JWK WildlifeSurveys
Conservation and Ecological Consultants

Barn Cottage, Ansty

Places Architects

Ground Level Tree Assessment

25/82

03 December 2025

Document History

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Contents

Executive Summary

A Ground Level Tree Assessment of the proposed development area was undertaken by JWK Wildlife Surveys Ltd in November 2025 on behalf of Places Architects at Ansty, West Sussex. This ecology report forms part of the environmental support to accompany the planning application for proposed re-development works for residential use at the site.

This report includes the results of a desk study and ground level tree assessment. The surveys were carried out to establish the ecological baseline conditions within the site and to identify any potential ecological constraints to the proposed development in relation to bats within trees subject to proposed works.

The desk-based search revealed that there were at least two bat species utilising habitats within 1km of the site. The site is not subject to any statutory designations with no statutory designated sites within 1km of the survey site with bats as a qualifying feature.

Ten trees and tree groups were assessed during the survey, five of which were proposed for felling or pruning works. Two trees were precautionarily categorised as providing low potential for roosting bats based on the presence of Ivy cladding; however, works are limited in extent and under current proposals no further assessment is required.

Recommendations for ecological enhancement have been provided to help contribute towards achieving biodiversity gains.

1. Introduction

1.1 Background

JWK Wildlife Surveys Ltd was commissioned by Places Architects to undertake a Ground Level Tree Assessment in relation to roosting bats for proposed development works at Barn Cottage, Ansty, West Sussex (hereafter referred to as “the site”).

Planning permission is being sought to develop the site for further residential use and includes the construction of a single detached dwelling with associated parking and landscaping. Existing access will be utilised. Under current proposals single tree requires removal with various pruning works to an additional two trees and two tree groups.

The area subject to survey is presented in Figure 1 (Appendix A).

1.2 Study Area Context

The survey site is located within Ansty village in the Mid-Sussex district of West Sussex. The settlements of Cuckfield and Bolney are situated 1.9km northeast and 2.9km west, respectively. The site is accessed via Cuckfield Road which bounds the eastern site boundary.

The site is within a predominantly suburban location, surrounded on all sides by private residential properties. Habitats within the survey boundary are dominated by amenity features forming existing residential gardens of the adjacent Barn Cottage property, vegetated areas are formed of amenity lawns, introduced shrub and planted beds with discrete areas of developed access tracks. The survey area has an approximate footprint of 0.06ha with a central grid reference of TQ290 232.

1.3 Scope of Survey and Aims

The primary aim of the survey is to provide an assessment of the baseline ecological conditions present in association with onsite trees, in order to identify any ecological constraints in relation to roosting bats. Specifically, the key objectives of this report are to:

- Identify the potential for and presence of bats within onsite trees scheduled for works from a ground level tree assessment and desk top search;
- Provide recommendations to mitigate any development related impacts where possible and highlight requirements for any further ecological surveys; and
- Provide recommendations for ecological enhancements.

1.4 Legislative and Regulatory Context

All bat species and their roosts and resting places are fully protected under Schedules 5 and 6 of the Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way (CRoW) Act 2000, and the Conservation of Habitats and Species Regulations 2017. Full details of the legislative, planning policy and biodiversity framework along with information regarding the biology of bats and their habitat requirements is provided in Appendix B.

2. Methodology

2.1 Desk Study

An online desk study was undertaken to obtain ecological information in regard to bats in the survey area and surrounding landscape (approximately 1 km from development boundary) in December 2025. This distance was determined using professional judgement in consideration of the likely Zone of Influence, habitat quality within the survey area and the bat species likely to occur. It is in accordance with good practice guidance (Hundt, 2012 and Collins, 2023).

The desk study included the identification of any statutory sites designated for features relating to bats as well as any granted Protected Species Mitigation Licences (PSML) for bat roosts within a 1km radius of the site. The data search was based on Multi-Agency Geographical Information for the Countryside (MAGIC, 2025); National Biodiversity Network Atlas (NBN, 2025); Ordnance Survey mapping and aerial photography.

2.2 Survey Area

The survey area for the information detailed within this report was limited to trees identified for pruning or felling works (Paul Davids Arboricultural Consultancy Ltd, 2025) to facilitate development. Professional judgement was used to determine a proportionate and pragmatic survey area appropriate to this project during the survey. This was determined through consideration of the Zone of Influence, the potential impacts of the development, geographical area, desk study results, habitat quality and likely species present in accordance with good practice guidance and was considered appropriate to meet the objectives of the survey (Refer to Section 1.3 Scope of Survey and Aims).

