



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 Survey Report

Site Name

Thakeham Tiles, Rock Road, Storrington

Client

Thakeham Concrete
Products Ltd.

Issue Date

9th September 2026

Author

Owen Crawshaw

Project No: P6018

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	Owen Crawshaw BSc (Hons) CEcol MCIEEM	Emma Baker BSc (Hons), MSc, MCIEEM	09.09.26	N/A	

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 Owen Crawshaw, a Principal Ecologist at The Ecology Co-op, specialising in Biodiversity Net Gain (BNG) assessment, UK Habitat Classification and protected species survey and licensing. He is a Chartered Ecologist and full member of the Chartered Institute for Ecology and Environmental Management (CIEEM), and 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 Thakeham Concrete Products Ltd to undertake further inspections/surveys for bats of T79 (Oak Tree 1), and T48 (Oak Tree 4), further to an outline planning application (Horsham District Council ref. DC/25/2087) for the demolition of existing buildings and the erection of up to 108 dwellings with associated landscaping and access.
Context	T79 is a mature oak identified for retention within the proposed development. A Ground Level Tree Assessment (The Ecology Co-op, May 2026) identified a Potential Roost Feature (PRF) on T79 comprising a hole and area of loose bark, and assessed the tree as a PRF-M. Sections of adjacent woodland are proposed for removal to facilitate the development. Following consultation between the applicant's ecologist and Horsham District Council's ecological advisor (Place Services), three bat emergence surveys were carried out between July and September 2026 to determine the presence or likely absence of a roost within T79 and to inform the assessment of potential impacts. T48 is a mature oak proposed for removal under the proposed development scheme. A PRF inspection survey of the tree was undertaken to classify the suitability of any PRFs.
Key findings	No bats were seen or heard to emerge from, or return to, any feature on T79 during any of the three survey visits. General bat activity included common pipistrelle, soprano pipistrelle, serotine, Myotis sp. and noctule recorded foraging and commuting in the vicinity of the tree on all three visits, including one instance of a Myotis sp. foraging close to the tree shortly after sunset during the first survey. No roost entrances or exits were recorded on camera or acoustically at any point across the three surveys. T48 is assessed as PRF-I due to the presence of a number of mature ivy stems which create small sheltered crevices.
Interpretation	These results indicate that T79 and the surrounding woodland form part of the local bat resource used for foraging and commuting, but that T79 is not currently occupied as a roost. The proposed removal of woodland adjacent to T79 will have no foreseeable impacts on roosting bats given the absence of identified roost sites. T48 contains PRFs suitable for individual roosting bats only and may form part of a wider bat roosting resource. Without reasonable avoidance measures and compensation, felling of the tree has the potential to negatively impact upon roosting bats (if present).
Recommendations	Prior to felling T48 must be inspected by an appropriately licensed ecologist to confirm the absence of roosting bats. A crevice bat box must be installed on a suitable nearby tree (to be retained) and T48 will then be section-felled by an experienced arborist. In the event a bat is discovered in-situ, felling of the tree will need to be delayed until a mitigation licence has been secured from Natural England.

CONTENTS PAGE

1 INTRODUCTION.....	1
1.1 Background.....	1
1.2 Purpose of the Report.....	1
2 LEGAL PROTECTION.....	1
3 METHODOLOGY.....	2
3.1 PRF Inspection	2
3.2 Emergence Surveys	2
3.3 Limitations to Emergence Surveys	3
4 RESULTS.....	4
4.1 PRF Inspection	4
4.2 Bat Emergence Surveys	5
4.2.1 Survey Conditions	5
4.2.2 Bat Emergence Results	5
• 16th July 2026	5
• 6th August 2026.....	5
• 1st September 2026	5
5 IMPACT ASSESSMENT AND MITIGATION RECOMMENDATIONS	6
5.1 Interpretation of Findings	6
5.2 Potential Impacts	6
5.3 Precautionary Approach	6
5.4 Conclusions	6
APPENDIX 1 – LEGISLATION AND POLICY.....	8
APPENDIX 2 – SURVEY RESULTS SUMMARY.....	10
APPENDIX 3 – REDUCING IMPACTS OF ARTIFICIAL LIGHT	11



1 INTRODUCTION

1.1 Background

Thakeham Concrete Products Ltd have submitted an outline planning application (Horsham District Council ref. DC/25/2087) for the demolition of existing buildings at Thakeham Tiles, Rock Road, Storrington, and the erection of up to 108 dwellings with associated landscaping, open space and access.

