

Bat Emergence Survey Report for 16 Dark Lane, Wargrave, Berkshire

Commissioned by: Mr. P Stubbs

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Executive summary

A preliminary roost assessment was carried out at 16 Dark Lane by Syntegra Consulting Ltd in July 2023. The house was assessed as having low potential to support roosting bats and the outbuildings as having negligible potential and one additional activity survey for the house was advised.

Based on the above assessment and in line with Bat Conservation Trust Guidelines, NewWays Ecology Ltd undertook one additional bat activity survey at 16 Dark Lane, Wargrave which was carried out in August 2024. The purpose of this survey work was to determine presence or absence of roosting bats and provide advice to inform a planning application for the extension of the property.

During the surveys, no bats were witnessed emerging from the building. There was a low level of activity around the site. Common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*P. Pygmaeus*) bats utilised the garden to the rear of the house for foraging during the survey with several passes by noctules (*Nyctalus noctule*) and brown long-eareds (*Plecotus auritus*).

The evidence gathered during the surveys suggests that during the time of the survey there are no bat roosts within the site. **HIGH CONFIDENCE**

The planned works to the house at 16 Dark Lane, Wargrave **will not** result in the disturbance, modification and destruction of a bat roost. **HIGH CONFIDENCE**

A protected species mitigation licence will NOT be required from Natural England.

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1. Introduction

1.1. Background

In relation to the proposed works to the house at 16 Dark Lane, Wargrave a preliminary roost assessment was carried out by Syntegra Consulting Ltd in July 2023. The preliminary survey found no evidence of bats and assessed the house as having low potential to host roosting bats.

The proposed development includes a single storey extension of the existing property.

This report presents the results of one bat activity survey carried out in August 2024 by NewWays Ecology Ltd. This was led by Ashley Butler MSc (Natural England (NE) class 17 bat survey license (Number 2023-11805-CL17-BAT) and accredited agent on class license 2016-20666-CLS-CLS (Mr. Steven Wadley)). The grid reference for this site is SU 78859 78749.

The purpose of this survey work was to determine presence of roosting bats and where necessary prescribe further surveys and/or appropriate mitigation advice to inform the planning application for the proposed works at the site.

This survey and report was carried out at the request of Mr. Phillip Stubbs of 16 Dark Lane, Wargrave.

1.2. Site description

The site is situated on the within the village of Wargrave, approximately 8.5km northeast of Reading city centre. The site comprises a 1930's style 4 bedroom brick-built and rendered house with a concrete tile roof surrounded by a mature garden. The living space extends into the roof line with a loft and crawl spaces into the eaves.

The wider landscape comprises residential properties with associated gardens, grassland and agricultural land. The River Thames is located 400m west of the site.

The location of the site is shown in Figure 1 and the extent of the site boundary is shown in Figure 2. The building surveyed is shown in Figure 3.

