



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

258 Singlewell Road

Issue Date

18th November 2024

Client

Peter Chopra

Author

Nik Neale

Project No: P10027

The Ecology Co-operation Ltd

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

Company number: 8905527





Document Control

Issue No	Author	Reviewer	Issue Date	Additions/alterations	Notes
Original	Nik Neale	Owen Crawshaw BSc (Hons) MCIEEM	18/11/24		

Conditions of use

This report has been prepared by The Ecology Co-operation Ltd, with all reasonable skill, care and diligence within the terms of the Contract with the client. This report only becomes the property of the client once payment for it has been received in full.

We disclaim responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client, and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

About the Author

This report has been prepared by Nik Neale, an Assistant Ecologist at The Ecology Co-op. He has been involved with, and managed various bat emergence and activity surveys, reptile surveys, dormouse surveys, great crested newt eDNA surveys, bat scoping surveys, bat scoping reports and Preliminary Ecological Appraisals. 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 Owen Crawshaw, a Principal Ecologist with over 10 years' experience. He has a Level 2 bat survey licence and has held numerous European Protected Species licences for bats. As a Full member of the Chartered Institute for Ecology and Environmental Management (CIEEM), he is bound by their code of professional conduct.



Report Summary

Purpose	The Ecology Co-op was commissioned by Mr Peter Chopra to undertake a Bat Scoping Assessment at 258 Singlewell Road, further to a proposal regarding the conversion of an existing dwelling into two separate properties. Works will involve the construction of a two-storey rear extension, alteration of roof including increase in height, rooflights in each side roof slope and dormer extension in each rear roof slope, single-storey front extension alongside construction of vehicular access and hard paving of the front garden area.
Context	This site is situated within an urban location in Gravesend in North Kent. It comprises a detached two-storey house with a patio, and garden area towards the east which consists of mown amenity grassland. A driveway is present towards the west alongside a landscaped area consisting of a substrate of slate with some planted shrubs.
Key findings	The building was assessed as having low suitability to support roosting bats with some slipped roof tiles, and where the edge of the apex on the rear elevation does not meet the timber. Habitat within the zone of influence of the proposals was considered to be of potential value to bats for foraging/commuting/dispersal purposes.
Recommendations	As the property has a low suitability for roosting bats, in line with best practice guidance, one bat survey, conducted between May and August, is required to inform a suitable impact assessment.
Further survey requirements	<u>A single bat emergence survey with one surveyor, and two infrared supporting cameras will be required between May-August.</u>



CONTENTS PAGE

1 INTRODUCTION.....	4
1.1 Purpose of the Report	5
1.2 Background	5
1.3 Policy and Legislation	6
2 METHODOLOGY.....	6
2.1 Desk Study	6
2.2 Field Survey.....	7
2.2.1 Roosting Potential.....	7
2.2.2 Hibernation Potential.....	8
2.2.3 Foraging and Commuting Potential	8
2.3 Other Protected and/or Notable Species	8
3 RESULTS/OBSERVATIONS	9
3.1 Desk Study and Granted EPS Licences	9
3.2 Site Context and Surrounding Habitats	9
3.3 Inspection for Bats.....	9
3.3.1 Roost Potential.....	9
3.3.2 Hibernation Potential.....	10
3.4 Survey Limitations	11
3.5 Photographs	11
4 ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES.....	14
4.1 Bats.....	15
4.1.1 Roost Potential.....	15
4.1.2 Hibernation Potential.....	15
4.1.3 Foraging and Commuting Suitability.....	15
APPENDIX 1 – Wildlife Legislation and National Planning Policy	16
APPENDIX 2 – Reducing Impacts of Artificial Light	18



1 INTRODUCTION

1.1 Purpose of the Report

The Ecology Co-op has been commissioned to undertake a bat scoping assessment of 258 Singlewell Road by Mr Peter Chopra. This report presents the findings of a walkover survey and building inspection for occupation by bats, undertaken by Dan Bennett, a Full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and licenced bat surveyor, on 15th November 2024. 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 erection of a two-storey rear extension, and erection of a single-storey front extension. 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 at 258 Singlewell Road, Gravesend, Kent, DA11 7RE. The central grid reference for the site is TQ 64817175.

