Preliminary Environmental Information Report Volume 2

Appendix 8.11 Baseline Report – Advanced Bat Survey [Redacted]

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AEWC Ltd

Animal Ecology & Wildlife Consultants

Advanced Bat Survey Report

Baseline Trapping and Radio Tracking Survey Results

Lionlink Project

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23-212
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1 Introduction

1.1 This bat survey and report has been carried out and prepared by Daniel Whitby of AEWC Ltd, Natural England Licensed bat worker on behalf of National Grid Lion Link Limited (NGLLL) (the Applicant) to conduct advanced bat surveys throughout the Proposed Onshore Scheme Scoping Boundary for the LionLink Project.

1.2 LionLink is a proposed electricity interconnector between Great Britain and the Netherlands that will supply up to 1.8 gigawatts (GW) of electricity and will connect to Dutch offshore wind via an offshore converter platform in Dutch waters (hereafter the Project).

1.3 The Proposed Scheme (defined as the part of the Project within the British jurisdiction) would involve the construction of a Converter Station and the installation of offshore and onshore underground high voltage direct current cables (HVDC) to the onshore Converter Station and underground high voltage alternating current cables (HVAC) between the Converter Station and the Kiln Lane Substation.

1.4 No previous advanced surveys have been conducted as part of the Proposed Scheme, however, there have been bat surveys in the wider area on other Nationally Significant Infrastructure Projects. These have identified the presence of barbastelle bat (*Barbastella barbastellus*) breeding colonies, an Annex II species.

1.5 The bat surveys and report writing were carried out in accordance with Bat Surveys: Good Practice Guidelines 4th edition (Bat Conservation Trust, 2023).

1.6 Barbastelle bats are one of the UK's rarest mammals, listed on Annex II of the EC Habitats and Species Directive (JNCC, 2007) and are a Species of Principal Importance in England under *Section 41* of the *Natural Environment and Rural Communities Act 2006*. Bechstein's bat (*Myotis bechsteinii*) is also listed as near threatened, and barbastelle as vulnerable on the IUCN global red list (IUCN, 2016).

1.7 The advanced surveys are used to identify the presence and breeding status and locate maternity colonies for bats found within the Proposed Onshore Scheme. Advanced surveys were required to help inform on the proximity of maternity colonies for all bat species and identify any key points of bat ecological interest, either by high species and numbers, important crossing points or proximity to maternity colonies close to the indicative Underground Cable Alignment (at the time of commencement of the bat surveys).

1.8 This report details the results of the advanced bat surveys and identifies features of higher bat ecological interest and importance that should be considered within the development of the design and mitigation proposals for the Proposed Onshore Scheme.

Aims and objectives

1.9 The objectives of the surveys were to:

- Assess the potential route options for the indicative Onshore Underground Cable Alignment and identify all features of bat ecological interest that may be impacted/crossed;

- Conduct advanced trapping surveys on and around the potential route options for the indicative Onshore Underground Cable Alignment to identify species present, breeding status and hence likely importance at survey points;
- Radio tag breeding female individuals to identify colony roost locations for bat species present using habitats within the Proposed Onshore Scheme Scoping Boundary;
- Survey identified roosts to estimate the size and status of identified colonies and identify if there are any existing roosts close to the Proposed Onshore Scheme Scoping Boundary and areas of impact;
- Identify key crossing points of, and key locations of bat ecological importance adjacent to the indicative Underground Cable Alignment;
- Provide information for use in the design and development of ecological mitigation and enhancement measures where appropriate.

Site location

1.10 The area of the Proposed Onshore Scheme subject to survey is in East Suffolk with a proposed Landfall Site on the east coast at Walberswick connecting to a proposed Underground Cable Alignment heading west inland before going south to a proposed Converter Station to the east of Saxmundham, and then continuing south to Kiln Lane Substation. In addition, the survey included an alternate Landfall Site option at Southwold and an associated Underground Cable Alignment, which has now been discounted. The Proposed Onshore Scheme Scoping Boundary, which includes the discounted Southwold option and which was used for the scoping of these surveys, and the indicative Underground Cable Alignment, are shown in Appendix 1 of this report.

Legislation

1.11 All species of bats are listed on *Schedule 5* of the *Wildlife and Countryside Act 1981 (as amended)* which affords them protection under *Section 9*, as amended. They are also protected under the *Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019*. In combination, this makes it an offence to:

- intentionally kill, injure or take (capture etc.);
- possess;
- intentionally or recklessly damage, destroy, obstruct access to any structure or place used by a scheduled animal for shelter or protection, or disturb any animal occupying such a structure or place; and
- sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative) or advertise for buying or selling such things.

1.12 Legislation defines a roost as ‘any structure or place which a bat uses for shelter or protection’. As bats tend to reuse the same roosts, legal opinion is that a roost is protected whether or not bats are present.

1.13 Any disturbance of a bat occupying a roost can lead to prosecution. Disturbance can be caused by noise, vibration and artificial lighting. Penalties for breaking the law can include fines of £5,000 per bat, imprisonment and the seizure of equipment.

1.14 Furthermore, seven bat species (barbastelle, Bechstein’s, noctule, soprano pipistrelle, brown long-eared, lesser horseshoe and greater horseshoe) are also

Species of Principal Importance in England under *Section 41* of the *Natural Environment and Rural Communities Act 2006*.

2 Methods

2.1 The methodology employed in this study consisted of a range of discrete and separate approaches of gathering data to ascertain the use of the site by bats. These approaches, while separate, are interlinked to form a range of advanced survey methods. These methods include trapping; using both harp traps and mist nets, in habitats and suitable trapping positions across the Proposed Onshore Scheme Scoping Boundary, radio tracking; with daytime tracking to identify roosts as well as non-advanced survey methods to gather additional information where necessary and available, including emergence surveys.

2.2 The first stage of surveys was to carry out an assessment along the indicative Underground Cable Alignment (at the time of conducting the survey work) for habitat suitability for bats, both foraging and commuting and to identify areas of potential impact from the indicative Underground Cable Alignment and suitable locations to target advanced surveys.

2.3 The advanced surveys conducted by AEWC Ltd work in conjunction with additional bat surveys completed by Arup to inform on bat use of the Proposed Onshore Scheme including, activity surveys, static detector surveys, Ground Level Tree Assessments (GLTA) and emergence surveys.

Habitat evaluation

2.4 Bats may use habitat features in different ways that could be impacted by the Proposed Onshore Scheme. These may include areas of high foraging suitability, or connectivity between important areas of dispersal, such as individuals dispersing from a core roost area or colony roost location. While habitat evaluation can identify habitats that are likely to be more important for bats foraging, in some cases some features may have high importance for bats as they are close to a colony roost area and used for dispersing from the roost, even where these may be ecologically poor features, such as species-poor hedges.

2.5 While bats may occasionally forage or commute along features with poor cover such as ditches and streams, low level vegetation or failing hedges, these features were not selected for surveys as the Proposed Onshore Scheme would not alter the existing conditions and connectivity, changing the suitability of these being used. Where there was already an absence of vegetation or notable gaps in connectivity present, surveys were not conducted as the Proposed Onshore Scheme would not alter the existing habitat or connectivity suitability. Features were selected for survey where the Proposed Onshore Scheme could potentially result in a notable change in the habitat and/or connectivity which could have potential to significantly alter the use of this by bats.

2.6 The indicative Underground Cable Alignment was assessed for the potential and suitability of features and habitats present that have good probability to be used by bats and may be intersected by the indicative Underground Cable Alignment. Initial assessments were made using aerial imagery to identify any potentially suitable features or habitats, which were then assessed visually by ground truthing to identify and confirm suitability for bats and surveys.

2.7 The following considerations were made in selecting or rejecting features for surveys:

Positive features:

- Tree lines;
- Mature hedges;
- Woodland; and
- Aquatic habitats.

Negative features:

- Large open gaps/failing hedges;
- Low level features such as ground vegetation field boundaries;
- Fence lines; and
- Unconnected linear features e.g. hedges ending in the middle of fields.

