

Munden Parva, Dane End, Hertfordshire

Bat survey and
assessment

Cousins & Cousins

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1. Summary

- 1.1.1** Cousins & Cousins, on behalf of their client, propose to alter a property known as Munden Parva, located within the Munden Parva estate near Dane End in Hertfordshire. The proposals include the removal of an existing dropped ceiling within the orangery to expose the original vaulted ceiling, alterations to the layout of the second floor and re-pointing external brickwork. It is understood that applications for planning and listed building consent for the proposed development will be submitted to East Herts District Council in due course.
- 1.1.2** The Ecology Partnership undertook a Preliminary Ecological Appraisal (PEA) of the Munden Parva estate in January 2022¹. A total of four bat roosts (two common pipistrelle roosts and two brown long-eared roosts) were identified within four separate loft voids during an inspection of the property. Three bat emergence surveys were recommended to inform works to the property.
- 1.1.3** Babec Ecological Consultants were commissioned in April 2023 to undertake three emergence surveys of the property and provide a report detailing the findings. The aim was to characterise known bat roosts at the property, determine the presence or likely absence of further bat roosts and assess the likely impact of the proposed development on roosting bats. The objective was to provide recommendations for mitigation to allow the proposed development to proceed in accordance with the relevant legislation and planning policy relating to roosting bats.
- 1.1.4** The property was subject to a suite of emergence and return to roost surveys in June, July and August 2023 following the methods set out in the Third Edition of the Bat Conservation Trust's good practice guidelines² and interim night vision aid guidance note³. All surveys were undertaken by appropriately experienced ecologists during optimal or suitable weather conditions at an optimal time of year. No significant limitations to the surveys were noted.
- 1.1.5** The results of the surveys indicate the presence of two brown long-eared day roosts (Roost A and Roost D), two common pipistrelle maternity roosts (Roost B and Roost E) and a common pipistrelle day roost (Roost C). All day roosts are of low conservation value, whereas the common pipistrelle maternity roosts are of moderate conservation value⁴. Given that brown long-eared bat and common pipistrelle are known to roost within buildings over winter, the presence of hibernation roosts of these species cannot be ruled out.
- 1.1.6** All species of bat and their roosts are strictly protected by legislation and policy, principally through the Conservation of Habitats and Species Regulations 2017 (as amended). Whilst most bat roosts are to be retained, without mitigation and licensing the proposed development would contravene legislation and planning policy relating to bats. This is because the proposed development would result in the loss of a brown long-eared day roost (Roost D) and could result in significant disturbance to two common pipistrelle maternity roosts (Roost B and Roost E). Without mitigation, there is also potential for roost access points to be obstructed and individual bats to be harmed during the works.
- 1.1.7** However, using established mitigation techniques⁵, it should be possible to avoid harm to individual bats and maintain the population of bats at a favourable conservation status.

1 The Ecology Partnership (2022). *Preliminary Ecological Appraisal | Munden Parva, Hertfordshire*. Report dated February 2022.

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

3 Bat Conservation Trust (2022). *Interim Guidance Note: Use of night vision aids for bat emergence surveys and further comment on dawn surveys*. Available at www.bats.org.uk.

4 Mitchell-Jones (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.

5 Mitchell-Jones (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.

- 1.1.8** A suite of appropriate avoidance and mitigation measures have been provided in Section 6 of this report. Providing these measures are fully adopted, the proposed development should be compliant with the relevant legislation and planning policy relating to roosting bats.
- 1.1.9** Central government policy also encourages the incorporation of ecological enhancements into development proposals. Further detail on the ecological enhancements for bats outlined in the Preliminary Ecological Appraisal is also provided in Section 6.

2. Introduction

2.1 Development background

- 2.1.1** Cousins & Cousins, on behalf of their client, propose to alter a property known as Munden Parva, located within the Munden Parva estate near Dane End in Hertfordshire. The proposals include:
- The removal of an existing dropped ceiling within the orangery to expose the original vaulted ceiling up to the level of existing tie beams.
 - The removal of two windows and an area of brickwork on the south-west elevation of the orangery to facilitate the insertion of French doors, and
 - Alterations to the layout of the second floor.
- 2.1.2** External brickwork on the property is currently being re-pointed, with works to date concentrating on the south-eastern and south-western elevations of the main section of the property.
- 2.1.3** The proposals described above are hereafter referred to as ‘the proposed development’.
- 2.1.4** Munden Parva is located north-west of the hamlet of Dane End in the District of East Hertfordshire (grid reference TL324221), see Figure 1 in Appendix A.

2.2 Ecology and planning background

- 2.2.1** The Ecology Partnership undertook a Preliminary Ecological Appraisal (PEA) of the Munden Parva estate on 27 January 2022 to inform proposals for the construction of a new gym/yoga studio with natural swimming pool⁶. The PEA included a desk study, phase 1 habitat survey of the property and grounds, and internal and external inspection of the property for bats. Applications for planning and listed building consent for these proposals was submitted to East Herts District Council in February 2023 (EHDC refs 3/23/0205/HH and 3/23/0206/LBC) and are currently under review.
- 2.2.2** Records of brown long-eared bat, Natterer’s bat, Daubenton’s bat and common pipistrelle were identified within 2km of the site during the desk study. During the building inspection, the property was found to comprise a three-storey residential dwelling with a complex pitched roof clad with slate tiles. Potential roosting features recorded at the property included lifted lead flashing and gaps between soffits and walls.
- 2.2.3** A total of four bat roosts and four loft voids were identified at the property during the inspection (see Figure 2 in Appendix A). Loft void 1 comprises a large void with a number of brown long-eared bat droppings scattered throughout (Roost A)⁷. Loft voids 2 and 3 are smaller and incorporate low numbers of common pipistrelle droppings (Roost B and Roost C, respectively). Loft void 4 is a large, long void incorporating a lower number of scattered brown long-eared droppings (Roost D).
- 2.2.4** Given the presence of four bat roosts, three bat emergence surveys were recommended to inform any future works to the property. It was also recommended that bat boxes should be hung on mature trees or buildings around the site to create new roosting opportunities for bats.
- 2.2.5** It is understood that separate applications for planning and listed building consent for the proposed development is to be submitted to East Herts District Council in due course.

⁶ The Ecology Partnership (2022). *Preliminary Ecological Appraisal | Munden Parva, Hertfordshire*. Report dated February 2022.

⁷ It should be noted that bat droppings from void 1 were reported as common pipistrelle and bat droppings from void 2 were reported as brown long-eared in the Ecology Partnership PEA. However, these samples have been confirmed by the surveyor to have been reported incorrectly (Jon Bannon, personal communication with Eddie Selwyn, 7 August 2023).

