Green Hill Solar Farm

EN010170

Environmental Statement
Appendix 9.6 Bat Surveys
Revision A (Tracked)

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APFP Regulation 5(2)(a)

Schedule of Changes

Revision	Section Reference	Description of Changes	Reason for Revision
A	[cover]	Updated to Revision A	As required for submission at Deadline 1.
	Section 1.2	Updates to document references.	As required for submission at Deadline 1.
	[throughout]	Updated to include survey results from Green Hill A.2 in Spring 2025.	Updated survey results based on survey of Green Hill A.2.
	[throughout]	A minor error in the data analysis, where variations in survey periods was not accounted for, has been rectified, and all values within the data tables have been updated.	Applicant due diligence.
	[throughout]	Clarifications and amendments of typographical errors.	Applicant due diligence.

Contents

1 Appendix 9.6 – Bat Surveys (Revision A)

1.1 Introduction

1.1.1 This appendix presents the methods and findings of bat surveys conducted to date as part of a Scheme-wide bat assessment. They include the following elements:

- Desk study and data search.
- Habitat suitability assessment.
- Daytime building assessment.
- Ground-level tree assessments (GLTAs).
- Automated bat activity surveys.

1.1.2 All surveys have followed the 3rd edition of the Bat Conservation Trust (BCT) Good Practice Guidelines (Ref.1). This was updated to the 4th edition after the survey programme had commenced (Ref.2).

1.1.3 Consultation with Natural England took place in January 2024 via their Discretionary Advice Service to agree the survey scope at the Solar PV Sites.

~~1.1.4 Surveys were completed across the Scheme between August 2023 and October 2024. At Green Hill A.2 only, one survey was completed in April 2025, and another is scheduled for May 2025, since this Site was added to the Scheme at a later date. This report will be updated as additional survey data becomes available.~~

~~1.1.5~~1.1.4 Ecological surveys have a limited validity due to the dynamic nature of the environment. If no action or development occurs within twelve months of this report, the survey results should be reviewed and may require updating. After three years, the survey data will be considered invalid and repeat surveys will be necessary.

~~1.1.6~~1.1.5 In accordance with CIEEM's Code of Professional Conduct (Ref.3), species recorded during surveys will be submitted to the county biological records centre to enhance their records.

~~1.1.7~~1.1.6 This appendix is supported by the following Figures:

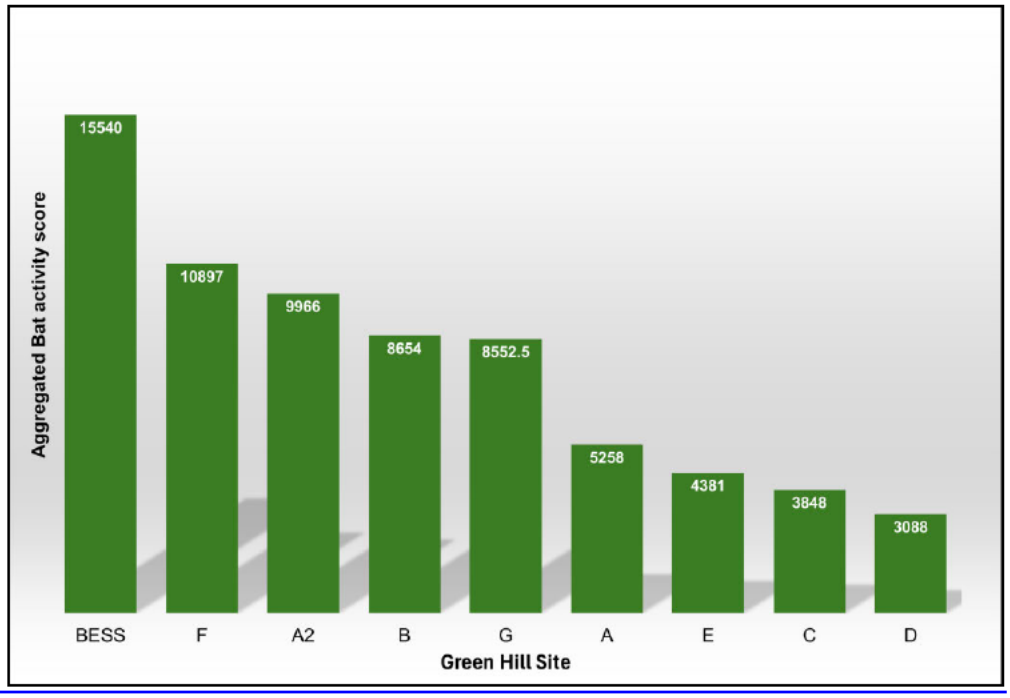
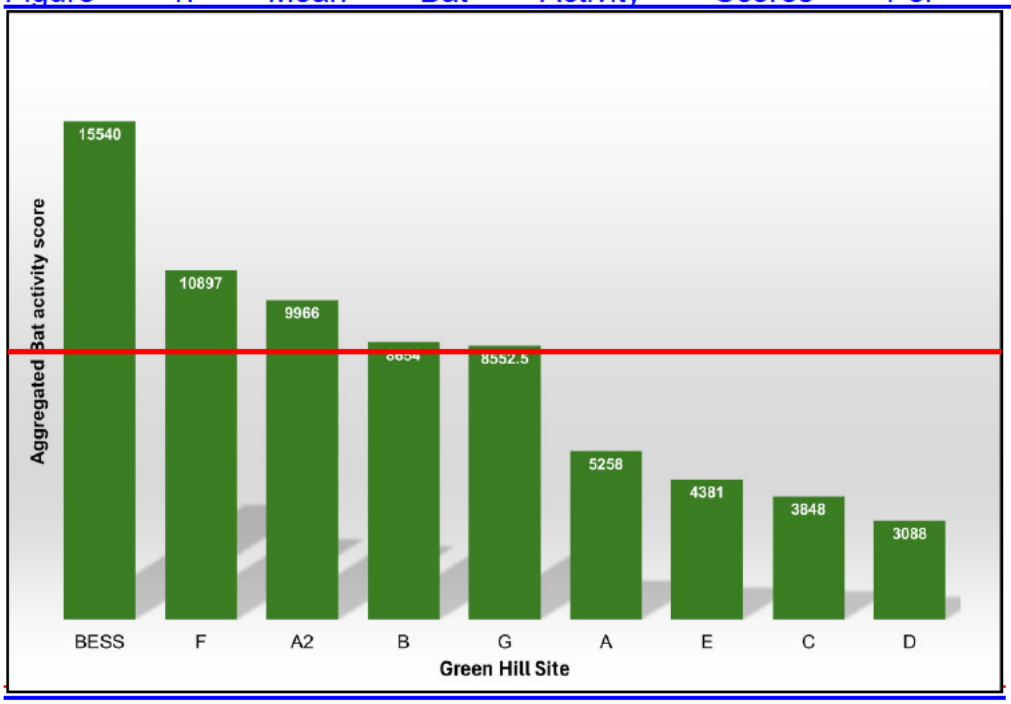


Figure 1: Mean Bat Activity Scores Per Site



- ~~Figure 1: Mean Bat Activity Scores Per Site~~
- Figure 9.6.1 Bat Static Detector Locations (Green Hill A & A.2)
- Figure 9.6.2 Bat Static Detector Locations (Green Hill B)
- Figure 9.6.3 Bat Static Detector Locations (Green Hill C & D)
- Figure 9.6.4 Bat Static Detector Locations (Green Hill E)
- Figure 9.6.5 Bat Static Detector Locations (Green Hill BESS)

- Figure 9.6.6 Bat Static Detector Locations (Green Hill F)
- Figure 9.6.7 Bat Static Detector Locations (Green Hill G)
- Figure 9.6.8 Bat Ground Level Tree Assessment Results (Green Hill A & A.2)
- Figure 9.6.9 Bat Ground Level Tree Assessment Results (Green Hill B)
- Figure 9.6.10 Bat Ground Level Tree Assessment Results (Green Hill C & D)
- Figure 9.6.11 Bat Ground Level Tree Assessment Results (Green Hill E)
- Figure 9.6.12 Bat Ground Level Tree Assessment Results (Green Hill BESS)
- Figure 9.6.13 Bat Ground Level Tree Assessment Results (Green Hill F)
- Figure 9.6.14 Bat Ground Level Tree Assessment Results (Green Hill G)
- Figure 9.6.15 Bat Ground Level Tree Assessment Results (Cable Route 1 of 5)
- Figure 9.6.16 Bat Ground Level Tree Assessment Results (Cable Route 2 of 5)
- Figure 9.6.17 Bat Ground Level Tree Assessment Results (Cable Route 3 of 5)
- Figure 9.6.18 Bat Ground Level Tree Assessment Results (Cable Route 4 of 5)
- Figure 9.6.19 Bat Ground Level Tree Assessment Results (Cable Route 5 of 5)

~~1.1.8~~1.1.7 This appendix is supported by the following Tables:

- Table 1: Static Detector Survey Programme~~Table 1: Static Detector Survey Programme~~
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- ~~Table 2: Sunset Times and Weather Conditions During Static Detector Deployments~~
- Table 3: Bat Survey Personnel
- Table 4: Summary of Designated Sites Relevant to Bats~~Table 4: Summary of Designated Sites Relevant to Bats~~
- Table 5: Results of Building Inspections~~Table 5: Results of Building Inspections~~
- Table 6: Rarity of Species Recorded During Automated Activity Surveys~~Table 6: Rarity of Species Recorded During Automated Activity Surveys~~
- Table 7: Relative Activity Levels of Bat Species Across All Sites~~Table 7: Relative Activity Levels of Bat Species Across All Sites~~
- Table 8: Ranked Composite Scores for Bat Activity Across Static Detector Locations~~Table 8: Ranked Composite Scores for Bat Activity Across Static Detector Locations~~
- Table 9: Ecological Evaluation of Bat Species and Assemblage~~Table 9: Ecological Evaluation of Bat Species and Assemblage~~
- Table A1: Static Detector Locations
- Table A2: Gross Number of Bat Passes Per Species
- Table A3: Mean Number of Bat Passes Per Hour
- Table A4: Percentage of Bat Passes Per Species (%)

Aims

~~1.1.9~~1.1.8 The primary aim of this appendix is to describe the baseline ecological conditions within the Survey Area as they relate to bats. This includes the suitability of key habitat features for roosting and flight activity. The purpose of the automated bat activity surveys was to further establish a baseline of bat species presence, relative abundance, distribution and significance of various landscape features. It describes the methods used, survey results and evaluation of the Survey Area's importance for bat species.

~~1.1.10~~1.1.9 This report and associated survey data have directly informed the impact assessment as set out in the ES Chapter. This will inform the design of appropriate avoidance, mitigation, and enhancement measures during both the construction and operational phases.

Description of Survey Area

~~1.1.11~~1.1.10 The Green Hill A–G and BESS Sites consist mainly of large, open fields on level or gently undulating terrain. The majority of these fields are arable farmland, including both cereal and non-cereal crops, with narrow uncultivated margins. Some fields feature wider margins, associated with environmental stewardship agreements. Permanent grassland is less common, primarily

occurring at Green Hill E and F, where it is grazed by sheep or horses or cut for silage. Small patches of grassland are also present at field corners. The boundaries of these fields are defined by a network of managed hedgerows and ditches.

~~1.1.12~~1.1.11 Woodland is limited to small plantation shelter belts and occasional sections of larger woodland blocks, most of which lie outside the Sites. Adjacent to the Sites are several woodland blocks, including ancient woodland.

~~1.1.13~~1.1.12 Wetland habitats are sparse. A few ponds lie just beyond field boundaries, and occasional watercourses, including wet and seasonally wet agricultural ditches, intersect or border the Sites. Flowing watercourses primarily consist of feeder streams to the River Nene and other managed drainage ditches.

Quality Assurance

~~1.1.14~~1.1.13 All ecologists employed by Clarkson and Woods are members or pending members of CIEEM and follow the Institute's Code of Professional Conduct when undertaking ecological work.

~~1.1.15~~1.1.14 The competence of all field surveyors has been assessed by Clarkson and Woods in accordance with the CIEEM Competencies for Species Survey (Ref.4).

~~1.1.16~~1.1.15 This report has been prepared in line with the relevant British Standard, BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development (Ref.5). It has been written by an experienced ecologist who is a full member of CIEEM and has undergone a two-stage quality assurance review by appropriately experienced ecologists, also full members of CIEEM.