2.3 Field Survey Methodology

All bat surveys were undertaken in consideration of current good practice guidelines, which include the Bat Mitigation Guidelines (Mitchell-Jones, 2004); Surveying for Bats in Trees and Woodland BS 8596 (BSI, 2015), The Bat Workers Manual (Mitchell-Jones and McLeish, 2004), Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition) (Collins, 2023) and Bat Roosts in Trees (BTHK, 2018). In addition, all surveys were undertaken by an ecologist who holds a Natural England Class 2 bat survey licence (WML-CL18).

2.3.1 Ground Level Tree Assessment

Trees scheduled for works (Paul Davids Arboricultural Consultancy Ltd, 2025) were visually inspected from the ground using a high-powered torch and close-focusing binoculars. Potential roost features (PRF), such as rot holes, woodpecker holes, cracks, cavities and thick-stemmed ivy, were recorded and each tree was assigned a category as detailed in Table 1 below.

Table 1: Explanation of Suitability of Trees (adapted from Collins, 2023)

Bat Roost Potential	Description of Roosting Habitats
None	Either no PRF's present within the tree or highly unlikely to be any.
FAR (Further Assessment Required)	Further assessment required to determine if PRF's are present within the tree.
PRF (at least one Potential Roost Feature Present)	A tree with at least one PRF present.

2.3.2 Roost Characterisation

Table 2: Explanation of Potential Categorisation of Trees (adapted from Collins, 2023)

Bat Roost 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 habitat.
PRF - M	PRF is suitable for use by multiple bats and may therefore be utilised by a maternity colony.

Where a potential bat roosting feature could be fully inspected or a confirmed roost was identified, the surveyor assessed how these could be used by bats throughout the year, in accordance with Natural England (2015):

- day roost - where individual bats, or small groups of males, rest or shelter in the day, but rarely on summer nights;
- night roost - where bats rest or shelter at night, but rarely during the day;
- feeding roost - where bats rest at night between feeding sessions, but rarely during the day;
- hibernation roost - where bats are found during winter;
- transitional or occasional roost - where bats gather at a temporary site before and after hibernation;
- mating site - where males and females gather from late summer to early winter;
- maternity roost - where babies are born and raised until they're independent;
- satellite roost - where breeding females roost close to the main nursery colony in the breeding season; and
- swarming site - where bats gather in large numbers from late summer to autumn.

2.4 Limitations

It is important to note that bat roosts are transitory in nature and the results of this assessment reflect the baseline conditions at the specific time of survey.

Wind and rainfall throughout winter may degrade bat droppings on trees that may otherwise provide evidence of a roost. An absence of droppings to exterior surfaces does not therefore indicate an absence of roosting bats.

A precautionary approach was applied during the interpretation of results in consideration of this factor and appropriate recommendations were provided to ensure that any survey limitation has been minimised.

The findings of this report represent the professional opinion of qualified ecologists and do not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this document. Should there be a delay in the proposed timeline, it is considered prudent that the survey findings be reviewed and updated as required for subsequent planning applications so that the assessment of ecological impacts is undertaken against an accurate baseline.

2.4.1 Data Search

It is important to note that, even where data is held, a lack of records for a defined geographical area does not necessarily mean that there is a lack of ecological interest; the area may be simply under-recorded.

3. Results

3.1 Desk Study Results

3.1.1 Statutory Designated Sites

The site is not subject to any statutory designations with bats as a qualifying feature and no statutory sites are present within 1km of the survey structure designated for bats as a qualifying feature and will therefore not be discussed further.

3.1.2 PSML

No granted PSML were present within 1km of the survey area.

3.1.3 Bat Records

Data search results from online, open source datasets (post 2015) returned recent records for at least two species of bat within 1km of the site. A summary of the records is presented in Table 3 below.

Table 3: Bat Records (post 2015) within 1km of the Site.

Species	Record details	Protection / Conservation status
Common Pipistrelle (*Pipistrellus pipistrellus*)	The data search returned a single recent record for Common Pipistrelle, located 550m east from 2020.	Schedule 2 of the Conservation of Habitats and Species Regulations 2010, NERC Act (2006), Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). UK BAP.
Soprano Pipistrelle (*Pipistrellus pygmaeus*)	The data search returned a single recent record for Soprano Pipistrelle, located 550m east from 2020.	Schedule 2 of the Conservation of Habitats and Species Regulations 2010, NERC Act (2006), Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). UK BAP.

