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Bat Scoping and Emergence Interim Report

Redwood, Penshurst Road

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Report Summary

1. The Ecology Co-op were commissioned by Fluid Planning Ltd to undertake a Bat Scoping Assessment at Redwood, Penhurst, followed by two emergence surveys of two separate outbuildings at the property. The purpose of this report is to present the findings of these surveys and identify potential ecological constraints and opportunities in relation to a proposal to convert the buildings into residential dwellings.

2. An initial assessment of the site was carried out by Dan Bennett BSc, MCIEEM and Natural England Level 2 class bat licence holder on the 14th of September 2020. This included a ground-based external inspection of both buildings, internal inspection and an appraisal of the surrounding habitats, to evaluate the site for its potential to support roosting bats. All bat species are European Protected Species (Annex IV, 'Habitats Directive').

3. The first building comprises an open sided timber-framed barn with timber ship-lap walls, used for storage and shelter of vehicles and equipment. The second comprises a brick stable block, now disused. Both buildings have simple pitched roofs made with clay-pegged tiles. The open sided barn's roof is lined, but neither buildings have insulation or internal void spaces. The Redwood estate is situated to the north of the small rural village of Penhurst within the High Weald AONB. The Redlands estate consists mainly of parkland with scattered trees surrounding a large country house and residential dwellings in the eastern section, the western section is dominated by a large lake surrounded by ancient and replanted and deciduous woodland.

4. Both buildings were assessed as having a 'moderate' potential to support roosting bats, in accordance with guidelines from the Bat Conservation Trust (BCT). Both buildings could support crevice dwelling bats between gaps in the peg tiles, furthermore there is a potential roosting habitat between the lining and the roof tiles in the first building, accessed through a small hole in the lining within the open sided barn.

5. In accordance with BCT guidelines, two emergence surveys were undertaken on the 24th August and 15th September 2020. These surveys observed brown-long eared bats using both buildings on separate occasions. The initial emergence survey confirmed two emerging brown long-eared bats *Plecotus auritus* from the open-sided barn, flying out from under the roof. The second survey recorded activity of two brown long-eared bats flying in and out of the stable block. There was also a lot of foraging activity of common pipistrelles *Pipistrellus pipistrellus*, and soprano pipistrelles *Pipistrellus pygmaeus*, within the woodland glades that surround the buildings. *Myotis* spp. were heard passing on the first survey as well as a noctule *Nyctalus noctula*. The second survey revealed the presence of serotine *Eptesicus serotinus*, foraging in the surrounding habitat.



6. The surveys indicated that brown long-eared bats are using both buildings, possibly as a feeding shelter. However, the possibility that long eared bats are roosting between the lining and the roof tiles of the open sided barn cannot be discounted. A precautionary approach is therefore recommended and further surveys and an EPS licence may be required if roosting bats are found during the initial works.

It is understood that the development will largely be contained within the footprint of the two buildings, which may be used by common nesting birds (swallows *Hirundo rustica*). If any of the mature scattered trees or shrubs on the site must be removed, this must be undertaken outside of the nesting bird season (typically 1st March to 31st August), unless the vegetation is firstly hand-searched by a suitably qualified ecologist and no nests found.

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1 INTRODUCTION

1.1 Purpose of the Report

The Ecology Co-op has been commissioned to undertake a bat scoping assessment and emergence surveys of two outbuildings at Redwood, Penshurst Road by Fluid Planning Ltd. This report presents the findings of a walkover survey and building inspection for occupation by bats, undertaken by Dan Bennett BSc MCIEEM and Natural England Level 2 bat survey class licence holder on the 14th of September 2020, together with the results of two subsequent emergence surveys carried out on the 24th August and the 15th September 2020. This document provides details of the potential for any protected species and/or habitats to be present at the site and an assessment of the potential ecological constraints to the proposed redevelopment/alteration of the building of the site. Where appropriate, measures to avoid, mitigate and/or compensate for impacts are outlined.

1.2 Background

The site includes two buildings at Redlands, Penshurst Road, Tonbridge, Kent, TN11 8HY. The central grid reference for the site is TQ 5244 3588.

The proposed site is situated within the Redwood estate, in the rural location north of the village of Penshurst, within the High Weald, a designated area of outstanding natural beauty (AONB). The report investigates two buildings: an open sided barn and a single-story stable block in the south east corner of the well-maintained estate. Redlands consists mainly of parkland with scattered trees surrounding residential dwellings in the eastern section, the western section is dominated by a large lake surrounded by ancient and replanted and deciduous woodland. The wider landscape is predominately mixed farmland with scattered woodland blocks and hedgerows, the River Eden flows 600m to the west of the site.



Figure 1. Aerial image showing the location of the site boundary (red line). Image produced courtesy of Google maps (Map data ©2021 Google).

