ECOLOGY SURVEY REPORT

Barn and outbuildings at:

Lower Daffaluke Farm
Glewstone
HR9 6BB

September 2021

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Environmental Methods
Ecology & Environmental Consultancy

REPORT SUMMARY

1. Introduction

Lower Daffaluke Farm comprises various disused farm buildings and a main, occupied farm house. The owner proposes to renovate/replace four farm buildings, one of which is a large barn for conversion to habitable accommodation.

2. The survey

- A walkover survey and building assessment was carried out in summer 2021.
- Of the species of potential relevance for this site, it was assessed as providing sub-optimal / negligible habitat for **hazel dormice**, **great crested newts**, **badgers** and **reptiles.**
- **Bats** and **breeding birds** required further consideration.

All accessible internal and external areas of the four buildings were surveyed for potential bat roosting features and signs of any current or past use by bats and nesting birds.

Only the large barn provided any scope for bat roosting, with the other three buildings scoped out.

The barn was surveyed for bat activity during two dusk emergence and one dawn re-entry surveys during May, July and August 2021.

3. Result

Seven soprano pipistrelles, two common pipistrelles and **two long-eared (*plecotus sp.*)** bats were observed using the barn for summer (non-maternity) day resting roosts during the activity surveys.

4. Recommendations

Mitigation and compensation are required to ensure bats aren't harmed during conversion of the barn and to maintain future roosting for bats at the site. Therefore mitigation and compensation measures are detailed within a Method Statement provided in this report.

The property owners will need to apply for and obtain a **European Protected Species licence** from Natural England before works start on the building once planning permission is secured, and works will be carried out in accordance with the conditions of the licence once granted.

The Method Statement includes a timetable of works and measures that will be taken to ensure the protection of any bats discovered during the works. The bat ecologist will function as an Ecological Clerk of Works and provide a briefing to the contractors before work commences to explain the Method Statement and Bat Discovery Action Plan that will be followed.

5. Biodiversity enhancement

Two Vivara Pro WoodStone® Starling Boxes will be installed at the site. This will provide valuable nesting provision for these now red-listed birds. Red listing is the highest conservation priority, needing urgent action.

1.0 Introduction

Environmental Methods Consultancy was appointed to survey and present the findings of an assessment for bats and nesting birds for disused farm buildings at Lower Daffaluke Farm, Glewstone.

The property comprises various disused farm buildings and a main, occupied farm house. The owner proposes to renovate four farm buildings, one of which is a large barn for conversion to habitable accommodation.

The survey included a physical inspection of the four building's internal and external features for signs of usage by bats and nesting birds. Only the large barn provided any scope for bat roosting, with the other three buildings scoped out.

A methodology was adopted to provide a high confidence characterisation of the bat use of the barn comprising three standard bat flight emergence/re-entry surveys during summer 2021.

2.0 Site location and habitat

The buildings sit within the curtilage of Lower Daffaluke Farm. The surrounding landscape comprises mixed agricultural fields, small watercourse, lines of trees with hedged/tree-lined lanes.

The landscape is well connected, with surrounding habitat of high quality for supporting bats.

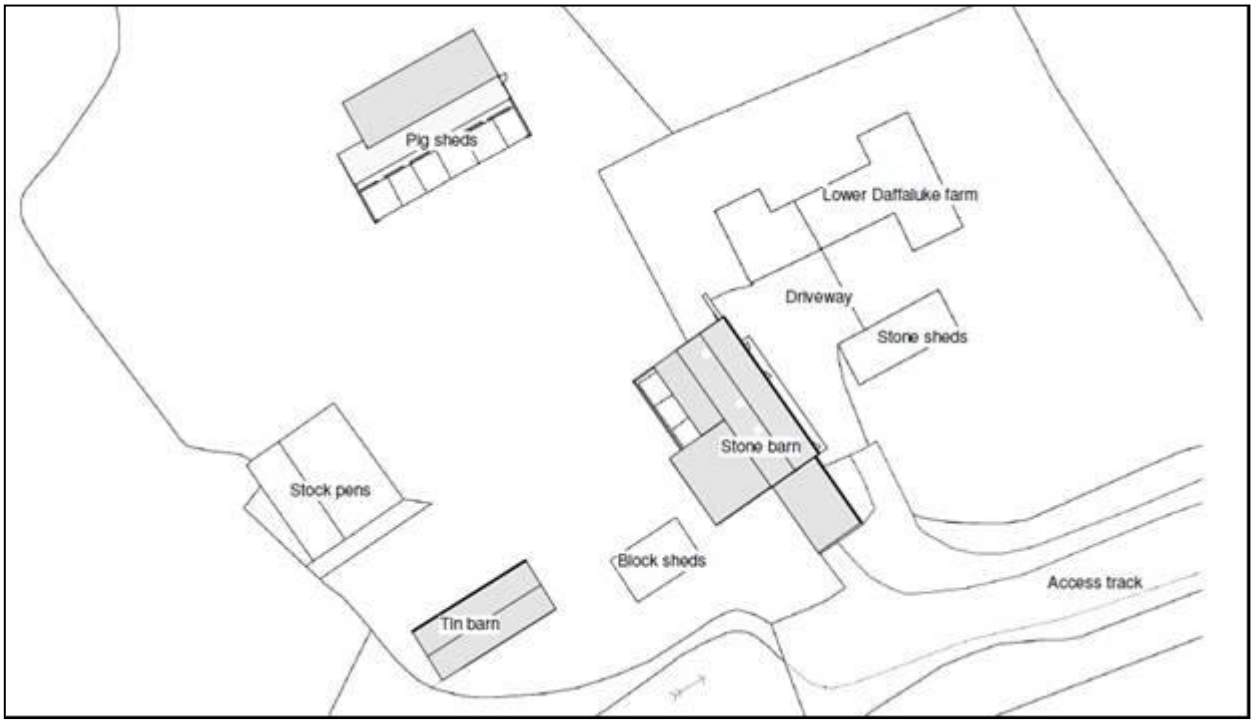

Figure 1 – *Site plan showing the existing farm buildings*

Figure 2 – *Aerial view showing wider landscape setting (property circled)*

- OS grid ref: **SO 55177 22969**
- Post code: **HR9 6BB**

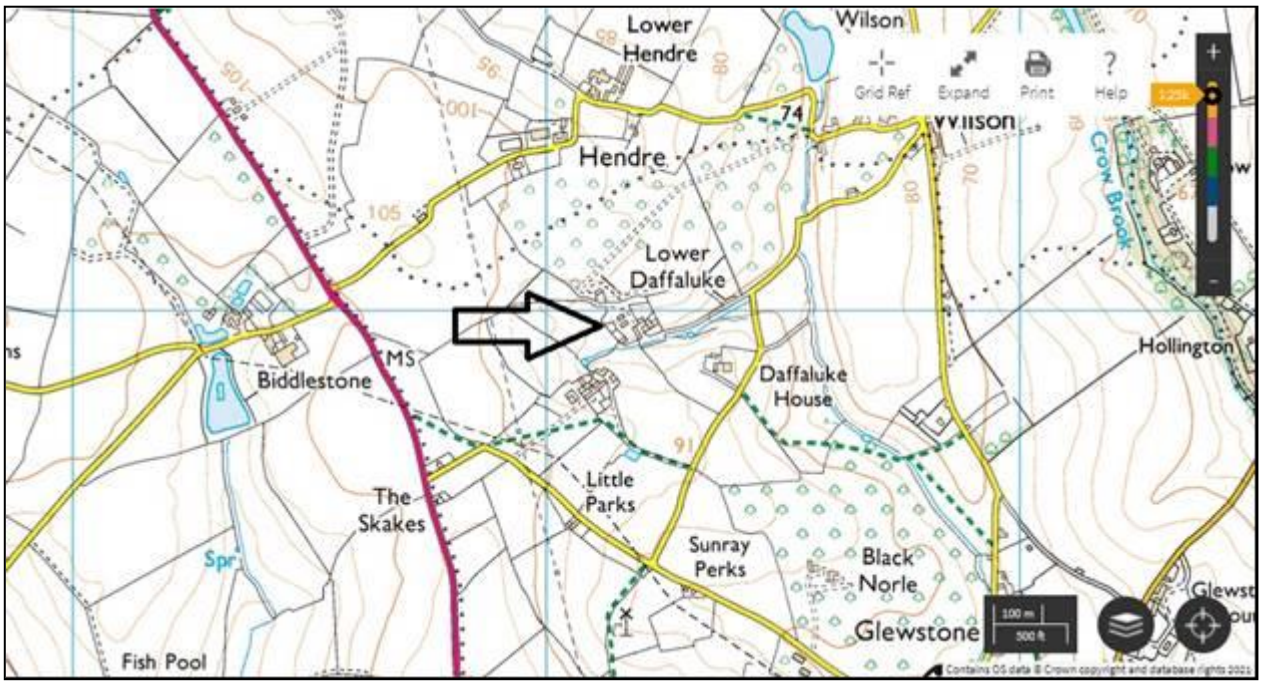

Figure 3 – *Ordnance Survey 2021 map showing site location*

3.0 Survey Objectives

a) Establish if the buildings are providing roosts for bats, which are all protected species whose disturbance may require consent by law (The Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2017), including evaluation of nearby associated features as supporting foraging areas;

b) Identify the species of any bats found to use the building, and subsequently characterise the roost if found, to enable suitable mitigation to be designed;

c) Identify any features or works that may require special attention during development.

