



BAT EMERGENCE SURVEY FOR:

BAILEYS FARM

POTSBRIDGE

ODIHAM

HOOK

HAMPSHIRE

RG29 1JW

For: **Mr. D Storey**
Baileys Farm

Issued by: **Wychwood Environmental Ltd**

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EXECUTIVE SUMMARY

Proposed development

- Development proposals consist of the erection of a detached double garage building with storage/recreation room following the demolition the current existing outbuilding

Likely impact on protected species

- Negligible risk of encountering crevice-dwelling species of bats (*Pipistrelle sp.*) under roof tiles and within the roof void.
- Negligible risk to void dwelling bats (such as *Plecotus auritus*)

Further surveys

- No further emergence surveys are required to inform planning.

Proposed mitigation

- A European Protected Species and Mitigation (EPSM) licence or Bat Mitigation Class Licence (BMCL) will not be required for works to progress and complete the extension of the existing dwelling.
- Roofing work is recommended for Autumn (September –November) or Spring (March-April) to avoid periods of roosting and hibernation, however other times are permitted.
- Enhancement of roosting areas in any retained/replacement buildings (e.g. via inserting an integrated or external bat box and bat access tiles).
- Inclusion of at least 2 ‘access’ bat tiles/slates (or similar) in the new structure. Additional boxes could be included in surrounding trees.
- A Tool Box Talk will be provided to roofers outlining precautionary working practices.

Further actions to be taken

- The erection of at least one crevice bat box for pipistrelles (e.g. 1FF Schwegler) on site prior to any works commencing, and then retained as an enhancement.
- Appropriate (wildlife friendly) landscaping.
- Appropriate lighting to be used in line with current guidance

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1.0 INTRODUCTION

- 1.1 Wychwood Environmental Ltd was instructed by Mr. D Storey to undertake bat emergence surveys on the detached property at Baileys Farm, Potsbridge, Odiham, Hook, Hampshire RG29 1JW, in order to provide supporting information for a planning application for the erection of a detached double garage building with storage/recreation room following the demolition the current existing outbuilding. These surveys follow a previous bat Potential Roost Assessment (PRA which was undertaken as part of a wider ecological appraisal of the site) completed in January 2022¹. The PRA survey identified moderate-high roosting suitability due a single dropping being found and a further two emergence surveys were advised.
- 1.2 The surveys were necessary to collect data relating to the possible presence of roosting bats and to provide any necessary guidance and mitigation advice to ensure that no bats or roosts are likely to be adversely affected by the development. The surveys were conducted to ensure that plans would not be constrained by the presence of roosting bats. The surveys should also refine the classification of the roost.
- 1.3 *Bats are European protected species, protected via The Conservation of Species and Habitats Regulations (2017) and also the Wildlife and Countryside Act 1981, as amended. Therefore, it is an offence to kill or injure a bat or interfere with any roosting or resting site. A bat roost is interpreted as "any structure or place used for shelter or protection" whether or not bats are present at the time.*
- 1.4 The surveys were completed to inform the Local Planning Authority (LPA) of any material impacts resulting from the proposed development and to ensure compliance with the requirements of the Natural Environment and Rural Communities (NERC) Act (2006) (Section 40) and the Government Circular: Biodiversity and Geological Conservation –Statutory obligations and their Impact within the Planning System (ODPM 06/2005, Defra 01/2005). Details of legislation and legal protection afforded to all species of British bats are given in Annex 1.

¹ Wychwood Environmental (2022) Preliminary Roost Assessment: Baileys Farm, Potsbridge, Odiham, Hook, Hampshire RG29 1JW.

- 1.5 The site is described in more detail in the previous PRA report and site is set in the surrounding rural area north-east of the village of Odiham, with some semi-detached and detached houses immediately adjacent to the site. The property is surrounded by gardens, grassland, pasture and scattered mature trees (Figures 1 & 2, Annex 2).
- 1.6 The local wider landscape, consists of pasture, arable land, open grassland and woodland to the south-west of the site, with tree lines providing habitats suitable for roosting and foraging bats. The site location is illustrated below Figures 1 & 2, Annex 2. Connectivity to habitat suitable for bats is deemed to be moderate-high (based on Bat Conservation Trust [BCT] criteria).
- 1.7 Development proposals will consist of the erection of a detached double garage building with storage/recreation room following the demolition the current existing outbuilding. The location of the site is shown in Figures 1-2 (Annex 2). Existing layouts are shown in Figures 3 to 4 (Annex 2).
- 1.8 Section two of this report describes the methodologies used for the bat surveys. Section three provides the results of these surveys; section four provides discussion and implications for development and conclusions are made in section five. Details of legislation relating to, and legal protection afforded to all species of British bats are given in Annex 1.