1.3 Policy and Legislation

Legal protection applying to all bat species in the UK is outlined in Appendix 1 of this report.

The results of this survey will be used to determine the need for further surveys, impact avoidance measures and/or an appropriate mitigation strategy to ensure compliance with UK and EU wildlife legislation.

2 METHODOLOGY

The methodology used for this survey are in accordance with the bat survey guidelines produced by the Bat Conservation Trust¹.

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



2.1 Desk Study

Considering the small-scale nature of the development proposal, biodiversity records were not considered a necessary consideration in this instance. However, they would need to be acquired to complete an EPS licence.

A search of on-line mapping resources was undertaken to characterise the local context of the site with respect to semi-natural habitats and linear features of value to foraging and commuting bats.

The MAGIC website resource (www.magic.gov.uk) was used to identify the location of designated sites for nature conservation within 2km and EPS licences granted within a 1km radius of the survey site. Priority habitats and ancient woodland sites upon or adjacent to the site have also been identified, due to their ecological value and potential to act as important foraging resources for bats.

Priority habitats and ancient woodland are classified as habitats of principal importance. Habitats of principal importance are listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act, 2006², which places a duty on Local Planning Authorities to have due regard to biodiversity.

2.2 Field Survey

2.2.1 Scoping for Roosting Potential

Bats can use a wide range of features including loft spaces, cavity walls, loose tiles, mortice joints and cracks/gaps in a variety of built structures. They can also be found in trees with holes, splits, cracks, cavities, ivy, and loose bark.

A detailed building inspection was carried out, looking for potential access points and 'potential roosting features (PRFs)' that bats could use and any evidence indicating the presence of bats using the building, such as rub marks, feeding remains, staining or droppings. This included a ground-based external inspection around the building and internal inspection of any enclosed loft spaces or roof voids, where safe access was possible. A high-powered torch was used for the internal and external assessment.

The potential for roosting bats for each feature, or group of features was assessed as either negligible, low, moderate, or high, in accordance with best practice. Any evidence confirming the presence of bats that was found was clearly recorded including photos and samples taken (e.g. droppings) where appropriate. Further surveys were recommended as appropriate.

2.2.2 Hibernation Potential

The structure and its associated features were assessed for their suitability to be used by hibernating bats. The assessment was carried out in accordance with guidelines produced by BatAbility³ and the bat survey guidelines produced by the Bat Conservation Trust¹. To determine the potential for features

² HM Government (2006). Natural Environment and Rural Communities Act 2006. Available online at: <https://www.legislation.gov.uk/ukpga/2006/16/section/41>.

³ Middleton. N. (2019). Assessing Sites for Hibernation Potential. A Practical Approach, including a Proposed Method & Supporting Notes. Version' Draft/V2.2019. BatAbility.



to support hibernating bats the following aspects were considered:

- The suitability of features to support roosting bats or to allow access for roosting bats;
- The temperature and humidity conditions likely to be present within the feature during the winter period and the suitability in this respect for it to be used by bats for hibernating;
- The surrounding habitat, in terms of its potential for use by bats outside of the hibernation period for commuting and/or foraging purposes; and
- The presence of known roosts within the structure, or adjacent structures, or surrounding area during the active season.

2.2.3 Foraging and Commuting Suitability

The habitats surrounding the site and wider landscape were broadly assessed for their potential to support foraging and commuting bats.

2.2.4 Emergence Surveys

Two emergence surveys were carried out on the 24th August and the 15th September 2020. These surveys used the methodology set out in the best practice guidelines prepared by the Bat Conservation Trust.

The surveys focused upon the clay peg roof tiles using two surveyors and one night vision camera positioned according to Figure 3. From these positions, surveyors could see almost all features potentially suitable for roosting bats that were identified during the initial bat scoping survey.

The surveyors recorded any bat activity on or around the potential roosting entry/exit features identified during the scoping survey, using full spectrum handheld bat detectors to identify species through call frequencies. The bat calls were logged and recorded as sonograms for later confirmation of species where necessary.



Figure 3. An aerial image of the site, showing the positions of surveyors (red dots) night vision camera (yellow dot). Images produced courtesy of Google maps (Map data ©2021 Google).

2.3 Other Protected and/or Notable Species

Any birds identified, or evidence of nesting birds discovered during the site visit were recorded. Special attention was paid to notable species such as red-listed Birds of Conservation Concern (Eaton et al. 2015) and those species afforded special protection on Schedule 1 of the Wildlife and Countryside Act (1981).

Whilst this survey focussed on bats and no specific searches were made with respect to other protected species, any evidence of other protected species that was encountered during the site visit was also recorded.

3 RESULTS/OBSERVATIONS

3.1 Desk Study and Granted EPS Licences

The Redwood Estate is situated within the High Weald a designated Area of Outstanding Natural Beauty (AONB), and a landscape of national importance for its medieval landscape with ancient routeways,



rolling hills, irregular shaped fields, sandstone outcrops, scattered farmsteads, and woodland.

