

Northern Arc Avenue – Central Section

T39 Bat emergence survey report

Homes England

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Executive Summary

AECOM Ltd (hereafter referred to as 'AECOM') was commissioned by Homes England in 2025 to undertake three dusk bat emergence surveys of a dead oak (*Quercus robur*) tree (hereafter known as 'T39'), with PRF-M suitability to support roosting bats (i.e. considered suitable to support multiple bats).

The aim of the survey was to provide updated results on the presence or likely absence of roosting bats within T39, following surveys in 2022 completed by AECOM that determined that bats were likely absent from T39. update previous emergence surveys. Updated surveys were required due to the age of the survey data¹, with the 2022 results no longer considered to be valid.

The surveys were completed in support of a planning application for Northern Arc Avenue – Central Section. T39 is located north of Burgess Hill, at central Ordnance Survey grid reference TQ2989420738.

AECOM understands that T39 is to be felled in order to facilitate the construction of the Central Section of Northern Arc Avenue, which includes a carriageway, one shared footway-cycleway, one footway, and two verges, along with soft landscaping, tree planting, utilities corridors, and drainage infrastructure. These are collectively referred to as the 'Proposed Development'.

T39 had suitability to support multiple roosting bats. As such, three emergence surveys were recommended to confirm the presence, or likely absence, of roosting bats and to characterise the type of bat roosts present, if any.

Three bat emergence surveys were completed between July 2025 and September 2025, in line with the current Bat Conservation Trust (BCT) best practice survey guidelines (Collins, 2023). These surveys did not record any evidence of roosting bats and confirmed that a bat roost is likely absent from T39.

Activity in the wider area was recorded of common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), noctule (*Nyctalus noctula*), Leisler's (*Nyctalus leisleri*), serotine (*Eptesicus serotinus*), brown long-eared (*Plecotus auritus*), and *Myotis* bats.

All species of bat and their roosts (whether bats are present or not) are protected under the Conservation of Habitats and Species Regulations 2017 (as amended) including legislative amendments via the Conservation of Habitats and Species (Amendment) (European Union Exit) Regulations 2019 and under the Wildlife and Countryside Act 1981 (as amended). Taken together, this legislation makes it an offence to deliberately damage, destroy, or obstruct access to a bat roost or to deliberately kill, damage, take, or disturb bats.

As a bat roost is likely absent, there is no requirement for a licence to be obtained prior to the commencement of Works. A precautionary approach to felling has been recommended, including felling the tree during the period that bats are most likely to be absent (October to March inclusive), and conducting works following a briefing by and under the supervision of a licensed bat ecologist.

¹ In line with CIEEM (2019) *Advice Note on the Lifespan of Ecological Reports and Surveys*, bat emergence data is considered to be valid for a period of 12 to 18 months.

1. Introduction

1.1 Project Background

1.1.1 AECOM Ltd (hereafter referred to as 'AECOM') was commissioned by Homes England in 2025 to undertake updated bat emergence surveys of a dead oak (*Quercus robur*) tree (hereafter known as 'T39') with PRF-M suitability to confirm the presence or likely absence of bats, in support of a planning application for Northern Arc Avenue – Central Section. T39 is located north of Burgess Hill, at central Ordnance Survey grid reference TQ 29894 20738.

1.1.2 Emergence surveys of T39 were conducted by AECOM in 2022 as part of an Ecological Impact Assessment for the Central Section of the Northern Arc Avenue development (AECOM, 2025). Updated surveys in 2025 are required due to the age of the survey data² meaning that the 2022 survey data is considered out of date, and to meet the following comment from the Local Planning Authority Ecologist:

'We are not satisfied that there is sufficient ecological information on protected species available for determination. This is because the bat emergence surveys for Tree T39 are out of date to support this application, in line with CIEEM Guidance and paragraph 6.2.1 of British Standard (BS) BS42020 'Biodiversity – Code of practice for planning and development 2013'. This is because we understand that Tree T39 (dead Oak) which has PRFs for Multiple bats (PRF-M) was subject to an emergence survey in 2022 and no bats were observed. However, these surveys are over two and a half years old and therefore out of date. We recommend that an up-to-date assessment for bat roost potential in this tree is made in accordance with Government Standing Advice and the results of further assessment are provided for PRF-Ms in T39. The additional assessment for roosting bats in Tree T39 is required prior to determination because paragraph 99 of ODPM Circular 06/2005 highlights that: "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." This information is required to provide the LPA with certainty of impacts on legally protected species and be able to secure appropriate mitigation either by a mitigation licence from Natural England or a condition of any consent.'

