

Flaxlands Solar Farm

Roosting Bats Report

Ampyr Solar Europe

Project number: 60727989

November 2024

Prepared for:

Ampyr Solar Europe

Prepared by:

AECOM Limited
5 Callaghan Square
Cardiff
CF10 5BT
United Kingdom

aecom.com

© 2024 AECOM Limited.

This document has been prepared by AECOM Limited ("AECOM") for sole use of our client in accordance with generally accepted consultancy principles, the budget for fees and terms of reference agreed between AECOM and the client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

Table of Contents

1.	Executive Summary	1
2.	Introduction	3
2.1	Location and Description	3
2.2	The Proposed Development	3
2.3	Objectives	3
3.	Legislation and Policy	4
3.1	Relevant Legislation	4
3.2	European Protected Species Mitigation Licences (EPSMLs)	4
3.3	Good Practice	5
3.4	Quality Assurance	5
4.	Methodology	6
4.1	Desk Study	6
4.2	Field Survey	6
4.3	Assessment of the Importance of Confirmed Roosts within the Ecological Assessment Area	9
4.4	Limitations	9
5.	Results	10
5.1	Desk Study	10
5.2	Field Survey	11
6.	Potential Impacts	16
6.1	Buildings	16
6.2	Trees	16
6.3	Wider Landscape	16
7.	Recommendations	17
7.1	Further Surveys	17
7.2	European Protected Species Mitigation Licence (EPSML)	17
7.3	Mitigation	17
7.4	Enhancements	18
8.	Figures	19
	Appendix A Photographs	26
	Appendix B Bat Activity Survey – Barbastelle Calls Summary	28
	Appendix C Bat Activity Survey – Lesser Horseshoe Bat Calls Summary	30
	Appendix D Ground Level Tree Assessment Results	32
	Appendix E Examples of Bat Box Options	37
	Appendix F Plant Species Associated with Bat Prey Invertebrates	38
	F.1 Trees and Shrubs	38
	F.2 Climbers and Scramblers	38
	F.3 Flowering Plants	39
	F.4 Grasses	39

Figures

Figure 1. Preliminary Roost Appraisal and Ground Level Tree Assessment Results	20
Figure 2. Location of Static Bat Detectors within the Ecological Assessment Area	21
Figure 3. Trees Scoped into Further Survey	22
Figure 4. T3 Dusk Emergence Survey and Surveyor Locations	23
Figure 5. T62 Dusk Emergence Survey and Surveyor Locations	24
Figure 6. PRF Aerial Inspection Results	25

Tables

Table 4-1 Buildings and Structures – Bat Roost Suitability Categories	7
Table 4-2 Trees – Bat Roost Suitability Categories – GLTA	7
Table 4-3 Trees – Bat Roost Suitability Categories	7
Table 4-4 Date and Environmental Conditions during Emergence Surveys	8
Table 5-1 Bat Roosting Records within 2 km of the Ecological Assessment Area	10
Table 5-2 PRA Results	12
Table 5-3 GLTA Results for the Trees Scoped into Further Survey	13
Table 5-4 Results of the PRF Aerial Inspection Survey	14

1. Executive Summary

AECOM Limited (hereafter referred to as 'AECOM') have been instructed by Ampyr Solar Europe to carry out roosting bat surveys to support the proposed installation of a solar photovoltaic array and Battery Energy Storage System (BESS) (hereafter referred to as the 'Proposed Development') within land north of Royal Wootton Bassett, Wiltshire. The land subject to ecological survey, in association with the Proposed Development, is illustrated on Figure 1 and referred to as the 'Ecological Assessment Area'.

The objectives of this report and associated surveys are to:

- assess the likelihood that roosting bats are present within the Ecological Assessment Area;
- outline the results of the roosting bat surveys undertaken within the Ecological Assessment Area;
- provide recommendations on avoidance, mitigation and compensation of potential impacts on roosting bats, and provide recommendations for enhancements; and,
- provide recommendations on any requirement for further survey and/or European Protected Species Mitigation Licence (EPSML) relating to roosting bats.

The work undertaken to advise this report include a desk study, Preliminary Roost Appraisal (PRA) of buildings and structures, a Ground Level Tree Assessment (GLTA) of trees within the Ecological Assessment Area and a 30 m buffer from the boundary; and dusk emergence surveys and/or aerial tree assessments of trees identified with Potential Roost Features (PRFs) during the GLTA.

The Ecological Assessment Area lies within the Core Sustenance Zone (CSZ) of several roosts identified in the desk study. Analysis of the survey data recorded during the Flaxlands bat activity survey also indicates that lesser horseshoe bat and barbastelle are roosting within the immediate landscape.

The PRA survey identified eight buildings within 30 m of the Ecological Assessment Area of which three were accessible for a full PRA. Of these, B2, was identified as having **High** bat roost suitability. As all construction works are to be avoided within a minimum of a 15 m buffer to buildings identified, all buildings are to be retained by the Proposed Development, and flight corridors (hedgerows) to and around the buildings will be retained and afforded a 10 m buffer, no further survey of buildings or structures were undertaken.

The GLTA identified 92 trees with PRFs or as Further Assessment Required (FAR). Of these trees, 79 were ruled out of requiring further survey due to the application of an appropriate 15 m buffer between all works associated with the Proposed Development and the tree. The remaining 13 were recommended for further survey, however one, T1, was felled by the landowner prior to the completion of further survey.

Two trees, T3 and T62, were subject to dusk emergence surveys as they were considered unsafe for aerial tree assessments. T3 was downgraded to 'PRF-I' (only suitable for individual bats or very small numbers of bats either due to size or lack of surrounding habitats) after the initial survey and no further survey was required. Three emergence surveys were undertaken at T62 and no bats were confirmed roosting within the tree. The remaining ten trees were subject to aerial tree assessments. Nine were downgraded to PRF-I or 'None' (either no PRFs in the tree or highly unlikely to be any) during the initial aerial tree assessment and no further survey was required. T60 was subject to three aerial tree assessments and no bats were confirmed roosting within the tree.

No further surveys are recommended and, as no bat roosts were confirmed within the Ecological Assessment Area, there is no requirement for an EPSML. No specific mitigation for roosting bats within buildings or trees is required.

If the Proposed Development design changes, and the removal of any mature trees is required, further mitigation will be required. If the tree to be removed was subject to further survey, those classified as 'PRF-M' (suitable for multiple bats and may therefore be used as a maternity colony) (T60 and T62) must be checked by a bat licensed ecologist prior to felling. Trees classified as PRF-I following dusk emergence surveys or PRF aerial inspection surveys should be soft-felled in the presence of a suitable experienced Ecological Clerk of Works (ECOW). If trees that were identified as FAR or PRF during the GLTA, but were not subject to further survey due to the implementation of appropriate buffers then require felling, or significant disturbance within 15 m is likely to be required, these should first be subject to further survey comprising either dusk emergence surveys or PRF aerial inspection surveys, as deemed appropriate by a suitably experienced ecologist.

Green infrastructure (vegetated 'green' corridors including hedgerows, tree lines, woodland edges) will be retained and a minimum 10 m 'no development' buffer will be applied (this increases to 30 m for areas of ancient woodland), and additional artificial nighttime lighting must not be introduced. This will ensure that connecting corridors to roost sites outside the Ecology Assessment Area are maintained and that indirect impacts to roosts within the wider landscape are avoided and the CSZ of these roosts remain uncompromised.

Proposed enhancements within the Ecological Assessment Area include: the installation of bat boxes on mature trees; the creation of new green infrastructure or improvement of existing green infrastructure to provide new or more robust flightlines for commuting and foraging bats; and, increasing grassland diversity/improving grassland management below and around the proposed solar panels to promote the diversity of invertebrate fauna (bat prey).

2. Introduction

AECOM Limited (hereafter referred to as 'AECOM') have been instructed by Ampyr Solar Europe to carry out bat surveys to support the proposed installation of a 49.9 MW solar farm and 49.9 MW Battery Energy Storage System (BESS) (hereafter referred to as the 'Proposed Development') within land north of Royal Wootton Bassett, Wiltshire. The land subject to ecological survey, in association with the Proposed Development, is illustrated on Figure 1 and hereafter referred to as the 'Ecological Assessment Area'.

A Preliminary Ecological Appraisal (PEA) of the Ecological Assessment Area was completed by AECOM in May 2024¹. This identified the need for further assessment for the presence of roosting bats due to the presence of buildings and trees within and adjacent to the Ecological Assessment Area with the potential to support roosting bats.

2.1 Location and Description

The footprint of the Proposed Development is located approximately 1.7 km north of the town of Royal Wootton Bassett, and approximately 250 m north of the M4, within Wiltshire County. The Ecological Assessment Area is centred at Ordnance Survey National Grid Reference SU 06910 85466. It is comprised of two land parcels, a north-western and a south-eastern land parcel, joined via Flaxlands Lane. Both parcels consist of multiple grassland fields which are bounded by hedgerows containing mature broadleaved trees. Wet ditches, assumed to be associated with the drainage of fields, are present in several locations throughout the Ecological Assessment Area, as are standing bodies of water.

The Ecological Assessment Area is surrounded by agricultural grassland fields which are common throughout the immediate landscape. The urban developed area of Royal Wootton Bassett lies to the south on the distal side of the M4 which runs east to west, approximately 250 m south of the Ecological Assessment Area, and creates a barrier to ecological connectivity. There are four blocks of broadleaved woodland directly adjacent to the Ecological Assessment Area, in the north, east and west.

2.2 The Proposed Development

The Proposed Development includes the installation of a 49.9 MW solar farm and 49.9 MW BESS within the Ecological Assessment Area. Solar photovoltaic arrays will be situated in both western and eastern land parcels with the location of the BESS in the north of the Ecological Assessment Area. It is understood that the Proposed Development will require clearance of vegetation, tracking for plant to access working areas, and widening of gaps within hedgerows for access purposes.

2.3 Objectives

The objectives of this report and associated surveys are to:

- assess the likelihood that roosting bats are present within the Ecological Assessment Area;
- outline the results of the roosting bat surveys undertaken;
- provide recommendations on avoidance, mitigation and compensation of potential impacts on roosting bats resulting from implementation of the Proposed Development;
- provide recommendations for ecological enhancements; and,
- provide recommendations on any requirement for further survey and/or European Protected Species Mitigation Licence (EPSML) relating to roosting bats to facilitate implementation of the Proposed Development.

¹ AECOM (2024) Flaxlands Solar Farm. Preliminary Ecological Appraisal Report.

3. Legislation and Policy

3.1 Relevant Legislation

All UK native bat species and their roosts (whether bats are present or not) are protected under the Conservation of Habitats and Species (Amendment)(EU Exit) Regulations 2019 and under the Wildlife and Countryside Act 1981. Taken together, this makes it an offence to deliberately, intentionally or recklessly:

- capture, injure or kill a bat;
- damage/destroy a breeding site or resting place of a bat;
- disturb a bat; or,
- obstruct access to any structure which a bat uses for shelter or protection.

Disturbance is defined as that which is likely to impair the ability of a bat to survive, to breed or reproduce, or to rear or nurture their young. In the case of animals of a hibernating or migratory species disturbance includes that which is likely to affect their ability to hibernate or migrate. Disturbance impacts also include that which has potential to significantly affect the local distribution or abundance of the species to which they belong.

Where development works are at risk of causing one or more of the offences, a mitigation licence from Natural England may be obtained to facilitate the works that would otherwise be illegal (see below for more detail).

Lower levels of disturbance not covered by the Conservation of Habitats and Species (Amendment)(EU Exit) Regulations 2019 remain an offence under the Wildlife and Countryside Act 1981 (as amended) although a defence is available where such actions are the incidental result of a lawful activity that could not reasonably be avoided.

A bat roost is defined as ‘any structure or breeding place which is used for shelter or protection’ or a ‘breeding site or resting place’. Because bats commonly use the same roosts at particular times of the year after periods of absence, the roost is protected whether or not the bats are resident.

Given the above legislation, the potential presence of bats within the Ecological Assessment Area represents a material consideration in the planning process. Even where planning permission is not required, there is still a legal responsibility placed on the developer to ensure that a Natural England licence is obtained to cover any works that have the potential to result in an offence under the above legislation.

Four bat species in the UK are listed on Annex II of the Conservation of Habitats and Species (Amendment)(EU Exit) Regulations 2019: greater horseshoe bat (*Rhinolophus ferrumequinum*), lesser horseshoe bat (*Rhinolophus hipposideros*), Bechstein’s bat (*Myotis bechsteinii*) and barbastelle (*Barbastellus barbastella*). These species are described as those of ‘community interest’ whose conservation requires the designation of Special Areas of Conservation (SACs).

Seven of the UK bat species are listed as species of principal importance within Section 41 of the Natural Environment and Rural Communities Act 2006: barbastelle, Bechstein’s bat, noctule (*Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat (*Plecotus auritus*), greater horseshoe bat and lesser horseshoe bat.

The Wiltshire Biodiversity Action Plan² includes all bat species present in Wiltshire: barbastelle, Bechstein’s bat, greater horseshoe bat, lesser horseshoe bat, common pipistrelle, soprano pipistrelle, Nathusius’ pipistrelle, Natterer’s bat, Brandt’s bat, Daubenton’s bat, whiskered bat, brown long-eared bat, noctule, serotine and Leisler’s bat.