3.2 Field Survey Results

3.2.1 Ground Level Tree Assessment

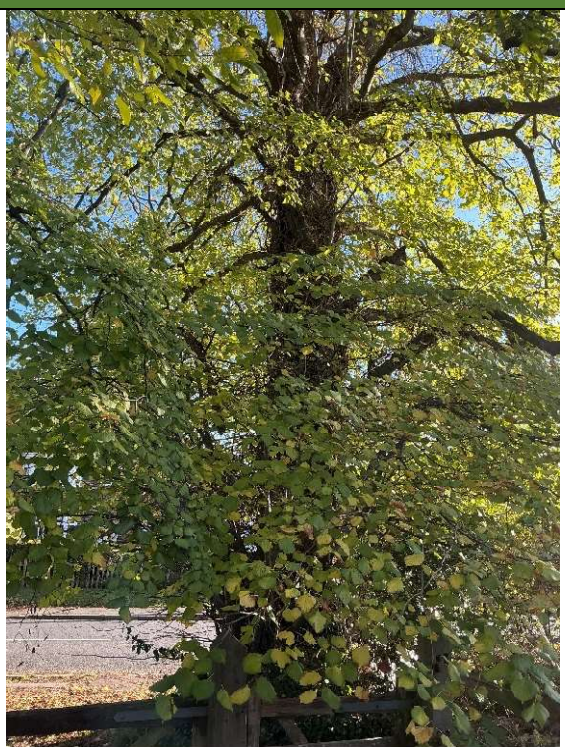
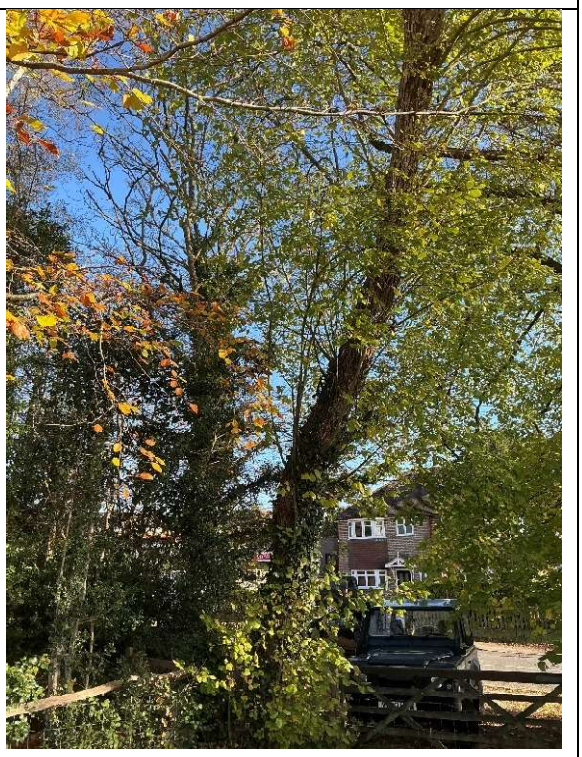
The GLTA was undertaken on the 25th November 2025, the weather conditions were dry and bright with a gentle breeze. The temperature was 9˚C.