1.1.3 The construction of the 'Central Section' of the Northern Arc Avenue includes a new 6.5 m wide carriageway, one shared 3 m wide footway-cycleway, one 2 m wide footway, and two 2.75 m verges, along with soft landscaping, tree planting, utilities corridors, and drainage infrastructure. These are collectively referred to as the 'Proposed Development'.

1.1.4 AECOM understands that T39 is to be felled to facilitate the Proposed Development.

1.2 Scope of Works

1.2.1 The purpose of this report is to provide an update to the survey results for T39, to confirm the presence or continued likely absence of bats in T39 and give recommendations for ecological good practice and potential licencing requirements with respect to bats.

² In line with CIEEM (2019) *Advice Note on the Lifespan of Ecological Reports and Surveys*, bat emergence data is considered to be valid for a period of 12 to 18 months.

2. Wildlife Legislation with Respect to Bats

- 2.1.1 All UK native bat species and their roosts (whether bats are present or not) are protected under the Conservation of Habitats and Species Regulations 2017 (as amended) and under the Wildlife and Countryside Act 1981 (as amended). Taken together, under this legislation it is an offence to:
- Deliberately, intentionally or recklessly capture, injure or kill a bat;
 - Damage/destroy a breeding site or resting place of a bat (this is an offence whether the act is deliberate or not);
 - Deliberately, intentionally or recklessly disturb a bat; or
 - Intentionally or recklessly obstruct access to any structure which a bat uses for shelter or protection.
- 2.1.2 A bat roost is defined as “any structure or place, which is used for shelter or protection” or a “breeding site or resting place”³. As bats commonly use the same roosts at particular times of the year after periods of absence, the roost is protected whether or not bats are resident.
- 2.1.3 Given the above legislation, the potential presence of bats at a site represents a material consideration in the planning process. Even where planning permission is not required there is still a legal responsibility placed on the developer to ensure that a Natural England European Protected Species licence is obtained to cover any works that have the potential to result in an offence under the above legislation.
- 2.1.4 Seven of the UK bat species are listed as species of principal importance within Section 41 of the NERC Act (2006, as amended): namely, the barbastelle (*Barbastella barbastellus*), Bechstein's bat (*Myotis bechsteinii*), noctule, soprano pipistrelle, brown long-eared bat (*Plecotus auritus*), greater horseshoe bat (*Rhinolophus ferrumequinum*) and lesser horseshoe bat (*Rhinolophus hipposideros*).

³ Conservation of Habitats and Species Regulations 2017 (as amended). London: HMSO

3. Methodology

3.1 Emergence surveys

- 3.1.1
- The aim of bat emergence surveys was to identify bats leaving and/or returning to any roost that may be present. In accordance with the BCT best practice survey guidelines available at the time of survey (Collins, 2023) the dusk emergence survey covered the period from 15 minutes before sunset to at least 1.5 hours after sunset. During these time periods surveyors observed potential roost features on the tree to watch for bats emerging from or returning to the tree.
- 3.1.2
- Surveyors carried echolocation detectors (Elekon Batlogger M) to help determine which species were present. Infra-red cameras (Canon XA11 and XA60) were used to allow review of footage to assist with verifying any bats emerging from, or re-entering the tree. The time, location, number, species (where possible) and direction of flight was recorded for each bat pass (either echolocation heard or activity seen) encountered during the survey. The echolocation calls detected were recorded to the Elekon Batlogger M internal memory card to allow the use of Bat Explorer to verify bat calls where required.
- 3.1.3
- The dates, times and weather conditions of the bat emergence survey visits conducted are presented in Table 1.