3.2 European Protected Species Mitigation Licences (EPSMLs)

Although the law provides strict protection to bats, it also allows this protection to be set aside (derogated) under Regulation 53 of the Habitats Regulations through the issuing of EPSMLs for the purpose of preserving public health/safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment. However, in accordance with the requirements of the Habitats Regulations an EPSML can only be issued where:

² Wiltshire Wildlife Trust (2008) The Wiltshire Biodiversity Action Plan. Available online at <https://www.wiltshirewildlife.org/sites/default/files/2022-08/wiltshirebap2008%281%29.pdf> [Accessed 18 November 2024]

- there is no satisfactory alternative; and,
- the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

In England, EPSML applications are currently determined by Natural England and take up to five working days to acknowledge receipt and up to 30 working days to determine, depending on the type of licence being sought. Natural England will normally only accept applications for schemes where planning consent has been granted and all ecology relevant conditions have been discharged.

3.3 Good Practice

Current guidance³ stresses the need for developers to maintain protected species within their current range at a favourable status. To achieve this, developers are often required to include mitigation strategies with their applications that describe how a scheme will identify and remediate potential adverse effects. The hierarchy of mitigation in descending order of preference is to avoid, mitigate and compensate³.

3.4 Quality Assurance

This survey and subsequent report were undertaken in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to maintaining our certification to the international standards BS EN ISO 9001:2015 and ISO 14001:2015 and BS ISO 45001 2018.

All AECOM ecologists who worked on this project are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) at the appropriate level and follow their code of professional conduct⁴ when undertaking ecological work.

³ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

⁴ CIEEM (2022) Code of Professional Conduct. Available online at <https://cieem.net/wp-content/uploads/2019/02/Code-of-Professional-Conduct-fEB-2022.pdf> [Accessed 29/07/2024]

4. Methodology

4.1 Desk Study

4.1.1 Publicly Available Records

The PEA included a desk study undertaken in May 2024 to review existing ecological baseline data and protected species records since 2014 within a defined radius of the Ecological Assessment Area. The following resources were consulted as part of the desk study, in relation to bats:

- the online Multi Agency Geographic Information for the Countryside (MAGIC) database was reviewed for all statutory sites designated for bats within 2 km, and for Sites of Special Scientific Interest (SSSIs) and Special Areas of Conservation (SACs) designated for bats within 10 km of the Ecological Assessment Area boundary; and,
- the Wiltshire and Swindon Biological Records Centre (WSBRC) was contacted to search for bat roost and field records within 10 km of the Ecological Assessment Area boundary, and locally designated sites within 2 km of the Ecological Assessment Area boundary.

4.1.2 Flaxlands Solar Farm Bat Activity Report (AECOM, 2024)

The results of the bat activity surveys completed by AECOM in 2024⁵ within the Ecological Assessment Area were reviewed to determine the likelihood of bat roosts being present within the Ecological Assessment Area or within the immediate landscape. The bat activity survey methodology and results are presented in the Flaxlands Solar Farm Bat Activity Report⁵. The bat activity survey included the deployment of nine Anabat Swift static bat detectors throughout the Ecological Assessment Area. The locations of these detectors are presented in Figure 2. These detectors were set up to record bat activity for at least five consecutive nights per month between May and October 2024.

The timing of bat calls identified within the Ecological Assessment Area by the static bat detectors can be used to draw high-level assumptions about the locations of potential bat roost sites. This is done by comparing the time of calls relative to sunset and sunrise time against the average time after sunset/before sunrise that a species emerges from or returns to its roost, respectively. The average roost emergence times for UK bat species are presented in the Bat Conservation Trust (BCT) bat survey guidelines⁶.

4.2 Field Survey

4.2.1 Preliminary Roost Appraisal (PRA) and Ground Level Tree Assessment (GLTA)

A Preliminary Roost Appraisal (PRA) of buildings and structures, and a Ground Level Tree Assessment (GLTA) of trees, within and adjacent to the Ecological Assessment Area was undertaken between 27 and 28 June 2024 paying due regard to the methodology set out in the BCT bat survey guidelines⁶.

The buildings and trees were inspected from the ground for Potential Roost Features (PRFs) that could be utilised by roosting bats. Based on this inspection, each building/structure and tree was classified for their suitability to support roosting bats. The classification system used to determine the suitability of buildings/structures is outlined in Table 4-1 and the classification system used to determine the suitability of trees is outlined in Tables 4-2 and 4-3. Often during a GLTA it is only possible to attribute a rating to a tree as outlined in Table 4-2, an aerial tree assessment is then required to accurately apply the more detailed ratings described in Table 4-3.

Both the PRA and GLTA included a check of the ground/ledges/crevices below identified features for evidence of bat occupation (such as bat droppings or fur-oil staining).

⁵ AECOM (2024) Flaxlands Solar Farm: Bat Activity Report

⁶ Bat Conservation Trust (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines

Table 4-1 Buildings and Structures – Bat Roost Suitability Categories

Roost Suitability	Description for Structures
None	No habitat features likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/suitable shelter at all ground/underground levels).
Negligible	No obvious habitat features likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by large numbers of bats (i.e., unlikely to be suitable for maternity and not a classic cool/stable hibernation site but could be used by individual hibernating bats).
Moderate	A structure 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, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure 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. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/stable hibernation site.

Source: Category descriptions drawn from Collins (2023)⁶ to be applied using professional judgement

Table 4-2 Trees – Bat Roost Suitability Categories – GLTA

Roost Suitability	Descriptions for Trees
None	Either no PRFs in the tree or highly unlikely to be any.
FAR	Further assessment required to establish if PRFs are present in the tree.
PRF	A tree with at least one PRF present.

Source: Category descriptions drawn from Collins (2023)⁶ to be applied using professional judgement

Table 4-3 Trees – Bat Roost Suitability Categories

Roost Suitability	Descriptions for Trees
None	Either no PRFs in the tree or highly unlikely to be any.
PRF-I	PRF-I is only suitable for individual bats or very small numbers of bats either due to size or lack of surrounding habitats.
PRF-M	PRF-M is suitable for multiple bats and may therefore be used as a maternity colony.

Source: Category descriptions drawn from Collins (2023)⁶ to be applied using professional judgement

4.2.2 Dusk Emergence Survey

Dusk emergence surveys were undertaken in August/September 2024 at trees identified as FAR or PRF during the GLTA that are considered unsafe for aerial tree assessment surveys (T3 and T62, see Figure 1 for the location of trees).

Surveys were led by a suitability experienced ecologist in accordance with BCT best practice guidelines⁶. One dusk survey was undertaken at T3, identified as FAR during the GLTA due to the presence of ivy (*Hedera helix*) cover on the trunk. Following the dusk emergence survey at T3, the tree was reassessed as PRF-I and no further assessment was required. Three surveys were undertaken at T62, identified as PRF-M during the GLTA due to the presence of a gaping cavity in the trunk.

Dusk emergence surveys started at least 15 minutes before sunset and ended 1.5 hours after sunset. Surveys were undertaken in suitable weather conditions, i.e., in sunset temperatures above 10°C and in the absence of heavy rain or strong wind. The dates and environmental conditions of the emergence surveys are presented in Table 4-4.

Notes of any potential emergences observed during the survey were recorded along with details of the roost location. Incidental notes of general bat activity around the surveyed tree were also made. In addition to direct observation, each surveyor was equipped with an Elekon Batlogger M to detect and record bat calls and was supported by an infra-red camera to record any potential emergences or re-entries. Still images of the infra-red camera view at the end of the survey are provided in Appendix A.

Sound recordings were made in full spectrum 'wav' files to allow subsequent verification of species or species groups where required. Calls recorded during the survey were subsequently analysed using Kaleidoscope software (v5.6.12) to identify the species of bat present. Where potential emergences observed during the survey the infrared camera footage was reviewed to confirm the presence or absence of the roost.

Table 4-4 Date and Environmental Conditions during Emergence Surveys

Tree ID	Date	Sunset Time	Start/ Finish Time	Temperature (°C)	Wind Speed (Beaufort)	Cloud Cover	Precipitation	Weather
T3	12/08/2024	20:35	20:20-22:05	18-17	0-1	1-1	0	Heavy rain shower earlier in the day; sunny and dry evening.
T62	13/08/2024	20:33	20:18-22:03	19-17	4-3	4-5	0	Overcast and breezy, but dry.
	27/08/2024	20:04	19:49-21:34	20-18	3-4	4-5	0	Overcast and breezy, but dry.
	10/09/2024	19:32	19:17-21:02	16-11	2-3	5-0	1-0	Very light drizzle at the start of the survey; rain stopped early, and the remainder of the survey was dry.

Beaufort wind force scale: 0 no wind, 1 light air, 2 light breeze, 3 gentle breeze, 4 moderate breeze, 5 fresh breeze, 6 strong breeze, 7 moderate gale

Cloud cover (% scale): 1 = 0-20%, 2 = 21-40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%

Precipitation scale: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood

4.2.3 PRF Aerial Inspection Survey

To determine roost presence/absence in trees likely to be impacted by the Proposed Development, PRF aerial inspection surveys were undertaken at trees classified as FAR or PRF during the GLTA and considered safe to climb. Where PRF aerial inspections were not possible due to health and safety risks or access constraints, dusk emergence surveys were undertaken in their place.

PRFs were accessed using tree climbing equipment (harness, ropes and/or ladders) to carry out a more detailed internal inspection using high-powered torches, mirrors and an endoscope to compile information on the dimensions of the features, whether the features are protected from the elements and to search for bats or any evidence of bats including:

- live or dead bats;
- droppings;
- urine staining;
- odour;
- feeding remains;
- scratch marks;
- grease stains; and,
- wear marks.

Following the first PRF aerial inspection, trees were re-categorised as having None, PRF-I, or PRF-M bat roost suitability based on Tables 4-2 and 4-3 in Section 4.2.1.

Trees (T60) that maintained a PRF-M roost suitability during the first aerial tree assessment were subject to two further aerial tree assessments, as per best practice guidelines⁶.

No further surveys were carried out for trees that were categorised as having None or PRF-I roost suitability following the first aerial tree inspection, as per best practice guidelines⁶.

Methods employed during PRF aerial inspection surveys paid due regard to best practice guidelines⁶, the Bat Workers Manual⁷, and the British Standard BS8596:2015 – Surveying for Bats in Trees and Woodland. The aerial tree assessments were undertaken in 2024 between August and September.

The first visit was undertaken between 15 and 16 August 2024 by a Natural England Level 2 licensed bat ecologist with an assistant. Both the surveyor and assistant were certified in tree climbing and aerial rescue (NPTC Level 2). The second and third visits to T60 were undertaken on 29 August 2024 and 11 September 2024. Following the first visit it was determined that T60 was safe and suitable to access by a Natural England Level 2 licensed bat ecologist via ladder only and that the assistant therefore did not hold a certification in tree climbing.

4.3 Assessment of the Importance of Confirmed Roosts within the Ecological Assessment Area

The Bat Mitigation Guidelines⁸ would typically be used to assess the Importance of confirmed roosts within the Ecological Assessment Area. No bat roosts have been confirmed within the Ecological Assessment Area and, therefore, no assessment of roost importance has been undertaken.

4.4 Limitations

The aim of a desk study is to help characterise the baseline context of a site and provide valuable background information that would not be captured by a survey alone. Information obtained from a desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a particular species does not necessarily mean that the species do not occur in the study area. Likewise, the presence of records for particular species does not automatically mean that these still occur within the area of interest or are relevant in the context of the Proposed Development.

Bats are highly mobile animals that, in addition to being faithful to certain preferred roosting locations, will also frequently move between and establish new roost sites. These surveys therefore only provide a snapshot of current roosting behaviour at the Ecological Assessment Area. Such survey data is typically considered valid for up to 18 months, after which point update surveys may be required.

Limitations to the bat activity surveys, referenced within the desk study of this report, are outlined in Flaxlands Solar Farm Bat Activity Report⁵.

Due to access limitations, such as not having land access agreed where trees were located at the Ecological Assessment Area boundary, the far-sided face of several trees could not be assessed during the GLTA. This is not considered a significant limitation as wherever this was the case the tree was assessed as FAR (or PRF if features were present on the accessible face) and were put forward for further survey if required. This was the case for T88, where the western face of the tree was not accessible during the GLTA, and it was subsequently subject to a PRF aerial tree inspection survey.

Full access to the roof void of B2 was not possible due to health and safety measures. Surveyors inspected the roof void through the access hatch only. Buildings 4-8 were not accessed for a thorough PRA during the survey and were assessed from a distance. This is due to not having access to these buildings at the time of the survey. This is not considered to be a significant limitation as these buildings will be retained by the Proposed Development and afforded a minimum 15 m buffer from any works to avoid disturbance. Should this change, recommendations are provided under Section 7.

⁷ Mitchell-Jones, A.J., & McLeish, A.P. (eds). 2004., 3rd Edition Bat Workers' Manual, JNCC, Peterborough, ISBN 1 86107 558 8

⁸ Reason, P.F & Wray, S. (2023) *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1* Chartered Institute of Ecology and Environmental Management, Ampfield.

5. Results

5.1 Desk Study

5.1.1 Publicly Available Records

There are no statutory or non-statutory designated sites for bats within 2 km of the Ecological Assessment Area and there are no internationally designated statutory sites for bats within 10 km of the Ecological Assessment Area.

The desk study returned field records of at least 12 species of bat within 10 km of the Ecological Assessment Area. Table 5-1 provides a summary of the records by species and approximate locations.

The Ecological Assessment Area lies within the Core Sustenance Zone (CSZ) of known roosts of the following species: brown long-eared bat, common pipistrelle, Natterer's bat (*Myotis nattereri*), noctule (*Nyctalus noctula*), serotine (*Eptesicus serotinus*), and soprano pipistrelle.