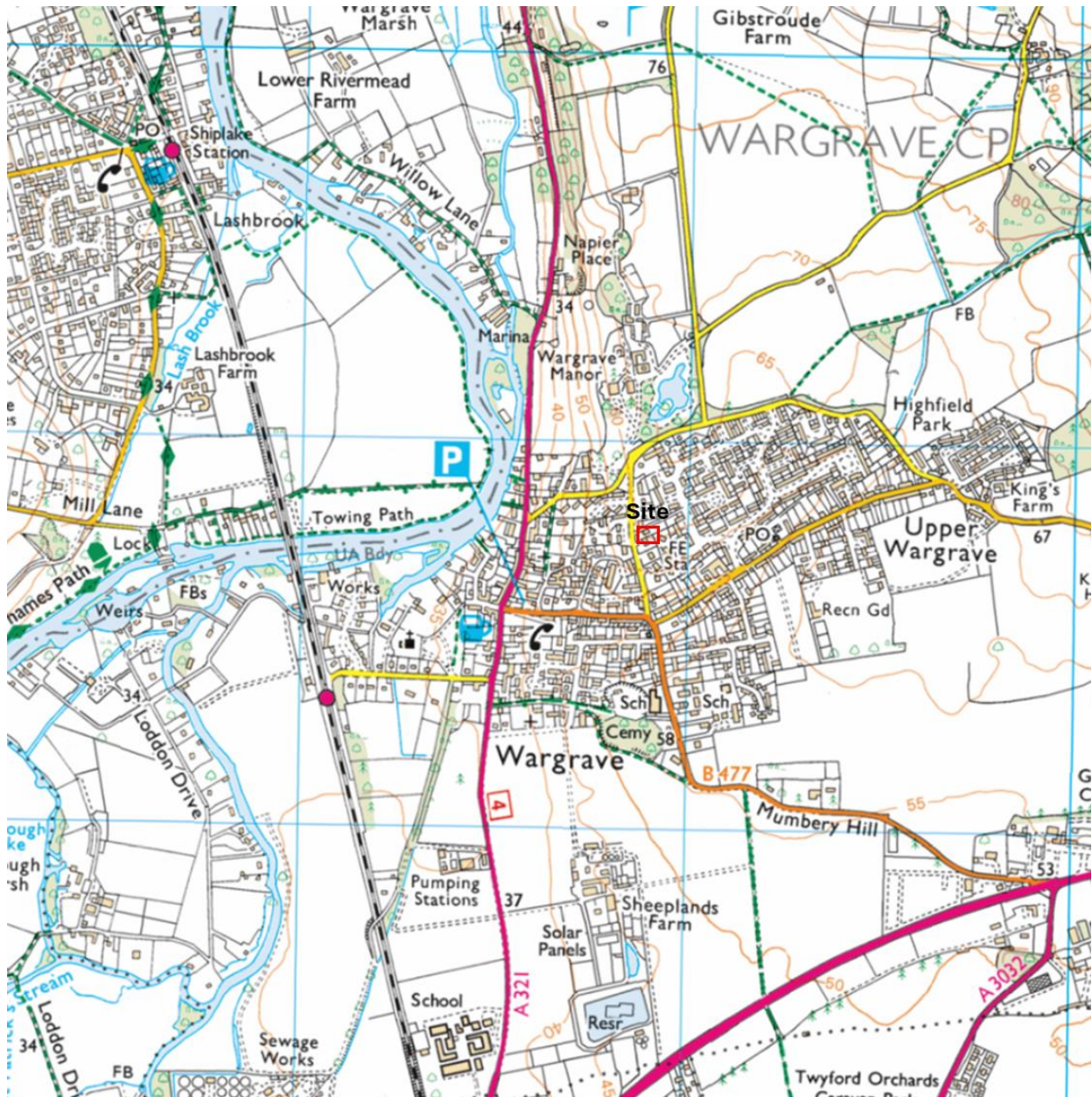


Figure 1: Site location. Contains Ordnance Survey data © Crown copyright and database right 2024



Figure 2: Site boundary. Images produced courtesy of Google maps (Map data ©2024 Google).



Figure 3: Buildings surveyed

The habitat at site is open lawned garden with mature shrubs and trees and hedge lined boundaries. Within the wider area the habitat is predominately detached houses with private gardens and areas of pastoral fields and broadleaf woodland and wood pasture (BAP priority habitats). The closest area of ancient woodland is 1km east of the site – Blakes Wood - an area of ancient semi natural woodland running to 1Ha. These wooded and wood pasture areas would provide roosting, foraging and commuting opportunities for bats.

Roosting potential locally is high due to numerous older buildings and proximity to large areas of well-connected mature woodland and riparian habitat.



Figure 4: Habitat surrounding the site

1.3. Development proposals

The proposed development includes the extension of the existing dwelling.

1.4. Legal Protection

The results of this survey will be used to determine the need for appropriate mitigation strategy to ensure compliance with UK wildlife legislation.

2. Methodology

2.1. Desk Survey

Within 10km of the site there are no designated sites of importance to bats. Within 2km of the site there are no statutory designated sites.

Reference to Natural England's MAGIC website, which holds records of granted protected species licenses, identified 9 licenses for bat species within 2 km of the site.

- EPS licence (EPSM2009- 1439) permitting the destruction of a resting site for common pipistrelle, soprano pipistrelle, brown long-eared and natterer's granted approximately 1900 m east of the site.
- EPS licence (2015-7300-EPS MIT) permitting the destruction of a resting site for common pipistrelle, soprano pipistrelle and brown long-eared, granted approximately 1450m north of the site.
- EPS licence (EPSM2012- 4004) permitting the destruction of a resting site for soprano pipistrelles, granted approximately 1050m northwest of the site.
- EPS licence (2020-44644- EPS-MIT) permitting the destruction of resting site for brown long-eared bat and common pipistrelle, granted approximately 1.9km south of the site.
- EPS licence (2018-35667- EPS-MIT) permitting the destruction of resting site for common pipistrelle, granted approximately 1.5km east of the site.
- EPS licence (2015-7768-EPS-MIT-1) permitting the destruction of resting site for soprano pipistrelle, granted approximately 1.6km northwest of the site.
- EPS licence (2015-7819-EPS-MIT) permitting the destruction of resting site for soprano pipistrelle and common pipistrelle, granted approximately 1.3km northwest of the site.
- EPS licence (2017-29718- EPS-MIT) permitting the destruction of resting site for soprano pipistrelle and brown long-eared, granted approximately 1.8km northwest of the site.
- EPS licence (2019-43232- EPS-MIT) permitting the destruction of resting site for soprano pipistrelle, granted approximately 1.8km northwest of the site.

