Bat Survey Report

Heywoods Farm, Stratfield Saye, Reading, RG7 2DG

Surveys conducted in August and September 2021 and June 2023

Document Control Sheet

Project Name: **Heywoods Farm, Stratfield Saye**
Project Ref: **753**
Report Title: **Heywoods Farm, Bat Report**
Date: **27/11/2023**

	Name	Position	Signature	Date
Prepared by:	Nick Kirke	Ecologist	NK	18/12/21
Checked by:	Lisha Price	Senior Ecologist	[redacted]	04/01/21
Updated:	Lisha Price	Ecologist	LP	27/11/23

Contents

SUMMARY

An internal and external daytime inspection for evidence of bats and bat roosting potential was conducted by ecologists from All Ecology at Heywoods Farm, Stratfield Saye on the 2nd of August 2021 and updated by Plan Ecology in June 2023.

The current proposed works include the demolition of the pool house on the southern elevation of the house and the addition of an extension on that elevation.

The Site consists of a house which is a large, brick-built, 'L-shaped' building with clay roof tiles and a pool house connected on the south elevation. It also has a cottage and cart shed on the Site. The buildings are surrounded by gardens, scattered trees, shrubs, a pond, a swimming pool, tennis court and a gravel driveway. The site lies in a rural area between Basingstoke and Reading.

Bat roosting potential was identified in the cottage, pool room and house in the form of the loft spaces, gaps under the ridge and roof tiles, gaps between the soffit boards and external walls, gaps in hanging wall tiles, gaps adjacent to the exposed roof timbers on the porch and the timber barge boards. The bat roosting potential was assessed according to the scale negligible, low, moderate, or high and the main house, cottage and pool house were deemed to have high bat roosting potential with confirmed roosts present.

Scattered bat droppings were found during the inspections of the of the loft spaces of main house, cottage, and pool house.

Three bat activity, dusk and dawn, surveys were conducted during optimal weather conditions in 2021 over seven weeks to illustrate the use of the building as a bat roost over a period of time. The surveys were required to take place between May and September, with a minimum of two surveys during the bat maternity period May to August. An additional 'update' survey was carried out in June 2023 confirming the same bat activity as in 2021.

A total of six roosting areas were identified during the survey. A maximum count of twenty-two soprano pipistrelle, two common pipistrelle and three brown long eared bats were recorded.

Roost A is a day roost for 1 common pipistrelle bats under a roof tile on the end of the pool house near the gutter line on the left-hand side.

Roost B is a day roost in the pool house loft space for a maximum of two brown long eared bats, accessed via gaps in roof tiles.

Roost C is a maternity roost for a maximum of twenty-one soprano pipistrelle bats under hanging wall tiles on the south gable end of the house.

Roost D is a day roost one common pipistrelle bat under a roof tile on the east aspect of the house.

Roost E is a day roost for one brown long eared bat in the loft of the house accessed around the base of the chimney.

Roost F is a day roost for one soprano pipistrelle in the eaves of the cottage accessed via a raised roof tile.

Roosts A, B and C will be destroyed by the planned demolition of the pool house and removal of the hanging wall tiles on the south elevation.

Therefore, it will be necessary to apply for a European Protected Species Licence (EPS) with Natural England (NE) and a bat mitigation plan will need to be designed from the survey results to minimise disturbance and reinstate bat roosting areas and access points.

The mitigation plan will provide temporary bat roosting. Any tiles or roof materials will be removed under a soft strip in September/ October or March/ April. On the house bat tiles will be added to the areas of roof on the southern elevation providing crevices for common pipistrelle bats as well as a squeeze box for the maternity roost to provide a similar roost space and access as that of under the wall tiles.

Additional access points will be added to provide access for the brown long eared bats and crevice creation will be added to the loft to provide roosting opportunities for the brown long eared bats. A traditional black bitumen roof liner must retained throughout.

1. INTRODUCTION

1.1 Site Description

Heywoods Farm, Stratfield Saye, Reading, RG7 2DG has a house which is a large, brick-built, 'L-shaped' building with clay roof tiles, it has a pool house attached to its southern elevation. It also has a cottage and cart shed on the Site. The buildings are surrounded by gardens, scattered trees, shrubs, a pond, a swimming pool, tennis court and a gravel driveway. The site lies in a rural area between Basingstoke and Reading.

See APPENDIX 1 for Site Location and APPENDIX 2 for building locations

1.2 Proposed works

The proposed works include the demolition of the pool house on the southern elevation of the house and the addition of an extension on that elevation.

1.1 Aims of the Survey

A Phase 1 bat survey was carried out with the aim to look for evidence of bats roosting and for the presence of structures within the buildings which hold bat roosting potential. Bat roosting potential was identified, and a roost confirmed via bat droppings in the loft space. Phase 2 emergence and dawn surveys were then carried out.

1.2 General information about bats and buildings

Loft spaces can potentially be utilised by bat species such as e.g., Brown Long-eared bats or Serotine bats which are known to commonly roost inside loft spaces. This can generally be discovered via droppings inside the loft as the droppings will stay protected from weather elements.

