

WOLD ECOLOGY LTD

Chris Toohie
4 Mill Street, Driffield,
East Riding of Yorkshire. YO25 6TS



Richard Baines
5 Coastguard Cottages, Flamborough,
East Riding of Yorkshire. YO15 1AW

www.woldecology.co.uk

Thirley Cote Farm, Harwood Dale

Bat and Barn Owl Survey, August 2010.

NYMNPA

20/04/2018

	Staff Member	Position
Surveyor.	Chris Toohie M Sc., MIEEM	Ecologist.
Report prepared by.	Chris Toohie M Sc., MIEEM	Ecologist.
Authorised by.	Chris Toohie M Sc., MIEEM	Project Manager.
Notes.	This report contains sensitive information concerning protected species and caution should be exercised when copying and distributing to third parties.	

Table of Contents.

1.0	INTRODUCTION	3
2.0	SURVEY AND SITE ASSESSMENT	4
2.1	Pre-existing information on bats and survey site	4
2.2	Status of bats in Yorkshire	4
2.3	Objective of the survey	5
2.4	Survey area	5
2.5	Habitat description	5
2.6	Field Survey	6
2.7	Results	7
2.8	Interpretation and evaluation	12
2.9	Maps of the survey area	14
2.10	Photographs of key features	17
3.0	IMPACT ASSESSMENT	21
4.0	MITIGATION	22
5.0	BARN OWL SURVEY	27
6.0	SUMMARY	29
7.0	REFERENCES	31
8.0	APPENDICES	32
Table 2.1	Local bat records	4
Table 2.2	Status of bat species in Yorkshire	4
Table 2.6.2	Emergence survey weather conditions	7
Table 2.6.3	Dawn survey weather conditions	7
Table 2.7.2	Summary of emergence survey	9
Table 2.7.3	Summary of dawn survey	11
Table 8.2.1	Appraisal of significance of bat roosts	35
Table 8.2.3	Status of bats	36

1.0 INTRODUCTION

1.1 Background Information

- 1.1.1 In August 2010, Wold Ecology was commissioned by Mr and Mrs Shepherd to undertake a bat and barn owl *Tyto alba* survey at Thirley Cote Farm, Harwood Dale (approximate National Grid Reference SE 97581 95071) in North Yorkshire (see 2.9.1: Site Location Plan and 2.10).
- 1.1.2 The survey focused on a large barn and cart shed. The proposed work will involve the development of the barn into holiday lets and the cart shed will become a garage. A bat survey is required prior to works commencing in order to prevent the potential injury/disturbance of bats and the disturbance/obstruction of their roosting places and as a requirement of the planning application process (ODPM Circular 06/2005 Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System).
- 1.1.3 The survey involved :
- Desktop study.
 - Daytime assessment.
 - Emergence survey.
 - Return (dawn) survey.

2.0 SURVEY AND SITE ASSESSMENT

2.1 Pre-existing information on bats at the survey site.

2.1.1 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 2010).

2.1.2 Consultation with the North Yorkshire Bat Group identified the following bat records within 2km of Thirley Cote Farm.

Table 2.1 – Local bat records

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

2.2 Status of species present in Yorkshire

Table 2.2 highlights the regional and national status of bat species present in Yorkshire.

Table 2.2 Status of Bat species 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.
Brown long-eared	Not threatened	Widespread	Widespread.
Noctule	Not threatened	Widespread (except in Ireland)	Widespread.
Daubenton's	Not threatened	Widespread	Widespread.
Natterer's	Not threatened	Widespread (except N & W Scotland)	Present
Brandts	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.nyorkbats.freeserve.co.uk/bats.htm>

2.3 Objective of survey

2.3.1 In order to fulfil the brief, the site was visited and assessed on 25th August and 31st August 2010. This was to determine whether the buildings on site were occupied by bats. The work involved the following elements:

- A daytime, visual survey for current bat roosts.
- An assessment of the on-site potential for bats and the likelihood of their presence.
- An assessment of whether bats are a constraint to the development.
- 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.

2.4 Survey area

2.4.1 The survey area targeted a two storey barn and attached single storey barn; and separate cart shed.

2.5 Habitat description

2.5.1 Thirley Cote Farm is located 1.5km east of Harwood Dale village, in a rural location. The farm is located within the North York Moors National Park and is surrounded by woodland, forest and open countryside including grazed pasture, arable and moorland. Habitat connectivity and foraging opportunities is excellent and provided by woodland, shelterbelts, hedgerows and a mosaic of interconnecting habitats.

2.5.2 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.
- Pits Wood.
- Cloughton Moor
- Arable.
- Ponds and watercourses.
- Harwood Dale Beck and tributaries.
- Grazed pasture.

2.6 Field survey

2.6.1 Daytime Survey

2.6.1.1 The daytime assessment identified whether the area had any signs of residency 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 and;
- Assessment of crevices and cracks in the buildings to assess their importance for roosting bats.

2.6.1.2 Timing

The daytime assessment survey was conducted on 25th August and 31st August 2010. The combined duration of the surveys was 90 minutes.

2.6.1.3 Personnel

The daytime surveys were conducted by Chris Toohie, Project Manager of Wold Ecology with 3 years field experience of surveying bats and hold a Natural England scientific licence (20101386). Richard Baines assisted with the inspections.

2.6.2 Emergence Survey

2.6.2.1 Emergence surveys are used to determine bat presence in a building and can also give a good estimate of the numbers present. Common pipistrelle bats can emerge approximately 30 minutes before sunset and brown long-eared emerge from dark from approximately 1 hour after sunset. The survey times ensured that bats would have emerged from their roost sites and would be foraging. Surveyors were positioned around the site so that all possible bat exits could be observed at one time. Five surveyors concentrated on all elevations of both buildings (see 2.9.3).

2.6.2.2 Timing

The emergence survey was conducted at 1930. The survey commenced 30 minutes before sunset and continued for duration of 2.5 hours.

2.6.2.3 Personnel

The emergence survey was conducted by Richard Baines who is an experienced bat surveyor. Experienced Wold Ecology staff assisted with the survey.

2.6.2.4 Weather conditions

Table 2.6.2 Weather Conditions

Climate	Date – 25 th August 2010	
	Start	Finish
Time	1845	2200
Wind speed	8mph	No change
Wind direction	SW	No change
Rainfall	None	None
Cloud cover	60%	No change
Temperature	14°C	14°C

2.6.3 Dawn Bat Survey

2.6.3.1 Surveys conducted at sunrise are particularly useful as bats tend to swarm outside their roosts for up to 2 hours before entering, thus allowing the surveyor more time to identify the bat and entrance locations. Bats will return to roosts approximately 90 minutes before sunrise and 15 minutes after. The timing of the survey ensured that returning bats would be recorded. Five surveyors concentrated on all elevations of the buildings (see 2.9.4).

2.6.3.2 Timing

The return survey was conducted at 0410 on 31st August 2010. The survey commenced 2 hours before sunrise and continued until 0630.

2.6.3.3 Personnel

The dawn survey was conducted by Chris Toohie who is an experienced bat surveyor who holds a Natural England scientific licence (20101386). Richard Baines and experienced Wold Ecology staff assisted with the survey.

2.6.3.4 Weather conditions

Table 2.6.3 Weather Conditions

Climate	Date – 31 st August 2010	
	Start	Finish
Time	0410	0630
Wind speed	Still	No change
Wind direction	N/A	N/A
Rainfall	None	None
Cloud cover	0%	0%
Temperature	7°C	7°C

2.6.4 Equipment

The following equipment was used or at hand during the field survey work:

- Telescopic ladders;
- Binoculars;
- Cluson 1 million candle power lamp;
- Dart Rigid Seesnake Endoscope;
- Digital thermometer.
- Frequency Division Bat Box Duet detectors;

- Heterodyne Stag Electronics Bat Box III detectors;
- MP3 recorders and Batsound analysis software;
- Night vision scope and;
- Anabat.

