

**MIRA TECHNOLOGY PARK SOUTH SITE,
WATLING STREET, WARWICKSHIRE**

BAT ACTIVITY SURVEYS

A Report to: ERI MTP Limited

Report No: RT-MME-154920-05 Rev B

Date: August 2022



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REPORT VERIFICATION AND DECLARATION OF COMPLIANCE

This study has been undertaken in accordance with British Standard 42020:2013 “Biodiversity, Code of practice for planning and development”.

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The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management’s Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

DISCLAIMER

The contents of this report are the responsibility of Middlemarch Environmental Ltd. It should be noted that, whilst every effort is made to meet the client’s brief, no site investigation can ensure complete assessment or prediction of the natural environment.

Middlemarch Environmental Ltd accepts no responsibility or liability for any use that is made of this document other than by the client for the purposes for which it was originally commissioned and prepared.

VALIDITY OF DATA

The findings of this study are valid for a period of 12 months from the date of survey. If works have not commenced by this date, an updated site visit should be carried out by a suitably qualified ecologist to assess any changes in the habitats present on site, and to inform a review of the conclusions and recommendations made.

NON-TECHNICAL SUMMARY

Middlemarch Environmental Ltd was commissioned by ERI MTP Limited to undertake bat activity surveys at the site of a proposed development situated to the south of Watling Street near Caldecote, Nuneaton. These surveys are required to inform a planning application associated with the proposed construction of commercial units and associated infrastructure at the site.

Bat activity surveys were undertaken between 26th May 2021 and 25th October 2021. The activity surveys identified that the site is utilised by eleven different species of bat: noctule, Leisler's bat, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, Daubenton's bat, Natterer's bat, Brandt's bat, whiskered bat and barbastelle. These species, with the exception of barbastelle, are common or widespread. Only low numbers of each species were recorded on site during the surveys. Common pipistrelle was the most frequently recorded bat species, most notably along the boundary trees and hedgerows. Overall, the site is considered to be of moderate value to foraging and commuting bats.

The current masterplan indicates the majority of existing trees and hedgerows on site are to be retained as part of the new development, especially around the perimeter of the site, and new tree and shrub planting is to be incorporated into the soft landscaping. The plan also indicates that a number of drainage features will also be created on site, including a series of ponds. Therefore, the impact on foraging and commuting habitat is considered to be temporary.

Whilst the new development is not expected to have a significant impact on commuting and foraging habitats, there is the potential for any new lighting, either temporary or permanent, at the site to impact commuting and foraging bats.

Following the results of the bat activity surveys, the following recommendations have been made:

R1 Buildings and Trees

The recommendations made within the Bat Surveys Report (RT-MME-154920-04 Rev B) must be adhered to.

R2 Lighting

In accordance with best practice guidance relating to lighting and biodiversity (Miles et al, 2018; Gunnell et al, 2012), any new lighting should be carefully designed to minimise potential disturbance and fragmentation impacts on sensitive receptors, such as bat species. Examples of good practice are provided in Chapter 6.

R3 Habitat Retention

The existing trees and hedgerows on site should be retained where possible. Buffers should be created around suitable commuting and foraging habitats to maintain connectivity across the site and surrounding area.

R4 Habitat Enhancement

In line with the National Planning Policy Framework, the development should aim to enhance the site for bats. This may include the provision of roosting opportunities through the installation of bat boxes, and the enhancement of foraging areas by planting species which attract night flying insects.

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1. INTRODUCTION

1.1 PROJECT BACKGROUND

Middlemarch Environmental Ltd was commissioned by ERI MTP Limited to undertake bat activity surveys at the site of a proposed development situated to the south of Watling Street near Caldecote, Nuneaton. These surveys are required to inform a planning application associated with the proposed construction of commercial units and associated infrastructure at the site.

Middlemarch Environmental Ltd has previously carried out ecological surveys at a site north of Watling Street. These surveys include:

- Preliminary Ecological Appraisal (Report RT-MME-151432-01);
- Preliminary Bat Roost Assessment (Report RT-MME-154919-01); and,
- Great Crested Newt Survey (Report RT-MME-154919-03).

Bat, reptile and badger surveys are also being undertaken at the site north of Watling Street, the results of which will be detailed in Reports RT-MME-154919-02, RT-MME-154919-04 and RT-MME-154919-05 respectively.

In addition, Middlemarch Environmental Ltd was commissioned to undertake the following assessments for the MIRA Technology Park South Site:

- Preliminary Ecological Appraisal (Report RT-MME-154920-01 Rev B);
- Great Crested Newt Habitat Suitability Index Assessment and eDNA Survey (Report RT-MME-154920-02 Rev B);
- Badger Survey (Report RT-MME-154920-03 Rev B);
- Bat Surveys (Report RT-MME-154920-04 Rev B);
- Breeding Bird Survey (Report RT-MME-154920-06 Rev A); and,
- Reptile Survey (Report RT-MME-154920-07 Rev A).

This report details the results of the bat activity surveys undertaken between 26th May 2021 and 25th October 2021.

All UK bat species are legally protected species and they are capable of being material considerations in the planning process. A summary of the legislation protecting bats is included within Appendix 1. This section also provides some brief information on the ecology of British bat species.

1.2 SITE DESCRIPTION AND CONTEXT

The proposed development site is located to the south of Watling Street near Caldecote in Warwickshire. Its central grid reference is approximately SP 358 951. The surrounding landscape is predominantly agricultural although the town of Nuneaton lies nearby to the south and the village of Caldecote is situated to the west. The northern boundary of the site is formed by Watling Street (the A5) and the south-western boundary by Weddington Lane (the A444). The south-eastern boundary abuts other fields, but a dismantled railway line, now the Weddington Way, is situated nearby, joining the proposed development site in the north-eastern corner of the site.

The site is approximately 69 ha in size and dominated by arable fields. Field margins comprise hedgerows, and a stream flows from north to south through the centre of the site. The Elms Farm is also situated within the site. This comprises a residential dwelling and a complex of barns and associated gardens. Two farm ponds are also present on site.

1.3 DOCUMENTATION PROVIDED

The conclusions and recommendations made in this report are based on information provided by the client regarding the scope of the project. Documentation made available by the client is listed in Table 1.1.

Document Name / Drawing Number	Author
Masterplan Option 10 B / 21092 SGP XX 00 DR A 111010 Rev M	SGP Architects + Masterplanners

Table 1.1: Documentation Provided by Client

2. METHODOLOGY

2.1 DESK STUDY

As part of the Preliminary Ecological Appraisal (Report RT-MME-154920-01 Rev B) an ecological desk study (which included a search for records of bats) was undertaken within a 1 and 2 km radius of the site. The consultees for the desk study were Warwickshire Biological Records Centre and Leicestershire and Rutland Environmental Records Centre.

Middlemarch Environmental Ltd then assimilated and reviewed the desk study data provided by these organisations. Relevant bat data are discussed in Chapter 3. In compliance with the terms and conditions relating to its commercial use, the full desk study data are not provided within this report.

The desk study included a search for statutory nature conservation sites designated for bats within a 10 km radius of the site.

2.2 FIELD SURVEYS

2.2.1 Manual Bat Activity Survey: Walkover Transect

The site was subject to a bat transect survey in order to allow a profile of site usage by bats to be compiled. Seven transects were completed, with one dusk survey completed per month (May to October) and one pre-dawn survey completed in August.

One transect route was identified which allowed all features of potential value to bats to be assessed within the proposed development area. The transect was designed with a total of twelve 'Stop Points'. This was to ensure that the transect was undertaken in accordance with guidelines of the Bat Conservation Trust (Collins, 2016) being a minimum of two hours long. At each 'Stop Point', the ecologist paused for a period of three minutes before continuing along the transect route.

The transect survey was conducted using electronic bat detectors (Echo Meter Touch) to facilitate the detection of bats and to aid in the determination of species of bats using the site. Subsequent computer analysis of recordings allowed all species of bats using the site to be identified.

It should be noted that bat passes refer to the number of times that bats were detected by the bat detectors. They do not necessarily represent separate bats, and may be repeat recordings of the same bat if, for example, it was foraging in a loop.

2.2.2 Automated Bat Activity Survey: Static Bat Detector

Automated surveys using static detectors were used to supplement the data collected from the walked transect surveys, as recommended by the Bat Conservation Trust (Collins, 2016). Two static bat detectors (Song Meter SM3+ time expansion with inbuilt recording device) were installed on trees located in the eastern and central parts of the survey area, and were left in place for a total of 5 consecutive nights. The detectors were set to record from 20 minutes before sunset to 20 minutes after sunrise.

The recordings made by the static detectors were subsequently subject to computer analysis in order to identify the bat species utilising habitats on site and the levels of activity throughout the night.

It should be noted that bat passes refer to the number of times that bats were detected by the bat detectors. They do not necessarily represent separate bats, and may be repeat recordings of the same bat if, for example, it was foraging in a loop.

3. DESK STUDY

3.1 STATUTORY NATURE CONSERVATION SITES

The site is not located within 10 km of any statutory nature conservation sites designated for the presence of bats.

3.2 SPECIES RECORDS

The data search was carried out on 6th August 2020 by Warwickshire Biological Records Centre and on 11th October 2021 by Leicestershire and Rutland Environmental Records Centre. Records of bat species within a 1 km radius of the survey area provided by the consultees are summarised in Table 3.1. It should be noted that the absence of records should not be taken as confirmation that a species is absent from the search area.

Species	No. of Records	Most Recent Record	Proximity of Nearest Record to Study Area	Species of Principal Importance?	Legislation
Common pipistrelle <i>Pipistrellus pipistrellus</i>	14	2017	390 m south-west	-	ECH 4, WCA 5, WCA 6
Noctule <i>Nyctalus noctula</i>	8	2017	390 m south-west	✓	ECH 4, WCA 5, WCA 6
Brown long-eared bat <i>Plecotus auritus</i>	5	2017	390 m south-west	✓	ECH 4, WCA 5, WCA 6
Soprano pipistrelle <i>Pipistrellus pygmaeus</i>	4	2017	390 m south-west	✓	ECH 4, WCA 5, WCA 6
Unidentified Myotis <i>Myotis</i> sp.	3	2017	440 m south	#	ECH 2 #, ECH 4, WCA 5, WCA 6
Unidentified bat <i>Chiroptera</i> sp.	3	2013	440 m south	#	ECH 2 #, ECH 4, WCA 5, WCA 6
Daubenton's bat <i>Myotis daubentonii</i>	1	2013	440 m south	-	ECH 4, WCA 5, WCA 6
Leisler's bat <i>Nyctalus leisleri</i>	1	2017	820 m north-east	-	ECH 4, WCA 5, WCA 6
Key: #: Dependent on species. ECH 2: Annex II of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. Animal and plant species of community interest whose conservation requires the designation of Special Areas of Conservation. ECH 4: Annex IV of the European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora. Animal and plant species of community interest in need of strict protection. WCA 5: Schedule 5 of Wildlife and Countryside Act 1981 (as amended). Protected animals (other than birds). WCA 6: Schedule 6 of Wildlife and Countryside Act 1981 (as amended). Animals which may not be killed or taken by certain methods. Species of Principal Importance: Species of Principal Importance for Nature Conservation in England.					

Table 3.1: Bat Species Records Within 1 km of Survey Area

4. SURVEY RESULTS

4.1 MANUAL BAT ACTIVITY SURVEY

4.1.1 Personnel

The manual bat activity surveys were undertaken by the following personnel:

- Tim Hextell (Principal Technical Ecological Consultant);
- Rowell Bingham (Ecological Consultant);
- Dorothy Dunne (Ecological Project Officer);
- Joseph Graham (Ecological Project Officer); and,
- Sophie Hextell (Ecological Project Officer).

4.1.2 Weather

The weather conditions recorded at the time of the survey are detailed in Table 4.1.

Survey Date	Survey Time	Conditions							
		Temperature (°C)		Cloud Cover (%)		Precipitation		Wind Speed (Beaufort)	
		Start	End	Start	End	Start	End	Start	End
May (27/05/2021)	Dusk	15	13	72	79	Nil	Nil	F1	F2
June (16/06/2021)	Dusk	22	19	54	71	Nil	Nil	F1	F1
July (20/07/2021)	Dusk	22	18	69	86	Nil	Nil	F2	F1
August (10/08/2021)	Dusk	20	18	50	60	Nil	Nil	F1	F1
August (11/08/2021)	Dawn	15	13	63	67	Nil	Nil	F2	F2
September (14/09/2021)	Dusk	15	15	97	97	Nil	Nil	F2	F2
October (20/10/2021)	Dusk	13	10	74	89	Nil	Nil	F1	F2

Table 4.1: Weather Conditions During Manual Bat Activity Survey

4.1.3 Transect Route

The transect route covered the majority of the habitats within the survey area. The walked route commenced in the north-eastern part of the survey area, next to the entrance off the A5. From here the route heads east, following the perimeter of the site for the most part and occasionally winding around hedgerows. The transect was designed with a total of twelve 'Stop Points', which are listed below.