2.3 The brief and objectives

- 2.3.1** Babec Ecological Consultants were commissioned on 13 April 2023 to deploy tell-tales, undertake static monitoring for bats and undertake three emergence surveys of the property and provide a report detailing the findings. The deployment of tell-tales and static monitoring elements of the surveys was cancelled after survey visit 1 due to amendments to the development proposals resulting in significantly less impact on known bat roosts.
- 2.3.2** The aim of the surveys was to characterise known bat roosts at the property, determine the presence or likely absence of further bat roosts and assess the likely impact of the proposed development on roosting bats. The objective was to provide recommendations for mitigation to allow the proposed development to proceed in accordance with the relevant legislation and planning policy relating to roosting bats.

3. Methods

3.1 Personnel

3.1.1 Emergence surveys were undertaken by Jon Bannon BSc MSc MCIEEM, Alex Matthams BSc MSc ACIEEM, Charlotte Mallory BA, Alexi Lamoon BSc, Kristin Dillon BSc and Jasmine Whitmore BSc. Jon has over 13 years’ commercial experience in conducting emergence surveys, is a full member of the Chartered Institute for Ecology and Environmental Management (CIEEM) and holds a Natural England level 2 survey licence for bats (registration number 2015-11543-CLS-CLS). Alex has over six years’ commercial experience of conducting emergence surveys and is an associate member of CIEEM, while Charlotte, Alexi and Kristin each have over two years’ experience conducting emergence surveys. Jasmine has one season of experience in undertaking emergence surveys.

3.1.2 Tell tales were deployed and retrieved by Jon Bannon with assistance from Alex Matthams.

3.2 Emergence surveys

3.2.1 In the first instance, appropriate surveyor locations were selected to allow a good view of all potential access points for bats. During emergence surveys, surveyors watched potential access points for bats throughout.

3.2.2 All surveyors were equipped with full-spectrum Elekon Batlogger M bat detectors to detect and record bat echolocation calls, as well as night vision aids (NVAs) to aid in the detection of roosts. NVAs comprised Canon XA series video cameras equipped with infrared lamps, as detailed in Appendix B. Echolocation calls were subsequently analysed using Elekon Batexplorer software and night vision footage was reviewed, where considered necessary.

3.2.3 All emergence surveys commenced 15 minutes before sunset and ended 90 minutes after sunset. Weather conditions during each survey were recorded, including rain, wind strength, cloud cover and maximum and minimum temperatures. The dates and weather conditions recorded during each of the surveys are provided in Table 1.

Table 1. Dates of emergence surveys and weather conditions.

Visit No.	Surveyor locations	Date	Temp (°C)		Cloud cover (oktas)	Rain	Wind* (start – end)	Overall suitability for survey
			Min	Max				
1	4, 5, 6	12/06/2023	15.6	19.4	1	None	0-0	Optimal
	1, 2, 3	13/06/2023	11.0	17.7	0	None	0-0	Optimal
2	4, 5, 6	11/07/2023	15.4	17.5	8	^	1-2	Suitable
	1, 2, 3	12/07/2023	15.2	16.7	3	None	1-2	Optimal
3	4, 5, 6	31/07/2023	13.7	17.0	2	None	2-2	Optimal
	1, 2, 3	01/08/2023	16.5	17.8	7	None	1-1	Optimal

* Measured on the Beaufort scale

^ Light unforecast rain from 29 mins after sunset to 39 mins after sunset. Bats emerged from roost and bat activity throughout, so weather conditions considered suitable overall.

3.3 Tell-tales

3.3.1 Tell-tales (sheets of plastic measuring approximately 2m x 2m) were deployed within loft void 1, loft void 2 and loft void 3 of the main house on 12 June 2023, to assist in detecting evidence of

roosting bats. The tell tales were checked for fresh evidence of bats on 11 July 2023 before being removed on the same date. The location of the tell tales is shown in Figure 2 in Appendix A.

3.4 Limitations of survey methods

3.4.1 All emergence surveys were undertaken in optimal or suitable weather conditions in June, July and August which are considered to be optimal months for undertaking this type of survey and incorporate the bat maternity period. The level of further survey undertaken is in accordance with the minimum survey levels set out in the Third Edition of the Bat Conservation Trust's good practice guidelines⁸ and interim night vision aid guidance note⁹.

3.4.2 Tell tales were not deployed within loft void 4 of the main house due to safety concerns with access to this loft void.

3.4.3 It should be noted that whilst every effort has been made to provide a comprehensive assessment of the use of the property by roosting bats, no investigation can ensure the complete characterisation and prediction of the natural environment. The results of the surveys will also become less reliable as time progresses. As a general rule, the results of the surveys should not be relied upon after 18 months from the date of the third emergence survey visit.

⁸ Collins (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

⁹ Bat Conservation Trust (2022). *Interim Guidance Note: Use of night vision aids for bat emergence surveys and further comment on dawn surveys*. Available at www.bats.org.uk.

4. Results and interpretation

- 4.1.1** Bats were recorded emerging and returning to roost to several features on the property during survey visits 1, 2 and 3, as detailed in Table 2 and set out in Figures 3, 4 and 5 in Appendix A, respectively. Surveyor locations are shown on Figures 3, 4 and 5 in Appendix A and incidental records of bat activity recorded during the surveys are provided in Table 2.
- 4.1.2** The results of the surveys indicate the presence of two brown long-eared day roosts (Roost A and Roost D), two common pipistrelle maternity roosts (Roost B and Roost E) and a common pipistrelle day roost (Roost C). All day roosts are of low conservation value, whereas the common pipistrelle maternity roosts are of moderate conservation value¹⁰. Given that brown long-eared bat and common pipistrelle are known to roost within buildings over winter, the presence of hibernation roosts of these species cannot be ruled out. Our full interpretation of the results of the surveys is provided in Table 3.

¹⁰ Mitchell -Jones (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.

Table 2. Results of the emergence surveys.