The full address for the site is Thakeham Tiles, Rock Road, Storrington, West Sussex, RH20 3AD. The central National Grid Reference for the site is TQ 10392 15033.

An Ecological Impact Assessment (The Ecology Co-op, November 2025) identified bats commuting and foraging across the site and recommended that any trees proposed for removal be subject to a Ground Level Tree Assessment (GLTA) to determine their suitability to support roosting bats. A GLTA (The Ecology Co-op, May 2026) subsequently assessed five oak trees with the potential to be affected by the proposals.

T79 (Oak Tree 1 in the GLTA), a large mature oak *Quercus* sp. proposed for retention, was identified as 'PRF' (Potential Roost Feature) from the ground, a PRF inspection survey then further classified the feature as a 'PRF-M': a PRF suitable for maternity roost, on the basis of a large hole and area of loose bark on the trunk. T48 (Oak Tree 4 in the GLTA) was assessed as 'FAR' (Further Assessment Required) during the GLTA due to dense ivy *Hedera helix* coverage.

Horsham District Council's ecological advisor, Place Services, subsequently advised that further information was required regarding T79 & T48 before the application could be determined, including confirmation of whether the trees support roosts and an assessment of the potential impact on the retained feature from the removal of adjacent woodland. The arboriculturist has since confirmed that T79 is to be retained under the current proposals.

1.2 Purpose of the Report

In accordance with the above, a PRF inspection survey of T48 and bat emergence surveys of T79 were carried out by The Ecology Co-op. The PRF inspection was undertaken on 13th July 2026 with emergence surveys conducted between 16th July and 1st September 2026.

The purpose of this survey work was to determine the presence or likely presence of roosting bats within T79 & T48, and where relevant, to identify any impacts associated with the proposed removal of T48 and the woodland adjacent to T79 and to prescribe appropriate mitigation and/or precautionary measures.

This survey and report were carried out at the request of Thakeham Concrete Products Ltd.

2 LEGAL PROTECTION

Details of legislation and legal protection afforded to all species of British bats are given in Appendix 1.

The results of this survey will be used to determine the need for an appropriate mitigation strategy to ensure



compliance with UK and EU wildlife legislation.

3 METHODOLOGY

3.1 PRF Inspection

A PRF inspection survey of T48 was undertaken by Owen Crawshaw CEcol, MCIEEM (Natural England Level 2 Bat Survey Class Licence: [REDACTED]) with assistance from Ellie Fitter MSc.

The survey involved the use of a ladder to enable close-up inspection of PRFs with a torch and endoscope. A PRF was then further assessed for its suitability to support roosting bats (either PRF-I or PRF-M) in accordance with Table 6.2. below (taken from Collins, 2023). Note this further assessment was only made where the surveyor could fully gauge the extent of a PRF.

Table 6.2. Guidelines for categorising the potential suitability of PRFs on a proposed development site for bats, to be applied using professional judgement.

Suitability	Description
PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
PRF-M	PRF is suitable for multiple bats and may therefore be used by a maternity colony.

3.2 Emergence Surveys

Three bat emergence surveys were undertaken on 16th July, 6th August and 1st September 2026, using the methodology set out in best practice guidelines produced by the Bat Conservation Trust (Collins, 2023).

