

BAT SURVEYS AND MITIGATION PLAN

**Farm Barns and Granary at
Warryfield Farm, Walford,
Herefordshire**

**Report
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Every reasonable attempt has been made to comply with BS42020 (Biodiversity: Code of practice for planning and development), CIEEM's Guidelines for Ecological Report Writing (2017), and the Bat Conservation Trust's *Bat Surveys - Good Practice Guidelines* (2016). If compliance has not been achieved, justification/explanation has been given.

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SUMMARY

- A preliminary bat roost assessment was undertaken in June 2019 of two large barns and a granary at Warryfield Farm, Walford, Herefordshire. This was followed by bat activity surveys of the buildings in July and August 2019.
- The surveys and assessment were required in connection with a planning proposal for conversion of the buildings to residential use (four dwellings). Because existing roof structures and the interior spaces of the buildings will be replaced and modified as a result of the proposed works, offences could be committed if bats or bat roosts are present. Nesting birds are also considered in this report
- The purpose of this report is to identify and describe the potential impacts of the works on bats, and to support a European Protected Species licence application in relation to bats. The report also provides information on the legislative requirements relating to bats.
- The surveys confirmed the presence of up to three day-roosting lesser horseshoe bats *Rhinolophus hipposideros*, two day-roosting brown long-eared bats *Plecotus auritus*, and two day-roosting common pipistrelle *Pipistrellus pipistrellus* within the barns and granary.
- Nesting house sparrows *Passer domesticus* and barn swallow *Hirundo rustica* were also identified in the buildings, and an old barn owl *Tyto alba* roost was found in the granary.
- The majority of bat roost sites and bird nesting sites identified will be lost as a result of the development.
- A comprehensive bat and bird mitigation plan is provided as an Appendix to this report, in order to inform the planning application in respect of the proposed conversion works, and in order to avoid and/or minimise impacts upon bats/birds, and mitigate/compensate for roosts/nest sites lost.
- Recommendations are also made for biodiversity enhancements, which would be in addition to the mitigation and compensation measures outlined in the Bat and Bird Mitigation Plan.
- **Because bat roosts are present in the buildings, a European Protected Species licence from Natural England (NE) will be required before works can proceed, and in order to avoid offences under the Conservation of Habitats and Species Regulations 2017.**

1 INTRODUCTION

1.1 Background

A preliminary bat roost assessment was undertaken on 14th June 2019 of two large barns and a former granary at Warryfield Farm, Walford, Herefordshire. The site is located at OS grid ref. SO582209.

The survey was required in connection with a planning proposal to convert the barns and granary to residential use (four dwellings). Because of the nature of the works, which involve impacts upon areas and structures that could potentially be used by roosting bats, there is a risk that offences could occur if bats or bat roosts are present.

Previous ecological surveys have been undertaken at the farm. In 2006 bat activity surveys of the buildings confirmed the presence of one roosting common pipistrelle *Pipistrellus pipistrellus* and one soprano pipistrelle *P. pygmaeus* (Catherine Bickmore Associates, 2006). In 2017 bat activity surveys confirmed the presence of day roosts for low numbers of common (n=3) and soprano (n=3) pipistrelles and brown long-eared bats *Plecotus auritus* (n=2), and a night roost for a single lesser horseshoe bat *Rhinolophus hipposideros* (Keystone Ecology, 2017).

1.2 Personnel

The assessment was carried out by Dr Nick Underhill-Day. Nick is employed as a Principal Ecologist and Director with Swift Ecology Ltd and has been actively involved with bat work for the last nine years, having undertaken numerous bat surveys, including both preliminary roost assessments and activity surveys, of a variety of buildings such as residential dwellings, farm buildings, industrial buildings and churches. He also has considerable experience in the associated ecological appraisal of bat roosts and in methods required for appropriate mitigation.

1.3 Ecological Context

Warryfield Farm is located approximately 2.5 km south-west of the market town of Ross-on-Wye, in a relatively low-lying area of agricultural farmland on the River Wye floodplain (Figure 1). The farm buildings comprise a granary and barns around a courtyard, with a cottage and two outbuildings to the west (Figure 2). One of the barns has already been converted to residential use; the farm is no longer in use in agricultural production.

To the immediate south of the farm is a rectangular field of rough grassland, otherwise the farm is surrounded mostly by arable fields bordered by hedgerows and hedgerow trees, with small stands and blocks of woodland, and fields of polytunnels and poultry farm buildings a little further out in the surrounding landscape.

A little over a kilometre to the west lies the tree-lined riparian corridor of the River Wye, flowing north to south. This is flanked on its western side by strips of woodland, between 1 and 1.8 km to the west and south-west, from Pencraig to Goodrich Castle. Approximately 500 m to the north-west lie the buildings and grounds of Hill Court, comprising parkland grassland, scattered trees and woodland plantation. The nearest large woodlands, and larger areas of scattered woodland, lie roughly 1.5 km to the north-east (Chase Wood), east (scattered woodlands on Howle Hill) and south-east (Bishops Wood and other interconnected scattered woodlands), fringing the rising hills and plateau of the Forest of Dean.

This assemblage of habitats in the surrounding landscape provides good opportunities for foraging and/or roosting bats.

1.4 Purpose of Report

The purpose of this report is to identify and describe all potentially significant ecological effects upon bats or bat roosts in the existing buildings, and to identify the mitigation, enhancement and compensation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects. The assessment also considers other protected species, including nesting birds.



Figure 1: Aerial photograph showing the location and landscape context of Warryfield Farm, Walford, Herefordshire.



Figure 2: Aerial photograph showing the location and immediate environmental context of the barns and granary (outlined in red) at Warryfield Farm, Walford, Herefordshire. The farm cottage and two outbuildings can be seen to the immediate west of the barns.

2 METHODS

2.1 Background Data Search

A background data search was commissioned by the Herefordshire Biological Records Centre (HBRC) of bat records within a 2 km radius of the site.

2.2 Survey Methods

The preliminary bat roost assessment was undertaken on 14th June 2019 by Nick Underhill-Day of Swift Ecology Ltd. Nick holds a Natural England licence for the disturbance of bats (Natural England class licence 2015-15526-CLS-CLS).

2.2.1 Preliminary Roost Assessment

Assessment of Bat Roost Potential

The barns and granary were assessed for their suitability to support bats or bat roosts. This involves a consideration of A) the habitat and environmental context of the buildings; B) the immediate environmental conditions of the building exteriors; C) the general construction and condition of exterior features; and D) the general construction and condition of interior features, particularly those within the roof spaces.

Based on these factors, an assessment was made of whether the buildings might support bats, and the type and number of roosts that might be present. The buildings were assigned a roost potential category (Collins, 2016) according to the criteria outlined in Table 1 below, based on the results of the assessment.

Table 1: Guidelines for assessing the potential suitability of buildings/structures for roosting bats (based on Collins, 2016).

| Category | Category description |
|------------------|---|
| Negligible | Negligible habitat features on site likely to be used by roosting bats |
| Low | A building or structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). |
| Moderate | A building or structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only). |
| High | A building or structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat |
| Known roost (KR) | Building or structure currently supporting bats (based on presence of bats, or evidence of use such as droppings, carcasses etc.) |

Survey for Signs of Bats

A detailed inspection was made of the buildings for any evidence of bat use, such as live or dead bats, droppings, scratch-marks, staining and prey remains, and in some cases the absence of cobwebs. Large quantities of cobwebs in roof voids or at access points tend to be suggestive of no bat use, although this evidence is not conclusive.

Features identified as possible bat access points or potential roosting locations were thoroughly searched where possible, using powerful torches and binoculars to facilitate the process. An endoscope and ladders were available to enable more detailed inspection of cracks and crevices if needed.

2.3 Bat Activity (presence/absence) Surveys

Bat activity dusk emergence and dawn re-entry surveys were carried out of the granary and barns on 22nd July and 6th August 2019 respectively.

During the surveys, surveyors were positioned outside the buildings to watch for evidence of bats entering or emerging from their roosts. Digital recording devices were used to store bat echolocation calls for subsequent analysis using Batsound and Analook software. All surveyors are experienced in the use of bat detectors and familiar with undertaking such surveys.

Static detectors were deployed within two of the buildings (granary and barn 1) during the dusk survey on 22nd July and in one of the buildings (barn 1) during the dawn survey on 6th August 2019. The bat activity survey approach was based upon Collins, 2016. Details of timings, personnel and weather conditions are given in Table 2.

Table 2: Bat Activity Survey Details

| Survey type | Dusk emergence survey | Dawn re-entry survey |
|---------------------------------------|--|--|
| Date | 22/07/2019 | 06/08/2019 |
| Weather conditions | Dry, muggy and overcast (90% cloud cover) | Warm night, cloud cover 80% clearing to 20%, Brief shower for 15 mins at start of survey (0400-0415) |
| Start temperature (°C) | 22.6°C | 15.4°C |
| End temperature (°C) | 17.1°C. | 13.8°C |
| Wind (Beaufort) | 1 | 0-1 |
| Precipitation | None | Short rain shower for first 15 minutes of survey. Otherwise dry. |
| Sunrise/Sunset | 2115 | 0538 |
| Start time | 2100 | 0400 |
| End time | 2300 | 0540 |
| Surveyors (numbered locations) | Nick Underhill-Day (1), Charlie Long (2), Rhiannon Taylor (3), Lisa Kerslake (4), Dave Smith (5), Mike Sharp (6) | Nick Underhill-Day (1), Charlie Long (2), Rhiannon Taylor (3), Johnny Birks (4), Mike Bailey (5), Mike Sharp (6) |
| Equipment | Anabat Walkabout (3), Pettersson D240X (2), EM3, (1), Duet (1), Song Meter SM4 (2) | Anabat Walkabout (2), Pettersson D240X (3), EM touch (1), Song Meter SM2+ (1) |

2.4 Survey Limitations

The surveys were undertaken in good light and weather conditions; all areas of the barns and granary were accessible for inspection. A preliminary roost assessment cannot rule out bat presence, as bats may roost in areas that are not accessible other than by a destructive search.

The dusk bat activity survey was undertaken in good weather conditions. During the dawn survey on 6th August 2019, a rain shower occurred during the first 15 minutes; however, bats were detected before and after this period, and thus this is not considered a significant limitation to the survey.

3 RESULTS

3.1 Data Search

The HBRC holds 137 bat records within 2 km of the site, between 2000 and 2016, of at least eight species including common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, Nathusius' pipistrelle *P. nathusii*, brown long-eared bat *Plecotus auritus*, Natterer's bat *Myotis nattereri*, noctule *Nyctalus noctula*, lesser horseshoe bat *Rhinolophus hipposideros* and barbastelle *Barbastella barbastellus*.

The majority of records are of individual or low numbers (<5) of commuting or foraging bats, with most records from locations greater than 1 km from the farm. There are also several records, from 2006, of individual common and soprano pipistrelles present at the farm, identified from previous surveys of the farm buildings (see Section 1.1).

Locations of bat records are shown in Appendix 1.

3.2 Building Descriptions

The location of the barns and granary surveyed are shown in Figure 3 and brief descriptions of each are provided below.

Barn 1

Barn 1 (Plates 1 and 2) is orientated roughly east-west and is approximately 40 m long by 7 m wide. It is located adjacent to the public highway to the immediate north and the farm courtyard to the immediate south (Figure 3). The barn has a height equivalent to two-storeys, but the rooms are open from the concrete floors to the roof.

The building is built of stone with areas of modern breezeblock interior walling, and supports a pitched slated roof containing regularly spaced skylight windows.