- Stop Point 1: Near a hedgerow in the north-eastern corner of the site.
- Stop Point 2: Near a hedgerow running along the south-eastern boundary of the site, to the north of the farm complex.
- Stop Point 3: Near a hedgerow running along the south-eastern boundary of the site, to the south of the farm complex.
- Stop Point 4: Near a hedgerow in the south-eastern corner of the site.
- Stop Point 5: Near a hedgerow in the centre of the south-eastern part of the site.
- Stop Point 6: Near the southern end of the stream that runs through the centre of the site.
- Stop Point 7: Near a hedgerow next to a residential property on the south-western boundary of the site.
- Stop Point 8: Near the junction of two hedgerows in the centre of the north-western part of the site.
- Stop Point 9: Near a hedgerow between two residential properties on the south-western boundary.
- Stop Point 10: Near a hedgerow in the north-western corner of the site.
- Stop Point 11: Near a hedgerow running along the northern boundary of the site.
- Stop Point 12: Near an area of poor semi-improved grassland with scattered scrub next to the entrance off the A5.

The total length of the walked transect route was approximately 4.6 km.

4.1.4 May Bat Activity Survey

The manual bat activity survey was undertaken on 27th May 2021. The survey commenced at sunset and continued until 120 minutes after sunset. Sunset was at 21:13 hrs (BBC Weather Centre Data for Caldecote). The results of the survey are shown on Drawing C154920-05-01 in Chapter 7.

Three species of bat were recorded during the transect survey: noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus*. See Table 4.2 for data obtained during the survey.

Time Band	Species Recorded		
	Noctule	Common pipistrelle	Soprano pipistrelle
21:00 – 21:15	-	-	-
21:15 – 21:30	-	-	-
21:30 – 21:45	-	4	-
21:45 – 22:00	-	4	-
22:00 – 22:15	-	-	1
22:15 – 22:30	1	1	-
22:30 – 22:45	1	1	-
22:45 – 23:00	-	6	-
23:00 – 23:15	-	-	-
Total	2	16	1

Table 4.2: Summary of Bat Passes Recorded during Manual Activity Survey, May 2021

Common pipistrelle

The first common pipistrelle was detected at 21:38 along the hedgerow on the south-eastern boundary of the site, but there was no visual contact with this bat. Then at 21:40, three common pipistrelle passes were recorded at Stop Point 3 as a bat briefly foraged along the hedgerow. Low levels of foraging continued along the hedgerow with a further three passes recorded at 21:47 and a single pass recorded near Stop Point 4 at 21:50. A single common pipistrelle pass was detected at 22:26 near one of the residential properties located on the south-western boundary and again on the other side of the property at 22:35. At 22:46, two common pipistrelles were observed foraging around the trees on the south-western boundary of the site close to the north-western corner of the site, with six passes recorded.

Soprano pipistrelle

At 22:07, a single soprano pipistrelle pass was detected close to the stream, but there was no visual contact with this bat.

Noctule

The first noctule pass was detected at 22:18 near the south-western boundary, but there was no visual contact with this bat. Then at 22:41, a single noctule pass was detected near Stop Point 9.

4.1.5 June Bat Activity Survey

The manual bat activity survey was undertaken on 16th June 2021. The survey commenced at sunset and continued until 120 minutes after sunset. Sunset was at 21:31 hrs (BBC Weather Centre Data for Caldecote). The results of the survey are shown on Drawing C154920-05-02 in Chapter 7.

One species of bat was recorded during the transect survey: noctule. See Table 4.3 for data obtained during the survey.

Time Band	Species Recorded
	Noctule
21:30 – 21:45	-
21:45 – 22:00	1
22:00 – 22:15	-
22:15 – 22:30	-
22:30 – 22:45	-
22:45 – 23:00	-
23:00 – 23:15	-
23:15 – 23:30	-
23:30 – 23:45	-
Total	1

Table 4.3: Summary of Bat Passes Recorded during Manual Activity Survey, June 2021

At 21:54, a single noctule pass was recorded as a bat flew high over Stop Point 4 and commuted north.

4.1.6 July Bat Activity Survey

The manual bat activity survey was undertaken on 20th July 2021. The survey commenced at sunset and continued until 120 minutes after sunset. Sunset was at 21:15 hrs (BBC Weather Centre Data for Caldecote). The results of the survey are shown on Drawing C154920-05-03 in Chapter 7.

No bats were recorded during the transect survey.

4.1.7 August Bat Activity Survey

4.1.7.1 Dusk Survey

The manual bat activity survey was undertaken on 10th August 2021. The survey commenced at sunset and continued until 120 minutes after sunset. Sunset was at 20:40 hrs (BBC Weather Centre Data for Caldecote). The results of the survey are shown on Drawing C154920-05-04 in Chapter 7.

Three species of bat were recorded during the transect survey: noctule, common pipistrelle and soprano pipistrelle. See Table 4.4 for data obtained during the survey.

Time Band	Species Recorded		
	Noctule	Common pipistrelle	Soprano pipistrelle
20:30 – 20:45	-	-	-
20:45 – 21:00	-	-	-
21:00 – 21:15	1	-	-
21:15 – 21:30	10	2	1
21:30 – 21:45	-	-	-
21:45 – 22:00	-	1	-
22:00 – 22:15	-	-	-
22:15 – 22:30	-	-	-
22:30 – 22:45	-	1	-
Total	11	4	1

Table 4.4: Summary of Bat Passes Recorded during Manual Activity Survey, August (Dusk) 2021

Noctule

The first noctule was detected at 21:11 as it flew high over Stop Point 5, but there was no visual contact with this bat. At 21:17, a noctule was recorded briefly foraging along the stream, with nine passes detected. Then at 21:28, a single noctule pass was detected near Stop Point 6.

Common pipistrelle

The first common pipistrelle was recorded at 21:19 as it briefly foraged along the stream, with two passes detected. At 21:48, a single common pipistrelle pass was detected near Stop Point 10, but there was no visual contact with this bat. Then at 22:33, a single common pipistrelle pass was detected along the northern boundary near the A5.

Soprano pipistrelle

At 21:28, a single soprano pipistrelle pass was detected near Stop Point 6, but there was no visual contact with this bat.

4.1.7.2 Dawn Survey

The manual bat activity survey was undertaken on 11th August 2021. The survey commenced 120 minutes prior to sunrise and continued until sunrise. Sunrise was at 05:41 hrs (BBC Weather Centre Data for Caldecote). The results of the survey are shown on Drawing C154920-05-05 in Chapter 7.

Two species of bat were recorded during the transect survey: noctule and common pipistrelle. See Table 4.5 for data obtained during the survey.

Time Band	Species Recorded	
	Noctule	Common pipistrelle
03:30 – 03:45	-	-
03:45 – 04:00	-	-
04:00 – 04:15	-	1
04:15 – 04:30	1	-
04:30 – 04:45	-	1
04:45 – 05:00	1	-
05:00 – 05:15	1	-
05:15 – 05:30	-	-
05:30 – 05:45	-	-
Total	3	2

Table 4.5: Summary of Bat Passes Recorded during Manual Activity Survey, August (Dawn) 2021

Common pipistrelle

The first common pipistrelle was detected at 04:08 near Stop Point 11, but there was no visual contact with this bat. Then at 04:41, a single common pipistrelle pass was recorded as a bat commuted along the stream.

Noctule

The first noctule was detected at 04:18 as it flew high over Stop Point 10, but there was no visual contact with this bat. At 04:45, a single noctule pass was recorded as a bat commuted along the stream. Then at 05:13, a noctule was recorded as if flew high over Stop Point 2 commuting north.

4.1.8 September Bat Activity Survey

The manual bat activity survey was undertaken on 14th September 2021. The survey commenced at sunset and continued until 120 minutes after sunset. Sunset was at 19:22 hrs (BBC Weather Centre Data for Caldecote). The results of the survey are shown on Drawing C154920-05-06 in Chapter 7.

One species of bat was recorded during the transect survey: noctule. See Table 4.6 for data obtained during the survey.

Time Band	Species Recorded
	Noctule
19:15 – 19:30	-
19:30 – 19:45	2
19:45 – 20:00	1
20:00 – 20:15	1
20:15 – 20:30	-
20:30 – 20:45	-
20:45 – 21:00	-
21:00 – 21:15	-
21:15 – 21:30	-
Total	4

Table 4.6: Summary of Bat Passes Recorded during Manual Activity Survey, September 2021

The first noctule was recorded at 19:39 with two passes detected as a bat flew high over Stop Point 3 commuting west. At 19:55, a single noctule pass was detected near Stop Point 6, but there was no visual contact with this bat. Then at 20:07, a single noctule pass was detected near Stop Point 7.

4.1.9 October Bat Activity Survey

The manual bat activity survey was undertaken on 20th October 2021. The survey commenced at sunset and continued until 120 minutes after sunset. Sunset was at 17:59 hrs (BBC Weather Centre Data for Caldecote). The results of the survey are shown on Drawing C154920-05-07 in Chapter 7.

One species of bat was recorded during the transect survey: noctule. See Table 4.7 for data obtained during the survey.

Time Band	Species Recorded
	Noctule
17:45 – 18:00	-
18:00 – 18:15	-
18:15 – 18:30	1
18:30 – 18:45	-
18:45 – 19:00	-
19:00 – 19:15	-
19:15 – 19:30	-
19:30 – 19:45	-
19:45 – 20:00	-
Total	1

Table 4.7: Summary of Bat Passes Recorded during Manual Activity Survey, October 2021

At 18:15, a single noctule pass was detected as a bat flew high over Stop Point 4, but there was no visual contact with this bat.

4.2 AUTOMATED BAT ACTIVITY SURVEY

4.2.1 May Static Bat Activity Survey

The weather conditions and sunrise/sunset times for the local area (BBC Weather Centre for Caldecote) over the five nights are detailed in Table 4.8.

Parameter	Conditions				
	Night 1 26/05/2021 – 27/05/2021	Night 2 27/05/2021 – 28/05/2021	Night 3 28/05/2021 – 29/05/2021	Night 4 29/05/2021 – 30/05/2021	Night 5 30/05/2021 – 31/05/2021
Temperature (°C)	Max: 12 Min: 6	Max: 17 Min: 9	Max: 14 Min: 12	Max: 18 Min: 7	Max: 15 Min: 7
Average Cloud Cover (%)	85	79	85	70	90
Precipitation	Nil	Nil	Nil	Nil	Nil
Average Wind Speed (Beaufort)	F2	F2	F1	F2	F2
Sunset / Sunrise times	Sunset: 21:12 Sunrise: 04:53	Sunset: 21:13 Sunrise: 04:52	Sunset: 21:14 Sunrise: 04:51	Sunset: 21:15 Sunrise: 04:50	Sunset: 21:17 Sunrise: 04:49

Table 4.8: Weather Conditions Over Course of Automated Bat Activity Survey

Seven species of bat were recorded during the automated bat activity survey: noctule, Leisler's bat *Nyctalus leisleri*, common pipistrelle, soprano pipistrelle, brown long-eared *Plecotus auritus*, Daubenton's bat *Myotis daubentonii* and whiskered bat *Myotis mystacinus*. See Table 4.9 for data obtained during the survey.

