John Drewett
Ecology

Bat Survey Report:

Mill Farm, Low Mill, Kirkbymoorside, York, YO62 7UY

Report prepared: 24 December 2020

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1 Executive summary

A bat survey of buildings at Mill Farm, Low Mill, Farndale was commissioned in 2020 in connection with a planning application (NYM/2020/0265/FL) for the restoration of the existing farmhouse and the conversion of two outbuildings to provide cottages for rental. The buildings had previously been surveyed for bats in 2012 and 2015 by John Drewett Ecology.

The 2020 survey comprised an examination of the buildings on site followed by a bat emergence survey on 9th June, a dawn survey on 15th June and an evening bat emergence survey of the outbuildings attached to south of the existing house on 19th June.

During the 2020 surveys small roosts of Natterer's bats and Brown Long-eared bats were located in the roof of the barn attached to the south side of the house. Other bats were recorded in flight and foraging over the site, but there was no evidence of roosting elsewhere on site.

The identified roost sites are both located in parts of the building forming one of the proposed holiday cottages. Although the bats are roosting between the roof tiles and underfelt these species access their roosts and socialise inside what will be the living space of the converted barn.

Mitigation will be provided by creating a bat loft within the 'Butcher's Shop' part of the barn immediately to the east, which is not being developed. This area will be enhanced internally to include additional roosting potential and access will be provided by bat roof tiles and small, unobtrusive access points. The bat loft will be created prior to the work to the rest of the building, to ensure that bat roosting options are available both during and after the works. The existing breathable membrane within the bat loft area will be replaced by a bitumen-based underfelt as breathable membranes are harmful to bats.

The works will have the advantage that bats will no longer be able to access currently used roost sites where they are at risk of entanglement in breathable roofing membrane.

The works to the bat roost areas will be carried out under licence from Natural England.

