Supplementary Ecology Report Bats

Land North-East of Humber Doucy Lane, Ipswich

Prepared by
CSA Environmental

On behalf of
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Report No: CSA/6675/10

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Report Reference	Revision	Date	Prepared by	Approved by	Comments
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1.0 Legislation

1.1 All British bat species are legally protected under Regulation 43 of the Conservation of Habitats and Species Regulations 2017 (as amended). These Regulations make it an offence to:

- Deliberately capture, injure, or kill a bat
- Deliberately disturb bats, impairing their ability to survive, breed, reproduce or rear/nurture their young, or which significantly affects the local distribution or abundance of the species
- Damage or destroy a breeding site or resting place used by bats

1.2 All bats and their roosts in the UK were previously fully protected under the Wildlife & Countryside Act 1981 (as amended). Amendments to the Act have removed most provisions as they relate to bats, however it remains an offence to:

- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection
- Intentionally or recklessly obstruct access to any structure or place used for shelter or protection

1.3 It is important to note that bat roosts are protected throughout the year, regardless of whether or not bats are present at the time. Under the Regulations, the offence of damaging or destroying a breeding site or resting place is subject to 'strict liability', i.e. an offence is commented irrespective of whether the causal act was deliberate or otherwise.

1.4 Where development is proposed that would result in an offence under the Regulations, a European Protected Species (EPS) statutory derogation licence (often termed 'EPS Mitigation Licence') will need to be secured from Natural England to permit an act that would otherwise be unlawful. Such a licence can only be granted following receipt of planning permission with all relevant conditions discharged, and where it has been demonstrated that specific statutory derogation tests have been met.

2.0 Methods

2.1 The following survey methods, design, data analysis and interpretation have been undertaken with due consideration of the Bat Conservation Trust (BCT) guidelines 4th edition (Collins, 2023).

Preliminary Roost Assessment (PRA)

Trees

2.2 All trees to be affected by development were inspected from ground level, using binoculars, high-powered torches and ladder as appropriate. Particular attention was given to woodpecker holes, limb splits, lifting bark and mature ivy stems. The survey was completed on

Carly Howes ACIEEM (Bat Class Survey Licence WML-CL17, Registration Number 2021-55125-CLS-CLS) and David Willis on 17 January 2024.

2.3   A description of each tree was made, including the species, height, diameter at breast height and condition.

2.4   The aim of this inspection was to record direct (i.e. actual roosting bats) or indirect evidence of roosting bats (e.g. droppings), as well as the nature and number of features with 'potential' to support roosting bats. This includes consideration of trees to support bats whilst in hibernation.

Assessing 'Potential' of Trees to Support Roosting Bats

2.5   All trees were assigned to one of four categories in respect of their 'potential' to support roosting bats, or the confirmation of any bat roosts identified. 'Potential' in this context is taken to be the broad suitability of features to support roosting bats, based upon the nature, condition or structure of such features, in the absence of confirmed evidence of roosting.

2.6   Assigning the following categories is intended to determine the effort of any further targeted survey or inspections which are necessary to prove presence or likely absence of roosting bats, rather than to assign importance to such features.

2.7   The following categories are assigned to structures and/or trees herein, Either:

- **Confirmed Roost** – where one or more bat roosts are identified during PRA inspections, either through direct sightings of bats, and/or indirect evidence such as bat droppings. Or;
- **High** – A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
- **Moderate** – A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, assessments at this stage are made irrespective of species conservation status).
- **Low** – A structure or tree with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
- **Negligible** – Negligible habitat features on site likely to be used by roosting bats.

2.8   The potential of a tree or structure to support roosting bats is often influenced by its age and construction, thermal stability, lighting and levels of human activity. Furthermore, the proximity to foraging habitat - particularly woodland, parkland and wetland- as well as the presence of navigational routes (e.g. hedgerows, treelines and watercourses) influence both the potential for bats to roost, as well as the species which may roost. Professional judgement is therefore applied, based upon known factors which effect the potential of features to support roosting bats, insofar as determining the need or scope of further surveys or inspections.

