JDEcology

Bat Survey Report

Monks Hall, Syleham

March 2022

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Report prepared by Dr J. Huckle for Huckle Ecology Ltd and Jonathan Durward for JDEcology Ltd.

Executive Summary

In February 2021, Huckle Ecology was commissioned by Mrs Juliet Grimes to undertake a preliminary roost assessment of Monks Hall Manor House, Syleham, Norfolk. The survey was carried out to determine the presence or likely absence of roosting bats and nesting birds in the house and associated outbuildings. The presence of bats was confirmed, and Huckle Ecology was subsequently commissioned by the client in March 2021 to carry out bat activity surveys to determine whether roosting bats were present in the Manor House, and if so, the location of roost access points and the status of any roosts present. Huckle Ecology used JDEcology to undertake the bat work for this project due to their bat surveying and licensing capabilities.

Current proposals are to construct a single storey extension to the rear of the house, restoration and re-roofing of the main roof area, replacing clay pan tile withs traditional clay 'flat tiles' and to repair structural timbers as required. ……

This report summarises relevant biodiversity policy and legislation in regard to current proposals and the methodologies used to determine and assess likely ecological impacts as a result of any development. The results and evaluation of the building inspections and bat activity surveys are also provided.

Bats were confirmed to be roosting in the Manor House, this included a soprano pipistrelle pre-maternity roost with a maximum count of 38 individuals, a soprano pipistrelle maternity roost of 68 individuals, and a common pipistrelle maternity roost with a maximum count of eight individuals. All other roosts of common and soprano pipistrelles in the building were day or transitional roosts, and there was also one nathusius pipistrelle day roost recorded.

A European Protected Species mitigation licence (EPSL) application will be submitted to Natural England to undertake any disturbance to, damage of or destruction of bat roosts in Monks Hall, which has been identified as having roosting bats present. Mitigation and compensation measures set out by best practice guidance (Bat Mitigation Guidelines, 2004) for bats are included within the proposals. The recommendations will ensure that the conservation status of the species present will not change and will also enhance the value of the site to bats as a result of the proposed development.

A great tit was observed nesting in a gap at the eastern gable during the bat activity surveys. As a precautionary measure, before works begin, a qualified ecologist will check any gaps in the Manor House will be checked for nesting birds.

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1 Introduction

1.1 Terms of Reference

1.1.1 In February 2021, Huckle Ecology was commissioned by Mrs Juliet Grimes to undertake a Preliminary Roost Assessment of Monks Hall Manor House, Syleham, Norfolk. The survey was carried out to determine the presence or likely absence of roosting bats and nesting birds in the house and associated outbuildings. The presence of bats was confirmed, and Huckle Ecology was subsequently commissioned by the client in March 2021 to carry out bat activity surveys to determine whether roosting bats were present in the Manor House, and if so, the location of roost access points and the status of any roosts present. Huckle Ecology used JDEcology to undertake the bat work for this project due to their bat licensing capabilities.

1.1.2 Bats were confirmed to be roosting in the Manor House, this included a soprano pipistrelle pre-maternity roost with a maximum count of 38 individuals, a soprano pipistrelle maternity roost of 68 individuals, and a common pipistrelle maternity roost with a maximum count of eight individuals. All other roosts of common and soprano pipistrelles in the building were day or transitional roosts, and there was also one nathusius pipistrelle day roost recorded.

1.1.3 This report details the methodologies used to determine the presence or likely absence of roosting bats within Monks Hall and associated outbuildings. Records from previous and recent survey work are presented and discussed in order to evaluate likely ecological impacts on bats as a result of conversion works to these specific buildings.

1.2 Proposed Development

1.2.1 Current proposals are to construct a single storey extension to the rear of the house, restoration and re-roofing of the main roof area, replacing clay pan tile with traditional clay 'flat tiles' and to repair structural timbers as required. The proposed extension is detailed on Figures 3 and 4 below.

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1.3 Site Description

The proposed development site is located in a rural area on the Norfolk/Suffolk County boundary, approximately 1 kilometre to the west of the village of Syleham (Figure 1). Immediately to the north of the property is the River Waveney, with associated wet grassland, parkland, and areas of mature broadleaved and mixed woodland, with rolling arable farmland lying to the south. Monks Hall itself is a 15th Century Grade II Listed Manor House with adjacent farm outbuildings and associated gardens, hedgerows, and mature trees (Figure 2). Habitat provision and connectivity surrounding the site is excellent given the diversity of habitats that are present in the landscape.

Figure 1 Location Plan Showing location of Monks Hall, Syleham

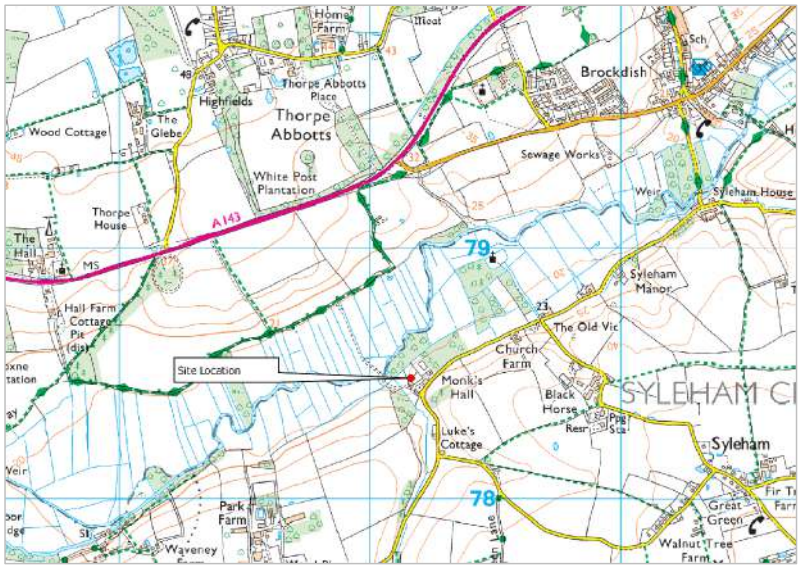

Figure 2 Existing Site Layout (Aerial imagery courtesy of Google Earth)

Figure 3 Proposed Site Plan

Figure 4 Proposed Elevations

1.4 Aim of this Report

This report presents the results of bat surveys undertaken at Monks Hall in 2021

The scope of the protected species surveys undertaken was determined based on a habitat suitability assessment for bats (as reported below) and an evaluation of the potential to support other protected species. Other than bats, the only protected species likely to be an ecological constraint are breeding birds, using the building structure for breeding.

2 Desk Study

2.1.1 A search for records of bats within a 2-kilometre radius was submitted to Suffolk Biodiversity Information Service in February 2022.

2.1.2 Due to the location of the Site close to the County border, the search also included records returned from the Norfolk Biodiversity Information Service; the search returned all bat records held within an 2km search radius of Monks Hall.

2.1.3 There were only four bat roost records from this area, with the closest breeding roosts of pipistrelle *Pipistrellus* species and brown long-eared *Plecotus auritus* bats being from St Margaret's Church, approximately 570 metres to the northeast of the site, recorded in 2013. There were a 105 bat detector records, mainly from Norfolk including common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus*, natterer's *Myotis nattereri*, daubenton's *Myotis daubentonii*, serotine *Eptesicus serotinus*, noctule *Nyctalus noctula*, brown long-eared and barbastelle *Barbastellus barbastellus*.

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3 Bat Surveys

3.1 Preliminary Roost Assessment–Scoping Survey

Methodology

3.1.1 A Site Visit was undertaken on 18th February 2021 to provide a bat preliminary roost assessment (PRA) of the barns included within the proposed development Site and to confirm the scope of further surveys that would be required to accompany the planning application, in line with best practice guidance on bat surveys (Collins, 2016). A separate inspection of the building was undertaken to look for hibernating bats on the 7th of February 2022.

3.1.2 The February 2021 survey was undertaken by Jonathan Durward, Rachel Bates and Dr Jon Huckle. The February 2022 survey was undertaken by Jonathan Durward and Rachel Bates.

3.1.3 Jonathan Durward is an experienced professional ecologist, who has over 18 years operating as an ecological consultant. He has undertaken numerous preliminary ecological appraisals that have included inspections of buildings, bridges, barns and trees for bats, and has held and currently holds Natural England European Protected Species Mitigation Licences (EPSL's) for a number of projects and bat species. Natural England Class Licence holder CL19 (2015-11967-CLS-CLS) – Classes 1,2,3 - Mist net. Natural England Class Licence CL20 (2015-11968-CLS-CLS) – Classes 1,2 4 - Harp trap.