There are no designated sites that include bats as a designated feature within the zone of influence of the site.

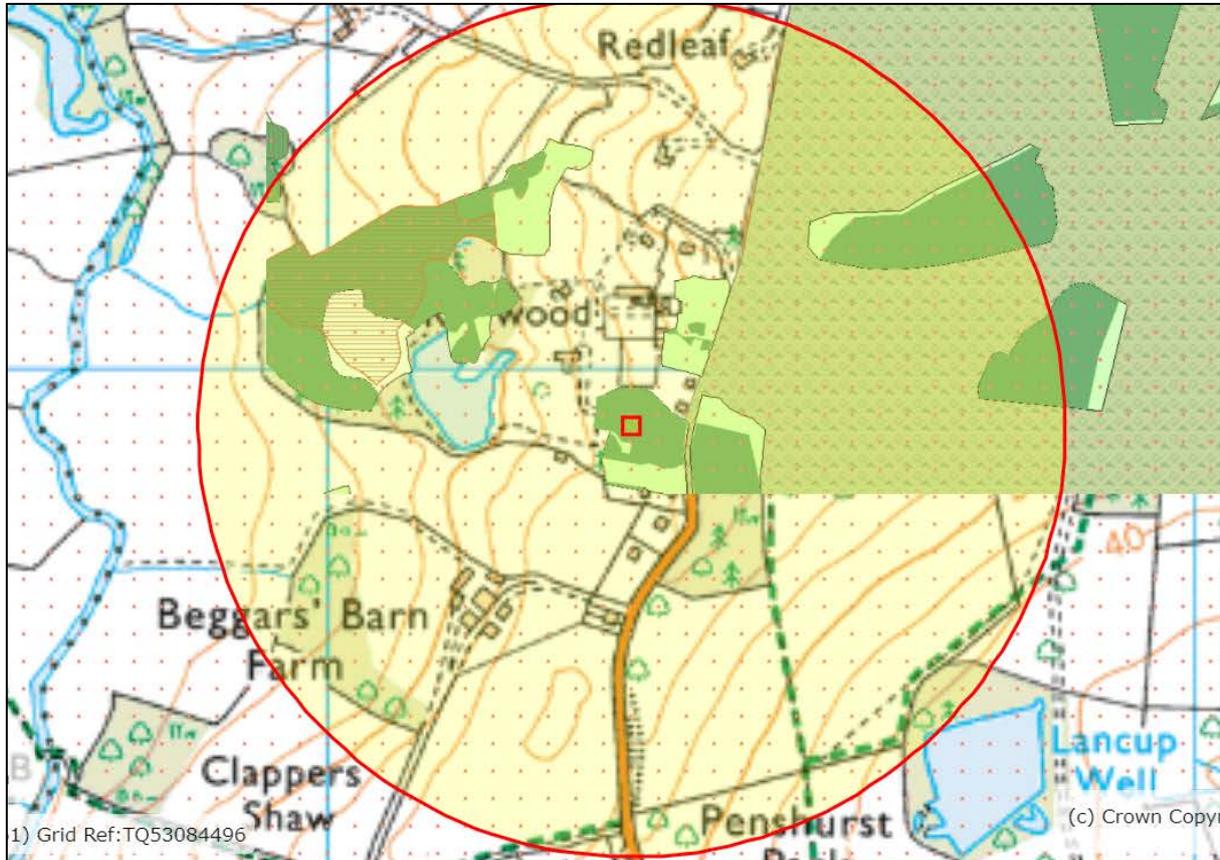


Figure 4. Ancient, replanted woodland, broadleaved woodland, deciduous woodland and wood pasture and parkland relative to the proposed development site (outlined in red), with a 500m buffer zone. Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0)

Within the Redwood estate and in the surrounding 500m of the site boundary there are a number of parcels of Priority Habitat Deciduous Woodland (Figure 4). In particular, Alder Wood comprises 3.3 hectares of ancient and replanted woodland within the estate itself, and is located 260m to the west of the open sided barn. The open sided barn sits in a glade within a small block of deciduous woodland and the stable block is surrounded by broadleaved woodland.

There are no EPS licenses granted for mitigation projects concerning bats within 2km of the site shown on the Magic Maps website.

3.2 Site Context and Surrounding Habitats

The two buildings proposed for development are both situated within woodland glades of the Redlands estate (Figure 5). The Redlands estate is approximately 16 hectares of woodland, parkland, and well-maintained gardens with large residential dwellings. There is a large lake along the southern boundary and a woodland to the west which is ancient and replanted known as Alder wood. The eastern boundary



is more developed with a few large residential dwellings leading to more open parkland in the centre. The open-sided barn is positioned on a patch of hardstanding within a pocket of deciduous woodland in the south west corner, whereas the stable block is 120m north east along the eastern boundary in a small glade within a broadleaved woodland, access is gained on an unsealed hardstanding. The woodland expands in a thin strip along the eastern boundary of the site separating the B2176.