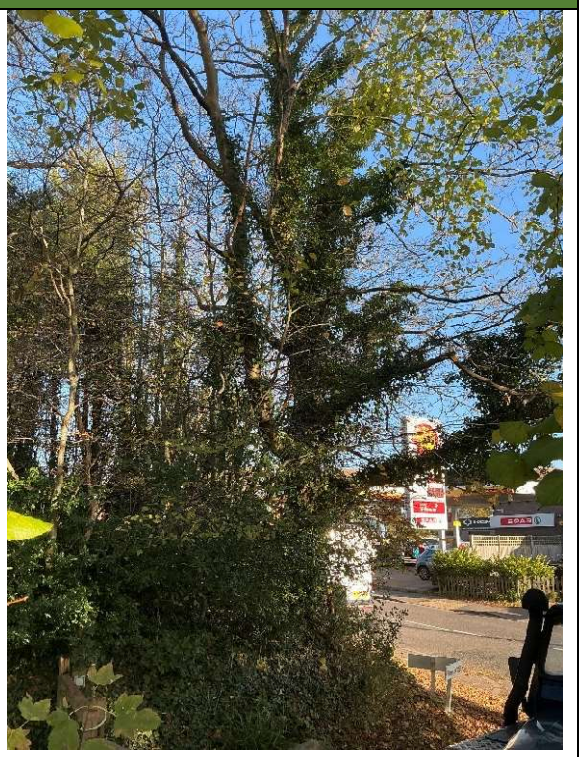
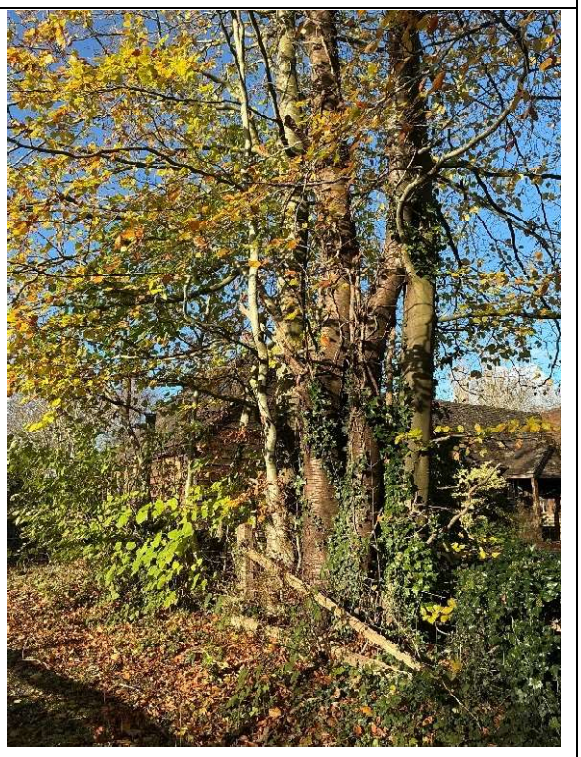
A total of eight trees were subject to ground level inspections in addition to two tree groups. Under current proposals T002 is the only tree to be removed with Trees 001 and 010 requiring pruning works. Additionally, Groups 003 and 006 also require pruning works (Paul Davids Arboricultural Consultancy Ltd, 2025).

Due to the size of the proposed development area and proximity of works to all onsite trees, all trees, including those not proposed for works, were assessed during the survey. The GLTA found not PRFs associated with any tree not proposed for removal/works and therefore Table 4 below is limited to trees and tree groups proposed for direct works.

The numbering of trees follows the same method as the Arboricultural Impact Assessment (Paul Davids Arboricultural Consultancy Ltd, 2025) and this document should be referred to for further details on specific tree works proposed.

Table 4: Results of GLTA.

Tree	BRP Category	Features	Photograph
T001	PRF-I (precautionary due to ivy cladding)	Common Lime (*Tilia – vulgaris*) Some basal and epicormic growth. Some mid-level limbs were noted to be dead with dead Ivy (*Hedera helix*) cladding on main trunk. No features were noted that were considered to provide potential roosting features for bats, however the presence of ivy cladding could obscure features beneath.	
T002	None	Goat Willow (*Salix caprea*) Ivy clad from base to approximately 4m, the upper sections becoming very sparse. Evidence of historic wounds/healed tear-outs on the southern aspect but no PRFs noted.	

Tree	BRP Category	Features	Photograph
T010	PRF-I (precautionary due to ivy cladding)	Sycamore (*Acer pseudoplatanus*) Ivy clad from base into mid-canopy, however all visible stems of Ivy small. Some deadwood noted but no PRFs identified. Evidence of historic management due to proximity to adjacent road.	
G003	None	Group of mixed broad-leaved trees Beech (*Fagus sylvatica*) and Cherry (*Prunus sp*) dominated. Some sparse Ivy cladding but limited.	

Tree	BRP Category	Features	Photograph
G006	None	Sycamore Some sparse Ivy cladding on single trunk.	

4. Discussion and Recommendations

4.1 Data Search

Recent records (post 2015) for at least two species of bat were present within 1km of the survey site.

The number and location of recent bat records returned indicate a distinct lack of records within close proximity to the survey structure covering a limited number of species. It is considered that this lack of records is due to under recording rather than the absence of bats and it is assumed that multiple bat species are present within the area and it is considered likely that bats would use the surrounding network of gardens for foraging and commuting, however the wider landscape is considered to provide more extensive and optimal features.

Recommendations

Under current proposals the level of external lighting is not considered to increase significantly above the existing baseline due to the nature of the surrounding residential properties and adjacent Cuckfield Road.