Table 1 Date, times, and weather conditions for emergence surveys at T39

Date of survey	Sunset time	Survey start time	Survey end time	Weather conditions
31 July 2025	20:48	20:33	22:18	Start: Cloudy (7 oktas), no wind (Beaufort 0), sporadic showers, 21 °C. End: Cloudy (7 oktas), no wind (Beaufort 0), dry, misty, 18 °C.
27 August 2025	19:56	19:41	21:26	Start: Cloudy (7 oktas), light air (Beaufort 1), spotty showers, 18 °C. End: Cloudy (7 oktas), light air (Beaufort 1), dry, 18 °C.
18 September 2025	19:07	18:52	20:37	Start: Cloudy (7 oktas), light air (Beaufort 1), light drizzle, 18 °C. End: Cloudy (6 oktas), light air (Beaufort 1), dry, 18 °C.

3.2 Constraints

- 3.2.1
- During the survey on 18 September 2025, the eastern IR camera stopped recording for a period of 20 minutes between 19:22 and 19:42 (15 minutes after sunset to 35 minutes after sunset). No bats were recorded during this time period on either surveyor’s Batlogger M, the western infra-red camera or by either of the surveyors watching the tree. This is therefore not considered to be a constraint to the survey results.

3.3 Quality Assurance

- 3.3.1
- All AECOM Ecologists involved with the surveys at the Site and authoring this report are members, at the appropriate level, of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct when undertaking ecological work.
- 3.3.2
- The emergence surveys were completed by two experienced ecologists.

4. Results

4.1 Emergence Surveys

- 4.1.1 A summary description of each emergence survey can be found below, with full results provided in Appendix A. Screenshots of the darkest point of each survey (at the end of each dusk emergence survey visit) for each infra-red camera are included in Appendix B.

Visit 1 – 31 July 2025

- 4.1.2 No bats emerged from Tree 39.
- 4.1.3 Bat activity in the wider area comprised mainly registrations of common pipistrelle bats (*Pipistrellus pipistrellus*) and soprano pipistrelle bats (*Pipistrellus pygmaeus*) foraging and commuting, between 16 minutes after sunset (21:04) and 1 hour 46 minutes after sunset (22:19). There was also activity by *Myotis* bats⁴ between 1 hour 4 minutes after sunset (21:54) and 1 hour 41 minutes after sunset (22:14). A noctule bat (*Nyctalus noctula*) was recorded at 16 minutes after sunset (21:04) and 1 hour 9 minutes after sunset (21:57). A Leisler's bat (*Nyctalus leisleri*) was recorded at 1 hour 6 minutes after sunset (21:54) and a serotine bat (*Eptesicus serotinus*) at 1 hours 24 minutes after sunset (22:12).

Visit 2 – 27 August 2025

- 4.1.4 No bats emerged from Tree 39.
- 4.1.5 Bat activity in the wider area comprised mainly common pipistrelle and soprano pipistrelle bats foraging and commuting, between 34 minutes after sunset (20:30) and 1 hour 42 minutes after sunset (21:38). There was also activity by *Myotis* bats between 34 minutes after sunset (20:30) and 1 hour 17 minutes after sunset (21:13). Brown long-eared bat activity was recorded between 56 minutes after sunset (20:52) and 1 hour 23 minutes after sunset (21:19). A Leisler's bat was recorded at 44 minutes after sunset (20:40) and a serotine bat at 45 minutes after sunset (20:41).

Visit 3 – 18 September 2025

- 4.1.6 No bats emerged from Tree 39.
- 4.1.7 Bat activity in the wider area comprised mainly common pipistrelle and soprano pipistrelle bats foraging and commuting, between 27 minutes after sunset (19:34) and 1 hour 27 minutes after sunset (20:34). A noctule bat was recorded at 51 minutes after sunset (19:58) and 1 hour 29 minutes after sunset (20:36).

⁴ *Myotis* bat calls can be very similar; therefore have been classified as *Myotis* species unless call characteristics or observations of the bat and behaviour have been recorded to enable species level identification.