2.7 Results

2.7.1 Daytime Survey

- 2.7.1.1 The barn was built in the 1830's and consists of two storeys built from local stone with a pitched roof; it is currently used for storage. The roof is in poor condition with loose and missing pan tiles on the north pitch. The roof deteriorated significantly during the winter of 2010. The ridge is intact with no obvious gaps but numerous gaps are present beneath the gable coping stones.

There are subsidence cracks on the north and south elevation and adjacent to the east gable; there are numerous gaps in the mortar and above the wall plate. There are also gaps adjacent to the timber window frames and doors. The western part of the barn is single storey and an open fronted barn in an 'L' shape. The red pan tile roof has gaps beneath the tiles. The single storey section is supported by smooth sawn timbers, brick pillars and steel girders; there are gaps in the brickwork and in the timber joints throughout.

Internally, the roof is supported by original timber beams that are individually numbered; consequently, the conservation officer has stated that the roof structure has significant conservation importance and must remain visible, post development. There are gaps above the beams and mortise joints. The roof is not felt lined but gaps are present above the timber sarking. A hay loft is located at the east end of the barn; the remainder of the barn is open plan with a single dividing wall. A small scattering (<5) of pipistrelle droppings were located in the north-west corner and on the south elevations internal wall. Brown long-eared droppings were also observed in the open room below the hayloft at the east of the barn, the hayloft above is supported by large timber beams with gaps above.

The barn has been assessed as having HIGH POTENTIAL to support bats, due to the presence of bat droppings and other features i.e. gaps underneath the tiles, below coping stones, above the wall plate and in the stonework, which have potential to provide roosting opportunities for bats (see 2.10 figures 1, 2 and 5 to 11).

- 2.7.1.2 The cart shed is a single storey building with a pitched roof and local stone walls, it is currently empty. The red pan tile roof is in a poor state of repair with missing and slipped tiles, gaps are present beneath. Brick pillars support the roof with gaps present in both the brickwork and stone elevations. There are also gaps beneath the coping stones on the gable ends and adjacent to the timber window frames. Internally, the roof is supported by smooth sawn timber beams, there are gaps above the beams and mortise joints. The roof is not felt lined but gaps are present above the timber sarking. There were no signs of roosting bats or bat activity inside the building, but due to the presence of features with potential to provide roosting opportunities for bats i.e. gaps underneath the tiles, ridge tiles and ivy. The building has been assessed as having a MEDIUM POTENTIAL to support bats (see 2.10 figures 3 and 4).

2.7.2 Emergence Survey

2.7.2.1 The first common pipistrelle bat was detected at 2023, the bat emerged from a gap above the wall plate on the south elevation of the barn. Numerous bat roosts were identified during the emergence survey and can be summarised as:

- Common pipistrelle summer roosts x 12 (11 in the barn and 1 in cart shed);
- Natterer's summer roosts x 2 (both in the barn) and;
- Brown long-eared summer roosts x 2 (both in the barn).

2.7.2.2 Bat activity was constant throughout the survey and numerous bats were recorded foraging around the farm complex (see 2.9.3).

Table 2.7.2 Summary of Emergence Survey (see 2.9.3)

Date – 25 th August 2010					
Loc.	Time	Species	kHz	Direction	Comment
3	2023	Pipistrelle	45	S	Emerged from a gap in the stonework on the barns south elevation (roost 2)
4 & 3	2024	Pipistrelle	45	W	Commuting
3 & 1	2024	Pipistrelle	45	W	Commuting
5	2025	Pipistrelle	45	N	Commuting
4	2028	Pipistrelle	45	S	Emerged from a gap in the brickwork on the cart sheds west elevation (roost 1)
5	2031	Pipistrelle	45	N	Commuting
1	2031	Pipistrelle x 3	45	S	Emerged from a gap above the wall plate on the barns south elevation (roost 3)
3	2033	Pipistrelle x 2	45	S	Emerged from a gap in the stonework on the barns south elevation (roost 4)
2	2034	Pipistrelle	45	N	Emerged from a gap above the wall plate on the barns north elevation (roost 7)
4	2034	Pipistrelle	45	W	Commuting
5 & 4	2035	Pipistrelle	45	W	Commuting
2	2036	Pipistrelle	45	N	Emerged from a gap above the wall plate on the barns north elevation (roost 8)
2	2036	Pipistrelle	45	N	Emerged from a gap above the wall plate on the barns north elevation (roost 9)

2	2039	Pipistrelle	45	N	Emerged from a gap above the wall plate on the barns north elevation (roost 10)
1	2039	Pipistrelle	45	W	Emerged from a gap in the stonework on the single storey section of the barns south gable (roost 12)
5 & 4	2041	Pipistrelle	45	S	Commuting
5 & 4	2043	Pipistrelle	45	S	Commuting
3	2043	Natterer's	49	S	Emerged from a gap in the stonework on the barns south elevation (roost 13)
2	2044	Pipistrelle	45	N	Emerged from a gap above the wall plate on the barns north elevation (roost 6)
1	2045	Pipistrelle	45	W	Emerged from beneath a tile on the west pitch of the barns roof (roost 11)
2	2046	Pipistrelle x 2	45	N	Emerged from a gap in the stonework on the barns north elevation (roost 5)
2	2050	Natterer's x 2	49	N	Emerged from a gap beneath a tile on the north pitch of the barns roof (roost 14)
3 & 2	2055	Pipistrelle	45	N	Commuting
2	2101	Natterer's	49		Foraging
5	2104	Pipistrelle	45	N	Commuting
1	2111	Natterer's	49	SW	Commuting
2	2112	Noctule	20	W	Commuting
2 & 1	2113	Natterer's	49	S	Commuting
2	2115	Natterer's	49		Foraging
5	2116	Brown long-eared	40	NE	Emerged from the eastern compartment of the barn (roost 15)
2 & 5	2131 - 2139	Natterer's	49		Foraging
2	2140	Noctule	20	W	Commuting
3	2142 - 2156	Pipistrelle	45	S	Foraging
5 & 4	2147	Pipistrelle	45	W	Commuting
2	2147	Noctule	20	W	Commuting
3	2150 -	Pipistrelle x 2	45		Foraging inside the

	2155				barn
3	2150	Brown long-eared	40		Foraging inside the barn
2	2152	Natterer's x 2	45	W	Commuting

2.7.3 Dawn Survey

- 2.7.3.1 A common pipistrelle bat returned to roost 9, above the wall plate on the north elevation of the barn.
- 2.7.3.2 Single brown long-eared bats returned to separate summer roosts above a ceiling joist supporting the hay loft (roost 15) and a roof joist (roost 16) in the barn.
- 2.7.3.3 A Natterer's bat returned to a gap beneath a tile on the north pitch of the barns roof (roost 14) and a gap in the stonework on the south elevation of the barn (roost 13).
- 2.7.3.4 No bats were observed entering roosts in the cart shed.

