

Land off Tattenhall Road, Tattenhall, Cheshire

Bat Activity Survey Technical Report

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TEP
The Reynard Suite
Bowden Business Village
Market Harborough
Leicestershire
LE16 7SA
Tel: 01858 383120
Email: mh@tep.uk.com
Offices in Warrington, Market Harborough, Gateshead, London and Cornwall

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This report is considered valid up to 18 months from the date of assessment in accordance with CIEEM guidance.

The conclusions and recommendations contained in this document are based upon information gathered by TEP and provided by third parties. Information provided by third parties and referred to herein has not been independently verified by TEP, unless otherwise expressly stated in the document.

Nothing in this report constitutes legal opinion. If legal opinion is required, the advice of a qualified legal professional should be secured.

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1.0 Introduction

1.1 The Environment Partnership (TEP) was commissioned by Gladman Developments in April 2026 to undertake an Ecological Impact Assessment (EcIA) to support an outline planning application for the construction of up to 110 new residential dwellings with associated infrastructure and soft landscaping on the settlement edge of Tattenhall, Cheshire (hereafter referred to as 'the site').

1.2 A suite of bat surveys was completed to inform the EcIA. This technical report is produced to provide detail of the bat activity surveys completed in support of the EcIA. It is not intended to be stand alone, it should be read in conjunction with:

- Ecological Desk Study (TEP Ref 10797.03.0010)
- Bat Roost Survey technical report (TEP Ref 11425.006)
- Ecological Impact Assessment (TEP Ref 11425.005).

Purpose of this Document

1.3 This technical report has the following objectives:

- Detail the methods of the bat activity surveys conducted;
- Detail the results of the bat activity surveys and to present these results to aid interpretation and assessment in the EcIA.

Site Description

1.4 The site is located in Tattenhall, Cheshire. The location of the site is depicted by the red line shown in Figure 1. The approximate central grid reference of the site is SJ 48887 59319.

1.5 The site comprises an area of modified grassland which is in use as a grazing paddock for horses. The site is bounded by hedgerows and trees with Keys Brook directly to the south of the site.

1.6 The wider area is predominantly rural comprising arable and grazing fields to the north, east and west with the outskirts of the village of Tattenhall to the south of Keys Brook. The city of Chester is situated approximately 11km northwest.

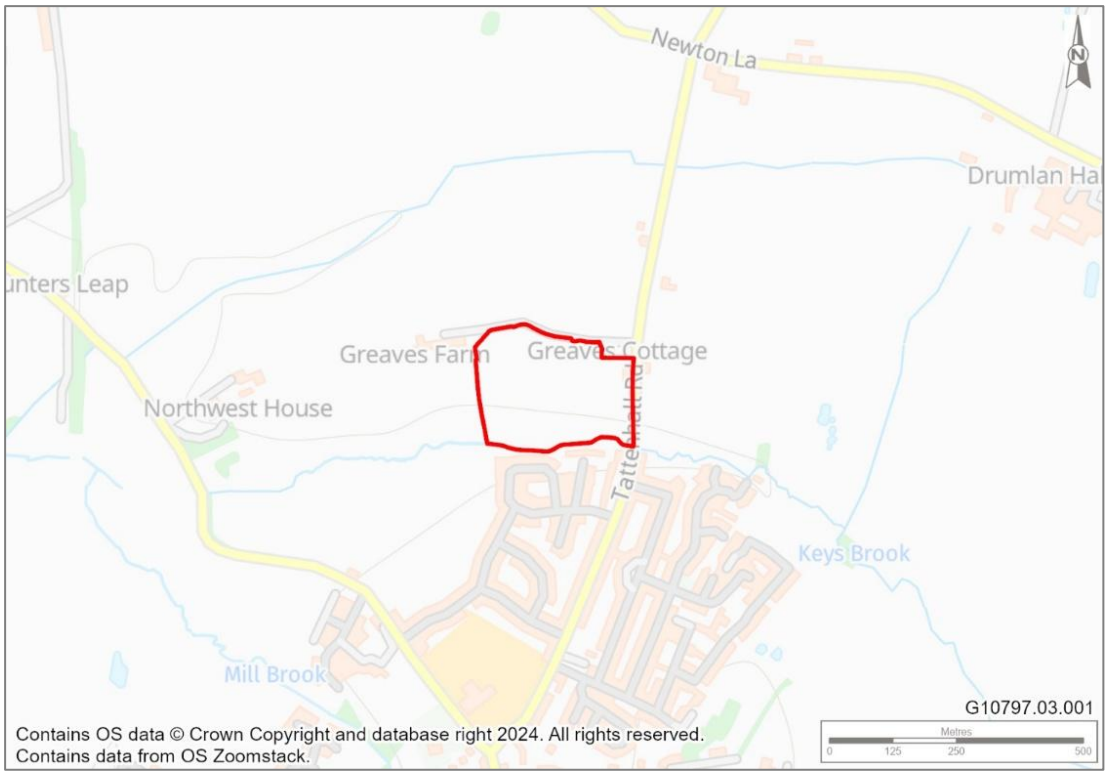


Figure 1: Site location in the context of the wider landscape

2.0 Methods

2.1 Table 1 summarises the bat activity surveys that were undertaken in accordance with the Bat Conservation Trust (BCT) Survey Guidelines (Collins, 2023[1]) and other relevant best practice guidance. Further details regarding survey methods adopted for the bat surveys are provided in Appendix A.

Table 1: Scope of bat activity surveys completed

	Guidance	Scope / Commentary
Ecological desk study	CIEEM, 2016[2], 2017b[3]	Search for National Site Network sites/component sites within 10km which include bat species as qualifying species. Search for other statutory sites which include bats as qualifying species or in their site descriptions. Search for bat pre-existing bat records within 2km of the site. Refer to the Ecological Desk Study Report (TEP Ref 10797.03.001) for further details.
Night-time bat walkover (NBW)	Collins, 2023[1]	Three seasonal NBWs were completed across the site on: 26th May 2026, 20th July 2026 and 16th September 2026. NBWs commenced at sunset. Further details of survey methods are presented in Appendix A and survey conditions are detailed in Appendix B.
Static activity survey	Collins, 2023	Two detectors were deployed seasonally in spring, summer and autumn, each for a minimum of five consecutive nights each month. Information regarding deployment locations and survey dates and conditions is provided in Appendix B.

2.2 The NBW route and the static locations are illustrated on Drawing 1 (TEP Ref G11425.001).

Survey Limitations

2.3 Moon illuminance was >50% with a waxing gibbous recorded during the spring (Visit 1) NBW. Moon illuminance may affect bat activity as some bat species are light-phobic and therefore activity by these species could be reduced on nights with high moon illuminance. However, given the presence of mature hedgerows and trees around the site that provide more sheltered habitat for bat foraging and commuting and the fact that moon illuminance >50% was recorded on a single visit only, moon illuminance did not impair confidence in the interpretation of the baseline data.

2.4 None of the static detectors were stolen or tampered with by human interference.

2.5 Average wind speeds were above average on two nights during static monitoring for the spring and summer surveys) (Visits 1 and 2), and above average to high on two

[1] 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

[2] CIEEM (2016) Guidelines for Accessing and Using Biodiversity Data. Chartered Institute of Ecology & Environmental Management

[3] CIEEM (2017b) Guidelines for Preliminary Ecological Appraisal, 2nd Edition. Chartered Institute of Ecology & Environmental Management

nights during autumn (Visit 3). Despite these conditions, bat activity continued to be recorded during the affected monitoring periods. The elevated wind speeds were therefore not considered to have significantly constrained the collection of activity data, although the potential for reduced bat activity and detectability under higher wind conditions has been considered in the interpretation of the results.

2.6 Average temperatures on one night during monitoring in autumn (Visit 3) dropped below 10ºC, with average temperatures of 7ºC recorded. Bat activity is known to be limited at temperatures below 10ºC however, this can be typical of weather conditions during autumn months particularly in northern habitats. Bat activity continued to be recorded during these nights and therefore this was not considered to be a significant constraint to activity data.

Overall data validity

2.7 To conclude, the level of survey effort with automated static monitoring surveys undertaken seasonally at two locations, in combination with NBWs allowed for interpretation of the baseline data and any limitations were taken into consideration when reflecting on habitat use within the site by bats in the locality.

3.0 Results

Desk-Study

3.1 None of the statutory sites identified from the Ecological Desk Study identified bat species as primary reasons for designation or as qualifying species.

3.2 Records for the following species of bat were identified from the desk study within 2km of the site:

- Common pipistrelle *Pipistrellus pipistrellus*
- Soprano pipistrelle *Pipistrellus pygmaeus*
- Pipistrelle species *Pipistrellus* sp.
- Brown long-eared *Plecotus auritus*
- Myotis species *Myotis* sp.
- Noctule *Nyctalus noctula*

3.3 The Multi-Agency Geographic Information for the Countryside (MAGIC) data identified eleven locations where Natural England EPS Mitigation Licences for bat roosts have been in place within 5km of the site. These are summarised in Table 2.

Table 2: Natural England mitigation licences within 5 km of the site.

Species on Licence	Licence Reference	Dates Valid	Licensable Activities
Brown Long-eared Bat Natterers	EPSM2012-5099	24/04/2013 to 30/09/2014	Affects a breeding place Destruction of a breeding place
Brown Long-eared Bat Common pipistrelle Soprano pipistrelle	2015-7153-EPS-MIT	13/03/2015 to 30/09/2020	Destruction of a resting place
Common pipistrelle	2015-15230-EPS-BDX	15/09/2015 to 31/10/2015	Affects a breeding place Damages a breeding place Damages a resting place Destruction of a breeding place Destruction of a resting place
Brown Long-eared Bat Common pipistrelle Soprano pipistrelle	2016-21792-EPS-MIT	16/03/2016 to 31/03/2021	Destruction of a resting place
Common pipistrelle	2017-28222-EPS-MIT-1	01/06/2017 to 30/09/2017	Damages a resting place
Common pipistrelle Soprano pipistrelle	2018-35123-EPS-MIT	04/06/2018 to 31/12/2018	Destruction of a resting place
Common pipistrelle	2018-36904-EPS-MIT	16/11/2018 to 01/05/2019	Destruction of a resting place

Species on Licence	Licence Reference	Dates Valid	Licensable Activities
Brandt's Bat Common pipistrelle Whiskered Bat	2018-37667-EPS-MIT	01/12/2018 to 29/11/2023	Affects a breeding place Damages a breeding place Destruction of a resting place
Brown Long-eared Bat Common pipistrelle Soprano pipistrelle Natterers	2019-39545-EPS-MIT	12/03/2019 to 11/03/2024	Affects a breeding place Damages a breeding place
Common pipistrelle Soprano pipistrelle Natterers	2020-49999-EPS-MIT	16/11/2020 to 31/12/2022	Destruction of a resting place
Common pipistrelle Soprano pipistrelle Natterers	2020-49999-EPS-MIT-1	16/11/2020 to 31/12/2022	Destruction of a resting place

Night-time Bat Walkover Results Summary

3.4 The results of the NBWs are illustrated on TEP Drawings G11425.008 to G11425.010.

3.5 At least six species were recorded across the three survey visits undertaken from April to October. Myotis bats were recorded, but only one species within this group could be identified to species level. It is possible that additional Myotis species were also present.

3.6 A total of 343 bat registrations were recorded across all surveys. Soprano pipistrelle and common pipistrelle generated the majority of the activity during NBWs (23.97% soprano 19.27% common) as was expected from the common and widespread occurrence of soprano and common pipistrelle within the region.

3.7 Relative abundance of other species/species groups also reflected local occurrence and species detectability, with noctules accounting for 6.74% of activity, Myotis species and brown long-eared accounting for 0.31% of activity and whiskered bats accounted for 0.16% of total activity. The relatively low abundance of brown long-eared bats compared to other bats in the assemblage is attributable to the species' quiet echolocation strategy.

3.8 Common pipistrelles, soprano pipistrelles and noctule were recorded during each NBW, while Myotis species, whiskered bat and brown long-eared bat were only recorded in the autumn.

3.9 Highest levels of activity were noted along the hedgerow/brook in the south of the site and the hedgerow bordering Tattenhall Road in the east of the site where mature trees and hedgerow are present. The spatial distributions of species recorded during the NBWs are illustrated on Drawings 2 to 4 G11425.008 to G11425.010.

3.10 Foraging activity, indicated by circular flight lines in TEP Drawings 2 to 4 G11425.008 to G11425.010, was recorded infrequently along the walkover transect routes during each NBW. All foraging recorded was by common and soprano pipistrelle, which is to be expected given the relative abundance of this species during each NBW.

3.11 Further detailed results are presented in Appendix C: Bat Activity Results - NBW.

Static Activity Results Summary

3.12 A total of 6,107 bat passes were recorded across all static detector locations and monitoring periods. An assemblage of at least eleven species were recorded, with the highest counts similar to that recorded during the NBWs, with the inclusion of serotine, unidentified *Nyctalus*, Natterer's bat, Daubenton's bat and unidentified *Pipistrellus*.

3.13 Common pipistrelle produced the majority of the activity (62.8%), similar to results of the NBW surveys and as may be expected in accordance with the abundance of roost records in the wider landscape and the common occurrence this species within the region. The other species/species groups ranged from 0.3-26% of activity recorded during automated static detector monitoring.

3.14 The BAI for the assemblage was greatest during the spring at 30.13 brh and lowest during the summer at 6.22 brh. This peak was generated by activity levels of common pipistrelle and soprano pipistrelle in the spring period. The data suggests that the site is of increased importance to these pipistrelles in spring, most especially the brook corridor in the south.

3.15 All other species, with the exception of the pipistrelles, were recorded during automated static detector monitoring period at proportionally lower levels.

3.16 The BAI for the assemblage was greatest at static detector Location B (20.78 brh) than at Location A (7.20 brh). Location B was positioned at the hedgerow/brook habitat where invertebrate prey was likely higher than in other locations and habitat continuity with the surrounding countryside was strongest.

3.17 It is likely that the brook corridor at Location B is used as a landscape commuting corridor for pipistrelle bats. Location A was positioned within a native hedgerow to the north of the site. Tree and hedgerow cover at this location is sparser in comparison to the south of the site with large gaps present between habitats for commuting and foraging bats.

3.18 Further detailed results are presented in Appendix D: Bat Activity Results - Statics.

4.0 Conclusions

Assemblage

4.1 The activity surveys in combination recorded an assemblage of at least 8 species, in the approximate order of abundance:

- Soprano pipistrelle;
- Common pipistrelle;
- Noctule;
- Brown long-eared;
- Daubenton's;
- Whiskered;
- Natterer's; and
- Serotine.

4.2 The assemblage composition reflects pre-existing data from the desk study and reflects the average assemblage that would be expected for the region given the site location and limited diversity of habitats present.

4.3 The presence of serotine is of interest as this species is rare for the region. However, data indicates this species is at the edge of its range and is not utilising the site for more than landscape scale movements. Serotines were only recorded in spring and autumn and did not show any difference in activity levels between the sampling locations. Compared with other species or groups recorded, serotine does not appear to comprise part of the 'local' assemblage supported by the site throughout the year.

4.4 As many as 11 species have been recorded in Cheshire including the above species, Brandt's bat and the rarer species Leisler's bat and lesser horseshoe bat. Overall, it is considered the assemblage is likely limited by the site's location and limited habitat diversity. This is further substantiated by the relatively low activity levels observed in the site overall, with only just over 6,000 contacts recorded across the three seasonal sampling periods.

Activity Patterns

4.5 No roosting was recorded within the site, although suitable roost habitat is present (TEP Ref 11425.006). Seven of the eight species recorded in the assemblage were recorded throughout the year, suggesting that despite not supporting roosts the site provides a valued function within the local landscape for bats. This function will primarily be for commuting between roost sites within or between seasons, foraging

at distance from roosts and/or foraging in proximity to roosts. The function of the site will vary from species to species and season to season.

4.6 Across the assemblage, the majority of activity was recorded in the south of the site, along the brook corridor. Most of this activity was generated by common and soprano pipistrelles. Nearly half of all the contacts recorded across the full survey period at both locations were these two pipistrelle species in spring along the brook. The brook had clear significance to both pipistrelle species for spring commuting along this landscape corridor.

4.7 The brook corridor was also of elevated value to the Myotis species recorded on the site, although the significance of this function varied between species and season. Daubenton's bats were most frequently recorded along the brook and in summer, while whiskered and Natterer's bats were recorded along the brook most frequently in autumn. This suggests different function of the brook between the species. Daubenton's bat are likely to be using the brook corridor more for foraging and local commuting while the activity patterns of the other two Myotis species suggest pre-hibernal value.

4.8 Noctules utilised the whole site throughout the year at broadly similar levels and consistently displayed night activity with peaks closer to sunset and sunrise. This would suggest the site is used for foraging and commuting at a local scale.

4.9 Brown long-eared showed shifting preference for the brook corridor, with data suggesting a trend for using the brook in summer and shifting away from the brook in autumn. Activity levels were highest overall in autumn. In combination is potentially indicative of a pre-hibernal mating or transitional roost nearby.

4.10 As noted above, serotines activity patterns were more suggestive of longer distant landscape-scale movements with individual serotines passing over the site in transit in spring or autumn; movements which may be commuting between winter and summer grounds.

Foraging and Commuting Value

4.11 The site is relatively small and non-complex, supporting a limited variety of habitats. The site will not function in isolation to support any individual colony of any bat species recorded during the activity surveys. The site functions as part of a wider 'jigsaw' of foraging sites and commuting corridors in the local landscape for most species, and on a more regional scale for serotine.

4.12 The corridor of Keys Brook provides the highest habitat diversity and connectivity and is the most valued feature within the site for local bat populations.

4.13 The peripheral hedgerow network functions to support local commuting while the site overall supports foraging for most species as part of a wider landscape.

Appendix A: Bat Activity Survey Methods

Bat Activity Survey Methods

Requirement for undertaking activity surveys with a site/survey area is determined based on the categorisation of habitat suitability for bats. Table 4.1 of the BCT 2023 Guidelines provides the categories, ranked from 'none' to 'high'. This table is represented below at Table A1.

Table A1: Based on BCT 2023 Guidelines Table 4.1 - Categorising bat habitat suitability

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

Habitats with low, moderate or high suitability for commuting and foraging bats require further survey and assessment. Professional judgement and survey scope is also used when designing requirements for further surveys.

The minimum number of activity surveys required to assess use of a site/survey area by commuting and foraging bats is determined based on the categorisation of habitat suitability for bats, in accordance with Table 8.3 of the BCT 2023 Guidelines. This is represented below in Table A2.

Multiple activity survey visits should be separated by at least three weeks, preferably longer, to observe temporal changes in activity.

Table A2: Based on BCT 2023 Guidelines Table 8.3 – Recommended activity survey effort

Activity Survey Type	Habitat Suitability for Bats[a]		
	Low[4]	Moderate	High
Night-time Bat Walkover (NBW)	One survey visit[5] per season (spring - April/May, summer - June/July/August, autumn - September/October)[c]. Further surveys may be required if these visits, or the results of static detector monitoring surveys, reveal activity of interest that requires more observation.		
Automated Static Monitoring Surveys[6] (same locations used for each survey for comparison)	Data to be collected for a minimum of five consecutive nights per season in appropriate (or the best available) weather conditions for bats: spring - April/May, summer - June/July/August, autumn - September/October)7.	Data to be collected for a minimum of five consecutive nights per month (April to October)[7] in appropriate (or the best available) weather conditions for bats.	

Night-time Bat Walkover Surveys

Night-time Bat Walkover (NBW) surveys are designed to provide qualitative information about bat behaviour within a site that cannot be recorded using automated static detector monitoring. Data collected during NBWs aim to record a representative sample of bats using a site and can assist with interpreting automated static detector monitoring, in addition to providing information about species assemblages.

Three NBW surveys are undertaken, with one NBW survey per season: spring (April/May), summer (June/July/August) and autumn (September/October) to sample as much of the bat active season (April/May to September/October) as possible. This is the default recommendation for all sites (regardless of low, moderate, or high suitability habitat for commuting and foraging bats). Where exceptional high-quality habitats are present, species

[4] If the habitat has been classified as having low suitability for bats, particularly on small sites with relatively few features, an ecologist should make a professional judgement on how to proceed based on all the evidence available. However, caution should be exercised in fringe areas where 'low suitability habitat for bats' may be important to local bat populations due to the relative scarcity of better habitats

[5] A survey visit should aim to cover all habitats represented in the site/survey area that could be impacted by the proposed activities. This may consist of a single walkover carried out on a single night for small sites (e.g. small housing developments) with low habitat diversity but could range up to multiple walkovers carried out over one or several nights (depending on number of ecologists) on a larger site (e.g. road schemes) with greater habitat diversity.

[6] Detector locations should be assigned to provide a representative sample of all habitats in the site/survey area that could be impacted by the proposed activities. This could mean a single detector location at a small site with only one habitat represented but could range up to many detector locations, on larger sites.