4.0 Methodology

4.1 Data search

Data search
Guidelines suggest that a desk-top data search, including records procured from the local biological records centre is usually carried out as an initial step for bat surveys involving activity investigations.

It was regarded that it would be unreasonable to incur additional considerable expense for the client to have purchased such a data search when it would have been unlikely to have contributed any necessary context to the survey beyond the freely available data.

As such, a desk study was undertaken using the freely available Nature on the Map website to establish the presence of statutory conservation sites within 2km of the site as well as establishing whether any European Protected Species (EPS) licences have been granted within 2km of the scheme.

4.2 Building inspection survey

A physical inspection of the buildings was carried out in daylight to identify and assess internal and external features for their potential to support use by bats. The inspection also provided opportunities to search for any live bats present. Features were examined for signs of present and past use by bats including presence of bat droppings (a very useful indicator of species), surface smoothing, staining, urine deposits, crevice clearing and prey remains.

The following equipment was used:

- Bright LED torches
- Extendable ladder
- Digital camera and binoculars
- Google and Ordnance Survey mapping.

All relevant features of the buildings were inspected both inside and out, where necessary using binoculars to examine features beyond close range, and with a high powered torch to examine dark areas. Features included any crevices where bats may roost or any other signs of bat occupation.

4.3 Bat activity surveying

Upon inspection, the three smaller buildings were found to have negligible scope for use by bats.

Inspection of the barn revealed potential for roosting use by bats within various cracks and crevices, particularly at roof-wall junctions. Internally, a relatively light accumulation of bat droppings indicated use by small numbers of long-eared (*plecotus sp*.) bats.

Methodology

The barn was therefore surveyed for bat activity during two dusk emergence and one dawn entry surveys in summer 2021.

Two surveyors were positioned at a view points with clear sight of all relevant parts of the building and to provide maximum opportunity to detect bat emergence or re-entry into the building.

The surveyors used Batbox Duet frequency division / heterodyne bat detectors.

4.4 Survey assessment limitations

While no ecological survey can guarantee that all signs of species can be detected and exhaustively assessed, the surveyor is confident that the study method provides sufficient evidence to enable the building, bat use, and the impact on the protected species to be sufficiently characterised and evaluated.

5.0 Bat ecology

There are 18 bat species that breed in the UK. An additional 12 species have been recorded as vagrants from Europe or the USA with some arrivals known to be ship assisted. All the recorded species are insect eaters. Although occasionally seen in the day, they are predominantly nocturnal.

Most bats are colonial. They roost usually in groups but sometimes singly in trees, buildings, cave systems, mines and other structures that provide suitable environmental conditions for them.

A roost is defined as any structure or place used by bats for shelter and/or protection. Bats frequently re-use roosts from year to year, so the roost is protected at all times, whether the bats are present or not.

Damage to a roost can include chemical treatment using some wood preservatives and also the use of insecticides and pesticides that might affect the bats or their roost.

All bats that occur in the UK are Protected Species, meaning that it is an offence to harm or disturb them or their roosts, either intentionally or by accident.

Different species of bat have different life-cycle strategies and require different conditions. However, each requires:

- Hibernation roost sites, also known as hibernaculum. These are places where stable winter temperatures allow a period of winter torpor to conserve energy (e.g. underground sites such as caves and mines; built environments sometimes also offer similar conditions).
- Nursery/maternity roost sites, where females gather in spring and early summer to give birth and rear their offspring (e.g. roof spaces, including cracks and crevices e.g. within dry stone walls, in beam joints, under roof tiles, between slates and roof felt, etc.). Hollows in mature trees and cliff faces may also be utilized. At the end of the summer these roosts are generally vacated, sometimes to another site in the same building.
- Individual roost sites for solitary males or small congregations of males that congregate during spring, summer and autumn. These roosts are far less obvious than maternal roosts and consequently more difficult to find. Individual male bats may use more than one roosting site during the same season.
- The same colony may have different roost sites in various structures spread over several kilometres (or all within a single building).
- An ecologically diverse feeding environment is needed. This environment should be insect rich.
- There is a poorly understood need for social gathering sites at certain times of the year for some or possibly all species (e.g. the Autumn mating season and in early Spring, males and females may gather together).
- Other roosts such as feeding perches, overnight roosts and transition roosts between summer and winter roost sites also occur. Therefore, even if a major maternity roost or hibernacula is not present, a site might still be important for a colony for other reasons at other times in the year or in different weather conditions.

5.1 Legislation relevant to bats

- All bat species currently resident in the UK are regarded as either Species of Conservation Concern or Priority Species.

- All are mentioned in the 'EC Habitats and Species Directive'. Five species are included in Annex II: Barbastelle, Bechstein's, greater mouse-eared, greater horseshoe and lesser horseshoe. All 18 species are included in Annex IV.

- All are listed in Appendix 3 of the 'Bonn Convention 1979'.

- All are listed in Appendix 2 or 3 of the 'Bern Convention 1982'.

- All British bat species are protected under the 'Wildlife and Countryside Act 1981' (as amended). This requires consultation with the SNCO (Natural Resources Wales or Natural England, as appropriate) before carrying out any activities that might harm or disturb them. Amendments to this act in the 'Countryside and Rights of Way Act 2000' also protect from reckless and/or intentional disturbance or damage.

- All bat species were listed in Schedule 2 of the 'Conservation (Natural Habitats &c) Regulations 1994'. These were amended by the Conservation of Habitats & Species Regs 2017. Regulation 41 makes it an offence to deliberately capture or kill bats, to deliberately disturb a bat, damage or destroy a breeding site or resting site of any bat. It is an offence to disturb any bat roosting site.

- A UKSAP has been produced for common pipistrelle in addition to barbastelle, lesser and greater horseshoe bats.

- The presence of bats or their roosts does not always mean that development proposals cannot proceed. If suitable, approved mitigation is specified, exemptions can be granted from the protection afforded to bats under regulation 41 by means of a European Protected Species licence. The Statutory Nature Conservation Organisation (SNCO) responsible for determining and issuing licenses for works associated with developments affecting bats in Wales is Natural Resources Wales (NRW), and in England, Natural England.

6.0 Survey Results

6.1 Desk top data search

The data search included the immediate location and a 1km search radius for European Protected Species records, a 2km radius search area for statutory habitat site/land designations, and a 500m radius for local designations. A summary of the data is provided as follows:

6.1.1 Statutory sites related to bats within the search radius:

SSSIs

Site name	Distance from site (m)
River Wye SSSI	1600

6.1.2 Locally designated sites:

Site name	Location	Feature	Distance from grid (m)
None			

6.1.3 European Protected Species (EPS) licences granted within 2km of the site.

- No licence records were found for the site or its immediate surrounds;
- There are four EPS licences granted within the 2km search radius:
    - Common pipistrelle and brown long-eared bats in 2014, 305m to the south-west.
    - Great crested newt in 2014, 1.19km to the north-west.
    - Common pipistrelle and brown long-eared bats in 2013, 1.5km to the north-west.
    - Common and soprano pipistrelle, and brown long-eared bats in 2010, 1.5km to the west.

It must be noted that the results of the desktop survey are unlikely to be a true representation of the actual bat population in the area.

