



Great Harmeston Solar Farm Environmental Statement

Technical Appendix 7.5
Bat Survey and Results



Bat Survey Results Addendum



**Tyler
Grange**

**Great Harmeston Solar Farm
11th March 2026**

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Section 1: Introduction and Context

- 1.1. This report has been prepared by Tyler Grange Group Ltd (TG) on behalf of ASUK HoldCo4 Ltd. (Arise Renewable Energy UK Ltd.) (“the applicant”), and relates to the Proposed Development at Great Harmeston Solar Farm, Pembrokeshire, SA62 3HL (the ‘Site’). This report sets out the findings of the bat surveys undertaken in 2024, 2025, and 2026 at the Site, see **Figure 1.1** below for the finalised redline boundary.



Figure 1.1: Redline Boundary (Google, 2026)

- 1.2. The boundary of the Proposed Development extends to approximately 128ha across a number of land parcels and is segregated by two ‘A’ roads and a railway line. The Site comprises arable and improved grassland fields, marshy grassland, neutral grassland, broadleaved woodland, ponds and boundary features including a ditch, hedgerows and hedgerows with trees.

Aims and Objectives

- 1.3. The purpose of this technical summary is to provide a single resource regarding all survey and background data available for bats to inform and support the Ecological Chapter of the Environmental Statement (ES) for development of the site.
- 1.4. The specific aims of the surveys completed to date were to:
- Assess the potential suitability of the habitats on site for commuting and foraging bats;
 - Identify the bat species using the site, their abundance, and commuting and foraging activity;
 - Assess the ecological importance of the bat species assemblage using the site; and
 - Assess the potential of trees which may be impacted by the proposals to support roosting bats.



Quality Control

- 1.5. All ecologists at Tyler Grange Group Limited are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) or are working towards membership, and act under the direction of members and abide by the Institute's Code of Professional Conduct¹.

¹ CIEEM (2025) *Code of Professional Conduct*. CIEEM, Winchester.



Section 2: Legislation and Conservation Status

- 2.1. As European protected species, all UK bats receive legal protection in Wales under the Conservation of Habitats and Species Regulations 2017 (as amended) and the Wildlife and Countryside Act (WCA) 1981 (as amended). In addition, planning policy set out in Planning Policy Wales (PPW) 2024 requires planning authorities to seek to maintain and enhance biodiversity in the exercise of their functions, meaning that development should not cause any significant loss of population of native species.
- 2.2. Several species of bats (barbastelle *Barbastella barbastellus*, Bechstein's *Myotis bechsteinii*, brown long-eared *Plecotus auritus*, greater horseshoe *Rhinolophus ferrumequinum*, lesser horseshoe *Rhinolophus hipposideros*, noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus*, and soprano pipistrelle *Pipistrellus pygmaeus* are listed as Species of Principal Importance (SoPI) under Section 7 of the Environment (Wales) Act 2016. These are the species found in Wales which were identified as requiring action under the UK BAP and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. Decision-makers such as Local Planning Authorities must have regard to SoPI in all their activities, including when making decisions on planning applications.
- 2.3. All British species of bat are listed on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended) as European Protected Species (EPS). Regulation 41 (1) makes it an offence to:
- Deliberately capture, injure an EPS;
 - Deliberately disturb an EPS; or
 - Damage or destroy a breeding site or resting place of an EPS.
- 2.4. All British bats are listed in Schedule 5 of the WCA and in England and Wales are protected under Section 9 subsections 4b, 4c and 5 which makes it an offence to:
- Disturb any bat while it is occupying a structure or place which it uses for shelter or protection; or
 - Obstruct access to any structure or place which any such animal uses for shelter or protection.
 - Sell, offer or expose for sale, or have in possession or transport for the purpose of sale (any live or dead wild Schedule 5 animal or any part or anything derived from such an animal); or
 - Publish or cause to be published any advertisement likely to be understood as conveying that they buy or sell, or intends to buy or sell, any of those things.
- 2.5. Seven bat species are included within the Pembrokeshire Local Biodiversity Action Plan (LBAP) as priority LBAP species:
- Barbastelle *Barbastellus barbastella*
 - Brown long-eared *Plecotus auritus*
 - Common pipistrelle *Pipistrellus pipistrellus*
 - Greater horseshoe *Rhinolophus ferrumequinum*
 - Lesser horseshoe *Rhinolophus hipposideros*



- Noctule *Nyctalus noctula*
- Soprano pipistrelle *Pipistrellus pygmaeus*



Section 3: Survey Methodology

Desk Study

- 3.1. Local Records of bats within 2 km of the site boundary were obtained from West Wales Biodiversity Information Centre (WWBIC) on the 4th November 2024².

Scope of Bat Surveys

- 3.2. Surveys followed standard methodologies set out in the Bat Mitigation Guidelines³, the Bat Workers Manual⁴ and Bat Surveys - Good Practice Guidelines⁵, and comprised:
- Day-time Bat Walkover (DBW) – Walkover of the site to assess the suitability of habitats on site for commuting and foraging bats;
 - Ground Level Tree Assessment (GLTA) – Ground level inspection of trees on site to assess their potential to support roosting bats;
 - Night-time Bat Walkover (NBW) – Walked transects to observe bat behaviour on-site and flight paths away from potential roost habitats; and
 - Automated static detector deployment – Fixed location recording of bat activity to establish species richness, a relative measure of abundance, and establish the importance of different landscape features to bats.

Day-time Bat Walkover (DBW)

- 3.3. A DBW was undertaken on all habitats within the site boundaries, on the 10th May 2024 by Laurence Brooks BSc MSc, an experienced ecologist. The DBW assessed habitats on-site for the likelihood to be used by foraging and commuting bats as detailed in **Table 3.1** below. This combined with data search records of bats is used to determine suitability of the site for bat activity.

² <https://www.wwbic.org.uk/>

³ Reason, P.F. and Wray, S. (2025). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.2. Chartered Institute of Ecology and Environmental Management, Ampfield.

⁴ Mitchell-Jones, A.J. and McLeish, A.P. (2004) Bat Workers' Manual, 3rd Edition. JNCC, Peterborough.

⁵ Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines, 4th Edition. The Bat Conservation Trust, London.



Table 3.1 Flight Path and Foraging Habits Assessment Criteria - adapted from Collins, 2023

Suitability	Description of potential flight-paths and foraging habitats
None	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/protection for flight-lines or generate/shelter insect populations available to foraging bats).
Negligible	No obvious habitat features on site are likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for flight-paths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

Ground Level Tree Assessment (GLTA)

3.4. A GLTA was undertaken on only the trees with potential to be impacted by the development proposals within the site boundary (T17, T74, T75, T76, T122, G7, G47). The assessment was undertaken on 19th February 2026 by Lucy Boulter MSc, BSc (Hons). The survey was a daytime inspection and the conditions for all surveys were considered optimal. The location of the trees and groups of trees surveyed are shown on **Plan 2**. All trees were inspected from the ground using binoculars, high powered torch, digital camera, and endoscope for accessible features.

3.5. Potential Roosting Features (PRFs) of interest for bats are detailed in **Table 3.2** below.

Table 3.2 PRF Types that can be Exploited by Bats and How they Form - adapted from Collins, 2023.

PRFs formed by disease and decay	PRFs formed by damage	PRFs formed by association
Woodpecker holes Squirrel holes Knot holes Pruning cuts Tear outs Wounds Cankers Compression forks Butt rots	Lightning strikes Hazard beams Subsidence cracks Shearing cracks Transverse snaps Welds Lifting bark Desiccation Fissures Frost cracks	Fluting Ivy



3.6. The potential of trees to support roosting bats was assessed using the criteria shown in **Table 3.3** below.

Table 3.3 Assessment of Tree Suitability Criteria - adapted from Collins, 2023.