2.8 The early design for the Proposed Onshore Scheme was developed in consultation with ecological specialists, following the Proposed Scheme's Design Principles, to avoid impacts to habitats and species of principal importance for the conservation of biodiversity (priority habitats and species) wherever reasonably practicable. As a result, the proposed route options for the indicative Underground Cable Alignment that were appraised to inform the bat survey scope in early 2024 included commitments to avoid many habitat features of high suitability for bats, through the use of trenchless cable installation methods. Features where the avoidance of

impacts was an embedded measure within the Proposed Onshore Scheme design included woodland blocks, species-rich grasslands, rivers and streams and a number of roads lined by mature hedgerows and trees. Where it was clearly established that trenchless cable installation methods would avoid direct impacts to such habitats, advanced bat surveys of these features were not included as part of the survey scope.

2.9 As the design of the Proposed Onshore Scheme evolved during the bat survey period further commitments to avoid habitats of high suitability for bats were included, either through routing or additional locations for trenchless cable installation methods. The emerging design was kept under review during the survey period and the scope adjusted to take account of any change in potential impacts where possible, ceasing to survey bat habitat features which were no longer at risk of adverse impacts.

Trapping surveys

2.10 To accurately identify what potential impacts the Proposed Onshore Scheme may have on any bats, or population/colony present locally, it is important to identify the sex and breeding status of individuals to inform on the presence, or potential presence, of a breeding population using habitats within the Proposed Onshore Scheme, as well as the presence, or proximity, of a local maternity colony that could be impacted.

2.11 In order to identify the species present, as well as the sex and breeding status of individuals, trapping surveys were undertaken, as the only survey method capable of obtaining this information.

2.12 Trapping surveys were conducted across a range of habitats and locations throughout the Proposed Onshore Scheme Scoping Boundary in 2024 with a total of 19 nights' trapping conducted (see Appendix 2). Trapping was conducted between May and August avoiding the more sensitive late pregnancy period and early birth period when bats can carry dependant young. Exact trapping locations were dependant on access availability, species being targeted, habitat present and trap suitability, and ground and weather conditions, as well as specific suitable trapping locations available within the survey area. These were to include habitats or features that were considered likely to be more important or higher levels of activity and have potential to be used by a range of species to maximise capture rate, with trapping conducted across multiple locations to inform on all species using the Proposed Onshore Scheme.

2.13 Trapping surveys were conducted using several Harp traps (Austbat two bank and three bank) and Mist nets (Ecotone) to trap bats. Where suitable this was accompanied with a sonic lure (Sussex Autobat or Binary Acoustic Technology AT100) to attract any bats foraging in the area using a range of bat species' social calls. This can increase the detection rate of quiet whispering species, such as Bechstein's bat, barbastelle, myotis (*Myotis sp*.) and long-eared bats (*Plecotus sp*.), which can be under-recorded on detector surveys.

2.14 In order to maximise capture rates during trapping sessions a range of lure calls were played. This included playing a range of calls to catch a full suite of species present, as well as a number of more species-specific calls to target certain species of interest, such as barbastelle bat calls.

2.15 Trapping was generally conducted, when the weather was suitable, from dusk until the early hours of the morning with a minimum trapping period of five hours (see

Appendix 3). All traps were checked regularly to ensure no bats were trapped for extended periods. All bats caught were identified accurately to species level, sexed, aged and reproductive status ascertained. All bats were released at the capture site shortly after capture. Target bat species were ringed where suitable and licensed with a Porzana bat ring.

2.16 All surveys conducted during 2024 followed an AEWC Trapping protocol methodology following a precautionary approach. This incorporated advice from IUCN, Eurobats and BCT regarding minimising the potential for transmission of Covid-19 to UK bat species during the pandemic. This included disinfecting equipment to be used, wearing of suitable PPE including face masks, regularly cleaning and hand sanitising and minimising handling and processing of bats.

Radio tracking surveys

2.17 Individual bats were radio tagged in order to gain the greatest amount of information on an individual bat and that species locally. This was primarily to identify the location of any specific species' roosts, notably maternity roosts and likely colonies, therefore breeding female bats were targeted for tagging. Radio tags (Biotrack - UK and Holohil - Canada) were fixed to a bat using a latex-based adhesive (Torbot bonding cement) by carefully attaching the tag to the bat between the shoulder blades at its most suitable centre of gravity.

2.18 All bats were radio tagged following a 5% rule so that no bats were tagged when the combined radio tag and glue weight was 5% or more of the bat's weight. A range of radio tags weights were used as suitable for the species being tagged.

2.19 After radio tagging, each aerial was carefully cleaned, and each bat kept for 5-10 minutes to be thoroughly checked before being released. Bats were monitored intermittently upon release.

2.20 Bats were radio tracked using Biotrack Sika receivers and different Yagi aerials using a range of radio tracking methods to find and locate the bat over the following days to identify roost locations.

2.21 Bats moving over large areas become increasingly difficult to find or follow and locate roosts for. Bats moving large distances can move out of range, have signals blocked by local topography or enter underground sites where signals will be lost, in these cases backtracking can be employed to follow tagged bats back to a roost location.

Emergence surveys

2.22 Once the day roost locations of tagged bats were identified, where suitable and accessible, emergence surveys were conducted to enable accurate roost counts of visible roosts to indicate colony size and roost characterisation.

2.23 The evening emergence surveys were conducted under suitable weather conditions between May and September 2024 during the radio tracking period when the tagged bats were known to be present within the roost (see Tables in Appendix 3).

2.24 The emergence surveys began approximately 15 minutes before sunset and finished 1 and a half hours after sunset on each survey.

2.25 Batlogger M bat detectors were used for taking time-expanded recordings of any bats when they may emerge from the buildings or trees. These recordings were analysed on Elekon BatExplorer acoustic analysis software that facilitates species identification.

2.26 Professional night vision infra-red or thermal imaging video cameras were used to film areas of the buildings or trees with the assistance of an external infra-red lamp to accurately identify and record bats emerging. All footage was analysed using VLC player following surveys in order to confirm roost features and obtain a count.

3 Constraints/Limitations

3.1 Bats are some of the most difficult species to locate, identify and study. They cannot be easily identified in flight and nocturnal activity means that they cannot be easily visually observed to identify behaviours and movements.

3.2 Many species have very similar echolocation calls making accurate species identification from acoustic surveys difficult, especially for cryptic groups like Myotis bats. Different amplitude of species' calls dramatically under or over identify the presence of some species, resulting in a very biased survey technique and commonly misidentifying presence of some species, notably quiet species like long-eared bats.

3.3 Trapping surveys can improve data gathering by confirming species identification, and sex and breeding status, however trapping is more difficult and specialist, and trapping success can vary depending on trap suitability in different areas and access to suitable trapping positions. Bats are difficult to locate in foraging habitat and difficult to catch, especially in large, exposed open areas. Different species may also forage in different habitats throughout the year according to the availability of their preferred prey and particular weather conditions, e.g. more sheltered areas can be more frequently used during periods of colder weather, wind or light rain compared to more open, exposed areas.

3.4 By their nature, rare species are difficult to catch, especially ones that have large, wide-ranging foraging areas. Trapping can be improved via use of an ultrasonic lure to target specific species; however, no surveys can be used as confirmation of absence, but rather an increased improbability of presence.

3.5 Poor weather can affect surveys in different ways, notably this can suppress foraging as cold weather means no food, so bats do not spend time foraging, but the loss of breeding success also directly affects trapping with fewer bats and reduced responsiveness to lures.

3.6 The weather during spring 2024 was particularly poor, there were prolonged periods of poor weather conditions and very cold nights well into May. A number of trapping surveys, notably in May had forecast conditions better than were found on-site, which were unsuitable and as such the survey was sub-optimal/unsuitable and some surveys terminated early. These surveys are not considered representative of the bat activity levels for the site.

