

Old Ullenwood Lodge, Ullenwood, Cheltenham

Bat Survey Report

Date: October 2023

For: Harshul Measuria

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Executive Summary

1. This report describes the results of a bat survey carried out by Cotswold Ecology Ltd at Old Ullenwood Lodge, Ullenwood, Cheltenham, GL53 9QX (Ordnance Survey Grid Reference SO 945 165). A site location map is given in Figure 1 and an aerial photograph of the site is shown in Figure 2.
2. A detailed daytime bat survey was carried out on 9th December 2022 in connection with proposals to extend and renovate the building. A Daytime bat survey of the garage was carried out on 12th September 2023. Two dusk surveys were carried out in September 2023. A static detector was also deployed in the garage for 16 survey nights.
3. The surveys indicate that Old Ullenwood Lodge is being used by a maternity colony of Brown Long-eared Bats (*Plecotus auritus*). The maternity roost is located between the tiles and the lining or on the wall top above Loft Void C (shown in Figure 4). The bats are using all loft voids in the building and are likely to use the building during all periods of the year, including the hibernation period. The main bat access point is a gap at the apex of the eastern gable wall. Other access points are at the eaves of the eastern gable wall and at the apex of the western gable wall.
4. The survey results also indicate that the garage is being used as a night roost for Lesser Horseshoe bats.
5. The bat-access point at the eaves of the eastern gable wall will be retained, but it is likely to be abandoned due to the construction of the extension below the access point. A Natural England European Protected Species (EPS) development licence would therefore be required prior to works commencing.
6. The location of the maternity colony will be retained in full and the access point at the apex of the eastern gable wall also retained. Measures will be taken to reduce lighting impacts on bats on the eastern and northern elevations but there is a possibility that bats would be disturbed by the introduction of lighting. As a precaution, a hotbox will be constructed in

Loft Void B to provide a warm environment for roosting in a space already familiar to the colony.

7. A new Lesser Horseshoe night roost provision will be created in the garden of the property to compensate for the loss of the garage. A proposed bin store will be constructed with wooden louvered windows on one end to allow for access for night roosting bats.
8. The western elevation of the site will be retained as a dark corridor for light sensitive bat species to continue to use the site for foraging and commuting.
9. Enhancements to the site will include the provision of two green sedums roofs over the new garage and the bin store which will result in an increase in invertebrates and biodiversity on the site. Bird boxes will also be installed on the trees on the boundaries of the site and hedgehog highways created in the new boundary fencing.

1 Introduction

1.1 Purpose of the Report

This report describes the results of bat surveys carried out by Cotswold Ecology Ltd at Old Ullenwood Lodge, Ullenwood, Cheltenham, GL53 9QX (Ordnance Survey Grid Reference SO 945 165). A site location map is given in Figure 1.

The building is currently occupied as a residential dwelling. The proposals include the construction of a single storey extension on the eastern elevation, internal modifications. The existing wooden garage will be demolished and a new garage building constructed.

A detailed daytime bat survey was carried out on the building to assess the potential for works to impact upon bat populations and determine if further surveys and/or a Natural England licence application would be required for works to proceed. Two dusk surveys were carried out in September 2023 and static detectors were deployed to survey the existing garage building.

1.2 Ecological Context

Old Ullenwood Lodge is a detached residential dwelling set within a mature garden largely laid to lawn with trees on the boundaries. There is a gravel driveway with hardstanding paths leading around the house. The A436 lies on the southern boundary of the garden, beyond which lies open countryside comprising woodland and mixed agricultural fields bounded by hedgerows. Ullenwood Manor Road, a single track road, lies on the western boundary of the site, beyond which lies Ullenwood Manor Golf Course with associated grassland and trees. The buildings associated with the National Star College, a specialist school, are located beyond the golf course to the north-east. This includes Ullenwood Manor, a large manor house constructed in 1850 likely to provide bat roosting potential.

Cotswold Hills Golf Club lies beyond the northern and eastern boundaries of the garden with associated small blocks of trees between the holes. Beyond the golf course lies mixed agricultural landscape and small blocks of woodland.

Other than the sub-optimal nature of the golf courses, the immediate habitat surrounding the building is good for bats and there is good commuting habitat within close proximity that leads to excellent foraging habitat within the wider area.

An aerial photograph of the site is shown in Figure 2.

1.3 Structure of the Report

The remainder of this report is structured as follows:

- Section 2 describes the survey and assessment methods;
- Section 3 presents the survey results;
- Section 4 provides relevant legislation;
- Section 5 gives an evaluation of the results;
- Section 6 lists the references; and
- Section 7 provides figures.

2 Methods

2.1 Background Data Search

Aerial photographs and Ordnance Survey maps were reviewed to assess the site in the context of surrounding habitats. In addition, the MAGIC (the Multi-Agency Geographic Information for the Countryside) website was searched for records of European Protected Species (EPS) bat licence applications in the area. The MAGIC website was also searched for any statutory sites designated for bats within 10 km of the site.

2.2 Habitat Assessment

Habitats on and surrounding the site were assessed for their suitability for foraging and commuting bats. Although foraging requirements differ between species, good bat foraging habitat generally includes sheltered areas and habitats with good numbers of insects, such as woodland, scrub, hedges, watercourses, ponds, lakes and more species-rich or rough grassland. For commuting, well-connected hedgerows, woodland edge, watercourses and other linear features are generally considered to be of high value.

2.3 Daytime Bat Survey

2.3.1 General

A daytime bat survey of the dwelling house was undertaken by James Pattenden on 9th December 2022. Later proposals included the demolition of the wooden garage building and this was therefore subject to a detailed inspection prior to Dusk Survey 1 on 12th September 2023. The bat survey was carried out according to standard bat surveying guidelines issued by the Bat Conservation Trust (Collins, 2016).

James Pattenden holds a Natural England survey licence for bats (Class 2 licence number 2015-106-CLS-CLS and Bat Low Impact Class Licence, CL21 - RC162, Annex B and D) and has held over 50 bat mitigation licences from Natural England and Natural Resources Wales (NRW). James is also a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has 18 years of experience in ecological surveying for developments.

2.3.2 Weather

Weather conditions on 09.12.23 were very cold with frost overnight: Cloud: 0/8 Octas; Wind:1 Beaufort; Temperature: 1°C. Weather conditions on 12.09.23 are provided in Section 2.4.4.

2.3.3 Method

As bats are crevice-dwelling mammals it is often difficult to thoroughly inspect buildings for bats and evidence of bats without a destructive search, which is not generally practical or acceptable. An example of this would be where bats roost in between the roof tiles and the lining. These areas cannot be inspected, but a surveyor would know that bats might roost here because there are places where bats could gain entry from the outside.

The buildings were therefore assessed for bat roost potential according to the following factors that influence the likelihood of bat roosting:

Surrounding habitat: whether there are potential flight-lines and bat foraging areas nearby.

Construction detail: the type and construction of architectural features such as attics, soffit boxes, lead flashing and hanging tiles that could be used by roosting bats. Some construction details and materials are more favourable to bat occupation than others.

Building condition: whether the building has no roof or has a sound roof without any potential bat-access points.

Internal conditions: bats favour sheltered locations with a stable temperature regime, protection from the elements and little wind/light/rain penetration.

Potential bat-access points: whether there is flight and crawl access.

Potential roosting locations: descriptions of all bat-accessible voids, cracks and crevices.

