



Technical Appendix 7.3 Bat Survey Report

Glenouther Wind Farm EIA Report

Wind Power North Four Limited

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1.0 Introduction

This Technical Appendix relates to the Proposed Development as defined in **Chapter 4: Development Description** of the Environmental Impact Assessment (EIA) Report. The baseline conditions (drawn from desk-based sources only) and the effects of the Likely Grid Connection Route (as defined in **Chapter 4**) on Ecology is assessed in **Chapter 7: Ecology** of the EIA Report.

MacArthur Green (now SLR¹) was commissioned by the Wind Power North Four Limited (the Applicant) to carry out bat surveys at the Proposed Development located south of Corsehouse Reservoir, East Ayrshire.

Bat surveys included:

- desk study;
- a Daytime Bat Walkover (DBW) and Ground Level Tree Assessment (GLTA) (2024); and
- automated activity surveys (2024).

The aim of the surveys was to quantify Site usage by bats and variation in bat activity levels within the Site, and to inform the Ecological Impact Assessment (EclA) presented in **Chapter 7** of the EIA Report.

2.0 The Site and Survey Area

The Site is located at Glenouther Moor, south of Corsehouse reservoir and west of the M77 motorway. The closest settlement is Stewarton, approximately 4.5 km to the south-west and lies wholly within the East Ayrshire Council (EAC) administrative area.

The Site occupies an area of approximately 205 hectares (ha) (OS grid reference NS 48337 48922). The Site broadly slopes from north to south from approximately 230 m Above Ordnance Datum (AOD) to 210 AOD. The Site is within an area of privately owned commercial coniferous forest, with some small areas of open moorland and bog (see **Technical Appendix 7.1: National Vegetation Classification & Habitats Survey Report**).

The northern part of the Site drains towards the Annick Water and Corsehouse Reservoir. The southern part of the Site drains towards the Swinzie Burn, a tributary of the Annick Water. The Site is surrounded by residential properties and farmsteads which flank the B769 to the north/north-west, Clunch Road (minor road) to the south/south-west and the A77 to the east/south-east; however, all are at least 1.1 km from the turbines. The operational Whitelee Wind Farm and its Extensions, and Middleton and Neilston Community Wind Farms all lie within 5 km of the Site.

The Site does not overlap with any statutory or local designated sites containing bat related qualifying features.

The temporal (Anabat) survey area covered the Site and consisted of six Anabat deployment locations, as shown in **Figure 7.6**.

The DBW and GLTA surveys undertaken during May 2024 covered the Site, see **Figure 7.6**.

The Proposed Development and Site are fully described within **Chapter 3: Site Selection and Design Strategy** and **Chapter 4: Development Description**.

¹ Following acquisition, MacArthur Green Ltd became part of SLR Consulting Limited on 1 September 2025.



3.0 Bats and Wind Farms

3.1 Policy and Guidance

All bat species are protected under the following legislation:

- The Habitats Directive 92/43/EEC (as amended);
- The Wildlife and Countryside Act 1981 (as amended); and
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).

Details pertaining to the legal status of bats are included within **Annex A**.

In the UK and Europe, guidelines have been produced with regards to assessing the ecological impact upon bats from wind farm developments. These guidelines help to inform survey and mitigation strategies.

The following guidance documents have been used in the preparation of this report:

- Andrews, H. (2018). *Bat Roosts in Trees: a guide for identification and assessment for tree-care and ecology professionals*. Pelagic Publishing, Exeter;
- Collins, J. (ed.) (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 4th Edition. The Bat Conservation Trust, London;
- Reason, P.F. and Wray, S. (2025). *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats*. Version 1.2. Chartered Institute of Ecology and Environmental Management, Ampfield;
- Russ, J. (2012). *British Bat Calls, A Guide to Species Identification*. Pelagic Publishing, Exeter; and
- NatureScot, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT). (2021). *Bats and Onshore Wind Turbines: Survey Assessment and Mitigation*.

4.0 Methods

4.1 Desk-Based Assessment

A desk-based study was undertaken with regards to the presence of bat species within the Site and its environs.

A National Biodiversity Network (NBN)² Atlas Scotland search was completed to obtain bat records from 2010 to 2025 within 10 km of the Site.

4.2 Field Survey Methods

4.2.1 Daytime Bat Walkover

The DBW followed the assessment methodology as set out in Collins (2023) to observe, assess and record any habitats suitable for bats to roost, commute or forage. This involved surveyors recording any trees, buildings and structures that could be suitable for roosting bats. Suitability of Potential Roost Features (PRFs) in structures were assigned a value of low, moderate or high suitability which indicates the likelihood of bats being present and informs the requirement for further survey work, such as internal inspections and/or dusk bat

² NBN Atlas occurrence download at <https://nbnatlas.org> (Accessed: 16 February 2026).



activity surveys. Collins (2023) states the following descriptions for assessing PRFs in structures:

- Low – A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions³ and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity and not a classic cool/stable hibernation site, but could be used by individual hibernating bats⁴).
- Moderate – A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions³ and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the assessments are made irrespective of species conservation status, which is established after presence is confirmed).
- High – A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions³ and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/stable hibernation site.

4.2.2 Ground Level Tree Assessment

A GLTA was conducted for trees within the survey area and followed the assessment methodology as set out in Collins (2023). Any trees with PRFs were categorised as one of the following:

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

The DBW and GLTA surveys were carried out within the survey area in 2024, as shown in **Figure 7.6**.

4.2.3 Automated Activity Surveys

NatureScot *et al.* (2021) recommends that, “Where developments have more than ten turbines, detectors should be placed within the developable area at ten potential turbine locations plus a third of additional potential turbine sites up to a maximum of 40 detectors for the largest developments.”

The Site layout at the time of survey in 2024 included six proposed wind turbines. A six-turbine site requires six locations to be sampled. The six detectors were placed at, or in proximity to, potential wind turbine locations across the Site, deployed seasonally (three deployment periods) from April to September. NatureScot *et al.* (2021) also recommends a minimum of 10 consecutive nights of sampling per seasonal deployment. Detector locations are shown in **Figure 7.6**.

³ For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

⁴ Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.



Anabat Swift detectors recording full spectrum files were deployed for a minimum period of 14 consecutive nights across the Site (i.e. exceeding minimum survey requirements of 10 days per season; spring April - May, summer June - mid-August; autumn mid-August - October) and were positioned at a height of 2 m. Each detector recorded bats from dusk to dawn with detectors starting 30 minutes before dusk and finishing 30 minutes after dawn. Detector operating times and a description of the habitat type at each location shown in **Table 13 of Annex B**.

The Swift detector was deployed with the following settings:

- sensitivity value of 14;
- minimum frequency of 15 kHz;
- maximum frequency of 250 kHz;
- maximum file length of 15 s;
- minimum event of -2 ms; and
- sampling rate of 320 kHz.

Data was analysed using Kaleidoscope Pro Auto ID classifier which assigns a species label to a sound file (Reason *et al.*, 2025). To ensure that all bat calls (with the exception of common and soprano pipistrelle which were excluded) were identified correctly by the software, they were manually reviewed by an appropriately trained ecologist using Kaleidoscope Viewer. This method of analysis is in line with current guidelines for data analysis which recommends the manual checking of all non-Pipistrellus (excluding Nathusius' pipistrelle) calls when using automated methods (Collins, 2023). Sound files labelled as noise were reviewed. Guidance on call parameters was taken from Russ (2012).

For the purpose of this report and for Ecobat analysis, a single bat registration was classed as a single labelled Kaleidoscope file containing a sequence of bat pulses.

In line with NatureScot *et al.* (2021), further analysis of bat data was carried out using the secure online tool Ecobat (Mammal Society, 2024), to gain a measure of relative bat activity at the Site. Ecobat data was then evaluated in accordance with NatureScot *et al.* (2021) guidance to determine the overall Site risk level. The Ecobat analysis automatically analyses data per month and not per season. The results are presented based on this analysis per month.

4.3 Methods for Analysing Bat Activity

NatureScot *et al.* (2021) details the methodology for analysing bat activity levels. This method is summarised below and involves the following steps:

- 1 estimating bat activity levels;
- 2 categorising collision risk of the relevant species;
- 3 identifying population relevant abundance (size of the populations);
- 4 categorising the potential vulnerability of bat populations by combining collision risk with population abundance;
- 5 categorising the Site risk level;
- 6 completing the overall risk assessment; and
- 7 carrying out an assessment of significance and mitigation.

The following sections outline the methods used in each step.



4.3.1 Step 1: Bat Activity Levels

A measure of relative bat activity was obtained using the secure online tool Ecobat (Mammal Society, 2024) for automated data. NatureScot *et al.* (2021) explains that “*The tool compares data entered by the user with bat survey information collected from similar areas at the same time of year and in comparable weather conditions.... Ecobat generates a percentile rank for each night of activity and provides a numerical way of interpreting the levels of bat activity recorded at a site across regions in Britain*”. **Table 1** below, taken from NatureScot *et al.* (2021) shows the five percentile categories for ease of reference.

The reference range data set were stratified to include:

- only records from within +/- 1 month of the survey date; and
- only records from within the Region of the survey location.

Table 1: Percentile Score and Categorised Level of Bat Activity

Percentile Score	Bat Activity
81 to 100	High (5)
61 to 80	Moderate to High (4)
41 to 60	Moderate (3)
21 to 40	Low to Moderate (2)
0 to 20	Low (1)

4.3.2 Step 2: Vulnerability to Collision

Appendix 3 of NatureScot *et al.* (2021) presents a generic assessment of vulnerability to collision for UK species, based on species behaviour, flight characteristics and casualties in the UK and Europe. **Table 2** provides a summary of the vulnerability of each bat species to collision.

Table 2: Vulnerability of Bat Species to Turbine Impact in the UK

Table Heading	Table Heading	Table Heading
Low Risk	Medium Risk	High Risk
<i>Myotis</i> spp.	Serotine	Common pipistrelle
Long-eared bats	Barbastelle	Soprano pipistrelle
Horseshoe bats		Noctule
		Leisler's bat
		Nathusius' pipistrelle

Habitat characteristics at the location of wind turbines can have an important influence on the vulnerability of bat species to collision. For example, proximity to key feeding sites and commuting routes such as water features and woodland edge habitats is known to increase the likelihood of bat collision (NatureScot *et al.*, 2021).

4.3.3 Step 3: Population Relative Abundance

NatureScot *et al.* (2021) details the sensitivity of a bat species to impact based on their population's relative abundance in Scotland as detailed in **Table 3**. Species with the rarest relative abundance are more susceptible to significant effects.



Table 3: Population Relative Abundance of Bats in Scotland

Relative Abundance	Species
Common	Common pipistrelle (<i>Pipistrellus pipistrellus</i>)
	Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)
Rarer	Brown long-eared bat (<i>Plecotus auritus</i>)
	Daubenton's bat (<i>Myotis daubentonii</i>)
	Natterer's bat (<i>Myotis nattereri</i>)
Rarest	Whiskered bat (<i>Myotis mystacinus</i>)
	Brandt's bat (<i>Myotis brandtii</i>)
	Nathusius' pipistrelle (<i>Pipistrellus nathusii</i>)
	Noctule bat (<i>Nyctalus noctule</i>)
	Leisler's bat (<i>Nyctalus leisleri</i>)

4.3.4 Step 4: Potential Vulnerability of Bat Populations

Table 4, sourced from NatureScot *et al.* (2021), uses the measure of collision risk, in combination with population relative abundance, to indicate the potential vulnerability of populations of British bat species. The overall potential vulnerability of bat populations is identified as: low (yellow), medium (orange), high (red).

Table 4: Level of Potential Vulnerability of Populations of British Bat Species

Relative Abundance of Bats in Scotland		Collision Risk		
		Low collision risk	Medium collision risk	High collision risk
	Common species			Common pipistrelle Soprano pipistrelle
	Rarer species	Brown long-eared bat Daubenton's bat Natterer's bat		
	Rarest species	Whiskered bat Brandt's bat		Nathusius' pipistrelle Noctule bat Leisler's bat

4.3.5 Step 5: Categorise the Site Risk Level

The Site risk level is categorised through a combination of habitat risk and project size which is then entered into the table matrix as shown below in **Table 5** to calculate the overall Site risk level. The full matrix table, as provided within NatureScot *et al.* (2021), is shown in **Annex C** of this report which includes descriptions on how to determine the habitat risk and project size for the Site.

Table 5: Initial Site Risk Assessment

Habitat Risk		Project Size		
		Small	Medium	Large
	Low			



	Moderate			
	High			

Key: Green (1-2) – low/lowest site risk; Amber (3) – medium site risk; Red (4-5) – high/highest site risk*

* Some sites could conceivably be assessed as being of no (0) risk to bats. This assessment is only likely to be valid in more extreme environments, such as above the known altitudinal range of bats, or outside the known geographical distribution of any resident British species.

4.3.6 Step 6: Risk Assessment

The overall risk assessment is undertaken for high collision risk species identified onsite and involves combining Site risk level (**Table 5**) with the Ecobat activity level (**Table 1**). The overall risk assessment matrix is shown in **Table 6** below where 'Low' Site risk level (green) is 0-4, 'Medium' Site risk level (amber) is 5-12, and 'High' Site risk level (red) is 15-25.

Table 6: Overall Risk Assessment

		Ecobat Activity Category (or equivalent justified categorisation)					
		Nil (0)	Low (1)	Low-Moderate (2)	Moderate (3)	Moderate-High (4)	High (5)
Site Risk Level	Lowest (1)	0	1	2	3	4	5
	Low (2)	0	2	4	6	8	10
	Medium (3)	0	3	6	9	12	15
	High (4)	0	4	8	12	15	18
	Highest (5)	0	5	10	15	20	25

4.3.7 Step 7: Assessment of Significance and Mitigation

The outputs of the risk assessment detailed in Step 6 above are then used to assess the significance of effect within the EcIA. At this stage, other Site-specific factors should be considered such as habitat characteristics (and how they may change), behaviour of species at the Site, and location of the Site regarding the natural range of the species and how this could affect favourable conservation status.

Mitigation measures as detailed within NatureScot *et al.* (2021) are then considered where appropriate.

5.0 Bat Survey Limitations

The guidance recommends the minimum level of pre-application survey required for ground level static detectors to be 10 nights of recordings in each of spring (April - May), summer (June to mid-August) and autumn (Mid-August to October). Ground-level automated activity surveys commenced in April and were completed in September.

Automated activity surveys should capture a sufficient number of nights (minimum of 10 nights) with appropriate weather conditions for bat activity (i.e., temperatures of on or above 8 °C in Scotland at dusk, maximum ground level wind speed of 5 m/s and no, or only very light, rainfall) (NatureScot *et al.*, 2021). To account for the potential limitations of weather on the number of suitable nights recorded, surveys were carried out over longer deployment periods, with a minimum of 14 nights recorded.

The Ecobat analysis automatically analyses data per month and not per season. The results are presented based on analysis per month.



There were no unforeseen errors with the detectors, microphones or batteries, and so 14 consecutive nights of recordings were completed in each season. The survey timings are provided in **Annex B**.

Anabat detectors are a commonly used bat detector for acoustic monitoring at wind farm sites, however all bat detectors have limitations and will only monitor bat activity within a limited area, which for Anabats is usually around 30 m, depending on a variety of environmental factors. Furthermore, due to passive monitoring methodologies depending on sound reaching the microphone, the detection rate of bat calls varies with a bias towards loud bat calls, with quieter calls, namely brown long-eared bats (low collision risk species), potentially being under-recorded.

6.0 Survey Results and Analysis

6.1 Desk-Based Assessment

The NBN Atlas data search² returned records of the following bat species and genus within 10 km of the Site between 2010 - 2025 inclusive:

- Common pipistrelle;
- Daubenton's bat;
- Leisler's bat;
- Natterer's bat; and
- Soprano pipistrelle.

Details regarding licences and data providers for these records are included in **Table 7**.

Table 7: Data Providers for NBN Atlas Scotland Records Used

Species	Data Provider	Licence
Common pipistrelle	Bat Conservation Trust (BCT) (Karen McCaffrey), NatureScot (Southern Scotland Bat Survey)	OGL ⁵
Daubenton's	NatureScot (Southern Scotland Bat Survey)	OGL
Leisler's	NatureScot (Southern Scotland Bat Survey)	OGL
Natterer's	NatureScot (Southern Scotland Bat Survey)	OGL
Soprano pipistrelle	BCT, NatureScot (Southern Scotland Bat Survey, Kieran Jones)	OGL

6.2 Daytime Bat Walkover and Ground Level Tree Assessment

The DBW and GLTA survey was undertaken in May 2024. No features with suitability for roosting bats were recorded during these surveys.

6.3 Automated Activity Surveys

MacArthur Green (now SLR) deployed detectors at six locations within the Site from April to September in 2024 over a total period of 42 days and collecting 252 complete recording nights of data, see **Table 13** within **Annex B** and **Figure 7.6**.

⁵ Open Government Licence (OGL). Available at: <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/> (Accessed: 16 February 2026).



Between April to September, bats were detected on 39 of the 42 nights. A total of six bat species and one genus classification were recorded for these locations. The total number of passes recorded for each species across all the detectors within the Site is shown in **Table 8**.

Table 8: Total number of Bat Passes for Each Species Across all Locations

Species/Species Group	No of Registrations	Percentage of total (%)
Soprano pipistrelle	5131	77.9
Common pipistrelle	1022	15.5
Nathusius' pipistrelle	7	0.1
<i>Nyctalus</i> spp.	145	2.2
Daubenton's	169	2.6
Natterer's	110	1.7
Brown long-eared	2	<0.01
Total	6586	100

The survey results were processed using the Ecobat tool (Mammal Society, 2024) to gain a measure of relative bat activity at the Site, the full Ecobat Report is appended in **Annex E**. The summarised results and analysis are presented in Steps 1 – 6 below.

6.3.1 Step 1: Bat Activity Levels

6.3.1.1 Average Annual Site Activity

Table 9 and **Chart 1** detail the average annual Site activity levels calculated using the Ecobat tool (Mammal Society, 2024).

The median percentile represents the most frequent activity category and the 'typical' bat activity levels in the Site; the maximum percentile can be used to help interpret if there are unusually high levels or important peaks of bat activity. The reference range is the number of nights for each species that the data was compared to (a reference range of 200+ is recommended to be confident in the relative activity level).

Table 9: Average Annual Site Activity Levels (taken from Ecobat Analysis⁶)

Species/Group	Median Percentile	Activity Level	95% CIs*	Maximum Percentile	Activity Level	Reference Range	Nights Recorded (out of 252)
Daubenton's	19	Low	5 – 31.5	68	Moderate – High	855	74
Natterer's	23	Low – Moderate	31 – 53.5	68	Moderate – High	304	62
<i>Nyctalus</i> spp.	2	Low	3.5 – 8	41	Moderate	3846	66
Nathusius' pipistrelle	71	Moderate - High	71 – 71	100	High	7	6

⁶ Taken from Ecobat analysis report created on the 26/03/2025 from static activity data of the Site in 2024 – see **Annex E**.



Species/ Group	Median Percentile	Activity Level	95% CIs*	Maximum Percentile	Activity Level	Reference Range	Nights Recorded (out of 252)
Common pipistrelle	1	Low	2 – 8	14	Low	38592	120
Soprano pipistrelle	4	Low	9 – 20	29	Low – Moderate	45590	158
Brown long- eared	52	Moderate	52 – 52	52	Moderate	117	2

*CIs: confidence intervals.

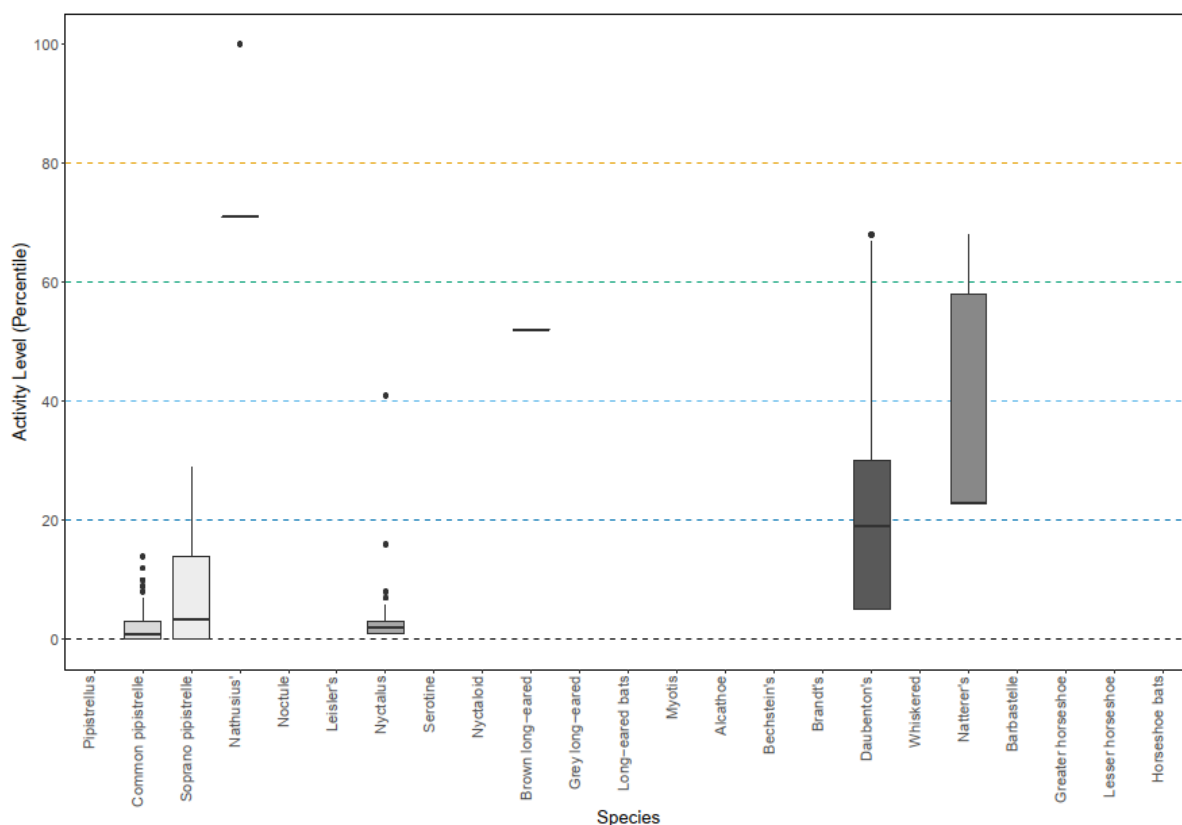


Chart 1: Average Annual Site Activity Levels

6.3.1.2 Monthly Location Specific Activity Levels

Data on the monthly activity levels per location is provided in **Table 15** in **Annex D**.

6.3.2 Step 2, 3 and 4: Collision Risk, Population Relative Abundance and Potential Vulnerability

Table 10 details the collision risk, population relative abundance and potential vulnerability of the bat species recorded within the Site.



Table 10: Collision Risk, Population Relative Abundance and Potential Vulnerability

Bat Species	Collision Risk	Population Relative Abundance	Potential Vulnerability
Common pipistrelle	High	Common	Medium
Soprano pipistrelle	High	Common	Medium
Nathusius' pipistrelle	High	Rarest	High
<i>Nyctalus</i> spp.	High	Rarest	High
Natterer's	Low	Rarer	Low
Daubenton's	Low	Rarer	Low
Brown long-eared	Low	Rarer	Low

6.3.3 Step 5: Categorising Site Risk Level

The Site risk level is determined by project size and habitat risk (see **Table 5**). The Site currently consists of five proposed wind turbines that are over 50 m in height, and so falls within the 'Small' project size, as shown in **Table 5** and **Table 14** in **Annex C**.

In terms of habitat risk for bats, there are no buildings, structures, or trees with moderate and/or high bat roosting potential within 200 m plus the rotor radius of wind turbines. Foraging habitat quality and connectivity within this buffer area is moderate with several watercourses throughout the Site and forestry boundaries present, resulting in a habitat risk classification of 'Moderate' as shown in **Table 5** and **Table 14** in **Annex C**.

According to **Table 6** above, the 'Small' project size combined with a 'Moderate' habitat risk level results in an overall Site risk assessment of 'Low' (2).

6.3.4 Step 6: Risk Assessment – High Collision Risk Species Only

The overall risk assessment is undertaken for high collision risk species which were identified within the Site. Low-risk species have a low risk of collision with a wind turbine blade, so the effect of the Site on the local bat population would likely be negligible.

The overall risk assessment involves multiplying the Site's risk level (**Table 5**) with the median and the maximum Ecobat activity levels (**Table 1**) to calculate both the typical (median) Site risk level, and the maximum Site risk level.

Table 11 combines the seasonal data and summarises the overall risk assessment score for high-risk species based on the median and maximum percentiles for the Site. The overall Site risk scores for all high collision risk species based on the median percentiles were 'Low' (2) to 'Medium' (8). For the maximum percentiles, 'Low' (2 – 4) to 'Medium' (6 – 10) risk assessment scores were recorded. No 'High' Site risk scores were recorded for high collision risk bat species.

Table 11: Risk Assessment Scores Based on Median and Maximum Percentiles for High Collision Risk Species

Species	Risk Assessment Score based on Median Percentile	Risk Assessment Score based on Max. Percentile
Common pipistrelle	Low (2)	Low (2)
Soprano pipistrelle	Low (2)	Low (4)
Nathusius' pipistrelle	Medium (8)	Medium (10)
<i>Nyctalus</i> spp.	Low (2)	Medium (6)



Figures 7.7 to 7.10 illustrate the results of the median monthly risk assessment scores for high collision risk bat species recorded at the Site at each survey location, illustrating how bat activity and risk levels varies within the Site across the year and by species. This data is also presented in **Table 15** in **Annex D** which includes both the median and maximum monthly risk assessment scores. Further Site-specific discussion regarding each high-risk species is provided below.

6.3.4.1 Common Pipistrelle

As shown in **Figure 7.7**, analysis of the risk assessment scores for common pipistrelle, when based on the median percentile, indicate consistent levels of activity across the survey locations throughout the year, with all locations having a risk assessment score of 2 (i.e., Low overall risk) or 0 (no activity⁷), in each survey visit.

6.3.4.2 Soprano Pipistrelle

As shown in **Figure 7.8**, analysis of the risk assessment scores for soprano pipistrelle, when based on the median percentile, follow similar results as common pipistrelle, with consistent levels of activity across the survey locations throughout the year, with all locations having a risk assessment score of 2, 4 (Low overall risk) or 0 (no activity⁷), in each survey Visit. Peaks in bat activity in July and August⁸ with a risk assessment score of 4 at Location 6, indicating Low risk.

6.3.4.3 *Nyctalus* spp.

As shown in **Figure 7.9**, analysis of the risk assessment scores for *Nyctalus* spp., when based on the median percentile, indicate consistent levels of activity across the survey locations throughout the year, with all locations having a risk assessment score of 2 (Low overall risk) or 0 (no activity⁷), in each survey Visit.

6.3.4.4 *Nathusius' pipistrelle*

As shown in **Figure 7.10**, several of the survey locations recorded no *Nathusius' pipistrelle* activity throughout April and May⁹ (Locations 1 - 6), July (Locations 1 and 4 - 6), August (Locations 1 – 4 and 6) and September (Locations 1, 4 and 5). There were no risk assessment scores of Low or High. Peaks in bat activity were recorded at Locations 2 and 3 in July and September, and Location 6 in September, each with Medium risk assessment scores of 8, while Location 5 recorded the highest activity in August with a score of 10. Although several locations recorded a Medium risk assessment based on the median percentile, the reference range for *Nathusius' pipistrelle* was 7 (see **Table 9**). For a reliable result a reference range of 200 and above is recommended, therefore the result is treated with caution, particularly in light of the low number of *Nathusius' pipistrelle* registrations actually recorded as per **Table 8** (i.e., only 7 registrations (over 252 data nights) and 0.1 % of total bat passes). The highest risk assessment score (10) at Location 5 in August was situated roughly 281 m north from the nearest turbine (T2).

