Coille Beith Wind Farm

Technical Appendix 6.3: Bats

June 2025

Contents

1. Introduction

1.1 Overview

1.1.1 This Technical Appendix has been prepared to accompany **Chapter 6** (EIA Report Volume 2) and presents detailed methodologies and the results of desk study and field surveys completed to establish baseline conditions with regards to bats to inform the design and assessment of the Proposed Development.

1.1.2 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 which may be used by bats.
- Identify the bat species assemblage using the Site, and temporal and spatial variations in use; and
- Assess the relative level of activity of bats within the Site.

1.1.3 This Technical Appendix also provides a Risk Assessment for bats in accordance with NatureScot guidance (2021) in Section 4.

1.1.4 It should be read with reference to **Figure 6.6** and **Figure 6.10** (EIA Report Volume 3a).

1.1.5 Only common species names are referred to within the main text of this Technical Appendix. Scientific names for all species referenced are supplied in **Annex 1.**

2. Methodology

2.1 Desk Study

2.1.1 The desk study has included a review of the following key sources, as summarised in **Table 2.1**.

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

Table 2.1 – Desk Study Key Sources and Information Sought

Key Source - incl. Date	Information Sought	Search Area
NatureScot's Sitelink (2025)[1]	Proximity to statutory designated sites, with bat interests.	Within 10 km of the Site, minus access routes (as shown on **Figure 6.1,** EIA Report Volume 3a)**.**
Highland Biological Recording Group (HBRG) – March 2025	Existing records of bats. Non-statutory designated sites.	Within 6 km for bat records, and 2 km of the Site (minus access routes).

2.1.3 Furthermore, the following have also been reviewed:

- Aerial imagery and Ordinance Survey (OS) maps to identify any features of potential value to foraging, commuting or roosting bats;
- A review of the Sites's location in relation to species known ranges in Scotland, with reference to the most recent UK Habitats Directive Article 17 Report[2]; and
- The location of other wind farm developments within 10 km of the Site, including the number of turbines and their size, through a review of the Highland Wind Turbine Map[3], where relevant to the Proposed Development.

2.2 Field Surveys

2.2.1 The following field surveys were undertaken in support of the Proposed Development:

- Habitat Suitability Appraisal (2021 and 2024);
- Preliminary Roost Appraisal (2021);

[1] https://sitelink.nature.scot/home
[2] JNCC (2019) Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019. https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/#regularly-occurring-species-vertebrate-species-mammals-terrestrial [Accessed February 2025].
[3] https://highland.maps.arcgis.com/apps/webappviewer/index.html?id=5ec04b13a9b049f798cadbd5055f1787

- Activity Surveys – Ground Level Automated Monitoring Surveys (2021); and
- Activity Surveys – Ground Level Automated Monitoring Validation Surveys (autumn 2024).

2.2.2 Survey methodologies and subsequent interpretation of results made reference to the following key guidance documents:

- Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). The Bat Conservation Trust, London.
- Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). The Bat Conservation Trust, London.
- Russ, J. (2012) British Bat Calls: A Guide to Species Identification. Pelagic Publishing, Exeter.
- NatureScot (2023) General pre-application and scoping advice for onshore wind farms.
- NatureScot (2024) Standing advice for planning consultations – Bats.
- NatureScot (2021) Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.

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

Habitat Suitability Appraisal

2.2.4 A Habitat Suitability Assessment (HSA) relative to the Proposed Development was informed by several ecological baseline surveys relating to the Proposed Development, which included:

- A Phase 1 Habitat and National Vegetation Classification (NVC) survey conducted on the 20th September 2021, by M. Wood.
- Protected mammal surveys conducted between the 2nd and 4th June 2021, and between the 17th and 18th August 2021 by M. Wood.
- Updated protected mammal surveys conducted on 8th and 9th April 2025 by J. Fairburn.
- An updated NVC and Peatland Condition survey conducted on 1st and 2nd July 2024 by J. Morton.
- Habitat survey of the western access route on 19th and 20th May 2025 by A. McMullen.

2.2.5 Collectively, baseline's Study Areas were comprised of the Site, applicable to the Proposed Development at the time of survey (note, the original Site boundary extended northerly, and it has been retracted in the north, and thus a greater area now outside the Site was also considered, but for the purpose of this Technical Appendix only habitats on-site are considered), and utilised BCT guidance available at the time of survey relative to observed bat ecology (Collins, 2016)[4].

2.2.6 However, habitats recorded on-site have since been appraised relative to both foraging and commuting opportunities, in accordance with current BCT guidance (Collins, 2023)[5], with HSA results informing the Habitat Risk component of an Initial Risk Assessment (Table 3a; NatureScot, 2021)[6] relative to wind turbines included within the Proposed Development.

Preliminary Roost Appraisal

2.2.7 A Preliminary Roost Assessment (PRA) of the Site area relative to Potential Roost Features (PRFs) was incorporated into baseline surveys, as defined BCT guidance applicable at the time of survey (Collins, 2016)[4].

2.2.8 Following updated guidance, data collected was reassessed based on current BCT guidelines (Collins, 2023)[5], following the previous Preliminary Roost Assessment guidelines being superseded by contemporary Ground Level Tree Assessments (GLTA) relative to trees, and PRA relative to structures (collectively referred to as a Preliminary Roost Appraisal within this report).

2.2.9 During baseline surveys (as listed above in 2021 and 2025), particular attention was given to habitats within turbine constraint buffers (i.e., areas within a 286 m buffer of proposed turbine locations) as addressed in NatureScot (2021) guidance, to identify any maternity roosts and/or substantial hibernation or swarming sites.

[4] Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). The Bat Conservation Trust, London.
[5] Collins, J. (ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th Edition). The Bat Conservation Trust, London.

[6] NatureScot (2021). Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. Jointly prepared with others.

2.2.10 Any PRFs recorded were later appraised and factored into the Habitat Risk component of an Initial Risk Assessment (Table 3a; NatureScot, 2021)[6] relative to wind turbines included within the Proposed Development.

Activity Surveys – Automated Monitoring

2.2.11 Bat activity surveys, comprising ground-level static surveys, were undertaken during spring (April), summer (June), and autumn (September) activity periods over the 2021 survey season, in accordance with NatureScot guidance (2021)[6].

2.2.12 An updated period of automated monitoring was undertaken in autumn (late-August – September) 2024 to determine if bat activity levels within the Site are relatively comparable to bat activity in 2021.

2.2.13 A summary of survey effort for 2021 is outlined in **Table 2.2**, whilst a summary of the autumn 2024 survey effort is provided in **Table 2.3**.

Table 2.2 – Total Deployment Duration of Monitoring Stations (MS) per Recording Period (2021)

Recording Period	Recording Location	Period Start	Period End	Deployment Duration (No. of Nights)
Spring	MS1	15/04/2021	28/04/2021	13
	MS2	15/04/2021	28/04/2021	13
	MS3	15/04/2021	28/04/2021	13
	MS4	15/04/2021	28/04/2021	13
	MS5	15/04/2021	28/04/2021	13
	MS6	15/04/2021	28/04/2021	13
	MS7	15/04/2021	28/04/2021	13
	MS8	15/04/2021	28/04/2021	13
	MS9	15/04/2021	28/04/2021	13
	MS10	15/04/2021	28/04/2021	13
Summer	MS1	16/06/2021	28/06/2021	12
	MS2	16/06/2021	28/06/2021	12
	MS3	16/06/2021	28/06/2021	12
	MS4	16/06/2021	28/06/2021	12
	MS5	16/06/2021	28/06/2021	12
	MS6	16/06/2021	28/06/2021	12
	MS7	16/06/2021	28/06/2021	12
	MS8	FAILED	FAILED	FAILED
	MS9	16/06/2021	28/06/2021	12
	MS10	16/06/2021	28/06/2021	12
Autumn	MS1	07/09/2021	20/09/2021	13
	MS2	07/09/2021	20/09/2021	13
	MS3	07/09/2021	20/09/2021	13
	MS4	07/09/2021	14/09/2021	7
	MS5	07/09/2021	20/09/2021	13
	MS6	07/09/2021	20/09/2021	8
	MS7	07/09/2021	20/09/2021	13
	MS8	07/09/2021	15/09/2021	8
	MS9	07/09/2021	20/09/2021	13
	MS10	07/09/2021	13/09/2021	6

Table 2.3 – Total Deployment Duration of Monitoring Stations (MS) During Autumn 2024 Activity Surveys

Recording Period	Recording Location	Period Start	Period End	Deployment Duration (No. of Nights)
Autumn	MS1	30/08/2024	25/09/2024	26
	MS2	30/08/2024	22/09/2024	23
	MS3	30/08/2024	24/09/2024	25
	MS4	30/08/2024	25/09/2024	26
	MS5	30/08/2024	24/09/2024	25
	MS6	30/08/2024	24/09/2024	25
	MS7	30/08/2024	FAILED	0
	MS8	30/08/2024	24/09/2024	25
	MS9	30/08/2024	FAILED	0

Recording Period	Recording Location	Period Start	Period End	Deployment Duration (No. of Nights)
	MS10	30/08/2024	23/09/2024	24
	MS11	30/08/2024	24/09/2024	25
	MS12	30/08/2024	24/09/2024	25
	MS13	30/08/2024	20/09/2024	21

2.2.14 The survey methodology employed the use of automated monitoring stations (MSs), each consisting of a full spectrum Wildlife Acoustics Songmeter Mini (SM Mini) or Songmeter 4 (SM4) bat detector, fitted with a single omnidirectional microphone and attached to a 1 m high wooden stake.

2.2.15 In total, ten MSs (MS1 – MS10) were deployed within the Site during spring, summer and autumn 2021 recording periods, whilst thirteen MSs (MS1 – MS13) were deployed during the autumn 2024) recording periods.

2.2.16 MSs were deployed in close proximity to each proposed turbine location applicable at the time of survey, or within representative habitats, in accordance NatureScot guidance (2021).

2.2.17 Monitoring was undertaken between time periods spanning approximately 30 minutes before sunset to 30 minutes after sunrise, with equipment set up to record simultaneously, allowing comparison of activity recorded between monitoring stations and habitats present.

2.2.18 A recording summary of MSs deployed during the 2021 survey effort is detailed in **Table 2.4**, and **Table 2.5** relative to the autumn 2024 survey effort. Deployment locations relative to the Site are further presented on **Figure 6.6** (EIA Report Volume 3a).

Table 2.4 – Monitoring Station (MS) Deployment Locations and 2021 Survey Effort (Recording Nights)

MS ID	Grid Reference	No. Suitable Recording Nights[7]			Nearest Turbine	Distance from Turbine (m)	Phase 1 Habitat Classification[8]	Linear Feature (50 m) of MS location
		Spring	Summer	Autumn				
MS1	NH 41671 97313	11	12	13	T7	410m	Blanket bog (E1.6.1) / Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride
MS2	NH 41496 98921	11	12	13	T3	500m	Wet dwarf shrub heath (D2) / Coniferous woodland plantation (A1.2.2)	Plantation edge
MS3	NH 42926 97926	11	12	13	T9	330m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride
MS4	NH 40778 97479	11	12	7	T5	340m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride and watercourse
MS5	NH 42597 98998	11	12	13	T11	450m	Coniferous woodland plantation (A1.2.2) / Blanket bog, wet dwarf shrub heath (E1.6.1/D2)	Plantation edge/ ride and watercourse
MS6	NH 41900 98508	11	12	8	T11	500m	Coniferous woodland plantation (A1.2.2) / Broadleaved woodland -semi-natural, bracken, dry dwarf shrub heath (A1.1.1/C1/D1)	Plantation edge/ ride and watercourse
MS7	NH 41123 98227	11	12	13	T3	290m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride and watercourse
MS8	NH 42431 98247	11	0 (failed)	8	T10	30m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride
MS9	NH 43161 98843	11	12	13	T11	850m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride and watercourse
MS10	NH 41530 97799	11	12	6	T6	650m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride and watercourse
Total Suitable Recording Nights per Season		**110**	**108**	**107**				
Total Suitable Recording Nights		**335**						

[7] Nights deemed unsuitable due to both poor weather conditions and no bat activity removed.
[8] JNCC (2010) Handbook for Phase 1 Habitat Survey – a technique for environmental audit. JNCC. Peterborough.

Table 2.5 – Monitoring Station (MS) Deployment Locations and Autumn 2024 Survey Effort (Recording Nights)

MS ID	Grid Reference	No. Suitbale Recording Nights	Nearest Turbine	Distance from Turbine (m)	Phase 1 Habitat Classification	Linear Feature (50 m) of MS location
MS1	NH 41671 97313	23	T7	410m	Blanket bog (E1.6.1) / Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride
MS2	NH 41496 98921	21	T3	500m	Wet dwarf shrub heath (D2) / Coniferous woodland plantation (A1.2.2)	Plantation edge
MS3	NH 42926 97926	22	T9	330m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride
MS4	NH 40778 97479	23	T5	350m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride and watercourse
MS5	NH 42597 98998	22	T11	450m	Coniferous woodland plantation (A1.2.2) / Blanket bog, wet dwarf shrub heath (E1.6.1/D2)	Plantation edge/ ride and watercourse
MS6	NH 41900 98508	22	T11	450m	Coniferous woodland plantation (A1.2.2) / Broadleaved woodland -semi-natural, bracken, dry dwarf shrub heath (A1.1.1/C1/D1)	Plantation edge/ ride and watercourse
MS7	NH 41180 98223	0 (failed)	T3	280m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride and watercourse
MS8	NH 42431 98247	22	T10	860m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride
MS9	NH 43161 98843	0 (failed)	T11	30m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride and watercourse
MS10	NH 41530 97799	22	T6	655m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride and watercourse
MS11	NH 42070 99456	22	T11	850m	Blanket bog (E.6.1) / Wet dwarf shrub heath (D2) / Acid grassland -unimproved (B1.1).	Watercourse
MS12	NH 40685 98501	22	T1	380m	Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride
MS13	NH 39922 98242	19	T2	250m	Blanket bog (E1.6.1) / Coniferous woodland plantation (A1.2.2)	Plantation edge/ ride and watercourse
Total Suitable Recording Nights		**240**				

Weather Data

2.2.19 During 2021 activity surveys, weather data were collected from a weather station located within the survey area during most of the spring recording period, and the full scope of the autumn recording period; however, following technical failure, weather data for summer recording period (and some dates comprising the spring recording period) were sourced via the World Weather Online[9] website.

2.2.20 Likewise, weather data were collected from an on-site weather station during most of the autumn 2024 activity survey period, although a technical error meant several initial dates of the recording period were also sourced via the World Weather Online website.

2.2.21 Weather parameters collected included temperature (C), rainfall (mm) and wind speed at dusk (meters per second (mps)) and data were analysed to account for any periods of poor weather which could have affected bat activity. Weather conditions are summarised in **Annex 2**. Nights of unsuitable weather that also recorded no bats were removed from the dataset.

Data Analysis and Assumptions of Bat Activity

Acoustic Analysis

2.2.22 Data analysis and interpretation of results followed the principles presented in the BCT guidance (Collins, 2023)[5]. Data analysis was undertaken by A. Hulme BSc (Hons.) and L. Quarton MSc BSc (Hons.), both experienced bat ecologists who regularly carry out analysis of bat survey data.

2.2.23 Bat detectors recorded data onto digital media and were analysed using Kaleidoscope Pro (Wildlife Acoustics) software. Kaleidoscope Pro automatically identified sonograms, and a manual check was conducted to confirm species identified. Bat species were identified using diagnostic features (e.g., frequency, slope, duration, time between calls, minimum call length etc.).

2.2.24 For the purpose of sonogram analysis, the number of 'bat registered calls' were defined as 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[10] and Gannon *et al*., 2003)[11], with a minimum call note length of two milliseconds (Weller *et al*., 2009)[12].

Bat Activity Index

2.2.25 An individual bat can pass a particular feature on several occasions while foraging. As such, it is not possible to estimate the number of individual bats or draw a fair comparison where survey times differ. In response, bat activity as presented within this technical appendix is recorded as an index, accounting for bat pass rate per hour or a 'Bat Activity Index (BAI)', as outlined in the BCT guidance (Collins, 2023)[5], and defined as follows:

BAI (per hour) = Number of bat passes 'registered calls' / number of recording per hours, per night

2.2.26 BAI is presented throughout this Technical Appendix as outputted by Ecobat[13] which includes average summary statistics (i.e., mean and median) relative to monitoring station location and recording period per species, to account for both spatial and temporal activity.

2.2.27 Ecobat recognises that BAI can be highly variable between recordings nights, in some cases accounting for few or no passes, compared to subsequent nights of high activity. As such, in reference to Lintott and Mathews (2018)[14], Ecobat adopts the median as its primary measure of average activity, relative to its usefulness in accounting for skew, rarity and small datasets, and over and/or under estimation of average activity based on environmental factors. However, in line with presentation standards also outlined in Lintott and Mathews (2018)[14], mean BAI is also included within this technical appendix, so as to disclose additional summary statistics available.

2.2.28 However, Ecobat analyses BAI relative to both presences only, defined as an 'Excludes Absences' variant (i.e., wherein analysis only takes into account the presence, and not the absences, of each bat species), and an inclusion of absences, defined as 'Includes Absences' (i.e., wherein analysis takes into account nights of zero data, during which bats were unrecorded).

2.2.29 Ecobat ultimately makes use of median 'Excludes Absences' in accounting for relative activity percentiles, although the inclusion of 'Includes Absences' variants is relevant as a comparative and in

[9] https://www.worldweatheronline.com [Accessed April 2025].
[10] White, E. and Gehrt, S. (2001). Effects of recording media on echolocation data from broadband bat detectors. Wildlife Society Bulletin, 29, pp. 974-978.
[11] Gannon, W., Sherwin, R. and Haymond, S. (2003). On the importance of articulating assumptions when conducting acoustic studies of habitat use by bats. Wildlife Society Bulletin, 31, pp. 45-61.
[12] Weller, T., Cryan, P. and O'Shea, T. (2009). Broadening the focus of bat conservation and research in the USA for the 21st century. Endangered Species Research. 8: 129-145.
[13] Ecobat (mammal.org.uk) [Accessed February 2025]
[14] Lintott, P.R. and Mathews, F. (2018). Basic mathematical errors may make ecological assessments unreliable. Biodiversity Conservation 27, 265–26.

demonstrating the level of bat interest at a site (e.g., 'no bats' on a recording night where there were no technical issues or weather constraints is a valid BAI result).

Ecobat Assessment Tool

Relative Activity Levels

2.2.30 In accordance with NatureScot guidance (2021)[6], Ecobat was used to provide an objective interpretation of the relative importance of bat activity levels recorded within the Site.

2.2.31 Ecobat utilises a database of user submitted data (i.e., a reference database), to determine relative bat activity levels within a given site. The reference range consist of the number of bat recording nights (nights that bat passes were recorded) held within the Ecobat reference database per species, relative to selected parameters considered essential for stratifying a given dataset (Lintott *et al*., 2018)[15]. Parameters applicable to the analysis included within this technical appendix include:

- **Location:** Only records within the region of Scotland North;
- **Seasonality:** Only records from within +/- 1 month from the survey start date; and,
- **Detector model**: Only records recorded using Wildlife Acoustics full-spectrum detectors.

2.2.32 Additionally, a stratified reference database (i.e., the reference range) requires a minimum sample size of ≥ 200 nights of bat surveying for confidence in the relative activity level provided by Ecobat; reference ranges per species, applicable to the Ecobat outputs included within this Technical Appendix each reached the minimum reference range, as summarised in **Table 2.6.**

Table 2.6 – Reference Range Sample Size per Species for Ecobat Relative Activity Level Outputs

Recorded Species	Reference Range (2021)	Reference Range (2024)
Common pipistrelle	29,597	28,899
Soprano pipistrelle	3,782	3,854
Myotis species	343	449
Brown long-eared	342	358

2.2.33 Following parameter selection, Ecobat provides a measure of relative activity via a percentile rank of median and maximum BAI compared against the stratified reference range, in addition to associated confidence intervals. Activity percentiles can subsequently be interpreted in relation to pre-determined activity bands (**Table 2.7**), as outlined in the NatureScot guidance (2021)[6].

Table 2.7 – 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

Potential Roost Emergence

2.2.34 The Ecobat assessment tool provides a summary of bat passes recorded within the potential emergence time of a given species which might indicate the presence of a nearby roost, (i.e., from 15 minutes before, to 90 minutes after sunset).

2.2.35 Ecobat also highlights recorded passes which fall within a predetermined emergence period (i.e., between 15th June to 30th July) based on species specific emergence time ranges.

2.2.36 In both instances, emergence parameters are adapted directly from those provided in Russ (2012)[16].

Risk Assessment

Relative Activity Levels

2.2.37 In accordance with NatureScot guidance (2021)[6], a risk assessment has been carried out to identify the potential risk to bat populations from the Proposed Development. Wind farm developments can impact upon bat populations as a result of:

[15] Lintott, P.R., Davison, S., van Breda, J., Kubasiewicz, L., Dowse, D., Daisley, J., Haddy, E. and Mathews, F. (2018). Ecobat: An online resource to facilitate transparent, evidence-based interpretation of bat activity data. Ecology and Evolution https://doi.org/10.1002/ece3.3692 [Accessed 10/02/2025].

[16] Russ, J. (2012). British Bat Calls: A Guide to Species Identification. Pelagic Publishing, Exeter.

- 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).

2.2.38 To ensure that bat species are protected by minimising the risk of collision, NatureScot guidance (2021)[6] advises that an assessment of impact for a proposed wind farm development, requires a detailed appraisal of:

- Level of activity of all bat species recorded at the Site assessed both spatially and seasonally;
- Risk of turbine-related mortality for all bat species recorded during bat activity surveys; and
- Effect on the species' population status if predicted impacts are not mitigated.

Assessing Potential Risk

2.2.39 NatureScot guidance (2021)[6] presents a two-stage process for assessing the potential risk to bats relative to 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; and
- 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.

2.2.40 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 potential requirements for mitigation.

Survey Limitations

Field Surveys

Monitoring Station Failure

2.2.41 During 2021 activity surveys, data for MS8 was not obtained during the summer recording period following a technical failure.

2.2.42 Likewise, during the autumn 2024 activity survey, data for MS7 and MS9 was also not obtained following technical failures.

2.2.43 As such, subsequent spatial analysis per individual location, and cumulative seasonal analysis, may have been impacted. However, given the general Site trends presented for activity of high collision risk (HCR) species, this is not considered to be a substantial limitation given the relative homogeneity of the habitats surveyed, and bat activity levels presented.

Survey Effort

2.2.44 Additionally, during the autumn 2021 recording period, several MSs (i.e., MS4, MS6, MS8 and MS10) did not account for the minimum survey effort outlined in guidance (i.e., 10 suitable nights of recording, due to technical failures **(Table 2.4)**. However, reduced survey effort is not likely to impact the validity of the activity assessment, as supported by activity recorded at adjacent MSs during the autumn within similar habitats being largely comparable.

Weather Conditions

2.2.45 Weather constraints, including temperatures below 8°C, heavy rain and/or winds exceeding 5 m/s, were recorded at dusk on five nights over the 2021 survey effort. However, bat activity was recorded during each of these nights, and so each date was subsequently retained within the analysis.

2.2.46 Likewise, weather constraints were also recorded on three nights over the autumn 2024 survey period. However, bat activity was unrecorded during these dates, which were subsequently omitted from activity analysis.

2.2.47 Although it is recognised that poor weather can affect bat activity, excluding these dates from the analysis may skew the data, and would likely remove some high collision risk species from the dataset. Consequently, inclusion of these nights represents a precautionary approach, and weather is considered representative of the conditions at the Site.

2.2.48 Overall, any limitations to the overall survey effort are not thought to represent a substantive constraint relative to the baseline data collected, which is considered sufficient to achieve the objectives of the study.

Acoustic Analysis

2.2.49 Kaleidoscope software can identify certain bat species from sonograms, but some species within the *Myotis* and *Nyctalus* genus can be difficult to distinguish. In some cases, calls may be partially heard or distorted by external factors like passing cars, rain or wind, resulting in unknown or genus-only labels. For example, brown long-eared bats have lower detectability and may not be detected during activity surveys due to their hunting strategies in less open habitats. Survey results have been carefully interpreted across species.

3. Results

3.1 Desk Study

Statutory Designated Sites for Nature Conservation

3.1.1 In review of NatureScot's SiteLink website, there are no nationally or internationally designated site for nature conservation, which include bat species as qualifying features, within 10 km of the Site.

Non-Statutory Designated Sites for Nature Conservation

3.1.2 There are no non-designated sites for nature conservation within the Search Area.

Existing Bat Records

3.1.3 The HBRG did not return any recent records relating to bat species from within the Search Area.

UK Bat Species Range

3.1.4 In review of the UK Habitats Directive Article 17 Report 'Habitats Directive Report 2019: Species Conservation Status Assessments 2019'[2] (JNCC, 2019)[17], the Site is located within the known UK distribution range for the following species:

- Common pipistrelle;
- Soprano pipistrelle;
- Daubenton's;
- Natterer's; and
- Brown long-eared bat.

3.1.5 Consequently, established distribution ranges would suggest these species could be present within the local landscape and/or on-site.

Other Wind Developments

3.1.6 **Table 3.1** provides a summary of operational or consented wind farm developments within 10 km of the Site.

Table 3.1 – Wind Farm Developments within 10 km of the Site

Wind Farm	Distance (km) (Nearest turbine to nearest turbine)	Status	No. Wind Turbines	Max Turbine Height (m)
Strath Oykel Wind Farm	0.43	Consented	11	200
Meall Buidhe Wind Farm	2.26	Consented	8	149.9
Rosehall Wind Farm	7.74	Operational	19	90
Achany Wind Farm Extension (Formerley Glencassley Wind Farm)	8.88	Operational	18	149.9
Achany Wind Farm	9.10	Consented	19	100

3.1.7 A review of baseline bat data recorded in 2021 relative to Strath Oykel Wind Farm (ECU Ref: ECU00003246) identified the presence of a minimum of four species, which included common pipistrelle, soprano pipistrelle, Myotis bats and brown long-eared bat.

3.1.8 Furthermore, an additional review of baseline bat data recorded in 2018 relative to Meall Buidhe Wind Farm (THC Ref: 20/02659/FUL) identified the presence of a minimum of four species, which also consisted of common pipistrelle, soprano pipistrelle, *Myotis* species and brown long-eared bats.

[17] JNCC (2019). Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments 2019. https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/#:~:text=Article%2017%20Habitats%20Directive%20Report%202019:%20Species%20Conservation%20Status%20Assessments,species%2C%20mainly%20bats%20and%20cetaceans [Accessed 10/02/2025]..

3.2 Field Surveys

Habitat Suitabilty Appraisal

Site Overview

3.2.1 A thorough summary of habitat types located within the Site are included in **Technical Appendix 6.1** (EIA Report Volume 4) and presented on **Figures 6.2** and **6.3** (EIA Report Volume 3a).

3.2.2 An HSA, as applicable to the Site is summarised below, in reference to both habitat descriptions provided in BCT guidance (Collins, 2023)[5], and NatureScot (2021)[6] relative to wind farm developments.

Foraging, Commuting and Roost Potential

3.2.3 Habitats present within the Site include open, edge and closed habitat types, which provide variable stability in supporting bat assemblages present within the local landscape.

3.2.4 The Site is dominated by closed habitat types, predominantly comprised of commercial conifer plantation, although localised areas of semi-natural woodland is present between plantation blocks. Whilst continuous in cover, the majority of plantation is noted to be densely packed and lacking established understory or ground layer communities. Such closed habitat niches provided by plantation woodland are considered sub-optimal and are unlikely to form a substantial foraging resource for bats (although plantation edges still provide sheltered habitat opportunities). Due to both the species present and commercial management practices, these habitats are unlikely to provide substantial roosting opportunities.

3.2.5 However, the broad-leaved woodland present offers increased species diversity and structural composition, providing both closed and edge habitat niches within a sheltered and well-connected location. As such, broad-leaved woodland represents an area of increased ecological value for bats.

3.2.6 Open habitats present broadly include grassland, heathland and bog, in addition to some localised areas of dense bracken. However, expansive open areas are mainly limited to the northwest, north and southern extreme of the Site, with continuous open habitats located within rides between plantation blocks. As such, these habitats benefit from relative shelter and connectivity, providing both open and edge space niches throughout the Site. These open habitats present on-Site largely provide viable habitat opportunities, relative to the local landscape. However, expansive areas located at distance from closed habitat types are likely to be of reduced suitability due to exposure.

3.2.7 Several riparian features (i.e., brooks and streams) and some standing water bodies (i.e., ponds) are also distributed across the Site, and represent areas of increased foraging suitability (particularly where benefiting from bankside vegetation). Likewise, streams and brooks are likely to provide established commuting corridors across Site and could act as connecting features relative to the local landscape (i.e., blue corridors).

Habitat Suitabiltiy and Risk Factor

3.2.8 The Site provides viable foraging and commuting opportunities for bats, which include habitat niches suitable for a variety of bat assemblages (i.e., edge-space and generalist species). However, ecologically valuable habitats are mainly limited to sheltered corridors found between expansive plantation blocks, and the habitats found within (e.g., broad-leaved woodland, bogs and streams). As such, the vast majority of the Site is unlikely to be extensively utilised by local bat populations, although localised areas within the Site are considered to be of value.

3.2.9 Consequently, the Site is most representative of Moderate suitability relative to habitats descriptions outlined in Table 4.1 of BCT guidance (Collins, 2023)[5], and Moderate habitat risk relative to the proposed wind farm development (4. Assessment of Potential Risk to Bats), as outlined in Table 3a of NatureScot Guidance (2021)[6].

Preliminary Roost Appraisal

3.2.10 No PRFs were recorded on-site during baseline ecological surveys undertaken in 2021, including within 286 m of proposed turbine locations (i.e., the turbine constraint buffer). However, during the update survey in 2025, two features were recorded on-site, with details provided in **Table 3.2**. Note, these features are greater than 286 m from the nearest proposed turbine, and woodland habitat will be retained between the features and the key-holed proposed turbine. The location of these features are provided in **Figure 6.10** (EIA Report Volume 3a). No further PRFs (including along the western access route in 2025) were recorded.

Table 3.2 – PRFs Recorded During the Updated 2025 Survey

Grid Reference	Description
NH42089 98801	Birch tree *c*. 0.5 m PRF-I or PRF-M within dry cavity and hollow stem where tearout gives access.
NH42103 98360	Birch *c*. 0.4 m dbh with hollow main stem and tearout at 1.5 to 2 m. Cavity open at the top, but dry within. PRF-M.

Activity Surveys – Automated Monitoring (2021)

Overview

3.2.11 Bats were detected across 34 nights over the course of the survey effort, covering April (spring), June (summer) and September (autumn) 2021, considering all MS records.

3.2.12 Species identified are presented in **Table 3.3** along with potential collision risk and population vulnerability as described in Table 2 of NatureScot guidance (2021)[6].

3.2.13 A minimum of four species were recorded on-site, of which common pipistrelle and soprano pipistrelle, are attributed as HCR species.

Table 3.3 – Bat Species Recorded, Collision Risk and Population Vulnerability as Applicable to Scotland

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

3.2.14 A total of 1,790 bat passes were recorded over a period of 325 accumulative nights across all MS locations combined.

3.2.15 Common pipistrelle was noted to be most abundantly recorded species, with a total of 1,264 passes recorded (i.e., 70.6 % of total bat calls recorded) over the duration of the survey period.

3.2.16 Likewise, common pipistrelle was also noted to be the most frequently recorded species over the survey effort, registering across 108 accumulative nights (i.e., 33.2 % of surveyed nights).

3.2.17 A summary of the total number and percentage of bat passes, in addition to the number of nights each species was recorded relative to the overall survey effort is presented in **Table 3.4.**

Table 3.4 – Total Number/Percentage of Bat Passes and Recording Frequency per Species in 2021

Species	No. Nights Bats Recorded	% Nights Bats Recorded[18]	Passes (No.)	Percentage (%)
Common pipistrelle	108	33.2	1,264	70.6
Soprano pipistrelle	19	5.8	40	2.2
Myotis species	68	20.9	284	15.9
Brown long-eared	89	27.4	202	11.3
Total			**1,790**	**100.0**

3.2.18 A summary of the spatial distribution of bat activity per MS location is presented in **Table 3.5.**

3.2.19 Bat passes were recorded on 49.2 % of accumulative survey nights (i.e., successful nights of bat recordings at each MS combined).

3.2.20 MS3 was noted to have recorded the most bat passes (i.e., 593 passes) and highest percentage of passes (33.1 %) recorded across the Site.

3.2.21 However, MS5 featured the highest percentage of bat passes relative to the number of nights surveyed, with activity recorded on 77.8 % of nights.

Table 3.5 – Bat Activity Survey Results per Monitoring Station (MS) in 2021

MS ID	No. Nights Sampled[19]	No. Nights Bats Recorded	Nights Bats Recorded (%)	Total No. Passes Recorded	Distribution Passes Recorded (%)
MS1	36	15	41.7	63	3.5
MS2	36	21	58.3	178	9.9
MS3	36	18	50.0	593	33.1
MS4	30	7	23.3	105	5.9
MS5	36	28	77.8	380	21.2
MS6	31	5	16.1	9	0.5
MS7	36	20	55.6	65	3.6
MS8	19	13	68.4	258	14.4
MS9	36	23	63.9	116	6.5
MS10	29	10	34.5	23	1.3
Total	**325**	**160**	**49.2**	**1,790**	**100.0**

[18] Percentage of nights bats were recorded within out of a possible 325 cumulate nights between MS locations.
[19] 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

3.2.22 A summary of bat activity per recording period is also presented in **Table 3.6**.

3.2.23 Per recording period, autumn accounted for the highest number of bat passes (1,061 passes) and percentage of bat passes (59.3 %) recorded across the survey effort.

3.2.24 Likewise, September also accounted for the highest percentage of bat passes relative to the number of nights surveyed, with activity recorded on 81.8% of nights.

Table 3.6 – Bat Activity Survey Results per Recording Period in 2021, Monitoring Stations (MS) Combined

Recording Period	No. Nights Sampled	No. Nights Bats Recorded	Nights Bats Recorded (%)	Total No. Passes Recorded	Distribution Passes Recorded (%)
Spring	110	48	43.6	400	22.3
Summer	108	43	39.8	329	18.4
Autumn	107	69	64.5	1,061	59.3
Total	**325**	**160**	**49.2**	**1,790**	**100.0**

Nightly Activity per Species

3.2.25 **Table 3.7** presents the total number of nights bat activity was categorised under each relative activity band (i.e., Low to Exceptional activity), in reference to the activity categories outlined in **Table 2.7**.

Table 3.7 – Number of Nights Recorded Bat Activity Fell into each Activity Band per Species in 2021

Species	Exceptional Activity	High Activity	Moderate/ High Activity	Moderate Activity	Low/Moderate Activity	Low Activity
Common pipistrelle	0	0	0	0	5	103
Soprano pipistrelle	0	0	0	0	0	19
Myotis spp.	2	2	4	7	53	0
Brown long-eared	7	27	0	20	35	0

High Collision Risk (HCR) Species

3.2.26 Nightly activity ranged from Low to Low-Moderate activity for common pipistrelle but was limited to Low activity for soprano pipistrelle.

Other Species

3.2.27 Nightly activity ranged from Low-Moderate to Exceptional activity for *Myotis* species, although Low-Moderate activity was most frequently recorded.

3.2.28 Nightly activity included both Low-Moderate to Moderate activity, and High to Exceptional activity relative to brown long-eared bats although Low-Moderate activity was most frequently recorded.

Overall Site Activity per Species

3.2.29 **Table 3.8** presents the total bat passes, and median and maximum activity percentiles per species for the overall Site (i.e., MS locations combined across the survey effort).

High Collision Risk (HCR) Species

3.2.30 At the median percentiles, common and soprano pipistrelle both accounted for Low activity at both the 1st and 0th median percentiles, respectively. However, at the maximum percentile, common pipistrelle accounted for Low-Moderate activity at the 36th maximum percentile, whilst soprano pipistrelle accounted for Low activity at 12th maximum percentile.

Table 3.8 – Key Activity Metrics Species Recorded on-site over the Total Survey Effort (2021)

Species	Total Passes	Median Percentile[20]	95% CIs[21]	Max Percentile[22]	Activity Level (Median Percentile)	Activity Level (Max Percentile)
Common pipistrelle	1,264	1st	5-18	36th	Low	Low-Moderate
Soprano pipistrelle	40	0th	7.5-7.5	12th	Low	Low
Myotis spp.	284	23rd	43.5-70.5	100th	Low-Moderate	High
Brown long-eared	202	59th	52.5-92.5	100th	Moderate	High

[20] A numerical representation of average activity levels relative to the Ecobat reference range summarised in **Table 2.6**.
[21] An indication of the confidence in the median percentile (Excludes Absences).
[22] A numerical representation of maximum activity levels relative to the Ecobat reference range summarised in **Table 2.6**.

Other Species

3.2.31 *Myotis* species accounted for Low-Moderate activity at 23rd median percentile, but High activity at the 100th maximum percentile.

3.2.32 Brown long-eared bat accounted for Moderate activity at 59th median percentile, and High activity at 100th maximum percentile.

Activity Analysis per Monitoring Station (MS) - Overview

3.2.33 **Table 3.9** presents the median and mean pass rates (BAI) for species recorded per MS location. BAI outputs presented include both an 'Excludes Absences' variant (i.e., including only nights bat presence was detected) and an 'Includes Absences' variant (i.e., including nights of absences).

Table 3.9 – Median and Mean Bat Pass Rate (BAI) per Species, per Monitoring Station (MS) Location (2021)

Species / Genus	MS 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	45	0.2	0.3	0.3	0.4
	MS2	148	0.2	0.4	0.8	1.3
	MS3	565	0.5	1.0	3.3	3.7
	MS4	63	0.6	1.0	0.9	1.3
	MS5	129	0.2	0.3	0.5	0.6
	MS6	5	0.2	0.2	0.1	0.2
	MS7	12	0.0	0.2	0.1	0.2
	MS8	226	0.9	2.2	1.6	2.3
	MS9	68	0.2	0.3	0.4	0.5
	MS10	3	0.0	0.2	0.0	0.2
Soprano pipistrelle	MS1	1	0.0	0.1	0.0	0.1
	MS2	3	0.0	0.1	0.0	0.1
	MS3	8	0.0	0.1	0.0	0.2
	MS4	15	0.0	0.6	0.2	0.6
	MS5	3	0.0	0.1	0.0	0.1
	MS6	0	N/A	N/A	N/A	N/A
	MS7	4	0.0	0.1	0.0	0.1
	MS8	4	0.0	0.2	0.0	0.2
	MS9	1	0.0	0.1	0.0	0.1
	MS10	1	0.0	0.1	0.0	0.1
Myotis spp.	MS1	4	0.0	0.1	0.0	0.1
	MS2	11	0.0	0.1	0.1	0.1
	MS3	9	0.0	0.1	0.1	0.1
	MS4	6	0.0	0.3	0.1	0.2
	MS5	218	0.4	1.8	1.5	2.2
	MS6	2	0.0	0.2	0.1	0.2
	MS7	20	0.1	0.2	0.1	0.2
	MS8	2	0.0	0.1	0.0	0.1
	MS9	5	0.0	0.1	0.0	0.1
	MS10	7	0.1	0.2	0.1	0.2
Brown long-eared	MS1	13	0.0	0.1	0.1	0.1
	MS2	16	0.0	0.2	0.1	0.2
	MS3	11	0.0	0.1	0.0	0.1
	MS4	21	0.3	0.3	0.3	0.3
	MS5	30	0.0	0.2	0.1	0.2
	MS6	2	0.0	0.1	0.1	0.1
	MS7	29	0.1	0.2	0.1	0.2
	MS8	26	0.2	0.2	0.3	0.3
	MS9	42	0.1	0.3	0.2	0.3
	MS10	12	0.1	0.2	0.2	0.3

3.2.34 **Table 3.10** presents the corresponding median and maximum bat activity percentiles for each species recorded per MS location, relative to 'Excludes Absences' variants (**Table 3.9**).

Table 3.10 – Median and Maximum Activity Percentiles per Species, per MS Location (2021)

Species / Genus	MS ID	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level (Median Percentile)	Activity Level (Max Percentile)
Common pipistrelle	MS1	0th	1-5	5th	11	Low	Low
	MS2	2nd	1.5-14	24th	13	Low	Low-Moderate
	MS3	5th	4.5-23	36th	16	Low	Low-Moderate
	MS4	5th	2-14	14th	5	Low	Low
	MS5	1st	2-7.5	14th	21	Low	Low
	MS6	0th	0-0	0th	4	Low	Low
	MS7	0th	0-0	0th	8	Low	Low
	MS8	14th	5-18	19th	9	Low	Low
	MS9	1st	1.5-5	6th	19	Low	Low
	MS10	0th	0-0	0th	2	Low	Low
Soprano pipistrelle	MS1	0th	0-0	0th	1	Low	Low
	MS2	1st	0.5-0.5	1st	2	Low	Low
	MS3	0th	0-0	5th	3	Low	Low
	MS4	5th	2-14	14th	5	Low	Low
	MS5	1st	2.7.5	14th	21	Low	Low
	MS6	N/A	N/A	N/A	N/A	N/A	N/A
	MS7	1st	0.5-0.5	1st	4	Low	Low
	MS8	2nd	1.5-1.5	3	2	Low	Low
	MS9	0th	0-0	0th	1	Low	Low
	MS10	0th	0-0	0th	1	Low	Low
Myotis spp.	MS1	23rd	23-23	23rd	4	Low-Moderate	Low-Moderate
	MS2	23rd	23-23	33rd	8	Low-Moderate	Low-Moderate
	MS3	23rd	23-28	33rd	8	Low-Moderate	Low-Moderate
	MS4	39th	39-39	39th	3	Low-Moderate	Low-Moderate
	MS5	54th	43.5-70.5	100th	19	Moderate	High
	MS6	23rd	23-23	23rd	2	Low-Moderate	Low-Moderate
	MS7	33rd	23-36	39th	11	Low-Moderate	Low-Moderate
	MS8	23rd	23-23	23rd	2	Low-Moderate	Low-Moderate
	MS9	23rd	23-23	23rd	5	Low-Moderate	Low-Moderate
	MS10	23rd	23-23	33rd	6	Low-Moderate	Low-Moderate
Brown long-eared	MS1	22nd	22-40.5	83rd	7	Low-Moderate	High
	MS2	59th	40.5-59	83rd	10	Moderate	High
	MS3	22nd	22-40.5	59th	6	Low-Moderate	Moderate
	MS4	86th	52.5-92.5	97th	6	High	High
	MS5	71st	52.5-83	88th	12	Moderate-High	High
	MS6	22nd	22-22	22nd	2	Low-Moderate	Low-Moderate
	MS7	59th	40.5-71	83rd	13	Moderate	High
	MS8	59th	22-83	97th	13	Moderate	High
	MS9	83rd	52.5-92	100th	14	High	High
	MS10	59th	22-92	92nd	6	Moderate	High

Activity Analysis per Monitoring Station (MS) – High Collision Risk (HCR) Species

Common Pipistrelle

3.2.35 Common pipistrelle activity was recorded at each MS location on-site.

3.2.36 Median pass rates ('Excludes Absences') for common pipistrelle ranged from 0.2 to 2.2 passes per hour, being relatively higher at MS3, MS4 and MS8 (≥ 1 pass per hour).

3.2.37 Median activity levels uniformly equated to Low activity, ranging between the 0th-14th median percentiles, and across each MS location.

3.2.38 Maximum activity levels ranged from Low to Low-Moderate activity, ranging between the 0th-36th maximum percentiles across MS locations (**Table 3.10**), with activity at MS2 and MS3 noted to be relatively higher (Low-Moderate).

Soprano Pipistrelle

3.2.39 Soprano pipistrelle activity was recorded at most MS locations on-site, with the exception of MS6.

3.2.40 Median pass rates ('Excludes Absences') for soprano pipistrelle ranged from 0.1 to 0.6 passes per hour, being relatively comparable between MS locations (< 1 pass per hour), but relatively higher at MS3 (0.6 pass per hour).

3.2.41 Median activity levels uniformly equated to Low activity, ranging between the 0th-5th median percentiles across each MS location.

3.2.42 Maximum activity levels also uniformly equated to Low activity, ranging between the 0th-14th percentiles across most MS locations.

Activity Analysis per Monitoring Station (MS) – Other Species

Myotis Species

3.2.43 *Myotis* bat activity was recorded at each MS location on-site.

3.2.44 Median pass rates ('Excludes Absences') for Myotis species ranged from 0.1 to 1.8 passes per hour, being relatively comparable at most MS locations (< 1 pass per hour), apart from MS5 (> 1 pass per hour).

3.2.45 Median activity levels mostly equated to Low-Moderate activity across most MS locations (ranging from 23rd to 39th median percentiles), apart from MS5 which accounted for Moderate activity (54th median percentile).

3.2.46 Likewise, maximum activity levels mostly equated to Low-Moderate activity across most MS locations (ranging from the 23rd to 39th maximum percentile), apart from MS5 which accounted for High activity (100th maximum percentile).

Brown Long-Eared

3.2.47 Brown long-eared bat activity was recorded at each MS location on-site.

3.2.48 Median pass rates ('Excludes Absences') for brown long-eared bat ranged from 0.1 to 0.3 passes per hour, being relatively comparable (< 1 pass per hour), but relatively higher at MS4 and MS9 (0.3 passes per hour).

3.2.49 Median activity levels showed variation between MS locations, ranging Low-Moderate to High, activity between locations, but accounting for Moderate activity most frequently. Specifically, Low-Moderate activity was recorded at MS1, MS3 and MS6 (22nd median percentile), Moderate activity at MS2, MS7 and MS8 (59th median percentile), Moderate-High activity at MS5 (71st median percentile), and High activity at MS4 and MS9 (83rd and 89th median percentile, respectively).

3.2.50 Likewise, maximum activity levels showed variation between MS locations, ranging from Low-Moderate to Moderate, and High activity, but accounting for High activity most frequently. Specifically, MS3 accounted for Moderate activity (59th maximum percentile), and MS6 Low-Moderate activity (22nd maximum percentile), with remaining MS locations accounting for High activity (ranging between 83rd and 100th maximum percentile).

Activity Analysis per Recording Period – Overview

3.2.51 **Table 3.11** presents relative bat activity levels (percentiles) for each species recorded, per seasonal recording period.

Table 3.11 – Median and Maximum Activity Percentiles per Species, per Recording Period (2021)

Species / Genus	Season	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level (Median Percentile)	Activity Level (Max Percentile)
Common pipistrelle	Spring	April	1st	5-18	33rd	22	Low	Low-Moderate
	Summer	June	0th	4.5-23	15th	28	Low	Low
	Autumn	Sep	2nd	5-18	36th	58	Low	Low-Moderate
Soprano pipistrelle	Spring	April	N/A	N/A	N/A	N/A	N/A	N/A
	Summer	June	N/A	N/A	N/A	N/A	N/A	N/A
	Autumn	Sep	0th	7.5-7.5	12th	19	Low	Low
Myotis spp.	Spring	April	23rd	43.5-70.5	33rd	7	Low-Moderate	Low-Moderate
	Summer	June	23rd	43.5-70.5	100th	25	Low-Moderate	High
	Autumn	Sep	28th	43.5-70.5	67th	36	Low-Moderate	Moderate-High
Brown long-eared	Spring	April	59th	52.5-92.5	97th	35	Moderate	High
	Summer	June	22nd	52.5-92	59th	6	Low-Moderate	Moderate
	Autumn	Sep	59th	52.5-92.5	100th	48	Moderate	High

Activity Analysis per Recording Period – High Collision Risk (HCR) Species

Common Pipistrelle

3.2.52 Common pipistrelle was recorded on-site during each recording period.

3.2.53 Median activity levels between recording periods uniformly accounted for Low activity, ranging between the 0th and 2nd median percentile (being relatively higher during autumn).

3.2.54 Maximum activity levels between recording periods ranged from Low activity during summer (15th maximum percentile), and Low-Moderate activity during spring and autumn (33rd and 36th maximum percentile), being relatively higher during autumn.

Soprano Pipistrelle

3.2.55 Soprano pipistrelle activity on-site was limited to the autumn recording period.

3.2.56 Median activity during autumn accounted for Low activity at the 0th median percentile.

3.2.57 Maximum activity during autumn accounted for Low activity at the 12th maximum percentile.

Activity Analysis per Recording Period – Other Species

Myotis Species

3.2.58 *Myotis* bat species were recorded on-site during each recording period.

3.2.59 Median activity levels between recording periods uniformly accounted for Low-Moderate activity, ranging between the 23rd and 28th median percentile (being relatively higher during autumn).

3.2.60 Maximum activity levels between recording periods were variable, and included Low-Moderate activity, and Moderate-High to High activity. Specifically, spring accounted for Low-Moderate activity (33rd maximum percentile), summer accounted for High activity (100th maximum percentile), and autumn accounted for Moderate-High activity (67th maximum percentile).

Brown Long-Eared

3.2.61 Brown long-eared bat was recorded on-site during each recording period.

3.2.62 Median activity levels between recording periods ranged from Low-Moderate activity during summer (22nd median percentile), and Moderate activity during spring and autumn (59th median percentile).

3.2.63 Maximum activity levels between recording periods ranged from Moderate activity during summer (59th maximum percentile), and High activity during spring and autumn (97th and 100th maximum percentile), being relatively higher during autumn.

Emergence Activity

3.2.64 Bat passes recorded throughout the survey season were assessed relative to species specific emergence times[23] which could indicate the presence of roosts in proximity to the Site, relative to each MS location.

3.2.65 Ecobat returned recorded activity within species-specific emergence times at six MS locations, collectively relating to a minimum of three species (common pipistrelle, *Myotis* bats, and brown long-eared bat), as detailed in **Table 3.12**.

3.2.66 Additionally, bat passes indicative of potential emergence activity within the maternity period[24] were recorded at MS5, relative to *Myotis* species during the summer recording period.

Table 3.12 - Bat Activity Recorded within Species-Specific Emergence Times, per Monitoring Station (MS) (2021)

MS ID	Species / Genus	Nights Recorded	Peak Count	Month of Peak Count
MS2	Brown long-eared	1	1	April
	Myotis spp.	1	1	September
MS3	Brown long-eared	1	1	April
MS4	*Myotis* spp.	1	1	September
MS5	Common pipistrelle	2	1	April / September
	Brown long-eared	1	1	September
	Myotis spp.	6	6	June / September
MS8	Common pipistrelle	1	1	September
MS9	Common pipistrelle	1	1	September
	Brown long-eared	1	1	September

[23] Species-specific emergence time ranges were adapted from British Bat Calls: A Guide to Species Identification (Ross, 2012).
[24] Calls indicative of potential emergence were recorded during the maternity period (defined by Ecobat as 15th June – 30th July).

Activity Surveys – Automated Monitoring (Autumn 2024)

Overview

3.2.67 A total of 2,806 bat passes were recorded over a period of 240 suitable accumulative nights, across all MS locations combined.

3.2.68 Common pipistrelle was noted to be most abundantly recorded species, with a total of 1,970 passes recorded (i.e., 70.2 % of total bat calls recorded) over the duration of the survey period.

3.2.69 Likewise, common pipistrelle was also noted to be the most frequently recorded species over the survey effort, registering across 130 accumulative nights (i.e., 54.17 % of surveyed nights).

3.2.70 A summary of the total number and percentage of bat passes, in addition to the number of nights presence was recorded relative to the overall survey effort is presented in **Table 3.13**, per species.

Table 3.13 - Total Number/Percentage of Bat Passes and Recording Frequency per Species (Autumn 2024)

Species	No. Nights Bats Recorded	Percentage Nights Bats Recorded[25]	Passes (No.)	Percentage (%)
Common pipistrelle	130	54.17	1,970	70.2
Soprano pipistrelle	73	30.42	228	8.1
Myotis species	95	39.58	390	13.9
Brown long-eared	104	43.33	218	7.8
Total			**2,806**	**100.0**

3.2.71 A summary of the spatial distribution of bat activity per MS location is presented in **Table 3.14**.

3.2.72 Bat passes were recorded on 67.9 % of accumulative survey nights (i.e., successful nights of bat recordings at each MS combined).

3.2.73 MS3 was noted to have recorded the most bat passes (i.e., 748 passes) and highest percentage of passes (26.7 %) recorded across the Site.

3.2.74 However, MS6 featured the highest percentage of bat passes relative to the number of nights surveyed, with activity recorded on 90.9 % of nights.

Table 3.14 - Bat Activity Survey Results per Monitoring Station (MS) (Autumn 2024)

MS ID	No. Nights Sampled	No. Nights Bats Recorded	Nights Bats Recorded (%)	Total No. Passes Recorded	Distribution Passes Recorded (%)
MS1	23	12	52.2	178	6.3
MS2	21	17	81.0	225	8.0
MS3	22	14	63.6	748	26.7
MS4	23	0	0.0	0	0.0
MS5	22	18	81.8	232	8.3
MS6	22	20	90.9	304	10.8
MS8	22	17	77.3	201	7.2
MS10	22	13	59.1	99	3.5
MS11	22	19	86.4	304	10.8
MS12	22	19	86.4	145	5.2
MS13	19	14	73.7	370	13.2
Total	**240**	**163**	**67.9**	**2,806**	**100.0**

3.2.75 A summary of bat activity during autumn 2024 is also presented in **Table 3.15**.

Table 3.15 - Bat Activity Survey Results during Autumn 2024, Monitoring Stations (MS) Combined

Recording Period	No. Nights Sampled	No. Nights Bats Recorded	Nights Bats Recorded (%)	Total No. Passes Recorded	Distribution Passes Recorded (%)
August	22	20	90.9	319	11.4
September	218	143	65.6	2,487	88.6
Total	**240**	**163**	**67.9**	**2,806**	**100.0**

Nightly Activity per Species

3.2.76 **Table 3.16** presents the total number of nights bat activity was categorised under each relative activity band (i.e., Low to Exceptional activity), in reference to activity categories outlined in **Table 2.7.**

[25] Percentage of nights bats were recorded within out of a possible 240 cumulate nights between MS locations.

High Collision Risk (HCR) Species

3.2.77 Nightly activity ranged from Low to Low-Moderate activity for common pipistrelle, but most frequently accounted for Low nightly activity.

3.2.78 Nightly activity ranged from Low to Moderate activity for soprano pipistrelle, but most frequently accounted for Low nightly activity.

Other Species

3.2.79 Nightly activity ranged from Low to Exceptional activity for *Myotis* species, but most frequently accounted for Low nightly activity.

3.2.80 Nightly activity ranged from Low-Moderate to Exceptional activity for brown long-eared, but most frequently accounted for Low-Moderate nightly activity.

Table 3.16 - Number of Nights Recorded Bat Activity Fell into each Activity Band per Species (Autumn 2024)

Species	Exceptional Activity	High Activity	Moderate/ High Activity	Moderate Activity	Low/Moderate Activity	Low Activity
Common pipistrelle	0	0	0	0	13	32
Soprano pipistrelle	0	0	0	2	2	69
Myotis spp.	2	4	12	20	25	32
Brown long-eared	7	16	12	32	37	0

Site Activity per Species

3.2.81 **Table 3.17** presents the total bat passes, and median and maximum activity percentiles per species for the overall Site (i.e., MS locations combined during the autumn 2024 survey effort).

Table 3.17 - Key Activity Metrics Species Recorded On-site During the Autumn 2024 Survey Effort

Species	Total Passes	Median Percentile	95% CIs	Max Percentile	Activity Level (Median Percentile)	Activity Level (Max Percentile)
Common pipistrelle	1970	3rd	4-9	34th	Low	Low-Moderate
Soprano pipistrelle	228	2nd	6-39	40th	Low	Low-Moderate
Myotis spp.	390	30th	42-59.5	100th	Low-Moderate	High
Brown long-eared	218	57th	57-84	100th	Moderate	High

High Collision Risk (HCR) Species

3.2.82 At the median percentiles, common and soprano pipistrelle both accounted for Low activity at both the 3rd and 2nd median percentiles, respectively.

3.2.83 Likewise, at the maximum percentile, common and soprano pipistrelle both accounted for Low-Moderate activity at both the 34th and 40th median percentiles, respectively.

Other Species

3.2.84 *Myotis* species accounted for Low-Moderate activity at 30th median percentile, but High activity at the 100th maximum percentile.

3.2.85 Brown long-eared bat accounted for Moderate activity at 57th median percentile, and High activity at 100th maximum percentile.

Activity Analysis per Monitoring Station (MS) - Overview

3.2.86 **Table 3.18** presents the median and mean pass rates (BAI) for species recorded per MS location.

3.2.87 BAI outputs presented include both an 'Excludes Absences' variant (i.e., including only nights bat presence was detected) and 'Includes Absences' variant (i.e., including nights of absences).

Table 3.18 - Median and Mean Bat Pass Rate (BAI) per Species, per Monitoring Station (MS) Location (Autumn 2024)

Species / Genus	MS 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	119	0.7	0.7	0.9	1.1
	MS2	195	0.6	0.9	1.3	1.4
	MS3	643	1.3	1.6	5.4	5.9
	MS5	118	0.6	0.7	0.7	0.8
	MS6	236	0.6	0.7	1.6	1.8
	MS8	151	0.2	0.7	1.3	1.8
	MS10	58	0.2	0.6	0.5	0.7
	MS11	233	0.6	1.0	1.5	1.8
	MS12	49	0.1	0.2	0.2	0.3
	MS13	168	0.4	0.7	1.6	2.2
Soprano pipistrelle	MS1	15	0.0	0.4	0.2	0.4
	MS2	15	0.0	0.3	0.1	0.3
	MS3	74	0.0	0.5	0.6	1.3
	MS5	17	0.1	0.2	0.1	0.2
	MS6	27	0.0	0.2	0.1	0.3
	MS8	15	0.0	0.2	0.1	0.3
	MS10	6	0.0	0.1	0.0	0.1
	MS11	24	0.0	0.1	0.1	0.3
	MS12	8	0.0	0.1	0.0	0.1
	MS13	27	0.1	0.2	0.2	0.3
Myotis spp.	MS1	23	0.1	0.2	0.2	0.3
	MS2	5	0.0	0.1	0.0	0.1
	MS3	6	0.0	0.1	0.0	0.1
	MS5	78	0.6	0.6	0.5	0.5
	MS6	20	0.1	0.2	0.1	0.2
	MS8	8	0.0	0.1	0.0	0.1
	MS10	9	0.1	0.1	0.1	0.1
	MS11	9	0.0	0.1	0.0	0.2
	MS12	74	0.3	0.5	0.5	0.5
	MS13	158	0.9	0.9	1.3	1.3
Brown long-eared	MS1	21	0.2	0.2	0.2	0.3
	MS2	10	0.0	0.1	0.0	0.1
	MS3	25	0.2	0.2	0.2	0.3
	MS5	19	0.1	0.2	0.1	0.2
	MS6	21	0.1	0.1	0.1	0.1
	MS8	27	0.1	0.1	0.2	0.3
	MS10	26	0.1	0.3	0.2	0.3
	MS11	38	0.2	0.2	0.2	0.3
	MS12	14	0.0	0.2	0.1	0.2
	MS13	17	0.1	0.2	0.1	0.2

3.2.88 **Table 3.19** presents the corresponding median and maximum bat activity percentiles for each species recorded per MS location, relative to 'Excludes Absences' variants (**Table 3.18**).

Table 3.19 - Median and Maximum Activity Percentiles per Species, per MS Location (Autumn 2024)

Species / Genus	MS ID	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level (Median Percentile)	Activity Level (Max Percentile)
Common pipistrelle	MS1	3rd	3-9.5	14th	10	Low	Low
	MS2	5th	4-14	23rd	15	Low	Low-Moderate
	MS3	9th	3-21.5	34th	13	Low	Low-Moderate
	MS5	3rd	2-7	13th	16	Low	Low
	MS6	3rd	3-13	23rd	17	Low	Low-Moderate
	MS8	4th	3.5-18.5	20th	12	Low	Low

Species / Genus	MS ID	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level (Median Percentile)	Activity Level (Max Percentile)
	MS10	3rd	4-9	9th	9	Low	Low
	MS11	5th	4-14	23rd	16	Low	Low-Moderate
	MS12	1st	1-4	4th	12	Low	Low
	MS13	4th	3.5-22	24th	10	Low	Low-Moderate
Soprano pipistrelle	MS1	7th	4.5-11	11th	5	Low	Low
	MS2	5th	1.5-7	7th	8	Low	Low
	MS3	11th	6-39	40th	7	Low	Low-Moderate
	MS5	2nd	2-2	2nd	11	Low	Low
	MS6	2nd	1.5-11	14th	9	Low	Low
	MS8	4th	1-9	11th	6	Low	Low
	MS10	1st	1-1	2nd	4	Low	Low
	MS11	1st	1-8	14th	9	Low	Low
	MS12	1st	1-2.5	4th	6	Low	Low
	MS13	3rd	1-11.5	22nd	8	Low	Low-Moderate
Myotis spp.	MS1	30th	23.5-45	45th	8	Low-Moderate	Moderate
	MS2	17th	17-17	17th	5	Low	Low
	MS3	17th	17-17	30th	5	Low	Low-Moderate
	MS5	55th	42-59.5	67th	16	Moderate	Moderate-High
	MS6	30th	23.5-41.5	53rd	12	Low-Moderate	Moderate
	MS8	17th	17-17	39th	5	Low	Low-Moderate
	MS10	17th	17-28	39th	7	Low	Low-Moderate
	MS11	17th	17-28	29th	6	Low	Low-Moderate
	MS12	45th	35-58	73rd	17	Moderate	Moderate-High
	MS13	63rd	41.5-81.5	100th	14	Moderate-High	High
Brown long-eared	MS1	67th	38.5-85.5	95th	10	Moderate-High	High
	MS2	20th	20-48	76th	6	Low	Moderate-High
	MS3	67th	57-84	92nd	12	Moderate-High	High
	MS5	57th	38.5-71.5	86th	10	Moderate	High
	MS6	39th	20-57	76th	14	Low-Moderate	Moderate-High
	MS8	20th	20-71.5	97th	13	Low	High
	MS10	76th	20-89	92nd	9	Moderate-High	High
	MS11	67th	38.5-85.5	100th	14	Moderate-High	High
	MS12	57th	38.5-57	57th	8	Moderate	Moderate
	MS13	39th	20-76	92nd	8	Low-Moderate	High

Activity Analysis per MS Location – High Collision Risk (HCR) Species

Common Pipistrelle

3.2.89 Common pipistrelle activity was recorded at each MS location on-site, apart from MS4.

3.2.90 Median pass rates ('Excludes Absences') for common pipistrelle ranged from 0.2 to 1.6 passes per hour, being relatively higher at MS3 and MS11 (≥ 1 pass per hour).

3.2.91 Median activity levels uniformly equated to Low activity across MS locations, ranging between the 1st-9th median percentiles.

3.2.92 Maximum activity levels ranged from Low to Low-Moderate activity across MS locations, ranging between the 4th-34th maximum percentiles.

Soprano Pipistrelle

3.2.93 Soprano pipistrelle activity was recorded at each MS location on-site, apart from MS4.

3.2.94 Median pass rates ('Excludes Absences') for soprano pipistrelle ranged from 0.1 to 0.5 passes per hour, being relatively comparable between MS locations (< 1 pass per hour).

3.2.95 Median activity levels uniformly equated to Low activity across MS locations, ranging between the 1st-11th median percentiles.

3.2.96 Maximum activity levels mostly equated to Low activity but accounted for Low-Moderate activity at MS3 and MS13, ranging between the 2nd-40th median percentile across MS locations.

Activity Analysis per MS Location – Other Species

Myotis Species

3.2.97 *Myotis* bat activity was recorded at each MS location on-site, apart from MS4.

3.2.98 Median pass rates ('Excludes Absences') for *Myotis* species ranged from 0.1 to 0.9 passes per hour, being relatively comparable between MS locations (< 1 pass per hour).

3.2.99 However, median activity levels range from Low to Moderate-High activity across most MS locations, ranging from the 17th to 63rd median percentiles.

3.2.100 Likewise, maximum activity levels range from Low to Moderate-High activity across most MS locations, ranging from the 17th to 100th maximum percentiles.

Brown Long-Eared

3.2.101 Brown long-eared bat activity was recorded at each MS location on-site, apart from MS4.

3.2.102 Median pass rates ('Excludes Absences') for brown long-eared bat ranged from 0.1 to 0.3 passes per hour, being relatively comparable between MS locations (< 1 pass per hour).

3.2.103 However, median activity levels range from Low to Moderate-High activity across most MS locations, ranging from the 20th to 76th median percentiles.

3.2.104 Maximum activity levels ranged from Moderate to High activity across most MS locations, ranging from the 57th to 100th maximum percentiles.

Activity Analysis per Recording Period - Overview

3.2.105 **Table 3.20** presents relative bat activity levels (percentiles) for each species recorded, during the autumn 2024 recording period.

Table 3.20 - Median and Maximum Activity Percentiles per Species (Autumn 2024)

Species / Genus	Season	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level (Median Percentile)	Activity Level (Max Percentile)
Common pipistrelle	Autumn	Aug	5th	4-9	23rd	17	Low	Low-Moderate
		Sep	3rd	4-9	34th	113	Low	Low-Moderate
Soprano pipistrelle	Autumn	Aug	1st	6-39	11th	14	Low	Low
		Sep	2nd	6-39	40th	59	Low	Low-Moderate
Myotis spp.	Autumn	Aug	30th	42-59.5	80th	14	Low-Moderate	Moderate-High
		Sep	30th	42-59.5	100th	81	Low-Moderate	High
Brown long-eared	Autumn	Aug	57th	57-84	97th	18	Moderate	High
		Sep	57th	57-84	100th	86	Moderate	High

Activity Analysis per Recording Period – High Collision Risk (HCR) Species

Common Pipistrelle

3.2.106 Common pipistrelle was recorded on-site during each month comprising the autumn recording period (i.e., August and September).

3.2.107 Median activity levels between months uniformly accounted for Low activity, ranging between the 3rd and 5th median percentiles (being relatively higher during August).

3.2.108 Maximum activity levels between months uniformly accounted for Low-Moderate activity, ranging between the 23rd and 34th median percentiles (being relatively higher during September).

Soprano Pipistrelle

3.2.109 Soprano pipistrelle was recorded on-site during each month comprising the autumn recording period.

3.2.110 Median activity levels between months uniformly accounted for Low activity, ranging between the 1st and 2nd median percentiles (being relatively higher during September).

3.2.111 Maximum activity levels between months were variable and accounted for Low activity during August (11th maximum percentile), and Low-Moderate activity during September (40th maximum percentile).

Activity Analysis per Recording Period – Other Species

Myotis Species

3.2.112 *Myotis* bat species was recorded on-site during each month comprising the autumn recording period.

3.2.113 Median activity levels between months uniformly accounted for Low-Moderate activity at the 30th median percentile per month.

3.2.114 Maximum activity levels between months were variable and accounted for Moderate-High activity during August (80th maximum percentile), and High activity during September (100th maximum percentile).

Brown Long-Eared

3.2.115 Brown long-eared was recorded on-Site during each month comprising the autumn recording period.

3.2.116 Median activity levels between months uniformly accounted for Moderate activity at the 57th median percentile per month.

3.2.117 Maximum activity levels between months uniformly accounted for High activity, ranging between the 97th and 100th median percentiles (being relatively higher during September).

Emergence Activity

3.2.118 Bat passes recorded throughout the survey effort were assessed relative to species specific emergence times which could indicate the presence of roosts in proximity, relative to each MS location on-site.

3.2.119 Ecobat returned recorded activity within species-specific emergence times at eight MS locations, collectively relating to a minimum of four species (common pipistrelle, soprano pipistrelle, *Myotis* bats, and brown long-eared bat), as detailed in **Table 3.21**.