Limitations

3.0   There were no specific limitations to the surveys, which were conducted at an optimum time of year and in good conditions.

Activity Surveys

Remote Monitoring

3.1   Four Wildlife Acoustics Songmeter (SM4) detectors were deployed during September 2023, May 2024 and June 2024 to provide three datasets. The location of these Monitoring Locations (ML) is shown on Figure 1 below.

ML 🟠 ML1 🔵 ML2 🟢 ML3 🟣 ML4

Figure 1. The locations of each Monitoring Location (ML) surveyed during remote monitoring surveys in September 2023, May 2024 and June 2024.

3.2 The detectors were setup to automatically record ultrasonic signals for the period from half an hour before sunset to half an hour after sunrise each night, with each monitoring period spanning at least five consecutive nights.

3.3 Weather conditions were obtained for each night surveyed using historic weather data from the World Weather Online website, with weather observations taken from the nearest weather station in Wattisham. The five nights showing the most optimal weather conditions (in terms of temperature, precipitation and wind speed, see Table 1) were taken forward for analysis.

3.4 Recordings are triggered when a bat echolocation call is detected and will contain a variable number of call 'pulses'. Each file containing call pulses by a bat/s is designated as a 'bat contact' for each species present. The maximum recording duration is 15 seconds after which time a new recording file, and thus a new bat contact, is generated if echolocation calls are still being detected. This means that periods of prolonged bat activity near a detector is represented as multiple bat contacts, rather than a single one.

3.5 Recorded bat calls were analysed using the specialist software AnalookW to identify the species present. Quantitative analysis of bat activity was then undertaken by calculating the average bat contacts per hour on each night monitored, for each species.

3.6 Bat activity can show considerable inter-night variability and is dependent on a number of variables, including temperature, wind, and seasonality, amongst others. To account for this variability the median values for the average hourly bat contacts per night are reported, rather than a mean value which would misrepresent the average activity.

Limitations

3.7 It should be noted that the findings described herein for remote monitoring surveys are based on the bat activity recorded at the location immediate to each detector, and therefore only describe localised activity at the Site.

3.8 In addition, comparisons drawn on the number of detector activations by different species/genera can only give an indication of relative species abundance at the Site, as detectability varies between species.

3.9 It is acknowledged that the quantum of bat contacts recorded during a survey may not give a true reflection of the abundance of bats using the Site. For example, a single bat foraging close to a detector may trigger several hundred activations in the course of one night. However, this activity level does provide a proxy for the level of use by bats, and therefore its relative importance.

3.10 The following report presents data from two time periods. This will be grouped with the data from September 2023, May 2024 and June 2024 to form a complete dataset.

4.0 Results

Preliminary Roost Assessment (PRA)

Trees

4.1 No trees with bat roosting potential are scheduled to be removed according to the current proposals. All sections of hedgerow scheduled to be removed are of 'Negligible' potential to support roosting bats.

Activity Surveys

Remote Monitoring

4.2 The weather conditions experienced during the fifteen nights where data was analysed are provided in Table 1 below.

Table 1. Overnight weather conditions during remote monitoring

Survey Month	Dates Sampled	Temp. (°C)		Cloud Cover		Wind (km/h)		Precipitation
		Min	Max	Min	Max	Min	Max	
Sept	15/09/23	16.0	17.0	0	22	3.0	12.0	None
Sept	16/09/23	3.0	17.0	13	79	13.0	18.0	Moderate rain at 06:00
Sept	17/09/23	17.0	18.0	38	86	10.0	23.0	Very light rain at 21:00, light rain at 06:00 and moderate rain at 24:00.
Sept	18/09/23	13.0	15.0	6	82	22.0	27.0	None
Sept	19/09/23	17.0	17.0	100	100	32.0	36.0	None
May	05/05/24	10.0	11.0	99	100	3.0	12.0	Very light rain at 03:00 and light rain at 06:00
May	06/05/24	10.0	10.0	37	100	5.0	10.0	Very light rain at 00:00.
May	07/05/24	7.0	9.0	20	100	9.0	12.0	None
May	08/05/24	9.0	11.0	8	67	7.0	10.0	None
May	09/05/24	11.0	13.0	9	49	3.0	6.0	None
June	06/06/24	6.0	11.0	4	46	9.0	12.0	None
June	07/06/24	8.0	12.0	12	91	15.0	18.0	None
June	08/06/24	5.0	10.0	0	1	13.0	14.0	None
June	09/06/24	9.0	13.0	53	100	13.0	24.0	Very light rain from 21:00 to 03:00, where light rain begins until 06:00
June	10/06/24	6.0	8.0	23	56	10.0	16.0	None