The site comprises a detached two-storey house which is currently occupied. There is a garden area towards the east which is comprised of both mown lawn and artificial turf areas. Trees within the surrounding areas are sparse and the overall context of the site is within an urban and primarily built-up environment. The location of the study building is illustrated in Figure 1.

The proposed development/project comprises the conversion of the existing house into two houses, a two-storey extension is proposed towards the rear which would involve increasing the roof height, and a single storey extension towards the front alongside vehicular access and hard paving the entirety of the front garden area.

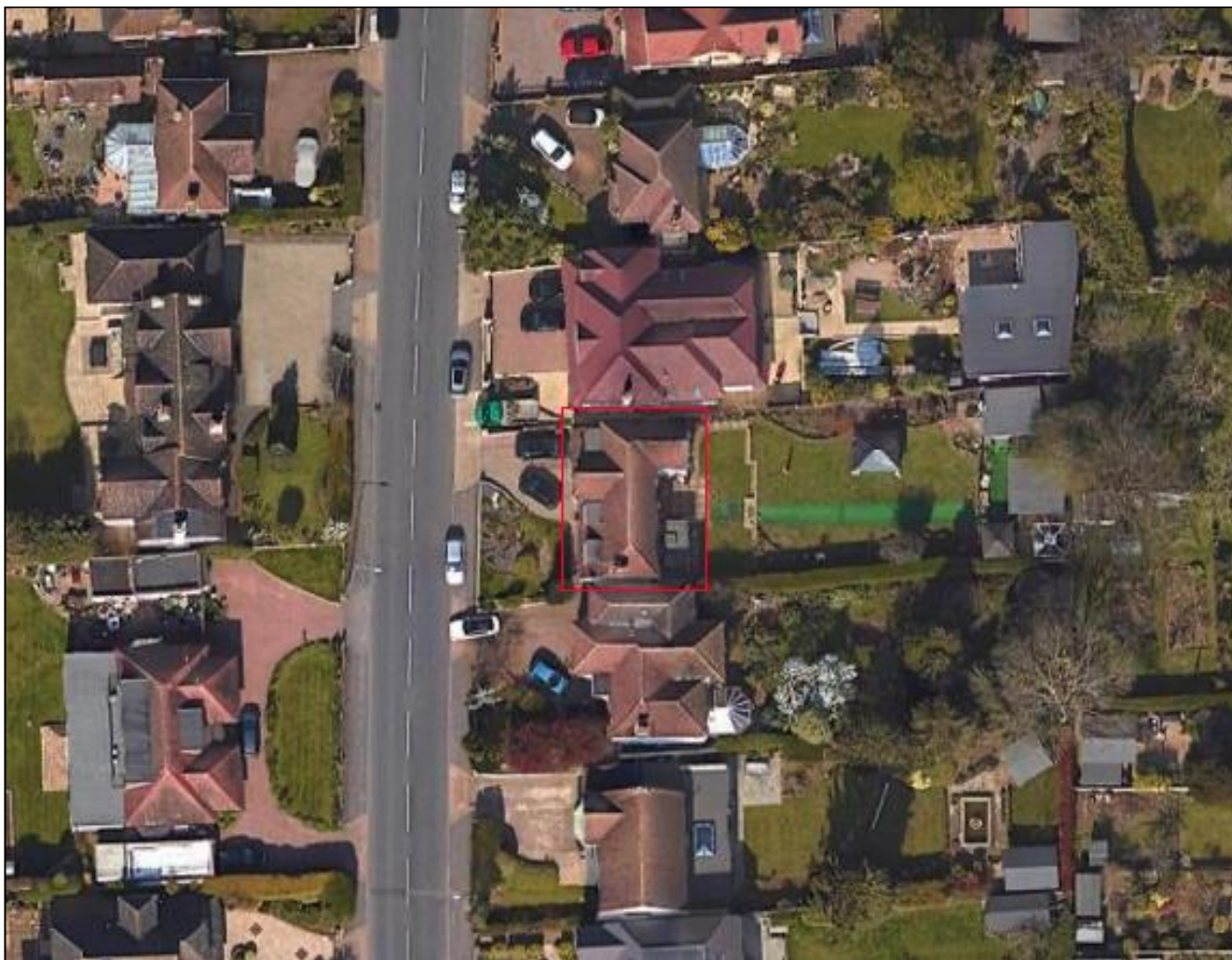


Figure 1. Aerial image showing the location of 258 Singlewell Road. Image produced courtesy of Google maps (map data ©2024 Google).

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.

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



2.1 Desk Study

A search of on-line 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 around the entirety of the property with the use of binoculars and internal inspection of PRFs with the use of a high-powered torch within 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 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.

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



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 its 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 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/trees, 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, 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 low 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

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

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..



protection on Schedule 1 of the Wildlife and Countryside Act (1981), such as barn owl *Tyto alba*.

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

There are no designated sites within 2km of the site that include bats as a designated feature within the zone of influence of the site. There is no priority habitat adjacent or in close proximity to the site. The closest area of ancient and semi-natural woodland is located approximately 1.9km south east of the site.

There are no EPS licences granted for mitigation projects concerning bats within 1km of the site. There are no EPS licences granted for mitigation projects regarding any other protected species within 2km of the site. The closest EPS licence regarding bats is approximately 3.3km south west of the site and concerns brown long-eared *Plecotus auritus* (2018-34833-EPS-MIT).

3.2 Site Context and Surrounding Habitats

