual timescale expected for the process of an application is approximately 30 working days from the date of acknowledgement of receipt. Natural England wildlife advisers are given 20 working days to fulfil requests for information. This timescale will also apply to requests for licence amendments.
- Additional on Site surveys, watching brief and implementation of license by a bat ecologist.
- For additional information on licences please refer to Natural England Guidance Leaflet WML-G12 (see www.naturalengland.org).

7.2 Mitigation is required to avoid or reduce the impact of a development on roosting and feeding bats present on site. Mitigation is designed to meet the requirements of the bat species present in the roost. The Bat Mitigation Guidelines (2004) defines the key principles which will be required in mitigation proposals. These are:

- Modifying the scheme design to incorporate a bat loft
- Altering the timing of the works
- The creation of replacement roosts and/or habitats.

7.3 Mitigation Strategy

7.3.1 Natural England requires mitigation and compensation to be proportionate to the size of the impact and the importance of the population affected and as a principle:

- There should be no net loss of roost sites and that compensation should provide an enhanced resource since the adoption of new roost sites by bats is not guaranteed.
- The scheme should aim to replace 'like with like' in terms of the status of the site i.e. maternity roost, hibernation roost etc. Maternity roosts of common and widespread species requires 'more or less like for like' replacement with constraints on timing (Bat Mitigation Guidelines, 2004). Bat boxes are inappropriate substitutes for significant roosts in buildings and do not constitute 'like for like' replacement.
- Compensation should ensure that the affected bat population can continue to function as before, so attention may need to be given to surrounding habitats.
- The strategy should be considered to ensure that the bat populations at the site are maintained at a favourable conservation status.

7.4 Timing

- 8 FEB 2016

7.4.1 If a maternity roost is present on site, the optimum period for carrying out works is 1st October until 1st May. This time period would relate to the construction of appropriate mitigation and disturbance of roost site. A late discovery plan will need to be included in the final method statement to outline measures to be implemented in the event that bats are discovered during the development.

7.4.2 It is recommended that the initial start date of the development should avoid late October – early March. This will prevent disturbance to potentially hibernating bats. If the initial start day is programmed for the winter, a hibernation survey

must be conducted prior to works commencing.

- 7.4.3 The building works must be carefully programmed so that roosting opportunities are permanently available during the development.
- 7.4.4 There are no mandatory timing constraints if roosting bats are not found or if the barn supports summer roosts or small numbers of common and widespread species.

7.5 Site Mitigation

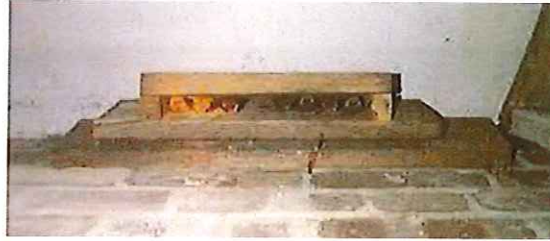
- 7.5.1 The mitigation strategy will ensure that the bat populations on site are maintained at a favourable conservation status by the retention of the original roost sites where possible. In addition, new roosting opportunities will be created through the provision of roosting opportunities. There should be a net gain in roosting opportunities post development.
- 7.5.2 This information will guide any modifications required to the scheme design, outline necessary timing of the works and recommend the creation of replacement roosts and/or habitats. The information contained within the following method statement will be used as guidance based on current data.

