Rosefield Solar Farm

Environmental Statement

Volume 4
Appendix 7.16: Paired Static Bat Detector Survey Report (2025)

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

EN010158/APP/6.4
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Rosefield Solar Farm Ltd

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1. Introduction

1.1. Purpose of this report

1.1.1. This report presents the results of paired bat static detector (hereafter referred to as detector(s)) surveys carried out in connection with the proposed Rosefield Solar Farm development (hereafter 'the Proposed Development') (central Grid Reference SP729231). Paired detector surveys were undertaken in three locations within the Order Limits (hereafter 'the Site') in October 2024 and in two locations within the Site in May 2025.

1.1.2. The Site and survey locations are shown on **Figure 1** (**Annex A**).

1.2. Ecological context

1.2.1. The Site predominantly comprises arable fields interspersed with hedgerows, ditches, lines of trees, grassland and small areas of woodland, with occasional small buildings and ponds.

1.2.2. The wider landscape is largely arable with occasional villages, farm complexes, scattered residential properties and woodland.

1.2.3. The Site is located adjacent to both Sheephouse Wood Site of Special Scientific Interest (SSSI) and Finemere Wood SSSI. A further SSSI, Grendon and Doddersall Wood, is located 1.36km to the south-west of the Site.

1.2.4. Two non-statutory designated sites are located within the Order Limits, Romer Wood Local Wildlife Site (LWS) and Greatsea Wood LWS.

1.2.5. Those non-statutory designated sites located outside of the Order Limits but directly adjacent/in close proximity (all of which are ancient woodland) are:

- Shrub Woods LWS –directly adjacent to Parcel 1;
- Decoypond Wood LWS – directly adjacent to Parcel 1;
- Runt's Wood LWS – directly adjacent to Parcel 2;
- Finemere Wildlife Trust Reserve (WTR) – south of Parcel 2;
- Home Wood, Middle Claydon LWS – adjacent to Interconnecting Cable Corridor; and
- Balmore Wood LWS – 95m west of Parcel 2.

1.2.6. In addition, whilst recognising that Ham Home-cum-Hamgreen Woods SSSI is located 3.2km south west of the Order Limits and therefore outside of the Study area for national statutory designated sites, it is acknowledged that Natural England are in the process of designating a landscape scale Bernwood SSSI that encompasses the above existing SSSIs and also extending to include neighbouring areas of ancient

woodland, of which Bechstein's bats (*Myotis bechsteinii*) will be included as a citation feature. The timetable for when this new designation will apply is not known but is unlikely to be before the Environmental Statement is submitted, therefore the Bernwood SSSI does not currently form part of the existing baseline.

1.2.7. All four SSSIs and non-statutory designated sites are known to be of importance to a range of roosting and foraging bat species, in particular the Bernwood population of Bechstein's bat, whose home range includes the majority of the Site. A further rare UK bat species, barbastelle (*Barbastella barbastellus*), has also been confirmed to use these woodlands.

1.2.8. Linear features, in particular hedgerows and lines of trees, are considered to be of considerable value to bats, supporting their movement through the landscape between roosting and foraging locations. However, the extent to which bats will also use more open areas, i.e. the centre of agricultural fields, has received less scientific study **[Ref. 1]**.

1.2.9. To determine bat usage within the Site of open fields, which will be impacted by the Proposed Development, relative to linear features such as hedgerows, which will be retained and protected by buffer zones, paired detectors were deployed and the results compared.

1.2.10. Due to the proximity of woodlands known to be of particular importance to Bechstein's bat and barbastelle, specific consideration is given in this report to these species, while the remaining bat species recorded are considered together as an '*all other species*' group.

1.3. Project overview

1.3.1. Rosefield Solar Farm is a proposed solar farm with energy storage which will generate and store renewable electricity for export to the National Grid. The main features of the Proposed Development consists of the following elements:

- Solar PV development consisting of:
  - Ground mounted Solar PV generating station. The generating station would include Solar PV modules and mounting structures; and
  - Balance of Solar System (BoSS) which comprises: Inverters; Transformers; Switchgear; Combiner Boxes; acoustic barriers and cabling.
- A project substation (the 'Rosefield Substation') compound comprising: Transformers; Switchgear; reactive power compensation bays; disconnectors; circuit breakers; busbars; control equipment; lightning surge arrestors; building(s) including office, control, functions, material storage, material laydown areas and welfare facilities; firewalls; fencing and acoustic barriers; a security cabin; parking as well as wider monitoring, maintenance and emergency equipment;