The wider landscape is dominated by sparsely populated mixed farmland with small hedge lined fields interconnecting woodland blocks. The River Eden flows 600 meters to the west of the proposed development site, and the small historic village of Penshurst is to the south.



Figure 5. Aerial view of the Redwood estate; open-sided barn=red dot, and stable block=yellow dot). Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0)

3.3 Building Inspection for Bats

3.3.1 Roosting Potential

The first building assessed comprises an open sided single storey timber-framed barn used for storage of vehicles and equipment. It has a single pitch roof measuring approximately 10m (l), 5m (w) (photograph 2). The roof is constructed from clay pegged tiles, some of which are damaged or lifted creating suitable roosting habitat for crevice roosting bats. There is a small store room on the eastern aspect illuminated by natural light from one window on the eastern gable end (photograph 3). The roof is lined with bitumen felt; there is a small hole in the lining, potentially providing access to the space between the lining and the roof tiles for bats. There is no enclosed loft space, although the ceiling of the small store room provides a mezzanine level above, and the building has no insulation. Three quarters



of the northern aspect are completely open to the elements and the other sides comprise single-skin ship-lap timber sheets. There is therefore limited thermal stability.

The second building comprises a single storey brick stable block building, now disused and falling into disrepair. It is approximately 15m (l), 8m(w), with a single pitched roof and a double barn door on the southern aspect (photograph 4). The clay peg-tiled roof is cluttered by encroached vegetation, there are many damaged and lifted tiles around all aspects providing potential crevices for roosting bats (photograph 5) and an area of missing tiles (approx. 1m (w) 2m (l) allowing access into the interior (photograph 6). There is no enclosed loft space, the interior of the roof is constructed from a timber frame, littered with cobwebbing, and there is no roof lining or insulation in the ceiling (photograph 7).

Features suitable for bats are described in detail within Table 2 below and illustrated in the following photograph section.

Table 2. Assessment of Potential Roost Features.

Building section	Description of features	Assessment of potential (Collins 2016)
Open sided barn	Some potential for crevice dwelling bats to be found roosting in gaps below the clay peg tiles roof tiles. There is a potential void roosting suitability in the space between the roof tiles and the bitumen lining access through a small hole in the lining. Surrounding habitat provides moderate foraging potential and commuting habitat is limited.	'Moderate' bat roost potential
Stable block	Some potential for crevice dwelling bats to be found roosting in gaps below the clay peg tiles roof tiles. Surrounding habitat provides moderate foraging potential and commuting habitat is limited.	'Moderate' bat roost potential

There were no trees contained within the development footprint and tree roosting bats would therefore not be a constraint to development.

3.3.2 Hibernation Potential

Each building section was also assessed for its hibernation potential. The potential for each section is described in Table 3 below.

Table 3. Assessment of hibernation roost potential.

Building section	Description of features	Assessment of hibernation potential ^{1 & 3}
Building 1 (open sided barn)	Some potential for bats to be found hibernating in gaps below the clay pegged roof tiles, though these are likely to have fluctuating temperatures that are less suitable for hibernation. Access into the space between the roof tiles and the bitumen lining, through the small hole in the lining. Although this is not what would be regarded as a 'classic' hibernation site there is the potential that bats could be occupying the property over	Low Potential



	the winter period (e.g. pipistrelle species in small numbers).	
Building 2 (stable block)	As above	Low Potential

3.4 Bat Emergence Surveys

3.4.1 Survey Conditions

The date, times, weather conditions, temperature and personnel for the first survey visit is presented in Table 4 below:

Table 4. Details of first survey undertaken, timings, weather conditions and personnel.

Date	Survey start time/end time	Temp. degrees centigrade, weather conditions throughout survey	Surveyors
24 th August 2020	Start time: 19:48 Sunset: 20:03 Finish time: 21:33	Max/Min temp: 18 - 16°C. 100% cloud cover, BF2, dry.	Dan Bennett BSc, MCIEEM Natural England Level 2 class bat licence holder Mike Marriot
15 th September 2020	Start time: 18:50 Sunset: 19:12 Finish: 20:50	Max/Min temp: 22°C-20°C 0% cloud cover, BF0, dry.	Dan Bennett BSc, MCIEEM Natural England Level 2 class bat licence holder Mike Marriot

3.4.2 Bat Emergence Results

The following description summarises bat activity and emergences from the building for the two survey visits.