6.3.4.5 Summary

In summary, the Site risk level for the high collision risk species recorded is generally Low, with many instances of no activity (as per **Figures 7.7 - 7.10**). Medium risk assessment scores were occasional and sporadic, with these risk scores only being attributable to

⁷ No bat calls were recorded during the deployment period.

⁸ Visit 2 in summer was deployed over July and August.

⁹ Visit 1 in spring was deployed over April and May.



Nathusius' pipistrelle; however, as noted in **Section 6.3.4.4** these Medium risk scores have a low level of confidence. There were no High risk assessment scores being attributed to high collision species.

7.0 Proximity of Roost Sites Based on Activity Data

The Ecobat output includes an analysis of bat activity data at sample locations, referenced against the known roost emergence times for each high collision risk bat species (Russ, 2012). This indicates whether a roost site may be present in close proximity to a sample location. This data is presented on pages 53 to 61 of the Ecobat report in **Annex E**.

Bat activity at Locations 1, 4, 5 and 6 indicated the potential for nearby roost sites which recorded bat species during their known emergence time ranges, as detailed in **Annex E**. The number of bat call registrations ranged from 1 – 3. The peak of 3 (soprano pipistrelle) was recorded in May which is out with the maternity roost season (15 June to 30 July¹⁰). During the maternity roost season, only one call was recorded during known roost emergence times for high collision risk bat species, a Daubenton's bat at Location 5 (see page 62 of the Ecobat report in **Annex E**).

Given a lack of suitable roosting features within the site identified during the DBW and GLTA surveys (**Section 6.2**) and the small number of registrations recorded during known roost emergence times, it is unlikely that the Site provides anything more than incidental use by individual bats.

¹⁰ Ecobat report defines the maternity period between 15 June – 30 July.



8.0 References

Andrews, H. (2018). *Bat Roosts in Trees: a guide for identification and assessment for tree-care and ecology professionals*. Pelagic Publishing, Exeter.

Collins, J. (ed) (2023). *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 4th Edition. The Bat Conservation Trust, London. ISBN-978-1-7395126-0-6.

Mammal Society (2024). *Bat survey tools - Ecobat*. Available at:
<https://mammal.org.uk/current-research/bat-survey-tools>.

NatureScot, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT). (2021). *Bats and Onshore Wind Turbines: Survey Assessment and Mitigation*.

Reason, P.F. and Wray, S. (2025). *UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats*. Version 1.2. Chartered Institute of Ecology and Environmental Management, Ampfield;

Russ, J. (2012). *British Bat Calls: A Guide to species Identification*. Pelagic Publishing.



Annex A. Bats Legal Status

Information contained in this Annex is a summarised version of the legislation and should be read in conjunction with the appropriate legislation.

All bat species receive protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)¹¹.

For any wild bat species, it is an offence to deliberately or recklessly:

- capture, injure or kill a bat;
- harass a bat or group of bats;
- disturb a bat in a roost (any structure or place it uses for shelter or protection);
- disturb a bat while it is rearing or otherwise caring for its young;
- obstruct access to a bat roost or otherwise deny an animal use of a roost;
- disturb a bat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species;
- disturb a bat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young; and
- disturb a bat while it is migrating or hibernating.

It is also an offence to:

- damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly); and
- keep, transport, sell or exchange, or offer for sale or exchange any wild bat (or any part or derivative of one) obtained after 10 June 1994¹².

¹¹ Sections 39(1) – (3)

¹² Available at: <https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/protected-species-z-guide/protected-species-bats> (Accessed: 16 February 2026).

Table 12: Legal and Conservation Status of all UK Bats¹³

Species	Legislation / Convention													
	Bern Convention Appendix II	Bonn Convention Appendix II	WCA	Habitats Directive Annex IV	Habitats Directive Annex II	Habs Regs 1994 (as amended) Scotland	Conservation of Habs & Species Regs 2010	Conservation Regs (N Ireland) 1995	CROW Act 2000	NERC Act 2006	Wild Mammals Protection Act	UK BAP Priority species	IUCN Red List*	EUROBATS Agreement
Greater horseshoe bat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	LC	✓
Lesser horseshoe bat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	LC	✓
Daubenton's bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Natterer's bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Whiskered bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Brandt's bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Bechstein's bat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NT	✓
Alcathoe bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		DD	✓
Noctule	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	LC	✓
Leisler's bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Serotine	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Common pipistrelle	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Soprano pipistrelle	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	LC	✓
Nathusius' pipistrelle	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Brown long-eared bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	LC	✓
Grey long-eared bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓
Barbastelle	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NT	✓
Greater mouse-eared bat	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		LC	✓

*IUCN categories: LC is Least Concern, NT is Near Threatened, DD is Data deficient; see www.iucnredlist.org for more details.

¹³ Source: Bat Conservation Trust. Available at: http://www.bats.org.uk/pages/bats_and_the_law.html (Accessed: 16 February 2026).

Annex B. Survey Timings and Anabat Locations

Table 13: Description of Anabat Locations and Summary of Temporal Survey Effort

Location	Easting	Northing	Bearing	Habitat	Total Number of Complete Recording Nights		
					Visit 1 26/04/2024 – 10/05/2024	Visit 2 26/07/2024 – 09/08/2024	Visit 3 06/09/2024 – 20/09/2024
1	286364	617049	180	Within open centre of plantation, adjacent to plantation edge	14	14	14
2	286849	618133	190	Within plantation ride	14	14	14
3	287073	616142	120	Within plantation ride and around 67 m northwest from tributary to Swinzie Burn	14	14	14
4	287709	617214	100	Within plantation ride and around 89 m north from Swinzie Burn	14	14	14
5	290157	618004	140	Within open centre of plantation, adjacent to plantation edge	14	14	14
6	290494	617403	60	Within plantation ride and around 139 m southeast from tributary to Swinzie Burn	14	14	14
Total					252		

Annex C. Initial Site Risk Assessment

Table 14: Initial Site Risk Assessment¹⁴

Habitat Risk	Project Size			
		Small	Medium	Large
	Low	1	2	3
	Moderate	2	3	4
	High	3	4	5
Key: Green (1-2) – low/lowest site risk; Amber (3) – medium site risk; Red (4-5) – high/highest site risk* * Some sites could conceivably be assessed as being of no (0) risk to bats. This assessment is only likely to be valid in more extreme environments, such as above the known altitudinal range of bats, or outside the known geographical distribution of any resident British species.				
Habitat Risk	Description			
Low	Small number of potential roost features, of low quality. Low-quality foraging habitats that could be used by small numbers of foraging bats. Isolated site not connected to the wider landscape by prominent linear features.			
Moderate	Buildings, trees or other structures with moderate-high potential as roost sites on or near the site. Habitat could be used extensively by foraging bats. Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.			
High	Numerous suitable buildings, trees (particularly mature ancient woodland) or other structures with moderate-high potential as roost sites on or near the site, and/or confirmed roosts present close to or on the site. Extensive and diverse habitat mosaic of high quality for foraging bats. Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows. At/near edge of range and or an important flyway. Close to key roost and /or swarming.			
Project Size	Description			
Small	Small scale development (<10 turbines). No other wind energy developments within 10 km. Comprising turbines <50 m in height.			
Medium	Larger developments (between 10 and 40). May have some other wind development within 5 km. Comprising turbines 50 – 100 m in height.			
Large	Largest developments (>40 turbines) with other wind energy developments within 5 km. Comprising turbines >100 m in height.			

¹⁴ Sourced from: NatureScot, Natural England, Natural Resources Wales, Renewable UK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT). (2021). Bats and Onshore Wind Turbines: Survey Assessment and Mitigation.

Annex D. Monthly Location Specific Data

Table 15: Monthly Location Specific Data for High Collision Risk Species

Location ID	Species	Month	Median Percentile	Median Activity Category	Maximum Percentile	Maximum Activity Category	Site Risk	Overall Median Site Risk Score	Overall Median Category Score	Overall Maximum Site Risk Score	Overall Maximum Category Score
I1	<i>Nyctalus</i> spp.	May	3	Low	3	Low	2	2	Low	2	Low
I1	<i>Nyctalus</i> spp.	Jul	2	Low	3	Low	2	2	Low	2	Low
I1	<i>Nyctalus</i> spp.	Aug	2	Low	3	Low	2	2	Low	2	Low
I1	<i>Nyctalus</i> spp.	Sep	1	Low	1	Low	2	2	Low	2	Low
I1	Common pipistrelle	May	0	Low	0	Low	2	2	Low	2	Low
I1	Common pipistrelle	Jul	1	Low	1	Low	2	2	Low	2	Low
I1	Common pipistrelle	Aug	1	Low	2	Low	2	2	Low	2	Low
I1	Common pipistrelle	Sep	0	Low	0	Low	2	2	Low	2	Low
I1	Soprano pipistrelle	Apr	0	Low	0	Low	2	2	Low	2	Low
I1	Soprano pipistrelle	May	1	Low	1	Low	2	2	Low	2	Low
I1	Soprano pipistrelle	Jul	18	Low	21	Low-Moderate	2	2	Low	4	Low
I1	Soprano pipistrelle	Aug	13	Low	15	Low	2	2	Low	2	Low
I1	Soprano pipistrelle	Sep	1	Low	2	Low	2	2	Low	2	Low
I2	<i>Nyctalus</i> spp.	May	1	Low	1	Low	2	2	Low	2	Low
I2	<i>Nyctalus</i> spp.	Jul	1	Low	3	Low	2	2	Low	2	Low
I2	<i>Nyctalus</i> spp.	Aug	2	Low	3	Low	2	2	Low	2	Low
I2	<i>Nyctalus</i> spp.	Sep	1	Low	1	Low	2	2	Low	2	Low
I2	Nathusius's pipistrelle	Jul	71	Moderate-High	71	Moderate-High	2	8	Medium	8	Medium
I2	Nathusius's pipistrelle	Sep	71	Moderate-High	71	Moderate-High	2	8	Medium	8	Medium
I2	Common pipistrelle	May	0	Low	0	Low	2	2	Low	2	Low
I2	Common pipistrelle	Jul	7	Low	10	Low	2	2	Low	2	Low

Location ID	Species	Month	Median Percentile	Median Activity Category	Maximum Percentile	Maximum Activity Category	Site Risk	Overall Median Site Risk Score	Overall Median Category Score	Overall Maximum Site Risk Score	Overall Maximum Category Score
I2	Common pipistrelle	Aug	3	Low	10	Low	2	2	Low	2	Low
I2	Common pipistrelle	Sep	1	Low	1	Low	2	2	Low	2	Low
I2	Soprano pipistrelle	May	1	Low	1	Low	2	2	Low	2	Low
I2	Soprano pipistrelle	Jul	18	Low	29	Low-Moderate	2	2	Low	4	Low
I2	Soprano pipistrelle	Aug	14	Low	29	Low-Moderate	2	2	Low	4	Low
I2	Soprano pipistrelle	Sep	4	Low	8	Low	2	2	Low	2	Low
I3	<i>Nyctalus</i> spp.	May	1	Low	1	Low	2	2	Low	2	Low
I3	<i>Nyctalus</i> spp.	Jul	3	Low	6	Low	2	2	Low	2	Low
I3	<i>Nyctalus</i> spp.	Aug	1	Low	41	Moderate	2	2	Low	6	Medium
I3	<i>Nyctalus</i> spp.	Sep	1	Low	1	Low	2	2	Low	2	Low
I3	Nathusius's pipistrelle	Jul	71	Moderate-High	71	Moderate-High	2	8	Medium	8	Medium
I3	Nathusius's pipistrelle	Sep	71	Moderate-High	71	Moderate-High	2	8	Medium	8	Medium
I3	Common pipistrelle	May	0	Low	0	Low	2	2	Low	2	Low
I3	Common pipistrelle	Jul	4	Low	12	Low	2	2	Low	2	Low
I3	Common pipistrelle	Aug	3	Low	12	Low	2	2	Low	2	Low
I3	Common pipistrelle	Sep	1	Low	1	Low	2	2	Low	2	Low
I3	Soprano pipistrelle	May	0	Low	0	Low	2	2	Low	2	Low
I3	Soprano pipistrelle	Jul	14	Low	21	Low-Moderate	2	2	Low	4	Low
I3	Soprano pipistrelle	Aug	9	Low	14	Low	2	2	Low	2	Low
I3	Soprano pipistrelle	Sep	0	Low	1	Low	2	2	Low	2	Low
I4	<i>Nyctalus</i> spp.	May	1	Low	1	Low	2	2	Low	2	Low
I4	<i>Nyctalus</i> spp.	Jul	3	Low	6	Low	2	2	Low	2	Low
I4	<i>Nyctalus</i> spp.	Aug	3	Low	4	Low	2	2	Low	2	Low
I4	<i>Nyctalus</i> spp.	Sep	1	Low	1	Low	2	2	Low	2	Low
I4	Common pipistrelle	Apr	0	Low	0	Low	2	2	Low	2	Low

Locat ion ID	Species	Month	Median Percentile	Median Activity Category	Maximum Percentile	Maximum Activity Category	Site Risk	Overall Median Site Risk Score	Overall Median Category Score	Overall Maximum Site Risk Score	Overall Maximum Category Score
I4	Common pipistrelle	May	0	Low	1	Low	2	2	Low	2	Low
I4	Common pipistrelle	Jul	5	Low	9	Low	2	2	Low	2	Low
I4	Common pipistrelle	Aug	1	Low	7	Low	2	2	Low	2	Low
I4	Common pipistrelle	Sep	0	Low	1	Low	2	2	Low	2	Low
I4	Soprano pipistrelle	Apr	0	Low	0	Low	2	2	Low	2	Low
I4	Soprano pipistrelle	May	0	Low	0	Low	2	2	Low	2	Low
I4	Soprano pipistrelle	Jul	13	Low	26	Low-Moderate	2	2	Low	4	Low
I4	Soprano pipistrelle	Aug	18	Low	18	Low	2	2	Low	2	Low
I4	Soprano pipistrelle	Sep	2	Low	8	Low	2	2	Low	2	Low
I5	<i>Nyctalus</i> spp.	May	7	Low	7	Low	2	2	Low	2	Low
I5	<i>Nyctalus</i> spp.	Jul	4	Low	8	Low	2	2	Low	2	Low
I5	<i>Nyctalus</i> spp.	Aug	7	Low	16	Low	2	2	Low	2	Low
I5	<i>Nyctalus</i> spp.	Sep	1	Low	1	Low	2	2	Low	2	Low
I5	Nathusius's pipistrelle	Aug	100	High	100	High	2	10	Medium	10	Medium
I5	Common pipistrelle	Apr	0	Low	0	Low	2	2	Low	2	Low
I5	Common pipistrelle	May	0	Low	2	Low	2	2	Low	2	Low
I5	Common pipistrelle	Jul	6	Low	10	Low	2	2	Low	2	Low
I5	Common pipistrelle	Aug	3	Low	14	Low	2	2	Low	2	Low
I5	Common pipistrelle	Sep	1	Low	1	Low	2	2	Low	2	Low
I5	Soprano pipistrelle	Apr	0	Low	0	Low	2	2	Low	2	Low
I5	Soprano pipistrelle	May	1	Low	3	Low	2	2	Low	2	Low
I5	Soprano pipistrelle	Jul	15	Low	22	Low-Moderate	2	2	Low	4	Low
I5	Soprano pipistrelle	Aug	14	Low	27	Low-Moderate	2	2	Low	4	Low
I5	Soprano pipistrelle	Sep	2	Low	17	Low	2	2	Low	2	Low
I6	<i>Nyctalus</i> spp.	May	1	Low	1	Low	2	2	Low	2	Low

Location ID	Species	Month	Median Percentile	Median Activity Category	Maximum Percentile	Maximum Activity Category	Site Risk	Overall Median Site Risk Score	Overall Median Category Score	Overall Maximum Site Risk Score	Overall Maximum Category Score
I6	<i>Nyctalus</i> spp.	Jul	3	Low	3	Low	2	2	Low	2	Low
I6	<i>Nyctalus</i> spp.	Aug	3	Low	3	Low	2	2	Low	2	Low
I6	Nathusius's pipistrelle	Sep	71	Moderate-High	71	Moderate-High	2	8	Medium	8	Medium
I6	Common pipistrelle	May	0	Low	0	Low	2	2	Low	2	Low
I6	Common pipistrelle	Jul	5	Low	7	Low	2	2	Low	2	Low
I6	Common pipistrelle	Aug	0	Low	5	Low	2	2	Low	2	Low
I6	Common pipistrelle	Sep	1	Low	1	Low	2	2	Low	2	Low
I6	Soprano pipistrelle	Apr	0	Low	0	Low	2	2	Low	2	Low
I6	Soprano pipistrelle	May	1	Low	3	Low	2	2	Low	2	Low
I6	Soprano pipistrelle	Jul	26	Low-Moderate	27	Low-Moderate	2	4	Low	4	Low
I6	Soprano pipistrelle	Aug	21	Low-Moderate	22	Low-Moderate	2	4	Low	4	Low
I6	Soprano pipistrelle	Sep	3	Low	4	Low	2	2	Low	2	Low

Annex E. Ecobat Report



Making Sustainability Happen



Ecobat Report

2025-03-26

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

Summary

Bats were detected on **39** nights between **26/04/2024** and **19/09/2024**, using **6** static bat detectors. Throughout this period, **7** species were recorded. **Table 1.**
Detectors were placed at the following locations:

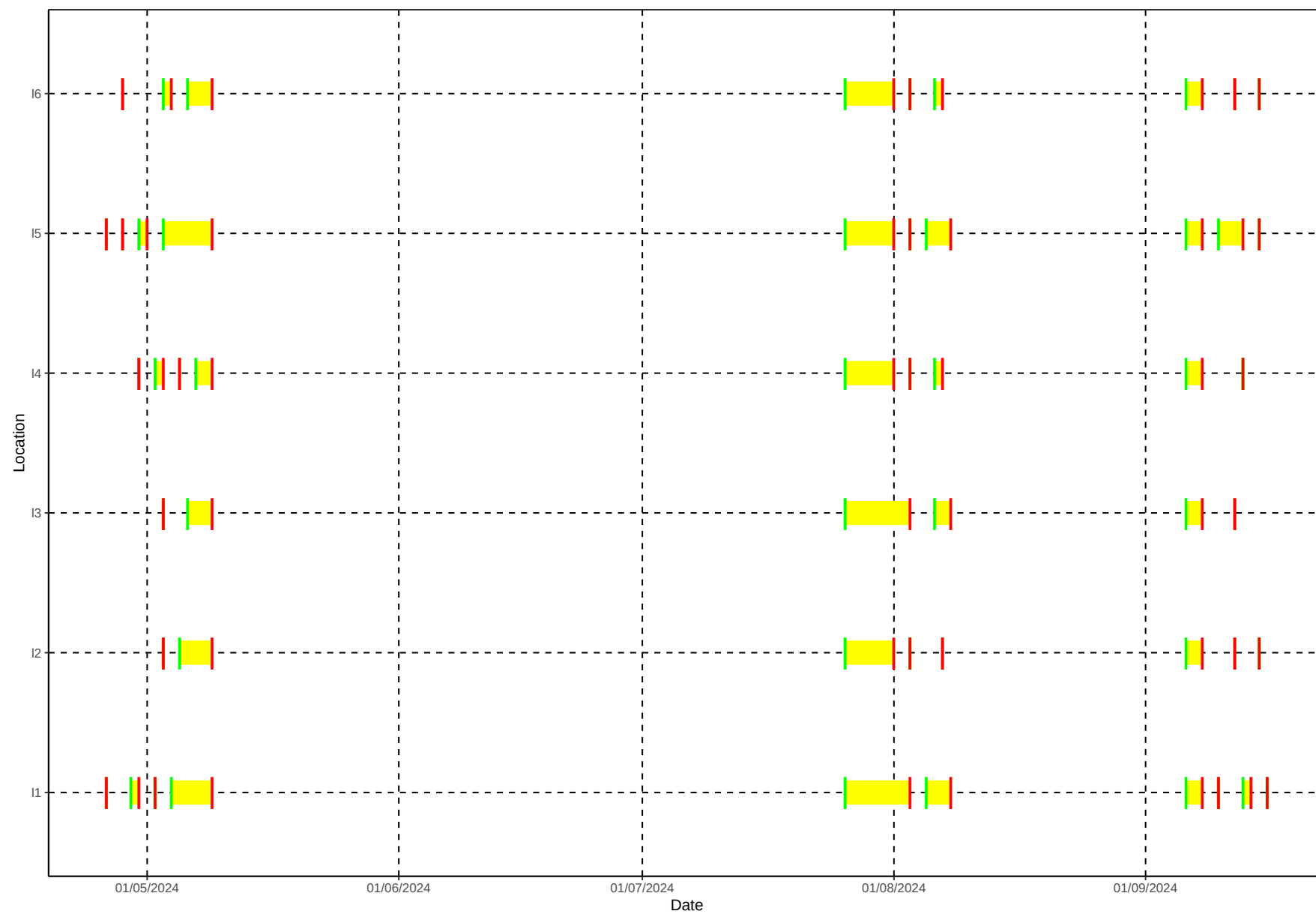
Detector ID	Latitude	Longitude
I1	55.70920	-4.430234
I2	55.71285	-4.412996
I4	55.70497	-4.419848
I5	55.71086	-4.422648
I6	55.70580	-4.427302
I3	55.70963	-4.414485

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
I1	33
I2	24
I3	28
I4	27
I5	35
I6	26

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



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
I1	Myotis daubentonii	0	0	0	0	4	13
I1	Myotis nattereri	0	0	4	3	13	0
I1	Nyctalus	0	0	0	0	0	8
I1	Pipistrellus pipistrellus	0	0	0	0	0	17
I1	Pipistrellus pygmaeus	0	0	0	0	2	26
I2	Myotis daubentonii	0	0	0	2	4	6
I2	Myotis nattereri	0	0	0	0	6	0
I2	Nyctalus	0	0	0	0	0	8
I2	Pipistrellus nathusii	0	0	2	0	0	0
I2	Pipistrellus pipistrellus	0	0	0	0	0	18
I2	Pipistrellus pygmaeus	0	0	0	0	4	19
I3	Myotis daubentonii	0	0	0	2	0	4
I3	Myotis nattereri	0	0	1	3	5	0
I3	Nyctalus	0	0	0	1	0	13
I3	Pipistrellus nathusii	0	0	2	0	0	0
I3	Pipistrellus pipistrellus	0	0	0	0	0	22
I3	Pipistrellus pygmaeus	0	0	0	0	2	21
I4	Myotis daubentonii	0	0	0	0	1	7

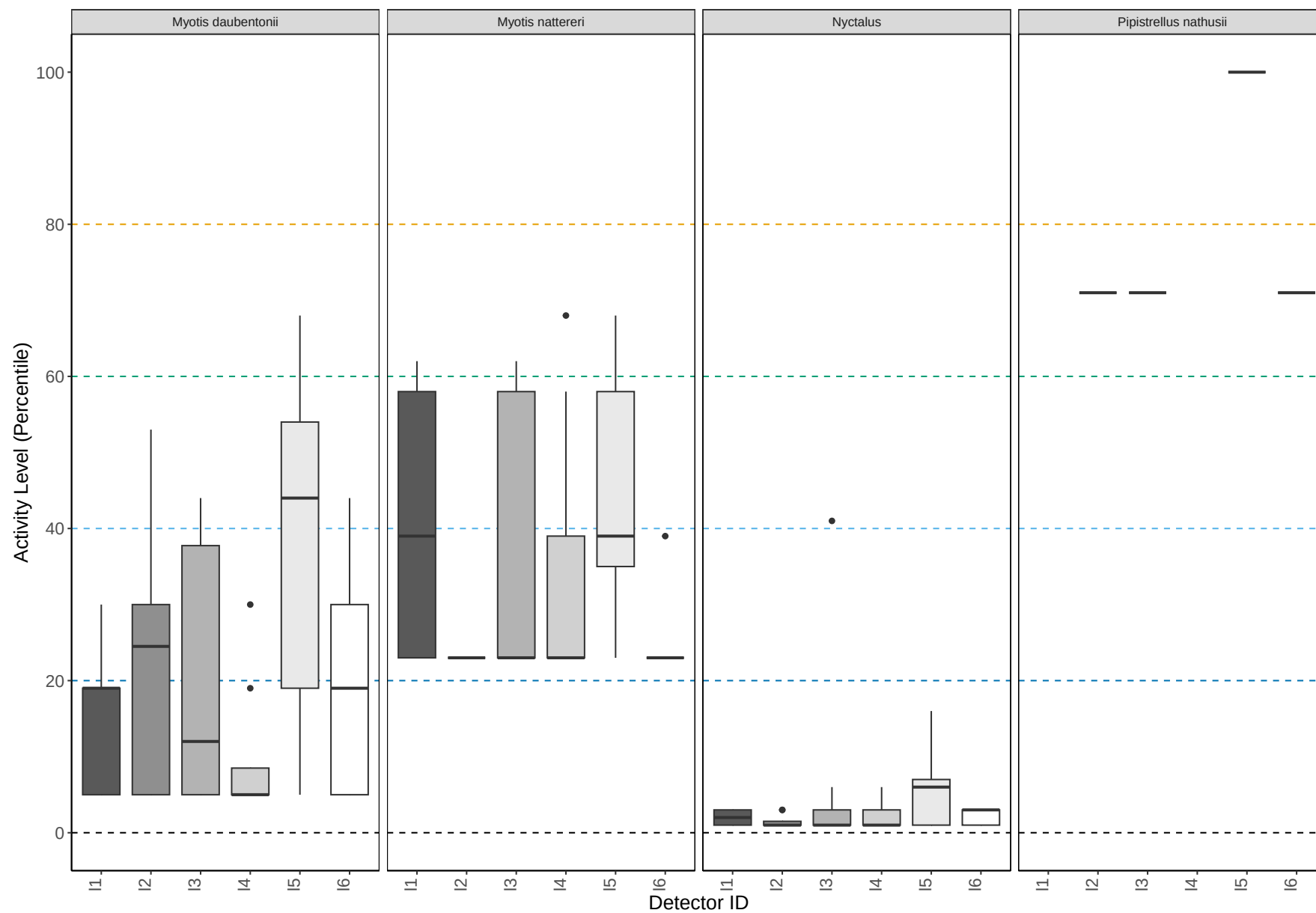
Detector ID	Species/Species Group	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
I4	Myotis nattereri	0	0	1	1	7	0
I4	Nyctalus	0	0	0	0	0	11
I4	Pipistrellus	0	0	0	0	0	19
	pipistrellus						
I4	Pipistrellus pygmaeus	0	0	0	0	2	24
I4	Plecotus auritus	0	0	0	2	0	0
I5	Myotis daubentonii	0	0	4	7	3	6
I5	Myotis nattereri	0	0	1	3	8	0
I5	Nyctalus	0	0	0	0	0	17
I5	Pipistrellus nathusii	1	0	0	0	0	0
I5	Pipistrellus	0	0	0	0	0	25
	pipistrellus						
I5	Pipistrellus pygmaeus	0	0	0	0	3	29
I6	Myotis daubentonii	0	0	0	2	2	7
I6	Myotis nattereri	0	0	0	0	6	0
I6	Nyctalus	0	0	0	0	0	8
I6	Pipistrellus nathusii	0	0	1	0	0	0
I6	Pipistrellus	0	0	0	0	0	19
	pipistrellus						
I6	Pipistrellus pygmaeus	0	0	0	0	8	18

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
I1	Myotis daubentonii	19	5 - 19	30	17	855
I1	Myotis nattereri	39	31 - 48.5	62	20	304
I1	Nyctalus	2	1 - 3	3	8	3846
I1	Pipistrellus pipistrellus	0	1 - 1.5	2	17	38592
I1	Pipistrellus pygmaeus	2	5.5 - 13	21	28	45590
I2	Myotis daubentonii	25	5 - 30	53	12	855
I2	Myotis nattereri	23	23 - 23	23	6	304
I2	Nyctalus	1	1 - 2	3	8	3846
I2	Pipistrellus nathusii	71	71 - 71	71	2	7
I2	Pipistrellus pipistrellus	1	2 - 8	10	18	38592
I2	Pipistrellus pygmaeus	6	5 - 15.5	29	23	45590
I3	Myotis daubentonii	12	5 - 31.5	44	6	855
I3	Myotis nattereri	23	23 - 58	62	9	304
I3	Nyctalus	1	1 - 3.5	41	14	3846
I3	Pipistrellus nathusii	71	71 - 71	71	2	7
I3	Pipistrellus pipistrellus	1	1.5 - 6.5	12	22	38592
I3	Pipistrellus pygmaeus	2	6 - 13.5	21	23	45590
I4	Myotis daubentonii	5	5 - 12	30	8	855
I4	Myotis nattereri	23	23 - 45.5	68	9	304
I4	Nyctalus	1	1 - 3.5	6	11	3846
I4	Pipistrellus pipistrellus	1	1 - 5	9	19	38592
I4	Pipistrellus pygmaeus	4	7.5 - 17	26	26	45590
I4	Plecotus auritus	52	52 - 52	52	2	117
I5	Myotis daubentonii	44	24.5 - 48.5	68	20	855
I5	Myotis nattereri	39	31 - 53.5	68	12	304
I5	Nyctalus	6	3.5 - 8	16	17	3846
I5	Pipistrellus nathusii	100	0	100	1	7
I5	Pipistrellus pipistrellus	1	1.5 - 6	14	25	38592
I5	Pipistrellus pygmaeus	3	8.5 - 15	27	32	45590
I6	Myotis daubentonii	19	5 - 31.5	44	11	855
I6	Myotis nattereri	23	23 - 23	39	6	304
I6	Nyctalus	3	2 - 3	3	8	3846
I6	Pipistrellus nathusii	71	0	71	1	7

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
I6	Pipistrellus pipistrellus	0	1.5 - 6	7	19	38592
I6	Pipistrellus pygmaeus	4	9 - 20	27	26	45590

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).



