Springwell Solar Farm

Environmental Statement
Appendix 7.13: Further Targeted Bat Activity Surveys

Volume 3

APFP Regulation 5(2)(a)

Planning Act 2008

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

EN010149/APP/6.3
November 2024
Springwell Energyfarm Ltd

Table of Contents

1. Introduction

1.1. Purpose of the report

1.1.1.1. This report describes the results of bat activity surveys (using static bat detectors) for Springwell Solar Farm (the 'Proposed Development') at targeted locations within the Order Limits where sections of hedgerow are proposed to be removed for access. The area within the Order Limits of the Proposed Development is referred to as the 'Site'.

1.1.1.2. Bat activity surveys (using static bat detectors) were previously carried out at the Site by RSK Biocensus in 2022 and 2023 **[Ref-1].** The aims of these previous surveys were to cover as much of the Site area as possible to determine the importance of various habitats around the Site for bats to inform impact assessment, design and mitigation.

1.1.1.3. For the Proposed Development works, several hedgerows would require removal of sections, more than 10m wide, for cable installation and access, including visibility splays for highways access and internal roads. Fragmentation of hedgerows by creating gaps more than 10m wide could affect foraging and commuting behaviour of some bat species using these hedgerows **[Ref-2].** The fragmentation effect is anticipated to be relatively short-term, due to hedgerow re-instatement planting proposed after works (as detailed in **Section 1.2** below). However, bat activity surveys were recommended, to inform the impact assessment and mitigation until hedgerows are re-instated after construction works. The hedgerows chosen for this targeted bat survey are proposed to be affected by highways access works, as larger sections of hedgerow here are proposed to be removed for highways access works compared to cable and internal access works. The hedgerows were all well connected and considered potentially important bat commuting and foraging routes, especially as several connect to woodlands. The locations of the bat detectors deployed in targeted hedgerows and woodlands is shown in **Figure 1**.

1.1.1.4. The aims of the surveys of 'targeted' hedgerows and woodlands in this report, are to inform the impact assessment of hedgerow removal on bats and mitigation by:

- identifying the bat species present;
- assessing relative activity levels and relative abundance; and
- reviewing timings of calls to determine if any significant communal bat roosts are likely to be present nearby.

1.2. Proposed Development

1.2.1.1. The Proposed Development comprises the construction, operation and maintenance of a solar photovoltaic (PV) generating modules, energy

storage facilities, and grid connection infrastructure across a proposed site in North Kesteven, Lincolnshire.

1.2.1.2. Several hedgerows will require removal of sections to facilitate access and enable underground cable installation. The sections to be removed are proposed to be:

- c. 10m wide to create internal access tracks;
- c. 30m wide for main cable installation; and
- of varying lengths for highways access i.e. for visibility splays and passing bays.

1.2.1.3. Re-instatement hedgerow planting would be carried out as soon as possible after works, including hedgerow gaps and along new boundaries, visibility splays and passing bays. Internal access roads, once constructed, would be only *c.* 6m wide. Therefore, after gaps in hedgerows have been re-instated and new planting has established, there should be no long-term adverse effect on bats from hedgerow fragmentation.

1.3. Ecological context

1.3.1.1. The Site is located close to the villages of Blankney, Scopwick, and Ashby de la Launde in the district of North Kesteven, Lincolnshire. The survey area is centred on OS National Grid Reference TF 06151 56947.

1.3.1.2. The Site is dominated by agricultural land (mostly arable) and hedgerows (often with trees), broadleaved woodland, and it includes several ponds, streams, and ditches.

1.3.1.3. The landscape surrounding the survey area is largely arable with a mixture of villages, farm complexes, a Royal Air Force base, pockets of woodland and some scattered residential properties. Arable fields are bounded by a mixture of hedgerows, lines of trees, stone walls, and fences.

1.3.1.4. A Preliminary Ecological Appraisal (PEA) (**ES Volume 3, Appendix 7.1 [EN010149/APP/6.3]**), including a background data search (BDS), was completed by RSK Biocensus in 2022 and in 2023. Records for at least nine species of bat were received from the BDS.

1.3.1.5. The Site was identified as suitable for foraging, commuting and roosting bats by the PEA, although the habitats on Site were considered to have low suitability for bats overall.

2. Legislation

2.1. General

2.1.1.1. This section briefly describes the legal protection afforded to bats. It is for information only and is not intended to be comprehensive or to replace specialised legal advice. It is not intended to replace the text of the legislation but summarises the salient points.

2.2. Bats

2.2.1.1. All species of bat are protected by The Wildlife and Countryside Act (WCA) 1981 (as amended) **[Ref-7]**, extended by the Countryside and Rights of Way Act 2000 **[Ref-8]**. Under Section 9 of the WCA, for 'European Protected Species' (EPS; see below) listed on Schedule 5, which includes bats, it is an offence to:

- intentionally or recklessly obstruct any place that a wild bat uses for shelter or protection;
- intentionally or recklessly disturb any wild bat while it is occupying a structure or place that it uses for shelter or protection; or
- publish, or cause to be published, any advertisement likely to be understood as conveying that they buy or sell, or intend to buy or sell, any live or dead wild bat or any part of, or anything derived from a wild bat.