- 24th August 2020

Two emergences were recorded from the building. Both were Brown long-eared bat *Plecotus auratus* from the open sided barn (B1), the first was one hour and 7 minutes after sunset followed by a second 2 minutes later flying out from the open sides of the barn along the northern aspect (photograph 1). The vast majority of activity was from foraging soprano and common pipistrelles, *Pipistrelles pipistrellus* and *P. pygmaeus* that had emerged elsewhere. The first bat recorded was a soprano pipistrelle 2 minutes after sunset foraging over the canopy of the stable block (B1), this continued intermittently for 13 minutes. The first soprano pipistrelle to be seen at the open sided barn arrived from the west and flew around the barn in a single pass 17 minutes after sunset. Common pipistrelle was recorded around both buildings intermittently during the early dusk period. It then went quiet at both buildings until a Noctule *Nyctalus noctula* was heard passing by just over half an hour after sunset. The survey produced two records of *Myotis spp.* one over each building, the first was 39 minutes after sunset passing by the open sided barn, the next followed 29 minutes later foraging past the stable block just after a visit from a foraging common pipistrelle.

- 15th September 2020

Bat activity was less than during the first survey in general, there were no observed emergences, but a



brown long-eared bat was observed flying inside the stable block, first seen 45 minutes after sunset and another 29 minutes later. Soprano and common pipistrelles were foraging in the glade around the stable block, the first appearing first 14 minutes after sunset and recorded flying together intermittently. A large bat flew out from a tree at high altitude and over the stable block building; this could have been a noctule bat. The last recording of the survey was a serotine passing overhead 29 minutes after sunset, bat activity then ceased for the remainder of the session.



Photograph 1. Image showing the location of an emerging brown long-eared bat from a from the open side of the barn at 21:14 on the 24th August 2020 (blue arrow).

3.5 Other Protected and/or Notable Species

Blue tits recorded flying in and out of the open sided barn on the first emergence survey and it is possible that they will have nested inside a suitable crevice earlier in the season. Both buildings could potentially support other birds who commonly nest in building such as house sparrow *Passer domesticus*, starling *Sturnus vulgaris* and swallow *Hirundo rustica*.

There is a small ornamental duck pond to the north of the open-sided barn. However this pond has vertical sides, supports no aquatic vegetation and has very poor water quality due to the influence of ducks. It is considered unlikely to support Great Crested Newts (photograph 8). The area around the front of the open-sided barn are dominated by hard standing and frequently mown amenity lawn. These habitats have very low ecological value and unlikely to support reptiles or amphibians. The dense scrub



vegetation behind the barn has potential to support breeding birds and dormouse.

The surrounding habitats of the stable block comprise woodland, scrub and bare ground. There are piles of rubble, debris stacked against one wall of the building. These habitats are shaded by the woodland canopy and are unlikely to support reptiles, although they may provide suitable resting places for amphibians (including great crested newts if present locally).

3.6 Survey Limitations

3.6.1 Bat Scoping

An initial site assessment such as this is only able to act like a ‘snapshot’ to record any flora or fauna that is present at the time of the survey. It is therefore possible that some species may not have been present during the survey but may be evident at other times of the year. For this reason, habitats are assessed for their potential to support bats, even where no direct evidence (such as droppings) has been found.

3.6.2 Bat Emergence Surveys

In accordance with best practice guidelines, the survey visit was undertaken during the peak period in bat activity and during good weather conditions. The results presented here are therefore considered to be an accurate representation of the general use of the property by roosting bats.

Nevertheless, bats can use roosting features intermittently throughout the year and may be present in larger or smaller numbers depending on their breeding cycle, weather conditions, and in response to disturbance. These surveys record the emergence of bats at the time of the survey visits and therefore only provide a snapshot of bat roosting activity at the site at that time. Bats may be present at other times and the results should therefore be viewed with caution.

Visibility during emergence surveys at both buildings was limited by the overhead tree canopy, which reduces light and contrast making observation of flying bats difficult. The rear of the open-sided barn was inaccessible due to dense vegetation growth along the property boundary. (Photograph 3).

3.7 Photographs





Photograph 2: view of northern aspect Open sided barn on hardstanding



Photograph 3. View of south east corner of open barn illustrating the only window and the roof.



Photograph 4. The southern aspect of the stable with the double timber stable doors, show the gaps underneath the lifted roof tiles and the patch of missing tiles.



Photograph 5. Example patch of roof showing the gaps amongst the tiles and the vegetation cover.



Photograph 6. Interior view of patch in the roof missing tiles and the timber double doors to the barn

Photograph 7. Internal view of the timber framed roof of the stable block with no lining or insulation.



Photograph 8. Duck pond to the north of the stable block



4 ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES

4.1 Bats

4.1.1 Roosting

In accordance with the Bat Conservation Trust guidelines, the overall suitability of both buildings to support bats is rated as 'moderate'. The proposed conversion of the two buildings into residential dwellings has the potential to impact upon the identified features that have the potential to support bats roosts.