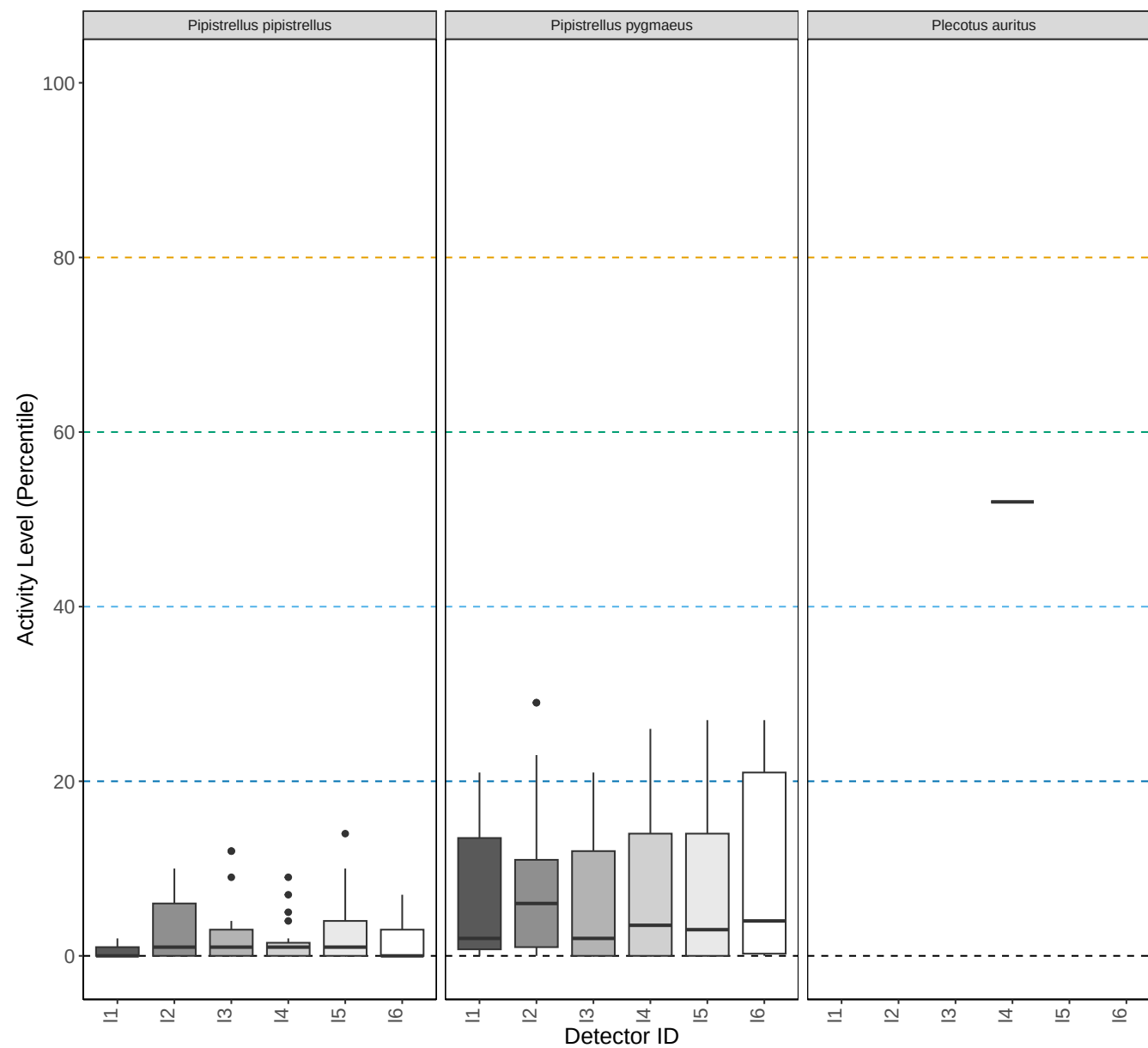
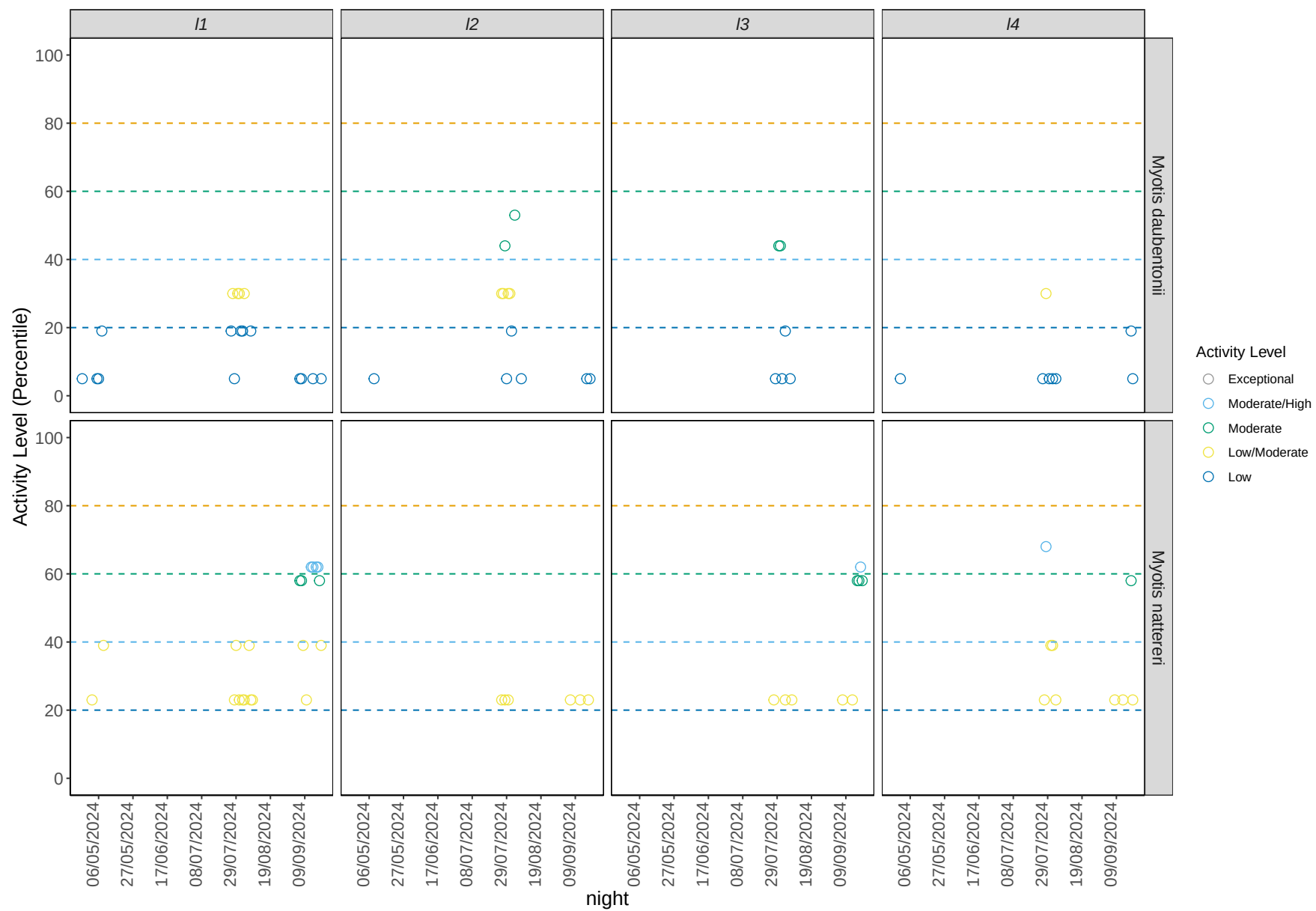
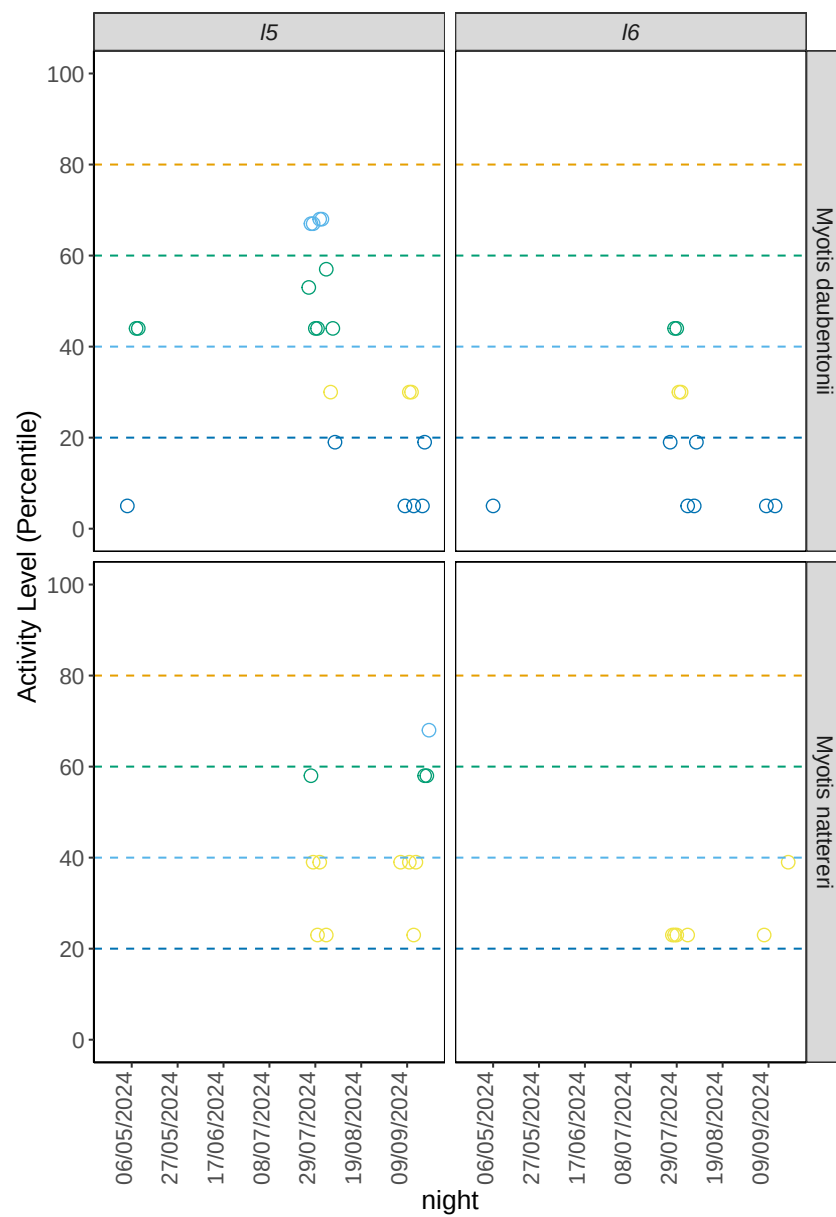
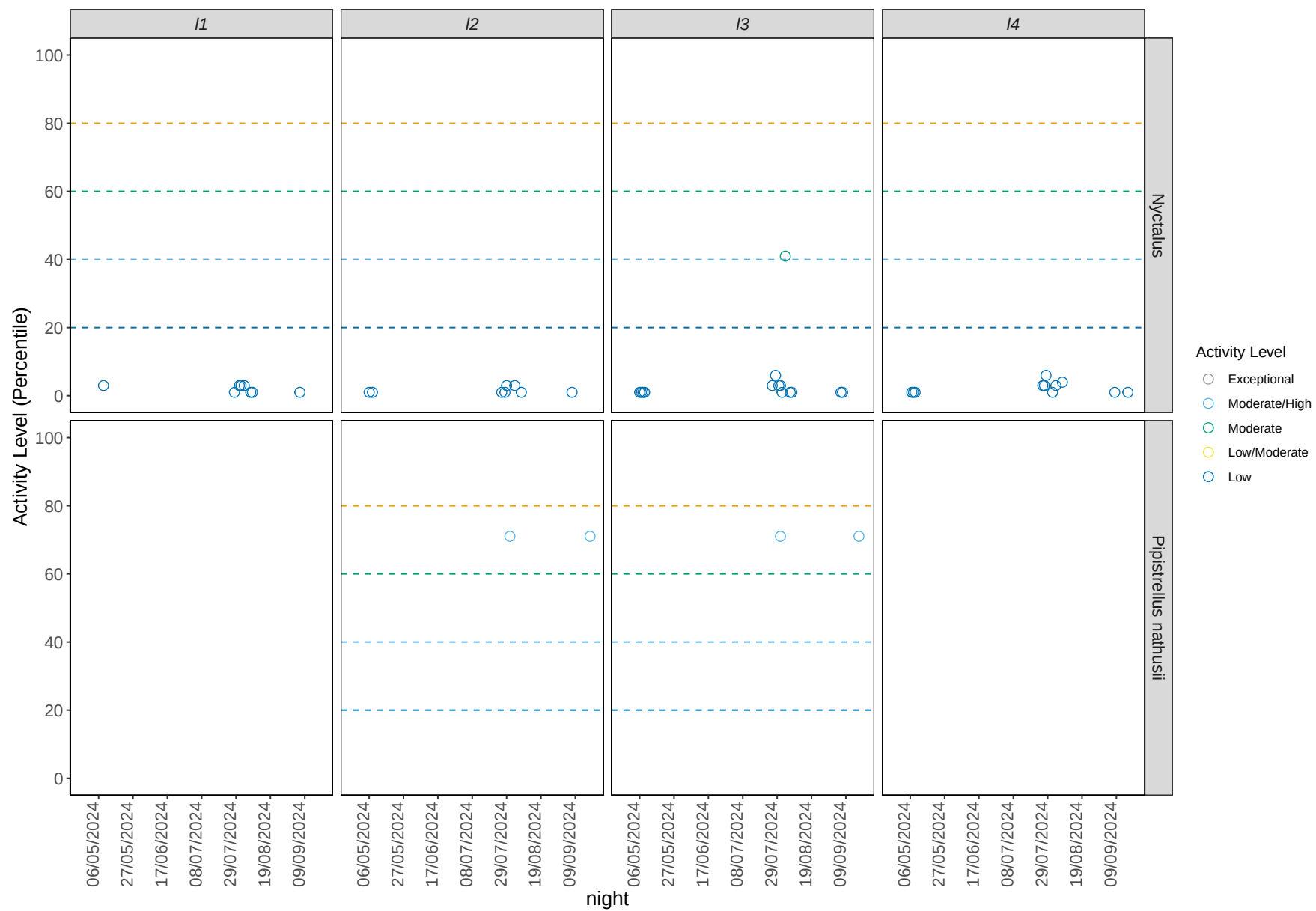
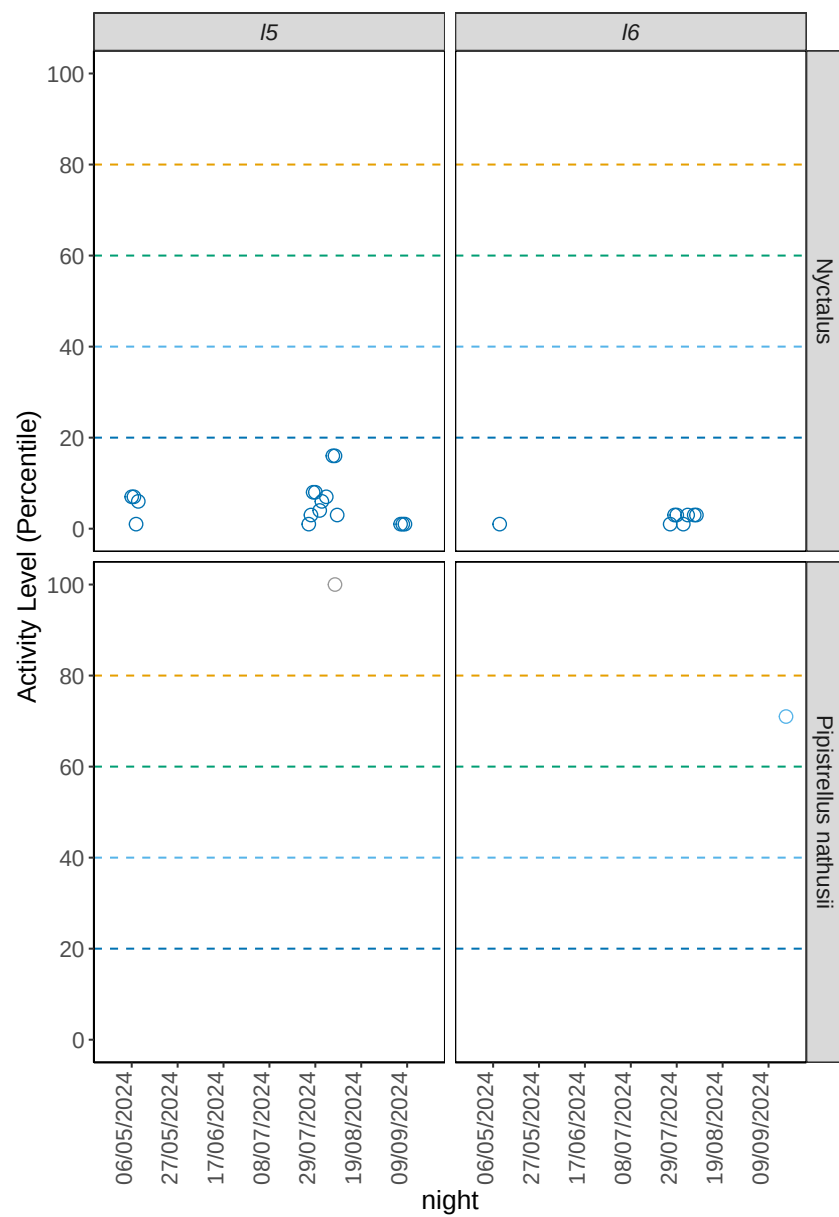


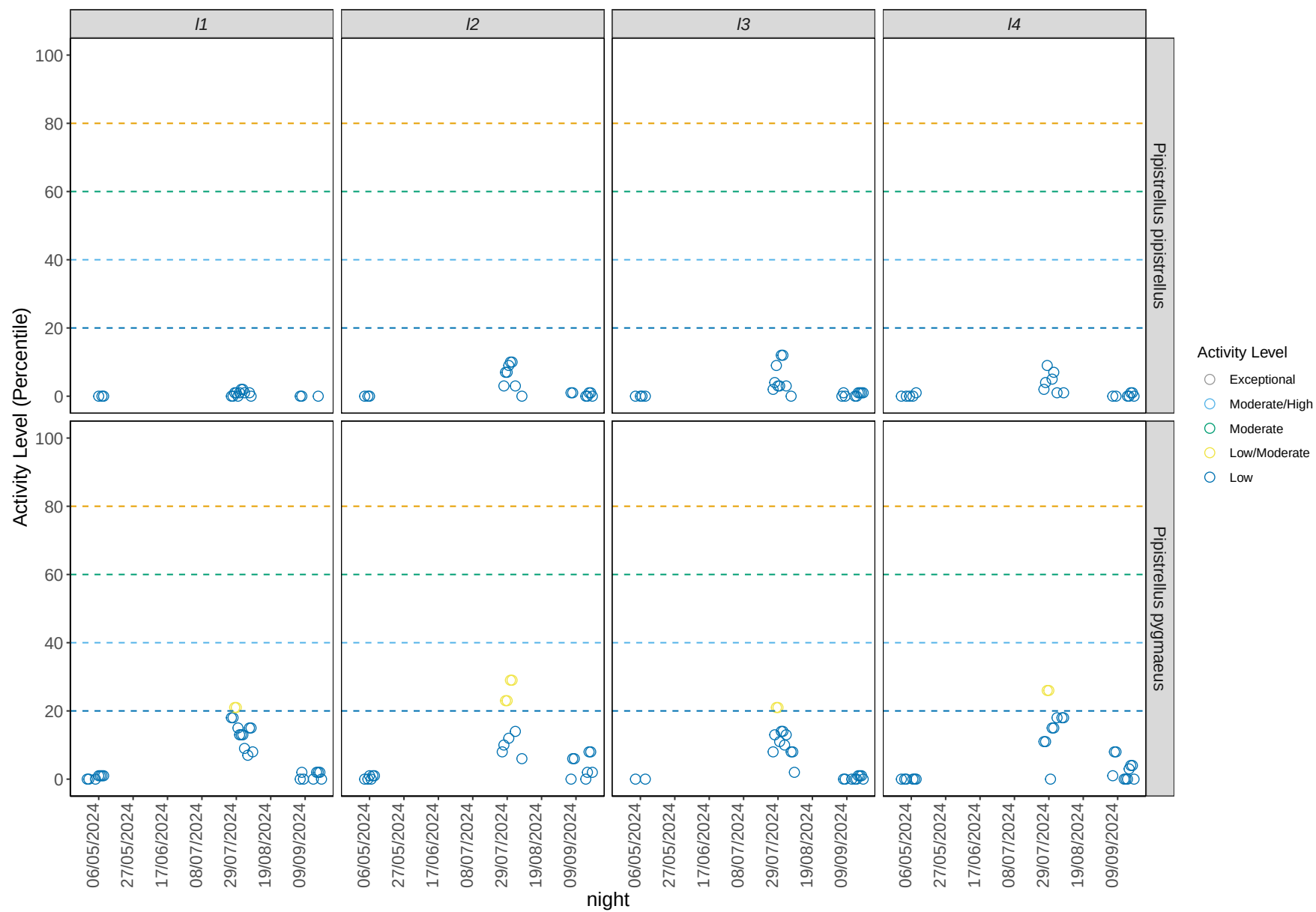
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.











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
I1	Myotis daubentonii	Apr	0	0	0	0	0	1
I1	Myotis daubentonii	May	0	0	0	0	0	3
I1	Myotis daubentonii	Jul	0	0	0	0	3	2
I1	Myotis daubentonii	Aug	0	0	0	0	1	3
I1	Myotis daubentonii	Sep	0	0	0	0	0	4
I1	Myotis nattereri	May	0	0	0	0	2	0
I1	Myotis nattereri	Jul	0	0	0	0	3	0
I1	Myotis nattereri	Aug	0	0	0	0	5	0
I1	Myotis nattereri	Sep	0	0	4	3	3	0
I1	Nyctalus	May	0	0	0	0	0	1
I1	Nyctalus	Jul	0	0	0	0	0	2
I1	Nyctalus	Aug	0	0	0	0	0	4
I1	Nyctalus	Sep	0	0	0	0	0	1
I1	Pipistrellus pipistrellus	May	0	0	0	0	0	3
I1	Pipistrellus pipistrellus	Jul	0	0	0	0	0	6
I1	Pipistrellus pipistrellus	Aug	0	0	0	0	0	5
I1	Pipistrellus pipistrellus	Sep	0	0	0	0	0	3
I1	Pipistrellus pygmaeus	Apr	0	0	0	0	0	2
I1	Pipistrellus pygmaeus	May	0	0	0	0	0	5

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
I1	Pipistrellus pygmaeus	Jul	0	0	0	0	2	4
I1	Pipistrellus pygmaeus	Aug	0	0	0	0	0	7
I1	Pipistrellus pygmaeus	Sep	0	0	0	0	0	8
I2	Myotis daubentonii	May	0	0	0	0	0	1
I2	Myotis daubentonii	Jul	0	0	0	1	4	1
I2	Myotis daubentonii	Aug	0	0	0	1	0	2
I2	Myotis daubentonii	Sep	0	0	0	0	0	2
I2	Myotis nattereri	Jul	0	0	0	0	3	0
I2	Myotis nattereri	Sep	0	0	0	0	3	0
I2	Nyctalus	May	0	0	0	0	0	2
I2	Nyctalus	Jul	0	0	0	0	0	3
I2	Nyctalus	Aug	0	0	0	0	0	2
I2	Nyctalus	Sep	0	0	0	0	0	1
I2	Pipistrellus nathusii	Jul	0	0	1	0	0	0
I2	Pipistrellus nathusii	Sep	0	0	1	0	0	0
I2	Pipistrellus pipistrellus	May	0	0	0	0	0	3
I2	Pipistrellus pipistrellus	Jul	0	0	0	0	0	5
I2	Pipistrellus pipistrellus	Aug	0	0	0	0	0	3
I2	Pipistrellus pipistrellus	Sep	0	0	0	0	0	7
I2	Pipistrellus pygmaeus	May	0	0	0	0	0	6

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
I2	Pipistrellus pygmaeus	Jul	0	0	0	0	3	3
I2	Pipistrellus pygmaeus	Aug	0	0	0	0	1	2
I2	Pipistrellus pygmaeus	Sep	0	0	0	0	0	8
I3	Myotis daubentonii	Jul	0	0	0	2	0	1
I3	Myotis daubentonii	Aug	0	0	0	0	0	3
I3	Myotis nattereri	Jul	0	0	0	0	1	0
I3	Myotis nattereri	Aug	0	0	0	0	2	0
I3	Myotis nattereri	Sep	0	0	1	3	2	0
I3	Nyctalus	May	0	0	0	0	0	4
I3	Nyctalus	Jul	0	0	0	0	0	4
I3	Nyctalus	Aug	0	0	0	1	0	3
I3	Nyctalus	Sep	0	0	0	0	0	2
I3	Pipistrellus nathusii	Jul	0	0	1	0	0	0
I3	Pipistrellus nathusii	Sep	0	0	1	0	0	0
I3	Pipistrellus pipistrellus	May	0	0	0	0	0	4
I3	Pipistrellus pipistrellus	Jul	0	0	0	0	0	6
I3	Pipistrellus pipistrellus	Aug	0	0	0	0	0	3
I3	Pipistrellus pipistrellus	Sep	0	0	0	0	0	9
I3	Pipistrellus pygmaeus	May	0	0	0	0	0	2
I3	Pipistrellus pygmaeus	Jul	0	0	0	0	2	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
I3	Pipistrellus pygmaeus	Aug	0	0	0	0	0	6
I3	Pipistrellus pygmaeus	Sep	0	0	0	0	0	9
I4	Myotis daubentonii	Apr	0	0	0	0	0	1
I4	Myotis daubentonii	Jul	0	0	0	0	1	2
I4	Myotis daubentonii	Aug	0	0	0	0	0	2
I4	Myotis daubentonii	Sep	0	0	0	0	0	2
I4	Myotis nattereri	Jul	0	0	1	0	2	0
I4	Myotis nattereri	Aug	0	0	0	0	2	0
I4	Myotis nattereri	Sep	0	0	0	1	3	0
I4	Nyctalus	May	0	0	0	0	0	3
I4	Nyctalus	Jul	0	0	0	0	0	3
I4	Nyctalus	Aug	0	0	0	0	0	3
I4	Nyctalus	Sep	0	0	0	0	0	2
I4	Pipistrellus pipistrellus	Apr	0	0	0	0	0	1
I4	Pipistrellus pipistrellus	May	0	0	0	0	0	4
I4	Pipistrellus pipistrellus	Jul	0	0	0	0	0	4
I4	Pipistrellus pipistrellus	Aug	0	0	0	0	0	3
I4	Pipistrellus pipistrellus	Sep	0	0	0	0	0	7
I4	Pipistrellus pygmaeus	Apr	0	0	0	0	0	1
I4	Pipistrellus pygmaeus	May	0	0	0	0	0	5