External features of the building can potentially be used as roosting sites by e.g., Pipistrelle bat species (*Pipistrellus* spp). Pipistrelle bats are the most common bats out of the British species, and they are known to almost exclusively roost inside buildings utilising areas such as cavity walls, soffits and fascia boards, and between tiles and roofing felt. It is not practical to carry out a full physical examination of such building features, which is why activity surveys must be done during summer months (May-September) when the bats are fully active.

Access points of 1-2 centimetres only are used by bats to enter and exit their roosting sites. Most buildings will have gaps of such size in roof areas as ventilation of the roof void would otherwise not be possible.

2. METHODOLOGY

The surveys were undertaken in accordance with the methods described in the Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn), Bat Conservation Trust (BCT).

2.1 External and internal inspection - Phase 1

The building was surveyed during the daytime on 2nd August 2021 by ecologists from All Ecology and (Please refer to their original report for full methodology and results). in June 2023 by Plan Ecology.

2.2 Bat roosting potential – Phase 1

The building was examined internally and externally to identify structural features that hold bat roosting potential.
The bat roosting potential was assessed according to the scale negligible, low, moderate, high or confirmed:

> Negligible: Negligible potential roost features likely to be used by roosting bats
> Low: simple structure buildings that have very few potential bat roosting features, which could only be used by individual bats opportunistically.
> Moderate: a structure with one or more potential roost sites that could be used by bats in some way, but which are unlikely to support a roost of high conservation status (such as a maternity roost).
> High: buildings with multiple internal and external structural features suitable for larger numbers of roosting bats on a regular basis for a longer period of time. Features that may be used by bats are e.g. loft spaces and other smaller roof voids, gaps between overlapping clay tiles, gaps in-between the tiles or slates and the roofing felt, cavities under ridge tiles, under soffits fascia and barge boards, by the brickwork of chimney stacks, under lead flashing, inside cavities of flat roofs, under wall hanging tiles, behind wooden cladding or other wooden structures, inside cavity walls or other smaller wall cavities, in gaps and cracks of stone walls and inside wooden beam mortise and tenon joints.
> Confirmed: evidence of bats such as live or dead bats or bat droppings are present, or there are confirmed records of a bat roost in the building.

2.3 Emergence survey methodology - Phase 2

Emergence surveys of the buildings were conducted by Nick Kirke (Bat licence 2020-50736), Myfanwy Price (Bat Licence 2019-40496), Sarah Wrenn, Ashley Johnson, and Lisha Price (Bat Licence 2015-11503) of Plan Ecology Ltd on 8th and 29th August 2021. Also, on the 1st of June 2023 by Nick Kirke and Ashley Johnson. The surveys started 15 minutes before the official sunset and were completed 1½ hour after sunset. Bat

passes were recorded with EchoMeter pro 2 Touch bat detectors. Infrared cameras and associated equipment was used to assist the surveys.

2.4 Dawn survey methodology - Phase 2

A dawn survey of the building was conducted by Lisha Price, Nick Kirke, Ashley Johnson, Sarah Wrenn and Myfanwy Price of Plan Ecology Ltd on 24th September 2021. The survey began 2 hours before official sunrise time and finished 15 minutes after. The building was surveyed with EchoMeter 2 Touch bat detectors. Dawn surveys, in general, provide a better overview of a building as the morning light increases the visibility of any bats flying around to enter their roost, and the bats tend to spend longer time on re-entry than they will on emergence. The bats may do a "swarming behaviour" in the morning just outside of their roost access point. Infrared cameras and associated equipment was used to assist the surveys.

2.5 Weather conditions

This information was taken from the BBC Weather online forecast for Reading, to illustrate that the survey was conducted during suitable weather conditions. Bats are generally fully active in the months of May - September at temperatures above 10°C if there are favourable weather conditions such as no strong winds (less than 15 mph) and no overnight rain.

Survey date	Sunset/ Sunrise	Weather 22:00/04:00	Temp	Wind speed	Humidity
8th August 2021	20:40	Partly cloudy	15°C	11 mph	21%
29th August 2021	19:55	Mostly cloudy	16°C	9 mph	67%
24th September 2021	06:54	Clear	11°C	6 mph	86%
1st June 2023	09:07	Clear	18°C	3 mph	71%

2.6 Sound Analysis

The recordings made during the surveys were analysed on Kaleidoscope software. All bat call recordings were compared to published reference material such as British Bat Calls Jon Russ (2012) and to a private reference library of previous recordings made from known bat species.

3. RESULTS

3.1 External and internal inspection results – Phase 1

Bat roosting potential: Bat roosting potential was identified in the cottage, pool room and house in the form of the loft spaces, gaps under the ridge and roof tiles, gaps between the soffit boards and external walls, gaps in hanging wall tiles, gaps adjacent to the exposed roof timbers on the porch and the timber barge boards. The bat roosting potential was assessed according to the scale negligible, low, moderate, or high and the main house, cottage and pool house were deemed to have high bat roosting potential with confirmed roosts present.

See Preliminary Roost Assessment report carried out by All Ecology.

Evidence of bats: Scattered bat droppings were found during the inspections of the loft spaces of the main house, cottage and pool house.