3.1.4 Rachel Bates is an experienced professional ecologist, who has over 10 years operating as an ecological consultant and has undertaken numerous preliminary ecological appraisals that have included inspections of buildings, barns and trees for bats. She holds Class 3 and 4 Natural England licences CL19 (2019-40153-CLS-CLS) and CL20 (2017-28515-CLS-CLS).

3.1.5 Jon Huckle is an experienced professional ecologist with over 25 years of postgraduate experience and over 18 years operating as an ecological consultant. He has undertaken numerous bat surveys, including building inspections, bat activity transects, emergence and return roost surveys and has managed ecological input to numerous ecology chapters of Environmental Statements. He has provided evidence as an expert witness on bat ecology at several planning inquiries.

3.1.6 The preliminary roost assessment comprised a detailed inspection of the exterior and interior of the buildings to look for features that bats could use for entry/exit and to search for signs of bats, in accordance with methodological guidance produced by the Bat Conservation Trust (Collins, 2016). The objective of the survey was to determine the actual or potential presence of bats and to identify potential emergence points to focus on during emergence surveys.

3.1.7 For each building or tree, the preliminary roost assessment assigns a category to each structure according to its potential for supporting bat roosts using the criteria detailed in the BCT survey guidelines (Collins, 2016) and summarised in Table 1 below.

Table 1 Guidelines for assessing the potential suitability of proposed development sites for bats, taken from Collins 2016.

Suitability	Description of roosting habitats	Description of commuting and foraging habitat
Negligible	Negligible habitat features onsite likely to be used by roosting bats.	Negligible habitat features on- site likely to be used by commuting or foraging bats.
Low	A 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.) A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree 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 – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.
High	A structure or tree 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.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. Site is close to and connected to known roosts.

Results of Preliminary Roost Assessment and Hibernation Visit

Monks Hall

3.1.8 Monks Hall is a 15th Century Grade II Listed Manor House with adjacent outbuildings (see Photo 1). The two-storey L-shaped building is timber-framed with plaster and lathe with exposed studding at the front (south side). The two-storey porch on the south side of the building has bargeboards at gable, with exposed timbers behind creating an internal soffit. The pitched roof is mainly plain tiled with ornate brick chimneys and overhanging eaves, there are gables at the east, west and north sides, and dormer windows on the north side of the building. There were gaps in roof tiles and at the base of the chimney, under the eaves and where exposed timbers had shrunk or been damaged in the past. Pipistrelle bat droppings were present on the first storey porch window and the wall next to the most easterly window on the southern elevation of the building. This indicated that bats had been roosting above or around these locations where there were gaps between timbers and under felt at the eaves. Internally, there was a loft running east to west that was approximately 3metres high to the

ridge, which was boarded, although there were gaps in the boarding where exposed insulation was visible. Inside the loft were less than ten pipistrelle droppings on the insulation and boarding. The 2022 hibernation visit did not find any pipistrelles roosting in gaps between timbers or under the eaves. This building was considered to be of high suitability for roosting bats as well as a confirmed bat roost.

Photo 1 – Southern elevation of Monks Hall

3.1.9 To the west of Monks Hall were two single-storey brick and flint-built outbuildings with pitched pan-tiled roofs. Internally these buildings were open with exposed timber beams and a mixture of bitumastic felt and breathable membrane. There were no signs of bats in either of these buildings and they were considered to be of low suitability for roosting bats.

Barn adjacent to Syleham Road

3.1.10 This building is not part of the proposed development, but there is likely to be some movement of bats between Monks Hall and this barn. The barn is a typical Suffolk barn of timber-frame construction, with weather boarding on a brick base with a pitched clay-tiled roof. Internally there were a number of supporting beams with exposed mortise joints and large piles of pipistrelle droppings on the floor. A thermal imaging camera allowed the surveyors to see that bats were present inside one of the mortise joints inside the barn. Underneath another mortise joint was a bucket that a number of dead pipistrelle bats inside. It is likely that this building has been and is used by bats during the maternity season given the number of droppings and (dead) bats present at the time of the inspection.

Bird Survey

3.1.11 During the building inspections, signs of any old or active bird nests were recorded.

3.2 Bat Activity Survey Methodology

3.2.1 Between May and September 2021, four activity surveys were carried out to record any bats emerging from or re-entering roosting sites within the buildings. Following three emergence surveys a fourth dawn re-entry survey was undertaken to provide additional information on bat activity using the Monks Hall.

3.2.2 Observations were made from outside, from positions to the north, east, south, and west of the house providing vantage points of the building elevations considered to support bat roosts or where bats may access the buildings, are shown in Figure 5.

Figure 5 Surveyor and camera locations around Monks Hall

3.2.3 The dusk surveys commenced fifteen minutes before sunset until ninety minutes after sunset, by which time any bats present were expected to have emerged (Collins, 2016). The dawn re-entry survey commenced 2 hours before sunrise and continued until just after sunrise.

3.2.4 All emergence surveys were undertaken by Jonathan Durward and Jon Huckle, assisted by a team of experienced surveyors including Rachel Bates, Terry Stopher, John Worthington-Hill, Saul Press and Charles Kilshaw.

3.2.5 Bat activity was surveyed using full spectrum handheld bat detectors: Elekon Batloggers M's, Elekon Batlogger M2 or an EMTouch/ EMTouch Pro attached to a tablet or smartphone. DUET bat detectors were also used in conjunction with full spectrum bat detectors. Time-expanded (x10) recordings were later analysed using computer software (e.g., Sonobat, BatExplorer or

Kaleidoscope).

3.2.6 Two Canon XA10 and two Canon XA20 video camcorders with infrared dedo lights and a Helion pulsar XP28 thermal imaging camera were used to support the emergence and return surveys, covering areas where bats were considered most likely to emerge.

3.2.7 The bat surveys were conducted during the bat activity season (May to September) using the correct methodology as per The Bat Conservation Trust Bat Survey - Good Practice Guidelines (Collins, 2016).

3.3 Survey Limitations

3.3.1 The initial bat preliminary roost assessment was undertaken at the end of February 2021 in good weather conditions. However, inspections before or at the start of the bat activity season are less likely to detect signs of bat activity such as bat droppings or feeding remains. The endoscope checks of the building in 2021 and 2022 were limited due to the size and condition of the building. External features were checked as far as was reasonably possible, although there were some areas where bats could roost that could not be checked thoroughly, or it was just not safe to access.

3.3.2 The building was accessible internally on the ground, first and second floors (attic rooms).

3.3.3 The bat emergence surveys were undertaken in optimal weather conditions for bat activity surveys, in dry weather and at appropriate temperatures. The vantage points were selected to provide coverage of the building elevations that could be easily viewed and accessed. However, given the sheer size and complexity of the building it was not always possible to detect the exact locations that bats were emerging from. This was especially true on the activity survey on the 4th of August 2021, where there were a large number of bat emergences on the southern side of the building.

3.4 Bat Activity Survey Results

Activity Survey 1 – Dusk Emergence Survey – 12th of May 2021

3.4.1 Weather conditions were optimal for bat activity surveys:

- Air temperature – 12°C (start) – 11°C (end)
- Wind – Beaufort scale 0/1 (still/light air)
- Precipitation – none
- Cloud – mostly clear with light scattered cloud (1/8 oktas)

3.4.2 The survey commenced at 20.25 with sunset scheduled for 20.40.

3.4.3 Observations were made from outside, from positions to the northeast, north-west, and south of the barns, providing good visual coverage of the entire roof and elevations of the building.

Summary of Survey on 12.05.2021

3.4.4 In summary, two soprano and one common pipistrelle bats were recorded emerging from the north side of the building. One bat emerged from the upper area of the roof near the eastern gable, and two bats from the area of tiles to the west of the dormer windows near the western gable (Figure 6).

3.4.5 From the south side of the building, 38 soprano pipistrelle bats were recorded emerging from a horizontal cavity or slot in the front porch adjacent to the gable fascia board and three from the western horizontal bar of the porch gable Two common pipistrelle bats were recorded emerging from the south side of the building, one from a roof tile near the chimney stack, and the second one from a roof tile between the chimney stack and porch (Figure 5).