2 The survey site

2.1 Location

Figure 1: Location of Mill Farm, Low Mill, SE672952

2.2 Site layout

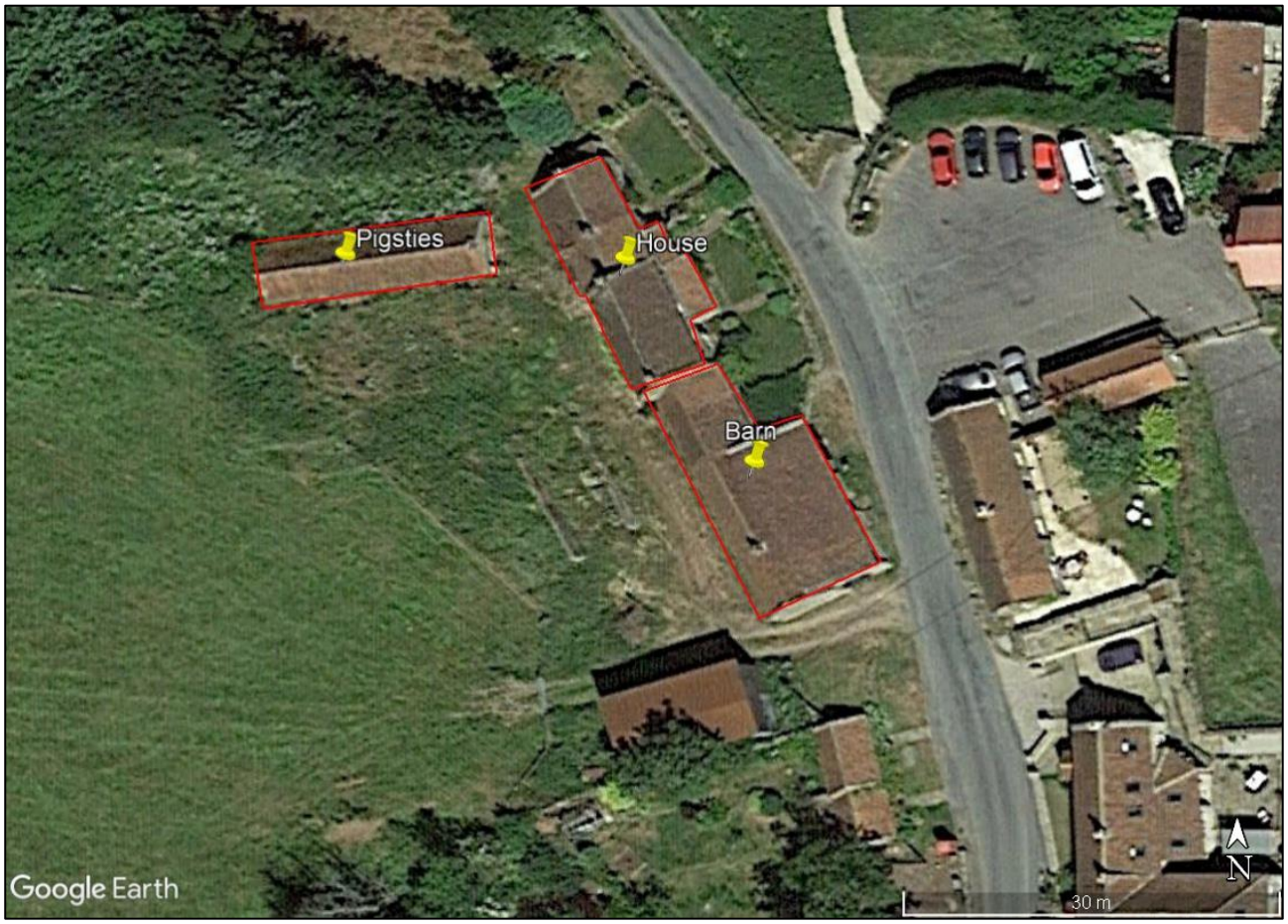

Figure 2: Aerial photograph of survey site with the locations of surveyed buildings indicated

2.3 Site description

The survey site comprises a range of buildings as illustrated in Fig. 2. In addition, the site includes gardens to the east side of the house and the former farmyard to the west. The farmyard comprises the bases of long demolished buildings and areas of grass. The land to the north of the Pigsties is largely occupied by Hogweed *Heracleum sphondylium*.

2.4 Surroundings

The surveyed property is located in a small hamlet in Farndale in the North York Moors National Park. There are domestic dwellings to the south and east, but otherwise the site is bordered by countryside.

Much of the countryside in this area is used as grazing land, but there are belts of woodland stretching out to the west and north from the surveyed property. These link with other woodlands in the local area including trees alongside the West Gill Beck.

The West Gill Beck flows from the hills to the west, past the south side of the property and joins the River Dove 200m to the east of Low Mill.

Figure 3: Aerial view of the setting of the survey site

3 Proposed works

The proposal is for alterations to the existing farmhouse, the conversion of the outbuildings to form two further cottages, the construction of a lean-to log store, creation of a parking area and associated landscaping.

4 Survey methods

4.1 Desk study

- Consulted the Multi-Agency Geographic Information for the Countryside (MAGIC) website at http://magic.defra.gov.uk to check if there are any statutory nature conservation designations relating to the site or nearby.
- Asked North Yorkshire Bat Group for records of bats previously recorded within 2km of the survey site to gather any previous information about bats at the site and to put our findings in the context of existing information.
- Reviewed the reports of previous bat surveys carried out in 2012 and 2015.
- Researched the features and habitats of the area through the use of maps and aerial photographs.

4.2 Field work

- Undertook a survey of habitats and landscape features on the site and within 300m
- Examined each building to record its main features especially those that may be suitable for roosting bats or other protected species.
- Carried out a detailed check of the interior and exterior of buildings to look for bat droppings; feeding remains such as moth & butterfly wings; live bats; dead bats; stains and marks on surfaces indicating regular use by bats; urine marks; and areas devoid of cobwebs
- Took photographs of the site, its features and any evidence of bats to illustrate the findings in this report.
- Carried out two evening bat activity surveys and a dawn re-entry survey to record bats flying over or past the site, feeding at the site and leaving or entering buildings.
- Recorded weather conditions.

4.3 Surveyors working on the project

Name	Natural England licences held	Survey dates
John Drewett BSc (Hons), MCIEEM	WML-CL20 (Bats); WML-CL21 (Bat Mitigation Class Licence); WML-CL08 (Great Crested Newts)	9th, 15th & 19th June 2020
Emma Herod	WML-CL18 (Bats)	9th & 19th June 2020
Val Kirk	WML-CL18 (Bats)	9th & 19th June 2020

4.4 Equipment used

Clulite 500,000 candlepower torch
LED Lenser torch
3.5m extending ladders
Heterodyne bat detectors (x3)
Anabat Express recording bat detectors (x3)
Nikon Coolpix L30 digital camera
Infra-red night vision scope
Long-handled hand net

5 Existing information

5.1 Designated statutory sites

The surveyed property is located within the North York Moors National Park.