T79 is a large mature oak located within woodland towards the northern boundary of the site (Figure 1 – see GLTA report). A GLTA (The Ecology Co-op, May 2026) identified a PRF approximately 3m above ground level, comprising a hole (approximately 5cm x 10cm) opening into a large cavity within the main trunk (Figure 2 – see GLTA report), together with an area of loose bark. Endoscope inspection indicated the cavity extends approximately 40cm below and 50cm above the entrance before narrowing. On the basis of this feature, T79 was assessed as a PRF-M.

The surveys focused on the identified PRF, together with the upper crown of the tree, which had not been possible to fully assess from the ground or by climbed inspection.

The surveyors recorded any bat activity on or around the identified PRF and the wider tree using full spectrum static detectors and thermal imaging cameras, in accordance with best practice guidance.

The following equipment was used to support this survey:

- 2 x Guide TK612 Gen2 thermal imaging cameras, one trained on the identified PRF and one trained on the upper crown of the tree
- 2 x BatLogger M2 full spectrum static bat detectors, co-located with the thermal cameras



Photograph 1a & 1b. The identified PRF-M within T79.

3.3 Limitations to Emergence Surveys

In accordance with best practice guidelines, each survey visit was undertaken during suitable weather conditions for bat activity, with temperatures above 10°C, low wind speeds and no persistent rain throughout (see Table 1).

Nevertheless, bats can use roosting features intermittently throughout the year and may be present in larger or smaller numbers depending on their breeding cycle and roost-switching behaviour; the results of this survey therefore represent a robust snapshot of activity at the time of survey rather than a permanent guarantee of absence.

Both thermal cameras were deployed and monitored on all three survey visits. Footage from both cameras was fully reviewed frame-by-frame using Wildlife Imaging Systems (WIS) following the first survey visit. For the second and third survey visits, the camera trained on the upper crown of the tree was monitored live by the surveyor in real time; no emergence was suspected and no additional potential roost feature was observed at the top of the tree on either occasion. The original footage from all three surveys has been retained by The Ecology Co-op and remains available for further review if required. No other limitations were identified.



4 RESULTS

4.1 PRF Inspection

No bats were observed in-situ. T48 was assessed as PRF-I (PRF suitable for an individual bat) due to the presence of mature ivy stems which create a number of shallow sheltered crevices.



Photographs 2a – 2d. T48 and the associated mature ivy stems which were assessed as a PRF-I.



4.2 Bat Emergence Surveys

4.2.1 Survey Conditions

The dates, times, weather conditions, temperatures and personnel for each survey visit are presented in Table 1 below:

Table 1. Details of surveys undertaken, timings weather conditions and personnel.

Date	Survey start time/end time	Temperature (°C), weather conditions throughout survey	Surveyors
16/07/26	Start time: 20:54 Sunset: 21:09 End time: 22:39	21, wind 3.4 m/s, 2% cloud cover, no precipitation	Clara Gonzalez Hernandez MCIEEM (NE licence [REDACTED]) Robert Wallace MA BA (Hons)
06/08/26	Start time: 20:25 Sunset: 20:40 End time: 22:10	20, wind 2.6 m/s, 91% cloud cover, no precipitation	Clara Gonzalez Hernandez MCIEEM Robert Wallace
01/09/26	Start time: 19:33 Sunset: 19:48 End time: 21:18	18, wind 3.6 m/s, 13% cloud cover, no precipitation	Clara Gonzalez Hernandez MCIEEM Robert Wallace

4.2.2 Bat Emergence Results

The following descriptions summarise bat activity recorded during each survey visit. A summary of species activity by survey is presented in Table 2 in Appendix 2.

- **16th July 2026**

No bats were seen to emerge from, or enter, the identified PRF or any other feature on T79. General bat activity was recorded throughout the survey, including common pipistrelle *Pipistrellus pipistrellus* (13 passes), *Myotis* spp. (7 passes), serotine *Cnephaeus serotinus* (4 passes) and soprano pipistrelle *Pipistrellus pygmaeus* (1 pass). At 21:49 (40 minutes after sunset), a *Myotis* sp. was recorded foraging close to the tree on both the thermal camera and the acoustic detectors; while this was noted by the surveyor as being consistent with post-emergence foraging behaviour, no emergence or roost entry was observed at any point, and this is interpreted as foraging activity in the vicinity of the tree rather than confirmed roost use.