An absence of records does not mean that a particular species is not present, merely that it has not been recorded. Many species records are not obtainable from the sources utilised and therefore there may be further undetected records for such species on the study site or in the local area.

2.2. Scoping survey

The scoping survey was undertaken on 26th July 2023 by Syntegra Consulting Ltd. Full details of the survey are available in the report – reference Syntegra 23-11446.

2.3. Activity surveys

A single bat activity survey was undertaken on the 21st August 2024. The survey was led by Ashley Butler MSc (Applied Ecology- University of Gloucestershire). Ms. Butler is an experienced ecologist and specialises in Ancient Woodland flora, National Vegetation Classification, Phase 1 Habitat Surveys and commercial survey work in Wales and England. Ms. Butler has been involved in commercial bat surveys since 2017– Natural England (NE) class 17 bat survey license (Number 2023-11805-CL17-BAT). All surveys were carried out in appropriate weather conditions using the methodology set out in the best practice guidelines prepared by the Bat Conservation Trust and CIEEM.

The survey focused upon the features of interest on the external faces of the property, with a particular focus upon the potential bat entry/exit points, such as the apexes, ridge tiles, fascia boards and roof valleys. The surveyors positioned themselves accordingly, at an appropriate vantage point in view of these interest features, and the locations of these are indicated in Figure 6. The dusk emergence survey commenced approximately 30 minutes before sunset and lasted approximately 2 hours, the optimum time for bats to emerge from a roost, in order to record any bats that may emerge from the building.

The surveyors recorded any bat activity on or around the potential roosting entry/exit features identified during the scoping survey, using full spectrum real time handheld bat detectors (Batlogger Elekton M1 and M2) to identify species through call frequencies.

A night Vision Aid (NVA) was also set up to provide an additional surveillance point of the building. A thermal spotting scope with recording facilities (Pulsar Axion 2 XG35) was set up at the location shown in figure 6 and provided a view of north side of the house.

All bat passes were noted, and all bats identified to species level where possible. Echolocation calls were recorded by the detectors in-built sound cards and subsequently analysed using BatExplorer software which facilitates species identification. Where possible additional notes on size, flight height, type of flight (such as commuting, foraging, fast or slow) and direction of flight were also recorded.

For pipistrelle species the following criteria, based on measurements of peak frequency, were used to classify calls:

- Common Pipistrelle ≥ 42 kHz and < 49 kHz
- Soprano Pipistrelle > 51 kHz
- Nathusius' Pipistrelle < 39 kHz
- Common/Soprano pipistrelle ≥ 49 kHz and < 51 kHz
- Common/Nathusius' Pipistrelle ≥ 39 kHz and < 42 kHz

In addition, calls by bat species of the *myotis* genus were not identified to species level. Bats in this genus cannot reliably be separated on calls alone due to the overlap in call characteristics between the species. Calls from this species group have been identified as 'myotis sp.'. This is also true for grey long-eared bats and brown long-eared bats. Calls from this species group have been identified as 'long-eared bat sp.'.