Date	Time Band	AM / PM	Temp (°C)	Static 1							Static 2						
				Noctule	Leisler' s bat	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Daubenton' s bat	Whiskered bat	Noctule	Leisler' s bat	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Daubenton' s bat	Whiskered bat
26-27/05/21 Sunset: 21:12 Sunrise: 04:53	20:00 – 21:00	PM	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	21:00 – 22:00		11	-	-	-	-	-	-	-	1	-	2	-	-	-	-
	22:00 – 23:00		10	-	-	3	-	-	-	-	1	-	16	1	-	-	-
	23:00 – 00:00		10	-	-	1	-	-	-	-	-	1	11	1	-	-	-
	00:00 – 01:00	AM	8	-	-	1	-	-	-	-	8	1	2	1	-	-	-
	01:00 – 02:00		8	-	-	2	1	-	-	-	23	-	5	-	-	-	-
	02:00 – 03:00		8	-	-	1	-	1	-	-	27	-	6	-	-	-	-
	03:00 – 04:00		7	1	-	-	-	-	-	-	7	-	-	-	-	-	-
	04:00 – 05:00		5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	05:00 – 06:00		6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total			1	0	8	1	1	0	0	67	2	42	3	0	0	0
27-28/05/21 Sunset: 21:13 Sunrise: 04:52	20:00 – 21:00	PM	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	21:00 – 22:00		15	-	-	2	-	-	-	-	4	-	2	1	-	-	-
	22:00 – 23:00		14	2	-	3	-	-	-	1	1	-	34	-	-	-	-
	23:00 – 00:00		13	-	-	-	-	-	-	-	1	-	9	-	-	-	-
	00:00 – 01:00	AM	12	-	-	1	-	-	-	-	14	-	29	-	-	-	-
	01:00 – 02:00		12	-	-	1	-	-	-	-	23	-	7	1	-	-	1
	02:00 – 03:00		11	-	-	2	-	-	-	-	16	-	5	-	-	-	-
	03:00 – 04:00		10	2	-	7	-	-	-	-	12	-	14	-	-	-	-
	04:00 – 05:00		10	2	-	-	-	-	-	-	1	-	-	-	-	-	-
	05:00 – 06:00		9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total			6	0	16	0	0	0	1	72	0	100	2	0	0	1
28-29/05/21 Sunset: 21:14 Sunrise: 04:51	20:00 – 21:00	PM	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	21:00 – 22:00		14	1	-	1	-	-	-	-	1	-	-	-	-	-	-
	22:00 – 23:00		13	1	-	8	1	1	-	-	1	-	4	-	-	-	-
	23:00 – 00:00		13	-	-	3	-	-	-	-	-	-	2	-	-	-	-
	00:00 – 01:00	AM	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	01:00 – 02:00		13	2	-	-	-	1	-	-	-	-	8	-	-	-	-
	02:00 – 03:00		13	-	-	1	-	-	-	-	2	-	35	-	-	-	-
	03:00 – 04:00		13	-	-	3	-	-	-	-	2	-	26	-	-	-	-
	04:00 – 05:00		13	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	05:00 – 06:00		12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total			5	0	16	1	2	0	0	6	0	75	0	0	0	0
29-30/05/21 Sunset: 21:15 Sunrise: 04:50	20:00 – 21:00	PM	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	21:00 – 22:00		17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	22:00 – 23:00		15	3	-	6	-	-	-	-	10	-	27	-	-	-	-
	23:00 – 00:00		14	-	-	-	-	-	-	-	27	-	17	-	-	2	-
	00:00 – 01:00	AM	12	-	-	-	-	-	-	-	16	-	19	-	-	-	-
	01:00 – 02:00		10	-	-	-	-	-	-	-	28	-	7	-	-	-	-
	02:00 – 03:00		10	-	-	-	-	-	-	-	-	-	13	-	-	-	-
	03:00 – 04:00		9	-	-	-	-	-	-	-	3	-	18	-	-	-	-
	04:00 – 05:00		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	05:00 – 06:00		7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total			3	0	6	0	0	0	0	84	0	101	0	0	2	0
30-31/05/21 Sunset: 21:17 Sunrise: 04:49	20:00 – 21:00	PM	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	21:00 – 22:00		14	-	-	-	-	-	-	-	1	-	-	-	-	-	-
	22:00 – 23:00		12	-	-	17	-	-	-	-	5	-	8	-	-	-	-
	23:00 – 00:00		10	3	-	8	1	-	-	-	1	-	6	-	-	-	-
	00:00 – 01:00	AM	8	-	-	3	-	-	-	-	1	-	16	1	-	-	-
	01:00 – 02:00		8	1	-	1	-	-	-	-	-	-	7	-	-	-	-
	02:00 – 03:00		7	-	-	-	-	-	-	-	2	-	26	-	-	-	1
	03:00 – 04:00		7	1	-	16	-	-	-	-	11	-	14	-	-	1	1
	04:00 – 05:00		7	-	-	-	-	-	-	-	3	-	-	-	-	-	-
	05:00 – 06:00		7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total			5	0	45	1	0	0	0	24	0	77	1	0	1	2

Table 4.9: Summary of Bat Passes Recorded by Static Detectors 1 and 2, May 2021

Noctule passes were detected during all five nights that the static detectors were in place. These detections were frequent, indicating that this species was commuting across the site and using the open arable farmland for foraging.

Two detections of Leisler's bat were recorded by static detector 2 on the first night that the static detectors were in place.

Common pipistrelle was by far the most frequently detected species, with passes recorded during all five nights that the static bat detectors were in place and throughout each night.

Sporadic and infrequent soprano pipistrelle activity was recorded during four of the five nights that the static bat detectors were in place.

A small number of brown long-eared bat passes were detected during two of the five nights that the static bat detectors were in place.

Daubenton's bat passes were detected during two of the five nights that the static detectors were in place. These detections were infrequent, but they were recorded by static detector 2 possibly indicating that this species was using the stream as a commute corridor.

Infrequent whiskered bat passes were recorded during two of the five nights that the static bat detectors were in place.

4.2.2 June Static Bat Activity Survey

The weather conditions and sunrise/sunset times for the local area (BBC Weather Centre for Caldecote) over the five nights are detailed in Table 4.10.

Parameter	Conditions				
	Night 1 16/06/2021 – 17/06/2021	Night 2 17/06/2021 – 18/06/2021	Night 3 18/06/2021 – 19/06/2021	Night 4 19/06/2021 – 20/06/2021	Night 5 20/06/2021 – 21/06/2021
Temperature (°C)	Max: 22 Min: 15	Max: 17 Min: 12	Max: 12 Min: 11	Max: 14 Min: 11	Max: 12 Min: 8
Average Cloud Cover (%)	70	80	90	96	95
Precipitation	Nil	Occasional light showers	Nil	Nil	Nil
Average Wind Speed (Beaufort)	F2	F3	F2	F2	F2
Sunset / Sunrise times	Sunset: 21:31 Sunrise: 04:42	Sunset: 21:31 Sunrise: 04:42	Sunset: 21:31 Sunrise: 04:42	Sunset: 21:32 Sunrise: 04:42	Sunset: 21:32 Sunrise: 04:42

Table 4.10: Weather Conditions Over Course of Automated Bat Activity Survey

Seven species of bat were recorded during the automated bat activity survey: noctule, Leisler's bat, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle *Pipistrellus nathusii*, brown long-eared bat and barbastelle *Barbastella barbastellus*. See Table 4.11 for data obtained during the survey.

Date	Time Band	AM / PM	Temp (°C)	Static 1							Static 2							
				Noctule	Leisler' s bat	Common pipistrelle	Soprano pipistrelle	Nathusius' pipistrelle	Brown long-eared bat	Barbastelle	Noctule	Leisler' s bat	Common pipistrelle	Soprano pipistrelle	Nathusius' pipistrelle	Brown long-eared bat	Barbastelle	
16-17/06/21 Sunset: 21:31 Sunrise: 04:42	21:00 – 22:00	PM	22	5	1	-	-	-	-	-	-	-	-	-	-	-	-	
	22:00 – 23:00		21	4	.	146	3	-	-	-	-	-	80	2	-	-	1	
	23:00 – 00:00		19	1	5	16	-	1	-	-	1	1	56	-	-	-	-	
	00:00 – 01:00	AM	19	-	6	-	-	-	-	-	4	-	29	-	-	-	-	-
	01:00 – 02:00		17	-	2	1	-	-	-	-	-	-	57	-	-	-	-	
	02:00 – 03:00		16	-	8	2	-	-	-	-	1	1	20	-	-	-	-	
	03:00 – 04:00		15	1	7	2	-	-	-	-	1	1	118	-	-	-	-	
	04:00 – 05:00		15	-	-	-	-	-	-	-	-	-	13	-	-	-	-	
	05:00 – 06:00		15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total			11	29	167	3	1	0	0	7	3	373	2	0	0	1	
17-18/06/21 Sunset: 21:31 Sunrise: 04:42	21:00 – 22:00	PM	17	5	3	2	-	-	-	-	-	-	11	-	-	-	-	
	22:00 – 23:00		16	2	23	10	-	-	-	-	7	2	168	-	-	-	-	
	23:00 – 00:00		16	-	6	4	-	-	-	-	-	1	3	-	-	-	-	
	00:00 – 01:00	AM	15	-	25	6	-	-	-	-	-	-	20	-	-	-	-	
	01:00 – 02:00		14	-	23	6	-	-	-	-	-	-	6	-	-	-	-	
	02:00 – 03:00		14	-	5	19	-	-	-	-	-	1	1	-	-	-	-	
	03:00 – 04:00		13	3	-	10	-	-	-	-	-	1	9	-	-	-	-	
	04:00 – 05:00		12	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
	05:00 – 06:00		12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total			10	86	57	0	0	0	0	7	5	218	0	0	0	0	
18-19/06/21 Sunset: 21:31 Sunrise: 04:42	21:00 – 22:00	PM	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	22:00 – 23:00		12	1	-	2	-	-	-	-	-	-	53	-	2	1	-	
	23:00 – 00:00		11	-	38	8	-	-	-	-	2	-	15	-	-	-	-	
	00:00 – 01:00	AM	11	1	2	3	-	-	-	-	1	-	1	-	-	-	-	
	01:00 – 02:00		11	-	-	1	-	-	-	-	-	-	-	-	-	-	-	
	02:00 – 03:00		11	-	1	-	-	-	-	-	-	-	1	-	-	-	-	
	03:00 – 04:00		11	-	-	2	-	-	-	-	-	-	-	-	-	-	-	
	04:00 – 05:00		11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	05:00 – 06:00		11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total			2	41	16	0	0	0	0	3	0	70	0	2	1	0	
19-20/06/21 Sunset: 21:32 Sunrise: 04:42	21:00 – 22:00	PM	14	6	-	10	-	-	-	-	-	-	33	-	-	-	-	
	22:00 – 23:00		13	-	-	37	-	-	-	-	-	-	61	-	-	1	-	
	23:00 – 00:00		12	-	7	3	-	-	-	-	1	-	-	-	-	-	-	
	00:00 – 01:00	AM	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	01:00 – 02:00		12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	02:00 – 03:00		12	-	-	-	-	-	-	-	-	-	1	-	-	-	-	
	03:00 – 04:00		11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	04:00 – 05:00		11	-	-	-	-	-	-	-	-	1	-	-	-	-	-	
	05:00 – 06:00		11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total			6	7	50	0	0	0	0	1	1	95	0	0	1	0	
20-21/06/21 Sunset: 21:32 Sunrise: 04:42	21:00 – 22:00	PM	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	22:00 – 23:00		11	2	18	9	-	-	-	-	7	1	106	-	-	-	-	
	23:00 – 00:00		11	-	23	-	-	-	-	-	-	-	3	-	-	-	-	
	00:00 – 01:00	AM	10	-	7	-	-	-	-	-	-	-	-	-	-	-	-	
	01:00 – 02:00		10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	02:00 – 03:00		9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	03:00 – 04:00		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	04:00 – 05:00		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	05:00 – 06:00		8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Total			2	48	9	0	0	0	0	0	1	109	0	0	0	0	

Table 4.11: Summary of Bat Passes Recorded by Static Detectors 1 and 2, June 2021

Noctule passes were detected during all five nights that the static detectors were in place. These detections were frequent, indicating that this species was commuting across the site and using the open arable farmland for foraging.

Frequent detections of Leisler's bat were recorded during all five nights that the static detectors were in place.

Common pipistrelle was by far the most frequently detected species, with passes recorded during all five nights that the static bat detectors were in place and throughout each night.

Five soprano pipistrelle passes were recorded during the first night that the static bat detectors were in place.

Infrequent Nathusius' pipistrelle passes were recorded during two of the five nights that the static bat detectors were in place.

A small number of brown long-eared bat passes were detected during two of the five nights that the static bat detectors were in place.

A single barbastelle pass was detected by static detector 2 during the first night that the static bat detectors were in place.

4.2.3 July Static Bat Activity Survey

The weather conditions and sunrise/sunset times for the local area (BBC Weather Centre for Caldecote) over the five nights are detailed in Table 4.12.

Parameter	Conditions				
	Night 1 20/07/2021 – 21/07/2021	Night 2 21/07/2021 – 22/07/2021	Night 3 22/07/2021 – 23/07/2021	Night 4 23/07/2021 – 24/07/2021	Night 5 24/07/2021 – 25/07/2021
Temperature (°C)	Max: 26 Min: 15	Max: 25 Min: 15	Max: 26 Min: 16	Max: 18 Min: 14	Max: 18 Min: 15
Average Cloud Cover (%)	90	85	80	86	85
Precipitation	Nil	Nil	Nil	Nil	Occasional light showers
Average Wind Speed (Beaufort)	F2	F2	F2	F3	F3
Sunset / Sunrise times	Sunset: 21:15 Sunrise: 05:08	Sunset: 21:14 Sunrise: 05:09	Sunset: 21:12 Sunrise: 05:10	Sunset: 21:11 Sunrise: 05:12	Sunset: 21:10 Sunrise: 05:13

Table 4.12: Weather Conditions Over Course of Automated Bat Activity Survey

Eight species of bat were recorded during the automated bat activity survey: noctule, Leisler's bat, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, Daubenton's bat and barbastelle. See Table 4.13 for data obtained during the survey.