There are no statutory sites designated for nature conservation at or within the immediate vicinity of the survey site.

5.2 Existing records of protected species

The following records of bats previously recorded within 2km of the site were supplied by North Yorkshire Bat Group. This information has largely been assembled as a result of responding to enquiries from the public about bats. Some recent records have also been supplied by consultants carrying out survey work in connection with proposed developments. It does not, therefore, represent a comprehensive assessment of the local bat fauna.

Species	Site	Grid ref.	No.	Date	Comment
Natterer's Bat	Mill Farm, Low Mill	SE672952		13 Jun 2012	One flying briefly in barn
Noctule Bat	Mill Farm, Low Mill	SE672952	1	30 May 2015	In flight
Common Pipistrelle	Mill Farm, Low Mill	SE672952		13 Jun 2012	In flight
Common Pipistrelle	Mill Farm, Low Mill	SE672952		30 May 2015	Commuting south to north
Soprano Pipistrelle	Mill Farm, Low Mill	SE672952		30 May 2015	In flight
Myotis bat sp.	Mill Farm, Low Mill	SE672952		30 May 2015	In flight

5.3 Review of previous surveys

John Drewett Ecology has previously surveyed the buildings at Mill Farm in 2012 and 2015.

5.3.1 2012 survey

The 2012 survey was carried out on 13th June & 3rd July. Common Pipistrelle and *Myotis* sp. bats were recorded in flight during the survey. Although the buildings were considered to have some bat roost potential no bats were seen to emerge from any buildings though a *Myotis* sp. bat was recorded briefly inside the Pigsties. The Common Pipistrelle bats passing over the site were clearly commuting from south to north, indicating the presence of a roost somewhere beyond the site to the south. There was some evidence of occasional use of the buildings by individual male bats. Swallows were found nesting in the outbuildings and Swifts were nesting under the east eaves of the house.

General mitigation measures were proposed to minimize risks to any bats that may have been using the buildings when work was carried out. To maintain and enhance biodiversity at the site the Method Statement stated that two bat access slates should be fitted to the roofs of each of the three buildings. Measures to provide nesting sites for Swallows in outbuildings were described as were measures necessary to maintain access for Swifts during the re-roofing of the house.

Subsequent to the survey the house and barn were re-roofed. No bat access slates appear to have been included during these works. At the time that the recommendation was made it was not known that breathable membranes in roofs used by bats were harmful to bats, so the absence of this mitigation provision in this instance has not been detrimental to bat conservation. No particular measures were taken to provide nesting sites for Swallows, but as both the barn and pigsties remain fully accessible to these birds this is, so far, not an issue. Although Swifts were not recorded during the 2020 survey access is presumably still available as they were present in 2015 after roofing works had been carried out.

5.3.2 2015 survey

The 2015 survey was an update to the previous survey and was carried out on 30th May. Common Pipistrelle, Soprano Pipistrelle, Noctule and *Myotis* bat sp. were recorded in flight. No bats were recorded using the interiors of any of the buildings. Nesting Swallows, Swifts, House Martin and Blue Tit were also recorded during the survey. At the time of survey the house and barn had already been re-roofed. General mitigation measures were proposed, especially regarding nesting birds.

6 Buildings

6.1 House

6.1.1 Description

This building is a two-storey stone house with a pantile roof. The building appears to have been extended on several occasions with single storey sections added to the front (east side) and north end. Much of the interior ceiling is boarded and roughly follows the profile of the roof, though there are two loft access points, neither fitted with a hatch at the time of survey. There are some gaps in the external pointing. This building is aligned roughly north to south. Since the first survey in 2012 this building has been re-roofed and the roof lined with a breathable membrane. Since the 2015 survey new windows have been fitted to the building.

Figure 4: West side of the house

Figure 5: East side of the house

Figure 6: Underside of roof

6.1.2 Evidence of bats

No bats, bat droppings, feeding remains or other evidence of bats was found in or around this building.

6.1.3 Bat roost potential

The building still includes a range of exterior crevices in walls that could be suitable for bats and nesting birds.

6.1.4 Other protected species

None observed.

6.2 Barn

6.2.1 Description

This is a large range of single storey barns attached to the southern end of the house. The range is of stone construction. The pantile roof has been replaced since the 2012 survey and is lined with breathable membrane. At the east side the roof forms a long 'cat-slide'. There is missing pointing in many parts of the walls and above lintels. There are some missing windows and doors which would allow ready access to the interior for bats and birds.