- A Main Collector Compound and two Satellite Collector Compounds comprising: Switchgear; Transformers; ancillary equipment; operation and maintenance and welfare facilities; material storage; material laydown areas; fencing and acoustic barriers; and security cabins;
- Battery Energy Storage System (BESS) compound comprising: batteries and associated Inverters; Transformers; Switchgear, ancillary equipment and their containers; office, control and welfare buildings; fencing and acoustic barriers; monitoring, maintenance and emergency systems; air conditioning; electrical cables; fire safety infrastructure; operation (including maintenance) security facilities; material storage; and material laydown areas;
- Interconnecting Cabling Corridor(s) to connect the Solar PV modules and the BESS to the Satellite and Main Collector Compounds to the Rosefield Substation;
- A Grid Connection Cable Corridor to connect the Rosefield Substation to the National Grid East Claydon Substation via 400kV cabling;
- Ancillary infrastructure works comprising: boundary treatment; security equipment; lighting; fencing; landscaping; internal access tracks; works to facilitate vehicular access; earthing devices; earthworks; surface water management; utility connections and diversions; and any other works identified as necessary to enable the Proposed Development;
- Green and blue infrastructure, recreation and amenity works comprising: landscaping; habitat management; biodiversity enhancement; the creation of three permissive footpaths; and works to permanently divert four public right of way footpaths in five instances;
- Site-wide operational monitoring and security equipment; and
- Highways infrastructure improvements and safety works comprising: minor junction improvement works; road widening; passing places; and works to facilitate vehicular access to the Site.

2. Methodology

2.1. Field surveys

2.1.1. Each pair of detectors comprised one detector which was placed along a linear feature (i.e. hedgerow) and one detector which was placed within a field (i.e. in the open). During each survey period detectors were deployed simultaneously for a period of at least five consecutive nights, in line with good practice guidance **[Ref. 2]**.

2.1.2. The detector deployment locations are illustrated on **Figure 1** (**Annex A**) and are summarised in **Table 1** below, along with details of the deployment periods.

Table 1: Paired detector deployment locations and timings

Site Location	Description	Position	Survey Period 1	Survey Period 2 (deployment period/ assessment period)
Location 1: The Roses	On the south eastern corner of Runt's Wood and within Field D28	Hedge Field	24/10/24 – 29/10/24	14/05/25 – 22/05/25 (14/05/25 – 19/05/25)
Location 2: Abbot's Coppice	On the tree line between Finemere Wood and Runt's Wood and within Field D29	Hedge Field	24/10/24 – 29/10/24	14/05/25 – 22/05/25 (14/05/25 – 19/05/25)
Location 3: Spinzel	On the northern boundary of Sheephouse Wood and within Field B8	Hedge Field	24/10/24 – 29/10/24	N/A[1]

2.1.3. Detector deployment in survey period 2 extended for a total of nine nights. However, to ensure consistency with survey period 1 only the first five nights were taken forward for consideration as part of the 'passes per night' assessment.

[1] Access not granted to this location during spring deployment

2.1.4. Full spectrum Wildlife Acoustic Song Meter SM4BAT-FS detectors with omnidirectional microphones were used. Each had a microphone mounted at a height between 1 and 2m to maximise the probability of recording bat calls in addition to reducing the likelihood of interference from insects and moving vegetation. Each detector was set to record bats from half an hour before sunset to half an hour after sunrise.

2.1.5. Detectors were deployed when the weather forecast indicated suitable weather conditions for foraging and commuting bats (i.e. sunset temperatures of 10°C or above, with no heavy rain or strong winds) as detailed within **Annex B**.

2.2. Analysis and verification

2.2.1. Recordings were processed using the British Trust for Ornithology (BTO) Acoustic Pipeline, a machine learning process that enables the automated identification of bat echolocation calls. The BTO Acoustic Pipeline considers recordings of no more than 5 seconds in length and provides an identification on each occasion that a bat species is identified. For the purposes of this assessment, each bat species identifications are considered to represent a bat 'pass'.

2.2.2. The results provided by the BTO Acoustic Pipeline were then subject to manual verification to determine the accuracy of the automated identification process. As the key species of interest to the Proposed Development manual verification specifically focus on barbastelle and *Myotis* (including Bechstein's bat) species identifications.

2.2.3. Recordings selected for manual verification were viewed in Kaleidoscope Viewer© software and assessed by an experienced bat call analyst to determine whether key call parameters (e.g. call shape, peak frequency, call duration etc.) reflected those expected for the given identification. All manual verification was undertaken by an experienced ecologist with over 10 years' experience in UK bat echolocation call analysis.