Roost Suitability	Description of Roosting Habitat
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

Night-time Bat Walkover (NBW)

3.7. Seasonal NBWs were completed at the site, based on habitats of high suitability for bats, in spring, summer and autumn 2024, to determine the importance of habitat features for foraging and / or commuting bats in line with survey guidelines (Collins, 2023).

3.8. The survey visits commenced at sunset with five transect routes walked slowly, at a steady pace (see **Plan 3**). The surveys continued for two hours in spring, three hours in summer, due to the recorded presence of horseshoe bats on-site, and two and a half hours in autumn. The first 30 minutes of each survey were spent in one ‘start location’ observing bat flight paths and commuting routes away from roost habitats. All NBWs were undertaken by Rebecca Bohane BSc MSc (Oxon) MCIEEM and Laurence Brooks BSc MSc.

3.9. The NBWs used a combination of visual observation and echolocation detection techniques to identify bat activity on the site. Anabat (zero-crossing) and EM2 Touch Pro (full-spectrum) detectors were used to record calls for later analysis in Analook and BatExplorer. Analysts of the sound files had all completed the Certificate of Bat Acoustic Analysis (COBAA) assessment course.

3.10. Weather conditions for surveys are recorded as per the Bat Conservation Trust (BCT) guidance including the air temperature, wind speed and precipitation at sunset. **Table 3.4** below includes sunset and sunrise times for each survey.

Table 3.4 NBW metadata and weather conditions

Visit	Transect	Survey Times	Weather Conditions (at start and end of survey)
Spring (V01)	10 th May 2024 (Northwest transect)	Start: 21:00 Sunset: 21:05 End: 23:32	Wind (Beaufort): 1 - 1 Temp (°C): 19 - 16 Precipitation: None Cloud (Octas): 6/8 – 2/8
	13 th May 2024 (Southwest transect)	Start: 20:45 Sunset: 21:05 End: 00:20	Wind (Beaufort): 1 - 1 Temp (°C): 18 – 15 Precipitation: None Cloud (Octas): 6/8 – 6/8
	14 th May 2024 (Northeast transect)	Start: 21:00 Sunset: 21:09 End: 23:35	Wind (Beaufort): 1 - 1 Temp (°C): 13 – 12 Precipitation: None Cloud (Octas): 4/8 – 4/8
	15 th May 2024 (Central transect)	Start: 21:00 Sunset: 21:10 End: 23:40	Wind (Beaufort): 1 - 1 Temp (°C): 14 – 13 Precipitation: None Cloud (Octas): 7/8 – 7/8
	17 th May 2024	Start: 21:09 Sunset: 21:09	Wind (Beaufort): 1 - 1 Temp (°C): 14 – 12



Visit	Transect	Survey Times	Weather Conditions (at start and end of survey)
	(Southeast transect)	End: 23:40	Precipitation: None Cloud (Octas): 2/8 – 2/8
Summer (V02)	18 th August 2024 (Northwest transect)	Start: 20:30 Sunset: 20:32 End: 23:05	Wind (Beaufort): 1 - 1 Temp (°C): 18 – 17 Precipitation: None Cloud (Octas): 6/8 – 6/8
	19 th August 2024 (Northeast transect)	Start: 20:35 Sunset: 20:35 End: 23:05	Wind (Beaufort): 1 - 3 Temp (°C): 17 – 14 Precipitation: None Cloud (Octas): 8/8 – 8/8
	20 th August 2024 (Central transect)	Start: 20:35 Sunset: 20:35 End: 23:05	Wind (Beaufort): 1 - 3 Temp (°C): 17 – 14 Precipitation: None Cloud (Octas): 8/8 – 8/8
	23 rd August 2024 (Southeast transect)	Start: 20:25 Sunset: 20:25 End: 22:55	Wind (Beaufort): 1 - 1 Temp (°C): 15 – 14 Precipitation: Paused due to rain shower 21:10 – 21:18 but was otherwise dry Cloud (Octas): 8/8 – 8/8
	24 th August 2024 (Southwest transect)	Start: 20:20 Sunset: 20:23 End: 23:05	Wind (Beaufort): 2 - 2 Temp (°C): 16 – 15 Precipitation: None Cloud (Octas): 2/8 – 2/8
Autum (V03)	23 rd September 2024 (Northeast transect)	Start: 19:15 Sunset: 19:15 End: 21:45	Wind (Beaufort): 1 - 1 Temp (°C): 15 – 15 Precipitation: None Cloud (Octas): 8/8 – 8/8
	24 th September 2024 (Northwest transect)	Start: 19:10 Sunset: 19:12 End: 21:45	Wind (Beaufort): 1 - 1 Temp (°C): 16 – 11 Precipitation: None Cloud (Octas): 5/8 – 5/8
	27 th September 2024 (Southwest transect)	Start: 19:05 Sunset: 19:05 End: 21:45	Wind (Beaufort): 1 - 1 Temp (°C): 16 – 11 Precipitation: None Cloud (Octas): 7/8 – 7/8
	30 th September 2024 (Southeast transect)	Start: 19:00 Sunset: 19:00 End: 21:40	Wind (Beaufort): 1 - 1 Temp (°C): 15 – 13 Precipitation: None Cloud (Octas): 8/8 – 8/8
	1 st October 2024 (Central, and single southeastern field transects)	Start: 18:55 Sunset: 18:56 End: 21:30	Wind (Beaufort): 1 - 1 Temp (°C): 16 – 14.5 Precipitation: None Cloud (Octas): 1/8 – 1/8

Bat Static Monitoring Surveys

- 3.13. Static monitoring surveys of the site were completed between April and July 2024, and August and October 2025. These surveys were designed to record bat species over an extended period and to determine whether any habitat features are of importance to bats.
- 3.14. During each static survey, 14 static detectors were deployed onsite (see **Plan 4** for locations). The detectors were left in situ for a minimum of five nights in total as per guidance (Collins, 2023). Static locations L10 and L15 are outside of the current red line boundary and so have not been included in the analysis of results.



- 3.15. The detectors were programmed to record from 30 minutes before sunset to 30 minutes after sunrise. Echolocation calls were later analysed utilising British Trust for Ornithology (BTO) Acoustic Pipeline and quality assessed using BatExplorer software. Analysts of the sound files have all completed BatAbility’s (COBAA) assessment course.
- 3.16. Weather conditions for surveys are recorded, including the air temperature, wind speed and precipitation at sunset. **Table 3.5** include sunset and sunrise times for each survey.

Table 3.5 Static Surveys - Weather Conditions

Survey	Date	Time of Sunset	Time of Sunrise	Weather Conditions		
				Air temperature at sunset (°C)	Precipitation	Wind at sunset (Beaufort Scale)
Visit 1	29/04/2024	20:41	05:52	10	Light Rain	3
	30/04/2024	20:43	05:50	10	Dry	4
	01/05/2024	20:44	05:48	9	Dry	2
	02/05/2024	20:46	05:46	10	Dry	4
	03/05/2024	20:48	05:44	10	Dry	3
Visit 2	24/05/2024	21:19	05:13	10	Dry	2
	25/05/2024	21:21	05:12	11	Light Rain	4
	26/05/2024	21:22	05:11	12	Dry	4
	27/05/2024	21:23	05:10	12	Dry	3
	28/05/2024	21:24	05:09	13	Dry	4
Visit 3	20/06/2024	21:42	05:01	12	Dry	2
	21/06/2024	21:42	05:01	13	Light Rain	3
	22/06/2024	21:42	05:01	15	Dry	2
	23/06/2024	21:42	05:01	13	Dry	1
	24/06/2024	21:42	05:02	15	Dry	2
Visit 4	23/07/2024	21:21	05:31	13	Dry	2
	24/07/2024	21:20	05:33	15	Light Rain	4
	25/07/2024	21:19	05:34	15	Dry	3
	26/07/2024	21:17	05:36	17	Dry	3
	27/07/2024	21:16	05:37	14	Dry	2
Visit 5	05/08/2025	21:01	05:50	17	Dry	3
	06/08/2025	20:59	05:52	16	Dry	3
	07/08/2025	20:58	05:53	16	Dry	4
	08/08/2025	20:56	05:55	17	Dry	3
	09/08/2025	20:54	05:57	16	Dry	3
Visit 6	22/09/2025	19:17	07:07	12	Dry	3
	23/09/2025	19:15	07:09	12	Dry	2
	24/09/2025	19:13	07:11	14	Dry	1
	25/09/2025	19:10	07:12	12	Dry	2
	26/09/2025	19:08	07:14	14	Dry	3
Visit 7	22/10/2025	18:11	07:58	11	Light Rain	0
	23/10/2025	18:09	08:00	9	Dry	3
	24/10/2025	18:07	08:02	10	Light Rain	3
	25/10/2025	18:05	07:03	10	Dry	4
	26/10/2025	17:03	07:05	12	Dry but rain during the day	3