Figure 7:Northern end of barn, west side

Figure 8: Southern end of barn, west side

Figure 9: South end of barn

Figure 10: Southern end, east side showing cat-slide roof

Figure 11: Interior of western side of barn

Figure 12: Underside of roof, south end of building

13: Interior of part of eastern single storey section beneath catslide roof

6.2.2 Evidence of bats

A small number of Brown Long-eared bat droppings were found inside the barn fitted with animal stalls along the base of its southern wall.

6.2.3 Bat roost potential

The interior of the barn is easily accessible due to missing and/or open doorways. Although the building has been re-roofed since the earlier surveys in 2012 & 2015, it is still possible for bats to roost among roof timbers and/or in wall crevices, both internal and external. The building supports two small bat roosts.

6.2.4 Other protected species

Swallows use this building for nesting.

6.3 Pigsties

6.3.1 Description

This is a single storey stone building with a pantile roof. The roof is supported on fairly small timbers and is lined with wooden laths. The building is aligned roughly east to west. Some parts of the building do not have a separate roof void, but the east end does have a substantial void which is accessed via a door opening in the upper wall of the most easterly unit. There are open doorways to most parts of the building, gaps in the pointing and between roof tiles. The north side of the building is partly set into the slope of the ground and is rather overgrown.

Figure 14: North side of building

Figure 15: South side of building

Figure 16: Underside of roof

Figure 17: View westwards through roof void

6.3.2 Evidence of bats

No evidence of use by bats was found in or around this building.

6.3.3 Bat roost potential

This is a building with numerous potential access points that would allow bats to access the roof void, gaps within the stone walls and gaps between roof tiles and wooden laths. It is considered to have moderate to high bat roost potential, although surveys have repeatedly found no evidence of bats using the building.

6.3.4 Other protected species

There are several pairs of nesting Swallows in the building.

7 Bat survey results

7.1 Introduction to bat activity surveys

These surveys record bats entering or emerging from buildings, trees or other structures, flying inside and outside of buildings and flying over the site. This supplements the data in the previous chapters that rely on existing records, finding signs of bats and assessments of roost potential based on characteristics of the buildings.

7.2 Weather and timing of activity surveys

Weather can have significant impacts on patterns of bat activity. Whenever possible, surveys are carried out during calm, mild and dry weather as these conditions are most conducive to bats.

Date	Time		Temp °C		Wind force		Cloud cover %		Rain		Sunset/
	Start	End	Start	End	Start	End	Start	End	Start	End	Sunrise
9/6/20	20:45	22:40	15.50	11.75	1	1	100	100	None	Drizzle	21:35
15/6/20	02:45	05:00	19.00	n/r	0	0	100	100	None	None	04:28
19/6/20	21:15	23:00	18.50	16.25	0	0	<10	<10	None	None	21:41

7.3 Bat activity survey results

7.3.1 9th June 2020

The bat emergence survey was preceded by a search of the buildings for any evidence of bats. A small number of Brown Long-eared droppings were found in the attached building to the south of the existing cottage.

Three observers took part in the survey, one either side of the barns and house and the other observing the Pigsties. Each observer used a handheld heterodyne bat detector. Static Anabat Express bat detectors were also used to record bats inside the barn and in the vicinity of the Pigsties.

During the course of the survey Soprano Pipistrelle, Common Pipistrelle, Noctule and *Myotis* sp. bats[1] were recorded by the observers.

The first bat recorded was a Soprano Pipistrelle that flew to the west of the house and barn at 21:13. No other Soprano Pipistrelles were recorded except for one heard very briefly at 21:27 at the north end of the site.

From 21:16 Common Pipistrelles were recorded in flight from time to time. All of the early Common Pipistrelles were flying south to north over the site indicating that there is a roost of this species somewhere to the south of the site and these bats were commuting to their feeding area. Towards the end of the survey

[1] *Myotis* bat sp. Indicates that bats of the genus *Myotis* were recorded during the survey. In Yorkshire, members of this genus are Whiskered, Brandt's, Alcathoe, Daubenton's and Natterer's bats. These species can be difficult to separate based on the characteristics of their echolocation calls alone. Where this is the case and bats have not been caught for identification purposes it is not possible to be more precise.