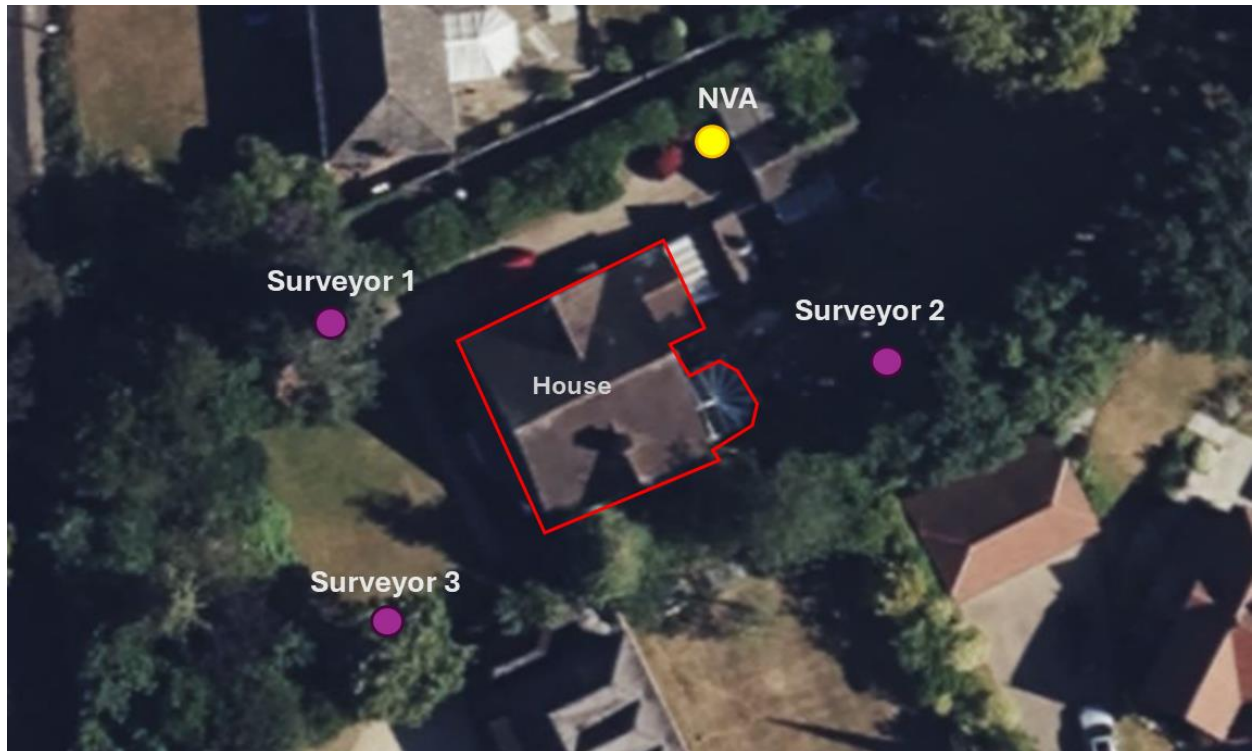


Figure 6: Site plan, showing the positions of surveyors (purple dots) on the surveys

2.4. Limitations of emergence surveys

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

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

The thermal imaging scope was focused on the most likely point for bats to emerge from the building – assessed during the preliminary survey. The viewshed of the building was limited by the angle of the scopes lens.

3. Results

3.1. Bat activity surveys

3.1.1. Survey conditions

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

Date	Survey start/end time	Temp (°C), weather conditions	Surveyors
21/8/24	Start: 1945 End: 2130 Sunset: 2013	Max temp: 20°C Min temp: 20°C Wind: 2 BFS Cloud: 100%	Amy Batten (Surveyor 1) Ashley Butler MSc (Surveyor 2) Ed Batten (Surveyor 3)

Table 1

3.2.2. Bat activity results

21st August 2024

General bat activity levels during the dusk emergence survey were low comprising observations and recordings of the following species: common pipistrelle, soprano pipistrelle, noctules and brown long-eared.

The first bat recorded during the survey, 15 minutes post sunset (2028), was a common pipistrelle foraging in the rear garden recorded by surveyor 2. The first soprano pipistrelle bat was recorded 2030 by surveyor 3. After this times there was a low level of commuting and foraging activity over the site from common and soprano pipistrelles with most bats arriving at the site from the east. There were a number of commuting passes over the site by noctules from 2040 recorded by all surveyors and there was a single pass over the rear garden by a brown long-eared at 2046 heading northeast and recorded by surveyor 2.

No emergence was recorded.

