

# PRELIMINARY ECOLOGICAL APPRAISAL AND PRELIMINARY BAT ROOST ASSESSMENT OF:

---

GREEN FARM COTTAGE  
GREEN LANE  
PELISTRY  
ST MARY'S  
ISLES OF SCILLY  
TR21 0NX

---

*Client: Duchy of Cornwall*

*Our reference: BS28-2020*

*Report date: 21-4-20*

*Author: Darren Mason BSc (Hons)*

*Report peer reviewed: Sarah Mason*

*Report signed off: Sarah Mason*

***REPORT ISSUED IN ELECTRONIC FORMAT ONLY***

**This page is intentionally blank**

## Contents

<b>Non-Technical Summary</b> .....	4
<b>1.0 Introduction</b> .....	5
1.1 Survey and reporting.....	5
1.2 The application site.....	5
1.3 Details of proposed works.....	5
<b>2.0 Methodology</b> .....	6
2.1 Preliminary Ecological Appraisal - Desk Study.....	6
2.2 Preliminary Bat Roost Assessment.....	6
2.3 Classification of building.....	7
2.4 Surveyor details.....	7
<b>3. Results</b> .....	10
Preliminary Ecological Appraisal - Bats.....	10
3.1 Pre-existing information on bat species.....	10
3.2 Statutory and non-statutory sites.....	10
3.3 Habitats surrounding the application site.....	11
3.4 Habitats within the application site.....	13
Preliminary Roost Assessment.....	14
3.5 External.....	14
3.6 Outbuildings.....	17
3.7 Internal.....	20
<b>Assessment and recommendations (excluding bats)</b> .....	21
4.1 Protected sites.....	21
4.2 Nesting birds.....	21
<b>5. Assessment and recommendations (bats)</b> .....	22
5.1 Survey constraints.....	22
5.2 Further survey requirements.....	22
5.3 Presence or absence surveys.....	23
5.4 Mitigation.....	24
<b>6. Summary</b> .....	24
<b>7. Bibliography</b> .....	26

## Non-Technical Summary

- On 21<sup>st</sup> April 2020, the Isles of Scilly Wildlife Trust (IoSWT) conducted a Preliminary Ecological Appraisal (PEA) and a Preliminary Roost Assessment (PRA) of Green Farm Cottage, Green Lane, Pelistry, St Mary's, Isles of Scilly, TR21 0NX, for which there is a proposal to
- This report outlines the findings of the PRA and provides advice based on the surveys' conclusions.
- During the PRA, an external/internal inspection of the building was undertaken (where accessible).
- Not all areas could be accessed and evaluated for roost potential and for evidence of bats.
- Evidence of nesting birds was found.
- Small mammal droppings were found during the inspection including Brown Rat and House Mouse.
- The immediate habitat surrounding the proposed development and its link to the wider countryside provides optimal foraging and commuting habitat for several species of bat. The location of Green Farm Cottage in relation to this varied habitat also falls within the typical core sustenance zone of all 5 species of bat recorded within the 2km zone of interest.
- The main building presented (both externally and internally) with several features which may be used by some of the species of bat recorded on St Mary's as either a maternity, transition or night roost.
- The outbuildings presented with limited features which may be used by some species of bat recorded from St Mary's, most likely as a night roost
- The characteristics of the building and the surrounding habitat suggest a high roost potential for bats. The recommendations of this PRA are to carry out three (3) presence and absence surveys consisting of at least one dusk and one dawn survey, with a third being either a dusk or dawn visit, carried between May and September, with at least two carried out between May and August
- Other than bats, if the recommendations given in this report are adhered to, there should be no further ecological constraints to the proposal.
- **It must be noted that this report alone is not enough to support a planning application.**

## 1.0 Introduction

### 1.1 Survey and reporting

This report details the results of a preliminary ecological appraisal (PEA) and a preliminary bat roost assessment (PRA) of Green Farm Cottage, Green Lane, Pelistry, St Mary's, Isles of Scilly TR21 0NX. The survey, carried out on 21<sup>st</sup> April 2020, was undertaken in order to ....

Commented [DM1]: Awaiting details from Nathan

### 1.2 The application site

The development is located at the northern end of Green Lane, Pelistry an area in the northern eastern part of the island of St Mary's (National Grid Reference SV9230611987). The application site is comprised of a detached .... (see photo 1), with two small outbuildings. The footprint of the building (including the outbuildings) is approximately 137m<sup>2</sup> and the total footprint of the site is approximately 846m<sup>2</sup> (red area, see Figure 1).

### 1.3 Details of proposed works

The proposal is to .....

Commented [DM2]: Awaiting details from Nathan



Figure 1. Location



Photo 1.