Date	Time Band	AM / PM	Temp (°C)	Static 1								Static 2
				Noctule	Leisler' s bat	Common pipistrelle	Soprano pipistrelle	Nathusius' pipistrelle	Brown long-eared bat	Daubenton' s bat	Barbastelle	
20-21/07/21 Sunset: 21:15 Sunrise: 05:08	20:00 – 21:00	PM	26	-	-	-	-	-	-	-	-	This detector stopped working and therefore it did not record any bat passes.
	21:00 – 22:00		22	23	-	1	-	-	-	-	-	
	22:00 – 23:00		21	1	2	25	-	-	-	-	-	
	23:00 – 00:00		18	3	2	22	-	-	-	-	-	
	00:00 – 01:00	AM	18	3	2	22	-	-	-	-	-	
	01:00 – 02:00		17	18	1	16	-	-	2	-	-	
	02:00 – 03:00		17	2	2	9	-	-	-	-	-	
	03:00 – 04:00		16	1	2	9	-	-	-	-	-	
	04:00 – 05:00		15	79	8	1	-	-	-	-	-	
	05:00 – 06:00		15	-	-	-	-	-	-	-	-	
	Total			130	19	105	0	0	2	0	0	
21-22/07/21 Sunset: 21:14 Sunrise: 05:09	20:00 – 21:00	PM	25	-	-	-	-	-	-	-	-	This detector stopped working and therefore it did not record any bat passes.
	21:00 – 22:00		23	3	-	2	-	-	-	-	-	
	22:00 – 23:00		21	-	-	17	-	-	-	-	-	
	23:00 – 00:00		20	1	-	25	-	-	-	-	-	
	00:00 – 01:00	AM	18	4	-	17	1	-	1	-	-	
	01:00 – 02:00		17	2	1	22	-	-	1	-	-	
	02:00 – 03:00		16	-	4	24	-	-	-	-	-	
	03:00 – 04:00		16	1	1	10	-	-	2	-	-	
	04:00 – 05:00		16	95	1	2	-	-	1	-	-	
	05:00 – 06:00		15	-	-	-	-	-	-	-	-	
	Total			106	7	119	1	0	5	0	0	
22-23/07/21 Sunset: 21:12 Sunrise: 05:10	20:00 – 21:00	PM	26	-	-	-	-	-	-	-	-	This detector stopped working and therefore it did not record any bat passes.
	21:00 – 22:00		24	21	-	4	-	-	-	-	-	
	22:00 – 23:00		23	-	-	26	1	-	-	-	2	
	23:00 – 00:00		22	-	-	32	-	-	-	1	2	
	00:00 – 01:00	AM	20	-	-	18	1	-	-	-	-	
	01:00 – 02:00		20	1	1	5	-	1	1	-	-	
	02:00 – 03:00		19	1	-	16	-	-	-	-	-	
	03:00 – 04:00		17	2	-	8	-	-	-	1	-	
	04:00 – 05:00		16	88	-	1	-	-	-	-	-	
	05:00 – 06:00		16	-	-	-	-	-	-	-	-	
	Total			113	1	110	2	1	1	2	4	
23-24/07/21 Sunset: 21:11 Sunrise: 05:12	20:00 – 21:00	PM	18	-	-	-	-	-	-	-	-	This detector stopped working and therefore it did not record any bat passes.
	21:00 – 22:00		18	9	-	6	-	-	-	-	-	
	22:00 – 23:00		17	-	-	31	-	-	-	-	-	
	23:00 – 00:00		17	-	-	123	-	-	-	-	-	
	00:00 – 01:00	AM	16	-	-	30	1	-	-	-	-	
	01:00 – 02:00		15	-	-	26	-	-	-	-	-	
	02:00 – 03:00		14	-	-	5	-	-	-	-	-	
	03:00 – 04:00		14	-	2	5	-	-	-	-	-	
	04:00 – 05:00		14	18	2	-	-	-	-	-	-	
	05:00 – 06:00		14	8	-	-	-	-	-	-	-	
	Total			35	4	226	1	0	0	0	0	
24-25/07/21 Sunset: 21:10 Sunrise: 05:13	20:00 – 21:00	PM	18	-	-	-	-	-	-	-	-	This detector stopped working and therefore it did not record any bat passes.
	21:00 – 22:00		17	4	-	7	-	-	-	-	-	
	22:00 – 23:00		16	4	2	80	-	-	-	-	-	
	23:00 – 00:00		16	-	1	65	-	-	-	-	-	
	00:00 – 01:00	AM	16	-	1	48	-	-	-	-	-	
	01:00 – 02:00		15	-	1	9	-	-	-	-	-	
	02:00 – 03:00		15	-	-	3	-	-	-	1	-	
	03:00 – 04:00		15	6	2	3	1	-	-	-	-	
	04:00 – 05:00		15	82	5	43	-	-	-	-	-	
	05:00 – 06:00		15	32	-	-	-	-	-	-	-	
	Total			128	12	258	1	0	0	1	0	

Table 4.13: Summary of Bat Passes Recorded by Static Detectors 1 and 2, July 2021

Noctule passes were detected during all five nights that the static detectors were in place. These detections were frequent, indicating that this species was commuting across the site and using the open arable farmland for foraging.

Infrequent Leisler's bat passes were recorded during all five nights that the static bat detectors were in place.

Common pipistrelle was by far the most frequently detected species, with passes recorded during all five nights that the static bat detectors were in place and throughout each night.

Sporadic and infrequent soprano pipistrelle activity was recorded during four of the five nights that the static bat detectors were in place.

A single Nathusius' pipistrelle pass was recorded during the third night that the static detectors were in place.

A small number of brown long-eared bat passes were detected during three of the five nights that the static bat detectors were in place.

Daubenton's bat passes were detected during two of the five nights that the static detectors were in place. These detections were infrequent.

Four barbastelle passes were recorded during the third night that the static detectors were in place.

4.2.4 August Static Bat Activity Survey

The weather conditions and sunrise/sunset times for the local area (BBC Weather Centre for Caldecote) over the five nights are detailed in Table 4.14.

Parameter	Conditions				
	Night 1 10/08/2021 – 11/08/2021	Night 2 11/08/2021 – 12/08/2021	Night 3 12/08/2021 – 13/08/2021	Night 4 13/08/2021 – 14/08/2021	Night 5 14/08/2021 – 15/08/2021
Temperature (°C)	Max: 20 Min: 12	Max: 20 Min: 12	Max: 18 Min: 12	Max: 19 Min: 14	Max: 20 Min: 14
Average Cloud Cover (%)	65	78	90	86	91
Precipitation	Nil	Occasional light showers	Nil	Nil	Nil
Average Wind Speed (Beaufort)	F2	F2	F2	F2	F1
Sunset / Sunrise times	Sunset: 20:41 Sunrise: 05:42	Sunset: 20:39 Sunrise: 05:44	Sunset: 20:37 Sunrise: 05:45	Sunset: 20:35 Sunrise: 05:47	Sunset: 20:33 Sunrise: 05:49

Table 4.14: Weather Conditions Over Course of Automated Bat Activity Survey

Six species of bat were recorded during the automated bat activity survey: noctule, Leisler's bat, common pipistrelle, soprano pipistrelle, Brandt's bat *Myotis brandti* and Natterer's bat *Myotis nattereri*. See Table 4.15 for data obtained during the survey.

Date	Time Band	AM / PM	Temp (°C)	Static 1						Static 2					
				Noctule	Leisler' s bat	Common pipistrelle	Soprano pipistrelle	Brandt' s bat	Natterer' s bat	Noctule	Leisler' s bat	Common pipistrelle	Soprano pipistrelle	Brandt' s bat	Natterer' s bat
10-11/08/21 Sunset: 20:41 Sunrise: 05:42	20:00 – 21:00	PM	20	-	-	-	-	-	-	-	-	-	-	-	-
	21:00 – 22:00		19	5	-	13	-	-	-	7	-	25	-	-	-
	22:00 – 23:00		18	-	-	54	-	-	-	2	-	18	3	-	4
	23:00 – 00:00		16	1	-	21	-	-	-	1	1	19	2	-	-
	00:00 – 01:00	AM	16	-	-	10	1	-	-	1	-	10	1	-	-
	01:00 – 02:00		16	2	1	2	1	-	-	1	1	4	1	-	-
	02:00 – 03:00		15	-	3	14	-	-	-	4	-	7	-	-	1
	03:00 – 04:00		15	4	1	5	1	1	-	-	-	1	2	-	-
	04:00 – 05:00		14	1	1	-	1	-	-	1	-	15	-	-	-
	05:00 – 06:00		13	24	-	-	-	-	-	63	-	-	-	-	-
	06:00 – 07:00		12	-	-	-	-	-	-	-	-	-	-	-	-
	Total			37	6	119	4	1	0	80	2	99	9	0	5
11-12/08/21 Sunset: 20:39 Sunrise: 05:44	20:00 – 21:00	PM	20	2	-	-	-	-	-	9	-	-	-	-	-
	21:00 – 22:00		19	10	-	57	-	-	-	14	-	136	3	-	-
	22:00 – 23:00		18	-	-	82	1	-	-	-	-	15	-	-	-
	23:00 – 00:00		18	-	-	43	1	-	-	-	-	2	-	-	-
	00:00 – 01:00	AM	17	-	-	7	1	-	-	-	-	14	-	-	1
	01:00 – 02:00		17	-	-	4	-	-	-	-	-	5	-	-	-
	02:00 – 03:00		16	1	-	2	-	1	-	-	-	6	-	-	2
	03:00 – 04:00		14	1	-	4	-	-	-	-	-	1	-	-	-
	04:00 – 05:00		12	-	-	2	-	1	-	5	-	9	-	-	-
	05:00 – 06:00		12	-	-	-	-	-	-	18	-	-	-	-	-
	06:00 – 07:00		12	-	-	-	-	-	-	-	-	-	-	-	-
	Total			14	0	201	3	2	0	46	0	188	3	0	3
12-13/08/21 Sunset: 20:37 Sunrise: 05:45	20:00 – 21:00	PM	18	-	-	-	-	-	-	-	-	-	-	-	-
	21:00 – 22:00		17	2	1	8	-	-	-	5	-	25	-	-	1
	22:00 – 23:00		16	-	-	4	-	-	-	-	-	6	-	-	-
	23:00 – 00:00		15	-	-	6	1	1	1	-	-	8	-	-	-
	00:00 – 01:00	AM	14	-	-	6	-	-	1	-	-	3	-	-	-
	01:00 – 02:00		13	-	1	16	-	-	-	1	-	-	-	-	-
	02:00 – 03:00		12	-	1	5	-	-	-	1	-	1	-	-	-
	03:00 – 04:00		13	-	-	3	-	-	-	-	-	17	-	-	-
	04:00 – 05:00		14	-	3	4	-	-	-	-	-	3	-	-	-
	05:00 – 06:00		14	1	-	1	-	-	-	22	-	-	-	-	-
	06:00 – 07:00		14	-	-	-	-	-	-	-	-	-	-	-	-
	Total			3	6	53	1	1	2	29	0	63	0	0	1
13-14/08/21 Sunset: 20:35 Sunrise: 05:47	20:00 – 21:00	PM	19	1	-	-	-	-	-	2	-	-	-	-	-
	21:00 – 22:00		18	2	-	9	-	-	-	3	-	43	-	-	-
	22:00 – 23:00		17	-	-	15	2	-	-	1	-	5	1	-	-
	23:00 – 00:00		17	-	-	7	-	1	-	-	-	4	-	-	-
	00:00 – 01:00	AM	17	-	-	4	-	-	-	-	-	5	-	-	-
	01:00 – 02:00		16	-	-	3	-	1	-	-	1	3	-	-	-
	02:00 – 03:00		16	-	-	7	-	1	-	This detector stopped working and therefore it did not record any bat passes.					
	03:00 – 04:00		15	2	-	4	-	-	-						
	04:00 – 05:00		15	-	1	2	-	-	-						
	05:00 – 06:00		14	4	-	-	-	-	-						
	06:00 – 07:00		14	-	-	-	-	-	-						
	Total			9	1	51	2	3	0	6	1	60	1	0	0
14-15/08/21 Sunset: 20:33 Sunrise: 05:49	20:00 – 21:00	PM	20	4	-	-	-	-	-	This detector stopped working and therefore it did not record any bat passes.					
	21:00 – 22:00		19	3	-	17	-	-	-						
	22:00 – 23:00		18	-	-	23	-	-	-						
	23:00 – 00:00		17	-	-	18	1	-	4						
	00:00 – 01:00	AM	16	2	1	8	-	-	-						
	01:00 – 02:00		16	1	-	10	-	-	1						
	02:00 – 03:00		15	1	-	22	1	-	-						
	03:00 – 04:00		15	-	-	25	-	-	-						
	04:00 – 05:00		14	-	1	3	-	-	2						
	05:00 – 06:00		14	6	-	-	-	-	-						
	06:00 – 07:00		14	-	-	-	-	-	-						
	Total			17	2	126	2	0	7						

Table 4.15: Summary of Bat Passes Recorded by Static Detectors 1 and 2, August 2021

Noctule passes were detected during all five nights that the static detectors were in place. These detections were frequent, indicating that this species was commuting across the site and using the open arable farmland for foraging.

Infrequent Leisler's bat passes were recorded during four of the five nights that the static bat detectors were in place.

Common pipistrelle was by far the most frequently detected species, with passes recorded during all five nights that the static bat detectors were in place and throughout each night.

Sporadic and infrequent soprano pipistrelle activity was recorded during all five nights that the static bat detectors were in place.

A small number of Brandt's bat passes were detected during four of the five nights that the static detectors were in place. These detections were infrequent.

Natterer's bat passes were recorded during four of the five nights that the static detectors were in place. These detections were infrequent.

4.2.5 September Static Bat Activity Survey

The weather conditions and sunrise/sunset times for the local area (BBC Weather Centre for Caldecote) over the five nights are detailed in Table 4.16.

