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☎ 01296 728351 · ✉ enquiries@bernwood.net · 🌐 www.bernwood.net

Lovelwood Farm Lillingstone Lovell Buckinghamshire

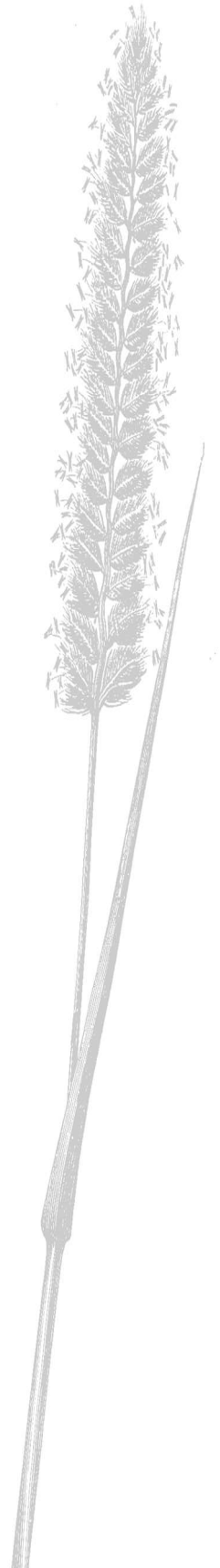


Bat emergence surveys report

Juliet Blayney

2nd October 2023

Blayney-LF-23.002 (Issue 1)



Proud to be:



Hensmans Farm, Nearton End, Swanbourne, Buckinghamshire, MK17 0SL

Limitations

Ecological assessments can be used to draw conclusions as to the likely presence or absence of species (animals and plants), population size, use of the site by animals Any ecological survey is a snapshot in time and should not be regarded as definitive nor complete.

The preparation of mitigation strategies, consultation exercise and submission of any licence applications cannot be relied upon until approved (licensed) in writing by the Statutory Nature Conservation Organisation. Allowance must be made for both programme and financial change to projects as a result of application failure, amendment, or refusal.

Every professional effort and due diligence have been applied to provide an accurate ecological assessment of the site at the time of the preparation of this report, but no liability can be assumed for omissions, or subsequent changes to design and development. Additional works should be anticipated as surveys and proposals for the site progress.

No responsibility will be accepted for any use of or reliance on the contents of this report by any third party. No responsibility will be accepted for changes or alterations made to this report following submission to Bernwood Ecology's client.

Bernwood Ecology, its employees and associates reserve the right to report on any incidents or actions [deliberate or reckless] that result in a breach of licence conditions or are in contravention of existing legislation.

Quality Assurance

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Author: Z. Paraskevopoulou, MBiol. CIEEM Qualifying Member, Ecologist

Editor: C. Damant, MCIEEM, Director and Principal Ecologist

Proof-reader: C. Damant, MCIEEM, Director and Principal Ecologist

Executive Summary

Bernwood Ecology have undertaken three bat emergence surveys at Lovelwood Farm, Lillingstone Lovell, Buckinghamshire. The purpose of the survey was to identify any actual or potential bat roosting interest on site, the suitability of the buildings to support bat roosts, and any impacts on any roosts from the proposed development. The proposals for the site include the conversion of the barns to residential dwellings.

The Preliminary Roost Assessment undertaken by Bernwood Ecology on 7th March 2023 determined the barns to either be confirmed bat roosts or have a 'Moderate' potential to support roosting bats. These findings prompted a recommendation for bat emergence/ re-entry surveys to be conducted on the buildings.

Three dusk emergence surveys of the buildings were conducted to determine presence/ absence of roosting bats. The surveys concluded that there are eight day-roosts of common and soprano pipistrelle, in addition to two likely satellite roosts of brown long-eared bats. It can therefore be determined that the proposed work will impact upon roosting bats and a European Protected Species Licence from Natural England will need to be sought.

There is a risk that nesting birds will utilise spaces on and within the buildings and the surrounding vegetation; recommendations are made to avoid the damage or destruction of active nests.

Any additional or changes in artificial lighting as part of the proposals must not increase light levels on nearby habitats of high ecological value, including the woodland to the north of the site and the fields surrounding it.

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1. Introduction and Objectives

- 1.1 Bernwood Ecology were instructed by Juliet Blayney on 26th May 2023 to undertake bat emergence surveys at the Lovelwood Farm, Lillingstone Lovell, Buckinghamshire, MK18 5AZ (SP 70763 41801) (Appendix 1).
- 1.2 The aims of the emergence surveys are to ascertain whether bats are using the building for roosting, determine entry/ exit points, and classify the roost through identification of species, numbers, and usage if present.
- 1.3 The proposals are to for the conversion of three stone barns to residential dwellings through class Q permitted development.
- 1.4 During the Preliminary Roost Assessment by Bernwood Ecology on 7th March 2023 (*Preliminary Roost Assessment*, issued: 21st March 2023), Building A was identified to be a confirmed bat roost, with Buildings C and E offering 'Moderate' suitability to support roosting bats (see Appendix 2 for building references).

2. Legal Protection

- 2.1 The finding of this report represents the professional opinion of qualified ecologists and does not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this report.
- 2.2 The following information is a simplified summary of the legislation and the full text of the Wildlife & Countryside Act 1981 (as amended) (WCA 1981), the Conservation of Habitats and Species Regulations 2017 (2017 Regulations) and other legislation together with current published guidelines should be consulted.

European Protected Species

- 2.3 It is understood that 2017 Regulations will be further amended due to the departure of the UK from the EU on 31st January 2020. From that date the provisions in The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 will apply (see <https://www.legislation.gov.uk/uksi/2019/579/contents/made>). Existing protection for habitats and species including standards and assessment procedures will remain as they have been prior to the UK leaving the EU.
- 2.4 The 2017 Regulations and The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 should be read together until further clarification or changes are made available by the UK Government or legal case law.

- 2.5 All European Protected Species (EPS; great crested newts, bats, otter, white clawed crayfish, hazel dormice, etc.) are protected under the 2017 Regulations and the WCA 1981. It is an offence under section 41 of the 2017 Regulations to:
- deliberately capture, injure or kill any wild animal of a EPS;
 - deliberately disturb a EPS (including in particular any disturbance which is likely to impair their ability to survive, breed or reproduce, rear or nurture their young; or to hibernate or migrate; or which affects significantly the local distribution or abundance of the species);
 - deliberately take or destroy the eggs of a EPS;
 - damage or destroy a breeding site or resting place of a EPS; or,
 - possess, control, transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal of a EPS, or any part of, or anything derived from a EPS.
- 2.6 Section 9(4) (b) and (c) of the WCA 1981 makes it an offence to:
- intentionally or recklessly disturb a EPS 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 EPS uses for shelter or protection.
- 2.7 In order for otherwise illegal acts to proceed lawfully, an appropriate licence must be sought under the 2017 Regulations and WCA 1981. Licences for the purpose of development are currently determined by Natural England and must include an appropriate mitigation and monitoring scheme to secure the "favourable conservation status" of the species in the local area.

Wild Birds

- 2.8 Wild birds are protected under the WCA 1981. The basic principle of the Act is that all wild birds, their nests and eggs are protected by law and some rarer species are afforded special protection. Wild birds are defined as those resident in or visitors to Great Britain, in a wild state (does not include poultry or game bird). Section 1(1) of the WCA 1981 states that it is an offence to intentionally or recklessly:
- kill, injure or take any wild bird;
 - take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
 - take or destroy an egg of any wild bird.
- 2.9 Section 1(2) of the WCA 1981 states that it is an offence to possess or control any live or dead wild bird or any part of or anything derived from a wild bird or an egg or part of an egg of a wild bird.
- 2.10 It is an offence under section 1(5) of the WCA 1981 to intentionally or recklessly:

- disturb any wild bird included in schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or,
- disturb dependent young of such a bird.