A description of the buildings were recorded onto specially-designed survey sheets, and digital photographs were taken as a record. The development was categorised into a standard scheme as follows:

Table 1. Classification criteria for Bat Roosting Potential (BRP) of Buildings and Built structures

Category (Potential to support roosting bats)	Description
Negligible Potential	Buildings with no features suitable for supporting roosting bats. Modern, well maintained buildings or built structures that provide few opportunities for bat access/roosting (i.e. with no cracks or crevices); composed of prefabricated steel and sheet materials; no internal loft space; high level of regular disturbance; high interior light levels and subject to large temperature fluctuations. Buildings may be surrounded by poor or sub-optimal bat foraging habitat. No evidence of bats found.
Low Potential	Buildings with limited features to support roosting bats - shallow crevices where mortar is missing between brickwork. Buildings may have large open locations subject to large temperature fluctuations. Buildings may be surrounded by poor or sub-optimal bat foraging habitat. No evidence of bats found.
Moderate Potential	Buildings with some features suitable for roosting bats – building usually of brick or stone construction with a small number of features suitable for roosting bats – loose roof or ridge tiles, gaps in brickwork, gaps under fascia boards, and/or sealed internal loft space. No evidence of bats found.
High Potential	Buildings with a large number of features or extensive areas with potential for roosting bats. Sheltered locations with a stable temperature regime and suitable access points. Features can include: weatherboarding and/or hanging tiles with gaps/large (>20cm) roof timbers with mortise joints, cracks, holes; poorly maintained fabric providing ready access into roofs, walls, but at the same time not being draughty and cool; large and complicated roof void with unobstructed flying spaces. No evidence of bats found.
Confirmed Roost	Bats or evidence of bats recorded within the building during the initial inspection surveys or during dusk/dawn surveys. A confirmed record (supplied by records centre/local bat group) would also apply.

External and internal features of the buildings were then inspected for evidence of bats.

In this case, visual, systematic examinations were made for bats and evidence of bats, both internally and externally, of the following:

- wall, window and door surfaces;
- window and door frames;
- wall bases;
- wall ledges and wall tops (where accessible);
- loft voids;
- cracks and crevices; and
- floors and stored items.

Evidence of roosting bats includes droppings, urine stains, staining from fur-oils, scratch marks, wear marks, feeding remains, dead bats, odour, squeaking and chattering, and in some cases the absence of cobwebs.

2.4 Dusk Surveys

2.4.1 General

Two dusk surveys were undertaken in September 2023. The bat survey were carried out according to standard bat surveying guidelines issued by the Bat Conservation Trust (Collins, 2016).

2.4.2 Personnel

The dusk surveys were each carried out by two surveyors, led by James Pattenden. All assistants are trained and experienced in using bat detectors and surveying buildings for bats. During the surveys, two more surveyor position covering the northern and southern elevations were covered by unmanned IR cameras and Song Meter (SM) Mini static detectors. Given the limited area that was required to be covered by the camcorder positions, the use of an unmanned IR camera for the surveys was considered appropriate in this instance. Full details of the equipment and methods used are detailed below.

Surveyor locations are provided in Figure 4.

2.4.3 Equipment

Surveyors used Elekon Batlogger M, Anabat Scout and Echo Meter Touch bat detectors to listen and view the echolocations of bats during the survey. Echolocations were recorded and if required, later analysed using BatSound and Bat Explorer software.

Surveyors were paired with Canon XA10, XA35 and XA40 camcorders and two Nightfox Whisker coupled with Nightfox XB5 torches, an iRedzilla IR torch and 12 LED 90° wide angle IR illuminators.

The footage from the darker periods of the surveys (or all of the survey period for the unmanned surveying position) were then viewed in the office at 1.5x normal speed to determine if any bats had emerged. A typical screenshot of the field of view from the darkest part of the surveys is provided in Plates 1 and 2 below, as suggested by the interim NVA Guidance Note (Bat Conservation Trust, 2022). Batteries and SD cards were sufficient to last the entire survey without a requirement to be changed.



Plate 1. Field of view of the IR camera deployed on the southern gable wall (Survey Point 1).



Plate 2. Field of view of the IR camera deployed on the northern elevation (Survey Point 2).



Plate 3. Field of view of the IR camera deployed on the western elevation (Survey Point 3).



Plate 4. Field of view of the IR camera deployed on the eastern elevation (Survey Point 4).

Surveyors used hand held radios to communicate with each other and ensure that bats passing over the ridge line of the building were only flying past and not emerging from the building.

2.4.4 Weather

Weather conditions during the survey was suitable for bat activity and is shown in Table 2 below. All timings followed best practice guidelines (Collins, 2016).

Table 2 – Survey timing and weather conditions

Date	12.09.23	29.09.23
Sunset/Sunrise	19:31	18:54
Survey start time	19:15	18:41
Survey end time	21:00	21:00
Survey start Temp (Air) °C	15	15
Wind (Beaufort Scale)	1	1
Cloud (Oktas Scale)	8	3
Weather Notes	Light drizzle showers. Heavier rain at 21:00 to end the survey.	Dry and warm following rain the previous evening

2.5 Static Detector Surveys

One SM Mini static detector was placed inside the wooden garage and another SM Mini was deployed just outside the entrance of the garage to act as a control. The detectors were left in position in the daytime of 13.09.23 and collected following the dusk survey on 29.09.23. Batteries were sufficient to last the survey period without requiring to be changed. A total of 16 complete nights of survey data was collected.

3 Results

3.1 Background Data Search

There are no statutory designated sites for bats within 10 km of the site, although there are other designated sites for habitats and other protected species in the area.

The closest European Protected Species (EPS) development licence (2020-45913-EPS-MIT) issued was for work affecting a non-breeding Common Pipistrelle roost, located near Crickley Hill (Ordnance Survey Grid Reference SO 9390 1711), approximately 895 m to the north-west of the site.

3.2 Habitat Assessment

Old Ullenwood Lodge is a detached residential dwelling set within a mature garden largely laid to lawn with trees on the boundaries. The A436 lies on the southern boundary of the garden, beyond which lies open countryside comprising woodland and mixed agricultural fields bounded by hedgerows. Ullenwood Manor Road, a single track road, lies on the western boundary of the site, beyond which lies Ullenwood Manor Golf Course with associated grassland and trees. The buildings associated with the National Star College, a specialist school, are located beyond the golf course to the north-east. This includes Ullenwood Manor, a large manor house constructed in 1850 likely to provide bat roosting potential.

Cotswold Hills Golf Club lies beyond the northern and eastern boundaries of the garden with associated small blocks of trees between the holes. Beyond the golf course lies mixed agricultural landscape and small blocks of woodland.

Other than the sub-optimal nature of the golf courses, the immediate habitat surrounding the building is good for bats and there is good commuting habitat within close proximity that leads to excellent foraging habitat within the wider area.

3.3 Daytime Bat Survey

A description of the buildings and results of the daytime inspection are provided below.

Photographs of the building and evidence of bats recorded are provided in Plates 5-16 below and shown in Figure 3.

3.3.1 Description of the Buildings

Old Ullenwood Lodge

The building is two stories and constructed of stone and is currently occupied as a residential dwelling. The roof is pitched in an L-shape and covered in slate tiles with concrete ridge tiles. There are two chimneys present with associated metal flashing. There is also flashing present in the valleys and around a dormer window on the south-eastern pitch.

Internally there are three loft voids within the roof space, separated by internal stone partition walls. Loft Void A is located on the southern end of the roof. Loft Void B is the largest loft void in the central and northern section of the building. Loft Void C is located in the north-eastern section of the roof. Loft Voids A and B are not lined and have insulation on the floor. Loft Void C is lined with felt and is boarded throughout on the floor indicating that this section of the building has been a more recent addition to the building or has been re-roofed in the past.

There appears to have been some repair work to Loft Void A, with silicone used to block up a large gap between the slates close to the chimney on the western roof pitch.

There is a cellar present in the building, accessed via an external door on the eastern elevation. Internally, the cellar is dry and dark and used for light storage.



Plate 5. View of the building from the south-west



Plate 6. View of the building from the south-east



Plate 7. View of the building from the north-east showing the cellar door.