Table 5-1 Bat Roosting Records within 2 km of the Ecological Assessment Area

Species	Roosting Records and Location	Species CSZ ⁹ radius
Common pipistrelle	37 records; closest 1.3 km west and connected via woodland and grassland.	2 km
Soprano pipistrelle	28 records, closest 2.2 km north of the Ecological Assessment Area and connected to it via woodland and grassland.	3 km
Natterer's bat (<i>Myotis nattereri</i>)	13 records, closest 2.2 km north of the Ecological Assessment Area and connected to it via woodland and grassland.	4 km
Brown long-eared bat	23 records; closest 2.5 km north-west and connected via grassland and woodland.	3 km
Brandt's bat (<i>Myotis brandtii</i>)	A single record, located approximately 2.7 km north of the Ecological Assessment Area and connected via woodland and grassland.	1 km
Whiskered bat (<i>Myotis mystacinus</i>)	Four records, closest is 3 km north-east of the Ecological Assessment Area and connected to it via woodland and grassland.	1 km
Noctule (<i>Nyctalus noctula</i>)	Four records, closest 3 km north of the Ecological Assessment Area and connected to it via woodland and grassland.	4 km
Serotine (<i>Eptesicus serotinus</i>)	Eight records, closest is 3 km north-east of the Ecological Assessment Area and connected to it via woodland and grassland.	4 km
Bechsteins's bat (<i>Myotis bechsteinii</i>)	14 records; closest is 4.7 km north-west of the Ecological Assessment Area and connected via woodland and grassland.	3 km
Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>)	11 records, closest 6.4 km south-west – some separation via the M4 and the great western main line.	2 km
Greater horseshoe bat (<i>Rhinolophus ferrumequinum</i>)	One record 8.5 km south-west – some separation via the M4 and the great western main line.	3 km
Daubenton's bat (<i>Myotis daubentonii</i>)	One record 9 km north at Cleveland Lakes Nature reserve.	2 km

Source: Data obtained from WSBRC in May 2024

5.1.2 Flaxlands Solar Farm Bat Activity Report

The bat activity surveys within the Ecological Assessment Area identified the frequent presence of Annex I species lesser horseshoe bat and barbastelle (*Barbastella barbastellus*)⁹. Both species have an average emergence time of between 30 and 40 minutes after sunset⁹. The lesser horseshoe bat has a CSZ of 2 km, while barbastelle have a CSZ of 6 km⁹.

Barbastelle bat passes were recorded during the static bat detector deployments within one hour of sunset at static detector Location A, and within an hour and a half of sunset at static detector Locations A, B, C, D, F, and G as

⁹ Bat Conservation Trust (2016). Core Sustenance Zones. Available at: <https://www.bats.org.uk/our-work/landscapes-for-bats/core-sustenance-zones> (Accessed: 30/09/21)

seen on Figure 2, and detailed in Appendix B. This indicates that barbastelle bat are roosting within the wider landscape around the Ecological Assessment Area, and that the Ecological Assessment Area is highly likely to be within the 6 km CSZ of a barbastelle roost. Barbastelle are known to roost within woodland and forage at woodland edge. Colonies are also known to switch roosts frequently, up to every 1-3 days during the maternity season, and these roosts may be located in different woodlands¹⁰. The Ecological Assessment Area is bounded by broadleaved woodland in four locations, all four of which are designated ancient woodland. The spread of barbastelle records throughout the Ecological Assessment Area, with early records at multiple static detector locations, implies that barbastelle are likely to be utilising all woodland habitat that bounds the Ecological Assessment Area and moving between each block of woodland. Barbastelle were recorded during every month of monitoring (May-October, inclusive), which includes the barbastelle breeding and birthing period¹¹, and as such there is the potential for maternity roosts within the nearby landscape.

Lesser horseshoe bat passes were recorded during the static bat detector deployments within one hour of sunset at static detector Locations A, D, G, and I and within an hour and a half of sunset at static detector Locations A, D, G, H, and I as seen on Figure 2, and detailed in Appendix C. At Location D lesser horseshoe bat passes were recorded within an hour of sunset during May and September, and within an hour of sunrise in July, August, and September. This indicates that lesser horseshoe bats are roosting within the wider landscape around the Ecological Assessment Area, and that the Ecological Assessment Area is highly likely to be within the 2 km CSZ of a lesser horseshoe roost. Lesser horseshoe bat are known to commonly utilise caves, buildings and other man-made structures where they can hang to roost⁶. The localisation of the early lesser horseshoe calls in the north of the Ecological Assessment Area, at Locations A and D implies that lesser horseshoe bat may be utilising buildings or structures to roost towards the north of the Ecological Assessment Area and commuting and foraging over the Ecological Assessment Area. This includes farm buildings to the north of the Ecological Assessment Area beyond the scope of the PRA. The farm buildings to the north were not subject to further surveys, as they were considered to be outside the zone of influence of the Proposed Development, and because potential habitat connections across the Ecological Assessment Area were being retained by design (see Sections 6 and 7).

5.2 Field Survey

5.2.1 PRA and GLTA

5.2.1.1 PRA Results

A total of eight buildings were confirmed within 30 m of the Ecological Assessment Area. One of these buildings is within the Ecological Assessment Area (B1) while the rest are within the 30 m buffer. Of these buildings, three (B1, B2 and B3) were fully accessible during the PRA. One of these, B2, was assessed as having **High** suitability for roosting bats, and B1 and B3 as **Negligible** suitability for roosting bats. The five remaining buildings (B4, B5, B6, B7 and B8) were not fully accessible during the PRA (see Limitations, Section 4.4).

The results of the PRA are presented in Table 5-2 and illustrated on Figure 1.

Following the PRA, a minimum working buffer of 15 m from all buildings has been confirmed within the design of the Proposed Development. Habitat connectivity and vegetated flightlines that link to, or are in proximity to, buildings have also been retained within the design. Therefore, no significant impacts are anticipated on any potential building roosts and no further bat roost surveys were undertaken at buildings in associated with the Proposed Development.

¹⁰ Natural England (2024) Definition of Favourable Conservation Status for Barbastelle bat. RP2974. Natural England.

¹¹ Bat Conservation Trust (2024) UK Bats: Barbastelle. Available online: <https://www.bats.org.uk/about-bats/what-are-bats/uk-bats/barbastelle> [Accessed 15 November 2024]

Table 5-2 PRA Results

Building Reference	Description and Features	PRA Result	Hibernation Suitability
B1	The house is a modern, single-storey structure built recently (estimated to be within last two years) with sandstone walls and a composite slate-like tile roof. The vaulted ceiling means there is no loft space, and it is equipped with modern UPVC windows. The roof is well-sealed, and there are no access points for bats. The building was not inspected internally at the request of the owner. No features for roosting bats recorded.	Negligible	No
B2	The building is a single-storey structure constructed using shipping containers clad with wooden planks (vertical on sides and horizontal on the front and back of the building). The roof is made of corrugated metal with wooden supports. There is a small access hatch on the southern aspect that allows access to the roof void. The roof is insulated with felt and contains a storage area for the owner's belongings. Full access to the roof void was not possible due to safety considerations (see Limitations Section 4.4). Surveyors instead viewed the roof void from the access hatch. A hedgerow runs adjacent to the building to the north and west, which could potentially be used as a commuting feature in the landscape by bats. A chicken coop is located immediately to the south of the building, this is constructed using Heras fencing, wooden posts, and wire mesh, with green netting on the lower part. There are gaps behind the wooden cladding on all aspects of the building. There is a purposely installed hole in the north face, designed to provide access for bats to the roof void. The hole is covered by a four-faced wooded box with the base missing to allow access to the hole whilst sheltering it from external weather (Photograph 1, Appendix A). The residents have reported that there are bats roosting in the void, species was unknown. Additionally, there are gaps under the corrugated metal roof on the east and west aspects. The building is suitable for summer, breeding and hibernating crevice-dwelling species but does not have access points and features suitable for horseshoe bats.	High (anecdotally a confirmed roost of unknown species by owner)	Yes
B3	The structure is a large, open-sided barn built with vertical wooden slats for the walls. It features a corrugated metal roof with skylights for natural light, supported by metal beams. The interior contains agricultural equipment, storage areas, and houses livestock. The entrance has a large sliding or roll-up door, with concrete flooring extending to the driveway. A hedgerow runs adjacent to the barn to the north and could potentially be used as a commuting feature in the landscape by bats. The beams could be used by opportunistic, non-crevice-dwelling bats during night-time only as Perspex skylights mean the barn is brightly lit during the day, although use of the beams is unlikely as the beams are constructed of metal. The beams are open and exposed and would not provide a secure roost to bat species. The barn is open access with slatted walls that allow access but mean the beams are exposed to elements including wind and the cold. The barn is potentially an important feature for foraging bats, as it provides a sheltered location in poor weather conditions for insect prey.	Negligible	No
B4, B5, B6	These buildings were viewed from Flaxlands Lane and the hedgerows along the Ecological Assessment Area boundary due to access restrictions. A thorough PRA could not be completed. The largest building (B5) is a modern agricultural barn, constructed with vertical wooden slats for the walls. The lean-to roof appears to be corrugated metal. It has several large rectangular unglazed openings on the northern face, some covered with clear plastic. The lower portion of the building is wrapped in blue tarp suggesting ongoing construction. The building is adjacent to a densely wooded area and is surrounded by open fields. There are a further two structures: a dwelling (B4) and a mobile home (B6). B4 is prefabricated with panelled walls and a pitched, tiled roof. B6 could not be accessed close enough to determine the materials. There is an open window into the large barn that would allow access for bats.	Not Accessed	Unknown
B7	This building was viewed from Flaxlands Lane due to access restrictions. A thorough PRA could not be completed. The building is an L-shaped stables. It has a series of individual stalls with doors. The structure has a pitched roof with two different roofing materials, red shingles	Not Accessed	Unknown

Building Reference	Description and Features	PRA Result	Hibernation Suitability
	on a liner on one side and corrugated metal or plastic on the other. The stable is situated next to woodland.		
	Open stable doors may allow access by bats.		
B8	This building was not viewed during the survey due to access restrictions and no visibility through the hedgerow that bounds the road. A thorough PRA could not be completed. The building was not accessed due to it being private property and obscured by a hedgerow. Via aerial imagery it appears to be single-storey generator building with a green roof.	Not Accessed	Unknown

5.2.1.2 GLTA Results

A total of 92 trees were recorded as either PRF or FAR during the GLTA (Figure 1). The full GLTA results are provided in Appendix D.

Of these trees, 79 were scoped out of requiring further assessment through the implementation of a minimum 15 m buffer around the trees to avoid potential impacts to roosting bats (this buffer is increased to 30 m around areas of Ancient Woodland).

The remaining 13 trees, where it could not be confirmed that no works would be required within the buffer, were scoped in for further survey. This was in the form of either PRF aerial inspections or dusk emergence surveys, depending on the accessibility and safety of completing an aerial tree assessment.

T1, which received an assessment of PRF during the GLTA and was recommended for further PRF aerial inspection, was felled by the landowner between the GLTA and the beginning of the further assessment.

The GLTA results of the 13 trees scoped in for further survey are presented in Table 5-3 and the locations are shown on Figure 3.

Table 5-3 GLTA Results for the Trees Scoped into Further Survey

Tree Reference	Tree Species	Description	GLTA Result	Further Survey Recommended
T1	Ash (<i>Fraxinus excelsior</i>)	Approximately 8 m in height and 0.7 m diameter at breast height (DBH), with lifted bark on an east facing limb at 2 m high.	PRF	PRF aerial inspection*
T3	Oak (<i>Quercus</i> sp.)	Approximately 16 m in height and 0.6 m DBH, with ivy cover that may have obscured potential features. The dense ivy makes this tree unsuitable for aerial tree assessment. Shown in Photograph 2, Appendix A.	FAR	Dusk emergence
T20	Oak	Approximately 14 m in height and 0.6 m DBH with a callus roll on the underside of branch on the eastern face of the tree at 4 m height.	PRF	PRF aerial inspection
T21	Oak	Approximately 12 m in height and 0.4 m DBH with a callus roll and a south-east facing branch cavity at 6 m height.	PRF	PRF aerial inspection
T22	Oak	Approximately 8 m in height and 0.5 m DBH with lifted bark on the western face of the tree at 2 m high.	PRF	PRF aerial inspection
T53	Oak	Approximately 13 m in height and 0.8 m DBH with a north-west facing callus roll at 6 m in height.	PRF	PRF aerial inspection
T54	Oak	Approximately 8 m in height and 0.8 m DBH with flaking bark between the ground and approximately 6 m in height.	PRF	PRF aerial inspection
T60	Oak	Approximately 13 m in height and 1.1 m DBH. The tree has butt rot at its base with callus rolls at 3 and 4 m in height on the north and south faces of the trunk, respectively. Shown in Photograph 3, Appendix A.	PRF-M	PRF aerial inspection
T61	Willow (<i>Salix</i> sp.)	Approximately 5 m in height and 0.3 m DBH, with deterioration at the base of a north-facing branch that leads to a potential cavity.	PRF	PRF aerial inspection

Tree Reference	Tree Species	Description	GLTA Result	Further Survey Recommended
T62	Oak	Approximately 11 m in height and 0.1 m DBH. There is a gaping cavity on the south face of the trunk that may extend upwards into the trunk. Due to the presence of dense scrub and a pond directly below the cavity at the base of the tree, this tree is not suitable for aerial tree assessment. Shown in Photograph 4, Appendix A.	PRF-M	Dusk emergence
T83	Oak	Approximately 12 m in height and 0.7 m DBH, with a callus roll on the east face of the trunk at 3.5 m high.	PRF	PRF aerial inspection
T84	Ash	Approximately 12 m in height and 0.4 m DBH, with a callus roll on the east face of the trunk at 5 m high.	PRF	PRF aerial inspection
T88	Oak	Approximately 10 m in height and 0.5 m DBH. Due to access limitations the western face of the tree was inaccessible to survey during the GLTA, and features may be present.	FAR	PRF aerial inspection

**No longer applicable as tree felled prior to further survey commencing*

5.2.2 Dusk Emergence Survey

No bats were recorded emerging from T3 or T62 during the dusk emergence surveys. Roosting bats are considered likely absent from both T3 and T62.