## 2.0 Methodology

### 2.1 Preliminary Ecological Appraisal - Desk Study

A desk study data search was undertaken. This involved carrying out a review of the Local Records Centres (LRC) available records for bat species and publicly available datasets and citations of statutory designated sites of importance for nature conservation for sites within the zone of influence (ZOI) of the survey area (considered to be a maximum of 2km in this case). The desk study was also undertaken to identify habitats and features that are likely to be important for bats and assess their connectivity through the use of aerial photographs.

### 2.2 Preliminary Bat Roost Assessment

The Preliminary Bat Roost Assessment comprised a survey of the building for bats, signs of bats and features potentially suitable for use by roosting bats, and an assessment of the surrounding habitat in terms of its suitability for commuting and foraging bats.

The survey consisted of a ground based inspection and a detailed search of the interior and exterior of the building (from ground level), looking for bats and/or evidence of bats including droppings (on walls and

windowsills and in roof and loft spaces), rub or scratch marks, staining at potential roosts and exit holes, live or dead bats and features, such as raised or missing tiles, potentially suitable for use by roosting bats. Binoculars, a ladder and a high-powered torch were used as required.

### 2.3 Classification of building

The building was classified according to its suitability for use by roosting bats. The classification was dependent on a number of factors including (but not limited to):

- Bats and/or signs of bats;
- External and internal features potentially suitable for use by roosting bats (e.g. raised or missing tiles, gaps behind fascia boards etc);
- Setting;
- Night time light levels;
- Disturbance levels;
- Proximity of suitable foraging habitat and commuting routes (e.g. ponds, streams, woodland, large gardens, hedgerows).

The categories used to classify buildings and the survey effort required to determine the presence or absence of bats (as per the Bat Conservation Trust's Bat Survey Guidelines<sup>1</sup>, referred to by Natural England in their standing advice to planning officers) are described in Table 1 (see below).

### 2.4 Surveyor details

The survey was undertaken by Darren Mason BSc (Hons) of the Isles of Scilly Wildlife Trust. Darren has undertaken professional Bat Licence Training and holds a Natural England WML-A34-Level 2 (Class 2 License); registration number: 2020-46277-CLS-CLS which permits him to survey bats using artificial light and endoscopes and capture bats using hand and hand-held static nets.

**Table 1 – Description of the categories used to classify a building’s bat roost potential and the survey effort required to determine the likely presence or absence of bats**

	Roost status	Description	Survey effort required to determine the likely presence or absence of bats
<b>Bat Roost Potential</b>	High	Numerous features potentially suitable for use by roosting bats, optimal or good quality bat foraging habitat nearby and good habitat connectivity. Alternatively, a building with fewer features potentially suitable for use by roosting bats and optimal foraging habitat nearby.	Three dusk emergence and/or pre-dawn re-entry surveys between May and September. Optimum period May – August. Two surveys should be undertaken during the optimal period and at least one survey should be a pre-dawn survey.
	Moderate	More than a few features potentially suitable for use by roosting bats, good foraging habitat nearby and limited habitat connectivity. Alternatively, a building with a few features potentially suitable for use by roosting bats but optimal foraging habitat nearby.	Two or three dusk emergence and/or pre-dawn re-entry surveys between May and September (but only if features will be affected by the proposals).
	Low	Only a few features potentially suitable for use by roosting bats but good bat foraging habitat nearby. Alternatively, a building with more than a few features potentially suitable for use by roosting bats but sub-optimal foraging habitat nearby and limited habitat connectivity.	One or two dusk emergence and/or pre-dawn re-entry surveys between May and September (but only if features will be affected by the proposals).
	Negligible	Very few features potentially suitable for use by roosting bats and / or in an area (such as a densely populated urban area) which has limited habitat connectivity and poor foraging habitat.	No further surveys required.

*Table 1. Categorising and classifying a building’s bat roost potential*

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



### 3. Results

#### Preliminary Ecological Appraisal - Bats

##### 3.1 Pre-existing information on bat species

The desk study showed that no species of bat had previously been recorded within the building. A data search of LRC records for bats revealed information on 5 species of bat recorded within the 2km ZOI of the site. The species conclusively identified were Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*) and Brown Long-eared Bat (*Plecotus auritus*) both UK Biodiversity Action Plan (BAP) priority species and the rare Leisler's Bat (*Nyctalus leisleri*) and Nathusius Pipistrelle (*Pipistrellus nathusii*). Nineteen bat roosts are known to exist within 2km of the proposed development, with 1 known roost within 500m of the property, this being located 46m due east of Green Farm Cottage.