Common Pipistrelles were recorded foraging over the Pigsties. No bats were recorded inside the Pigsty building.

Myotis species bats were first recorded in the barn at 21:28 and outside at 21:33. Bats were seen to emerge from a barn door roughly halfway down the range attached to the south of the farmhouse at 21:45 & 21:47; three emerged at 21:52. These bats were recorded inside the barn on four separate occasions after the last was seen to emerge. Altogether, this suggests that up to 11 bats were present.

Noctule bats were recorded flying over the site, heading south, at 21:39 (two bats), 21:40 & 21:41. This species usually roosts in old trees and the bats were flying high, so it is considered that these bats were not using the building.

7.3.2 15th June 2020

This survey was conducted by a single observer. This was a dawn survey to watch for bats returning to their roosts at dawn in order to attempt to locate roosts. This survey focused on the barn attached to the house.

The first bats recorded within the building were just before 04:00 when bats could be heard scrabbling between the underfelt and tiles at the northern end of the building. The entry point of these bats was not identified, but based on the periods of activity both inside and outside the barn these bats were considered to be *Myotis* sp. bats. Approximately five bats were thought to be present.

After the *Myotis* sp. bats had returned, Brown Long-eared bats began to return to the south end of the main room. Some of these bats were using the gap between the end wall and the final roof timber. At least one bat entered the roof at the south end of the room via a gap beneath the pantiles above the door at that end of the building. Once bats had entered the roost area they could be heard moving down the west slope of the roof to somewhere near the eaves. There was a small number of Brown Long-eared bat droppings and some moth wings on the floor at the base of the wall at the south end of the building. Approximately six Brown Long-eared bats were thought to be present.

After bats had finished returning to the interior of the building, around ten Soprano Pipistrelle bats were observed swarming at the extreme south end of the building. After a few minutes these bats mostly flew off to the south-west, but one entered the arrow slit in the gable end.

Checking during the survey period found no evidence of bats using the Butcher's shop area on the east side of the barn with the cat-slide roof.

7.3.3 19th June 2020

This survey was focused on confirming the presence of bats using the previously identified roost sites and attempting to count numbers of bats and identify roost access points.

At the north end of the attached barn six Natterer's bats were confirmed to be roosting between the pantiles and underfelt. Judging by the sound of bats moving over the underfelt the bats are roosting towards the north-eastern corner of the building, but are emerging into the inside of the building from behind the last timbers against the north end wall at the north-west corner.

At the south end of the barn five Brown Long-eared bats are roosting between the pantiles and underfelt at the extreme south-west corner. These bats enter and emerge from their roost at the internal gable apex of the building, reaching their roosting site by scrambling between the pantiles and underfelt.

No bats emerged from the south gable end of the milking parlour.