The records indicate that the wider landscape surrounding the site provides habitats of significance to bats. The immediate locality is well connected to the wider landscape and is therefore of high habitat significance. The survey was designed accordingly and the data provides context to the significance of the findings on the site.

6.2 Results of the inspection survey of the farm buildings

6.2.1 Pig sheds

The pig sheds building is of concrete block construction with a tiled pitched roof. A pole barn lean-to is attached to the northern side. It is currently used for housing a small number of animals.

All areas were carefully inspected, with binoculars and high-powered torch where necessary.

There are various cracks and crevices present, but all were either too large to be suitable for use by bats, or contained old cobwebs and debris indicating absence of use. No sign of use by bats were found, and there is negligible potential for such use.

Photo 1 *– South roof pitch*

Photo 2 *– North open pole barn section*

Photo 3 *– Pig stall interior*

Photo 4 *– No use under barge boards*

6.2.2 Tin barn

The tin barn is of framed construction with corrugated sheet wall and roof coverings. It is largely disused.

All areas were carefully inspected, with binoculars and high-powered torch as necessary.

There are no cracks and crevices suitable for use by bats present. No sign of use by bats were found, and there is negligible potential for such use.

Photo 5 *– General view of tin barn*

6.2.3 Block sheds

The block sheds are of concrete block construction with corrugated sheet roof coverings. They are disused.

All areas were carefully inspected, with binoculars and high-powered torch as necessary.

There are no cracks and crevices suitable for use by bats present. No sign of use by bats were found, and there is negligible potential for such use.

***Photo 6** – Block sheds north aspect*

***Photo 7** – South aspect*

***Photo 8** – Example block shed interior*

***Photo 9** – Gaps unsuitable / debris-filled at verges*

6.2.4 Main barn

The barn is a relatively large, traditional masonry-built detached barn. It has a large lean-to extension to the west façade and a garaging extension to the south.

The interior of the main barn has three rooms at ground floor level and two at first floor. The walls are constructed of stone, with roofs clad with corrugated sheets.

Internally, there are various gaps and crevices between masonry and structural timber elements suitable for potential use by bats. A very light scattering of butterfly wing feeding remains and bat droppings consistent with *plecotus sp.* bat origin was present on the floor of the first floor rooms only.

Photo 10 *– South east aspect*

Photo 11 *– North aspect*

Photo 12 *– South aspect*

Photo 13 *– South showing garaging extension*

Photo 14 *– West lean-to interior*

Photo 15 *– Garaging extension interior*

Photo 16 *– Ground floor interior room example*

Photo 17 *– First floor interior*

Photo 18 *– First floor interior*

Photo 19 *– Bat feeding remains - first floor*

6.3 Results of bat flight activity surveys

The surveyor's bat activity survey sheets can be found at **Appendix 1**. They display the contemporaneous notes made during the activity survey, including bat flight path descriptions.

Bat activity was noted on tables and maps with approximate height, flight direction, numbers and species recorded. The significant observations are detailed as follows.

<table>
<tr><th colspan="2">SUMMARY OF BAT ACTIVITY SURVEY RESULTS</th></tr>
<tr><th>Survey date</th><th>Significant observations</th></tr>
<tr><td>DUSK

<u>25th May 2021</u>

20:55 to 22:25hrs

Sunset 21:10hrs

Start temp: 11ºC
Fin temp: 10ºC
Cloud: 1/8
BFT: 0
Precip: Nil</td><td>Bat activity was surveyed from 15 minutes before sunset. Between 21:03 and 21:34hrs, seven common and soprano pipistrelles emerged from the building at the locations shown below:

 

Photo 20

Two unidentified bats emerged through the north door:

 
Photo 21</td></tr>
</table>

	At 21:55hrs, upon checking, two plecotus sp. bats were **observed flying within** the first floor of the barn. Throughout the survey period, common and soprano pipistrelles were observed and detected intermittently forging around the survey area.
DUSK **15th July 2021** **21:10 to 22:40hrs** Sunset 21:25hrs **Start temp:** 22°C **Fin temp:** 18°C **Cloud:** 0/8 **BFT:** 1 **Precip:** Nil	Bat activity was surveyed from 15 minutes before sunset. At 21:57 and then at 22:00hrs, two soprano pipistrelles **emerged** from the verge of the north gable as shown in the photo above. At 22:08hrs, a plecotus sp. bat emerged from the north door also as shown above (and repeatedly re-entered). Upon checking towards the end of the survey period, two plecotus sp. bats were observed flying within the first floor of the barn. For most of the survey period, pipistrelles were observed flying and foraging intermittently around the building.
DAWN **31st August 2021** **04:00 to 06:30hrs** Sunrise 06:25hrs **Start temp:** 13°C **Fin temp:** 13°C **Cloud:** 8/8 **BFT:** 4 **Precip:** Nil	Bat activity was surveyed until shortly after sunrise. For most of the survey period, pipistrelles were observed flying and foraging intermittently around the building. At 06:01 and 06:13hrs, two plecotus sp. bats **entered** into the north doorway. At 06:12hrs a soprano pipistrelle entered into a gap beneath the facia board at the east eaves at the position shown below  *Photo 22*

6.4 Results of survey for nesting birds

All wild birds and their nests (including eggs and young) are legally protected whilst nesting.

During the visits to the buildings, two old and two more recently used nests were found within the main barn.

Whilst no active nesting was found to confirm species, these all appeared to be blackbird nests, with one adapted by robin or wren.

Photo 23 – *Blackbird nests in main barn ground floor*

7.0 Assessment

7.1 Characterisation of the bat roosts identified at the barn

7.1.1 Common and soprano pipistrelle bats

One common and **six soprano pipistrelle** bats using gaps at the eaves and verges of the barn for roosting were confirmed during the study.

These bats are most likely non-breeding individuals, with the building characterised as a **summer day resting roost**.

7.1.2 Plecotus sp. bats (most likely brown long-eared)

Two *plecotus sp.* bats using the first floor interior of the barn as a day roost were confirmed during the study. Although not confirmed by DNA genotyping, these are assumed to be brown long-eared. However, it is *possible* that grey long-eared are under-recorded throughout the UK as most ecologists casually assumed them to be browns.

The absence of large numbers of droppings or individuals indicates that the building does not support a high conservation status roost, but is used as a **summer day resting roost**. The bats are most likely males or non-breeding females.

7.2 Nature conservation significance

Assessed in accordance with the *Bat Mitigation Guidelines 2004, Figure 4 Guidelines for Proportionate Mitigation* (displayed at Appendix 2), the building is of **low** nature conservation significance.

Whilst there is flexibility over provision, compensatory roosts will be necessary and suitable based on the species' requirements to ensure continued roosting facilities. Minimal timing constraints or monitoring are necessary.

7.3 Potential direct impacts to bats and their roosts

The barn is due to be fully renovated and converted for habitable use.

If conversion works take place when bats are roosting within the building during their active season (April to September inclusive), there is a high risk of entombing, killing or injuring the bats.

Therefore a carefully timed works schedule and precautionary methods of working are detailed in the Mitigation Plan at Section 10 below.

7.4 Potential direct impacts to roost sites

The interior of the barn that hosts the BLE roost will be converted into habitable accommodation and the roosts will therefore be permanently destroyed.

The roof, eaves and verges will be renovated / replaced, which will destroy the pipistrelle roosts. Suitable mitigation / compensation is therefore described in Section 10 below.

8.0 Conclusions

8.1 Ecological scoping

Of the species of potential relevance, the site was assessed as providing sub-optimal / negligible habitat for **hazel dormice**, **great crested newts**, **badgers** and **reptiles**.

Bats and **breeding birds** required further consideration.

8.2 Bat roosts

This study concludes that the pig sheds, tin barn and block sheds have negligible potential for use by bats. No bat activity survey work was necessary.

Bat activity surveying revealed that the main barn is a place of rest or shelter as **summer day roosts for one common and six soprano pipistrelle bats, and two brown long-eared bats**, European Protected Species (EPS). Therefore the development of the site must mitigate and compensate for the disturbance and loss of the roosts by providing suitable replacement roosts.

8.3 European Protected Species licensing

Any work affecting European Protected Species and/or their places of rest or shelter must only be carried out under and in accordance with an EPS licence issued by Natural England. This derogates the development for activities that would otherwise be illegal.

