Technical Appendix 8.3: Bats

Contents

1.0 Introduction

This Technical Appendix has been prepared to accompany Chapter 8 of the Oliver Forest Wind Farm ('the Proposed Development') Environmental Impact Assessment (EIA) Report.

It presents detailed methodologies, and results of desk studies and field surveys completed to establish baseline conditions with regard to bats.

The objectives of the baseline studies were to:

- assess the habitats within the site to identify:
  - features that have potential to support maternity roosts and significant hibernation roosts; and
  - the location and extent of commuting and foraging habitat used by bats;
- identify the bat species assemblage using the site, and the temporal and spatial variations in use.
- assess the level of activity of bats within the site.

It should be read with reference to the following:

- Figure 8.2: Non-Statutory Designated Sites For Nature Conservation Interest.
- Figure 8.3b: Desk Study Records – Notable Faunal Species.
- Figure 8.8: Bat Survey Plan.
- Figure 8.9: Preliminary Bat Roost Appraisal Results.

Common names are used throughout the report, with scientific names presented in Annex A.

1.1 Key Guidance

Bat survey methodology and subsequent interpretation of results make reference to the following key guidance documents, applicable at the time of the surveys:

- Hundt, L. (2012). *Bat Surveys: Good Practice Guidelines (2nd edition)*. The Bat Conservation Trust, London.
- Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd Edition). The Bat Conservation Trust, London.
- Natural England (2014). Technical Information Note TIN051: Bats and onshore wind turbines interim guidance. Natural England, Peterborough.
- Russ, J. (2012). *British Bat Calls: A Guide to Species Identification*. Pelagic Publishing, Exeter.
- NatureScot (2022). *General pre-application and scoping advice for onshore wind farms.*
- NatureScot (2019). *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation*.

2.0 Methodology

2.1 Desk Study

The desk study has included a review of the following key sources summarised in Table 1.

Additional peer-reviewed literature and industry guidance has also been reviewed and is referred to where relevant.

Table 1 – Desk Study Key Sources and Information Sought

Key Source – incl. Date	Information Sought	Search area
NatureScot's Sitelink https://sitelink.nature.scot/home-2022	Proximity to statutory designated sites, with bat interests.	Within 10 km of the site.
The Wildlife Information Centre (TWIC) – October 2022	Existing records of bat species. Non-statutory designated sites.	Within 2 km of the site, as shown on Figure 8.2.
Consented Whitelaw Brae Wind Farm – April 2024	Existing bat records from baseline field surveys.	Search areas used for bat surveys for the consented scheme.

Furthermore, the following have been reviewed:

- Aerial imagery and Ordnance Survey (OS) maps to identify any features of potential value to foraging, commuting or roosting bats.
- A review of the site's location in relation to species known ranges in Scotland, with reference to the most recent UK Habitats Directive[1] Article 17 Report[2].
- The location of other wind farm developments within 5 km of the site, including the number of turbines and their size, through a review of Scottish Borders Council (SBC) downloadable wind development map[3].

2.2 Field Surveys

Survey Approach

The Bat Survey Area for the bat activity surveys comprised the site as shown on Figure 8.8. In terms of the preliminary roost assessment, the Bat Survey Area was surveyed, and this resulted in all potentially suitable structures within 280 m of the turbines for the Proposed Development being appraised, in accordance with NatureScot (SNH, 2019) guidance (as shown in Figure 8.9).

Bat activity surveys were undertaken in accordance with NatureScot guidance applicable at the time of the surveys (SNH, 2019) to establish the bat species assemblage using the Bat Survey Area, the spatial and temporal distribution of bat activity, the location and extent of commuting or foraging habitat used by bats and the locations of roosts and swarming sites that could potentially be affected by the Proposed Development.

Surveys were undertaken in 2022 and consisted of the following:

- Habitat Appraisal.
- Preliminary Roost Assessment.
- Activity Surveys – Automated Monitoring.

The habitat appraisal and preliminary roost assessment were completed by Mr M. Wood, an experienced bat ecologist, in June 2022.

Habitat Appraisal

The habitats present within the Bat Survey Area were appraised for their potential to support bats in terms of foraging and commuting opportunities in accordance with Bat Conservation Trust (BCT) guidance (Collins, 2016) applicable at the time.

The habitat appraisal was undertaken through a review of aerial imagery and OS mapping, together with ground truthing during other on-site surveys (for example the extended Phase 1 habitat survey, see Technical Appendix 8.1).

Preliminary Roost Assessment

Structures and trees with the potential to support maternity bat roosts and significant hibernation and/ or swarming sites within the Bat Survey Area were identified through a review of aerial imagery and the preliminary habitat appraisal.

A daytime, ground-level preliminary roost assessment in accordance with BCT guidance (Collins, 2016) was undertaken to identify trees and structures for bat roost features.

Activity Surveys – Automated Monitoring

Ten automated monitoring stations (MS1 – MS10) were deployed within the Bat Survey Area during each survey period as illustrated on Figure 8.8 and detailed in Table 2.

In accordance with NatureScot (SNH, 2019) guidance, the automated monitoring stations were located as close to each proposed turbine location as possible, while considering on-site habitats and particularly focusing on habitats potentially suitable for foraging/commuting bats (e.g. with linear features within 50 m).

Each monitoring station comprised a single Songmeter (SM2, SM4 or SM Mini) bat detector fitted with a single omnidirectional microphone attached to a 1 m high wooden stake.

Monitoring was undertaken between the time period spanning approximately 30 minutes before sunset and half an hour after sunrise, with equipment set up to record simultaneously, to allow comparison of activity recorded at monitoring stations located within different habitats.

[1]Council Directive 92/43/EEC.
[2]https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/#regularly-occurring-species-vertebrate-species-mammals-terrestrial (Accessed 16 November 2022).
[3]https://www.scotborders.gov.uk/downloads/file/530/over_5mw_wind_development_applications_-_june_2021_map (Accessed 16 November 2022).

Table 2 – Automated Monitoring Station Locations and Recording Nights

I.D.	Grid Ref (BNG)	No. of Successful Recording Nights[4]			Nearest Turbine Location	Distance from Turbine (m)	Phase 1 Habitat Classification[5]	Linear Feature within 50 m
		Spring	Summer	Autumn				
MS1	NT 06937 24098	11	14	14	T3	140	E1.6.1: Blanket Bog	Brick wall and metal fence
MS2	NT 07341 24333	11	0	14	T4	130	E1.6.1: Blanket Bog	Metal fence
MS3	NT 07759 24488	11	0	14	T5	180	E1.6.1: Blanket Bog	Metal fence
MS4	NT 08087 24812	11	14	14	T5	285	D1/B1.1/C1: Dry heath/unimproved acid grassland/bracken mix	Stone wall
MS5	NT 08594 24950	11	14	14	T6	160	E1.6.1: Blanket Bog	Stone wall and forest ride
MS6	NT 07345 23871	11	14	14	T2	150	B1.1/D1/B5: Unimproved acid grassland/dry heath/marshy grassland mix	Forest ride
MS7	NT 08437 24487	11	14	14	T7	170	D1/B1.1/C1: Dry heath/unimproved acid grassland/bracken mix	Forest ride
MS8	NT 07551 23497	11	14	14	T2	320	D1/B1.1/C1: Dry heath/unimproved acid grassland/bracken mix	Plantation woodland edge
MS9	NT 07964 23751	8	14	14	T1	90	A1.2.2: Coniferous plantation woodland	Forest ride
MS10	NT 08243 24120	11	14	14	T7	245	B5: Marshy grassland	Plantation woodland edge and forestry track

2.3 Weather Data

Weather data were collected from a weather station located within the site at NT 07452 23993 for the spring and summer deployment period and from the World Weather Online[6] website for the autumn deployment period. Temperature, rainfall and wind speed at dusk were collected. Weather conditions are summarised in Annex B.

Weather data were analysed to check for any periods of poor weather which could have affected bat activity. Nights of unsuitable weather that recorded no bat activity were removed from the dataset.

2.4 Data Analysis and Assumptions of Bat Activity

Data analysis and interpretation of results followed the principles presented in the BCT guidance (Collins, 2016). Data analysis was undertaken by A. Hulme *BSc (Hons.)* who is an experienced bat ecologist, who regularly carries out analysis of bat survey data.

Bat detectors recorded data onto digital media for subsequent analysis using 'Analook' (Titley Electronics) and Kaleidoscope Pro (Wildlife Acoustics) software. All data was processed through Kaleidoscope Pro to separate out noise files. The remaining sonograms were then automatically identified by the software. A selection of sonograms from each species or species group was manually checked with particular attention given to non-pipistrelle species.

4 Combined survey periods (where applicable), nights deemed unsuitable due to weather conditions removed.
5 Taken from habitats identified during extended Phase 1 habitat survey (see Technical Appendix 7.1).
6 https://www.worldweatheronline.com/tweedsmuir-weather-history/scottish-borders/gb.aspx (Accessed November 2022).

Bat species were identified using characteristic features associated with species echolocation calls. Diagnostic features used in this analysis include characteristic frequency, slope, call duration, time between calls, minimum length of the body of the call and smoothness.

Bat detectors record the passage of echolocating bats during surveys, enabling an estimation of relative bat activity levels for assessment. It is recognised, however, that there are limitations to the use of this method for determining bat activity levels.

For the purpose of sonogram analysis, bat activity was taken as the number of 'bat registered calls' i.e., a sequence of echolocation calls consisting of two or more call notes (pulse of frequency), not separated by more than one second (White and Gehrt, 2001 and Gannon *et al*., 2003), with a minimum call note length of two milliseconds (Weller *et al.,* 2009).

An individual bat can pass a particular feature on several occasions while foraging and therefore it was not possible to estimate the number of individual bats or draw a fair comparison where survey time differs.

Ecobat Tool

In accordance with NatureScot guidance (SNH, 2019), the Ecobat tool (see Table 3) was used to provide an objective interpretation of the relative importance of bat activity levels recorded within the site.

Table 3 – Ecobat Tool

Ecobat Tool Description
Ecobat[7] is a secure online tool initially designed by the University of Exeter and now hosted and developed by the Mammal Society (Lintott *et al*., 2018). The *Ecobat* tool compares baseline bat activity data collected for a site, with bat survey information collected from similar areas (i.e., the 'reference range') at the same time of year. It then provides a percentile rank for each species and a numerical representation of activity levels recorded at a site, relative to the surrounding landscape for each night of surveying. Percentiles can then be assigned to activity categories (low, moderate, high) to provide a quantifiable and objective measure of bat activity, rather than relying on professional judgment alone It should be noted that the online tool remains limited by the amount of data in the database on a locational basis; and therefore, the results should be regarded as indicative rather than conclusive evidence of the importance of a site for bats.

Relative levels of activity are determined by Ecobat by comparison to a reference data set, the 'reference range'. When uploading data into the Ecobat tool, the reference range was stratified to only include the following records from the reference dataset:

- only records +/- one month from the survey periods start and end dates; and
- only records from within the region of survey location; Scotland East.

Records of each species included within the reference range for comparison included:

- Soprano pipistrelle – 21,794 records.
- Common pipistrelle – 10,352 records.
- Myotis species – 1,589 records.
- Nyctalus species – 992 records.
- Brown long-eared – 155 records.

For each night where bat activity was recorded, the Ecobat tool reports the percentile and associated confidence limits of the night of data against the reference range. Table 4 presents the percentile and associated bat activity category, replicated from NatureScot guidance (SNH, 2019).

Table 4 – Percentile Scope and Categorised Level of Bat Activity

Percentile	Bat Activity Category
81 to 100	High
61 to 80	Moderate to High
41 to 60	Moderate
21 to 40	Low to Moderate
0 to 20	Low

Risk Assessment

In accordance with NatureScot guidance (SNH, 2019), a risk assessment has been carried out to identify the potential risk to bat populations. Wind farm developments can impact upon bat species as a result of:

[7] http://www.ecobat.org.uk/about-ecobat (Accessed November 2022).

- collision mortality and other injuries (although it is important to consider these in the context of other forms of anthropogenic mortality);
- loss or damage to commuting and foraging habitat, (wind farms may form barriers to commuting or seasonal movements, and can result in severance of foraging habitat);
- loss of, or damage to, roosts; and
- displacement of individuals or populations (due to wind farm construction or because bats avoid the wind farm area).

To ensure that bat species are protected by minimising the risk of collision, NatureScot guidance (SNH, 2019) advises that an assessment of the impact for a proposed wind farm development requires a detailed appraisal of:

- the level of activity of all bat species recorded at the site assessed both spatially and temporally;
- the risk of turbine-related mortality for all bat species recorded at the site during bat activity surveys; and
- the effect on the species' population status if predicted impacts are not mitigated.

Assessing Potential Risk

NatureScot guidance (SNH, 2019) presents a two-stage process for assessing the potential risk to bats as a result of onshore wind turbine developments:

- Stage 1 - gives an indication of the potential risk level of a site, based on a consideration of habitat and development-related features.
- Stage 2 – uses the output of Stage 1 (i.e., the potential risk level of a site) to provide an overall risk assessment based on the activity level of high collision risk species.

The assessment is intended to assist in the identification of those developments which are of greatest concern in terms of potential collision risks at the population level and inform the potential requirements for mitigation.

2.5 Survey Limitations

Field Surveys

NatureScot guidance (SNH, 2019) requires a minimum of ten consecutive monitoring nights for each of the spring, summer and autumn activity periods. This results in a minimum of 30 survey nights throughout the survey period.

During the summer monitoring period, MS2 and MS3 failed to record due to an unforeseen detector malfunction. As a result, MS2 and MS3 failed to record for the summer period and failed to record the minimum 30-night total when the seasons for each monitoring station were combined. This is not considered a substantive limitation given the number of detectors used exceeded the number required in accordance with NatureScot guidance (SNH, 2019; ten deployed, and seven Proposed Development turbines). Furthermore, MS2 and MS3 are located in exposed, open moorland areas (away from notable bat linear habitat structures, like forestry edge) and therefore they are likely to represent lower-value habitats for bats. Representative monitoring during the summer period of such open habitats relatively near MS2 and MS3 from MS1 and MS4 also means that an appropriate appraisal of bat activity in these open habitats was determined.

Weather

Weather constraints including temperatures below 8 °C, heavy rain and/ or winds exceeding 5 m/s were recorded at dusk on five nights during spring and two nights during autumn.

Bat activity was still recorded on four of these nights and so have been included within the analysis. Although it is recognised that poor weather can affect bat activity, excluding these data from the analysis skews the dataset and would remove some high collision-risk species from the dataset. Furthermore, it is considered that given the extent of sub-optimal weather this is likely representative of the typical weather conditions at the locality. Subsequently, inclusion of these nights represents a precautionary approach.

The remaining three nights, all in spring, failed to recorded bat activity and therefore have been removed from the data. As a result, MS9 failed to record for the recommended ten nights in spring, recording for just eight nights. Full nightly weather conditions are presented in Annex B.

Sonogram Analysis

Analysing bat sonograms using Kaleidoscope can clearly identify certain species. However, some genus groups (such as *Myotis* and *Nyctalus*) can be difficult to determine the specific species due to their similar styles of calls. In addition, it can be difficult to determine species or even genus in some circumstances, due to partial calls being heard or due to distortion from, for example other sources of noise, rain or wind. In cases where it is not possible to identify a bat call to genus, it is labelled as an unknown bat. If the genus can be identified but not the species, the call is labelled by the genus group only.

The detectability of some bat species, such as brown long-eared bat, is lower than that of, for example, *Nyctalus* and *Pipistrellus*. The echolocation calls of brown long-eared bats are comparatively more difficult to detect with bat detectors. Careful interpretation has been applied when comparing survey results across species.

Ecobat Tool

For the Ecobat tool, there is the possibility of having limited data in the reference range, reducing the confidence in the assigned category. The tool does, however, provide a guide for discussion along with site-specific circumstances (e.g., habitats present, desk study information) and its use is advised in accordance with NatureScot guidance (SNH, 2019).

The data within the reference range used to compare activity levels between site data and other records within the relevant region is likely to have been obtained from surveys undertaken at proposed or operational wind farm sites. Therefore, most of the records are likely to be from low-value habitats (upland, exposed commercial forestry) compared to habitats of greater value (such as those detailed in Table 3a of NatureScot guidance (SNH, 2019) and listed under 'High').

When data are entered into Ecobat for analysis, there is no allowance for entering recording nights where no bat passes were recorded, and so the analysis is carried out only on presence data. For example, the detector may have recorded 200 bat passes over a seven-day period; all of these passes were recorded on two nights but the Ecobat medians and means only consider those two nights in their analysis, not the full seven days. This can act to skew the results and elevate the risk levels of percentile ranks calculated.

Ecobat output is therefore regarded as an indicative assessment and to be considered alongside desk study information and professional judgement, rather than conclusive evidence of the importance of a site for bats.

3.0 Results

3.1 Desk Results

Statutory Designated Sites for Nature Conservation

The Proposed Development is not located within 10 km of any national or internationally designated site for nature conservation, with bat-qualifying interests.

Non-statutory Designated Sites for Nature Conservation

In consultation with the TWIC, the site is located within 2 km of three non-statutory sites (Glenmuck Bog, Hawkshaw Bog and Talla Reservoir) (see Figure 8.2), and of these, Talla Reservoir lists common pipistrelle as a 'notable' species.

Existing Bat Records

TWIC returned five records of soprano pipistrelle and four records of common pipistrelle with all records from 2018, located at Blacklaw, Tweedsmuir. Records are presented on Figure 8.3b.

The field surveys (bat roost potential check) for the consented Whitelaw Brae Wind Farm revealed a potentially suitable roost site in a building at the reservoir on Fingland Burn, but no evidence of the presence of bats was identified during an external inspection.

Six bat species were recorded during bat activity surveys, comprising soprano pipistrelle, common pipistrelle, pipistrelle species, *Myotis* species, brown long-eared and *Nyctalus* species. Low levels of activity for high, medium and low-risk species were identified. The main bat activity was along the River Tweed, and along the edge of a conifer plantation within the survey area.

UK Bat Species Range

In review of the UK Habitats Directive Article 17 Report 'Habitats Directive Report 2019: Species Conservation Status Assessments 2019' based on JNCC (2019), the site is located within the known UK distribution range for common pipistrelle, soprano pipistrelle, Daubenton's bat, Natterer's bat, whiskered bat and brown long-eared bat.

The site is not within the published usual range of noctule or Leisler's bat, however *Nyctalus* species were recorded during the bat activity surveys and therefore it is considered that one, or both, of these species are present within the wider area.

Other Wind Developments

In review of SBC downloadable map, the site is located within 5 km of four wind farm developments; two of which are operational, as summarised in Table 5.

Table 5 – Wind Farm Developments within 5 km of the Site

Wind Farm	Location	Description
Glenkerie	1.7 km north	Operational. 11 turbines with a rotor tip height between 90-120 m.
Whitelaw Brae	2.2 km south-west	Consented. 14 turbines with a rotor tip height between 90-120 m.
Glenkerie Extension	2.5 km north	Approved (on appeal). Six turbines with a rotor tip height between 120-150 m.
Clyde Extension	2.6 km south-west	Operational. 54 turbines with a rotor tip height between 120-150 m.

3.2 Field Surveys

Habitat Appraisal

The habitats within the Bat Survey Area are dominated by plantation coniferous woodland interspersed with areas of blanket bog, acid grassland, marshy grassland, bracken, dry heath, clear-fell and broad-leaved plantation woodland. A number of ponds are within the Bat Survey Area and small watercourses intersect the Bat Survey Area which flow into the River Tweed that defines the southern boundary of the site.

In terms of interest for bats, the majority of the Bat Survey Area comprises coniferous plantation woodland which is likely to provide very limited foraging and roosting opportunities within the interior of forestry blocks, but which may provide suitable foraging and commuting opportunities along rides and woodland edges, providing connectivity to more favourable opportunities in the wider surrounding area.

The small watercourses that flow through the Bat Survey Area (tributaries of the River Tweed) are likely to provide some connectivity, but foraging opportunities are limited within the Bat Survey Area and likely to be localised to clear-fell areas, around ponds and open grassland areas where shelter is provided by the woodland edge.

Overall, the bat survey area (the site) is considered to offer low-value habitats for bats although small patches of habitat of increased value are present and offer localised foraging opportunities.

Preliminary Roost Inspection

Areas of broad-leaved and mixed woodland, comprising tall mature trees, located in the centre/south of the site, particularly the scattered trees to the east of the A701 road, were considered to have features suitable to support roosting bats.

Structures (trees) with bat roost potential are presented on Figure 8.9[8]. A flying bat (unidentified species) was also recorded along a forestry track, to the north of these identified structures (as shown on Figure 8.9).

All structures with potential to support roosting bats are >280 m from turbine locations.

The majority of the Bat Survey Area, comprising coniferous plantation woodland, is sub-optimal for roosting bats.

Activity Surveys – Automated Monitoring

Bats were detected on 38 dates out of a possible 42 sampled dates over the full survey period between May and September 2022.

Species identified are presented in Table 6 along with potential collision risk and population vulnerability as described in Table 2 of NatureScot guidance (SNH, 2019).

Table 6 – Bat Species Recorded, Collision Risk and Population Vulnerability

Species	Collision Risk	Population Vulnerability
Common pipistrelle	High	Medium
Soprano pipistrelle	High	Medium
Nyctalus species	High	High
Brown long-eared	Low	Low
Myotis species	Low	Low/Medium

A total of 22,559 bat passes were recorded over a total of 359 nights (all detectors combined and including nights that no bats were recorded; with exception of poor weather nights when no bats were recorded, see Section 2.5) as summarised in Table 7.

Table 7 – Total Number of Bat Passes.

Species	Passes (No.)	Percentage of total (%)
Common pipistrelle	10,216	45.3
Soprano pipistrelle	8,739	38.7

[8] And also, TN4 on Figure 8.1.

Species	Passes (No.)	Percentage of total (%)
Myotis species	2,233	9.9
Nyctalus species	1,343	6.0
Brown long-eared	28	0.1
Total	**22,559**	**100**

The full Ecobat tool output report is included as Annex C.

Table 8 presents the total number of nights bat activity fell under each band of high to low activity and Table 9 presents the percentiles, confidence intervals (CI) and key metrics of the Ecobat output for each species.

Table 8 – Number of Nights Recorded Bat Activity Fell into Each Activity Band per Species

Species/Species Group	High Activity	Moderate/ High Activity	Moderate Activity	Low/ Moderate Activity	Low Activity
Common pipistrelle	27	13	41	45	69
Soprano pipistrelle	2	8	21	52	109
Nyctalus species	3	5	11	45	69
Brown long-eared	0	5	18	0	0
Myotis species	19	21	6	51	46

Table 9 – Percentiles and Passes per Night for Each Species

Species/Species Group	Total Passes	Passes per Night		Median Percentile[9]	95% Cis[10]	Max Percentile[11]	Nights Recorded
		Recorded[12]	Included in Ecobat[13]				
Common pipistrelle	10,216	28.46	44.23	33	9.5 – 33.5	100	Common pipistrelle
Soprano pipistrelle	8,739	24.34	37.83	18	8 – 12.5	80	Soprano pipistrelle
Nyctalus species	1,343	3.74	5.81	17	9.5 – 26	100	Nyctalus species
Brown long-eared	28	0.08	0.12	42	42 – 69	69	Brown long-eared
Myotis species	2,233	6.22	9.67	30	54.5 - 91	100	Myotis species

The Ecobat output median and mean nightly pass rate (passes per hour, per night) of each species, at each detector for all months is presented in Table 10. The use of the median value is recognised to provide the more accurate representation of activity, as bat activity levels between nights can be highly variable, and therefore the median provides a more reliable value than the mean or maximum (Lintott *et al.*, 2018). In addition, the dataset is unlikely to be normally distributed, therefore the median is the most appropriate metric to report.

Data for 'Includes Absences' and 'Excludes Absences' are included in Table 10. 'Includes absences' takes into account nights when no bats were recorded and therefore lowers the overall medians and means (note this does not include any nights when no bats of any species were recorded as these are filtered out by *Ecobat* in the initial data upload to the *Ecobat* tool, see Section 2.5). Including absences are key to demonstrating the level of bat interest at a site as 'no bats' on a recording night where there were no technical issues or weather constraints is a valid result.

Table 10 – Median and Mean Bat Pass Rate per Species, per Detector.

Species	Detector ID	Total Bat Passes	Median Pass Rate (passes per hour/night)		Mean Pass Rate (passes per hour/night)	
			Incl. Absences	Excl. Absences	Incl. Absences	Excl. Absences
Common pipistrelle	MS1	581	1.1	1.2	2.1	2.4
	MS2	366	1.0	4.3	2.3	4.1
	MS3	7	0.1	0.2	0.1	0.3
	MS4	48	0.2	0.4	0.4	0.5
	MS5	2,284	21.4	22.9	20.3	21.7
	MS6	532	2.8	3.1	3.2	3.4
	MS7	3,053	4.1	4.5	11.6	12.2
	MS8	875	2.6	3.3	2.9	3.2
	MS9	715	3.5	3.8	3.6	3.8
	MS10	1,755	3.8	4.0	6.5	7.5

[9] A numerical representation of average activity levels relative to the surrounding landscape (within the region of Scotland East) for each night of surveying.
[10] An indication of the confidence in the median percentile.
[11] A numerical representation of maximum activity levels on any one night relative to the surrounding landscape (within the region of Scotland West) for each night of surveying.
[12] Total recorded nights for the survey period is 359 (all MS combined, excluding unsuitable nights due to weather).
[13] A total of 231 nights were included in Ecobats analysis (all MS combined). Nights when no bats are recorded are excluded.

Species	Detector ID	Total Bat Passes	Median Pass Rate (passes per hour/night)		Mean Pass Rate (passes per hour/night)	
			Incl. Absences	Excl. Absences	Incl. Absences	Excl. Absences
Soprano pipistrelle	MS1	569	0.4	3.0	2.0	2.9
	MS2	485	3.0	4.3	3.1	4.1
	MS3	3	0	0.2	0.1	0.2
	MS4	43	0.3	0.4	0.3	0.4
	MS5	1,351	6.4	9.3	12.0	14.8
	MS6	607	4.3	4.3	3.6	4.1
	MS7	1,903	3.7	4.0	7.0	7.9
	MS8	1,680	5.2	6.8	5.4	6.5
	MS9	1,481	7.4	7.4	7.5	7.5
	MS10	617	1.8	2.1	0.5	2.3
Nyctalus species	MS1	68	0	0.7	0.3	0.6
	MS2	65	0.3	0.5	0.4	0.6
	MS3	0	0	0	0	0
	MS4	16	0	0.6	0.1	0.6
	MS5	64	0.3	0.7	0.5	1.0
	MS6	92	0.5	0.6	0.6	0.7
	MS7	205	0.7	0.8	0.7	0.9
	MS8	99	0	0.4	0.3	0.8
	MS9	62	0.1	0.3	0.3	0.5
	MS10	672	0.4	2.2	2.4	3.0
Brown long-eared	MS1	6	0	0.2	0	0.2
	MS2	0	0	0	0	0
	MS3	0	0	0	0	0
	MS4	0	0	0	0	0
	MS5	0	0	0	0	0
	MS6	4	0	0.1	0	0.1
	MS7	10	0	0.1	0	0.1
	MS8	2	0	0.1	0	0.1
	MS9	1	0	0.1	0	0.1
	MS10	5	0	0.1	0	0.1
Myotis species	MS1	517	0.1	2.9	1.8	2.9
	MS2	527	4.2	5.2	3.3	4.5
	MS3	5	0	0.1	0.1	0.2
	MS4	2	0	0.1	0	0.1
	MS5	62	0.6	0.7	0.5	0.6
	MS6	499	4.1	4.6	3.0	4.2
	MS7	218	0.8	0.8	0.7	0.8
	MS8	167	0.2	0.5	0.6	1.0
	MS9	86	0	0.5	0.5	1.7
	MS10	150	0.4	0.5	0.5	0.7

Table 11 presents the relative bat activity levels (percentiles) per detector, per species. Table 12 presents the percentage distribution of no. bats per detector.

Table 11 – Percentiles for Each Species per Detector Location for the Whole Survey Period

Species / Genus	Detector ID	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level (Median Percentile)	Activity Level (Max Percentile)
Common pipistrelle	MS1	10	9.5 – 33.5	66	26	Low	Moderate to High
	MS2	45	17 – 57.5	66	9	Moderate	Moderate to High
	MS3	1	2.5 – 2.5	4	3	Low	Low
	MS4	4	3 – 6	6	13	Low	Low
	MS5	88	49.5 – 92	100	15	High	High
	MS6	32	23 – 50.5	66	16	Low to Moderate	Moderate to High
	MS7	46	39.5 – 64	100	34	Moderate	High
	MS8	29	21 – 34.5	73	33	Low to Moderate	Moderate to High
	MS9	35	24.5 – 40.5	73	22	Low to Moderate	Moderate to High
	MS10	42	9.5 – 33.5	66	26	Moderate	Moderate to High
Soprano pipistrelle	MS1	15	11 – 25	40	20	Low	Low to Moderate
	MS2	21	14.5 – 30.5	40	12	Low to Moderate	Low to Moderate
	MS3	0	0 – 0	0	2	Low	Low
	MS4	1	1 – 1.5	2	14	Low	Low
	MS5	34	18.5 – 57	80	13	Low to Moderate	High
	MS6	21	16.5 – 28.5	40	15	Low to Moderate	Low to Moderate
	MS7	18	14.5 – 29	80	32	Low	High
	MS8	31	25 – 40	57	30	Low to Moderate	Moderate
	MS9	35	25 – 41	57	23	Low to Moderate	Moderate
	MS10	10	8 – 12.5	20	31	Low	Low

Species / Genus	Detector ID	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level (Median Percentile)	Activity Level (Max Percentile)
Nyctalus species	MS1	17	9.5 – 26	35	12	Low	Low to Moderate
	MS2	17	11 – 26	35	11	Low	Low to Moderate
	MS3	-	-	-	-	N/A	N/A
	MS4	14	10 – 17	20	4	Low	Low
	MS5	17	11.5 – 30.5	36	9	Low	Low to Moderate
	MS6	20	15.5 – 32	35	13	Low	Low to Moderate
	MS7	24	17.5 – 27	43	28	Low to Moderate	Moderate
	MS8	10	8 – 30.5	55	14	Low	Moderate
	MS9	10	6 – 15	55	13	Low	Moderate
	MS10	39	24.5 – 51	100	29	Low to Moderate	High
Brown long-eared	MS1	56	42 – 69	69	4	Moderate	Moderate to High
	MS2	-	-	-	-	N/A	N/A
	MS3	-	-	-	-	N/A	N/A
	MS4	-	-	-	-	N/A	N/A
	MS5	-	-	-	-	N/A	N/A
	MS6	42	42 – 42	69	3	Moderate	Moderate to High
	MS7	42	42 – 55.5	69	8	Moderate	Moderate to High
	MS8	42	42 – 42	42	2	Moderate	Moderate
	MS9	42	0	42	1	Moderate	Moderate
	MS10	42	42 – 42	42	5	Moderate	Moderate
Myotis species	MS1	70	40 – 79.5	100	18	Moderate to High	High
	MS2	86	52.5 – 95	100	12	High	High
	MS3	5	5 – 5	19	3	Low	Low
	MS4	5	5 – 5	5	2	Low	Low
	MS5	27	17.5 – 28.5	31	14	Low to Moderate	Low to Moderate
	MS6	81	54.5 – 91	100	12	High	
	MS7	30	26 – 40	64	30	Low to Moderate	Moderate to High
	MS8	25	16 – 37	73	22	Low to Moderate	Moderate to High
	MS9	27	19 – 49	71	7	Low to Moderate	Moderate to High
	MS10	27	17.5 – 35.5	65	23	Low to Moderate	Moderate to High

Table 12 – Bat Activity Survey Results per Monitoring Station (MS)[14]

Detector ID	No. Dates Sampled	No. of Dates Bats were Recorded	Percentage of Dates Bats were Recorded	Total No. Bats recorded	Percentage Distribution of No. Bats
MS1	39	29	74.4%	1,741	7.72%
MS2	25	16	64.0%	1,443	6.40%
MS3	25	6	24.0%	15	0.07%
MS4	39	16	41.0%	109	0.48%
MS5	39	16	41.0%	3,761	16.67%
MS6	39	17	43.6%	1,734	7.69%
MS7	39	36	92.3%	5,389	23.89%
MS8	39	36	92.3%	2,823	12.51%
MS9	36	23	63.9%	2,345	10.39%
MS10	39	36	92.3%	3,199	14.18%

A summary of results per season is provided in Table 13.

Activity levels were calculated by Ecobat per species (or species group) per month to allow for temporal variations in bat activity. Median and maximum percentiles and corresponding activity levels are presented.

Table 13 – Percentiles for Each Species Per Month for the Whole Monitoring Period

Species / Genus	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level (Median Percentile)	Activity Level (Max Percentile)
Common pipistrelle	May	5	9.5 – 33.5	45	32	Low	Moderate
	Jul	38	9.5 – 33.5	100	78	Low to Moderate	High
	Aug	43	9.5 – 33.5	73	68	Moderate	Moderate to High
	Sep	17	9.5 – 33.5	38	24	Low	Low to Moderate
Soprano pipistrelle	May	0	8 – 12.5	6	18	Low	Low
	Jul	16	8 – 12.5	80	75	Low	High
	Aug	21	8 – 12.5	57	71	Low to Moderate	Moderate

[14] The number of dates sampled is the number of nights each detector was operational for throughout the survey period, taking account of detector failures and unsuitable weather conditions.

Species / Genus	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level (Median Percentile)	Activity Level (Max Percentile)
	Sep	13	8 – 12.5	45	28	Low	Moderate
Nyctalus species	May	36	24.5 – 51	100	16	Low to Moderate	High
	Jul	17	9.5 – 26	68	47	Low	Moderate to High
	Aug	20	9.5 – 26	55	56	Low	Moderate
	Sep	8	9.5 – 26	17	14	Low	Low
Brown long-eared	May	42	42 – 42	42	1	Moderate	Moderate
	Jul	42	42 – 55.5	42	1	Moderate	Moderate
	Aug	42	42 – 69	69	18	Moderate	Moderate to High
	Sep	42	42 – 69	42	3	Moderate	Moderate
Myotis species	May	19	54.5 – 91	65	23	Low	Moderate to High
	Jul	27	5 – 5	73	44	Low to Moderate	Moderate to High
	Aug	54	54.5 – 91	100	56	Moderate	High
	Sep	31	54.5 – 91	78	20	Low to Moderate	Moderate to High

Ecobat analysis showed that activity was recorded within the species-specific emergence time for nine monitoring locations. This is detailed in Table 14.

No activity was recorded within any species-specific emergence time at MS4.

Common pipistrelle and soprano pipistrelle had over 200 passes within the species-specific emergence time at MS7 and MS10 and MS7 and MS8 respectively.

Based on the Ecobat analysis, it is possible that roosts for common pipistrelle, soprano pipistrelle, *Myotis* species, *Nyctalus* species and brown long-eared bat may be present within close proximity to the site.

Table 14 – Bat Activity Recorded Within the Species-Specific Emergence Time

Detector ID	Species / Genus	Passes Recorded
MS1	Common pipistrelle	2
	Soprano pipistrelle	2
	Nyctalus species	1
	Myotis species	2
MS2	Common pipistrelle	1
	Soprano pipistrelle	2
	Nyctalus species	1
	Myotis species	1
MS3	Common pipistrelle	1
	Soprano pipistrelle	1
MS5	Common pipistrelle	22
	Soprano pipistrelle	4
MS6	Common pipistrelle	53
	Soprano pipistrelle	82
	Nyctalus species	20
	Myotis species	24
	Brown long-eared	3
MS7	Common pipistrelle	289
	Soprano pipistrelle	215
	Nyctalus species	9
	Myotis species	3
MS8	Common pipistrelle	99
	Soprano pipistrelle	249
	Myotis species	1

Detector ID	Species / Genus	Passes Recorded
MS9	Common pipistrelle	27
	Soprano pipistrelle	73
	Myotis species	3
MS10	Common pipistrelle	231
	Soprano pipistrelle	81
	Nyctalus species	12
	Myotis species	3

4.0 Summary

4.1 Field Surveys

Habitat Assessment

The habitats within the site are considered to be of low habitat risk for bats, in accordance with criteria presented in the BCT guidelines (Collins, 2016).

Roosts

Areas of woodland and private dwellings both located in the east of the site close to the A701 road were considered to have features suitable to support roosting bat.

None of these structures or trees with the potential to support maternity or hibernation roosts were identified within at least 200 m plus the rotor radius distance (c. 281 m) of the proposed turbine locations, nor from the Proposed Development infrastructure.

The Ecobat tool identified the possible presence of roosts of common pipistrelle, soprano pipistrelle, *Myotis* species, *Nyctalus* species and brown long-eared bat species within proximity of the site based on recording of activity at the site within their species-specific emergence times.

Common pipistrelle and soprano pipistrelle had over 200 passes within the species-specific emergence time at MS7 and MS10; and MS7 and MS8, respectively. MS7, MS8 and MS10 are all located at the edge of plantation coniferous woodland within open grassland habitats and all within 150 m of a watercourse; suggesting that these open linear habitats are regularly used as commuting routes from possible bat roosts within proximity of the site.

4.2 Ground-level Static Surveys

Surveys identified the following species:

- brown long-eared bat;
- common pipistrelle;
- *Myotis* species;
- *Nyctalus* species; and
- soprano pipistrelle.

Common pipistrelle was the most frequently recorded species representing 45.3 % of all recordings. The species was recorded on 202 nights out of 359 and represented 28.46 passes per night for the survey period. When compared with activity at other sites (Ecobat reference range and percentiles) common pipistrelle activity was concluded to be low to moderate at the 33rd median percentile and high at the 100th max percentile.

Soprano pipistrelle represented 38.7 % of all recordings. The species was recorded on 192 nights out of 359 and represented 24.34 passes per night for the survey period. When compared with activity at other sites (Ecobat reference range and percentiles) soprano pipistrelle activity was concluded to be low at the 18th median percentile and moderate to high at the 80th max percentile.

Myotis species represented 9.9 % of all recordings. The species group was recorded on 143 nights out of 359 and represented 6.22 passes per night for the survey period. When compared with activity at other sites (Ecobat reference range and percentiles) *Myotis* species activity was concluded to be low to moderate at the 30th median percentile and high at the 100th max percentile.

Nyctalus species represented 6 % of all recordings. The species group was recorded on 133 nights out of 359 and represented 3.74 passes per night for the survey period. When compared with activity at other sites (Ecobat reference range and percentiles), *Nyctalus* species activity was concluded to be low at the 17th median percentile and high at the 100th percentile.

Brown long-eared represented 0.1 % of all recordings. The species was recorded on 23 nights out of 359 and represented <1 pass per night for the survey period. When compared with activity at other sites (Ecobat reference range and percentiles) activity of brown long-eared bat was considered to be moderate at the 42nd median percentile and moderate to high at the 69th max percentile. It is worth noting that the reference range for brown long-eared bat was below the Ecobat recommended 200 (155) and so the confidence in the percentile scores should be treated with caution. Brown long-eared bat is typically a common widespread species that has a call that is difficult to detect on static bat detectors; so the low number of records within the reference range is likely due to the limited detectability of brown long-eared bat rather than the species being rare within the geographical location.

Spatial Distribution of Bat Activity

Common pipistrelle activity was recorded at all the detectors. Highest activity was at MS5, with high activity (88th median percentile), followed by MS7, MS2 and MS10 with moderate activity (46th, 45th and 42nd median percentile, respectively). The remaining detectors recorded low to moderate and low activity. The median pass rate (passes per hour, per night) for common pipistrelle peaked at 22.9 for MS5, followed by MS7 and MS2 at 4.5 and 4.3 respectively. All remaining monitoring stations had activity levels <4 median passes.

Soprano pipistrelle activity was recorded at all the detectors. Highest activity was at MS9, with low to moderate activity (35th median percentile), followed by MS5 and MS8 which also had with low to moderate activity (34th and 31st median percentile, respectively). The remaining detectors recorded low to moderate and low activity. The median pass rate for soprano pipistrelle peaked at 9.3 for MS5, followed by MS9 and MS8 at 7.4 and 6.8 respectively. All remaining monitoring stations had activity levels <4.3 passes.

Nyctalus species activity was recorded at all the detectors, except for MS3. Highest activity was at MS10, with low to moderate activity (39th median percentile), followed by MS7 which also had low to moderate activity (24th median percentile). The remaining detectors recorded low activity levels. The median pass rate for *Nyctalus* species peaked at 2.2 for MS10, with all other monitoring stations having a median pass rate of <1.

Myotis species activity was recorded at all the detectors. Highest activity was at MS2, with high activity (86th median percentile), followed by MS6 which also had high activity (81st median percentile). MS1 had moderate to high activity (70th median percentile), with the remaining detectors all recording low to moderate activity levels. The median pass rate for *Myotis* species peaked at 5.2 for MS2, followed by MS6 and MS1 at 4.6 and 2.9 respectively. All remaining monitoring stations had activity level <1 median passes.

Brown long-eared bat activity was recorded at six of the detectors, with no activity at MS2, MS3, MS4, and MS5. All activity was low, with every monitoring station returning a median pass rate of <0.2.

Overall, bat activity was concentrated at MS5, MS7, MS8 and MS10, all of which were located at the edge of plantation forestry within open grassland/bog habitat; further suggesting the feature of the forestry edge is used as a commuting route for bats within the open habitats. The other habitats within the Bat Survey Area, particularly the open grassland/bog areas, such as MS1 to MS4, are considered to represent less suitable habitat for foraging and commuting bats.

MS7 recorded the most bat passes overall with 23.89 % of the total. MS5 recorded the second most bat passes overall with 16.67 % of the total. Although MS7 had the higher overall bat passes; MS5 had a higher median pass rate per species (with the exception of brown long-eared bat (MS5 did not record any) and *Myotis* species (by only 0.1 median pass rate)) due to only 16 nights of recording compared to 36 nights at MS7.

MS5 recorded the highest median pass activity for soprano pipistrelle and common pipistrelle and equated to 16.67 % of the total bat passes. MS10 recorded the highest median pass activity for *Nyctalus* species and equated to 14.18 % of the total bat passes. MS2 recorded the highest median pass activity for Myotis species and equated to 6.40 % of the total bat passes. MS1 recorded the highest median pass activity for brown long-eared bat and equated to 7.72 % of the total bat passes.

Temporal Distribution of Bat Activity

Common pipistrelle was recorded every month, peaking in July with 6,690 bat passes; approximately 65.5 % of the total for common pipistrelle.

Soprano pipistrelle was recorded every month, peaking in July with 4,045 bat passes; approximately 46.3 % of the total for soprano pipistrelle.

Myotis species was recorded every month, peaking in August with 1,586 bat passes; approximately 71 % of the total for *Myotis* species.

Nyctalus species was recorded every month, peaking in July with 436 bat passes; approximately 32.5 % of the total for *Nyctalus* species.

Brown long-eared bat was recorded every month; however, May and July only recorded a single bat pass each and September only recorded three bat passes. August recorded the most bat passes with 23 bat passes, equating to approximately 82.1 % of total brown long-eared bat.

Overall, activity was generally higher in summer and early autumn, with lower activity consistently recorded in spring and late autumn.

Bat Activity Relative to Other Sites

On nights where common pipistrelle was recorded, the level of activity most frequently represented low to moderate activity when compared against records from a similar date in a similar geographical location in Ecobat.

On nights where soprano pipistrelle was recorded, the level of activity most frequently represented low activity when compared against records from a similar date in a similar geographical location in Ecobat.

On nights where *Nyctalus* species was recorded, the level of activity most frequently represented low activity when compared against records from a similar date in a similar geographical location in Ecobat.

On nights where brown long-eared bat was recorded, the level of activity most frequently represented moderate activity when compared against records from a similar date in a similar geographical location in Ecobat. However, this is likely skewed as this was only compared to 155 other records from a similar date in a similar geographical location, which for a common widespread species such as brown long-eared bat is very low. The low number of records within the reference range is likely due to the limited detectability of brown long-eared on static bat detectors rather than the species being rare within the geological location.

On nights where *Myotis* species was recorded, the level of activity most frequently represented low to moderate activity when compared against records from a similar date in a similar geographical location in Ecobat.

5.0 Assessment of the Potential Risks to Bats

5.1 Stage 1 – Initial Site Risk Assessment

In accordance with NatureScot guidance (2019) an assessment of the potential risk level of the Proposed Development, has been undertaken based on a consideration of habitat and development-related features detailed in Table 3a of the NatureScot guidance (SNH, 2019).

The values and classification criteria provided within Table 3a of NatureScot guidance (SNH, 2019) are intended to be taken as a guide, with habitat and development-related features at proposed wind farm sites rarely matching rigid descriptions. Professional judgement has therefore been applied to interpret and assign risk categories and conclude on the overall risk level for the site.

The site has been assessed as having an overall 'Site Risk' of 2, representing a **Low** Site Risk:

- The site 'Habitat Risk' is classified as **Low**.

The site 'Project Size' is precautionarily classified as being **Medium**, comprising a development of seven turbines of up to 200 m tip height, with two other operational wind farm developments (Glenkerie (x11 turbines) and Clyde Extension (x54 turbines)), and two approved wind farm developments (Glenkerie Extension (x6 turbines) and Whitelaw Brae (up to x14 turbines)) located within 5 km of the site.