- **6th August 2026**

No bats were seen to emerge from, or enter, any feature on T79. This was the busiest survey acoustically, with common pipistrelle (65 passes), soprano pipistrelle (15 passes), serotine (4 passes) and *Myotis* sp. (3 passes) recorded, consistent with general foraging and commuting activity along the woodland edge.

- **1st September 2026**

No bats were seen or heard to emerge from, or enter, any feature on T79. Common pipistrelle (25 passes), soprano pipistrelle (22 passes), serotine (4 passes) and a single noctule *Nyctalus noctula* pass were recorded.



5 IMPACT ASSESSMENT AND MITIGATION RECOMMENDATIONS

5.1 Interpretation of Findings

T48 contains PRFs suitable for individual roosting bats only and may form part of a wider bat roosting resource. Should roosting bats use the PRF-Is the roost would likely be of site to local value dependent on the species of bat.

No bats were recorded emerging from, or entering, T79 during any of the three survey visits, despite the identified PRF and the upper crown of the tree being monitored throughout using thermal imaging and full spectrum acoustic detectors. General bat activity, comprising at least five species, was recorded with foraging and commuting in the vicinity of the tree on every visit, confirming that the tree and surrounding woodland form part of the local bat resource, but that T79 is not currently occupied as a roost. On the basis of these results, roosting bats are considered likely to be absent from T79 at the time of survey.

5.2 Potential Impacts

T48 contains PRFs suitable for individual roosting bats only and may form part of a wider bat roosting resource. Without reasonable avoidance measures and compensation, felling of the tree has the potential to negatively impact upon roosting bats (if present).

The emergence survey results indicate that T79 and the surrounding woodland form part of the local bat resource used for foraging and commuting, but that T79 is not currently occupied as a roost. The proposed removal of woodland adjacent to T79 will have no foreseeable impacts on roosting bats given the absence of identified roost sites.

5.3 Precautionary Approach

Prior to felling, T48 must be inspected by an appropriately licensed ecologist to confirm the absence of roosting bats. A crevice bat box (such as an improved crevice bat box or similar available alternative) must be installed on a suitable nearby tree (to be retained) and T48 will then be section-felled by an experienced arborist. In the event a bat is discovered in-situ felling of the tree will need to be delayed until a mitigation licence has been secured from Natural England.

5.4 Conclusions

T48 has been assessed as containing a PRF-I (mature ivy stems). No further surveys or an EPS mitigation licence are required, however a pre-commencement check, provision of a bat box on an alternative tree and careful section felling will be required.

The bat emergence surveys of T79 recorded no evidence of roosting bats using the tree across three survey visits between July and September 2026, despite foraging and commuting activity by at least five bat species in the immediate vicinity throughout. On this basis, roosting bats are considered likely to be absent from T79 at the time of survey. The proposed development is not considered likely to result in significant adverse effects on bats associated with T79.



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



APPENDIX 1 – LEGISLATION AND POLICY

All species of British bat are fully protected under the Wildlife and Countryside Act 1981 as amended through inclusion in Schedule V. All bat species in the UK are also 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 ("EC Habitats Directive") which defines European protected species of animals.

Bat species are afforded further protection by the Natural Environment and Rural Communities Act 2006.

Under the above legislation it is an offence to:

- kill, injure or take an individual;
- possess any part of an individual either alive or dead;
- intentionally or recklessly damage, destroy or obstruct access to any place or structure used by these species for shelter, rest, protection or breeding;
- intentionally or recklessly disturb these species whilst using any place of shelter or protection; or
- deliberate disturbance in such a way as to be likely to impair their ability to:
 - survive, to breed or reproduce, or to rear or nurture their young; or
 - in the case of animals of a hibernating or migratory species, 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. In the case all species of British bat there is also protection under Schedule 6 of The Wildlife and Countryside Act 1981 (as amended) relating specifically to trapping and direct pursuit of these species.

