

EASTLEIGH BOROUGH COUNCIL – ONE HORTON HEATH TEAM

The Folds and The Holme and The Homestal, One Horton Heath Bat Survey Technical Note

1 INTRODUCTION

1.1 BACKGROUND

Johns Associates Ltd was commissioned by Eastleigh Borough Council (One Horton Heath Team) to update relevant components of the detailed bat baseline surveys undertaken in support of the One Horton Heath (OHH) Outline Planning Permission (O/20/89498) and subsequent annual update walkover surveys. This was to inform the proposed The Folds and The Holme and Homestal Reserved Matters (RM) planning applications associated with the Outline Planning Permission (OPP) for the wider OHH OPP. The 2025 survey work builds upon the detailed surveys undertaken in support of the Outline Planning Application in 2020 and subsequent annual update walkover surveys to record any significant general ecological and land use changes across the wider area. The scope of this update work was to undertake a Ground Level Tree Assessment (GLTA), an aerial tree climbing survey and static bat activity surveys for bats in 2025.

The land associated with the RMA parcels is hereafter referred to as 'the Site'. The Site has the postcode SO50 7BZ and the central grid reference is SU 48897 17427. A plan showing the Site location, context and red line boundary is provided in Figure 1.

The Site was previously determined to be of high value to bats during previous surveys conducted at the Site including GLTA, habitat assessment, acoustic surveys, radio tracking and trapping surveys from bats conducted as part of the OHH OPP in 2020 (See OPA EIA Appendix 10.4 for 2020 results). Surveys in 2025 were required to update the previous survey results to inform the RM planning applications and masterplan for the Site and to inform avoidance, mitigation, compensation and enhancement measures for bats.

1.2 PURPOSE OF THE SURVEY AND REPORT

The purpose of the survey and subsequent reporting is to:

- Undertake a GLTA, tree climbing and bat static detector surveys to update the previous bat surveys undertaken at the Site (as shown in Figure 1).
- To identify evidence of roost presence/suitability and map the locations of these areas on, or in the vicinity of the site.

- Present the results of the 2025 GLTA, aerial tree climbing surveys, evidence of roosts and bat static statistical R analysis of the static survey results.
- Present a summary of the 2020 bat survey results.
- Present the results of an updated desk study, which included bat roost records held by Hampshire Biodiversity Information Centre (HBIC) for the area extending 2 km from the Site.
- Present a characterisation of the bat species and roosts (if present) associated with the Site.
- Provide specifications for avoidance, mitigation, compensation and enhancement measures to protect roosting bats and their habitat from harm during construction and operation of the development.

1.3 PERSONNEL

The production of this Technical Note and management of the survey work was conducted by Tessa Pepler BSc (Hons) MSc MCIEEM, a Principal Ecologist and Ecology Team Leader at Johns Associates who has worked as an ecological consultant since 2005. Tessa has a BSc (Hons) in Environmental Studies and an MSc in Ecology and Management of the Natural Environment. Tessa is a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM) and holds a Natural England Class 1 survey licence for bats (2019-40584-CLS-CLS-1), great crested newt *Triturus cristatus* (2015-18828-CLS-CLS), and hazel dormouse *Muscardinus avellanarius* (2016-20745-CLS-CLS). Tessa is proficient in botanical identification and is certified FISC Level 3.

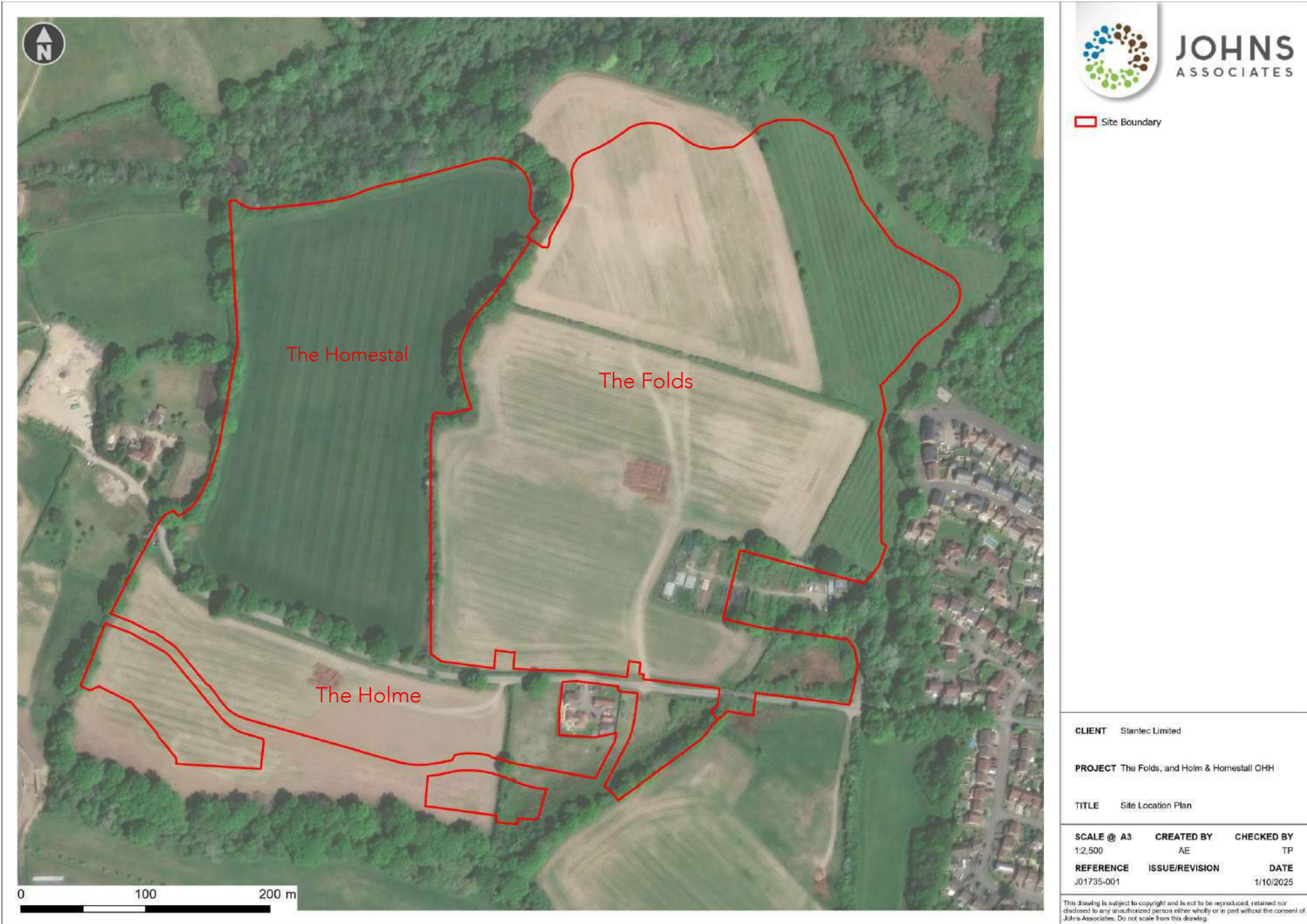
The Lead Surveyor for the bat tree surveys was Ellie Hack BSc (Hons) ACIEEM. Ellie is a Principal Ecologist and Bat Technical Lead at Johns Associates. Ellie is an experienced bat ecologist with considerable experience of designing and implementing bat mitigation and monitoring strategies, using of a wide range of equipment and software, alongside data processing, analysis and interpretation. Ellie holds Class 3 and Class 4 bat licences, alongside numerous EPS mitigation licences for complex sites, with large numbers of roosts including for rare species.

Tree surveys were assisted by Nicole Evans, Billy Wing and George Jones. Nicole Evans BSc (Hons) is a Consultant Ecologist at Johns Associates with three years' experience in ecological consultancy. Nicole has a BSc (Hons) in Conservation biology and is particularly experienced in bat ecology, holding a Natural England Class 1 survey licence for bats (2025-80156-SCI-CL17). George Jones BSc (Hons) is an Assistant Ecologist at Johns Associates who has worked in ecological consultancy since May 2025. George has a BSc in Conservation Biology and Ecology and is a qualifying member of CIEEM. Billy Wing is a tree surgeon and is currently training in a Diploma for Level 4 Arboriculture. Billy has been trained by Ellie Hack to undertake tree surveys for bats and is an Accredited Agent on Ellie's bat survey licences. Billy has two years of survey experience in surveying trees for bats.

1.4 SITE DESCRIPTION AND LOCATION

The Folds and the Holme and Homestal sites are located to the west of the village of Horton Heath in Hampshire and measure approximately 25.59 ha. Fir Tree Lane is located to the south of the The Holmestall and The Folds parcels and to the north of the Holme parcel. Areas of woodland are located to the north and south, with Quobleigh pond and woods (SINC) to the north. Lapstone Playing Fields are located to the north-east, while a solar farm is located to the south beyond the Foxwalks woodland. The wider landscape consists of a matrix of agricultural fields, hedgerows, woodland patches, bodies of water and urban settlements. The UKhab habitat baseline plan for the combined sites is provided in Figure 2.

Figure 1: Location of Sites and Red Line Boundary



Legend:

- Site Boundary
- h2a - native hedgerow
- h2a5 - species-rich native hedgerow
- w1 - broadleaved and mixed woodland
- c1c - cereal crops
- c1f - horticulture
- g1c - bracken
- g3 - neutral grassland
- g3c - other neutral grassland
- g3c5 - Arrhenatherum neutral grassland
- g4 - modified grassland
- h3d - bramble scrub
- h3f - hawthorn scrub
- h3h - mixed scrub
- u1b - developed land, sealed surface
- u1b5 - buildings
- u1c - artificial unvegetated unsealed surface
- u1f - sparsely vegetated urban land

Client: Stantec Limited

Project: The Folds, and Holm & Homestall OHH

Title: Site Location Plan

Scale @ A3: 1:2,500

Created By: AE

Checked By: TP

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2 LEGAL PROTECTION OF BATS

Bats are highly protected in the UK under several legal instruments, which provide strict safeguards against disturbance, harm, and destruction of their roosts. The key laws that apply are:

2.1.1 The Conservation of Habitats and Species Regulations 2019 (as amended) (Habitats Regulations)

The Habitats Regulations implement the EU Habitats Directive (92/43/EEC) into UK law and provide strong legal protection for bats. Under Schedule 2, all UK bat species are classified as European Protected Species (EPS).

Key Protections

Under Regulation 43 of the Habitat Regulations, it is an offence to:

- Deliberately capture, injure, or kill a bat.
- Deliberately disturb bats in a way that:
 - Impairs their ability to survive, breed, or rear their young.
 - Affects their local distribution or abundance.
- Damage or destroy a breeding site or resting place (bat roost), even if bats are not present.
- Keep, transport, sell, or exchange bats (alive or dead) or any part of a bat.

Defences & Licences

Defences exist for acts carried out incidentally and without intent, but the destruction of roosts is strictly controlled. Licences (issued by Natural England, Natural Resources Wales, NatureScot, and NIEA) allow certain activities that would otherwise be illegal, associated with development, scientific research, or bat conservation projects.

2.1.2 The Wildlife and Countryside Act 1981 (as amended) (WCA)

The WCA complements the Habitats Regulations and provides additional protections for bats across the UK.

Key Offences (Schedule 5 Protection)

Under Section 9, it is an offence to:

- Intentionally kill, injure, or take a bat.
- Possess or control a bat (alive or dead) unless legally acquired.
- Intentionally or recklessly disturb bats in their places of rest.
- Intentionally or recklessly obstruct access to any bat roost.

Recklessness: Unlike the Habitats Regulations (which require intent), the WCA criminalises reckless actions, broadening protection.

Penalties

Conviction under the WCA can result in:

- Unlimited fines.
- Up to six months' imprisonment per offence.
- Forfeiture of equipment used in committing the offence.

2.1.3 The Countryside and Rights of Way Act 2000 (CRoW Act) (England and Wales only)

This Act strengthens the Wildlife and Countryside Act 1981 by:

- Extending offences to include "reckless" disturbance of bats or damage to roosts.
- Strengthening enforcement powers and penalties.

2.1.4 The Natural Environment and Rural Communities Act 2006 (NERC Act) (England and Wales only)

Under Section 40, public authorities have a duty to conserve biodiversity, including bats. Recognises bats as species of principal importance in conservation decisions. Barbastelle, Bechstein's (*Myotis bechsteinii*), greater horseshoe (*Rhinolophus ferrumequinum*), lesser horseshoe, brown long-eared, soprano pipistrelle (*Pipistrellus pygmaeus*), and noctule (*Nyctalus noctula*) bats are all listed as Species of Principal Importance in England under Section 41 of the Natural Environment and Rural Communities Act 2006.

2.1.5 The Animal Welfare Act 2006

Protects individual bats in captivity from unnecessary suffering.

2.1.6 Local and International Agreements & Guidelines

The Bonn Convention on Migratory Species (CMS) and its Agreement on the Conservation of Populations of European Bats (EUROBATS) set international obligations for UK bat conservation.

2.1.7 Bat Roost Licensing

The government's statutory conservation advisory organisation in England (Natural England) is the body responsible for administering protected species licences that permit activities that would otherwise result in an offence being committed.

There are currently a number of licensing options available, depending on the size and nature of the roost(s) present and the species using them.

A licence can be obtained if the following three tests have been met:

- Regulation 53(9)(a) - there is "no satisfactory alternative" to the derogation, and
- Regulation 53(9)(b) - the derogation "will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range" and

- Regulation 53(2)(e) - the derogation is for the purposes of “preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment.”

2.2 NATIONAL PLANNING POLICY

There are numerous national and local planning policies associated with flora and fauna (also referred to as biodiversity) that need to be addressed as part of the planning process. The Government has issued its National Planning Policy Framework (NPPF) December 2024 (updated in February 2025), which requires impacts to biodiversity to be minimised. Paragraph 194 of the NPPF applies the same protection to Ramsar sites as that conferred by the Habitats Regulations to SACs and SPAs, it also applies the same protection to sites identified or required as compensatory measures for adverse effects on habitat sites.

To protect and enhance biodiversity plans should:

- 192a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation;
- 192b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

The NPPF requires development to apply the following principles (Paragraph 193):

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

Planning authorities should follow key principles to ensure that the potential impacts of planning decisions on biodiversity conservation are considered. Circular 06/05: Biodiversity and Geological Conservation provides guidance on the application of the law relating to planning and nature conservation and complements the NPPF.

2.2.1 Local – Eastleigh Borough Council

As well as national policy, there is relevant biodiversity policy contained within the Eastleigh Borough Local Plan 2016-2036, adopted in April 2022.

Policy DM11: Nature Conservation

5. Development will not be permitted if it is likely (either individually or in combination with other developments) to have a direct or indirect adverse effect on **priority habitats, protected priority species, or on the local ecological network** unless it can be demonstrated that:
 - a. there are no alternative solutions;
 - b. the adverse effects are unavoidable;
 - c. measures are taken to mitigate or, as a last resort, compensate for the adverse effects;
 - d. there is an overall biodiversity net gain; and
 - e. if there are any residual adverse effects, the benefits of the development clearly outweigh the adverse effects on priority habitats, priority and protected species, and the local ecological network.
6. **Buffers** free from development will be provided to designated sites to avoid/mitigate impacts, including recreational impact and impacts on edge habitats, and to maintain dark skies.
7. Development will not be permitted unless it can be demonstrated that:
 - a. there have been thorough habitat and species **surveys**;
 - b. the great crested newt strategic survey and strategy have been considered in all developments within 500m of a great crested newt pond; and
 - c. the strategic bat trapping survey has been considered in all developments within the locality of a woodland or connected habitat networks.

Strategic Policy S9, Green Infrastructure

1. Through new development and other initiatives and the Borough Council will seek to achieve the provision, retention and/or enhancement of the following forms of multi-functional green infrastructure, including provision of:
 - a. landscape scale strategic links across the Borough boundary, to and between the Borough's settlements, the countryside, the coast, and the major areas of open space including the country parks (see strategic policy S12);
 - b. interlinked publicly accessible open space through new and existing development including for example formal sports facilities and informal amenity spaces and cemeteries (see policies DM32-DM34, Chapter 5 and detailed proposals in Chapter 6);

- c. green infrastructure incorporated into all new development with multifunctional spaces connected by primary, secondary and tertiary green links;
- d. interconnected urban green infrastructure within the fine grain of existing and new development including green, cycle ways, paths and linkages between community facilities and open spaces to link community facilities;
- e. green stepping stones such as street trees, green roofs and walls, pocket parks and urban copses (see policy DM1, Chapter 5);
- f. connected habitats linking the network of designated sites and existing priority habitats, taking account of the Hampshire ecological network map (see policy DM11, Chapter 5);
- g. incorporation of historic buildings and landscapes, including historic parks and gardens within the wider Green Infrastructure to protect their setting (see policy DM12, Chapter 5); and
- h. opportunities for local food growing including allotments, community orchards and farms (see policies DM32 to DM34, Chapter 5 and detailed proposals in Chapter 6).

3 METHODOLOGY

3.1 BAT HABITAT SUITABILITY

An updated bat habitat suitability assessment was undertaken in June 2025 by Tessa Pepler from Johns Associates. This built on the previous bat surveys, habitat management and associated work at OHH.

The overall suitability of the Site and adjacent habitats for foraging and commuting bats was assessed to determine its importance within the wider local context, particularly with reference to the location of known roosts obtained through the Desk Study and previous work at the Site. The assessment was conducted using the criteria described in Table 1.

Table 1 : Guidelines for assessing the potential suitability of proposed development sites for bats, based on presence of habitat features within the landscape, to be applied using professional judgement (Bat Conservation Trust, 2023)

Suitability	Description Roosting Habitats	Commuting and Foraging Habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/suitable shelter at all ground/underground levels).	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 ^a	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site likely to be used as flightpaths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions ^b and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a	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.

	classic cool/stable hibernation site but could be used by individual hibernating bats ^c).	
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^b and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	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	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions ^b and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/stable hibernation site.	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.
a. Negligible is defined as 'so small or unimportant as to be not worth considering, insignificant'. This category may be used where there are places that a bat could roost or forage (due to one attribute) but it is unlikely that they actually would (due to another attribute). b. For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance. c. Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten et al., 2016 and Jansen et al., 2022). Common pipistrelle swarming has been observed in the UK (Bell, 2022 and Tomlison, 2020) and winter hibernation of numbers of this species has been detected at Seaton Delaval Hall in Northumberland (National Trust, 2018). This phenomenon requires some research in the UK, but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in prominent buildings in the landscape, urban or otherwise.		

3.2 DESK STUDY

A desk study was undertaken to collate all relevant existing information relating to the Site and its surrounding area. The data was used to inform the scope of the Site survey and to enable a full assessment of the likely effects of any development at the Site on any sites, habitats, or species of conservation interest to be carried out. The Multi Agency Geographic Information for the Countryside (MAGIC) website was used to conduct the following desk study searches with regards to bats on 10 July 2025:

- Records and citations to a 10 km radius of international statutory designated wildlife sites including Special Areas of Conservation (SACs) that support bat species.
- Records and citations to a 2 km radius for national statutory sites designated for bats including Sites of Special Scientific Interest (SSSI), Local Nature Reserves (LNR) and National Nature Reserves (NNRs).
- Records of European Protected Species Licences (EPSL) to a 2 km for bats.

Google Maps aerial images were used to assess habitats at a landscape level (www.maps.google.com) in proximity to the Site to assess wider connectivity and habitat size to help determine whether the Site is suitable to support a functional population of the species.

3.3 DATA SEARCH

A data search was conducted with the Hampshire Biodiversity Information Centre (HBIC) on 10 July 2025 to identify records of bats within 2 km of the proposed Site.

3.4 ASSESSMENT OF HABITAT IMPORTANCE AND IMPACT

An assessment of the habitat importance, taking into account potential and known roosts and commuting and foraging areas used by bats, and potential function with respect to designated sites for bats (e.g. SAC and SSSI) was undertaken.

The assessment of habitat importance for bats (within the context of the proposed development and its zone of influence) considers the following:

- The habitat type and its use by bats (for roosting, commuting or foraging).
- The suitability of the habitat to support bats.
- For identified roosts: the likely roost type and species present.
- The availability of the habitat type and its connectivity within the wider landscape.

3.5 ZONE OF INFLUENCE

The Zone of Influence (ZoI) is defined as ‘the biophysical areas/resources that may be affected by the biophysical changes caused by activities associated with a project’ (CIEEM, 2017). The ZoI therefore may expand beyond the site boundary when impacts of the proposals may influence as such.

3.6 GROUND LEVEL TREE ASSESSMENT (GLTA)

A GLTA survey was undertaken by a team of surveyors led by Ellie Hack BSc (Hons) ACIEEM, NE Level 3 and 4 Bat Licence on 12 August 2025, by Billy Wing on 1 and 2 October 2025 and by Ellie Hack, George Jones and Tessa Pepler on 27 October 2025. The inspection followed the professional survey guidance as detailed in Bat Survey Guidelines for Professional Ecologists: Good Practice Guidelines (Bat Conservation Trust, 2023).

All trees within the Site were inspected systematically for Potential Roost Features (PRFs) that could be used by bats including woodpecker holes, squirrel holes, rot holes, knot holes, pruning cuts, tear outs, wounds, cankers, compression forks, butt rots, lightening strikes, hazard beams, subsidence, cracks, shearing cracks, transverse snaps, welds, lifting bark, desiccation, fissures, frost cracks, fluting and ivy. The assessment was conducted using the criteria described in Table 2.

Table 2: Guidelines for Assessing the Suitability of Trees on Proposed Development Sites for Bats (Collins, 2023)

Suitability	Description
None	Either no PRFs in the tree or highly unlikely to be any
FAR	Further assessment required to establish if PRFs are present in the tree
PRF	A tree with at least one PRF present

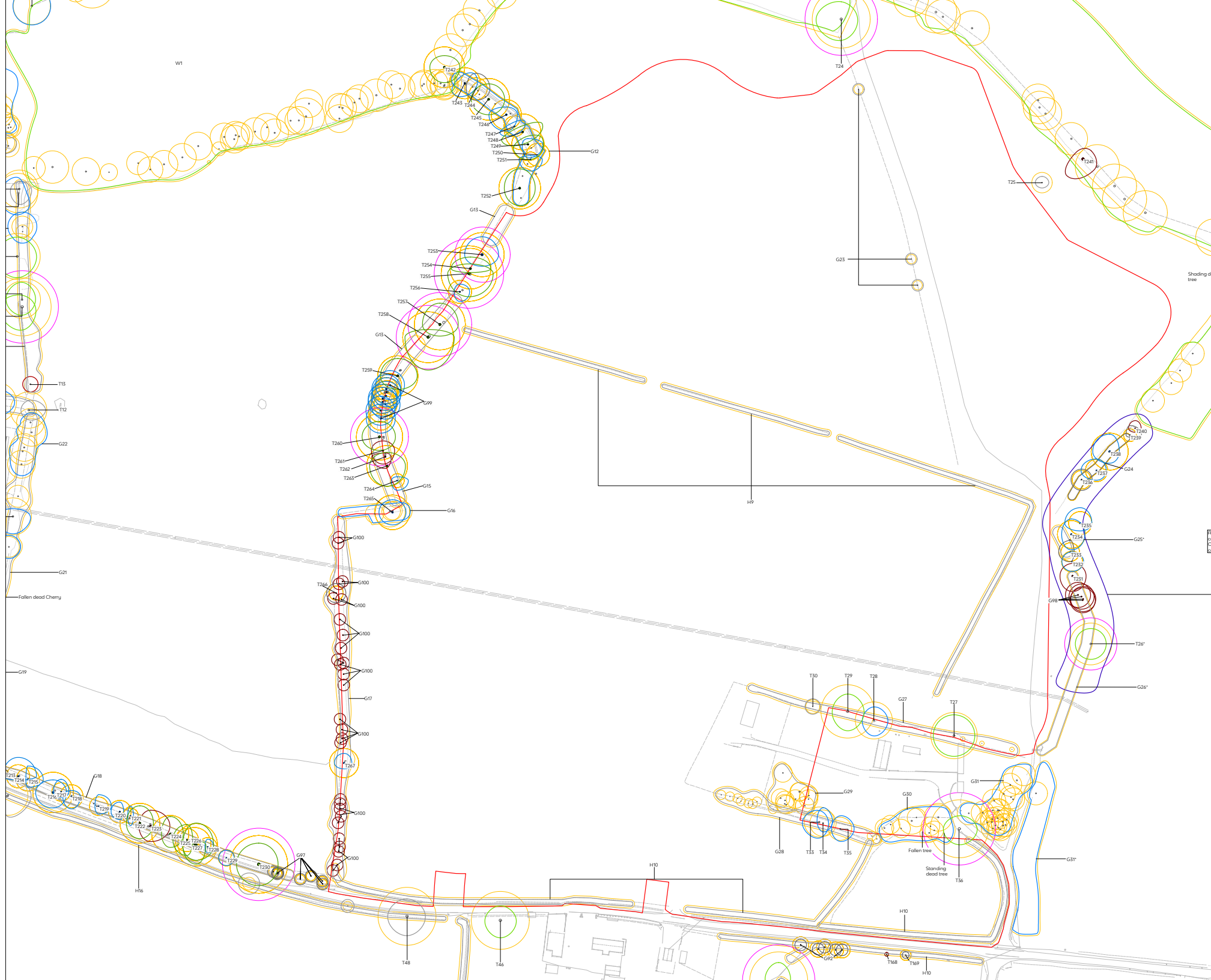
All trees were numbered as per the arboricultural tree plans (Figure 3 and Figure 4) and marked on a plan of the site. The tree species, height, whether the tree is alive or dead and a tree tag number (if present), the diameter at breast height, number of stems and whether the tree has been coppiced were recorded. Information regarding PRFs present was collected including whether the PRF is on a stem or a limb, the PRF type, height and what direction the PRF faces. The height and orientation of the entrance was recorded if this was different.

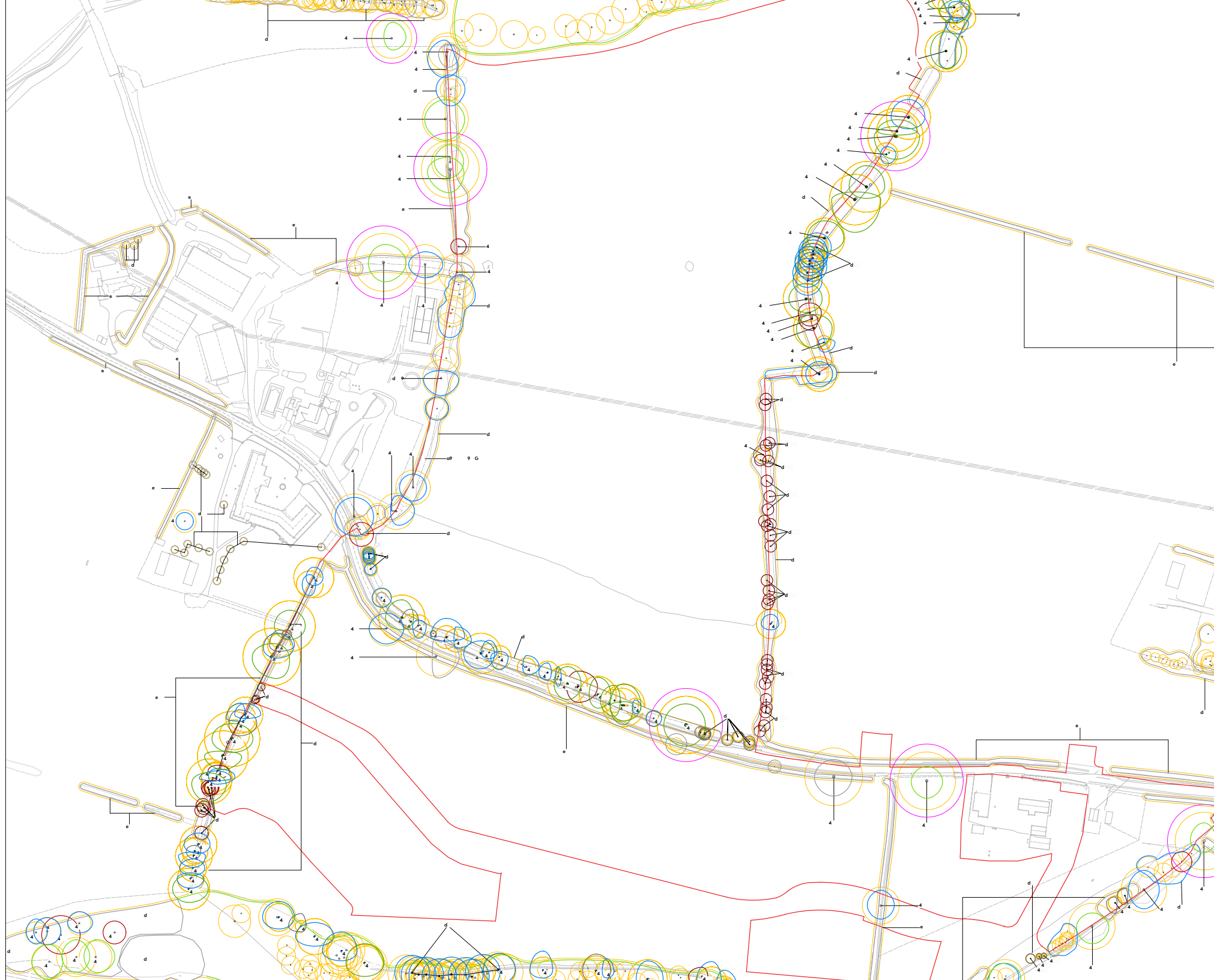
3.7 POTENTIAL ROOST FEATURE INSPECTION TREE SURVEY

A PRF inspection was conducted by Billy Wing on 22 - 23 October 2025 accredited under Ellie Hack BSc (Hons) ACIEEM, NE Level 3 and 4 Bat Licence with a ladder and aerial tree climb to conduct a more detailed assessment of the likely suitability for roosting bats and to look for more conclusive evidence of bats including live or dead bats, droppings, staining and odour. A torch and endoscope were used. The following information was recorded:

- The diameter of the stem or limb where the PRF is
- If multiple entrances are present
- PRF entrance width
- Internal height, width and depth of PRF
- Substrate within PRF
- PRF apex shape
- Whether PRF is dry, damp or wet
- Competitors present
- Bats absent or present (photo's taken). If present – bat species, number of bats, whether bats are awake or torpid, location of bats, distance from entrance.
- Droppings absent or present (droppings taken for DNA analysis)
- Evidence of bats lacking
- Odour

PRFs are assessed to be either PRF-I – PRF is only suitable for individual bats or very small numbers of bats due to size or lack of suitable surrounding habitats or PRF-M – PRF is suitable for multiple bats and may therefore be used by a maternity colony.





3.8 BAT ACTIVITY SURVEYS

3.8.1 Bat Static Surveys

Static surveys were designed to comply BCT guidelines (2023). The BCT guidelines for the number of recommended activity surveys for the suitability of habitats for bats are described in Table 3.

Table 3: Guidelines on the number of recommended bat activity surveys (BCT, 2023) based upon habitat suitability

Survey Type	High
Activity (NBW)	One survey visit ^a per season (spring - April/May, summer - June/July/August, autumn - September/October) ^b . Further surveys may be required if these visits, or the results of static detector surveys, reveal activity interest that requires more observation on site.
Automated/static bat detector surveys ^c	Data to be collected for a minimum of five consecutive nights per month (April to October) in appropriate (or the best available) weather conditions for bats.
a A survey visit should aim to cover all habitats represented in the 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 a low habitat diversity but could range up to multiple walkovers carried out over one or several nights (depending on the number of ecologists) on a larger site (e.g. road aches) with greater habitat diversity b April and October surveys are both weather- and location-dependant. 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. c Detector locations should be assigned to provide a representative sample of all habitats in the 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. Automated/ static surveys are also useful when assessing collision risk, e.g. detectors can be placed at crossing points on proposed roads or railways. However, these surveys should generally be complemented by manual surveys where observations of how bats interact with the site can be made. Note: Multiple survey visits should be separated by at least three weeks, preferably longer, to observe temporal changes in activity.	

Johns Associates were appointed to commence static bat detector surveys in June 2025. Static detector surveys were carried out for five months from June to October 2025. Five static detectors were set to record for a minimum of 5 consecutive nights per deployment. Both Batlogger C and Wildlife Acoustics SM4 bat detectors were used as static detectors. The automated detector locations are given in Table 4 and illustrated in Figure 5.

Table 4: Automated Detector Locations (see also Figures 4 to 8, below)

Location	Grid Reference	Location Description
ST1	SU 48659 17581	To north of western boundary treeline of The Homestal in treeline to the north of Fir Tree House.
ST2	SU 48834 17512	Mid-way down the treeline that extends to the south of Quobleigh Woods between The Folds and The Homestal.
ST3	SU 48961 17215	Mid-way along the eastern boundary treeline of The Holme.
ST4	SU 49041 17561	Mid-way along the hedgerow that bisects The Fold in an east/west direction.
ST5	SU 49138 17753	To the south of Quobleigh Woods to the east of the northern boundary of The Folds.

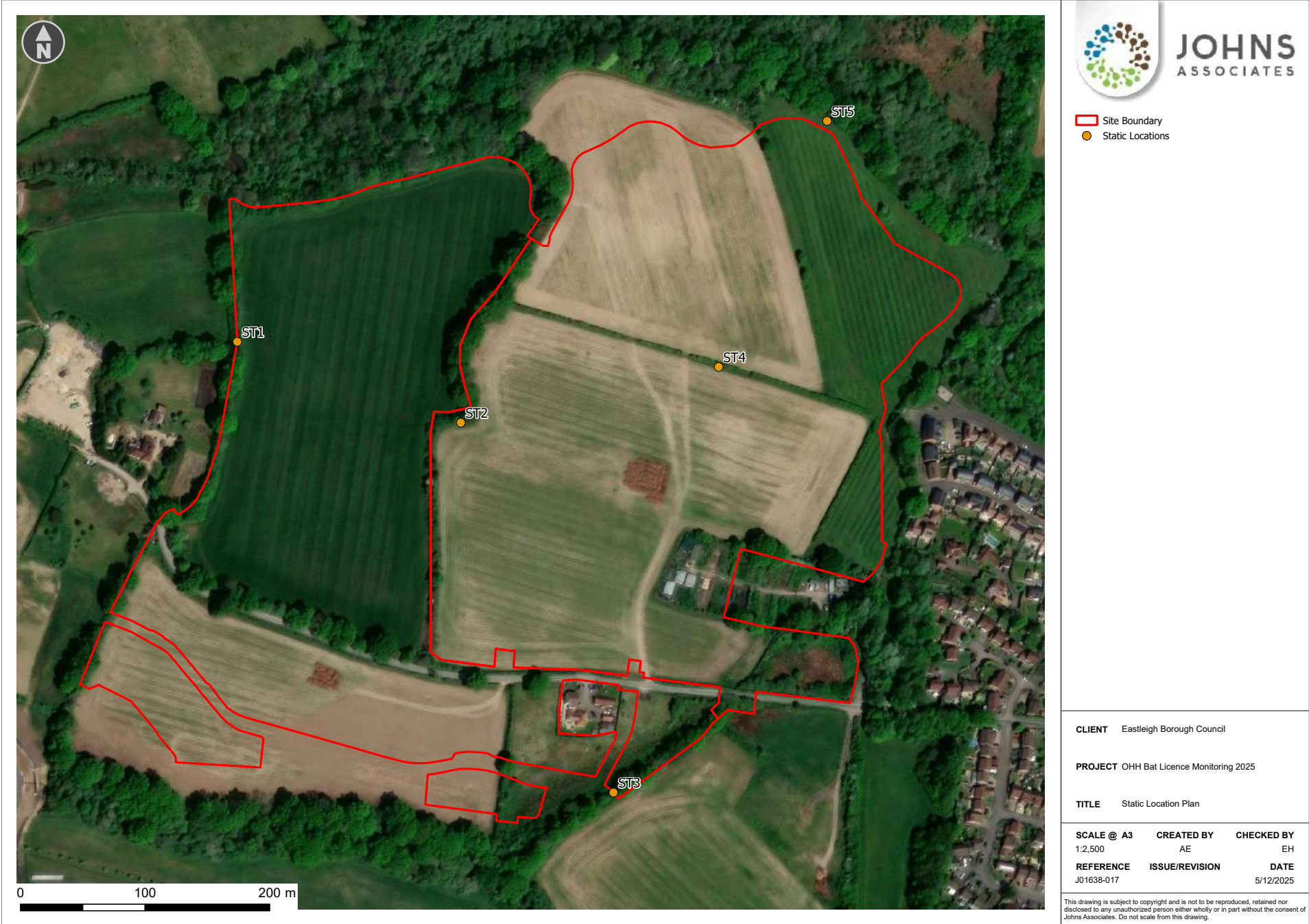
3.8.2 Static Deployment Summary

The deployment period (number of nights) for the automated detector surveys is detailed in Table 5, which provides the static deployment data dates and the number of survey nights with data to analyse, which is slightly lower than the actual deployment nights owing to no data being collected on some nights when no bats were recorded.

Table 5: Static Deployment Summary

Static Number	Number of Deployment Nights 2025								
	June	July	August	September	October	Total Deployment Nights per Static	Total Nights Overall	Total Survey Nights	Delivery Against Target (125 Nights - 25 Nights per Static)
ST1	4	No data	7	5	No data	17	135	129	+5
ST2	No data	8	5	6	9	28			
ST3	5	7	6	No data	No data	19			
ST4	5	14	7	6	9	41			
ST5	5	11	6	6	2	30			

Figure 5: Location of Static Bat Detectors at the Site in 2025



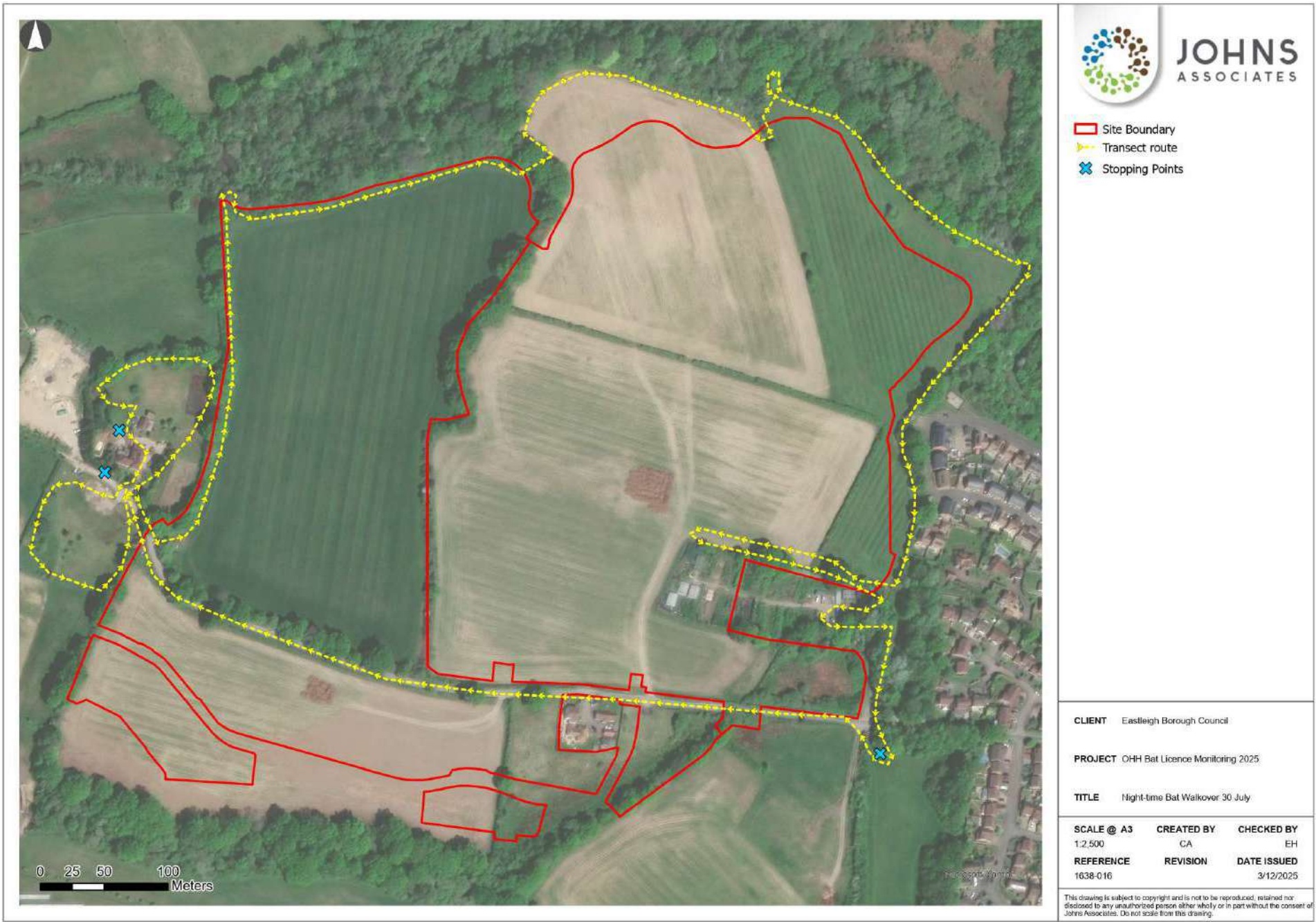
3.8.3 Night-Time Bat Walkover (NBW) Surveys

One Night-Time Bat Walkover survey was conducted at the Site on 30 July 2025 by Ellie Hack with Assistant Ecologist Nicole Evans, as part of the licence monitoring scope of work for the Fir Tree House bat mitigation licence. The survey route incorporated some but not all habitats within the Site, Figure 6 provides the NBW survey route. The first part of the survey included a 45-minute static position. Following completion of the static position period, the surveyors followed a set transect route, taking opportunity to follow bats off of the transect route to record any behaviours of note and incorporating two additional shorter stopping points.

The NBW was walked at a constant speed along the planned route. Direct observations of bats were recorded by the surveyors i.e. number of bats, flight direction, flight height and behaviour (e.g. commuting or foraging). Back-tracking was also used when appropriate if post-emergence behaviour was recorded, in attempt to locate any bat roosts in the vicinity to the survey area.

The NBW survey commenced at 20:54 and ended at 23:54. was carried out in suitable weather conditions (19°C at the start and 18°C at the end) with no rain and light wind (3 at start and 1 at end)). There was a half-moon and the cloud cover was 3 at the start and 2 at the end. The survey commenced at sunset and continued for three hours. Elekon, Batlogger M and/or Echometer Touch 2 bat detectors were used for all surveys with GPS data for all bat recordings logged.

Figure 6: Night-time Bat Walkover Route 30 July 2025



3.9 BAT CALL ANALYSIS

3.9.1 Weather Screening

The data has not been screened for suitable weather, rather the sample only includes nights where bat activity was recorded to remove nights of automated detector effort during unsuitable weather. This survey has been designed to monitor suitable habitats in all weather conditions to capture the variation in relative importance of habitats for any given period of weather.

3.9.2 Recording Analysis

All echolocation calls were recorded and subsequently analysed to species/genus (Table 6) where possible, with a satisfactory level of confidence, using the established call parameters for UK bat species (Russ, 2012; Barataud, 2016; Middleton, Froud, & French, 2014; and Reason, and Wray, 2023).

Recordings were analysed using the British Trust for Ornithology (BTO) Acoustic Pipeline, a tool providing accurate species identification and data management in acoustic monitoring. The training data used for BTO ultrasonic classifiers comprise over 90,000 known species recordings and gives higher quality performance than most systems by:

- Identification of social bat calls, reducing the chance of them being misidentified in error as another species.
- Warnings where species are rare or unexpected based on region-specific data, which facilitates checking of high-profile records and cases where confidence in the identification is low.
- Identification of all species per file including quieter species such as *Barbastella* and *Plecotus spp.*, and not just the call with the strongest signal.

Identification of recordings is not always possible to species level (e.g. for *Myotis spp.*, *Plecotus spp.* and *Nyctalus spp.*), therefore some recordings have been classified to genus level only. This is because the echolocation of these species groups alone is not adequate to be able classify to species level without other identification factors. Noise files have not been included in the classification and have been removed from the project files.

Following BTO analysis, an audit was completed by a qualified bat ecologist from Johns Associates for quality assurance purposes and to ensure the analysis was accurate. The methodology of file selection for the manual audit is detailed in Table 7.

Table 6: Bat Species and Genus Classification

Common Name	Scientific Name
Species Level Classification	
Common pipistrelle	<i>Pipistrellus pipistrellus</i>
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>
Nathusius' pipistrelle	<i>Pipistrellus nathusii</i>
Serotine	<i>Cnephaeus serotinus</i>
Barbastelle	<i>Barbastella barbastellus</i>
Lesser horseshoe	<i>Rhinolophus hipposideros</i>
Greater horseshoe	<i>Rhinolophus ferrumequinum</i>
Genus Level Classification	
<i>Myotis spp.</i>	All species of <i>Myotis</i> bat excluding Greater Mouse Eared
<i>Nyctalus spp.</i>	Noctule and Leisler's
<i>Plecotus spp.</i>	Brown long-eared and grey long-eared

Table 7: Audit methodology and auditor details

Species/File Category	Number of Files Audited
Rare species (Rhinolophus spp., Barbastella sp.)	All files
Low confidence (< 0.2 probability determined by BTO)	1 in 50
All other bat calls	1 in 100
Noise / No ID files	1 in 200
Auditor Name	Auditor Experience
Ellie Hack, Principal Ecologist	BCT Level 5. 8 years experience in bat sound analysis. Previously worked as bat sound specialist. Level 3 & 4 bat licence holder.
Tessa Pepler, Principal Ecologist	BCT Level 3. 10 years experience in bat sound analysis. Level 2 bat licence holder.
Nicole Evans, Assistant Ecologist	BCT Level 2. Completed Certificate of Bat Acoustics Analysis (BatAbility). 2 years experience in bat sound analysis.
Ben Hough, Assistant Ecologist	BCT Level 1. Completed Certificate of Bat Acoustics Analysis (BatAbility). 1 year experience in bat sound analysis.
George Jones, Assistant Ecologist	BCT Level 1. Completed Certificate of Bat Acoustics Analysis (BatAbility). 1 years experience in bat sound analysis.

3.10 R ANALYSIS

R Studio is an open-source software package which can analyse the large volumes of bat activity data generated by static automated bat surveys. All bat sound data gathered during site surveys are input into R, to produce a report with graphics, figures and statistical analysis which is then interpreted by an ecologist. This provides a method by which to identify patterns in the data and act as an aid in the interpretation of the results.

3.11 SURVEY LIMITATIONS/CONSTRAINTS

3.11.1 General Limitations and Assumptions

With automated recording it is impossible to separate commuting bats from bats foraging within close proximity of the static bat detector. It is possible a high nightly pass rate could relate to one or two foraging bats as opposed to individual commuting bat passes. It is therefore very difficult to draw meaningful relationships between activity levels recorded in terms of passes per night or the use of the site by specific bats for defined purposes (e.g. adult females foraging during the natal period).

The models of automated detectors deployed (Elekon Batlogger C & Wildlife Acoustics SM4) are extremely sensitive and are considered to be some of the best units available at this time. Despite this, a number of bats will not have been recorded (e.g. due to flight path, low call volume, attenuation from surrounding vegetation etc.) the sample recorded is, however considered representative as this will only apply to calls of a low number of species.

3.11.2 Tree Climbing

The tree climbing survey has been conducted upon trees that are to be removed and therefore the conclusions drawn are constrained with respect to the extent of the information obtained. There may be additional roosts in trees on site that have not been surveyed in detail. Full tree climbing surveys could not be conducted in 2025 due to timing constraints with the application submission.

Further precautionary tree climbing surveys will be required to be conducted on some trees to be removed prior to removal in the summer months with surveys conducted three weeks apart.

3.11.3 Equipment Limitations

Various technical issues were encountered with equipment, resulting in less than 5 nights of data being recorded in static locations ST1 and ST3 during two months of the survey period. On a number of occasions, equipment malfunction occurred, including battery or microphone failure. During these occasions no data was recorded. There were however additional nights recorded on the other detectors on other months and overall the survey nights recorded exceed the number of nights required for the survey season.

3.11.4 Night-time Bat Walkover

No site-specific NBWs were conducted at the Site because the work reflected an update of the previous considerable survey effort and no notable change in habitat condition or type had been recorded during any of the annual updated walkover surveys. Notwithstanding this, as part of a separate piece of work, one NBW was conducted which incorporated a large portion of the Site as part of Mitigation licence monitoring for Fir Tree House. Due to the Site habitats and status having remained the same since the 2020 surveys and the OPA trapping and tracking surveys conducted between 2018 and 2020, it is considered that the 2020 data in combination with the interim walkover appraisals, and current June to October 2025 data provides sufficient information to inform a confident evaluation of the bat baseline associated with the proposed RM applications.

3.11.5 Remedial Measures

There are not considered to be a significant limitations to the surveys or the conclusions drawn following analysis of the data, as sufficient data was obtained across the active bat season from the combination of the static detector surveys as well as previous data from past survey years.

The findings of this report are considered valid at the time of the final survey (27 October 2025). Should there be delays to the project timetable and/or implementation of the proposed development for more than 12 months, updated desk study and/or survey work may be required. In this instance, advice should be sought to ensure the data, recommendations and conclusions set out in this report remain valid.

It has been assumed that the development proposals are as described in this document and that all proposed mitigation and enhancement measures will be implemented in full.

4 BAT HABITAT SUITABILITY ASSESSMENT

The Site was assessed to determine its importance to bats within the wider local context, particularly with reference to the location of known roosts obtained through the Desk Study and from previous bat surveys conducted at the Site since 2018. The assessment was conducted using the criteria described in the Bat Conservation Trust Guidelines (2023) for assessing the potential suitability of proposed development sites for bats, based on presence of habitat features within the landscape, to be applied using professional judgement.

The Site was re-assessed and continued to offer high suitability for foraging, commuting and roosting bats. There are multiple confirmed bat roosts within the OHH development area, including a compensation maternity roost for brown long-eared bats at Fir Tree House located adjacent to the western boundary of The Homestall RM application area. There are continuous treelines and hedgerows and areas of woodland adjacent to the Site. Watercourses are also located in proximity to the Site, which are of value to foraging and commuting bats.

5 DESK STUDY RESULTS

5.1 STATUTORY DESIGNATED SITES

There are no SACs designated for supporting bats within 10 km of the proposed application Sites.

5.2 NON-STATUTORY SITES

The EclA Reports for the RM applications (Johns Associates, 2025) can be referred to for the SINC site descriptions and locations. All of the SINCS would be suitable to support foraging and commuting bats.

5.3 DATA SEARCH

Table 8 provides the bat data recorded within 2 km of the Site.

Table 8: Bat Data Records within 2 km of the Site provided by HBIC

Species/Groups	Details
Bats	There were 260 bat species records post 2015, of species brown long-eared <i>Plecotus auritus</i> , soprano pipistrelle (<i>Pipistrellus pygmaeus</i>), common pipistrelle (<i>Pipistrellus pipistrellus</i>), Nathusius's pipistrelle (<i>Pipistrellus nathusii</i>), noctule (<i>Nyctalus noctula</i>), Natterers (<i>Myotis nattereri</i>), whiskered bat (<i>Myotis mystacinus</i>), Daubenton's bat (<i>Myotis daubentonii</i>), serotine (<i>Cnephaeus serotinus</i>), barbastelle (<i>Barbastella barbastellus</i>). Four records are within the Site boundary and include a pipistrelle bat species (2017), a brown long eared species (2017), and 2 brown long eared (2020). Roosts of whiskered bat, common pipistrelle and brown long eared have also been recorded within 100 m of the Site boundary within the Victoria House compensation roost.

5.3.1 European Protected Species Licences

Nine European Protected Species (EPS) licenses for bats issued by Natural England were identified within 2 km of the site, for brown long-eared *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus*. Further licences are known for the Site which John's Associates hold or are aware of and these are also included in Table 9 which provides a summary of the bat EPSLs within 2 km of the Site.

Table 9: Granted EPS Licences for Bats

Case reference	Date	Distance/Direction from the site	Species included	Reason
2019-39527EPS-MIT	27/02/2019 – 22/02/2024	Approximately 187 m to the west at Chalcroft Farm – OHH licence	Bat (Brown long-eared, common pipistrelle, natterers)	Affects breeding, destroy breeding place, destroy resting place
2021-52226-EPS-MIT-1		Foxholes Farm, Calcroft Farm, Northern building cluster – OHH licence	Bat (common pipistrelle mating roost & day roost, BLE day roosts, Natterer's day roost, BLE maternity roost, BLE satellite roost, soprano pipistrelle day roost	Destroy resting place
2021-52226-EPS-MIT-2		Victoria House (now demolished) 752 m to the north west – OHH licence	Bat (brown long-eared (satellite roost), whiskered, Soprano pipistrelle, common pipistrelle (all day roosts)).	Destroy breeding place
2019-39954-EPS-MIT	20/03/2019 – 31/12/2024	Approximately 1.1 km to the north – Fair oak Lodge, Allington Lane – OHH licence	Bat (common pipistrelle, soprano pipistrelle)	Destroy resting place
2015-16719-EPS-MIT	02/11/2015 – 31/10/2020	Approximately 1.4 km to the west	Bat (Common pipistrelle)	Destroy resting place
2018-36779-EPS-MIT	01/09/2018 –	Approximately 1.1km	Bat (Common pipistrelle)	Destroy resting place

Case reference	Date	Distance/Direction from the site	Species included	Reason
	30/09/2019	to the east		
2016-22386-EPS-MIT	11/04/2016 – 30/04/2020	Approximately 1.24 km to the south-west	Bat (brown long-eared, common pipistrelle, soprano pipistrelle)	Destroy resting place
2020-48450-EPS-MIT	01/08/2020 – 31/12/2026	Approximately 1.27 km to the north	Bat (Soprano pipistrelle)	Destroy resting place
2014-1914-EPS-MIT	02/04/2015 – 31/03/2020	Approximately 2 km to the north-east	Bat (Common pipistrelle, soprano pipistrelle)	Destroy resting place

6 SUMMARY OF 2018 - 2020 SURVEY FINDINGS

6.1 SUMMARY OF OVERALL BAT SURVEY RESULTS

Ten species have been confirmed to be present on Site through various surveys carried out:

Barbastelle:

A very low level of activity was recorded through static detector surveys; however this species was recorded at all detector locations and in all months with the exception of May. Maximum of 16 passes recorded (median 0.15 passes per night of recording effort).

Serotine:

No roosts identified on site. Two adult males recorded during trapping. Low activity levels observed (maximum 1.03 median passes per night in August) despite high detectability and distinctive call structure. Few records (28 passes recorded within emergence window over 1133 recording nights) indicating potential presence of low status non-breeding roost within ZOI.

Brown long-eared:

Two maternity roosts present within the wider OHH area but outside of the two RM application Site(s). These are located at Fir Tree Farmhouse and Chalcroft Farm. Fir Tree Farmhouse (Northern Colony) – static data indicates that these bats are using the two main connective habitats leading both north and south across Fir Tree Lane from the Farmhouse, presumably to the highly suitable foraging habitats in Quobleigh Wood and the central/western stream corridor respectively. Two post lactating female BLE and one adult male were caught in Quobleigh Wood in August 2020. Chalcroft Farm (Southern Colony) – Maternity roost present in Pond Cottages to the north of Chalcroft pond.

Additional satellite roosts identified in tree in Hearts Copse and within the stables building (A6). Key supporting habitats are considered to be Hearts Copse (offsite) with the marshy grassland and riparian corridor of the southwest and western areas of the site. Trapping in the vicinity of Hearts Copse in 2020 caught four lactating female bats, two adult males and two juvenile bats (male and female). Key connective corridors are the hedgerows to the south and the riparian corridor to the north and west of Chalcroft Farm. Radiotracking in 2019 recorded a female adult post lactating female from this colony roosting in Round Copse and foraging repeatedly in the central and eastern woodland utilising the central hedgerow east of the solar park and the western riparian corridor.

One confirmed tree roost was found (T23) at the time of the radiotracking survey of a brown long-eared roost which was found on the 20th October 2019 and re-checked on the 27th October 2019 with the maximum count of two individuals present on the 20th October 2019.

Natterer's:

One roost was recorded at OHH in B18 in 2018. This building has subsequently been demolished under licence. Static detector surveys are limited to providing additional information at genus level. This genus is represented at all locations sampled. Radiotracking surveys tracked a post lactating female to two maternity roosts to the east of Horton Heath (both tree roosts, colony size 20-30). This bat foraged along the central woodland belt and within a young woodland within the existing housing estate each night of the survey. Trapping surveys recorded a total of 19 Natterer's bats with female lactating bats captured in Quobleigh Wood, Hearts Copse and the Central Woodland. Males and juveniles were also present in these areas.

Daubenton's:

No known roosts present within OHH. Anecdotal observation of two Daubenton's bats entering oak tree in parkland south of Chalcroft during trapping surveys. One male was captured in Chalcroft Farm Parkland in 2018. Eight female (4 adults and 4 juveniles) were caught in Hearts Copse, 14 males (2 adult and 12 juveniles) caught in Hearts copse and Chalcroft Farm Parkland. One adult female and three adult male was caught in Quobleigh Woods. These were predominantly males (18 in total) and juveniles. No evidence of the use of the site of lactating females was recorded. One adult male bat caught in Quobleigh Woods on the 22nd Aug 2019, was radiotagged but the tag failed within minutes of application. Key locations are considered to be the riparian corridors, particularly the western site boundary connecting Quobleigh Wood and the habitats south of the site to the River Itchen and to Itchen Valley Country Park.

Nathusius Pipistrelle:

There were 51 passes over 1,133 recording nights during the previous surveys, 26 of which at location ST16. Of these, 41 were recorded in October 2020. No records in July or August.

Noctule:

The majority of records for this species were recorded at ST1, ST2, ST3, ST5, ST6 and ST16 with ST5 recording the highest median number of recordings in total. An Ash tree next to the pond at Chalcroft Farm, was confirmed as a mating roost. Noctule were heard lekking from the tree in 2018 and emergence surveys on the tree in September 2020 confirm three noctules emerging from a tear out at the top of the tree. In total four adult noctules were caught (2 post-lactating females and 2 males) all in Chalcroft Parkland.

Common pipistrelle:

Common pipistrelle were recorded at high levels at all static locations. The majority of records for this species were recorded at ST1, ST5 and ST14. The median bat passes per hour per month found April, June and July to have the highest activity for common pipistrelle which is within the peak maternity period for this species. ST14 recorded the highest number of pre-sunset recordings with 100 recordings, Recordings made within the species-specific emergence window (Russ J. , 2012) are considered to give an indication as to the likelihood of a roost being nearby. Therefore, recordings made very close to or pre-sunset are likely to give a stronger indication of a roost nearby. There were 40 common pipistrelle captured during the trapping surveys; 18 females (4 post lactating and 6 juveniles) and 22 males (12 adults and 10 juveniles). They were caught in all years and at all locations.

Soprano pipistrelle:

The majority of static records for this species were recorded at ST1, ST2 and ST4 with ST2 recording the highest median number of recordings in total. The median bat passes per hour per month found April recorded the highest level of recordings with the lowest number of recordings in May and then a similarly low level of recordings for the remaining months. There were 18 soprano pipistrelle captured during the trapping surveys; five females (2 parous and 1 juveniles) and 13 males (10 adults and 3 juveniles). They were caught in all years and at all locations.

6.2 SUMMARY OF TRAPPING FINDINGS

An analysis of trapping data for the north of the site has been presented in the table below, which indicates the time which each of the bats were captured and the resulting assessment which has been made on this basis. The zones were then added to the map based on where the traps/nets were on these dates. Please note that in 2020 the breeding condition of bats was not always checked due to covid restrictions, therefore if female bats were captured these have been assumed to be breeding females on a precautionary basis. Table 10 provides a summary of the findings.