The central part of the barn has floor to eaves sliding metal doors for vehicular access on both the north and south elevations. The central access room provides access into the west part of the barn, which is split into two large rooms, and into the east part of the barn, containing one large room.

The north and south elevations of the barn have regularly spaced vertical slit windows at approximate ground and first-floor levels, mostly glazed or covered by Perspex, but some unglazed/uncovered. The middle western room has a doorway providing access into a small single-storey room at the northern end of barn 2. There are additional access doors on the east gable and at the western end of the south elevation.

The barn has been part converted/renovated and has areas of relatively new and repaired interior walling, roof timbers, roof insulation and roof linings and/or insulation boarding.

The barn is currently unused but contains building materials and scaffolding suggesting the previous conversion/renovation stopped before completion.



Plates 1 and 2: North (left) and south (right) elevations of barn 1.

Barn 2

Barn 2 (Plates 3 and 4) adjoins a small section of barn 1 on its southern elevation and the granary on its northern elevation, is orientated roughly north-south, and is located to the west of the farm courtyard (Figure 3). The building is built of stone and brick, with a section of timber clad walling on the east elevation (Plate 3) and areas of interior brick walling.

The barn is approximately 20 m long by 6 m wide, is of single-storey height, and supports a pitched slated roof. There are doors on the east and west elevations providing access to the barn interior, which comprises two rooms separated by a brick wall and open doorway. The barn has a separate north room accessed from barn 1 (described above). The barn is currently empty and unused.



Plates 3 and 4: East (left) and west (right) elevations of barn 2.

Granary

The granary (Plates 5 and 6) is a two-storey building attached to the western end of the south barn (residential dwelling), and is approximately 8 m long by 6.5 m wide (Figure 3).

The building is built of stone below a pitched slated roof and comprises a ground-floor containing two rooms and a first-floor with one room, open to the roof. Access is provided by a ground-floor doorway and separate stepped first-floor doorway on the northern elevation, from the farm courtyard (Plate 5).

The west gable (Plate 6) of the granary has a first-floor loading doorway, a wooden ground-floor doorway, partially blocked with logs, and a small boarded window (Plate 6). The granary is currently empty and unused.



Plates 5 and 6: North (left) and west (right) elevations of the granary. The building is located at the western end of the converted south barn (Plate 5: black and white building in left of photo) and southern end of barn 2 (Plate 5: single-storey red brick building in right of photo).

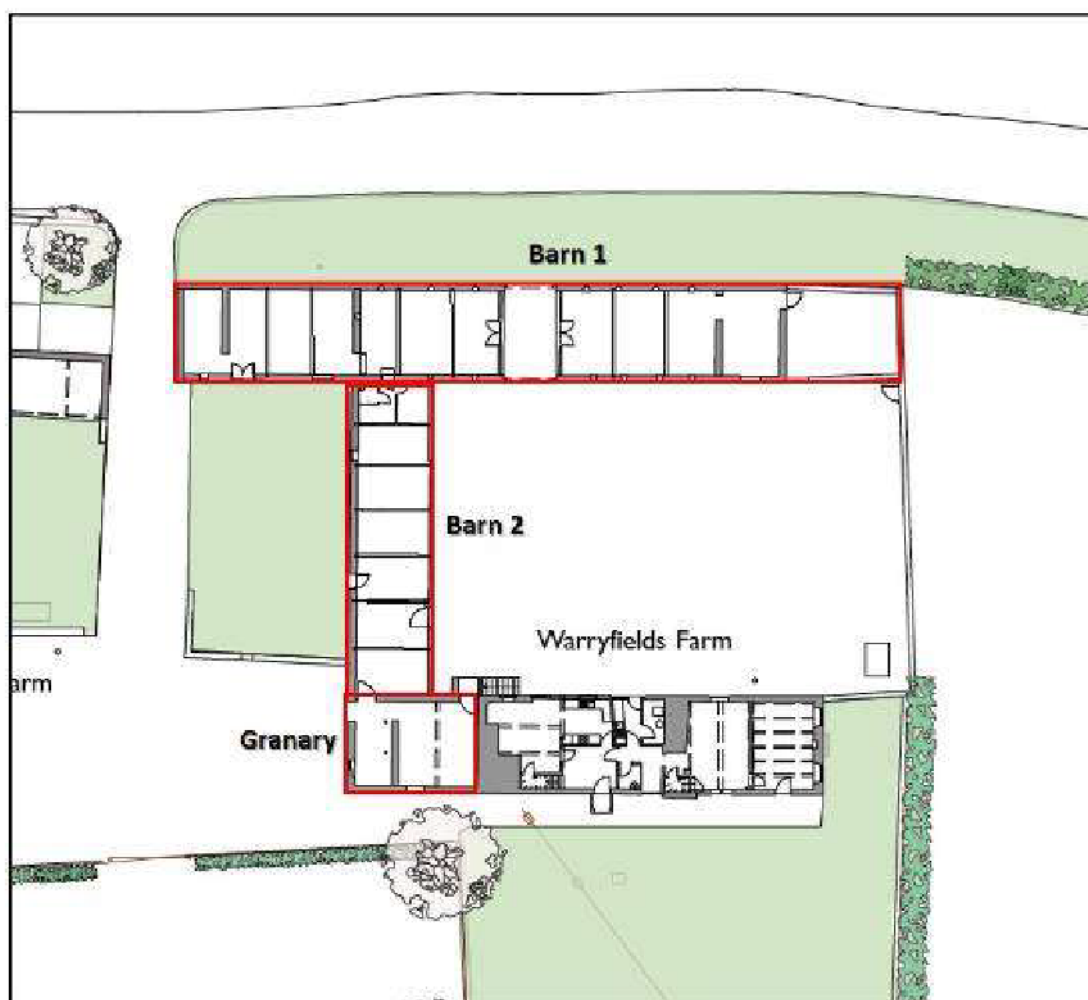


Figure 3: Barns and granary surveyed at Warryfield Farm.

3.3 Assessment of Bat Roost Potential and Survey for Signs of Bats

3.3.1 Environmental Context of the Buildings

The farm barns and granary lie in a rural farmed landscape dominated by arable crops and fields of polytunnels. The nearby cottage and converted south barn have associated gardens with mown lawns, shrub and flower beds and several small trees, beyond which are arable fields. To the south of the site lies a long rectangular field of rough grassland with more arable fields to the south and east.

With the exception of the converted south barn and farm cottage, the next nearest dwellings are located roughly 500 m to the south-east in Walford, but comprise a good mixture of old and new buildings, including old farm buildings, suitable for roosting bats.

The farmed landscape in the immediate vicinity supports only a few small blocks of woodland and stands of trees; roughly 330 m to the east lies a dismantled railway lined by trees. Cover in the vicinity of the buildings is limited to a few small trees within the gardens and the interior spaces of the open-fronted outbuildings and

barns, while flight lines for bats, if present, between the buildings and foraging grounds are limited to field boundary hedgerows.

Foraging opportunities in the immediate vicinity of the buildings are of moderate value, comprising rough grassland, gardens of the cottage and converted barn, and nearby hedgerows and hedgerow trees.

Further out beyond the fields of arable farmland, between 0.5 and 1 km distant, lie more extensive areas of woodland, the riparian corridor of the River Wye, and other semi-natural habitats likely to provide good foraging opportunities for bats. However, ecological connectivity from the site to these areas is sub-optimal, as bats would have to commute some distance along field boundary hedgerows, or cross exposed arable fields, in order to reach these areas; this might deter some bat species which prefer dense cover such as woodland edges, lines of trees or riparian corridors for flight lines between roost sites and foraging grounds. The location is also considered sub-optimal for larger maternity colonies, which are more likely to establish nearer to good quality foraging habitat.

3.3.2 Building Exterior and Interior

Barn 1 exterior

The stonework of the barn elevations has numerous gaps, cracks and crevices providing opportunities for roosting bats.

The central sliding metal doors (Plate 7) are loosely fitted and provide flying access for bats around the sides, over the top and between the doors. An access door on the west gable is also loosely fitted and would provide flying access for bats. Most of the vertical slit-style windows on the north and south elevations (Plate 8) are glazed or covered with Perspex but several are open and would also provide easy flying access for bats. There are several additional glazed windows in the south elevation, at the western end of the barn; these appear well-sealed to the adjacent stonework. The eaves are open and would offer suitable access opportunities for bats into the building.

The roof slates are mostly intact and well-sealed but there are some lifted slates with gaps beneath, as well as gaps beneath the ridge tiles, which might offer roosting opportunities for bats. An area where two sections of the roof are joined supports a strip of lead flashing; there are sections of poorly fitted or lifted flashing which might contain gaps large enough to provide access and/or roosting opportunities for bats.

The roof of the barn extends beyond the gable end stonework; there are small gaps between the top course of stones and roof linings, and where the roof purlins extend through the stone gable walls, which might offer bats access and roosting opportunities.

No bat droppings were found anywhere on the exterior of the building.

House sparrows *Passer domesticus* were observed nesting in a wall cavity on the northern elevation of the barn.

Barn 1 interior

The barn interior stone walling has numerous gaps and cracks providing suitable roosting features for bats, although some of the internal walls have been repointed.

The main interior spaces of the barn (Plates 9-12) are mostly open from the floor to the ceiling, while the numerous elevation and skylight windows make the interior of the barn well-lit; consequently, there are no dark enclosed roof spaces suitable for void-dwelling bats species. The majority of roof timbers look well-sealed and do not appear to have gaps or hidden voids typical of old timber mortice-tenon joints.

There are gaps between the top course of stones comprising the gable and partition walls and insulation boarding above that might provide access/roosting opportunities for bats; however, some of these areas have glass fibre or foam insulation installed, which may block potential bat access (Plates 13 and 14).

Previous building works included installation of Celotex insulation boards (Plates 13 and 14) and/or new plastic roof lining (Plate 16) which might limit bat access into spaces above; however, the roof slates were visible in several places through gaps in the Celotex boarding, providing potential bat access to spaces above the boarding. The central room has traditional bituminous felt lining (Plate 15).

At the western end of the building is small partition stone wall to approximately half-height (Plate 11) beyond which is a set of steps leading up to a timber platform. The area below the platform is more enclosed and marginally darker than the rest of the building. Several dozen scattered bat droppings, with a size and shape characteristic of lesser horseshoe bat, were present on the ground floor below the platform, but no bats were present.

A small area at the north end of barn 2 is accessed through a doorway from the central west room of barn 1; the area is split into two rooms and a defunct toilet and cloakroom (Plate 17), accessible through open doorways. The rooms are single-storey and open from the floor to the ceiling. One of the rooms has single small skylight window, but otherwise the rooms are relatively dark compared to other parts of barn 1. The roof has been lined with plastic beneath which polystyrene insulation has been installed, but is currently falling away (Plate 18). Several hundred bat small-sized bat droppings, with a size and morphology characteristic of lesser horseshoe bat, were present scattered below the roof area of the small central room (Plate 19) and cloakroom. A single lesser horseshoe bat was present roosting on the central ridge beam of the roof (Plate 20).

A separate inspection of barn 1 on 3rd July 2019 found three lesser horseshoe bats roosting within the building, two in the small room described immediately above, and a third beneath the timber platform at the western end of the barn.

Barn swallows *Hirundo rustica* were present in the central room and central west room, nesting on the timbers. An old barn swallow nest was also present in one of the rooms at the northern end of barn 2; this had an additional moss nest added, possibly by a robin *Erithacus rubecula*, as a dead bird of this species was found on the floor below. A dead starling *Sturnus vulgaris* was also found on the floor of barn 1, indicating potential nesting by this species within the barn.