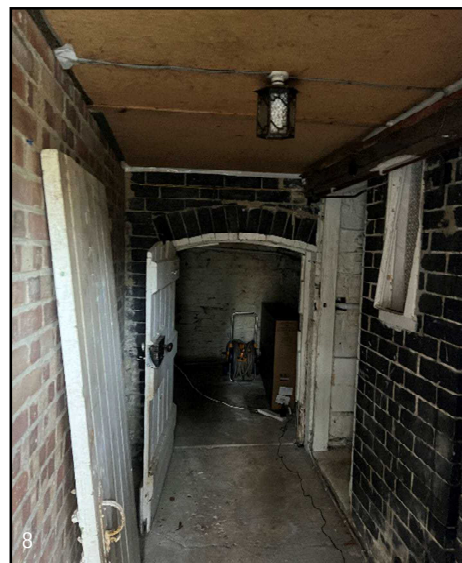


Plate 8. View of the internal areas of the cellar



Plate 9. Internal view of Loft Void B

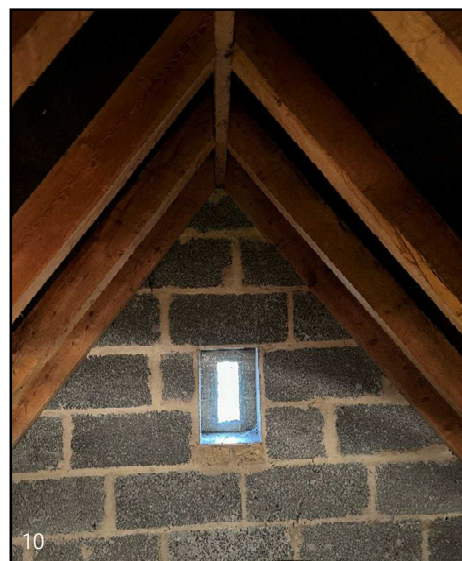


Plate 10. Internal view of Loft Void C, the gap shown is blocked with wire mesh.

Potential Bat-access Points and Roosting Locations

The three loft voids provide the greatest opportunity for roosting in the building. Although Loft Voids A and B are both unlined, there is very little wind ingress that would result in fluctuating temperatures. The loft voids are therefore relatively cold, but stable in temperature. Loft Void C is lined and is therefore warmer and more stable in temperature. There are small gaps between the loft voids, above the partition wall tops and so bats are potentially able to move between loft voids internally.

There are small gaps between the weatherboarding and the wall on the southern gable wall (Bat Note 3) with suspected bat droppings present on the security alarm cover below the apex (shown in Plate 9). This potential bat-access point would lead into Loft Void A.

There are gaps at the wall tops on the north-western gable wall and the northern gable wall (shown as Bat Notes 7 and 9 on Figure 3). The gaps may lead onto the wall top and into Loft Void B. There are also gaps under the ridge tiles that may lead to Loft Void B at Bat Note 8.

There are small gaps between the weatherboarding and the wall at Bat Note 10. However, these were full of old cobwebs at the time of survey and do not appear to be used. Otherwise the roof and ridge tiles and other external areas of the building appear well sealed for potential bat-access. There do not appear to be any potential bat-access points on the eastern elevation, where the extension is to be constructed.

The external door to the cellar was tightly shut at the time of survey and the internal areas were not accessible to bats.

Evidence of Bats

Evidence of bats is shown as Bat Notes on Figure 3 with the details below:

Bat Note 1. Approximately 150 bat droppings on the loft hatch, with another 50-80 around the loft hatch entrance on the floor of the loft.

Bat Note 2. Approximately 80 bat droppings concentrated on the floor adjacent to the gable wall under the apex. There are also scattered bat droppings throughout the loft void.

Bat Note 3. A small number of droppings on the security alarm on the external gable wall close to suspected bat-access points.

Bat Note 4. A concentration of approximately 80 bat droppings on the floor with a single Brown Long-eared Bat (*Plecotus auritus*) present hanging on the timbers. There are smaller piles of bat droppings and scattered droppings throughout Loft Void B.

Bat Note 5. A concentration of approximately 50 bat droppings on the floor adjacent to the loft hatch under the apex.

Bat Note 6. A concentration of approximately 50 bat droppings on the floor adjacent to the gable wall under the apex. There were small numbers of scattered bat droppings throughout the loft.

Bat Note 7. Gaps at the wall top.

Bat Note 8. Gaps under the ridge tiles in Loft Void B on the north and south aspects.

Bat Note 9. Gaps at the wall top.

Bat Note 10. Gaps between the weatherboarding and wall.

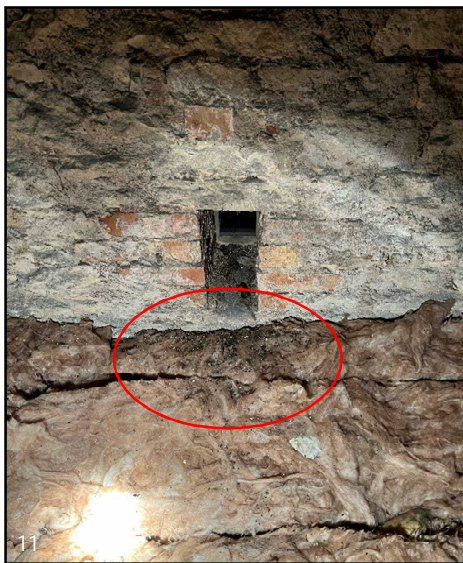


Plate 11. Typical view of a concentration of bat droppings in the loft voids. This was observed in Bat Loft B.

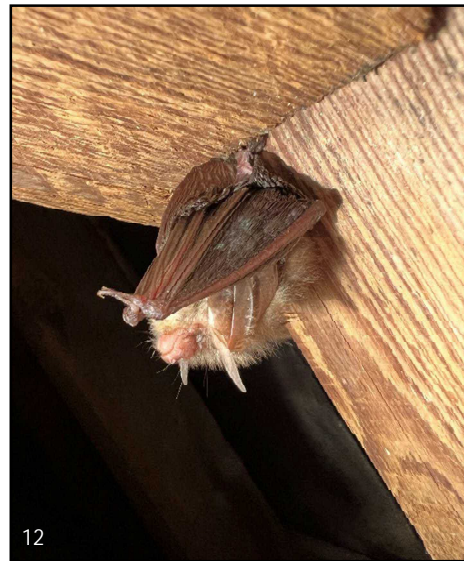


Plate 12. Brown Long-eared Bat hibernating on timbers in Loft Void B (located at Bat Note 4 on Figure 3).

No evidence of bats was recorded in the cellar.

Given the presence of a hibernating Brown Long-eared Bat and bat droppings in locations and concentrations that would indicate roosting bats, the building has been classified as a Confirmed

Roost according to the Classification criteria for Bat Roosting Potential (BRP) of Buildings and Built structures.



Plate 13. Possible bat droppings on the security alarm below possible gaps at the wall top on the southern gable wall.

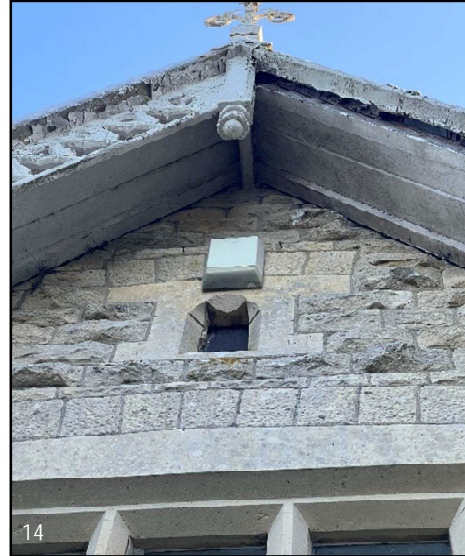


Plate 14. Gaps at the wall top on the northern gable wall (Bat Note 9).

Garage

The garage is constructed of wooden tongue and groove boarding with a wooden pitched roof covered in felt. There are double wooden doors on the northern gable wall, one of which is left permanently open. The garage appears more of a garden shed but may be possible to fit a car in. The garage is in a poor state of repair with several large holes on the rear southern wall and on the eastern wall, close to the base of the wall. The garage is currently being used for light storage and as a wood store.

Given the open nature of the building that allows wind ingress, the garage is unlikely to be used for day roosting. The internal areas are still relatively dark and as such, it is possible that the building could be used for day roosting, on occasion. The garage is more suitable for night roosting or as a feeding perch.

A concentration of approximately 60 bat droppings were observed on the floor on stored items. The droppings would indicate a roosting location on the wooden ceiling of the garage. The bat droppings

were small, ovoid and some were linked in chains, indicative of Lesser Horseshoe Bat (*Rhinolophus hipposideros*).