7.6 Bat Loft

- 7.6.1 A bat loft may be created in the roof space of the barn or in another building on site (depending on species and number of bats present). The internal drop will be at least 2 metres from the ridge board. The proposed bat loft/void should be at least 5 metres in length and 4 metres wide. New access to the proposed bat loft will be created to allow the continued use of the roof apex by bats. An access slot 250mm wide and 100mm in length will be incorporated into the gable of the building – if applicable. This will be located approximately 400mm above the loft floor and not the apex; this will retain warmer air within the ridge roost area.
- 7.6.2 The roof structure will be traditional, open design and **not modern trussed** to allow bat flight activity. Roofing felt in the bat loft should be traditional bitumen type 1f felt. This will not be tight but allowed to sag very slightly between the rafters. Only bitumen felt which **does not** include any of the following words will be used for the bat loft:
- Non-woven
 - Polypropylene
 - Spun-bond
- 7.6.3 Additional roosting locations will be provided by fixing boards, approximately 1m long x 75mm wide x 15mm thick to the side of the rafters with 25mm spacers to form a narrow slot butted up to the ridge board at the top end. These will be provided at four locations throughout loft of the building. The licensed bat ecologist will identify locations immediately prior to their installation.
- 7.6.4 Open bottomed, rough sawn, slot boxes will be sited within the internal roof structure of the bat loft. These will be constructed from rough soft wood measuring 300mm deep by 450 – 600mm long leaving a narrow space about 30mm wide. This can be attached to the wall to create additional roosting opportunities in the bat loft (see plate 5).

- 8 FEB 2016

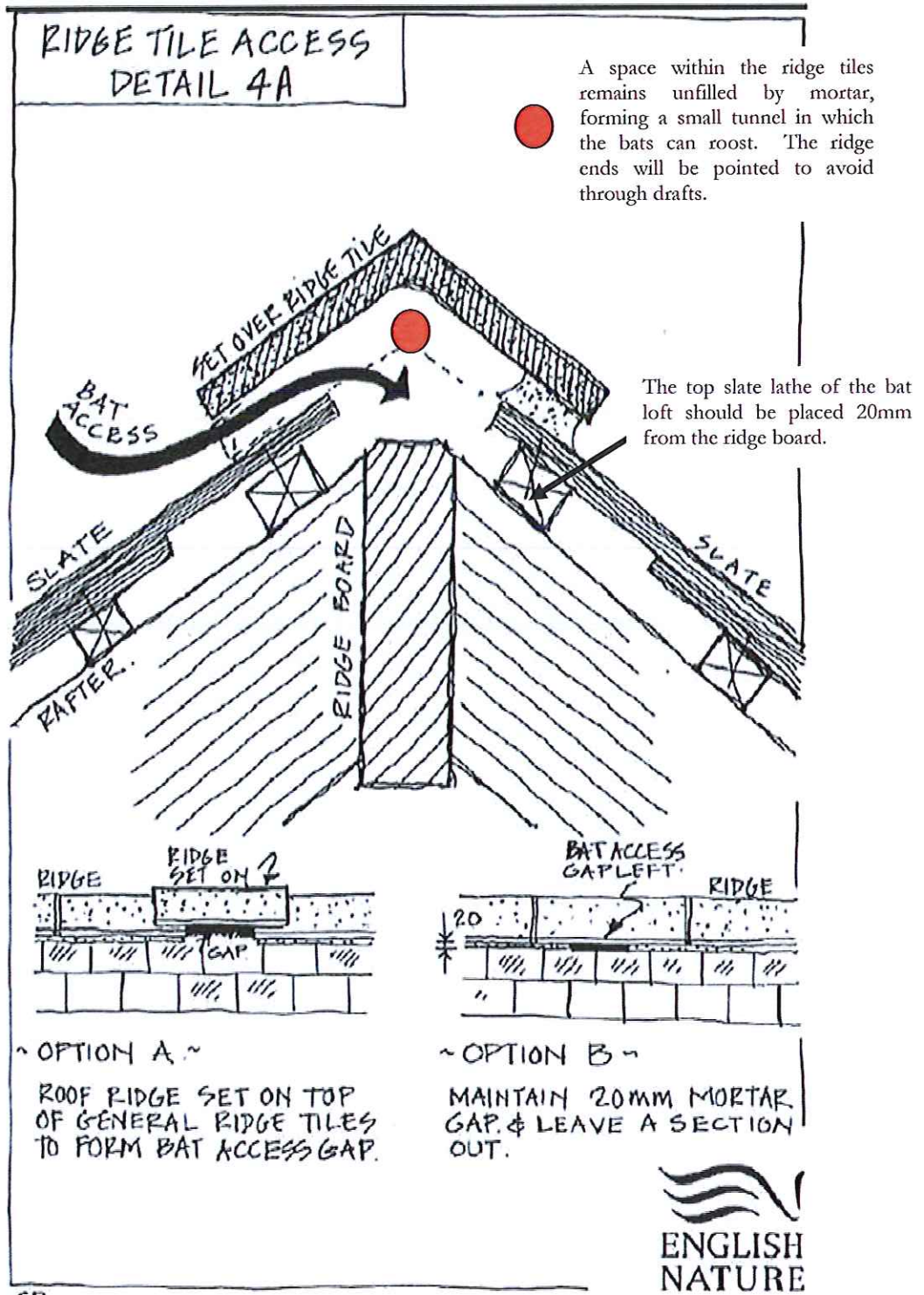
Plate 5 - Example of an open bottomed slot box (Norfolk Bat Group)