3.2 Emergence survey results – Phase 2

8th August 2021: Common pipistrelle bats (*Pipistrellus pipistrellus*), soprano pipistrelle *(Pipistrellus pygmaeus)*, western Barbastelle *(Barbastella barbastellus)*, Brown long eared bats *(Plecotus auritus*), daubenton's Myotis *(Myotis daubentonii)* and brandt's Myotis *(Myotis brandtii)* bats were recorded foraging and commuting in the area.

A total of two brown long eared bats were seen emerging from a roof tile on the top of the pool house.
A total of twenty-one Soprano pipistrelle bats were seen emerging from gaps under various hanging wall tiles above the pool house on the southern gable of the house.
One common pipistrelle was seen emerging from the left side of the pool house gutter line.

29th August 2021: Common pipistrelle, soprano pipistrelle, noctule *(Nyctalus noctula)*, and brown long eared, were recorded foraging and commuting around the site.

A total of one brown long eared bat was observed emerging from under a roof tile on near the chimney of the house.
A total of twenty soprano pipistrelle were seen emerging from under hanging wall tiles above the pool room.

One Common pipistrelle was seen emerging from under a tile gap in the east aspect of the house.

1st June 2023: This survey focused on the pool house and elevation.

A total of 18 soprano pipistrelle emerged from under hanging wall tiles above the pool room.

One brown long eared bat emerged from a roof tile on the pool house.

3.3 Dawn survey results – Phase 2

24th September 2021: Common pipistrelles, Soprano pipistrelle, Brown long eared and Noctule bats were seen and recorded foraging around the site.

A Soprano pipistrelle bat was seen entering under a roof tile on the cottage (west elevation).

See Appendix 4 for activity survey and sound analysis results.

3.4 Identified bat roosting areas.

A total of six roosting areas were identified during the survey. A maximum count of twenty-two soprano pipistrelle, two common pipistrelle and three brown long eared bats were recorded.

Roost A is a day roost for 1 common pipistrelle bats under a roof tile on the end of the pool house near the gutter line on the left-hand side.

Roost B is a day roost in the pool house loft space for a maximum of two brown long eared bats, accessed via gaps in roof tiles.

Roost C is a maternity roost for a maximum of twenty-one soprano pipistrelle bats under hanging wall tiles on the south gable end of the house.

Roost D is a day roost one common pipistrelle bat under a roof tile on the east aspect of the house.

Roost E is a day roost for one brown long eared bat in the loft of the house accessed around the base of the chimney.

Roost F is a day roost for one soprano pipistrelle in the eaves of the cottage accessed via a raised roof tile.

See Appendix 3 for position of bat access points.

4. ASSESSMENT

4.1 Constraints on study information

All accessible areas of the building could be surveyed without restrictions.

The phase 1 survey was carried out on one visit during the month of August. As such, seasonal variations could not be observed and potentially only a selection of all species that occur within the survey area will have been noted. The Survey therefore provides a general assessment of potential nature conservation value. However, it is considered that the combination of biological records from the desk study and the site visit provides an accurate representation of the various species and habitat types present or potentially present within the survey area.

Bat survey results are generally considered to be valid within a year of the survey date or until the next active bat season of May-September. The County Council Ecologists and/or Natural England may ask for updated surveys if the reports are older than one year.

4.2 Potential impacts on bat foraging and commuting habitat.

There will be no negative impact on bat commuting and foraging areas as the buildings will not increase significantly in footprint enough to have an effect.

4.3 Legislation and policy guidance

As population numbers have fallen, all bats and their roosts are protected under The Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2017.

Under this legislation it is an offence to:

deliberately capture (or take), injure or kill a bat;
intentionally, recklessly or deliberately disturb a bat (in relation to the Wildlife and Countryside Act 1981 (as amended) the offence applies whilst the species is occupying a structure or place which it uses for shelter or protection; in relation to the Conservation of Habitats and Species Regulations 2017 it applies anywhere);
damage or destroy the breeding or resting place (roost) of a bat;
possess a bat (alive or dead), or any part of a bat;
intentionally or recklessly obstruct access to a bat roost;
sell (or offer for sale) or exchange bats (alive or dead), or parts of bats.

Please refer to the original legislation for the definitive interpretation.

5. RECOMMENDATIONS

5.1 Discussion of results

A total of six roosting areas were identified during the survey. A maximum count of twenty-two soprano pipistrelle, two common pipistrelle and three brown long eared bats were recorded.

Roost A is a day roost for 1 common pipistrelle bats under a roof tile on the end of the pool house near the gutter line on the left-hand side.

Roost B is a day roost in the pool house loft space for a maximum of two brown long eared bats, accessed via gaps in roof tiles.

Roost C is a maternity roost for a maximum of twenty-one soprano pipistrelle bats under hanging wall tiles on the south gable end of the house.

Roost D is a day roost one common pipistrelle bat under a roof tile on the east aspect of the house.

Roost E is a day roost for one brown long eared bat in the loft of the house accessed around the base of the chimney.

Roost F is a day roost for one soprano pipistrelle in the eaves of the cottage accessed via a raised roof tile.

See Appendix 3 for position of bat access points.

Roosts A, B and C will be destroyed by the planned demolition of the pool house and removal of the hanging wall tiles on the south elevation.

