



The Ecology Co-op

ENVIRONMENTAL CONSULTANTS

Unit 4, Langham Stables, Langham Lane, Lodsworth, Petworth, West Sussex, GU28 9BU.

Tel: 01798 861 800 – E-Mail: info@ecologyco-op.co.uk – Web: www.ecologyco-op.co.uk

Bat Scoping Report and Preliminary Ecological Appraisal

Site Name

Roosthole, Mannings Heath

Client

Cees Ovelgonne

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Author

Ben Small MSc

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The Ecology Co-operation Ltd

Registered Office: Unit 4, Langham Stables, Langham Lane, Lodsworth, West Sussex, GU28 9BU

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About the Author

This report has been prepared by Ben Small, MSc, a consultant ecologist at The Ecology Co-op with 3.5 years' experience. He holds a Level 1 Great Crested Newt Survey Licence and is an accredited agent under Holly Waters' Level 2 Bat Licence. As a Qualifying member of the Chartered Institute for Ecology and Environmental Management (CIEEM) he is bound by their code of professional conduct.

About the Reviewer

This report has been reviewed by Emma Baker, who is a Senior ecologist with nine years' experience. She holds Level 1 great crested newt and hazel dormice survey licences. As a Full member of the Chartered Institute for Ecology and Environmental Management (CIEEM), she is bound by their code of professional conduct.



Report Summary

Purpose	The Ecology Co-op was commissioned by Cees Ovelgonne to undertake a Bat Scoping Assessment at Roosthole, Mannings Heath, further to a proposal to build a single-storey extension on the western elevation.
Context	The site is located in a semi-rural location, north of the village of Mannings Heath, Horsham. It comprises a large two-storey dwelling and is bordered by the rest of the associated property, including a private garden and access drive.
Key findings	The building overall was assessed to have high suitability to support roosting bats, with a confirmed roost identified in the loft void, with bat droppings and a brown long-eared bat found roosting at the ridge. The proposed single-storey extension on the western elevation, however, falls outside this zone, and no suitable roost features were identified within the zone of impact. Habitat within the zone of influence of the proposal was considered to be of high potential value for foraging and commuting bats.
Recommendations	As no suitable features that might support roosting bats have been identified within the zone of impact, no further surveys are considered necessary for this development proposal to proceed. However, as bats are using the property as a whole, precautionary mitigation measures have been proposed.
Further survey requirements	No further surveys required.



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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 of Roosthole, Mannings Heath by Cees Ovelgonne. This report presents the findings of a walkover survey and building inspection for occupation by bats, undertaken by Ben Small MSc, qualifying member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and accredited agent under Holly Waters' Natural England Level 2 bat survey class licence, on 27th May 2026. Whilst this report has maintained a focus on assessing potential impacts upon roosting bats and bat activity within the proposal's zone of influence, it has also considered the potential for any other protected/notable species and/or habitats to be adversely affected.

The proposal for the site comprises a single-storey extension on the western elevation of the dwelling. Recommendations for further surveys that are likely to be required to inform a planning application and Ecological Impact Assessment are provided, if necessary. Where appropriate, measures to avoid, mitigate and/or compensate for significant adverse effects are outlined.

This report is intended to inform the client and the appropriate planning authority of the potential impacts that this development proposal may have upon roosting bats as well as identifying potential impacts to commuting routes and foraging habitat of value. Where bat roosting potential or physical evidence of bats has been identified, further survey effort will be required in order to complete an impact assessment to inform a planning application.

1.2 Background

The site is located in a semi-rural location, north of the village of Mannings Heath, West Sussex RH13 6PG. The central grid reference for the site is TQ 20922 29614.

The site supports a large two-storey dwelling and is bordered by the rest of the associated property, including a private garden and access drive. The site is surrounded by other residential properties to the north-east and south-east, parkland to the south, and woodland to the north. Additional residential dwellings and woodland, as well as industrial estate, are situated to the west and east of the site respectively.