2.2.1.2. Bats are also EPS listed on The Conservation of Habitats and Species Regulations 2017 (as amended) **[Ref-9]**. This legislation makes it an offence to:

- deliberately capture, injure or kill such a bat;
- deliberately disturb bats, including in particular any disturbance which is likely (a) to impair their ability – (i) to survive, to breed or reproduce, or to rear or nurture their young; or (ii) hibernate or migrate, where relevant; or (b) to affect significantly the local distribution or abundance of the species to which they belong;
- damage or destroy a breeding site or resting place of a bat; or
- possess, control, transport, sell, exchange, or offer for sale or exchange any live or dead bat or part of a bat or anything derived from a bat or any part of a bat.

2.2.1.3. Additionally, certain bat species are afforded additional protection as an Annex II species (under the Habitats Directive) for which Special Areas of Conservation (SACs) may be designated. Of these, only barbastelle (*Barbastella barbastellus*) is present in Lincolnshire.

3. Methodology

3.1. General

3.1.1.1. The work described below was undertaken following current Bat Surveys for Professional Ecologists, Good Practice Guidance **[Ref-3]**. Where methods deviate from the guidance regarding survey effort (number and timing of survey visits) this has been detailed and fully justified in **Section 3.3** below.

3.2. Background Data Search

3.2.1.1. To provide context for the results of the bat surveys, a BDS was carried out for biological records from the Greater Lincolnshire Nature Partnership **[Ref-10]**. The BDS was undertaken in April 2023 to produce a PEA report (**ES Volume 3, Appendix 7.1 [EN010149/APP/6.1]**) **[Ref-1].** A search was made for information on statutory designated sites and non-statutory designated (local wildlife) sites within 2km of the survey area boundary. The search was extended to 10km for internationally designated sites, i.e., Ramsar sites, Special Areas of Conservation (SAC), and Special Protection Areas (SPA). The search included a 2km radius for notable species, including bats.

3.3. Static bat detector surveys

3.3.1.1. The Site was determined to be overall 'low' suitability to support foraging and commuting bats from the PEA due to habitats on Site **[Ref-2]**. General guidance for bat activity surveys recommends a single activity survey per season (in spring, summer and autumn) for low suitability habitat **[Ref-3]** which was the method used for the previous surveys to determine bat activity across the whole Site **[Ref-5]**. However, the aims of this survey are more specific, which are to inform if the proposed hedgerow removal could have a significant impact on the local bat population i.e. if any significant communal bat roosts or commuting routes would be affected. Bats breed in communal maternity bat roosts between May and August. Previous surveys showed a relatively low level of bat activity in May so it was decided that a survey visit each month in June, July and August would be sufficient to cover the maternity season.

3.3.1.2. Thirteen Full Spectrum (FS) static bat detectors were deployed in separate locations within the survey area for five nights each month, to comprise 195 nights of surveillance across all locations (13 units x 5 nights x 3 months). They were deployed in targeted locations, within hedgerows where sections are proposed to be removed and also in nearby woodlands which could potentially provide roosting opportunities.

3.3.1.3. FS units comprised nine Wildlife Acoustics Song Meter 4 (SM4) and four Anabat Swift (AS) detectors, all with omni-directional microphones. Each microphone was mounted at a minimum height of 1.5m to maximise the

probability of recording bat calls and to reduce the likelihood of noise interference from insects and moving vegetation.

3.3.1.4. Prior to static detector deployment, walkover surveys were conducted in 'Gorse Hill Covert' woodland, at the north-west edge of the Site, (TF 01538 56450) and in the two woodlands, at the north-east edge of the Site, (TF 06978 59142 and TF 07374 59298) - as these woodlands connect directly to hedgerows affected. The aims of the woodland surveys were to determine the potential for communal barbastelle (*Barbastella barbastellus*) roosts and to inform the placement of the detectors to aid in detecting possible communal roosts of any bat species. The size and age of the woodland and trees, as well as potential roost features were considered. Static detector 'S1' was deployed at the edge of Gorse Hill Covert in Springwell West and detectors 'S10' and 'S11' were deployed in the woodlands in Springwell East, as shown in **Figure 1**.

3.3.1.5. The bat call data was analysed each month prior to each subsequent survey to check detectors were working and to determine if they needed to be moved. There was found no reason to move them, so the detectors were deployed in the same locations each month which were considered optimal.

3.3.1.6. Each monthly detector deployment was at least ten days after the previous one. Detectors were deployed when the weather forecast indicated suitable conditions for foraging and commuting bats (i.e. air temperature above 8°C, wind speed below 5m/s and light or no precipitation).

3.3.1.7. Each detector was programmed to listen for and record acoustic bat activity from 30 minutes before sunset until 30 minutes after sunrise.