Table 2.7.3 Summary of Dawn Survey (see 2.9.3)

Date – 31 st August 2010					
Loc.	Time	Species	kHz	Direction	Comment
3	0420	Pipistrelle	45	S	Commuting
3	0424 - 0500	Natterer's	49		Foraging
3	0430	Natterer's	49		Returned to a gap beneath a tile on the north pitch of the barns roof (roost 14)
5 & 3	0440 - 0453	Natterer's	49		Foraging above the barn ridge.
4 & 5	0440	Pipistrelle x 2	45	E	Commuting
4 & 3	0442	Brown long-eared	40	N	Commuting
4	0445	Brown long-eared	40		Returned to a roost above a timber ceiling support at the east end of the barn (roost 15)
5 & 4	0445	Pipistrelle	45	E	Commuting
5	0445	Pipistrelle	45		Foraging
5	0454	Brown long-eared	40		Returned to a roost above a timber roof support in the barn (roost 16)
3 & 4	0500	Pipistrelle	45	S	Commuting
1	0500	Pipistrelle	45	NW	Commuting
5	0505	Natterer's	49		Returned to a gap in the stonework on the barns south elevation

					(roost 13)
2 & 1	0505	Natterer's	49	S	Commuting
4	0509	Pipistrelle x 3	45	S	Commuting
1	0522	Pipistrelle	45	S	Commuting
2	0524	Pipistrelle	45		Returned to a gap above the wall plate on the north elevation of the barn (roost 9)

2.8 Interpretation and evaluation

2.8.1 Presence/absence

2.8.1.1 The barn supports 15 bat roosts and can be summarised as:

- 11 separate common pipistrelle summer roosts supporting 15 bats;
- 2 separate brown long-eared summer roosts supporting two bats and;
- 2 separate Natterer's roosts supporting 3 bats.

2.8.1.2 The cart shed supports a single common pipistrelle roost with one bat roosting in a gap in the stonework.

2.8.1.3 The site is currently used by foraging and commuting common pipistrelle, Natterer's, noctule and brown long eared bats, a minimum of twelve common pipistrelle bats, two brown long-eared bats and four Natterer's bats were observed.

2.8.2 Site Status Assessment

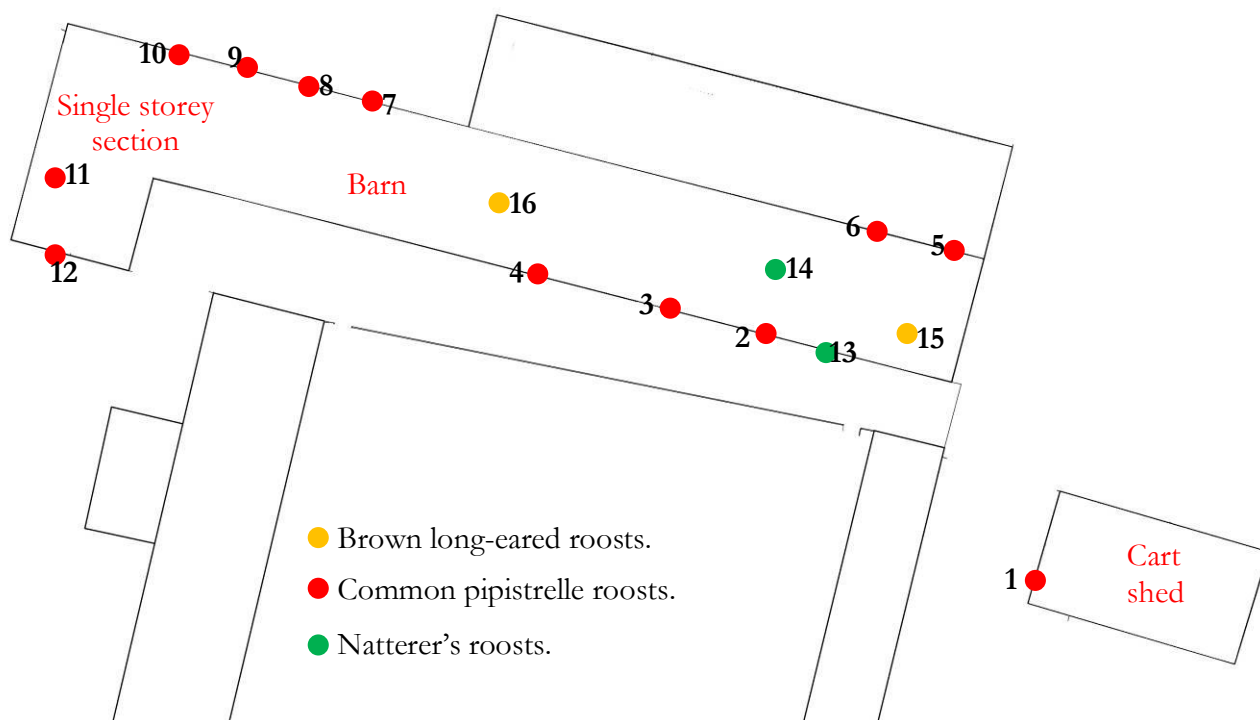
2.8.2.1 Based on a building inspection, emergence and dawn survey, it has been determined that the site provides the following roosts.

- **Roost 1** – common pipistrelle (x 1 bat) summer roost is located on the west gable of the cart shed, in an external crack in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 4).
- **Roost 2** – common pipistrelle (x 1 bat) summer roost is located on the south elevation of the barn, in a gap in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 5).
- **Roost 3** – common pipistrelle (x 3 bats) summer roost is located on the south elevation of the barn, in a gap above the wall plate. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 5).
- **Roost 4** – common pipistrelle (x 2 bats) summer roost is located on the south elevation of the barn, in a gap in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 5).
- **Roost 5** – common pipistrelle (x 2 bats) summer roost is located on the north elevation of the barn, in a gap in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 6).
- **Roosts 6, 7, 8, 9 and 10** – common pipistrelle (x 1 bat) summer roosts are located on the north elevation of the barn, in gaps above the wall plate. The roosts will be lost as part of the proposed development (see 2.9.3 and 2.10, figures 6 and 7).
- **Roost 11** – common pipistrelle (x 1 bat) summer roost is located beneath a tile on the west pitch of the single storey section of the barn. The roost will

be lost as part of the proposed development (see 2.9.3 and 2.10, figure 8).

- **Roost 12** – common pipistrelle (x 1 bat) summer roost is located in the south gable of the single storey section of the barn, in a gap in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 8).
- **Roost 13** – Natterer's (x 1 bat) summer roost is located on the south elevation of the barn, in an external crack in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 9).
- **Roost 14** – Natterer's (x 2 bats) summer roost is located beneath a tile on the north pitch of the barn. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 6).
- **Roost 15** – Brown long-eared (x 1 bat) summer roost is located in the east end of the barn, above a timber ceiling support for the hay loft. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 10).
- **Roost 16** – Brown long-eared (x 1 bat) summer roost is located inside the barn, above a timber roof support. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 11).

2.8.2.2 Location of bat roosts



2.8.2.3 The roosts are located adjacent to favourable foraging habitat which will play an important role in the ecology of the local bat population.