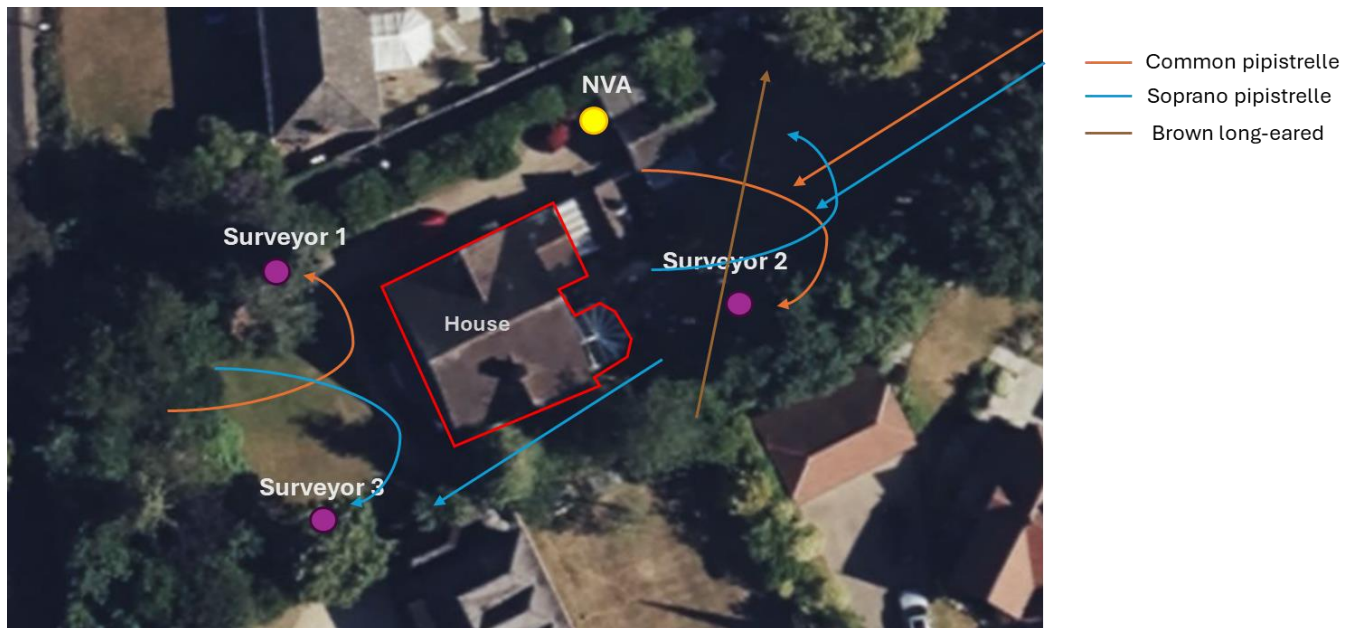


Figure 7: Survey 1 results

4. Evaluation

All species of bat present in the UK receive full protection under The Conservation of Habitats and Species Regulations 2010, and the Wildlife and Countryside Act 1981 (as amended).

The initial bat building assessment in 2023 recorded no evidence of bats and the building was assigned as having low potential to support roosting bats.

In August 2024 NewWays Ecology was commissioned to carry out an activity survey. The bat activity survey **showed no emergence** from the house and a low level of foraging activity by common pipistrelles and soprano pipistrelles was recorded around the site with a single pass by a brown long-eared.

Therefore, the house at 16 Dark Lane, Wargrave is not an active bat roost – **HIGH CONFIDENCE**.

Potential impacts on roost type taken from the Bat Mitigation Guidelines 2023:

Roost category: note this table relates to VALUATION and does not mean that all such sites are 'places of shelter' as referenced in the W&CA or Habitats Regulations. Inclusion in this table does not indicate that a licence <u>would</u> be required; this would be driven by roost status, any impacts and the likelihood of an offence.							
Conservation status/ distribution	Feeding perches; night-roosts; Individual or very small occasional/ transitional/ opportunistic roosts	Non-breeding day roosts (small numbers of species)	Mating sites (excluding individual trees and larger swarming sites); small numbers of hibernating bats	Larger transitional roosts	Hibernation sites ^c	Autumn swarming sites [largely, vesper species which hibernate underground]	Maternity sites ^c
Widespread all geographies	Site	Site	Site	Site/Local	District/County [Larger hibernation sites rare in the UK]	District/County [Very large pipistrelle swarming sites appear uncommon in the UK ¹ , but see Section 6.7.]	Unlikely to exceed District importance unless colonies are atypically large; importance increased for assemblages.
Widespread in many geographies, but not as abundant in all	Site	Site	Site, dependent on local distribution [For Myotis, see swarming site column]	District	District/County importance dependent on size ^b and number of species	County/Regional importance dependent on size ^b ; importance increased for larger sites that serve larger numbers/species	Unlikely to exceed County importance unless colonies are atypically large; importance increased for assemblages.
Rarer or restricted distribution	Site (very well-used night roosts may be of District importance for some species)	Site/Local/District, dependent on local distribution	Site/Local/District, dependent on local distribution	District	District/County importance dependent on size ^b and local distribution; increased value for assemblages.	County/Regional importance on size ^b and local distribution; increased value for assemblages.	County/Regional importance on size ^b and local distribution; increased value for assemblages.
Rarest Annex II species and very rare	Site (very well-used night roosts may be of District importance for some species)	Site/Local/District, dependent on local distribution	Site/Local/District, dependent on local distribution	District	County/Regional importance on size ^b and local distribution; increased value for assemblages	County/Regional importance on size ^b and local distribution; increased value for assemblages.	County/Regional importance on size ^b and local distribution; increased value for assemblages.