2.2.4. **Table 2** below summarises the extent of the manual verification undertaken across the October 2024 and May 2025 datasets.

Table 2: Manual verification undertaken for the October 2024 and May 2025 datasets

Deployment	Manual verification approach (number of recordings checked)		
	Barbastelle	Bechstein's bat	Other Myotis sp.
October 2024	5% (38)	N/A (none recorded)	All (113)
May 2024	5% (13)	All (32)	5% (157)

2.2.5. Manual verification was applied at the species group level for *Myotis* identifications as it is often not possible to reliably identify individual species of the *Myotis* genus solely from their echolocation calls. As such all confirmed *Myotis* species identifications were considered to have the potential to represent Bechstein's bat activity.

2.2.6. A measure of 'passes per night' for '*all other species*', *Myotis* species and barbastelle activity was applied to the results of each detector to enable the consistent comparison of relative levels of bat activity. The 'passes per night' measure was calculated by dividing the number of identifications made for a given group by the number of recording nights within a survey period[2].

Limitations

2.2.7. Detectors cannot distinguish between large numbers of bats moving through an area and small numbers of bats making repeated passes within an area. Therefore, high levels of bat activity can be generated by a large number of commuting bats, a small number of foraging bats flying past the detector on multiple occasions or even individual bats flying close to a detector on multiple occasions. Therefore, the assessment of results has been based not on an assessment of the likely number of bats using an area, but instead a measure of relative activity that can be applied in a consistent and repeatable format across datasets, namely 'passes per night'.

2.2.8. As already noted, it is often not possible to reliably identify individual species of *Myotis* solely from their echolocation calls and therefore these species have been grouped into a *Myotis* species group for the purposes of analysis. In determining the potential implications of the results for the *Myotis* species it has been assumed that any or all of these identifications could represent Bechstein's bat activity, the *Myotis* species considered to be of most significant consideration for the Proposed Development.

2.2.9. There are a number of variables that affect the 'detectability' of a bat, ranging from its biology and ecology to the environmental conditions and the condition of the equipment. There are, therefore, limitations in drawing certain conclusions about bat activity on a site from the use of bat detectors and sound analysis alone. The detection rate of bat calls varies, with a bias towards loud bat calls, with quieter calls such as those from brown long-eared bat (*Plecotus autritus*), potentially being under recorded.

2.2.10. Collected data was analysed using the BTO Acoustic Pipeline and a sub-set of the most relevant data manually verified by an appropriately experienced ecologist. Manually verified data focused on the accuracy of

[2] Although survey period 2 lasted for nine nights, the assessment of 'passes per night' considered only the first five nights of the survey period to maximise consistency with survey period 1.

identification for *Myotis* species and barbastelle and did not consider any 'noise' files, i.e. recordings for which the BTO Acoustic Pipeline did not make any bat identifications. While it is possible that a small number of bat identifications, including for *Myotis* species and/or barbastelle could be present within these 'noise' files the identification accuracy levels found through manual verification (see **Section 3** below), which included calls of varying quality, suggests that any such missed calls should be limited in number and are considered unlikely to result in a substantial change in how the data has been interpreted.

2.2.11. No manual verification was undertaken of species other than barbastelle and *Myotis* species as these species are grouped together as *'all other species'* for the purpose of this analysis and therefore the accuracy of these recordings is of lesser impact to the overall assessment. As detailed above, while it is possible that a small number of barbastelle and/or *Myotis* species calls could be present within these *'all other species'* files the accuracy levels found via manual verification of barbastelle and *Myotis* species identifications means that any such inaccurately assigned calls should be limited in number and are considered unlikely to result in a substantial change in how the data has been interpreted.

2.2.12. Access restrictions meant it was not possible to deploy the Location 3: Spinzel detectors during the second survey period. While this means that variations in activity levels at this location at different times of the year cannot be assessed, the consistency in the overall pattern of activity seen across Locations 1 and 2 in both October 2024 and May 2025 suggests that it is unlikely that substantial variations would have been recorded for Location 3 had the detectors been deployed for the May 2025 survey period.

3. Results

3.1. October 2024

Manual verification

3.1.1. The BTO Acoustic Pipeline identified eight species within the October 2024 data, including three species level *Myotis* identifications (Daubenton's bat, Natterer's bat and whiskered bat), which have been grouped for the purposes of this analysis, as detailed in **Section 2.2**. The BTO Acoustic Pipeline results for October 2024 are detailed in **Table 5**.