However, should proposals change and additional floodlighting be required, and due to the assumed presence of bats within the surrounding landscape, the proposals should aim to incorporate a sensitive lighting design to minimise light spill on surrounding linear features.

Bats and Lighting

Different species of bat have been found to react differently to night-time lighting however research has found that generally, all species of bats are sensitive to artificial lighting and that excessive lighting can delay bats from emerging, thus shortening the time available for foraging, as well as causing individuals to move away from suitable foraging grounds or roost sites, to alternative dark areas (Jones, 2000). Bats can also become isolated from their foraging grounds if the linear features they use for commuting are suddenly illuminated, creating a light barrier (Fure, 2006).

New development should minimise indirect impacts from lighting associated with works on foraging and commuting bats. This can be achieved by following accepted best practice (Institute of Ecology and Environmental Management 2006, Institute of Lighting Engineers 2009, Bat Conservation Trust, 2014):

- low pressure sodium lights are a preferred option to high pressure sodium or mercury lamps, and lights should be directed low with minimal light spillage;
- ideally, all areas should be kept dark, preferably at bat emergence (0-1 hour after sunset) and during peak bat activity periods (e.g. 1.5 hours after sunset and 1.5 hours before sunrise); and
- artificial lighting should not directly illuminate any potential bat commuting areas such as surrounding linear features.

4.2 Ground Level Tree Assessment

The GLTA assessed eight trees and two tree groups. Three trees and two tree groups are scheduled for direct works as part of the development proposals. No onsite tree or tree group were found to have any confirmed PRF present, however due to Ivy cladding on Trees 001 and 010 it is considered some features could be hidden and therefore a precautionary approach to works should be undertaken in regard to these trees. Works to the remaining trees and tree groups scheduled for removal/pruning can be undertaken without constraints to roosting bats.

Recommendations

T001 - no further survey required. Currently the proposals to this tree include removal of basal and epicormic growth to 5m and crown lift to 6m on the northern aspect. The main features potentially associated with this tree relate to Ivy cladding and it is considered that under current proposals no significant removal of dead Ivy cladding is required. Should this approach remain and Ivy cladding

on the main trunk it to be retained then no further works are required, however; should the removal of the cladding be required then a pre-works check using an endoscope of the working area, by a suitably qualified ecologist, should be undertaken immediately prior to works.

T010 – no further survey required. Proposals include the reduction of the crown post-works. The features associated with this tree are restricted to Ivy clad features which extend into the canopy, however; the reduction in crown of 2 – 2.5m would not impact the clad areas and therefore no further assessment is required. However, should proposals change and the denser Ivy clad sections be impacted it is recommended that a soft-felling approach is undertaken following a pre-works check using endoscope by a suitably qualified ecologist.

Should any roosting bats be found during works, works should cease and a suitable way forward discussed with the project ecologist. This may involve completing the required number of dusk emergence surveys to assess how bats are using the tree and a Protected Species Mitigation Licence application to Natural England.

4.3 Roosting Provision

Due to the loss of potential roosting features identified within the trees scheduled for removal/pruning works replacement roosting habitat will be required to ensure any bats utilising onsite habitats for roosting can continue to do so during and post construction.

It is recommended that replacement roosting habitat/direct impacts to trees with potential features should be installed to a ratio of 1:1 for trees with potential features lost/impacted.

Based on the results of the GLTA it is recommended that two bat boxes are installed to replace features lost/impacted on Trees 001 and 010 (Refer to Section 5.1 for siting and box type).

Refer to Figure 1 in Appendix A for suitable locations of replacement roosting provision.

5. Ecological Enhancements

Development provides the opportunity to enhance a site for biodiversity in accordance with local and national planning policy, therefore recommendations for general site enhancement measures are provided below.

Government planning policy (National Planning Policy Framework) now explicitly requires local authorities to seek wildlife gains through the planning process and not to just offset losses. Therefore, development projects should aim to create ecological enhancements and improve the biodiversity value of sites above and beyond mitigation/compensation requirements. A range of enhancement measures have been recommended below to contribute towards meeting these aims.

5.1 Bats

The proposed development presents an opportunity to enhance the site for bats. In addition to the roosting provision proposed to replace potential roosting features lost due to felling/pruning works an additional bat box should be installed within the site to increase the habitat value for roosting bats.