3.3.1.8. **Table 1** provides dates of deployments. **Table 2** provides weather conditions during deployments. **Figure 1** shows the locations of the static detector monitoring points.

Table 1 Survey dates for each static detector deployment

Month	Start date	End date	Notes
June	26/06/2024	01/07/2024	13 detectors deployed (1 failed, only 12 recorded)
July	23/07/2024	28/07/2024	13 detectors deployed (all 13 recorded)
August	08/08/2024	12/08/2024	13 detectors deployed (all 13 recorded)

Table 2 Weather conditions for each static detector deployment

Month of monitoring	Minimum temperature at sunset (˚C)	Maximum temperature at sunset (˚C)	General weather during monitoring period	Number of nights with rain
June	15	22	Warm, sunny and humid at the beginning of the monitoring period, with brief rain showers during the last two nights	2
July	17	24	Warm and sunny with some cloudy periods	0
August	19	26	Cloudy but dry and warm	0

3.4. Data analysis and quality assurance

3.4.1.1. Due to the large volume of acoustic data recorded on the detectors the manual identification of recorded calls was not feasible. Consequently, the British Trust for Ornithology's Acoustic Pipeline (BTO AP) auto-identification software was used to process and identify calls, with additional manual auditing applied as necessary.

3.4.1.2. The BTO AP recommends that recordings with probabilities lower than 0.5 be discarded (after checking as appropriate) and are therefore not included in this report.

3.4.1.3. Manual quality assurance (QA) was undertaken on all calls that were auto-identified as being from non-Pipistrelle or *Myotis* species, except for Nathusius' pipistrelle *Pipistrellus nathusii* calls, which were also manually checked.

3.4.1.4. For the calls that did require QA, if there were more than 50 calls of one species in one location, only 50 were checked, and any low confidence calls (probabilities less than 0.5) were discarded. The exception was for barbastelle, for which all calls, regardless of the quantity were checked, because of the scarcity and conservation status of this species.

3.4.1.5. The BTO pipeline software is highly efficient at identifying bat calls from the genus Pipistrellus due to the extensive library of bat calls stored within it. It is also currently the only system that considers the sound identification of bat social calls, reducing the chance of social calls being misidentified as the wrong bat species.

3.4.1.6. Echolocation calls were identified down to species wherever possible; however, depending on the type of bat encountered and call recorded, it is not always possible to reliably identify all bats beyond their genus. In particular, because of the similarities of their Frequency-Modulated (FM) calls, *Myotis* bat species cannot always be reliably separated. For this

reason, myotis calls were not manually checked, as they are difficult to differentiate accurately.

3.4.1.7. Experienced bat ecologists carried out all QA of recorded calls using sound analysis software (Elekon Bat Explorer and Wildlife Acoustics Kaleidoscope).

3.4.1.8. Note that it can be difficult to separate some calls of *Plecotus* (long-eared) bat species, as well as separating some *Plecotus* calls from *Myotis* bats, although only one species of *Plecotus* (*P. auritus*, the brown long-eared bat) is present in Lincolnshire. It can also be difficult to distinguish between 'big bats' i.e., the two bats in the *Nyctalus* genus (noctule *N. noctula* and Leisler's bat *N. leisleri*) and those of serotine (*Eptesicus serotinus*). Some calls of common pipistrelle (*Pipistrellus pipistrellus*) also overlap with either Nathusius' pipistrelle or soprano pipistrelle (*P. pygmaeus*).

3.4.1.9. Analysis of cryptic calls can also be more difficult with faint or poor-quality recordings. There are several variables that affect the 'detectability' of a bat call, ranging from the bat's biology and ecology to the environmental conditions and condition of the equipment, and so there are limitations in drawing certain conclusions about bat activity on a site from the use of bat detectors/sound analysis alone. Given the variable detectability between different species of bats i.e. from a few meters for the quietest species (e.g. brown long-eared bat and barbastelle) up to 100m for louder species (e.g., noctule) the percentage distributions of units of activity detected (recordings containing a particular species' calls) should not be extrapolated to estimate abundance or compare levels of relative activity between species groups.

3.4.1.10. Caution should be exercised when reviewing the results as the number of recordings does not equate to the number of individual bats, and reliable assumptions cannot therefore be made about species populations.

3.5. Validity of data

3.5.1.1. The data collected is usually valid for 18 months following the field survey to provide evidence that is material to the planning determination. Should consent not be awarded within 18 months of the completed surveys, then it may be necessary to confirm that there have not been material changes before planning is determined.

3.6. Survey considerations

3.6.1.1. Night-time walkover transect surveys were not undertaken, which is a deviation from recommendations within bat survey guidance (Collins, 2023) **[Ref-3]**. Transects were not undertaken due to the size of the Site and because there were very few trees and structures nearby that could support roosts and it was considered that limited information would be gained from nighttime walkover surveys. There were also significant health and safety considerations posed by roads for night time surveys. To

counter the lack of walked transects, several detectors were deployed in different locations and more data on bat activity was gathered overall. The lack of walked transects is not therefore considered a survey constraint.