5.2 Stage 2 – Overall Risk Assessment

In accordance with NatureScot guidance (SNH, 2019), Stage 2 should be carried out separately for all high collision-risk species recorded, which includes the following species recorded during bat activity surveys for the Proposed Development:

- soprano pipistrelle
- common pipistrelle; and
- *Nyctalus* species.

In order to derive an 'Overall Risk Assessment' the determined Bat Activity Category derived from the Ecobat Tool Output Report is compared against the Site Risk Level (Stage 1) using the matrix presented in Table 3b in NatureScot (SNH, 2019) to determine the level of overall risk.

The calculated 'Overall Risk Assessment' per species, both temporally and spatially, is presented in Table 15 and Table 16.

In summary, the Overall Risk Assessment is considered to fall under "Low/Medium Site Risk" when using the median percentile and "Low/Medium Site Risk" when using the max percentile for common pipistrelle; "Low Site Risk" when using the median percentile and "Low/Medium Site Risk" when using the max percentile for soprano pipistrelle; and “Low Site Risk” when using the median percentile and “Low/Medium Site Risk” when using the max percentile for *Nyctalus* species.

Table 15 – Overall Risk Assessment per MS Location for both the Median and Max Percentiles (Table 3b from SNH (2019) Guidance). Key: Green = Low, Amber = Medium, Red = High

Species / Genus	MS	Median Percentile	Percentile Category	Overall Risk Assessment (Stage 2)	Species / Genus	MS	Max Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
Common pipistrelle	MS1	10	Low	2	Common pipistrelle	MS1	66	Moderate to High	8
	MS2	45	Moderate	6		MS2	66	Moderate to High	8
	MS3	1	Low	2		MS3	4	Low	2
	MS4	4	Low	2		MS4	6	Low	2
	MS5	88	High	10		MS5	100	High	10
	MS6	32	Low to Moderate	4		MS6	66	Moderate to High	8
	MS7	46	Moderate	6		MS7	100	High	10
	MS8	29	Low to Moderate	4		MS8	73	Moderate to High	8
	MS9	35	Low to Moderate	4		MS9	73	Moderate to High	8
	MS10	42	Moderate	6		MS10	66	Moderate to High	8
Soprano pipistrelle	MS1	15	Low	2	Soprano pipistrelle	MS1	40	Low to Moderate	4
	MS2	21	Low to Moderate	4		MS2	40	Low to Moderate	4
	MS3	0	Low	2		MS3	0	Low	2
	MS4	1	Low	2		MS4	2	Low	2
	MS5	34	Low to Moderate	4		MS5	80	High	10
	MS6	21	Low to Moderate	4		MS6	40	Low to Moderate	4
	MS7	18	Low	2		MS7	80	High	10
	MS8	31	Low to Moderate	4		MS8	57	Moderate	6
	MS9	35	Low to Moderate	4		MS9	57	Moderate	6
	MS10	10	Low	2		MS10	20	Low	2
Nyctalus species	MS1	17	Low	2	Nyctalus species	MS1	35	Low to Moderate	4
	MS2	17	Low	2		MS2	35	Low to Moderate	4
	MS4	14	Low	2		MS4	20	Low	2
	MS5	17	Low	2		MS5	36	Low to Moderate	4
	MS6	20	Low	2		MS6	35	Low to Moderate	4
	MS7	24	Low to Moderate	4		MS7	43	Moderate	6
	MS8	10	Low	2		MS8	55	Moderate	6
	MS9	10	Low	2		MS9	55	Moderate	6
	MS10	39	Low to Moderate	4		MS10	100	High	10

Table 16 - Overall Risk Assessment per Month for both the Median and Max Percentiles (Table 3b from SNH (2019) Guidance). Key: Green = Low, Amber = Medium, Red = High

Species / Genus	Month	Median Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
Common pipistrelle	May	5	Low	2
	Jul	38	Low to Moderate	4
	Aug	43	Moderate	6
	Sep	17	Low	2
Soprano pipistrelle	May	0	Low	2
	Jul	16	Low	2
	Aug	21	Low to Moderate	4
	Sep	13	Low	2
Nyctalus species	May	36	Low to Moderate	4
	Jul	17	Low	2
	Aug	20	Low	2
	Sep	8	Low	2

Species / Genus	Month	Max Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
Common pipistrelle	May	45	Moderate	6
	Jul	100	High	10
	Aug	73	Moderate to High	8
	Sep	38	Low to Moderate	4
Soprano pipistrelle	May	6	Low	2
	Jul	80	High	10
	Aug	57	Moderate	6
	Sep	45	Moderate	6
Nyctalus species	May	100	High	10
	Jul	68	Moderate to High	8
	Aug	55	Moderate	6
	Sep	17	Low	2

6.0 References

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ANNEX A - SCIENTIFIC NAMES

Table A-1 – Common and scientific names of bat species included in this Technical Appendix.

Common Name	Species Name
Pipistrellus species	*Pipistrellus* spp.
Soprano pipistrelle	*Pipistrellus pygmaeus*
Common pipistrelle	*Pipistrellus pipistrellus*
Myotis species	*Myotis* spp.
Whiskered bat	*Myotis mystacinus*
Natterer's bat	*Myotis nattereri*
Daubenton's bat	*Myotis daubentonii*
Nyctalus species	*Nyctalus* spp.
Noctule	*Nyctalus noctula*
Leisler's bat	*Nyctalus leisleri*
Brown long-eared	*Plecotus auritus*

ANNEX B - SURVEY WEATHER CONDITIONS

Table B-1 provides weather conditions for bat activity survey periods. Those values in red font represent less suitable weather conditions for bats (above average for rainfall and wind speed, and below average for temperature).

Table B-1 Weather Conditions

Date	Temp at Dusk (ºC)	Rainfall (mm)	Maximum Wind Speed (m/s)
02/05/2022	5.7	0.25	0
03/05/2022	8.1	0	2.2
04/05/2022	7	0	0.9
05/05/2022	9.9	0	1.3
06/05/2022	8.8	0	0.4
07/05/2022	8.8	0	0
08/05/2022	10.3	0	3.6
09/05/2022	9.2	0	5.4
10/05/2022	7.6	0	4
11/05/2022	7.3	0	1.3
12/05/2022	7.2	0.51	3.6
13/05/2022	8.1	0	2.2
14/05/2022	10.4	0	0
15/05/2022	11.5	0	1.3
04/07/2022	8.6	0	1.3
05/07/2022	10.8	0	1.8
06/07/2022	10.7	0	1.3
07/07/2022	13	0	0.4
08/07/2022	11.7	0	1.3
09/07/2022	11.1	0	0
10/07/2022	12.4	0	0.4
11/07/2022	13.7	0	0
12/07/2022	11.6	0	0.4
13/07/2022	10.7	0	0.4
14/07/2022	10.4	0	0.4
15/07/2022	10.4	0	0
16/07/2022	12.9	0	0
17/07/2022	16.7	0	1.8
22/08/2022	14	0	1.67
23/08/2022	16	0	3.33
24/08/2022	14	0.2	3.89
25/08/2022	13	0.1	3.06
26/08/2022	13	2.2	1.67
27/08/2022	15	0	1.39
28/08/2022	15	0	1.11
29/08/2022	14	0	2.50
30/08/2022	13	0	1.94
31/08/2022	14	0	1.39
01/09/2022	15	0.1	3.06
02/09/2022	15	0	5.83
03/09/2022	15	0	8.06
04/09/2022	15	0	2.78

ANNEX C - ECOBAT REPORT

Bat Activity Analysis

Site Name: Oliver Forest

Author: Andrew Hulme

2022-11-25 09:58:23

Summary

The geographic filter was: **Region** The time filter was: **+/- 1 month from survey start date**

Bats were detected on **38** nights between **2022-05-03** and **2022-09-04**, using **10** static bat detectors. Throughout this period **5** species were recorded. **Table 1.** Detectors were placed at the following locations:

latlon	date	Detector ID	Latitude	Longitude
55.5_-3.47	14/05/2022	MS1	55.50	-3.47
55.5_-3.47	07/05/2022	MS1	55.50	-3.47
55.5_-3.47	08/05/2022	MS1	55.50	-3.47
55.5_-3.47	15/07/2022	MS1	55.50	-3.47
55.5_-3.47	17/07/2022	MS1	55.50	-3.47
55.5_-3.47	11/07/2022	MS1	55.50	-3.47
55.5_-3.47	13/07/2022	MS1	55.50	-3.47
55.5_-3.47	26/08/2022	MS1	55.50	-3.47
55.5_-3.47	02/09/2022	MS1	55.50	-3.47
55.5_-3.47	28/08/2022	MS1	55.50	-3.47
55.5_-3.47	30/08/2022	MS1	55.50	-3.47
55.5_-3.47	01/09/2022	MS1	55.50	-3.47
55.5_-3.47	29/08/2022	MS1	55.50	-3.47
55.5_-3.47	24/08/2022	MS1	55.50	-3.47
55.5_-3.47	31/08/2022	MS1	55.50	-3.47
55.5_-3.47	25/08/2022	MS1	55.50	-3.47
55.5_-3.47	23/08/2022	MS1	55.50	-3.47
55.5_-3.47	04/09/2022	MS1	55.50	-3.47
55.5_-3.47	03/09/2022	MS1	55.50	-3.47
55.5_-3.47	30/08/2022	MS2	55.50	-3.47
55.5_-3.47	24/08/2022	MS2	55.50	-3.47
55.5_-3.47	25/08/2022	MS2	55.50	-3.47
55.5_-3.47	23/08/2022	MS2	55.50	-3.47
55.5_-3.47	02/09/2022	MS2	55.50	-3.47
55.5_-3.47	28/08/2022	MS2	55.50	-3.47
55.5_-3.47	31/08/2022	MS2	55.50	-3.47
55.5_-3.47	26/08/2022	MS2	55.50	-3.47
55.5_-3.47	29/08/2022	MS2	55.50	-3.47
55.5_-3.47	01/09/2022	MS2	55.50	-3.47
55.5_-3.47	27/08/2022	MS2	55.50	-3.47
55.5_-3.47	04/09/2022	MS2	55.50	-3.47
55.5_-3.47	22/08/2022	MS2	55.50	-3.47
55.51_-3.46	08/05/2022	MS3	55.51	-3.46
55.51_-3.46	03/09/2022	MS3	55.51	-3.46
55.51_-3.46	01/09/2022	MS3	55.51	-3.46

latlon	date	Detector ID	Latitude	Longitude
55.51_-3.46	16/07/2022	MS4	55.51	-3.46
55.51_-3.46	13/07/2022	MS4	55.51	-3.46
55.51_-3.45	15/05/2022	MS5	55.51	-3.45
55.51_-3.45	08/05/2022	MS5	55.51	-3.45
55.51_-3.45	06/05/2022	MS5	55.51	-3.45
55.51_-3.45	13/07/2022	MS5	55.51	-3.45
55.51_-3.45	12/07/2022	MS5	55.51	-3.45
55.51_-3.45	07/07/2022	MS5	55.51	-3.45
55.51_-3.45	05/07/2022	MS5	55.51	-3.45
55.51_-3.45	11/07/2022	MS5	55.51	-3.45
55.51_-3.45	08/07/2022	MS5	55.51	-3.45
55.51_-3.45	10/07/2022	MS5	55.51	-3.45
55.51_-3.45	17/07/2022	MS5	55.51	-3.45
55.51_-3.45	18/07/2022	MS5	55.51	-3.45
55.51_-3.45	14/07/2022	MS5	55.51	-3.45
55.51_-3.45	16/07/2022	MS5	55.51	-3.45
55.5_-3.47	14/05/2022	MS6	55.50	-3.47
55.5_-3.47	01/09/2022	MS6	55.50	-3.47
55.5_-3.47	28/08/2022	MS6	55.50	-3.47
55.5_-3.47	30/08/2022	MS6	55.50	-3.47
55.5_-3.47	27/08/2022	MS6	55.50	-3.47
55.5_-3.47	24/08/2022	MS6	55.50	-3.47
55.5_-3.47	02/09/2022	MS6	55.50	-3.47
55.5_-3.47	29/08/2022	MS6	55.50	-3.47
55.5_-3.47	23/08/2022	MS6	55.50	-3.47
55.5_-3.47	25/08/2022	MS6	55.50	-3.47
55.5_-3.47	04/09/2022	MS6	55.50	-3.47
55.5_-3.47	31/08/2022	MS6	55.50	-3.47
55.51_-3.45	05/05/2022	MS7	55.51	-3.45
55.51_-3.45	14/05/2022	MS7	55.51	-3.45
55.51_-3.45	08/05/2022	MS7	55.51	-3.45
55.51_-3.45	06/05/2022	MS7	55.51	-3.45
55.51_-3.45	18/07/2022	MS7	55.51	-3.45
55.51_-3.45	14/07/2022	MS7	55.51	-3.45
55.51_-3.45	08/07/2022	MS7	55.51	-3.45
55.51_-3.45	12/07/2022	MS7	55.51	-3.45
55.51_-3.45	16/07/2022	MS7	55.51	-3.45
55.51_-3.45	13/07/2022	MS7	55.51	-3.45
55.51_-3.45	10/07/2022	MS7	55.51	-3.45
55.51_-3.45	17/07/2022	MS7	55.51	-3.45
55.51_-3.45	15/07/2022	MS7	55.51	-3.45
55.51_-3.45	11/07/2022	MS7	55.51	-3.45
55.51_-3.45	09/07/2022	MS7	55.51	-3.45
55.51_-3.45	06/07/2022	MS7	55.51	-3.45
55.51_-3.45	28/08/2022	MS7	55.51	-3.45
55.51_-3.45	27/08/2022	MS7	55.51	-3.45
55.51_-3.45	25/08/2022	MS7	55.51	-3.45
55.51_-3.45	04/09/2022	MS7	55.51	-3.45
55.51_-3.45	29/08/2022	MS7	55.51	-3.45
55.51_-3.45	24/08/2022	MS7	55.51	-3.45
55.51_-3.45	30/08/2022	MS7	55.51	-3.45
55.51_-3.45	31/08/2022	MS7	55.51	-3.45
55.51_-3.45	02/09/2022	MS7	55.51	-3.45
55.51_-3.45	26/08/2022	MS7	55.51	-3.45
55.51_-3.45	01/09/2022	MS7	55.51	-3.45
55.51_-3.45	23/08/2022	MS7	55.51	-3.45
55.51_-3.45	05/09/2022	MS7	55.51	-3.45

latlon	date	Detector ID	Latitude	Longitude
55.51_-3.45	03/09/2022	MS7	55.51	-3.45
55.5_-3.46	06/05/2022	MS8	55.50	-3.46
55.5_-3.46	08/05/2022	MS8	55.50	-3.46
55.5_-3.46	04/05/2022	MS8	55.50	-3.46
55.5_-3.46	15/05/2022	MS8	55.50	-3.46
55.5_-3.46	16/05/2022	MS8	55.50	-3.46
55.5_-3.46	03/05/2022	MS8	55.50	-3.46
55.5_-3.46	07/07/2022	MS8	55.50	-3.46
55.5_-3.46	08/07/2022	MS8	55.50	-3.46
55.5_-3.46	11/07/2022	MS8	55.50	-3.46
55.5_-3.46	09/07/2022	MS8	55.50	-3.46
55.5_-3.46	12/07/2022	MS8	55.50	-3.46
55.5_-3.46	10/07/2022	MS8	55.50	-3.46
55.5_-3.46	05/07/2022	MS8	55.50	-3.46
55.5_-3.46	13/07/2022	MS8	55.50	-3.46
55.5_-3.46	16/07/2022	MS8	55.50	-3.46
55.5_-3.46	15/07/2022	MS8	55.50	-3.46
55.5_-3.46	04/09/2022	MS8	55.50	-3.46
55.5_-3.46	01/09/2022	MS8	55.50	-3.46
55.5_-3.46	27/08/2022	MS8	55.50	-3.46
55.5_-3.46	24/08/2022	MS8	55.50	-3.46
55.5_-3.46	28/08/2022	MS8	55.50	-3.46
55.5_-3.46	02/09/2022	MS8	55.50	-3.46
55.5_-3.46	26/08/2022	MS8	55.50	-3.46
55.5_-3.46	25/08/2022	MS8	55.50	-3.46
55.5_-3.46	31/08/2022	MS8	55.50	-3.46
55.5_-3.46	30/08/2022	MS8	55.50	-3.46
55.5_-3.46	11/07/2022	MS9	55.50	-3.46
55.5_-3.46	07/07/2022	MS9	55.50	-3.46
55.5_-3.46	30/08/2022	MS9	55.50	-3.46
55.5_-3.46	28/08/2022	MS9	55.50	-3.46
55.5_-3.46	25/08/2022	MS9	55.50	-3.46
55.5_-3.46	29/08/2022	MS9	55.50	-3.46
55.5_-3.46	31/08/2022	MS9	55.50	-3.46
55.5_-3.46	26/08/2022	MS9	55.50	-3.46
55.5_-3.46	27/08/2022	MS9	55.50	-3.46
55.5_-3.45	14/05/2022	MS10	55.50	-3.45
55.5_-3.45	09/05/2022	MS10	55.50	-3.45
55.5_-3.45	08/05/2022	MS10	55.50	-3.45
55.5_-3.45	07/05/2022	MS10	55.50	-3.45
55.5_-3.45	15/05/2022	MS10	55.50	-3.45
55.5_-3.45	13/07/2022	MS10	55.50	-3.45
55.5_-3.45	07/07/2022	MS10	55.50	-3.45
55.5_-3.45	17/07/2022	MS10	55.50	-3.45
55.5_-3.45	14/07/2022	MS10	55.50	-3.45
55.5_-3.45	10/07/2022	MS10	55.50	-3.45
55.5_-3.45	08/07/2022	MS10	55.50	-3.45
55.5_-3.45	16/07/2022	MS10	55.50	-3.45
55.5_-3.45	18/07/2022	MS10	55.50	-3.45
55.5_-3.45	24/08/2022	MS10	55.50	-3.45
55.5_-3.45	01/09/2022	MS10	55.50	-3.45
55.5_-3.45	29/08/2022	MS10	55.50	-3.45
55.5_-3.45	30/08/2022	MS10	55.50	-3.45
55.5_-3.45	31/08/2022	MS10	55.50	-3.45
55.5_-3.45	25/08/2022	MS10	55.50	-3.45
55.5_-3.45	02/09/2022	MS10	55.50	-3.45
55.5_-3.45	27/08/2022	MS10	55.50	-3.45

latlon	date	Detector ID	Latitude	Longitude
55.5_-3.45	28/08/2022	MS10	55.50	-3.45
55.5_-3.45	26/08/2022	MS10	55.50	-3.45
55.5_-3.45	23/08/2022	MS10	55.50	-3.45
55.5_-3.45	04/09/2022	MS10	55.50	-3.45
55.5_-3.45	03/09/2022	MS10	55.50	-3.45
55.5_-3.47	16/05/2022	MS1	55.50	-3.47
55.5_-3.47	05/05/2022	MS1	55.50	-3.47
55.5_-3.47	14/07/2022	MS1	55.50	-3.47
55.5_-3.47	16/07/2022	MS1	55.50	-3.47
55.5_-3.47	12/07/2022	MS1	55.50	-3.47
55.5_-3.47	18/07/2022	MS1	55.50	-3.47
55.5_-3.47	10/07/2022	MS1	55.50	-3.47
55.5_-3.47	09/07/2022	MS1	55.50	-3.47
55.5_-3.47	05/09/2022	MS1	55.50	-3.47
55.5_-3.47	27/08/2022	MS1	55.50	-3.47
55.5_-3.47	22/08/2022	MS1	55.50	-3.47
55.5_-3.47	14/05/2022	MS2	55.50	-3.47
55.51_-3.46	07/05/2022	MS3	55.51	-3.46
55.51_-3.46	14/05/2022	MS3	55.51	-3.46
55.51_-3.46	15/05/2022	MS3	55.51	-3.46
55.51_-3.46	30/08/2022	MS3	55.51	-3.46
55.51_-3.46	15/07/2022	MS4	55.51	-3.46
55.51_-3.46	11/07/2022	MS4	55.51	-3.46
55.51_-3.46	17/07/2022	MS4	55.51	-3.46
55.51_-3.46	10/07/2022	MS4	55.51	-3.46
55.51_-3.46	09/07/2022	MS4	55.51	-3.46
55.51_-3.46	14/07/2022	MS4	55.51	-3.46
55.51_-3.46	12/07/2022	MS4	55.51	-3.46
55.51_-3.46	31/08/2022	MS4	55.51	-3.46
55.51_-3.46	25/08/2022	MS4	55.51	-3.46
55.51_-3.46	27/08/2022	MS4	55.51	-3.46
55.51_-3.46	23/08/2022	MS4	55.51	-3.46
55.51_-3.45	14/05/2022	MS5	55.51	-3.45
55.51_-3.45	07/05/2022	MS5	55.51	-3.45
55.51_-3.45	15/07/2022	MS5	55.51	-3.45
55.51_-3.45	09/07/2022	MS5	55.51	-3.45
55.5_-3.47	08/05/2022	MS6	55.50	-3.47
55.5_-3.47	15/05/2022	MS6	55.50	-3.47
55.5_-3.47	03/09/2022	MS6	55.50	-3.47
55.51_-3.45	07/05/2022	MS7	55.51	-3.45
55.51_-3.45	15/05/2022	MS7	55.51	-3.45
55.51_-3.45	09/05/2022	MS7	55.51	-3.45
55.51_-3.45	03/05/2022	MS7	55.51	-3.45
55.51_-3.45	13/05/2022	MS7	55.51	-3.45
55.51_-3.45	05/07/2022	MS7	55.51	-3.45
55.51_-3.45	07/07/2022	MS7	55.51	-3.45
55.51_-3.45	04/07/2022	MS7	55.51	-3.45
55.51_-3.45	22/08/2022	MS7	55.51	-3.45
55.5_-3.46	13/05/2022	MS8	55.50	-3.46
55.5_-3.46	07/05/2022	MS8	55.50	-3.46
55.5_-3.46	14/05/2022	MS8	55.50	-3.46
55.5_-3.46	09/05/2022	MS8	55.50	-3.46
55.5_-3.46	10/05/2022	MS8	55.50	-3.46
55.5_-3.46	14/07/2022	MS8	55.50	-3.46
55.5_-3.46	18/07/2022	MS8	55.50	-3.46
55.5_-3.46	06/07/2022	MS8	55.50	-3.46
55.5_-3.46	17/07/2022	MS8	55.50	-3.46

latlon	date	Detector ID	Latitude	Longitude
55.5_-3.46	29/08/2022	MS8	55.50	-3.46
55.5_-3.46	23/08/2022	MS8	55.50	-3.46
55.5_-3.46	05/09/2022	MS8	55.50	-3.46
55.5_-3.46	03/09/2022	MS8	55.50	-3.46
55.5_-3.46	10/07/2022	MS9	55.50	-3.46
55.5_-3.46	15/07/2022	MS9	55.50	-3.46
55.5_-3.46	13/07/2022	MS9	55.50	-3.46
55.5_-3.46	12/07/2022	MS9	55.50	-3.46
55.5_-3.46	17/07/2022	MS9	55.50	-3.46
55.5_-3.46	14/07/2022	MS9	55.50	-3.46
55.5_-3.46	16/07/2022	MS9	55.50	-3.46
55.5_-3.46	09/07/2022	MS9	55.50	-3.46
55.5_-3.46	18/07/2022	MS9	55.50	-3.46
55.5_-3.46	05/07/2022	MS9	55.50	-3.46
55.5_-3.46	02/09/2022	MS9	55.50	-3.46
55.5_-3.46	23/08/2022	MS9	55.50	-3.46
55.5_-3.46	24/08/2022	MS9	55.50	-3.46
55.5_-3.46	01/09/2022	MS9	55.50	-3.46
55.5_-3.46	03/09/2022	MS9	55.50	-3.46
55.5_-3.46	04/09/2022	MS9	55.50	-3.46
55.5_-3.45	05/07/2022	MS10	55.50	-3.45
55.5_-3.45	09/07/2022	MS10	55.50	-3.45
55.5_-3.45	12/07/2022	MS10	55.50	-3.45
55.5_-3.45	11/07/2022	MS10	55.50	-3.45
55.5_-3.45	06/07/2022	MS10	55.50	-3.45
55.5_-3.45	15/07/2022	MS10	55.50	-3.45
55.5_-3.45	22/08/2022	MS10	55.50	-3.45
55.5_-3.45	05/09/2022	MS10	55.50	-3.45
55.5_-3.47	15/05/2022	MS1	55.50	-3.47
55.5_-3.47	15/05/2022	MS2	55.50	-3.47
55.5_-3.47	03/09/2022	MS2	55.50	-3.47
55.51_-3.46	29/08/2022	MS3	55.51	-3.46
55.51_-3.46	28/08/2022	MS4	55.51	-3.46
55.51_-3.46	30/08/2022	MS4	55.51	-3.46
55.51_-3.46	29/08/2022	MS4	55.51	-3.46
55.51_-3.46	05/09/2022	MS4	55.51	-3.46
55.5_-3.47	26/08/2022	MS6	55.50	-3.47
55.5_-3.46	22/08/2022	MS8	55.50	-3.46
55.5_-3.46	08/07/2022	MS9	55.50	-3.46
55.5_-3.46	05/09/2022	MS9	55.50	-3.46
55.5_-3.47	07/07/2022	MS1	55.50	-3.47
55.5_-3.47	07/05/2022	MS2	55.50	-3.47
55.5_-3.45	05/05/2022	MS10	55.50	-3.45
55.5_-3.45	03/05/2022	MS10	55.50	-3.45

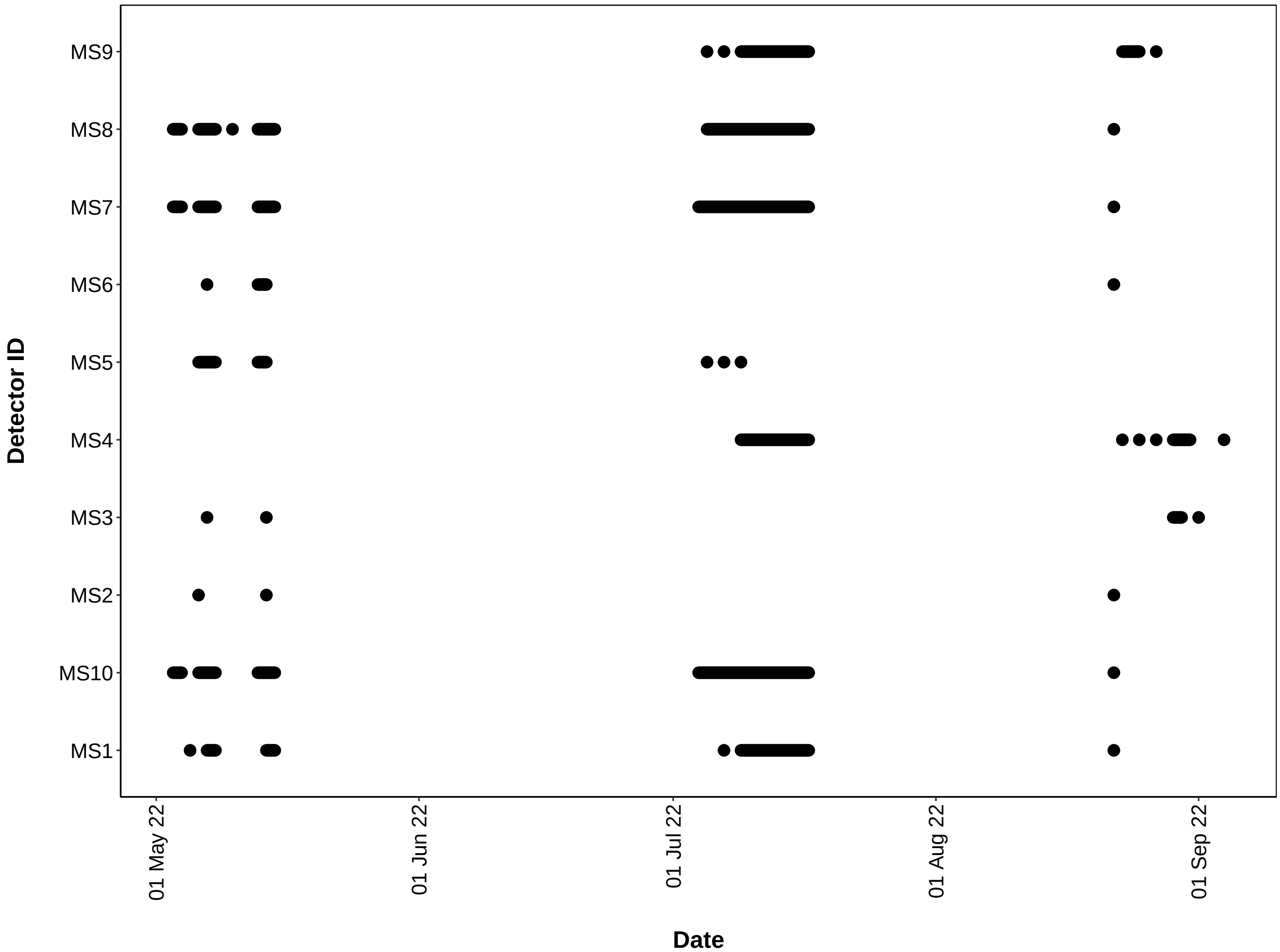
Survey Nights

Table 2. The number of nights that bats were detected on each recorder. This is not the same as the number of nights that detectors were active if there were nights when no bats were detected.

Detector ID	No. of nights
MS1	29
MS10	36
MS2	16
MS3	6
MS4	16
MS5	16
MS6	17
MS7	36
MS8	36
MS9	23

Survey Nights

Figure 1. Horizontal bars show nights when acoustic detectors recorded bats.



PART 1: Percentiles Analysis

This first part of the analysis looks at the relative activity levels of the bats you recorded. We take your value for the total bat passes each night for each species, and compare this to the values in our reference database. We tell you what percentile your data falls at, and therefore what the relative activity level is. For example, if the reference database has values of 5, 10, 15, 20 and you submit a value of 18, this will be the 80th percentile, and be classed as high activity.

The reference range dataset was stratified to include:

PER DETECTOR

Table 3. Summary table showing the number of nights recorded bat activity fell into each activity band for each species.

Detector ID	Species/Species Group	Night.exceed	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
MS1	*Myotis*	4	2	4	0	1	7
MS1	*Nyctalus*	0	0	0	0	5	7
MS1	*Pipistrellus pipistrellus*	0	0	2	5	2	17
MS1	*Pipistrellus pygmaeus*	0	0	0	0	9	11
MS1	*Plecotus auritus*	0	0	2	2	0	0
MS10	*Myotis*	0	0	4	0	10	9
MS10	*Nyctalus*	2	1	5	6	3	12
MS10	*Pipistrellus pipistrellus*	0	6	2	12	5	6
MS10	*Pipistrellus pygmaeus*	0	0	0	0	2	29
MS10	*Plecotus auritus*	0	0	0	5	0	0
MS2	*Myotis*	5	2	2	0	2	1
MS2	*Nyctalus*	0	0	0	0	5	6
MS2	*Pipistrellus pipistrellus*	0	0	2	3	1	3
MS2	*Pipistrellus pygmaeus*	0	0	0	0	7	5
MS3	*Myotis*	0	0	0	0	0	3
MS3	*Pipistrellus pipistrellus*	0	0	0	0	0	3
MS3	*Pipistrellus pygmaeus*	0	0	0	0	0	2
MS4	*Myotis*	0	0	0	0	0	2
MS4	*Nyctalus*	0	0	0	0	1	3
MS4	*Pipistrellus pipistrellus*	0	0	0	0	0	13
MS4	*Pipistrellus pygmaeus*	0	0	0	0	0	14
MS5	*Myotis*	0	0	0	0	10	4
MS5	*Nyctalus*	0	0	0	0	4	5
MS5	*Pipistrellus pipistrellus*	4	6	0	1	1	3
MS5	*Pipistrellus pygmaeus*	0	1	4	0	3	5
MS6	*Myotis*	4	2	3	1	1	1
MS6	*Nyctalus*	0	0	0	0	8	5
MS6	*Pipistrellus pipistrellus*	0	0	2	5	2	7
MS6	*Pipistrellus pygmaeus*	0	0	0	0	10	5
MS6	*Plecotus auritus*	0	0	1	2	0	0
MS7	*Myotis*	0	0	3	5	16	6
MS7	*Nyctalus*	0	0	0	2	15	11
MS7	*Pipistrellus pipistrellus*	4	7	1	7	10	5

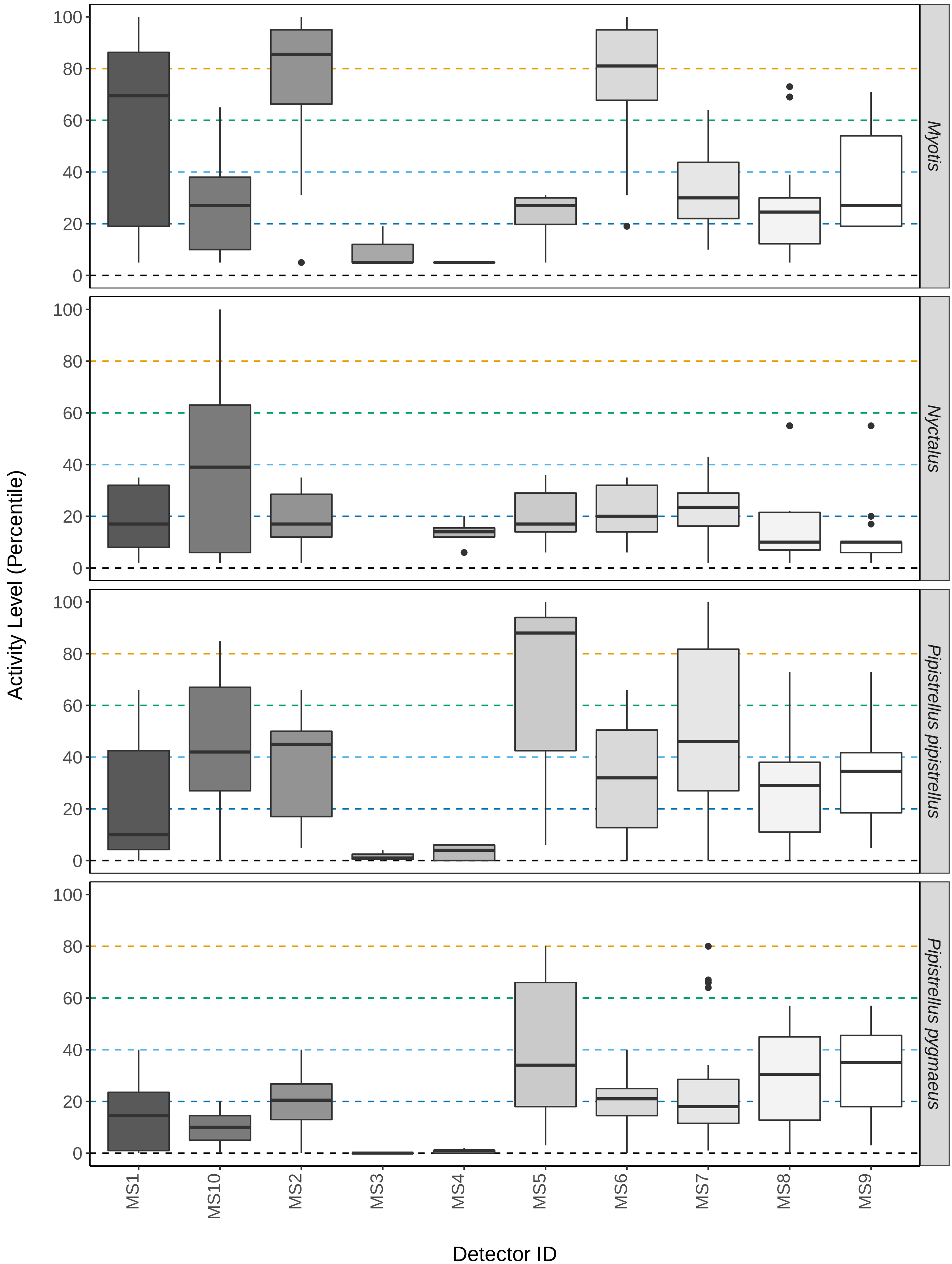
Detector ID	Species/Species Group	Night.exclp	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
MS7	*Pipistrellus pygmaeus*	0	1	4	0	5	22
MS7	*Plecotus auritus*	0	0	2	6	0	0
MS8	*Myotis*	0	0	3	0	9	10
MS8	*Nyctalus*	0	0	0	2	3	9
MS8	*Pipistrellus pipistrellus*	0	0	2	4	14	13
MS8	*Pipistrellus pygmaeus*	0	0	0	11	9	10
MS8	*Plecotus auritus*	0	0	0	2	0	0
MS9	*Myotis*	0	0	2	0	2	3
MS9	*Nyctalus*	0	0	0	1	1	11
MS9	*Pipistrellus pipistrellus*	0	0	2	4	10	6
MS9	*Pipistrellus pygmaeus*	0	0	0	10	7	6
MS9	*Plecotus auritus*	0	0	0	1	0	0

Table 4. Summary table showing key metrics for each species recorded. The reference range is the number of nights for each species that your data were compared to. We recommend a Reference Range of 200+ to be confident in the relative activity level.

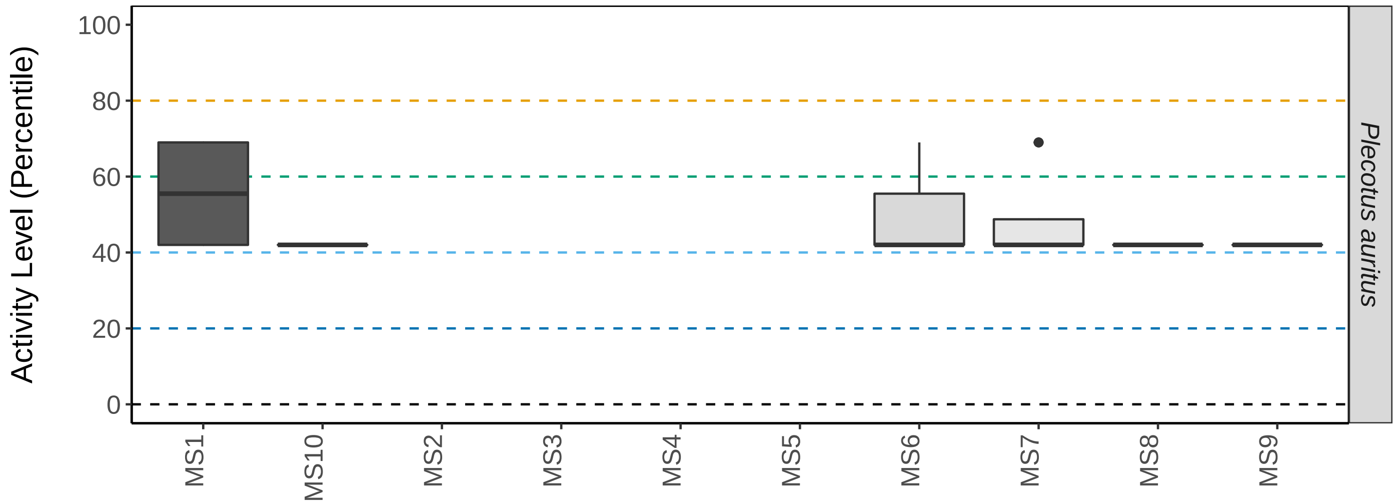
Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
MS1	*Myotis*	70	40 - 79.5	100	18	1589
MS1	*Nyctalus*	17	9.5 - 26	35	12	992
MS1	*Pipistrellus pipistrellus*	10	9.5 - 33.5	66	26	10352
MS1	*Pipistrellus pygmaeus*	15	11 - 25	40	20	21794
MS1	*Plecotus auritus*	56	42 - 69	69	4	155
MS10	*Myotis*	27	17.5 - 35.5	65	23	1589
MS10	*Nyctalus*	39	24.5 - 51	100	29	992
MS10	*Pipistrellus pipistrellus*	42	37.5 - 59	85	31	10352
MS10	*Pipistrellus pygmaeus*	10	8 - 12.5	20	31	21794
MS10	*Plecotus auritus*	42	42 - 42	42	5	155
MS2	*Myotis*	86	52.5 - 95	100	12	1589
MS2	*Nyctalus*	17	11 - 26	35	11	992
MS2	*Pipistrellus pipistrellus*	45	17 - 57.5	66	9	10352
MS2	*Pipistrellus pygmaeus*	21	14.5 - 30.5	40	12	21794
MS3	*Myotis*	5	5 - 5	19	3	1589
MS3	*Pipistrellus pipistrellus*	1	2.5 - 2.5	4	3	10352
MS3	*Pipistrellus pygmaeus*	0	0 - 0	0	2	21794
MS4	*Myotis*	5	5 - 5	5	2	1589
MS4	*Nyctalus*	14	10 - 17	20	4	992
MS4	*Pipistrellus pipistrellus*	4	3 - 6	6	13	10352
MS4	*Pipistrellus pygmaeus*	1	1 - 1.5	2	14	21794
MS5	*Myotis*	27	17.5 - 28.5	31	14	1589
MS5	*Nyctalus*	17	11.5 - 30.5	36	9	992
MS5	*Pipistrellus pipistrellus*	88	49.5 - 92	100	15	10352
MS5	*Pipistrellus pygmaeus*	34	18.5 - 57	80	13	21794
MS6	*Myotis*	81	54.5 - 91	100	12	1589
MS6	*Nyctalus*	20	15.5 - 32	35	13	992
MS6	*Pipistrellus pipistrellus*	32	23 - 50.5	66	16	10352
MS6	*Pipistrellus pygmaeus*	21	16.5 - 28.5	40	15	21794
MS6	*Plecotus auritus*	42	42 - 42	69	3	155
MS7	*Myotis*	30	26 - 40	64	30	1589
MS7	*Nyctalus*	24	17.5 - 27	43	28	992
MS7	*Pipistrellus pipistrellus*	46	39.5 - 64	100	34	10352
MS7	*Pipistrellus pygmaeus*	18	14.5 - 29	80	32	21794
MS7	*Plecotus auritus*	42	42 - 55.5	69	8	155
MS8	*Myotis*	25	16 - 37	73	22	1589
MS8	*Nyctalus*	10	8 - 30.5	55	14	992
MS8	*Pipistrellus pipistrellus*	29	21 - 34.5	73	33	10352
MS8	*Pipistrellus pygmaeus*	31	25 - 40	57	30	21794
MS8	*Plecotus auritus*	42	42 - 42	42	2	155
MS9	*Myotis*	27	19 - 49	71	7	1589
MS9	*Nyctalus*	10	6 - 15	55	13	992
MS9	*Pipistrellus pipistrellus*	35	24.5 - 40.5	73	22	10352
MS9	*Pipistrellus pygmaeus*	35	25 - 41	57	23	21794
MS9	*Plecotus auritus*	42	0	42	1	155

Figures

Figure 2. The recorded activity of bats during the survey. The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity)

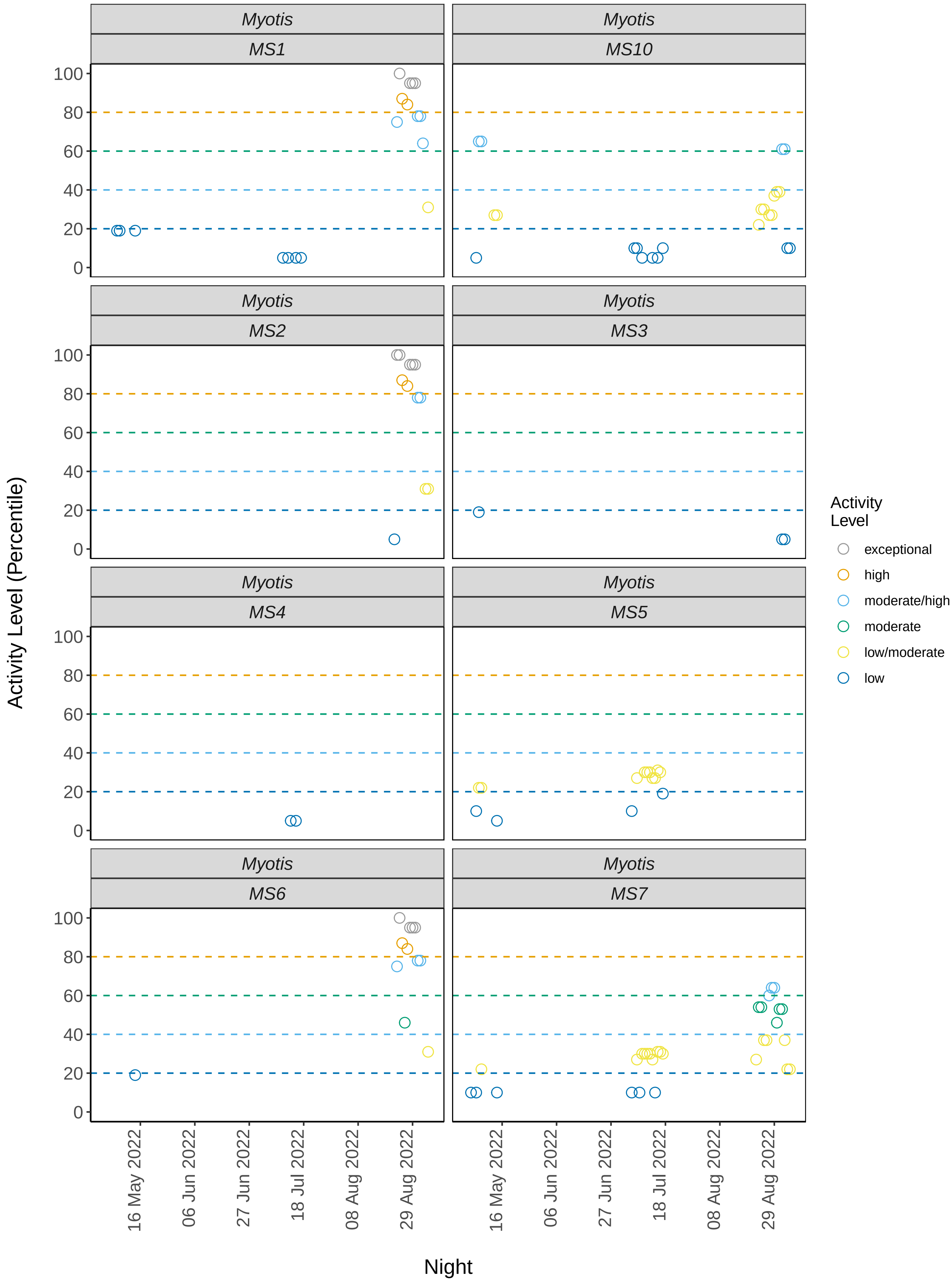


Activity Level (Percentile)
Myotis
Nyctalus
Pipistrellus pipistrellus
Pipistrellus pygmaeus
100
80
60
40
20
0
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID

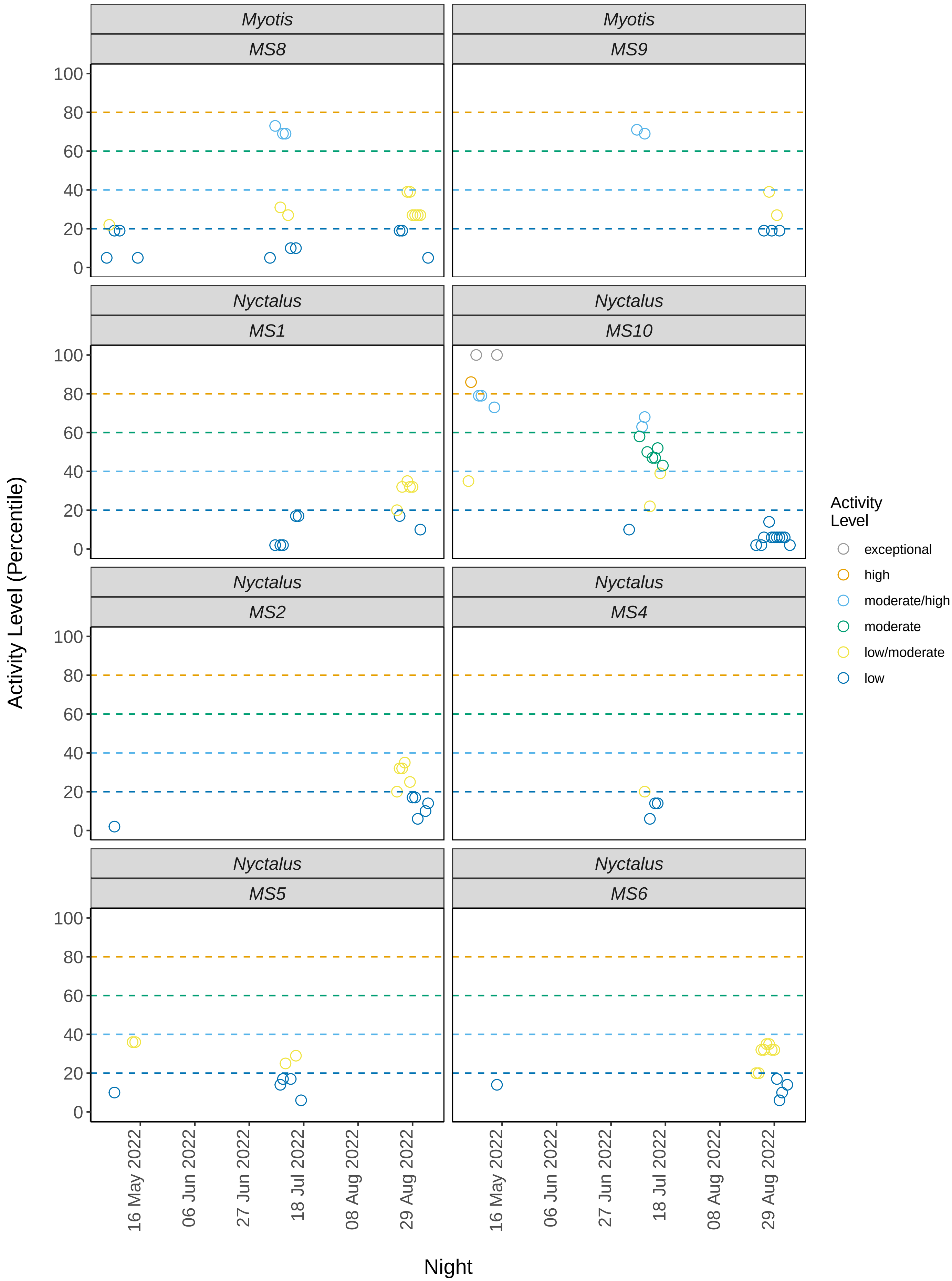

Activity Level (Percentile)
100
80
60
40
20
0
Plecotus auritus
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9

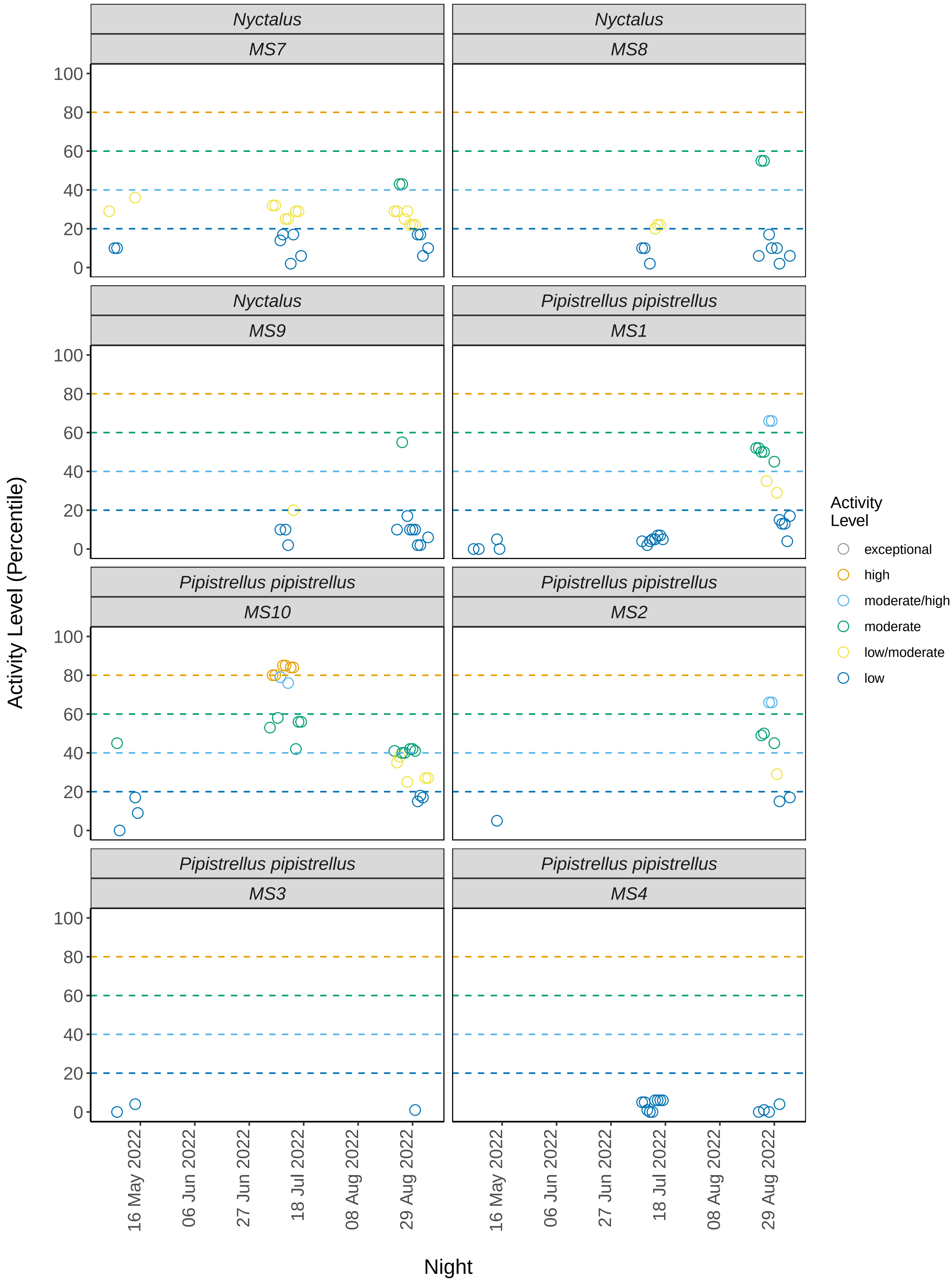
Detector ID

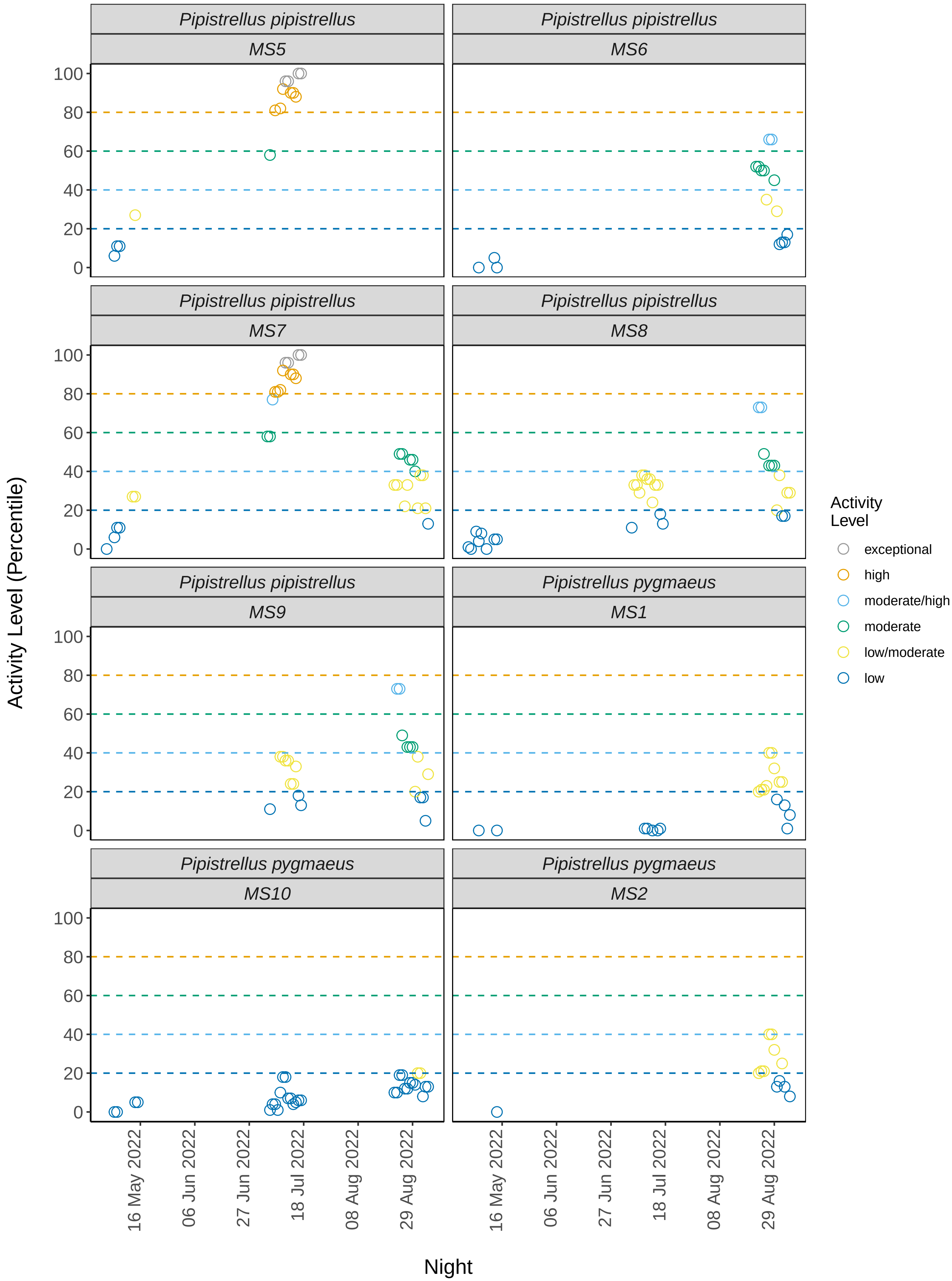
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.

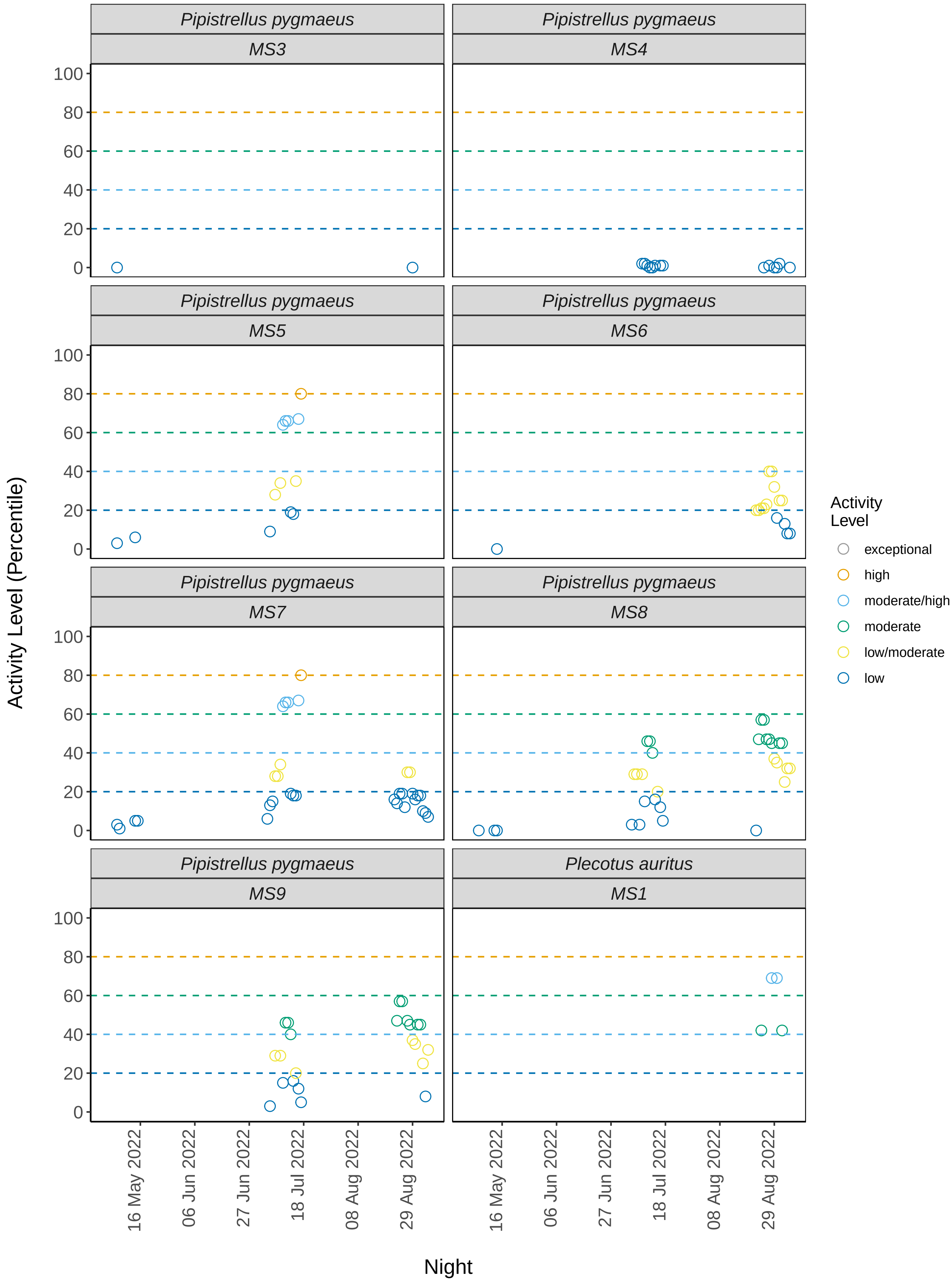


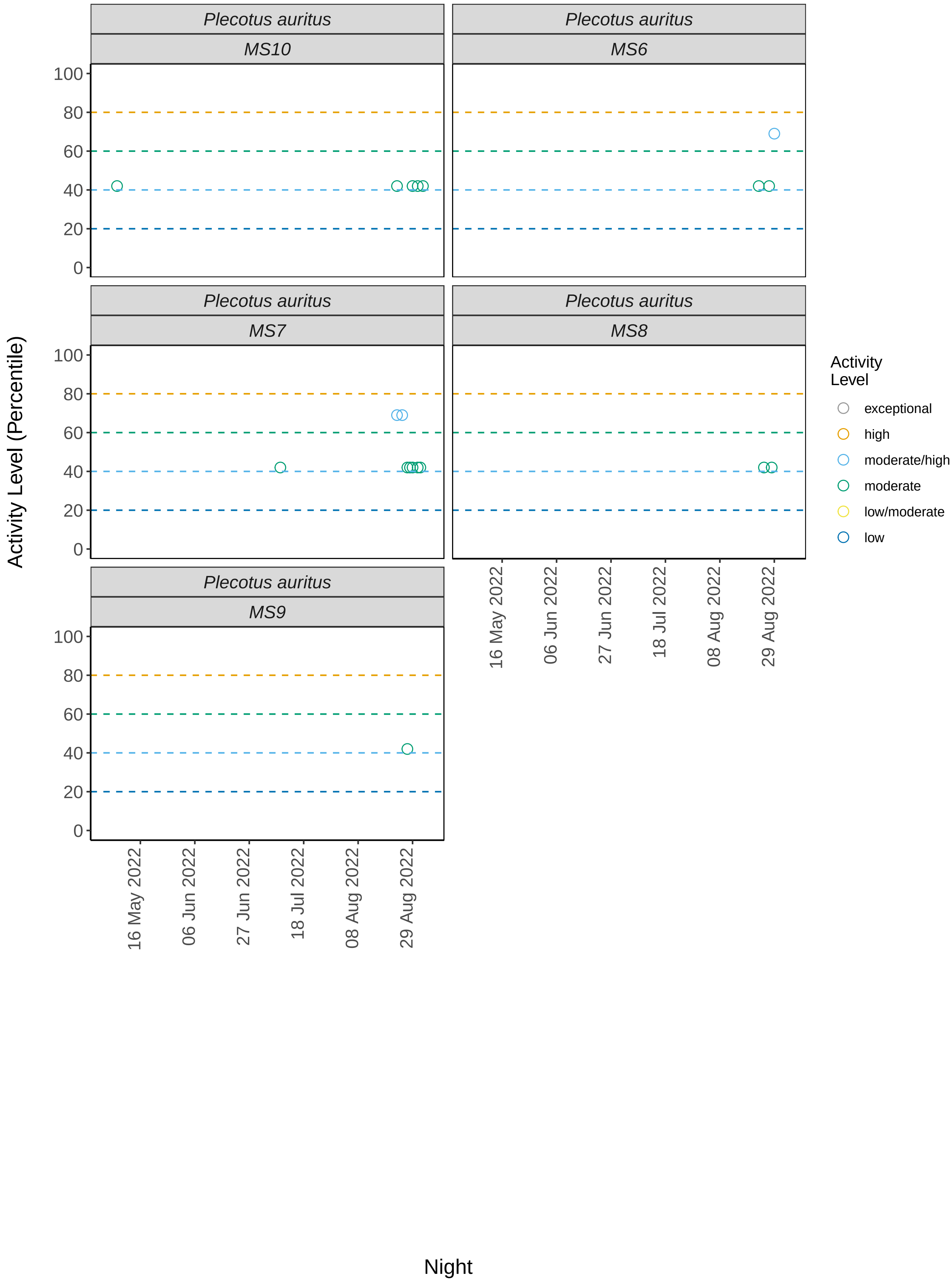
Myotis
MS1
Myotis
MS10
Myotis
MS2
Myotis
MS3
Myotis
MS4
Myotis
MS5
Myotis
MS6
Myotis
MS7
100
80
60
40
20
0
Activity Level (Percentile)
16 May 2022
06 Jun 2022
27 Jun 2022
18 Jul 2022
08 Aug 2022
29 Aug 2022
Night
Activity Level
exceptional
high
moderate/high
moderate
low/moderate
low


Myotis
MS8
Myotis
MS9
Nyctalus
MS1
Nyctalus
MS10
Nyctalus
MS2
Nyctalus
MS4
Nyctalus
MS5
Nyctalus
MS6
100
80
60
40
20
0
Activity Level (Percentile)
16 May 2022
06 Jun 2022
27 Jun 2022
18 Jul 2022
08 Aug 2022
29 Aug 2022
Night
Activity Level
exceptional
high
moderate/high
moderate
low/moderate
low


Nyctalus
MS7
Nyctalus
MS8
Nyctalus
MS9
Pipistrellus pipistrellus
MS1
Pipistrellus pipistrellus
MS10
Pipistrellus pipistrellus
MS2
Pipistrellus pipistrellus
MS3
Pipistrellus pipistrellus
MS4
Activity Level (Percentile)
100
80
60
40
20
0
16 May 2022
06 Jun 2022
27 Jun 2022
18 Jul 2022
08 Aug 2022
29 Aug 2022
Night
Activity Level
exceptional
high
moderate/high
moderate
low/moderate
low


Pipistrellus pipistrellus
MS5
Pipistrellus pipistrellus
MS6
Pipistrellus pipistrellus
MS7
Pipistrellus pipistrellus
MS8
Pipistrellus pipistrellus
MS9
Pipistrellus pygmaeus
MS1
Pipistrellus pygmaeus
MS10
Pipistrellus pygmaeus
MS2
Activity Level (Percentile)
0
20
40
60
80
100
16 May 2022
06 Jun 2022
27 Jun 2022
18 Jul 2022
08 Aug 2022
29 Aug 2022
Night
Activity Level
exceptional
high
moderate/high
moderate
low/moderate
low


Pipistrellus pygmaeus
MS3
Pipistrellus pygmaeus
MS4
Pipistrellus pygmaeus
MS5
Pipistrellus pygmaeus
MS6
Pipistrellus pygmaeus
MS7
Pipistrellus pygmaeus
MS8
Pipistrellus pygmaeus
MS9
Plecotus auritus
MS1
Activity Level (Percentile)
100
80
60
40
20
0
16 May 2022
06 Jun 2022
27 Jun 2022
18 Jul 2022
08 Aug 2022
29 Aug 2022
Night
Activity Level
exceptional
high
moderate/high
moderate
low/moderate
low



Plecotus auritus
MS10
Plecotus auritus
MS6
Plecotus auritus
MS7
Plecotus auritus
MS8
Plecotus auritus
MS9
Activity Level (Percentile)
100
80
60
40
20
0
16 May 2022
06 Jun 2022
27 Jun 2022
18 Jul 2022
08 Aug 2022
29 Aug 2022
Night
Activity Level
exceptional
high
moderate/high
moderate
low/moderate
low

PER DETECTOR, PER MONTH

Table 5. Summary table showing the number of nights recorded bat activity fell into each activity band for each species at each detector during each month.

Detector ID	Species/Species Group	Month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
MS1	*Myotis*	May	0	0	0	0	0	3
MS1	*Myotis*	Jul	0	0	0	0	0	4
MS1	*Myotis*	Aug	4	2	2	0	0	0
MS1	*Myotis*	Sep	0	0	2	0	1	0
MS1	*Nyctalus*	Jul	0	0	0	0	0	5
MS1	*Nyctalus*	Aug	0	0	0	0	5	1
MS1	*Nyctalus*	Sep	0	0	0	0	0	1
MS1	*Pipistrellus pipistrellus*	May	0	0	0	0	0	4
MS1	*Pipistrellus pipistrellus*	Jul	0	0	0	0	0	8
MS1	*Pipistrellus pipistrellus*	Aug	0	0	2	5	2	1
MS1	*Pipistrellus pipistrellus*	Sep	0	0	0	0	0	4
MS1	*Pipistrellus pygmaeus*	May	0	0	0	0	0	2
MS1	*Pipistrellus pygmaeus*	Jul	0	0	0	0	0	5
MS1	*Pipistrellus pygmaeus*	Aug	0	0	0	0	8	1
MS1	*Pipistrellus pygmaeus*	Sep	0	0	0	0	1	3
MS1	*Plecotus auritus*	Aug	0	0	2	1	0	0
MS1	*Plecotus auritus*	Sep	0	0	0	1	0	0
MS10	*Myotis*	May	0	0	2	0	2	1
MS10	*Myotis*	Jul	0	0	0	0	0	6
MS10	*Myotis*	Aug	0	0	0	0	8	0
MS10	*Myotis*	Sep	0	0	2	0	0	2
MS10	*Nyctalus*	May	2	1	3	0	1	0
MS10	*Nyctalus*	Jul	0	0	2	6	2	1
MS10	*Nyctalus*	Aug	0	0	0	0	0	8
MS10	*Nyctalus*	Sep	0	0	0	0	0	3
MS10	*Pipistrellus pipistrellus*	May	0	0	0	1	0	3
MS10	*Pipistrellus pipistrellus*	Jul	0	6	2	5	0	0
MS10	*Pipistrellus pipistrellus*	Aug	0	0	0	6	3	1
MS10	*Pipistrellus pipistrellus*	Sep	0	0	0	0	2	2
MS10	*Pipistrellus pygmaeus*	May	0	0	0	0	0	4
MS10	*Pipistrellus pygmaeus*	Jul	0	0	0	0	0	13
MS10	*Pipistrellus pygmaeus*	Aug	0	0	0	0	1	9

Detector ID	Species/Species Group	Month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
MS10	*Pipistrellus pygmaeus*	Sep	0	0	0	0	1	3
MS10	*Plecotus auritus*	May	0	0	0	1	0	0
MS10	*Plecotus auritus*	Aug	0	0	0	3	0	0
MS10	*Plecotus auritus*	Sep	0	0	0	1	0	0
MS2	*Myotis*	Aug	5	2	1	0	0	1
MS2	*Myotis*	Sep	0	0	1	0	2	0
MS2	*Nyctalus*	May	0	0	0	0	0	1
MS2	*Nyctalus*	Aug	0	0	0	0	5	3
MS2	*Nyctalus*	Sep	0	0	0	0	0	2
MS2	*Pipistrellus pipistrellus*	May	0	0	0	0	0	1
MS2	*Pipistrellus pipistrellus*	Aug	0	0	2	3	1	1
MS2	*Pipistrellus pipistrellus*	Sep	0	0	0	0	0	1
MS2	*Pipistrellus pygmaeus*	May	0	0	0	0	0	1
MS2	*Pipistrellus pygmaeus*	Aug	0	0	0	0	6	2
MS2	*Pipistrellus pygmaeus*	Sep	0	0	0	0	1	2
MS3	*Myotis*	May	0	0	0	0	0	1
MS3	*Myotis*	Sep	0	0	0	0	0	2
MS3	*Pipistrellus pipistrellus*	May	0	0	0	0	0	2
MS3	*Pipistrellus pipistrellus*	Aug	0	0	0	0	0	1
MS3	*Pipistrellus pygmaeus*	May	0	0	0	0	0	1
MS3	*Pipistrellus pygmaeus*	Aug	0	0	0	0	0	1
MS4	*Myotis*	Jul	0	0	0	0	0	2
MS4	*Nyctalus*	Jul	0	0	0	0	1	3
MS4	*Pipistrellus pipistrellus*	Jul	0	0	0	0	0	9
MS4	*Pipistrellus pipistrellus*	Aug	0	0	0	0	0	4
MS4	*Pipistrellus pygmaeus*	Jul	0	0	0	0	0	8
MS4	*Pipistrellus pygmaeus*	Aug	0	0	0	0	0	5
MS4	*Pipistrellus pygmaeus*	Sep	0	0	0	0	0	1
MS5	*Myotis*	May	0	0	0	0	2	2
MS5	*Myotis*	Jul	0	0	0	0	8	2
MS5	*Nyctalus*	May	0	0	0	0	2	1
MS5	*Nyctalus*	Jul	0	0	0	0	2	4
MS5	*Pipistrellus pipistrellus*	May	0	0	0	0	1	3
MS5	*Pipistrellus pipistrellus*	Jul	4	6	0	1	0	0

Detector ID	Species/Species Group	Month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
MS5	*Pipistrellus pygmaeus*	May	0	0	0	0	0	2
MS5	*Pipistrellus pygmaeus*	Jul	0	1	4	0	3	3
MS6	*Myotis*	May	0	0	0	0	0	1
MS6	*Myotis*	Aug	4	2	2	1	0	0
MS6	*Myotis*	Sep	0	0	1	0	1	0
MS6	*Nyctalus*	May	0	0	0	0	0	1
MS6	*Nyctalus*	Aug	0	0	0	0	8	2
MS6	*Nyctalus*	Sep	0	0	0	0	0	2
MS6	*Pipistrellus pipistrellus*	May	0	0	0	0	0	3
MS6	*Pipistrellus pipistrellus*	Aug	0	0	2	5	2	1
MS6	*Pipistrellus pipistrellus*	Sep	0	0	0	0	0	3
MS6	*Pipistrellus pygmaeus*	May	0	0	0	0	0	1
MS6	*Pipistrellus pygmaeus*	Aug	0	0	0	0	9	1
MS6	*Pipistrellus pygmaeus*	Sep	0	0	0	0	1	3
MS6	*Plecotus auritus*	Aug	0	0	1	2	0	0
MS7	*Myotis*	May	0	0	0	0	1	3
MS7	*Myotis*	Jul	0	0	0	0	9	3
MS7	*Myotis*	Aug	0	0	3	4	3	0
MS7	*Myotis*	Sep	0	0	0	1	3	0
MS7	*Nyctalus*	May	0	0	0	0	2	2
MS7	*Nyctalus*	Jul	0	0	0	0	6	5
MS7	*Nyctalus*	Aug	0	0	0	2	7	1
MS7	*Nyctalus*	Sep	0	0	0	0	0	3
MS7	*Pipistrellus pipistrellus*	May	0	0	0	0	2	4
MS7	*Pipistrellus pipistrellus*	Jul	4	7	1	2	0	0
MS7	*Pipistrellus pipistrellus*	Aug	0	0	0	5	5	0
MS7	*Pipistrellus pipistrellus*	Sep	0	0	0	0	3	1
MS7	*Pipistrellus pygmaeus*	May	0	0	0	0	0	4
MS7	*Pipistrellus pygmaeus*	Jul	0	1	4	0	3	6
MS7	*Pipistrellus pygmaeus*	Aug	0	0	0	0	2	8
MS7	*Pipistrellus pygmaeus*	Sep	0	0	0	0	0	4
MS7	*Plecotus auritus*	Jul	0	0	0	1	0	0
MS7	*Plecotus auritus*	Aug	0	0	2	4	0	0
MS7	*Plecotus auritus*	Sep	0	0	0	1	0	0
MS8	*Myotis*	May	0	0	0	0	1	4

Detector ID	Species/Species Group	Month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
MS8	*Myotis*	Jul	0	0	3	0	2	3
MS8	*Myotis*	Aug	0	0	0	0	5	2
MS8	*Myotis*	Sep	0	0	0	0	1	1
MS8	*Nyctalus*	Jul	0	0	0	0	3	3
MS8	*Nyctalus*	Aug	0	0	0	2	0	5
MS8	*Nyctalus*	Sep	0	0	0	0	0	1
MS8	*Pipistrellus pipistrellus*	May	0	0	0	0	0	8
MS8	*Pipistrellus pipistrellus*	Jul	0	0	0	0	10	3
MS8	*Pipistrellus pipistrellus*	Aug	0	0	2	4	2	0
MS8	*Pipistrellus pipistrellus*	Sep	0	0	0	0	2	2
MS8	*Pipistrellus pygmaeus*	May	0	0	0	0	0	3
MS8	*Pipistrellus pygmaeus*	Jul	0	0	0	3	4	6
MS8	*Pipistrellus pygmaeus*	Aug	0	0	0	7	2	1
MS8	*Pipistrellus pygmaeus*	Sep	0	0	0	1	3	0
MS8	*Plecotus auritus*	Aug	0	0	0	2	0	0
MS9	*Myotis*	Jul	0	0	2	0	0	0
MS9	*Myotis*	Aug	0	0	0	0	2	3
MS9	*Nyctalus*	Jul	0	0	0	0	1	3
MS9	*Nyctalus*	Aug	0	0	0	1	0	6
MS9	*Nyctalus*	Sep	0	0	0	0	0	2
MS9	*Pipistrellus pipistrellus*	Jul	0	0	0	0	7	3
MS9	*Pipistrellus pipistrellus*	Aug	0	0	2	4	2	0
MS9	*Pipistrellus pipistrellus*	Sep	0	0	0	0	1	3
MS9	*Pipistrellus pygmaeus*	Jul	0	0	0	3	3	5
MS9	*Pipistrellus pygmaeus*	Aug	0	0	0	6	2	0
MS9	*Pipistrellus pygmaeus*	Sep	0	0	0	1	2	1
MS9	*Plecotus auritus*	Aug	0	0	0	1	0	0

Table 6. Summary table showing key metrics for each species recorded per month. Please note that we cannot split the reference range by month, hence this column is not shown in this table.

Detector ID	Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
MS1	*Myotis*	May	19	40 - 79.5	19	3
MS1	*Myotis*	Jul	5	40 - 79.5	5	4
MS1	*Myotis*	Aug	91	40 - 79.5	100	8
MS1	*Myotis*	Sep	64	40 - 79.5	78	3
MS1	*Nyctalus*	Jul	2	9.5 - 26	17	5
MS1	*Nyctalus*	Aug	32	9.5 - 26	35	6
MS1	*Nyctalus*	Sep	10	9.5 - 26	10	1
MS1	*Pipistrellus pipistrellus*	May	0	9.5 - 33.5	5	4
MS1	*Pipistrellus pipistrellus*	Jul	5	9.5 - 33.5	7	8
MS1	*Pipistrellus pipistrellus*	Aug	50	9.5 - 33.5	66	10
MS1	*Pipistrellus pipistrellus*	Sep	13	9.5 - 33.5	17	4
MS1	*Pipistrellus pygmaeus*	May	0	11 - 25	0	2
MS1	*Pipistrellus pygmaeus*	Jul	1	11 - 25	1	5
MS1	*Pipistrellus pygmaeus*	Aug	23	11 - 25	40	9
MS1	*Pipistrellus pygmaeus*	Sep	11	11 - 25	25	4
MS1	*Plecotus auritus*	Aug	69	42 - 69	69	3
MS1	*Plecotus auritus*	Sep	42	42 - 69	42	1
MS10	*Myotis*	May	27	17.5 - 35.5	65	5
MS10	*Myotis*	Jul	8	17.5 - 35.5	10	6
MS10	*Myotis*	Aug	30	17.5 - 35.5	39	8
MS10	*Myotis*	Sep	36	17.5 - 35.5	61	4
MS10	*Nyctalus*	May	79	24.5 - 51	100	7
MS10	*Nyctalus*	Jul	47	24.5 - 51	68	11
MS10	*Nyctalus*	Aug	6	24.5 - 51	14	8
MS10	*Nyctalus*	Sep	6	24.5 - 51	6	3
MS10	*Pipistrellus pipistrellus*	May	13	37.5 - 59	45	4
MS10	*Pipistrellus pipistrellus*	Jul	79	37.5 - 59	85	13
MS10	*Pipistrellus pipistrellus*	Aug	40	37.5 - 59	42	10
MS10	*Pipistrellus pipistrellus*	Sep	23	37.5 - 59	27	4
MS10	*Pipistrellus pygmaeus*	May	3	8 - 12.5	5	4
MS10	*Pipistrellus pygmaeus*	Jul	6	8 - 12.5	18	13
MS10	*Pipistrellus pygmaeus*	Aug	15	8 - 12.5	20	10
MS10	*Pipistrellus pygmaeus*	Sep	13	8 - 12.5	20	4
MS10	*Plecotus auritus*	May	42	42 - 42	42	1
MS10	*Plecotus auritus*	Aug	42	42 - 42	42	3
MS10	*Plecotus auritus*	Sep	42	42 - 42	42	1
MS2	*Myotis*	Aug	95	52.5 - 95	100	9
MS2	*Myotis*	Sep	31	52.5 - 95	78	3
MS2	*Nyctalus*	May	2	11 - 26	2	1
MS2	*Nyctalus*	Aug	23	11 - 26	35	8
MS2	*Nyctalus*	Sep	12	11 - 26	14	2
MS2	*Pipistrellus pipistrellus*	May	5	17 - 57.5	5	1
MS2	*Pipistrellus pipistrellus*	Aug	49	17 - 57.5	66	7
MS2	*Pipistrellus pipistrellus*	Sep	17	17 - 57.5	17	1
MS2	*Pipistrellus pygmaeus*	May	0	14.5 - 30.5	0	1
MS2	*Pipistrellus pygmaeus*	Aug	21	14.5 - 30.5	40	8
MS2	*Pipistrellus pygmaeus*	Sep	13	14.5 - 30.5	25	3
MS3	*Myotis*	May	19	5 - 5	19	1
MS3	*Myotis*	Sep	5	5 - 5	5	2
MS3	*Pipistrellus pipistrellus*	May	2	2.5 - 2.5	4	2
MS3	*Pipistrellus pipistrellus*	Aug	1	2.5 - 2.5	1	1
MS3	*Pipistrellus pygmaeus*	May	0	0 - 0	0	1
MS3	*Pipistrellus pygmaeus*	Aug	0	0 - 0	0	1

Detector ID	Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
MS4	*Myotis*	Jul	5	5 - 5	5	2
MS4	*Nyctalus*	Jul	14	10 - 17	20	4
MS4	*Pipistrellus pipistrellus*	Jul	5	3 - 6	6	9
MS4	*Pipistrellus pipistrellus*	Aug	1	3 - 6	4	4
MS4	*Pipistrellus pygmaeus*	Jul	1	1 - 1.5	2	8
MS4	*Pipistrellus pygmaeus*	Aug	0	1 - 1.5	2	5
MS4	*Pipistrellus pygmaeus*	Sep	0	1 - 1.5	0	1
MS5	*Myotis*	May	16	17.5 - 28.5	22	4
MS5	*Myotis*	Jul	29	17.5 - 28.5	31	10
MS5	*Nyctalus*	May	36	11.5 - 30.5	36	3
MS5	*Nyctalus*	Jul	17	11.5 - 30.5	29	6
MS5	*Pipistrellus pipistrellus*	May	11	49.5 - 92	27	4
MS5	*Pipistrellus pipistrellus*	Jul	90	49.5 - 92	100	11
MS5	*Pipistrellus pygmaeus*	May	5	18.5 - 57	6	2
MS5	*Pipistrellus pygmaeus*	Jul	35	18.5 - 57	80	11
MS6	*Myotis*	May	19	54.5 - 91	19	1
MS6	*Myotis*	Aug	87	54.5 - 91	100	9
MS6	*Myotis*	Sep	55	54.5 - 91	78	2
MS6	*Nyctalus*	May	14	15.5 - 32	14	1
MS6	*Nyctalus*	Aug	32	15.5 - 32	35	10
MS6	*Nyctalus*	Sep	12	15.5 - 32	14	2
MS6	*Pipistrellus pipistrellus*	May	0	23 - 50.5	5	3
MS6	*Pipistrellus pipistrellus*	Aug	50	23 - 50.5	66	10
MS6	*Pipistrellus pipistrellus*	Sep	13	23 - 50.5	17	3
MS6	*Pipistrellus pygmaeus*	May	0	16.5 - 28.5	0	1
MS6	*Pipistrellus pygmaeus*	Aug	22	16.5 - 28.5	40	10
MS6	*Pipistrellus pygmaeus*	Sep	11	16.5 - 28.5	25	4
MS6	*Plecotus auritus*	Aug	42	42 - 42	69	3
MS7	*Myotis*	May	10	26 - 40	22	4
MS7	*Myotis*	Jul	30	26 - 40	31	12
MS7	*Myotis*	Aug	54	26 - 40	64	10
MS7	*Myotis*	Sep	30	26 - 40	53	4
MS7	*Nyctalus*	May	20	17.5 - 27	36	4
MS7	*Nyctalus*	Jul	25	17.5 - 27	32	11
MS7	*Nyctalus*	Aug	27	17.5 - 27	43	10
MS7	*Nyctalus*	Sep	10	17.5 - 27	17	3
MS7	*Pipistrellus pipistrellus*	May	11	39.5 - 64	27	6
MS7	*Pipistrellus pipistrellus*	Jul	89	39.5 - 64	100	14
MS7	*Pipistrellus pipistrellus*	Aug	37	39.5 - 64	49	10
MS7	*Pipistrellus pipistrellus*	Sep	30	39.5 - 64	38	4
MS7	*Pipistrellus pygmaeus*	May	4	14.5 - 29	5	4
MS7	*Pipistrellus pygmaeus*	Jul	28	14.5 - 29	80	14
MS7	*Pipistrellus pygmaeus*	Aug	19	14.5 - 29	30	10
MS7	*Pipistrellus pygmaeus*	Sep	10	14.5 - 29	18	4
MS7	*Plecotus auritus*	Jul	42	42 - 55.5	42	1
MS7	*Plecotus auritus*	Aug	42	42 - 55.5	69	6
MS7	*Plecotus auritus*	Sep	42	42 - 55.5	42	1
MS8	*Myotis*	May	19	16 - 37	22	5
MS8	*Myotis*	Jul	29	16 - 37	73	8
MS8	*Myotis*	Aug	27	16 - 37	39	7
MS8	*Myotis*	Sep	16	16 - 37	27	2
MS8	*Nyctalus*	Jul	15	8 - 30.5	22	6
MS8	*Nyctalus*	Aug	10	8 - 30.5	55	7
MS8	*Nyctalus*	Sep	6	8 - 30.5	6	1
MS8	*Pipistrellus pipistrellus*	May	5	21 - 34.5	9	8
MS8	*Pipistrellus pipistrellus*	Jul	33	21 - 34.5	38	13

Detector ID	Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
MS8	*Pipistrellus pipistrellus*	Aug	43	21 - 34.5	73	8
MS8	*Pipistrellus pipistrellus*	Sep	23	21 - 34.5	29	4
MS8	*Pipistrellus pygmaeus*	May	0	25 - 40	0	3
MS8	*Pipistrellus pygmaeus*	Jul	20	25 - 40	46	13
MS8	*Pipistrellus pygmaeus*	Aug	46	25 - 40	57	10
MS8	*Pipistrellus pygmaeus*	Sep	32	25 - 40	45	4
MS8	*Plecotus auritus*	Aug	42	42 - 42	42	2
MS9	*Myotis*	Jul	70	19 - 49	71	2
MS9	*Myotis*	Aug	19	19 - 49	39	5
MS9	*Nyctalus*	Jul	10	6 - 15	20	4
MS9	*Nyctalus*	Aug	10	6 - 15	55	7
MS9	*Nyctalus*	Sep	4	6 - 15	6	2
MS9	*Pipistrellus pipistrellus*	Jul	29	24.5 - 40.5	38	10
MS9	*Pipistrellus pipistrellus*	Aug	43	24.5 - 40.5	73	8
MS9	*Pipistrellus pipistrellus*	Sep	17	24.5 - 40.5	29	4
MS9	*Pipistrellus pygmaeus*	Jul	20	25 - 41	46	11
MS9	*Pipistrellus pygmaeus*	Aug	46	25 - 41	57	8
MS9	*Pipistrellus pygmaeus*	Sep	29	25 - 41	45	4
MS9	*Plecotus auritus*	Aug	42	0	42	1

PER SITE

In this 'Per Site' section of the analysis, all values are taken from across all of the detectors to provide site-wide averages/medians.

Table 7. Summary table showing the number of nights recorded bat activity fell into each activity band for each species.

Species/Species Group	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis	13	6	21	6	51	46
Nyctalus	2	1	5	11	45	69
Pipistrellus pipistrellus	8	19	13	41	45	76
Pipistrellus pygmaeus	0	2	8	21	52	109
Plecotus auritus	0	0	5	18	0	0

Table 8. Summary table showing key metrics for each species recorded.

Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis	30	54.5 - 91	100	143
Nyctalus	17	9.5 - 26	100	133
Pipistrellus pipistrellus	33	9.5 - 33.5	100	202
Pipistrellus pygmaeus	18	8 - 12.5	80	192
Plecotus auritus	42	42 - 69	69	23

Figures

Figure 4. The activity level (percentile) of bats recorded across each night of the bat survey for the **entire site**.