Therefore, it will be necessary to apply for a European Protected Species Licence (EPS) with Natural England (NE) and a bat mitigation plan will need to be designed from the survey results to minimise disturbance and reinstate bat roosting areas and access points.

The mitigation plan will provide temporary bat roosting. Any tiles or roof materials and hanging tiles will be removed under a soft strip in September/ October or March/ April. On the house bat tiles will be added to the areas of roof on the southern elevation providing crevices for common pipistrelle bats as well as a squeeze box for the maternity roost to provide a similar roost space and access to that currently under the wall tiles.

Additional access points will be added to provide access for the brown long eared bats and crevice creation will be added to the loft to provide roosting opportunities for the brown long eared bats. A traditional black bitumen roof liner must retained throughout.

Limited external lighting on site: Extra care should be taken to ensure that external lights are kept to a minimum and will not illuminate the bat access points or flight paths to nearby trees. The light will be aimed to illuminate only the immediate area required by using as sharp a downward angle as possible.

A shield or hood will be used to control or restrict the area to be lit and limit "light spillage" on the site. Brown long-eared bats are bat species that are known to be "light sensitive" and may be disturbed by an increase in light levels by the bat access points which could cause them to abandon their roosts.

5.2 Survey Effort

The house, cottage and pool house building were deemed to have high bat roosting potential and three activity surveys were therefore carried in accordance with the Bat Conservation Trust Bat Survey Guidelines. These guidelines are used by Local Planning Authority ecology team during the planning application process to determine the level of survey effort that is needed.

Activity dusk and dawn surveys were conducted over a period of about 7 weeks to illustrate the use of the building as a bat roost over a period of time. The surveys were conducted during a time of the year when bats are generally fully active, and a bat maternity roost would be present and were done during optimal weather conditions.

Six bat roosts were identified during the surveys which may be affected if the planned works include any alterations to the pool house, main house, or cottage. No further surveys are recommended to prepare for this particular scenario. It is not believed that additional surveys could add any further information to aid the licence and design the bat mitigation plan.

6. Bat Mitigation Plan

Timing schedule for works: Removal of roof tiles and roofing materials will be restricted to be carried out between the months of September/ October or March/ April during suitable weather conditions.

The work will be carried out during a time of the year when bats are active enough to move away from dangerous building works and outside of the maternity period. If roof areas would be suddenly exposed during frost the bats would be unable to move and save themselves.

See Appendix 6 for time schedule of works

Temporary Bat Roost: A 1FF Schwegler Bat Box and a 1FS Schwegler Large Colony Bat Box or similar will be put up on a suitable tree on site as a safe place to move any bats to. The licenced ecologist will identify a suitable tree and bat box.

Inspection prior to works: The loft spaces of the pool room and house will be inspected by a licenced bat worker on the morning before any works of removing any roof tiles, wall tiles or roofing material starts.

On site supervision during works: A licensed bat worker will hold a "tool box talk" to the building contractors prior to works commencing and will be onsite during the removal of the roof tiles, roofing material and cladding in case bats or evidence of bats are found and will be on standby during further works. Evidence found may be used to tweak and improve the mitigation plan where possible. All materials will be carefully removed by hand.

Precautions if bats are found during works: If bats are found during building works, they will be safeguarded by the licensed bat worker supervising the works. If bats are found during building works, they may be moved by a licensed bat worker to the bat boxes attached to the trees as temporary mitigation following a health check.

Using bat friendly roofing material: The roof of the house must be retained as lined with black bitumen roofing felt and be insulated at floor levels with fibreglass insulation material as favoured by the species of bats present. Breathable roof membranes like e.g. Tyvek should not be used as it is known to rip when bats climb across it and the holes caused will reduce the efficiency of the breathable membrane. It has been well documented that bats often get entangled in the ripped Tyvek felt and die as they become trapped.

Additional bat access points: On the house bat tiles will be added to the areas of roof on the southern elevation to provide crevices for common pipistrelle bats and access into the loft for brown long eared bats.

In addition a squeeze box or maternity box will be added into the retained loft space to mitigate for the soprano pipistrelle maternity roost being lost. This will be accessed by

the bats via a bat access tile which will create a similar access to that of the previous roost.

See Appendix 7 for design of bat mitigation.

Inspection of new bat access points: The new bat access points and bat boxes will be inspected by a licenced bat worker on completion.

Limited external lighting on site: Extra care will be taken to ensure that external lights are kept to a minimum and will not illuminate the bat access points or flight paths to nearby trees. The light will be aimed to illuminate only the immediate area required by using as sharp a downward angle as possible. No lighting should be placed near the roost entrances.

A shield or hood will be used to control or restrict the area to be lit and limit "light spillage" on the site.

7. References

Collins, J. (ed.)(2016) Bat Surveys for Professional Ecologists: Good Practise Guidelines (3rd edn).The Bat Conservation Trust, London.

Mitchell-Jones A J & McLeish A P (Ed.), 2004. *The Bat Workers' Man*ual. JNCC, Peterborough, United Kingdom.

Mitchell-Jones A J. 2004. *Bat Mitigation Guidelines*, English Nature. Peterborough, United Kingdom.