The emergence surveys indicated that brown long-eared bats are frequently using both buildings, probably as a feeding shelter. However, the possibility that long eared bats are roosting between the lining and the roof tiles of the open sided barn cannot be discounted, and it is possible that crevice dwelling bats may use the gaps between tiles at other times. A precautionary approach is therefore recommended that includes a supervised 'soft strip' comprising removal of tiles one by one by hand as required at the start of renovation works. A qualified and licensed bat ecologist should be present during these works. Further surveys and an EPS licence may be required if roosting bats are found during the initial works.

It should be noted that bat roosting activity is dynamic and this assessment represents the situation at the time of these surveys, which could be different in future years. As such, it is recommended that bat emergence surveys are updated and the impact assessment is reviewed if the development does not proceed within 12 months of the date of these surveys.

4.1.2 Hibernation Potential

Both buildings were assessed as having low hibernation potential for bats. The features that could be used for hibernation include crevices between lifted roof tiles and roof lining, but the location and building fabric are likely to result in low thermal stability, reducing the suitability for hibernation. It would be impossible to fully investigate bat use over the winter period without dismantling the features, and hence potentially destroying a bat roost. Therefore, in this instance no further surveys for winter roost potential are recommended. Instead mitigation must be implemented to reflect the risk that bats may use this building for hibernating during the winter. This must include timing the works to the building in the period between mid-March and the end of October to avoid disturbing bats that could be in hibernation.

4.1.3 Foraging and Commuting Suitability

The buildings at Redwood estate and the surrounding woodland with open parkland with scattered trees and water bodies, provide high value foraging habitat for a variety of common bat species. The tree lined boundaries of the site provide connectivity to a variety of habitat for an array of species of bats. The habitats immediately bordering the site are also of high value.

As the site is used by foraging and commuting bats, it is important that the potential for disturbance from artificial lights is considered. The proposed development should include an 'ecologically sensitive lighting scheme' in accordance with guidance produced by the Bat Conservation Trust (summarised in Appendix 3).



4.2 Other Protected and/or Notable Species

If any of the mature scattered trees or shrubs on the site are to be removed, this must be undertaken outside of the nesting bird season (typically 1st March to 31st August), unless the vegetation is firstly hand-searched by a suitably qualified ecologist and no nests found.

The proposed conversion of the open sided barn is not likely to result in significant impacts on habitats suitable for other protected species; the construction activities are most likely to be focussed on the front and side aspects of the building comprising amenity lawn and hard standing. However, some clearance of vegetation may be required to the rear of this building.

Conversion of the stable block is likely to result in disturbance to potentially suitable resting places for amphibians, and substantial vegetation clearance around the building is likely to be required for access. Both these activities have potential to impact on common dormouse, nesting birds and great crested newts, but the scale of the works are relatively minor (compared to other projects). As such, a proportionate mitigation strategy would involve the use of ‘reasonable avoidance measures’ to prevent harm to protected species, including hand searches of debris for amphibians, and searches for active nests of breeding birds and dormouse prior to construction. If any of the above protected species are found, appropriate mitigation will be put into place.

4.3 Biodiversity Enhancement Opportunities

The proposed development represents an opportunity for biodiversity enhancements for bats, and the developer is encouraged to consider incorporating an enclosed loft space dedicated to roosting bats, and/or integral bat roosting opportunities into the building fabric such as Bat Access Tiles or internal voids/access points for bats, such as Schwegler 2FR bat tubes and 2FE Schwegler Wall-Mounted bat shelters (see Figure 6a-c below) into the architects design.

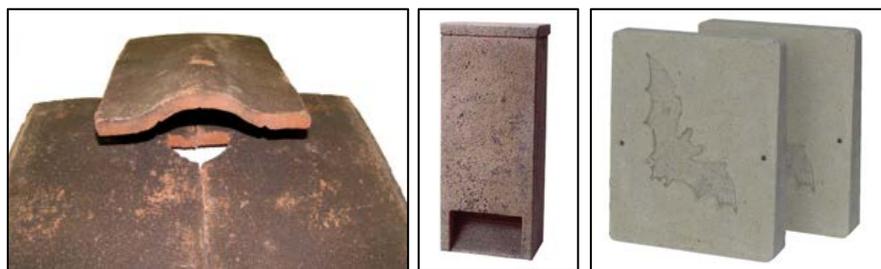


Figure 6a (left), 5b (centre) & 5c (right). Left - Bat Access Tile Set, Centre - 2FR Schwegler Bat Tube, Right - 2FE Schwegler Wall-Mounted bat shelters.

If any protected species are found during the proposed work, work should be stopped immediately, and an ecologist must be contacted immediately for advice.

Should you need any further advice on the information provided above, please do not hesitate to contact The Ecology Co-op.



APPENDIX 1 – Wildlife Legislation and National Planning Policy

The following text is intended for general guidance only and does not constitute comprehensive professional legal advice. It provides a summary of the current legal protection afforded to bats.