Table 3.21 - Bat Activity Recorded Within Species-Specific Emergence Times, per Monitoring Station (MS)

MS ID	Species / Genus	Nights Recorded	Peak Count	Month of Peak Count
MS2	Brown long-eared	1	1	September
MS3	Common pipistrelle	1	1	September
MS5	Common pipistrelle	2	3	September
	Soprano pipistrelle	2	1	September
	Myotis species	5	7	September
MS6	Common pipistrelle	2	3	September
	Myotis species	2	1	September
MS8	*Myotis* species	1	1	August
MS11	Common pipistrelle	1	2	August
	Brown long-eared	5	3	September
	Myotis species	1	1	September
MS12	Common pipistrelle	1	1	September
	Myotis species	2	3	September
MS13	Common pipistrelle	1	1	September
	Soprano pipistrelle	1	1	September
	Brown long-eared	1	1	September
	Myotis species	1	1	September

Activity Surveys – Comparison Between 2021 and 2024 Data

3.2.120 Bat activity levels appear to be relatively similar between the 2021 and 2024 datasets.

3.2.121 Common pipistrelle was the most abundant species recorded in both survey periods; accounting for 70.6 % of bat passes in 2021 and 70.2 % in 2024. *Myotis* and brown-longed were also recorded in similar abundances between the two datasets; accounting for bat passes of 15.9 % in 2021 and 13.9 % in 2024 and 11.3 % in 2021 and 7.8 % in 2024 respectively. Soprano pipistrelle showed the greatest difference between the survey periods; increasing from 2.2 % of the total in 2021 to 8.1 % in 2024.

3.2.122 MS3 recorded the most bat passes during both the 2021 and 2024 survey periods; accounting for 33.1 % of total passes in 2021 and 26.7 % in 2024.

3.2.123 Nightly activity was similar between the 2021 and 2024 datasets. Common pipistrelle fell within the Low/Moderate and Low activity bands during both survey periods. Soprano pipistrelle fell into the Low activity band only in 2021, with slightly higher activity recorded in 2024 with two nights each also falling into Moderate and Moderate/Low activity bands; however, the vast majority of nights still fell into Low activity band. *Myotis* had two nights of Exceptional activity in both survey periods and activity fell into all but the Low activity band in 2021 and into every activity band in 2024. Brown long-eared had seven nights of Exceptional activity in both survey periods and activity fell into all but Moderate/High and Low activity bands in 2021 and into all but the Low activity band in 2024.

3.2.124 Overall median and max activity percentiles were also similar between the 2021 and 2024 datasets. Common pipistrelle had both Low activity at the median percentile and both Low-Moderate at the max

percentile during both survey periods. *Myotis* and brown long-eared also had the same median and max percentile activity levels between the datasets (*Myotis*: Low-Moderate at the median and High at the max; brown long-eared: Moderate at the median and High at the max). Soprano pipistrelle was the same at the median percentile; both being Low activity, however it varied at the max percentile with the 2021 activity being Low and the 2024 activity being Low-Moderate.

3.2.125 The median and max activity percentiles per species per MS location were also similar between the 2021 and 2024 datasets for the high collision risk species; with only the max percentile at MS6 for common pipistrelle, the max percentile at MS3 and both the median and max percentile at MS6 for soprano pipistrelle being different between the two survey periods.

4. Assessment of the Potential Risk to Bats

4.1 Stage 1 – Initial Site Risk Assessment

4.1.1 In accordance with NatureScot guidance (2021)[6], an assessment of the potential risk level of the Proposed Development has been undertaken based on a consideration of both habitat and development-related features detailed in Table 3a of the NatureScot guidance (2021)[6].

4.1.2 The values and classification criteria provided within Table 3a of the NatureScot guidance (2021)[6] 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 to conclude on the overall risk level for the Site.

4.1.3 The Site has been assessed as having an 'Initial Site Risk' of 3 representing a Medium Site Risk:

- The Site 'Habitat Risk' is classified as 'Medium'.
- The Site 'Project Size' is classified as being Medium, comprising a development of 11 turbines of up to 200 m tip height, with two consented wind farm developments located within 5 km of the Site, as described in **Table 3.1**.

4.2 Stage 2 – Overall Site Risk Assessment

4.2.1 In accordance with the NatureScot guidance (2021), Stage 2 should be carried out separately for all HCR species recorded, which includes the following species recorded during bat activity surveys for the Proposed Development:

- Common pipistrelle; and
- Soprano pipistrelle.

4.2.2 In order to derive an 'Overall Risk Assessment' the determined Bat Activity Category derived from the Ecobat assessment tool, is compared against the Site Risk Level (Stage 1) using the matrix presented in Table 3b in NatureScot (2021)[6] to determine the level of Overall Risk.

Activity Surveys (2021)

4.2.3 As calculated using the NatureScot (2021)[6] guidance, an 'Overall Risk Assessment' for each HCR species recorded on-Site, per MS location and per recording period, is presented in **Table 4.1** and **Table 4.2**.

4.2.4 On considering Overall Risk Assessment per MS location (**Table 4.1**) HCR species assessments uniformly equated to 'Low Risk' when considering median percentiles for both common and soprano pipistrelles. Maximum activity percentiles also uniformly accounted for 'Low Risk' relative to soprano pipistrelle; however, maximum activity percentiles mostly accounted for 'Low Risk' relative to common pipistrelle, but 'Medium Risk' in relation to MS2 and MS3.

4.2.5 In considering Overall Risk Assessment per recording period (**Table 4.2**), Overall Risk Assessment uniformly equated to 'Low Risk' at the median activity percentile for common and soprano pipistrelle (when recorded during autumn). The maximum activity percentile for soprano pipistrelle during the autumn recording period also accounted for 'Low Risk'; however, maximum activity percentiles accounted for 'Low Risk' during summer, and 'Medium Risk' during spring and autumn, relative to common pipistrelle.

Activity Surveys (Autumn 2024)

4.2.6 As calculated using the NatureScot (2021)[6] guidance, an 'Overall Risk Assessment' for each HCR species recorded on-Site during autumn 2024 activity surveys, per MS location and per recording month, is presented in **Table 4.3** and **Table 4.4**.

4.2.7 In considering Overall Risk Assessment per MS location (**Table 4.3**) HCR species assessments uniformly equated to 'Low Risk' when considering median percentiles for both common and soprano pipistrelles. However, maximum activity percentiles ranged from 'Low Risk' to 'Medium Risk' for both common pipistrelle and soprano pipistrelle, but more frequently accounted for 'Low Risk' relative to soprano pipistrelle.

4.2.8 In considering Overall Risk Assessment per month during the autumn activity survey (**Table 4.4**), median activity percentiles uniformly equated to 'Low Risk' for both common and soprano pipistrelle. However, maximum activity percentiles per month uniformly accounted for 'Medium Risk' relative to common pipistrelle but varied relative to soprano pipistrelle (accounting for 'Low Risk' during August, and 'Medium Risk' during September).

Table 4.1 - Overall Risk Assessment per MS Location in 2021, for both the Median and Maximum Percentiles (Table 3b from NatureScot (2021)6 Guidance). Key: Green = Low, Amber = Medium, Red = High

Species	MS ID	Median Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
Common pipistrelle	MS1	0th	Low	Low (3)
	MS2	2nd	Low	Low (3)
	MS3	5th	Low	Low (3)
	MS4	5th	Low	Low (3)
	MS5	1st	Low	Low (3)
	MS6	0th	Low	Low (3)
	MS7	0th	Low	Low (3)
	MS8	14th	Low	Low (3)
	MS9	1st	Low	Low (3)
	MS10	0th	Low	Low (3)
Soprano pipistrelle	MS1	0th	Low	Low (3)
	MS2	1st	Low	Low (3)
	MS3	0th	Low	Low (3)
	MS4	5th	Low	Low (3)
	MS5	1st	Low	Low (3)
	MS6	N/A	N/A	Low (3)
	MS7	1st	Low	Low (3)
	MS8	2nd	Low	Low (3)
	MS9	0th	Low	Low (3)
	MS10	0th	Low	Low (3)

Species	MS ID	Max Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
Common pipistrelle	MS1	5th	Low	Low (3)
	MS2	24th	Low-Moderate	Medium (6)
	MS3	36th	Low-Moderate	Medium (6)
	MS4	14th	Low	Low (3)
	MS5	14th	Low	Low (3)
	MS6	0th	Low	Low (3)
	MS7	0th	Low	Low (3)
	MS8	19th	Low	Low (3)
	MS9	6th	Low	Low (3)
	MS10	0th	Low	Low (3)
Soprano pipistrelle	MS1	0th	Low	Low (3)
	MS2	1st	Low	Low (3)
	MS3	5th	Low	Low (3)
	MS4	14th	Low	Low (3)
	MS5	14th	Low	Low (3)
	MS6	N/A	N/A	Low (3)
	MS7	1st	Low	Low (3)
	MS8	3rd	Low	Low (3)
	MS9	0th	Low	Low (3)
	MS10	0th	Low	Low (3)

Table 4.2 - Overall Risk Assessment per Month in 2021, for both the Median and Maximum Percentiles (Table 3b from NatureScot (2021)6 Guidance). Key: Green = Low, Amber = Medium, Red = High

Species	Season	Month	Median Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
Common pipistrelle	Spring	April	1st	Low	Low (3)
	Summer	June	0th	Low	Low (3)
	Autumn	September	2nd	Low	Low (3)
Soprano pipistrelle	Spring	April	N/A	N/A	N/A
	Summer	June	N/A	N/A	N/A
	Autumn	September	0th	Low	Low (3)

Species	Season	Month	Max Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
Common pipistrelle	Spring	April	33rd	Low-Moderate	Medium (6)
	Summer	June	15th	Low	Low (3)
	Autumn	September	36th	Low-Moderate	Medium (6)
Soprano pipistrelle	Spring	April	N/A	N/A	N/A
	Summer	June	N/A	N/A	N/A
	Autumn	September	12th	Low	Low (3)

Table 4.3 - Overall Risk Assessment per MS Location in Autumn 2024, for both the Median and Maximum Percentiles (Table 3b from NatureScot (2021)6 Guidance). Key: Green = Low, Amber = Medium, Red = High

Species	MS ID	Median Percentile	Percentile Category	Overall Risk Assessment (Stage 2)		Species	MS ID	Max Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
Common pipistrelle	MS1	3rd	Low	**Low (3)**		Common pipistrelle	MS1	14th	Low	**Low (3)**
	MS2	5th	Low	**Low (3)**			MS2	23rd	Low-Moderate	**Medium (6)**
	MS3	9th	Low	**Low (3)**			MS3	34th	Low-Moderate	**Medium (6)**
	MS5	3rd	Low	**Low (3)**			MS5	13th	Low	**Low (3)**
	MS6	3rd	Low	**Low (3)**			MS6	23rd	Low-Moderate	**Medium (6)**
	MS8	4th	Low	**Low (3)**			MS8	20th	Low	**Low (3)**
	MS10	3rd	Low	**Low (3)**			MS10	9th	Low	**Low (3)**
	MS11	5th	Low	**Low (3)**			MS11	23rd	Low-Moderate	**Medium (6)**
	MS12	1st	Low	**Low (3)**			MS12	4th	Low	**Low (3)**
	MS13	4th	Low	**Low (3)**			MS13	24th	Low-Moderate	**Medium (6)**
Soprano pipistrelle	MS1	7th	Low	**Low (3)**		Soprano pipistrelle	MS1	11th	Low	**Low (3)**
	MS2	5th	Low	**Low (3)**			MS2	7th	Low	**Low (3)**
	MS3	11th	Low	**Low (3)**			MS3	40th	Low-Moderate	**Medium (6)**
	MS5	2nd	Low	**Low (3)**			MS5	2nd	Low	**Low (3)**
	MS6	2nd	Low	**Low (3)**			MS6	14th	Low	**Low (3)**
	MS8	4th	Low	**Low (3)**			MS8	11th	Low	**Low (3)**
	MS10	1st	Low	**Low (3)**			MS10	2nd	Low	**Low (3)**
	MS11	1st	Low	**Low (3)**			MS11	14th	Low	**Low (3)**
	MS12	1st	Low	**Low (3)**			MS12	4th	Low	**Low (3)**
	MS13	3rd	Low	**Low (3)**			MS13	22nd	Low-Moderate	**Medium (6)**

Table 4.4 - Overall Risk Assessment per Month in Autumn 2024, for both the Median and Maximum Percentiles (Table 3b from NatureScot (2021)6 Guidance). Key: Green = Low, Amber = Medium, Red = High

Species	Season	Month	Median Percentile	Percentile Category	Overall Risk Assessment (Stage 2)		Species	Season	Month	Max Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
Common pipistrelle	Autumn	April	1st	Low	**Low (3)**		Common pipistrelle	Spring	April	33rd	Low-Moderate	**Medium (6)**
		June	0th	Low	**Low (3)**			Summer	June	15th	Low	**Low (3)**
Soprano pipistrelle	Autumn	April	N/A	N/A	**N/A**		Soprano pipistrelle	Spring	April	N/A	N/A	**N/A**
		June	N/A	N/A	**N/A**			Summer	June	N/A	N/A	**N/A**

Annex 1 – Scientific Names

Table A1.1 – Common and Scientific Names

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

Annex 2 – Survey Weather Conditions

4.2.9 **Table A2.1** below provides weather conditions for bat activity survey periods (2021), and **Table A2.2** provides the equivalent weather conditions for the autumn 2024 period. Those values in red font represent sub-optimal weather conditions for bats.

Table A2.1 – Weather Conditions During the 2021 Survey Period

Date	Temp at Dusk (ºC)	Rainfall (mm)	Maximum Wind Speed (m/s)
15/04/2021	9	0	1.94
16/04/2021	8	0	2.50
17/04/2021	9	0	3.89
18/04/2021	8.4	0	0.11
19/04/2021	8.2	0	0.11
20/04/2021	3.3	0	0.00
21/04/2021	5.4	0	0.00
22/04/2021	7.1	0	0.00
23/04/2021	5.1	0	0.36
24/04/2021	6	0	0.25
25/04/2021	8.4	0	0.11
16/06/2021	10	0	2.22
17/06/2021	10	0	2.22
18/06/2021	9	0	3.06
19/06/2021	11	0	2.50
20/06/2021	9	0	2.50
21/06/2021	8	0	2.22
22/06/2021	10	0	3.06
23/06/2021	13	0	1.11
24/06/2021	11	0	2.50
25/06/2021	10	0	2.50
26/06/2021	10	0	0.83
27/06/2021	13	0	1.11
07/09/2021	17.3	0	0.00
08/09/2021	17.6	0	0.25
09/09/2021	13.2	0	0.25
10/09/2021	14.3	0	0.11
11/09/2021	10.7	0	0.00
12/09/2021	10.1	0	0.11
13/09/2021	12.2	0	0.11
14/09/2021	14.4	0	0.00
15/09/2021	13.6	0	0.00
16/09/2021	12.8	0	0.25
17/09/2021	11.9	0.25	0.11
18/09/2021	12.8	0	0.00
19/09/2021	10.2	0	0.25

Table A2.2 – Weather Conditions During the Autumn 2024 Survey Period

Date	Temp at Dusk (ºC)	Rainfall (mm)	Maximum Wind Speed (m/s)
30/08/2024	8	0	0.28
31/08/2024	9	0	0.83
01/09/2024	12	0	1.11
02/09/2024	12	0	1.11
03/09/2024	8	0.1	1.67
04/09/2024	8	0	1.67
05/09/2024	10	0	0.83
06/09/2024	11	0	1.11
07/09/2024	12	0	0.83
08/09/2024	9.2	0	0.11
09/09/2024	8.7	0	0.00

Date	Temp at Dusk (ºC)	Rainfall (mm)	Maximum Wind Speed (m/s)
10/09/2024	4.3	0	0.11
11/09/2024	6.1	0	0.11
12/09/2024	4.6	0	0.11
13/09/2024	8.6	0	0.00
14/09/2024	14.7	0	0.86
15/09/2024	9.2	0	0.25
16/09/2024	12.2	0	0.00
17/09/2024	16.3	0	0.00
18/09/2024	15.2	0	0.00
19/09/2024	14.4	0	0.00
20/09/2024	9.9	0	0.25
21/09/2024	10.3	0	0.00
22/09/2024	8.5	0	0.00
23/09/2024	8.8	0	0.00
24/09/2024	**5.1**	0	0.00

Annex 3 – EcoBat Ouput

Ecobat Report

2025-03-06

Geo filter: region, Time filter: +- 1 month

Summary

Bats were detected on **21** nights between **30/08/2024** and **23/09/2024**, using **10** static bat detectors. Throughout this period, **4** species were recorded. **Table 1.** Detectors were placed at the following locations:

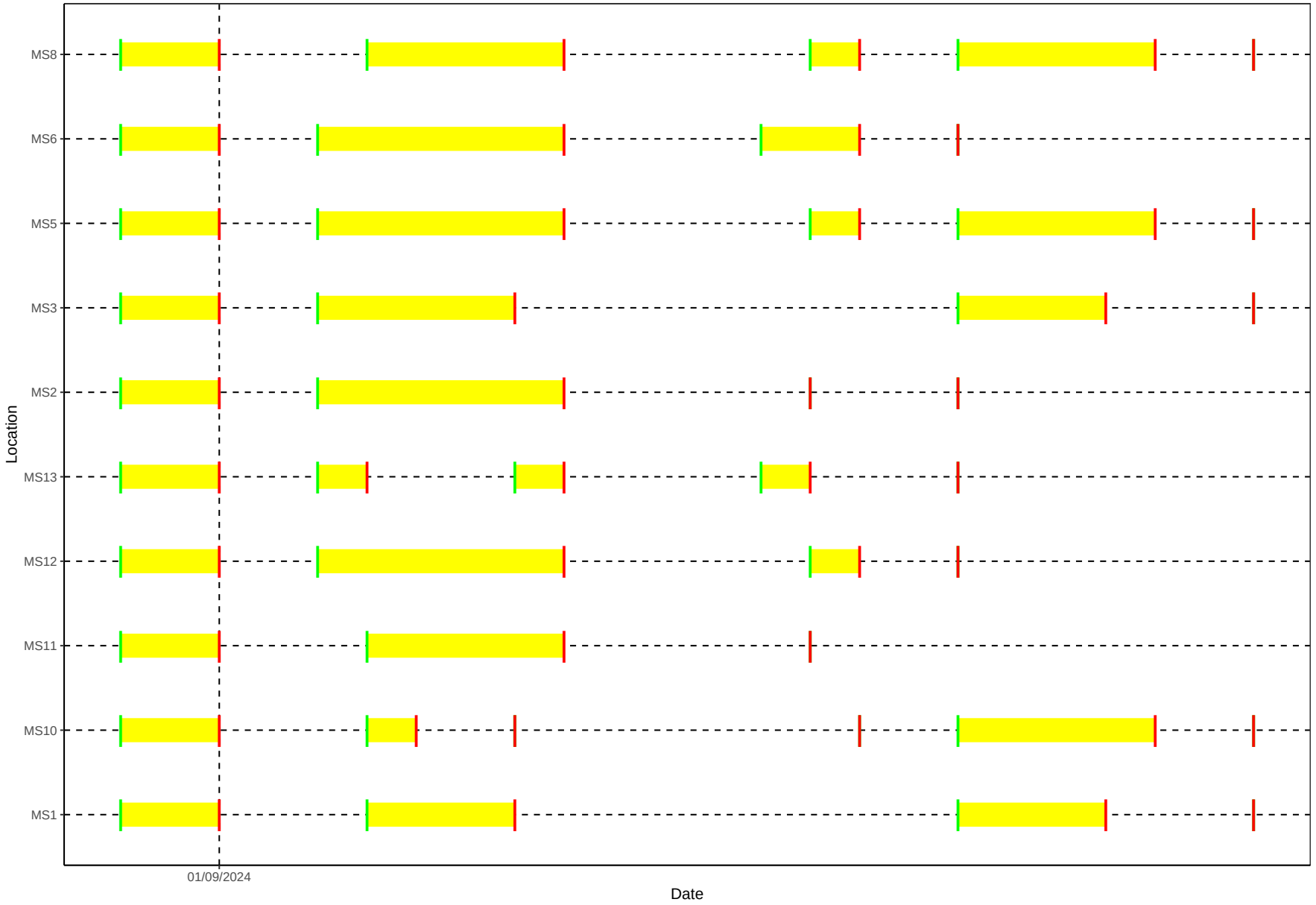
Detector ID	Latitude	Longitude
MS1	57.93693	-4.675906
MS2	57.95129	-4.679935
MS3	57.94287	-4.655142
MS5	57.95238	-4.661405
MS6	57.94773	-4.672841
MS8	57.94558	-4.663707
MS10	57.94124	-4.678610
MS11	57.95630	-4.670605
MS12	57.94724	-4.693338
MS13	57.94464	-4.706038

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	12
MS10	13
MS11	19
MS12	19
MS13	14
MS2	17
MS3	14
MS5	18
MS6	20
MS8	17

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


MS8
MS6
MS5
MS3
MS2
MS13
MS12
MS11
MS10
MS1
Location
01/09/2024
Date

Part 1: Percentile 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.

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	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	0	0	0	3	3	2
MS1	Pipistrellus pipistrellus	0	0	0	0	0	10
MS1	Pipistrellus pygmaeus	0	0	0	0	0	5
MS1	Plecotus auritus	2	0	3	3	2	0
MS10	Myotis	0	0	0	0	3	4
MS10	Pipistrellus pipistrellus	0	0	0	0	0	9
MS10	Pipistrellus pygmaeus	0	0	0	0	0	4
MS10	Plecotus auritus	0	4	1	1	3	0
MS11	Myotis	0	0	0	0	2	4
MS11	Pipistrellus pipistrellus	0	0	0	0	2	14
MS11	Pipistrellus pygmaeus	0	0	0	0	0	9
MS11	Plecotus auritus	3	2	2	3	4	0
MS12	Myotis	0	0	6	3	6	2
MS12	Pipistrellus pipistrellus	0	0	0	0	0	12
MS12	Pipistrellus pygmaeus	0	0	0	0	0	6
MS12	Plecotus auritus	0	0	0	6	2	0
MS13	Myotis	2	4	1	3	2	2
MS13	Pipistrellus pipistrellus	0	0	0	0	3	7
MS13	Pipistrellus pygmaeus	0	0	0	0	1	7
MS13	Plecotus auritus	0	1	2	1	4	0

Detector ID	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
MS2	Myotis	0	0	0	0	0	5
MS2	Pipistrellus pipistrellus	0	0	0	0	1	14
MS2	Pipistrellus pygmaeus	0	0	0	0	0	8
MS2	Plecotus auritus	0	0	1	1	4	0
MS3	Myotis	0	0	0	0	1	4
MS3	Pipistrellus pipistrellus	0	0	0	0	3	10
MS3	Pipistrellus pygmaeus	0	0	0	2	1	4
MS3	Plecotus auritus	0	4	2	5	1	0
MS5	Myotis	0	0	5	7	3	1
MS5	Pipistrellus pipistrellus	0	0	0	0	0	16
MS5	Pipistrellus pygmaeus	0	0	0	0	0	11
MS5	Plecotus auritus	0	2	0	5	3	0
MS6	Myotis	0	0	0	4	4	4
MS6	Pipistrellus pipistrellus	0	0	0	0	2	15
MS6	Pipistrellus pygmaeus	0	0	0	0	0	9
MS6	Plecotus auritus	0	0	1	6	7	0
MS8	Myotis	0	0	0	0	1	4
MS8	Pipistrellus pipistrellus	0	0	0	0	2	10
MS8	Pipistrellus pygmaeus	0	0	0	0	0	6
MS8	Plecotus auritus	2	3	0	1	7	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	30	23.5 - 45	45	8	449
MS1	Pipistrellus pipistrellus	3	3 - 9.5	14	10	28899
MS1	Pipistrellus pygmaeus	7	4.5 - 11	11	5	3854
MS1	Plecotus auritus	67	38.5 - 85.5	95	10	358
MS10	Myotis	17	17 - 28	39	7	449
MS10	Pipistrellus pipistrellus	3	4 - 9	9	9	28899
MS10	Pipistrellus pygmaeus	1	1 - 1	2	4	3854
MS10	Plecotus auritus	76	20 - 89	92	9	358
MS11	Myotis	17	17 - 28	39	6	449
MS11	Pipistrellus pipistrellus	5	4 - 14	23	16	28899
MS11	Pipistrellus pygmaeus	1	1 - 8	14	9	3854
MS11	Plecotus auritus	67	38.5 - 85.5	100	14	358
MS12	Myotis	45	35 - 58	73	17	449
MS12	Pipistrellus pipistrellus	1	1 - 4	4	12	28899
MS12	Pipistrellus pygmaeus	1	1 - 2.5	4	6	3854
MS12	Plecotus auritus	57	38.5 - 57	57	8	358
MS13	Myotis	63	41.5 - 81.5	100	14	449
MS13	Pipistrellus pipistrellus	4	3.5 - 22	24	10	28899
MS13	Pipistrellus pygmaeus	3	1 - 11.5	22	8	3854
MS13	Plecotus auritus	39	20 - 76	92	8	358
MS2	Myotis	17	17 - 17	17	5	449
MS2	Pipistrellus pipistrellus	5	4 - 14	23	15	28899
MS2	Pipistrellus pygmaeus	5	1.5 - 7	7	8	3854
MS2	Plecotus auritus	20	20 - 48	76	6	358
MS3	Myotis	17	17 - 17	30	5	449
MS3	Pipistrellus pipistrellus	9	3 - 21.5	34	13	28899
MS3	Pipistrellus pygmaeus	11	6 - 39	40	7	3854
MS3	Plecotus auritus	67	57 - 84	92	12	358
MS5	Myotis	55	42 - 59.5	67	16	449
MS5	Pipistrellus pipistrellus	3	2 - 7	13	16	28899
MS5	Pipistrellus pygmaeus	2	2 - 2	2	11	3854
MS5	Plecotus auritus	57	38.5 - 71.5	86	10	358
MS6	Myotis	30	23.5 - 41.5	53	12	449

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
MS6	Pipistrellus pipistrellus	3	3 - 13	23	17	28899
MS6	Pipistrellus pygmaeus	2	1.5 - 11	14	9	3854
MS6	Plecotus auritus	39	20 - 57	76	14	358
MS8	Myotis	17	17 - 17	39	5	449
MS8	Pipistrellus pipistrellus	4	3.5 - 18.5	20	12	28899
MS8	Pipistrellus pygmaeus	4	1 - 9	11	6	3854
MS8	Plecotus auritus	20	20 - 71.5	97	13	358

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).

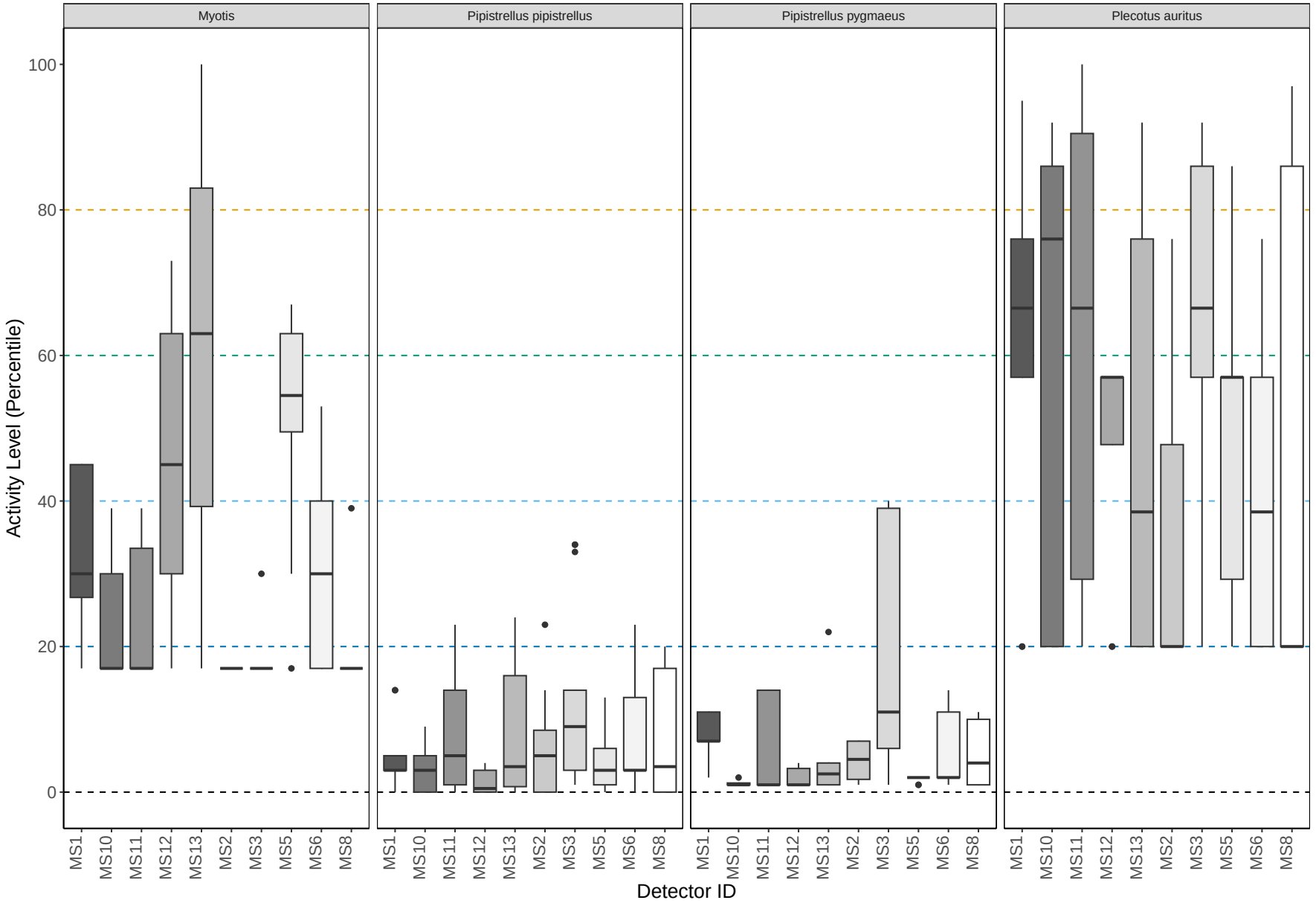
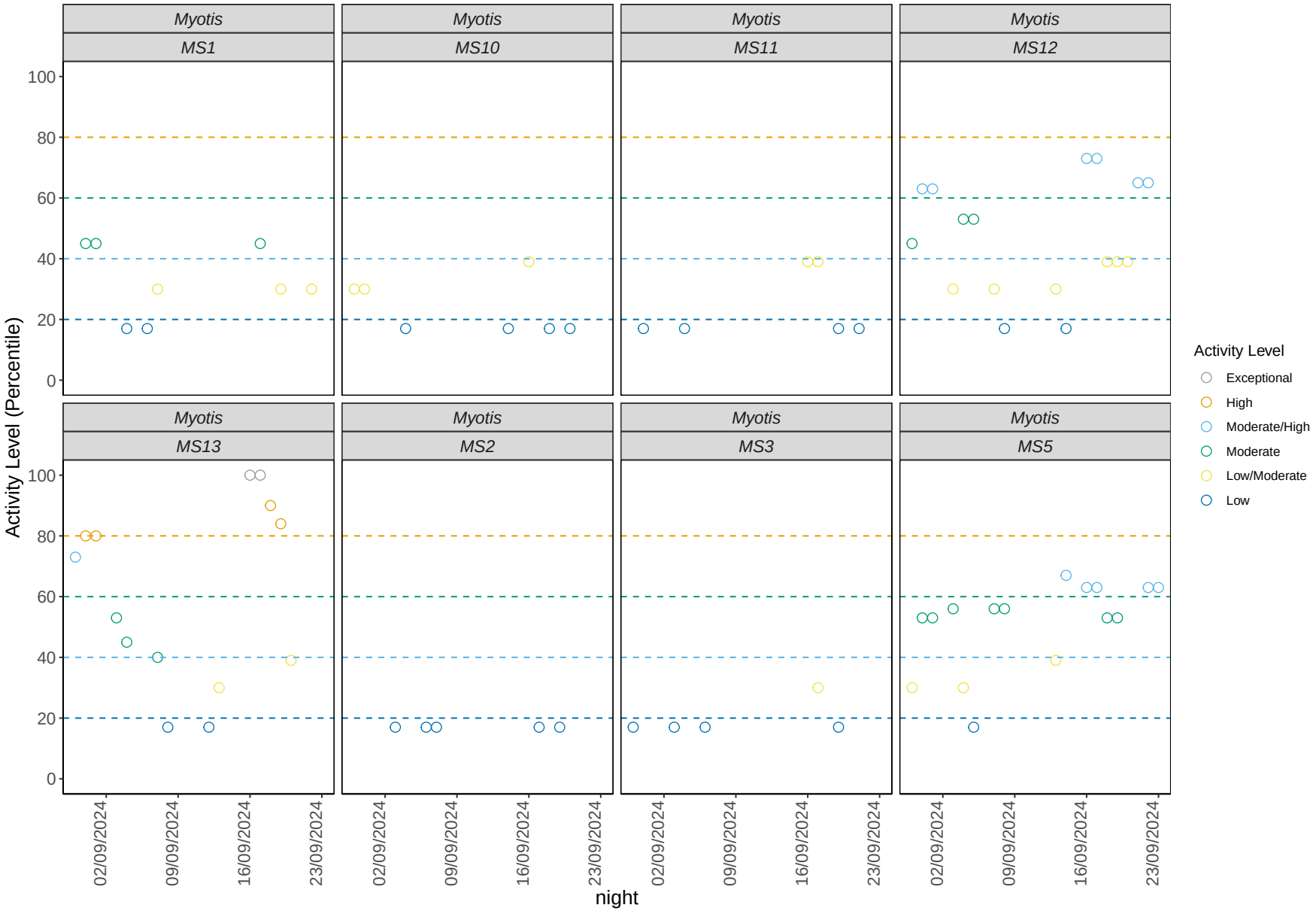
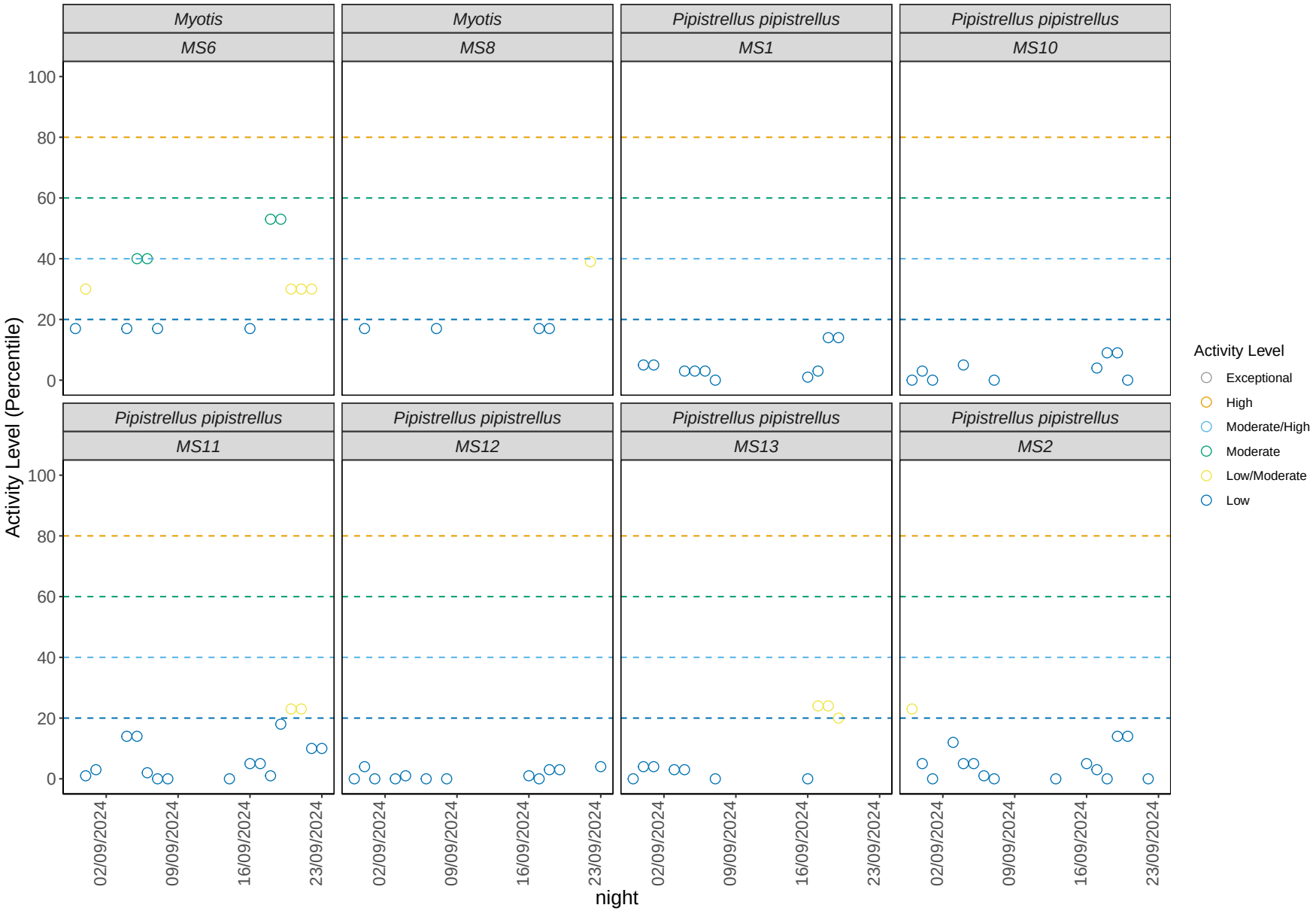
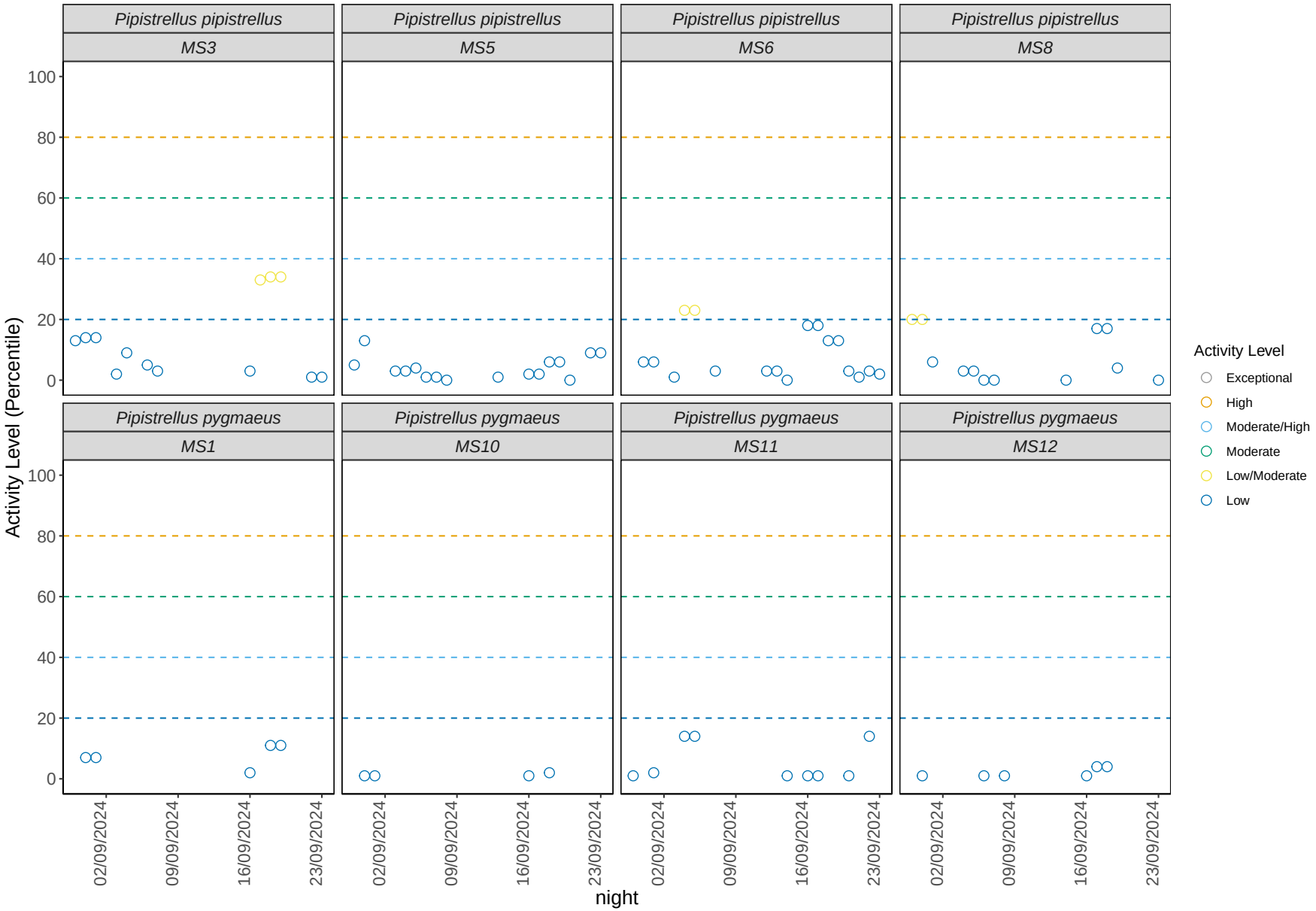
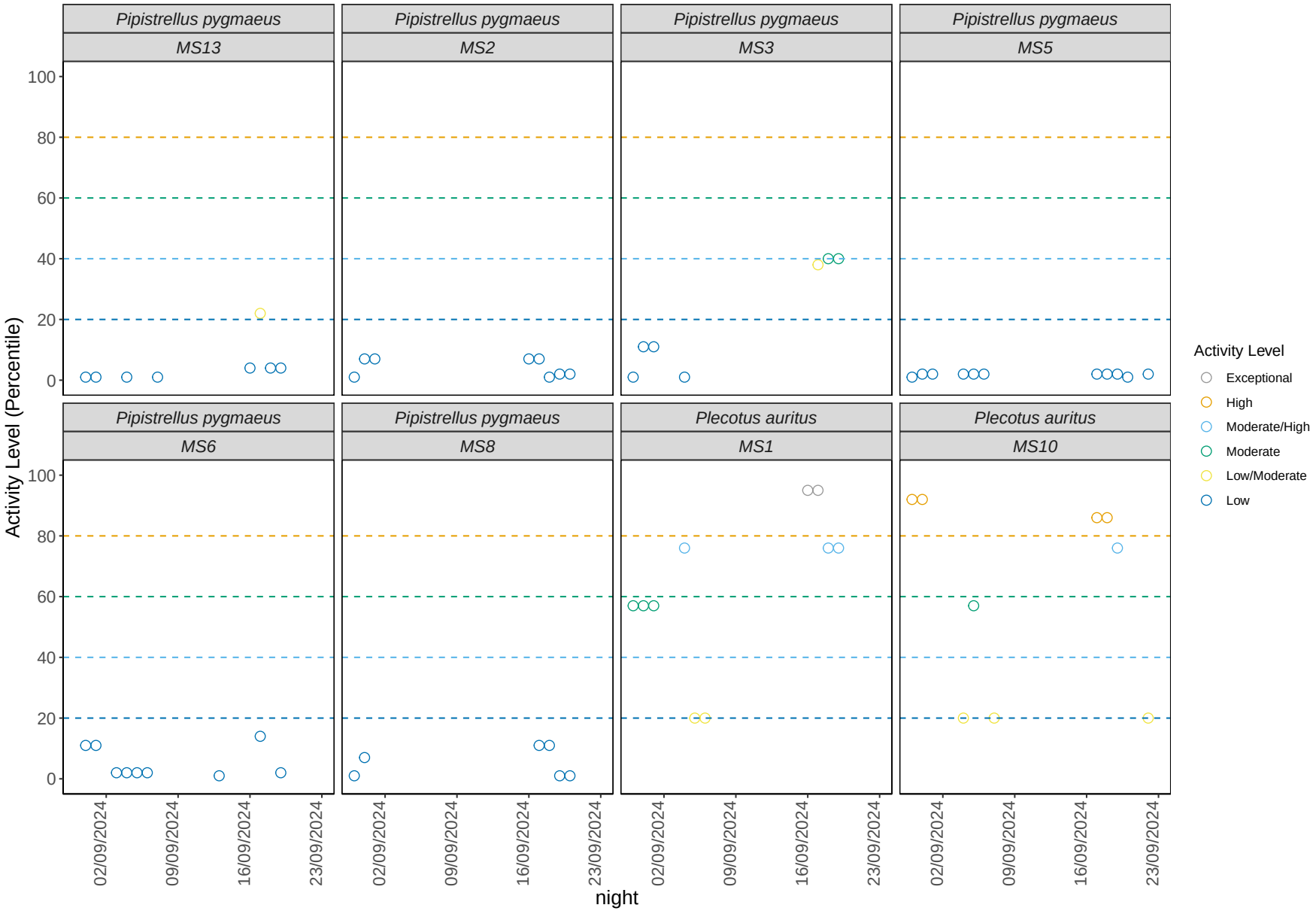

Myotis
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Activity Level (Percentile)
100
80
60
40
20
0
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID

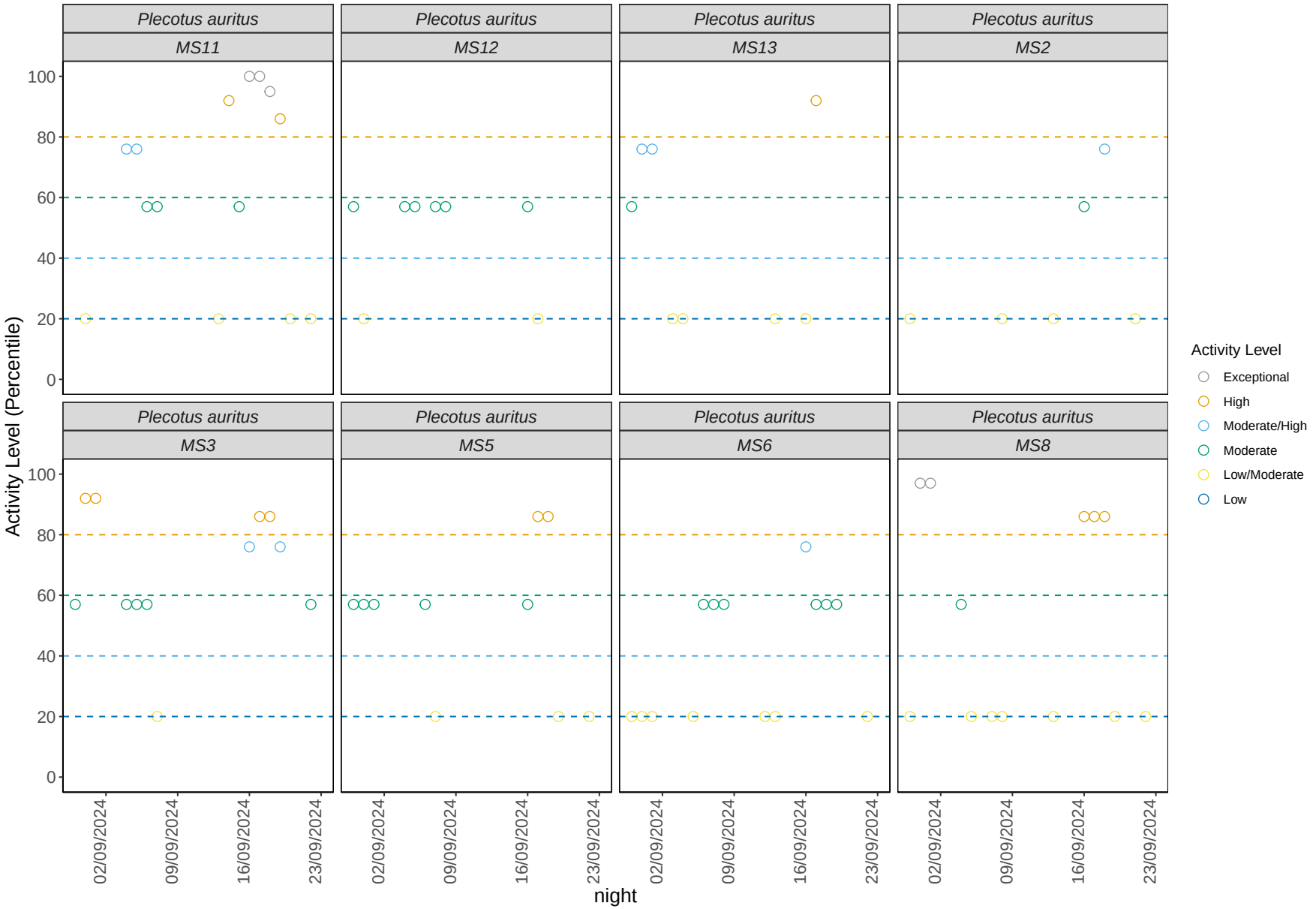
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.


Myotis
MS1
Myotis
MS10
Myotis
MS11
Myotis
MS12
Myotis
MS13
Myotis
MS2
Myotis
MS3
Myotis
MS5
Activity Level (Percentile)
0
20
40
60
80
100
02/09/2024
09/09/2024
16/09/2024
23/09/2024
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


Myotis
MS6
Myotis
MS8
Pipistrellus pipistrellus
MS1
Pipistrellus pipistrellus
MS10
Pipistrellus pipistrellus
MS11
Pipistrellus pipistrellus
MS12
Pipistrellus pipistrellus
MS13
Pipistrellus pipistrellus
MS2
Activity Level (Percentile)
100
80
60
40
20
0
02/09/2024
09/09/2024
16/09/2024
23/09/2024
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


Pipistrellus pipistrellus
MS3
Pipistrellus pipistrellus
MS5
Pipistrellus pipistrellus
MS6
Pipistrellus pipistrellus
MS8
Pipistrellus pygmaeus
MS1
Pipistrellus pygmaeus
MS10
Pipistrellus pygmaeus
MS11
Pipistrellus pygmaeus
MS12
Activity Level (Percentile)
100
80
60
40
20
0
02/09/2024
09/09/2024
16/09/2024
23/09/2024
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


Pipistrellus pygmaeus
MS13
Pipistrellus pygmaeus
MS2
Pipistrellus pygmaeus
MS3
Pipistrellus pygmaeus
MS5
Pipistrellus pygmaeus
MS6
Pipistrellus pygmaeus
MS8
Plecotus auritus
MS1
Plecotus auritus
MS10
Activity Level (Percentile)
100
80
60
40
20
0
02/09/2024
09/09/2024
16/09/2024
23/09/2024
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


Plecotus auritus
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Activity Level (Percentile)
0
20
40
60
80
100
02/09/2024
09/09/2024
16/09/2024
23/09/2024
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	Aug	0	0	0	1	0	0
MS1	Myotis	Sep	0	0	0	2	3	2
MS1	Pipistrellus pipistrellus	Aug	0	0	0	0	0	1
MS1	Pipistrellus pipistrellus	Sep	0	0	0	0	0	9
MS1	Pipistrellus pygmaeus	Aug	0	0	0	0	0	1
MS1	Pipistrellus pygmaeus	Sep	0	0	0	0	0	4
MS1	Plecotus auritus	Aug	0	0	0	2	0	0
MS1	Plecotus auritus	Sep	2	0	3	1	2	0
MS10	Myotis	Aug	0	0	0	0	2	0
MS10	Myotis	Sep	0	0	0	0	1	4
MS10	Pipistrellus pipistrellus	Aug	0	0	0	0	0	2
MS10	Pipistrellus pipistrellus	Sep	0	0	0	0	0	7
MS10	Pipistrellus pygmaeus	Aug	0	0	0	0	0	1
MS10	Pipistrellus pygmaeus	Sep	0	0	0	0	0	3
MS10	Plecotus auritus	Aug	0	2	0	0	0	0
MS10	Plecotus auritus	Sep	0	2	1	1	3	0
MS11	Myotis	Aug	0	0	0	0	0	1
MS11	Myotis	Sep	0	0	0	0	2	3
MS11	Pipistrellus pipistrellus	Aug	0	0	0	0	0	1
MS11	Pipistrellus pipistrellus	Sep	0	0	0	0	2	13

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
MS11	Pipistrellus pygmaeus	Aug	0	0	0	0	0	1
MS11	Pipistrellus pygmaeus	Sep	0	0	0	0	0	8
MS11	Plecotus auritus	Aug	0	0	0	0	1	0
MS11	Plecotus auritus	Sep	3	2	2	3	3	0
MS12	Myotis	Aug	0	0	1	1	0	0
MS12	Myotis	Sep	0	0	5	2	6	2
MS12	Pipistrellus pipistrellus	Aug	0	0	0	0	0	2
MS12	Pipistrellus pipistrellus	Sep	0	0	0	0	0	10
MS12	Pipistrellus pygmaeus	Aug	0	0	0	0	0	1
MS12	Pipistrellus pygmaeus	Sep	0	0	0	0	0	5
MS12	Plecotus auritus	Aug	0	0	0	1	1	0
MS12	Plecotus auritus	Sep	0	0	0	5	1	0
MS13	Myotis	Aug	0	1	1	0	0	0
MS13	Myotis	Sep	2	3	0	3	2	2
MS13	Pipistrellus pipistrellus	Aug	0	0	0	0	0	2
MS13	Pipistrellus pipistrellus	Sep	0	0	0	0	3	5
MS13	Pipistrellus pygmaeus	Aug	0	0	0	0	0	1
MS13	Pipistrellus pygmaeus	Sep	0	0	0	0	1	6
MS13	Plecotus auritus	Aug	0	0	1	1	0	0
MS13	Plecotus auritus	Sep	0	1	1	0	4	0
MS2	Myotis	Sep	0	0	0	0	0	5
MS2	Pipistrellus pipistrellus	Aug	0	0	0	0	1	1

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
MS2	Pipistrellus pipistrellus	Sep	0	0	0	0	0	13
MS2	Pipistrellus pygmaeus	Aug	0	0	0	0	0	2
MS2	Pipistrellus pygmaeus	Sep	0	0	0	0	0	6
MS2	Plecotus auritus	Aug	0	0	0	0	1	0
MS2	Plecotus auritus	Sep	0	0	1	1	3	0
MS3	Myotis	Aug	0	0	0	0	0	1
MS3	Myotis	Sep	0	0	0	0	1	3
MS3	Pipistrellus pipistrellus	Aug	0	0	0	0	0	2
MS3	Pipistrellus pipistrellus	Sep	0	0	0	0	3	8
MS3	Pipistrellus pygmaeus	Aug	0	0	0	0	0	2
MS3	Pipistrellus pygmaeus	Sep	0	0	0	2	1	2
MS3	Plecotus auritus	Aug	0	1	0	1	0	0
MS3	Plecotus auritus	Sep	0	3	2	4	1	0
MS5	Myotis	Aug	0	0	0	1	1	0
MS5	Myotis	Sep	0	0	5	6	2	1
MS5	Pipistrellus pipistrellus	Aug	0	0	0	0	0	2
MS5	Pipistrellus pipistrellus	Sep	0	0	0	0	0	14
MS5	Pipistrellus pygmaeus	Aug	0	0	0	0	0	2
MS5	Pipistrellus pygmaeus	Sep	0	0	0	0	0	9
MS5	Plecotus auritus	Aug	0	0	0	2	0	0
MS5	Plecotus auritus	Sep	0	2	0	3	3	0
MS6	Myotis	Aug	0	0	0	0	1	1
MS6	Myotis	Sep	0	0	0	4	3	3

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
MS6	Pipistrellus pipistrellus	Aug	0	0	0	0	0	1
MS6	Pipistrellus pipistrellus	Sep	0	0	0	0	2	14
MS6	Pipistrellus pygmaeus	Aug	0	0	0	0	0	1
MS6	Pipistrellus pygmaeus	Sep	0	0	0	0	0	8
MS6	Plecotus auritus	Aug	0	0	0	0	2	0
MS6	Plecotus auritus	Sep	0	0	1	6	5	0
MS8	Myotis	Aug	0	0	0	0	0	1
MS8	Myotis	Sep	0	0	0	0	1	3
MS8	Pipistrellus pipistrellus	Aug	0	0	0	0	2	0
MS8	Pipistrellus pipistrellus	Sep	0	0	0	0	0	10
MS8	Pipistrellus pygmaeus	Aug	0	0	0	0	0	2
MS8	Pipistrellus pygmaeus	Sep	0	0	0	0	0	4
MS8	Plecotus auritus	Aug	1	0	0	0	1	0
MS8	Plecotus auritus	Sep	1	3	0	1	6	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	Aug	45	23.5 - 45	45	1
MS1	Myotis	Sep	30	23.5 - 45	45	7
MS1	Pipistrellus pipistrellus	Aug	5	3 - 9.5	5	1
MS1	Pipistrellus pipistrellus	Sep	3	3 - 9.5	14	9
MS1	Pipistrellus pygmaeus	Aug	7	4.5 - 11	7	1
MS1	Pipistrellus pygmaeus	Sep	9	4.5 - 11	11	4
MS1	Plecotus auritus	Aug	57	38.5 - 85.5	57	2
MS1	Plecotus auritus	Sep	76	38.5 - 85.5	95	8
MS10	Myotis	Aug	30	17 - 28	30	2
MS10	Myotis	Sep	17	17 - 28	39	5
MS10	Pipistrellus pipistrellus	Aug	2	4 - 9	3	2
MS10	Pipistrellus pipistrellus	Sep	4	4 - 9	9	7
MS10	Pipistrellus pygmaeus	Aug	1	1 - 1	1	1
MS10	Pipistrellus pygmaeus	Sep	1	1 - 1	2	3
MS10	Plecotus auritus	Aug	92	20 - 89	92	2
MS10	Plecotus auritus	Sep	57	20 - 89	86	7
MS11	Myotis	Aug	17	17 - 28	17	1
MS11	Myotis	Sep	17	17 - 28	39	5
MS11	Pipistrellus pipistrellus	Aug	1	4 - 14	1	1
MS11	Pipistrellus pipistrellus	Sep	5	4 - 14	23	15
MS11	Pipistrellus pygmaeus	Aug	1	1 - 8	1	1
MS11	Pipistrellus pygmaeus	Sep	2	1 - 8	14	8
MS11	Plecotus auritus	Aug	20	38.5 - 85.5	20	1
MS11	Plecotus auritus	Sep	76	38.5 - 85.5	100	13
MS12	Myotis	Aug	54	35 - 58	63	2
MS12	Myotis	Sep	39	35 - 58	73	15
MS12	Pipistrellus pipistrellus	Aug	2	1 - 4	4	2
MS12	Pipistrellus pipistrellus	Sep	1	1 - 4	4	10
MS12	Pipistrellus pygmaeus	Aug	1	1 - 2.5	1	1
MS12	Pipistrellus pygmaeus	Sep	1	1 - 2.5	4	5
MS12	Plecotus auritus	Aug	39	38.5 - 57	57	2
MS12	Plecotus auritus	Sep	57	38.5 - 57	57	6
MS13	Myotis	Aug	77	41.5 - 81.5	80	2

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
MS13	Myotis	Sep	49	41.5 - 81.5	100	12
MS13	Pipistrellus pipistrellus	Aug	2	3.5 - 22	4	2
MS13	Pipistrellus pipistrellus	Sep	4	3.5 - 22	24	8
MS13	Pipistrellus pygmaeus	Aug	1	1 - 11.5	1	1
MS13	Pipistrellus pygmaeus	Sep	4	1 - 11.5	22	7
MS13	Plecotus auritus	Aug	67	20 - 76	76	2
MS13	Plecotus auritus	Sep	20	20 - 76	92	6
MS2	Myotis	Sep	17	17 - 17	17	5
MS2	Pipistrellus pipistrellus	Aug	14	4 - 14	23	2
MS2	Pipistrellus pipistrellus	Sep	3	4 - 14	14	13
MS2	Pipistrellus pygmaeus	Aug	4	1.5 - 7	7	2
MS2	Pipistrellus pygmaeus	Sep	5	1.5 - 7	7	6
MS2	Plecotus auritus	Aug	20	20 - 48	20	1
MS2	Plecotus auritus	Sep	20	20 - 48	76	5
MS3	Myotis	Aug	17	17 - 17	17	1
MS3	Myotis	Sep	17	17 - 17	30	4
MS3	Pipistrellus pipistrellus	Aug	14	3 - 21.5	14	2
MS3	Pipistrellus pipistrellus	Sep	5	3 - 21.5	34	11
MS3	Pipistrellus pygmaeus	Aug	6	6 - 39	11	2
MS3	Pipistrellus pygmaeus	Sep	38	6 - 39	40	5
MS3	Plecotus auritus	Aug	75	57 - 84	92	2
MS3	Plecotus auritus	Sep	67	57 - 84	92	10
MS5	Myotis	Aug	42	42 - 59.5	53	2
MS5	Myotis	Sep	56	42 - 59.5	67	14
MS5	Pipistrellus pipistrellus	Aug	9	2 - 7	13	2
MS5	Pipistrellus pipistrellus	Sep	3	2 - 7	9	14
MS5	Pipistrellus pygmaeus	Aug	2	2 - 2	2	2
MS5	Pipistrellus pygmaeus	Sep	2	2 - 2	2	9
MS5	Plecotus auritus	Aug	57	38.5 - 71.5	57	2
MS5	Plecotus auritus	Sep	57	38.5 - 71.5	86	8
MS6	Myotis	Aug	24	23.5 - 41.5	30	2
MS6	Myotis	Sep	30	23.5 - 41.5	53	10
MS6	Pipistrellus pipistrellus	Aug	6	3 - 13	6	1
MS6	Pipistrellus pipistrellus	Sep	3	3 - 13	23	16
MS6	Pipistrellus pygmaeus	Aug	11	1.5 - 11	11	1
MS6	Pipistrellus pygmaeus	Sep	2	1.5 - 11	14	8

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
MS6	Plecotus auritus	Aug	20	20 - 57	20	2
MS6	Plecotus auritus	Sep	57	20 - 57	76	12
MS8	Myotis	Aug	17	17 - 17	17	1
MS8	Myotis	Sep	17	17 - 17	39	4
MS8	Pipistrellus pipistrellus	Aug	20	3.5 - 18.5	20	2
MS8	Pipistrellus pipistrellus	Sep	3	3.5 - 18.5	17	10
MS8	Pipistrellus pygmaeus	Aug	4	1 - 9	7	2
MS8	Pipistrellus pygmaeus	Sep	6	1 - 9	11	4
MS8	Plecotus auritus	Aug	59	20 - 71.5	97	2
MS8	Plecotus auritus	Sep	20	20 - 71.5	97	11

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	2	4	12	20	25	32
Pipistrellus pipistrellus	0	0	0	0	13	117
Pipistrellus pygmaeus	0	0	0	2	2	69
Plecotus auritus	7	16	12	32	37	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	42 - 59.5	100	95
Pipistrellus pipistrellus	3	4 - 9	34	130
Pipistrellus pygmaeus	2	6 - 39	40	73
Plecotus auritus	57	57 - 84	100	104

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

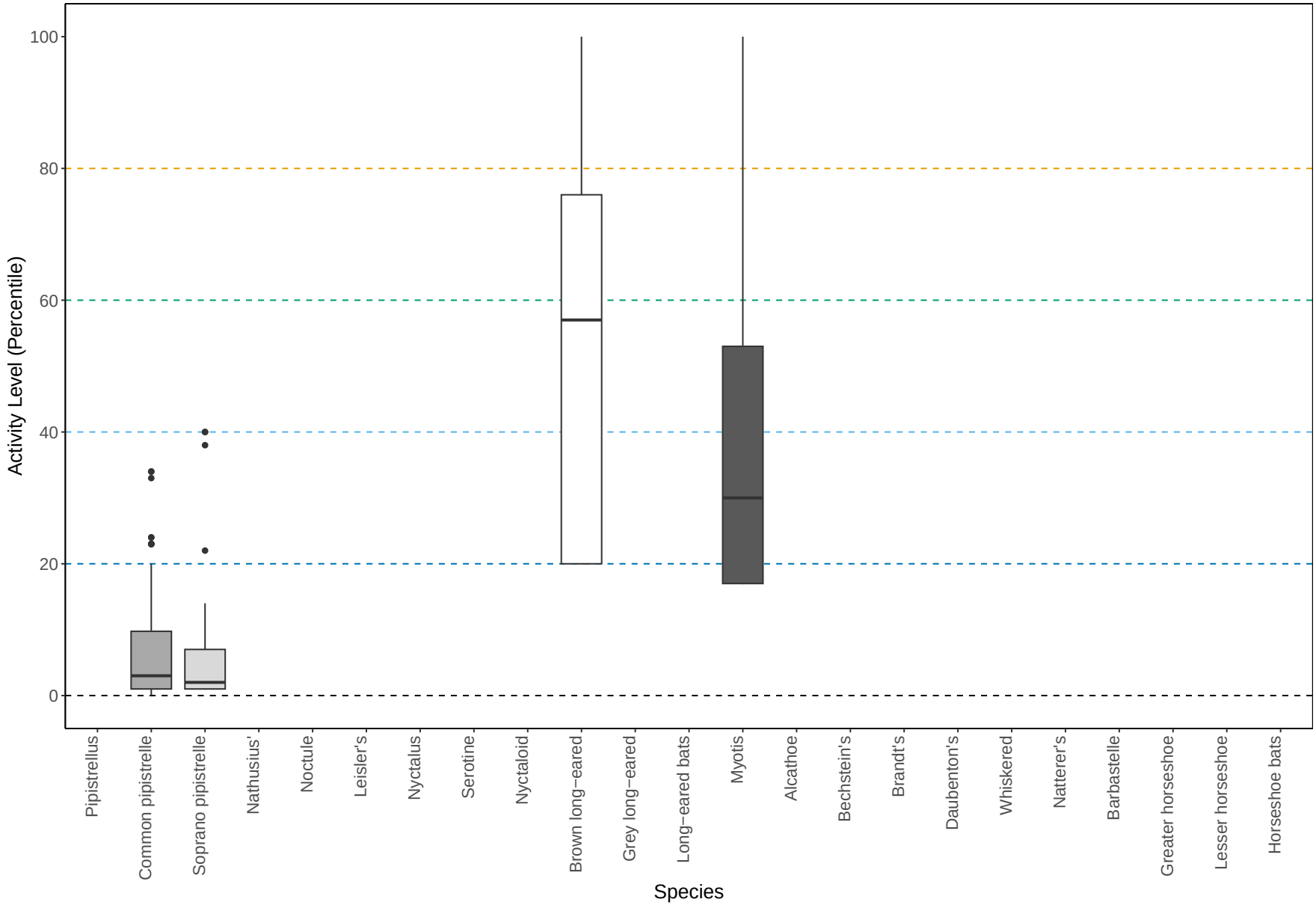
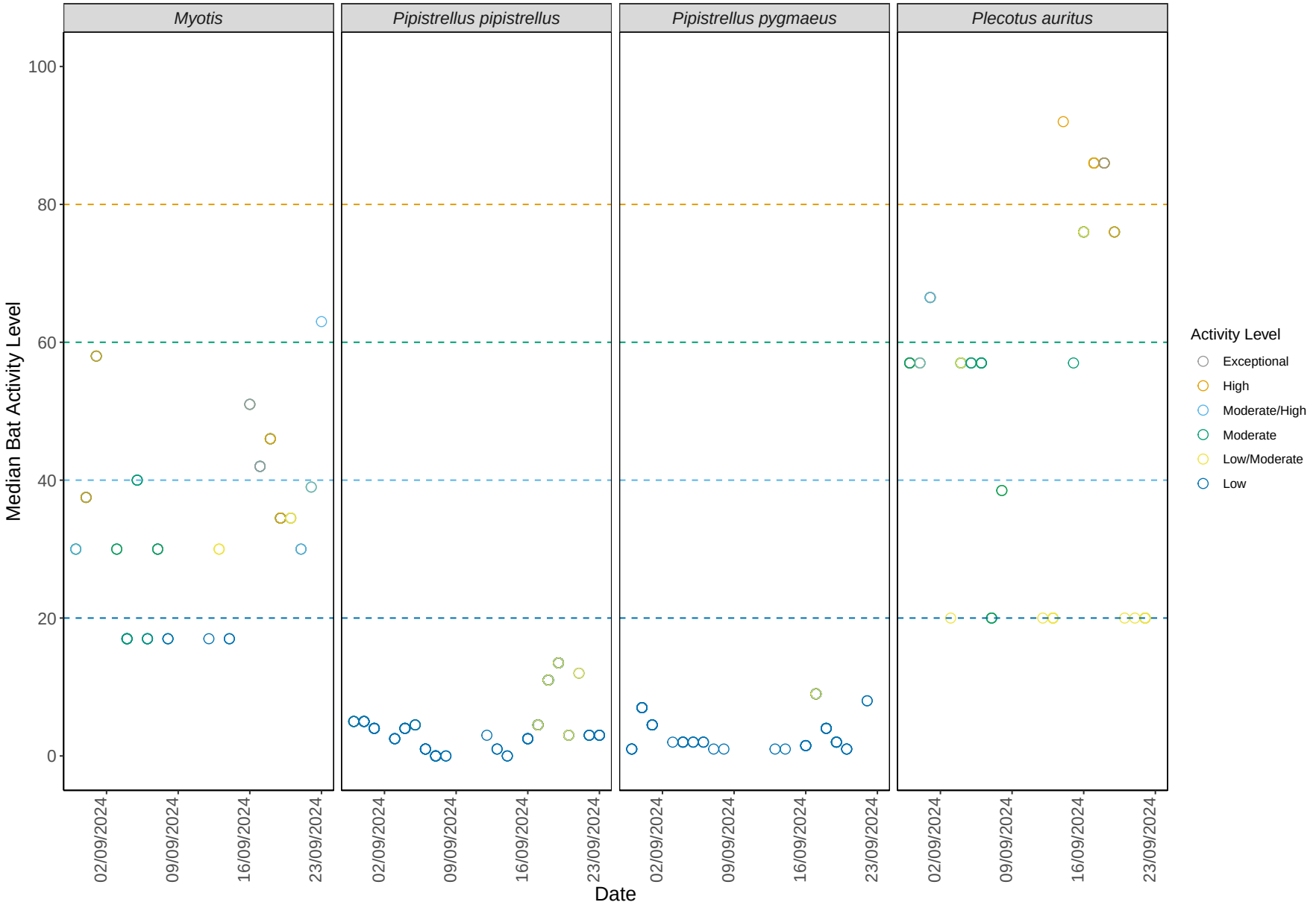

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Leisler's
Nyctalus
Serotine
Nyctaloid
Brown long−eared
Grey long−eared
Long−eared bats
Myotis
Alcathoe
Bechstein's
Brandt's
Daubenton's
Whiskered
Natterer's
Barbastelle
Greater horseshoe
Lesser horseshoe
Horseshoe bats
Species

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


Myotis
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Median Bat Activity Level
100
80
60
40
20
0
02/09/2024
09/09/2024
16/09/2024
23/09/2024
Date
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low

Per Site, Per Month

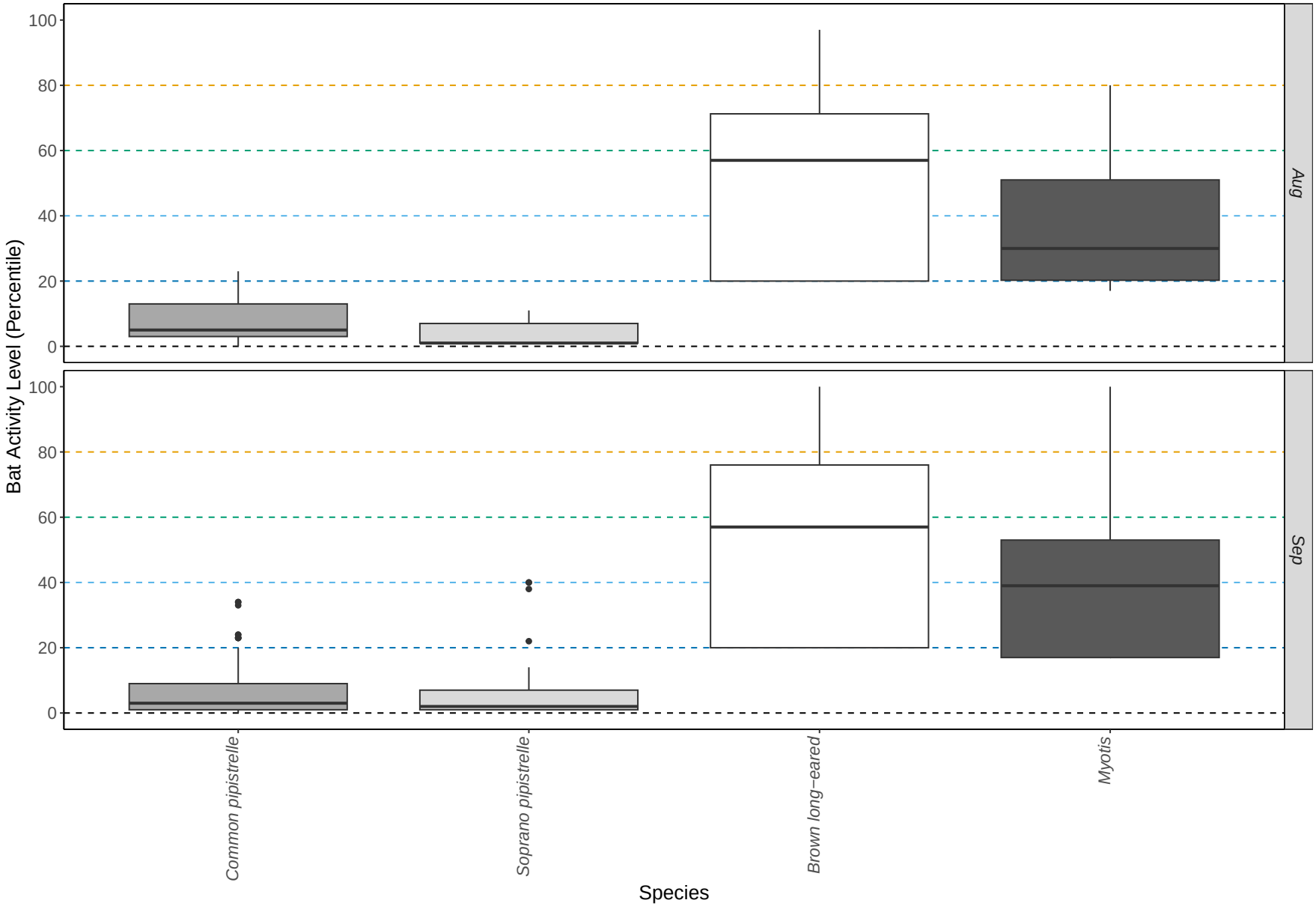
Table 9. Summary table showing the number of nights recorded bat activity fell into each activity band for each species during each month.