3.7 The survey results presented in the study represent a snapshot in time and so should not be extrapolated to predict how bats are likely to use the site at different times of

year, or at the same time in different years, but instead used as averages and a guide to behaviours.

3.8 Design development for the Proposed Onshore Scheme was occurring in parallel with the survey work. The original scope of survey work was based upon the options for the indicative Underground Cable Alignment in early 2024. Any differences between the final preferred route option for the Proposed Onshore Scheme and the indicative Underground Cable Alignment that was used for the advanced bat surveys and any resulting data gaps should be taken into account during the assessment of impacts upon bats within the Environmental Statement.

3.9 Access was not available to all areas throughout the survey season. Many areas of the Proposed Onshore Scheme were only surveyed late in the survey season as access was unavailable to these areas. Some roosts on private land and property were not able to be accessed to gather all details, however roosts were triangulated to location.

4 Results

Habitat assessment

4.1 The initial assessment identified 85 linear features that may be bisected by the indicative Underground Cable Alignment which were all assessed for suitability of use by bats. A total of 44 of these linear features were considered to meet the habitat evaluation criteria for survey (see sections 2.4 - 2.9), at the start of the survey period. Additional avoidance commitments made after surveys commenced removed the risk of impacts to 14 of these linear features, which were therefore only subject to a single survey. The habitat evaluation concluded that the remaining 41 linear features were not considered to be suitable for regular foraging or commuting use by bats and they were not therefore included within the survey.

4.2 In addition to areas to be directly impacted, additional trapping was carried out at three unaffected locations of high suitability for bats. This included locations where linear features at risk of impact were directly adjacent to larger woodlands that could support notable bat populations. This also included locations that were surveyed to inform on species present locally and provide a comparison between bat use within unaffected areas of higher habitat value, and the populations present within the areas to be potentially impacted by the Proposed Onshore Scheme. These consisted of three areas spread out along the Proposed Onshore Scheme Scoping Boundary, which had one survey each:

- Blythe River Valley;
- Minsmere New Cut; and
- Theberton Woods.

Trapping

4.3 Trapping surveys were conducted throughout 2024 as close as reasonably possible to the location of potential impact to suitable linear features, taking into account habitat and trap suitability, weather conditions and health and safety requirements. Where suitable, more than one trap location was used on the same linear feature to inform

on bat species and populations present (trap locations can be found in Appendix 1 and 2). Where relevant and accessible, nearby and adjacent woodlands were surveyed to inform on the bat assemblages present adjacent to the indicative Underground Cable Alignment and provide further context for the evaluation of the importance of the impacted linear features.

4.4 In 2024, trapping was conducted on 19 survey nights with a total of 95 trap nights (multiple traps were used on a single survey night). Of the 95 trap nights of survey effort, 79 trap nights were conducted on features across the Proposed Onshore Scheme Scoping Boundary that have potential to be directly impacted by the indicative Underground Cable Alignment. An additional 16 nights were conducted that were across the Proposed Onshore Scheme Scoping Boundary but adjacent to features of potential impact, notably larger woodlands and habitats where trenchless cable installation methods are proposed. All trapping was conducted between May and August which caught a total of 424 captures of 9 species (See Table 1 and Appendix 1):

- Common pipistrelle – *Pipistrellus pipistrellus – P.pip;*
- Soprano pipistrelle – *Pipistrellus pygmaeus – P.pyg;*
- Nathusius' pipistrelle – *Pipistrellus nathusii – P.nat;*
- Brown long-eared bat – *Plecotus auritus – P.aur;*
- Barbastelle bat – *Barbastella barbastellus – B.barb;*
- Natterer's bat – *Myotis nattereri – M.nat;*
- Daubenton's bat – *Myotis daubentonii – M.daub;*
- Noctule bat – *Nyctalus noctula – N.noc;* and
- Serotine bat – *Eptesicus serotinus – E.ser.*

TABLE 1 – SHOWING SUMMARY RESULTS OF ALL TRAPPING SURVEYS

Date	No of traps	Total Captures	P.pip	P.pyg	P.nat	P.aur	M.nat	M.daub	B.barb	N.noc	E.ser
16/05/2024	4	13	4	6	0	1	1	1	0	0	0
17/05/2024	6	20	10	8	0	0	1	0	0	1	0
18/05/2024	7	7	1	0	0	3	3	0	0	0	0
23/05/2024	8	7	1	2	0	1	2	1	0	0	0
24/05/2024	6	30	2	22	2	2	1	0	1	0	0
25/05/2024	6	42	6	28	1	4	0	3	0	0	0
21/07/2024	7	15	4	8	0	1	1	0	1	0	0
22/07/2024	8	37	10	19	0	3	2	0	3	0	0
23/07/2024	8	23	3	9	0	1	6	2	1	1	0
25/07/2024	4	11	3	1	0	1	2	1	1	1	1
26/07/2024	3	67	14	43	1	3	4	2	0	0	0
27/07/2024	3	11	3	2	0	1	4	0	1	0	0
28/07/2024	3	50	6	37	0	3	1	2	1	0	0
29/07/2024	3	11	3	1	0	2	1	0	0	4	0
16/08/2024	3	11	1	7	0	1	0	1	1	0	0
17/08/2024	4	21	7	10	0	0	2	1	0	0	1
18/08/2024	4	20	5	7	0	0	1	6	1	0	0
19/08/2024	4	13	1	8	0	1	0	1	0	1	1
20/08/2024	4	15	4	7	0	1	0	0	3	0	0
	95	424	88	225	4	29	32	21	14	8	3

Radio tagging tracking

4.5 Throughout the surveys a total of 18 adult female bats of 6 species (3 P.pyg, 3 P.pip, 4 P.aur, 5 M.nat, 2 B.barb and 1 P.nat) were tagged and tracked to locate roosts where breeding females were caught and considered likely to indicate notable or nearby maternity colonies, to inform the assessment of potential impacts of the Proposed Onshore Scheme upon these colonies.

TABLE 2 – SHOWING TOTAL BATS TAGGED DURING 2024

Bat number	Date	Species	Breeding status	Trap number	Grid ref of trap
1	16/05/2024	*P.aur*	Parous	Trap 1	TM46069 79638
2	17/05/2024	*P.pyg*	Parous	Trap 6	TM47901 79874
3	17/05/2024	*P.pip*	Parous	Trap 7	TM48403 79034
4	18/05/2024	*M.nat*	Parous	Trap 11	TM43530 79503
5	23/05/2024	*M.nat*	Parous	Trap 18	TM41997 67930
6	24/05/2024	*P.pip*	Parous	Trap 27	TM48624 74522
7	24/05/2024	*M.nat*	Parous	Trap 26	TM48461 74491
8	24/05/2024	*P.pyg*	Parous	Trap 27	TM48624 74522
9	24/05/2024	*P.nat*	Parous	Trap 27	TM48624 74522
10	24/05/2024	*B.barb*	Nulliparous	Trap 26	TM48461 74491
11	25/05/2024	*P.pyg*	Parous	Trap 36	TM42962 69257
12	22/07/2024	*P.aur*	Lactating	Trap 45	TM42309 65634
13	22/07/2024	*P.pip*	Post lac	Trap 46	TM42314 65490
14	22/07/2024	*B.barb*	Nulliparous	Trap 46	TM42314 65490
15	23/07/2024	*M.nat*	Lactating	Trap 55	TM42622 76182
16	25/07/2024	*P.aur*	Lactating	Trap 4	TM46550 79914
17	25/07/2024	*M.nat*	Lactating	Trap 4	TM46550 79914
18	26/07/2024	*P.aur*	Lactating	Trap 26	TM48461 74491

Parous – breeding female, Nulliparous – nonbreeding female.

4.6 The surveys for the Proposed Onshore Scheme have identified 19 roosts of 7 species and at least 12 separate breeding colonies (see Appendix 4).