2.0 METHODOLOGY

Activity/Emergence Surveys

- 2.1 Two emergence surveys were conducted on the 2nd August 2022 and the 15th September 2022, by Dr. Andrew Perkin (Natural England Class license holder: 2020:47354-CLS-CLS), Daniel Bardey BSc (Hons) MRes and Rebecca Dunn BSc (Hons), following best practice guidelines as outlined by the Bat Conservation Trust (BCT 2016). Two dusk activity/emergence surveys using two surveyors were conducted at the proposed site. The surveys were conducted 15 minutes before sunset and for 1.5 hours after sunset, (Table 1).
- 2.2 Surveyors positioned themselves to allow for the best visibility of areas, identified as possible emergence points (Figure 5). Echometer Touch² bat detectors were used to assist with determining the nature of any bat activity and with bat identification. Analysis software (Analook W and Kaleidoscope) was used to verify calls identified in the field. All data was verified by Dr Craig Turner MCIEEM FRGS FLS (Natural England Bat Class license holder: 2016-21436-CLS-CLS).

Table 1 – Survey weather conditions

Date	Sunset/Sunrise	Temp °C	Weather Conditions	Wind
02/08/2022	20:49 BST	21 - 19	Dry	BF 1-2
15/09/2022	19:18 BST	19 – 13.5	Dry	BF 0 - 1

Constraints and Limitations

- 2.3 It should be noted that lack of evidence of a protected species does not necessarily preclude it from being present at a later date. In relation to use of habitats or roost sites by bat species, use of a particular area of land can vary not only on a seasonal basis but also from day to day. Whilst activity surveys are used to provide an estimate of the likely importance of a given area of habitat for bats, due to the highly mobile nature of bats, it is not possible to accurately determine the exact numbers of bats using standard non-intrusive survey methods.

² <https://www.wildlifeacoustics.com/products/echo-meter-touch-2-ios>

- 2.4 The echolocation used by some bats is very quiet and difficult to detect; species such as brown long eared bat may have been present without registering on the bat detectors used during the activity survey.
- 2.5 The recording system employed by Anabats can only respond to the signal with the highest intensity at any time. As the signal from some bat species (such as common pipistrelles) will nearly always be more intense than that of other bat species (such as myotis bats), it is possible that some bat signals were not recorded. As a result, some bat activity may have been under-recorded.
- 2.6 The identification of bats in the genus *Myotis* to species level based on recorded echolocations is not always possible³ with a high degree of confidence. This is due to the similarity and overlap in characteristics between *Myotis* bats and the calls they make, together with the ability of these bats to emit different calls in different habitats and situations. Techniques are being developed to assist with the identification of these bats from recordings, such as the use of ‘slope’ in the Anlook programme designed for use with Anabat CF detectors. Comparison of slope between *Myotis* and a library of known calls was used to assist with identification.

³ BCT guidelines identify that *Myotis* bats can only be identified with a low degree of confidence to species level, as set out in section 6.4.3 of the guidelines.

3.0 RESULTS

Activity/Emergence Surveys

- 3.1 During the survey, at least four species were detected using the site (or in close proximity to it). These were: common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*), noctule (*Nyctalus noctula*) and brown long eared (*Plecotus auritus*). Species identifications were completed in Analook W (and/or Kaleidoscope Pro) against a known library of bat calls. Neither of these species are roosting in the property with results are described below.
- 3.2 On the 2nd August 2022, during the dusk survey the first record was at 21:13 (common pipistrelle), and the last at 21:54 (noctule). Throughout the survey period, bat activity was limited, and no bats were seen emerging or returning to the building throughout the survey. Those observed /detected via echolocation are summarised below (Table 2). The bat activity consisted mainly of commuting bats, with some intermitted periods of foraging.

Table 2 - Bat activity recording during the August survey.

Time	Species	Comments	Surveyor
21.13	Common pipistrelle	H+S commuting north / south over B1.	2
21:16	Noctule	H+S Flying north / south over B1.	1 + 2
21:22	Noctule	HNS	1
21:42	Soprano pipistrelle	H+S commuting north / south over B1.	1 + 2
21:44	Common pipistrelle	H+S commuting west / east north of B1	1 + 2
21:54	Noctule	HNS	1

- 3.3 On the 15th September 2022, during the dusk survey the first record was at 19:23 (common pipistrelle), and the last at 20:39 (noctule). Throughout the survey period, bat activity was limited, and no bats were seen emerging or returning to the building throughout the survey. However, 3 common pipistrelles were seen emerging from the garage to the north of building 1. Those observed /detected via echolocation are summarised below (Table 3). The bat activity consisted mainly of commuting bats, with some intermitted periods of foraging.