Figure 5 South Elevation - Roost locations identified on Survey 1 - 12.05.2021

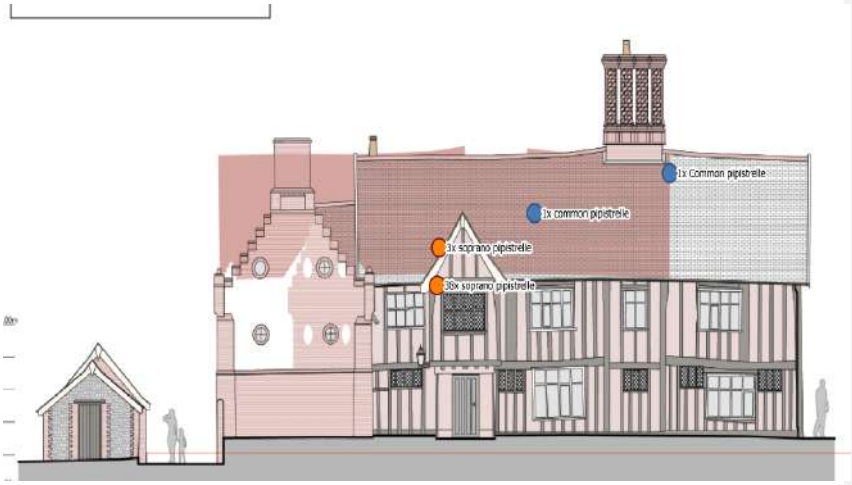

Figure 6 North Elevation - Roost locations identified on Survey 1 - 12.05.2021

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3.4.6 Bat activity was considered to be relatively low, given the number of bats recorded emerging, indicative of bats leaving the area around the building to commute to preferred foraging areas. Other species briefly recorded commuting through the site included brown long-eared, barbastelle and serotine.

3.4.7 No bats emerged from the two single-storey brick and flint-built outbuildings.

Activity Survey 2 – Dusk Emergence Survey – 9th of June 2021

3.4.8 Weather conditions were optimal for bat activity surveys:

- Air temperature – 21°C (start) - 18°C (end)
- Wind – Beaufort scale 0 (still)
- Precipitation – none
- Clear sky (0/8 oktas)

3.4.9 The survey commenced at 20.55 with sunset scheduled for 21:15.

3.4.10 Observations were made around the house providing visual coverage of the entire roof and elevations of the building.

Summary of Survey on 09.06.2021

3.4.11 In summary, on the north side of the house, two bats were observed emerging from roosts associated with roof tiles to the west of the central dormer window (Figure 8 and Photo 2)).

3.4.12 On the south elevation of the house, 12 pipistrelle bats were observed emerging from roosts associated with the front porch, recorded emerging from different locations to those emerging on the May survey. A further six pipistrelle bats were observed emerging from roosting areas around the roof and eaves near the eastern gable (Figure 7).

3.4.13 Other species recorded foraging around the site included noctule and serotine. Brown long-eared, natterer's and Nathusius pipistrelle were briefly recorded in the grounds of the manor house.

3.4.14 No bats emerged from the two single-storey brick and flint-built outbuildings.

3.4.15 A great tit was observed nesting in a gap at the eastern gable.

Figure 7 South Elevation - Roost locations identified on Survey 2 09.06.2021

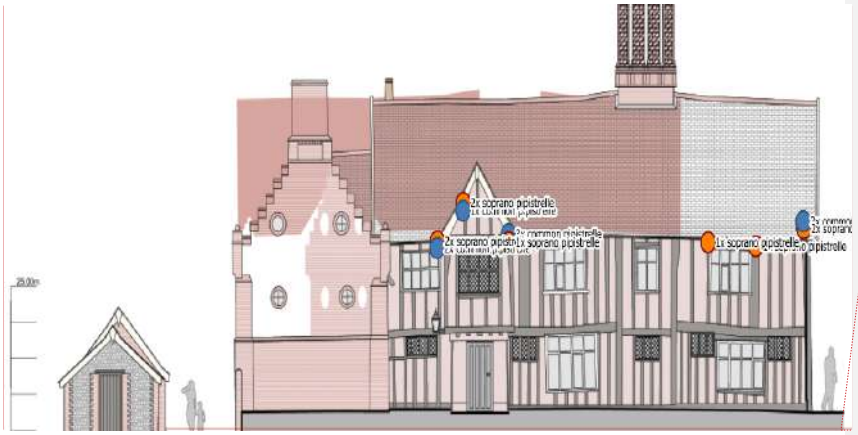

Figure 8 North Elevation - Roost locations identified on Survey 2 – 09.06.2021

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Photo 2 - Locations of emerging common and soprano pipistrelle bats from the northern elevation of Monks Hall at 21.47 on the 9th of June 2021.

Activity Survey 3 – Dusk Emergence Survey – 4th of August 2021

3.4.16 Weather conditions were optimal for bat activity surveys:

- Air temperature – 19°C (start) - 14°C (end)
- Wind – Beaufort scale 0/1 (still/ light air)
- Precipitation – none
- Clear sky with very scattered cloud (0/8 oktas)

3.4.17 The survey commenced at 20.30 with sunset scheduled for 20.42.

3.4.18 Observations were made around the house providing visual coverage of the entire roof and elevations of the building.

Summary of Survey on 04.08.2021

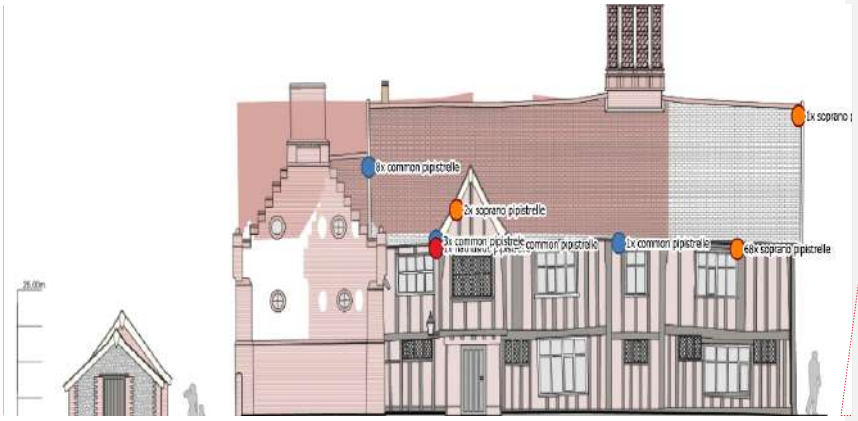
3.4.19 In summary, on the north side of the house, two soprano pipistrelles were observed emerging from roosts associated with roof tiles on either side of the main chimney stacks (Figure 10).

3.4.20 On the south elevation of the house, 16 pipistrelle bats including a single nathusius pipistrelle (Figure 11) were observed emerging from roosts associated with the front porch (see Photos 3 and 4) and recorded emerging from the same and different locations to those emerging on the June survey. One pipistrelle bat was observed emerging from a roost around the apex of

the roof near the eastern gable, one at the base of the chimney stack, with another emerging from underneath the eaves at the top western part of middle window. 68 soprano pipistrelle bats emerged from underneath the eaves at the top easternmost window (Figure 9).

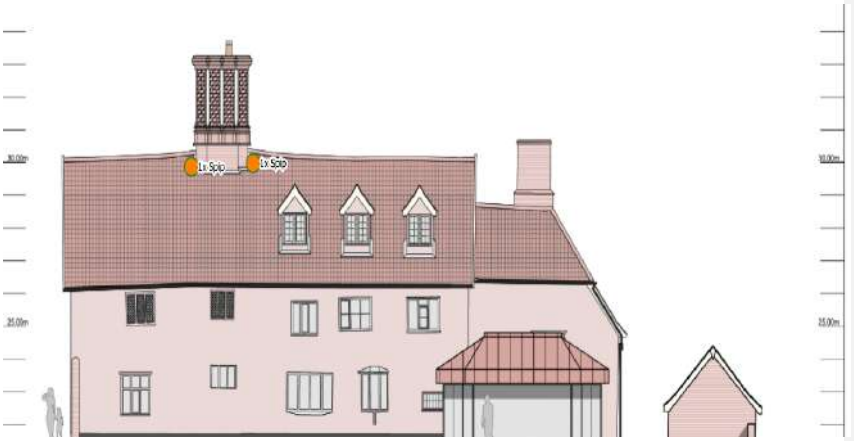
3.4.21 The soprano pipistrelles that had previously roosted above the porch in May 2021 moved to underneath the eaves at the top easternmost window (Figure 9, Photos 5 & 6), with approximately double the numbers from May meaning it is highly likely that the bats moved to this location either to give birth or to wean their pups. Smaller numbers of common pipistrelles were present in the building, with 8 emerging at the western gable, which may indicate a small maternity roost at this location. Individual pipistrelles were also present throughout this side of the building due to the number of available roosting locations. A single nathusius pipistrelle was recorded roosting in the western roof area. In total, 84 bats emerged from seven different locations.