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
14	Pipistrellus pygmaeus	Jul	0	0	0	0	2	4
14	Pipistrellus pygmaeus	Aug	0	0	0	0	0	4
14	Pipistrellus pygmaeus	Sep	0	0	0	0	0	10
14	Plecotus auritus	Jul	0	0	0	1	0	0
14	Plecotus auritus	Sep	0	0	0	1	0	0
15	Myotis daubentonii	May	0	0	0	2	0	1
15	Myotis daubentonii	Jul	0	0	3	3	0	0
15	Myotis daubentonii	Aug	0	0	1	2	1	1
15	Myotis daubentonii	Sep	0	0	0	0	2	4
15	Myotis nattereri	Jul	0	0	0	1	3	0
15	Myotis nattereri	Aug	0	0	0	0	1	0
15	Myotis nattereri	Sep	0	0	1	2	4	0
15	Nyctalus	May	0	0	0	0	0	4
15	Nyctalus	Jul	0	0	0	0	0	5
15	Nyctalus	Aug	0	0	0	0	0	5
15	Nyctalus	Sep	0	0	0	0	0	3
15	Pipistrellus nathusii	Aug	1	0	0	0	0	0
15	Pipistrellus pipistrellus	Apr	0	0	0	0	0	1
15	Pipistrellus pipistrellus	May	0	0	0	0	0	7
15	Pipistrellus pipistrellus	Jul	0	0	0	0	0	6
15	Pipistrellus pipistrellus	Aug	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
I5	Pipistrellus pipistrellus	Sep	0	0	0	0	0	7
I5	Pipistrellus pygmaeus	Apr	0	0	0	0	0	3
I5	Pipistrellus pygmaeus	May	0	0	0	0	0	8
I5	Pipistrellus pygmaeus	Jul	0	0	0	0	2	4
I5	Pipistrellus pygmaeus	Aug	0	0	0	0	1	4
I5	Pipistrellus pygmaeus	Sep	0	0	0	0	0	10
I6	Myotis daubentonii	May	0	0	0	0	0	1
I6	Myotis daubentonii	Jul	0	0	0	2	2	1
I6	Myotis daubentonii	Aug	0	0	0	0	0	3
I6	Myotis daubentonii	Sep	0	0	0	0	0	2
I6	Myotis nattereri	Jul	0	0	0	0	3	0
I6	Myotis nattereri	Aug	0	0	0	0	1	0
I6	Myotis nattereri	Sep	0	0	0	0	2	0
I6	Nyctalus	May	0	0	0	0	0	1
I6	Nyctalus	Jul	0	0	0	0	0	3
I6	Nyctalus	Aug	0	0	0	0	0	4
I6	Pipistrellus nathusii	Sep	0	0	1	0	0	0
I6	Pipistrellus pipistrellus	May	0	0	0	0	0	5
I6	Pipistrellus pipistrellus	Jul	0	0	0	0	0	6
I6	Pipistrellus pipistrellus	Aug	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
I6	Pipistrellus pipistrellus	Sep	0	0	0	0	0	4
I6	Pipistrellus pygmaeus	Apr	0	0	0	0	0	1
I6	Pipistrellus pygmaeus	May	0	0	0	0	0	6
I6	Pipistrellus pygmaeus	Jul	0	0	0	0	5	1
I6	Pipistrellus pygmaeus	Aug	0	0	0	0	3	1
I6	Pipistrellus pygmaeus	Sep	0	0	0	0	0	9

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
I1	Myotis daubentonii	Apr	5	5 - 19	5	1
I1	Myotis daubentonii	May	5	5 - 19	19	3
I1	Myotis daubentonii	Jul	30	5 - 19	30	5
I1	Myotis daubentonii	Aug	19	5 - 19	30	4
I1	Myotis daubentonii	Sep	5	5 - 19	5	4
I1	Myotis nattereri	May	31	31 - 48.5	39	2
I1	Myotis nattereri	Jul	23	31 - 48.5	39	3
I1	Myotis nattereri	Aug	23	31 - 48.5	39	5
I1	Myotis nattereri	Sep	58	31 - 48.5	62	10
I1	Nyctalus	May	3	1 - 3	3	1
I1	Nyctalus	Jul	2	1 - 3	3	2
I1	Nyctalus	Aug	2	1 - 3	3	4
I1	Nyctalus	Sep	1	1 - 3	1	1
I1	Pipistrellus pipistrellus	May	0	1 - 1.5	0	3
I1	Pipistrellus pipistrellus	Jul	1	1 - 1.5	1	6
I1	Pipistrellus pipistrellus	Aug	1	1 - 1.5	2	5
I1	Pipistrellus pipistrellus	Sep	0	1 - 1.5	0	3
I1	Pipistrellus pygmaeus	Apr	0	5.5 - 13	0	2
I1	Pipistrellus pygmaeus	May	1	5.5 - 13	1	5
I1	Pipistrellus pygmaeus	Jul	18	5.5 - 13	21	6
I1	Pipistrellus pygmaeus	Aug	13	5.5 - 13	15	7
I1	Pipistrellus pygmaeus	Sep	1	5.5 - 13	2	8
I2	Myotis daubentonii	May	5	5 - 30	5	1
I2	Myotis daubentonii	Jul	30	5 - 30	44	6
I2	Myotis daubentonii	Aug	19	5 - 30	53	3
I2	Myotis daubentonii	Sep	5	5 - 30	5	2
I2	Myotis nattereri	Jul	23	23 - 23	23	3
I2	Myotis nattereri	Sep	23	23 - 23	23	3
I2	Nyctalus	May	1	1 - 2	1	2
I2	Nyctalus	Jul	1	1 - 2	3	3
I2	Nyctalus	Aug	2	1 - 2	3	2
I2	Nyctalus	Sep	1	1 - 2	1	1
I2	Pipistrellus nathusii	Jul	71	71 - 71	71	1

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
I2	Pipistrellus nathusii	Sep	71	71 - 71	71	1
I2	Pipistrellus pipistrellus	May	0	2 - 8	0	3
I2	Pipistrellus pipistrellus	Jul	7	2 - 8	10	5
I2	Pipistrellus pipistrellus	Aug	3	2 - 8	10	3
I2	Pipistrellus pipistrellus	Sep	1	2 - 8	1	7
I2	Pipistrellus pygmaeus	May	1	5 - 15.5	1	6
I2	Pipistrellus pygmaeus	Jul	18	5 - 15.5	29	6
I2	Pipistrellus pygmaeus	Aug	14	5 - 15.5	29	3
I2	Pipistrellus pygmaeus	Sep	4	5 - 15.5	8	8
I3	Myotis daubentonii	Jul	44	5 - 31.5	44	3
I3	Myotis daubentonii	Aug	5	5 - 31.5	19	3
I3	Myotis nattereri	Jul	23	23 - 58	23	1
I3	Myotis nattereri	Aug	23	23 - 58	23	2
I3	Myotis nattereri	Sep	58	23 - 58	62	6
I3	Nyctalus	May	1	1 - 3.5	1	4
I3	Nyctalus	Jul	3	1 - 3.5	6	4
I3	Nyctalus	Aug	1	1 - 3.5	41	4
I3	Nyctalus	Sep	1	1 - 3.5	1	2
I3	Pipistrellus nathusii	Jul	71	71 - 71	71	1
I3	Pipistrellus nathusii	Sep	71	71 - 71	71	1
I3	Pipistrellus pipistrellus	May	0	1.5 - 6.5	0	4
I3	Pipistrellus pipistrellus	Jul	4	1.5 - 6.5	12	6
I3	Pipistrellus pipistrellus	Aug	3	1.5 - 6.5	12	3
I3	Pipistrellus pipistrellus	Sep	1	1.5 - 6.5	1	9
I3	Pipistrellus pygmaeus	May	0	6 - 13.5	0	2
I3	Pipistrellus pygmaeus	Jul	14	6 - 13.5	21	6
I3	Pipistrellus pygmaeus	Aug	9	6 - 13.5	14	6
I3	Pipistrellus pygmaeus	Sep	0	6 - 13.5	1	9
I4	Myotis daubentonii	Apr	5	5 - 12	5	1
I4	Myotis daubentonii	Jul	5	5 - 12	30	3
I4	Myotis daubentonii	Aug	5	5 - 12	5	2
I4	Myotis daubentonii	Sep	12	5 - 12	19	2
I4	Myotis nattereri	Jul	39	23 - 45.5	68	3
I4	Myotis nattereri	Aug	31	23 - 45.5	39	2
I4	Myotis nattereri	Sep	23	23 - 45.5	58	4
I4	Nyctalus	May	1	1 - 3.5	1	3

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
I4	Nyctalus	Jul	3	1 - 3.5	6	3
I4	Nyctalus	Aug	3	1 - 3.5	4	3
I4	Nyctalus	Sep	1	1 - 3.5	1	2
I4	Pipistrellus pipistrellus	Apr	0	1 - 5	0	1
I4	Pipistrellus pipistrellus	May	0	1 - 5	1	4
I4	Pipistrellus pipistrellus	Jul	5	1 - 5	9	4
I4	Pipistrellus pipistrellus	Aug	1	1 - 5	7	3
I4	Pipistrellus pipistrellus	Sep	0	1 - 5	1	7
I4	Pipistrellus pygmaeus	Apr	0	7.5 - 17	0	1
I4	Pipistrellus pygmaeus	May	0	7.5 - 17	0	5
I4	Pipistrellus pygmaeus	Jul	13	7.5 - 17	26	6
I4	Pipistrellus pygmaeus	Aug	18	7.5 - 17	18	4
I4	Pipistrellus pygmaeus	Sep	2	7.5 - 17	8	10
I4	Plecotus auritus	Jul	52	52 - 52	52	1
I4	Plecotus auritus	Sep	52	52 - 52	52	1
I5	Myotis daubentonii	May	44	24.5 - 48.5	44	3
I5	Myotis daubentonii	Jul	60	24.5 - 48.5	68	6
I5	Myotis daubentonii	Aug	44	24.5 - 48.5	68	5
I5	Myotis daubentonii	Sep	12	24.5 - 48.5	30	6
I5	Myotis nattereri	Jul	39	31 - 53.5	58	4
I5	Myotis nattereri	Aug	23	31 - 53.5	23	1
I5	Myotis nattereri	Sep	39	31 - 53.5	68	7
I5	Nyctalus	May	7	3.5 - 8	7	4
I5	Nyctalus	Jul	4	3.5 - 8	8	5
I5	Nyctalus	Aug	7	3.5 - 8	16	5
I5	Nyctalus	Sep	1	3.5 - 8	1	3
I5	Pipistrellus nathusii	Aug	100	0	100	1
I5	Pipistrellus pipistrellus	Apr	0	1.5 - 6	0	1
I5	Pipistrellus pipistrellus	May	0	1.5 - 6	2	7
I5	Pipistrellus pipistrellus	Jul	6	1.5 - 6	10	6
I5	Pipistrellus pipistrellus	Aug	3	1.5 - 6	14	4
I5	Pipistrellus pipistrellus	Sep	1	1.5 - 6	1	7
I5	Pipistrellus pygmaeus	Apr	0	8.5 - 15	0	3
I5	Pipistrellus pygmaeus	May	1	8.5 - 15	3	8
I5	Pipistrellus pygmaeus	Jul	15	8.5 - 15	22	6
I5	Pipistrellus pygmaeus	Aug	14	8.5 - 15	27	5

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
I5	Pipistrellus pygmaeus	Sep	2	8.5 - 15	17	10
I6	Myotis daubentonii	May	5	5 - 31.5	5	1
I6	Myotis daubentonii	Jul	30	5 - 31.5	44	5
I6	Myotis daubentonii	Aug	5	5 - 31.5	19	3
I6	Myotis daubentonii	Sep	5	5 - 31.5	5	2
I6	Myotis nattereri	Jul	23	23 - 23	23	3
I6	Myotis nattereri	Aug	23	23 - 23	23	1
I6	Myotis nattereri	Sep	31	23 - 23	39	2
I6	Nyctalus	May	1	2 - 3	1	1
I6	Nyctalus	Jul	3	2 - 3	3	3
I6	Nyctalus	Aug	3	2 - 3	3	4
I6	Pipistrellus nathusii	Sep	71	0	71	1
I6	Pipistrellus pipistrellus	May	0	1.5 - 6	0	5
I6	Pipistrellus pipistrellus	Jul	5	1.5 - 6	7	6
I6	Pipistrellus pipistrellus	Aug	0	1.5 - 6	5	4
I6	Pipistrellus pipistrellus	Sep	1	1.5 - 6	1	4
I6	Pipistrellus pygmaeus	Apr	0	9 - 20	0	1
I6	Pipistrellus pygmaeus	May	1	9 - 20	3	6
I6	Pipistrellus pygmaeus	Jul	26	9 - 20	27	6
I6	Pipistrellus pygmaeus	Aug	21	9 - 20	22	4
I6	Pipistrellus pygmaeus	Sep	3	9 - 20	4	9

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 daubentonii	0	0	4	13	14	43
Myotis nattereri	0	0	7	10	45	0
Nyctalus	0	0	0	1	0	65
Pipistrellus	1	0	5	0	0	0
nathusii						
Pipistrellus	0	0	0	0	0	120
pipistrellus						
Pipistrellus	0	0	0	0	21	137
pygmaeus						
Plecotus auritus	0	0	0	2	0	0

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

Species/Species Group	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
Myotis daubentonii	19	5 - 31.5	68	74
Myotis nattereri	23	31 - 53.5	68	62
Nyctalus	2	3.5 - 8	41	66
Pipistrellus nathusii	71	71 - 71	100	6
Pipistrellus pipistrellus	1	2 - 8	14	120
Pipistrellus pygmaeus	4	9 - 20	29	158
Plecotus auritus	52	52 - 52	52	2

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

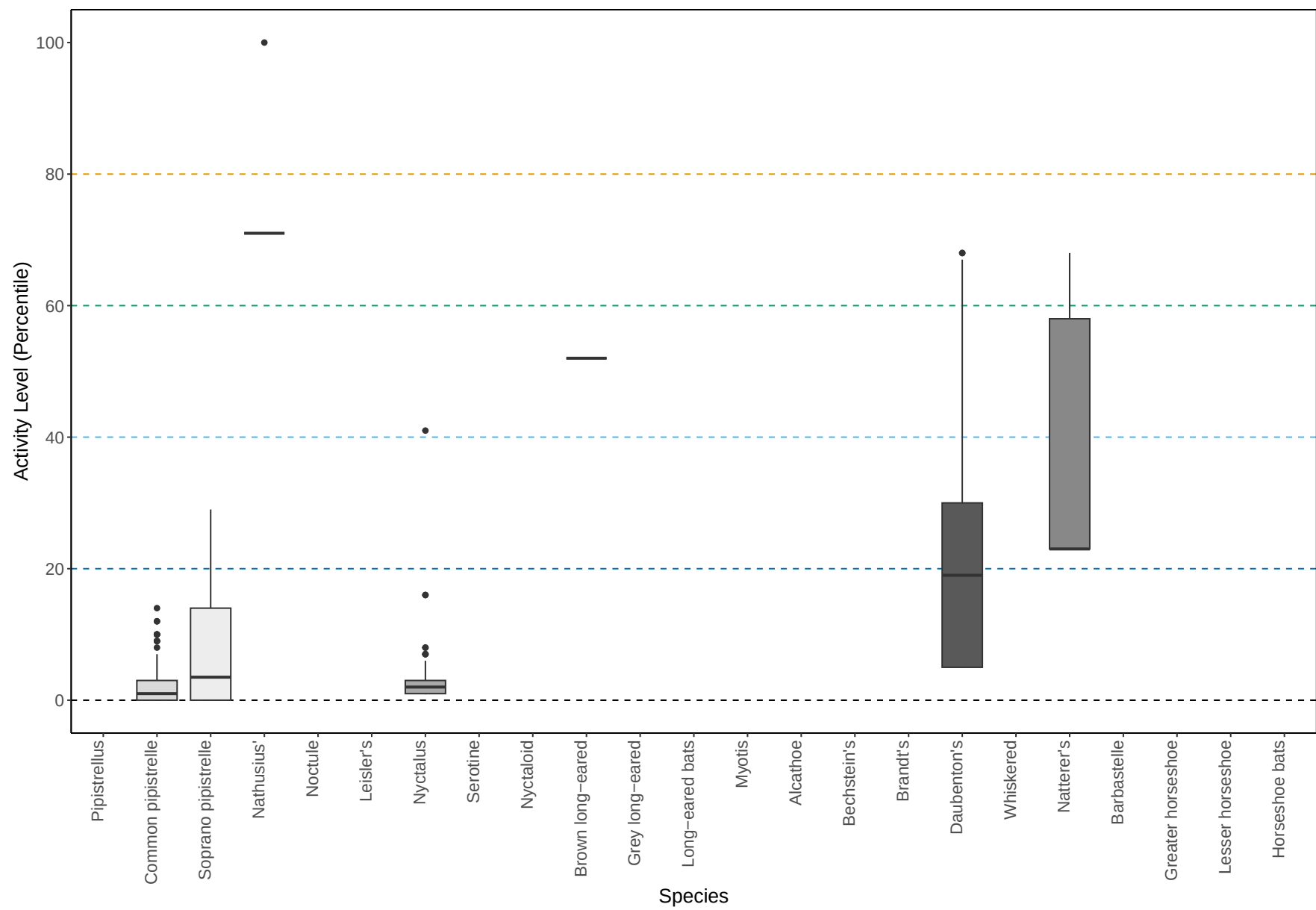
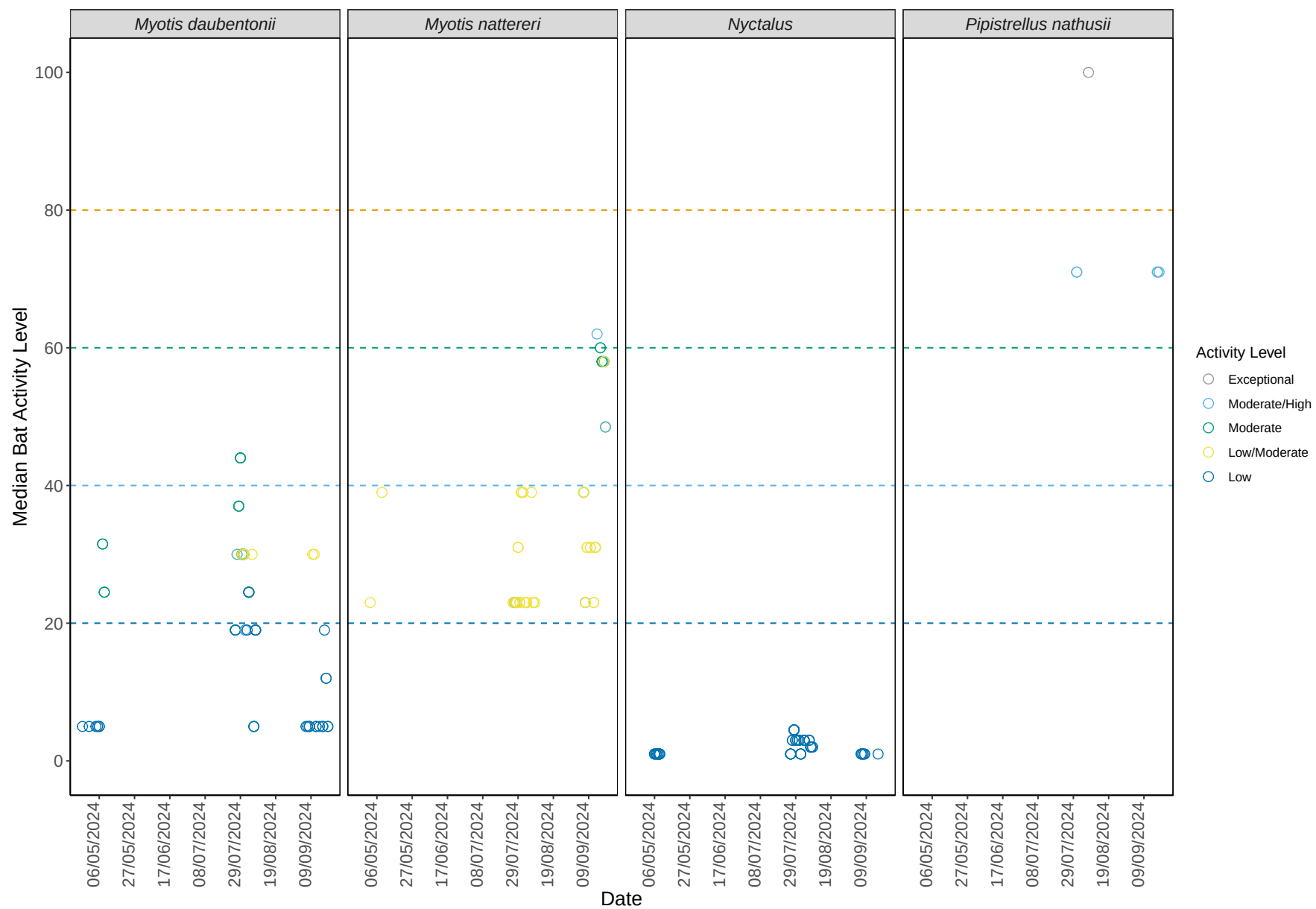
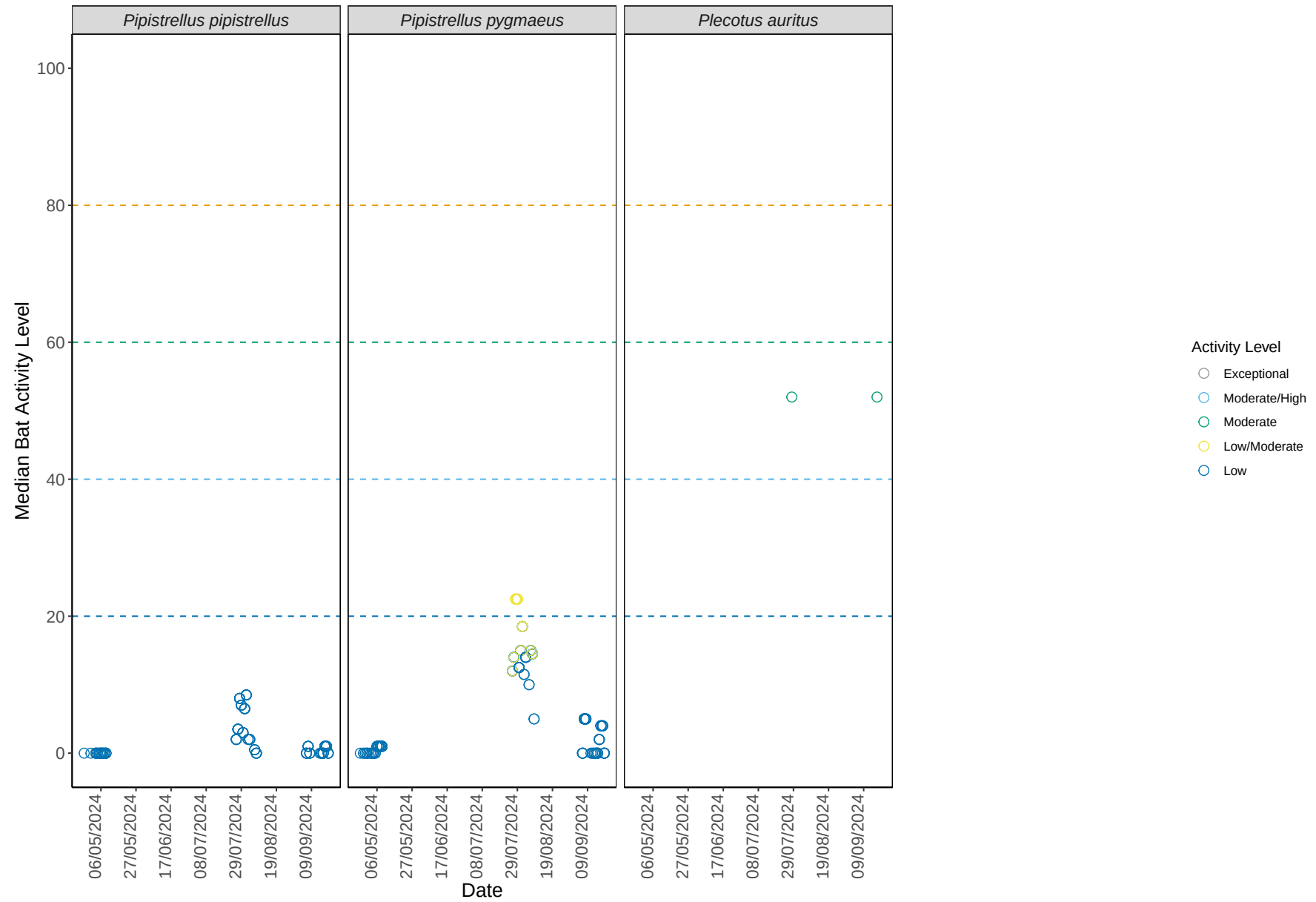


Figure 5. The median activity levels of bats recorded across all detectors each night.





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.