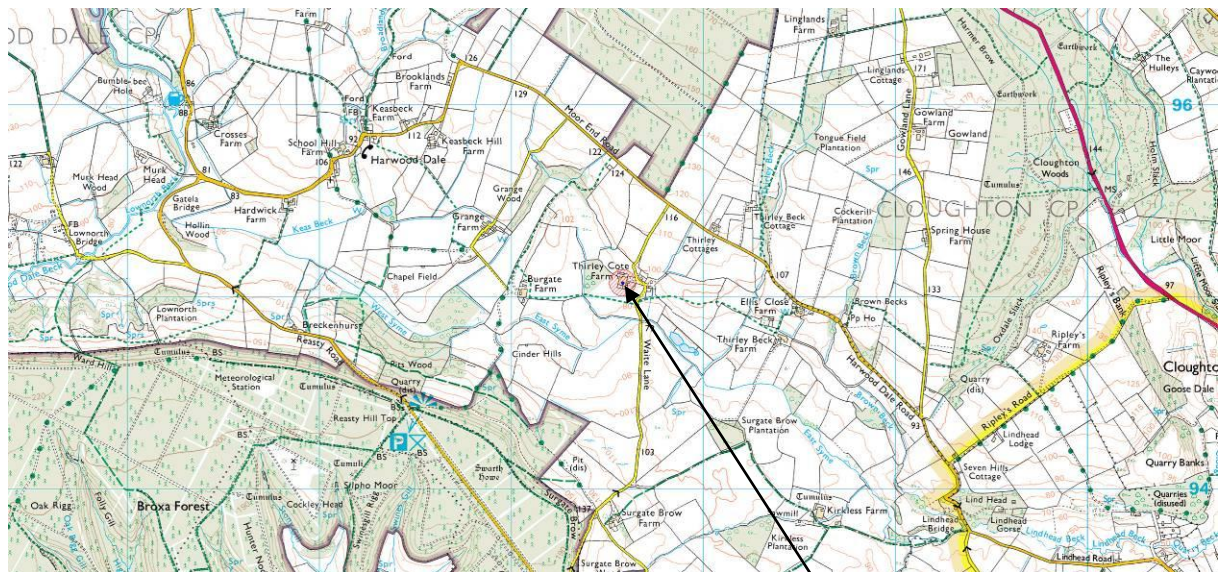
2.8.2.4 The presence of high numbers of pipistrelle bats suggests that the building is significant to bats at the Site. It is possible that the pipistrelle represent numbers of adults and juveniles from a disbanded maternity roost. There is also potential for mating or transitional activity to occur on Site; although no swarming activity was observed.

2.8.2.5 The survey was conducted in late August and only reflects bat usage during late summer months. There is currently no data available to assess bat usage on Site during the early summer, autumn or winter months. It is recommended that the development should avoid late early May – late July and the initial start date should avoid late October – early March. This will prevent disturbance to potential maternity colonies and hibernating bats.

2.8.2.6 Further survey work should be conducted between May and July to confirm the presence/absence of breeding bats on site. In addition, a survey should be undertaken between September and early October to assess mating activity.

2.9 Maps of the survey area

2.9.1 Location Map

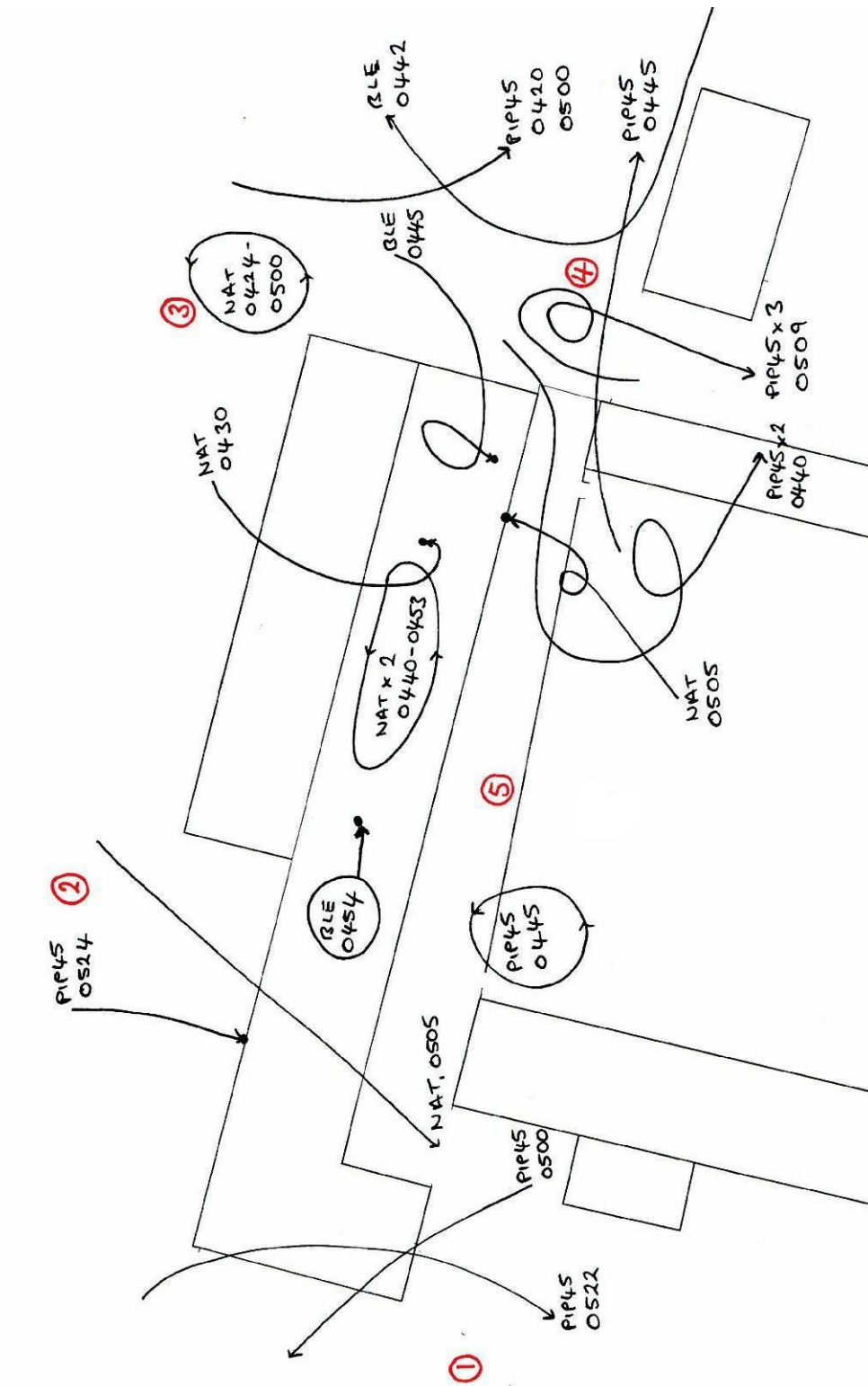


Thirley Cote Farm

2.9.2 Aerial Photograph



2.9.4 Dawn Survey – 28th August 2010



N
↑
Not to scale

1, 2, 3, 4, and 5 - location of surveyors

⊙ Foraging activity

2.10 Photographs of key features

Figure 1 – Barn, south elevation.



Figure 2 – Barn, single storey west section.



Figure 3 – Cart shed, south elevation.



Figure 4 – Common pipistrelle roost 1, west gable of cart shed.



Figure 5 – Common pipistrelle roosts 4, 3 and 2.

