

**APPENDIX 9.3
BAT SURVEY REPORT**

APPENDIX 9.3
(BAT SURVEY REPORT)
TO
CHAPTER 9 OF THE ENVIRONMENTAL STATEMENT

ALLESTON SOLAR FARM, PEMBROKESHIRE

carried out by



commissioned by

ALLESTON CLEAN ENERGY LIMITED

SEPTEMBER 2024



BAT SURVEY REPORT

ALLESTON SOLAR FARM, PEMBROKESHIRE

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	Charlie Durigan	Harry Fox	

The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.



1 INTRODUCTION

- 1.1.1 Clarkson and Woods Ltd. was commissioned by the Applicant to carry out bat surveys of at the land at Alleston Farm, Lower Lamphey Road, Lamphey, Pembrokeshire hereafter referred to as 'the Site'.
- 1.1.2 The Development comprises the installation of approximately a 30MW ground mounted photovoltaic solar farm together with associated equipment, infrastructure and ancillary works.
- 1.1.3 A series of automated bat detector surveys were carried out by Clarkson and Woods Ltd between July 2023 June 2024. Surveys followed a scope agreed through consultation with Pembroke CC LPA and followed a survey methodology modified from that specified within the Bat Conservation Trust Good Practice Guidelines¹.
- 1.1.4 Unless the client indicates to the contrary, information on the presence of species collected during the surveys will be passed to the county biological records centre in order to augment their records for the area. This is in line with the CIEEM code of professional conduct².

1.2 Survey and Report Objectives

- 1.2.1 Given the size of the Development and the proposed changes to land use, bat activity surveys were recommended to ascertain a baseline of the level of use by foraging and commuting bats along with species composition and abundance. The objective of these surveys was to establish the likely value of the habitats and features within a Survey Area which encompasses all long-term development activities (solar energy) elements of the Development to individual species of bats, and bats in general in the context of the wider landscape.
- 1.2.2 This report details the methods and results of the surveys and provides a brief overview of the potential impacts that could result from the proposals so as to inform the layout of the Development.
- 1.2.3 This information will be used within the eventual Alleston Solar Farm Project Environmental Statement to inform the ecological evaluation of the habitats used by bats and to characterise the impacts on them considered likely to result from the Development.

1.3 Description of the Survey Area

- 1.3.1 The Site is located on land at Alleston Farm, Pembrokeshire and is bound to the north by Lower Lamphey Road and agricultural fields, and to the east by further fields. Watery Lane forms the western and south-western boundaries of the Site. The southern boundary follows an existing area of woodland in a south-easterly direction. In addition, there are a small number of residential properties located adjacent to the north and west of the Site boundary.
- 1.3.2 The residential dwellings of Pembroke are 190m northwest of the Site whilst the village of Lamphey is located 370m to the north-eastern corner of the Site.
- 1.3.3 Land use in the surrounding area of the Site is predominantly agricultural, with scattered farmhouses as well as residential developments associated with Pembroke and Lamphey. The West Wales Line railway line, which connects Pembroke and Lamphey, runs approximately 40m north of the Site. Pembroke train station is located 680m north-east of the Site and Lamphey train station is located 415m east of the Site.
- 1.3.4 The Site encompasses approximately 96 hectares (ha) and comprises of several agricultural fields with separated by rows of mature hedgerows. This is with the exception of Alleston Farmhouse, a Grade II Listed building, and the associated buildings which are located within the centre of the Site, accessed from the north along Lower Lamphey Road and West along Watery Lane, both along unnamed tracks. Within the eastern region of the Site a collection of fields is currently used for equestrian activities, which will continue, whilst an area of mature trees and vegetation are located within the south-western region of the Site and run into the central region of the Site, this collection of trees are known as Alleston Wood.

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

² Code of Professional Conduct. CIEEM, January 2019.



1.4 Quality Assurance

- 1.4.1 All ecologists employed by Clarkson and Woods are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow the Institute's Code of Professional Conduct³ when undertaking ecological work.
- 1.4.2 The competence of all field surveyors has been assessed by Clarkson and Woods with respect to the CIEEM Competencies for Species Survey (CSS)⁴.
- 1.4.3 This report has been prepared in accordance with the relevant British Standard: *BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development*⁵. It has been prepared by an experienced ecologist who is a member of CIEEM. The report has also been subject to a two stage quality assurance review by appropriately experienced ecologists who are full members of CIEEM.

³ CIEEM (2013). *Code of Professional Conduct*. www.cieem.net/professional-conduct.

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

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



2 SURVEY METHODOLOGIES

2.1 Desk Study

Designated Sites

- 2.1.1 Statutory designated sites focussed on bats within the proximity of the Site (30km for International Sites, 5km for National Sites and 2km for Local Sites) were identified using the Defra web-based MAGIC database (<https://magic.defra.gov.uk/>) and National Resources Wales GIS database.
- 2.1.2 Non-statutory designated sites focussed on bats within 2km of the application Site were identified using the Aderyn Record Centre data search.

Local Conservation Strategies

- 2.1.3 Relevant Local Authority plans and strategies with a biodiversity focus were consulted for aspects relevant to bats, including priority species listed under Section 7 of the Natural Environment and Environment (Wales) Act (2016).

Landscape-scale Conservation Strategies, Initiatives and Records

- 2.1.4 The Aderyn Record Centre was consulted for records of bat species within 2km of Alleston Solar Farm. The Natural Resources Wales Map Viewer was also consulted for records of European Protected Species (EPS) licences issued for mitigation projects concerning bats within 30km of the Site.

General

- 2.1.5 Where relevant, Ordnance Survey maps (1:25,000) and online aerial images of the Site were examined online to assess habitat connectivity (e.g. <https://www.google.com/maps>).
- 2.1.6 The data presented within this report constitutes a summary of the data obtained from the local records centre. Should additional detail be required on any of the records described within this report Clarkson and Woods Ltd. should be contacted.

2.2 Field Surveys

Tree Assessments for Roosting Bats

- 2.2.1 A detailed ground-based inspection of trees within the Site was not carried out, as all mature trees within the Site are understood to be retained and protected throughout the construction phase of the Development, and the Development has been designed in such a way that ensures mature trees will not be isolated from other suitable connecting habitat.
- 2.2.2 It is assumed that all mature trees present within and adjacent to the Site would have at least low bat roost potential.

Static Detector Surveys

- 2.2.3 Existing habitats within the Site principally comprise agricultural fields and a small number of grassland fields, in use for horse grazing, bounded by a network of hedgerows and streams. A small block of woodland lies between the northern and southern parcels of the Site. These habitat types are ubiquitous within the local landscape.
- 2.2.4 In general, the most suitable habitat for foraging/commuting bats (woodland and hedgerows) are expected to remain unaffected by the Development, although a small number of new field accesses are anticipated to facilitate construction and operational maintenance. The large agricultural fields, which comprise the majority of the survey area, were considered to provide sub-optimal habitat for foraging/commuting bats due to monoculture cropping and application of agricultural herbicides and fertilisers which are likely to limit the abundance of invertebrate prey.