Bat Survey Limitations

- 3.17. GLTA surveys were conducted on trees with potential to be impacted, according to the current Masterplan and landscaping plans. Further tree climbing/endoscopic surveys will be required on any trees to be impacted to determine their potential to support bat roosts, and whether roosts are present or not. If roosts are present a licence from Natural Resources Wales will be required before any further works can take place. Bat roosts are highly transient in nature, with some species moving between a large number of roosts frequently. Should any additional trees be impacted, they would require additional survey.
- 3.18. The spring NBW was two hours long and the autumn NBW two and a half hours long. As greater and lesser horseshoe bats have been recorded on-site, and a longer three hour survey length is good practice for detecting horseshoe bats, the shorter survey lengths present a slight survey limitation. However, this is only a minor limitation when considering the results of the static detectors.
- 3.19. The bat detectors during the NBWs recorded a combination of zero-crossing and full-spectrum sound files. Zero-crossing is less sensitive than full spectrum, and as a result bat calls, particularly quieter bats, may have been missed by the detectors. Additionally, due to technical issues sound files were not available post-survey for several of the visits. Whilst these are limitations of the survey, where sound files are missing the surveyors survey forms and field bat activity maps have been used to make an assessment of bat activity. When the NBW results are looked at in relation to the static results it is considered that an appropriate assessment of the sites use by commuting and foraging bats can be made.
- 3.20. During the static detector deployments there were multiple technical failures (L05, L08 and L12 in April 2024, L06 in August 2025, L05 in September 2025, and L03 in October 2025). As a result there is no survey data for these static locations and months. Although this is a limitation, it is considered that the number of static detectors across the site (12 static locations) provided suitable coverage of the habitats on site, in line with guidance. Furthermore, all detectors recorded a full-five-night data during the core activity season (May to July). Therefore, an adequate and suitably large data set was gathered throughout the season to assess bat activity on site, and the conclusions of the surveys can be considered valid.
- 3.21. Bat surveys are subject to numerous variables. The echolocation calls of species such as brown long-eared bat *Plecotus auritus*, barbastelle *Barbastella barbastellusare*, *Myotis* species, greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat *Rhinolophus hipposideros* are of low amplitude and may not always be picked up on bat detectors. Survey results therefore represent a sample of bat activity present on site during surveys.
- 3.22. Bat calls cannot always be identified to species level, either due poor recording quality or similarity between species of bat. Where this occurs, the recording is assigned to genus or group level to show which species group the bat is a member of (e.g. *Pipistrelle* spp., *Myotis* spp.).
- 3.23. Bat sound recordings were analysed by the British Trust for Ornithology (BTO) Acoustic Pipeline. A proportion of assigned bat species calls were then audited by suitability qualified ecologists (CoBAA) to determine BTO species accuracy. A random sample of 100 sound recordings for BTO species probabilities over 50% were audited for common pipistrelle, soprano pipistrelle, *Myotis* genus, and noctule, for each static location; and all sound files for BTO species probabilities over 50% were audited for barbastelle, serotine, leisler's, nathusius, brown long-eared, greater horseshoe and lesser horseshoe, for each static location. The error rate for BTO species assignment for common pipistrelle was 15%, soprano pipistrelle 3%, *Myotis* genus 13%, noctule 6%, barbastelle 4%, serotine 60%, leisler's 60%, nathusius pipistrelle 100%, brown long-eared 6%, greater horseshoe 1%, and lesser horseshoe 3%. The error rates are not considered to be a limitation as they will not affect an assessment of impact or influence the mitigation proposed within this assessment report.



- 3.24. The raw sound recordings for September (2025) L02, L04-6, L09 and L11, and October (2025) L01-9, L11, L13-14 were lost following data upload to the BTO Pipeline. The BTO Species assignments for these statics have therefore not been audited. Whilst this is a limitation, considering the large amount of survey data that has been audited the loss of data is unlikely to have a significant impact on the interpretation of the results.
- 3.25. The BTO pipeline assigns 'No ID' to all recordings where bat species probability is < 10%. A random sample of 100 'No ID' recordings were audited for each static location. 5% of the 'No ID' recordings audited contained bat calls (all non-Annex II species). This means around 17,899 of the 357,971 recordings assigned No ID by the BTO pipeline contain bat calls and have been missed from analysis. It is most likely the missed bat calls were not assigned a species due to very quiet echolocation, distance of the bat from the detector, very noisy recordings, or highly ambiguous calls that didn't fit the call characteristic for any one species. The error rates are not considered to be a limitation as they will not impact the mitigation proposed within this assessment report.

Assessment of Importance

- 3.26. The assemblage of bat species using the site has been assessed using the methodology in best practice guidance⁶, see **Table 3.6** below for scoring system. The score is determined based on the species recorded during surveys compared to those known to be present in the region, and their relative abundance. This is then compared to the maximum score possible in a region to determine the relative importance of the bat assemblage.
- 3.27. Great Harmeston is considered part of South Wales, thus the South-west England and South Wales category has been used and is shown below.

Table 3.6 Assessment of Importance for a Bat Assemblage for South-west England and South Wales- adapted from Reason and Wray, 2025.

Rarity category [points/species]	South-west England and South Wales	Maximum score per rarity category
Widespread all geographies [scores 1]	Common pipistrelle Soprano pipistrelle Brown long-eared	Score: 3
Widespread in many geographies, but not as abundant in all [scores 2]	Daubenton's bat <i>Myotis daubentonii</i> Natterer's bat <i>Myotis nattereri</i> Whiskered bat <i>Myotis mystacinus</i> Brandt's bat <i>Myotis brandtii</i> Noctule <i>Nyctalus noctula</i>	Score: 10
Rarer or restricted distribution [scores 3]	Lesser horseshoe Serotine <i>Eptesicus/Cnephaeus serotinus</i> Leisler's bat <i>Nyctalus leisleri</i> Nathusius' pipistrelle <i>Pipistrellus nathusii</i>	Score: 12
Rarest Annex II species and very rare [scores 4]	Greater horseshoe Bechstein's bat <i>Myotis bechsteinii</i> Barbastelle Grey long-eared <i>Plecotus austriacus</i>	Score: 16
Thresholds	Maximum	41
County importance threshold: 45%	County	18
Regional importance threshold: 55%	Regional	23
National importance threshold: 70%	National	29

⁶ Reason, P.F. and Wray, S. (2025). UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.2. Chartered Institute of Ecology and Environmental Management, Ampfield.