1.2 Methodology

1.2.1 This section outlines the methodology used for the bat assessment across the Scheme.

Desk Study

1.2.2 A comprehensive desk study and data search has been undertaken for the Scheme as described in **Appendix 9.3 Desk Study [~~EN010170/~~APP~~/GH6.3.9.3~~-086]**. Elements of the desk study relevant to this bat assessment are as follows:

- A search for 'International' designated sites for nature conservation using the Multi-Agency Geographic Information for the Countryside (MAGIC) website. This included Special Areas of Conservation (SACs) or potential SACs within 30km of the Scheme boundary for which bats are listed as a qualifying feature.
- A search for 'National' designated sites for nature conservation within 5km of the Scheme Boundary using the MAGIC website for which bats are a reason for designation. These included Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs).
- Information on 'Local' designated sites within 2km, specifically those citing bats as a reason for selection. These included Local Wildlife Sites (LWSs), County Wildlife Sites (CWSs) and Wildlife Trust Reserves (WTRs).
- Information pertaining to existing records on bats within 2km of the Sites was obtained from the Northants Bat Group and Local Environmental Records Centres (LERCs), including: Northamptonshire Biodiversity Records Centre (NBRC); Bedfordshire and Luton Biodiversity Recording and Monitoring Centre; and Buckinghamshire and Milton Keynes Environmental Records Centre.
- The MAGIC website was consulted for records of European Protected Species (EPS) licences issued for mitigation projects concerning bats within 2km of the Site Boundary.

1.2.3 The above search radii ~~incorporates~~incorporate the Zone of Influence (ZoI) for the Scheme. This is the extent over which proposed activities could directly or indirectly influence bats as ecological features of the landscape. It is unlikely that the proposals would impact designated site features beyond these ranges.

1.2.4 Desk study data relating to the Cable Route Area was assessed using the same sources. However, given the temporary and limited nature of impacts associated with this element, data relating to areas beyond its working width was not considered proportionate. Therefore, no specific search radii were included as part of the desk study.

Habitat Suitability Assessment

1.2.5 A Habitat Suitability Assessment for bats was completed to assess the suitability of habitats within the Survey Area for commuting and foraging bats. The assessment considered key habitat features, including hedgerows, woodland edges, watercourses, and grassland, as well as the overall connectivity of the landscape. Following surveys, the suitability of each Site for foraging and commuting bats was assigned a 'high', 'moderate', 'low' or 'negligible' category as a guide for informing any necessary further survey effort. Initial habitat suitability assessments were based on the 3rd edition of the Bat Conservation Trust (BCT) Good Practice Guidelines (Ref.1). Although the guidelines were updated in 2023 (Ref.2), the changes to site suitability criteria were minimal so the original assessment remains valid.

Building Assessments

1.2.6 Buildings within or directly adjacent to the Survey Area were assessed for their suitability for roosting bats. Surveyors assessed building exteriors using torches and binoculars to identify potential roosting features (PRFs). Building interiors were not inspected at this time. Each building was assigned a 'high', 'moderate', 'low', or 'negligible' category as a guide to inform further survey effort as necessary (Ref.1). This level of survey effort conforms most closely to Daytime Bat Walkovers for buildings using the most recent BCT guidance (Ref.2).

Ground Level Tree Assessments (GLTA)

1.2.7 Mature trees were assessed for their suitability for roosting bats in accordance with the Bat Conservation Trust Guidelines, 3rd edition (Ref.1). Tree assessments were completed using digital survey forms, with each tree manually ground-truthed and visually assessed using binoculars and a high-powered torch. Trees considered suitable (or potentially suitable) for roosting bats were mapped, numbered and assigned to a 'high', 'moderate', 'low' or 'negligible' roost suitability category. Where groups or lines of trees were all classified as suitable, only the first or most suitable tree was mapped.

1.2.8 On a precautionary basis, it was determined prior to survey that linear features within the Sites containing multiple trees would be buffered from the development area according to the highest level of suitability for roosting bats afforded to any single tree along that particular linear feature. As such, survey effort focused on trees with the highest suitability for roosting bats across any particular hedgerow/other linear feature. Some trees with lower suitability in the same linear feature were therefore not surveyed.

1.2.9 The methodology for assessing tree suitability was updated in the 4th edition of the bat survey guidelines (Ref.2). Since most survey work had been completed before this update, subsequent surveys continued using the 3rd edition methodology to ensure consistency across all Sites.

1.2.10 Trees were not inspected to the level of detail described for detailed GLTAs under the updated guidelines (Ref 2). For example, while obvious PRFs were recorded, individual PRFs were not systematically described and categorised. However, the

survey scope went above and beyond that typically expected of a PEA for bats during a Daytime Bat Walkover (DBW). The level of survey effort was considered proportionate to the likely impacts, as suitable trees were safeguarded by integrating buffer distances into Scheme design. The approach taken was based on the intention to determine an appropriately sized protective buffer in the scheme design to safeguard trees, rather than to exhaustively categorise bat roosting suitability and find evidence of use. Should any trees be impacted, more detailed follow-up surveys will be completed. This will be set out in the Outline Ecological Protection and Mitigation Strategy (OEPMS).

1.2.11 The results of the Ground Level Tree Assessments are provided in the supporting Figures, **Figures 9.6.8-9.6.19** at the end of this appendix.

Automated Bat Activity Assessment

Rationale

1.2.12 The results of the Habitat Suitability Assessment were used to inform survey effort. This preliminary assessment indicated that most of the Survey Area consisted of large arable fields. Such habitats are typically considered sub-optimal habitat for foraging and commuting bats due to monoculture cropping and the use of agricultural chemicals that likely reduce invertebrate prey abundance. As such, the combined Sites were assigned as 'Moderate' level of suitability for bats, as defined by the BCT guidelines (see Results below).

1.2.13 The most suitable habitats for bat activity within the Survey Area are woodland, hedgerows, and watercourses, which will almost entirely be retained within the proposals. Surveys were designed to provide a representative sample of bat activity across all habitats present in accordance with best practice guidelines (Ref.1; Ref.2).

1.2.14 Given the temporary and limited nature of impacts associated with cable route construction, bat activity surveys for the Cable Route Corridor were not considered proportionate considering the potential impacts. Furthermore, given the similarity of habitats and topography within the Cable Route Seach Area relative to that found within the Sites, it is anticipated that bat activity within the Cable Route Corridor will be relatively comparable to that recorded within the Sites.

Survey Timings

1.2.15 The automated bat activity surveys were completed at Green Hill A-G and Green Hill BESS between August 2023 and October 2024. ~~However, at Green Hill A.2 only, a survey has been completed in April 2025 and one further survey is scheduled for May 2025, since this Site was added to the Scheme at a later date. This report will be updated as additional survey data becomes available. The evaluation of the bat assemblage in the Ecology and Biodiversity Chapter of the Environmental Statement (ES) will be updated accordingly following the completion of this additional survey work, as appropriate.~~However, due to Green

Hill A.2's later addition to the Scheme, surveys continued for this Site into 2025, with surveys in April and May 2025.

Survey Effort

1.2.16 The 4th Edition of the BCT guidelines (Ref.2) recommend automated static detector surveys and manned Night-time Bat Walkover (NBW) surveys. Walked transect surveys are commonly used in baseline assessments, where surveyors walk pre-defined routes for 2-3 hours during the evening, using bat detectors to record bat species, locations, and behaviour. While useful, walked surveys provide relatively brief snapshots of bat activity, limiting data collection efficiency compared to continuous monitoring with automated static detectors. Several studies have shown that static detector surveys are more effective in providing comprehensive data (Ref.6; Ref.7; Ref.8).

1.2.17 Although the 4th edition of the BCT guidelines recommends manned NBW surveys in addition to automated surveys to capture qualitative behavioural observations, the guidelines also acknowledge the limitations of manned surveys. Given the size and relative homogeneity of the Survey Area, coupled with the logistical challenges and costs of implementing walked transects across such a large area, it was determined that a larger number of automated static detectors would provide a more reliable and efficient dataset for the baseline assessment.

1.2.18 During consultation via the Discretionary Advice Service, Natural England agreed that manned transects across the Solar PV Sites would be disproportionate to the scale of potential impacts on bat habitats, and thus, were not considered necessary or practical in this context. Furthermore, the overall retention of key foraging and commuting habitats within the Scheme supported the decision to rely primarily on automated surveys.

1.2.19 In accordance with the BCT 3rd edition guidelines, which recommended increased survey effort for sites of 'High' suitability, it was agreed to increase the number of static detectors despite the Survey Area itself being of 'moderate' suitability. This was to ensure a comprehensive baseline of bat activity, compensating for the absence of manned surveys. However, the distinction between 'Moderate' and 'High' suitability sites in terms of survey effort was removed in the 4th edition of the BCT guidelines, which occurred during the course of the assessment.

1.2.20 A total of 43 fixed static detector locations were used in this assessment. At each location, static detectors (Song Meter Minis by Wildlife Acoustics) were deployed monthly between April-October inclusive. Detectors recorded for a minimum of five consecutive nights per deployment, beginning 30 minutes before sunset and continuing until 30 minutes after sunrise each day.

Static Detector Locations

1.2.21 A total of 43 fixed static detector locations were used in this assessment. All detectors were placed at boundary habitats, selected based on their potential as foraging areas or commuting routes within the Survey Area, as identified during the habitat walkover survey. Due to agricultural activities, detectors could not be

deployed in the middle of fields. The detector locations remained consistent throughout the survey period to ensure comparability of data. **Table A1** lists the map references and What3Words locations for each detector, while **Figures 9.6.1-9.6.7** illustrate their positions.

Survey Dates

1.2.22 Surveys commenced in August 2023 at Green Hill A-E and were completed at these Sites in July 2024. Following the later addition of Green Hill F, G, and A.2, survey schedules differed across the Sites. Surveys at Green Hill F and G started in April 2024 and finished in October 2024, while surveys at Green Hill A.2 began in June 2024 and will be completed in May 2025. **Table 1** provides the deployment periods and details of the Sites surveyed. **Table 2** gives weather details during the deployment periods.

Table 1: Static Detector Survey Programme

Month	Deployment Date Range*	Green Hill Site								
		A	A.2	B	C	D	E	BESS	F	G
August 2023	14/08/2023 – 22/08/2023	✓		✓	✓	✓	✓	✓		
September 2023	11/09/2023 – 19/09/2023	✓		✓	✓	✓	✓	✓		
October 2023	09/10/2023 – 18/10/2023	✓		✓	✓	✓	✓	✓		
April 2024	22/04/2024 – 30/04/2024	✓		✓	✓	✓	✓	✓	✓	✓
May 2024	20/05/2024 – 29/05/2024	✓		✓	✓	✓	✓	✓	✓	✓
June 2024	17/06/2024 – 25/06/2024	✓	✓	✓	✓	✓	✓	✓	✓	✓
July 2024	15/07/2024 – 23/07/2024	✓	✓	✓	✓	✓	✓	✓	✓	✓
August 2024	12/08/2024 – 28/08/2024		✓						✓	✓
September 2024	09/09/2024 – 24/09/2024		✓						✓	✓
October 2024	08/10/2024- 15/10/2024		✓						✓	✓
April 2025	~~TBC~~14/04/2025 – 24/04/2025		✓							
May 2025	~~TBC~~12/05/2025 – 23/05/2025		✓							

* Note these dates represent a range. Although not necessarily deployed or collected on the same dates, all detectors recorded for at least five consecutive nights within this range.

Table 2: Sunset Times and Weather Conditions During Static Detector Deployments

Month	Deployment Date Range	Sunset ~~range~~Range	Nightly ~~temp range~~Temp Range (°C)*	Precipitation*
August 2023	14/08/2023 – 22/08/2023	20:34 - 20:14	11 - 18	Occasional showers
September 2023	11/09/2023 – 19/09/2023	19:31 - 19:06	11 - 20	Occasional showers
October 2023	09/10/2023 – 18/10/2023	18:22 - 18:02	1 - 17	Occasional showers
April 2024	22/04/2024 – 30/04/2024	20:16 - 20:33	4 - 10	Occasional showers
May 2024	20/05/2024 – 29/05/2024	21:03 - 21:17	9 - 15	Occasional showers
June 2024	17/06/2024 – 25/06/2024	21:36 - 21:28	8 - 16	Occasional showers
July 2024	15/07/2024 – 23/07/2024	21:22 - 21:12	10 - 18	Occasional showers
August 2024	12/08/2024 – 28/08/2024	20:32 - 19:57	10 - 18	Occasional showers
September 2024	09/09/2024 – 24/09/2024	19:30 - 18:55	4 - 12	Occasional showers
October 2024	08/10/2024- 15/10/2024	18:22 - 18:07	1 - 10	Occasional showers
April 2025	14/04/2025 – 24/04/2025	20:00 - 20:17	5 - 15	Occasional showers
May 2025	~~TBC~~12/05/2025 – 23/05/2025	~~TBC~~20:47 – 21:03	~~TBC~~3-22.8	~~TBC~~Occasional showers

*Historical weather data taken from www.wunderground.com

Data Analysis

1.2.23 Static detector data were downloaded and analysed using Wildlife Acoustics' Kaleidoscope software. Initial automatic classification of each recording was performed using the software's AutoID algorithm. Species such as barbastelle, serotine, Nathusius' pipistrelle, and horseshoe bats, which are rarer or at the edge of their range in Northamptonshire, were manually verified. Due to the difficulty of identifying individual species within the *Myotis* genus from ultrasonic recordings alone, passes attributed to *Myotis* bats have been amalgamated. Similarly to *Myotis* bats, noctule and Leisler's bats within the *Nyctalus* genus have

calls which are difficult to reliably separate. Where differentiation was not possible, the records were identified to genus level only.