Plate 15. View of the garage from the north-east.

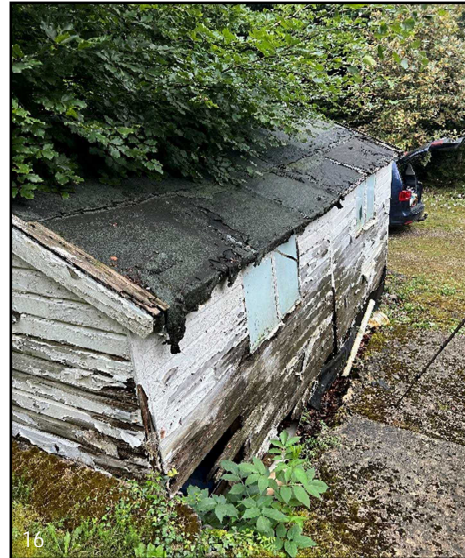


Plate 14. View of the garage from the south-east.

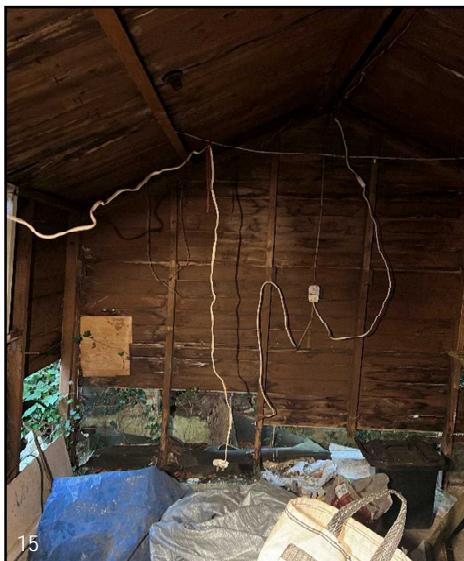


Plate 15. Internal view of the garage.



Plate 16. Lesser Horseshoe droppings on stored items indicating roosting close to the rear of the garage.

Given the presence of a bat droppings in locations and concentrations that would indicate roosting bats, the garage has been classified as a Confirmed Roost according to the Classification criteria for Bat Roosting Potential (BRP) of Buildings and Built structures.

3.4 Dusk Surveys

3.4.1 General

A summary of the bat activity from each of the surveys is provided below. Detailed observations from each surveyor for each survey have not been included in this report, but can be made available upon request.

3.4.2 Dusk Survey 1

Two Brown Long-eared Bats were recorded emerging from the apex of the gable wall on the eastern elevation at 20:03 and 20:08. A Brown Long-eared Bat was also recorded emerging from the building from the apex of the gable wall on the western elevation.

No bats were recorded emerging from the north or south elevations.

A Lesser Horseshoe was recorded commuting though the site early in the survey indicating a roost close to the site. A second pass was recorded later in the survey, approximately 45 minutes after sunset. Both passes were recorded at Survey Point 3.

Other bats recorded included Common Pipistrelle (*Pipistrellus pipistrellus*), Noctule (*Nyctalus noctula*) and Serotine (*Eptesicus serotinus*).

3.4.3 Dusk Survey 2

A summary of the emerging bat data is provided below:

A single Brown Long-eared Bat was recorded emerging early in the survey period from the eaves on the eastern gable wall.

Ten Brown Long-eared Bats were recorded emerging from the apex of the gable wall on the eastern elevation throughout the first half of the survey period.

Two Brown Long-eared Bats were recorded emerging from the building from the apex of the gable wall on the western elevation.

Some of the bats recorded emerging from the gable wall on the eastern elevation were not echolocating, but other bats from the same location were recorded and confirmed as Brown Long-eared Bat. All bats were recorded emerging and flying immediately north at height other than on two occasions:

The bat recorded emerging from the eaves on the eastern gable wall flew east and low towards Survey Point 3.

One bat recorded emerging from the gable wall on the eastern elevation was observed flying immediately south at height around 4m.

No bats were recorded emerging from the north or south elevations.

Four passes of Lesser Horseshoe were recorded at Survey Point 3. One pass was recorded at Survey Point 4.

Again, other bats recorded included Common Pipistrelle, Noctule and Serotine (*Eptesicus serotinus*).



Plate 17. Flight path of the low numbers of Brown Long-eared Bats emerging from the apex of the western gable wall.



Plate 18. Flight path of Brown Long-eared Bats on the eastern elevation. Red arrow indicates the 9 bats emerging from the apex of the eastern gable wall and flying north on 29.09.23 (also two bats on 12.09.23). Orange arrow indicates a single bat emerging and flying south on 29.09.23. Yellow arrow indicates a single bat emerging on 29.09.23.

3.5 Static Detector Survey

3.5.1 Summary

The survey results from the static detector surveys are summarised in Table 3. The most common bat species recorded inside the garage was Lesser Horseshoe indicating bats flying or roosting inside the garage. Calls from other bat species are likely to be from bats foraging outside the barn with bats calling loudly and being picked up by the detector located inside the building. The calls of Horseshoe bats are quiet and directional and as such, are more likely to be from bats inside the barn.

Table 3. Results of the bat activity surveys between 13.09.23 and 29.09.22 (16 complete survey nights).

Species	Inside Garage	Outside Garage
Common Pipistrelle	173	2130
Soprano Pipistrelle	78	1
Brown Long-eared Bat	36	754
Serotine	134	189
Noctule	291	550
Leisler's Bat	3	37
Myotis sp.	12	139
Lesser Horseshoe	1647	7
Barbastelle	0	5

3.5.2 Lesser Horseshoe

Lesser Horseshoe were recorded a very low number of occasions by the detector on the outside of the building, indicating that bats were passing very low when entering and exiting the building and not being picked up by the detector. There were multiple survey nights when Lesser Horseshoes were obviously inside the garage with multiple call sequences recorded in close succession for several minutes at a time. The calls were recorded on 10 of the 16 survey nights indicating that the building is regularly used.

No calls were recorded in the daytime. The median emergence time for Lesser Horseshoe is 31 minutes after sunset (Jones & Rydell, 1994) and this species generally returns to day roost close to sunrise (Ransome, 1991). The earliest calls recorded inside the garage over the 16 survey nights were recorded at 20:00 on the 28.09.23, 64 minutes after sunset indicating that bats are not using the building for day roosting. Several of the periods when calls were recorded were in the middle of the evening, indicating the presence of a night roost.

The lack of a concentration of moth wings associated with the pile of droppings would indicate that the barn is not being used as a feeding roost.

3.6 Survey Constraints

3.6.1 General

There are areas where bats may roost (e.g. between the tiles and the lining in Loft Void C) that were not able to be inspected during the survey. Loft Voids A and B were not lined and so all potential roosting spaces were able to be inspected for evidence of roosting. However, there are external gaps leading to the wall tops adjacent to Loft Void B which were also not able to be inspected (Bat Notes 7 and 9). Dusk surveys were carried out on the building in order to determine presence and/or likely absence of roosting bats in these areas.

Dusk Survey 1 on 12.09.23 was carried out in sub-optimal conditions as there were intermittent drizzle showers. However, the rain was light enough to continue to use the Night Vision Aid equipment and bats were recorded both emerging and foraging and commuting through the site. As a result, the survey results have been included. A further survey on 29.09.23 was carried out to ensure there were no further unrecorded roosts or bat-access points that were missed as a result of the sub-optimal conditions during Dusk Survey 1.

This data can be considered to be accurate for a maximum of 12-18 months, as per guidance issued by CIEEM (CIEEM, 2019). Bats frequently move around and adopt new roosting sites and therefore if more than one year elapses prior to commencement of the works it may be advisable to conduct a further inspection to insure up-to-date information.