##### 3.2 Statutory and non-statutory sites

In addition, the desk study revealed the presence of the following statutory designated sites within the 2Km ZOI of the site:

- i.) **Lower Moors SSSI** – Situated 1.5km due south-west of Green Farm Cottage lies Lower Moors SSSI. A topogenous mire that has a range of wetland habitats supporting a diverse range of wetland wildflower species, including the Nationally Scarce Tubular Water-dropwort (*Oenanthe fistulosa*). The site also holds locally important populations of Royal Fern (*Osmunda regalis*) and Southern Marsh Orchid (*Dactylorhiza praetermissa*) and is particularly important feeding for passage and wintering birds including Corncrake (*Crex crex*) and Spotted Crake (*Porzana porzana*).
- ii.) **Higher Moors & Porth Hellick Pool SSSI** – 900m south of the proposed development is Higher Moors SSSI. A topogenous mire designated for several rare and notable plant species) including; Bog pimpernel (*Anagallis tenella*), Star Sedge (*Carex echinata*) and Marsh St John's-wort (*Hypericum elodes*).
- iii.) **Porthloo SSSI** – Situated 1.6km west of the proposed development lies Porthloo SSSI designated for its geology, particularly for its Quaternary sediments in the cliffs that show changes in the climates and environments of the Quaternary period in Scilly.

iv.) **Watermill Cove SSSI** – Lying 250m north-east of Green Farm Cottage, Watermill Cove SSSI is designated for its cliff exposures of Quaternary sediments, that clearly show the sequence of changes in the climate and environment during the Quaternary period.

### 3.3 Habitats surrounding the application site

Green Farm Cottage is in the north-east region of the island of St Mary's, situated at the northern end of an area known as Pelistry. The area comprises of 8 detached or semi-detached dwellings (including Green Farm Cottage) and a large farm holding. Green Farm Cottage and four other buildings (two dwellings and two agricultural barns) is found 230m north of Pelistry at the end of a farm track.

This single farm-track is bounded on both sides by a mix of both native hedgerow comprising of Hawthorn (*Crataegus monogyna*), Dutch Elm (*Ulmus x hollandica*) and rare Sweet Chesnut (*Castanea sativa*) which primarily encloses improved cattle-pasture and non-native hedgerow dominated by Karo (*Pittosporum crassifolium*) which encloses small cultivated bulb fields or productive 'fallow' leys, particularly immediately to the west and south-east of the development. This patchwork of improved pasture and cultivated fields and their inter-linking hedgerows is dominant for at least 900m north and south, 1.5km west and 600m east of the proposed development.

This contiguous habitat links with the Elm tree-lined stream at Watermill and the large coniferous shelterbelt of Monterey and Lodgepole Pine (*Pinus radiata* and *Pinus contorta*) at Trenoweth 200m and 900m north respectively. Likewise, the inter-connected hedgerows continue southwards and south-westward reaching the wet woodland at Holy Vale (600m south-west), the large wet woodlands and reedbeds at both Lower (1.5km south-west) and Higher Moors SSSIs (900m due south).

Several large areas of open habitat are also linked by this contiguous hedge network including the coastal headlands consisting of their mosaic of maritime grassland, heathland and scrub which are grazed for conservation purposes (1.3km south-east), the local airport 1.4km south-west dominated by mown semi-natural grassland of varying height as well as the golf course with its very short mown grassland and heathland sward 1.5km west.

As the property is set within a very rural area street lighting is not present. The nearest lights can be found 780m south-east at the small conurbation at Normandy and 1km to the west at Telegraph Tower.

In summary, the habitats surrounding the proposed development and links to the wider countryside provide optimal foraging habitat for species in the *Pipistrellus* genus and Leisler's bat, particularly as it has been shown that these species require 'edge' habitat (such as hedgerows, tree-lined lanes or woodland edge) to both feed from and to use as commuting routes to other feeding areas<sup>2,3,4&5</sup>. This habitat is particularly contiguous for at least 1.5km west, south-west and south-east, providing access to a wide variety of habitats for which these species are known to take advantage<sup>6</sup>. This continuity of habitat is also important for both Soprano and Nathusius Pipistrelle as it provides feeding corridors to their preferred habitat of open water, watercourses<sup>2,3&4</sup>, which can be found at both Lower and Higher Moors SSSIs and other riparian habitats such as those found at Watermill and Holy Vale. As these habitats fall within the core sustenance zones of all 3 pipistrelle species (1.7km, 1.5km and 3km respectively<sup>7</sup>) the location of Green Farm Cottage makes it suitable as a potential roost site.

Brown Long-eared bat have been shown to prefer to feed in open canopy deciduous woodland typically located close to their roosts. Larger tracts of woodland should be available (no greater than .5km away<sup>8</sup>), making the shelterbelt and tree-lined stream at Watermill and its onward link to Trenoweth Shelterbelt potential feeding sites. Despite the distance the woodland at Holy Vale 600m to the south-west could be reached by utilising the small native shelterbelt due south of the cottage and the native hedges that link Holy Vale to the area surrounding the development. Although there is initially little woodland cover in this direction, Brown Long-eared bats are known to emerge from their roosts much later than other species of bat due to their method of feeding and the type of prey they take which reduces the need for cover and avoids the risk of predation<sup>9</sup>. All sites also fall within this species' core sustenance zone of 1.1km<sup>10</sup>.