Table 10: Summary of 2018 – 2020 Trapping Results and Assessment

Trapping Survey Dates	Equipment Used	Trap Number	Bat species, age, gender	Caught in emergence window	Assessment of result
15 th and 16 th August 2018	Trapping was undertaken in the south of the site only – no results for the northern parcel				
20 th July 2019	2 harp traps 3 mist nets (2 x 12m, 1 x 6/9m)	Trap No. not recorded – located to west of Quobleigh Wood off-site	Whiskered, adult male	No	Foraging habitat of this species
21 st July 2019	3 harp traps	HT1 – North west corner of The Homestal	Whiskered, adult male	Yes	Roost in proximity to site
			Whiskered, adult male	No	Foraging habitat of this species
			2 Common pipistrelle, adult male	No	Foraging habitat of this species
			Soprano pipistrelle, adult male	No	Foraging habitat of this species
		HT2 – North of western boundary of The Homestal	Common pipistrelle, adult male	No	Foraging habitat of this species
			Common pipistrelle, adult female post lactating	No	Site is within the juvenile sustenance zone for common pipistrelle
			2 x Daubenton's, adult male	No	Foraging habitat of this species
		HT3 – Quobleigh Woods to north of north western corner of The Homestal	Natterer's, adult male	No	Foraging habitat of this species
2 nd August 2020	4 harp traps	In harp traps green 1, 2, 3 or 4	Natterer's, adult female	Yes	Maternity roost in proximity to site. Site is

Trapping Survey Dates	Equipment Used	Trap Number	Bat species, age, gender	Caught in emergence window	Assessment of result
		(trap No. not recorded in error)	Natterer's, adult female post lactating	No	within the juvenile sustenance zone for Natterer's bat
			Natterer's, adult male	No	Foraging habitat of this species
3 rd August 2020	10 harp traps	Orange 1 – western end of Foxwalks Wood, West of The Avenue Road	Whiskered, adult female lactating	Yes	Maternity roost in proximity to site
		Orange 2 - western end of Foxwalks wood	3 Natterer's, 2 adult female, 1 juvenile male	No	Site is within the juvenile sustenance zone for Natterer's bat
			Natterer's, juvenile female	No	
		HTA – Quobleigh Woods in north western corner of The Homestal	Common pipistrelle, juvenile male	Yes	Maternity roost in proximity to site
			Soprano pipistrelle, adult male	Yes	Roost in proximity to site
			Daubenton's, adult male	No	Foraging habitat of this species
		HTB – Quobleigh Woods to north of The Homestal	Brown long-eared, adult male	Yes	Roost in proximity to site
			Natterer's, adult male	No	Foraging habitat of this species
		HTC – central treeline between The Fold and The Homestal	2 Common pipistrelle, juvenile female	Yes	Maternity roost in proximity to site
			Common pipistrelle, adult female	Yes	Maternity roost in proximity to site
			Soprano pipistrelle, adult male	Yes	Roost in proximity to site
			Daubenton's, adult female	Yes	Maternity roost in proximity to site
			Brown long-eared, adult female lactating	No	Site is within the juvenile sustenance zone for brown long-eared bat
		HTD – Quobleigh woods to north of central treeline between The Homestal and The Folds	2 soprano pipistrelle, adult female	Yes	Maternity roost in proximity to site
			Whiskered, adult male	Yes	Roost in proximity to site
			2 soprano pipistrelle, 1	Yes	Maternity roost in proximity to site

Trapping Survey Dates	Equipment Used	Trap Number	Bat species, age, gender	Caught in emergence window	Assessment of result
		HTE – Quobleigh woods, to north of The Folds	adult male, 1 juvenile		
			2 Whiskered, 1 female lactating, 1 juvenile male	Yes	Maternity roost in proximity to site
		HTF – Quobleigh woods, to north of The Folds	Common pipistrelle, adult female	Yes	Maternity roost in proximity to site
			Natterer's, juvenile male	Yes	Maternity roost in proximity to site

0 250 500 m

OPA FRP Phase 1 (Scenario 1) Boundary
 OPA Site Boundary
 Link Road Alignment
 Harp Trap, 02/08/20
 Harp Trap, 03/08/20
 Harp Trap, 04/08/20
 Harp Trap, 20/07/19
 Harp Trap, 21/07/19
 Harp Trap, 22/07/19
 Mist Net, 20/07/19

HT1 6m/9m
 MN1 12m
 MN2 12m
 HT2
 HT3
 HT4
 HT5
 HT6
 HT7
 HT8
 HT9
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0 250 500 m

Client: Eastleigh Borough Council
 Project: OHH - OPA - Ecology Support 2020
 Title: Appendix 10.4 2020 Bat Trapping Locations
 Scale @ A3: 1:4,096
 Created By: AE
 Checked By: EH
 Reference: J00558-039
 Revision: 1
 Date Issued: 27/10/2025

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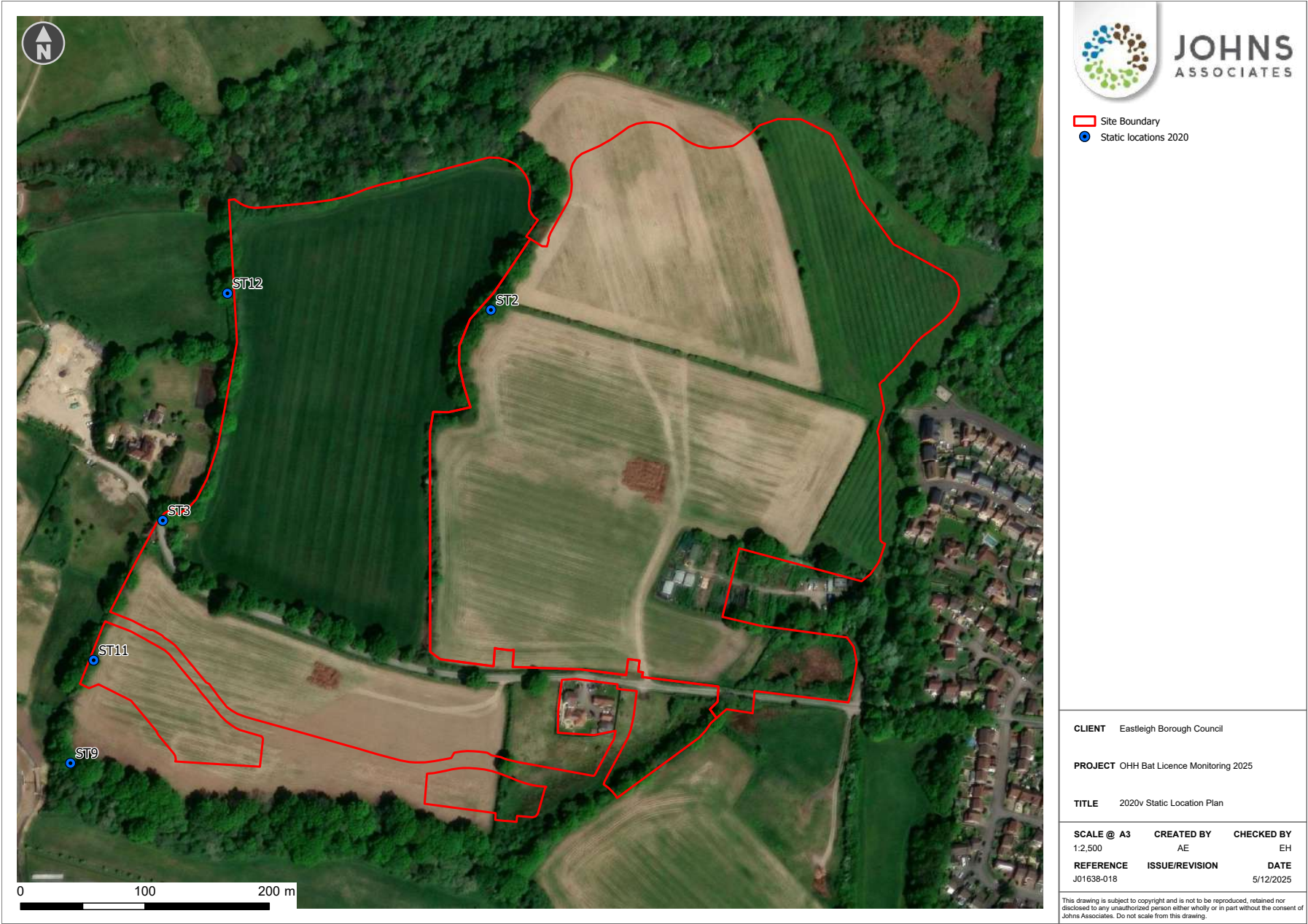
6.3 SUMMARY OF 2020 STATIC FINDINGS

Five static detectors were deployed within the area of The Folds and The Home and The Homestal within the wider OHH OPA surveys in 2020. Figure 8 provides the locations of the static detectors. Nine species were recorded during the static surveys in 2020. A total of 423 nights of data were collected at the five static locations deployed at the site in 2020. Figure 10 provides the number of passes near a roost per month per static in the 2020 data. The full assessment of the 2018 to 2020 data can be requested separately from the OHH team if required.

Table 11: Number of Passes per Species per Static Detector and Total Species Recorded for all Statics 2020

Species	ST2	ST3	ST9	ST11	ST12	TOTAL
Common pipistrelle	34,941	40,377	10,042	32,361	18,132	117,721
Long-eared sp.	68	81	79	663	529	6,945
Myotis spp.	730	1,880	475	1111	2,327	6,523
Soprano pipistrelle	3,184	966	435	493	1,867	1,420
Serotine	31	75	42	281	54	1,299
Noctule	557	367	67	111	197	485
Nyctalus spp.	21	24	50	56	334	483
Barbastelle	0	5	1	16	1	23
Nathusius pipistrelle	0	2	0	7	5	14
TOTAL	68	81	79	35,099	529	131,189

Figure 8: Location of 2020 Bat Static Detectors



7 2025 SURVEY FINDINGS

7.1 BAT ROOSTS SUMMARY 2018-2025

Eleven species have been confirmed to be present on Site through the various surveys, comprising barbastelle, serotine, brown long-eared, Natterer's, Daubenton's, Whiskered, nathusius pipistrelle, noctule, common pipistrelle and soprano pipistrelle.

The following species are confirmed to roost in the north of the OPP area and in proximity to The Folds, The Holme and The Homestal. The roost locations are provided in Appendix A.

- Barbastelle – 1 x potential mating roost: In tree in the vicinity of T259.
- Serotine – 1 x likely maternity roost: Fir Tree Farmhouse.
- Brown long-eared – 1 x maternity roost, 2 x satellite maternity roost, 1 x day roosts: Fir Tree Farmhouse, Fir Tree Bat House (compensation roost), crab apple tree in vicinity of Bat Box CA18, Bat Box VH17.
- Whiskered – Minimum 1 x day roost: Fir Tree Bat House (compensation roost).
- Common pipistrelle – Multiple day roosts: Fir Tree Farmhouse, Fir Tree Bat House (compensation roost).
- Soprano pipistrelle - Multiple day roosts: Fir Tree Farmhouse, Fir Tree Bat House (compensation roost), 1 x mating roost: Bat Box VH21.

Table 12 provides a summary of the known bat roosts recorded within and in proximity to The Folds and The Holme and The Homestal Sites from 2018 to 2025.

Table 12: Summary of Roosting Bats at The Folds and The Holme and Homestal

Bat species present	Species ecology in context of the site	Rarity category (Southern England)	Light sensitive species?	Roost status on site
Barbastelle	Rare species, near threatened on the ICUN Red List. Woodland-dwelling species that forages in a wide variety of habitats, including wooded river valleys, wetlands, and grasslands. Moths make up majority of diet. Roosts in crevices of old or damaged trees and sometimes buildings, hibernates in underground sites or hollow trees, and is highly sensitive to habitat disturbance.	Rarest Annex II species and very rare	Yes	One potential mating roost recorded around T259 in treeline between The Folds and The Homestal on 27 October 2025. Foraging recorded along treeline between The Folds and The Homestal on 27 October 2025. Foraging recorded around pond to west of Quobleigh Woods on NBW conducted 31 July 2025.
Serotine	In decline and now considered rare and vulnerable in the UK. Use a variety of habitats, including open woodland, parkland, and pastures. Roost in old buildings.	Rarer or restricted distribution	No	Roost in Fir Tree Farmhouse, unknown status but likely maternity.
Brown long-eared	Common and widespread. Associated with foraging in light woodland, parkland, and gardens, especially near linear features like hedges and fences. Fly close to the ground and vegetation, and moths	Widespread all geographies	Yes	Minimum of two maternity colonies on site and three known satellite maternity roosts. One satellite maternity roost at Victoria House destroyed under licence and compensated for in Fir Tree Bat House. Four day roosts destroyed under

Bat species present	Species ecology in context of the site	Rarity category (Southern England)	Light sensitive species?	Roost status on site
	make up a large proportion of their diet. Roost in both buildings and trees.			licence at Buildings 17, 21, 25 and 29, compensated for with tree mounted bat boxes. Multiple day roosts across the site, predominantly in trees or bat boxes, including one in box VH17. The site is within the juvenile sustenance zone for this species.
Natterer's bat	Locally common although considered scarce on a county level. Associated primarily with woodland and farmland near water, and their diet consists of flying insects and spiders. Roost in both buildings and trees.	Widespread in many geographies, but not as abundant in all	Yes	Minimum of one maternity roost in proximity to site, unknown location however presence confirmed by trapping surveys. Two known day roosts on site, 1 in Building 18 destroyed under licence and compensated for in tree mounted bat boxes and 1 roost in bat box CB6. The site is within the juvenile sustenance zone for this species.
Daubenton's bat	Locally common. Have a close association with water, which they depend on for foraging. Roost near water in tree holes, under bridges, or in tunnels.	Widespread in many geographies, but not as abundant in all	Yes	Minimum of one maternity roost in proximity to site, unknown location however presence confirmed by trapping surveys. The site is within the juvenile sustenance zone for this species.
Whiskered bat	Uncommon and widespread. Predominantly forage in cluttered habitats like woodland edges, tree lines, and over water. While they prefer the more sheltered, obstacle-rich environments for hunting, they will use open areas for foraging, particularly over flowing water and in areas with scattered vegetation like parks and gardens. Roost in both buildings and trees.	Widespread in many geographies, but not as abundant in all	Yes	Minimum of one maternity roost in proximity to site, unknown location however presence confirmed by trapping surveys. One day roost at Victoria House destroyed under licence and compensation provided in Fir Tree Bat House. The site is within the juvenile sustenance zone for this species.
Common pipistrelle	Generalist species, common and widespread. Commonly roosts in man-made structures like crevices in buildings (behind hanging tiles, eaves, or in cavity walls), as well as natural locations like tree holes.	Widespread all geographies	Yes – in some instances	Minimum of one maternity roost in proximity to site, unknown location however presence confirmed by trapping surveys. Nine day roosts destroyed under licence at Buildings 17, 18, 22, 25 and 29 and compensated for with tree mounted bat boxes.

Bat species present	Species ecology in context of the site	Rarity category (Southern England)	Light sensitive species?	Roost status on site
				The site is within the juvenile sustenance zone for this species.
Soprano pipistrelle	Generalist species, common and widespread. Primarily inhabit suburban areas and woodlands near water, emerging at dusk to hunt small flying insects like midges and mosquitoes. They roost in tight crevices in buildings (such as under roof tiles) or in trees.	Widespread all geographies	Yes	Minimum of one maternity roost in proximity to site, unknown location however presence confirmed by trapping surveys. One day roost destroyed under licence at Building 29 and compensated for with tree mounted bat boxes. Mating roost present within bat box VH21. The site is within the juvenile sustenance zone for this species.
Nathusius pipistrelle	Rare and classed as near threatened in England. Long-distance migratory bat strongly associated with freshwater habitats like lakes and rivers, woodlands, and coastal areas	Rarer or restricted distribution	Yes – in some instances	No known roosts on site. Multiple habitats and trees which would be suitable for roosting by this species.
Noctule	Large, high-flying bat that predominantly roosts in trees. These bats forage over open landscapes, including parkland and waterbodies, preying on insects like moths, beetles, and winged ants, often catching them mid-air during fast, diving flights.	Widespread in many geographies, but not as abundant in all	No	Mating roost present at Pond Cottage to the south of the OPP site in a tree cavity. Multiple habitats and trees which would be suitable for roosting by this species.

7.1.1 Potential Barbastelle Mating Roost Record

During the 27th October GLTA survey, an incidental record of a potential barbastelle roost was identified on site. This was due to the GLTA survey continuing post-dusk and as bats begun to emerge surveyors identified roosting bats by echolocation recorded on a bat detector. At approximately 17:15 (27 minutes post sunset), a minimum of one barbastelle bat was observed emerging in the vicinity to Tree 259. A second barbastelle was observed foraging up and down the tree line for approximately 20 minutes.

While it cannot be completely ruled out that the barbastelles did not fly south from Quobleigh Woods to the location that they were observed and recorded, the barbastelle bats were not observed/recorded flying south down the treeline whilst the surveyors walked south. Barbastelle favour flying in proximity to their roosts following emergence, particularly when these roosts are exposed. It would therefore seem more likely that should these bats have been roosting within Quobleigh Woods, that the type of behaviour witnessed would have occurred in the woodland and not within the treeline where the bats were observed. Based upon the presence of the bats appearing so close to sunset, it would seem more probable that the bats were roosting within the treeline.

Additional calls of barbastelle were recorded as the surveyors walked south to Tree 266 and Tree 267, albeit at lower frequency. It was assumed that these bats were then moving out from the roost potentially in Tree 259 to foraging grounds elsewhere.

Further analysis of acoustic recordings collected on static detectors (see Section 7.5) confirmed high barbastelle activity on this tree line at static ST2, with post emergence behaviour recorded along with numerous social calls. Considering all data recorded it is likely that a mating roost for barbastelle is present in the vicinity of Tree 259.

7.2 GLTA AND TREE CLIMBING SURVEY RESULTS

Appendix B provides the full GLTA Survey Results for the two Sites. Figure 9 provides the locations of the trees and the GLTA/climbing survey results for The Folds and Figure 10 provides the locations of the trees and the GLTA/climbing survey results for The Holme and The Homestal. The location of the trunks of the trees in relation to the red line boundaries as located on the arboricultural plan has determined whether the tree survey results are included with The Folds or The Holme or The Homestal survey results table. Where the trees are located within the treeline between The Folds and The Homestal this is noted in the Tree Number column.

A summary of the results of the trees that were surveyed in the GLTA and tree climbing survey are shown below. For the Folds, there are ten trees that have PRF-I, 19 trees with PRF-M, and 14 trees that would require further assessment to determine the roost suitability (PRF-FAR) and one potential barbastelle mating roost within The Folds parcel. In summary for The Holme and The Homestal there are 44 trees that have PRF-Ms, 33 trees with PRF-Is and 22 trees that would require further assessment to determine the roost suitability (PRF-FAR).

Table 13: The Folds GLTA & Tree Climbing Survey Results Summary

Location	Overall Tree Categorisation	Tree Numbers	Total Number of Trees with PRFs
Within Site	PRF-I	G23B	1
Northern Boundary	PRF-M	T241, T24	2
	PRF-I	T25	1
	Potential Roost	T259	1
Western Boundary and Eastern Boundary of The Homestal	PRF-M	T248, T255, T257, T258, T260, T261, T263, T266	8
	PRF-I	T249, T252, T265	3
	FAR	T251, T253, T254, T256, T262, T264, T267, G100, G16, G12,	10
Eastern Boundary	PRF-M	T26, T231, T232,	3
	PRF-I	G26A, G26B, G98A, T233,	4
Northern Boundary Tree Nursery	PRF-M	T29, T28, T27,	3
Southern Boundary Tree Nursery	PRF-M	T33, G31B, G31C,	3
	PRF-I	G30A,	1
	FAR	G30B, G31A, G27,	3
Southern Boundary	Nil		0

Table 14: The Holme and The Homestal GLTA & Tree Climbing Survey Results Summary

Location	Overall Tree Categorisation	Tree Numbers	Total Number of Trees with PRFs
Western Boundary	PRF-M	T17, T14, T12, T23, T21, T208, T206, T204, T201, T200, T197, T196, T196A, T196B, T193, T192, T191, T190, T189, T188	21
	PRF-I	T18, T15, G21A, G21D, T22, T207, T202, T187	9
	FAR	T16, G22a, G21B, G21C, G21E, T203, T199, T198,	8
The Holme Eastern Boundary	PRF-M	G34E, G34F, G34G, T45, G34E, G34F, G34G	7
	PRF-I	G34B, G34C, T167, G34B, G34C	5
	FAR	T37, G34A, G34H, T44, T43, G34A, G34H	7
The Homestal Southern Boundary	PRF-M	G19B, T210, T219, T224, T225, T226, T227, T230	8
	PRF-I	G19A, T217, T221, T222, T223, G97	6
	FAR	T209, T211, T212, T213, T214, T216,	6
The Holme Southern Boundary	PRF-M	T182, T183, T184, T186A	4

	PRF-I	T170, T170A, T171, T171A, T171B, T172, T175, T176, T181, G93A, G93B, T166	12
	FAR	T178A	1
The Holme Northern Boundary	PRF-M	T46, T48, T49, T50	4
The Holme within Site	PRF-I	T47	1

Figure 9: The Folds GLTA and Tree Climb Bat Roost Suitability Plan



Figure 10: The Home and The Homestall GLTA and Tree Climb Bat Roost Suitability Plan



7.3 BAT BOXES

A total of seven pairs (14) bat boxes and one bat colony box are installed across the northern parcel of the One Horton Heath site which were provided to compensate for the loss of several bat roosts during building demolition. Their locations are illustrated in Appendix C.

7.4 NIGHT-TIME BAT WALKOVER

The majority of species recorded comprised common pipistrelle, with soprano pipistrelle, Daubenton's, long-eared, serotine and Barbastelle also recorded. No bat activity was recorded along the eastern boundary of The Folds. More bat activity was recorded to the west of Fir Tree Lane than the east. The southern boundary of Quobleigh Woods is an important commuting and foraging route. A high amount of bat activity and emergences of common pipistrelle (4 bats from 4 roosts), serotine (1) and brown long-eared (5) emergence were recorded at Fir Tree House which was the focus of the NBW. A description of each species recorded commuting and foraging is provided below.

Common pipistrelle

Foraging recorded in the garden of Fir Tree House, along the southern boundary of Fir Tree House and along the western boundary treeline of The Homestal. A high amount of foraging was recorded around the pond to the west of Quobleigh Woods and along the southern boundary of Quobleigh Woods. Foraging was recorded along the northern treeline boundary of the EBC tree nursery along the eastern boundary of The Folds. Three bats were recorded foraging along the southern boundary of The Folds and continuous foraging was recorded along the southern boundary of The Homestal. Continuous foraging was recorded along the lane to the east of the EBC tree nursery.

Soprano pipistrelle

Soprano pipistrelle were recorded foraging in the garden of Fir Tree House, one was recorded along the southern boundary of Fir Tree House and one was recorded along the western boundary treeline of The Homestal. Foraging recorded was along the southern boundary of Quobleigh Woods to the north of The Folds. Continuous foraging was recorded along the lane to the east of the EBC tree nursery.

Daubenton's bat

Foraging was visually recorded around the pond to the west of Quobleigh Woods.

Long-eared Species

Brown long-eared bats were recorded emerging at Fir Tree House and one was long-eared pass was recorded at the north of treeline which is located between The Folds and The Holmestal near to the southern boundary of Quobleigh Woods.

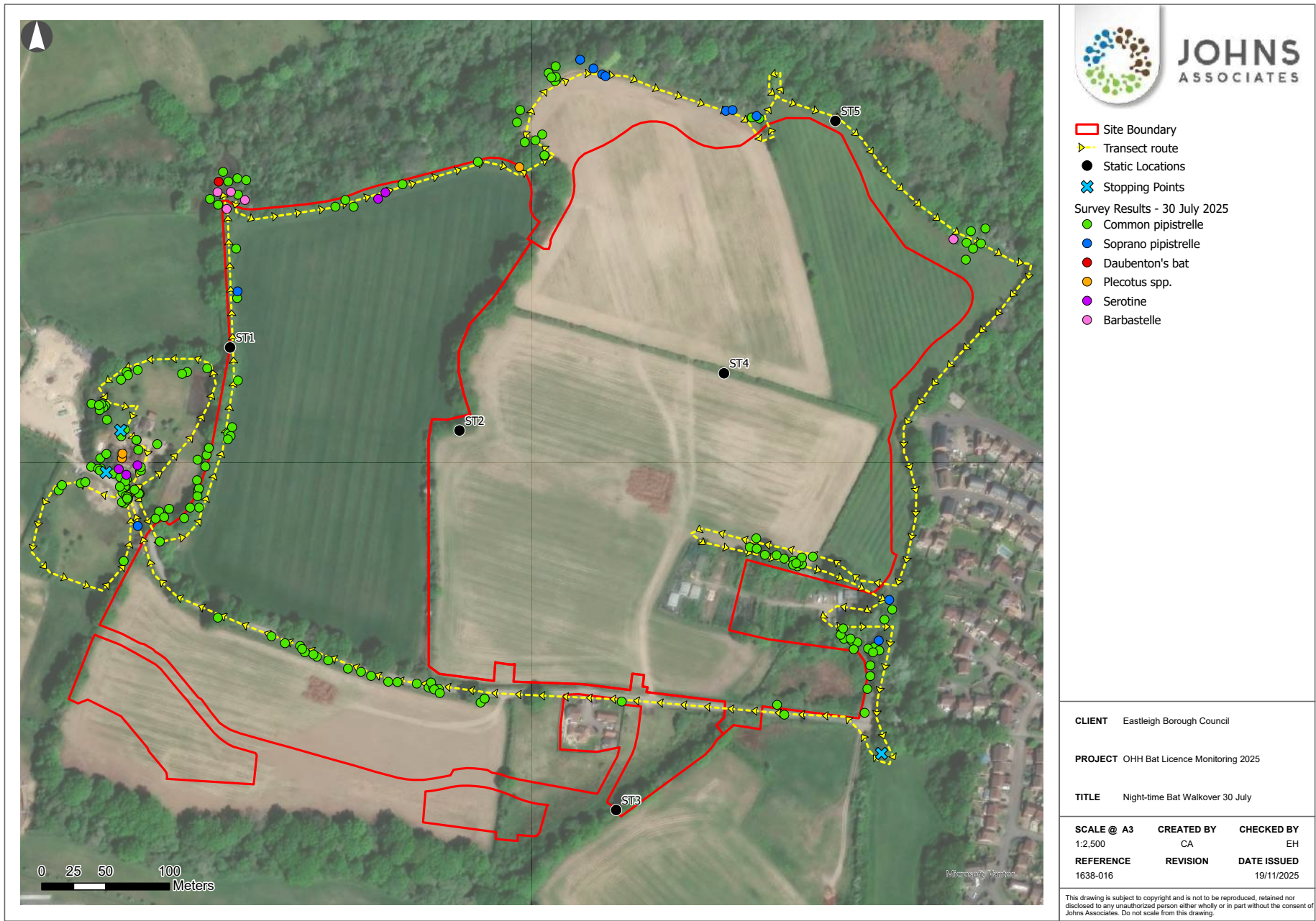
Serotine

A serotine was recorded emerging from Fir Tree House with two further bat calls recorded on the detector in that area. Two passes were recorded mid-way along the northern boundary of The Homestal along the southern boundary of Quobleigh Wood.

Barbastelle

Four barbastelle passes recorded in the norther western corner of The Homestal around the pond in Quobleigh Woods and one to the west of the northern boundary of The Folds along the southern boundary of Quobleigh Woods.

Figure 11: NBW Survey Results 30 July 2025



7.5 STATIC BAT DETECTOR SURVEY FINDINGS

7.5.1 2025 Findings

At least eight bat species were recorded across the site during the 2025 static monitoring surveys across five static locations. As discussed in Section 3.9, identification to species level is not always possible for *Myotis spp.*, *Plecotus spp.* and *Nyctalus spp.*, therefore, the overall total of individual species may be higher. Table 15 provides the total number of bat passes recorded on the five statics at the OHH Site over the 129 survey nights of data. Figure 12 provides the static locations again, for ease of reference.

Pipistrelle species are common and widespread and are usually the highest recorded species on surveys in England. Common pipistrelle is a light tolerant species. A high number of *Myotis* species were recorded on the statics. It is likely that at least three species will have been included within this species group, comprising Natterer's, Daubenton's and Whiskered bat. There is a whiskered bat roost located in Fir Tree House compensation roost and Lactating whiskered, Daubenton's and post-lactating Natterer's bats were recorded during the trapping survey.

There are brown long-eared bat maternity roost, satellite roost and day roosts at Fir Tree House. There are a very high number of barbastelle bat passes, in particular at ST2 which was located within the treeline where a mating roost was recorded in October 2025, in proximity T259.

Table 15: Number of Passes per Species per Static Detector and Total Species Recorded for all Statics 2025

Species	ST1	ST2	ST3	ST4	ST5	Total
Common pipistrelle	7,952	10,432	10,653	1,480	8,555	39,072
Soprano pipistrelle	95	414	85	209	553	1,356
<i>Myotis</i> sp.	165	175	165	49	341	895
<i>Nyctalus</i> sp.	184	259	52	86	258	839
Barbastelle	40	388	0	0	24	452
<i>Plecotus</i> sp.	110	108	69	63	93	443
<i>Nathusius pipistrelle</i>	1	12	5	0	1	19
Serotine	0	0	3	3	0	6
TOTAL	8,547	11,788	11,032	1,890	9,825	43,082

Table 16: Bat activity in 2025, indicated by peak mean bat passes per hour, across all survey months and locations. The highest recorded level of activity per species is indicated in green.

Static Number	Bat species/genus							
	Common pipistrelle	Soprano pipistrelle	<i>Nathusius pipistrelle</i>	<i>Nyctalus spp.</i>	Serotine	<i>Plecotus spp.</i>	<i>Myotis spp.</i>	Barbastelle
ST1	50.70	0.64	0.13	1.17	0.71	0.85	1.24	0.54
ST2	42.48	1.83	0.24	1.48	0.51	0.52	0.80	1.93
ST3	73.64	0.92	0.16	0.49	2.31	0.75	1.67	0
ST4	3.58	0.69	0	0.43	0.20	0.36	0.23	0
ST5	31.11	3.42	0.08	2.70	0.83	0.88	3.20	0.30

Figure 12: 2025 Static Locations

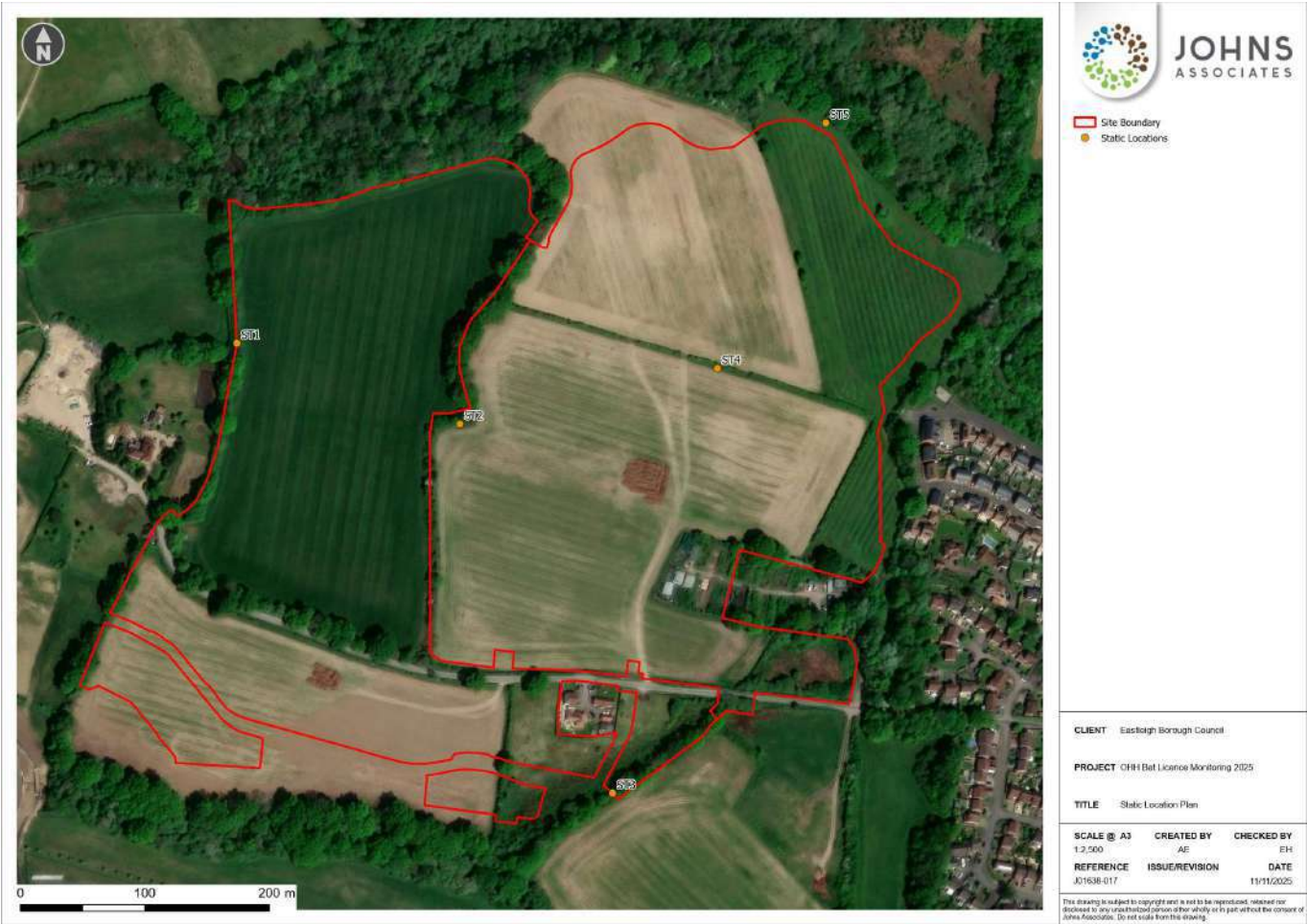


Table 17 provides the total number of passes recorded per month per static detector Figure 13 provides pie charts with the static locations for illustration.

Table 17: Total Number of Bat Passes Recorded per Month per Static

Static Number	Species	June	July	August	September	October	Total
ST1	Pipistrellus pipistrellus	2,315	0	3,075	2,562	0	7,952
	Nyctalus spp.	14	0	101	69	0	184
	Myotis spp.	24	0	27	114	0	165
	Plecotus spp.	44	0	13	53	0	110
	Pipistrellus pygmaeus	21	0	56	18	0	95
	Barbastella barbastellus	1	0	12	27	0	40
	Pipistrellus nathusii	1	0	0	0	0	1
ST2	Pipistrellus pipistrellus	0	2,743	3,576	695	3,418	10,432
	Pipistrellus pygmaeus	0	19	114	9	272	414
	Barbastella barbastellus	0	12	71	11	294	388
	Nyctalus spp.	0	2	172	6	79	259
	Myotis spp.	0	15	51	11	98	175
	Pipistrellus nathusii	0	0	0	1	11	12
	Plecotus spp.	0	16	37	16	39	108
ST3	Pipistrellus pipistrellus	3,147	7,308	198	0	0	10,653

Static Number	Species	June	July	August	September	October	Total
	Myotis spp.	62	102	1	0	0	165
	Pipistrellus pygmaeus	31	48	6	0	0	85
	Plecotus spp.	8	59	2	0	0	69
	Nyctalus spp.	34	14	4	0	0	52
	Pipistrellus nathusii	2	3	0	0	0	5
	Cnephaeus serotinus	0	3	0	0	0	3
ST4	Pipistrellus pipistrellus	35	179	251	259	756	1,480
	Pipistrellus pygmaeus	7	21	66	34	81	209
	Nyctalus spp.	5	10	56	7	8	86
	Plecotus spp.	4	12	37	1	9	63
	Myotis spp.	6	14	11	16	2	49
	Cnephaeus serotinus	0	3	0	0	0	3
ST5	Pipistrellus nathusii	0	0	0	0	1	1
	Pipistrellus pipistrellus	11	548	6,103	798	1 095	7,460
	Pipistrellus pygmaeus	0	17	385	9	142	553
	Myotis spp.	0	6	306	3	26	341
	Nyctalus spp.	1	2	246	0	9	258
	Plecotus spp.	0	2	83	0	8	93
	Barbastella barbastellus	0	0	9	0	15	24

Figure 13: Total Number of Species Passes per Detector in 2025



The R statistical analysis coding has provided the number of bat passes near a roost. This is indicated by the time that the pass was recorded being within the emergence survey time window in relation to the time of sunset on the survey night. This does not however provide any indication of where a roost is located, whether it be on-site or off-site. The results do show that the Site is important to bats emerging from roosts in proximity to it for the species listed in Table 18. The R results have been manually reviewed to assess the passes recorded either prior to or very soon (within a few minutes) of the start of the emergence window for each species – in these cases it is considered likely that a roost is located within the vicinity to the static detector due to how early in the emergence window that the bat calls were detected. Please refer to the R Report for the full results.

Table 18: Number of Passes Near a Roost per Species per Static Detector 2025

Location	Bat Species	Bat Passes within very early part of emergence window	Roost Likely Nearby
Location ST1	<i>Myotis spp.</i>	18	Yes
	<i>Nyctalus spp.</i>	8	Yes
	<i>Pipistrellus pipistrellus</i>	616	Yes - confirmed
	<i>Pipistrellus pygmaeus</i>	13	Yes - confirmed
	<i>Plecotus spp.</i>	27	Yes - confirmed
Location ST2	<i>Barbastella barbastellus</i>	1	Yes - confirmed
	<i>Myotis spp.</i>	53	Yes
	<i>Nyctalus spp.</i>	22	Yes
	<i>Pipistrellus pipistrellus</i>	2,400	Yes
	<i>Pipistrellus pygmaeus</i>	77	Yes
	<i>Plecotus spp.</i>	20	Yes
Location ST3	<i>Myotis spp.</i>	7	
	<i>Pipistrellus nathusii</i>	2	
	<i>Pipistrellus pipistrellus</i>	841	Yes
	<i>Pipistrellus pygmaeus</i>	6	
	<i>Plecotus spp.</i>	7	Yes
Location ST4	<i>Eptesicus serotinus</i>	3	Yes
	<i>Myotis spp.</i>	24	Yes
	<i>Nyctalus spp.</i>	4	Yes
	<i>Pipistrellus pipistrellus</i>	208	Yes
	<i>Pipistrellus pygmaeus</i>	41	Yes
	<i>Plecotus spp.</i>	24	Yes
Location ST5	<i>Myotis spp.</i>	114	
	<i>Nyctalus spp.</i>	20	Yes
	<i>Pipistrellus nathusii</i>	1	
	<i>Pipistrellus pipistrellus</i>	1,525	Yes
	<i>Pipistrellus pygmaeus</i>	100	Yes
	<i>Plecotus spp.</i>	18	Yes

7.5.2 Comparison of 2020 and 2025 Findings

The static surveys conducted to inform the 2020 data used Batlogger C Static detectors. The 2025 static detector surveys in the main used Batlogger C static detectors however SM4 static detectors were used at all locations in June 2025. As a result, the results are in the main comparable, however the different detectors used in June will result in slight variation of the results.

This species composition matches the 2020 survey results, which recorded the same eight bat species/genus on site. The changes in the % proportion of total calls recorded at the Site show an increase in the proportion of common pipistrelle, soprano pipistrelle, serotine, *Nyctalus* sp, barbastelle and *Nathusius* pipistrelle. The proportion of long-

eared bat and *Myotis* sp. calls have decreased. The changes in the proportion of bat species calls recorded at the Site may be as a result of the commencement of construction at the Site including the Avenue Road and Lower Acre, in addition to roost loss works under licence upon buildings within the OPP Site.

Table 19: Comparison of bat activity at five static locations in 2020 to five static locations in 2025.

Bat Species	Peak Mean Bat Pass Rate Per Hour (by Location)		Direction of change in activity between survey years
	2020	2025	
Common pipistrelle	52.89	73.64	Increase
Soprano pipistrelle	5.01	3.42	Decrease
<i>Myotis</i> sp.	3.65	3.20	Decrease
<i>Nyctalus</i> sp.	1.63	2.70	Increase
Barbastelle	0.21	1.93	Increase
<i>Plecotus</i> sp.	1.30	0.88	Decrease
<i>Nathusius</i> pipistrelle	0.12	0.24	Increase
Serotine	0.77	2.31	Increase

Static location ST2 recorded the highest amount of bat activity overall across all locations, followed by location ST3. Static ST2 is located in the central mature tree line which runs north to south through the proposed development parcels. The high bat activity here indicates that this tree line is a key foraging and commuting feature for bats. Due to the mature trees within this tree line with multiple roost features, and the connection to additional potential roost trees along Fir Tree Lane to the south of ST2 and Quobleigh Wood to the north of ST2, it is likely that there are several bat roosts located in these trees across the site. Notably, the highest pass rate of barbastelle bat was recorded at ST2, with a peak mean of 1.93 passes per hour. This is considered a high pass rate for this rare species, which is considerably higher than the 2020 peak mean pass rate of 0.21 passes per hour. This result indicates the significant importance of the central hedgerow in the site for bats and the quality of mature and veteran trees present on Site which barbastelle depend upon. The high pass rate of barbastelle at ST2 is partially attributed to the mating roost which was discovered in a tree at this location in October 2025 for this species.

Static location ST4 recorded the lowest bat activity overall, which is likely due to the open exposed nature of this hedgerow which is in poorer condition than other tree lines on site. Despite the overall pass rates being lower than other areas, static ST4 recorded the highest rate of post-emergence flight behaviour, indicating that this hedgerow is an important key feature for bats at dusk/dawn, who use it as a linear habitat feature to travel across the site to foraging grounds from their roosts.

7.5.3 Static 1 and Static 2 2020 compared to 2025 data

Two locations on site were compared between 2020 and 2025, with statics installed in the same locations between survey years. Batlogger C detectors with the same microphones were used at this location during the 2020 surveys and for all of the 2025 surveys except in June 2025, when a Wildlife Acoustics SM4 detector was used. This may result in a slight variation in the results for June. Bat activity has changed between 2020 and 2025 at both locations, with decreases in soprano pipistrelle and *Myotis* spp. at both locations and increases in serotine and barbastelle activity at both locations. For barbastelle, this was particularly apparent during the month of October, with mean pass rates per hour peaking at 1.93 passes per hour.

The changes in bat activity since 2020 could be due to a number of reasons, including habitat or roost displacement due to several areas of local development which may be causing bats to rely more heavily on the Site. Decreases in activity for soprano pipistrelle and *Myotis* spp. may be caused by habitat changes or roost loss within the wider OPP Site or locally to the site.

Table 20: Comparison of Bat Activity Between 2020 and 2025 at Two Locations

Bat Species	Peak Mean Bat Passes Per Hour					
	Location ST12 (2020) / ST1 (2025)		Direction of Change from 2020 to 2025	Location ST2		Direction of Change from 2020 to 2025
	2020	2025		2020	2025	
Common pipistrelle	30.50	50.7	Increase	52.89	42.48	Decrease
Soprano pipistrelle	3.51	0.64	Decrease	5.01	1.83	Decrease
<i>Myotis spp.</i>	3.65	1.24	Decrease	1.28	0.80	Decrease
<i>Plecotus spp.</i>	1.30	0.85	Decrease	0.20	0.52	Increase
<i>Nyctalus spp.</i>	0.64	1.17	Increase	1.63	1.48	Stable
Serotine	0.28	0.71	Increase	0.16	0.51	Increase
Barbastelle	0.11	0.54	Increase	0	1.93	Increase
Nathusius pipistrelle	0.12	0.13	Stable	0	0.24	Increase

7.5.4 Barbastelle Bat Activity

In 2025, barbastelle accounted for 1.05% of all recordings across the site, with a total of 452 passes recorded of this species across the survey months. Barbastelle were recorded at locations ST1, ST2 and ST5, with no recordings of this species at locations ST3 and ST4. The highest rate of barbastelle passes was recorded at ST2, with a peak mean of 1.93 passes per hour and a median of 1.18 passes per hour. This increased activity at ST2 was statistically significant when compared to both ST1 ($P<0.05$) and ST5 ($P<0.05$). The month of October recorded the highest level of barbastelle activity, which was statistically significant compared to August ($P<0.05$) and September ($P<0.05$).

Barbastelle activity was generally continuous throughout the night at location ST2, with peaks in activity at emergence, re-entry and in the mid-part of the night (see Appendix D, R-Report, Figure 25). There is evidence of a roost in the vicinity to ST2, which was confirmed in October 2025 to be located in the mature oak trees to the north of static ST2. Sound analysis of calls for barbastelle recorded the presence of numerous social calls for barbastelle on site, confirming the mating roost behaviour of this species.

Considering the 2020 data, there is evidence of a potential roost for barbastelle in the vicinity of static ST11, with three passes in July, 1 pass in August, 1 pass in September and 1 pass in October recorded within the first few minutes of the emergence window. There is also potential evidence of a roost for barbastelle in the vicinity to ST10, with 1 pass in August in the emergence window.

7.5.5 Differences Between Static Locations

Other than barbastelle (detailed above), additional differences in bat activity were recorded between static locations. For *Myotis spp.*, location ST4 recorded significantly less activity than ST2 ($P<0.05$), ST3 ($P<0.05$) and ST5 ($P<0.05$). This is to be anticipated considering the exposed nature of location ST4 and as *Myotis spp.* are a clutter-associated species which prefer dense cover.

For *Nyctalus spp.*, location ST5 recorded higher levels of activity than location ST4 ($P<0.05$) and location ST3 ($P<0.05$). Location ST4 also recorded lower activity than locations ST2 ($P<0.05$) and ST1 ($P<0.05$). As statics ST1, ST2 and ST5 are situated within mature tree lines and/or woodland, this may explain the increased activity here as *Nyctalus spp.* depend upon cavity features in mature trees to roost.

Common pipistrelle activity was lower at location ST4 than locations ST1, ST2 and ST3 ($P<0.001$) and higher at location ST3 than ST5 ($P<0.05$).

8 ASSESSMENT OF FINDINGS

8.1 IMPORTANCE OF BAT ASSEMBLAGE ON SITE IN 2025

The bat mitigation guidelines published by CIEEM (2023) includes a tool to aid assessment of the conservation status of different bat species in different regions of the UK. Table 21 shows the rarity categories of the bat species recorded at One Horton Heath (Southern England). The categories were used to determine importance of the bat assemblage recorded using or commuting across the development site.

Table 21 Importance of the Bat Assemblage on Site at One Horton Heath

Bat Species	Rarity Category	Rarity Score
Common pipistrelle	Widespread all geographies	1
Soprano pipistrelle	Widespread all geographies	1
<i>Plecotus spp.</i>	Widespread all geographies	1
<i>Nyctalus spp.</i>	Widespread in many geographies, but not as abundant in all	2
Natterer's bat	Widespread in many geographies, but not as abundant in all	2
Daubenton's bat	Widespread in many geographies, but not as abundant in all	2
Whiskered bat	Widespread in many geographies, but not as abundant in all	2
Myotis sp.	Widespread in many geographies, but not as abundant in all	2
Serotine	Rarer or restricted distribution	3
Nathusius' pipistrelle	Rarer or restricted distribution	3
Barbastelle	Rarest Annex II species and very rare	4
Total score:		23

Based on the combined rarity score, the assemblage of bat species recorded at One Horton Heath is assessed to be of county importance. The scores in the table above are a minimum value only, due to it not being possible to identify some species (such as *Myotis spp.*) to a species level, therefore the true score is likely to be higher than this.

8.2 ROOSTING BATS

Presence of several bat roosts have been confirmed on Site or within the vicinity to Site. In addition, several bat roosts are assumed to be present either on Site or within the vicinity to Site based on data analysis and interpretation and following a Worst Case Scenario approach. The exact location of some of these assumed roosts is unknown. Table 22 details the presence of known bat roosts and likely roosts in the vicinity to Site.

Table 22: Confirmed and Assumed Bat Roosts on Site and Locally to Site

Bat Species	Roost or Potential Roost Detail	Roost Assumed or Confirmed	Location in Reference to Site	Conservation Status
Barbastelle	Potential mating roost	Confirmed	In vicinity to T259	County Importance
	Unknown roost status – identified by 2020 static surveys	Assumed	In vicinity of static ST11	Unknown
Brown long-eared bat	Maternity roost	Confirmed	Fir Tree Farmhouse	District
	Satellite maternity roosts x 2	Confirmed	Fir Tree Bat House (compensation roost) and Crab apple tree near box CA18	District
	Day roost	Confirmed	Bat box VH17	Site
Serotine	Likely maternity roost	Confirmed	Fir Tree Farmhouse	County Importance
Whiskered bat	Day roost	Confirmed	Fir Tree Bat House (compensation roost)	Site
	Potential maternity roost – lactating adult female bats and juveniles trapped on	Assumed	Unknown – likely in the local area	Up to County

Bat Species	Roost or Potential Roost Detail	Roost Assumed or Confirmed	Location in Reference to Site	Conservation Status
	Site during emergence window			
Common pipistrelle	Multiple day roosts	Confirmed	Fir Tree Farmhouse and Fir Tree Bat House (compensation roost)	Site
	Potential maternity roost – lactating adult female bats and juveniles trapped on Site during emergence window	Assumed	Unknown – likely in the local area	District
Soprano pipistrelle	Multiple day roosts	Confirmed	Fir Tree Farmhouse and Fir Tree Bat House (compensation roost)	Site
	Mating roost	Confirmed	Bat box VH21	Site
	Potential maternity roost – lactating adult female bats and juveniles trapped on Site during emergence window	Assumed	Unknown – likely in the local area	District
Natterer's bat	Potential maternity roost – lactating adult female bats and juveniles trapped on Site during emergence window	Assumed	Unknown – likely in the local area. Two maternity roost trees confirmed off-site to the east during radiotracking in 2020 at SU 50100 16865 and SU 49821 16916.	Up to County
Daubenton's bat	Potential maternity roost – lactating adult female bat trapped on Site during emergence window	Assumed	Unknown – likely in the local area	Up to County
<i>Nyctalus spp.</i>	Unknown roost status – identified during 2025 static survey	Assumed	Multiple locations – potential presence at ST1, ST2 and ST5	Up to County
Unknown	63 Trees with PRF-M Features on Site	Assumed	Mature trees surrounding The Folds, Holm and Holmstall	County Importance
Unknown	79 Trees with PRF-I or FAR Features on Site	Assumed	Mature trees surrounding The Folds, Holm and Holmstall	Up to County

Considering the assemblage of roosts and potential/assumed roosts on Site, the importance of the Site as a whole would be considered of up to regional conservation significance (as per CIEEM 2023 Bat Mitigation Guidelines).

Tree Roost Features

A number of trees within and adjacent to the site have features that could support maternity and individual bat roosts. All retained trees within the Site will be protected and through the construction and operation phase with only a small number being removed where no alternative solution was present.

The trees and groups of trees that are scheduled for removal have no suitability for roosting bats, other than four trees (T18, T25, T47 and T219) and trees within four groups of trees (G27, G23B, G95 and G97) which are to be removed and are potentially suitable to support roosting bats. The removal of trees could result in harm to roosting bats, and loss/damage/modification to roost offences being committed. All trees have PRF-I other than T219 which contains PRF-M.

There is a risk of disturbance to bats and/or damage to resting/ breeding places associated with trees as a result of construction activities if mitigation is not put in place. There is also a risk of roost damage or disturbance on a permanent basis for trees located in proximity to development, due to changes in habitat connectivity, decreased solar warming due to shading from buildings, increased lighting and disturbance.

There is the potential for recreational disturbance from increased public access during occupation if suitable mitigation is not put in place.

8.3 FORAGING AND COMMUTING BATS

The site provides high quality foraging and commuting habitat for bats and is confirmed to be part of the Core Sustenance Zone for common pipistrelle, soprano pipstrelle, Natterer’s bat, whiskered bat, Daubenton’s bat, brown long-eared bat and serotine bat maternity roosts. Loss of foraging habitat, and interruption of flight lines and light disturbance may affect certain foraging and commuting bats including CSZ resource if mitigation and compensation is not provided.

The development will result in some permanent change in habitat connectivity through the site including loss of hedgerow H6 which is believed to currently be a post-emergence commute route for brown long-eared, soprano and common pipistrelle bats.

9 INTEGRATED/EMBEDDED MITIGATION AND ENHANCEMENT MEASURES

The development design and impact avoidance and mitigation measures will be adopted during the construction and operation phases of the proposed development. This section of the report outlines how these embedded measures will influence the biodiversity assessment. A Construction Ecological Management Plan (CEMP), a Habitat Management and Monitoring Plan (HMMP) and an Ecological Mitigation and Monitoring Plan (EMMP) will be produced that will set out the full detail of all appropriate measures for the delivery/aftercare/monitoring and long-term management for these measures.

Table 23: Summary of Integrated and Embedded Bat Mitigation and Enhancement Measures

Potential Changes and Effects	Integrated/Embedded Measures and Influence on Assessment
Disturbance and damage to additional potential roosts in trees within a <20m buffer on perimeter habitats.	1. Preparation of a CEMP through Condition to avoid and minimise all potential construction related pollution (water quality) and water quantity effects using best practice tried and tested industry methods (such as the NetRegs Guidance for Pollution Prevention Documentsⁱ and Ciria Control of water pollution from construction sites. Guidance for consultants and contractors (C532)ⁱⁱ) and a monitoring program. Installation of site demarcation fencing to prevent accidental access. 2. Ecological toolbox talk and supervision of certain tasks by Ecological Clerk of Works (ECoW). 3. Installation of site demarcation/tree protection fencing around retained hedgerow and tree habitats in accordance with BS5837:2012 to prevent accidental access and use of signage as necessary. 4. A 10-30m construction buffer around all retained trees.

Potential Changes and Effects

Integrated/Embedded Measures and Influence on Assessment

Loss of potential roosts through removal of Trees within G27, G23B (central oak in group), G95 and G97 and T25 T18, T25, T47 and T219.
Loss of foraging and commuting habitat.

5. The Folds: Ladder inspection in summer to inspect the trees in G27 to be removed once scrub and ivy is cleared to access trees. Ground inspection of oak (G23B) and ground/ladder inspection hawthorn (T25) to inspect PRF in summer prior to removal.

6. The Holme and The Homestal: MEWP inspection of T18 which is unsafe to climb, precautionary inspection of T47 prior to removal, precautionary inspections of T219 prior to removal, inspection of G95 and G97 following removal of scrub vegetation to allow access to trees.

7. Mitigation licence application to be submitted to Natural England if bat roosts are present. Compensation roost features to be provided in retained trees on Site and in wider GI parcels/Applicant ownership land for any loss in roosts and for 16 trees in The Folds and 30 trees in The Holme and The Homestal with roost suitability that will be indirectly damaged through development in the 20 - 25 m buffer zone. Limbs with PRFs will be translocated to retained trees and/or new roost chainsaw features created and/or tree mounted Schwegler or Greenwoods bat boxes installed on and adjacent to the Site and in a designated compensation habitat at a ratio of 2:1 for each PRF lost/damaged to ensure no net loss in roost resource post development.

8. Additional provision of translocation of tree limbs mounted on retained mature trees and/or chainsaw roost features and/or bat features in buildings and structures throughout the Site and within woodland in the wider OPP to compensate for disturbance / in-direct damage to all retained trees with PRFs present where a <25m buffer is present from development. A total of 172 features will be required to compensate for disturbance/in-direct damage to PRFs. Chainsaw tree features suitable for barbastelle will be created in appropriate habitats connected to the Folds to increase roost resource for this Annex II species. The numbers and locations of features will be agreed through the planning process.

9. Provision of one crevice features on a SW aspect of every suitable residential building, avoiding lighting that faces boundary vegetation comprising either a gaps in mortar under tiles on roof or a specific built in bat roosting feature. Bat-safe roofing felt will be installed on properties.

Accidental damage to trees with PRFs in proximity to removed trees through accidental damage during vegetation clearance works.

10. The Folds: Bat licensed ECoW present for vegetation clearance works to in proximity to T46, T48, T193, T201, T202, T252, G97 and G94 to ensure that the trees are not damaged during the vegetation clearance works of The Folds.

11. The Holme and The Homestal: Bat licensed ECoW present for vegetation clearance works to in proximity to T17, T252, T11, T12, T21, G19, T46, T48, T201, T192 and G94 to ensure that the trees are not damaged during the vegetation clearance works of The Holme and The Homestal.

12. Production of an Ecology Mitigation and Management Plan (EMMP) which will provide mitigation strategies for the protection of protected and notable species. This will include a phased approach to development co-ordinating all OPP RM applications.

Loss and interruption of flight lines through severance with road and

13. To compensate for damage to foraging and commuting routes through habitat loss and where there is development within a 15 m buffer zone of treelines, new foraging and commuting habitat equal in distance to the lengths affected will be created within the GI

Potential Changes and Effects	Integrated/Embedded Measures and Influence on Assessment
footpath, with particular respect to the compensation brown long-eared maternity and bat species roosts within Fir Tree House and the potential barbastelle mating roost in proximity to T259.	parcels and on land under the control of the Applicant. Planting specifically tailored to the insect prey of bat species on site will be provided to compensate for the decreased foraging opportunity on site. A 674 m length of linear foraging habitat to be provided off-site or within GI parcels. The provision of the buffer along the southern boundary of Quobleigh Woods will be enhanced with orchard planting, other neutral grassland and non-priority ponds. This will provide an alternative east/west commuting/foraging route in compensation for the loss of hedgerow H6.
Habitat loss resulting in isolation and fragmentation of foraging and commuting bat populations from increased lighting from street lights, external housing lights and footpath lighting for light sensitive bats and in particular the brown long-eared bat roost at Fir Tree House and barbastelle bat species.	14. A bat sensitive lighting strategy will be designed to ensure that <0.5 Lux is achieved within all buffer habitat and boundary habitats (including woodland, treelines and hedgerow). This will be implemented across both the horizontal and vertical planes at all heights. In addition, for the tree line where the barbastelle mating roost is present lighting will be restricted to <0.2 Lux on the horizontal plane and <0.4 Lux on the vertical plane on a moonless night within the 25 m buffer zone. The lighting strategy will be informed and reviewed by a suitably qualified ecologist.
Additional recreational pressure from residents on the habitats present within the hedgerows and treelines and adjacent woodlands Quobleigh Breach and Foxwalks Wood.	15. Enhancement of the habitats within the GI parcels to increase species diversity, vegetation structure and connectivity for bats. This will be included within a GI parcel HMMP and will compensate for the additional recreational pressure.

10 FURTHER BAT MITIGATION MEASURES

10.1 DISTURBANCE DURING CONSTRUCTION

Disturbance to roosting bats may occur as a result of noise and vibration from the construction works at the Site including tree removal works adjacent to trees with a high suitability for roosting bats. Bats can become acclimatised to regular low levels of noise disturbance and are more affected by irregular and loud noise/vibration. Bats that may roost within trees at the Site may become temporarily displaced by the construction works to retained roosts outside of the Site including within Quobleigh Woods and Foxwalks Woods.

Construction works will be avoided in proximity to the potential barbastelle bat roost within/in proximity to T259 from August to mid-November. The full detail of the protection buffer is provided in Appendix E.

An EMMP will be produced to outline the timing of each phase of the OPP development and will time construction works in certain areas of the RM parcels carefully so that disturbance throughout the phased development

construction works is minimised. This strategy will apply to the protection of bats that may roost within the linear protected and retained habitats bordering the Site and particular disturbing works will be avoided in proximity to areas of treelines containing trees with potential features that may be suitable to support summer roosts during the maternity season (May to August).

10.1.1 Work Lighting

No work lighting will be permitted during hours of darkness on site. This is to ensure that bats can continue to use commuting and foraging habitat through the site and potential roosts within boundary habitats are protected from disturbance by artificial light during construction.

10.2 TREE REMOVAL WORKS

All trees with a less than 25 m buffer from development where PRFs have been identified will also be inspected prior to development taking place. Should bat roosts be confirmed at these trees, suitable compensation for potential roost damage will be implemented (see section 12.1 below).

10.2.1 The Folds

The trees and groups of trees that are scheduled for removal have no suitability for roosting bats, other than some trees within G27, one tree in G23 and T25. Further inspections will be required on these trees prior to removal and this is outlined below. Tree and shrub clearance will be supervised by a bat licenced ECoW to ensure that trees in proximity to the vegetation removal are not damaged or disturbed by the works, should roosting bats be present in these trees. A pre-works inspection of all suitable roost features in trees scheduled for felling and trees in the impact zone will be required to be conducted by a bat licenced ecologist.

Should roosting bats or evidence of roosting bats be encountered, a EPSL application will be submitted to NE and the works to the trees will be delayed. Up to three surveys scheduled three weeks apart between May – September would be required to inform the licence application. NE takes a minimum of 30 working days to determine a licence.

A Precautionary Working Method Statement (PWMS) will be implemented for the tree/vegetation removal works and will be provided within the EMMP for the Site.

G27 – PRF-I

Further inspections of dead elm trees within G27 are required to be conducted by a licenced bat worker with a ladder prior to removal. Ivy on the trees may obscure PRF-I's (features for individual bats) and the ivy will be removed by hand under the supervision of the bats worker to aid inspection.

G23B – PRF-I

One inspection of exposed hole located at eye level by ECoW as a precaution prior to removal of the oak tree. This can be conducted without a ladder.

T25 -PRF-I

Should this hawthorn not be retained, the weld on the stem will require inspection by a licenced bat worker prior to removal.

10.2.2 The Holme and The Homestal

The trees and groups of trees that are scheduled for removal have no suitability for roosting bats, other than some trees within G27, G95 and G97, and T18, T47 and T219. Further inspections will be required on these trees prior to removal and this is outlined below.

Tree and shrub clearance will be supervised by an ECoW to ensure that trees in proximity to the vegetation removal are not damaged or disturbed by the works, should roosting bats be present in these trees nearby. A pre-works inspection of all suitable roost features in trees scheduled for felling and trees in the impact zone will be required to be conducted by a bat licenced ecologist.

Should PRF-M be identified during inspections on trees which are not currently accessible, further surveys will be required on these trees.

Should roosting bats or evidence of roosting bats be encountered, a EPSL application will be submitted to NE and the works to the trees will be delayed. Up to three surveys scheduled three weeks apart between May – September would be required to inform the licence application. NE takes a minimum of 30 working days to determine a licence.

A Precautionary Working Method Statement (PWMS) will be implemented for the tree/vegetation removal works and will be provided within the EMMP for the Site.

T18 -PRF-I, FAR

This tree is dead and unsafe to climb to inspect the upper sections. The lower sections had a weld and a dead stem with two PRF-I's. A MWEF will be required to inspect the upper sections prior to removal by a licenced bat worker to assess the suitability for roosting bats. Should PRF-Ms be present further surveys will be required.

T47 – PRF-I

One climb was conducted out of season (late September 2025) and two PRF-I's were recorded. The tree will be inspected in season (summer) prior to removal.

T219 – PRF-M

Tree climbed and two PRF-M recorded, bats were not present, however the inspection was conducted out of season. Three tree climbs will be conducted three weeks apart from May 2026 prior to clearance to update the survey results, prior to removal of the tree.

G95 - FAR

A hawthorn had a weld and elm were obscured by scrub vegetation. The trees will be inspected by a licenced bat worker prior to removal after scrub around them has been cleared under supervision to assess suitability for bats.

G97 - FAR

Trees were obscured by scrub vegetation. Further inspections of trees within G97 are required to be conducted by an ecologist after scrub around them has been cleared under supervision to assess suitability for bats.

10.3 BAT LIGHTING STRATEGY

A lighting strategy will be produced for the Site through the planning process which will minimise levels of lighting and use uni-directional lights, PIR timers, cowlings etc. to reduce light spill to the treeline and hedgerow habitats within the Site to a minimum. The lighting strategy will include <0.2 Lux on the horizontal plane and <0.4 Lux on the vertical plane on a moonless night for a 25 m buffer along the northern half of the western boundary avoid light spill on the

potential barbastelle mating roost and <0.5 Lux within buffers along the linear habitats and woodland habitats along the Site boundaries. No lighting will be permitted where footpaths cut through tree lines or hedgerows. A similar approach has been followed for the lighting along the roads that lead through H5 along the southern boundary, with any required lighting being spaced to allow a dark corridor through the hedgerow habitat to be maintained.

A strategic site wide network of retained and dark wildlife corridors (including for light sensitive bats) have been established through the development of this reserved matters application and taking into account adjacent land parcels. This has drawn on principals established in the Outline Planning Permission, and has been refined by site-specific criteria and constraints.

The retained and dark corridor minimum width has been defined through the application of the root protection areas and up to 25m either side of certain retained trees, the root protection area for all other retained trees, 20m for all SNCI woodland and Ancient woodland, 30m for Quobleigh Woods, and a minimum of between 5m to 10m either side of all hedgerows where large hedgerow trees do not exist.