3.6.2 Static Detectors

Bat detectors are known to be more sensitive to certain bat calls than to others for reasons such as varying bat call loudness and directionality of certain calls. For example, a call from a Lesser Horseshoe Bat is directional and a bat detector will only be able to record the call if the bat echolocates directly at the detector whereas a Common Pipistrelle call is less directional and can be recorded even when the call is aimed away from the microphone. This can result in certain bat species (such as Lesser Horseshoe Bat and Brown Long-eared Bat) being under-recorded due to the limitations of current bat detectors. Some detectors (e.g. SM Mini) may be better at picking up quiet calls than other detectors (e.g. EMT). The difference in recording efficiency may therefore bias any results and this has been taken into account where possible during any assessment of the results.

BTO Pipeline Analysis

The calls recorded by the static detector have been analysed using the BTO Pipeline automated analysis software. This software has been specifically designed to automatically classify the known bat calls of Britain and Ireland.

The programme automatically identifies bat calls using algorithms and provides statistical levels of confidence associated with each classified call. The confidence levels reflect the fact that there will be certain classification errors related to every classified bat call. With experience of using the software it is, on the whole, reliable when identifying certain bat calls (Common Pipistrelle, Soprano Pipistrelle, Noctule, Serotine, Leisler's Bat, Lesser Horseshoe Bat and Greater Horseshoe Bat) but less reliable when identifying other species (Brown Long-eared Bat, Myotis and Barbastelle species).

The software also cannot always distinguish between the various Myotis species and as such, we have simply classified them to genus level (i.e. Myotis sp.). This is in line with classification that would be achieved by manual identification due to the similar nature of Myotis calls making species classification subject to a high degree of error.

From experience of using the software, it appears that various species of bat are either under or over recorded and classifications can be inaccurate. Given the number of call sequences recorded, analysing all calls manually would be beyond the requirements of the survey, especially given that no evidence of other species other than Lesser Horseshoe are suspected of using the garage building for roosting. Given the automated software appears accurate at identifying Lesser Horseshoe bats, only a small sample of calls were manually verified (and were found to be accurate).

In conclusion, the classification data produced from BTO Pipeline is considered to provide an accurate representation of the target bat species recorded by the static bat detector and as such has been used within this report.

4 Legislation

All species of British bat are protected by The Wildlife and Countryside Act 1981 (as amended) extended by the Countryside and Rights of Way Act 2000. This legislation makes it an offence to:

- intentionally kill, injure or take a bat;
- possess or control a bat;
- intentionally or recklessly damage, destroy or obstruct access to a bat roost; and
- intentionally or recklessly disturb a bat whilst it occupies a bat roost.

Bats are also European Protected Species listed on The Conservation (Natural Habitats, & c.) Regulations 2017 (as amended). This legislation makes it an offence to:

- deliberately capture, injure or kill a bat;
- deliberately disturb a bat (in such a way as to be likely to significantly affect, (i) the ability of a significant group of bats to survive, breed or rear/nuture their young; and (ii) the local distribution or abundance of the species concerned);
- damage or destroy a breeding site or resting place of a bat; and
- possess, control, transport, sell, exchange a bat, or offer a bat for sale or exchange.

The above legislation was amended by the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations 2019 which continue the same provision for European Protected Species, licencing requirements and protected areas after Brexit.

All bat roosting sites receive legal protection even when bats are not present.

5 Evaluation and Conclusions

5.1 Confirmation of Results

The evidence recorded during the surveys indicates that both Old Ullenwood Lodge and the associated garage are being used by roosting bats.

Old Ullenwood Lodge

The survey results from the dusk survey on 29.09.23 recorded 10 Brown Long-eared Bats from a single location in Old Ullenwood Lodge, likely to be roosting on the wall top or between the tiles and the lining above Loft Void C. A bat was also recorded emerging from the eaves at this location. A further two bats were recorded emerging from the other side of the building with a gap leading into Loft Void B where evidence and a live bat was recorded during the daytime survey.

A dusk survey in the breeding period (mid-May to August) is usually required to confirm the presence or absence of a breeding roost. However, 11 bats were recorded during a survey at the end of September. Brown Long-eared Bat maternity colonies are smaller than many other UK bat species, typically comprising 10-20 individuals (Entwistle, 1994). Given the presence of 11 bats recorded from above Loft Void C during a survey in September, it is very likely that a breeding roost is present and it is reasonable to assume this is the case in order to design appropriate mitigation. Bats of this species using transitional roosts between summer and winter roosts tend to live independently of one another. The results at the end of September suggest the end of a breeding period prior to dispersal in Autumn. Bats using the other loft voids may form part of the breeding colony or are males or non-breeding female.

Garage

The evidence suggest this building is being used regularly as a night roost for individual or low numbers of Lesser Horseshoe.

5.2 Roost Status

Roost importance is provided as per guidance issued in the UK Bat mitigation Guidelines (Reason and Wray, 2023).

Brown Long-eared Bats are classified as 'Widespread' in south-west England. The breeding roost is therefore unlikely to exceed district importance unless colonies are atypically large.

Lesser Horseshoe have a 'rarer or restricted distribution' in south-west England and night roosts used by individuals of this species are of site importance.

5.3 Potential Impacts

Old Ullenwood Lodge

The proposals include the construction of a single storey extension on the eastern elevation. This will include the rendering of the remaining sections of the eastern elevation, including the gable wall where the bat are using for access to the breeding roost.

The southern and western elevations will be unaffected.

The roof of Old Ullenwood Lodge will be unaffected other than the repair of some slipped or missing tiles where necessary to keep the building waterproof. The two existing bat roost access points at the apex of the eastern and western gable walls will be retained in full.

The breeding roost location at the apex of the gable wall on the eastern elevation will not be directly affected by the proposals. There may be some disturbance as a result of the rendering work to the eastern gable wall, but the roost-access point and the roosting space will be retained in full.

The single storey extension will include glazing to maximise the view from the new kitchen diner into the garden. The glazing will be on the eastern elevation and continue on the north-eastern corner of the building. Brown Long-eared Bat are known to avoid lighting (Rydell, 1992) and the introduction of glazing below the roost may deter bats from using the existing access point. It may delay emergence from the roost, resulting in bats missing the period in which peak invertebrate prey is available (at or soon after dusk). This may result in reduced survivorship, fitness or delayed juvenile growth rates (Boldogh, Dobrosi & Samu, 2007). In the worst-case scenario, this may lead to roost abandonment. However, the bats were largely recorded emerging from the roost and immediately flying north, rather than west where the largest levels of potential increased lighting would be located. As a result, even without mitigation, it is possible that the bats would continue to use this access point following the introduction of glazing.

The bat-access point under the eaves on the side of the gable wall on the eastern elevation is likely to be abandoned. The new extension will be located below this bat-access point and although the

access point will remain, there will be a limited 'drop zone' from the eaves and bats may be dissuaded from using this access point in the future.

The bat-access point at the apex of the gable wall on the western elevation that leads into Loft Void B will be unaffected. The repair of slipped or missing tiles around the roof will make Loft Voids A and B less subject to wind ingress and will improve conditions for roosting in the loft voids.

Garage

The garage is to be demolished and a replacement garage constructed. The existing Lesser Horseshoe roost in the garage will therefore be lost as a result of the proposals.

5.4 Natural England EPS Development Licence

All bat roosts are protected, even if bats are not present. The proposals are may result in the disturbance of bats and create permanent changes to roost access locations. The Lesser Horseshoe roost in the garage will also be destroyed. Further surveys and a Natural England European Protected Species (EPS) development licence will be required prior to works commencing.

The building is being used by hibernating bats and may impact a breeding roost and as such, would not be eligible to be registered under the Bat Low Impact Class Licence (BLICL) scheme. A full EPS development licence would therefore be required.

Natural England allow 30 working days to process full licence applications and require full planning permission with all relevant conditions discharged (that are capable of being discharged) prior to accepting the application.

5.5 Mitigation Strategy

As discussed in Section 5.2, even without mitigation, it is possible that the bats would continue to use the existing access point at the apex of the eastern gable wall following the introduction of glazing. Nevertheless, a precautionary approach will be taken in case the introduction of lighting, even with proposed mitigation, has a negative impact on the roosting location to such an extent that bats abandon the roost.