3. Planning

- 3.1 The local planning authority has the power to request information under Article 4 of the Town and Country (Planning Applications) Regulations 1988 (SI1988.1812) (S3) which covers general information for full applications.
- 3.2 The National Planning Policy Framework (NPPF) revised in 2021 requires the planning system and policies to balance economic, social and environmental factors of sustainable development. The environmental component of the NPPF states that any planning application must: *'contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy'*. Chapter 15 (Conserving and Protecting the Natural Environment) includes the methods by which this is to be achieved, including:
- protecting and enhancing valued landscapes, sites of biodiversity or geological value;
 - recognising the intrinsic character and beauty of the countryside; and,
 - minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.
- 3.3 Planning permission should be refused if: significant harm from a development cannot be adequately avoided, adequately mitigated, or as a last resort compensated for. The presumption in favour of development does not apply where development requiring appropriate assessment under the Habitats Directive is being considered, planned or determined. Planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscape and nature conservation. Please see updated Planning Practice Guidance <https://www.gov.uk/government/speeches/local-planning>.
- 3.4 Section 99 of ODPM Circular 06/2005 states: 'It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning

permission has been granted. However, bearing in mind the delay and cost that may be involved, developers should not be required to undertake surveys for protected species unless there is a reasonable likelihood of the species being present and affected by development. Where this is the case, the survey should be completed and any necessary measures to protect the species should be in place, through conditions and/ or planning obligations, before permission is granted’.

- 3.5 Local authorities have a duty to consider the three derogation ‘tests’ of the Habitats Directive: no satisfactory alternative, imperative reasons of overriding public interest (including those of a social or economic nature or beneficial consequences for the environment) and that the favourable conservation status of the species will be maintained. If any of these requirements are not met, the local authority should refuse planning permission regardless of any commitment to obtain a Natural England licence.

Local

- 3.6 The Vale of Aylesbury Local Plan (VALP) 2013-2033 (adopted in 2021) includes Policies NE1, NE2, and NE8, detailing strategies concerning biodiversity and geodiversity, and trees, hedgerows and woodlands, respectively.
- 3.7 Policy NE1 sets out the strategies for protecting and enhancing biodiversity and geodiversity through measures including:
- seeking net gains in major and minor developments;
 - refusing permission where significant detriment (including to sites of principal importance such as Priority Habitats) cannot be avoided, mitigated or compensated;
 - requiring that mitigation for Priority Habitats be delivered on site and,
 - promoting site permeability for wildlife by maintaining existing corridors and ensuring continued and enhanced habitat connectivity in new developments.
- 3.8 Policy NE2 relates to protecting watercourses and their associated corridors. The policy states that developments should conserve and enhance the biodiversity value of the watercourse and its corridor through good design... Opportunities for de-culverting of watercourses should be actively pursued and planning permission will only be granted for proposals which do not involve the culverting of watercourses. Development proposals adjacent to or containing a watercourse must provide or retain a 10m ecological buffer (unless existing physical constraints prevent) between any watercourse and the development. There must also be a long-term landscape and ecological management plan for this buffer.

- 3.9 Policy NE8 aims to protect the trees, hedgerows and woodlands of Aylesbury Vale, requiring full tree surveys and AIAs as part of planning applications, and adequately sympathetic replacement planting of any justified losses.

4. Methodology

Desktop Study

- 4.1 A 2km search for bat species records was commissioned from Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC).
- 4.2 A search of MAGIC Map (magic.defra.gov.uk) for statutory sites and priority habitats within 1km, as well as European Protected Species Licenses (EPSLs) within 1km, was undertaken by Bernwood Ecology. This was extended to 5km for Special Areas of Conservation (SACs), Special Protected Areas (SPAs) and Ramsar sites, and an additional check was made to ascertain if the site lies within 12.6km of the Chilterns Beechwoods SAC. It should be noted that the MAGIC database was last updated in February 2022, therefore any licences granted after that time will not yet have been uploaded into the database.

Bat Emergence Surveys

- 4.3 Three dusk bat emergence surveys were undertaken (Table 1). The surveys were carried out by C. Damant (bat survey class licence levels 3 & 4 surveyor: 2015-12601-CLS-CLS/ 2015-12602-CLS-CLS), J. Sowden MSc (bat survey class licence level 2 surveyor: 2016-24351-CLS-CLS), S. Sanchez MSc., Z. Paraskevopoulou MBiol., M. Davis, BSc., and S. Freemantle MSc. in line with best practice guidelines (e.g., English Nature, 2004; Natural England, 2016; and Collins, 2016). Surveyors were positioned to cover all potential roost entry/ exit points where possible to determine presence/ absence of bat use.
- 4.4 Surveys were conducted with Anabat Walkabout full spectrum handheld detectors, and Pettersson 240X time expansion handheld detectors recording to Tascam digital audio recorders. The surveys were supported by Pettersson D500X and Wildlife Acoustics SM4-BAT-FS remote bat detectors. Details of the remote bat detector settings used are included (Tables 2 and 3). Canon XA20, Canon XA30, Canon XA40, Sony HDR SR5 night-shot video cameras, and SANNCE 4CH 1080N Security Camera System (1TB HDD+ 10.1" LCD screen monitor built-in, 4X 2.0MP outdoor CCTV cameras system with up to four cameras), paired with infrared lights, were used, in addition to a Pulsar Helion thermal imaging scope and a FLIR Scion OTM266 thermal monocular camera.

Table 1. Bat activity survey details.

Date	Start Time	End Time	Sunset/ Sunrise	Surveyor Initials	Weather Conditions
10/07/2023	21:07	22:57	21:22	CD, JS, SS, ZP, MD	17°C, light rain at start of the survey, 100% cloud cover, windy (moderate rain preceding the survey)
10/08/2023	20:25	22:10	20:40	JS, SS, MD, ZP	19.5-22°C, dry, 80% cloud cover, windy (very warm day)
23/08/2023	19:57	21:42	20:12	JS, SS, ZP, MD, SF	17-20°C, dry, 90% cloud cover, light breeze

Table 2. Pettersson D500X settings.

Settings	Standard (User 0)
Sample frequency	500
Pre trigger	Off
Record length	3
High pass filter	Yes
Auto record	Yes
Trigger sense	Very high
Input gain	45
Trigger level	36
Interval	5
Relative timers	
On/Off	-00:30/+00:30
Batteries	4 x AA 1.5v Alkaline

Table 3. Wildlife Acoustics SM4-BAT-FS settings.

Settings	Standard
Gain	12dB
16k High filter	Off
Sample rate	256kHz
Min duration	1.5ms
Maz duration	None
Min trigger frequency	16kHz
Trigger level	12db

Trigger window	3.0s
Max length	15s
Compression	None
Batteries	1.5v Alkaline

Biosafety and Biosecurity

- 4.5 All fieldwork is undertaken in line with the current government and professional (CIEEM, BCT, IUCN, etc.) COVID-19 guidelines at the time, including maintaining physical distancing between surveyors and wildlife as appropriate.
- 4.6 Hygiene and biosecurity measures set out with Bernwood Ecology's Health and Safety Policy are strictly adhered to, including regular thorough handwashing where possible and, where not, regular use of an appropriate viricidal hand sanitiser.

Data Analysis

- 4.7 All sonograms recorded using handheld bat detectors were identified by Bernwood Ecology in the field where possible. Where identification in the field was not possible and for recordings made by the Wildlife Acoustics SM4-BAT-FS remote bat detectors recordings were manually verified by Bernwood Ecology using Sonobat (v.30.0) and BatSound (v.3.31) to visualise the sonograms and confirm identification.
- 4.8 All recordings from Pettersson D500X remote bat detectors were analysed using BatClassify; an automated call extraction and identification software by University of Leeds (Scott 2014; Scott & Altringham, 2014). The software analyses the recordings and returns a 'probability of occurrence' value (0-1) for each species (barbastelle *Barbastella barbastellus*, alcaholic *Myotis alcaholic*, Bechstein's bat *M. bechsteinii*, whiskered/ Brandt's bat *M. mystacinus*/*M. brandtii*, Daubenton's bat *M. daubentonii*, Natterer's bat *M. nattereri*, brown long-eared bat *Plecotus auritus*, lesser *Rhinolophus hipposideros* and greater *Rhinolophus ferrumequinum* horseshoe, common *Pipistrellus pipistrellus* and soprano *P. pygmaeus* pipistrelle and large species of bats termed 'NSL' [noctule *Nyctalus noctula*, serotine *Eptesicus serotinus*, Leisler's bat *N. leisleri*]) to be present within a call sequence. The values highest to 1 indicate a higher likelihood of a species present within a call sequence. The presence of other species, including Nathusius's pipistrelle *P. nathusii*, are not considered by the software.
- 4.9 Scott & Altringham (2014) recommend a standard threshold of acceptance of ≥ 0.9 for all species. Bernwood Ecology have undertaken a number of verification exercises of sonograms and compared these to BatClassify, resulting in the following observations:

- Barbastelle results ≥ 0.8 are accurate, but as this is generally an under-recorded species, verification of any records is always undertaken.
- Results for *Myotis* bats are occasionally above the recommended 0.9 threshold, possibly due to the similarities between call characteristics of bats within this genus. Bernwood Ecology found that *Myotis* sp. calls ≥ 0.5 were reliably emitted by a *Myotis* bat, but identification beyond genus to species was difficult, if not impossible. For this reason, the *Myotis* bats have been grouped and a threshold of ≥ 0.5 applied; however, this may result in the double-counting of *Myotis* and caution is advised when drawing conclusions on the abundance of this genus within a set of recordings.
- 'NSL', common and soprano pipistrelle results appear to be accurate above ≥ 0.9 .
- Brown long-eared bats are rarely recorded using remote bat detectors, even where high numbers of brown long-eared bats are known, resulting in an underrepresentation of this species on most sites. Verification of brown long-eared bat calls > 0.5 are mostly accurate but verification is required.
- Greater and lesser horseshoe bats have not been positively recorded at any sites where Bernwood Ecology has surveyed; therefore, the recommended threshold of ≥ 0.9 has been applied.

5. Constraints and Limitations

Historical Records

- 5.1 Environmental records can provide an indication of the likely presence of a species on, or within proximity, to the site. The absence of records for protected species and sites does not necessarily indicate absence. The use of historical environmental records is not a substitute for appropriate surveys at the correct time of year when informing land use change and development proposals.
- 5.2 Qualifications for historical records, e.g., if a badger record is of a road casualty or of a sett, may not always be known.
- 5.3 Data search accuracy is variable and will often range from 10km to 1m. Most commonly, accuracy will be within 10m. The original raw data from data searches should be consulted where the record accuracy is needed.

Safe Access

- 5.4 Part or all the site may be considered to be inaccessible following an assessment of risk and therefore the survey may be constrained. Risks that may limit the survey effort include structurally unsafe structure(s) (including roof joists), confined spaces and dangerous egress and ingress points, asbestos, sharps, livestock, and hostilities

from members of the public. Details of any access constraints are provided within the results of the report.

Digital Mapping

- 5.5 Every effort is made to ensure mapping accuracy; however, the exact locations of features should not be relied upon.

Mobile Species

- 5.6 Bats are a highly mobile species and move throughout a landscape often using multiple roost sites (depending on the species). Bats may be found in any suitable roosting cavity or void at any time of the year.

6. Results

Desktop Study

- 6.1 Brown long-eared and pipistrelle bat records were returned from the data search. A summary of relevant historical species records is included in Table 5 (public data search results available upon request).
- 6.2 A summary of relevant designated sites and priority habitats is included in Table 4 (public data search results available upon request).
- 6.3 The MAGIC Map Licensing Layer did not return any records of EPSLs, great crested newts licence returns or any surveys from the DEFRA great crested newt pond surveys 2017-2019.

Table 4. Summary of relevant designated site records and priority habitats. Obtained from MAGIC Map.

Abbreviations: NNR: National Nature Reserves. SSSI: Site of Special Scientific Interest.

Site name	Designation	Approx. distance from the site (at closest point)	Details
<u>Statutory Sites</u>			
Whittlewood Forest	SSSI	890m	Lowland broadleaved, mixed and yew woodland
Buckingham Thick Copse	NNR	920m	-
<u>Priority Habitats</u>			
Deciduous woodland	-	0m (adjacent to the north of the site)	Three large areas within 1km from the site
Woodpasture and parkland	-	900m	One area within 1km from the site
Ancient semi-natural woodland	-	0m (adjacent to the north of the site)	Two areas within 1km from the site including Buckingham Thick Copse
Ancient-replanted woodland	-	640m	One area within 1km from the site (Buckingham Thick Copse)

Table 5. Summary of relevant protected species records. Obtained from BMERC.
Abbreviations: EPS: European Protected Species.

Species	Highest designation	Year of most recent record	Approx. distance from the site	Details
<u>Bats</u>				
Brown long-eared bat <i>Plecotus auritus</i>	EPS	2010	400m (1km grid reference)	One record
Common pipistrelle <i>Pipistrellus pipistrellus</i>	EPS	2008	1.1km	One record of five adults
Pipistrelle species <i>Pipistrellus</i> sp.	EPS	2008	1.1km	One record

Bat Emergence Surveys

- 6.4 Survey conditions were optimal for the survey to be considered valid under the BCT Good Practice Guidelines (Collins, 2016) and surveyor positions provided adequate coverage of all aspects of the structure, assisted with high-quality technology (infrared cameras and thermal imaging scope). The emergence surveys were able to determine bat use with a high degree of confidence.
- 6.5 Brown long-eared bats and common pipistrelles were found foraging in all buildings. The background commuting and foraging activity was very high in all three surveys and included barbastelle, *Myotis* sp. bats, NSL, and soprano pipistrelle in addition to the two roosting species. Fresh droppings were noted on the second survey inside Building C and a sample was taken for future DNA analysis if needed (S1). Details of the emergence survey can be found in Table 6, a plan of summarised bat activity in Appendix 2.
- 6.6 The remote bat detectors recorded a total of 1596 bat passes across the three surveys: soprano pipistrelle (57), common pipistrelle (1394), *Myotis* bat (5), brown long-eared bat (115), and 'NSL' type bat (25). The majority of the calls were recorded from inside Building E (Table 4). Details of the static detector recordings are in Appendix 3.
- 6.7 Multiple house martins *Delichon urbicum* were seen foraging at the start and during the first survey. Sparrows *Passer domesticus* and swallows *Hirundo rustica* were seen nesting inside Building E and an active wren's *Troglodytes troglodytes* nest was seen south of Building C in the third survey. Due to the presence of the ancient semi-natural woodland north of the site multiple bird species, including WCA Sch1.1 species (such as barn owl), will be attracted to the area and they are likely to use the buildings, although no evidence of them were seen during any of the surveys.

Table 6. Summary of bat emergence survey results.

Time	Species	Description of activity
<i>Survey 1: 10th July 2023, Sunset: 21:22</i>		
21:41	Common pipistrelle	A bat was seen foraging at the paddock west of Building A.
21:46	Common pipistrelle	Emergence of one bat from the eaves close to the door on the western elevation of Building E (Roost 1; Figure 1).
21:56	Common pipistrelle	A common pipistrelle flew south to north over Building C.
	Brown long-eared	A brown long-eared bat was seen foraging inside Building E.
21:57	Common pipistrelle	Emergence of one bat from the cladding on the southern gable wall of Building E (Roost 2; Figure 2).
22:04	Common pipistrelle	Several passes recorded north west and north east of Building E (externally) until 22:06.
22:05, 22:07	Brown long-eared	A bat was seen foraging inside Building E and another was seen flying over it.
22:11-22:12	Common pipistrelle	Two common pipistrelle passes were recorded south east of Building C (externally).
	Brown long-eared	A brown long-eared bat flew over Building A.
22:14-22:19	Brown long-eared	At least three brown long-eared bats were seen flying inside Building E.

		A brown long-eared was seen foraging west of Building C in the courtyard, and between the courtyard and the woods at the north.
	Common pipistrelle	At least two common pipistrelles were seen foraging west of Building C in the courtyard, and between the courtyard and the woods at the north.
22:20	Brown long-eared	One bat flew out Building E from the open stable doors on the eastern aspect of Building E.
22:20	Common pipistrelle, soprano pipistrelle	Up to five bats were seen foraging and socialising around and over Building E, at the courtyard north east of Building E and at the fields south of Building A, until 22:30.
22:24	Brown long-eared	A brown long-eared bat pass was recorded south east of Building C (externally).
	Barbastelle	A barbastelle pass was recorded north west of Building E (externally).
	Pipistrelle species	Multiple pipistrelle passes were recorded north west of Building E (externally).
22:28	Brown long-eared	A brown long-eared bat was seen foraging inside Building A and perched at the wall on the east aspect, where it was hand netted and verified to be a lactating female.
	Common pipistrelle	Multiple common pipistrelles were seen foraging in the yard north east of Building E until 22:52.
22:31, 22:34	Brown long-eared	A recording of a brown long-eared bat was made south east of Building C (externally).
	NSL	An NSL type bat pass was recorded from all survey positions.
22:36	Pipistrelle species	A faint bat pass was recorded south of Building E (externally).