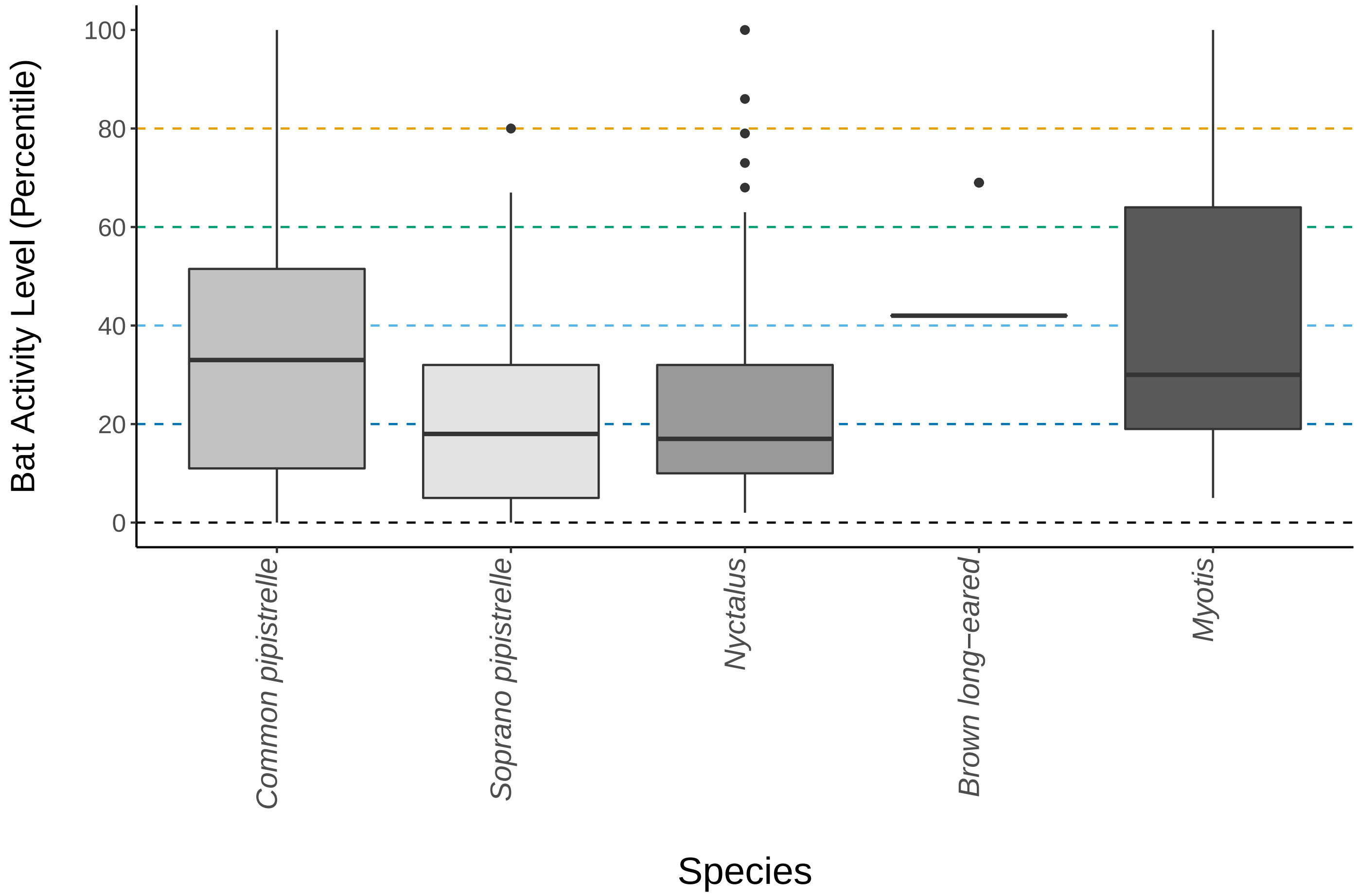
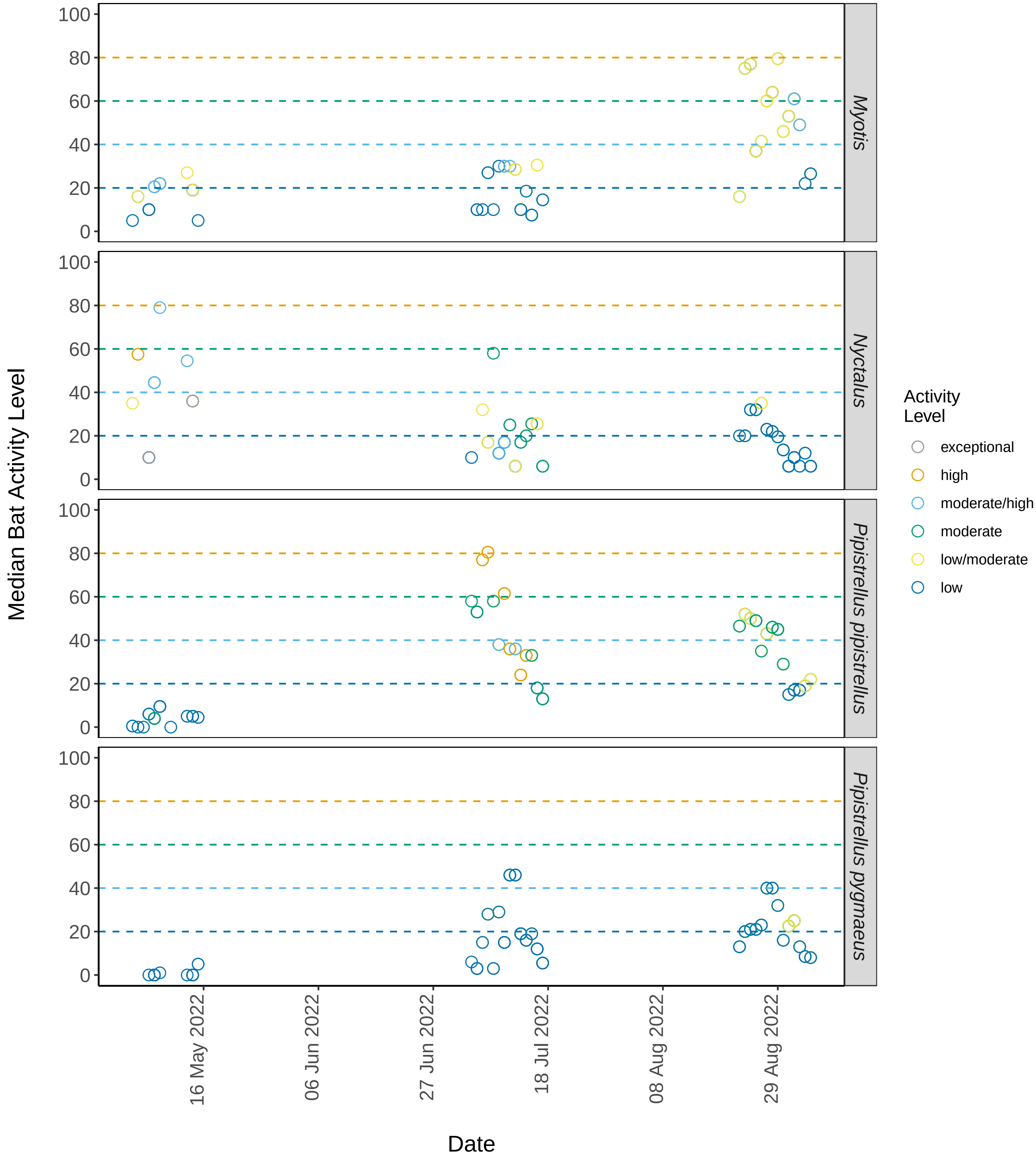
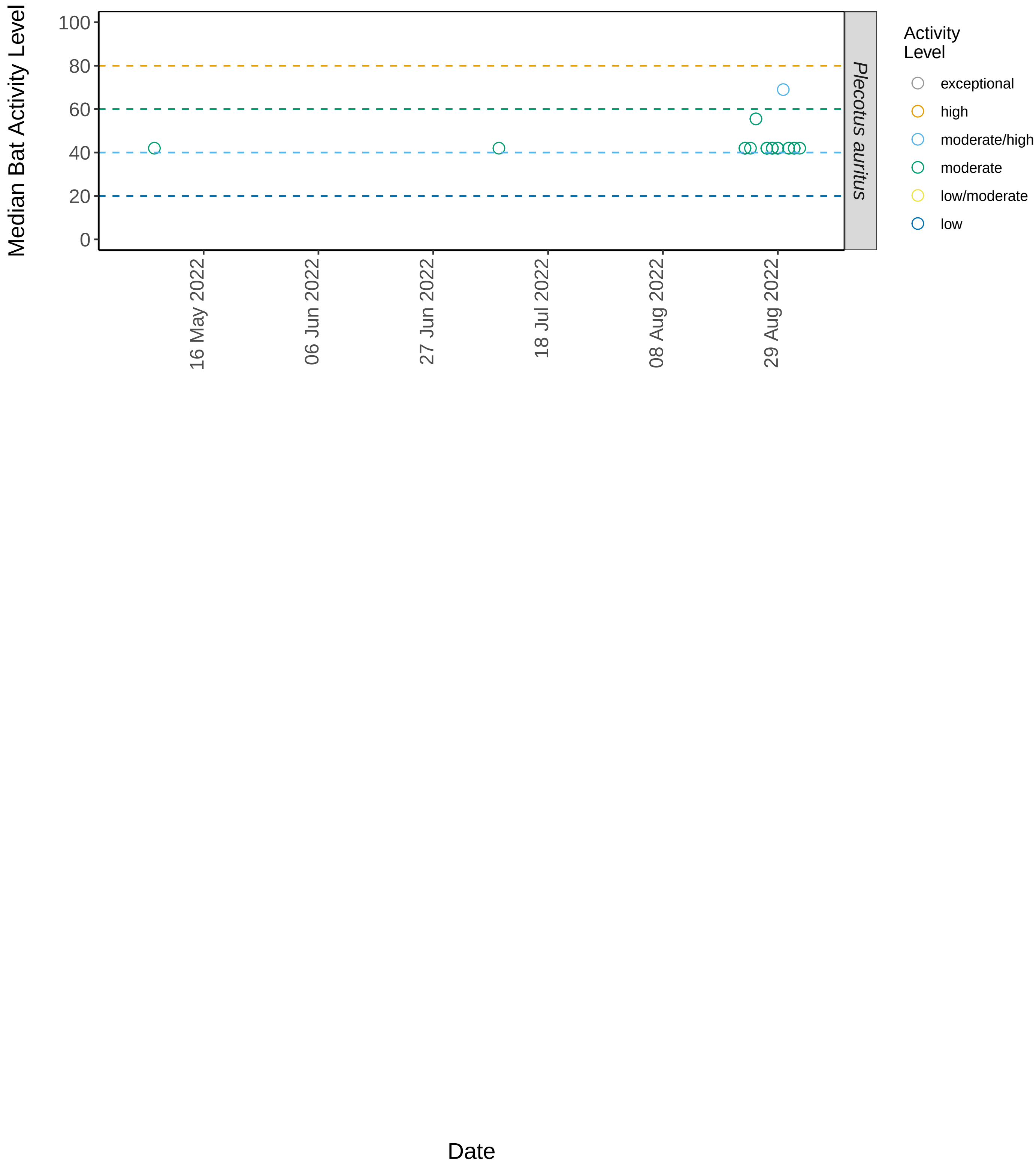


Figure 5. The median activity levels of bats recorded across all detectors each night.




Median Bat Activity Level
100
80
60
40
20
0
16 May 2022
06 Jun 2022
27 Jun 2022
18 Jul 2022
08 Aug 2022
29 Aug 2022
Plecotus auritus
Activity Level
exceptional
high
moderate/high
moderate
low/moderate
low
Date

PER SITE, PER MONTH

Table 9. Summary table showing the number of nights recorded bat activity fell into each activity band for each species during each month.

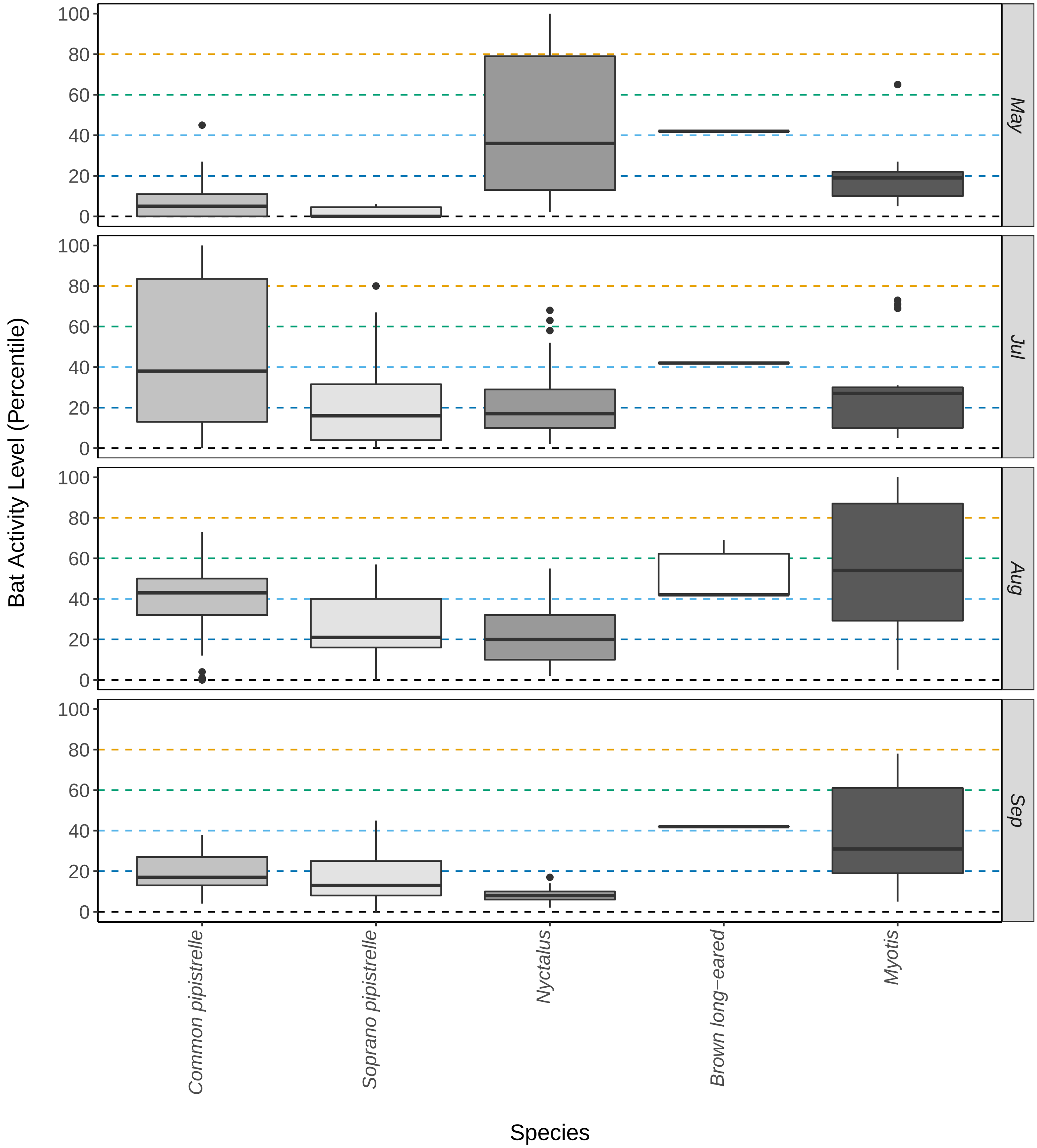
Species/Species Group	Month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis	May	0	0	2	0	6	15
Myotis	Jul	0	0	5	0	19	20
Myotis	Aug	13	6	8	5	18	6
Myotis	Sep	0	0	6	1	8	5
Nyctalus	May	2	1	3	0	5	5
Nyctalus	Jul	0	0	2	6	15	24
Nyctalus	Aug	0	0	0	5	25	26
Nyctalus	Sep	0	0	0	0	0	14
Pipistrellus pipistrellus	May	0	0	0	1	3	28
Pipistrellus pipistrellus	Jul	8	19	3	8	17	23
Pipistrellus pipistrellus	Aug	0	0	10	32	17	9
Pipistrellus pipistrellus	Sep	0	0	0	0	8	16
Pipistrellus pygmaeus	May	0	0	0	0	0	18
Pipistrellus pygmaeus	Jul	0	2	8	6	13	46
Pipistrellus pygmaeus	Aug	0	0	0	13	30	28
Pipistrellus pygmaeus	Sep	0	0	0	2	9	17
Plecotus auritus	May	0	0	0	1	0	0
Plecotus auritus	Jul	0	0	0	1	0	0
Plecotus auritus	Aug	0	0	5	13	0	0
Plecotus auritus	Sep	0	0	0	3	0	0

Table 10. Summary table showing key metrics for each species recorded per month.

Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis	May	19	54.5 - 91	65	23
Myotis	Jul	27	5 - 5	73	44
Myotis	Aug	54	54.5 - 91	100	56
Myotis	Sep	31	54.5 - 91	78	20
Nyctalus	May	36	24.5 - 51	100	16
Nyctalus	Jul	17	9.5 - 26	68	47
Nyctalus	Aug	20	9.5 - 26	55	56
Nyctalus	Sep	8	9.5 - 26	17	14
Pipistrellus pipistrellus	May	5	9.5 - 33.5	45	32
Pipistrellus pipistrellus	Jul	38	9.5 - 33.5	100	78
Pipistrellus pipistrellus	Aug	43	9.5 - 33.5	73	68
Pipistrellus pipistrellus	Sep	17	9.5 - 33.5	38	24
Pipistrellus pygmaeus	May	0	8 - 12.5	6	18
Pipistrellus pygmaeus	Jul	16	8 - 12.5	80	75
Pipistrellus pygmaeus	Aug	21	8 - 12.5	57	71
Pipistrellus pygmaeus	Sep	13	8 - 12.5	45	28
Plecotus auritus	May	42	42 - 42	42	1
Plecotus auritus	Jul	42	42 - 55.5	42	1
Plecotus auritus	Aug	42	42 - 69	69	18
Plecotus auritus	Sep	42	42 - 69	42	3

Figures

Figure 6. The activity level (percentile) of bats recorded across each night of the bat survey for the entire site, split between months.



PART 2: Nightly Analysis

ENTIRE SURVEY PERIOD

Sunrise and Sunset Times

Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.

Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)	NA	NA
55.5_-3.46	03/05/2022	2022-05-03	20:54	05:26	8.5
55.51_-3.45	03/05/2022	2022-05-03	20:54	05:26	8.5
55.5_-3.45	03/05/2022	2022-05-03	20:54	05:26	8.5
55.51_-3.45	05/05/2022	2022-05-04	20:56	05:24	8.5
55.5_-3.46	04/05/2022	2022-05-04	20:56	05:24	8.5
55.5_-3.45	05/05/2022	2022-05-04	20:56	05:24	8.5
55.5_-3.47	05/05/2022	2022-05-05	20:58	05:22	8.4
55.51_-3.45	06/05/2022	2022-05-06	21:00	05:20	8.3
55.5_-3.46	06/05/2022	2022-05-06	21:00	05:20	8.3
55.5_-3.45	07/05/2022	2022-05-06	21:00	05:20	8.3
55.5_-3.47	07/05/2022	2022-05-06	21:00	05:20	8.3
55.51_-3.45	07/05/2022	2022-05-06	21:00	05:20	8.3
55.5_-3.47	07/05/2022	2022-05-07	21:02	05:18	8.3
55.5_-3.47	08/05/2022	2022-05-07	21:02	05:18	8.3
55.51_-3.46	08/05/2022	2022-05-07	21:02	05:18	8.3
55.51_-3.45	08/05/2022	2022-05-07	21:02	05:18	8.3
55.5_-3.45	08/05/2022	2022-05-07	21:02	05:18	8.3
55.51_-3.46	07/05/2022	2022-05-07	21:02	05:18	8.3
55.51_-3.45	07/05/2022	2022-05-07	21:02	05:18	8.3
55.5_-3.46	07/05/2022	2022-05-07	21:02	05:18	8.3
55.5_-3.45	07/05/2022	2022-05-07	21:02	05:18	8.3
55.5_-3.46	08/05/2022	2022-05-07	21:02	05:18	8.3
55.5_-3.47	08/05/2022	2022-05-08	21:04	05:16	8.2
55.51_-3.45	08/05/2022	2022-05-08	21:04	05:16	8.2
55.5_-3.46	08/05/2022	2022-05-08	21:04	05:16	8.2
55.5_-3.45	09/05/2022	2022-05-08	21:04	05:16	8.2
55.5_-3.45	08/05/2022	2022-05-08	21:04	05:16	8.2
55.51_-3.45	09/05/2022	2022-05-08	21:04	05:16	8.2
55.5_-3.46	09/05/2022	2022-05-08	21:04	05:16	8.2
55.5_-3.46	10/05/2022	2022-05-10	21:08	05:12	8.1
55.5_-3.45	14/05/2022	2022-05-13	21:14	05:07	7.9
55.5_-3.47	14/05/2022	2022-05-13	21:14	05:07	7.9
55.51_-3.45	13/05/2022	2022-05-13	21:14	05:07	7.9
55.51_-3.45	14/05/2022	2022-05-13	21:14	05:07	7.9
55.5_-3.46	13/05/2022	2022-05-13	21:14	05:07	7.9
55.5_-3.46	14/05/2022	2022-05-13	21:14	05:07	7.9
55.5_-3.47	14/05/2022	2022-05-14	21:15	05:05	7.8
55.51_-3.45	15/05/2022	2022-05-14	21:15	05:05	7.8
55.51_-3.45	14/05/2022	2022-05-14	21:15	05:05	7.8
55.5_-3.45	14/05/2022	2022-05-14	21:15	05:05	7.8
55.5_-3.45	15/05/2022	2022-05-14	21:15	05:05	7.8
55.51_-3.46	14/05/2022	2022-05-14	21:15	05:05	7.8
55.51_-3.46	15/05/2022	2022-05-14	21:15	05:05	7.8
55.5_-3.47	15/05/2022	2022-05-14	21:15	05:05	7.8
55.5_-3.46	15/05/2022	2022-05-14	21:15	05:05	7.8
55.5_-3.46	14/05/2022	2022-05-14	21:15	05:05	7.8
55.5_-3.46	15/05/2022	2022-05-15	21:17	05:03	7.8
55.5_-3.46	16/05/2022	2022-05-15	21:17	05:03	7.8

Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)	NA	NA
55.5_-3.47	16/05/2022	2022-05-15	21:17	05:03	7.8
55.5_-3.45	15/05/2022	2022-05-15	21:17	05:03	7.8
55.51_-3.45	15/05/2022	2022-05-15	21:17	05:03	7.8
55.51_-3.45	04/07/2022	2022-07-04	21:59	04:40	6.7
55.51_-3.45	05/07/2022	2022-07-04	21:59	04:40	6.7
55.5_-3.45	05/07/2022	2022-07-04	21:59	04:40	6.7
55.51_-3.45	05/07/2022	2022-07-05	21:58	04:41	6.7
55.51_-3.45	06/07/2022	2022-07-05	21:58	04:41	6.7
55.5_-3.46	05/07/2022	2022-07-05	21:58	04:41	6.7
55.5_-3.45	05/07/2022	2022-07-05	21:58	04:41	6.7
55.5_-3.45	07/07/2022	2022-07-06	21:57	04:42	6.7
55.51_-3.45	06/07/2022	2022-07-06	21:57	04:42	6.7
55.51_-3.45	07/07/2022	2022-07-06	21:57	04:42	6.7
55.5_-3.46	07/07/2022	2022-07-06	21:57	04:42	6.7
55.5_-3.46	06/07/2022	2022-07-06	21:57	04:42	6.7
55.5_-3.45	06/07/2022	2022-07-06	21:57	04:42	6.7
55.51_-3.45	07/07/2022	2022-07-07	21:56	04:43	6.8
55.51_-3.45	08/07/2022	2022-07-07	21:56	04:43	6.8
55.5_-3.46	07/07/2022	2022-07-07	21:56	04:43	6.8
55.5_-3.46	08/07/2022	2022-07-07	21:56	04:43	6.8
55.5_-3.45	07/07/2022	2022-07-07	21:56	04:43	6.8
55.5_-3.45	08/07/2022	2022-07-07	21:56	04:43	6.8
55.5_-3.47	07/07/2022	2022-07-07	21:56	04:43	6.8
55.51_-3.45	09/07/2022	2022-07-08	21:56	04:44	6.8
55.51_-3.45	08/07/2022	2022-07-08	21:56	04:44	6.8
55.5_-3.46	08/07/2022	2022-07-08	21:56	04:44	6.8
55.5_-3.45	09/07/2022	2022-07-08	21:56	04:44	6.8
55.5_-3.45	08/07/2022	2022-07-08	21:56	04:44	6.8
55.51_-3.45	10/07/2022	2022-07-09	21:55	04:46	6.8
55.51_-3.45	09/07/2022	2022-07-09	21:55	04:46	6.8
55.5_-3.46	09/07/2022	2022-07-09	21:55	04:46	6.8
55.5_-3.46	10/07/2022	2022-07-09	21:55	04:46	6.8
55.5_-3.45	10/07/2022	2022-07-09	21:55	04:46	6.8
55.5_-3.47	10/07/2022	2022-07-09	21:55	04:46	6.8
55.5_-3.47	09/07/2022	2022-07-09	21:55	04:46	6.8
55.51_-3.46	10/07/2022	2022-07-09	21:55	04:46	6.8
55.51_-3.46	09/07/2022	2022-07-09	21:55	04:46	6.8
55.5_-3.45	09/07/2022	2022-07-09	21:55	04:46	6.8
55.5_-3.47	11/07/2022	2022-07-10	21:54	04:47	6.9
55.51_-3.45	10/07/2022	2022-07-10	21:54	04:47	6.9
55.51_-3.45	11/07/2022	2022-07-10	21:54	04:47	6.9
55.5_-3.46	11/07/2022	2022-07-10	21:54	04:47	6.9
55.5_-3.46	10/07/2022	2022-07-10	21:54	04:47	6.9
55.51_-3.46	11/07/2022	2022-07-10	21:54	04:47	6.9
55.51_-3.46	10/07/2022	2022-07-10	21:54	04:47	6.9
55.5_-3.45	11/07/2022	2022-07-10	21:54	04:47	6.9
55.5_-3.45	10/07/2022	2022-07-10	21:54	04:47	6.9
55.5_-3.47	10/07/2022	2022-07-10	21:54	04:47	6.9
55.51_-3.45	11/07/2022	2022-07-11	21:53	04:48	6.9
55.51_-3.45	12/07/2022	2022-07-11	21:53	04:48	6.9
55.5_-3.46	11/07/2022	2022-07-11	21:53	04:48	6.9
55.5_-3.47	11/07/2022	2022-07-11	21:53	04:48	6.9
55.5_-3.47	12/07/2022	2022-07-11	21:53	04:48	6.9
55.51_-3.46	11/07/2022	2022-07-11	21:53	04:48	6.9
55.5_-3.46	12/07/2022	2022-07-11	21:53	04:48	6.9
55.5_-3.45	12/07/2022	2022-07-11	21:53	04:48	6.9
55.5_-3.45	11/07/2022	2022-07-11	21:53	04:48	6.9

Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)	NA	NA
55.5_-3.47	13/07/2022	2022-07-12	21:52	04:49	7.0
55.51_-3.45	12/07/2022	2022-07-12	21:52	04:49	7.0
55.51_-3.45	13/07/2022	2022-07-12	21:52	04:49	7.0
55.5_-3.46	12/07/2022	2022-07-12	21:52	04:49	7.0
55.5_-3.47	12/07/2022	2022-07-12	21:52	04:49	7.0
55.51_-3.46	12/07/2022	2022-07-12	21:52	04:49	7.0
55.5_-3.46	13/07/2022	2022-07-12	21:52	04:49	7.0
55.5_-3.45	13/07/2022	2022-07-12	21:52	04:49	7.0
55.5_-3.45	12/07/2022	2022-07-12	21:52	04:49	7.0
55.51_-3.46	13/07/2022	2022-07-12	21:52	04:49	7.0
55.51_-3.46	13/07/2022	2022-07-13	21:51	04:51	7.0
55.51_-3.45	13/07/2022	2022-07-13	21:51	04:51	7.0
55.51_-3.45	14/07/2022	2022-07-13	21:51	04:51	7.0
55.5_-3.46	13/07/2022	2022-07-13	21:51	04:51	7.0
55.5_-3.45	13/07/2022	2022-07-13	21:51	04:51	7.0
55.5_-3.45	14/07/2022	2022-07-13	21:51	04:51	7.0
55.5_-3.47	14/07/2022	2022-07-13	21:51	04:51	7.0
55.5_-3.47	13/07/2022	2022-07-13	21:51	04:51	7.0
55.5_-3.46	14/07/2022	2022-07-13	21:51	04:51	7.0
55.51_-3.45	14/07/2022	2022-07-14	21:50	04:52	7.0
55.51_-3.45	15/07/2022	2022-07-14	21:50	04:52	7.0
55.5_-3.47	14/07/2022	2022-07-14	21:50	04:52	7.0
55.51_-3.46	15/07/2022	2022-07-14	21:50	04:52	7.0
55.51_-3.46	14/07/2022	2022-07-14	21:50	04:52	7.0
55.5_-3.46	14/07/2022	2022-07-14	21:50	04:52	7.0
55.5_-3.46	15/07/2022	2022-07-14	21:50	04:52	7.0
55.5_-3.45	14/07/2022	2022-07-14	21:50	04:52	7.0
55.5_-3.45	15/07/2022	2022-07-14	21:50	04:52	7.0
55.5_-3.47	15/07/2022	2022-07-15	21:48	04:54	7.1
55.51_-3.46	16/07/2022	2022-07-15	21:48	04:54	7.1
55.51_-3.45	16/07/2022	2022-07-15	21:48	04:54	7.1
55.5_-3.46	16/07/2022	2022-07-15	21:48	04:54	7.1
55.5_-3.46	15/07/2022	2022-07-15	21:48	04:54	7.1
55.5_-3.45	16/07/2022	2022-07-15	21:48	04:54	7.1
55.5_-3.47	16/07/2022	2022-07-15	21:48	04:54	7.1
55.51_-3.46	15/07/2022	2022-07-15	21:48	04:54	7.1
55.51_-3.45	15/07/2022	2022-07-15	21:48	04:54	7.1
55.5_-3.45	15/07/2022	2022-07-15	21:48	04:54	7.1
55.51_-3.45	17/07/2022	2022-07-16	21:47	04:55	7.1
55.51_-3.45	16/07/2022	2022-07-16	21:47	04:55	7.1
55.5_-3.47	16/07/2022	2022-07-16	21:47	04:55	7.1
55.51_-3.46	17/07/2022	2022-07-16	21:47	04:55	7.1
55.51_-3.46	16/07/2022	2022-07-16	21:47	04:55	7.1
55.5_-3.46	16/07/2022	2022-07-16	21:47	04:55	7.1
55.5_-3.46	17/07/2022	2022-07-16	21:47	04:55	7.1
55.5_-3.45	17/07/2022	2022-07-16	21:47	04:55	7.1
55.5_-3.45	16/07/2022	2022-07-16	21:47	04:55	7.1
55.5_-3.47	17/07/2022	2022-07-17	21:46	04:57	7.2
55.51_-3.45	18/07/2022	2022-07-17	21:46	04:57	7.2
55.51_-3.45	17/07/2022	2022-07-17	21:46	04:57	7.2
55.5_-3.45	17/07/2022	2022-07-17	21:46	04:57	7.2
55.5_-3.45	18/07/2022	2022-07-17	21:46	04:57	7.2
55.5_-3.47	18/07/2022	2022-07-17	21:46	04:57	7.2
55.51_-3.46	17/07/2022	2022-07-17	21:46	04:57	7.2
55.5_-3.46	18/07/2022	2022-07-17	21:46	04:57	7.2
55.5_-3.46	17/07/2022	2022-07-17	21:46	04:57	7.2
55.5_-3.47	22/08/2022	2022-08-22	20:35	06:02	9.5

Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)	NA	NA
55.51_-3.45	23/08/2022	2022-08-22	20:35	06:02	9.5
55.5_-3.47	23/08/2022	2022-08-22	20:35	06:02	9.5
55.51_-3.45	22/08/2022	2022-08-22	20:35	06:02	9.5
55.5_-3.45	22/08/2022	2022-08-22	20:35	06:02	9.5
55.5_-3.45	23/08/2022	2022-08-22	20:35	06:02	9.5
55.5_-3.46	22/08/2022	2022-08-22	20:35	06:02	9.5
55.5_-3.47	23/08/2022	2022-08-23	20:33	06:04	9.5
55.5_-3.47	24/08/2022	2022-08-23	20:33	06:04	9.5
55.51_-3.45	24/08/2022	2022-08-23	20:33	06:04	9.5
55.51_-3.45	23/08/2022	2022-08-23	20:33	06:04	9.5
55.5_-3.45	24/08/2022	2022-08-23	20:33	06:04	9.5
55.5_-3.45	23/08/2022	2022-08-23	20:33	06:04	9.5
55.51_-3.46	23/08/2022	2022-08-23	20:33	06:04	9.5
55.5_-3.46	23/08/2022	2022-08-23	20:33	06:04	9.5
55.5_-3.46	24/08/2022	2022-08-23	20:33	06:04	9.5
55.5_-3.47	24/08/2022	2022-08-24	20:30	06:06	9.6
55.5_-3.47	25/08/2022	2022-08-24	20:30	06:06	9.6
55.51_-3.45	25/08/2022	2022-08-24	20:30	06:06	9.6
55.51_-3.45	24/08/2022	2022-08-24	20:30	06:06	9.6
55.5_-3.46	24/08/2022	2022-08-24	20:30	06:06	9.6
55.5_-3.45	24/08/2022	2022-08-24	20:30	06:06	9.6
55.5_-3.45	25/08/2022	2022-08-24	20:30	06:06	9.6
55.5_-3.46	25/08/2022	2022-08-24	20:30	06:06	9.6
55.5_-3.47	26/08/2022	2022-08-25	20:28	06:08	9.7
55.5_-3.47	25/08/2022	2022-08-25	20:28	06:08	9.7
55.51_-3.45	26/08/2022	2022-08-25	20:28	06:08	9.7
55.51_-3.45	25/08/2022	2022-08-25	20:28	06:08	9.7
55.5_-3.46	26/08/2022	2022-08-25	20:28	06:08	9.7
55.5_-3.46	25/08/2022	2022-08-25	20:28	06:08	9.7
55.5_-3.45	26/08/2022	2022-08-25	20:28	06:08	9.7
55.5_-3.45	25/08/2022	2022-08-25	20:28	06:08	9.7
55.51_-3.46	25/08/2022	2022-08-25	20:28	06:08	9.7
55.5_-3.47	27/08/2022	2022-08-26	20:25	06:10	9.7
55.51_-3.45	27/08/2022	2022-08-26	20:25	06:10	9.7
55.5_-3.47	26/08/2022	2022-08-26	20:25	06:10	9.7
55.51_-3.45	26/08/2022	2022-08-26	20:25	06:10	9.7
55.5_-3.45	26/08/2022	2022-08-26	20:25	06:10	9.7
55.5_-3.45	27/08/2022	2022-08-26	20:25	06:10	9.7
55.5_-3.46	26/08/2022	2022-08-26	20:25	06:10	9.7
55.5_-3.46	27/08/2022	2022-08-26	20:25	06:10	9.7
55.5_-3.47	28/08/2022	2022-08-27	20:23	06:12	9.8
55.5_-3.47	27/08/2022	2022-08-27	20:23	06:12	9.8
55.51_-3.45	28/08/2022	2022-08-27	20:23	06:12	9.8
55.51_-3.45	27/08/2022	2022-08-27	20:23	06:12	9.8
55.5_-3.46	27/08/2022	2022-08-27	20:23	06:12	9.8
55.5_-3.46	28/08/2022	2022-08-27	20:23	06:12	9.8
55.5_-3.45	27/08/2022	2022-08-27	20:23	06:12	9.8
55.5_-3.45	28/08/2022	2022-08-27	20:23	06:12	9.8
55.51_-3.46	27/08/2022	2022-08-27	20:23	06:12	9.8
55.51_-3.46	28/08/2022	2022-08-27	20:23	06:12	9.8
55.5_-3.47	29/08/2022	2022-08-28	20:20	06:14	9.9
55.5_-3.47	28/08/2022	2022-08-28	20:20	06:14	9.9
55.51_-3.45	28/08/2022	2022-08-28	20:20	06:14	9.9
55.51_-3.45	29/08/2022	2022-08-28	20:20	06:14	9.9
55.5_-3.46	28/08/2022	2022-08-28	20:20	06:14	9.9
55.5_-3.46	29/08/2022	2022-08-28	20:20	06:14	9.9
55.5_-3.45	29/08/2022	2022-08-28	20:20	06:14	9.9

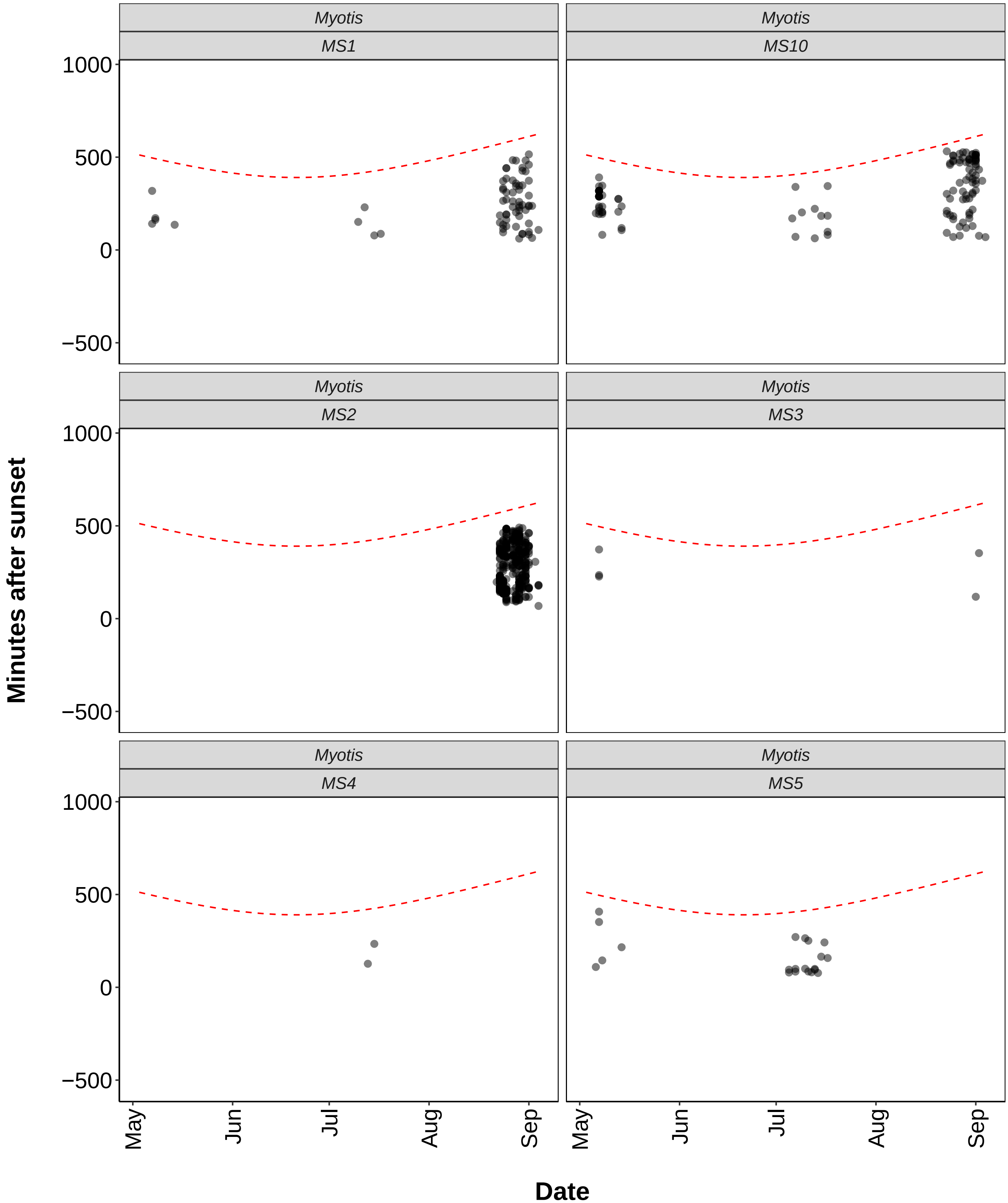
Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)	NA	NA
55.5_-3.45	28/08/2022	2022-08-28	20:20	06:14	9.9
55.5_-3.47	30/08/2022	2022-08-29	20:18	06:16	10.0
55.5_-3.47	29/08/2022	2022-08-29	20:18	06:16	10.0
55.51_-3.45	29/08/2022	2022-08-29	20:18	06:16	10.0
55.51_-3.45	30/08/2022	2022-08-29	20:18	06:16	10.0
55.5_-3.46	30/08/2022	2022-08-29	20:18	06:16	10.0
55.5_-3.45	30/08/2022	2022-08-29	20:18	06:16	10.0
55.5_-3.45	29/08/2022	2022-08-29	20:18	06:16	10.0
55.5_-3.46	29/08/2022	2022-08-29	20:18	06:16	10.0
55.51_-3.46	29/08/2022	2022-08-29	20:18	06:16	10.0
55.51_-3.46	30/08/2022	2022-08-29	20:18	06:16	10.0
55.5_-3.47	31/08/2022	2022-08-30	20:15	06:18	10.0
55.5_-3.47	30/08/2022	2022-08-30	20:15	06:18	10.0
55.51_-3.45	30/08/2022	2022-08-30	20:15	06:18	10.0
55.51_-3.45	31/08/2022	2022-08-30	20:15	06:18	10.0
55.5_-3.46	31/08/2022	2022-08-30	20:15	06:18	10.0
55.5_-3.46	30/08/2022	2022-08-30	20:15	06:18	10.0
55.5_-3.45	31/08/2022	2022-08-30	20:15	06:18	10.0
55.5_-3.45	30/08/2022	2022-08-30	20:15	06:18	10.0
55.51_-3.46	30/08/2022	2022-08-30	20:15	06:18	10.0
55.5_-3.47	01/09/2022	2022-08-31	20:13	06:20	10.1
55.5_-3.47	31/08/2022	2022-08-31	20:13	06:20	10.1
55.51_-3.45	31/08/2022	2022-08-31	20:13	06:20	10.1
55.51_-3.45	01/09/2022	2022-08-31	20:13	06:20	10.1
55.5_-3.46	01/09/2022	2022-08-31	20:13	06:20	10.1
55.5_-3.46	31/08/2022	2022-08-31	20:13	06:20	10.1
55.5_-3.45	01/09/2022	2022-08-31	20:13	06:20	10.1
55.5_-3.45	31/08/2022	2022-08-31	20:13	06:20	10.1
55.51_-3.46	31/08/2022	2022-08-31	20:13	06:20	10.1
55.5_-3.47	02/09/2022	2022-09-01	20:10	06:22	10.2
55.5_-3.47	01/09/2022	2022-09-01	20:10	06:22	10.2
55.51_-3.46	01/09/2022	2022-09-01	20:10	06:22	10.2
55.51_-3.45	01/09/2022	2022-09-01	20:10	06:22	10.2
55.51_-3.45	02/09/2022	2022-09-01	20:10	06:22	10.2
55.5_-3.46	01/09/2022	2022-09-01	20:10	06:22	10.2
55.5_-3.46	02/09/2022	2022-09-01	20:10	06:22	10.2
55.5_-3.45	02/09/2022	2022-09-01	20:10	06:22	10.2
55.5_-3.45	01/09/2022	2022-09-01	20:10	06:22	10.2
55.5_-3.47	02/09/2022	2022-09-02	20:08	06:23	10.3
55.5_-3.47	03/09/2022	2022-09-02	20:08	06:23	10.3
55.51_-3.46	03/09/2022	2022-09-02	20:08	06:23	10.3
55.51_-3.45	02/09/2022	2022-09-02	20:08	06:23	10.3
55.51_-3.45	03/09/2022	2022-09-02	20:08	06:23	10.3
55.5_-3.45	02/09/2022	2022-09-02	20:08	06:23	10.3
55.5_-3.45	03/09/2022	2022-09-02	20:08	06:23	10.3
55.5_-3.46	02/09/2022	2022-09-02	20:08	06:23	10.3
55.5_-3.46	03/09/2022	2022-09-02	20:08	06:23	10.3
55.5_-3.47	04/09/2022	2022-09-03	20:05	06:25	10.3
55.51_-3.45	04/09/2022	2022-09-03	20:05	06:25	10.3
55.5_-3.45	04/09/2022	2022-09-03	20:05	06:25	10.3
55.5_-3.47	03/09/2022	2022-09-03	20:05	06:25	10.3
55.51_-3.45	03/09/2022	2022-09-03	20:05	06:25	10.3
55.5_-3.46	04/09/2022	2022-09-03	20:05	06:25	10.3
55.5_-3.46	03/09/2022	2022-09-03	20:05	06:25	10.3
55.5_-3.45	03/09/2022	2022-09-03	20:05	06:25	10.3
55.5_-3.47	04/09/2022	2022-09-04	20:02	06:27	10.4
55.51_-3.45	04/09/2022	2022-09-04	20:02	06:27	10.4