Species rarity taken from the Bat Mitigation Guidelines 2023:

Rarity category	South-west England and South Wales	Southern England	South-eastern/ East Anglia to The Wash	North/ mid-Wales ^a	Central England/ Midlands ^a	Northern England	Southern Scotland	Northern Scotland	Northern Ireland
Widespread all geographies	Ppip Ppyg Paur	Ppip Ppyg Paur	Ppip Ppyg Paur	Ppip Ppyg Paur	Ppip Ppyg Paur	Ppip Ppyg Paur	Ppip Ppyg Paur	Ppip Ppyg Paur	Ppip Ppyg Paur
Widespread in many geographies, but not as abundant in all	Mmys Mbra Mdau Mnat Nnyc	Mmys Mbra Mdau Mnat Nnyc	Mdau Mnat Nnyc	Mmys Mbra Mdau Mnat Nnyc	Mmys Mbra Mdau Mnat Nnyc	Mmys Mbra Mdau Mnat Nnyc	Mdau Mnat Paur	Mdau Mnat Paur	Mdau Mnat Nlei
Rarer or restricted distribution	Rhip Eser Nlei Pnat	Malc Eser Nlei Pnat	Mmys Mbra Eser Nlei Pnat	Rhip	Eser Nlei Pnat	Malc Nlei Pnat	Mmys Nnyc Nlei Pnat	Pnat	Mmys Pnat
Rarest Annex II species and very rare	Rfer Mbec Bbar Paus	Rfer Rhip Mbec Bbar Paus	Malc Bbar	Rfer Bbar Eser Nlei Pnat	Malc Bbar		Mbra		

5. Conclusion and recommendations

5.1 Conclusion

The site is not currently a bat roost. The proposals are for the extension of the existing dwelling. The proposed works are likely to have negligible impact on bats at both a site and local level.

A protected species mitigation licence will NOT be required from Natural England.

5.2 Recommendations

No roosts were found on site during the survey however due to the proximity of the site to known roosts, and areas of woodland, wood pasture and riparian habitat which may host roosting and foraging bats means the following mitigations and habitat enhancement must be included in plans:

- If bats are discovered at any stage of the development the ecologist must be informed immediately and works stopped until the ecologist has given advice.
- Any new external lights will need to be low level, low wattage, and on a PIR timed switch.
- Enhancement to habitat: One crevice bat box bat box will be installed on the site post development. These will be installed on with an east or west facing aspect and at a minimum height of 2.5m, one general passerine 32mm bird box to be installed on the site post development.

6. References

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

Gloucester Wildlife Trust et al. (2016) *A strategy for conservation of horseshoe bats in the Wye Valley and Forest of Dean*

Institution of Lighting Professionals (2018) *Bats and artificial lighting in the UK: Bats and the built environment series (Guidance note 08/18)* Rugby: Institution of Lighting Professionals

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

Mitchell-Jones A.J. and McLeish A.P. (2004) *The Bat Workers Manual 3rd Edition*. Joint Nature Conservation Committee

Natural England (1995) *Sylvan House Barn SSSI notification*

UK Government. *The Wildlife and Countryside Act 1981 (as amended)*

UK Government. 2017. *Conservation of Habitats and Species Regulations*

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 2010.

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 of 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.

A European Protected Species Mitigation License (EPSM) is required from Natural Resources Wales 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 of 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 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 – Examples of bespoke bat roosting features



The 2FE shelter produced by Schwegler. This is designed to be attached to the external wall of a building and provides a shelter for crevice dwelling bats.

Suitable bat box products to be installed integral to the walling of the new sections include:

- Segovia Build-in Woodstone bat box
- Schwegler 2FR Bat Tube



Bat tiles or slates to be installed to provide access into roof space – an example below



Crevice dwelling bat species often exploit gaps in or under fascias, soffits and bargeboards, to gain entry into buildings. If these features are being removed, replaced or made inaccessible to bats during the development work and bats are known to be using these features, then compensation within the new fascia, soffit or bargeboard should be implemented. This can be as simple as cutting holes in the new soffit box or bargeboard. The holes must be located next to the wall of the building as bats often require a surface (often a wall) to land on before crawling through the access. Examples of this are shown below:



Appendix 3 – Artificial lighting and wildlife

Interim Guidance: Recommendations to help minimise the impact of artificial lighting – produced by The Bat Conservation Trust.