In addition, the wildlife corridors extend beyond the Application boundary into the adjacent existing habitats, extending their spatial function. Whilst there is some variability in the minimum unlit wildlife corridor width, the core ecological functionality of these key structural habitat features are retained throughout.

A Homeowner pack will be produced for each new dwelling, to include information on the effects of lighting to nocturnal species including bats and will provide specification for external lighting to homes that are low-spill, unidirectional to avoid boundary habitats, PIR timers, LED and warm light. In addition, homeowners of perimeter housing will not be permitted to install any additional external lighting without consultation with a suitably qualified ecologist.

10.3.1 Specifications for Bat Sensitive Lighting

The following measures will be implemented to ensure the lighting on site is suitable for roosting, foraging and commuting bats in retained habitat areas.

Overarching principles to be observed within the ecologically sensitive lighting strategy includes the following:

- Bat roosting areas and other bat sensitive areas (e.g. key commuting and foraging habitats), must be either retained at their existing Lux level or not exceed 0.5 Lux at all heights. In addition, light spill in the barbastelle roost buffer zone will be <0.2 Lux on the horizontal plane and <0.4 Lux on the vertical plane on a moonless night within the entire 25 m buffer zone;
- External lighting should only be installed where it is absolutely required and new external lighting should be minimised as much as is feasible;
- Column height for all external light fittings will be carefully considered to ensure minimal light spill is achieved, with fittings preferably <0.5 m in height;
- All lamps will be fitted with UV filters or lack UV elements when manufactured;
- A warm white spectrum (<2700 Kelvin) will be adopted as this will reduce impacts of blue light upon wildlife;
- LED lamps will be used where possible;
- The use of bollard or low-level downward-directional luminaires is strongly discouraged. They can be considered for specific cases where the lighting professional and project manager are able to resolve the

issues of unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased light scatter from surfaces and poor facial recognition;

- Luminaires with an Upward Light Ratio above zero will be used;
- Any lights installed should incorporate PIR/motion sensors if possible, which are set on a short interval once triggered (<5 minutes);
- If/ where outside security lighting is required these will be specified with ecologist and lighting engineer input to avoid later unchecked installation by the householders. These should be set on a motion-sensors and timers to decrease the light pollution impacts. These lights will also be directed away from vegetation (and hooded/cowled where necessary) and be of the lowest intensity/brightness necessary for their purpose;
- Where required, accessories such as baffles, hoods or louvres will be used on the lamps to reduce light spill;
- The potential for glare to act upon dark corridors must be considered and managed where possible; and
- The orientation of fences, walls, the open space of gardens and other permanent features can be used to achieve the lighting strategy parameters.

Lux contour plans will be produced by a qualified lighting engineer. The lux contour plans will require the following elements to be provided within the appropriate reports:

- All modelling should include the combined effect of internal and external light spill;
- Four horizontal calculation planes used; one at ground level, one at 1 m in height, one at 3 m in height and one at roof height. Both inverted and non-inverted planes should be included for each height;
- Vertical calculation planes should be used where appropriate to show the illumination directly upon the edges of the habitat features used by foraging and commuting bats;
- Each plot should be accompanied by their minimum, average and maximum Lux values;
- Where dimming, PIR or variable illuminance states are to be used, a plot should accompany each of these states;
- The contours for 0.1, 0.2, 0.5, 1, 2 and 3 Lux (and up to 10 Lux in 1 Lux intervals) must be clearly shown as well as contours for values above these in either 5 or 10 Lux intervals;
- Modelled plots should not include any light attenuation factor from new or existing planting due to the lag time between planting and establishment and the risk of damage, removal or failure of vegetation which may result in difficulties in enforcing the screening effect or when undertaking post-construction compliance surveys;
- Only a maintenance factor of 1 may be used in order to best replicate the brightness of luminaires to be expected at 'Day 1' of operation; and
- The lux contour plots should be accompanied by an explanatory note from the lighting engineer to list where, in their opinion, sources of glare (essentially the experience of high contrast between a light source and the surrounding darkness) acting upon the dark corridors may occur and what has been done/can be done to reduce their impacts (hoods, screening, orientation, reconfiguration etc).

11 BAT COMPENSATION MEASURES

11.1 DISTURBANCE TO TREES WITH PRF-M FEATURES

In the absence of roost characterisation surveys having been conducted at the Site, it is assumed that trees with PRF-Ms contain roosting bats and compensation will be embedded into the project to compensate for disturbance to the trees as a result of the development. Figure 14 and Figure 15 provide a plan for each parcel with a 25 m buffer upon each tree with a PRF-M feature. The plans show that a 20 - 25 m buffer is not possible for a number of the trees and as a result, compensation will be provided at a 2:1 ratio of replacement PRF:PRF recorded on each tree. Further surveys will be conducted in 2026 to scope out trees should no roosting bats present and the number of compensation roost features required will be reduced accordingly.

Table 24 provides a summary of the trees within The Folds with PRF-Ms where a 20 – 25 m buffer around them is not possible.

The total number of PRF-Ms within The Folds Site is considered to be 27; therefore 54 (x2) PRFs will be created within the wider OPP Site and/or within land under the control of the Applicant to mitigate for this effect.

Table 24: Total Number of PRFs on Trees with PRF-M and Number of Compensation Roost Features Required

Tree Number	Number of PRF-M	Number of Compensation Features Required
T232	1	2
T231	2	4
T26	1	2
T27	1	2
T28	4	8
T33	5	10
T36	3	6
T266 (borders The H&H)	1	2
T263 (borders The H&H)	1	2
T261 (borders The H&H)	1	2
T260 (borders The H&H)	2	4
T259 (borders The H&H)	1	2
T258 (borders The H&H)	1	2
T258A (borders The H&H)	1	2
T257 (borders The H&H)	1	2
T255 (borders The H&H)	1	2
TOTAL	27	54

Table 25 provides a summary of the trees within The Holme and The Homestal with PRF-Ms where a 20 – 25 m buffer around them is not possible.

The total number of PRF-Ms within The Holme and The Homestal Site is 86, therefore 172 (x2) PRFs will be created within the wider OPP Site and within land under the control of the Applicant to compensate for the damage to trees which may support bats.

Table 25: The Holme and The Homestal Total Number of PRFs on Trees with PRF-M and Number of Compensation Roost Features Required

Tree Number	Number of PRF-M	Number of Compensation Features Required
T12	1	2
G22A	1	2
G22B	1	2
G22C	1	2
T23	2	4
T48	8	16

T208	1	2
T206	1	2
T204	7	14
T201	4	8
T200	1	2
T197	3	6
T196	2	4
T193	4	8
T46	3	6
G34E	1	2
G34F	1	2
G34G	1	2
G34I	3	6
T230	5	10
T227	1	2
T226	2	4
T225	5	10
T224	5	10
T219	5	10
T49	6	12
T50	4	8
T210	7	14
TOTAL	86	172

Figure 14: The Holme and The Homestal 25 m Buffer on Trees with PRF-Ms

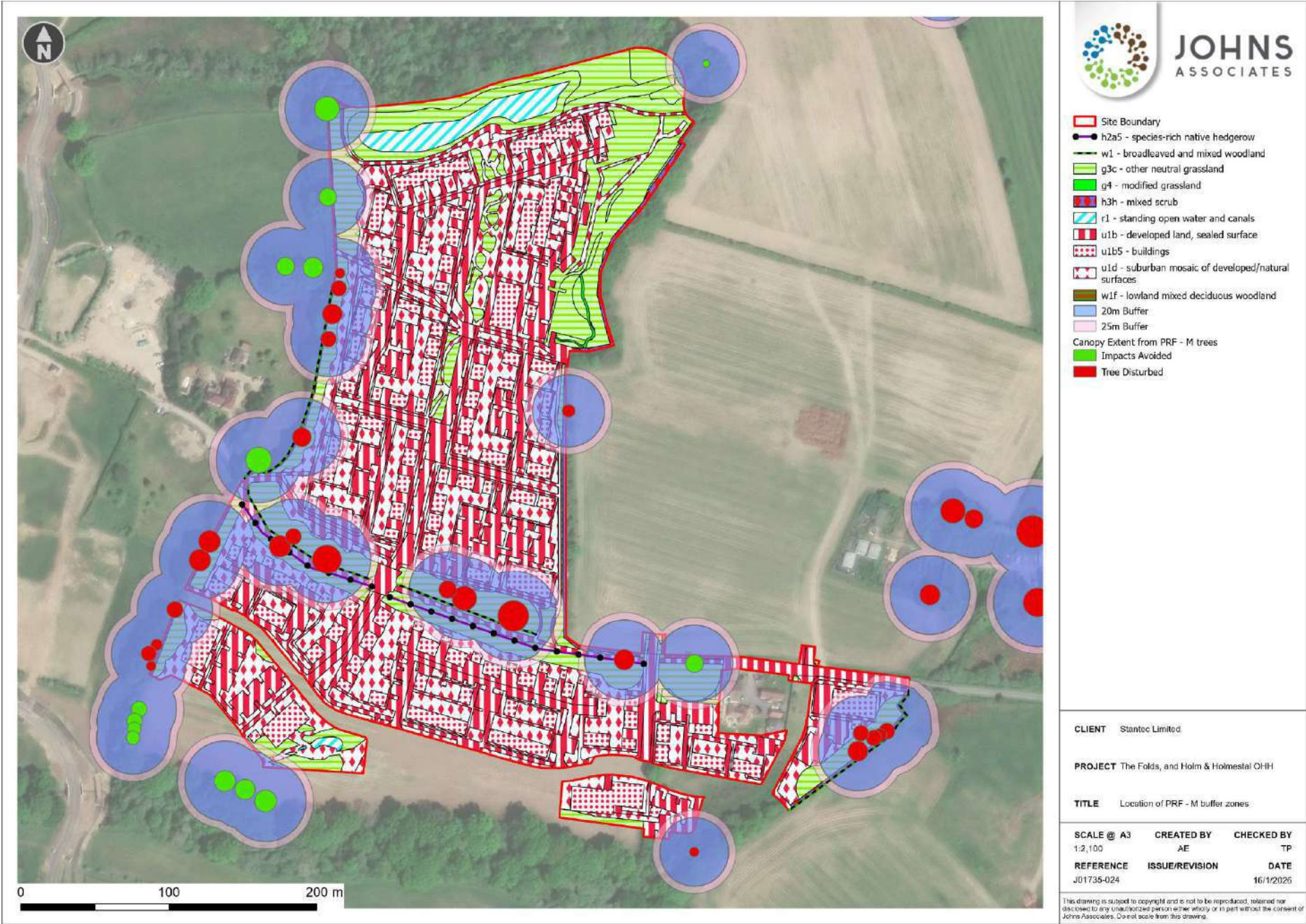
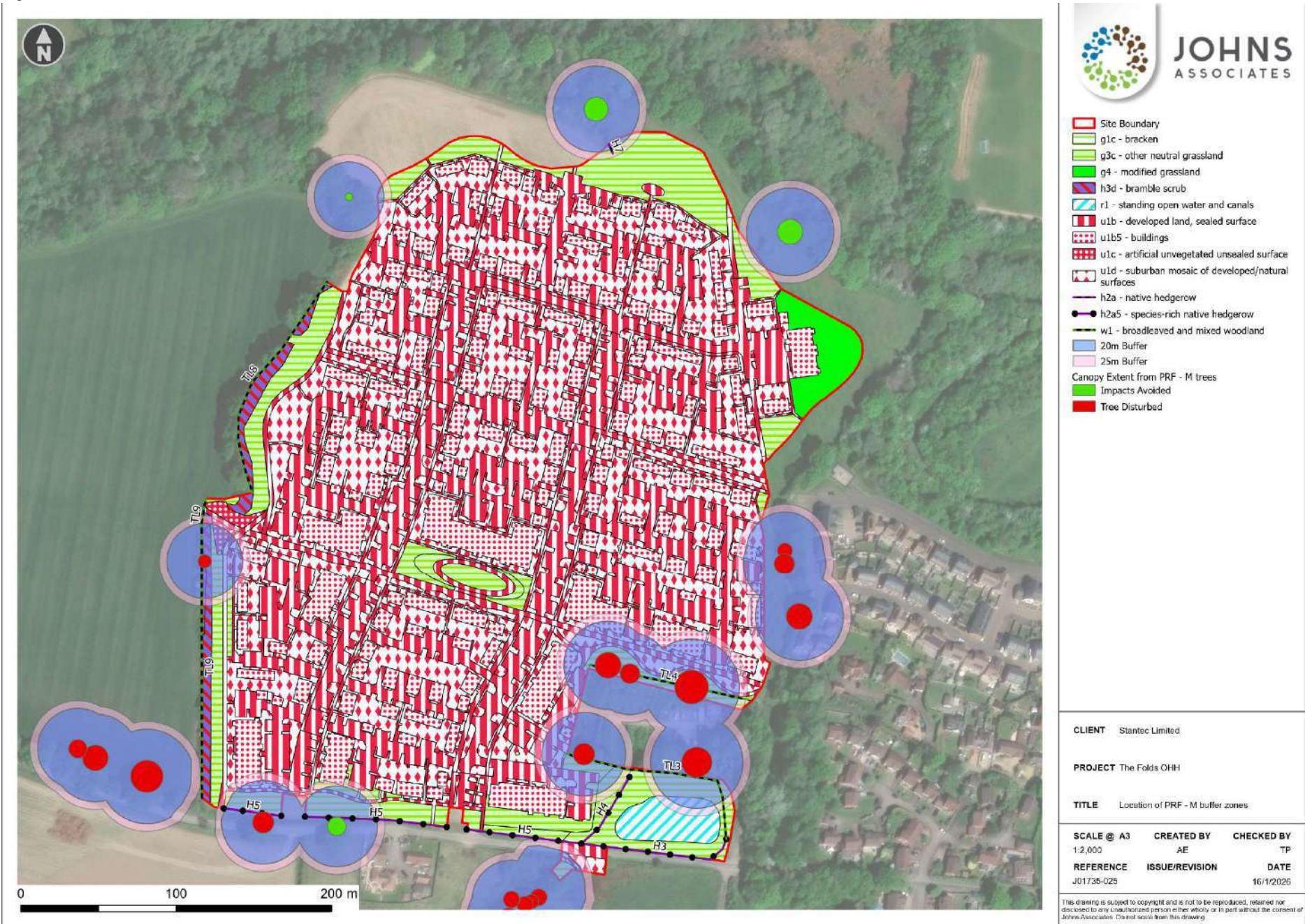


Figure 15: The Folds 25 m Buffer on Trees with PRF-Ms



11.1.1 Roost Compensation Features

Each PRF which is lost as a result of either direct or indirect impacts will be compensated for by the creation or installation of additional roost features on a 2:1 ratio. These features include PRF salvage, new chainsaw bat features, tree mounted bat boxes, integrated bat boxes and/or integrated bat features into buildings. Details of specifications for PRF salvage, chainsaw features and bat boxes are provided below. Details of the design of bat chainsaw features are provided in Appendix F.

PRF Salvage

PRF salvage involves the removal of the feature from the tree, using hand tools or an electric chainsaw. The cut should be made a suitable distance from the internal ends of the feature at each end (a minimum of 0.5 m). The feature must then be lowered to the ground with a rigging system, or inside the basket of a MEWP, to ensure it is not damaged.

The feature is then reinstated in a suitable nearby "donor" tree, ideally at the same height and aspect as it was positioned on the original tree. Fixings to attach the salvaged PRF can initially use ratchet straps, however these degrade with UV exposure so should only be used as an initial temporary measure. Permanent fixings can include wire coated with hosepipe, timber bracing or another appropriate solution as recommended by a qualified arborist. Damage to the donor tree and potential safety considerations as a result must be considered.

Considerations must be made for the longevity of the feature and safety implications. Additional roost provision will be required to supplement PRF salvage due to the degradation of features over time. Maintenance of salvaged features (particularly of the bracing or ratchet fixings) is crucial and a maintenance regime must be secured and implemented in advance of any PRF salvage being planned.

Plate 1 and 2: Example of PRF salvage, lowering the feature using a pulley system and reinstalling in beech tree with bracing (Photos: CIEEM InPractice, Issue 89, Conservation Translocations, 2015)



Chainsaw Features

Creation of chainsaw features must be advised and supervised by a suitably qualified arborist. An appropriate tree should be selected, with consideration of future tree health once features have been created. It may be appropriate to only install features in trees which have already been monolithed or reduced, to ensure that the tree remains stable.

Design of features should be carefully considered to ensure they are appropriate for the species of bat they are designed to provide a roost for. Details of feature designs which are confirmed to be successful are included in Appendix G.

Plate 3: Example of slot crevice chainsaw feature for crevice dwelling bat species



Plate 4: Barbastelle "future roost" design © BATS Research and Training 2024



Bat Boxes – Tree Mounted

Appropriate bat box models must be constructed of woodcrete, such as Schwegler or Greenwoods Ecohabitats bat boxes. Schwegler 1FF bat boxes should be included in any provision as this model is known to be used by barbastelle.

The location of the boxes will be determined by a licensed bat ecologist to ensure the likelihood of uptake is increased. They will be installed at a height of between 4 - 10 m, preferably on a sheltered, un-cluttered aspect within retained woodland. The boxes must be installed at the earliest opportunity before the works and remain on site in perpetuity.

Bat boxes will require maintenance a minimum of once per year, including replacement of fixings and clearing of the internal contents of the box to remove any nesting material. It is the responsibility of the client to ensure that bat boxes are maintained.

11.2 DISTURBANCE TO FORAGING AND COMMUTING HABITAT

11.2.1 Assessment of Bat Commuting Habitat Loss

In line with the Outline Planning Application for the Site, suitable buffer widths were proposed based on historical survey results to avoid impacts to bats on site. In areas where this buffer width is unable to be provided, suitable mitigation and compensation is required to mitigate impacts to bats on site. Buffer widths as per the Landscape and Ecological Mitigation Strategy detailed in below.

Table 26: Buffer Widths for Habitats on Site

Habitat Feature	Specified Buffer Width (as per Landscape and Ecological Mitigation Strategy, 2020).
Hedgerows without trees	Minimum 5m
Hedgerows with trees and tree lines	15m
Woodland	50m

Proposed habitats on site have been assessed to measure any areas where these buffers were unable to be applied, to quantify the amount of compensatory habitat required.

Figure 16 and Figure 17 provide the location of 10 m buffers on hedgerows, 15 m buffers on the treelines and 50 m buffers on the woodland. Impacts to the potential barbastelle mating roost located within the treeline between the Homestal and The Folds has been avoided through the provision of a 25 m buffer on each side of the treeline extending from the edge of the canopy. A Lux lighting assessment will be required to be conducted for the treeline to assess both internal and external lighting sources as part of the planning process to ensure that the treeline retains suitably low lighting levels. Figure 16 and Figure 17 also provide the lengths of development encroachment within the buffer zones.

Within The Folds development, development encroaches within 336.73 m of the specified and conditioned OPP buffer zone. Within The Holme and The Homestal development, development encroaches within 337.15 m of the specified and conditioned OPP buffer zone.

11.2.2 Compensatory Habitat Provision

As a result, 674 m of new linear habitat is required to be provided off-site to compensate for this loss. The loss of H6 within The Folds is compensated through enhancement and creation of hedgerows and treelines and through the provision of enhanced habitat along the southern boundary of Quobleigh Wood, which must be retained at <0.5lux to ensure it's suitability for use by commuting bats.

A new native species rich treeline, 191 m in length will be created along the southern half of the western boundary to provide enhanced foraging and commuting habitat and connectivity. A line of mixed scrub planting will be planted along the retained treelines (TL8, TL4 and TL3) and the retained hedgerows (H3, H7 and H5) which will provide additional connectivity for foraging and commuting bats and will plug any small gaps present within the habitats. The species poor hedgerow within the Site (H7) at the north of the Site which extends south from Quobleigh Woods will be enhanced with additional native woody species planting to make it species rich. H5 located along the southern boundary will be enhanced from poor to good condition. A diverse range of native woody species to increase invertebrate prey for foraging bats will be included within the planting schedule. Planting specifically tailored to the insect prey of bat species on site will be provided to compensate for the decreased foraging opportunity on site.

Additional tree planting will be included around the section of hedgerow and treeline to be removed to facilitate the footpath through TL8 and the roads through H5 to strengthen connectivity as much as possible around the breaks. Branches of trees will be encouraged to grow and arch over the footpath in TL8 to retain arboreal connectivity for commuting bats. No artificial lighting will be permitted where the footpaths cut through tree lines with a buffer width either side of these habitats. The woodland, scrub and hedgerow habitat within the GI parcels will be additionally enhanced to support bats including increasing species diversity, plugging gaps and increasing structural diversity.

A full lighting assessment with proposed Lux lighting levels will be produced through the planning process (via condition) which will need to demonstrate that the buffer zones have suitably low light spill of <0.5lux across both the vertical and horizontal plane at all heights. The lighting assessment will inform an updated assessment of the length of commuting linear habitat that will be affected by the proposed development and as a result further compensation areas off-site in the GI parcels or within land under the control of the Applicant may be required.

Figure 16: The Holme and The Homestall Conditioned OPP habitat buffers and Barbastelle Treeline Buffer

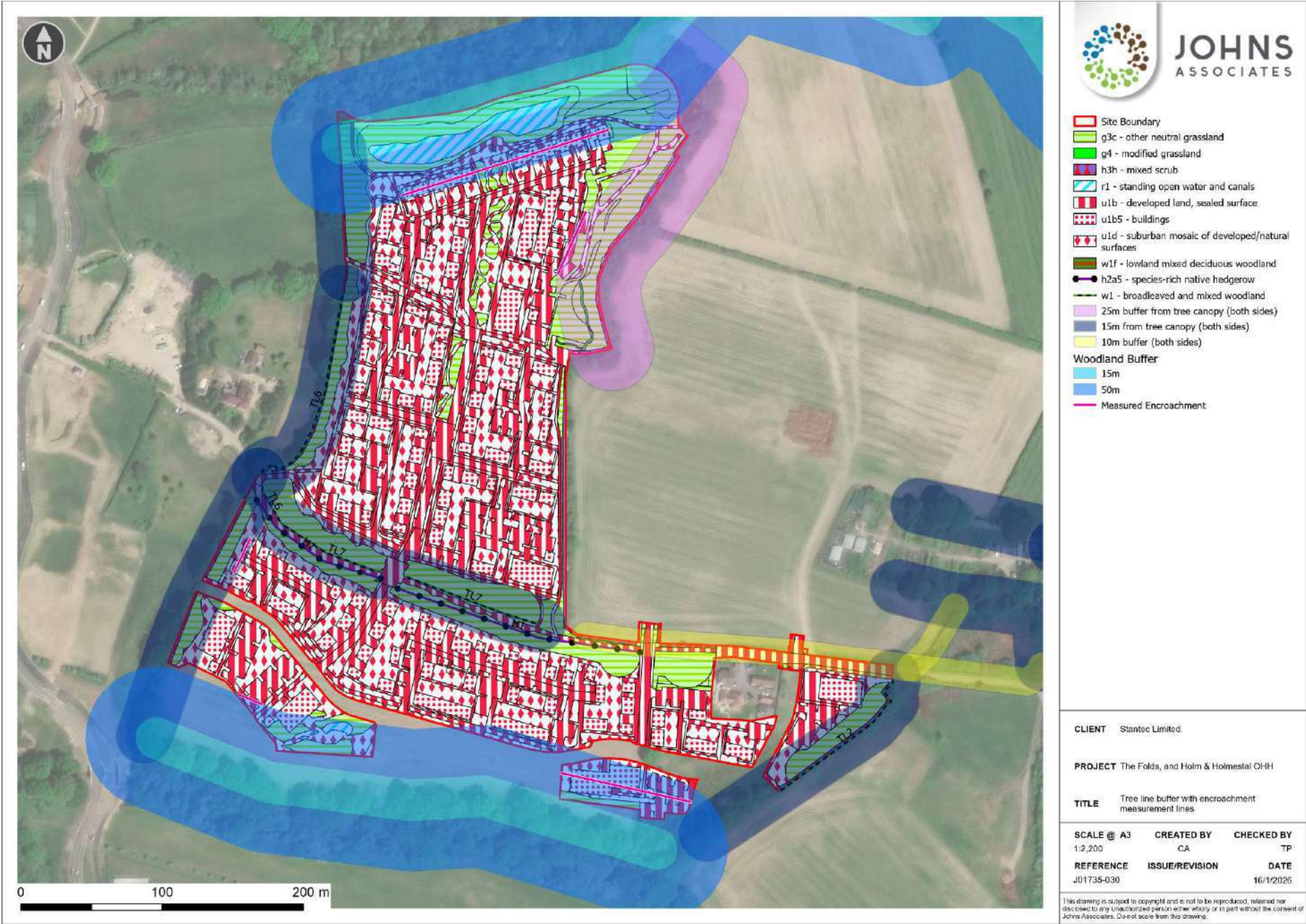
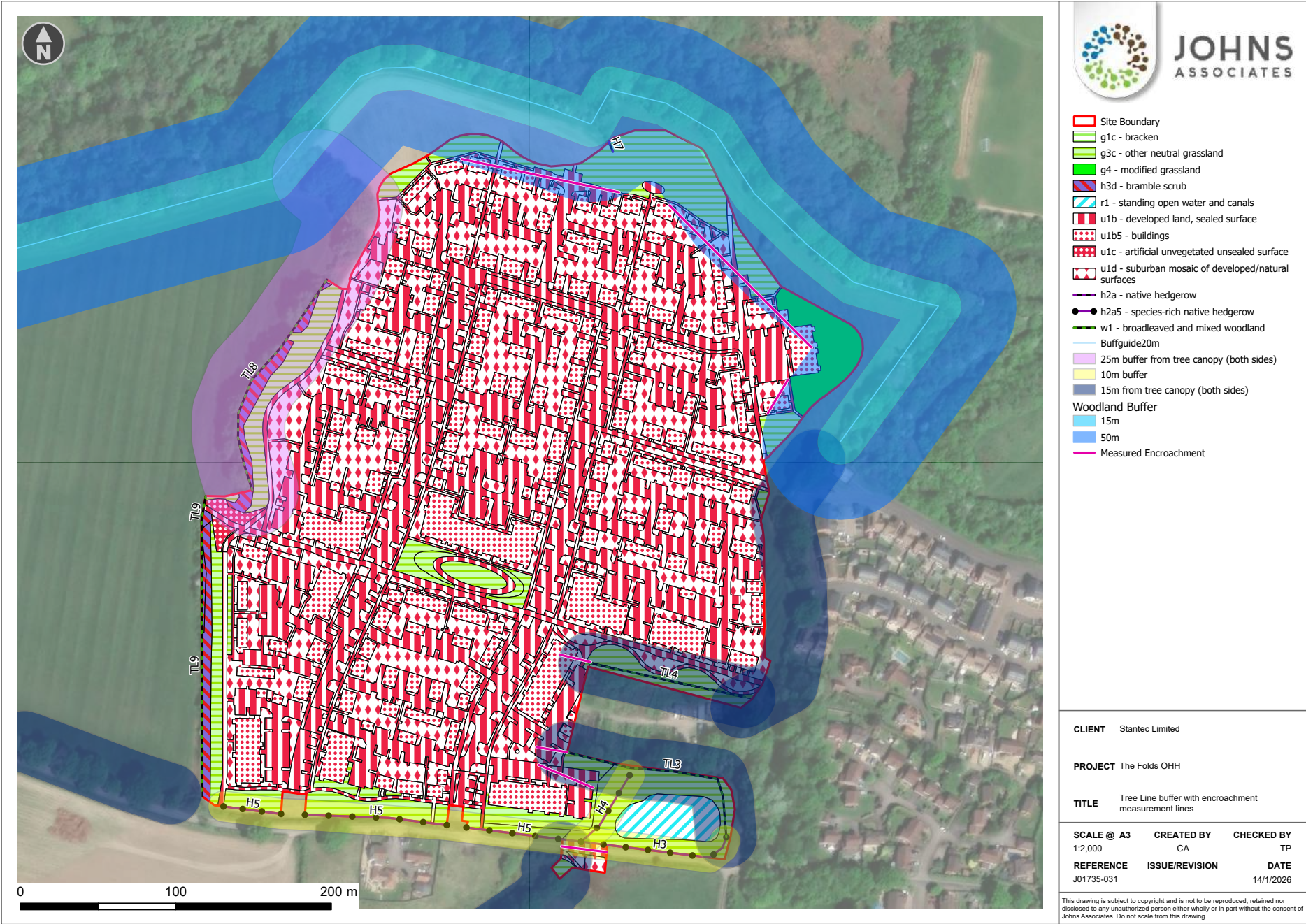


Figure 17: The Folds Conditioned OPP habitat buffers and Barbastelle Treeline Buffer



12 BAT MONITORING STRATEGY

Post-development monitoring is required to ensure the success of the scheme, as well as identify any needs for remedial action should mitigation be unsuccessful.

There are two stages of post-development monitoring:

Ensuring all mitigation is implemented as stated
Stage 1 – ensuring that all mitigation has been implemented as designed. This stage should begin during construction, and continue until all elements are in place (and all remedial requirements resolved). Complex proposals will require the involvement of other disciplines such as lighting engineers or landscape architects, and their roles and responsibilities should all be defined. This stage extends throughout construction and beyond, and requires compliance checks against design objectives at regular intervals.
Assessment and reporting of outcomes
Stage 2 – the level of detail collected should be sufficient to determine whether or not the monitoring objective has been met. Licences are granted on the assumption that the test of maintaining FCS can be met, therefore the objective(s) set and data collected should demonstrate that this test has indeed been met. Identifying only the 'presence of bats' on a site where higher-status roosts have been affected is rarely sufficient.

As per The Bat Mitigation Guidelines (CIEEM, 2023), the following monitoring period is required for roosts at The Folds, Holm and Holmstall (up to regional importance):

- 10 years, with monitoring in at least four years within a ten-year monitoring schedule.

To assess whether the mitigation measures have been successful in maintaining FCS of the species concerned, the following questions will need to be answered:

1. To assess the impact on the local occurrence/distribution of the species concerned: Has the number/assemblage of bat species occurring within the site changed or been reduced, despite mitigation?
2. To assess the impact on the local occurrence/distribution of the species concerned: Has the breeding status of the relevant bat species occurring on the site changed or been reduced?
3. For qualitative assessment of the impact on the population and distribution of the species concerned, has the population type (i.e. presence of maternity roosts and mating roosts) of key target species changed or been reduced, despite mitigation?
4. Has the area of compensatory habitat developed sufficiently to provide for the species concerned in the long term?
5. To what extent have the roost mitigation features been used by the species concerned?

Table 13 illustrates the overall principals for Stage 2 of the bat monitoring strategy for the Site. It is recommended that a detailed full bat monitoring plan is designed and provided, which should be secured by planning condition.

Table 13: Summary Proposed Bat Monitoring Strategy – Stage 2

Element to be monitored	Objective	Monitoring survey methodology	Month/period of monitoring	Monitoring years	Broad success indicators
All confirmed retained roosts	Ensure roosts remain in good health post-works	2 x Emergence surveys with Night Vision Aids	May - August	Year 2, 5, 7 and 10	Retained roosts are being used by the same species of bats, using the roost for the same function.

Element to be monitored	Objective	Monitoring survey methodology	Month/period of monitoring	Monitoring years	Broad success indicators
		Internal roost inspection and/or tree climbing survey	May – August or September/October for mating roosts	Year 2, 5, 7 and 10	
Retained commuting and foraging habitat including buffer habitats	Ensure lux parameters are met and retained habitats are protected and functional	Light level surveys using appropriate lux meter and qualified lighting consultant	Any appropriate month	Year 0 (during development) and Year 1	Lux levels as per recommendations are achieved
New compensation habitats	Ensure habitat is in good health and condition	Habitat walkover survey	Spring	Year 0 (during development) and Year 1	Habitat is in good health and target condition achieved
Roost Compensation Features (including salvaged PRFs, chainsaw tree features and bat boxes)	Monitoring of compensation feature uptake by bats, comparison of species assemblage and breeding status post works	2 x roost mitigation inspections confirming the presence of bat species and breeding status. Dropping collection for eDNA analysis to confirm species where possible.	One month of May, June, August or September. One check required.	Year 2, 5, 7 and 10	Usage of features by same species of bats as per those impacted is confirmed.
Bat assemblage and distribution on site post-development	Comparison of species assemblage and breeding status post-works.	Trapping surveys in June, August and September/October. Radio-tracking of target bat species to locate roosts in June or August and September/October.	June, August and September/October	Year 2 and 5	Continued presence of the relevant bat species and associated breeding status post-works
	Comparison of bat activity levels on site post-works	Bat activity surveys including 3 x NBWs and 7 x static surveys with a minimum of 5 statics in the same locations as 2025 with same model and microphone of static as 2025	April - October	Year 2 and 5	Continued presence of the relevant bat species and comparable bat activity levels to 2025 post-works

The monitoring strategy will be implemented and funded by the client, Eastleigh Borough Council. It is recommended that funding for monitoring and any associated remedial measures is allocated in advance and secured prior to development commencing. It is the responsibility of the client to instruct a suitably qualified ecologist to conduct the monitoring as per the above.

Monitoring reports should be produced following each monitoring year, detailing all monitoring results and the need for any remedial action should mitigation/compensation measures not be installed as intended or are unsuccessful.

V1.0

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V2.0

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APPENDIX A LOCATION OF RECORDED BAT ROOSTS



JOHNS
ASSOCIATES

- Wider OPA Boundary
- The Folds Site Boundary
- Soprano pipistrelle mating roost bat box
- Barbastelle mating tree roost
- Brown long-eared day roost bat
- Brown long-eared maternity & satellite roost, serotine, common & soprano day roost - Fir Tree House EPSL
- Brown long-eared satellites tree roost
- Common & Soprano pipistrelle day roost bat box
- BLE maternity, common & soprano pipistrelle & Natterer's day roost EPSL compensation - Chalcroft Farm
- Noctule mating tree roost
- Brown long-eared satellite tree roost

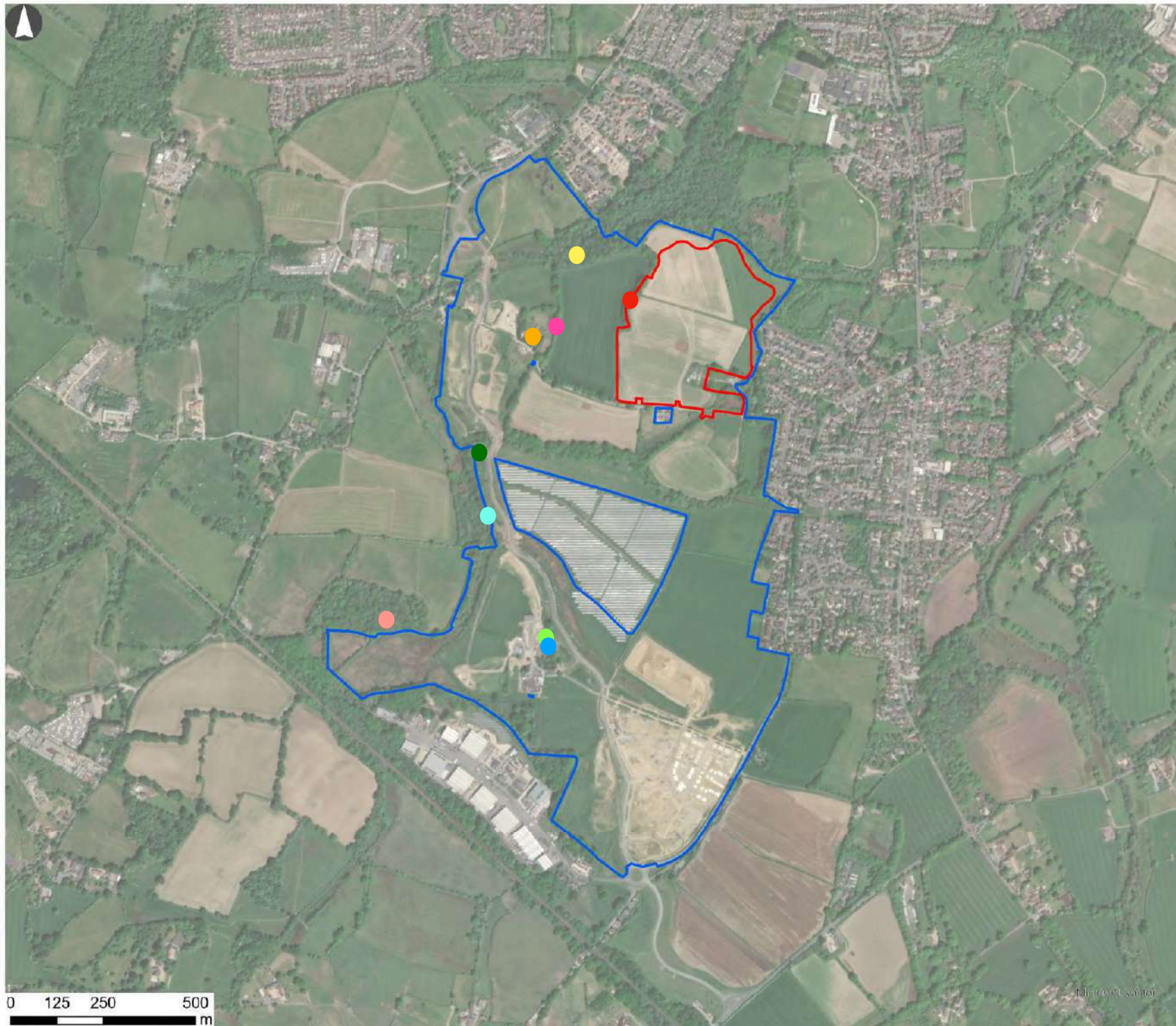
CLIENT Eastleigh Borough Council

PROJECT Quobleigh Breach, OHH - EcIA, BNG & P2 Surveys

TITLE The Folds Site Overview

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REFERENCE	REVISION	DATE ISSUED
1791-011		6/11/2025

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APPENDIX B FULL GLTA AND TREE CLIMBING RESULTS 2025

THE FOLDS

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
T24	Oak	Veteran; Very high suitability for bats			1	Limb	2 x knot hole	East	15			PRF-M	PRF-M
					2	Limb	2 x knot hole	East	12			PRF-I	
					3	Limb	Lifted bark	East	12			PRF-M	
					4	Limb	Hole at base of dead peg	East	12			PRF-I	
					5	Limb	Woodpecker hole	North	15			PRF-M	
					6	Limb	Wound and pruning cut	South	16			PRF-M	
T25	Hawthorn					Stem	Weld	North	3				PRF-I
T26	Oak					Limb	Branch split		4	Dead limb with cracks along			PRF-M
T27	English oak		100	13			Tear out	North-east	4.5			PRF-M	PRF-M
T28	English oak		80	11	1		Pruning cut	South	3				PRF-M
					2		Knot hole	East	4				
					3		Pruning cut	North-east	2.5				

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
					4		Pruning cut	North-east	3				
T29	English oak	Tree climb inspected by BW	115	14	1	Stem	Collar rot out	North				No PRF	PRF-M
					2		Bat Boxes			No bat droppings		PRF-M	
					3		Pruning cuts	North				No PRF	
					4		Dead stem					No PRF	
T33	English oak	Tree climb inspected by BW	65	9	1		Knot hole	East	1.2			PRF-M	PRF-M
					2		Knot hole	South-west		Knot hole at base of dead branch		PRF-I	
					3		Peeling bark					PRF-M	
					4		Branch collar		2.5	Entrance on south side of collar		PRF-I	
					5		Knot hole	South-west	5			PRF-M	
T36	English oak		100	15	1	Stem	Collar, dead bark	North-east	8				PRF-M
					2	Stem	Collar, tear wound	South-east	5				
					3	Stem	Collar, tear wound	South	5.5				
T231	Ash							South		Two large holes		PRF-M	PRF-M

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
										going into branch on southern side			
T232	English oak		45	11			Tear out	West/North-west	6			PRF-M	PRF-M
T233	Ash		50	14		Stem	Knot hole	West	10				PRF-I
T241	Crack willow									Hole and cavity on northern face. Hole in fallen limb. Horizontal cracks in fallen limb		PRF-M	PRF-M
T248 (The F & H&H)	Oak	Very good features for bats.				Limb	Split on dead limb	West	3	Split running along for 2m up dead limb		PRF-M	PRF-M
T249 (The F & H&H)	Oak	Single stem				Stem	Collar at base of peg	East	10			PRF-I	PRF-I

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
T251 (The F & H&H)	Oak	Single stem											FAR
T252 (The F & H&H)	Oak	Mature, single-stem, wide sprawling. Tree climb inspected by BW.	90	18	1		Tear out, hazard beam	North-west	12			PRF-I	PRF-I
					2		Tear out	North-west		Small tear out hole on top side of branch. Potential for night roost.		PRF-I	
T253 (The F & H&H)	Ash	Multi-stem			1	Stem	Wound	East	15			PRF	FAR
					2		Rot-hole	East	14	Rot-hole in dead peg		PRF	
					3	Stem	Rot-hole/tear out	South	14	Rot-hole/tear out on stem 2		FAR	
					4	Stem	Tear-oat	East	12	Tear-out on stem 1		PRF	
T254 (The F & H&H)	Oak						Knot hole					PRF	FAR

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
T255 (The F & H&H)	Oak	Veteran tree – very high value tree for bats					Hazard beam			10+ features – hazard beam is main feature			PRF-M
T256 (The F & H&H)	Field maple	Ivy may obscure PRFs											FAR
T257 (The F & H&H)	Oak	Veteran					Crack in dead limb	East				PRF-M	PRF-M
T258(The F & H&H)	Oak						Wound, rot hole						PRF-M
T258A (The F & H&H)	Ash	Located to the south of T258				Stem	Wound						PRF-M
T259 (The F & H&H)	Oak	Single stem. Barbastelle calls recorded x 4 and multiple close passes. Minimum 1 barbastelle likely emerged. At least 2 barbastelle seen. East side assessed only.											Potential Roost
T260 (The F & H&H)	Oak	Veteran; potential barbastelle roost. East					Peeling bark and split					PRF-M	PRF-M

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
		side only assessed.											
T261 (The F & H&H)	Ash	East side only assessed					Wound			Large basal wound		PRF-M	PRF-M
T262 (The F & H&H)		PRFs obscured by ivy											FAR
T263 (The F & H&H)	Oak	East side only assessed					Flaking bark at dead peg					PRF-M	PRF-M
T264 (The F & H&H)	Oak	East side only assessed								No PRFs on East side			FAR
T265 (The F & H&H)	Ash				1	Stem	Basal rot	North	0			PRF	PRF-I
					2	Stem	Ivy	East	0 – 6			PRF	PRF-I
T266 (The F & H&H)	Ash						Weld			Weld at base		PRF-M	PRF-M
T267 (The F & H&H)	Field maple	East side checked only											FAR

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
G12 (The F & H&H)													FAR
G13 (The F & H&H)	Bramble and blackthorn	Tree climb inspected by BW										No PRF	No PRF
G15 (The F & H&H)												No PRF	No PRF
G16 (The F & H&H)	Hazel				1		Knot hole					PRF-I	PRF-I
	Elm	Dead					Ivy			Possibly splits/bark beneath		PRF	PRF-FAR
G23B	Oak					Stem	Hole	East	1.5	Small exposed hole at eye level – inspect before removal.		PRF-I	PRF-I
G26A	Hazel						Weld in the canopy and tear out.		6				PRF-I
G26B	Ash						Rot hole/wound		5				PRF-I

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
G27		Tree climb inspected by BW. Dead elms, thick ivy, potential concealed PRF-I.								Potential concealed PRF-I.			FAR
G30A	Oak						Bat boxes			Two bat boxes		PRF-I	PRF-I
G30B	Ash	No PRFs but ivy could obscure											FAR
G31A	Elm x 2									Ivy may obscure features			FAR
G31B	Oak	Single stem					Ivy lattice	North	2	Stems latticed together			PRF-I
							Lifted bark	south	5-6	On 3 dead stems			PRF-M
G31C	Poplar						Split in branch & tear out	west	6				PRF-M

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
G98	Ash					Stem	Wound	West	12			PRF-I	PRF-I
G100 (The F & H&H)	Elm	Obscured by ivy								Trees to the north no PRFs.			FAR

THE HOLME AND THE HOMESTAL

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
T10 (off-site in proximity)	Oak	Veteran tree (exceptional for bats)	1250+		1	Limb	Wood pecker hole	South-east	5	Endoscope: Clean, dry inside		PRF-M	PRF-M
					2	Limb	Wound	East	5			PRF-M	
					3	Limb	Lifted bark	South-east	6	Lifted bark at tear out, end of torn limb			
					4	Limb	Wound, tear out	North	10				
					5	Limb	Wound	South-west	14	Wound/hole on underside of tear out		PRF-M	
					6	Limb	Wound	West	18	Wound on underside of limb in canopy		PRF-M	
					7		Tear out	North-west	15	Tear out on underside		PRF-M	
T11 (Off-site in proximity)	Oak	Mature, single-stem. Bat box on tree.	85			Limb	Wound collar	South	6				PRF-M
T12	Scots pine		78	14								PRF-M	PRF-M
T14	Oak		125		1	Limb	Wound	West	5				PRF-M

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
		Veteran tree. Very good suitability for barbastelle			2	Stem	Lifted bark, tear out	East	3-4				
					3	Limb	Hazard beam	South	3-4				
T15	Oak				1		Wound	West	5	Wound from a limb that has come off on western face		PRF-I	PRF-I
					2		Crack	North	6	Horizontal crack in dead limb on north face		PRF-I	
T16	Oak	Mature, single-stem	99	22						Multiple PRFs – bark, knot holes, tear out features		Likely PRF-I but FAR	FAR
T17	Oak	Two bat boxed on east side, one on west side			1		Split			Split in tree branch under western bat box		PRF-I	PRF-M
					2		Tear out	South-east	3	Tear out wound		PRF-M	

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
T18	Ash	Too dangerous to climb. Potential for PRF-M higher up.	50	15	1		Weld			Night roost potential	No	PRF-I	PRF- I FAR
					2		Dead stem			Base of dead stem		PRF-I	
T21	Oak	Mature single stem	98	14	1	Stem	Tear out	north	8			PRF-M	PRF-M
					2	Branch	2 x tear out	north	6			PRF-I	
					3	Stem	Pruning tear out	East	7	Dead branches, dead wood			
					4	Limb	Lifted bark	South	5	Limb stretching south		PRF-M	
					5	Stem	Ivy on stem	South	5	Could obscure PRFs		PRF-I	
T22	English oak	Twin-stem	78	12	1	Limb	Tear out with lifted bark	South-west	5			PRF-I	PRF-I
					2	Limb	Ivy						
					3		Dead peg with collar	East	3			PRF-I	
					4	Limb	Peeling bark	North-east	4				
					5	Limb	Weld	South-east	5				
					6		4 x dead peg with collar						
					7	Limb	Lifted bark	East	6				

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
					8	Limb	Weld	West	12				
T23	English oak	Single-stem PRF accessible with ladder	75	15	1	Limb	Hazard beam	West	8			PRF-M	PRF-M
					2	Stem	Collar	South-east	4			PRF	
G34E	Goat willow						Limb	North	1	Hazard beam			PRF-M
G34F	Goat Willow						Limb	North to south	4	Hazard beam			PRF-M
G34G	Goat willow						Stem	South	1	Wound			PRF-M
							Stem	North	1.5	Wound			
							Limb	North	2	Hazard beam			
G34H	Goat willow						Stem	West	0.5	Wound/basal hole			PRF-M
T37	English oak		125+	11									FAR
T43	English oak		85	15								PRF-I	FAR
T44	English oak		100	15		Stem	Compression fork	North-east	7			FAR	FAR
T45	English oak	Exceptional for bats	98			Limb	2 PRF-M	Southeast		Lifted bark at end of two peg		Very high	PRF-M

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
										branches at pruning cut and knot hole on same branch connected to lifted bark		quality tree for bats.	
							Possible 3+PRF-M			Lifted bark			
T46	English oak	Exceptional for bats	130	30	1	Limb	Knot hole	East	25				PRF-M
					2	Limb	Hollowed out stem	South	6			PRF-M	
					3	Limb	Tear out	East	5			PRF-M	
T47	English oak	Climbed and inspected by BW	80	11	1	Limb	Desiccation fissures	South	3-4m	Desiccation fissures in vertical dead limb from 3m to 4m on south side of the tree facing east. The cavity depth is only a maximum of 4cm but could host a small bat and expand in time.		PRF-I	PRF-I
					2	Branch	Cavity	North			Dead branch cavity at 5m high, north facing on a		PRF-I

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
										western extending limb. Picture taken from the east side of the tree. The entrance is 60cm long and a maximum of 4cm wide, the heart wood has evidence of gnawing, seemingly from a squirrel. The cavity extends up 2cm to a wedge apex with a slug and is otherwise exposed with a depth of 8cm. The cavity extends down 5cm with fungi sludge at the base. Otherwise dry and clear.			
T48			130	15	1	Stem	Tear out	North-east	15			FAR	PRF-M

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
	English oak	In hedgerow, west of gate. Multi-stem. Important tree in terms of bat value.			2	Stem	Wood pecker hole	East	15			FAR	
					3	Stem	Tear/wound	North	12			FAR	
					4	Stem	Knot hole	North				FAR	
					5	Limb	Tear out	South	8			FAR	
					6	Stem	Wood pecker hole	East	12	Deep hole		FAR	
					7	Stem	Tear out	East	12			FAR	
					8	Limb	Tear out		13			FAR	
T49	English oak		86	15	1	Limb	Dead peg	East	13			PRF-I	PRF-M
					2	Limb	Tear out	South	10			PRF-I	
					3	Limb	Tear out	South	10			PRF-I	
					4	Limb	Colar	North-west	10			PRF-I	
					5	Limb	Tear out	South	10			PRF-M	
					6	Limb	Tear out	West					
T50	English oak		75	14	1	Stem	Dead ivy	South-west				PRF-I	PRF-M
					2	Limb	Tear out	South-west	10			PRF-M	
					3	Limb	Colar around dead peg	West	10				
					4	Limb	Lifted bark	West	10				
T167	Goat willow						Bark	North-west	3	Holes into and under bark		PRF-I	PRF-I

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
T170	Oak	Single stem			1		Dead stem	North-west	4	Lifted bark on dead stem		PRF-I	PRF-I
					2		Dead stem	South	3			PRF-I	
T170A	Oak	Single stem					Raised bark	South					PRF-I
T171	Oak					Stem	Bark plate	West	5	Bark plate on near side of dead peg		PRF-I	PRF-I
T171A	Ash	Multi-stem				Stem	Knot hole	North	4			PRF-I	PRF-I
T171B	Oak	Multi-stem										PRF-I	PRF-I
T172	Oak	Double stem					Dead branch	South-west	4	Gap at base of dead branch		PRF-I	PRF-I
T175	Oak							North-east	5	Gaps under bark on north-east facing limb. Only one side of tree viewed.		PRF-I	PRF-I
T176	Ash	Dying. South side not inspected.					Snapped limb	North-east	4			PRF-I	PRF-I

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
T178A	Beech						Tear out			Looks exposed with a woodpecker hole – but FAR.			FAR
T181	Ash	Three stems					Snapped branch			Hole into stem from a snapped branch, could be PRF-M if it expands but unlikely		PRF-I	PRF-I
T182	Oak	Single stem. Bat box on west face					Snapped limb	North-east	3	Potential PRF on short snapped limb in a hollow on north face		PRF-M	PRF-M
T183	Oak	Dead cherry with PRF-I and two other oaks set back but still in IRZ				Limb	Pruning cut	East	5			PRF-M	PRF-M
T184	Oak	Double stem Bat box on southern trunk			1		Crack	South		Crack in deadwood into cavity on south-face of northern stem		PRF-M	PRF-M

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
					2		Raised bark	South-east				PRF-I	
T186A	Ash	Dead						North		Several holes into deadwood stem through rotten bark			PRF-M
T186	Oak							South		Under bark on dead limbs			PRF-I
T187	Oak	Single stem					Raised bark					PRF-I	PRF-I
T188	Oak	Single stem			1	Limb	Collar at pruning cut	East	7			PRF-M	PRF-M
					2	Limb	Peeling bark at dead peg	East	4			PRF-M	
					3	Limb	Crack in dead branch	West	3			PRF-M	
					4	Limb	Split	West	8			PRF-I	
T189	Oak	Multi-stem			1			South		PRFs on cut stems where bark has come away from inner wood		PRF-M	PRF-M
					2		Raised bark	South-east		A least two PRFs on dead branches under raised bark			

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
T190	Oak				1	Stem	Basal wound	West	0.5			PRF-M	PRF-M
					2	Stem	Peeling bark at dead peg	West	6			PRF-M	
					3	Limb	Hole at collar	West	5			PRF-M	
					4	Limb	Knot hole	West	18	In canopy		PRF-I	
T191	Ash (marked oak on tree schedule)				1	Stem	3 x WPH	N/NE	20	10cm diameter very good feature		PRF-M	PRF-M
					2	Limb	Wound	West	16	Upwards facing		PRF-M	
					3	2 nd stem	WPH	South	18			PRF-M	
					4	2 nd stem	Wound	South	20			PRF-M	
					5	Rear stem	WPH x 2	West	12			PRF-M	
T192	Oak	Single stem			1		Pruning cut, dead limb	East	6	Split rotten out inside		PRF-M	PRF-M
					2		Collar, dead peg	North-east	6			PRF-I	
					3		Weld			In canopy		PRF-I	
T193	English oak	Tree climb inspected by BW	98	20	1		Tear out	West				No PRF	PRF-M
					2		Hole/wound (hollow stem)			2cm diameter hole, 30 cm		PRF-M	

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
										deep, damp woody smell			
					3		Weld	East	7	Close to trunk		No PRF	
					4		Pruning cut	South-west	3.5			No PRF	
T196	Ash				1	Stem	Wound	South	0	Basal wound		PRF-M	PRF-M
					2	Stem	Wood pecker hole	South	6			PRF-M	
T196A	Oak	South of T196					Collar			Pruning cut		PRF-M	PRF-M
T196B	Oak	South of T196					Cankers					PRF-M	PRF-M
T197	Oak				1		Hole into trunk	East	2			PRF-M	PRF-M
					2		Hole	East				PRF-M	
					3		Cracked dead stem	East				PRF-M	
T198	Oak		120	27			Peeling bark, collars, small tear outs						FAR
T199	Ash		60	28			Peg, collar, tear out	West		2 x upward facing peg in canopy			FAR

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
T200	Oak		70	22			Knot hole, tear out, collars						PRF-M
T201	Oak	Tree climb inspected by BW Large pruning wound tear out with multiple PRFs.	85	20	1		Tear out	South	5	North side of tear out. Clean, dry.		PRF-M	PRF-M
					2		Knot hole	East		Facing east out of tearout. Clean, dry.		PRF-I	
					3		Basal rot	South				PRF-I	
					4		Large wound/edge of tear out					PRF-M	
T202	English oak	Crowded canopy	130	22	1		Weld	South-east				PRF-I	PRF-I
					2		Dead branch	South-east				No PRF	
					3		Pruning cuts		3	West of stem		No PRF	
					4		Weld			Potential night roost		PRF-I	
T203	Ash		64	18								FAR	FAR
T204	Ash	Tree not checked on north-west side	40, 30	18	1	Stem	Wound	North	12				PRF-M
					2	Stem	Wound	North	15				
					3	Limb	Wound	East	18				

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
					4	Limb	Knot hole	East	12	Upwards facing knot hole			
					5	Stem	Knot hole	North-east	12				
					6	Stem	Pruning tear out	South	5	Multiple splits			
					7	Stem	Knot hole	East	4	Upwards facing knot hole			
T206	Oak	Multi-stem				Limb	Split/pruning cut	East	7	Plus 2 PRF-I		PRF-M - FAR	PRF-M - FAR
T207	Ash	Single stem					Tear out split	South-west	6	Split in dead peg		PRF-I - FAR	PRF-I - FAR
T208	Oak	Single stem				Stem	Pruning cut and bark	East	3.5	Peeling bark around pruning cut		PRF-M	PRF-M
T209	Field maple	Multi-stem		12		Stem	Ivy		0.5				FAR
T210	English oak	Veteran tree, single-stem	100	20	1	Stem	Knothole	South-west	6			PRF-M	PRF-M
					2	Stem	Tear out	South-east	6				
					3	Stem	Pruning cut	South-west	7				
					4	Stem	Pruning cut	South	8				
					5	Stem	Peeling bark	West	9				

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
					6	Stem	Dead pegs	West and North	4 and 5				
					7	Stem	Peeling bark and tear out	East	6				
T211	Ash	Twin-stem, ash dieback	250,	13		Stem			6	Potential knots		PRF	FAR
		220											
T212	English oak	Single=stem. Squirrel damage.		24						Likely PRFs but non visible from ground.		FAR	FAR
T214	Ash		50	20		Limb	Weld	East	5	Possible additional features but cannot see from ground		FAR	FAR
T216	Oak	Triple stem	50, 50, 50	24						No PRF but north side not checked			FAR
T217	Field maple		25	6		Limb	Tear-out	North	5				PRF-I
T219		Tree climb inspected by BW			1	Stem	Hollow stem	North-east	1	8 cm diameter. Opening 20x10 cm goes up to 70		PRF-M	PRF- M

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
										cm out of top. Open top is shielded to limit water ingress. Mushroomy smell is faint.			
					2	Stem	Tear out					No PRF	
					3	Stem	Wound	East		Wound on top side of middle stem.		PRF-M	
					4	Stem	Wound	East		Wound higher up on east/underside		PRF-I	
					5	Stem	Tear out					PRF-I	
T221	Field maple		15	8								PRF-I	PRF-I
T222	Oak		86	16			Wound, Peeling bark	West	8	Peeling bark next to knot		PRF	PRF-I
T223	Ash	Multi-stem	60	18	1		Tear out	South-west	4.5	Southern stem below fork			PRF-I
					2		Wound	South	7	Dead branch off southern stem			
T224	Oak		80	14	1		Tear out		4				PRF-M
					2		Wound						

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
					3		Weld	East/west	4				
					4		Collar	East	5				
					5		Knot hole	East	5.5				
T225	English oak		50	14	1		Tear out	South	2.5				PRF-M
					2		Dead branch	West	2.6				
					3		Dead branch	West	3.5				
					4		Weld	East	4.5				
					5		Peeling bark/tear out	South/south-west	4.5				
T226	Oak	Two stems		15	1		Tear out	South	8				PRF-M
					2		Tear out	south	3				
T227	Oak		80	20			Tear out	East	3				PRF-M
T230	English oak		110	20	1		Pruning cut	North	4				PRF-M
					2		Collar	North-east	5.5				
					3		Tear out	West	3.5				
					4		Tear out	West	4				
					5		Hazard beam	East	6				

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
G12 (between The F & H&H)													FAR
G16	Hazel				1		Knot hole					PRF-I	PRF-I
	Elm	Dead					Ivy			Possibly splits/bark beneath		PRF	
G19A	Field maple		15	9		Stem	Split	North and south	5			PRF-I	PRF-I
G19B	Hazel	Multi-stem, coppiced. Several areas of squirrel damage.		9	1		Knothole, wound, tear out					PRF-M	PRF-M
					2		Wound with knot hole	South	1		PRF-M		
G21A	Ash					Stem	Knot holes	East		3 x knot holes		PRF	PRF_I
G21B	Cherry	Fallen, dead Limited access due to scrub	15	3.5		Stem	Lifted bark	South-east	2.5			FAR	FAR
G21C	Cherry	Small group of pollarded cherry					Welds, pruning wounds					FAR	FAR
G21D	Ash	Dieback	70	22			Wound	South-east	8			PRF	PRF-I
G21E	Cherry	Single stem	20	11			Ivy					FAR	FAR

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
G22a	English oak	Multi-stem	115	27		Stem	Pruning cut	North-east	3.5	Pruning cut on lower east stem near trunk		FAR	FAR
G22b	Ash	Single-stem. Bird box on tree.	70	15		Stem	Wound	West	1	Endoscope: dry, multichambered, dusty, clean		PRF – M	PRF-M
G22c	Field maple		30	10		Stem	Wound	West	1	Multi-chambered		PRF - M	PRF-M
G22	Oak G22a		40	20		Stem	Weld	West	4				PRF-I
	Oak		60				Splits and peeling bark	West/East	W=3m E=6m	PRF = multiple splits and peeling bark on dead limbs		PRF	FAR
	Sycamore	Dead	20			Stem	Wound	West	1.5	Clean, dry inside, 60cm long			PRF-M
	Oak		60	20			Collar	East		Collar at base of dead branch of secondary stem		FAR	FAR
G34A	Oak									NW side very obscured by scrub but no PRFs seen.			FAR

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
G34B	Ash	Multi-stemmed						SE		Knot hole		PRF-I	PRF-I
								10cm	Very low – potential night roost warm evening		PRF-I		
G34C	Oak	Two stems				Limb	Holes	SW		Small holes on dead limb			PRF-I
G34E	Goat willow					Limb	Hazard beam	N	1m				PFM-M
G34F	Goat willow					Limb	Hazard beam	North to south	4m				PFM-M
G34G	Goat willow				1	Stem	Wound	S	1			PRF-M	PRF-M
					2	Stem	Wound	N	1.5			PRF-M	
					3	Limb	Hazard beam	N	2			PRF-M	
G34H	Goat willow	2 stems				Stem	Wound	W	0.5	Basel hole/wound		PRF	FAR
G38										Covered under G95, H17, G94, and various other trees			FAR

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
G93A	Goat willow	Single stem			1		Wound	N	8	Wound in canopy		PRF-I	PRF-I
					2		Wound	E	8	Upward facing		PRF-I	
G93B	Oak	Single stem					Split	W	6	Split below dead peg			PRF-I
G94	Ash	Dead ash stems next to T193 with hanging dead elm. Mewp access required to assess for PRFs								MEWP access required			FAR
G95	Hawthorn		20	9	1		Weld	North-west	2.5				FAR
					2		Weld/fluting	East	1.5				
	Elm	View obscured by vegetation											FAR
G97	Ash		35	12	1	Limb	Tear out	East	2.5				PRF-I

Tree No.	Tree Species	Other Comments	DBH (cm)	Tree Height (m)	Feature Number	PRF Stem or Limb	PRF Type	Direction PRF Faces	PRF Height (m)	Description of PRFs	Safe to Climb	PRF Categorisation	Overall Tree Categorisation
					2		Weld	North-east/south-west	2.7				
G99 (between The F & H&H)	Oak	Mature											FAR
G100 (between The F & H&H)	Elm	Obscured by ivy								Northern trees have no PRFs. Ivy needs removal to check trees prior to removal (if removed).			FAR

APPENDIX C LOCATIONS OF INSTALLED BAT BOXES IN OPP AREA



- Wider OPA Boundary
- Bat Box Model
- 1FS
 - 2F
 - 2FN
 - Greenwoods Small Hollow
- Bird Box Model
- 1B
 - Unknown
 - Vivara sparrow box
 - Vivara starling box
- Bat Mitigation/Compensation Features
- Bat Houses

CLIENT Eastleigh Borough Council

PROJECT OHH - Ecological Constraints

TITLE Bats and Birds - Combined

SCALE @ A3 1:3,000	CREATED BY CA	CHECKED BY EH
REFERENCE 1696-004	REVISION	DATE ISSUED 16/1/2026

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APPENDIX D R STATISICAL ANALYSIS REPORT

Bat Report for 1735 2025 Static Data

Johns Associates

08 December, 2025

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1. INTRODUCTION

1.1. General Information on Bat Species Recorded

Below is a general introduction to the species recorded on the survey. Further information can be found on the Bat Conservation Trust website <https://www.bats.org.uk/about-bats/what-are-bats/uk-bats>.