This site is located in an urban location in Gravesend, Kent. The surrounding area is primarily built-up urban environments, some trees are present within garden areas and a block of trees is present beyond the north west boundary of the site. The close surrounding habitats are considered to be of low value for common bat species.

The site supports a single building and front and rear garden areas. The building is sits within a garden space comprising mown lawn areas, artificial turf, area of patio and hardstanding, and occasional shrubs.

3.3 Inspection for Bats

3.3.1 Roost Potential

This detached dwelling has a pebbledash facade on all aspects, with a clay peg tiled roof that is accessible by a single void space. No features were identified from the interior or exterior that could potentially allow entry into the enclosed loft space. The exterior of the building had a limited number of features including slipped tiles, gaps in the rear apex, and hanging tiles. Table 4 describes the PRFs assessed during this survey.

Table 4. Assessment of PRFs

Building section	Description of features	Assessment of suitability
258 Singlewell Road - interior	The loft void is composed of an L-shaped ridge which has had an extension towards the north-east. The loft void is between 1.75-2m high, other approximate dimensions are shown in Figure 3. The void space is described as cluttered with timber frame purlins and horizontal	Low bat roost suitability



Building section	Description of features	Assessment of suitability
	struts for support. The intrusion of external light is not noticed within the loft void apart from on the eastern elevation where a soffit box grill can be seen. No evidence of bats was found within the loft void during the survey.	
258 Singlewell Road - exterior	Rear (eastern) elevation; slipped tile is present on this elevation (Photograph 1 & 3) which could provide a suitable crevice feature for bats, the pugging is intact on the majority of this elevation apart from a small section where the ridge tiles meet the roof tiles (Photograph 2). Soffit boxes are well sealed with no features. There is a single gap present on the apex of where the tile does not meet the timber frame (Photograph 4). Side (northern) elevation; no features were noted on this elevation (Photograph 12). Front (western) elevation; hanging tiles on the dormer windows have gaps that provide a feature for crevice dwelling bats (Photograph 6). A missing roof tile is present however this is discounted as a feature as half of the tile remains in the roof and therefore a crevice space between the tiles and lining is not present (Photograph 7). Side (southern) elevation; no features were noted on this elevation, although the base of the chimney could not be viewed entirely (Photograph 13).	Low bat roost suitability



Figure 3. Loft void and approximate dimensions at 258 Singlewell Road.