Bat 1 – Brown long-eared bat – Adult female (Parous)

4.7 Tagged 16/05/2024 from trap 1 – TM 46069 79638
The tag signal was found the following day to the south towards Henham quarry, following access, the signal was triangulated to the northern edge of inaccessible woodland on the eastern side of the quarry. An ash *(Fraxinus excelsior*) tree was identified as a likely roost (roost 1 – [redacted]) but close access was not possible for pinpointing a feature or emergence. This bat is likely part of the same colony as bat 16. This roost is approximately 900m from the trap location and is located in an area where trenchless cable installation methods are proposed.

Bat 2 – Soprano pipistrelle – Adult female (Parous)

4.8 Tagged 17/05/2024 from trap 6 – TM 47901 79874
The tag signal was found the following day in a property in South Cove Road (roost 2). Access was gained the following day and emergence counted 329 bats present where a roost was unknown. The colony appeared to be present throughout the summer with droppings present in good numbers in July and August however additional emergence surveys were not possible. This is likely a main local maternity colony. This roost is approximately 1km from the indicative Underground Cable Alignment.

Bat 3 – Common pipistrelle – Adult female (Parous)

4.9 Tagged 17/05/2024 from trap 7 – TM 48401 78855
The tag signal was found the following day towards a residential property (roost 3). An emergence survey identified 23 bats emerge from under roof tiles. This roost is approximately 500m from the indicative Underground Cable Alignment.

Bat 4 – Natterer's bat – Adult female (Parous)

4.10 Tagged 18/05/2024 from trap 11 – TM 43530 79503
The bat was identified the following day roosting in [redacted] (roost 4) approximately 600m from the trap location, and 500m from the indicative Underground Cable Alignment.
Bat 17 tagged on 25/07/2024 from trap 4 was found to be using the same roost location. Emergence surveys of [redacted] in May and July identified small populations of Natterer's bats present with a peak count of 11. The surveys indicate that this roost is used consistently throughout the summer, but only a small colony or satellite roost is present.

Bat 5 – Natterer's bat – Adult female (Parous)

4.11 Tagged 23/05/2024 from trap 18 – TM 41997 67930
This bat was found roosting in a large oak tree (*Quercus robur* – roost 5) approximately 1.5km from the indicative Underground Cable Alignment. An emergence survey on this tree identified 16 individuals present. This roost is a separate colony to the more northern roosts (bat 4+17).

Bat 6 – Common pipistrelle – Adult female (Parous)

4.12 Tagged 24/05/2024 from trap 27 – TM 48624 74522
This bat was tracked to a semi-detached property (roost 6). The owner knew they had bats, and reported seeing them move between the two adjacent properties over recent years. This roost is in a residential area on the western edge of Walberswick approximately 400m from the indicative Underground Cable Alignment. An emergence survey in May identified 95 individuals, however a survey in July did not identify that the colony was still present using these buildings with only 2 individuals present.

Bat 7 – Natterer's bat – Adult female (Parous)

4.13 Tagged 24/05/2024 from trap 26 – TM 48461 74491
This bat was tracked to a sweet chestnut tree (*Castanea sativa* – roost 7) within an area of woodland approximately 250m from the indicative Underground Cable Alignment. An emergence survey identified 24 bats emerge. This is considered a new separate colony to bats 4, 5 and 17 given they are over 7km and 10.5km away.

Bat 8 – Soprano pipistrelle – Adult female (Parous)

4.14 Tagged 24/05/2024 from trap 27 – TM 48624 74522
This bat was tracked to a residential property in Walberswick (roost 8) which identified 174 bats emerge on the 26/05/2024. A subsequent survey in July found that the colony had moved location. This roost is in a built-up residential area and is approximately 700m from the indicative Underground Cable Alignment.

Bat 9 – Nathusius' pipistrelle – Adult female (Parous)

4.15 Tagged 24/05/2024 from trap 27 – TM 48624 74522
This bat was not identified the following day, night tracking found the bat a long way north of the Proposed Onshore Scheme Scoping Boundary well out of range, the bat was not found to return to the Proposed Onshore Scheme Scoping Boundary again and during extensive daytime tracking no roost was identified, however, this bat was not roosting on or near the Proposed Onshore Scheme.

Bat 10 – Barbastelle bat – Adult female (nulliparous)

4.16 Tagged 24/05/2024 from trap 26 – TM 48461 74491
This bat was caught at a site distant from other previously reported local populations. Following tagging the signal was picked up within a small copse just over 13km SE of the trap location and around 5km west of the closest the indicative Underground Cable Alignment. This identified a small roost of 9 individuals within a dead tree (likely oak – roost 9), before the bat moved to an inaccessible adjacent woodland (roost 10). Subsequently another barbastelle, bat 14 was tagged from another location and found roosting in this area with a roost count of 23. This roost area is sufficiently far from any other reported colonies to be considered a new colony.

Bat 11 – Soprano pipistrelle – Adult female (Parous)

4.17 Tagged 25/05/2024 from trap 36 – TM 42962 69257
This bat was identified roosting in a private property (roost 11) within a woodland approximately 400m from the indicative Underground Cable Alignment. An emergence survey identified 269 bats emerge in May followed by 176 in late July when the colony may have started fragmenting. This is likely to be a main maternity colony and roost for this species and is reported to have been used for several years by the owners.

Bat 12 – Brown long-eared bat – Adult female (Lactating)

4.18 Tagged 22/07/2024 from trap 45 – TM 42309 65634
This bat was identified roosting in a modern agricultural building (roost 12) approximately 200m from the indicative Underground Cable Alignment. Only a low number of droppings were identified, and the precise signal and roosting position could not be identified. No emergence survey was conducted. Given this bat was lactating it is likely that if not this building, the colony was roosting nearby.

Bat 13 – Common pipistrelle – Adult female (Post lactating)

4.19 Tagged 22/07/2024 from trap 46 – TM 42314 65490
Following tagging this bat was identified in an isolated residential semi-detached property (roost 13) on the end of a woodland approximately 600m from the indicative Underground Cable Alignment. Surveying the property identified that this is also a brown long-eared maternity roost. Surveys identified a minimum of 27 common pipistrelles, 31 brown long-eared bats and 2 serotine bats, however not all of the building could be watched, and pipistrelle bats were emerging from the northern half of the building which was not being monitored.

Bat 14 – Barbastelle bat – Adult female (Nulliparous)

4.20 Tagged 22/07/2024 from trap 46 – TM 42314 65490
Following tagging, this bat was identified in an ash tree (roost 14) in the same woodland area as bat 10 moved to in May (see bat 10). An emergence survey identified 23 bats emerge.

Bat 15 – Natterer's bat – Adult female (Lactating)

4.21 Tagged 23/07/2024 from trap 55 – TM 42622 76182
Following tagging this bat was identified in the same area where trapping was conducted, this bat used three trees within the same local area, two poplars (*Populus sp.* – roosts 15 and 16) and an oak tree (roost 17), with a peak count of 34 bats. This colony is located in an area where trenchless cable installation methods are proposed, avoiding any impacts to the roosts. This colony is located approximately 9.5km from the southern identified colony (bat 5) and 6.5km from the eastern identified colony (bat 7) showing that this a separate colony, however it is only 3.3km from the church roost (bats 4 and 17) and so may be linked with this smaller possible satellite roost.

Bat 16 – Brown long-eared bat (Lactating)

4.22 Tagged 25/07/2024 from trap 4 – TM 46550 79914
This bat was caught and tagged in the same area as bat 1. Following tagging this bat was identified roosting within a bungalow (roost 18), used as a private holiday home. This roost is located approximately 300m from the indicative Underground Cable Alignment and less than 1km from the roost identified for bat 1. It is considered highly likely that this bat is part of the same population as bat 1. No access was available to do an emergence survey.

Bat 17 – Natterer's bat (Lactating)

4.23 Tagged 25/07/2024 from trap 4 – TM 46550 79914
Following tagging this bat was found roosting in the same roost as bat 4 (roost 4), approximately 2.5km west of the trap location. See bat 4.