Visit no	Fig no	Date	Surveyor locations	Results of the survey	Incidental records of bat activity
1	3	12/06/2023	4, 5, 6	<p>Roost B 76 common pipistrelles emerged from a gap in the eaves on the eastern elevation of the property from 17 mins after sunset.</p> <p>Roost C 2 Common pipistrelles emerged from a gap in the eaves on the northern elevation of the property at 1 minute before sunset and 16 minutes after sunset.</p>	High levels of activity from foraging and commuting common pipistrelles, including some social calling. Two passes of Myotis sp. and single passes of soprano pipistrelle and Nyctalus sp. were also recorded.
		13/06/2023	1, 2, 3	No roosts recorded	Low levels of activity from foraging and commuting common pipistrelles. Very low levels of activity from long-eared bats and a single pass of Myotis was also recorded.
2	4	11/07/2023	4, 5, 6	<p>Roost B 96 common pipistrelles emerged from a gap in the eaves on the eastern elevation of the property between 9 minutes and 55 minutes after sunset. Nine common pipistrelles returned to roost to the same feature between 32 minutes and 84 minutes after sunset.</p> <p>Roost C 2 Common pipistrelles emerged from a gap in the eaves on the northern elevation of the property at 14 and 21 minutes after sunset.</p>	High levels of activity from foraging and commuting common pipistrelles, and very low levels of activity from soprano pipistrelle and long-eared bats. A single pass of Nathusius' pipistrelle was also recorded.
		12/07/2023	1, 2, 3	No roosts recorded	Low to moderate levels of activity, predominantly from foraging and commuting common pipistrelles. Some activity from soprano pipistrelle also recorded, together with a single pass of a long-eared bat.
3	5	31/07/2023	4, 5, 6	<p>Roost E 11 common pipistrelles emerged from a gap between the soffit and wall on the northern elevation of the property from 17 minutes after sunset. 34 common pipistrelles emerged from an adjacent gap under a roof tile from 21 minutes after sunset. Two bats subsequently returned to the same feature at 70 and 86 minutes after sunset.</p>	High levels of activity from foraging and commuting common pipistrelles, including some social calling. Single passes of Serotine, soprano pipistrelle and Myotis sp. also recorded.
		01/08/2023	1, 2, 3	No roosts recorded	Low to moderate levels of activity, predominantly from foraging and commuting common pipistrelle. A few passes of soprano pipistrelle, Myotis sp. and long-eared also recorded.

Table 3. Interpretation of the results of the surveys.

Bat species	Roost number and description	Roosting location(s)	Access point(s)	Cons. status ¹¹	Interpretation of roost type and numbers of bats
Brown long-eared bat	Roost A A number of bat droppings were recorded scattered throughout loft void 1 during the internal inspection on 27 January 2022, with three concentrated piles along the north-east ridge. A sample of these droppings was subject to eDNA analysis and confirmed to be from brown long-eared bat. No fresh droppings were detected on the tell-tale deployed within loft void 1 between 12 June and 11 July 2023, and no brown long-eared bats emerged from loft void 1 during any of the emergence survey visits.	Location of bat droppings indicate that the roosting location is along the ridge beam.	Unknown, but considered most likely to be via gaps between brick walls and soffits.	Low	The results of the surveys indicate the presence of a brown long-eared day roost which is used infrequently by an individual or low numbers of bats. As brown long-eared bats are known to hibernate in buildings over winter, the presence of a hibernation roost of this species cannot be ruled out.
	Roost D A low number of bat droppings were recorded scattered throughout loft void 4 during the internal inspection on 27 January 2022. A sample of these droppings was subject to eDNA analysis and confirmed to be from brown long-eared bat. No brown long-eared bats emerged from loft void 4 during any of the emergence survey visits.	Unknown, but most likely roosting location is along the ridge beam.	Unknown, but considered most likely to be via gaps between brick walls and soffits.	Low	The results of the surveys indicate the presence of a brown long-eared day roost which is used infrequently by an individual or low numbers of bats. As brown long-eared bats are known to hibernate in buildings over winter, the presence of a hibernation roost of this species cannot be ruled out.
Common pipistrelle	Roost B A 'light smattering' of bat droppings were recorded within loft void 2 during the internal inspection on 27 January 2022. A sample of these droppings was subject to eDNA analysis and confirmed to be from common pipistrelle. No fresh droppings were detected on the tell-tale deployed within loft 2 between 12 June and 11 July 2023. However, approximately 30 pipistrelles were seen roosting near the soffit area of loft void 2 when the tell-tale was collected on 11 July 2023. 76 common pipistrelles emerged from Roost B during survey visit 1 on 12 June 2023. 96 common pipistrelles emerged from Roost B, and 9 common pipistrelles returned to Roost B during survey visit 2 on 11 July 2023. No common pipistrelles emerged or returned to Roost B during survey visit 3 on 31 July.	Within soffit area of loft void 2.	Gap between brick wall and soffit	Mod	The results of the surveys indicate the presence of a common pipistrelle maternity roost . Common pipistrelle maternity roosts consist almost exclusively of female bats, which each give birth to single young from early June to mid-July. Most maternity roosts tend to disperse soon after the young are weaned, meaning that maternity roosts are generally occupied between mid-May and August, although this sometimes extends into September. Common pipistrelles often move irregularly between several maternity roosts within a small area during this time, and as such, numbers at any one site can fluctuate markedly throughout the maternity period.

¹¹ Mitchell -Jones (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.

Bat species	Roost number and description	Roosting location(s)	Access point(s)	Cons. status ¹¹	Interpretation of roost type and numbers of bats
Common pipistrelle	<p>Roost C Low numbers of common pipistrelle bat droppings were recorded within loft void 3 during the internal inspection on 27 January 2022. A sample of these droppings was subject to eDNA analysis and confirmed to be from common pipistrelle.</p> <p>Approximately 25 fresh pipistrelle sized droppings were recorded on the tell-tale deployed within loft 3 between 12 June and 11 July 2023.</p> <p>2 common pipistrelles emerged from Roost C during survey visit 1 on 12 June 2023. 2 common pipistrelles also emerged from Roost C during survey visit 2 on 11 July 2023. No bats emerged from Roost C during survey visit 3 on 31 July 2023.</p>	Unknown, but most likely roosting location is suitable crevices in loft void 3.	Gap in the eaves	Low	<p>The results of the surveys indicate the presence of a common pipistrelle day roost which is used relatively regularly by low numbers of bats.</p> <p>As common pipistrelles are known to hibernate in buildings over winter, the presence of a hibernation roost of this species cannot be ruled out.</p>
	<p>Roost E 11 common pipistrelles emerged from a gap between the soffit and wall and 34 common pipistrelles emerged from an adjacent gap under a roof tile during survey visit 3 on 31 July 2023. Two bats also returned to the same feature.</p> <p>No common pipistrelles emerged from Roost E during survey visit 1 or survey visit 2 on 12 June and 11 July 2023, respectively.</p>	Unknown, but most likely roosting location is in soffit and/or in crevice under roof tiles.	Two access points are present (gap between soffit and wall, and gap under adjacent roof tile).	Mod	<p>The results of the surveys indicate the presence of a second common pipistrelle maternity roost.</p> <p>Common pipistrelles often move irregularly between several maternity roosts within a small area during the maternity period, and as such, numbers at any one site can fluctuate markedly throughout this time.</p>

5. Assessment

5.1.1 All species of bat and their roosts are protected by the Conservation of Habitats and Species Regulations, 2017 (as amended) and the Wildlife and Countryside Act, 1981 (as amended). Taken together, these make it an offence to:

- Deliberately capture, injure or kill a bat.
- Deliberately disturb a bat in such a way as to be likely to:
 - Impair its ability to survive, to breed or reproduce, or to rear or nurture its young.
 - Impair its ability to hibernate or migrate.
 - Affect significantly the local distribution or abundance of the species to which they belong.
- Damage or destroy a breeding site or resting place of a bat.
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead bat, or any part of, or anything derived from a bat.
- Disturb a roosting bat or obstruct access to a roost or place of shelter.