Survey Personnel

1.2.24 **Table 3** lists the personnel involved in completing the bat surveys between August 2023 and October 2024.

Table 3: Bat Survey Personnel

Surveyor Name and Relevant Qualifications	Survey Work Completed	Survey Experience and Natural England Licence Information
Adèle Remazeilles MSc ACIEEM	GLTAs, Building inspections	7 years' survey experience Natural England Level 1 Class Licence (Reg. No. 2022-10200-CL17-BAT)
Andrew Ross BSc MSc MCIEEM	GLTAs, Building inspections	15 year's survey experience Natural England Level 2 Class Licence (Reg. No. 2015-13114-CLS-CLS)
Bryan Tan MBiolSci	Static detector deployments	1 year's survey experience
Charlie Ball	Static detector deployments	1 year's survey experience
Chris Poole MSc ACIEEM	GLTAs	7 year's survey experience
Harry Fox BSc MCIEEM	GLTAs, Building inspections	17 year's survey experience Natural England Level 2 Class Licence (Reg. No. 2018-33520-CLS-CLS)
Heather Parris BSc (Hons) ACIEEM	GLTAs	8 year's survey experience
Henry Sturgess BSc MCIEEM	GLTAs	9 year's survey experience
Holly Chapman-White BSc MSc	Static detector deployments	1 year's survey experience
James Gilbert MCIEEM CEnv	Static detector deployments	20 year's survey experience
Mike Hockey BSc (Hons) MCIEEM	GLTAs, Building inspections	11 year's survey experience Natural England Level 1 Class Licence (Reg. No. 2020-44436-CLS-CLS)
Miranda Jones BSc QualCIEEM	Static detector deployments	2 years' survey experience
Paul Kennedy ACIEEM	Static detector deployments	Over 20 years' survey experience for bats

Surveyor Name and Relevant Qualifications	Survey Work Completed	Survey Experience and Natural England Licence Information
		Natural England Level 2 Class Licence (Reg. No. 2015-14471-CLS-CLS)
Rebecca Sandey MSc ACIEEM	GLTAs	5 year's survey experience
Richard Anderton	GLTAs	At least 5 year's survey experience
Sarah Richards BSc MSc QualCIEEM	Static detector deployments	3 years' survey experience
Will Fisher MGeol MSc QualCIEEM	Static detector deployments	2 years' survey experience

Evaluation of Importance

1.2.25 The Survey Area's ecological importance for bats was valued using the methodology described in the Bat Mitigation Guidelines (Ref.10), which considers the distribution and conservation status of recorded species. Additional reference is also made to the guidance developed by CIEEM for Ecological Impact Assessments (Ref.9). Each bat species (or species group) was assigned a level of importance based on a geographical framework (Site, Local, District, County, Regional, National, or International). Additional categories of 'Site' or 'Negligible' importance are also applied, where relevant.

1.2.26 In relation to a Site's importance for bat commuting routes (flightlines) and foraging areas, the 2023 bat survey guidelines recommend against a scoring or matrix-based approach based on volume of bat passes alone. This is due to the complexity of bat behaviour and seasonal variations in habitat use. Therefore, professional ecological judgement has been used to carefully consider factors, including habitat suitability, overall bat activity levels, landscape connectivity, species assemblage and seasonality.

1.2.27 As well as individual species / species groups, the overall bat assemblage was also evaluated. This assessment followed the scoring system outlined in the Bat Mitigation Guidelines (Ref 10). The overall importance of the bat assemblage was determined by comparing the site's species composition against regional and national species distributions.

1.3 Limitations

General Bat Survey Limitations

1.3.1 Not all features in trees or buildings suitable for use by bats are visible from the ground and there can be no external evidence of use. Bats are also very small animals and may take refuge in extremely small spaces. Therefore, it is possible that bats or their signs may not have been evident during the survey, especially if they are normally present opportunistically or in small numbers for a short period of time each year. However, a reasonable level of effort was always employed when carrying out survey work.

1.3.2 Bat detectors are known to be more sensitive to certain bat calls than to others for reasons such as varying call volume and directionality. This can result in certain bat species (notably horseshoe, barbastelle and long-eared bats) being under-recorded due to the limitations of current bat detectors. The difference in recording efficiency may therefore bias any results and this has been taken into account during the assessment and evaluation.

Equipment Failure

1.3.3 During the survey period, a small number of instances of equipment malfunction occurred. This resulted in no data being recorded at the following times and locations: Location 13 in August 2023; Location 15 in April 2024; Location 17 in May 2024; Location 36 in May 2024; Location 41 in July 2024; and Location 33 in October 2024. However, given the extensive dataset collected (over 2,751 hours of recordings across 43 locations) these isolated failures are not considered to have significantly affected the overall findings or the robustness of the assessment. Additionally, no location experienced repeated failures, ensuring that gaps in data collection were limited and did not systematically bias the results.

Call Detection and Analysis

1.3.4 Kaleidoscope Pro automatically classifies bat calls using algorithm-based analysis, assigning confidence levels to each identification. However, classification errors are inherent in all automated identification datasets. Through experience, the software has proven generally reliable for identifying certain species, particularly horseshoe bats due to their distinct and unmistakable call parameters. It also performs well for common pipistrelle, soprano pipistrelle, noctule, and serotine bats.

1.3.5 However, accuracy is lower for species such as long-eared bats, Leisler's bats, and barbastelle bats. Notably, *Myotis* species cannot be reliably distinguished to species level and are classified only to genus level (*Myotis* sp.), which aligns with the limitations of manual sonogram analysis. While the Echo Meter Touch software does attempt species-level identification for *Myotis*, its accuracy has been found to be inconsistent.

1.3.6 To improve reliability, a percentage of calls are manually verified to check software classifications. Calls that the software is unable to confidently classify

are marked as 'NoID' and, where possible, were reviewed for completeness. Noise files were not examined, as these are typically unidentifiable and unrelated to bat calls.

1.3.7 Automated detectors trigger recordings when ultrasonic signals are detected, stopping either after one second of silence or at a 30-second maximum. If multiple species are present within a single recording, the software can only classify one and prioritizes the dominant species. This may result in under-recording of quieter species (such as horseshoe bats) or those with a slower pulse repetition rate.

1.3.8 Overall, the combination of Kaleidoscope Pro's classifications and manual verification is considered to provide an acceptably accurate record of bat species presence and has been used accordingly in this report.

1.4 Results

1.4.1 This section presents a summary of the habitat assessment and automated bat surveys completed between August 2023 and October 2024.

Desk Study

Designated Sites

1.4.2 Comprehensive descriptions of statutory and non-statutory designated sites in proximity to the Scheme are provided in a centralised desk study appendix. What follows is a brief summary of protected sites in which bats have been cited as a reason for their designation.

Table 4: Summary of Designated Sites Relevant to Bats

Site and Designation	Distance and Direction to Site	Area (Ha)	Primary Reasons for Designation
Harrold Odell Country Park Local Nature Reserve (LNR)	4.51km northeast of Green Hill G	59.1	The site is on the edge of the River Ouse. There are two lakes, seasonally flooded woodland, osier beds and water meadows. The site supports a range of birds, including several priority species. Otters, bats, amphibians, reptiles and a range of orchid species are also known to be present.

Background Data Search

1.4.3 Data search records for bats obtained from Northamptonshire Bat Group were only provided with four-figure OS grid references. This identified records to the level of a 1km x 1km square (i.e. a monad), preventing more precise locations.

1.4.4 Records of the following species were returned within 2km of at least one of the Sites since 2000:

- Barbastelle *Barbastella barbastellus*
- Brown long-eared *Plecotus auritus*
- Common pipistrelle *Pipistrellus pipistrellus*
- Noctule *Nyctalus noctula*
- Soprano pipistrelle *Pipistrellus pygmaeus*
- Whiskered bat *Myotis mystacinus*
- Unidentified *Pipistrellus* sp.
- Whiskered/Brandt's *Myotis brandtii* bats.

1.4.5 Records of Daubenton's bat *Myotis daubentonii*, Leisler's *Nyctalus leisleri*, Nathusius's pipistrelle *Pipistrellus nathusii*, Natterer's *Myotis nattereri* and unidentified *Myotis* sp. were gathered from the surrounding area beyond 2km.

1.4.6 Within 2km, three barbastelle records were returned, including one roost record, which related to OS Grid Reference SP8370, closest to Green Hill C. 17 brown long-eared records were returned, including 15 roost records. 14 common pipistrelle records were returned, including six roost records. Six soprano pipistrelle records were returned, including two roost records. A further 23 unidentified *Pipistrellus* sp. records were returned, including 21 roost records. One noctule and one whiskered bat record were returned, as well as a roost record of a whiskered/ Brandt's bat.

1.4.7 Two European Protected Species (EPS) licences relating to bats were identified during the desk study. Firstly, EPSM2013-5557, which relates to the destruction of a breeding site and resting place of common pipistrelle, soprano pipistrelle and brown long-eared bat, approx. 1.8km west of Green Hill B. Secondly, 2016-21753-EPS-MIT, relating to damage and destruction of resting place of common pipistrelle, within 2km of Green Hill C to E.

Habitat Suitability Assessment

1.4.8 A brief summary of the habitat suitability for bats within the Scheme Boundary is provided below.

Green Hill A

1.4.9 Fields were primarily arable, with non-cereal crops in the northeast of the Site and cereal crops elsewhere. Occasional grassland pasture was recorded alongside the stream corridor. Arable margins were present in a number of fields, providing greater shelter opportunities. The hedgerow network was generally intact, although chiefly species-poor. Small woodland strips were present, alongside a small number of in-field trees.

Green Hill A.2

1.4.10 Fields were large and open and were all arable, comprising cereal crops. The hedgerow network was generally intact and chiefly species-rich, associated with ditches.

Green Hill B

1.4.11 Fields were generally large and open and were a mixture of arable and grassland, with arable field margins and in-field grass strips present. The grassland fields were observed to be damp. A small patch of scrub was present in one field corner, and two ponds. The surrounding hedgerows were generally tall and intact, of mixed quality. A ditch ran along the southwestern Site boundary.

Green Hill C

1.4.12 Fields were of mixed size and were all arable except for a small field corner of grassland. Fields comprised cereal crops, often with arable margins, except for one non-cereal crop field. The field bordering the existing solar array had a border of tussocky grassland and scrub. The hedgerow network was generally intact and chiefly species-poor. Sywell Wood lay at the northeastern Site boundary. An active airfield lay to the west.

Green Hill D

1.4.13 Fields were large and open, with coarse grassland margins suitable for bat foraging and commuting activities. The two northern fields were non-cereal crops and the southern two were cereal crops. A brook ran along the western Site boundary. Hedgerows were of mixed quality but generally tall and intact. A small strip of ruderal vegetation and scrub lay near the edge of the southernmost field.

Green Hill E

1.4.14 Fields were chiefly arable and cereal crops. Non-cereal crops, grass leys and permanent grassland were also present. Fields were of mixed size, with some large, open fields and some smaller, enclosed fields. In the north of the Site, numerous agri-environmental measures were in place, including wide field margins. In the south of the Site, these were less prevalent. The hedgerow network was varied, with a small number of ditches and streams, chiefly at the far edges of the Site. A few small blocks of plantation woodland, grassland field corners and ponds were scattered across the Site.

Green Hill BESS

1.4.15 The three fields were all arable with narrow or non-existent margins. Fields were bounded by a number of streams and ditches and/or hedgerows or woodland belts. An existing substation lay between the three fields, posing a source of disturbance. Two large pylons were also present in the northernmost field. To the north lay the Upper Nene Valley Gravel Pits, including large open ponds and the River Nene further north.

Green Hill F

1.4.16 Fields were all large arable cereal crops with a subset of smaller grassland fields used as pasture for horses or sheep grazing. Field margins were generally narrow, although easements were present in the north of the Site which offered enhanced commuting or foraging habitat. The hedgerow network was varied, and streams or ditches were also present along a large number of fields. A large woodland block (Horn Wood) lay to the south, bordering three fields.

Green Hill G

1.4.17 Fields were all arable and were generally large and open. The topography was more undulating, rising in the north of the Site. Around half the fields were cereal crops and the other half temporary grass leys. A large woodland block (Threeshires Wood) lay to the north-east bordering two fields. The hedgerow network was of mixed quality with ditches also present. Some fields in the centre of the Site were bordered solely by ditches with no hedgerows present.