3.1.2. Manual verification of all *Myotis* species identifications determined that all bar two identifications accurately reflected *Myotis* species echolocation calls, for an accuracy level of 98.23%. The two recordings determined to be inaccurate were instead identified as comprising barbastelle echolocation calls.

3.1.3. Manual verification of 5% of all barbastelle identifications determined that all bar one of the reviewed identifications were correct, for an accuracy level of 97.44%. The single recording found to be inaccurate instead contained common pipistrelle (*Pipistrellus pipistrellus*) and *Myotis* species echolocation calls.

3.1.4. Although a small number of inaccuracies were identified the overall levels of accuracy for the key species/species group of interest (i.e. barbastelle and *Myotis* species) were considered to be sufficiently high (at 98 and 97% respectively) to provide an accurate reflection of how these species are using habitats within the Site.

Activity assessment

3.1.5. A total of 3,485 bat identifications were made by the BTO Acoustic Pipeline across the paired detectors at all three locations in October 2024, comprising 2,846 identifications across the three hedgerow detectors (equivalent to 189.73 passes per night) and 639 identifications (or 42.6 passes per night) on the field detectors.

3.1.6. Overall, the highest levels of bat activity in October 2024 were recorded by the hedgerow detector at Location 3: Spinzel (1,409 identifications/281.8 passes per night), closely followed by the hedgerow detector at Location 2: Abbot's Coppice (1,100 identifications/220 passes per night). The lowest overall bat activity was recorded by the field detector at Location 1: The Roses, with just 40 identifications recorded across the five survey nights (equivalent to 8 passes per night), with almost half of these relating to common pipistrelle activity.

3.1.7. Variations in activity levels between hedgerow and field detector positions, were assessed through consideration of the average number of 'passes per night'. **Table 3** summarises the 'passes per night' for, *Myotis* sp. only, barbastelle only and '*all other species*'.

Table 3: October 2024 'passes per night'

Location	Position	Passes per night		
		All other species	*Myotis* sp.	Barbastelle
Location 1: The Roses	Hedge	32.20	4.60	30.60
	Field	5.40	2.60	0.00
Location 2: Abbots Coppice	Hedge	196.40	5.80	17.80
	Field	96.60	6.40	0.20
Location 3: Spinzel	Hedge	184.80	2.00	95.00
	Field	14.20	1.20	1.20
All Locations Combined	**Hedge**	**137.80**	**4.13**	**47.80**
	Field	**38.73**	**3.40**	**0.47**

3.1.8. As detailed in **Table 3** within each pair of detectors '*all other species*' activity levels were consistently higher, by a significant degree, at the hedgerow detector than the field detector. While this variation was lowest at Location 2: Abbot's Coppice, the hedgerow detector still recorded double the activity levels recorded by the field detector. Elsewhere hedgerow detector activity levels ranged from approximately 6 (Location 1: The Roses) to 13 (Location 3: Spinzel) times that recorded by the paired field detector.

3.1.9. Amongst *Myotis* species identifications the variation between paired detectors was more stable, with hedgerow detectors at Location 1: The Roses and Location 3: Spinzel recording approximately 1.5 times more activity than the paired field detector. However, at Location 2: Abbot's Coppice a slightly greater level of activity was recorded by the field detector (approximately 1.1 times that of the hedgerow detector). Overall, when considering the combined hedgerow and field passes per night for *Myotis* sp. activity levels were found to be slightly higher at the hedgerow; however, based on the October 2024 data alone, the variation is insufficient to enable this difference to be considered statistically significance.

3.1.10. Barbastelle showed a consistent and significant variation between the hedgerow and field detectors, such that the combined hedgerow and field passes per night showed hedgerow barbastelle activity levels to be almost 120 times higher than those recorded within the field.

3.2. May 2025

Manual verification

3.2.1. Overall, the BTO Acoustic Pipeline identified 13 species within the data, including five species level *Myotis* identifications (Bechstein's bat, Brandt's bat, Daubenton's bat, Natterer's bat and whiskered bat). As with the October 2024 data, the *Myotis* species level identifications were grouped for the purposes of this analysis (see **Section 2.2**). The BTO Acoustic Pipeline results for the first five nights of survey in May 2025, on which this assessment are based, as well as the longer nine night period that the detectors were deployed for in May 2025, are detailed in **Table 6**.

3.2.2. Manual verification of all Bechstein's bat identifications determined that all bar one identification accurately reflected *Myotis* species echolocation calls, for an accuracy level of 96.88%. The one identification determined to be inaccurate was instead identified as comprising common pipistrelle echolocation calls.