- 2.2.5 The assessment of the suitability of the Site for foraging and roosting bats was based on current guidance set out by the Bat Conservation Trust⁶. Walked activity survey transects are an alternative survey methodology for the collection of bat activity data typically used in baseline bat activity assessments. Walked activity transects involve the monthly completion of 2-3hr evening survey where a route around a site is walked by a surveyor using a bat detector to collect information on species, location and activity class. As walked transects are comparatively brief survey events, and are considered to represent poor data-collection efficiency in comparison to the longer-term deployment of passive static bat detectors, it was concluded that a more complete and reliable bat species assemblage baseline could be derived from preferentially using automated detectors. This was considered especially appropriate when the relative homogeneity of the habitats within the Survey Area and wider landscape is taken into account, as well as the near-wholesale retention of the likely best foraging and commuting habitat inherent within the Development. Consequently, it was considered appropriate to carry out the level of static detector survey recommended for 'Moderate' and 'High' suitability habitats according to Bat Conservation Trust guidelines, without walked activity transects, to obtain as robust a baseline as practically possible. As such, a total of ten detector locations were selected and one automated detector survey was carried out per month for each location from April – October.
- 2.2.6 Automated static detectors (Song Meter Mini or Anabat Swift) were deployed at each of the deployment locations for a minimum of five consecutive nights per deployment between July and October 2023 and between April and June 2024. Ten detector locations covered the Site as evenly as possible and were selected to focus on key habitat features for bats, such as hedgerows and woodland edges (**Figure 1** refers). The detectors were programmed to begin recording at least 30 minutes before sunset and finish recording 30 minutes after sunrise each night.
- 2.2.7 The deployment dates, weather details and durations of the static detector surveys are detailed in Appendix B. Recordings made were subsequently analysed using Kaleidoscope software, and bat species and the number of bat passes recorded was identified. All identified bat calls and 'No ID' files were manually analysed using the analysis software, and a minimum of 10% of the total noise files were also manually checked.

⁶ Collins, J. (ed) (2024) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.



Figure 1: Static detector deployment locations at Alleston Farm



3 LIMITATIONS

3.1 General Bat Survey Limitations

3.1.1 Bat detectors are known to be more sensitive to certain bat calls than to others for reasons such as varying bat call loudness and directionality of certain calls. For example, a call from a horseshoe bat is directional and a bat detector will only be able to record the call if the bat echo-locates directly at the detector whereas a common pipistrelle call is less directional and can be recorded even when the call is aimed away from the microphone. This can result in certain bat species (notably horseshoe bats and long-eared bats) being under-recorded due to the limitations of the current bat detectors. The difference in recording efficiency may therefore bias any results and this has been taken into account where possible during any assessment of the results.

3.2 Bat Data Analysis Limitations

3.2.1 Static detector data has been analysed using the latest Kaleidoscope Pro automated analysis software. This software has been specifically designed to automatically classify the known bat calls of Britain and Ireland.

3.2.2 The program automatically identifies bat calls using various algorithms and provides statistical levels of confidence associated with each classified call. The confidence levels reflect the fact that there will be certain classification errors related to every classified bat call. With experience of using the software it appears that, on the whole, it is reliable when identifying certain bat calls (common and soprano pipistrelles, noctule, serotine, Leisler's, lesser and greater horseshoe bats) but less reliable when identifying other species (long-eared and barbastelle bat species).

3.2.3 Steps have been taken to ensure sufficient quality assurance considering the relative classification difficulty faced by the software between different species. All records of greater horseshoe, lesser horseshoe, barbastelle, *Myotis* and long-eared species identified by the automated software have been manually verified and where appropriate the call identity corrected.

3.2.4 The software does not distinguish between the various *Myotis* species and simply classifies them to genus level (ie *Myotis* sp.). This is in line with classification that would be achieved by manual identification due to the similar nature of *Myotis* calls making species classification subject to a high degree of error.

3.2.5 Where the software is unsure of a bat call, it will classify the call as 'NoID'. Where a relatively high number of calls are classified as NoID within a deployment's dataset (more than 10% of a data set), these calls were also manually verified by an experienced ecologist. NoID results are included within this report.

3.2.6 In conclusion, the classification data produced from Kaleidoscope, along with any manual verification of certain problem/important species, is considered to provide an accurate record of the bat species recorded by a static bat detector and as such has been used with confidence within this report.

3.3 Static Detectors

3.3.1 Automated bat detectors did not record any bat activity on six occasions which was attributed to a number of factors, including technical failures (i.e. resulting from water ingress into detectors) and flailing being undertaken causing damage to a detector, for example. Despite these failures, no fewer than 30 static detector recording nights were carried out at each deployment location across the survey seasons, with a total of 374 successful recording nights being completed across the entire survey. This allowed for sufficient bat activity data to have been collected to undertake robust analysis of the data.



4 RESULTS

4.1 Desk Study Information

Legislation, Local Plans and Policies

- 4.1.1 All 17 species of bat known to breed in England and Wales, and their roost sites, are protected under the Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a bat, or to deliberately disturb a bat such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place. Intentional or reckless disturbance of bats in their resting places, and damage to or obstruction of resting places are also offences under the Wildlife and Countryside Act 1981 (as amended). As a result, development works which are likely to involve the loss of or alteration to roost sites, or which could result in killing of or injury to bats, need to take place under licence.
- 4.1.2 The following bat species are listed as Species of Principal Importance under the Environment (Wales) Act 2016; barbastelle, Bechstein's, Noctule, common pipistrelle, soprano pipistrelle, brown long-eared bat, greater horseshoe bat, lesser horseshoe bat.
- 4.1.3 Section 7 of the Environment (Wales) Act 2016 requires all statutory authorities to produce a list of protected habitats and species, both at a national and county level. These detail lists of habitats and species of principal importance for conservation action (i.e. SPI or Species of Principal Importance).

Designated Sites

- 4.1.4 Taken from the local environmental data searches, **Table 1** includes details of internationally designated sites situated 30km or less, nationally designated sites found within a 5km distance and local designated sites where present within 2km or less, none of which have been specifically designated for bats but are likely to support habitats of good suitability for bats.

Table 1: Summary of Designated Sites for Nature Conservation of Relevance

Protected Site Name	Distance and Direction from Site	Reason for Designation
Pembrokeshire Bat Sites and Bosherton Lake Special Area of Conservation (SAC)	3.9km southwest at its closest point	<p>Greater and lesser horseshoe bats are among at least ten species of bat utilising the surrounding woodland and swampy lakeside margins as feeding flyways connected to important summer, winter and intermediate roost sites, which are component SSSI within the overarching SAC.</p> <p>The other SSSI which make up the SAC represent a range of important nursery and hibernation roosts for horseshoe bats across Pembrokeshire, ranging from adjacent nursery roosts in the Stackpole Courtyard Flats and Walled Garden SSSI, in South Pembrokeshire to Slebech Stableyard lofts and tunnels SSSI in mid Pembrokeshire to Felin Llwyngwair SSSI in North Pembrokeshire.</p> <p>Orielton Stable Block and cellars SSSI, Beech Cottage, Waterwynch SSSI and Park House Outbuildings SSSI, hold significant nursery roosts of lesser horseshoe bats in Pembrokeshire.</p> <p>Carew Castle SSSI provides a range of important intermediate roosting sites for greater and lesser horseshoe bats, particularly between spring and autumn, including a summer roost for male bats and a mating roost. Surrounding castle grassland and walled boundaries provide important feeding areas connected to bat flyways and a range of temporary roosting sites through a well-wooded pastoral landscape, including along the tidal Cleddau (part of the Pembrokeshire Marine SAC).</p> <p>Both greater horseshoe bats and lesser horseshoe bats feed, and have important sheltered flight corridors, at Stackpole - through woodland at Coldwell, Lodge Park, Castle Dock, Cheriton,</p>