The location of the study building is illustrated in Figure 1. The proposed development comprises a single-storey extension on the western elevation of the dwelling. The proposed plans for the site are illustrated in Figure 2.



Figure 1. Aerial image showing the location of Roosthole, Mannings Heath (indicated with a red outline). Image produced courtesy of Google maps (map data ©2026 Google).

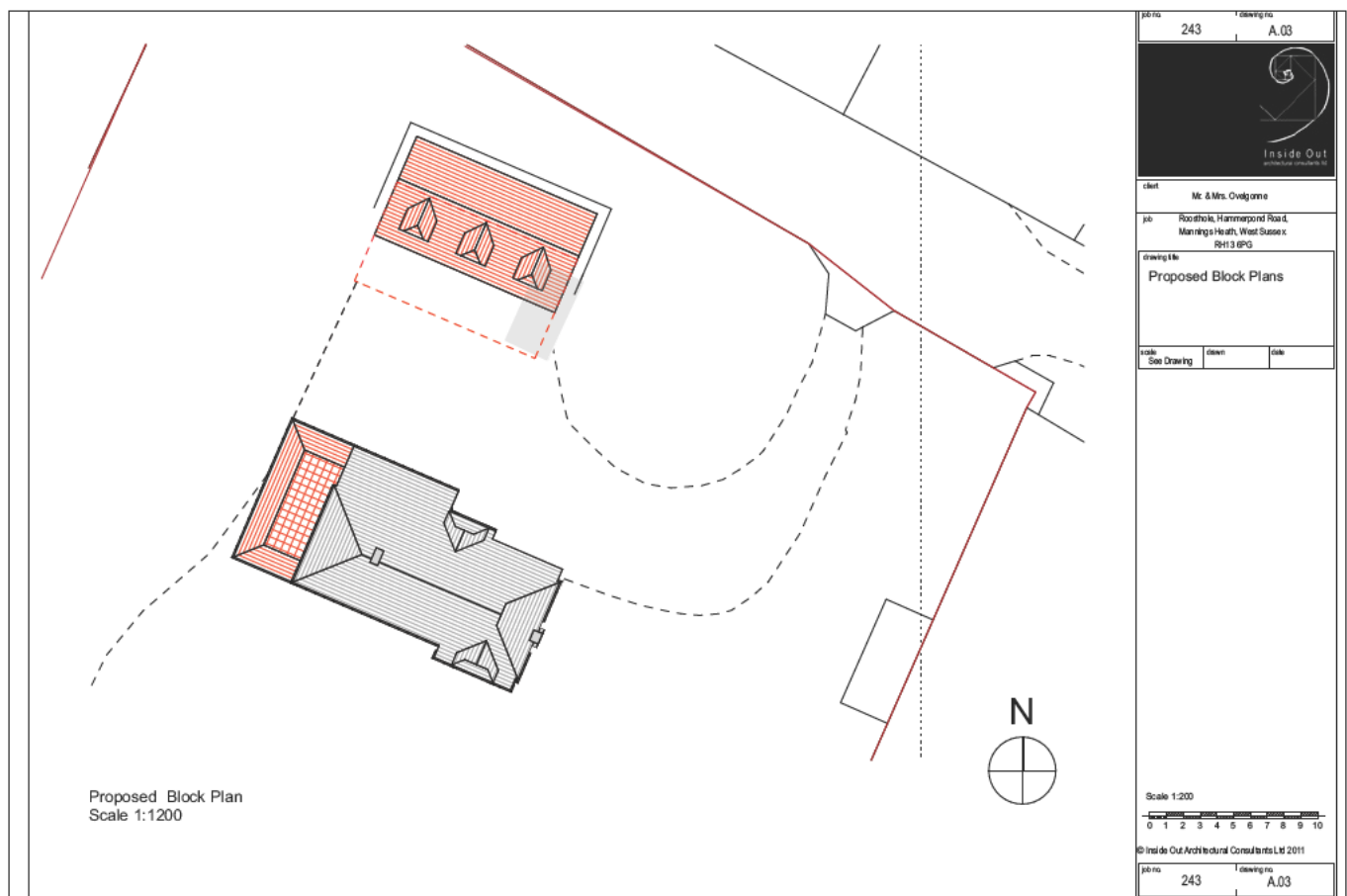


Figure 2. Proposed plan showing single-storey extension of the existing two-storey dwelling, provided courtesy of Inside out architectural consultants ltd. (drawing no. A.03)