These should comprise Schwegler 2F box (brand is interchangeable but species specificity and build quality must remain), which is maintenance free. Bat Boxes should be oriented southwest to southeast and located at least 3m above ground level on trees. The bat boxes must be located outside external light spill and close to suitable vegetation. They should be sheltered from strong winds and be exposed to the sun for part of the day.

More details are provided in Appendix A and C.

5.2 Native Planting

It is recommended that native species rich planting with plants of known value to wildlife are incorporated within the landscaping scheme. Supplementary planting could also be undertaken within habitats being retained to increase the biodiversity value of the site.

5.3 Further Assessment

Due to the mobile nature of bats, if works do not commence within 12 months of the date of the last bat survey, an update assessment of the site will be required.

6. References

Bat Conservation Trust (2014). *Interim Guidance: Artificial lighting and* wildlife - *Recommendations to help minimise the impact of artificial lighting* [online]. Available from http://www.bats.org.uk/publications_download.php/1330/BCT_Interim_Guidance_Artificial_Lighting_June_2014.pdf [Accessed on 03/12/2025].

Bird Brick Houses Ltd (2013). Homes for bats and birds [on-line]. Available from: http://birdbrickhouses.co.uk/ [Accessed on 03/12/2025].

BTHK (2018). *Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-Care and Ecology Professionals.* Exeter: Pelagic Publishing.

CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

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

Fure, A. (2006) *Bats and lighting*. The London Naturalist, No. 85.

Hundt, L. (2012) *Bat Surveys Good Practice Guidelines 2nd Edition*, London: Bat Conservation Trust.

IEEM - Institute of Ecology and Environmental Management (2006). *Bats and Lighting*. Winchester: IEEM.

ILE - Institute of Lighting Engineers (2009). *Bats and Lighting in the UK.* ILE and the Bat Conservation Trust [on-line]. Available from http://www.bats.org.uk/data/files/bats_and_lighting_in_the_uk__final_version_version_3_may_09.pdf [Accessed on 03/12/2025].

Institute for Environmental Assessment (1995) *Guidance for Baseline Ecological Assessment*

Jones, J. (2000). *Impact of Lighting on Bats.* Bat Conservation Trust. [on-line]. Available from http://www.bats.org.uk/downloads/Helpline/lighting.pdf [Accessed on 03/12/2025].

Kunz, T. (1982) The Ecology of Bats. Plenum Press, New York.

MAGIC (Multi-Agency Geographic Information for the Countryside) (2025) http://www.magic.gov.uk/ [Accessed on 03/12/2025]

Mitchell-Jones, A J. (2004) Bat mitigation guidelines. English Nature: Peterborough.

Mitchell-Jones, A.J. and McLeish, A. P. Ed. (2004) Bat Workers' Manual, 3rd Edition. Joint Nature Conservancy Council: Peterborough.

Natural England (2015). *Standing advice for local planning authorities to assess impacts of development on bats: Survey and Mitigation for development projects.* [online]. Available from https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects [Accessed on 03/12/2025].

Schofield, H.W. and Mitchell-Jones, A.J. (2003) The Bats of Britain and Ireland. The Vincent Wildlife Trust, Ledbury.

Schwegler (2016). *Bird and Nature Conservation Products* [on-line]. Available from http://www.schwegler-natur.de/pdf/Katalog/CatalogueEN_HQ.pdf [Accessed on 03/12/2025]

Paul Davids Arboricultural Consultancy Ltd, 2025) *Arboricultural Impact Assessment: Barn Cottage, Ansty.*