Protected Site Name	Distance and Direction from Site	Reason for Designation
		Stackpole Warren and the Mere Pool valley – all linked to lakeside habitats.
Stackpole SSSI	3.9km southwest	Greater and lesser horseshoe bats are among at least ten species of bat utilising the surrounding woodland and swampy lakeside margins as feeding flyways connected to important summer, winter and intermediate roost sites, which are component SSSI within the overarching SAC
Stackpole Courtyard Flats and Walled Garden SSSI	3.9km southwest	Breeding site for greater and lesser horseshoe bats
Carew Castle SSSI	4.8km northeast	Provides a range of important intermediate roosting sites for greater and lesser horseshoe bats, particularly between spring and autumn, including a summer roost for male bats and a mating roost.
Orielton Stable Block and Cellars SSSI	4.3km west	Holds significant nursery roosts of lesser horseshoe bats in Pembrokeshire
Park House Outbuildings SSSI	3.9km southwest	Breeding site for lesser horseshoe bats

Local Bat records

4.1.5 In excess of 140 field records returned by Aderyn identified common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, Noctule Bat *Nyctalus noctula*, greater horseshoe bat *Rhinolophus ferrumequinum*, lesser horseshoe bat *R. hipposideros*, brown long-eared bat *Plecotus auritus*, myotis species *Myotis spp.* including Natterer's and Daubenton's bats, barbastelle bat *Barbastella barbastellus*, and further unidentified bat species within 2km of the Site. Records comprised animals in flight and roosting in the local area.

4.2 Habitat Suitability for Roosting and Foraging Bats

4.2.1 In terms of dispersal habitat of value to bats, the Site is highly conducive to the unimpeded movement of bats within the local landscape owing to the abundance of hedgerows and watercourses as well as neighbouring woodland parcels. The fields that make up the majority of the Site's area are of less value in terms of dispersal and navigation, but nonetheless do not pose a barrier to movement. The Site is assumed to receive no artificial lighting at night at present.

4.2.2 The Site is considered to contain habitat of high potential value to roosting bats in the form of mature trees, which line many of the hedgerows, as well as those present at the woodland edges. The Site contained a large number of mature trees which were seen to contain between low and high potential for roosting bats. The unlit and rural nature of the Site, together with the interconnected linear vegetated features increases the likelihood that these potential roosting features may be discovered and investigated by bats. No buildings were located within the Site boundary.

4.2.3 In terms of habitat value to foraging bats, the most valuable habitats are the woodland edges and hedgerows along with any associated boundary watercourses as they can be expected to support the greatest abundance and diversity of nocturnal flying invertebrates. Woodland and species rich hedgerows are considered to be of high value while species poor hedgerows are likely to be of moderate value.

4.2.4 The arable farmland, which occupies the majority of the Site, is generally considered to provide poor foraging suitability for bats. The cereal monoculture in cultivation has a uniform structure and is likely to support low species diversity and richness of invertebrate prey. Pesticides, if in use, also have the effect of reducing the abundance of bat prey species. A hedgerow network formed the boundaries of the Site which connected into the wider landscape, and which were considered to provide optimal suitability for foraging and commuting bats.



- 4.2.5 The field margins provided suitable habitat for invertebrate prey species but were narrow within the Site which makes them more susceptible to disturbance from agricultural activities and overspray of pesticides and other chemical inputs.
- 4.2.6 The presence of grazing livestock is of interest to horseshoe bats, particularly greater horseshoe bats which selectively feed on dung beetles at certain times of year. While this particular food source is used opportunistically by greater horseshoe bats, it is particularly important within the core sustenance zone of breeding roosts. Significant colonies for both lesser and greater horseshoe bats have been designated as part of the Pembrokeshire Bat Sites and Bosherton Lake Special Area of Conservation (SAC) and are located 3.9km southwest of the Site at its closest point, although smaller roosts may occur in traditional agricultural buildings. Core Sustenance Zones (CSZ) have been defined as 3km from a communal greater horseshoe roost and 2km from a communal lesser horseshoe bat roost⁷, therefore the Site is unlikely to be located within this.
- 4.2.7 On the basis of the survey results and desk study data, it is appropriate to apply a precautionary approach towards the assemblage of bat species which may be present, and so it should be assumed that the Site hosts multiple roosts of a range of species within trees and adjacent woodlands (it would be disproportionately onerous to carry out full survey of all of these features), as well as of foraging bats over the entire land holding, although with greater focus attributed to the hedgerows and woodland edges. This assemblage should be assumed to contain the diversity of species reflected by the static detector data, namely pipistrelle (including *Nathusius*), noctule, *Myotis* and long-eared bats, as well as rarer species including *Barbastelle*, lesser horseshoe and greater horseshoe. Consequently, it should be considered that the Site's habitats are of Local Importance to roosting, dispersing and foraging bats.

4.3 Static Detector Survey Results

- 4.3.1 **Table 4** provides a summary of the number of passes, average number of passes per night and percentage of activity for each species at each of deployment location. A visual representation of the data is presented **Figure 2**, which shows the percentage of passes by species and overall passes per night at each deployment location. A full set of results of the static detector survey are provided in **Table 5**.

Species Richness

- 4.3.2 Overall, at least ten bat species were recorded during the static detector surveys comprising the following:
- *Barbastelle*
 - Serotine *Eptesicus serotinus*
 - *Myotis* sp. (potentially comprising *M. daubentonii*, *M. bechsteinii*, *M. brandtii*, *M. mystacinus* and *M. nattereri*)
 - *Nyctalus* sp. (potentially comprising *N. noctula* and *N. leisleri*)
 - *Nathusius'* pipistrelle *Pipistrellus nathusii*
 - Common pipistrelle
 - Soprano pipistrelle
 - *Plecotus* sp. (potentially comprising *P. auritus* and *P. austriacus*)
 - Greater horseshoe
 - Lesser horseshoe
- 4.3.3 Both the *Myotis* and *Nyctalus* genera are grouped due to the similar nature of calls making classification subject to a high degree of error. The Site is likely to support more than one species from each of the two genera listed above. The *Plecotus* genus is also grouped with both brown long-eared and grey long-eared being present in Pembrokeshire, although grey long-eared bat is very rare with a very restricted distribution and the recordings from this genus is likely to be the much more common brown long-eared bat.

⁷ Core Sustenance Zones: Determining Zone Size. Bat Conservation Trust,



4.3.4 **Table 2** shows the rarity of the species recorded during the static detector surveys, or possibly recorded in the case of *Myotis*, *Nyctalus* and *Plecotus* species, using the definition of relative rarity of bat species within England (no similar definitions are available for Wales but rarity should be broadly similar between the two countries) produced by Wray et al⁸ and the current population size and distribution based on information provided by the Bat Conservation Trust⁹ and Mammal Society¹⁰.