1.3 Policy and Legislation

Legal protection applying to all bat species in the UK and any other species relevant to this appraisal, 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/compensation strategy to ensure compliance with UK wildlife legislation, policy and best practice.

2 METHODOLOGY

The methodologies used for this survey are in accordance with the bat survey guidelines produced by the Bat Conservation Trust¹. Where there has been any deviation from the guidelines due to any site-specific constraints or other circumstances, reasoning and justification has been provided.

2.1 Desk Study

A search of online mapping resources has been 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) has been used to identify the location of designated sites for nature conservation within 2km and European Protected Species (EPS) licences granted within a 1km radius of the survey site. Priority habitats and ancient woodland, upon the site and within the proposal's zone of influence, 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 Roosting Potential

Bats can use a wide range of features for roosting purposes 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 and internal

¹ Collins, J.(ed.) (2023) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (4th edn). The Bat Conservation Trust, London..

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



inspection of PRFs, such as enclosed loft spaces or roof voids or basements, where safe access was possible. A high-powered torch was used for the internal and external assessment.

The suitability of each feature, or group of features, to support roosting bats has been assessed as either negligible, low, moderate, or high, in accordance with best practice guidance¹ (see Table 1). Any evidence confirming the presence of bats was clearly recorded including photos and samples taken (e.g. droppings), where appropriate. Further surveys have been recommended in accordance with best practice guidance and the surveyor's professional judgement, where evidence of a bat roost or PRFs have been identified that would be adversely impacted by the proposal and where precautionary mitigation alone cannot ensure that bats would not be potentially disturbed or harmed.

Table 1. Guidelines for assessing suitability of structures (buildings and trees etc) to support bat roosts.

Suitability	Description of roosting habitats
None	No habitat features on the structure likely to be used by any roosting bats at any time of year (i.e. a complete absence of crevices/suitable shelter at all ground/underground levels).
Negligible	A structure that does not have any obvious habitat features that are likely to be used by roosting bats. However, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.
Low	A structure that has one or more potential roosting features that could support individual roosting bats opportunistically. These features however lack the space, shelter or appropriate conditions, to support larger numbers of bats (such as a maternity roost).
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter and suitable conditions for roosting, but are unlikely to support a roost of high conservation significance.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potential for longer periods of time due to their size, shelter, protection and conditions.

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 the Bat Ability³ and the bat survey guidelines produced by the Bat Conservation Trust¹. To determine the potential for features 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 surrounding area during the active season.

The potential for use by hibernating bats for each feature, or group of features was assessed as either negligible, low, moderate, or high, in accordance with best practice. Further surveys are recommended where appropriate,

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



considering the feasibility of a hibernation survey for certain PRFs.

2.2.3 Foraging and Commuting Potential

The habitats surrounding the site and within the wider landscape were broadly assessed for their potential to support foraging and commuting bats, and were categorised as negligible, low, moderate or high potential suitability in line with published guidance¹.

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 Concern⁴ and those species afforded special protection on Schedule 1 of the Wildlife and Countryside Act (1981), such as barn owl *Tyto alba* and swallow *Hirundo rustica*.