5. Discussion and Recommendations

- 5.1.1 Three dusk bat emergence surveys completed during 2025 to update the results of surveys completed in 2022 confirmed the continued likely absence of roosting bats from T39.
- 5.1.2 As such there are no licensing requirements that must be met prior to the removal of the tree.
- 5.1.3 A precautionary approach is still recommended for felling, in line with the recommendation of the Ecological Impact Assessment report (AECOM 2025) as follows:
- The felling contractors will be notified that the tree has been assessed for bats by way of a toolbox talk, and that although no signs of roosts have been identified, the tree is still suitable with a risk of bat presence;
 - Trees will be subject to an aerial inspection of features by an ecologist who holds a Natural England WML-CL18 (Bat Survey Level 2) licence where possible;
 - Where aerial inspection is not possible, trees will be soft felled (sections of the tree will be carefully lowered to the ground for inspection by an ecologist) under an ecological watching brief;
 - Trees will be felled using hand tools; and
 - The tree should be felled during the time bats are least likely to be present (October to March inclusive).
- 5.1.4 Should bats be discovered, clearance should stop immediately, and a European Protected Species Mitigation Licence from Natural England should be obtained before works continue.
- 5.1.5 If felling does not occur within 12 months, further emergence surveys will be necessary to obtain up to date information regarding bats and T39.

6. References

AECOM (2025) *Northern Arc Avenue Central Section Ecological Impact Assessment* (February 2025).

CIEEM (2019) *Advice Note on the Lifespan of Ecological Reports and Surveys*

Collins, J. (ed) (2023). *Bat Surveys for Professional Ecologists – Good Practice Guidelines* (4th edition). Bat Conservation Trust, London.

Mitchell-Jones, A.J. & McLeish, A.P. (2012). *The Bat Workers' Manual*. Pelagic Publishing, Exeter.

Her Majesty's Stationery Office (HMSO) (2006). *Natural Environment and Rural Communities Act 2006*. London.

HMSO (2019). *The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019*. London.

HMSO (2017). *The Conservation of Habitats and Species Regulations 2017*. London: HMSO.

HMSO (1981). *Wildlife and Countryside Act 1981*. London: HMSO.

Appendix A Full bat emergence results

A.1 Visit 1 – 31 July 2025

Project Name	Northern Arc Avenue	Surveyors	MK (west), SG (east)
Survey Location	T39	Rain (0-5)	Start: 2 End: 0
Date	31 July 2025	Wind (Beaufort 0-7)	Start: Beaufort 0 (still) End: Beaufort 0 (still)
Start	20:33	Temperature / °C	Start: 21 End: 18
Sunset	20:48	Cloud Cover (Okta 0-8)	Start: 7 End: 7
Finish	22:18	Weather description	Start: Cloudy, no wind, sporadic rain showers. End: Cloudy, no wind, dry, misty.

No emergence from T39. Activity recorded below.

Time	Survey Point	Species	No. of Bats	Emerge (Y/N)	Description of behaviour
21:04	East	Noctule	1	N	Heard, not seen. Two brief passes.
21:04	East	Soprano pipistrelle	1	N	Heard, not seen.
21:27	East	Common pipistrelle	1	N	Heard, not seen.
21:27	East	Soprano pipistrelle	1	N	Heard, not seen.
21:27	West	Soprano pipistrelle	1	N	Heard and seen. Flying towards south.
21:31	East	Common pipistrelle	1	N	Heard, not seen.
21:33	East	Common pipistrelle	1	N	Heard, not seen.
21:35-21:39	East	Common pipistrelle	1	N	Heard, not seen. Multiple passes.
21:36	West	Common pipistrelle	1	N	Heard, not seen. Three passes
21:36	West	Soprano pipistrelle	1	N	Heard, not seen.
21:38-21:46	West	Common pipistrelle	1	N	Heard and seen. Foraging.
21:40	East	Common pipistrelle	1	N	Heard, not seen. Two passes.
21:41-21:53	East	Common pipistrelle	1	N	Heard, and seen. Foraging.
21:46	West	Soprano pipistrelle	1	N	Heard and seen. Commuting from south to north.
21:47	West	Common pipistrelle	1	N	Heard, not seen.