Plate 7: Barn 1 - metal sliding doors.



Plate 8: Barn 1 - vertical window slits.



Plate 9: Barn 1 - middle west room.



Plate 10: Barn 1 - west room.



Plates 11 and 12: Barn 1 – east room.





Plates 13 and 14: Barn 1 – glass fibre (left) and foam (right) insulation below recently installed roof boarding.



Plates 15 and 16: Barn 1 – Central room (left) and east room (right) showing traditional bituminous felt lining (left – central room) and more recently installed plastic roof lining (right – east room).



Plate 17: Barn 2 – north room and toilet/cloakroom.



Plate 18: Barn 2 – north room roof space



Plate 19: Barn 2 – north room floor with scattered bat droppings.



Plate 20: Barn 2 – north room with roosting lesser horseshoe bat.

Barn 2 exterior

The stone elevation of barn 2 contain gaps, cracks and crevices suitable for roosting bats. However, the walls are not very high and partially obscured by tall vegetation (Plates 3 and 4), and thus less suitable for roosting bats compared to the higher wall elevations of barn 1.

The roof slates are mostly intact and tightly sealed with a few lifted slates and gaps under ridge tiles that might offer access opportunities to spaces beneath. Where barn 2 adjoins barn 1 at its north end, and the granary at its south end, the slates are sealed with lead flashing to the stonework. At the southern end of the eastern roof pitch are several lead openings, either ventilation gaps or previously installed bat access points; these may provide access into the space between the roof lining and slates (Plate 21).

The eaves are open and would offer suitable access opportunities for bats into the building, although some areas of the eaves are covered with dead ivy.

No signs of bats were found anywhere on the exterior of the building. No evidence of nesting birds was recorded associated with the exterior of the building.

Barn 2 interior

With the exception of the small northern rooms, accessed from barn 1 (Plates 17 and 18), the main body of barn 2 has two rooms accessed by an open doorway on the eastern elevation (Plate 22); this would provide easy flying access for bats into the building. There are also gaps in the stone walling, and a large gap above a sealed door in the west elevation that would allow flying access for bats.

The barn has no skylights or windows, and thus is relatively dark and enclosed (Plates 23-26), and might offer suitable conditions for void-dwelling bats species, although the roof is not particularly high, which might deter some species.

The two rooms are separated by a brick partition wall with an open doorway. The roof timbers look well-sealed with no gaps present in the timber joints. However,

there are cracks and crevices where the timbers meet the walls which might offer suitable crevice roost sites.

The building roof timbers and roof spaces were heavily cobwebbed, suggestive of no recent bat use. No signs of bats were found anywhere on the interior of the building. An old barn swallow nest was noted on one of the roof timbers.



Plate 21: Barn 2 – lead ventilation previously installed bat access points?



Plate 22: Barn 2-open doorway on east Elevation.



Plate 23: Barn 2 – south room.



Plate 24: Barn 2 – south room roof space



Plate 25: Barn 2 – north room.



Plate 26: Barn 2 – north room roof space

Granary exterior

The exterior stone walling of the granary (Plates 5 and 6) has gaps, cracks and crevices suitable for roosting bats. The roof slates are mostly well-sealed but there is a hole in the roof (Plate 27) and a lifted ridge tile at the west end of the roof that would provide flying access into the building and roosting opportunities respectively for bats.

The two doors on the north elevation are poorly fitted, and bats might be able to gain access around the side of the doors, into both the ground and first-floor rooms. The north elevation also has a first-floor unglazed window through which bats could fly.

In the west gable wall is a first-floor loading doorway; bats might be able to gain access over the top of the wooden door. At ground floor level is a doorway, partially blocked with logs with ripped plastic sheeting behind (Plate 28); this would allow flying access for lesser horseshoe bats into the ground floor rooms. The granary eaves are closed with some areas covered with dead ivy.

No signs of bats were found anywhere on the exterior of the building. No evidence of nesting birds was recorded associated with the exterior of the building.

Granary interior

The stonework of the interior granary walling is mostly well-sealed with few gaps, cracks or crevices suitable for roosting bats. The lower walls of the first-floor room are rendered and have few potential roost features present (Plates 29-30). There are cracks and crevices where the large timber purlins enter the stonework, and between the top course of stones forming the gable walls and roof timbers above that would offer suitable crevice roosting opportunities.

The roof is lined with traditional bituminous felt; gaps from above, or through areas of torn felt, offer access/roosting opportunities for bats between the felt lining and slates above.

The ground and first-floor rooms (Plates 29 to 32) are moderately dark and enclosed, and might provide suitable conditions for void-roosting bat species. In the south-west corner of the first-floor room is an old, blocked hopper chute (Plate 31) forming an enclosed cavity accessible from the ground room beneath; this might provide a suitable roosting site for some species, particularly lesser horseshoe bats.

In the west ground-floor room, several scattered bat droppings, with a size and morphology characteristic of lesser horseshoe bat, were present on the floor. A single roosting lesser horseshoe bat was present roosting on a ceiling joist (Plate 33).

A cluster of roughly 50 medium-sized bat droppings were present on the floor of the first-floor room, below a section of the apex ridge board.

An old barn swallow nest cup was noted on one of the granary roof timbers. A collection of approximately 30 dozen old and mostly disintegrated barn owl *Tyto alba* pellets were present scatted across the floor, below the roof timbers (Plate 34); the pellets were estimated to be several years old, and it is unlikely that this species has roosted on the site recently.

No other evidence of nesting/roosting birds was recorded in the interior spaces of the building.



Plate 27: Granary – hole in roof.



Plate 28: Granary – partially blocked unglazed window at ground-floor level in west gable.



Plates 29 and 30: Granary– ground-floor rooms.



Plate 31: Granary – first-floor room with hopper chute in corner.



Plate 32: Granary – roof space.



Plate 33: Granary – roosting lesser Horseshoe bat in first-floor room.



Plate 34: Granary – several dozen old barn owl pellets on the floor of first-floor room, below the roof timbers.

3.4 Bat Activity Surveys

Two bat activity surveys were conducted, as described in section 2. The raw data is presented in Appendix 2 and the main findings are summarised below. Figures 4 and 5 included below illustrate the layout of the site and the key results of the surveys.

3.4.1 Dusk emergence survey 22nd July 2019

Survey results

General bat activity levels during the survey were moderate and mostly comprised commuting and/or foraging passes of several individual common and soprano pipistrelles.

The earliest recorded bats were identified during an internal inspection of the granary; a lesser horseshoe bat and brown long-eared bat were visible roosting among the timbers of the granary roof at 2120hrs.

Common pipistrelle foraging was recorded from 2141hrs onwards, 26 minutes after sunset, while the first soprano pipistrelle was recorded at 2206hrs, 51 minutes after sunset. Frequent foraging passes by both species were recorded until the end of the survey.

At 2215hrs, a brown long-eared bat was observed emerging through the partially open doorway on the south elevation of barn 1; this bat was assumed to be roosting within the barn in addition to the brown long-eared bat roosting with the granary, which did not emerge during the survey.

Other bat species recorded during the survey, but not thought to be roosting on the site included noctule *Nyctalus noctula*, an unidentified large bat (possible serotine *Eptesicus serotinus* or Leisler's bat *Nyctalus leisleri*) and several *Myotis* sp. bats.

A check of the granary at the end of the survey revealed the continued presence of the brown long-eared bat, but not the lesser horseshoe bat, which was assumed to have emerged unseen.

Raw data from surveyors is presented in Table A2.1, Appendix 2.

Static Detector results

A static detector deployed within barn 1 recorded a single common pipistrelle file at 2122hrs.

A static detector deployed within the granary recorded seven files of lesser horseshoe bat, between 2104 and 2240hrs. A file of a common pipistrelle was recorded on the detector at 2157hrs; the quality of the recording was poor, and is considered likely to be a bat flying close to but outside the building.

Raw data from static detectors is presented in Table A2.2, Appendix 2.

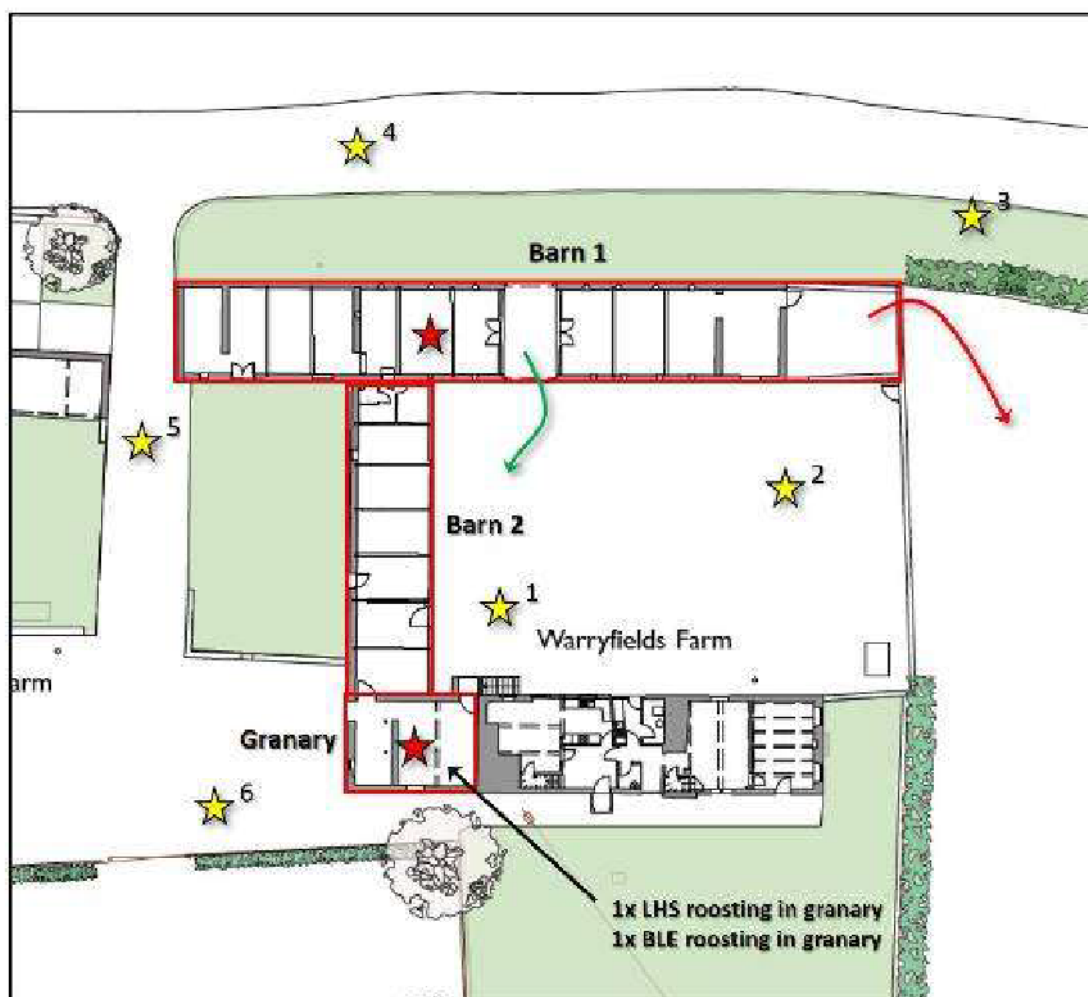


Figure 4: Summary of survey on 22.07.19. Yellow stars/numbers - surveyor locations; red stars – static detector locations; solid red arrow - common pipistrelle emergence; solid green arrow – brown long-eared bat emergence.