Appendix A. Figure

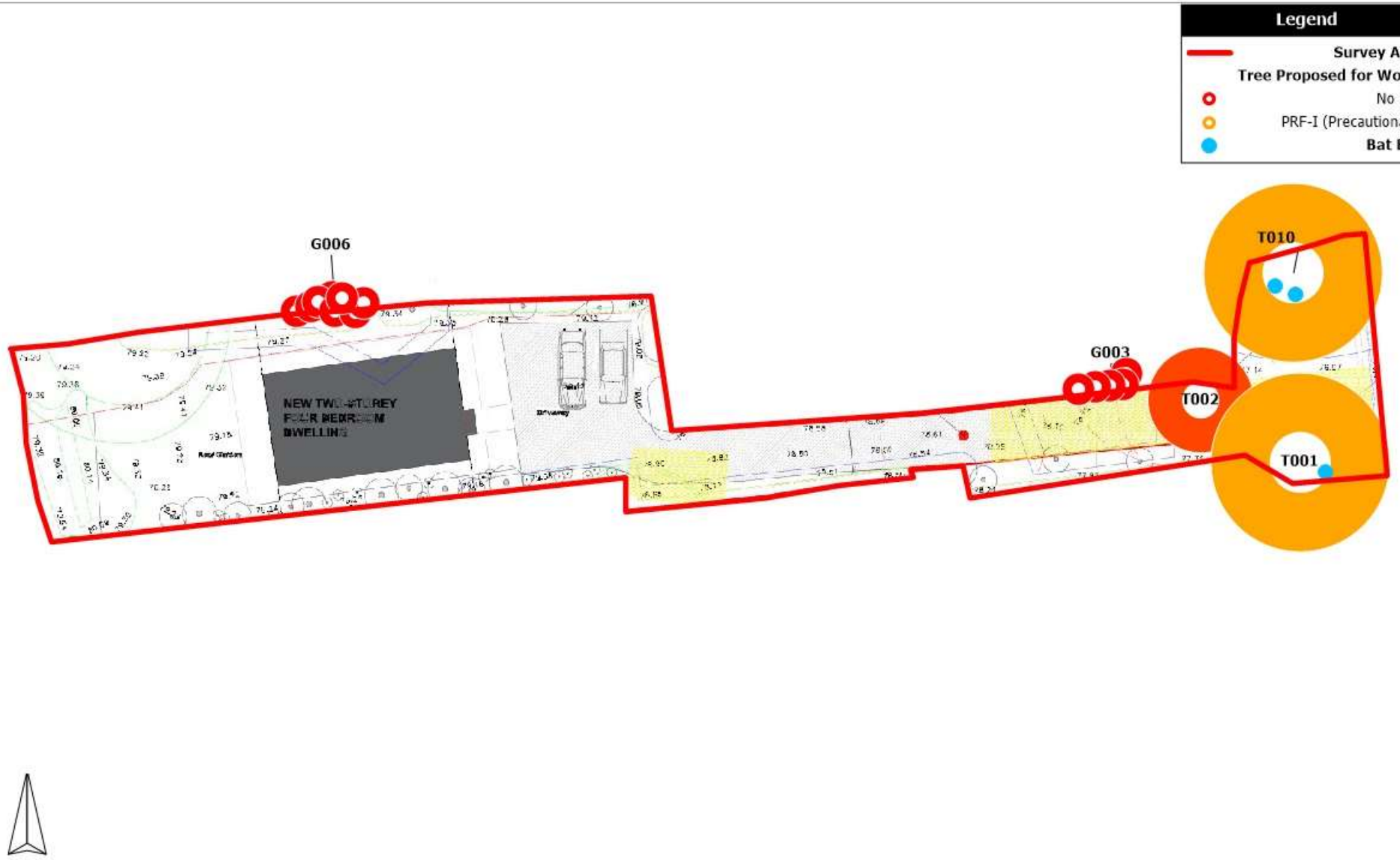


Figure 1. Barn Cottage Ground Level Tree Assessment

Drawn by: JK
Date: 03/12/2025
Not to Scale

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Appendix B. Legislation and Biology

Legislation and Policy Framework

Bats and their resting places (e.g. bat roosts) are protected under the Wildlife and Countryside Act 1981 (as amended), the Countryside and Rights of Way (CRoW) Act 2000, and the Conservation of Habitats and Species Regulations 2017.

The Conservation of Habitats and Species Regulations 2017 transpose the European Union's 'Habitats Directive' (Council Directive 92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora (EC Habitats Directive) into UK law. The Regulations provide for the designation and protection of 'European Sites', the protection of 'European Protected Species' (EPS), and the adaptation of planning and other controls for the protection of European Sites. Bats and other European Protected Species (EPS) are listed on Schedule 2 of the Conservation of Habitats and Species Regulations 2017.

Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to:

- Intentionally kill, injure or take certain animals listed ion Schedule 5 (including bats)
- Intentionally or recklessly damage or destroy any structure or place which any wild animal listed on Schedule 5 (included bats) uses for shelter or protection;
- Intentionally or recklessly disturb any such animal (including bats) while it is occupying a structure or place which it uses for shelter or protection; or
- Intentionally or recklessly obstruct access to any structure or place which any such animal (including bats) uses for shelter or protection.

In addition, under this legislation there are offences relating to sale, possession and control of wild animals listed in Schedule 5.