5.1.2 Development affecting bats and their roosts is also subject to a licensing procedure administered by Natural England.

5.1.3 In addition to the above legislation, the government circular 06/2005¹² states that the presence of protected species is a material consideration in the planning process. The National Planning Policy Framework¹³ also states that *'When determining planning applications, local authorities should apply the following principles: a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or as a last resort, compensated for, then planning permission should be refused'*. Brown long-eared bat is also Species of Principal Importance under the Natural Environment and Rural Communities (NERC) Act 2006, which places a duty on East Hertfordshire District Council to have regard for this species when determining the planning application.

5.1.4 Without mitigation and licensing the proposed development would contravene the legislation and planning policy set out above. This is because the proposed development would result in the loss of a brown long-eared day roost (Roost D) and could result in significant disturbance to two common pipistrelle maternity roosts (Roost B and Roost E). Without mitigation, there is also potential for roost access points to be obstructed and individual bats to be harmed during the works.

5.1.5 However, using established mitigation techniques¹⁴, it should be possible to avoid harm to individual bats and maintain the population of bats at a favourable conservation status. A suite of appropriate avoidance and mitigation measures have been provided in Section 6 of this report. Providing these measures are fully adopted, the development should be compliant with the above legislation and planning policy relating to roosting bats.

5.1.6 Central government policy also encourages the incorporation of ecological enhancements into development proposals. For example, Paragraph 180d of the National Planning Policy Framework

¹² Office of the deputy prime minister (ODPM). *Government circular 06/2005: Biodiversity and geological conservation*.

¹³ Ministry of Housing, Communities and Local Government (2021). *National Planning Policy Framework*. As revised on 20 July 2021.

¹⁴ Mitchell-Jones (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.

(2021) states that '*... opportunities to improve biodiversity in and around developments should be integrated as part of their design...*'. Appropriate ecological enhancements have been outlined in the Preliminary Ecological Appraisal (PEA)¹⁵ and further detail is provided in Section 6.

¹⁵ The Ecology Partnership (2022). *Preliminary Ecological Appraisal | Munden Parva, Hertfordshire*. Report dated February 2022.

6. Recommendations

6.1 Works that may be undertaken outside of a Natural England bat licence

- 6.1.1** It should be possible to undertake elements of the works without the need for licensing, providing the following avoidance measures are adhered to.
- 6.1.2** If there is any doubt as to whether works would be likely to affect roosting bats, then a licensed bat worker must be consulted. In the unlikely event that a bat is discovered during the works, then works should cease until a licensed bat worker can be consulted to determine an appropriate course of action.
- 6.1.3** **It should be noted that carrying out the works specified below other than in accordance with the above avoidance measures could result in an offence being committed.**

Re-pointing external brickwork

- 6.1.4** The following avoidance measures will be adopted during the remaining re-pointing of the external brickwork:
- Remaining re-pointing should not be undertaken during the bat hibernation or maternity roost periods, as this is when bats are most vulnerable to harm and disturbance. Therefore, all remaining re-pointing should only be undertaken between 1 October and 31 October (Autumn period), or between 15 March and 15 May (Spring period).
 - All contractors will be given a toolbox talk by a licensed bat worker prior to the commencement of any further re-pointing. The toolbox talk will include a discussion of the presence of bat roosts in close proximity to the works, the location of the roosts, the protection afforded to bats, what to do if a bat is found and a suitable working approach.
 - All existing gaps between soffits and walls must be retained as part of the re-pointing works.
 - Care must be taken not to temporarily block or obstruct access (i.e. by installing sheeting or scaffolding) to any known bat access points during the re-pointing.

Removal of windows and insertion of French doors

- 6.1.5** The following avoidance measures will be adopted during the removal of the windows and section of brickwork within the orangery, and the insertion of French doors:
- Due to the presence of a nearby common pipistrelle maternity roost (i.e. Roost E) and the potential presence of hibernating bats, the removal of the windows and brickwork, and the insertion of French doors should not be undertaken during the bat hibernation or maternity roost periods, as this is when bats are most vulnerable to harm and disturbance. Therefore, these works should only be undertaken between 1 October and 31 October (Autumn period), or between 15 March and 15 May (Spring period).

Alterations to the layout of the second floor

- 6.1.6** The following avoidance measures will be adopted during the alterations to the second floor:
- As brown long-eared bats are known to hibernate within roof voids over winter, no works (including but not limited to electrical or plumbing installations) may take place within roof void 1 (as illustrated on Figure 2 in Appendix A) during the bat hibernation period. i.e. no works can be undertaken within loft void 1 between 1 November and 15 March. Any works

undertaken within roof void 1 should be carefully planned to be undertaken over as few days as possible and causing the least amount of disturbance by vibration, noise and light. Furthermore, a licensed bat worker should be consulted during each occasion works are required within the roof to determine if supervision will be required.

- Should it be necessary to enter loft void 2 to facilitate the alterations to the layout of the second floor, then this must be done outside of the bat hibernation and maternity roost periods i.e. only between 1 October and 31 October (Autumn period), or between 15 March and 15 May (Spring period). Any works within loft void 2 should be carefully planned to be undertaken causing the least amount of disturbance by noise and light. Furthermore, any works undertaken within loft void 2 must be supervised by a licensed bat worker.

External lighting

- 6.1.7** Any external lighting that is required in the proximity of the renovated property will be located below roof level and will point away from any known access points for bats.

6.2 Works to be undertaken under a Natural England bat licence

- 6.2.1** Once planning and listed building consent for the proposed development have been granted, it will be necessary to gain a bat mitigation licence from Natural England to allow the remaining works to the property to lawfully proceed. Licence applications for developments affecting bats are subject to very close scrutiny and must satisfy regulations set out in the Conservation of Habitats and Species Regulations, 2017 (as amended) that:

- The actions are essential for '*imperative reasons of overriding public interest*',
- '*There is no satisfactory alternative*', and
- '*The action authorised will not be detrimental to the maintenance of the population of the species conserved at a favourable conservation status in their natural range*'.