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	Aug	0	1	2	3	4	4
Myotis	Sep	2	3	10	17	21	28
Pipistrellus pipistrellus	Aug	0	0	0	0	3	14
Pipistrellus pipistrellus	Sep	0	0	0	0	10	103
Pipistrellus pygmaeus	Aug	0	0	0	0	0	14
Pipistrellus pygmaeus	Sep	0	0	0	2	2	55
Plecotus auritus	Aug	1	3	1	7	6	0
Plecotus auritus	Sep	6	13	11	25	31	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	Aug	30	42 - 59.5	80	14
Myotis	Sep	39	42 - 59.5	100	81
Pipistrellus pipistrellus	Aug	5	4 - 9	23	17
Pipistrellus pipistrellus	Sep	3	4 - 9	34	113
Pipistrellus pygmaeus	Aug	1	6 - 39	11	14
Pipistrellus pygmaeus	Sep	2	6 - 39	40	59
Plecotus auritus	Aug	57	57 - 84	97	18
Plecotus auritus	Sep	57	57 - 84	100	86

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


Bat Activity Level (Percentile)
100
80
60
40
20
0
Aug
Sep
Common pipistrelle
Soprano pipistrelle
Brown long−eared
Myotis
Species

Part 2: Nightly Analysis

Entire Survey Period

Sunrise and Sunset Times

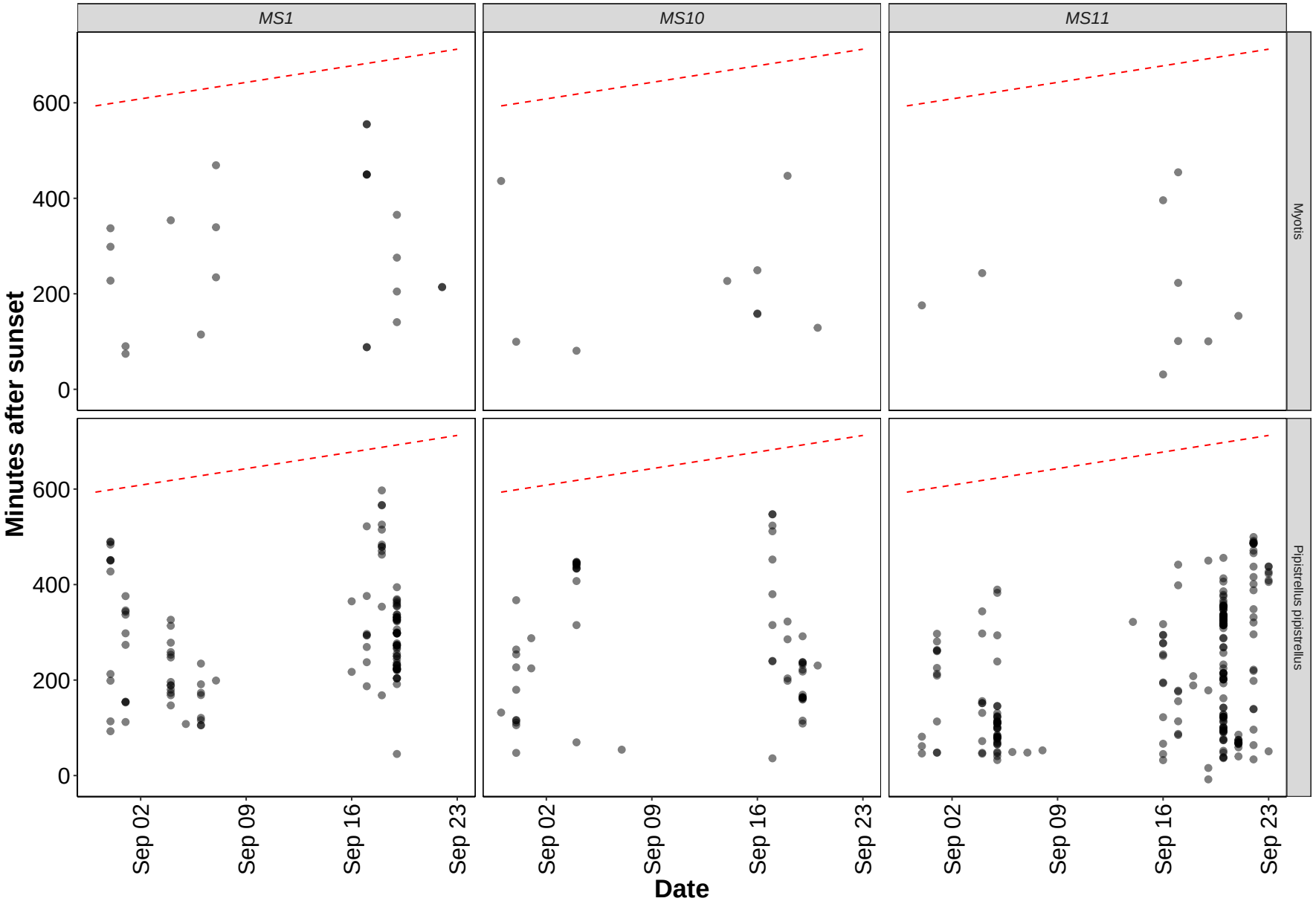
Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.

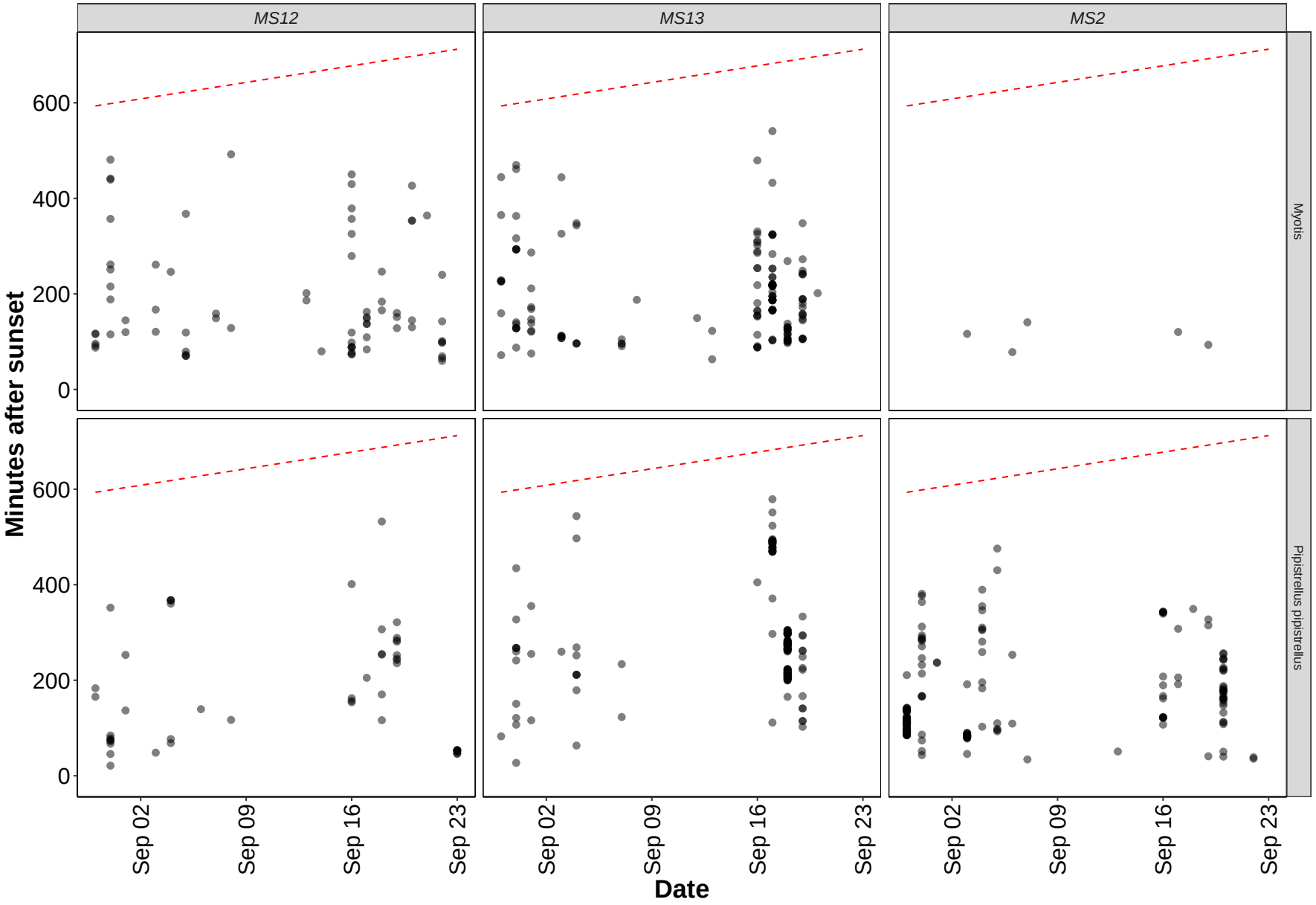
Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2024-08-30	20:25	06:18	9.9
2024-08-31	20:22	06:20	10.0
2024-09-01	20:19	06:22	10.1
2024-09-03	20:13	06:27	10.2
2024-09-04	20:11	06:29	10.3
2024-09-05	20:08	06:31	10.4
2024-09-06	20:05	06:33	10.5
2024-09-07	20:02	06:35	10.5
2024-09-08	19:59	06:37	10.6
2024-09-12	19:48	06:46	11.0
2024-09-13	19:45	06:48	11.0
2024-09-14	19:42	06:50	11.1
2024-09-15	19:40	06:52	11.2
2024-09-16	19:37	06:54	11.3
2024-09-17	19:34	06:56	11.4
2024-09-18	19:31	06:58	11.5
2024-09-19	19:28	07:01	11.5
2024-09-20	19:25	07:03	11.6
2024-09-21	19:22	07:05	11.7
2024-09-22	19:20	07:07	11.8
2024-09-23	19:17	07:09	11.9

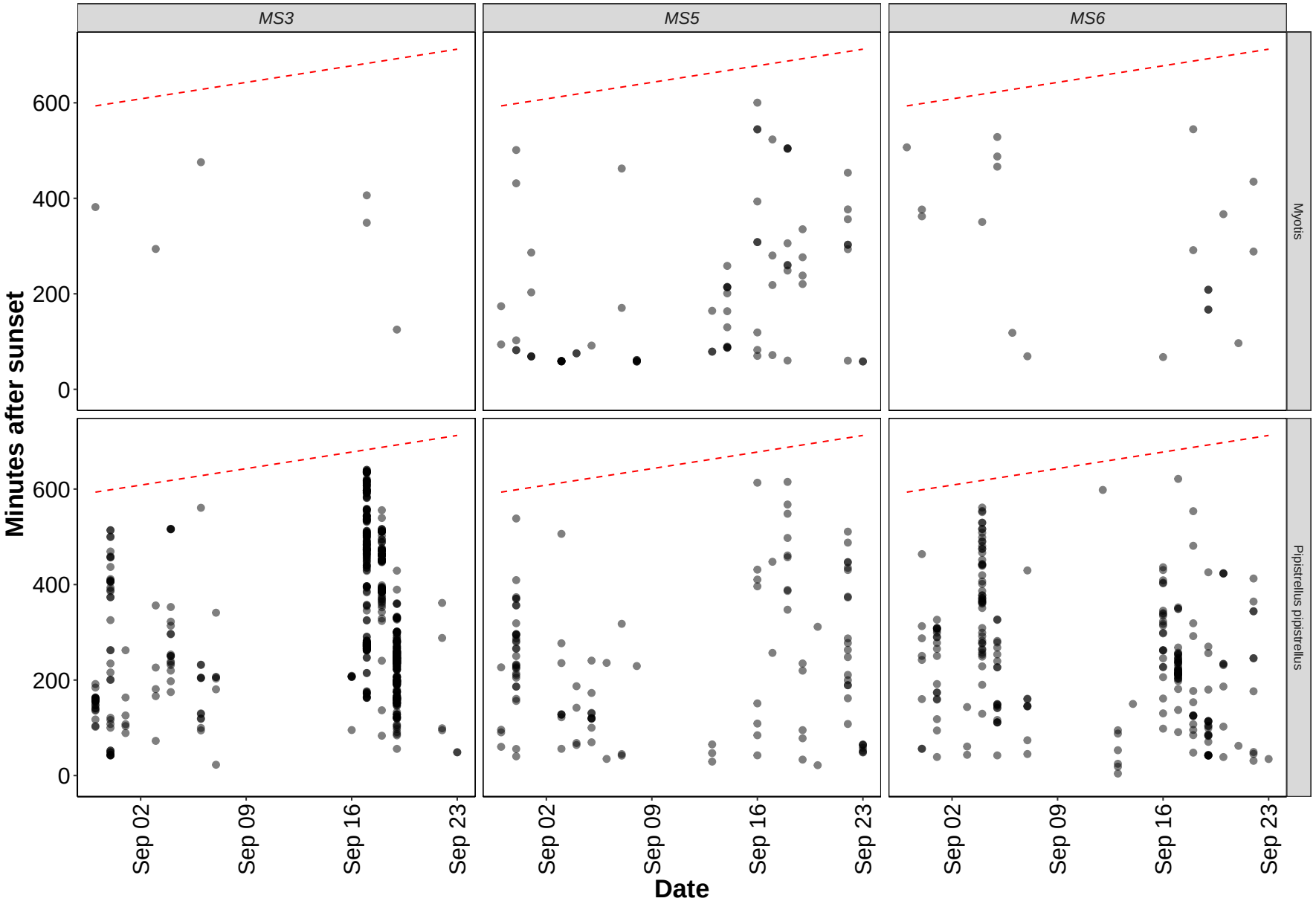
Distribution of Bat Activity Across the Night through Time

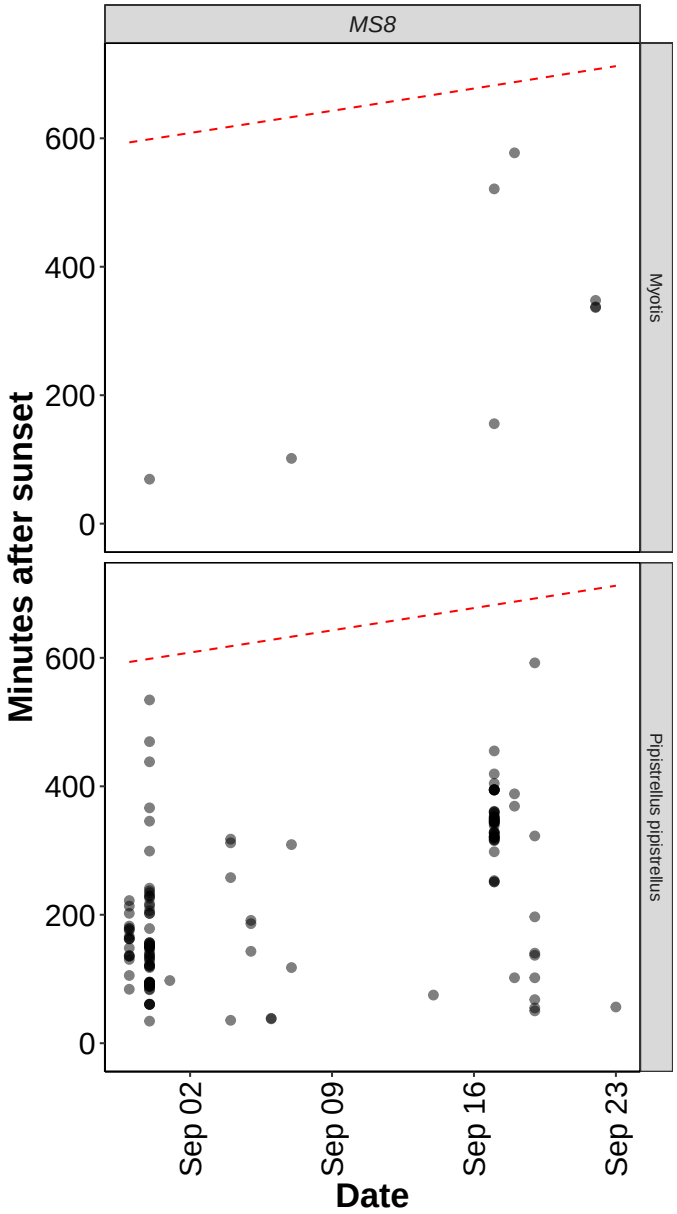
Per Detector

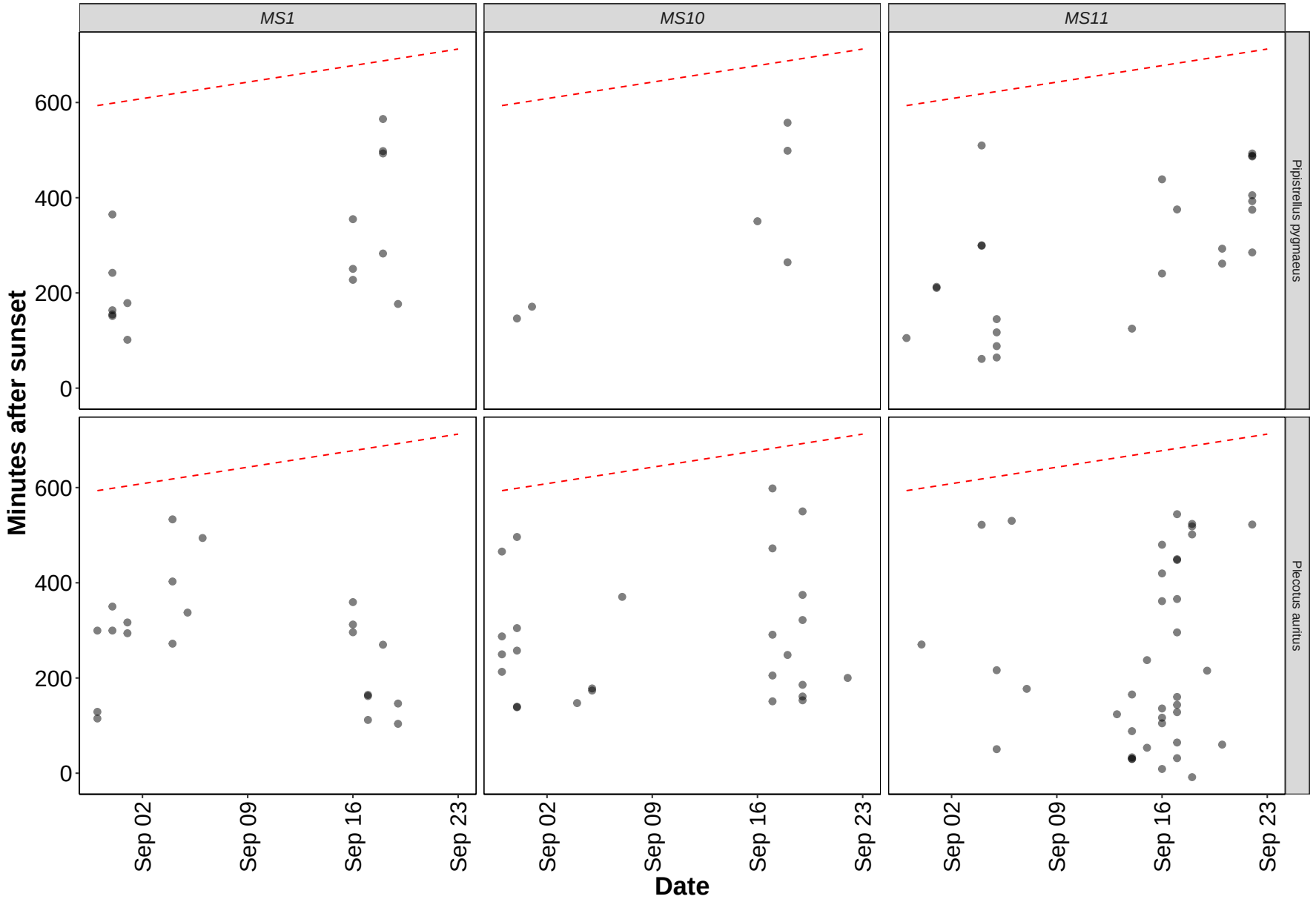
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

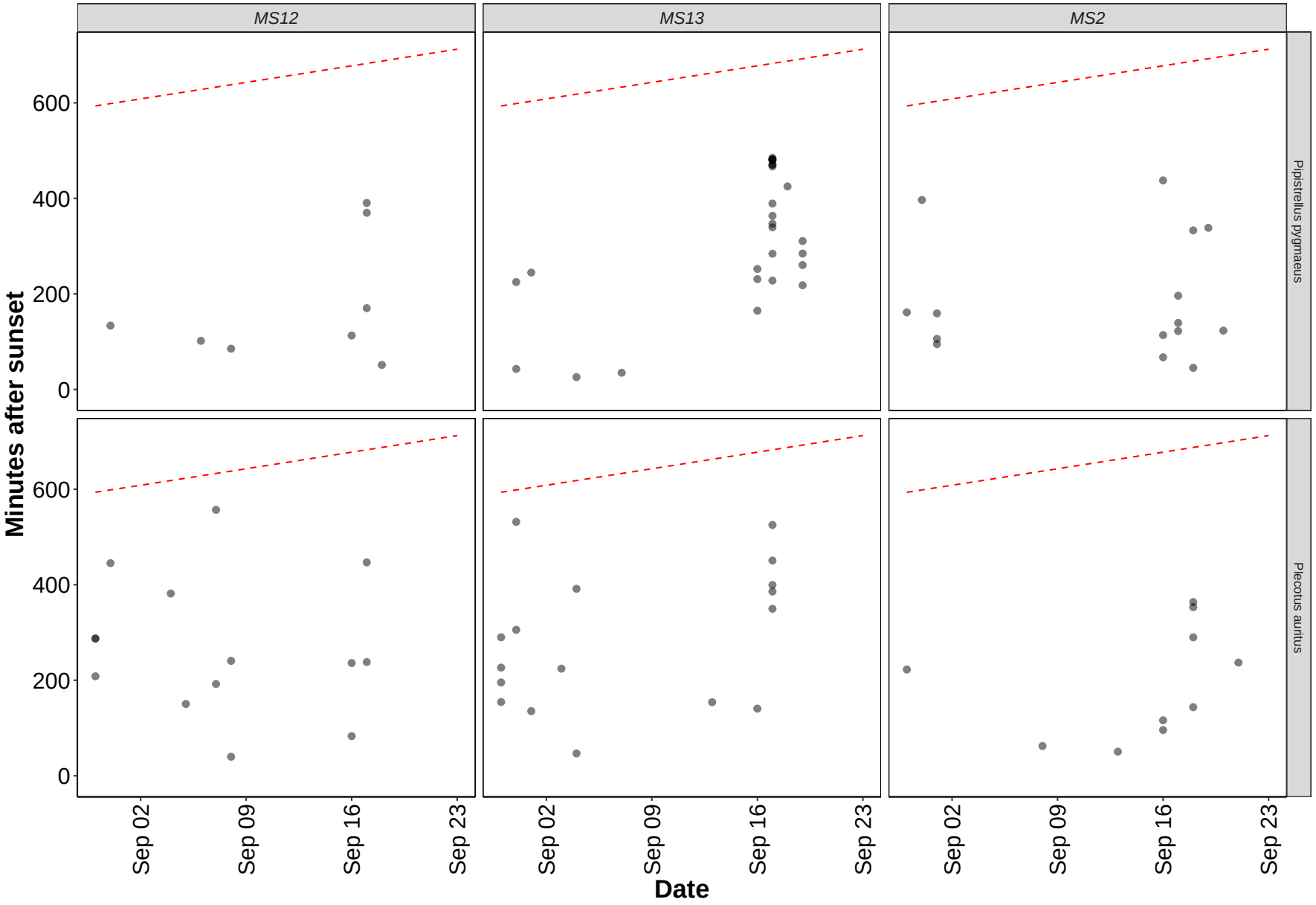

MS1
MS10
MS11
Myotis
Pipistrellus pipistrellus
Minutes after sunset
0
200
400
600
Sep 02
Sep 09
Sep 16
Sep 23
Date

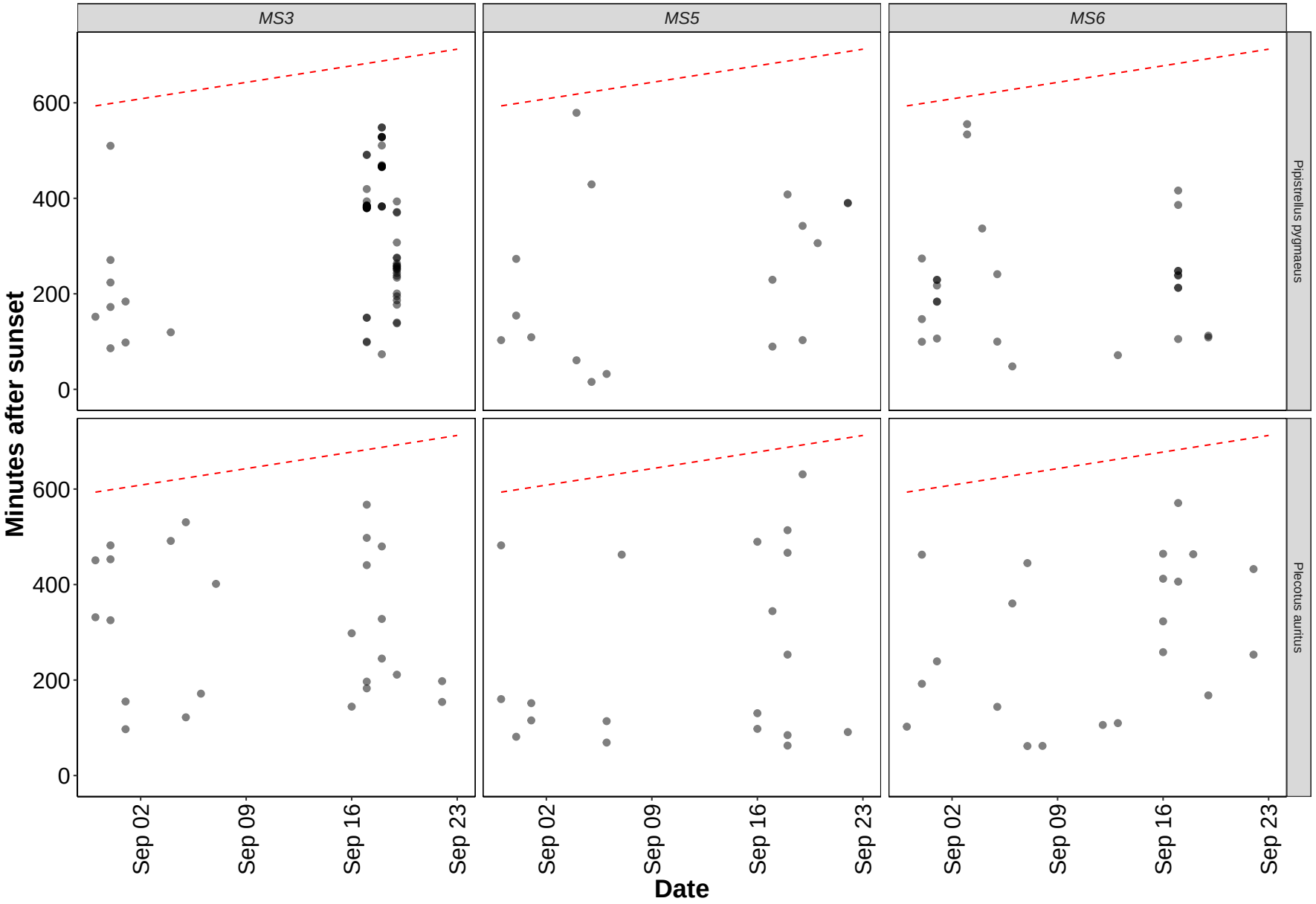

MS12
MS13
MS2
Myotis
Pipistrellus pipistrellus
Minutes after sunset
0
200
400
600
Sep 02
Sep 09
Sep 16
Sep 23
Date


MS3
MS5
MS6
Myotis
Pipistrellus pipistrellus
Minutes after sunset
0
200
400
600
Sep 02
Sep 09
Sep 16
Sep 23
Date


MS8
Myotis
Pipistrellus pipistrellus
Minutes after sunset
0
200
400
600
Sep 02
Sep 09
Sep 16
Sep 23
Date


MS1
MS10
MS11
Pipistrellus pygmaeus
Plecotus auritus
Minutes after sunset
0
200
400
600
Sep 02
Sep 09
Sep 16
Sep 23
Date


MS12
MS13
MS2
Pipistrellus pygmaeus
Plecotus auritus
Minutes after sunset
0
200
400
600
Sep 02
Sep 09
Sep 16
Sep 23
Date


MS3
MS5
MS6
Pipistrellus pygmaeus
Plecotus auritus
Minutes after sunset
0
200
400
600
Sep 02
Sep 09
Sep 16
Sep 23
Date

Roost Emergence Time and Bat Observation

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

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

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	2024-08-31	2024-09-01	2024-09-03	2024-09-04	2024-09-05
Common pipistrelle	MS11	0	0	0	0	0
Common pipistrelle	MS12	1	0	0	0	0
Common pipistrelle	MS13	1	0	0	0	0
Common pipistrelle	MS3	0	0	0	0	0
Common pipistrelle	MS5	0	0	0	0	0
Common pipistrelle	MS6	0	0	0	0	0
Soprano pipistrelle	MS13	0	0	0	1	0
Soprano pipistrelle	MS5	0	0	0	0	1
Brown long-eared	MS11	0	0	0	0	1
Brown long-eared	MS12	0	0	0	0	0
Brown long-eared	MS13	0	0	0	1	0
Brown long-eared	MS2	0	0	0	0	0
Myotis	MS11	0	0	0	0	0
Myotis	MS12	0	0	0	0	1
Myotis	MS13	0	0	0	0	0
Myotis	MS5	0	3	7	0	0
Myotis	MS6	0	0	0	0	0
Myotis	MS8	1	0	0	0	0

Table 13: Table continues below

2024-09-07	2024-09-08	2024-09-13	2024-09-14	2024-09-15	2024-09-16	2024-09-17
0	0	0	0	0	0	0

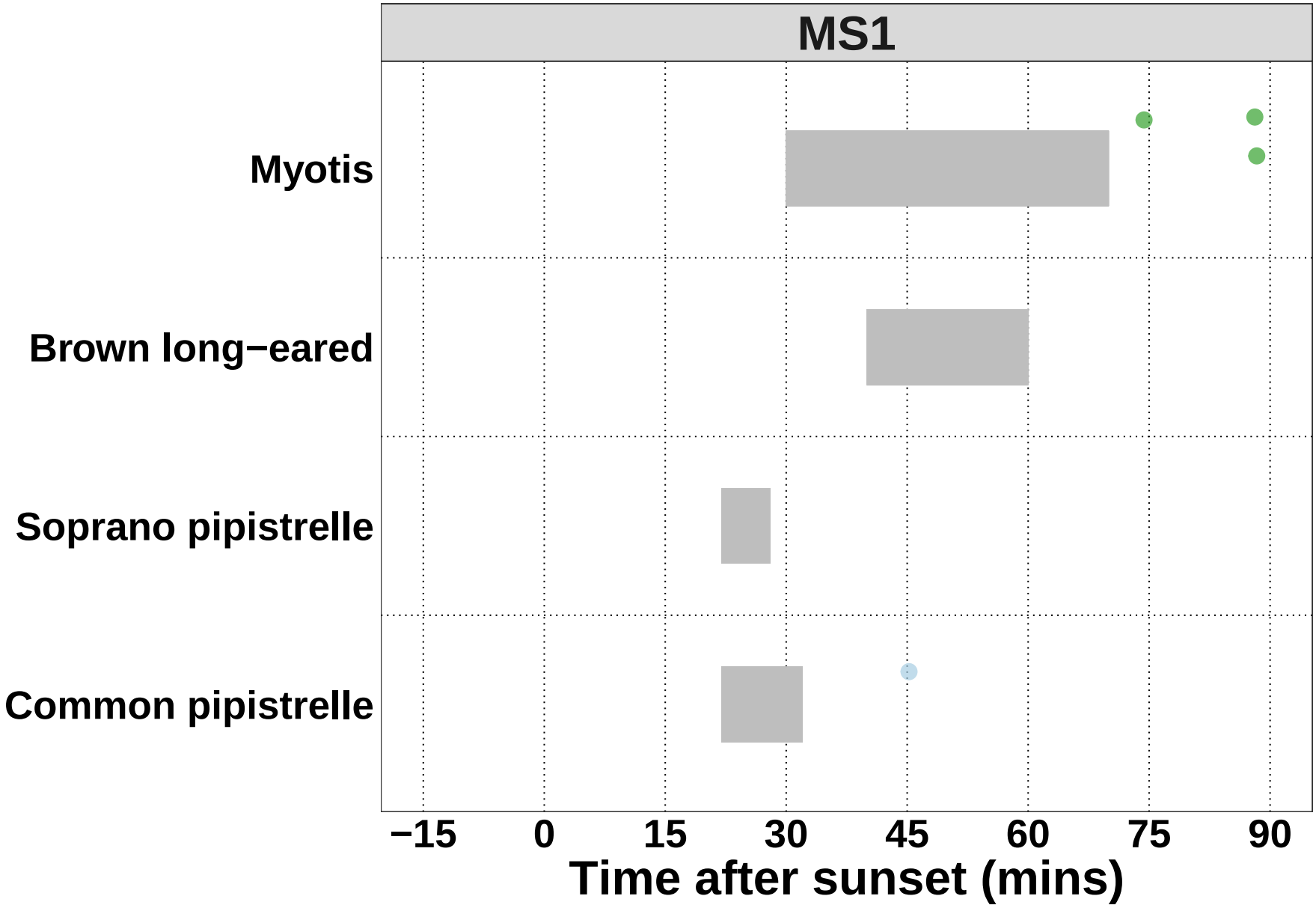
2024-09-07	2024-09-08	2024-09-13	2024-09-14	2024-09-15	2024-09-16	2024-09-17
0	0	0	0	0	0	0
0	0	0	0	0	0	0
1	0	0	0	0	0	0
0	0	1	0	0	0	0
0	0	3	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	3	1	1	1
0	1	0	0	0	0	0
0	0	0	0	0	0	0
0	0	1	0	0	0	0
0	0	0	0	0	1	0
0	0	0	0	0	0	0
0	0	1	0	0	0	0
0	6	0	0	0	0	0
1	0	0	0	0	1	0
0	0	0	0	0	0	0

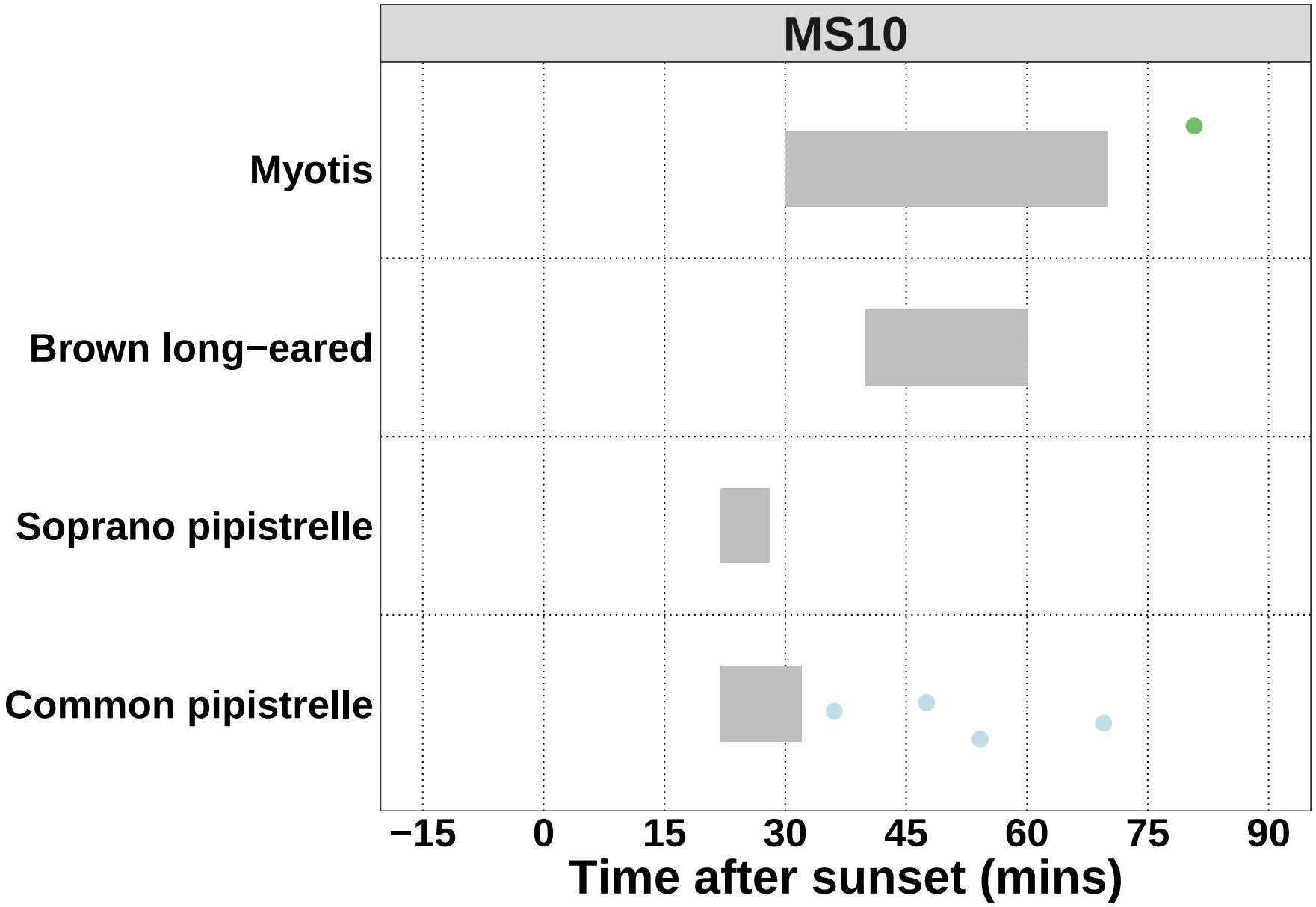
2024-09-18	2024-09-19	2024-09-20	2024-09-22	2024-09-23
0	2	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	0
0	0	0	1	0
0	0	0	0	0
0	0	0	0	0
1	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	3	0
0	0	0	0	0

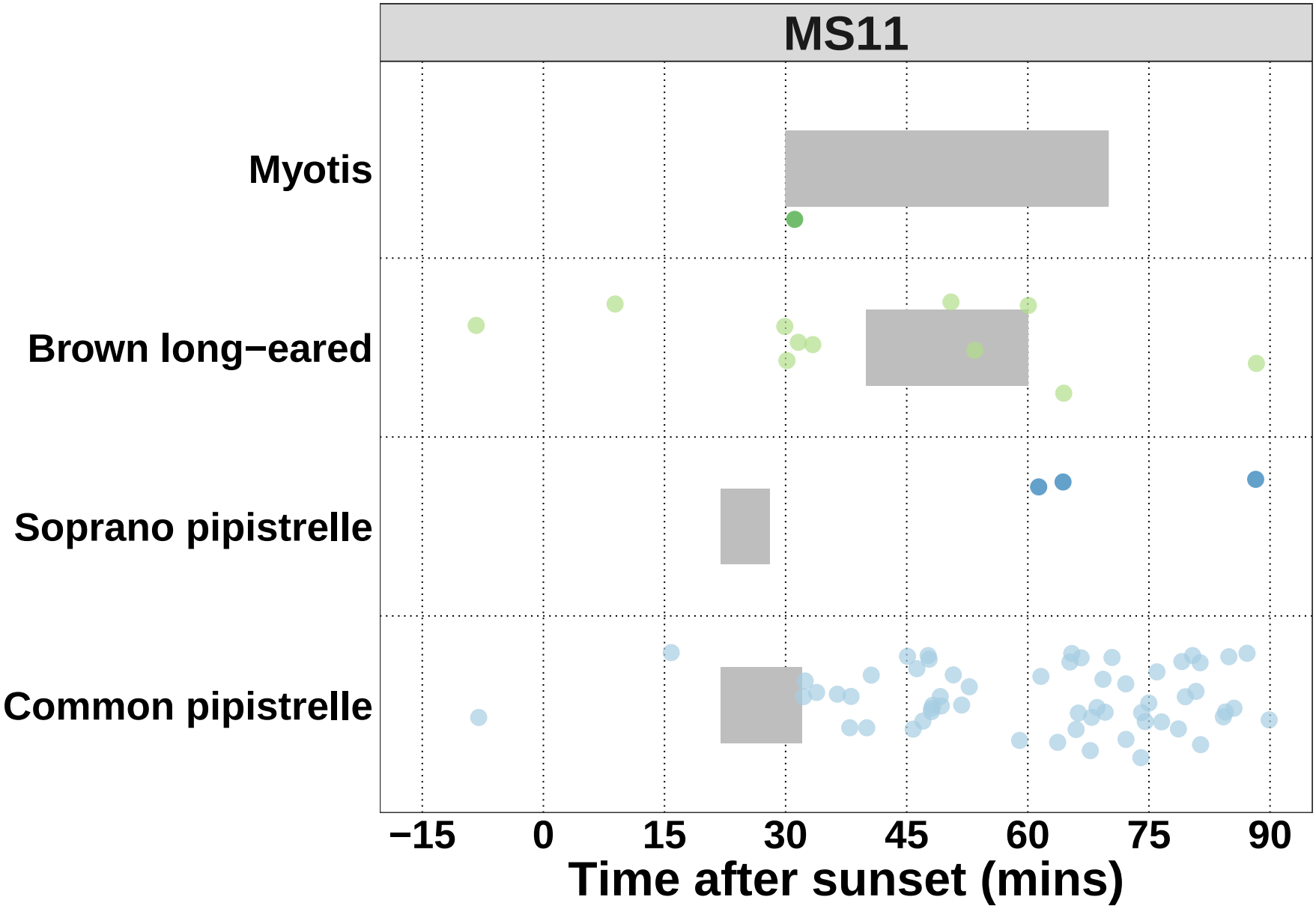
2024-09-18	2024-09-19	2024-09-20	2024-09-22	2024-09-23
1	0	0	1	2
0	0	0	0	0
0	0	0	0	0

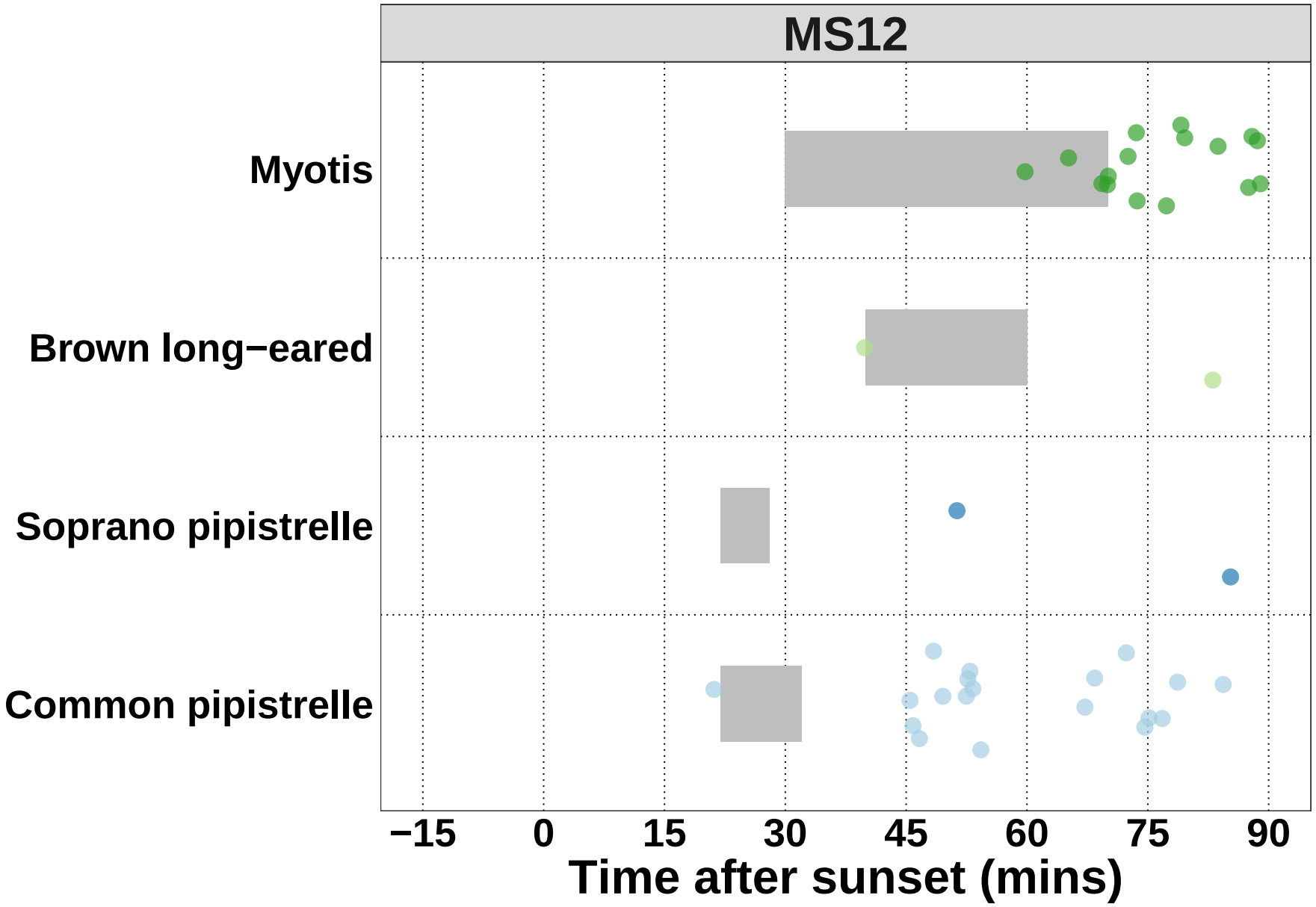
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012)

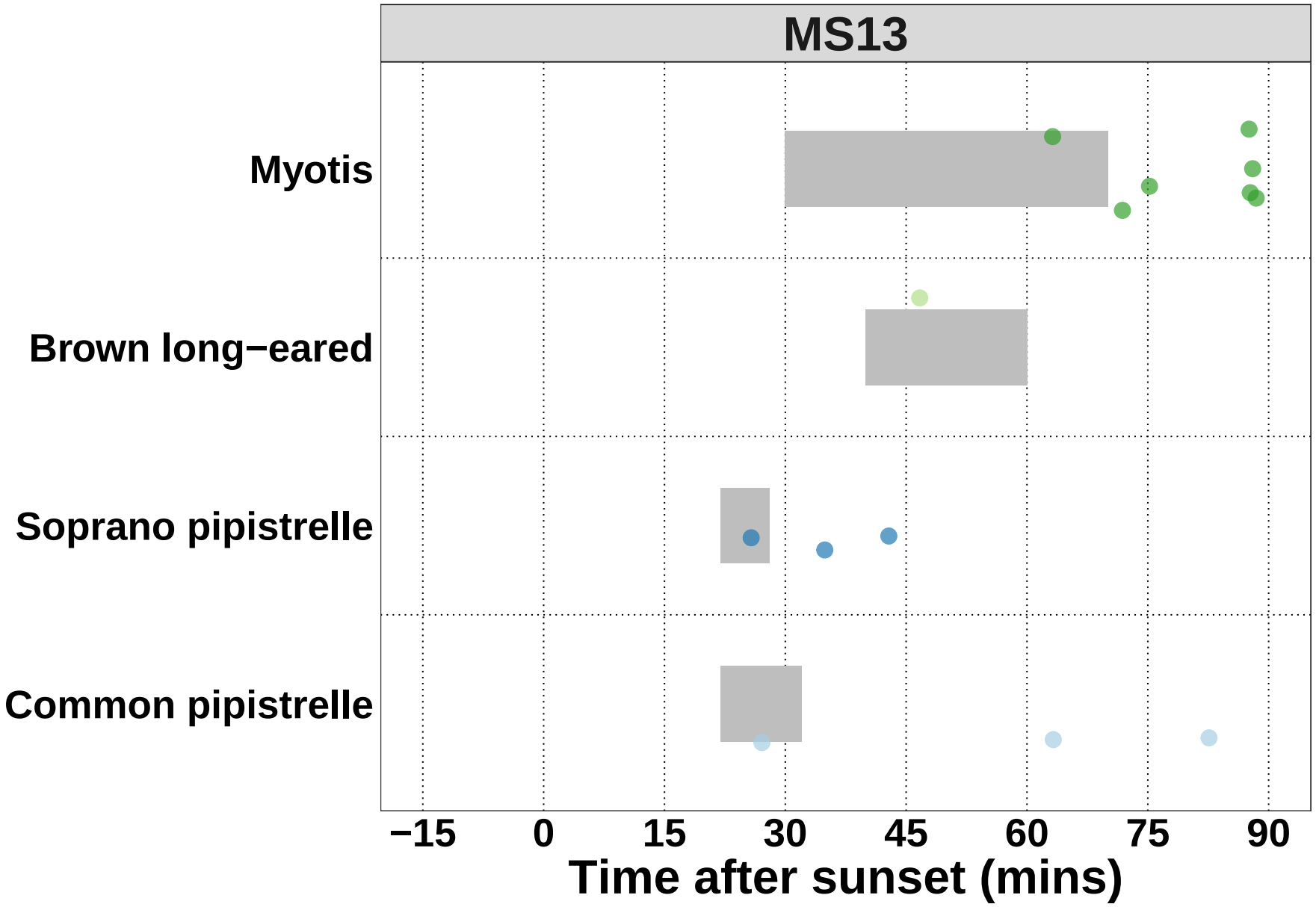
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.

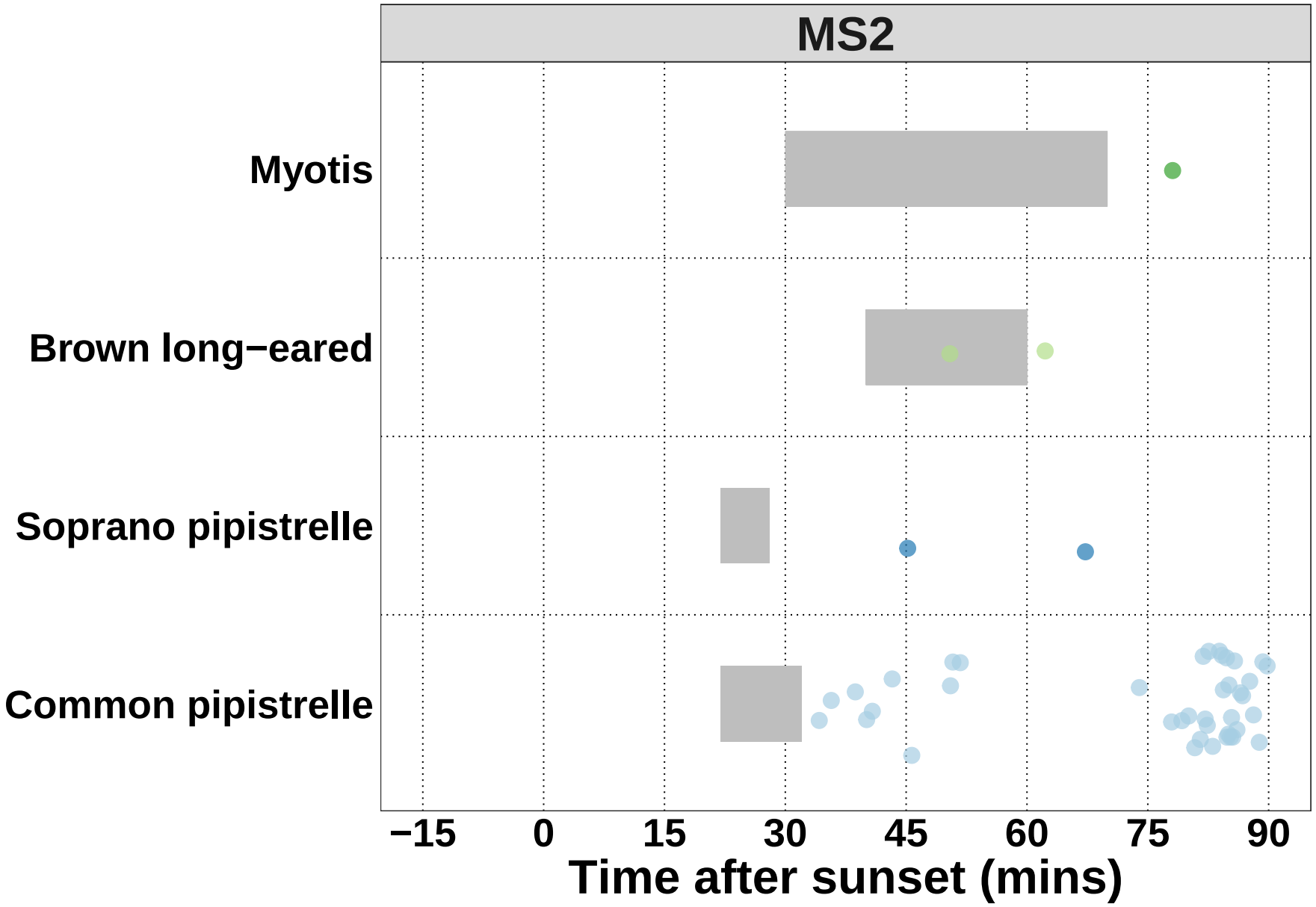

MS1
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

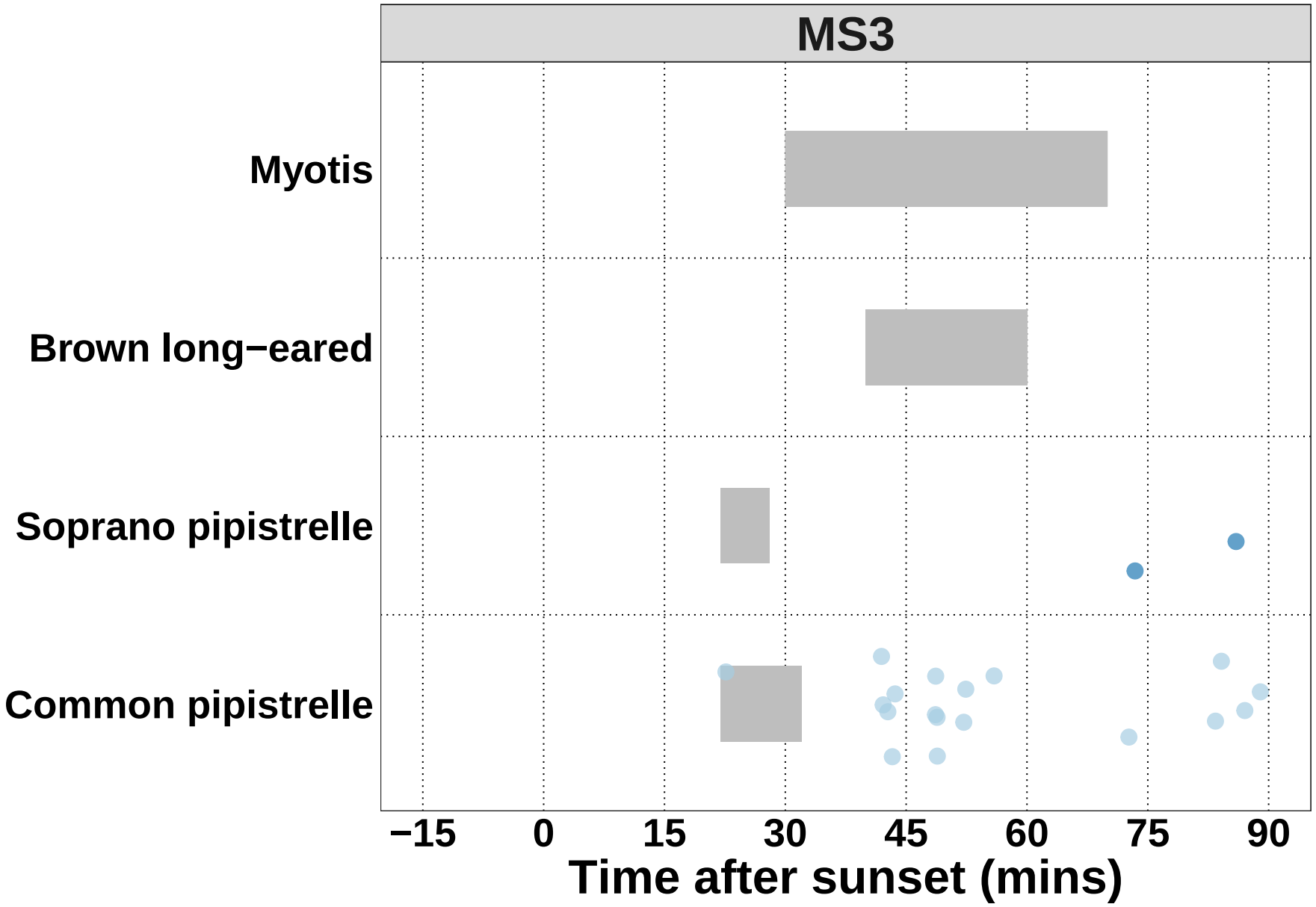

MS10
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

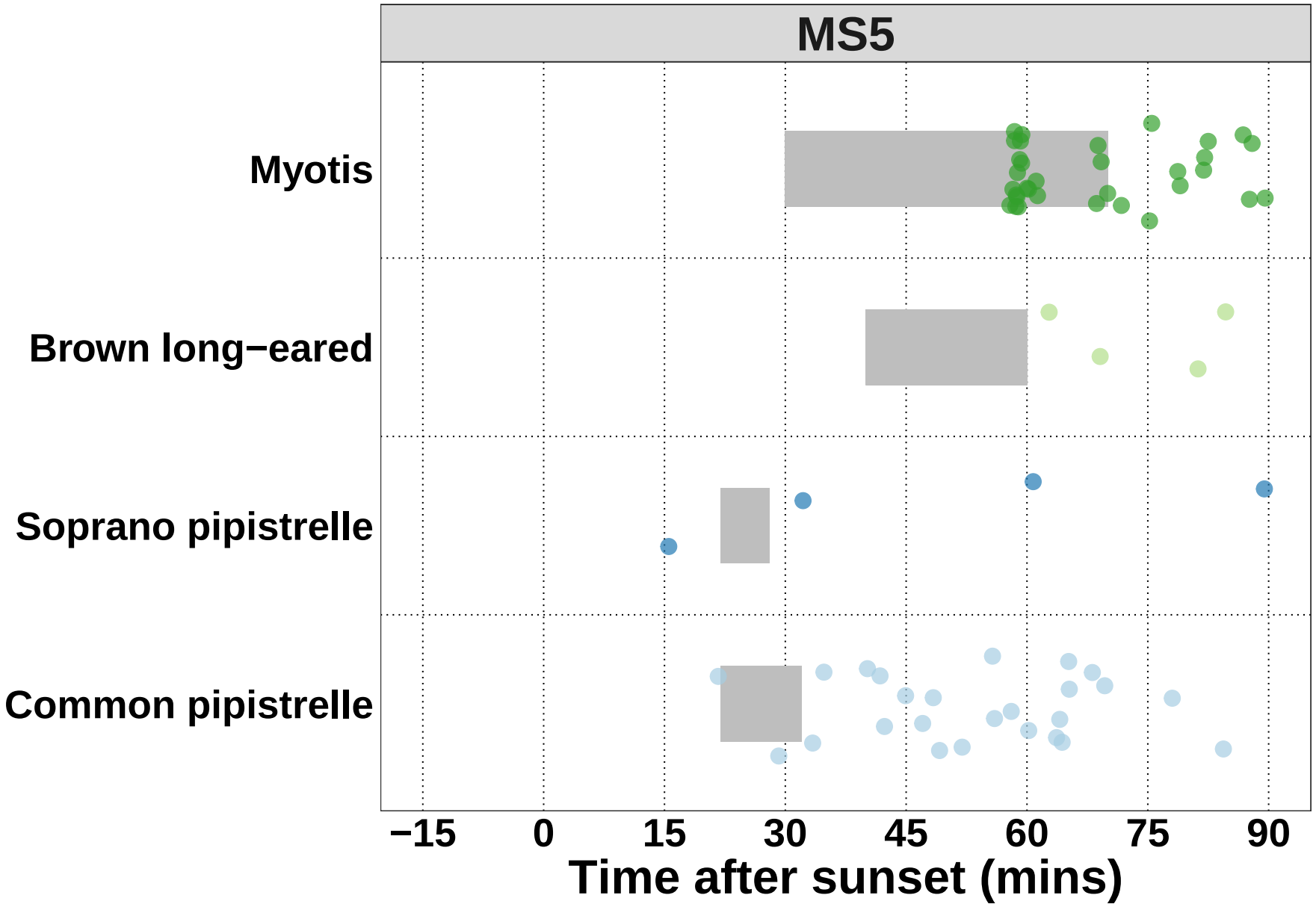

MS11
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

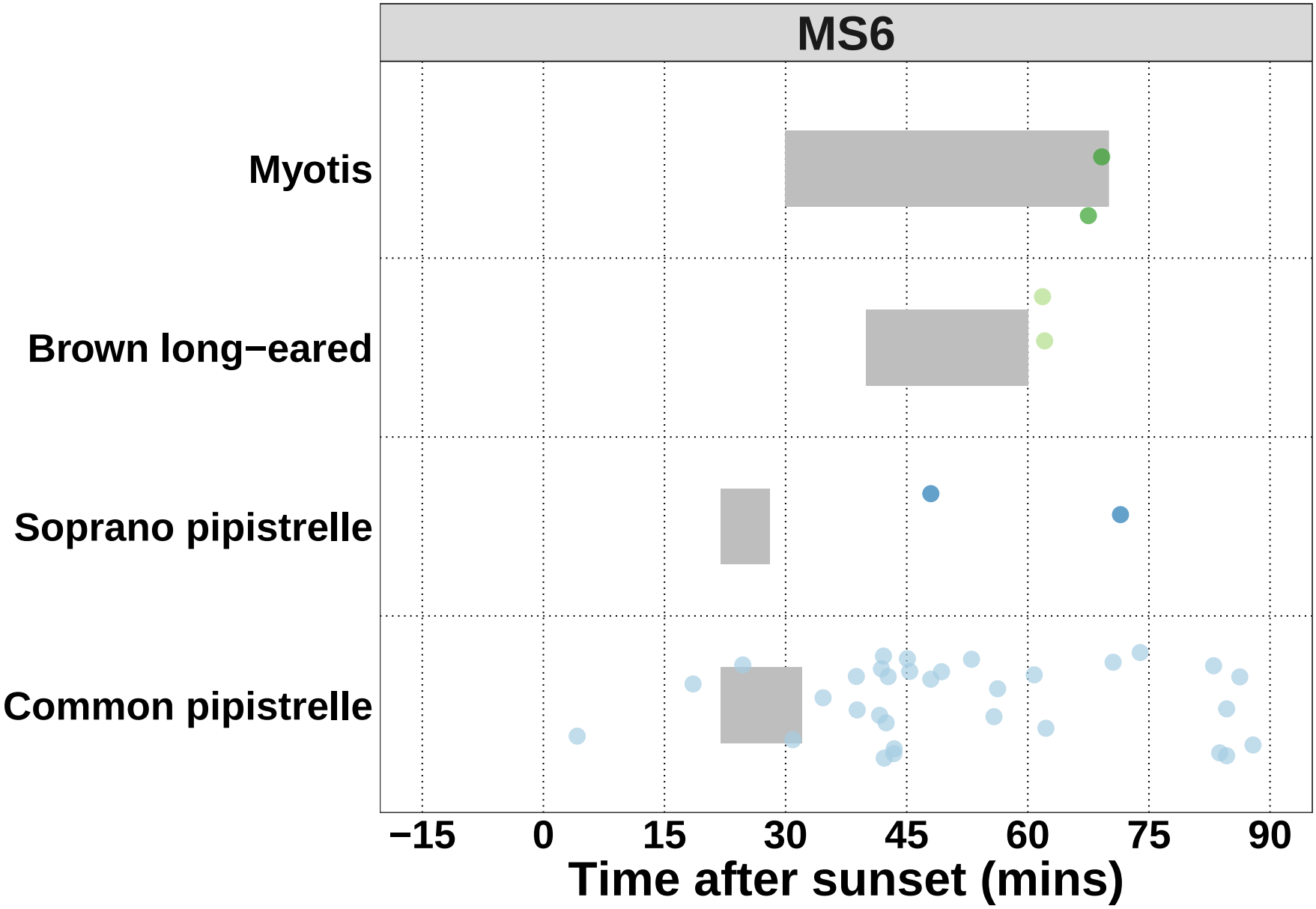

MS12
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

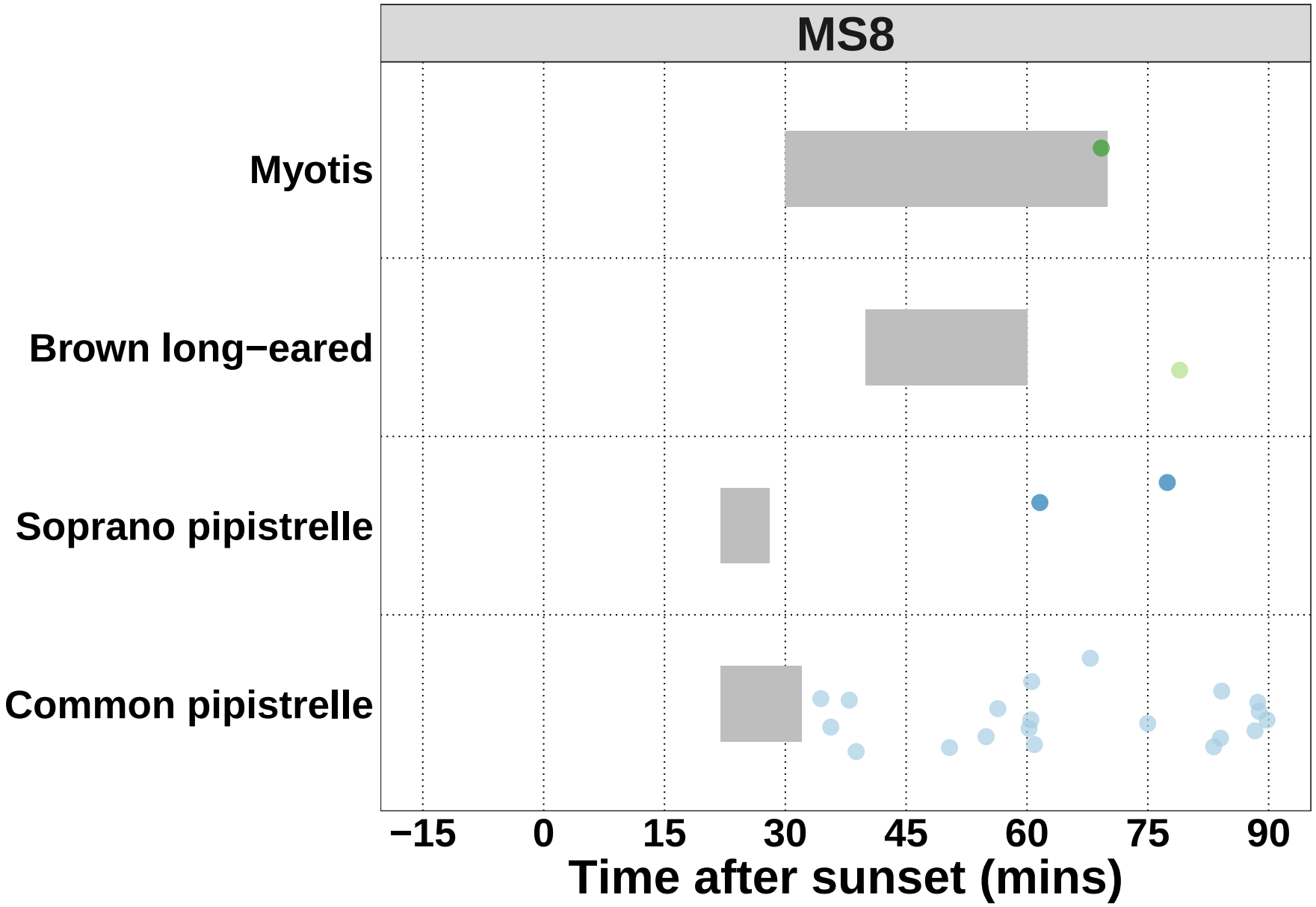

MS13
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


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


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


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


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


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

Count 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 (%)
Myotis	390	13.9
Pipistrellus pipistrellus	1970	70.2
Pipistrellus pygmaeus	228	8.1
Plecotus auritus	218	7.8
Total	2806	100.0