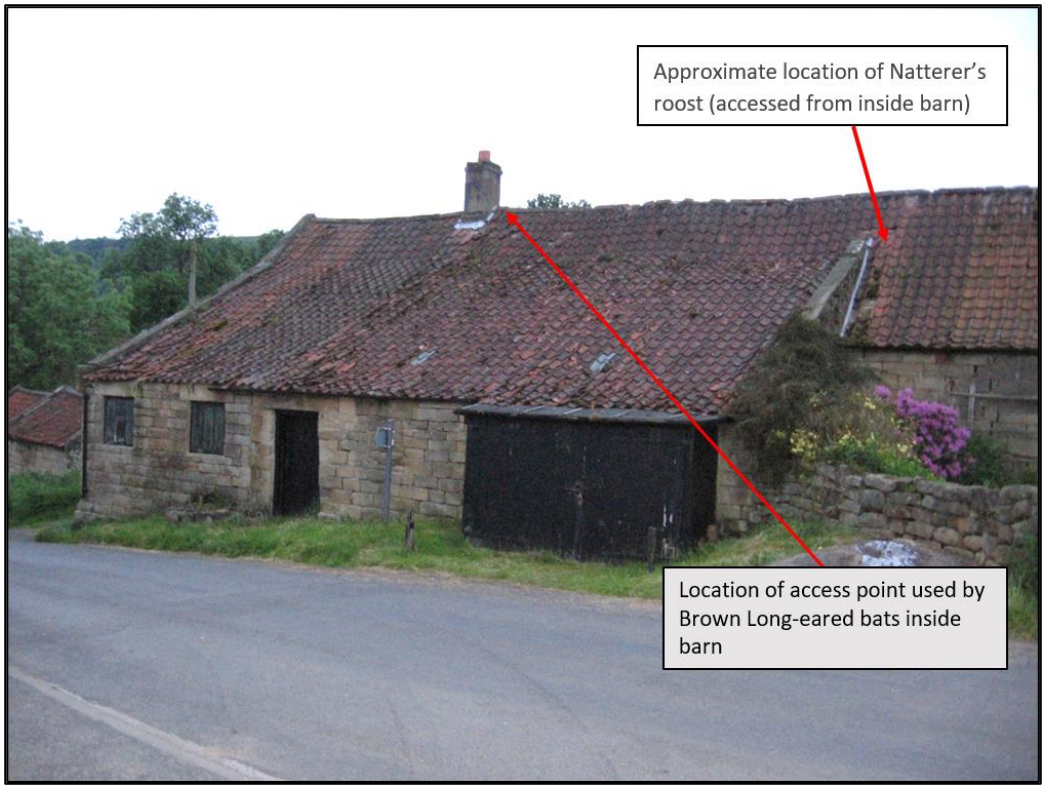

Figure 18: Indicative locations of access points and roosts from east side

Figure 19: Emergence / access point of Natterer's bats from building

Figure 20: Approximate location of Brown Long-eared roost

8 Assessment

8.1 Evaluation of survey findings

The buildings covered by this survey were previously surveyed in 2012 and 2015. At the time of those surveys there was no evidence of established roosts in any of the buildings. Since those surveys, some work has been carried out to the existing house and attached barns to the south; this includes roofing works and the introduction of a breathable roofing membrane. No work has been carried out to the Piggeries. Several species of bat have previously been recorded foraging or flying over the site.

A survey was planned in 2020 to confirm that there had been no changes to the status of bats at the site since the previous surveys. This survey comprised an internal examination of all of the buildings, followed by a bat emergence survey. As previously, this identified a number of bats in flight at Mill Farm. Towards the end of the survey some bat activity was recorded in the barns attached to the south side of the house which suggested that a bat roost or roosts were present. A dawn survey was arranged a few days later which confirmed that bats were returning to roosts at two locations in the barn. A further emergence survey confirmed the presence of six Natterer's bats between the pantiles and underfelt at the northern end of the barn and five Brown Long-eared bats in a similar location against the southern wall of the stalls area, adjoining the milking parlour. The breeding status of the roosts was not determined as the bats emerged from varied and unpredictable exit points so could not be caught. Consequently, a worse-case scenario has been adopted with the roosts being assumed to be maternity roosts.

8.2 Potential impacts in the absence of mitigation

The proposed works are likely to result in the destruction and obstruction of roosts of Natterer's bats and Brown Long-eared bats established in the barn adjoining the south end of the existing house at Mill Farm. They will also make the barn unsuitable for bats following conversion.

There is a slight risk that individual bats of other species may use any of the buildings on the site for roosting on a casual basis and so may be present at the time of works.

Any bats present at the time works take place would be at risk of death or injury if appropriate precautions were not taken. It is also possible that any bats concealed or roosting in crevices could be entombed by pointing works.

9 Mitigation and Compensation Method Statement

9.1 Introduction

Where bats or their roosts are determined likely to be affected by the proposed works it is necessary to carry out mitigation and/or compensation in accordance with this Method Statement. Where mitigation is judged, on its own, to be unlikely to avoid some adverse impact on bats the works will need to be carried out under some form of licence from Natural England. The need for a licence, mitigation methods and compensation measures are detailed below and must be strictly adhered to**. If licensing is stated to be necessary then the licence must be in force before licensable activities begin**. To ensure that, as far as possible, the mitigation and compensation measures taken are effective in conserving bat populations the impact on bats must be monitored; such monitoring may need to take place sometime after completion of the project in accordance with the schedule below. Issues raised by the monitoring may require some changes to implemented mitigation or compensation measures.

9.2 Is a Licence required?

The proposed works will have a significant adverse impact on bats or their roosts at this site. Even where mitigation and compensation is being provided a development licence from Natural England must be applied for and have been granted before work commences. The application needs to be drawn up by a suitably qualified ecologist.