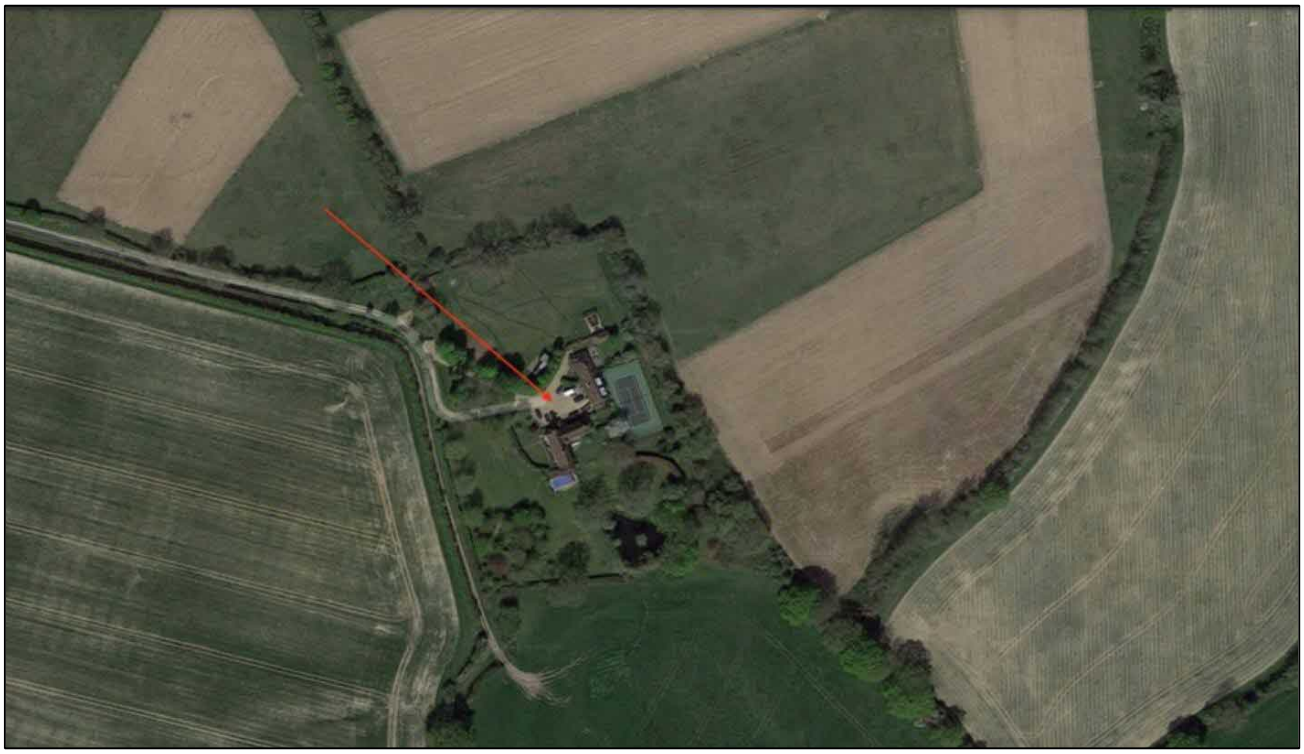
Natural England and Countryside Council for Wales, 2007. *Disturbance and protected species: understanding and applying the law in England and Wales. – A view from Natural England and the Countryside Council for Wales.* United Kingdom.

Parsons, K *et al* (Ed.) 2007. *Bat Surveys – Good Practise Guidelines.* Bat Conservation Trust, London, United Kingdom.

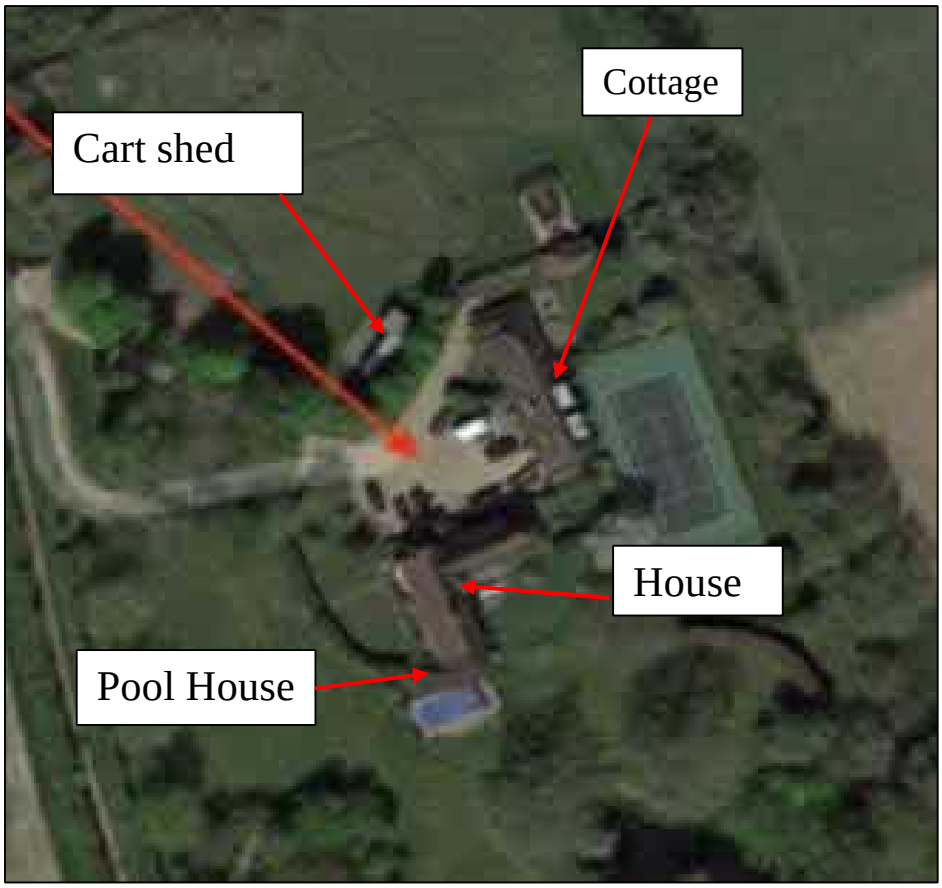
Richardson, P. 2000. *Distribution Atlas of Bats in Britain and Ireland 1980-1999.* Bat Conservation Trust, London, United Kingdom.