22:38	NSL	An NSL type bat pass was recorded south east of Building C (externally).
	Barbastelle	A barbastelle pass was recorded north west of Building E (externally).
22:40	Brown long-eared	A bat was seen foraging inside Building E.
22:41-22:42	NSL	A bat pass was recorded north east and north west of Building E (externally) as well as south east of Building C (externally).
22:42	Brown long-eared	Two bats were seen foraging inside Building E.
22:43	<i>Myotis</i> sp.	A <i>Myotis</i> sp. pass was recorded south east of Building C (externally).
	Noctule	A noctule pass was recorded south of Building A (externally).
22:49-22:50	Common pipistrelle	A bat was heard foraging south of Building E (externally).

Survey 2: 10 th August 2023, Sunset: 20:40		

20:41	Common pipistrelle	Emergence of one bat from the verge of the north gable of Building E, near the ridge (Roost 3).
20:48-20:53	Common pipistrelle	Two bats were seen flying northwards in the courtyard west of Building E.
20:56	Common pipistrelle	Emergence of one bat behind a beam at the north gable of Building E (Roost 3; Figure 3).
20:57	Unidentified bat	Emergence of one unidentified bat from the verge of the north gable of Building E, near the ridge (Roost 4). Identification was not possible as it did not echolocate, and no camera was covering this aspect of the building.

	Common pipistrelle	A common pipistrelle pass was recorded north east of Building C (externally).
20:59	Common pipistrelle	One bat flew out from one of the open stable doors on the east aspect of Building E.
20:59	Common pipistrelle	Two common pipistrelles were seen commuting and foraging at the field east of Building C until 21:06.
	Soprano pipistrelle	A soprano pipistrelle was seen flying inside Building E from the open stable doors on the eastern aspect and continued foraging inside.
21:00-21:03	Unidentified bat	An unidentified bat flew over Building C.
	Common pipistrelle	Multiple common pipistrelles foraging passes of ~2-3 bats were recorded from north-east of Building E (externally) until 22:14. A common pipistrelle was seen foraging east of Building E, very close to the building.
	Soprano pipistrelle	A soprano pipistrelle was seen foraging inside Building E.
21:05	Brown long-eared,	A brown long-eared bat flew inside Building A through the open door on the north aspect and flew out a few seconds later. A brown long-eared bat flew inside Building E at the eaves level, probably from the open stable door on the east aspect.
	Common pipistrelle	A common pipistrelle entered Building E from the open stable door on the east aspect.
21:06	Common pipistrelle	A bat emerged from under a roof tile on the hipped roof of Building C – exact location is unclear as no camera was covering this aspect (Roost 5).

21:07-21:08	Soprano pipistrelle,	A soprano pipistrelle flew out of Building E through the open stable door on the east aspect.
	Brown long-eared	A brown long-eared bat was seen foraging inside Building E.
21:08-21:09	Noctule,	A noctule pass was recorded north east of Building E (externally).
	Common pipistrelle,	A common pipistrelle was seen commuting northwards in the courtyard west of Building E.
	Soprano pipistrelle	A soprano pipistrelle flew northwards close to the eastern aspect of Building E.
21:12	Soprano pipistrelle	A bat was seen foraging at the field south of Building E.
21:11	Brown long-eared	A bat flew inside Building A through the open door on the northern aspect, foraged inside the building for a minute and then flew out the same way. Another bat was seen flying inside Building E and then flying out a couple seconds later through the open stable doors of Building E on the east aspect.
21:13	Common pipistrelle	Emergence of two common pipistrelles from under roof tiles on the east aspect of Building C (Roost 5; Figures 4 and 5).
	Brown long-eared	A brown long-eared was seen perching at the apex of the northern gable wall of Building E (Figure 6).
21:14	Brown long-eared	Emergence of one bat from the verge of the north gable of Building E, near the ridge (Roost 6).

21:15	Common pipistrelle	A bat was seen foraging inside Building A and exited through the open door in the northern aspect.
21:18	Brown long-eared	One bat flew out Building E through the open stable doors on the eastern aspect after it was seen foraging inside the building.
21:20-21:22	Common pipistrelle	Bat passes were recorded south of Buildings A and E and north east of Building C (externally).
21:24	<i>Myotis</i> sp.,	A faint <i>Myotis</i> sp. bat pass was recorded north east of Building C (externally).
	Brown long-eared	A brown long-eared bat was seen foraging inside Building E.
21:28	Noctule	A distant and brief bat pass was recorded south of Buildings A and E (externally).
21:30	Common pipistrelle,	A common pipistrelle pass of each species was recorded north east of Building E (externally).
	Barbastelle	A barbastelle pass of each species was recorded north east of Building E (externally).
21:31	Brown long-eared,	A brown long-eared bat was seen foraging inside Building A and flew out through the open door on the northern aspect.
	<i>Myotis</i> sp.,	A <i>Myotis</i> sp. bat pass was recorded from the north east of Building E (externally).
	Common pipistrelle	Up to four common pipistrelles were seen foraging south of Building E.
21:34-22:00	Common pipistrelle,	Common pipistrelle passes were recorded north east of Building C and north west of Building E (externally). Three common pipistrelles were seen commuting, foraging and socialising over Building E.

	<i>Myotis</i> sp.	A <i>Myotis</i> sp. bat pass was recorded from the north east of Building E (externally).
22:09	Common pipistrelle	A bat was seen entering a roosting point on a gap between the walls on the north east corner of Building A (Roost 7; Figure 7).
22:14	Barbastelle	A bat pass was recorded north east of Building E (externally).
----- <i>Survey 3: 23rd August 2023, Sunset: 20:12</i> -----		
20:20	Common pipistrelle	A bat flew between Buildings A and E and went towards the paddocks to the west.
20:23-20:24	Unidentified bat,	An unidentified bat flew over Building C. It could not be identified as it did not echolocate and no camera was point at this section of the building.
	Common pipistrelle	Two common pipistrelles flew northwards from the paddocks and through the western courtyard and another common pipistrelle flew northwards through Buildings A and E.
20:23, 20:24	Common pipistrelle	Two bat passes emerged from the cladding on the southern aspect of Building E (Roost 2).
20:26, 20:29	Common pipistrelle	A bat was seen foraging inside Building A. Another bat was seen foraging inside Building E.
20:30	Common pipistrelle	One bat flew out Building E through the open stable door on the eastern aspect of the building.
20:30	Common pipistrelle	Two common pipistrelles flew northwards from the paddocks and through the western courtyard. Distant frequent foraging passes (likely from Building E or woods to the north) were

		recorded north east of Building E (externally) until 20:56. Bats were also seen foraging and commuting at the fields east of Building C until 20:55.
20:33-20:35	Unidentified bat,	An unidentified bat flew northwards on the west side of Building C.
	Common pipistrelle	One common pipistrelle was seen foraging through Buildings A and E.
		One common pipistrelle was seen flying inside Building A through the open door at the north aspect to forage.
20:37-20:38	Unidentified bat,	An unidentified bat flew west of Building A. It could not be identified due to the use of a lawn mower nearby that interfered with the bat detector.
	Common pipistrelle,	A common pipistrelle foraging pass was recorded south west of Building C and two common pipistrelles were seen foraging in the courtyard west of Building E.
	<i>Myotis</i> sp.	A <i>Myotis</i> sp. flew inside Building E to forage through an open stable door on the eastern aspect.
20:41	Common pipistrelle,	A common pipistrelle flew eastwards over Building E.
	<i>Myotis</i> sp.	A <i>Myotis</i> sp. pass was recorded north east of Building C.
20:42-20:49	Common pipistrelle,	A common pipistrelle was seen flying inside through the open door at the north aspect of Building A, foraged inside for a couple of seconds and then flew out in the same way.
		In addition, common pipistrelles were seen commuting and foraging around Building C and at the field south of Buildings A and E until 20:54.
	Soprano pipistrelle,	Soprano pipistrelles were seen commuting and foraging around Building C and at the field south of Buildings A and E until 20:54.