Leisler's bat also take advantage of woodlands, particularly woodland edge<sup>11</sup>, making the woodland blocks at Trenoweth and Lower and Higher Moors suitable as feeding sites, as would the smaller woodland block at Holy Vale. As Leisler's bat has a large core sustenance zone of 4.2-7.4km<sup>5</sup>, the Garrison 3km to the south-west could also be used. Leisler's bats in England are also known to take advantage of open areas of pasture<sup>5</sup>, making the immediate area surrounding the property, the coastal headlands to the south-east, the golf course and the airport to the west and south respectively potential feeding areas. This contrasts

with most other species of bat which typically avoid this type of open habitat, particularly during peak times of prey abundance (dusk and dawn) to avoid predation<sup>12&13</sup>.

Street lighting has been shown to negatively impact upon a bats commuting and foraging routes<sup>14</sup>. As street lighting does not exist in the immediate area and movement to and from other potential feeding sites by bats can avoid the nearest street lights the impact upon bats for this proposal is negligible.

### 3.4 Habitats within the application site

Green Farm Cottage is bounded on three sides (north-west, south-west and north-east) by dry stone walls that are clad in a variety of climbers, shrub and plant including; Ivy (*Hedera helix*), Bramble (*rubus fruticosus*), Red Valerian (*Centranthus ruber*) and Tree House Leek (*Aeonium* sp.). To the south-east the boundary is relatively open comprising of the driveway which is lined (to the south east) with scattered Dutch Elm, Karo and Hawthorn (*Crataegus monogyna*) trees, before reaching an existing Dutch Elm hedge.

The garden can be divided into two distinct areas. To the south east is a small lawn comprising of wildflower species which include; White Clover (*Trifolium repens*), Common Cat's-ear (*Hypochaeris radicata*), Yarrow (*Achillea millfolium*), Spotted Medick (*Medicago arabica*), Common Fumitory (*Fumaria officinalis*) and Geranium Cranesbill (*Geranium sanguineum*). Interspersed around the border of the lawn, the north-east boundary and lining the driveway are shrubs such as; Japanese camellia (*Camellia japonica*), Laurustinus (*Viburnum tinus*), Butterfly Bush (*Buddleja davidii*), Bottlebrush (*Callistemon* sp.), Tree Fuchsia (*Fuchsia excorticata*) and Common Lilac (*Syringa vulgaris*). Also scattered along the driveway and the north-eastern boundary are several specimens of Common Cherry tree (*Prunus avium*) and a single Blue Gum Eucalyptus (*Eucalyptus globulus*). Interspersed with these shrubs and forming the understorey below the scattered trees to the south-east several species of plant were recorded including; Three-cornered Leek (*Allium triquetrum*), Alexanders (*Smyrniolum olusatrum*), Cow Parsley (*Anthriscus sylvestris*), Red Campion (*Silene dioica*), Hogweed (*Heracleum sphondylium*), African Lily (*Agapanthus africanus*), Spanish Bluebell (*Hyacinthoides hispanica*), Cape Daisy (*Osteospermum* sp.) and Montbretia (*Crocasmia aurea*).

The garden to the north-west is much smaller, terraced and laid mainly to lawn, with scattered shrubs. Here plants including Fennel (*Foeniculum vulgare*) and Lupin (*Lupinus* sp.) dominate with occasional Red Clover (*Trifolium pratense*) found within the grassland.

In summary, the garden and immediate habitats surrounding Green Farm Cottage provide cover for bats within 10m of the building and there are many species of shrub and plant that may attract a wider variety of invertebrates which bats may prey upon, making the immediate habitat optimal for bats to feed and leave and enter a roost.

## Preliminary Roost Assessment

### 3.5 External

Green Farm Cottage is a detached granite stone-built (part rendered) building sat within the centre of its own plot. The cottage has a north-west/south-east aspect with a pitched roof of approximately 35°. A stone-built porch on the south-east elevation has a pent style roof with a south-east aspect and an approximate pitch of 25°. Both roofs are laid with the original 'scantle' tiles (with mortar between each layer), with some obvious repairs present on the buildings south-east aspect. The main is roof capped with concrete ridge tiles and the porch roof tied into the main building with mortar. The porch has no door and



Photo 2.

internally the roof structure has been lined with what appears to be hardboard. The porch also has a single PIR security light.