4.3 The total number of bat contacts recorded across all monitoring locations and monitoring periods for each bat species/genera are provided in Figure 2 below.
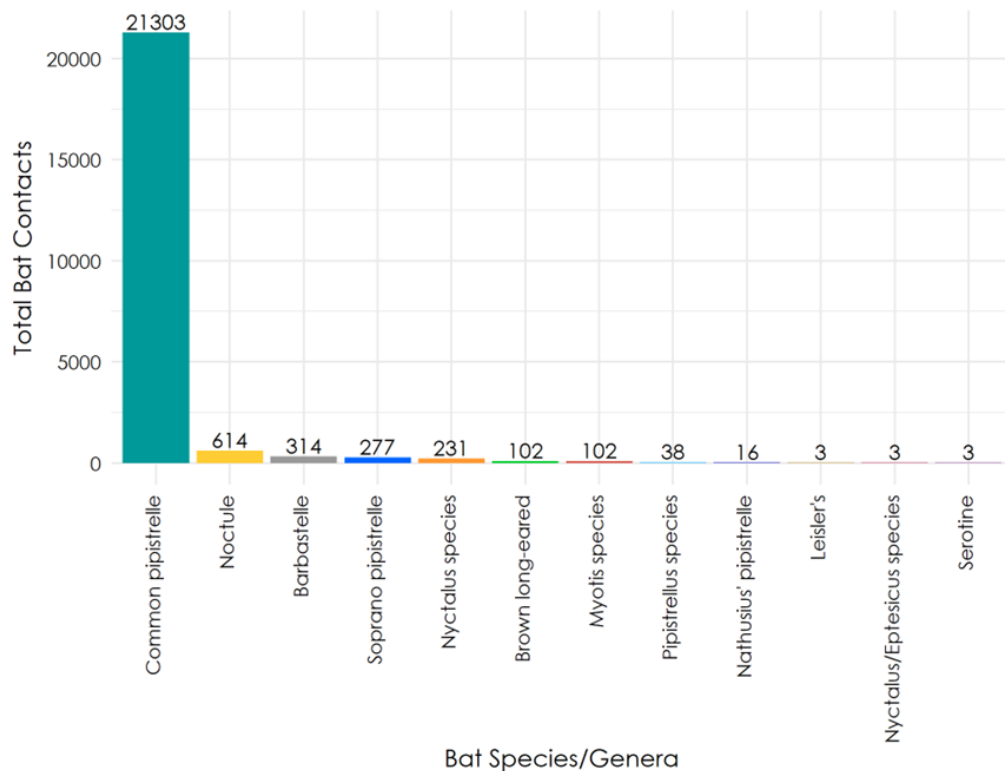
Figure 2. Total bat contacts by species/genera recorded across all remote monitoring periods and monitoring locations.

Table 2. Summary of bat contacts during the September 2023, May 2024 and June 2024 monitoring period and monitoring locations.

Month	Barbastelle	Brown long-eared bat	Common pipistrelle	Leisler' s	Myotis species	Nathusius' pipistrelle	Noctule	Nyctalus species	Nyctalus/Eptesicus species	Pipistrellus species	Serotine	Soprano pipistrelle
September 2023	98	13	3050	0	47	4	560	213	1	11	0	160
May 2024	99	52	8139	0	22	4	43	15	0	3	0	80
June 2024	117	37	10114	3	33	8	11	3	2	24	3	37
Total	314	102	21,303	3	102	16	614	231	3	38	3	277
Percent-age of Total (%)	1.36	0.44	92.6	0.01	0.44	0.07	2.67	1.00	0.01	0.17	0.01	1.20

4.4 At least seven species of bat were identified during the three monitoring periods. In addition to this a number of contacts were recorded for bats which fall within the genera of *Pipistrellus*, *Myotis* and *Nyctalus/Eptesicus* but were unidentifiable to species level. A single contact was also

identified as 'big bat' which could not be identified to species level and is attributable to either of the *Nyctalus* species bats.