Per Detector

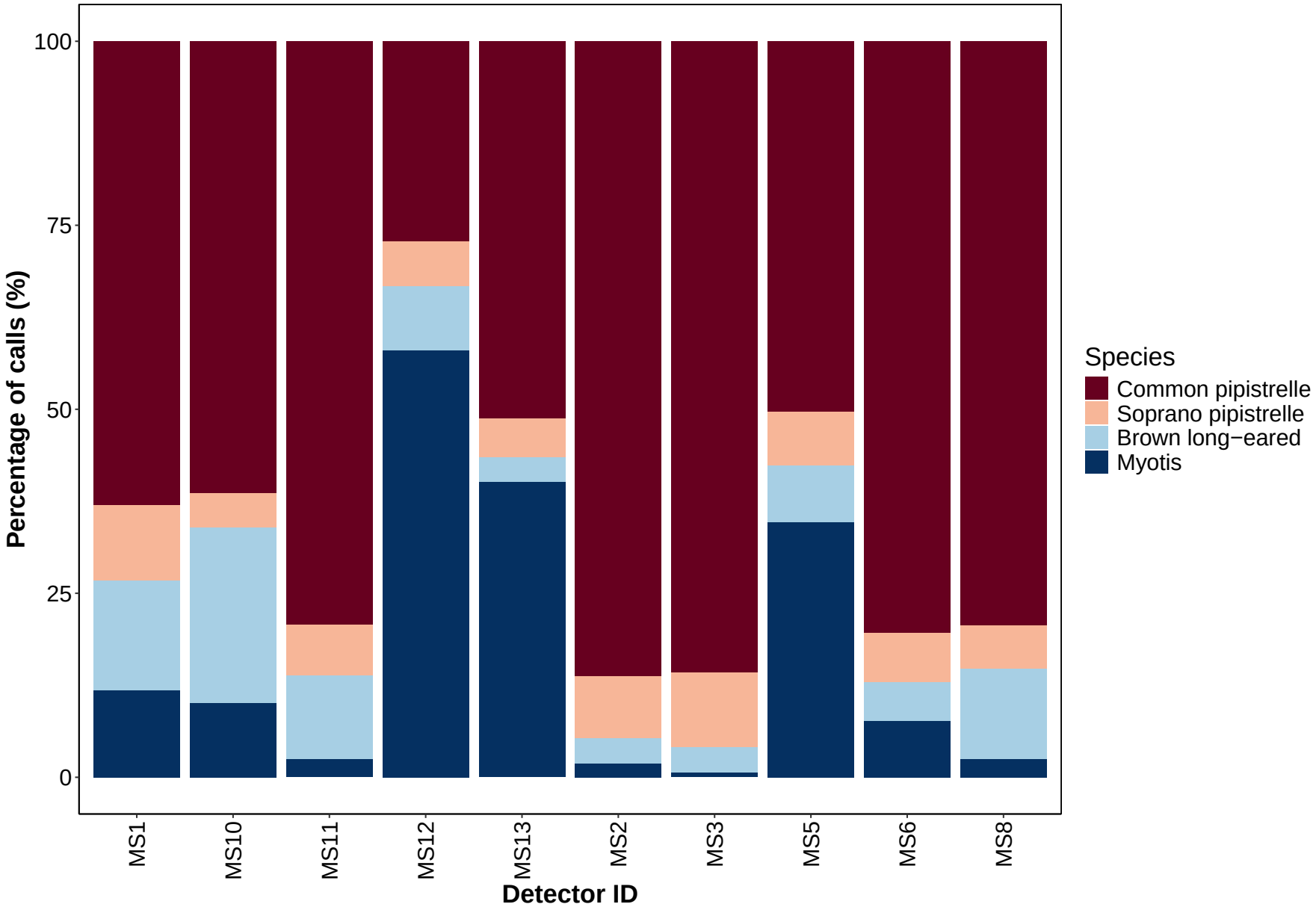
The number of passes recorded for each species at each detector.

Species	Detector ID	Count (no.)	Percentage by Detector (%)
Common pipistrelle	MS1	119	66.853933
Common pipistrelle	MS10	58	58.585859
Common pipistrelle	MS11	233	76.644737
Common pipistrelle	MS12	49	33.793103
Common pipistrelle	MS13	168	45.405405
Common pipistrelle	MS2	195	86.666667
Common pipistrelle	MS3	643	85.962567
Common pipistrelle	MS5	118	50.862069
Common pipistrelle	MS6	236	77.631579
Common pipistrelle	MS8	151	75.124378
Soprano pipistrelle	MS1	15	8.426966
Soprano pipistrelle	MS10	6	6.060606
Soprano pipistrelle	MS11	24	7.894737
Soprano pipistrelle	MS12	8	5.517241
Soprano pipistrelle	MS13	27	7.297297
Soprano pipistrelle	MS2	15	6.666667
Soprano pipistrelle	MS3	74	9.893048
Soprano pipistrelle	MS5	17	7.327586
Soprano pipistrelle	MS6	27	8.881579
Soprano pipistrelle	MS8	15	7.462687
Brown long-eared	MS1	21	11.797753
Brown long-eared	MS10	26	26.262626
Brown long-eared	MS11	38	12.500000
Brown long-eared	MS12	14	9.655172
Brown long-eared	MS13	17	4.594595
Brown long-eared	MS2	10	4.444444
Brown long-eared	MS3	25	3.342246
Brown long-eared	MS5	19	8.189655
Brown long-eared	MS6	21	6.907895
Brown long-eared	MS8	27	13.432836
Myotis	MS1	23	12.921348
Myotis	MS10	9	9.090909

Species	Detector ID	Count (no.)	Percentage by Detector (%)
Myotis	MS11	9	2.960526
Myotis	MS12	74	51.034483
Myotis	MS13	158	42.702703
Myotis	MS2	5	2.222222
Myotis	MS3	6	0.802139
Myotis	MS5	78	33.620690
Myotis	MS6	20	6.578947
Myotis	MS8	8	3.980100

Species Composition

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


100
75
50
25
0
Percentage of calls (%)
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID
Species
Common pipistrelle
Soprano pipistrelle
Brown long−eared
Myotis

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.

Nighlty 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	0.7
Common pipistrelle	MS10	0.6
Common pipistrelle	MS11	1.0
Common pipistrelle	MS12	0.2
Common pipistrelle	MS13	0.7
Common pipistrelle	MS2	0.9
Common pipistrelle	MS3	1.6
Common pipistrelle	MS5	0.7
Common pipistrelle	MS6	0.7
Common pipistrelle	MS8	0.7
Soprano pipistrelle	MS1	0.4
Soprano pipistrelle	MS10	0.1
Soprano pipistrelle	MS11	0.1
Soprano pipistrelle	MS12	0.1
Soprano pipistrelle	MS13	0.2
Soprano pipistrelle	MS2	0.3
Soprano pipistrelle	MS3	0.5
Soprano pipistrelle	MS5	0.2
Soprano pipistrelle	MS6	0.2
Soprano pipistrelle	MS8	0.2
Brown long-eared	MS1	0.2
Brown long-eared	MS10	0.3
Brown long-eared	MS11	0.2
Brown long-eared	MS12	0.2
Brown long-eared	MS13	0.2
Brown long-eared	MS2	0.1
Brown long-eared	MS3	0.2
Brown long-eared	MS5	0.2
Brown long-eared	MS6	0.1
Brown long-eared	MS8	0.1
Myotis	MS1	0.2
Myotis	MS10	0.1
Myotis	MS11	0.1
Myotis	MS12	0.5
Myotis	MS13	0.9
Myotis	MS2	0.1

Species	Detector ID	Median Pass Rate
Myotis	MS3	0.1
Myotis	MS5	0.6
Myotis	MS6	0.2
Myotis	MS8	0.1

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.

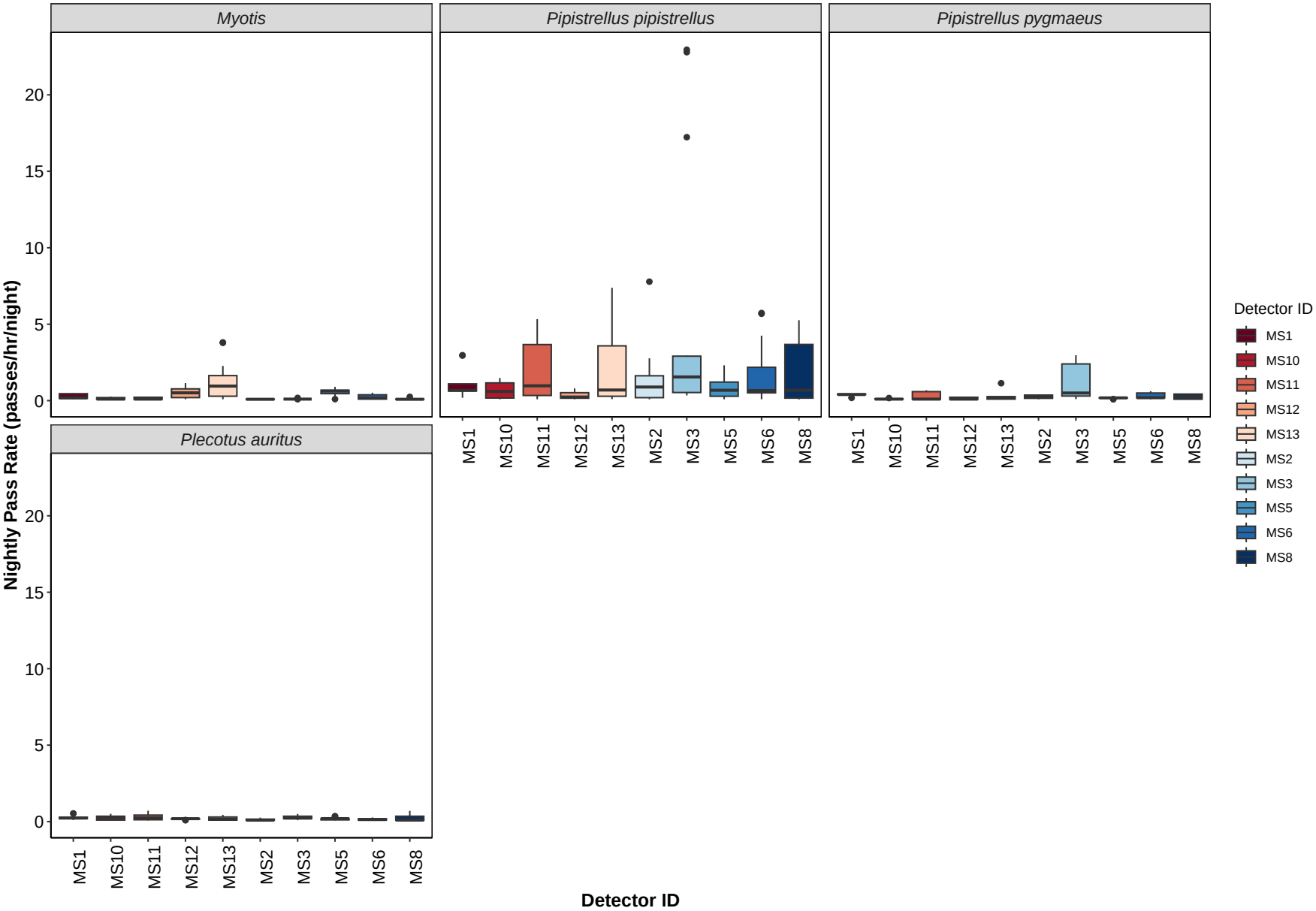
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

Species	Detector ID	Mean Pass Rate
Common pipistrelle	MS1	1.1
Common pipistrelle	MS10	0.7
Common pipistrelle	MS11	1.8
Common pipistrelle	MS12	0.3
Common pipistrelle	MS13	2.2
Common pipistrelle	MS2	1.4
Common pipistrelle	MS3	5.9
Common pipistrelle	MS5	0.8
Common pipistrelle	MS6	1.8
Common pipistrelle	MS8	1.8
Soprano pipistrelle	MS1	0.4
Soprano pipistrelle	MS10	0.1
Soprano pipistrelle	MS11	0.3
Soprano pipistrelle	MS12	0.1
Soprano pipistrelle	MS13	0.3
Soprano pipistrelle	MS2	0.3
Soprano pipistrelle	MS3	1.3
Soprano pipistrelle	MS5	0.2
Soprano pipistrelle	MS6	0.3
Soprano pipistrelle	MS8	0.3
Brown long-eared	MS1	0.3
Brown long-eared	MS10	0.3
Brown long-eared	MS11	0.3
Brown long-eared	MS12	0.2
Brown long-eared	MS13	0.2
Brown long-eared	MS2	0.1
Brown long-eared	MS3	0.3
Brown long-eared	MS5	0.2
Brown long-eared	MS6	0.1
Brown long-eared	MS8	0.3

Species	Detector ID	Mean Pass Rate
Myotis	MS1	0.3
Myotis	MS10	0.1
Myotis	MS11	0.2
Myotis	MS12	0.5
Myotis	MS13	1.3
Myotis	MS2	0.1
Myotis	MS3	0.1
Myotis	MS5	0.5
Myotis	MS6	0.2
Myotis	MS8	0.1

Per Detector

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
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID
Detector ID
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8

Split by Month

Total Bat Passes per Detector each Month

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	Aug	Sep
Common pipistrelle	MS1	11	112
Common pipistrelle	MS10	7	60
Common pipistrelle	MS11	3	323
Common pipistrelle	MS12	10	34
Common pipistrelle	MS13	9	244
Common pipistrelle	MS2	89	138
Common pipistrelle	MS3	54	803
Common pipistrelle	MS5	33	105
Common pipistrelle	MS6	13	324
Common pipistrelle	MS8	104	123
Soprano pipistrelle	MS1	4	16
Soprano pipistrelle	MS10	1	4
Soprano pipistrelle	MS11	1	27
Soprano pipistrelle	MS12	1	9
Soprano pipistrelle	MS13	1	25
Soprano pipistrelle	MS2	5	17
Soprano pipistrelle	MS3	6	95
Soprano pipistrelle	MS5	3	17
Soprano pipistrelle	MS6	5	23
Soprano pipistrelle	MS8	5	12
Brown long-eared	MS1	4	25
Brown long-eared	MS10	10	16
Brown long-eared	MS11	1	46
Brown long-eared	MS12	3	11
Brown long-eared	MS13	5	12
Brown long-eared	MS2	1	8
Brown long-eared	MS3	7	28
Brown long-eared	MS5	4	17
Brown long-eared	MS6	2	20
Brown long-eared	MS8	8	27
Myotis	MS1	5	18
Myotis	MS10	4	7
Myotis	MS11	1	9
Myotis	MS12	13	81
Myotis	MS13	29	169
Myotis	MS2	0	5

Species	Detector ID	Aug	Sep
Myotis	MS3	1	5
Myotis	MS5	8	87
Myotis	MS6	3	29
Myotis	MS8	1	6

Survey Effort

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

month	Detector ID	No. of Survey Nights
Aug	MS1	2
Aug	MS10	2
Aug	MS11	2
Aug	MS12	2
Aug	MS13	2
Aug	MS2	2
Aug	MS3	2
Aug	MS5	2
Aug	MS6	2
Aug	MS8	2
Sep	MS1	10
Sep	MS10	11
Sep	MS11	17
Sep	MS12	17
Sep	MS13	12
Sep	MS2	15
Sep	MS3	12
Sep	MS5	16
Sep	MS6	18
Sep	MS8	15

Nightly Bat Passes 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	Aug	Sep
Common pipistrelle	MS1	1.1	0.7
Common pipistrelle	MS10	0.3	0.8
Common pipistrelle	MS11	0.3	1.0
Common pipistrelle	MS12	0.5	0.2
Common pipistrelle	MS13	0.4	0.7
Common pipistrelle	MS2	4.5	0.6
Common pipistrelle	MS3	2.7	1.0
Common pipistrelle	MS5	1.7	0.6
Common pipistrelle	MS6	1.3	0.7
Common pipistrelle	MS8	5.2	0.6
Soprano pipistrelle	MS1	0.4	0.4
Soprano pipistrelle	MS10	0.1	0.1
Soprano pipistrelle	MS11	0.1	0.1
Soprano pipistrelle	MS12	0.1	0.1
Soprano pipistrelle	MS13	0.1	0.3
Soprano pipistrelle	MS2	0.2	0.3
Soprano pipistrelle	MS3	0.3	1.9
Soprano pipistrelle	MS5	0.2	0.2
Soprano pipistrelle	MS6	0.5	0.2
Soprano pipistrelle	MS8	0.2	0.3
Brown long-eared	MS1	0.2	0.3
Brown long-eared	MS10	0.5	0.2
Brown long-eared	MS11	0.1	0.3
Brown long-eared	MS12	0.2	0.2
Brown long-eared	MS13	0.2	0.1
Brown long-eared	MS2	0.1	0.1
Brown long-eared	MS3	0.3	0.2
Brown long-eared	MS5	0.2	0.2
Brown long-eared	MS6	0.1	0.2
Brown long-eared	MS8	0.4	0.1
Myotis	MS1	0.5	0.2
Myotis	MS10	0.2	0.1
Myotis	MS11	0.1	0.1
Myotis	MS12	0.7	0.3
Myotis	MS13	1.5	0.5
Myotis	MS2	NA	0.1

Species	Detector ID	Aug	Sep
Myotis	MS3	0.1	0.1
Myotis	MS5	0.4	0.7
Myotis	MS6	0.2	0.2
Myotis	MS8	0.1	0.1

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.

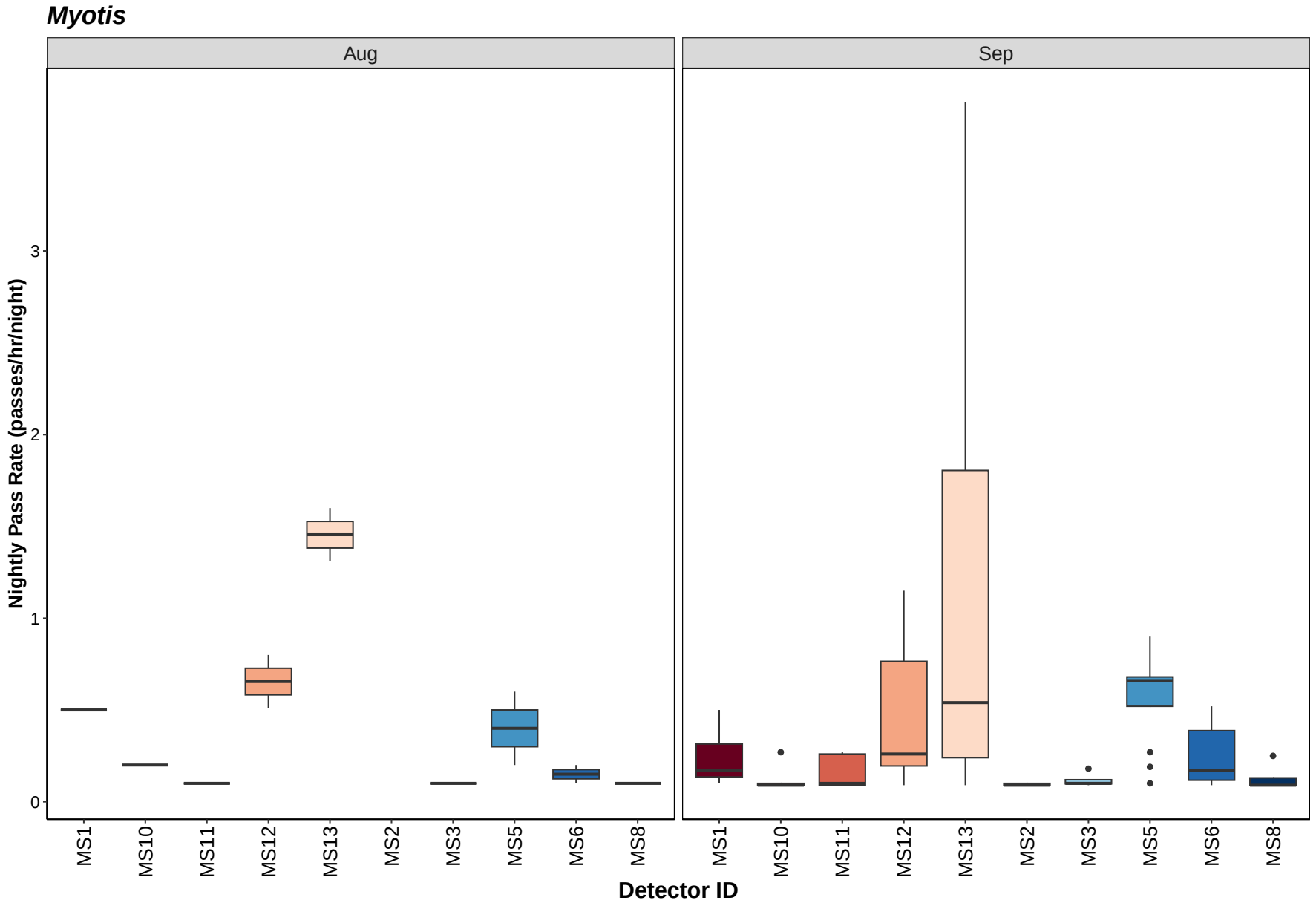
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

Species	Detector ID	Aug	Sep
Common pipistrelle	MS1	1.1	1.1
Common pipistrelle	MS10	0.3	0.8
Common pipistrelle	MS11	0.3	1.9
Common pipistrelle	MS12	0.5	0.3
Common pipistrelle	MS13	0.4	2.7
Common pipistrelle	MS2	4.5	1.0
Common pipistrelle	MS3	2.7	6.4
Common pipistrelle	MS5	1.7	0.7
Common pipistrelle	MS6	1.3	1.9
Common pipistrelle	MS8	5.2	1.1
Soprano pipistrelle	MS1	0.4	0.4
Soprano pipistrelle	MS10	0.1	0.1
Soprano pipistrelle	MS11	0.1	0.3
Soprano pipistrelle	MS12	0.1	0.2
Soprano pipistrelle	MS13	0.1	0.3
Soprano pipistrelle	MS2	0.2	0.3
Soprano pipistrelle	MS3	0.3	1.7
Soprano pipistrelle	MS5	0.2	0.2
Soprano pipistrelle	MS6	0.5	0.3
Soprano pipistrelle	MS8	0.2	0.3
Brown long-eared	MS1	0.2	0.3
Brown long-eared	MS10	0.5	0.2
Brown long-eared	MS11	0.1	0.3
Brown long-eared	MS12	0.2	0.2
Brown long-eared	MS13	0.2	0.2
Brown long-eared	MS2	0.1	0.1
Brown long-eared	MS3	0.3	0.3
Brown long-eared	MS5	0.2	0.2
Brown long-eared	MS6	0.1	0.2
Brown long-eared	MS8	0.4	0.2

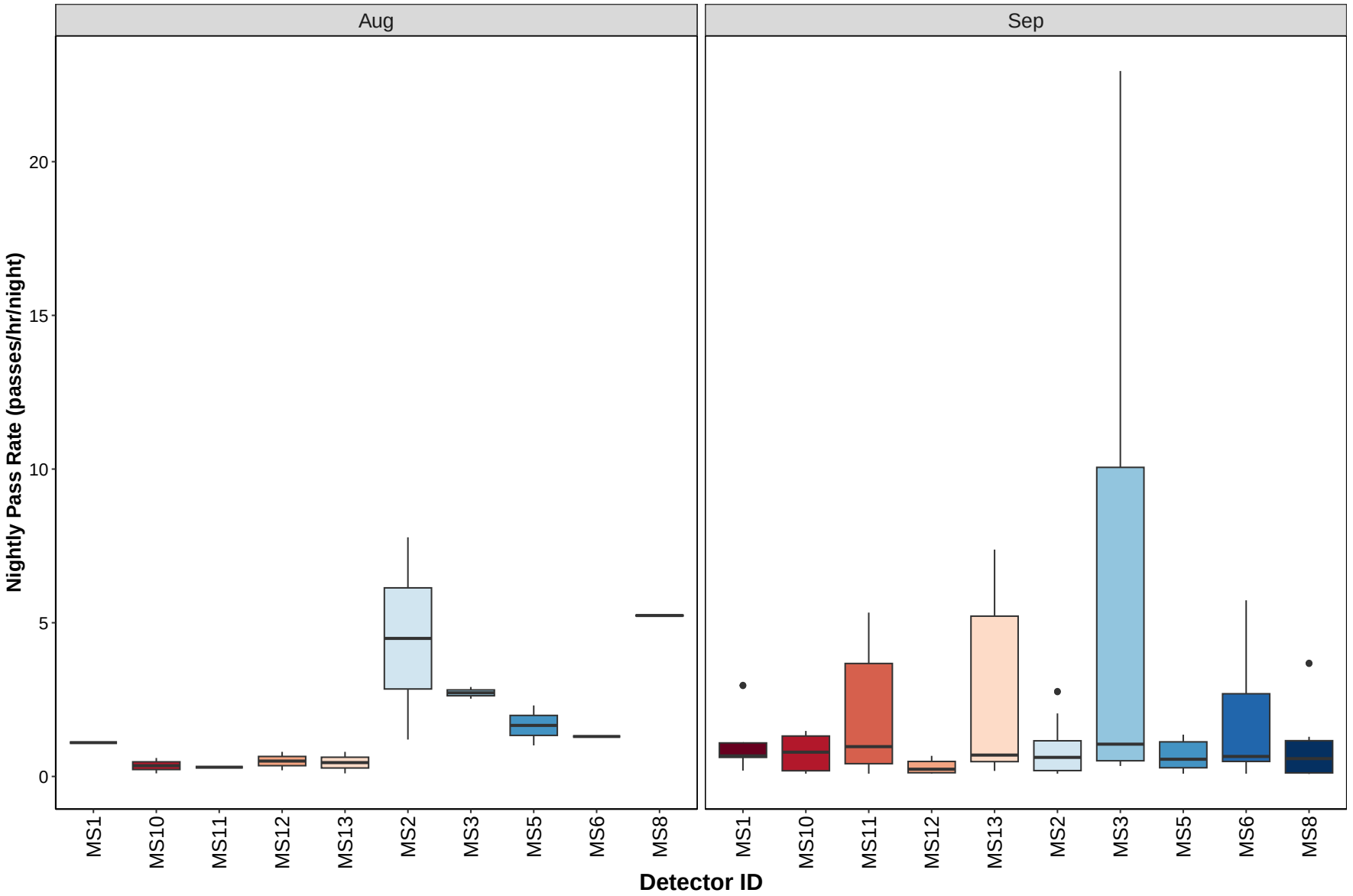
Species	Detector ID	Aug	Sep
Myotis	MS1	0.5	0.2
Myotis	MS10	0.2	0.1
Myotis	MS11	0.1	0.2
Myotis	MS12	0.7	0.5
Myotis	MS13	1.5	1.3
Myotis	MS2	NA	0.1
Myotis	MS3	0.1	0.1
Myotis	MS5	0.4	0.6
Myotis	MS6	0.2	0.3
Myotis	MS8	0.1	0.1

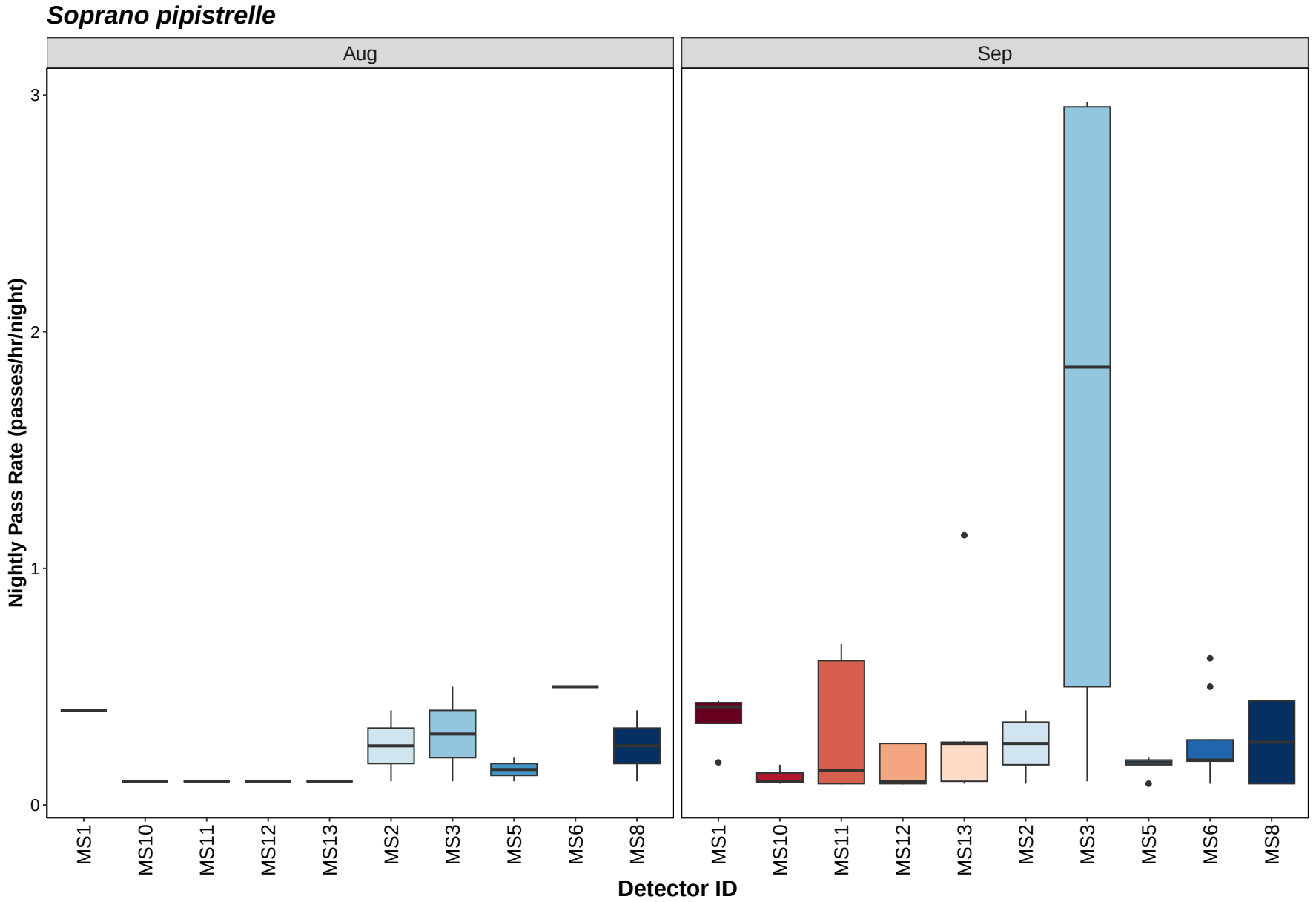
Per Detector

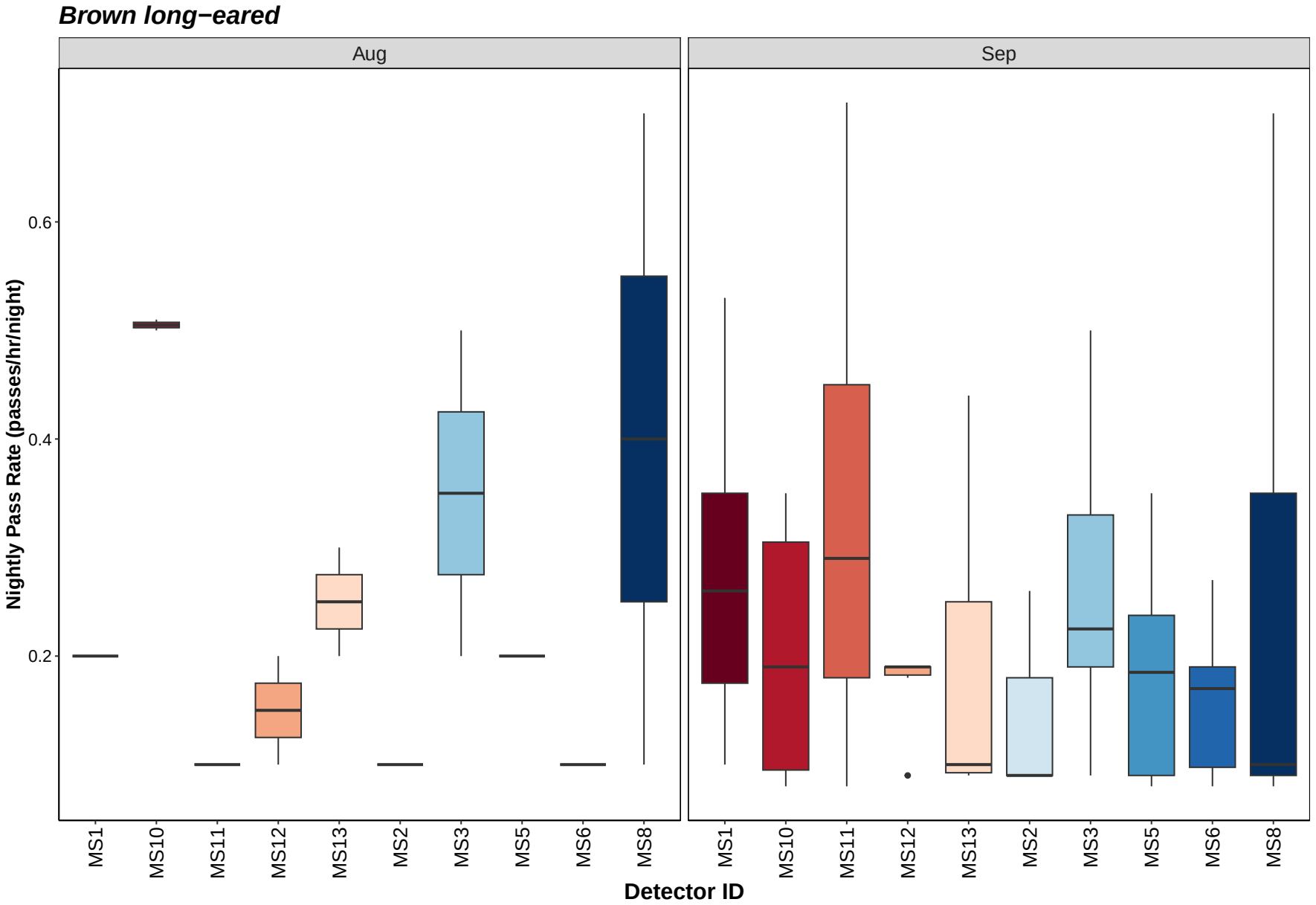
Figure 12. Figures show boxplots for the number of bat passes per hour by detector, for each month. The ‘box’ shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The ‘whiskers’ extend from the box and represent 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.


Myotis
Aug
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID

Common pipistrelle




Soprano pipistrelle
Aug
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID


Brown long−eared
Aug
Sep
Nightly Pass Rate (passes/hr/night)
0.6
0.4
0.2
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID

Bat Activity per Detector Location

Figure 13. Detector ID reference:

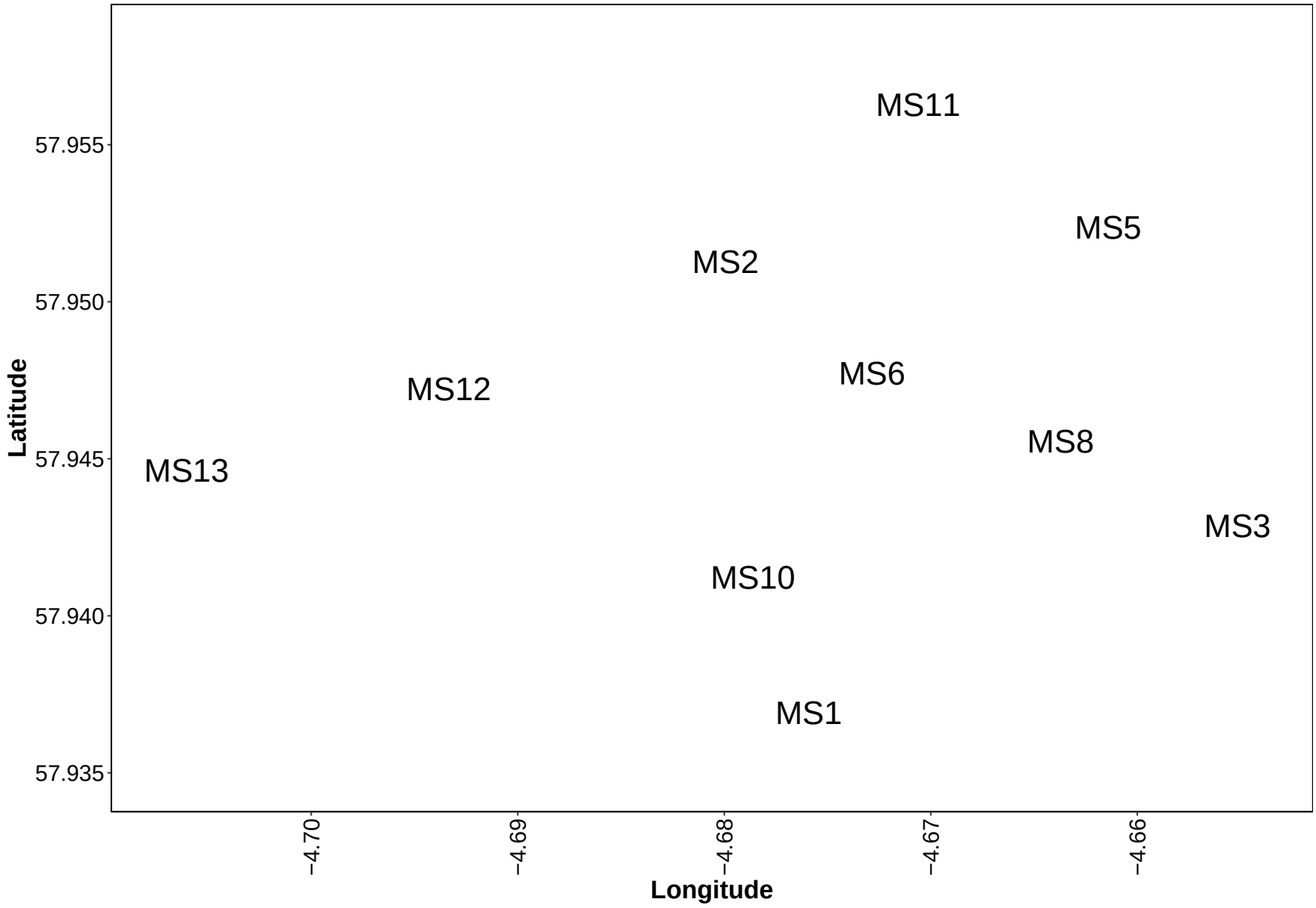

MS11
MS5
MS2
MS6
MS12
MS8
MS13
MS3
MS10
MS1
57.955
57.950
57.945
57.940
57.935
Latitude
−4.70
−4.69
−4.68
−4.67
−4.66
Longitude

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.

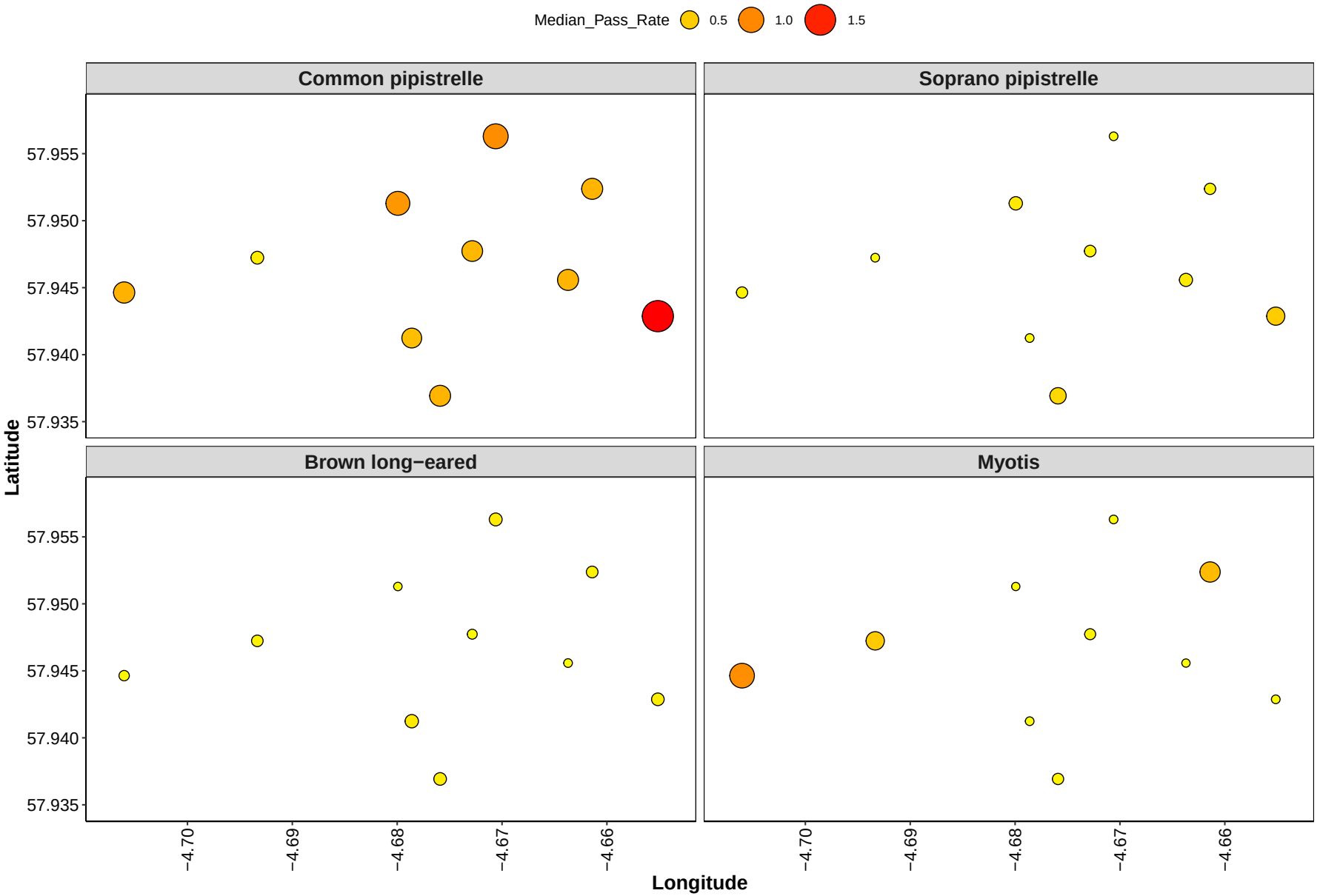
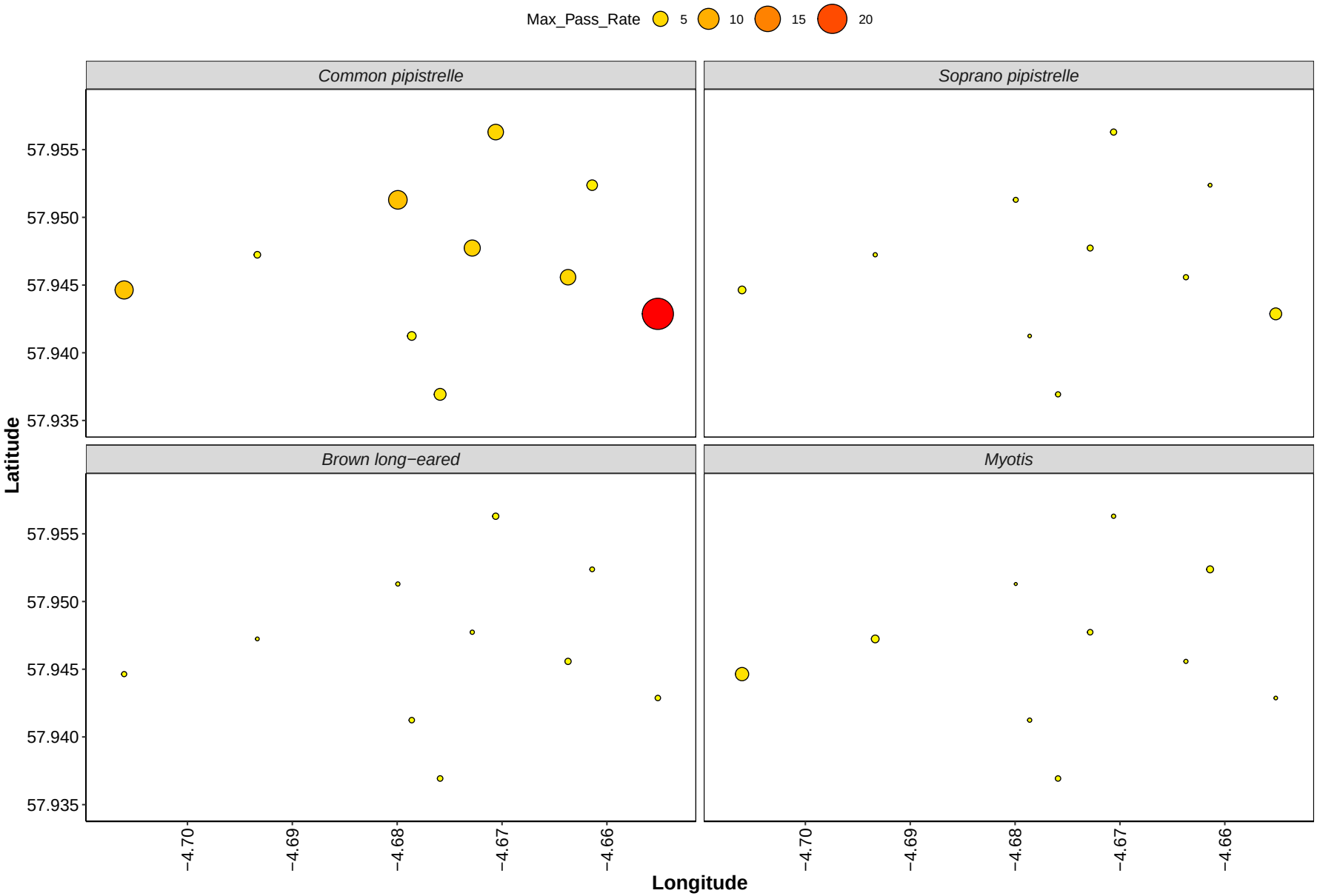

Median_Pass_Rate
0.5
1.0
1.5
Common pipistrelle
Soprano pipistrelle
Brown long−eared
Myotis
Latitude
57.955
57.950
57.945
57.940
57.935
−4.70
−4.69
−4.68
−4.67
−4.66
Longitude

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.


Max_Pass_Rate
5
10
15
20
Common pipistrelle
Soprano pipistrelle
Brown long−eared
Myotis
Latitude
57.955
57.950
57.945
57.940
57.935
−4.70
−4.69
−4.68
−4.67
−4.66
Longitude

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

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	0.2
Brown long-eared	MS10	0.1
Brown long-eared	MS11	0.2
Brown long-eared	MS12	0.0
Brown long-eared	MS13	0.1
Brown long-eared	MS2	0.0
Brown long-eared	MS3	0.2
Brown long-eared	MS5	0.1
Brown long-eared	MS6	0.1
Brown long-eared	MS8	0.1
Common pipistrelle	MS1	0.7
Common pipistrelle	MS10	0.2
Common pipistrelle	MS11	0.6
Common pipistrelle	MS12	0.1
Common pipistrelle	MS13	0.4
Common pipistrelle	MS2	0.6
Common pipistrelle	MS3	1.3
Common pipistrelle	MS5	0.6
Common pipistrelle	MS6	0.6
Common pipistrelle	MS8	0.2
Myotis	MS1	0.1
Myotis	MS10	0.1
Myotis	MS11	0.0
Myotis	MS12	0.3
Myotis	MS13	0.9
Myotis	MS2	0.0
Myotis	MS3	0.0
Myotis	MS5	0.6
Myotis	MS6	0.1
Myotis	MS8	0.0
Soprano pipistrelle	MS1	0.0
Soprano pipistrelle	MS10	0.0
Soprano pipistrelle	MS11	0.0
Soprano pipistrelle	MS12	0.0
Soprano pipistrelle	MS13	0.1
Soprano pipistrelle	MS2	0.0

Species	Detector ID	Median Pass Rate
Soprano pipistrelle	MS3	0.0
Soprano pipistrelle	MS5	0.1
Soprano pipistrelle	MS6	0.0
Soprano pipistrelle	MS8	0.0

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.

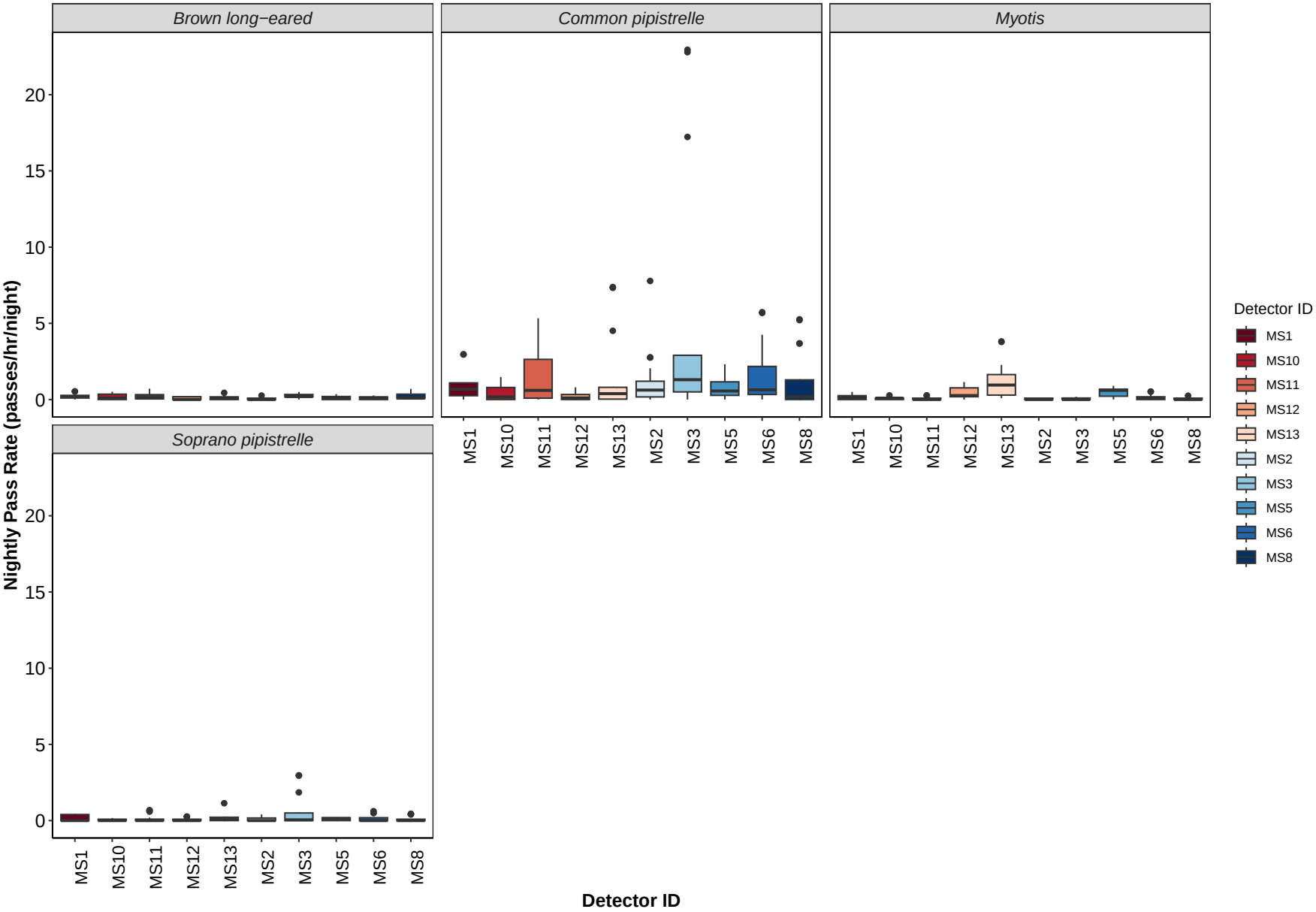
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

Species	Detector ID	Mean Pass Rate
Brown long-eared	MS1	0.2
Brown long-eared	MS10	0.2
Brown long-eared	MS11	0.2
Brown long-eared	MS12	0.1
Brown long-eared	MS13	0.1
Brown long-eared	MS2	0.0
Brown long-eared	MS3	0.2
Brown long-eared	MS5	0.1
Brown long-eared	MS6	0.1
Brown long-eared	MS8	0.2
Common pipistrelle	MS1	0.9
Common pipistrelle	MS10	0.5
Common pipistrelle	MS11	1.5
Common pipistrelle	MS12	0.2
Common pipistrelle	MS13	1.6
Common pipistrelle	MS2	1.3
Common pipistrelle	MS3	5.4
Common pipistrelle	MS5	0.7
Common pipistrelle	MS6	1.6
Common pipistrelle	MS8	1.3
Myotis	MS1	0.2
Myotis	MS10	0.1
Myotis	MS11	0.0
Myotis	MS12	0.5
Myotis	MS13	1.3
Myotis	MS2	0.0
Myotis	MS3	0.0
Myotis	MS5	0.5
Myotis	MS6	0.1
Myotis	MS8	0.0
Soprano pipistrelle	MS1	0.2
Soprano pipistrelle	MS10	0.0
Soprano pipistrelle	MS11	0.1
Soprano pipistrelle	MS12	0.0
Soprano pipistrelle	MS13	0.2
Soprano pipistrelle	MS2	0.1

Species	Detector ID	Mean Pass Rate
Soprano pipistrelle	MS3	0.6
Soprano pipistrelle	MS5	0.1
Soprano pipistrelle	MS6	0.1
Soprano pipistrelle	MS8	0.1

Per Detector

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.


Brown long−eared
Common pipistrelle
Myotis
Soprano pipistrelle
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID
Detector ID
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8

Survey Effort

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

month	Detector ID	No. of Survey Nights
Aug	MS1	2
Aug	MS10	2
Aug	MS11	2
Aug	MS12	2
Aug	MS13	2
Aug	MS2	2
Aug	MS3	2
Aug	MS5	2
Aug	MS6	2
Aug	MS8	2
Sep	MS1	10
Sep	MS10	11
Sep	MS11	17
Sep	MS12	17
Sep	MS13	12
Sep	MS2	15
Sep	MS3	12
Sep	MS5	16
Sep	MS6	18
Sep	MS8	15

Nighlty 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	Sep
Brown long-eared	MS1	0.2	0.2
Brown long-eared	MS10	0.5	0.1
Brown long-eared	MS11	0.0	0.2
Brown long-eared	MS12	0.2	0.0
Brown long-eared	MS13	0.2	0.0
Brown long-eared	MS2	0.0	0.0
Brown long-eared	MS3	0.3	0.2
Brown long-eared	MS5	0.2	0.0
Brown long-eared	MS6	0.1	0.1
Brown long-eared	MS8	0.4	0.1
Common pipistrelle	MS1	0.6	0.7
Common pipistrelle	MS10	0.3	0.2
Common pipistrelle	MS11	0.1	1.0
Common pipistrelle	MS12	0.5	0.1
Common pipistrelle	MS13	0.4	0.4
Common pipistrelle	MS2	4.5	0.3
Common pipistrelle	MS3	2.7	0.8
Common pipistrelle	MS5	1.7	0.4
Common pipistrelle	MS6	0.7	0.6
Common pipistrelle	MS8	5.2	0.1
Myotis	MS1	0.2	0.1
Myotis	MS10	0.2	0.0
Myotis	MS11	0.0	0.0
Myotis	MS12	0.7	0.3
Myotis	MS13	1.5	0.5
Myotis	MS2	0.0	0.0
Myotis	MS3	0.0	0.0
Myotis	MS5	0.4	0.6
Myotis	MS6	0.2	0.1
Myotis	MS8	0.0	0.0
Soprano pipistrelle	MS1	0.2	0.0
Soprano pipistrelle	MS10	0.0	0.0
Soprano pipistrelle	MS11	0.0	0.0
Soprano pipistrelle	MS12	0.0	0.0
Soprano pipistrelle	MS13	0.0	0.1
Soprano pipistrelle	MS2	0.2	0.0

Species	Detector ID	Aug	Sep
Soprano pipistrelle	MS3	0.3	0.0
Soprano pipistrelle	MS5	0.2	0.1
Soprano pipistrelle	MS6	0.2	0.0
Soprano pipistrelle	MS8	0.2	0.0

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.