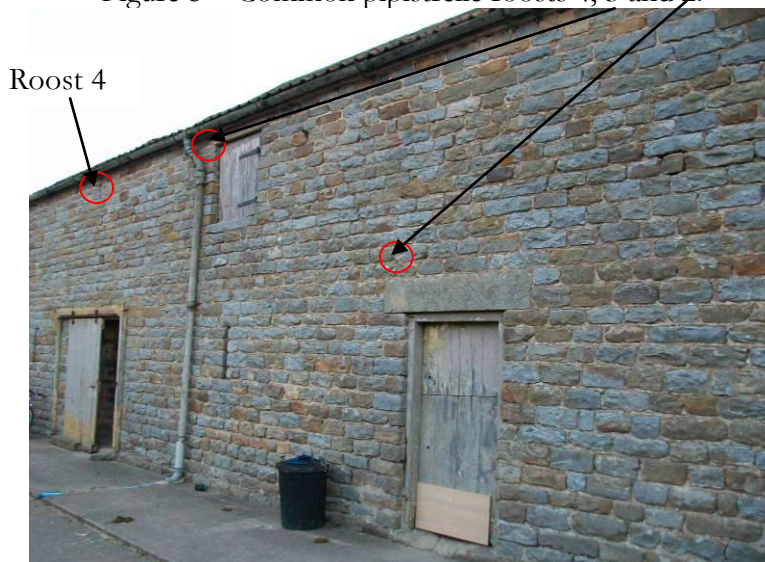


Figure 6 – Common pipistrelle roosts 5 and 6. Natterer's roost 14

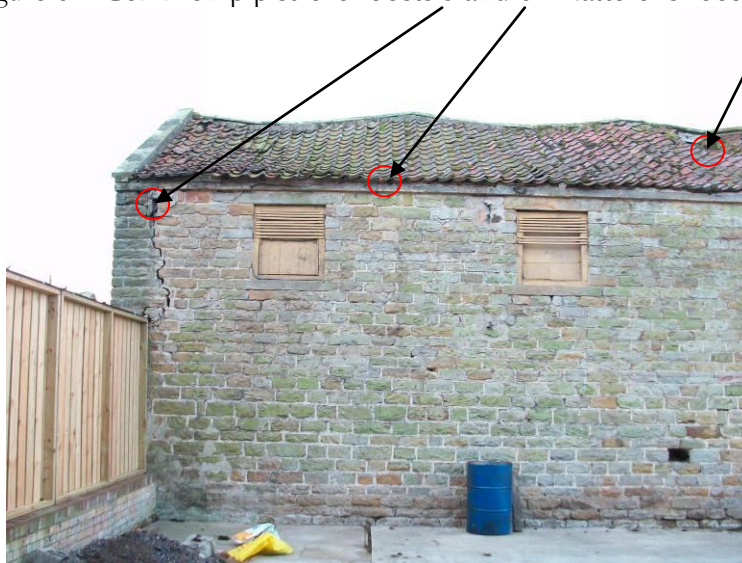


Figure 7 – Common pipistrelle roosts 7, 8, 9 and 10.

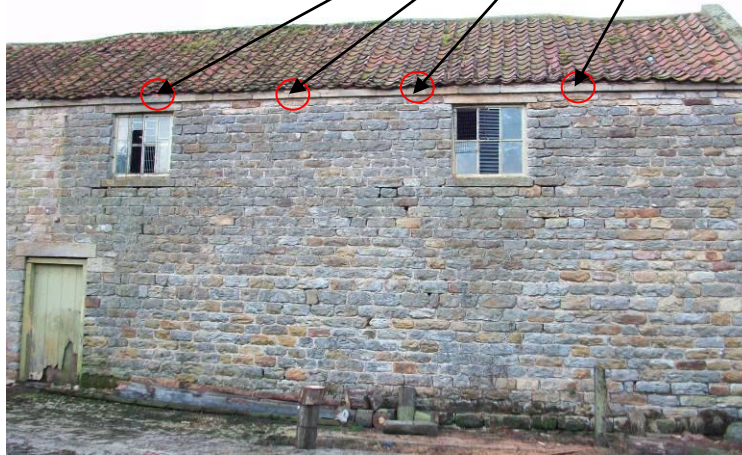


Figure 8 – Common pipistrelle roosts 11 and 12.



Figure 9 – Natterer's roost 13.

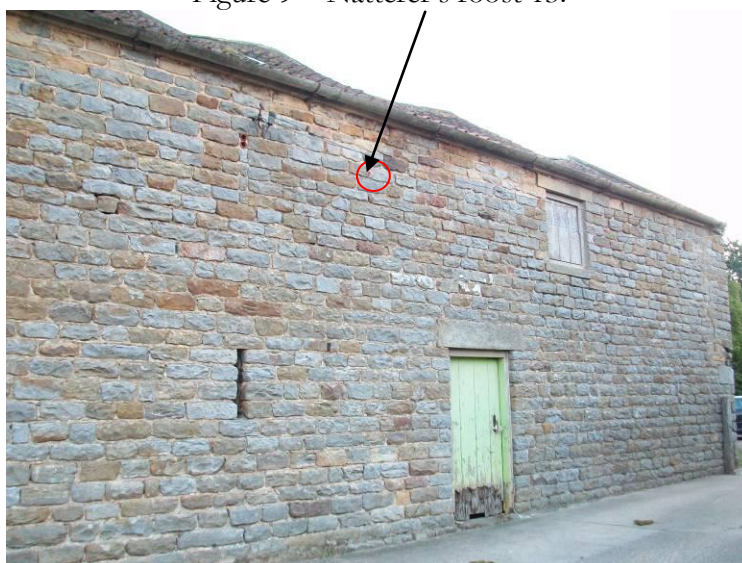


Figure 10 – Brown long-eared roost 15, east gable of barn.



Figure 11 – Brown long-eared roost 16, inside barn.



3.0 IMPACT ASSESSMENT – in the absence of mitigation

- 3.1 The Site supports a total of sixteen roosts (see 2.8.2.1).
- 3.2 The proposed development to the barn will involve the conversion of the building into a holiday-let; the cart shed will be repaired and used as a garage. Structural work, re-roofing, re-pointing and internal refurbishment, will result in major disturbance to the summer bat roosts. The roosts include:
- 12 separate common pipistrelle summer roosts supporting 16 bats;
 - 2 separate brown long-eared summer roosts supporting two bats and;
 - 2 separate Natterer's roosts supporting 3 bats.
- 3.3 Temporary Construction Effects
- Bats are susceptible to disturbance as a result of a development affecting a roost site. The pre-construction and post construction period of the development will result in significant alterations and disturbance to the roost sites including:
- a. The construction of scaffolding against the roof of the buildings which will cause an obstruction to the access points.
 - b. Disturbance and modification of roosts in the stonework and above the wall plates.
 - c. The removal of the roofing and tiles will result in major disturbance to the roosts located under the roof tiles.
 - d. The removal of roof timbers will result in disturbance to bats roosting in roof void and above the wall plates.
- 3.4 Permanent Construction Effects
- In the absence of mitigation, the sealing up of the access points during pointing up of the external brickwork, re roofing and internal refurbishment will involve the permanent loss of 16 summer bat roosts.
- 3.5 Increased lighting through the installation of security lighting on the external walls of buildings will affect bat activity in the location of the roost sites.
- 3.6 The current information obtained is based on a desk top study, visual inspection and activity surveys conducted in late August. Due to the numerous common pipistrelle roosts identified at the Site, further information is required before a more accurate impact assessment can be produced. Individually, the common pipistrelle roosts are of low conservation significance to the local and regional area. However, accumulatively their presence suggests that the Site provides a significant role in supporting a local population of common pipistrelle bats.
- 3.7 Based on current information, the common pipistrelle, Natterer's and brown long-eared bat summer roosts at are Thirley Cote Farm are of low conservation significance to Yorkshire. The roosts each contain <5 individual bats and are most probably occupied by male bats. Male summer roosts of a common and widespread species are of low conservation significance and therefore, the loss of the roosts will not have a significant impact at a local, regional or national level.
- 3.8 Subject to more survey input, the Site currently supports numbers of common pipistrelle bats with a potentially high significance. If the Site is used for mating and swarming, then the destruction and loss of the roosts will cause a medium impact on local bat populations.

4.0 MITIGATION & COMPENSATION

4.1 Legal Protection

- 4.1.1 Legal obligations towards bats are generally concerned with roost protection. All developments, known to contain bat roosts, require a licence from Natural England (see 7.1.11 – 7.1.16). Under Section 9 of the Wildlife and Countryside Act (1981) 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 intentionally to damage or obstruct access to any place that a bat uses for shelter or protection. As the barn and cart shed supports numerous common pipistrelle, Natterer's and brown long-eared summer roosts, any works that will disturb or permanently lose the roosts **will** require a derogation licence from Natural England. It is also possible that individual bats could turn up roosting in other parts of the barn, cart shed and or wider site.
- 4.1.2 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, altering the timing of the works and the creation of replacement roosts and/or habitats.
- 4.1.3 The licence application process currently requires the input of a qualified bat ecologist/consultant and includes:
- The submission of a licence to capture, disturb and/or destroy the roosts or resting places of bats.
 - 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 (Natural Habitats & c.) Regulations 1994, namely Regulations 44(2) (e), (f) or (g), and 44(3) (a).
 - 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 and 7.3).