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

3 RESULTS/OBSERVATIONS

3.1 Desk Study and Granted EPS Licences

The site lies within the High Weald National Landscape, an area of outstanding natural beauty. There are two designated sites located within 2km of Roosthole, with St. Leonard's Park Ponds Site of Special Scientific Interest (SSSI) situated 1.35km to the north-east and St Leonard's Forest Site of Special Scientific Interest (SSSI) situated approximately 164m north-west of the site (see Figure 3). Full details of the designated sites are provided in Table 2 below. None of these sites include bats as a designated feature.

Table 2. Designated sites within 2km of Roosthole, Mannings heath.

Site name	Designation	Features listed on citation	Proximity to the site
St Leonard's Forest	SSSI	This site includes sections of former deciduous forest. The streams across the site still retain fauna from over 5000 years ago. The humid microclimate of sheepwash gill has enabled the 'atlantic' bryophytes (mosses and liverworts) <i>Hookeria lucens</i>, and <i>Hyoconium flagellare</i> to survive. The presence of these plants indicates the continuity of woodland cover at this site for the past 5000 years. The woodlands also support a population of the purple emperor <i>Apatura iris</i> and a range of breeding birds such as nightjar <i>Caprimulgus europaeus</i> and wood warbler	164m northwest

⁴ Stanbury, A., Eaton, M., Aebischer, N., Balmer, N., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021). Birds of Conservation Concern 5: the status of bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man. British Birds 114, pp 723-747..



		<i>Phylloscopus sibilatrix</i> .	
St Leonard's Park and Ponds	SSSI	Species-rich ponds lie along a wooded stream and there are uncommon botanical species at Dry Pond. The ponds and surrounding habitats support dragonflies and damselflies including the uncommon variable damselfly <i>Coenagrion pulchellum</i>. The fen surrounding the ponds includes the locally uncommon shoreweed <i>Littorella uniflora</i> and floating club-rush <i>Eleogiton fluitans</i>. The nationally rare yellow centaury <i>Cicendia filiformis</i> is known to occur on the site. A number of uncommon bryophytes (mosses and liverworts) have been recorded in Dry Pond including the rare moss <i>Nanomitrium tenerum</i>.	1.35km northeast