3.2.3. Manual verification of 5% of all remaining *Myotis* species identifications determined that all bar eight identifications accurately reflected *Myotis* species echolocation calls, for an accuracy level of 94.90%. The eight identifications determined to be inaccurate were instead found to comprise common pipistrelle and serotine (*Eptesicus serotinus*) echolocation calls. Together the manual verification of all *Myotis* species identifications found a 95.24% accuracy level.

3.2.4. Manual verification of 5% of all barbastelle identifications determined that all bar one of the reviewed identifications were correct, for an accuracy level of 92.13%. The single recording found to be inaccurate instead comprised a *Myotis* species echolocation call.

3.2.5. Although the accuracy levels identified from the manual verification of the May 2025 data were slightly lower than those found for the October 2024 data (*Myotis* species at 95% (down from 98%) and barbastelle at 92% (down from 97%)) both were considered to be sufficiently high to provide an accurate reflection of how these species are using habitats within the Site.

Activity assessment

3.2.6. Significantly higher levels of bat activity were recorded in May 2025 compared to October 2024 as would be expected given seasonal changes in bat activity. A total of 24,039 bat identifications were made during the first five nights of survey by the BTO Acoustic Pipeline across the paired detectors at both locations monitored in May 2025. These comprised 22,309 identifications across the two hedgerow detectors (equivalent to 2,230.9 passes per night) and 1,730 identifications (or 173 passes per night) on the field detectors.

3.2.7. Overall, the highest levels of bat activity in May 2025 were recorded by the hedgerow detector at Location 1: The Roses (16,225 identifications/3,245

passes per night), almost all of which related to common pipistrelle activity (13,509 identifications). Activity levels in all other locations were significantly lower with the 6,084 identifications (1,216.8 passes per night) recorded on the hedgerow detector at Location 2: Abbot's Coppice the next highest rate of bat activity. The lowest overall bat activity was recorded by the field detector at Location 2: Abbot's Coppice with 613 identifications recorded (122.60 passes per night), although this still represented greater levels of bat activity than all bar one location during the first survey period in October 2024 (Location 3: Spinzel (hedgerow)).

3.2.8. Variations in activity levels between hedgerow and field detector positions, were assessed through consideration of the average number of 'passes per night'. **Table 4** summarises the 'passes per night' for *Myotis* sp. only, barbastelle only and '*all other species*'. To ensure consistency with survey period 1 only the first five nights of survey data from survey period 2 were considered in this assessment, although data from the remaining four nights within survey period 2 was considered to maintain the overall pattern of activity recorded during the initial five survey nights (see **Table 6**).

Table 4: May 2025 'passes per night'

Location	Position	Passes per night		
		All other species	*Myotis* sp.	Barbastelle
Location 1: The Roses	Hedge	3,107.60	107.20	30.2
	Field	218.40	4.00	1.00
Location 2: Abbots Coppice	Hedge	865.60	344.60	6.60
	Field	120.40	1.80	0.40
All Locations Combined	**Hedge**	**1,986.60**	**225.90**	**18.40**
	Field	**169.40**	**2.90**	**0.70**

3.2.9. Across both pairs of detectors '*all other species*' activity levels were to a significant degree higher at the hedgerow detector than the field detector, driven, in large part, by comparatively high levels of common pipistrelle activity.

3.2.10. Unlike the findings from data collected during October 2024, in May 2025 Location 1: The Roses recorded greater levels of activity than at Location 2: Abbot's Coppice across both hedgerow and field detectors. However, significant variations between the hedgerow and field detectors were noted in both locations, with Location 1: The Roses recording approximately 14 times more '*all other species*' activity on the hedgerow

than within the field, while at Location 2: Abbot's Coppice hedgerow activity was seven times higher than within the field.

3.2.11. Amongst the *Myotis* species identifications, those that the BTO Acoustic Pipeline assigned specifically to Bechstein's bat were recorded at both Location 1: The Roses and Location 2.: Abbot's Coppice. In both locations Bechstein's bat identifications were recorded from the hedgerow detectors only.

3.2.12. Overall, across all *Myotis* species hedgerow activity was greatest at Location 2: Abbot's Coppice, consistent with the findings from October 2024. However, unlike the findings from October 2024 activity from both hedgerow detectors was significantly greater than that recorded on their respective paired field detectors (26 times greater at Location 1: The Roses and 191 times greater at Location 2: Abbot's Coppice). Meanwhile, levels of *Myotis* species activity recorded by the field detectors in May 2025 were largely consistent with that recorded in October 2024.

3.2.13. Overall barbastelle activity levels at Location 1: The Roses and Location 2: Abbot's Coppice were largely consistent between October 2024 and May 2025, resulting in between 26 and 16 times more barbastelle activity being recorded along the hedgerows than within the fields, respectively, during the May 2025 survey.