Table 2: Rarity of the species recorded and potentially recorded during the static detector surveys

Species	Rarity within UK	UK status, distribution and population size estimate in Wales
Barbastelle	Rarest	Very rare, found in southern and central England and Wales. Species of Principal Importance in Wales under the Environment (Wales) Act 2016 and Habitats Directive Annex II and IV Species. Population size unknown.
Greater horseshoe	Rarest	The greater horseshoe bat has shown a marked decline. It is rare in Britain and now confined to southwest England and south Wales. Species of Principal Importance in Wales under the Environment (Wales) Act 2016 and Habitats Directive Annex II and IV Species. Population size in Wales estimated to be 2,700.
Bechstein's bat	Rarest	Very rare, found in southern Wales and parts of southern England. The UK is at the northernmost edge of its distribution range. Species of Principal Importance in Wales under the Environment (Wales) Act 2016 and Habitats Directive Annex II and IV Species. Population size in Wales estimated to be 250.
Grey long-eared	Rarest	They are regarded as absent from Wales, however, there has been a single genetic record in Pembrokeshire which could not be fully confirmed. Habitats Directive Annex IV Species.
Lesser horseshoe	Rarer	This species has shown a marked decline in numbers and distribution, although there is evidence of a recent increase in Wales. The lesser horseshoe bat is rare in the British Isles and is confined to Wales, western England and western Ireland. Species of Principal Importance in Wales under the Environment (Wales) Act 2016 and Habitats Directive Annex II and IV Species. Population size in Wales estimated to be 30,900.
Nathusius' pipistrelle	Rarer	Rare but widespread, migratory. Habitats Directive Annex IV Species.
Leisler's bat	Rarer	Uncommon but widespread in UK, more common in Ireland. Habitats Directive Annex IV Species.
Brandt's bat	Rarer	Uncommon but widespread in UK. Habitats Directive Annex IV Species
Noctule	Rarer	Fairly common and widespread. Species of Principal Importance in Wales under the Environment (Wales) Act 2016 and Habitats Directive Annex IV Species. Population size in Wales estimated to be 91,900.
Whiskered bat	Rarer	Uncommon but widespread in UK. Habitats Directive Annex IV Species
Natterer's bat	Rarer	Locally common and widespread throughout Britain. Habitats Directive Annex IV Species. Population size in Wales estimated to be 52,300.
Daubenton's bat	Rarer	Relatively common and widespread throughout Britain. Habitats Directive Annex IV Species. Population size in Wales estimated to be 108,000.

⁸ Wray, S., Wells, D., Long, E. and Mitchell-Jones, T. (2010). Valuing Bats in Ecological Impact Assessment. In Practice, December 2010. Chartered Institute of Ecology and Environmental Management.

⁹ Based on information provided by the Bat Conservation Trust <http://www.bats.org.uk/>

¹⁰ Mathews F, Smith B, Harrower C, Coomber F in association with the Wales Mammal Biodiversity Action Forum. (2020). The State of Mammals in Wales. A report by the Mammal Society for Natural Resources Wales, produced in association with Wales Mammal Biodiversity Action Forum. The Mammal Society, London. ISBN: 978-0-9935673-6-0



Species	Rarity within UK	UK status, distribution and population size estimate in Wales
Serotine	Rarer	A less common species, occurring mainly south of a line drawn from The Wash to parts of South Wales. Habitats Directive Annex IV Species. 18,700.
Brown long-eared	Common	Common and widespread. Species of Principal Importance in Wales under the Environment (Wales) Act 2016 and Habitats Directive Annex IV Species. Population size in Wales estimated to be 96,600.
Soprano pipistrelle	Common	Common and widespread. Species of Principal Importance in Wales under the Environment (Wales) Act 2016 and Habitats Directive Annex IV Species. Population size in Wales estimated to be 478,000.
Common pipistrelle	Common	Very common and widespread. Species of Principal Importance in Wales under the Environment (Wales) Act 2016 and Habitats Directive Annex IV Species. Population size in Wales estimated to be 297,000.

- 4.3.5 The level of species-richness was considered to be high for a Site within Wales as 10+ species were recorded out of the 16 known resident species in Wales (including grey long-eared bat, which have been confirmed as present, although not at the Site). The remaining species not identified are members of the *Myotis*, *Nyctalus* and *Plecotus* genera that cannot be identified confidently to species level using sound recordings.
- 4.3.6 Deployment Locations 3 and 8 recorded 10+ species, while Locations 1, 2, 4, 5, 9 and 10 did not record any Nathusius' pipistrelle (recording 9+ species) and Locations 6 and 7 did not record any Nathusius' pipistrelle nor serotine (recorded 8+ species).
- 4.3.7 The Site is located at the western edge of the range for barbastelle, with only a few isolated colonies recorded in Pembrokeshire¹¹. This species is considered to be most closely linked with woodland edge habitats and tree roosts although they will occasionally roost in buildings. Barbastelle was recorded at each of the deployment locations at the Site but with significantly higher activity from this species recorded within the southern half of the Site (Locations 1 – 5).

Bat Activity Analysis

- 4.3.8 A total of 142,091 bat passes were recorded over 374 recording nights at ten deployment locations. This equates to an average of 380 bat passes per recording night. This is considered to represent a relatively high level of bat activity based on Clarkson and Woods' UK-wide static detector data set.
- 4.3.9 When taken individually, Location 4 had the highest level of bat activity (856.05 average passes per night), followed by Location 2 (561.48 average passes per night), Location 3 (429.57 average passes per night), Location 5 (425.78 average passes per night), Location 7 (400.94 average passes per night), Location 6 (380.35 average passes per night), Location 1 (221.5 average passes per night), Location 9 (159.70 average passes per night), Location 8 (153.38 average passes per night), and Location 10 (121.4 average passes per night).
- 4.3.10 Location 4 had the highest average passes per night for three species including *Myotis* sp., common pipistrelle and soprano pipistrelle. Location 1 had the highest average passes per night for barbastelle, one of the rarest species, and recorded the lowest level of activity from the two most common species; common pipistrelle and soprano pipistrelle. Location 5 had the highest average passes per night for two species including serotine and *Plecotus* sp. Location 2 had the highest average passes per night for greater horseshoe only. Location 3 had the highest average passes per night for lesser horseshoe only. Location 10 had the highest average passes per night for *Nyctalus* sp. only. Locations 3 and 8 were the only locations to record the rarest species, Nathusius' pipistrelle. Locations 6, 7, and 9 did not have the highest average passes per night for any species recorded during the surveys.

¹¹ <https://www.vwt.org.uk/projects-all/natur-am-byth-barbastelles-in-pembrokeshire/>



4.3.11 Temporally, the average number of bat passes per night was highest in late August (665.91), July (545.18), early August (448.23) followed by September (299.89) and May (290.00) with lower levels of activity being recorded during June (184.72) and April (158.31).

4.3.12 Relative activity rates by each species are given in the paragraphs below in order of highest activity to lowest.

Common pipistrelle

4.3.13 A high level of activity was recorded from common pipistrelle, which was the most recorded species overall, and the most recorded species the majority of deployment locations including 1, 2, 3, 4, 6 and 7, accounting for 54.86% of all passes with an average of 175.56 passes per night across the deployment locations. Average passes per night for common pipistrelle ranged from 40.21 (Location 10) to 443.53 (Location 4). Very high levels of activity were recorded at Location 4 which was located on the edge of broadleaved woodland and close to a stream and reservoir. Significantly lower levels of activity were recorded at Location 8 (55.57 passes per night), Location 9 (52.41 passes per night) and Location 10 (40.21 passes per night) which were located in the northeastern parcel of the Site and along well managed, species-poor hedgerows.