Overall Suitability

1.4.18 The Green Hill A–G and BESS Sites predominantly consist of large, open arable fields with limited structural diversity. While field margins, hedgerows, and occasional watercourses provide some connectivity, the landscape is largely open and intensively managed. Woodland is scarce within the Sites, limited to small plantation shelter belts, with more significant woodland blocks lying outside the survey area. Wetland habitats are similarly sparse, comprising a few ponds and drainage ditches.

1.4.19 The habitat characteristics across most of the Sites align with a Moderate suitability classification for commuting and foraging bats. This is primarily due to the presence of continuous features such as hedgerows, ditches, and small woodland blocks that provide flight paths and foraging resources. While these linear elements offer connectivity to the wider landscape, their quality and extent vary across the Sites. Additionally, the presence of permanent grassland, field margins, and occasional scrub patches further enhances the availability of foraging habitat, particularly for more adaptable bat species.

1.4.20 Some sections of Green Hill A, C, and F include areas of pasture or Other Neutral Grassland in proximity to good-quality hedgerows, woodland copses, and watercourses. These areas provide more optimal conditions for commuting and foraging bats. However, as they only make up a small proportion of each Site, they are best classified as falling between the Moderate and High suitability categories.

1.4.21 None of the Sites are classified as High suitability due to the dominance of arable land, which constitutes the vast majority of the area. Arable fields generally provide limited foraging opportunities for bats, particularly outside of periods when winter stubbles or arable margins offer temporary resources. The open nature of much of the landscape reduces its attractiveness to bat species that rely on sheltered, well-connected flight paths. Furthermore, the limited availability of high-quality foraging habitats such as broadleaved woodland, tree-lined watercourses, or grazed parkland further constrains the potential for a higher classification.

1.4.22 In summary, while the Sites contain moderate-quality commuting and foraging habitat due to hedgerows, ditches, and small woodland blocks, the predominance of arable farmland and the lack of extensive high-value habitats prevent classification as High. Overall, a Moderate suitability classification is considered appropriate.

Building Assessments

1.4.23 Buildings within or directly adjacent to the Survey Area were assessed for their suitability for roosting bats. A total of seven buildings were assessed. A summary of the results is presented in **Table 5** below and **Photos 1 to** 4.

1.4.24 No evidence of bat presence was recorded in any building surveyed. Despite most buildings having some level of suitability for roosting bats, no buildings are anticipated to be removed or damaged by the Proposed Development. Therefore, no further survey effort is proposed.

Photo 1: Building FS2

Photo 2: ES1

Photo 3: ES4

Photo 4: ES4

Table 5: Results of Building Inspections

Building Ref	Site	Location	Description	Suitability
AS1	Green Hill A	Southwestern corner of AF23. Grid ref. SP 80631 73794.	Remains of old farm building with stone and brick walls. No roof remains and the interior overgrown with dense bramble scrub. PRFs include numerous cavities associated with stonework.	Low
ES1	Green Hill E	Northwest corner of EF7. Grid ref. SP 84689 67258	Prefabricated building with flat-roof and no obvious roosting opportunities.	Negligible
ES2	Green Hill E	Southeastern corner of EF6. Grid ref. SP 85264 66700	Derelict farm building with partial roof collapse. Remaining part of roof is corrugated. Sall number of gaps in brickwork. [redacted]	Low
ES3	Green Hill E	Eastern boundary of EF15. Grid ref. SP 84966 66360	Disused, open sided barn with stone walls. Tin roof with wooden rafters slowly collapsing. PRFs include gaps at wall tops and in stone wall crevices.	Low
ES4	Green Hill E	Eastern boundary of EF28. Grid ref. SP 85080 65521	Large stone barn with tin roof. PRFs include cracks in walls, gaps at wall tops, internal timber joints, and large fly-in entrances to interior. Moderate suitability. [redacted]. Lean-to structures have low suitability due to limited number of gaps in brick and stonework.	Low to Moderate
FS1	Green Hill F	Intersection of FF7, FF8 and FF11. Grid ref. SP 89012 59754	Remains of old farm building, with only stone and brick walls remaining. No roof remains and the interior overgrown with bramble scrub. Some crevice-roosting opportunities in walls.	Low
FS2	Green Hill F	Eastern boundary of FF11. Grid ref. SP 89090 59343	Stone barn with an unlined, corrugated asbestos / metallic sheet roof. Missing doors provide opportunities for open flight access. Currently used to	High

Building Ref	Site	Location	Description	Suitability
			store some farm machinery. PRFs associated with gaps at wall tops and wall stonework. [redacted].	
CR1	Cable Route Corridor	In pasture field on Cable Route Corridor adjacent to BESS1.	Open fronted field shelter with wooden frame and an unlined, corrugated iron roof and corrugated iron walls.	Negligible

Ground Level Tree Assessments

Solar PV Sites

1.4.25 Surveys were carried out of mature trees across the Sites to assess their suitability for roosting bats. The results of the surveys are presented in **Figures 9.6.8 – 9.6.14**.

1.4.26 Potential roost features were primarily recorded in mature ash *Fraxinus excelsior* and oak *Quercus robur* trees. Additional tree species included willow *Salix* sp., aspen *Populus tremula*, field maple *Acer campestre*, sycamore *Acer pseudoplatanus*, horse chestnut *Aesculus hippocastanum*, and dead standing trees.

1.4.27 Surveyors recorded 372 trees / groups of trees with potential roost features. These comprised 156 trees / tree groups with Low suitability, 141 with Moderate, and 75 with High suitability.

Cable Route Corridor

1.4.28 A further 113 ground level tree assessments were completed within the Cable Route Corridor, with an additional 77 trees being assessed within the wider Cable Route Survey Area. Of the trees within the Cable Route Corridor, the GLTA surveys recorded 70 Low, 24 Moderate, and 19 High suitability trees. The vast majority (73) of the trees within the Cable Route Corridor were ash, although other species recorded included oak, sycamore, and poplar.

Automated Activity Surveys

1.4.29 Bat activity was recorded at each of the 43 locations in which static detectors were deployed at the Green Hill Sites between June 2023 and October 2024~~.~~, with additional data collected in April and May 2025 at Green Hill A.2. Together, they recorded ~~292,647~~298,205 bat passes over 1,~~752~~790 cumulative recording nights. This equates to an average of ~~132.2~~166.6 bat passes per detector per night. This is considered to represent a moderate level of bat activity in comparison to other sites Clarkson and Woods have surveyed in the East Midlands.

~~1.4.30 As discussed, a full suite of surveys has not yet been completed at Green Hill A2. The results of surveys at Green Hill A.2 from April and May 2025 will be incorporated into a revised version of this appendix, with summary data across all Sites revised accordingly.~~

~~1.4.31~~1.4.30 Detailed static survey results are provided in Appendix A.

Species Richness

~~1.4.32~~1.4.31 Overall, at least nine different bat species were recorded during the automated activity surveys. They comprised the following:

- Common pipistrelle

- Soprano pipistrelle
- Nathusius' pipistrelle
- Brown long-eared
- *Myotis* ~~sp~~spp.
- Noctule
- Leisler's
- Serotine
- Barbastelle

~~1.4.33~~1.4.32 *Myotis* sp. represents an aggregation of very similar species that cannot be reliably distinguished through sonogram analysis alone. They are most likely to include one or more of Natterer's bat *Myotis nattereri*, Daubenton's bat *Myotis daubentonii*, Brandt's bat *Myotis brandtii* and whiskered bat *Myotis mystacinus*. While within the known range of Bechstein's bat, this species is found almost exclusively in woodland, with a particular association with ancient woodland, and so is much less likely to be recorded within the Site. Similarly to *Myotis* bats, noctule and Leisler's bats within the *Nyctalus* genus have calls which are difficult to reliably separate. Where differentiation has not been possible, the records have been identified to genus level only.

~~1.4.34~~1.4.33 Species richness was consistent for each Green Hill Site, although it differed between individual detector locations. This level of species richness (i.e. nine) is considered relatively high for a Site in Northamptonshire as nine plus species were recorded out of the 12 known resident species in ~~Lincolnshire.~~Northamptonshire. It is also reasonably likely that all four of the more widespread *Myotis* species may have been detected, even if this cannot be proven. This may be a reflection of the very large level of survey effort completed over a large area.

~~1.4.35~~1.4.34 The Sites are located at the northern edge of the barbastelle's natural range. This species is most closely linked with woodland edge habitats and tree roosts. Known colonies exist in Cambridgeshire, including the Wimpole and Eversden Woods Special Area of Conservation (SAC) approximately 45km to the south-east of the Survey Area. Specific distribution details in Bedfordshire are limited. Within 2km of the Sites, three barbastelle records were returned from the data search.

~~1.4.36~~1.4.35 **Table 6** below shows the relative rarity of each species recorded during the static detector surveys. It also includes the most widespread *Myotis* species that may have been recorded within the genus. The table uses the definition of relative rarity in England based on the assessment methodology in the Bat Mitigation Guidelines (Ref.10). Categories reflect the relative abundance of each species in Central England / the Midlands.

Table 6: Rarity of Species Recorded During Automated Activity Surveys

Species	Rarity in Midlands	UK status (current estimated UK population size and IUCN status)*
Common pipistrelle	Widespread, all geographies	~2,430,000 with increasing population trend. Least Concern in England.
Soprano pipistrelle	Widespread, all geographies	~1,300,000 with stable population trend. Least Concern in England.
Nathusius' pipistrelle	Rarer or restricted distribution	Data limited
Brown long-eared bat	Widespread, all geographies	~245,000 with increasing population trend. Least Concern in England.
Natterer's bat	Widespread, but less abundant	~132,000 (70,000 in England) with stable population trend. Least Concern in England.
Daubenton's bat	Widespread, but less abundant	~560,000 (95,000 in England) with stable population trend. Least Concern in England.
Brandt's bat	Widespread, but less abundant	Data limited; Not currently listed as threatened.
Whiskered bat	Widespread, but less abundant	Data limited; Not currently listed as threatened.
Noctule	Widespread, but less abundant	~50,000 with declining population trend. Least Concern in England.
Leisler's bat	Rarer or restricted distribution	Estimated England population 9,500 (28,000 in UK). Near Threatened due to fragmented populations and low numbers of known roosts.
Serotine bat	Rarer or restricted distribution	~15,000 with declining population trend; Classified as Vulnerable
Barbastelle	Rarest Annex II species	~5,000 with declining population trend; Classified as Vulnerable

*Based on information provided by the Mammal Society and Bat Conservation Trust

Relative Bat Activity Levels

~~1.4.37~~1.4.36 **Table 7** presents the relative activity levels of different bat species recorded across the 43 locations. It details the proportion of total bat passes for each species, their average number of passes per hour of night, and the locations with the highest and lowest recorded activity levels.

Table 7: Relative Activity Levels of Bat Species Across All Sites

Species	Proportion of Total Bat Passes (%)	Average No. Passes per Hour	Location with Lowest Average Activity	Location with Highest Average Activity
Common pipistrelle	36.347.2	3.447.8	SD12 (0.561 passes/hr)	SD34 (45.442.23 passes/hr)
Soprano pipistrelle	4642.1	4.376.39	SD12 (0.2733 passes/hr)	SD23 (33.528.66 passes/hr)
Nathusius' pipistrelle	0.21	0.0204	9 Sites8 locations with zero activity	SD6SD24 (0.091 passes/hr)
Pipistrellus sp.	0.3	0.1	SD10 (0.01 passes/hr)	SD41 (0.65 passes/hr)
Brown long-eared bat	2.21.1	0.20	SD3 (SD13 (7 passes, or 0.0203 passes/hr)	SD8 (1.019 passes/hr)
Myotis spspp.	8.43.2	0.8016	SD12 (0.403 passes/hr)	SD24 (6.971.53 passes/hr)
Noctule	4.2.5	0.4056	SD39 (53 passes, or SD41 (0.1308 passes/hr)	SD32SD34 (2.664 passes/hr)
Leisler's bat	0.91	0.0911	19 Siteslocations with zero activity	SD32 (0.2356 passes/hr)
Nyctalus sp.	1.9	0.39	SD4 (0.07 passes/hr)	SD32 (1.45 passes/hr)
Serotine bat	0.4	0.0406	28 Siteslocations with zero activity	SD32 (0.0525 passes/hr)
Barbastelle	1.45	0.1327	SD13SD2 (one pass, or 0.00301 passes/hr)	SD41 (2.41.11 passes/hr)

1.4.381.4.37 In terms of the most widespread and abundant species, common pipistrelle and soprano pipistrelle and common pipistrelle were recorded most frequently across the deployment locations. SopranoCommon pipistrelle was the most frequently recorded species overall, accounting for 46.147.2% of all bat passes, with an average of 4.377.8 passes per hour. The lowest common pipistrelle activity was recorded at SD12 (0.2761 passes/hour), while the highest was at SD23 (33.5SD34 (42.23 passes/hour). CommonSoprano pipistrelle was similarly abundant, representing 36.342.1% of all bat passes, with an average of 3.446.39 passes per hour. It was detected at every deployment location, with

activity ranging from SD12 (0.533 passes/hour (SD12) to SD34 (45.428.66 passes/hour (SD23). Brown long-eared bat passes accounted for only 2.21.1% of activity, which is typical for a species that is very quiet and difficult to detect.