4.5   The vast majority of contacts are attributable to common pipistrelle *Pipistrellus pipistrellus* accounting for 92.6% of total contacts (21,303 contact). The next highest proportion of contacts were attributable to noctule *Nyctalus noctula* at 2.6% (614 contacts), barbastelle bat *Barbastella barbastellus* at 1.36% (314 contact), soprano pipistrelle *P. pygmaeus* at 1.2% (277 contacts) and *Nyctalus* species at 1.00% (231 contacts).

4.6   All remaining bat species contributed to less than 1% of total calls. These include 102 contacts of *Myotis* sp., 102 contacts brown long-eared bat *Plecotus auritus,* 16 contacts of Nathusius' pipistrelle *P. nathusii,* three contacts of Leisler's bat *Nyctalus leisleri* and three contacts serotine *Eptesicus serotinus*.

4.7   In total, there were found to be 314 contacts of barbastelle, being relatively evenly distributed across the survey months.

4.8   Figure 3 below shows the variance in nightly activity levels for common pipistrelle. Figure 4 shows this data for each of the remaining bat species recorded on-site.

4.9   More detailed data describing Figures 3 and 4 are provided in Table 3.

4.10   The activity data is presented as boxplots for each bat species, which show the inter-night variability in bat activity across the 5 nights monitored. The median value (middle line of the boxplot) is taken as the typical level of activity for that species on-site at the point monitored. The length of each coloured boxplot is the interquartile range which shows the variance in nightly activity around the median value. The ends of each whisker line define the minimum and maximum nightly activity values recorded at the monitoring location. Outlying values are nightly activity levels that are greatly different when compared to the distribution of the remaining nightly activity levels. Outliers are illustrated as black points away from the boxplot. While important to note, these outliers do not represent the bat activity more commonly found at the Site for the species in question.
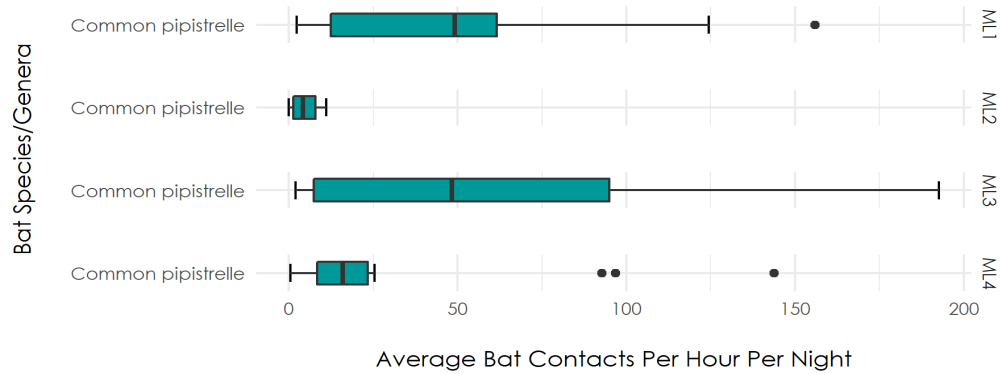
Figure 3. Average bat contacts per hour per night for each bat species/genera recorded across all remote monitoring