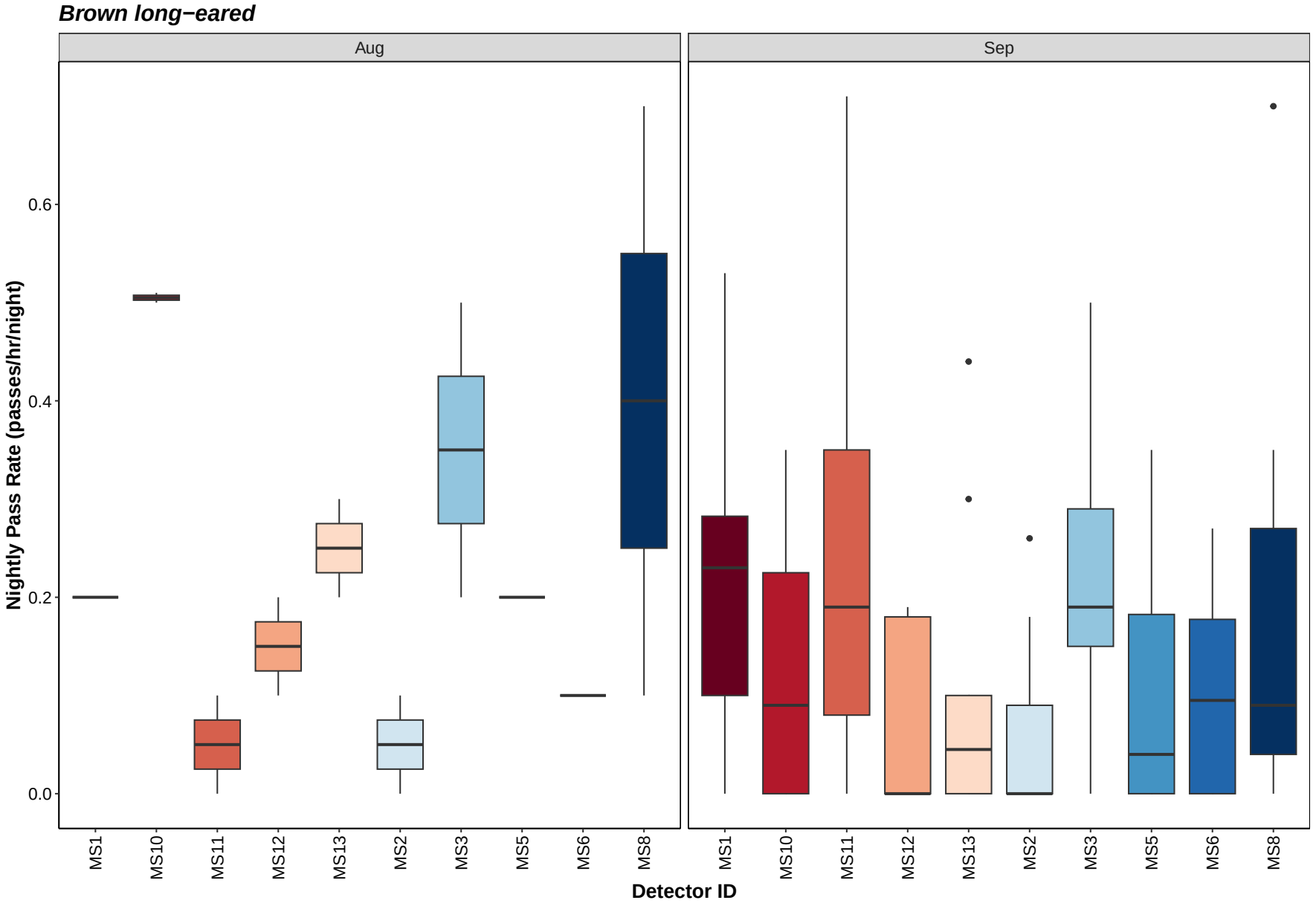
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

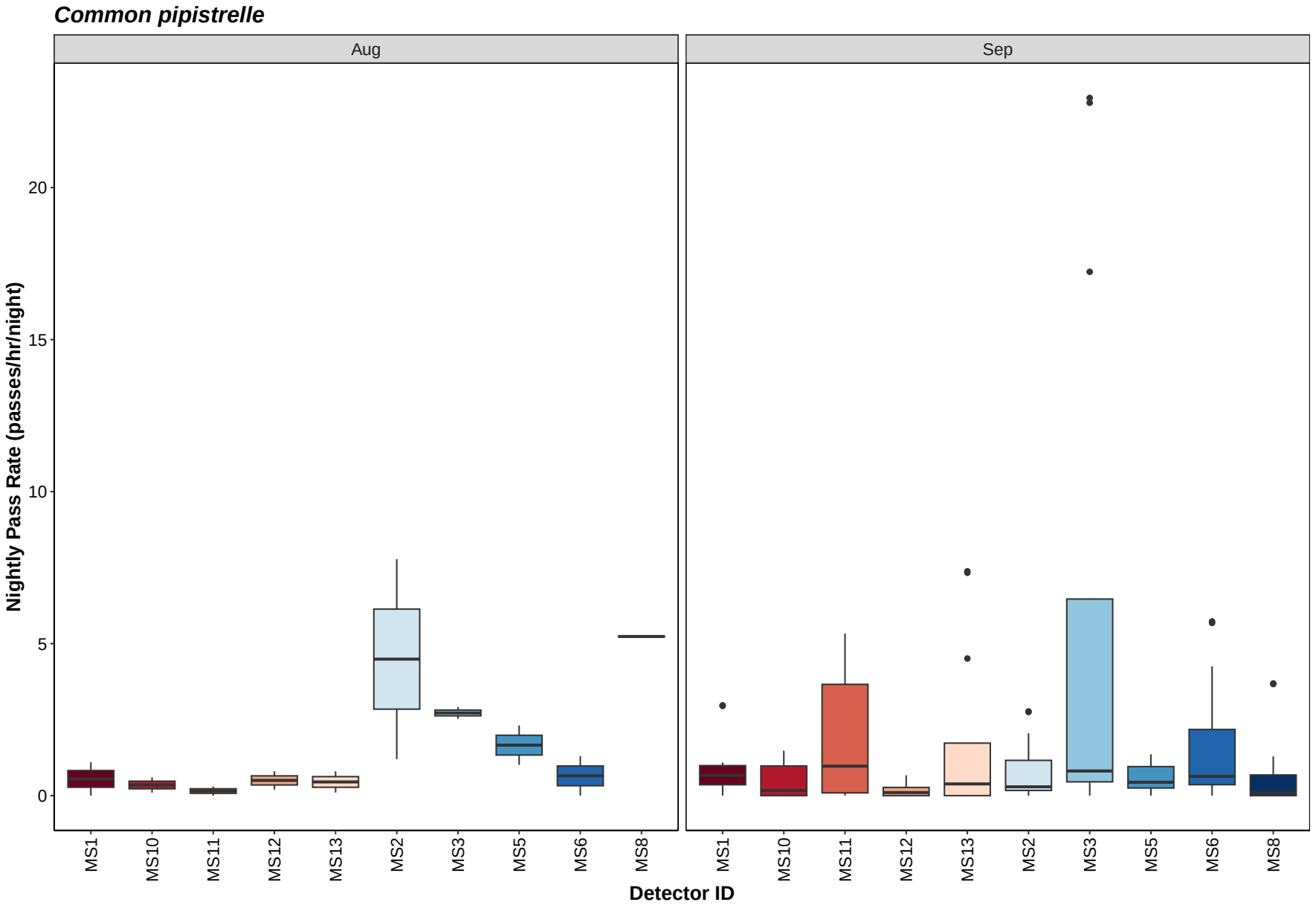
Species	Detector ID	Aug	Sep
Brown long-eared	MS1	0.2	0.2
Brown long-eared	MS10	0.5	0.1
Brown long-eared	MS11	0.0	0.2
Brown long-eared	MS12	0.2	0.1
Brown long-eared	MS13	0.2	0.1
Brown long-eared	MS2	0.0	0.0
Brown long-eared	MS3	0.3	0.2
Brown long-eared	MS5	0.2	0.1
Brown long-eared	MS6	0.1	0.1
Brown long-eared	MS8	0.4	0.2
Common pipistrelle	MS1	0.6	1.0
Common pipistrelle	MS10	0.3	0.5
Common pipistrelle	MS11	0.1	1.7
Common pipistrelle	MS12	0.5	0.2
Common pipistrelle	MS13	0.4	1.8
Common pipistrelle	MS2	4.5	0.8
Common pipistrelle	MS3	2.7	5.9
Common pipistrelle	MS5	1.7	0.6
Common pipistrelle	MS6	0.7	1.6
Common pipistrelle	MS8	5.2	0.7
Myotis	MS1	0.2	0.2
Myotis	MS10	0.2	0.1
Myotis	MS11	0.0	0.0
Myotis	MS12	0.7	0.4
Myotis	MS13	1.5	1.3
Myotis	MS2	0.0	0.0
Myotis	MS3	0.0	0.0
Myotis	MS5	0.4	0.5
Myotis	MS6	0.2	0.1
Myotis	MS8	0.0	0.0
Soprano pipistrelle	MS1	0.2	0.1
Soprano pipistrelle	MS10	0.0	0.0
Soprano pipistrelle	MS11	0.0	0.1
Soprano pipistrelle	MS12	0.0	0.0
Soprano pipistrelle	MS13	0.0	0.2
Soprano pipistrelle	MS2	0.2	0.1

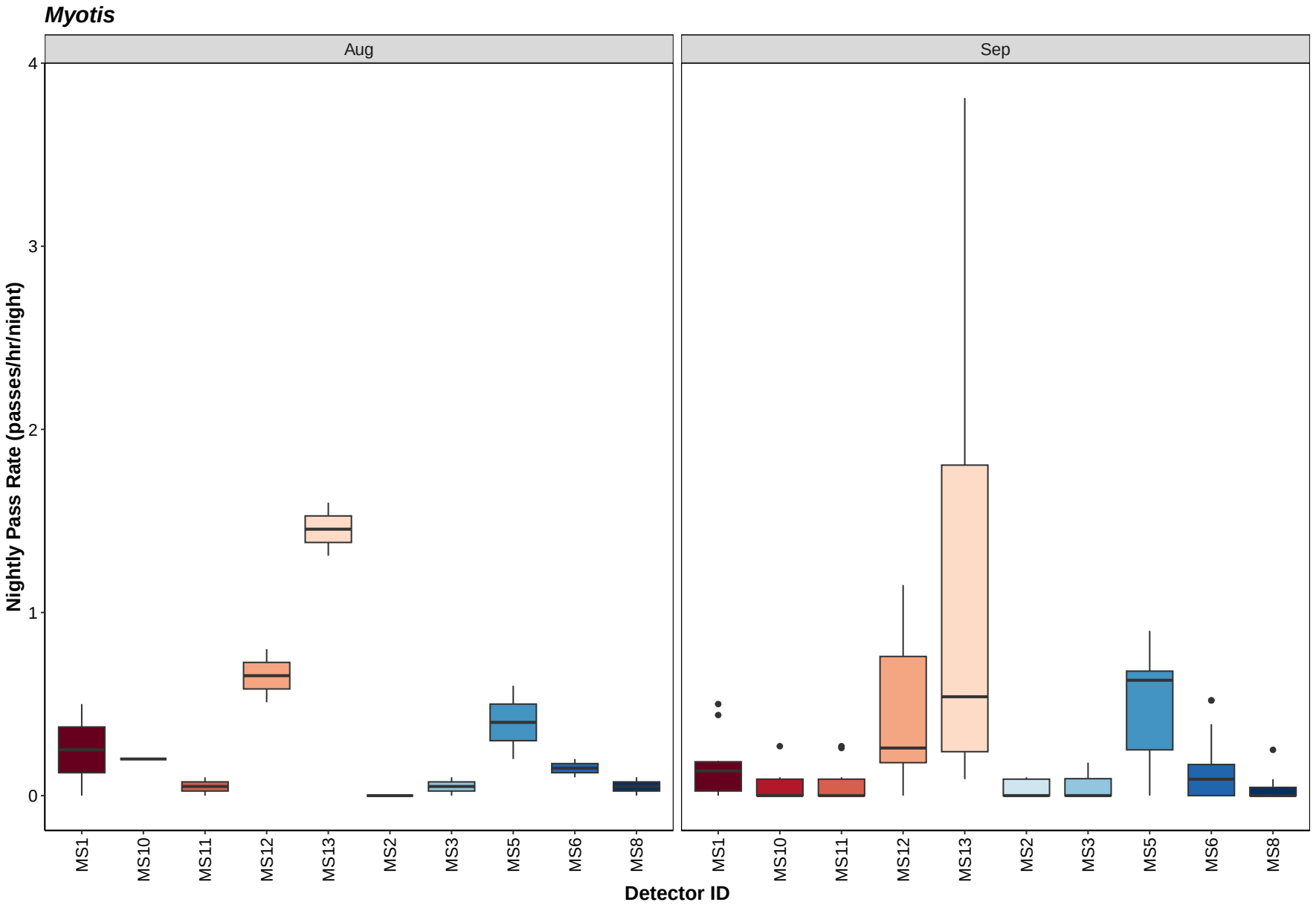
Species	Detector ID	Aug	Sep
Soprano pipistrelle	MS3	0.3	0.7
Soprano pipistrelle	MS5	0.2	0.1
Soprano pipistrelle	MS6	0.2	0.1
Soprano pipistrelle	MS8	0.2	0.1

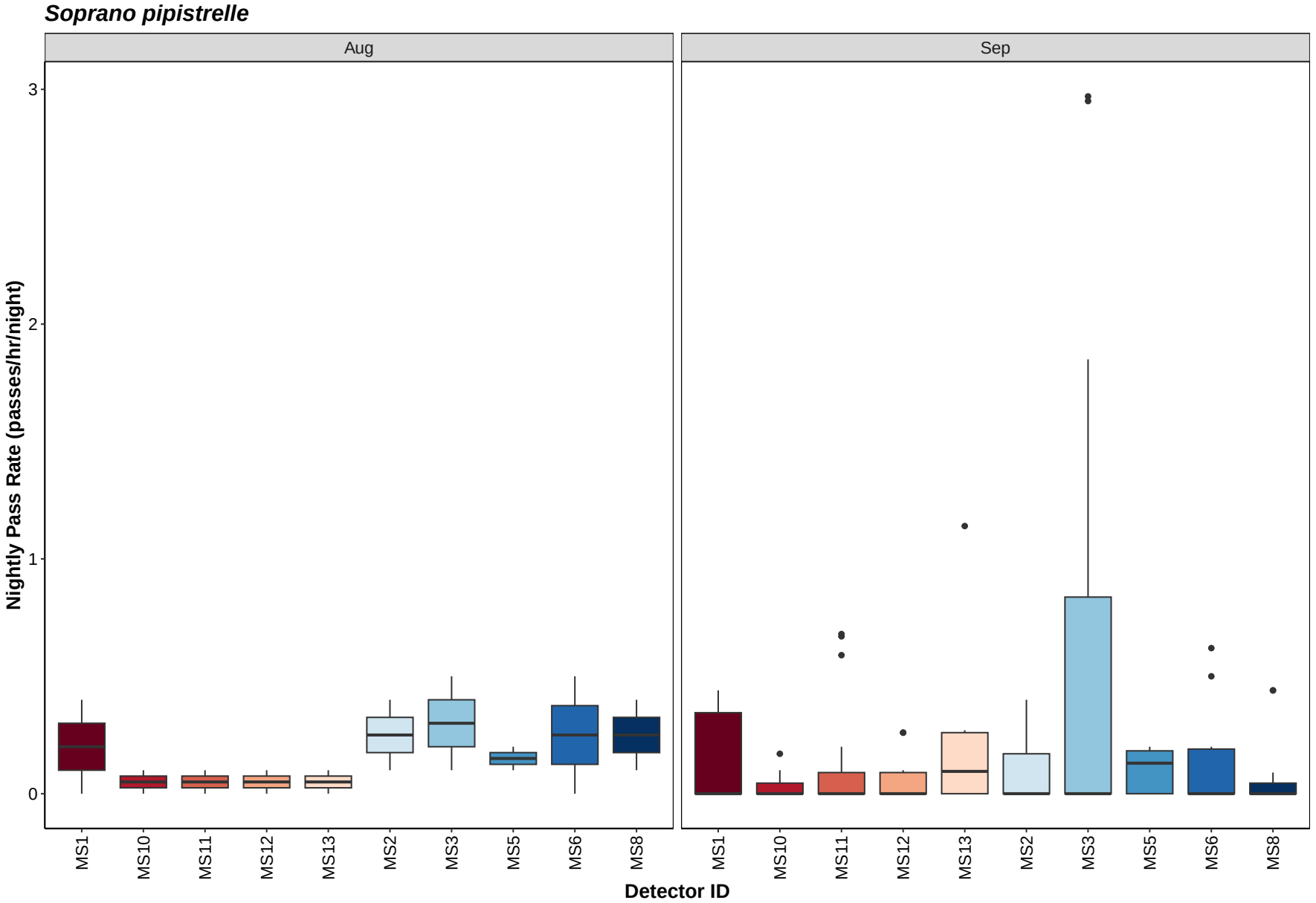
Per Detector

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.


Brown long−eared
Aug
Sep
Nightly Pass Rate (passes/hr/night)
0.0
0.2
0.4
0.6
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID


Common pipistrelle
Aug
Sep
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID


Myotis
Aug
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
4
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID


Soprano pipistrelle
Aug
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
MS1
MS10
MS11
MS12
MS13
MS2
MS3
MS5
MS6
MS8
Detector ID

Bat Activity per Detector Location

Figure 18. Detector ID reference:

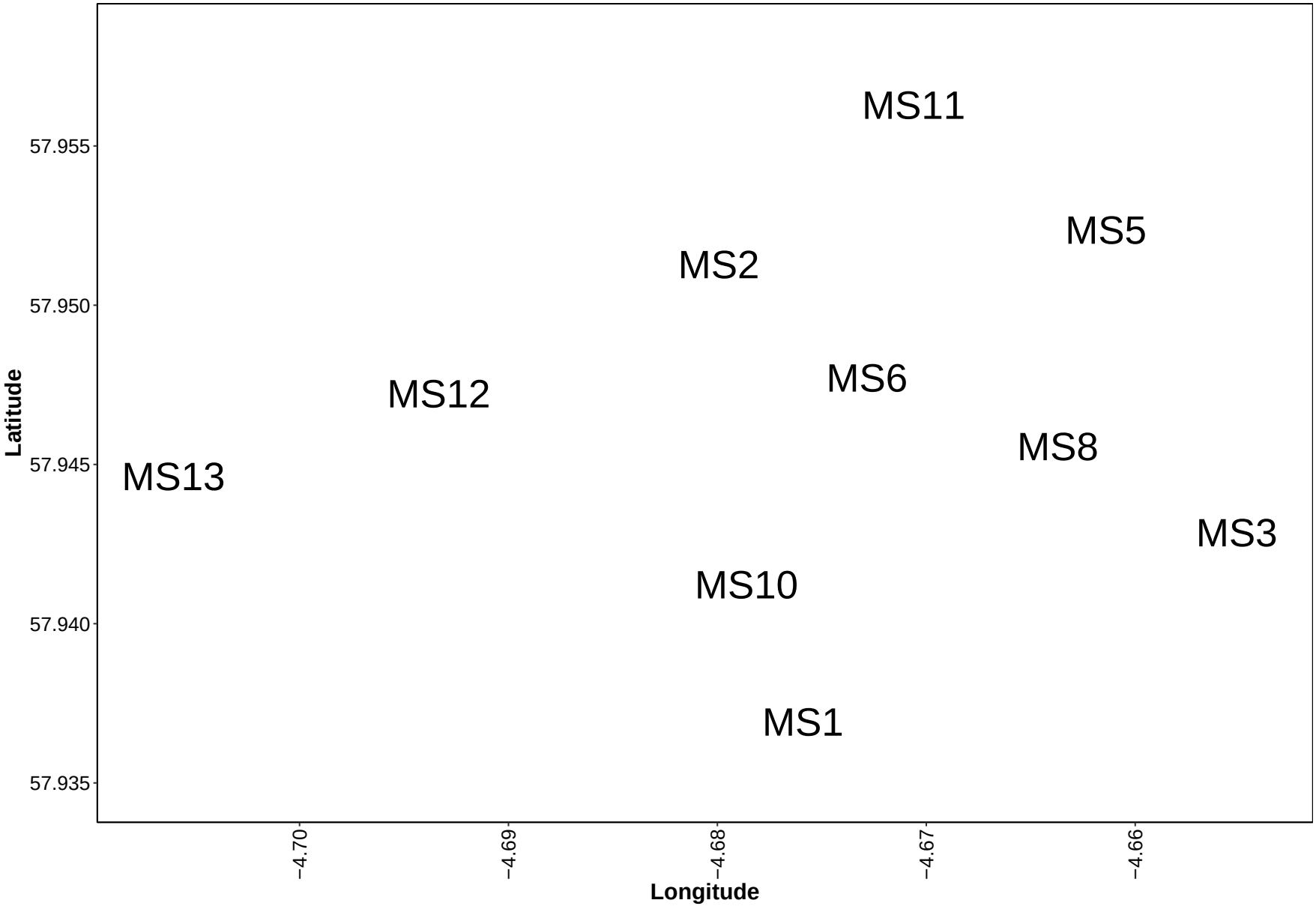

MS11
MS5
MS2
MS6
MS12
MS8
MS13
MS3
MS10
MS1
57.955
57.950
57.945
57.940
57.935
Latitude
−4.70
−4.69
−4.68
−4.67
−4.66
Longitude

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.

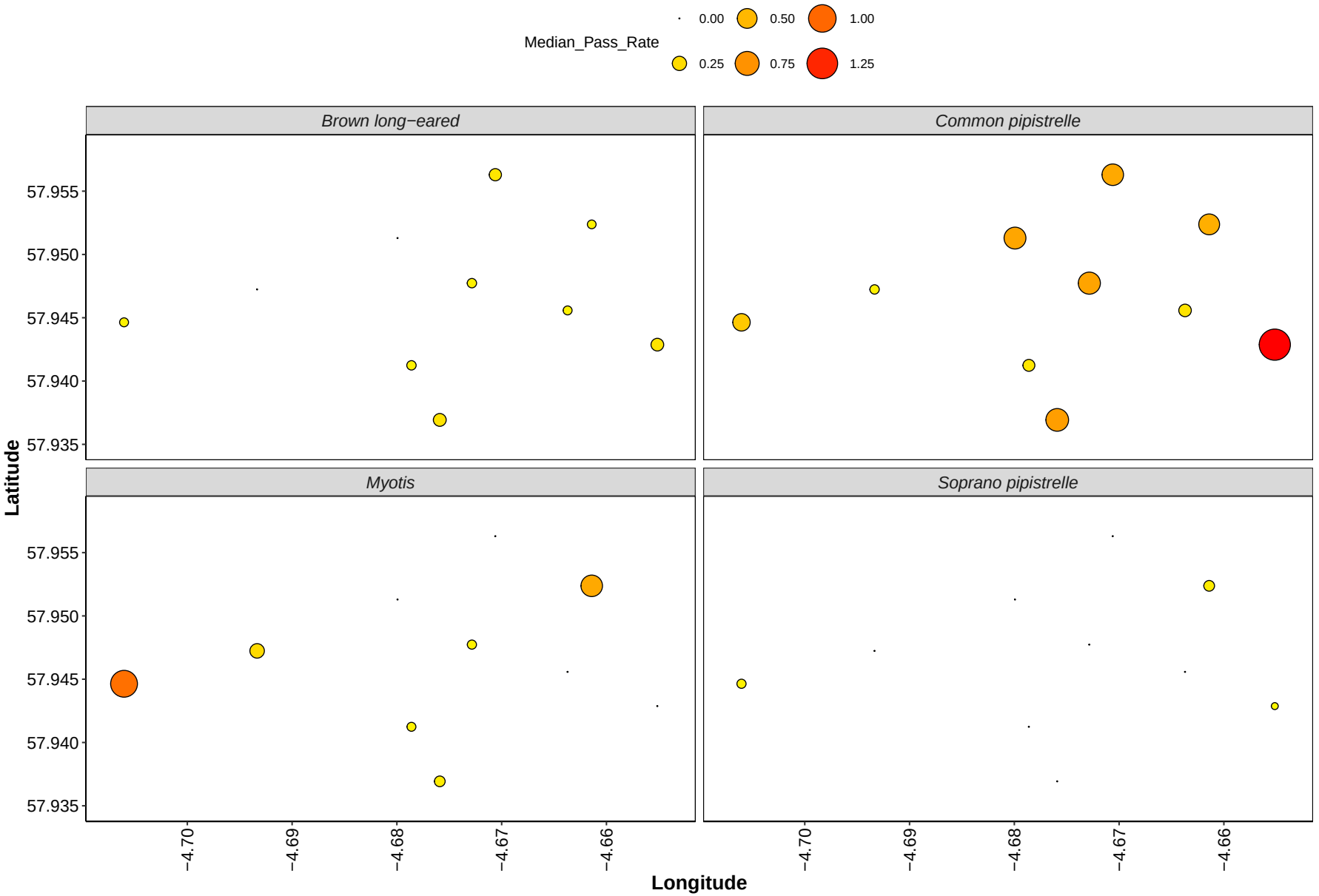
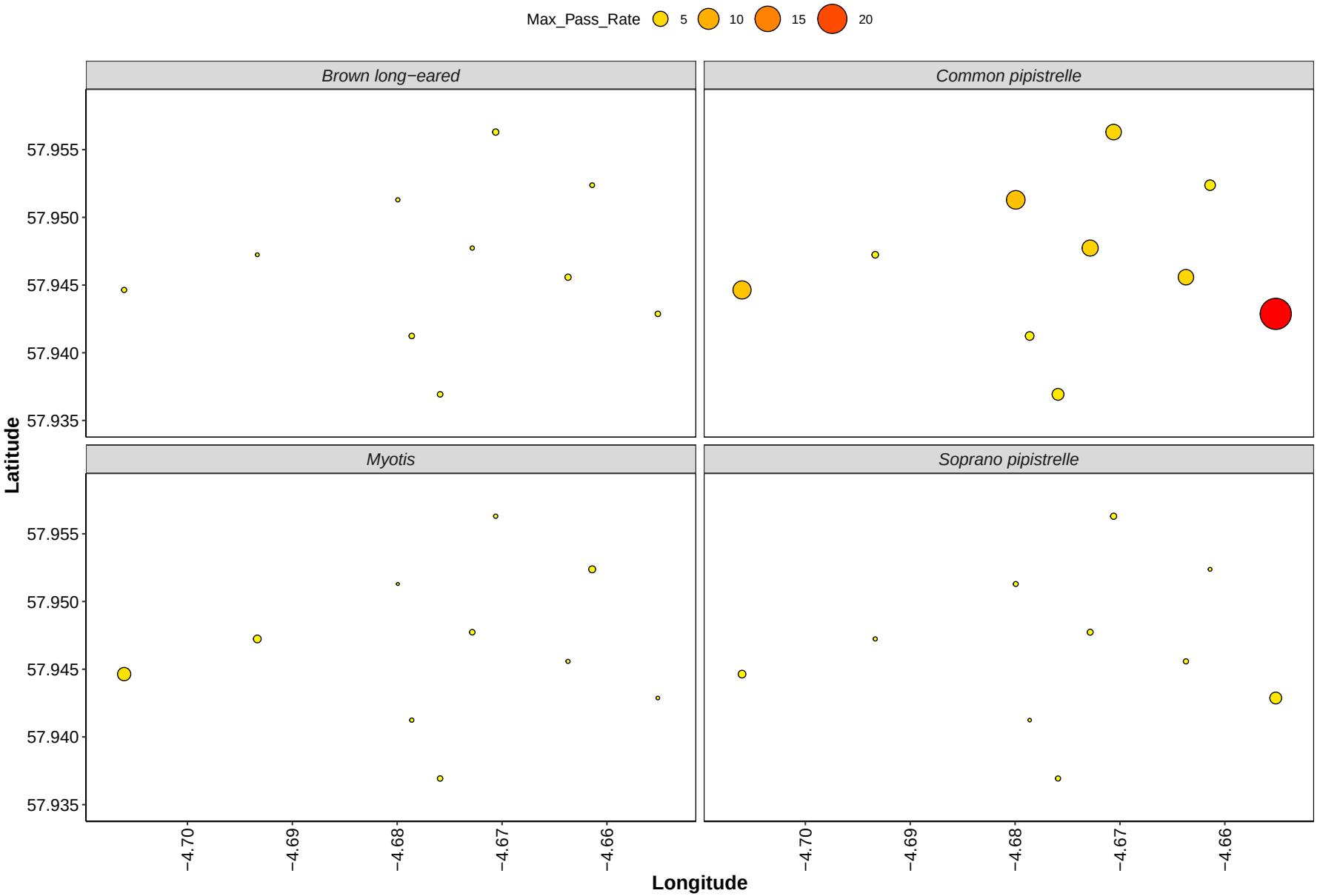

Median_Pass_Rate
0.00
0.25
0.50
0.75
1.00
1.25
Brown long−eared
Common pipistrelle
Myotis
Soprano pipistrelle
Latitude
57.955
57.950
57.945
57.940
57.935
−4.70
−4.69
−4.68
−4.67
−4.66
Longitude

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.


Max_Pass_Rate
5
10
15
20
Brown long−eared
Common pipistrelle
Myotis
Soprano pipistrelle
Latitude
57.955
57.950
57.945
57.940
57.935
−4.70
−4.69
−4.68
−4.67
−4.66
Longitude

Thank you for using Ecobat!

Ecobat Report

2025-03-03

Geo filter: region, Time filter: +- 1 month

Summary

Bats were detected on **34** nights between **15/04/2021** and **19/09/2021**, using **10** static bat detectors. Throughout this period, **4** species were recorded. **Table 1.** Detectors were placed at the following locations:

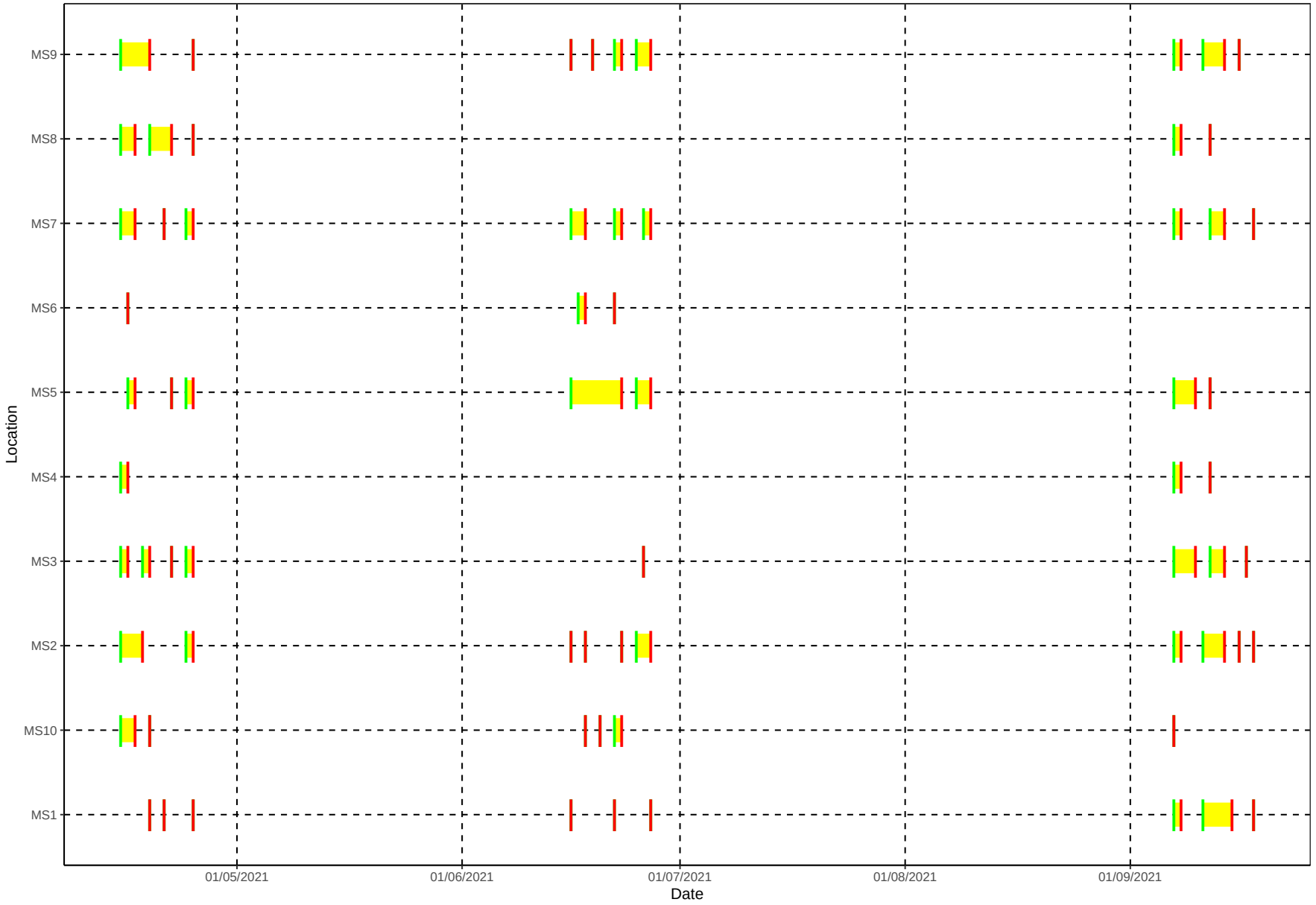
Detector ID	Latitude	Longitude
MS1	57.93693	-4.675906
MS10	57.94124	-4.678610
MS2	57.95129	-4.679935
MS3	57.94287	-4.655142
MS4	57.93810	-4.691082
MS5	57.95238	-4.661405
MS6	57.94773	-4.672841
MS7	57.94494	-4.685764
MS8	57.94558	-4.663707
MS9	57.95118	-4.651784

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	15
MS10	10
MS2	21
MS3	18
MS4	7
MS5	28
MS6	5
MS7	20
MS8	13
MS9	23

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


MS9
MS8
MS7
MS6
MS5
MS4
MS3
MS2
MS10
MS1
Location
01/05/2021
01/06/2021
01/07/2021
01/08/2021
01/09/2021
Date

Part 1: Percentile 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.

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	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	0	0	0	0	4	0
MS1	Pipistrellus pipistrellus	0	0	0	0	0	11
MS1	Pipistrellus pygmaeus	0	0	0	0	0	1
MS1	Plecotus auritus	0	1	0	1	5	0
MS10	Myotis	0	0	0	0	6	0
MS10	Pipistrellus pipistrellus	0	0	0	0	0	2
MS10	Pipistrellus pygmaeus	0	0	0	0	0	1
MS10	Plecotus auritus	0	2	0	2	2	0
MS2	Myotis	0	0	0	0	8	0
MS2	Pipistrellus pipistrellus	0	0	0	0	1	12
MS2	Pipistrellus pygmaeus	0	0	0	0	0	2
MS2	Plecotus auritus	0	1	0	6	3	0
MS3	Myotis	0	0	0	0	8	0
MS3	Pipistrellus pipistrellus	0	0	0	0	4	12
MS3	Pipistrellus pygmaeus	0	0	0	0	0	3
MS3	Plecotus auritus	0	0	0	2	4	0
MS4	Myotis	0	0	0	0	3	0
MS4	Pipistrellus pipistrellus	0	0	0	0	0	5
MS4	Pipistrellus pygmaeus	0	0	0	0	0	2
MS4	Plecotus auritus	1	4	0	0	1	0

Detector ID	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
MS5	Myotis	2	2	4	7	4	0
MS5	Pipistrellus pipistrellus	0	0	0	0	0	21
MS5	Pipistrellus pygmaeus	0	0	0	0	0	3
MS5	Plecotus auritus	0	6	0	4	2	0
MS6	Myotis	0	0	0	0	2	0
MS6	Pipistrellus pipistrellus	0	0	0	0	0	4
MS6	Plecotus auritus	0	0	0	0	2	0
MS7	Myotis	0	0	0	0	11	0
MS7	Pipistrellus pipistrellus	0	0	0	0	0	8
MS7	Pipistrellus pygmaeus	0	0	0	0	0	4
MS7	Plecotus auritus	0	5	0	3	5	0
MS8	Myotis	0	0	0	0	2	0
MS8	Pipistrellus pipistrellus	0	0	0	0	0	9
MS8	Pipistrellus pygmaeus	0	0	0	0	0	2
MS8	Plecotus auritus	2	4	0	1	6	0
MS9	Myotis	0	0	0	0	5	0
MS9	Pipistrellus pipistrellus	0	0	0	0	0	19
MS9	Pipistrellus pygmaeus	0	0	0	0	0	1
MS9	Plecotus auritus	4	4	0	1	5	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	23	23 - 23	23	4	343
MS1	Pipistrellus pipistrellus	0	1 - 5	5	11	29597
MS1	Pipistrellus pygmaeus	0	0	0	1	3782
MS1	Plecotus auritus	22	22 - 40.5	83	7	342
MS10	Myotis	23	23 - 23	33	6	343
MS10	Pipistrellus pipistrellus	0	0 - 0	0	2	29597
MS10	Pipistrellus pygmaeus	0	0	0	1	3782
MS10	Plecotus auritus	59	22 - 92	92	6	342
MS2	Myotis	23	23 - 23	33	8	343
MS2	Pipistrellus pipistrellus	2	1.5 - 14	24	13	29597
MS2	Pipistrellus pygmaeus	1	0.5 - 0.5	1	2	3782
MS2	Plecotus auritus	59	40.5 - 59	83	10	342
MS3	Myotis	23	23 - 28	33	8	343
MS3	Pipistrellus pipistrellus	5	4.5 - 23	36	16	29597
MS3	Pipistrellus pygmaeus	0	0 - 0	5	3	3782
MS3	Plecotus auritus	22	22 - 40.5	59	6	342
MS4	Myotis	39	39 - 39	39	3	343
MS4	Pipistrellus pipistrellus	5	2 - 14	14	5	29597
MS4	Pipistrellus pygmaeus	8	7.5 - 7.5	12	2	3782
MS4	Plecotus auritus	86	52.5 - 92.5	97	6	342
MS5	Myotis	54	43.5 - 70.5	100	19	343
MS5	Pipistrellus pipistrellus	1	2 - 7.5	14	21	29597
MS5	Pipistrellus pygmaeus	0	0 - 0	0	3	3782
MS5	Plecotus auritus	71	52.5 - 83	88	12	342
MS6	Myotis	23	23 - 23	23	2	343
MS6	Pipistrellus pipistrellus	0	0 - 0	0	4	29597
MS6	Plecotus auritus	22	22 - 22	22	2	342
MS7	Myotis	33	23 - 36	39	11	343
MS7	Pipistrellus pipistrellus	0	0 - 0	0	8	29597
MS7	Pipistrellus pygmaeus	1	0.5 - 0.5	1	4	3782
MS7	Plecotus auritus	59	40.5 - 71	83	13	342
MS8	Myotis	23	23 - 23	23	2	343
MS8	Pipistrellus pipistrellus	14	5 - 18	19	9	29597

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
MS8	Pipistrellus pygmaeus	2	1.5 - 1.5	3	2	3782
MS8	Plecotus auritus	59	22 - 83	97	13	342
MS9	Myotis	23	23 - 23	23	5	343
MS9	Pipistrellus pipistrellus	1	1.5 - 5	6	19	29597
MS9	Pipistrellus pygmaeus	0	0	0	1	3782
MS9	Plecotus auritus	83	52.5 - 92	100	14	342

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).

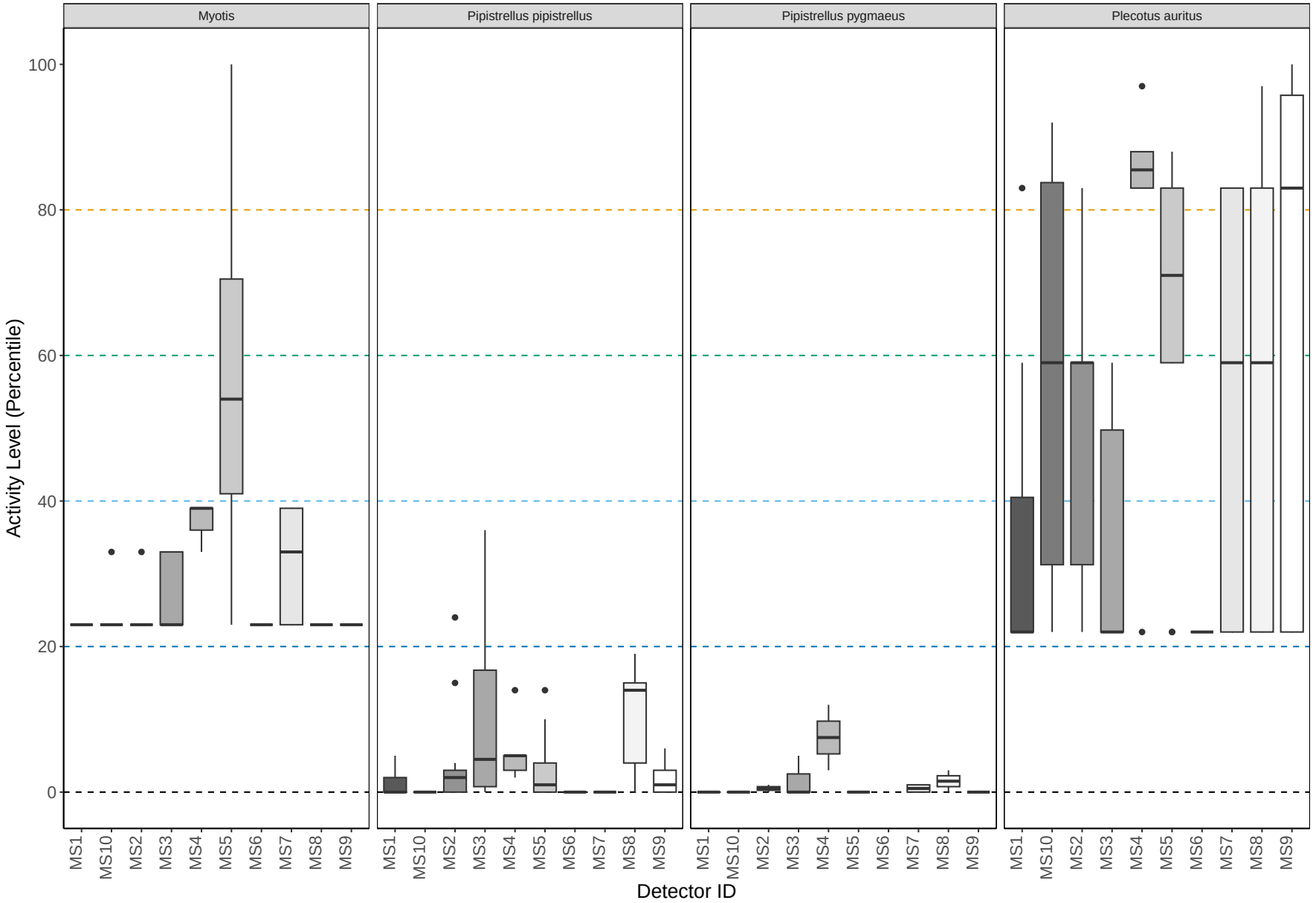
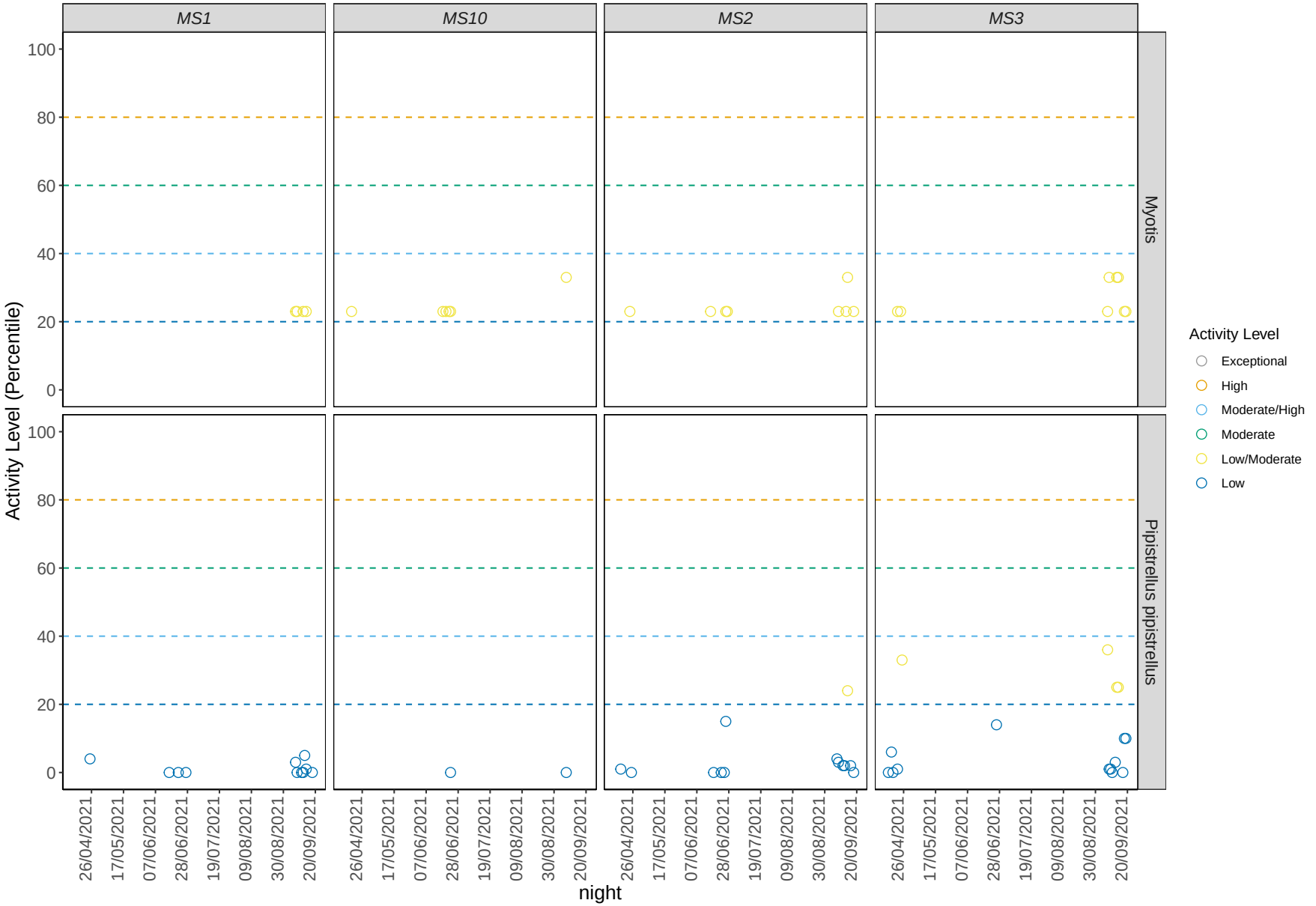
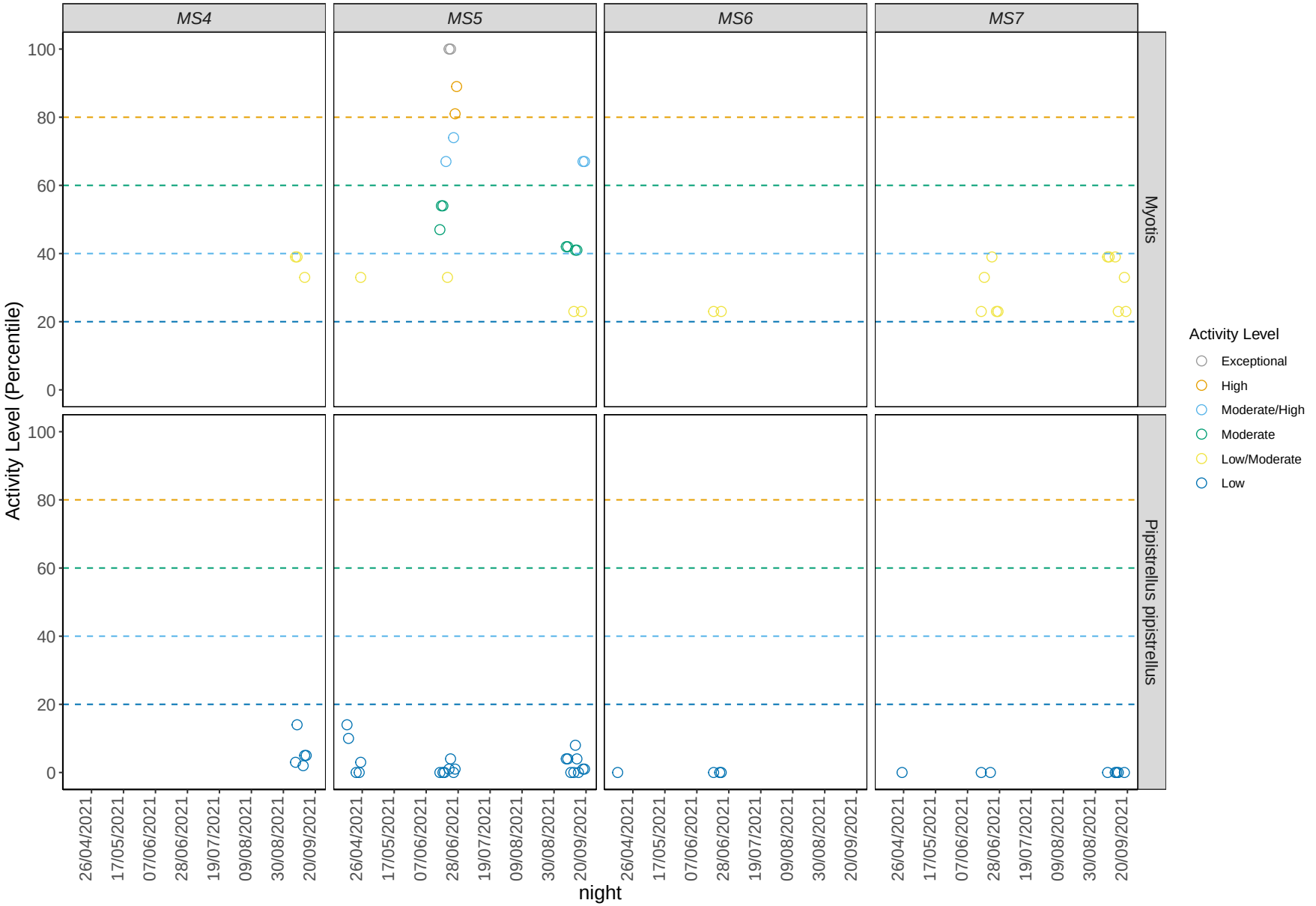
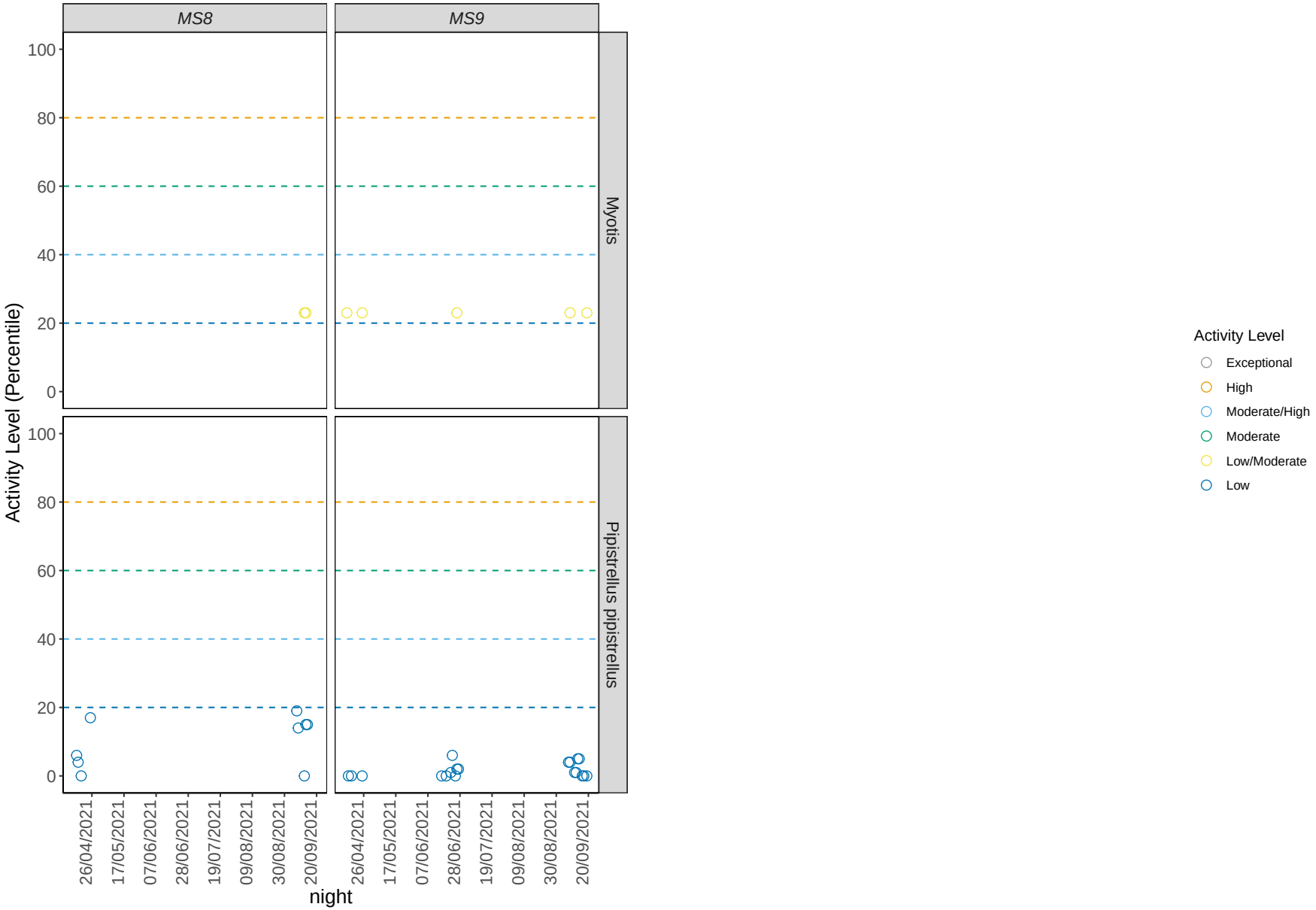
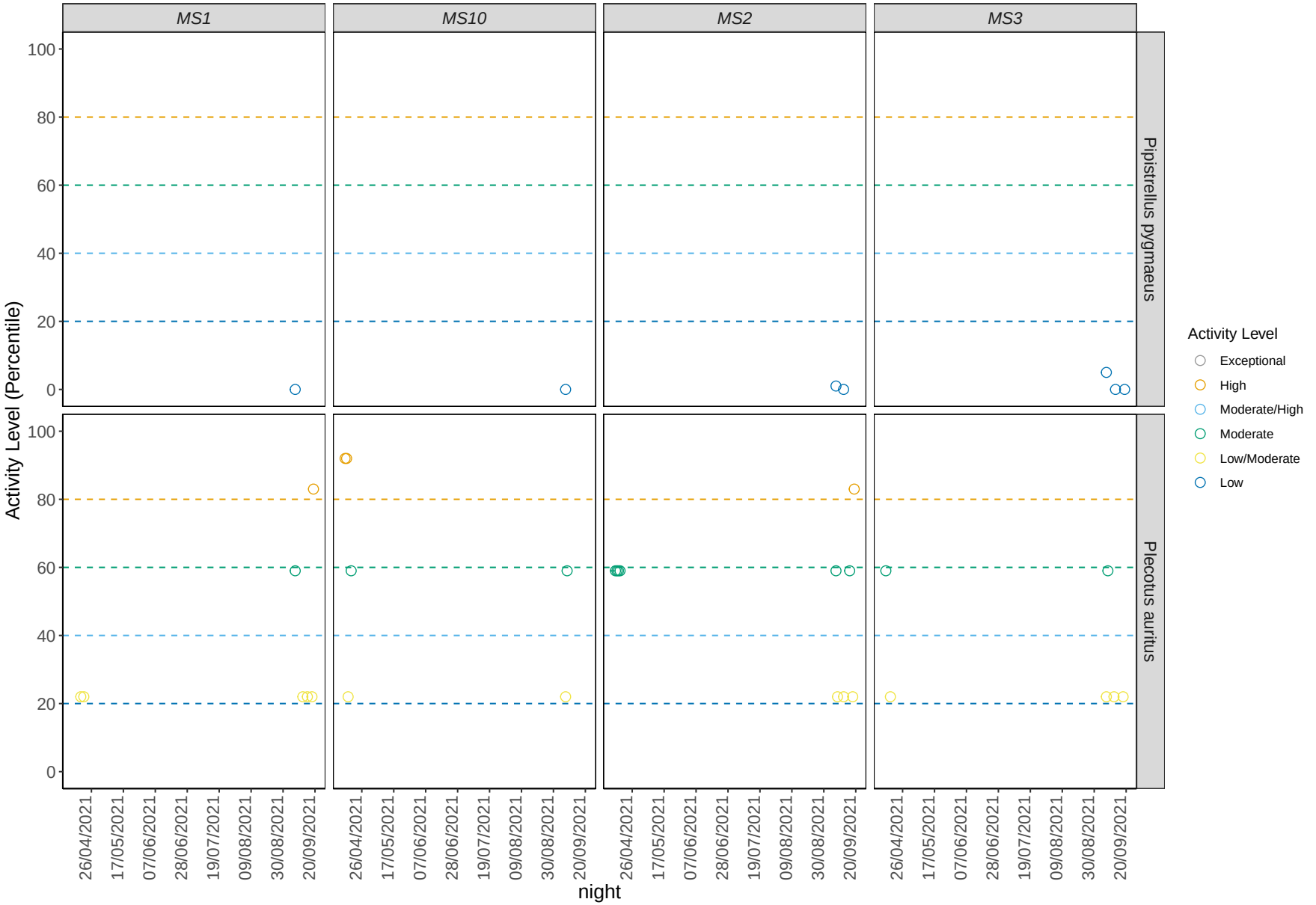

Myotis
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Activity Level (Percentile)
100
80
60
40
20
0
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID

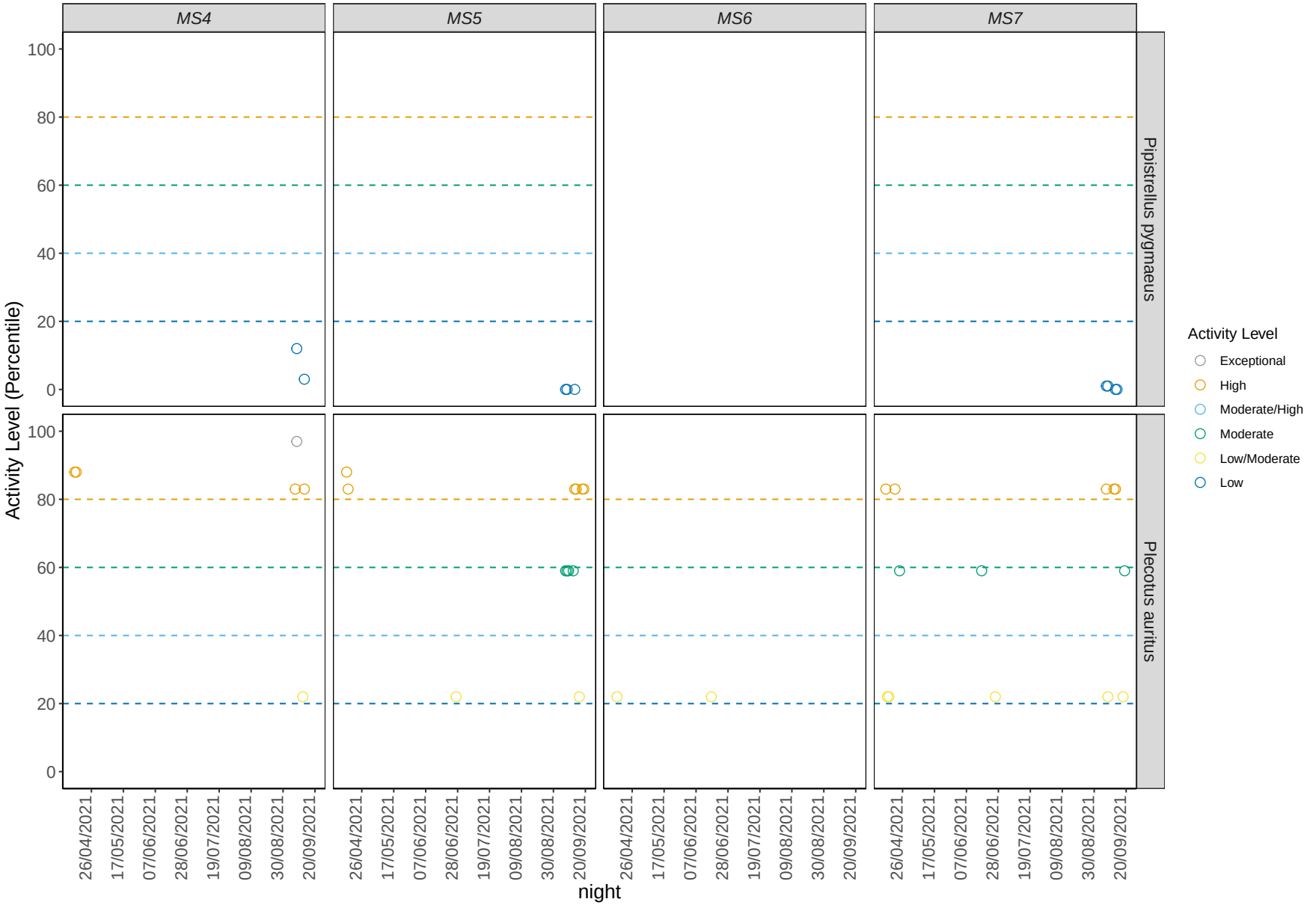
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.