[7] April and October surveys are both weather- and location-dependent. Conditions may become more unsuitable in these months, particularly in northern England and Scotland. Surveys in the 'shoulder' seasons may, however, help to identify activity close to transitional or hibernation roosts or help to understand how bats adapt their behaviour in different weather conditions. Professional judgement should be used on the necessity for surveys during these months.

abundance and assemblage are notable, or habitats are in proximity to nationally designated sites survey design may vary.

Pre-determined walkover routes are designed prior to undertaking NBWs, to cover either the whole site or to target areas or key habitats within the site according to survey brief and purpose. Pre-determined walkover routes are generally designed to be between 3km and 5km in length, depending on terrain, to allow the route to be walked at a slow, steady pace over a period of 2.5 to 3 hours.

Walked transects are completed by one pair of surveyors per walkover route. Pairs of surveyors are deployed to allow coverage of all habitats to be surveyed and use full spectrum bat detectors to record activity, in addition to night vision aids (NVAs) and walkie-talkies as required to inform nearby pairs of surrounding bat activity noted. To minimise spatial and sampling bias and enable data comparison the same model(s) of detector are used for each survey visit and the sensitivity of detectors is standardised between survey visits. Bat calls are recorded automatically by the detectors for later analysis using specialist computer software.

NBWs are completed as dusk survey visits and are started at sunset with a stationary observation point lasting from 30-60 minutes, dependent on bat activity observed after which surveyors walk the pre-determined walkover route. The stationary observation point is pre-determined for surveyors and designed to be situated near potential roost resources/key habitats of interest and is iteratively updated to reflect any observations made during surveys.

The start time of surveys may be adjusted if bat activity is noted or is likely earlier than sunset e.g., if near habitat that provides darker conditions, or if early emerging species are observed on arrival during the initial survey/from automated/static monitoring data.

NBWs are intended to be dynamic and informed by observations, with routes altered to survey bat behaviour. Surveyors undertake observational interpretation in the field to allow a dynamic approach and to alter the pre-determined walkover route if required to better observe bat activity.

Surveyors mark the stationary observation point and walkover route taken (including direction of travel) on survey maps. Surveyors also record a time stamped narrative during the stationary observation point and whilst walking the pre-determined walkover route, noting each pass, bat behaviour (e.g., feeding buzzes, social calls, commuting), directions of flight, numbers of bats and variations in activity on survey forms. The manually recorded data is used to QA digital recordings, provide a backup of field data in the event of equipment failures with digital recordings and to provide further context to inform interpretation of bat activity and behaviours across the site.

Locations of each observation recorded on the survey form is cross referenced onto the field survey map. Any other relevant field data is noted either on the survey form or map as appropriate, for example areas where significant light spill or glare might be experienced.

Where smaller sites/survey areas are present NBWs may include walking the site/survey area over twice during one survey. The number of times a walkover route is completed is kept consistent between each survey visit.

The adaptive approach to NBWs allows surveyors to stop and observe bat behaviour where required. Time periods where surveyors have stopped to observe bat behaviour are included on the survey form and map annotations.

Weather conditions at the start and end of the NBWs (in addition to any variable weather of note throughout the survey e.g., rain) are recorded on the activity survey form as a minimum including: air temperature (°C to the nearest full degree), rainfall, cloud cover (oktas), windspeed (Beaufort) and moon phase.

Maps also include annotations with any features that may assist future surveyors whilst undertaking NBWs i.e., passing points, gates, barbed wire fences, bridges, ditches, parking locations etc.

Automated Static Monitoring Surveys

Automated static monitoring surveys are designed with reference to Table 8.3 of the BCT 2023 Guidelines and as determined by the suitability of habitats for bats and professional judgement.

Automated static monitoring surveys are completed by the deployment of full spectrum detectors at fixed locations within a site/survey area. The locations at which static detectors are deployed may be random or non-random according to the survey brief. Most survey objectives require non-random deployment, where locations for automated static monitoring are selected according to criteria including: overall site/survey area coverage and target habitat types, specific habitat features and/or specific site/survey areas.

Most commonly, static detector locations are determined by habitat type, informed by proposals, and are designed to:

- Confirm the species assemblage using the habitats within the site/survey area;
- Determine the relative activity and spatial distribution of bats across the site/survey area to enable evaluation of habitat use; and
- Identify potential commuting/dispersal corridors.

Static detectors are recorded using GPS in the field and mapped manually on a site/survey area plan, with detectors being individually referenced in a standardised manner. To ensure compatibility with data downloads, static detector locations are referenced A, B, C etc.

Micro-siting is used to discretely hide the static detector unit from public view, with the microphone positioned to avoid significant obstruction or noise from rustling canopy foliage etc.

Static detectors are deployed with standardised sensitivity settings.

Each static detector is deployed in the fixed location for a minimum of five or seven consecutive nights per recording period. Automated static monitoring surveys are normally completed once per season (spring/summer/autumn) or once per month, from April to October inclusive.

Static detectors are set to automatically commence recording each night of deployment from 30 minutes before sunset to 30 minutes after sunrise.

All details regarding deployment locations, survey dates and survey conditions are recorded.

Several models of static detector will record air temperatures at regular intervals throughout the recording period. If models are used which do not provide this capability, weather data is acquired from the nearest weather station. In addition to minimum and maximum air temperatures (°C), additional data collated for each automated static monitoring survey includes:

- Rainfall events;
- Cloud cover (oktas);
- Maximum windspeed (Beaufort); and
- Moon phase / illuminance.

Data Analysis and Species Identification

Raw data files from NBW and static (and roost) surveys are downloaded in the office immediately after the survey and stored according to a standardised project folder structure. Separate data folders are created to store data files from different types of surveys including individual folders for separate VPs of structures and trees, NBWs and static detector locations to avoid data duplications or omissions. An initial quality check of data is undertaken at this stage to identify any data errors.

Sonogram analysis of raw data files from detectors used during bat roost and activity surveys is undertaken using the most current version of Kaleidoscope software by qualified TEP ecologists.

Analysing bat sonograms using Kaleidoscope can automatically identify some sonograms to a 100% accuracy depending on the quality and signal parameters recorded of the sonogram.

Kaleidoscope is set to an 80% auto identification threshold maintaining a standard high end of certainty for bat species identification. Any sonograms with parameters below the 80% auto identification are manually identified, where sufficient call characteristics are available.

If insufficient call characteristics are available, the bat contact is recorded as an unidentified bat. The proportion of unidentified bat contacts are tallied for each data set (individual walkover route or static detector location and individual survey visits). Should the proportion of unidentified bat contacts comprise more than 1% of the data set, a second quality assurance review of the data is undertaken.

For the purposes of presentation and interrogation, data is transformed to calculate bat activity indices (BAI). For most datasets and statistical analysis the BAI represents bat registrations per hour (brh), to account for different night lengths throughout the recording period.

BAIs quantify the amount of use bats make of an area i.e. activity levels, not abundance. Consistency is achieved throughout survey periods regarding detector model, sensitivity and calibration, position and orientation and in the software used in subsequent sonogram analysis. High confidence can therefore be placed in the relative bat activity levels presented.

Furthermore, transformation of data to a standardised BAI based on bat registrations recorded per hour, rather than ‘passes’ or ‘pulses’ removes potential bias that could be introduced by any differences in sonogram file recording techniques of different models of bat detector, should circumstances require different models or techniques to be utilised.

Some genus groups (such as Myotis species) can be difficult to determine the specific species due to similar styles of calls. In addition, it can be difficult to determine species or even genus in some circumstances due to partial calls or other noises such as passing cars or rain or wind distorting the data. In these cases when it not possible to identify a bat call even to genus, it is labelled as an unknown bat. If the genus can be identified but not the species, the call is labelled only by the genus group.

Myotis species have overlapping call characteristics, and it is therefore not possible to identify these bats to species level with good confidence (at least 80%). Myotis data often represents a small proportion of the activity recorded and therefore for the purposes of meaningful data interrogation, Myotis species are generally grouped. Where possible, individual Myotis species are identified particularly when larger datasets of Myotis species are recorded.

Detectability of some bat species e.g., Plecotus and Barbastella is lower than others, e.g., Nyctalus and Pipistrellus, as a consequence of their less detectable echolocation calls and hunting strategies that take them into less open habitats. Careful interpretation is therefore applied if comparison across species or species groups is required.

Activity survey data is exported to excel and standardised to a bat activity index (BAI) comprising bat registrations per hour, based on the precise survey length for each individual activity survey.

Bat registrations have therefore been applied as the standard BAI metric to offer an alternative means of measuring bat activity with the added benefit of producing activity metrics that would be directly comparable between different sites, dates and species. A bat registration is the identification of a bat species within any given individual sonogram file. Multiple species may be recorded within one sonogram file, in which case each species is included separately, each with the same time stamp as the 'group' sonogram.

Appendix B: Activity Survey Times and Conditions

Activity Survey Times and Conditions

Night-time Bat Walkovers

Table B 1: Static locations and recording periods

Date	Sunset	Start Time	End Time	Weather at Start				Weather at End			
				Temp °C	Rain	Wind[8]	Cloud [9]	Temp °C	Rain	Wind	Cloud
26/05/26	21:19	21:19	23:20	22	0	1	0	20	0	1	0
17/07/24	21:23	21:24	23:46	19	0	0	1	13	0	6	1
20/07/26	21:24	19:24	21:24	15	0	8	1	14	0	6	0

Static Surveys

Table B2: Static locations and recording periods

Location	Visit	Survey Dates	# Nights Deployed	# Nights with Bat Activity	Survey Recording Period (mins)	Description of Location and Orientation of Microphone
A	1	27/05/26-03/06/26	8	8	4078	Model: Anabat Express FS Location: 53.129400° - 2.764120° Placement: Hedgerow with trees Habitat: Horse grazed pasture Mic Dir: SW Mic Height (m):2
	2	20/07/26-26/07/26	7	7	3741	
	3	16/09/26-22/09/26	7	7	5281	
B	1	27/05/26-03/06/26	8	8	4078	Model: Anabat Express FS Location: 53.127650° - 2.766680° Placement: Hedgerow with trees Habitat: Horse grazed pasture Mic Dir: SW Mic Height (m):2
	2	20/07/26-26/07/26	7	7	3741	
	3	16/09/26-22/09/26	7	7	5281	

Table B3: Static survey conditions

Location	Visit	Night #	Start Date	First Bat	Last Bat	Activity Period (m)	Start Temp (C)	Midnight Temp (C)	End Temp (C)	Rain (hr)	Max Wind Speed
A	1	1	27/5/26	22:11	05:23	432	24	21	13	0	7
A	1	2	28/5/26	21:48	04:22	393	25	18	15	0	12
A	1	3	29/5/26	21:46	05:01	434	19	17	14	0	6
A	1	4	30/5/26	21:01	05:14	493	20	20	15	2	7

8 Wind strength is reported using the Beaufort Scale of Wind Force, this scale runs from 0 to 12, information on the conditions experienced during surveys are as follows: 0 – Calm (vertical smoke); 1 – Light Air (slight smoke drift); 2 – Light Breeze (leaves gently rustle).

9 Cloud cover is reported in oktas or eighths (i.e. 0 oktas represents the complete absence of cloud, 1 okta cloud cover of 1 eighth or less, and so on to 8 oktas which represents full cloud cover), with the additional convention that 9 oktas represents sky obscured by fog or mist.

Location	Visit	Night #	Start Date	First Bat	Last Bat	Activity Period (m)	Start Temp (C)	Midnight Temp (C)	End Temp (C)	Rain (hr)	Max Wind Speed
A	1	5	31/5/26	22:05	04:45	400	17	18	15	2	10
A	1	6	1/6/26	21:22	05:18	476	18	17	15	2	8
A	1	7	2/6/26	21:21	04:11	410	19	16	13	2	7
A	1	8	3/6/26	21:37	01:33	235	14	13	12	3	17
B	1	1	27/5/26	21:52	05:14	442	24	21	13	0	7
B	1	2	28/5/26	21:05	05:04	479	25	18	15	0	12
B	1	3	29/5/26	21:50	04:59	429	19	17	14	0	6
B	1	4	30/5/26	21:51	04:54	423	20	20	15	2	7
B	1	5	31/5/26	21:58	05:09	431	17	18	15	2	10
B	1	6	1/6/26	21:36	05:15	459	18	17	15	2	8
B	1	7	2/6/26	21:46	04:26	400	19	16	13	2	7
B	1	8	3/6/26	21:51	05:14	443	14	13	12	3	17
A	2	1	20/7/26	21:36	04:45	429	17	16	14	0	10
A	2	2	21/7/26	21:37	05:01	443	17	17	16	0	9
A	2	3	22/7/26	21:36	05:08	451	18	18	17	0	9
A	2	4	23/7/26	21:59	04:47	407	19	17	17	0	13
A	2	5	24/7/26	21:39	22:37	57	19	18	18	0	7
A	2	6	25/7/26	00:00	00:00	NO DATA	20	19	17	2	10
A	2	7	26/7/26	00:00	00:00	NO DATA	19	19	15	3	16
B	2	1	20/7/26	21:48	04:45	416	17	16	14	0	10
B	2	2	21/7/26	21:34	05:14	460	17	17	16	0	9
B	2	3	22/7/26	21:35	05:03	447	18	18	17	0	9
B	2	4	23/7/26	21:41	04:49	428	19	17	17	0	13
B	2	5	24/7/26	21:50	04:50	420	19	18	18	0	7
B	2	6	25/7/26	21:35	05:04	449	20	19	17	2	10
B	2	7	26/7/26	21:37	05:04	447	19	19	15	3	16
A	3	1	16/9/26	20:12	06:29	617	14	13	13	2	6
A	3	2	17/9/26	19:52	06:03	611	18	17	16	0	30
A	3	3	18/9/26	19:39	06:19	639	19	18	17	0	24
A	3	4	19/9/26	19:38	05:49	610	18	17	12	2	10
A	3	5	20/9/26	19:32	06:19	646	11	11	9	3	14
A	3	6	21/9/26	19:17	06:31	673	14	12	4	0	12
A	3	7	22/9/26	19:24	07:11	706	10	9	4	0	5
B	3	1	16/9/26	17:54	03:35	580	14	13	13	2	6
B	3	2	17/9/26	19:01	04:34	572	18	17	16	0	30
B	3	3	18/9/26	00:35	05:54	319	19	18	17	0	24
B	3	4	19/9/26	18:37	05:07	629	18	17	12	2	10
B	3	5	20/9/26	18:42	05:04	621	11	11	9	3	14
B	3	6	21/9/26	18:45	04:57	611	14	12	4	0	12
B	3	7	22/9/26	18:37	05:24	647	10	9	4	0	5

Table B4: Static survey data constraints

Location	Visit	Night #	Temperature constraints	Windspeed constraints	Rainfall constraints	Data validity
A	1	1	Temperatures acceptable	Conditions acceptable	Dry	Data valid
A	1	2	Temperatures acceptable	Winds B3-B4	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
A	1	3	Temperatures acceptable	Conditions acceptable	Dry	Data valid
A	1	4	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
A	1	5	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
A	1	6	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
A	1	7	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
A	1	8	Temperatures acceptable	Winds B3-B4	Precipitation recorded for short period(s)	Data valid but with possible limitations due to sub-optimal weather conditions
B	1	1	Temperatures acceptable	Conditions acceptable	Dry	Data valid
B	1	2	Temperatures acceptable	Winds B3-B4	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
B	1	3	Temperatures acceptable	Conditions acceptable	Dry	Data valid
B	1	4	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
B	1	5	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
B	1	6	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
B	1	7	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
B	1	8	Temperatures acceptable	Winds B3-B4	Precipitation recorded for short period(s)	Data valid but with possible limitations due to sub-optimal weather conditions
A	2	1	Temperatures acceptable	Conditions acceptable	Dry	Data valid
A	2	2	Temperatures acceptable	Conditions acceptable	Dry	Data valid

Location	Visit	Night #	Temperature constraints	Windspeed constraints	Rainfall constraints	Data validity
A	2	3	Temperatures acceptable	Conditions acceptable	Dry	Data valid
A	2	4	Temperatures acceptable	Winds B3-B4	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
A	2	5	Temperatures acceptable	Conditions acceptable	Dry	Data valid
A	2	6	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
A	2	7	Temperatures acceptable	Winds B3-B4	Precipitation recorded for short period(s)	Valid conditions, no technical issues, but no bats recorded
B	2	1	Temperatures acceptable	Conditions acceptable	Dry	Data valid
B	2	2	Temperatures acceptable	Conditions acceptable	Dry	Data valid
B	2	3	Temperatures acceptable	Conditions acceptable	Dry	Data valid
B	2	4	Temperatures acceptable	Winds B3-B4	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
B	2	5	Temperatures acceptable	Conditions acceptable	Dry	Data valid
B	2	6	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
B	2	7	Temperatures acceptable	Winds B3-B4	Precipitation recorded for short period(s)	Data valid but with possible limitations due to sub-optimal weather conditions
A	3	1	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
A	3	2	Temperatures acceptable	Winds B5+	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
A	3	3	Temperatures acceptable	Winds B5+	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
A	3	4	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
A	3	5	Temperatures acceptable	Winds B3-B4	Precipitation recorded for short period(s)	Data valid but with possible limitations due to sub-optimal weather conditions

Location	Visit	Night #	Temperature constraints	Windspeed constraints	Rainfall constraints	Data validity
A	3	6	Cold at sunrise	Winds B3-B4	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
A	3	7	Cold at sunrise	Conditions acceptable	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
B	3	1	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
B	3	2	Temperatures acceptable	Winds B5+	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
B	3	3	Temperatures acceptable	Winds B5+	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
B	3	4	Temperatures acceptable	Conditions acceptable	Precipitation recorded for short period(s)	Data valid
B	3	5	Temperatures acceptable	Winds B3-B4	Precipitation recorded for short period(s)	Data valid but with possible limitations due to sub-optimal weather conditions
B	3	6	Cold at sunrise	Winds B3-B4	Dry	Data valid but with possible limitations due to sub-optimal weather conditions
B	3	7	Cold at sunrise	Conditions acceptable	Dry	Data valid but with possible limitations due to sub-optimal weather conditions

Appendix C: Bat Activity Results - NBW

Bat Activity Results - NBW

Table C1: Summary of registrations and activity indices for bats recorded during the NBW

Species	Species Code	# Registrations	%age	BAI (brh)
Common pipistrelle	PIPPIP	123	38.0%	19.27
Soprano pipistrelle	PIPPYG	153	47.2%	23.97
Myotis species	MYO	2	0.6%	0.31
Whiskered bat	MYOMYS	1	0.3%	0.16
Noctule	NYCNOC	43	13.3%	6.74
Brown long-eared bat	PLEAUR	2	0.6%	0.31
All Bats		324	100%	50.76

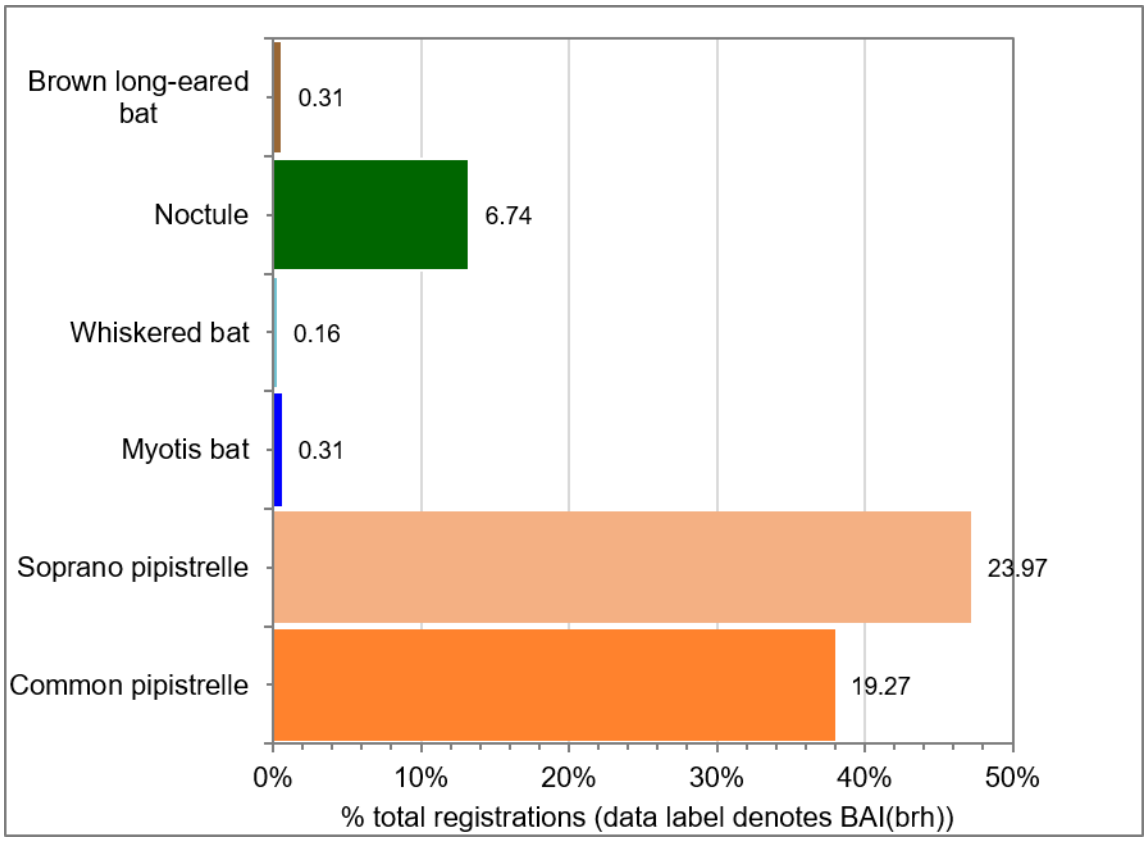


Figure C1: NBW species assemblage recorded and Bat Activity Index (BAI)