3.4.2 Dawn re-entry survey 6th August 2019

General bat activity levels during the dawn survey were low and mostly comprised commuting and/or foraging passes of several individual common and soprano pipistrelles.

An initial inspection of the barns and granary did not identify any bats present within these buildings.

During an internal check of the granary at 0452hrs a lesser horseshoe bat entered the building through the partially blocked ground floor doorway on the west gable; the bat went to roost in the small ground floor west room of the building.

At 0507 a common pipistrelle was observed swarming near the west gable of barn 1 but flew off to the east. However, at 0507 a common pipistrelle was observed entering a roost site beneath a slate at the west end of barn 1, on the southern roof pitch.

A final check of the barns at the end of the survey did not identify any roosting bats within these buildings. A check of the granary at the end of the survey revealed the continued presence of the lesser horseshoe bat.

Raw data from surveyors is presented in Table A2.3, Appendix 2.

Static Detector results

A static detector deployed within barn 1 recorded two common pipistrelle files at 0439 and 0404hrs. A static detector was not deployed in the granary on this occasion.

Raw data from static detectors is presented in Table A2.4, Appendix 2.

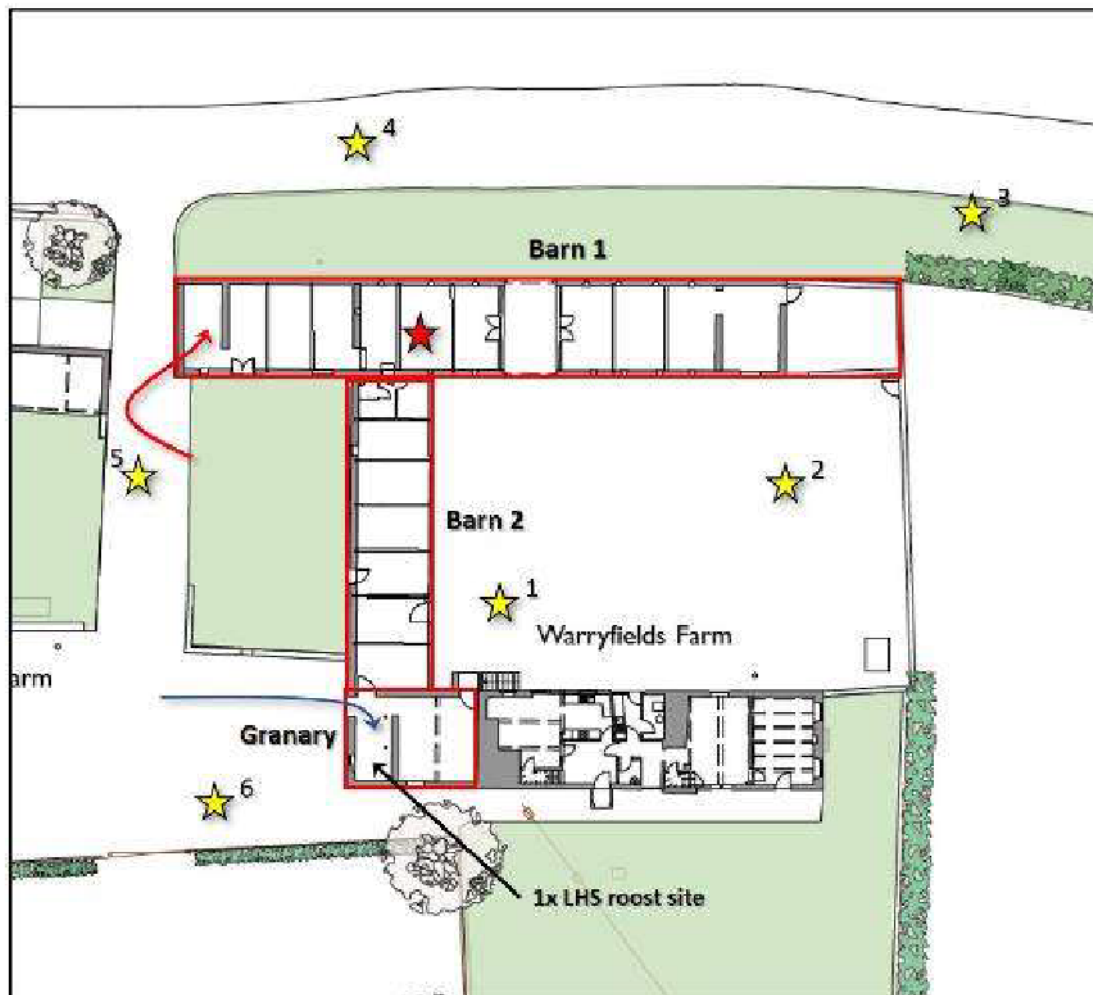


Figure 5: Summary of survey on 06.08.19. Yellow stars/numbers - surveyor locations; red star – static detector location; solid red arrow - common pipistrelle entry; solid blue arrow – lesser horseshoe entry.

4 EVALUATION AND IMPACT ASSESSMENT

4.1 *Bat roosts*

The buildings at Warryfield Farm are surrounded by habitats with moderate suitability for foraging and commuting bats, comprising mainly arable farmland and associated field boundary hedgerows and trees.

Previous surveys undertaken in 2006 and 2017 established the presence of at least four bat species roosting on the site, in low numbers, including common and soprano pipistrelle, brown long-eared bat and lesser horseshoe bat; all records of roosting bats were from locations within the barns.

Based on the results of the preliminary bat roost assessment, undertaken in June 2019, the two barns and granary are considered to be of moderate to high suitability to support roosting bats. During the survey, a single lesser horseshoe bat was recorded roosting in the small room at the northern end of barn 2, and a second lesser horseshoe bat roosting in the western ground floor room of the granary, above a log pile.

A separate inspection on 3rd July revealed two lesser horseshoe bats roosting within the small room in barn 2, and a third at the western end of barn 1 (but none within the granary).

Inspections during the dusk emergence activity survey on 22nd July 2019 revealed the presence of a lesser horseshoe bat and brown long-eared bat roosting among the granary roof timbers, while the dawn re-entry survey on 6th August 2019 recorded a lesser horseshoe bat entering the granary and roosting in the western ground floor room, above the log pile.

The daytime inspections and bat activity surveys undertaken in July and August 2019 recorded up to eight roost sites of three species of bats roosting in the buildings as follows:

Lesser Horseshoe bat

- Two lesser horseshoe bats roosting within the small room at the northern end of barn 2;
- One lesser horseshoe bat roosting at the western end of barn 1;
- One lesser horseshoe bat roosting in the western ground-floor room of the granary; and
- One lesser horseshoe bat roosting among the roof timbers of the granary.

A maximum of three lesser horseshoe bats were recorded roosting at any one time, and it is considered that these bats use at least four roost sites within the barns and granary.

Brown long-eared bat

- One brown long-eared bat roosting among the roof timbers of the granary; and
- One brown long-eared bat roosting in barn 1.

A maximum of two brown long-eared bats were recorded roosting/emerging at any one time within barn 1 and the granary.

Common pipistrelle

- Two common pipistrelle roosts within barn 1, one at the western end and one at the eastern end; and
- Several files of common pipistrelle were also recorded in barn 1 during activity surveys, indicating the possible presence of a third bat of this species roosting within this barn.

4.2 Nesting birds

Barn 1 supports nesting birds, including a colony of house sparrows and several pairs of barn swallow. Barn 2 has historical evidence of nesting barn swallow. The granary has historical evidence of nesting barn swallow and roosting barn owl. Starling and robin may also nest in barn 1; all nesting birds are protected by law, regardless of how common the species.

4.3 Impact assessment**4.3.1 Bats**

The proposed conversion works to the barns and granary (Figure 6) will have an impact upon bats and their roosts and, therefore, offences are very likely to occur. In the absence of mitigation, the potential adverse impacts on bats of the proposed works are as follows:

- Disturbance or harm to bats that may be present at the time of works;
- Destruction or modification of known bat roosts during the conversion works;
- Loss, interference with or obstruction of access points into the barns and granary;
- Use of materials, such as breathable membranes, that may cause harm to roosting bats that come into contact with them; and
- Disturbance of bat flight lines and foraging activities in areas surrounding the granary and barns due to newly installed lighting.

The Local Planning Authority will require a detailed mitigation plan to ensure that the favourable conservation status of the bats at the site be maintained during and after works.

In order to avoid offences a European Protected Species licence (EPS) will be required from Natural England before works to the barns and granary can commence so that those works can proceed without offences being committed under the *Conservation of Habitats and Species Regulations 2017*.

4.3.2 Birds

House sparrow, barn swallow and other species

In the absence of mitigation the proposed conversion works could have impacts upon nesting birds, including house sparrow and barn swallow, if undertaken during the breeding season.

Precautions will be needed to prevent harm or disturbance to breeding birds. Compensatory house sparrow and barn swallow nesting habitat will be required in lieu of loss of nest sites within the buildings.

Barn owl

There is evidence of barn owl roosting in the granary; consequently, there could be impacts upon roosting barn owl, if this species still uses the building. The evidence suggests that the roost site is only occasionally used by this species as all accumulated owl pellets were at least 12 months old and there was no evidence of nesting within the building. No birds were observed during any of the survey visits.

Even so, appropriate mitigation measures should be adopted to further reduce the likelihood of impacts arising upon this species as a result of development works. An alternative barn owl roost site will also be required in lieu of the barn owl roost site lost as a result of the proposed conversion of the granary.