Bat 18 – Brown long-eared bat (Lactating)

4.24 Tagged 26/07/2024 from trap 26 – TM 48461 74491
Following tagging this bat was found roosting in a Scots pine tree (*Pinus sylvestris* – roost 19) within adjacent woodland and within a reserve forming part of the Minsmere SAC. This roost is located on the indicative Underground Cable Alignment; however this is an area where trenchless cable installation methods are proposed, avoiding any impacts to the roost. An emergence survey identified a minimum count of 22 bats present.

Roosts

4.25 The tagging and tracking of 18 bats of 6 species has identified 19 roost sites of 7 species (see Appendix 4). One roost, roost 13, was identified as having 3 species with a common pipistrelle and brown long-eared maternity and two individual serotine bats present.

4.26 Of all 18 bats, only one bat's roost was not found, bat 9 the Nathusius' pipistrelle that moved a long way out of range away from the Proposed Onshore Scheme. Three bat roosts identified did not have the roost classified through emergence surveys due to restricted access: roosts 1, 12 and 16, all brown long-eared bats.

4.27 One roost identified, roost 10 for bat 9 in May, was not confirmed as no access was available, however, subsequent tagging of another individual barbastelle bat 14 in July was found in the same woodland when access was available, confirming this woodland as used by a maternity colony.

4.28 The surveys have confirmed a total of 15 sites used as maternity/satellite roosts, considered to represent 12 separate colonies. Roost 4 used by bats 4 and 17, and roosts 15-17 used by bat 15 are considered likely to be potentially close enough that they may be the same colony. The two tagged barbastelle, bats 10 and 14, were found roosting in the same area, despite being caught 12km and 6km from their roosts, respectively, demonstrating they are from the same colony.

5 Discussion

5.1 The trapping surveys throughout 2024 have caught a total of 424 bats of 9 species over 95 trap nights of survey effort, an average of 4.45 bats per trap, and a range of zero to 26 bats. In total there were 13 trap nights that caught no bats and 12 that caught 10 or more bats in a night, showing a wide range in use of different features of the Proposed Onshore Scheme by bats.

5.2 Of the 95 nights, 79 nights were on features of potential impact by the Proposed Onshore Scheme, and 16 were on habitats within the Proposed Onshore Scheme Scoping Boundary and adjacent to the indicative Underground Cable Alignment (Theberton Woods and The Wilderness Woods), or on higher quality habitats with impacts being avoided by trenchless cable installation methods (Blythe River valley and Darsham Marshes).

5.3 The trapping of habitats not being impacted caught a higher average trap rate around 33% higher, with greater species diversity than those on the indicative Underground Cable Alignment. In addition, none of the 16 trap nights within the higher quality habitat had zero captures, compared to 13 trap nights with zero captures at locations along the indicative Underground Cable Alignment. The trapping of these sites also accounted for just over half of all Daubenton's caught and four of 14 barbastelle bats.

5.4 The trapping success on the linear features with potential to be impacted was an average of 4.2 bats per trap night and ranged from zero to 26. Notably one area, survey features 18 and 19 (trap locations 26, 27 and 28) were trapped twice and had notably higher capture rates, with a capture of 94 bats over 6 trap nights of effort, an average of 15.6 bats per trap. The average capture rate of the remaining 73 traps was only 3.3 bats per trap.

5.5 This trapping rate is overall considered to be low, however, there are a high number of trap nights where no bats were caught, or only very low numbers and odd individuals. There are a number of reasons as to why some traps caught very low numbers, including that much of the Proposed Onshore Scheme Scoping Boundary and habitats are sub-optimal and unsuitable for bats and this is portrayed in the trapping results. However, 2024 was additionally a poor spring with notably cold and sub-optimal weather conditions. Ten of the 13 traps with no captures were in May which was unseasonably cold with regular forecast cold nights and fog present, making it less suitable for trapping on some occasions. These conditions supressed bat activity and notably reduced trapping success, especially when trapping in more open, colder, and exposed habitats.

5.6 The trapping has confirmed the presence of 9 species across the Proposed Onshore Scheme Scoping Boundary, with breeding females caught of all but one species, serotine bats, where only a single nonbreeding female was caught.

Soprano pipistrelle

5.7 Soprano pipistrelle bats were by far the most common species caught accounting for over half of all bats trapped, with 225 bats caught, making up 53% of all captures. Adult females were the most common with 71. This high capture rate matches with the radio tracking and emergence surveys with 3 large maternity colonies identified across the Proposed Onshore Scheme Scoping Boundary from tagged bats 2, 8 and 11 which identified roosts 2, 8 and 11 with peak counts of 329, 174 and 269 respectively. These three colonies were the three largest colonies identified across the Proposed Onshore Scheme Scoping Boundary. Given the behaviour of the species, and survey evidence such as roost 8 in Walberswick was absent in July as this will have likely moved to another residential property locally, it is likely that there are other soprano pipistrelle roosts within the local area.

5.8 The closest colony to the indicative Underground Cable Alignment is roost 11 at approximately 400m. The surveys in this area caught a number of soprano pipistrelle bats as they dispersed from this roost and woodland after emergence, notably on flightlines heading south towards the Wildlife Trust Reserve Darsham Marshes and, representing highly suitable foraging habitat for this species. Any linear features around this roost are likely to be used by a higher number of bats. The highest number of soprano pipistrelle caught in any one trap was in survey position 71, just south of this woodland, catching 22 soprano pipistrelles in one night.

5.9 The highest number of bats caught was just west of Walberswick at survey position 18 and 19. These features provide the optimum connectivity between Walberswick, where bat 8 and roost 8 was found with a pre juvenile peak of 174 individuals, and Dunwich River and marshes forming part of the Minsmere SAC. Trapping caught 43 soprano pipistrelles on these two features on 28/07/2024. This is considered a key commuting route for this species.

Common pipistrelle

5.10 Common pipistrelle were the 2nd most common species caught with 88 individuals making up 20.7% of all bats caught. This capture rate matches the radio tracking and emergence surveys with 3 bats tagged and 3 colonies identified from roosts 3, 6 and 13 which identified minimum counts of 23, 95 and 27 individuals, respectively. The 95 individuals in roost 6 in Walberswick is considered to be a large roost for this species which are more typically 40-60 individuals. This is also the closest common pipistrelle roost to the indicative Underground Cable Alignment.

5.11 The highest number of common pipistrelle bats caught were also along survey location 18 leading west out of Walberswick to the woodland and marshes area of Minsmere SAC and optimum foraging habitat for this species in this area. This is considered a key commuting route for this species.

Natterer's bat

5.12 A total of 32 Natterer's bats were caught making up 7.5% of all captures, with slightly higher numbers of males (n15) compared to females (n10) and juveniles (n7). Surveys identified at least 3 colonies, roosts 4, 5, 7 and 15, however these typical had lower numbers of bats present with counts of 11, 16, 24 and 34 individuals respectively.

5.13 It is considered possible that roost 4 and 15 may be the same colony/population given the proximity to each other, however, it is likely that the other roosts are separate

colonies given the distances to each other. Two of the roosts, 7 and 15 are considered close to the indicative Underground Cable Alignment, however, in both cases the habitats where the roosts are present are having impact avoided through trenchless cable installation methods.

5.14 The highest number of Natterer's bats caught was at the River Blyth trapping area and survey location 18, this is the connectivity feature between Walberswick and the woodland and marshes area of Minsmere SAC.

Brown long-eared bat

5.15 A total of 29 brown long-eared bats were caught making up 6.85% of all captures. 13 individuals of both adult male and female were caught, with 3 juveniles, possibly as a result of lower breeding during 2024 with the cold spring.

5.16 Two bats were tagged in the northern area of the Proposed Onshore Scheme Scoping Boundary (bat 1+16), however, in both cases, there was no access to survey the roosts. The second roost located in a bungalow is close to the indicative Underground Cable Alignment and if this route is selected this should ideally be surveyed to confirm roosts status, or following precautionary principal assume this is a maternity roost. Two other colonies were considered, one in a residential house (roost 13) around 600m away from the indicative Underground Cable Alignment, and the other within a woodland forming part of Minsmere SAC and close to the indicative Underground Cable Alignment, however, this area would have trenchless cable installation methods therefore all impacts are being avoided.