3.2.14. Barbastelle activity at Location 1: The Roses showed significant consistency between the October 2024 and May 2025 surveys, as did levels of activity at the field detector in Location 2: Abbot's Coppice. The most notable variation between the two deployments was a reduction by almost one third in the level of barbastelle activity at the hedgerow detector at Location 2: Abbot's Coppice.

Table 5: October 2024 BTO acoustic pipeline results

Location	Position	Number of identifications							
		Barbastelle	Brown long-eared bat	Common pipistrelle	Leisler's bat	*Myotis* sp.	Nathusius' pipistrelle	Noctule	Soprano pipistrelle
The Roses	Hedge	153	2	104	0	23	0	2	53
The Roses	Field	0	1	19	0	13	0	2	5
Abbot's Coppice	Hedge	89	10	865	0	29	3	9	95
Abbot's Coppice	Field	1	11	422	0	32	5	5	39
Spinzel	Hedge	475	31	128	2	10	2	19	742
Spinzel	Field	6	3	9	3	6	0	26	30

Table 6: May 2025 BTO acoustic pipeline results

Location	Position	Number of Identifications from first five nights (Number of identifications across entire nine night survey period)								
		Barbastelle	Brown long-eared bat	Common pipistrelle	Leisler's bat	*Myotis* sp.	Nathusius' pipistrelle	Noctule	Serotine	Soprano pipistrelle
The Roses	Hedge	151 (181)	6 (11)	13,509 (16,770)	54 (86)	536 (614)	100 (118)	1,118 (1,193)	154 (164)	597 (724)
The Roses	Field	5 (5)	11 (14)	420 (538)	46 (80)	20 (26)	5 (14)	574 (636)	30 (35)	6 (11)
Abbot's Coppice	Hedge	33 (43)	40 (71)	3,409 (4,310)	17 (24)	1,723 (2,524)	13 (31)	582 (753)	92 (92)	175 (589)
Abbot's Coppice	Field	2 (2)	29 (56)	71 (90)	21 (26)	9 (13)	0 (1)	381 (591)	98 (101)	2 (6)

4. Discussion and conclusions

4.1. Overall bat activity

4.1.1. Based on analysis by the BTO Acoustic Pipeline up to 13 bat species were recorded during the paired static detector surveys within the Site[3], with all 13 recorded during May 2025 and eight recorded in October 2024[4].

4.1.2. Data from both May 2025 and October 2024 recorded a clear pattern of overall activity being significantly greater at hedgerow detectors than at field detectors, with this based on a significantly larger dataset from May 2025, despite it only being possible to deploy detectors in two of the three locations surveyed in October 2024.

4.2. *Myotis* species activity

4.2.1. *Myotis* species activity at hedgerow detectors increased significantly in May 2025 compared to October 2024; however, activity levels at field detectors remained largely consistent between the two survey periods. Therefore, while no statistically significant difference in hedgerow and field activity could be found from the October 2024 data, potential due to generally low levels of *Myotis* species activity, a clearly statistically significant variation is present within the May 2025 data.

4.2.2. These results suggest that the October 2024 field detector results are not simply a result of overall low levels of *Myotis* species activity during the first survey period, but instead may reflect extremely limited use, and therefore reliance on, open field areas by *Myotis* species across multiple times of the year. This reflects studies of *Myotis* species behaviour, such as Blary *et al.,* (2021) **[Ref. 3]** who found that *Myotis* species activity decreased with increasing distance from field margins.

4.2.3. The *Myotis* species of most significant consideration to the Proposed Development is the Bechstein's bat. As a result of combining all *Myotis*

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[3] Barbastelle, Bechstein's bat, Brandt's bat, brown long-eared bat, common pipistrelle, Daubenton's bat, Leisler's bat (*Nyctalus leisleri*), Nathusius' pipistrelle (*Pipistrellus nathusii*), Natterer's bat, noctule (*Nyctalus noctula*), serotine, soprano pipistrelle (*Pipistrellus pygmaeus*) and whiskered bat. **Note**. manual verification of these species considered only a sample of barbastelle and *Myotis* species identifications, the latter to the species group only. No manual verification has been undertaken to confirm the presence of the remaining bat species identified by the BTO Acoustic Pipeline. However, the presence of these species within the Site is considered reasonable given the location of the site, habitats present and the known range and requirements of these 'other' bat species.