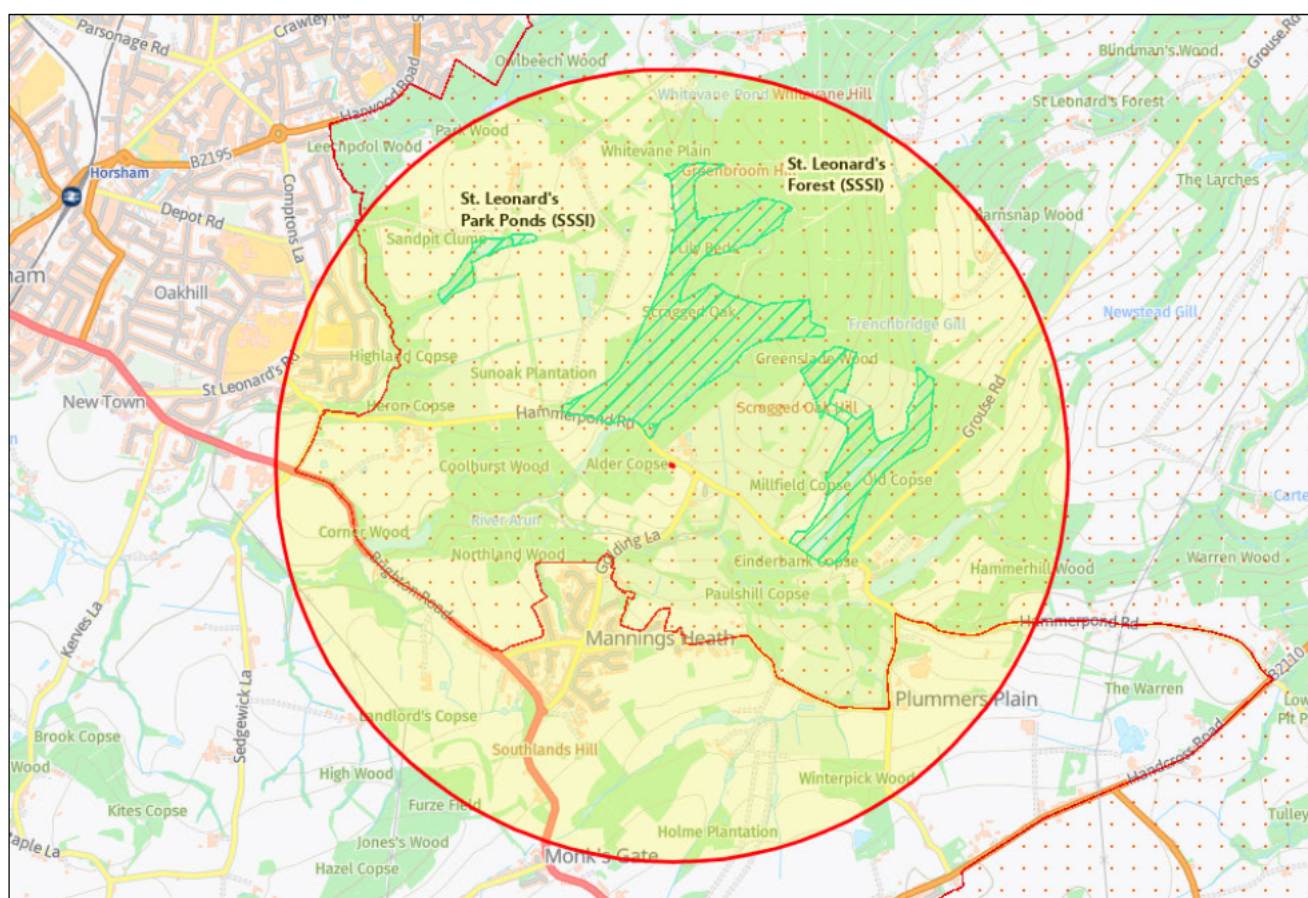


Figure 3. Designated sites within a radius of 2km of the application site. Images produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0)

There are no EPS licences granted for mitigation projects regarding any protected species within 2km of the site. Priority deciduous woodland habitat is located immediately adjacent to the western boundary of the site. Ancient and semi-natural woodland as well as ancient replanted woodland is located approximately 17m west of the site boundary (see Figure 4).