Parameter	Conditions				
	Night 1 14/09/2021 – 15/09/2021	Night 2 15/09/2021 – 16/09/2021	Night 3 16/09/2021 – 17/09/2021	Night 4 17/09/2021 – 18/09/2021	Night 5 18/09/2021 – 19/09/2021
Temperature (°C)	Max: 15 Min: 14	Max: 18 Min: 10	Max: 20 Min: 10	Max: 19 Min: 10	Max: 20 Min: 13
Average Cloud Cover (%)	97	96	90	86	83
Precipitation	Nil	Nil	Nil	Nil	Nil
Average Wind Speed (Beaufort)	F2	F1	F1	F1	F1
Sunset / Sunrise times	Sunset: 19:23 Sunrise: 06:40	Sunset: 19:21 Sunrise: 06:42	Sunset: 19:18 Sunrise: 06:43	Sunset: 19:16 Sunrise: 06:45	Sunset: 19:14 Sunrise: 06:47

Table 4.16: Weather Conditions Over Course of Automated Bat Activity Survey

Eight species of bat were recorded during the automated bat activity survey: noctule, Leisler's bat, common pipistrelle, soprano pipistrelle, brown long-eared bat, Daubenton's bat, Brandt's bat and Natterer's bat. See Table 4.17 for data obtained during the survey.

Date	Time Band	AM / PM	Temp (°C)	Static 1								Static 2							
				Noctule	Leisler' s bat	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Daubenton' s bat	Brandt' s bat	Natterer' s bat	Noctule	Leisler' s bat	Common pipistrelle	Soprano pipistrelle	Brown long-eared bat	Daubenton' s bat	Brandt' s bat	Natterer' s bat
14-15/09/21 Sunset: 19:23 Sunrise: 06:40	19:00 – 20:00	PM	15	8	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-
	20:00 – 21:00		15	13	-	1	-	-	-	-	-	5	3	61	1	-	-	-	
	21:00 – 22:00		15	2	-	1	-	-	-	-	-	3	-	38	-	-	-	-	
	22:00 – 23:00		15	1	-	2	-	-	-	-	1	-	-	9	1	-	-	-	
	23:00 – 00:00	AM	14	-	1	2	-	-	-	-	-	1	-	-	-	-	-	-	-
	00:00 – 01:00		14	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	
	01:00 – 02:00		14	2	-	-	-	-	-	-	-	-	2	1	-	-	-	-	
	02:00 – 03:00		14	1	-	2	-	-	-	-	-	-	-	1	-	-	-	-	
	03:00 – 04:00		14	2	-	-	-	-	-	-	-	-	-	2	1	-	-	-	
	04:00 – 05:00		14	-	-	-	-	-	-	-	-	-	-	4	-	-	1	-	
	05:00 – 06:00		14	2	3	-	-	-	-	1	-	3	1	1	-	-	-	-	
	06:00 – 07:00		14	5	-	-	-	-	-	-	-	21	1	-	-	-	-	-	
	Total			36	4	9	0	0	0	1	2	32	9	118	3	0	0	1	0
15-16/09/21 Sunset: 19:21 Sunrise: 06:42	19:00 – 20:00	PM	18	6	-	-	-	-	-	-	-	6	-	-	-	-	-	-	
	20:00 – 21:00		14	16	-	56	2	-	-	-	2	15	-	79	13	-	-	2	
	21:00 – 22:00		13	3	-	48	1	-	-	-	-	-	-	4	2	-	-	-	
	22:00 – 23:00		12	1	-	7	1	-	-	-	1	-	3	1	-	-	-	-	
	23:00 – 00:00	AM	12	-	1	5	-	-	-	2	-	-	1	-	-	-	-	-	
	00:00 – 01:00		12	5	1	-	-	-	-	1	3	-	1	-	-	-	-	-	
	01:00 – 02:00		12	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	
	02:00 – 03:00		12	-	-	-	1	-	-	-	-	-	1	-	-	-	-	1	
	03:00 – 04:00		11	2	-	-	-	-	-	-	2	-	1	1	-	-	-	-	
	04:00 – 05:00		10	3	-	5	-	-	-	-	-	-	-	-	-	-	-	-	
	05:00 – 06:00		11	1	1	2	2	-	-	-	-	-	-	-	-	-	-	-	
	06:00 – 07:00		10	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	07:00 – 08:00	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total			40	3	123	7	0	0	3	8	21	8	85	15	0	0	0	3	
16-17/09/21 Sunset: 19:18 Sunrise: 06:43	18:00 – 19:00	PM	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	19:00 – 20:00		18	4	4	-	-	-	-	-	-	4	5	1	-	-	-	-	
	20:00 – 21:00		16	5	-	61	-	-	-	1	-	3	2	141	3	-	-	-	
	21:00 – 22:00		15	-	-	37	3	-	-	1	3	-	-	122	-	-	-	-	
	22:00 – 23:00	AM	14	-	1	48	1	-	-	-	2	-	-	10	1	-	-	-	
	23:00 – 00:00		13	26	4	37	1	-	1	-	-	1	-	-	-	-	-	-	
	00:00 – 01:00		13	12	2	5	-	-	-	-	1	-	-	-	-	-	-	-	
	01:00 – 02:00		13	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
	02:00 – 03:00		12	4	-	3	-	-	-	1	-	-	-	-	-	-	-	-	
	03:00 – 04:00		12	-	1	2	1	-	-	-	1	-	-	-	-	-	-	-	
	04:00 – 05:00		11	-	-	2	-	-	-	-	-	-	-	-	1	-	-	-	
	05:00 – 06:00		11	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	
	06:00 – 07:00		10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
07:00 – 08:00	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Total			51	12	197	6	0	1	3	7	8	7	274	4	1	0	0	0	
17-18/09/21 Sunset: 19:16 Sunrise: 06:45	18:00 – 19:00	PM	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	19:00 – 20:00		18	8	5	5	1	-	-	-	-	2	2	7	-	-	-	-	
	20:00 – 21:00		17	31	1	73	-	-	-	-	1	7	-	63	-	-	-	-	
	21:00 – 22:00		17	-	-	97	-	-	-	-	2	6	-	56	2	-	-	-	
	22:00 – 23:00	AM	16	-	-	126	-	-	-	-	-	-	-	10	-	1	-	-	
	23:00 – 00:00		16	-	-	121	-	-	-	-	-	-	-	8	-	-	-	-	
	00:00 – 01:00		16	-	-	87	-	-	-	-	2	-	-	85	-	-	-	-	
	01:00 – 02:00		16	-	3	80	-	-	-	-	-	-	-	-	-	-	-	-	
	02:00 – 03:00		13	-	1	22	-	-	-	-	-	-	-	1	-	1	-	-	
	03:00 – 04:00		12	-	-	21	1	-	-	-	1	-	-	1	-	1	-	-	
	04:00 – 05:00		12	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	
	05:00 – 06:00		11	-	2	1	-	-	-	-	-	-	-	-	-	-	-	-	
	06:00 – 07:00		10	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
07:00 – 08:00	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Total			40	12	634	2	0	0	1	5	15	2	231	2	4	0	0	0	
18-19/09/21 Sunset: 19:14 Sunrise: 06:47	18:00 – 19:00	PM	20	-	-	-	-	-	-	-	-	This detector stopped working and therefore it did not record any bat passes.							
	19:00 – 20:00		19	27	3	-	-	-	-	-	-								
	20:00 – 21:00		19	8	-	107	1	-	-	-	1								
	21:00 – 22:00		18	-	1	168	2	-	-	-	1								
	22:00 – 23:00	AM	18	-	-	168	-	-	-	-	1								
	23:00 – 00:00		17	-	-	161	-	-	-	-	6								
	00:00 – 01:00		16	4	1	164	2	-	-	-	1								
	01:00 – 02:00		15	2	-	74	1	-	-	-	2								
	02:00 – 03:00		14	-	1	64	-	-	-	-	-								
	03:00 – 04:00		14	-	-	14	-	-	-	-	-								
	04:00 – 05:00		13	-	-	18	-	-	-	-	-								
	05:00 – 06:00		13	2	-	13	-	-	-	-	-								
	06:00 – 07:00		13	11	-	-	-	-	-	-	-								
07:00 – 08:00	14	-	-	-	-	-	-	-	-										
Total			54	6	951	6	0	0	0	12	6	0	71	0	0	0	0	0	

Table 4.17: Summary of Bat Passes Recorded by Static Detectors 1 and 2, September 2021

Noctule passes were detected during all five nights that the static detectors were in place. These detections were frequent, indicating that this species was commuting across the site and using the open arable farmland for foraging.

Infrequent Leisler's bat passes were recorded during all five nights that the static bat detectors were in place.

Common pipistrelle was by far the most frequently detected species, with passes recorded during all five nights that the static bat detectors were in place and throughout each night.

Sporadic and infrequent soprano pipistrelle activity was recorded during all five nights that the static bat detectors were in place.

A small number of brown long-eared bat passes were detected during two of the five nights that the static bat detectors were in place.

A single detection of Daubenton's bat was recorded during the third night that the static detectors were in place.

Infrequent Brandt's bat passes were detected during four of the five nights that the static detectors were in place.

Natterer's bat passes were recorded during all five nights that the static detectors were in place. These detections were infrequent.

4.2.6 October Static Bat Activity Survey

The weather conditions and sunrise/sunset times for the local area (BBC Weather Centre for Caldecote) over the five nights are detailed in Table 4.18.

Parameter	Conditions				
	Night 1 20/10/2021 – 21/10/2021	Night 2 21/10/2021 – 22/10/2021	Night 3 22/10/2021 – 23/10/2021	Night 4 23/10/2021 – 24/10/2021	Night 5 24/10/2021 – 25/10/2021
Temperature (°C)	Max: 14 Min: 5	Max: 10 Min: 5	Max: 12 Min: 7	Max: 12 Min: 10	Max: 13 Min: 10
Average Cloud Cover (%)	87	85	80	76	95
Precipitation	Occasional light showers	Nil	Nil	Nil	Nil
Average Wind Speed (Beaufort)	F3	F2	F1	F3	F2
Sunset / Sunrise times	Sunset: 18:00 Sunrise: 07:42	Sunset: 17:58 Sunrise: 07:44	Sunset: 17:56 Sunrise: 07:46	Sunset: 17:53 Sunrise: 07:48	Sunset: 17:51 Sunrise: 07:50

Table 4.18: Weather Conditions Over Course of Automated Bat Activity Survey

Two species of bat were recorded during the automated bat activity survey: common pipistrelle and soprano pipistrelle. See Table 4.19 for data obtained during the survey.

Date	Time Band	AM / PM	Temp (°C)	Static 1		Static 2	
				Common pipistrelle	Soprano pipistrelle	Common pipistrelle	Soprano pipistrelle
20-21/10/21 Sunset: 18:00 Sunrise: 07:42	17:00 – 18:00	PM	14	-	-	-	-
	18:00 – 19:00		13	-	-	3	-
	19:00 – 20:00		12	-	-	-	-
	20:00 – 21:00		10	-	-	1	-
	21:00 – 22:00		10	-	-	-	-
	22:00 – 23:00		10	-	-	-	-
	23:00 – 00:00		9	-	-	-	-
	00:00 – 01:00	AM	9	-	-	-	-
	01:00 – 02:00		9	-	-	-	-
	02:00 – 03:00		9	-	-	1	-
	03:00 – 04:00		8	-	-	7	-
	04:00 – 05:00		9	-	-	6	-
	05:00 – 06:00		9	-	-	-	-
	06:00 – 07:00		8	-	-	-	-
	07:00 – 08:00		7	-	-	-	-
	08:00 – 09:00	5	-	-	-	-	
Total			0	0	18	0	
21-22/10/21 Sunset: 17:58 Sunrise: 07:44	17:00 – 18:00	PM	10	-	-	-	-
	18:00 – 19:00		8	-	-	3	-
	19:00 – 20:00		8	-	-	-	-
	20:00 – 21:00		7	-	-	-	-
	21:00 – 22:00		7	-	-	-	-
	22:00 – 23:00		6	-	-	-	-
	23:00 – 00:00		6	-	-	-	-
	00:00 – 01:00	AM	6	-	-	-	-
	01:00 – 02:00		6	1	-	-	-
	02:00 – 03:00		5	3	-	-	-
	03:00 – 04:00		5	2	-	-	-
	04:00 – 05:00		6	1	-	-	-
	05:00 – 06:00		6	-	-	-	-
	06:00 – 07:00		7	-	-	-	-
	07:00 – 08:00		7	-	-	-	-
	08:00 – 09:00	6	-	-	-	-	
Total			7	0	3	0	
22-23/10/21 Sunset: 17:56 Sunrise: 07:46	17:00 – 18:00	PM	12	-	-	-	-
	18:00 – 19:00		11	-	-	-	-
	19:00 – 20:00		10	-	-	-	-
	20:00 – 21:00		10	-	-	-	-
	21:00 – 22:00		9	-	-	-	-
	22:00 – 23:00		8	-	-	-	-
	23:00 – 00:00		9	-	-	-	-
	00:00 – 01:00	AM	7	-	-	-	-
	01:00 – 02:00		7	8	-	-	-
	02:00 – 03:00		8	2	-	-	-
	03:00 – 04:00		8	8	-	1	-
	04:00 – 05:00		9	13	-	17	-
	05:00 – 06:00		9	11	1	117	-
	06:00 – 07:00		9	1	-	9	-
	07:00 – 08:00		9	-	-	-	-
	08:00 – 09:00	9	-	-	-	-	
Total			43	1	144	0	
23-24/10/21 Sunset: 17:53 Sunrise: 07:48	17:00 – 18:00	PM	12	-	-	-	-
	18:00 – 19:00		11	2	-	50	-
	19:00 – 20:00		12	-	-	39	-
	20:00 – 21:00		11	-	-	23	-
	21:00 – 22:00		11	1	-	-	-
	22:00 – 23:00		11	-	-	-	-
	23:00 – 00:00		11	3	-	-	-
	00:00 – 01:00	AM	11	6	-	3	-
	01:00 – 02:00		11	14	-	24	-
	02:00 – 03:00		11	18	-	23	-
	03:00 – 04:00		11	27	-	13	-
	04:00 – 05:00		10	19	-	41	-
	05:00 – 06:00		10	21	-	49	-
	06:00 – 07:00		10	8	-	18	-
	07:00 – 08:00		10	-	-	1	-
	08:00 – 09:00	10	-	-	-	-	
Total			119	0	284	0	
24-25/10/21 Sunset: 17:51 Sunrise: 07:50	17:00 – 18:00	PM	13	-	-	-	-
	18:00 – 19:00		12	6	-	23	-
	19:00 – 20:00		12	4	-	-	-
	20:00 – 21:00		12	4	-	-	-
	21:00 – 22:00		12	1	-	-	-
	22:00 – 23:00		12	7	-	-	-
	23:00 – 00:00		12	6	-	-	-
	00:00 – 01:00	AM	11	10	-	-	-
	01:00 – 02:00		11	9	-	9	-
	02:00 – 03:00		11	16	-	40	-
	03:00 – 04:00		11	22	-	37	-
	04:00 – 05:00		10	37	-	22	-
	05:00 – 06:00		10	8	-	35	-
	06:00 – 07:00		10	7	-	-	-
	07:00 – 08:00		10	-	-	-	-
	08:00 – 09:00	10	-	-	-	-	
Total			137	0	166	0	

Table 4.19: Summary of Bat Passes Recorded by Static Detectors 1 and 2, October 2021

Common pipistrelle was by far the most frequently detected species, with passes recorded during all five nights that the static bat detectors were in place and throughout each night.