The UK Bat Mitigation Guidelines (Reason and Wray, 2023) state that for the Brown Long-eared Bat breeding roost (district importance) appropriate mitigation would be:

Like-for like replacement (as close as possible or better); do not leave bats without a roost.

The Lesser Horseshoe night roost is listed as being 'flexible (in terms of timing and type)'.

5.5.1 Timings

Old Ullenwood Lodge has been confirmed as being used by both hibernating and breeding bats. These sensitive periods are usually avoided when carrying out works in order to avoid disturbance. However this would only leave the months of March-April and mid-September-October in order to carry out all works which is not practical or necessary given the works will largely be carried out on the basement or ground floor. The extension will be constructed on the eastern elevation which will therefore be subject to the most disturbance. The breeding roost is located on this elevation and although the works are largely limited to the basement and ground floor, we would suggest that any major works resulting in large amounts of noise and vibration (e.g. breaking through walls) to be carried out outside of the breeding period (mid-May to mid-September inclusive).

Erection of scaffolding, rendering of the eastern elevation and fixing of tiles should be carried out at any time outside of the breeding period (May to mid-September inclusive).

The demolition of the garage could be carried out at any time of year as it is not suitable for hibernation or breeding.

5.5.2 Toolbox Talk

Immediately prior to the commencement of works, a site briefing will be given by a bat licensed ecologist to ensure that all contractors are fully aware of the conditions of the EPS Licence. This 'toolbox' talk will be held with the construction team before any works to the roof, external areas or loft voids are undertaken and will discuss the adoption of appropriate methodologies to exclude the building to ensure no harm to bats occurs.

5.5.3 Inspection and Ecological Watching Brief

An inspection of the building will be carried out by a licenced and experienced bat ecologist prior to works to render the eastern gable wall. Works to render the top of the wall will then be carried out under ecological watching brief to ensure the roost-access points are not blocked. Any disturbance caused by the rendering works will be temporary and as such, exclusion of the roost will not be required.

The works to construct the extension will be in close proximity to the bat-access point at the eaves on the eastern gable wall. However, it is considered that temporarily or permanently blocking the roost access point would be more disturbing in this instance given the main roost access point at the apex will be retained. It is therefore proposed to leave the bat roost access point on the eaves undisturbed. Works to render the wall adjacent to the eaves will then be carried out under ecological watching brief to ensure the roost-access point is not blocked.

The garage is not being used for day roosting and as such, would not require a pre-works inspection or watching brief in order to demolish the building.

5.5.4 Brown Long-eared Bat Roost Enhancement

The proposals include the introduction of lighting at ground floor level on the eastern elevation and as discussed in Section 5.3, there is some potential for the lighting to affect the use of the roost entrance at the apex of the eastern gable wall. Measures have been included to limit the amount of lighting where possible within the constraints of the design, as discussed in Section 5.5.5.

Nevertheless, as a precaution, roosting provision suitable for breeding bats will be provided within Loft Space B.

A hot box will be installed in the centre of Loft Void B (shown in Figure 5) constructed of rough untreated 12 mm ply boarding measuring 1500 mm in length. The ridge board will extend into the hot box to allow bats to roost against the timbers. Insulation board will be placed between the ply boarding and the slate tiles and also on the floor of the hotbox to provide a warmer environment internally. The floor of the hotbox will be boarded with 12mm ply boarding but there will be an opening in the floor measuring 300 mm x 300 mm close to one end. An inspection hatch will also be created to allow for monitoring and cleaning. Internally wire mesh (not chicken wire e.g.

<https://www.screwfix.com/p/apollo-13mm-galvanised-welded-mesh-panels-610mm-x-910mm-10-pack/31202>) will be stapled on to the roof on both pitches to provide perching opportunities. No artificial heating will be required due to the use of insulation on the walls of the hot box and the lack of any artificial heating below the existing roost.

Works to construct the hotbox should be carried out following an inspection of the loft void for bats by a licensed bat ecologist who will remain on site for consultation during the construction. Good communication between the contractor and the ecologist is essential to ensure remedial works are not required. The works should be carried out in March to April or mid-September to October to avoid disturbing breeding or hibernating bats.

Some of the tiles around the roof will be fixed during the works and as such, the internal areas of all loft voids will be less subject to wind ingress.

Bats are already using the three connected loft voids for roosting and are using the access point on the western elevation which will remain unaffected by increased lighting and works. As a result, the loft void and access points should already be familiar to the breeding colony and would be used if the lighting on the eastern elevation.

5.5.5 Lesser Horseshoe Bat Night Roost

A replacement structure will be constructed in the form of a bin store in the northern area of the garden (shown in Figure 5). The bin store will measure approximately 3.9 m in length, 1.6 m in width and 2 m from floor to the roof. The walls will be constructed of stone with a sloped roof covered in a green sedum roof. There will be a lean-to wood store on the western elevation, also with a green sedum roof. The eastern wall will have wooden double doors to allow for access for bin storage.

Wooden louvres will be installed on the northern end of the structure to allow bat-access into the structure. There will be a 400 mm gap between the louvres to allow for free flight access for Lesser Horseshoe and other bat species into the structure. Internally, the wooden timbers of the roof structure would be suitable for perching.

5.5.6 Lighting

Measures have been included to limit the amount of lighting where possible within the constraints of the design. This includes the following, as detailed in Bats and Artificial Lighting at Night - Guidance Note 08/23 (ILP and BCT, 2023).

- Increasing the spacing of lanterns and fitting them further into the room away from the windows;

- Having areas of lanterns on separate switches to allow for times when not all lanterns are required to be lit;

- Light fixings will be recessed e.g. <https://www.astrolighting.com/products/1248023-trimless-round-fixed>;

- All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used;

- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability;

- A warm white light source (2700Kelvin or lower) should be adopted to reduce blue light component;

- Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012);

There are two existing external lights on PIR sensors that illuminate both the existing garden and the northern elevation, to illuminate the existing car park. These lights are on long timers and the external light on the northern elevation is set high on the building. The proposals will remove both of these external lights, to be replaced with downlighting fixed lower on the building that the existing lighting and in a limited number of locations in order to illuminate the outside space when required. The external lighting will be on short 1 minute timers to prevent lights from being left on for extended periods.

The majority of light-sensitive bats recorded on the site (Brown Long-eared Bat and Lesser Horseshoe) were recorded at Survey Point 3 on the western elevation. There will be no lighting introduced on the western elevation and so this aspect will be retained as dark corridor for foraging

and commuting bats. Lighting on the southern elevation will be reduced from 4.7m² to 1.1m² and as such, will be darker as a result of the proposals.

The new lighting on the northern elevation will be restricted to the glazing on the north-eastern corner. In order to keep the north-western and western elevations dark, a new hedgerow (using native species of local provenance, shown in Figure 5) is proposed between the glazing and the garage which will reduce any light spill on in the north-western corner of the site. The western boundary will therefore be retained in darkness for light-sensitive bats to continue to use.

5.6 Other Ecological Impacts

The surveys were primarily aimed at assessing the impacts of the proposals on bats. However, other protected species impacts would have been noted, if observed. No evidence of nesting birds was recorded in either the main house or the wooden garage.

The new garage is to be constructed adjacent to the existing wooden garage, in an area largely covered in hardstanding with some small areas of amenity grassland and shrubs. The area has negligible potential for protected species such as herpetofauna and the habitats are of negligible nature conservation interest.

Two hedgehog highways will be installed in the new perimeter fencing to allow hedgehogs and other mammals to continue to pass through the site without obstruction.

As an enhancement to the scheme, two bird boxes (one open-fronted bird box and one traditional bird box will be installed on mature trees on the boundaries of the site. Boxes will be constructed of long lasting material such as woodcrete and not wood.

In addition, both the garage and the bin store will be covered in green sedum roofs, which would provide habitat for invertebrates and act as an enhancement for biodiversity on the site.

Enhancements are shown in Figure 5.