Under the Conservation of Habitats and Species Regulations 2017 it is an offence to:

- Deliberately capture, injure or kill any wild animal listed as a European Protected Species (including bats);
- Deliberately disturb wild animals of any such species in such a way as to be likely:
    - To impair their ability:
      i) to survive, to breed or reproduce, or to rear or nurture their young, or;
      ii) 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.
- Deliberately take or destroy the eggs of such an animal, or;
- Damage or destroy a breeding site or resting place of such an animal.

In addition, under this legislation there are offences relating to possession, control sale and exchange of an EPS.

National Planning Policy

National Planning Policy Framework 2018 (NPPF) and Section 40 of the Natural Environment and Rural Communities Act 2006 (NERC), places a duty on all public bodies including local planning authorities to consider habitats and species of Principal Importance listed in Section 41 of the NERC Act and Priority Species/Habitats within Biodiversity Action Plans when considering a planning application.

It is recognised by the NPPF that the planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes, recognising the benefits of ecosystem services, minimising impacts on biodiversity and providing net gain where possible by establishing coherent and resilient wildlife networks. Furthermore, it prevents both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, soil, air, water or noise pollution or land instability.

When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following:

- If significant harm from a development cannot be avoided, mitigated or compensated, then planning should be refused;
- Development within or outside SSSIs should not normally be permitted;
- Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted as should those that encourage opportunities to incorporate biodiversity; and
- Development that would result in deterioration of irreplaceable habitats (such as ancient woodland etc.) should be refused unless the benefits outweigh the loss.

Summary of Biology and Habitat Requirements

Bats have evolved a number of behavioural, physiological and morphological features connected with their ability to fly and their nocturnal activity patterns (Kunz, 1982). British bats are entirely insectivorous and have a complex sonar system known as echolocation that enables them to find their insect prey and navigate around their environment at night. Echolocation involves emitting a rapid series of high frequency calls and then interpreting the returning echoes to build up a picture of their surroundings.

Bats' habitat requirements vary widely both at an individual and species level. Certain features such as woodland edges and freshwater pools support the highest densities of insects and are therefore often focal points for foraging bats (Walsh and Harris, 1996 a and b). Natterer's and brown long-eared bats for example mainly forage in woodland environments whilst Daubenton's bats forage chiefly in areas associated with water. Pipistrelle (*Pipistrellus spp*.), noctule, Brandt's, whiskered, serotine (*Eptesicus serotinus*) and Leisler's bats are generalist in their feeding strategies and forage around water bodies, woodlands, hedgerows and pasture (Altringham, 2003).

Bats use natural and man-made landmarks to navigate between roosts and foraging habitat (Schofield and Mitchell-Jones, 2003). Of importance are linear habitat features such as rivers, hedgerows and woodland edges as well as minor unlit roads or roads with hedgerows or tree

lines. Distances that bats travel between roosts and foraging areas are variable both within and between species. For example, brown long-eared bats generally forage within 1 – 2 km of a roost, whereas pipistrelles generally forage within 3 – 4 km of a roost and a Leisler's may forage up to 14 km from its roost (Hundt, 2012).

Bats use different types of roosts at different times of the year and different roosts within the breeding season. Bats hibernate between late October and March in an unexposed roost with a stable temperature, typically a cave, mine, cellar or tunnel. Around March, bats emerge from hibernation sites and move to their summer roosts, typically within man-made structures or suitable crevices in trees. Some of these roosts are used regularly (i.e. every summer) and for substantial periods of time, whereas others serve as 'transitional roosts' being used for only one or two days every year or temporarily (e.g. for one season only). Births occur during the summer months (June to August). The numbers of bats using roosts can vary from a single bat to hundreds of bats in a nursery colony or hibernation site (Altringham, 2003). Mating takes place between late August and early December, either at the winter hibernating site or at autumn mating sites.

Appendix C. Bat Box Design

Example	Type	Dimension D x W x H (cm)	Target species	Location
	**2F Schwegler Bat Box (General Purpose) with or without Double Front Panel**	16 x 16 x 33	**Without panel:** Particularly successful with brown long-eared bat. Also used by noctule. **With panel:** Ideal for crevice-dwelling species: pipistrelles, *Myotis* species (particularly Daubenton's), Leisler's and serotine.	On trees or buildings and at a height of 3 to 6m. In open sunny positions and in groups of 3 to 5 facing different directions. **Please note that once bats have inhabited a roost site, they may only be disturbed by licensed bat workers.**