Figure 9 South Elevation - Roost locations identified on Survey 3 04.08.2021



Commented [JD8]: Can you add a SP roost under the chimney stack. I got this on the thermal camera. Assume same bat went back to roost in same place at end of September.

Figure 10 North Elevation - Roost locations identified on Survey 3 04.08.2021



3.4.22 The only other species recorded foraging around the house (at the end of the activity survey) was natterer's bat.

3.4.23 No bats emerged from the two single-storey brick and flint-built outbuildings.

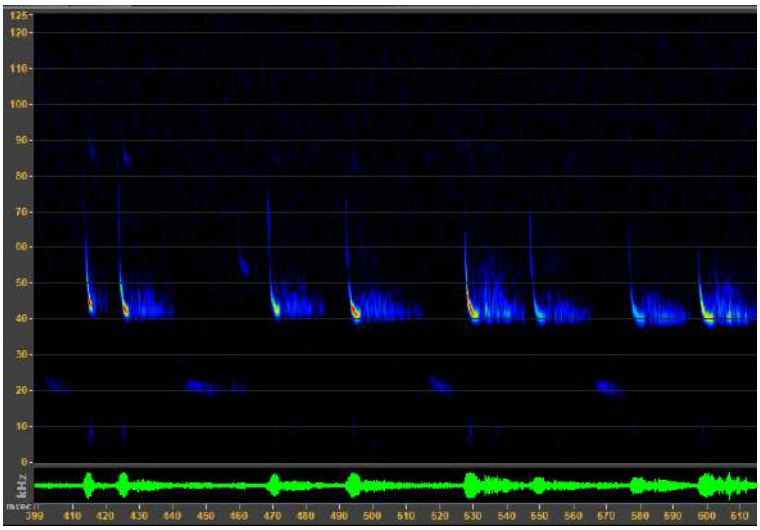
Photo 3 – Features above the porch where bats were observed emerging from.

Photo 4 – Gap between timbers in the porch with bat droppings on the plaster.

Photo 5 – Roosting features above easternmost window of southern elevation

Photo 6 – Gap above easternmost window of southern elevation showing bat droppings

Figure 11 – Sonogram of Nathusius pipistrelle emerging from porch on 04.08.2021



Activity Survey 3 Dawn Re-entry Survey – 23rd September 2021

3.4.24 Weather conditions were optimal for bat activity surveys:

- Air temperature – 12°C (start) - 12°C (end)
- Wind – Beaufort scale 0 (calm/still)

- Precipitation – none
- Clear skies (0/8 oktas)

3.4.25 The survey commenced at 05.00 with sunrise scheduled for 06.45.

3.4.26 Observations were made from four locations to the north, west and south of the building.

Summary of Survey on 23.09.2021

3.4.27 In summary, on the north side of the house a single soprano pipistrelle was observed returning to a roosting location at the base of the chimney stack (Figure 13).

3.4.28 On the south elevation of the house, 3 individual soprano pipistrelle bats returned to 3 separate roosting locations below missing tiles in the roof (Figure 12).

3.4.29 No bats returned to the two single-storey brick and flint-built outbuildings.

Figure 12 South Elevation - Roost locations identified on Survey 4 23.09.2021

Figure 13 North Elevation - Roost locations identified on Survey 4 23.09.2021

3.5 Conclusion of Bat Activity Surveys

Roosting Sites

3.5.1 There were eighteen roosting locations for three pipistrelle species at Monks Hall, three on the northern elevation and fifteen on the southern elevation – see paragraph 4.2.1 for the definition of a roost. Bat emergence and pre-dawn return locations are shown in Figures 6 - 12 above, with the combined locations in all four surveys being summarised in Figure 14 and 15 below.

Figure 14 South Elevation – locations of roosts recorded on all surveys

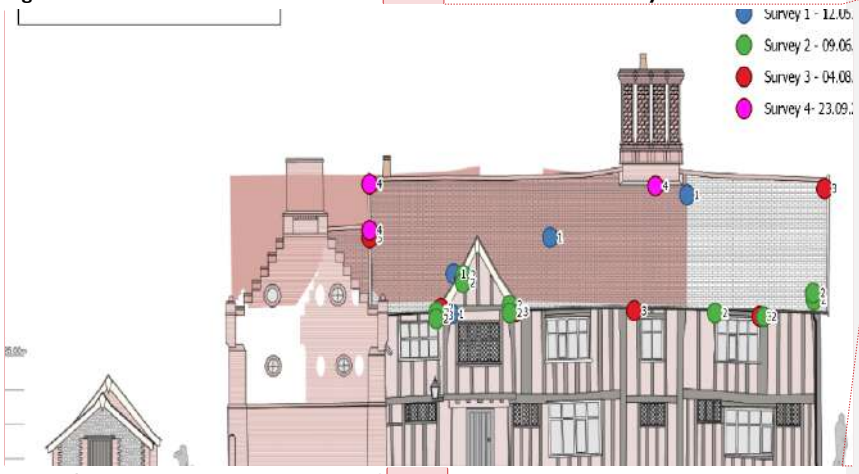


Figure 15 North Elevation – locations of roosts recorded on all surveys

3.5.2 At the northern elevation bats were observed emerging from or returning to the following locations:

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- 1 Soprano pipistrelle near apex of gable at eastern elevation
- 1 Common pipistrelle under a roof tile between dormer window and western elevation
- 1 Soprano pipistrelle halfway up gable at the western elevation
- 1 Soprano pipistrelle under a roof tile to west of the central dormer window
- 1 Common pipistrelle under a roof tile to west of the central dormer window
- 1 Soprano pipistrelle near the apex of the roof to the east of the chimney stack
- 1 Soprano pipistrelle near the apex of the roof to the west of the chimney stack
- 1 Soprano pipistrelle near the apex of the roof to the west of the chimney stack

3.5.3 At the southern elevation bats were observed emerging from or returning to the following locations.

- 1 Common pipistrelle near the apex of the roof to the east of the chimney stack
- 1 Common pipistrelle under a roof tile between chimney stack and porch
- 3 Soprano pipistrelles in western horizontal bar of porch gable
- 38 Soprano pipistrelles in a horizontal cavity at front porch adjacent to the gable fascia board
- 2 Soprano pipistrelles and 3 Common pipistrelles from lower part of southern elevation near eastern gable
- 1 Soprano pipistrelle under eaves at top eastern part of the easternmost window on the southern elevation
- 1 Soprano pipistrelle under eaves at top western part of the easternmost window on the southern elevation
- 2 Common pipistrelles and 2 Soprano pipistrelles in from corner eaves of western part of porch gable
- 2 Common pipistrelles and 2 Soprano pipistrelles in western horizontal bar of porch gable
- 2 Common pipistrelles and 1 Soprano pipistrelle in corner eaves of eastern part of porch gable
- 68 Soprano pipistrelles in a gap under the eaves at the top of the easternmost window on the southern elevation
- 2 Soprano pipistrelles in western horizontal bar of porch gable
- 2 Common pipistrelles in corner eaves of eastern part of porch gable
- 8 Common pipistrelles halfway up gable at the western elevation
- 3 Common pipistrelles and a Nathusius pipistrelle in corner eaves of western part of porch gable
- 1 Soprano pipistrelle under roof tile near the apex of the eastern gable
- 1 Common pipistrelle under the eaves at the top western part of middle window on the southern elevation
- 1 Soprano pipistrelle halfway up gable at the western elevation
- 1 Soprano pipistrelle under roof tile near the apex of the western gable
- 1 Soprano pipistrelle under a missing tile beneath the chimney stack

Foraging and Commuting Habitat

3.5.4 Foraging and commuting habitats for bats in the local area are numerous, and include the River Waveney, with associated wet grassland, parkland, and mature broadleaved woodland. The levels of bat foraging in the gardens in the immediate vicinity of Monks Hall were relatively low, which was unsurprising given the richness of foraging habitats close by.