9.3 Mitigation Method Statement

9.3.1 Creation of a bat loft

A bat loft will be created above the Butcher's Shop area on the east side of the attached barn. This will have a maximum height from floor to ridge of 1507mm along its west wall and will cover an area of approximately 33.5m^2. This area will be separated from the unconverted part of the building below by a floor of tongue & grooved loft boards. The roof of this area will be lined with Type 1F bitumen based underfelt. The existing breathable membrane within this area will be removed. A small loft hatch will be fitted to give human access to the loft for maintenance and bat monitoring only. A notice will be fitted inside the loft reaffirming the need for consent before entering.

Bat access to the loft area will be provided by means of three Morris bat slates between roof slates towards the highest part of the loft. These will be positioned and fitted in accordance with the separate document provided. The slates need to be adjacent to a roof timber to assist bats crawling in and out of the loft and small holes will need to be cut into the felt beneath the Morris bat slates to enable bats to access the interior of the loft. Additionally, a small hole approximately 20mm across will be provided in the north and south walls of the loft to provide crawl holes for bats to access the interior.

To enhance the interior of the bat loft two boards of untreated, unplaned timber will be attached to the west wall inside the bat loft using 25mm battens at each end, to create gaps approximately 25mm deep between the boards and the wall in which bats could roost. Each board should be at least 750 x 750mm in area.

The new bat loft will be constructed prior to any other works on site so that it is available for bats returning to the site in the Spring. As there are currently no bats using this location on the site, the construction of the bat loft does NOT require a licence to be in place first. The bat loft must be complete prior to the start of any other works to the barns attached to the south side of the house.

9.3.2 Toolbox talk

The ecologist must give a toolbox talk to contractors prior to the start of ANY works on site. This will cover the locations known to be used by bats on site, the protection afforded them, the procedures and materials to be used in carrying out works and when ecological supervision is necessary. The talk will play a key role in ensuring that works to create the bat loft are carried out in an appropriate manner.

9.3.3 Exclusion of bats from existing roosts

Provided that a licence has been granted, bats will be excluded from their existing roosts prior to the 15 April 2021. The exclusion will be carried out by fitting one way valves to existing roost entrances that will allow bats to leave the roosts, but not return. Monitoring of the exclusion will be by observation and/or automatic cameras. Roost entrances will only be finally blocked after no bats have been recorded emerging over three continuous nights.

Given the nature of the barn supporting bats it is possible that excluded bats may find alternative entry points nearby. Therefore, any works to the roof of the buildings south of the house must be fully discussed first with the ecologist. If potentially disturbing works such as re-roofing, roof repairs or alterations to the roof are to be carried out, it may be necessary for the ecologist to be on-site and to carry out a watching brief. If any bats are found during this operation they will be rescued by the ecologist and transferred to the bat loft.

9.3.4 Bats discovered when the ecologist is not present

If bats are discovered during works to ANY of the buildings on site when the ecologist is not present, works in the immediate area MUST STOP. The ecologist must be contacted and asked to visit the site to assess the situation. Where appropriate the ecologist will relocate bats found to the bat loft. Contractors must not handle bats.

9.4 Monitoring Schedule

Where bat roosts are disturbed or destroyed under licence post-works monitoring must be carried out to assess the impact on bats. In this case monitoring will be carried out in the summer following completion of works (2022) and two years later (2024). This will take the form of a bat emergence survey in June or July of those years, plus an examination of the bat loft for evidence of use. A recording bat detector may also be left inside the bat roost for a week around the time of these surveys to record any bat activity.

10 Background information and references

10.1 Bats: legislation and policy guidance

The following is a summary and brief interpretation of the legislation relating to bats. You are advised to consult the original legislation and/or a legal professional if you have particular concerns about the legality of a planned operation.

Bats and their roost sites are protected by the Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act, 1981 (as amended). This protection applies at all times, even if the bats are absent at the time that an activity is carried out.

Although many surveys are undertaken because Local Planning Authorities must consider the impact of a development on protected species during their decision making, it should be noted that bats and their roosts are protected, whether or not a survey has been requested, and that ignorance of the presence of bats is no defence against prosecution. Fines of up to £5000 and a six month prison sentence can be imposed for each offence.