MS1
MS10
MS2
MS3
Myotis
Pipistrellus pipistrellus
Activity Level (Percentile)
100
80
60
40
20
0
night
26/04/2021
17/05/2021
07/06/2021
28/06/2021
19/07/2021
09/08/2021
30/08/2021
20/09/2021
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


MS4
MS5
MS6
MS7
Myotis
Pipistrellus pipistrellus
Activity Level (Percentile)
100
80
60
40
20
0
26/04/2021
17/05/2021
07/06/2021
28/06/2021
19/07/2021
09/08/2021
30/08/2021
20/09/2021
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


MS8
MS9
Myotis
Pipistrellus pipistrellus
Activity Level (Percentile)
100
80
60
40
20
0
26/04/2021
17/05/2021
07/06/2021
28/06/2021
19/07/2021
09/08/2021
30/08/2021
20/09/2021
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


MS1
MS10
MS2
MS3
Pipistrellus pygmaeus
Plecotus auritus
Activity Level (Percentile)
100
80
60
40
20
0
night
26/04/2021
17/05/2021
07/06/2021
28/06/2021
19/07/2021
09/08/2021
30/08/2021
20/09/2021
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


MS4
MS5
MS6
MS7
Pipistrellus pygmaeus
Plecotus auritus
Activity Level (Percentile)
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	Sep	0	0	0	0	4	0
MS1	Pipistrellus pipistrellus	Apr	0	0	0	0	0	1
MS1	Pipistrellus pipistrellus	Jun	0	0	0	0	0	3
MS1	Pipistrellus pipistrellus	Sep	0	0	0	0	0	7
MS1	Pipistrellus pygmaeus	Sep	0	0	0	0	0	1
MS1	Plecotus auritus	Apr	0	0	0	0	2	0
MS1	Plecotus auritus	Sep	0	1	0	1	3	0
MS10	Myotis	Apr	0	0	0	0	1	0
MS10	Myotis	Jun	0	0	0	0	4	0
MS10	Myotis	Sep	0	0	0	0	1	0
MS10	Pipistrellus pipistrellus	Jun	0	0	0	0	0	1
MS10	Pipistrellus pipistrellus	Sep	0	0	0	0	0	1
MS10	Pipistrellus pygmaeus	Sep	0	0	0	0	0	1
MS10	Plecotus auritus	Apr	0	2	0	1	1	0
MS10	Plecotus auritus	Sep	0	0	0	1	1	0
MS2	Myotis	Apr	0	0	0	0	1	0
MS2	Myotis	Jun	0	0	0	0	3	0
MS2	Myotis	Sep	0	0	0	0	4	0
MS2	Pipistrellus pipistrellus	Apr	0	0	0	0	0	2
MS2	Pipistrellus pipistrellus	Jun	0	0	0	0	0	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
MS2	Pipistrellus pipistrellus	Sep	0	0	0	0	1	6
MS2	Pipistrellus pygmaeus	Sep	0	0	0	0	0	2
MS2	Plecotus auritus	Apr	0	0	0	4	0	0
MS2	Plecotus auritus	Sep	0	1	0	2	3	0
MS3	Myotis	Apr	0	0	0	0	2	0
MS3	Myotis	Sep	0	0	0	0	6	0
MS3	Pipistrellus pipistrellus	Apr	0	0	0	0	1	4
MS3	Pipistrellus pipistrellus	Jun	0	0	0	0	0	1
MS3	Pipistrellus pipistrellus	Sep	0	0	0	0	3	7
MS3	Pipistrellus pygmaeus	Sep	0	0	0	0	0	3
MS3	Plecotus auritus	Apr	0	0	0	1	1	0
MS3	Plecotus auritus	Sep	0	0	0	1	3	0
MS4	Myotis	Sep	0	0	0	0	3	0
MS4	Pipistrellus pipistrellus	Sep	0	0	0	0	0	5
MS4	Pipistrellus pygmaeus	Sep	0	0	0	0	0	2
MS4	Plecotus auritus	Apr	0	2	0	0	0	0
MS4	Plecotus auritus	Sep	1	2	0	0	1	0
MS5	Myotis	Apr	0	0	0	0	1	0
MS5	Myotis	Jun	2	2	2	3	1	0
MS5	Myotis	Sep	0	0	2	4	2	0
MS5	Pipistrellus pipistrellus	Apr	0	0	0	0	0	5
MS5	Pipistrellus pipistrellus	Jun	0	0	0	0	0	7
MS5	Pipistrellus pipistrellus	Sep	0	0	0	0	0	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
MS5	Pipistrellus pygmaeus	Sep	0	0	0	0	0	3
MS5	Plecotus auritus	Apr	0	2	0	0	0	0
MS5	Plecotus auritus	Jun	0	0	0	0	1	0
MS5	Plecotus auritus	Sep	0	4	0	4	1	0
MS6	Myotis	Jun	0	0	0	0	2	0
MS6	Pipistrellus pipistrellus	Apr	0	0	0	0	0	1
MS6	Pipistrellus pipistrellus	Jun	0	0	0	0	0	3
MS6	Plecotus auritus	Apr	0	0	0	0	1	0
MS6	Plecotus auritus	Jun	0	0	0	0	1	0
MS7	Myotis	Jun	0	0	0	0	5	0
MS7	Myotis	Sep	0	0	0	0	6	0
MS7	Pipistrellus pipistrellus	Apr	0	0	0	0	0	1
MS7	Pipistrellus pipistrellus	Jun	0	0	0	0	0	2
MS7	Pipistrellus pipistrellus	Sep	0	0	0	0	0	5
MS7	Pipistrellus pygmaeus	Sep	0	0	0	0	0	4
MS7	Plecotus auritus	Apr	0	2	0	1	2	0
MS7	Plecotus auritus	Jun	0	0	0	1	1	0
MS7	Plecotus auritus	Sep	0	3	0	1	2	0
MS8	Myotis	Sep	0	0	0	0	2	0
MS8	Pipistrellus pipistrellus	Apr	0	0	0	0	0	4
MS8	Pipistrellus pipistrellus	Sep	0	0	0	0	0	5
MS8	Pipistrellus pygmaeus	Sep	0	0	0	0	0	2
MS8	Plecotus auritus	Apr	2	2	0	1	3	0
MS8	Plecotus auritus	Sep	0	2	0	0	3	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
MS9	Myotis	Apr	0	0	0	0	2	0
MS9	Myotis	Jun	0	0	0	0	1	0
MS9	Myotis	Sep	0	0	0	0	2	0
MS9	Pipistrellus pipistrellus	Apr	0	0	0	0	0	3
MS9	Pipistrellus pipistrellus	Jun	0	0	0	0	0	7
MS9	Pipistrellus pipistrellus	Sep	0	0	0	0	0	9
MS9	Pipistrellus pygmaeus	Sep	0	0	0	0	0	1
MS9	Plecotus auritus	Apr	0	2	0	0	3	0
MS9	Plecotus auritus	Jun	0	0	0	1	1	0
MS9	Plecotus auritus	Sep	4	2	0	0	1	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	Sep	23	23 - 23	23	4
MS1	Pipistrellus pipistrellus	Apr	4	1 - 5	4	1
MS1	Pipistrellus pipistrellus	Jun	0	1 - 5	0	3
MS1	Pipistrellus pipistrellus	Sep	0	1 - 5	5	7
MS1	Pipistrellus pygmaeus	Sep	0	0	0	1
MS1	Plecotus auritus	Apr	22	22 - 40.5	22	2
MS1	Plecotus auritus	Sep	22	22 - 40.5	83	5
MS10	Myotis	Apr	23	23 - 23	23	1
MS10	Myotis	Jun	23	23 - 23	23	4
MS10	Myotis	Sep	33	23 - 23	33	1
MS10	Pipistrellus pipistrellus	Jun	0	0 - 0	0	1
MS10	Pipistrellus pipistrellus	Sep	0	0 - 0	0	1
MS10	Pipistrellus pygmaeus	Sep	0	0	0	1
MS10	Plecotus auritus	Apr	76	22 - 92	92	4
MS10	Plecotus auritus	Sep	41	22 - 92	59	2
MS2	Myotis	Apr	23	23 - 23	23	1
MS2	Myotis	Jun	23	23 - 23	23	3
MS2	Myotis	Sep	23	23 - 23	33	4
MS2	Pipistrellus pipistrellus	Apr	1	1.5 - 14	1	2
MS2	Pipistrellus pipistrellus	Jun	0	1.5 - 14	15	4
MS2	Pipistrellus pipistrellus	Sep	2	1.5 - 14	24	7
MS2	Pipistrellus pygmaeus	Sep	1	0.5 - 0.5	1	2
MS2	Plecotus auritus	Apr	59	40.5 - 59	59	4
MS2	Plecotus auritus	Sep	41	40.5 - 59	83	6
MS3	Myotis	Apr	23	23 - 28	23	2
MS3	Myotis	Sep	28	23 - 28	33	6
MS3	Pipistrellus pipistrellus	Apr	1	4.5 - 23	33	5
MS3	Pipistrellus pipistrellus	Jun	14	4.5 - 23	14	1
MS3	Pipistrellus pipistrellus	Sep	7	4.5 - 23	36	10
MS3	Pipistrellus pygmaeus	Sep	0	0 - 0	5	3
MS3	Plecotus auritus	Apr	41	22 - 40.5	59	2
MS3	Plecotus auritus	Sep	22	22 - 40.5	59	4
MS4	Myotis	Sep	39	39 - 39	39	3

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
MS4	Pipistrellus pipistrellus	Sep	5	2 - 14	14	5
MS4	Pipistrellus pygmaeus	Sep	8	7.5 - 7.5	12	2
MS4	Plecotus auritus	Apr	88	52.5 - 92.5	88	2
MS4	Plecotus auritus	Sep	83	52.5 - 92.5	97	4
MS5	Myotis	Apr	33	43.5 - 70.5	33	1
MS5	Myotis	Jun	71	43.5 - 70.5	100	10
MS5	Myotis	Sep	42	43.5 - 70.5	67	8
MS5	Pipistrellus pipistrellus	Apr	3	2 - 7.5	14	5
MS5	Pipistrellus pipistrellus	Jun	0	2 - 7.5	4	7
MS5	Pipistrellus pipistrellus	Sep	1	2 - 7.5	8	9
MS5	Pipistrellus pygmaeus	Sep	0	0 - 0	0	3
MS5	Plecotus auritus	Apr	86	52.5 - 83	88	2
MS5	Plecotus auritus	Jun	22	52.5 - 83	22	1
MS5	Plecotus auritus	Sep	59	52.5 - 83	83	9
MS6	Myotis	Jun	23	23 - 23	23	2
MS6	Pipistrellus pipistrellus	Apr	0	0 - 0	0	1
MS6	Pipistrellus pipistrellus	Jun	0	0 - 0	0	3
MS6	Plecotus auritus	Apr	22	22 - 22	22	1
MS6	Plecotus auritus	Jun	22	22 - 22	22	1
MS7	Myotis	Jun	23	23 - 36	39	5
MS7	Myotis	Sep	36	23 - 36	39	6
MS7	Pipistrellus pipistrellus	Apr	0	0 - 0	0	1
MS7	Pipistrellus pipistrellus	Jun	0	0 - 0	0	2
MS7	Pipistrellus pipistrellus	Sep	0	0 - 0	0	5
MS7	Pipistrellus pygmaeus	Sep	1	0.5 - 0.5	1	4
MS7	Plecotus auritus	Apr	59	40.5 - 71	83	5
MS7	Plecotus auritus	Jun	41	40.5 - 71	59	2
MS7	Plecotus auritus	Sep	71	40.5 - 71	83	6
MS8	Myotis	Sep	23	23 - 23	23	2
MS8	Pipistrellus pipistrellus	Apr	5	5 - 18	17	4
MS8	Pipistrellus pipistrellus	Sep	15	5 - 18	19	5
MS8	Pipistrellus pygmaeus	Sep	2	1.5 - 1.5	3	2
MS8	Plecotus auritus	Apr	71	22 - 83	97	8
MS8	Plecotus auritus	Sep	22	22 - 83	83	5
MS9	Myotis	Apr	23	23 - 23	23	2
MS9	Myotis	Jun	23	23 - 23	23	1

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
MS9	Myotis	Sep	23	23 - 23	23	2
MS9	Pipistrellus pipistrellus	Apr	0	1.5 - 5	0	3
MS9	Pipistrellus pipistrellus	Jun	1	1.5 - 5	6	7
MS9	Pipistrellus pipistrellus	Sep	1	1.5 - 5	5	9
MS9	Pipistrellus pygmaeus	Sep	0	0	0	1
MS9	Plecotus auritus	Apr	22	52.5 - 92	83	5
MS9	Plecotus auritus	Jun	41	52.5 - 92	59	2
MS9	Plecotus auritus	Sep	97	52.5 - 92	100	7

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	2	2	4	7	53	0
Pipistrellus pipistrellus	0	0	0	0	5	103
Pipistrellus pygmaeus	0	0	0	0	0	19
Plecotus auritus	7	27	0	20	35	0

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

Species/Species Group	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
Myotis	23	43.5 - 70.5	100	68
Pipistrellus pipistrellus	1	5 - 18	36	108
Pipistrellus pygmaeus	0	7.5 - 7.5	12	19
Plecotus auritus	59	52.5 - 92.5	100	89

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

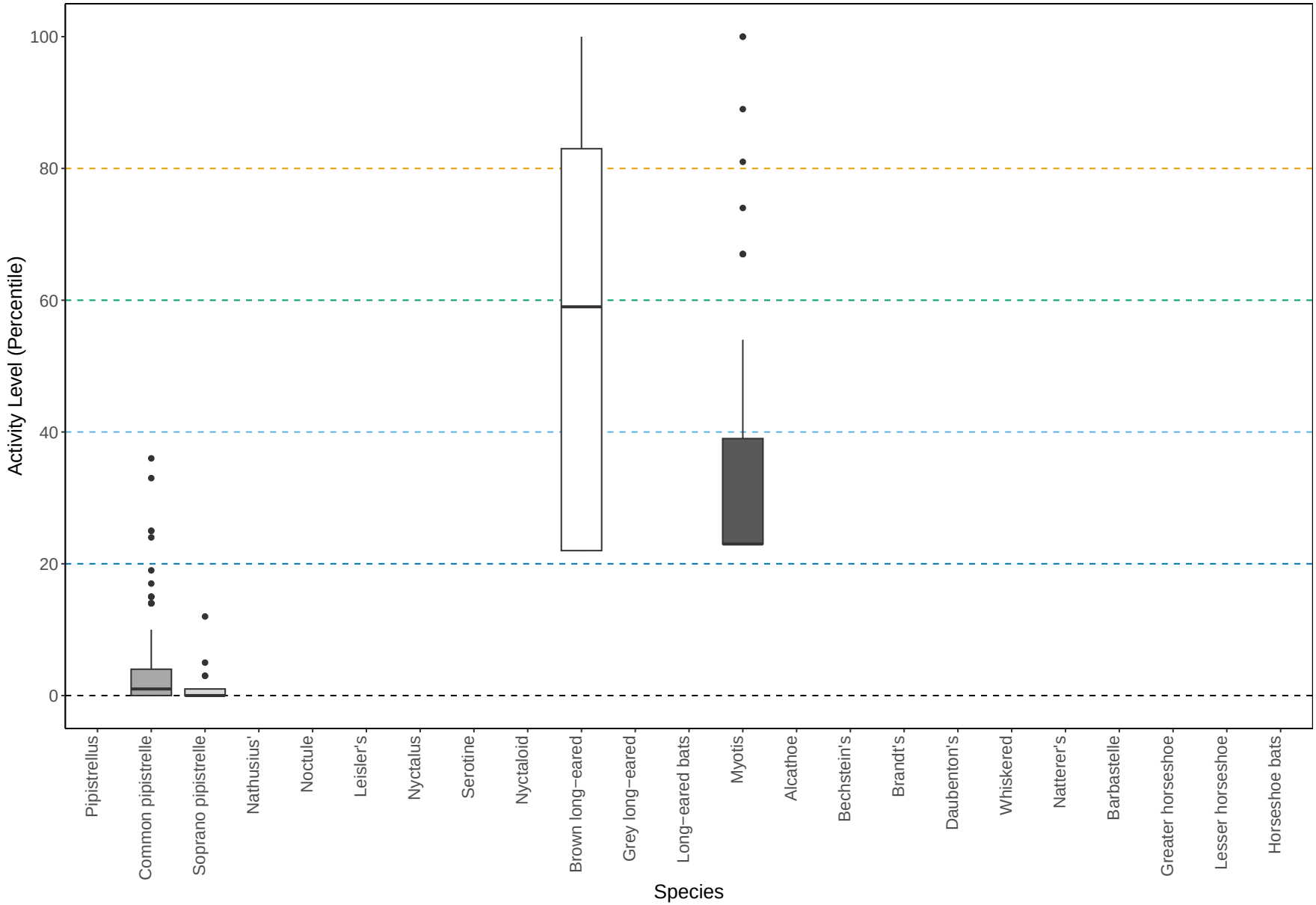
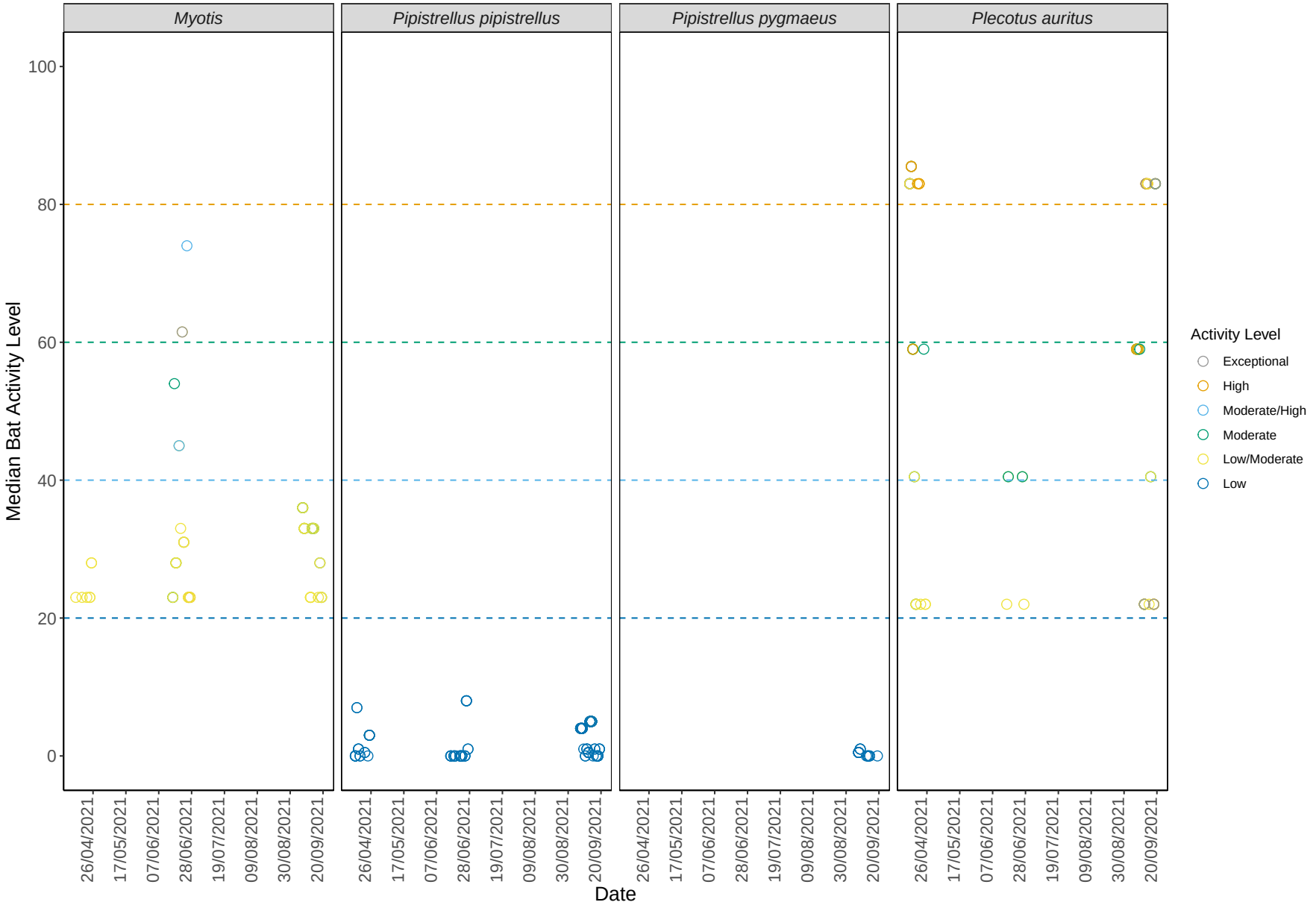

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Leisler's
Nyctalus
Serotine
Nyctaloid
Brown long−eared
Grey long−eared
Long−eared bats
Myotis
Alcathoe
Bechstein's
Brandt's
Daubenton's
Whiskered
Natterer's
Barbastelle
Greater horseshoe
Lesser horseshoe
Horseshoe bats
Species

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


Myotis
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Median Bat Activity Level
100
80
60
40
20
0
26/04/2021
17/05/2021
07/06/2021
28/06/2021
19/07/2021
09/08/2021
30/08/2021
20/09/2021
Date
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low

Per Site, Per Month

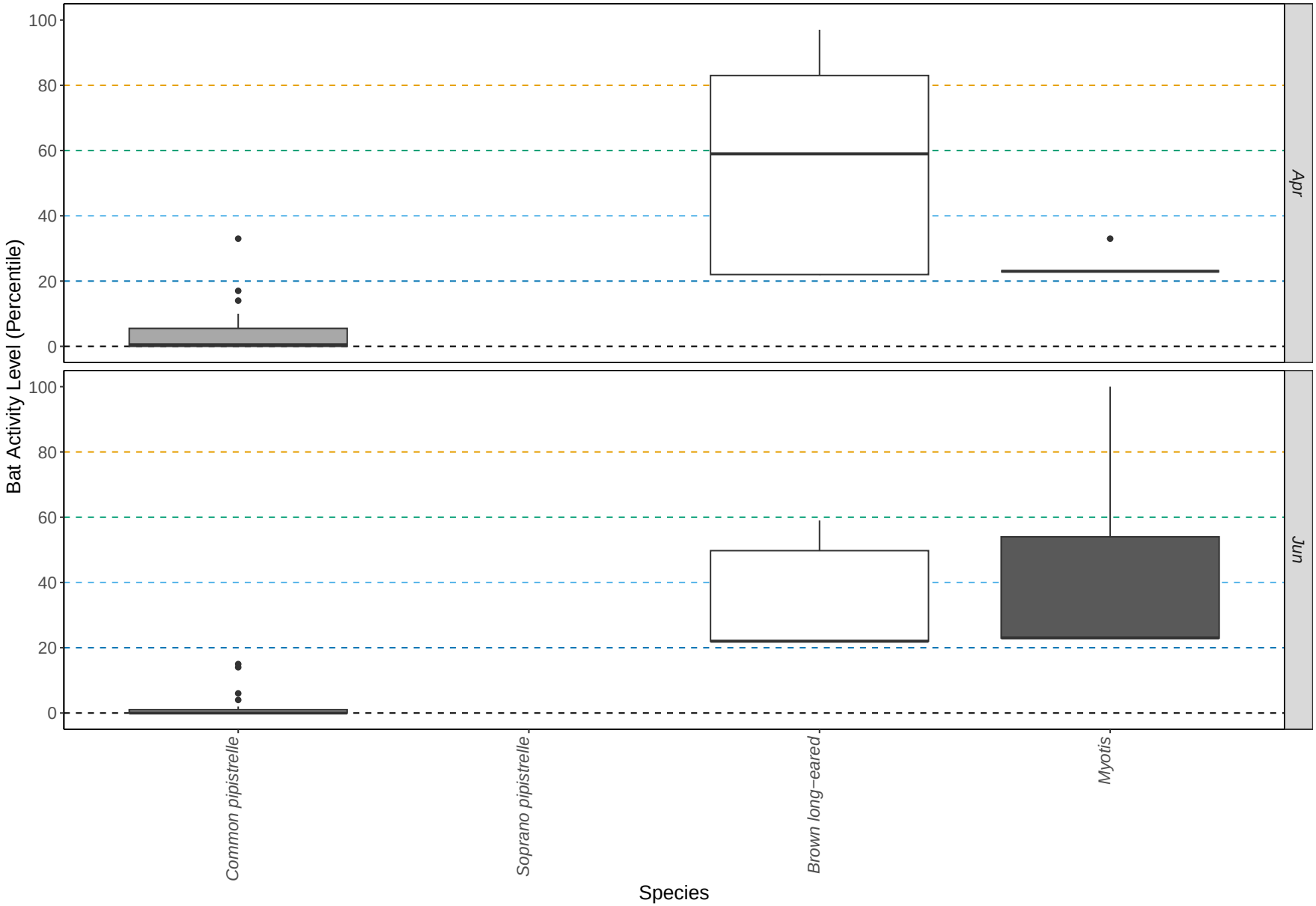
Table 9. Summary table showing the number of nights recorded bat activity fell into each activity band for each species during each month.

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	Apr	0	0	0	0	7	0
Myotis	Jun	2	2	2	3	16	0
Myotis	Sep	0	0	2	4	30	0
Pipistrellus pipistrellus	Apr	0	0	0	0	1	21
Pipistrellus pipistrellus	Jun	0	0	0	0	0	28
Pipistrellus pipistrellus	Sep	0	0	0	0	4	54
Pipistrellus pygmaeus	Sep	0	0	0	0	0	19
Plecotus auritus	Apr	2	12	0	8	13	0
Plecotus auritus	Jun	0	0	0	2	4	0
Plecotus auritus	Sep	5	15	0	10	18	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	Apr	23	43.5 - 70.5	33	7
Myotis	Jun	23	43.5 - 70.5	100	25
Myotis	Sep	28	43.5 - 70.5	67	36
Pipistrellus pipistrellus	Apr	1	5 - 18	33	22
Pipistrellus pipistrellus	Jun	0	4.5 - 23	15	28
Pipistrellus pipistrellus	Sep	2	5 - 18	36	58
Pipistrellus pygmaeus	Sep	0	7.5 - 7.5	12	19
Plecotus auritus	Apr	59	52.5 - 92.5	97	35
Plecotus auritus	Jun	22	52.5 - 92	59	6
Plecotus auritus	Sep	59	52.5 - 92.5	100	48

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


Bat Activity Level (Percentile)
100
80
60
40
20
0
Apr
Jun
Common pipistrelle
Soprano pipistrelle
Brown long−eared
Myotis
Species

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.

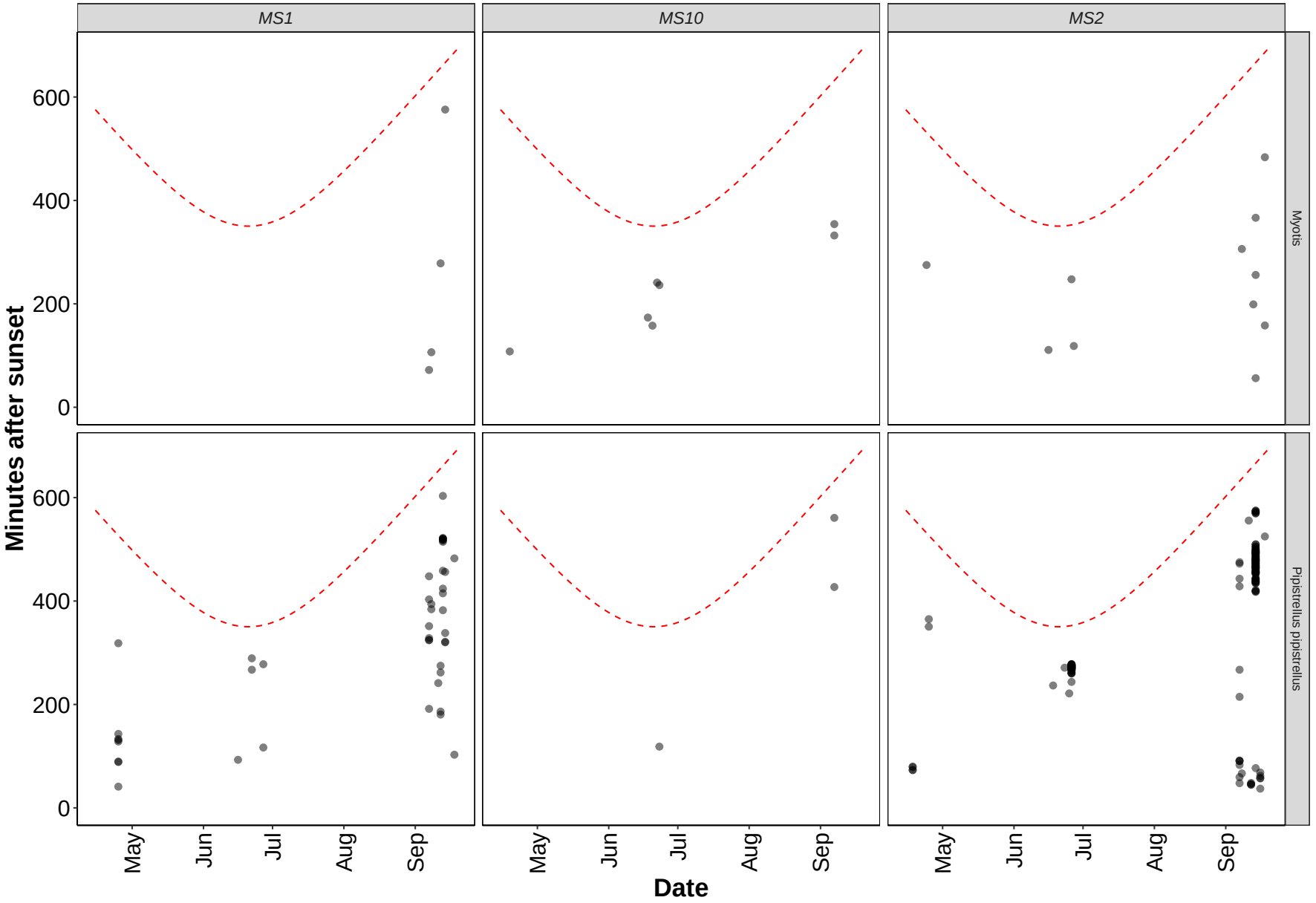
Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2021-04-15	20:30	06:06	9.6
2021-04-16	20:32	06:03	9.5
2021-04-17	20:35	06:00	9.4
2021-04-18	20:37	05:58	9.3
2021-04-19	20:39	05:55	9.3
2021-04-20	20:41	05:52	9.2
2021-04-21	20:44	05:50	9.1
2021-04-22	20:46	05:47	9.0
2021-04-24	20:50	05:42	8.9
2021-04-25	20:53	05:39	8.8
2021-06-16	22:24	04:16	5.9
2021-06-17	22:25	04:16	5.9
2021-06-18	22:25	04:16	5.8
2021-06-19	22:26	04:16	5.8
2021-06-20	22:26	04:16	5.8
2021-06-21	22:26	04:16	5.8
2021-06-22	22:26	04:17	5.8
2021-06-23	22:26	04:17	5.8
2021-06-25	22:26	04:18	5.9
2021-06-26	22:26	04:19	5.9
2021-06-27	22:26	04:19	5.9
2021-09-07	20:03	06:35	10.5
2021-09-08	20:00	06:37	10.6
2021-09-09	19:57	06:39	10.7
2021-09-10	19:54	06:41	10.8
2021-09-11	19:51	06:43	10.9
2021-09-12	19:49	06:45	10.9
2021-09-13	19:46	06:47	11.0

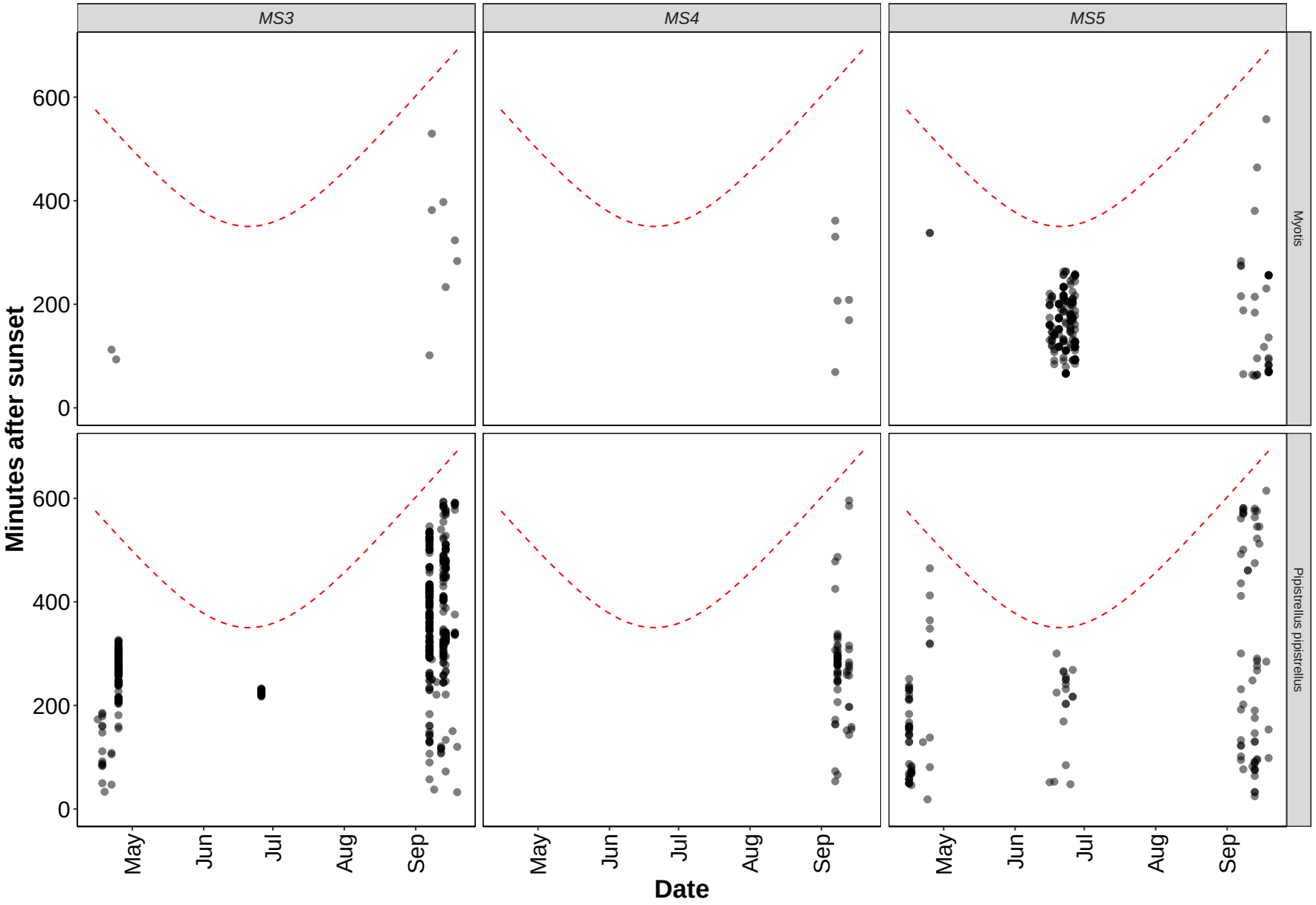
Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2021-09-14	19:43	06:49	11.1
2021-09-15	19:40	06:52	11.2
2021-09-16	19:37	06:54	11.3
2021-09-17	19:34	06:56	11.4
2021-09-18	19:32	06:58	11.4
2021-09-19	19:29	07:00	11.5

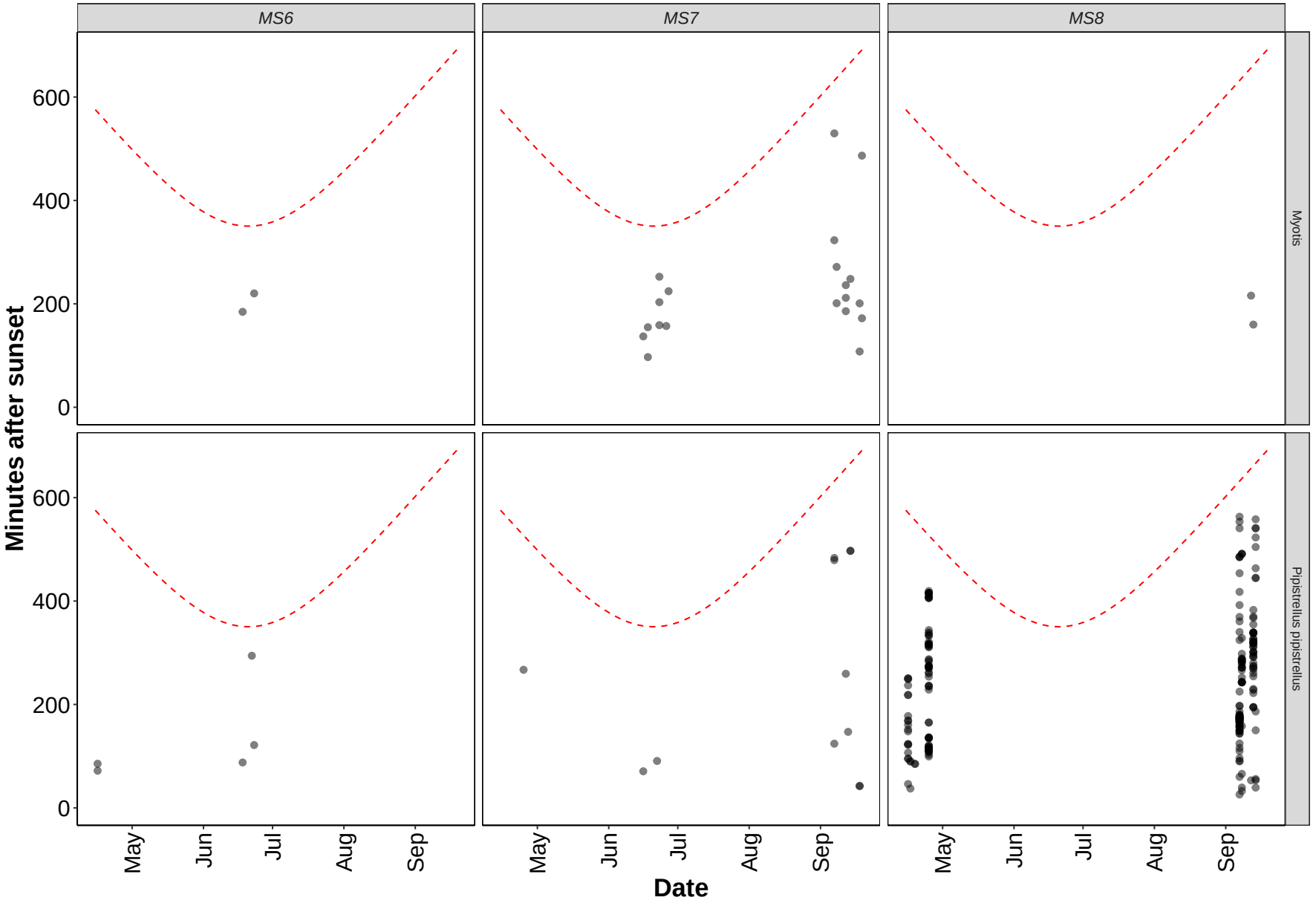
Distribution of Bat Activity Across the Night through Time

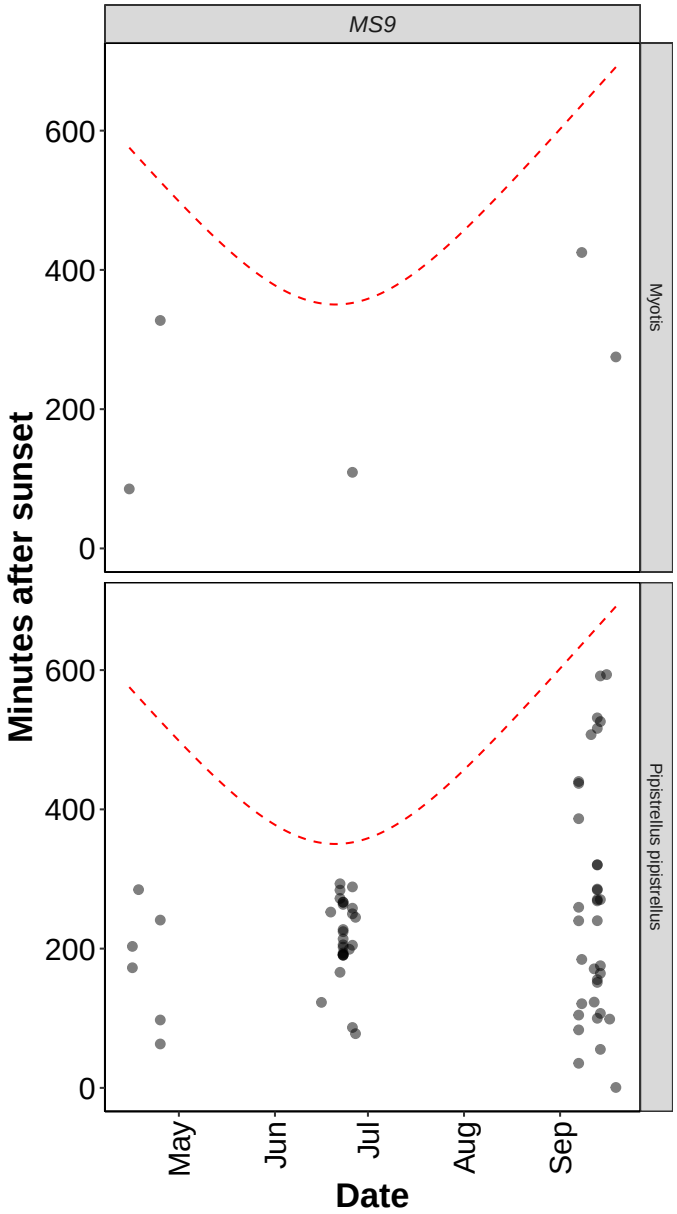
Per Detector

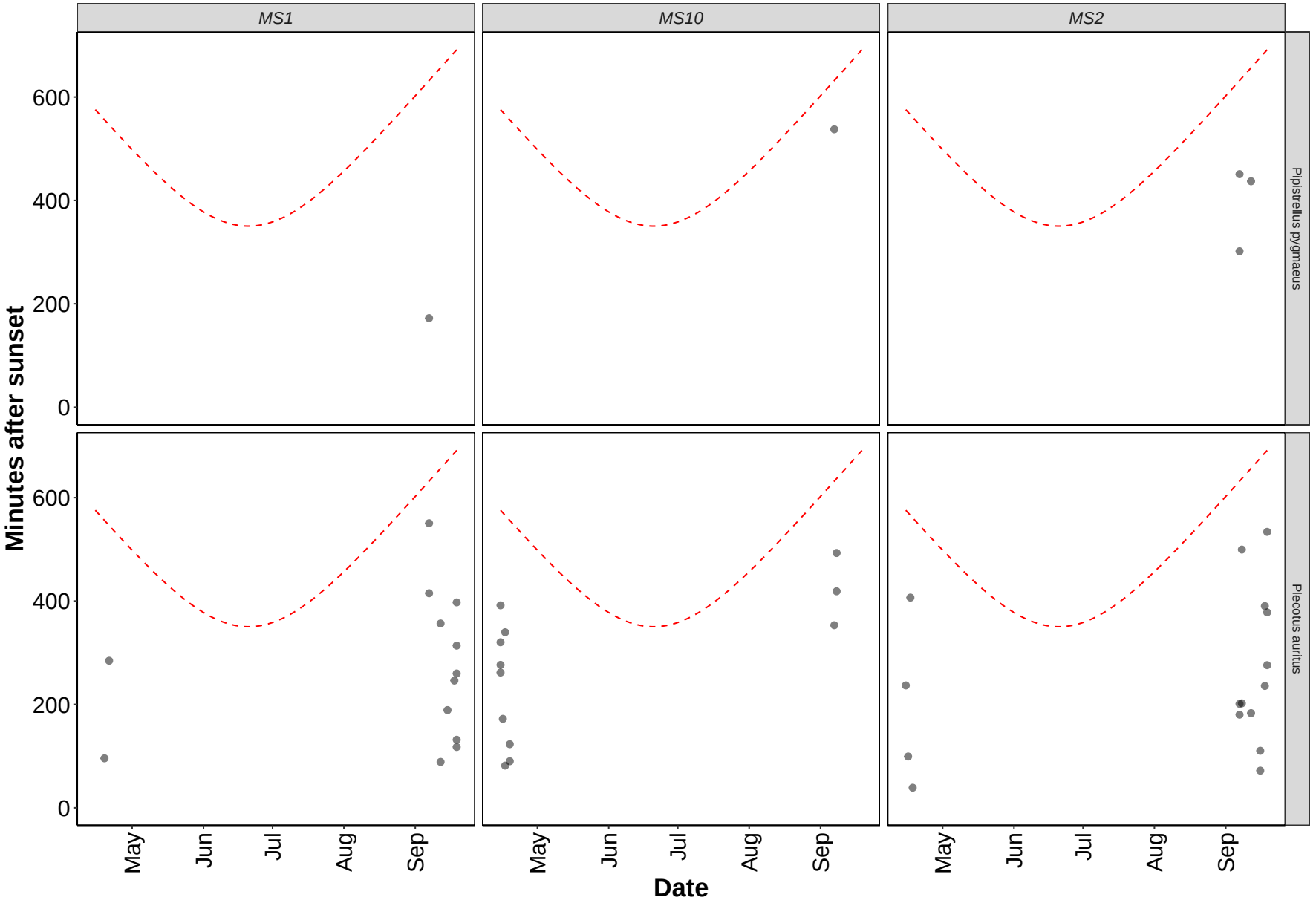
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

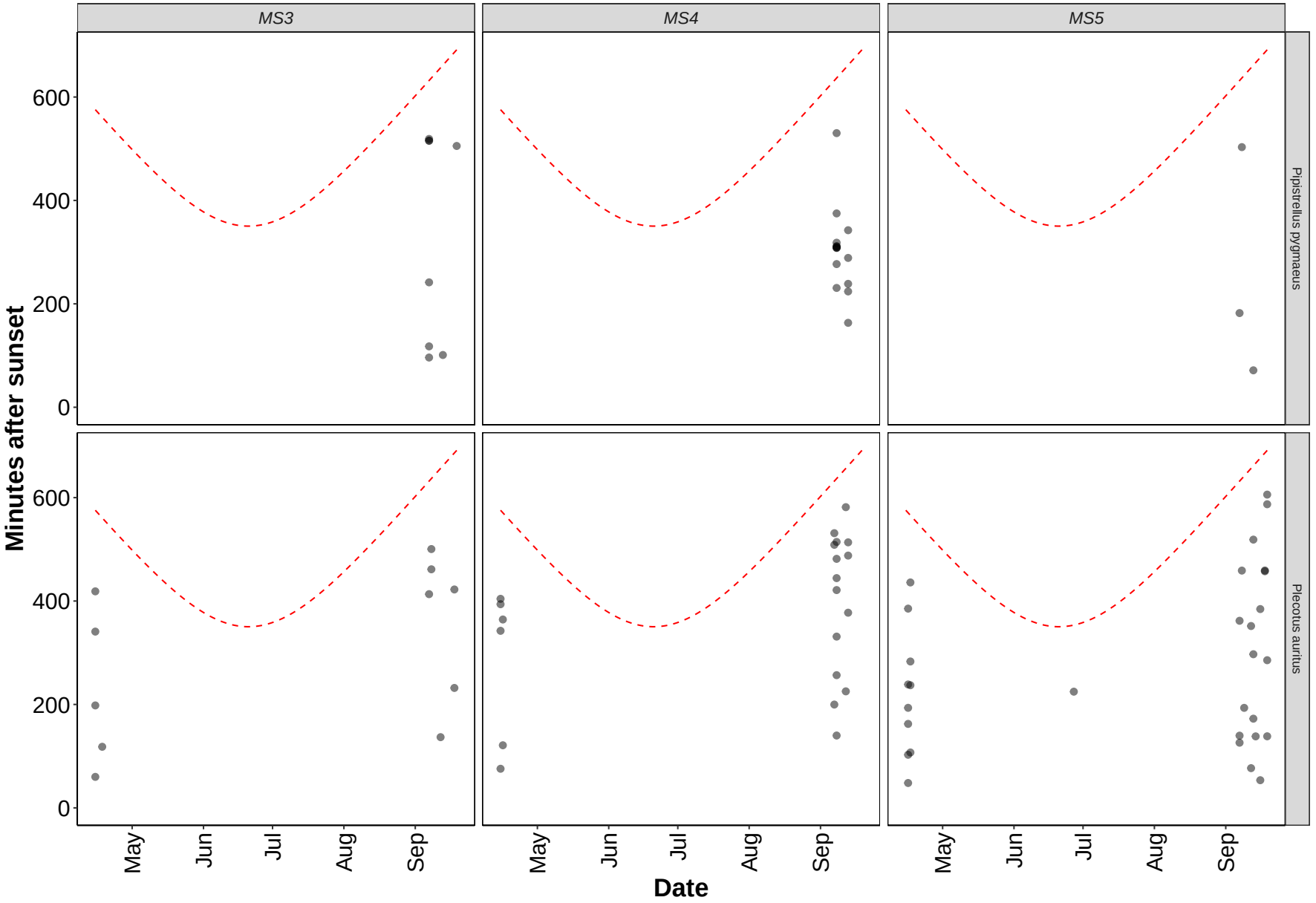

MS1
MS10
MS2
Myotis
Pipistrellus pipistrellus
Minutes after sunset
0
200
400
600
May
Jun
Jul
Aug
Sep
Date

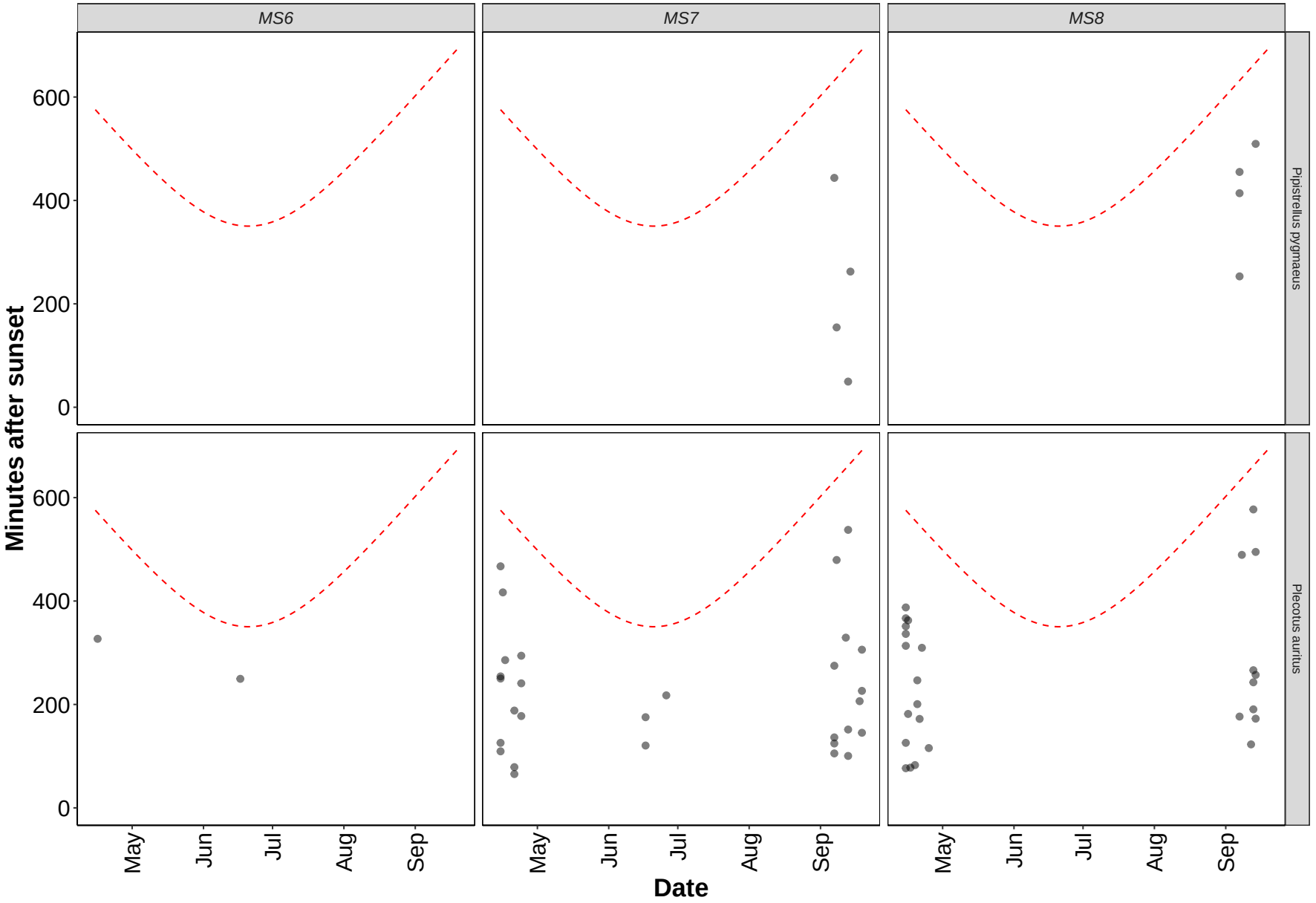

MS3
MS4
MS5
Myotis
Pipistrellus pipistrellus
Minutes after sunset
0
200
400
600
May
Jun
Jul
Aug
Sep
Date


MS6
MS7
MS8
Myotis
Pipistrellus pipistrellus
Minutes after sunset
0
200
400
600
May
Jun
Jul
Aug
Sep
Date


MS9
Myotis
Pipistrellus pipistrellus
Minutes after sunset
0
200
400
600
May
Jun
Jul
Aug
Sep
Date


MS1
MS10
MS2
Pipistrellus pygmaeus
Plecotus auritus
Minutes after sunset
0
200
400
600
May
Jun
Jul
Aug
Sep
Date


MS3
MS4
MS5
Pipistrellus pygmaeus
Plecotus auritus
Minutes after sunset
0
200
400
600
May
Jun
Jul
Aug
Sep
Date


MS6
MS7
MS8
Pipistrellus pygmaeus
Plecotus auritus
Minutes after sunset
0
200
400
600
May
Jun
Jul
Aug
Sep
Date

Roost Emergence Time and Bat Observation

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

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

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.

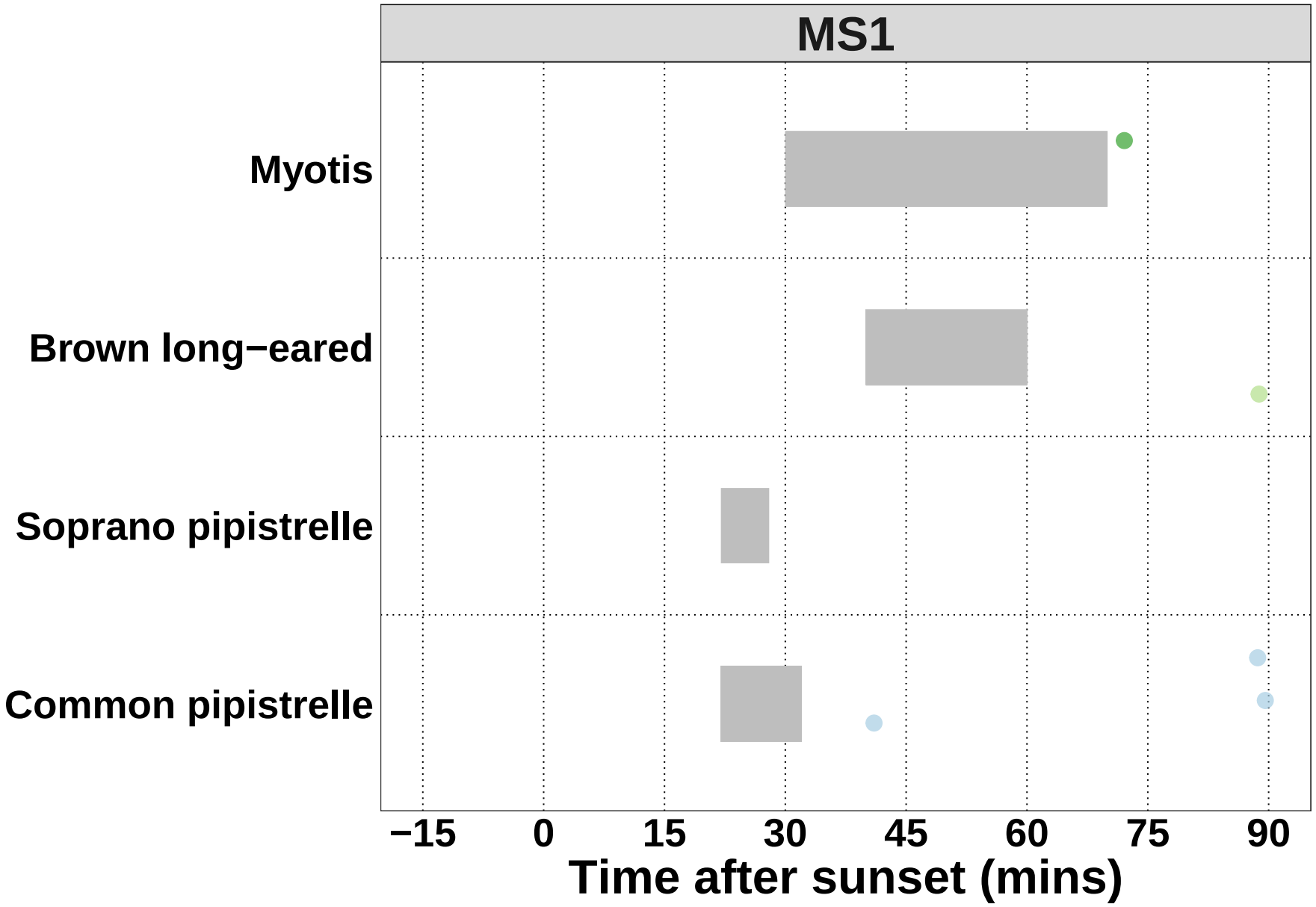
Table 12: Table continues below

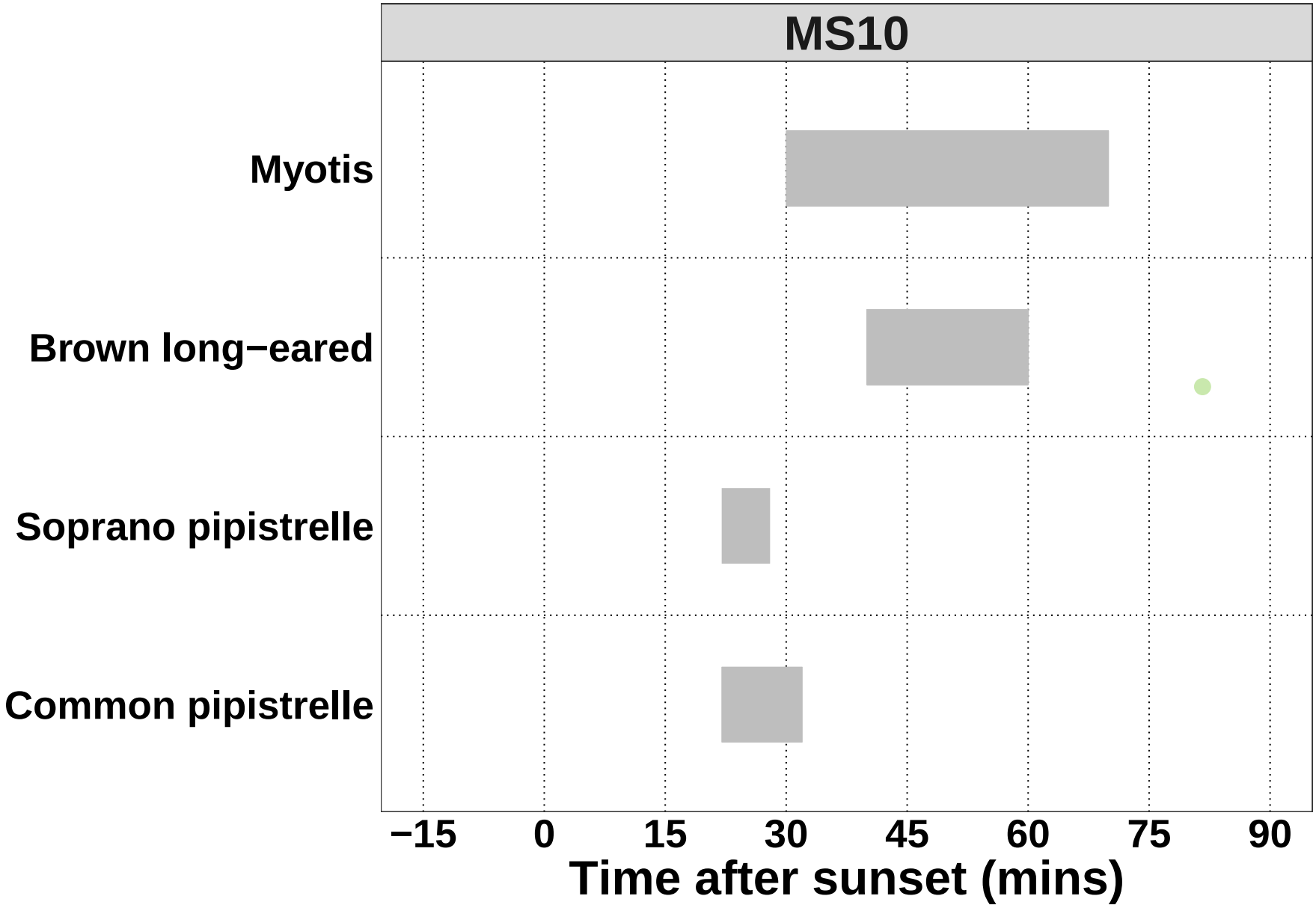
Species	Detector ID	2021-04-15	2021-04-16	2021-04-18	2021-04-24	2021-06-23
Common pipistrelle	MS5	0	0	0	1	0
Common pipistrelle	MS8	0	0	0	0	0
Common pipistrelle	MS9	0	0	0	0	0
Brown long-eared	MS2	0	0	1	0	0
Brown long-eared	MS3	1	0	0	0	0
Brown long-eared	MS5	0	1	0	0	0
Brown long-eared	MS9	0	0	0	0	0
Myotis	MS2	0	0	0	0	0
Myotis	MS4	0	0	0	0	0
Myotis	MS5	0	0	0	0	6

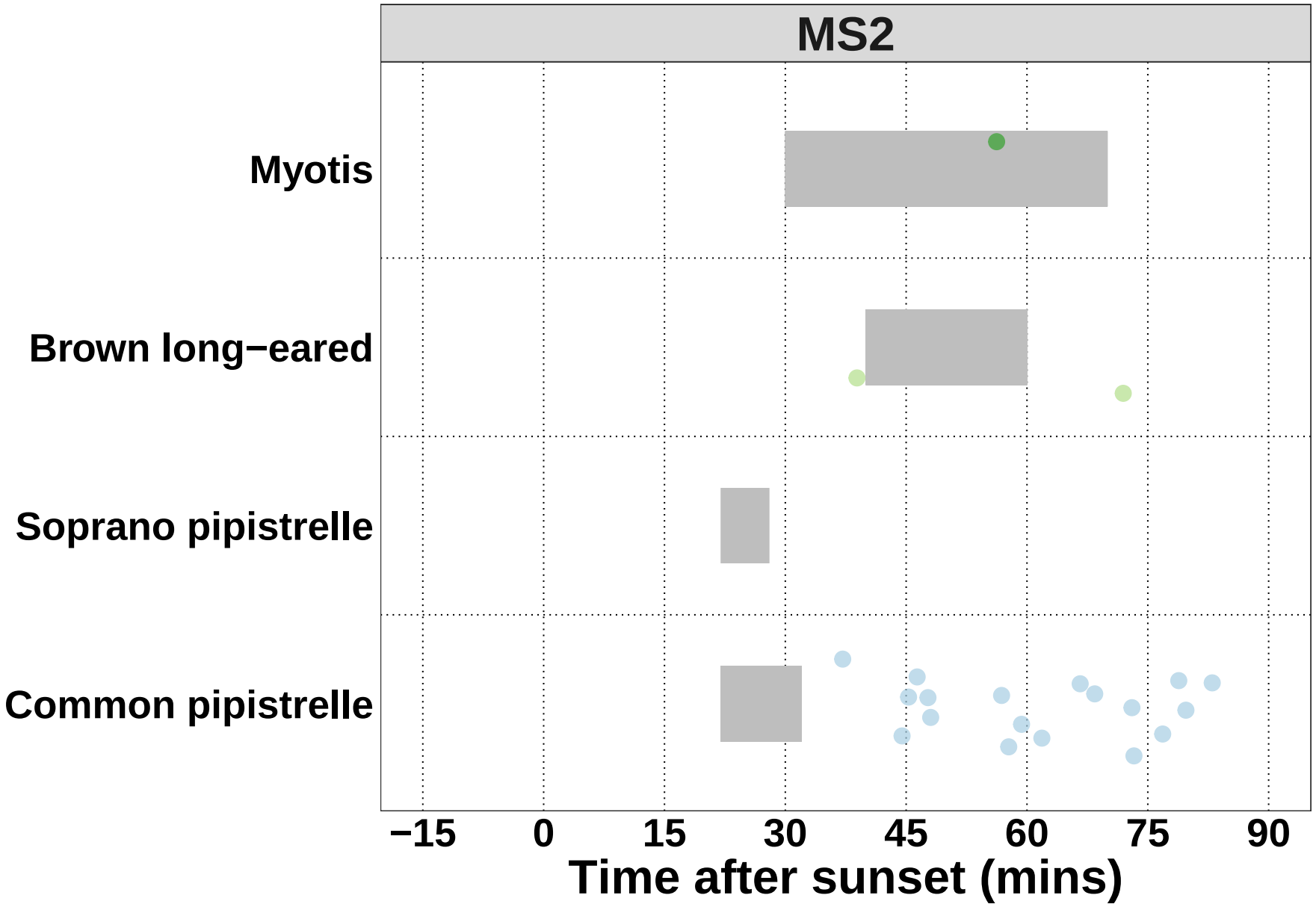
2021-09-07	2021-09-08	2021-09-12	2021-09-13	2021-09-14	2021-09-16	2021-09-19
0	0	0	1	0	0	0
1	0	0	0	0	0	0
0	0	0	0	0	0	1
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	0	0	0	0	1
0	0	0	0	1	0	0
1	0	0	0	0	0	0
0	1	1	1	2	0	6

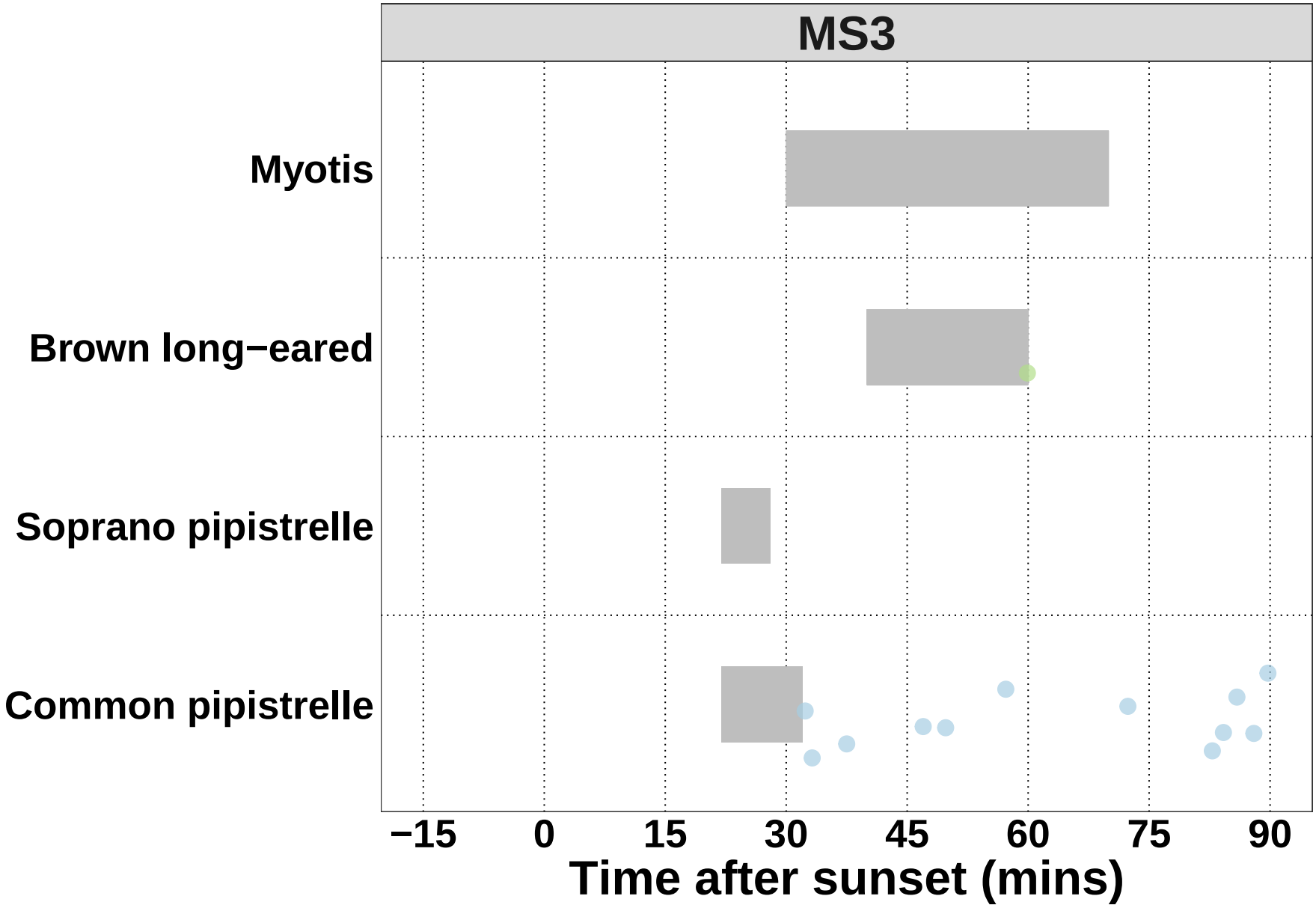
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012)

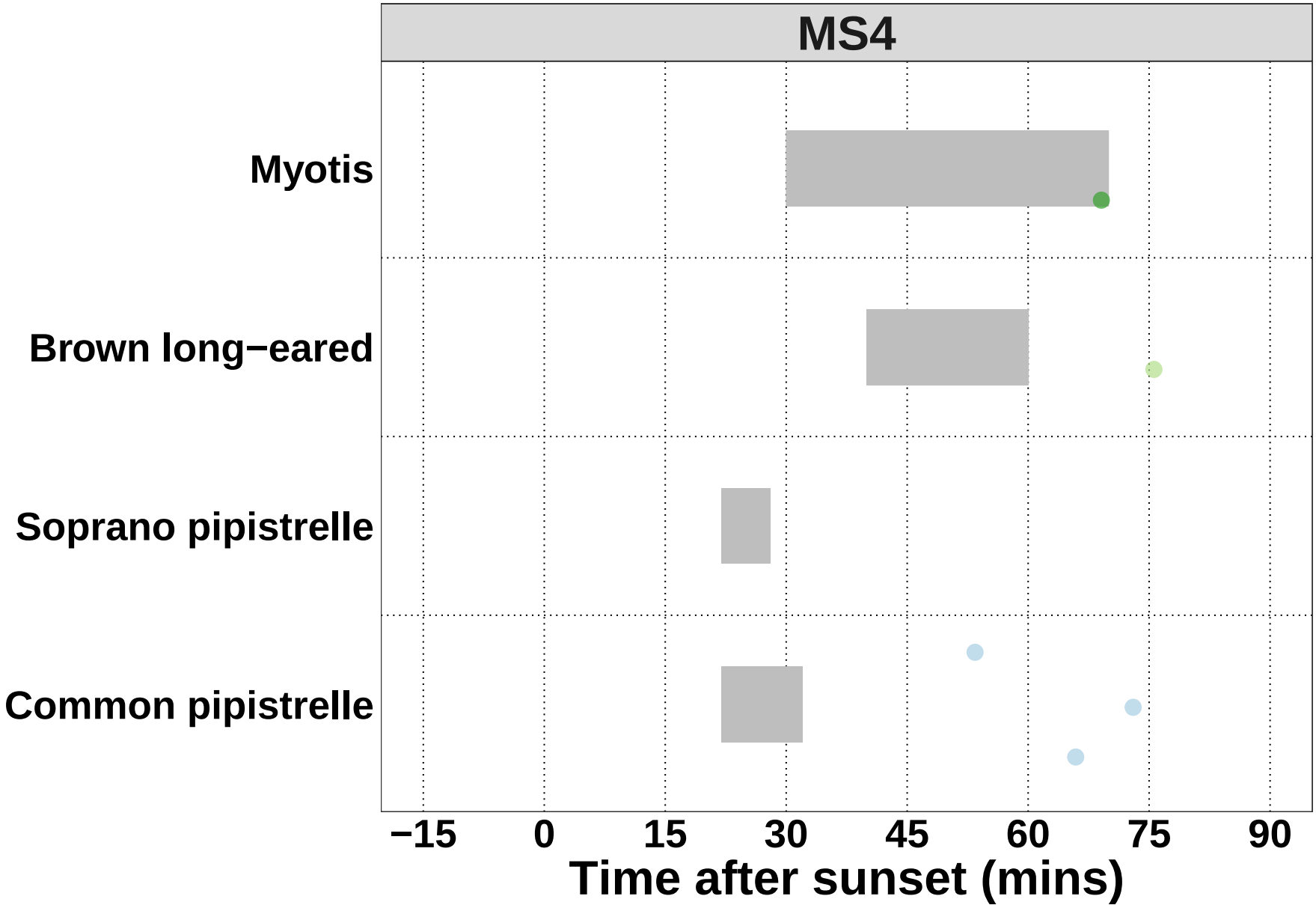
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.