8.4 Nature conservation significance

It is assessed that the site is of low nature conservation significance as defined in Figure 4. Guidelines for proportionate mitigation of the Bat Mitigation Guidelines (2004). As such the guidelines recommend flexibility over provision of replacement roosts, with minimal timing constraints or monitoring necessary. However, in the interests of best practice, a carefully timed works schedule and precautionary methods of working are recommended.

8.5 Nesting birds

Four blackbird, robin and wren nests were found within the main barn. Precautions are specified in the recommendations section below to ensure that any wild birds are not disturbed or harmed during development.

9.0 Recommendations

9.1 Derogation licensing

Once planning permission is granted, and before any development that could affect the bat roosts proceeds, **a European Protected Species licence must be obtained by the property owners from Natural England**. The application must be written by a licensed bat ecologist, and will need to detail suitable mitigation and compensation within a method statement to enable the bats to persist at the site.

To obtain a licence, the application will need to demonstrate that the development is required in the public interest and that there are no other satisfactory alternatives to the development that will have less impact on the bat population.

In addition it will be necessary to demonstrate that the development will maintain the favourable conservation status (FCS) of the population. This means that the natural range of bats is stable or increasing, and that the species structure and functions that are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future, notwithstanding the development.

Once the licence is granted, only then will destruction of the bat roosts be permitted and lawful.

9.2 Protection of bats during development and compensation for loss of bat roosts

A full Mitigation Plan is provided in Section 10 below which includes methods to protect the bats during development.

It is recommended that replacement roosting facility is provided by the installation of self-contained bat roosting boxes suitable for the pipistrelle and long-eared bats. These will be permanently installed on the walls of the converted barn.

9.3 Nesting birds

There are numerous locations around the buildings where birds could nest, and these sites could change from year to year.

If active nests are discovered anywhere during the course of works, all works in that area must immediately cease. A suitably experienced ecologist must be contacted for advice. Works may restart only when the ecologist confirms that they may do so.

The species nesting within the barn are nationally common and widespread, and neither is of general conservation concern. On that basis, compensation for replacement nesting sites is not considered necessary.

If any development works are proposed to take place during the breeding season (March to August inclusive), then it might be necessary to prevent access to the building for birds to ensure they don't start nesting.

9.4 Biodiversity enhancements

For any new development, national planning policy seeks to reverse the current decline in biodiversity by enhancing habitats for wildlife. The following permanent features will therefore be incorporated into this development for nesting birds, which is proportionate and suitable for the characteristics of the site and scale of development:

> Two Vivara Pro WoodStone® Starling Boxes will be installed – one on the west gable apex of the rebuilt Tin Barn, and one on the main barn as shown in figure 6 below.
>
> This will provide valuable nesting provision for these now red-listed birds. Red listing is the highest conservation priority, needing urgent action.

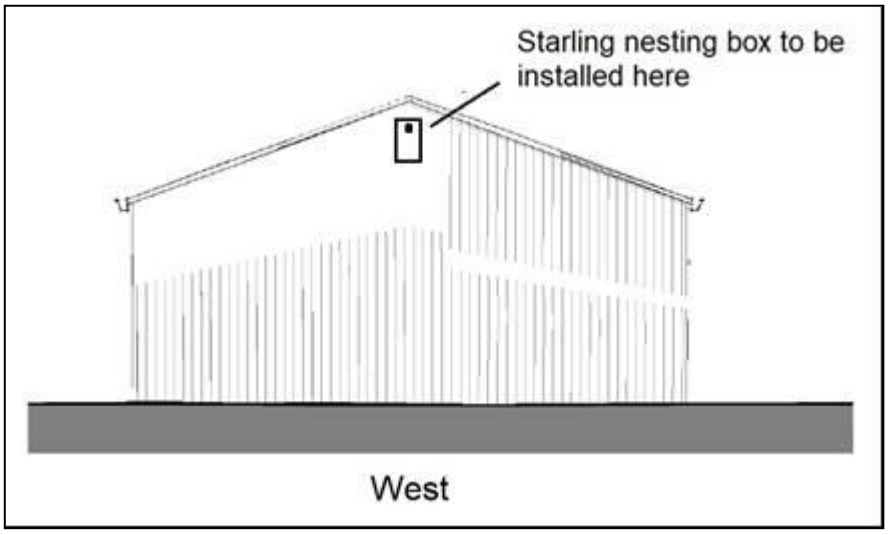

***Figure 4** – Position to install starling nest bo*

10.0 Mitigation plan

This Mitigation Plan comprises four sections:

- Method Statement (including timings of all works)
- Bat discovery action plan (BDAP)
- Bat roost and habitat creation
- Lighting protection plan.

10.1 Method statement

1. The conversion works are planned to commence in winter 2021 / 22 and conclude in winter 2022.

2. A briefing by the bat ecologist fulfilling the role of Ecological Clerk of Works (ECW) will be provided to all contractors involved with the dismantling of the structure / roofs before any such works commence. The ECW will brief the contractors on the possible presence of bats, the legal implications of their presence and the appropriate procedures and control measures to be put in place to avoid harming or disturbing them.

3. The use of endoscopes, artificial light from torches, destructive search by soft demolition, permanent exclusion methods and use of static hand held nets will only be undertaken or directly supervised by the Named Ecologist, or an Accredited Agent of the EPS mitigation licence which will be sought prior to works. Endoscopes and hand-held nets will only be used to assist with the locating and capture of bats.

4. If necessary, permanent exclusion will be carried out using techniques specified in the most up-to -date edition of the 'Bat Workers Manual'. If one-way exclusion devices are used, each device will remain in position for a period of at least five consecutive days / nights throughout a spell of suitable weather conditions, or remain longer until these conditions prevail.

5. Prior to destructive works, an inspection using torches and/or an endoscope will be performed internally by the ecologist to search for the presence of bats. If any licensed vesper bat species is found and are accessible, each will be captured by gloved hand or hand-held net, given a health check and then each placed carefully inside a draw-string calico cloth holding bag or similar for transport. It will be later released or transferred to a new roost box in accordance with the BDAP below.

6. Following inspection and exclusion operations, the removal of any feature with bat roost potential will be only performed by hand in suitable weather conditions and under direct ecological supervision. Where applicable, materials will be removed carefully away and not rolled or sprung to avoid potential harm to bats. The undersides of materials will be checked by the Named Ecologist or Accredited Agent for bats that may be clung to them before removal.

7. Similarly, any timber elements that will be dismantled in areas of the known bat roosts will be first inspected by the ECW, then carefully dismantled by hand / hand tools.to prevent injuring or killing any bats that might be present.

8. Where capture and/or handling of bats becomes necessary, only the Named Ecologist, Accredited Agent, or an Assistant directly supervised by the Named Ecologist will do so. Capture / handling / exclusion of bats will only be undertaken in conditions suitable for bats to be active.

9. A copy of the licence and Method Statement will be retained on site at all times for the contractors to refer to.

10. All contractors on site are explicitly forbidden from handling bats and this message will be reinforced during the briefing. If any bats are found at any time that the ECW is not present, then work will cease immediately. The bat must be left to disperse of its own accord, or wait for a licensed bat ecologist to move the bat in accordance with the BDAP.

Timings of works

1. Implementation for the compensation measures will, where practicable be in place ready for the beginning of the 2023 bat activity season which is generally regarded as 1st May.

2. As it is not possible to rule out the possibility that bats might occupy the building as transient roosts during autumn or spring, all workmen will be advised according to the Method Statement and BDAP that if bats are found during operations, work should stop immediately and the ECW must be consulted.

3. The following table summarises the work programme:

WORK PROGRAMME	
TIMING	**ACTION**
Before works start	Briefing provided to contractors.
Winter 2021 to Winter 2022.	Dismantling and conversion of the barn.
Before end of April 2023.	New bat boxes installed and inspected by ECW to confirm fit for purpose.

10.2 Bat Discovery Action Plan (BDAP)

In the unlikely event that any bats are found during works when the bat ecologist is not present, work must stop immediately and the licensed bat ecologist must be consulted.

If necessary and possible, the ecologist will rescue the bat/s and hold them in accordance with methods detailed in the Bat Workers Manual in a suitable handling box for release at a suitable location on site in the evening. This will be done by transferring the bat into a bat box installed on a suitable nearby tree or building. This will allow the bat/s to settle for the remainder of the day, and to emerge safely in the evening.