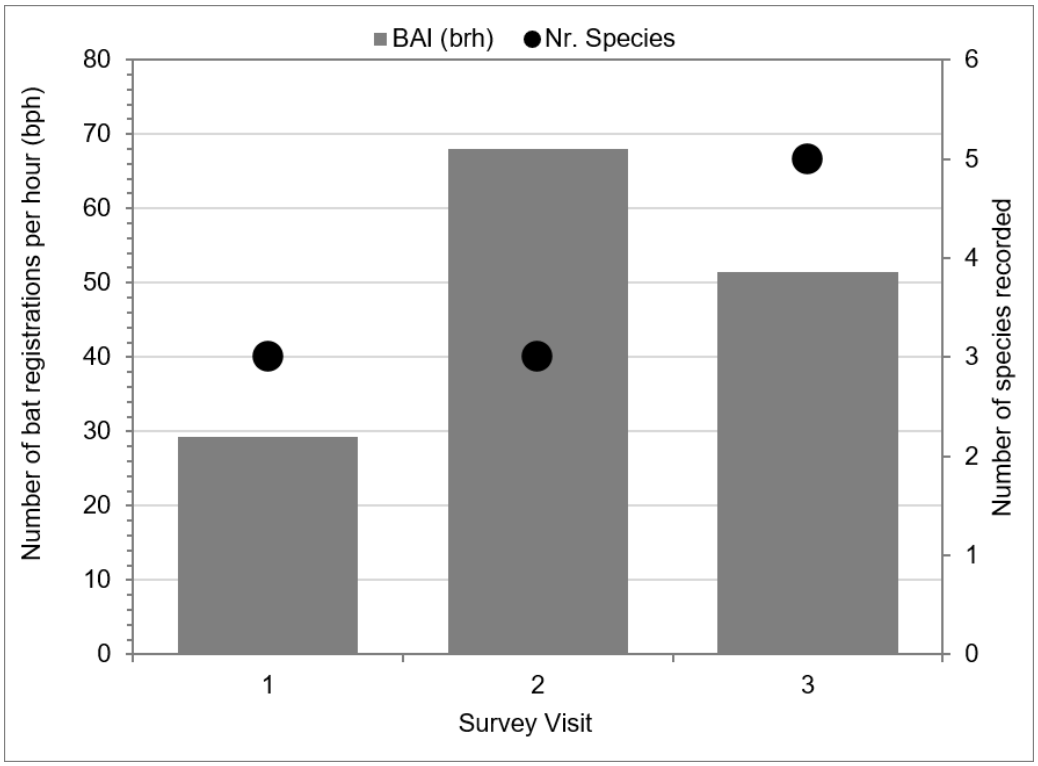


Figure C2: Number of species recorded against total BAI for each NBW seasonal visit

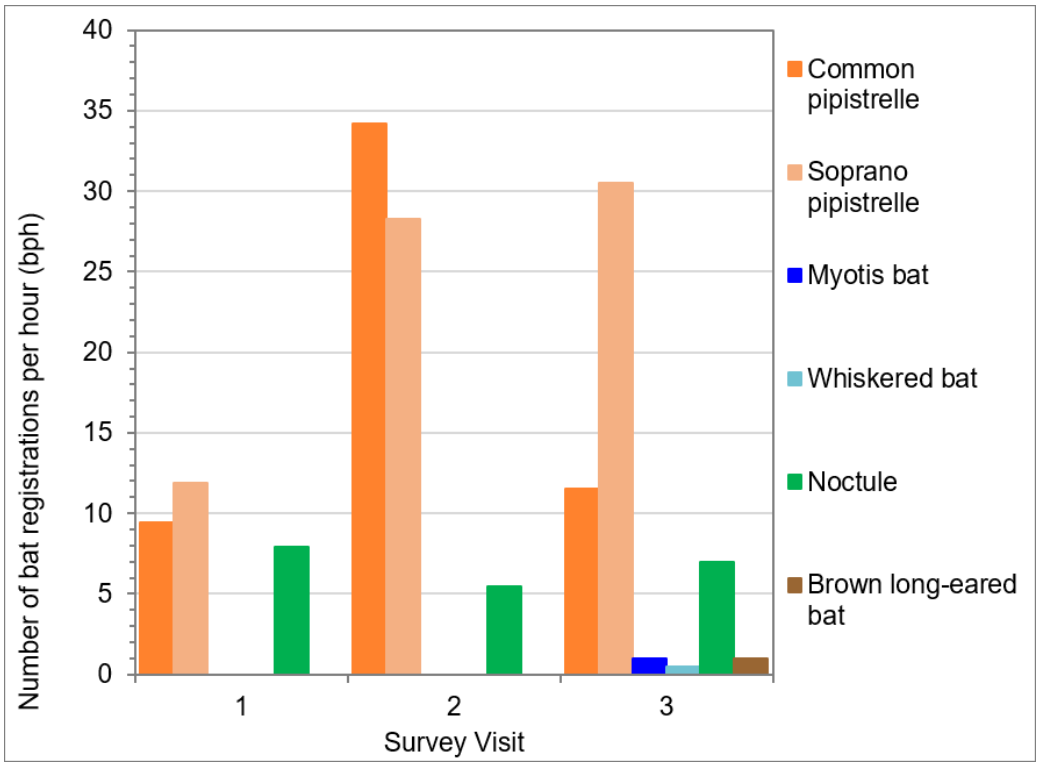


Figure C3: BAI of bat species during each seasonal survey visit

Appendix D: Bat Activity Results - Statics

Bat Activity Results – Statics

Assemblage

Table D1: Summary of bat registrations and bat activity indices (BAI) recorded by static detectors

Species	Species Code	# Registrations	% of assemblage	BAI (brh)
Common pipistrelle	PIPPIP	3834	62.8%	8.780
Soprano pipistrelle	PIPPYG	1589	26.0%	3.639
Unidentified Pipistrellus	PIP	25	0.4%	0.057
Daubenton's bat	MYODAU	44	0.7%	0.101
Whiskered bat	MYOMYS	25	0.4%	0.057
Natterer's bat	MYONAT	23	0.4%	0.053
Unidentified Myotis	MYO	53	0.9%	0.121
Brown long-eared bat	PLEAUR	118	1.9%	0.270
Noctule	NYCNOC	328	5.4%	0.751
Unidentified Nyctalus	NYC	38	0.6%	0.087
Serotine	EPTSER	21	0.3%	0.048
All Bats		6107	100%	13.99

Table D2: Summary of bat registrations at each detector location

Species	Species Code	# Registrations by detector location		Site Total
		A	B	
Common pipistrelle	PIPPIP	781	3052	3834
Soprano pipistrelle	PIPPYG	459	1130	1589
Unidentified Pipistrellus	PIP	1	24	25
Daubenton's bat	MYODAU	11	33	44
Whiskered bat	MYOMYS	3	22	25
Natterer's bat	MYONAT	6	17	23
Unidentified Myotis	MYO	27	35	53
Brown long-eared bat	PLEAUR	82	26	118
Noctule	NYCNOC	173	155	328
Unidentified Nyctalus	NYC	17	21	38
Serotine	EPTSER	11	10	21
All Bats		1571	4536	6107

Table D3: Summary of bat registrations during each survey visit

Species	Species Code	# Registrations by survey visit			Site Total
		1	2	3	
Common pipistrelle	PIPPIP	2963	277	594	3834
Soprano pipistrelle	PIPPYG	910	336	343	1589
Unidentified Pipistrellus	PIP	25			25
Daubenton's bat	MYODAU	10	23	11	44
Whiskered bat	MYOMYS	2	1	22	25
Natterer's bat	MYONAT	1	3	19	23
Unidentified Myotis	MYO	15	21	26	62
Brown long-eared bat	PLEAUR	3	26	89	118
Noctule	NYCNOC	126	89	113	328
Unidentified Nyctalus	NYC	32	0	6	38
Serotine	EPTSER	8	0	13	21
All Bats		4095	776	1236	6107