3.6.1.2. One detector failed during its deployment, in Location 11 in June, and no recordings were made during the five nights of this deployment. Otherwise, 190 of 195 intended survey nights were successfully completed. The failure of this one deployment is not considered to be a significant constraint given the objectives of the surveys.

3.6.1.3. While the presence/absence of different species in the genera *Myotis*, *Plecotus* and *Nyctalus* is easier to ascertain where high-quality calls have been collected, there are often calls where certainty is not possible, and therefore levels of bat activity by these species (rather than genus) must be interpreted with some caution.

3.6.1.4. *Myotis spp.* and some large bat calls were only identified to the genus level. It is possible that some of these recordings could represent species not identified in the analysis of the recorded data.

3.6.1.5. As discussed above, passive (static) monitoring methodologies depend on sound reaching the microphone, and as such the detection rate of bat calls varies with a bias towards loud bats / calls, with quieter calls and species likely under-recorded.

4. Results

4.1. Background Data Search

4.1.1.1. There were no internationally protected nature conservation sites within 10km of the survey area boundary nor nationally protected statutory designated nature conservation sites within 2km. There are no nature conservation sites specifically designated for bats within 10km.

4.1.1.2. The results of the 2km search for bat species are provided in **Table 3** below.

4.1.1.3. At least nine species of bats have been recorded within 2km of the survey area, with additional records also returned which were not identified to species level. All species have been recorded within the past 10 years. Number of records includes all records for the species / genus held by the records centre.

Table 3 BDS bat results

Scientific name	Common name	Number of records	Most recent record
Barbastella barbastellus	Western barbastelle	15	2016
Chiroptera	Unidentified bat	468	2020
Myotis daubentonii	Daubenton's	5	2015
Myotis mystacinus / brandtii	Whiskered / Brandt's	4	2019
Myotis nattereri	Natterer's	8	2016
Myotis species	Unidentified Myotis species	17	2017
Nyctalus noctula	Noctule	28	2019
Pipistrellus nathusii	Nathusius's pipistrelle	5	2017
Pipistrellus pipistrellus	Common pipistrelle	76	2019
Pipistrellus pygmaeus	Soprano pipistrelle	34	2020
Pipistrellus species	Unidentified pipistrelle species	108	2020
Plecotus auritus	Brown long-eared bat	83	2019

4.2. Woodland roost potential

4.2.1.1. The walkover survey of the three woodlands determined they were of low suitability for communal barbastelle bat roosts. Trees were mostly semi-mature and lacked naturally damaged and decaying trees with cracks and crevices suitable for roosting and were not typical for colonies. Trees in the woodlands may be suitable for sporadic day/night roosts for a small number of individual bats but were not considered suitable for any significant communal or maternity bat roosts.

4.3. Static detector results

4.3.1.1. **Tables 4** to **6** below show the combined static data recorded from each location. **Figure 1** shows the locations for each deployment.

4.3.1.2. A total of 53,287 call registrations from at least ten species were recorded over the survey period. These were common pipistrelle (75.5% of total call registrations), soprano pipistrelle (9.7%), noctule (4.6%), species in the *Myotis* genus (4.2%), barbastelle (2.8%), Nathusius' pipistrelle (1.3%), brown long-eared bat (1.2%) and Leisler's (0.7%).

4.3.1.3. While species within the *Myotis* genus were not counted separately during data analysis, due to the similarity and overlapping parameters of their calls, the BTO AP is designed to work at a species level and the following Myotis species were auto-ID'd with probabilities of greater than 0.9: Daubenton's bat *Myotis daubentonii*, Natterer's bat *M. nattereri*, and whiskered / Brandt's bat *M. mystacinus* / *M. brandtii*. It is therefore reasonable to assume that all of these species were detected.

4.3.1.4. Common and soprano pipistrelle accounted for 85.1% of the total calls across the three months. Common pipistrelle was the species with the most monthly call registrations (June 79% of total calls, July 77%, and August 71%).

4.3.1.5. Soprano pipistrelle had the second-highest call registrations every month (June 8.5% of total calls, July 8.7%, and August 11.2%)

4.3.1.6. Barbastelle was the only species recorded that is listed under Annex II of the Habitats Directive, with 1,446 call registrations across the three survey months (2.8% of total call registrations). Of these, 25.5% of calls were recorded in June, 28.3% in July, and 46.2% in August.