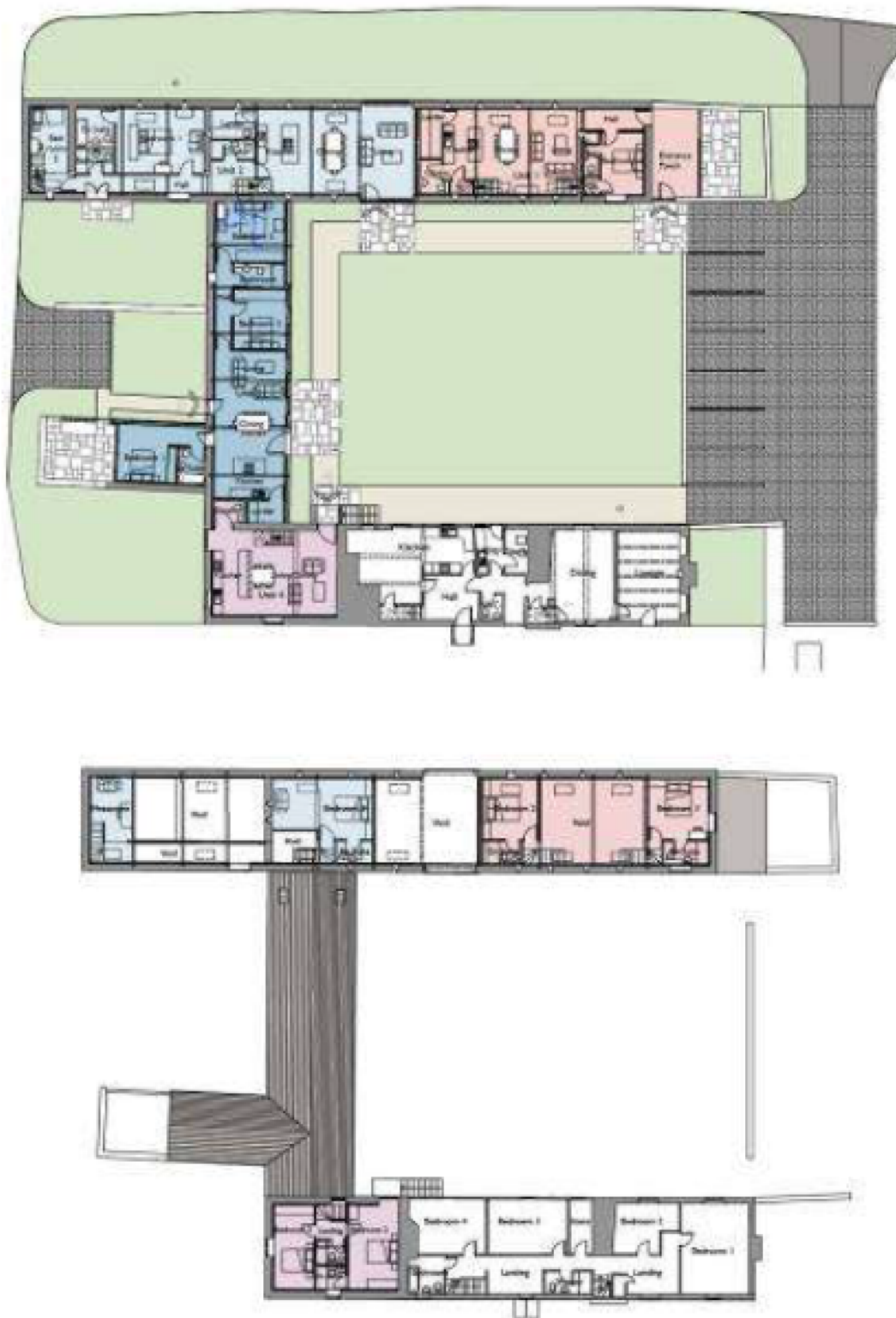


Figure 6: Ground floor (top) and first floor (bottom) plans for the proposed conversion works to the barns and granary at Warryfield Farm.

5 RECOMMENDATIONS

5.1 *EPS Licence Application (Bats)*

In order to avoid offences under the *Wildlife and Countryside Act 1981* and the *Conservation of Habitats and Species Regulations 2017*, conversion works likely to affect bats and their roosts in the barns and granary at Warryfield Farm must be conducted under a European Protected Species (EPS) licence granted by Natural England. The licence can be applied for only after any necessary Planning Permissions and/or Listed Building Consents are in place.

5.2 *Mitigation/Compensation Plan*

In order to accommodate the species of roosting bats present, to ensure that bats are not harmed during works and to ensure that there are no negative effects on bat populations, detailed mitigation measures for bats will be designed into the scheme and will be incorporated into a working method statement/mitigation plan. This is provided in detail in Appendix 3.

5.3 *Birds*

Breeding Birds

As all nesting birds are protected by law, the following measures are needed to ensure compliance with legislation during the conversion of buildings:

- To avoid committing an offence, any works to the buildings that might be used by nesting birds should be undertaken outside the bird breeding season (March to August inclusive). If this is not possible, the structure or habitat should be checked immediately prior to works commencing by a suitably qualified ecologist. If there are breeding birds present, works cannot continue until the chicks have fledged and left the nest; and
- Mitigation for the loss of nesting sites within the farm buildings should include erection of bird boxes for house sparrows, starling and robin, and installation of nest cups within suitable structures for barn swallow.

Barn owl

Mitigation measures for barn owl are as follows:

- It is recommended that prior to development works of the building at Warryfield Farm, an inspection by a qualified ecologist is undertaken for fresh evidence of roosting or nesting barn owls. If any evidence is found of nesting/current use, further surveys or mitigation might be required; and
- To mitigate for loss of a barn owl roosting site, an artificial roost/nesting box located away from any likely disturbance, and easily visible to barn owls, should be provided.

5.4 Biodiversity Enhancements

Current planning policy requires that development projects minimise ecological damage and should contain elements of ecological enhancement. A variety of planting options, to fit in with landscaping proposals, insect chamber boxes, and bat and bird roosting options should be implemented at the site to enhance biodiversity; these should be in addition to measures detailed within mitigation/compensation plan. Suggested enhancements are provided in Section 6.

5.5 Validity of report

Bats may move and change roosts, and numbers of individuals or species in any one roosting location may increase or decrease at any time. Consequently, if the proposed development does not start before May 2020, further bat surveys are likely to be needed.

6 ECOLOGICAL ENHANCEMENTS

Current planning policy requires that development projects minimise ecological damage and should contain elements of ecological enhancement. The Natural Environment White Paper (2011) and National Planning Policy Framework (2018) require that development results in net gains for biodiversity.

Landscaping proposals should include planting that provides biodiversity benefits for invertebrates, small mammals, birds, amphibians and reptiles. Options provided below are designed to ensure provision of new foraging areas, features for refuge, breeding and shelter (e.g. insect chamber boxes, bug hotel), and to make sure that habitat connectivity within the area is retained, wherever possible. Enhancement measures should consider species listed in the Herefordshire Local Biodiversity Action Plan¹, species of Principal Importance for the purpose of conserving biodiversity within section 41 of the Natural Environment and Rural Communities Act 2006, and bird species of conservation concern².

A variety of bat and bird roosting options could also be implemented at the site to ensure future opportunities for roosting bats and/or nesting birds. The following would be considered appropriate options for the site **in addition** to measures outlined within the Bat and Bird Method Statement (Appendix 3).

6.1 Planting Enhancements

1) Grassland

Areas of new amenity grassland to form the lawns of the new residential units should be sown, or supplied as turf, and comprise a species-rich grassland mix, containing low-flowering species suitable for short-mown grassland, such as daisy *Bellis perennis*, wild thyme *Thymus polytrichus*, lawn chamomile *Anthemis nobilis*, violets *Viola* sp., red clover *Trifolium pratense*, selfheal *Prunella vulgaris* and birds-foot trefoil *Lotus corniculatus*.

An example of a suitable species-rich grassland mix includes Emorsgate EL1 flowering lawn mixture: <https://wildseed.co.uk/mixtures/view/56>.

2) Shrubs and herbaceous borders

Planting borders of flowering shrubs and herbs will enhance the site for pollinating insects by providing a rich source of pollen and nectar. Species should be selected so that the overall plant assemblage provides a year-round supply of nectar/pollen which would attract pollinating invertebrates, such as bees, hoverflies, butterflies

¹ <https://herefordshirewildlifelink.wordpress.com/biodiversity-action-plan/>

² Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. and Gregory, R.D. (2015). *Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man*. British Birds 108, 708–746.

and moths. In turn, these will provide a valuable food resource for birds, bats, amphibians and other animals. Suitable low maintenance shrub and herb species include:

- Holly *Ilex aquifolium*
- Dogwood *Cornus sanguinea*
- Spindle *Euonymus europaeus*
- Guelder rose *Viburnum opulus*
- Honeysuckle *Lonicera periclymenum*
- Stonecrops *Sedum* spp.
- Firethorn *Pyracantha* spp.
- Barberry *Berberis* spp.
- Lavender *Lavendula* spp.
- Rosemary *Rosemaria* spp.
- Red valerian *Centranthus ruber*
- Hebe *Hebe* spp.
- Common jasmine *Jasminum officinale*
- Evening primrose *Oenothera* spp.
- Night-scented stock *Matthiola longipetala*
- Ornamental tobacco *Nicotiana glauca*
- Marjoram *Origanum vulgare*

3) **Hedgerow and trees**

Site and residential unit boundaries can be enhanced by planting of native hedgerow and broadleaved tree species. Existing species-poor hedgerows on the site's peripheral boundaries can also be improved by planting a variety of woody species and/or hedgerow trees. This will improve the connectivity and provide benefits for invertebrates, amphibians, reptiles, nesting birds, small terrestrial mammals and bats. Native species to be used in this planting should be taken from the list below (ornamental varieties should not be used in new hedgerow planting).

New/additional hedgerow and hedgerow tree species should include the following:

- Oak *Quercus robur*
- Hawthorn *Crataegus monogyna*
- Blackthorn *Prunus spinosa*
- Wild privet *Ligustrum vulgare*
- Field maple *Acer campestre*
- Hazel *Corylus avellana*
- Rowan *Sorbus aucuparia*
- Guelder rose *Viburnum opulus*
- Holly *Ilex aquifolium*
- Dogwood *Cornus sanguinea*
- Goat willow *Salix caprea*

Planting of trees should also include berry-bearing species and could include specimens of the following species:

- Wild crab *Malus sylvestris* or other apple *Malus* sp. varieties
- Pear *Pyrus* sp.
- Bullace/damson *Prunus domestica* ssp. *insititia*
- Plum *Prunus domestica*
- Rowan *Sorbus aucuparia*
- Cherry *Prunus* sp. varieties

6.2 Insect Chamber Boxes

The site could be enhanced by provision of insect chamber box products, installed on suitable walls or fencing in sunny locations. Suggested products include the following:

- Schwegler woodcrete insect nesting aid
- Schwegler clay and reed insect nest
- Mini insect house



Figure 7: Schwegler woodcrete insect nesting aid (left) and Schwegler clay and reed insect nest (right)



Figure 8: Mini insect house



Figure 9: Bee Bricks



Figure 10: Bee Block



Figure 11: Bug hotel

6.3 Bat Roosting Enhancements

Bat roost boxes could be installed on the site, on suitable trees or walls, to provide new opportunities for roosting bats. Suitable bat roosting box products include:

- Schwegler 1FQ bat box
- Beaumaris Woodstone bat box



Figure 12: Schwegler 1FQ bat box (left) and Beaumaris Woodstone bat box (right)

Suitable bat boxes products to be installed on existing trees include:

- Schwegler 1FF bat box
- Schwegler 2FN bat box
- Schwegler 1FD bat box



Figure 13: Schwegler 1FF bat box (left), Schwegler 2FN bat box (middle) & Schwegler 1FD bat box

6.4 Bird Nesting Enhancements

Bird boxes could be installed within the site, such as on suitable trees or walls, to provide new opportunities for notable and common garden bird species for nesting.

Suitable bird nesting box products include:

- Schwegler 1B nest box
- Traditional wooden nest box
- Open fronted wooden nest box
- 3S Schwegler starling nest box
- Schwegler 9A house martin nests



Figure 14: from left to right - Schwegler 1B nest box, Schwegler 2H robin box, open-fronted wooden nest box



Figure 15: 3A Schwegler starling nest box



Figure 16: Schwegler 9A house martin nests

Suitable bird box products to be integrated into areas of new extension walling include:

- Habibat 003 swift box



Figure 17: Habibat 003 swift box

7 LEGISLATION AND PLANNING POLICY

7.1 Introduction

This section briefly describes legal protection/planning policy applying to species or habitats mentioned in this report. It does not comprehensively reflect the text of the legislation/policy and it should not be relied upon in place of it. The following documents are relevant:

- The Local Government Act 1985;
- The Wildlife and Countryside Act 1981 (as amended);
- The Environmental Protection Act 1990;
- The Countryside and Rights of Way (CROW) Act 2000 (in England and Wales);
- The Natural Environment and Rural Communities (NERC) Act 2006;
- Conservation of Habitats and Species Regulations 2010 (which implements the Habitats Directive 92/43/EEC and parts of the Birds Directive 2009/147/EC in the United Kingdom)
- EU Regulation 1143/2014 on Invasive Alien Species;
- The National Environment White Paper (England) (DEFRA, 2011);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (DEFRA, 2011), which underpins the UK Post-2010 Biodiversity Framework (JNCC & DEFRA, 2012);
- National Planning Policy Framework (DCLG, 2012); and
- Herefordshire Local Plan, adopted 16th October 2015.