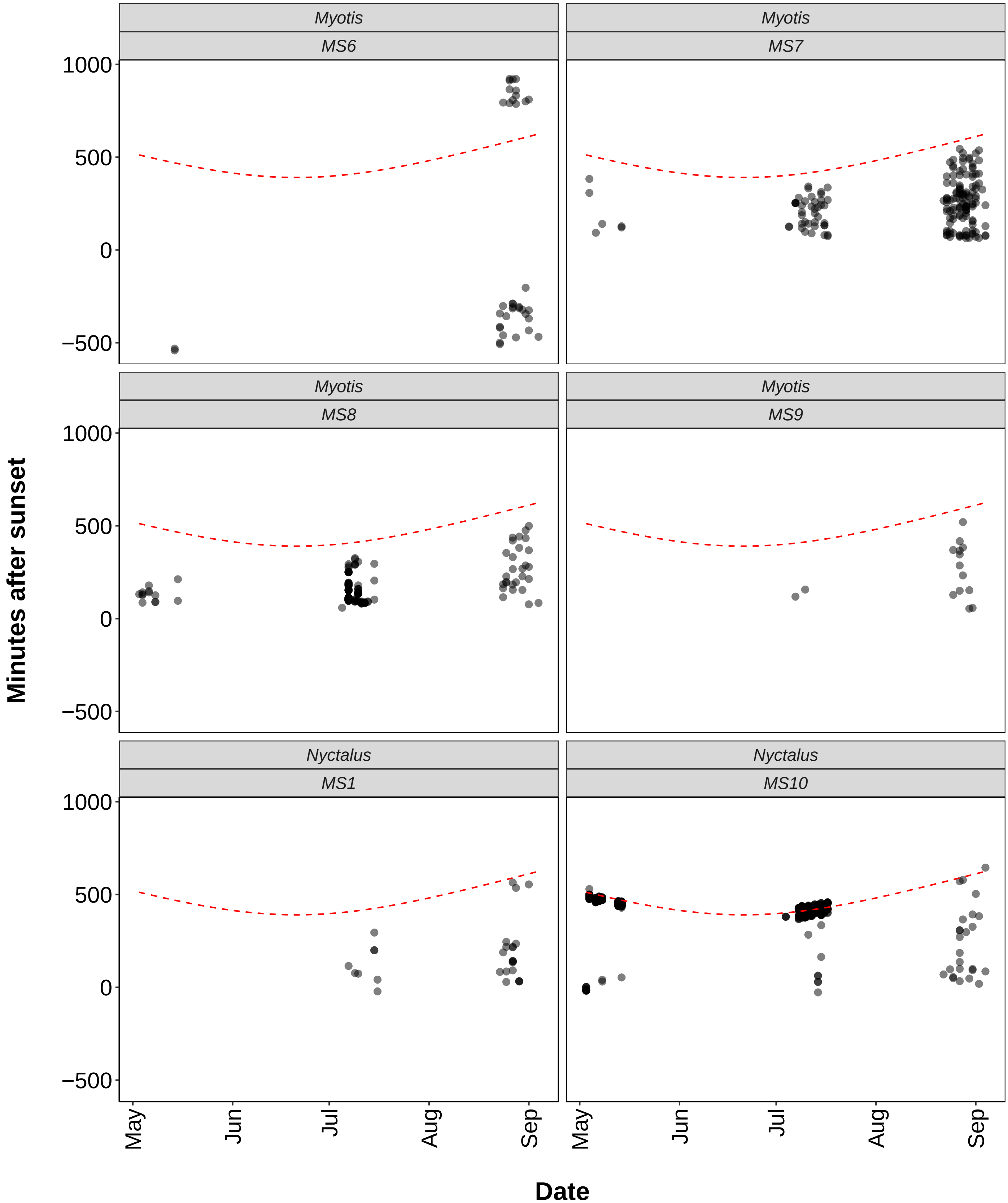
Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)	NA	NA
55.51_-3.45	05/09/2022	2022-09-04	20:02	06:27	10.4
55.5_-3.46	04/09/2022	2022-09-04	20:02	06:27	10.4
55.5_-3.45	04/09/2022	2022-09-04	20:02	06:27	10.4
55.5_-3.47	05/09/2022	2022-09-04	20:02	06:27	10.4
55.5_-3.46	05/09/2022	2022-09-04	20:02	06:27	10.4
55.5_-3.45	05/09/2022	2022-09-04	20:02	06:27	10.4
55.51_-3.46	05/09/2022	2022-09-04	20:02	06:27	10.4

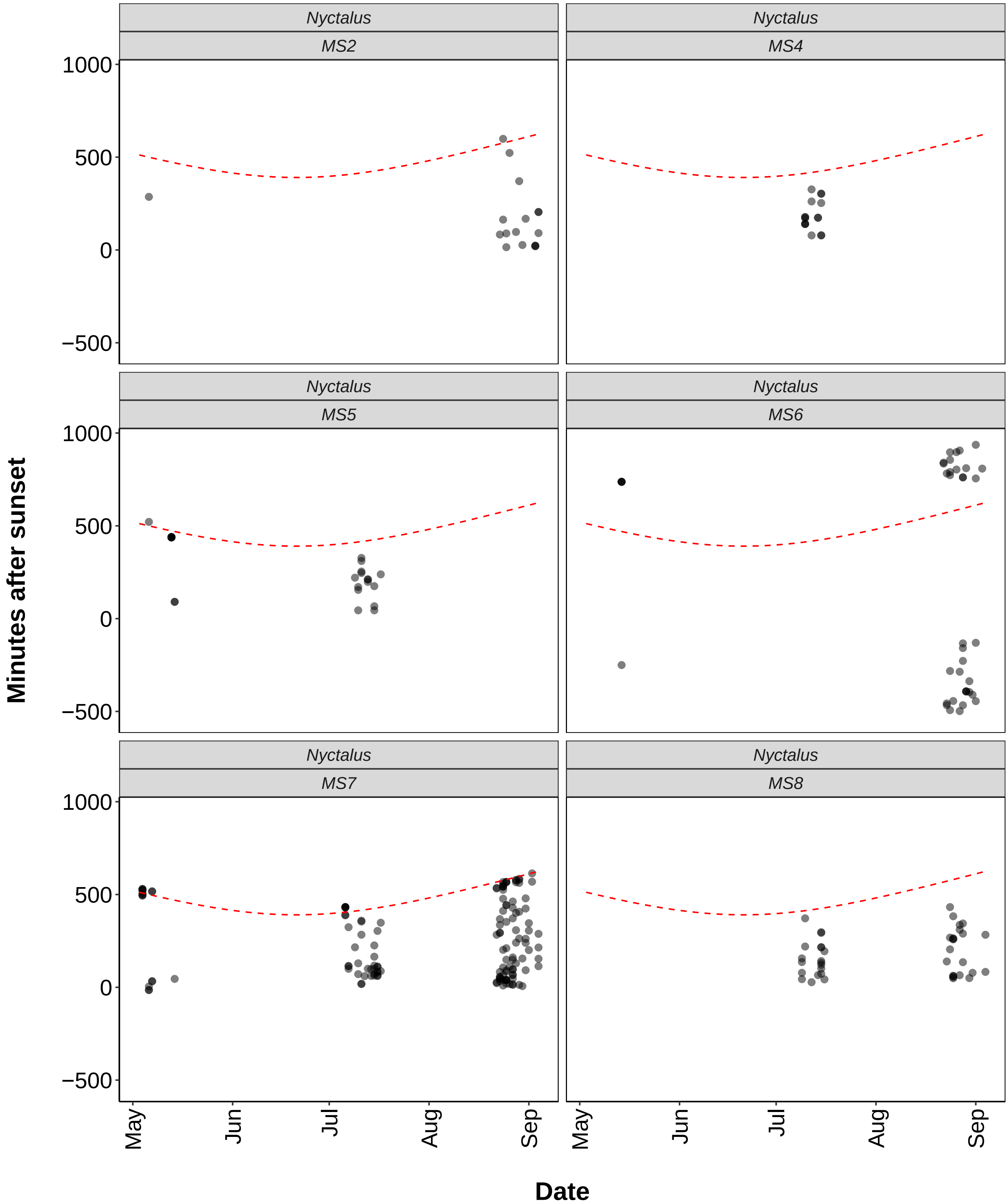
Distribution of Bat Activity Across the Night through Time

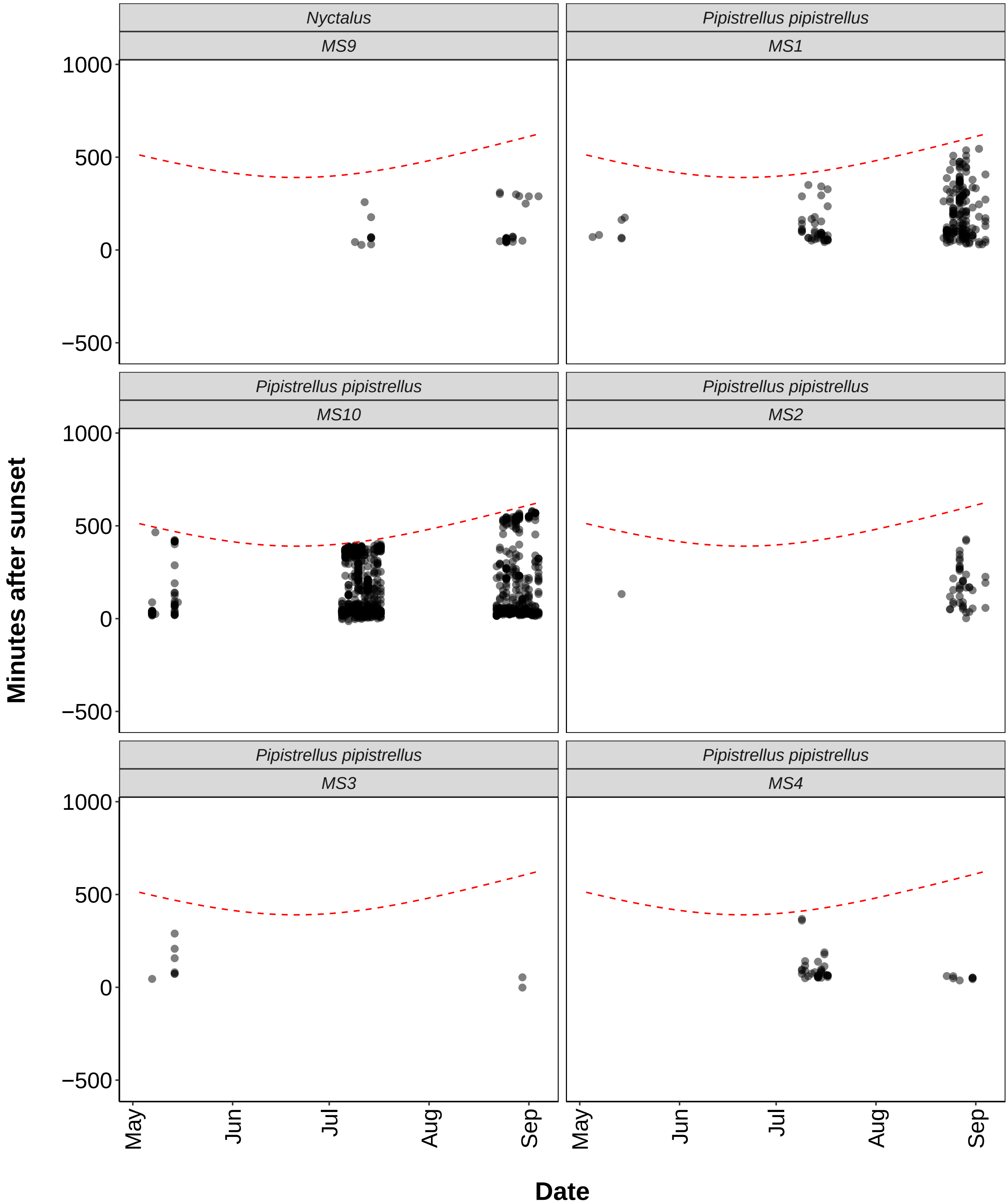
Per Detector

Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only within each plot, and do not account for overall activity.

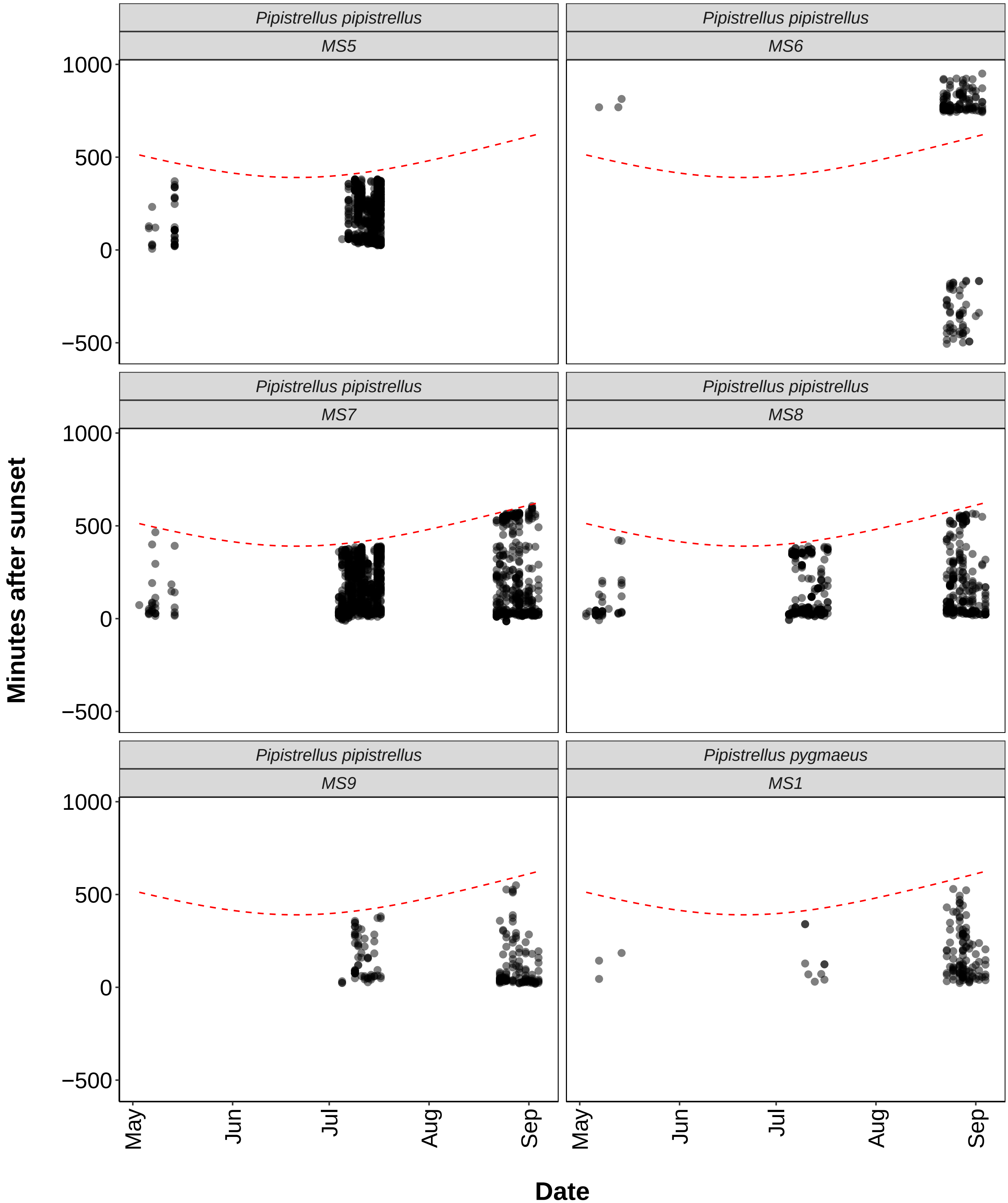

Myotis
MS1
Myotis
MS10
Myotis
MS2
Myotis
MS3
Myotis
MS4
Myotis
MS5
1000
500
0
−500
May
Jun
Jul
Aug
Sep
Minutes after sunset
Date

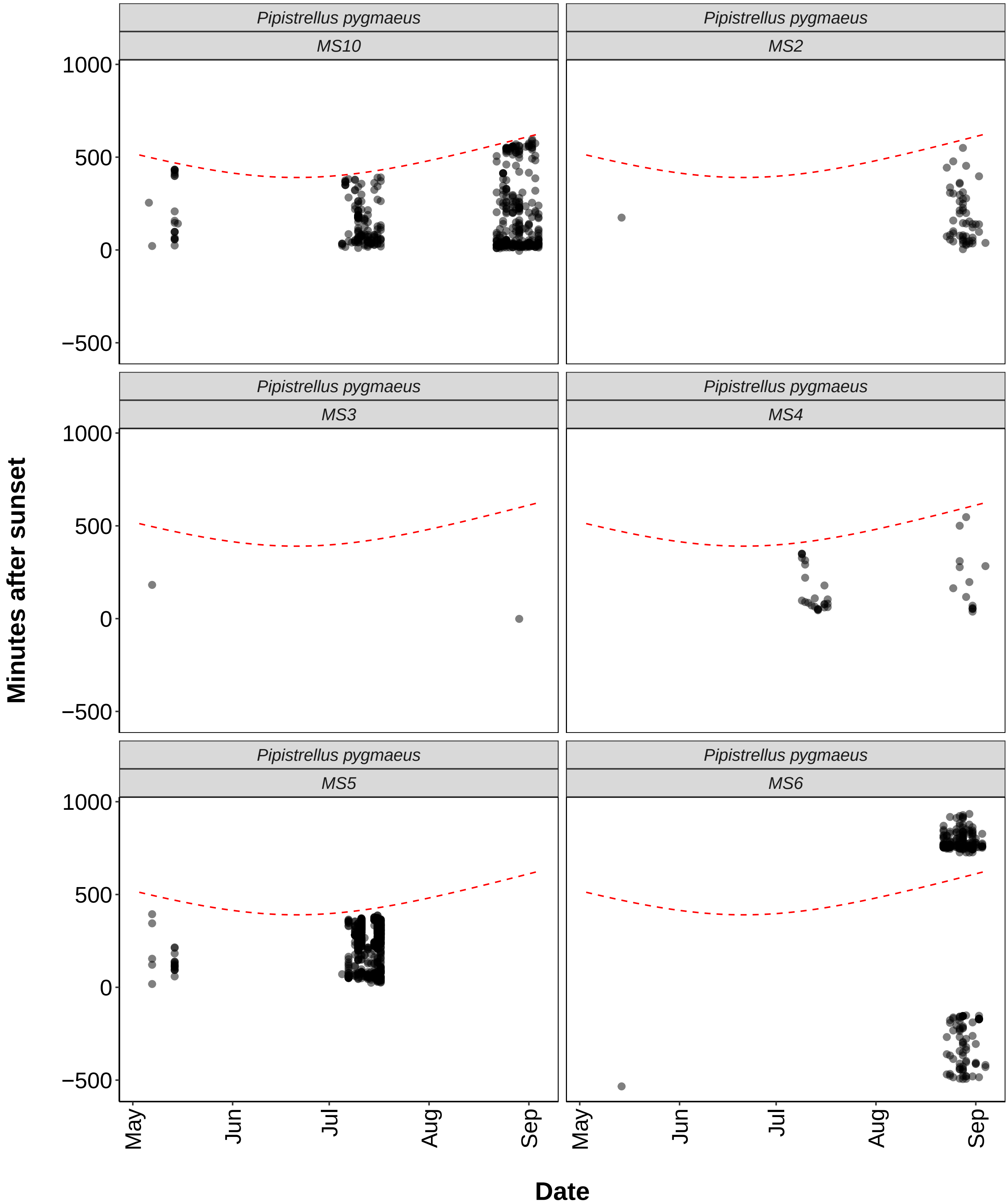

Myotis
MS6
Myotis
MS7
Myotis
MS8
Myotis
MS9
Nyctalus
MS1
Nyctalus
MS10
1000
500
0
−500
Minutes after sunset
May
Jun
Jul
Aug
Sep
Date


Nyctalus
MS2
Nyctalus
MS4
Nyctalus
MS5
Nyctalus
MS6
Nyctalus
MS7
Nyctalus
MS8
1000
500
0
−500
Minutes after sunset
May
Jun
Jul
Aug
Sep
Date

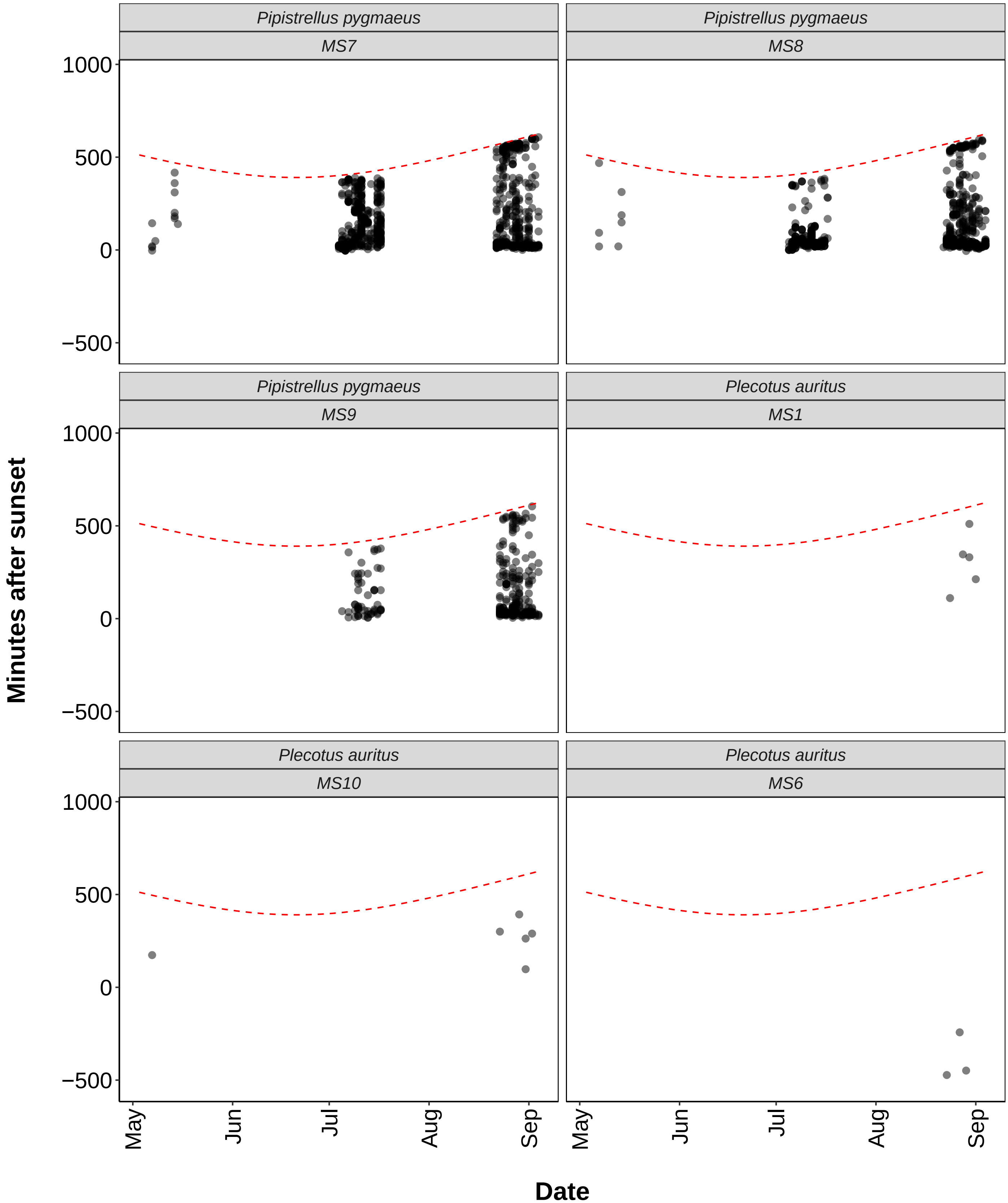


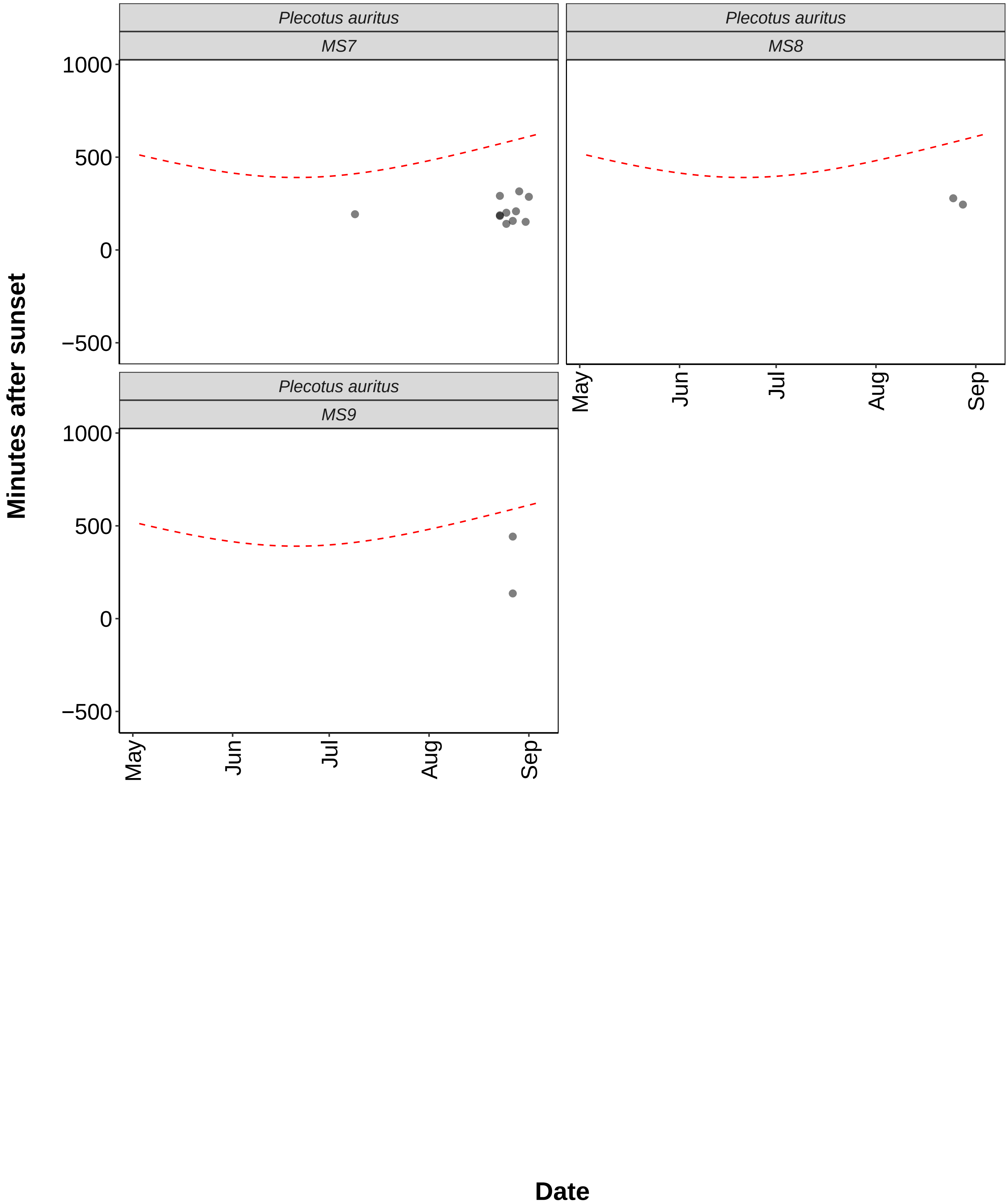
Nyctalus
MS9
Pipistrellus pipistrellus
MS1
Pipistrellus pipistrellus
MS10
Pipistrellus pipistrellus
MS2
Pipistrellus pipistrellus
MS3
Pipistrellus pipistrellus
MS4
1000
500
0
−500
Minutes after sunset
May
Jun
Jul
Aug
Sep
Date


Pipistrellus pipistrellus
MS5
Pipistrellus pipistrellus
MS6
Pipistrellus pipistrellus
MS7
Pipistrellus pipistrellus
MS8
Pipistrellus pipistrellus
MS9
Pipistrellus pygmaeus
MS1
1000
500
0
−500
May
Jun
Jul
Aug
Sep
Minutes after sunset
Date



Pipistrellus pygmaeus
MS10
Pipistrellus pygmaeus
MS2
Pipistrellus pygmaeus
MS3
Pipistrellus pygmaeus
MS4
Pipistrellus pygmaeus
MS5
Pipistrellus pygmaeus
MS6
Minutes after sunset
1000
500
0
−500
May
Jun
Jul
Aug
Sep
Date


Pipistrellus pygmaeus
MS7
Pipistrellus pygmaeus
MS8
Pipistrellus pygmaeus
MS9
Plecotus auritus
MS1
Plecotus auritus
MS10
Plecotus auritus
MS6
Minutes after sunset
1000
500
0
−500
May
Jun
Jul
Aug
Sep
Date


Plecotus auritus
MS7
Plecotus auritus
MS8
Plecotus auritus
MS9
1000
500
0
−500
May
Jun
Jul
Aug
Sep
Minutes after sunset
Date

Roost Emergence Time and Bat Observation

Based on: *Russ, Jon. 2012. British Bat Calls a Guide to species Identification. Pelagic Publishing.*

For more information see https://rbats-blog.updog.co/2018/05/29/bat-emergence/

Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012) - Table

Table 12. Number of bat calls recorded before the upper time of the species-specific emergence time range, and which therefore may potentially indicate the presence of a nearby roost.

Table 12: Table continues below

Species	Detector ID	2022-05-03	2022-05-06	2022-05-07	2022-05-08	2022-05-13
Common pipistrelle	MS1	0	0	0	0	0
Common pipistrelle	MS10	0	0	21	1	0
Common pipistrelle	MS2	0	0	0	0	0
Common pipistrelle	MS3	0	0	0	0	0
Common pipistrelle	MS5	0	0	4	0	0
Common pipistrelle	MS6	0	0	0	0	0
Common pipistrelle	MS7	0	3	0	4	0
Common pipistrelle	MS8	2	5	3	3	3
Common pipistrelle	MS9	0	0	0	0	0
Soprano pipistrelle	MS1	0	0	0	0	0
Soprano pipistrelle	MS10	0	0	1	0	0
Soprano pipistrelle	MS2	0	0	0	0	0
Soprano pipistrelle	MS3	0	0	0	0	0
Soprano pipistrelle	MS5	0	0	1	0	0
Soprano pipistrelle	MS6	0	0	0	0	0
Soprano pipistrelle	MS7	0	0	3	0	0
Soprano pipistrelle	MS8	0	0	1	0	1
Soprano pipistrelle	MS9	0	0	0	0	0
Nyctalus	MS1	0	0	0	0	0
Nyctalus	MS10	11	0	0	0	0
Nyctalus	MS2	0	0	0	0	0
Nyctalus	MS6	0	0	0	0	0
Nyctalus	MS7	0	3	0	0	0
Brown long-eared	MS6	0	0	0	0	0
Myotis	MS1	0	0	0	0	0
Myotis	MS10	0	0	0	0	0
Myotis	MS2	0	0	0	0	0
Myotis	MS6	0	0	0	0	0
Myotis	MS7	0	0	0	0	0
Myotis	MS8	0	0	0	0	0
Myotis	MS9	0	0	0	0	0

Table 13: Table continues below

2022-05-14	2022-07-04	2022-07-05	2022-07-06	2022-07-07	2022-07-08	2022-07-09
0	0	0	0	0	0	0
5	0	17	13	5	1	8
0	0	0	0	0	0	0
0	0	0	0	0	0	0
6	0	0	0	0	0	0
0	0	0	0	0	0	0
2	18	27	38	48	2	1

2022-05-14	2022-07-04	2022-07-05	2022-07-06	2022-07-07	2022-07-08	2022-07-09
1	0	8	12	6	1	2
0	0	2	0	0	0	0
0	0	0	0	0	0	0
1	0	1	1	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
1	0	0	0	0	0	0
0	12	8	17	6	3	2
0	0	5	4	8	0	1
0	0	0	0	1	0	1
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
1	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
2	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	1	0	0	0	0
0	0	0	0	0	0	0

Table 14: Table continues below

2022-07-10	2022-07-11	2022-07-12	2022-07-13	2022-07-14	2022-07-15	2022-07-16
0	0	0	0	0	0	0
5	12	11	10	4	2	10
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	5
0	0	0	0	0	0	0
1	3	3	13	7	3	9
3	3	7	3	1	4	4
0	0	0	1	0	0	0
0	0	0	0	0	0	0
1	0	1	2	0	1	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	1	0	0
0	0	0	0	0	0	0
1	4	1	3	1	0	3
3	5	0	27	18	11	4
3	0	1	3	2	0	1
0	0	0	0	0	0	1
0	0	0	0	1	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	1	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

2022-07-10	2022-07-11	2022-07-12	2022-07-13	2022-07-14	2022-07-15	2022-07-16
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

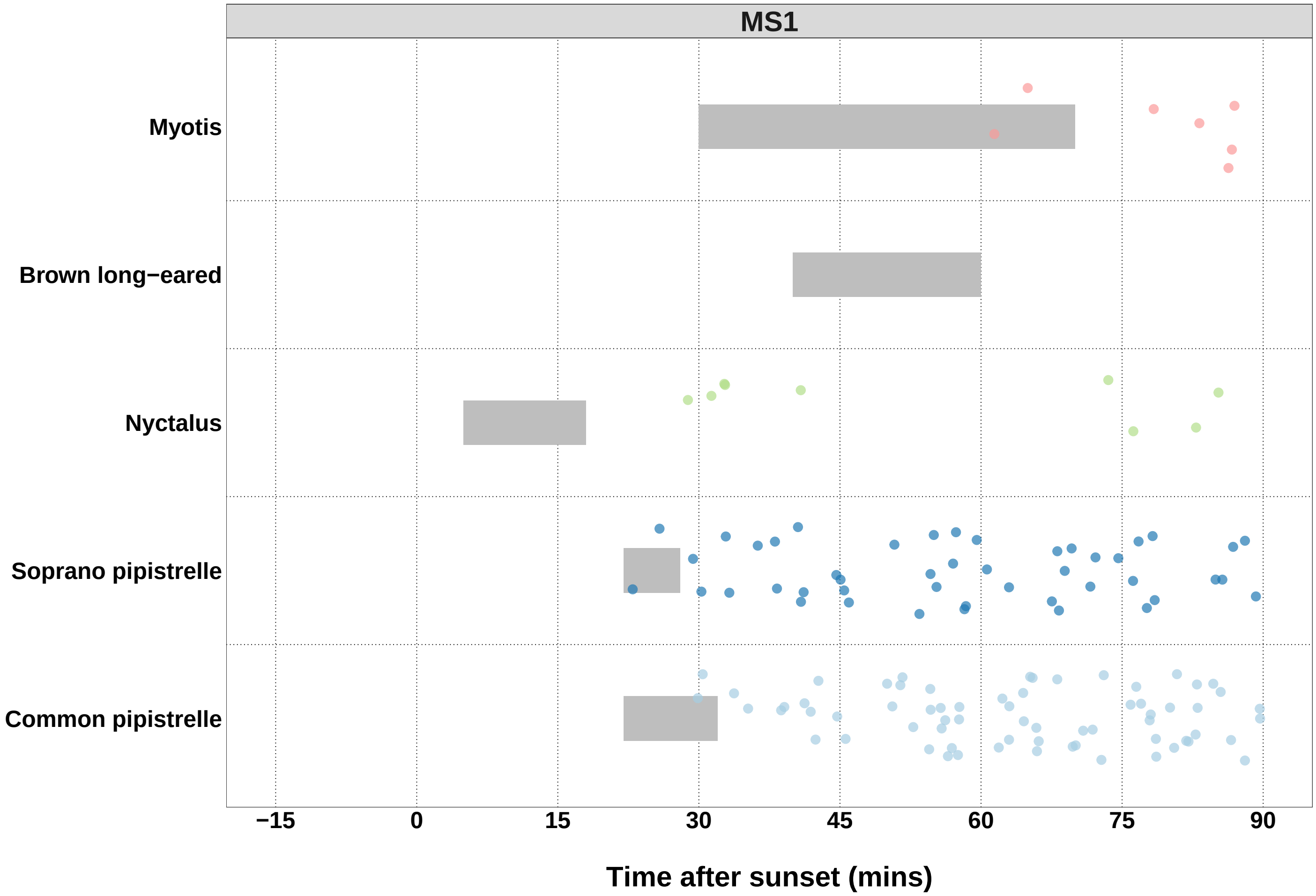
Table 15: Table continues below

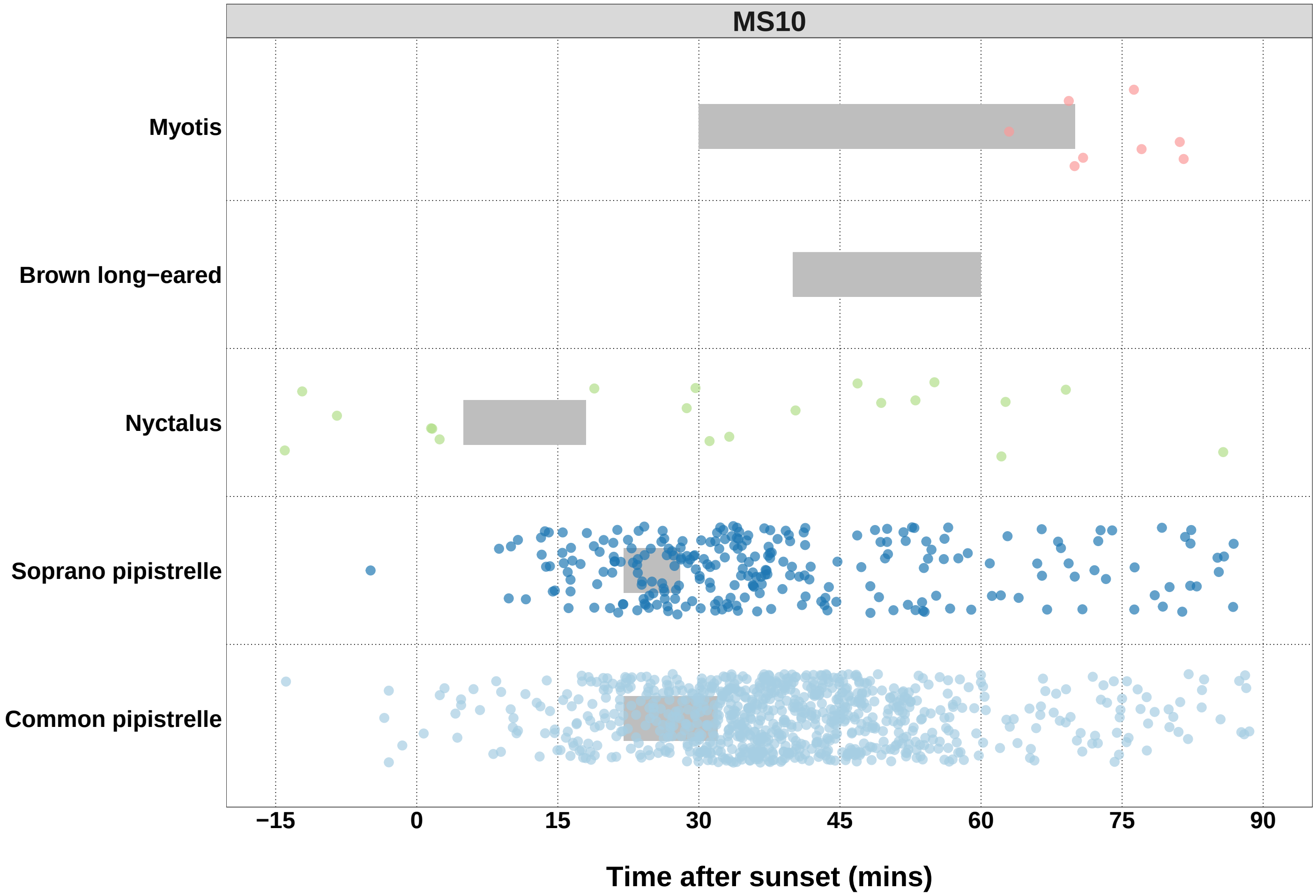
2022-07-17	2022-08-22	2022-08-23	2022-08-24	2022-08-25	2022-08-26	2022-08-27
0	0	0	0	0	0	0
14	31	6	3	2	6	5
0	0	0	0	0	0	0
0	0	0	0	0	0	0
7	0	0	0	0	0	0
0	0	8	10	7	0	9
4	11	9	4	13	2	3
1	0	2	1	2	0	1
0	0	3	1	0	0	1
0	0	0	0	0	0	1
1	7	7	5	5	2	4
0	0	0	0	0	0	0
0	0	0	0	0	0	0
2	0	0	0	0	0	0
0	0	3	5	5	1	14
2	26	6	4	3	2	11
0	1	2	3	13	3	15
0	0	6	4	11	0	6
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	1	0	0
0	0	2	2	1	0	2
0	0	0	1	0	1	2
0	0	1	0	0	0	1
0	0	0	0	0	0	0
0	0	0	0	1	0	0
0	0	0	0	0	0	0
0	0	5	2	1	0	4
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

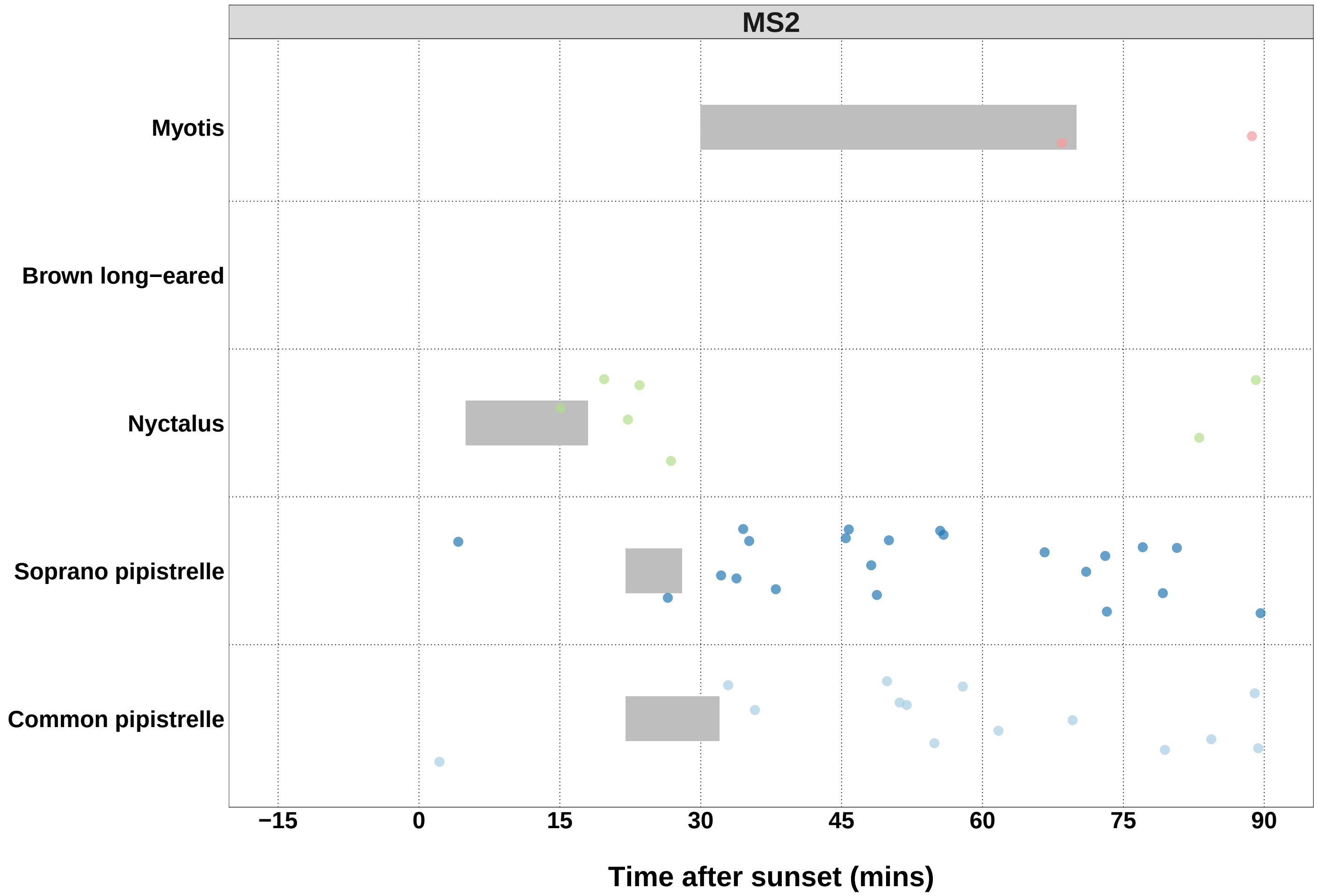
2022-08-28	2022-08-29	2022-08-30	2022-08-31	2022-09-01	2022-09-02	2022-09-03	2022-09-04
0	0	0	0	0	1	1	0
0	10	6	3	4	7	4	5
0	1	0	0	0	0	0	0
0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0
9	4	2	0	1	3	0	0
3	3	14	7	6	13	12	3
1	4	3	3	1	3	1	5
0	3	3	2	1	4	4	2
0	0	1	0	0	0	0	0
4	5	6	5	7	5	5	4
1	1	0	0	0	0	0	0
0	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0