	Brown long-eared	<p>Two brown long-eared bats were seen foraging inside Building E and they ended up perching on the ridge, beams and at the apex of the northern gable wall (Figures 8 and 9) until 21:47.</p> <p>Two brown long-eared bats were seen flying inside through the open door at the north aspect of Building A and were foraging inside.</p> <p>In addition, brown long-eared bats were seen foraging south of Buildings A and E (close to the buildings and the field), north of Building E and the courtyard west of Building E.</p>
20:50-20:52	<i>Myotis sp.</i> ,	A <i>Myotis</i> sp. bat was seen flying at the field east of Building C and four common pipistrelles were seen foraging at the same field as well as over Building C.
	Common pipistrelle	A common pipistrelle was seen foraging at the field east of Building C as well as over Building C.
	Brown long-eared	Two brown long-eared bats were seen perching at the beams inside Building E (Figure 10).
20:53	Noctule,	A noctule pass was recorded from all survey positions except for north east of Building C.
	Common pipistrelle	A common pipistrelle flew eastwards south of Building C.
20:54	Brown long-eared	A bat pass was recorded north east of Building C (externally), possibly from the woods to the north.
20:59, 21:00	Common pipistrelle,	Two common pipistrelle bat passes were recorded north east of Building C (externally).
	<i>Myotis</i> sp.	A <i>Myotis</i> sp. bat was seen flying in the courtyard east of Building E.
21:07	Common pipistrelle	Two bats were commuting and foraging at the field south of Buildings E and A and a bat flew over and around Building C.

21:09	Barbastelle	A barbastelle pass was recorded north east of Building E (externally).
21:10	Common pipistrelle, brown long-eared	One to two bats were seen foraging inside Building E until 21:31. Social calls were also heard.
21:12	Barbastelle	A bat pass was recorded south west of Building C (externally).
21:13-21:16	Common pipistrelle,	Two common pipistrelles were foraging at the field south of Buildings E and A.
	Soprano pipistrelle	A soprano pipistrelle was seen commuting through the courtyard west of Building E.
21:19	Common pipistrelle	A bat pass was recorded south west of Building C (externally).
21:24-21:25	Brown long-eared,	A brown long-eared pass was recorded south of Buildings A and E and south west of Building C (externally).
	Common pipistrelle,	A common pipistrelle pass was recorded south of Buildings A and E and south west of Building C (externally).
	Barbastelle	A barbastelle pass was recorded south west of Building C (externally).
21:26	Brown long-eared	A bat pass was recorded north east of Building C (externally).
21:28	Common pipistrelle,	A common pipistrelle was seen flying east of Building E.
	<i>Myotis</i> sp.	A <i>Myotis</i> sp. pass was recorded north east of Building C (externally).

21:29	Brown long-eared, Common pipistrelle	A brown long-eared bat pass was recorded north east of Building C. A common pipistrelle pass was recorded south west of Building C (externally), respectively.
21:31, 21:36, 21:37	Brown long-eared, Common pipistrelle	A brown long-eared bat was seen perching inside Building E at the apex of the south gable wall (Figure 11). Two brown long-eared passes were recorded south west of Building C (externally). Two common pipistrelles were seen commuting and foraging at the field south of Buildings A and E.
21:38, 21:42	Barbastelle	Two barbastelle passes were recorded north east of Building C (externally).



Figure 1. Roost 1; eaves on western elevation of Building E.



Figure 2. Roost 2; cladding on south gable wall of Building E.



Figure 3. Roost 3; behind beam on northern gable wall of Building E.



Figure 4. Roost 5; roof tile in eastern aspect of Building C.



Figure 5. Roost 5; roof tile in eastern aspect of Building C.



Figure 6. Brown long-eared perching point at the apex of north gable wall in Building E.



Figure 7. Roost 7; gap in north eastern corner of Building A.



Figure 8. Two brown long-eared bats perching at the ridge of Building E.

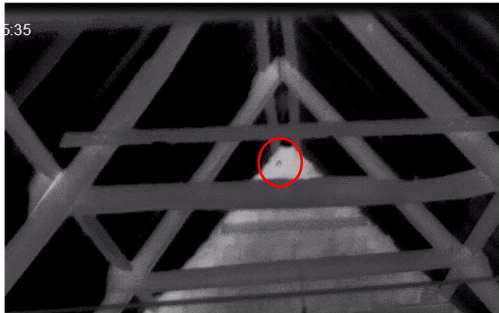


Figure 9. Brown long-eared perching on the northern gable of Building E.

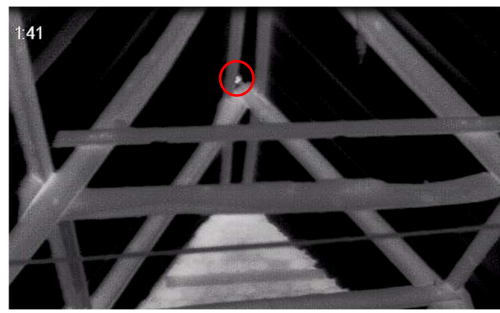


Figure 10. Brown long-eared perching on a beam in Building E.



Figure 11. Brown long-eared perching on the apex of the southern gable of Building E.

Table 7. Summary of remote bat detecting results by species, genus, or group.

Species	Summary
<i>Survey 1: 10th July 2023</i>	
Barbastelle	There were no recordings.
<i>Myotis</i> species	There were no recordings.
'NSL' group	There were no recordings.
Brown long-eared bat	There were no recordings.
Common pipistrelle	There were three recordings, two of which were inside Building A and one was inside Building C.
Soprano pipistrelle	There were no recordings.
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<i>Survey 2: 10th August 2023</i>	
Barbastelle	There were no recordings.
<i>Myotis</i> species	There were three recordings, two from inside Building C and one from inside Building A.
'NSL' group	There were 20 recordings, the majority of which were from inside Building A.
Brown long-eared bat	There were 72 recordings, most of which were from inside Building E (27 at the north end and 39 at the south end).
Common pipistrelle	The most frequently recorded species with 776 recordings, the majority being made inside Building E (263 at the north end and 334 at the south end).
Soprano pipistrelle	There were 32 recordings the majority of which were from inside Building E (25 at the north end and 2 at the south end).
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<i>Survey 3: 23rd August 2023</i>	
Barbastelle	There were no recordings.
<i>Myotis</i> species	There were two recordings; one from inside Building E and one south of Buildings A and E (externally).
'NSL' group	There were five recordings, the majority of which (four) were from south of Buildings A and E (externally).
Brown long-eared bat	There were 43 recordings the majority of which (32) were from inside Building A.

Common pipistrelle	The most frequently recorded species with 615 recordings. Most of them were recorded from inside Building A (289) and south of Buildings A and E (246).
Soprano pipistrelle	There were 25 recordings most of which were recorded south of Buildings A and E (13) and inside Building E (11).

7. Discussion and Conclusions

7.1 There are eight different roosts (identified sequentially) on site:

- Roost 1: eaves on the western aspect of Building E, common pipistrelle roost, peak count: one.
- Roost 2: Cladding on Building E's southern gable wall, common pipistrelle, peak count: two.
- Roost 3: Verge of Building E's northern gable wall connected to a beam on the inside, common pipistrelle, peak count: two.
- Roost 4: Verge of Building E's northern gable wall, unidentified bat, peak count: one (likely to be common pipistrelle or brown long-eared due to these species already recorded roosting here)
- Roost 5: Three roof tiles on the eastern and northern aspect of Building C (three access points), common pipistrelle, peak count: three.
- Roost 6 (satellite): Verge of Building E's northern gable wall but other roosting points also likely, brown long-eared, peak count: three.
- Roost 7: Gap between the walls on the north east corner of Building A, common pipistrelle, peak count: one.
- Roost 8: No specific roosting point identified, however, a possible soprano pipistrelle day roost used sporadically by soprano pipistrelle bats is likely to be present in Building E as soprano pipistrelle bats were seen using the structure for foraging frequently. Peak count: one.

7.2 Roosts 1-5 and Roosts 7-8 were found to be used sporadically by individual bats (common pipistrelle and soprano pipistrelle), suggesting day roosts. A day roost is defined as a "*place where individual bats, or small groups of males, rest or shelter in the day but are rarely found by night in the summer*" (Collins, 2016).