Wherever human habitation spreads, so does artificial lighting. This increase in lighting has been shown to have an adverse effect on our native wildlife, particularly on those species that have evolved to be active during the hours of darkness. Consequently, development needs to carefully consider what lighting is necessary and reduce any unnecessary lighting, both temporally and spatially. When the impacts on different species groups are reviewed, the solutions proposed have commonalities that form the basis of good practice. These are outlined in the following document.

Overview of impacts

Invertebrates

Artificial light significantly disrupts natural patterns of light and dark, disturbing invertebrate feeding, breeding and movement, which may reduce and fragment populations. Some invertebrates, such as moths, are attracted to artificial lights at night. It is estimated that as many as a third of flying insects that are attracted to external lights will die as a result of their encounter. Insects can become disoriented and exhausted making them more susceptible to predation. In addition, the polarisation of light by shiny surfaces attracts insects, particularly egg laying females away from water. Reflected light has the potential to attract pollinators and impact on their populations, predators and pollination rates. Many invertebrates natural rhythms depend upon day-night and seasonal and lunar changes which can be adversely affected by artificial lighting levels.

It is not always easy to disentangle the effects of lighting on moths from other impacts of urbanisation. However, it is known that UV and green and blue light, which have short wavelengths and high frequencies, are seen by most insects and are highly attractive to them. Where a light source has a UV component, male moths in particular will be drawn to it. Most light-induced changes in physiology and behaviour are likely to be detrimental. They discern it to be 'light', so they do not fly to feed or mate.

Birds

There are several aspects of changes to bird behaviour to take into account. The phenomenon of robins and other birds singing by the light of a street light or other external lighting installations is well known, and research has shown that singing did not have a significant effect on the bird's body mass regulation.

However, it was felt that the continual lack of sleep was likely to be detrimental to the birds' survival and could disrupt the long-term circadian rhythm that dictates the onset of the breeding season³. Many species of bird migrate at night and there are well-documented cases of the mass mortality of nocturnal migrating birds as they strike tall lit buildings. Other UK bird species that are particularly sensitive to artificial lighting are long-eared owls, black-tailed godwit and stone curlew.

Mammals

A number of our British mammals are nocturnal and have adapted their lifestyle so that they are active in the dark in order to avoid predators. Artificial illumination of the areas in which these mammals are active and foraging is likely to be disturbing to their normal activities and their foraging areas could be lost in this way. It is thought that the most pronounced effect is likely to be on small mammals due to their need to avoid predators. However, this in itself has a knock-on effect on those predators.

The detrimental effect of artificial lighting is most clearly seen in bats. Our resident bat species have all suffered dramatic reductions in their numbers in the past century. Light falling on a bat roost exit point, regardless of species, will at least delay bats from emerging, which shortens the amount of time available to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence means this vital time for feeding is missed. At worst, the bats may feel compelled to abandon the roost. Bats are faithful to their roosts over many years and disturbance of this sort can have a significant effect on the future of the colony. It is likely to be deemed a breach of the national and European legislation that protects British bats and their roosts.

In addition to causing disturbance to bats at the roost, artificial lighting can also affect the feeding behaviour of bats and their use of commuting routes. There are two aspects to this: one is the attraction that short wave length light (UV and blue light) has to a range of insects; the other is the presence of lit conditions.

As mentioned, many night-flying species of insect are attracted to lamps that emit short wavelength component. Studies have shown that, although noctules, serotines, pipistrelle and Leisler's bats, take advantage of the concentration of insects around white street lights as a source of prey, this behaviour is not true for all bat species. The slower flying, broad-winged species, such as long-eared bats, barbastelle, greater and lesser horseshoe bats and the *Myotis* species (which include Brandt's, whiskered, Daubenton's, Natterer's and Bechstein's bats) generally avoid external lights.

Lighting can be particularly harmful if it illuminates important foraging habitats such as river corridors, woodland edges and hedgerows used by bats. Studies have shown that continuous lighting along roads creates barriers which some bat species cannot cross⁵. It is also known that insects are attracted to lit areas from further afield. This could result in adjacent habitats supporting reduced numbers of insects, causing a further impact on the ability of light-avoiding bats to feed.

These are just a few examples of the effects of artificial lighting on British wildlife, with migratory fish, amphibians, some flowering plants, a number of bird species, glow worms and a range of other invertebrates all exhibiting changes in their behaviour as a result of this unnatural lighting.

Recommendations

Survey and Planning

The potential impacts of obtrusive light on wildlife should be a routine consideration in the Environmental Impact Assessment (EIA) process. Risks should be eliminated or minimised wherever

possible. Some locations are particularly sensitive to obtrusive light and lighting schemes in these areas should be carefully planned.