- 7.6.5 If applicable, insulation should be used on the floor of the bat loft and should be boarded to protect the bats from the insulation. A trap door will be built into the ceilings to allow human access to the bat loft or lofts.
- 7.6.6 If a maternity roost is present on site, the building should be designed so as to provide a suitable thermal regime. For maternity sites, this is likely to require a fairly steeply pitched roof (42° is optimum) with one pitch facing south, so as to achieve high temperatures (up to 50°C maximum) in summer but with a choice of roosting temperatures. Dark-coloured roof coverings, such as black slates, will help to produce high temperatures.
- 7.6.7 Timber treatment should be carried out using Permethryn type chemicals on the Natural England list of approved safe chemicals. New pre-treated timbers i.e. tanalised timber will be allowed to dry thoroughly before use, if applicable. New timbers used at specific roost sites in ridge area will be thoroughly brushed with a stiff yard brush to remove any crystalline residues before use.
A list of Natural England approved paints and timber treatments are available at http://www.naturalengland.org.uk/Images/Bat%20roost%20timber%20treatment_tcm6-10167.pdf.
- 7.6.8 The top slate lathe of the bat loft should be placed 20mm from the ridge board. At approximately 2m intervals along the ridge the membrane and under felt will have 30mm x 100mm slots cut out beside the ridge boards to allow bats access to the ridge tiles for roosting. These will need to be inspected before the tiles are laid to ensure proper access is created. When the ridge tiles are laid, it is important to ensure the space within the ridge tiles remains unfilled by mortar forming a small tunnel in which the bats can roost. The ridge ends will be well pointed to avoid through drafts. The design detail will follow plate 6 below.

- 8 FEB 2016

Plate 6: showing ridge access design detail.



SP

The above information is for guidance only and may not be appropriate in all circumstances. For further professional advice, English Nature, Countryside Team, Jubilee House, Mablethorpe Road, Skegness, Lincolnshire, LN23 7PL. Tel: 01533 792900. Fax: 01533 792830. Email: countryside@englishnature.gov.uk

- 8 FEB 2016

7.7 Bat boxes

7.7.1 Specially designed bat boxes can be located on site and are available from Wold Ecology or www.jacobijayne.co.uk. Schwegler Bat Boxes are recommended and well tested boxes and provide additional roost habitats:

- The rectangular shape makes the **1FF** ideal for attaching to the sides of buildings and trees or in sites such as bridges. It has a narrow crevice-like internal space to attract pipistrelle and noctule bats.
- The **1FQ** is an attractive box designed specifically to be fitted on the external wall of a house, barn or other building. Equally appealing to bats as a roost or a nursery, it features a special porous coating to help maintain the ideal temperature inside along with a rough sawn front panel to enable the bats to land securely.
- Bat Tube (**1FR** and **2FR**) system. The tube is designed to meet behavioural requirements of the types of bats that roost in buildings i.e. pipistrelle spp. This design can be installed flush to external walls and beneath a rendered surface.