7.3 In addition to these roosts, multiple brown long-eared bats were seen foraging freely inside Buildings A and E, entering through the open doors. During the PRA conducted by Bernwood Ecology earlier in the year a maternity roost was identified to be present in the Main House, indicated by the very large numbers of bat droppings in the roof void (see *Preliminary Roost Assessment*, issued: 21st March

2023). It is therefore likely that a small number of brown long-eared bats (three to five bats) are occasionally roosting within Buildings A and E and using them as satellite roosts (e.g., Roost 6), as indicated by the hand netting of the lactating female individual in Building A during the first bat survey. A satellite roost is defined as "*an alternative roost found in close proximity to the main nursery colony used by a few individual breeding females to small groups of breeding females throughout the breeding season*" (Collins, 2016). Therefore, both Buildings A and E are identified to be brown long-eared satellite roosts.

- 7.4 A *Myotis* sp. bat was seen entering Building E on one occasion. However, this was just considered a single passing individual and therefore, no roost of this species is considered to be present in the building.
- 7.5 Bats are known to move within a landscape and use multiple roosts between years and even within the same year. In the absence mitigation, the proposals have the potential to disturb and/or destroy the bat roosts, therefore, a licence from Natural England is required to proceed lawfully.
- 7.6 Background bat activity levels were high during all three surveys and concentrated in the courtyards and the surrounding fields. Except for the species roosting in the buildings, other species were also recorded including *Myotis* sp., NSL, barbastelle and soprano pipistrelle indicating local populations of these bats commute and possibly forage in the area.
- 7.7 Artificial light levels at the site are currently low, which is likely to contribute to the high background levels of activity. The proposals must avoid any new additional lighting where possible, limiting essential lighting for the purposes of health and safety only and implementing measures to reduce the spill onto onsite habitats of value to nocturnal wildlife (including local bat populations), particularly the woodland at the north, the fields and any identified bat roosts.
- 7.8 Three active bird nests were seen during the last bat survey. All buildings on site and the surround vegetation have the potential to offer nesting opportunities to common garden birds and WCA Sch.1.1 species (i.e., barn owls). Recommendations are made to avoid the risk of damage and destruction of active nests during repairs.

8. Recommendations

- 8.1 The ecological mitigation hierarchy must be followed by all elements of the project, from design, to construction, to end use, to ensure there is a net gain to biodiversity on site and the favourable conservation status of protected species is maintained. The mitigation hierarchy follows:

- *Avoid*: avoid impacts on biodiversity as a priority.
- *Minimise*: minimise impacts that cannot be completely avoided, through alternations to design, use, scale, location, timing of phases, etc.
- *Mitigate and compensate*: undertake works which will have an impact by implementing safeguarding measures, such as using an Ecological Clerk of Works (ECoW) where there are risks to wildlife. Provide compensation to replace habitats that have been lost as a consequence of proposals.
- *Enhance*: Provide additional habitats and features for wildlife to ensure biodiversity net gain. Habitat offsetting may be required where net biodiversity gain cannot be secured within the site boundary.

8.2 This report is to be read in conjunction with Bernwood Ecology's *Preliminary Roost Assessment* (issued: 21st March 2023) for the site, including its recommendations. The recommendations pertaining to bats and wild nesting birds are repeated below.

8.3 The proposals are likely to disturb and/or destroy bat roosts. Therefore, they will require a bat mitigation licence (A13) to be granted by Natural England to proceed lawfully. A licence can only be sought from Natural England following the successful granting of planning consent, and only once all matters relating to wildlife that are capable of being discharged are discharged. The application needs to be made in advance of the works starting on site. Time must be allowed for the project ecologist to prepare and complete the application together with allowing a 6–8-week determination period by Natural England (the target of 30 working days for determination is often exceeded). The following are outline mitigation principles for the licence application to assist with the reduction of risk of harm and disturbance to individual bats:

- Works are to be timed to commence in the spring (mid-March to end of April) or autumn (September to mid-October) when bats are unlikely to be torpid, heavily pregnant, or rearing young.
- A pre-start briefing is to be given to all site workers from the first day of on-site works by the Named Ecologist or Accredited Agent acting on behalf of the Named Ecologist. The pre-start briefing will include information of the bat roost interest at the farmhouse, the details of the licence for the site and the 'unexpected finds' process.
- Roof tiles, hanging tiles and other features which may be suitable for supporting roosting bats in the structure are to be removed by hand and under ecological direction (minimum of Bat Class Licence Level 2) by either the Named Ecologist or an Accredited Agent nominated by the Named Ecologist. Time must be allowed for the ecologist to undertake searches for bats throughout this process.

- As part of the licence application process, all agreed compensation complying with published guidelines will need to be delivered.

8.4 In addition to the aforementioned mitigation principles following review of the proposals by Bernwood Ecology, the following adaptations are proposed to ensure bats and their roosts are well considered within the working methods and materials used:

- Scaffolding is to be designed and installed per the Project Ecologist's recommendations to avoid blocking potential bat access points.
- Breathable membrane types or synthetic poly-spun fibres are not permissible for use around bat roosts (Natural England), and subject to confirmation by Project Ecologist before installation.
- All chemically treated wood (*in situ* or by manufacturers of products) must be first approved by the Project Ecologist.
- Retention of actual or potential bat roost access points as described by the Project Ecologist.

8.5 Based on the identified roosts the following mitigation is recommended:

Table 8: Roosts and suggested mitigation for Building A.

Roost	Species	Peak Count	Building ID	ER Guidance	Suggested mitigation (Appendices 4 & 5)
Satellite Roost	Brown long-eared	2	Building A; no specific point identified during surveys	<p>Satellite roost Satellite roosts (i.e. alternative roosts found in close proximity to the main nursery colony) should be considered with the associated main colony.</p> <p>The provision of one feature, suitable for the species concerned (e.g. a bat box/tile/brick/crevice) per roost to be impacted. For BLE: Ideally retain access to the original roost (maintaining the same conditions) however it may be acceptable to replace this type of roost qualitatively rather than quantitatively should it be demonstrated there is no suitable alternative to the proposal.</p> <p>Post development monitoring: One inspection occurring immediately post-development to ensure the compensation/mitigation feature is completed in accordance with the authorised Site Registration.</p>	<p>Dedicated bat space to be incorporated into design and implemented in phases:</p> <p>Phase 1: On commencement of Building A Construct thermalite wall to apex, install two 1FF bat boxes, create 300mm x 150mm opening to door to allow bats to fly into space</p> <p>Phase 2: On commencement of Building E Construct division between ground floor and roof void with 400mm open access. Add 2 x IFF bat boxes to ground floor cool room.</p> <p>Re-roofing of building with hessian backed 1F bituminous felt</p>
Roost 7 (day roost)	Common pipistrelle	1	Building A: Gap between the walls on the north east corner of Building A	<p>Feeding Roost1, Night Roost, Day Roost, Transitional Roost</p> <p>Where more than 3 species AND/OR more than 3 roosts will be impacted, OR where more than small numbers² of bats will be impacted: the provision of at least one feature, suitable for the species concerned (e.g. a bat box/tile/brick/crevice) per roost and species to be impacted is considered appropriate.</p> <p>Post development monitoring: Where compensation and/or mitigation features are provided, one inspection by the Joint Licensee and/or the Earned Recognition Consultant, occurring immediately post-development to ensure the compensation/mitigation feature is completed in accordance with the authorised Site Registration</p>	<p>Dedicated bat space to be incorporated into design and implemented in phases:</p> <p>Phase 1: Building A Install 2 x Schwegler 1GS Brick Bat Roosts & 2 x Schwegler 27 Brick Bat Boxes, or similar.</p> <p>Phase 2: On commencement of Building E Install 1 x Schwegler 1GS Brick Bat Roost</p> <p>Phase 3: Building C Install 2 Schwegler 27 Brick Bat Boxes, or similar. Incorporate 4 x lifted bat slates into roof of Building C</p> <p>Re-roofing of building with hessian backed 1F bituminous felt</p>

Table 9: Roosts and suggested mitigation for Building E.