Table 3 - Bat activity recording during the September survey.

Time	Species	Comments	Surveyor
19:23	Common pipistrelle	HNS	2
19:33	Noctule	H+S commuting north over B1.	2
19:35	Common pipistrelle	H+S commuting north / south; west of B1.	2
19:35	Common pipistrelle	Three bats were seen emerging from the building north of B1.	1
19:36	Common pipistrelle	H+S commuting north / south; west of B1.	2
19:50	Common pipistrelle	H+S foraging north of B1.	1
19:58	Common pipistrelle	H+S foraging north of B1.	1
20:04	Soprano pipistrelle	H+S commuting north over B1.	2
20:11	Soprano pipistrelle	H+S commuting north / south; west of B1.	2
20:17	Soprano pipistrelle	H+S commuting north / south; west of B1.	2
20:18	Common pipistrelle	H+S foraging north of B1.	1
20:20	Common pipistrelle	H+S foraging north of B1.	1
20:21	Common pipistrelle	H+S foraging north of B1.	1
20:33	Brown Long Eared	HNS	2
20:35	Soprano pipistrelle	H+S commuting north / south; west of B1.	2
20:37	Brown Long Eared	HNS	1
20:39	Noctule	HNS	2

- 3.4 In summary during the emergence survey there appears to be no active bat roosts at the property; however, 3 common pipistrelles were seen emerging from the garage north of the small barn. There is local activity of at least four species of bat which commute/forage in close proximity to the building, commuting over the small barn.
- 3.5 No further surveys are required to comply with the recommendations of the PRA report and BCT guidance.

4.0 DISCUSSION & IMPLICATIONS FOR DEVELOPMENT²

Legislation

4.1 Bats are European Protected species, protected via The Conservation of Species and Habitats Regulations (2017) and also the Wildlife and Countryside Act 1981 (as amended). These make it illegal to kill, injure, capture or disturb bats; or to obstruct access to, damage or destroy bat roosts. A bat roost is interpreted as "any structure or place used for shelter or protection" whether or not bats are present at the time.

4.2 Penalties on conviction – an unlimited per incident or per bat, up to six months in prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery. Further details on the protection afforded to bats and their roosts are given in Annex 1.

Overview

4.3 In summary, no emergence behaviour from the building was observed during the survey. Three common pipistrelles were seen emerging from the garage to the north of the observed building. Whilst no further surveys are recommended on the small barn, due to the results of the survey, the following precautionary measures should be considered (in conjunction with those detailed in the previous PRA report).

Tool Box Talk

4.4 The builders and demolition contractors should be briefed on the possible presence of bats, and the legal protection afforded to them, and briefed on working methods to ensure no harm occurs to any roosting bats when removing any tiles (e.g. looking for bat droppings/wing cases and lifting tiles to check for bats before sliding out).

Roost creation

4.5 To conform with local and national planning policy (e.g. NPPF) at least one crevice bat box (either integrated⁴ or external⁵) should be erected on a south facing elevation of a retained building(s) to provide alternative/new roosting opportunities, or situated in a suitable tree. A crevice style box is the best option for pipistrelles. This should be installed close to roof height away from windows and light sources.

⁴ <http://www.habibat.co.uk/category/bat-boxes>

⁵ <https://www.nestbox.co.uk/products/eco-bat-box>

- 4.6 Roof access tiles (at least two) should also be considered on the southern elevation of the new roof areas (<https://www.nhbs.com/bat-access-tile-set>). Alternatively, at least two bat boxes suitable for small crevice dwelling species such as pipistrelles as well as larger species such as noctule⁶ should be installed on mature trees within the development site at least 4 metres up on the trunks of mature deciduous trees, on a southerly aspect.

Materials

- 4.7 On account of bats likely to be active and roosting in the local area, additional bat roosting habitat could be incorporated into the areas within the development site. The roof of any retained buildings which has loft spaces and tiled roofs should seek to use bitumen felt (Type 1F) for the lining of the new roof and avoid Breathable Roofing Membrane (BRM). This is because of research showing that bats can get tangled in the BRM fibres, often resulting in death^{7,8}. The use of bitumen still complies with building regulations⁹.