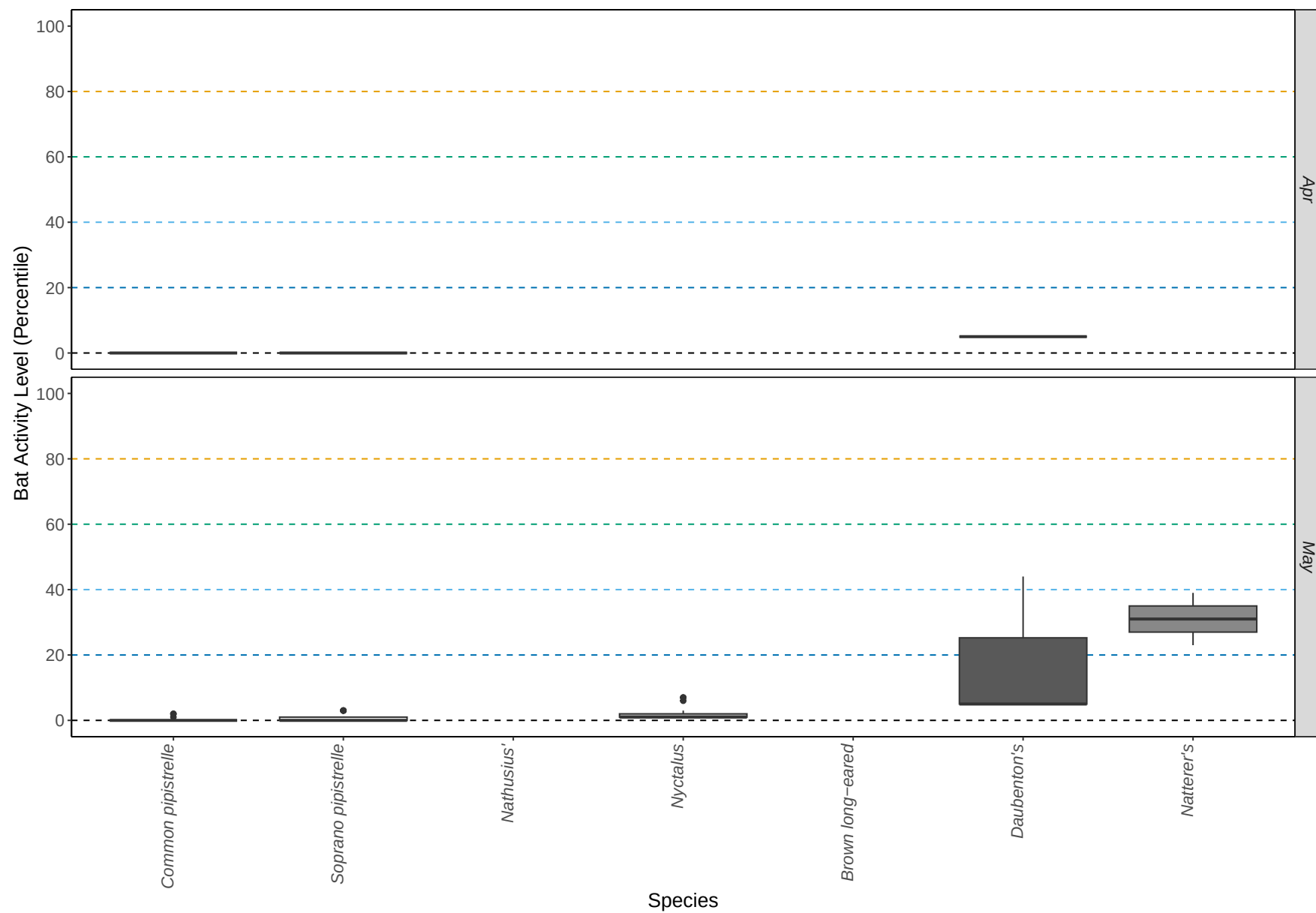
Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
Myotis daubentonii	Apr	0	0	0	0	0	2
Myotis daubentonii	May	0	0	0	2	0	6
Myotis daubentonii	Jul	0	0	3	8	10	7
Myotis daubentonii	Aug	0	0	1	3	2	14
Myotis daubentonii	Sep	0	0	0	0	2	14
Myotis nattereri	May	0	0	0	0	2	0
Myotis nattereri	Jul	0	0	1	1	15	0
Myotis nattereri	Aug	0	0	0	0	11	0
Myotis nattereri	Sep	0	0	6	9	17	0
Nyctalus	May	0	0	0	0	0	15
Nyctalus	Jul	0	0	0	0	0	20
Nyctalus	Aug	0	0	0	1	0	21
Nyctalus	Sep	0	0	0	0	0	9
Pipistrellus nathusii	Jul	0	0	2	0	0	0
Pipistrellus nathusii	Aug	1	0	0	0	0	0
Pipistrellus nathusii	Sep	0	0	3	0	0	0
Pipistrellus pipistrellus	Apr	0	0	0	0	0	2
Pipistrellus pipistrellus	May	0	0	0	0	0	26
Pipistrellus pipistrellus	Jul	0	0	0	0	0	33

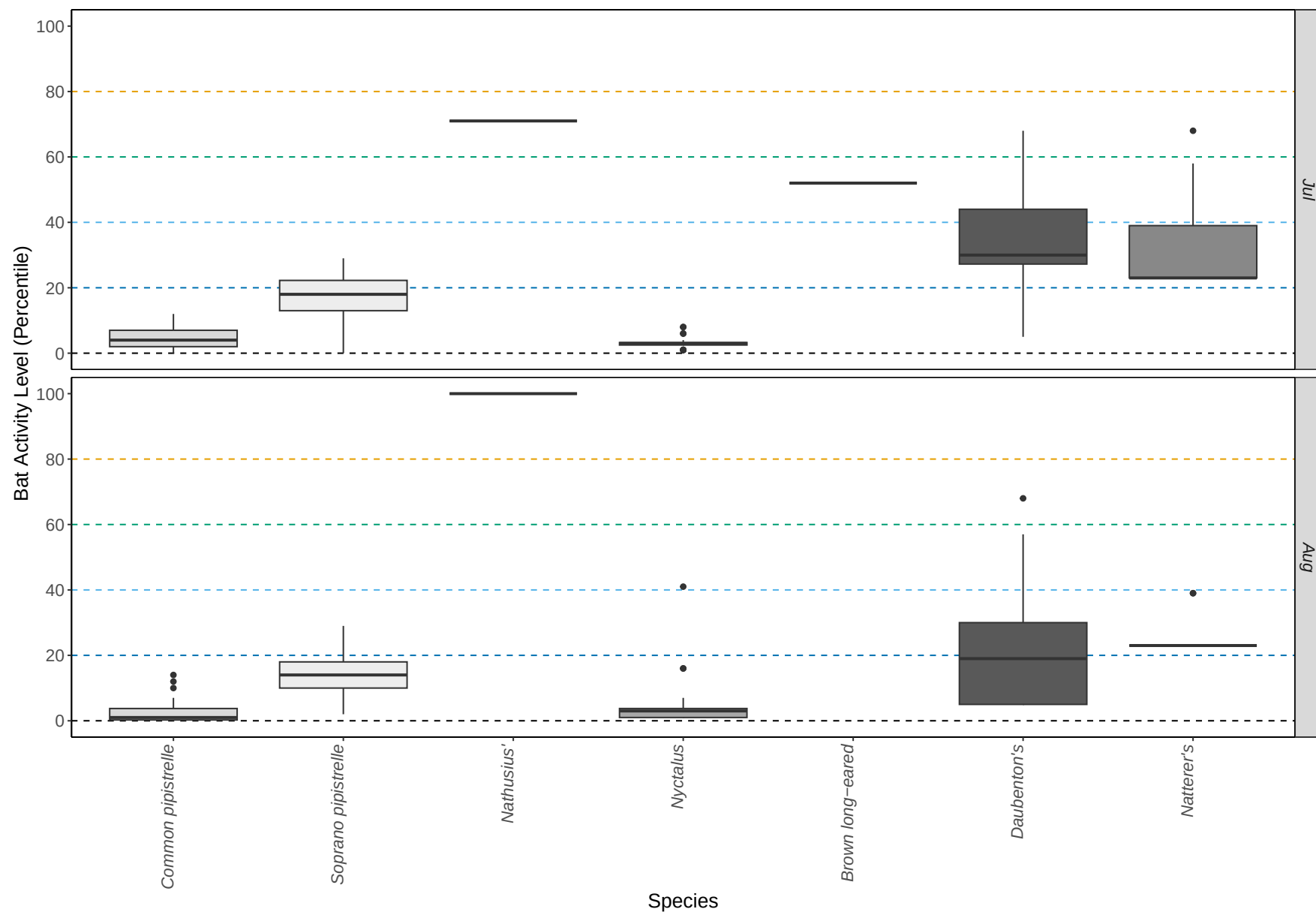
Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
Pipistrellus	Aug	0	0	0	0	0	22
pipistrellus							
Pipistrellus	Sep	0	0	0	0	0	37
pipistrellus							
Pipistrellus	Apr	0	0	0	0	0	7
pygmaeus							
Pipistrellus	May	0	0	0	0	0	32
pygmaeus							
Pipistrellus	Jul	0	0	0	0	16	20
pygmaeus							
Pipistrellus	Aug	0	0	0	0	5	24
pygmaeus							
Pipistrellus	Sep	0	0	0	0	0	54
pygmaeus							
Plecotus auritus	Jul	0	0	0	1	0	0
Plecotus auritus	Sep	0	0	0	1	0	0

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

Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
Myotis daubentonii	Apr	5	5 - 19	5	2
Myotis daubentonii	May	5	5 - 31.5	44	8
Myotis daubentonii	Jul	30	5 - 31.5	68	28
Myotis daubentonii	Aug	19	5 - 31.5	68	20
Myotis daubentonii	Sep	5	5 - 31.5	30	16
Myotis nattereri	May	31	31 - 48.5	39	2
Myotis nattereri	Jul	23	31 - 53.5	68	17
Myotis nattereri	Aug	23	31 - 53.5	39	11
Myotis nattereri	Sep	39	31 - 53.5	68	32
Nyctalus	May	1	3.5 - 8	7	15
Nyctalus	Jul	3	3.5 - 8	8	20
Nyctalus	Aug	3	3.5 - 8	41	22
Nyctalus	Sep	1	3.5 - 8	1	9
Pipistrellus nathusii	Jul	71	71 - 71	71	2
Pipistrellus nathusii	Aug	100	0	100	1
Pipistrellus nathusii	Sep	71	71 - 71	71	3
Pipistrellus pipistrellus	Apr	0	1.5 - 6	0	2
Pipistrellus pipistrellus	May	0	2 - 8	2	26
Pipistrellus pipistrellus	Jul	4	2 - 8	12	33
Pipistrellus pipistrellus	Aug	1	2 - 8	14	22
Pipistrellus pipistrellus	Sep	0	2 - 8	1	37
Pipistrellus pygmaeus	Apr	0	9 - 20	0	7
Pipistrellus pygmaeus	May	0	9 - 20	3	32
Pipistrellus pygmaeus	Jul	18	9 - 20	29	36
Pipistrellus pygmaeus	Aug	14	9 - 20	29	29
Pipistrellus pygmaeus	Sep	1	9 - 20	17	54
Plecotus auritus	Jul	52	52 - 52	52	1
Plecotus auritus	Sep	52	52 - 52	52	1

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





Part 2: Nightly Analysis

Entire Survey Period

Sunrise and Sunset Times

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

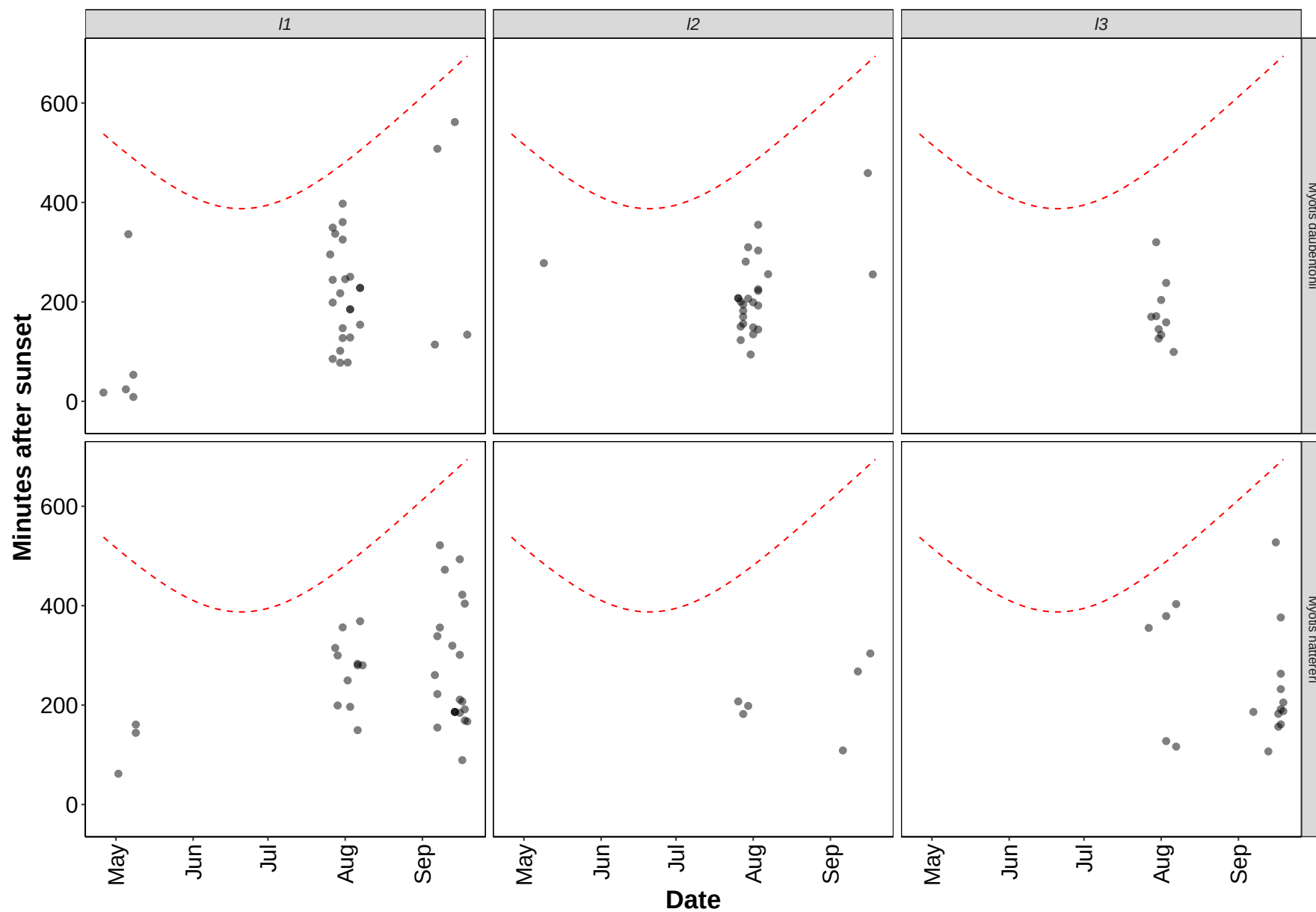
Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2024-04-26	20:46	05:44	9.0
2024-04-28	20:50	05:39	8.8
2024-04-29	20:52	05:37	8.8
2024-04-30	20:54	05:35	8.7
2024-05-01	20:56	05:33	8.6
2024-05-02	20:58	05:31	8.5
2024-05-03	21:00	05:28	8.5
2024-05-04	21:02	05:26	8.4
2024-05-05	21:04	05:24	8.3
2024-05-06	21:06	05:22	8.3
2024-05-07	21:08	05:20	8.2
2024-05-08	21:10	05:18	8.1
2024-05-09	21:12	05:16	8.1
2024-07-26	21:36	05:15	7.7
2024-07-27	21:34	05:17	7.7
2024-07-28	21:33	05:19	7.8
2024-07-29	21:31	05:21	7.8
2024-07-30	21:29	05:23	7.9
2024-07-31	21:27	05:24	8.0
2024-08-01	21:25	05:26	8.0
2024-08-02	21:23	05:28	8.1
2024-08-03	21:21	05:30	8.1
2024-08-05	21:17	05:34	8.3
2024-08-06	21:15	05:36	8.3
2024-08-07	21:13	05:38	8.4
2024-08-08	21:11	05:40	8.5
2024-09-06	20:00	06:36	10.6
2024-09-07	19:58	06:37	10.7

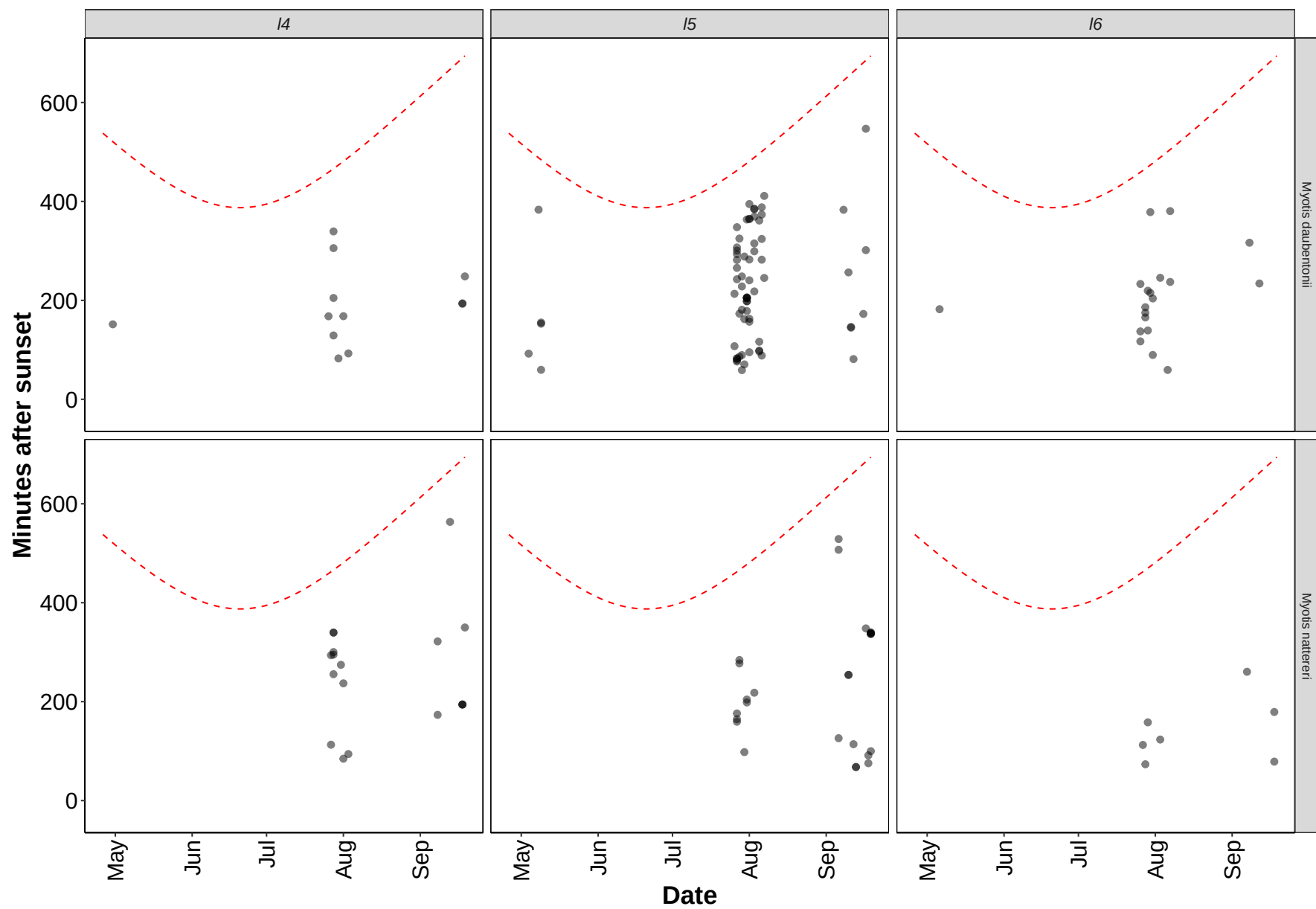
Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2024-09-08	19:55	06:39	10.7
2024-09-10	19:50	06:43	10.9
2024-09-11	19:47	06:45	11.0
2024-09-12	19:45	06:47	11.0
2024-09-13	19:42	06:49	11.1
2024-09-14	19:39	06:51	11.2
2024-09-15	19:37	06:53	11.3
2024-09-16	19:34	06:55	11.3
2024-09-17	19:31	06:57	11.4
2024-09-18	19:29	06:58	11.5
2024-09-19	19:26	07:00	11.6

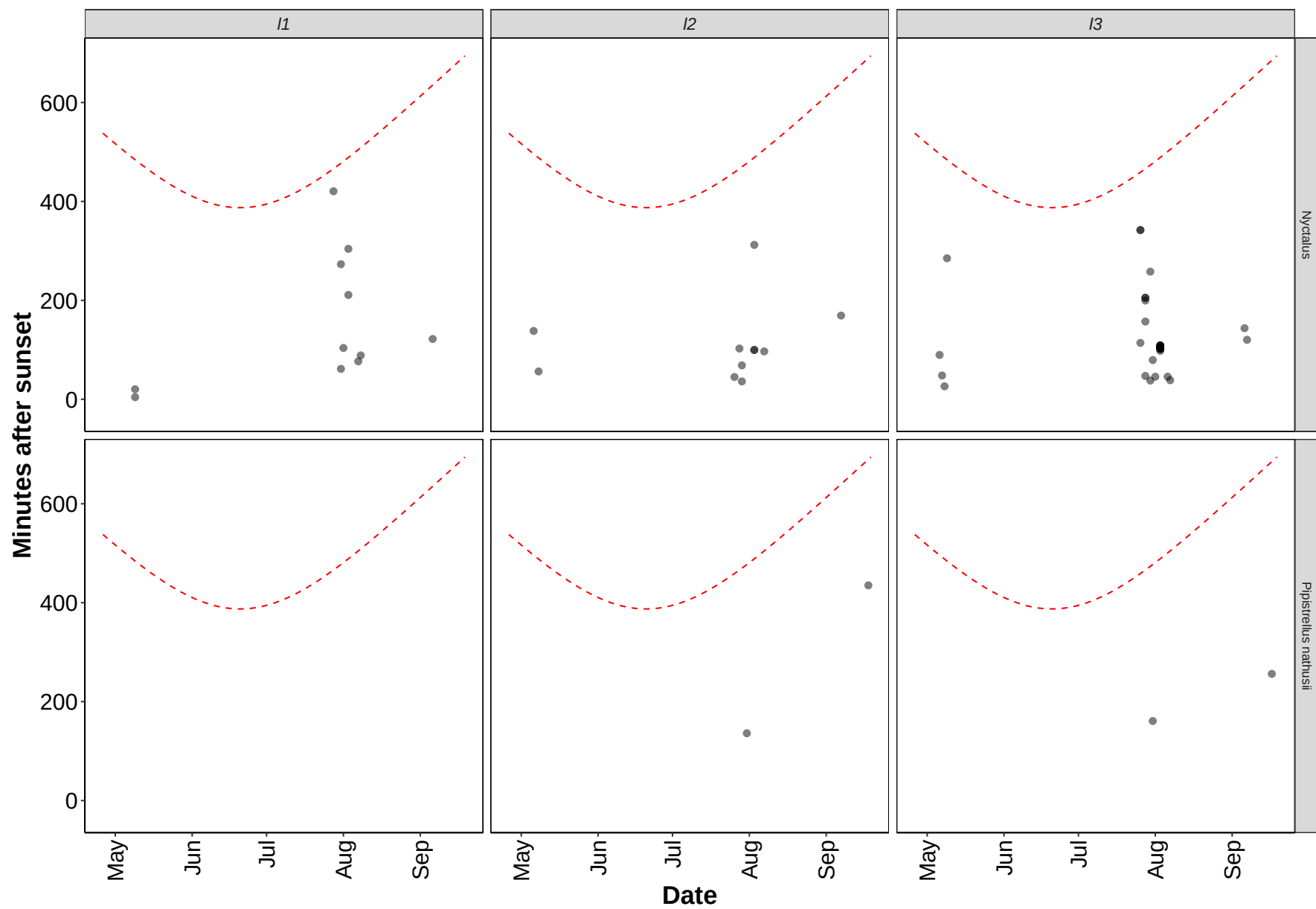
Distribution of Bat Activity Across the Night through Time

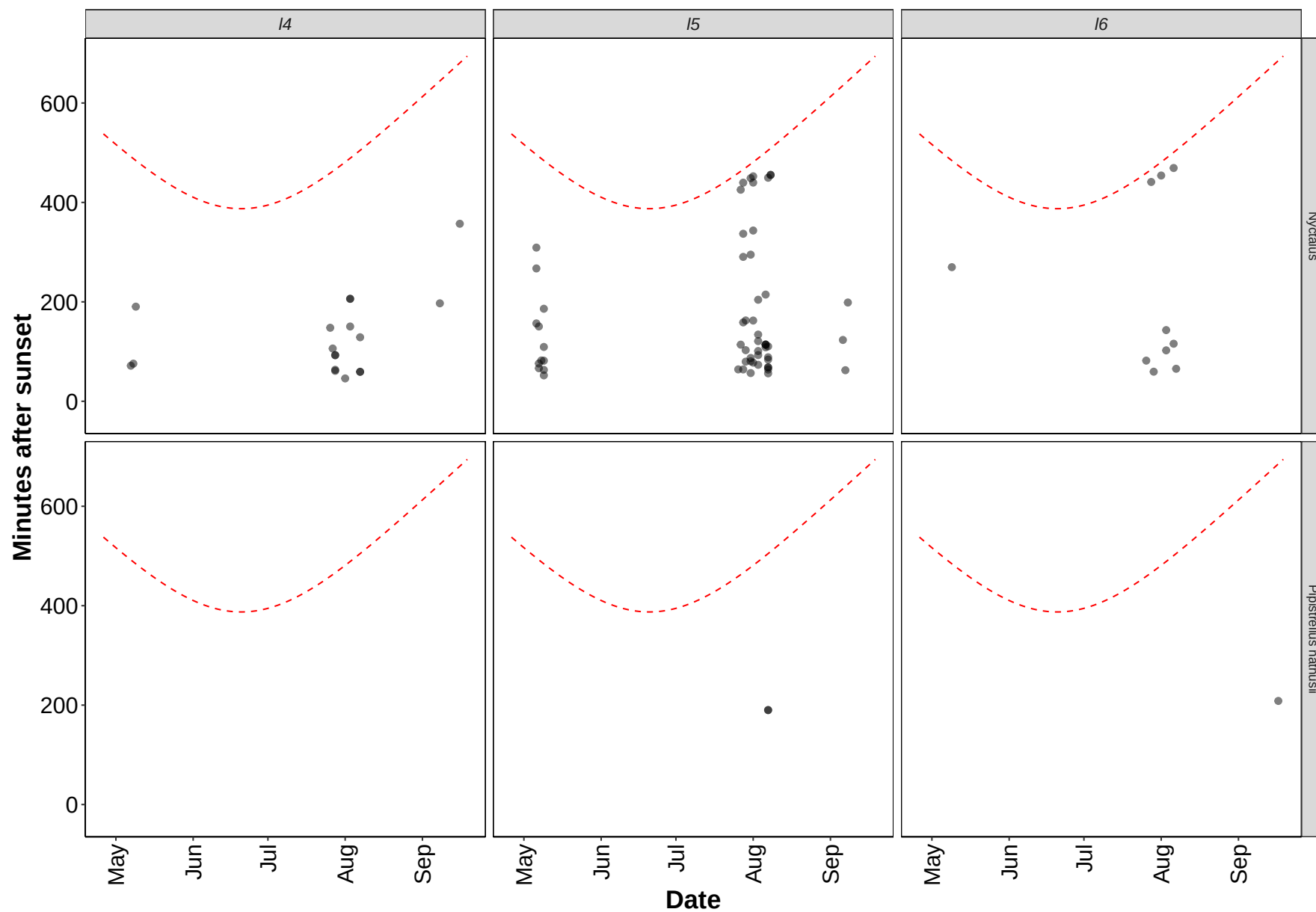
Per Detector

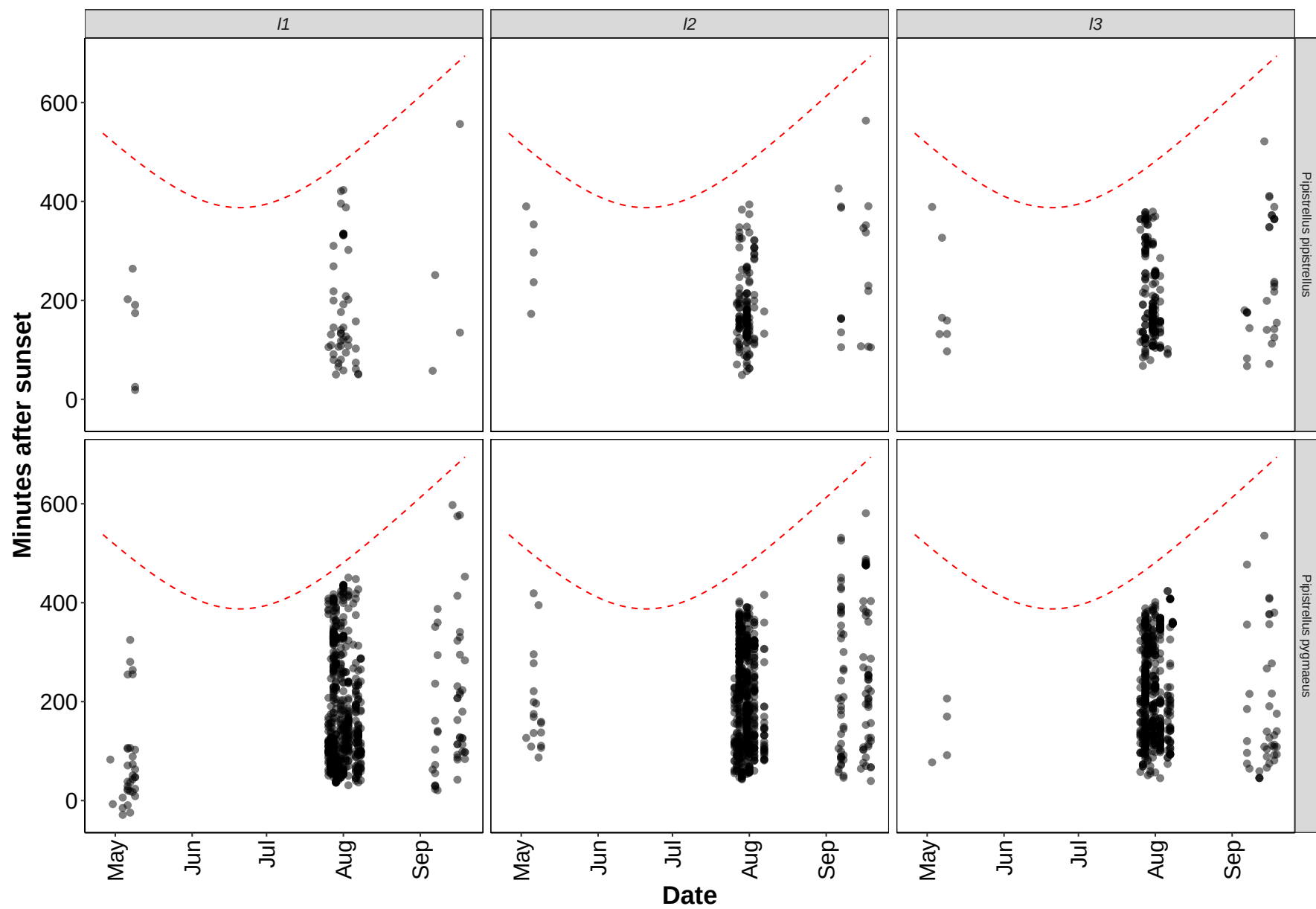
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