Table 4 June 2024 remote monitoring data

Static #	Bbar	Myotis sp.	Nlei	Nnoc	Ppip	Ppyg	Pnat	Paur	Total
S1	15	35	1	8	217	337	-	2	615
S2	17	13	3	7	246	26	1	18	331
S3	12	44	-	6	1699	73	1	50	1885
S4	13	50	-	25	3833	110	218	-	4249
S5	152	159	-	50	1798	12	52	-	2223
S6	37	57	-	13	277	7	18	-	409
S7	9	23	-	27	274	5	-	-	338
S8	2	13	-	29	545	5	9	-	603
S9	51	4	1	11	250	8	-	17	342
S10	47	18	4	31	149	16	-	7	272
S12	14	47	-	19	164	45	-	11	300
S13	1	21	53	105	1361	522	1	4	2068
Grand Total	370	484	62	331	10813	1166	300	109	13635

Note: Bbar = Barbastelle. Myotis sp. = Species in Myotis genus. Nlei = Leisler's. Nnoc = Noctule. Ppip = Common pipistrelle. Ppyg = Soprano pipistrelle. Pnat = Nathusius pipistrelle. Paur = Brown long-eared.

Static 11 did not record in this month so is not respresented here.

Table 5 July 2024 remote monitoring data

Static #	Bbar	Myotis sp.	Nlei	Nnoc	Ppip	Ppyg	Pnat	Paur	Total
S1	-	24	7	40	246	669	-	5	991
S2	82	70	8	34	378	14	5	13	604
S3	16	79	5	9	643	8	-	6	766
S4	3	19	4	189	2987	134	96	2	3434
S5	60	99	5	70	1203	10	1	4	1452
S6	138	70	4	56	344	4	1	3	620
S7	29	20	16	50	497	41	1	-	654
S8	1	8	1	13	675	8	1	1	708
S9	39	32	4	38	1056	17	4	9	1199
S10	-	1	-	-	40	-	-	-	41
S11	-	2	-	9	1	-	-	-	12
S12	9	64	10	45	1323	113	5	5	1574
S13	30	112	103	299	4015	514	219	76	5368
Grand Total	407	600	167	852	13408	1532	333	124	17423

Note: Bbar = Barbastelle. Myotis sp. = Species in Myotis genus. Nlei = Leisler's. Nnoc = Noctule. Ppip = Common pipistrelle. Ppyg = Soprano pipistrelle. Pnat = Nathusius pipistrelle. Paur = Brown long-eared.

Table 6 August 2024 remote monitoring data

Static #	Bbar	Myotis sp.	Nlei	Nnoc	Ppip	Ppyg	Pnat	Paur	Total
S1	12	100	3	70	332	69	-	62	648
S2	21	70	10	46	642	59	1	24	873
S3	18	107	1	36	803	58	-	33	1056
S4	69	356	17	380	1305	263	-	17	2407
S5	169	76	9	43	1115	42	-	28	1482
S6	72	21	32	38	612	36	-	10	821
S7	115	40	26	77	2252	22	8	19	2559
S8	90	32	5	24	579	36	-	6	772
S9	31	44	16	30	530	643	-	23	1317
S10	-	1	-	5	135	22	-	1	164
S11	41	41	4	17	659	75	-	8	845
S12	-	11	1	9	3	2	-	-	26
S13	31	248	62	511	6994	1183	98	132	9259
Grand Total	669	1147	186	1286	15961	2510	107	363	22229

Note: Bbar = Barbastelle. Myotis sp. = Species in Myotis genus. Nlei = Leisler's. Nnoc = Noctule. Ppip = Common pipistrelle. Ppyg = Soprano pipistrelle. Pnat = Nathusius pipistrelle. Paur = Brown long-eared.

5. Evaluation

5.1. Activity levels

5.1.1.1. The surveys recorded a total of 53,287 call registrations across three months of static bat detector deployments.

5.1.1.2. Bat activity (based on the number of call registrations) peaked in August, with 42% of the total recordings from the three months recorded. July recorded 32.5% of total call registrations, while June was the quietest month, with 25.5% of call registrations.

5.1.1.3. Activity was recorded in similar levels across the survey area.

5.2. Species assemblage

5.2.1.1. At least 10 species were recorded across the survey area. Common pipistrelle had the highest number of call registrations across the survey period, with 75.5% of total calls, and was the most recorded species in each month, which is often the case for this 'common and widespread' species. Call registrations for common pipistrelle were similar across all months (10,813 in June, 13,408 in July and 15,961 in August) and made up the highest percentages of all calls (79.3% of all calls in June, 76.9% in July and 71.8% in August).

5.2.1.2. Soprano pipistrelle comprised 9.7% of the total recordings and was the second most recorded species in July and August.

5.2.1.3. *Myotis* species recorded likely included Daubenton's bat, Natterer's bat and whiskered/Brandt's bats. The BTO Acoustic Pipeline software attributed 29 calls to Brandt's bat, 288 to whiskered bat, 813 to Daubenton's bat, and 1,063 to Natterer's bat. There were also 38 calls initially identified as a different species; however, during QA these were deemed to be *Myotis* but they could not be identified to species level.

5.2.1.4. For the purposes of this report, the calls of *Myotis* are not distinguished. When grouped, call registrations from *Myotis* species accounted for 4.2% of the total across the survey period. Activity for this group peaked in August, with 1,147 call registrations attributed to *Myotis* species, comprising 5.1% of the monthly calls. The BTO Acoustic Pipeline software allocated most of these calls to Natterer's bat (455) and Daubenton's bat (426), although this has not been verified manually.