Lighting

- 4.8 With respect to lighting, street lighting is known to disturb bats and have a negative impact on their commuting and foraging behaviour¹⁰. With specific reference to light pollution, Section 125 of the National Planning Policy Framework also states: “By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.” There is also a basis to consider that bat foraging areas and commuting routes also have some legal protection under the above legislation and planning policy, even on sites not designated for their bats¹¹.
- 4.9 The following basic set of guidelines (which includes those in Bat Conservation Trust, 2010) provides a concise checklist of points:

⁶ <https://www.wildlifeservices.co.uk/batboxes.html>

⁷ <http://www.batsandbrms.co.uk/>

⁸ Waring et al (2013) Double Jeopardy: The Potential for Problems when Bats Interact with Breathable Roofing Membranes in the United Kingdom. *Architecture & Environment*, 1(1): 1-13.

⁹ <http://www.batsandbrms.co.uk/background.php>

¹⁰ Stone et al., (2009) Street Lighting Disturbs Commuting Bats, *Current Biology*, 19, 1-5.

¹¹ Garland L. & Markham S. (2007) Is important bat foraging and commuting habitat legally protected? http://www.bats.org.uk/publications_download.php/351/Batflightpathlegalprotectionarticle_FinalVersionSep2007.pdf

- *Use professional lighting design engineers to model and predict light spill so that it can be avoided.*
- *Reduce light levels to the minimum necessary to meet legal and safety requirements.*
- *Reduce horizontal and upward/downward light spillage to the minimum achievable. The use of cowling, masks, louvers etc. and limiting the height of lighting columns may be important depending on the design of the lighting units. No bare bulbs. Lighting should only light the target area.*
- *Reduce the duration of lighting. The use of lighting ‘curfews’ can also be helpful - especially in the vicinity of bats roosts. For example, the emergence of bats, typically within the hour after sunset, may be disrupted (delayed) by raised light levels and this may result in a loss of feeding opportunities^{12 13}.*
- *Consider the type of light to be used and whether a different type or design may reduce potential impacts on bats and other wildlife. Narrow spectrum lighting with minimal UV emission should be used.*
- *Use ‘screen planting’ to limit light spill into dark areas.*

4.10 The site is known to be used by foraging and commuting bats with moderate levels of activity around the buildings during the survey. It is therefore recommended, to minimise the risk of disturbing foraging and commuting bats in the local area, that measures to limit the amount of light spillage into the wider site and surrounding gardens and tree canopies. Further details on lighting recommendations in relation to bats is provided in Annex 4.

Recommended enhancements (non- compulsory)

4.11 Mature trees and nearby woodland provide roosting and foraging opportunities for bats. Planting bat friendly species (trees, shrubs and herbaceous plants) throughout the site would help to enhance the site for bats and other wildlife. Any landscaping plan should take account of this guidance. A guide to bat friendly gardening is provided in Annex 5.

¹² Jones J. (2000) *The impacts of lighting on bats.*

http://www.lbp.org.uk/downloads/Publications/Management/lighting_and_bats.pdf

¹³ Fure A. (2006) Bats and Lighting *The London Naturalist*, No. 85, 93-104

5.0 CONCLUSION

- 5.1 The building does not support any active bat roosts. No further surveys are needed in relation to the small barn. 3 common pipistrelles were seen emerging from the garage north of the observed building, this is not set to be impacted by any works and no further recommendations are required at this time. The site and immediate surroundings are used for foraging and commuting by noctule, common/soprano pipistrelles and brown long eared bats. Mitigation measures, as briefly outlined in this report should be followed to ensure no negative impacts on local bat populations. This is advised in order to avoid committing an offence and to safeguard the viability of local bat populations. Enhancement measure to ensure the proposals will provide a net benefit to bats is provided and is recommended.

6.0 REFERENCES

Bat Conservation Trust (2012) Bat Surveys – Good Practice Guidelines. Bat Conservation Trust, London.

Bat Conservation Trust (2011) Statement on the impact and design of artificial light on bats.

Mitchell-Jones, J. (2004) Bat Mitigation Guidelines. Natural England.

Mitchell-Jones, A.J. and McLeish, A.P. (2004) Bat Workers Manual. JNCC

ANNEX 1 – Legislation, Policy & Licensing

Bats

All bat species in the UK are included in Schedule II of the Conservation of Habitats and Species Regulations 2018 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. All species of British bat are fully protected under the Wildlife and Countryside Act 1981 (as amended) through inclusion in Schedule V.

Bat species are afforded further protection by the Countryside and Rights of Way (CROW) Act 2000; and 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.

Penalties on conviction

The maximum fine is £5,000 per incident or per bat (some roosts contain several hundred bats), up to six months in prison, and forfeiture of items used to commit the offence, e.g. vehicles, plant, machinery.