Section 4: Results

Data Search

- 4.1. Records received from WWBIC returned 113 records of passes from nine species of bat within 2 km of the site, in the past 10 years. The following species were recorded:
- Brown long-eared
 - Common pipistrelle
 - Nathusius' pipistrelle
 - Soprano pipistrelle
 - Daubenton's bat
 - Natterer's bat
 - Greater horseshoe
 - Lesser horseshoe
 - Noctule

Day-time Bat Walkover



- 4.2. The site contains continuous high quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths, namely the broadleaved woodland-watercourse corridor that passes through and around the edges of site, and the connected native hedgerows with associated mature trees. The site also contains rush pasture, other neutral grassland, and 13 modified grassland fields, some of which are sometimes cattle grazed. The site is therefore considered to be of **high suitability** to support commuting and foraging bats.

Ground Level Tree Assessment (GLTA)


- 4.3. A total of seven trees or groups of trees were assessed for bat roost potential during the GLTA survey. **Table 4.1** below summarises the results of these surveys, highlighting which trees require further survey effort. The locations of the trees surveyed and their bat roost potential are shown on **Plan 2**.




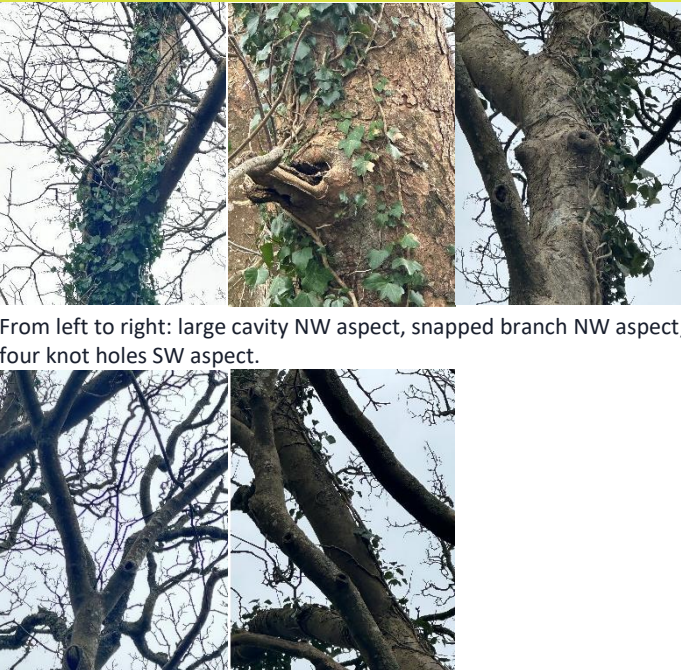
Table 4.1 Ground Level Tree Assessment Results

Tree No (Arb tree number)	Species (Common name)	Tree and PRF description	Overall Tree Potential (BCT, 2023)	Photographs
T17	Sessile oak	<p>A mature oak tree of ~ 8 m high that contains six PRFs.</p> <p>Features likely suitable for multiple roosting bats:</p> <ul style="list-style-type: none"> • Rot hole on the southwest aspect and • Wound on the southeast aspect <p>Features likely suitable for individual roosting bats:</p> <ul style="list-style-type: none"> • Two rot holes on the southwest aspect, • One rot hole on the southeast aspect, and • A snapped branch on the northeast aspect 	Further Assessment Required (FAR), likely to be PRF-M.	 <p>From left to right: rot hole SW aspect, wound SE aspect, and rot holes SW aspect.</p>  <p>Rot hole SE aspect and snapped branch NE aspect.</p>





Tree No (Arb tree number)	Species (Common name)	Tree and PRF description	Overall Tree Potential (BCT, 2023)	Photographs
G7	Multi-stem hazel	<p>This is a group of semi-mature and mature willow, hazel, hawthorn, and alder. Only one tree has PRF's. Some have ivy on them but it is not enough to support PRFs.</p> <p>Feature likely suitable for multiple roosting bats:</p> <ul style="list-style-type: none"> Wound on the east facing aspect <p>Features likely suitable for individual roosting bats:</p> <ul style="list-style-type: none"> Knot hole on the east aspect 	FAR, likely to be PRF-M.	 <p>From left to right: knot hole at 1.5 m high E aspect, wound at 4m high E aspect.</p>
G47	Sycamore, common hawthorn, common ash, blackthorn, grey willow	A group of trees around an existing track. Almost every tree in the group contains multiple PRFs. If any trees within this group are to be impacted/removed additional surveys will be required.	FAR on any trees in this group to be impacted.	No photographs
G47 (T74)	Ash	<p>Features likely suitable for individual roosting bats:</p> <ul style="list-style-type: none"> Knot hole on the southwest access 	FAR, likely to be PRF-I	No photographs



Tree No (Arb tree number)	Species (Common name)	Tree and PRF description	Overall Tree Potential (BCT, 2023)	Photographs
G47 (T75)	Sycamore	<p>A multi-stem sycamore.</p> <p>Feature likely suitable for multiple roosting bats:</p> <ul style="list-style-type: none"> • Wound from snapped branch • Trunk base cavity <p>Features likely suitable for individual roosting bats:</p> <ul style="list-style-type: none"> • Knot hole 	FAR, likely to be PRF-M.	 <p>Wound from snapped branch</p>
G47 (T76)	Sycamore	<p>A large mature sycamore – 10 m+ high, that contains eight PRFs.</p> <p>Features likely suitable for multiple roosting bats:</p> <ul style="list-style-type: none"> • Snapped branch on northwest aspect • Large cavity in main trunk obscured by ivy on northwest aspect <p>Features likely suitable for individual roosting bats:</p> <ul style="list-style-type: none"> • Four knot holes – all one inch wide on southwest aspect • Knot hole on northwest aspect • Knot hole on south aspect 	FAR, likely to be PRF-M.	 <p>From left to right: large cavity NW aspect, snapped branch NW aspect, and four knot holes SW aspect.</p> <p>From left to right: knot hole NW aspect, knot hole S aspect.</p>



Tree No (Arb tree number)	Species (Common name)	Tree and PRF description	Overall Tree Potential (BCT, 2023)	Photographs
T122	Common ash	<p>A mature ash ~8 m high, ~100 cm DBH that contains five PRFs.</p> <p>Features likely suitable for multiple roosting bats:</p> <ul style="list-style-type: none"> • Snapped branch on southwest aspect • Fissure from snapped branch on southwest aspect <p>Features likely suitable for individual roosting bats:</p> <ul style="list-style-type: none"> • Knot hole on southwest aspect • Knot hole on southwest aspect • Knot hole on east aspect 	FAR, likely to be PRF-M.	 <p>From left to right: fissure from snapped branch SW aspect, snapped branch SW aspect, knot hole SW aspect.</p>  <p>From left to right: knot hole SW aspect, knot hole SE aspect.</p>



Night-time Bat Walkover Results

- 4.4. The Night-Time Bat Walkovers (NBWs) recorded common pipistrelle, soprano pipistrelle, noctule, nyctaloid (noctule/Leisler's/serotine), brown long-eared, barbastelle and greater horseshoe bats. The majority of activity was from foraging and commuting common pipistrelle, soprano pipistrelle, noctule and myotis species with occasional-to-rare passes by the other species.
- 4.5. Bat activity was highest around the western woodland-watercourse corridor during the spring and summer visits with frequent foraging and commuting by common pipistrelle, soprano pipistrelle, noctule and myotis. Lower levels of bat activity were present across the rest of the site with occasional passes and foraging in all seasons. Low numbers of barbastelle were recorded in autumn on the northwest and southeast transects (total of 3 passes) and one greater horseshoe pass was recorded during the summer southeast transect. Bat activity was highest in autumn (around 80 passes across all transects) and lowest in spring (around 30 passes across all transects).
- 4.6. The majority of observed bat activity was foraging activity along the woodland, woodland-edge, and hedgerow habitats on-site. Additionally, foraging activity by common and soprano pipistrelle and noctule was observed over grassland and grassland-edge habitats on-site.