Overall, the bat roost suitability at this site is assessed as 'low', considering the condition of the building and its context within the surrounding environment. The lack of hedgerows and tree-lines approaching the building used by bats for commuting and navigation may also reduce the potential for bats establishing roosts at this site.

3.3.2 Hibernation Potential

The features described above have low potential for hibernating bats. The building is in use all year round and is centrally heated, therefore the interior loft space is likely to fluctuate in temperature and not remain stable for hibernating bats. However, the presence of hibernating bats including pipistrelle species using any of the crevice features described above for hibernation cannot be discounted

3.4 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.

Due to the location of the chimney on the southern elevation, this could not be viewed entirety as to do so would have meant entering the neighbour's garden. The chimney could be viewed from the front elevation and an assessment has been made from here.

3.5 Photographs



Photograph 1. Overview of the rear elevation.



Photograph 2. Missing pugging from below the ridge tile on the left side of the rear elevation as highlighted in red.



Photograph 3. Missing tile from the roof on the left side of the rear elevation as highlighted in red.



Photograph 4. Gap present where tile does not meet the timber frame on the right side of the rear elevation as highlighted in red.



Photograph 5. Overview of the front elevation.



Photograph 6. Gaps present on the hanging tiles of the dormer window on the front elevation as highlighted in red.



Photograph 7. Missing tile from the roof on the right side of the front elevation as highlighted in red, feature discounted as the stub of tile can be seen with binoculars.



Photograph 8. Internal loft void.



Photograph 9. Internal loft void.



Photograph 10. Internal loft void.



Photograph 11. Internal loft void.



Photograph 12. Side (northern) elevation.



Photograph 12. Side (southern) elevation, note chimney that could not be fully viewed.



4 ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES

4.1 Bats

4.1.1 Roost Potential

In accordance with the Bat Conservation Trust guidelines, the overall suitability of the building/structure/trees to support bats is rated as 'low'. The works to extend the building towards the front and rear as well as raise the existing roof height has the potential to impact upon features that have the potential to support bats roosts, not yet identified.

Therefore, in accordance with the guidelines one bat emergence/re-entry survey is required to confirm the presence/likely absence of roosting bats as without further surveys the level of impact upon bats cannot be fully assessed. To ensure adequate coverage of all potential roost features, it is estimated that one observer will be required the single survey visit to observe all suitable roost features. To ensure that the survey effort conforms with interim guidance on the use of night vision aids, produced by the Bat Conservation Trust⁵, two night vision cameras supported by infra-red lighting will be used to support the surveyor.

This survey can be undertaken between May and August (September surveys cannot be undertaken in for low potential buildings). These surveys will be completed at dusk, during suitable weather conditions for bat activity to observe any bats emerging or re-entering roosts. The surveyor will use ultrasonic recording equipment to try and establish the species of bat present. If bats are discovered, further surveys to classify the nature of the roost (day/maternity/social) may be required.

If any bat roosts are identified, an EPS licence will be required for any actions that would directly disturb, modify or destroy a bat roost. This would include measures to replace the existing roosting habitat such as designing integral bat roosting opportunities into the building fabric such as bat tiles and internal voids/access points for bats, depending on the scale of impact.

4.1.2 Hibernation Potential

258 Singlewell Road is assessed as having low hibernation potential for bats. The features that could be used for hibernation include roof tiles which 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 implemented to reflect the risk that bats may be use this building for hibernating during the winter. This must include timing the works to the building between 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 sites overall foraging and commuting suitability is assessed as low due to the lack of hedgerows and tree

⁵ Bat Conservation Trust (2022). Interim Guidance Note: Use of night vision aids for bat emergence surveys and further comment on dawn surveys.



lines that are approaching the site and the lack of these within the surrounding environment. Bat activity surveys are not recommended in this instance as it can be assumed that the surrounding area has low numbers of common bat species.

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 Trust⁶ 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,

⁶ 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