10.3 Bat roost and habitat creation details

The following **compensation** will be undertaken to maintain the roosting site for pipistrelle and long-eared bats.

10.3.1 Crevice-dwelling bats – common and soprano pipistrelle

To compensate for the loss of the pipistrelle roosts:

- Five self-contained bat roosting box (Beaumaris Woodstone Bat Box, midi size) will be permanently installed on the external barn walls as indicated on the drawings below.

10.3.2 Hole-dwelling bats – long-eared bats (*plecotus sp.*)

To compensate for the loss of the long-eared bat roost within the barn, one self-contained bat roosting box (**Vivara Pro WoodStone Bat Box**) will be permanently installed on the barn as indicated on the drawing at **Figure 6** below.

This box has a small entrance hole and relatively large void which mimics a hollow tree stem and is designed to be highly suitable for BLE bats.

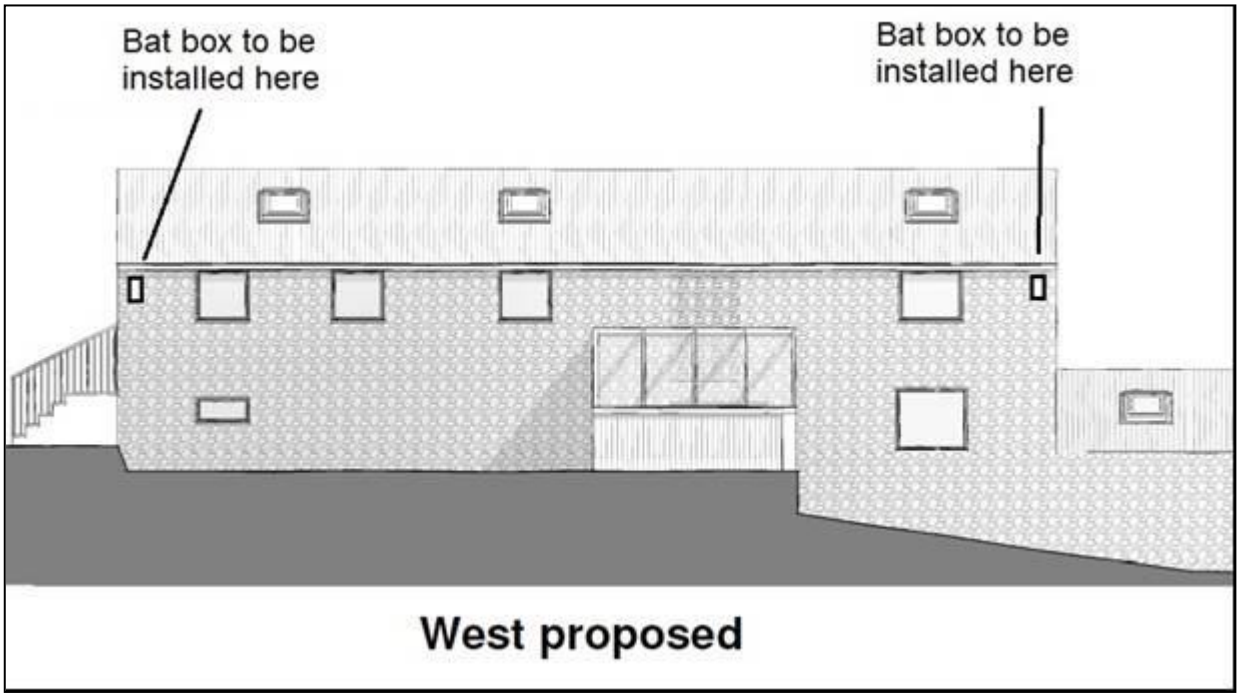

Figure 5 *– West gable elevation showing position of compensatory bat boxes*

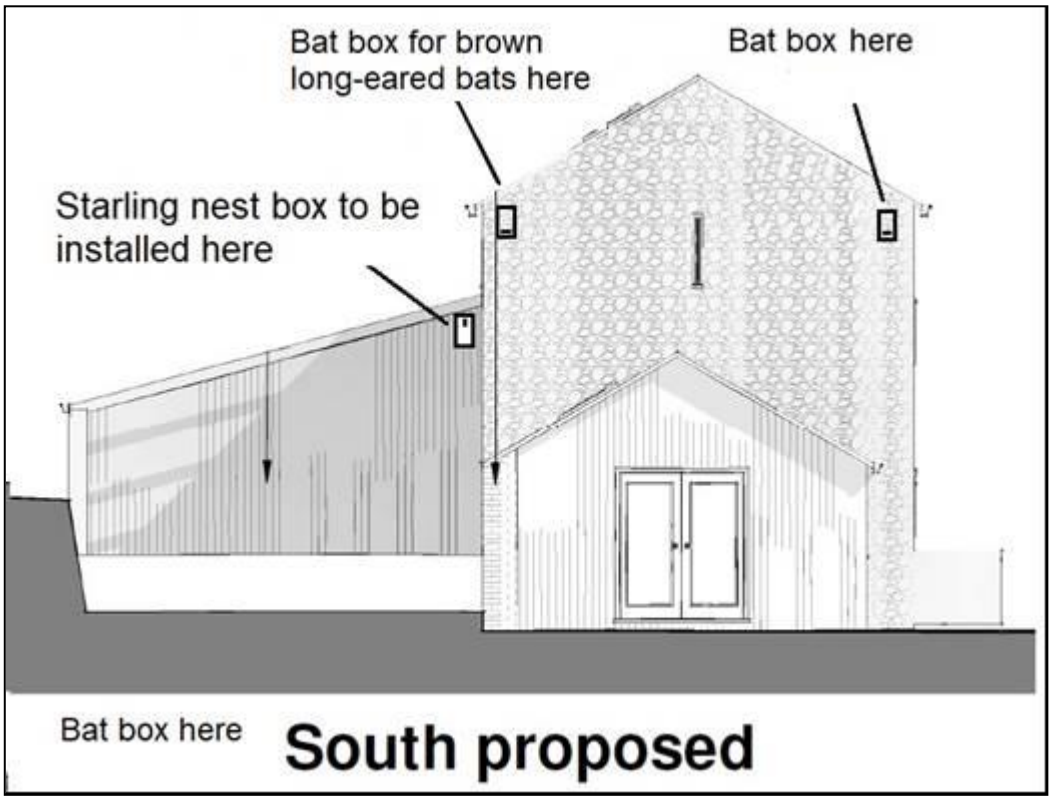

Figure 6 *– South gable elevation showing position of starling box and compensatory bat boxes*

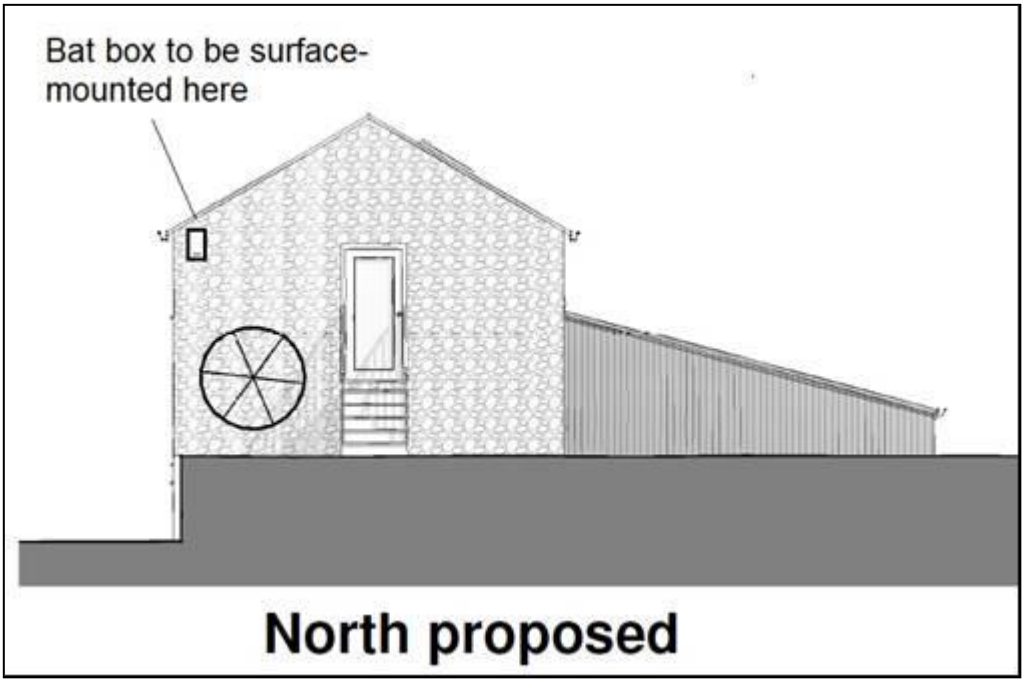

Figure 7 *– North gable elevation showing position of compensatory bat box*

10.3.3 Roost maintenance

The bat box roosts will be permanently installed and are self-maintaining, therefore a specific maintenance plan is unnecessary.