A single detection of soprano pipistrelle was recorded during the third night that the static detectors were in place.

5. DISCUSSION AND CONCLUSIONS

5.1 DISCUSSION

5.1.1 Summary of Proposals

The proposal is for the construction of seven commercial units with associated access and parking. The entrance to the site from the A5 will utilise the existing site entrance on the roundabout to the existing Horiba MIRA site to the north. The exit onto the Weddington Lane will require the creation of a new site entrance and junction. The stream that runs centrally through the site will be retained in situ. A new crossing will be created over this to allow vehicular access to the western half of the site. Two internal hedgerows will be lost, but the external site boundary features will be preserved intact except the new entrance proposed onto Weddington Lane. Pedestrian and cycle access is proposed onto the site via the Weddington Walk on the disused railway line at the northeast corner of the site. A band of soft landscaping with planting and pools is proposed along this pedestrian walkway, around the eastern, western and southern boundaries of the site, and along the west of the stream. Whilst some of these pools are proposed for site drainage, it is understood that some are proposed for ornamental and wildlife purposes. No construction work is currently proposed on the westernmost field included in the survey area for this study.

5.1.2 Summary of Bat Activity Surveys

Noctule

Noctule is still a relatively widespread species in much of England, Wales and to south-west Scotland, but has become scarce in some areas of intensive agriculture (Bat Conservation Trust, 2010). This species was frequently recorded commuting across the site and foraging over the open arable farmland during both the manual and automated activity surveys, with 15.5% of the total number of bat passes recorded (1,400 out of 9,012 bat passes recorded during the surveys). Noctule is one of the largest native bat species, and often emerges from roost locations prior to sunset. The bat surveys undertaken at the site identified no noctule roosts; however, suitable roosting locations are present on site and in the wider landscape. This species will readily fly over large open areas, and it is not considered that the survey area is likely to provide a key habitat resource.

Leisler's bat

Leisler's bat is found throughout the British Isles, with the exception of northern Scotland (Bat Conservation Trust, 2010). This species was recorded infrequently during the automated activity surveys, with 3.9% of the total number of bat passes recorded (347 out of 9,012 bat passes recorded during the surveys). The bat surveys undertaken at the site identified no Leisler's bat roosts; however, suitable roosting locations are present on site and in the wider landscape. Due to the low level of activity recorded on site by this species, it is not considered that the survey area is likely to provide a key habitat resource.

Common pipistrelle

Common pipistrelle is one of the most common species of bat in England and Wales (Bat Conservation Trust, 2010). It was the most frequently recorded bat species using the site during both the manual and automated activity surveys, with 78.4% of the total number of bat passes recorded (7,064 out of 9,012 bat passes recorded during the surveys). There are roosts for this species present within the farm complex and tree T4, as identified during the recent dusk emergence and dawn re-entry surveys undertaken at the site. Further suitable roosting locations are also present in the wider landscape. The survey evidence collected indicates that the site contains habitats that are highly suitable for common pipistrelles, with the boundary trees and hedgerows, as well as the stream, used frequently for foraging and as commute corridors. However, other suitable habitat resources with connectivity to the site are widespread in the area.

Soprano pipistrelle

The soprano pipistrelle is widely distributed across the UK, with the exception of the very northern parts of Scotland (Bat Conservation Trust, 2010). Along with the common pipistrelle it is one of Britain's commonest bat species. The soprano pipistrelle was infrequently recorded using the site during both the manual and automated activity surveys, with 1% of the total number of bat passes recorded (92 out of 9,012 bat passes recorded during the surveys). The bat surveys undertaken at the site identified no soprano pipistrelle roosts; however, suitable roosting locations are present on site and in the wider landscape. Due to the low level of activity recorded on site by this species, it is not considered that the survey area is likely to provide a key habitat resource.

Nathusius' pipistrelle

Nathusius' pipistrelles have been widely recorded throughout the British Isles but records are sparse (Bat Conservation Trust, 2010). Three detections of this species were recorded during the June automated activity survey and a single detection of this species was recorded during the July automated activity survey. The bat surveys undertaken at the site identified no Nathusius' pipistrelle roosts; however, suitable roosting locations are present on site and in the wider landscape. Due to the very low level of activity recorded on site by this species, it is not considered that the survey area is likely to provide a key habitat resource.

Brown long-eared bat

Brown long-eared bats have declined in Britain due to changing land use, including modern intensive agricultural practices, and the conversion of barns which have resulted in the loss of suitable feeding and roosting habitats (Bat Conservation Trust, 2010). They do, however, remain a common and widespread species, although are often under recorded due to their quiet echolocation call (Bat Conservation Trust, 2010). A small number of brown long-eared bat passes were recorded during the automated activity surveys, with 0.2% of the total number of bat passes recorded (18 out of 9,012 bat passes recorded during the surveys). The bat surveys undertaken at the site identified no brown long-eared bat roosts; however, suitable roosting locations are present on site and in the wider landscape. Due to the low level of activity recorded on site by this species, it is not considered that the survey area is likely to provide a key habitat resource. However, if any new lighting is proposed to illuminate the boundary trees and hedgerows as part of the new development, then there is potential for the new development to impact local populations of brown long-eared bat by severing commute routes.

Daubenton's bat

Daubenton's bat is widely distributed across the UK, with the exception of the very northern parts of Scotland, Ireland and the Isle of Man (Bat Conservation Trust, 2010). This species was occasionally recorded during the automated activity surveys, with 0.1% of the total number of bat passes recorded (7 out of 9,012 bat passes recorded during the surveys). The bat surveys undertaken at the site identified no Daubenton's bat roosts; however, suitable roosting locations are present on site and in the wider landscape. Due to the very low level of activity recorded on site by this species, it is not considered that the survey area is likely to provide a key habitat resource. However, if any new lighting is proposed to illuminate the boundary trees and hedgerows, or the stream, as part of the new development, then there is potential for the new development to adversely impact local populations of Daubenton's bat by severing commute routes.

Natterer's bat

Natterer's bat is a scarce yet widely distributed species in Britain (Bat Conservation Trust, 2010). This species was occasionally recorded during the automated activity surveys, with 0.1% of the total number of bat passes recorded (55 out of 9,012 bat passes recorded during the surveys). The bat surveys undertaken at the site identified no Natterer's bat roosts; however, suitable roosting locations are present on site and in the wider landscape. Due to the low level of activity recorded on site by this species, it is not considered that the survey area is likely to provide a key habitat resource. However, if any new lighting is proposed to illuminate the boundary trees and hedgerows as part of the new development, then there is potential for the new development to impact local populations of Natterer's bat by severing commute routes.

Brandt's bat

Brandt's bat is thought to be slightly less common and widespread than the whiskered bat, but has been found throughout England and Wales (Bat Conservation Trust, 2010). This species was occasionally recorded during the automated activity surveys, with 0.2% of the total number of bat passes recorded (16 out of 9,012 bat passes recorded during the surveys). The bat surveys undertaken at the site identified no Brandt's bat roosts; however, suitable roosting locations are present on site and in the wider landscape. Due to the low level of activity recorded on site by this species, it is not considered that the survey area is likely to provide a key habitat resource. However, if any new lighting is proposed to illuminate the boundary trees and hedgerows, or the stream, as part of the new development, then there is potential for the new development to impact local populations of Brandt's bat by severing commute routes and potential foraging areas.

Whiskered bat

Whiskered bat is an uncommon but widespread species in England and Wales (Bat Conservation Trust, 2010). Four detections of this species were recorded during the May automated activity survey. The bat surveys undertaken at the site identified no whiskered bat roosts; however, suitable roosting locations are present on site and in the wider landscape. Due to the very low level of activity recorded on site by this species, it is not considered that the survey area is likely to provide a key habitat resource. However, if any

new lighting is proposed to illuminate the boundary trees and hedgerows as part of the new development, then there is potential for the new development to impact local populations of whiskered bat by severing commute routes.

Barbastelle

The barbastelle is very rare in the UK, with its range currently thought to extend mainly over southern and central England and Wales (Bat Conservation Trust, 2010). A single detection of barbastelle was recorded during the June automated activity survey and four detections were recorded during the July automated activity survey. Due to the low number of bat passes by this species, which were considered likely to be from an individual bat passing through, and the presence of other suitable habitat within the wider landscape, it is considered that the site is unlikely to provide a key habitat resource for barbastelle. However, if any new lighting is proposed to illuminate the boundary trees and hedgerows as part of the new development, then there is potential for the new development to impact local populations of barbastelle by severing commute routes.

5.2 CONCLUSIONS

The activity surveys identified that the site is utilised by eleven different species of bat. These species, with the exception of barbastelle, are common or widespread. Only low numbers of each species were recorded on site during the surveys. Common pipistrelle was the most frequently recorded bat species, most notably along the boundary trees and hedgerows. Overall, the site is considered to be of moderate value to foraging and commuting bats.

The current masterplan indicates the majority of existing trees and hedgerows on site are to be retained as part of the new development, especially around the perimeter of the site, and new tree and shrub planting is to be incorporated into the soft landscaping. The plan also indicates that a number of drainage features will also be created on site, including a series of ponds. Therefore, the impact on foraging and commuting habitat is considered to be temporary. To increase the value of the site for bats, a recommendation is made in Chapter 6 regarding suitable plant species to incorporate into the soft landscaping to attract night flying insects.

Whilst the new development is not expected to have a significant impact on commuting and foraging habitats, there is the potential for any new lighting, either temporary or permanent, at the site to impact commuting and foraging bats. Therefore, a recommendation regarding sensitive lighting is made in Chapter 6.

6. RECOMMENDATIONS

All recommendations provided in this section are based on Middlemarch Environmental Ltd's current understanding of the site proposals, correct at the time the report was compiled. Should the proposals alter, the conclusions and recommendations made in the report should be reviewed to ensure that they remain appropriate.

R1 Buildings and Trees

The recommendations made within the Bat Surveys Report (RT-MME-154920-04 Rev B) must be adhered to.

R2 Lighting

In accordance with best practice guidance relating to lighting and biodiversity (Miles et al, 2018; Gunnell et al, 2012), any new lighting should be carefully designed to minimise potential disturbance and fragmentation impacts on sensitive receptors, such as bat species. Examples of good practice include:

- Avoiding the installation of new lighting in proximity to key ecological features, such as trees, hedgerows and woodland edges.
- Using modern LED fittings rather than metal halide or sodium fittings, as modern LEDs emit negligible UV radiation.
- The use of directional lighting to reduce light spill, e.g. by installing bespoke fittings or using hoods or shields. For example, downlighting can be used to illuminate features such as footpaths whilst reducing the horizontal and vertical spill of light.
- Where the use of bollard lighting is proposed, columns should be designed to reduce horizontal light spill.
- Implementing controls to ensure lighting is only active when needed, e.g. the use of timers or motion sensors.
- Use of floor surface materials with low reflective quality. This will ensure that bats using the site and surrounding area are not affected by reflected illumination.
- For internal lights, recessed light fittings cause significantly less glare than pendant type fittings. The use of low-glare glass may also be appropriate where internal lighting has the potential to influence sensitive ecological receptors.

R3 Habitat Retention

The existing trees and hedgerows on site should be retained where possible. Buffers should be created around suitable commuting and foraging habitats to maintain connectivity across the site and surrounding area.