Roost	Species	Peak Count	Building ID	ER Guidance	Suggested mitigation (Appendices 4 & 5)
Roost 1 (day roost)	Common pipistrelle	1	Building E: Eaves on the western aspect of Building E	<p>Feeding Roost1, Night Roost, Day Roost, Transitional Roost</p> <p>Where more than 3 species AND/OR more than 3 roosts will be impacted, OR where more than small numbers² of bats will be impacted: the provision of at least one feature, suitable for the species concerned (e.g. a bat box/tile/brick/crevice) per roost and species to be impacted is considered appropriate.</p> <p>Post development monitoring: Where compensation and/or mitigation features are provided, one inspection by the Joint Licensee and/or the Earned Recognition Consultant, occurring immediately post-development to ensure the compensation/mitigation feature is completed in accordance with the authorised Site Registration.</p>	<p>Dedicated bat space to be incorporated into design and implemented in phases:</p> <p>Phase 1: Building A Install 2 x Schwegler 1GS Brick Bat Roosts & 2 x Schwegler 27 Brick Bat Boxes, or similar.</p> <p>Phase 2: On commencement of Building E Install 1 x Schwegler 1GS Brick Bat Roost</p> <p>Phase 3: Building C Install 2 Schwegler 27 Brick Bat Boxes, or similar. Incorporate 4 x lifted bat slates into roof of Building C</p> <p>Re-roofing of building with hessian backed 1F bituminous felt</p>
Roost 2 (day roost)	Common pipistrelle	2	Building E: Cladding on Building E's southern gable wall		
Roost 3 (day roost)	Common pipistrelle	2	Building E: Verge of Building E's northern gable wall connected to a beam on the inside		
Roost 4 (day roost)	Unidentified bat (likely to be common pipistrelle or brown long-eared)	1	Building E: Verge of Building E's northern gable wall, unidentified bat		
Roost 8	Soprano pipistrelle	1	Building E: no specific point		
Satellite Roost (e.g., Roost 6)	Brown long-eared	3	Building E: Verge of Building E's northern gable wall, but other roosting points also likely.	<p>Satellite Roost</p> <p>Satellite roosts (i.e. alternative roosts found in close proximity to the main nursery colony) should be considered with the associated main colony.</p> <p>The provision of one feature, suitable for the species concerned (e.g. a bat box/tile/brick/crevice) per roost to be impacted. For BLE: Ideally retain access to the original roost (maintaining the same conditions) however it may be acceptable to replace this type of roost qualitatively rather than quantitatively should it be demonstrated there is no suitable alternative to the proposal.</p> <p>Post development monitoring: One inspection occurring immediately post-development to ensure the compensation/mitigation feature is completed in accordance with the authorised Site Registration.</p>	<p>Dedicated bat space to be incorporated into design and implemented in phases:</p> <p>Phase 1: On commencement of Building A Construct thermalite wall to apex, install two 1FF bat boxes, create 300mm x 150mm opening to door to allow bats to fly into space</p> <p>Phase 2: On commencement of Building E Construct division between ground floor and roof void with 400mm open access. Add 2 x IFF bat boxes to ground floor cool room.</p> <p>Re-roofing of building with hessian backed 1F bituminous felt</p>

Table 10: Roosts and suggested mitigation for Building C.

Roost	Species	Peak Count	Building ID	ER Guidance	Suggested mitigation (Appendices 4 & 5)
Roost 5 (day roost)	Common pipistrelle	3	Building C: Three roof tiles on the eastern and northern aspect of Building C (three access points)	<p>Feeding Roost¹, Night Roost, Day Roost, Transitional Roost</p> <p>Where more than 3 species AND/OR more than 3 roosts will be impacted, OR where more than small numbers² of bats will be impacted: the provision of at least one feature, suitable for the species concerned (e.g. a bat box/tile/brick/crevice) per roost and species to be impacted is considered appropriate.</p> <p>Post development monitoring: Where compensation and/or mitigation features are provided, one inspection by the Joint Licensee and/or the Earned Recognition Consultant, occurring immediately post-development to ensure the compensation/mitigation feature is completed in accordance with the authorised Site Registration</p>	<p>Dedicated bat space to be incorporated into design and implemented in phases:</p> <p>Phase 1: Building A Install 2 x Schwegler 1GS Brick Bat Roosts & 2 x Schwegler 27 Brick Bat Boxes, or similar.</p> <p>Phase 2: On commencement of Building E Install 1 x Schwegler 1GS Brick Bat Roost</p> <p>Phase 3: Building C Install 2 Schwegler 27 Brick Bat Boxes, or similar. Incorporate 4 x lifted bat slates into roof of Building C</p> <p>Re-roofing of building with hessian backed 1F bituminous felt</p>

- 8.10 Any changes in the bat use of the building will require a full review of the impacts, and potentially a revision to the proposals and any granted A13 licence. This could cause additional time delays and costs to the proposed works.
- 8.11 Where protected species are unexpectedly encountered on or near to the site (i.e., species other than bats, bats not included in the granted licence, bats are encountered in the absence of a licenced ecologist), works are to cease, and the advice of a professional ecologist sought to allow a reassessment of impacts and appropriate advice to be given.
- 8.12 There must be no additional lighting on site that will spill artificial light onto any new or existing bat roost habitat (e.g., bat access points, roosts) or habitats of ecological value (woodland to the north of the site, surrounding fields etc.). Published guidance on the use of lighting in relation to bats (Institute of Lighting Professionals and the Bat Conservation Trust, 2023) should be used to guide any necessary lighting for health and safety purposes, such as:
- All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used.
 - LED luminaires to be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
 - A warm white spectrum (ideally <2700 Kelvin) to be adopted to reduce blue light component.
 - Luminaires to feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2013).
 - Internal luminaires can be recessed (as opposed to using a pendant fitting) where installed in proximity to windows to reduce glare and light spill.
 - Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges.
 - Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards.
 - Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered.
 - Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt.
 - Where appropriate, external security lighting should be set on motion-sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1- or 2-minute timer is likely to be appropriate.
 - Use of a Central Management System (CMS) with additional web-enabled devices to light on demand.

- Use of motion sensors for local authority street lighting may not be feasible unless the authority has the potential for smart metering through a CMS.
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites. Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues.
- Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely.

8.13 To ensure that active birds' nests are not damaged or destroyed during the works, it is advised that any vegetation clearance and works on the buildings are started during the autumn months (i.e., September-mid-October) when birds are least likely to be nesting. Works undertaken outside of this period will require a nesting bird check to be conducted by a suitably experienced ecologist no more than 24 hours prior to works starting. If active nests are observed, all works within the vicinity must cease and an appropriate safe zone around the nest established until the young have been verified to have fledged by the ecologist.

Age of Survey Data

8.14 It is accepted that ecological surveys have a limited period of validity due to changing habitats and the transient behaviours of some UK wildlife species. Delays on the progression of the project beyond 12-18 months will require the surveys to be repeated (CIEEM, 2019).

9. References and Further Reading

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<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=178>

Stone, E. L. (2013). Bats and lighting: Overview of current evidence and mitigation.

Appendix 1. Site location.



Appendix 2. Bat emergence surveys summary plans.







Appendix 3. Summary of remote bat detector recordings.

The quantity of recordings does not necessarily indicate levels of bat activity, as other noises may also be recorded. Most calls (barbastelle, *Myotis* sp., 'NSL' and long-eared bat) verified for accuracy.

Location	ID	Recording period	No. of recordings	Detection probability	Barbastelle	<i>Myotis</i> sp.	'NSL'	Long-eared bat	Common pipistrelle	Soprano pipistrelle
					>0.8	>0.5	>0.9	>0.5	>0.9	>0.9
<i>Dusk Survey 1, 10/07/2023.</i>										
North of Main House (externally)	888	10/07/20 20:53 to 23:05	1	No. of calls	0	0	0	0	0	0
Inside Building A	894	10/07/20 20:53 to 23:02	67	No. of calls	0	0	0	0	2	0
Inside Building C	895	10/07/20 20:53 to 23:05	13	No. of calls	0	0	0	0	1	0
Inside Building E	1025	10/07/20 20:53 to 23:05	29	No. of calls	0	0	0	0	0	0
<i>Dusk Survey 2, 10/08/2023.</i>										
Inside Building E (north end)	SM4-1	10/08/2023 19:48 to 22:28	293	No. of calls	0	0	1	27	263	25
Inside Building C	SM4-2	10/08/2023 19:44 to 22:18	50	No. of calls	0	2	1	1	37	4
Inside Building A	SM4-3	10/08/2023 19:47 to 22:22	181	No. of calls	0	1	14	5	142	1
Inside Building E (south end)	SM4-4	10/08/2023 19:53 to 22:29	357	No. of calls	0	0	4	39	334	2
<i>Dusk Survey 3, 23/08/2023.</i>										
Inside Building A	SM4-1	23/08/2023 19:12 to 21:39	311	No. of calls	0	0	0	32	289	1
Inside Building E	SM4-2	23/08/2023 19:17 to 21:48	92	No. of calls	0	1	0	3	75	11
Inside Building C	SM4-3	23/08/2023 19:16 to 21:49	13	No. of calls	0	0	1	0	5	0
South of Buildings A and E (externally)	SM4-4	23/08/2023 19:14 to 21:50	274	No. of calls	0	1	4	8	246	13

Appendix 4. Suggested mitigation for Buildings A and C.