3.6 Breeding Bird Habitat

3.6.1 No evidence of barn owl Tyto alba was recorded during the inspection and/or bat activity surveys; this species is not considered likely to be present

3.6.2 A great tit was observed nesting in a gap at the eastern gable on the 9th of June 2021 (Photo 7). There are numerous gaps around the building, but this was the only location that a bird was noted to be nesting at. Little owl pellets were found on the hard standing below the porch on the 7th of February 2022 and it is likely that they have been using the porch as a winter roosting location as it is in full sunlight.

Photo 7 – Great tit nesting location at eastern gable on 09.06.2021

4 Discussion and Recommendations

4.1 Evaluation

Bats

4.1.1 The records search information showed that the closest breeding roosts of pipistrelle species was from St Margaret's Church, approximately 570 metres to the northeast of the site in 2013. It was not specified what type of pipistrelle was roosting in the church, but if they were soprano pipistrelles, given the proximity of the church to Monks Hall, there may be mixing of the two colonies. Apart from brown long-eared's roosting the church all other bat records within 2 kilometres were detector records.

4.1.2 During the initial building inspection on the 18th of February 2021, pipistrelle bat droppings were present on the first storey porch window and the wall next to most easterly window on the southern elevation of the building. Inside the loft were less than ten pipistrelle droppings on the insulation and boarding. No bats were seen roosting externally or internally on this date. The hibernation check on the 6th of February 2022 confirmed the results of the initial building inspection with no bats seen during endoscope inspections of various external features. Droppings were present in gaps in the porch and in cavities above the easternmost window on the southern elevation. The two single-storey brick and flint-built outbuildings had no signs of bat use.

4.1.3 Activity surveys on the 12th of May, 9th of June, 4th of August and 23rd of September 2021 confirmed eighteen roosting locations for soprano, common and nathusius pipistrelles. Four day roosts and two transitional roosts of a total of twenty individual bats were located under roof tiles on the northern and southern elevations. A further nine day roosts were located around the porch and near the windows on the southern elevation. A pre-maternity roost of 38 soprano pipistrelles was observed in a horizontal cavity at the front porch adjacent to the gable fascia board on the 12th of May 2021. It is likely that those bats moved to maternity roosting area under the eaves at the top of the easternmost window on the southern elevation after they had given birth, where 68 soprano pipistrelles were recorded emerging on the 4th of August 2021. The activity survey on the 9th of June recorded no more than two or three individual bats in those two locations, indicating that the maternity roost had moved elsewhere at that time.

4.1.4 A small maternity roost of eight common pipistrelles was recorded halfway up gable at the western elevation on the 4th of August 2021. All other roosts on the southern elevation totalled between one and three bats but included a single nathusius pipistrelle roosting in the corner eaves of western part of porch gable, also on the 4th of August 2021. On more than one occasion, soprano and common pipistrelles were recorded emerging from the same roosting spot, and there is no reason to believe that either species has a specific association to a particular roosting location.

4.1.5 Other bat species recorded during the surveys but not roosting in the building included natterer's bat, serotine, noctule, brown long-eared and barbastelle. The age, structure, and

geographic location of the building, plus the abundance of high-quality foraging areas nearby, means that it is safe and easy for bats to commute to good foraging areas, which is why there are so many roosts present.

4.1.6 No bats were recorded roosting in the two single-storey brick and flint-built outbuildings.

4.1.7 A European Protected Species mitigation licence (EPSL) application will be submitted to Natural England to undertake any disturbance to, damage of or destruction of bat roosts in Monks Hall, which has been identified as having roosting bats present. Mitigation and compensation measures set out by best practice guidance (Bat Mitigation Guidelines, 2004) for bats are included within the proposals. The recommendations will ensure that the conservation status of the species present will not change and will also enhance the value of the site to bats as a result of the proposed development.

Birds

4.1.8 As a precautionary measure, before works begin, a qualified ecologist will check any gaps in the Manor House for nesting birds.

4.2 Impacts

4.2.1 To be considered the same roost, the locations need to have the same functional and qualitative characteristics, be used by the same species for the same purpose (e.g., day roosting) and be within the same building / structure. If the physical characteristics are different (e.g., one roost is in external crevices in the wall and the other is in the roof void against internal timbers) then they should be considered different roosts – because they offer bats different roosting opportunities. If the physical characteristics are similar and provide the same functional characteristics, used by the same species for the same purpose (e.g., transitional roost) but with different individual roosting locations within the overall building / structure, that could be considered one transitional roost. If two species are using an area that provides the same characteristics, for the same function, it is still two roosts – as they are two species.

4.2.2 Without any mitigation, the renovation of Monks Hall will result in the loss of legally protected bat roosts. It is likely to disturb common, soprano and nathusius pipistrelles if they are present when work is carried out. Disturbance, damage, and destruction of roosts is most likely during removal of roof tiles, and whilst repairing structural timbers, bargeboards, and soffits.

4.2.3 Without any mitigation, reparation of timbers will lead to the loss of:

- a pre-maternity roost of 38 Soprano pipistrelles in a horizontal cavity at front porch adjacent to the gable fascia board
- a maternity roost of 68 Soprano pipistrelles in a gap under the eaves at the top of the easternmost window on the southern elevation
- 3 soprano pipistrelles (day roost) in the western horizontal bar of the porch gable
- 2 common pipistrelles (day roost) in the western horizontal bar of the porch gable
- 1 soprano pipistrelle (day roost) under the eaves at top western part of the easternmost window on the southern elevation

- 1 soprano pipistrelle (transitional roost) under the eaves at top eastern part of the easternmost window on the southern elevation
- 3 common pipistrelles (day roost) in from the corner eaves of western part of porch gable
- 2 soprano pipistrelles (day roost) in from the corner eaves of western part of porch gable
- 1 nathusius pipistrelle (day roost) in from the corner eaves of western part of porch gable
- 2 common pipistrelles (day roost) in corner eaves of eastern part of porch gable
- a maternity roost of 8 common pipistrelles halfway up gable at the western elevation and 1 Soprano pipistrelle halfway up gable at the western elevation; and
- 1 common pipistrelle (day roost) under the eaves at the top western part of the middle window on the southern elevation

Commented [JD12]: It is contentious whether or not these locations in the porch are considered 'one roost' or not, but as they have different physical characteristics, I have kept them separate.

4.2.4 Without any mitigation, removal of roof tiles on the southern elevation will lead to the loss of:

- a day roost of 5 common pipistrelles under roof tiles in the southern elevation
- a day roost of 4 soprano pipistrelles under roof tiles in the southern elevation
- a transitional roost of 3 soprano pipistrelles under roof tiles in the southern elevation

4.2.5 Without any mitigation, removal of roof tiles on the northern elevation will lead to the loss of:

- a day roost of 2 common pipistrelles under roof tiles in the northern elevation
- a day roost of 5 soprano pipistrelles under roof tiles in the northern elevation
- a transitional roost of 1 soprano pipistrelle under a roof tile in the northern elevation

4.2.6 The CIEEM EcIA guidelines (2018) note that 'various approaches can be adopted for defining local importance, including assessment within a district, borough or parish context or within other locally defined areas.'

4.2.7 Day roosts of common species that will be impacted during the development will result in a negative impact at a local level. Maternity and pre-maternity roosts of common species that will be impacted during the development will result in a negative impact at a district level. The day roost of the single data-deficient deficient species will result in a negative impact at a local level.

4.3 Mitigation and Compensation Measures

4.3.1 For the Manor House, which has been identified as having roosting bats present, works to undertake disturbance or modification to, or damage or destruction of bat roosts will be carried out under a European Protected Species Licence (EPSL) from Natural England. Before the development commences, a standalone pole mounted bat box Photo 7) will be erected in the grounds of Monks Hall, plus bat boxes placed on trees. These are designed to mitigate for the damage, modification, or destruction of bat roosts during works.