All bat species in the UK are included in Schedule II of the Habitats Regulations 2017, which transpose Annex II of the Council Directive 92/43/EEC 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (“The EC Habitats Directive”). As such all bat species in the UK are defined as ‘European Protected Species (EPS).

Four species of bat (Bechstein’s bat *Myotis bechsteinii*, Barbastelle bat *Barbastella barbastellus*, greater and lesser horseshoe bats, *Rhinolophus ferrumequinum* and *R. hipposideros*) are also listed on Annex IV of the EC Habitats Directive. This requires the designation of a series of sites which contain important populations of these species as Special Areas of Conservation (SACs).

All species of British bat are also fully protected under the Wildlife and Countryside Act (1981), as amended, through inclusion in Schedule V.

All species of bat are listed on Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006). Section 41 of the NERC Act lists the habitats and species of principle importance. This places a statutory duty on all public bodies, including planning authorities, under Section 40, to take, or promote the taking by others, steps to further the conservation of habitats and species of principal importance for the conservation of biodiversity in England (commonly referred to as the ‘Biodiversity Duty’). This duty extends to all public bodies the biodiversity duty of Section 74 of the Countryside and Rights of Way (CROW) Act 2000, which placed a duty only on Government and Ministers.

Under the above legislation it is an offence to:

- Kill, injure or take any individual bat of any species;
- possess any part of an individual bat, either alive or dead;
- intentionally or recklessly damage, destroy or obstruct access to any place or structure used by bats for shelter, rest, protection, or breeding;
- intentionally or recklessly disturb these species whilst using any place of shelter or protection; or
- deliberately disturb bats in such a way as to be likely to impair their ability to:
 - survive, to breed or reproduce, to rear or nurture their young; to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong;
- keep (possess), transport, sell or exchange, or offer for sale or exchange, any live or dead bat, or any part of, or anything derived from a bat.

It is also an offence to set and use articles capable of catching, injuring, or killing bats (for example a trap or poison), or knowingly cause or permit such an action. There is also protection under Schedule 6 of The Wildlife and Countryside Act 1981 (as amended) relating specifically to trapping and direct pursuit of bats.

A European Protected Species License (EPSL) in relation to bats is required from Natural England for any work that would result in an otherwise unlawful activity (e.g. damage to a bat roost). A license can



only be issued to permit otherwise prohibited acts if Natural England are satisfied that all the following three tests are met:

- The proposal is for ‘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’;
- There is no satisfactory alternative; and
- The action authorised by the license will not be detrimental to the maintenance of bat populations at a favourable conservation status in their natural range.

A bat roost is defined by the Bat Conservation Trust’s Bat Surveys—Good Practice Guidelines 3rd Edition as “the resting place of a bat”. In general, the word roost is interpreted as “any structure or place, which any wild bat uses for shelter or protection.”

Bats tend to re-use the same roosts; therefore, legal opinion is guided by recent case law precedents, that a roost is protected, whether or not the bats are present at the time. This includes summer roosts used for resting during the day and/or breeding; or winter roosts, used for hibernating.



APPENDIX 2 – Emergence Survey Results

Table 1: Results of bat emergence survey visit 1: 24th August 2020. CP=common pipistrelle; SP=soprano pipistrelle; NOC=noctule bat; MYO= Myotis spp. bat; BLE=brown long-eared bat, SER= Serotine. Number in parenthesis refers to number of bats above one individual. B1= open sided barn; B2= stable block

Time	Species	Bat seen/heard	Activity (number)	Location/direction
20:07	SP	H/S	Foraging	Single pass over the canopy B2
20:14	SP	H	Foraging	Single pass over canopy B2
20:18	SP	H/S	Foraging	Single bat foraging intermittently every 1-2mins in the glade. B2
20:22	PIP spp?	H		Very faint B1
20:23	SP	H/S	Pass	Flying overhead of surveyor and around B1
20:26	CP	H/S	Commuting	Heading west across the face of B1
20:29	CP	H/S	Foraging	Single bat foraging intermittently in the glade by B2
20:36	NOC	H	Pass	Regular calls (from B1)
20:44	MYO	H		B1
21:10	CP	H	Foraging	Foraging in the glade by B2
21:12	MYO	H	Foraging/Pass	Didn't see it but a close pass by the canopy of B2
21:12	BLE	H/S	Emergence	Flew across face of the building east to west of B1
21:14	BLE	H/S	Emergence	Came from the northern aspect from under open side of B1
21:19	CP/SP	H	Single pass	Heard from B2
21:26	CP	H	Single pass	Heard from B1