5.2.1.5. The acoustic data shows that barbastelles commute across the survey area. Barbastelle calls were recorded in all three survey months. August accounted for 46.2% of the total calls for the species. Barbastelle accounted for 2.8% of the total call registrations across the survey periods.

5.2.1.6. Statics 5, 6, and 7 were in the same area but monitoring three different hedgerows. These units were located at TF 03094 53121, TF 03400

53160 and TF 03556 53235 respectively. Statics 5 and 6 were located approximately 300 m apart, and statics 6 and 7 were 173 m apart. These three detectors accounted for 53.2% of all the barbastelle call registrations in August. These detectors were located on roads bordered by hedgerows, surrounded by arable fields.

5.2.1.7. The earliest barbastelle calls on all three detectors were at 22:00, approximately 1.5 hours after sunset, and the latest was 04:15, approximately 1.5 hours before sunrise. The average number of calls per night per detector was 23 (range 50 – 1). In August, the earliest calls after sunset were recorded at detectors 11 and 13, approximately 50 minutes after sunset. The latest calls were recorded at the same two locations approximately 70 minutes before sunrise.

5.2.1.8. Barbastelle can range up to 20 km per night to forage, and emergence times are usually within 60 minutes of sunset (range of 12-36 minutes after sunset within woodland), whilst roost return times are highly variable (range of 194 – 59 minutes before sunrise) (Zeale *et al*. 2012).

5.2.1.9. Noctule call registrations were recorded on all surveys. The number of calls was lowest in June, accounting for 13.5% of recordings, higher in July with 34.5%, and highest in August with 52%.

5.2.1.10. Leisler's bat was recorded in low numbers in all months, and from detectors located across the survey area, accounting for 0.7% of all bat calls.

5.2.1.11. The BTO Acoustic Pipeline software attributed 189 calls to serotine. Many of the serotine call parameters overlap with those of Leisler's bat and, to some extent, with those of noctule. Serotine is considered absent from Lincolnshire (GLNP, 2013; LBP, 2011; Matthews *et al*., 2018), and as none of the calls could be confirmed as serotine, these 189 calls have been labelled as Leisler's bat or noctule; or, discarded as noise.

5.2.1.12. Nathusius' pipistrelle was recorded in low numbers compared to other species. In total, they accounted for 1.3% of the total call registrations, and 740 was the highest number of registrations recorded in August.

5.2.1.13. Small numbers of brown long-eared bat calls were recorded across the survey periods, totalling 596 call registrations (1.1% of total registrations). Of these 363 (60.9%) were recorded within August. As discussed above it is likely that this is an under-representation of their presence within the survey area.

5.3. Conclusion

5.3.1.1. The species assemblage was similar in terms of species and relative abundance when compared with previous surveys of the wider area of the Site carried out in 2022 and 2023 **[Ref-1]**. A total of 10 species were recorded, comprised of common pipistrelle (75.5% of total call registrations), soprano pipistrelle (9.7%), noctule (4.6%), species in the

Myotis genus (4.2%), barbastelle (2.8%), Nathusius' pipistrelle (1.3%), brown long-eared bat (1.2%) and Leisler's (0.7%).

5.3.1.2. The late timings of most calls and the relatively low number of bat passes which were recorded around expected emergence times did not indicate that there were likely to be any significant communal bat roosts for any bat species near to where hedgerow removal works are proposed.

5.3.1.3. Barbastelle are a rare bat listed under Annex II of the habitats directive. They are generally associated with woodlands which they use for foraging and roosting. Barbastelle have wide ranges and are most likely to be using hedgerows and other field boundaries across the Site for commuting to access woodlands adjacent to the Site or further afield where they can forage and roost. Barbastelle are less affected by gaps of 10m in hedgerows and can commute freely across large open areas **[Ref-4].**

5.3.1.4. Removal of sections of hedgerow 10m or more could affect other bat species which are more sensitive to gaps in vegetation, such as brown long-eared bats. However re-instatement planting with appropriate hedgerow species would be carried out as soon as possible after works. Internal access roads, once constructed, would be only 6m wide. Therefore, after gaps in hedgerows have been re-instated and new planting has established, there should be no long-term adverse effect on bats from hedgerow fragmentation.

5.3.1.5. To mitigate the temporary effects of hedgerow fragmentation during the construction phase, mitigation such as installing fencing with brash or shrubs in planters in gaps in 'key' hedgerows at night would maintain hedgerow connectivity for bats by mimicking hedgerow vegetation.

5.3.1.6. The survey findings indicate that it is unlikely that there are any significant communal bat roosts directly connected to the surveyed hedgerows, which would be temporarily fragmented by highways access works. Any communal bat roosts in the vicinity are therefore unlikely to be significantly affected as they would likely be able to use the surrounding network of hedgerows for commuting and foraging.