21:48	West	Common pipistrelle	1	N	Heard, not seen.
21:49	West	Common pipistrelle	1	N	Heard and seen. Multiple passes looping around surveyor.
21:51	West	Common pipistrelle	1	N	Heard and seen. Foraging.
21:52	West	Common pipistrelle	1	N	Heard, not seen. Two passes.
21:54	West	Leisler's bat	1	N	Heard, not seen.
21:54	West	Common pipistrelle	1	N	Heard, not seen.
21:55	East	<i>Myotis</i> sp.	1	N	Heard not seen.
21:56	East	Common pipistrelle	1	N	Heard not seen. Two passes and a social call.
21:56	East	<i>Myotis</i> sp.	1	N	Heard not seen.
21:57	East	Noctule	1	N	Heard not seen.
21:57-22:06	East	Common pipistrelle	1	N	Heard not seen. Multiple passes.
21:57	East	<i>Myotis</i> sp.	1	N	Heard not seen.
22:00-22:03	West	Common pipistrelle	1	N	Heard, not seen.
22:07	West	<i>Myotis</i> sp.	1	N	Heard, not seen.
22:07-22:10	West	Common pipistrelle	1	N	Heard and seen. Foraging.
22:08	East	Common pipistrelle	1	N	Heard, not seen.
22:09	East	Common pipistrelle	1	N	Heard, not seen.
22:10-22:11	East	Common pipistrelle	1	N	Heard, not seen. Multiple passes.
22:12	West	Serotine	1	N	Heard, not seen.
22:14	East	<i>Myotis</i> sp.	1	N	Heard, not seen.
22:18	East	Soprano pipistrelle	1	N	Heard, not seen.
22:18-22:19	East	Common pipistrelle	1	N	Heard, not seen. Multiple passes.

A.2 Visit 2 – 27 August 2025

Project Name	Northern Arc Avenue	Surveyors	EL (west), LD (east)
Survey Location	T39	Rain (0-5)	Start: 2 End: 0
Date	27 August 2025	Wind (Beaufort 0-7)	Start: Beaufort 1(light air) End: Beaufort 1 (light air)
Start	19:41	Temperature / °C	Start: 18 End: 18
Sunset	19:56	Cloud Cover (Okta0-8)	Start: 7 End: 7
Finish	21:26	Weather description	Start: Spotty showers, light air, cloudy, and cool. End: Dry, light air, cool, and cloudy.

No emergence from T39. Activity recorded below.

Time	Survey Point	Species	No. of Bats	Emerge (Y/N)	Description of behaviour
20:27	East	Unknown	1	N	Seen on IR camera, not heard. Brief pass.
20:30-20:31	East	<i>Myotis</i> sp.	1	N	Heard, not seen. Brief passes.
20:32-20:39	East	<i>Myotis</i> sp.	2	N	Heard and seen. Foraging over hedge, with second bat joining at 20:39.
20:32	West	Common pipistrelle			Heard and seen. Social call.
20:39-20:40	East	Common pipistrelle	1	N	Heard, and seen on IR camera. Five passes.
20:40	West	Leisler's bat	1	N	Heard, not seen.
20:40	West	Soprano pipistrelle			Heard, not seen.
20:41	East	Soprano pipistrelle	1	N	Heard, not seen. Brief pass.
20:41	East	Serotine	1	N	Heard, not seen
20:44	West	Common pipistrelle			Heard and seen. Brief pass.
20:45	East	Common pipistrelle	1	N	Heard, and seen on IR camera. Brief pass.
20:48	East	Unknown	1	N	Seen on IR camera, not heard. Brief pass.
20:49	West	<i>Myotis</i> sp.	1	N	Heard, not seen.
20:52	West	Brown long-eared bat	1	N	Heard, not seen.
20:54	West	<i>Myotis</i> sp.	1	N	Heard, not seen.
20:55	West	<i>Pipistrellus</i> sp.	1	N	Heard, not seen.
21:59	East	Unknown	1	N	Seen on IR camera, not heard. Brief pass.
21:01	West	Common pipistrelle	1	N	Heard and seen. Brief pass.
21:01	East	Common pipistrelle	1	N	Heard, and seen on IR camera. Brief pass.
21:02	East	<i>Myotis</i> sp.	1	N	Heard, not seen. Brief pass
21:04	East	Common pipistrelle	1	N	Heard, and seen on IR camera. Brief pass
21:05	East	Common pipistrelle	1	N	Heard, not seen.
21:10-21:11	West	Brown long-eared bat	1	N	Heard, not seen.
21:12-21:13	East	Common pipistrelle	1	N	Heard, and seen on IR camera. Foraging, with social calls.
21:13	East	<i>Myotis</i> sp.	1	N	Heard, not seen.
21:13	West	Bat species	1	N	Brief pass on IR camera footage. No echolocation.
21:15	East	Common pipistrelle	1	N	Heard, not seen.
21:15-21:16	West	Brown long-eared bat	1	N	Heard, not seen.