R4 Habitat Enhancement

In line with the National Planning Policy Framework, the development should aim to enhance the site for bats. Bat boxes should be installed to provide roosting habitat for species such as pipistrelle. In general, bats seek warm places and for this reason boxes should be located where they will receive full/partial sun, although installing boxes in a variety of orientations will provide a range of climatic conditions. Position boxes at least 4 m above ground to prevent disturbance from people and/or predators. The planting of species which attract night flying insects is encouraged as this will be of value to foraging bats, for example: evening primrose *Oenothera biennis*, goldenrod *Solidago virgaurea*, honeysuckle *Lonicera periclymenum* and fleabane *Pulicaria dysenterica*.

7. DRAWINGS

Drawing C154920-05-01 – May Manual Bat Activity Survey (Dusk)

Drawing C154920-05-02 – June Manual Bat Activity Survey (Dusk)

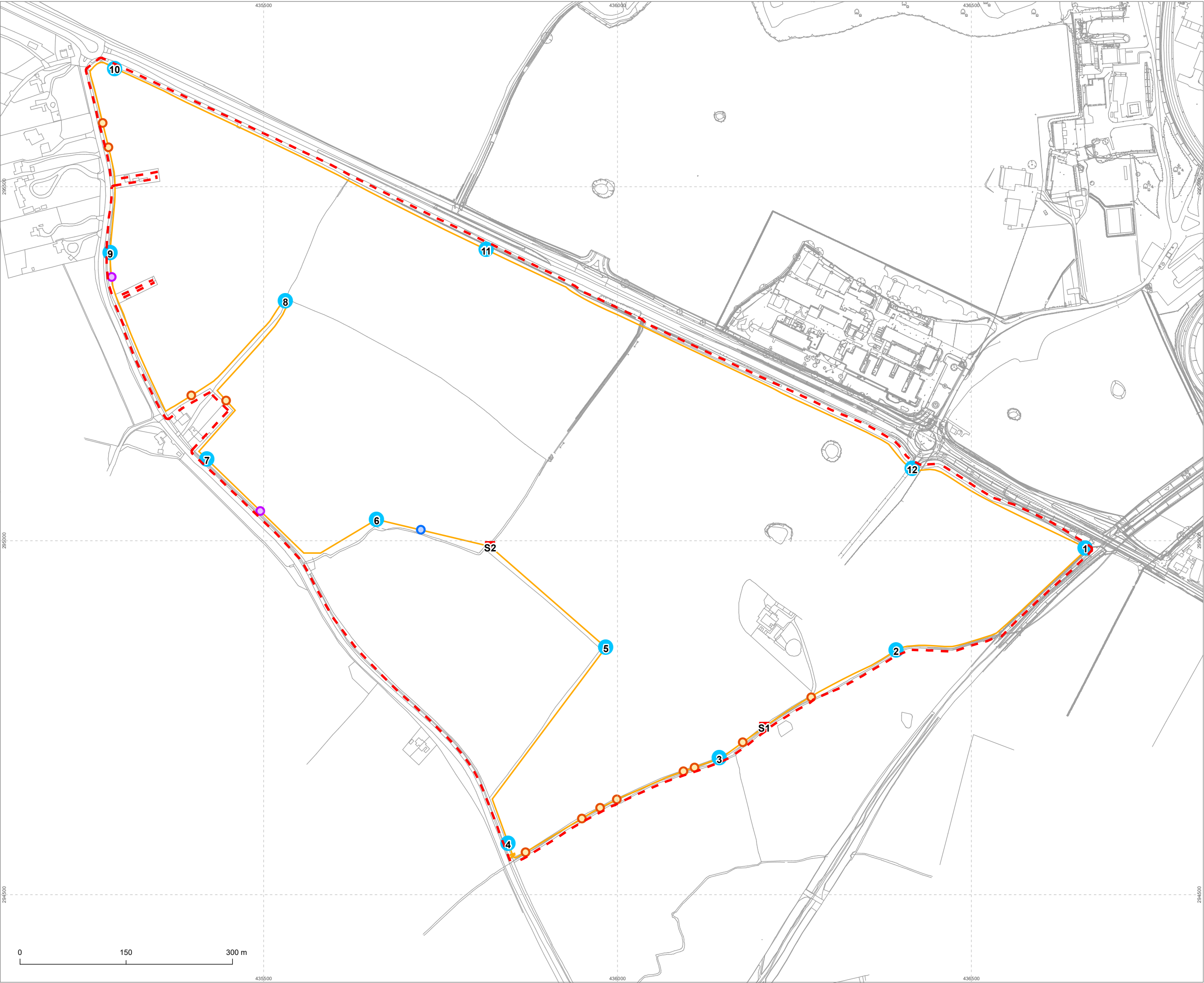
Drawing C154920-05-03 – July Manual Bat Activity Survey (Dusk)

Drawing C154920-05-04 – August Manual Bat Activity Survey (Dusk)

Drawing C154920-05-05 – August Manual Bat Activity Survey (Dawn)

Drawing C154920-05-06 – September Manual Bat Activity Survey (Dusk)

Drawing C154920-05-07 – October Manual Bat Activity Survey (Dusk)



C154920-05-01

Legend

Site boundary

Transect route

Static detector

Stop point

Bat activity

Common pipistrelle

Noctule

Soprano pipistrelle

Project

MIRA SMS, Watling Street, Warwickshire

Drawing

May Manual Bat Activity Survey (Dusk)

Client

ERI MTP Limited

Drawing Number

C154920-05-01

Revision

00

Scale @ A3

1:5,000

Date

November 2021

Approved By

SB

Drawn By

JR

MIDDLEMARCH

ENVIRONMENTAL

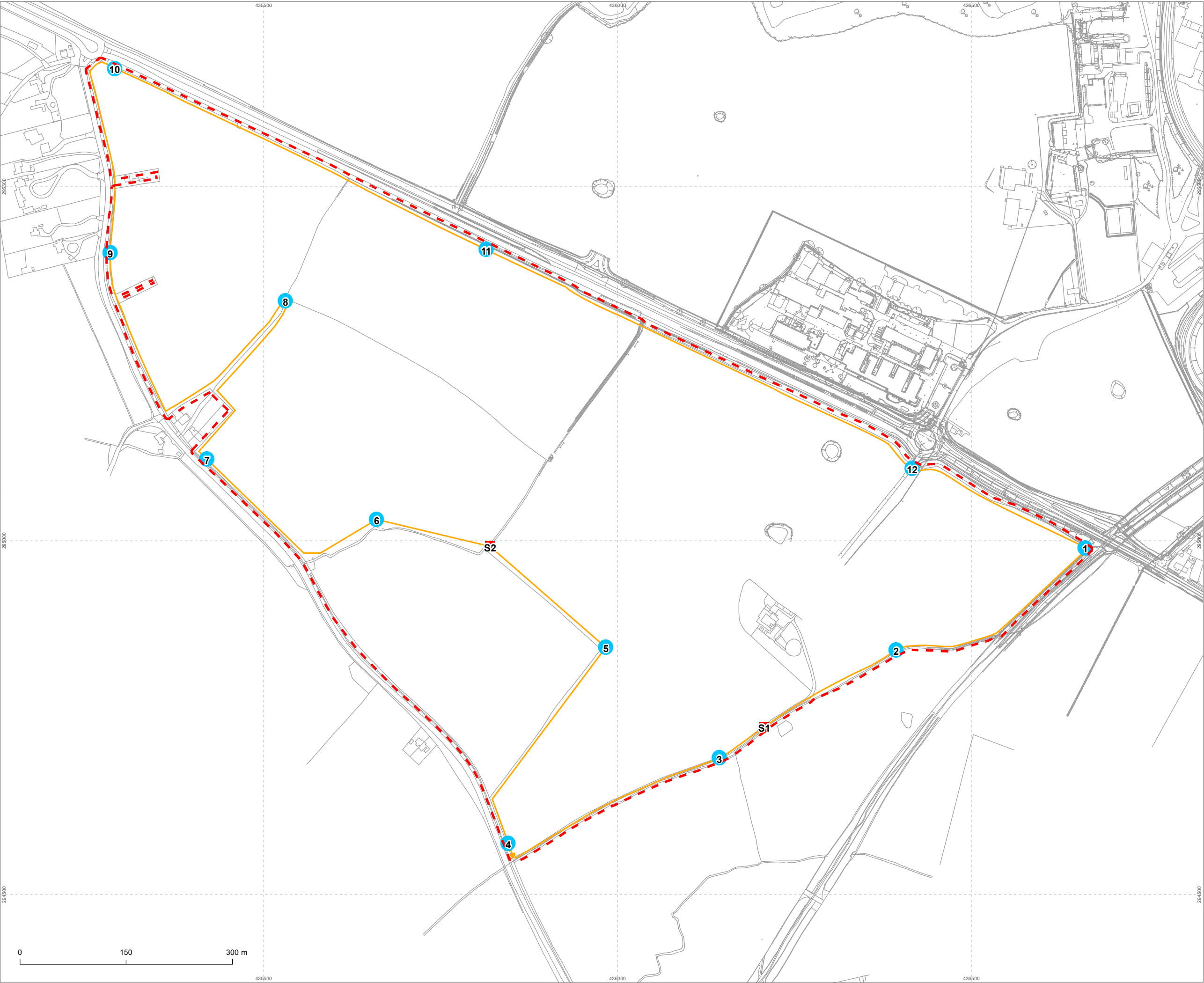
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C154920-05-03

Legend

Site boundary

Transect route

Static detector

Stop point

Note: No bats were recorded during this survey.

Project

MIRA SMS, Watling Street, Warwickshire

Drawing

July Manual Bat Activity Survey (Dusk)

Client

ERI MTP Limited

Drawing Number

C154920-05-03

Revision

00

Scale @ A3

1:5,000

Date

November 2021

Approved By

SB

Drawn By

JR

MIDDLEMARCH ENVIRONMENTAL

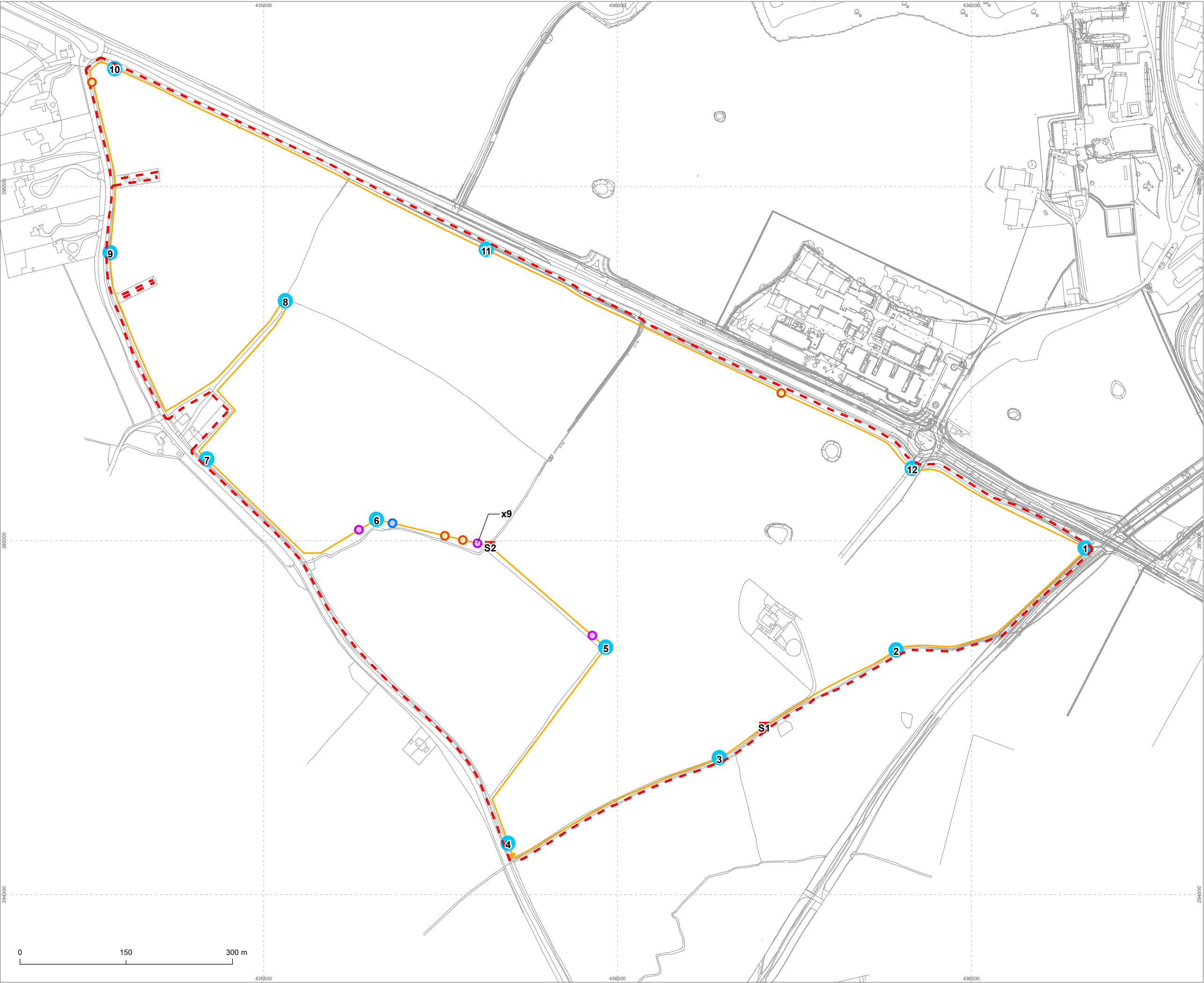
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C154920-05-04