The cottage has two chimney stacks located at the gable ends of both the north-east and south west elevations, with the gap between the roof and the blockwork covered with mortar. The latter chimney stack is rendered with the other exposed mortared granite blocks. On the north-west elevation a modern block-built, smooth rendered single-storey kitchen extension has been built with a pent style roof with an approximate pitch of 15°. The roof is laid with modern faux slate tiles and tied into the north-west elevation with zinc flashing.

Set within the roof is a single velux window, tied in with zinc flashing. Another velux window sits in the centre of the lower part of the north-west roof.

The sash windows and frames are wooden in construction as are the doors and the fascia which is present along the full lengths of both the north-west/south-east elevations. The south-west open gable end of the building is smooth rendered and has no fascia so that the mortared joint between the gable end and the roof tiles is exposed. In contrast, the north-eastern open gable end of the cottage is only part rendered and has 'scantle' tile fascia present below south-eastern roof, but no fascia present on the opposite side. The mortar below the ridge tiles, between the chimney and the roof along with the zinc flashing that ties in the kitchen extension and the two velux windows on the north-west elevation also appear in good condition with no missing mortar or raised flashing.



*Photo 3.*

The proposed development has several features which are potentially suitable for roosting bats which include;

- Gap between fascia and lintel above first floor window on south-east elevation (see Photo 2.)
- Large crack in render of the south-west chimney stack (see Photo 3.)
- Gap between the fascia and the south-east elevation towards the north-east corner (see Photo 4.)
- Gaps between the internal roof covering and gable wall ends of the external porch (see Photo 5.)
- Loss of scantle tile fascia in the south-east corner of the north-east gable end eaves causing gap between gable end roof tile (see Photo 6.)
- Gap between scantle tile fascia and open gable end of the north east gable end (see Photo 7.)
- Gap between fascia and smooth render of north-west elevation (see Photo 8.)
- Numerous gaps on both the north-west and south-east roof aspects between scantle tiles where mortar has been lost (see Photo 9.)



Photo 4.



Photo 5.



Photo 6.



Photo 7.



Photo 8.



Photo 9.

### 3.6 Outbuildings

Two semi-detached outbuildings are in the south-west corner of the plot. The first is a single-skin block-built building with a pent style roof constructed of zinc corrugated sheets, with a pitch of approximately  $30^{\circ}$  and a north-west aspect. The roof is in relatively poor condition, with several holes some with vegetation clambering through. The north-east elevation is completely open permitting access into the interior of the building where the simple roof structure is exposed and comprised of rafters only.

The second outbuilding lies immediately north-west of the first. The 2nd building is split into two construction types. The north-eastern half constructed of single skin concrete blocks, up to the height of the eaves of the roof. The south-western half is constructed of exposed granite blockwork. The north-west/south-east aspect roof in contrast, runs the full length of the building and is constructed of fibre cement corrugated roofing sheets with an approximate pitch of  $30^{\circ}$  and capped with fibre cement ridge tiles. The roof appears to be in good condition, but part of the south-east aspect could not be inspected



due to the large amount of Bramble and Ivy covering the sheeting. The building is open gable ended, with the north-eastern elevation constructed of wooden sheeting (from the eaves to the apex) with large wooden-framed single-glazed windows below. No gaps exist between these frames and the adjacent blockwork, but 50% of the glazing was missing thereby permitting access into the interior of the building. Wooden fascia boards were present on 3 elevations of this first half of the building, but all fitted tightly to the underlying block work and wooden sheeting. On the north-west aspect of the block-built half of the outbuilding a timber-framed wooden door was present. Again, no gaps were present between the frames and the blockwork, but a large gap between the top of the wooden door and the lintel was present. A 2<sup>nd</sup> timber framed wooden door was also present on the same elevation but built into the granite blockwork. No gaps between the framework and the blocks, or between the top of the door and the lintel were present. However, the door was open at the time of the survey. The south-west elevation could not be searched due to the large amount of vegetation climbing over this elevation.

Internally, the dividing wall between the two buildings was constructed of granite blocks up to the apex. However, some blocks (particularly towards the apex) were missing thereby providing access between the two buildings. The mortar between the exposed granite blocks in places was missing particularly the upper sections of the dividing wall, but also in places on the interior of the south-west elevation. The internal roof structure was exposed throughout which was constructed of simple butt jointed rafters with the corrugated sheets sat directly on. During the search two Barn Swallow (*Hirundo rustica*) nests were found on the rafters in the granite half of the building.