The location of T3 and T62, as well as surveyor locations during each survey are provided in Figures 4 and 5, respectively. The survey end IR camera views of T3 and T62 (survey visit 1) are shown in Photographs 5 and 6, Appendix A, respectively.

Bat activity near to each tree was recorded incidentally during the emergence surveys:

- T3 - common and soprano pipistrelles, noctule, and myotis bat species.
- T62 - common and soprano pipistrelles, Leisler's bat, noctule, long-eared bat species, and myotis bat species.

5.2.3 PRF Aerial Inspection Survey

The results of the PRF aerial inspection survey are presented in Table 5-4 and shown in Figure 6, Appendix A.

Of the 11 trees that were scoped in for aerial tree assessments, one (T1) was felled by the landowner prior to the first assessment. Nine of the trees (T20, T21, T22, T53, T54, T61, T83, T84, and T88) were assessed as PRF-I or None during the first PRF aerial inspection and consequently required no further survey.

The final tree (T60) was confirmed as PRF-M during the PRF aerial inspection and was subject to two further inspections. No bats were recorded roosting within the feature during the PRF aerial inspection and roosting bats are considered likely absent.

Table 5-4 Results of the PRF Aerial Inspection Survey

Tree Reference	PRF Aerial Inspection Survey Notes	GLTA Result	PRF Aerial Inspection Result	Roost Confirmed (Y/N)
T1	Tree felled prior to further survey.	PRF	N/A	N/A
T20	Cavity is approximately 3 cm in diameter and extends to approximately 5 cm but narrows and prevents access deeper. The cavity is dry but clean with no signs of bats. It is suitable for a single bat.	PRF	PRF-I	N
T21	A split 30 cm long with a 5 cm diameter but there is no cavity other than at the callus roll. Cobwebs, old birds nest material and woodlice are present.	PRF	PRF-I	N
T22	A small cavity behind bark about 5 cm deep. It is suitable for a single bat. The cavity is quite exposed but would likely stay dry.	PRF	PRF-I	N

Tree Reference	PRF Aerial Inspection Survey Notes	GLTA Result	PRF Aerial Inspection Result	Roost Confirmed (Y/N)
T53	A cavity, 5 cm in diameter, goes in and down approximately 10cm. There is an old bird nest internally with lots of woodlice.	PRF	PRF-I	N
T54	There are several small cavities behind lifted bark, and a larger cavity is present with cracked bark along the top, the cavity therefore likely gets wet.	PRF	PRF-I	N
T60	Butt rot extends to above 1 m with a cavity that has a clear drop zone. There is a smaller cavity at 4 m high with squirrel-chewed nuts and a small mammal jaw present. Two callus rolls are present, one has a 10 cm diameter and extends to 40 cm deep, and the second is more than 1 m deep and has a diameter of 30 cm. There is a tear out at 4 m that faces upwards and extends into the crown with a large cavity. An old bird nest is present. Two further PRF aerial inspections were completed at this tree to check for roosting bat. No roosting bats were confirmed on any of the three inspections.	PRF-M	PRF-M	N
T61	A cavity extends back about 30 cm but narrows at 10 cm deep and becomes too small for bats. The cavity is open and light before this point.	PRF	PRF-I	N
T83	A cavity with a 3 cm diameter that extends to 6 cm in depth. The internal cavity is dry, extends into the branch and ends.	PRF	PRF-I	N
T84	The cavity has a 3 cm diameter and extends to 7cm before it narrows.	PRF	PRF-I	N
T88	None. Some ivy and dead limbs but no features noted	FAR	None	N/A

6. Potential Impacts

6.1 Buildings

Direct impacts of killing/injury of bats, obstruction of access, disturbance to, or destruction of potential roosts within buildings adjacent to the Ecological Assessment Area have been avoided through the implementation of a minimum 15 m buffer around all buildings. This buffer is considered sufficient to avoid disturbance to roosting bats. All buildings within and adjacent to the Ecological Assessment Area will be retained by the Proposed Development, including those with identified features.

There is a risk of indirect impacts to any potential bats roosting within B2, and all buildings that were not accessed fully during the PRA, through the loss of foraging habitat associated with the Proposed Development. All land within the Ecological Assessment Area is likely to be within the CSZ of any roost at these locations and any significant loss of foraging habitat could impact the ability of the potential roosts to survive and thrive. The design of the Proposed Development has incorporated buffers around green infrastructure and notable foraging and commuting habitat within the Ecological Assessment Area to maintain their functionality for bats: 30 m buffers for ancient woodland; 15 m for all other woodland; 30 m for trees identified as having bat roost suitability during the GLTA, 15 m for high value hedgerows for commuting bats; 10 m for all other hedgerows; and, 10 m for all watercourses and waterbodies⁵. The Flaxlands bat activity report⁵ also details the need for a grassland management plan and associated monitoring within the Ecological Assessment Area to ensure that the conditions within it remain consistent or are improved. The implementation of these measures will prevent any significant habitat loss and ensure that any roosts in proximity to the Ecological Assessment Area remain viable and individuals are able to survive and thrive.

6.2 Trees

It is anticipated that all trees within the Ecological Assessment Area will be retained by the Proposed Development.

A buffer of 15 m was confirmed around 79 of the 92 trees identified as FAR or PRF during the GLTA. This buffer is sufficient to avoid disturbance to roosting bats. No roosts were confirmed within the 13 trees subject to further survey. In the absence of confirmed roosts there are no anticipated direct impacts to bats roosting within trees within the Ecological Assessment Area. Bats are however a highly mobile species, and it is possible that roosting bats will occupy the features within the retained trees prior to works commencing. In this instance, potential impacts are limited to temporary disturbance during the construction phase of the works.

There is a risk of indirect impacts to any potential bats roosting within trees not subject to further survey through the loss of foraging habitat associated with the Proposed Development. All land within the Ecological Assessment Area is likely to be within the CSZ of any roost within these trees and a significant loss of foraging habitat could impact the ability of the potential roosts to survive and thrive. The mitigation by design measures described in Section 6.1 apply to any tree with potential to support roosting bats within or adjacent to the footprint of the Proposed Development. The design buffers and proposed management and monitoring plan as detailed in the Flaxlands bat activity report⁵ will ensure that the loss of foraging habitat is minimal and that there are no significant impacts on bats roosting within trees.

6.3 Wider Landscape

The desk study identified roosts within the wider landscape for five species where the Ecological Assessment Area falls within the CSZ of the roost: noctule, brown long-eared bat, common pipistrelle, soprano pipistrelle, and serotine.

The bat activity surveys⁵ within the Ecological Assessment Area indicated that the Ecological Assessment Area also falls within the CSZ for barbastelle and lesser horseshoe bat roosts, and these species are likely roosting within the immediate landscape. There is potential for these species to be roosting within woodland (barbastelle) or buildings (lesser horseshoe) directly adjacent to the Ecological Assessment Area.

The retention of all trees and buildings within the Ecological Assessment Area and the implementation of the mitigation by design measures described in Section 6.1 apply to any within the wider landscape, and the design buffers and proposed management and monitoring plan as detailed in the Flaxlands bat activity report⁵ will ensure that the loss of foraging habitat is minimal and that there are no significant impacts on the CSZ of roosting bats.

7. Recommendations

7.1 Further Surveys

No further surveys are required.

Bats are highly mobile animals that, in addition to being faithful to certain preferred roosting locations, will also frequently move between and establish new roost sites. These surveys therefore only provide a snapshot of current roosting behaviours at the Ecological Assessment Area. Such survey data is typically considered valid for up to 18 months, after which point update surveys will be required.

7.2 European Protected Species Mitigation Licence (EPSML)

No bat roosts were confirmed and no direct impacts upon roosting bats are anticipated. Therefore, an EPSML is not required to facilitate the Proposed Development.

7.3 Mitigation

7.3.1 Buildings

No direct impacts to bats currently roosting within buildings are anticipated; therefore, no mitigation is required.

If the design changes and the Proposed Development requires works within 15 m of any buildings further survey such as emergence surveys at B2 and thorough PRAs at B4-8 will be required as deemed appropriate by a suitably experienced ecologist.

7.3.2 Trees

No direct impacts to bats currently roosting within trees are anticipated; therefore, no mitigation is required.

If the design changes and the removal of mature trees is required further mitigation will be required. If the trees in question were subject to further survey, those classified as PRF-M must be checked by a bat-licensed ecologist prior to felling. Trees classified as PRF-I should be soft-felled in the presence of a suitable experienced Ecological Clerk of Works (ECoW).

The methodology for soft-felling includes felling the tree in sections, with the following precautions:

- cutting above or below (rather than directly through) a potential roosting feature;
- lowering the cut sections gently to ground level by rope; and,
- cut sections should be left within the Ecological Assessment Area, with any potential roost feature entrances left unobstructed, for 48 hours prior to chipping or removal from the Ecological Assessment Area.

Trees classified as None may be felled without an ECoW present.

If trees that were identified as FAR or PRF during the GLTA but were not subject to further survey due to the implementation of appropriate buffers then require felling, or significant disturbance within 15 m is anticipated, these should first be subject to further survey as deemed appropriate by a suitably experienced ecologist.

7.3.3 General Mitigation Measures and CSZs

Green infrastructure (vegetated 'green' corridors including hedgerows, tree lines, woodland edges) should be retained throughout the Ecological Assessment Area. These should be retained within the Ecological Assessment Area to retain established flightlines and foraging habitat for bats roosting within the wider landscape.

The grassland management plan around and below the solar array should focus on the creation of a species-rich grassland via a grazing regime that is less intensive than the current levels in order to maintain or improve the grassland foraging habitat and suitability through increased availability of invertebrate prey. The management plan should be subject to regular review and monitoring, as detailed in the Flaxlands Bat Activity report⁵, to ensure it remains viable and effective, especially during the initial transition period of around five years.

There must be no increase in levels of artificial night-time lighting within the Ecological Assessment Area during the construction or the operation of the Proposed Development.

Ensuring foraging habitat and landscape connectivity is retained, and additional artificial night-time lighting is avoided, will mitigate indirect impacts to roosts within the wider landscape and ensure that the CSZs of these roosts remain uncompromised. Following these measures will also prevent the Proposed Development from being a limiting factor in the future establishment of any roosts within the Ecological Assessment Area.

7.4 Enhancements

There are several opportunities within the Proposed Development to enhance the Ecological Assessment Area for bat species, as discussed below.

7.4.1 Bat Boxes

It is recommended that at least eight bat boxes are positioned on existing trees or buildings within the Ecological Assessment Area to provide additional roosting opportunities for bats. All new roost features should be situated away from light spill, with clear flight paths towards corridors and suitable foraging habitats to be used by bats. Advice from a suitably qualified ecologist should be sought when determining the locations for new bat boxes. Bat boxes should be positioned at least 4 m above ground level to protect any resident bats from disturbance or predation by domestic pets. Each box can be positioned with a different orientation between south east and south west to provide a range of microclimate options. Example roost provisions to incorporate on buildings or trees are shown in Appendix E.

7.4.2 Green Infrastructure

Creation of new green infrastructure (including hedgerows and treelines) or improvement of existing green infrastructure to provide new or more robust flightlines for commuting and foraging bats is recommended.

Where landscaping is required, the inclusion of new hedgerows or lines of trees of locally native species will provide additional foraging opportunities for bat species, as well as new connectivity. This landscaping may be considered at the solar array boundary fence, public rights of way and adjacent to access tracks.

Planting of additional native trees species, and native shrub species currently absent, within existing hedgerows, particularly those which are defunct or structurally poor, will increase the structural integrity and species diversity within the Ecological Assessment Area and help to provide more robust connections and improved foraging resources for bats.

7.4.3 Increase Insect Diversity

The landscaping design and grassland habitat management plan should take into consideration the terrestrial invertebrate assemblage and how this might be improved to provide greater foraging resources for bat species. As detailed within the Flaxlands bat activity report⁵, the management plan and bat population should be subject to regular review and monitoring to ensure that implemented measures are viable and effective, and to enable any required changes. Landscaping should consider plant species known to provide foraging resources for bat species, notably barbastelle and lesser horseshoe bat, which are known to commute and forage within the Ecological Assessment Area and are believed to be roosting within the wider landscape. Species listed in Appendix F are likely to provide the greatest foraging resource for bats¹².

Deadwood, where it occurs naturally or as a result of the Proposed Development, should be retained as far as possible and may be positioned horizontally on the ground. This will provide natural foraging and sheltering habitat for various terrestrial invertebrates and in turn provide additional foraging resources for bats roosting within or adjacent to the Ecological Assessment Area.

¹² Andrews, H. & McGill, J (2022) *Account of Bat Prey Species Associations (BPSA) for bats resident in the British Isles – 2022*. Aecol – Andrews Ecology, Barnstaple.