Soprano pipistrelle

4.3.14 Soprano pipistrelle was the next highest recorded species, accounting for 36.84% of all passes and was the most recorded species at deployment Locations 5, 8, 9 and 10. Soprano pipistrelle had an average of 117.91 passes per night across the deployment locations, which was considered to be a high level of activity for this species. Soprano pipistrelle passes per night ranged from 47.13 (Location 10) to 243.38 (Location 4). Very high levels of activity were recorded at Location 4 which was located on the edge of broadleaved woodland and close to a stream and reservoir. Soprano pipistrelle is a species known to be closely associated with watercourses and waterbodies and, as such, it is unsurprising to see higher levels of activity close to water features.

Greater Horseshoe

4.3.15 Greater horseshoe bats accounted for 2.58% of all passes with an average of 9.80 passes per night per deployment location. Passes from this species were highest at Location 2 (24.70 passes per night) and Location 3 (21.57 passes per night) which were both located within the southern parcel of the Site. Moderate levels of activity were also recorded at Location 5 (7.33 passes per night), Location 6 (9.00 passes per night) and Location 7 (10.54 passes per night). Lower levels of activity were recorded at Location 1 (2.83 passes per night), Location 4 (3.13 passes per night), Location 8 (3.08 passes per night), Location 9 (3.93 passes per night) and Location 10 (3.65 passes per night). Temporally, greater horseshoe activity was highest in the first half of the main active period in April, May and June with much lower activity recorded in July, August and September. July and August coincide with the main period for giving birth and weaning pups for this species and individuals are more likely forage closer to maternity roost sites at this time, further corroborating the conclusion that the Site is not located within a Core Sustenance Zone for this species, considering the presence of the SAC 3.9km away.

4.3.16 Night roosting behaviour by greater horseshoe bats were recorded on at least ten occasions at a variety of locations (**Table 3** refers). It is considered highly likely that greater horseshoe bats are making use of natural features within the mature hedgerow network, such as large mature tree branches, where available.

Table 3: Greater Horseshoe Bat Night Roosting Records

Month	Static Location(s)
July 2023	7
Late-August 2023	2, 5, 6, 10
September 2023	2, 4, 6
May 2024	2
June 2024	3



Nyctalus sp.

- 4.3.17 *Nyctalus sp.* were recorded at low levels overall (6.85 passes per night) and at each Site, with the exception of Locations 2 and 10, which had slightly higher levels of activity (7.88 and 8.35 passes per night, respectively). All other deployment locations ranged between 1.31 passes per night (Location 7) to 6.61 passes per night (Location 1). *Nyctalus sp.* are less strongly associated with hedgerows for commuting and foraging and often forage high above fields with loud multi-directional calls, which may be contributing factors for the even distribution across the Site. *Nyctalus* activity was highest in June with smaller peaks in April and late August.

Myotis Bats

- 4.3.18 Across the Site, low levels of activity were recorded from *Myotis sp.* (5.36 passes / night) although this ranged from 0.74 passes per night (Location 10), considered to be very low levels of activity to 30.49 passes per night (Location 4) which was considered to be a moderate level of activity for this group of species. Significantly higher levels of *Myotis sp.* activity was recorded at deployment Location 4 which is located adjacent to broadleaved woodland and close to a stream and reservoir. Daubentons's bat are strongly associated with foraging above watercourses and waterbodies and it is considered possible that recordings at this location are from regular foraging activity of this species. The outlying peak in activity at Location 4 may also suggest a roost from a *Myotis sp.* is nearby.

Lesser Horseshoe

- 4.3.19 Lesser horseshoe bats accounted for 1.52% of passes with an average of 4.86 passes per night per deployment location. Passes from this species was highest at Location 3 (11.79 passes per night) which was located along a strip of broadleaved woodland. Moderate levels of activity were recorded at Location 2 (6.96 passes per night), Location 5 (6.49 passes per night), Location 6 (5.68 passes per night) and lower levels of activity were recorded at Location 10 (4.19 passes per night), Location 7 (3.71 passes per night), Location 8 (3.68 passes per night), Location 9 (2.76 passes per night), Location 4 (2.60 passes per night) and Location 1 (0.37 passes per night). Lesser horseshoe activity was highest at the deployment locations nearest the centre of the Site and were lower at the outer edges of the Site. This could suggest a roost within the farm buildings associated with Alleston Farm.
- 4.3.20 Temporally, lesser horseshoe activity was significantly higher in June with high activity levels also recorded in May and much lower activity recorded in April, July, August and September.
- 4.3.21 Lesser horseshoe bat night roosting behaviour was recorded on at least one occasion at Location 8 during the September survey.

Plecotus sp.

- 4.3.22 Low levels of brown long-eared bat were recorded overall (1.87 pass per night) and were recorded at every deployment location. Passes from this species were highest at Location 5 (6.33 passes per night) with low levels of activity recorded at each of the remaining deployment locations. A peak in activity from *Plecotus sp.* was recorded in late August with relatively even levels of activity during the remaining months.

Barbastelle

- 4.3.23 Very low levels of barbastelle activity was recorded at the Site (0.59 passes per night), although this species was recorded at each of the deployment locations. The highest level of activity was recorded at Location 1 (2.05 passes per night) with the remaining deployment locations recording an average of fewer than 1 pass per night. Barbastelle activity was significantly higher in the later part of the main active period in late August and September and was very low during the remaining months April – July. Barbastelle bats are closely associated with enclosed woodland environments, such as those outside but adjacent to the south of the red line boundary.

Nathusius pipistrelle

- 4.3.24 *Nathusius' pipistrelle* was recorded at very low levels overall (0.01 pass per night) and was only recorded at deployment Locations 3 and 8, attributable to single passes at these locations, both during the late-August survey. *Nathusius' pipistrelle* bats are known to migrate long distances and in the UK it appears that a small summer breeding population is supplemented by migratory individuals during the autumn and winter for



hibernation. Breeding strongholds occur in the east and south east of England. It is possible that the area may constitute an occasional migration commuting route for very low numbers of Nathusius' pipistrelles, with very low levels of activity occurring after the main breeding period.

Serotine

- 4.3.25 Serotine was recorded at very low levels overall (0.10 pass per night) and was only recorded at deployment Locations 1, 2, 3, 4, 5, 8, 9, 10. The highest levels of activity were recorded at Location 5 (0.33 pass per night) with only 1-9 passes being recorded at the remaining Locations across the whole survey season. Higher levels of activity were recorded in early August (18 passes) with <5 passes being recorded in each of the remaining months.