6 References

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7 Figures

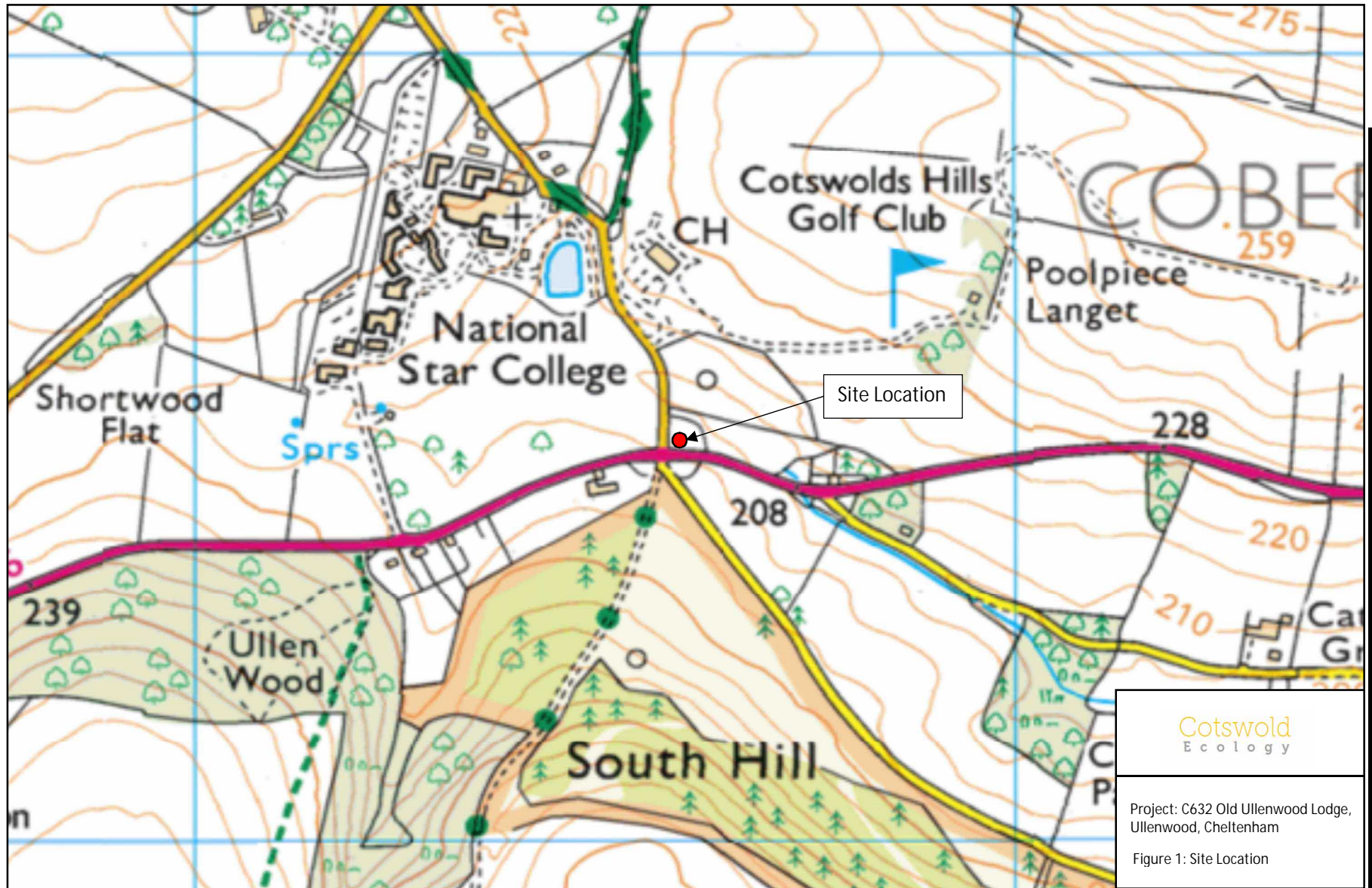
Figure 1. Site Location Plan

Figure 2. Aerial Photograph

Figure 3. Bat Survey Results

Figure 4. Dusk Survey Results

Figure 5. Mitigation and Enhancement Plan



Cotswold
Ecology

Project: C632 Old Ullenwood Lodge,
Ullenwood, Cheltenham

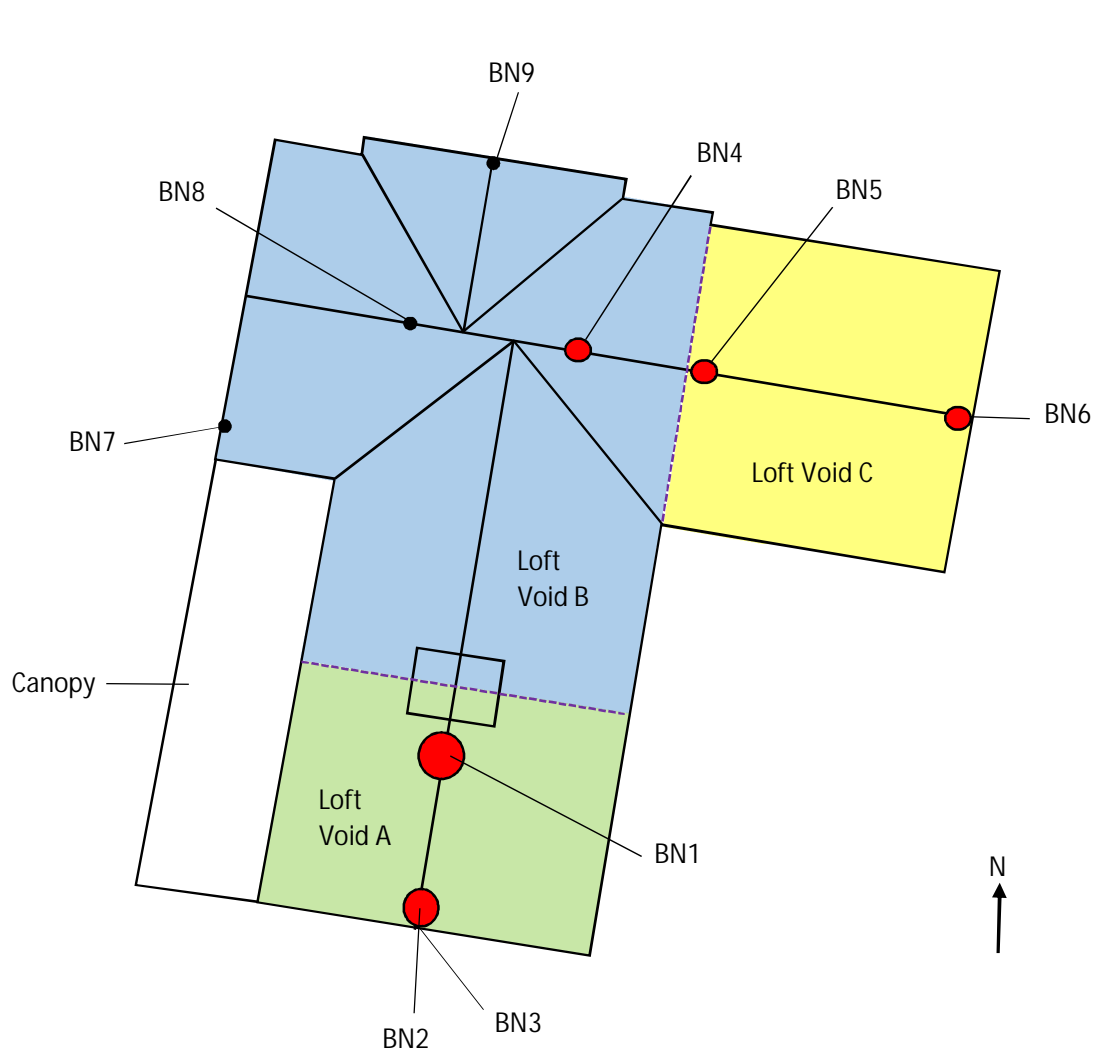
Figure 1: Site Location