Licensing

A European Protected Species Mitigation (EPSM) Licence or a Bat Mitigation Class Licence (BMCL) 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 BMCL permits activities resulting in the disturbance and/or capture of certain species of bats and/or damage or destruction of roosts of low conservation significance. 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 by the Bat Conservation Trust publication *Bat Surveys for Professional Ecologists— Good Practice Guidelines 3rd Edition* as “*the resting place of a bat*”¹⁴. Generally however, 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 can include for summer roosts, used for breeding; or winter roosts, used for hibernating.

¹⁴ Collins J (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn) (published by Bat Conservation Trust, London)

ANNEX 2 – Figures

Figure 1 – Approximate location of the site (red outline). Image taken from Google.



Figure 2 – Approximate location of the site (red outline) within the wider landscape. Image taken from Google.

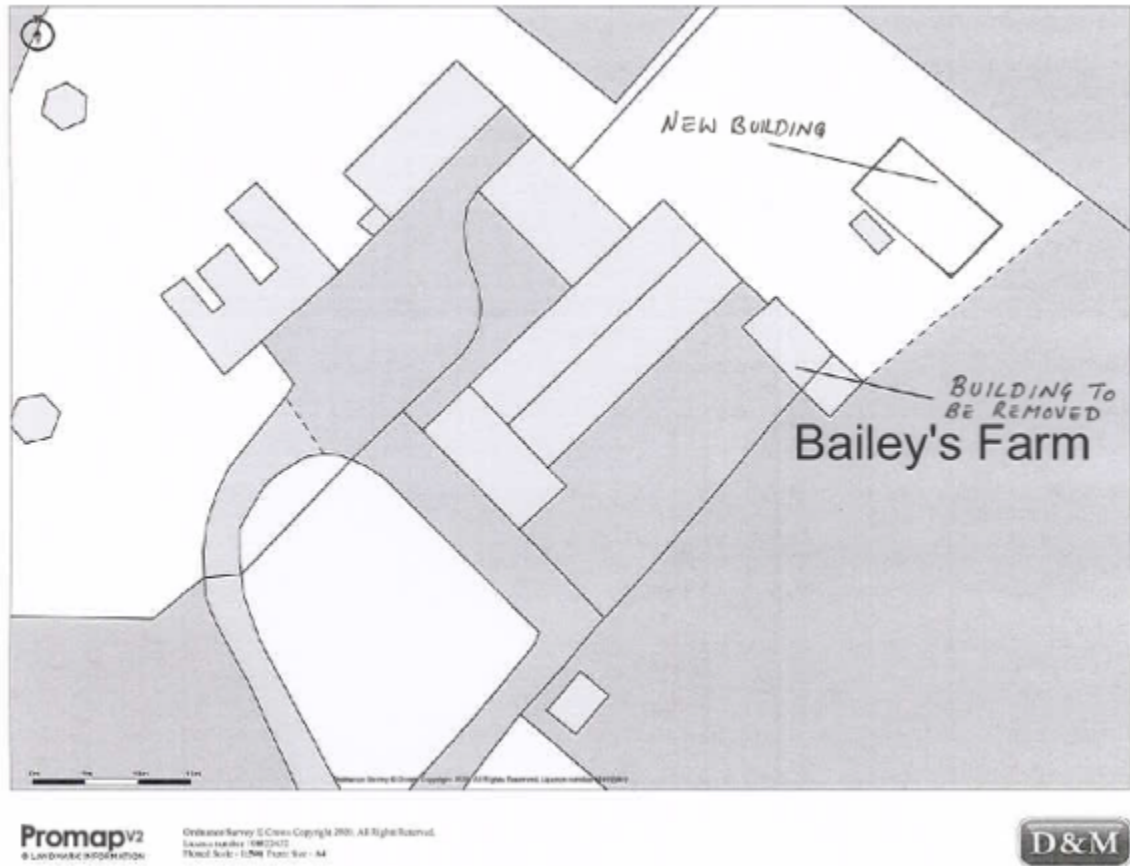


Figure 3. Existing site layout as provided by the client.