Among other things it is an offence to:-

- Deliberately capture (or take), injure or kill a bat
- Deliberately disturb bats where the disturbance is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young or
- Deliberately disturb bats which is likely to impair their ability in the case of hibernating or migratory species, to hibernate or migrate
- Deliberately disturb bats, in particular any disturbance which is likely to affect significantly the local distribution or abundance of the species to which they belong
- Intentionally or recklessly disturb any bat while it is occupying a structure or place which it uses for shelter or protection
- Intentionally or recklessly obstruct access to any structure or place which any bat uses for shelter or protection
- Damage or destroy a breeding site or resting place of any bat

The National Planning Policy Framework 2012 recognises that the planning system should perform an environmental role – contributing to protecting and enhancing our natural, built and historic environment. This should include “moving from a net loss of bio-diversity to achieving net gains for nature”. Planning should “promote…recovery of priority species populations”. Paragraph 119 states that “if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused”. This section also states that “opportunities to incorporate biodiversity in or around developments should be encouraged”. Significantly, paragraph 119 states that “The presumption in favour of sustainable development does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined”.

Where it is proposed to carry out works which will have an adverse impact on bats or on a bat roost, a European Protected Species (EPS) licence must first be obtained from Natural England, even if no bats are expected to be present when the work is carried out. Granting of planning permission does not override this requirement.

Bat conservation is also part of the biodiversity action plan process. The Convention on Biological Diversity, signed in Rio de Janeiro in 1992, requires states to develop national strategies and to undertake actions aimed at maintaining or restoring a wide range of biodiversity.

In England & Wales, the Natural Environment and Rural Communities (NERC) Act, 2006 imposes a duty on all public bodies, including local authorities and statutory bodies, in exercising their functions, *"to have due regard, as far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity"*. It notes that *"conserving biodiversity includes restoring or enhancing a population or habitat"*. Local authorities frequently require protected species surveys to be submitted with planning applications so that they can fully take conservation into account in their decision making.

An EPS licence application requires details of the proposed works, the bats which may be affected and the mitigation proposed to maintain the favourable status of bats in the region. The application is usually drawn up on behalf of the client by a specialist ecological consultant. The consultant is required to check that work is proceeding in accordance with the method statement and to also carry out monitoring of the impact on bats for some time after completion of the works – the length of monitoring is dependent on the species, development and expected impact of the development on protected species. Natural England aims to make a decision on licence applications within 30 working days of receipt. There is no guarantee that a licence will be granted and there is no fast track process to obtaining one. Applications can only be made once planning permission has already been obtained (where appropriate).

EPS licences can only be issued if Natural England is satisfied that there is no satisfactory alternative to the development and that the action authorised will not be detrimental to the maintenance of the population of the species at a favourable conservation status in their natural range.

10.2 Brief summary of bat biology

Bats are the only mammals to have developed powered flight. They are the second largest group of mammals in the world, with almost 1000 different species. In Britain 17 species occur, with the range of species declining towards the north. All British bats feed solely on invertebrates.

British bats live in crevices in trees, caves, buildings, bridges, tunnels and other structures. They are long-lived animals which use roost sites to which they return year after year. In summer females are usually colonial, each species gathering together in warm maternity roosts to give birth to their single young. Males often spend the summer alone or in small groups. Several different roosts may be used over a year, the bats moving between these places depending on time of year, prevailing weather and other conditions.

In winter bats hibernate, a process of long periods of deep torpor punctuated by regular arousals. Their body temperature falls close to the ambient temperature of their chosen hibernaculum and their heart rate and metabolism drop dramatically. In this state they use little energy, allowing them to survive until spring on their fat reserves. They are very sensitive to temperature changes at this time. Changes may cause them to wake, a process which uses considerable energy reserves. Many species hibernate in cool, stable

underground sites such as caves and tunnels, although individual bats may be found in almost any small crevice. Summer roosts and hibernation sites for the same bats are normally located in different places.

For more than 50 years bats suffered a major decline. The reasons are many and varied, but include destruction of roost sites, a reduction in insect prey and direct and indirect poisoning from toxic chemicals. As a result of greater protection, some are now doing better, but they are still vulnerable and threatened.

The survival of a colony of bats depends on there being a range of suitable summer roost sites, hibernation sites and feeding areas within a reasonable distance. Deep crevices in which they can roost, woodland, hedgerows and freshwater nearby all help to provide the conditions and food they need. A continuous linked network of good habitat provides ideal conditions. Some species will follow hedgerows and woodland edges and rivers where their food is concentrated whilst others fly higher and largely ignore features on the ground. Almost anywhere, even city centres, will be visited by bats at some time.

Each species of bat is different in the places it roosts, the food it eats, how it hunts and what it requires. That is just one reason why a bat survey must identify the species and numbers of bats present on a site, their roost locations, access points, feeding areas, etc., before determining any mitigation necessary.

10.3 References

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