[4] Barbastelle, common pipistrelle, Daubenton's bat, Leisler's bat, Nathusius' pipistrelle, Natterer's bat, noctule, soprano pipistrelle and whiskered bat. See footnote 2 for caveats regarding the verification of these species.

species level identifications into a *Myotis* species group for analysis it is considered that any or all of the *Myotis* species identifications has the potential to represent a Bechstein's bat. However, while the BTO Pipeline did not record any Bechstein's bat species level identification within the October 2024 data, a small number of Bechstein's bat species level identifications were recorded in the May 2025 data, all of which were recorded by hedgerow detectors.

4.2.4. Bechstein's bats are considered to be, principally, a bat of wooded environments, primarily roosting in deciduous semi-natural or ancient woodlands **[Ref. 4]**. While there is some evidence to suggest some Bechstein bats may forage in open fields **[Ref. 5]**, other studies have indicated that, in the UK, optimal foraging habitat is more frequently associated with mature broadleaved woodland **[Ref. 6]**. Given this preference, and the presence of suitable woodland habitats in close proximity to the Site, Bechstein's bat may be less likely to make use of open field areas, where the impacts of the Proposed Development will be focused.

4.3. Barbastelle activity

4.3.1. Barbastelle activity levels across the two locations monitored in both October 2024 and May 2025 were largely consistent, both in terms of overall activity levels and the split of this activity across the hedgerow and field detectors, with very low activity levels recorded from field detectors on both survey occasions. Overall activity levels were significantly higher at Location 3: Spinzel, which was only monitored in October 2024 due to access constraints; however, this data reflected the pattern seen elsewhere, with almost all of this activity recorded by the hedgerow detector. This is illustrated by the fact that across all detectors and survey periods only 14 barbastelle identifications were recorded by field detectors.

4.4. All other species

4.4.1. Activity levels across '*all other species*' were significantly higher in May 2025 compared to October 2024, with the dominant species in both cases being common pipistrelle, followed by soprano pipistrelle in October 2024 and noctule and then soprano pipistrelle in May 2025.

4.4.2. During both survey periods, activity levels were significantly greater at hedgerow detectors than field detectors (3.5 times higher in October 2024 and 11.7 times higher in May 2025). Although changes in the location with greatest activity were noted, with Location 1: The Roses recording the lowest '*all other species*' activity levels in October 2024 but the highest in May 2025.

4.4.3. In October 2024, a small number of individual bat species appeared not to follow the broader trend for this grouping, with Leisler's bat and noctule

recording very slightly greater activity at the field detectors[5] and Nathusius' pipistrelle recording the same number of identifications across both field and hedgerow detectors (five). Due to the low numbers of identifications these differences were based on, none of these variations are considered significant, and notably, these were not reflected in the May 2025 data, which recorded a higher number of identifications across the board.

4.4.4. In May 2025 the data found all individual species within the '*all other species*' group recorded higher levels of activity at the hedgerow detectors than at the field detectors, albeit that this was associated with small, non-significant variations for some species (e.g. brown long-eared bat and Leisler's bat[6]). Even noctule, which are widely considered to have very little reliance on linear features, recorded notably higher levels of activity on the hedgerow detectors[7], albeit that as a bat species that echolocates loudly this does not necessarily indicate close proximity to either the hedgerow or field detectors.

4.5. Proposed Development implications

4.5.1. This pattern of activity recorded across the October 2024 and May 2025 paired static detector surveys reflects the typical assumptions made regarding bat activity in which bats are considered to show greater affinity for linear features such as hedgerows, compared to open areas. While such a pattern is often considered to reflect a need for commuting bats to be supported by linear features **[Ref. 7]** for some species (e.g. barbastelle) it has also been suggested that this pattern of behaviour could relate to the increased foraging opportunities that may be present along hedgerows **[Ref. 8]**.

4.5.2. The data indicates that, overall, within the Site, the hedgerows are likely to provide a more valuable and well used resource, than more open areas of the fields.

4.5.3. The Proposed Development has been designed such that the majority of hedgerows and other linear features within the Site will be retained and a buffer of up to 10-15m will be created either side of these retained features and the solar farm development. As such, the evidence collected indicates that while a small number of bats may be displaced from central field

[5] Leisler' bat – two identifications at the hedgerow detector and three at the field detector/noctule – 30 identifications at the hedgerow detector and 33 at the field detector.
[6] Brown long-eared bat – 46 identifications at the hedgerow detector and 40 at the field detector/Leisler's bat – 71 identifications at the hedgerow detector and 69 at the field detector.
[7] 1,700 identifications across the hedgerow detectors and 955 identifications across the field detectors.

locations, the majority of bats using the Site do not appear to demonstrate a significant reliance on these areas for foraging or commuting.