Russ, J. 1999. *The Bats of Britain and Ireland*. Alana Books, Alana Ecology Ltd. United Kingdom.

APPENDIX 1: Site Location

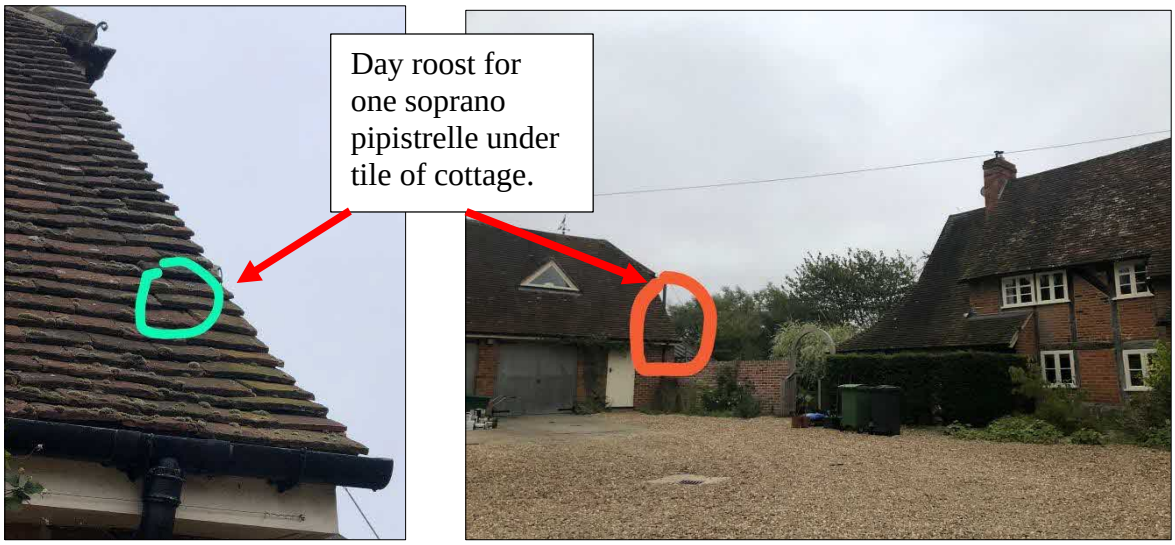


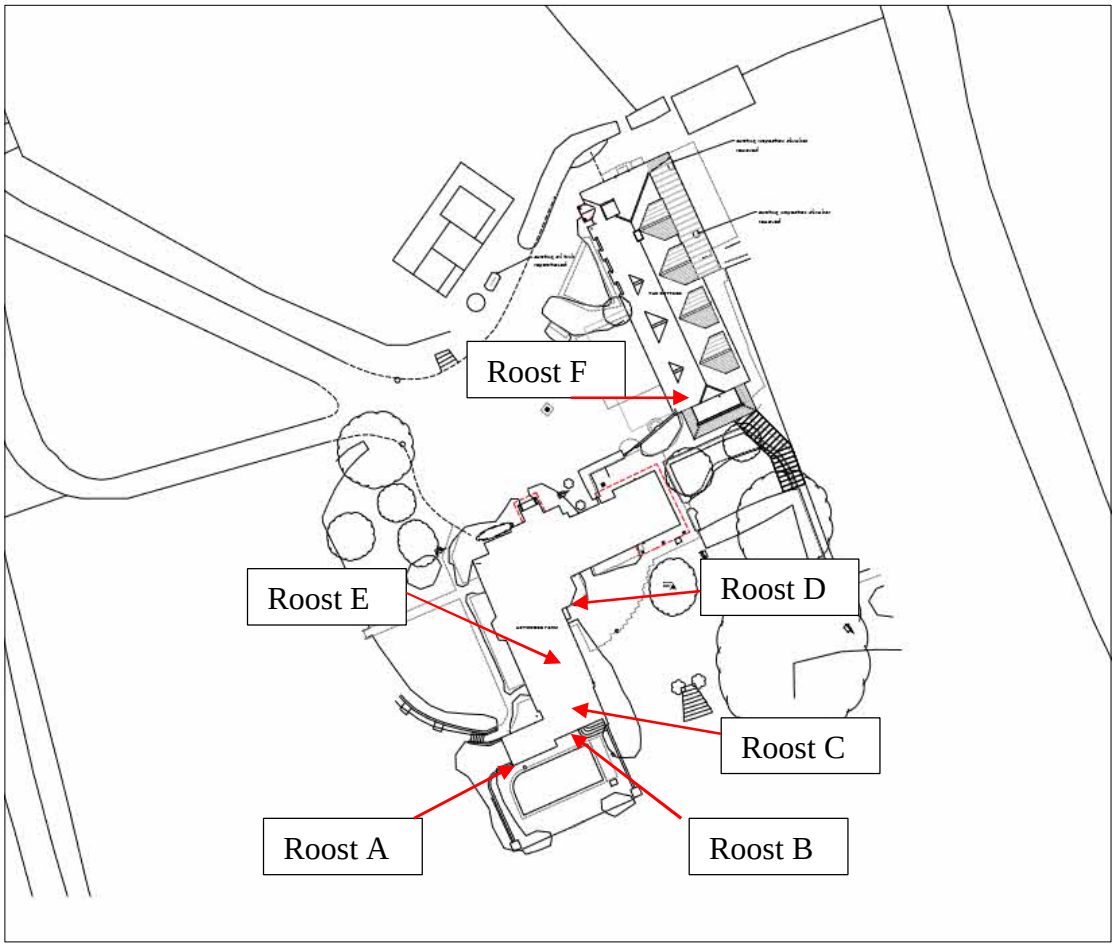
APPENDIX 2: Diagram of buildings



APPENDIX 3: Position of Bat Roosts


Day roost for a maximum of one brown long eared bat in loft of main house.
Day roost for one common pipistrelle under a roof tile on the main house 'turret'


Day roost for one soprano pipistrelle under tile of cottage.


Roost F
Roost E
Roost D
Roost C
Roost A
Roost B

APPENDIX 4: Activity Survey & Sound Analysis Results

Emergence 1 Survey 8th August 2021

Surveyors Nick Kirke, Sarah Wrenn, Ashley Johnson, Myfanwy Price and Lisha Price

Time	Species	Activity	Flight Direction
20:25	Survey start		
20:40	Official sunset		
20:45	**1 Common pipistrelle**	**Emerging pool house near gutter.**	
20:49	**6 Soprano pipistrelle**	**Emerging from hanging wall tiles on the left-hand side**	
20:50	**7 Soprano pipistrelle**	**Emerging from hanging wall tiles on the left-hand side**	
20:53	**4 Soprano pipistrelles**	**Emerging from hanging wall tiles on the left-hand side**	
20:54	**Brown long eared**	**Emerging from top of pool house roof**	
20:55	**2 Soprano pipistrelles**	**Emerging from hanging wall tiles on the pool house gable end**	
20:56	**Soprano pipistrelle**	**Emerging from right side of pool house guttering**	