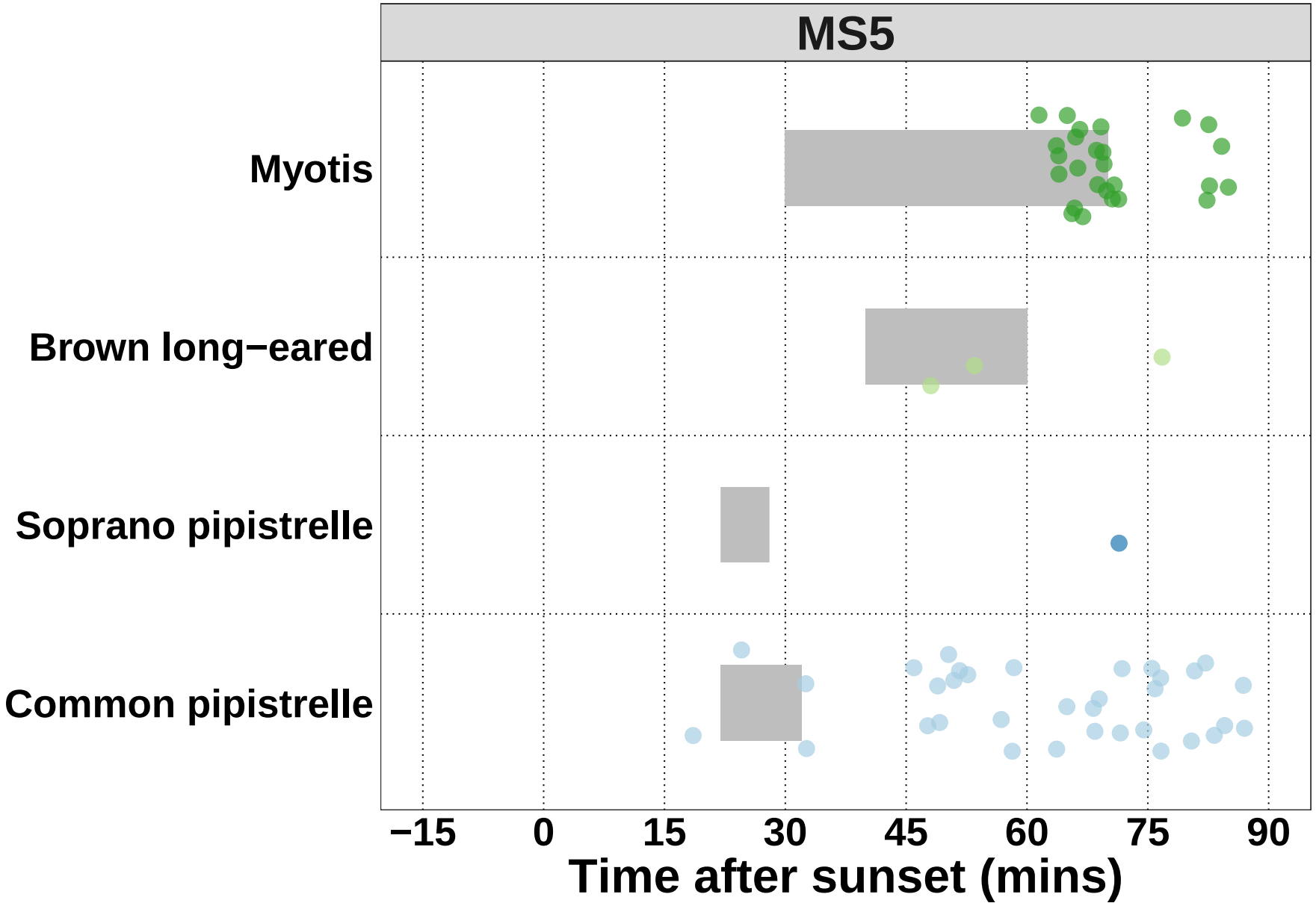

MS1
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

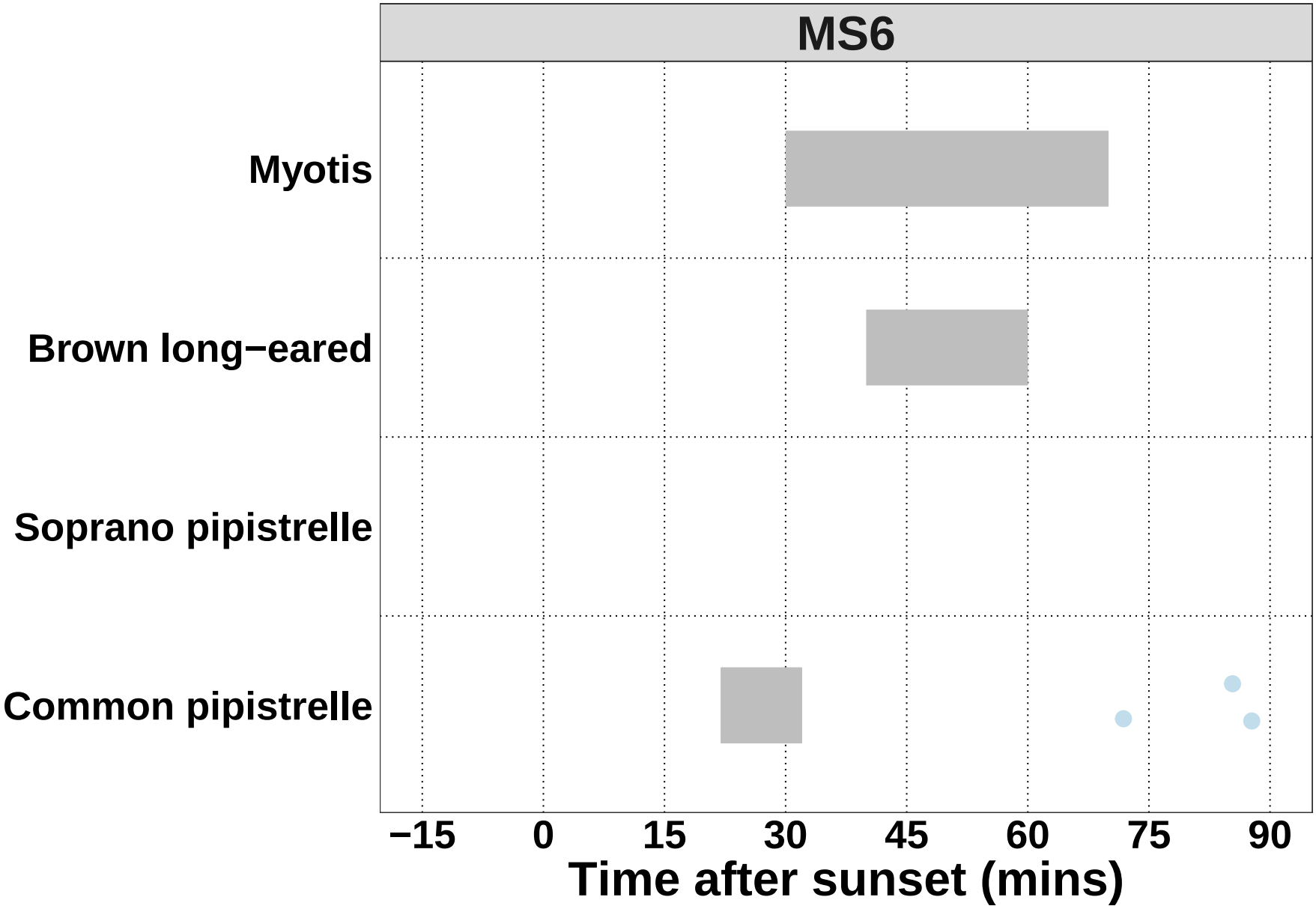

MS10
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

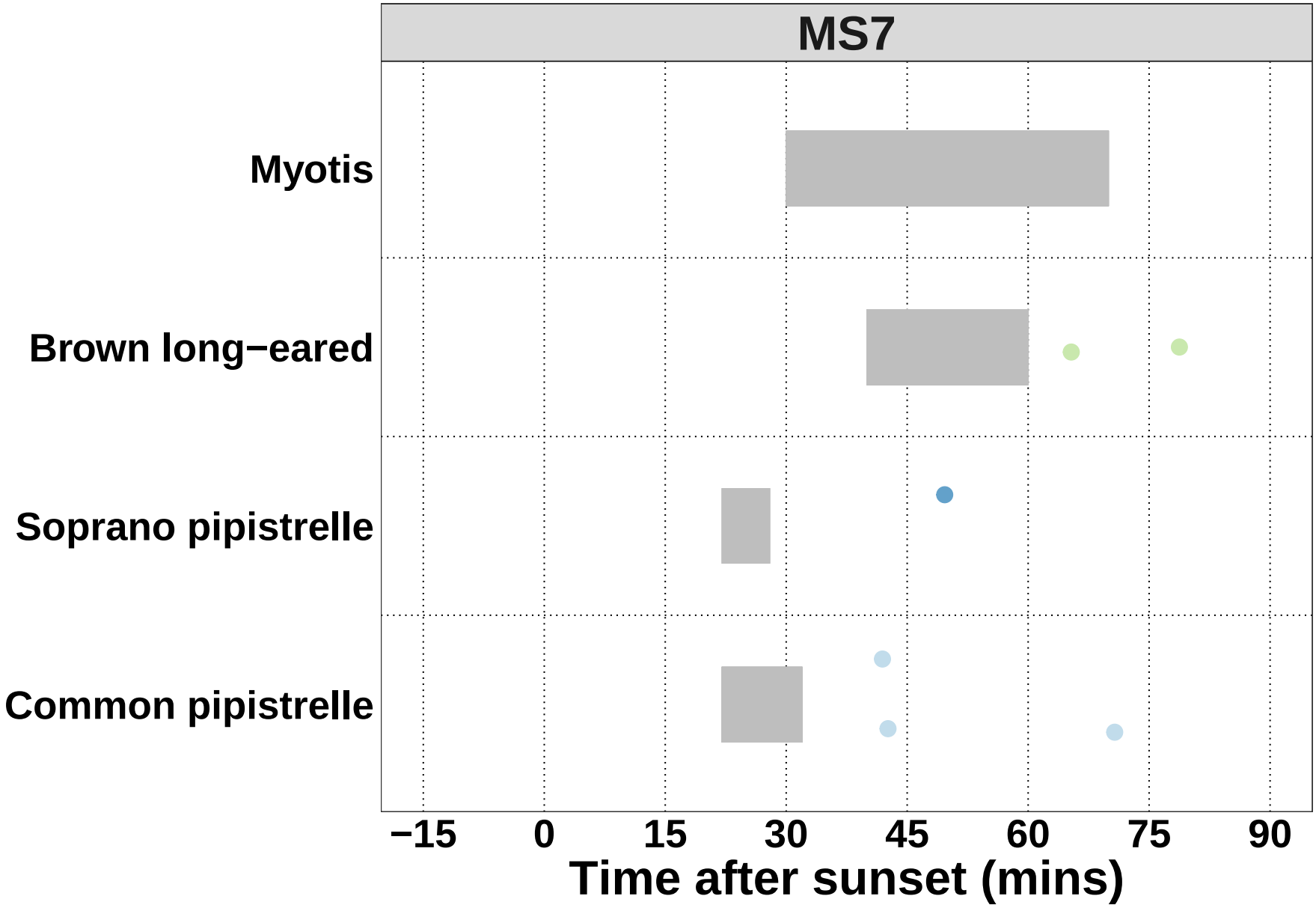

MS2
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

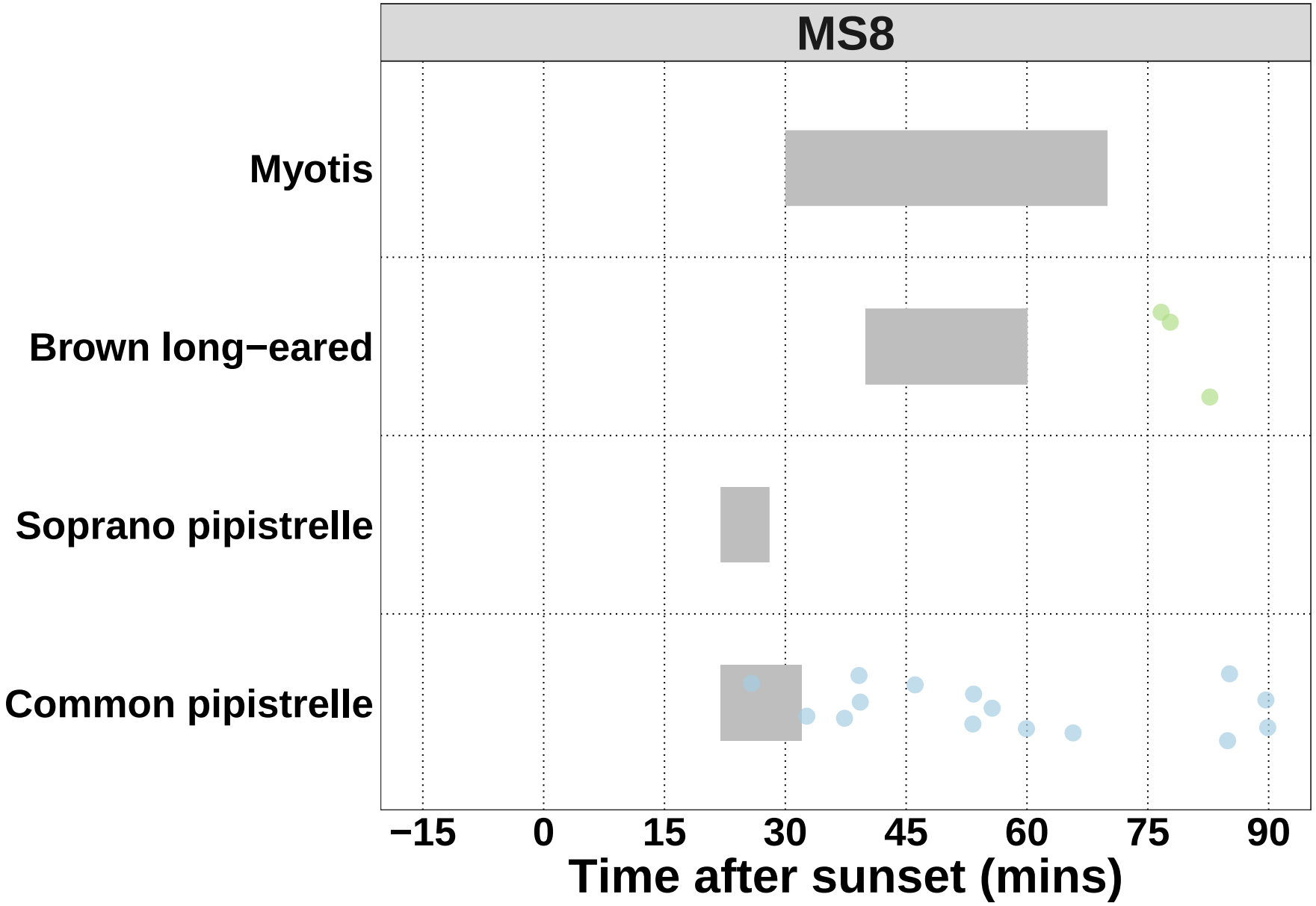

MS3
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

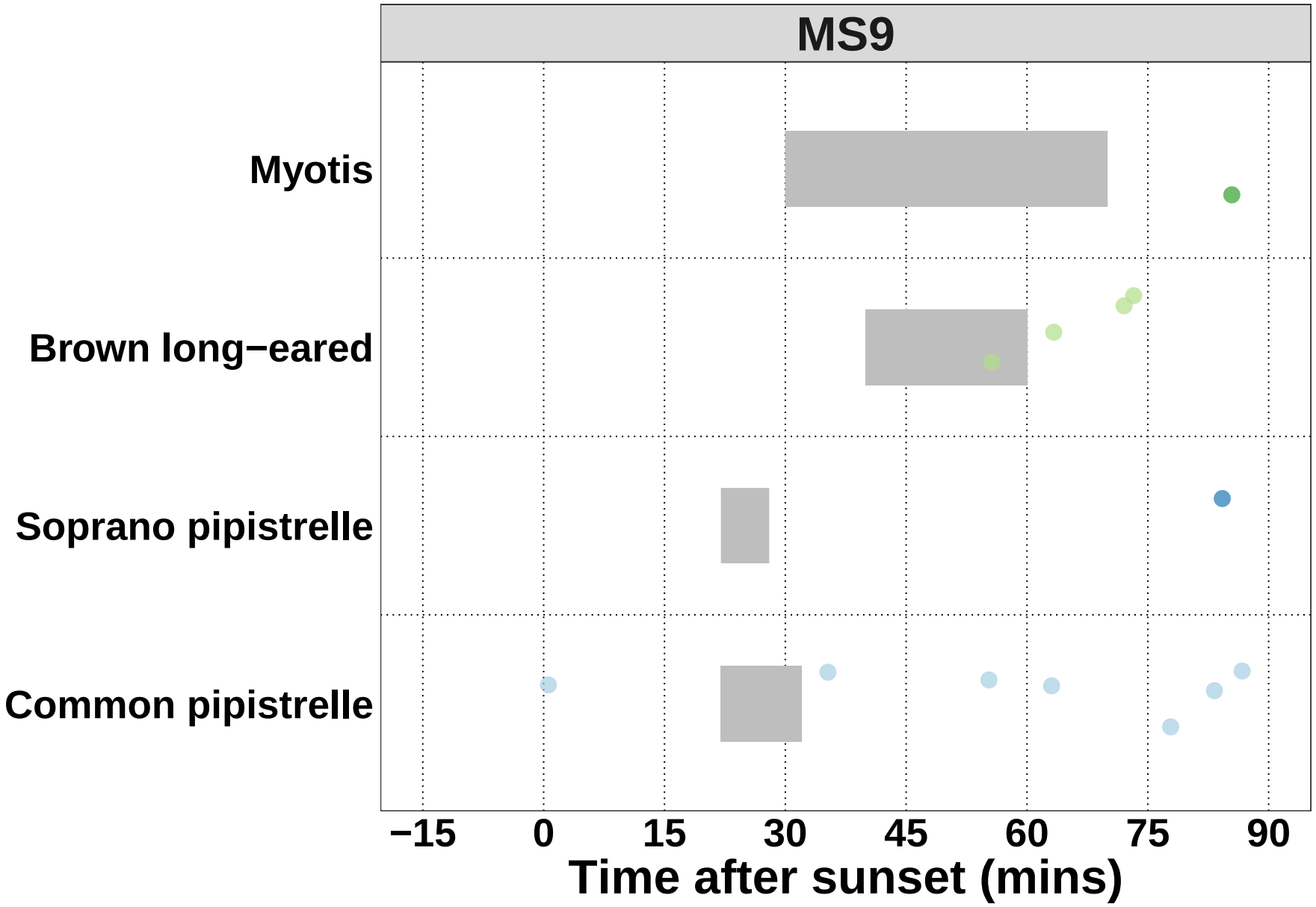

MS4
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


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


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


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

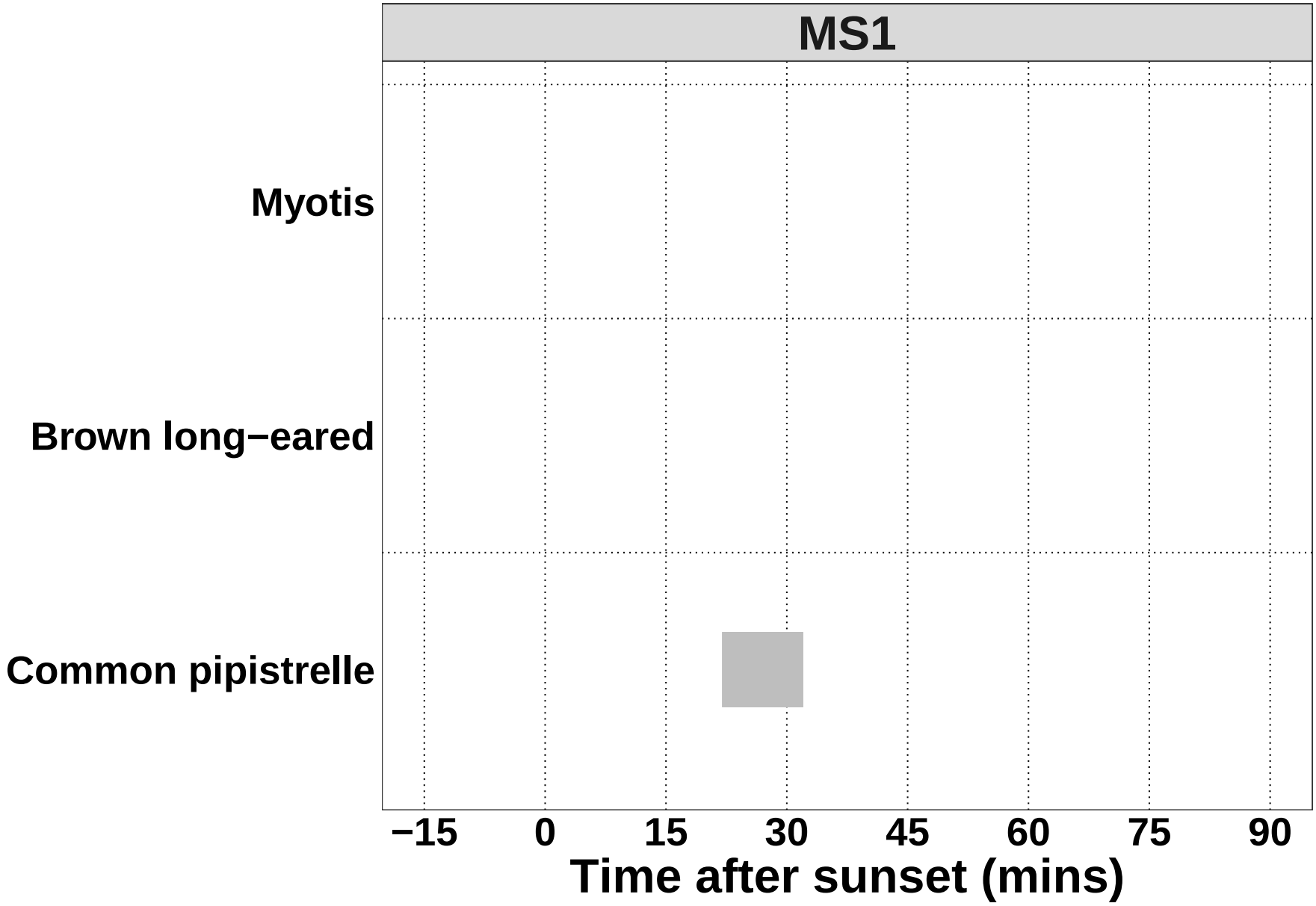

MS8
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

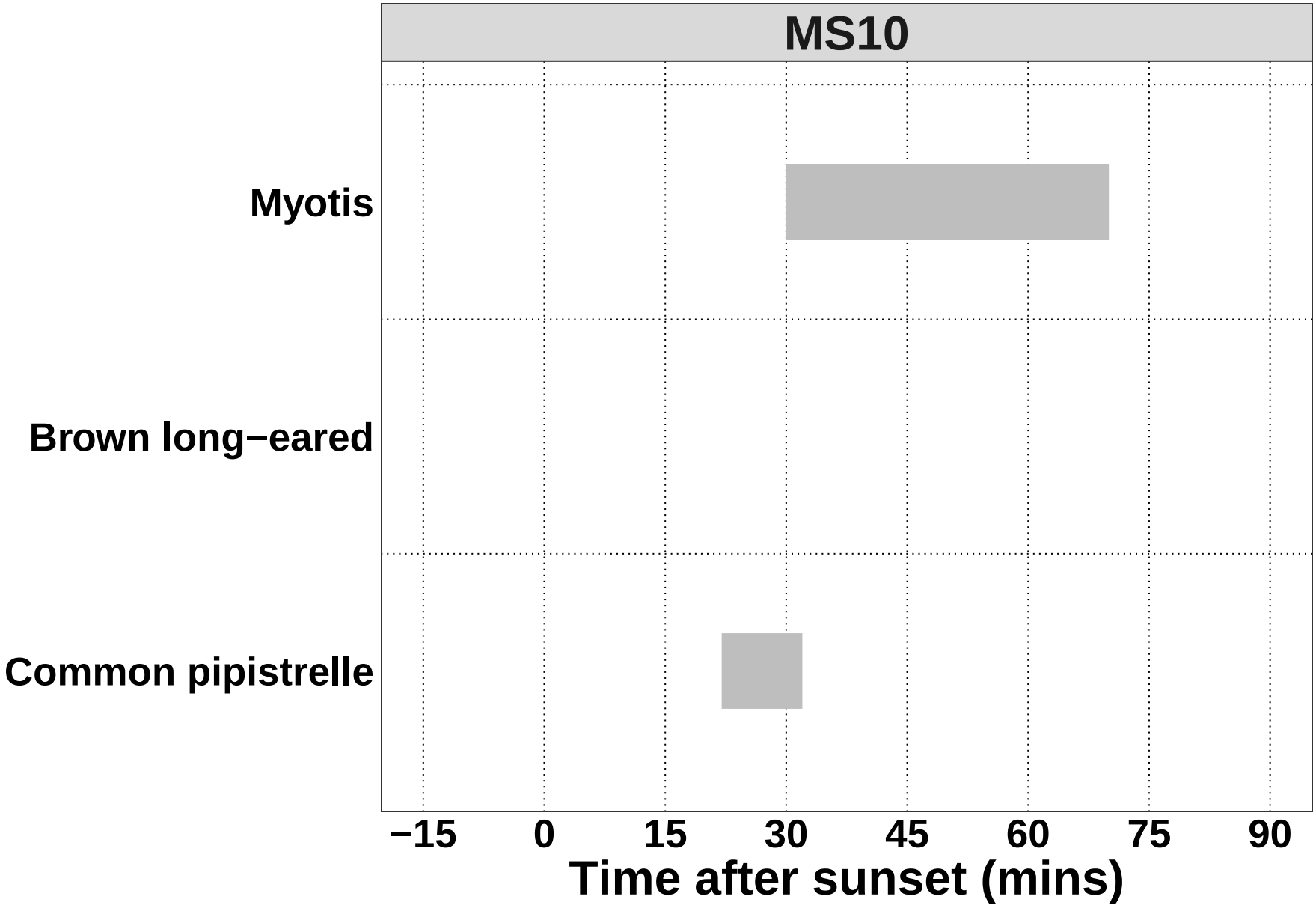

MS9
Myotis
Brown long−eared
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

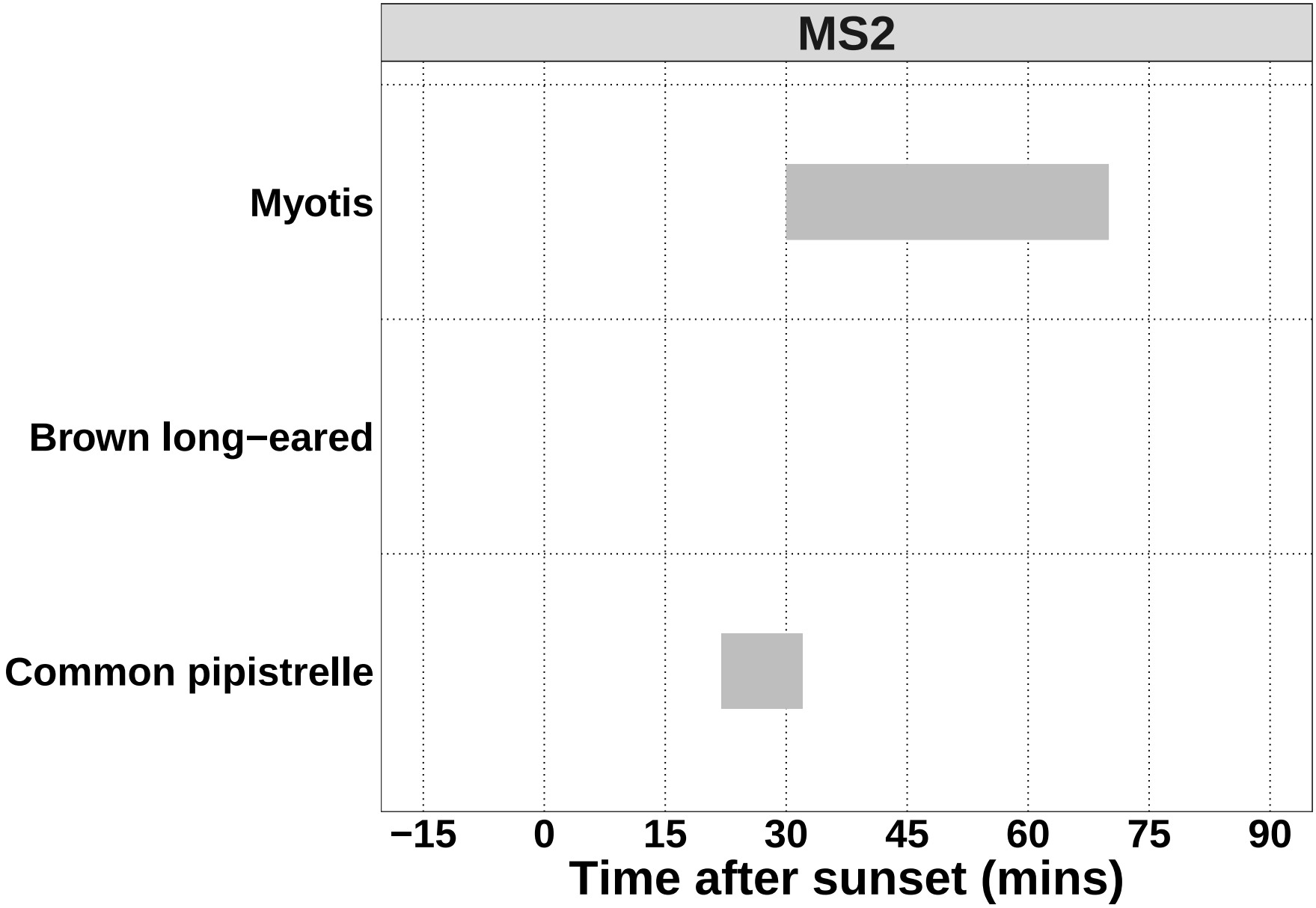
Bat Passes Potentially Indicating Close Proximity to a Roost (Maternity Period Only) - *Maternity period defined as 15th June - 30th July.

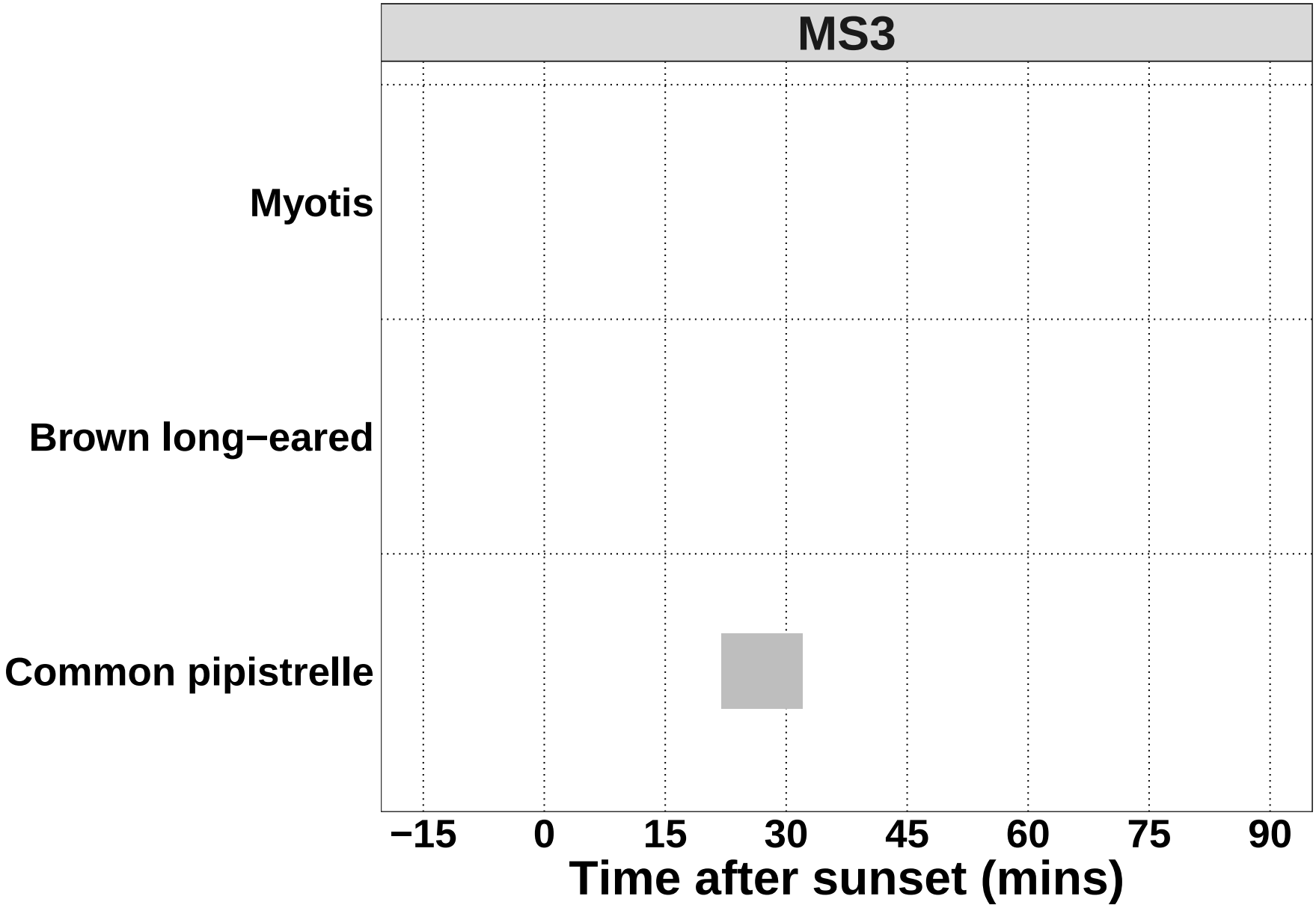
Species	Detector ID	2021-06-23
Myotis	MS5	6

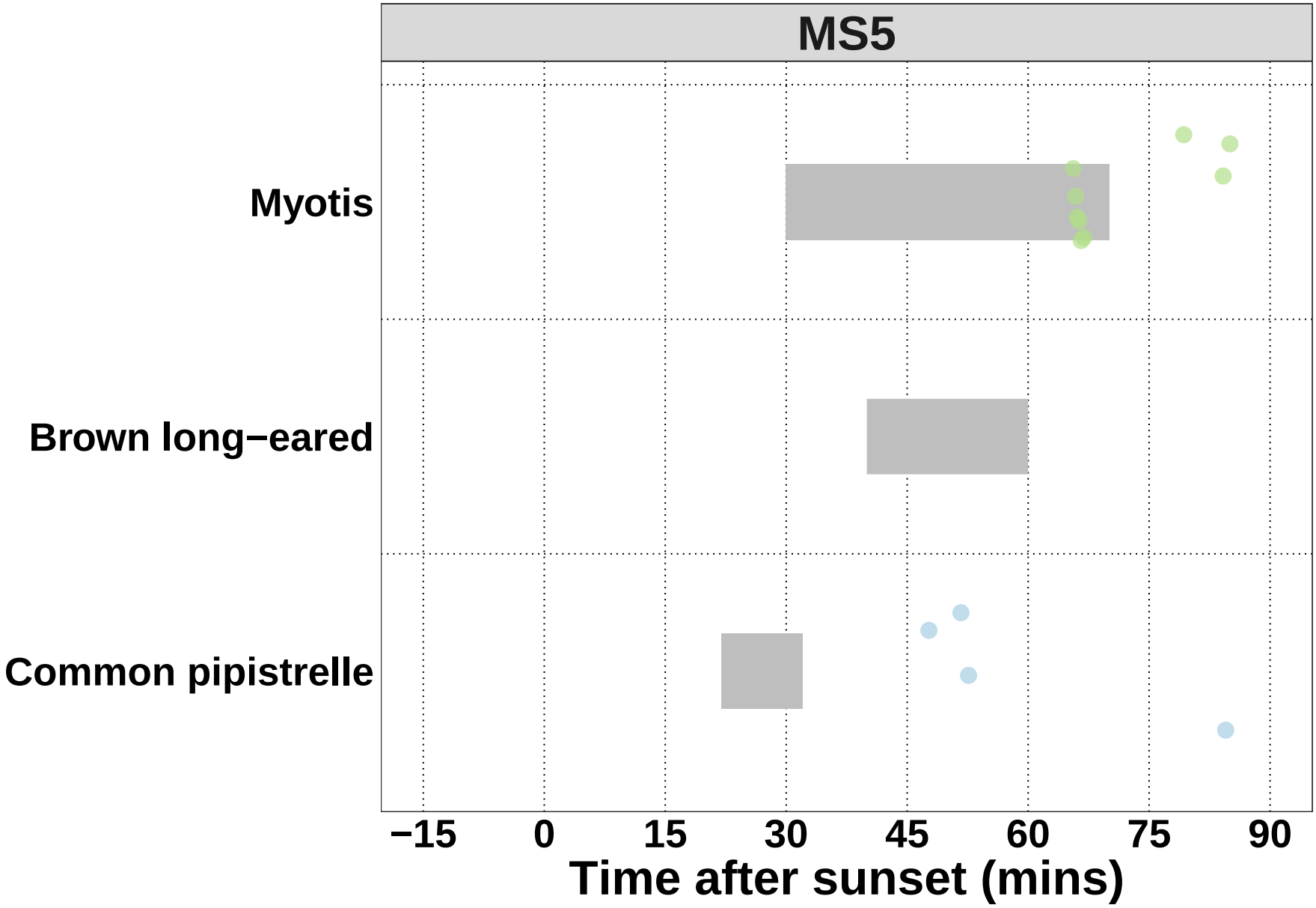
Bat Passes Potentially Indicating Close Proximity to a Roost (Maternity Period Only) - Maternity period defined as 15th June - 30th July.

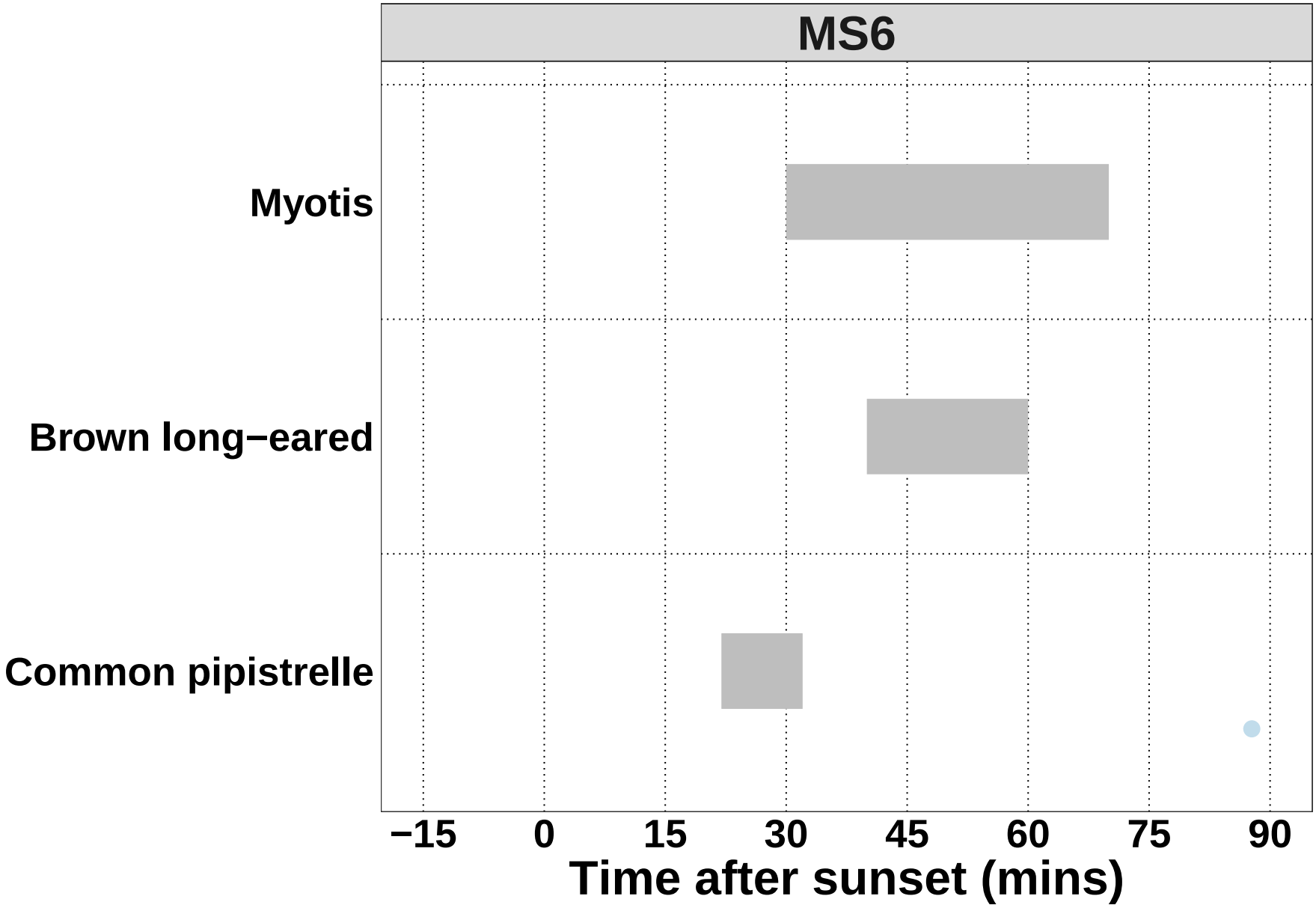

MS1
Myotis
Brown long−eared
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

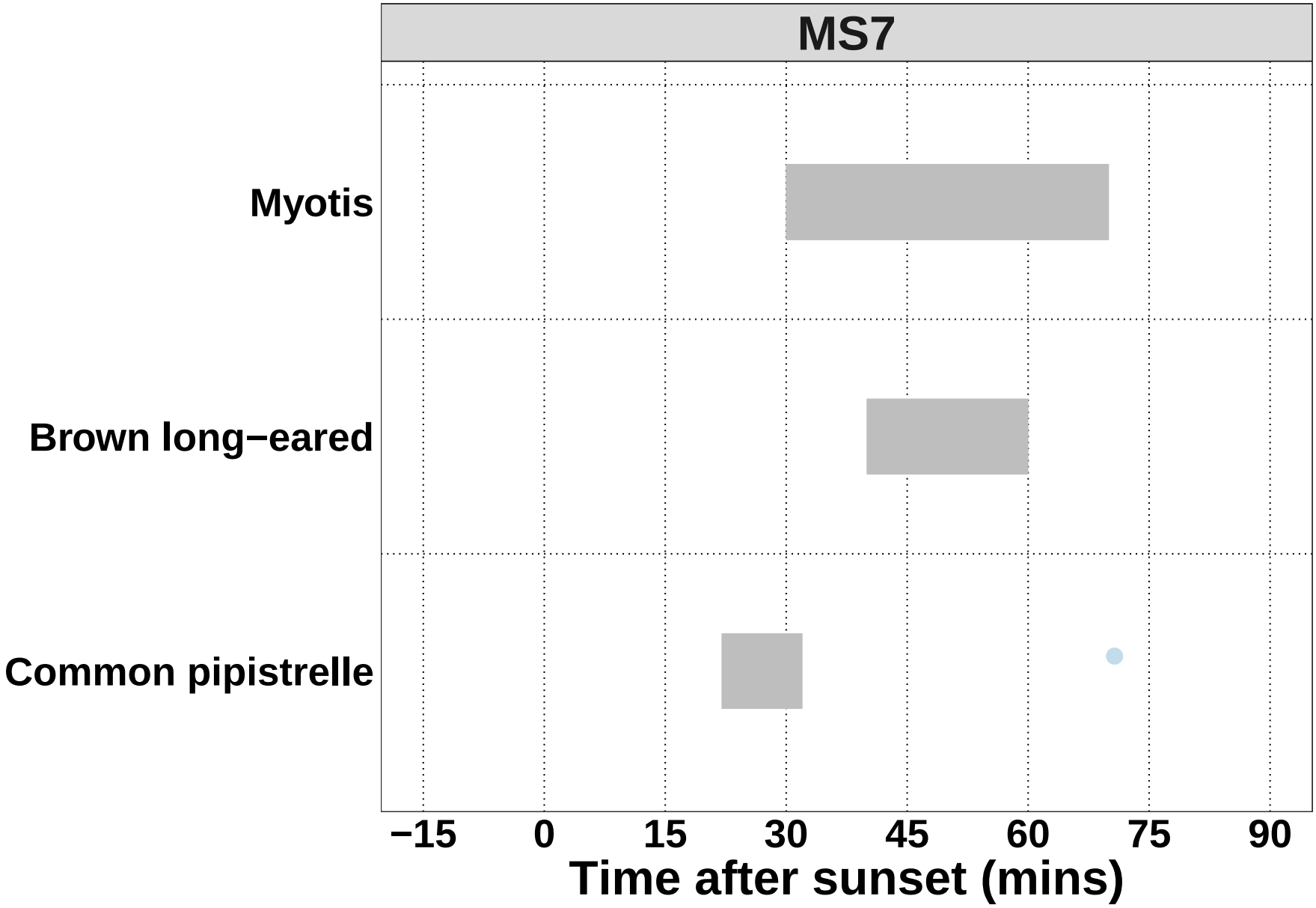

MS10
Myotis
Brown long−eared
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

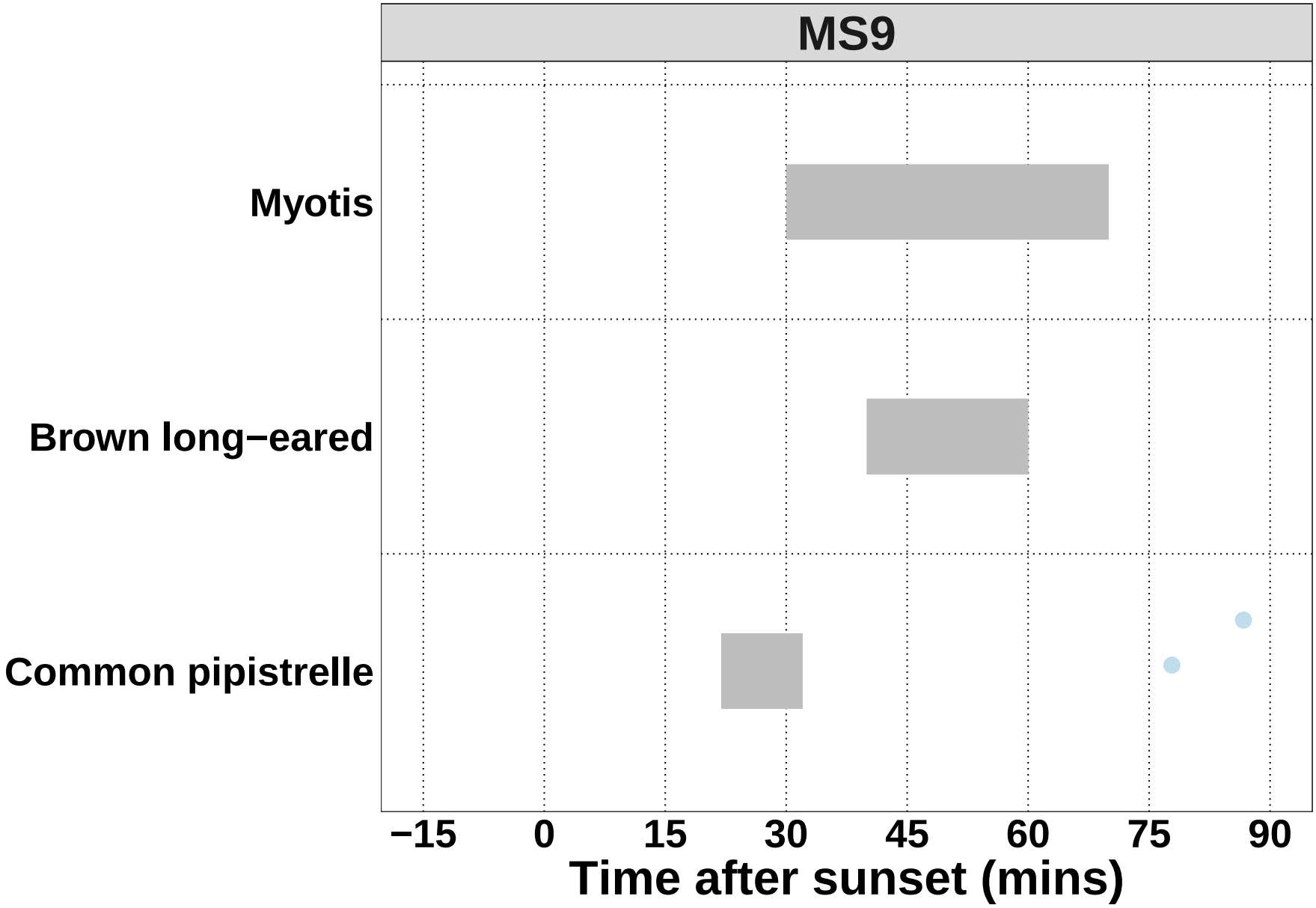

MS2
Myotis
Brown long−eared
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


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


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


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


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


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

Count 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 (%)
Myotis	284	15.9
Pipistrellus pipistrellus	1264	70.6
Pipistrellus pygmaeus	40	2.2
Plecotus auritus	202	11.3
Total	1790	100.0

Per Detector

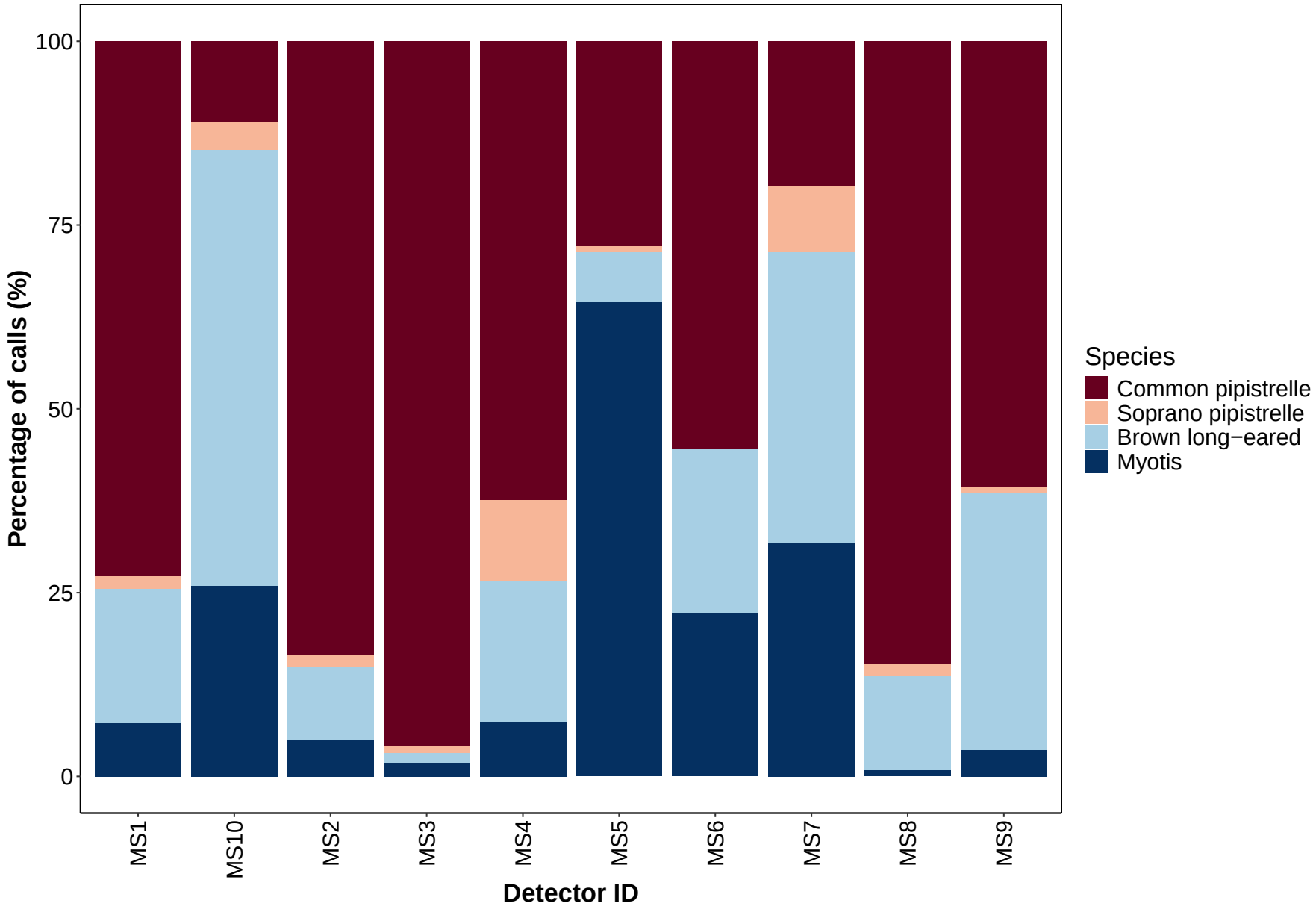
The number of passes recorded for each species at each detector.

Species	Detector ID	Count (no.)	Percentage by Detector (%)
Common pipistrelle	MS1	45	71.4285714
Common pipistrelle	MS10	3	13.0434783
Common pipistrelle	MS2	148	83.1460674
Common pipistrelle	MS3	565	95.2782462
Common pipistrelle	MS4	63	60.0000000
Common pipistrelle	MS5	129	33.9473684
Common pipistrelle	MS6	5	55.5555556
Common pipistrelle	MS7	12	18.4615385
Common pipistrelle	MS8	226	87.5968992
Common pipistrelle	MS9	68	58.6206897
Soprano pipistrelle	MS1	1	1.5873016
Soprano pipistrelle	MS10	1	4.3478261
Soprano pipistrelle	MS2	3	1.6853933
Soprano pipistrelle	MS3	8	1.3490725
Soprano pipistrelle	MS4	15	14.2857143
Soprano pipistrelle	MS5	3	0.7894737
Soprano pipistrelle	MS7	4	6.1538462
Soprano pipistrelle	MS8	4	1.5503876
Soprano pipistrelle	MS9	1	0.8620690
Brown long-eared	MS1	13	20.6349206
Brown long-eared	MS10	12	52.1739130
Brown long-eared	MS2	16	8.9887640
Brown long-eared	MS3	11	1.8549747
Brown long-eared	MS4	21	20.0000000
Brown long-eared	MS5	30	7.8947368
Brown long-eared	MS6	2	22.2222222
Brown long-eared	MS7	29	44.6153846
Brown long-eared	MS8	26	10.0775194
Brown long-eared	MS9	42	36.2068966
Myotis	MS1	4	6.3492063
Myotis	MS10	7	30.4347826
Myotis	MS2	11	6.1797753

Species	Detector ID	Count (no.)	Percentage by Detector (%)
Myotis	MS3	9	1.5177066
Myotis	MS4	6	5.7142857
Myotis	MS5	218	57.3684211
Myotis	MS6	2	22.2222222
Myotis	MS7	20	30.7692308
Myotis	MS8	2	0.7751938
Myotis	MS9	5	4.3103448

Species Composition

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


100
75
50
25
0
Percentage of calls (%)
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID
Species
Common pipistrelle
Soprano pipistrelle
Brown long−eared
Myotis

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.

Nighlty 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	0.3
Common pipistrelle	MS10	0.2
Common pipistrelle	MS2	0.4
Common pipistrelle	MS3	1.0
Common pipistrelle	MS4	1.0
Common pipistrelle	MS5	0.3
Common pipistrelle	MS6	0.2
Common pipistrelle	MS7	0.2
Common pipistrelle	MS8	2.2
Common pipistrelle	MS9	0.3
Soprano pipistrelle	MS1	0.1
Soprano pipistrelle	MS10	0.1
Soprano pipistrelle	MS2	0.1
Soprano pipistrelle	MS3	0.1
Soprano pipistrelle	MS4	0.6
Soprano pipistrelle	MS5	0.1
Soprano pipistrelle	MS7	0.1
Soprano pipistrelle	MS8	0.2
Soprano pipistrelle	MS9	0.1
Brown long-eared	MS1	0.1
Brown long-eared	MS10	0.2
Brown long-eared	MS2	0.2
Brown long-eared	MS3	0.1
Brown long-eared	MS4	0.3
Brown long-eared	MS5	0.2
Brown long-eared	MS6	0.1
Brown long-eared	MS7	0.2
Brown long-eared	MS8	0.2
Brown long-eared	MS9	0.3
Myotis	MS1	0.1
Myotis	MS10	0.2
Myotis	MS2	0.1
Myotis	MS3	0.1
Myotis	MS4	0.3
Myotis	MS5	1.8
Myotis	MS6	0.2

Species	Detector ID	Median Pass Rate
Myotis	MS7	0.2
Myotis	MS8	0.1
Myotis	MS9	0.1

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.

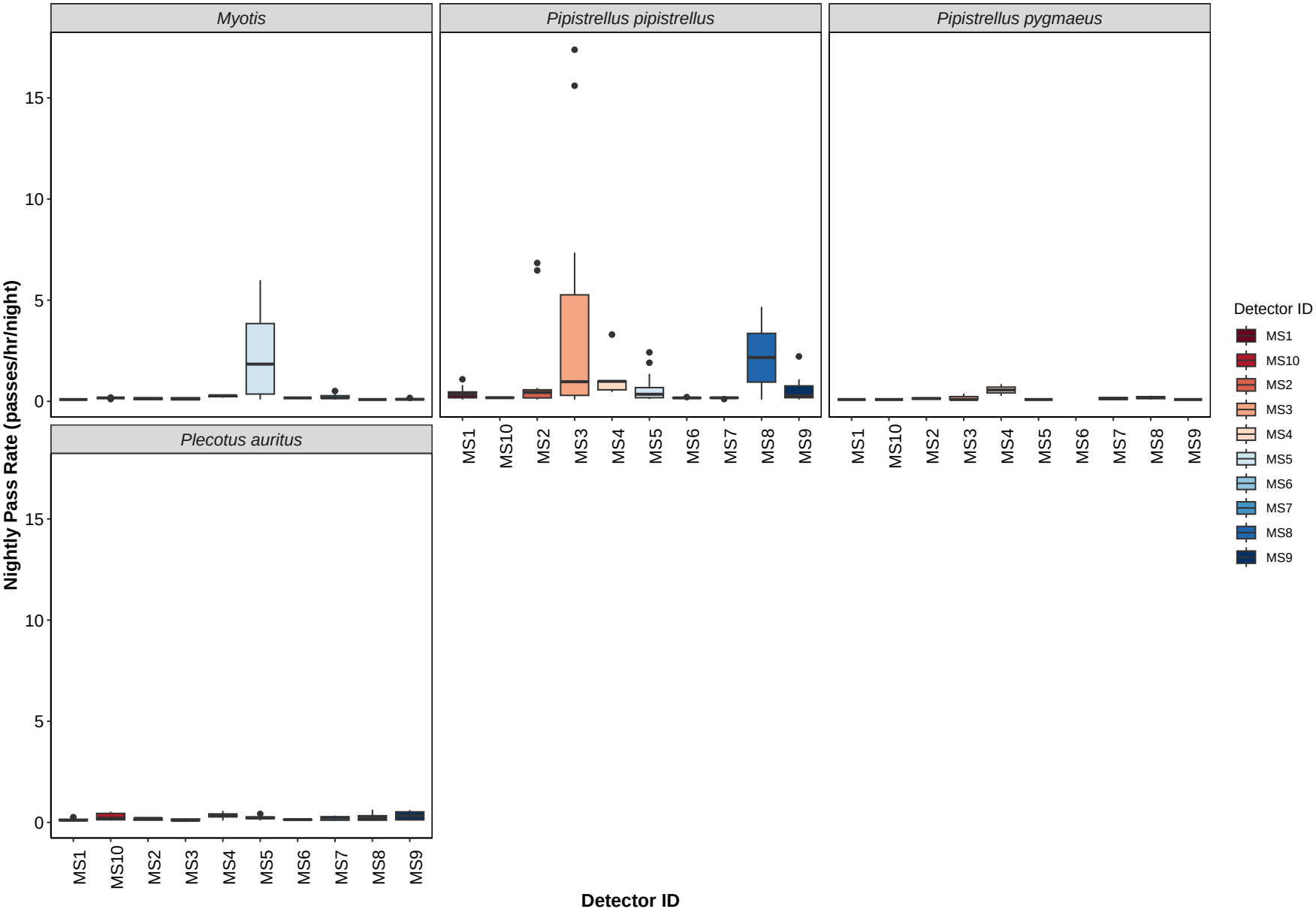
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

Species	Detector ID	Mean Pass Rate
Common pipistrelle	MS1	0.4
Common pipistrelle	MS10	0.2
Common pipistrelle	MS2	1.3
Common pipistrelle	MS3	3.7
Common pipistrelle	MS4	1.3
Common pipistrelle	MS5	0.6
Common pipistrelle	MS6	0.2
Common pipistrelle	MS7	0.2
Common pipistrelle	MS8	2.3
Common pipistrelle	MS9	0.5
Soprano pipistrelle	MS1	0.1
Soprano pipistrelle	MS10	0.1
Soprano pipistrelle	MS2	0.1
Soprano pipistrelle	MS3	0.2
Soprano pipistrelle	MS4	0.6
Soprano pipistrelle	MS5	0.1
Soprano pipistrelle	MS7	0.1
Soprano pipistrelle	MS8	0.2
Soprano pipistrelle	MS9	0.1
Brown long-eared	MS1	0.1
Brown long-eared	MS10	0.3
Brown long-eared	MS2	0.2
Brown long-eared	MS3	0.1
Brown long-eared	MS4	0.3
Brown long-eared	MS5	0.2
Brown long-eared	MS6	0.1
Brown long-eared	MS7	0.2
Brown long-eared	MS8	0.3
Brown long-eared	MS9	0.3
Myotis	MS1	0.1

Species	Detector ID	Mean Pass Rate
Myotis	MS10	0.2
Myotis	MS2	0.1
Myotis	MS3	0.1
Myotis	MS4	0.2
Myotis	MS5	2.2
Myotis	MS6	0.2
Myotis	MS7	0.2
Myotis	MS8	0.1
Myotis	MS9	0.1

Per Detector

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
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
0
5
10
15
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID
Detector ID
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9

Split by Month

Total Bat Passes per Detector each Month

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	Apr	Jun	Sep
Common pipistrelle	MS1	7	5	28
Common pipistrelle	MS10	0	1	2
Common pipistrelle	MS2	6	41	105
Common pipistrelle	MS3	155	27	394
Common pipistrelle	MS4	0	0	68
Common pipistrelle	MS5	49	19	50
Common pipistrelle	MS6	2	3	0
Common pipistrelle	MS7	1	2	10
Common pipistrelle	MS8	65	0	146
Common pipistrelle	MS9	5	31	49
Soprano pipistrelle	MS1	0	0	1
Soprano pipistrelle	MS10	0	0	1
Soprano pipistrelle	MS2	0	0	3
Soprano pipistrelle	MS3	0	0	6
Soprano pipistrelle	MS4	0	0	12
Soprano pipistrelle	MS5	0	0	3
Soprano pipistrelle	MS7	0	0	6
Soprano pipistrelle	MS8	0	0	4
Soprano pipistrelle	MS9	0	0	1
Brown long-eared	MS1	2	0	8
Brown long-eared	MS10	13	0	3
Brown long-eared	MS2	8	0	10
Brown long-eared	MS3	3	0	5
Brown long-eared	MS4	8	0	13
Brown long-eared	MS5	7	1	21
Brown long-eared	MS6	1	1	0
Brown long-eared	MS7	10	3	13
Brown long-eared	MS8	23	0	9
Brown long-eared	MS9	9	3	37
Myotis	MS1	0	0	4
Myotis	MS10	1	4	2
Myotis	MS2	1	3	5
Myotis	MS3	2	0	9
Myotis	MS4	0	0	8
Myotis	MS5	2	208	62
Myotis	MS6	0	2	0

Species	Detector ID	Apr	Jun	Sep
Myotis	MS7	0	8	13
Myotis	MS8	0	0	2
Myotis	MS9	2	1	2

Survey Effort

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

month	Detector ID	No. of Survey Nights
Apr	MS1	3
Apr	MS10	4
Apr	MS2	6
Apr	MS3	7
Apr	MS4	2
Apr	MS5	5
Apr	MS6	1
Apr	MS7	6
Apr	MS8	8
Apr	MS9	6
Jun	MS1	3
Jun	MS10	4
Jun	MS2	6
Jun	MS3	1
Jun	MS5	11
Jun	MS6	4
Jun	MS7	7
Jun	MS9	7
Sep	MS1	9
Sep	MS10	2
Sep	MS2	9
Sep	MS3	10
Sep	MS4	5
Sep	MS5	12
Sep	MS7	7
Sep	MS8	5
Sep	MS9	10

Nightly Bat Passes 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	Apr	Jun	Sep
Common pipistrelle	MS1	0.8	0.3	0.2
Common pipistrelle	MS10	NA	0.2	0.2
Common pipistrelle	MS2	0.3	0.2	0.5
Common pipistrelle	MS3	0.3	4.6	1.0
Common pipistrelle	MS4	NA	NA	1.0
Common pipistrelle	MS5	0.7	0.3	0.3
Common pipistrelle	MS6	0.2	0.2	NA
Common pipistrelle	MS7	0.1	0.2	0.2
Common pipistrelle	MS8	1.2	NA	3.3
Common pipistrelle	MS9	0.2	0.7	0.3
Soprano pipistrelle	MS1	NA	NA	0.1
Soprano pipistrelle	MS10	NA	NA	0.1
Soprano pipistrelle	MS2	NA	NA	0.1
Soprano pipistrelle	MS3	NA	NA	0.1
Soprano pipistrelle	MS4	NA	NA	0.6
Soprano pipistrelle	MS5	NA	NA	0.1
Soprano pipistrelle	MS7	NA	NA	0.1
Soprano pipistrelle	MS8	NA	NA	0.2
Soprano pipistrelle	MS9	NA	NA	0.1
Brown long-eared	MS1	0.1	NA	0.1
Brown long-eared	MS10	0.4	NA	0.1
Brown long-eared	MS2	0.2	NA	0.1
Brown long-eared	MS3	0.2	NA	0.1
Brown long-eared	MS4	0.4	NA	0.3
Brown long-eared	MS5	0.4	0.2	0.2
Brown long-eared	MS6	0.1	0.2	NA
Brown long-eared	MS7	0.2	0.3	0.2
Brown long-eared	MS8	0.3	NA	0.1
Brown long-eared	MS9	0.1	0.3	0.5
Myotis	MS1	NA	NA	0.1
Myotis	MS10	0.1	0.2	0.2
Myotis	MS2	0.1	0.2	0.1
Myotis	MS3	0.1	NA	0.1
Myotis	MS4	NA	NA	0.3
Myotis	MS5	0.2	3.8	0.4
Myotis	MS6	NA	0.2	NA

Species	Detector ID	Apr	Jun	Sep
Myotis	MS7	NA	0.2	0.2
Myotis	MS8	NA	NA	0.1
Myotis	MS9	0.1	0.2	0.1

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.