Bat Static Results

- 4.7. A summary table for each static per month is shown in **Table 4.2** below and should be read in conjunction with **Plan 4**. Average bat activity at each location and month is shown in **Figures 4.1** and **4.2**.
- 4.8. Static location L03 had higher bat activity per night than all other static locations, except L02 and L04 (Kruskal-Wallis, $p < 0.05$), see **Figure 4.1**. Levels of activity in general were higher at L02 and L03. The two locations are both situated in broadleaved woodland running along a watercourse, with L02 adjacent to a pond. The woodland connects the two locations. These areas had high levels of *Myotis* spp., serotine, noctule, Leisler's, *Pipistrellus* spp., and greater horseshoe activity. This suggests that these habitats, and the corridor between, forms an important resource for foraging and commuting bats.



Table 4.2 Total bat activity by static location

Location	<i>Barbastella barbastellus</i>	<i>Myotis spp.</i>	<i>Eptesicus serotinus</i>	<i>Nyctalus noctula</i>	<i>Nyctalus leisleri</i>	<i>Nyctalus spp.</i>	<i>Nyctaloid</i>	<i>Pipistrellus pipistrellus</i>	<i>Pipistrellus pygmaeus</i>	<i>Pipistrellus nathusii</i>	<i>Plecotus auritus</i>	<i>Rhinolophus ferrumequinum</i>	<i>Rhinolophus hipposideros</i>	Total
L01	319	314	14	98	107	-	1	866	2,255	1	84	12	16	4,087
L02	10	557	46	1,416	61	6	6	4,771	12,510	7	37	36	-	19,463
L03	49	363	69	1,095	153	1	25	4,023	9,529	3	76	4	4	15,394
L04	6	1,410	22	1,710	61	2	4	1,906	2,576	2	171	29	8	7,907
L05	2	54	-	452	19	-	2	904	424	-	16	1	-	1,874
L06	47	364	6	61	105	-	-	889	3,370	3	146	4	5	5,000
L07	7	439	6	938	45	-	-	1,641	2,790	2	45	71	9	5,993
L08	22	58	7	190	54	-	-	2,316	1,515	-	51	22	6	4,241
L09	851	369	17	110	47	-	-	1,376	2,952	-	19	23	33	5,797
L11	13	48	7	192	75	-	-	3,519	1,137	3	36	9	1	5,040
L12	12	212	2	238	41	-	-	1,236	711	-	51	27	23	2,553
L13	85	70	11	489	33	-	-	1,374	1,362	1	114	15	53	3,607
L14	86	88	21	436	82	-	-	5,880	3,619	2	36	28	16	10,294
L16	20	176	3	274	57	-	-	1,167	2,676	1	50	19	6	4,449
Total	1,529	4,522	231	7,699	940	9	38	31,868	47,426	25	932	300	180	4,087
Percentage of total bat activity	1.6	4.7	0.2	8.1	1.0	0.01	0.04	33.3	49.6	0.03	1.0	0.3	0.2	



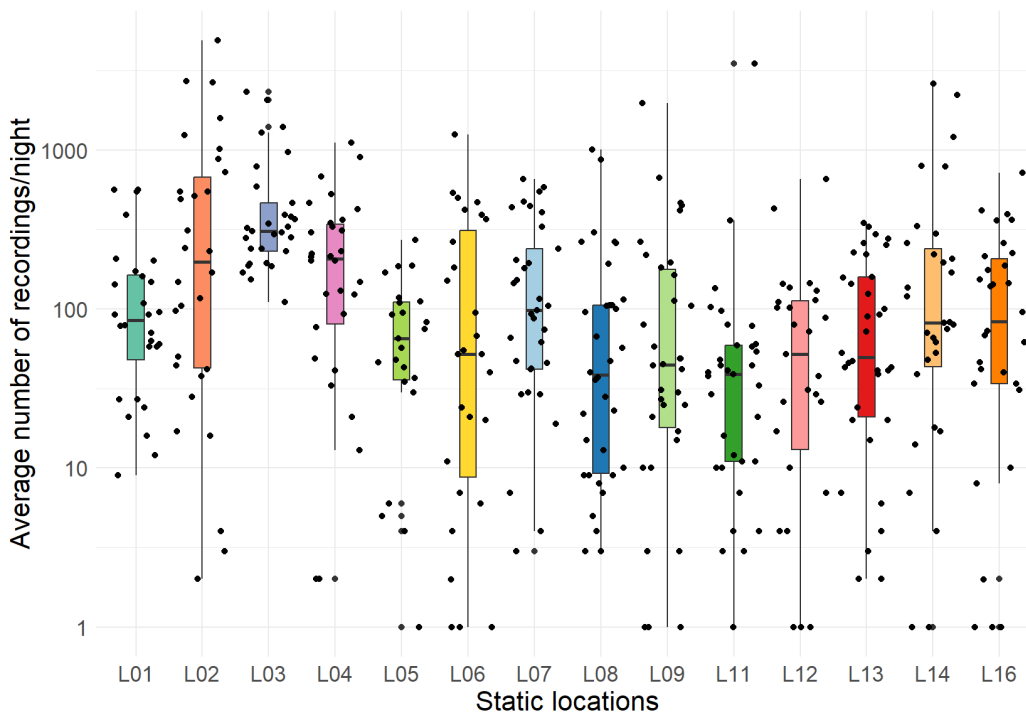


Figure 4.1 Average total bat activity per night for each location

4.9. Bat activity was relatively similar across visits 1-6, ranging between ~11,000 and ~20,000 total recordings, however the activity levels greatly dropped off in V07 and were an order of magnitude lower, with a total of ~1,700 recordings, see **Figure 4.2**.

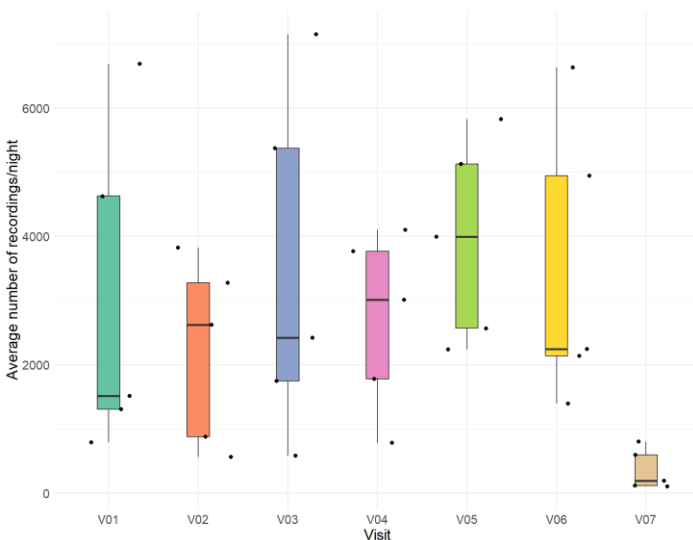


Figure 4.2 Average nightly bat activity by visit number

4.10. Greater and lesser horseshoe bats (Annex II species) were recorded at all static locations across site, on all survey visits, and throughout the night, see **Figures 4.3 & 4.4**. The greater horseshoe activity was highest along the western woodland-stream corridor (static locations L02, L04 and L07; a quarter of the total greater horseshoe activity was at L07), in the south eastern woodland and neutral grassland tree area (static locations L12 – L16), and along the road (L08). Activity levels were consistent across all visits, except for October 2025 (V07) where activity was lower. Lesser



horseshoe activity was highest in June 2024 and September 2025 (V03 and V06; ~85% of activity was in these months). All horseshoe passes are considered to be commuting or ‘foraging contact’ passes as per Miller’s Activity Index⁷, there were no instances where horseshoes were recorded for six or more consecutive minutes at any static location.