20:58	**2 Soprano pipistrelles**	**Emerging from hanging wall tile halfway down the gable end**	
21:09	**Brown long eared**	**Emerging from height of pool house roof**	
22:10	Survey Finish		

Emergence 2 Survey 29th August 2021

Surveyors Nick Kirke, Sarah Wrenn, Ashley Johnson, Myfanwy Price and Lisha Price

Time	Species	Activity	Flight Direction
19:40	Survey start		
19:55	Official sunset		
19:59	**Soprano pipistrelle**	**Emerging from hanging wall tiles on the left-hand side above pool house**	
20:00	**2 Soprano pipistrelle**	**Emerging from hanging wall tiles on the right-hand side above pool house**	
20:02	**2 Soprano pipistrelle**	**Emerging from hanging wall tiles on lower left-hand side above pool house**	
20:12	**4 Soprano pipistrelle**	**Emerging from hanging wall tiles on upper left-hand side above pool house**	
20:13	**6 Soprano pipistrelle**	**Emerging from under hanging wall tile above pool house on right-hand side**	
20:13	**Soprano pipistrelle**	**Emerging from under hanging wall tile above pool house on right-hand side**	
20:21	**4 Soprano pipistrelle**	**Emerging from hanging wall tiles on lower left-hand side above pool house**	
20:25	**Common pipistrelle**	**Emerging from roof tile east aspect of house near turret.**	
20:47	**Brown long eared**	**Emerging from near chimney of house.**	
21:25	Survey end		

Dawn Survey 24th September 2021

Surveyors Lisha Price, Nick Kirke, Ashley Johnston, Sarah Wrenn and Myfanwy Price