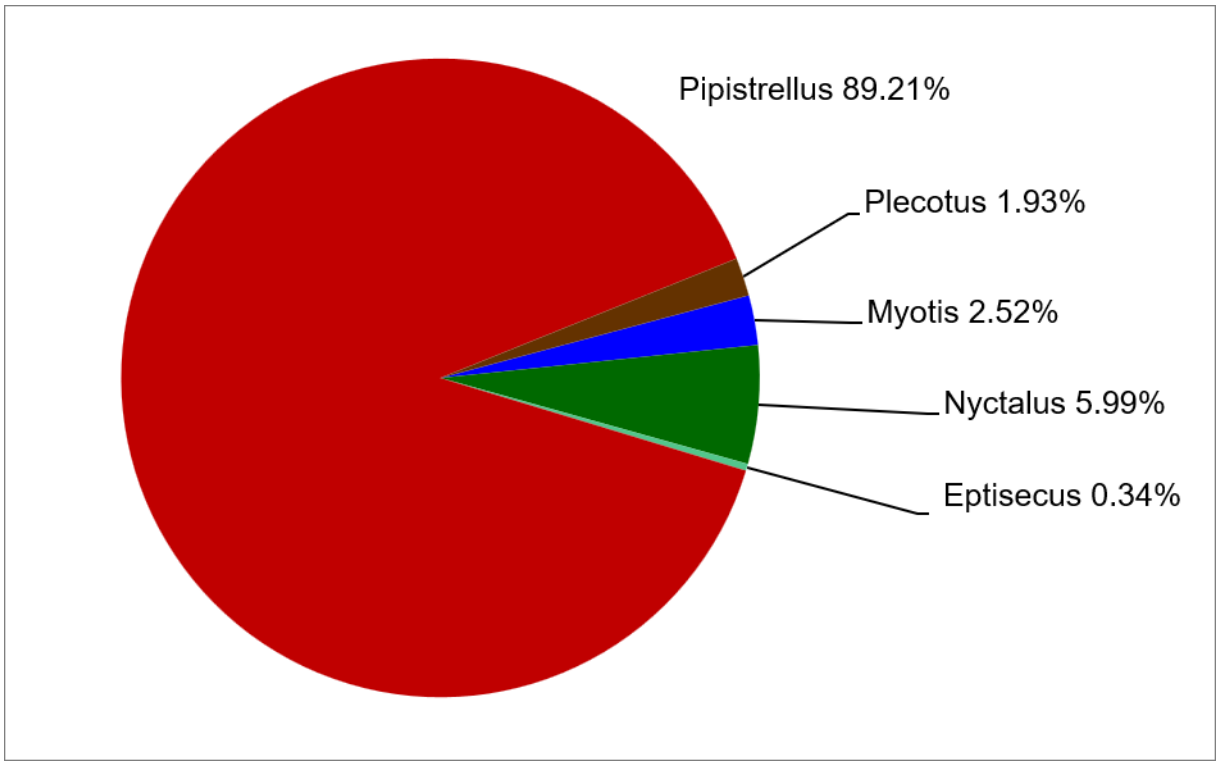


Figure D1: Species groups recorded during static activity surveys

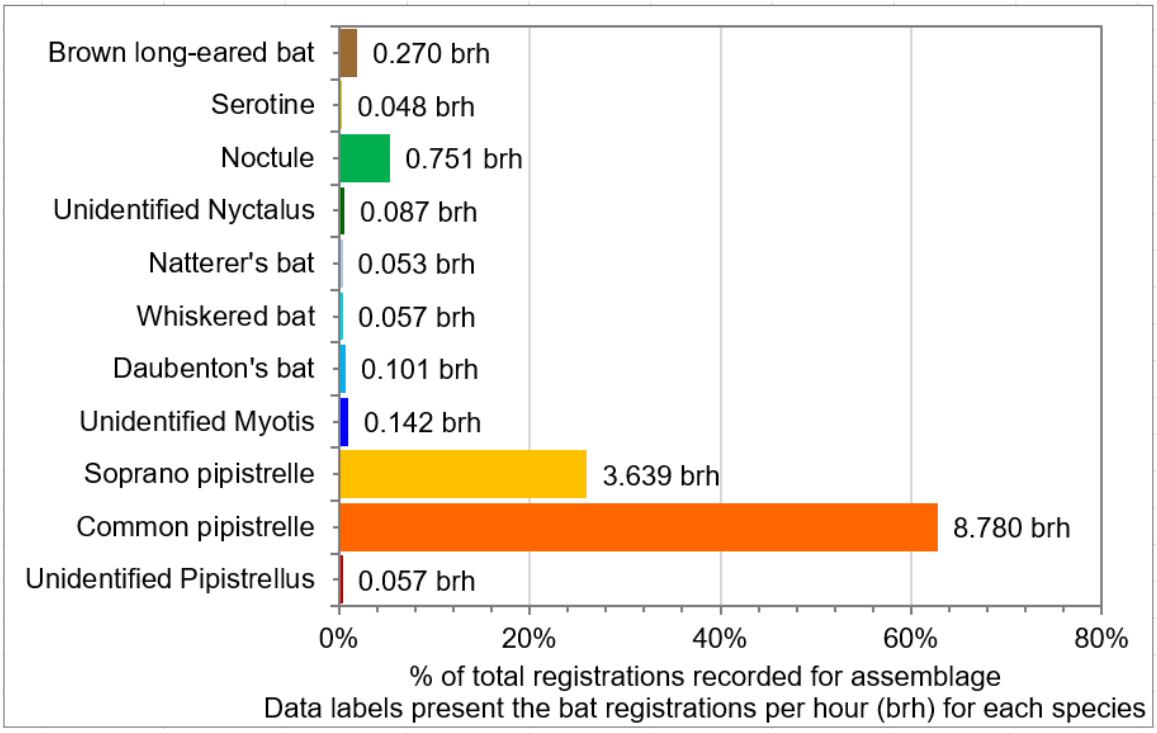


Figure D2: Species recorded during static activity surveys

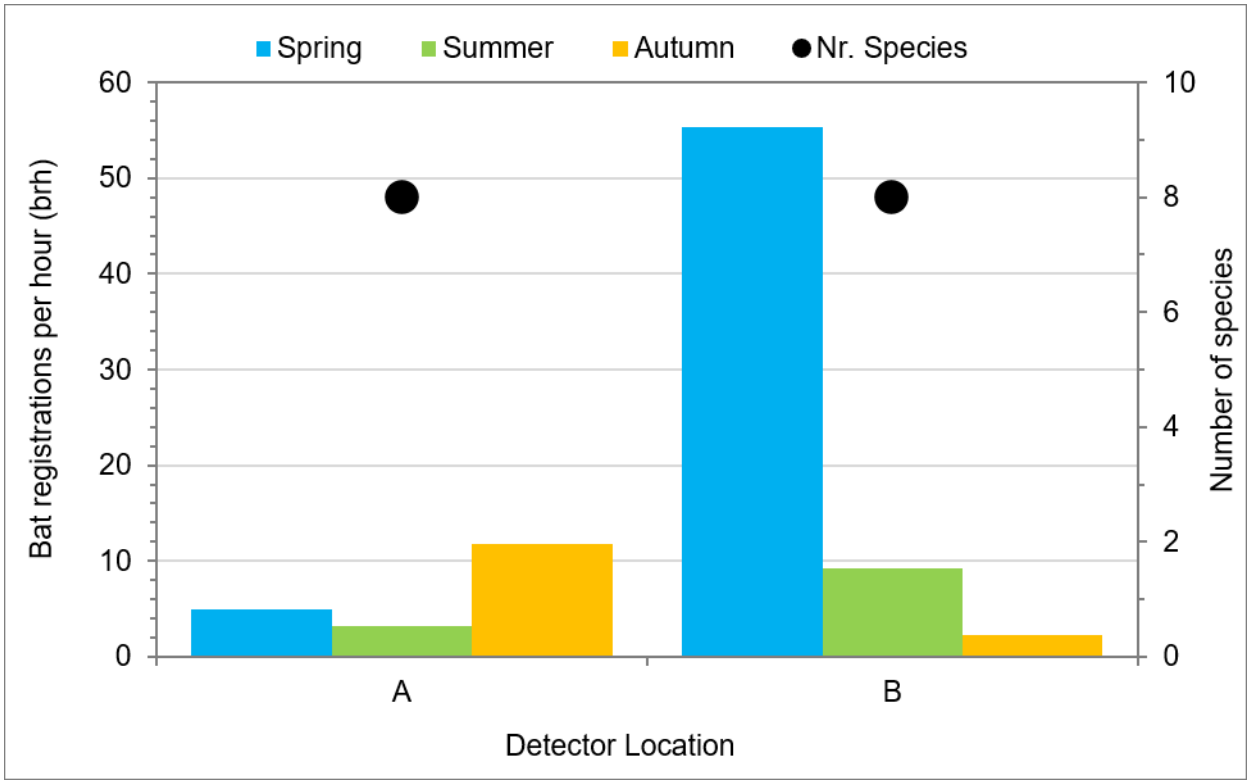


Figure D3: Spatial variation in assemblage activity across detector locations

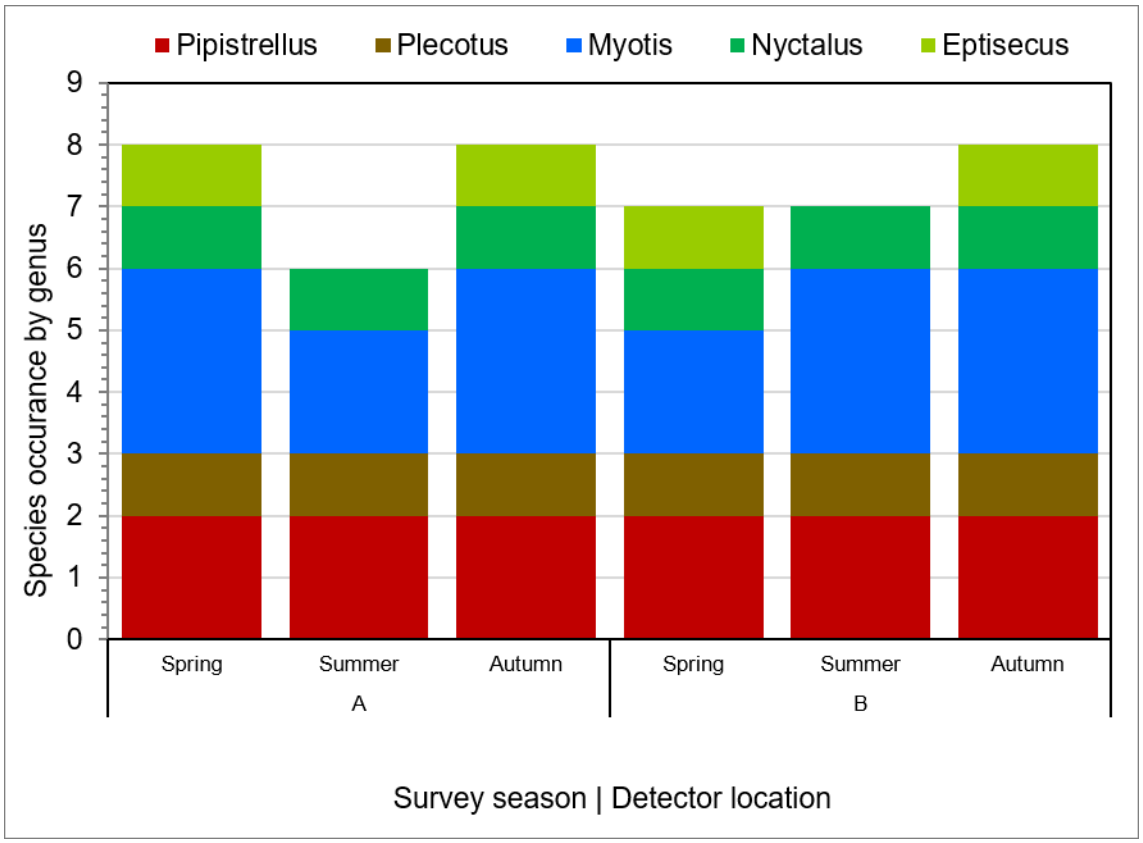


Figure D4: Seasonal variation in assemblage, split by detector location

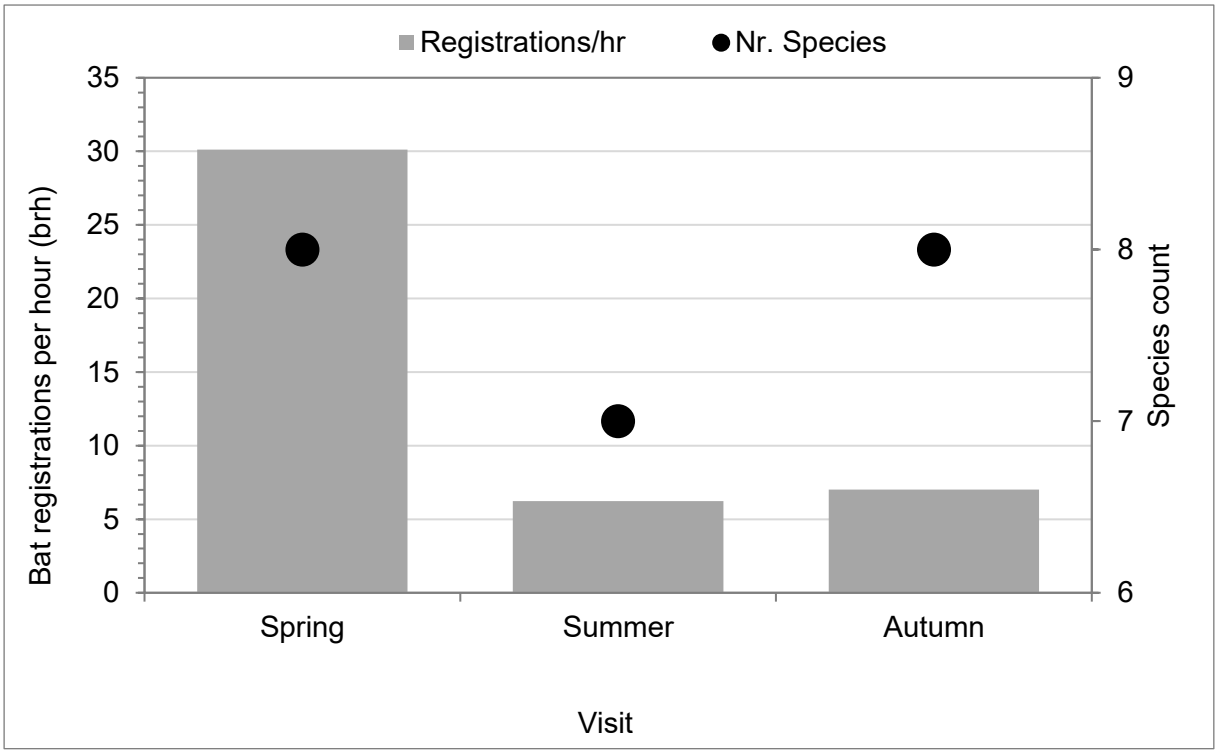


Figure D5: Seasonal variation in assemblage activity and species count

Pipistrelles



Figure D6: BAI of common pipistrelle across detector locations

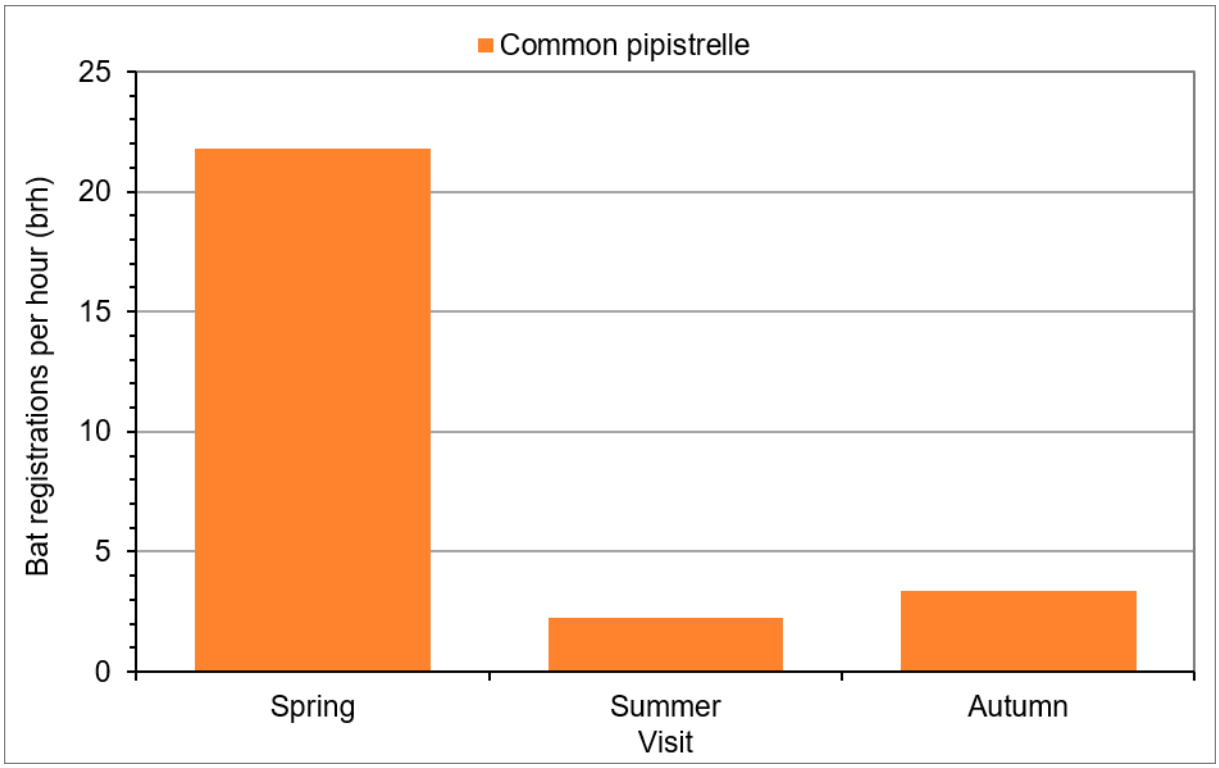


Figure D7: BAI of common pipistrelle during each survey visit

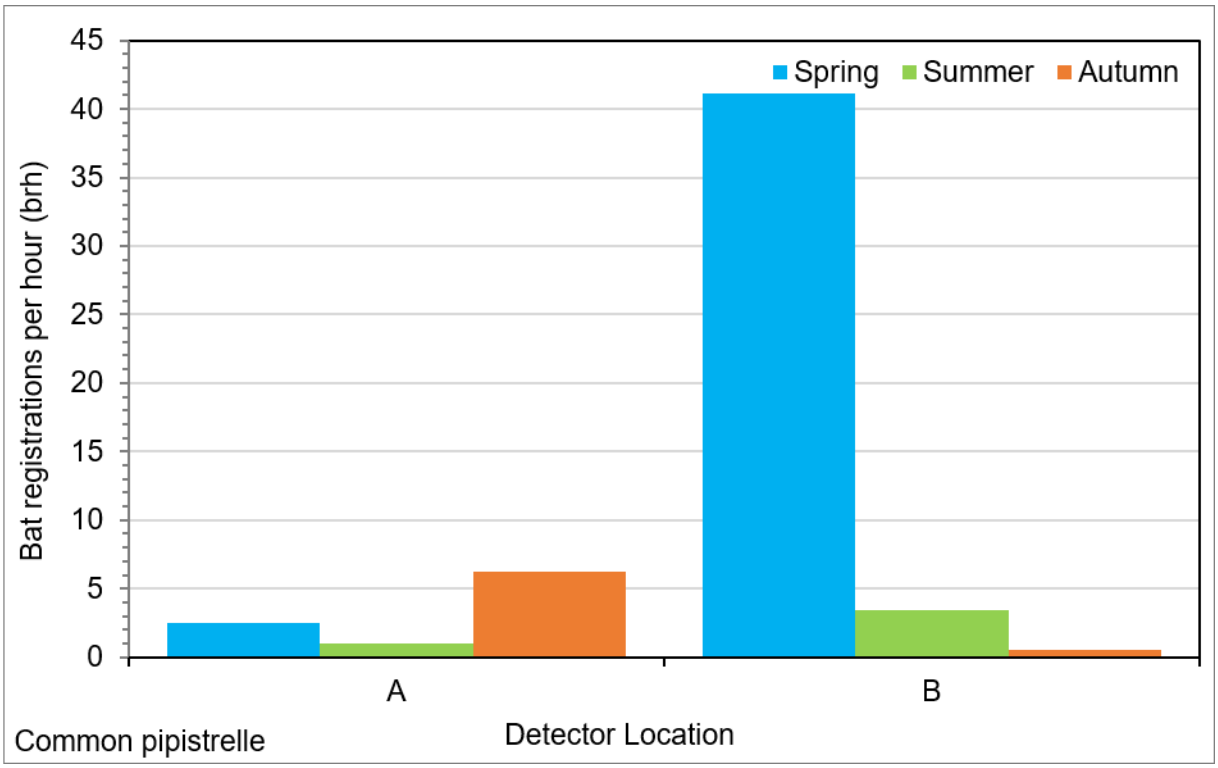


Figure D8: BAI of common pipistrelle across detector locations during each survey season

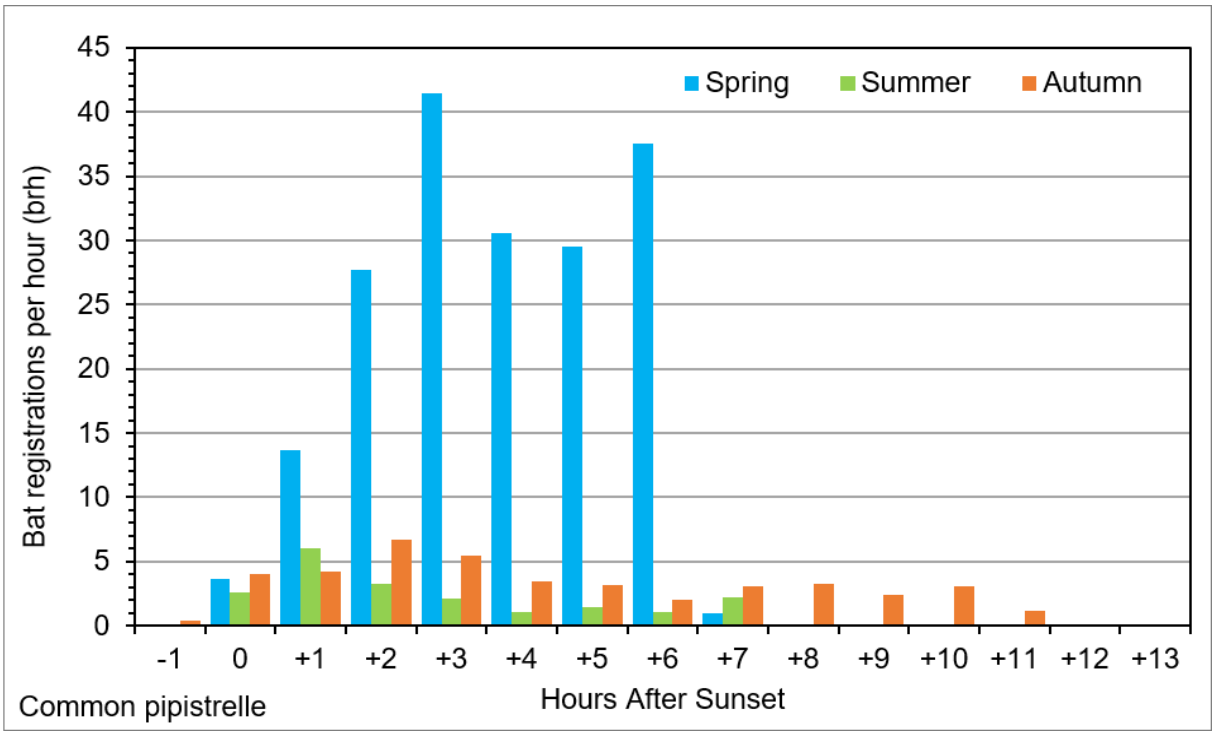


Figure D9: Nightly activity patterns of common pipistrelle during each survey season

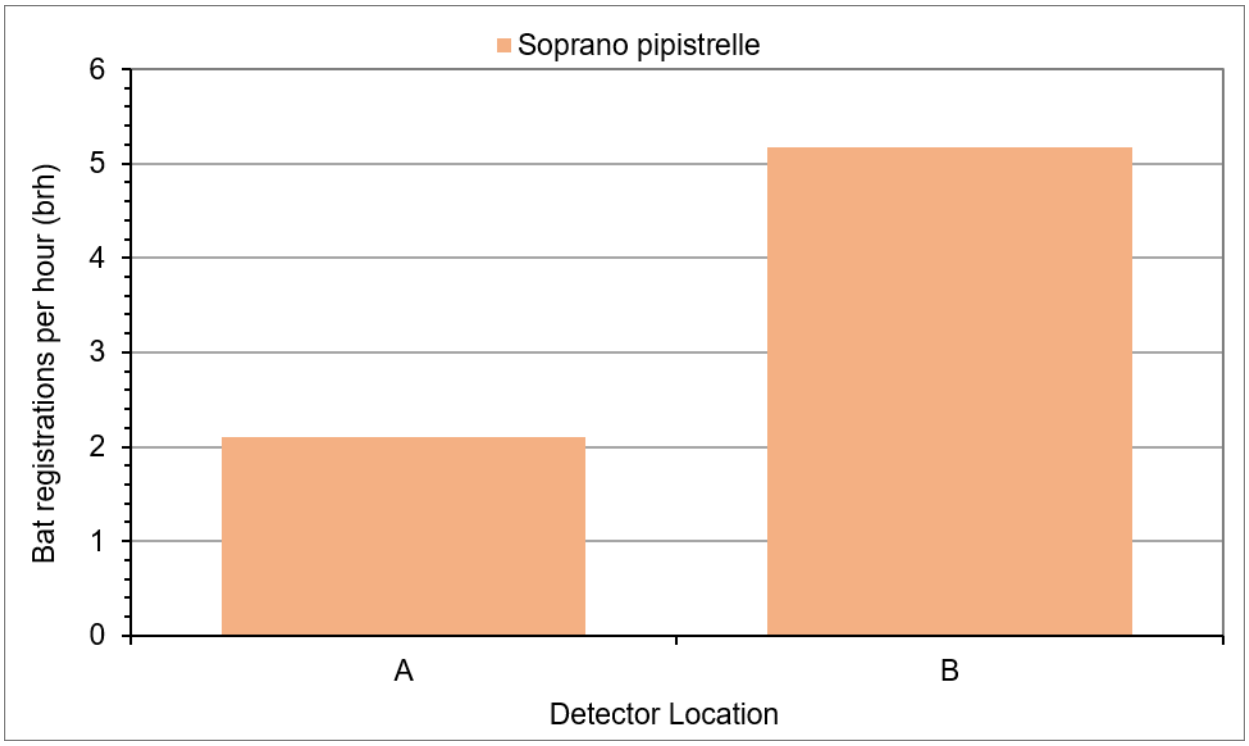


Figure D10: BAI of soprano pipistrelle across detector locations

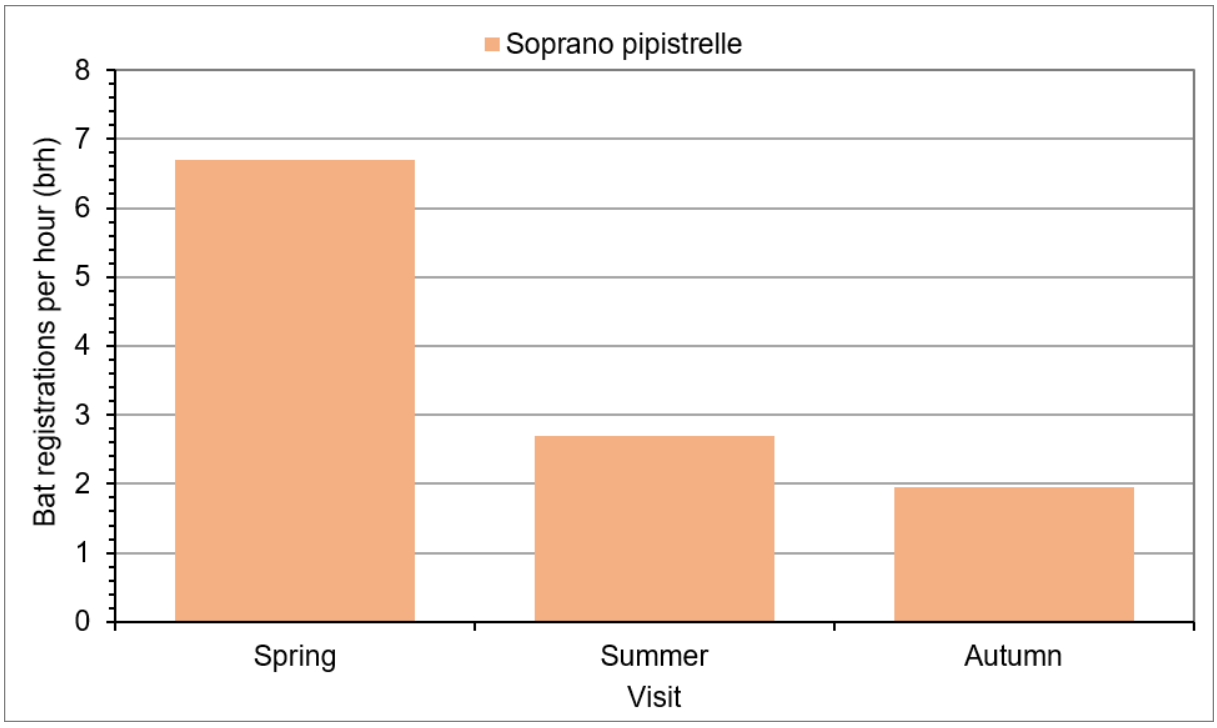


Figure D11: BAI of soprano pipistrelle during each survey visit

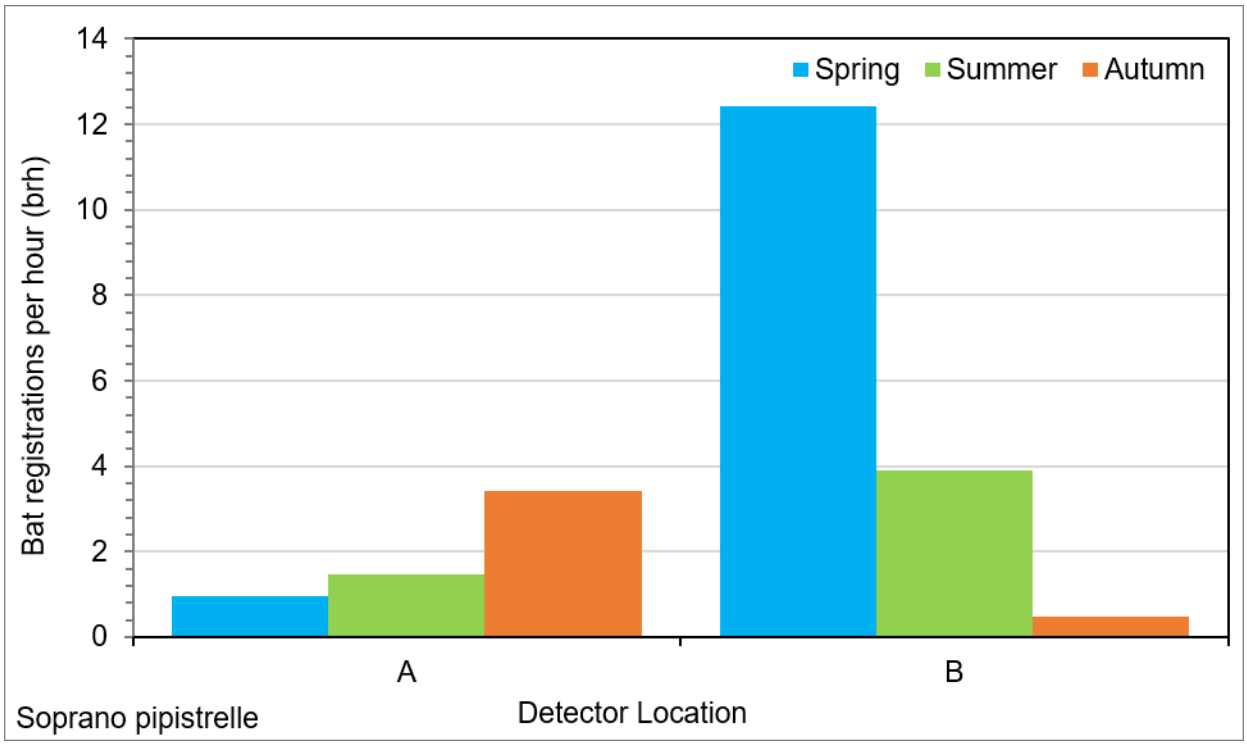


Figure D12: BAI of soprano pipistrelle across detector locations during each survey season