The 'targeted' hedgerows were chosen for survey as they are proposed to be affected by highways access, which is where larger sections of hedgerow are proposed to be removed compared to cable and internal access works. The hedgerows were considered likely of 'key' importance for bats as they have few gaps, connect well to other hedgerows, woodlands and other habitats and are therefore potentially important bat commuting and foraging routes. However, there are many other 'key' hedgerows across the Site, also well connected and considered potentially important for bats, which were not surveyed. All 'key' hedgerows which are to be fragmented by both access and cable works should be considered in bat mitigation proposals.

6. References

Ref-1: RSK Biocensus (2023) Springwell Solar Farm: Preliminary Ecological Appraisal Report. 2483765. RSK Biocensus, Coventry.

Ref-2: 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-3: Collins (ed.) (2023): Bat Surveys for Professional Ecologists, Good Practice Guidelines. 4th edition. Bat Conservation Trust.

Ref-4: Zeale, M., Davidson-Watts, I., & Jones, G. (2012). Home range use and habitat selection by barbastelle bats (*Barbastella barbastellus*): implications for conservation. Journal of Mammalogy 93(4): 1110-1118

Ref-5: RSK Biocensus (2023) Springwell Solar Farm: Bat Activity Survey Report.. RSK Biocensus, Coventry.

Ref-6: RSK Biocensus (2023) Springwell Solar Farm: Bat Activity Survey, Addendum. RSK Biocensus, Coventry

Ref-7: Wildlife and Countryside Act 1981. Available online: https://www.legislation.gov.uk/ukpga/1981/69

Ref-8: Countryside and Rights of Way Act 2000. Available online: https://www.legislation.gov.uk/ukpga/2000/37/contents

Ref-9: The Conservation of Habitats and Species Regulations 2017. Available online: https://www.legislation.gov.uk/uksi/2017/1012/contents

Ref-10: Greater Lincolnshire Nature Partnership. Available online: [redacted]

Figure 1 - Static Detector Locations

Application Document Ref: EN010149/APP/6.3
Planning Inspectorate Scheme Ref: EN010149

500000 501000 502000 503000 504000 505000 506000 507000 508000 509000 510000

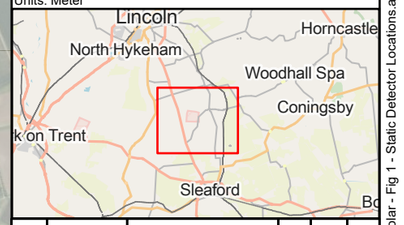
361000 360000 359000 358000 357000 356000 355000 354000 353000 352000

S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13

LEGEND:

- Order limits
- Static detector

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



Rev	Date	Description	Drn	Chk	App
01	NOV 2024	DCO SUBMISSION	RSK	RSK	EDF

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
ENVIRONMENTAL STATEMENT
VOLUME 3, APPENDIX 7.13: FURTHER TARGETED BAT ACTIVITY SURVEYS
REGULATION 5(2)(a)

TITLE:
FIGURE 1 STATIC DETECTOR LOCATIONS

PINS REFERENCE NUMBER:
EN010149/APP/6.3

0 0.5 1
Kilometers

Scale: 1:35,000 @ A3

REV 01

Path: RSK Group \ RSK Biocensus - 06 GIS - 2483765 - EDF Solar Springwell \ 03 - APRX \ 2483765 - Springwell Solar - Fig 1 - Static Detector Locations.aprx

Figure 2 - Species Diversity June 2024

Application Document Ref: EN010149/APP/6.3
Planning Inspectorate Scheme Ref: EN010149

500000 501000 502000 503000 504000 505000 506000 507000 508000 509000 510000

361000 360000 359000 358000 357000 356000 355000 354000 353000 352000

S1 (7)
S2 (8)
S3 (7)
S4 (6)
S5 (6)
S6 (6)
S7 (5)
S8 (6)
S9 (7)
S10 (7)
S12 (6)
S13 (8)

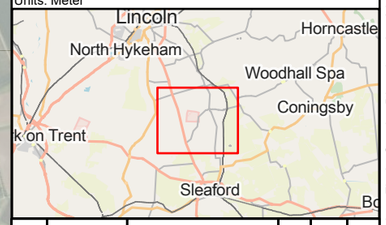
LEGEND:

Order limits

Species Count at Static Detector

1
2
3
4
5
6
7
8

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



Rev	Date	Description	Drn	Chk	App
01	NOV 2024	DCO SUBMISSION	RSK	RSK	EDF

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ENVIRONMENTAL STATEMENT
VOLUME 3, APPENDIX 7.13: FURTHER TARGETED BAT ACTIVITY SURVEYS
REGULATION 5(2)(a)

TITLE:
FIGURE 2 SPECIES DIVERSITY – JUNE 2024

PINS REFERENCE NUMBER:
EN010149/APP/6.3

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Kilometers

Scale: 1:35,000 @ A3

REV 01

Path: RSK Group \ RSK Biocensus - 06 GIS - 2483765 - EDF Solar Springwell \ 03 - APRX \ 2483765 - Springwell Solar - Fig 2 - Species Diversity - Jun 24.aprx