4.11 The number of contacts of common pipistrelle was highest at ML3, with a total of 8,658, closely followed by ML1 at 7,026 contacts, over the 15 monitoring nights. Both ML1 and ML3 have a similar median number of bat contacts per hour, at 49.174 and 48.263, respectively. Both ML2 and ML4 showed notably lower number of common pipistrelle contacts, at 693 and 4,926 respectively. Likewise, both ML2 and ML4 reflected this by having a lower median number of contacts at 4.154 and 15.952, respectively.
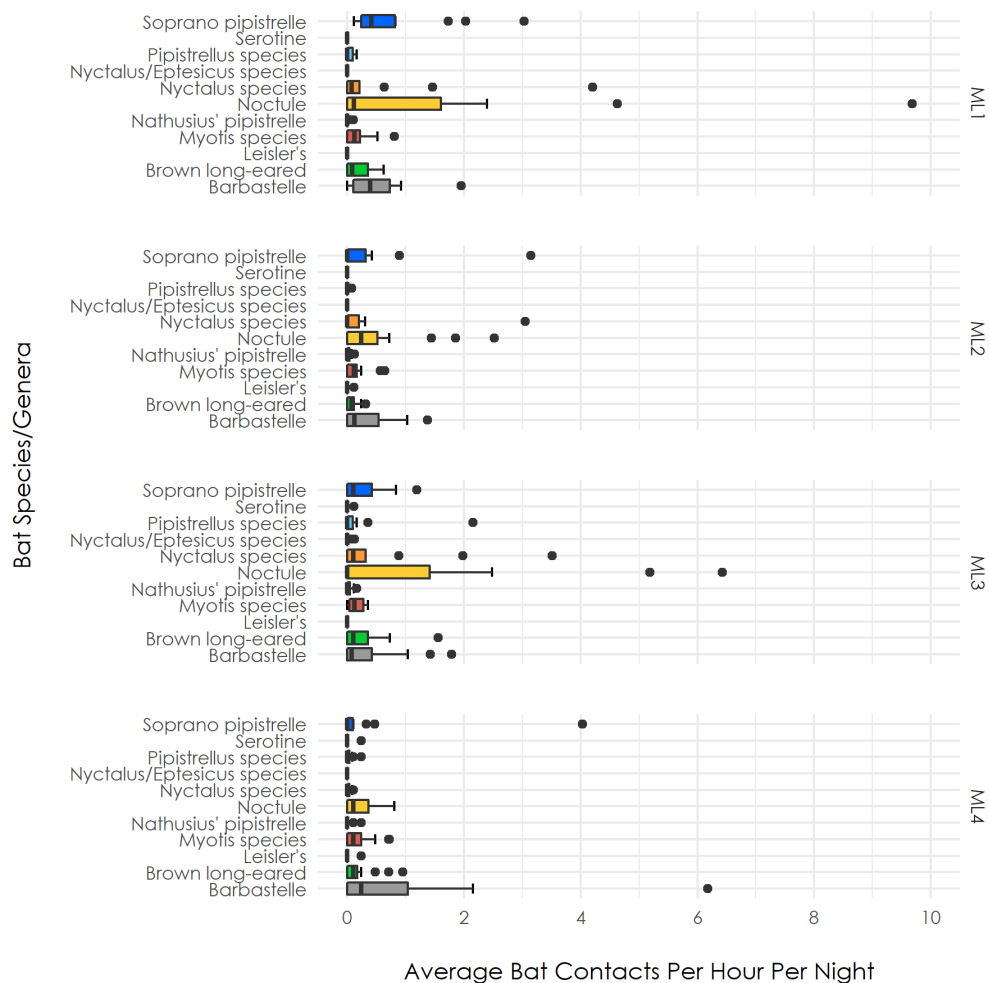
Figure 4. Average bat contacts per hour per night for each bat species/genera recorded across all remote monitoring locations

4.12   For the majority of remaining species and monitoring locations, the frequency of bat contacts at both monitoring locations suggests relatively low levels of bat activity, with a median of less than 1 contact per hour.

4.13   Barbastelle bat was detected at all monitoring locations with the highest number of contacts at ML4 (total of 122; medium of 0.238).

4.14   Nathusius' pipistrelle was detected at lower levels with two contacts at ML1, four contacts ML2, three contacts at ML3 and ML4 over the 15 survey nights. The median number of bat contacts per hour per night was 0 for all monitoring locations.

4.15   There were only found to be contacts of Leisler's bat from ML2 and ML4 (total of one and three total contacts, respectively). Of the three total contacts of serotine, one was from ML3 and two were from ML4.