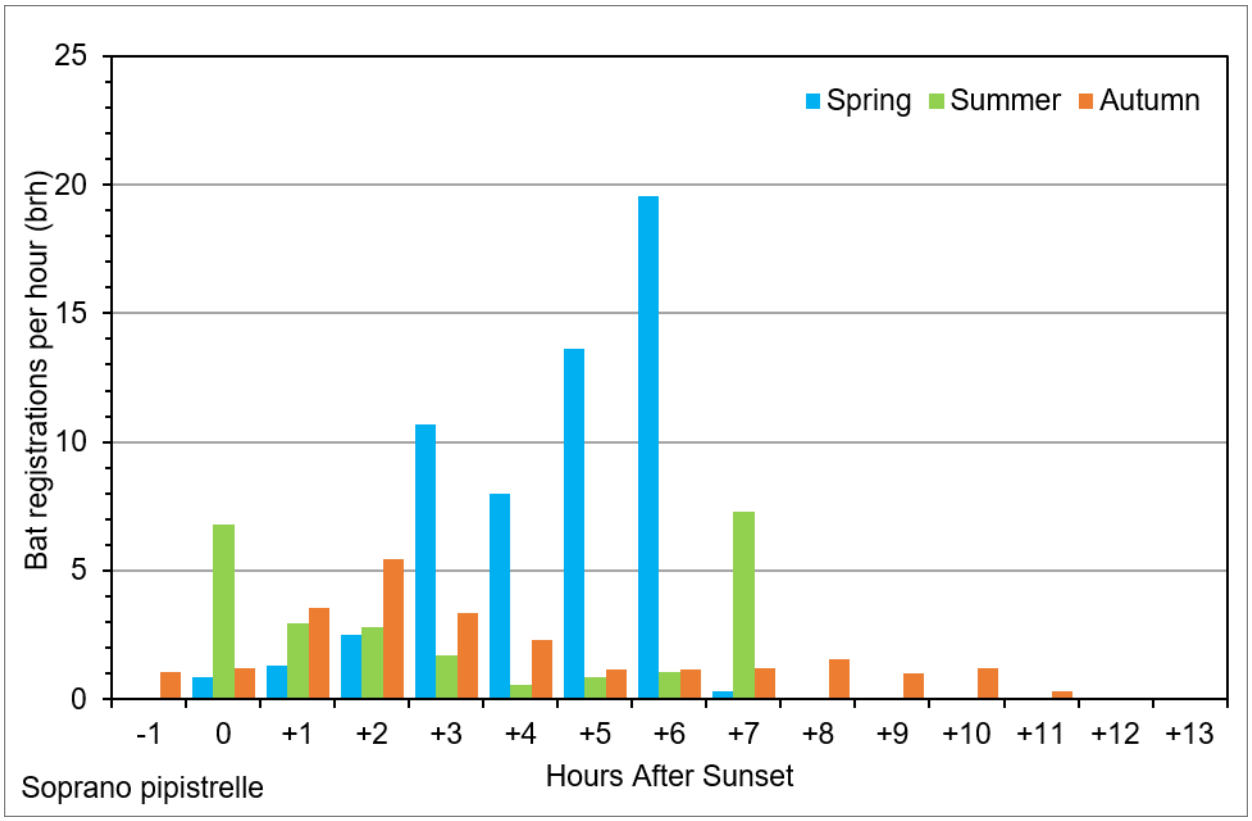


Figure D13: Nightly activity patterns of soprano pipistrelle during each survey season

Nyctalus Bats

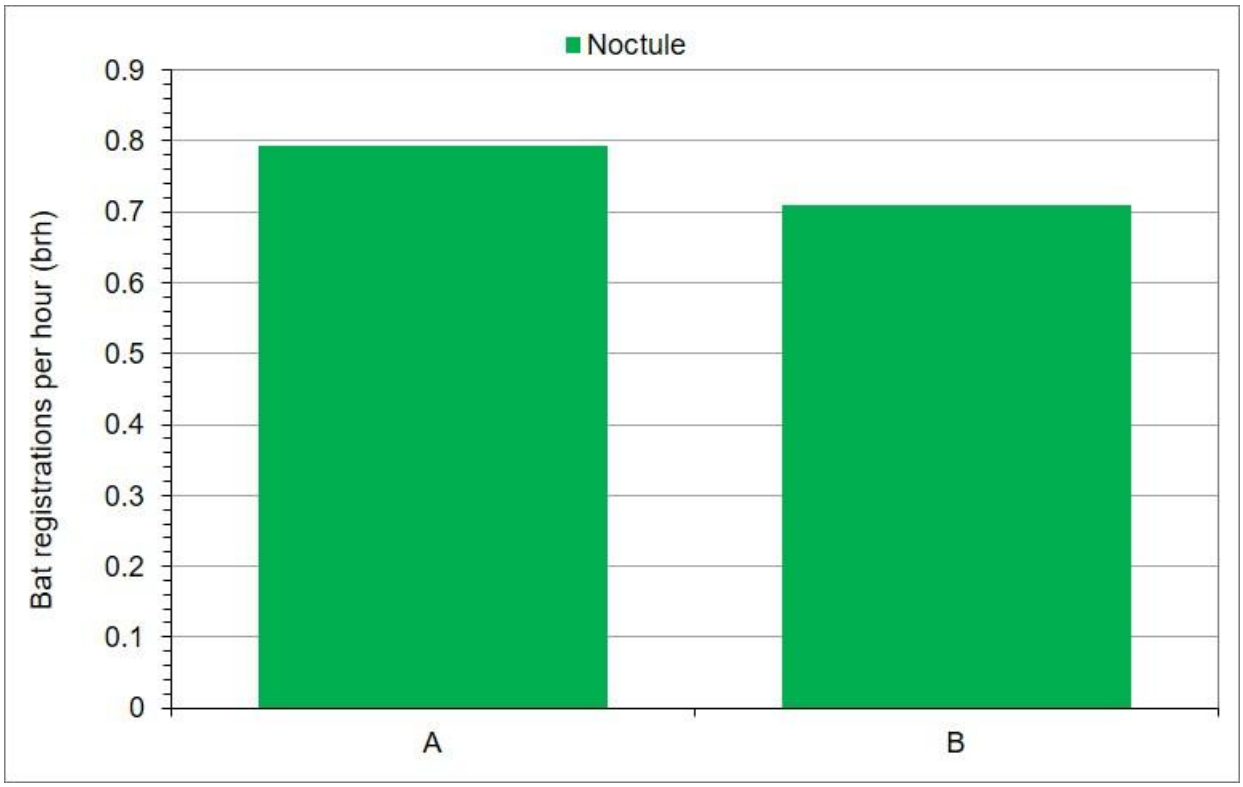


Figure D14: BAI of noctule across detector locations

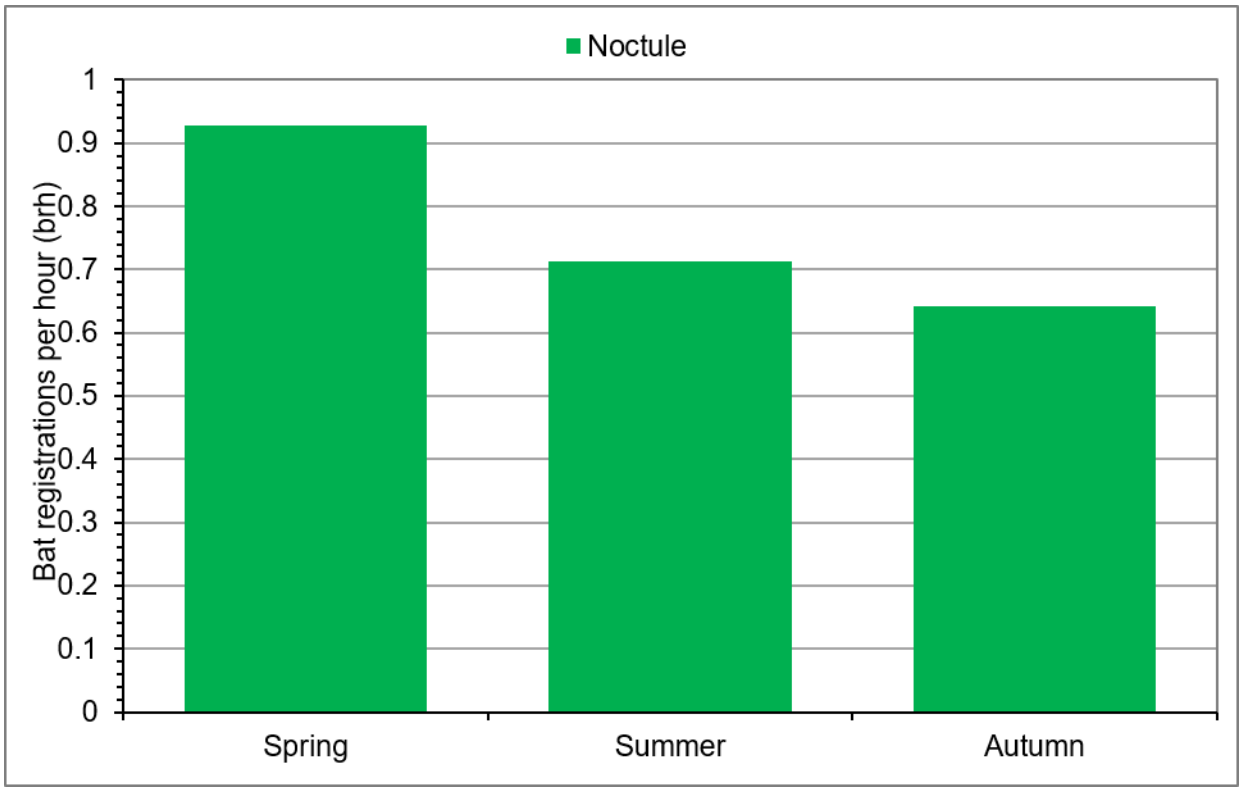


Figure D15: BAI of noctule during each survey visit

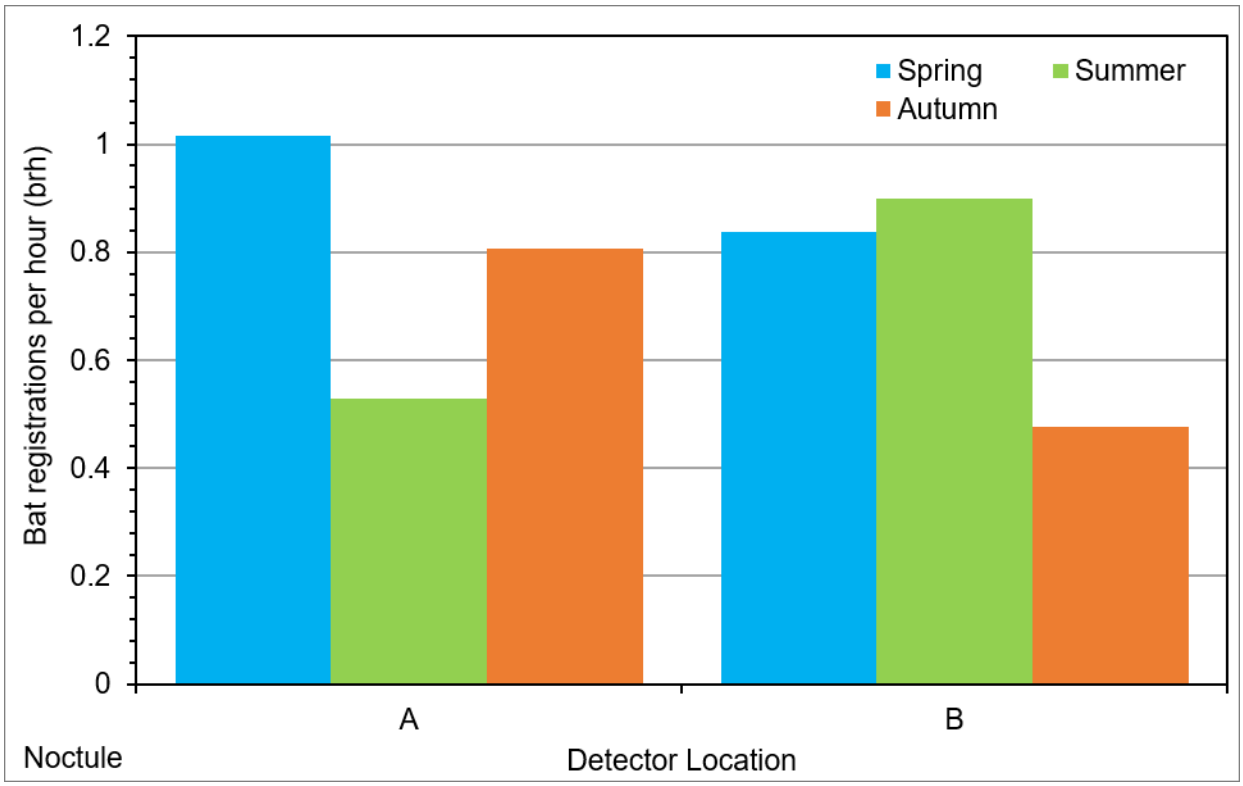


Figure D16: BAI of noctule across detector locations during each survey season

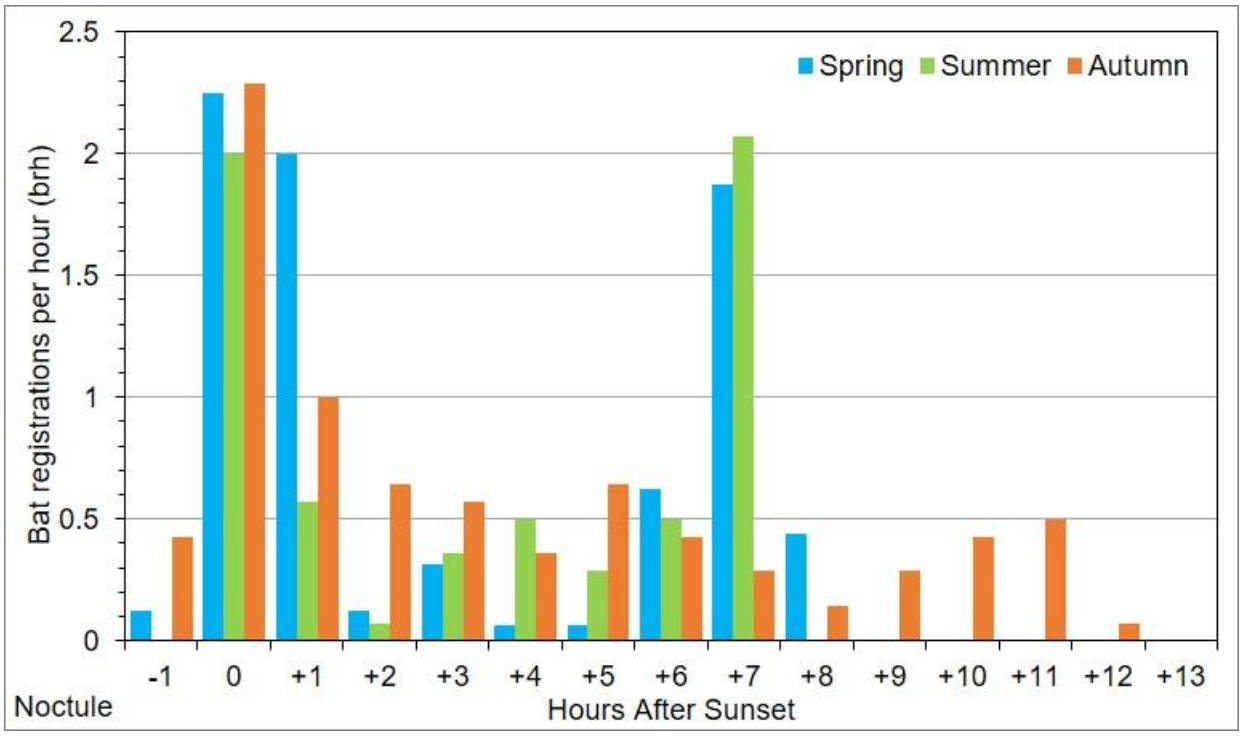


Figure D17: Nightly activity patterns of noctule during each survey season

Myotis Bats

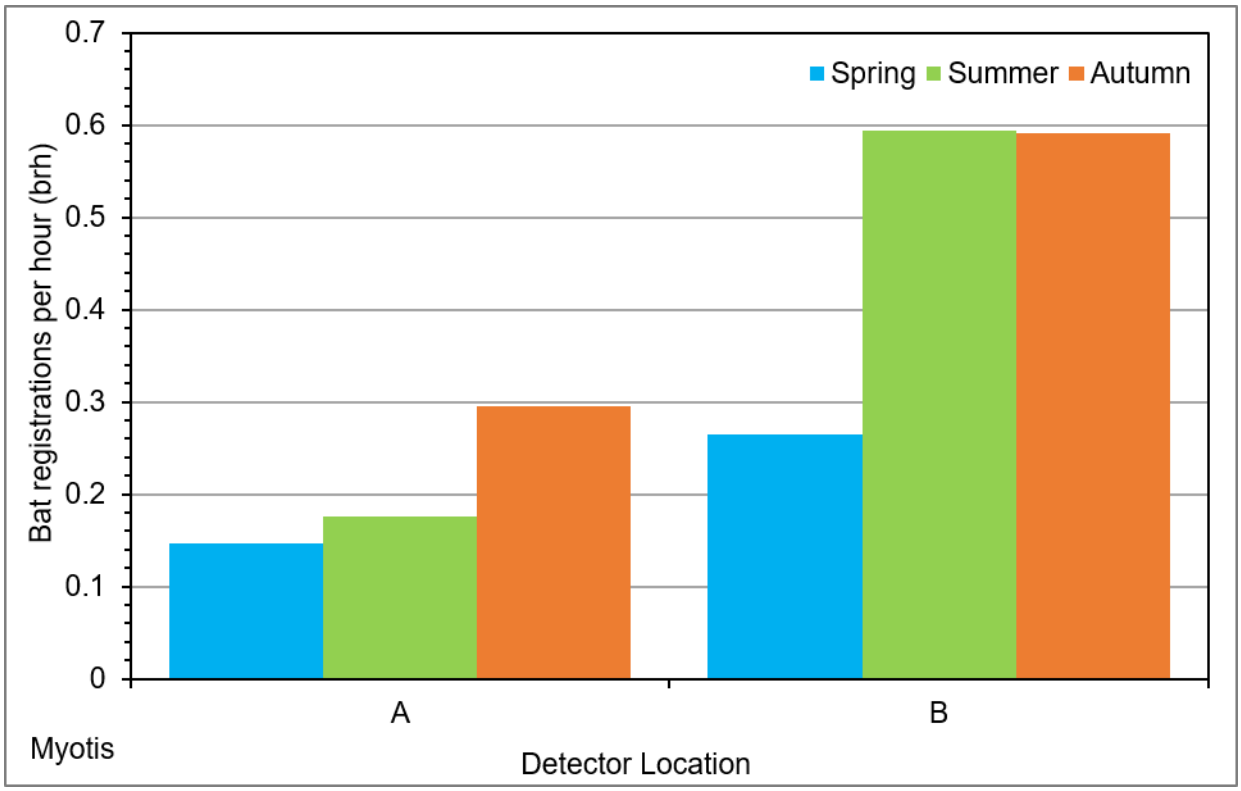


Figure D18: BAI of all Myotis bats across detector locations during each survey season