Figure 2: Static Detector Survey Results (level of activity by each species at each location, proportionally scaled)



Table 4: Summary of the Static Bat Detector Survey at the Site (Highlighted Orange at location with highest average passes per night for each species)

Deployment Location	Total no. bat species / passes recorded	Species	No. passes	Average no. of passes per night	% of activity
Location 1	9 species (at least) 7531 passes 34 recording nights 221.50 (avg. passes per night)	Barbastelle	84	2.05	1.12
		Serotine	1	0.02	0.01
		<i>Myotis</i> sp.	210	4.90	2.79
		<i>Nyctalus</i> sp.	146	6.61	1.94
		Nathusius' pipistrelle	0	0	0
		Common pipistrelle	4842	117.07	64.29
		Soprano pipistrelle	2008	48.24	26.66
		<i>Plecotus</i> sp.	101	2.20	1.34
		Lesser Horseshoe	20	0.37	0.27
		Greater Horseshoe	119	2.83	1.58
Location 2	9 species (at least) 22,459 passes 40 recording nights 561.48 (av. passes per night)	Barbastelle	24	0.60	0.11
		Serotine	2	0.05	0.01
		<i>Myotis</i> sp.	151	3.78	0.67
		<i>Nyctalus</i> sp.	315	7.88	1.40
		Nathusius' pipistrelle	0	0	0
		Common pipistrelle	12069	301.73	53.74
		Soprano pipistrelle	8326	208.15	37.07
		<i>Plecotus</i> sp.	56	1.40	0.25
		Lesser Horseshoe	355	8.88	1.58
		Greater Horseshoe	1161	24.70	5.12
Location 3	10 species (at least) 15,035 passes 35 recording nights 429.57 (av. passes per night)	Barbastelle	10	0.29	0.07
		Serotine	1	0.03	0.01
		<i>Myotis</i> sp.	159	4.54	1.06
		<i>Nyctalus</i> sp.	127	3.63	0.84
		Nathusius' pipistrelle	1	0.03	0.01
		Common pipistrelle	9393	268.37	62.47
		Soprano pipistrelle	3884	110.97	25.83
		<i>Plecotus</i> sp.	59	1.69	0.39
		Lesser Horseshoe	495	1414	3.29
		Greater Horseshoe	906	25.89	6.03
Location 4	9 species (at least) 34,242 passes 40 recording nights 856.05 (av. passes per night)	Barbastelle	32	0.8	0.09
		Serotine	5	0.13	0.01
		<i>Myotis</i> sp.	1433	35.83	4.18
		<i>Nyctalus</i> sp.	185	4.63	0.54
		Nathusius' pipistrelle	0	0	0
		Common pipistrelle	20846	521.15	60.88
		Soprano pipistrelle	11439	285.98	33.41
		<i>Plecotus</i> sp.	55	1.38	3.05
		Lesser Horseshoe	122	0.16	0.36
		Greater Horseshoe	125	3.13	0.37
Location 5	9 species (at least) 17,031 passes 40 recording nights 425.78 (av. passes per night)	Barbastelle	40	1.00	0.23
		Serotine	13	0.33	0.08
		<i>Myotis</i> sp.	81	2.03	0.48
		<i>Nyctalus</i> sp.	136	3.4	0.80
		Nathusius' pipistrelle	0	0	0
		Common pipistrelle	7807	195.18	45.84
		Soprano pipistrelle	8103	202.58	47.58
		<i>Plecotus</i> sp.	253	6.33	1.49
		Lesser Horseshoe	305	7.63	1.79
		Greater Horseshoe	293	7.33	1.72



Location 6	8 species (at least) 15,214 passes 40 recording nights 380.35 (av. passes per night)	Barbastelle	6	0.15	0.04
		Serotine	0	0	0
		<i>Myotis</i> sp.	110	2.75	0.72
		<i>Nyctalus</i> sp.	120	3.00	0.79
		Nathusius' pipistrelle	0	0	0
		Common pipistrelle	7184	179.60	47.22
		Soprano pipistrelle	7133	178.33	46.88
		<i>Plecotus</i> sp.	34	0.85	0.22
		Lesser Horseshoe	267	6.68	1.75
		Greater Horseshoe	360	9.00	2.37
Location 7	8 species (at least) 14,033 passes 35 nights 400.94 (av. passes per night)	Barbastelle	3	0.09	0.02
		Serotine	0	0	0
		<i>Myotis</i> sp.	48	1.37	0.34
		<i>Nyctalus</i> sp.	46	1.31	0.33
		Nathusius' pipistrelle	0	0	0
		Common pipistrelle	9409	268.83	67.05
		Soprano pipistrelle	3992	114.06	28.45
		<i>Plecotus</i> sp.	10	0.29	0.07
		Lesser Horseshoe	156	4.46	1.11
Greater Horseshoe	369	10.54	2.63		
Location 8	10 species (at least) 6126 passes 40 nights 153.28 (av. passes per night)	Barbastelle	6	0.15	0.10
		Serotine	9	0.23	0.15
		<i>Myotis</i> sp.	109	2.73	1.78
		<i>Nyctalus</i> sp.	125	3.13	2.04
		Nathusius' pipistrelle	1	0.03	0.02
		Common pipistrelle	2616	65.40	42.67
		Soprano pipistrelle	2894	72.35	47.20
		<i>Plecotus</i> sp.	73	1.83	1.19
		Lesser Horseshoe	175	4.38	2.85
Greater Horseshoe	123	3.08	2.01		
Location 9	9 species (at least) 4791 passes 30 nights 159.70 (av. passes per night)	Barbastelle	7	0.23	0.15
		Serotine	2	0.07	0.04
		<i>Myotis</i> sp.	70	2.33	1.46
		<i>Nyctalus</i> sp.	124	4.13	2.59
		Nathusius' pipistrelle	0	0	0
		Common pipistrelle	1939	64.63	40.47
		Soprano pipistrelle	2385	79.50	49.48
		<i>Plecotus</i> sp.	44	1.47	0.92
		Lesser Horseshoe	102	3.40	2.13
Greater Horseshoe	118	3.93	2.46		
Location 10	9 species (at least) 4856 passes 40 nights 121.40 (av. passes per night)	Barbastelle	1	0.03	0.02
		Serotine	4	0.10	0.08
		<i>Myotis</i> sp.	38	0.95	0.78
		<i>Nyctalus</i> sp.	334	8.35	6.88
		Nathusius' pipistrelle	0	0	0
		Common pipistrelle	1890	47.25	38.92
		Soprano pipistrelle	2216	55.40	45.63
		<i>Plecotus</i> sp.	29	0.73	0.60
		Lesser Horseshoe	198	4.95	4.08
Greater Horseshoe	146	3.65	3.01		



Table 5: Summary of the passes per night for each species at each deployment location