Barbastelle bat *Barbastella barbastellus*

The barbastelle is a distinctive looking medium-sized bat. It has a pug-shaped nose and broad ears which join across the top of the head, and its fur is very dark with "frosted" tips. It prefers woodland, roosting in trees and hunting both beneath the canopy and over tree-tops but can also be found over rough meadows, ponds and streams.

Common pipistrelle bat *Pipistrellus pipistrellus*

Common pipistrelles are the most common and widespread of all British bat species. They are found in lots of places, including towns and cities, as well as in the countryside. They are small, and their flight is fast and jerky as they pursue small insects which they catch and eat whilst flying.

Leisler's or Noctule bats

These two bats belong to the same family, and are fairly large for a British bat. The noctule is generally one of the first bats to be seen of an evening, and they like to hunt over open ground, particularly pasture. Leisler's are more likely to be found in woodland, but they can also be found in the same places as noctules-making them hard to tell apart!

1.1.1. Myotis Species

The Myotis are a group of bats which includes Alcaethoe, Bechstein's, Brandt's, Daubenton's, Natterer's and Whiskered bats. They all make very similar sounds which mean that sometimes it is very hard to tell them apart from their recordings alone.

Nathusius' pipistrelle bat *Pipistrellus nathusii*

This bat is quite rare in the UK, though records have increased in recent years. It is migratory (with one bat recorded travelling between Bristol and Holland!) and is most commonly found in autumn, although there are now records of colonies remaining all year and breeding in the UK. It is similar in appearance to, but slightly larger than the common and soprano pipistrelles and the fur on its back is longer, sometimes giving a shaggy appearance. The Nathusius' is strongly associated with water and woodlands.

Soprano pipistrelle bat *Pipistrellus pygmaeus* The soprano pipistrelle was discovered as a different species to the common pipistrelle in the 1990s - they are very similar but they use slightly different echolocation calls and there are subtle differences in how they look. They also tend to roost and hunt in slightly different places, with the soprano pipistrelle favouring river habitat and wetland areas.

2. TABLES

Table 1: shows the number of nights that bats were detected on each recorder. Note:- *this is not the same as the number of nights that detectors were active if there were nights when no bats were detected.*

Table 2: bats are nocturnal, active at night rather than day; therefore, the surveys are reported relative to the *night* which runs from the date at sunset to dawn the following day. Table 2 gives the survey *night*, time of sunset, time of sunrise and the length in hours of each night.

Table 3: shows the total number of passes recorded for each species across all the detectors. A total of 43,385 passes was recorded.

Passes are the number of bat calls recorded by the bat detector. Individual recordings are limited to 15 seconds and multiple bat call passes may be identified within each recording. Each pass does not equate to an individual bat on each call event, i.e., multiple calls could be from an individual bat foraging back and forth.

Table 4: shows the number of bat passes at each recorder location.

Table 5: shows the number of bat passes with location and species.

Table 6: shows the total number of bat passes per month.

Table 7: shows the total Number of bat passes by location and month.

Table 8: shows the median *nightly pass rate* (bat passes per hour, per night) of each species at each recorder location. Bat pass rates are often highly variable between nights, with some nights having few or no passes and other nights having high activity. In these circumstances, the median is likely to be a more useful summary of the 'average' activity than is the mean.

Table 9: shows the median *nightly pass rate* (bat passes per hour, per night) of each species by month. Bat passes are often highly variable between nights, with some nights having few or no passes and other nights having high activity. In these circumstances, the median is likely to be a more useful summary of the 'average' activity than is the mean.

Table 10: shows the summary statistics of the *bat passes per hour* grouped by species and month.

Table 11: shows the summary statistics of the *bat passes per hour* grouped by species and Location.

Table 12: shows the summary statistics of the *bat passes per hour* by month and species.

Table 13: shows the summary statistics of the *bat passes per hour* by Location and species.

Table 14: presents the bat recordings, within the estimated emergence time, for a species to exit the roost; indicating that a roost for that species is nearby. The roost emergence times for the bat species is based on the work of Andrews; the calculation has used the upper roost emergence time as the threshold to be included in the list of bats potentially near a roost.

Table 14: presents the roost emergence times relative to sunset for the bats recorded.

Table 16: details the roost emergence time range for the bat species recorded at the site. The lower and upper columns show the roost emergence time range Andrews, in minutes, for the bat species relative to sunset; in practice the calculation for the table above only used the upper

limit, listing bats recorded before this time; any observation nearer or before sunset is likely to be a stronger indication that a roost is nearby.

Table 17: details the date Location and potential roost emergence for each species of bat.

Table 18: gives the number of bat passes each hour after sunset.

Table 19: gives the portion of bat passes through the night.

Table 62: gives small mammal registrations.

Table 63: gives the number of small mammal registrations by location and month.

Table 64: shows bird registrations.

Table 65: shows the number of bird registrations by location and month.

Table 66: shows moth registrations.

Table 66: gives the number of moth registrations by location and month.

Table 68: includes summary statistics of species and analysis probability.

Table 69: provides bat names and colours used in this report.

Table 70: provides a list of Conversion Names

Table 1: Ohh ref static data number of survey nights

Description	No. of nights
Location ST1	17
Location ST2	25
Location ST3	19
Location ST4	40
Location ST5	29

Table 2: Ohh ref static data sun times for each survey night

Night	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)
26 June 2025	21:24	04:54	7.5
27 June 2025	21:24	04:54	7.5
28 June 2025	21:24	04:55	7.5
29 June 2025	21:24	04:55	7.5
30 June 2025	21:24	04:56	7.5
01 July 2025	21:23	04:57	7.6
02 July 2025	21:23	04:57	7.6
03 July 2025	21:23	04:58	7.6
04 July 2025	21:22	04:59	7.6
05 July 2025	21:22	05:00	7.6
06 July 2025	21:21	05:01	7.7
07 July 2025	21:21	05:02	7.7
08 July 2025	21:20	05:03	7.7
09 July 2025	21:20	05:04	7.7
17 July 2025	21:13	05:13	8.0
18 July 2025	21:12	05:14	8.0
19 July 2025	21:10	05:15	8.1
20 July 2025	21:09	05:16	8.1
21 July 2025	21:08	05:18	8.2
13 August 2025	20:32	05:52	9.3
14 August 2025	20:30	05:53	9.4
15 August 2025	20:28	05:55	9.4
16 August 2025	20:26	05:56	9.5
17 August 2025	20:24	05:58	9.6
18 August 2025	20:22	05:59	9.6
19 August 2025	20:20	06:01	9.7
10 September 2025	19:33	06:35	11.0
11 September 2025	19:31	06:37	11.1
12 September 2025	19:28	06:38	11.2
13 September 2025	19:26	06:40	11.2
14 September 2025	19:24	06:41	11.3
15 September 2025	19:21	06:43	11.4
06 October 2025	18:34	07:16	12.7
07 October 2025	18:32	07:17	12.8
08 October 2025	18:29	07:19	12.8
09 October 2025	18:27	07:21	12.9
10 October 2025	18:25	07:22	13.0
11 October 2025	18:23	07:24	13.0
12 October 2025	18:21	07:26	13.1
13 October 2025	18:19	07:27	13.1
14 October 2025	18:16	07:29	13.2

Table 3: Species and number of bat passes

Scientific Name	Common Name	Count (No)	Percentage of total (%)
<i>Pipistrellus pipistrellus</i>	Common pipistrelle	39 072	90.059
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	1 356	3.126
<i>Myotis spp.</i>	Myotis	895	2.063
<i>Nyctalus spp.</i>	Noctule or Leisler's	839	1.934
<i>Barbastella barbastellus</i>	Barbastelle	452	1.042
<i>Plecotus spp.</i>	Long-eared	443	1.021
<i>Eptesicus serotinus</i>	Serotine	309	0.712
<i>Pipistrellus nathusii</i>	Nathusius pipistrelle	19	0.044

Table 4: Number of bat passes and location

Species	Location ST1	Location ST2	Location ST3	Location ST4	Location ST5
<i>Barbastella barbastellus</i>	40	388	0	0	24
<i>Eptesicus serotinus</i>	44	21	174	3	67
<i>Myotis spp.</i>	165	175	165	49	341
<i>Nyctalus spp.</i>	184	259	52	86	258
<i>Pipistrellus nathusii</i>	1	12	5	0	1
<i>Pipistrellus pipistrellus</i>	7 952	10 432	10 653	1 480	8 555
<i>Pipistrellus pygmaeus</i>	95	414	85	209	553
<i>Plecotus spp.</i>	110	108	69	63	93

Table 5: Number of bat passes with location and species

Description	<i>Barbastella barbastellus</i>	<i>Eptesicus serotinus</i>	<i>Myotis</i> spp.	<i>Nyctalus</i> spp.	<i>Pipistrellus nathusii</i>	<i>Pipistrellus pipistrellus</i>	<i>Pipistrellus pygmaeus</i>	<i>Plecotus</i> spp.
Location ST1	40	44	165	184	1	7 952	95	110
Location ST2	388	21	175	259	12	10 432	414	108
Location ST5	24	67	341	258	1	8 555	553	93
Location ST3	0	174	165	52	5	10 653	85	69
Location ST4	0	3	49	86	0	1 480	209	63

Table 6: Number of bat passes and month

Species	Jun	Jul	Aug	Sep	Oct
<i>Barbastella barbastellus</i>	1	12	92	38	309
<i>Eptesicus serotinus</i>	157	123	25	2	2
<i>Myotis spp.</i>	92	137	396	144	126
<i>Nyctalus spp.</i>	54	28	579	82	96
<i>Pipistrellus nathusii</i>	3	3	0	1	12
<i>Pipistrellus pipistrellus</i>	5 508	10 778	13 203	4 314	5 269
<i>Pipistrellus pygmaeus</i>	59	105	627	70	495
<i>Plecotus spp.</i>	56	89	172	70	56

Table 7: Number of bat passes by location and month

Description	Species	Jun	Jul	Aug	Sep	Oct
Location ST1	<i>Barbastella barbastellus</i>	1	0	12	27	0
	<i>Eptesicus serotinus</i>	39	0	3	2	0
	<i>Myotis spp.</i>	24	0	27	114	0
	<i>Nyctalus spp.</i>	14	0	101	69	0
	<i>Pipistrellus nathusii</i>	1	0	0	0	0
	<i>Pipistrellus pipistrellus</i>	2 315	0	3 075	2 562	0
	<i>Pipistrellus pygmaeus</i>	21	0	56	18	0
	<i>Plecotus spp.</i>	44	0	13	53	0
Location ST2	<i>Barbastella barbastellus</i>	0	12	71	11	294
	<i>Eptesicus serotinus</i>	0	16	4	0	1
	<i>Myotis spp.</i>	0	15	51	11	98
	<i>Nyctalus spp.</i>	0	2	172	6	79
	<i>Pipistrellus nathusii</i>	0	0	0	1	11
	<i>Pipistrellus pipistrellus</i>	0	2 743	3 576	695	3 418
	<i>Pipistrellus pygmaeus</i>	0	19	114	9	272
	<i>Plecotus spp.</i>	0	16	37	16	39
Location ST3	<i>Eptesicus serotinus</i>	115	59	0	0	0
	<i>Myotis spp.</i>	62	102	1	0	0
	<i>Nyctalus spp.</i>	34	14	4	0	0
	<i>Pipistrellus nathusii</i>	2	3	0	0	0
	<i>Pipistrellus pipistrellus</i>	3 147	7 308	198	0	0
	<i>Pipistrellus pygmaeus</i>	31	48	6	0	0
	<i>Plecotus spp.</i>	8	59	2	0	0
Location ST4	<i>Eptesicus serotinus</i>	0	3	0	0	0
	<i>Myotis spp.</i>	6	14	11	16	2
	<i>Nyctalus spp.</i>	5	10	56	7	8
	<i>Pipistrellus pipistrellus</i>	35	179	251	259	756
	<i>Pipistrellus pygmaeus</i>	7	21	66	34	81
	<i>Plecotus spp.</i>	4	12	37	1	9
Location ST5	<i>Barbastella barbastellus</i>	0	0	9	0	15
	<i>Eptesicus serotinus</i>	3	45	18	0	1
	<i>Myotis spp.</i>	0	6	306	3	26
	<i>Nyctalus spp.</i>	1	2	246	0	9
	<i>Pipistrellus nathusii</i>	0	0	0	0	1
	<i>Pipistrellus pipistrellus</i>	11	548	6 103	798	1 095
	<i>Pipistrellus pygmaeus</i>	0	17	385	9	142
	<i>Plecotus spp.</i>	0	2	83	0	8

Table 8: Median bat passes per hour by location

Species	Location ST1	Location ST2	Location ST3	Location ST4	Location ST5
<i>Barbastella barbastellus</i>	0.18	1.18	0.00	0.00	0.11
<i>Eptesicus serotinus</i>	0.44	0.26	1.72	0.20	0.17
<i>Myotis spp.</i>	0.42	0.64	0.80	0.26	2.82
<i>Nyctalus spp.</i>	0.68	0.76	0.27	0.23	1.22
<i>Pipistrellus nathusii</i>	0.13	0.12	0.13	0.00	0.08
<i>Pipistrellus pipistrellus</i>	35.04	29.32	50.78	1.61	10.16
<i>Pipistrellus pygmaeus</i>	0.63	1.35	0.40	0.54	1.92
<i>Plecotus spp.</i>	0.41	0.37	0.33	0.26	0.52

Table 9: Median bat passes per hour by month

Species	Jun	Jul	Aug	Sep	Oct
<i>Barbastella barbastellus</i>	0.13	0.78	0.64	0.27	2.51
<i>Eptesicus serotinus</i>	4.80	0.92	0.32	0.09	0.16
<i>Myotis spp.</i>	1.73	1.05	6.55	0.63	1.08
<i>Nyctalus spp.</i>	1.33	0.26	5.90	0.80	0.92
<i>Pipistrellus nathusii</i>	0.20	0.20	0.00	0.09	0.12
<i>Pipistrellus pipistrellus</i>	143.53	94.73	169.86	46.85	33.17
<i>Pipistrellus pygmaeus</i>	1.60	0.40	8.78	0.90	1.85
<i>Plecotus spp.</i>	0.67	1.30	2.27	0.99	0.39

Table 10: Summary statistics: bat pass rate (per hour) by species and month

Species	Month	Minimum	Lower Quartile (Q1)	Mean	Median	Upper Quartile (Q3)	Maximum	Standard Deviation	Number
<i>Barbastella barbastellus</i>	Jun	0.13	0.13	0.13	0.13	0.13	0.13		1
	Jul	0.39	0.58	0.78	0.78	0.97	1.17	0.55	2
	Aug	0.10	0.16	1.40	0.64	0.85	7.03	2.51	7
	Sep	0.18	0.18	0.68	0.27	0.82	1.94	0.75	5
	Oct	0.54	1.23	2.66	2.51	3.41	5.17	1.59	9
<i>Eptesicus serotinus</i>	Jun	0.80	2.93	4.18	4.80	5.58	6.77	2.35	5
	Jul	0.13	0.52	1.79	0.92	1.81	5.73	2.00	9
	Aug	0.21	0.32	0.52	0.32	0.53	1.24	0.42	5
	Sep	0.09	0.09	0.09	0.09	0.09	0.09	0.00	2
	Oct	0.16	0.16	0.16	0.16	0.16	0.16		1
<i>Myotis spp.</i>	Jun	0.80	1.07	2.45	1.73	1.99	6.66	2.40	5
	Jul	0.12	0.59	1.79	1.05	1.58	5.86	2.07	10
	Aug	3.77	4.84	5.95	6.55	7.12	7.44	1.51	7
	Sep	0.35	0.40	2.12	0.63	1.12	9.51	3.63	6
	Oct	0.08	0.60	1.22	1.08	1.55	3.23	0.98	8
<i>Nyctalus spp.</i>	Jun	0.80	0.93	1.44	1.33	1.87	2.27	0.62	5
	Jul	0.13	0.13	0.33	0.26	0.46	0.75	0.22	11
	Aug	1.78	3.56	8.74	5.90	9.11	28.17	9.11	7
	Sep	0.18	0.65	1.22	0.80	1.17	3.61	1.23	6
	Oct	0.23	0.53	0.93	0.92	1.23	1.89	0.54	8
<i>Pipistrellus nathusii</i>	Jun	0.13	0.17	0.20	0.20	0.23	0.27	0.09	2
	Jul	0.13	0.16	0.20	0.20	0.23	0.26	0.09	2
	Sep	0.09	0.09	0.09	0.09	0.09	0.09		1
	Oct	0.08	0.08	0.23	0.12	0.27	0.62	0.26	4
<i>Pipistrellus pipistrellus</i>	Jun	53.83	122.85	146.72	143.53	176.69	236.69	67.46	5
	Jul	0.37	14.89	100.60	94.73	170.91	270.45	92.39	14
	Aug	94.95	158.78	199.21	169.86	249.53	313.02	75.77	7
	Sep	15.67	21.75	63.83	46.85	102.86	138.67	52.53	6
	Oct	1.21	4.07	45.66	33.17	70.74	157.00	51.52	9
<i>Pipistrellus pygmaeus</i>	Jun	1.33	1.43	1.96	1.60	2.13	3.32	0.92	4
	Jul	0.13	0.32	1.24	0.40	0.96	4.95	1.72	11
	Aug	5.47	5.84	9.44	8.78	12.69	14.73	3.91	7
	Sep	0.62	0.72	1.04	0.90	1.41	1.58	0.43	6
	Oct	0.15	1.54	4.29	1.85	3.20	20.00	6.26	9
<i>Plecotus spp.</i>	Jun	0.13	0.66	1.49	0.67	2.66	3.33	1.41	5
	Jul	0.13	0.53	1.30	1.30	2.09	2.51	0.92	9
	Aug	1.67	2.04	2.59	2.27	3.25	3.62	0.77	7

Species	Month	Minimum	Lower Quartile (Q1)	Mean	Median	Upper Quartile (Q3)	Maximum	Standard Deviation	Number
	Sep	0.27	0.51	1.04	0.99	1.12	2.47	0.79	6
	Oct	0.15	0.27	0.55	0.39	0.70	1.26	0.44	8

Table 11: Summary statistics: bat pass rate (per hour) grouped by species and location

Species	Location	Minimum	Lower Quartile (Q1)	Mean	Median	Upper Quartile (Q3)	Maximum	Standard Deviation	Number
<i>Barbastella barbastellus</i>	Location ST1	0.09	0.12	0.54	0.18	0.68	1.94	0.73	7
	Location ST2	0.18	0.54	1.93	1.18	2.51	5.75	1.78	17
	Location ST5	0.10	0.11	0.30	0.11	0.26	1.18	0.40	7
<i>Eptesicus serotinus</i>	Location ST1	0.09	0.10	0.71	0.44	0.90	2.53	0.84	8
	Location ST2	0.08	0.11	0.51	0.26	0.32	1.81	0.73	5
	Location ST3	0.13	0.63	2.31	1.72	3.71	6.63	2.19	10
	Location ST4	0.13	0.16	0.20	0.20	0.23	0.26	0.09	2
	Location ST5	0.08	0.13	0.82	0.17	0.29	5.73	1.75	10
<i>Myotis spp.</i>	Location ST1	0.18	0.21	1.24	0.42	1.20	9.07	2.41	13
	Location ST2	0.08	0.38	0.80	0.64	1.23	2.36	0.61	20
	Location ST3	0.10	0.27	1.67	0.80	1.72	5.09	1.88	13
	Location ST4	0.08	0.12	0.23	0.26	0.27	0.53	0.14	23
	Location ST5	0.08	1.14	3.20	2.82	5.45	7.44	2.61	11
<i>Nyctalus spp.</i>	Location ST1	0.13	0.27	1.17	0.68	1.56	3.61	1.18	16
	Location ST2	0.13	0.27	1.48	0.76	1.08	12.18	2.83	17
	Location ST3	0.13	0.15	0.49	0.27	0.53	2.00	0.53	14
	Location ST4	0.08	0.15	0.43	0.23	0.42	2.75	0.61	21
	Location ST5	0.13	0.71	2.70	1.22	4.12	9.74	3.22	10
<i>Pipistrellus nathusii</i>	Location ST1	0.13	0.13	0.13	0.13	0.13	0.13		1
	Location ST2	0.08	0.09	0.24	0.12	0.27	0.62	0.26	4
	Location ST3	0.13	0.13	0.16	0.13	0.17	0.26	0.06	4
	Location ST5	0.08	0.08	0.08	0.08	0.08	0.08		1
<i>Pipistrellus pipistrellus</i>	Location ST1	2.26	7.58	50.70	35.04	54.12	210.56	60.50	17
	Location ST2	0.37	3.69	42.48	29.32	58.99	169.78	48.80	25
	Location ST3	0.96	3.89	73.64	50.78	123.34	222.86	73.74	19
	Location ST4	0.37	0.78	3.58	1.61	4.43	40.00	6.55	38
	Location ST5	0.13	0.40	31.11	10.16	48.81	127.07	41.55	28
<i>Pipistrellus pygmaeus</i>	Location ST1	0.09	0.25	0.64	0.63	0.80	2.13	0.51	16
	Location ST2	0.09	0.24	1.83	1.35	2.25	6.78	2.22	20
	Location ST3	0.13	0.30	0.92	0.40	0.81	3.84	1.21	12
	Location ST4	0.13	0.37	0.69	0.54	0.91	2.83	0.54	29
	Location ST5	0.13	0.27	3.42	1.92	4.92	12.21	3.92	16
<i>Plecotus spp.</i>	Location ST1	0.09	0.24	0.85	0.41	0.90	3.07	0.98	14
	Location ST2	0.09	0.26	0.52	0.37	0.56	2.13	0.49	20
	Location ST3	0.13	0.19	0.75	0.33	0.95	2.51	0.85	12
	Location ST4	0.08	0.15	0.36	0.26	0.48	1.05	0.29	19
	Location ST5	0.13	0.29	0.88	0.52	1.46	2.04	0.77	11

Table 12: Summary statistics: bat pass rate (per hour) grouped by month and species

Month	Species	Minimum	Lower Quartile (Q1)	Mean	Median	Upper Quartile (Q3)	Maximum	Standard Deviation	Number
Jun	<i>Barbastella barbastellus</i>	0.13	0.13	0.13	0.13	0.13	0.13		1
	<i>Eptesicus serotinus</i>	0.80	2.93	4.18	4.80	5.58	6.77	2.35	5
	<i>Myotis spp.</i>	0.80	1.07	2.45	1.73	1.99	6.66	2.40	5
	<i>Nyctalus spp.</i>	0.80	0.93	1.44	1.33	1.87	2.27	0.62	5
	<i>Pipistrellus nathusii</i>	0.13	0.17	0.20	0.20	0.23	0.27	0.09	2
	<i>Pipistrellus pipistrellus</i>	53.83	122.85	146.72	143.53	176.69	236.69	67.46	5
	<i>Pipistrellus pygmaeus</i>	1.33	1.43	1.96	1.60	2.13	3.32	0.92	4
	<i>Plecotus spp.</i>	0.13	0.66	1.49	0.67	2.66	3.33	1.41	5
Jul	<i>Barbastella barbastellus</i>	0.39	0.58	0.78	0.78	0.97	1.17	0.55	2
	<i>Eptesicus serotinus</i>	0.13	0.52	1.79	0.92	1.81	5.73	2.00	9
	<i>Myotis spp.</i>	0.12	0.59	1.79	1.05	1.58	5.86	2.07	10
	<i>Nyctalus spp.</i>	0.13	0.13	0.33	0.26	0.46	0.75	0.22	11
	<i>Pipistrellus nathusii</i>	0.13	0.16	0.20	0.20	0.23	0.26	0.09	2
	<i>Pipistrellus pipistrellus</i>	0.37	14.89	100.60	94.73	170.91	270.45	92.39	14
	<i>Pipistrellus pygmaeus</i>	0.13	0.32	1.24	0.40	0.96	4.95	1.72	11
	<i>Plecotus spp.</i>	0.13	0.53	1.30	1.30	2.09	2.51	0.92	9
Aug	<i>Barbastella barbastellus</i>	0.10	0.16	1.40	0.64	0.85	7.03	2.51	7
	<i>Eptesicus serotinus</i>	0.21	0.32	0.52	0.32	0.53	1.24	0.42	5
	<i>Myotis spp.</i>	3.77	4.84	5.95	6.55	7.12	7.44	1.51	7
	<i>Nyctalus spp.</i>	1.78	3.56	8.74	5.90	9.11	28.17	9.11	7
	<i>Pipistrellus pipistrellus</i>	94.95	158.78	199.21	169.86	249.53	313.02	75.77	7
	<i>Pipistrellus pygmaeus</i>	5.47	5.84	9.44	8.78	12.69	14.73	3.91	7
	<i>Plecotus spp.</i>	1.67	2.04	2.59	2.27	3.25	3.62	0.77	7
Sep	<i>Barbastella barbastellus</i>	0.18	0.18	0.68	0.27	0.82	1.94	0.75	5
	<i>Eptesicus serotinus</i>	0.09	0.09	0.09	0.09	0.09	0.09	0.00	2
	<i>Myotis spp.</i>	0.35	0.40	2.12	0.63	1.12	9.51	3.63	6
	<i>Nyctalus spp.</i>	0.18	0.65	1.22	0.80	1.17	3.61	1.23	6
	<i>Pipistrellus nathusii</i>	0.09	0.09	0.09	0.09	0.09	0.09		1
	<i>Pipistrellus pipistrellus</i>	15.67	21.75	63.83	46.85	102.86	138.67	52.53	6
	<i>Pipistrellus pygmaeus</i>	0.62	0.72	1.04	0.90	1.41	1.58	0.43	6
	<i>Plecotus spp.</i>	0.27	0.51	1.04	0.99	1.12	2.47	0.79	6
Oct	<i>Barbastella barbastellus</i>	0.54	1.23	2.66	2.51	3.41	5.17	1.59	9
	<i>Eptesicus serotinus</i>	0.16	0.16	0.16	0.16	0.16	0.16		1
	<i>Myotis spp.</i>	0.08	0.60	1.22	1.08	1.55	3.23	0.98	8
	<i>Nyctalus spp.</i>	0.23	0.53	0.93	0.92	1.23	1.89	0.54	8
	<i>Pipistrellus nathusii</i>	0.08	0.08	0.23	0.12	0.27	0.62	0.26	4
	<i>Pipistrellus pipistrellus</i>	1.21	4.07	45.66	33.17	70.74	157.00	51.52	9

Month	Species	Minimum	Lower Quartile (Q1)	Mean	Median	Upper Quartile (Q3)	Maximum	Standard Deviation	Number
	<i>Pipistrellus pygmaeus</i>	0.15	1.54	4.29	1.85	3.20	20.00	6.26	9
	<i>Plecotus</i> spp.	0.15	0.27	0.55	0.39	0.70	1.26	0.44	8

Table 13: Summary statistics: bat pass rate (per hour) grouped by location and species

Location	Species	Minimum	Lower Quartile (Q1)	Mean	Median	Upper Quartile (Q3)	Maximum	Standard Deviation	Number
Location ST1	<i>Barbastella barbastellus</i>	0.09	0.12	0.54	0.18	0.68	1.94	0.73	7
	<i>Eptesicus serotinus</i>	0.09	0.10	0.71	0.44	0.90	2.53	0.84	8
	<i>Myotis spp.</i>	0.18	0.21	1.24	0.42	1.20	9.07	2.41	13
	<i>Nyctalus spp.</i>	0.13	0.27	1.17	0.68	1.56	3.61	1.18	16
	<i>Pipistrellus nathusii</i>	0.13	0.13	0.13	0.13	0.13	0.13		1
	<i>Pipistrellus pipistrellus</i>	2.26	7.58	50.70	35.04	54.12	210.56	60.50	17
	<i>Pipistrellus pygmaeus</i>	0.09	0.25	0.64	0.63	0.80	2.13	0.51	16
	<i>Plecotus spp.</i>	0.09	0.24	0.85	0.41	0.90	3.07	0.98	14
Location ST2	<i>Barbastella barbastellus</i>	0.18	0.54	1.93	1.18	2.51	5.75	1.78	17
	<i>Eptesicus serotinus</i>	0.08	0.11	0.51	0.26	0.32	1.81	0.73	5
	<i>Myotis spp.</i>	0.08	0.38	0.80	0.64	1.23	2.36	0.61	20
	<i>Nyctalus spp.</i>	0.13	0.27	1.48	0.76	1.08	12.18	2.83	17
	<i>Pipistrellus nathusii</i>	0.08	0.09	0.24	0.12	0.27	0.62	0.26	4
	<i>Pipistrellus pipistrellus</i>	0.37	3.69	42.48	29.32	58.99	169.78	48.80	25
	<i>Pipistrellus pygmaeus</i>	0.09	0.24	1.83	1.35	2.25	6.78	2.22	20
	<i>Plecotus spp.</i>	0.09	0.26	0.52	0.37	0.56	2.13	0.49	20
Location ST3	<i>Eptesicus serotinus</i>	0.13	0.63	2.31	1.72	3.71	6.63	2.19	10
	<i>Myotis spp.</i>	0.10	0.27	1.67	0.80	1.72	5.09	1.88	13
	<i>Nyctalus spp.</i>	0.13	0.15	0.49	0.27	0.53	2.00	0.53	14
	<i>Pipistrellus nathusii</i>	0.13	0.13	0.16	0.13	0.17	0.26	0.06	4
	<i>Pipistrellus pipistrellus</i>	0.96	3.89	73.64	50.78	123.34	222.86	73.74	19
	<i>Pipistrellus pygmaeus</i>	0.13	0.30	0.92	0.40	0.81	3.84	1.21	12
	<i>Plecotus spp.</i>	0.13	0.19	0.75	0.33	0.95	2.51	0.85	12
Location ST4	<i>Eptesicus serotinus</i>	0.13	0.16	0.20	0.20	0.23	0.26	0.09	2
	<i>Myotis spp.</i>	0.08	0.12	0.23	0.26	0.27	0.53	0.14	23
	<i>Nyctalus spp.</i>	0.08	0.15	0.43	0.23	0.42	2.75	0.61	21
	<i>Pipistrellus pipistrellus</i>	0.37	0.78	3.58	1.61	4.43	40.00	6.55	38
	<i>Pipistrellus pygmaeus</i>	0.13	0.37	0.69	0.54	0.91	2.83	0.54	29
	<i>Plecotus spp.</i>	0.08	0.15	0.36	0.26	0.48	1.05	0.29	19
Location ST5	<i>Barbastella barbastellus</i>	0.10	0.11	0.30	0.11	0.26	1.18	0.40	7
	<i>Eptesicus serotinus</i>	0.08	0.13	0.82	0.17	0.29	5.73	1.75	10
	<i>Myotis spp.</i>	0.08	1.14	3.20	2.82	5.45	7.44	2.61	11
	<i>Nyctalus spp.</i>	0.13	0.71	2.70	1.22	4.12	9.74	3.22	10
	<i>Pipistrellus nathusii</i>	0.08	0.08	0.08	0.08	0.08	0.08		1
	<i>Pipistrellus pipistrellus</i>	0.13	0.40	31.11	10.16	48.81	127.07	41.55	28
	<i>Pipistrellus pygmaeus</i>	0.13	0.27	3.42	1.92	4.92	12.21	3.92	16
	<i>Plecotus spp.</i>	0.13	0.29	0.88	0.52	1.46	2.04	0.77	11

Table 14: Locations near a bat roost

Location	Bat Species	Bat Passes Near Roost
Location ST1	<i>Myotis spp.</i>	18
	<i>Nyctalus spp.</i>	8
	<i>Pipistrellus pipistrellus</i>	616
	<i>Pipistrellus pygmaeus</i>	13
	<i>Plecotus spp.</i>	27
Location ST2	<i>Barbastella barbastellus</i>	1
	<i>Myotis spp.</i>	53
	<i>Nyctalus spp.</i>	22
	<i>Pipistrellus pipistrellus</i>	2 400
	<i>Pipistrellus pygmaeus</i>	77
Location ST3	<i>Plecotus spp.</i>	20
	<i>Myotis spp.</i>	7
	<i>Pipistrellus nathusii</i>	2
	<i>Pipistrellus pipistrellus</i>	841
	<i>Pipistrellus pygmaeus</i>	6
Location ST4	<i>Plecotus spp.</i>	7
	<i>Eptesicus serotinus</i>	3
	<i>Myotis spp.</i>	24
	<i>Nyctalus spp.</i>	4
	<i>Pipistrellus pipistrellus</i>	208
Location ST5	<i>Pipistrellus pygmaeus</i>	41
	<i>Plecotus spp.</i>	24
	<i>Myotis spp.</i>	114
	<i>Nyctalus spp.</i>	20
	<i>Pipistrellus nathusii</i>	1
Location ST5	<i>Pipistrellus pipistrellus</i>	1 525
	<i>Pipistrellus pygmaeus</i>	100
	<i>Plecotus spp.</i>	18

Roost emergence times used are from (Andrews and Pearson, 2022)

Table 15: Roost emergence times relative to sunset for the bats recorded

Species	First Emergence (mins)	Last Emergence (mins)	Mean Emergence (mins)
<i>Myotis spp.</i>	-16.4	85.0	40.20
<i>Nyctalus spp.</i>	-16.0	31.0	7.00
<i>Pipistrellus pipistrellus</i>	6.9	42.7	24.80
<i>Pipistrellus pygmaeus</i>	12.0	47.0	31.00
<i>Plecotus spp.</i>	20.0	94.0	34.25
<i>Barbastella barbastellus</i>	17.1	30.9	24.00
<i>Pipistrellus nathusii</i>	11.0	50.0	30.00
<i>Eptesicus serotinus</i>	3.9	19.3	11.60

Species	First Emergence (mins)	Last Emergence (mins)	Mean Emergence (mins)
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Roost emergence times used are from (Andrews and Pearson, 2022)

Time between First and Last are where 95% of recordings occurred

Table 16: Roost emergence times relative to sunset from (Andrews and Pearson, 2022)

Species	First Emergence (mins)	Last Emergence (mins)	Mean Emergence (mins)
<i>Barbastella barbastellus</i>	17.1	30.9	24.00
<i>Eptesicus serotinus</i>	3.9	19.3	11.60
<i>Myotis bechsteinii</i>			51.50
<i>Myotis alcaethoe</i>	-16.4	14.3	1.10
<i>Myotis brandtii</i>	18.0	30.9	24.50
<i>Myotis daubentonii</i>	16.0	85.0	47.60
<i>Myotis mystacinus</i>			32.80
<i>Myotis nattereri</i>	22.0	57.7	54.00
<i>Nyctalus leisleri</i>	8.3	26.9	18.60
<i>Nyctalus noctula</i>	-16.0	31.0	7.00
<i>Pipistrellus nathusii</i>	11.0	50.0	30.00
<i>Pipistrellus pipistrellus</i>	6.9	42.7	24.80
<i>Pipistrellus pygmaeus</i>	12.0	47.0	31.00
<i>Plecotus austriacus</i>	20.0	52.0	37.50
<i>Plecotus auritus</i>	28.0	94.0	61.00
<i>Rhinolophus ferrumequinum</i>	11.0	45.0	26.00
<i>Rhinolophus hipposideros</i>	14.0	58.0	30.50
<i>Myotis spp.</i>	-16.4	85.0	40.20
<i>Nyctalus spp.</i>	-16.0	31.0	7.00
<i>Plecotus spp.</i>	20.0	94.0	34.25
<i>Pipistrellus spp.</i>	6.9	55.0	28.60

Roost emergence times used are from (Andrews and Pearson, 2022)

Time between First and Last are where 95% of recordings occurred

Table 17: Locations, survey date and roost emergence

Location	Night	Bat Species	Pass Near Roost (No.)
Location ST1	26 Jun 2025	<i>Myotis</i> spp.	2
	27 Jun 2025	<i>Myotis</i> spp.	1
	27 Jun 2025	<i>Pipistrellus pipistrellus</i>	10
	27 Jun 2025	<i>Plecotus</i> spp.	1
	28 Jun 2025	<i>Myotis</i> spp.	1
	28 Jun 2025	<i>Pipistrellus pipistrellus</i>	1
	29 Jun 2025	<i>Pipistrellus pipistrellus</i>	1
	13 Aug 2025	<i>Nyctalus</i> spp.	7
	13 Aug 2025	<i>Pipistrellus pipistrellus</i>	100
	13 Aug 2025	<i>Pipistrellus pygmaeus</i>	1
	14 Aug 2025	<i>Pipistrellus pipistrellus</i>	33
	15 Aug 2025	<i>Pipistrellus pipistrellus</i>	10
	16 Aug 2025	<i>Nyctalus</i> spp.	1
	16 Aug 2025	<i>Pipistrellus pipistrellus</i>	9
	17 Aug 2025	<i>Myotis</i> spp.	2
	17 Aug 2025	<i>Pipistrellus pipistrellus</i>	73
	17 Aug 2025	<i>Pipistrellus pygmaeus</i>	1
	18 Aug 2025	<i>Myotis</i> spp.	2
	18 Aug 2025	<i>Pipistrellus pipistrellus</i>	174
	18 Aug 2025	<i>Pipistrellus pygmaeus</i>	1
	19 Aug 2025	<i>Pipistrellus pipistrellus</i>	13
	19 Aug 2025	<i>Pipistrellus pygmaeus</i>	1
	10 Sep 2025	<i>Pipistrellus pipistrellus</i>	34
	10 Sep 2025	<i>Pipistrellus pygmaeus</i>	1
	10 Sep 2025	<i>Plecotus</i> spp.	1
	11 Sep 2025	<i>Pipistrellus pipistrellus</i>	9
	11 Sep 2025	<i>Pipistrellus pygmaeus</i>	3
	11 Sep 2025	<i>Plecotus</i> spp.	5
	12 Sep 2025	<i>Myotis</i> spp.	4
	12 Sep 2025	<i>Pipistrellus pipistrellus</i>	57
	12 Sep 2025	<i>Pipistrellus pygmaeus</i>	1
	12 Sep 2025	<i>Plecotus</i> spp.	3
	13 Sep 2025	<i>Myotis</i> spp.	1
	13 Sep 2025	<i>Pipistrellus pipistrellus</i>	27
	13 Sep 2025	<i>Pipistrellus pygmaeus</i>	1
	13 Sep 2025	<i>Plecotus</i> spp.	3
	15 Sep 2025	<i>Myotis</i> spp.	5
	15 Sep 2025	<i>Pipistrellus pipistrellus</i>	65
	15 Sep 2025	<i>Pipistrellus pygmaeus</i>	3
	15 Sep 2025	<i>Plecotus</i> spp.	14
Location ST2	08 Jul 2025	<i>Myotis</i> spp.	1
	08 Jul 2025	<i>Pipistrellus pipistrellus</i>	108

Location	Night	Bat Species	Pass Near Roost (No.)
	09 Jul 2025	<i>Myotis</i> spp.	1
	09 Jul 2025	<i>Pipistrellus pipistrellus</i>	178
	21 Jul 2025	<i>Pipistrellus pipistrellus</i>	2
	13 Aug 2025	<i>Myotis</i> spp.	9
	13 Aug 2025	<i>Nyctalus</i> spp.	4
	13 Aug 2025	<i>Pipistrellus pipistrellus</i>	26
	13 Aug 2025	<i>Pipistrellus pygmaeus</i>	2
	14 Aug 2025	<i>Myotis</i> spp.	1
	14 Aug 2025	<i>Pipistrellus pipistrellus</i>	340
	14 Aug 2025	<i>Plecotus</i> spp.	1
	15 Aug 2025	<i>Myotis</i> spp.	5
	15 Aug 2025	<i>Nyctalus</i> spp.	8
	15 Aug 2025	<i>Pipistrellus pipistrellus</i>	206
	15 Aug 2025	<i>Pipistrellus pygmaeus</i>	25
	15 Aug 2025	<i>Plecotus</i> spp.	2
	16 Aug 2025	<i>Pipistrellus pipistrellus</i>	366
	17 Aug 2025	<i>Pipistrellus pipistrellus</i>	200
	10 Sep 2025	<i>Myotis</i> spp.	1
	10 Sep 2025	<i>Pipistrellus pipistrellus</i>	5
	10 Sep 2025	<i>Pipistrellus pygmaeus</i>	2
	11 Sep 2025	<i>Pipistrellus pipistrellus</i>	9
	12 Sep 2025	<i>Myotis</i> spp.	1
	12 Sep 2025	<i>Pipistrellus pipistrellus</i>	6
	13 Sep 2025	<i>Pipistrellus pipistrellus</i>	13
	13 Sep 2025	<i>Plecotus</i> spp.	1
	15 Sep 2025	<i>Myotis</i> spp.	1
	15 Sep 2025	<i>Pipistrellus pipistrellus</i>	91
	06 Oct 2025	<i>Myotis</i> spp.	6
	06 Oct 2025	<i>Pipistrellus pipistrellus</i>	246
	06 Oct 2025	<i>Pipistrellus pygmaeus</i>	16
	06 Oct 2025	<i>Plecotus</i> spp.	4
	07 Oct 2025	<i>Myotis</i> spp.	3
	07 Oct 2025	<i>Pipistrellus pipistrellus</i>	156
	07 Oct 2025	<i>Pipistrellus pygmaeus</i>	2
	07 Oct 2025	<i>Plecotus</i> spp.	9
	08 Oct 2025	<i>Myotis</i> spp.	1
	08 Oct 2025	<i>Pipistrellus pipistrellus</i>	32
	09 Oct 2025	<i>Myotis</i> spp.	16
	09 Oct 2025	<i>Nyctalus</i> spp.	3
	09 Oct 2025	<i>Pipistrellus pipistrellus</i>	198
	09 Oct 2025	<i>Pipistrellus pygmaeus</i>	2
	10 Oct 2025	<i>Barbastella barbastellus</i>	1
	10 Oct 2025	<i>Myotis</i> spp.	1

Location	Night	Bat Species	Pass Near Roost (No.)
	10 Oct 2025	<i>Pipistrellus pipistrellus</i>	25
	10 Oct 2025	<i>Pipistrellus pygmaeus</i>	2
	11 Oct 2025	<i>Pipistrellus pipistrellus</i>	46
	11 Oct 2025	<i>Pipistrellus pygmaeus</i>	14
	11 Oct 2025	<i>Plecotus spp.</i>	2
	12 Oct 2025	<i>Myotis spp.</i>	1
	13 Oct 2025	<i>Myotis spp.</i>	4
	13 Oct 2025	<i>Nyctalus spp.</i>	7
	13 Oct 2025	<i>Pipistrellus pipistrellus</i>	138
	13 Oct 2025	<i>Pipistrellus pygmaeus</i>	12
	13 Oct 2025	<i>Plecotus spp.</i>	1
	14 Oct 2025	<i>Myotis spp.</i>	1
	14 Oct 2025	<i>Pipistrellus pipistrellus</i>	9
Location ST3	26 Jun 2025	<i>Pipistrellus pipistrellus</i>	47
	26 Jun 2025	<i>Pipistrellus pygmaeus</i>	3
	28 Jun 2025	<i>Myotis spp.</i>	1
	28 Jun 2025	<i>Pipistrellus nathusii</i>	1
	28 Jun 2025	<i>Pipistrellus pipistrellus</i>	123
	29 Jun 2025	<i>Myotis spp.</i>	1
	29 Jun 2025	<i>Pipistrellus pipistrellus</i>	82
	30 Jun 2025	<i>Pipistrellus pipistrellus</i>	143
	30 Jun 2025	<i>Plecotus spp.</i>	1
	01 Jul 2025	<i>Pipistrellus nathusii</i>	1
	01 Jul 2025	<i>Pipistrellus pipistrellus</i>	111
	02 Jul 2025	<i>Myotis spp.</i>	1
	02 Jul 2025	<i>Pipistrellus pipistrellus</i>	88
	02 Jul 2025	<i>Plecotus spp.</i>	2
	03 Jul 2025	<i>Myotis spp.</i>	1
	03 Jul 2025	<i>Pipistrellus pipistrellus</i>	48
	04 Jul 2025	<i>Pipistrellus pipistrellus</i>	34
	05 Jul 2025	<i>Pipistrellus pipistrellus</i>	31
	06 Jul 2025	<i>Pipistrellus pipistrellus</i>	14
	06 Jul 2025	<i>Plecotus spp.</i>	1
	07 Jul 2025	<i>Myotis spp.</i>	3
	07 Jul 2025	<i>Pipistrellus pipistrellus</i>	110
	07 Jul 2025	<i>Plecotus spp.</i>	1
	13 Aug 2025	<i>Pipistrellus pipistrellus</i>	6
	13 Aug 2025	<i>Pipistrellus pygmaeus</i>	3
	16 Aug 2025	<i>Plecotus spp.</i>	2
	17 Aug 2025	<i>Pipistrellus pipistrellus</i>	3
	18 Aug 2025	<i>Pipistrellus pipistrellus</i>	1
Location ST4	26 Jun 2025	<i>Pipistrellus pipistrellus</i>	3
	27 Jun 2025	<i>Plecotus spp.</i>	1

Location	Night	Bat Species	Pass Near Roost (No.)
	28 Jun 2025	<i>Myotis</i> spp.	4
	28 Jun 2025	<i>Pipistrellus pipistrellus</i>	6
	28 Jun 2025	<i>Pipistrellus pygmaeus</i>	3
	28 Jun 2025	<i>Plecotus</i> spp.	2
	30 Jun 2025	<i>Myotis</i> spp.	2
	30 Jun 2025	<i>Pipistrellus pipistrellus</i>	8
	30 Jun 2025	<i>Plecotus</i> spp.	1
	01 Jul 2025	<i>Eptesicus serotinus</i>	1
	01 Jul 2025	<i>Myotis</i> spp.	1
	01 Jul 2025	<i>Pipistrellus pipistrellus</i>	4
	01 Jul 2025	<i>Pipistrellus pygmaeus</i>	3
	02 Jul 2025	<i>Myotis</i> spp.	2
	02 Jul 2025	<i>Pipistrellus pipistrellus</i>	6
	03 Jul 2025	<i>Plecotus</i> spp.	1
	04 Jul 2025	<i>Myotis</i> spp.	2
	04 Jul 2025	<i>Nyctalus</i> spp.	1
	04 Jul 2025	<i>Pipistrellus pipistrellus</i>	5
	04 Jul 2025	<i>Plecotus</i> spp.	2
	05 Jul 2025	<i>Pipistrellus pipistrellus</i>	5
	05 Jul 2025	<i>Pipistrellus pygmaeus</i>	1
	06 Jul 2025	<i>Myotis</i> spp.	2
	06 Jul 2025	<i>Plecotus</i> spp.	5
	07 Jul 2025	<i>Myotis</i> spp.	1
	07 Jul 2025	<i>Pipistrellus pipistrellus</i>	1
	08 Jul 2025	<i>Eptesicus serotinus</i>	2
	08 Jul 2025	<i>Myotis</i> spp.	1
	08 Jul 2025	<i>Plecotus</i> spp.	2
	09 Jul 2025	<i>Myotis</i> spp.	3
	09 Jul 2025	<i>Pipistrellus pipistrellus</i>	3
	09 Jul 2025	<i>Pipistrellus pygmaeus</i>	3
	09 Jul 2025	<i>Plecotus</i> spp.	2
	18 Jul 2025	<i>Pipistrellus pipistrellus</i>	2
	19 Jul 2025	<i>Pipistrellus pipistrellus</i>	1
	19 Jul 2025	<i>Pipistrellus pygmaeus</i>	2
	21 Jul 2025	<i>Pipistrellus pipistrellus</i>	2
	13 Aug 2025	<i>Pipistrellus pipistrellus</i>	2
	13 Aug 2025	<i>Pipistrellus pygmaeus</i>	4
	14 Aug 2025	<i>Pipistrellus pipistrellus</i>	3
	16 Aug 2025	<i>Nyctalus</i> spp.	1
	16 Aug 2025	<i>Plecotus</i> spp.	1
	17 Aug 2025	<i>Plecotus</i> spp.	4
	19 Aug 2025	<i>Nyctalus</i> spp.	1
	19 Aug 2025	<i>Pipistrellus pipistrellus</i>	5

Location	Night	Bat Species	Pass Near Roost (No.)
	10 Sep 2025	<i>Myotis</i> spp.	1
	10 Sep 2025	<i>Pipistrellus pipistrellus</i>	15
	10 Sep 2025	<i>Pipistrellus pygmaeus</i>	3
	11 Sep 2025	<i>Myotis</i> spp.	1
	11 Sep 2025	<i>Pipistrellus pipistrellus</i>	7
	11 Sep 2025	<i>Pipistrellus pygmaeus</i>	2
	12 Sep 2025	<i>Myotis</i> spp.	3
	12 Sep 2025	<i>Nyctalus</i> spp.	1
	12 Sep 2025	<i>Pipistrellus pipistrellus</i>	35
	12 Sep 2025	<i>Pipistrellus pygmaeus</i>	5
	14 Sep 2025	<i>Pipistrellus pipistrellus</i>	22
	14 Sep 2025	<i>Pipistrellus pygmaeus</i>	2
	15 Sep 2025	<i>Myotis</i> spp.	1
	15 Sep 2025	<i>Pipistrellus pipistrellus</i>	7
	15 Sep 2025	<i>Pipistrellus pygmaeus</i>	2
	06 Oct 2025	<i>Pipistrellus pipistrellus</i>	3
	06 Oct 2025	<i>Pipistrellus pygmaeus</i>	3
	07 Oct 2025	<i>Pipistrellus pipistrellus</i>	7
	07 Oct 2025	<i>Pipistrellus pygmaeus</i>	2
	07 Oct 2025	<i>Plecotus</i> spp.	2
	08 Oct 2025	<i>Pipistrellus pipistrellus</i>	22
	08 Oct 2025	<i>Pipistrellus pygmaeus</i>	2
	08 Oct 2025	<i>Plecotus</i> spp.	1
	09 Oct 2025	<i>Pipistrellus pipistrellus</i>	4
	09 Oct 2025	<i>Pipistrellus pygmaeus</i>	3
	10 Oct 2025	<i>Pipistrellus pipistrellus</i>	9
	11 Oct 2025	<i>Pipistrellus pipistrellus</i>	4
	12 Oct 2025	<i>Pipistrellus pipistrellus</i>	1
	13 Oct 2025	<i>Pipistrellus pipistrellus</i>	10
	13 Oct 2025	<i>Pipistrellus pygmaeus</i>	1
	14 Oct 2025	<i>Pipistrellus pipistrellus</i>	6
Location ST5	26 Jun 2025	<i>Pipistrellus pipistrellus</i>	1
	01 Jul 2025	<i>Pipistrellus pipistrellus</i>	1
	05 Jul 2025	<i>Pipistrellus pipistrellus</i>	1
	06 Jul 2025	<i>Pipistrellus pipistrellus</i>	1
	07 Jul 2025	<i>Myotis</i> spp.	4
	07 Jul 2025	<i>Pipistrellus pipistrellus</i>	92
	07 Jul 2025	<i>Plecotus</i> spp.	1
	17 Jul 2025	<i>Pipistrellus pipistrellus</i>	10
	17 Jul 2025	<i>Pipistrellus pygmaeus</i>	1
	18 Jul 2025	<i>Pipistrellus pipistrellus</i>	6
	13 Aug 2025	<i>Myotis</i> spp.	1
	13 Aug 2025	<i>Nyctalus</i> spp.	6

Location	Night	Bat Species	Pass Near Roost (No.)
	13 Aug 2025	<i>Pipistrellus pipistrellus</i>	58
	13 Aug 2025	<i>Pipistrellus pygmaeus</i>	5
	13 Aug 2025	<i>Plecotus spp.</i>	5
	14 Aug 2025	<i>Myotis spp.</i>	29
	14 Aug 2025	<i>Pipistrellus pipistrellus</i>	58
	14 Aug 2025	<i>Pipistrellus pygmaeus</i>	2
	14 Aug 2025	<i>Plecotus spp.</i>	1
	15 Aug 2025	<i>Myotis spp.</i>	13
	15 Aug 2025	<i>Nyctalus spp.</i>	14
	15 Aug 2025	<i>Pipistrellus pipistrellus</i>	40
	15 Aug 2025	<i>Pipistrellus pygmaeus</i>	11
	15 Aug 2025	<i>Plecotus spp.</i>	1
	16 Aug 2025	<i>Myotis spp.</i>	13
	16 Aug 2025	<i>Pipistrellus pipistrellus</i>	103
	16 Aug 2025	<i>Pipistrellus pygmaeus</i>	9
	16 Aug 2025	<i>Plecotus spp.</i>	1
	17 Aug 2025	<i>Myotis spp.</i>	6
	17 Aug 2025	<i>Pipistrellus pipistrellus</i>	59
	17 Aug 2025	<i>Pipistrellus pygmaeus</i>	9
	17 Aug 2025	<i>Plecotus spp.</i>	3
	18 Aug 2025	<i>Myotis spp.</i>	18
	18 Aug 2025	<i>Pipistrellus pipistrellus</i>	114
	18 Aug 2025	<i>Pipistrellus pygmaeus</i>	8
	19 Aug 2025	<i>Myotis spp.</i>	14
	19 Aug 2025	<i>Pipistrellus pipistrellus</i>	18
	19 Aug 2025	<i>Pipistrellus pygmaeus</i>	4
	19 Aug 2025	<i>Plecotus spp.</i>	1
	11 Sep 2025	<i>Pipistrellus pipistrellus</i>	3
	12 Sep 2025	<i>Pipistrellus pipistrellus</i>	342
	12 Sep 2025	<i>Pipistrellus pygmaeus</i>	3
	13 Sep 2025	<i>Pipistrellus pipistrellus</i>	192
	13 Sep 2025	<i>Pipistrellus pygmaeus</i>	3
	15 Sep 2025	<i>Pipistrellus pipistrellus</i>	72
	06 Oct 2025	<i>Myotis spp.</i>	15
	06 Oct 2025	<i>Pipistrellus nathusii</i>	1
	06 Oct 2025	<i>Pipistrellus pipistrellus</i>	156
	06 Oct 2025	<i>Pipistrellus pygmaeus</i>	35
	06 Oct 2025	<i>Plecotus spp.</i>	3
	07 Oct 2025	<i>Myotis spp.</i>	1
	07 Oct 2025	<i>Pipistrellus pipistrellus</i>	198
	07 Oct 2025	<i>Pipistrellus pygmaeus</i>	10
	07 Oct 2025	<i>Plecotus spp.</i>	2

Roost emergence times used are from (Andrews and Pearson, 2022)

Table 18: Bat passes each hour after sunset

Species	Hours After Sun Set (hr)													
	-1	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Barbastella barbastellus</i>		85	34	18	78	82	53	69	25	3	5			
<i>Eptesicus serotinus</i>	3	169	71	20	15	5	20	6						
<i>Myotis spp.</i>	10	219	190	111	60	75	100	34	43	24	22	5	2	
<i>Nyctalus spp.</i>	48	317	168	85	52	27	55	47	29	6		5		
<i>Pipistrellus nathusii</i>		4	8	3	1	3								
<i>Pipistrellus pipistrellus</i>	1 791	12 006	6 139	4 547	3 622	2 913	2 595	1 800	1 496	1 645	342	120	54	2
<i>Pipistrellus pygmaeus</i>	121	341	284	127	111	64	55	88	48	41	17	9	45	5
<i>Plecotus spp.</i>	12	82	53	42	65	50	46	28	46	11		3	5	

Table 19: Bat passes proportioned through the night

Species	Activity Through the Night											
	-0.1	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
<i>Barbastella barbastellus</i>	0	8	91	25	83	90	53	22	58	22	0	0
<i>Eptesicus serotinus</i>	0	4	104	102	36	20	5	10	10	13	5	0
<i>Myotis spp.</i>	0	21	232	149	84	89	73	53	31	118	42	3
<i>Nyctalus spp.</i>	0	62	287	181	81	58	27	35	51	26	31	0
<i>Pipistrellus nathusii</i>	0	1	9	2	3	3	0	0	1	0	0	0
<i>Pipistrellus pipistrellus</i>	2	2 035	10 833	6 402	3 447	2 752	2 432	3 016	2 509	2 289	3 184	171
<i>Pipistrellus pygmaeus</i>	0	152	327	281	177	61	42	49	60	60	107	40
<i>Plecotus spp.</i>	2	13	76	50	41	43	38	43	52	48	37	0

3. GRAPHS

Figure 1: shows the period the detector was placed in the field recording bats.

Figure 2: shows the count of all the species recordings as a pie chart.

Figure 3: shows the count of all the species recordings as a bar chart.

Figure 4: shows the count of all the species recordings as a dot chart.

Figure 5: shows the count of all the species recordings by Location as a dot chart.

Figures 6 to 8: show dusk and dawn activity levels.

The graphs up to Figure **24** below show the potential nearness of a bat roost; based on a recorded emergence time of less than 90 minutes after sunset for each month. The white bars show the emergence time for the species from (Andrews and Pearson, 2022).

Figure 25 shows for all Location recorded bat species less than 100 minutes after sunset by month and year.

Figure 26 shows the proportion of Bat activity through the night by Location.

Figure 27 shows the proportion of Bat activity through the night by month.

Figure 28 shows the proportion of Bat activity through the night by month and year.

Figure 29 shows a tree map of the species and location with the number of passes.

Figure 30 shows a tree map of the species and month with the area representing the number of passes.

Figure 31 shows a tree map of the species by month and year with the area representing the number of passes.

Figure 32 shows a tree map of the species by Location with the area representing the number of passes.

Figure 33 shows a tree map of the species by Location and month with the area representing the number of passes.

Figure 34 shows a tree map of the species by Location, month and year with the area representing the number of passes.