7.2 All species of British bat

All species of British bat (*Vespertilionidae* and *Rhinolophidae*) are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and receive some limited protection under Section 9. These species are also all listed as European Protected Species in Schedule 2 of The Conservation of Habitats and Species Regulations 2017 (which implements the EC Directive 92/43/EEC in the United Kingdom), which gives them full protection under Regulation 43.

It is also an offence to set and use articles capable of catching, injuring or killing such species (for example a trap or poison), or knowingly cause or permit such an action.

Seven species of British bat are listed as species of principal importance for the purpose of conserving biodiversity in England under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

7.3 Birds

All species of bird are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended). Protection was extended by the Countryside and Rights of Way (CROW) Act 2000.

Certain species, including barn owl *Tyto alba*, are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and receive protection under Sections 1(4) and 1(5). The protection was extended by the Countryside and Rights of Way (CRoW) Act 2000. There are special penalties where offences are committed for any Schedule 1 species.

8 RELEVANT LITERATURE

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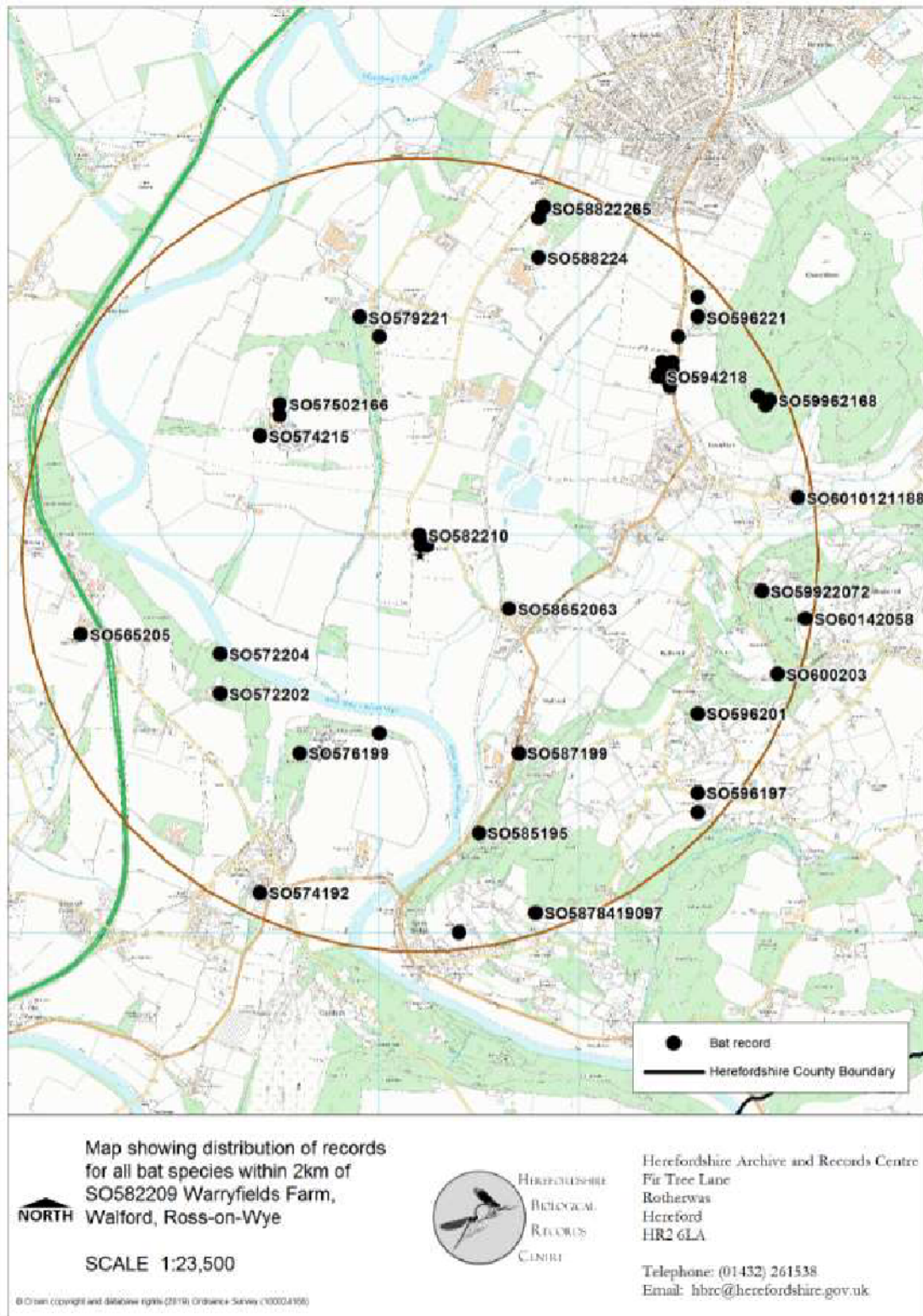
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APPENDIX 1: BAT RECORDS WITHIN 2 KM



APPENDIX 2: BAT ACTIVITY SURVEY RESULTS

Table A2.1: Bat Activity Survey Results from the dusk survey on 22nd July 2019 at Warryfield Farm. Bold text indicates a bat confirmed, probably or possibly emerging from, entering or flying within a building. HNS = heard not seen.

| Time | Species | Activity |
|-------------------------|---|--|
| Surveyor 1 – NUD | | |
| 2120 | Lesser horseshoe bat | Roosting on roof timber in granary roof |
| 2120 | Brown long-eared bat | Roosting on roof board in granary roof |
| 2152 | Common pipistrelle | Commuting pass west side of barn 2. HNS. |
| 2154 | Brown long-eared bat | Brief pass. HNS. |
| 2158 | Common pipistrelle | Foraging pass. HNS. |
| 2200 | Lesser horseshoe bat, brown long-eared bat | Still roosting in granary |
| 2206 | Common pipistrelle | Very brief pass. HNS. |
| 2210 | Common pipistrelle | Foraging pass. HNS. |
| 2213 | Common pipistrelle | Foraging pass. HNS. |
| 2215 | Brown long-eared bat | Emerged through south doorway of barn 1 |
| 2215 | Noctule | Overhead pass, HNS. |
| 2218 | Soprano pipistrelle | Foraging pass. HNS. |
| 2223 | Large bat | Pass. HNS. Peak frequency 27 kHz. Possibly serotine. |
| 2224 | Common pipistrelle | Foraging pass. HNS. |
| 2228 | Soprano pipistrelle | Foraging pass. HNS. |
| 2231 | Large bat | Pass. HNS. Peak frequency 27 kHz. Possibly serotine. |
| 2300 | Lesser horseshoe bat | No longer roosting in granary |
| 2300 | Brown long-eared bat | Still roosting in granary |
| Surveyor 2 - CL | | |
| 2143 | Common pipistrelle | Emerged from N pitch of east gable end of barn 1 |
| 2152 | Common pipistrelle | 1 commuting pass HNS |
| 2157 | Common pipistrelle | 1 circled from W to N to E round buildings |
| 2205 | Common pipistrelle | 1 circling in courtyard |
| 2210 | Bat species | Non-echolocating bat flying over courtyard W to E |
| 2211 | Common pipistrelle | 1 commuting N to S over courtyard |
| 2213 | Soprano pipistrelle | 2 passes HNS |
| 2215 | Bat species | Seen not heard; flew through open doors of barn 1 |
| 2220 | Common pipistrelle | Faint call HNS |
| 2224- 2227 | Common and soprano pipistrelle | Occasional commuting/foraging passes |
| 2231 | Common pipistrelle | 1 pass |
| 2234 - 2300 | Common and soprano pipistrelle | Occasional commuting/foraging passes across courtyard until end of survey |
| 2246 | Bat species | Possible big bat; no recording due to interference on detector |

| Time | Species | Activity |
|------------------------|---------------------------------|---|
| Surveyor 3 - RT | | |
| 2155 | Common pipistrelle | HNS |
| 2200 | Common pipistrelle | HNS |
| 2209 | Soprano pipistrelle | Flew from field opposite towards and over barn. |
| 2213 | Common pipistrelle | Flew down side of barn towards me. |
| 2115 | Brown long eared | HNS |
| 2117 | Common pipistrelle | Flew from field opposite towards barn. |
| 2118 | Common pipistrelle | Foraging along lane. |
| 2221 | Common pipistrelle | HNS |
| 2226 | <i>Myotis</i> sp. | HNS |
| 2230 | Common pipistrelle | HNS |
| 2232 | Common pipistrelle | Foraging along lane |
| 2233 | Unknown bat | Low flying large bat? HNS |
| 2236 | Soprano pipistrelle | HNS |
| 2238 | Common pipistrelle | Foraging along lane until end of survey. |
| Surveyor 4 - LK | | |
| 2142 | Common pipistrelle | Shown on screen but not seen or heard |
| 2152 | Common pipistrelle | HNS |
| 2158 | Common pipistrelle | Flew over roof of barn towards surveyor |
| 2158 | Noctule | HNS |
| 2201 | Common pipistrelle (2) | Flew from east to west along road verge |
| 2205 | Noctule | HNS |
| 2206 | Soprano pipistrelle | HNS |
| 2207 | Soprano pipistrelle | Foraging in front of barn then flew off to east |
| 2210 | Lesser horseshoe | Brief, HNS |
| 2210 | Soprano pipistrelle | HNS |
| 2211 | Common pipistrelle | Foraging in front of barn |
| 2212 | Soprano pipistrelle | Flew along verge west to east |
| 2213- 2216 | Noctule | Three passes |
| 2214- 2223 | Soprano pipistrelle | HNS, frequent passes with occasional social calling |
| 2221 | Big bat | Around 25-30 khz |
| 2223 | Big bat | Around 25-30 khz |
| 2225 | Common pipistrelle | HNS |
| 2226- 2255 | Common and soprano pipistrelles | Frequent passes to end of survey |
| Surveyor 5 - DS | | |
| 2141 | Common pipistrelle | Pass. HNS. |
| 2152 | Common pipistrelle | Flew from road up access track. |
| 2157 | Common pipistrelle | Flew overhead and along access track. |
| 2158 | Common pipistrelle | Foraging above and behind for 5 minutes. |
| 2205 | Common pipistrelle | Foraging overhead. |
| 2207 | Common pipistrelle | Foraging overhead. |

| Time | Species | Activity |
|------------------------|---|--|
| 2210 | Soprano pipistrelle | Foraging passes. |
| 2211 | Common pipistrelle | Foraging passes. |
| 2213 | Noctule | Commuting pass overhead. |
| 2214 | Common pipistrelle | Foraging passes. |
| 2215 | Noctule | Overhead pass. |
| 2217 | Soprano pipistrelle | Foraging passes. |
| 2218 | Soprano pipistrelle | Foraging passes. |
| 2220 | Common pipistrelle | Foraging passes. |
| 2222 | Large bat | 20-30 kHz |
| 2225 | Common pipistrelle, soprano pipistrelle | Foraging passes of both bats |
| 2231 | Large bat | 20-30 kHz |
| 2247 | Brown long-eared bat | HNS. |
| Surveyor 6 – MS | | |
| 2124 | Noctule | Heard, not seen. Distant calls |
| 2142 | Common pipistrelle | Commuting pass from west to east. From direction of Warryfield Cottage. |
| 2149 | Noctule | Heard, not seen. Distant calls |
| 2153 | Common pipistrelle | Commuting pass from west to east. From direction of Warryfield Cottage. |
| 2156 | Common pipistrelle | Commuting pass from east to west along hedge line south of granary |
| 2157 | Noctule | Heard, not seen. |
| 2158 | Common pipistrelle | Foraging in yard area west of granary |
| 2159 | Common pipistrelle | Two bats chasing from east to west over yard area |
| 2202-end | Common pipistrelle (1-2) | Frequent foraging and commuting passes mainly from east to west or west to east along hedge line south of granary and around yard |
| 2205 | Noctule | Heard, not seen. |
| 2206 | Soprano pipistrelle | Heard, not seen. |
| 2208 | <i>Myotis</i> sp. | Commuting pass from east to west and back again along hedge line south of granary. BatClassify results of 0.8 and 0.88 probability whiskered/Brandt's for each pass respectively |
| 2213 | Soprano pipistrelle | Multiple passes around yard west of granary |
| 2213 | Noctule | Heard, not seen. |
| 2215 | Brown long-eared bat | Faint passes. Heard not seen. |
| 2219-end | Soprano pipistrelle | Frequent foraging and commuting passes mainly from east to west or west to east along hedge line south of granary and around yard |
| 2223 | Large bat | Possible Leisler's (FmaxE 28 kHz), but more possibly low flying noctule. Heard, not seen. |
| 2227-end | Large bat | Intermittent passes as above. Heard, not seen. |

| Time | Species | Activity |
|------|-------------------|---|
| 2229 | <i>Myotis</i> sp. | Commuting pass from east to west and back again along hedge line south of granary. BatClassify results of 0.89 and 0.87 probability whiskered/Brandt's for each pass respectively |