Table 2. Results of emergence survey visit 1: 9th September 2020

Time	Species	Bat seen/heard	Activity (number)	Location/direction
19:16	SP	H/S	Foraging	Above the glade and around B2
19:20	SP	H/S	Foraging	Above the glad and around B2
19:21	CP	H/S	Foraging	Arrived from the south much higher than the building and foraged in the glade around B2
19:23	SER/NOC	H/S	Pass	
19:29-33	SP	H/S	Foraging	From the trees around clearly seen above the building
19:35	CP/SP	H/S	Foraging	See foraging together in the glade
19:38	SER	H	Foraging	Distant and intermittent
19:50	BLE	S	Foraging	Bat seen inside the building, perching
19:59	SP	H	Foraging	Foraging in the glade
20:19	BLE?	S?	Emergence?	Need to check camara footage
20:34	SER	H	Pass	From B2



APPENDIX 3 – Reducing Impacts of Artificial Light

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths, but more importantly can also cause bats to remain in their roosts for longer. Artificial lighting can also cause significant impacts on other nocturnal species, most notably moths and other nocturnal insects. It can also result in disruption of the circadian rhythms of birds, reducing their fitness. Guidelines issued by the Bat Conservation Trust⁴ should be considered while designing the lighting scheme. A simple process which should be followed where the impact on bats is being considered as part of a proposed lighting scheme. It contains techniques which can be used on all sites, whether a small domestic project or larger mixed-use, commercial or infrastructure development. This includes the following measures:

Avoid lighting on key habitats and features altogether

there is no legal duty requiring any place to be lit. British Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety, such as some industrial sites with 24-hour operation. However, in the public realm, while lighting can increase the perception of safety and security, measurable benefits can be subjective. Consequently, lighting design should be flexible and be able to fully consider the presence of protected species

Apply mitigation methods to reduce lighting to agreed limits in other sensitive locations – lighting design considerations

Where bat habitats and features are considered to be of lower importance or sensitivity to illumination, the need to provide lighting may outweigh the needs of bats. Consequently, a balance between a reduced lighting level appropriate to the ecological importance of each feature and species, and the lighting objectives for that area will need to be achieved. The following are techniques which have been successfully used on projects and are often used in combination for best results;

- Dark buffers, illuminance limits and zonation
- Sensitive site configuration, whereby the location, orientation and height of newly built structures and hard standing can have a considerable impact on light spill
- Consider the design of the light and fittings, whereby the spread of light is minimised ensuring that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Consider the height of lighting columns. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light-spill or require more columns. Column height should be carefully considered to balance task and mitigation measures. Consider no lighting solutions where possible such as white lining, good signage, and LED cats eyes. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times.
- Screening, whereby light spill can be successfully screened through soft landscaping and the installation of walls, fences and bunding
- Glazing treatments, whereby glazing should be restricted or redesigned wherever the ecologist and lighting professional determine there is a likely significant effect upon key bat habitat and features.
- Creation of alternative valuable bat habitat on site, whereby additional or alternative bat

⁴ Bat Conservation Trust and Institute for Lighting Professionals (2018) Guidance note 8. Bats and Artificial Lighting. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>



flightpaths, commuting habitat or foraging habitat could result in appropriate compensation for any such habitat being lost to the development.

- Dimming and part-night lighting. Depending on the pattern of bat activity across the key features identified on site it may be appropriate for an element of on-site lighting to be controlled either diurnally, seasonally or according to human activity. A control management system can be used to dim (typically to 25% or less) or turn off groups of lights when not in use.

Demonstrate compliance with illuminance limits and buffers

- *Design and pre-planning phase*; It may be necessary to demonstrate that the proposed lighting will comply with any agreed light-limitation or screening measures set as a result of your ecologist's recommendations and evaluation. This is especially likely to be requested if planning permission is required.
- *Baseline and post-completion light monitoring surveys*; baseline, pre-development lighting surveys may be useful where existing on or off-site lighting is suspected to be acting on key habitats and features and so may prevent the agreed or modelled illuminance limits being achieved.
- *Post-construction/operational phase compliance-checking*; as a condition of planning, post-completion lighting surveys by a suitably qualified person should be undertaken and a report produced for the local planning authority to confirm compliance. Any form of non-compliance must be clearly reported, and remedial measures outlined. Ongoing monitoring may be necessary, especially for systems with automated lighting/dimming or physical screening solutions.

Further reading:

Buglife (2011) *A review of the impact of artificial light on invertebrates*.

Royal Commission on Environmental Pollution (2009) *Artificial light in the environment*. HMSO, London.
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CPRE (2014) *Shedding Light: A survey of local authority approaches to lighting in England*. Available at: <http://www.cpre.org.uk/resources/countryside/dark-skies/item/3608-shedding-light>

Planning Practice Guidance guidance (2014) *When is light pollution relevant to planning?* Available at: <https://www.gov.uk/guidance/light-pollution>

Institution of Lighting Professionals (2011) *Guidance Notes for the Reduction of Obtrusive Light* GN01:2011. Available at: <https://www.theilp.org.uk/resources/free-resources/>