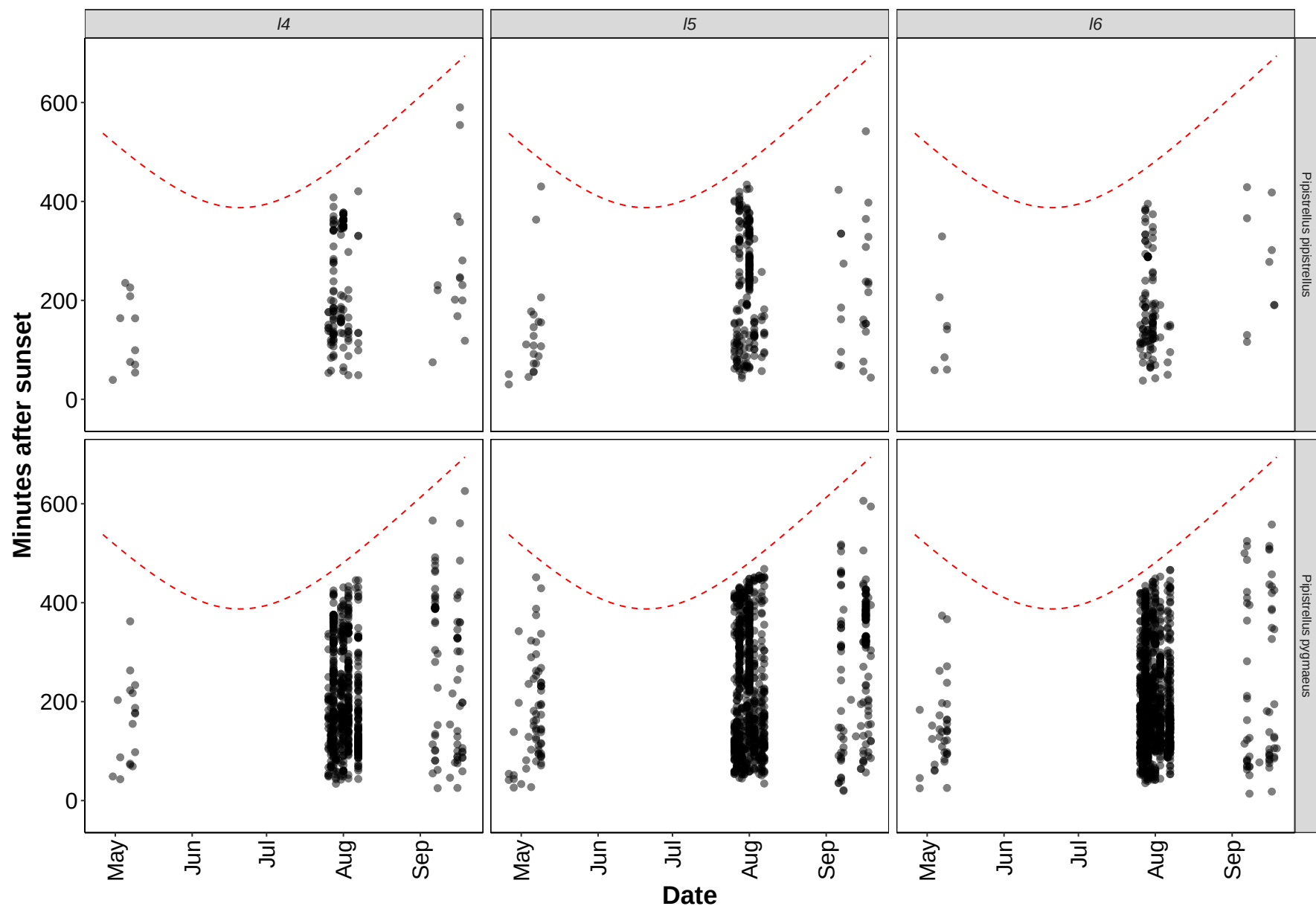












Roost Emergence Time and Bat Observation

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	2024-04-26	2024-04-28	2024-04-30	2024-05-04	2024-05-05
Common pipistrelle	I1	0	0	0	0	0
Common pipistrelle	I5	1	0	0	0	0
Soprano pipistrelle	I1	0	0	1	3	0
Soprano pipistrelle	I4	0	0	0	0	0
Soprano pipistrelle	I5	0	1	0	0	1
Soprano pipistrelle	I6	0	1	0	0	0
Nyctalus	I1	0	0	0	0	0
Daubenton's	I1	1	0	0	0	1
Daubenton's	I5	0	0	0	0	0
Daubenton's	I6	0	0	0	0	0

Table 13: Table continues below

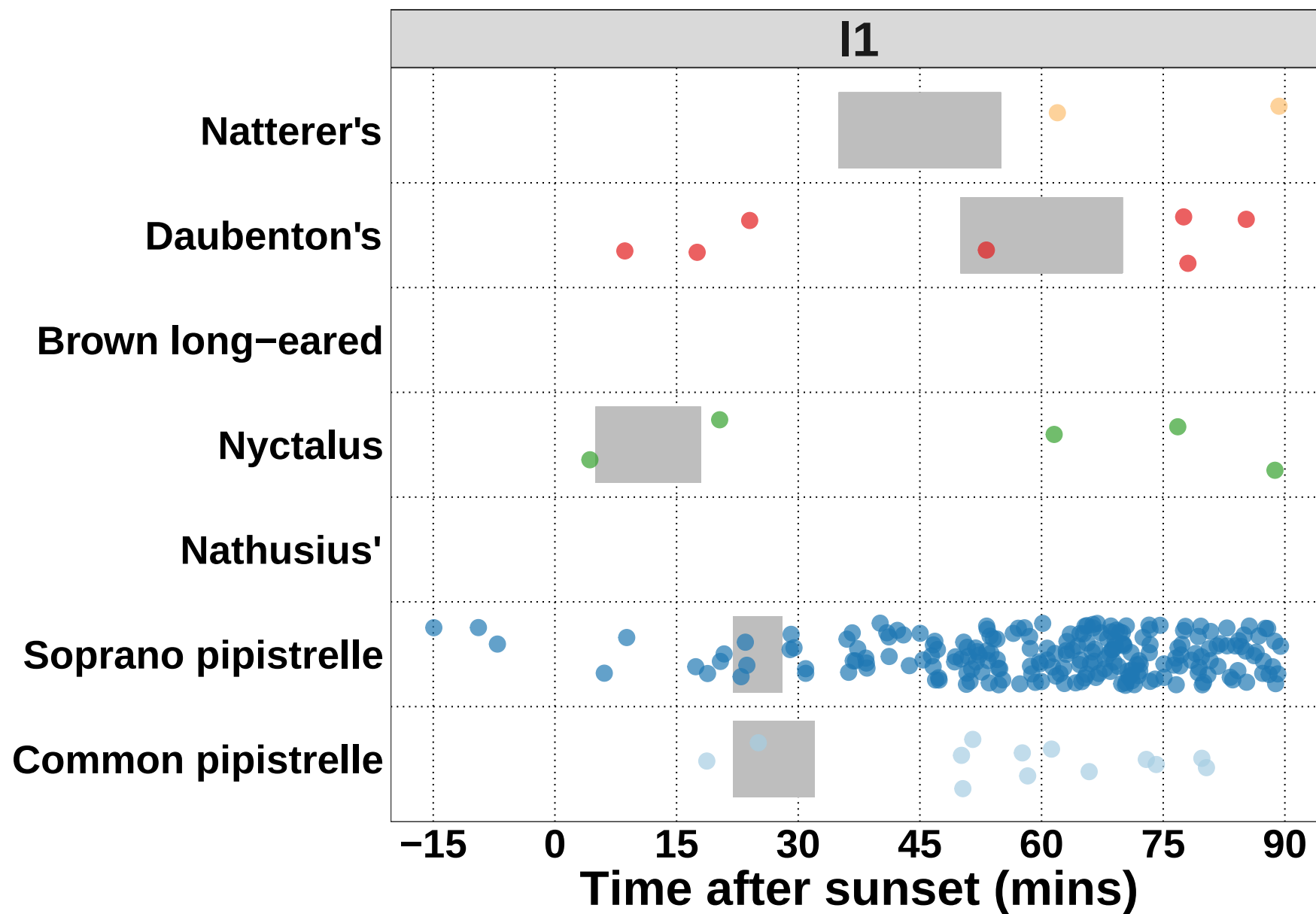
2024-05-06	2024-05-07	2024-05-08	2024-05-09	2024-07-29	2024-08-06	2024-09-07
0	0	0	2	0	0	0
0	0	0	0	0	0	0
3	2	1	2	0	0	1
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	1	0	0	0
0	0	0	1	0	0	0
0	0	2	0	0	0	0
0	0	0	1	1	0	0

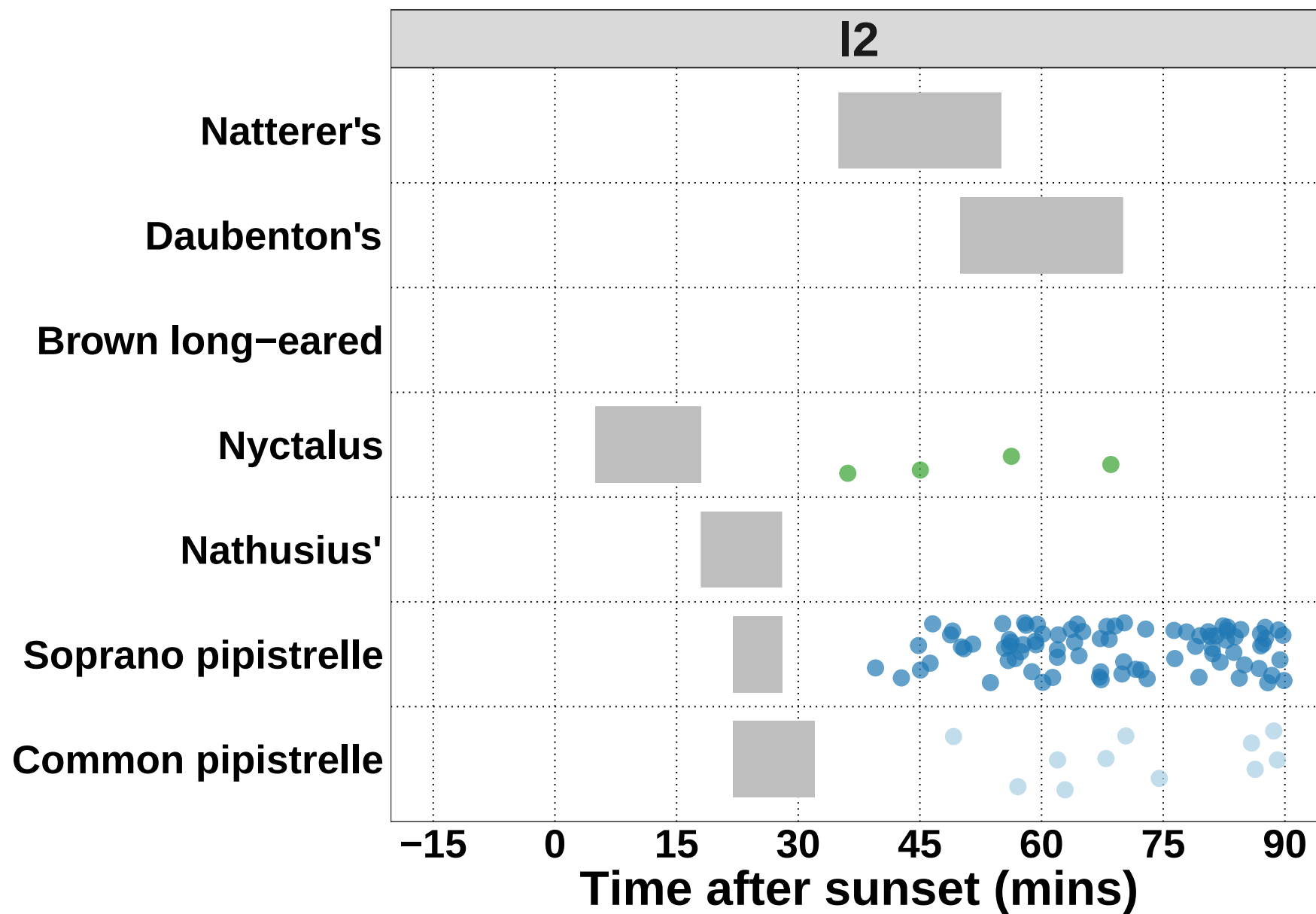
2024-05-06	2024-05-07	2024-05-08	2024-05-09	2024-07-29	2024-08-06	2024-09-07
0	0	0	0	0	1	0

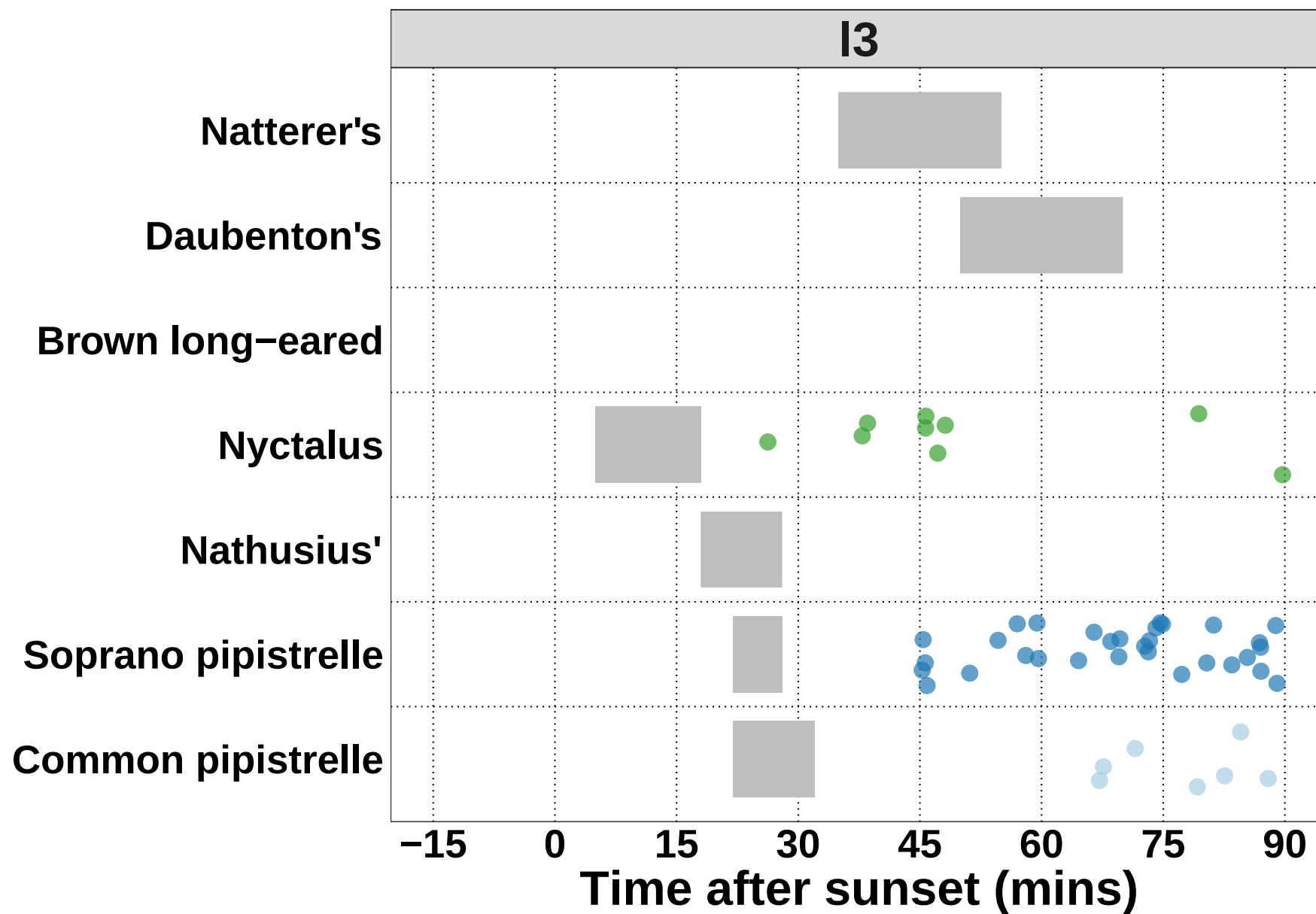
2024-09-08	2024-09-16	2024-09-17
0	0	0
0	0	0
1	0	0
1	1	0
2	0	0
1	0	1
0	0	0
0	0	0
0	0	0
0	0	0

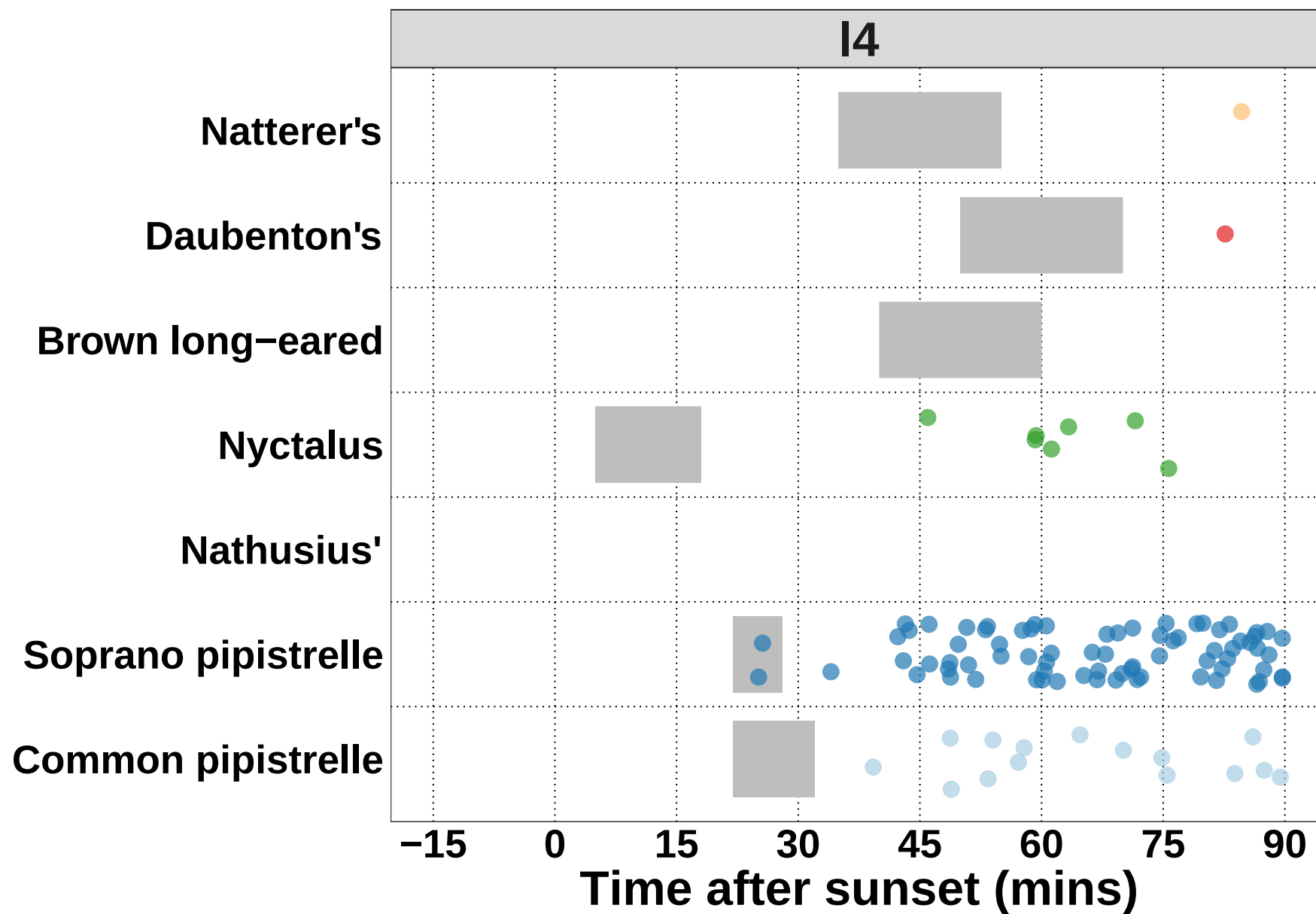
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012)

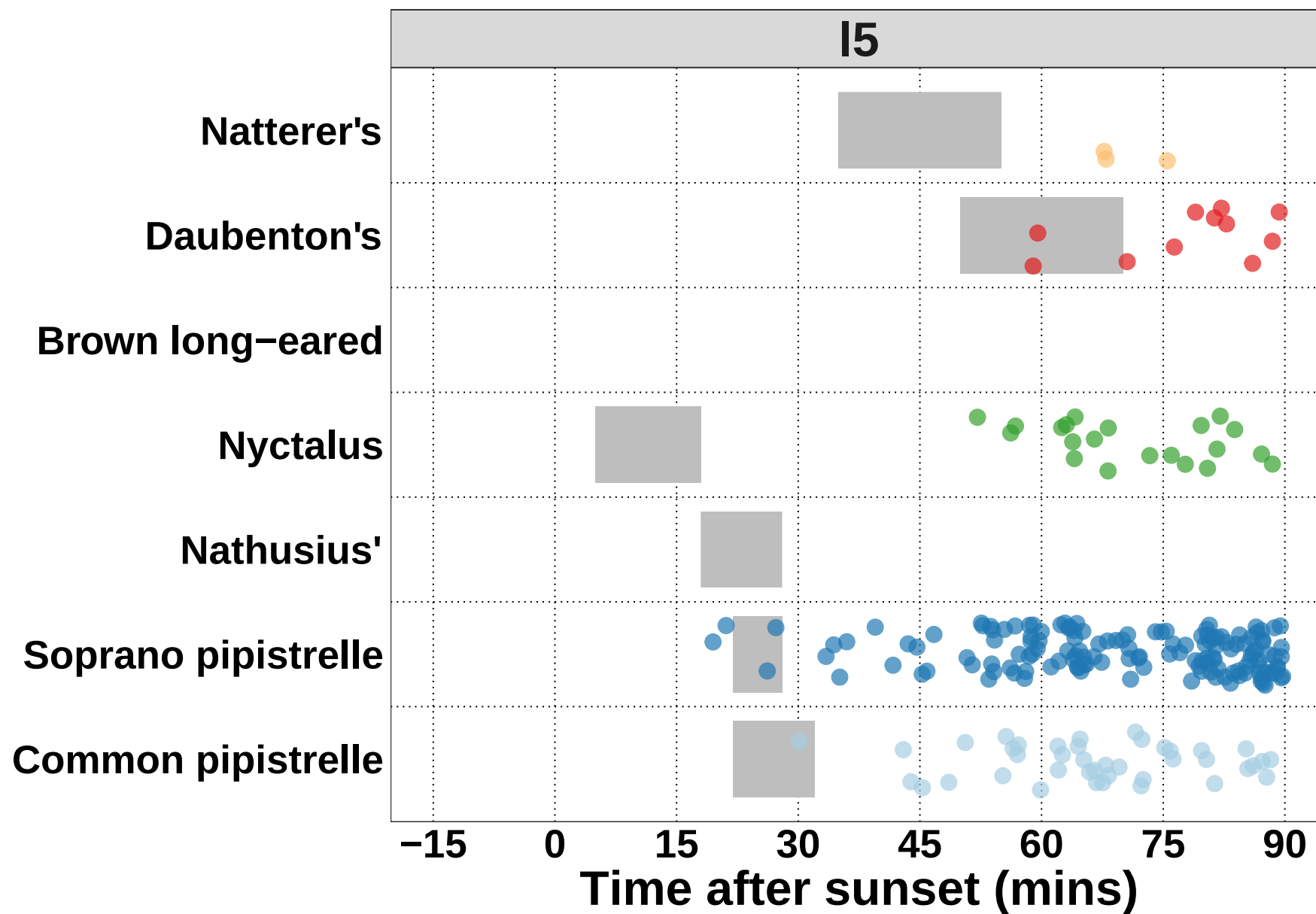
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occurring earlier than this time range, may potentially indicate the presence of a nearby roost.