Table A2.2: Bat Activity Static Detector Survey Results from the dusk survey on 22nd July 2019 at Warryfield Farm.

| Time | Species |
|---------------------|--|
| Barn 1: SM4 | |
| 2122 | Common pipistrelle |
| Granary: SM4 | |
| 2104-2240 | 7 recordings of lesser horseshoe bat |
| 2157 | Common pipistrelle (poor quality recording, probably of a bat flying close by outside of the building) |

Table A2.3: Bat Activity Survey Results from the dawn survey 6th August 2019 at Warryfield Farm. Bold text indicates a bat confirmed, probably or possibly emerging from, entering or flying within a building. HNS = heard not seen.

| Time | Species | Activity |
|-------------------------|-----------------------------|---|
| Surveyor 1 (NUD) | | |
| 0400 | none | Internal inspection of barns and granary – no BLE or LHS bats present |
| 0430 | none | Internal inspection of barns and granary – no BLE or LHS bats present |
| 0452 | Lesser horseshoe bat | Entered ground floor of granary through partially blocked doorway on west elevation. Went to roost in smaller west room. |
| 0500 | none | Internal inspection of barns – no BLE or LHS bats present |
| 0515 | Lesser horseshoe bat | Bat roosting in small ground floor western room (as above) |
| 0520 | none | Internal inspection of barns – no BLE or LHS bats present |
| 0540 | none | Final check of barns – no bats visible roosting |
| Surveyor 1 (CL) | | |
| 0423 | Common pipistrelle | Brief pass. HNS. |
| 0449 | Lesser horseshoe bat | Brief pass from north-east over wall. |
| 0450 | Bat sp. | Non-echolocating bat flew past south elevation of barn 1 heading west. |
| 0506 | Soprano pipistrelle | Faint pass. HNS. |
| Surveyor 1 (RT) | | |
| 0406 | Common pipistrelle | Foraging along road. |
| 0436 | Common pipistrelle | Foraging along road. |

| Time | Species | Activity |
|------------------------|---|---|
| 0438 | Soprano pipistrelle | Foraging pass. HNS. |
| 0452 | Common pipistrelle | Foraging pass. HNS. |
| 0509 | Common pipistrelle | Flew eastwards along lane past north elevation of barn 1. |
| 0511 | Common pipistrelle | Brief pass. HNS. |
| Surveyor 1 (JB) | | |
| 0356 | Common pipistrelle | Foraging passes along lane. |
| 0358 | Soprano pipistrelle | Foraging passes along lane. |
| 0419-0445 | Common pipistrelle, soprano pipistrelle | Occasional foraging passes along lane, mostly common pipistrelle. |
| 0505 | Common pipistrelle | Faint passes. HNS. |
| 0507 | Common pipistrelle | Swarming near west gable of barn 1 then flew east along north elevation. |
| Surveyor 1 (MB) | | |
| 0400 | Soprano pipistrelle | Foraging pass. HNS. |
| 0400-0415 | n/a | Rain shower |
| 0438 | Soprano pipistrelle | Pass. HNS. |
| 0506-0507 | Common pipistrelle | Entered roost site beneath slate at western end of south roof pitch of barn 1 |
| Surveyor 1 (MS) | | |
| 0439 | Soprano pipistrelle | Observed commuting east to west to south of granary |
| 0458 | Common pipistrelle | Observed commuting west to east from direction of cottage and then back again |
| 0504 | Common pipistrelle | Observed commuting east to west to south of granary |

Table A2.4: Bat Activity Static Detector Survey Results from the dusk survey on 6th August 2019 at Warryfield Farm.

| Time | Species |
|---------------------|--------------------|
| Barn 1: SM2+ | |
| 0457 | Common pipistrelle |
| 0504 | Common pipistrelle |

APPENDIX 3 BAT AND BIRD MITIGATION PLAN

1 *Introduction*

In order to ensure that bats are not harmed during the renovation and conversion works of the granary and barns at Warryfield Farm, the method statement contains the following elements:

- Toolbox talk to contractors, and ecological supervision of works to bat roosts to ensure minimal disturbance to bats, and avoidance of killing or injury to bats;
- Timing or phasing of works to avoid the most sensitive periods for bats;
- Provision of temporary roosting sites for bats in undisturbed locations during the course of works;
- Provision of new dedicated bat roosting areas, features and access points for the bat species present;
- Use of traditional bitumastic roofing felt in all areas of roof to be used by bats; breathable roofing membranes will not be used;
- Working methods to ensure minimal disturbance to bats and other protected species;
- Methods to be followed in the event of a bat being discovered during works;
- Use of approved timber treatment chemicals, if required;
- Retention of the integrity of bat flight lines to and from roost access points, and control of external lighting; and
- Final site check to ensure compliance with the mitigation strategy.

2 *General Measures*

A site agent will be appointed to ensure that the details of the mitigation strategy are complied with, copies of which will be available on site. Contractors will be made aware of the procedures to be followed in the unlikely event that bats are found during the works in the absence of an experienced bat ecologist. Contractors will be given a 'toolbox talk' by the ecologist at the commencement of works so that they are aware of the particular issues relating to this site and their responsibilities in the event of a bat being found in the absence of an ecologist (see below).

The site briefing will cover the following topics:

- that bats may be present;
- the legislation relating to bats;
- measures that will be used to protect bats and their roosts;
- good working practices;
- licensable activities; and
- what to do should bats be found in the absence of an ecologist.

This information will be provided before any works commence on site and a written record that this has been undertaken will be kept.

3 *Provision of Bat Boxes*

Prior to commencement of works, two Schwegler 1FF (or similar) bat boxes and one Schwegler 2FN bat box will be installed on suitable nearby trees or building walls at a height of at least 3 m and preferably facing SE, S or SW. The location will be agreed with the ecologist prior to installation.

The bat boxes provided will remain in place for at least 5 years. If bats use the boxes to roost, then they cannot be removed without a bat licence.

4 *Timing of Works*

During conversion works to the barns and granary, removal of any of the roof structures (including tiles, sheeting, lining, lead flashing and any other roofing materials) and internal works affecting roof voids will take place under supervision from an ecologist to ensure that bats are not harmed during the works (see Section 5 below).

Works to the buildings will avoid the winter hibernation period (December to February inclusive) when bats are potentially hibernating in the roof structures, wall cavities and other crevices, and thus are at their most vulnerable. Licensed works should be timed to avoid this period.

No works will occur during the hours of darkness, so as to avoid impacts upon bats that forage on, or commute across, the site.

Any works during the breeding bird season will be preceded by a check for the presence of nesting birds. If nesting birds are present and works cannot proceed without disturbing them, then works must be halted until all chicks have fledged and left the nest.

The granary will be checked by a suitably experienced and licensed (barn owl survey licence) ecologist for any fresh evidence of roosting/nesting barn owl. If any fresh evidence is found of nesting/current use works must not proceed and further surveys might be required.

5 *Working Methods*

Immediately prior to the commencement of works affecting the roof structures and other known roost sites (e.g. granary and barn 1 lesser horseshoe roost sites) a licensed bat ecologist will check these areas internally and externally to look for any roosting bats, so far as it is safe to do so. Should any roosting bats be found they will be identified, and their numbers determined to ensure that there is no conflict with the stipulations in the EPS licence. Capture and exclusion procedures will be undertaken according to the conditions of the licence.

All roofing materials will be removed carefully by hand, with contractors briefly inspecting any potential roosting spaces so revealed for the presence of bats. A licensed bat ecologist will be present during this process in order to recover any bats

that are revealed. Any roosting bats revealed during this process will be transferred to a pre-installed bat box.

All suitable crevices in walls or roof structures of the buildings will be inspected by the ecologist using an endoscope and torch. If bats are present and cannot be safely captured, or the absence of bats cannot be confirmed, then exclusion methods will be applied, to allow bats to escape but not return to the roost areas. Exclusion devices will need to remain in place for sufficient time and in suitable weather conditions to give confidence that bats have dispersed. This will be advised by the ecologist.

At other times a licensed bat worker or accredited agent will be available at short notice should bats be found.

6 New Bat Roost and Bird Box Provision

1) Common and soprano pipistrelle bats

Provision for roosting common and soprano pipistrelle bats will be incorporated into the external fabric of the granary and barns as part of the mitigation. This will comprise a minimum of ten crevice-roosting access opportunities suitable for pipistrelle bat species, with two located on the roof of the granary and eight located on the roof of barn 1.

The roost features will comprise either mortar gaps beneath ridge tiles, bat access slates incorporated into the roofs, located at approximately mid- to two-thirds pitch height, or a mixture of both of the above. Indicative locations of ridge tile access/access slates are shown in Figure A3.1.

Modern breathable membranes must not be used during the conversion of the buildings in any areas where crevice roost features are to be installed as bats can become entangled within it; instead, traditional bituminous type 1F roofing felt should be used.

Dry ridge systems will also NOT be used and ridge tiles will be bedded with mortar.

It is essential that any external lighting is located and/or directed away from all new crevice roost features and access points.