The outbuildings present with several features potentially suitable for roosting bats and these include;

- Gap between the frame and lintel and its adjacent blockwork and rafter to the entrance of the 1<sup>st</sup> outbuilding
- Gap between the corrugated fascia and the adjacent door lintel and frame of the first outbuilding
- Gap created between the overlapping ridge tiles and the apex of the north-east elevation of the 2<sup>nd</sup> outbuilding (see Photo 10.)
- Missing glazing from the windows of the 2<sup>nd</sup> outbuilding
- Gap between the timber lintel and wooden door of the 2<sup>nd</sup> outbuilding (see Photo 11.)
- Missing mortar between the granite blocks, particularly the dividing wall (see Photo 12.)



Photo 10.



Photo 11.



Photo 12.

### 3.7 Internal

There are two internal roof spaces at Green Farm Cottage. The first is situated over the kitchen extension of the north-west elevation. This space occupies only half the length of the extension (north-eastern end of the extension). The construction is simple in design comprising solely of ceiling joists and rafters, with simple butt joints (see Photo 13.). Modern breathable membrane is present between the rafters and the roof tiles. Throughout the membrane is in good condition, with no obvious tears or gaps. Two ventilation pipes and one soil pipe were present. All joints between the pipework and external roof space were in good order. The nearest ventilation pipe had become separated from its down pipe, but external investigation of the cowl revealed that access through the downpipe was not possible.

Examination of the ceiling joists and the insulated floor revealed evidence of mammal droppings including Brown Rat (*Rattus norvegicus*), House Mouse (*Mus musculus*) and Lesser White-toothed Shrew (*Crocidura suaveolens*) and scattered throughout the roof space was abundant dust laden cobwebs. No natural light was also observed when the internal roof space was closed-up.

The roof space of the main building runs the full length of the cottage but is reduced in height as a result of the first-floor bedroom ceilings being 'hipped.' The roof construction comprises the original double ridge boards, rafters with their associated lap joints and wooden fixing pegs. Examination of the joints revealed no obvious claw marks, or staining. Between the rafters are battens which support the tiling battens above. No membrane, or underfelt was present throughout resulting in all the scandle tiles being exposed. Closing the loft space and removing all light sources revealed that natural light could be seen entering the roof void from the gap between the lintel and fascia of the 1<sup>st</sup> floor window (see Photo 2.). Further examination revealed few cobwebs, no wing caches and the droppings of House Mouse.

In summary, it has been shown that all 3 pipistrelle species of bat typically roost within buildings, utilising a very wide variety of features<sup>15</sup> including, crevices, cracks, holes etc either as individuals up to several hundred at a time. In contrast, Brown Long-eared bats prefer to roost in roof voids that provide flight space within their chosen roost, or roofs that are divided into several smaller compartments. Brown Long-eared bats also typically roost between the joints where the rafters meet the ridge board, or along the ridge board itself<sup>6</sup>. Though the internal roof space of the main building provides some of these conditions it would typically be expected to see large concentrations of droppings below the ridge board as Long-eared bats are known to show high roost fidelity<sup>8</sup>. Leisler's bat in contrast to the other species is a typical

tree dwelling species, particularly during the non-breeding season with roosts typically found in cavities such as mechanical breaks, rot cavities, loose bark and woodpecker holes of large live trees, in open conditions<sup>16</sup>. However, it has been shown that nursery roosts of Leilser's bat show a limited preference for buildings, but only those with lined with roof felt and are constructed of stone, rather than of block and brick<sup>17</sup>.

In contrast, the easy access and the open nature of the interior of the outbuildings provide suitable conditions for a night roost. It has been shown that many species of bat utilise a variety of structures during the night for several reasons including predator avoidance, food digestion, energy conservation and social interactions<sup>18</sup>. Night roosts are thought to be particularly important near to foraging sites when foraging conditions are sub-optimal for example during poor weather<sup>19</sup>.

Green Farm Cottage, therefore, presents with several features suitable for a small number of roosting crevice-dwelling bats, in both the main building and outbuildings, with the latter being suitable as a night roost.

## Assessment and recommendations (excluding bats)

### 4.1 Protected sites

The proposed development falls within the main SSSI Impact Risk Zones of Lower Moors and Higher Moors SSSIs. Impact zones are used in the assessment of planning applications for likely impacts on SSSI's, Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar Sites (England). However, the likely impact in this zone is for large-scale rural non-residential developments (those where net additional gross internal floor space is greater than 1,000m<sup>2</sup>). In this instance the additional gross internal floor space will be no greater than ??m<sup>2</sup> and therefore the development is not likely to impact on the surrounding SSSIs.

### 4.2 Nesting birds

All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended). Section 1 of this Act makes it an offence to kill, injure or take any wild bird, or intentionally to take damage or destroy the nest of any wild bird while that nest is in use or being built<sup>20</sup>. During this survey, evidence of nesting birds was identified, with two Barn Swallow nests found sat on the rafters of the granite outbuilding. Therefore,

if work was to commence between the months of March and August inclusive, then the site would need to be checked first for nesting birds and if, any evidence of breeding activity was found, or nests are identified works that would disturb the adults, the nest or young must be postponed until all young have fledged the nest and it is no longer in use.