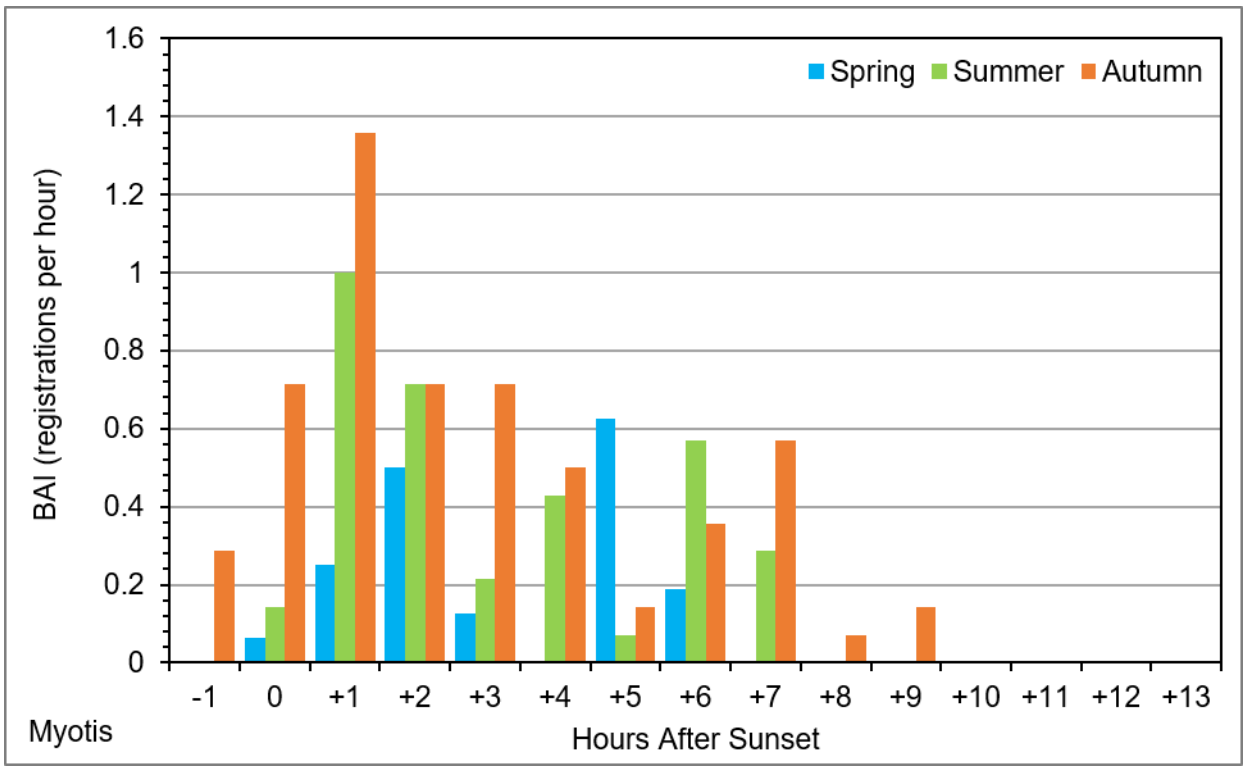


Figure D19: Nightly activity patterns of all Myotis bats during each survey season

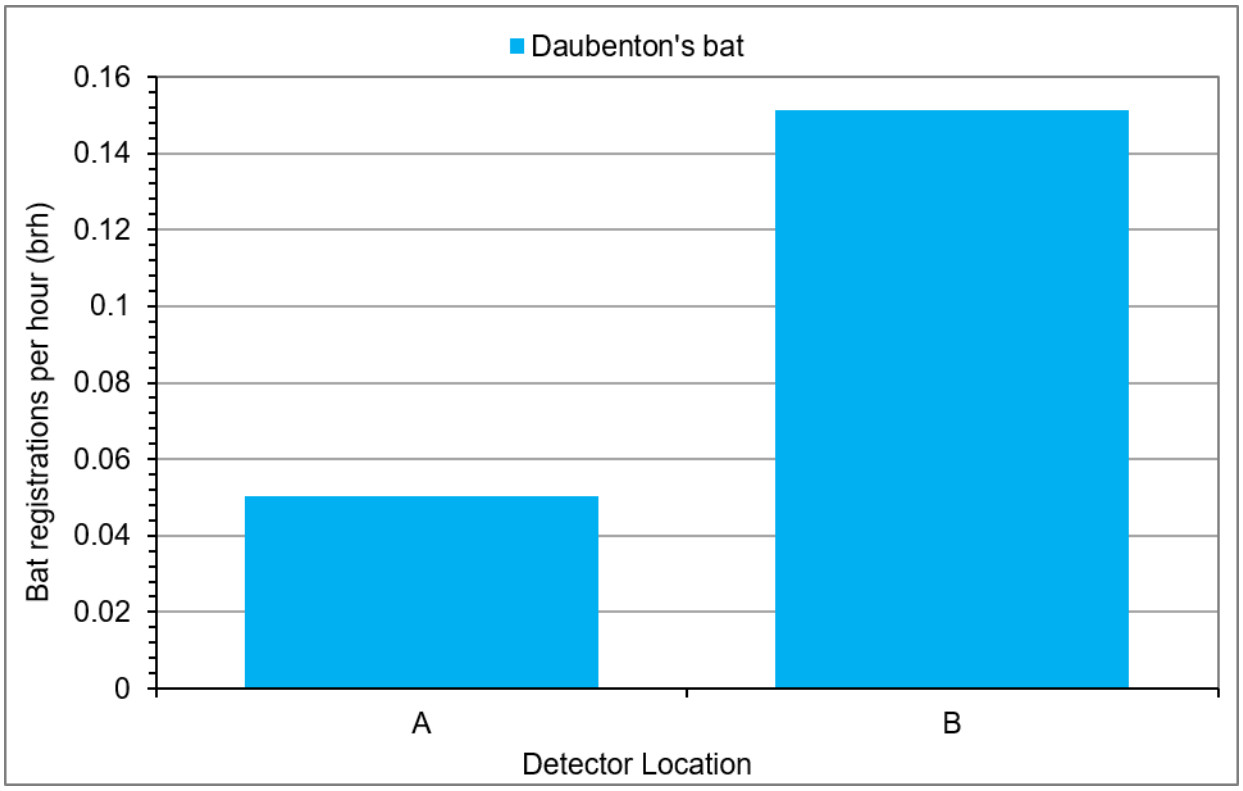


Figure D20: BAI of Daubenton's bat across detector locations

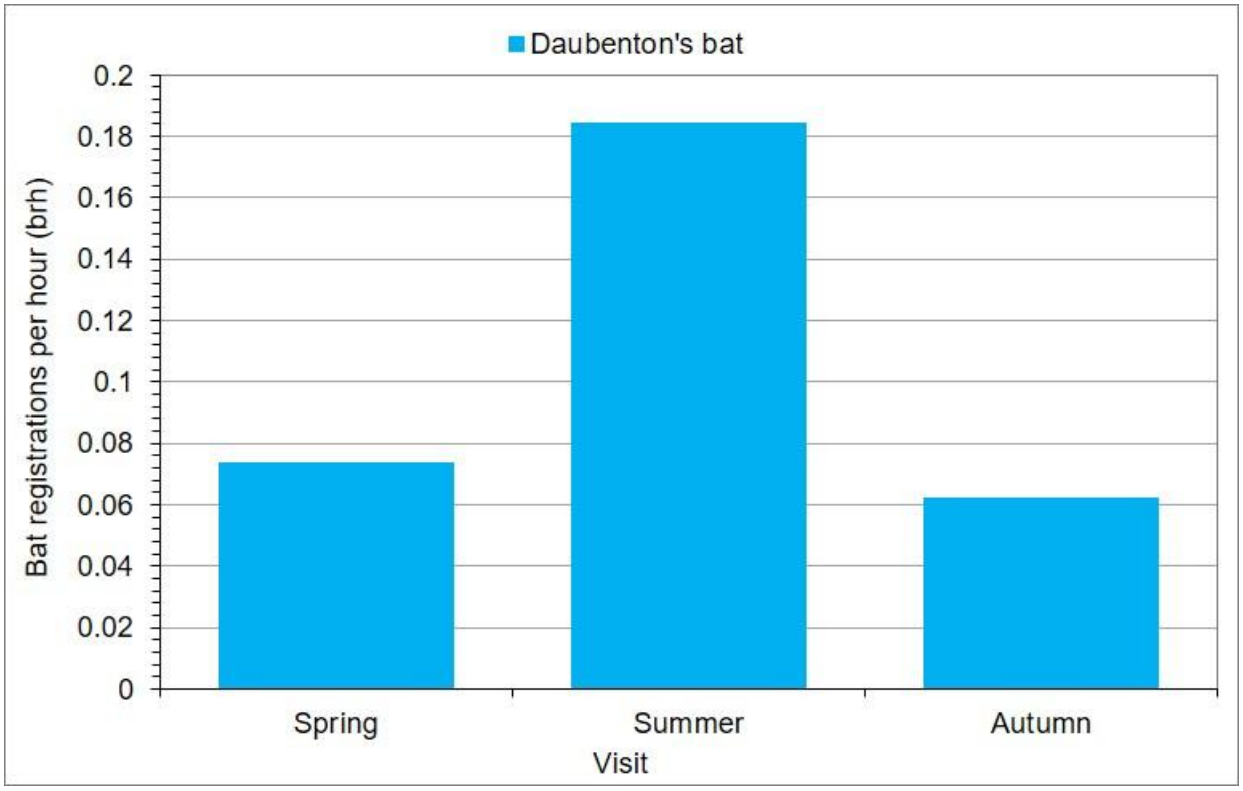


Figure D21: BAI of Daubenton's bat during each survey visit

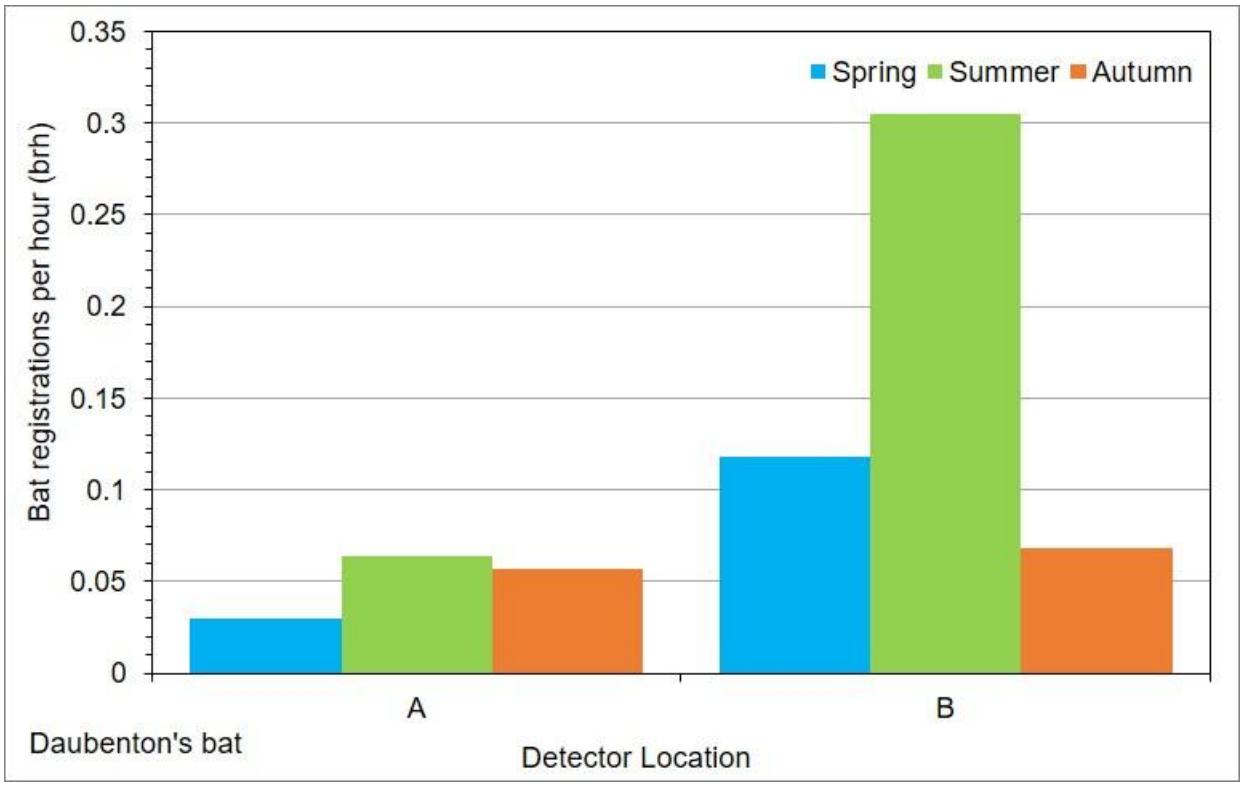


Figure D22: BAI of Daubenton's bat across detector locations during each survey season

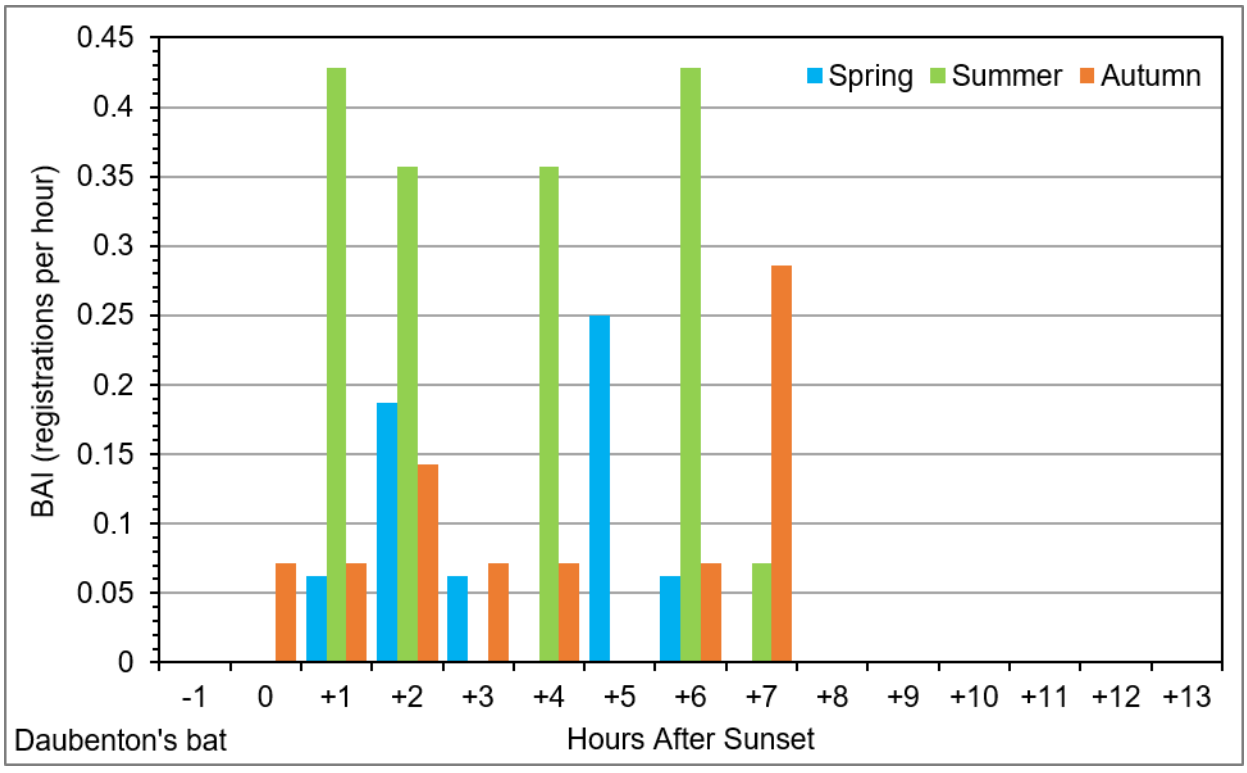


Figure D23: Nightly activity patterns of Daubenton's bat during each survey season



Figure D24: BAI of whiskered bat across detector locations

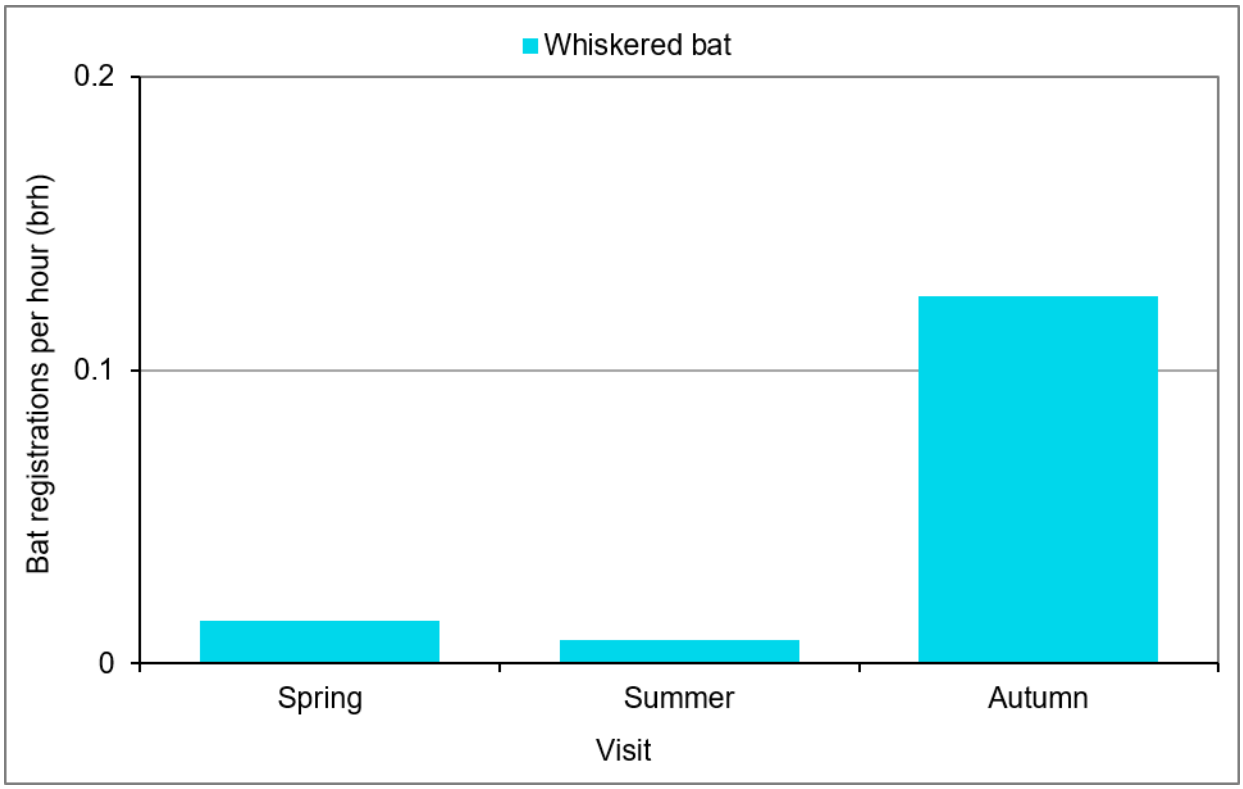


Figure D25: BAI of whiskered bat during each survey visit

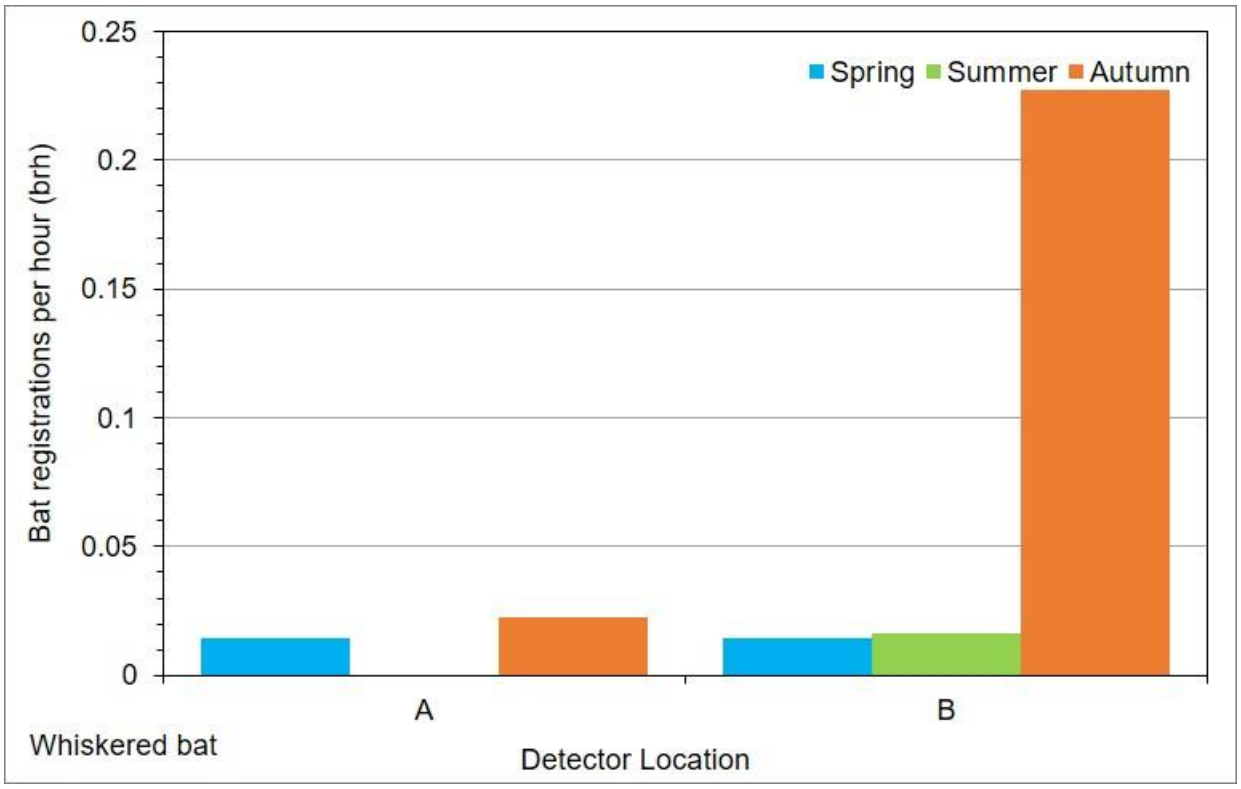


Figure D26: BAI of whiskered bat across detector locations during each survey season