4.2 Mitigation Strategy

4.2.1 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.
- Compensation should ensure that the affected bat population can continue to function as before, so attention may need to be given to surrounding habitats.

4.2.2 Based on current survey information, the roosts in the barn and cart shed are of low conservation significance and therefore requires 'like for like' replacement with no constraints on timing.

4.3 Compensation measures

4.3.1 The roof space of barn 1 will form part of the accommodation for the new dwelling; the conservation officer has insisted that the beams remain visible as they have historic importance to the site. Consequently, the creation of a bat loft in barn 1 is not an option.

4.3.2 However, a bat loft will be created in the cart shed. A ceiling will be created to establish a single storey garage beneath leaving a drop of at least 2m from the ridge board; the bat loft will be at least 10 metres in length and 4 metres wide. New access will be created to allow the use of the roof apex by brown long-eared bats and Natterer's bats. An access slot of at least 250mm wide and 100mm in length will be incorporated into the east and west gable of the cart shed. This will be located approximately 400mm above the loft floor and not the apex; this will retain warmer air within the ridge roost area. Additional, access into the bat loft roof void will be provided through the installation of 4 lead saddles in place of a pan tile. A bat ecologist will be on site to supervise the positioning of the access locations. Holes in the felt underneath the lead saddles will be cut to allow access into the roof.

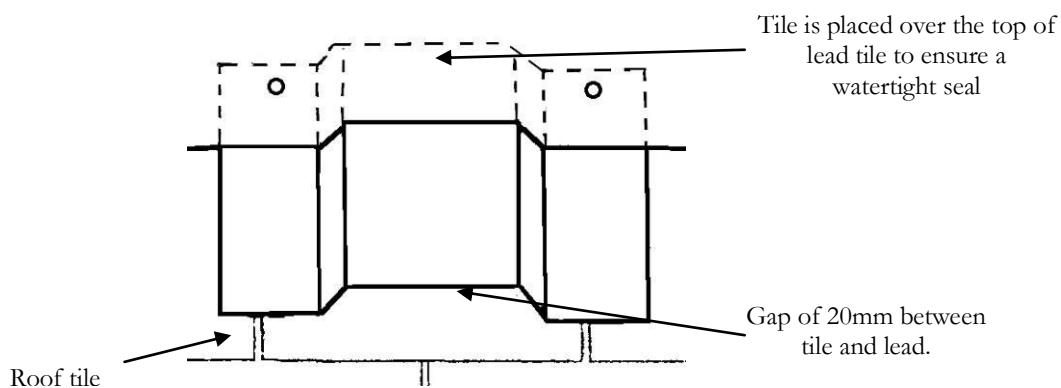
4.3.3 The roof apex will be open without modern trussed rafters. Roofing felt in the barn will be traditional bitumastic and Hessian or an approved breathable membrane. This will not be tight but allowed to sag very slightly between the rafters. However, in the areas of the internal roof directly above the bat access apertures on the gable, 8 separate roosting opportunities will be created specifically for use by bats. This will involve a second layer of traditional

bitumastic and Hessian under-felt being used. This will ensure that the bats will have enough grip and will not be tight but allowed to sag very slightly between the rafters and will be incorporated between rafters and purlins to ensure that a sufficient area is covered (>20m²). A bat ecologist will identify the required area to be covered with a second layer of the traditional bitumastic and Hessian under-felt.

- 4.3.4 The top slate lathe of the roof will 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.
- 4.3.5 Additional roosting locations in the bat loft 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.
- 4.3.6 If insulation is to be used on the floor of the bat loft, it will 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 lofts.
- 4.3.7 Timber treatment should be carried out using Permethryn type chemicals on the Natural England list of approved safe chemicals. A list of Natural England approved paints and timber treatments is available at http://www.naturalengland.org.uk/Images/Bat%20roost%20timber%20treatment_tcm6-10167.pdf. New pre-treated timbers i.e. tanalised timber will be allowed to dry thoroughly before use. 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.
- 4.3.8 Specially designed bat boxes can be located on site. Schwegler Bat Boxes are recommended and well tested boxes. The following bat boxes provide additional roost habitats and are available from Wold Ecology:
- The **1FD** is a larger version of the 2F. A general purpose bat box with two internal rough wood panels which simulate crevices.
 - 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.

- 4.3.9 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.
- 4.3.10 Wold Ecology recommends that 16 boxes are sited on the barns or within the grounds of Thirley Cote Farm. The following locations are recommended and will be close to existing roost points:
- 4 bat boxes on the north elevation of the barn;
 - 3 bat boxes on the south elevation of the barn;
 - 1 bat box on the south gable of the single storey barn;
 - A bat box on the east and west elevation of the cart shed;
 - 5 bat boxes on trees or buildings within the farm complex;
 - 1 bat box inside the created bat loft in the cart shed.
- 4.3.11 Eight lead tiles (16 in total) will be sited on the north, east and south facing pitches of the barn. The exact locations of the tiles will be determined on site by the bat ecologist.
- 4.3.12 Two lead tiles (4 in total) will be sited on the north and south facing pitches of the cart shed. The exact locations of the tiles will be determined on site by the bat ecologist.

Diagram of a lead bat tile.



- 4.3.12 The walls of the barn and the cart shed will remain intact, therefore a similar variety of crevices to those on the existing stone walls will be provided. Crevices must be maintained at a minimum of 150mm deep by approximately 20 x 20mm wide. At least 8 gaps and crevices will remain post development and suitable crevices will be determined by the bat ecologist. Scaffolding and an endoscope will assist with determining suitable crevices for roosting bats and will include existing roosts or crevices close to the existing roosts.
- 4.3.13 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. A list of Natural England approved paints and timber treatments is available at http://www.naturalengland.org.uk/Images/Bat%20roost%20timber%20treatment_tcm6-10167.pdf.

- 4.3.14 The data collected to support the output of this report is valid for one year. This report is valid until **August 2011**. After this time, additional surveys need to be undertaken to confirm that the status of the building, as a bat roost, has not changed.
- 4.4 Habitat Enhancements
- 4.4.1 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. Management of these habitats should aim to maintain a favourable status of local populations by encouraging bat usage through the provision of additional roosting opportunities, habitat enhancement and maintaining commuting routes.
- 4.4.2 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). External lighting requirements will be carefully designed to avoid light spillage and will not be mounted where they will shine directly on to new roosts. All on site lighting will be fitted with downward facing cowls or hoods to prevent light contamination. Security lighting should be on a short timer and motion sensitive to large objects only. Low sodium down lighting is available and bats are more tolerant towards.
- 4.4.3 Urban gardens and recreation areas can provide good foraging grounds for bats. Green 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 perichlymenum*.
 - Wild Clematis *Clematis virginiana*
- 4.4.4 Leaving areas of uncut grass and providing open water will attract insects. Trees and shrubs in gardens will also provide cover and additional feeding grounds. More information on suitable planting to encourage bats obtained from The Bat Conservation Trust (www.bats.org).

5.0 BARN OWL SURVEY

5.1 The following survey followed guidance and methods recommended within *Bird Monitoring Methods, a manual of techniques for key UK species* Gilbert et. al RSPB 1998, *Common Standards Monitoring Guidance for Birds* JNCC 2004 and *Survey Techniques Leaflet 8*, The Barn Owl Trust.

5.2 Wold Ecology conducts voluntary monitoring of barn owl nests within designated grid squares in East Yorkshire for the Wold Barn Owl Study Group (WBSG). Wold Ecology also liaises with the WBSG to ensure data is shared and good survey practice is maintained.