The Habitats Directive and the Habitats Regulations provide for derogation from these prohibitions for specific reasons, provided certain conditions are met. A European Protected Species (EPS) licensing regime allows operations that would otherwise be unlawful to be carried out lawfully. In England, Natural England is the relevant licensing body and, in order to grant a licence, must be satisfied that three statutory conditions (the "three derogation tests") are met:

- the licence is granted for a permitted purpose — in this case "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" (Regulation 55(2)(e) of the Conservation of Habitats and Species Regulations 2017);
- there is no satisfactory alternative (Regulation 55(9)(a)); and
- the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range (Regulation 55(9)(b)).

A bat roost is defined 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 can include all summer roosts, used for breeding, resting or



sheltering and all winter roosts used for hibernating.



APPENDIX 2 – SURVEY RESULTS SUMMARY

A summary of bat activity recorded on the static detectors and thermal cameras during each survey visit is presented in Table 2 below. Full acoustic and thermal imaging datasets have been retained by The Ecology Co-op and are available on request. No roost entrances or exits were recorded on any survey visit.

Survey date	Common pipistrelle	Soprano pipistrelle	Serotine	Myotis sp.	Noctule	Roost entrances/exits
16/07/26	13	1	4	7	0	0
06/08/26	65	15	4	3	0	0
01/09/26	25	22	4	0	1	0



Figure 1. Representative thermal camera still of the identified PRF (16th July 2026, 22:38 – 89 minutes after sunset).



APPENDIX 3 – REDUCING IMPACTS OF ARTIFICIAL LIGHT

Bright external lighting can have a detrimental impact upon foraging and commuting bat flight paths and behaviour, but more importantly can also cause bats to remain in their roosts for longer, shortening the time available to them to forage. Lighting can increase the chances of predation, such as by owls and hawks, which can result in bats modifying their behaviour. Desertion/obstruction of a roost due to lighting disturbance could constitute an offence under the legislation. 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 Trust¹ should be referred to when designing the lighting scheme. Note that lighting designs in very sensitive areas, such as in proximity to woodland edge, hedgerows and waterways, 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.

The mitigation hierarchy applies to lighting design. Avoidance of the impact should be demonstrated in the first instance through no illumination (and retention) of roost entrances, flight paths, habitats and features used by bats.

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

Where avoidance cannot be achieved, mitigation measures need to be put in place to minimise impacts from lighting to an acceptable (non-significant) level². In the first instance, design should maintain or reduce existing light levels and reduce the blue content of lighting to protect the bat species present.

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 to maintain/create ecologically functional ‘dark corridors’;
- sensitive site configuration, whereby the location, orientation and height of newly built structures and hard

¹ Bat Conservation Trust and Institute for Lighting Professionals (2023). Guidance note GN08/23. Bats and Artificial Lighting at Night. <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>

² Compensation is reverted to as a last resort to address any remaining impacts after avoidance and mitigation.



- 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;
 - internal luminaires can be recessed (as opposed to using a pendant fitting) where installed in proximity to windows to reduce glare and light spill;
 - waymarking inground markers (low output with cowls or similar to minimise upward light spill) can be used to delineate path edges;
 - consideration should be given to the height of lighting columns. The use of bollard or low-level downward-directional luminaires is strongly discouraged. A lower mounting height can create a range of adverse issues such as increased light-spill and unacceptable glare. 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 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;
 - external security lighting should be set on motion-sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1- or 2-minute timer is likely to be appropriate.

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
- LED luminaires should be used where possible
- upward light ratio of 0% and good optical control
- luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt.

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

Institution of Lighting Professionals (2019) Guidance Notes for Domestic exterior lighting: getting it right. GN09:2019. Available at: <https://theilp.org.uk/resource/gn09-domestic-exterior-lighting-pdf-1.html>

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/EUROBATGuidelines8_lightpollution.pdf?v=1542109376

End.