5.17 The highest number of brown long-eared bats caught in any one trap was three, in traps 11, 45, 26 and 72, indicating that features surveyed had low commuting activity for this species.

Daubenton's bat

5.18 A total of 21 Daubenton's bats were caught making up 5% of all captures. However, the majority of these were adult male (n15) and very few adult females (n2) and juveniles (n4) indicating that there were no colonies located nearby. Daubenton's are a water habitat species, and no surveys were located adjacent to open water.

5.19 In addition, 11 of the 21 bats trapped were located on a survey feature being not being impacted, these being the River Blythe and Darsham Marshes. There was only one trapping location that caught juvenile Daubenton's bats with 2 individuals caught in survey location 18, representing the connectivity feature between Walberswick and the woodland and marshes area of Minsmere SAC.

5.20 The low number of individuals caught indicate that none of the surveyed features likely to be impacted were near to or used as a commuting route by any Daubenton's colony.

Barbastelle bat

5.21 A total of 14 barbastelle bats were caught making up 3.3% of all captures with adult males (n6) and adult females (n8). Barbastelle bats are a wide-ranging species, traveling both fast and further than most UK species.

5.22 Two individuals were radio tagged, bats 10 and 14 in May and July respectively. Both bats were found to be roosting in the same area two months apart. Bat 10 was located 13km from trap location 18 near Walberswick to the eastern end of the Proposed Onshore Scheme, and the roost located approximately 5km west of the indicative Underground Cable Alignment.

5.23 Only one barbastelle bat was caught during all of the May surveys out of 119 bats caught, with higher numbers caught in the July surveys. This is largely typical of the behaviour of the species, where more time is spent in denser, warmer woodlands in the earlier parts of the summer, and bats then foraging in more open, grassland and meadow habitats in later summer, with capture rates more than 5 times higher.

5.24 Given the location of the identified colony, and records of other colonies in the area, near Sizewell power station, it is unlikely that there are other unidentified colonies along the length of the Proposed Onshore Scheme.

Noctule bat

5.25 Only eight noctule bats were caught in total which is considered low, in addition, half of these were caught in one trap on one night at the end of July. These were all caught late in the night and well after sunset indicating that they are not roosting close to the Proposed Onshore Scheme. In no cases were any number of bats caught near sunset to indicate a maternity colony nearby. Noctule bats are high flying species and do not use linear features for commuting like many other species and so will not be impacted to severance. No bats were tagged to avoid having an unnecessary impact on any individuals, as no trapping indicated a nearby roost or any impact on this species.

Nathusius' pipistrelle

5.26 Only four Nathusius' pipistrelle bats were caught. Three of these were caught in the far eastern areas of the Proposed Onshore Scheme Scoping Boundary, south of Walberswick, and one individual within The Wilderness Woods near central area. Nathusius' are a migratory species, and the majority of bats caught in the UK are adult males, and near waterbodies. This survey did however catch an adult female in late May, this could possibly be a late individual migrating, or one that is resident in the UK or not breeding this year. This bat was tagged; however, this bat moved a long way from the Proposed Onshore Scheme, and well out of range, this was only heard briefly a long way north of the Proposed Onshore Scheme Scoping Boundary.

5.27 No roost was identified as no other females or juveniles were caught throughout the rest of the trapping surveys to indicate that there is any colony in the local area to the Project. While the roost was not found, it is known from the tracking that it is not located anywhere on or near the indicative Underground Cable Alignment.

Serotine bat

5.28 Only three serotine bats were caught throughout all surveys, 2 males and 1 female. All bats were caught in July when conditions were warmer and more suitable for foraging in the open. A single female was caught late in the night and was a nulliparous nonbreeding individual.

5.29 No serotine bats were tagged as no breeding females were identified. No trapping or observations indicate that there is a serotine colony on or near the Proposed Onshore Scheme or a higher number of bats would have been expected to have been caught.

Target locations of higher ecological interest

5.30 Trapping was highly variable across the Proposed Onshore Scheme Scoping Boundary, with a notable range in capture rates at different locations. While weather conditions and other factors can have an impact on bat activity and bat numbers, in many cases higher numbers of bats were caught on the same nights as other locations catching very low numbers, or no bats at all, demonstrating that these differences are due to higher activity.

5.31 In many cases, increased trapping and observations identified features of higher bat ecological interest and importance (listed below), in addition to maternity colony locations which will result in nearby features being used more and having more importance due to proximity to a maternity colony.

5.32 Location 1 – Survey features 18 and 19.
These locations caught the highest number of bats with a total of 94 bats over 6 trap nights of effort, an average of 15.6 bats per trap. The capture rate in July when juveniles were active was the highest trapping rate on the Proposed Onshore Scheme Scoping Boundary with 67 bats in one night, in 3 traps. These also caught a high diversity of species with 7 species in total, including 3 of the 4 Nathusius' pipistrelle bats, the highest capture rate of common pipistrelle, soprano pipistrelle and Natterer's bat, and joint highest brown long-eared bats on any feature surveyed. Maternity roosts for all these species were identified locally to this site (roosts 6 and 7 within 350m, roosts 8 and 19 within 700m of the trap sites). In addition to the capture rates a high number of commuting bats were observed early during the survey commuting in a south/south westerly direction from Walberswick.

5.33 The location of features 18 and 19 are likely to be of increased importance given the local landscape and connectivity. Walberswick is a coastal town with a number of roosts identified present, with the sea on the east side and river on the north it has limited connectivity. Features 18 and 19 offer the only suitable connectivity from this village to the wider area. In addition, the habitats to the south and south west of Walberswick are considered optimal for a range of species with mature woodland, Westwood Marshes, open waterbodies and Dunwich River.

5.34 Location 2 – Habitat between The Wilderness Woodland and Darsham Marshes/Minsmere River.
This area had a high number of captures including the highest number of bats caught in an individual trap during both the pre and post parturition periods. Trap 36 had 16 bats on 25/05/2024 and the adjacent trap 71 had 26 bats on 28/07/2024, the highest capture rate in any one trap for the Proposed Onshore Scheme.

5.35 The high capture rates, which were predominantly soprano pipistrelle bats are due to the nearby soprano maternity colony in The Wilderness Woodland. This area has the best connectivity between roost 11, with a peak count of 269 soprano pipistrelle bats, and the optimal foraging habitats on Darsham Marshes.

5.36 The traps within The Wilderness Woodland also accounted for the only other Nathusius' pipistrelle caught for the Proposed Onshore Scheme and the highest number of Daubenton's caught in one trap, which were all identified as males. There may be a number of commuting routes leading out of The Wilderness Woodland, however, the ones leading south were identified as highest importance.

5.37 Location 3 – Theberton Wood

This woodland is not directly impacted by the Proposed Onshore Scheme but represents one of the largest woodland blocks near the indicative Underground Cable Alignment. This had a good capture rate and high species diversity with eight species caught; the highest across the Proposed Onshore Scheme Scoping Boundary. This included the capture of three barbastelle bats in one night on 22/07/2024, the highest caught in any night. Radio tagging identified the roost approximately 6km away.

5.38 Location 4 – Roosts 15-17 – Natterer's bat 15

The indicative Underground Cable Alignment is close to these roosts and the Natterer's maternity colony present, as well as having good species diversity. Trenchless cable installation methods are proposed for this area which would avoid any severance impacts on this colony.

5.39 Location 5 – Roost 18 – Brown long-eared bat 16

The indicative Underground Cable Alignment is close to this roost, which was not accessed, and roost status could not be confirmed. Given that this bat was lactating it is considered a higher likelihood that this may be a maternity roost location. The indicative Underground Cable Alignment is passing close to this roost, the connectivity to and from this roost should be considered.