4.3.2 The disturbance or modification to, or damage or destruction of bat roosts will be supervised by a licensed bat worker. Features that may support bat roosts will be stripped by hand (soft demolition), features will be checked using torches and/or endoscopes, bats will be

temporarily excluded from some roosts using exclusion devices. If bats are found during the soft demolition, they will be removed by hand (licensed bat worker) and placed in the bat boxes on site (see above).

4.3.3 As the building is being renovated, bat features may be incorporated into the roof, porch or around the windows of the building to compensate for any roosts which have been lost.

4.3.4 Timings of works will be required to avoid the bat maternity season in locations where these types of roosts have been found. The bat maternity season is roughly from the beginning of May to the end of August, with the main birthing and weaning period between June and July. For day roosts timings of works are not so restrictive unless they are in proximity to maternity roosts. It is good practice to avoid undertaking works during the hibernation season (roughly December to February inclusive), as at this time of year bats are generally hibernating or in torpor, and there is a high risk of mortality if they are disturbed. Therefore, works will be timed in order to take advantage of milder weather conditions after several nights where temperatures are no lower than 8 degrees Celsius. The ideal times of year to undertake building works is either Spring or Autumn, where bats will be moving between hibernation and mating areas or vice versa.

Photo 7 – an example of a pole mounted bat box that is used as a soprano pipistrelle maternity roost

4.3.5 Current proposals are to construct a single storey extension to the rear of the house, restoration and re-roofing of the main roof area, replacing clay pan tile withs traditional clay 'flat tiles' and to repair structural timbers as required. Where roof tiles are being replaced bat access tiles can be used to create roosting spaces for one or two bats, these tiles are made to order to match the materials of the new roof tiles (Photo 8) https://www.nhbs.com/bat-access-tile-set?bkfno=187127 .

Photo 8 – an example of a bat access roof tile

4.3.6 Depending on the requirements for repairing the structural timbers, it may be possible to keep or modify the locations of the soprano pipistrelle pre-maternity roost above the porch and maternity roost above the easternmost window on the southern elevation. For the small common pipistrelle maternity at the gable of the western elevation, it is not known if a new or modified roost can be incorporated into the building due to listed building planning considerations. If it is not possible to keep any of the maternity or pre-maternity locations, then woodstone interconnecting bat boxes (Photo 9) https://www.wildcare.co.uk/10667-interconnecting-bat-box.html can be put in alternative structures.

Photo 9 – Woodstone interconnecting bat box

4.3.7 Temporary and permanent lighting will be in-line with lighting guidelines (Bats and Lighting in the UK, Bat Conservation Trust 2018). This lighting should be of low level, be on downward

deflectors and ideally be on PIR sensors. Using LED directional lighting can also be a way of minimizing the light spill affecting the adjacent habitat. No up-lighting should be used. This will ensure that any roosting, commuting and foraging resources that the bats are likely to be using is maintained. This includes any lighting near buildings and trees where mitigation and compensations features have been installed.

4.4 Biodiversity Enhancement

4.4.1 Following the issue of Planning Policy Statement 9 by the Office of the Deputy Prime Minister (ODPM, 2005) and the National Planning Policy Framework (2019), all planning decisions should aim to minimise impacts on and providing net gains for biodiversity, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

Biodiversity Net Gain

4.4.2 Paragraph 118a of the National Planning Policy Framework 2019 (NPPF) states: "Planning policies and decisions should: a) encourage multiple benefits from both urban and rural land, including through mixed use schemes and taking opportunities to achieve net environmental gains – such as developments that would enable new habitat creation or improve public access to the countryside"

4.4.3 Paragraph 170d states: "Planning policies and decisions should: d) contribute to and enhance the natural and local environment by: minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;"

4.4.4 Paragraph 174b states: "To protect and enhance biodiversity and geodiversity, plans should: b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity."

4.4.5 Exemptions can be granted from the protection afforded to bats or GCN under the Habitat Regulations, by means of an EPS (European Protected Species) Habitats Regulations licence obtained from Natural England.

5 References

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, and Coastal, September 2018. Chartered Institute of Ecology and Environmental Management, Winchester.

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

The Conservation of Habitats and Species Regulations 2017, London: HMSO.

The Countryside and Rights of Way Act 2000, (c.37), London: HMSO.

MHCLG. (2019). National Planning Policy Framework. London, UK.: Ministry of Housing, Communities and Local Government.

Mitchell-Jones, A. J. (2004) Bat Mitigation Guidelines. English Nature, Peterborough.

Mitchell-Jones, A. J. & McLeish, A. P. (2004) Bat Workers' Manual (3RD Edition). JNCC, Peterborough.

The Natural Environment and Rural Communities Act 2006. HMSO: London

Wildlife and Countryside Act 1981 (and amendments), (c.69), London: HMSO

Appendices

Appendix 1 – Summary of Legislation - Bats

This section provides a brief guide to legislation and planning policy, and it is recommended that the full text of policy and legislation is consulted for the correct legal wording.

All bat species benefit from statutory protection provided by the 'Habitats Regulations' and the Wildlife and Countryside Act, which have been enshrined within national and local planning policy throughout England and Wales.

All bat species are included in Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). Under Regulation 43 it is an offence to:

- Deliberately capture, injure or kill a bat;
- Deliberately disturb bats including:
- impairing their ability to survive, breed or rear young;
- impairing their ability to hibernate or migrate;
- Significantly affect the local distribution or abundance of that species
- Damage or destroy a breeding site or resting place of a bat;
- Possess, control, transport, sell or exchange any live or dead bat, or any part or thing derived from a bat.

Bats are listed on Schedule 5 of the Wildlife & Countryside Act 1981, as amended, and as such are protected under Section 9 of the Act, which applies to all stages in their life cycle and makes it an offence to:

- intentionally kill, injure or take bats. [Section 9(1)]
- to possess or control a bat, live or dead or any part or thing derived from them. [Section 9(2)]
- to intentionally or recklessly damage, destroy, or obstruct access to any structure or place which bats use for shelter or protection. It is also an offence to intentionally disturb them while occupying a structure or place which it uses for that purpose. [Section 9(4)]
- to sell, offer or expose for sale, or possess or transport for the purpose of sale, any live or dead bat or any part or thing derived from them. [It is also an offence to publish or cause to be published any advertisement likely to be understood as conveying that bats, or parts or derived things of them are bought, sold or are intended to be]. [Section 9(5)]

Prosecution could result in imprisonment, fines of £5,000 per animal affected and confiscation of vehicles and equipment used.

This legislation provides defences so that necessary operations may be carried out in places used by bats, provided the appropriate Statutory Nature Conservation Organisation (in England this is Natural England) is notified and allowed a reasonable time to advise on whether the proposed operation should be carried out and, if so, the approach to be used. The UK is a signatory to the Agreement on the Conservation of Bats in Europe, set up under the Bonn Convention. The Fundamental Obligations of Article III of this Agreement require the protection of all bats and their

habitats, including the identification and protection from damage or disturbance of important feeding areas for bats.

Paragraph 98 of Circular 06/2005 states that 'the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat'.

Section 9 of the National Planning Policy Framework 2019 (NPPF) (MHCLG, 2019) states that 'the planning system should contribute to and enhance the natural and local environment by ….minimising impacts on biodiversity and providing net gains in biodiversity where possible.'

Exemptions can be granted from the protection afforded to bats under the Habitat Regulations, by means of an EPS (European Protected Species) Habitats Regulations licence obtained from Natural England.

An 'EPS Habitats Regulations Licence' could be required for:

- Demolition of a building known to be used by bats prior to development of a site
- Conversion of barns or other buildings to be used by bats
- Removal of trees known be used by bats as well as tree pruning
- Significant alterations to roof voids known to be used by bats
- Road building or widening
- Bridge strengthening

There are three tests, which must be satisfied before a licence can be issued to permit otherwise prohibited acts;

- Regulation 55(2)(e), for the purpose of preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment; or
- Regulation 55(9)(a) and there is no satisfactory alternative; and
- Regulation 55(9)(b) that the action authorised will not be detrimental to the maintenance of the species concerned at favourable conservation status in their natural range.

A European Protected Species Licence is required before the commencement of any development that might impact on bats and their roosts.