Note: coloured title show nights when acoustic detectors recorded bats

Figure 1: Period detector recorded bats

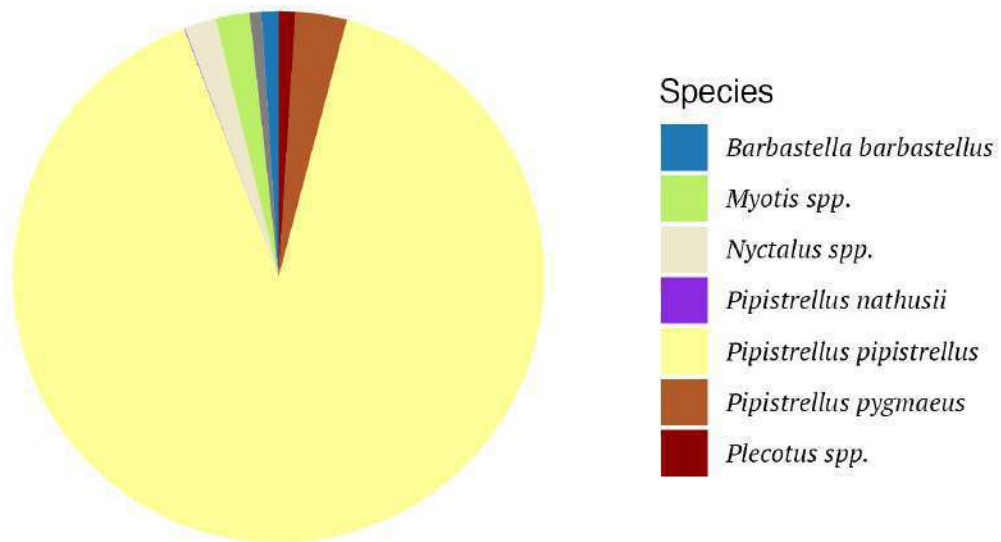


Figure 2: Pie chart: count of all species recordings

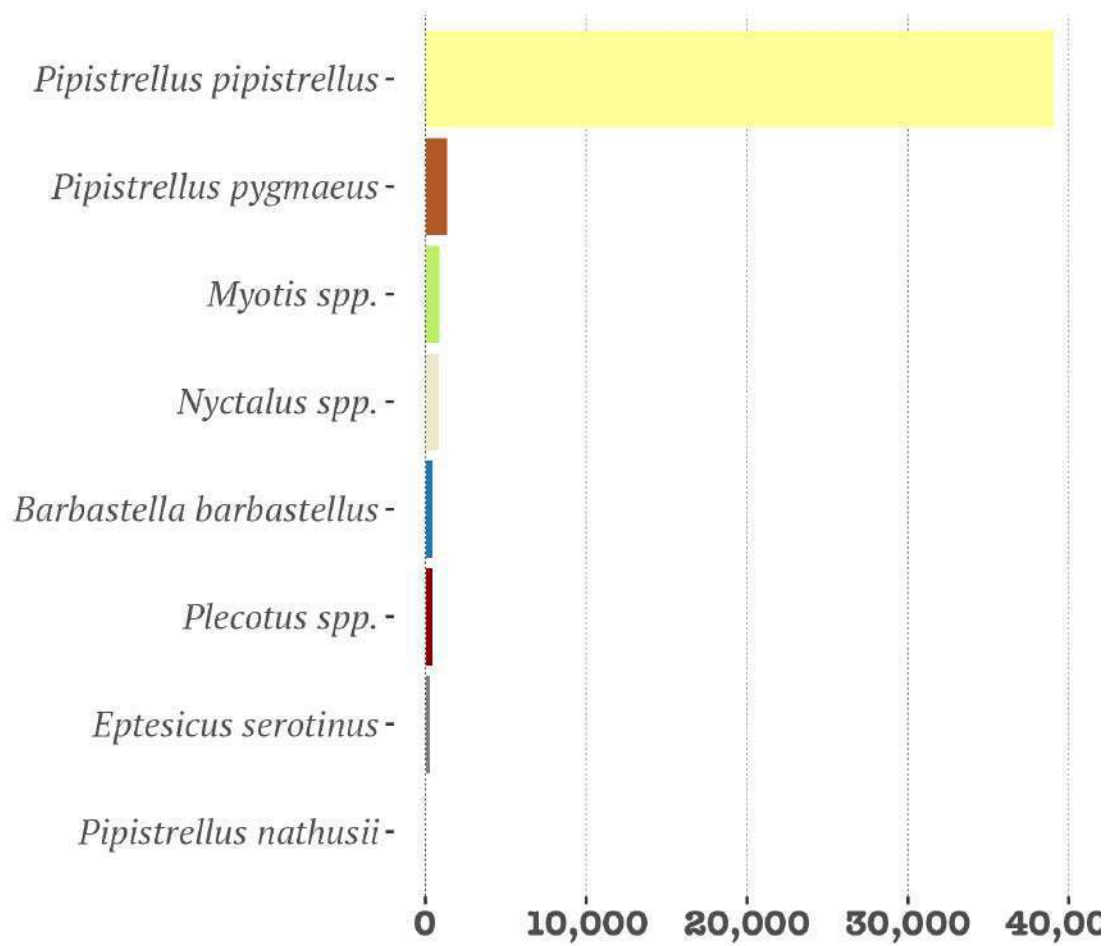


Figure 3: Bar chart: count of all species recordings

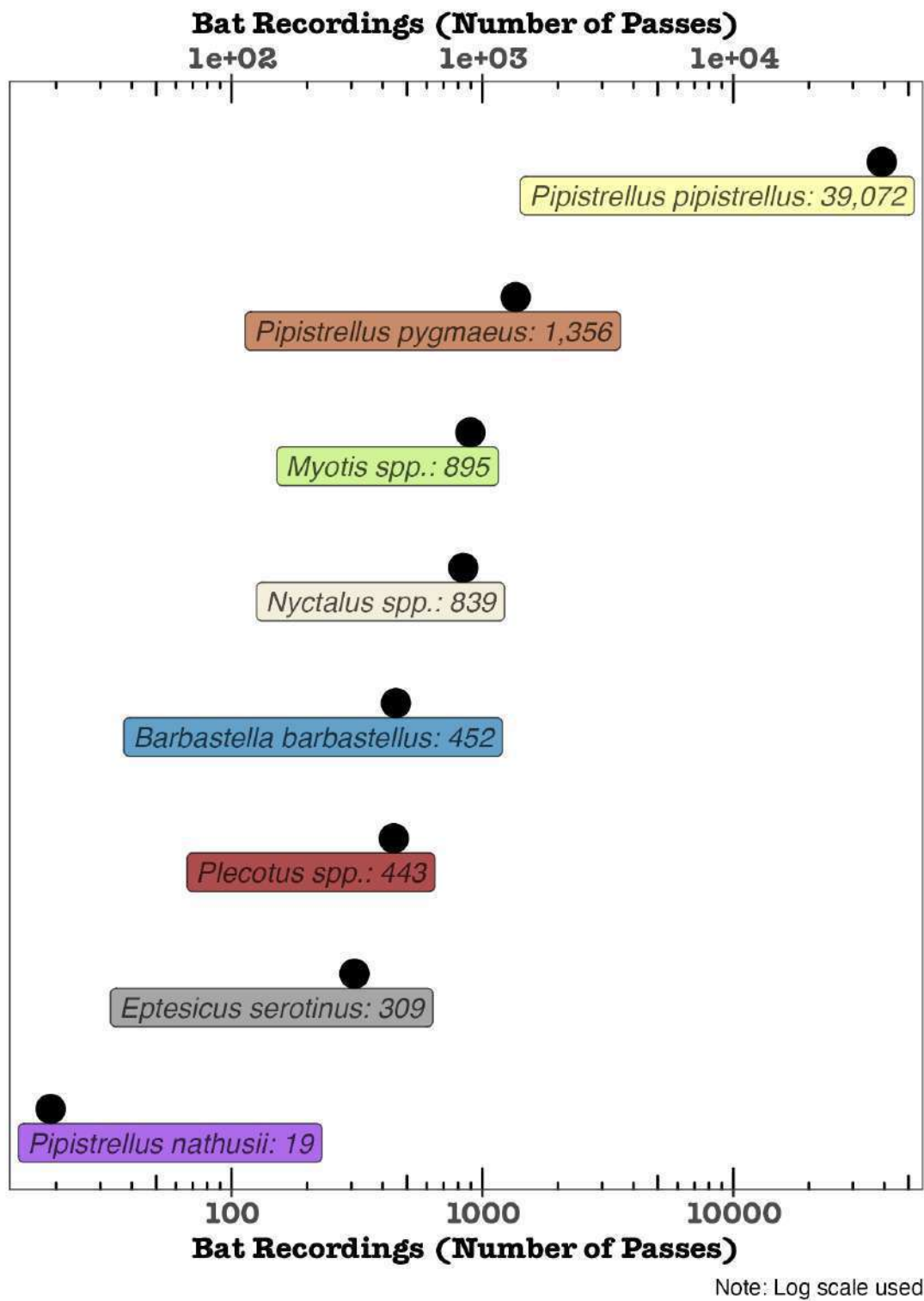


Figure 4: Dot chart: count of all species recordings

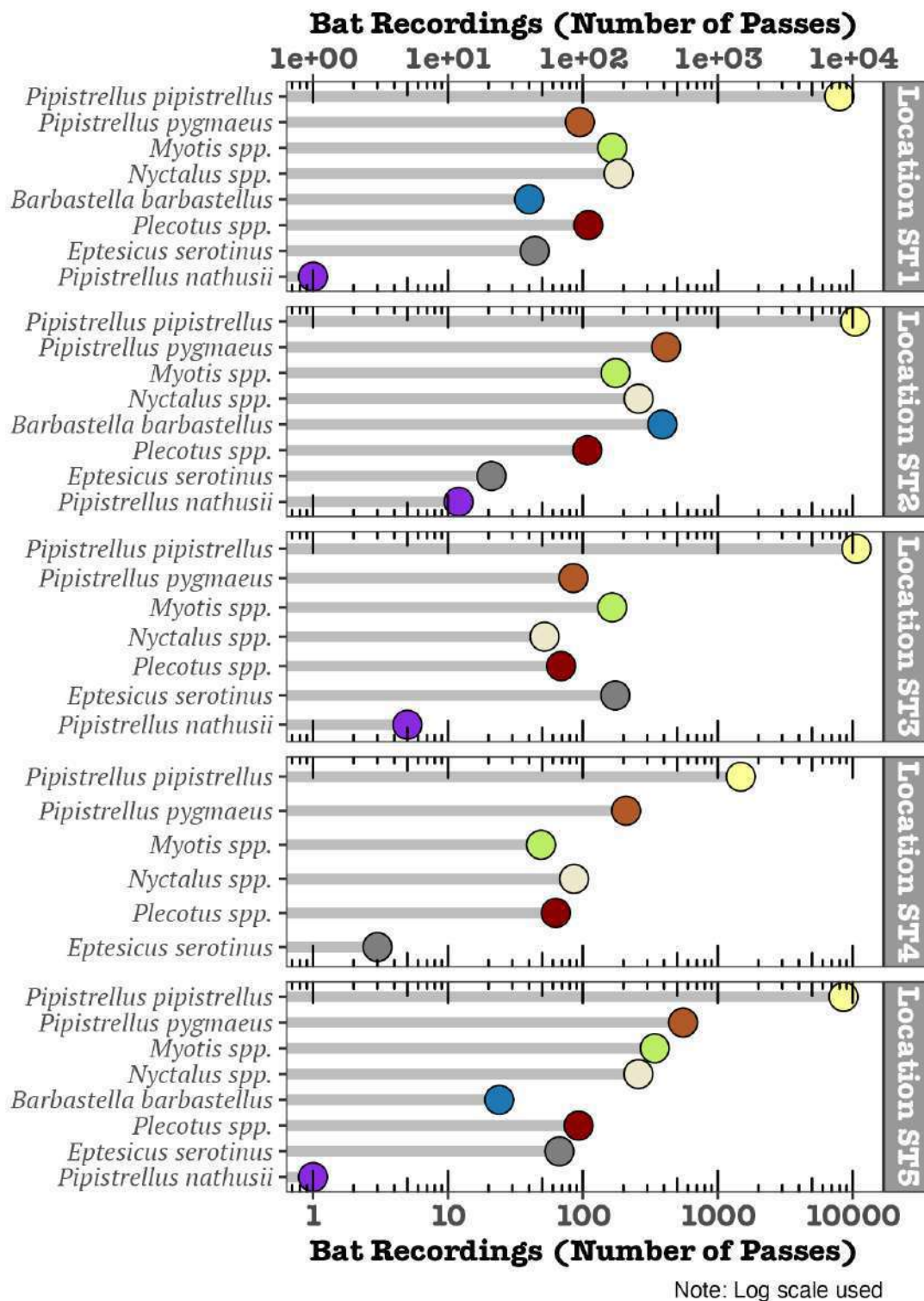
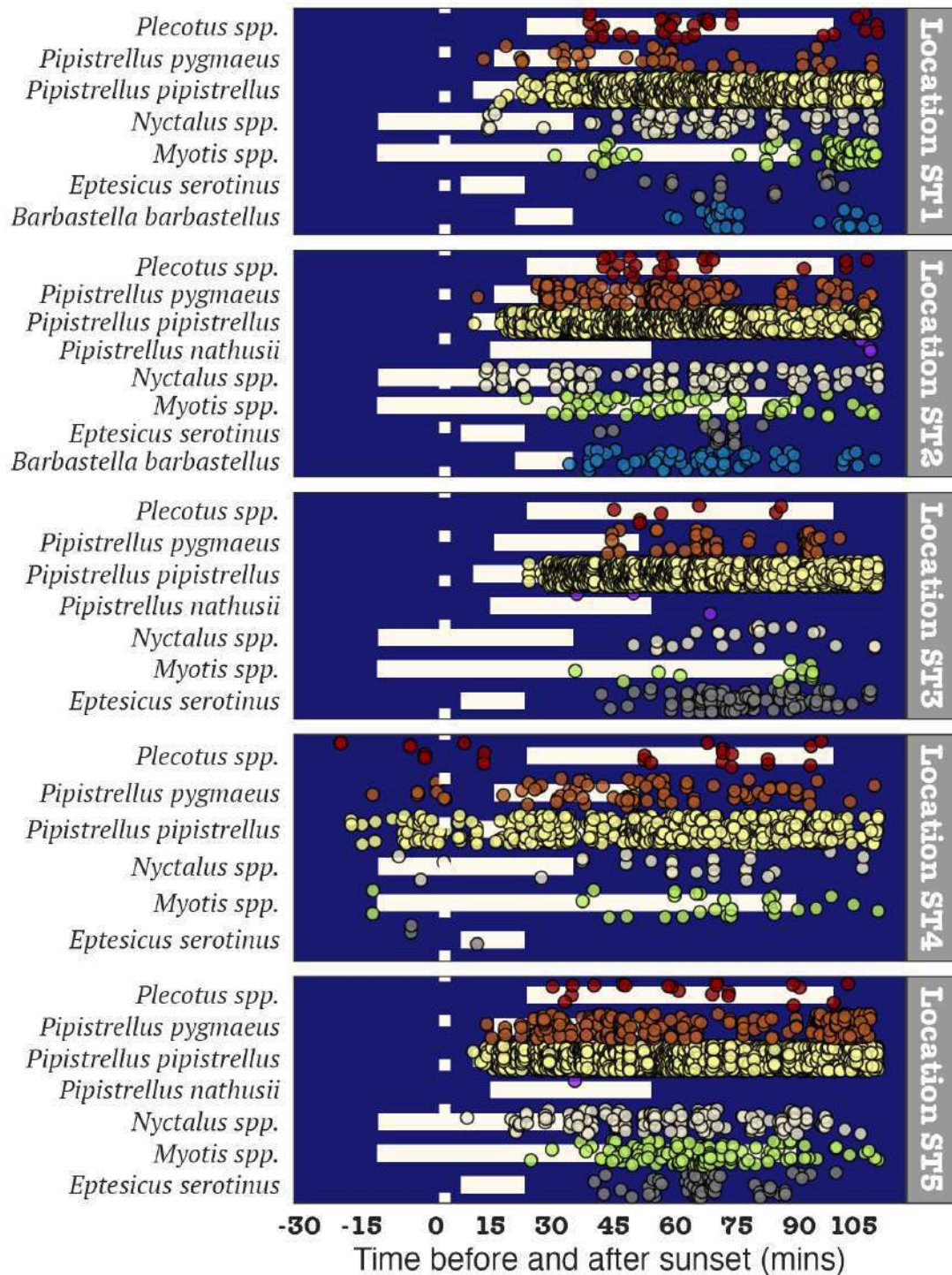
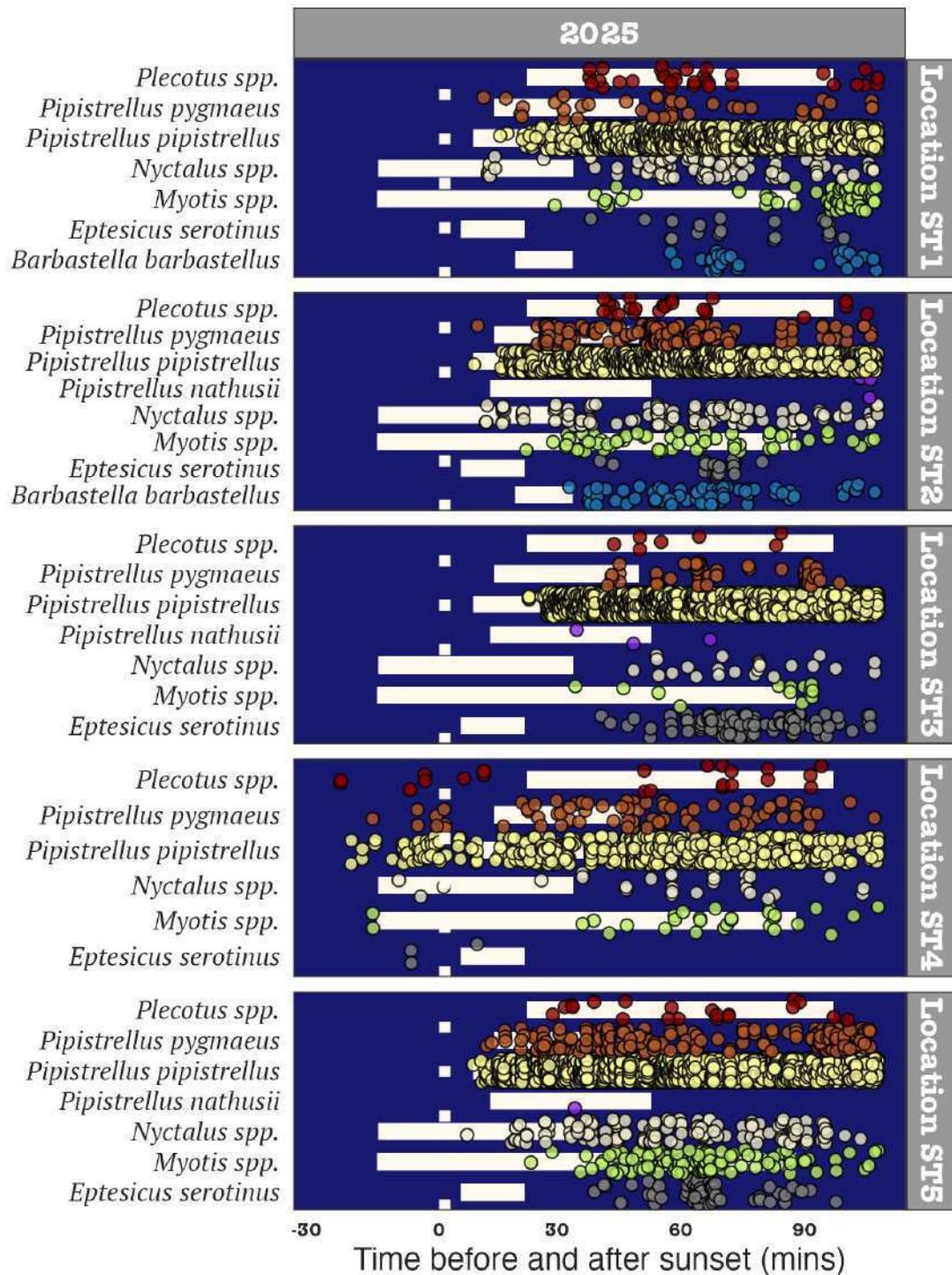


Figure 5: Dot chart: count of species recordings by location



Vertical dotted line represents sunset
Horizontal bars are emergence times from (Andrews and Pearson, 2022)

Figure 6: Dusk activity by location



Vertical dotted line represents sunset
Horizontal bars are emergence times from (Andrews and Pearson, 2022)

Figure 7: Dusk activity by location and year

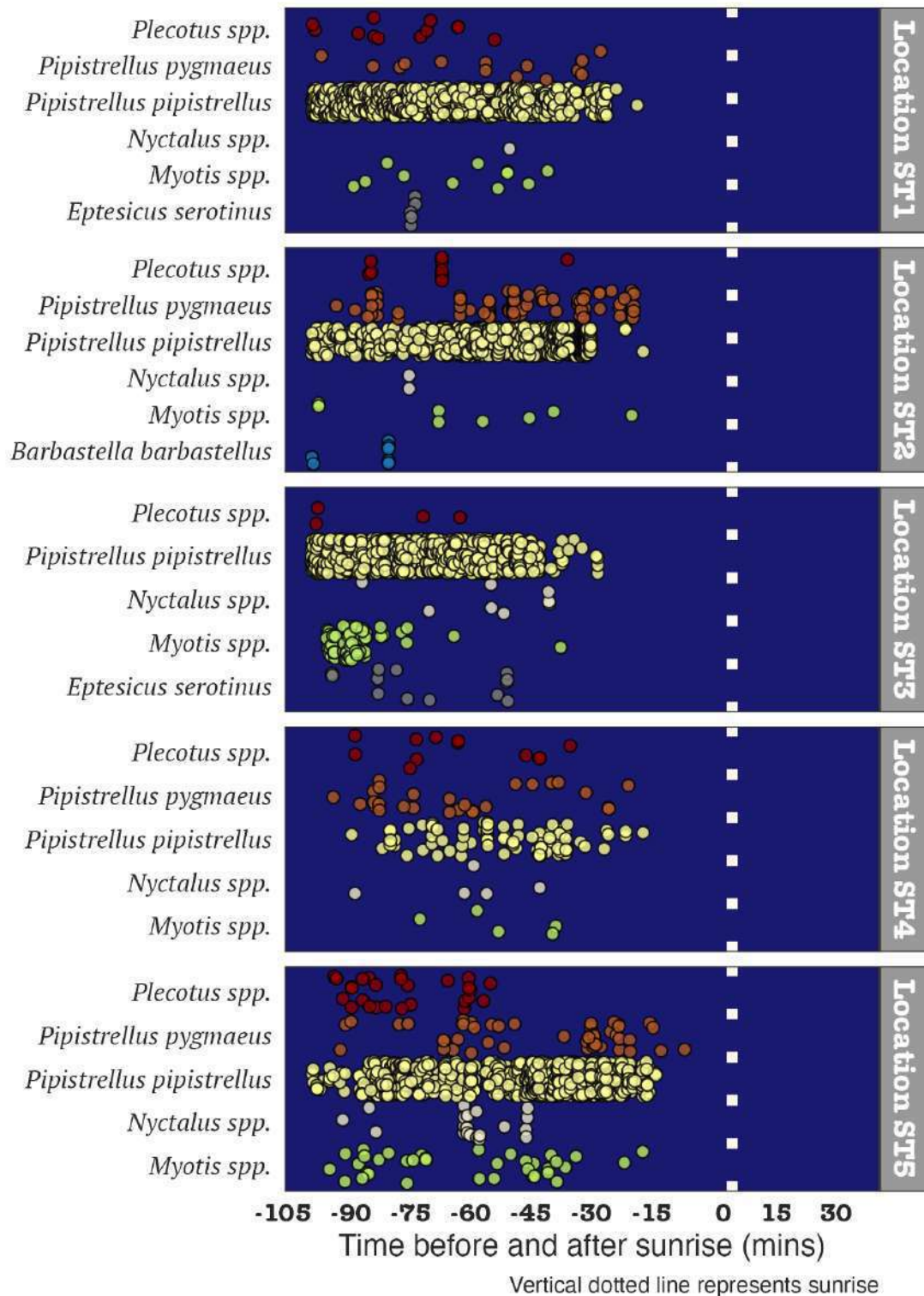


Figure 8: Dawn activity for location

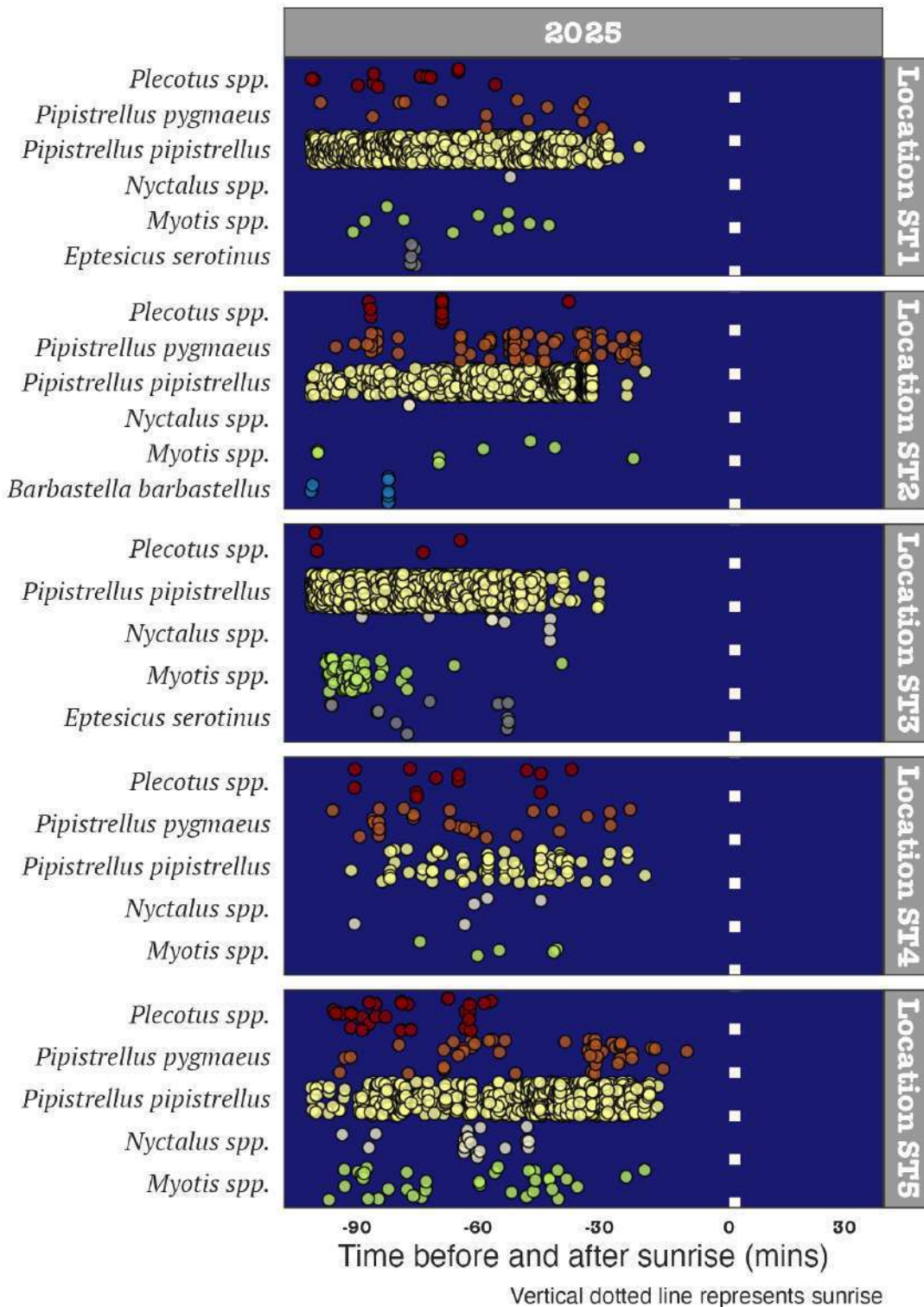


Figure 9: Dawn activity for location and year

Location ST1

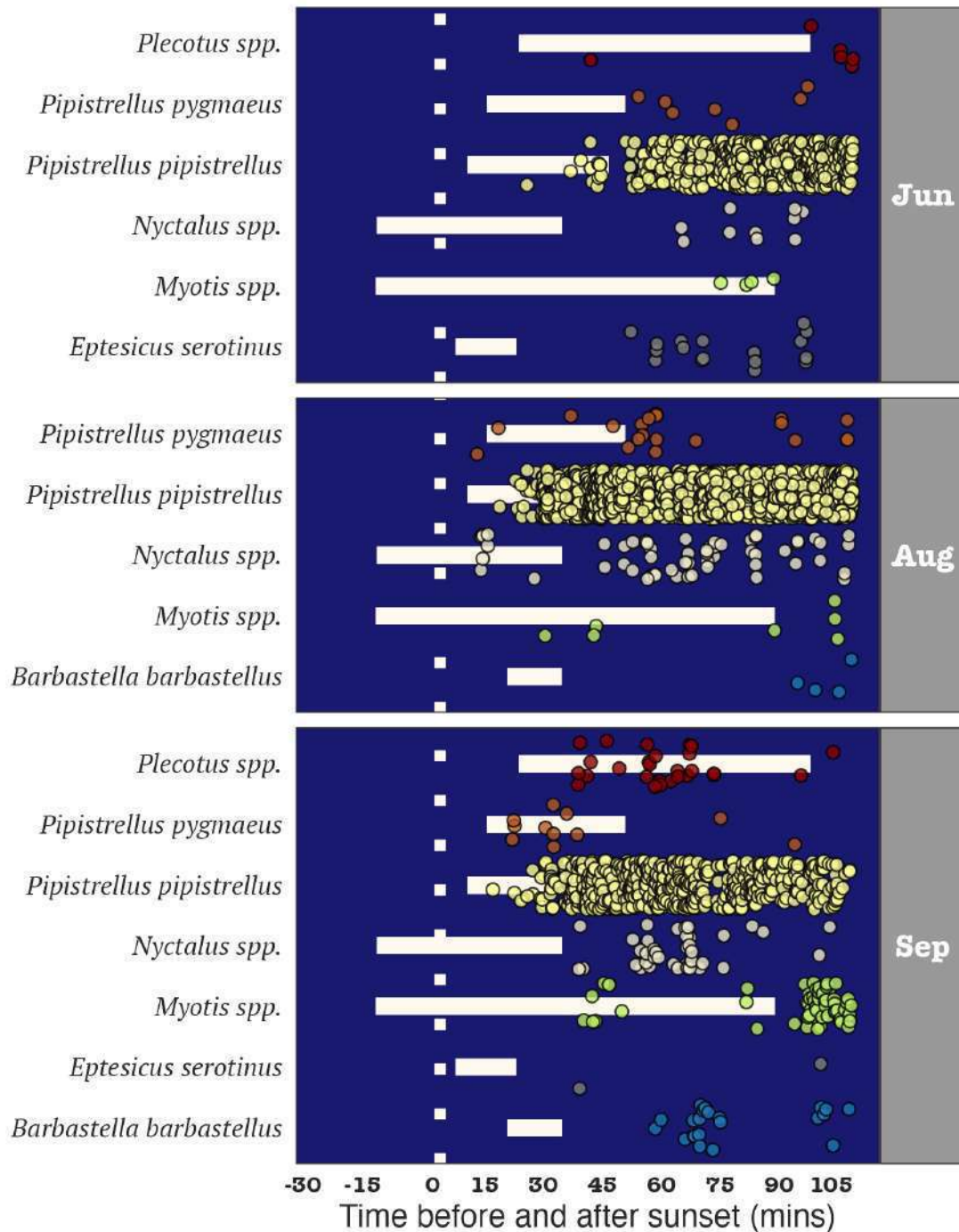


Figure 10: Potential roost and recordings at dusk by month for location st1

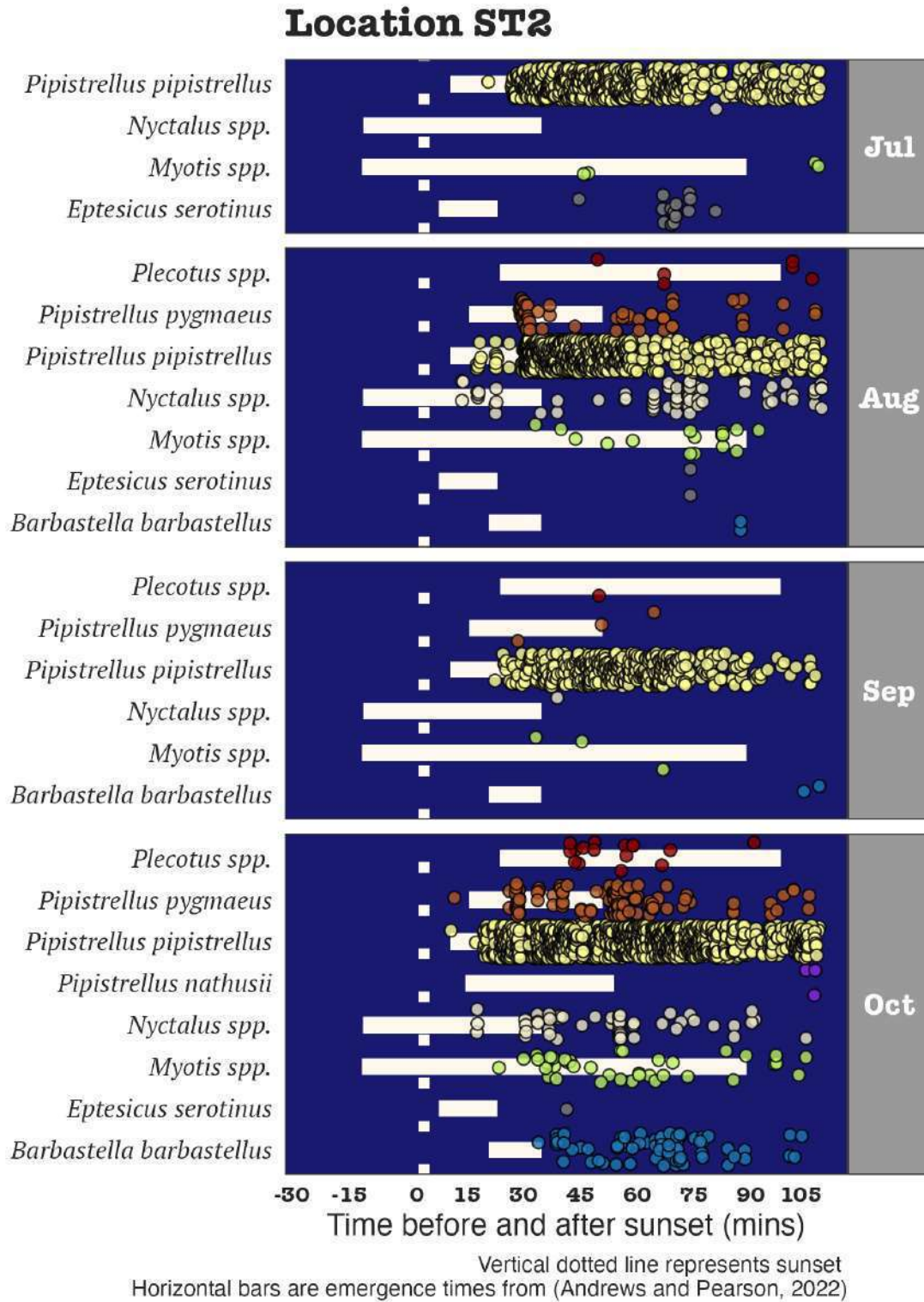


Figure 11: Potential roost and recordings at dusk by month for location st2

Location ST3

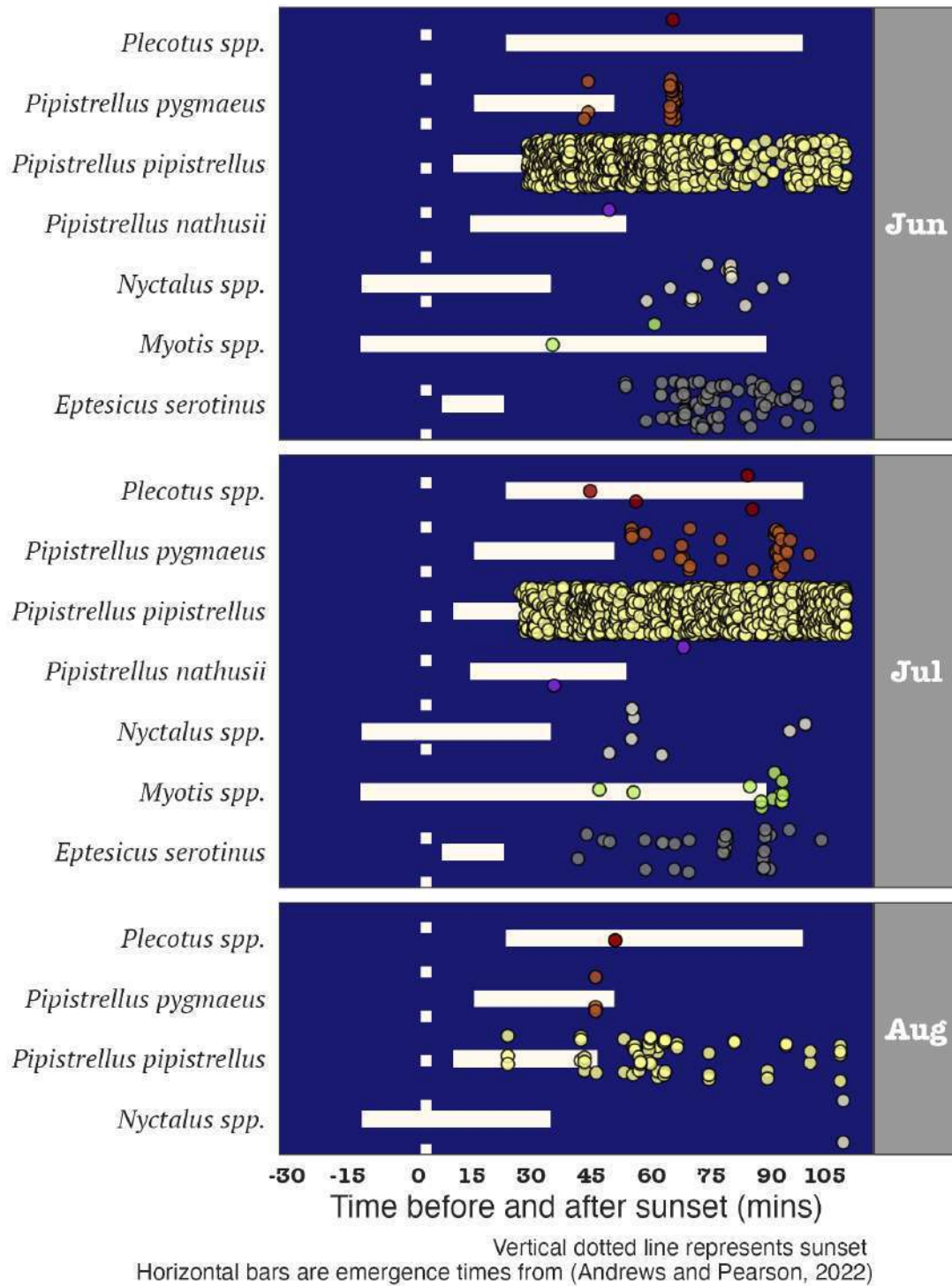
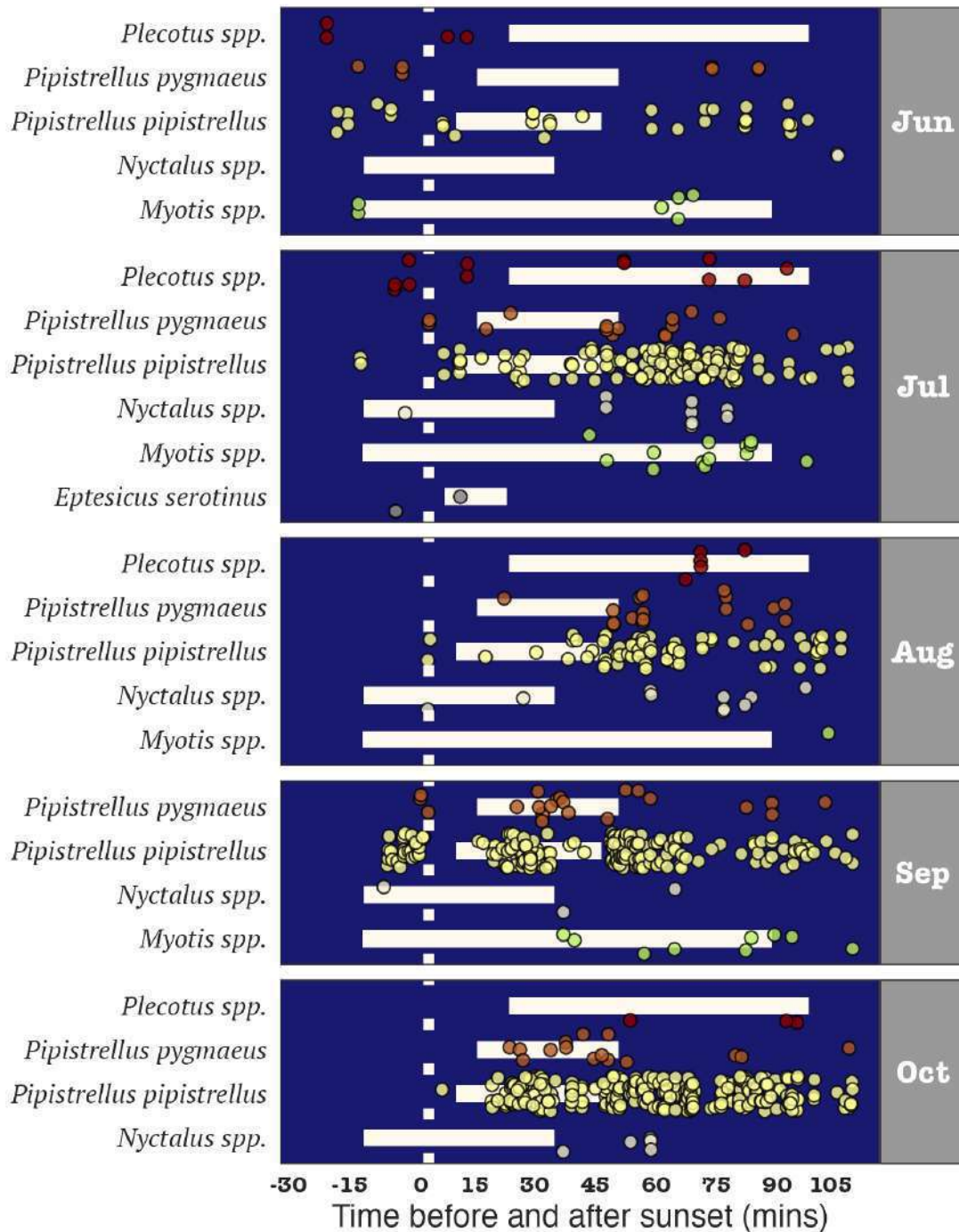


Figure 12: Potential roost and recordings at dusk by month for location st3

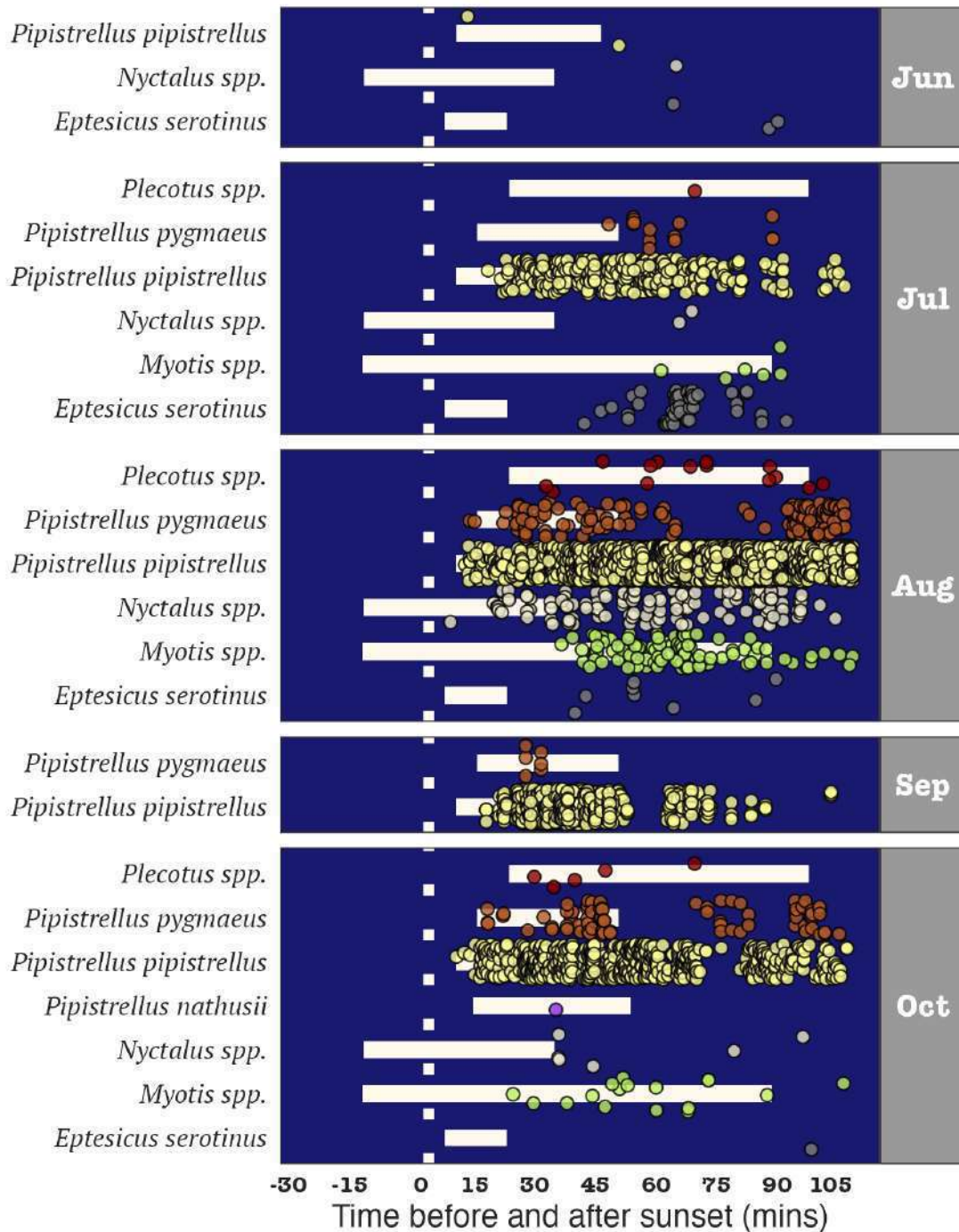
Location ST4



Vertical dotted line represents sunset
Horizontal bars are emergence times from (Andrews and Pearson, 2022)

Figure 13: Potential roost and recordings at dusk by month for location st4

Location ST5



Vertical dotted line represents sunset
Horizontal bars are emergence times from (Andrews and Pearson, 2022)

Figure 14: Potential roost and recordings at dusk by month for location st5

Location ST1

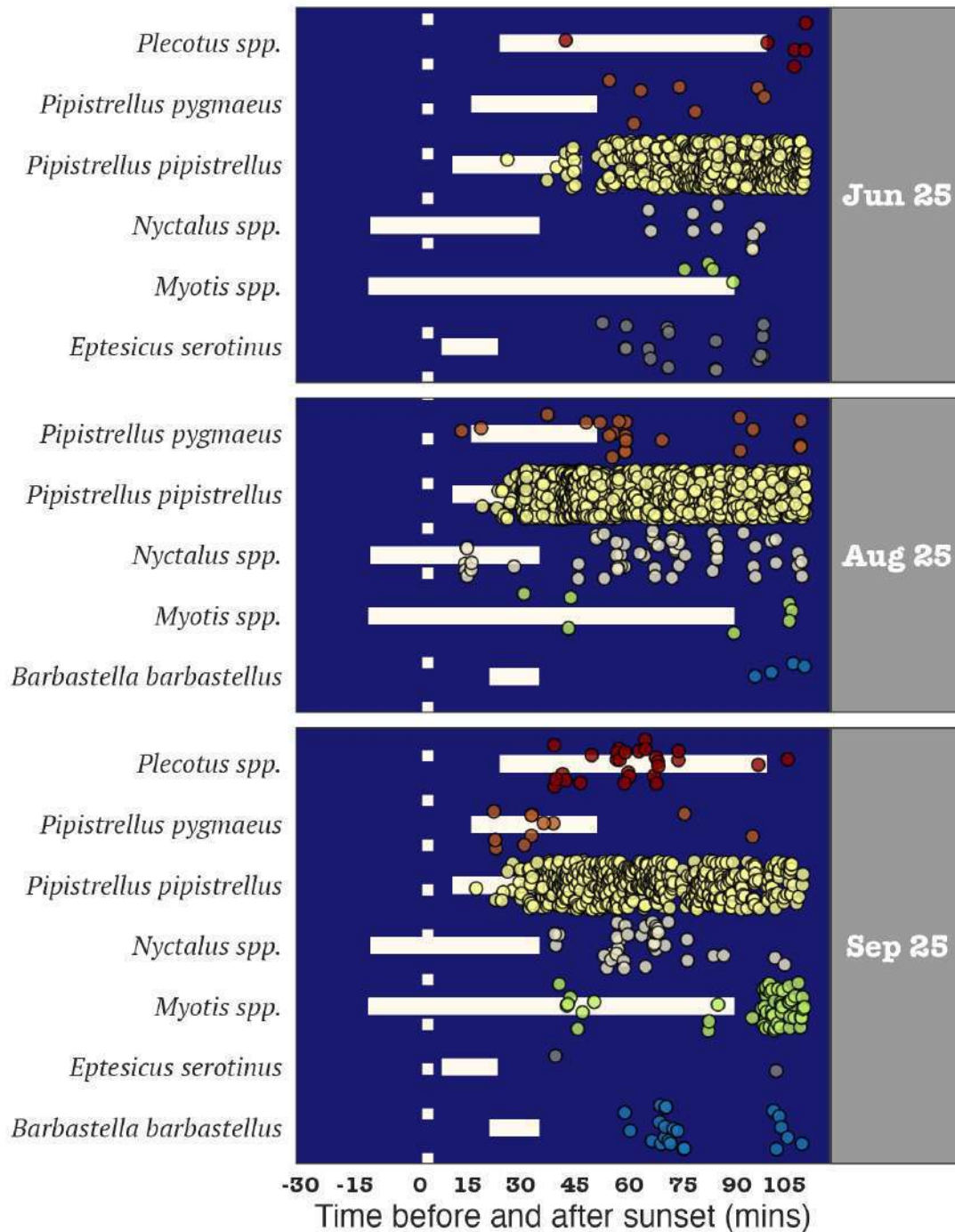


Figure 15: Potential roost and recordings at dusk by month and year for location st1

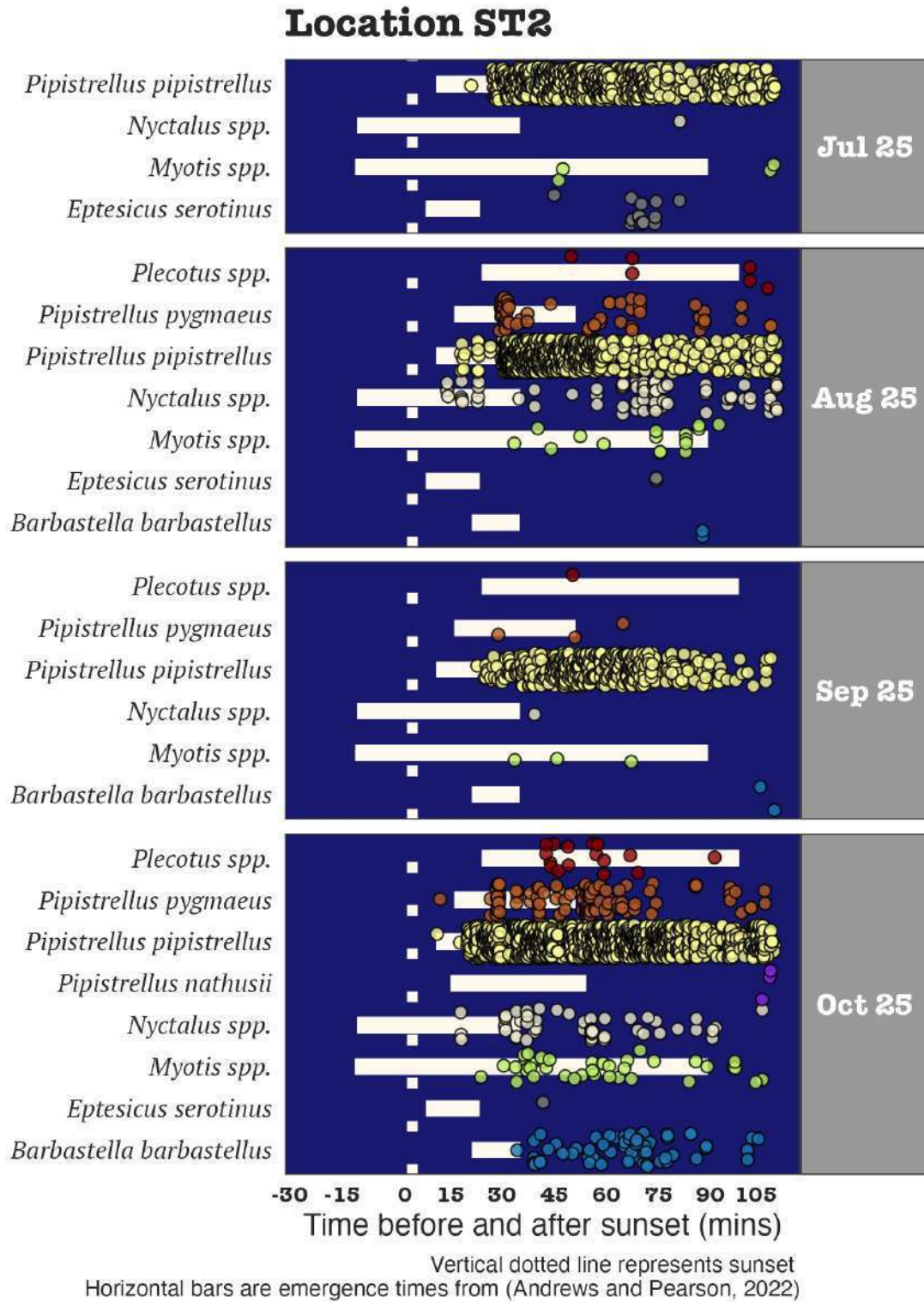
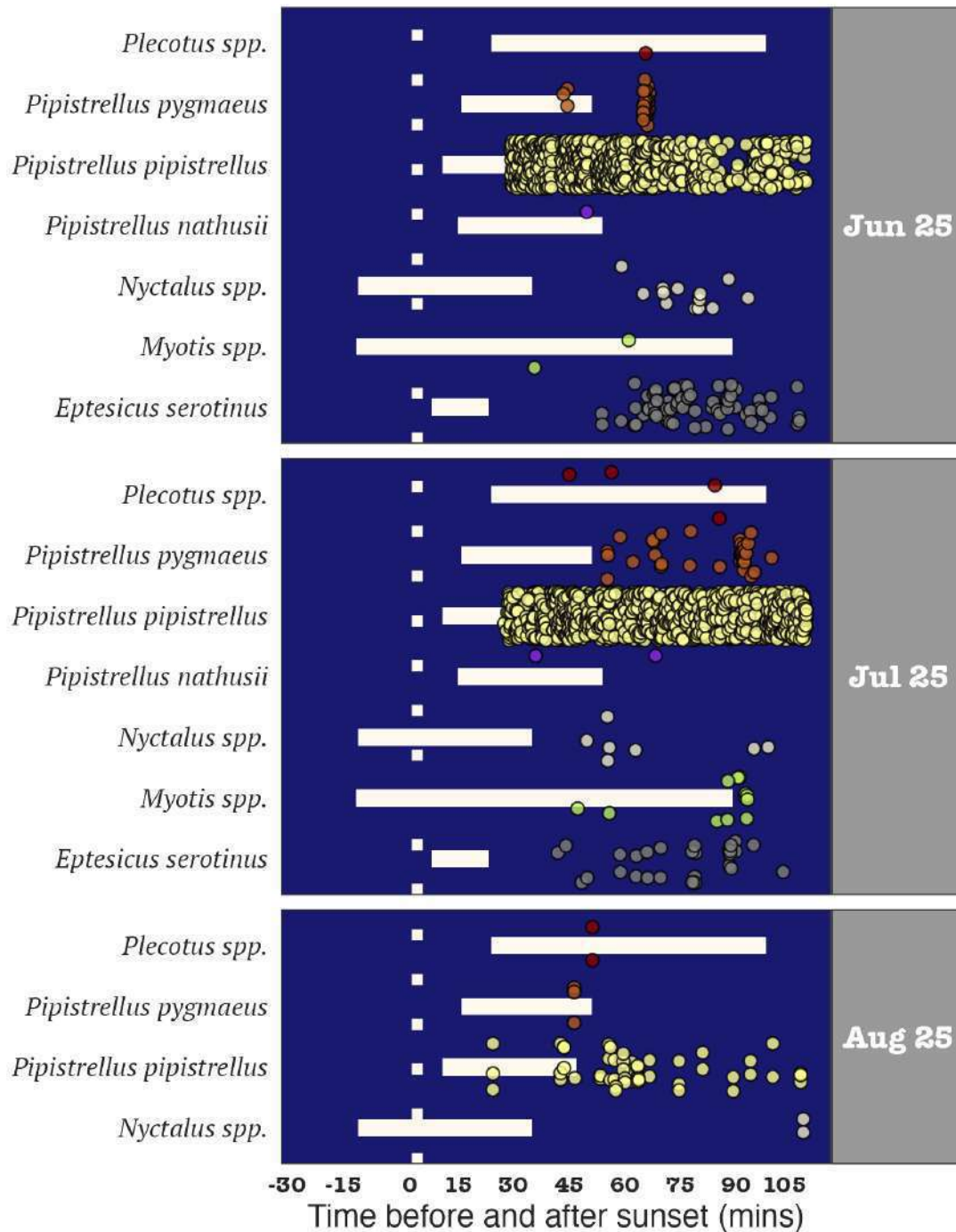


Figure 16: Potential roost and recordings at dusk by month and year for location st2

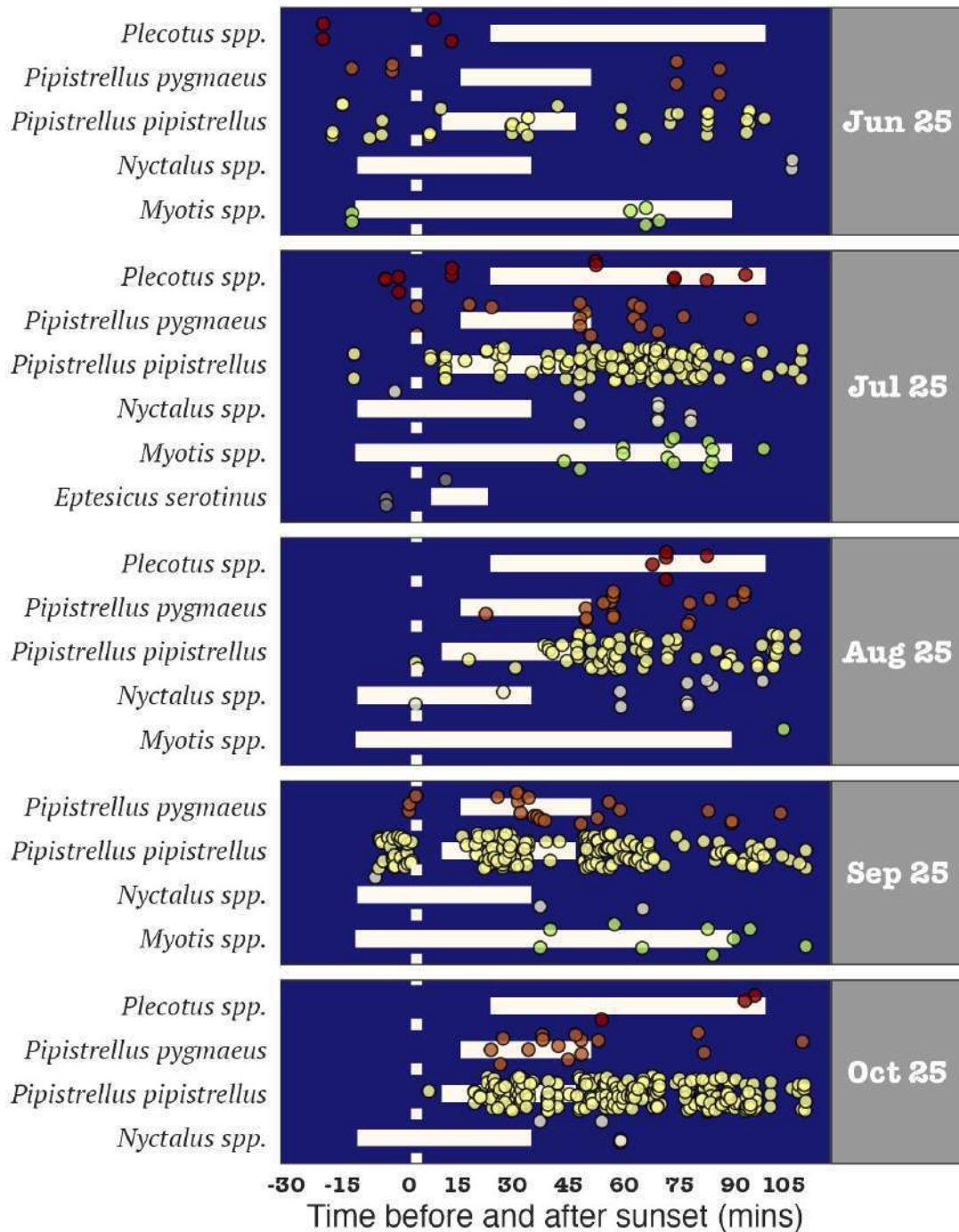
Location ST3



Vertical dotted line represents sunset
Horizontal bars are emergence times from (Andrews and Pearson, 2022)

Figure 17: Potential roost and recordings at dusk by month and year for location st3

Location ST4



Vertical dotted line represents sunset
Horizontal bars are emergence times from (Andrews and Pearson, 2022)

Figure 18: Potential roost and recordings at dusk by month and year for location st4

Location ST5

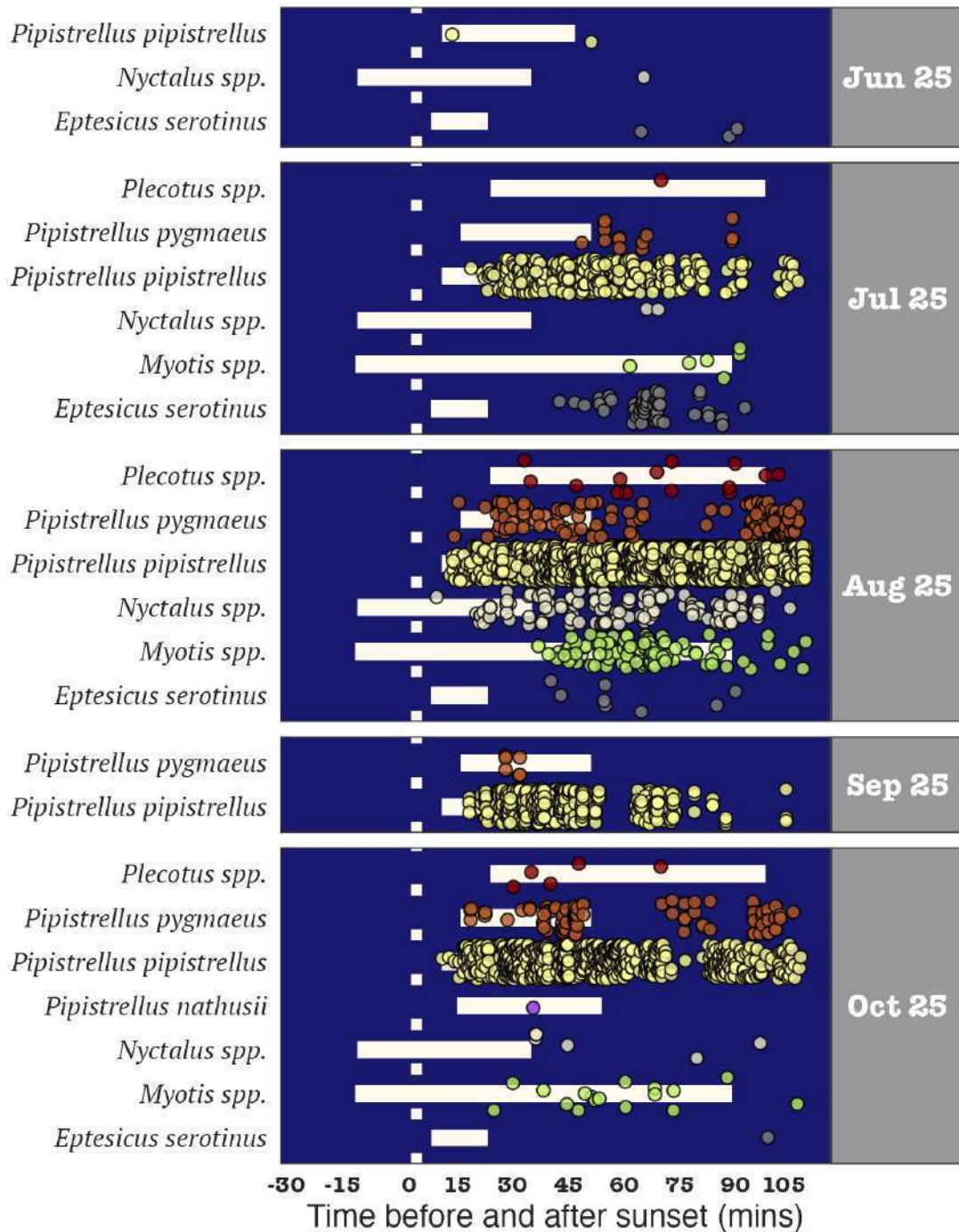


Figure 19: Potential roost and recordings at dusk by month and year for location st5