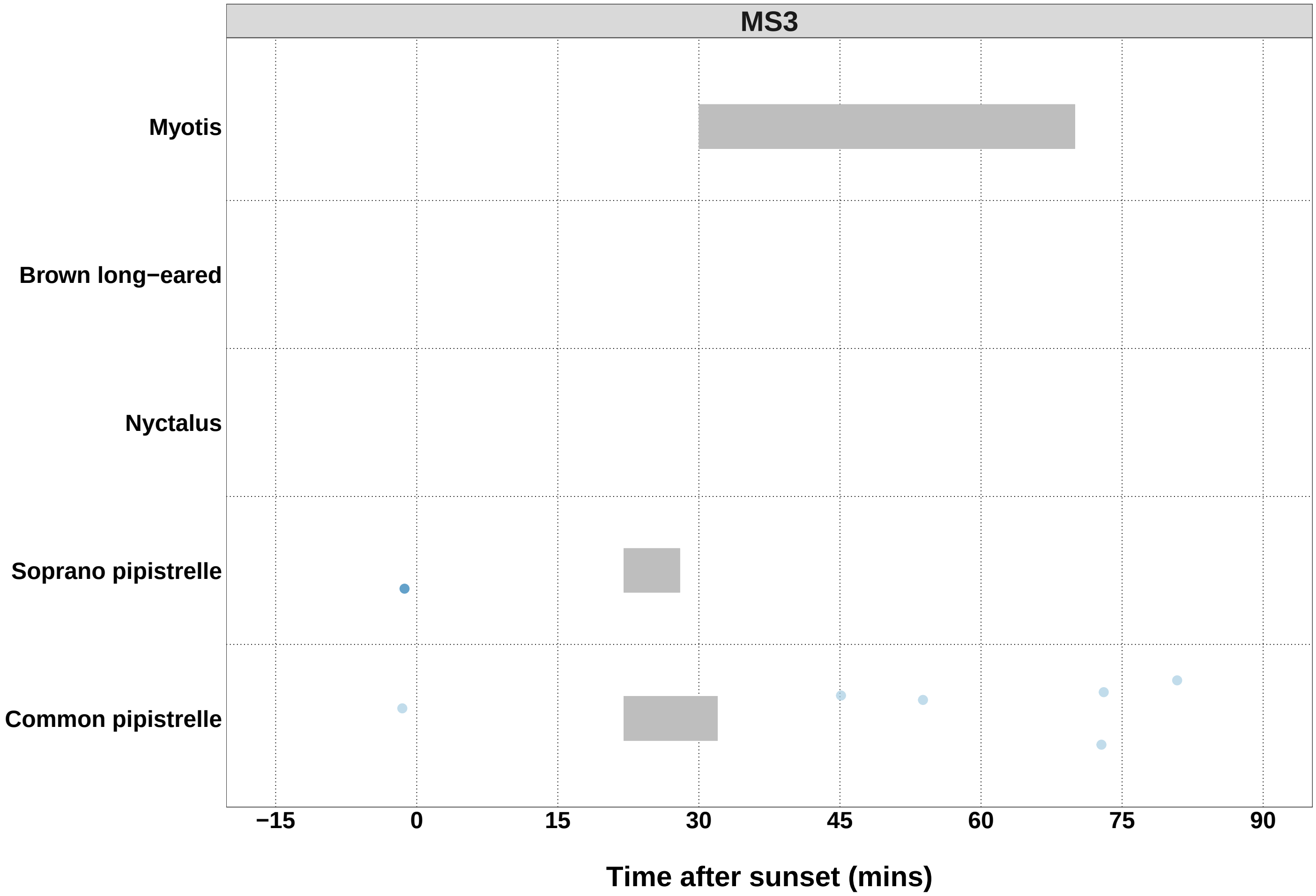
2022-08-28	2022-08-29	2022-08-30	2022-08-31	2022-09-01	2022-09-02	2022-09-03	2022-09-04
20	9	0	3	4	15	0	2
16	3	20	9	18	14	11	6
0	23	35	2	28	16	5	15
3	1	5	8	7	5	2	3
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
4	3	2	1	2	0	0	0
0	1	1	0	0	0	0	0
0	1	0	0	0	0	0	0
0	1	0	0	0	1	0	0
0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	1
1	2	1	2	3	0	0	1
0	1	1	0	0	1	0	0
0	0	0	0	0	0	0	0
0	0	1	1	0	0	0	0

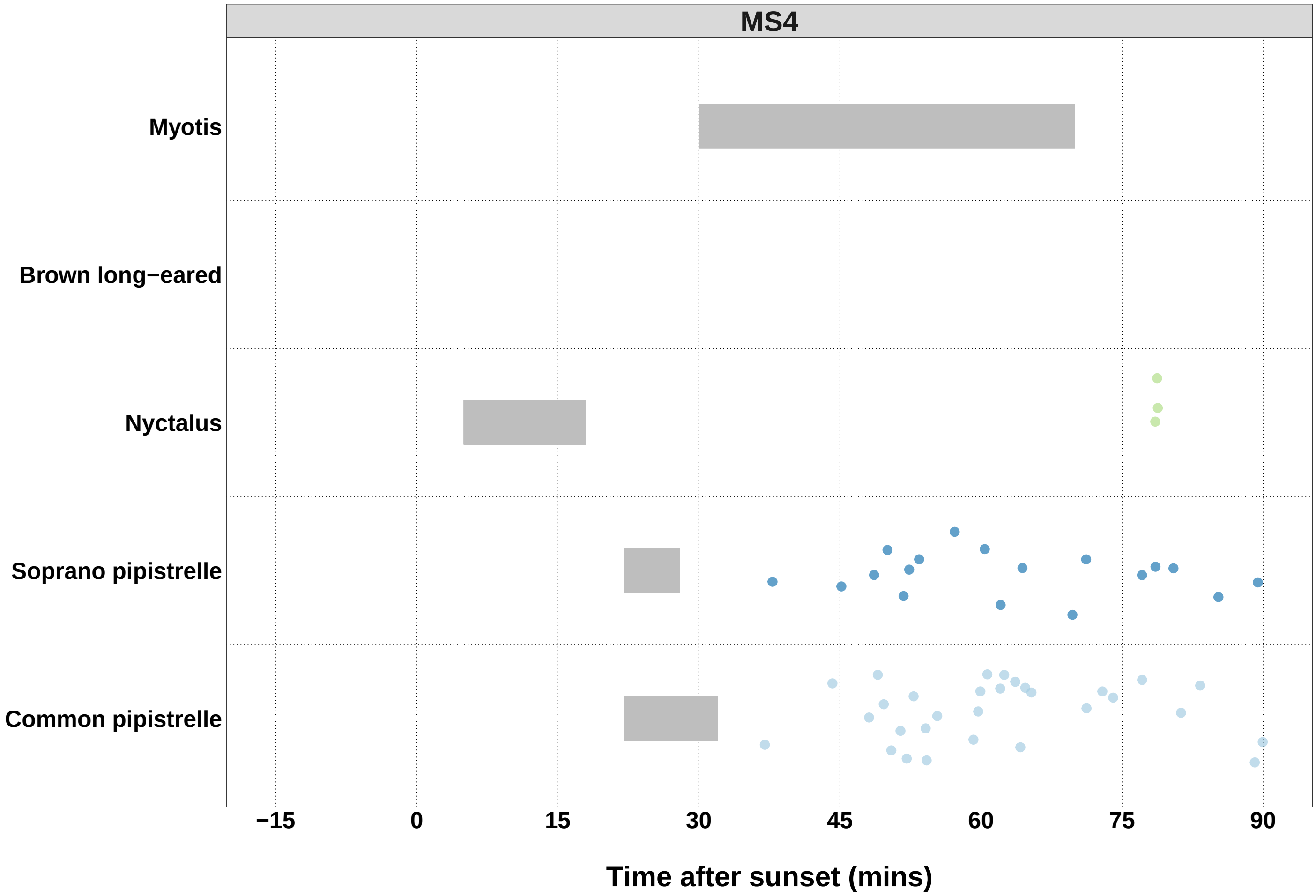
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.

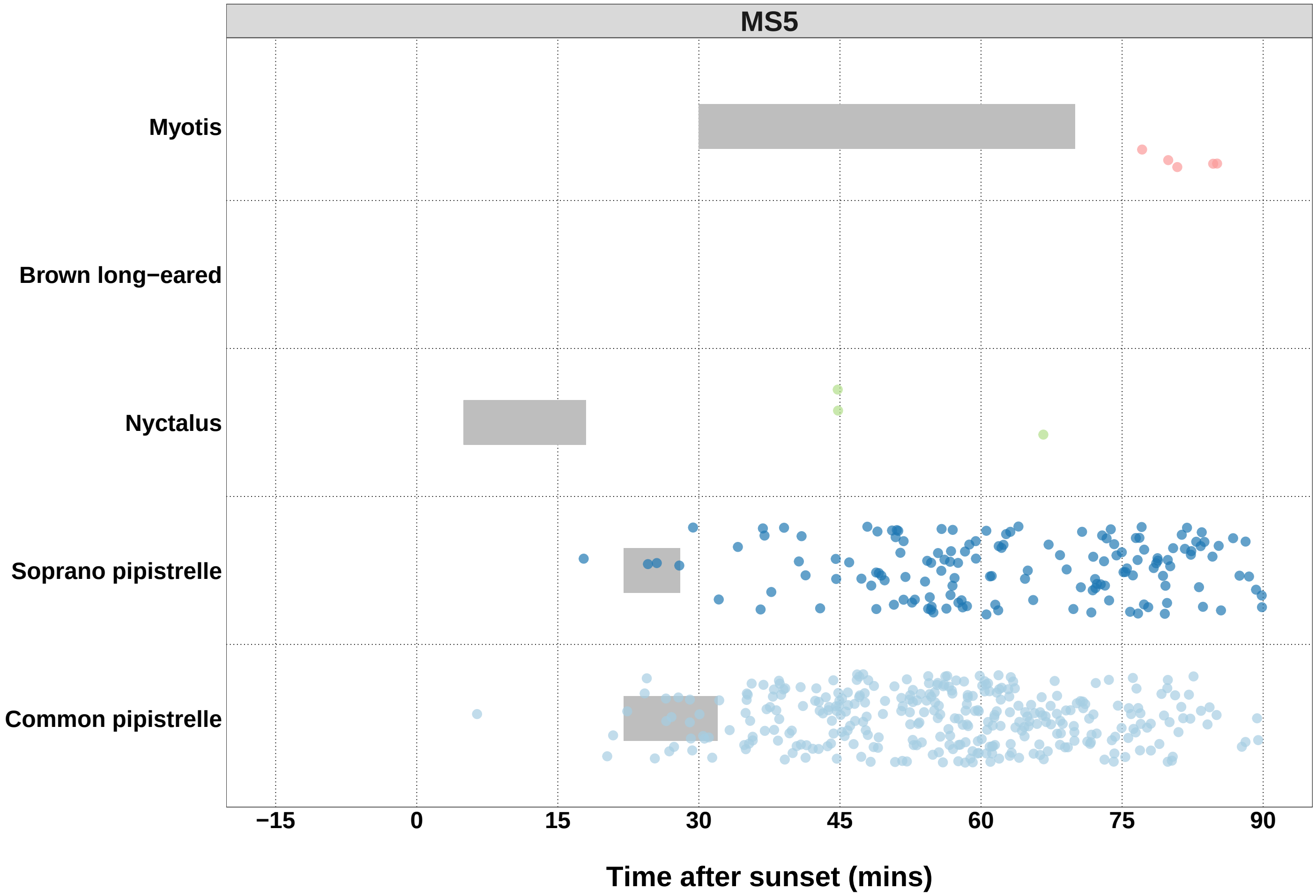


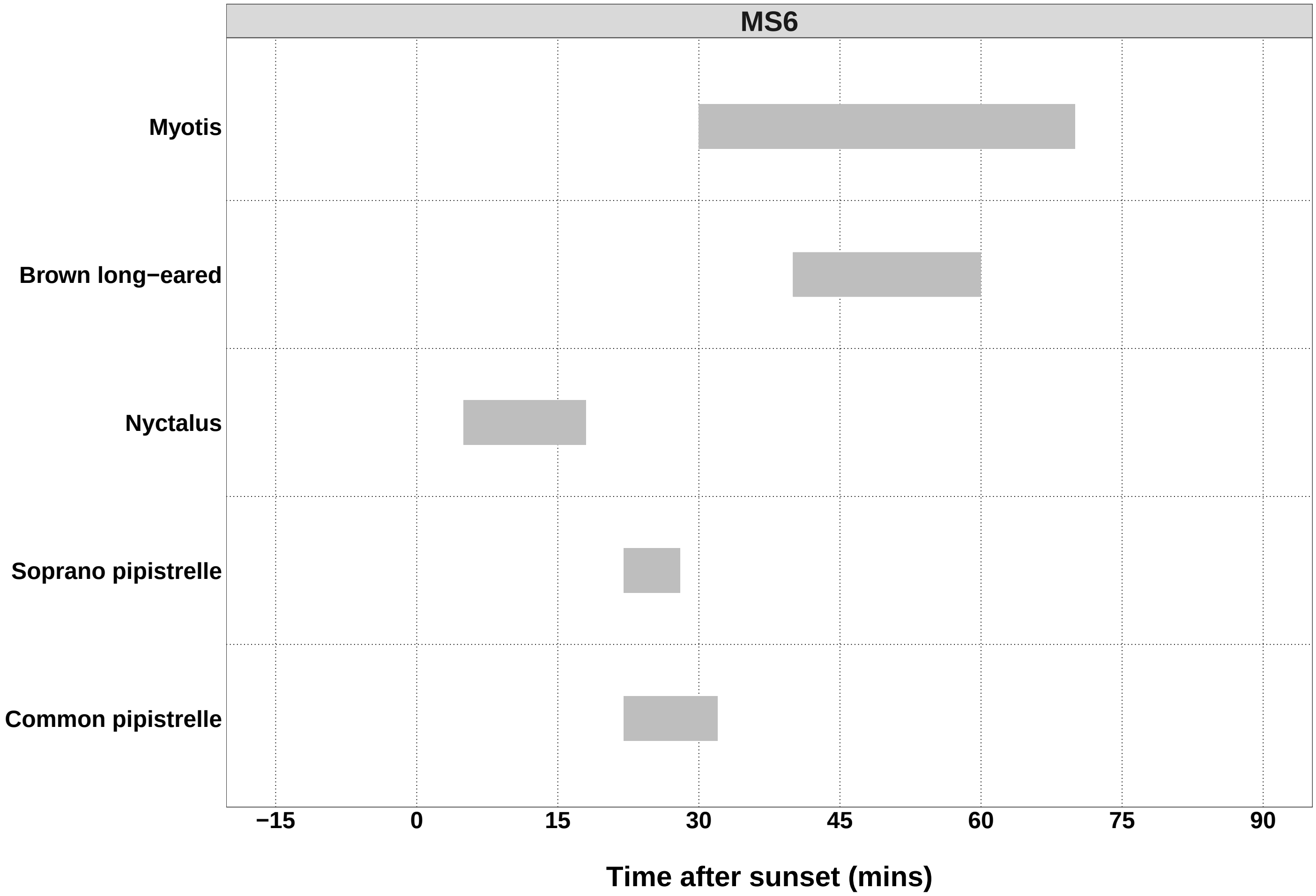

MS10
Myotis
Brown long−eared
Nyctalus
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

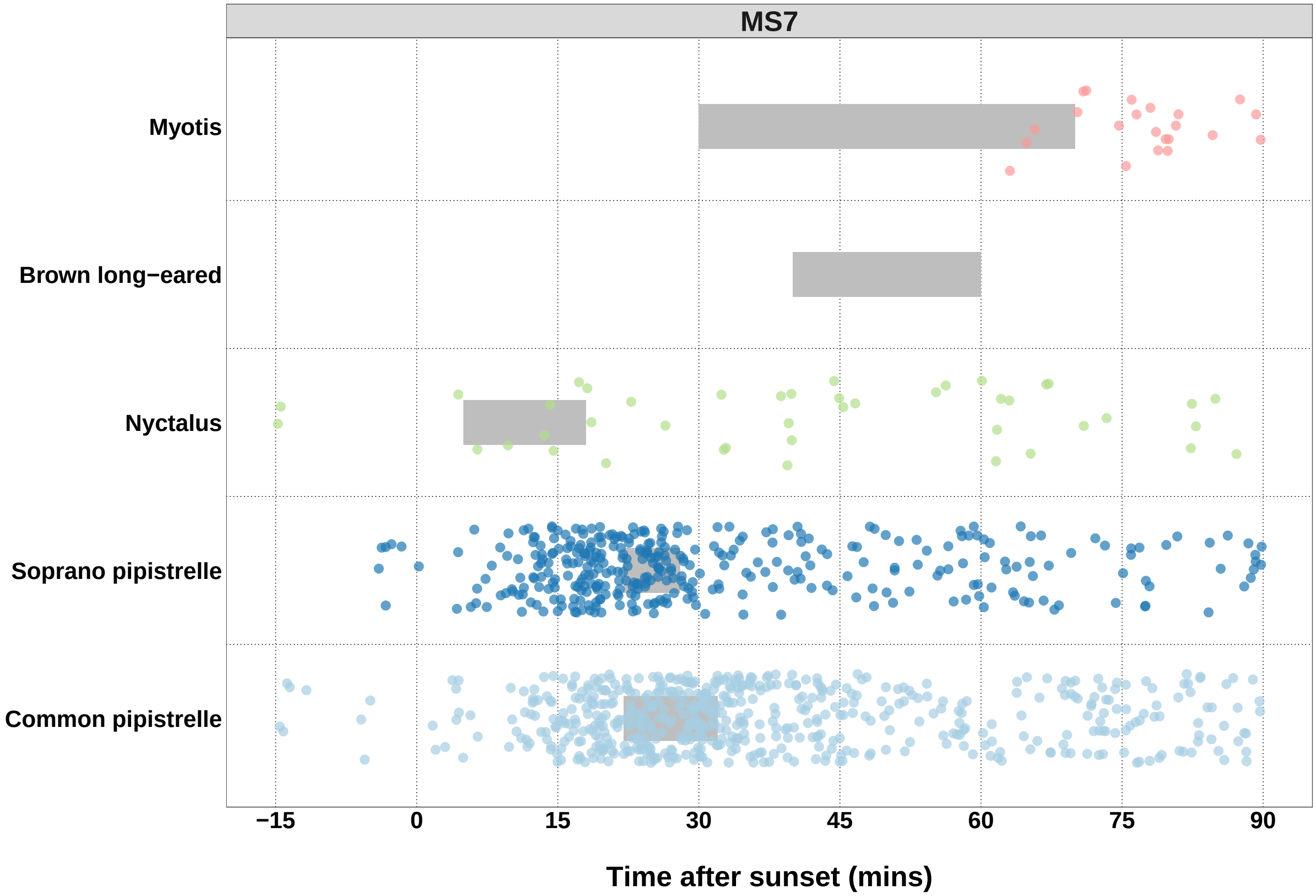

MS2
Myotis
Brown long−eared
Nyctalus
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

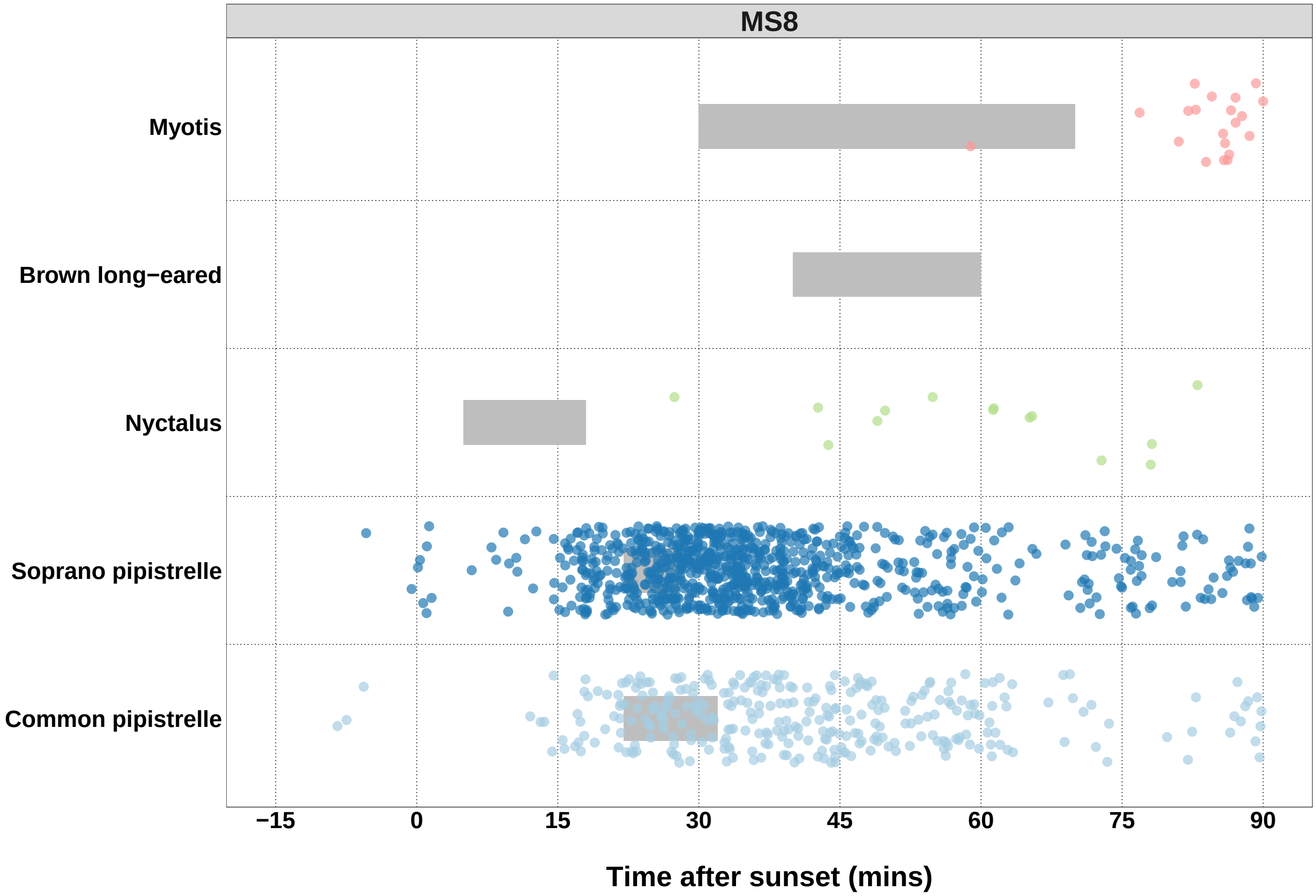

MS3
Myotis
Brown long−eared
Nyctalus
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


MS4
Myotis
Brown long−eared
Nyctalus
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

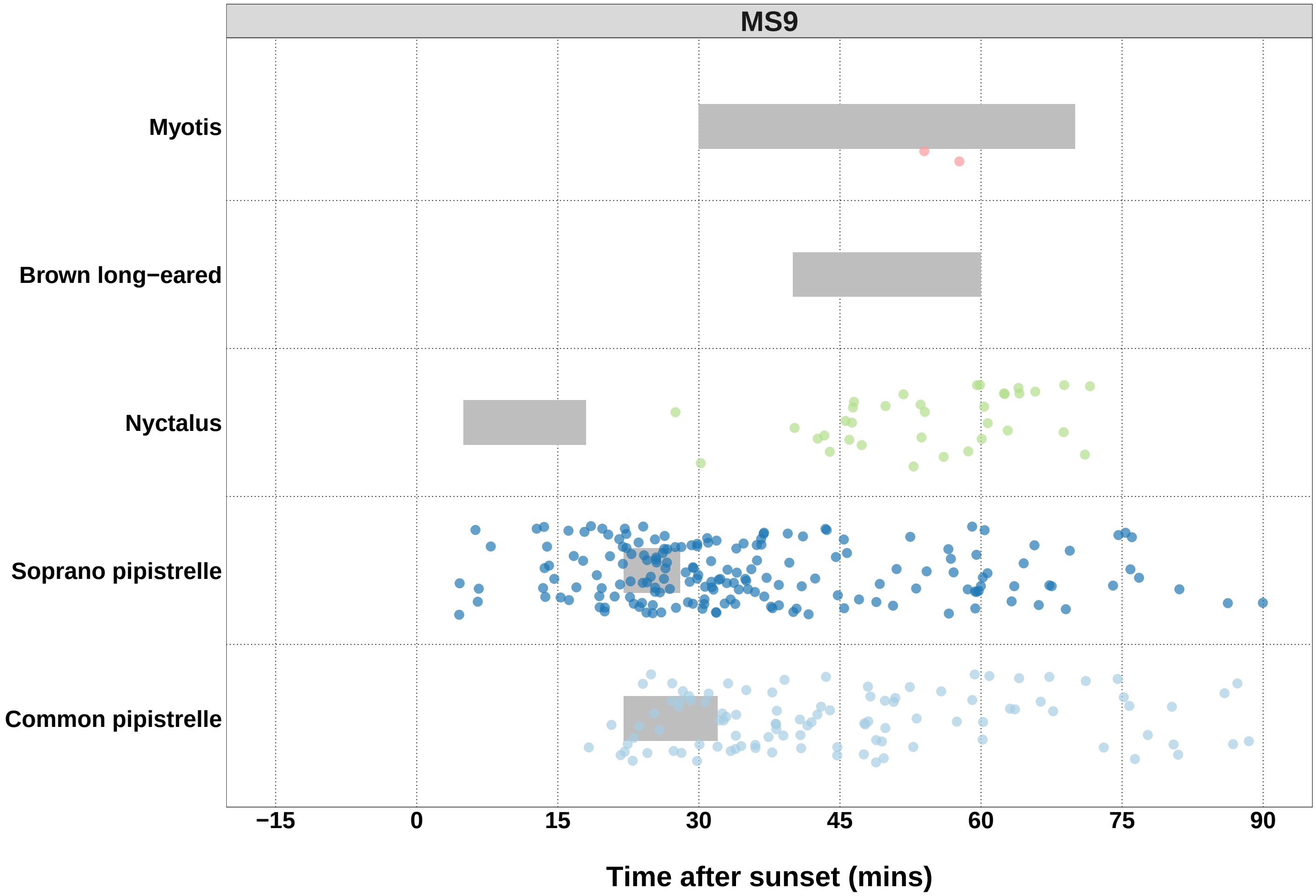

MS5
Myotis
Brown long−eared
Nyctalus
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


MS6
Myotis
Brown long−eared
Nyctalus
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


MS7
Myotis
Brown long−eared
Nyctalus
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)



MS8
Myotis
Brown long−eared
Nyctalus
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


MS9
Myotis
Brown long−eared
Nyctalus
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

Counts of Bat Passes

All detectors

Table 14. The total number of passes recorded for each species across all of the detectors. The 'Total' percentage may not be exactly 100% due to rounding of the percentages per species.

Species	Passes (No.)	Percentage of total (%)
Common pipistrelle	10216	45.3
Soprano pipistrelle	8739	38.7
Nyctalus	1343	6.0
Brown long-eared	28	0.1
Myotis	2233	9.9
Total	22559	100.0

Page Break

Counts of Bat Passes

Per Detector

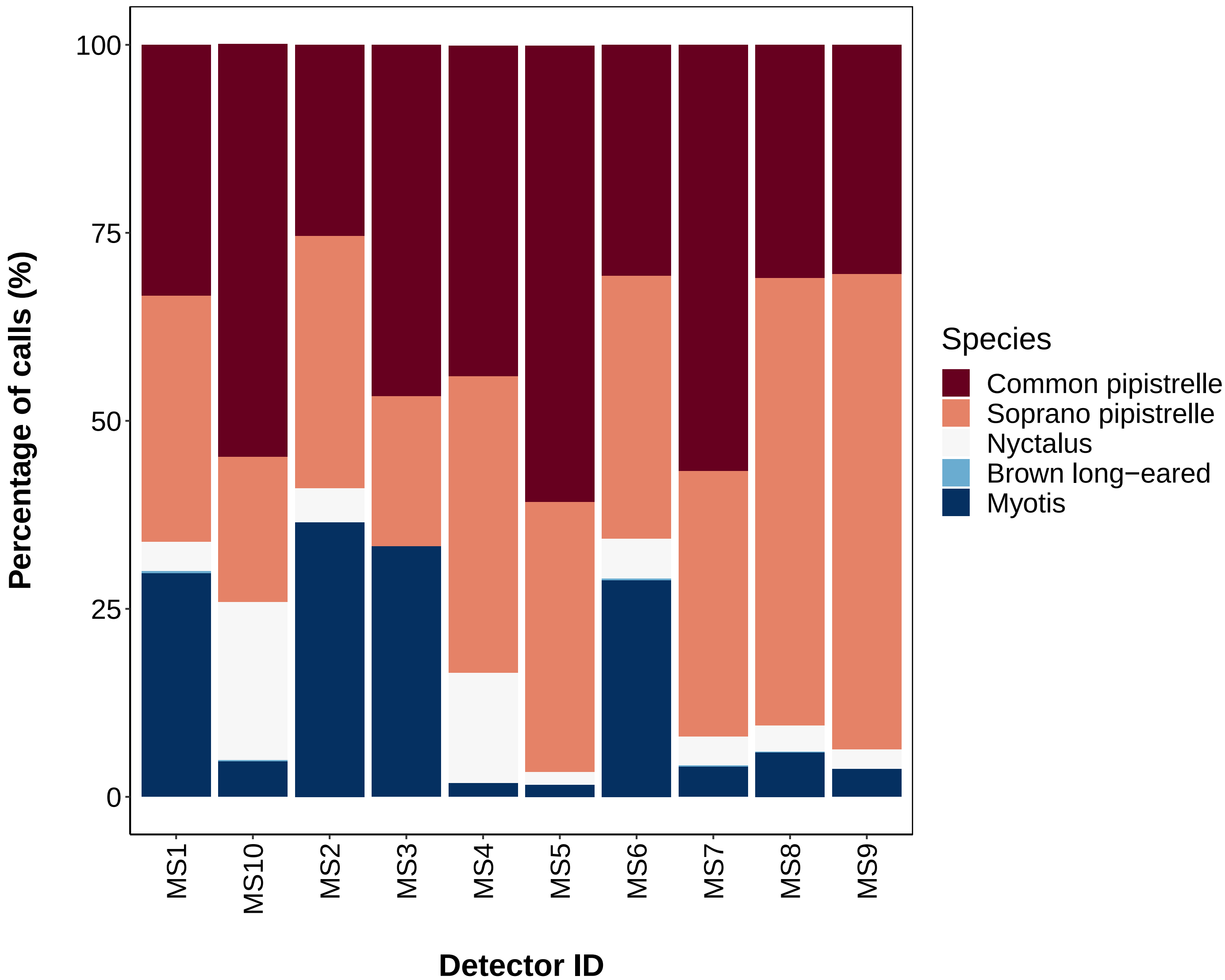
Table 15. The number of passes recorded for each species at each detector.

Species	Detector ID	Count (No)	Percentage by Detector (%)
Common pipistrelle	MS1	581	33.4
Common pipistrelle	MS10	1755	54.9
Common pipistrelle	MS2	366	25.4
Common pipistrelle	MS3	7	46.7
Common pipistrelle	MS4	48	44.0
Common pipistrelle	MS5	2284	60.7
Common pipistrelle	MS6	532	30.7
Common pipistrelle	MS7	3053	56.7
Common pipistrelle	MS8	875	31.0
Common pipistrelle	MS9	715	30.5
Soprano pipistrelle	MS1	569	32.7
Soprano pipistrelle	MS10	617	19.3
Soprano pipistrelle	MS2	485	33.6
Soprano pipistrelle	MS3	3	20.0
Soprano pipistrelle	MS4	43	39.4
Soprano pipistrelle	MS5	1351	35.9
Soprano pipistrelle	MS6	607	35.0
Soprano pipistrelle	MS7	1903	35.3
Soprano pipistrelle	MS8	1680	59.5
Soprano pipistrelle	MS9	1481	63.2
Nyctalus	MS1	68	3.9
Nyctalus	MS10	672	21.0
Nyctalus	MS2	65	4.5
Nyctalus	MS4	16	14.7
Nyctalus	MS5	64	1.7
Nyctalus	MS6	92	5.3
Nyctalus	MS7	205	3.8
Nyctalus	MS8	99	3.5
Nyctalus	MS9	62	2.6

Species	Detector ID	Count (No)	Percentage by Detector (%)
Brown long-eared	MS1	6	0.3
Brown long-eared	MS10	5	0.2
Brown long-eared	MS6	4	0.2
Brown long-eared	MS7	10	0.2
Brown long-eared	MS8	2	0.1
Brown long-eared	MS9	1	0.0
Myotis	MS1	517	29.7
Myotis	MS10	150	4.7
Myotis	MS2	527	36.5
Myotis	MS3	5	33.3
Myotis	MS4	2	1.8
Myotis	MS5	62	1.6
Myotis	MS6	499	28.8
Myotis	MS7	218	4.0
Myotis	MS8	167	5.9
Myotis	MS9	86	3.7

Species Composition

Figure 10. Percentage species composition of passes at each detector.



PART 2a: Presence Only

THE NEXT SECTION OF THE REPORT FEATURES THE RAW DATA SUPPLIED TO ECOBAT AND ONLY TAKES INTO ACCOUNT THE PRESENCE, AND NOT THE ABSENCE, OF EACH BAT SPECIES. FOR EACH NIGHT, THERE IS NO 'ZERO DATA' FOR WHEN SPECIES WERE NOT DETECTED.

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

Table 16. The median Nightly Pass Rate (bat passes per hour, per night) of each species. If NA, then no bat passes.

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. For further information see: *Lintott, P. R., & Mathews, F. (2018). Basic mathematical errors may make ecological assessments unreliable. Biodiversity and Conservation, 27(1), 265-267.* https://doi.org/10.1007/s10531-017-1418-5

Species	Detector ID	Median Pass Rate
Common pipistrelle	MS1	1.2
Common pipistrelle	MS10	4.0
Common pipistrelle	MS2	4.3
Common pipistrelle	MS3	0.2
Common pipistrelle	MS4	0.4
Common pipistrelle	MS5	22.9
Common pipistrelle	MS6	3.1
Common pipistrelle	MS7	4.5
Common pipistrelle	MS8	3.3
Common pipistrelle	MS9	3.8
Soprano pipistrelle	MS1	3.0
Soprano pipistrelle	MS10	2.1
Soprano pipistrelle	MS2	4.3
Soprano pipistrelle	MS3	0.2
Soprano pipistrelle	MS4	0.4
Soprano pipistrelle	MS5	9.3
Soprano pipistrelle	MS6	4.3
Soprano pipistrelle	MS7	4.0
Soprano pipistrelle	MS8	6.8
Soprano pipistrelle	MS9	7.4
Nyctalus	MS1	0.7
Nyctalus	MS10	2.2
Nyctalus	MS2	0.5
Nyctalus	MS4	0.6
Nyctalus	MS5	0.7
Nyctalus	MS6	0.6
Nyctalus	MS7	0.8
Nyctalus	MS8	0.4
Nyctalus	MS9	0.3
Brown long-eared	MS1	0.2
Brown long-eared	MS10	0.1
Brown long-eared	MS6	0.1
Brown long-eared	MS7	0.1
Brown long-eared	MS8	0.1
Brown long-eared	MS9	0.1
Myotis	MS1	2.9
Myotis	MS10	0.5
Myotis	MS2	5.2
Myotis	MS3	0.1
Myotis	MS4	0.1
Myotis	MS5	0.7
Myotis	MS6	4.6
Myotis	MS7	0.8
Myotis	MS8	0.5

Species	Detector ID	Median Pass Rate
Myotis	MS9	0.5

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

Table 17. The mean Nightly Pass Rate (bat passes per hour, per night) of each species at each detector. Values are given to 1 decimal place.

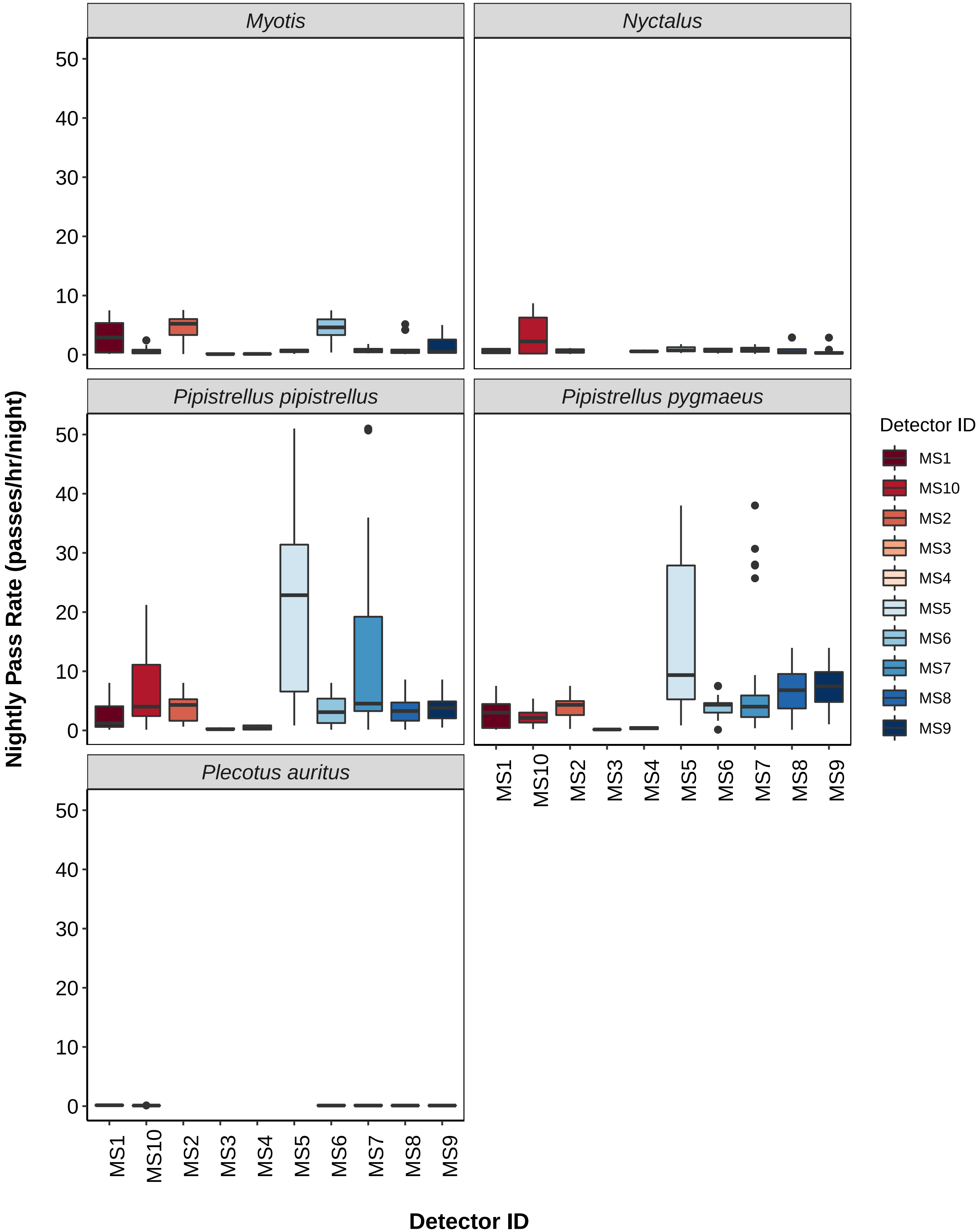
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

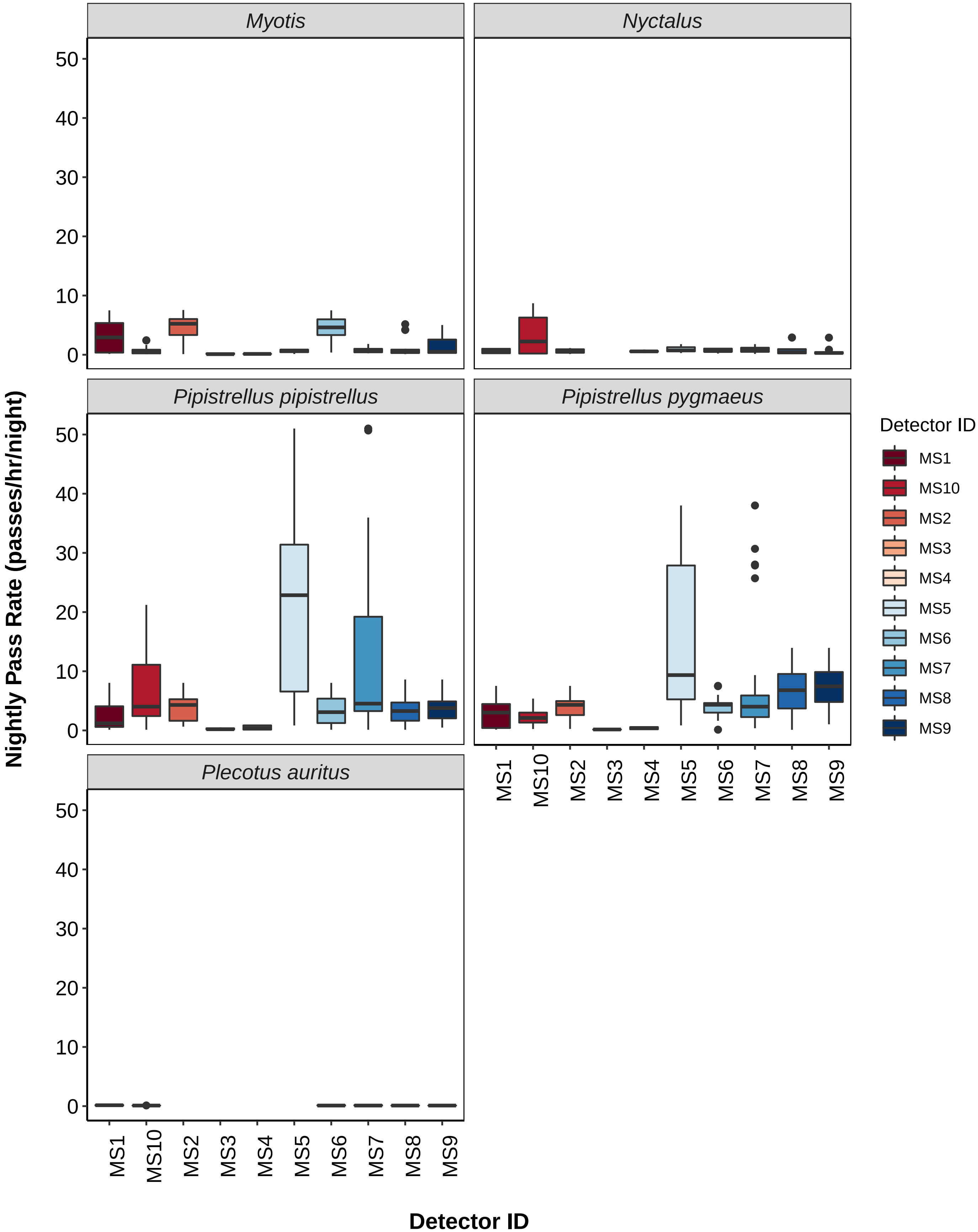
Species	Detector ID	Mean Pass Rate
Common pipistrelle	MS1	2.4
Common pipistrelle	MS10	7.5
Common pipistrelle	MS2	4.1
Common pipistrelle	MS3	0.3
Common pipistrelle	MS4	0.5
Common pipistrelle	MS5	21.7
Common pipistrelle	MS6	3.4
Common pipistrelle	MS7	12.2
Common pipistrelle	MS8	3.2
Common pipistrelle	MS9	3.8
Soprano pipistrelle	MS1	2.9
Soprano pipistrelle	MS10	2.3
Soprano pipistrelle	MS2	4.1
Soprano pipistrelle	MS3	0.2
Soprano pipistrelle	MS4	0.4
Soprano pipistrelle	MS5	14.8
Soprano pipistrelle	MS6	4.1
Soprano pipistrelle	MS7	7.9
Soprano pipistrelle	MS8	6.5
Soprano pipistrelle	MS9	7.5
Nyctalus	MS1	0.6
Nyctalus	MS10	3.0
Nyctalus	MS2	0.6
Nyctalus	MS4	0.6
Nyctalus	MS5	1.0
Nyctalus	MS6	0.7
Nyctalus	MS7	0.9
Nyctalus	MS8	0.8
Nyctalus	MS9	0.5
Brown long-eared	MS1	0.2
Brown long-eared	MS10	0.1
Brown long-eared	MS6	0.1
Brown long-eared	MS7	0.1
Brown long-eared	MS8	0.1
Brown long-eared	MS9	0.1
Myotis	MS1	2.9
Myotis	MS10	0.7
Myotis	MS2	4.5
Myotis	MS3	0.2
Myotis	MS4	0.1
Myotis	MS5	0.6
Myotis	MS6	4.2
Myotis	MS7	0.8
Myotis	MS8	1.0
Myotis	MS9	1.7

Nightly Bat Passes (Bat passes per hour)

Per Detector - Figures

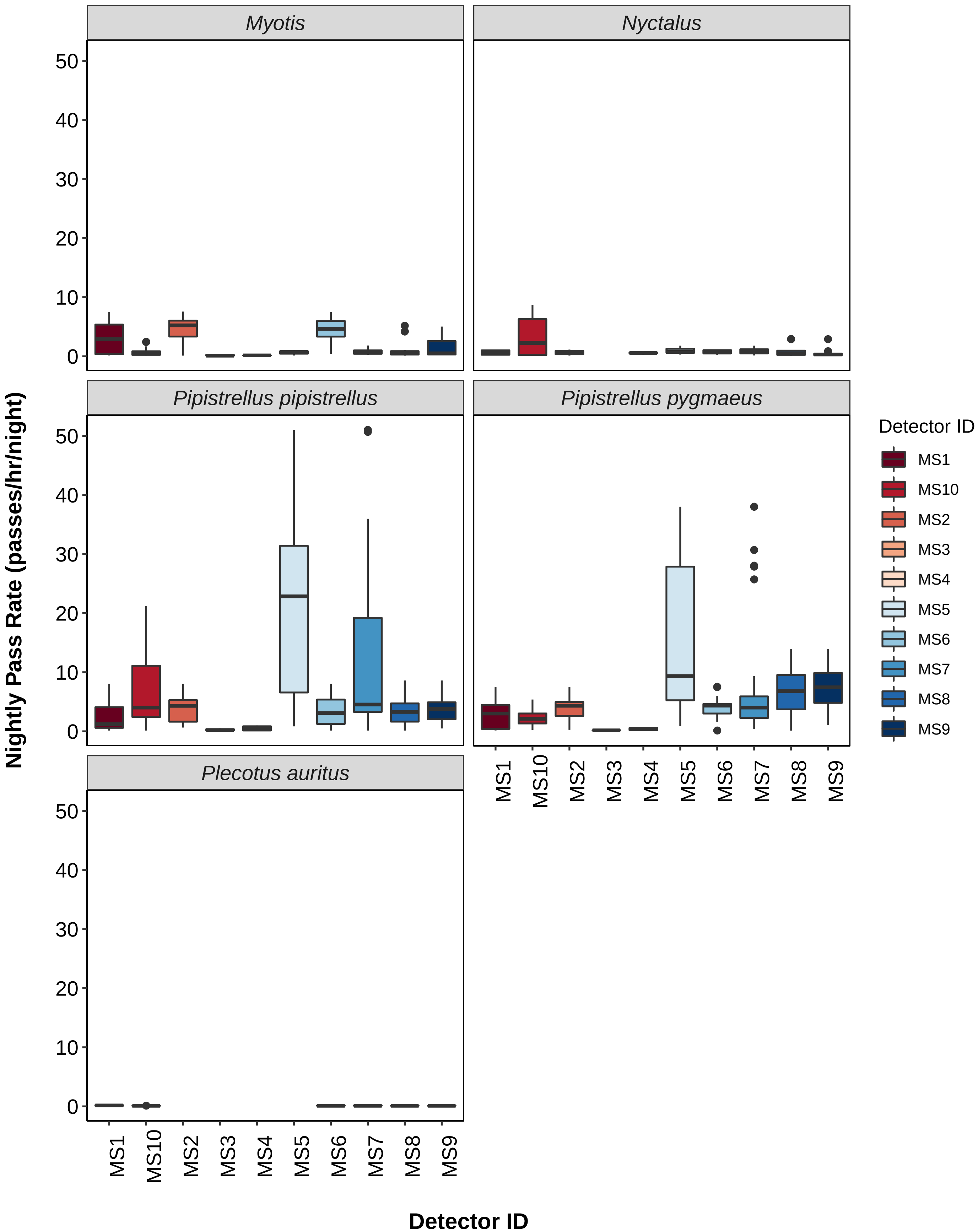
Figure 11. Boxplots for the number of bat passes per hour each night, for each detector. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent the ranges for the bottom 25% and the top 25% of the data values, excluding outliers. An outlier is any extreme value that lies further away from the box than 1.5 times the interquartile range. Outliers are shown as dots. Where very few passes are recorded it is not possible to produce the box, so the data are shown as a line.