7.7.2 The majority of these boxes are self-cleaning as they are designed so that the droppings fall out of the entrance. This reduces the possibility of smell during the summer months. For more information on designs and installation of bat boxes see: www.schwegler-natur.de and www.bct.org.uk.

7.7.3 Wold Ecology recommends that at least 2 bat boxes are located on buildings or trees on site. Bat boxes should be erected on south, east or west elevations; 3-5 metres above ground level or close to roof lines.

7.8 Habitat enhancements

7.8.1 Freshwater, woodland, grassland, urban gardens, trees and amenity green space are suitable foraging habitats for bats whilst linear habitats such as hedgerows and streams are particularly important commuting routes between roosts and foraging ground. It is recommended that the natural landscape remains largely unchanged and as many mature trees are retained on the site to continue to provide cover and feeding grounds. Landscaped areas can provide good foraging grounds for bats. Areas can be improved by growing night-scented flowers and other flowers favoured by insects. More information on suitable planting to encourage bats obtained from The Bat Conservation Trust (www.bats.org).

Suitable species include:

- Foxglove *Digitalis purpurea*
- Cowslip *Primula veris*
- Red campion *Silene dioica*
- Marjoram *Origanum vulgare*
- Ox-eye daisy *Leucanthemum vulgare*
- Red clover *Trifolium pratense*
- Evening primrose *Oenothera biennis*.
- Honeysuckle *Lonicera periclymenum*.
- Wild Clematis *Clematis virginiana*

- 8 FEB 2016

7.8.2 Lighting has a detrimental effect on bat activity; many bats will actually avoid areas that are well lit. Lighting can cause habitat fragmentation by preventing bats from commuting between roosts and foraging grounds (A.J Mitchell-Jones 2004).

The principles are:

- Reduce or remove the UV component of light emitted. To achieve this, a lamp that does not emit UV or a filtration product is recommended
- External lighting requirements will be carefully designed to avoid light spillage affecting foraging bats and bat box entrances. Thus creating a dark and green infrastructure and can be achieved by using hoods, cowls, shields and louvers. Planting or manmade barriers can also protect against light spillage.
- Security lighting will be on a short timer and motion sensitive to large objects only.
- Use of timers to reduce the hours lit and tailor this specifically to wildlife affected.
- Lights will not be mounted where they will shine directly on to the surrounding habitat used by foraging bats.