5.3 Breeding Status

The British race of barn owl, for which Scotland is the northern limit, has a European distribution that includes countries adjoining the Mediterranean basin. In 1987, the British barn owl population was estimated at 5,000 pairs, a reduction from 12,000 pairs in 1934. Since the 1930's, the barn owl has undergone a significant decline in numbers. Despite continued decline, the barn owl is still widespread in lowland agricultural habitats. Yorkshire has one of the highest densities of breeding barn owls in the UK.

5.4 Breeding Biology

The barn owl is associated with ruined farm buildings, church towers, parks, timbered hedges, cliffs, and quarries. It nests in roof spaces, hollow trees (particularly elms and oaks), rock crevices, caves and buildings. The species feeds predominantly on small mammals, as well as insects and birds and is largely crepuscular, hunting at dawn and dusk, as well as at night.

5.5 Legal Status

Barn owl is protected under schedules 1 and 9 of the Wildlife and Countryside Act 1981. It is listed in the EC birds Directive and under Appendix II of the Bern Convention. Barn owl is on the 'amber' list in 'Birds of Conservation Concern' as a bird of unfavourable conservation status in Europe and it is included on the list of species of conservation concern in the UK Biodiversity Steering Group Report (1995).

5.6 Field Survey Methods

The survey on 25th August and 31st August 2010, was carried out by Richard Baines who is an experienced barn owl surveyor; Schedule 1 barn owl license number 20091023. Extreme care was taken when approaching potential roosts, in accordance with guidance from JNCC and Natural England.

5.6.1 Daytime Survey – Methodology

The daytime assessment identified whether the area had any signs of residency and/or barn owl usage. This took the form of a methodical search in all suitable buildings, both internally and externally, for actual roosting barn owls and/or their signs. Specifically, the visual survey involved:

- An assessment of the suitability of the buildings that provide access for breeding barn owls within the study area.
- A thorough check for pellets, feathers or signs of old nest remains in the form of pellet debris and/or old broken egg shells.

- A visual survey of one hour for barn owl sightings within or close to the study area.
- An assessment of the suitability of the habitat for hunting barn owls within and surrounding the study area.

5.7 Results

5.7.1 Barn owl pellets, were found on the floor of the open fronted, single storey section at the western end of the barn. A barn owl was observed during the bat emergence survey and it returned to the roost in the single storey section of the barn during the dawn survey.

5.8 Evaluation

5.8.1 The results show a barn owl is using the single storey section of the barn as a roost. This could either be a late winter/early spring roost for a non-breeding bird or a roost for a breeding male whilst the female roosts in the nest site.

5.8.2 The location and nature of the fresh pellets would also fit with a barn owl feeding on prey on the ground. The quantity and age of pellets indicates that it is used regularly. This area is sheltered from bad weather affording a dry environment where the prey can be consumed. No evidence of breeding barn owls was found within any buildings. However, as barn owls habitually use the same or nearby roost sites within a breeding territory throughout the year, it is highly likely barn owls are nesting within the area close to the study area.

5.9 Mitigation/Recommendations

5.9.1 As conversion of the barn would destroy a barn owl roost site, **Wold Ecology highly recommend the provision of 2 barn owl nest boxes on the borders of the site, away from the proposed development.** Both boxes should be erected on poles or trees and work should be completed prior to any work being started on the hayloft. Two boxes are usually recommended because during the breeding season the male bird is often driven from the nest site by the female. The male is forced to roost elsewhere whilst still providing food for both the female and the chicks. A second box would make provision for nesting and the roosting male.

5.9.2 Nesting barn owls will also increase the general bio-diversity of the proposed barn conversion. Wold Ecology can advise on the best locations for the nest boxes and recommend a source for the nest boxes.

6.0

SUMMARY

- 6.1 The field surveys during August 2010 revealed the following roosts:
- **Roost 1** – common pipistrelle (x 1 bat) summer roost is located on the west gable of the cart shed, in an external crack in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 4).
 - **Roost 2** – common pipistrelle (x 1 bat) summer roost is located on the south elevation of the barn, in a gap in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 5).
 - **Roost 3** – common pipistrelle (x 3 bats) summer roost is located on the south elevation of the barn, in a gap above the wall plate. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 5).
 - **Roost 4** – common pipistrelle (x 2 bats) summer roost is located on the south elevation of the barn, in a gap in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 5).
 - **Roost 5** – common pipistrelle (x 2 bats) summer roost is located on the north elevation of the barn, in a gap in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 6).
 - **Roosts 6, 7, 8, 9 and 10** – common pipistrelle (x 1 bat) summer roosts are located on the north elevation of the barn, in gaps above the wall plate. The roosts will be lost as part of the proposed development (see 2.9.3 and 2.10, figures 6 and 7).
 - **Roost 11** – common pipistrelle (x 1 bat) summer roost is located beneath a tile on the west pitch of the single storey section of the barn. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 8).
 - **Roost 12** – common pipistrelle (x 1 bat) summer roost is located in the south gable of the single storey section of the barn, in a gap in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 8).
 - **Roost 13** – Natterer's (x 1 bat) summer roost is located on the south elevation of the barn, in an external crack in the stonework. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 9).
 - **Roost 14** – Natterer's (x 2 bats) summer roost is located beneath a tile on the north pitch of the barn. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 6).
 - **Roost 15** – Brown long-eared (x 1 bat) summer roost is located in the east end of the barn, above a timber ceiling support for the hay loft. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 10).
 - **Roost 16** – Brown long-eared (x 1 bat) summer roost is located inside the barn, above a timber roof support. The roost will be lost as part of the proposed development (see 2.9.3 and 2.10, figure 11).
- 6.2 The roosts will be disturbed and some will be destroyed as part of the proposed conversion and structural repair work to the barn and cart shed. Consequently, a Natural England European Protected Species development license is required before building work to the south elevation can commence. Details of appropriate mitigation to be included in the licence application are outlined in section 4.2.
- 6.3 Further activity surveys are required to support any subsequent license application and will involve:

- Dawn survey during late September/early October.
 - Activity survey during the active summer period, mid May to mid July.
- 6.4 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 Regulation 39(1) of the Conservation (Natural Habitats &c.) Regulations 1994. 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 Wildlife and Countryside Act 1981 (as amended) and applies to whoever carries out the work. All contractors on site should be made aware of this requirement and given Natural England's contact details.
- 6.5 Habitat enhancement for bats should be implemented as outlined in section 4.4, in order to improve foraging opportunities to bats in the local area.
- 6.6 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.
- 6.7 Whilst the survey provided detailed information on bats, bird's nests were observed in the barns. All nests should remain undisturbed and intact until after the breeding bird season – 1st March to 31st August. There was evidence of barn owls roosting in the single storey barn and mitigation has been included in section 5.9.

REFERENCES

Bat Conservation Trust. 'Bats in Churches' leaflet.

Mitchell-Jones A.J. (2004). 'Bat Mitigation Guidelines'. English Nature, Peterborough.

English Nature (2003). 'Focus on Bats'.

English Nature (1993) 'Bats in Roofs; A Guide for Surveyors'.

English Nature Northumbria Team (2004) 'Bat surveys for development proposals in North-East England'. English Nature.

Mitchell-Jones, A.J. & McLeish, A.P. (1999) 'The bat workers' manual' 2nd edition. Joint Nature Conservation Committee.

Mitchell-Jones, A.J. (2004) 'Bat mitigation guidelines'. English Nature, Peterborough.

The Bat Conservation Trust (electronic 2002) www.bats.org.uk Much additional information is available on bats at this website.

Habitat Management for Bats. (2001). A guide for land managers, land owners and their advisors. JNCC.

8.0 APPENDICES

8.1 Background to Bats - Bat Biology.

8.1.1 There are currently 17 species of bat native to the United Kingdom. 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).