Legend

Site boundary

Transect route

Static detector

Stop point

Bat activity

Noctule

Common pipistrelle

Soprano pipistrelle

Project

MIRA SMS, Watling Street, Warwickshire

Drawing

August Manual Bat Activity Survey (Dusk)

Client

ERI MTP Limited

Drawing Number

C154920-05-04

Revision

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Scale @ A3

1:5,000

Date

November 2021

Approved By

SB

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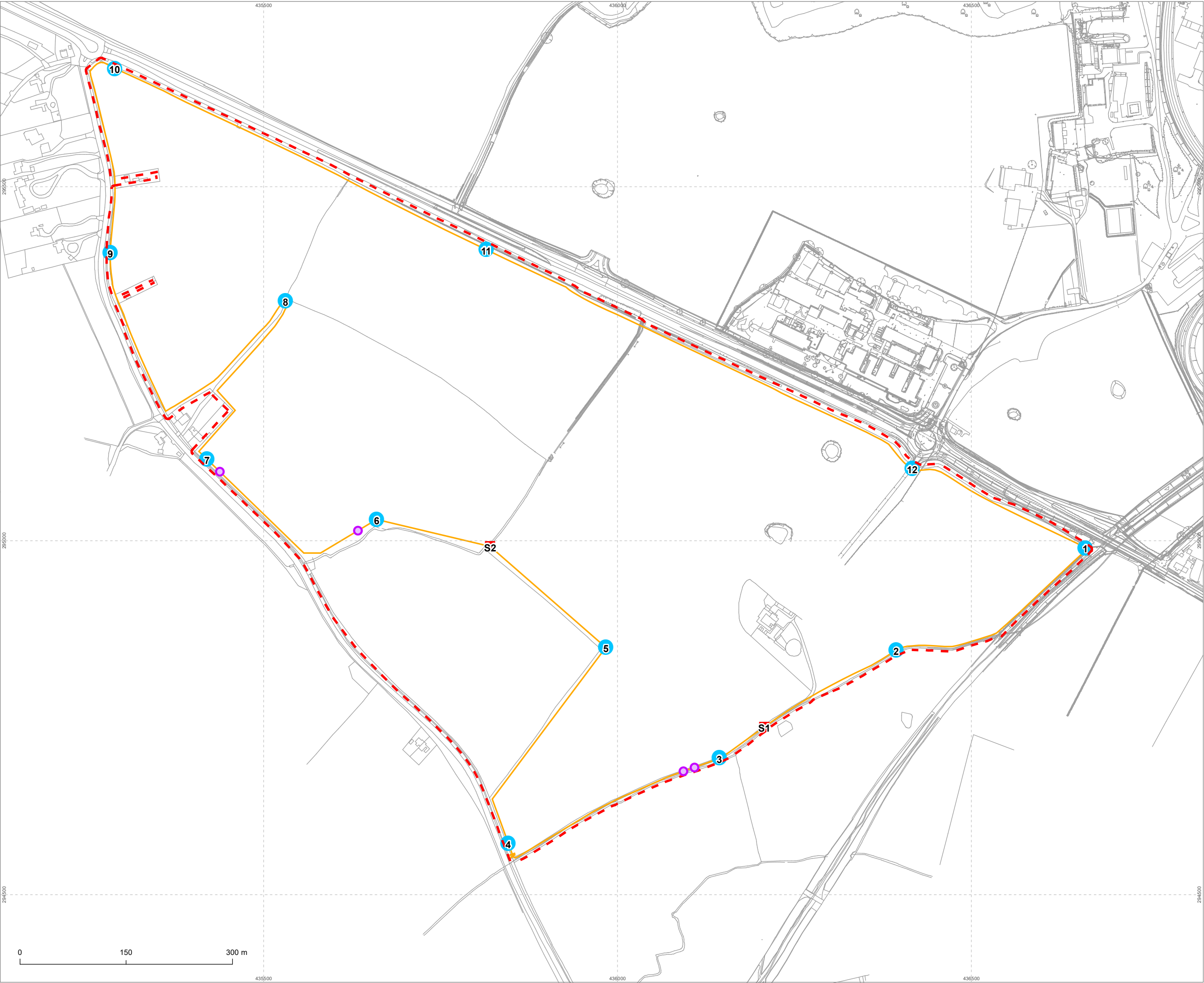
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C154920-05-06

Legend

Site boundary

Transect route

Static detector

Stop point

Bat activity

Noctule

Project

MIRA SMS, Watling Street, Warwickshire

Drawing

September Manual Bat Activity Survey (Dusk)

Client

ERI MTP Limited

Drawing Number

C154920-05-06

Revision

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Scale @ A3

1:5,000

Date

November 2021

Approved By

SB

Drawn By

JR

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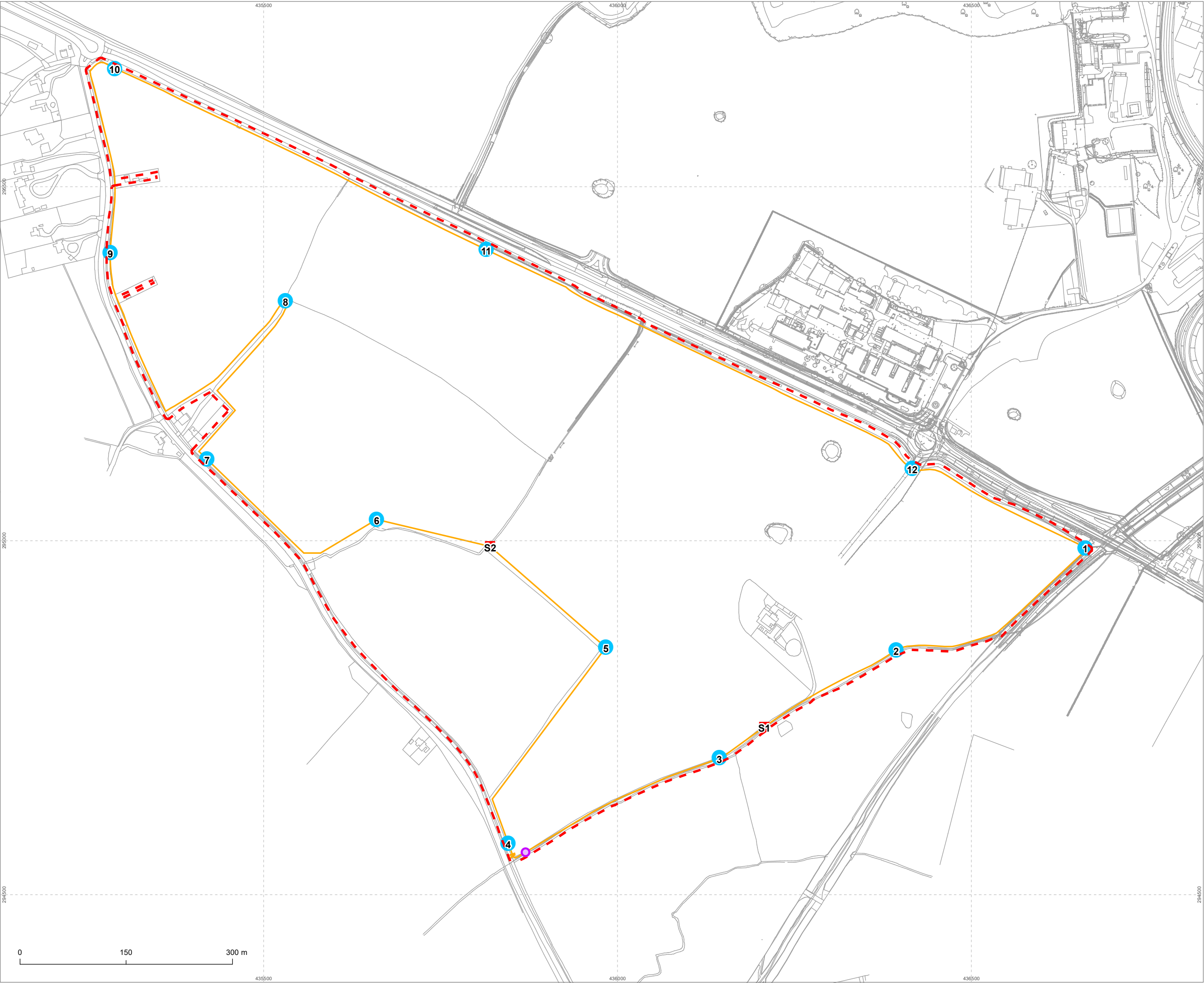
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C154920-05-07

Legend

Site boundary

Transect route

Static detector

Stop point

Bat activity

Noctule

Project

MIRA SMS, Watling Street, Warwickshire

Drawing

October Manual Bat Activity Survey (Dusk)

Client

ERI MTP Limited

Drawing Number

C154920-05-07

Revision

00

Scale @ A3

1:5,000

Date

November 2021

Approved By

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Drawn By

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APPENDIX 1

LEGISLATION

Bats and the places they use for shelter or protection (i.e. roosts) receive legal protection under the Conservation of Habitats and Species Regulations 2017 (Habitats Regulations 2017) and the Conservation of Habitats and Species Regulations (Amendment) (EU Exit) Regulations 2019 (Habitats Regulations 2019). They receive further legal protection under the Wildlife and Countryside Act (WCA) 1981, as amended. This protection means that bats, and the places they use for shelter or protection, are capable of being a material consideration in the planning process.

Regulation 41 of the Habitats Regulations 2017, states that a person commits an offence if they:

- deliberately capture, injure or kill a bat;
- deliberately disturb bats; or
- damage or destroy a bat roost (breeding site or resting place).

Disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong.

It is an offence under the Habitats Regulations 2017 for any person to have in his possession or control, to transport, to sell or exchange or to offer for sale, any live or dead bats, part of a bat or anything derived from bats, which has been unlawfully taken from the wild.

Changes have been made to parts of the Habitats Regulations 2017 so that they operate effectively from 1st January 2021. The changes are made by the Habitats Regulations 2019, which transfer functions from the European Commission to the appropriate authorities in England and Wales.

All other processes or terms in the 2017 Regulations remain unchanged and existing guidance is still relevant.

The obligations of a competent authority in the 2017 Regulations for the protection of species do not change. A competent authority is a public body, statutory undertaker, minister or department of government, or anyone holding public office.

Whilst broadly similar to the above legislation, the WCA 1981 (as amended) differs in the following ways:

- Section 9(1) of the WCA makes it an offence to *intentionally* kill, injure or take any protected species.
- Section 9(4)(a) of the WCA makes it an offence to *intentionally or recklessly** damage or destroy, or *obstruct access to*, any structure or place which a protected species uses for shelter or protection.
- Section 9(4)(b) of the WCA makes it an offence to *intentionally or recklessly** disturb any protected species *while it is occupying a structure or place which it uses for shelter or protection*.

*Reckless offences were added by the Countryside and Rights of Way (CROW) Act 2000.

As bats re-use the same roosts (breeding site or resting place) after periods of vacancy, legal opinion is that roosts are protected whether or not bats are present.

The reader should refer to the original legislation for the definitive interpretation.

The following bat species are Species of Principal Importance for Nature Conservation in England: barbastelle bat *Barbastella barbastellus*, Bechstein's bat *Myotis bechsteinii*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auritus*, greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat *Rhinolophus hipposideros*. Species of Principal Importance for Nature Conservation in England are material considerations in the planning process. The list of species is derived from Section 41 list of the Natural Environment and Rural Communities (NERC) Act 2006.

ECOLOGY

At present, 18 species of bats are known to live within the United Kingdom, of which 17 species are confirmed as breeding. All UK bat species are classed as insectivorous, feeding on a variety of invertebrates including midges, mosquitoes, lacewings, moths, beetles and small spiders.

Bats will roost within a variety of different roosting locations, included houses, farm buildings, churches, bridges, walls, trees, culverts, caves and tunnels. At different times of the year the bats roosting requirements alter and they can have different roosting locations for maternity roosts, mating roosts and hibernation roosts. Certain bat species will also change roosts throughout the bat activity season with the bat colony using the site to roost for a few days, abandoning the roost and then returning a few days or weeks later. This change can be for a variety of reasons including climatic conditions and prey availability. Bats are known live for several years and if the climatic conditions are unfavourable at a particular roost, they may abandon it for a number of years, before returning when conditions change. Due to the matriarchal nature of bat colonies, the locations of these roosts can be passed down through the generations.

Bats usually start to come out of hibernation in March and early April (weather dependent), when they start to forage and replenish the body weight lost during the hibernation period. The female bats then start to congregate together in maternity roosts prior to giving birth and a single baby is born in June or July. The female then works hard to feed her young so that they can become independent and of a sufficient weight to survive the winter before the weather gets too cold and invertebrate activity reduces. Males generally live solitary lives, or in small groups with other males, although in some species the males can be found living with the females all year. The mating season begins in the autumn. During the winter bats hibernate in safe locations which provide relatively constant conditions, although they may venture outside to forage on warmer winter nights.