21:18	East	Common pipistrelle and soprano pipistrelle	2	N	Heard, not seen. Soprano pipistrelle passing briefly, common pipistrelle making three passes.
21:18	West	Brown long-eared bat	1	N	Heard, not seen.
21:19	East	Brown long-eared bat	1	N	Heard, not seen. Two passes.
21:20	East	Common pipistrelle	1	N	Heard, and seen on IR camera. Two passes.
21:21	West	Soprano pipistrelle	1	N	Heard, and seen on IR camera. Brief pass.
21:23	West	Common pipistrelle	1	N	Heard and seen. Three brief passes on IR camera footage. Social call.
21:25-21:26	East	Soprano pipistrelle	1	N	Heard, and seen on IR camera. Foraging and social calls.
21:28	East	Common pipistrelle	1	N	Heard, not seen. Biref pass.

A.3 Visit 3 – 18 September 2025

Project Name	Northern Arc Avenue – Central Section	Surveyors	LD (east), SK (west)
Survey Location	T39	Rain (0-5)	Start: 1 End: 0
Date	18 September 2025	Wind (Beaufort 0-7)	Start: Beaufort 1 (light air) End: Beaufort 1 (light air)
Start	18:52	Temperature / °C	Start: 18 End: 18
Sunset	19:07	Cloud Cover (Okta 0-8)	Start: 7 End: 6
Finish	20:37	Weather description	Start: Light breeze, light drizzle, cloudy, and cool End: Light breeze, dry, less cloudy then at start

No emergence from T39. Activity recorded below.

Time	Survey Point	Species	No. of Bats	Emergence (Y/N)	Description of behaviour
19:34	East	Common pipistrelle	1	N	Heard, not seen. Brief passes.
19:35	East	Common pipistrelle	1	N	Heard, and seen on IR camera. Two brief passes.
19:36	West	Bat species, likely common pipistrelle	1	N	Seen on IR camera but no echolocation.
19:36-19:38	East	Common pipistrelle	1	N	Heard and seen. Multiple passes, and a social call.
19:37	West	Common pipistrelle	1	N	Heard, not seen. Social call.
19:39	West	Common pipistrelle	1	N	Heard, not seen.
19:40	East	Soprano pipistrelle	1	N	Heard and seen. Brief pass.