Appendix 2 – Results of Bat Activity Surveys

Table 2 Results of Emergence Survey on 12/05/2021

Time	Species	Observation
Vantage Point 1 (JH) - N of Building, viewing north elevation and chimney stack – two soprano pipistrelles emerged from this side of the building.		
20.25	-	Survey Start
20.45	**Common pipistrelle**	E – Bat seen, emergence from west end of roof close to VP2
21.00	**Soprano pipistrelle**	E- from near gable end at west end of house
21.00	**Soprano pipistrelle**	E – from gable at east end of roof, close to apex of gable wall
21.00-21.15	Soprano pipistrelle	Several brief passes, one possible emergence at 21.05 but unconfirmed
21.15-21.30	Soprano pipistrelle	4x passes recorded – brief passes of commuting bats
21.24	Barbastelle	Brief pass of barbastelle bat
21.30 – 21.45	Common pipistrelle, soprano pipistrelle	Regular frequent passes of both pipistrelle species
21.34	Brown long-eared bat	2x passes recorded
21.36	Serotine	Single pass
21.45-22.00	Soprano pipistrelle	10x passes of soprano pipistrelle only
22.00-22.15	Common pipistrelle, soprano pipistrelle	Occasional passes
22.20		Survey ended
Vantage Point 2 (CK)- NW of Building viewing north west elevations and dormer windows on north roof – a single soprano pipistrelle		
20.25	-	Survey Start
20.44	Common pipistrelle	Heard but not seen
21.00	**Soprano pipistrelle**	E – from behind chimney, emergence from roof (same bat as at VP1)
21.10	Common pipistrelle	Heard but not seen
21.26	Common pipistrelle	
21.28	Soprano pipistrelle	Heard but not seen
21.34	Soprano pipistrelle	Heard but not seen
21.40	Soprano pipistrelle	Heard but not seen
21.43	Soprano pipistrelle	
21.46	Soprano pipistrelle	Foraging, not seen
21.52	Soprano pipistrelle	Foraging
21.56	Soprano pipistrelle	Foraging
22.20		Survey ended – early due to low bat activity
Vantage Point 4 (RB)- S of house, viewing porch and south elevation – 41 soprano pipistrelles emerged from the area around the porch		
20.25	-	Survey Start
20.33	**Soprano pipistrelle**	E – from a gap in southern gable in porch
20.37	**Soprano pipistrelle**	E – from a gap in southern gable in porch
20.38	**Soprano pipistrelle**	E – from a gap in southern gable in porch
20.40	**Soprano pipistrelle x 2**	E – from a gap in southern gable in porch
20.42	**Soprano pipistrelle x 2**	E – from a gap in southern gable in porch
20.43	**Soprano pipistrelle x 3**	E – from western horizontal bar of porch gable
20.44	**Soprano pipistrelle x 2**	E – from a gap in southern gable in porch
20.46	**Soprano pipistrelle**	E – from a gap in southern gable in porch
20.48	**Soprano pipistrelle x 2**	E – from a gap in southern gable in porch

Time	Species	Observation
20.49	**Soprano pipistrelle x 3**	E – from a gap in southern gable in porch
20.50	**Soprano pipistrelle x 3**	E – from a gap in southern gable in porch
20.51	**Soprano pipistrelle x 2**	E – from a gap in southern gable in porch
20.52	**Soprano pipistrelle x 5**	E – from a gap in southern gable in porch
20.53	**Soprano pipistrelle x 3**	E – from a gap in southern gable in porch
20.54	**Soprano pipistrelle x 4**	E – from a gap in southern gable in porch
20.58	**Soprano pipistrelle x 2**	E – from a gap in southern gable in porch
21.00	**Soprano pipistrelle x 4**	E – from a gap in southern gable in porch
22.20	-	Survey ended
Vantage Point 5 (JD)- S of house, viewing south east corner and east gable – two common pipistrelles emerged from underneath roof tiles.		
20.25	-	Survey Start
20.57	**Common pipistrelle**	E – from a roof tile near the chimney stack
21.01	**Common pipistrelle**	E – from a roof tile between the chimney stack and porch
21.35	Serotine	C – from eastern gable over the porch
21.00 – 22.00	Soprano pipistrelles	F – in the gardens to the south and east of the building.
22.20	-	Survey ended

Table 3 Results of Emergence Survey on 09/06/2021

Time	Species	Observation
Vantage Point 1 (JWH) – NE corner of house, viewing east and north elevations. **(2 bats emerged from roof tiles to west of middle dormer window)**		
20.55	-	Survey Start
21.18	**Soprano pipistrelle**	E – emerged from gap under tiles on west side of middle dormer window
21.31	Noctule	Commuting from south in northerly direction
21.32	Noctule	Commuting
21.37	**Common pipistrelle**	E - emergence from similar location to soprano pipistrelle at 21.18
21.50-51	Common pipistrelle	4x passes
21.52	Soprano pipistrelle	X4 bats – chasing around garden with social calling
22.04	Soprano pipistrelle	X2 bats chasing with lots of social calls
22.04	Brown long-eared bat	Several calls mixed in with soprano pipistrelle
22.05	Serotine	Heard but not seen
22.10-15	Soprano pipistrelle, Common pipistrelle	Frequent foraging activity in garden -
22.20-30	Common pipistrelle	Frequent foraging in garden
22.26	Nathusius pipistrelle	Heard but not seen – single pass
22.30		Survey end
Vantage Point 2 – (CK) - NW of house, viewing north and west elevation **(no emergence recorded)**		
20.50	-	Survey Start
21.26	Soprano pipistrelle	Flew around from front of house
21.27	Soprano pipistrelle	Ditto
21.30	Noctule	Heard but not seen
21.32	Noctule	Heard but not seen
21.33	Common pipistrelle	Flew around west side of house from front
21.36	Common pipistrelle	2x passes overhead
21.42-21.50	Common pipistrelle, soprano pipistrelle	Frequent passes flying form front and around west gable end. Several foraging bats
21.50-22.00	Common pipistrelle	Quiet spell – few calls

Time	Species	Observation
22.00-22.30	Common pipistrelle, soprano pipistrelle	Frequent foraging with both species flying around garden and in front of gable end
22.19	Myotis sp	Single pass, probably Natterer's bat
22.28	Serotine	Foraging in garden
22.30		Survey end

Vantage Point 3 – (SP) – Southwest corner of house with view of west extension and SW corner of porch (3 soprano pipistrelle emerged from behind end wall/wing)		
20.50	-	Survey Start
21.26	**Soprano pipistrelle**	E- from west edge of porch roof or south roof of house behind gable wall
21.30	Noctule	Commuting
21.32	Noctule	Commuting
21.37	**Soprano pipistrelle x 2**	E – 2 x bats emerged from behind the end wall (from between porch and west wing
21.40-50	Common pipistrelle, soprano pipistrelle	Mostly Common pipistrelle with occasional soprano pipistrelle calls recorded – active around west end.
21.50-22.00	Common pipistrelle	1x pass
22.05-07	Common pipistrelle	6x passes – heard but not seen
22.15-22.30	Common pipistrelle, soprano pipistrelle	Frequent passes recorded - heard but not seen. Often both species recorded together
22.30		Survey end

Vantage Point 4 – (JH) – Southeast of front porch with view of southside of porch and south east end of house (11/12 bats emerged including 6 soprano pipistrelle and 6 Common pipistrelle)		
20.50	-	Survey Start
21.26	**Soprano pipistrelle**	E- from west edge of porch roof -appeared to emerge from lower end of sloping fascia board and from around corner on west side of porch (2.A)
21.27	**Soprano pipistrelle**	E – emerged from cavity on west edge of gable end wall, ca. 1m above edge of roof (2.B)
21.30	Noctule	3x passes, flying north towards river
21.32	Noctule	1x pass, flying northwards overhead
21.33	**Soprano pipistrelle**	E – from near window on eastern end of south elevation (2.C)
21.33	**Common pipistrelle**	E – possible appeared to emerge from west end of porch
21.36	**Soprano pipistrelle**	E – emerged from same point as at 21.27 – (Roost 2.B)
21.36	**Soprano pipistrelle**	E – 2nd bat emerged from lower end of west edge of porch roof (Roost 2.A)
21.37	**Common pipistrelle**	E – bat emerged from east end of porch roof (Roost 2.D)
21.41	**Common pipistrelle**	E – from west edge of porch roof (roost 2.A/B)
21.42	**Common pipistrelle**	E – from Roost 2.B
21.44	**Common pipistrelle**	E – from Roost 2.D
21.45	**Common pipistrelle**	E – from Roost 2.D
21.47	Soprano pipistrelle	Commuting east to west – did not emerge
21.48	Soprano pipistrelle	Heard but not seen
21.49	Soprano pipistrelle	Flew form around side of building, forgaing
21.50-22.00	Soprano pipistrelle	Occasional passes
21.52	**Soprano pipistrelle**	E – possible – from east edge of porch rood (roost 2.D)
22.00-22.15	Common pipistrelle, soprano pipistrelle	Frequent passes of bats foraging and chasing around house, including social calls
22.16-17	Soprano pipistrelle	2x bats seen chasing around roofs to west of porch
22.15-35	Common pipistrelle, soprano pipistrelle	Continuous foraging in front of house
22.35		Survey end