8. Figures

Figure 1. Preliminary Roost Appraisal and Ground Level Tree Assessment Results

Figure 2. Location of Static Bat Detectors within the Ecological Assessment Area

Figure 3. Trees Scoped into Further Survey

Figure 4. T3 Dusk Emergence Survey and Surveyor Locations

Figure 5. T62 Dusk Emergence Survey and Surveyor Locations

Figure 6. PRF Aerial Inspection Results



AECOM

PROJECT

Flaxlands Solar Farm

CLIENT

Ampyr Solar Europe

CONSULTANT

AECOM Limited
5th Floor, 5 Callaghan Square
Cardiff
CF10 5BT
www.aecom.com

LEGEND

Ecological Assessment Area

Buildings

PRA Results

- Moderate
- Negligible
- Not Accessed

Ground Level Tree Assessment Results

GLTA Results

- FAR
- PRF
- PRF-M

NOTES

1: Reproduced from Ordnance Survey digital map data © Crown copyright [2024]. All rights reserved. Licence number 0100031673.
2: Ordnance Survey © Crown copyright - OS OpenMap Local Buildings.
3: Maxar, Microsoft

ISSUE PURPOSE

ROOSTING BATS REPORT

PROJECT NUMBER

60727989

FIGURE TITLE

The Preliminary Roost Appraisal and Ground Level Tree Assessment Results

FIGURE NUMBER

Figure 1



AECOM

PROJECT

Flaxlands Solar Farm

CLIENT

Ampyr Solar Europe

CONSULTANT

AECOM Limited
5th Floor, 5 Callaghan Square
Cardiff
CF10 5BT
www.aecom.com

LEGEND

-  Ecological Assessment Area
-  Static Detector (* deployed June-October only)

NOTES

1. Reproduced from Ordnance Survey digital map data © Crown copyright [2024]. All rights reserved. Licence number 0100031673.
2. Maxar, Microsoft

ISSUE PURPOSE

BAT REPORT

PROJECT NUMBER

60727989

FIGURE TITLE

Location of Static Bat Detectors within the Ecological Assessment Area

FIGURE NUMBER

Figure 2



- ▭ Ecological Assessment Area
- ▲ Trees subject to Aerial Tree Assessments
- ▲ Trees subject to Dusk Emergence Surveys

NOTES

1. Reproduced from Ordnance Survey digital map data © Crown copyright [2024]. All rights reserved. Licence number 0100031673.
2. Maxar, Microsoft

ISSUE PURPOSE

ROOSTING BATS REPORT

PROJECT NUMBER

60727989

FIGURE TITLE

Trees scoped into further survey

FIGURE NUMBER

Figure 3



AECOM

PROJECT

Flaxlands Solar Farm

CLIENT

Ampyr Solar Europe

CONSULTANT

AECOM Limited
5th Floor, 5 Callaghan Square
Cardiff
CF10 5BT
www.aecom.com

LEGEND

- Ecological Assessment Area
- T3 - No Roost
- Surveyor Location

NOTES

1. Reproduced from Ordnance Survey digital map data © Crown copyright [2024]. All rights reserved. Licence number 0100031673.
2. Maxar, Microsoft

ISSUE PURPOSE

ROOSTING BATS REPORT

PROJECT NUMBER

60727989

FIGURE TITLE

T3 Dusk Emergence Survey and
Surveyor Locations

FIGURE NUMBER

Figure 4

This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.



AECOM

PROJECT

Flaxlands Solar Farm

CLIENT

Ampyr Solar Europe

CONSULTANT

AECOM Limited
5th Floor, 5 Callaghan Square
Cardiff
CF10 5BT
www.aecom.com

LEGEND

- Ecological Assessment Area
- T62 - No Roost
- Surveyor Location

NOTES

1. Reproduced from Ordnance Survey digital map data © Crown copyright [2024]. All rights reserved. Licence number 0100031673.
2. Maxar, Microsoft

ISSUE PURPOSE

ROOSTING BATS REPORT

PROJECT NUMBER

60727989

FIGURE TITLE

T62 Dusk Emergence Survey and
Surveyor Locations

FIGURE NUMBER

Figure 5

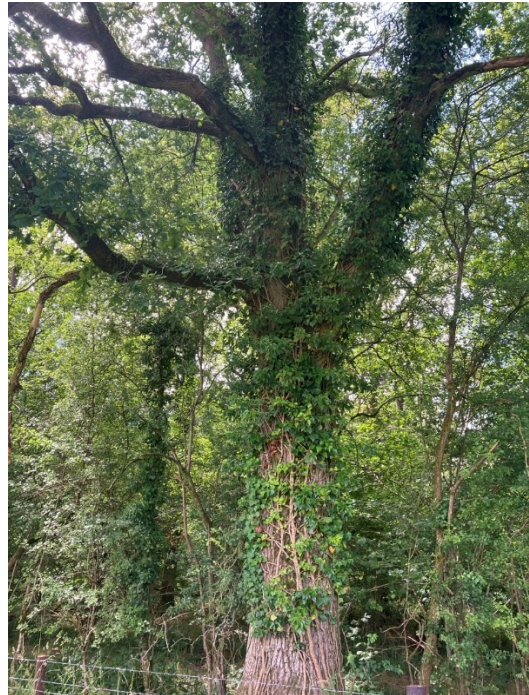
This drawing has been prepared for the use of AECOM's client. It may not be used, modified, reproduced or relied upon by third parties, except as agreed by AECOM or as required by law. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that uses or relies on this drawing without AECOM's express written consent. Do not scale this document. All measurements must be obtained from the stated dimensions.



Appendix A Photographs



Photograph 1: The north face of B2. The bat box present covers a hole that leads into the roof void.



Photograph 2: T3 is an ivy-clad oak. It was catagorised as FAR during the GLTA.



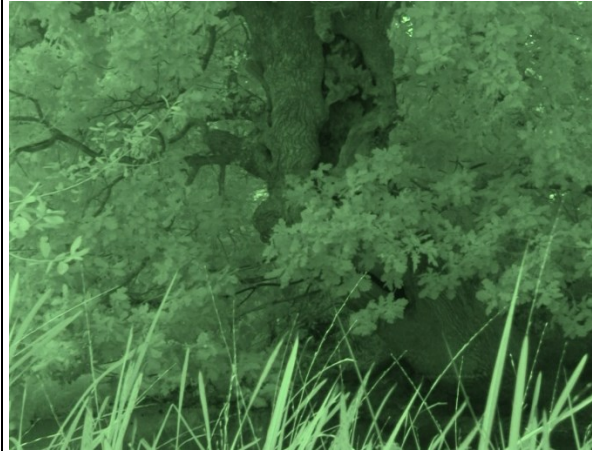
Photograph 3: T60 is a mature oak with advaned butt rot and was assessed as PRF-M during the GLTA.



Photograph 4: T62 is a mature oak with a gaping cavity on the south face of the trunk. It was assessed as PRF-M during the GLTA.



Photograph 5: The survey end view of the IR camera during the dusk emergence survey of T3 on 12 August 2024.



Photograph 6: The survey end view of the IR camera during the dusk emergence survey of T62 on 13 August 2024.

Appendix B Bat Activity Survey – Barbastelle Calls Summary

Automated Bat Detector	Month	Sunset Time	Sunrise Time	Barbastelle Passes/Hour	Earliest Barbastelle Call	Latest Barbastelle Call
A	May	21:00	05:15	0.25	22:23	N/A – one pass
A	June	21:30	04:50	0	-	-
A	July	21:25	05:00	0.286	22:25	01:10
A	August	20:40	05:50	0.049	01:03	01:04
A	September	19:40	06:40	0.04	22:11	03:03
A	October	18:30	07:20	0.021	19:19	N/A – one pass
B	May	21:00	05:15	0.025	22:23	N/A – one pass
B	June	21:30	04:50	0	-	-
B	July	21:25	05:00	0.029	22:27	N/A – one pass
B	August	20:40	05:50	0.022	23:02	N/A – one pass
B	September	19:30	06:40	0.055	00:42	03:35
B	October	18:30	07:20	0.05	21:13	03:26
C	May	21:00	05:15	0	-	-
C	June	21:30	04:50	0	-	-
C	July	21:25	05:00	0.057	02:50	03:30
C	August	20:40	05:50	0.022	23:06	N/A – one pass
C	September	19:40	06:40	0	-	-
C	October	18:30	07:20	0	-	-
D	May	21:00	05:15	0	-	-
D	June	21:30	04:50	0.286	23:21	01:19
D	July	21:25	05:00	0.029	22:29	N/A – one pass
D	August	20:40	05:50	0	-	-
D	September	19:40	06:40	0.018	01:21	N/A – one pass
D	October	18:30	07:20	0.017	23:38	N/A – one pass
E	May	21:00	05:15	0	-	-
E	June	21:30	04:50	0	-	-
E	July	21:25	05:00	0	-	-
E	August	20:40	05:50	0.022	23:18	N/A – one pass
E	September	19:40	06:40	0.02	02:08	N/A – one pass
E	October	18:30	07:20	0	-	-
F	May	21:00	05:15	0	-	-
F	June	21:30	04:50	0	-	-
F	July	21:25	05:00	0.714	22:27	03:15
F	August	20:40	05:50	0.05	00:33	03:56
F	September	19:40	06:40	0.2	01:12	02:54
F	October	18:30	07:20	0.083	02:32	-
G	June	21:30	04:50	0	-	-
G	July	21:25	05:00	0.029	22:40	N/A – one pass
G	August	20:40	05:50	0	-	-

G	September	19:40	06:40	0	-	-
G	October	18:30	07:20	0.042	21:03	04:40
H	June	21:30	04:50	0	-	-
H	July	21:25	05:00	0	-	-
H	August	20:40	05:50	0.022	02:23	N/A – one pass
H	September	19:40	06:40	0	-	-
H	October	18:30	07:20	0	-	-
I	June	21:30	04:50	3.657	23:09	03:39
I	July	21:25	05:00	0.486	22:56	03:29
I	August	20:40	05:50	0.756	22:56	04:08
I	September	19:40	06:40	0.2	21:14	03:14
I	October	18:30	07:20	0.05	23:40	01:08
Passes recorded within one hour of sunset/sunrise				Passes recorded within an hour and a half of sunset/sunrise		

Appendix C Bat Activity Survey – Lesser Horseshoe Bat Calls Summary

Automated Bat Detector	Month	Sunset Time	Sunrise Time	Lesser Horseshoe Bat Passes/Hour	Earliest Lesser Horseshoe Bat Call	Latest Lesser Horseshoe Bat Call
A	May	21:00	05:15	0	-	-
A	June	21:30	04:50	0	-	-
A	July	21:25	05:00	0	-	-
A	August	20:40	05:50	0	-	-
A	September	19:40	06:40	0.02	20:16	N/A – one pass
A	October	18:30	07:20	0.021	01:11	N/A – one pass
B	May	21:00	05:15	0.025	01:52	N/A – one pass
B	June	21:30	04:50	0.057	01:47	02:06
B	July	21:25	05:00	0	-	-
B	August	20:40	05:50	0.022	03:53	N/A – one pass
B	September	19:30	06:40	0	-	-
B	October	18:30	07:20	0	-	-
C	May	21:00	05:15	0	-	-
C	June	21:30	04:50	0	-	-
C	July	21:25	05:00	0	-	-
C	August	20:40	05:50	0	-	-
C	September	19:40	06:40	0	-	-
C	October	18:30	07:20	0	-	-
D	May	21:00	05:15	0.15	21:48	04:08
D	June	21:30	04:50	0.143	23:31	03:15
D	July	21:25	05:00	0.286	22:30	04:08
D	August	20:40	05:50	0.259	21:48	04:49
D	September	19:40	06:40	0.2	20:40	05:36
D	October	18:30	07:20	0.033	00:03	01:35
E	May	21:00	05:15	0.025	03:05	N/A – one pass
E	June	21:30	04:50	0	-	-
E	July	21:25	05:00	0.114	01:08	03:23
E	August	20:40	05:50	0.044	02:26	04:20
E	September	19:40	06:40	0.04	00:21	03:40
E	October	18:30	07:20	0.033	12:45	05:40
F	May	21:00	05:15	0	-	-
F	June	21:30	04:50	0	-	-
F	July	21:25	05:00	0.143	02:07	03:29
F	August	20:40	05:50	0.025	22:50	N/A – one pass
F	September	19:40	06:40	0	-	-
F	October	18:30	07:20	0	-	-
G	June	21:30	04:50	0	-	-

G	July	21:25	05:00	0	-	-
G	August	20:40	05:50	0	-	-
G	September	19:40	06:40	0.127	20:21	02:23
G	October	18:30	07:20	0.021	19:19	N/A – one pass
H	June	21:30	04:50	0	-	-
H	July	21:25	05:00	0	-	-
H	August	20:40	05:50	0.244	21:31	03:26
H	September	19:40	06:40	0.08	20:42	00:53
H	October	18:30	07:20	0.183	19:32	06:09
I	June	21:30	04:50	0.4	00:10	03:27
I	July	21:25	05:00	0.143	22:47	03:53
I	August	20:40	05:50	0.022	N/A – one pass	04:19
I	September	19:40	06:40	0.622	20:00	05:16
I	October	18:30	07:20	0.017	00:09	N/A – one pass
Passes recorded within one hour of sunset/sunrise				Passes recorded within an hour and a half of sunset/sunrise		