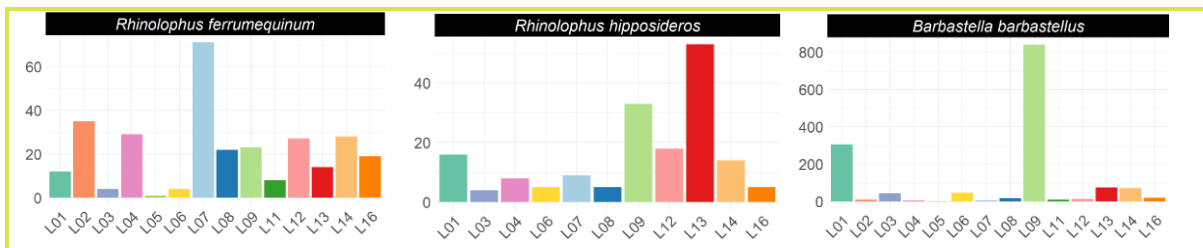


Figure 4.3. Total number of recordings per static location for greater and lesser horseshoe and barbastelle

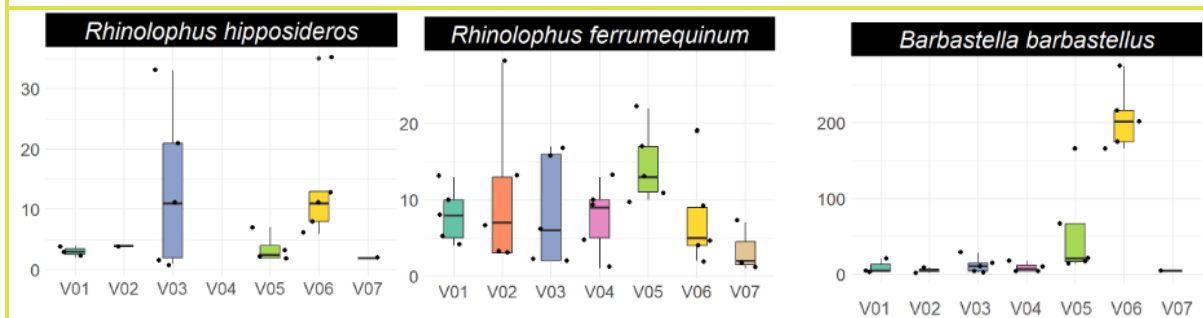


Figure 4.4. Average number of recordings per night, per visit for greater and lesser horseshoe and barbastelle

4.12. Barbastelle (Annex II species) were recorded at all static locations across site. The highest number of passes were recorded along two hedgerows between grassland fields in the eastern side of site (L09; ~56% of all barbastelle recordings) and western side of site (L01). Barbastelle activity was highest in September 2025 (V06; ~73% of all barbastelle recordings). Barbastelle are considered to have been foraging at static locations L01 and L09 in September, as they were recorded for up to 10 and 21 consecutive minutes multiple times at these locations, and commuting at all other static locations, see **Figure 4.5**.

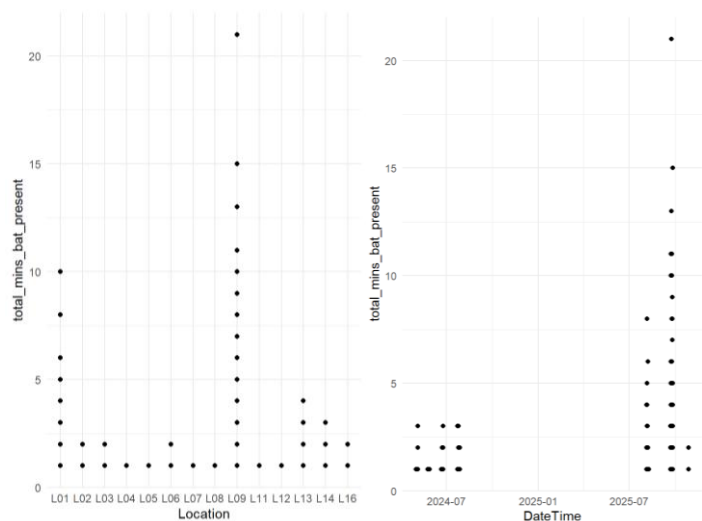


Figure 4.5. Plot of the maximum number of consecutive minutes of barbastelle recordings for each static location (left) and month (right)

⁷ Miller, B. 2001. A method for determining relative activity of free flying bats using a new activity index for acoustic monitoring. Acta Chiropterologica 3 (1): 93 – 105.



- 4.13. Light-sensitive *Myotis* spp. and brown long-eared bats were recorded at all locations. *Myotis* spp. made up an average of ~5% of the total bat activity on site, and brown long-eared recordings made up ~1% of total bat activity. ~30% of the *myotis* spp. recordings occurred at static location L04, which was located on a hedgerow along the western watercourse.
- 4.14. *Nyctalus* spp. (combined noctule and Leisler's) activity was highest at the western end of the site, with the highest activity recorded along the western edge of site at L02 and L04. *Nyctalus* activity was highest in summer (May, July and August; V02, V04 and V05), with ~40% of the total noctule activity occurring in August 2025 (V05). Serotine activity was also higher along the western edge of site, with ~60% of the total serotine activity occurring across L02 - L04.
- 4.15. Whilst at least ten bat species were recorded using the site, common pipistrelle and soprano pipistrelle made up the majority of activity onsite, with ~83% of the total bat calls being from the two species, as shown in **Table 2.8**. Common pipistrelle activity was spread across the site, however, the soprano pipistrelle activity was greatest in the west of the site, with ~45% of the total activity being detected at locations L02 and L03. Low numbers of Nathusius' pipistrelle (*Pipistrellus* spp.) were also recorded at static locations L02, L06 and L16 in September 2025.
- 4.16. Bat activity for common pipistrelle, soprano pipistrelle and noctule was recorded prior to sunset at several locations (L04, L05, L06, L08, L09, L11, L13 and L14) suggesting close proximity roosts for these species to the northwest and southeast areas of site, see **Figure 4.6**. Bat activity for myotis species and brown long-eared was present during known roost emergence times for these species at all static locations, suggesting close proximity of roosts for these species, particularly for myotis species at location L04. Additionally, bat activity for greater horseshoe was recorded within the known roost emergence times for this species along the western woodland-watercourse corridor (L04 and L07) and eastern side of site (L08, L09 and L14).