- 8 FEB 2016

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- 8 FEB 2016

9.0 APPENDICES

9.1 Background to Bats - Bat Biology.

- 9.1.1 Bats roost in a variety of places such as caves, mines, trees and buildings. Woodlands, pasture, ponds and slow flowing rivers or canals provide suitable feeding areas for bats as they support an abundance of suitable insect forage. Bats tend to feed during the first two to three hours after sunset and again before dawn, when insect activity is at its most intense (JNCC 2004).
- 9.1.2 Bat activity over the course of a year reflects the seasonal climate and the availability of food as follows (The Bat Conservation Trust, undated):
January - March - insect prey is scarce and bats will hibernate alone or in small groups.
April - May - insects are more plentiful and bats will become active. They may become torpid (cool and inactive) in bad weather. Females will start to form groups and will roost in several sites.
June - July - females gather in maternity roosts and give birth to young, which are suckled for several weeks. Males roost alone nearby.
August - September – mothers leave the roost before the young. Bats mate and build up fat for the winter.
October - December – Bats search for potential hibernacula. They become torpid for longer periods and then hibernate.
- 9.1.3 Bats do not stay in the same roost throughout the year. They have different requirements of roosts at different times of the year. During late April/May the bats leave their winter roosts and the females come together to form 'nursery roosts', these usually consist of pregnant females along with a few non-breeding and immature females. At this time the males roost either singly or in small numbers. The single offspring is born during late June early July and can fly within 3-5 weeks.
- 9.1.4 Typical roost sites are cracks and crevices in buildings and other structures but more typically under hanging tiles, slates, soffits and cavity walls of fairly modern buildings or holes and splits in trees.
- 9.1.5 The conditions needed by bats for hibernation require the maintenance of a relatively stable low temperature (2 – 6°). Suitable sites include; old trees, caves, cellars, tunnels, and icehouses.
- 9.1.6 Whilst the summer roosts consist of single species (although 2-3 species can be found within one large structure but occupying separate roost sites), winter sites often consist of 4 – 6 different species of bat, although there is often niche separation.
- 9.1.7 Bats have a complex social structure based on 'meta populations' and also utilise other transitional or intermediate roost sites. The several different types of roost, which bats occupy throughout the year, are as follows:
- **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 it 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 sites:** sites where mating takes place from later summer and can continue through winter.
- **Maternity roost:** where female bats give birth and raise their young to independence.
- **Hibernation roost:** where bats may be found individually or together during winter. They have a constant cool temperature and high humidity. These have to be cold and free from any temperature fluctuation with high humidity. The coldness enables bats to lower their body temperature and become torpid. This saves a lot of energy, enabling them to survive on the fat stores within their bodies that they have built up throughout the summer.
- **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.

- 8 FEB 2016

9.1.8 The main threats to bats include:

- Habitat loss (e.g. deforestation)
- Loss of feeding areas as a result of modern forestry and farming practices.
- Use of toxic agrochemicals and remedial timber treatment chemicals.
- Disturbance and damage to bat roosts.

9.1.9 Bats have been in decline both nationally and internationally during the latter part of the 20th Century. Bats require a variety of specific habitats in order to meet the basic needs of feeding, breeding and hibernating and are therefore extremely vulnerable to change such as the loss of flight lines through the removal of hedgerows. It is thought that even the two most common and widespread bats, the common pipistrelle and the soprano pipistrelle, have declined by an estimated 70% (1978-1993 figures). There are a number of bat species, which are now considered seriously threatened with one species, the greater mouse-eared bat being classed as extinct as it is no longer breeding in the U.K.

9.1.10 All European bats are listed in Annex IV of the EC Directive 92/94/EEC 'The Conservation of Natural Habitats and of Wild Fauna and Flora' as being in need of "strict protection". This is translated into British Law under the Habitats and Species Regulations 2010. British bats are included under Schedule 5 of the Wildlife & Countryside Act 1981. They can therefore be described as a 'fully protected' or 'protected' species.

9.1.11 A summary of the legal protection afforded to bats under both European and British law is provided by the Bat Conservation Trust (BCT, 2010). This reads: All European bat species and their roosts are listed in Annex IV of the EC Directive 92/94/EEC 'The Conservation of Natural Habitats and of Wild Fauna and Flora' as being in need of "strict protection". This is implemented in Britain under the Conservation of Habitats and Species Regulations 2010 which has

updated the Conservation (Natural Habitats &c.) Regulations (as amended). In summary, in the UK, it is an offence to:

- Deliberately capture, injure or kill a bat;
- Deliberately disturb a bat in a way that would affect its ability to survive, breed or rear young, hibernate or migrate or significantly affect the local distribution or abundance of the species;
- Damage or destroy a roost (this is an absolute offence); and
- Possess, control, transport, sell, exchange or offer for sale/exchange any live or dead bat or any part of a bat.

9.1.12 The species is also listed in Appendix II of the Bonn Convention (and its Agreement on the Conservation of Bats in Europe) and Appendix II of the Bern Convention (and Recommendation 36 on the Conservation of Underground Habitats). Although these are recommendations and not statutory instruments.