Appendix D Ground Level Tree Assessment Results

Tree Reference	Tree Species	Description	GLTA Result	Further Survey Recommended
T1	Ash	Approximately 8 m in height and 0.7 m diameter at breast height (DBH), with lifted bark on an east facing limb at 2 m high.	PRF	Aerial tree assessment*
T2	Oak	Approximately 14 m in height with ivy cover that may have obscured potential features.	FAR	N/A – Scoped Out
T3	Oak	Approximately 16 m in height and 0.7 m DBH, with ivy cover that may have obscured potential features. The dense ivy makes this tree unsuitable for aerial tree assessment.	FAR	Dusk emergence
T4	Oak	Approximately 13 m in height with a south-facing callus roll at 6 m. There is loose bark at 4 m facing north and south-west.	PRF	N/A – Scoped Out
T5	Oak	Approximately 13 m in height with a tear away on the north face.	PRF	N/A – Scoped Out
T6	Ash	Approximately 11 m in height with two tear aways at 5 m and 6.5 m, both north-facing. There is a callus roll on the south face at 4 m. There are further potential features 2 m above the callus roll.	PRF	N/A – Scoped Out
T7	Ash	Approximately 13 m in height. There is a south-west facing woodpecker hole at 7m in height. There is also a branch cavity at 6 m in height facing north-east.	PRF	N/A – Scoped Out
T8	Ash	Approximately 15 m in height with a callus roll facing west at 5.5 m.	PRF	N/A – Scoped Out
T9	Oak	Approximately 12 m in height. There is a snapped branch at 3 m that is facing south.	PRF	N/A – Scoped Out
T10	Ash	Approximately 12 m in height with two trunk cavities facing south at 6 and 7 m high. There are two branch cavities at 6 m high facing north and one further trunk cavity facing north at 5 m.	PRF	N/A – Scoped Out
T11	Oak	Approximately 12 m in height with a cracked limb at 4 m facing east.	PRF	N/A – Scoped Out
T12	Ash	Approximately 15 m in height with a callus roll at 6 m facing east.	PRF	N/A – Scoped Out
T13	Oak	Approximately 12 m in height with multiple callus rolls on the east face between 6-8 m.	PRF	N/A – Scoped Out
T14	Oak	Approximately 9 m in height with a callus roll on the east face at 3.5 m.	PRF	N/A – Scoped Out
T15	Ash	Approximately 10 m in height with callus rolls at 2 and 4 m facing south, 6 m facing south-west and 8 m facing east.	PRF	N/A – Scoped Out
T16	Oak	Approximately 14 m in height with a tear out at 8.5 m facing east.	PRF	N/A – Scoped Out
T17	Oak	Approximately 10 m in height with a callus roll on the trunk approximately 2.5 m high facing west and another at 6 m facing south.	PRF	N/A – Scoped Out
T18	Oak	Approximately 14 m in height with a stem cavity between 5 m and 9 m on the east face. The bark on the trunk is also flaking.	PRF	N/A – Scoped Out
T19	Oak	Approximately 13 m in height covered in ivy that may have obscured potential features.	PRF	N/A – Scoped Out
T20	Oak	Approximately 14 m in height and 0.6 m DBH with a callus roll on the underside of branch on the eastern face of the tree at 4 m height.	PRF	Aerial tree assessment
T21	Oak	Approximately 12 m in height and 0.4 m DBH with a callus roll and a south-east facing branch cavity at 6 m height.	PRF	Aerial tree assessment

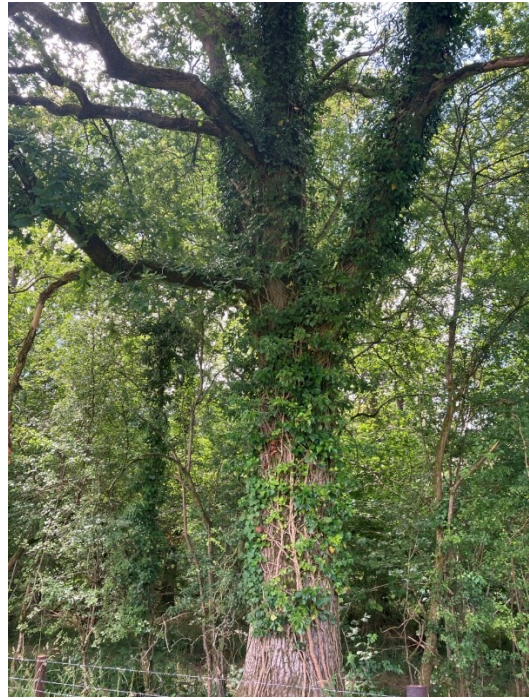
Tree Reference	Tree Species	Description	GLTA Result	Further Survey Recommended
T22	Oak	Approximately 8 m in height and 0.5 m DBH with lifted bark on the western face of the tree at 2 m high.	PRF	Aerial tree assessment
T23	Oak	Approximately 12 m in height with partially dead branches and lots of flaking bark from the base of the tree to the crown.	PRF	N/A – Scoped Out
T24	Ash	Approximately 10 m in height and covered with ivy that potentially obscured features.	FAR	N/A – Scoped Out
T25	Oak	Approximately 15 m in height with three east-facing branch cavities at 4 m, 4.5m and 6 m. There is a branch cavity approximately 8 m high facing north-east and there is bark coming away from a manually severed limb 6 m high facing north.	PRF	N/A – Scoped Out
T26	Oak	Approximately 14 m in height with a tear away facing north at 8 m high, there is a tear away 3 m high facing south and flaking bark at 4 m high.	PRF	N/A – Scoped Out
T27	Blackthorn	Approximately 5.5 m in height with a stem cavity at 1.3 m facing north. Cavity appears to extend up into the trunk.	PRF	N/A – Scoped Out
T28	Oak	Approximately 10.5 m in height with an east-facing cavity in a branch at 5 m.	PRF	N/A – Scoped Out
T29	Oak	Approximately 14 m in height with a snapped branch at 5 m with flaking bark.	PRF	N/A – Scoped Out
T30	Oak	Approximately 14 m in height with a branch cavity located 12 m high facing north-east.	PRF	N/A – Scoped Out
T31	Oak	Approximately 12m in height with a south-facing callus roll at 3 m and an east facing cavity at 4.5 m facing north.	PRF	N/A – Scoped Out
T32	Ash	Approximately 9 m in height with a north west facing callus roll at 3.5 m.	PRF	N/A – Scoped Out
T33	Ash	Approximately 7 m in height with ivy cover that may have obscured potential features.	FAR	N/A – Scoped Out
T34	Ash	Approximately 12 m in height with ivy cover that may have obscured potential features and an access limitation to far side of tree.	FAR	N/A – Scoped Out
T35	Oak	Approximately 14 m in height with ivy cover that may have obscured potential features and an access limitation to far side of tree.	FAR	N/A – Scoped Out
T36	Oak	Approximately 14 m in height with ivy cover that may have obscured potential features and an access limitation to far side of tree.	FAR	N/A – Scoped Out
T37	Beech	Approximately 15 m in height with ivy cover that may have obscured potential features.	FAR	N/A – Scoped Out
T38	Oak	Approximately 15 m in height with a callus roll approximately 6 m high facing south-east and a branch cavity 9 m high facing north-west. There is a partial branch tear away at 7 m high facing north-west with an adjacent tear away that wasn't entirely visible.	PRF	N/A – Scoped Out
T39	Hawthorn	Approximately 7 m in height with flaking bark at 5 m high facing north-west.	PRF	N/A – Scoped Out
T40	Oak	Approximately 14m in height with a south-facing cavity at 5.5 m.	PRF	N/A – Scoped Out
T41	Oak	Approximately 12 m in height with a stem cavity facing north at 6 m high.	PRF	N/A – Scoped Out
T42	Oak	Approximately 14 m in height with a south-facing branch cavity at 5.5 m.	PRF	N/A – Scoped Out
T43	Deadwood	Approximately 7 m in height with standing deadwood cracks along the south-west face and a hole at base of the trunk indicating potential hollow standing deadwood.	PRF	N/A – Scoped Out

Tree Reference	Tree Species	Description	GLTA Result	Further Survey Recommended
T44	Oak	Approximately 14 m in height with a south-west facing branch cavity at 4 m.	PRF	N/A – Scoped Out
T45	Ash (dead)	Approximately 10 m in height with cankering associated with dieback.	PRF	N/A – Scoped Out
T46	Deadwood	Approximately 7 m in height with a woodpecker hole at 3 m facing north-west.	PRF	N/A – Scoped Out
T47	Ash	Approximately 8 m in height with a stem cavity 2.5 m high facing north-east.	PRF	N/A – Scoped Out
T48	Oak	Approximately 11 m in height with a crack in the base of the trunk facing north.	PRF	N/A – Scoped Out
T49	Oak	Approximately 9 m in height, there is a north-west facing branch cavity at 2.75 m.	PRF	N/A – Scoped Out
T50	Oak	Approximately 11 m in height with a snapped branch on the west face at 2.5 m high.	PRF	N/A – Scoped Out
T51	Oak	Approximately 9 m in height with a west-facing branch with potential flaking bark at 3 m.	PRF	N/A – Scoped Out
T52	Oak	Approximately 10 m in height with a broken branch leading to a cavity just above the adjacent hedgerow at 5 m high facing north.	PRF	N/A – Scoped Out
T53	Oak	Approximately 13 m in height and 0.8 m DBH with a north-west facing callus roll at 6 m in height	PRF	Aerial tree assessment
T54	Oak	Approximately 8 m in height and 0.8 m DBH with flaking bark between the ground and approximately 6 m in height	PRF	Aerial tree assessment
T55	Oak	Approximately 18 m in height with a broken limb leading to a branch cavity on the south face at 4 m high with a second broken limb facing west at 3 m high.	PRF	N/A – Scoped Out
T56	Oak	Approximately 13 m in height with an east-facing callus roll at 1 m.	PRF	N/A – Scoped Out
T57	Oak	Approximately 14 m in height with a stem cavity at 0.5 m facing north-east. The cavity goes in approximately 0.3 m with cobwebs.	PRF	N/A – Scoped Out
T58	Oak	A veteran tree approximately 15 m in height with a cracked limb on the north-east face at 8 m high.	PRF	N/A – Scoped Out
T59	Oak	Approximately 12 m in height with a cavity approximately 6 m high facing north, and a stem cavity where the tree forks approximately 3.5 m high. There is a branch cavity at 7 m high facing east.	PRF	N/A – Scoped Out
T60	Oak	Approximately 13 m in height and 1.1 m DBH. The tree has butt rot at its base with callus rolls at 3 and 4 m in height on the north and south faces of the trunk, respectively	PRF-M	Aerial tree assessment
T61	Willow	Approximately 5 m in height and 0.3 m DBH, with deterioration at the base of a north-facing branch that leads to a potential cavity	PRF	Aerial tree assessment
T62	Oak	Approximately 11 m in height and 1 m DBH. There is a gaping cavity on the south face of the trunk that may extend upwards into the trunk. Due to the presence of dense scrub and a pond directly below the cavity at the base of the tree, this tree is not suitable for aerial tree assessment.	PRF-M	Dusk emergence
T63	Oak	Approximately 12 m in height with an east-facing cavity on a north facing branch at 5 m.	PRF	N/A – Scoped Out
T64	Oak	Approximately 13 m in height, with three large holes on the east face at 2 and 4 m.	PRF	N/A – Scoped Out
T65	Oak	Approximately 13 m in height with a large stem cavity at 4 m on the west face.	PRF	N/A – Scoped Out

Appendix A Photographs



Photograph 1: The north face of B2. The bat box present covers a hole that leads into the roof void.



Photograph 2: T3 is an ivy-clad oak. It was catagorised as FAR during the GLTA.



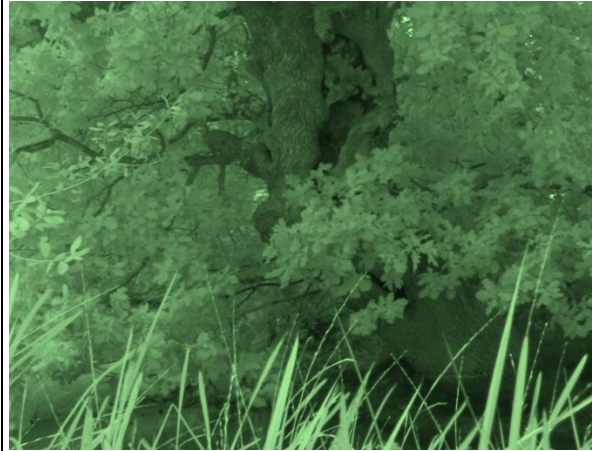
Photograph 3: T60 is a mature oak with advaned butt rot and was assessed as PRF-M during the GLTA.



Photograph 4: T62 is a mature oak with a gaping cavity on the south face of the trunk. It was assessed as PRF-M during the GLTA.



Photograph 5: The survey end view of the IR camera during the dusk emergence survey of T3 on 12 August 2024.



Photograph 6: The survey end view of the IR camera during the dusk emergence survey of T62 on 13 August 2024.