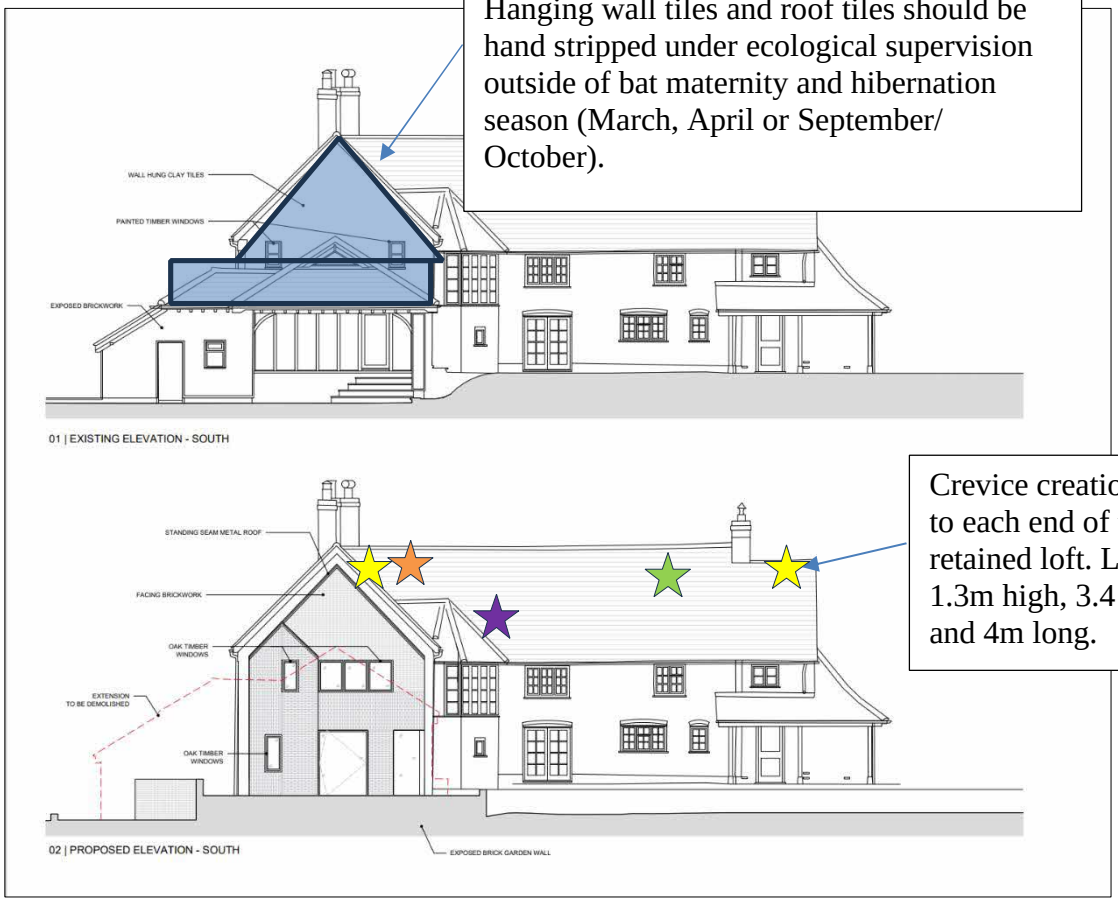
Time	Species	Activity	Flight Direction
04:53	Survey start		
05:10	**Soprano pipistrelle**	**Entering under cottage roof tile west side.**	
06:53	Sunrise		
07:08	Survey end		

APPENDIX 5: Proposed Plans

APPENDIX 6: Work Schedule

Works to be carried out	**Before any works begin**	**When bats are active & outside of maternity period September-October / March-April**	**After works**
Bat boxes on trees to be installed to provide temporary roosting.			
Interior inspection prior to start of works – by licensed bat worker			
Toolbox talk to building team - by licensed bat worker			
Supervised removal of tiles/ hanging tiles/ roofing materials - by licensed bat worker			
Inspection of mitigation installed			
Monitoring surveys			

APPENDIX 7: Design of Mitigation



Crevice Creation

Bat Access tiles into loft for brown long eared bats

Bat Access tile leading to a squeeze box to mitigate for the Soprano pipistrelle maternity roost.

Bat tile not entering loft to mitigate for loss of day roost for one common pipistrelle.

Rationale: A recent CIEEM study[1] found that the probability of pipistrelles returning to a modified roost was greater if roost enhancements such as new crevices were provided. A recent BCT study[2] found there was a relationship between the number of bats (all species) and the number of small internal cavities provided.

1. Materials (plus fixings) – **at each end of the ridge i.e. two per roof, where space allows**
    - 1x rough-sawn 3.6 metre board (125-150mm deep; 12-15mm thick; shown in blue)
    - Short lengths of 25x25mm battens (shown in orange)
2. Cut board in half; attach battens at each end and in the middle (see Plate 5).

Plate 5. Stage 1 and 2 to create crevices at the ridge

3. Attach the other half, leaving a gap between the boards that is the width of the battens (25 mm). The crevice will be open from the top and bottom for most of the length of the boards (see Plate 6).

Plate 6. Stage 3 to create crevices at the ridge

4. Align this with the ridge board (or equivalent); and fix to the rafters, as high as possible whilst leaving a 25mm gap between the top of the boards and ridge board (see Plate 7).
5. Place one on the warmest side of the roof (south or west pitch) and one on the coolest side of the roof (north or east pitch) – adapt as necessary to alignment of property.
6. In a hipped roof, it may only be possible to include one set of boards.

Tudor Tile bat access points ★

Colours available:

- Red antique
- Dark antique
- Medium antique
- Sussex red
- Sussex brown

Gaps will need to be cut into the bitumen liner beneath the tiles to allow access into the loft space.