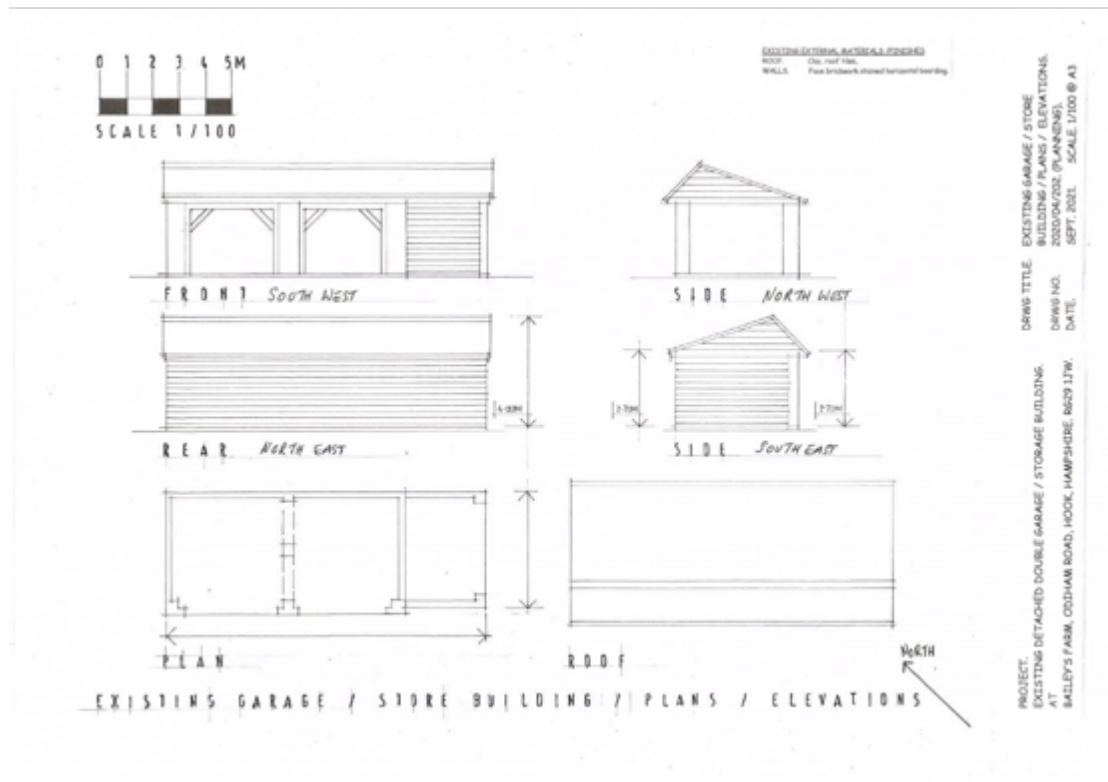


Figure 4. Building to be removed as provided by the client.



Figure 5. Surveyor locations (1 & 2). Surveyors were not static and these locations varied slightly between surveys to ensure all aspects were covered. Main flight paths shown in orange.

ANNEX 3 – Images of the site.



Photo 1: South-western elevation of building.



Photo 2: North-western elevation of building.



Photo 3: North-eastern elevation of building.



Photo 4: South-eastern elevation of building 1.



Photos 5 and 6: Gap within clay tiles on the north-eastern corner of building where a single bat dropping was found. Red circle gives location of found dropping.



Photo 7: Example of the slipped and missing tiles on the south-western elevation.



Photo 8: Gaps on the bottom of the Tuscan tiles that lead into the space between the roofing membrane.



Photo 9: Showing the inside gap below a Tuscan tile, and roofing baton that may obstruct bats from roosting deep within the space.



Photo 10: Example of wooden cladding in good condition with minor gaps on the south-western elevation.



Photo 11: Inside of the building, facing north-west.



Photo 12: Inside of the building, facing south-west.



Photo 13: Inside of the building, facing north-east.



Photo 14: Inside of the building from the north-eastern entrance.

ANNEX 4 – Lighting guidance - the impact of artificial light on bats.

The following basic set of guidelines is summarized from the latest Guidance Note (08/18)¹⁵ provides a concise checklist of points to consider with any lighting scheme:

- *Use professional lighting design engineers to model and predict light spill so that it can be avoided.*
- *Reduce light levels to the minimum necessary to meet legal and safety requirements.*
- *Reduce horizontal and upward/downward light spillage to the minimum achievable. The use of cowling, masks, louvers etc. and limiting the height of lighting columns may be important depending on the design of the lighting units. No bare bulbs. Lighting should only light the target area.*
- *Use non-reflective surfaces within the area to be lit to minimise indirect (reflected) spillage of light. The use of planting or other structures to add screening.*
- *Reduce the duration of lighting. The use of lighting ‘curfews’ can also be helpful - especially in the vicinity of bats roosts. For example, the emergence of bats, typically within the hour after sunset, may be disrupted (delayed) by raised light levels and this may result in a loss of feeding opportunities.*
- *Consider the type of light to be used and whether a different type or design may reduce potential impacts on bats and other wildlife. Narrow spectrum lighting with minimal UV emission should be used.*
- *Use ‘screen planting’ to limit light spill into dark areas.*
- *Use narrow spectrum light sources to lower the range of species affected by lighting, as research has shown that spectral composition does impact biodiversity.*
- *Use light sources that emit minimal ultra-violet light*
- *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.*

For more details, please refer to:

<https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>

http://www.bats.org.uk/pages/bats_and_lighting.html

<http://www.batsandlighting.co.uk/index.html>

¹⁵ <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>

ANNEX 5 – Gardening for bats.