Appendix B Bat Activity Survey – Barbastelle Calls Summary

Automated Bat Detector	Month	Sunset Time	Sunrise Time	Barbastelle Passes/Hour	Earliest Barbastelle Call	Latest Barbastelle Call
A	May	21:00	05:15	0.25	22:23	N/A – one pass
A	June	21:30	04:50	0	-	-
A	July	21:25	05:00	0.286	22:25	01:10
A	August	20:40	05:50	0.049	01:03	01:04
A	September	19:40	06:40	0.04	22:11	03:03
A	October	18:30	07:20	0.021	19:19	N/A – one pass
B	May	21:00	05:15	0.025	22:23	N/A – one pass
B	June	21:30	04:50	0	-	-
B	July	21:25	05:00	0.029	22:27	N/A – one pass
B	August	20:40	05:50	0.022	23:02	N/A – one pass
B	September	19:30	06:40	0.055	00:42	03:35
B	October	18:30	07:20	0.05	21:13	03:26
C	May	21:00	05:15	0	-	-
C	June	21:30	04:50	0	-	-
C	July	21:25	05:00	0.057	02:50	03:30
C	August	20:40	05:50	0.022	23:06	N/A – one pass
C	September	19:40	06:40	0	-	-
C	October	18:30	07:20	0	-	-
D	May	21:00	05:15	0	-	-
D	June	21:30	04:50	0.286	23:21	01:19
D	July	21:25	05:00	0.029	22:29	N/A – one pass
D	August	20:40	05:50	0	-	-
D	September	19:40	06:40	0.018	01:21	N/A – one pass
D	October	18:30	07:20	0.017	23:38	N/A – one pass
E	May	21:00	05:15	0	-	-
E	June	21:30	04:50	0	-	-
E	July	21:25	05:00	0	-	-
E	August	20:40	05:50	0.022	23:18	N/A – one pass
E	September	19:40	06:40	0.02	02:08	N/A – one pass
E	October	18:30	07:20	0	-	-
F	May	21:00	05:15	0	-	-
F	June	21:30	04:50	0	-	-
F	July	21:25	05:00	0.714	22:27	03:15
F	August	20:40	05:50	0.05	00:33	03:56
F	September	19:40	06:40	0.2	01:12	02:54
F	October	18:30	07:20	0.083	02:32	-
G	June	21:30	04:50	0	-	-
G	July	21:25	05:00	0.029	22:40	N/A – one pass
G	August	20:40	05:50	0	-	-

G	September	19:40	06:40	0	-	-
G	October	18:30	07:20	0.042	21:03	04:40
H	June	21:30	04:50	0	-	-
H	July	21:25	05:00	0	-	-
H	August	20:40	05:50	0.022	02:23	N/A – one pass
H	September	19:40	06:40	0	-	-
H	October	18:30	07:20	0	-	-
I	June	21:30	04:50	3.657	23:09	03:39
I	July	21:25	05:00	0.486	22:56	03:29
I	August	20:40	05:50	0.756	22:56	04:08
I	September	19:40	06:40	0.2	21:14	03:14
I	October	18:30	07:20	0.05	23:40	01:08
Passes recorded within one hour of sunset/sunrise				Passes recorded within an hour and a half of sunset/sunrise		

Appendix C Bat Activity Survey – Lesser Horseshoe Bat Calls Summary

Automated Bat Detector	Month	Sunset Time	Sunrise Time	Lesser Horseshoe Bat Passes/Hour	Earliest Lesser Horseshoe Bat Call	Latest Lesser Horseshoe Bat Call
A	May	21:00	05:15	0	-	-
A	June	21:30	04:50	0	-	-
A	July	21:25	05:00	0	-	-
A	August	20:40	05:50	0	-	-
A	September	19:40	06:40	0.02	20:16	N/A – one pass
A	October	18:30	07:20	0.021	01:11	N/A – one pass
B	May	21:00	05:15	0.025	01:52	N/A – one pass
B	June	21:30	04:50	0.057	01:47	02:06
B	July	21:25	05:00	0	-	-
B	August	20:40	05:50	0.022	03:53	N/A – one pass
B	September	19:30	06:40	0	-	-
B	October	18:30	07:20	0	-	-
C	May	21:00	05:15	0	-	-
C	June	21:30	04:50	0	-	-
C	July	21:25	05:00	0	-	-
C	August	20:40	05:50	0	-	-
C	September	19:40	06:40	0	-	-
C	October	18:30	07:20	0	-	-
D	May	21:00	05:15	0.15	21:48	04:08
D	June	21:30	04:50	0.143	23:31	03:15
D	July	21:25	05:00	0.286	22:30	04:08
D	August	20:40	05:50	0.259	21:48	04:49
D	September	19:40	06:40	0.2	20:40	05:36
D	October	18:30	07:20	0.033	00:03	01:35
E	May	21:00	05:15	0.025	03:05	N/A – one pass
E	June	21:30	04:50	0	-	-
E	July	21:25	05:00	0.114	01:08	03:23
E	August	20:40	05:50	0.044	02:26	04:20
E	September	19:40	06:40	0.04	00:21	03:40
E	October	18:30	07:20	0.033	12:45	05:40
F	May	21:00	05:15	0	-	-
F	June	21:30	04:50	0	-	-
F	July	21:25	05:00	0.143	02:07	03:29
F	August	20:40	05:50	0.025	22:50	N/A – one pass
F	September	19:40	06:40	0	-	-
F	October	18:30	07:20	0	-	-
G	June	21:30	04:50	0	-	-

G	July	21:25	05:00	0	-	-
G	August	20:40	05:50	0	-	-
G	September	19:40	06:40	0.127	20:21	02:23
G	October	18:30	07:20	0.021	19:19	N/A – one pass
H	June	21:30	04:50	0	-	-
H	July	21:25	05:00	0	-	-
H	August	20:40	05:50	0.244	21:31	03:26
H	September	19:40	06:40	0.08	20:42	00:53
H	October	18:30	07:20	0.183	19:32	06:09
I	June	21:30	04:50	0.4	00:10	03:27
I	July	21:25	05:00	0.143	22:47	03:53
I	August	20:40	05:50	0.022	N/A – one pass	04:19
I	September	19:40	06:40	0.622	20:00	05:16
I	October	18:30	07:20	0.017	00:09	N/A – one pass
Passes recorded within one hour of sunset/sunrise				Passes recorded within an hour and a half of sunset/sunrise		

Appendix D Ground Level Tree Assessment Results

Tree Reference	Tree Species	Description	GLTA Result	Further Survey Recommended
T1	Ash	Approximately 8 m in height and 0.7 m diameter at breast height (DBH), with lifted bark on an east facing limb at 2 m high.	PRF	Aerial tree assessment*
T2	Oak	Approximately 14 m in height with ivy cover that may have obscured potential features.	FAR	N/A – Scoped Out
T3	Oak	Approximately 16 m in height and 0.7 m DBH, with ivy cover that may have obscured potential features. The dense ivy makes this tree unsuitable for aerial tree assessment.	FAR	Dusk emergence
T4	Oak	Approximately 13 m in height with a south-facing callus roll at 6 m. There is loose bark at 4 m facing north and south-west.	PRF	N/A – Scoped Out
T5	Oak	Approximately 13 m in height with a tear away on the north face.	PRF	N/A – Scoped Out
T6	Ash	Approximately 11 m in height with two tear aways at 5 m and 6.5 m, both north-facing. There is a callus roll on the south face at 4 m. There are further potential features 2 m above the callus roll.	PRF	N/A – Scoped Out
T7	Ash	Approximately 13 m in height. There is a south-west facing woodpecker hole at 7m in height. There is also a branch cavity at 6 m in height facing north-east.	PRF	N/A – Scoped Out
T8	Ash	Approximately 15 m in height with a callus roll facing west at 5.5 m.	PRF	N/A – Scoped Out
T9	Oak	Approximately 12 m in height. There is a snapped branch at 3 m that is facing south.	PRF	N/A – Scoped Out
T10	Ash	Approximately 12 m in height with two trunk cavities facing south at 6 and 7 m high. There are two branch cavities at 6 m high facing north and one further trunk cavity facing north at 5 m.	PRF	N/A – Scoped Out
T11	Oak	Approximately 12 m in height with a cracked limb at 4 m facing east.	PRF	N/A – Scoped Out
T12	Ash	Approximately 15 m in height with a callus roll at 6 m facing east.	PRF	N/A – Scoped Out
T13	Oak	Approximately 12 m in height with multiple callus rolls on the east face between 6-8 m.	PRF	N/A – Scoped Out
T14	Oak	Approximately 9 m in height with a callus roll on the east face at 3.5 m.	PRF	N/A – Scoped Out
T15	Ash	Approximately 10 m in height with callus rolls at 2 and 4 m facing south, 6 m facing south-west and 8 m facing east.	PRF	N/A – Scoped Out
T16	Oak	Approximately 14 m in height with a tear out at 8.5 m facing east.	PRF	N/A – Scoped Out
T17	Oak	Approximately 10 m in height with a callus roll on the trunk approximately 2.5 m high facing west and another at 6 m facing south.	PRF	N/A – Scoped Out
T18	Oak	Approximately 14 m in height with a stem cavity between 5 m and 9 m on the east face. The bark on the trunk is also flaking.	PRF	N/A – Scoped Out
T19	Oak	Approximately 13 m in height covered in ivy that may have obscured potential features.	PRF	N/A – Scoped Out
T20	Oak	Approximately 14 m in height and 0.6 m DBH with a callus roll on the underside of branch on the eastern face of the tree at 4 m height.	PRF	Aerial tree assessment
T21	Oak	Approximately 12 m in height and 0.4 m DBH with a callus roll and a south-east facing branch cavity at 6 m height.	PRF	Aerial tree assessment

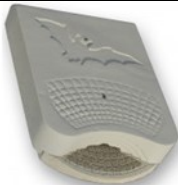
Tree Reference	Tree Species	Description	GLTA Result	Further Survey Recommended
T22	Oak	Approximately 8 m in height and 0.5 m DBH with lifted bark on the western face of the tree at 2 m high.	PRF	Aerial tree assessment
T23	Oak	Approximately 12 m in height with partially dead branches and lots of flaking bark from the base of the tree to the crown.	PRF	N/A – Scoped Out
T24	Ash	Approximately 10 m in height and covered with ivy that potentially obscured features.	FAR	N/A – Scoped Out
T25	Oak	Approximately 15 m in height with three east-facing branch cavities at 4 m, 4.5m and 6 m. There is a branch cavity approximately 8 m high facing north-east and there is bark coming away from a manually severed limb 6 m high facing north.	PRF	N/A – Scoped Out
T26	Oak	Approximately 14 m in height with a tear away facing north at 8 m high, there is a tear away 3 m high facing south and flaking bark at 4 m high.	PRF	N/A – Scoped Out
T27	Blackthorn	Approximately 5.5 m in height with a stem cavity at 1.3 m facing north. Cavity appears to extend up into the trunk.	PRF	N/A – Scoped Out
T28	Oak	Approximately 10.5 m in height with an east-facing cavity in a branch at 5 m.	PRF	N/A – Scoped Out
T29	Oak	Approximately 14 m in height with a snapped branch at 5 m with flaking bark.	PRF	N/A – Scoped Out
T30	Oak	Approximately 14 m in height with a branch cavity located 12 m high facing north-east.	PRF	N/A – Scoped Out
T31	Oak	Approximately 12m in height with a south-facing callus roll at 3 m and an east facing cavity at 4.5 m facing north.	PRF	N/A – Scoped Out
T32	Ash	Approximately 9 m in height with a north west facing callus roll at 3.5 m.	PRF	N/A – Scoped Out
T33	Ash	Approximately 7 m in height with ivy cover that may have obscured potential features.	FAR	N/A – Scoped Out
T34	Ash	Approximately 12 m in height with ivy cover that may have obscured potential features and an access limitation to far side of tree.	FAR	N/A – Scoped Out
T35	Oak	Approximately 14 m in height with ivy cover that may have obscured potential features and an access limitation to far side of tree.	FAR	N/A – Scoped Out
T36	Oak	Approximately 14 m in height with ivy cover that may have obscured potential features and an access limitation to far side of tree.	FAR	N/A – Scoped Out
T37	Beech	Approximately 15 m in height with ivy cover that may have obscured potential features.	FAR	N/A – Scoped Out
T38	Oak	Approximately 15 m in height with a callus roll approximately 6 m high facing south-east and a branch cavity 9 m high facing north-west. There is a partial branch tear away at 7 m high facing north-west with an adjacent tear away that wasn't entirely visible.	PRF	N/A – Scoped Out
T39	Hawthorn	Approximately 7 m in height with flaking bark at 5 m high facing north-west.	PRF	N/A – Scoped Out
T40	Oak	Approximately 14m in height with a south-facing cavity at 5.5 m.	PRF	N/A – Scoped Out
T41	Oak	Approximately 12 m in height with a stem cavity facing north at 6 m high.	PRF	N/A – Scoped Out
T42	Oak	Approximately 14 m in height with a south-facing branch cavity at 5.5 m.	PRF	N/A – Scoped Out
T43	Deadwood	Approximately 7 m in height with standing deadwood cracks along the south-west face and a hole at base of the trunk indicating potential hollow standing deadwood.	PRF	N/A – Scoped Out

Tree Reference	Tree Species	Description	GLTA Result	Further Survey Recommended
T44	Oak	Approximately 14 m in height with a south-west facing branch cavity at 4 m.	PRF	N/A – Scoped Out
T45	Ash (dead)	Approximately 10 m in height with cankering associated with dieback.	PRF	N/A – Scoped Out
T46	Deadwood	Approximately 7 m in height with a woodpecker hole at 3 m facing north-west.	PRF	N/A – Scoped Out
T47	Ash	Approximately 8 m in height with a stem cavity 2.5 m high facing north-east.	PRF	N/A – Scoped Out
T48	Oak	Approximately 11 m in height with a crack in the base of the trunk facing north.	PRF	N/A – Scoped Out
T49	Oak	Approximately 9 m in height, there is a north-west facing branch cavity at 2.75 m.	PRF	N/A – Scoped Out
T50	Oak	Approximately 11 m in height with a snapped branch on the west face at 2.5 m high.	PRF	N/A – Scoped Out
T51	Oak	Approximately 9 m in height with a west-facing branch with potential flaking bark at 3 m.	PRF	N/A – Scoped Out
T52	Oak	Approximately 10 m in height with a broken branch leading to a cavity just above the adjacent hedgerow at 5 m high facing north.	PRF	N/A – Scoped Out
T53	Oak	Approximately 13 m in height and 0.8 m DBH with a north-west facing callus roll at 6 m in height	PRF	Aerial tree assessment
T54	Oak	Approximately 8 m in height and 0.8 m DBH with flaking bark between the ground and approximately 6 m in height	PRF	Aerial tree assessment
T55	Oak	Approximately 18 m in height with a broken limb leading to a branch cavity on the south face at 4 m high with a second broken limb facing west at 3 m high.	PRF	N/A – Scoped Out
T56	Oak	Approximately 13 m in height with an east-facing callus roll at 1 m.	PRF	N/A – Scoped Out
T57	Oak	Approximately 14 m in height with a stem cavity at 0.5 m facing north-east. The cavity goes in approximately 0.3 m with cobwebs.	PRF	N/A – Scoped Out
T58	Oak	A veteran tree approximately 15 m in height with a cracked limb on the north-east face at 8 m high.	PRF	N/A – Scoped Out
T59	Oak	Approximately 12 m in height with a cavity approximately 6 m high facing north, and a stem cavity where the tree forks approximately 3.5 m high. There is a branch cavity at 7 m high facing east.	PRF	N/A – Scoped Out
T60	Oak	Approximately 13 m in height and 1.1 m DBH. The tree has butt rot at its base with callus rolls at 3 and 4 m in height on the north and south faces of the trunk, respectively	PRF-M	Aerial tree assessment
T61	Willow	Approximately 5 m in height and 0.3 m DBH, with deterioration at the base of a north-facing branch that leads to a potential cavity	PRF	Aerial tree assessment
T62	Oak	Approximately 11 m in height and 1 m DBH. There is a gaping cavity on the south face of the trunk that may extend upwards into the trunk. Due to the presence of dense scrub and a pond directly below the cavity at the base of the tree, this tree is not suitable for aerial tree assessment.	PRF-M	Dusk emergence
T63	Oak	Approximately 12 m in height with an east-facing cavity on a north facing branch at 5 m.	PRF	N/A – Scoped Out
T64	Oak	Approximately 13 m in height, with three large holes on the east face at 2 and 4 m.	PRF	N/A – Scoped Out
T65	Oak	Approximately 13 m in height with a large stem cavity at 4 m on the west face.	PRF	N/A – Scoped Out