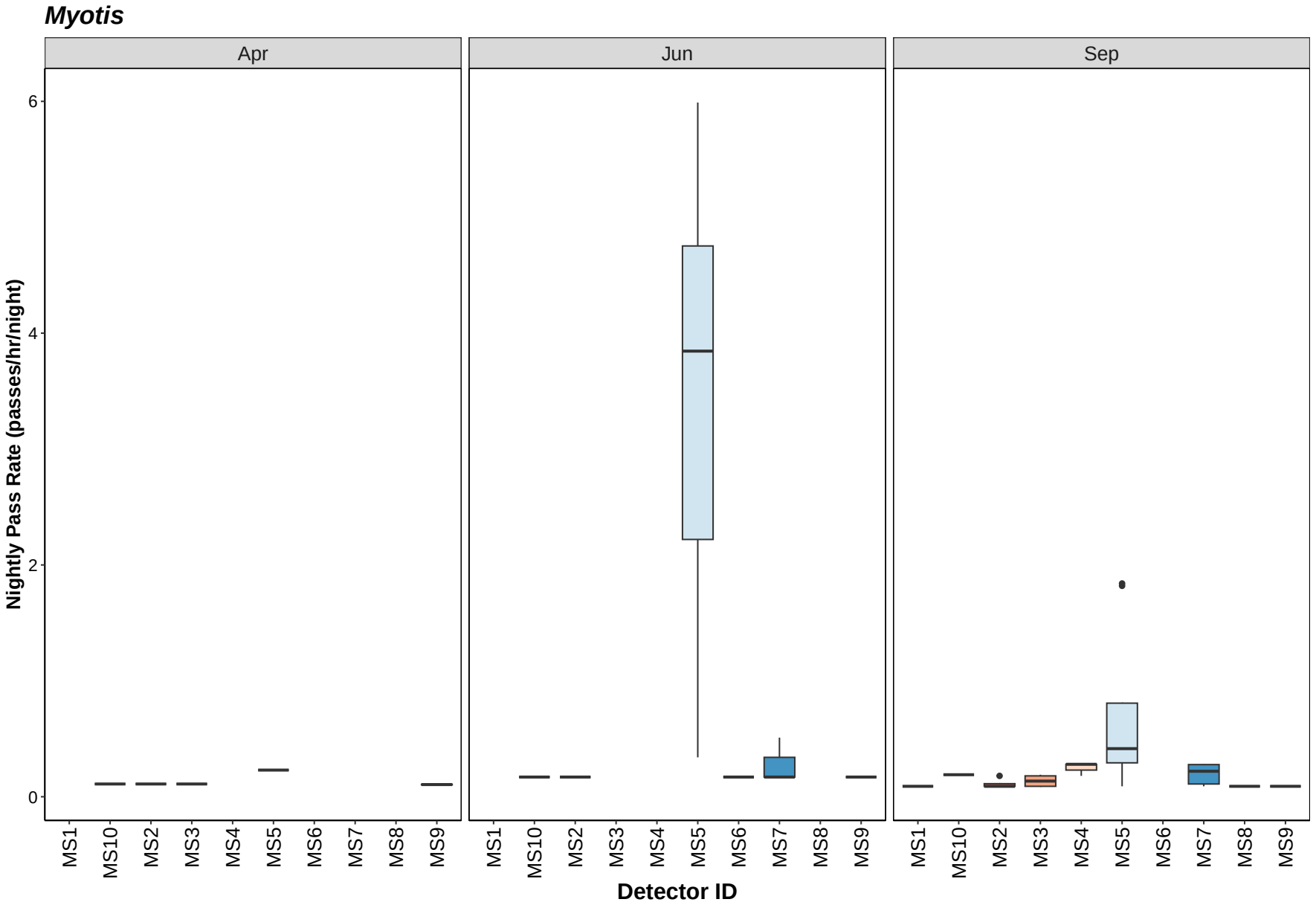
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

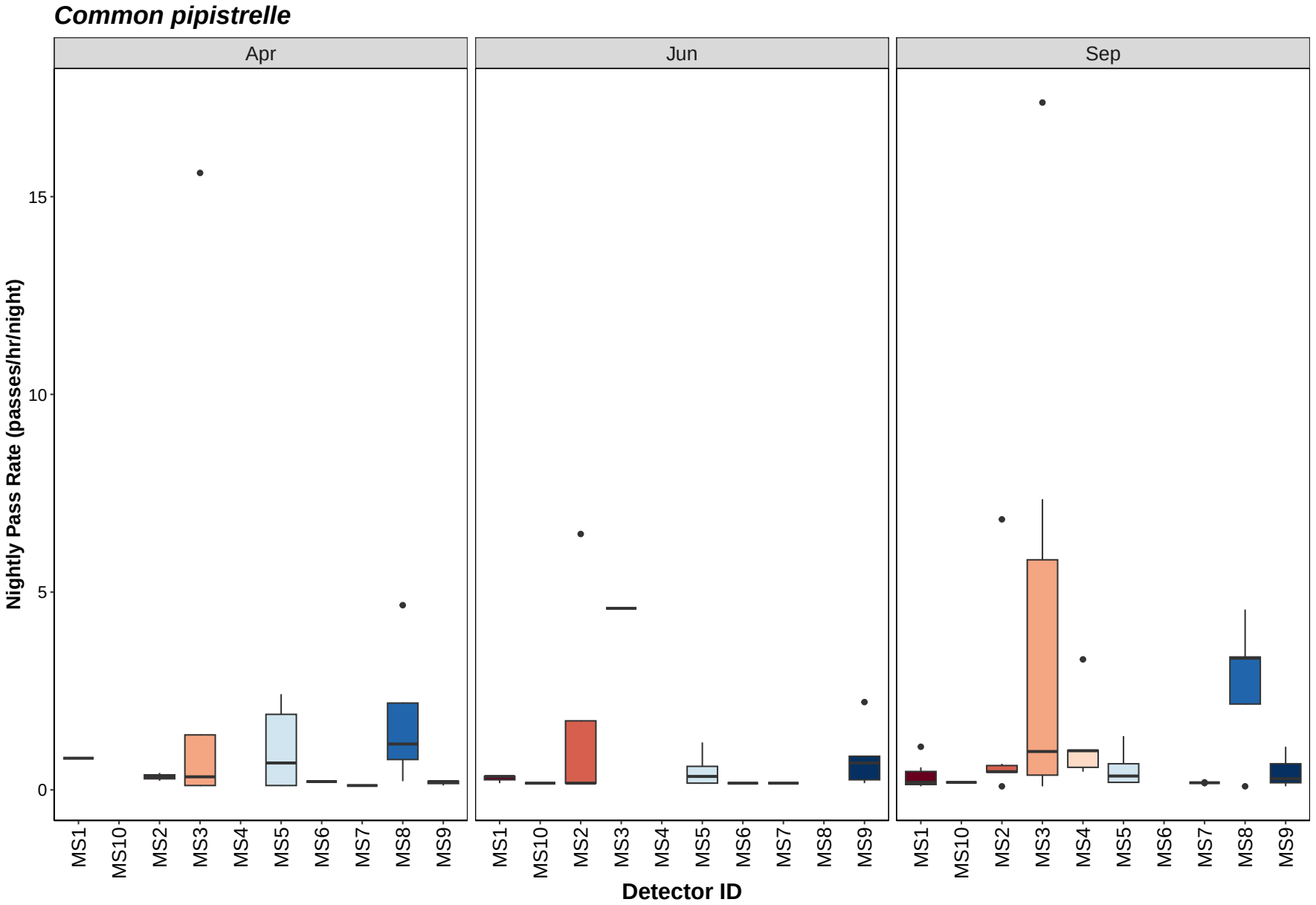
Species	Detector ID	Apr	Jun	Sep
Common pipistrelle	MS1	0.8	0.3	0.4
Common pipistrelle	MS10	NA	0.2	0.2
Common pipistrelle	MS2	0.3	1.7	1.4
Common pipistrelle	MS3	3.5	4.6	3.6
Common pipistrelle	MS4	NA	NA	1.3
Common pipistrelle	MS5	1.0	0.5	0.5
Common pipistrelle	MS6	0.2	0.2	NA
Common pipistrelle	MS7	0.1	0.2	0.2
Common pipistrelle	MS8	1.8	NA	2.7
Common pipistrelle	MS9	0.2	0.8	0.5
Soprano pipistrelle	MS1	NA	NA	0.1
Soprano pipistrelle	MS10	NA	NA	0.1
Soprano pipistrelle	MS2	NA	NA	0.1
Soprano pipistrelle	MS3	NA	NA	0.2
Soprano pipistrelle	MS4	NA	NA	0.6
Soprano pipistrelle	MS5	NA	NA	0.1
Soprano pipistrelle	MS7	NA	NA	0.1
Soprano pipistrelle	MS8	NA	NA	0.2
Soprano pipistrelle	MS9	NA	NA	0.1
Brown long-eared	MS1	0.1	NA	0.1
Brown long-eared	MS10	0.3	NA	0.1
Brown long-eared	MS2	0.2	NA	0.1
Brown long-eared	MS3	0.2	NA	0.1
Brown long-eared	MS4	0.4	NA	0.3
Brown long-eared	MS5	0.4	0.2	0.2
Brown long-eared	MS6	0.1	0.2	NA
Brown long-eared	MS7	0.2	0.3	0.2
Brown long-eared	MS8	0.3	NA	0.2
Brown long-eared	MS9	0.2	0.3	0.5
Myotis	MS1	NA	NA	0.1

Species	Detector ID	Apr	Jun	Sep
Myotis	MS10	0.1	0.2	0.2
Myotis	MS2	0.1	0.2	0.1
Myotis	MS3	0.1	NA	0.1
Myotis	MS4	NA	NA	0.2
Myotis	MS5	0.2	3.6	0.7
Myotis	MS6	NA	0.2	NA
Myotis	MS7	NA	0.3	0.2
Myotis	MS8	NA	NA	0.1
Myotis	MS9	0.1	0.2	0.1

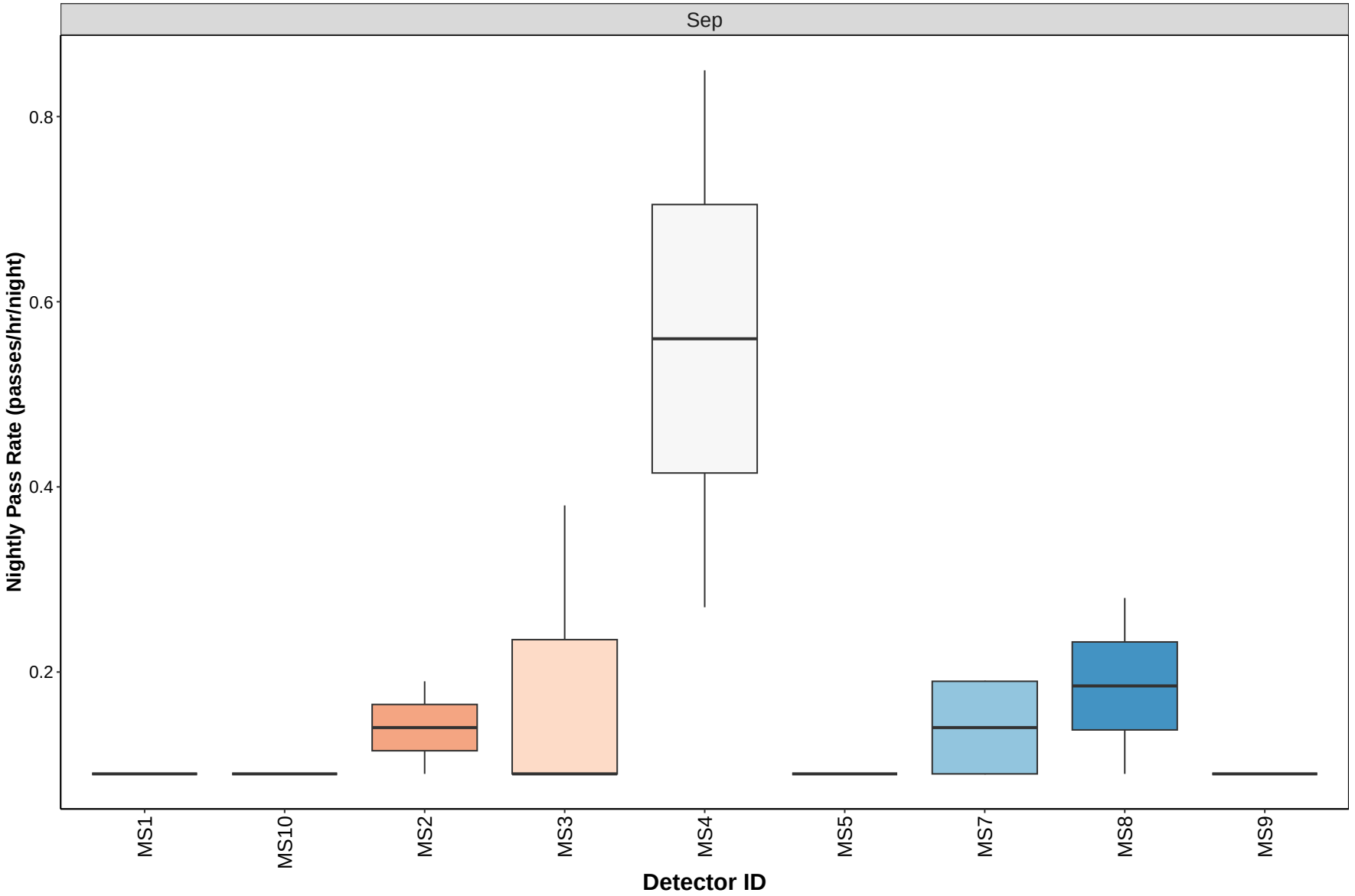
Per Detector

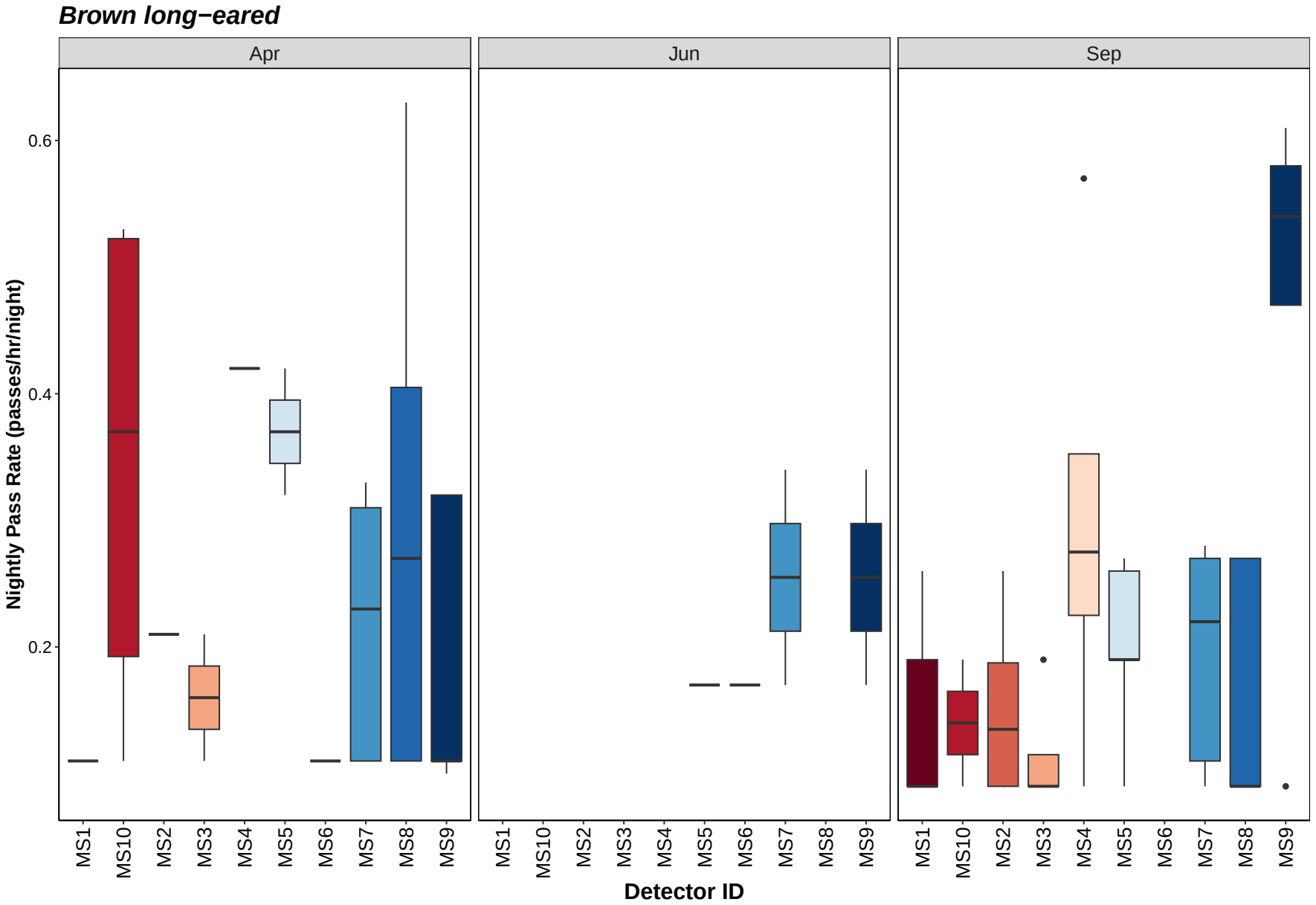
Figure 12. Figures show boxplots for the number of bat passes per hour by detector, for each month. The ‘box’ shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The ‘whiskers’ extend from the box and represent 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.


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


Common pipistrelle
Apr
Jun
Sep
Nightly Pass Rate (passes/hr/night)
0
5
10
15
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID

Soprano pipistrelle




Brown long−eared
Apr
Jun
Sep
Nightly Pass Rate (passes/hr/night)
0.6
0.4
0.2
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID

Bat Activity per Detector Location

Figure 13. Detector ID reference:

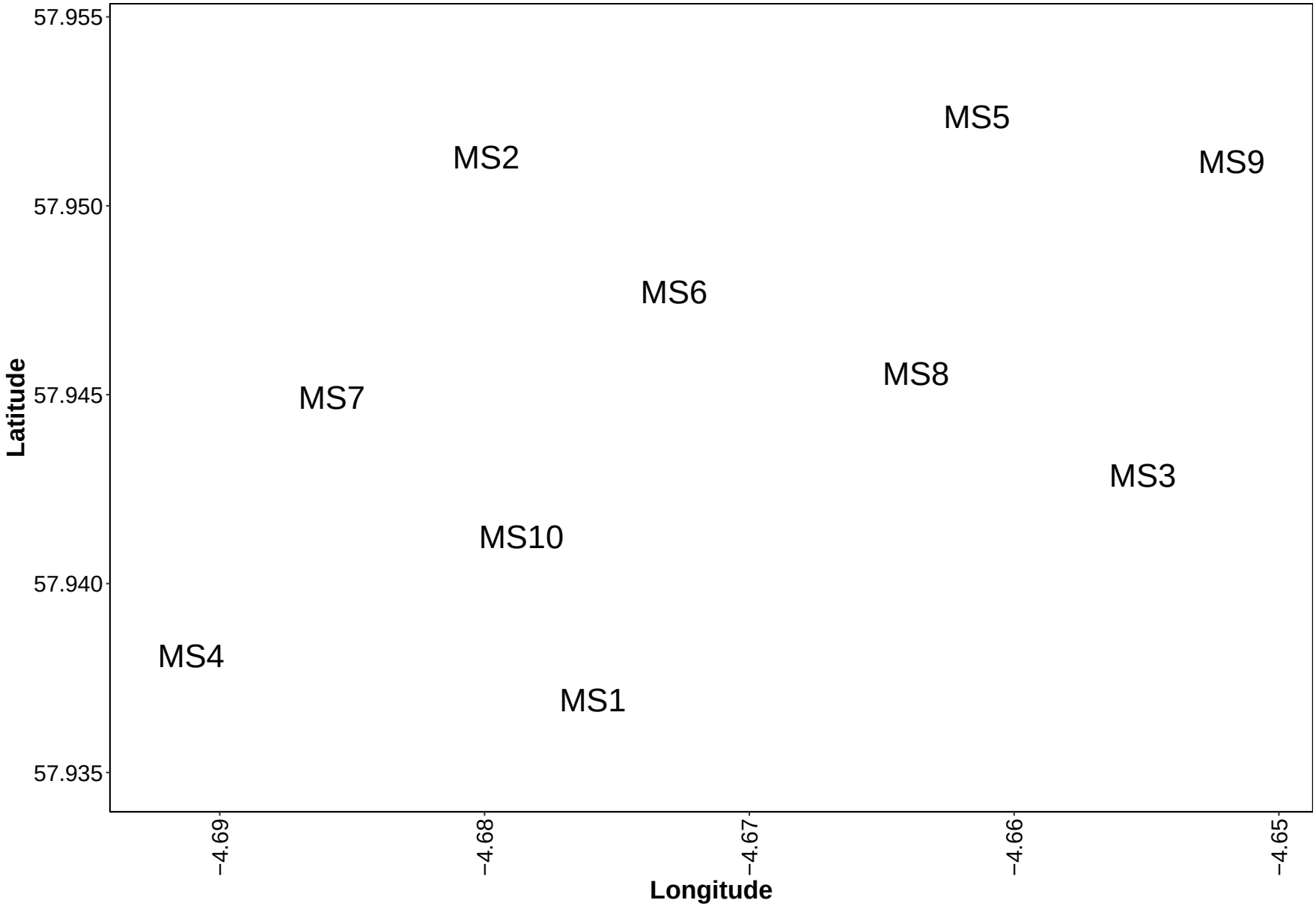

57.955
57.950
57.945
57.940
57.935
Latitude
MS5
MS2
MS9
MS6
MS8
MS7
MS3
MS10
MS4
MS1
−4.69
−4.68
−4.67
−4.66
−4.65
Longitude

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.

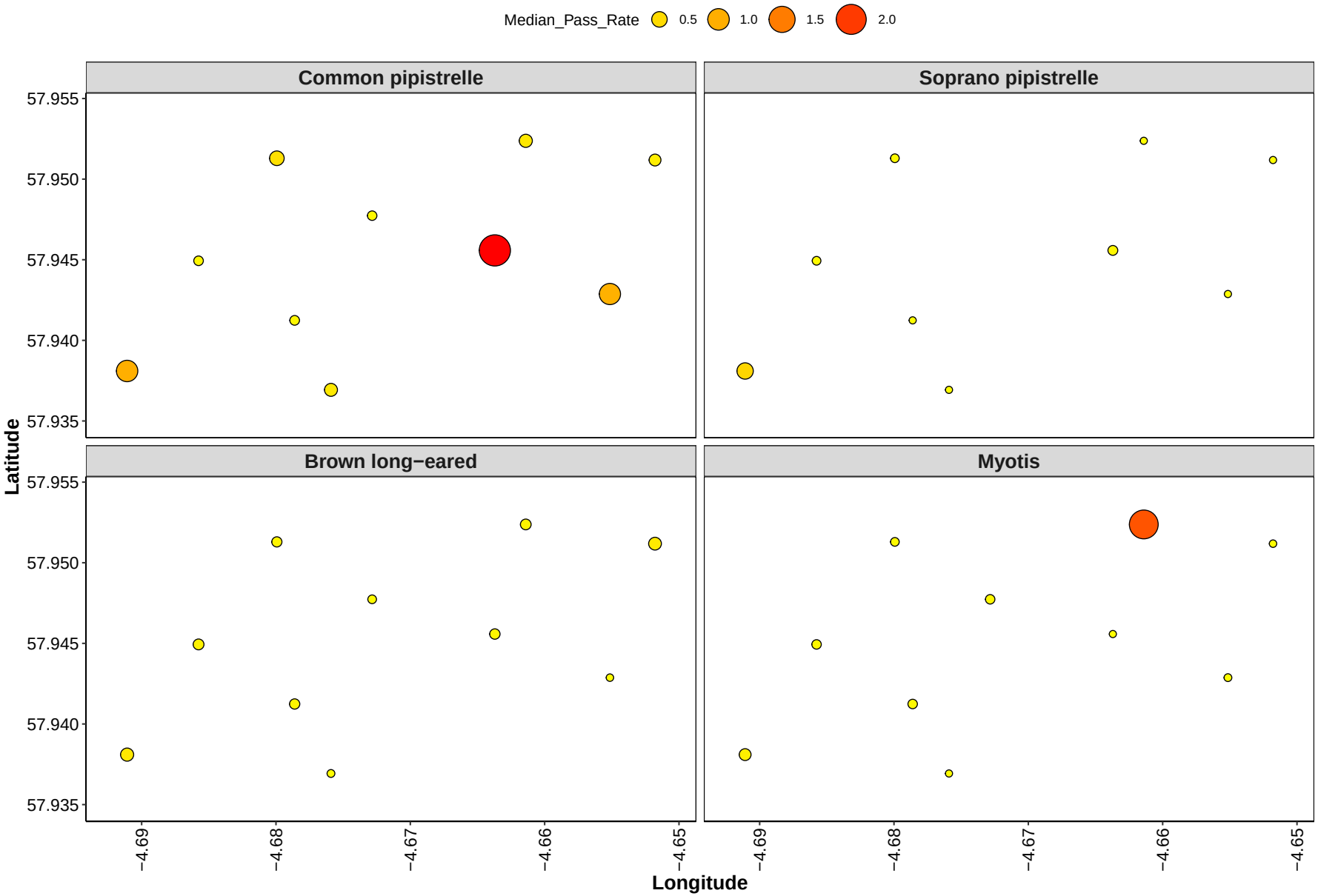
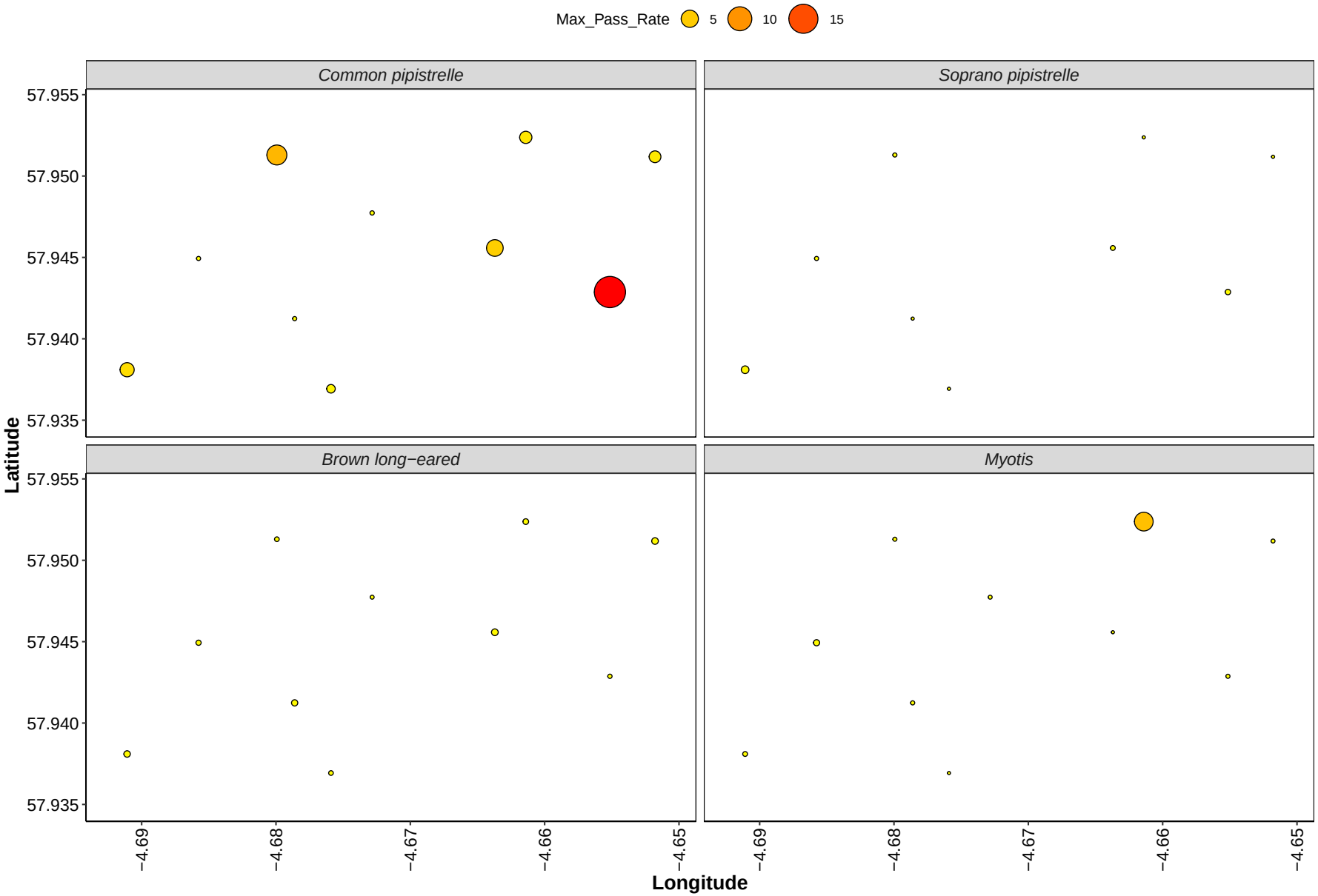

Median_Pass_Rate
0.5
1.0
1.5
2.0
Common pipistrelle
Soprano pipistrelle
Brown long−eared
Myotis
Latitude
57.955
57.950
57.945
57.940
57.935
−4.69
−4.68
−4.67
−4.66
−4.65
Longitude

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.


Max_Pass_Rate
5
10
15
Common pipistrelle
Soprano pipistrelle
Brown long−eared
Myotis
Latitude
57.955
57.950
57.945
57.940
57.935
−4.69
−4.68
−4.67
−4.66
−4.65
Longitude

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

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	0.1
Brown long-eared	MS2	0.0
Brown long-eared	MS3	0.0
Brown long-eared	MS4	0.3
Brown long-eared	MS5	0.0
Brown long-eared	MS6	0.0
Brown long-eared	MS7	0.1
Brown long-eared	MS8	0.2
Brown long-eared	MS9	0.1
Common pipistrelle	MS1	0.2
Common pipistrelle	MS10	0.0
Common pipistrelle	MS2	0.2
Common pipistrelle	MS3	0.5
Common pipistrelle	MS4	0.6
Common pipistrelle	MS5	0.2
Common pipistrelle	MS6	0.2
Common pipistrelle	MS7	0.0
Common pipistrelle	MS8	0.9
Common pipistrelle	MS9	0.2
Myotis	MS1	0.0
Myotis	MS10	0.1
Myotis	MS2	0.0
Myotis	MS3	0.0
Myotis	MS4	0.0
Myotis	MS5	0.4
Myotis	MS6	0.0
Myotis	MS7	0.1
Myotis	MS8	0.0
Myotis	MS9	0.0
Soprano pipistrelle	MS1	0.0
Soprano pipistrelle	MS10	0.0
Soprano pipistrelle	MS2	0.0
Soprano pipistrelle	MS3	0.0
Soprano pipistrelle	MS4	0.0
Soprano pipistrelle	MS5	0.0

Species	Detector ID	Median Pass Rate
Soprano pipistrelle	MS6	0.0
Soprano pipistrelle	MS7	0.0
Soprano pipistrelle	MS8	0.0
Soprano pipistrelle	MS9	0.0

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.

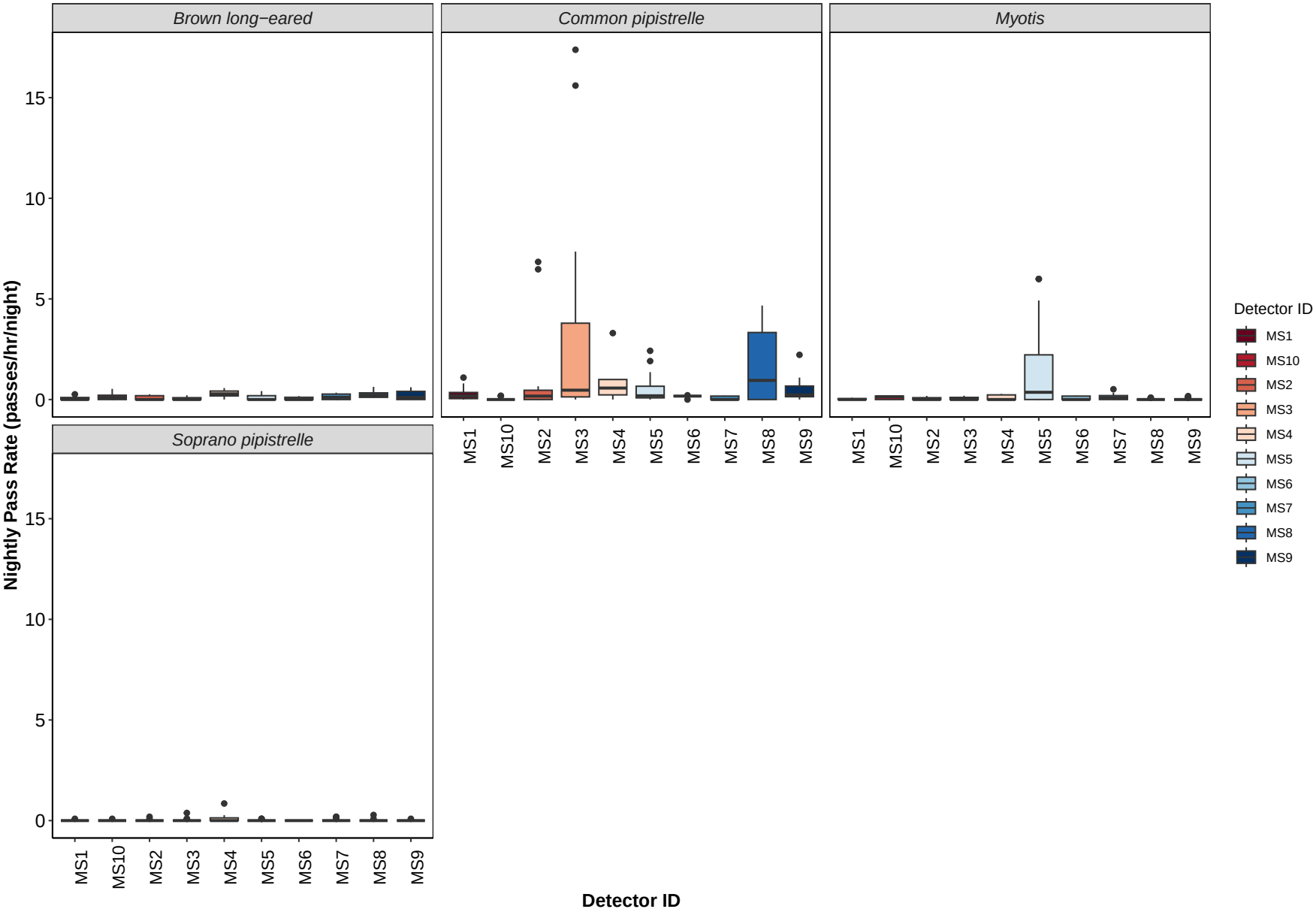
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

Species	Detector ID	Mean Pass Rate
Brown long-eared	MS1	0.1
Brown long-eared	MS10	0.2
Brown long-eared	MS2	0.1
Brown long-eared	MS3	0.0
Brown long-eared	MS4	0.3
Brown long-eared	MS5	0.1
Brown long-eared	MS6	0.1
Brown long-eared	MS7	0.1
Brown long-eared	MS8	0.3
Brown long-eared	MS9	0.2
Common pipistrelle	MS1	0.3
Common pipistrelle	MS10	0.0
Common pipistrelle	MS2	0.8
Common pipistrelle	MS3	3.3
Common pipistrelle	MS4	0.9
Common pipistrelle	MS5	0.5
Common pipistrelle	MS6	0.1
Common pipistrelle	MS7	0.1
Common pipistrelle	MS8	1.6
Common pipistrelle	MS9	0.4
Myotis	MS1	0.0
Myotis	MS10	0.1
Myotis	MS2	0.1
Myotis	MS3	0.1
Myotis	MS4	0.1
Myotis	MS5	1.5
Myotis	MS6	0.1
Myotis	MS7	0.1
Myotis	MS8	0.0
Myotis	MS9	0.0
Soprano pipistrelle	MS1	0.0
Soprano pipistrelle	MS10	0.0
Soprano pipistrelle	MS2	0.0
Soprano pipistrelle	MS3	0.0
Soprano pipistrelle	MS4	0.2
Soprano pipistrelle	MS5	0.0

Species	Detector ID	Mean Pass Rate
Soprano pipistrelle	MS6	0.0
Soprano pipistrelle	MS7	0.0
Soprano pipistrelle	MS8	0.0
Soprano pipistrelle	MS9	0.0

Per Detector

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.


Brown long−eared
Common pipistrelle
Myotis
Soprano pipistrelle
Nightly Pass Rate (passes/hr/night)
0
5
10
15
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
Apr	MS1	3
Apr	MS10	4
Apr	MS2	6
Apr	MS3	7
Apr	MS4	2
Apr	MS5	5
Apr	MS6	1
Apr	MS7	6
Apr	MS8	8
Apr	MS9	6
Jun	MS1	3
Jun	MS10	4
Jun	MS2	6
Jun	MS3	1
Jun	MS5	11
Jun	MS6	4
Jun	MS7	7
Jun	MS9	7
Sep	MS1	9
Sep	MS10	2
Sep	MS2	9
Sep	MS3	10
Sep	MS4	5
Sep	MS5	12
Sep	MS7	7
Sep	MS8	5
Sep	MS9	10

Nighlty 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	Apr	Jun	Sep
Brown long-eared	MS1	0.1	0.0	0.1
Brown long-eared	MS10	0.4	0.0	0.1
Brown long-eared	MS2	0.2	0.0	0.1
Brown long-eared	MS3	0.0	0.0	0.0
Brown long-eared	MS4	0.4	NA	0.3
Brown long-eared	MS5	0.0	0.0	0.2
Brown long-eared	MS6	0.1	0.0	NA
Brown long-eared	MS7	0.2	0.0	0.2
Brown long-eared	MS8	0.3	NA	0.1
Brown long-eared	MS9	0.1	0.0	0.5
Common pipistrelle	MS1	0.0	0.3	0.2
Common pipistrelle	MS10	0.0	0.0	0.1
Common pipistrelle	MS2	0.0	0.2	0.5
Common pipistrelle	MS3	0.1	4.6	1.0
Common pipistrelle	MS4	0.0	NA	1.0
Common pipistrelle	MS5	0.7	0.2	0.3
Common pipistrelle	MS6	0.2	0.2	NA
Common pipistrelle	MS7	0.0	0.0	0.2
Common pipistrelle	MS8	0.1	NA	3.3
Common pipistrelle	MS9	0.1	0.7	0.3
Myotis	MS1	0.0	0.0	0.0
Myotis	MS10	0.0	0.2	0.1
Myotis	MS2	0.0	0.1	0.0
Myotis	MS3	0.0	0.0	0.1
Myotis	MS4	0.0	NA	0.2
Myotis	MS5	0.0	3.6	0.2
Myotis	MS6	0.0	0.1	NA
Myotis	MS7	0.0	0.2	0.2
Myotis	MS8	0.0	NA	0.0
Myotis	MS9	0.0	0.0	0.0
Soprano pipistrelle	MS1	0.0	0.0	0.0
Soprano pipistrelle	MS10	0.0	0.0	0.0
Soprano pipistrelle	MS2	0.0	0.0	0.0
Soprano pipistrelle	MS3	0.0	0.0	0.0
Soprano pipistrelle	MS4	0.0	NA	0.0
Soprano pipistrelle	MS5	0.0	0.0	0.0

Species	Detector ID	Apr	Jun	Sep
Soprano pipistrelle	MS6	0.0	0.0	NA
Soprano pipistrelle	MS7	0.0	0.0	0.1
Soprano pipistrelle	MS8	0.0	NA	0.0
Soprano pipistrelle	MS9	0.0	0.0	0.0

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.

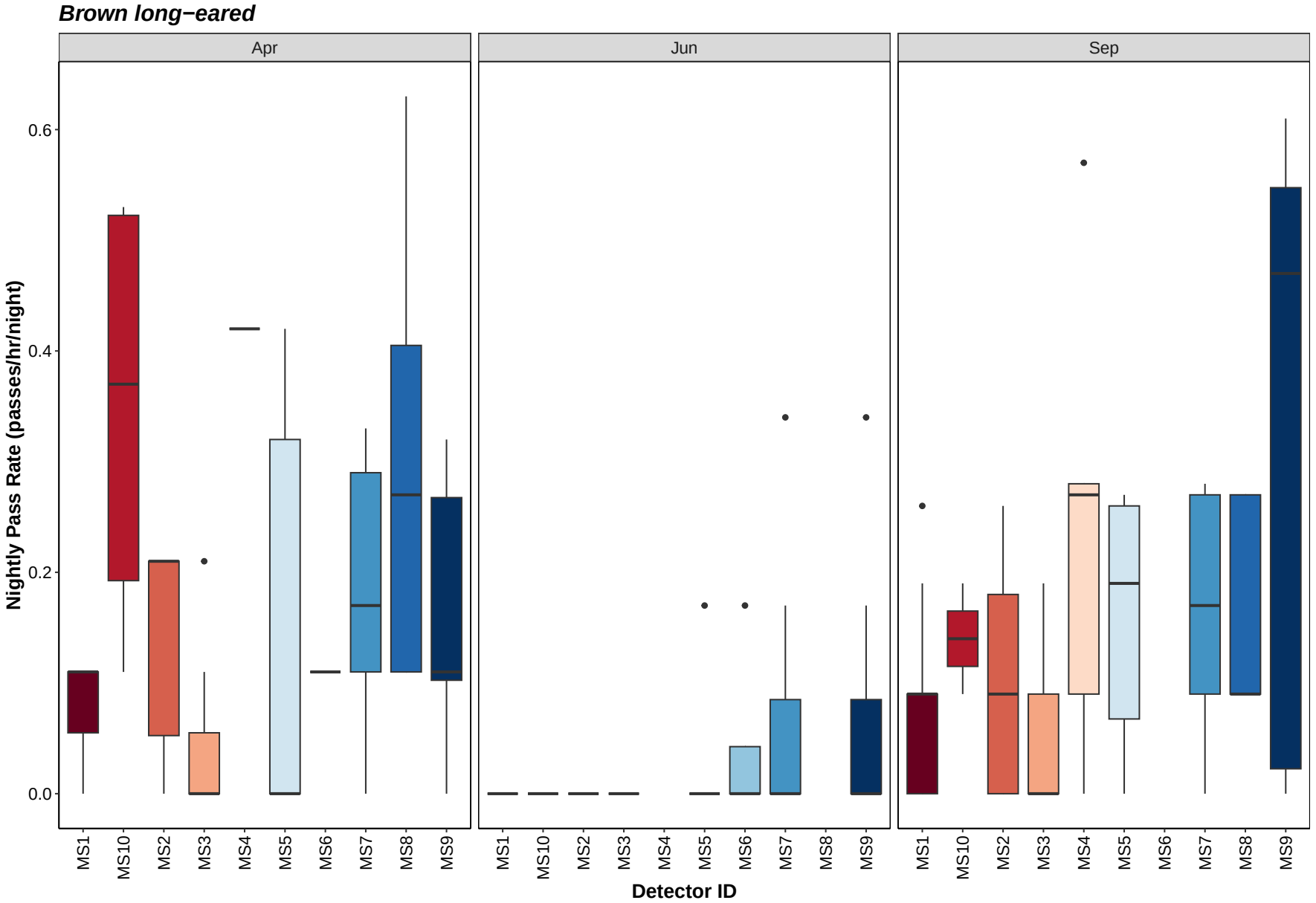
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

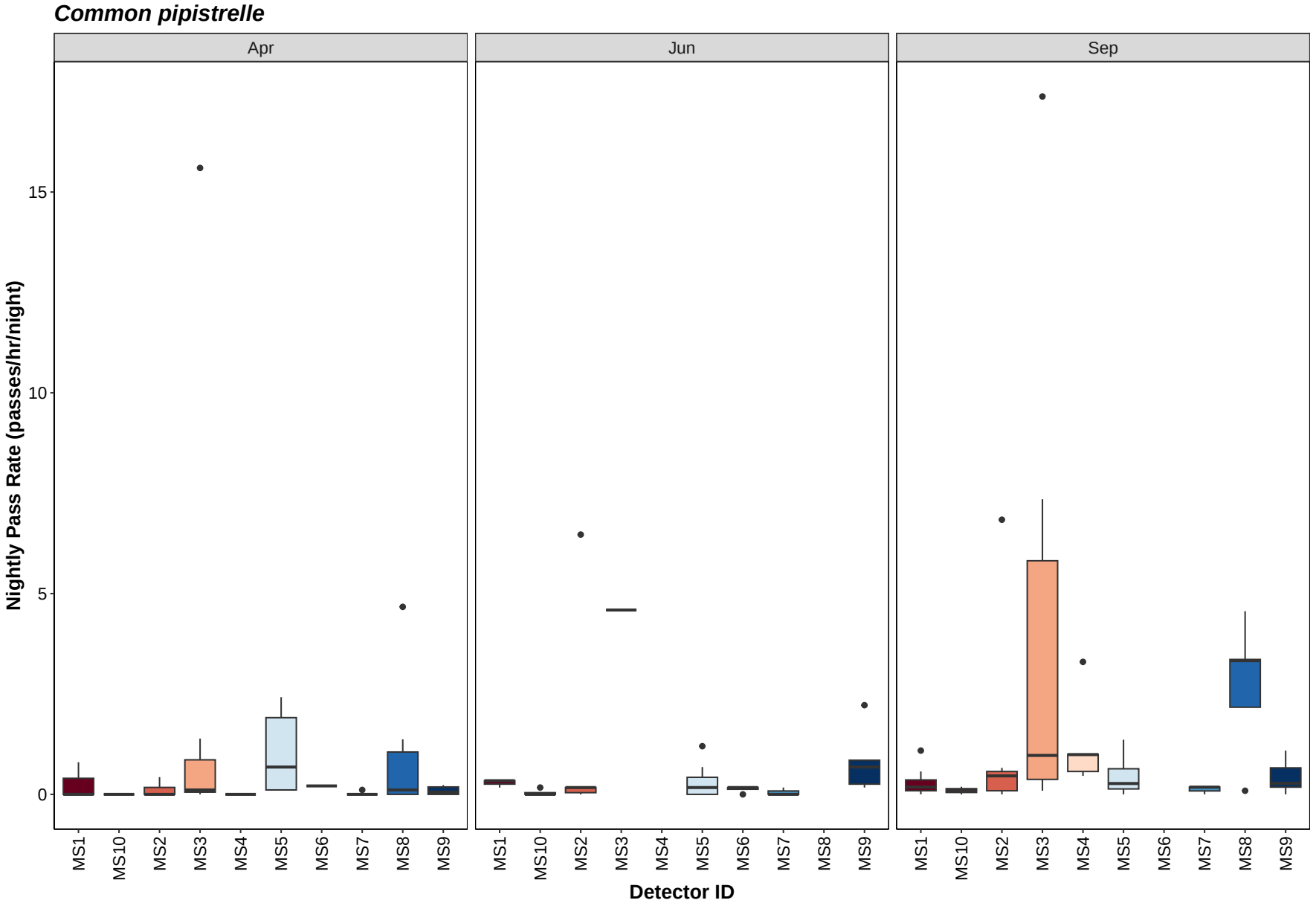
Species	Detector ID	Apr	Jun	Sep
Brown long-eared	MS1	0.1	0.0	0.1
Brown long-eared	MS10	0.3	0.0	0.1
Brown long-eared	MS2	0.1	0.0	0.1
Brown long-eared	MS3	0.0	0.0	0.0
Brown long-eared	MS4	0.4	NA	0.2
Brown long-eared	MS5	0.1	0.0	0.2
Brown long-eared	MS6	0.1	0.0	NA
Brown long-eared	MS7	0.2	0.1	0.2
Brown long-eared	MS8	0.3	NA	0.2
Brown long-eared	MS9	0.2	0.1	0.3
Common pipistrelle	MS1	0.3	0.3	0.3
Common pipistrelle	MS10	0.0	0.0	0.1
Common pipistrelle	MS2	0.1	1.2	1.1
Common pipistrelle	MS3	2.5	4.6	3.6
Common pipistrelle	MS4	0.0	NA	1.3
Common pipistrelle	MS5	1.0	0.3	0.4
Common pipistrelle	MS6	0.2	0.1	NA
Common pipistrelle	MS7	0.0	0.0	0.1
Common pipistrelle	MS8	0.9	NA	2.7
Common pipistrelle	MS9	0.1	0.8	0.4
Myotis	MS1	0.0	0.0	0.0
Myotis	MS10	0.0	0.2	0.1
Myotis	MS2	0.0	0.1	0.0
Myotis	MS3	0.0	0.0	0.1
Myotis	MS4	0.0	NA	0.1
Myotis	MS5	0.0	3.2	0.5
Myotis	MS6	0.0	0.1	NA
Myotis	MS7	0.0	0.2	0.2
Myotis	MS8	0.0	NA	0.0
Myotis	MS9	0.0	0.0	0.0
Soprano pipistrelle	MS1	0.0	0.0	0.0
Soprano pipistrelle	MS10	0.0	0.0	0.0
Soprano pipistrelle	MS2	0.0	0.0	0.0
Soprano pipistrelle	MS3	0.0	0.0	0.1
Soprano pipistrelle	MS4	0.0	NA	0.2
Soprano pipistrelle	MS5	0.0	0.0	0.0

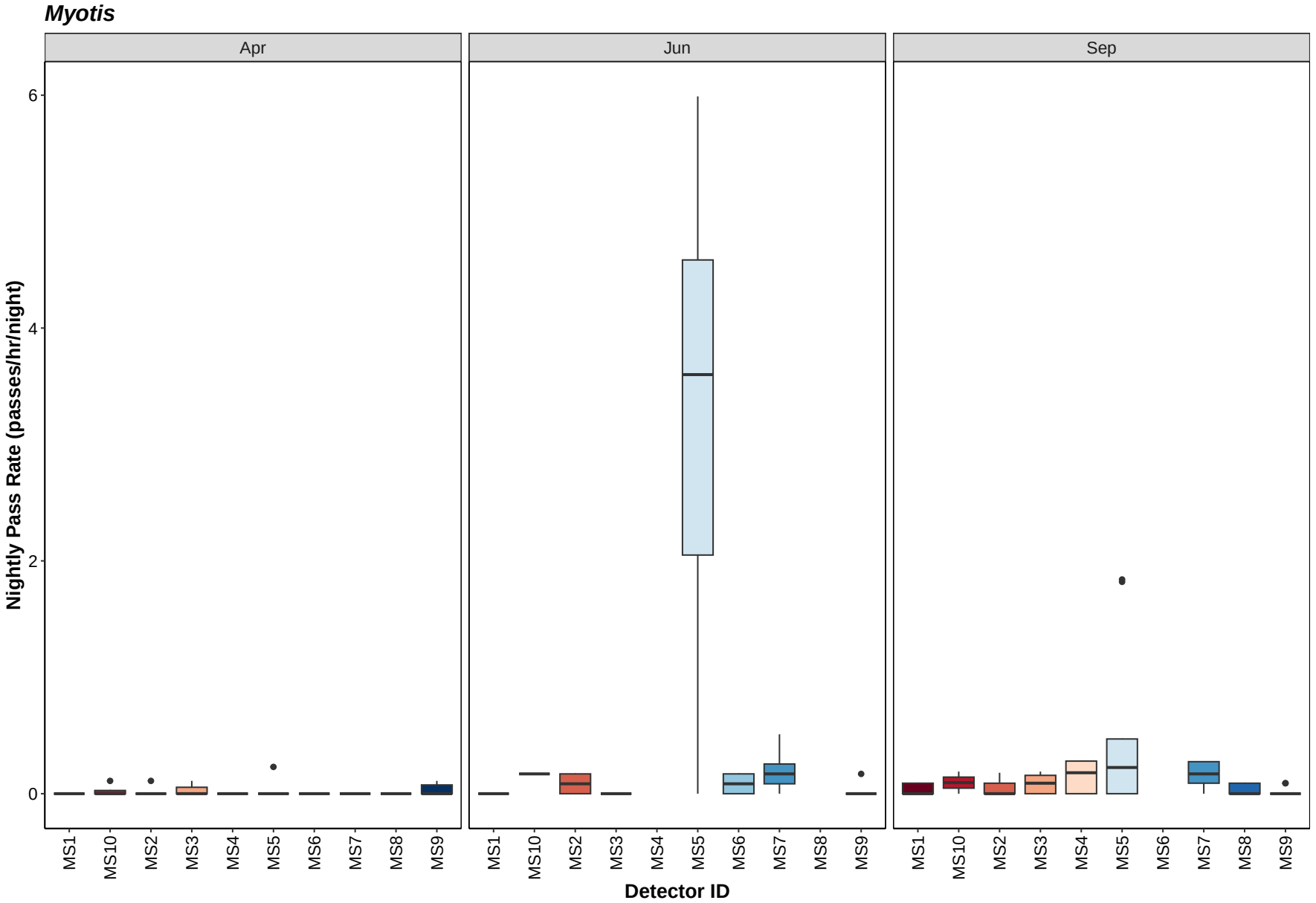
Species	Detector ID	Apr	Jun	Sep
Soprano pipistrelle	MS6	0.0	0.0	NA
Soprano pipistrelle	MS7	0.0	0.0	0.1
Soprano pipistrelle	MS8	0.0	NA	0.1
Soprano pipistrelle	MS9	0.0	0.0	0.0

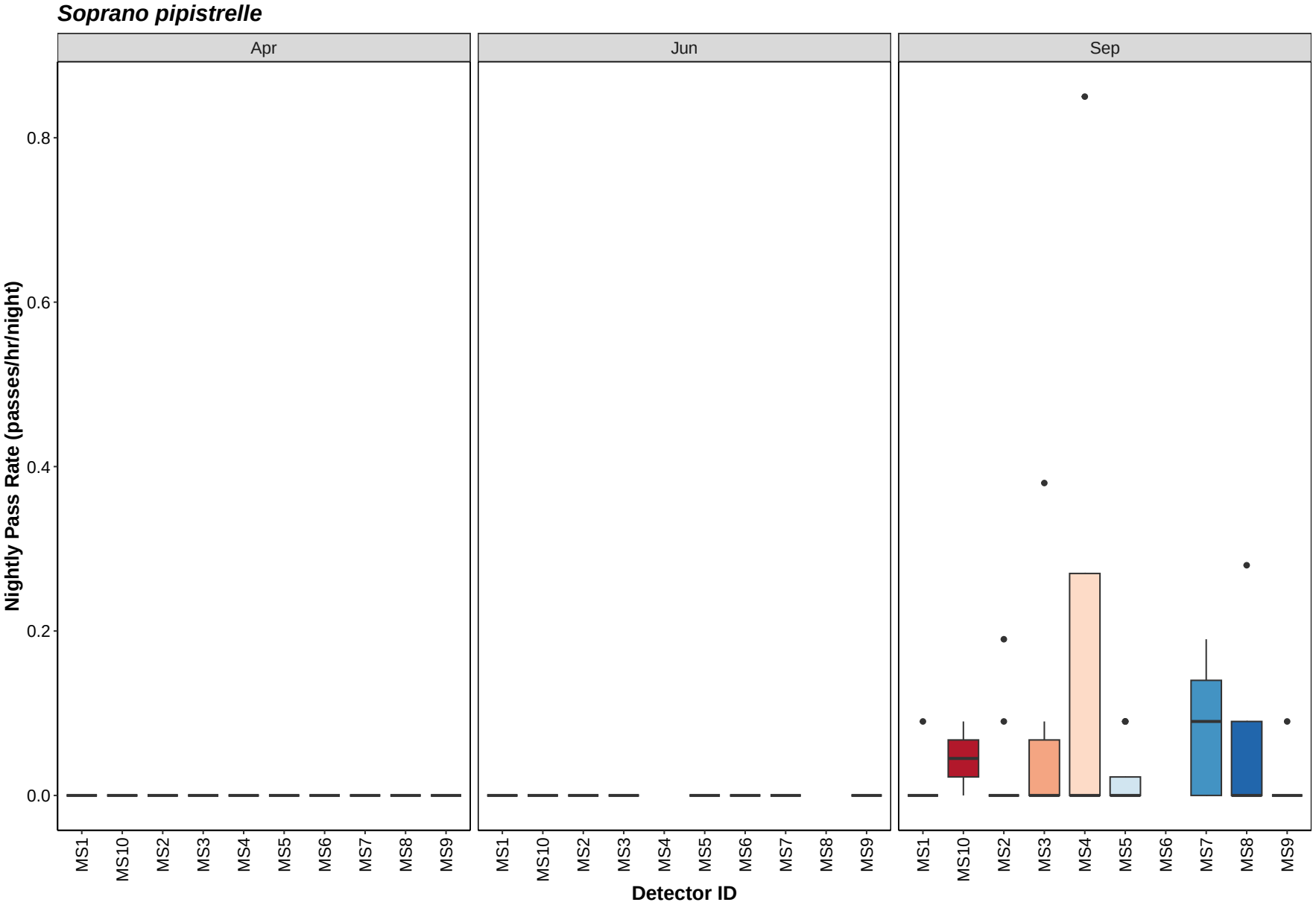
Per Detector

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.


Brown long−eared
Apr
Jun
Sep
Nightly Pass Rate (passes/hr/night)
0.0
0.2
0.4
0.6
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID


Common pipistrelle
Apr
Jun
Sep
Nightly Pass Rate (passes/hr/night)
0
5
10
15
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID


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


Soprano pipistrelle
Apr
Jun
Sep
Nightly Pass Rate (passes/hr/night)
0.0
0.2
0.4
0.6
0.8
MS1
MS10
MS2
MS3
MS4
MS5
MS6
MS7
MS8
MS9
Detector ID

Bat Activity per Detector Location

Figure 18. Detector ID reference:

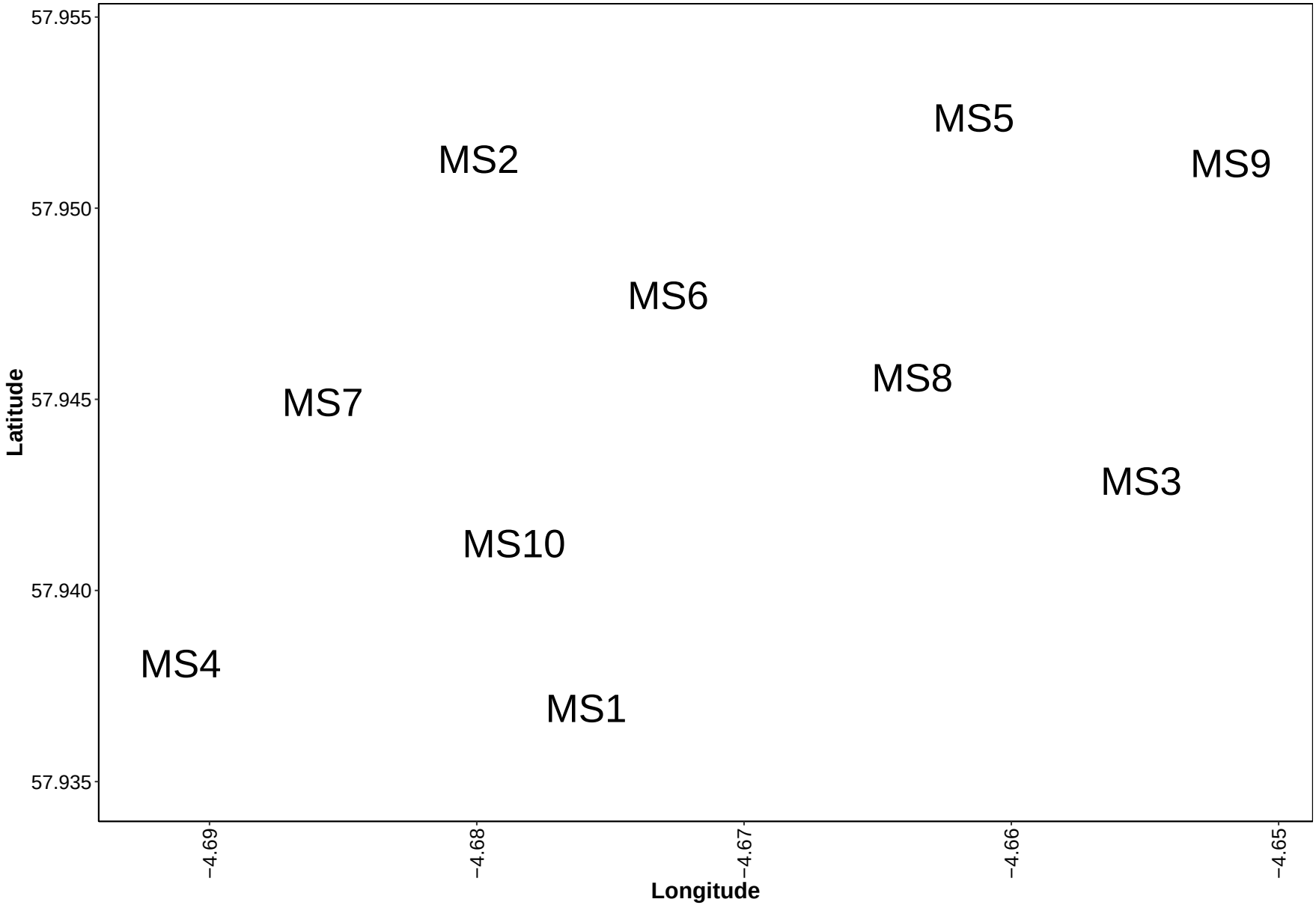

MS5
MS2
MS9
MS6
MS8
MS7
MS3
MS10
MS4
MS1
57.955
57.950
57.945
57.940
57.935
Latitude
−4.69
−4.68
−4.67
−4.66
−4.65
Longitude

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.

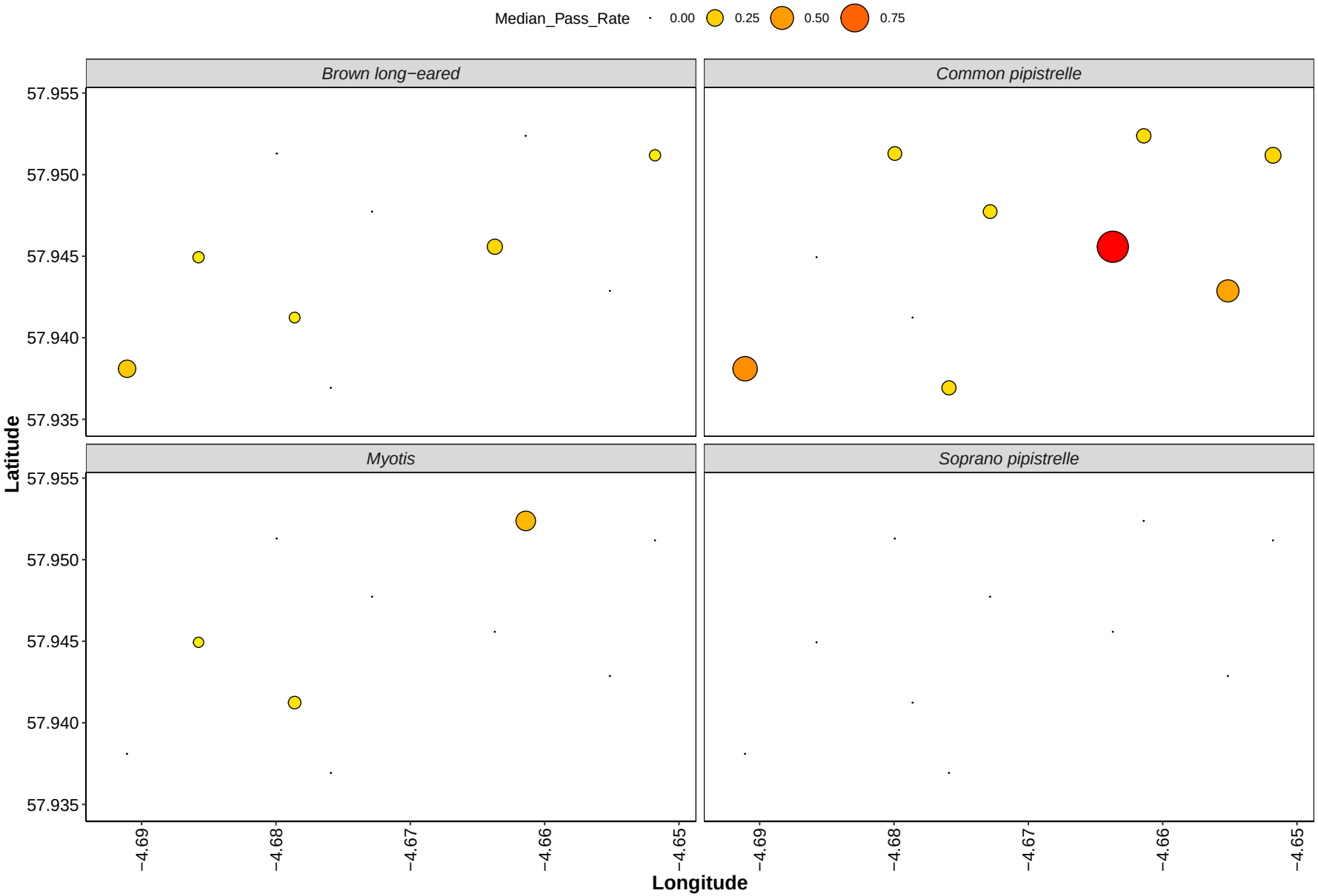
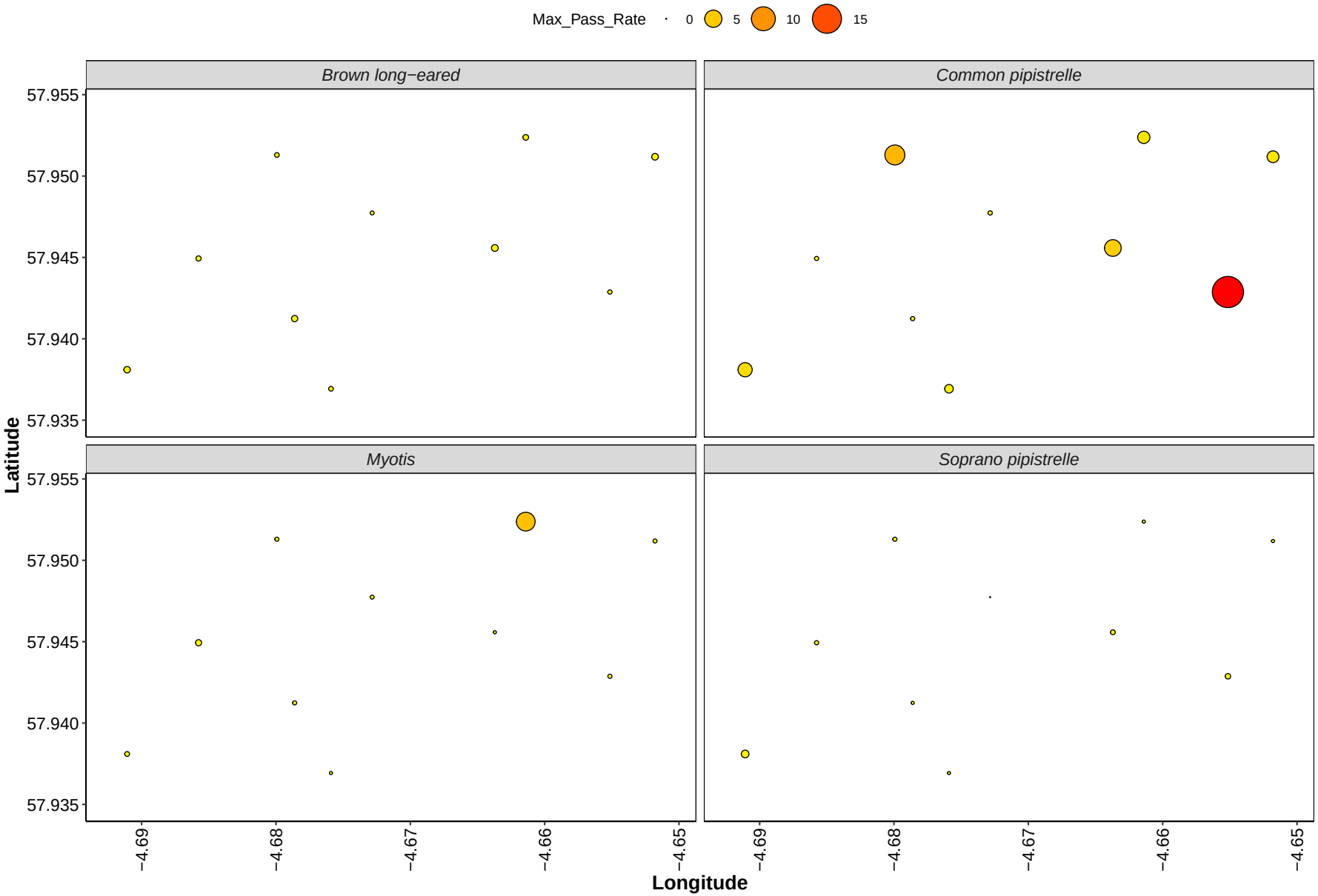

Median_Pass_Rate
0.00
0.25
0.50
0.75
Brown long−eared
Common pipistrelle
Myotis
Soprano pipistrelle
Latitude
57.955
57.950
57.945
57.940
57.935
−4.69
−4.68
−4.67
−4.66
−4.65
Longitude

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.


Max_Pass_Rate
0
5
10
15
Brown long−eared
Common pipistrelle
Myotis
Soprano pipistrelle
Latitude
57.955
57.950
57.945
57.940
57.935
−4.69
−4.68
−4.67
−4.66
−4.65
Longitude

Thank you for using Ecobat!