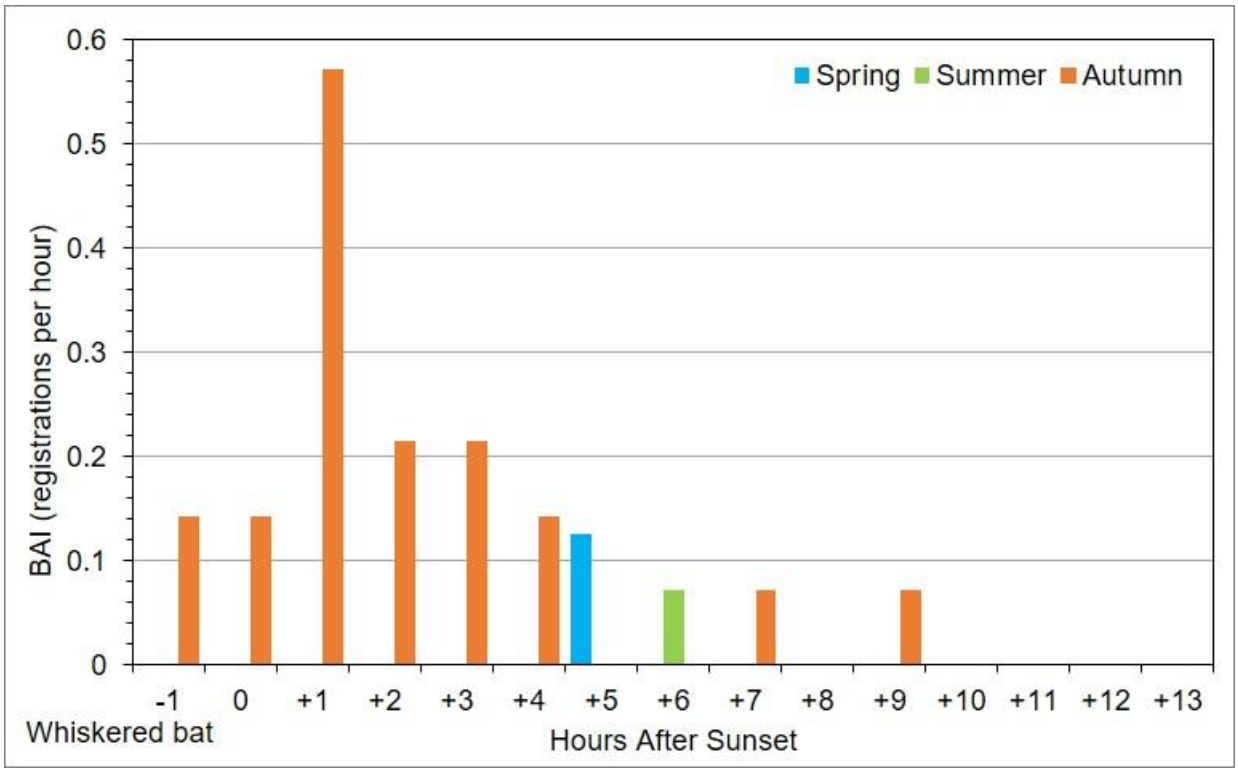


Figure D27: Nightly activity patterns of whiskered bat during each survey season

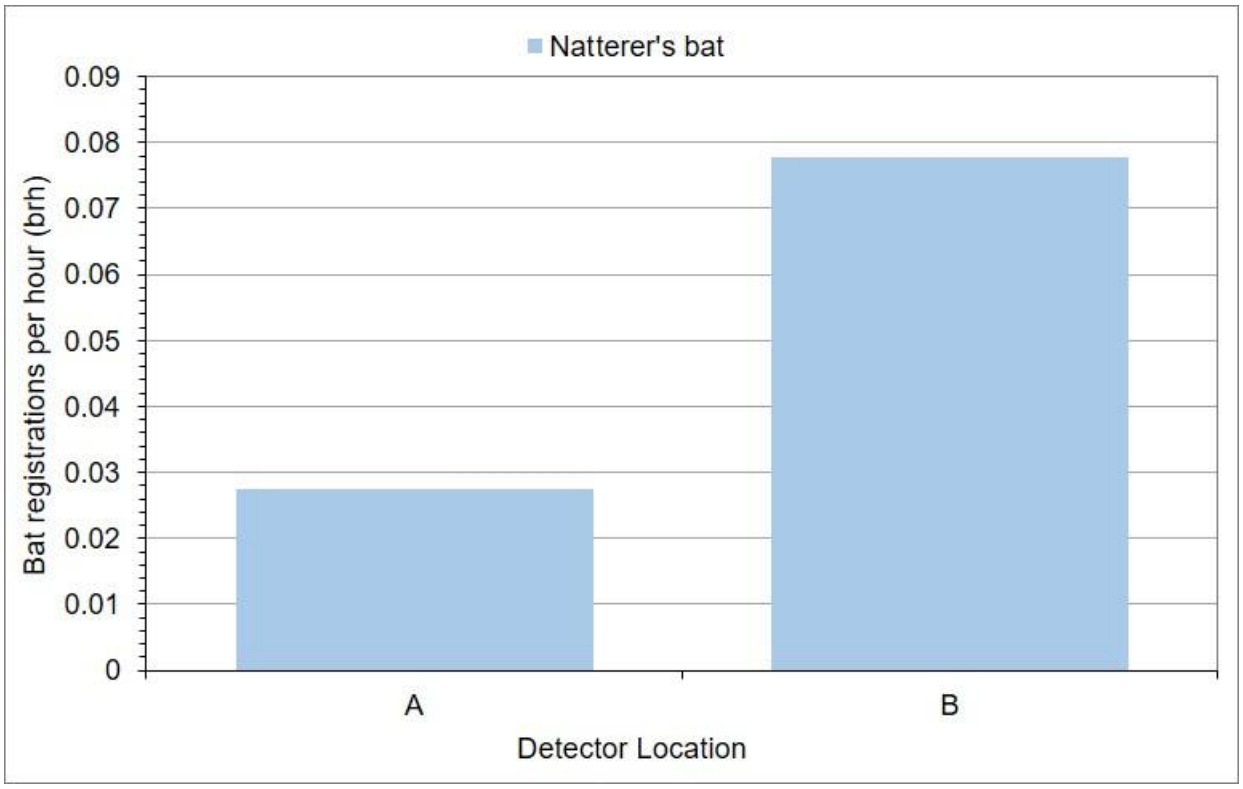


Figure D28: BAI of Natterer's bat across detector locations

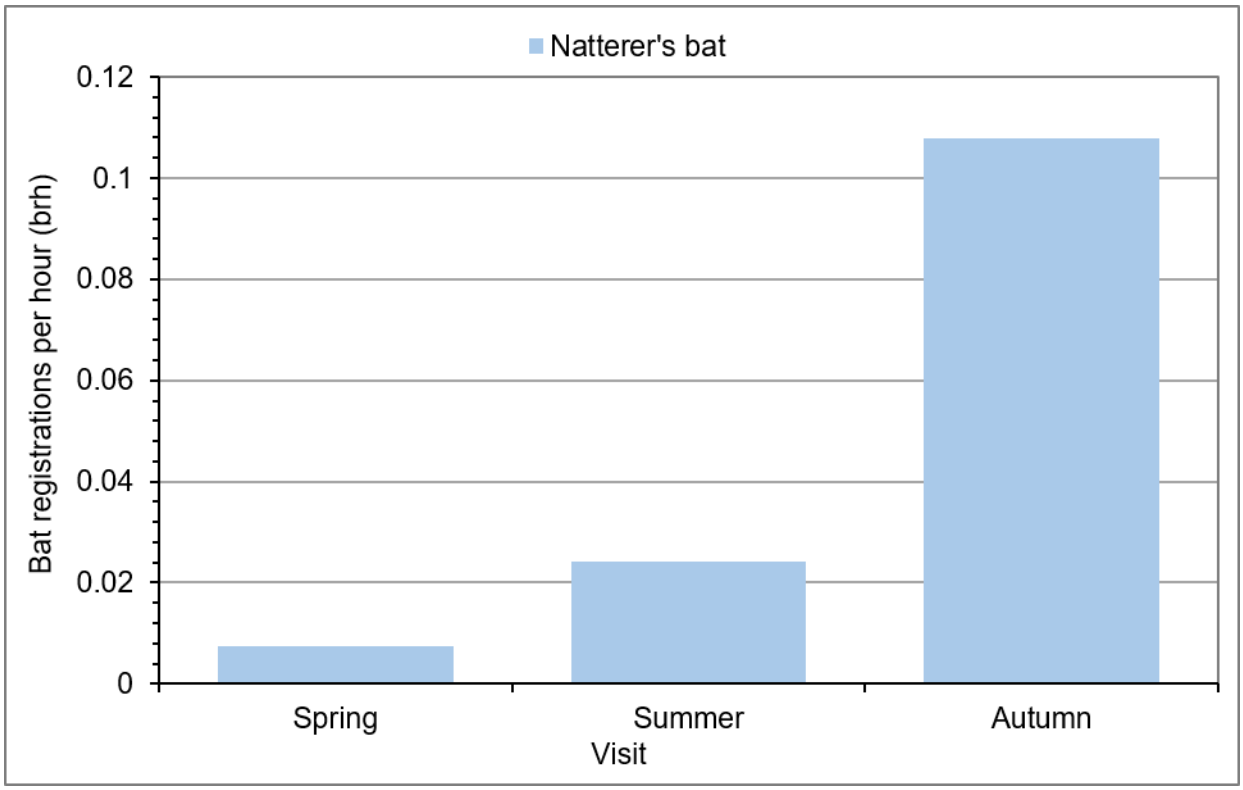


Figure D29: BAI of Natterer's bat during each survey visit

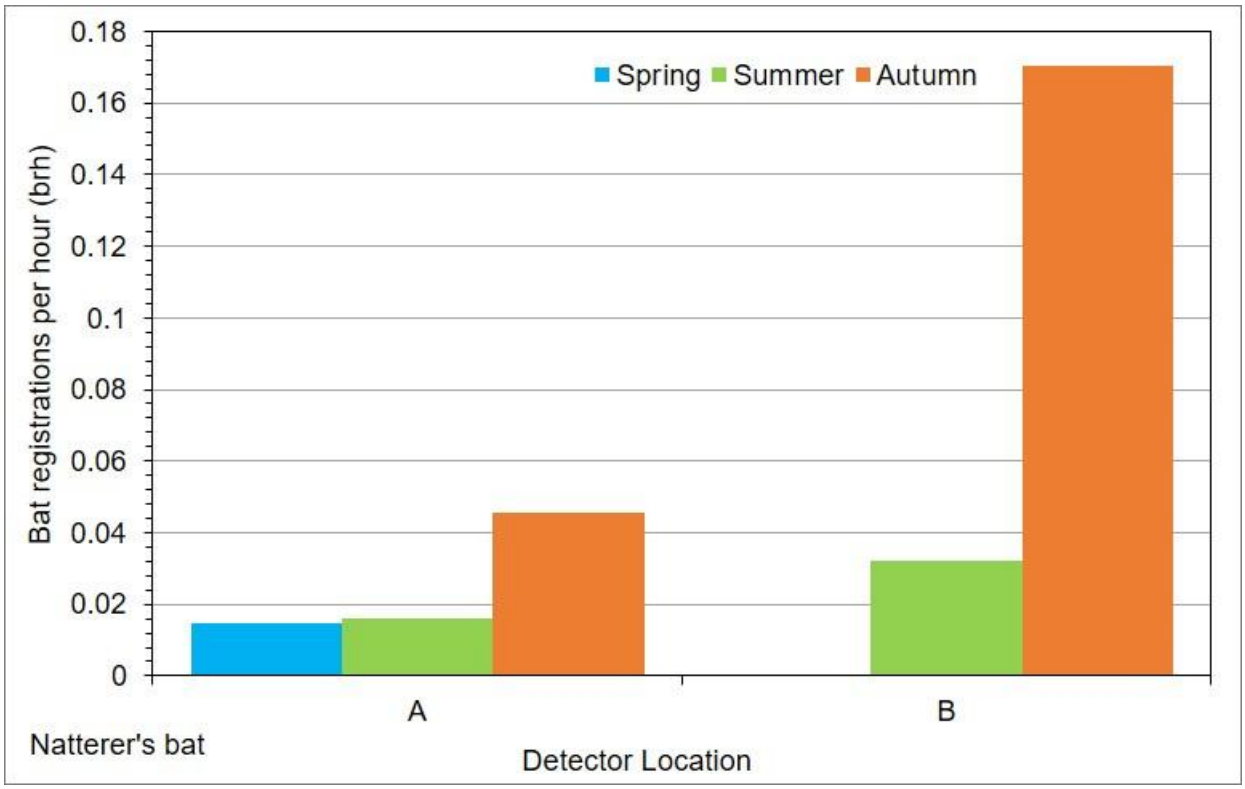


Figure D30: BAI of Natterer's bat across detector locations during each survey season

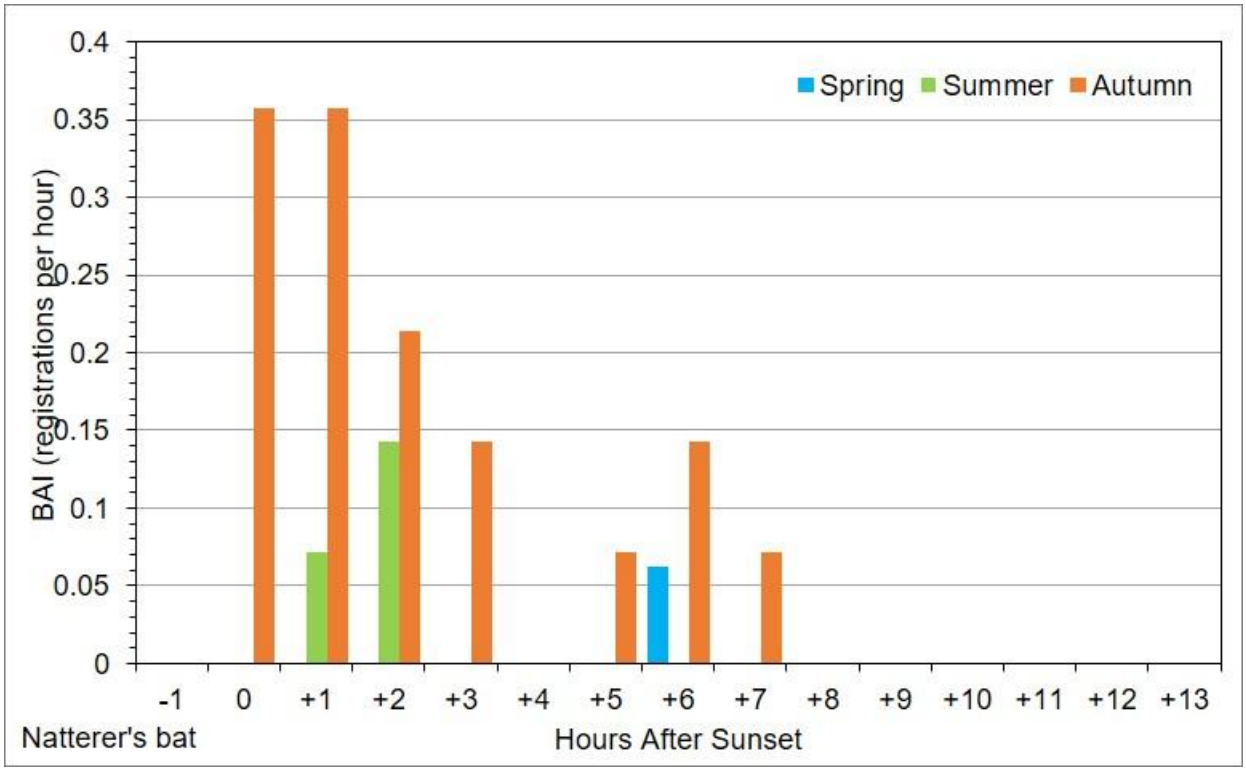


Figure D31: Nightly activity patterns of Natterer's bat during each survey season