Tree Reference	Tree Species	Description	GLTA Result	Further Survey Recommended
T66	Oak	Approximately 12 m in height with a south-facing branch cavity with flaking bark at 7.5 m.	PRF	N/A – Scoped Out
T67	Oak	Approximately 10 m in height with west-facing gaps around the heartwood on an east leaning stem, between 5 - 6.5 m high. There is a potential gap in a south-west facing callus roll at 5 m.	PRF	N/A – Scoped Out
T68	Oak	Approximately 20 m in height with cracked branches approximately 9 m high facing south. There is a branch cavity approximately 12 m high.	PRF	N/A – Scoped Out
T69	Oak	Approximately 10 m in height with three branch cavities on the lower two branches facing east at approximately 6 m and 6.5 m high.	PRF	N/A – Scoped Out
T70	Ash	A multi-limbed tree approximately 10 m in height, with a tall crack in the stem at a fork that potentially goes up further.	PRF	N/A – Scoped Out
T71	Oak	Approximately 12 m in height with a stem cavity facing north-east at 2 m.	PRF	N/A – Scoped Out
T72	Oak	Approximately 12 m in height with a stem cavity at 1.5 m facing north-east.	PRF	N/A – Scoped Out
T73	Oak	Approximately 15 m in height with flaking bark at 3.5 m.	PRF	N/A – Scoped Out
T74	Oak	Approximately 17 m in height with a west facing hazard beam at 3.5 m. There is an east-facing hazard at 4 m.	PRF	N/A – Scoped Out
T75	Oak	Approximately 16 m in height with a south-facing callus roll at 3 m.	PRF	N/A – Scoped Out
T76	Oak	Approximately 11 m in height with a stem cavity at 3 m facing south. There are two branch cavities approximately 3.5 m high facing south-west.	PRF	N/A – Scoped Out
T77	Ash	Approximately 9 m in height with a north-facing callus roll at 4.5 m. There is a south facing callus roll on the southern stem.	PRF	N/A – Scoped Out
T78	Ash	Approximately 12 m in height with three stem holes approximately 2.5, 3.5 and 4 m high facing north.	PRF	N/A – Scoped Out
T79	Oak	Approximately 12 m in height with a branch cavity located at 3.5 m facing north and slightly upwards however a callus roll shelters the opening.	PRF	N/A – Scoped Out
T80	Deadwood	Approximately 16 m in height with ivy cover that potentially obscured suitable features.	FAR	N/A – Scoped Out
T81	Oak	Approximately 16 m in height with an ivy cover that potentially obscured suitable features. There are cracked limbs at 8 m high facing south.	PRF	N/A – Scoped Out
T82	Oak	Approximately 18 m in height with ivy cover that potentially obscured suitable features.	FAR	N/A – Scoped Out
T83	Oak	Approximately 12 m in height and 0.7 m DBH, with a callus roll on the east face of the trunk at 3.5 m high.	PRF	Aerial tree assessment
T84	Ash	Approximately 12 m in height and 0.4 m DBH, with a callus roll on the east face of the trunk at 5 m high.	PRF	Aerial tree assessment
T85	Ash	Approximately 12 m in height with a callus roll at 9 m facing south.	PRF	N/A – Scoped Out
T86	Oak	Approximately 14 m in height with a branch cavity on a south facing branch at 4.5 m.	PRF	N/A – Scoped Out
T87	Oak	Approximately 10 m in height. No features were observed however there was an access limitation to far side of tree that means features may have been missed.	FAR	N/A – Scoped Out
T88	Oak	Approximately 10 m in height and 0.5 m DBH. Due to access limitations the western face of the tree was	FAR	Aerial tree assessment

Tree Reference	Tree Species	Description	GLTA Result	Further Survey Recommended
		inaccessible to survey during the GLTA and features may be present.		
T89	Oak	Approximately 12 m in height was a callus roll at 2 m facing south-east.	PRF	N/A – Scoped Out
T90	Ash	Approximately 12 m in height with one large callus roll that is 1.5 m long at 2 m high, facing south-west.	PRF	N/A – Scoped Out
T91	Oak	Approximately 16 m in height with ivy cover that potentially obscured suitable features.	FAR	N/A – Scoped Out
T92	Oak	Approximately 16 m in height with ivy cover that potentially obscured suitable features.	FAR	N/A – Scoped Out

Appendix E Examples of Bat Box Options

Roost Provision	Image	Designed for Trees/Buildings
Schwegler 1WQ Summer and Winter Bat Roost https://www.wildcareshop.com/summer-and-winter-bat-roost.html http://www.nhbs.com/title/161275/1wq-schwegler-summer-winter-bat-roost		Buildings
Schwegler 1FQ Bat Box (75) https://www.wildcareshop.com/bat-box-75.html http://www.nhbs.com/title/160551/1fq-schwegler-bat-roost-for-external-walls		Buildings
Schwegler 1WI Summer and Winter Bat Box https://www.wildcareshop.com/schwegler-1wi-summer-and-winter-bat-box.html http://www.nhbs.com/title/177079/1wi-schwegler-summer-and-winter-bat-box		Buildings
Bat Slope for 1MF Bat and Swift Nest Box http://www.nhbs.com/bat-slope-for-1mf-bat-and-swift-nest-box		Buildings
1FTH Schwegler Universal Bat Summer Roost http://www.nhbs.com/title/203503/1fth-schwegler-universal-bat-summer-roost		Buildings
1FD Schwegler Bat Box http://www.nhbs.com/title/177076/1fd-schwegler-bat-box		Trees

Appendix F Plant Species Associated with Bat Prey Invertebrates

The below tables provide suggested plant species to be included in replanting efforts for the mitigation and compensation of impacts likely to occur as a result of the Proposed Development. The listed are adapted from the Bat Prey Species Associations tool and Table A2 of the associated guide¹². The species included here are those known to support prey species of barbastelle and lesser horseshoe bat, as well as a number of other species of bat identified present within the Ecological Assessment Area. For the purpose of this report, this species list is considered in relation to bat species only, no consideration has been given the conditions, topography or soils present on-site.

F.1 Trees and Shrubs

Species Common Name	Species Latin Name	Number of UK Bat Species Known to Prey on Associated Invertebrates
Field maple	<i>Acer campestre</i>	15
Sycamore	<i>Acer pseudoplatanus</i>	12
Horse chestnut	<i>Aesculus hippocastanum</i>	11
Alder	<i>Alnus glutinosa</i>	15
Silver birch	<i>Betula pendula</i>	15
Downy birch	<i>Betula pubescens</i>	14
Hornbeam	<i>Carpinus betulus</i>	15
Sweet chestnut	<i>Castanea sativa</i>	16
Hazel	<i>Corylus avellana</i>	15
Hawthorn	<i>Crataegus monogyna</i>	13
Beech	<i>Fagus sylvatica</i>	15
Alder buckthorn	<i>Frangula alnus</i>	10
Ash	<i>Fraxinus excelsior</i>	15
Holly	<i>Ilex aquifolium</i>	12
Common juniper	<i>Juniperus communis</i>	8
Apple	<i>Malus domestica</i>	14
Crab apple	<i>Malus sylvestris</i>	11
Scots pine	<i>Pinus sylvestris</i>	13
Black poplar	<i>Populus nigra</i>	9
Aspen	<i>Populus tremula</i>	12
Wild plum	<i>Prunus domestica</i>	12
Blackthorn	<i>Prunus spinosa</i>	14
Sessile oak	<i>Quercus petraea</i>	13
Pedunculate oak	<i>Quercus robur</i>	13
Goat willow	<i>Salix caprea</i>	10
Grey willow	<i>Salix cinerea</i>	7
Rowan	<i>Sorbus aucuparia</i>	13
Yew	<i>Taxus baccata</i>	10
Dogwood	<i>Cornus sanguinea</i>	8
Broom	<i>Cytisus scoparius</i>	12
Wild privet	<i>Ligustrum vulgare</i>	13
Elder	<i>Sambucus nigra</i>	8
Gorse	<i>Ulex europaeus</i>	10
Bilberry	<i>Vaccinium myrtillus</i>	14
Wayfaring tree	<i>Viburnum lantana</i>	5

F.2 Climbers and Scramblers

Species Common Name	Species Latin Name	Number of UK Bat Species Known to Prey on Associated Invertebrates
Traveller's joy	<i>Clematis vitalba</i>	12

Species Common Name	Species Latin Name	Number of UK Bat Species Known to Prey on Associated Invertebrates
Common ivy	<i>Hedera helix</i>	11
Hop	<i>Humulus lupulus</i>	12
Honeysuckle	<i>Lonicera periclymenum</i>	12
Bramble	<i>Rubus fruticosus</i>	12

F.3 Flowering Plants

Species Common Name	Species Latin Name	Number of UK Bat Species Known to Prey on Associated Invertebrates
Yarrow	<i>Achillea millefolium</i>	11
Angelica	<i>Althaea officinalis</i>	9
Wild celery	<i>Apium graveolens</i>	8
Burdocks	<i>Arctium spp.</i>	10
Mugwort	<i>Artemisia vulgaris</i>	11
Oraches	<i>Atriplex spp.</i>	10
Borages	<i>Borago spp.</i>	8
Wild cabbage	<i>Brassica oleracea</i>	11
Common knapweed	<i>Centaurea nigra</i>	11
Goosefoots	<i>Chenopodium spp.</i>	11
Foxglove	<i>Digitalis purpurea</i>	10
Teasels	<i>Dipsacus spp.</i>	8
Willowherbs	<i>Epilobium spp.</i>	8
Meadowsweet	<i>Filipendula mulmaria</i>	8
Wild strawberry	<i>Fragaria vesca</i>	12
Cleavers	<i>Galium aparine</i>	11
Bedstraws	<i>Galium spp.</i>	10
Wood avens	<i>Geum urbanum</i>	7
Common ragwort	<i>Jacobaea vulgaris</i>	7
Prickly lettuce	<i>Lactuca serriola</i>	8
White dead nettle	<i>Lamium album</i>	10
Common toadflax	<i>Linaria vulgaris</i>	9
Dog's mercury	<i>Mercurialis perennis</i>	7
Common restharrow	<i>Ononis repens</i>	9
Geraniums	<i>Pelargonium spp.</i>	9
Ribwort plantain	<i>Plantago lanceolata</i>	9
Greater plantain	<i>Plantago major</i>	6
Primrose	<i>Primula vulgaris</i>	11
Selfheal	<i>Prunella vulgaris</i>	6
Buttercups	<i>Ranunculus spp.</i>	9
Groundsel	<i>Senecio vulgaris</i>	11
Woundworts	<i>Stachys spp.</i>	7
Comon chickweed	<i>Stellaria media</i>	12
Stitchworts	<i>Sellaria spp.</i>	10
Dandelion	<i>Taraxacum spp.</i>	15
Clovers	<i>Trifolium spp.</i>	13
Mulleins	<i>Verbascum spp.</i>	11

F.4 Grasses

Species Common Name	Species Latin Name	Number of UK Bat Species Known to Prey on Associated Invertebrates
False oat grass	<i>Arrhenatherum elatius</i>	9
False brome	<i>Brachypodium sylvaticum</i>	12
Cock's foot	<i>Dactylis glomerata</i>	10

Species Common Name	Species Latin Name	Number of UK Bat Species Known to Prey on Associated Invertebrates
Annual meadow grass	<i>Poa annua</i>	12

There are no sedges (*Carex* spp.) or rushes (*Juncus* spp.) known to be associated with the prey species of barbastelle bat. Several are associate with the prey species of the lesser horseshoe bat, including but not limited to:

- pendulous sedge (*Carex pendula*);
- greater pond sedge (*Carex riparia*);
- galingale (*Cyperus longus*);
- common spike-rush (*Eleocharis palustris*);
- common club-rush (*Schoenoplectus lacustris*);
- sharp-flowered rush (*Juncus acutiflorus*);
- jointed rush (*Juncus articulatus*);
- compact rush (*Juncus conglomeratus*);
- soft-rush (*Juncus effusus*); and,
- hard rush (*Juncus inflexus*).