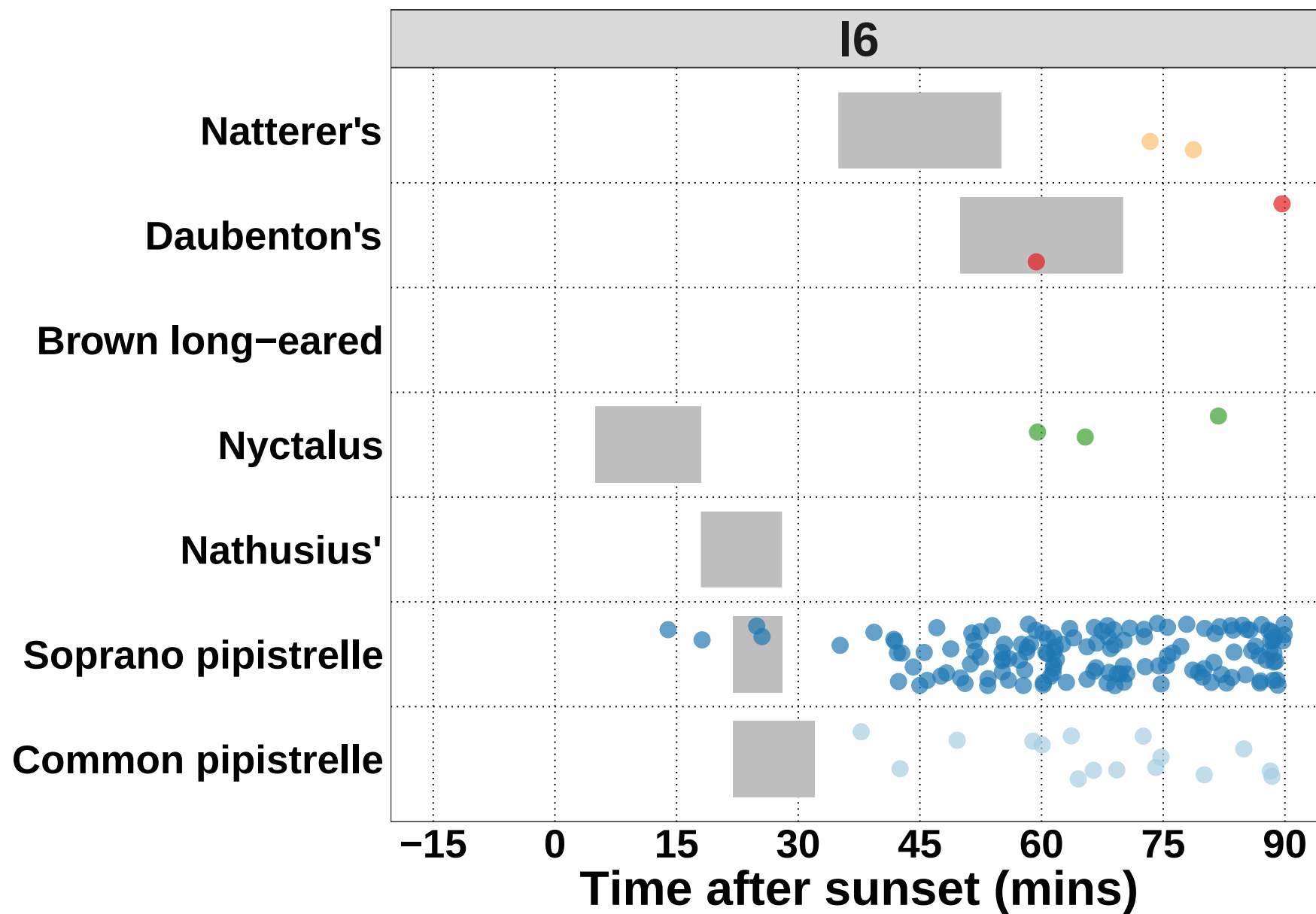








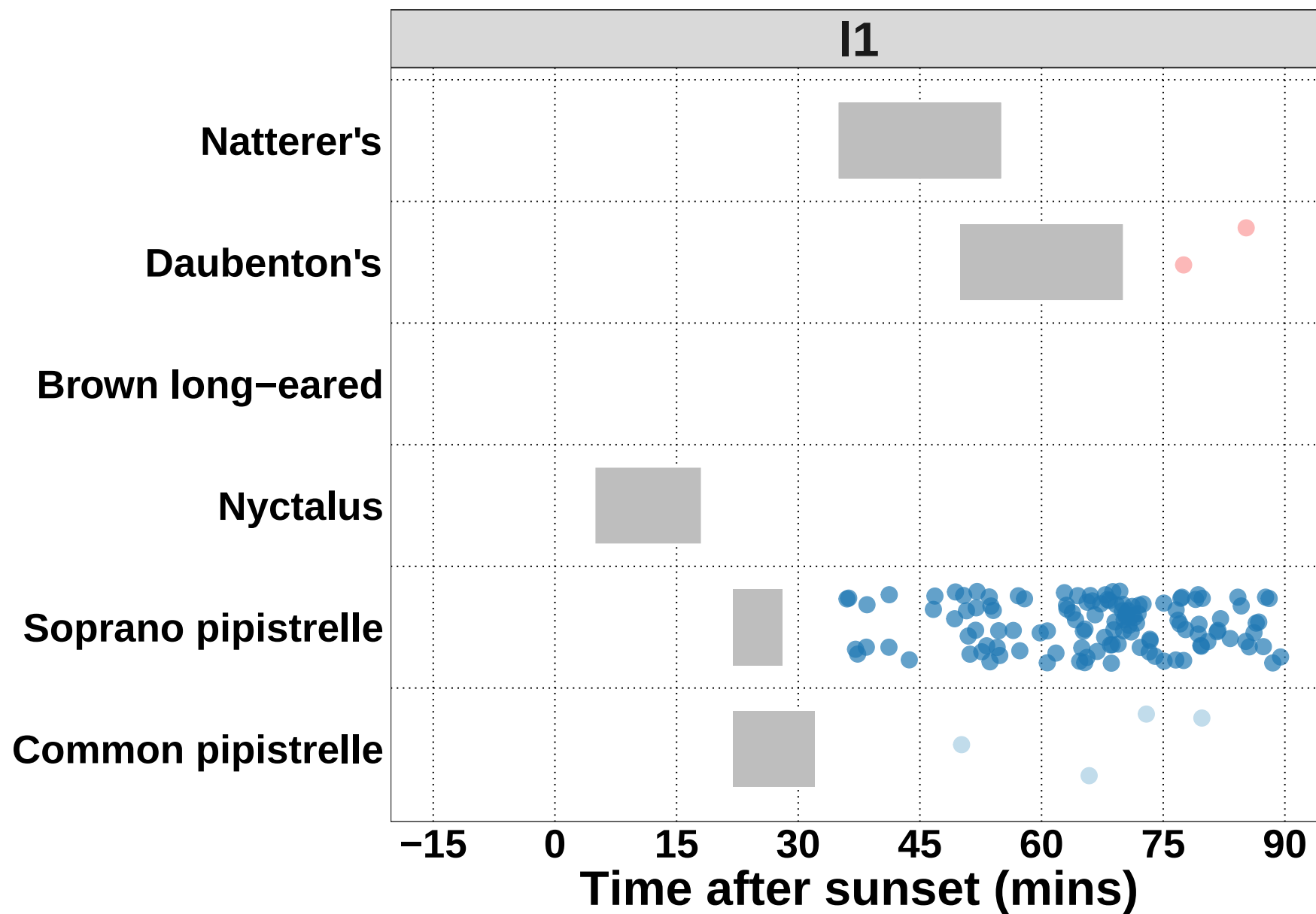


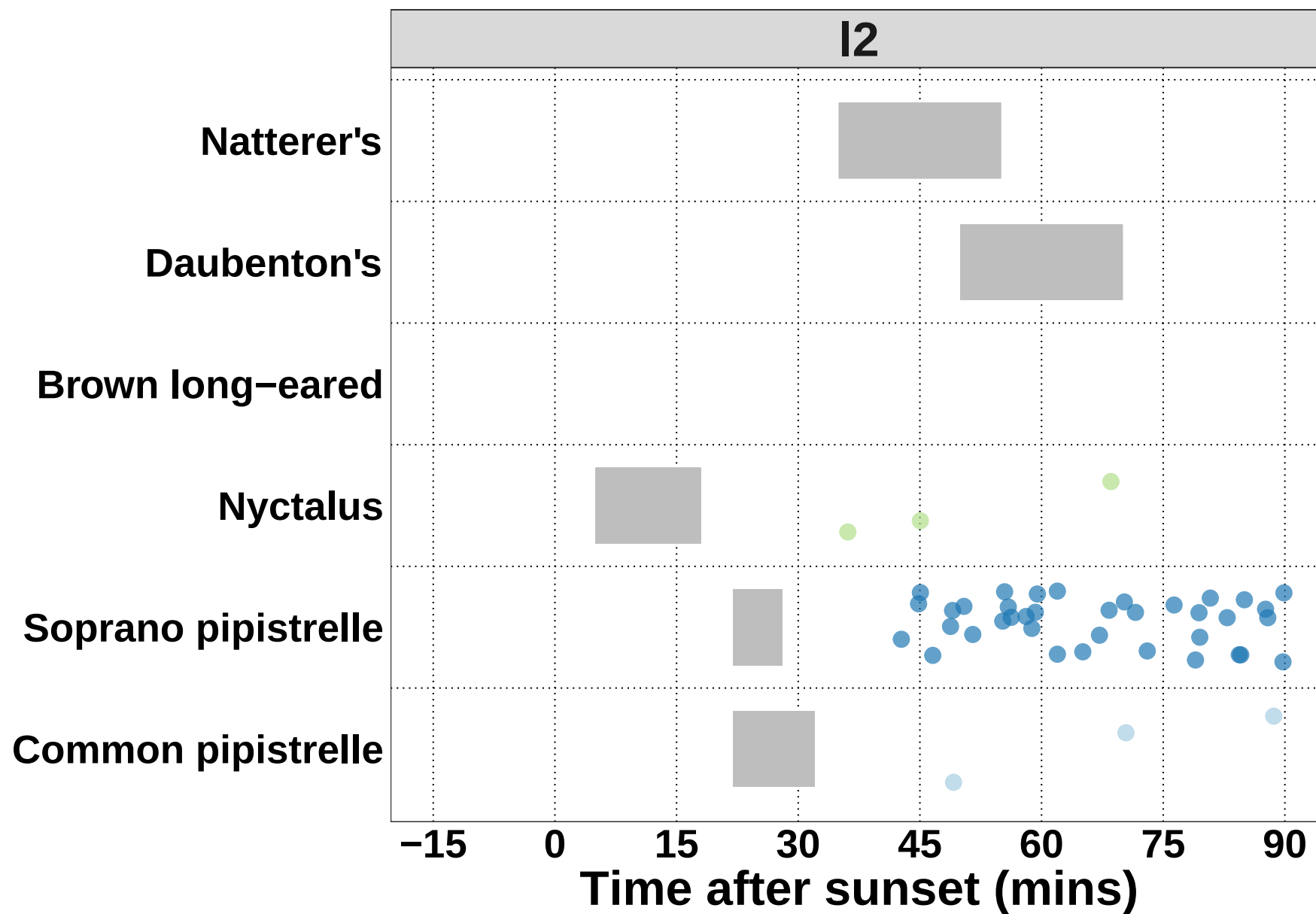


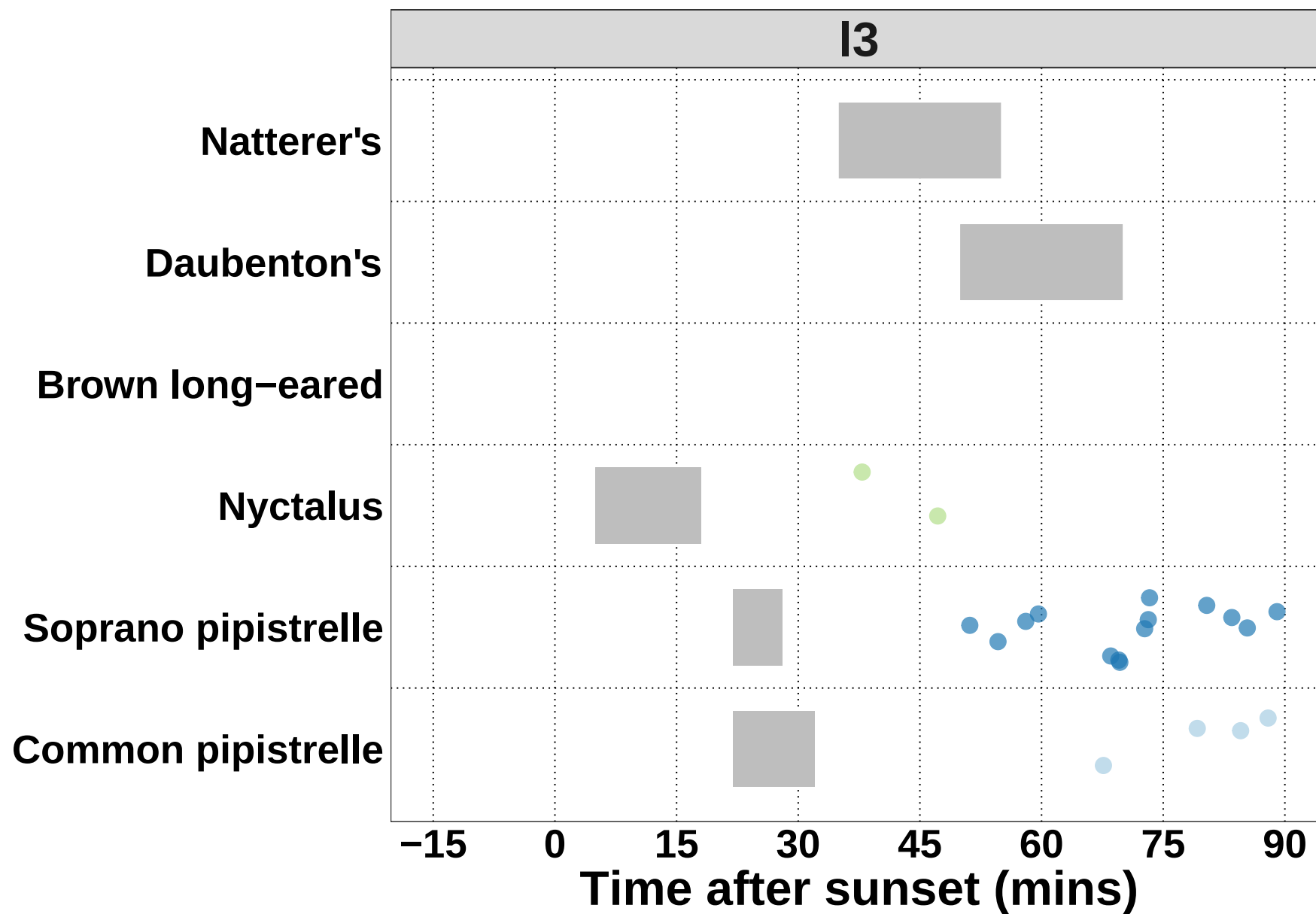
Bat Passes Potentially Indicating Close Proximity to a Roost (Maternity Period Only) - *Maternity period defined as 15th June - 30th July.

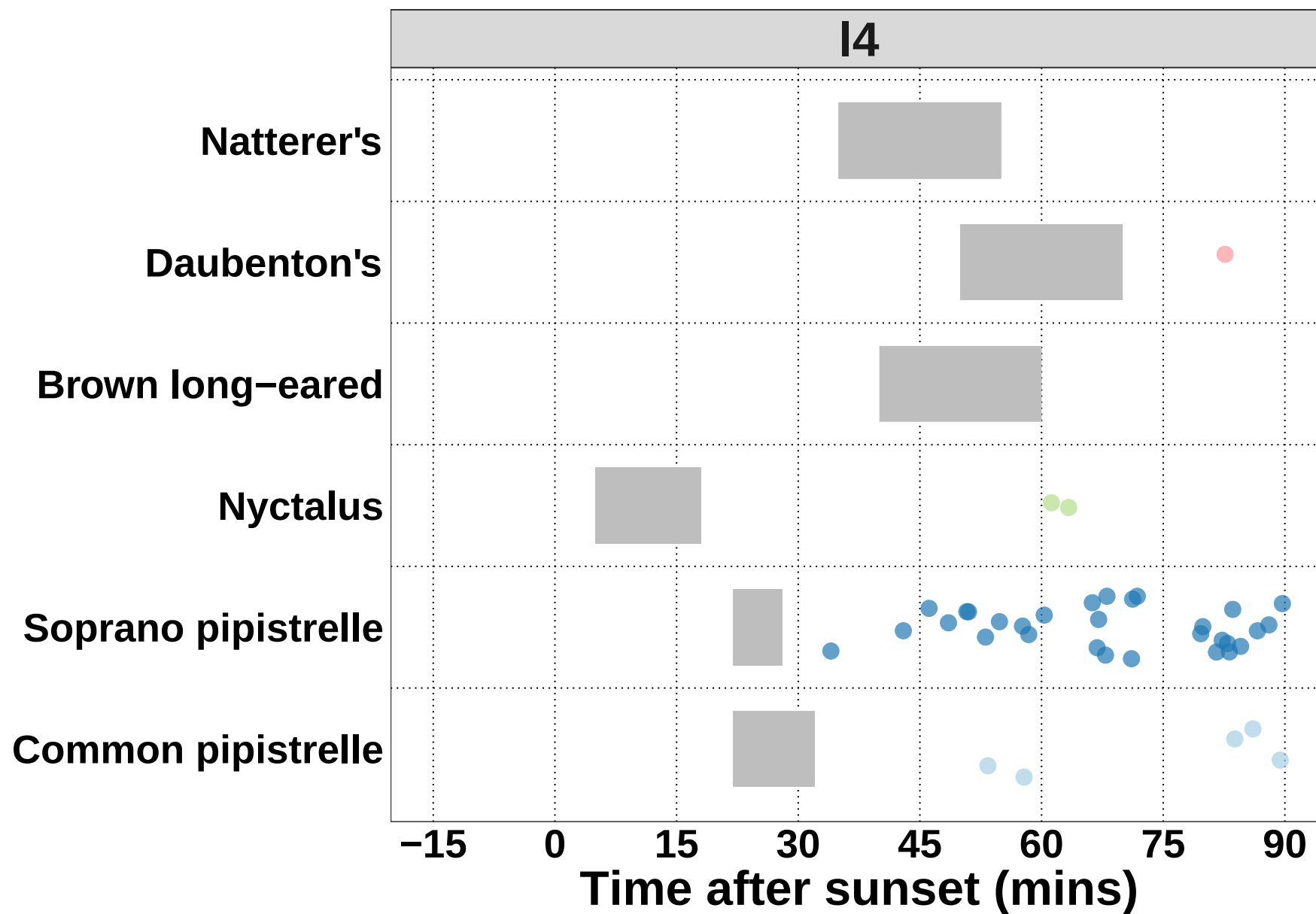
Species	Detector ID	2024-07-29
Daubenton's	I5	1

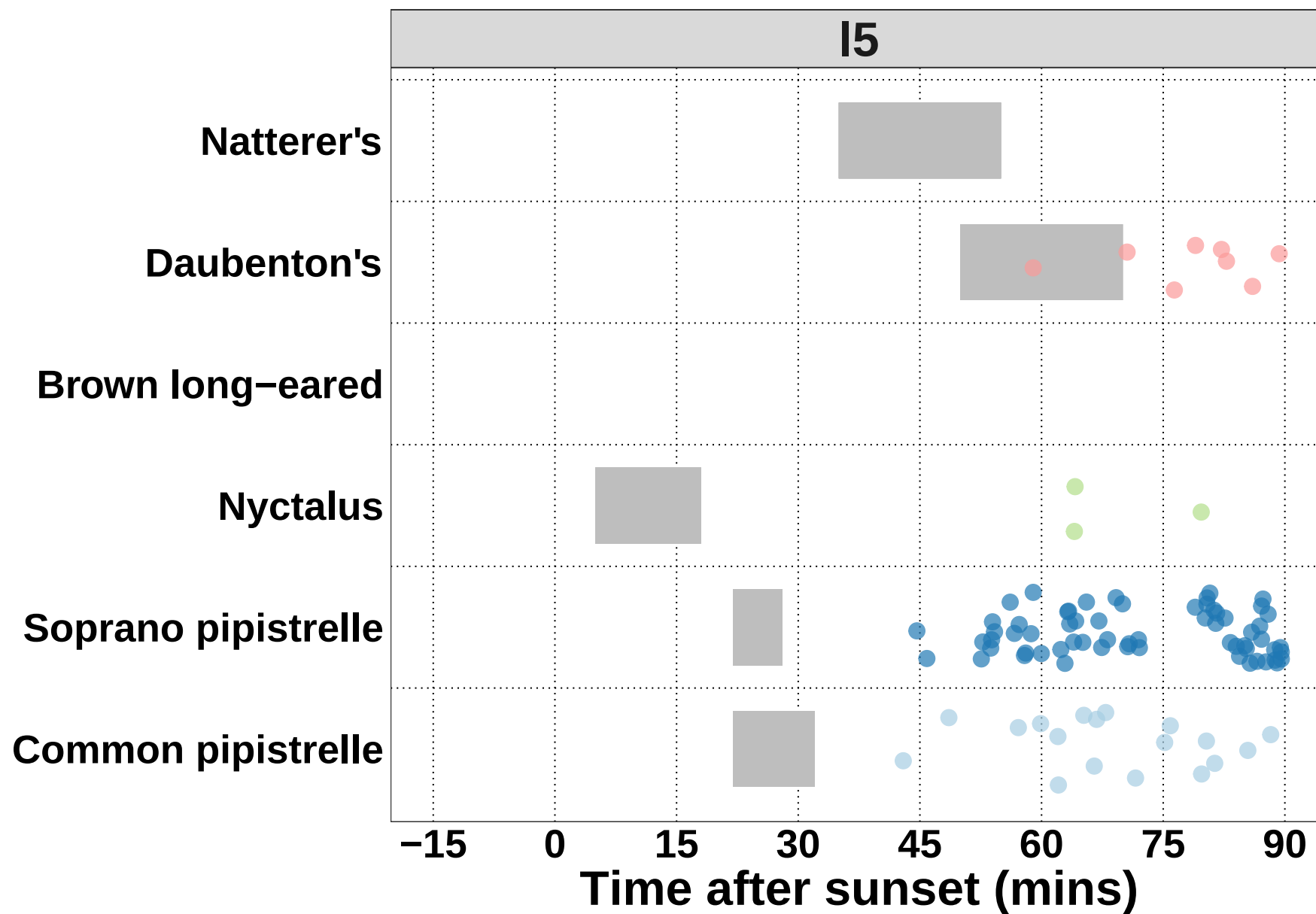
Bat Passes Potentially Indicating Close Proximity to a Roost (Maternity Period Only) - Maternity period defined as 15th June - 30th July.

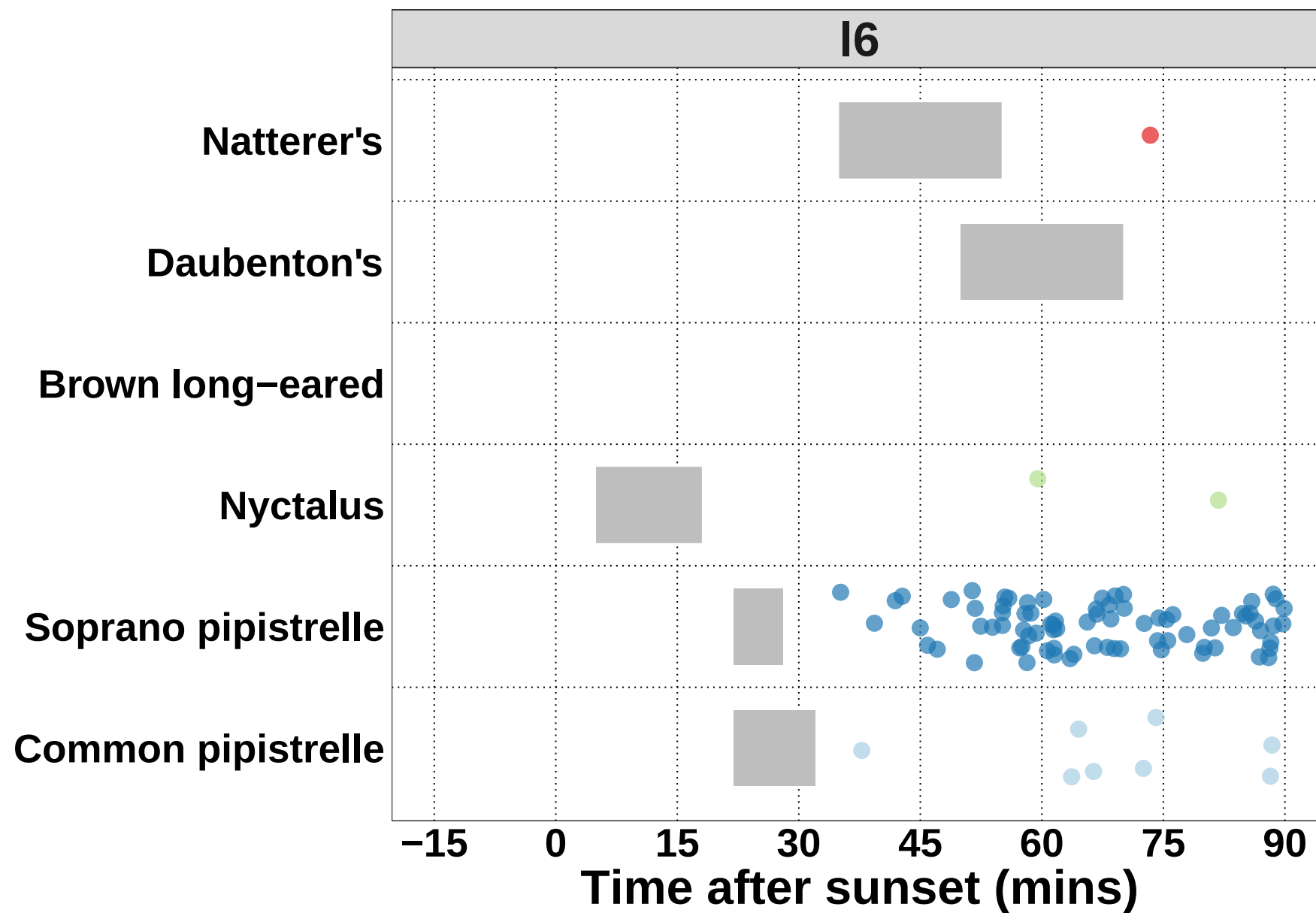












Count of Bat Passes

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 (%)
<i>Myotis daubentonii</i>	169	2.6
<i>Myotis nattereri</i>	110	1.7
<i>Nyctalus</i>	145	2.2
<i>Pipistrellus nathusii</i>	7	0.1
<i>Pipistrellus pipistrellus</i>	1022	15.5
<i>Pipistrellus pygmaeus</i>	5131	77.9
<i>Plecotus auritus</i>	2	0.0
Total	6586	100.0

Per Detector

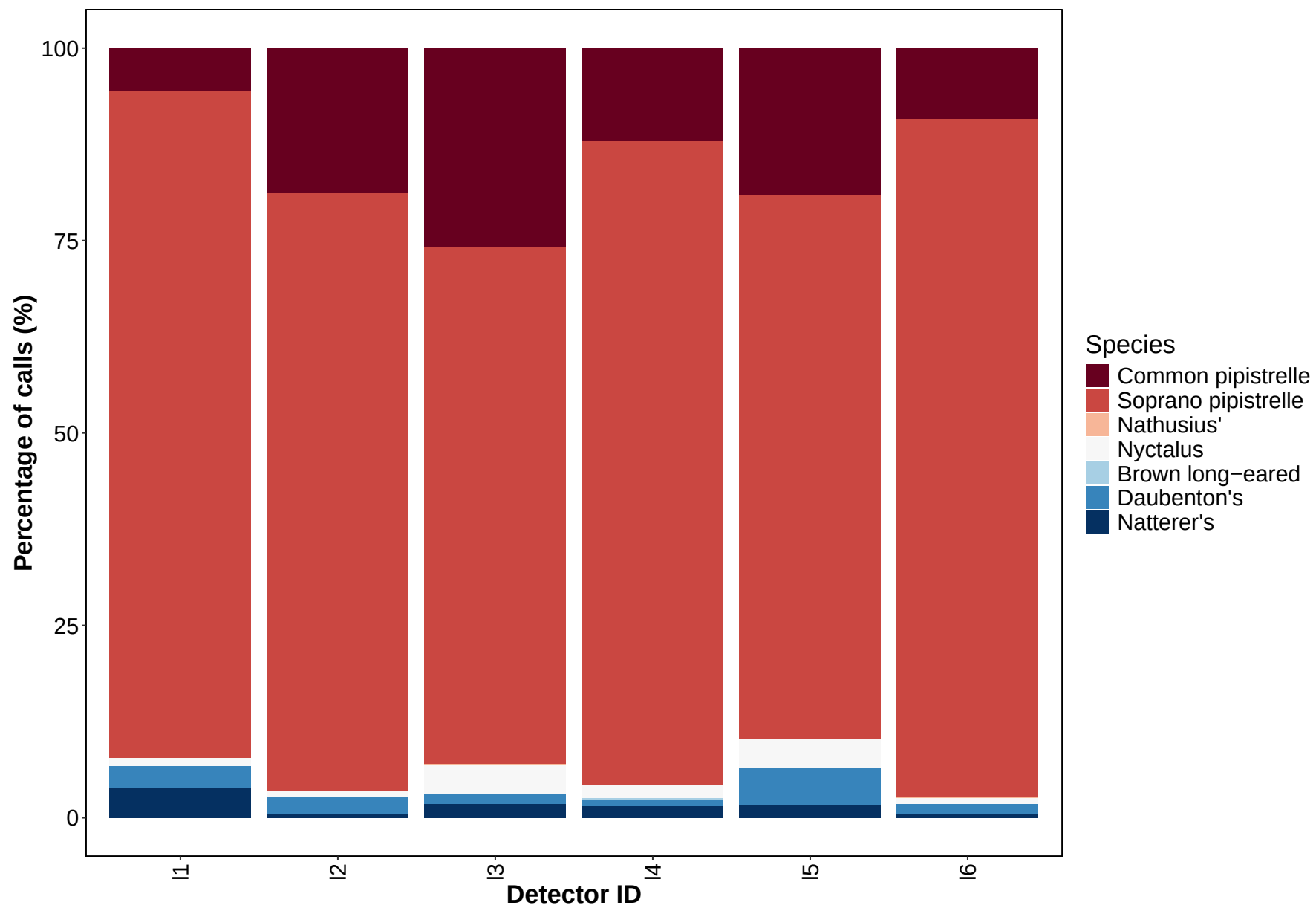
The number of passes recorded for each species at each detector.