Myotis
Nyctalus
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
0
10
20
30
40
50
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Nightly Pass Rate (passes/hr/night)
Detector ID
Detector ID
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9



Myotis
Nyctalus
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
Detector ID
0
10
20
30
40
50
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID

[[1]]



Myotis
Nyctalus
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
0
10
20
30
40
50
Nightly Pass Rate (passes/hr/night)
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID

SPLIT BY MONTH

Total Bat Passes per Detector, each Month

Per Detector

Table 18. The total number of bat passes of each species in each month at each detector. This table simply tells you how many bats of each species were recorded passing each detector during each month. These numbers are not standardised by the night length, or how many nights each detector was active for during each month.

Species	Detector ID	May	Jul	Aug	Sep
Common pipistrelle	MS1	8	42	484	47
Common pipistrelle	MS10	71	1261	338	85
Common pipistrelle	MS2	5	0	344	17
Common pipistrelle	MS3	5	0	2	0
Common pipistrelle	MS4	0	40	8	0
Common pipistrelle	MS5	55	2229	0	0
Common pipistrelle	MS6	7	0	482	43
Common pipistrelle	MS7	82	2501	366	104
Common pipistrelle	MS8	37	359	391	88
Common pipistrelle	MS9	0	258	391	66
Soprano pipistrelle	MS1	4	13	457	95
Soprano pipistrelle	MS10	24	188	298	107
Soprano pipistrelle	MS2	2	0	392	91
Soprano pipistrelle	MS3	1	0	2	0
Soprano pipistrelle	MS4	0	29	13	1
Soprano pipistrelle	MS5	20	1331	0	0
Soprano pipistrelle	MS6	1	0	498	108
Soprano pipistrelle	MS7	30	1402	380	91
Soprano pipistrelle	MS8	5	570	863	242
Soprano pipistrelle	MS9	0	512	765	204
Nyctalus	MS1	0	13	52	3
Nyctalus	MS10	388	263	16	5
Nyctalus	MS2	1	0	57	7
Nyctalus	MS4	0	16	0	0
Nyctalus	MS5	31	33	0	0
Nyctalus	MS6	4	0	81	7
Nyctalus	MS7	29	71	95	10
Nyctalus	MS8	0	27	70	2
Nyctalus	MS9	0	13	46	3
Brown long-eared	MS1	0	0	5	1
Brown long-eared	MS10	1	0	3	1
Brown long-eared	MS6	0	0	4	0
Brown long-eared	MS7	0	1	8	1
Brown long-eared	MS8	0	0	2	0
Brown long-eared	MS9	0	0	1	0
Myotis	MS1	9	4	436	68
Myotis	MS10	51	9	52	38
Myotis	MS2	0	0	470	57
Myotis	MS3	3	0	0	2
Myotis	MS4	0	2	0	0
Myotis	MS5	11	51	0	0
Myotis	MS6	3	0	446	50
Myotis	MS7	10	60	120	28
Myotis	MS8	12	110	39	6
Myotis	MS9	0	63	23	0

Survey Effort

Table 19. The number of survey nights per month per detector.

Month	Detector ID	No. of Survey Nights
May	MS1	5
May	MS10	8
May	MS2	2
May	MS3	2
May	MS5	5
May	MS6	3
May	MS7	8
May	MS8	9
Jul	MS1	10
Jul	MS10	14
Jul	MS4	9
Jul	MS5	11
Jul	MS7	14
Jul	MS8	13
Jul	MS9	11
Aug	MS1	10
Aug	MS10	10
Aug	MS2	10
Aug	MS3	2
Aug	MS4	6
Aug	MS6	10
Aug	MS7	10
Aug	MS8	10
Aug	MS9	8
Sep	MS1	4
Sep	MS10	4
Sep	MS2	4
Sep	MS3	2
Sep	MS4	1
Sep	MS6	4
Sep	MS7	4
Sep	MS8	4
Sep	MS9	4

Nightly Bat Pass Rate for each Month

Median Per Detector

Table 20. The median Nightly Pass Rate (bat passes per hour, per night) of each species throughout each month. If NA, then no bat passes.

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. For further information see: *Lintott, P. R., & Mathews, F. (2018). Basic mathematical errors may make ecological assessments unreliable. Biodiversity and Conservation, 27(1), 265-267.* https://doi.org/10.1007/s10531-017-1418-5

Species	Detector ID	May	Jul	Aug	Sep
Common pipistrelle	MS1	0.1	0.7	5.3	1.3
Common pipistrelle	MS10	1.7	14.2	3.8	2.1
Common pipistrelle	MS2	0.6	NA	5.2	1.6
Common pipistrelle	MS3	0.3	NA	0.2	NA
Common pipistrelle	MS4	NA	0.7	0.2	NA
Common pipistrelle	MS5	1.3	24.1	NA	NA
Common pipistrelle	MS6	0.1	NA	5.3	1.3
Common pipistrelle	MS7	1.3	23.4	3.5	2.7
Common pipistrelle	MS8	0.6	4.5	4.2	2.1
Common pipistrelle	MS9	NA	3.9	4.2	1.7
Soprano pipistrelle	MS1	0.2	0.4	4.4	2.1
Soprano pipistrelle	MS10	0.8	1.5	3.0	2.4
Soprano pipistrelle	MS2	0.3	NA	4.4	2.6
Soprano pipistrelle	MS3	0.1	NA	0.2	NA
Soprano pipistrelle	MS4	NA	0.6	0.2	0.1
Soprano pipistrelle	MS5	1.3	9.4	NA	NA
Soprano pipistrelle	MS6	0.1	NA	4.4	2.1
Soprano pipistrelle	MS7	1.1	7.4	3.8	1.9
Soprano pipistrelle	MS8	0.2	5.8	9.2	5.2
Soprano pipistrelle	MS9	NA	5.8	9.2	5.0
Nyctalus	MS1	NA	0.1	1.0	0.3
Nyctalus	MS10	7.4	3.1	0.2	0.2
Nyctalus	MS2	0.1	NA	0.7	0.3
Nyctalus	MS4	NA	0.6	NA	NA
Nyctalus	MS5	1.8	0.7	NA	NA
Nyctalus	MS6	0.5	NA	1.0	0.3
Nyctalus	MS7	0.7	1.1	0.9	0.3
Nyctalus	MS8	NA	0.6	0.3	0.2
Nyctalus	MS9	NA	0.4	0.3	0.1
Brown long-eared	MS1	NA	NA	0.2	0.1
Brown long-eared	MS10	0.1	NA	0.1	0.1
Brown long-eared	MS6	NA	NA	0.1	NA
Brown long-eared	MS7	NA	0.1	0.1	0.1
Brown long-eared	MS8	NA	NA	0.1	NA
Brown long-eared	MS9	NA	NA	0.1	NA
Myotis	MS1	0.4	0.1	5.7	1.8
Myotis	MS10	0.6	0.2	0.6	0.9
Myotis	MS2	NA	NA	6.0	0.7
Myotis	MS3	0.4	NA	NA	0.1
Myotis	MS4	NA	0.1	NA	NA
Myotis	MS5	0.4	0.8	NA	NA
Myotis	MS6	0.4	NA	5.5	2.4
Myotis	MS7	0.2	0.8	1.3	0.6
Myotis	MS8	0.4	0.9	0.5	0.3

Species	Detector ID	May	Jul	Aug	Sep
Myotis	MS9	NA	4.6	0.3	NA

Nightly Bat Pass Rate for each Month

Mean per Detector

Table 21: The mean Nightly Pass Rate (bat passes per hour, per night) of each species throughout each month. Values are given to 1 decimal place.

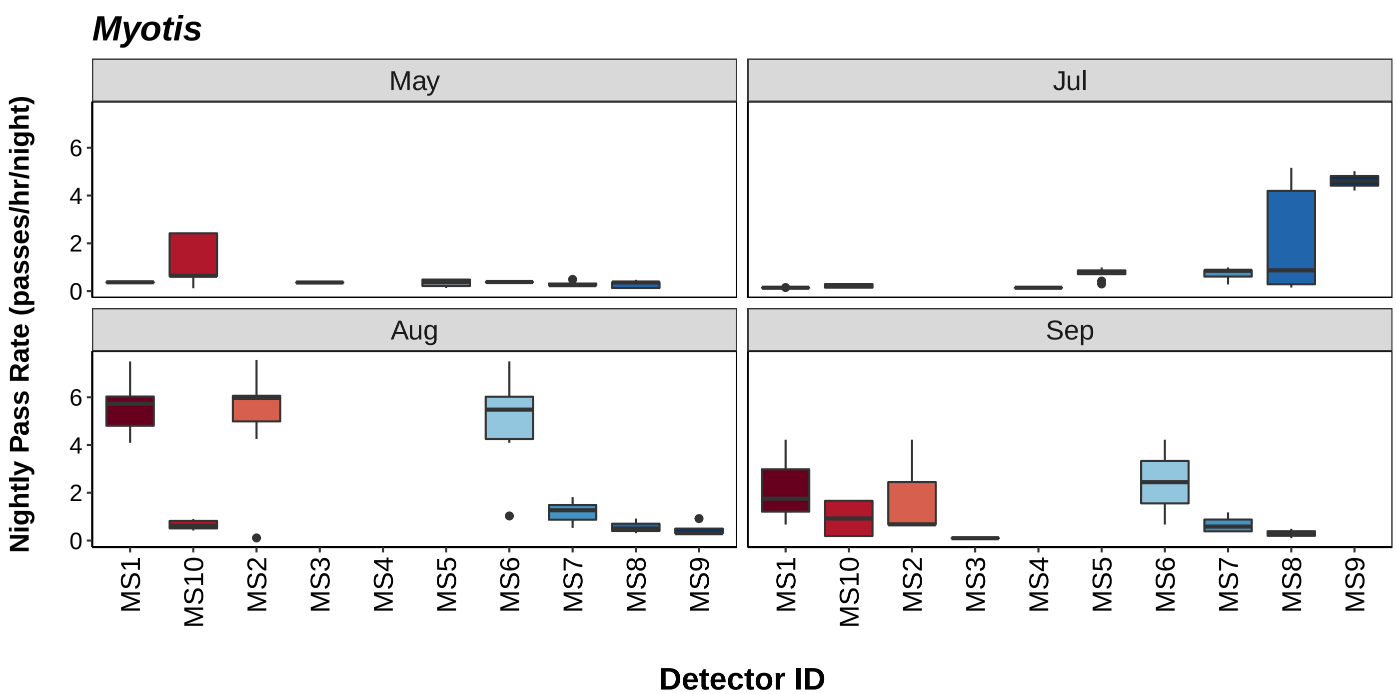
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

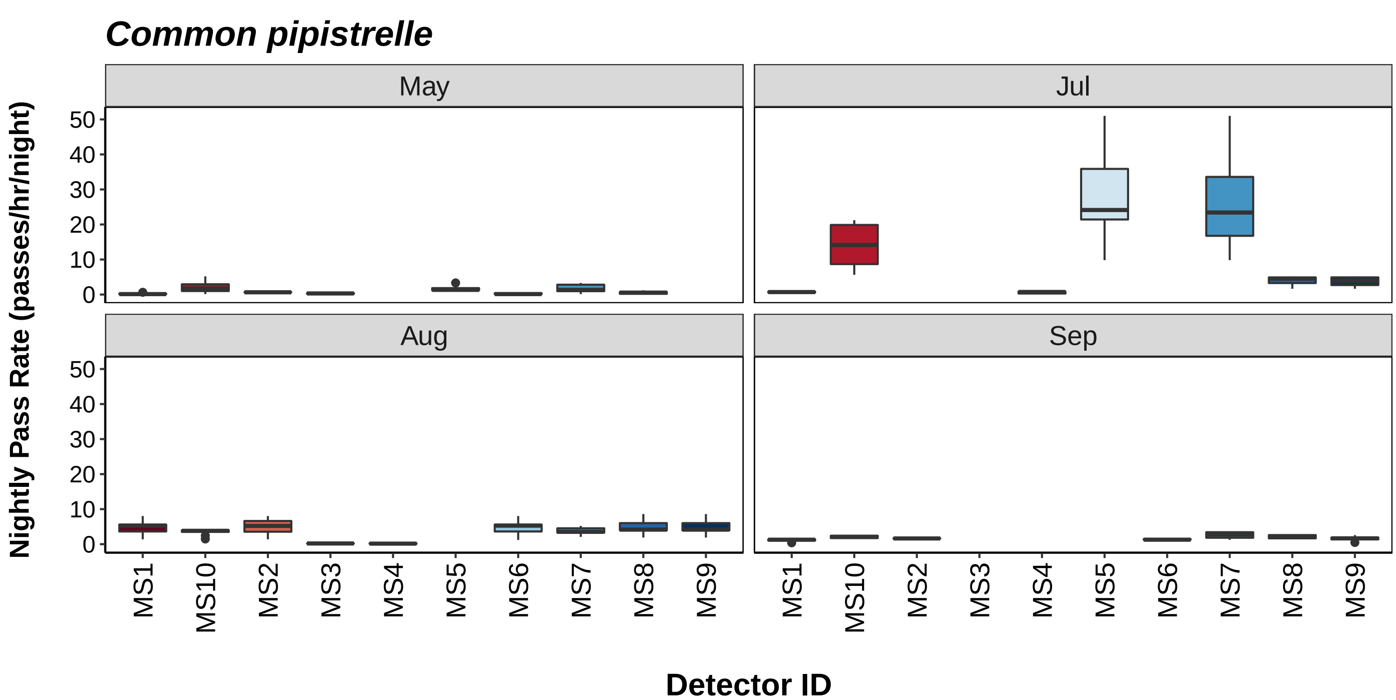
Species	Detector ID	May	Jul	Aug	Sep
Common pipistrelle	MS1	0.3	0.7	5.0	1.1
Common pipistrelle	MS10	2.2	14.0	3.5	2.1
Common pipistrelle	MS2	0.6	NA	5.0	1.6
Common pipistrelle	MS3	0.3	NA	0.2	NA
Common pipistrelle	MS4	NA	0.6	0.2	NA
Common pipistrelle	MS5	1.7	28.9	NA	NA
Common pipistrelle	MS6	0.3	NA	4.9	1.4
Common pipistrelle	MS7	1.7	25.6	3.7	2.5
Common pipistrelle	MS8	0.6	4.0	5.0	2.1
Common pipistrelle	MS9	NA	3.7	5.0	1.6
Soprano pipistrelle	MS1	0.2	0.4	5.2	2.3
Soprano pipistrelle	MS10	0.8	2.1	3.0	2.6
Soprano pipistrelle	MS2	0.3	NA	5.0	3.0
Soprano pipistrelle	MS3	0.1	NA	0.2	NA
Soprano pipistrelle	MS4	NA	0.5	0.3	0.1
Soprano pipistrelle	MS5	1.3	17.3	NA	NA
Soprano pipistrelle	MS6	0.1	NA	5.1	2.6
Soprano pipistrelle	MS7	0.9	14.3	3.9	2.2
Soprano pipistrelle	MS8	0.2	6.3	8.8	5.9
Soprano pipistrelle	MS9	NA	6.7	9.8	5.0
Nyctalus	MS1	NA	0.4	0.9	0.3
Nyctalus	MS10	6.8	3.4	0.2	0.2
Nyctalus	MS2	0.1	NA	0.7	0.3
Nyctalus	MS4	NA	0.6	NA	NA
Nyctalus	MS5	1.3	0.8	NA	NA
Nyctalus	MS6	0.5	NA	0.8	0.3
Nyctalus	MS7	0.9	0.9	1.0	0.3
Nyctalus	MS8	NA	0.6	1.0	0.2
Nyctalus	MS9	NA	0.5	0.7	0.1
Brown long-eared	MS1	NA	NA	0.2	0.1
Brown long-eared	MS10	0.1	NA	0.1	0.1
Brown long-eared	MS6	NA	NA	0.1	NA
Brown long-eared	MS7	NA	0.1	0.1	0.1
Brown long-eared	MS8	NA	NA	0.1	NA
Brown long-eared	MS9	NA	NA	0.1	NA
Myotis	MS1	0.4	0.1	5.5	2.2
Myotis	MS10	1.2	0.2	0.7	0.9
Myotis	MS2	NA	NA	5.3	1.9
Myotis	MS3	0.4	NA	NA	0.1
Myotis	MS4	NA	0.1	NA	NA
Myotis	MS5	0.3	0.7	NA	NA
Myotis	MS6	0.4	NA	5.0	2.4
Myotis	MS7	0.3	0.7	1.2	0.7
Myotis	MS8	0.3	2.0	0.6	0.3
Myotis	MS9	NA	4.6	0.5	NA

Nightly Bat Pass Rate for each Month

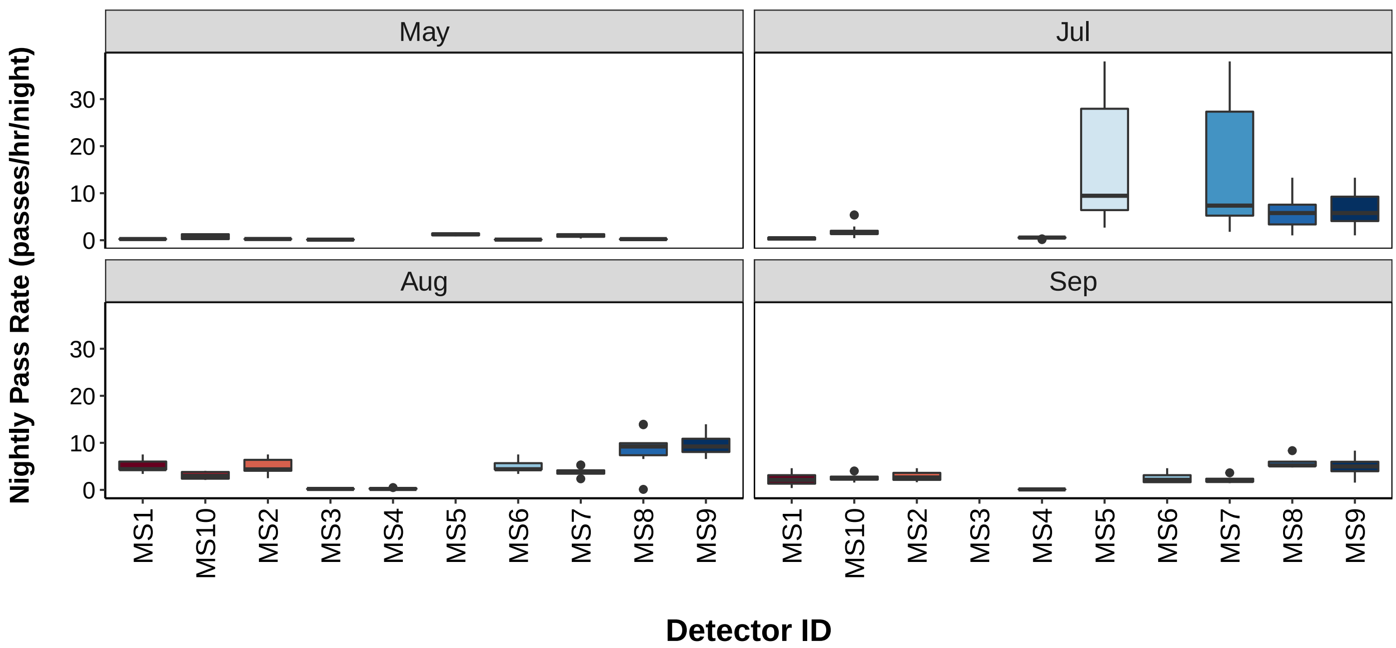
Per Detector - Figures

Figure 12. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent the ranges for the bottom 25% and the top 25% of the data values, excluding outliers. An outlier is any extreme value that lies further away from the box than 1.5 times the interquartile range. Outliers are shown as dots. Where very few passes are recorded it is not possible to produce the box, so the data are shown as a line.

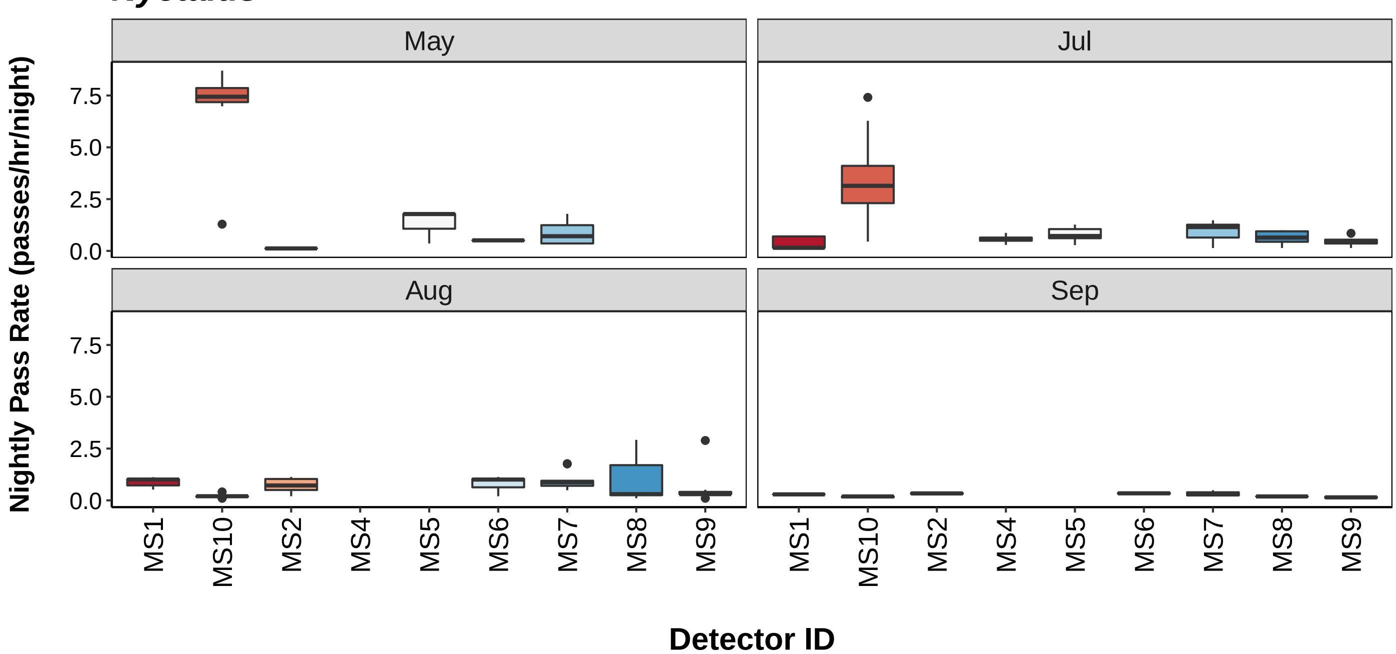


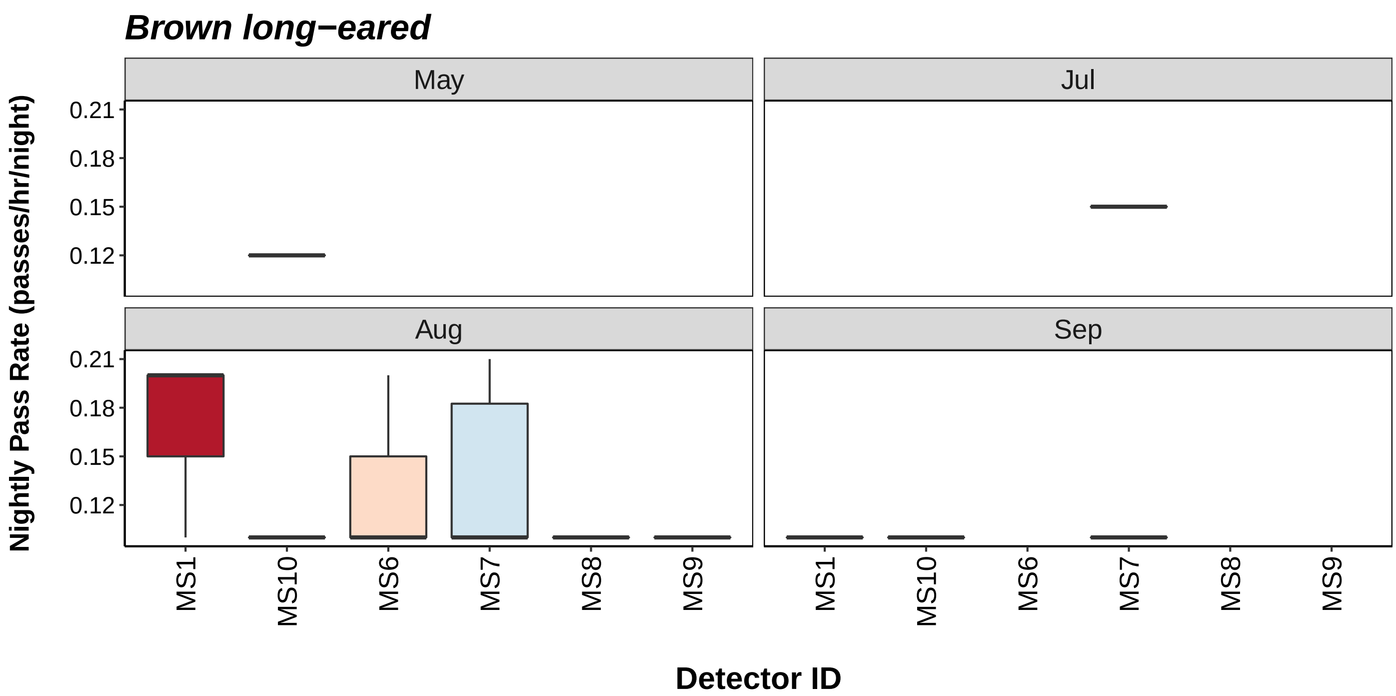


Soprano pipistrelle



Nyctalus




Brown long−eared
May
Jul
Aug
Sep
Nightly Pass Rate (passes/hr/night)
0.21
0.18
0.15
0.12
MS1
MS10
MS6
MS7
MS8
MS9
Detector ID

Bat Activity per Detector Location

Figure 13. Detector ID reference:

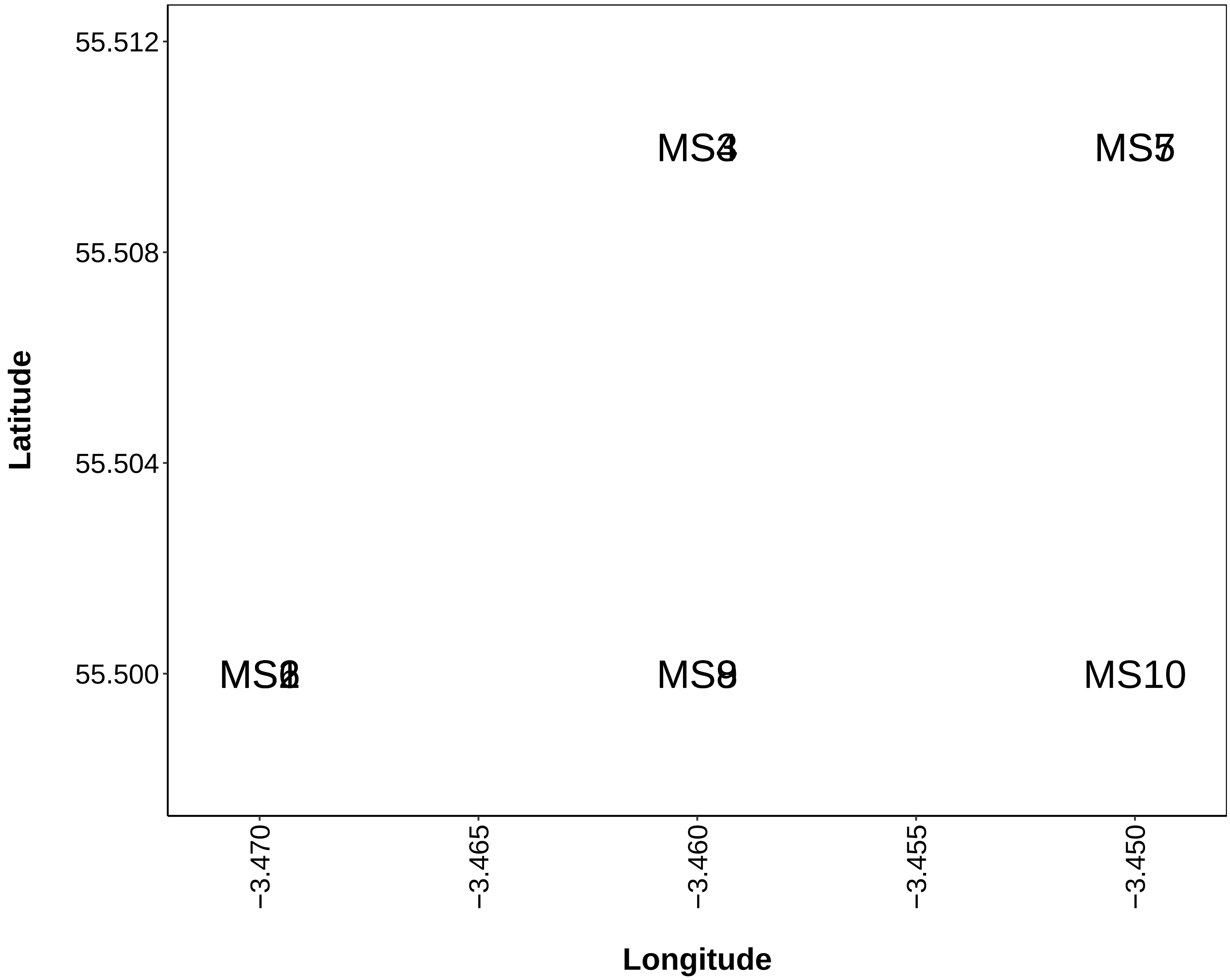
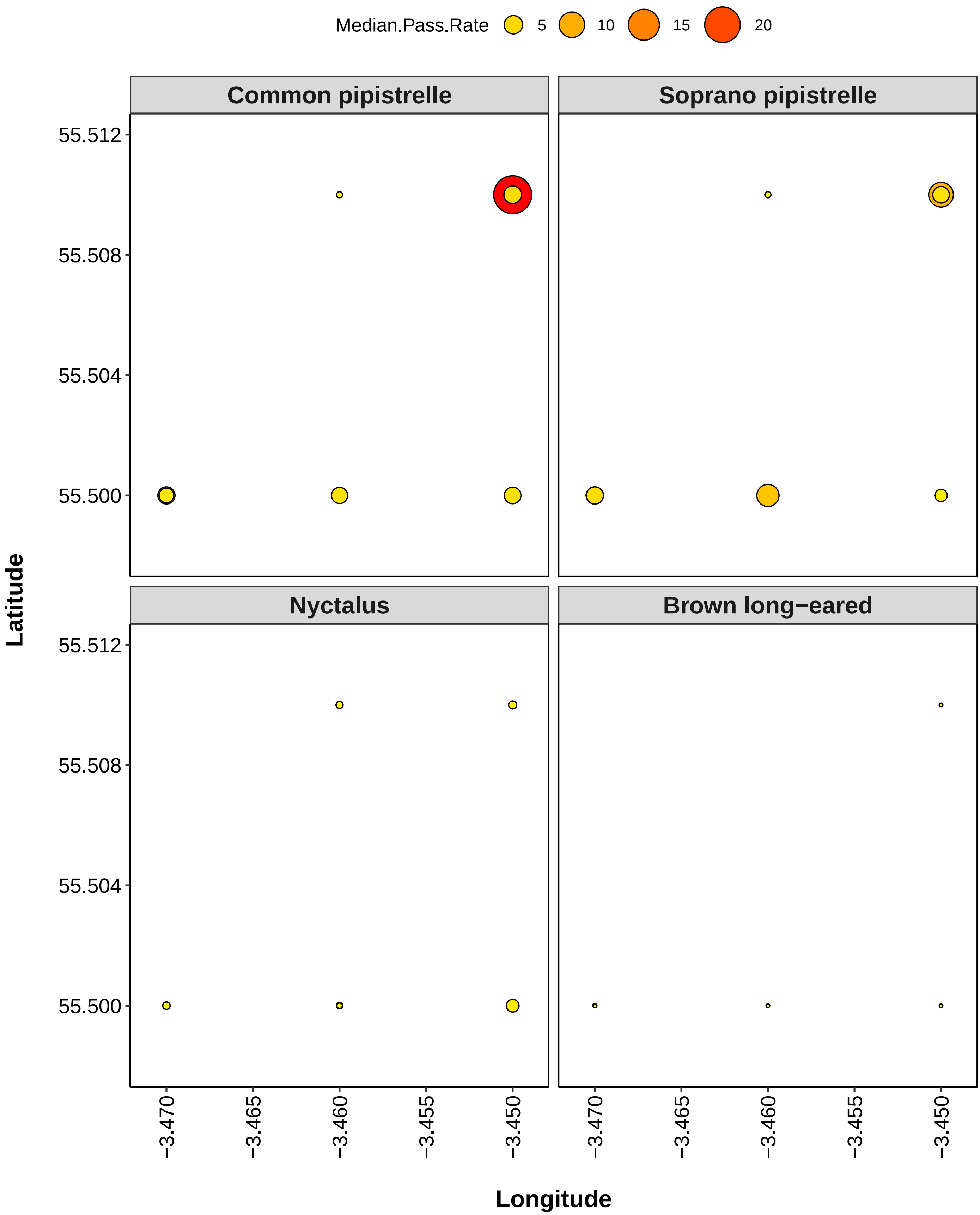


Figure 14. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.



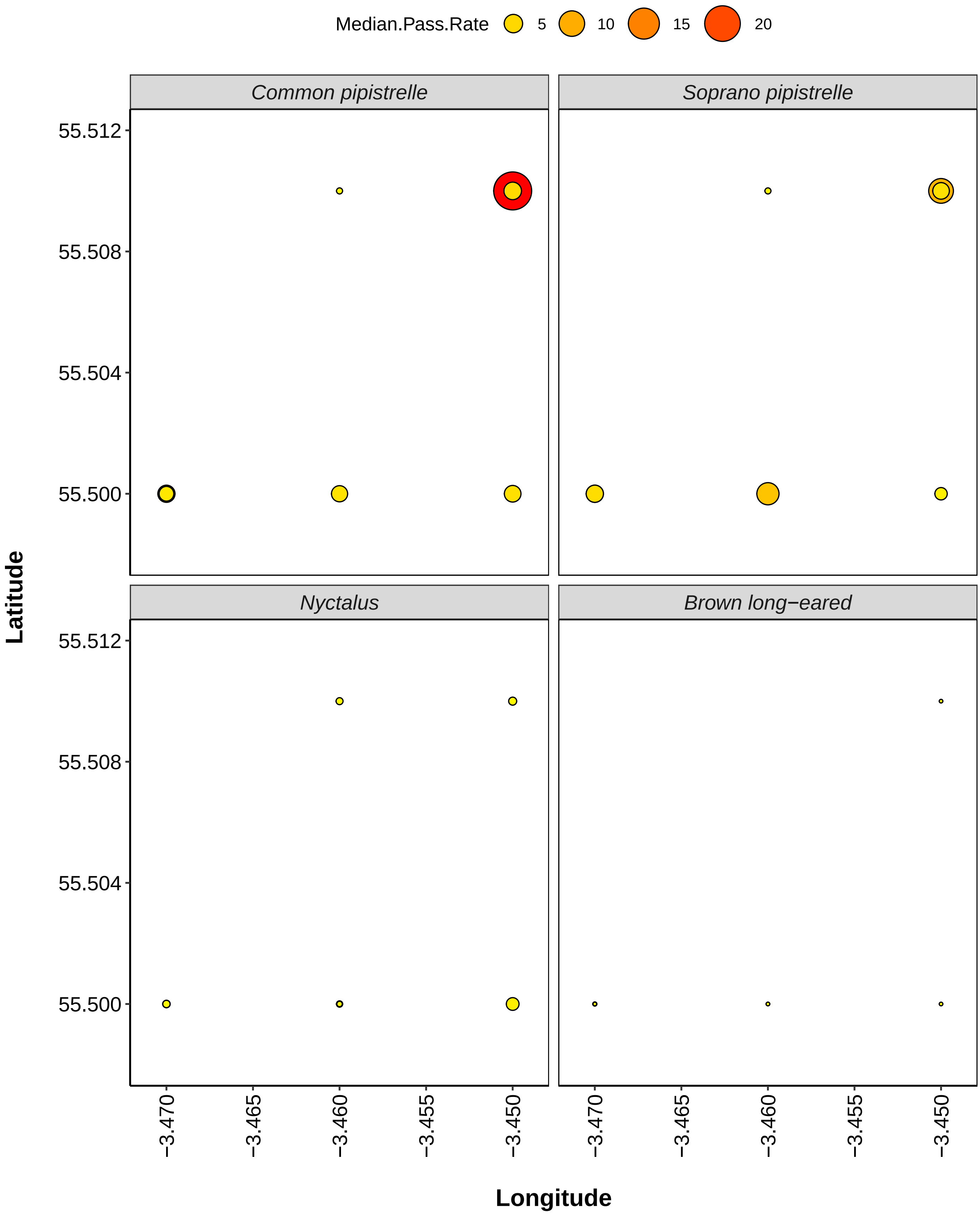
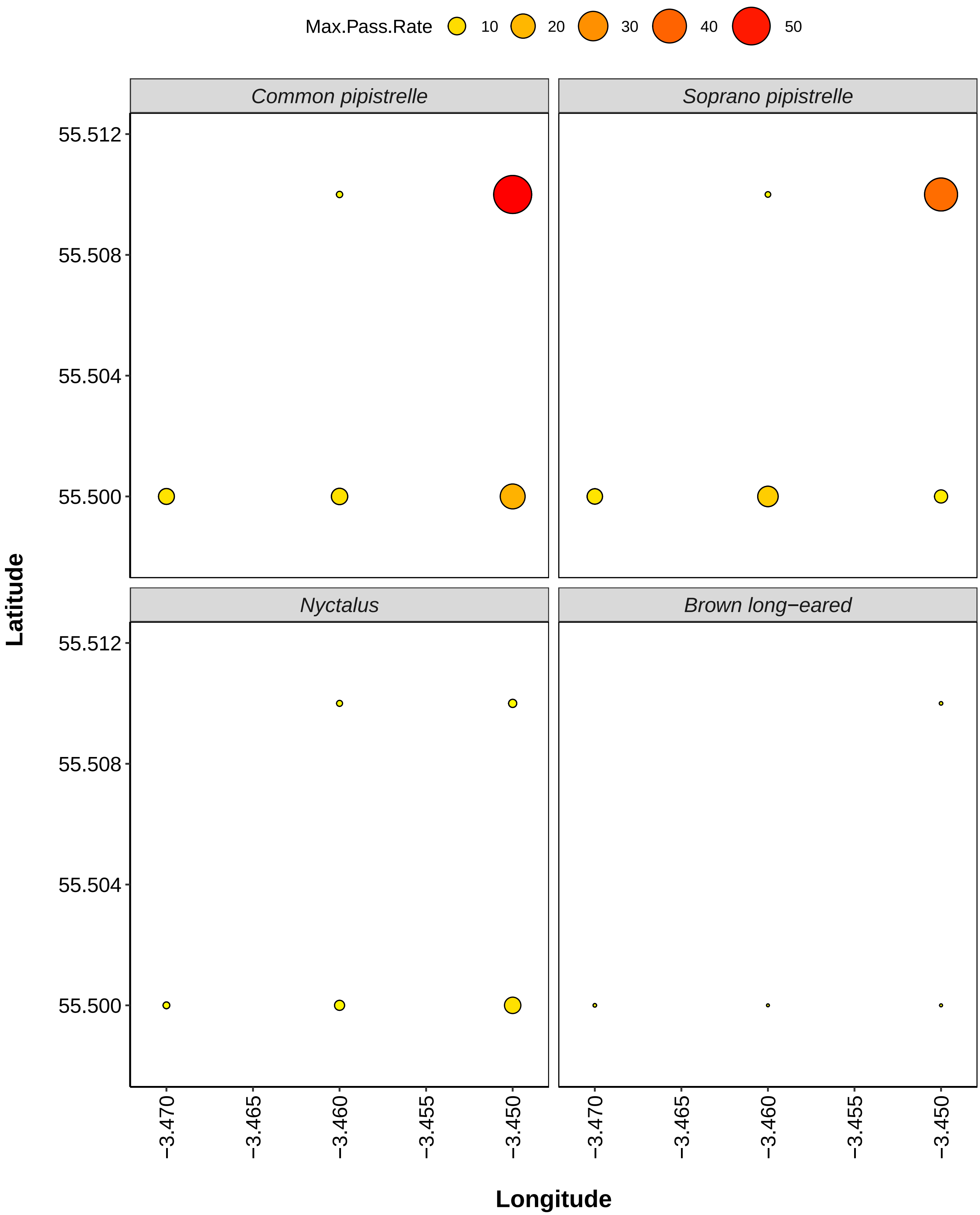

Median.Pass.Rate
5
10
15
20
Common pipistrelle
Soprano pipistrelle
Nyctalus
Brown long−eared
Latitude
55.512
55.508
55.504
55.500
Longitude
−3.470
−3.465
−3.460
−3.455
−3.450

Figure 15. Maximum Nightly Pass Rate (bat passes/hr/night) recorded in a single night throughout the survey period - represented by the size and colour of the point at each detector location.