- 6.2.2** The licence application must demonstrate compliance with these regulations and licensable works to the property may only commence upon receipt of a bat mitigation licence from Natural England and must only be undertaken in strict accordance with the licence.

- 6.2.3** To avoid harm to individual bats and maintain the population of bats at a favourable conservation status, the mitigation measures detailed below will need to be adopted and incorporated into an application for a bat mitigation licence.

Removal of dropped ceiling within orangery

- 6.2.4** The following mitigation measures will be adopted during the removal of the dropped ceiling within the orangery, which will result in the loss of a brown long-eared day roost (Roost D):

- An alternative roosting opportunity will be provided for brown long-eared bats prior to the demolition of this section of the building. This will be achieved by installing one improved cavity bat box, or a bat box of similar specification on a suitable nearby tree. Where possible, the bat box will be installed facing south or west at least 3m from ground level with the entrance free from obstruction and not lit by external lighting.
- Due to the presence of a nearby common pipistrelle maternity roost (Roost E) and the potential presence of hibernating bats, the removal of the dropped ceiling within the orangery should not be undertaken during the bat hibernation or maternity roost periods, as this is when bats are most vulnerable to harm and disturbance. Therefore, these works should only be undertaken between 1 October and 31 October (Autumn period), or

between 15 March and 15 May (Spring period). The dropped ceiling will only be removed in suitable weather conditions (no heavy rain or high winds) and once overnight temperatures have been above 8°C for at least three consecutive nights.

- All contractors will be given a toolbox talk by the named ecologist or an accredited agent on the bat mitigation licence prior to the removal of the dropped ceiling. The toolbox talk will include a discussion of the presence of bat roosts, the location of the roosts, the protection afforded to bats, what to do if a bat is found and a suitable working approach.
- If possible and safe to do so, the named ecologist or an accredited agent will check loft void 4 for bats prior to any works commencing. If possible, any bats present will be captured by hand and moved into the newly installed tree mounted bat box.
- The named ecologist or an accredited agent will supervise the careful removal of the dropped ceiling. If necessary, any bats encountered at this stage will be captured by hand or hand-held net and placed into the newly installed tree mounted bat box.
- Given that Roost D comprises an infrequently used brown long-eared day roost, and the property incorporates a separate loft void suitable for brown long-eared bats which is to be retained (loft 1), it is not considered necessary to provide compensation for the loss of Roost D.

External lighting

- 6.2.5** Any external lighting that is required in the proximity of the renovated property will be located below roof level and will point away from any known access points for bats.

Monitoring

- 6.2.6** Given that the works will only result in the loss of a brown long-eared day roost (Roost D), post-development monitoring is not considered necessary.

6.3 Ecological enhancements

- 6.3.1** As outlined in the Preliminary Ecological Appraisal (PEA)¹⁶, at least two additional bat boxes should be hung on buildings or mature trees around the Munden Parva estate to create new roosting opportunities for bats within the site. This should comprise one improved crevice bat box and one improved cavity bat box, or bat boxes of similar specifications. Where possible, bat boxes should be installed facing south or west at least 3m from ground level with the entrance free from obstruction and not lit by external lighting.

¹⁶ The Ecology Partnership (2022). *Preliminary Ecological Appraisal | Munden Parva, Hertfordshire*. Report dated February 2022.