Year	Month	Deployment Location	Night	BARBAR	EPTSER	MYOTIS	NYCTALUS	PIP NAT	PIPPIP	PIPPYG	PLECOTUS	RHIHIP	RHIFER	Total passes	Total Passes/night
2023	July	1	5	0	0	4	18	0	2286	559	14	2	8	2891	578.2
2023	July	2	5	0	0	5	9	0	191	278	4	2	24	513	102.6
2023	July	3	5	1	0	29	6	0	4578	59	7	4	151	4835	967.0
2023	July	4	5	0	0	8	52	0	4407	2098	4	0	4	6573	1314.6
2023	July	5	5	9	0	5	7	0	1346	185	24	2	25	1603	320.6
2023	July	6	5	0	0	5	12	0	435	892	15	0	3	1362	272.4
2023	July	7	5	0	0	0	4	0	5817	235	2	6	38	6102	1220.4
2023	July	8	5	0	0	1	0	0	31	30	0	0	0	62	12.4
2023	July	9	0	Detector Failure										0	0.0
2023	July	10	5	0	0	1	5	0	61	521	1	0	3	592	118.4
2023	Early Aug	1	5	3	1	76	27	0	207	225	56	4	47	1818	363.6
2023	Early Aug	2	5	0	1	17	20	0	1032	666	2	0	80	646	129.2
2023	Early Aug	3	0	Detector Failure										0	0.0
2023	Early Aug	4	5	1	2	32	30	0	1343	439	8	6	6	5692	1138.4
2023	Early Aug	5	5	5	4	8	2	0	1907	3719	14	6	27	1867	373.4
2023	Early Aug	6	5	0	0	2	4	0	157	706	0	3	3	5122	1024.4
2023	Early Aug	7	5	0	0	2	3	0	2176	2856	0	35	50	875	175.0
2023	Early Aug	8	5	0	9	14	51	0	275	214	11	16	9	599	119.8
2023	Early Aug	9	0	Detector Failure										0	0.0
2023	Early Aug	10	5	0	1	2	19	0	1006	270	1	0	11	1310	262.0
2023	Late Aug	1	0	Detector Failure										0	0.0
2023	Late Aug	2	6	12	1	97	30	0	2714	3201	40	49	179	6323	1053.8
2023	Late Aug	3	6	9	1	95	96	1	2691	3123	43	34	158	6251	1041.8
2023	Late Aug	4	6	0	1	11	18	0	7028	2496	4	13	29	9600	1600.0
2023	Late Aug	5	6	11	4	42	87	0	1822	2553	117	38	43	4717	786.2
2023	Late Aug	6	6	2	0	9	36	0	1659	1286	13	13	22	3040	506.7
2023	Late Aug	7	6	1	0	2	4	0	769	171	3	9	29	988	164.7
2023	Late Aug	8	6	3	0	26	34	1	567	423	24	2	18	1098	183.0
2023	Late Aug	9	6	5	1	15	32	0	1743	1052	31	15	15	2909	484.8



Year	Month	Deployment Location	Night	BARBAR	EPTSER	MYOTIS	NYCTALUS	PIP NAT	PIPPIP	PIPPYG	PLECOTUS	RHIHIP	RHIFER	Total passes	Total Passes/night
2023	Late Aug	10	6	1	2	16	67	0	400	457	23	6	66	1038	173.0
2023	Sept	1	5	78	0	115	20	0	1677	798	19	9	11	2727	545.4
2023	Sept	2	5	11	0	7	6	0	63	185	3	8	23	306	61.2
2023	Sept	3	5	0	0	1	0	0	81	11	0	0	1	94	18.8
2023	Sept	4	5	31	0	1349	9	0	2249	3074	33	50	5	6800	1360.0
2023	Sept	5	5	5	0	1	2	0	349	426	7	14	2	806	161.2
2023	Sept	6	5	3	0	6	17	0	541	245	3	21	51	887	177.4
2023	Sept	7	0	Detector Failure										0	0.0
2023	Sept	8	5	0	0	40	2	0	770	419	7	32	0	1270	254.0
2023	Sept	9	5	2	0	6	10	0	64	373	7	48	4	517	103.4
2023	Sept	10	5	0	0	5	3	0	45	17	1	13	4	88	17.6
2024	April	1	6	0	0	2	0	0	409	337	0	0	16	768	128.0
2024	April	2	6	0	0	2	37	0	206	492	0	0	489	1226	204.3
2024	April	3	6	0	0	0	7	0	1165	57	3	2	51	1285	214.2
2024	April	4	6	0	0	0	44	0	1081	1428	2	0	41	2596	432.7
2024	April	5	6	2	0	3	7	0	489	401	15	98	37	1052	175.3
2024	April	6	6	1	0	0	24	0	84	203	0	0	124	436	72.7
2024	April	7	6	1	0	2	32	0	222	519	1	0	14	791	131.8
2024	April	8	6	2	0	0	10	0	228	720	2	1	22	985	164.2
2024	April	9	6	0	0	0	0	0	0	3	0	0	4	7	1.2
2024	April	10	6	0	1	5	4	0	50	50	1	2	10	123	20.5
2024	May	1	6	3	0	13	81	0	263	89	12	5	37	503	83.8
2024	May	2	6	1	0	3	4	0	606	854	2	86	189	1745	290.8
2024	May	3	6	0	0	29	18	0	598	512	6	42	108	1313	218.8
2024	May	4	6	0	1	3	20	0	1251	1198	3	39	10	2525	420.8
2024	May	5	6	7	0	9	13	0	1506	632	48	111	114	2440	406.7
2024	May	6	6	0	0	73	9	0	1995	3260	1	161	91	5590	931.7
2024	May	7	6	0	0	35	2	0	157	113	4	26	168	505	84.2
2024	May	8	6	1	0	7	3	0	83	915	17	32	49	1107	184.5
2024	May	9	6	0	0	4	0	0	75	517	0	21	3	620	103.3
2024	May	10	6	0	0	3	155	0	280	620	1	37	36	1132	188.7



Year	Month	Deployment Location	Night	BARBAR	EPTSER	MYOTIS	NYCTALUS	PIP NAT	PIPIPI	PIPPYG	PLECOTUS	RHIHIP	RHIFER	Total passes	Total Passes/night
2024	June	1	7	Detector Failure										0	0.0
2024	June	2	7	0	0	20	209	0	7773	2840	5	210	177	11234	1604.9
2024	June	3	7	0	0	5	0	0	280	122	0	413	437	1257	179.6
2024	June	4	7	0	1	30	12	0	3487	706	1	14	30	4281	611.6
2024	June	5	7	1	5	13	18	0	388	187	28	36	45	721	103.0
2024	June	6	7	0	0	15	18	0	2313	541	2	69	66	3024	432.0
2024	June	7	7	1	0	7	1	0	268	98	0	80	70	525	75.0
2024	June	8	7	0	0	21	25	0	662	173	12	92	25	1010	144.3
2024	June	9	7	0	1	45	82	0	57	440	6	18	92	741	105.9
2024	June	10	7	0	0	6	81	0	48	281	1	140	16	573	81.9
Total			374	220	36	2380	2562	69	77949	52350	700	2159	3666	142091	379.8



5 ECOLOGICAL EVALUATION

- 5.1.1 This section provides an analysis of the value of ecological receptors (bats) identified as occurring within or in proximity of the site. The valuation of the receptor reflects the rarity and conservation status of each species as well as its relative abundance and activity levels on site.
- 5.1.2 At least eight species of bat were recorded within the Sites during the static detector survey. Table 6 provides the status of each bat species recorded and also the importance of the Site to each species based on the combined survey results.