1.4.391.4.38 For the less abundant species, *Myotis* species and noctule bats were both recorded across numerous locations but at lower overall abundance levels. *Myotis* species made up 8.43.2% of total bat passes, with noctule bats accounting for 4.2.5% of all passes.

1.4.401.4.39 Rarer species with a more restricted distribution like Leisler's bat, Nathusius' pipistrelle and serotine were all recorded at relatively few locations, reflecting their more limited distribution at a regional scale. Nathusius' pipistrelle was infrequent, making up just 0.21% of total passes and was absent from nine sites.eight locations. Leisler's bat was similarly uncommon, accounting for 0.91% of passes and absent from 19 detector locations. Serotine bat was the least frequently recorded species, absent from 28 of the 43 locations. Notably, noctule, Leisler's bat, and serotine bat were all recorded most frequently at SD32 (or SD34 (both at Green Hill F). Given the overlap in call frequencies between Leisler's bat and the other two species, it is possible that only two of these three species were recorded, or that the relative activity levels of each species may not be entirely accurate.

1.4.411.4.40 Barbastelle bats, despite being an Annex II species and typically considered very rare nationally, were recorded at all deployment locations. They accounted for 1.45% of total passes, averaging 0.1327 passes per hour. The highest level of activity was recorded at SD41 (Green Hill G).

1.4.421.4.41 The following indicates the distribution of species across the different Sites:

- Brown long-eared was recorded across all Sites, with generally low levels of activity. Average activity was highest at Green Hill C and BESS, and substantially lower at other Sites.
- Common pipistrelle was recorded across all Sites and average activity was highest at Green Hill F. Activity was also high at Green Hill A.2, BESS and G, and lowest at Green Hill C and D.
- Nathusius' pipistrelle was recorded across all Sites except Green Hill A, with very low activity. The greatest activity levels were recorded at Green Hill BESS.
- Soprano pipistrelle was recorded across all Sites and average activity was markedly highest at Green Hill A.2 and BESS. Activity was also high at Green Hill A.2, B and G. The lowest activity levels were recorded at Green Hill C, D and E.
- *Myotis* spspp. were recorded at all Sites. Activity of *Myotis* spspp. at Green Hill BESS was almost more than double the levels at Green Hill BG, where the next highest activity levels were recorded. This trend may be due to the presence of several rivers, woodland belts and the high ecological value of

offsite habitats adjacent to Green Hill BESS. The lowest activity levels for *Myotis* spp. were recorded at Green Hill A.2, D and E.

- *Nyctalus* sp. were recorded at all Sites. Recorded activity of *Nyctalus* sp. was greatest at Green Hill BESS and F, but broadly comparable with other Green Hill sites.
- Serotine was only recorded at Green Hill A.2, B, E, BESS and F. Activity was very low, which was not unexpected given that this species has a patchy distribution in Northamptonshire.

Variation in Activity Across Sites

~~1.4.43~~1.4.42 This section evaluates the relative importance of each static detector location to identify key areas of importance for bats. **Table 8** presents a ranked list of all 43 static detector locations based on a composite bat activity score. Clarkson & Woods used a scoring system that accounts for both the relative volume of bat passes and diversity of species recorded at each location. To reflect ecological importance, bat passes were weighted according to species rarity:

- Common and widespread species (e.g., common / soprano pipistrelle; brown long-eared bat) were assigned a weight of 1.
- Less common species (*Myotis* ~~sp~~spp., noctule bat) were given a weight of 2.
- Rarer species (Leisler's bat; serotine; Nathusius' pipistrelle) were assigned a weight of 3.
- The rarest species (i.e. barbastelle) were weighted by 4.

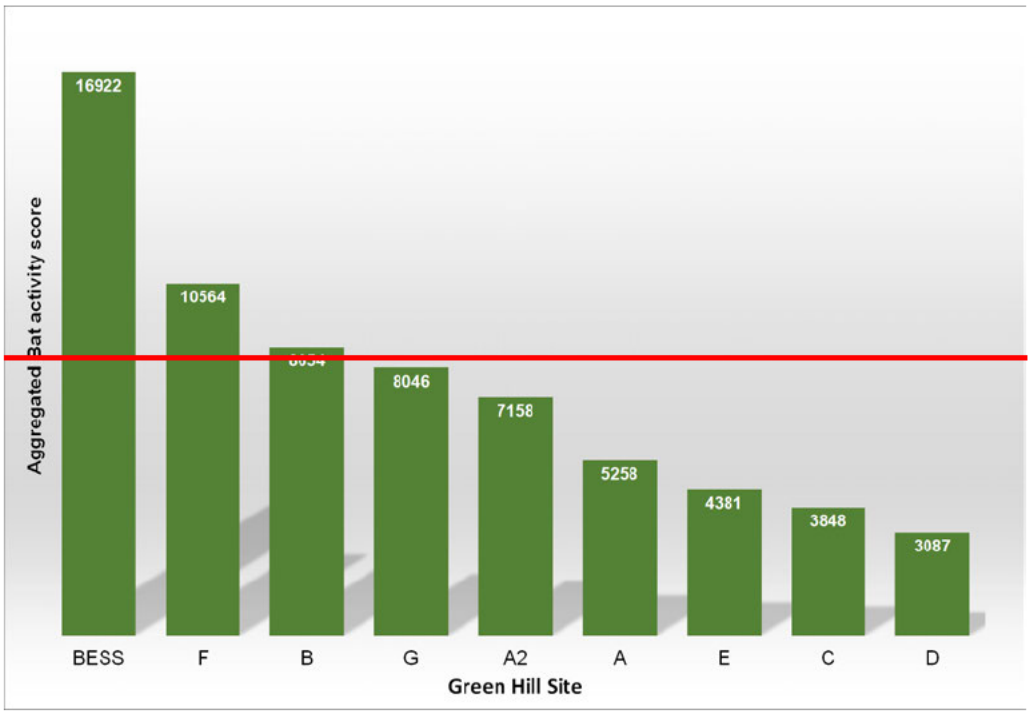
~~1.4.44~~1.4.43 By incorporating this weighting system, locations with higher activity levels of rarer species receive a proportionally higher score. **Table 8** ranks locations from highest to lowest composite score, offering a relative indication of bat activity and species diversity across the different locations. Figure 1 displays the weighted means of static detector locations for each Green Hill Site as a whole.

Table 8: Ranked Composite Scores for Bat Activity Across Static Detector Locations

Parent Site	Static Detector Location	Composite Score	Ranking
Green Hill F	SD34	23377	1
Green Hill BESS	SD23	19877	2
Green Hill F	SD35	19166	3
Green Hill ~~BESS~~F	SD27~~SD24~~	~~18051~~18280	4
Green Hill F	SD32~~SD27~~	17229~~17964~~	5

Parent Site	Static Detector Location	Composite Score	Ranking
Green Hill FA.2	SD42SD32	16588717229	6
Green Hill G	SD40SD41	1615043231	7
Green Hill GBESS	SD24SD40	1311413904	8
Green Hill BESSG	SD25SD41	1323112838	9
Green Hill GBESS	SD25SD36	1283812648	10
Green Hill A.2G	SD36SD42	1264811857	11
Green Hill B	SD7	10815	12
Green Hill E	SD22	9943	13
Green Hill A	SD3	8870	14
Green Hill BF	SD6SD26	874278838	15
Green Hill GB	SD8SD6	7838 7564	16
Green Hill BC	SD5SD8	7309 7564	17
Green Hill EB	SD14SD5	7184 7309	18
Green Hill FE	SD26SD14	6774 7184	19
Green Hill A	SD1	6678	20
Green Hill E	SD19	6091	21
Green Hill F	SD30SD29	56075374	22
Green Hill DF	SD29SD11	537455295	23
Green Hill FD	SD11SD30	50595295	24
Green Hill G	SD37	5026	25
Green Hill F	SD33SD31	436043514	26
Green Hill F	SD31SD33	435138673	27
Green Hill A	SD2	3831	28
Green Hill E	SD15	3587	29
Green Hill E	SD17	3565	30
Green Hill E	SD20	3372	31
Green Hill E	SD13	3360	32
Green Hill GA2	SD43SD38	33443206	33
Green Hill CG	SD38SD10	32062632	34
Green Hill EC	SD16SD10	25302632	35
Green Hill FE	SD28SD16	24842530	36
Green Hill A.2F	SD28SD43	24592484	37

Parent Site	Static Detector Location	Composite Score	Ranking
Green Hill E	SD18	2212	38
Green Hill E	SD21	1969	39
Green Hill A	SD4	1653	40
Green Hill C	SD9	1349	41
Green Hill G	SD39	1054	42
Green Hill D	SD12	880	43



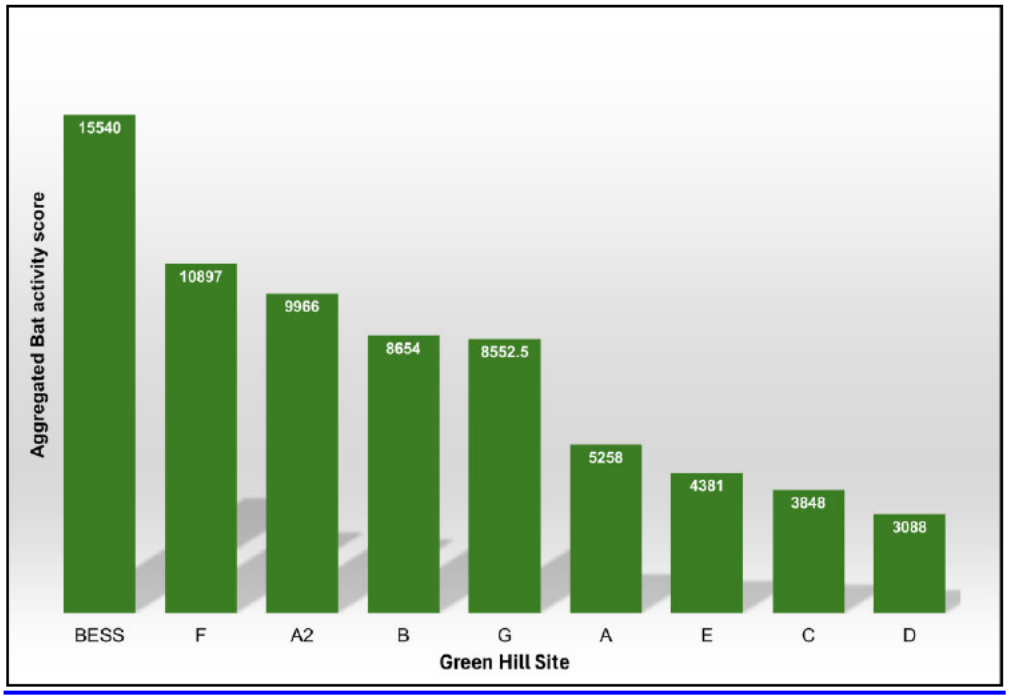


Figure 1: Mean Bat Activity Scores Per Site

Areas With Highest Bat Activity and Diversity

~~1.4.45~~1.4.44 Analysis of the composite scores indicated that Green Hill BESS supported notably higher bat activity levels than all other Sites, followed by Green Hill F. When deployment location scores were averaged within each of the nine parent sites, these two sites had the highest mean values. At Green Hill BESS, all three deployment locations ranked within the top ten highest-scoring locations across the ~~Survey Area~~Sites. This pattern was driven by consistently higher volumes of bat passes for common and soprano pipistrelles, as well as less abundant species such as brown long-eared bats, *Myotis* ~~sp~~spp., *Nyctalus* sp., and barbastelles.

~~1.4.46~~1.4.45 The higher activity levels observed at Green Hill BESS and Green Hill F may be associated with habitat suitability at these locations. Green Hill BESS is situated near ponds and lakes associated with the Upper Nene Valley Gravel Pits, which likely provide abundant foraging opportunities for a variety of bat species. Similarly, the Green Hill F sites, particularly SD34 and SD35, are located at or near Horn Wood and connecting hedgerows. The presence of nearby tree roosts may also elevate activity levels if deployment locations were located on well-used flight-lines.

~~1.4.47~~1.4.46 Individual static detector locations which recorded substantially higher activity scores included the following:

- The south of Green Hill F (SD34), adjacent to a large block of woodland; the proximity of the woodland, which offers elevated foraging potential to the surrounding landscape, is likely to account for the greater activity levels

recorded at this location. The woodland may also support roosting bats, which would also account for higher levels of bat activity in this area of the landscape.