5. References

- **Ref. 1** Finch, D., Schofield, H and Mathews, F. 2020. *Habitat Associations of Bats in an Agricultural Landscape: Linear Features Versus Open Habitats*. Animals, 10(10), 1856. https://doi.org/10.3390/ani10101856
- **Ref. 2** Collins, J. 2023. *Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition)*. The Bat Conservation Trust, London.
- **Ref. 3** Blary, C., Kerbiriou, C., Le Viol, I and Barré, K. 2021. *Assessing the importance of field margins for bat species and communities in intensive agricultural landscapes.* Agriculture, Ecosystem and Environment. 319. https://doi.org/10.1016/j.agee.2021.107494
- **Ref. 4** Dietz, M and Pir, J. 2011. *Distribution, Ecology and Habitat Selection by Bechstein's Bat (Myotis bechsteinii) in Luxembourg*. Ökologie der Säugetiere. 6
- **Ref. 5** Wright, P. 2018. *Monitoring population size, structure and change in Bechstein's bat (Myotis bechsteinii): combined approaches using molecular and landscape ecology*. Available online: https://www.proquest.com/openview/1274d38b84eba1cb628cfaa04232ff9c/1?cbl=51922&diss=y&pq-origsite=gscholar (Accessed April 2025).
- **Ref. 6** Scofield, H. and Morris, C. 2000. *Ranging behaviour and habitat preferences of female Bechstein's bat, Myotis bechsteinii (Kuhl, 1818)*
- **Ref. 7** Entwistle A. C, Harris S., Hutson A. M., Racey P.A, Walsh A., Gibson S.D., Hepburn I. and Johnston J. 2001. *Habitat Management for Bats – A Guide for Land Managers, Land Owners and Their Advisors*. Joint Nature Conservation Committee. Available online: https://data.jncc.gov.uk/data/23745574-3756-40ef-81cd-e6fea30decc0/habitat-management-for-bats.pdf
- **Ref. 8** Merckx, T., Feber, R.E., Dulieu, R.L., Townsend, M.C., Parsons, M.S., Bourn, N.A.D., Riordan, P., Macdonald, D.W. 2009. *Effect of field margins on moths depends on species mobility: Field-based evidence for landscape-scale conservation.* Agriculture, Ecosystems & Environment. 129(1–3) pp. 302 – 309. Doi: https://doi.org/10.1016/j.agee.2008.10.004

Annex A – Figures

LEGEND:

- Site boundary

Bat Static Detector Location

- 1: The Roses (field)
- 1: The Roses (hedgerow)
- 2: Abbot's Coppice (field)
- 2: Abbot's Coppice (hedgerow)
- 3: Spinzel (field)
- 3: Spinzel (hedgerow)

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	04/07/2025	First Draft	TG	RJ	KS

Rosefield Solar Farm

Rosefield Solar Farm

DOCUMENT:
ROSEFIELD SOLAR FARM

TITLE:
Site and Static Detector Locations

FIGURE NUMBER:
1

0 470 940
Metres

Scale: 1:25,000 @ A3

REV 00

Path:

Annex B – Weather conditions

Annex B – Weather conditions

Weather conditions – taken from the nearest location (Bicester) for which historical weather data is available via the website www.timeanddate.com

Survey Period	Date (survey nights)	Sunset / Sunrise	Sunset Temperature (°C)	Wind Speed (mph)	Overnight rain
October 2024	24/10/2024	07:45/17:51	15	7-16	None
	25/10/2024	07:47/17:49	14	1 – 13	None
	26/10/2024	07:49/17:47	13	1 - 7	Light rain for approx. 30 mins around 23:20
	27/10/2024	06:50/16:45 *	10	0 - 10	None
	28/10/2024	06:52/16:43	14	2 - 14	Drizzle at sunset. Light rain at 19:20 for approx. 1 hour
May 2025	14/05/2025	05:12/20:50	13	2 - 16	None
	15/05/2025	05:10/20:51	12	2 – 15	None
	16/05/2025	05:09/20:53	14	1 – 14	None
	17/05/2025	05:07/20:54	13	1 – 13	None
	18/05/2025	05:06/20:56	11	1 – 12	None
	19/05/2025	05:05/20:57	15	3 - 10	None
	20/05/2025	05:03/20:59	15	0 – 9	None
	21/05/2025	05:02/21:00	12	1 – 14	Light rain between 02:50 and 09:20
	22/05/2025	05:01/21:02	10	0 - 13	None

*clocks changed

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