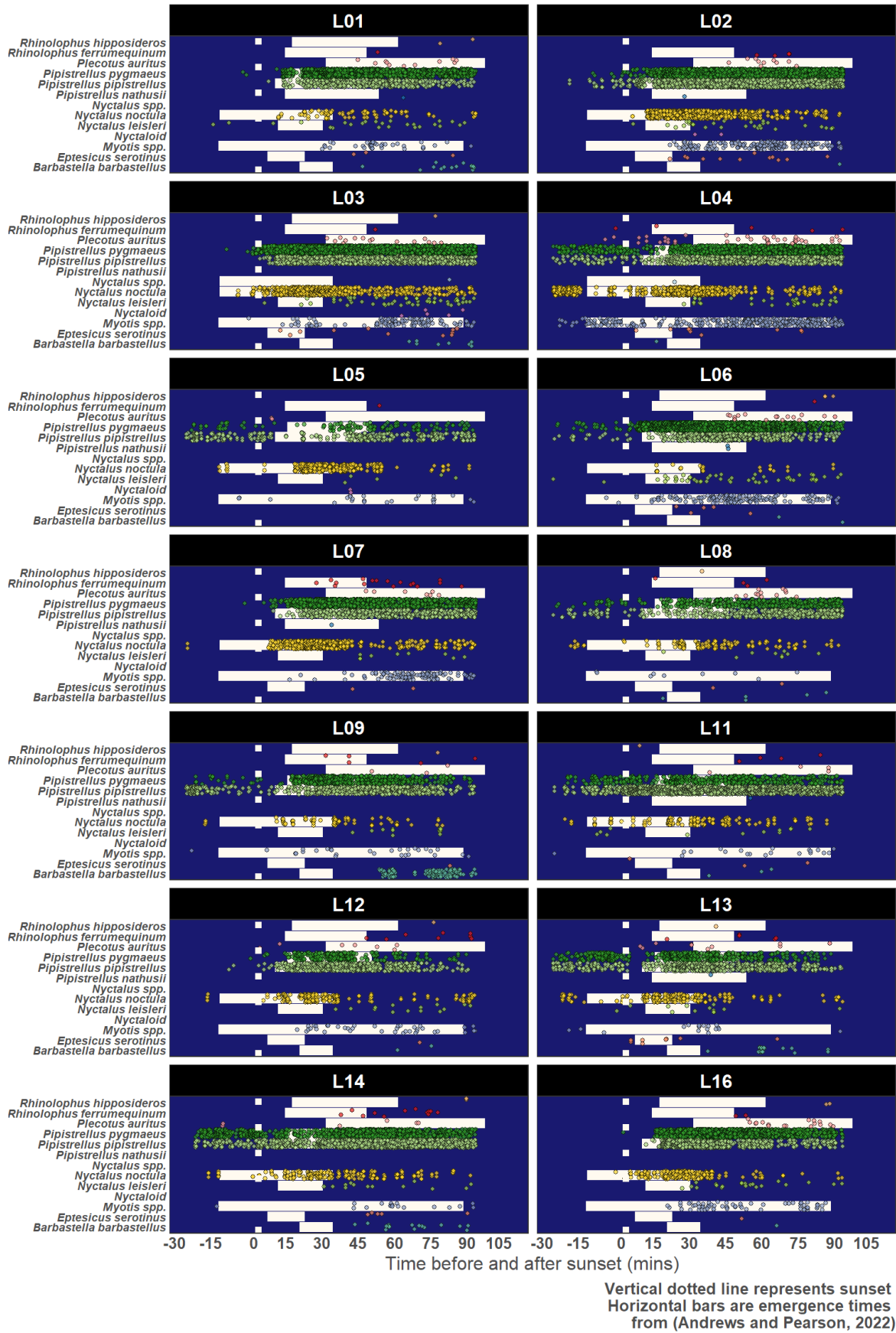


Figure 4.6 Bat passes in relation to sunset and known emergence times



- 4.17. The assemblage of species utilising the site includes species marked as 'Rarer or restricted distribution' to south Wales including serotine, Leisler's, and Nathusius pipistrelle, and 'Rarest Annex II species and very rare' to south Wales including greater horseshoe, lesser horseshoe and barbastelle. In considering the species confirmed to be present on the site, including those not identified down to species level but likely to be captured within the identified assemblage, a 'species score' of at least 29 has been calculated, using **Table 2.6** in **Section 3**.
- 4.18. However, the species assemblage recorded on the site during the various bat surveys comprised predominantly common and widespread bat species (~83% pipistrelle species, ~8% noctule), and the low activity recorded for some of the rarer species (~0.03% Nathusius pipistrelle, ~0.2% serotine, ~0.2% lesser horseshoe, ~0.3% greater horseshoe) represent what are likely infrequent commuting passes of individuals or small groups of bats. When considering the species which were recorded as frequently present, commuting and foraging on the site, rather than rare or occasional individual commuting passes, this 'species score' is likely lower. Therefore, the assemblage of bats utilising the site is considered to be of **up to regional importance**.



Discussion and Conclusions

- 4.19. All the trees and tree groups surveyed during the GLTA contain PRFs. To determine bat roosting potential of the trees to be impacted, and whether bat roosts are present, further aerial/endoscopic inspections would need to be undertaken for all the trees assessed as having potential to support roosting bats during the GLTA. Considering the bat activity results, common pipistrelle, soprano pipistrelle, noctule, myotis species and brown long-eared bats have potential to be roosting either on or near to site.
- 4.20. The habitats on-site are considered to be of **high suitability** for commuting and foraging bats. At least 11 bat species/groups were recorded on-site. Bat activity on site is associated with the woodland, woodland-edge, hedgerow, and grassland habitats. Activity is highest around the woodland-watercourse corridor that bounds and passes through the site. Annex II bat activity was recorded across the whole site. Greater and lesser horseshoe bat activity consisted of commuting and 'foraging contact' passes, it is therefore considered that these species are using the habitats on-site to travel between their roosting and foraging areas. Barbastelle were recorded foraging at locations L01 and L09. These two locations are on species-poor hedgerows between non-grazed uniform modified grassland fields. Since optimal barbastelle foraging habitat is unimproved neutral grassland, the habitat on-site does not present optimal opportunities for foraging barbastelle. The site is therefore not likely to present an important foraging resource for barbastelle. The site is considered to be of **at least local ecological importance** and **up to regional ecological importance** for the species assemblage of bats utilising the site for commuting and foraging.



Plans:

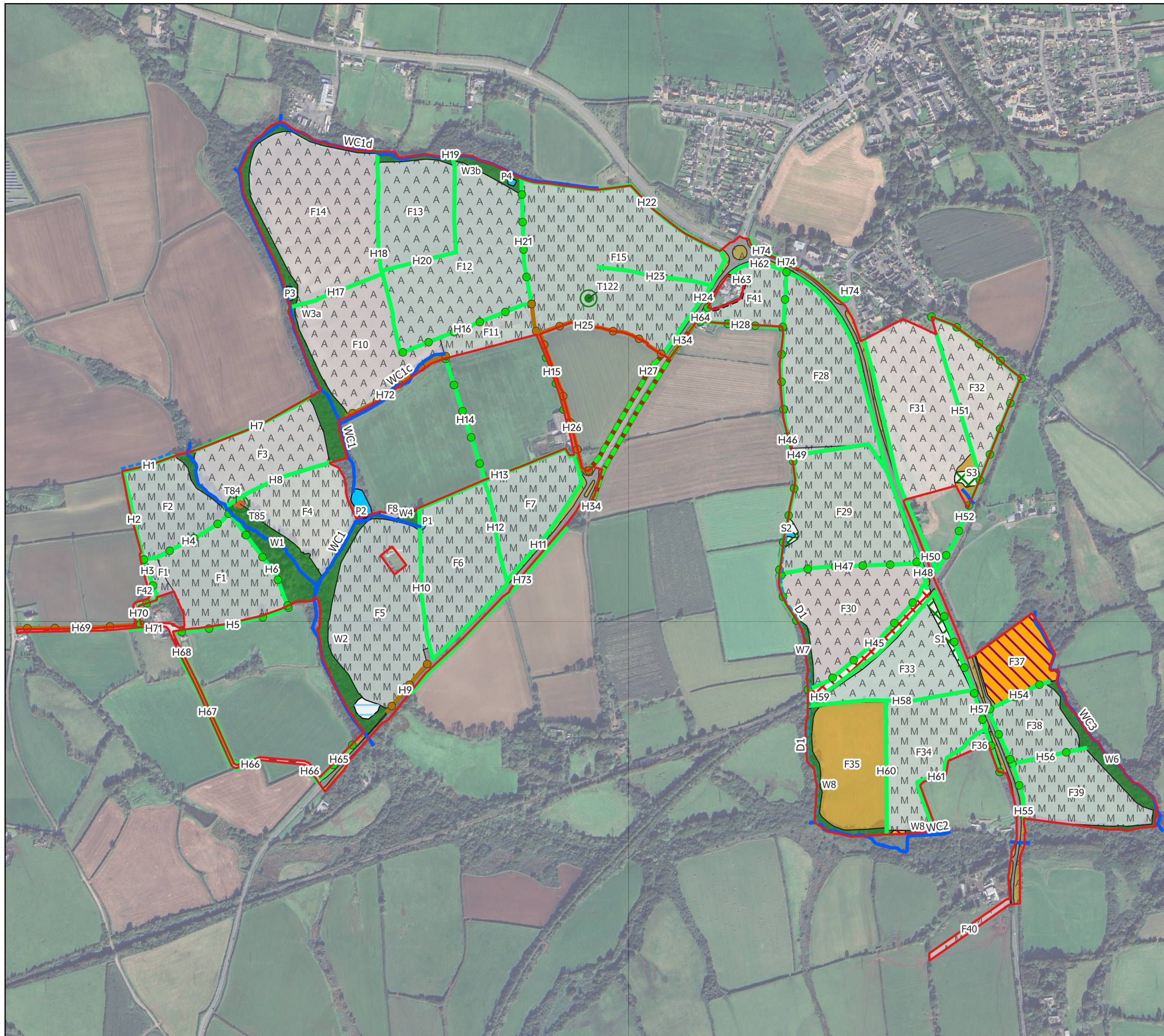
Plan 1: Baseline Habitat Features Plan (16720/P08)