Time	Species	Observation
Vantage Point 5 – (JD) – East end of house, viewing east gable wall and south east corner of house (6 bats emerged including 3 soprano pipistrelle and 3 Common pipistrelle)		
20.50	-	Survey Start
21.19	Great tit	Entered gap where lowest timber was present on north-east part of gable.
21.29	**Soprano pipistrelle**	E – emerged from the lower part of the roof near the eastern gable.
21.30	Noctule	C – seen flying east to west over the house
21.33	**Soprano pipistrelle**	E – emerged from under the eaves of the southern part of the roof near the eastern gable.
21.37	**Common pipistrelle**	E – emerged from the lower part of the roof near the eastern gable.
21.39	**Common pipistrelle x 2**	E – emerged from the lower part of the roof near the eastern gable.
21.42	**Soprano pipistrelle**	E – emerged from the lower part of the roof near the eastern gable.
21.43 – 22.35	Common pipistrelle, soprano pipistrelle	F – intermittent foraging behaviour in the garden to the east of the house, although quite quiet at this location.
22.35		Survey end

Table 7 Results of Emergence Survey on 04/08/2021

Time	Species	Observation
Vantage Point 1 (JWH) – NE corner of house, viewing east and north elevations. (2 bats emerged from roof tiles on either side of main chimney stack)		
20.30	-	Survey Start
20.36	Soprano pipistrelle	Flew around east end of house – did not emerge from north elevation
20.39	**Soprano pipistrelle**	E - No echolocation – observed emerging from roof tile on east side of chimney at base of chimney stack – visible gap in concrete present (Roost 3.1)
20.43	**Soprano pipistrelle**	No echolocation – emerged from west side of chimney stack at apex of roof – from roof tiles (Roost 3.2)
20.56	soprano pipistrelle	Flew around east end of house – did not emerge from north elevation
21.22-32	Common pipistrelle	Foraging in garden
21.50		Survey end
Vantage Point 2 – (JH) - NW of house, viewing north and west elevation (2 bats emerged from roof tiles on either side of main chimney stack)		
20.30	-	Survey Start
20.39	**Soprano pipistrelle**	E – emerged from apex of roof to east of chimney (as seen at VP1 – Roost 3.1)
20.41	Soprano pipistrelle	Flew E to W across lawn – did not emerge
20.43	**Soprano pipistrelle**	E – emerged from roof tile on west side of chimney stack (Roost 3.2)
20.56	Soprano pipistrelle	Flew around side of house
21.04	Soprano pipistrelle	Flew across lawn – commuting
21.22 – 32	Common pipistrelle	Foraging in garden to rear of house
21.34-35	Common pipistrelle	2x passes, one bat
21.50		Survey end
Vantage Point 3 (RB)- S of house, viewing porch and south elevation (16 bats emerged from around the porch and/or the western gable).		
20.30	-	Survey Start
20.36	**Soprano pipistrelle**	E – emerged from western horizontal bar of porch gable
20.38	**Soprano pipistrelle**	E – emerged from western horizontal bar of porch gable
20.40	**Common pipistrelle**	E – emerged from corner eaves of eastern part of porch gable
20.48	**Common pipistrelle**	E – emerged from corner eaves of eastern part of porch gable
20.42 – 20.54	**Common pipistrelle x 8**	E – emerged from midway up the western gable
20.47 – 20.50	**Common pipistrelle x 3**	E – emerged from corner eaves of western part of porch gable

Time	Species	Observation
20.44	**Nathusius pipistrelle**	E – emerged from corner eaves of western part of porch gable.
21:44	Natterer's bat	F – foraging in front of house (two passes).
21.08 – 21.50	Common pipistrelle, soprano pipistrelle	F – bats observed/heard foraging around the front garden until the end of the survey.
21.50	-	Survey ended
Vantage Point 4 (JD)- S of house, viewing south east corner and east gable 68 soprano pipistrelles emerged from underneath the eaves at the top easternmost window. One bat emerged near the apex of the eastern gable and another bat emerged from underneath the eaves at the top western part of middle window.		
20.30	-	Survey Start
20.36 - 21.07	**Soprano pipistrelle x 68**	E – 68 bats emerged from underneath the eaves at the top easternmost window.
20:48	**Soprano pipistrelle**	E - a single soprano pipistrelle was observed emerging from the base of the chimney stack.
20.50	**Soprano pipistrelle**	E – emerged from near the apex of the eastern gable
20.58	**Common pipistrelle**	E – emerged from underneath the eaves at the top western part of middle window
21.13	**Soprano pipistrelle**	R – returned to underneath the eaves at the top easternmost window.
21.27	**Soprano pipistrelle**	E - emerged from underneath the eaves at the top easternmost window (same bat as previous?)
21.08 – 21.50	Common pipistrelle, soprano pipistrelle	F – bats observed/heard foraging around the front garden until the end of the survey.
21.50	-	Survey ended

Table 8 Results of Dawn Re-entry Survey on 23.09.2021

Time	Species	Observation
Vantage Point 1 (JH) – north, viewing north side of house		
04.42	-	Survey Start
05.00-05.30	Common pipistrelle, soprano pipistrelle	Occasional calls of both species, foraging and commuting
05.30 – 06.00	Common pipistrelle, soprano pipistrelle	Periodic activity recorded with individual bats or small numbers of bats foraging and commuting in back garden
06.00 – 06.30	Common pipistrelle, Soprano pipistrelle	Ditto, with numerous social calls recorded
06.36	**Soprano pipistrelle**	**R – Returned to roost under tile at west edge of main chimney stack**
06.30 – 06.42		No further records after 06.26
06.42	-	Survey ended
Vantage Point 2 – (TS) – west of house, viewing west elevation		
04.42	-	Survey Start
05.00-06.27	Common pipistrelle, Soprano pipistrelle	Frequent records of commuting and foraging including social calls between main house and trees to west. No bats recorded returning to roosts.
06.42	-	Survey ended
Vantage Point 4 (RB) – south, viewing south side of house and porch (2 bats returned to roost on the south side of the house).		
04.42	-	Survey Start
05.18	Barbastelle	C – brief pass
05.23	Common pipistrelle	C – brief pass
05.27	Soprano pipistrelle	SC- Social calls mixed in with foraging/commuting. Swarming activity.
05.30	Soprano pipistrelle	C – brief pass
05.43	Common pipistrelle	SC- Social calls mixed in with foraging/commuting.
05.45	Common pipistrelle	SC- Social calls.
05.46	Soprano pipistrelle	C – brief pass
06.15	**Soprano pipistrelle**	R - returned to roost under a missing tile next to the strip of lead flashing midway up the western gable

Time	Species	Observation
06.17	**Soprano pipistrelle**	R - returned to roost under a missing tile near the apex / ridge of the western gable
06.42	-	Survey ended
Vantage Point 5 – (JD) – southeast, viewing south east corner of house (a single bat returned to roost under a missing tile near the chimney stack).		
04.42	-	Survey Start
05.20 – 05.32	Common pipistrelle	F – foraging in garden and window area at the front of the house.
05.43	Common pipistrelle	F – foraging in garden and window area at the front of the house.
05.45	Common pipistrelle	F – foraging in garden and window area at the front of the house.
05.59	Common pipistrelle	F – foraging in garden and around the building
06.15	Soprano pipistrelle x 2	F - flying around the building
06.15	Common pipistrelle	C – brief pass
06.34	Soprano pipistrelle	C – brief pass
06.36	**Soprano pipistrelle**	R – returned to roost under a missing tile beneath the chimney stack.
06.42	-	Survey ended