Appendix A | Figures

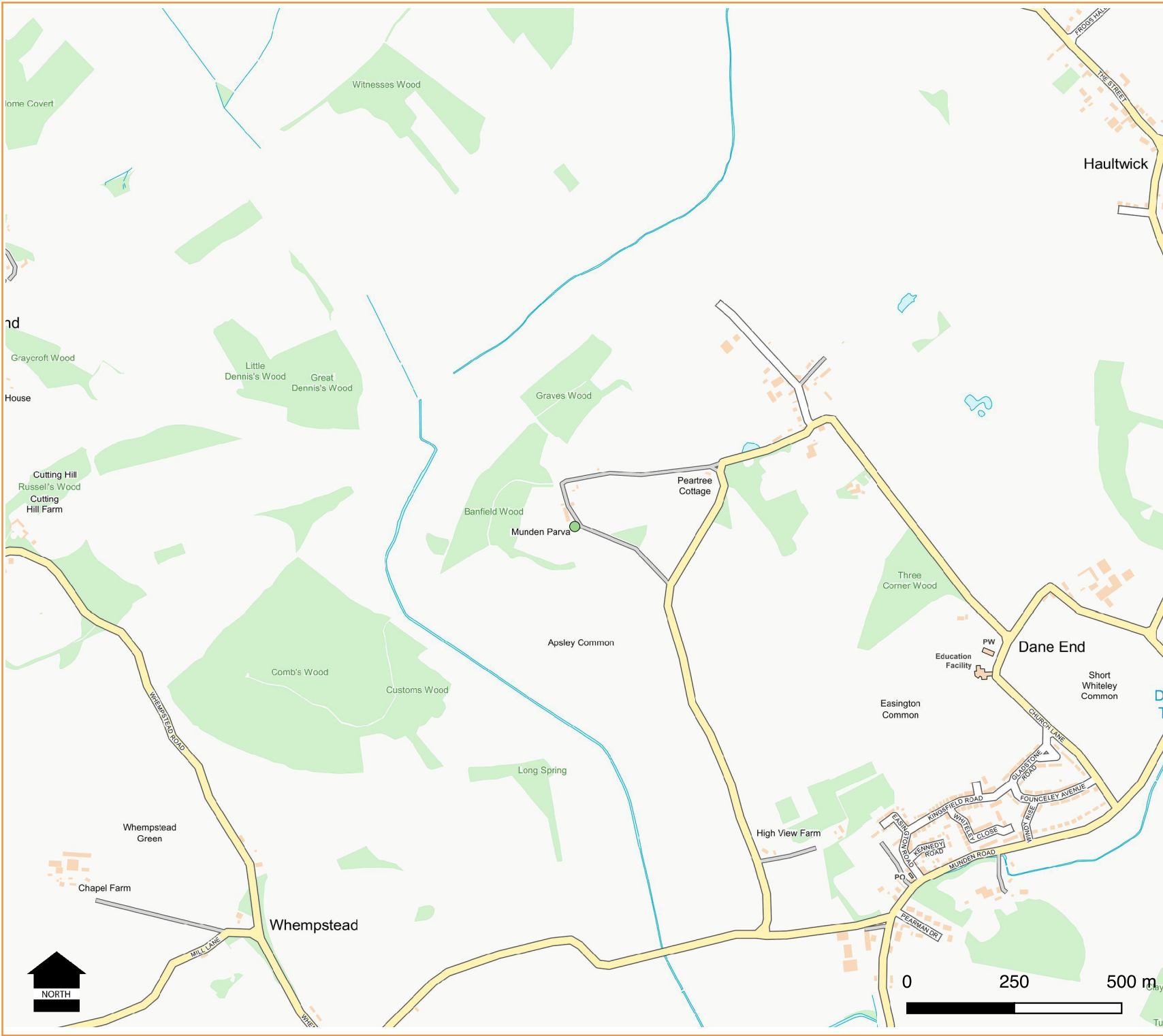


Figure 1.
Property location

Legend

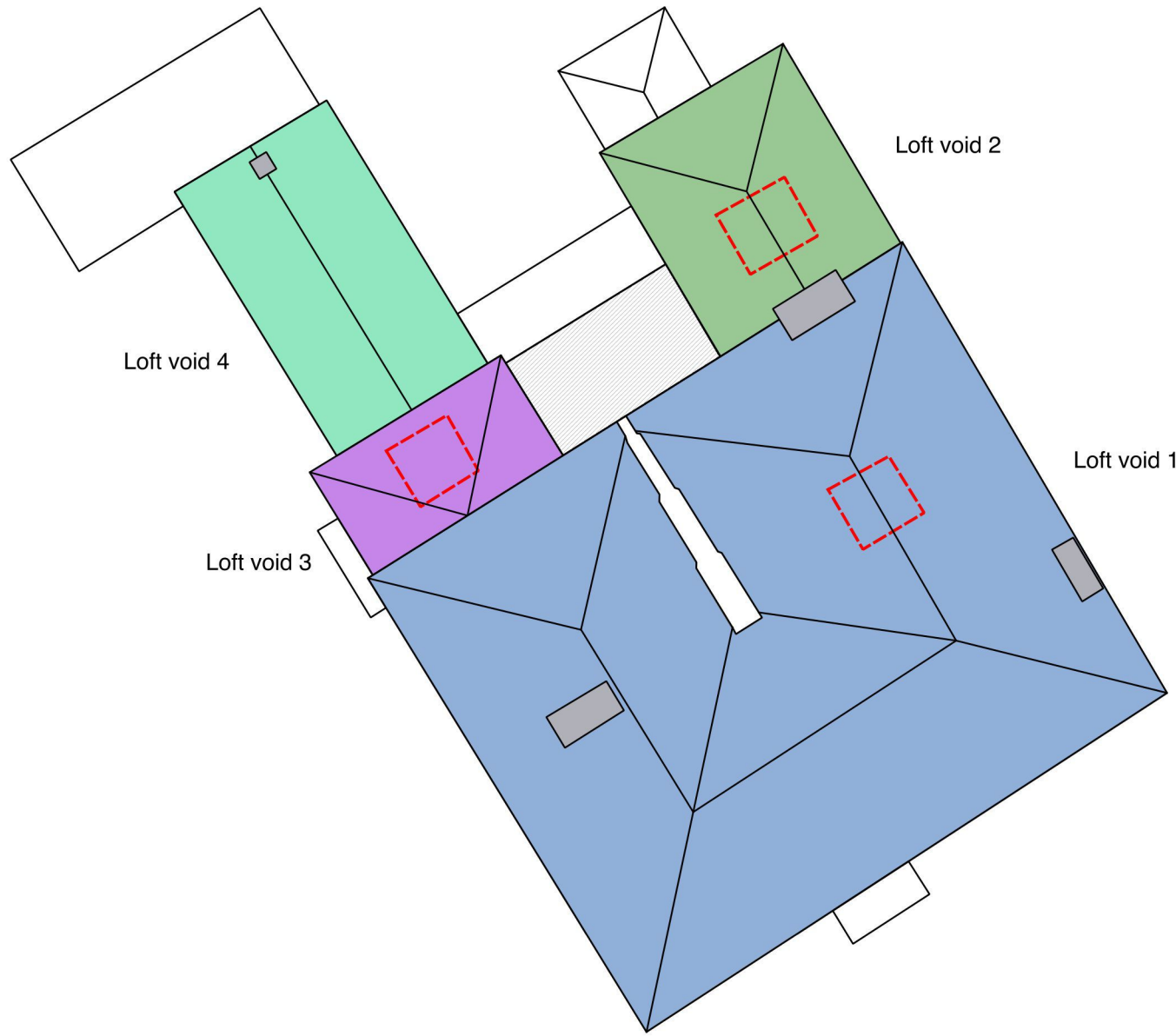
- Location of the property

Date of survey	N/A	
Date of issue	25 August 2023	
Job reference	COU101	
Drawn by	JB	Checked by TB
Status	Final	




Figure 2.

Location of loft voids and tell tales



Legend

 Location of tell tales

Loft voids

 Loft void 1

 Loft void 2

 Loft void 3

 Loft void 4

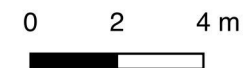
Date of survey N/A

Date of issue 25 August 2023

Job reference COU101

Drawn by JB Checked by TB

Status Final





Roost C | 2 Common pipistrelles emerged from a gap in the eaves on the northern elevation of the property.



Roost B | 76 common pipistrelles emerged from a gap in the eaves on the eastern elevation of the property.