10.4 Lighting design strategy

a) Objective

To ensure that the introduction of artificial lighting as a result of the development is suitably controlled so that it does not interfere with the use of the site habitat by bats.

b) Assessment of existing site light levels

The site is currently moderately lit at night due to light spill from the adjacent main house. Some species of bat are sensitive to ***bright*** light which can create a barrier to roost use, foraging and dispersal – particularly brown long-eared bats. Bats using the site will be accustomed to the existing lighting conditions.

The garden areas around the site are used by common and soprano pipistrelle, and brown long-eared bats for commuting and foraging. Pipistrelle bats are one of the least light-sensitive species, particularly as they emerge early and re-enter late. They are also often seen foraging insects around bright security and street lamps at night.

c) New lighting

A detailed lighting plan is not available at time of writing.

Any new external lamps at the site will be PIR-activated and 40w max (6w LED equivalent) ~400 lumens (warm white 2700k to avoid blue-white wavelengths). They will be set to deactivate after two minutes max, with a cowl to direct light downwards (no more than 70º). This will ensure that the new bat box roosts and nearby commuting and foraging areas are not subject to unnecessary illumination that could disturb the functionality of the roosts or use of the wider site habitat.

d) Areas of particular sensitivity

The most light-sensitive area is the bat box that will be installed onto the south west corner area of the main barn. This is intended for use by brown long-eared bats which are intolerant of bright artificial lighting. This area benefits from an existing nearby tree and hedge line that provides seclusion and connectivity to the wider landscape and dark areas.

e) Dark zones

No external lamps will be installed in the area of sensitivity. There are also no windows that would be regularly used during the months of bat activity on that façade of the building that could cast any light (the workshop would be rarely used after dark outside of winter months, so the skylights would rarely cast any light).

Dark zones will be maintained at the south areas of the site.

11. References

- Bat Surveys for Professional Ecologists – Good Practice Guidelines, Bat Conservation Trust, third edition 2016;
- Bat Workers Manual, Ed: T. Mitchell-Jones & A. P. McLeish, JNCC 2001;
- Bat Mitigation Guidelines version Jan 2004 A.J.Mitchell-Jones, English Nature 2004, ISBN 1 85716 781 3;
- Natural England website: www.gov.uk
- Legislation.gov.uk website: www.legislation.gov.uk

12. Surveyors

Haydn Brookes BSc (Hons) Chartered MCIEH

- Ten years' experience of conservation field study and ecological consultancy surveying, including trained Phase 1 habitat surveys, SSSI impact assessments, reptile, GCN, badger, dormouse and bat surveys;
- Committee member of Gloucestershire Bat Group (Chairman 2018 and Bat Care Coordinator);
- Natural Resources Wales bat licence to disturb and take (science, education and conservation) **no**. **S085825/1**;
- Natural England Volunteer Bat Roost Visitor licence registration number **2016-15125-CLS-CLS**;
- Natural England Level 2 Bat Class Survey Licence registration number **2016-15126-CLS-CLS**;
- Local authority Environmental Protection and Licensing Officer/Manager 2000 to 2015;
- Fully EBLV vaccinated with experience of handling many bat species. Registered bat carer.

Liz Brookes MSc, MCIEEM

- Over ten years' experience in an ecological consultancy role, including training for Phase 1 habitat surveys, SSSI impact assessments, reptile, badger and bat surveys;
- Phase 1 Habitat and National Vegetation Classification (NVC) specialist;
- FISC Field Identification Skills Certificate Level 4;
- Natural England great crested newt licence registration 2015-19234-CLS CLS;
- Natural England dormouse licence registration 2016-22162-CLS CLS.

Beth Hempshall BSc

- Bat surveyor with three years' experience of regular bat activity surveying;
- Member of Gloucestershire Bat Group;
- Level 1 bat survey licence and trained bat carer.

Haydn Brookes BSc (Hons) CMCIEH

Environmental Methods

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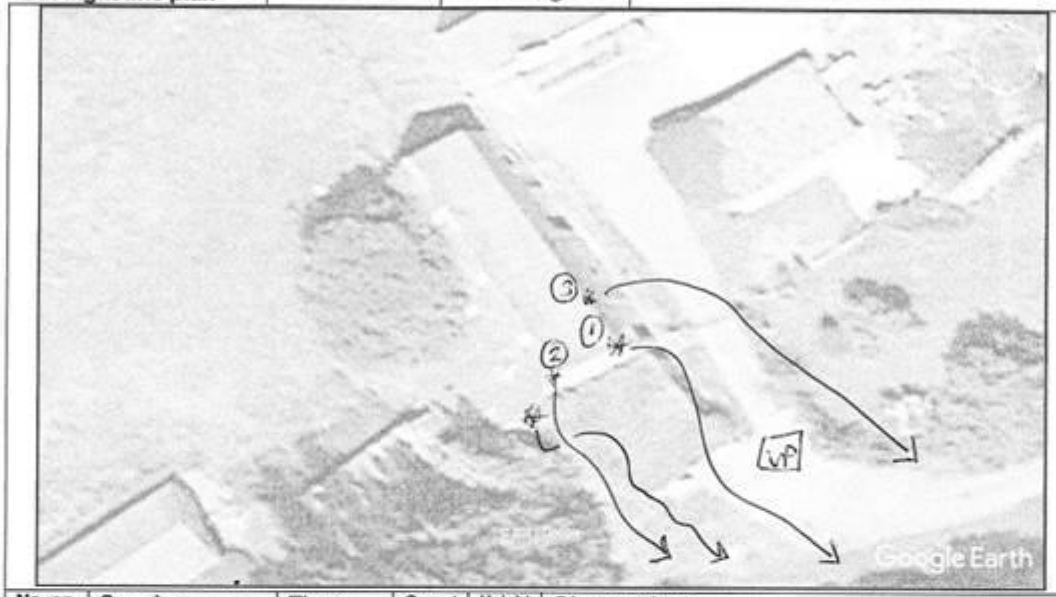
APPENDIX 1

Bat activity survey sheets

Bat activity survey sheet 1 **(DUSK – 25th May 2021 - H. Brookes)**

Bat flight survey record sheet

Site: Lower Daffaluke Farm	Date: 25/5/21	Dusk / ~~dawn~~ From: 20:55 To: 22:25	Cloud: 1 /8 Precip: NIL BFT: 2 Temp start: 11 °C Fin: 10 °C
Bat flight line plan	Detector: EMT Pro	Sunset / sunrise: 21:10	Surveyor: H. BROOKES



No. on plan	Species	Time	Count	Height	Observations
1	C. PIP	21:03	1	M	Emergence from SE eaves corner.
2	S. PIP	21:05	1	M	" " S gable verge.
3	S. PIP	21:07	1	M	" " E eaves
4 AS 3	S. PIP	21:17	1	M	"
AS 2	S. PIP	21:18	1	~~M~~ L	
6	S. PIP	21:37	1	M	AS 3
					General foraging around S of barn for duration.