Suitable products include the following:

- Habibat Access Slate (Figure A3.2)
- Habibat lead access tile (Figure A3.3)
- Morris bat slate or similar lead access tile (DIY) (Figure A3.4)

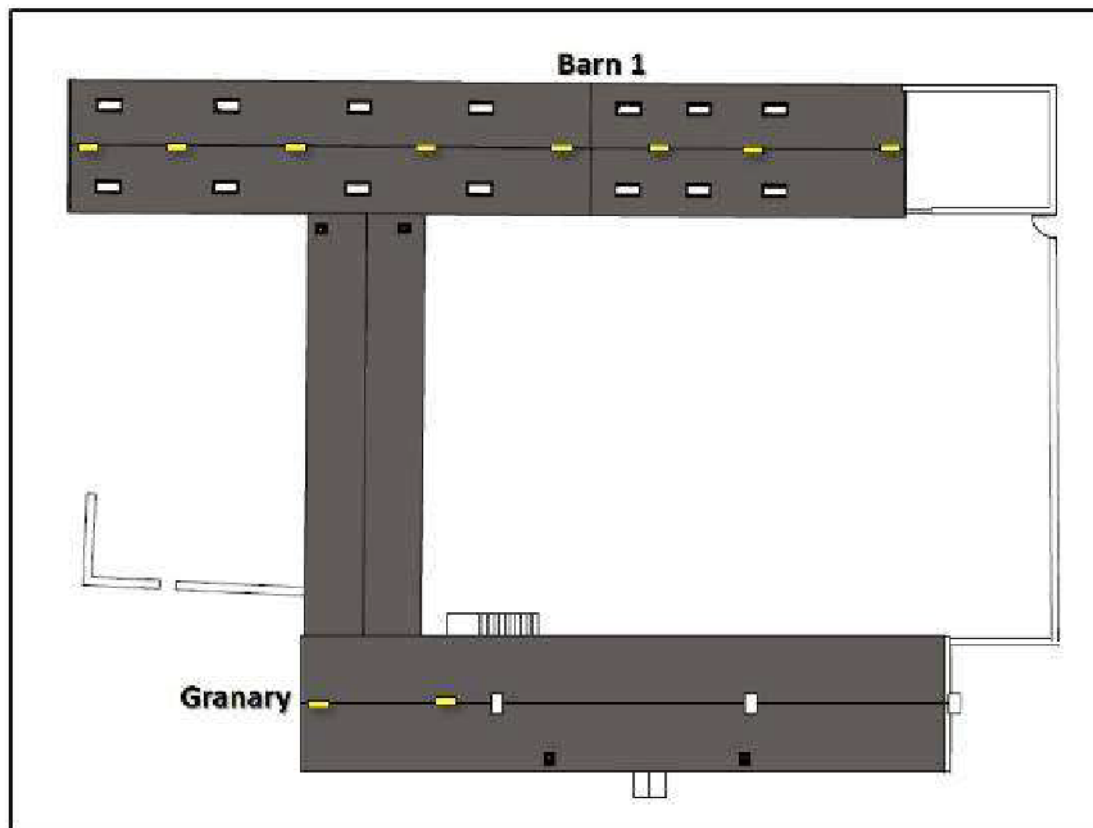


Figure A3.1: Indicative locations (yellow rectangles) of ridge tile bat access gaps or bat access tiles on the roofs of the granary and barn 1.



Figure A3.2: Habibat access slate



Figure A3.3: Habibat lead access tile



Figure A3.4: Morris bat slate (left) or similar lead access feature (right)

2) *Lesser horseshoe and brown long-eared bats*

Provision for roosting lesser horseshoe and brown long-eared bats will be incorporated into an adjacent outbuilding a few metres to the west of the granary, upon the same site (Figure A3.5). An enclosed bat loft will be incorporated into the roof void of the building providing access and roosting opportunities for both species (Figure A3.6). The building will remain open-fronted, and thus will also provide suitable post-emergence cover, particularly for lesser horseshoe bats which regularly use such structures for light sampling.

In addition, an enclosed barn owl nest/roost box will be incorporated into the south part of the building, with the box entrance high up in the south gable wall overlooking the field of rough grassland to the immediate south.

The open-fronted outbuilding measures approximately 12.3 m long by 6.3 m wide, and is roughly 2.95 m from the top of the ties of the trusses to the ridge at the roof apex. An enclosed dedicated bat loft will be constructed in the southern half of the roof space from plywood boarding and will contain the following features:

- Enclosed dedicated bat loft measuring approximately 6.3 m wide by 6 m long and roughly 2.75 m at its highest point;
- Wooden plywood flooring and internal north gable wall;
- Internal plywood baffle on Kingpost/principle rafters to half-height, to compartmentalize void for lesser horseshoe bats;
- Horseshoe fly-in access (3000 mm long by 200 mm high) in internal north gable walling, with 'turnstile' baffle;
- Plywood 'hotbox' for lesser horseshoe bats;
- Up-and-over crawl access for brown long-eared bats at apex of internal north gable wall;
- Crevice roost features installed in void for brown long-eared and other bat species; and
- Human access hatch for monitoring/inspection purposes.



Figure A3.5: Location of bat roost provision for lesser horseshoe and brown long-eared bats in nearby outbuilding (outlined in blue). The granary and barns 1 and 2 are outlined in red.

3) **Barn owl box**

The barn owl nest/roost box will be attached to the internal south gable wall of the building and will contain the following features:

- Plywood box measuring at least 1.25 m wide by 1.25 m long, and 1.5 m deep;
- Entrance hole in south gable stone wall, measuring 125 mm wide by 250 mm high;
- Small ledge on outside of entrance hole for landing/take off;
- No access for owls into bat loft; and
- Small access hatch on north side for occasional cleaning.

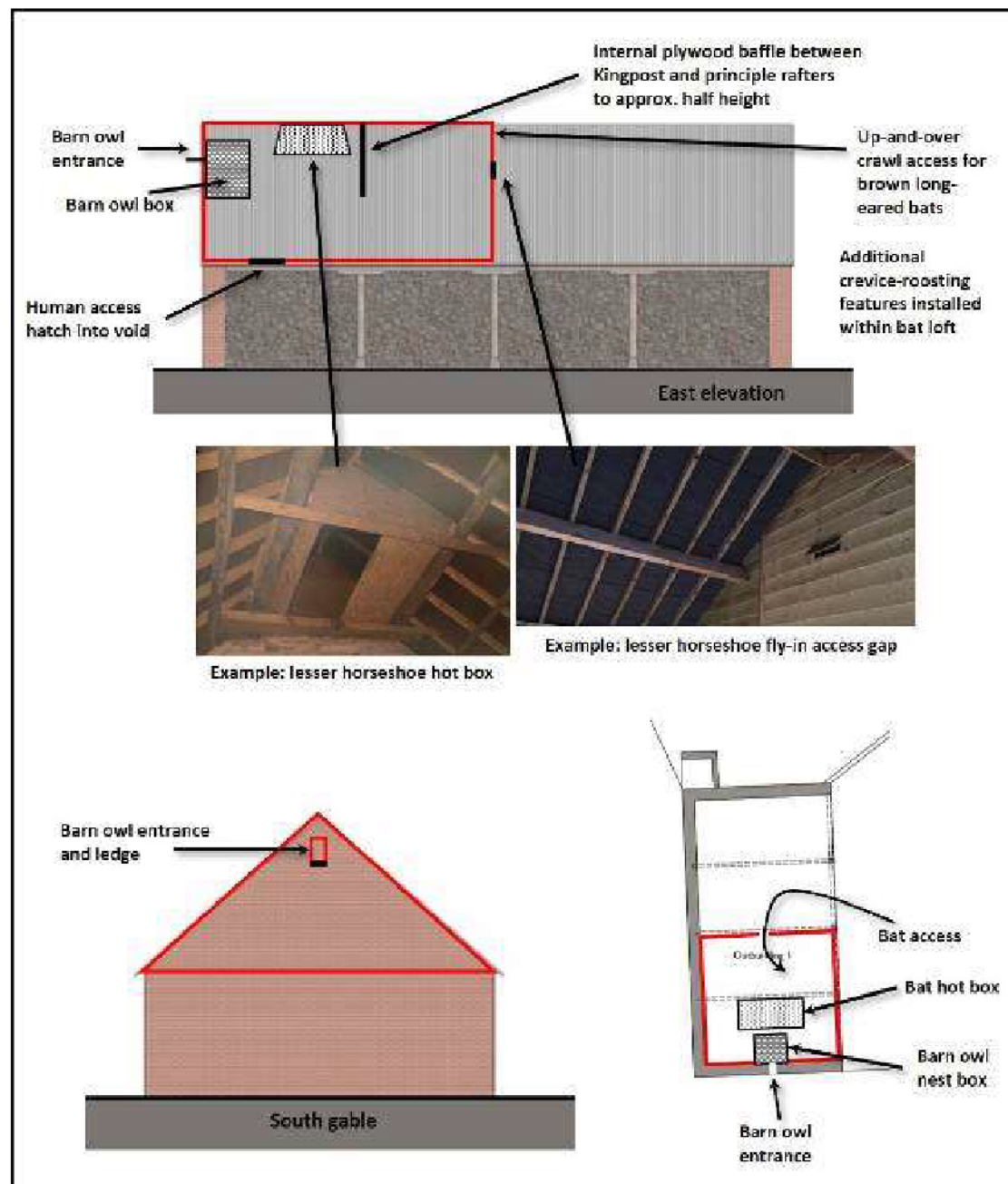


Figure A3.5: Bat roost provision for lesser horseshoe and brown long-eared bats in outbuilding. Dedicated bat loft, measuring approx. 6.3 m wide by 6 m long and 2.75 m high, outlined in red; Enclosed barn owl nest/roost box incorporated onto internal south gable walling, with owl access in south gable wall.

4) *House sparrow, barn swallow and other bird species*

The granary and barns support nesting birds including house sparrow and barn swallow, both of high (red-listed) conservation concern³.

The proposed development will result in the loss of existing nesting sites for both species, and thus provision will be made by installation of new nesting opportunities for these species, include the following:

- Installation of three new Schwegler 1SP sparrow terrace boxes (Figure A3.6) immediately below the eaves, or house sparrow nest boxes integrated into the walling (Figures A3.7 and A3.8), in suitable locations on the west and north elevations of the granary and barn 1.
- Installation of four No. 10 Schwegler swallow nest cups (Figure A3.9), in suitable locations high up on timbers or walling within the two open-fronted outbuildings to the west of the barns and granary (see Figure A3.5).
- Installation of three additional bird nesting boxes for other species, such as starling and robin (see Section 6.4 for suitable nest boxes).



Figure A3.6: Schwegler 1SP sparrow terrace



Figure A3.7: Habibat terraced sparrow box

³ Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. and Gregory, R.D. (2015). *Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man*. British Birds 108, 708–746.



Figure A3.8: WoodStone Build-in House Sparrow Nest Box



Figure A3.9: No. 10 Schwegler swallow nest

7 Timber Treatment

Should timber treatment be required, only those products approved by Natural England will be used in this development. Advice on suitable timber treatment products and active ingredients approved for use in bat roosts can be found via the link below to the gov.uk website (Bat roosts: use of chemical pest control products and timber treatments in or near them: <https://www.gov.uk/guidance/bat-roosts-use-of-chemical-pest-control-products-and-timber-treatments-in-or-near-them>).

8 Procedures in the Event of Discovering a Bat in the Absence of an Ecologist

All site workers will be made aware of the possibilities of finding bats and the procedure to follow should they be found when the ecologist is not on site.

If at any point a bat is discovered, contractors will stop work immediately and telephone an ecological professional qualified to deal with bats. Telephone numbers of such will be held on site (Swift Ecology numbers: 01299 890261 or 07719 329170).

Should any bats fall out of structures or be injured, they will be gently placed in a secure ventilated box (e.g. a cardboard box) and left in a cool dark place, until appropriate advice can be sought. Bats should not be handled without gloves.

9 *Retention of Flight Lines and Control of Lighting*

Any newly installed external lighting will be designed so as not to illuminate new roost access points, sparrow nest boxes and important flight lines to and from the new roosts/boxes. Any necessary external lighting will be located sensitively and will incorporate directional cowling to prevent light spill up towards the roofs. No night-time working will be carried out during the construction phase.

10 *Final Check and Monitoring*

The ecologist will visit the site on completion of the works to check that the method statement has been complied with and that any mitigation measures for bats have been installed correctly. Post-works monitoring will be carried out to assess the efficacy of the mitigation, and in line with EPS licence requirements for the species and roost types present.