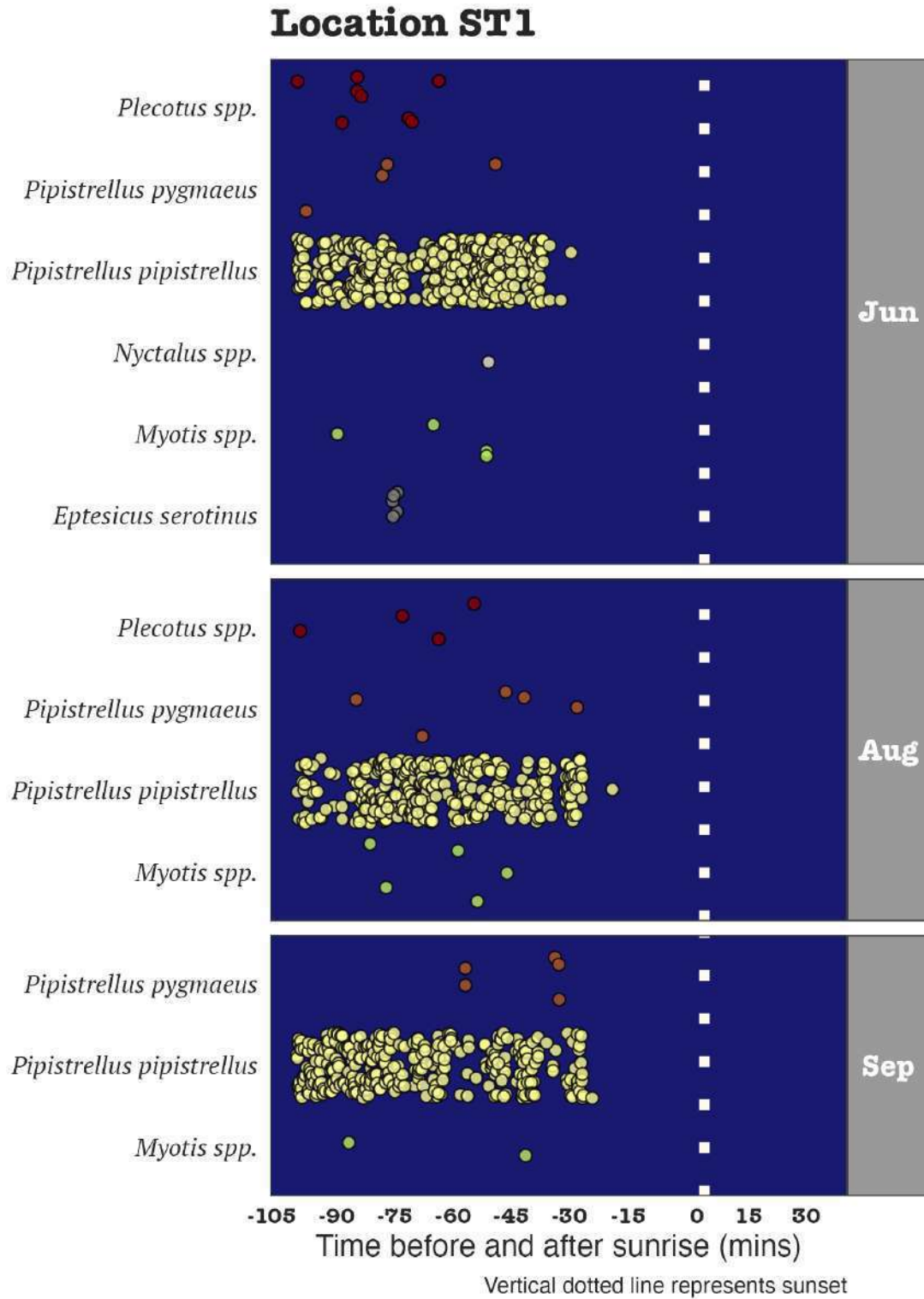


Figure 20: Potential roost and recordings at dawn by month for location st1

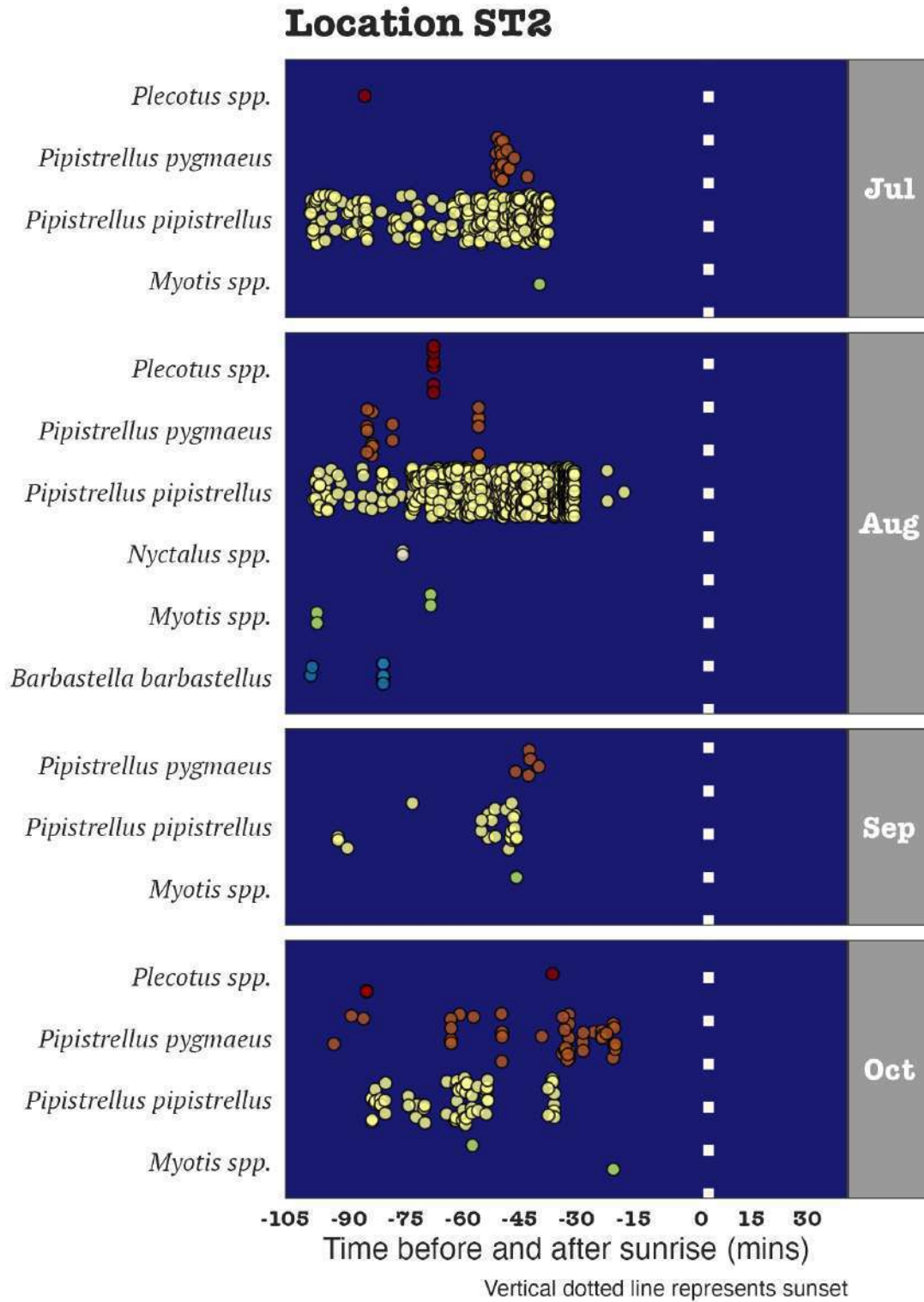


Figure 21: Potential roost and recordings at dawn by month for location st2

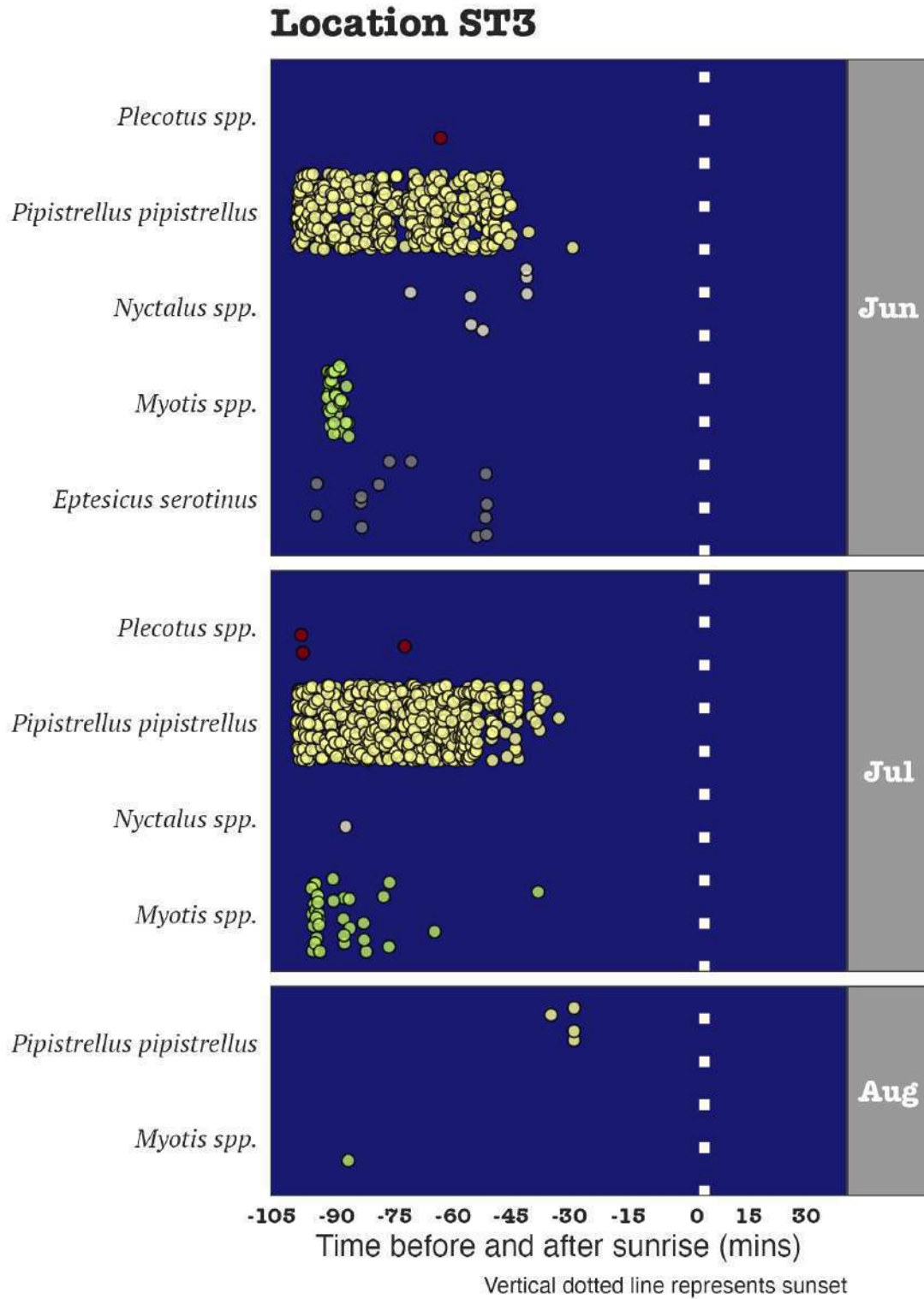


Figure 22: Potential roost and recordings at dawn by month for location st3

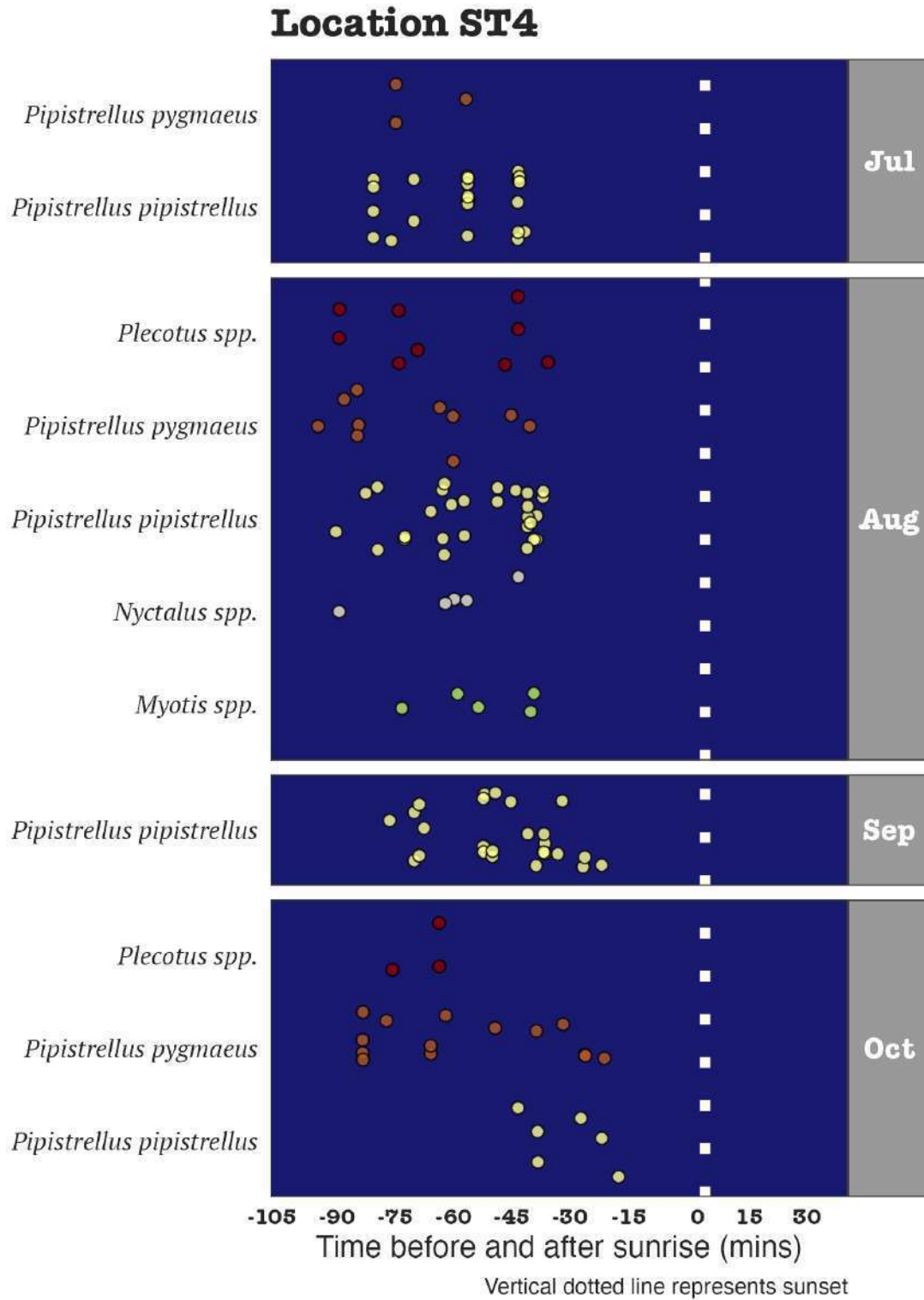


Figure 23: Potential roost and recordings at dawn by month for location st4

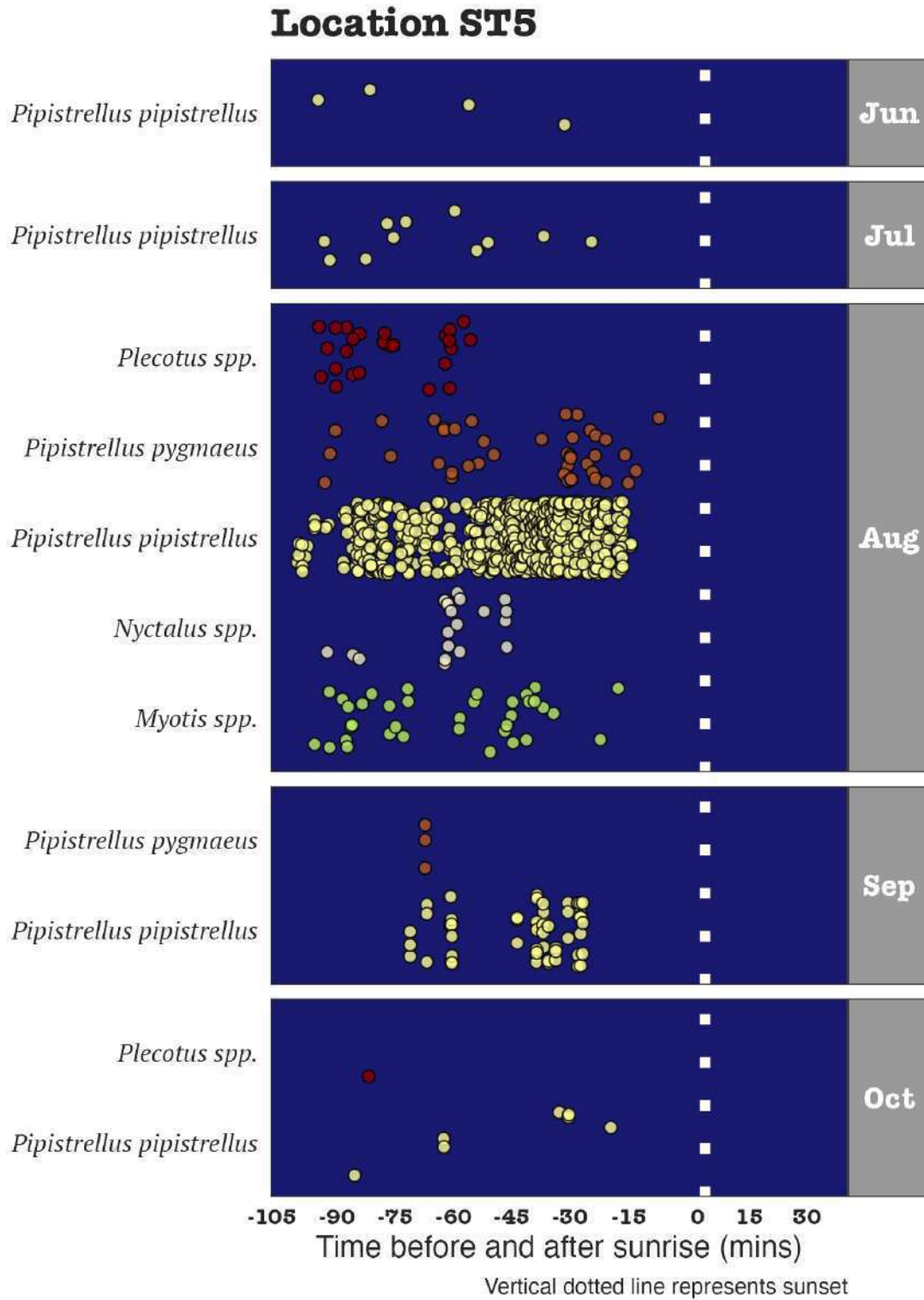
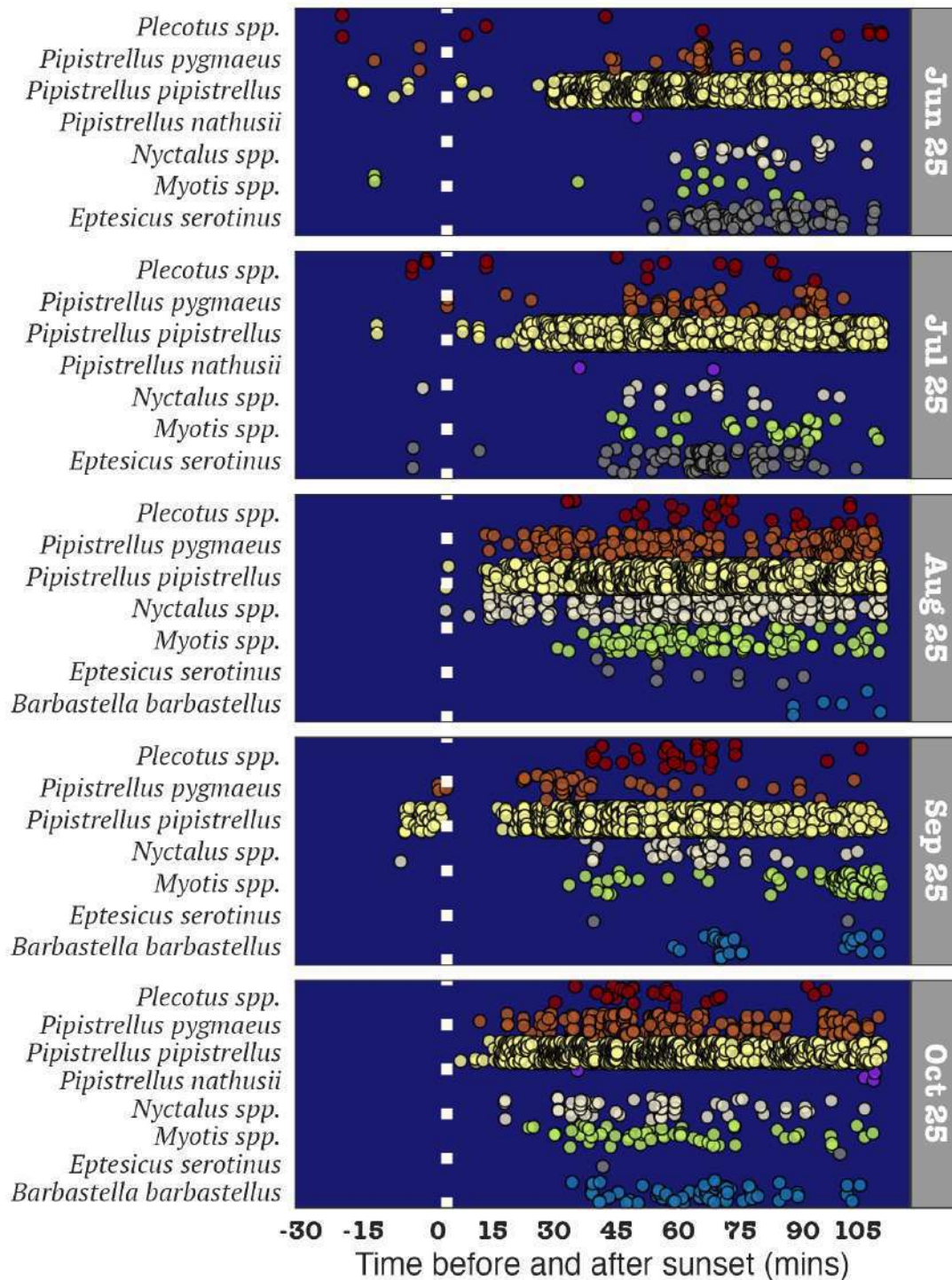
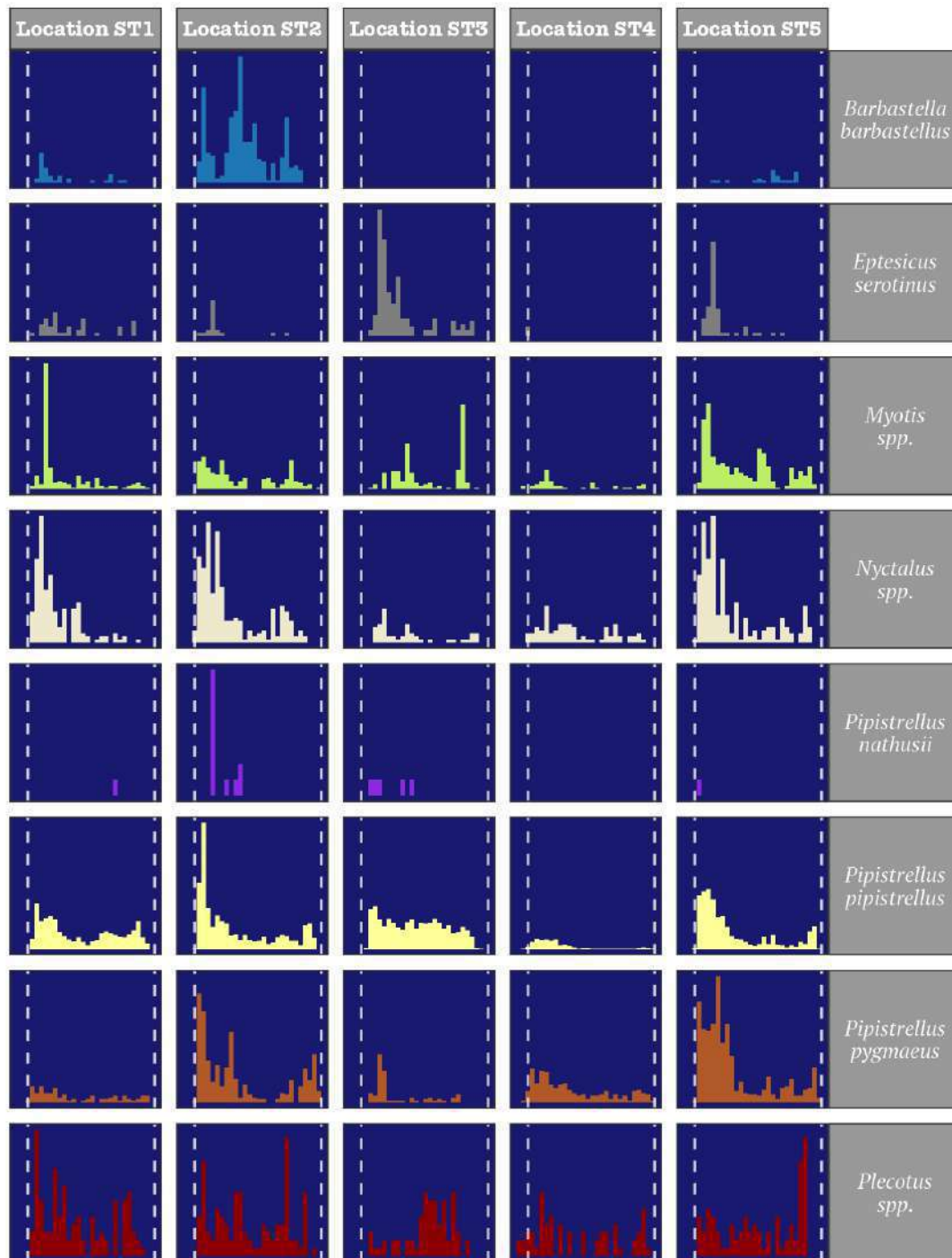


Figure 24: Potential roost and recordings at dawn by month for location st5



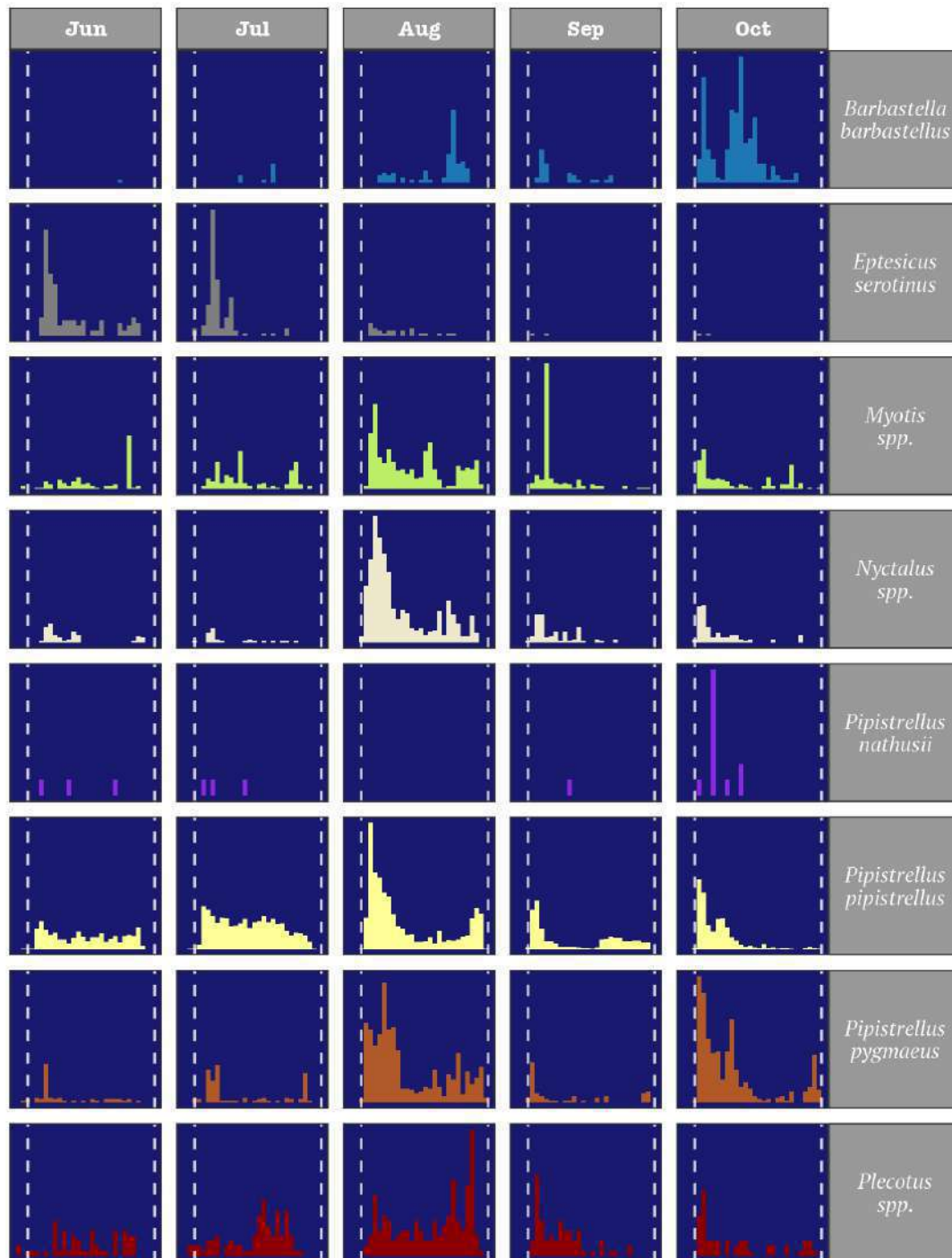
Vertical dotted line represents sunset
Horizontal bars are emergence times from (Andrews and Pearson, 2022)

Figure 25: Species by month and year



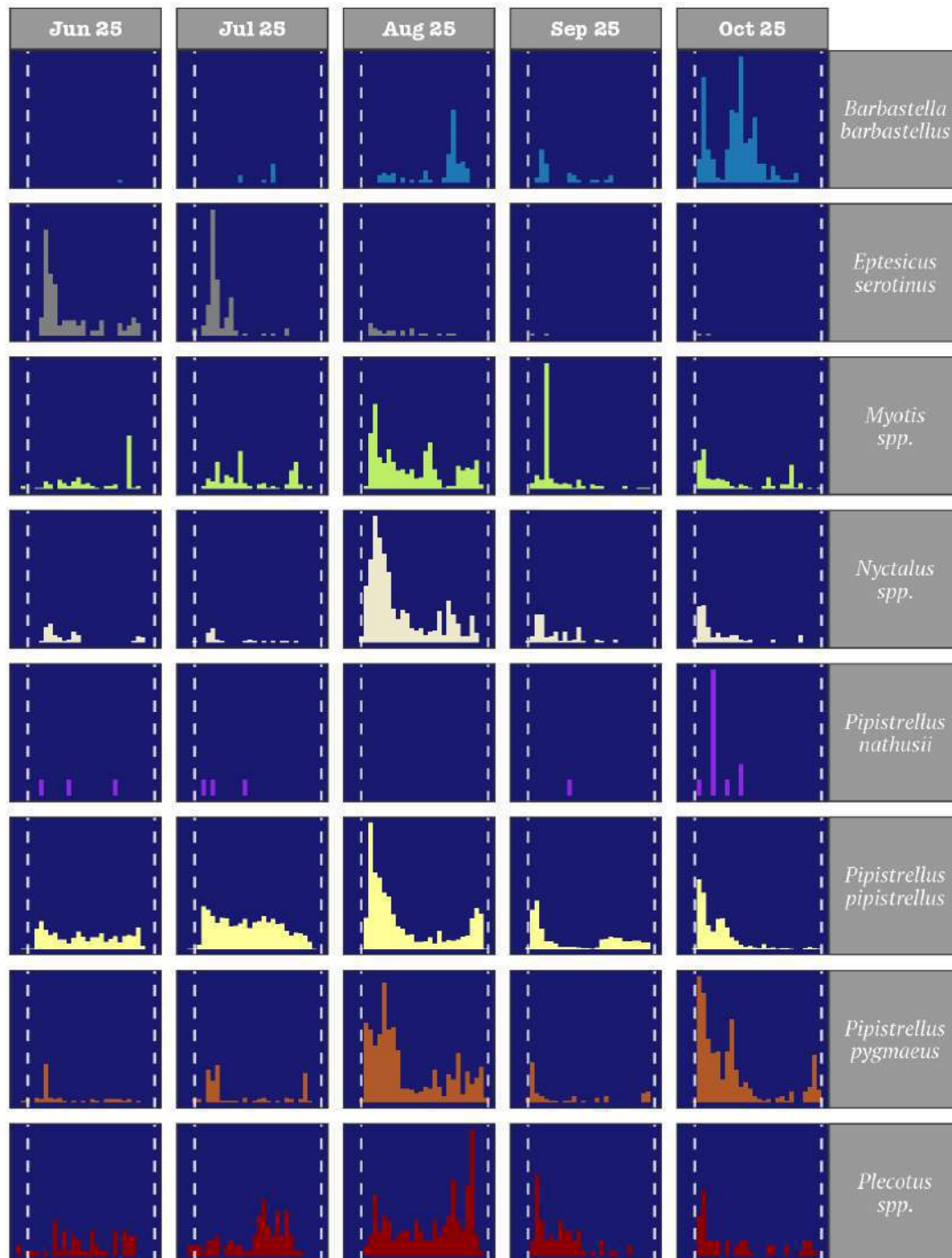
Left dashed line shows the time of sunset
 Right dashed line shows the time of sunrise
 The y scale is independent for each species

Figure 26: Proportion of bat activity through the night by location



Left dashed line shows the time of sunset
 Right dashed line shows the time of sunrise
 The y scale is independent for each species

Figure 27: Proportion of bat activity through the night by month



Left dashed line shows the time of sunset
 Right dashed line shows the time of sunrise
 The y scale is independent for each species

Figure 28: Proportion of bat activity through the night by month and year

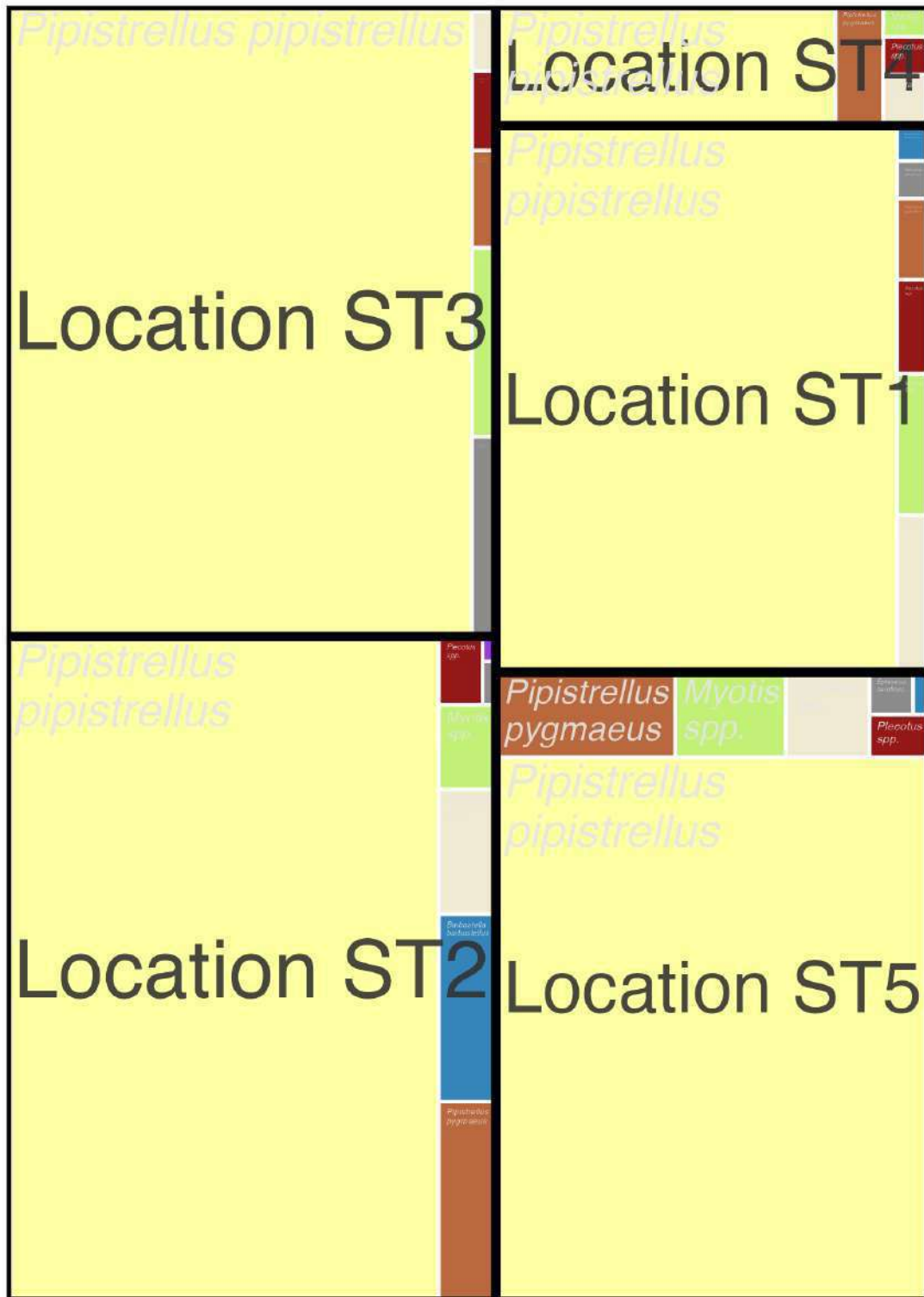


Figure 29: Species and location with the number of passes

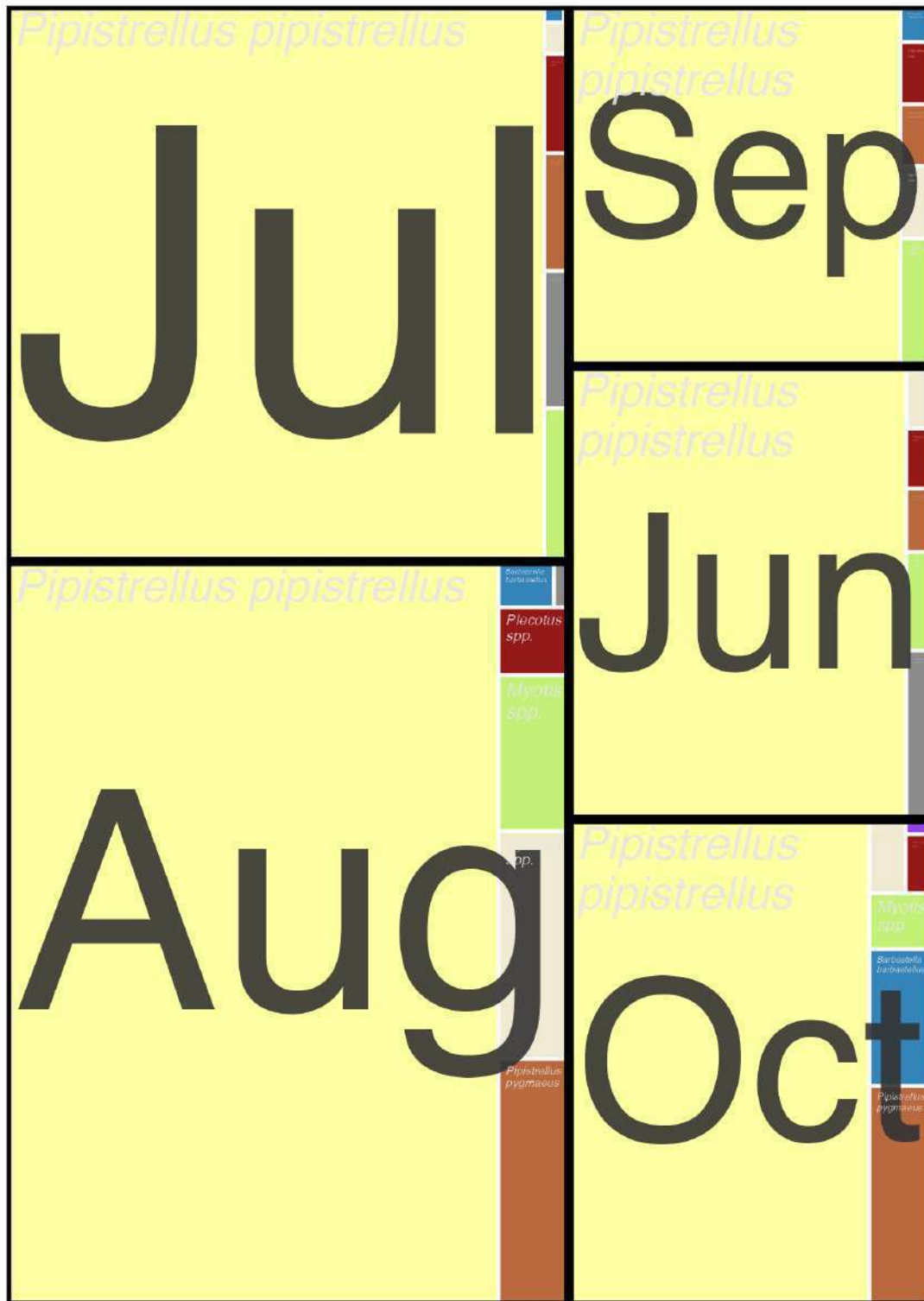


Figure 30: Species and month with the number of passes

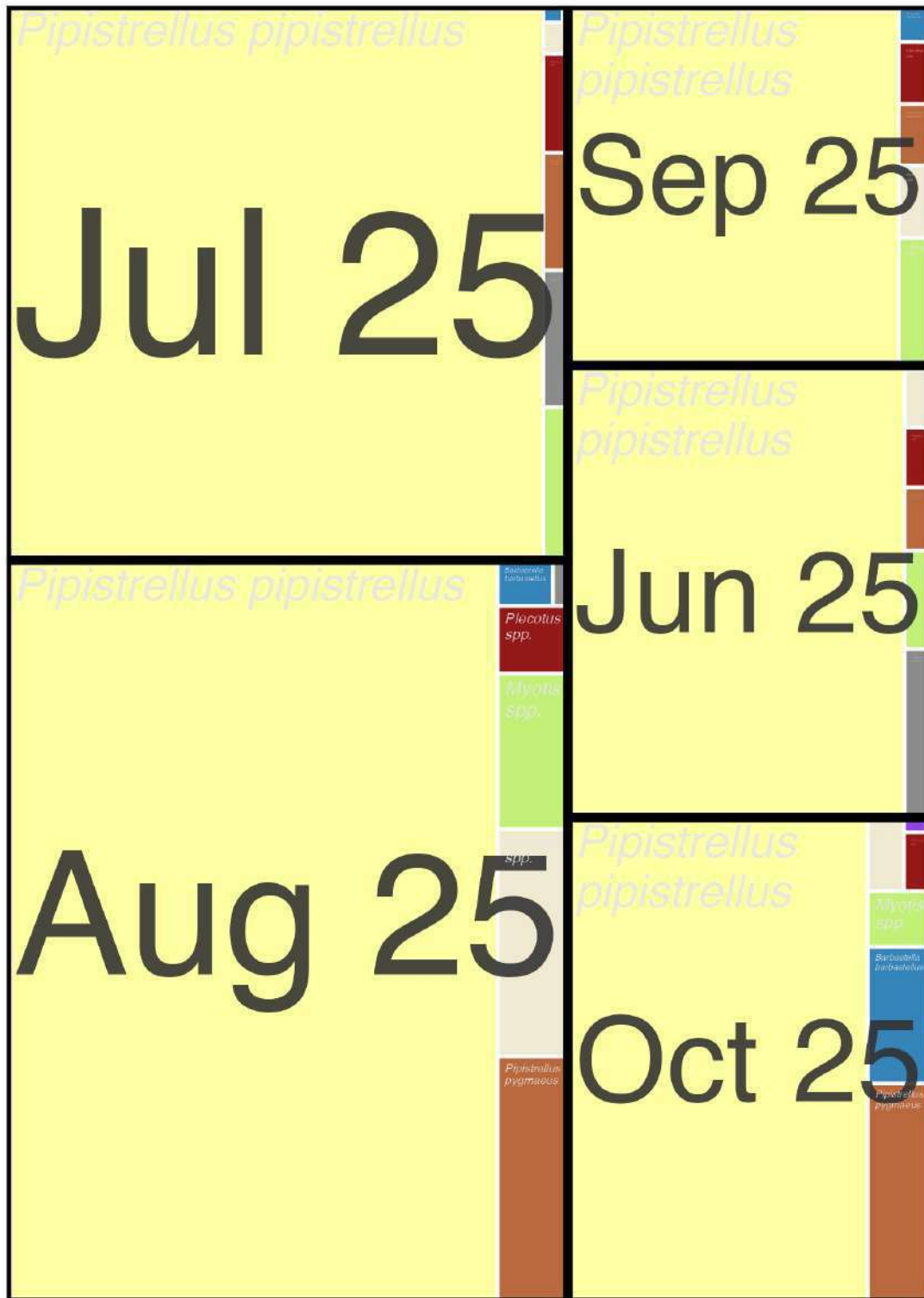


Figure 31: Species and month plus year with the number of passes

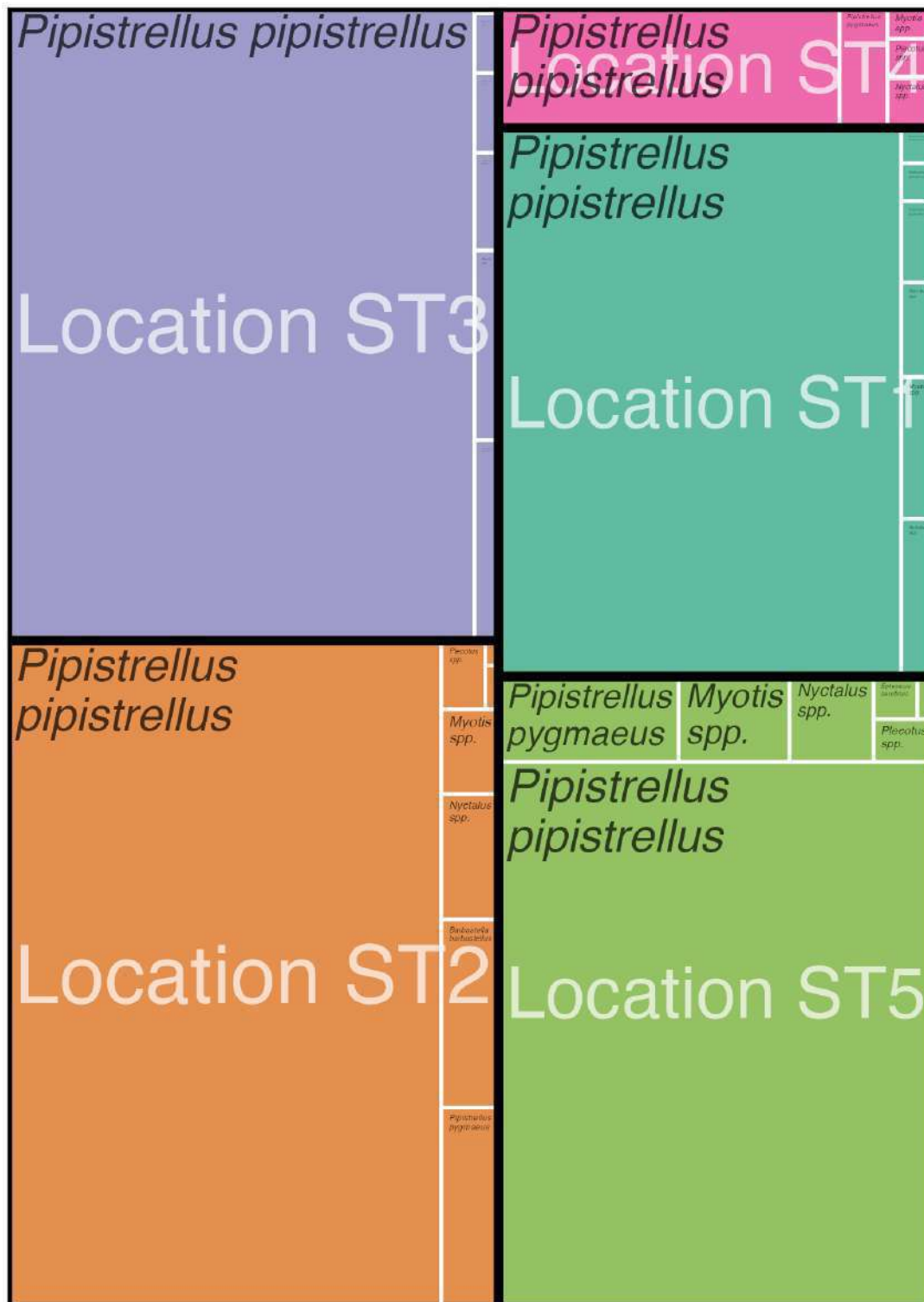


Figure 32: Location with the number of passes

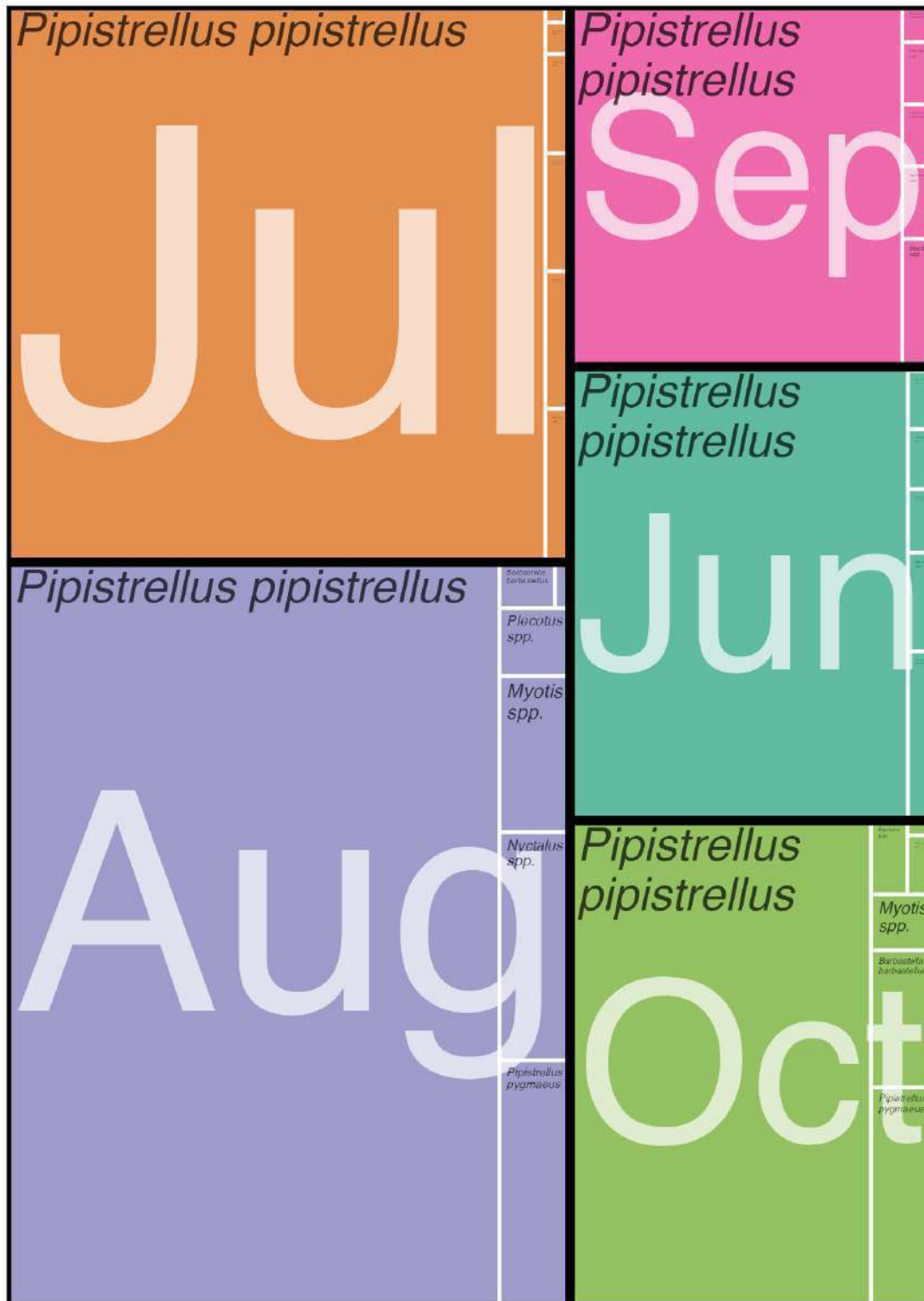


Figure 33: Month with the number of passes



Figure 34: Month by year with the number of passes

4. MAPS

Figure 35: shows a location map.

Figure 36: shows a map with all the recorded species.

Figure 37: shows a series of maps with the recorded location by species.

Figure 38: shows a series of maps with the recorded species by location.



Figure 35: Location map



Figure 36: Map of species recordings



Figure 37: Recordings by species



Figure 38: Recordings by location

5. STATISTICS

5.1. Comparison of Location Activity

The average bat pass rate has been calculated for the night at each survey location; Location ST1, Location ST2, Location ST3, Location ST4, and Location ST5 using the formula:

$$\frac{\text{Batpasses}}{\text{Nightlength}}$$

Where:

Batpasses = number of bat Passes during the night at the location

Nightlength = Length of the night in decimal hours

The comparison of location's is undertaken with the Mann-Whitney-Wilcoxon or Kruskal-Wallis test. The Kruskal-Wallis test is a rank-based test that is similar to the Mann-Whitney-Wilcoxon test, but can be applied to one-way data with more than two groups. If there are just two location's the Mann-Whitney-Wilcoxon test is applied. The Kruskal-Wallis test *may* be used when there are only two samples, but the Mann-Whitney-Wilcoxon is more powerful for two samples and is preferred.

Both tests assume that the observations are independent.

The probability threshold for *statistical significance* used in the tests is: 0.05

- **The Null Hypothesis:** *bat pass rates per hour* are from distributions with the same median.
- **The Alternative Hypothesis:** *bat pass rates per hour* are from distributions with a different median.

5.1.1. *Barbastella barbastellus*: Statistical Comparison of Activity Between Location's

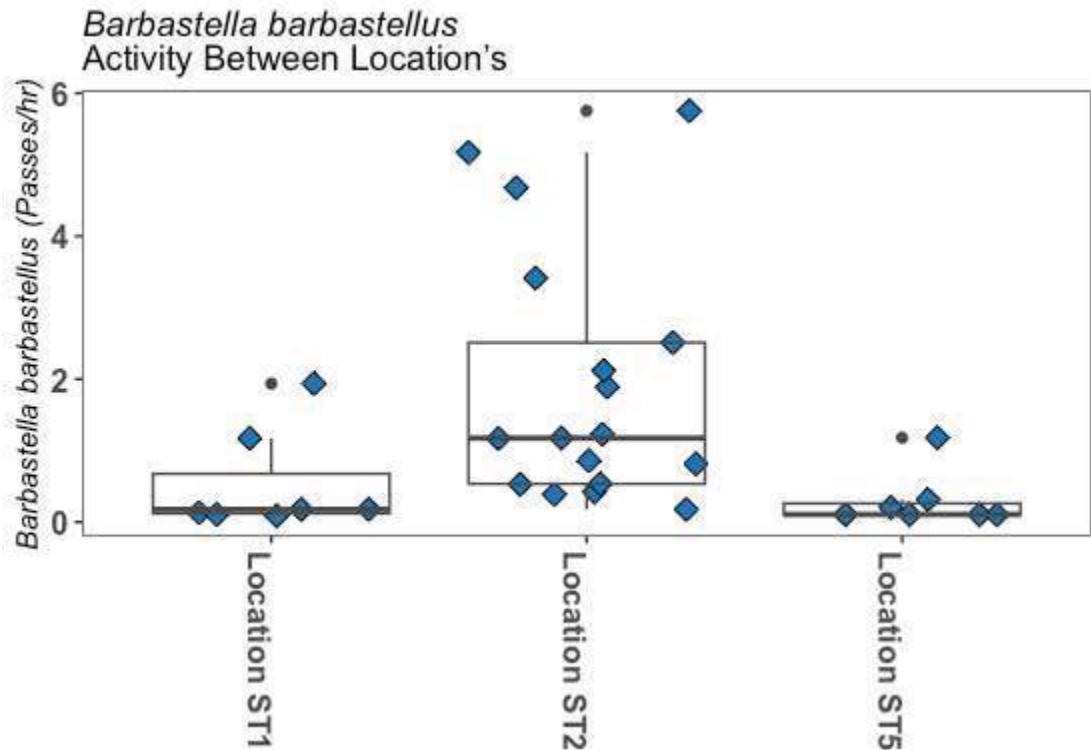


Figure 39: *Barbastella barbastellus* activity for location

Table 20: *Barbastella barbastellus* number of observations

Location	Number
Location ST1	7
Location ST2	17
Location ST5	7

The Kruskal-Wallis test was undertaken for *Barbastella barbastellus* between the following Location's: **Location ST1, Location ST2, and Location ST5**. The null hypothesis is rejected at $P < 0.05$. Activity between some location's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which location's are different; the results are shown below.

Table 21: *Barbastella barbastellus* results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Location ST1 - Location ST2	0.019037968
Location ST2 - Location ST5	0.002693854

5.1.2. *Eptesicus serotinus*: Statistical Comparison of Activity Between Location's

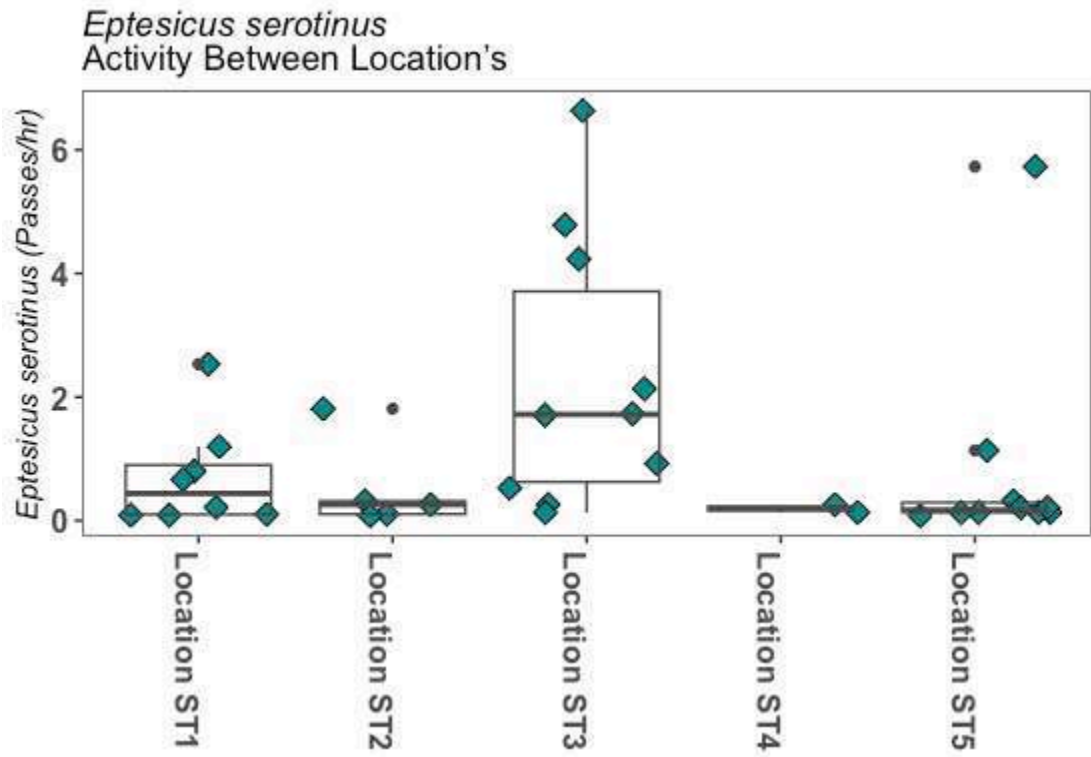


Figure 40: *Eptesicus serotinus* activity for location

Table 22: *Eptesicus serotinus* number of observations

Location	Number
Location ST1	8
Location ST2	5
Location ST3	10
Location ST4	2
Location ST5	10

The Kruskal-Wallis test was undertaken for ***Eptesicus serotinus*** between the following Location's: **Location ST1, Location ST2, Location ST3, and Location ST5**. The null hypothesis is accepted at $P < 0.05$. Activity between the Location's is unlikely to be different.