8.1.2 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.

8.1.3 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.

8.1.4 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.

8.1.5 The conditions needed by bats for hibernation require the maintenance of a relatively stable low temperature (2 – 6^o). Suitable sites include; old trees, caves, cellars, tunnels, and icehouses.

8.1.6 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.

8.1.7 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:

Daytime summer roosts are usually cool and secluded and are where bats wait for their next feeding opportunity.

Nursery/maternity roosts where young are born and are usually quite warm. Young spend their first few weeks here before they become independent.

Temporary night roosts are used for shelter nearer to feeding areas if the weather is bad. They are also used for short periods between dusk and dawn to save returning to the main roost.

Mating roosts are set up by the males, where they attempt to attract females for mating.

Hibernacula are those roosts in which bats hibernate over winter. These have to be cold and free from any temperature fluctuation. 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.

8.1.8 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.

8.1.9 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.

8.1.10 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.

8.1.11 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 Statutory Instrument No. 2716 Conservation (Natural Habitats & c.) Regulations 1994. 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.

8.1.12 Under Section 9 of the Wildlife and Countryside Act (1981) 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 intentionally to damage or obstruct access to any place that a bat uses for shelter or protection

(i.e. a roost). This holds true even for sites that are not currently occupied, as bats can return to roosts year after year. The Bat Conservation Trust recognises bat roosts for up to 5 years after being vacant (Anon 2004).

8.1.13 Under the Regulations it is an offence to:

- Deliberately capture or kill any wild animal of a European Protected species.
- Deliberately disturb any such animal.
- Damage or destroy a breeding site or resting place of such a wild animal.
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal (or plant) of a European protected species, or any part of, or anything derived from such a wild animal.

8.1.14 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.

8.1.15 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.

8.1.16 “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 (Natural Habitats, &c.) Regulations 1994. This includes all developments and engineering schemes, regardless of whether or not they require planning permission.

8.1.17 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.

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

- 8.2.1 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.

Table 8.2.1 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.

8.2.2 Site Selection Guidelines for Biological SSSIs

- 8.2.2.1 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.”

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.”

8.2.3 Current status of bats in the UK.

8.2.3.1 The current known status of bats as given by the Bat Conservation Trust is shown in Table 6.

Table 8.2.3 Status of bats.

Species	Status of Population Nationally
Whiskered/Brandt’s	Endangered
Natterer’s	Not Threatened
Daubenton’s	Not Threatened
Noctule	Not Threatened
Serotine	Vulnerable
Pipistrelle 45	Not Threatened
Pipistrelle 55	Not Threatened

8.2.4 Definitions of potential to support bats.

8.2.4.1 Low Potential.

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 to support bats**.

8.2.4.2 Medium Potential

- 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 probability 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 to support bats**, it is often best practice to conduct sensitive roof stripping or architectural salvaging to minimise any possible disturbance and to employ mitigation techniques.

8.2.4.3 High Potential

- 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 probability 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 probability 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.

8.2.5 Further information on Bats

8.2.5.1 Review of Bat Legislation

Bats are fully protected under the Wildlife and Countryside Act 1981 and the Conservation (Natural Habitats &c) Regulations 1994. The Act and Regulations include provisions making it illegal to intentionally or deliberately kill, injure or capture (take) bats or deliberately or recklessly disturb bats (whether in a roost or not) or damage, destroy or obstruct access to bat roosts.

8.2.5.2 Review of Bat Ecology

All British bats have two main types of roost (a) A summer or nursery roost and (b) A winter or hibernation roost.

a. Summer Nursery or Breeding Roost.

During late April/May the bats leave their winter roosts and the females come together to form 'nursery roosts', these usually consists 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.

Typical roost site 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.

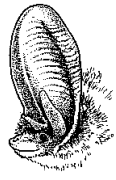
b. Winter or Hibernation Roost



The conditions required by bats for hibernation are the opposite of the warm dry summer roost, often being cold and wet, and where a relatively stable low temperature (2 – 6^o) can be maintained. Suitable sites include; old trees, caves, cellars, tunnels, and ice houses.


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 again there is often niche separation.

c. Bats have a complex social structure based on 'meta populations' and also utilise other transitional or intermediate roost sites.

2.5.3 Species accounts.

Species	Picture	Description
The Brown Long-eared Bat		<p>A medium sized bat (weighing about the same as a 2 pence piece) with strikingly long ears. A relatively common species, which is found in a number of habitats ranging from woodland, parkland and human habitation, where it is usually found in large clean attic spaces and holes in trees.</p> <p>The nursery roosts in buildings are usually located along the main ridge beam within a darkened attic, with the bats exiting from under ridge tiles, often some distance from the roost site.</p> <p>They fly at about an hour after dark and feed by hovering around the foliage of trees, gleaning insects such as moths. The remains of their food (moth wings) can be found either in the roost or in a sheltered place nearby.</p> <p>In the winter the Long-eared bat utilises trees, cellars, tunnels and caves in which to hibernate as the winter progresses they often awake and move to a more suitable</p>

		roost where a cold but stable temperature range (2-6 ^o) can be maintained.
The Pipistrelle Bat		<p>One of our smallest and commonest bat species, which has only recently been split into two separate species <i>Pipistrellus pipistrellus</i> and <i>P. pygmaeyus</i>, which have been found to have differing ecological niches.</p> <p>In summer, large nursery colonies are found in the cracks and crevices of modern houses where the single offspring is born during late June and early July.</p> <p>Typical roosts are under the soffit and bargeboards, cavity wall, under hanging tiles and under loose lead flashing but not normally within an attic space.</p> <p>The nursery roosts consists of mainly pregnant female bats and a few immature females and can number up to hundreds but 20-30 is a more normal figure. The male bats are often found either singly or in small numbers, more often away from the breeding roost.</p> <p>As with all bats their hibernation (winter) requirement is the opposite from the summer. In the summer their roosts are warm and dry in the winter they are cold and damp.</p> <p>In hibernation Pipistrelle bats are often found roost singly or in small numbers, although occasionally fairly large numbers have been found, where they are associated with a variety of habitats within buildings</p> <p>As their winter roosts are located deep within cavity walls, between tiles and felt or behind loose plaster or skirting board or panelling, they are difficult to locate.</p> <p>Whilst in such locations their presence is only discovered by building workers during demolition and refurbishment.</p>
Natterer's Bat.		<p>A medium sized bat (weighing about 9g). A characteristic feature is a fringe of very stiff bristles along the trailing edge of its broad tail membrane. It has rather pinkish limbs which gives rise to its old name of 'red armed bat'.</p> <p>Few summer roosts are known but most are in old stone buildings with large wooden beams. Crevices in beams or gaps in beam joints are common roost sites. Winter roosts are often in any small cave like site or exposed rock crevices. They are usually solitary but small groups are not uncommon and may include other species. Individual Natterer's are occasionally found hibernating in churches, in crevices between beams.</p> <p>Their feeding habitat is open woodland, parkland, hedgerows and along waterside vegetation.</p>

<p>Noctule Bat.</p>		<p>The Noctule bat is one of the largest British species and is usually the first species to be observed emerging. Adults generally have short, sleek, golden, evenly coloured fur. Juveniles, newly moulted adults and some females are a dull chocolate brown colour.</p> <p>Noctule's have broad brown ears and a distinctive mushroom-shaped tragus.</p> <p>Noctule bats are found roosting mainly in trees, frequenting rot and woodpecker holes. They are rarely found roosting in buildings.</p> <p>Hibernation sites include tree holes, rock fissures but are often found in bat boxes, buildings and other man-made structures.</p> <p>Noctule's have a powerful, fast direct flight. They fly in the open well above the tree top level and chase insects with repeated deep dives.</p>
---------------------	---	--