- The north of Green Hill BESS (SD23), close to Grendon Lakes; this is likely due to the proximity of the off-site lake, which serves as a good-quality foraging area and water resource. The level of activity recorded for both soprano pipistrelle and *Myotis* ~~sp~~spp. (assumed in this case to predominately comprise Daubenton's bats, as this species preferentially forages over water) was substantially higher at Green Hill BESS than at any other site.
- The south of Green Hill F (SD35), along a hedgerow between two blocks of woodland; this hedgerow is likely to be of significant importance for bats commuting between the two woodland areas.
- ~~The southeast of Green Hill BESS (SD24), adjacent to Grendon Brook; this is likely due to the proximity of the brook, which serves as a good-quality foraging area, water resource and commuting corridor.~~
- The northeast of Green Hill F (SD27), close to woodland; as above, the woodland likely offers enhanced foraging and roosting habitat relative to arable habitats.
- The southwest of Green Hill F (SD32), along a watercourse and close to a small patch of woodland; as above, the stream and woodland likely ~~offers~~offer enhanced foraging habitat relative to arable habitats.
- The central hedgerow in Green Hill A.2 (SD42), which was a species-rich hedgerow associated with trees and a ditch. The high-quality hedgerows present within Green Hill A.2 likely provide a good abundance and diversity of invertebrate prey for foraging bats. Green Hill A.2 is also situated between various blocks of high-quality habitat in the local landscape such as blocks of deciduous woodland priority habitat, as well as being approximately 310m from Badsaddle, Withmale Park and Bush Walk Woods SSSI and 140m from Walgrave East Meadow LWS. The vast majority of bat activity at SD42 was attributed to common and soprano pipistrelles.

Areas with Highest Levels of Barbastelle Activity

~~1.4.48~~1.4.47 The distribution of barbastelle passes was not uniform, with activity concentrated at a subset of sites, particularly within Green Hill G and Green Hill F, which together accounted for a substantial proportion of the total detections. The highest level of barbastelle activity occurred at SD41 (Green Hill G), where 861 passes were detected, accounting for 19.~~6~~9% of all barbastelle passes across the survey. Notably, 596 of these passes (69%) were recorded in September, suggesting a strong seasonal peak in activity at this location. A similar pattern was observed at SD32 (Green Hill F), where a disproportionately high number of barbastelle recordings also occurred in September. However, this was not a universal trend, and other locations, such as SD35 (Green Hill F), SD40 (Green Hill G), and SD30 (Green Hill F), exhibited a more even distribution of

barbastelle activity across the survey period, while SD15 (Green Hill E) featured a larger number of barbastelle passes in May 2024. These variations may indicate site-specific differences in habitat suitability, roost-switching behaviour or seasonal foraging preferences.

~~1.4.49~~1.4.48 SD41 was situated within a hedgerow south of ~~Threeshire~~Threeshire's Wood and SD32 was positioned on the woodland edge associated with a small copse. Both habitats may offer possible roosting opportunities and more diverse foraging habitats compared to the surrounding arable landscape. Therefore, both locations may be used as seasonal commuting routes, possibly associated with nearby tree roosts or foraging grounds.

Areas With Lower Bat Activity and Diversity

~~1.4.50~~1.4.49 The sites with the lowest composite scores indicated areas of limited bat activity, which may highlight opportunities for ecological enhancement. Notably, ~~six~~seven of the ten detector locations at Green Hill E scored in the bottom third of all locations. Several locations associated with Green Hill ~~E~~C and A also consistently showed lower bat activity, potentially indicating sub-optimal habitat conditions or lacking key resources such as food availability, roosting opportunities, or commuting corridors. Looking at the four lowest scoring ~~detectors~~detector locations, three were sited in hedgerows surrounded by arable fields, and one within a small patch of ruderals and scrub within an arable field. Such locations show a lack of proximate habitat diversity, and are further from, or less well connected to, optimal foraging habitats, such as woodland or pasture.

1.5 Evaluation

1.5.1 This section provides a valuation of bat species and overall assemblage as ecological receptors within the Survey Area. **Table 9** below provides the Survey Area's geographic importance for each species, and bat assemblage as a whole. Automated activity surveys recorded at least nine bat species within the Sites. Species valuations reflect their rarity, conservation status, relative abundance and baseline activity levels as described in the Methodology section above.

Table 9: Ecological Evaluation of Bat Species and Assemblage

Species	Regional Status	Relative Activity	Geographic Importance
Common pipistrelle	Widespread	High	District
Soprano pipistrelle	Widespread	High	District
Nathusius' pipistrelle	Rarer	Very low	Local
Brown long-eared bat	Widespread	Low	Local
Myotis ~~sp~~spp.	Less common	Low	Local
Noctule	Less common	Low	Local
Leisler's bat	Rarer	Very low	Local
Serotine bat	Rarer	Very low	Local
Barbastelle	Rarest	Low	County
Overall Bat Assemblage			**Regional**

Bat Assemblage

1.5.2 The overall bat assemblage was valued using the scoring system described in the Bat Mitigation Guidelines (Ref.10). This system assigns a maximum theoretical score of 26 to the Survey Area, based on the species present in the region and their relative rarity. To assess the ecological importance of the bat assemblage, the geographic level of importance was calculated as follows:

- County importance: An assemblage score of 12 or more, representing at least 45% of the maximum possible score.
- Regional importance: An assemblage score of 14 or more, representing at least 55% of the maximum possible score.

- National importance: An assemblage score of 18 or more, representing at least 70% of the maximum possible score.

1.5.3 The overall bat assemblage score for the Survey Area falls between 17 and 26, indicating an assemblage of between **Regional** to National importance. This range is due to some uncertainty in the identification of several species recorded within the Survey Area, since precise identification would require trapping techniques. Specifically, the presence of Leisler's bat and true number of different *Myotis* species~~.~~ is uncertain. However, since the activity levels of several species (including Leisler's, serotine~~,~~ and Nathusius' pipistrelle) were extremely low, Regional is considered most appropriate for the Survey Area.

Summary

1.5.4 A large number of trees and small number of buildings within the Sites were assessed as being suitable for roosting bats.

1.5.5 It is considered that the general assemblage and rate of activity recorded was typical for the habitats present on the Sites. The presence of relatively high barbastelle activity is considered notable, and this species is considered to be of County Importance in the context of the Survey Area. The ~~remaining~~overall bat assemblage is considered to be ~~between~~of Regional Importance in terms of ~~its~~the conservation status and activity levels of recorded species.

1.6 References

Ref.1 Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.

Ref.2 Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London. ISBN-978-1-7395126-0-6.

Ref.3 CIEEM (February 2022) Code of Professional Conduct. https://cieem.net/resource/code-of-professional-conduct/

Ref.4 CIEEM (2013) Competencies for Species Survey (CSS). www.cieem.net/competencies-for-species-survey-css-

Ref.5 The British Standards Institution (2013) BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development. BSI Standards Ltd.

Ref.6 Stahlschmidt, P. & Bruhl, C. (2012) Bats as bioindicators – the need of a standardized method for acoustic bat activity surveys. Methods in Ecology and Evolution 3 (3): 503-508.

Ref.7 Braun de Torrez, E.C., Wallrichs, M,A., Ober, H,K., & McCleery, R,A. (2017) Mobile acoustic transects miss rare bat species: implications of survey method and spatio-temporal sampling for monitoring bats. I5:e3940 https://doi.org/10.7717/peerj.3940

Ref.8 Teets, K.D., Loeb, S.C. and Jachowski, D.S. (2019) Detection probability of bats using active versus passive monitoring. Acta Chiropterologica 21: 205-213.

Ref.9 CIEEM (2024) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management. Available at: https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/

Ref.10 Reason, P.F. and Wray, S. (2023). UK Bat Mitigation Guidelines V 1.1. CIEEM.

Annex A

~~1.6.1~~ The following tables and figures below provide detail of static detector deployment locations and a summary of bat activity data, as follows:

- Table A1 gives the map references and What3Words locations for each detector, while Figures 1–9 illustrate their positions.
- Table A2 shows the gross number of bat passes for each species at each deployment location.
- Table A3 shows the average number of passes per hour at each location.
- Table A4 shows the overall proportion of activity for each species, expressed as a percentage.

Table A1: Static Detector Locations

Detector Map Reference	What Three Words Location
Green Hill A	
SD1	economics.commented.chills
SD2	blues.boards.tangent
SD3	elevated.passage.aimlessly
SD4	giants.slippery.amuses
Green Hill B	
SD5	caskets.liquid.humidity
SD6	reliving.animate.tweed
SD7	punch.encroach.hospitals
Green Hill C	
SD8	tissue.firmly.yield
SD9	forensic.treaty.education
SD10	tweed.imprints.buckling
Green Hill D	
SD11	removal.accompany.tonality
SD12	newly.dusters.panicking
Green Hill E	
SD13	vote.heartless.risk
SD14	curvy.buckling.teeth
SD15	dabbling.sands.hazy
SD16	bookshelf.normal.solves
SD17	geologist.blotting.either
SD18	briskly.blink.sweetly
SD19	tangling.novelists.limes
SD20	regarding.trim.bibs
SD21	supplier.airliners.noisy
SD22	gilding.instincts.cheaper
Green Hill BESS	
SD23	pounds.funds.engulfing
SD24	handwriting.storeroom.movie
SD25	liquids.surnames.affirming
Green Hill F	

Detector Map Reference	What Three Words Location
SD26	likely.loafing.libraries
SD27	elbowing.hockey.fortnight
SD28	concluded.shuts.creatures
SD29	chops.showcases.acute
SD30	masks.consoles.doormat
SD31	idealist.ferried.isolating
SD32	pull.pans.chiefs
SD33	blazing.bridge.emulating
SD34	emerge.collected.prom
SD35	beads.exhale.instead
Green Hill G	
SD36	soonest.kickbacks.hopping
SD37	motive.singled.topped
SD38	steers.serenade.ally
SD39	unfilled.title.slugs
SD40	rice.same.scrambles
SD41	abolish.juror.marathons
Green Hill A.2	
SD42	marketing.competent.admiral
SD43	etchings.times.gent

Table A2: Gross Number of Bat Passes Per Species

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Brown Long-eared	Myotis sp.	Noctule / Nyctalus sp.	Leisler's bat	Serotine	Barbastelle	Total
Green Hill A	SD1	1,973	3,998	1	33	62	228	8	1	12	6,316
	SD2	1,255	1,668	0	60	146	274	0	0	2	3,405
	SD3	3,049	5,087	0	9	174	163	5	2	5	8,494
	SD4	6,37	506	0	18	20	157	6	0	27	1,371
Green Hill B	SD5	3,112	3,040	5	36	217	288	8	0	14	6,720
	SD6	2,656	3,812	9	37	205	397	3	9	15	7,143
	DS7	1,409	7,370	3	166	653	271	1	0	2	9,875
Green Hill C	SD8	990	3,693	1	405	158	492	1	0	292	6,032
	SD9	654	122	2	88	55	171	0	1	6	1,099
	SD10	1,456	388	3	47	52	256	0	0	29	2,231
Green Hill D	SD11	845	2,725	3	128	71	619	1	1	50	4,443
	SD12	207	107	2	37	16	230	3	0	4	606
Green Hill E	SD13	1,100	1,408	1	7	44	375	0	0	1	2,936
	SD14	2,656	3,383	5	188	57	338	0	0	38	6,665
	SD15	921	477	3	48	34	522	0	0	255	2,260
	SD16	693	1,344	1	26	22	160	0	0	25	2,271
	SD17	1,456	985	5	103	31	303	0	2	83	2,968

	SD18	618	452	6	16	40	182	0	0	166	1,480
	SD19	1,210	3,968	1	32	65	104	0	0	135	5,515
	SD20	1,463	1,204	0	53	26	140	0	0	80	2,966
	SD21	1,103	455	3	17	17	156	0	1	9	1,761
	SD22	8,518	1,029	4	43	32	127	0	1	5	9,759
Green Hill BESS	SD23	4,290	13,494	11	152	458	401	2	0	45	18,853
	SD24	4,213	6,122	34	213	2,502	862	1	8	161	14,116
	SD25	3,354	6,435	3	203	867	421	1	4	61	11,349
Green Hill F	SD26	4,100	1,724	2	29	128	190	0	1	69	6,243
	SD27	10,445	5,893	2	118	161	247	6	0	164	17,036
	SD28	824	620	1	29	38	351	2	0	55	1,920
	SD29	3,738	501	0	128	101	255	39	0	25	4,787
	SD30	1,454	1,850	4	61	115	352	8	0	177	4,021
	SD31	2,258	551	0	52	119	320	6	2	144	3,452
	SD32	7,091	4,615	1	97	742	1,046	94	19	330	14,035
	SD33	2,636	687	0	82	36	159	8	0	8	3,616
	SD34	18,186	2,170	0	13	231	945	4	0	159	21,708
	SD35	16,623	684	4	24	227	73	0	1	305	17,941
Green Hill G	SD36	3,387	7,573	4	84	98	496	0	0	101	11,743
	SD37	1,684	2,530	2	47	243	72	5	0	26	4,609
	SD38	1,004	435	3	40	362	165	0	0	166	2,175