Table 6: Ecological Evaluation

Bat species	UK status (current estimated UK population size) ¹²	County status	Level of activity on site	Ecological Importance
Barbastelle	Very rare, found in southern and central England and Wales. UK estimated population 5,000.	Uncommon and widespread.	Very low activity, average of 0.12 passes per night. Recorded at 10 of 16 deployment locations. Likely one or two individuals at Sites they were recorded.	District
<i>Myotis spp.</i>	Daubenton's - relatively common and widespread throughout Britain with a UK estimated population of 560,000 (95,000 in England)	Common and widespread wherever wetland habitat is present	Moderate level of activity, average of 10.28 passes per night. Recorded at all deployment locations. Likely small number of individuals	Local
	Natterer's - locally common and widespread throughout Britain with a UK estimated population of 148,000 (70,000 in England)	Local, more common along the western edge of the county		
	Whiskered - uncommon but widespread in England, UK population of 64,000	Fairly common and widespread		
	Brant's - uncommon but widespread in England. UK population of 30,000	Not known possibly quite widespread		
Serotine	Uncommon - UK population of 136,000, generally restricted to southern England and Wales	Scarce; rarely recorded in Wales	Very low levels of activity (0.10 passes per night) recorded at 8 deployment locations. Likely small number of individuals where recorded.	District

¹² Based on information provided by the Bat Conservation Trust <http://www.bats.org.uk/>



Noctule	Fairly common and widespread (50,000). UK BAP Priority Species	Thought to be declining in some areas, although relatively common in the northern half of the county.	Low activity, average of 6.85 passes per night. Recorded at all deployment locations. Likely small number of individuals.	Local
Leisler's bat	Uncommon but widespread in UK, more common in Ireland. Estimated England population 9,500 (28,000 in UK).	Rare, but thought to be under-recorded.		
Nathusius' pipistrelle	Rare but widespread, migratory. No population estimate for UK.	Rare. A strongly migratory species.	Very low activity, average of 0.01 passes per night. Recorded at 2 of 16 deployment locations. Likely one individual at Sites they were recorded.	District
Common pipistrelle	Common and widespread (2,430,000)	Common and widespread	High activity, average of 83.66 passes per night. Recorded at all deployment locations. Likely large number of individuals.	Local
Soprano pipistrelle	Common and widespread (1,300,000). UK BAP Priority Species	Common, (but less so than common pipistrelles) and widespread	Moderate activity, average of 13.22 passes per night. Recorded at all deployment locations. Likely moderate number of individuals.	Local
Brown long-eared	Common and widespread (245,000). UK BAP Priority Species	Common, with nationally important colonies in the centre and north	Very low activity, average of 0.58 passes per night. Recorded at all deployment locations. Likely small number of individuals at Sites they were recorded.	Local
Bat Species Assemblage	N/A			District



6 SUMMARY

6.1.1 A large number of trees within the Sites have the potential to support roosting bats. A small number of buildings adjacent to the Sites were assessed as having potential to support roosting bats. The habitats within the Site of greatest value to bats were the hedgerow network and woodland edges, principally for commuting, while the arable and pasture fields were generally of lower value. The Site is not considered to be located within a Core Sustainance Zone for greater or lesser horseshoe bats. The Site lies adjacent to a variety of contiguous woodland and wetland habitats which were seen to support the greatest species diversity and activity levels within the survey, although these habitats will be retained and preserved through the development in their entirety.

6.1.2 It is considered that the general assemblage and rate of activity recorded was relatively high when considered at a national scale, although this becomes more typical in the context of the habitat diversity and known network of important sites for bat conservation within the local landscape. The presence of barbastelle, serotine and Nathusius' pipistrelle is notable, but not unexpected and these species can be considered as being of District Importance in the context of the Site. The remaining assemblage of bat species is considered to be of Local Importance in terms of their conservation status and activity rates. Overall, the species assemblage is considered to be of **District Importance**.

Potential sources of impacts on bats which may occur during development at the Site range from disturbance of roosts within adjacent and nearby trees during construction activities, lighting disturbance from insensitively specified lighting sources, direct harm during any necessary habitat clearance operations affecting trees (although this is not understood to be necessary) and a fragmentation or degradation of foraging resource through hedgerow removal for access or grassland removal during construction. These impacts will be characterised within the eventual Alleston Solar Farm Project Environmental Statement and appropriate mitigation measures will be put forward in order to reduce their effects to acceptable levels. Opportunities for ecological enhancement for bats and opportunities for a net benefit for biodiversity will also be set out.



APPENDIX A: WILDLIFE LEGISLATION & SPECIES INFORMATION

BATS

All 17 species of bat known to breed in England and Wales, and their roost sites, are protected under the Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a bat, or to deliberately disturb a bat such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place. Intentional or reckless disturbance of bats in their resting places, and damage to or obstruction of resting places are also offences under the Wildlife and Countryside Act 1981 (as amended). Under UK law a bat roost is "any structure or place which any wild [bat]...uses for shelter or protection". As bats tend to reuse the same roosts, legal opinion is that the roost is protected whether or not the bats are present at the time. Penalties for offences against bats or their roosts include fines of up to £5,000 and/or up to six months in prison.

As a result, development works which are likely to involve the loss of or alteration to roost sites, or which could result in killing of or injury to bats, need to take place under licence. Works which could disturb bats may also be licensable, though this needs to be assessed on a case by case basis, as bats' sensitivity to disturbance varies depending on normal background levels, and the definition of disturbance offences under the Habitats Regulations is complex. In practice this means that works involving modification or loss of roosts (typically in buildings, trees or underground sites) or significant disturbance to bats in roosts are likely to be licensable.

Licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of bats in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.



APPENDIX B: STATIC DETECTOR DEPLOYMENT DATES AND WEATHER CONDITIONS

Table 7: Static detector deployment dates and weather conditions for Alleston Farm

Deployment Number	Deployment Date	Collection Date	No of Nights Surveyed	Overnight Weather Conditions Summary
1	20 July 2023	25 July 2023	5	Max overnight temp: 1°C - 16°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 22/07, and 24/07. Wind speeds between 2 – 16mph.
2	05 August 2023	10 August 2023	5	Max overnight temp: 12°C - 17°C. Min overnight temp: 11°C - 15°C. Largely dry with light rain occurring on 05/08 and brief showers on 08/08 and 09/08. Wind speeds between 4 – 23mph.
3	25 August 2023	31 August 2023	5	Max overnight temp: 14°C - 16°C. Min overnight temp: 12°C - 15°C. Largely dry with brief spells of light rain occurring on 26/08, 29/08 and 31/08. Wind speeds between 7 – 16mph.
4	27 September 2023	04 October 2023	6	Max overnight temp: 15°C - 16°C. Min overnight temp: 12°C - 15°C. Largely dry with light rain and drizzle occurring on 27/09, 28/09, 30/09, 01/10 and 02/10. Wind speeds between 6 – 32mph.
5	04 April 2024	10 April 2024	6	Max overnight temp: 8°C - 14°C. Min overnight temp: 6°C - 11°C. Largely dry with light rain occurring on 04/04, 05/04 and 08/04. Wind speeds between 9 – 29mph.
6	03 May 2024	09 May 2024	6	Max overnight temp: 8°C - 13°C. Min overnight temp: 7°C - 11°C. Largely dry with light rain and drizzle occurring on 03/05 and 05/05. Wind speeds between 0 – 14mph.
7	03 June 2024	10 June 2024	7	Max overnight temp: 10°C - 13°C. Min overnight temp: 7°C - 12°C. Dry throughout the survey period. Wind speeds between 4 – 15mph.



Clarkson and Woods Ltd.

Overbrook Business Centre,
Poolbridge Road, Blackford,
Somerset BS28 4PA

t: 01934 712500

e: info@clarksonwoods.co.uk

www.clarksonwoods.co.uk