5.1.3. *Myotis spp.*: Statistical Comparison of Activity Between Location's

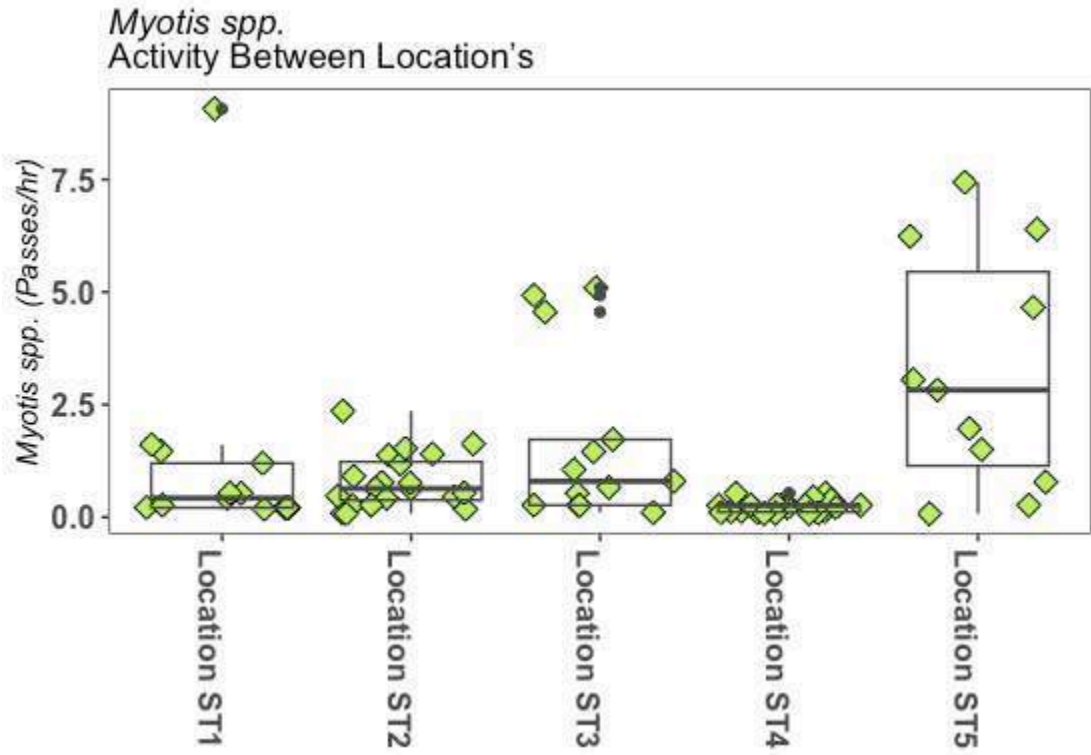


Figure 41: *Myotis spp.* Activity for location

Table 23: *Myotis spp.* Number of observations

Location	Number
Location ST1	13
Location ST2	20
Location ST3	13
Location ST4	23
Location ST5	11

The Kruskal-Wallis test was undertaken for *Myotis spp.* between the following Location's: **Location ST1, Location ST2, Location ST3, Location ST4, and Location ST5**. The null hypothesis is rejected at $P < 0.05$. Activity between some location's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which location's are different; the results are shown below.

Table 24: *Myotis spp.* Results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Location ST2 - Location ST4	0.00749786572

Locations with a significant difference	adjusted P
Location ST3 - Location ST4	0.00202729080
Location ST4 - Location ST5	0.00001867611

5.1.4. *Nyctalus spp.*: Statistical Comparison of Activity Between Location's

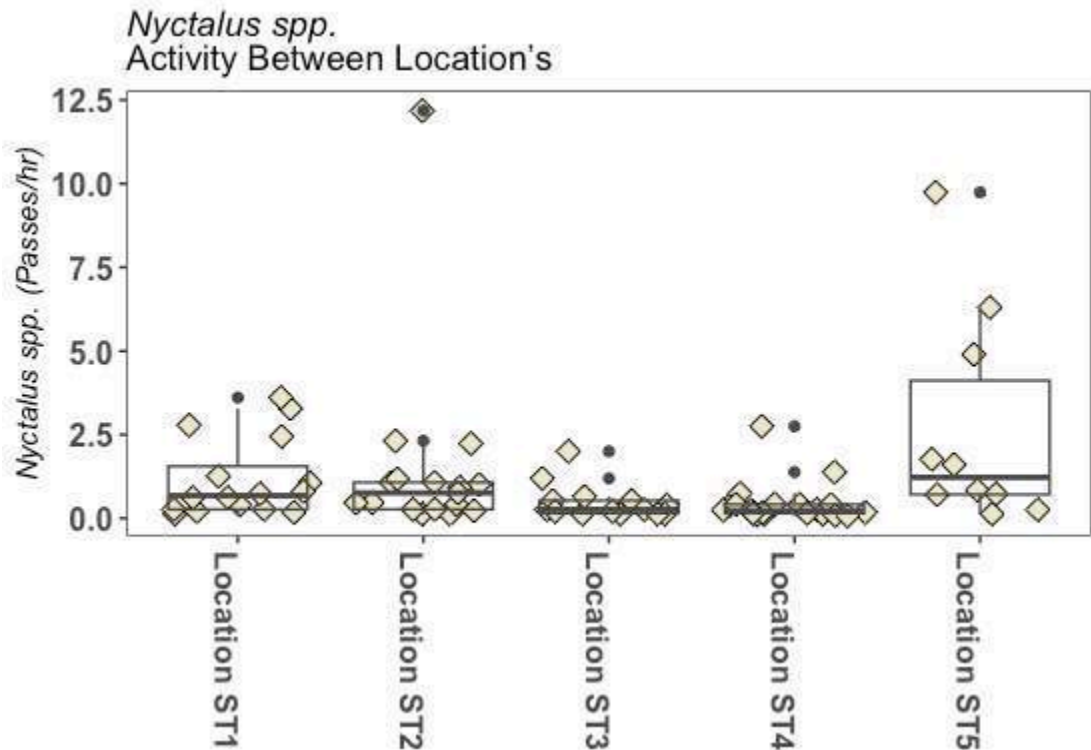


Figure 42: *Nyctalus spp.* Activity for location

Table 25: *Nyctalus spp.* Number of observations

Location	Number
Location ST1	16
Location ST2	17
Location ST3	14
Location ST4	21
Location ST5	10

The Kruskal-Wallis test was undertaken for ***Nyctalus spp.*** between the following Location's: **Location ST1, Location ST2, Location ST3, Location ST4, and Location ST5**. The null hypothesis is rejected at $P < 0.05$. Activity between some location's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which location's are different; the results are shown below.

Table 26: *Nyctalus* spp. Results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Location ST1 - Location ST4	0.03067436
Location ST2 - Location ST4	0.04522178
Location ST3 - Location ST5	0.04787724
Location ST4 - Location ST5	0.00518890

5.1.5. *Pipistrellus nathusii*: Statistical Comparison of Activity Between Location's

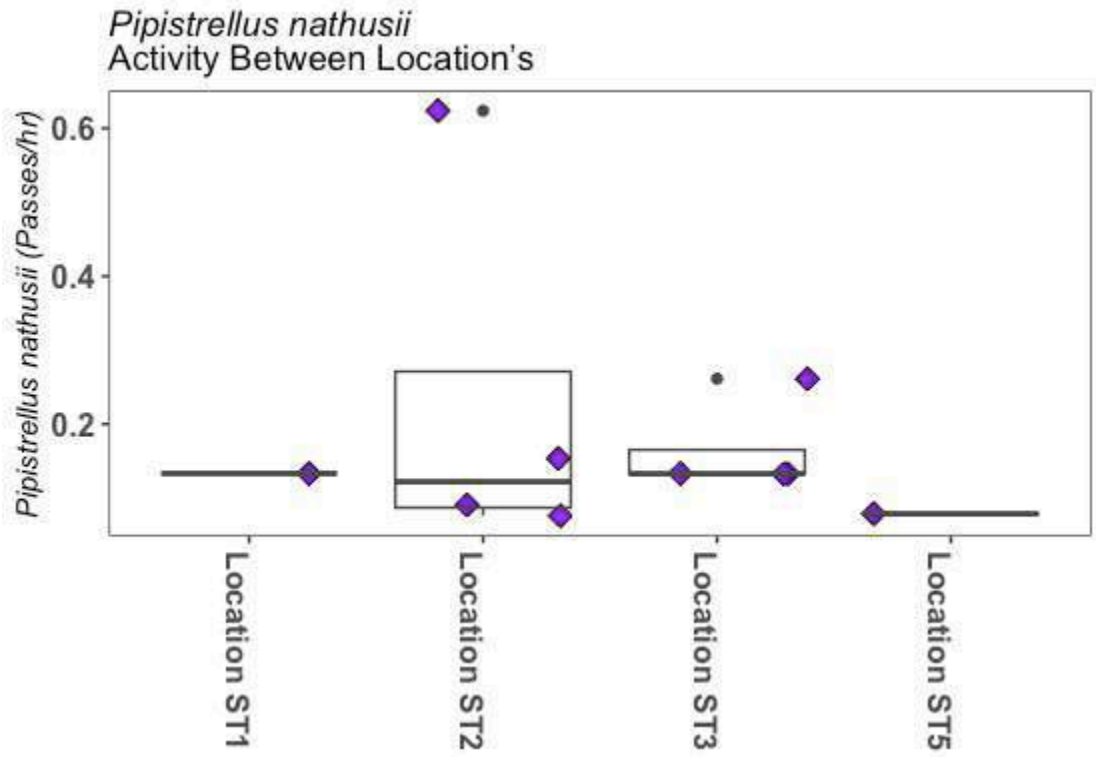


Figure 43: *Pipistrellus nathusii* activity for location

Table 27: *Pipistrellus nathusii* number of observations

Location	Number
Location ST1	1
Location ST2	4
Location ST3	4
Location ST5	1

There is insufficient data to undertake the Kruskal-Wallis or Mann-Whitney-Wilcoxon test

5.1.6. *Pipistrellus pipistrellus*: Statistical Comparison of Activity Between Location's

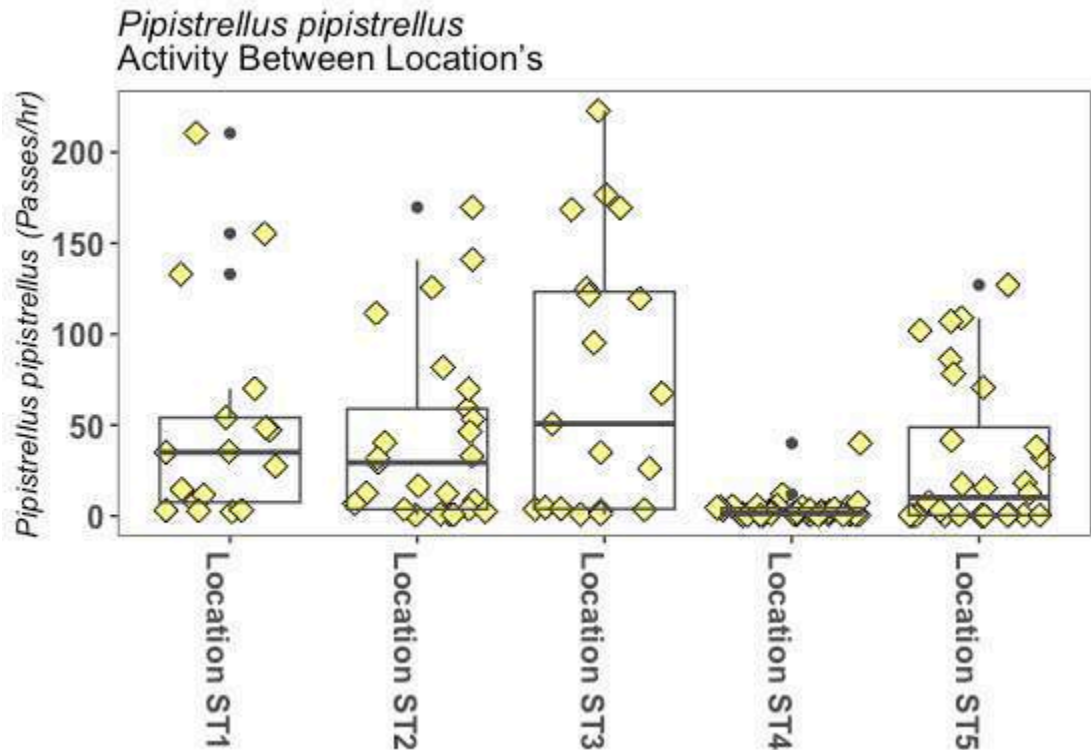


Figure 44: *Pipistrellus pipistrellus* activity for location

Table 28: *Pipistrellus pipistrellus* number of observations

Location	Number
Location ST1	17
Location ST2	25
Location ST3	19
Location ST4	38
Location ST5	28

The Kruskal-Wallis test was undertaken for *Pipistrellus pipistrellus* between the following Location's: **Location ST1, Location ST2, Location ST3, Location ST4, and Location ST5**. The null hypothesis is rejected at $P < 0.05$. Activity between some location's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which location's are different; the results are shown below.

Table 29: *Pipistrellus pipistrellus* results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Location ST1 - Location ST4	0.00020913660
Location ST2 - Location ST4	0.00041928079
Location ST3 - Location ST4	0.00002541332
Location ST3 - Location ST5	0.03238294985

5.1.7. *Pipistrellus pygmaeus*: Statistical Comparison of Activity Between Location's

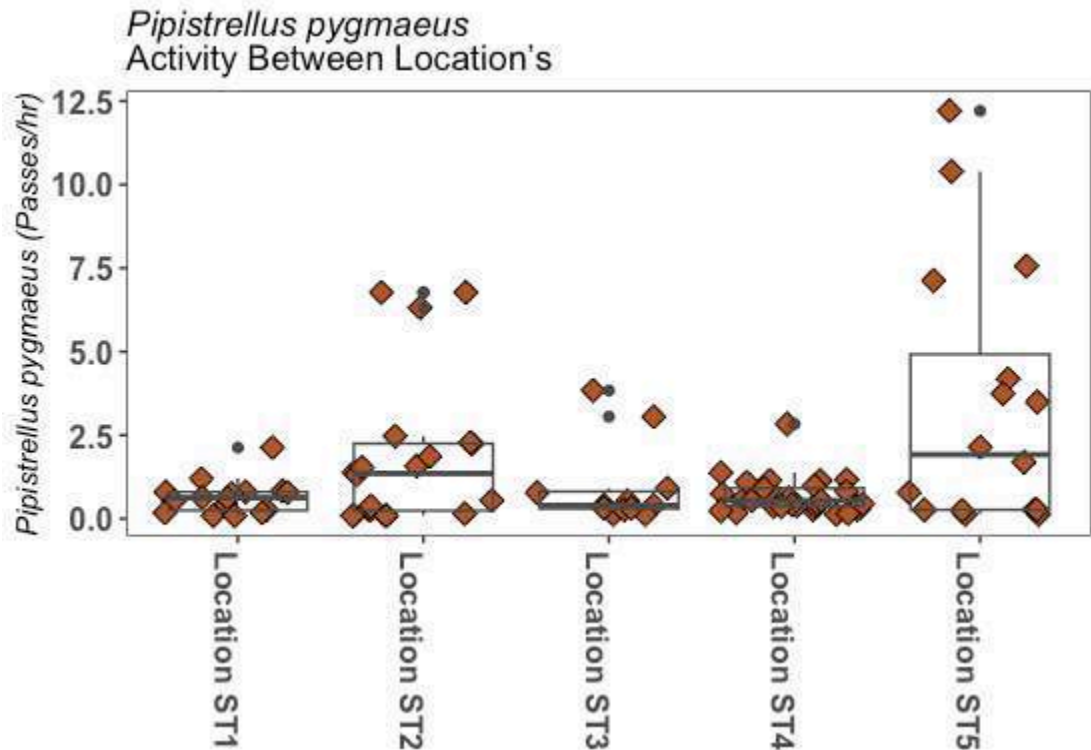


Figure 45: *Pipistrellus pygmaeus* activity for location

Table 30: *Pipistrellus pygmaeus* number of observations

Location	Number
Location ST1	16
Location ST2	20
Location ST3	12
Location ST4	29
Location ST5	16

The Kruskal-Wallis test was undertaken for *Pipistrellus pygmaeus* between the following Location's: **Location ST1, Location ST2, Location ST3, Location ST4, and Location ST5**. The null hypothesis is accepted at $P < 0.05$. Activity between the Location's is unlikely to be different.

5.1.8. *Plecotus* spp.: Statistical Comparison of Activity Between Location's

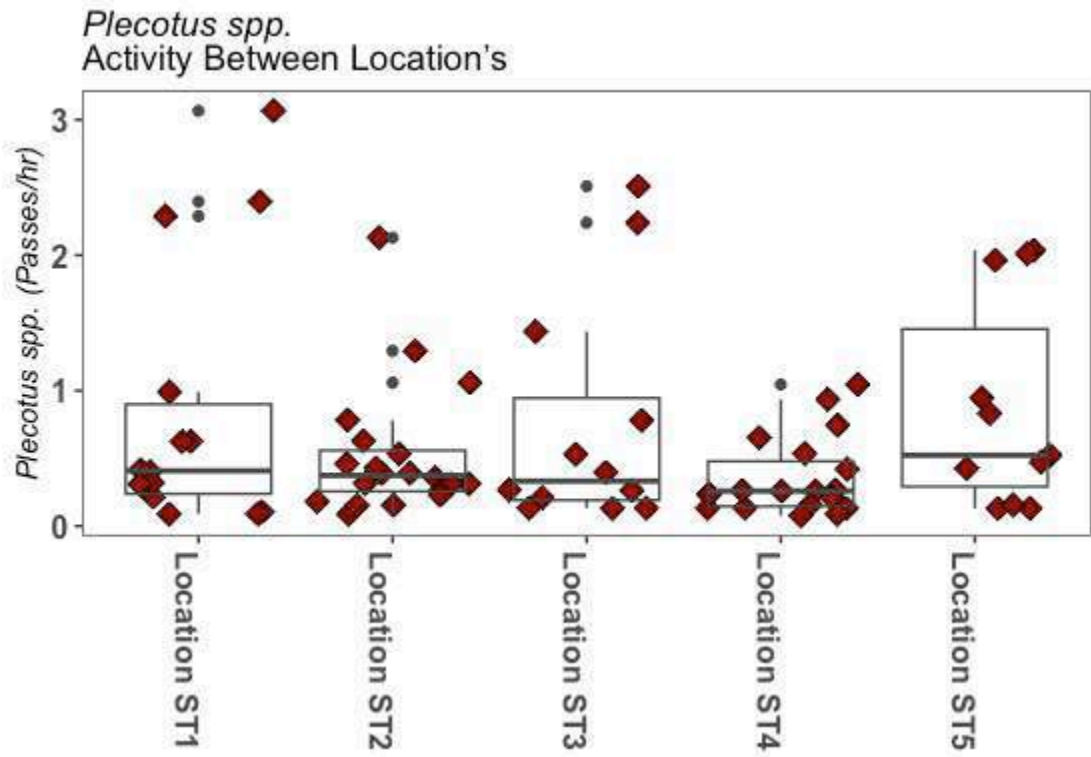


Figure 46: *Plecotus* spp. Activity for location

Table 31: *Plecotus* spp. Number of observations

Location	Number
Location ST1	14
Location ST2	20
Location ST3	12
Location ST4	19
Location ST5	11

The Kruskal-Wallis test was undertaken for *Plecotus* spp. between the following Location's: **Location ST1, Location ST2, Location ST3, Location ST4, and Location ST5**. The null hypothesis is accepted at $P < 0.05$. Activity between the Location's is unlikely to be different.

5.2. Comparison of Month Activity

The average bat pass rate has been calculated for the night at each survey location; Location ST1, Location ST2, Location ST3, Location ST4, and Location ST5 using the formula:

$$\frac{\text{Batpasses}}{\text{Nightlength}}$$

Where:

Batpasses = number of bat Passes during the night at the location

Nightlength = Length of the night in decimal hours

The comparison of Month's is undertaken with the Mann-Whitney-Wilcoxon or Kruskal-Wallis test. The Kruskal-Wallis test is a rank-based test that is similar to the Mann-Whitney-Wilcoxon test, but can be applied to one-way data with more than two groups. If there are just two Month's the Mann-Whitney-Wilcoxon test is applied. The Kruskal-Wallis test may be used when there are only two samples, but the Mann-Whitney-Wilcoxon is more powerful for two samples and is preferred.

Both tests assume that the observations are independent.

The probability threshold for *statistical significance* used in the tests is: 0.05

- **The Null Hypothesis:** *bat pass rates per hour* are from distributions with the same median.
- **The Alternative Hypothesis:** *bat pass rates per hour* are from distributions with a different median.

5.2.1. *Barbastella barbastellus*: Statistical Comparison of Activity Between Month's

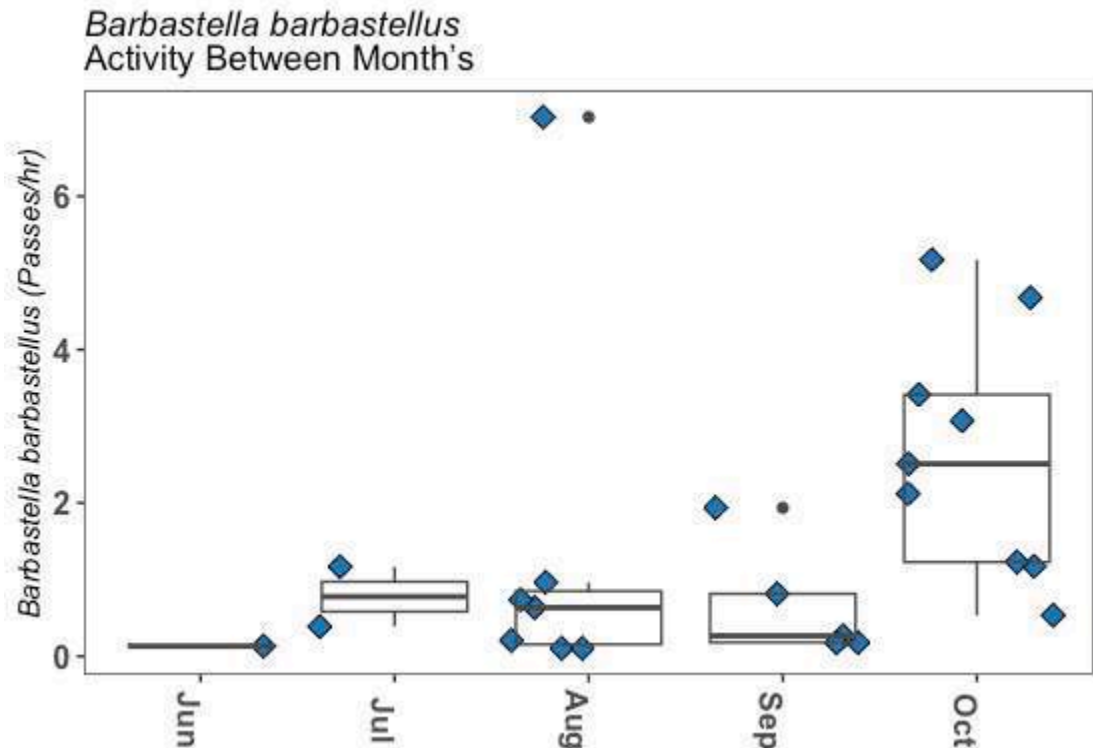


Figure 47: *Barbastella barbastellus* activity for location

Table 32: *Barbastella barbastellus* number of observations

Month	Number
Jun	1
Jul	2
Aug	7
Sep	5
Oct	9

The Kruskal-Wallis test was undertaken for *Barbastella barbastellus* between the following Month's: **Aug, Sep, and Oct**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month's are different; the results are shown below.

Table 33: *Barbastella barbastellus* results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug - Oct	0.03536223

Locations with a significant difference	adjusted P
Oct - Sep	0.03571561

5.2.2. *Eptesicus serotinus*: Statistical Comparison of Activity Between Month's

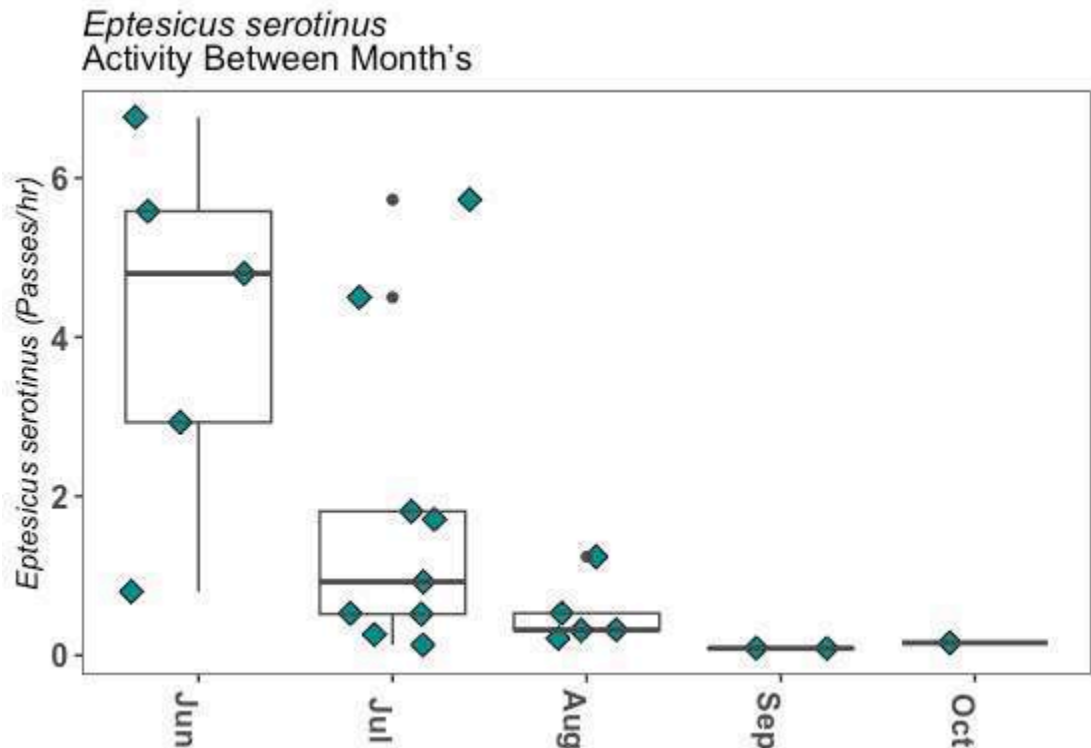


Figure 48: *Eptesicus serotinus* activity for location

Table 34: *Eptesicus serotinus* number of observations

Month	Number
Jun	5
Jul	9
Aug	5
Sep	2
Oct	1

The Kruskal-Wallis test was undertaken for ***Eptesicus serotinus*** between the following Month's: **Jun, Jul, and Aug**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month's are different; the results are shown below.

Table 35: *Eptesicus serotinus* results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug - Jun	0.01716888

5.2.3. *Myotis spp.*: Statistical Comparison of Activity Between Month's

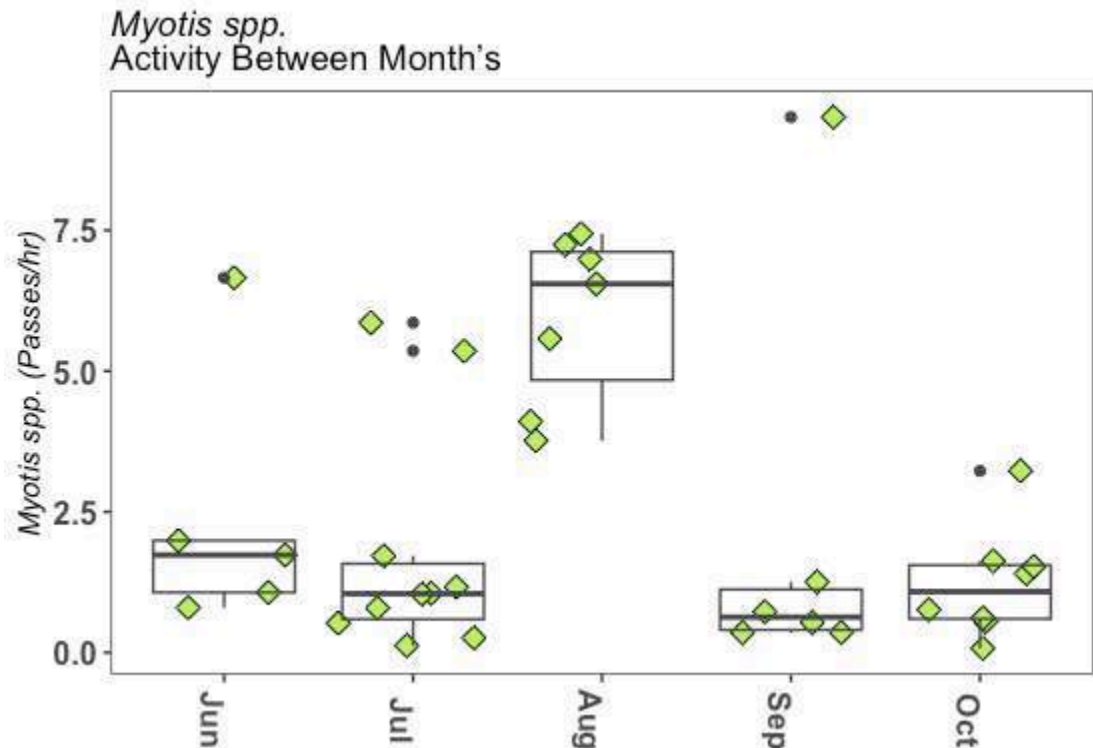


Figure 49: *Myotis spp.* Activity for location

Table 36: *Myotis spp.* Number of observations

Month	Number
Jun	5
Jul	10
Aug	7
Sep	6
Oct	8

The Kruskal-Wallis test was undertaken for ***Myotis spp.*** between the following Month's: **Jun, Jul, Aug, Sep, and Oct**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month's are different; the results are shown below.

Table 37: *Myotis spp.* Results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug - Jul	0.01160006

Locations with a significant difference	adjusted P
Aug - Oct	0.01266114
Aug - Sep	0.01512060

5.2.4. *Nyctalus spp.*: Statistical Comparison of Activity Between Month's

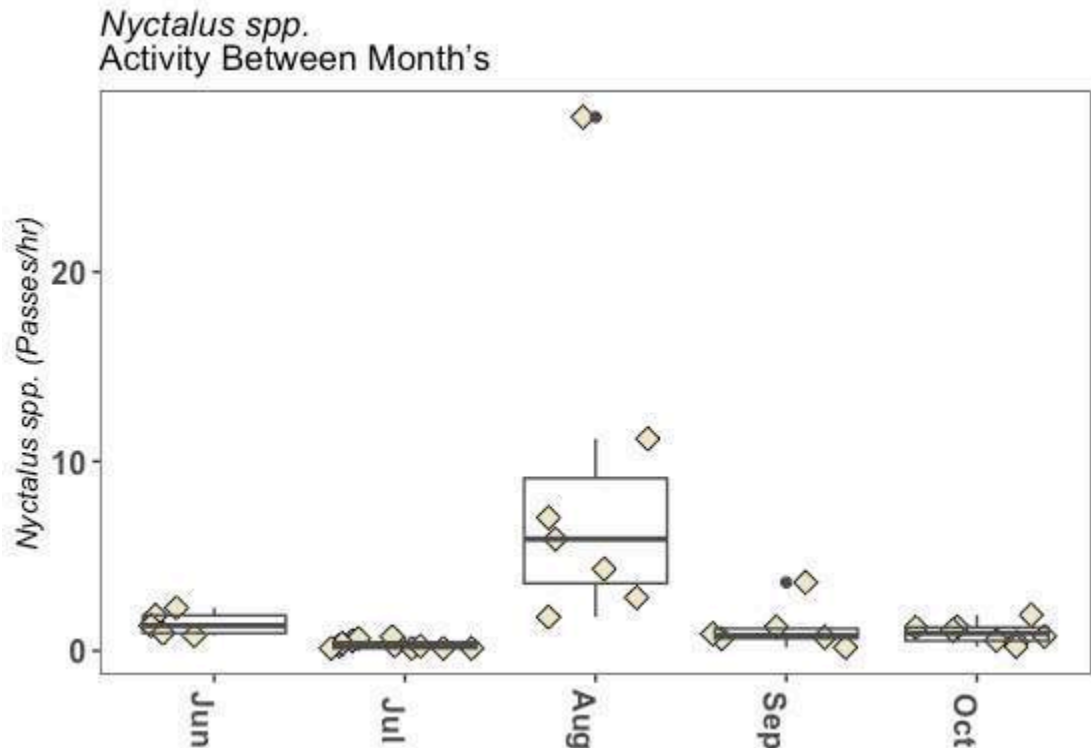


Figure 50: *Nyctalus spp.* Activity for location

Table 38: *Nyctalus spp.* Number of observations

Month	Number
Jun	5
Jul	11
Aug	7
Sep	6
Oct	8

The Kruskal-Wallis test was undertaken for ***Nyctalus spp.*** between the following Month's: **Jun, Jul, Aug, Sep, and Oct**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month's are different; the results are shown below.

Table 39: *Nyctalus spp.* Results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug - Jul	0.000006775292

Locations with a significant difference	adjusted P
Jul - Jun	0.020036412911
Aug - Oct	0.036381689791

5.2.5. *Pipistrellus nathusii*: Statistical Comparison of Activity Between Month's

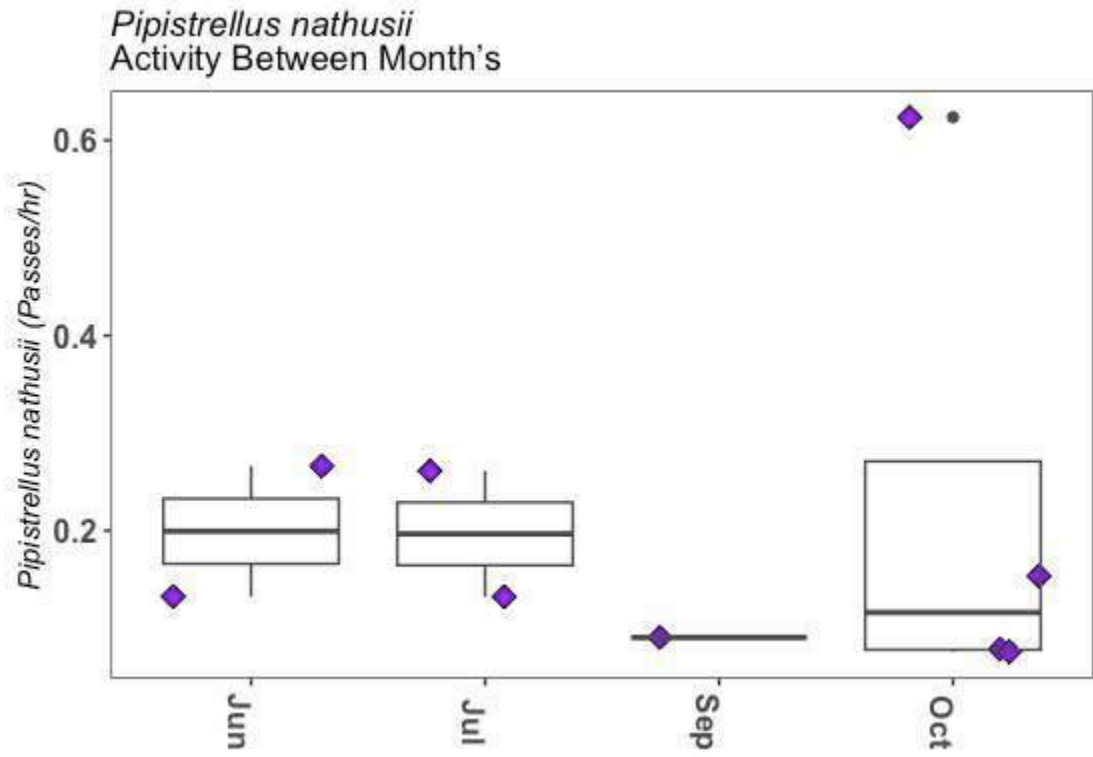


Figure 51: *Pipistrellus nathusii* activity for location

Table 40: *Pipistrellus nathusii* number of observations

Month	Number
Jun	2
Jul	2
Sep	1
Oct	4

There is insufficient data to undertake the Kruskal-Wallis or Mann-Whitney-Wilcoxon test

5.2.6. *Pipistrellus pipistrellus*: Statistical Comparison of Activity Between Month's

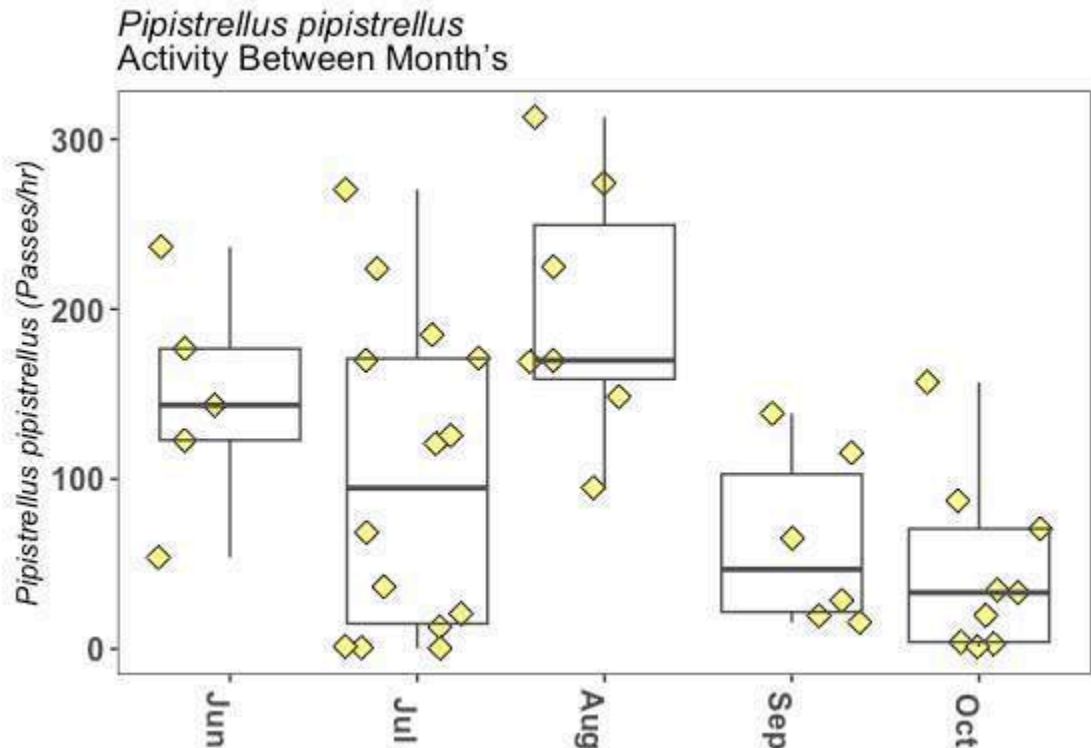


Figure 52: *Pipistrellus pipistrellus* activity for location

Table 41: *Pipistrellus pipistrellus* number of observations

Month	Number
Jun	5
Jul	14
Aug	7
Sep	6
Oct	9

The Kruskal-Wallis test was undertaken for ***Pipistrellus pipistrellus*** between the following Month's: **Jun, Jul, Aug, Sep, and Oct**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month's are different; the results are shown below.

Table 42: *Pipistrellus pipistrellus* results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug - Oct	0.006749756

5.2.7. *Pipistrellus pygmaeus*: Statistical Comparison of Activity Between Month's

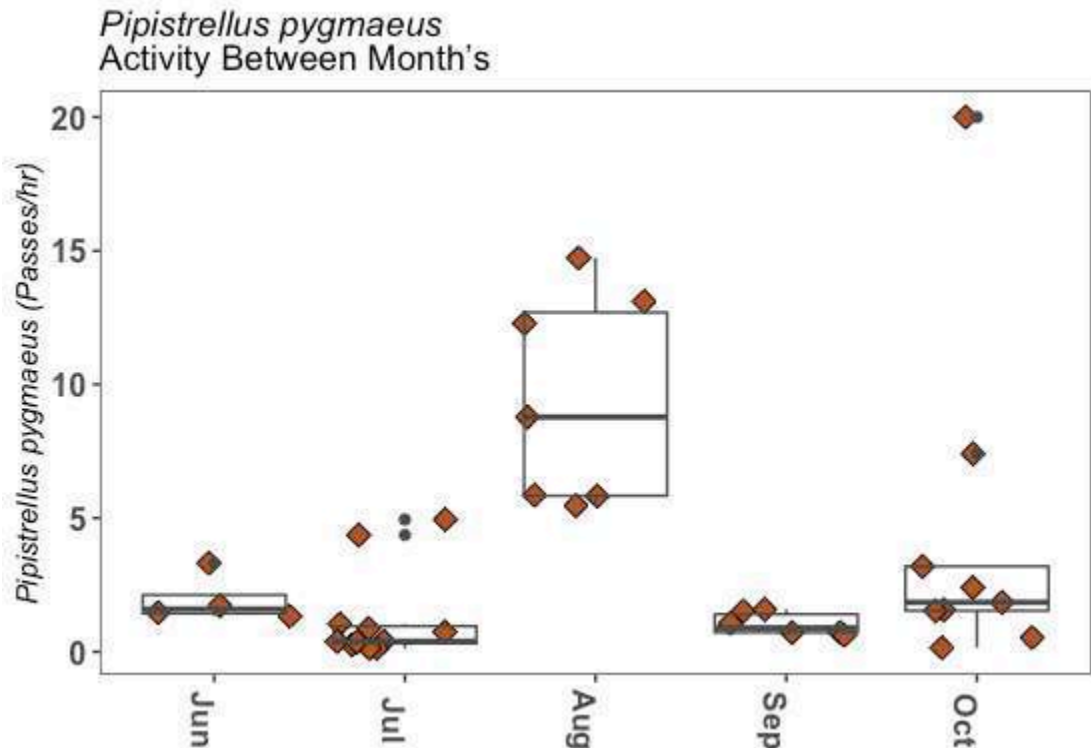


Figure 53: *Pipistrellus pygmaeus* activity for location

Table 43: *Pipistrellus pygmaeus* number of observations

Month	Number
Jun	4
Jul	11
Aug	7
Sep	6
Oct	9

The Kruskal-Wallis test was undertaken for ***Pipistrellus pygmaeus*** between the following Month's: **Jul, Aug, Sep, and Oct**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month's are different; the results are shown below.

Table 44: *Pipistrellus pygmaeus* results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug - Jul	0.0002316146

Locations with a significant difference	adjusted P
Aug - Sep	0.0138534289

5.2.8. *Plecotus* spp.: Statistical Comparison of Activity Between Month's

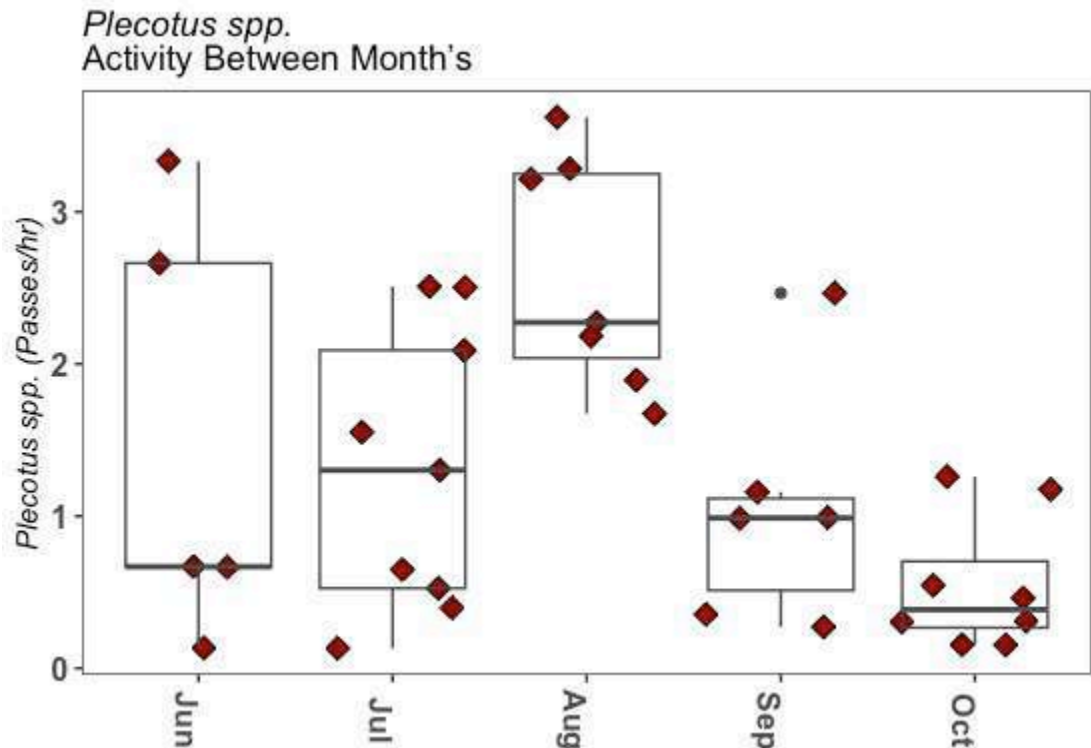


Figure 54: *Plecotus* spp. Activity for location

Table 45: *Plecotus* spp. Number of observations

Month	Number
Jun	5
Jul	9
Aug	7
Sep	6
Oct	8

The Kruskal-Wallis test was undertaken for *Plecotus* spp. between the following Month's: **Jun, Jul, Aug, Sep, and Oct**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month's are different; the results are shown below.

Table 46: *Plecotus* spp. Results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug - Oct	0.0025231

5.3. Comparison of Month Year Activity

The average bat pass rate has been calculated for the night at each survey location; Location ST1, Location ST2, Location ST3, Location ST4, and Location ST5 using the formula:

$$\frac{\text{Batpasses}}{\text{Nightlength}}$$

Where:

Batpasses = number of bat Passes during the night at the location

Nightlength = Length of the night in decimal hours

The comparison of Month Year's is undertaken with the Mann-Whitney-Wilcoxon or Kruskal-Wallis test. The Kruskal-Wallis test is a rank-based test that is similar to the Mann-Whitney-Wilcoxon test, but can be applied to one-way data with more than two groups. If there are just two Month Year's the Mann-Whitney-Wilcoxon test is applied. The Kruskal-Wallis test may be used when there are only two samples, but the Mann-Whitney-Wilcoxon is more powerful for two samples and is preferred.

Both tests assume that the observations are independent.

The probability threshold for *statistical significance* used in the tests is: 0.05

- **The Null Hypothesis:** *bat pass rates per hour* are from distributions with the same median.
- **The Alternative Hypothesis:** *bat pass rates per hour* are from distributions with a different median.

5.3.1. *Barbastella barbastellus*: Statistical Comparison of Activity Between Month Year's

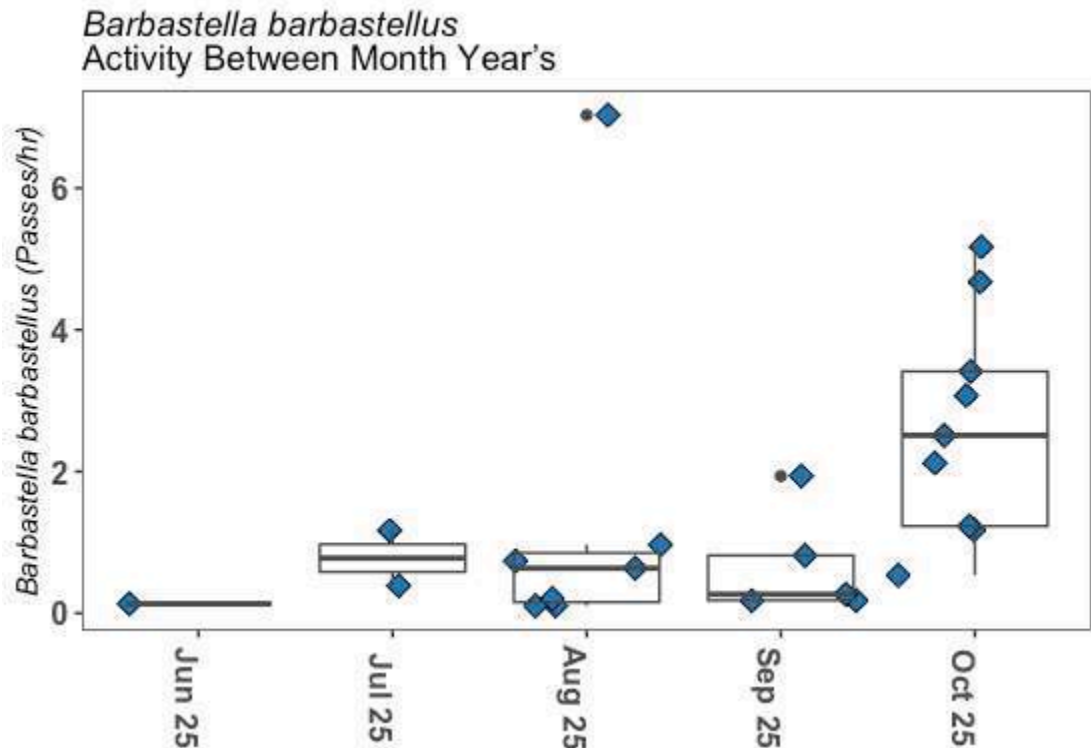


Figure 55: *Barbastella barbastellus* activity for location

Table 47: *Barbastella barbastellus* number of observations

Month Year	Number
Jun 25	1
Jul 25	2
Aug 25	7
Sep 25	5
Oct 25	9

The Kruskal-Wallis test was undertaken for *Barbastella barbastellus* between the following Month Year's: **Aug 25, Sep 25, and Oct 25**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month Year's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month Year's are different; the results are shown below.

Table 48: *Barbastella barbastellus* results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug 25 - Oct 25	0.03536223

Locations with a significant difference	adjusted P
Oct 25 - Sep 25	0.03571561

5.3.2. *Eptesicus serotinus*: Statistical Comparison of Activity Between Month Year's

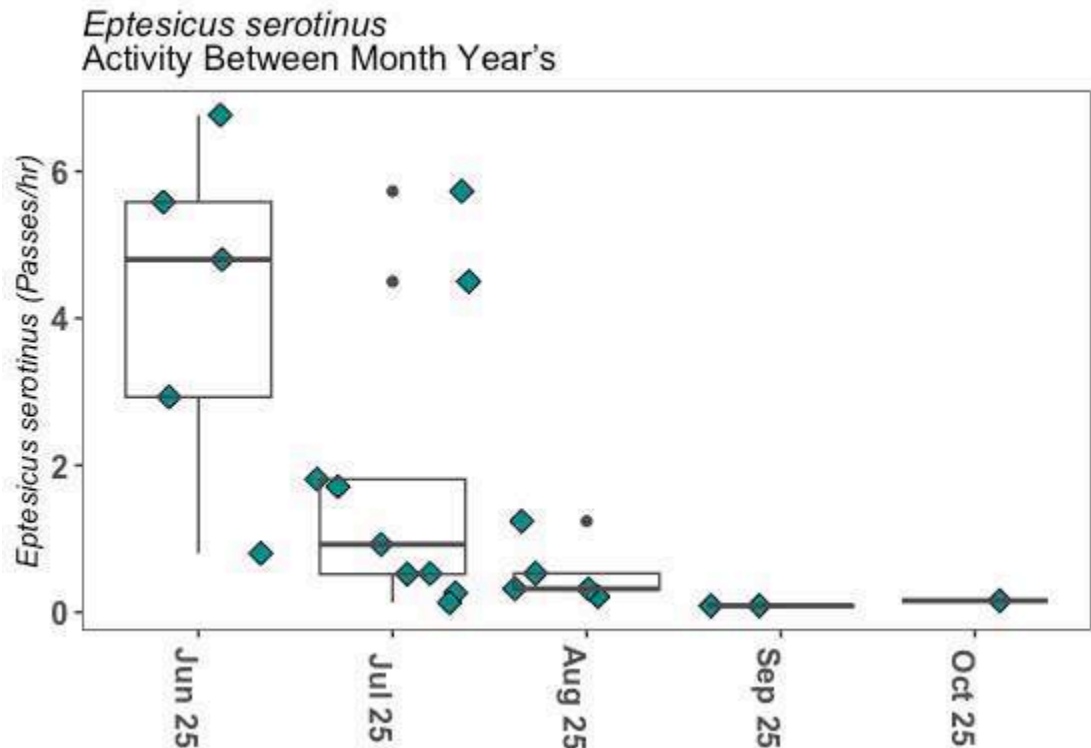


Figure 56: *Eptesicus serotinus* activity for location

Table 49: *Eptesicus serotinus* number of observations

Month Year	Number
Jun 25	5
Jul 25	9
Aug 25	5
Sep 25	2
Oct 25	1

The Kruskal-Wallis test was undertaken for ***Eptesicus serotinus*** between the following Month Year's: **Jun 25, Jul 25, and Aug 25**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month Year's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month Year's are different; the results are shown below.

Table 50: *Eptesicus serotinus* results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug 25 - Jun 25	0.01716888

5.3.3. *Myotis spp.*: Statistical Comparison of Activity Between Month Year's

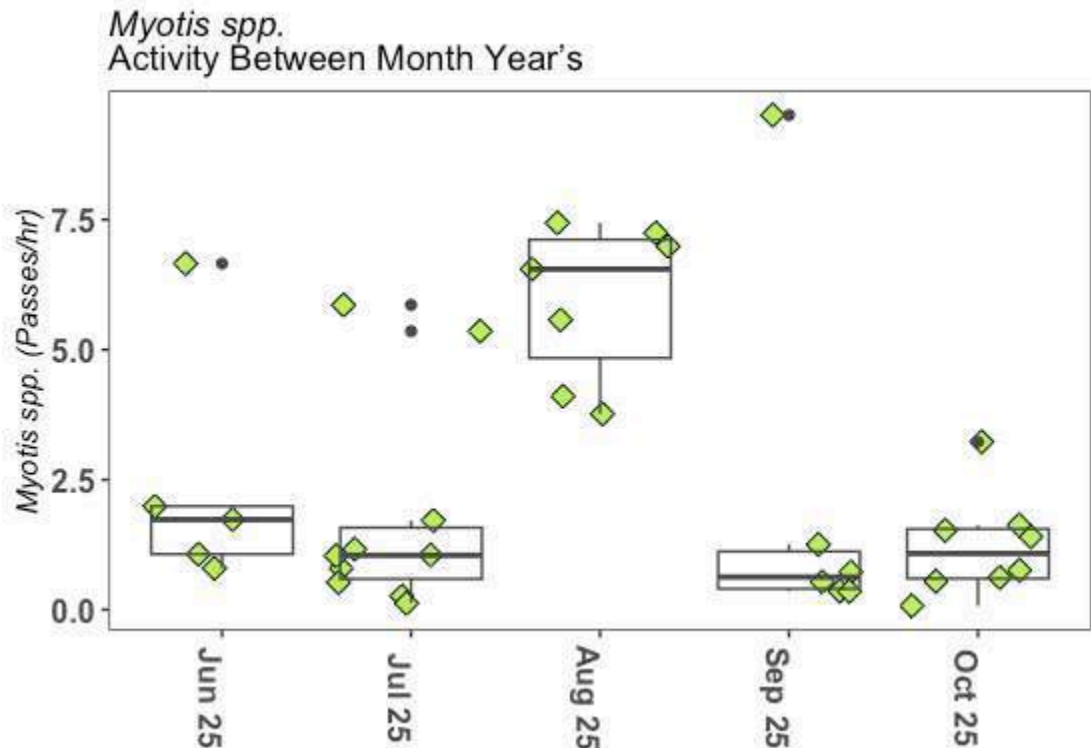


Figure 57: *Myotis spp.* Activity for location

Table 51: *Myotis spp.* Number of observations

Month Year	Number
Jun 25	5
Jul 25	10
Aug 25	7
Sep 25	6
Oct 25	8

The Kruskal-Wallis test was undertaken for ***Myotis spp.*** between the following Month Year's: **Jun 25, Jul 25, Aug 25, Sep 25, and Oct 25**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month Year's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month Year's are different; the results are shown below.

Table 52: *Myotis spp.* Results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug 25 - Jul 25	0.01160006

Locations with a significant difference	adjusted P
Aug 25 - Oct 25	0.01266114
Aug 25 - Sep 25	0.01512060

5.3.4. *Nyctalus spp.*: Statistical Comparison of Activity Between Month Year's

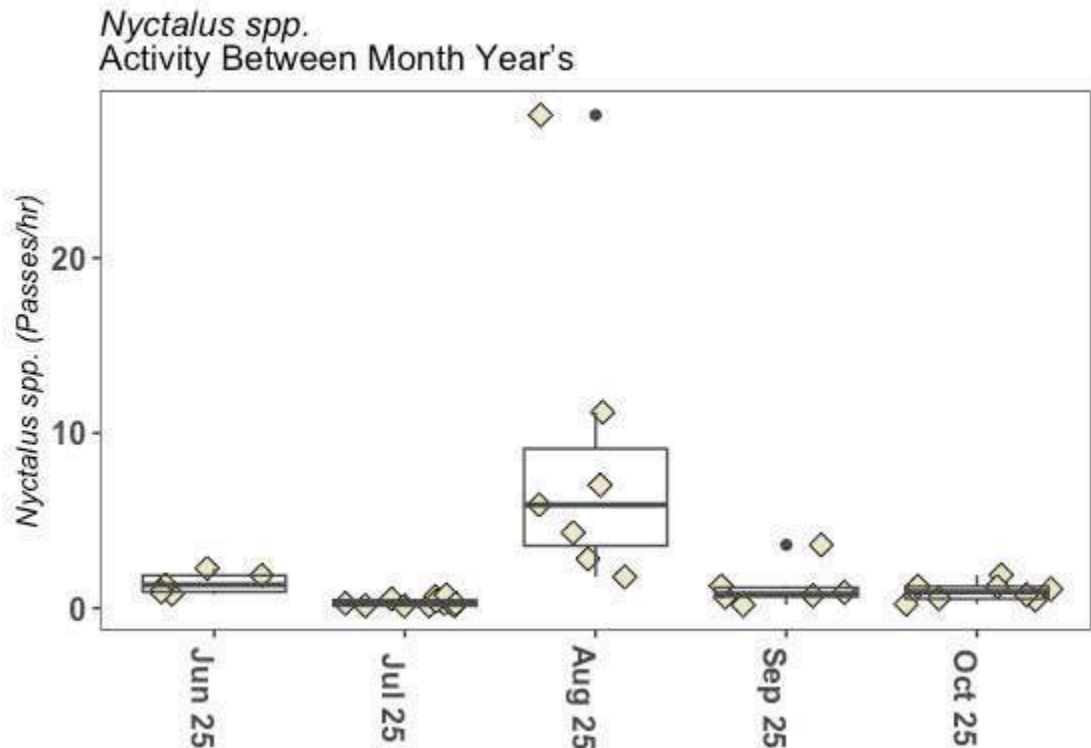


Figure 58: *Nyctalus spp.* Activity for location

Table 53: *Nyctalus spp.* Number of observations

Month Year	Number
Jun 25	5
Jul 25	11
Aug 25	7
Sep 25	6
Oct 25	8

The Kruskal-Wallis test was undertaken for ***Nyctalus spp.*** between the following Month Year's: **Jun 25, Jul 25, Aug 25, Sep 25, and Oct 25**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month Year's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month Year's are different; the results are shown below.