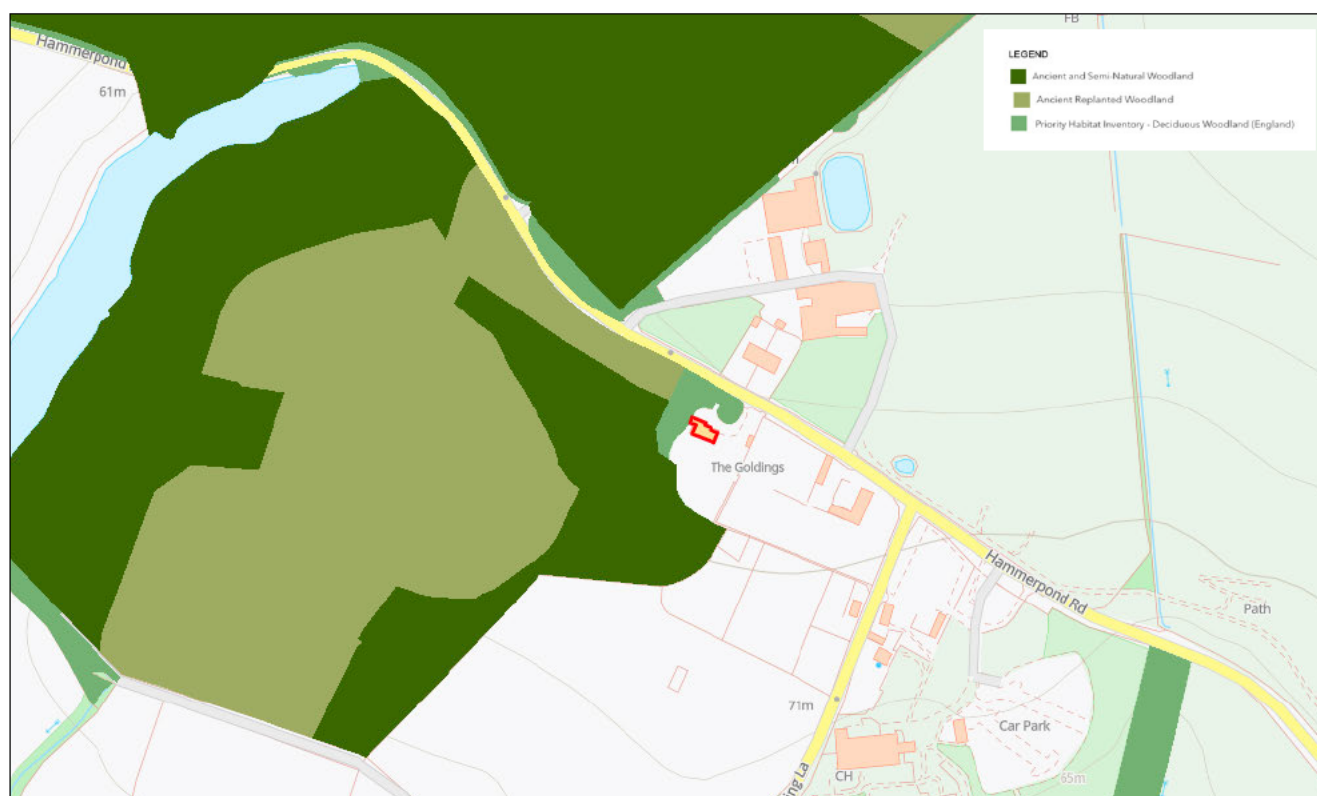


Figure 4. Priority deciduous woodland, ancient and semi-natural woodland and ancient replanted woodland relative to Roosthole, Mannings Heath (outlined in red). Image produced courtesy of Magic maps (<http://www.magic.gov.uk/>, contains public sector information licensed under the Open Government Licence v3.0)

3.2 Site Context and Surrounding Habitats

The site is located in a rural location north of Mannings Heath, comprising a two-storey dwelling, with associated unvegetated unsealed surface, bordered by the rest of the associated property, including a private garden and access drive.

Residential properties, parkland and woodland surround the area, with priority deciduous woodland habitat immediately adjacent to the western boundary of the site, and ancient and semi-natural woodland and ancient replanted woodland also in close proximity to the western boundary of the site. The close surrounding habitats are considered to be of high ecological value for bats, providing well-connected foraging and shelter opportunities.

3.3 Inspection for Bats

3.3.1 Roost Potential

The building inspection identified a confirmed bat roost through the identification of bat droppings and feeding remains in the loft void. Additionally, a brown long-eared *Plecotus auritus* bat was identified at the ridge of the void. A collection of approximately 250 bat droppings was found under the ridge with half of these appearing to be fresh. These droppings were morphologically similar to a *Plecotus* species bat. A number of features were evident around the building that could potentially allow entry into the enclosed loft spaces. These are described in Table 3 below and illustrated in the following photographs section.