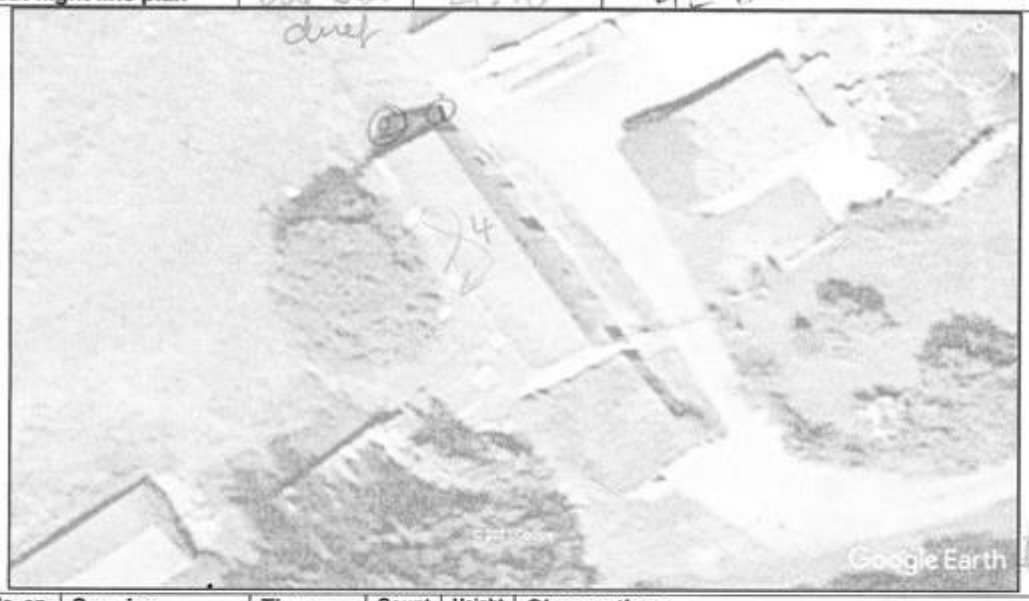
Heights are approximate and indicative: **Low** = below eaves, **Med** = eaves to tree tops, **High** = above tree tops.

Bat activity survey sheet 2 **(DUSK – 25th May 2021 – L. Brookes)**

Bat flight survey record sheet

Site: Lower Daffaluke Farm	Date: 25/05/21	Dusk / ~~dawn~~ From: 20:55 To: 22:25	Cloud: 1 /8 Precip: NIL BFT: 2 Temp start: 11 °C Fin: 10 °C
	Detector: Bat box duet	Sunset / ~~sunrise~~: 21:10	Surveyor: LIZ BROOKES

Bat flight line plan



No. on plan	Species	Time	Count	Height	Observations
1	Pip?	21:06	2	M	Bat echolocating - emerged from under fascia
2	P. Pip?	21:11	1	M	Emerged from gap door
			1		not echolocating
3	Pip	21:12	1	M	Same as above
	BLE	21:55	1		HNS
4	BLE	21:55	1		Flying inside barn
	BLE	22:04			HNS

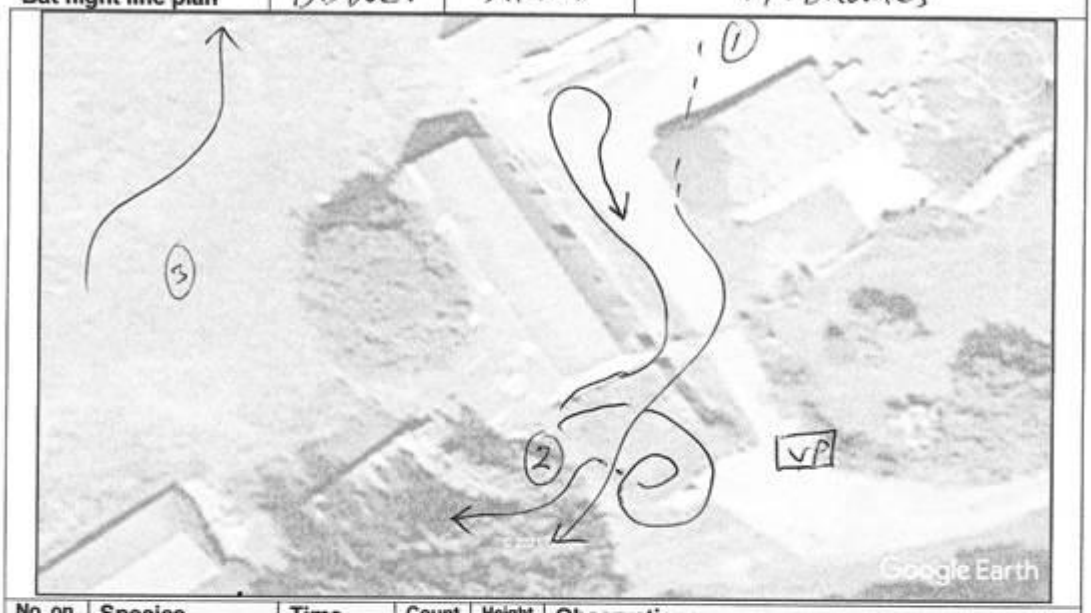
Heights are approximate and indicative: **Low** = below eaves, **Med** = eaves to tree tops, **High** = above tree tops.

Bat activity survey sheet 3 **(DUSK – 15th July 2021 – H. Brookes)**

Bat flight survey record sheet

Site:	Date:	Dusk / ~~dawn~~	Cloud: 0/8 Precip: NIL
Lower Daffaluke Farm	~~24~~ 15/7/21	From: 21:10 To: 22:40	BFT: 1 Temp start: 22 °C Fin: 18 °C
	Detector: BB DUET	Sunset / ~~sunrise~~: 21:25	Surveyor: H. Brookes

Bat flight line plan



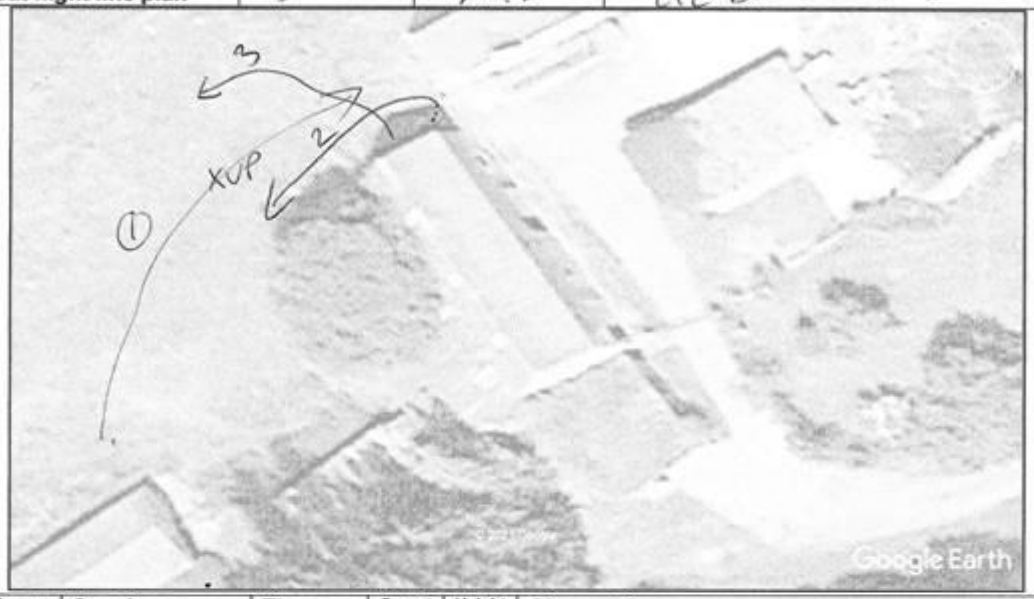
No. on plan	Species	Time	Count	Height	Observations
1	C. PIP	21:45	1	M	Bat emerged from the main house.
As 1	C. PIP	21:48	1	M	"
2	S. PIP	21:49	2	M	Regular foraging around south area. Then around courtyard
3	NOCTULE	21:59			Brief foraging fly by.
					Upon checking within barn, two long-eared were flying within.

Heights are approximate and indicative: **Low** = below eaves, **Med** = eaves to tree tops, **High** = above tree tops.

Bat activity survey sheet 4 **(DUSK – 15th July 2021 – L. Brookes)**

Bat flight survey record sheet

Site: Lower Daffaluke Farm	Date: 15/07/21	Dusk / dawn From: 21:10 To: 22:40	Cloud: 0/8 Precip: NIL BFT: 1 Temp start: 12°C Fin: 18°C
Bat flight line plan	Detector: Duet.	Sunset / ~~sunrise~~: 21:25	Surveyor: LIZ BROOKES.



No. on plan	Species	Time	Count	Height	Observations
1	C.pip	21:50	1	M	flew overhead from behind
1	C.pip	21:55	1	M	"
2	S.pip	21:57	1	M	Emerged from corner just above wheel by lead flashing.
2	S.pip	22:00	1	M	Emerged from corner
	Nochule	22:05	1	H	Overhead
3	BLE	22:08	1	L	Emerged from open door at gable end.
	S.pip	22:00 END	2	M	Foraging around main barn.