Plan 2: Ground Level Tree Assessment Results (16720/P13)

Plan 3: Night-Time Bat Walkover Plan (16720/P11)

Plan 4: Bat Statics Plan (16720/P14)





Legend

- Redline boundary
- Arable/Cropland
- Hardstanding
- Ponds
- Modified grassland
- Purple moor-grass and rush pastures
- Other neutral grassland
- Mixed and Willow Scrub
- Lowland mixed deciduous woodland
- Other neutral grassland (Road verges)
- Unvegetated; unsealed surface
- Railway (Not surveyed)
- Veteran trees
- Individual trees
- Native hedgerow
- Native hedgerow with trees
- Species-rich native hedgerow with trees
- Native hedgerow with bank
- Native hedgerow with ditch
- Non-native and ornamental hedgerow
- Watercourse
- Ditch



Project	Great Harmeston Solar Farm
Drawing Title	Habitat Features Plan
Scale	As Shown (Approximate)
Drawing No.	16720/P08
Date	February 2026
Checked	HM/AH




97 Icknield Street, Hockley, Birmingham, B18 6RU
 T: 0121 828 4043 E: hello@tylergrange.co.uk W: tylergrange.co.uk

Legend

 Redline boundary

Ground Level Tree Assessment

 FAR: (Likely PRF M but direct endoscope assessment required to confirm)

T74: Likely PRF I but direct endoscope assessment required to confirm







Project	Great Harmeston Solar Farm
Drawing Title	Ground Level Tree Assessment Plan
Scale	1:8,000
Drawing No.	16720/P13
Date	February 2026
Checked	HM/GS






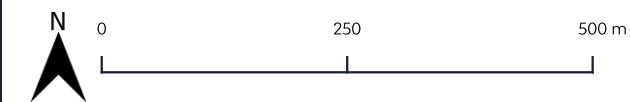
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W: www.tylergrange.co.uk

Legend

-  Redline boundary
-  Visit 1 Transect Route
-  Visit 2 Transect Route
-  Visit 3 Transect Route

Starting Points

-  Visit 1
-  Visit 2
-  Visit 3





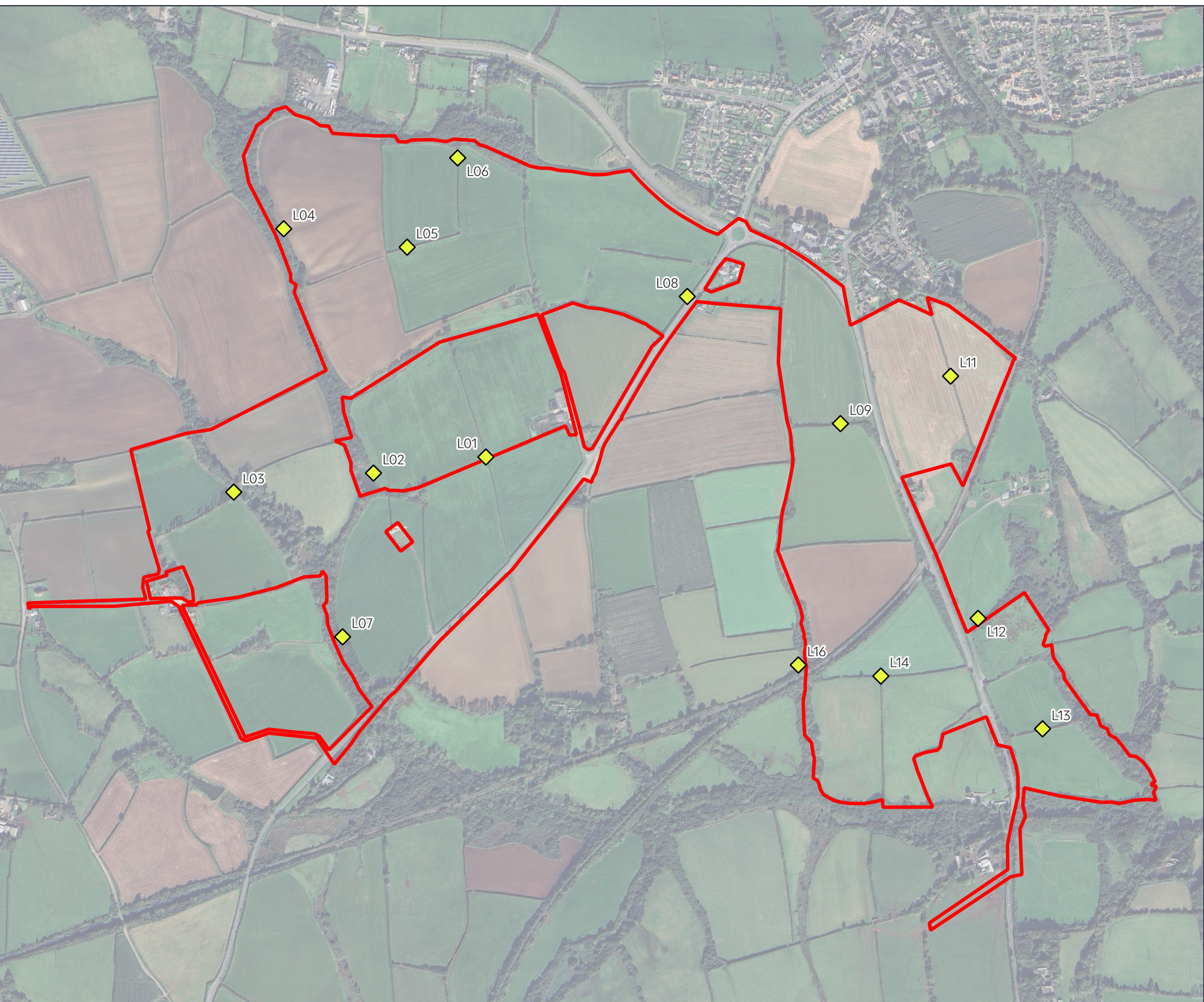
Project	Great Harmeston Solar Farm
Drawing Title	Night-Time Bat Walkover Transect Routes
Scale	1:7,700
Drawing No.	16720/P11
Date	February 2026
Checked	HM/GS



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Legend

-  Redline boundary
-  Bat Static Locations



Project	Great Harmeston Solar Farm
Drawing Title	Bat Static Plan
Scale	1:8,000
Drawing No.	16720/P14
Date	February 2026
Checked	HM/GS



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