**Table 3.** Assessment of PRFs.

Building section	Description of features	Assessment of suitability ⁵
Exterior	The building is of brick construction with partial timber board cladding, featuring a hipped roof made of machine-made clay tiles, which extend into a catslide on the northern elevation that forms an extension over the porch. The catslide on the northern elevation is in generally good condition, however approximately 30+ gaps were identified under roof tiles. Timber soffits are present on all elevations of the building, with no gaps identified. Two small two-storey extensions with dormer windows are also present on the northern and southern elevations, with an additional pergola leading to a utility room on the western elevation. This room has a flat plastic roof and timber soffits, with windows providing lots of daylight. No evidence of bats was found in the utility room. On the western elevation, one gap was identified high in the north-western corner of the timber cladding; another gap was identified by the drainpipe, though this appeared superficial and is unlikely to be suitable for bats. On the southern elevation, the timber board cladding is highly warped with multiple (30+) gaps, and five droppings were found on the ground in the south-eastern corner. Felt lining was identified underneath the cladding on the southeast corner with roof tiles generally in good condition, however approximately 15–20 gaps were also identified under roof tiles. On the eastern elevation, approximately 8 gaps were identified under cladding and 1–2 gaps under roof tiles.	High bat roost suitability
Interior – Loft Void Space	The dwelling supports an interior loft void space covering the entire blueprint of the building, partially boarded with rock wool insulation and bitumen felt on the roof underside. Approximately 250 droppings were found by the chimney entrance hatch and under the ridge. One brown long-eared bat was found roosting at the ridge. Feeding remains and droppings were additionally found at the south-east corner.	Confirmed bat roost

Overall, Roosthole has been confirmed to contain one bat roost, with further roost suitability at this site assessed as “high”; however, the zone of impact does not hold any suitable roost features and is therefore assessed as having negligible roosting potential (the utility room additionally has negligible potential for bats). The site is also assessed as having high suitability for foraging bats, due to the garden on site and surrounding woodland parcels providing opportunities to support a wide variety of bat species.

3.3.2 Hibernation Potential

The loft void, weather boarding and roof tiles are considered to have “low suitability” for hibernating bats. However, the zone of impact itself does not hold any suitable features and is therefore assessed to have no hibernating potential.

3.4 Other Protected and/or Notable Species

The proposed development footprint is covered by hardstanding and therefore poses no risk to reptiles or amphibians. There are no suitable features on site for birds, and the habitats are not considered to hold any value for [REDACTED] any other notable species.

⁵ Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn)*. Bat Conservation Trust, London.



3.5 Survey Limitations

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. Bats will commonly roost in small inaccessible crevices, such as spaces underneath ridge tiles that are impossible to inspect during a scoping assessment. For this reason, habitats and features are assessed for their potential to support bats, even where no direct evidence (such as droppings) has been identified.

There were considered to be no limitations to this survey. All loft voids were accessible and inspected in full and all aspects of the building to be impacted could be observed fully during the survey.

3.6 Photographs



Photograph 1a (left) and 1b (right). The northern elevation (left) and the southern elevation (right) of the property.



Photograph 2a (left) and 2b (right). The eastern elevation (left) and the western elevation (right) of the property.



Photograph 3a (left) and 3b (right). The utility room on the western elevation (left) and the interior of the utility room on the western elevation (right) of the property.



Photograph 4a (left) and 4b (right). The gap under timber cladding on the western elevation (left) and the interior of the void (right).



Photograph 5a (left) and 5b (right). Bat droppings found in loft void (left) and one brown long-eared bat identified roosting under the ridge (right).



4 ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES

4.1 Designated Sites

The site at Roosthole lies within proximity to two designated sites, St. Leonard's Park Ponds SSSI, approximately 1.35km to the north-east, and St. Leonard's Forest SSSI, approximately 164m to the north-west. Given the considerable distance between Roosthole and St. Leonard's Park Ponds SSSI, construction phase impacts such as dust, lighting, physical damage, vibration and noise are considered unlikely to negatively impact this site. St. Leonard's Forest SSSI, however, lies in close proximity to the site and appropriate care must be taken during the construction phase. All precautions must be taken to avoid discharges and spills to the ground, and best working practices for dust suppression through damping and surface water management must be employed to minimise any risk to this designation.

Post-construction, the single-storey extension will not result in an increase in the number of residents and therefore presents no potential for increased recreational pressure on either designated site.