	SD39	529	244	7	21	50	53	1	0	7	912
	SD40	4,784	6,439	3	106	384	70	0	0	217	12,003
	SD41	6,535	1,762	8	250	458	150	0	0	861	10,024
Green Hill A.2	SD42	2,866	8,467	0	33	14	205	1	0	12	11,598
	SD43	1,088	701	6	21	75	137	4	1	46	2,079

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	*Pipistrellus* sp.	Brown Long-eared	*Myotis* spp.	Noctule	Leisler's	*Nyctalus* sp.	Serotine	Barbastelle	Total
Green Hill A	SD1	1966	3998	1	7	33	62	164	8	64	1	12	6316
	SD2	1245	1668	0	10	60	146	161	0	113	0	2	3405
	SD3	3014	5087	0	35	9	174	121	5	42	2	5	8494
	SD4	632	506	0	5	18	20	130	6	27	0	27	1371
Green Hill B	SD5	3096	3040	5	16	36	217	206	8	82	0	14	6720
	SD6	2634	3812	9	22	37	205	343	3	54	9	15	7143
	SD7	1409	7370	3	0	166	653	189	1	82	0	2	9875
Green Hill C	SD8	934	3693	1	56	405	158	371	1	121	0	292	6032
	SD9	651	122	2	3	88	55	73	0	98	1	6	1099
	SD10	1454	388	3	2	47	52	161	0	95	0	29	2231
Green Hill D	SD11	838	2725	3	7	128	71	351	1	268	1	50	4443
	SD12	207	107	2	0	37	16	167	3	63	0	4	606
Green Hill E	SD13	1099	1408	1	1	7	44	199	0	176	0	1	2936
	SD14	2654	3383	5	2	188	57	193	0	145	0	38	6665

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	*Pipistrellus* sp.	Brown Long-eared	*Myotis* spp.	Noctule	Leisler's	*Nyctalus* sp.	Serotine	Barbastelle	Total
	SD15	913	477	3	8	48	34	272	0	250	0	255	2260
	SD16	686	1344	1	7	26	22	92	0	68	0	25	2271
	SD17	1453	985	5	3	103	31	98	0	205	2	83	2968
	SD18	617	452	6	1	16	40	101	0	81	0	166	1480
	SD19	1208	3968	1	2	32	65	49	0	55	0	135	5515
	SD20	1454	1204	0	9	53	26	74	0	66	0	80	2966
	SD21	1096	455	3	7	17	17	104	0	52	1	9	1761
	SD22	8486	1029	4	32	43	32	57	0	70	1	5	9759
Green Hill BESS	SD23	4263	13494	11	27	152	458	216	2	185	0	45	18853
	SD24	2675	4812	31	48	193	2116	534	1	231	8	73	10722
	SD25	3312	6435	3	42	203	867	254	1	167	4	61	11349
Green Hill F	SD26	6059	1724	2	9	29	128	18	0	172	1	69	8211
	SD27	10680	5919	5	27	119	161	52	6	204	0	164	17337
	SD28	816	620	1	8	29	38	54	2	297	0	55	1920
	SD29	3721	501	0	17	128	101	78	39	177	0	25	4787
	SD30	1700	1929	1	25	64	128	247	8	152	0	198	4452
	SD31	2247	551	0	11	52	119	201	6	119	2	144	3452
	SD32	7065	4615	1	26	97	742	422	94	624	19	330	14035
	SD33	2995	721	3	2	91	38	92	8	105	0	8	4063
	SD34	18169	2170	0	17	13	231	888	4	57	0	159	21708
	SD35	16611	684	4	12	24	227	25	0	48	1	305	17941

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	*Pipistrellus* sp.	Brown Long-eared	*Myotis* spp.	Noctule	Leisler's	*Nyctalus* sp.	Serotine	Barbastelle	Total
Green Hill G	SD36	3285	7573	4	102	84	98	419	0	77	0	101	11743
	SD37	1678	2530	2	6	47	243	33	5	39	0	26	4609
	SD38	993	435	3	11	40	362	100	0	65	0	166	2175
	SD39	523	244	7	6	21	50	27	1	26	0	7	912
	SD40	5610	7610	3	16	113	755	37	0	36	0	284	14464
	SD41	6271	1762	8	264	250	458	21	0	129	0	861	10024
Green Hill A.2	SD42	3043	12927	0	19	34	19	10	1	227	0	12	16292
	SD43	1337	1102	6	13	26	111	43	4	135	2	61	2840

Table A3: Mean Number of Bat Passes Per Hour

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Brown Long-eared	Myotis sp.	Noctule / *Nyctalus sp.*	Leisler's ba
Green Hill A	SD1	4.91	9.95	0.00	0.08	0.15	0.57	0.02	0.00
	SD2	3.12	4.15	N/A	0.15	0.36	0.68	N/A	N/A	0.00
	SD3	7.58	12.65	N/A	0.02	0.43	0.41	0.01	0.00	0.01
	SD4	1.84	1.46	N/A	0.05	0.06	0.45	0.02	N/A	0.08
Green Hill B	SD5	7.73	7.55	0.01	0.09	0.54	0.72	0.02	N/A	0.03
	SD6	6.59	9.46	0.02	0.09	0.51	0.98	0.01	0.02
	DS7	3.50	18.28	0.01	0.41	1.62	0.67	0.00	N/A
Green Hill C	SD8	2.46	9.18	0.00	1.01	0.39	1.22	0.00	N/A	0.73	14.99
	SD9	1.84	0.34	0.01	0.25	0.15	0.48	N/A	0.00	0.02
	SD10	3.61	0.96	0.01	0.12	0.13	0.64	N/A	N/A	0.07
Green Hill D	SD11	2.10	6.76	0.01	0.32	0.18	1.53	0.00	0.00	0.12
	SD12	0.51	0.27	0.00	0.09	0.04	0.57	0.01	N/A	0.01
Green Hill E	SD13	3.18	4.07	0.00	0.02	0.13	1.08	N/A	N
	SD14	6.58	8.38	0.01	0.47	0.14	0.84	N/A	N/A	0.09
	SD15	2.67	1.38	0.01	0.14	0.10	1.51	N/A	N/A	0.74	6
	SD16	1.72	3.33	0.00	0.06	0.05	0.40	N/A	N/A	0.06	5.63
	SD17	4.10	2.77	0.01	0.29	0.09	0.85	N/A	0.01	0.23
	SD18	1.53	1.12	0.01	0.04	0.10	0.45	N/A	N/A	0.41

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	Brown Long-eared	Myotis sp.	Noctule / *Nyctalus* sp.	Leisler's ba
	SD19	3.00	9.85	0.00	0.08	0.16	0.26	N/A N/A 0.34
	SD20	3.63	2.99	N/A	0.13	0.06	0.35	N/A N/A 0.20
	SD21	2.73	1.13	0.01	0.04	0.04	0.39	N/A 0.00 0.02
	SD22	21.12	2.55	0.01 0.11 0.08	0.31	N/A	0.00	0.01
Green Hill BESS	SD23	10.64	33.45	0.03	0.38	1.14	0.99	0.00 N/A 0.11
	SD24	11.74	17.06	0.09	0.59	6.97	2.40	0.00 0.02 0.45
	SD25	9.70	18.60	0.01	0.59	2.51	1.22	0.00 0.01 0.18
Green Hill F	SD26	10.24	4.31	0.00	0.07	0.32	0.47	N/A 0.00 0.17
	SD27	28.16	15.89	0.01				0.32 0.43
	SD28 2.05	1.54	0.00	0.07	0.09	0.87	0.00	N/A 0.14
	SD29	9.28	1.24	N/A				0.32 0.25
	SD30	4.37	5.56	0.01 0.18 0.35 1.06	0.02	N/A	0.53	12.09
	SD31	6.79	1.66	N/A	0.16	0.36	0.96	0.02 0.01 0.43
	SD32	17.72	11.53	0.00	0.24 1.85	2.61	0.23	0.05 0.82 35.0
	SD33	9.44	2.46	N/A	0.29	0.13	0.57	0.03 N/A
	SD34	45.39	5.42	N/A	0.03	0.58	2.36	0.01 N/A 0.40 5
	SD35	40.14	1.65	0.01	0.06	0.55	0.18	N/A 0.00 0.74
Green Hill G	SD36	9.25	20.69	0.01	0.23	0.27	1.35	N/A N/A 0.28
	SD37	4.20	6.32	0.00	0.12	0.61	0.18	0.01 N/A 0.06
	SD38	2.50	1.08	0.01	0.10	0.90	0.41	N/A N/A 0.41

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle		Brown Long-eared	Myotis sp.	Noctule / *Nyctalus* sp.		Leisler's ba
	SD39	1.32	0.61	0.02	0.05	0.12	0.13	0.00	N/A	0.02
	SD40	13.40	18.04	0.01	0.30	1.08	0.20	N/A	N/A	0.61
	SD41	18.43	4.97	0.02	0.71	1.29	0.42	N/A	N/A	2.43
Green Hill A.2	SD42	9.61	28.38	N/A	0.11	0.05	0.69	0.00	N/A	0.04	38.87
	SD43	4.52	2.91	0.02	0.09	0.31	0.57	0.02	0.00	0.19

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	*Pipistrellus* sp.	Brown Long-eared	*Myotis* spp.	Noctule	Leisler's bat	*Nyctalus* sp.	Serotine	Barbastelle	Total
Green Hill A	SD1	4.93	10.86	0.02	0.05	0.11	0.08	0.44	0.14	0.19	0.02	0.04	16.88
	SD2	3.21	3.55	-	0.06	0.16	0.2	0.41	-	0.39	-	0.01	7.99
	SD3	8.46	10.45	-	0.19	0.03	0.23	0.29	0.09	0.1	0.03	0.02	19.89
	SD4	2.03	1.51	-	0.03	0.09	0.04	0.33	0.1	0.07	-	0.11	4.31
Green Hill B	SD5	8.26	7.06	0.09	0.11	0.11	0.2	0.52	0.12	0.21	-	0.07	16.75
	SD6	5.9	8.43	0.1	0.14	0.09	0.19	0.69	0.02	0.15	0.13	0.04	15.88
	SD7	3.37	18.76	0.03	-	0.4	0.83	0.48	0.01	0.3	-	0.02	24.2
Green Hill C	SD8	2.84	10.13	0.01	0.29	1.19	0.18	0.73	0.01	0.34	-	0.7	16.42
	SD9	1.85	0.36	0.02	0.02	0.28	0.09	0.29	-	0.36	0.01	0.03	3.31
	SD10	3.39	0.77	0.02	0.01	0.11	0.05	0.43	-	0.35	-	0.07	5.2
Green Hill D	SD11	2.41	6.92	0.03	0.05	0.33	0.11	0.97	0.02	0.9	0.02	0.14	11.9
	SD12	0.61	0.33	0.02	-	0.1	0.03	0.63	0.03	0.35	-	0.02	2.12

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	*Pipistrellus* sp.	Brown Long-eared	*Myotis* spp.	Noctule	Leisler's bat	*Nyctalus* sp.	Serotine	Barbastelle	Total
Green Hill E	SD13	3.54	4.37	0.02	0.02	0.03	0.09	0.66	-	1.16	-	0.01	9.9
	SD14	5.96	7.77	0.06	0.04	0.43	0.08	0.52	-	0.54	-	0.08	15.48
	SD15	3.18	1.7	0.02	0.08	0.21	0.08	1.18	-	0.95	-	0.93	8.33
	SD16	2.21	3.73	0.02	0.14	0.08	0.05	0.25	-	0.27	-	0.1	6.85
	SD17	4.1	3.12	0.03	0.03	0.28	0.05	0.3	-	1	0.02	0.24	9.17
	SD18	1.82	1.23	0.03	0.02	0.04	0.05	0.35	-	0.24	-	0.39	4.17
	SD19	3.43	8.87	0.02	0.04	0.08	0.08	0.15	-	0.21	-	0.36	13.24
	SD20	5.43	3.22	-	0.09	0.16	0.06	0.2	-	0.26	-	0.29	9.71
	SD21	3.04	1.03	0.03	0.07	0.06	0.04	0.29	-	0.27	0.01	0.06	4.9
	SD22	16.64	2.22	0.02	0.31	0.13	0.06	0.14	-	0.32	0.02	0.04	19.9
Green Hill BESS	SD23	9.43	28.66	0.03	0.11	0.31	0.37	0.63	0.03	0.55	-	0.1	40.22
	SD24	5.85	10.64	0.09	0.16	0.41	1.53	1.34	0.02	0.68	0.13	0.22	21.07
	SD25	8.35	15.26	0.02	0.16	0.5	0.82	0.93	0.02	0.62	0.03	0.15	26.86
Green Hill F	SD26	11.22	2.37	0.04	0.04	0.07	0.2	0.1	-	0.36	0.02	0.15	14.57
	SD27	24.24	9.41	0.07	0.06	0.21	0.27	0.22	0.05	0.32	-	0.39	35.24
	SD28	1.83	0.94	0.01	0.05	0.07	0.08	0.31	0.04	0.57	-	0.12	4.02
	SD29	7.37	0.75	-	0.07	0.22	0.13	0.23	0.34	0.32	-	0.05	9.48
	SD30	3.85	4.14	0.01	0.06	0.16	0.19	1.05	0.07	0.32	-	0.42	10.27
	SD31	6.33	1.5	-	0.07	0.2	0.17	0.9	0.06	0.43	0.04	0.38	10.08
	SD32	16.67	12.64	0.02	0.1	0.2	0.7	1.26	0.56	1.45	0.25	0.62	34.47
	SD33	6.65	1.14	0.06	0.01	0.18	0.05	0.31	0.07	0.3	-	0.03	8.8