Figure 3 - Species Diversity July 2024

Application Document Ref: EN010149/APP/6.3
Planning Inspectorate Scheme Ref: EN010149

500000 501000 502000 503000 504000 505000 506000 507000 508000 509000 510000

361000 360000 359000 358000 357000 356000 355000 354000 353000 352000

S1 (6)
S2 (8)
S3 (7)
S4 (8)
S5 (8)
S6 (8)
S7 (7)
S8 (8)
S9 (8)
S10 (2)
S11 (3)
S12 (8)
S13 (8)

LEGEND:

Order limits

Species Count at Static Detector

1
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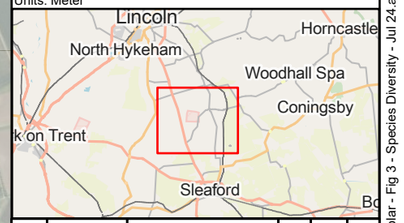
4
5
6
7
8

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



Rev	Date	Description	Drn	Chk	App
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ENVIRONMENTAL STATEMENT
VOLUME 3, APPENDIX 7.13: FURTHER TARGETED BAT ACTIVITY SURVEYS
REGULATION 5(2)(a)

TITLE:
FIGURE 3 SPECIES DIVERSITY – JULY 2024

PINS REFERENCE NUMBER:
EN010149/APP/6.3

0 0.5 1
Kilometers

Scale: 1:35,000 @ A3

REV 01

Path: RSK Group \ RSK Biocensus - 06 GIS - 2483765 - EDF Solar Springwell \ 03 - APRX \ 2483765 - Springwell Solar - Fig 3 - Species Diversity - Jul 24.aprx

Figure 4 - Species Diversity August 2024

Application Document Ref: EN010149/APP/6.3
Planning Inspectorate Scheme Ref: EN010149

500000 501000 502000 503000 504000 505000 506000 507000 508000 509000 510000

361000 360000 359000 358000 357000 356000 355000 354000 353000 352000

S1 (7)
S2 (8)
S3 (7)
S4 (7)
S5 (7)
S6 (7)
S7 (8)
S8 (7)
S9 (7)
S10 (5)
S11 (7)
S12 (5)
S13 (8)

LEGEND:

Order limits

Species Count at Static Detector

1
2
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4
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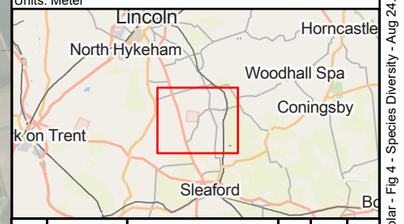
6
7
8

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



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VOLUME 3, APPENDIX 7.13: FURTHER TARGETED BAT ACTIVITY SURVEYS
REGULATION 5(2)(a)

TITLE:
FIGURE 4 SPECIES DIVERSITY – AUGUST 2024

PINS REFERENCE NUMBER:
EN010149/APP/6.3

0 0.5 1
Kilometers

Scale: 1:35,000 @ A3

REV 01

Path: RSK Group \ RSK Biocensus - 06 GIS - 2483765 - EDF Solar Springwell \ 03 - APRX \ 2483765 - Springwell Solar - Fig 4 - Species Diversity - Aug 24.aprx

Figure 5 - Barbastelle Activity

Application Document Ref: EN010149/APP/6.3
Planning Inspectorate Scheme Ref: EN010149

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361000 360000 359000 358000 357000 356000 355000 354000 353000 352000

S11 (41) S12 (23) S9 (121) S13 (62) S10 (47) S7 (153) S2 (120) S1 (27) S3 (46) S4 (85) S8 (93) S5 (381) S6 (247)

LEGEND:

Order limits

Call Registrations

- Proportional symbology

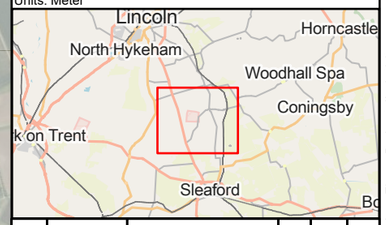
1

10

50

100

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



Rev	Date	Description	Drn	Chk	App
01	NOV 2024	DCO SUBMISSION	RSK	RSK	EDF

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DOCUMENT:
ENVIRONMENTAL STATEMENT
VOLUME 3, APPENDIX 7.13: FURTHER TARGETED BAT ACTIVITY SURVEYS
REGULATION 5(2)(a)

TITLE:
FIGURE 5 BARBASTELLE ACTIVITY

PINS REFERENCE NUMBER:
EN010149/APP/6.3

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Kilometers

Scale: 1:35,000 @ A3

REV 01

Path: RSK Group \ RSK Biocensus - 06 GIS - 2483765 - EDF Solar Springwell \ 03 - APRX \ 2483765 - Springwell Solar - Fig 5 - Barbastelle Activity aprx

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