9.1.13 Natural England is the Government body responsible for nature conservation. Local planning authorities must consult them before granting planning permission for any work that would be likely to result in harm to the species or its habitat. Natural England issue “survey” licenses for survey work that requires the disturbance or capture of a species for scientific purposes. They also issue “conservation” licenses that are required for actions that are intended to improve the natural habitat of a European protected species or to halt the natural degradation of its habitat.

9.1.14 ‘Development’ licences are issued by Natural England for any actions that may compromise the protection of a European protected species, including bats, under the Conservation of Habitats and Species Regulations 2010. This includes all developments and engineering schemes, regardless of whether or not they require planning permission.

9.1.15 The UK Biodiversity Action Plan states that although the pipistrelle is one of the most abundant and widespread bat species in the UK, it is still thought to have undergone a significant decline in the latter part of this century. The main factors cited for causing loss and decline include:

- A reduction in insect prey abundance, due to high intensity farming practice and inappropriate riparian management.
- Loss of insect-rich feeding habitats and flyways, due to loss of wetlands, hedgerows and other suitable prey habitats.
- Loss of winter roosting sites in buildings and old trees.
- Disturbance and destruction of roosts, including the loss of maternity roosts due to the use of toxic timber treatment chemicals.

9.2 Significance of bat roosts, appraising the nature conservation value;

9.2.1 The significance of bat roosts should be appraised against the following table. Where the extent of the bat roost is unclear a precautionary approach should be taken in evaluating the significance of the roost and the highest potential category should be selected.

- 8 FEB 2016

Table 9.2.1 Appraisal of significance of bat roosts.

Scale	Summary	Examples
International	Any significant roosting sites for European Annex 2 species	Barbastelle bat roosts are only known applicable feature in East Anglia.
National	Any roosts qualifying as SSSI under the EN criteria.	Details of criteria are given in 9.1.2 Site Selection Guidelines for Biological SSSI's.
Regional	Any significant bat roosts and features, equivalent in interest to qualifying a site as a Country Wildlife Site.	Breeding and hibernation roosts of most species.
Local	All other sites supporting feeding bats as Wildlife and Countryside Act protected species.	Bats foraging within a structure, night roosts and minor transition roosts.

9.2.2 Site Selection Guidelines for Biological SSSIs

9.2.2.1 The following statements are made in respect of selecting SSSIs for bats in JNCC (1989) and JNCC (1998) in Section 13;

Sub-section 1.9 Reason for notification

"The bats have become a major focus of conservation concern in Britain, and all 15 species are protected through Schedule 5 of the 1981 Act.

The mouse-eared bat is now virtually extinct in Britain and other species, most notably the two horseshoe bats, are threatened.

Some species, for example the barbastelle, are so rare that little is known about their conservation status, but other species appear to be declining in numbers.

All bats are vulnerable, through their use of a relatively small number of sites for communal roosting and breeding, often in buildings; so legal protection against disturbance and taking has been an effective conservation measure.

Enhancing the protection of key sites through the SSSI mechanism can be helpful, but the notification of sites in buildings, particularly domestic dwellings, needs to be considered carefully if it is to have the desired effect."

- 8 FEB 2016

Sub-section 3.3 basis of selection

"The selection of bat roosts is on a national basis except for certain mixed hibernacula in AOSs where large roosts are unknown."

Sub-section 3.3.4 Barbastelle, Bechstein's and grey long-eared bats

"All of these are rare species with no or very few breeding roosts known. Any traditional breeding roosts should be considered for selection if found."

Sub-section 3.3.5 Natterer's, Daubenton's, Whiskered, Brandt's, Serotine, Noctule and Leisler's bats

"These species are reasonably widespread and it would be difficult to justify the notification of breeding roosts except in the most exceptional circumstances. These might include exceptionally large colonies with a long history of usage of a particular site. In general, protection of roosts of these species should come under section 9 of the 1981 Act."