5.40 Location 6 – Roost 19 – Brown long-eared bat 18

This roost is located on the indicative Underground Cable Alignment. This is however within an area of woodland forming the SAC and the proposed cabling route specifies trenchless cable installation methods, which would avoid any roost, or severance impacts on this colony.

5.41 Location 7 – Survey feature 20

Access to this area was not available until late in the survey season and only had a single survey. This connectivity feature was considered to be sub-optimal as, while the north western end was a good tree lined section of lane, the south eastern was sparsely vegetated and lacking suitable connectivity. A survey was conducted here as this feature represented the only suitable connectivity between Big Wood/Common Wood and Dunwich Forest/Westwood Marshes and the SAC, providing optimum foraging habitats for a range of bat species. The trap at this location caught 11 bats, which was considered high for a sub-optimal connectivity feature. This included a barbastelle bat.

6 Appendix 1 - Trapping results

7 Appendix 2 – Trapping

TABLE 3 – FULL TRAPPING RESULTS

Date	Survey location	Trap no	Grid Ref	Total Bats	P.pip	P.pyg	P.nat	P.aur	M.nat	M.daub	B.barb	N.noc	E.ser
16/05/2024	9	1	TM 46069 79638	4	3			1					
	8	2	TM 46191 79682	2		2							
	8	3	TM 46324 79602	2		1				1			
	7	4	TM 46550 79914	5	1	3			1				
17/05/2024	6	5	TM 46841 79876	0									
	5	6	TM 47901 79874	4		4							
	4	7	TM 48403 79034	3	2	1							
	3	8	TM 48401 78855	2	1	1							
	2	9	TM 48668 78469	4	1	1			1			1	
	1	10	TM 49713 78201	7	6	1							
18/05/2024	13	11	TM 43530 79503	4				3	1				
	12	12	TM 43647 79491	0									
	11	13	TM 43674 79658	0									
	10	14	TM 45178 79459	0									
	15	15	TM 43862 78045	1	1								
	16	16	TM 43476 77226	2					2				
	17	17	TM 43688 77238	0									
23/05/2024	31	18	TM 41997 67930	2					1	1			
	32	19	TM 41984 67801	0									
	32	20	TM 42151 67790	0									
	32	21	TM 42172 67796	1		1							
	33	22	TM 42644 66324	0									
	34	23	TM 42737 66263	1		1							
	35	24	TM 42855 66176	1	1								
	35	25	TM 42830 66118	2				1	1				
24/05/2024	18	26	TM 48461 74491	11		9			1		1		
	18	27	TM 48624 74522	11	1	8	2						

Date	Survey location	Trap no	Grid Ref	Total Bats	P.pip	P.pyg	P.nat	P.aur	M.nat	M.daub	B.barb	N.noc	E.ser
	19	28	TM 49210 74271	5	1	4							
	22	29	TM 43614 71793	0									
	22	30	TM 43668 71514	2				2					
	23	31	TM 43554 71375	1		1							
25/05/2024	24	32	TM 43067 69772	0									
	Wilderness Woods	33	TM 43019 69557	11	2	4		2		3			
	Wilderness Woods	34	TM 43117 69642	7	1	4	1	1					
	25	35	TM 42830 69240	5	1	4							
	26	36	TM 42962 69257	16	2	13		1					
	27	37	TM 43281 69178	3		3							
21/07/2024	40	38	TM 40738 62332	1					1				
	40	39	TM 40777 62173	3	1	1					1		
	40	40	TM 40738 61991	4	2	2							
	41	41	TM 40631 61633	0									
	42	42	TM 40730 61507	2		1		1					
	43	43	TM 40593 61347	5	1	4							
	44	44	TM 40839 61281	0									
22/07/2024	Theberton Woods	45	TM 42309 65634	10	2	4		3			1		
	Theberton Woods	46	TM 42314 65490	2	1						1		
	36	47	TM 42931 65836	3	3								
	Theberton Woods	48	TM 42297 65244	10	1	8					1		
	Theberton Woods	49	TM 42443 65202	5		4			1				
	37	50	TM 43037 65582	3	1	2							
	38	51	TM 43096 65421	2	2								
	39	52	TM 42908 65251	2		1			1				
23/07/2024	River Blyth	53	TM 42606 76477	5		1			3			1	
	River Blyth	54	TM 42520 76374	2	1					1			
	River Blyth	55	TM 42622 76182	8	1	4			2	1			
	River Blyth	56	TM 42767 76099	4		3		1					

Date	Survey location	Trap no	Grid Ref	Total Bats	P.pip	P.pyg	P.nat	P.aur	M.nat	M.daub	B.barb	N.noc	E.ser
23/07/2024	33	22	TM 42644 66324	1					1				
	34	23	TM 42724 66249	1		1							
	35	24	TM 42868 66173	1	1								
	35	25	TM 42825 66109	1							1		
25/07/2024	7	4	TM 46550 79914	4	1			1	1				1
	6	62	TM 46873 79849	5	2				1	1	1		
	5	63	TM 47824 79870	1								1	
	1	10	TM 49720 78199	1		1							
26/07/2024	18	26	TM 48461 74491	19	3	7		3	4	2			
	18	27	TM 48624 74522	24	8	16							
	19	28	TM 49210 74271	24	3	20	1						
27/07/2024	31	18	TM 41997 67930	3				1	1		1		
	32	19	TM 41984 67801	4	2	1			1				
	32	20	TM 42151 67790	4	1	1			2				
28/07/2024	28	71	TM 43049 69154	26	3	22				1			
	29	72	TM 42872 68804	6	1	1		3		1			
	30	73	TM 43019 68619	18	2	14			1		1		
29/07/2024	16	16	TM 43476 77226	3	1	1		1					
	17	17	TM 43688 77238	5	1							4	
	16/17	75	TM 43636 77085	3	1			1	1				
18/08/2024	Minsmere Cut	77	TM 42161 68621	7	1	3				2	1		
	Minsmere Cut	78	TM 42410 68521	2		1				1			
	Minsmere Cut	79	TM 42532 68382	7	2	3				2			
	Minsmere Cut	80	TM 42603 68328	4	2				1	1			
16/08/2024	11	81	TM 43660 79693	2				1		1			
	12	12	TM 43647 79491	3		3							
	14	83	TM 43582 79231	6	1	4					1		

Date	Survey location	Trap no	Grid Ref	Total Bats	P.pip	P.pyg	P.nat	P.aur	M.nat	M.daub	B.barb	N.noc	E.ser
17/08/2024	40	40	TM 40738 61991	8	2	4				1			1
	41	85	TM 40669 61821	3	1	1			1				
	43	43	TM 40593 61347	5	3	2							
	44	44	TM 40839 61281	5	1	3			1				
19/08/2024	Theberton Woods	88	TM 41951 65333	1				1					
	Theberton Woods	89	TM 42196 65264	5	1	3						1	
	39	52	TM 42908 65251	6		4				1			1
	38	91	TM 43209 65371	1		1							
20/08/2024	20	92	TM 44358 73000	11	4	5		1			1		
	21	93	TM 44138 72569	1							1		
	22	94	TM 43647 71571	0									
	23	31	TM 43561 71362	3		2					1		
				424	88	225	4	29	32	21	14	8	3