Table 3. Average bat contacts per hour per night recorded during remote monitoring surveys

ML	Species	Average bat contacts per hour per night				Total bat contacts	Number of nights monitored
		Minimum	Maximum	Median	IQ range		
ML1	Barbastelle	0.000	1.948	0.397	0.629	83	15
ML1	Brown long-eared	0.000	0.620	0.081	0.360	25	15
ML1	Common pipistrelle	2.381	155.833	49.174	49.251	7026	15
ML1	Leisler's	0.000	0.000	0.000	0.000	0	15
ML1	Myotis species	0.000	0.812	0.120	0.222	28	15
ML1	Nathusius' pipistrelle	0.000	0.103	0.000	0.000	2	15
ML1	Noctule	0.000	9.683	0.119	1.606	256	15
ML1	Nyctalus species	0.000	4.206	0.080	0.206	87	15
ML1	Nyctalus/Eptesicus species	0.000	0.000	0.000	0.000	0	15
ML1	Pipistrellus species	0.000	0.160	0.000	0.092	7	15
ML1	Serotine	0.000	0.000	0.000	0.000	0	15
ML1	Soprano pipistrelle	0.119	3.030	0.413	0.577	121	15
ML2	Barbastelle	0.000	1.380	0.119	0.538	58	15
ML2	Brown long-eared	0.000	0.313	0.080	0.119	13	15
ML2	Common pipistrelle	0.000	11.054	4.154	6.464	693	15
ML2	Leisler's	0.000	0.119	0.000	0.000	1	15
ML2	Myotis species	0.000	0.642	0.119	0.163	25	15
ML2	Nathusius' pipistrelle	0.000	0.119	0.000	0.040	4	15
ML2	Noctule	0.000	2.516	0.238	0.518	96	15
ML2	Nyctalus species	0.000	3.047	0.000	0.200	49	15
ML2	Nyctalus/Eptesicus species	0.000	0.000	0.000	0.000	0	15
ML2	Pipistrellus species	0.000	0.081	0.000	0.000	1	15
ML2	Serotine	0.000	0.000	0.000	0.000	0	15
ML2	Soprano pipistrelle	0.000	3.145	0.000	0.315	63	15
ML3	Barbastelle	0.000	1.792	0.081	0.418	51	15
ML3	Brown long-eared	0.000	1.558	0.102	0.357	38	15
ML3	Common pipistrelle	2.016	192.619	48.263	87.514	8658	15
ML3	Leisler's	0.000	0.000	0.000	0.000	0	15
ML3	Myotis species	0.000	0.358	0.120	0.234	23	15
ML3	Nathusius' pipistrelle	0.000	0.162	0.000	0.051	5	15
ML3	Noctule	0.000	6.429	0.000	1.415	228	15
ML3	Nyctalus species	0.000	3.512	0.104	0.316	91	15

ML3	Nyctalus/Epte sicus species	0.000	0.119	0.000	0.000	3	15
ML3	Pipistrellus species	0.000	2.151	0.000	0.092	25	15
ML3	Serotine	0.000	0.119	0.000	0.000	1	15
ML3	Soprano pipistrelle	0.000	1.195	0.104	0.418	33	15
ML4	Barbastelle	0.000	6.176	0.238	1.038	122	15
ML4	Brown long-eared	0.000	0.950	0.102	0.173	26	15
ML4	Common pipistrelle	0.397	143.802	15.952	14.948	4926	15
ML4	Leisler's	0.000	0.238	0.000	0.000	2	15
ML4	Myotis species	0.000	0.717	0.102	0.242	26	15
ML4	Nathusius' pipistrelle	0.000	0.239	0.000	0.000	5	15
ML4	Noctule	0.000	0.806	0.102	0.363	34	15
ML4	Nyctalus species	0.000	0.104	0.000	0.040	4	15
ML4	Nyctalus/Epte sicus species	0.000	0.000	0.000	0.000	0	15
ML4	Pipistrellus species	0.000	0.238	0.000	0.040	5	15
ML4	Serotine	0.000	0.239	0.000	0.000	2	15
ML4	Soprano pipistrelle	0.000	4.032	0.000	0.092	60	15

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