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	*Pipistrellus* sp.	Brown Long-eared	*Myotis* spp.	Noctule	Leisler's bat	*Nyctalus* sp.	Serotine	Barbastelle	Total
	SD34	43.23	3.82	_	0.05	0.06	0.37	2.64	0.06	0.12	_	0.32	50.67
	SD35	36.15	1.44	0.02	0.09	0.05	0.3	0.09	_	0.15	0.02	0.59	38.9
Green Hill G	SD36	8.09	8.12	0	0.07	0.1	0.22	1.59	_	0.24	_	0.1	18.53
	SD37	4.94	7.94	0.01	0.1	0.15	0.52	0.11	0.09	0.31	_	0.11	14.28
	SD38	2.85	0.99	0.05	0.04	0.11	0.63	0.42	_	0.31	_	0.35	5.75
	SD39	1.22	0.49	0.03	0.05	0.05	0.15	0.13	0.02	0.12	_	0.03	2.29
	SD40	11.94	15.52	0.02	0.05	0.21	0.85	0.11	_	0.12	_	0.55	29.37
	SD41	8.53	3.06	0.04	0.65	0.44	0.38	0.08	_	0.19	_	1.11	14.48
Green Hill A.2	SD42	4.24	19.61	_	0.07	0.06	0.04	0.09	0.01	0.34	_	0.03	24.49
	SD43	2.8	2.5	0.03	0.09	0.06	0.2	0.2	0.04	0.3	0.01	0.11	6.34

Table A4: Percentage of Bat Passes Per Species (%)

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle		Brown Long-eared	Myotis sp.		Noctule / *Nyctalus* sp.		Leisler's bat		Serotine	Barbastelle
Green Hill A	SD1	31.2	63.3	0.0	0.5	1.0	3.6		0.1		0.0		0.2	
	SD2	36.9	49.0	0.0	1.8	4.3	8.0		0.0		0.0		0.1	
	SD3	35.9	59.9	0.0	0.1	2.0	1.9		0.1	0.0			0.1	
	SD4	46.5	36.9	0.0	1.3	1.5	11.5		0.4	0.0			2.0	
Green Hill B	SD5	46.3	45.2	0.1	0.5	3.2	4.3		0.1	0.0			0.2	
	SD6	37.2	53.4	0.1	0.5	2.9	5.6		0.0		0.1		0.2	
	DS7	14.3	74.6	0.0	1.7	6.6	2.7		0.0	0.0	0.0			
Green Hill C	SD8	16.4	61.2	0.0	6.7	2.6	8.2		0.0	0.0			4.8	
	SD9	59.5	11.1	0.2	8.0	5.0	15.6		0.0	0.1			0.5	
	SD10	65.3	17.4	0.1	2.1	2.3	11.5		0.0	0.0			1.3	
Green Hill D	SD11	19.0	61.3	0.1	2.9	1.6	13.9		0.0	0.0	1.1			
	SD12	34.2	17.7	0.3	6.1		2.6	38.0	0.5	0.0			0.7	
Green Hill E	SD13	37.5	48.0	0.0	0.2	1.5	12.8		0.0	0.0	0.0			
	SD14	39.8	50.8	0.1	2.8	0.9	5.1		0.0	0.0			0.6	
	SD15	40.8	21.1	0.1	2.1	1.5	23.1		0.0	0.0	11.3			
	SD16	30.5	59.2	0.0	1.1	1.0	7.0	0.0		0.0	1.1			
	SD17	49.1	33.2	0.2	3.5	1.0	10.2		0.0	0.1			2.8	
	SD18	41.8	30.5	0.4	1.1	2.7	12.3		0.0	0.0	11.2			

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle		Brown Long-eared	Myotis sp.	Noctule / *Nyctalus* sp.		Leisler's bat		Serotine	Barbastelle
	SD19	21.9	71.9	0.0	0.6	1.2	1.9	0.0		0.0		2.4	
	SD20	49.3	40.6	0.0	1.8	0.9	4.7	0.0		0.0		2.7	
	SD21	62.6	25.8	0.2	1.0	1.0	8.9	0.0		0.1		0.5	
	SD22	87.3	10.5	0.0	0.4	0.3	1.3	0.0		0.0		0.1	
Green Hill BESS	SD23	22.8	71.6	0.1	0.8	2.4	2.1	0.0		0.0		0.2	
	SD24	29.8	43.4	0.2	1.5	17.7	6.1	0.0		0.1		1.1	
	SD25	29.6	56.7	0.0	1.8	7.6	3.7	0.0		0.0		0.5	
Green Hill F	SD26	65.7	27.6	0.0	0.5	2.1	3.0	0.0		0.0		1.1	
	SD27	61.3	34.6	0.0	0.7	0.9	1.4	0.0		0.0		1.0	
	SD28	42.9	32.3	0.1	1.5	2.0	18.3	0.1		0.0		2.9	
	SD29	78.1	10.5	0.0	2.7	2.1	5.3	0.8		0.0		0.5	
	SD30	36.2	46.0	0.1	1.5	2.9	8.8	0.2		0.0		4.4	
	SD31	65.4	16.0	0.0	1.5	3.4	9.3	0.2		0.1		4.2	
	SD32	50.5	32.9	0.0	0.7	5.3	7.5	0.7		0.1		2.4	
	SD33	72.9	19.0	0.0	2.3	1.0	4.4	0.2		0.0		0.2	
	SD34	83.8	10.0	0.0	0.1	1.1	4.4	0.0		0.0		0.7	
	SD35	92.7	3.8	0.0	0.1	1.3	0.4	0.0		0.0		1.7	
Green Hill G	SD36	28.8	64.5	0.0	0.7	0.8	4.2	0.0		0.0		0.9	
	SD37	36.5	54.9	0.0	1.0	5.3	1.6	0.1		0.0		0.6	

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle		Brown Long-eared	Myotis sp.	Noctule / *Nyctalus* sp.		Leisler's bat		Serotine	Barbastelle
	SD38	46.2	20.0	0.1	1.8	16.6	7.6		0.0	0.0	7.6		
	SD39	58.0	26.8	0.8	2.3	5.5	5.8	0.1		0.0	0.8		
	SD40	39.9	53.6	0.0	0.9	3.2	0.6	0.0		0.0	1.8		
	SD41	65.2	17.6	0.1	2.5	4.6	1.5	0.0		0.0	8.6		
Green Hill A.2	SD42	24.7	73.0	0.0	0.3	0.1	1.8	0.0		0.0	0.1		
	SD43	52.3	33.7	0.3	1.0	3.6	6.6	0.2		0.0	2.2		

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	*Pipistrellus* sp.	Brown Long-eared	*Myotis* spp.	Noctule	Leisler's bat	*Nyctalus* sp.	Serotine	Barbastelle
Green Hill A	SD1	31.1	63.3	0	0.1	0.5	0.9	2.6	0.1	1	0	0.2
	SD2	36.6	49	0	0.3	1.8	4.3	4.7	0	3.3	0	0.1
	SD3	35.5	59.9	0	0.4	0.1	2.1	1.4	0.1	0.5	0	0.1
	SD4	46.1	36.9	0	0.4	1.3	1.5	9.5	0.4	2	0	2
Green Hill B	SD5	46.1	45.2	0.1	0.2	0.5	3.2	3.1	0.1	1.2	0	0.2
	SD6	36.9	53.4	0.1	0.3	0.5	2.8	4.8	0	0.8	0.1	0.2
	SD7	14.3	74.6	0	0	1.7	6.6	1.9	0	0.8	0	0
Green Hill C	SD8	15.5	61.2	0	0.9	6.7	2.5	6.2	0	2	0	4.8
	SD9	59.2	11.1	0.2	0.3	8	5.1	6.6	0	8.9	0.1	0.5
	SD10	65.2	17.4	0.1	0.1	2.1	2.3	7.2	0	4.3	0	1.3

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	*Pipistrellus* sp.	Brown Long-eared	*Myotis* spp.	Noctule	Leisler's bat	*Nyctalus* sp.	Serotine	Barbastelle
Green Hill D	SD11	18.9	61.3	0.1	0.2	2.9	1.6	7.9	0	6	0	1.1
	SD12	34.2	17.7	0.3	0	6.1	2.7	27.6	0.5	10.4	0	0.7
Green Hill E	SD13	37.4	48	0	0	0.2	1.5	6.8	0	6	0	0
	SD14	39.8	50.8	0.1	0	2.8	0.9	2.9	0	2.2	0	0.6
	SD15	40.4	21.1	0.1	0.4	2.1	1.5	12	0	11.1	0	11.3
	SD16	30.2	59.2	0	0.3	1.1	0.9	4.1	0	3	0	1.1
	SD17	49	33.2	0.2	0.1	3.5	1.1	3.3	0	6.9	0.1	2.8
	SD18	41.7	30.5	0.4	0.1	1.1	2.7	6.8	0	5.5	0	11.2
	SD19	21.9	71.9	0	0	0.6	1.2	0.9	0	1	0	2.4
	SD20	49	40.6	0	0.3	1.8	0.9	2.5	0	2.2	0	2.7
	SD21	62.2	25.8	0.2	0.4	1	1	5.9	0	3	0.1	0.5
	SD22	87	10.5	0	0.3	0.4	0.3	0.6	0	0.7	0	0.1
Green Hill BESS	SD23	22.6	71.6	0.1	0.1	0.8	2.4	1.1	0	1	0	0.2
	SD24	24.9	44.9	0.3	0.4	1.8	19.6	5	0	2.2	0.1	0.7
	SD25	29.2	56.7	0	0.4	1.8	7.7	2.2	0	1.5	0	0.5
Green Hill F	SD26	73.8	21	0	0.1	0.4	1.6	0.2	0	2.1	0	0.8
	SD27	61.6	34.1	0	0.2	0.7	0.9	0.3	0	1.2	0	0.9
	SD28	42.5	32.3	0.1	0.4	1.5	2	2.8	0.1	15.5	0	2.9
	SD29	77.7	10.5	0	0.4	2.7	2.1	1.6	0.8	3.7	0	0.5
	SD30	38.2	43.3	0	0.6	1.4	2.9	5.5	0.2	3.4	0	4.4
	SD31	65.1	16	0	0.3	1.5	3.4	5.8	0.2	3.4	0.1	4.2

Site	Location	Common Pipistrelle	Soprano Pipistrelle	Nathusius' Pipistrelle	*Pipistrellus* sp.	Brown Long-eared	*Myotis* spp.	Noctule	Leisler's bat	*Nyctalus* sp.	Serotine	Barbastelle
	SD32	50.3	32.9	0	0.2	0.7	5.3	3	0.7	4.4	0.1	2.4
	SD33	73.7	17.7	0.1	0	2.2	1	2.3	0.2	2.6	0	0.2
	SD34	83.7	10	0	0.1	0.1	1	4.1	0	0.3	0	0.7
	SD35	92.6	3.8	0	0.1	0.1	1.2	0.1	0	0.3	0	1.7
Green Hill G	SD36	28	64.5	0	0.9	0.7	0.8	3.6	0	0.7	0	0.9
	SD37	36.4	54.9	0	0.1	1	5.3	0.7	0.1	0.8	0	0.6
	SD38	45.7	20	0.1	0.5	1.8	16.6	4.6	0	3	0	7.6
	SD39	57.3	26.8	0.8	0.7	2.3	5.5	3	0.1	2.9	0	0.8
	SD40	38.8	52.6	0	0.1	0.8	5.2	0.3	0	0.2	0	2
	SD41	62.6	17.6	0.1	2.6	2.5	4.5	0.2	0	1.3	0	8.6
Green Hill A.2	SD42	18.7	79.3	0	0.1	0.2	0.1	0.1	0	1.4	0	0.1
	SD43	47.1	38.8	0.2	0.5	0.9	3.9	1.5	0.1	4.8	0.1	2.1