Sub-section 3.3.6 Pipistrelle and brown long-eared bat

“These two species are widespread and more common than the above. Protection should rely on section 9 of the 1981 Act.”

Sub-section 3.3.7 All bat species – mixed assemblages

“Large hibernacula of mixed species are very important and sometimes spectacular, but perhaps number only 20 sites in total. On a national basis, all hibernacula containing (a) four or more species and 50 or more individuals, (b) three species and 100 or more individuals or (c) two species and 150 or more individuals should be selected. In some parts of Britain such large sites are unknown, so alternatively in these areas one hibernaculum site per AOS containing 30 or more bats of two or more species may be considered for selection.”

“Because of the complications associated with the notification of sites in buildings, the appropriate CSD mammal’s specialist should be consulted over the selection of all such sites.”

9.2.3 Definitions of probabilities of bat interest.

- 8 FEB 2016

9.2.3.1 Low potential of bat interest.

Buildings in this category fall into two main types:

- Generally well maintained without cracks and crevices, no gaps between bargeboard or soffit and wall or without an attic space.
- Contain some or all of the above features but are both draughty and thick in cobwebs or contain strong odours such as solvents, diesel, etc.
- It must be borne in mind that a building from this latter group can become suitable for bats due to refurbishment. This often happens to houses once the attic space has been cleaned and under felted prior to timber treatment.
- In a non-residential property, no licence is required for development to a building classified as **Low potential of bat interest**.

9.2.3.2 Medium potential of bat interest

- The buildings here contain many sites suitable for roosting bats although no obvious signs were recorded during the survey. In exposed conditions on large buildings the signs of bat usage such as droppings and urine marks can be obliterated by heavy rain.
- Occasionally a light scattering of droppings will be recorded in an attic or a semi-derelict building, which is considered by the surveyor unsuitable for use as a bat roost or may be used occasionally as a night perch or feeding post. The medium potential of bat interest can be used based on the surveyor’s experience.
- Whilst no licence is required for development to a non-residential building classified as **Medium potential of bat interest**, it is often best practice to conduct sensitive roof stripping or architectural salvaging to minimise any possible disturbance and to employ mitigation techniques.

9.2.3.3 High potential of bat interest

- This group includes buildings with known roosts or signs of bat occupancy such as droppings and staining at a roost entrance. The description of high potential buildings will also contain an indication as to the time of the year when it will be occupied by bats i.e. summer – nursery roost. Winter – hibernation.

- If the building/buildings fall into the high potential group then the area of bat interest should be identified on site with the contractors to ensure that work does not affect the bats roost.
- If it is thought the work will have a direct effect on the bat roost and is unavoidable then advice must be sought from the Species Office for Natural England and derogation licence obtained prior to any of the work proceeding.

9.3 Summary of conservation significance of roost types (Bat Mitigation Guidelines, 2004).

Roost type	Development effect	Scale of impact		
		Low	Medium	High
Maternity	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside breeding season	✓		
	Post-development interference			✓
Major hibernation	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction; modification		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference			✓
Minor hibernation	Destruction			✓
	Isolation caused by fragmentation			✓
	Partial destruction, modification		✓	
	Modified management		✓	
	Temporary disturbance outside hibernation season	✓		
	Post-development interference		✓	
	Temporary destruction, then reinstatement	✓		
Mating	Destruction		✓	
	Isolation caused by fragmentation		✓	
	Partial destruction	✓		
	Modified management	✓		
	Temporary disturbance	✓		
	Post-development interference	✓		
	Temporary destruction, then reinstatement	✓		
Night roost	Destruction	✓		
	Isolation caused by fragmentation	✓		
	Partial destruction	✓		
	Modified management	✓		
	Temporary disturbance	✓		
	Post-development interference	✓		
	Temporary destruction, then reinstatement	✓		

NB 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.

- 8 FEB 2016