## 5. Assessment and recommendations (bats)

### 5.1 Survey constraints

The survey was undertaken at a time of year suitable for undertaking preliminary bat roost assessments. However, no full inspection of the granite outbuilding roof and south-west elevation could take place due to dense vegetation covering the area and no inspection could take place either of the crack in the south-west chimney. All other areas of the proposed development were assessed for their roost potential.

### 5.2 Further survey requirements

The value of Green Farm Cottage (main building) for bats is considered to be 'high' (see Table 1). This assessment is based on the occurrence of the following features within or immediately adjacent to the site:

- The development has several potential roost features suitable to a small number of crevice dwelling bats.
- The age and overall construction of the main building, including the original rafters with their lap joints and narrow roof angles
- The main building has optimal foraging habitats in the immediate area with links to the wider countryside and a broad range of other habitats.
- The internal roof space has potential to act as a roost for Brown Long-eared bat, being open and un-cluttered
- The roof aspect and materials of the main building are likely to provide a variety of temperatures
- Dark light levels in main roof space
- The absence of any roof lining and relatively few cobwebs
- Its proximity to a known bat roost

**Commented [DM3]:** From the survey results any work that will involve either:

- replacement rafters
- timber treatment of rafters (existing or new) a
- any replacement tiling, fascia, lining etc of the main building
- re-pointing of the chimney

Or any general work in these areas will require surveys, as they could potentially cause either disturbance, block a potential roost entrance/exit or destroy a roost

The value of the outbuildings at Green Farm Cottage for bats is considered 'low' (see Table 1). This

assessment is based on the occurrence of the following features within or immediately adjacent to the site:

- The development has limited potential roost features suitable to a small number of crevice dwelling bats.
- The relatively small size of the buildings, their mixed age and overall construction, including the relatively modern roof construction and joints
- The light, open nature of the interior and the exposed roof structure
- The likely greater variety in temperature, particularly the building with metal roofing
- The outbuildings have optimal foraging habitats in the immediate area with links to the wider countryside and a broad range of other habitats.

Green Farm Cottage and its outbuildings has the potential to host bats, likely utilising the site as a maternity, transition or night roost for cavity dwelling species such as Common and/or Soprano Pipistrelles. The internal roof space also provides suitable conditions to host Brown Long-eared Bat. In contrast, the construction of the development is less likely to be utilised by Leisler's bat. To confirm whether this proposed development site hosts roosting bats, further surveys need to be undertaken during the bat active season (see section 5.3).

### 5.3 Presence or absence surveys

The Bat Conservation Trust's Bat Survey Guidelines<sup>1</sup> (referred to by Natural England in their advice to planning officers) state that buildings with 'high' bat suitability require three separate survey visits between May and September, with at least two undertaken between May and August. These surveys should consist of at least one dusk emergence, a separate dawn re-entry survey with the third visit being either a dusk or dawn visit.

The surveys should take place in optimum weather conditions, in order to maximise the likelihood of recording bats, with dusk air temperatures exceeding 10°C and not rain or strong wind.

Dusk emergence surveys should commence 15 minutes before sunset and continue for 1.5 – 2 hours after sunset. A pre-dawn re-entry survey should commence 1.5 – 2 hours before sunrise and continue until 15 minutes after sunrise.

**Commented [DM4]:** From the survey results any work that will involve either;

- new window/door frames
- replacement glazing
- alterations to the roof
- removal of vegetation from the roofs
- removal of vegetation of the south-west wall
- re-pointing of the interior of the south-west wall or the partition wall (between the pitched roofed outbuilding)

Any of this type of work will require a survey primarily as this work has the potential to destroy a roost (i.e. negate access to)

Sufficient surveyors should be used on each survey so that all aspects of the building can be viewed at one time, therefore the building should be adequately surveyed by three surveyors. Surveyors should be positioned no more than 50m away from the buildings with an awareness of the likely exit/access points and potential roost locations. Each surveyor should be equipped with a bat detector and recording equipment and should count the number and species of bats and their activity in a defined area.

If no roosts are found during the presence or likely absence surveys, then no further surveys would be required.

#### **5.4 Mitigation**

In order to comply with planning policy and wildlife legislation (both domestic and European) it will be necessary to ensure that following the development the "favourable conservation status" of bats will be maintained. This means that, where a roost will be lost, appropriate mitigation needs to be provided.

If roosts are found a detailed roost characterisation survey would be required to establish how bats use the roost, the intensity of use and what features and characteristics of the roost and the surroundings are important. The information gained would allow an accurate assessment of the potential impacts of the development on bats and inform the requirement of a European Protected Species Mitigation licence, to be considered and issued by Natural England prior to the works commencing.