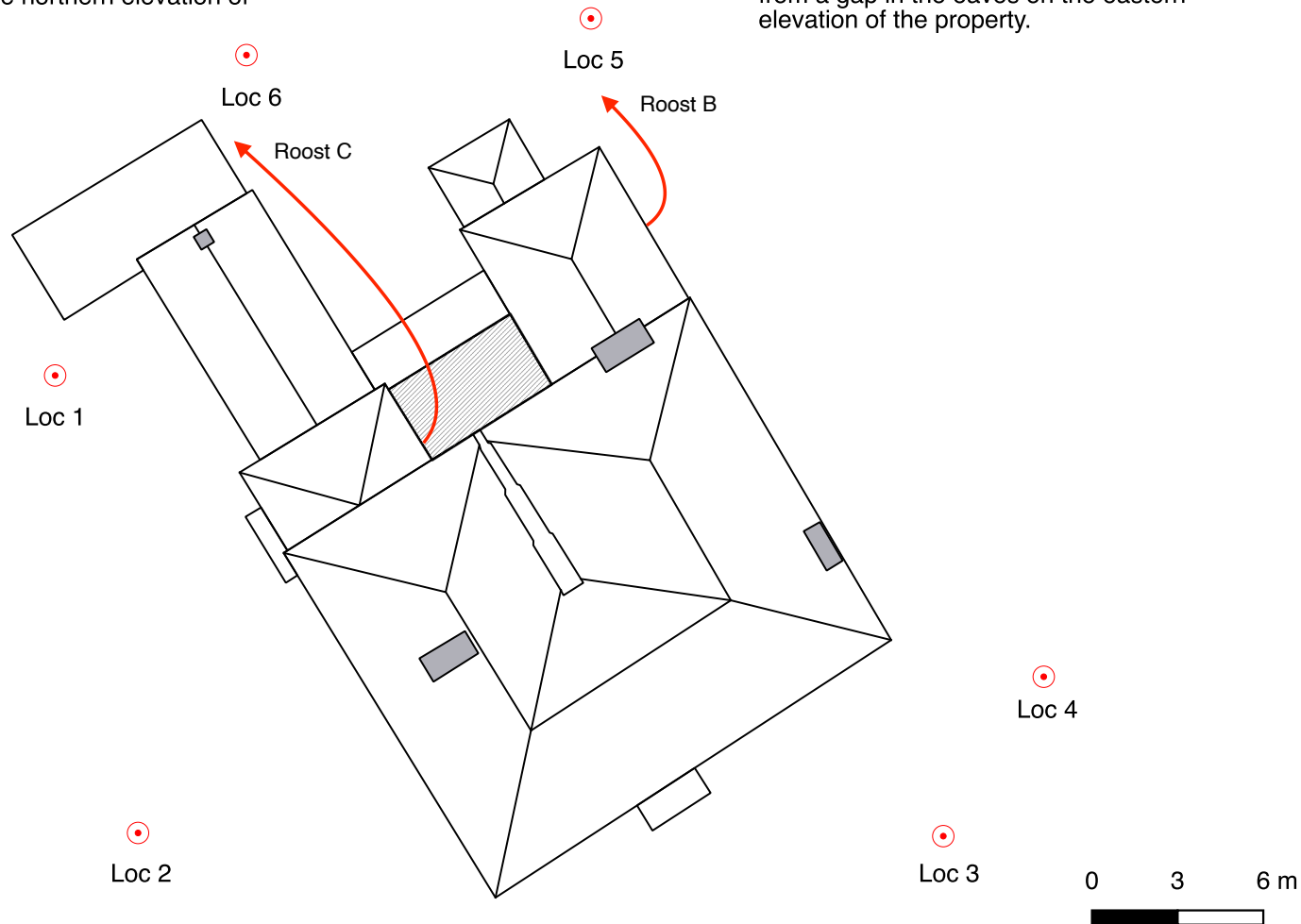


Figure 3.
Results of survey visit 1

Legend

- ⊙ Surveyor location
- ↪ Common pipistrelle emergence

Date of survey 12 & 13 June 2023

Date of issue 25 August 2023

Job reference COU101

Drawn by JB Checked by TB

Status Final





Roost C | 2 Common pipistrelles emerged from a gap in the eaves on the northern elevation of the property.



Roost B | 96 common pipistrelles emerged from a gap in the eaves on the eastern elevation of the property. Nine common pipistrelles returned to roost to the same feature.