Table 54: *Nyctalus spp.* Results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug 25 - Jul 25	0.000006775292

Locations with a significant difference	adjusted P
Jul 25 - Jun 25	0.020036412911
Aug 25 - Oct 25	0.036381689791

5.3.5. *Pipistrellus nathusii*: Statistical Comparison of Activity Between Month Year's

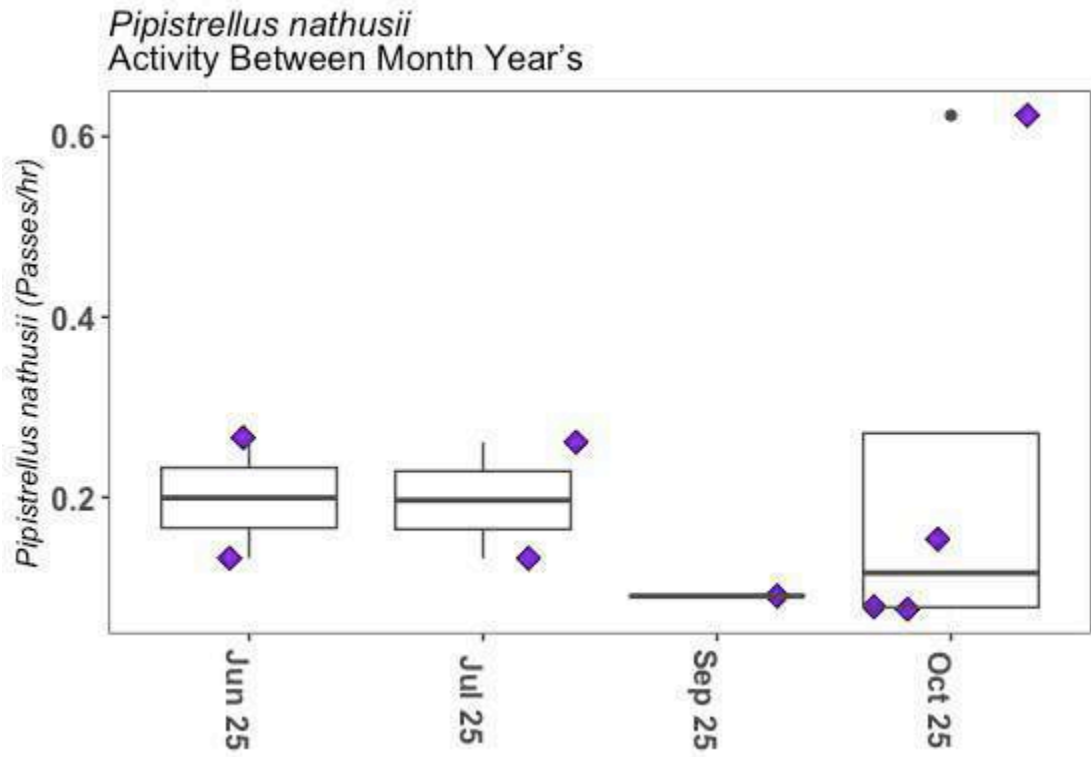


Figure 59: *Pipistrellus nathusii* activity for location

Table 55: *Pipistrellus nathusii* number of observations

Month Year	Number
Jun 25	2
Jul 25	2
Sep 25	1
Oct 25	4

There is insufficient data to undertake the Kruskal-Wallis or Mann-Whitney-Wilcoxon test

5.3.6. *Pipistrellus pipistrellus*: Statistical Comparison of Activity Between Month Year's

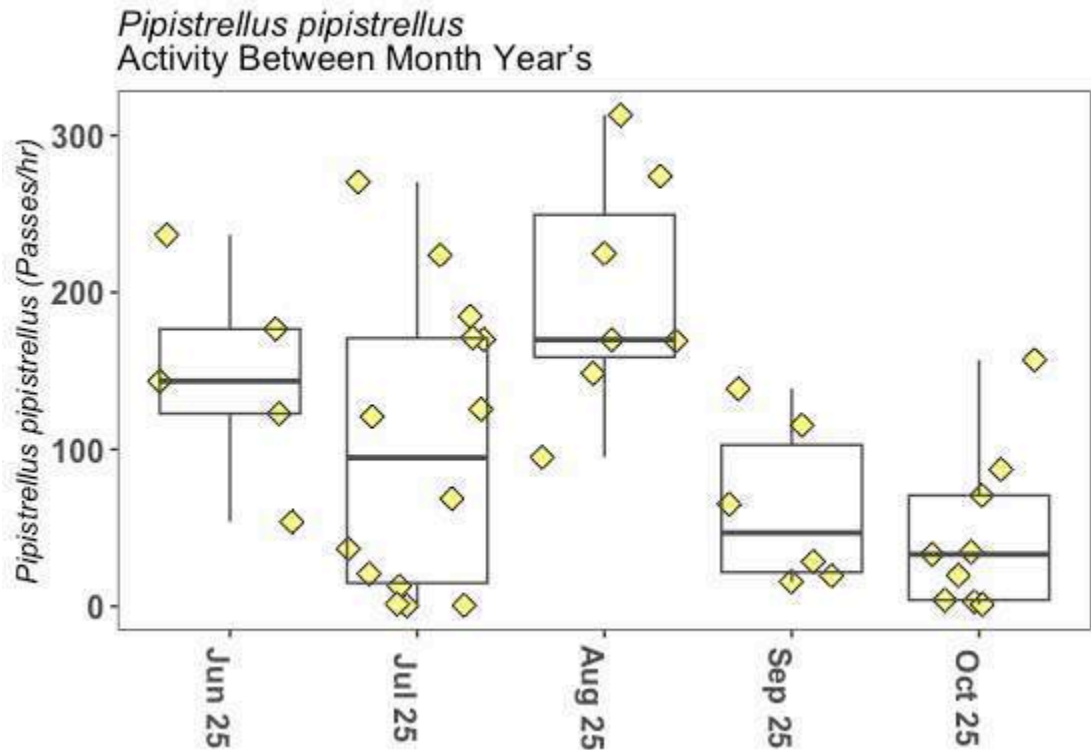


Figure 60: *Pipistrellus pipistrellus* activity for location

Table 56: *Pipistrellus pipistrellus* number of observations

Month Year	Number
Jun 25	5
Jul 25	14
Aug 25	7
Sep 25	6
Oct 25	9

The Kruskal-Wallis test was undertaken for *Pipistrellus pipistrellus* between the following Month Year's: **Jun 25, Jul 25, Aug 25, Sep 25, and Oct 25**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month Year's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month Year's are different; the results are shown below.

Table 57: *Pipistrellus pipistrellus* results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug 25 - Oct 25	0.006749756

5.3.7. *Pipistrellus pygmaeus*: Statistical Comparison of Activity Between Month Year's

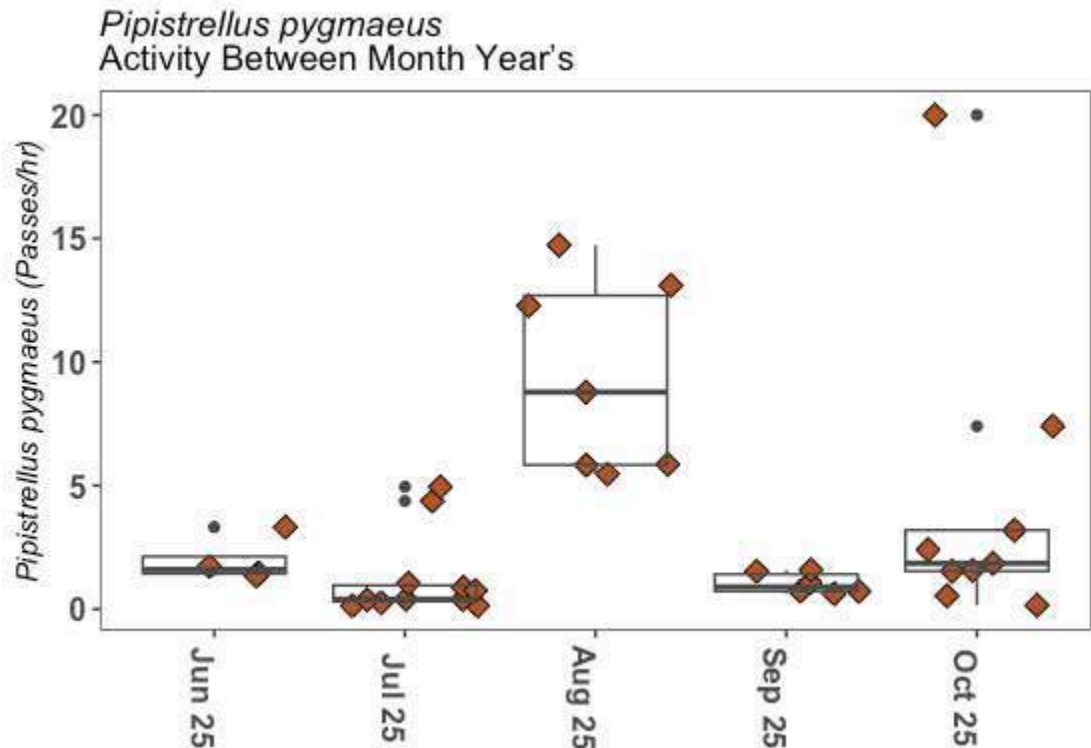


Figure 61: *Pipistrellus pygmaeus* activity for location

Table 58: *Pipistrellus pygmaeus* number of observations

Month Year	Number
Jun 25	4
Jul 25	11
Aug 25	7
Sep 25	6
Oct 25	9

The Kruskal-Wallis test was undertaken for *Pipistrellus pygmaeus* between the following Month Year's: **Jul 25, Aug 25, Sep 25, and Oct 25**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month Year's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month Year's are different; the results are shown below.

Table 59: *Pipistrellus pygmaeus* results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug 25 - Jul 25	0.0002316146

Locations with a significant difference	adjusted P
Aug 25 - Sep 25	0.0138534289

5.3.8. *Plecotus* spp.: Statistical Comparison of Activity Between Month Year's

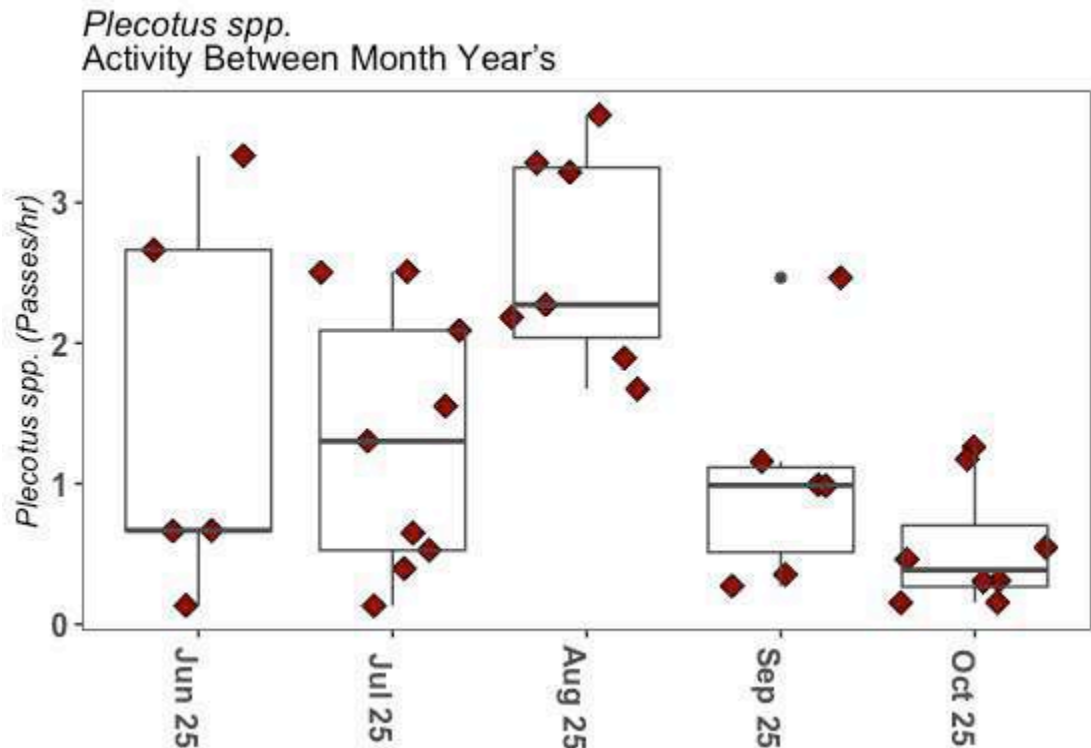


Figure 62: *Plecotus* spp. Activity for location

Table 60: *Plecotus* spp. Number of observations

Month Year	Number
Jun 25	5
Jul 25	9
Aug 25	7
Sep 25	6
Oct 25	8

The Kruskal-Wallis test was undertaken for *Plecotus* spp. between the following Month Year's: **Jun 25, Jul 25, Aug 25, Sep 25, and Oct 25**. The null hypothesis is rejected at $P < 0.05$. Activity between some Month Year's is likely to be different. *Post hoc* testing with the Dunn's Test, has been applied to determine which Month Year's are different; the results are shown below.

Table 61: *Plecotus* spp. Results of kruskal-wallis post hoc testing

Locations with a significant difference	adjusted P
Aug 25 - Oct 25	0.0025231

6. OTHER SPECIES

6.1. Small Mammals

Table 62: Small mammal registrations

Small Mammal Registrations
No Data

Table 63: Number of small mammal registrations by location and month

Small Mammal Registrations
No Data

6.2. Birds

Table 64: Bird registrations

Scientific Name	English Name	Count (No)	Percentage of total (%)
Aves sp.	Unidentified bird	3 682	100

Table 65: Number of Bird Registrations by Location and Month

Description	English Name	Jun	Jul	Aug	Sep	Oct
Location ST1	Unidentified bird	72	0	499	7	0
Location ST3	Unidentified bird	68	160	0	0	0
Location ST4	Unidentified bird	5	32	493	551	5
Location ST2	Unidentified bird	0	75	598	753	260
Location ST5	Unidentified bird	0	12	73	0	19

6.3. Moths

Table 66: Moth registrations

Scientific Name	English Name	Count (No)	Percentage of total (%)
<i>Yponomeuta evonymella</i>	Bird Cherry Ermine	497	100

Table 67: Number of Moth Registrations by Location and Month

Description	English Name	Jun	Jul	Aug
Location ST3	Bird Cherry Ermine	24	25	0
Location ST4	Bird Cherry Ermine	95	272	11
Location ST2	Bird Cherry Ermine	0	28	0
Location ST5	Bird Cherry Ermine	0	1	0
Location ST1	Bird Cherry Ermine	0	0	41

7. APPENDIX

7.1. BTO's Probability in the Species Analysis

The species analysis probability, a confidence metric provided by BTO's acoustic pipeline, is illustrated through the summary statistics shown in **Table 68** and the kernel density plots shown in **Figure 63**.

Table 68: Summary statistics: species and analysis probability

Species	Minimum	Lower Quartile (Q1)	Mean	Median	Upper Quartile (Q3)	Maximum	Standard Deviation	Number
<i>Barbastella barbastellus</i>	0.10	0.89	0.86	0.99	0.99	0.99	0.25	452
<i>Eptesicus serotinus</i>	0.10	0.40	0.65	0.70	0.87	4.50	0.40	309
<i>Myotis spp.</i>	0.10	0.21	0.53	0.50	0.86	0.99	0.31	895
<i>Nyctalus spp.</i>	0.10	0.34	0.62	0.66	0.92	1.21	0.30	839
<i>Pipistrellus nathusii</i>	0.14	0.34	0.56	0.65	0.77	0.83	0.25	19
<i>Pipistrellus pipistrellus</i>	0.10	0.99	0.94	0.99	0.99	24.99	0.39	39 072
<i>Pipistrellus pygmaeus</i>	0.10	0.58	0.72	0.81	0.90	2.35	0.24	1 356
<i>Plecotus spp.</i>	0.10	0.17	0.54	0.51	0.92	0.99	0.34	443

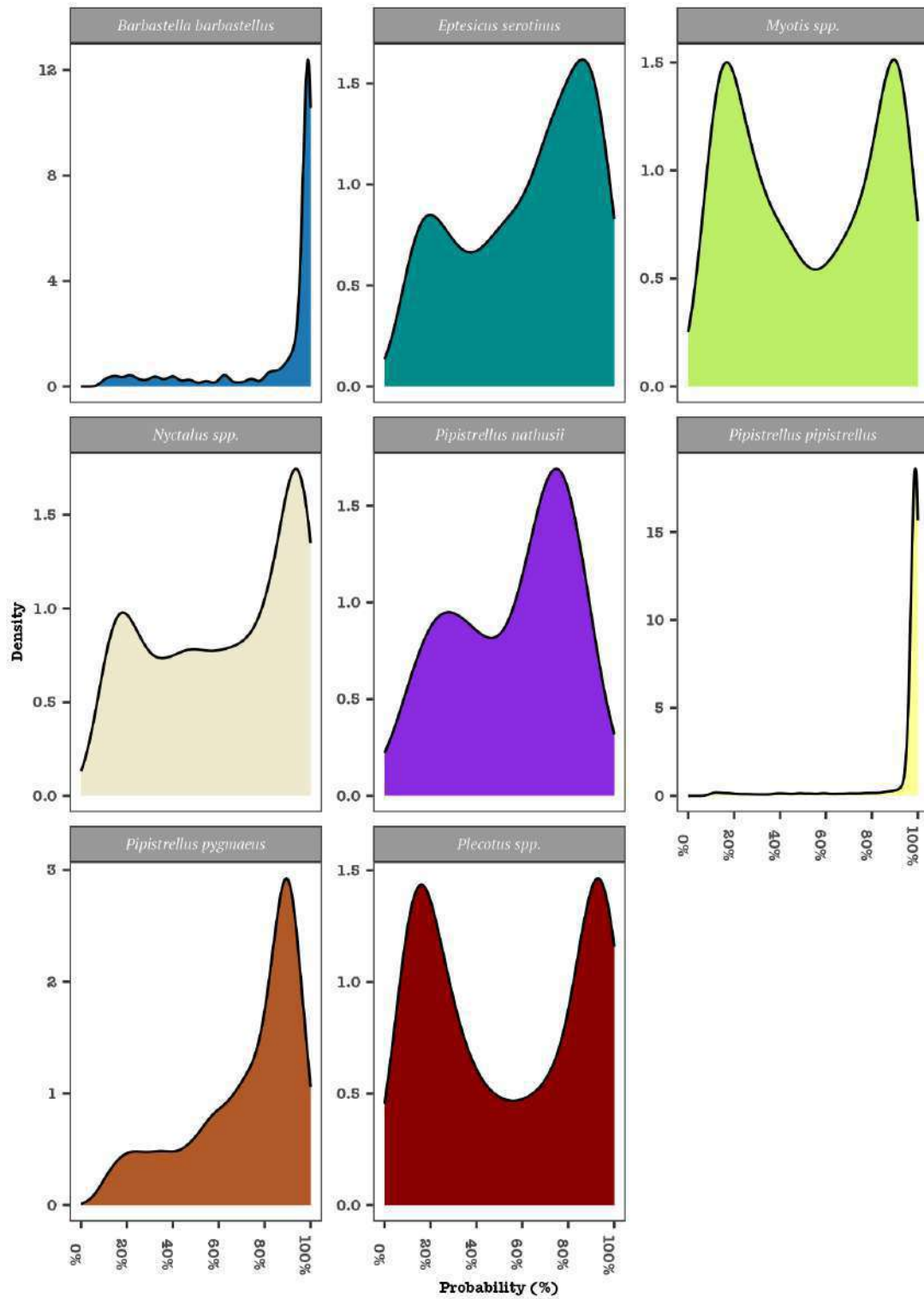


Figure 63: Kernel density plots of the species analysis probability

7.2. The Colour and Codes for Bat Species

The colour assigned to each bat species is listed in Table 69. The colour for each bat is consistent throughout the document (i.e. the same for every graphic). Any colour can be assigned and used to represent a species.

Table 69: Bat names and colours

Scientific Name	Common Name	Colour	Colour (Hex)
<i>Barbastella barbastellus</i>	Barbastelle		#1F78B4
<i>Myotis alcathoe</i>	Alcathoe		#A52A2A
<i>Myotis bechsteinii</i>	Bechstein's		#7FFF00
<i>Myotis brandtii</i>	Brandt's		#B2DF8A
<i>Myotis mystacinus</i>	Whiskered		#6A3D9A
<i>Myotis nattereri</i>	Natterer's		#FF7F00
<i>Myotis daubentonii</i>	Daubenton's		#A6CEE3
<i>Myotis spp.</i>	Myotis		#BCEE68
<i>Plecotus auritus</i>	Brown long-eared		#8B0000
<i>Plecotus spp.</i>	Long-eared		#8B0000
<i>Plecotus austriacus</i>	Grey long-eared		#000000
<i>Pipistrellus pipistrellus</i>	Common pipistrelle		#FFFF99
<i>Pipistrellus nathusii</i>	Nathusius pipistrelle		#8A2BE2
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle		#B15928
<i>Pipistrellus spp.</i>	Pipistrelle		#FDBF6F
<i>Rhinolophus ferrumequinum</i>	Greater horseshoe		#E31A1C
<i>Rhinolophus hipposideros</i>	Lesser horseshoe		#33A02C
<i>Nyctalus noctula</i>	Noctule		#CAB2D6
<i>Nyctalus leisleri</i>	Leisler's		#FB9A99
<i>Nyctalus spp.</i>	Noctule or Leisler's		#EEE8CD
<i>Eptesicus serotinus</i>	Serotine		#008B8B
<i>Nyctaloid</i>	Noctule or Leisler's or Serotine		#3C533C

Table 70: List of conversion names

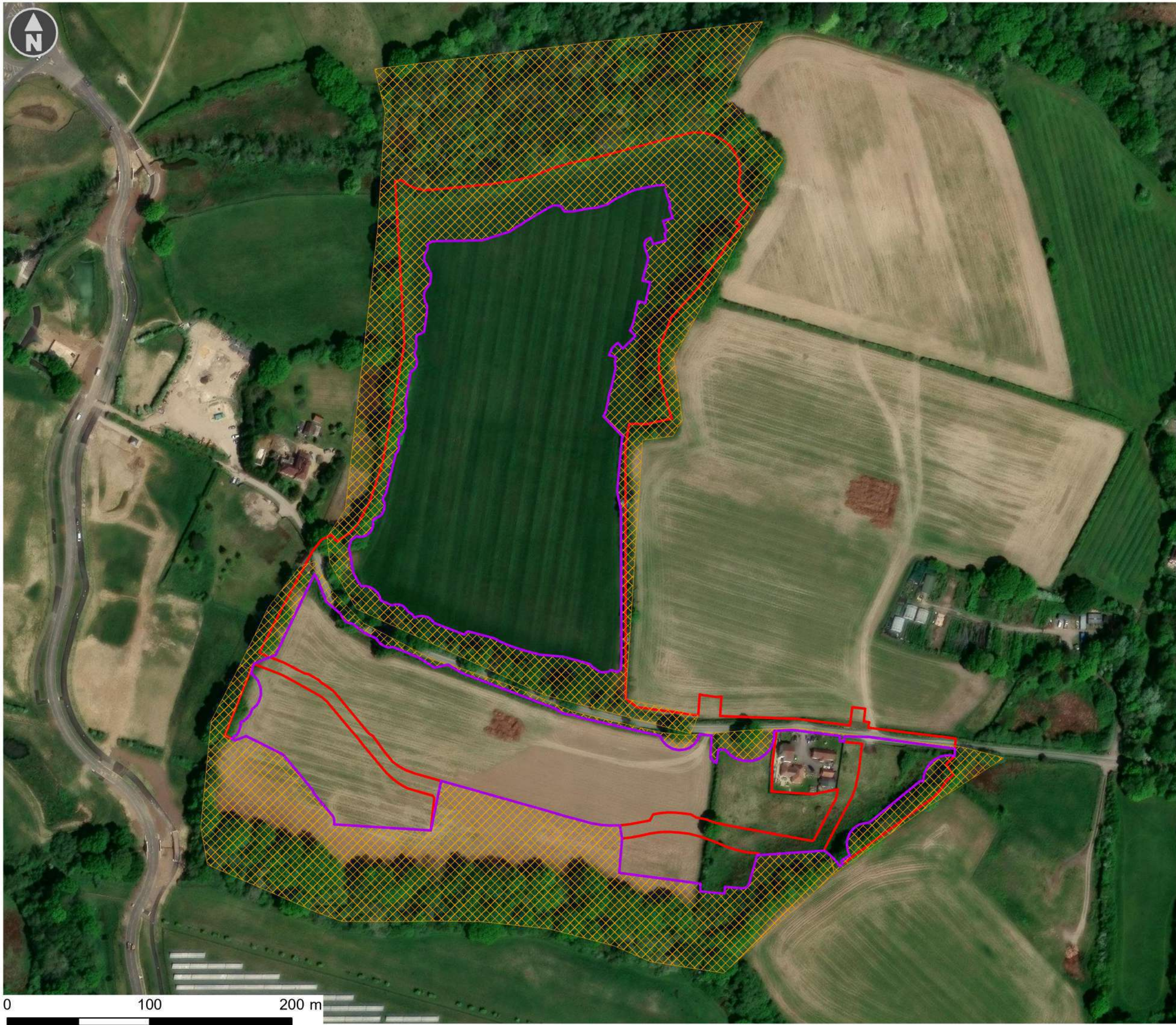
Code or Abbreviation	Scientific Name
45 pip	<i>Pipistrellus pipistrellus</i>
55 pip	<i>Pipistrellus pygmaeus</i>
Nathpip	<i>Pipistrellus nathusii</i>
alcathoe	<i>Myotis alcathoe</i>
alcathoebrandtswiskered	<i>Myotis spp.</i>
alcathoewhiskeredbrandts	<i>Myotis spp.</i>
baba	<i>Barbastella barbastellus</i>
barb	<i>Barbastella barbastellus</i>
barbar	<i>Barbastella barbastellus</i>
barbastella barbastellus	<i>Barbastella barbastellus</i>
barbastelle	<i>Barbastella barbastellus</i>
barbastelle barbastellus	<i>Barbastella barbastellus</i>
barbastellus barbastellus	<i>Barbastella barbastellus</i>
bat	NA
bbar	<i>Barbastella barbastellus</i>
bechstein	<i>Myotis bechsteinii</i>
bechsteins	<i>Myotis bechsteinii</i>
big bat	NA
big bat sp	NA
ble	<i>Plecotus auritus</i>
bleb	<i>Plecotus auritus</i>
brandt	<i>Myotis brandtii</i>
brandts	<i>Myotis brandtii</i>
brandtsalcathoewhiskered	<i>Myotis spp.</i>
brandtswiskered	<i>Myotis spp.</i>
brandtswiskeredalcathoe	<i>Myotis spp.</i>
brandtwhiskered	<i>Myotis spp.</i>
brown longeared	<i>Plecotus auritus</i>
common pip	<i>Pipistrellus pipistrellus</i>
common pipistrelle	<i>Pipistrellus pipistrellus</i>
daubenton	<i>Myotis daubentonii</i>
daubentons	<i>Myotis daubentonii</i>
epse	<i>Eptesicus serotinus</i>
eptesicus serotinus	<i>Eptesicus serotinus</i>
eptser	<i>Eptesicus serotinus</i>
eser	<i>Eptesicus serotinus</i>
greater horseshoe	<i>Rhinolophus ferrumequinum</i>
grey longeared	<i>Plecotus austriacus</i>
lei	<i>Nyctalus leisleri</i>
leisler	<i>Nyctalus leisleri</i>
leislernoctule	<i>Nyctalus spp.</i>
leislars	<i>Nyctalus leisleri</i>
leislarsnoctule	<i>Nyctalus spp.</i>

Code or Abbreviation	Scientific Name
lesser horseshoe	<i>Rhinolophus hipposideros</i>
longeared sp	<i>Plecotus spp.</i>
longeared species	<i>Plecotus spp.</i>
mybr	<i>Myotis brandtii</i>
mydau	<i>Myotis daubentonii</i>
myna	<i>Myotis nattereri</i>
myobec	<i>Myotis bechsteinii</i>
myobra	<i>Myotis brandtii</i>
myodau	<i>Myotis daubentonii</i>
myomys	<i>Myotis mystacinus</i>
myonat	<i>Myotis nattereri</i>
myosp	<i>Myotis spp.</i>
myotis	<i>Myotis spp.</i>
myotis alcathoe	<i>Myotis alcathoe</i>
myotis bechsteinii	<i>Myotis bechsteinii</i>
myotis brandtii	<i>Myotis brandtii</i>
myotis daubentonii	<i>Myotis daubentonii</i>
myotis mystacinus	<i>Myotis mystacinus</i>
myotis nattereri	<i>Myotis nattereri</i>
myotis sp	<i>Myotis spp.</i>
myotis spec	<i>Myotis spp.</i>
myotis species	<i>Myotis spp.</i>
myotis spp	<i>Myotis spp.</i>
mysp	<i>Myotis spp.</i>
nathpip	<i>Pipistrellus nathusii</i>
nathusius	<i>Pipistrellus nathusii</i>
nathusius pipistrelle	<i>Pipistrellus nathusii</i>
natterer	<i>Myotis nattereri</i>
natterers	<i>Myotis nattereri</i>
nnoc	<i>Nyctalus noctula</i>
noc	<i>Nyctalus noctula</i>
noctule	<i>Nyctalus noctula</i>
noctuleleisler	<i>Nyctalus spp.</i>
noctuleleislars	<i>Nyctalus spp.</i>
noid	NA
noise	NA
nyclei	<i>Nyctalus leisleri</i>
nycnoc	<i>Nyctalus noctula</i>
nycsp	<i>Nyctalus spp.</i>
nyctaloid	<i>Nyctaloid</i>
nyctalus	<i>Nyctalus spp.</i>
nyctalus leisleri	<i>Nyctalus leisleri</i>
nyctalus noctula	<i>Nyctalus noctula</i>
nyctalus sp	<i>Nyctalus spp.</i>

Code or Abbreviation	Scientific Name
nyctalus spec	<i>Nyctalus spp.</i>
nyctalus species	<i>Nyctalus spp.</i>
nyctalus spp	<i>Nyctalus spp.</i>
nyctsp	<i>Nyctalus spp.</i>
nyle	<i>Nyctalus leisleri</i>
nyno	<i>Nyctalus noctula</i>
parasi	NA
pi	<i>Pipistrellus spp.</i>
pina	<i>Pipistrellus nathusii</i>
pip45	<i>Pipistrellus pipistrellus</i>
pip55	<i>Pipistrellus pygmaeus</i>
pipi	<i>Pipistrellus pipistrellus</i>
pipistrelle sp	<i>Pipistrellus spp.</i>
pipistrelle species	<i>Pipistrellus spp.</i>
pipistrellus	<i>Pipistrellus spp.</i>
pipistrellus nathusii	<i>Pipistrellus nathusii</i>
pipistrellus pipistrellus	<i>Pipistrellus pipistrellus</i>
pipistrellus pipistrellus nathusii	<i>Pipistrellus pipistrellus</i>
pipistrellus pygmaeus	<i>Pipistrellus pygmaeus</i>
pipistrellus pygmaeus	<i>Pipistrellus pygmaeus</i>
pipistrellus sp	<i>Pipistrellus spp.</i>
pipistrellus spec	<i>Pipistrellus spp.</i>
pipistrellus species	<i>Pipistrellus spp.</i>
pipistrellus spp	<i>Pipistrellus spp.</i>
pipnat	<i>Pipistrellus nathusii</i>
pippip	<i>Pipistrellus pipistrellus</i>
pipppippippyp	<i>Pipistrellus spp.</i>
pippyg	<i>Pipistrellus pygmaeus</i>
pipsp	<i>Pipistrellus spp.</i>
pipy	<i>Pipistrellus pygmaeus</i>
pipyg	<i>Pipistrellus pygmaeus</i>
plaur	<i>Plecotus auritus</i>
pleaur	<i>Plecotus auritus</i>
pleaus	<i>Plecotus austriacus</i>
plec	<i>Plecotus spp.</i>
plecotus	<i>Plecotus spp.</i>
plecotus auritus	<i>Plecotus auritus</i>
plecotus austriacus	<i>Plecotus austriacus</i>
plecotus sp	<i>Plecotus spp.</i>
plecotus spec	<i>Plecotus spp.</i>
plecotus species	<i>Plecotus spp.</i>
plecotus spp	<i>Plecotus spp.</i>
plecotussp	<i>Plecotus spp.</i>
pnat	<i>Pipistrellus nathusii</i>

Code or Abbreviation	Scientific Name
ppip	<i>Pipistrellus pipistrellus</i>
ppyg	<i>Pipistrellus pygmaeus</i>
query	NA
rfer	<i>Rhinolophus ferrumequinum</i>
rhfe	<i>Rhinolophus ferrumequinum</i>
rhihi	<i>Rhinolophus hipposideros</i>
rhifer	<i>Rhinolophus ferrumequinum</i>
rhinolophus ferrumequinum	<i>Rhinolophus ferrumequinum</i>
rhinolophus hipposideros	<i>Rhinolophus hipposideros</i>
rhip	<i>Rhinolophus hipposideros</i>
serotine	<i>Eptesicus serotinus</i>
soprano pip	<i>Pipistrellus pygmaeus</i>
soprano pipistrelle	<i>Pipistrellus pygmaeus</i>
whiskered	<i>Myotis mystacinus</i>
whiskeredalcathebrandts	<i>Myotis spp.</i>
whiskeredbrandt	<i>Myotis spp.</i>
whiskeredbrandts	<i>Myotis spp.</i>
whiskeredbrandtsalcathe	<i>Myotis spp.</i>

APPENDIX E CONSTRAINTS BUFFERS



JOHNS
ASSOCIATES

-  Site Boundary
-  Extent and Location of Boundary Protective Fencing
-  Constraints Buffer

CLIENT Stantec Limited

PROJECT The Folds, and Holm & Holmestall OHH

TITLE Constraints

SCALE @ A3 1:2,500	CREATED BY AE	CHECKED BY TP
REFERENCE J01735-023	ISSUE/REVISION	DATE 11/12/2025

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JOHNS
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-  Site Boundary
-  Extent and Location of Boundary Protective Fencing
-  Constraints Buffer

CLIENT Stantec Limited

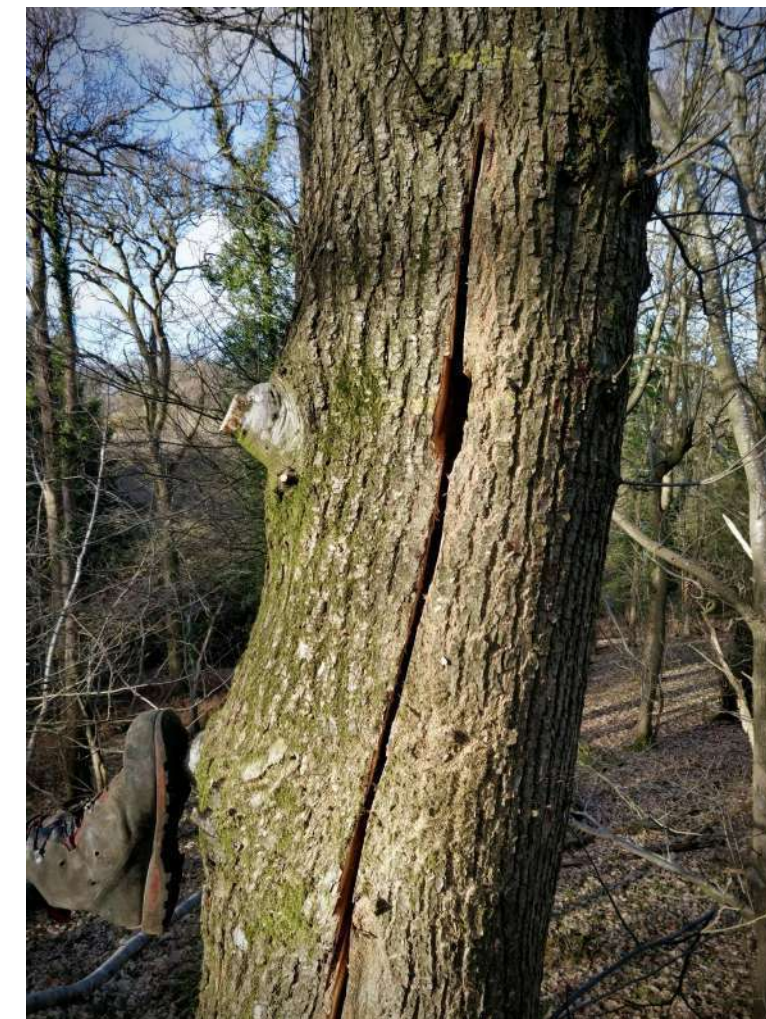
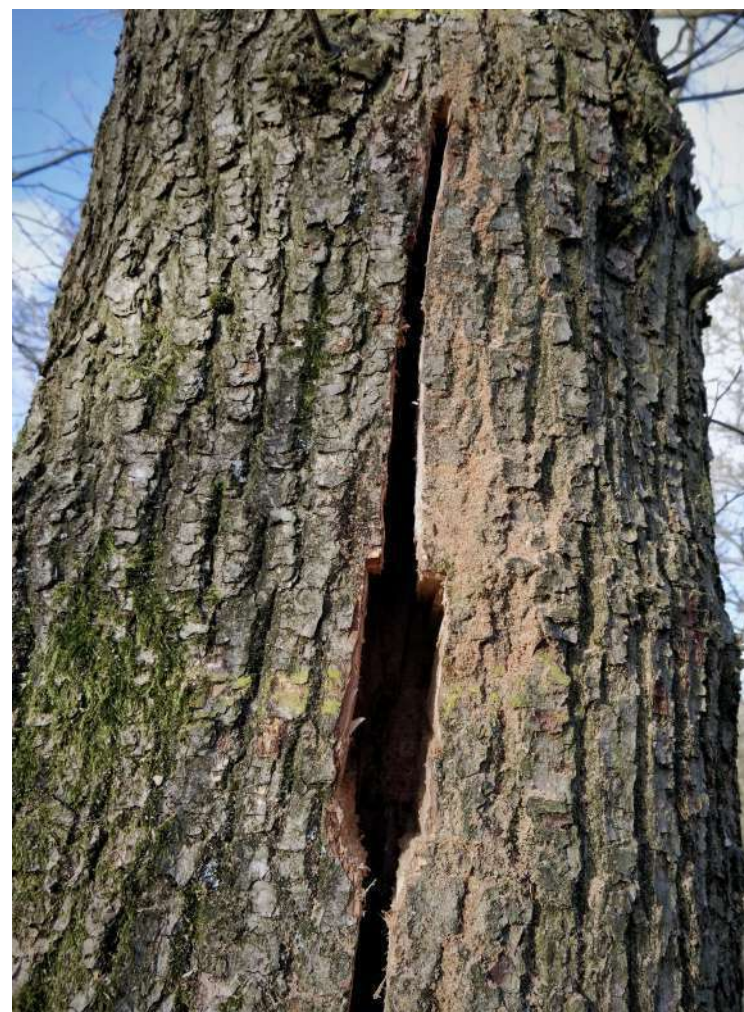
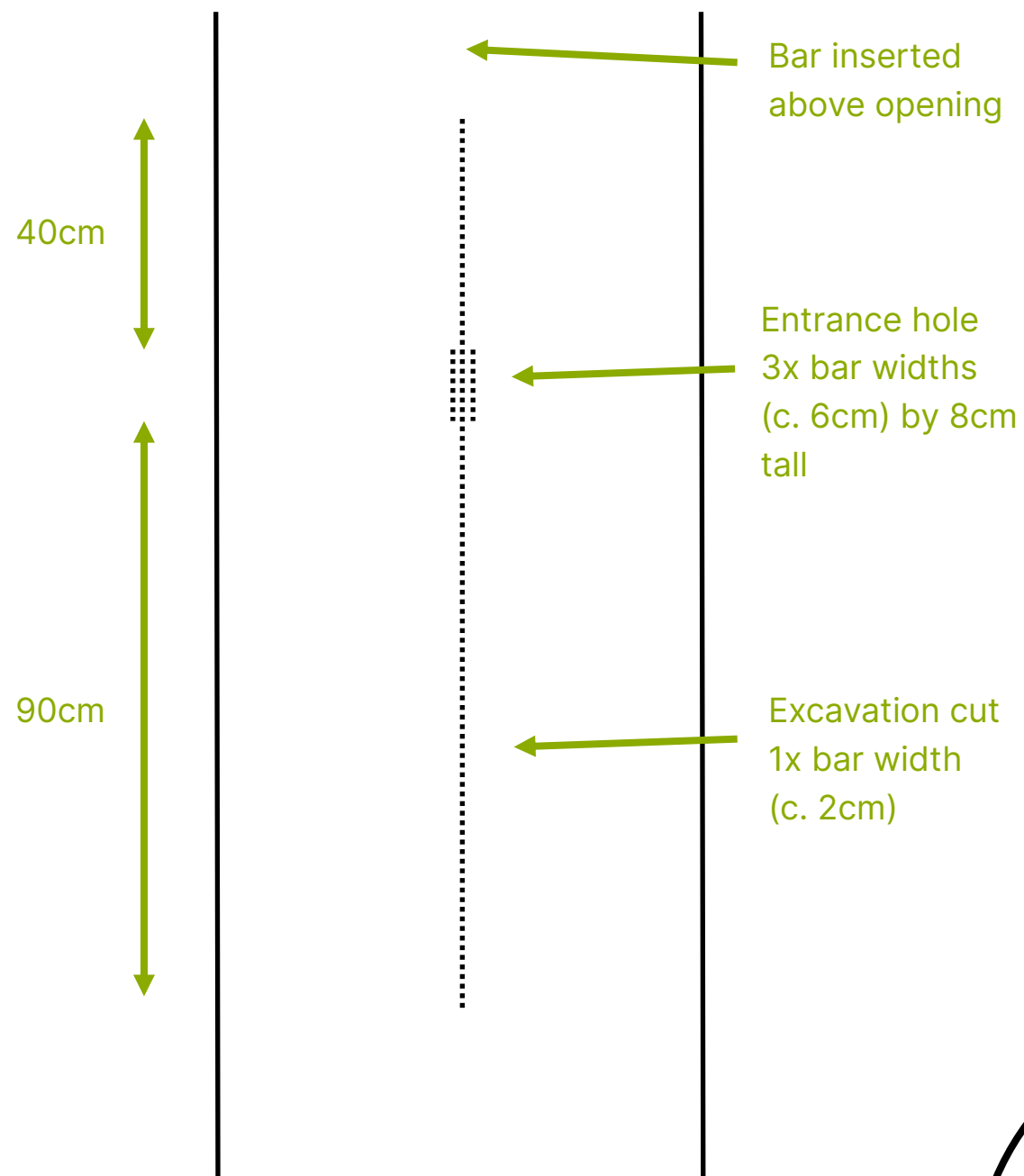
PROJECT The Folds OHH

TITLE Constraints Plan

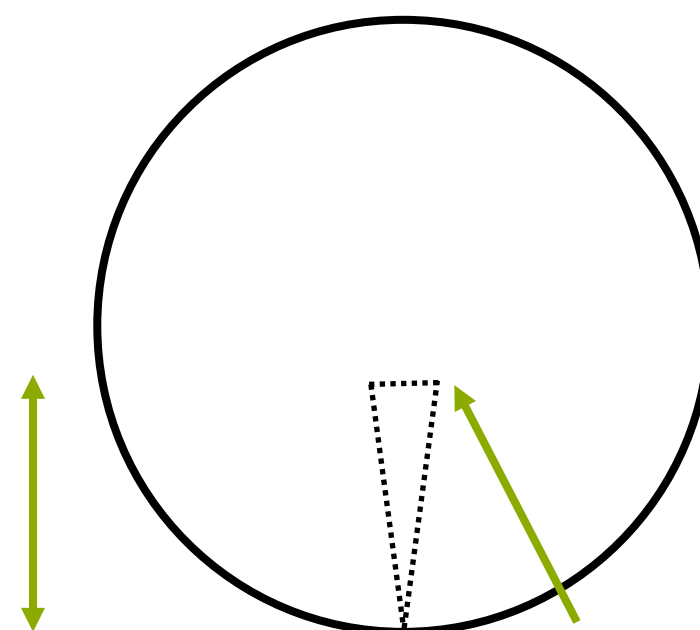
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REFERENCE J01735-022	ISSUE/REVISION	DATE 11/12/2025

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APPENDIX F - CHAINSAW BARBASTELLE FEATURE DESIGN



Between 1/3 & 1/2
stem diameter

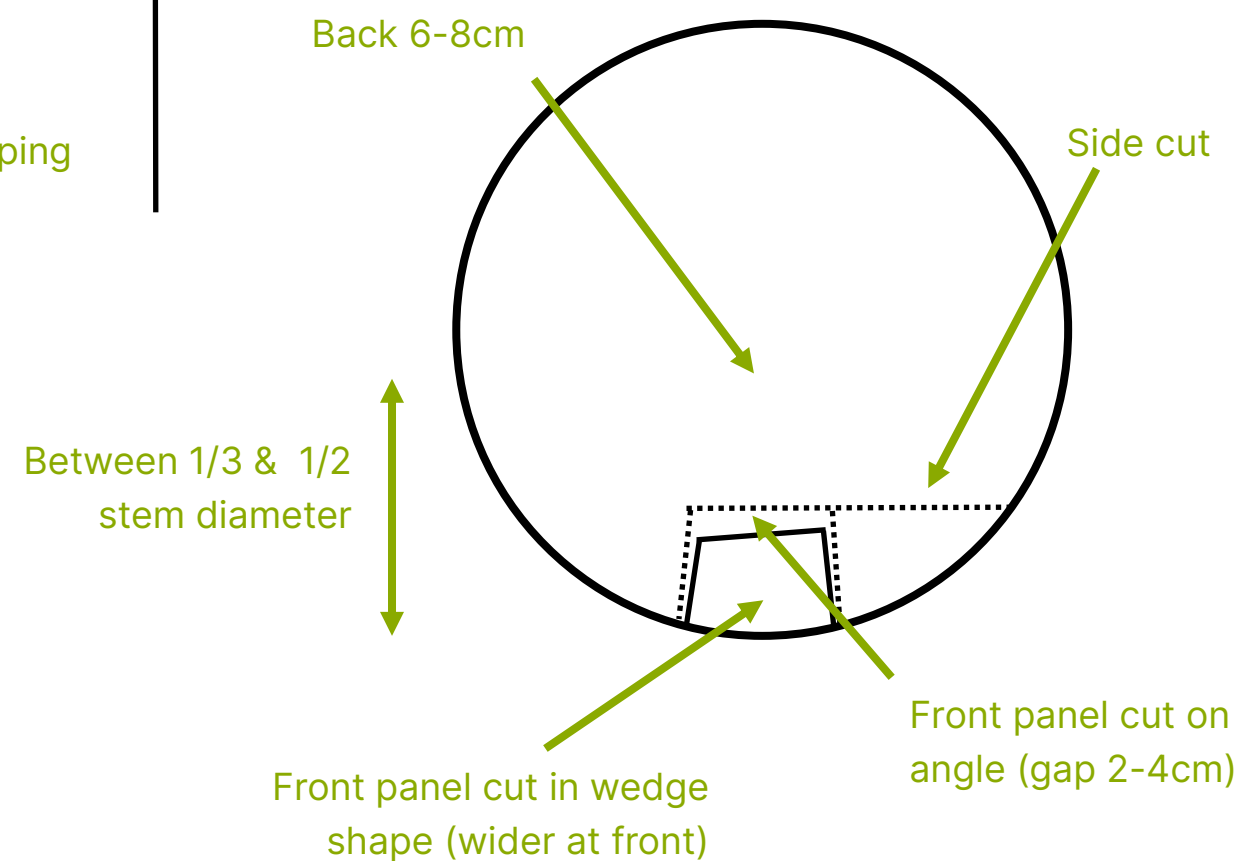
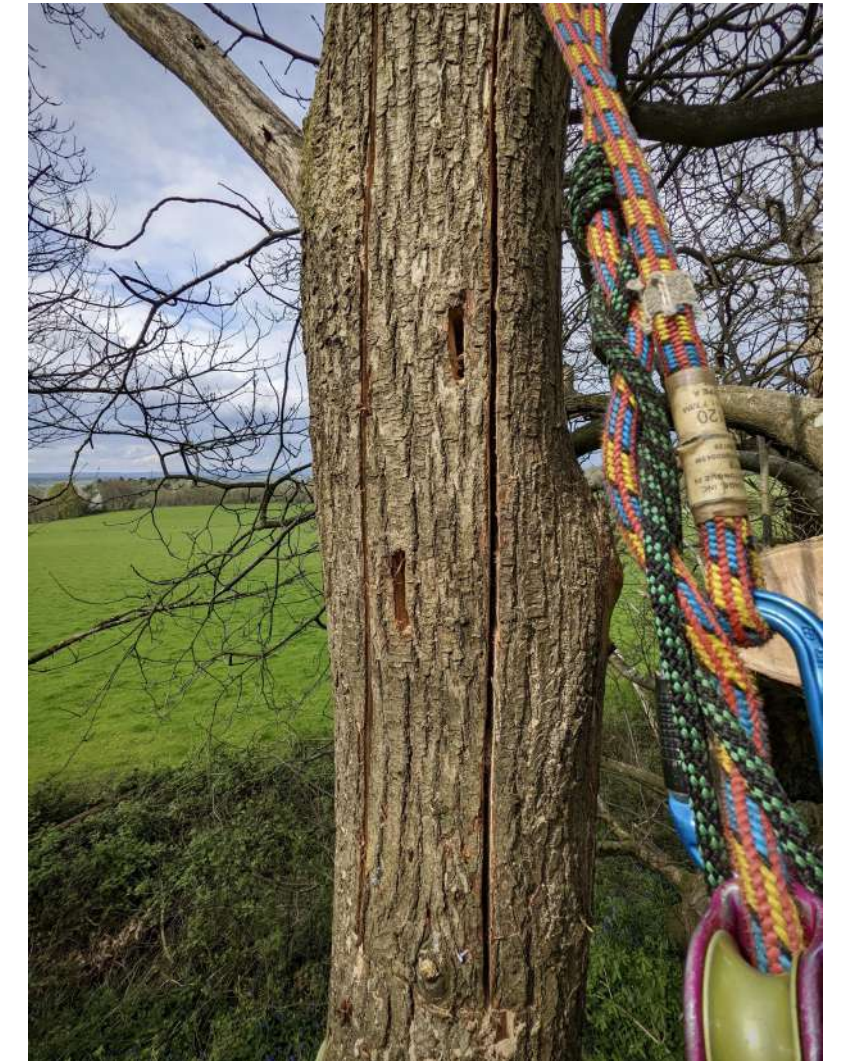
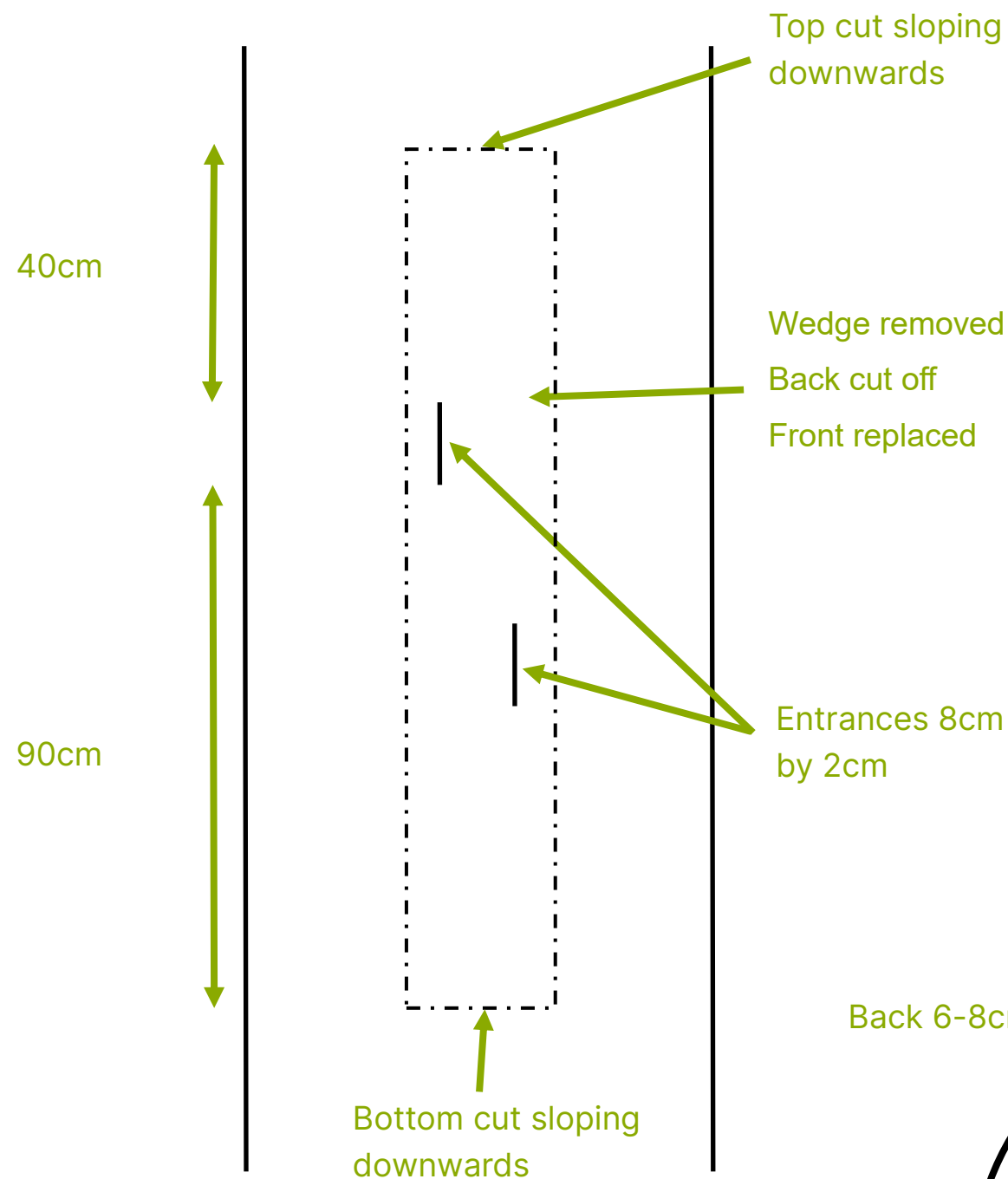


Fan out cut to create
wider back (c. 4cm)



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Target species	<i>Barbastella barbastellus</i>
Instant / future	Future
Version	v3 2024
• Cutting features into trees is dangerous. Engage a competent arborist. • Cutting features may increase the likelihood of failure. A risk assessment must be undertaken. Avoid areas of existing decay, tree species prone to splitting and trees with non-durable wood. • Not to be used on trees with existing habitat value. Designed for trees between 40—50cm diameter. • This design accompanies the <i>Creating Bat Roosts In Trees</i> training	
Design © BATS Research and Training 2024	



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APPENDIX G - CHAINSAW BAT FEATURE DESIGN

BAT CHAINSAW FEATURES: INFO SHEET 1 - SLOT CREVICE FEATURE



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Suitable species:	Crevice roosting inc. pipistrelles, long-eared, Natterer's, Whiskered, Barbastelle
Roost types:	Day roost
Install height:	Minimum of 4m from ground level
Aspect:	South or west
Design and photographs (c) Ellie Hack, Johns Associates Ltd, 2023	
Cutting features is a dangerous activity. This design should be implemented by a competent arborist. The structural integrity of the tree once the feature has been installed must be considered. Not to be used on trees with wood prone to splitting or rapid strength loss following decay. To be used only on trees with limited ecological importance, or those which would otherwise be removed.	

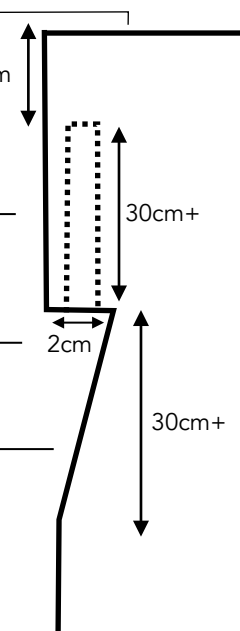
If monolith: neat finishing cut to minimise rot into the feature

Minimum of 1m in height above the top of the internal feature

Feature depth into tree full length of bar, vertically upwards
As deep as possible, >30cm

Entrance width 2-2.5cm, approx 2 bar width (no wider)

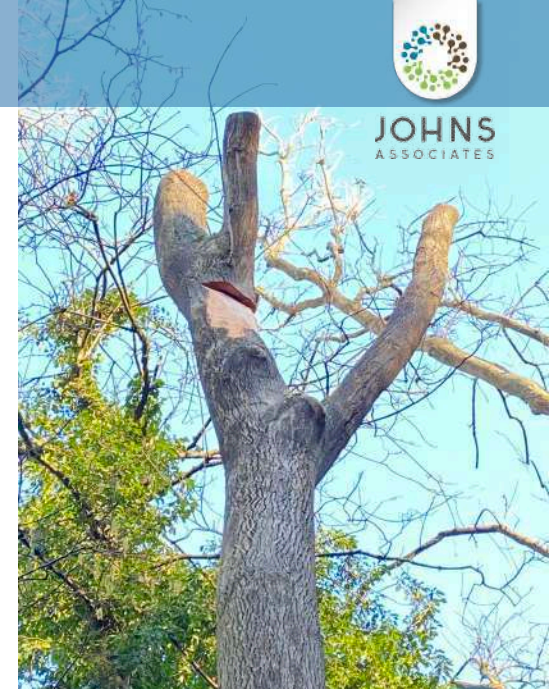
Shallow gob cut with extended lower face



1. Create shallow gob cut which extends down face of tree, rough sawn
2. Cut slot with full length of bar, two bar widths
3. Ensure internal part of slot is open and clear, multiple cuts may be needed to remove all wood flakes



- Multiple features can be added to the same stem - always ensure a minimum of 1m in height between top of feature and top of monolith / second feature.
- Features can be monitored / inspected from the ground with a torch.
- Can be installed into living or dead trees.

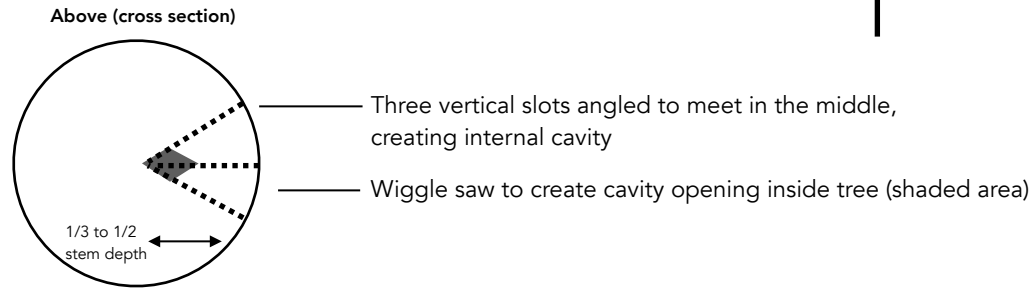
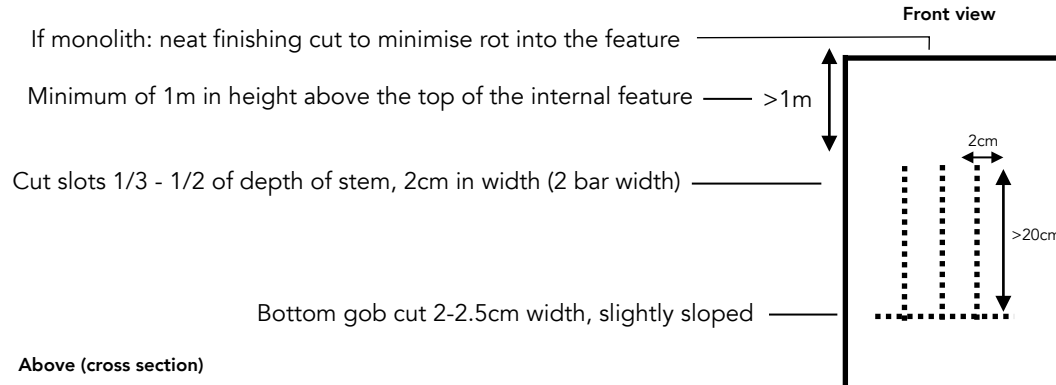


BAT CHAINSAW FEATURES: INFO SHEET 2 - TRIPLE SLOT CAVITY FEATURE



JOHNS
ASSOCIATES

Suitable species:	Pipistrelles, long-eared, Noctule
Roost types:	Day roost
Install height:	Minimum of 4m from ground level
Aspect:	South or west
Design and photographs (c) Ellie Hack, Johns Associates Ltd, 2023	
Cutting features is a dangerous activity. This design should be implemented by a competent arborist. The structural integrity of the tree once the feature has been installed must be considered. Not to be used on trees with wood prone to splitting or rapid strength loss following decay. To be used only on trees with limited ecological importance, or those which would otherwise be removed.	



1. Create gob cut 1/3-1/2 stem depth
2. Cut three angled vertical slots which meet in the middle of the stem
3. Wiggle saw at tip to create cavity where the slots meet
4. Ensure gaps aren't too wide, 2-2.5cm width



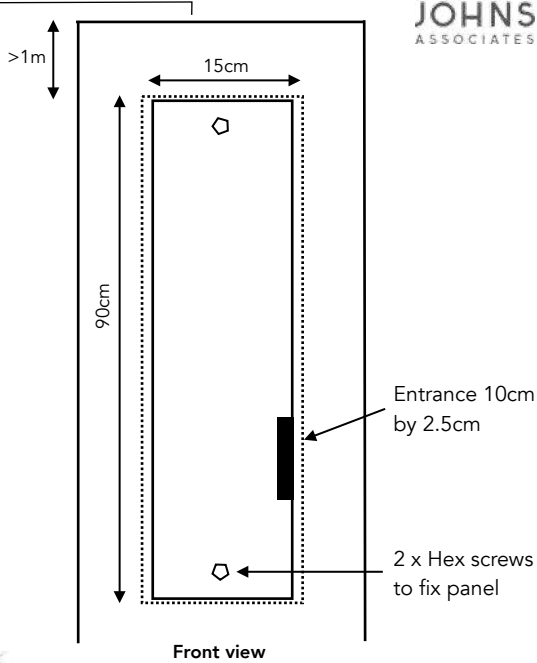
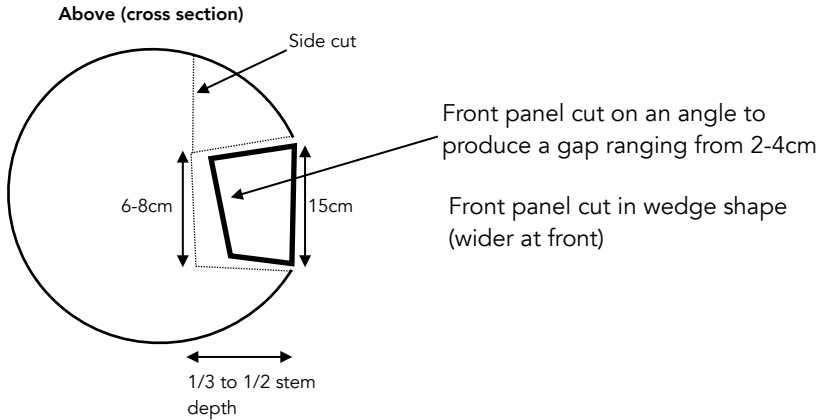
- Always ensure a minimum of 1m in height between top of feature and top of monolith.
- Install on living trees.



BAT CHAINSAW FEATURES: INFO SHEET 3 - MATERNITY WEDGE CAVITY FEATURE

Suitable species:	Cavity roosting inc. all Myotis sp., long-eared, pipistrelle, barbastelle. Modification specific to Bechstein's bat
Roost types:	Maternity roost
Install height:	Minimum of 4m from ground level
Aspect:	South or west
Tree spec:	Between 40-60cm diameter, without existing defects
Photographs (c) Ellie Hack, Johns Associates Ltd, 2023. Design adapted from Jim Mullholland, instant roost, Bats Research and Training, 2021	

If monolith: neat finishing cut to minimise rot into the feature
Minimum of 1m in height above the top of the internal feature



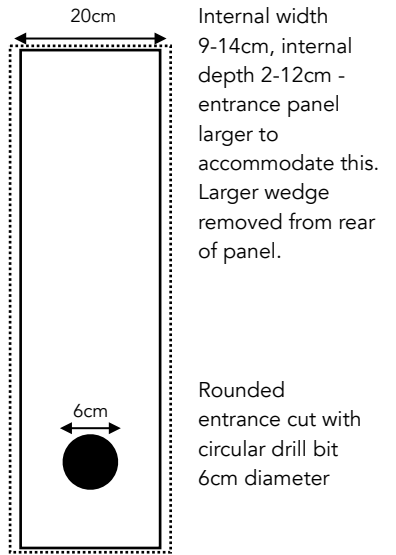
1. Cut wedge as per measurements above, side release cut x2 may be needed

2. Carefully lower wedge to ground level

3. Cut entrance 10cm x 2.5cm, 1/3 from base of wedge

4. Cut sloped section off from back of wedge, 4cm at wide end, 2cm at narrow end

5. Re-install wedge into stem, fix with 2x hex screws at top and bottom. Ensure gap behind panel remains in place.



Entrance panel modification for Bechstein's bat