Cotswold
Ecology

Project: C632 Old Ullenwood Lodge,
Ullenwood, Cheltenham

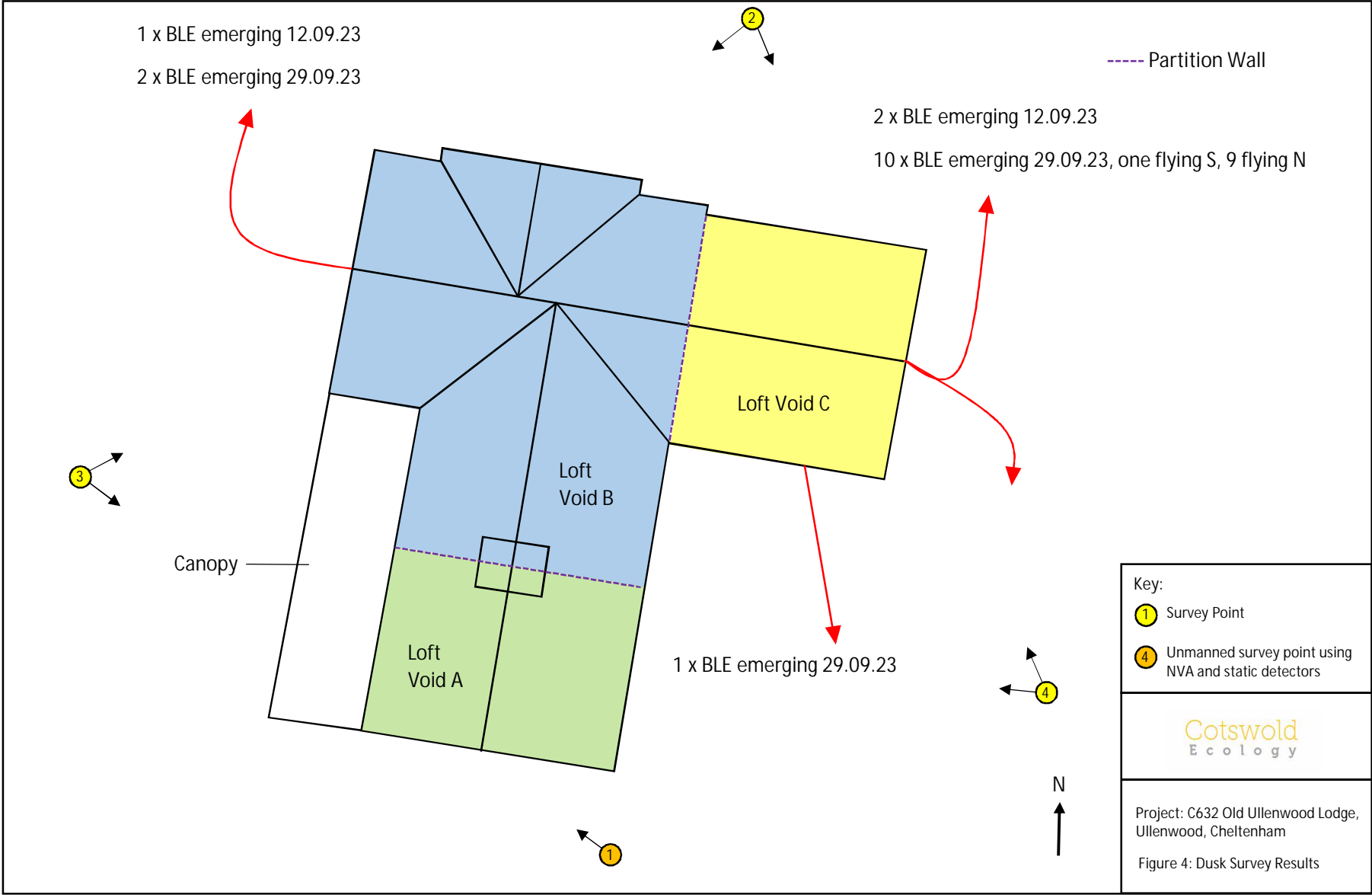
Figure 2: Aerial Photograph

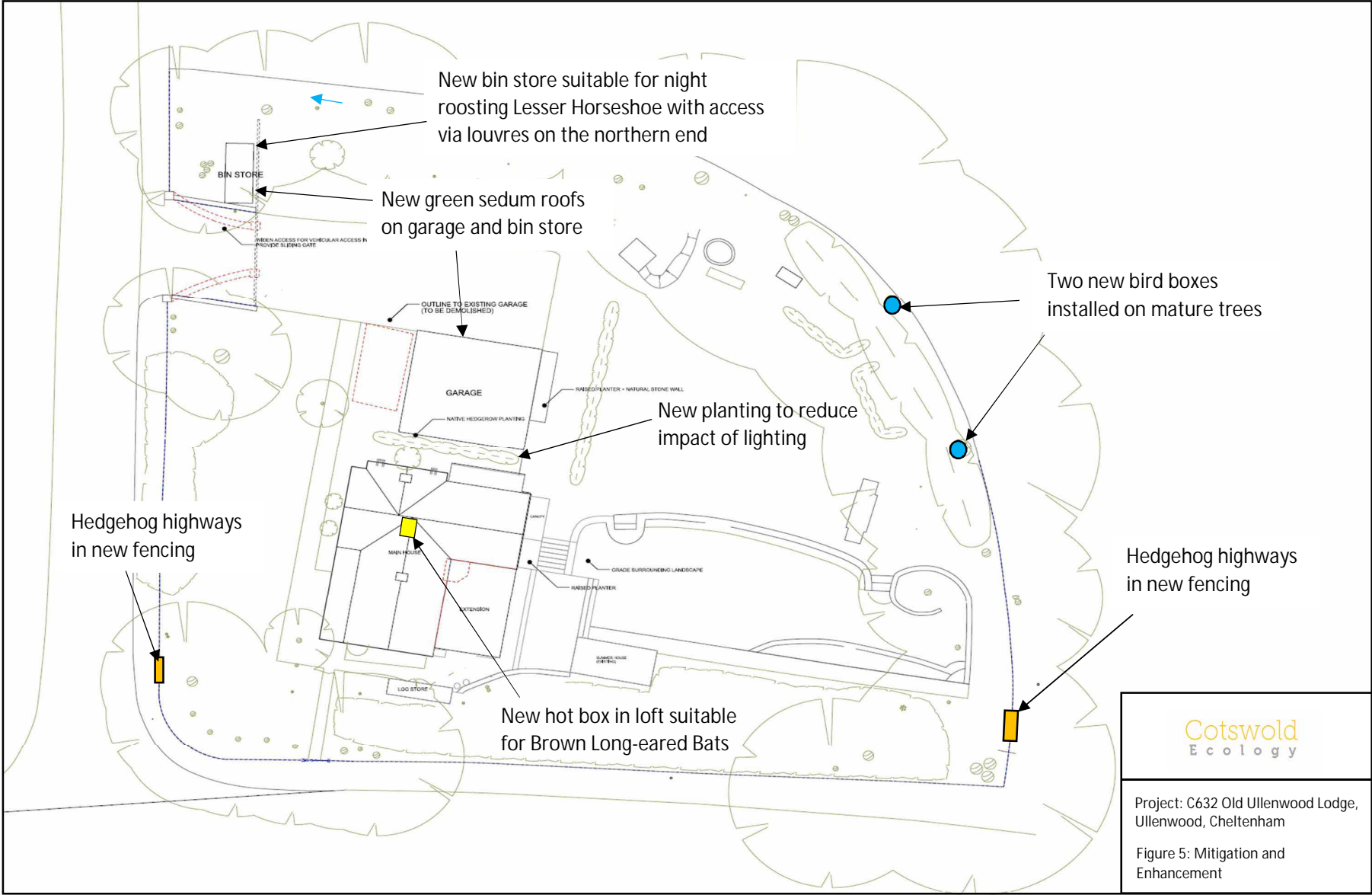


--- Partition Wall
 BN: Bat Note



Project: C632 Old Ullenwood Lodge, Ullenwood, Cheltenham
Figure 3: Bat Survey Results





Cotswold Ecology

Project: C632 Old Ullenwood Lodge, Ullenwood, Cheltenham

Figure 5: Mitigation and Enhancement