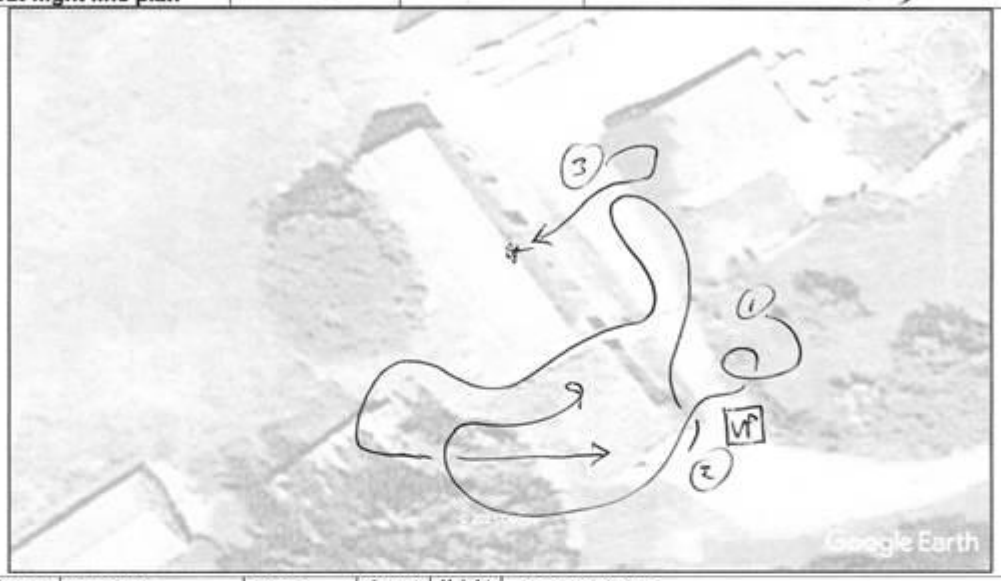
Heights are approximate and indicative: **Low** = below eaves, **Med** = eaves to tree tops, **High** = above tree tops.

Bat activity survey sheet 5 **(DAWN – 31st August 2021 – H. Brookes)**

Bat flight survey record sheet

Site: Lower Daffaluke Farm	Date: 31/8/21	~~Dusk~~ / dawn From : 04:00 To : 06:30	Cloud: 8/8 Precip: Nil BFT: 4 Temp start: 13 °C Fin: 13 °C
	Detector: BB Duet	Sunset / sunrise: 06:25	Surveyor: H. Brookes

Bat flight line plan



No. on plan	Species	Time	Count	Height	Observations
/	C. PIP	04:21	1	/	Brief HNS detections
	S. PIP	04:22	1	/	"
(1)	"	04:40	2	M	Regular foraging around barn
(2)	C.&S PIPS	|	5	M	
		↓			until 06:15 ish
(3)	C. PIP	06:12	1	M	Bat entered via gap above second window from S.
	Plecotus sp		1		One bat flying within barn at start of survey.

Heights are approximate and indicative: **Low** = below eaves, **Med** = eaves to tree tops, **High** = above tree tops.

Bat activity survey sheet 6 **(DAWN – 31st August 2021 – B. Hempshall)**

Bat flight survey record sheet

Site:	Date:	~~Dusk~~ / dawn	Cloud: 8/8 Precip: NIL
Lower Daffaluke Farm	TUE 31st AUG '21	From : 4.00 To : 6.30	BFT: 4 Temp start: 13°C Fin: 3 °C
	Detector: BATSCANNER STEREO	~~Sunset~~ / sunrise: 6-25	Surveyor: BETH HEMPSHALL

Bat flight line plan

No. on plan	Species	Time	Count	Height	Observations
	BROWN LONG EARED	4.22	2	L	FREQUENT FORAGING THROUGH BARN AND GROUNDS.
	S. PIP		3	L	FREQUENT FORAGING THROUGH THE GROUNDS.
(1)	BROWN L. EARED.	6.01	1	L	ENTRY THROUGH THE DOORWAY.
(2)	BROWN L. EARED	6.13	1	L	ENTRY THROUGH DOORWAY

Heights are approximate and indicative: **Low** = below eaves, **Med** = eaves to tree tops, **High** = above tree tops.

APPENDIX 2

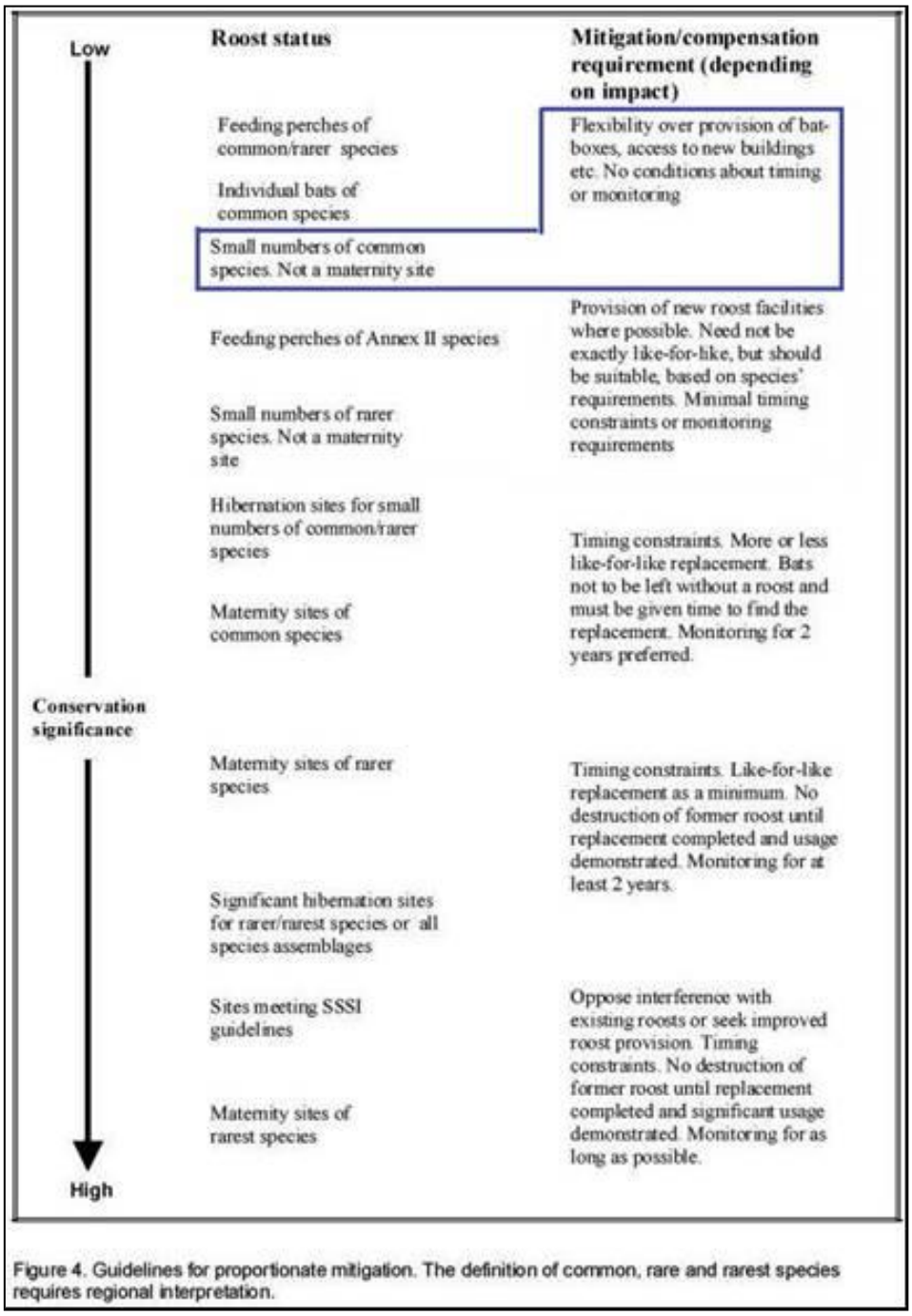


Figure 4. Guidelines for proportionate mitigation. The definition of common, rare and rarest species requires regional interpretation.