8 Appendix 3 – Weather conditions

TABLE 4 – WEATHER CONDITIONS DURING TRAPPING AND EMERGENCE SURVEYS

				Temperature (˚C)		Wind (km/h)	
Date	**Trapping Location**	**Emergence Location**	**Weather Description**	**Daily High**	**Nightly Low**	**Speed**	**Gusts**
16/05/2024	7-9		Precipitation during the day with overcast skies in the evening. Light, cool breeze and damp air with moisture on the foliage. Skies cleared overnight with temperature dropping quickly, damp with heavy mist forming.	14.8	8.0	13.5	20.1
17/05/2024	1-6		Warm day with a mild evening. Night partly overcast and calm.	18.7	10.9	10.5	17.9
18/05/2024	10-13, 15-17		Warm day, overcast with a stiff breeze and dry conditions. Night turning cold and windy.	18.6	10.7	17	24.3
19/05/2024		Roost 1, 2, 4	Clear and warm with a moderate breeze	19.7	6.9	16.1	23.5
22/05/2024		Roost 3	Overcast with some very slight drizzle and a moderate breeze	16.4	11.9	15.1	22.3
23/05/2024	31-35		Warm and breezy during the day, becoming still in the evening with clear skies, evening quickly turning cold and damp.	15.6	8.0	29.3	40.7
24/05/2024	18, 19, 22, 23		Partly overcast during the day, with a clear and still evening. Warm initially but cooling quickly.	17.4	8.0	16.4	23.7
25/05/2024	24-27, Wilderness Woods		Precipitation during the day with the night overcast and with ligh breeze and temperature dropping quickly during the survey.	14.7	10.2	12	20.4
26/05/2024		Roost 5, 7, 8, 11	Partly cloudy and warm with a light breeze	18.1	12.8	15	21
27/05/2024		Roost 6, 9	Partly cloudy, warm and dry with a slight breeze	17.2	11.0	12.2	18.1
21/07/2024	40-44		Partly overcast, dry, and warm during the day, with a mostly clear night with a light breeze.	21.5	13.3	18.6	27.3
22/07/2024	36-39, Theberton Woods		Partly overcast, dry, and warm during the day, with a clear night and a light breeze.	24.2	16.1	22.8	34.2
23/07/2024	33-35, River Blyth		Warm, dry day with partial cloud cover. Temperature dropped quickly after sunset, with damp conditions and fog setting in from midnight.	20.5	10.2	21.9	34.3
24/07/2024		Roost 9, 13, 14, 15	Warm and partly cloudy with a slight breeze and intermittent fine drizzle	22.7	15.1	11.1	21.1
25/07/2024	1, 5-7		Mild weather with forecasted showers. Light rain initially, turning to heavy showers from 11pm.	20.7	13.3	24.1	35.1
26/07/2024	18, 19		Still, warm, and dry evening.	22.1	12.0	19	28.1
27/07/2024	31, 32	Roost 19	Overcast, warm and dry evening with light breeze.	22.3	10.5	15.3	27.4
28/07/2024	28-30	Roost 4	Overcast, warm and dry evening with light air.	23.5	12.6	15.7	27.4
29/07/2024	16, 17	Roost 8, 11	Clear, warm, and dry evening with light breeze.	25.7	13.4	17.4	29.7
30/07/2024		Roost 6, 14	Warm and partly cloudy and largely calm	27.3	15.0	10.2	12.6
31/07/2024		Roost 17	Overcast and warm with a light breeze	23.5	13.6	14.2	25
16/08/2024	11, 12, 14		Overcast, warm, and dry evening with light breeze.	22.1	12.5	19.8	29.3
17/08/2024	40, 41, 43, 44		Clear and warm during the day, with a clear evening and a light breeze. Temperature dropping rapidly after sunset.	21.6	11.7	11.8	21.8
18/08/2024	Minsmere Cut		Warm, partly overcast, and dry evening with a light breeze.	22.9	11.4	19.3	32.5
19/08/2024	38, 39, Theberton Woods		Clear, warm, and dry evening with gentle breeze.	23.1	17.1	24.9	37.6
20/08/2024	20-23		Clear and warm during the day. Clear evening and a moderate breeze. Temperature dropping rapidly after sunset.	23.3	10.5	31.2	46.4

9 Appendix 4 – Roosts

TABLE 5 – ROOSTS IDENTIFIED THROUGH RADIO TRACKING

Roost No.	Bat No.	Species	Trap Location	Distance to roost	Roost Type	Dates Used	Roost Location	Roost Grid Ref	Confirmed/ Feature	Emergence Survey Date	Count	Notes - Confidential	Lat	Long
1	1	P.aur	TM 46069 79638	790m	Unknown	18/05-19/05	[redacted]	[redacted]	not confirmed	19/05/2024	NA	[redacted]	[redacted]	[redacted]
2	2	P.pyg	TM 47901 79874	964m	Maternity	19/05-25/5	[redacted]	[redacted]	SW corner	19/05/2024	329	[redacted]	[redacted]	[redacted]
3	3	P.pip	TM 48401 78855	1202m	Maternity	18/05-25/05	[redacted]	[redacted]	Under roof tiles below eastern ridge.	22/05/2024	23	[redacted]	[redacted]	[redacted]
4	4	M.nat	TM 43530 79503	594m		19/05	[redacted]	[redacted]	Southern elevation eaves, and ridge	19/05/2024	8	[redacted]	[redacted]	[redacted]
	17	M.nat	TM 46550 79914	2462m		26/07-28/07				28/07/2024	11	[redacted]	[redacted]	[redacted]
5	5	M.nat	TM 41997 67930	1644m	Maternity	24/05-27/05	[redacted]	[redacted]	Rot hole on branch end of large oak	26/05/2024	16	[redacted]	[redacted]	[redacted]
6	6	P.pip	TM 48624 74522	367m	Maternity	25/05-27/05	[redacted]	[redacted]	N gable	27/05/2024	95	[redacted]	[redacted]	[redacted]
										30/07/2024	2			
7	7	M.nat	TM 48461 74491	352m	Maternity	26/05	[redacted]	[redacted]	Woodpecker hole in sweet chestnut	26/05/2024	24	[redacted]	[redacted]	[redacted]
8	8	P.pyg	TM 48624 74522	1207m	Maternity	25/05-27/05	[redacted]	[redacted]	N end of building	26/05/2024	174	[redacted]	[redacted]	[redacted]
										29/07/2024	0			
	9	P.nat	TM 48624 74522				[redacted]	[redacted]				[redacted]	[redacted]	[redacted]
9	10	B.barb	TM 48461 74491	12723m	Satellite	27/05	[redacted]	[redacted]	Behind bark plate on dead tree	27/05/2024	9	[redacted]	[redacted]	[redacted]
										24/07/2024	0		[redacted]	[redacted]
10				12919m	Unknown	25/05-26/05	[redacted]	[redacted]	NA	NA	NA	[redacted]		
11	11	P.pyg	TM 42962 69257	454m	Maternity	26/05-27/05	[redacted]	[redacted]		26/05/2024	269		[redacted]	[redacted]
										29/07/2024	176	[redacted]		
12	12	P.aur	TM 42309 65634	1197m	Solitary	24/07-28/07	[redacted]	[redacted]	NA	NA	NA	[redacted]	[redacted]	[redacted]
13	13	P.pip	TM 42314 65490	4340m	Maternity	24/07 - 28/07	[redacted]	[redacted]	Bats emerging from eaves and tiles around entire building	24/07/2024	min 27	[redacted]	[redacted]	[redacted]
		P.aur			Maternity						31			
		E.ser			Solitary						2			
14	14	B.barb	TM 42314 65490	6100m	Maternity	24/07-31/07	[redacted]	[redacted]	Hazard beam	24/07/2024	2	[redacted]	[redacted]	[redacted]
										30/07/2024	23			
15	15	M.nat	TM 42622 76182	329m	Satellite		[redacted]	[redacted]	Rot hole S side of large poplar	24/07/2024	34	[redacted]	[redacted]	[redacted]
16				332m	Satellite	25/07-28/07	[redacted]	[redacted]	Wound	NA	NA		[redacted]	[redacted]
17				186m	Satellite	30/07-31/07	[redacted]	[redacted]	Split in oak tree branch	31/07/2024	25		[redacted]	[redacted]
18	16	P.aur	TM 46550 79914	467m	NA	26/07	[redacted]	[redacted]	NA	NA	NA	[redacted]	[redacted]	[redacted]
19	18	P.aur	TM 48461 74491	717m	Maternity	27/07-29/07	[redacted]	[redacted]	Multiple woodpecker holes	27/07/2024	22	[redacted]	[redacted]	[redacted]

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