GARDENING FOR BATS

All sixteen species of bats in the UK eat insects, and need a good supply of these from spring through to the autumn. By growing flowers attractive to a range of insects, our gardens can become important feeding stations for bats, birds and other wildlife.

**Many plants depend on insects**

We grow flowers in our gardens for our own enjoyment. But colour and perfume are really the plants' way of advertising themselves to insects. Sweet nectar and protein-rich pollen are bait to encourage insects to visit. In return, pollen is carried from one flower to another on their bodies so the flowers are fertilised.

Bats need insects

Flying uses a lot of energy, so bats have huge appetites. All our UK bats eat insects. Five species, including the long-eared bat, prefer moths, but most bats rely more heavily on flies as food than any other insect group. Especially important are craneflies, and a range of midge families and their relatives. Pipistrelles, the bats most likely to visit your garden, depend on catching very large numbers of tiny insects, some of which are pests.

Flower shape and insect tongues

Flowers with long narrow petal tubes, such as evening primrose and honeysuckle, are visited by moths and butterflies. Only their long tongues can reach deep down to the hidden nectar. Short-tongued insects include many families of flies and some moths. They can only reach nectar in flowers with short florets. By planting a mixture of flowering plants, vegetables, trees and shrubs, you can encourage a diversity of insects to drop in and refuel.

Follow these general rules

- ? Plant flowers varying not only in colour and fragrance, but also in shape.
- ? Daisies and daisy-like flowers are open with a mass of shallow florets.
- ? Pale flowers are more easily seen in poor light.
- ? Single flowers have more nectar than double varieties
- ? Native wild flowers or those closely related are most useful
- ? Flowers with landing platforms and short florets such as daisy or carrot family attract many insects.
- ? Many flowering vegetables such as beans and courgettes are also good for insects.

Plant trees and shrubs

These are important in providing

- food for insect larvae
- food for adult insects
- shelter for flying insects

- roosting opportunities for bats.

In a small garden, choose trees that can be coppiced – cut down to the ground every few years - to allow new shoots to spring from the base. Young shoots and leaves will support leaf-eating insects, even if they do not produce flowers. Hawthorn and elder are useful small trees.

Create a wet area

A pond, a marshy area, even a half-tub made into a mini-pond can attract insects. Many of the tiny flies favoured by bats start life in water as aquatic larvae.

Say NO to insecticides

Chemical pesticides kill natural predators and so may do more harm than good. They reduce bats' insect prey, and surviving insects carry traces of poison.

Encourage natural predators

Hoverflies, wasps, ladybirds, lacewings, ground beetles and centipedes are the gardener's friends. As natural predators they help keep the balance, eating many pests.

- ? Allow some weeds to grow to provide ground cover for natural predators
- ? Grow favourites of hoverflies and other predators close to the flowers and vegetables that tend to become infested.
- ? Leave hollow-stemmed plants to overwinter as shelter for ladybirds.
- ? Leave heaps of dead leaves and brushwood undisturbed for hedgehogs.
- ? Most garden birds are effective predators. Provide them with regular food and water.

Prevent a CATastrophe

Many bats and other small mammals fall prey to Britain's most dangerous four-legged predator, the domestic cat. Cats do not need to stay out all night. Bring your cat in an hour before sunset so bats can emerge undisturbed.

(Send for our special leaflet on cats and bats.)

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Registered Charity no 1012361 Company limited by guarantee, registered in England no 271282

August 2004

Gardening for bats

Aim at having flowers in bloom through the year, including both annuals and herbaceous perennials.

Below are some suggestions, but this is by no means an exhaustive list. See what grows well in YOUR garden, and what seems most attractive to insects. Flowering times are approximate, varying in different areas. Regular dead-heading extends flowering period in many flowers. A=annual, HA=hardy annual, HHA=half-hardy annual, P=perennial, W=wild flower.