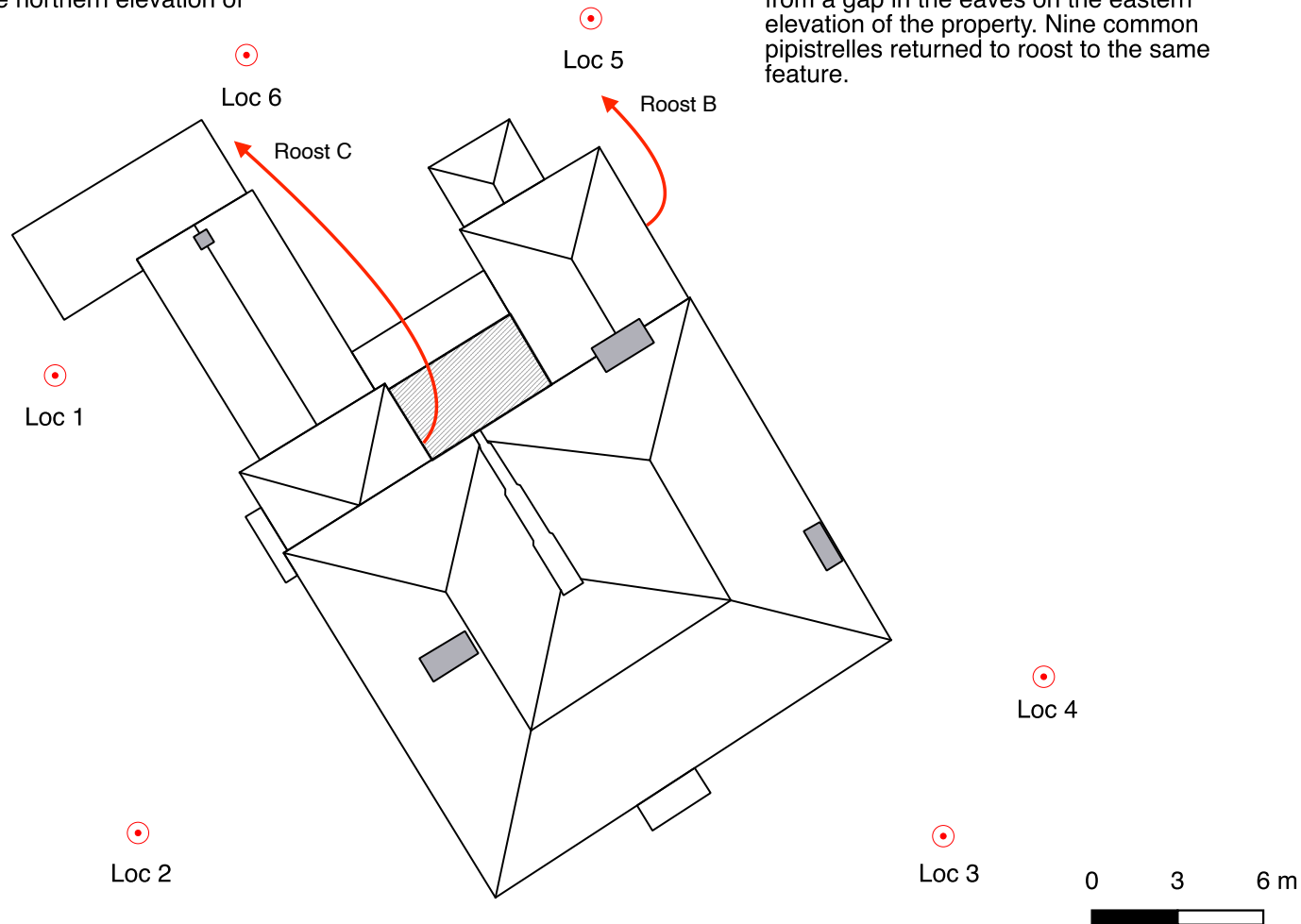




Figure 4.
Results of survey visit 2

Legend

-  Surveyor location
-  Common pipistrelle emergence / return to roost

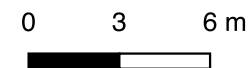
Date of survey 11 & 12 July 2023

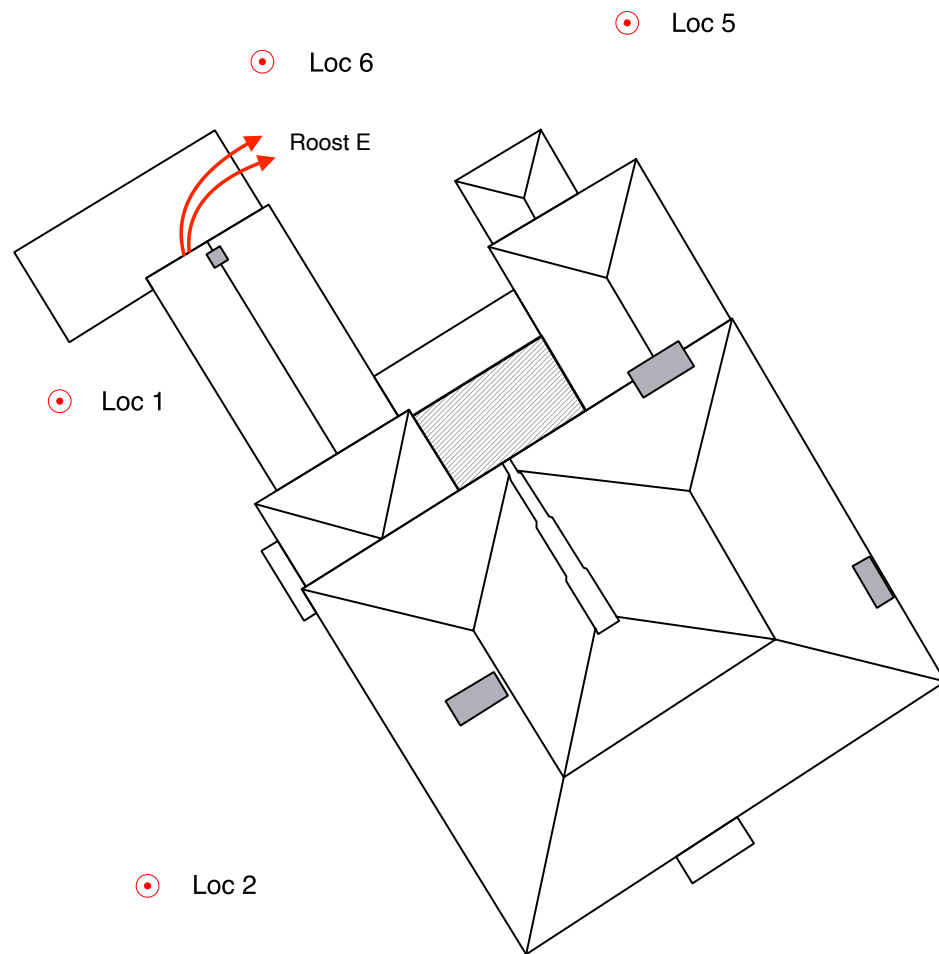
Date of issue 25 August 2023

Job reference COU101

Drawn by JB Checked by TB

Status Final







Roost E | 11 common pipistrelles emerged from a gap between the soffit and wall on the northern elevation of the property. 34 common pipistrelles emerged from an adjacent gap under a roof tile. Two bats subsequently returned to the same feature.

Figure 5.
Results of survey visit 3

Legend

-  Surveyor location
-  Common pipistrelle emergence / return to roost

Date of survey 31 July & 1 August 2023

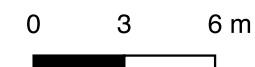
Date of issue 25 August 2023

Job reference COU101

Drawn by JB

Checked by TB

Status Final



Appendix B | Use of Night Vision Aids (NVAs)

In accordance with Bat Conservation Trust’s interim guidance note¹⁷ on the use of night vision aids (NVAs), NVAs were used at each surveyor location on each survey visit unless stipulated in the survey limitations. NVAs comprised a Canon XA series video camera equipped with infrared lamps. Surveyors were also equipped with a full-spectrum Elekon Batlogger M bat detector. An example of the equipment used by Babec Ecological Consultants during emergence surveys is provided below:











1. Canon XA series camcorder 2. Screen 3. Infrared floodlamp 4. Batlogger-M 5. Thermometer











Surveyors watched potential roost features directly from the start of the survey until ambient light levels were too low for the potential roost features to be clearly visible, which was typically approximately 20 minutes after sunset. Surveyors then watched potential roost features using their NVAs for the remainder of the survey.



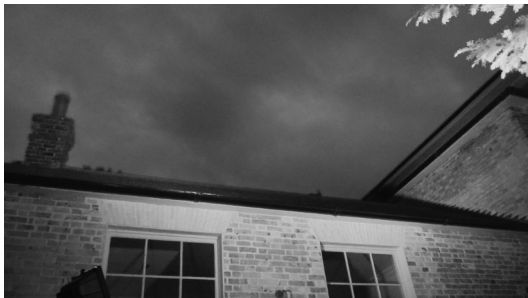
Video footage was recorded for the full extent of each survey. NVA screenshots taken at the start and end of a survey (i.e., the lightest and darkest points of the survey, respectively) are presented in Table 4 below. Recorded footage was analysed following the survey when considered appropriate, such as when a bat roost was recorded, when the surveyor suspected the presence of a roost or when a bat was seen but not heard. Where a bat roost was confirmed during video analysis, bat calls recorded during the survey on the Batlogger M detector were analysed using Elekon BatExplorer software to identify the species of roosting bat.



¹⁷ Bat Conservation Trust (2022). *Interim Guidance Note: Use of night vision aids for bat emergence surveys and further comment on dawn surveys*. Available at www.bats.org.uk.

Table 4. Screenshots taken from NVAs at each surveyor location during the emergence survey.

Surveyor location	Start of survey screenshot	End of survey screenshot
Visit 1		
1		
2		
3		
4		

Surveyor location	Start of survey screenshot	End of survey screenshot
5		
6		
Visit 2		
1		
2		
3		

Surveyor location	Start of survey screenshot	End of survey screenshot
4		
5		
6		
Visit 3		
1		
2		

Surveyor location	Start of survey screenshot	End of survey screenshot
3		
4	Image not saved	Image not saved
5	Image not saved	Image not saved
6	