Serotine

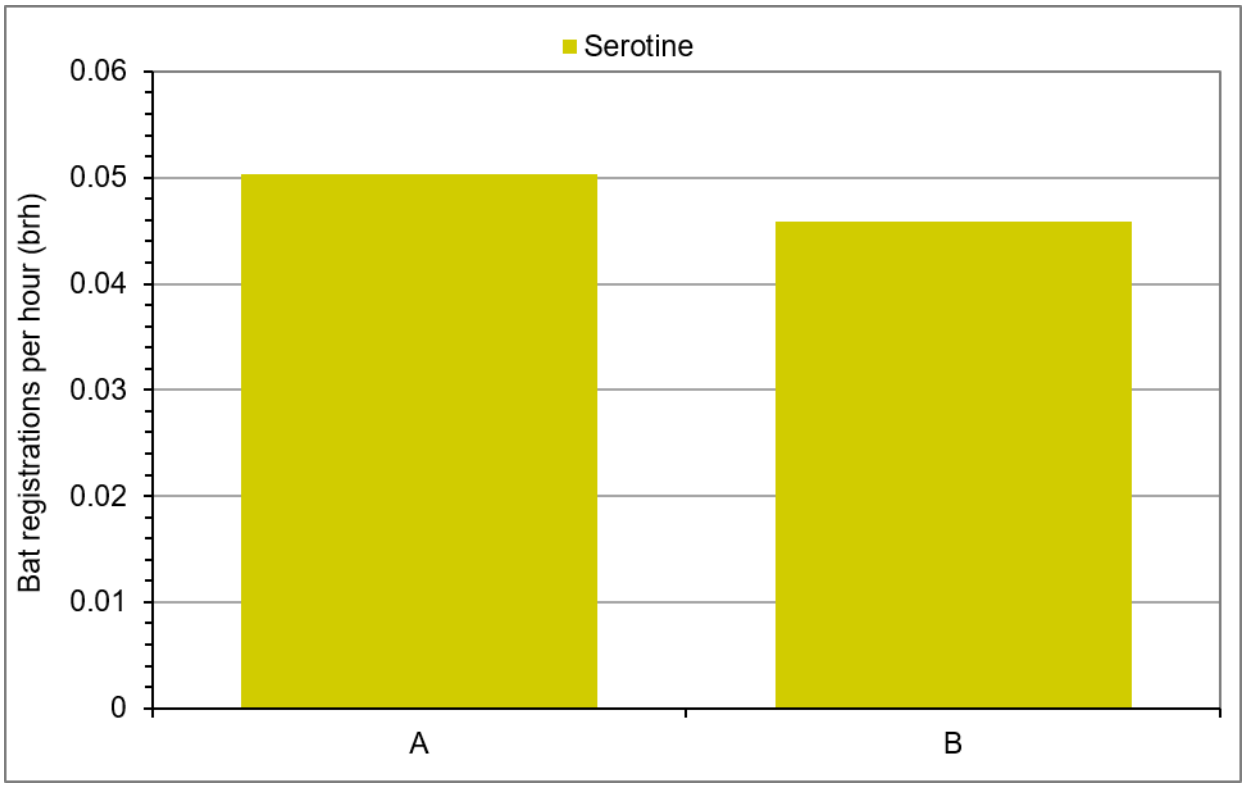


Figure D32: BAI of serotine across detector locations

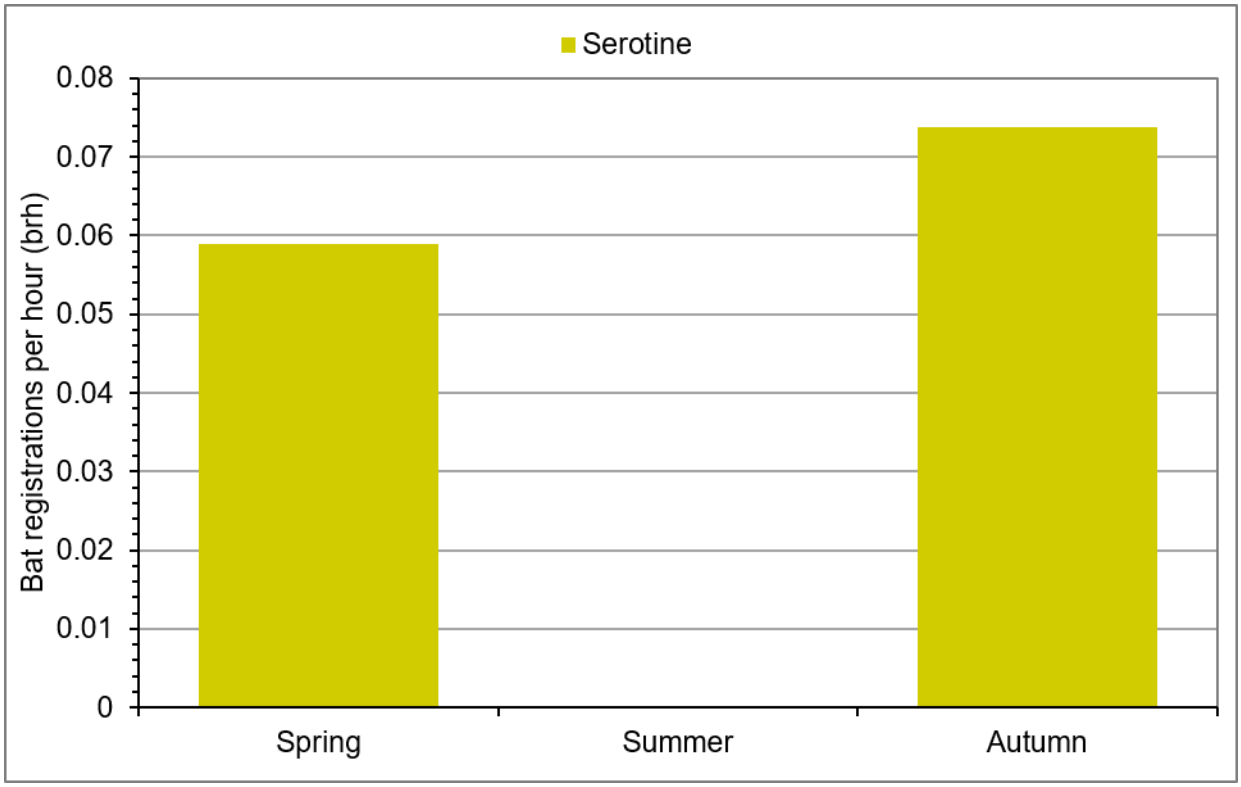


Figure D33: BAI of serotine during each survey visit



Figure D34: BAI of serotine across detector locations during each survey season

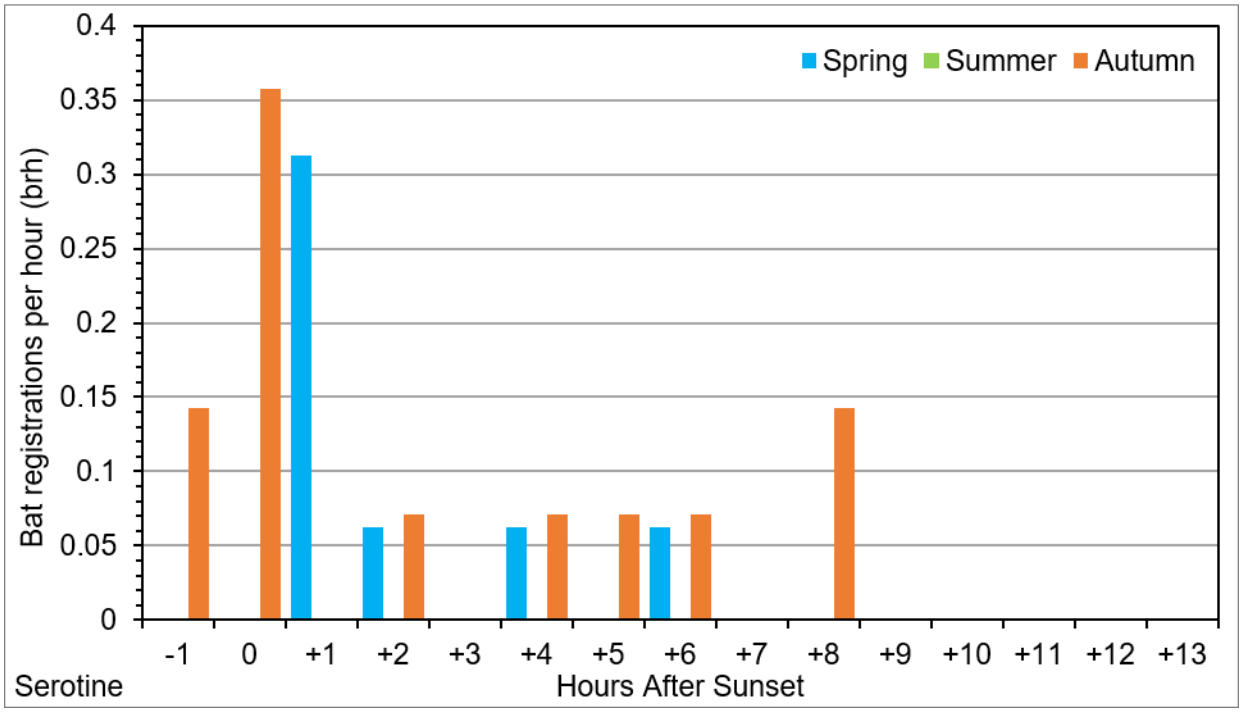


Figure D35: Nightly activity patterns of serotine during each survey season

Long-eared Bats



Figure D36: BAI of brown long-eared bats across detector locations

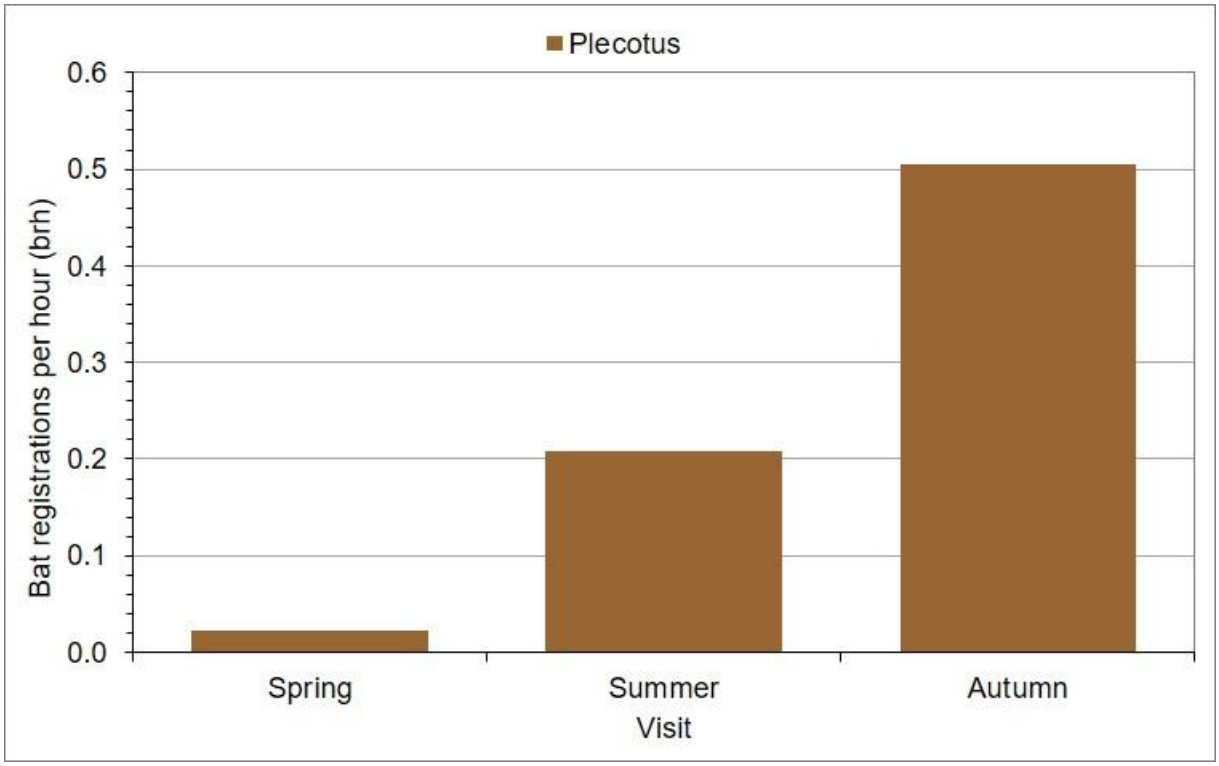


Figure D37: BAI of brown long-eared bats during each survey visit

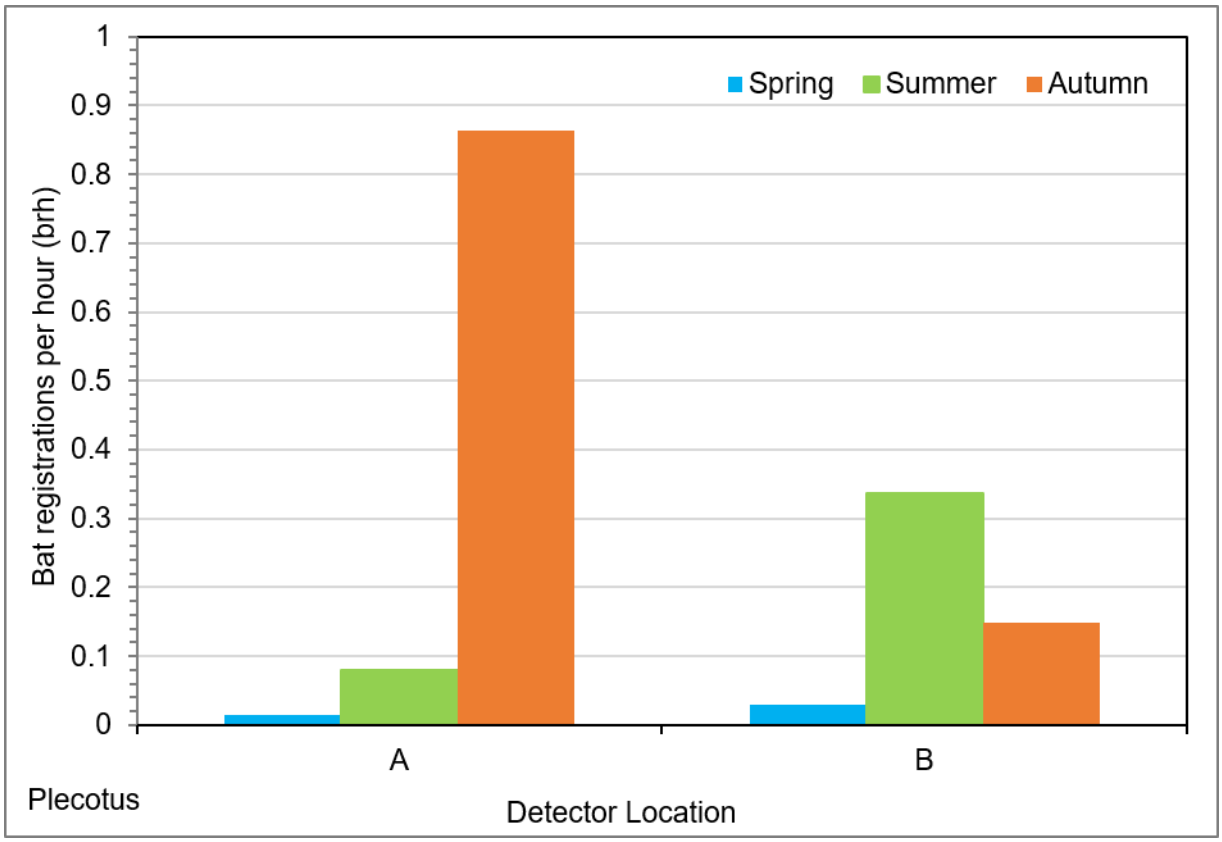


Figure D38: BAI of brown long-eared bats across detector locations during each survey season

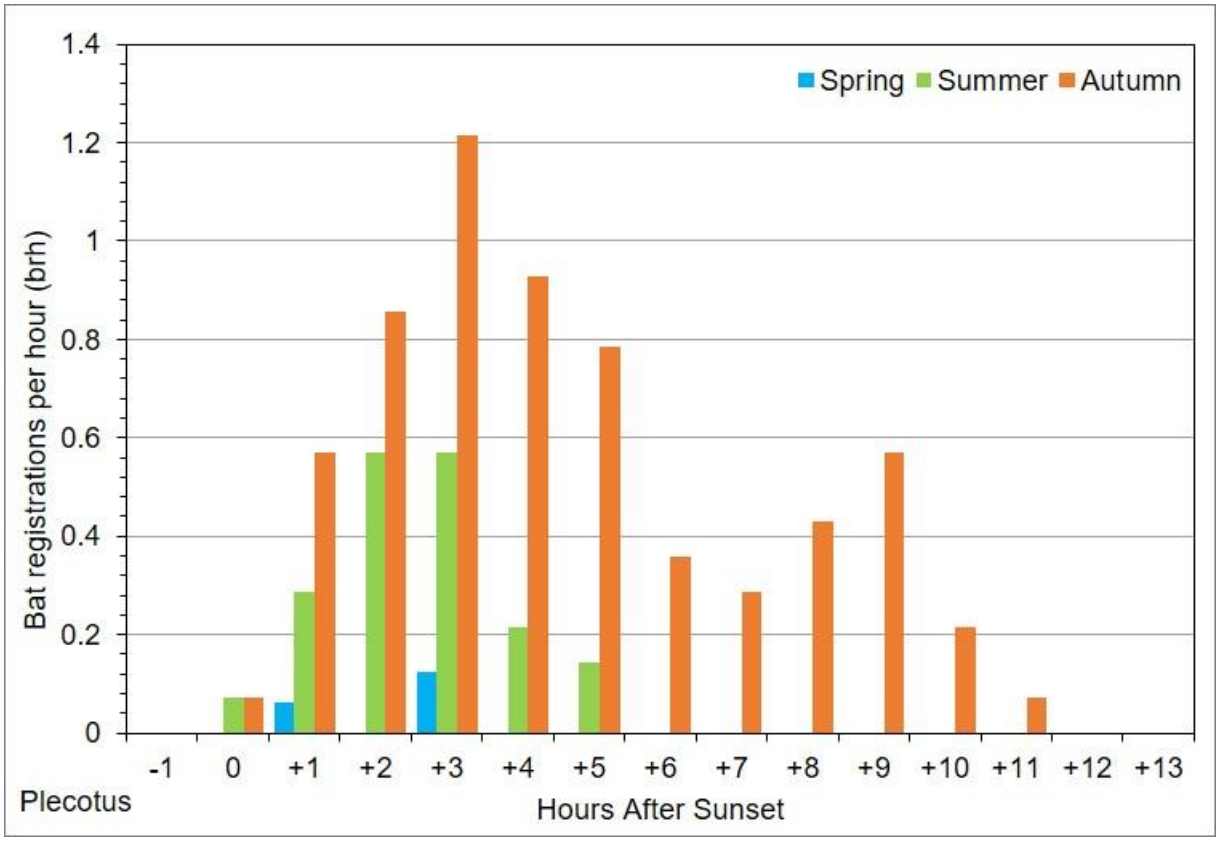


Figure D39: Nightly activity patterns of brown long-eared bats during each survey season

Drawings

Drawing 1: NBW route and static detector locations (Ref G11425.001)

Drawing 2: NBW results – Visit 1 (May 2026) (Ref G11425.008)

Drawing 3: NBW results – Visit 2 (July 2026) (Ref G11425.009)

Drawing 4: NBW results – Visit 3 (September 2026) (Ref G11425.010)

WARRINGTON

401 Faraday Street
Birchwood Park
Warrington
WA3 6GA

T: 01925 844004
E: tep@tep.uk.com

MARKET HARBOROUGH

The Reynard Suite
Bowden Business Village
Market Harborough
Leicestershire
LE16 7SA

T: 01858 383120
E: mh@tep.uk.com

GATESHEAD

Office 26 Gateshead
International Business
Centre
Mulgrave Terrace
Gateshead
NE8 1AN

T: 0191 6053340
E:gateshead@tep.uk.com

LONDON

8 Trinity Street
London
SE1 1DB

T: 020 3096 6050
E: london@tep.uk.com

CORNWALL

Nr Falmouth
Cornwall

T: 01326 240081
E: cornwall@tep.uk.com

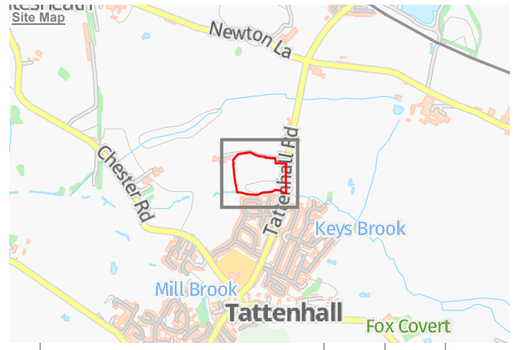


KEY

- Site boundary
- Automated static detector
- Pre-determined walkover route

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Site Map



Rev	Description	Drawn	Approved	Date

THE ENVIRONMENT PARTNERSHIP

401 Faraday Street, Birchwood Park, Warrington, WA3 6GA
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project
Land to the West of Tattenhall Road, Tattenhall, Cheshire

Title
Night-time Bat Walkover Survey – Pre-determined Walkover Route and Automated Static Detector Locations Map

Drawing Number
G11425.001

Drawn	Checked	Approved	Scale	Date
ET	BJ	EH	1:1,500 @ A3	29/09/2026



KEY

- Site boundary
- Stationary observation point
- Common pipistrelle
- Soprano pipistrelle
- Noctule
- Bat flightline (colour denotes bat species)

Stationary Observation Point Records

Noctule x18

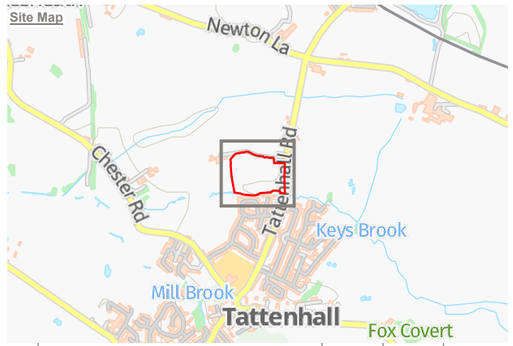
Common pipistrelle x12

Soprano pipistrelle x20

Note:
Multiple bat records in the same location may obscure some results from displaying on the map.

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401 Faraday Street, Birchwood Park, Warrington, WA3 6GA
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project
Tattenhall Road, Tattenhall

Title
Night-time Bat Walkover Survey
Visit 1 - 26th May 2026

Drawing Number
G11425.008

Drawn	Checked	Approved	Scale	Date
HP	BJ	SV	1:1,400 @ A3	29/09/2026



KEY

- Site boundary
- Stationary observation point
- Common pipistrelle
- Common pipistrelle social call
- Soprano pipistrelle
- Noctule
- Bat flightline (colour denotes bat species)

Stationary Observation Point Records

Noctule x11

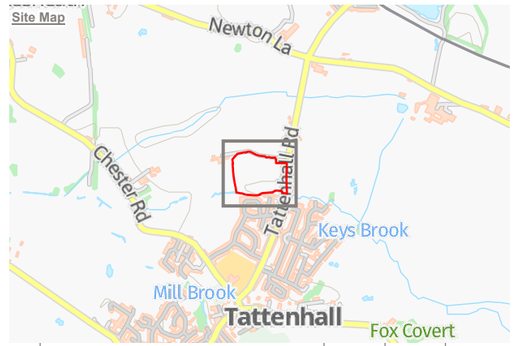
Soprano pipistrelle x14

Pipistrelle species social call x1

Note:
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Site Map



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TEP THE ENVIRONMENT PARTNERSHIP
401 Faraday Street, Birchwood Park, Warrington, WA3 6GA
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project
Tattenhall Road, Tattenhall

Title
Night-time Bat Walkover Survey
Visit 2 - 20th July 2026

Drawing Number
G11425.009

Drawn	Checked	Approved	Scale	Date
HP	BJ	SV	1:1,400 @ A3	29/09/2026



KEY

- Site boundary
- Stationary observation point
- Common pipistrelle
- Common pipistrelle social call
- Soprano pipistrelle
- Soprano pipistrelle social call
- Brown long-eared bat
- Myotis species
- Whiskered bat
- Noctule
- Bat flightline (colour denotes bat species)

Stationary Observation Point Records

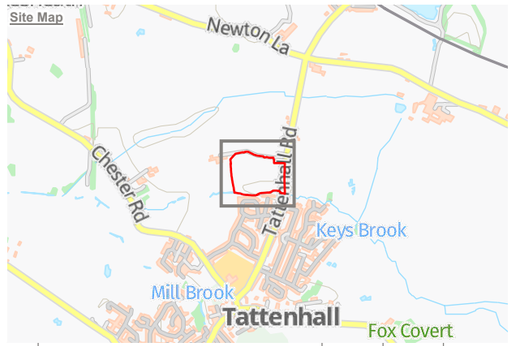
Noctule x3

Soprano pipistrelle x6

Note:
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Site Map



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THE ENVIRONMENT PARTNERSHIP

401 Faraday Street, Birchwood Park, Warrington, WA3 6GA
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project
Tattenhall Road, Tattenhall

Title
Night-time Bat Walkover Survey
Visit 3 - 16th September 2026

Drawing Number
G11425.010

Drawn	Checked	Approved	Scale	Date
HP	BJ	SV	1:1,400 @ A3	29/09/2026