19:40	West	Common pipistrelle	1	N	Heard, and seen on IR camera. Social call.
19:40-19:46	East	Common pipistrelle	1	N	Heard and seen. Foraging along hedge. Social calls heard.
19:41	West	Common pipistrelle	1	N	Heard and seen on IR camera. Brief pass and social call.
19:41	West	Soprano pipistrelle	1	N	Heard, not seen.
19:42-19:43	West	Common pipistrelle	1	N	Heard, not seen. Some social calls.
19:45	West	Common pipistrelle	1	N	Heard, not seen.
19:45-19:47	East	<i>Pipistrellus</i> sp.	1	N	Heard and seen. Foraging along hedge.
19:47	West	Common pipistrelle	1	N	Heard, not seen. Social call.
19:47-19:49	East	Soprano pipistrelle	1	N	Heard and seen.
19:48-19:50	East	Common pipistrelle	1	N	Heard, not seen. Social call.
19:48-19:49	West	Soprano pipistrelle	1	N	Heard, and seen on IR camera. Three brief passes. Social call.
19:48	West	<i>Pipistrellus</i> sp.	1	N	Heard, not seen.
19:50	West	Common pipistrelle	1	N	Heard, and seen on IR camera. Two brief passes. Social call.
19:51-19:56	East	Common pipistrelle	1	N	Heard, not seen. Foraging. Some social calls.
19:51	West	Soprano pipistrelle	1	N	Heard, not seen. Social call.
19:51-19:54	West	Common pipistrelle	1	N	Heard, and seen on IR camera. Multiple passes. Occasional social call.
19:56	East	<i>Pipistrellus</i> sp.	1	N	Heard, not seen. Social call.
19:56-20:17	East	Common pipistrelle	1	N	Heard, and seen on IR camera. Foraging continuously. Occasional social call.
19:56-20:17	West	Common pipistrelle	1	N	Heard, and seen on IR camera. Foraging continuously. Occasional social call.
19:58	West	Noctule	1	N	Heard, not seen. Brief pass.
20:04	East	Soprano pipistrelle	1	N	Heard and seen on IR camera. Two passes, social calls.
20:09	East	Soprano pipistrelle	1	N	Heard and seen on IR camera. Social calls.
20:09	East	Soprano pipistrelle	1	N	Heard, not seen.
20:10	West	Soprano pipistrelle	1	N	Heard, and seen on IR camera. Brief pass, social call.
20:11	East	<i>Pipistrellus</i> sp.	1	N	Heard and seen on IR camera. Foraging.
20:14	East	Soprano pipistrelle	1	N	Heard, and not seen. Foraging.
20:15	East	<i>Pipistrellus</i> sp.	1	N	Heard and not seen. Social call.
20:16-20:17	East	<i>Pipistrellus</i> sp.	1	N	Heard and not seen. Multiple passes, occasional social call.

20:16	West	<i>Pipistrellus</i> sp.	1	N	Heard, and seen on IR camera. Brief pass.
20:17	East	Soprano pipistrelle	1	N	Heard and seen on IR camera. Brief pass
20:17-20:25	East	Common pipistrelle	1	N	Heard and seen on IR camera. Multiple passes, occasional social call.
20:18-20:25	West	Common pipistrelle	1	N	Heard and seen on IR camera. Multiple passes, occasional social call.
20:23	East	<i>Pipistrellus</i> sp.	1	N	Heard and seen on IR camera. Social call.
20:25	West	Soprano pipistrelle	1	N	Heard, not seen. Social call.
20:27	West	Common pipistrelle	1	N	Heard, and seen on IR camera. Two or three pass, looping tree.
20:28-20:33	East	Common pipistrelle	1	N	Heard and seen on IR camera. Multiple passes, occasional social call.
20:28-20:31	West	Common pipistrelle	1	N	Heard, and seen on IR camera. Multiple passes, occasional social calls.
20:31	East	<i>Pipistrellus</i> sp.	1	N	Heard and not seen. Brief pass.
20:33	West	Common pipistrelle	1	N	Heard, and seen on IR camera. Brief pass.
20:34	West	Common pipistrelle	1	N	Heard, and seen on IR camera. Two brief passes. Social call.
20:36	West	Noctule	1	N	Heard, and seen on IR camera. Two brief passes.

Appendix B Screenshots at Darkest Point of Emergence Surveys



Plate 1 T39 Visit 1 – 31 July 2025 (western surveyor location)



Plate 2 T39 Visit 1 – 31 July 2025 (eastern surveyor location)



Plate 3 T39 Visit 2 – 27 August 2025 (western surveyor location)



Plate 4 T39 Visit 2 – 27 August 2025 (eastern surveyor location)



Plate 5 T39 Visit 3 –18 September 2025 (western surveyor location)



Plate 6 T39 Visit 3 –18 September 2025 (eastern surveyor location)