PART 2B: Includes absences

THE NEXT SECTION OF THE REPORT FEATURES THE DATA SUPPLIED TO ECOBAT BUT TAKES INTO ACCOUNT SPECIES ABSENCES, AND THEREFORE INCLUDES 'ZERO DATA' FOR WHEN SPECIES WERE NOT DETECTED AT EACH DETECTOR ON A NIGHT. THIS DRAMATICALLY LOWERS THE MEANS AND MEDIANS OF THE DATA PRESENTED.

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

Table 22. The median Nightly Pass Rate (bat passes per hour, per night) of each species. If NA, then no bat passes.

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. For further information see: *Lintott, P. R., & Mathews, F. (2018). Basic mathematical errors may make ecological assessments unreliable. Biodiversity and Conservation, 27(1), 265-267.* https://doi.org/10.1007/s10531-017-1418-5

Species	Detector ID	Median Pass Rate
Brown long-eared	MS1	0.0
Brown long-eared	MS10	0.0
Brown long-eared	MS2	0.0
Brown long-eared	MS3	0.0
Brown long-eared	MS4	0.0
Brown long-eared	MS5	0.0
Brown long-eared	MS6	0.0
Brown long-eared	MS7	0.0
Brown long-eared	MS8	0.0
Brown long-eared	MS9	0.0
Common pipistrelle	MS1	1.1
Common pipistrelle	MS10	3.8
Common pipistrelle	MS2	1.0
Common pipistrelle	MS3	0.1
Common pipistrelle	MS4	0.2
Common pipistrelle	MS5	21.4
Common pipistrelle	MS6	2.8
Common pipistrelle	MS7	4.1
Common pipistrelle	MS8	2.6
Common pipistrelle	MS9	3.5
Myotis	MS1	0.1
Myotis	MS10	0.2
Myotis	MS2	4.2
Myotis	MS3	0.0
Myotis	MS4	0.0
Myotis	MS5	0.6
Myotis	MS6	4.1
Myotis	MS7	0.8
Myotis	MS8	0.2
Myotis	MS9	0.0
Nyctalus	MS1	0.0
Nyctalus	MS10	0.4
Nyctalus	MS2	0.3
Nyctalus	MS3	0.0
Nyctalus	MS4	0.0
Nyctalus	MS5	0.3
Nyctalus	MS6	0.5
Nyctalus	MS7	0.7
Nyctalus	MS8	0.0
Nyctalus	MS9	0.1
Soprano pipistrelle	MS1	0.4
Soprano pipistrelle	MS10	1.8
Soprano pipistrelle	MS2	3.0
Soprano pipistrelle	MS3	0.0
Soprano pipistrelle	MS4	0.3

Species	Detector ID	Median Pass Rate
Soprano pipistrelle	MS5	6.4
Soprano pipistrelle	MS6	4.3
Soprano pipistrelle	MS7	3.7
Soprano pipistrelle	MS8	5.2
Soprano pipistrelle	MS9	7.4

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

Table 23. The mean Nightly Pass Rate (bat passes per hour, per night) of each species at each detector. Values are given to 1 decimal place.

We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

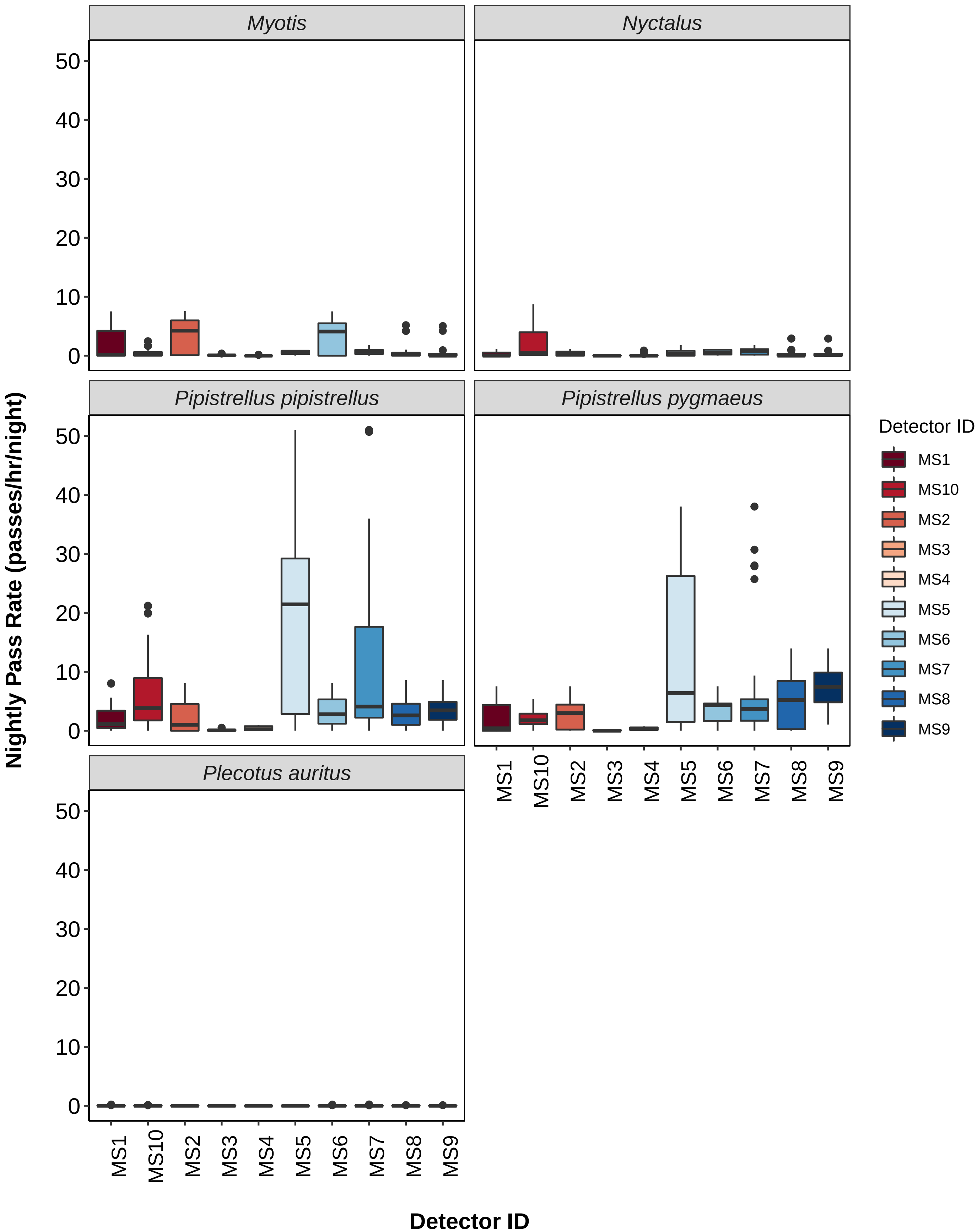
Species	Detector ID	Mean Pass Rate
Brown long-eared	MS1	0.0
Brown long-eared	MS10	0.0
Brown long-eared	MS2	0.0
Brown long-eared	MS3	0.0
Brown long-eared	MS4	0.0
Brown long-eared	MS5	0.0
Brown long-eared	MS6	0.0
Brown long-eared	MS7	0.0
Brown long-eared	MS8	0.0
Brown long-eared	MS9	0.0
Common pipistrelle	MS1	2.1
Common pipistrelle	MS10	6.5
Common pipistrelle	MS2	2.3
Common pipistrelle	MS3	0.1
Common pipistrelle	MS4	0.4
Common pipistrelle	MS5	20.3
Common pipistrelle	MS6	3.2
Common pipistrelle	MS7	11.6
Common pipistrelle	MS8	2.9
Common pipistrelle	MS9	3.6
Myotis	MS1	1.8
Myotis	MS10	0.5
Myotis	MS2	3.3
Myotis	MS3	0.1
Myotis	MS4	0.0
Myotis	MS5	0.5
Myotis	MS6	3.0
Myotis	MS7	0.7
Myotis	MS8	0.6
Myotis	MS9	0.5
Nyctalus	MS1	0.3
Nyctalus	MS10	2.4
Nyctalus	MS2	0.4
Nyctalus	MS3	0.0
Nyctalus	MS4	0.1
Nyctalus	MS5	0.5
Nyctalus	MS6	0.6
Nyctalus	MS7	0.7
Nyctalus	MS8	0.3
Nyctalus	MS9	0.3
Soprano pipistrelle	MS1	2.0
Soprano pipistrelle	MS10	2.0
Soprano pipistrelle	MS2	3.1
Soprano pipistrelle	MS3	0.1
Soprano pipistrelle	MS4	0.3
Soprano pipistrelle	MS5	12.0
Soprano pipistrelle	MS6	3.6

Species	Detector ID	Mean Pass Rate
Soprano pipistrelle	MS7	7.0
Soprano pipistrelle	MS8	5.4
Soprano pipistrelle	MS9	7.5

Nightly Bat Passes (Bat passes per hour)

Per Detector - Figures

Figure 16. Figures show boxplots for the number of bat passes per hour each night, for each detector. The ‘box’ shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The ‘whiskers’ extend from the box and represent the ranges for the bottom 25% and the top 25% of the data values, excluding outliers. An outlier is any extreme value that lies further away from the box than 1.5 times the interquartile range. Outliers are shown as dots. Where very few passes are recorded it is not possible to produce the box, so the data are shown as a line.


Myotis
Nyctalus
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
0
10
20
30
40
50
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID
Detector ID
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9

Survey Effort

Table 24. The number of nights bats were detected per month per detector.

Month	Detector ID	No of Survey Nights
May	MS1	5
May	MS10	8
May	MS2	2
May	MS3	2
May	MS5	5
May	MS6	3
May	MS7	8
May	MS8	9
Jul	MS1	10
Jul	MS10	14
Jul	MS4	9
Jul	MS5	11
Jul	MS7	14
Jul	MS8	13
Jul	MS9	11
Aug	MS1	10
Aug	MS10	10
Aug	MS2	10
Aug	MS3	2
Aug	MS4	6
Aug	MS6	10
Aug	MS7	10
Aug	MS8	10
Aug	MS9	8
Sep	MS1	4
Sep	MS10	4
Sep	MS2	4
Sep	MS3	2
Sep	MS4	1
Sep	MS6	4
Sep	MS7	4
Sep	MS8	4
Sep	MS9	4

Nightly Bat Pass Rate for each Month

Median Per Detector

Table 25. The median Nightly Pass Rate (bat passes per hour, per night) of each species throughout each month. If NA, then no bat passes.

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. For further information see: *Lintott, P. R., & Mathews, F. (2018). Basic mathematical errors may make ecological assessments unreliable. Biodiversity and Conservation, 27(1), 265-267.* https://doi.org/10.1007/s10531-017-1418-5

Species	Detector ID	Aug	Jul	May	Sep
Brown long-eared	MS1	0.0	0.0	0.0	0.0
Brown long-eared	MS10	0.0	0.0	0.0	0.0
Brown long-eared	MS2	0.0	NA	0.0	0.0
Brown long-eared	MS3	0.0	NA	0.0	0.0
Brown long-eared	MS4	0.0	0.0	NA	0.0
Brown long-eared	MS5	NA	0.0	0.0	NA
Brown long-eared	MS6	0.0	NA	0.0	0.0
Brown long-eared	MS7	0.1	0.0	0.0	0.0
Brown long-eared	MS8	0.0	0.0	0.0	0.0
Brown long-eared	MS9	0.0	0.0	NA	0.0
Common pipistrelle	MS1	5.3	0.6	0.1	1.3
Common pipistrelle	MS10	3.8	13.3	0.1	2.1
Common pipistrelle	MS2	3.5	NA	0.3	0.0
Common pipistrelle	MS3	0.1	NA	0.3	0.0
Common pipistrelle	MS4	0.1	0.7	NA	0.0
Common pipistrelle	MS5	NA	24.1	1.3	NA
Common pipistrelle	MS6	5.3	NA	0.1	1.3
Common pipistrelle	MS7	3.5	23.4	1.1	2.7
Common pipistrelle	MS8	4.1	4.5	0.5	2.1
Common pipistrelle	MS9	4.2	3.3	NA	1.7
Myotis	MS1	5.2	0.0	0.4	1.2
Myotis	MS10	0.6	0.0	0.4	0.9
Myotis	MS2	5.7	NA	0.0	0.7
Myotis	MS3	0.0	NA	0.2	0.1
Myotis	MS4	0.0	0.0	NA	0.0
Myotis	MS5	NA	0.7	0.2	NA
Myotis	MS6	5.2	NA	0.0	0.3
Myotis	MS7	1.3	0.8	0.1	0.6
Myotis	MS8	0.4	0.3	0.1	0.0
Myotis	MS9	0.3	0.0	NA	0.0
Nyctalus	MS1	0.6	0.1	0.0	0.0
Nyctalus	MS10	0.2	2.7	7.4	0.1
Nyctalus	MS2	0.6	NA	0.1	0.1
Nyctalus	MS3	0.0	NA	0.0	0.0
Nyctalus	MS4	0.0	0.0	NA	0.0
Nyctalus	MS5	NA	0.3	0.4	NA
Nyctalus	MS6	1.0	NA	0.0	0.1
Nyctalus	MS7	0.9	0.7	0.2	0.2
Nyctalus	MS8	0.3	0.0	0.0	0.0
Nyctalus	MS9	0.3	0.0	NA	0.0
Soprano pipistrelle	MS1	4.4	0.1	0.0	2.1
Soprano pipistrelle	MS10	3.0	1.5	0.1	2.4
Soprano pipistrelle	MS2	4.3	NA	0.1	2.1
Soprano pipistrelle	MS3	0.1	NA	0.1	0.0
Soprano pipistrelle	MS4	0.2	0.6	NA	0.1

Species	Detector ID	Aug	Jul	May	Sep
Soprano pipistrelle	MS5	NA	9.4	0.0	NA
Soprano pipistrelle	MS6	4.4	NA	0.0	2.1
Soprano pipistrelle	MS7	3.8	7.4	0.2	1.9
Soprano pipistrelle	MS8	9.2	5.8	0.0	5.2
Soprano pipistrelle	MS9	9.2	5.8	NA	5.0

Nightly Bat Pass Rate for each Month

Mean per Detector

Table 26. The mean Nightly Pass Rate (bat passes per hour, per night) of each species throughout each month. Values are given to 1 decimal place.

We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

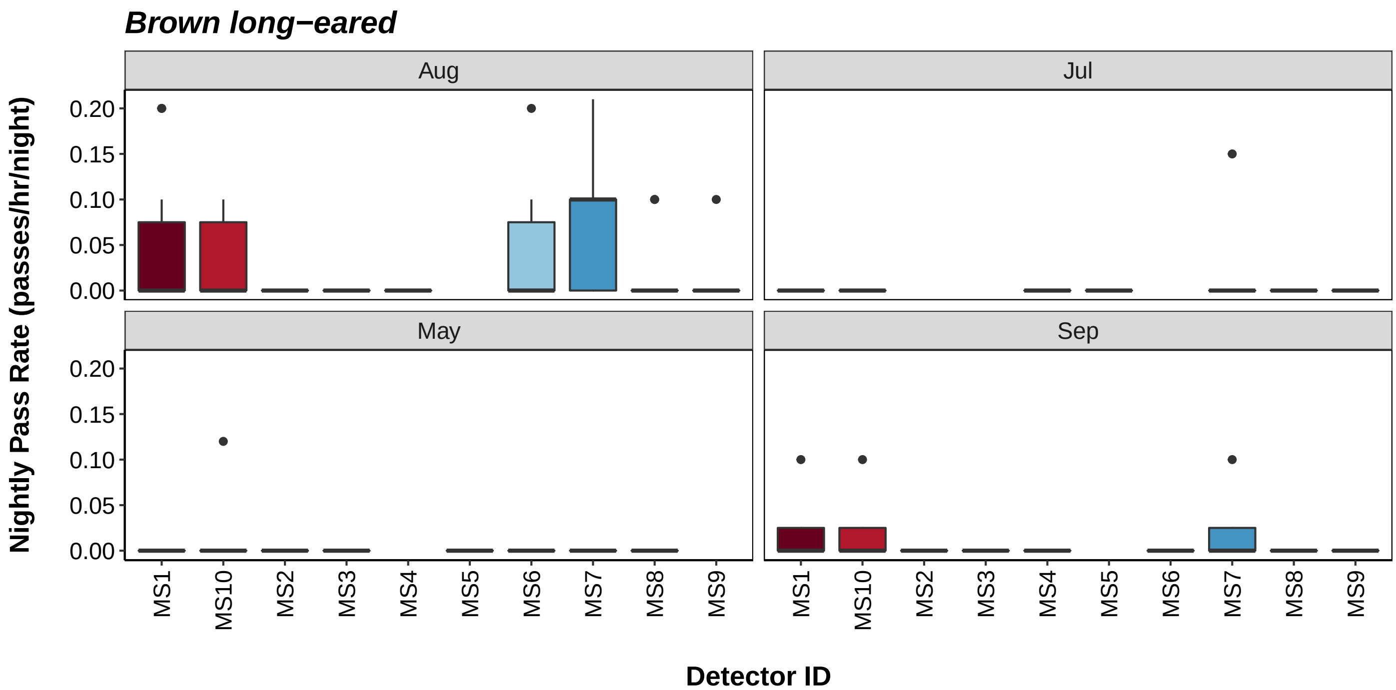
Species	Detector ID	Aug	Jul	May	Sep
Brown long-eared	MS1	0.0	0.0	0.0	0.0
Brown long-eared	MS10	0.0	0.0	0.0	0.0
Brown long-eared	MS2	0.0	NA	0.0	0.0
Brown long-eared	MS3	0.0	NA	0.0	0.0
Brown long-eared	MS4	0.0	0.0	NA	0.0
Brown long-eared	MS5	NA	0.0	0.0	NA
Brown long-eared	MS6	0.0	NA	0.0	0.0
Brown long-eared	MS7	0.1	0.0	0.0	0.0
Brown long-eared	MS8	0.0	0.0	0.0	0.0
Brown long-eared	MS9	0.0	0.0	NA	0.0
Common pipistrelle	MS1	5.0	0.6	0.2	1.1
Common pipistrelle	MS10	3.5	13.0	1.1	2.1
Common pipistrelle	MS2	3.5	NA	0.3	0.4
Common pipistrelle	MS3	0.1	NA	0.3	0.0
Common pipistrelle	MS4	0.1	0.6	NA	0.0
Common pipistrelle	MS5	NA	28.9	1.4	NA
Common pipistrelle	MS6	4.9	NA	0.3	1.0
Common pipistrelle	MS7	3.7	25.6	1.3	2.5
Common pipistrelle	MS8	4.0	4.0	0.5	2.1
Common pipistrelle	MS9	5.0	3.4	NA	1.6
Myotis	MS1	4.4	0.1	0.2	1.7
Myotis	MS10	0.5	0.1	0.8	0.9
Myotis	MS2	4.8	NA	0.0	1.4
Myotis	MS3	0.0	NA	0.2	0.1
Myotis	MS4	0.0	0.0	NA	0.0
Myotis	MS5	NA	0.7	0.3	NA
Myotis	MS6	4.5	NA	0.1	1.2
Myotis	MS7	1.2	0.6	0.2	0.7
Myotis	MS8	0.4	1.2	0.2	0.1
Myotis	MS9	0.3	0.8	NA	0.0
Nyctalus	MS1	0.5	0.2	0.0	0.1
Nyctalus	MS10	0.2	2.7	5.9	0.1
Nyctalus	MS2	0.6	NA	0.1	0.2
Nyctalus	MS3	0.0	NA	0.0	0.0
Nyctalus	MS4	0.0	0.3	NA	0.0
Nyctalus	MS5	NA	0.4	0.8	NA
Nyctalus	MS6	0.8	NA	0.2	0.2
Nyctalus	MS7	1.0	0.7	0.4	0.2
Nyctalus	MS8	0.7	0.3	0.0	0.0
Nyctalus	MS9	0.6	0.2	NA	0.1
Soprano pipistrelle	MS1	4.6	0.2	0.1	2.3
Soprano pipistrelle	MS10	3.0	1.9	0.4	2.6
Soprano pipistrelle	MS2	4.0	NA	0.1	2.2
Soprano pipistrelle	MS3	0.1	NA	0.1	0.0
Soprano pipistrelle	MS4	0.2	0.5	NA	0.1
Soprano pipistrelle	MS5	NA	17.3	0.5	NA
Soprano pipistrelle	MS6	5.1	NA	0.0	2.6

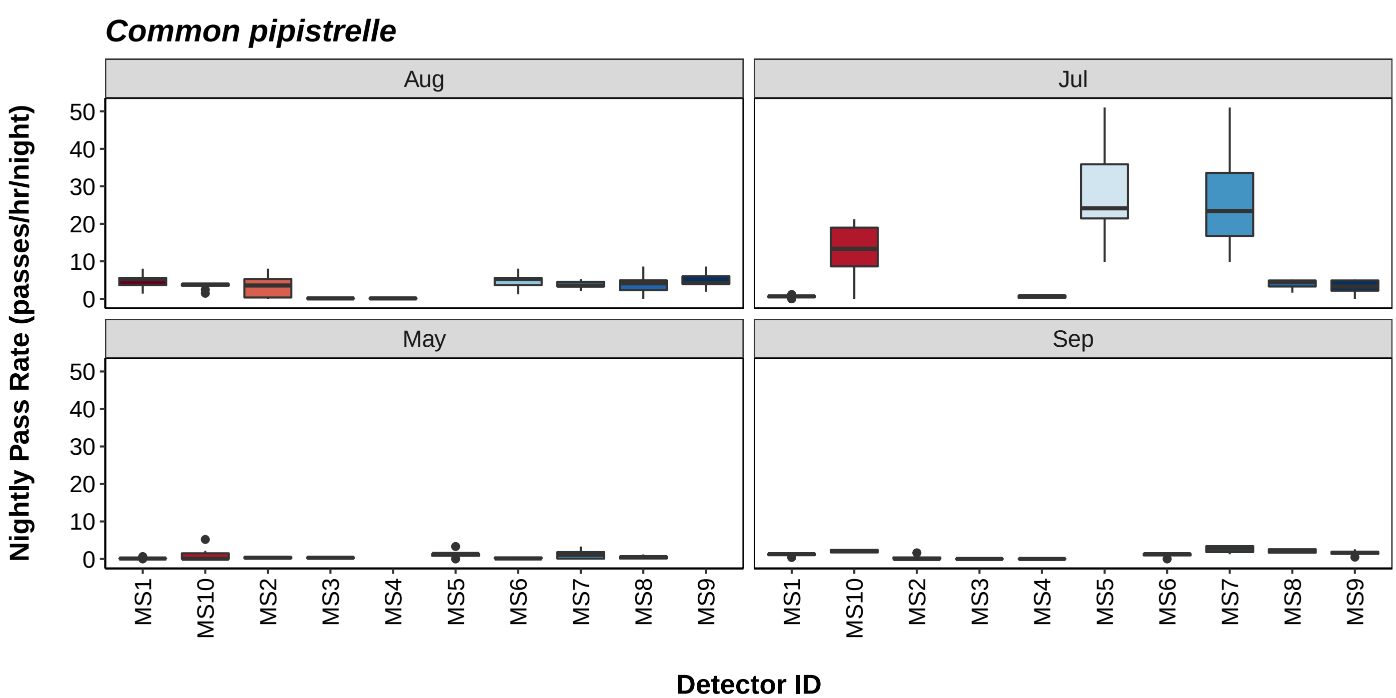
Species	Detector ID	Aug	Jul	May	Sep
Soprano pipistrelle	MS7	3.9	14.3	0.5	2.2
Soprano pipistrelle	MS8	8.8	6.3	0.1	5.9
Soprano pipistrelle	MS9	9.8	6.7	NA	5.0

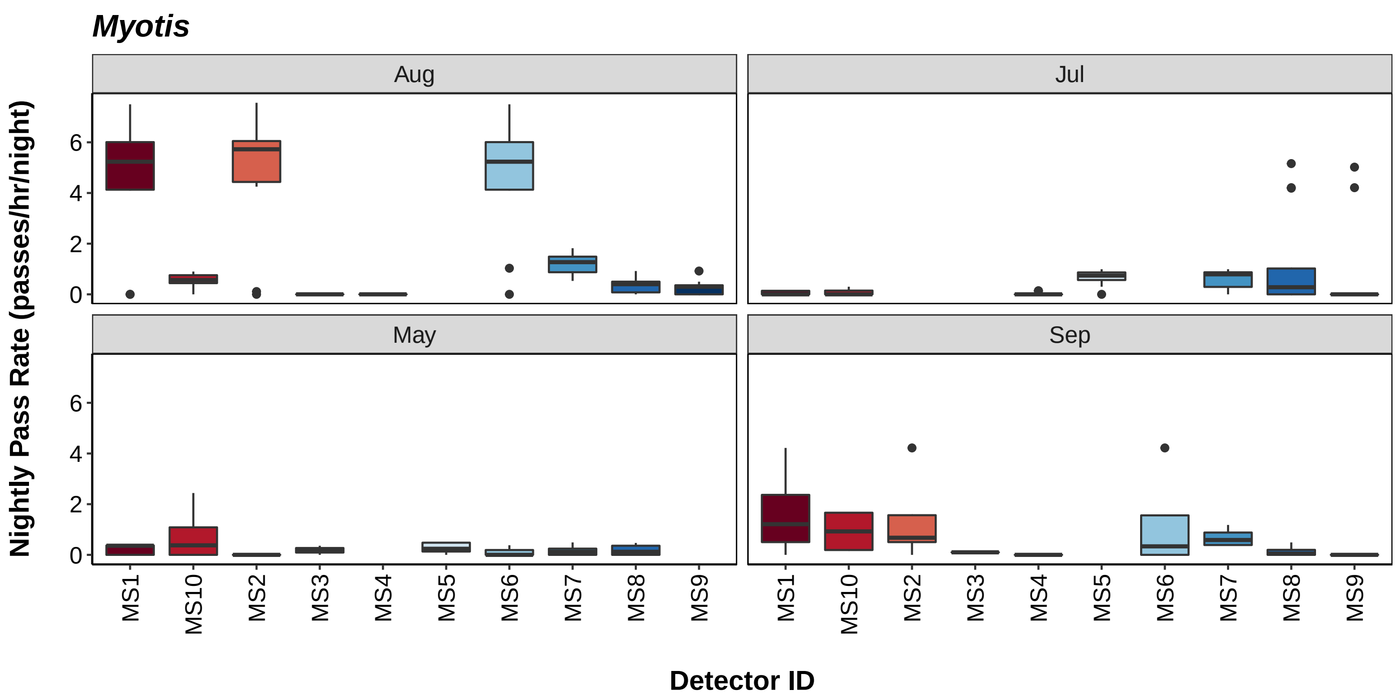
Nightly Bat Pass Rate for each Month

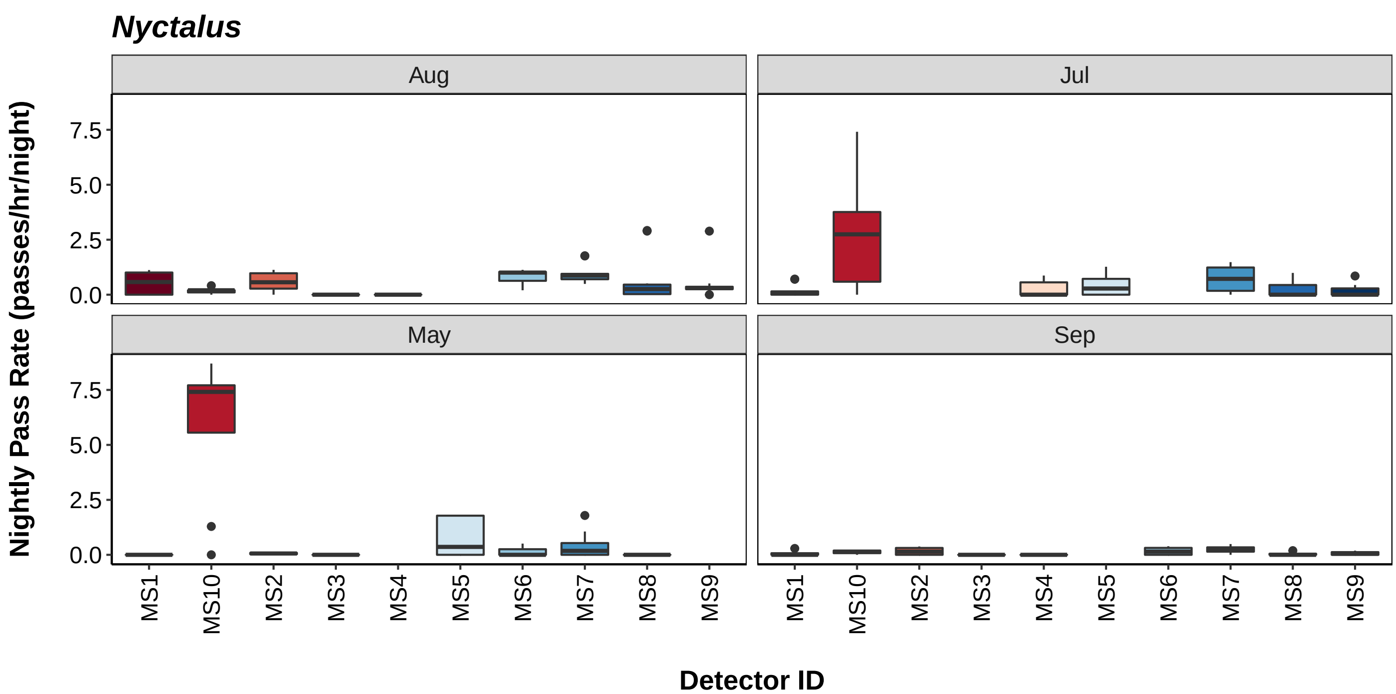
Per Detector - Figures

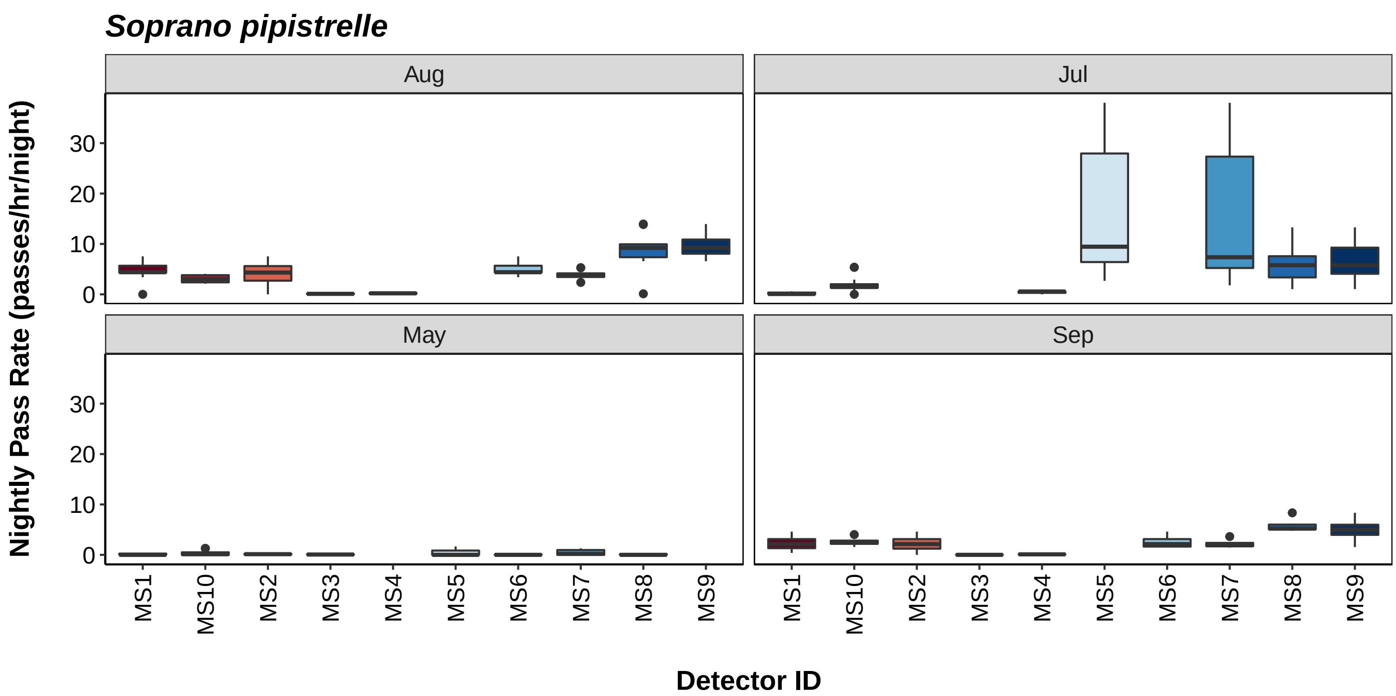
Figure 17. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent the ranges for the bottom 25% and the top 25% of the data values, excluding outliers. An outlier is any extreme value that lies further away from the box than 1.5 times the interquartile range. Outliers are shown as dots. Where very few passes are recorded it is not possible to produce the box, so the data are shown as a line.






Myotis
Aug
Jul
May
Sep
Nightly Pass Rate (passes/hr/night)
0
2
4
6
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID


Nyctalus
Aug
Jul
May
Sep
Nightly Pass Rate (passes/hr/night)
0.0
2.5
5.0
7.5
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID



Soprano pipistrelle
Aug
Jul
May
Sep
Nightly Pass Rate (passes/hr/night)
30
20
10
0
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID

Bat Activity per Detector Location

Figure 18. Detector ID reference:

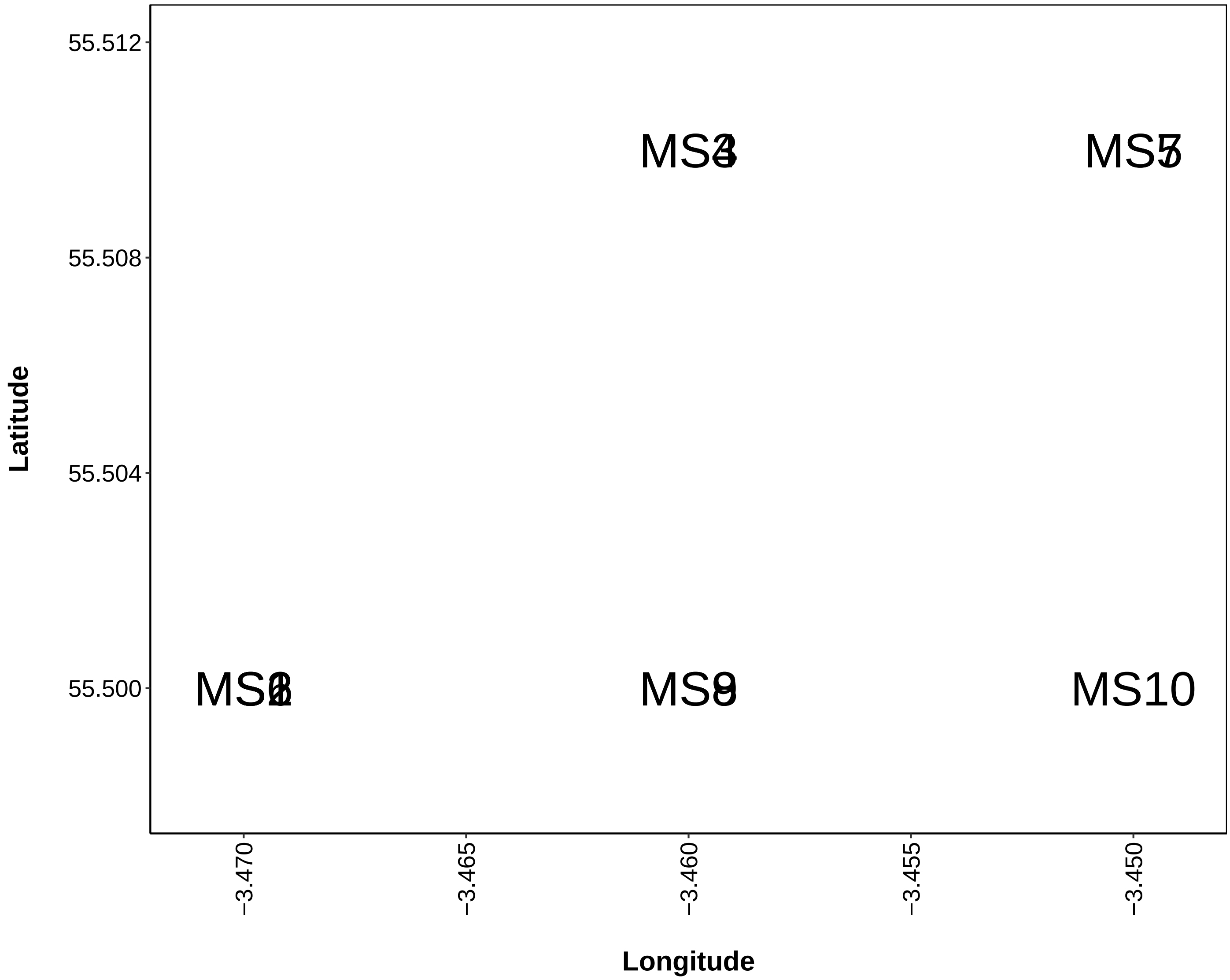


Figure 19. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.

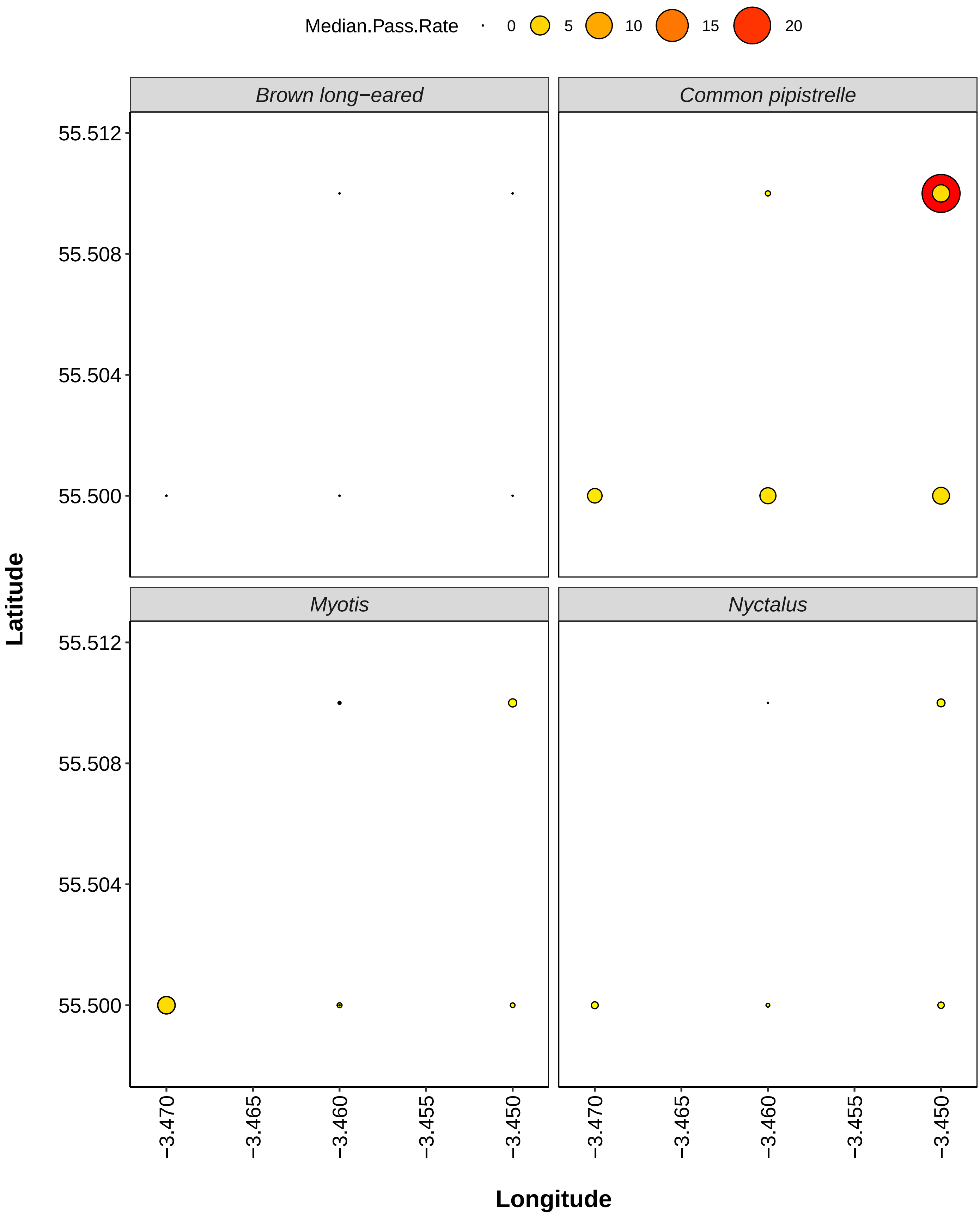
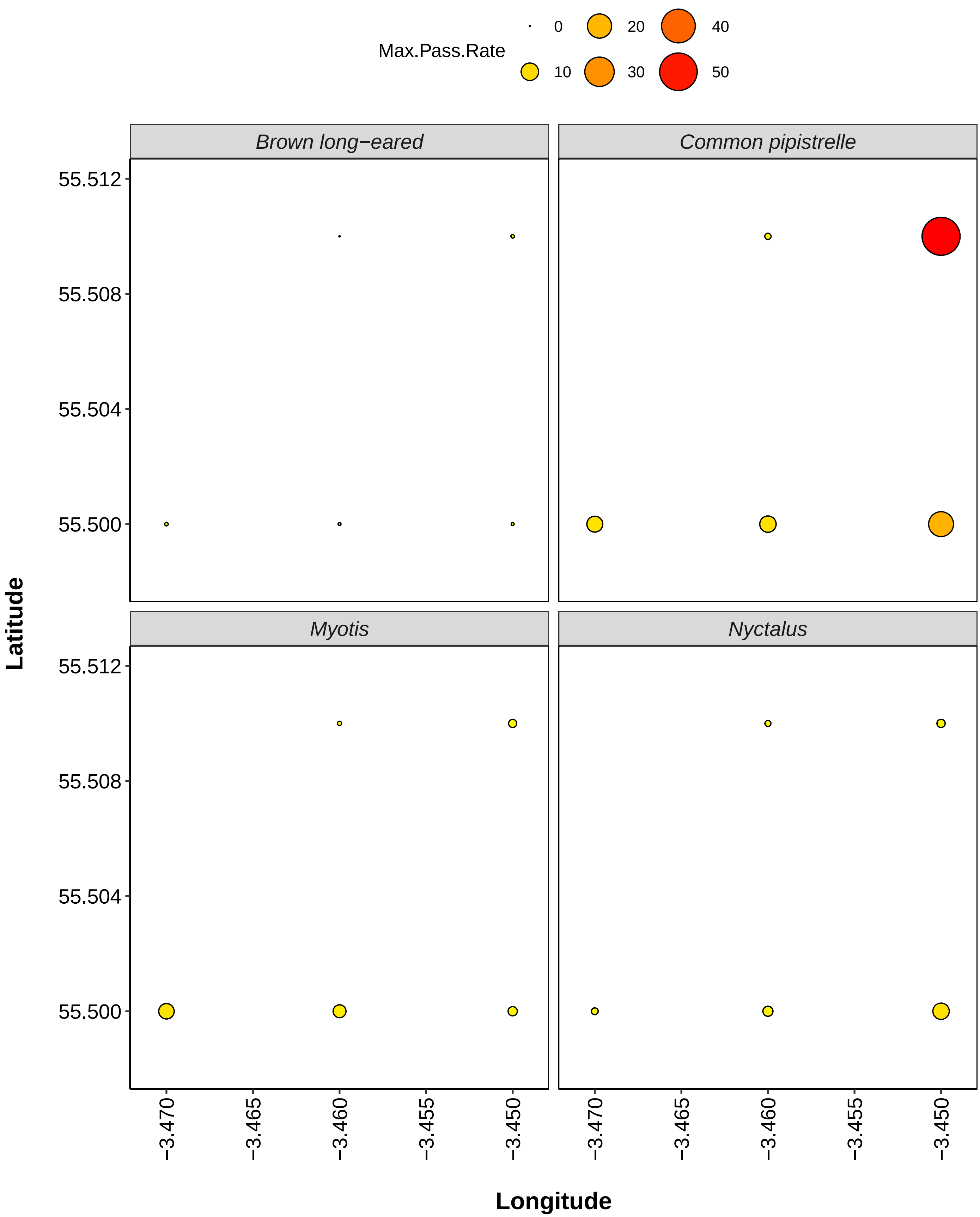


Figure 20. Maximum Nightly Pass Rate (bat passes/hr/night) recorded in a single night throughout the survey period - represented by the size and colour of the point at each detector location.



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