In August 2013, Planning Minister Nick Boles launched the new National Online Planning Guidance Resource aimed at providing clearer protection for our natural and historic environment. The guidance looks at when lighting pollution concerns should be considered and is covered within one of the online planning practice guides 7. The guide provides an overview for planners with links to documents that aim to give planners an overview of the subject through the following discussion points:

7. When is obtrusive light / light pollution relevant to planning?
8. What factors should be considered when assessing whether a development proposal might have implications for obtrusive lighting / light pollution?
9. What factors are relevant when considering where light shines?
10. What factors are relevant when considering how much the light shines?
11. What factors are relevant when considering possible ecological impact?

This can help planners reach the right design through the setting of appropriate conditions relating to performance and mitigation measures at the planning stage.

The Institution of Lighting Professionals (ILP) recommends that Local Planning Authorities specify internationally recognised environmental zones for exterior lighting control within their Development Plans. In instances lacking classification, it may be necessary to request a Baseline Lighting Assessment/Survey conducted by a Lighting Professional in order to inform the classification of areas, particularly for large-scale schemes and major infrastructure projects.

When assessing or commissioning projects that include the installation of lighting schemes, particularly those subject to the EIA process, the following should be considered and relayed to applicants:

- ***Ecological consultants should confirm the presence of any sensitive fauna and flora***, advising the lighting designers of bat routes and roosts and other areas of importance in order to ensure that reports correspond with each other.
- ***Ecological consultants should consider the need for quantitative lighting measurements***. In some instances it may be necessary for further lighting measurements to be taken. For example, outside an important bat roost. These should follow best practice guidance from the ILP and would ideally be conducted by a Lighting Professional.
- ***Where appropriate, professional lighting designers should be consulted*** to design and model appropriate installations that achieve the task but mitigate the impacts. This should be done at the earliest opportunity. Early decisions can play a key role in mitigating the impact from lighting.

- **Reports submitted should outline the impacts of lighting in relation to ecology**, making clear reference to the ecological findings, highlighting any sensitive areas and detail proposed mitigation. Consideration should also be given to internal lighting where appropriate.
- **Post –installation checks and sign off upon commissioning should be carried out** by the lighting designer to ensure that the lighting installation has been installed in accordance with the design, that predictions were accurate and mitigation methods have been successful.

Principles and design considerations

Do not:

- **Provide excessive lighting.** Use only the minimum amount of light needed for the task.
- **directly illuminate bat roosts** or important areas for nesting birds

Avoid

- **Installing lighting in ecologically sensitive areas** such as: near ponds, lakes, rivers, areas of high conservation value; sites supporting particularly light-sensitive species of conservation significance (e.g. glow worms, rare moths, slow-flying bats) and habitat used by protected species.
- **Using reflective surfaces under lights.**

Do

- **consider employing a competent lighting designer** who will apply the principals of providing the right light, in the right place, at the right time and controlled by the right system.
- **minimise the spread of light** to at, or near horizontal and ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required.
- **consider the height of lighting columns.** It should be noted that a lower mounting height is not always better. A lower mounting height can create more light spill or require more columns.
- **consider no lighting solutions where possible** such as white lining, good signage and LED cats eyes. These options can also be effective. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times;
- **use temporary close-boarded fencing until vegetation matures**, to shield sensitive areas from lighting;
- **limit the times that lights are on to provide some dark periods.** The task being lit often varies, for example roads are less used after 23.00hrs and car parks are empty. A lighting designer can vary the lighting levels as the use of the area changes reducing lighting levels or perhaps even switching installations off after certain times. This use of adaptive lighting can tailor the installation to suit human health and safety as well as wildlife needs.

Technological specifications

Research from the Netherlands has shown that spectral composition does impact biodiversity.

- ***Use narrow spectrum light sources*** to lower the range of species affected by lighting.
- ***Use light sources that emit minimal ultra-violet light***
- ***Lights should peak higher than 550 nm***
- ***Avoid white and blue wavelengths of the light spectrum*** to reduce insect attraction and where white light sources are required in order to manage the blue short wave length content they should be of a warm / neutral colour temperature <4,200 kelvin.

Further guidance on the spectral composition of artificial lighting will be made available following the publication of research from the Netherlands.

Further reading:

- A review of the impact of artificial light on invertebrates. Buglife. 2011
- Royal Commission on Environmental Pollution. 2009. Artificial light in the environment. London, HMSO
- The Ecological Consequences of Artificial Night Lighting" edited by Longcore and Rich
- Shedding Light: A survey of local authority approaches to lighting in England. CPRE 2014