If roosts are found, then a data search will be required to support the European Protected Species Mitigation licence if an application is required. Information should be obtained in relation to bat roost sites or any sites of nature conservation importance designated for their bat interest within or near to the proposed development site. When requesting information, a minimum search radius of 2km from the site should be applied.

## **6. Summary**

Green Farm Cottage has the potential to host roosting bats, likely providing shelter as a maternity, transition or night roost for cavity dwelling species such as Common and/or Soprano Pipistrelle and possibly Brown Long-eared Bat. In contrast, the lack of typical roosting features reduces its roost potential for Leisler's bat.

To assess whether bats roost in the main building or utilise the outbuildings, three further surveys are recommended; one dusk emergence, one dawn re-entry and a third either a dawn or dusk survey carried out between May and September, with at least two being carried out between May and August. If bats are found to be roosting in the dwelling the status of the roost(s) will need to be identified. Likewise, if bats are shown to preferentially utilise the eastern and southern hedgerows further surveys will then be required to inform a mitigation strategy which would need to be implemented.

Other than bats, if the recommendations given in this report are adhered to, there should be no further ecological constraints to the proposals.



## 7. Bibliography

1. Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3<sup>rd</sup> edition)*. The Bat Conservation Trust
2. Vaughan N, Jones G, Harris S (1997) *Habitat use by bats (Chiroptera) assessed by means of a broad-band acoustic method*. J Appl Ecol 34:716-730
3. Russ JM, Montgomery WI (2002) *Habitat use associations of bats in Northern Ireland: implications for conservation*. Biol Conserv 108:49-58
4. Nicholls B, Racey PA (2006) *Habitat selection as a mechanism of resource partitioning in two cryptic bat species Pipistrellus and Pipistrellus pygmaeus*. Ecography, vol 29 (5) 697-708
5. Waters, D, Jones, G and Furlong, M. (1999). *Foraging ecology of Leisler's bat (Nyctalus leisleri) at two sites in southern Britain*. Journal of Zoology 249: p173-180
6. Russ, J.M. and Montgomery, W.I. (2002). *Habitat associations of bats in Northern Ireland: implications for conservation*. Biological Conservation 108. P.49-58
7. Watts-Davidson, I. & Jones, G. (2005). *Differences in foraging behavior between Pipistrellus and Pipistrellus pygmaeus*. Journal of Zoology 268. P. 55-62
8. Entwistle, A.C., Racey, P.A. and Speakman, J.R. (1997). *Roost selection by the brown long-eared bat Plecotus auritus*. Journal of Applied Ecology 34. P399-408
9. Swift, S.M. (2010). *Long-Eared Bats*. T & AD Poyser. A&C Black Publishers Ltd, London.
10. Swift, S.M. & Racey, P.A. (1983). *Resource partitioning in two species of vespertilionid bats (Chiroptera) occupying the same roost*. Journal of Zoology 200 p.249-259
11. Shiel, C.B., Duverge, P.L., Smiddy, P. and Fairley, J.S. (1998). *Analysis of the diet of Leisler's bat (Nyctalus leisleri) in Ireland, with some comparative analyses from England and Germany*. Journal of Zoology 246: p417-425
12. Downs N, Racey PA (2006). *The use by bats of habitat features in mixed farmland in Scotland*. Acta Chiropterologica, vol 8:169-185
13. Jones, G. and Rydell, J. (1994). *Foraging Strategy and Predation Risks as Factors Influencing Emergence Time in Echolocating Bats*. Biological Sciences, Vol 346, Issue 1318: p445-455
14. Stone, E.L., Jones, G. & Harris, S. (2009). *Street Lighting Disturbs Commuting Bats*. Current Biology 19. P1123-1127

15. Jenkins, E.V. et al. (1997). *Roost selection in the pipistrelle bat, Pipistrellus (Chiroptera: Vespertilionidae), in northeast Scotland*. *Animal Behaviour* 56. P909-917
16. Spada, M. et al. (2008). *Roost selection by non-breeding Leisler bats (Nyctalus leisleri) in montane woodlands: implications for habitat management*. *Acta Chiropterologica* 10 (1). P81-88
17. Lundy, M.G. et al. (2011). *Landscape conservation for Irish bats and species-specific roosting characteristics*. Bat Conservation Ireland
18. Kunz, T.H. (1982). *Ecology of Bats*. Plenum Press: p1-55
19. Kunz, T.H. and Lumsden, L.F. (2003). *Bat Ecology*. University of Chicago Press. Chicago, IL: p3-89
20. H.M.S.O. (1981). *The Wildlife and Countryside Act 1981 (as amended)*. London.