4 x external SCHWEGLER 1GS BRICK BAT ROOST or similar on south east elevation

Common and soprano pipistrelle night roost compensation

Dedicated bat space to be incorporated into design and implemented in phases:

Phase 1: Building A

Install 2 x Schwegler 1GS Brick Bat Roosts & 2 x Schwegler 27 Brick Bat Boxes, or similar.

Phase 2: On commencement of Building E

Install 1 x Schwegler 1GS Brick Bat Roost

Phase 3: Building C

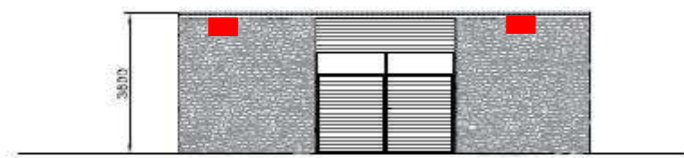
Install 2 Schwegler 27 Brick Bat Boxes, or similar.

Incorporate 4 x lifted bat slates into roof of building C

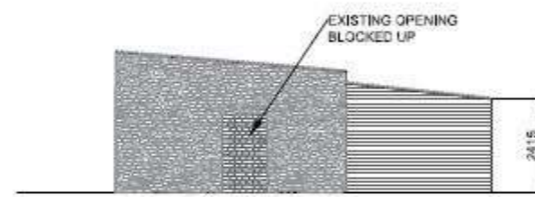
Re-roofing of building with hessian backed 1F bituminous felt



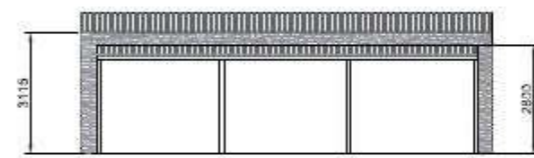
2 x external SCHWEGLER 27 BRICK BAT BOX or similar on south west elevation



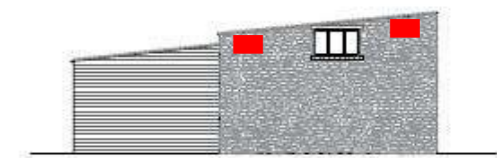
SOUTH EAST ELEVATION



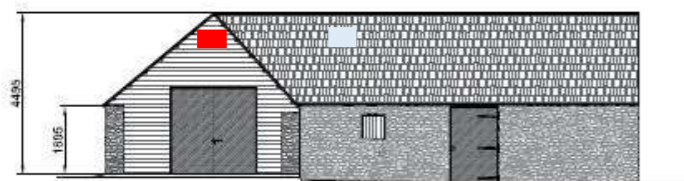
NORTH EAST ELEVATION



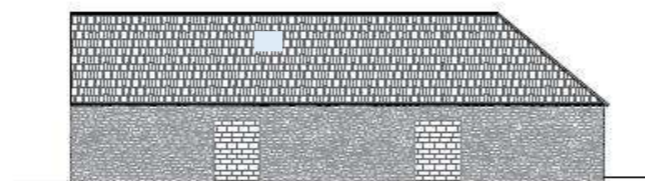
NORTH WEST ELEVATION



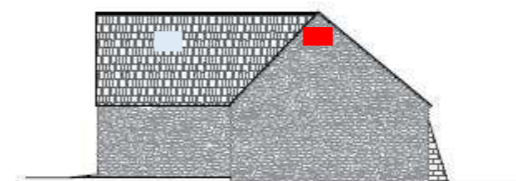
SOUTH WEST ELEVATION



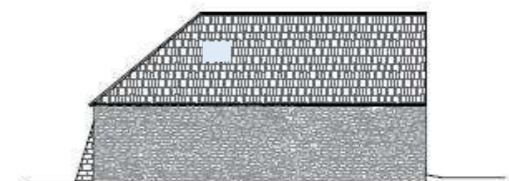
SOUTH WEST ELEVATION



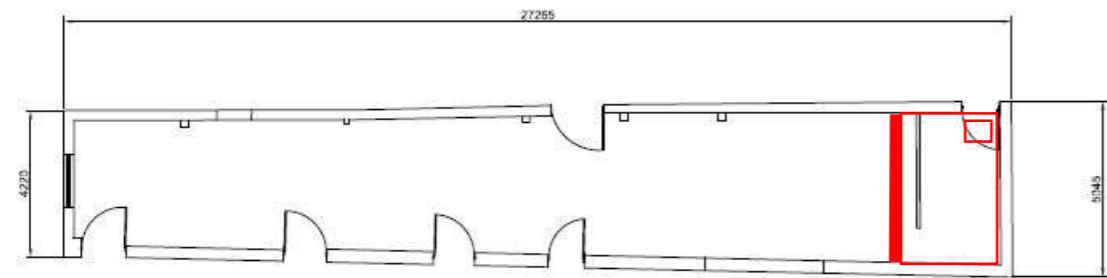
NORTH EAST ELEVATION



NORTH EAST ELEVATION



Appendix 5. Suggested mitigation for Buildings E.



FLOOR PLAN

Brown long-eared satellite roost compensation

Dedicated bat space to be incorporated into design and implemented in phases:

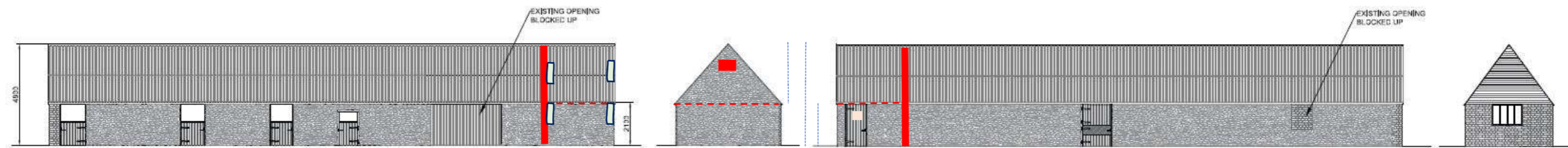
Phase 1: On commencement of Building A
Construct thermalite wall to apex, install two 1FF bat boxes, create 300mm x 150mm opening to door to allow bats to fly into space

Phase 2: On commencement of Building E
Construct division between ground floor and roof void with 400m open access. Add 2 x IFF bat boxes to ground floor cool room.

Re-roofing of building with hessian backed 1F bituminous felt



1 x external SCHWEGLER 1GS BRICK BAT ROOST or similar



North Gable End

BUILDING 2

Minimum dimensions 3000 x 5000 with 4900 height. In phase 2 divide space with false ceiling to give roof void height of 2800 and ground floor 'cool room' of 2100

FLOOR PLAN & ELEVATIONS

Scale 1:100



- NOTES:
1. Use written dimensions only. All dimensions to be checked on site and any discrepancies reported to ACORUS immediately. If in doubt ask.
 2. Where relevant, significant hazards have been identified on the drawing. Hazards which should be obvious to a competent contractor or unforeseeable have not been identified.
 3. This drawing is confidential and remains the exclusive property of ACORUS.
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Rev	Date	Description	Drawn	Checked

PROJECT
BLAYNEY
LOVELWOOD FARM, TOWCESTER ROAD
LILLINGSTONE LOVELL, MK18 5AZ

TITLE
EXISTING BUILDING 2
FLOOR PLAN AND ELEVATIONS

SCALE: AS SHOWN @ A1 03/23 CF SR

BLF/BB23/01 100_03

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