4.2 Bats

4.2.1 Roost Potential

Overall, the loft void space within the dwelling is confirmed to support a bat roost, with a sighting of one brown long-eared bat. Additionally, the suitability of the property as a whole is considered to be “high”, considering the condition of the building, its context within suitable foraging habitat and the capacity for the identified roost features to support roosting bats. However, the works are currently limited to a single-storey extension on the western elevation of the building where a single suitable roost feature was identified. This feature is high enough that it will not be directly or indirectly impacted by the proposed extension, and as such the zone of impact is assessed to have “negligible” suitability for bats with no further surveys recommended.

Given the presence of confirmed bat roosts in the loft void space, it is recommended that the works are completed through careful working practices and sensitive timing, to be detailed in a non-licensed method statement. The zone of impact is considered to have no potential to support roosting bats, however, should the proposed works be amended, an updated assessment will be required, and further surveys may be necessary.

4.2.2 Mitigation Measures

To mitigate disturbance to foraging and commuting bats from artificial lighting, the proposed development should include an ‘ecologically sensitive lighting scheme’ in accordance with guidance produced by the Bat Conservation Trust (summarised in Appendix 2).

Bat boxes could also be installed on the south-eastern or western external faces of the new buildings, close to the eaves to provide additional roosting opportunities. Further details of recommended bat enhancements are provided in the accompanying Biodiversity Enhancement Strategy⁶. These enhancement measures will help

⁶ The Ecology Co-op (2026). *P11687 Roosthole, Mannings Heath – Biodiversity Enhancement Strategy (BES)* for issue.



illustrate that the proposals are in adherence of Paragraphs 187 (d) of the National Planning Policy Framework (NPPF) and should therefore be considered favourably within the planning process.

4.2.3 Hibernation Potential

While the main house is assessed to be of “low” suitability for roosting bats, the zone of impact at Roosthole is considered to have no hibernation potential for bats. As bats may be hibernating within other areas of the property works to the building should be timed in the period between mid-March and the end of October to avoid disturbing bats that could be in hibernation.

4.2.4 Foraging and Commuting Suitability

As the site and zone of influence may be 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 2).

4.3 Biodiversity Enhancement Opportunities

The proposed development represents an opportunity for habitat enhancement to benefit insects, birds, and bats. Any planting scheme should include native shrub species and flowering species known to encourage insect diversity. Such enhancement measures are in line with the recommendations of the NPPF and as such would be considered favourably when determining the planning application.

If any bats or other protected species are found during the development, work should be stopped immediately, and an ecologist must be contacted 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 Licence (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 – 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 to 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 Trust⁷ should be referred to when designing the lighting scheme. Note that lighting designs in very sensitive areas should be created with consultation from an ecologist and using up-to-date bat activity data where possible. The guidance contains techniques that 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 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;
- consideration of 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. Consideration should be given to 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 cat's 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 flightpaths,

⁷ 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/>



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.

Lighting Fixture Specifications

The Bat Conservation Trust recommends the following specifications for lighting on developments to prevent disturbance:

- Lighting spectra: peak wavelength >550nm
- Colour temperature: <2700K (warm)
- Reduction in light intensity
- Minimal UV emitted
- Upward light ratio of 0% and good optical control

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. Available at: <https://www.gov.uk/government/publications/artificial-light-in-the-environment>

Rich, C., Longcore, T., Eds. (2005) Ecological Consequences of Artificial Night Lighting. Island Press. ISBN 9781559631297.

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 (2021) Guidance Notes for the Reduction of Obtrusive Light GN01:2011.
Available at: <https://www.theilp.org.uk/resources/free-resources/>

Voigt, C.C., Azam, C., Dekker, J., Ferguson, J., Fritze, M., Gazaryan, S., Hölker, F., Jones, G., Leader, N., Lewanzik, D. and Limpens, H., 2018. *Guidelines for consideration of bats in lighting projects*. Unep/Eurobats.
Available at:

https://cdn.bats.org.uk/uploads/pdf/Resources/EUROBATsguidelines8_lightpollution.pdf?v=1542109376