Flowers for borders			
St John's Wort	<i>Hypericum</i>	P	March-
marigolds	<i>Calendula</i>	H/A	March – Oct.
aubretia	<i>a. deltoidea</i>	P	March-June
honesty	<i>Lunaria rediva</i>	HB	March
forget-me-not	<i>Myosotis sp.</i>	A/P	March - May
elephant ears	<i>Begonia</i>	P	April
Wallflowers	<i>Erysimum</i>	B	April - June
Cranesbills	<i>Geranium sp</i>	P	May – Sept.
Yarrow	<i>Achillea</i>	P	May -
Poppies	<i>Papaver sp.</i>	A	May - July
Dames violet	<i>Hesperis matronalis</i>	P	May - August
Red Valerian	<i>Centranthus ruber</i>	P	May – Sept.
Poached egg plant	<i>Limnanthes</i>	HA	June – Aug.
Knapweed	<i>Centaurea nigra</i>	P	June- Sept.
Phacelia		HA	June – Sept.
Ox-eye daisy	<i>Leucanthemum vulgare</i>	P	June – Aug.
Evening primrose	<i>Oenothera biennis</i>	B	June-Sept.
Candytuft	<i>iberis umbellata</i>	HA	June – Sept.
Sweet William	<i>Dianthus barbatus</i>	B	June - July
Blanket flowers	<i>Gaillardia</i>	P	June -
Verbena	<i>V.bonariensis</i>	HHA	June – Oct.
Scabious	<i>knautia arvensis</i>	P	July-Aug.
Night-scented stock	<i>matthiola bicornis</i>	HA	July-Aug
Pincushion flower	<i>Scabious sp.</i>	A/P	July – Sept.
Cherry pie	<i>heliotrope</i>	HHA	July – Oct.
Mexican aster	<i>Cosmos sp.</i>	A/P	July – Oct.
Cone flower	<i>Rudbeckia sp.</i>	A/P	August-Nov.
Mallow	<i>lavatera sp.</i>	P	August-Oct.
Michaelmas daisy	<i>Aster sp.</i>	P	August-Sept.
Ice plant 'Pink lady'	<i>Sedum spectabile</i>	P	Sept.
Herbs – both leaves and flowers are fragrant			
Fennel	<i>Foeniculum vulgare</i>		July – Sept.
Bergamot	<i>Monarda didyma</i>		June - Sept
Sweet Cicely	<i>Myrrhis odorata</i>		April - June
Hyssop	<i>Hyssopus officinalis</i>		July - Sept
Feverfew	<i>Tanacetum parthenium</i>		June – Sept.
Borage	<i>Borago officinalis</i>		May – Sept.

Rosemary	<i>Rosemary officinalis</i>	March - May
Lemon balm	<i>Melissa officinalis</i>	
Coriander	<i>Copriannum sativum</i>	June - August
Lavenders	<i>Lavendula sp.</i>	
Marjoram	<i>Origanum sp</i>	
Trees, shrubs and climbers important to insects		
Oak	<i>Quercus sp.</i>	large gardens only
Silver birch	<i>Betula pendula</i>	
Common alder	<i>Alnus glutinosa</i>	Suitable for coppicing
Hazel	<i>Corylus avellana</i>	Suitable for coppicing
Elder	<i>Sambucus nigra</i>	Small
Pussy willow	<i>Salix caprea</i>	Suitable for coppicing
Hawthorn	<i>Crataegus monogyna</i>	Suitable for coppicing
Honeysuckle	<i>Lonicera sp.</i>	grow a variety for succession.
Dog rose	<i>Rosa canina</i>	Climber
Bramble	<i>Rubus fruticosus</i>	Climber
Ivy	<i>hedera helix</i>	Climber
Buddleia	<i>Buddleia davidii</i>	shrub
Guelder rose	<i>Viburnum opulus</i>	shrub
Gorse	<i>Ulex sp.</i>	shrub
Plants for pond edges and marshy areas		
Purple loosestrife	<i>Lythrum salicaria</i>	W June – Aug.
Meadow sweet	<i>Filipendula ulmaria</i>	W June – Sept.
Lady's smock	<i>Cardamine pratensis</i>	W April - June
Water mint	<i>mentha aquatica</i>	W July – Sept.
Angelica	<i>Angelica sylvestris</i>	W July – Sept.
Hemp agrimony	<i>Eupatorium cannabinum</i>	W July – Sept.
Marsh marigold	<i>Caltha palustris</i>	W March – May
Creeping Jenny	<i>Lysimachia nummularia</i>	W May - August
Fringed water lily	<i>Nymphoides peltata</i>	W June – Sept.
Water forget-me-not	<i>Myosotis scorpioides</i>	W June – Sept.

Allow part of your lawn to grow long in summer and cut in autumn, removing the clippings. Avoid using fertilizers. Compost heaps are good producers of insects too.

Add a seat to watch your garden come to life!

Other sources include:

<https://www.buglife.org.uk/activities-for-you/wildlife-gardening>

<https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/creating-a-wildlife-friendly-garden/>

<https://www.rhs.org.uk/advice/design/design-with-plants/wildlife-friendly-garden-plants>

<https://www.wildlifetrusts.org/gardening>