Species	Detector ID	Count (no.)	Percentage by Detector (%)
Common pipistrelle	I1	58	6.6666667
Common pipistrelle	I2	179	18.3778234
Common pipistrelle	I3	235	27.1676301
Common pipistrelle	I4	148	15.7112527
Common pipistrelle	I5	280	18.8172043
Common pipistrelle	I6	122	8.4312370
Soprano pipistrelle	I1	733	84.2528736
Soprano pipistrelle	I2	750	77.0020534
Soprano pipistrelle	I3	563	65.0867052
Soprano pipistrelle	I4	744	78.9808917
Soprano pipistrelle	I5	1053	70.7661290
Soprano pipistrelle	I6	1288	89.0117484
Nathusius'	I2	2	0.2053388
Nathusius'	I3	2	0.2312139
Nathusius'	I5	2	0.1344086
Nathusius'	I6	1	0.0691085
Nyctalus	I1	11	1.2643678
Nyctalus	I2	11	1.1293634
Nyctalus	I3	38	4.3930636
Nyctalus	I4	18	1.9108280
Nyctalus	I5	57	3.8306452
Nyctalus	I6	10	0.6910850
Brown long-eared	I4	2	0.2123142
Daubenton's	I1	32	3.6781609
Daubenton's	I2	26	2.6694045
Daubenton's	I3	10	1.1560694
Daubenton's	I4	12	1.2738854
Daubenton's	I5	70	4.7043011
Daubenton's	I6	19	1.3130615
Natterer's	I1	36	4.1379310
Natterer's	I2	6	0.6160164
Natterer's	I3	17	1.9653179

Species	Detector ID	Count (no.)	Percentage by Detector (%)
Natterer's	I4	18	1.9108280
Natterer's	I5	26	1.7473118
Natterer's	I6	7	0.4837595

Species Composition

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



Part 2a: Presence Only

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

Nightly Bat 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	I1	0.4
Common pipistrelle	I2	0.5
Common pipistrelle	I3	0.5
Common pipistrelle	I4	0.4
Common pipistrelle	I5	0.5
Common pipistrelle	I6	0.4
Soprano pipistrelle	I1	1.0
Soprano pipistrelle	I2	2.1
Soprano pipistrelle	I3	1.2
Soprano pipistrelle	I4	1.1
Soprano pipistrelle	I5	1.6
Soprano pipistrelle	I6	1.3
Nathusius'	I2	0.1
Nathusius'	I3	0.1
Nathusius'	I5	0.2
Nathusius'	I6	0.1
Nyctalus	I1	0.2
Nyctalus	I2	0.1
Nyctalus	I3	0.1
Nyctalus	I4	0.1
Nyctalus	I5	0.5
Nyctalus	I6	0.2
Brown long-eared	I4	0.1
Daubenton's	I1	0.2
Daubenton's	I2	0.3
Daubenton's	I3	0.2
Daubenton's	I4	0.1
Daubenton's	I5	0.5
Daubenton's	I6	0.2
Natterer's	I1	0.2
Natterer's	I2	0.1
Natterer's	I3	0.1
Natterer's	I4	0.1
Natterer's	I5	0.2
Natterer's	I6	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.

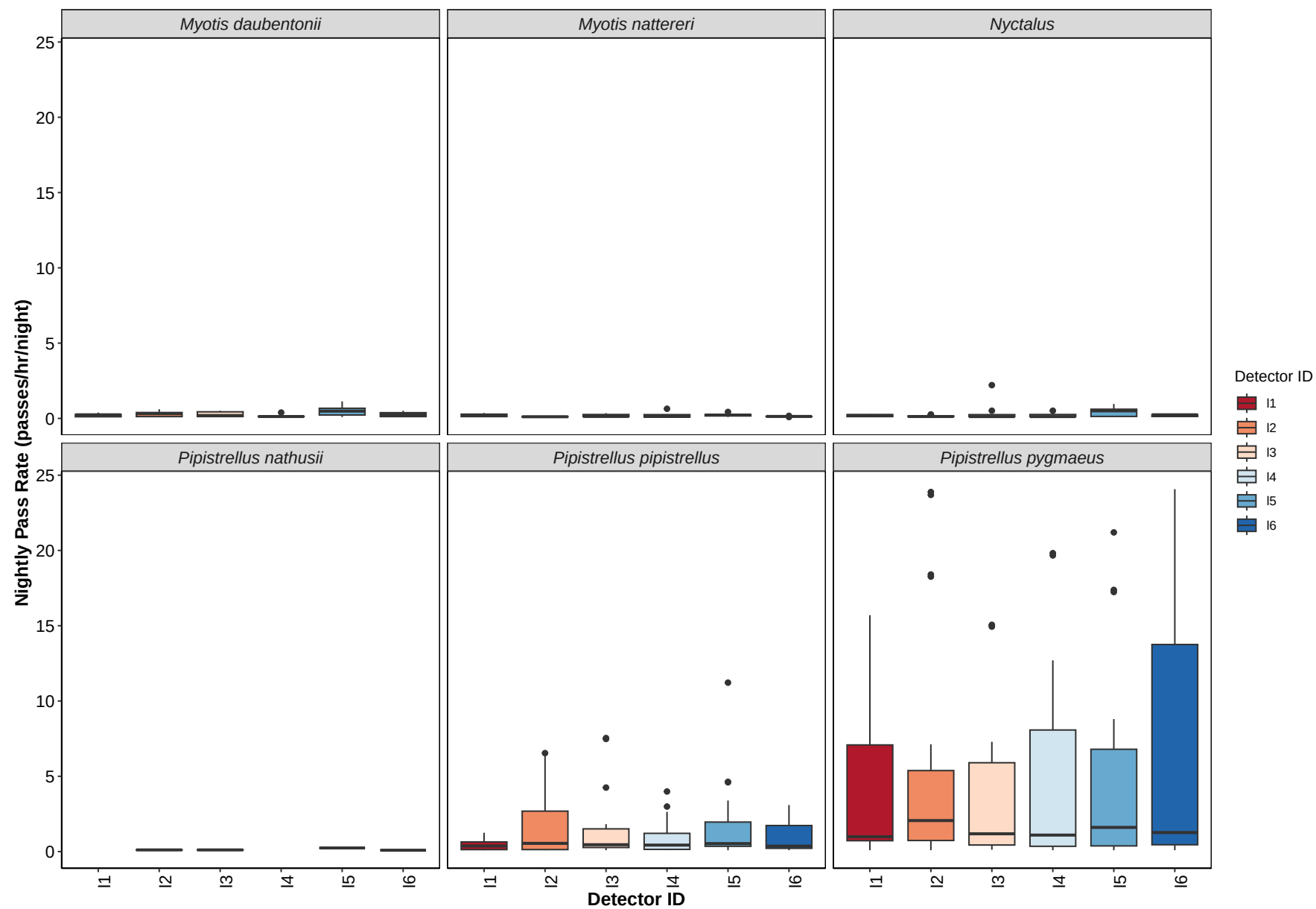
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

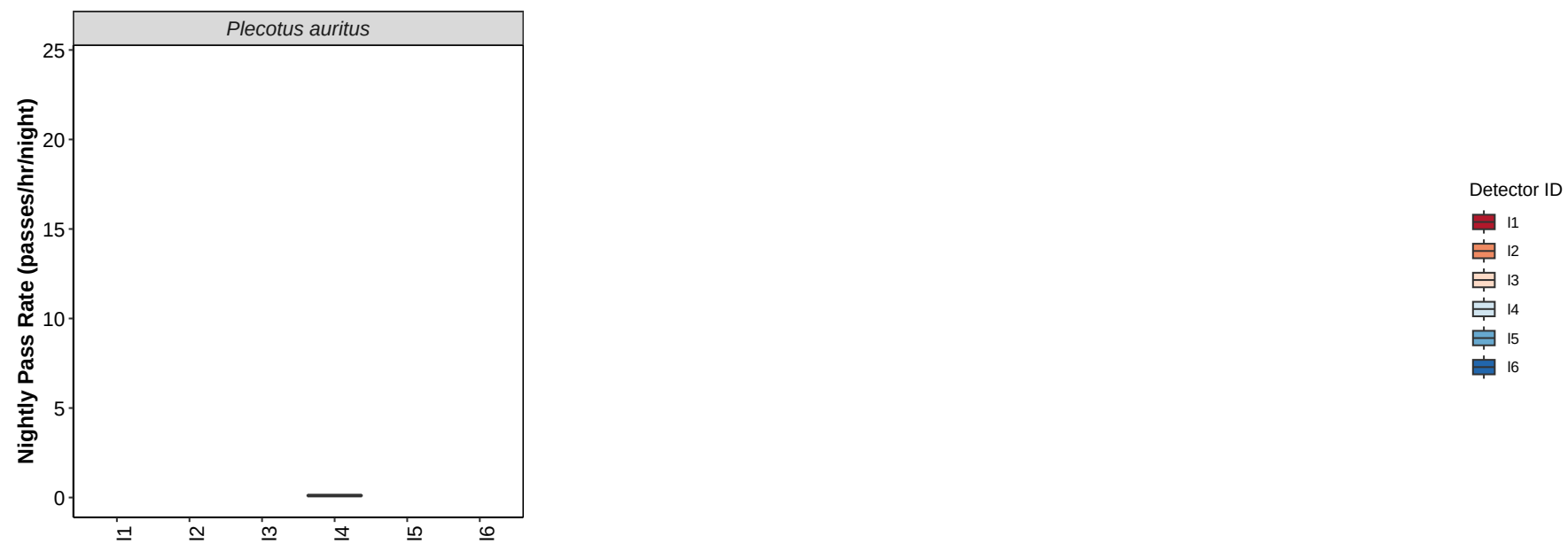
Species	Detector ID	Mean Pass Rate
Common pipistrelle	I1	0.4
Common pipistrelle	I2	1.7
Common pipistrelle	I3	1.4
Common pipistrelle	I4	0.9
Common pipistrelle	I5	1.6
Common pipistrelle	I6	1.0
Soprano pipistrelle	I1	4.2
Soprano pipistrelle	I2	5.3
Soprano pipistrelle	I3	3.6
Soprano pipistrelle	I4	4.5
Soprano pipistrelle	I5	4.4
Soprano pipistrelle	I6	7.1
Nathusius'	I2	0.1
Nathusius'	I3	0.1
Nathusius'	I5	0.2
Nathusius'	I6	0.1
Nyctalus	I1	0.2
Nyctalus	I2	0.2
Nyctalus	I3	0.3
Nyctalus	I4	0.2
Nyctalus	I5	0.5
Nyctalus	I6	0.2
Brown long-eared	I4	0.1
Daubenton's	I1	0.2
Daubenton's	I2	0.3
Daubenton's	I3	0.3
Daubenton's	I4	0.2
Daubenton's	I5	0.5
Daubenton's	I6	0.3
Natterer's	I1	0.2

Species	Detector ID	Mean Pass Rate
Natterer's	I2	0.1
Natterer's	I3	0.2
Natterer's	I4	0.2
Natterer's	I5	0.2
Natterer's	I6	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.





Detector ID

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	May	Jul	Aug	Sep
Common pipistrelle	I1	0	7	22	30	3
Common pipistrelle	I2	0	5	147	65	28
Common pipistrelle	I3	0	6	140	75	39
Common pipistrelle	I4	1	8	76	37	19
Common pipistrelle	I5	2	28	145	120	30
Common pipistrelle	I6	0	9	106	29	11
Soprano pipistrelle	I1	2	34	538	332	48
Soprano pipistrelle	I2	0	22	590	270	125
Soprano pipistrelle	I3	0	3	414	214	47
Soprano pipistrelle	I4	1	20	469	376	107
Soprano pipistrelle	I5	9	58	503	386	241
Soprano pipistrelle	I6	3	31	929	447	82
Nathusius'	I2	0	0	1	0	1
Nathusius'	I3	0	0	1	0	1
Nathusius'	I5	0	0	0	2	0
Nathusius'	I6	0	0	0	0	1
Nyctalus	I1	0	2	3	6	1
Nyctalus	I2	0	2	4	3	1
Nyctalus	I3	0	4	10	21	2
Nyctalus	I4	0	3	8	6	2
Nyctalus	I5	0	15	18	27	3
Nyctalus	I6	0	1	5	7	0
Brown long-eared	I4	0	0	1	0	1
Daubenton's	I1	1	4	12	9	4
Daubenton's	I2	0	1	17	8	2
Daubenton's	I3	0	0	9	4	0
Daubenton's	I4	1	0	5	2	3
Daubenton's	I5	0	9	38	24	11
Daubenton's	I6	0	1	16	4	2
Natterer's	I1	0	3	4	6	30
Natterer's	I2	0	0	3	0	3
Natterer's	I3	0	0	1	2	15
Natterer's	I4	0	0	8	3	6
Natterer's	I5	0	0	8	1	18
Natterer's	I6	0	0	3	1	3

Survey Effort

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

month	Detector ID	No. of Survey Nights
Apr	I1	3
Apr	I4	1
Apr	I5	3
Apr	I6	1
May	I1	7
May	I2	6
May	I3	5
May	I4	6
May	I5	8
May	I6	6
Jul	I1	6
Jul	I2	6
Jul	I3	6
Jul	I4	6
Jul	I5	6
Jul	I6	6
Aug	I1	7
Aug	I2	3
Aug	I3	6
Aug	I4	4
Aug	I5	6
Aug	I6	4
Sep	I1	10
Sep	I2	9
Sep	I3	11
Sep	I4	10
Sep	I5	12
Sep	I6	9

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	May	Jul	Aug	Sep
Common pipistrelle	I1	NA	0.4	0.5	0.5	0.1
Common pipistrelle	I2	NA	0.1	3.1	1.5	0.5
Common pipistrelle	I3	NA	0.1	1.7	1.5	0.4
Common pipistrelle	I4	0.1	0.2	2.2	1.0	0.2
Common pipistrelle	I5	0.2	0.4	2.8	1.4	0.5
Common pipistrelle	I6	NA	0.2	2.5	0.4	0.3
Soprano pipistrelle	I1	0.1	1.0	11.1	6.7	0.6
Soprano pipistrelle	I2	NA	0.5	12.0	7.1	1.4
Soprano pipistrelle	I3	NA	0.2	6.8	4.0	0.4
Soprano pipistrelle	I4	0.1	0.5	7.3	12.0	0.8
Soprano pipistrelle	I5	0.3	0.7	8.4	6.6	0.7
Soprano pipistrelle	I6	0.3	0.5	21.6	13.7	1.0
Nathusius'	I2	NA	NA	0.1	NA	0.1
Nathusius'	I3	NA	NA	0.1	NA	0.1
Nathusius'	I5	NA	NA	NA	0.2	NA
Nathusius'	I6	NA	NA	NA	NA	0.1
Nyctalus	I1	NA	0.2	0.2	0.2	0.1
Nyctalus	I2	NA	0.1	0.1	0.2	0.1
Nyctalus	I3	NA	0.1	0.3	0.1	0.1
Nyctalus	I4	NA	0.1	0.3	0.2	0.1
Nyctalus	I5	NA	0.6	0.4	0.6	0.1
Nyctalus	I6	NA	0.1	0.3	0.2	NA
Brown long-eared	I4	NA	NA	0.1	NA	0.1
Daubenton's	I1	0.1	0.1	0.4	0.2	0.1
Daubenton's	I2	NA	0.1	0.4	0.2	0.1
Daubenton's	I3	NA	NA	0.5	0.1	NA
Daubenton's	I4	0.1	NA	0.1	0.1	0.1
Daubenton's	I5	NA	0.5	0.8	0.5	0.1
Daubenton's	I6	NA	0.1	0.4	0.1	0.1
Natterer's	I1	NA	0.2	0.1	0.1	0.3
Natterer's	I2	NA	NA	0.1	NA	0.1
Natterer's	I3	NA	NA	0.1	0.1	0.3
Natterer's	I4	NA	NA	0.2	0.2	0.1
Natterer's	I5	NA	NA	0.3	0.1	0.2
Natterer's	I6	NA	NA	0.1	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.

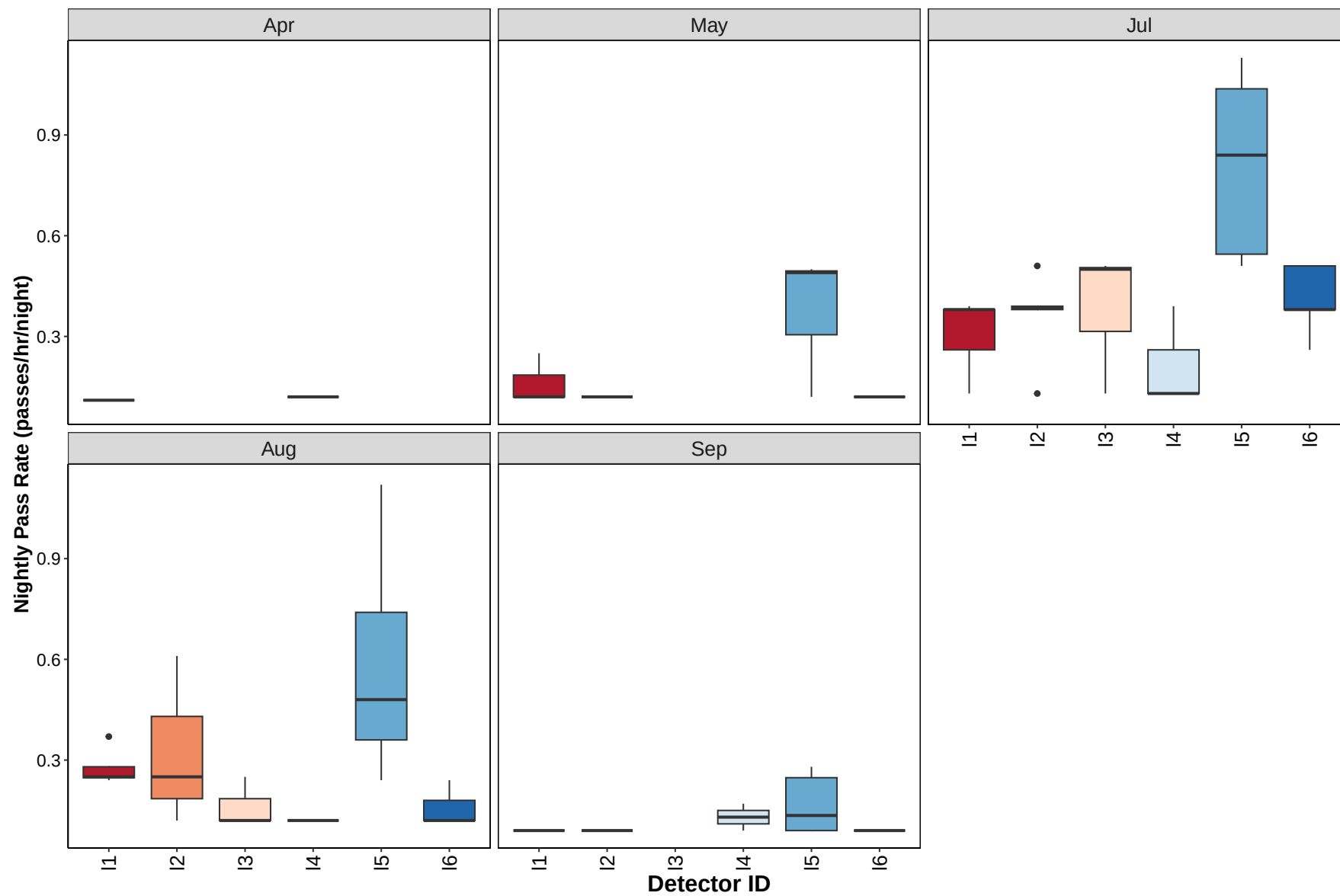
Species	Detector ID	Apr	May	Jul	Aug	Sep
Common pipistrelle	I1	NA	0.3	0.5	0.7	0.1
Common pipistrelle	I2	NA	0.2	3.7	2.7	0.4
Common pipistrelle	I3	NA	0.2	3.0	3.1	0.4
Common pipistrelle	I4	0.1	0.2	2.4	1.5	0.2
Common pipistrelle	I5	0.2	0.5	3.1	3.7	0.4
Common pipistrelle	I6	NA	0.2	2.3	0.9	0.2
Soprano pipistrelle	I1	0.1	0.8	11.5	5.7	0.5
Soprano pipistrelle	I2	NA	0.4	12.5	11.1	1.4
Soprano pipistrelle	I3	NA	0.2	8.8	4.4	0.5
Soprano pipistrelle	I4	0.1	0.5	10.0	11.4	1.0
Soprano pipistrelle	I5	0.3	0.9	10.7	9.4	2.1
Soprano pipistrelle	I6	0.3	0.6	19.9	13.6	0.8
Nathusius'	I2	NA	NA	0.1	NA	0.1
Nathusius'	I3	NA	NA	0.1	NA	0.1
Nathusius'	I5	NA	NA	NA	0.2	NA
Nathusius'	I6	NA	NA	NA	NA	0.1
Nyctalus	I1	NA	0.2	0.2	0.2	0.1
Nyctalus	I2	NA	0.1	0.2	0.2	0.1
Nyctalus	I3	NA	0.1	0.3	0.6	0.1
Nyctalus	I4	NA	0.1	0.3	0.2	0.1
Nyctalus	I5	NA	0.5	0.5	0.7	0.1
Nyctalus	I6	NA	0.1	0.2	0.2	NA
Brown long-eared	I4	NA	NA	0.1	NA	0.1
Daubenton's	I1	0.1	0.2	0.3	0.3	0.1
Daubenton's	I2	NA	0.1	0.4	0.3	0.1
Daubenton's	I3	NA	NA	0.4	0.2	NA
Daubenton's	I4	0.1	NA	0.2	0.1	0.1
Daubenton's	I5	NA	0.4	0.8	0.6	0.2
Daubenton's	I6	NA	0.1	0.4	0.2	0.1
Natterer's	I1	NA	0.2	0.2	0.1	0.3

Species	Detector ID	Apr	May	Jul	Aug	Sep
Natterer's	I2	NA	NA	0.1	NA	0.1
Natterer's	I3	NA	NA	0.1	0.1	0.2
Natterer's	I4	NA	NA	0.3	0.2	0.1
Natterer's	I5	NA	NA	0.3	0.1	0.2
Natterer's	I6	NA	NA	0.1	0.1	0.1

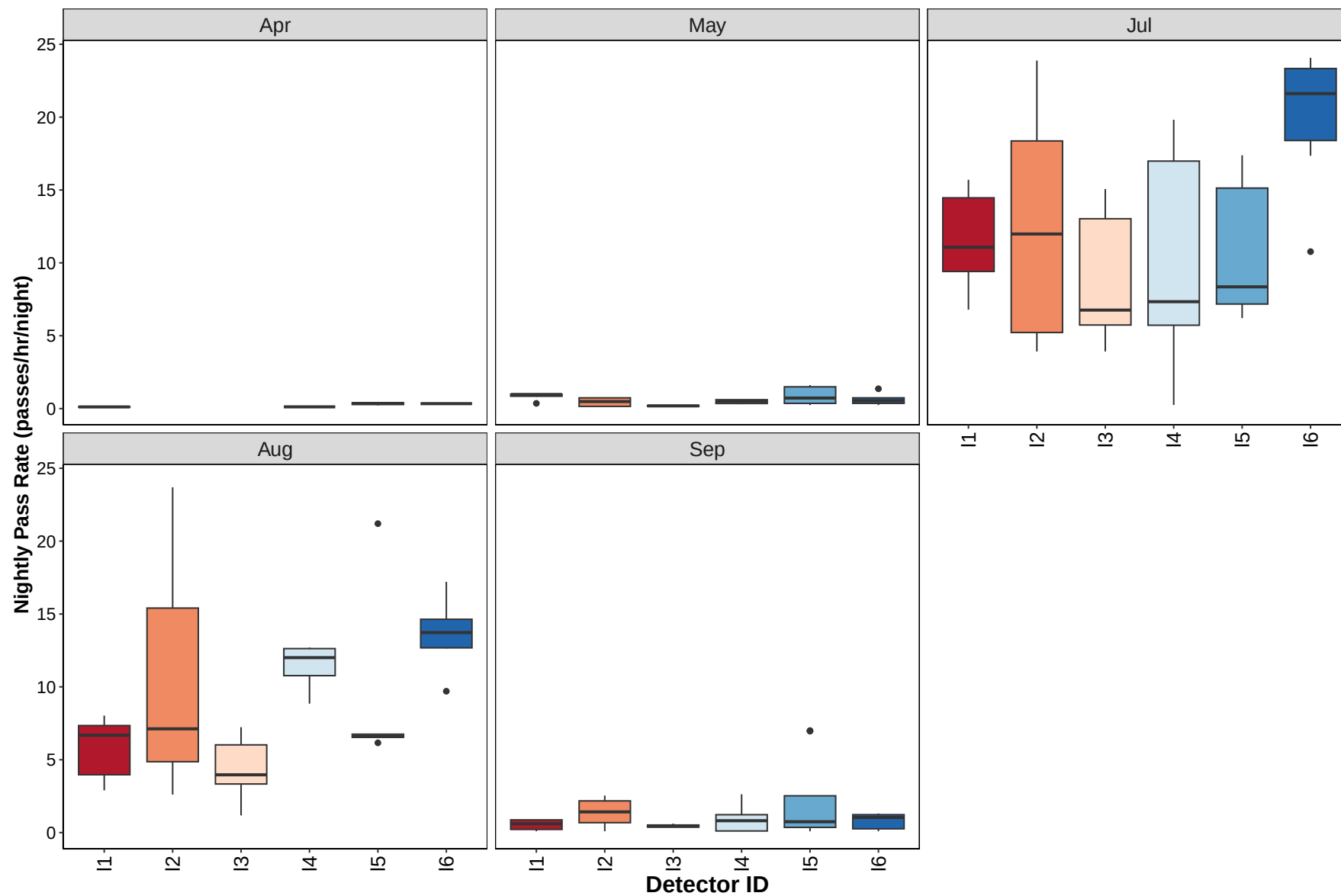
Per Detector

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.

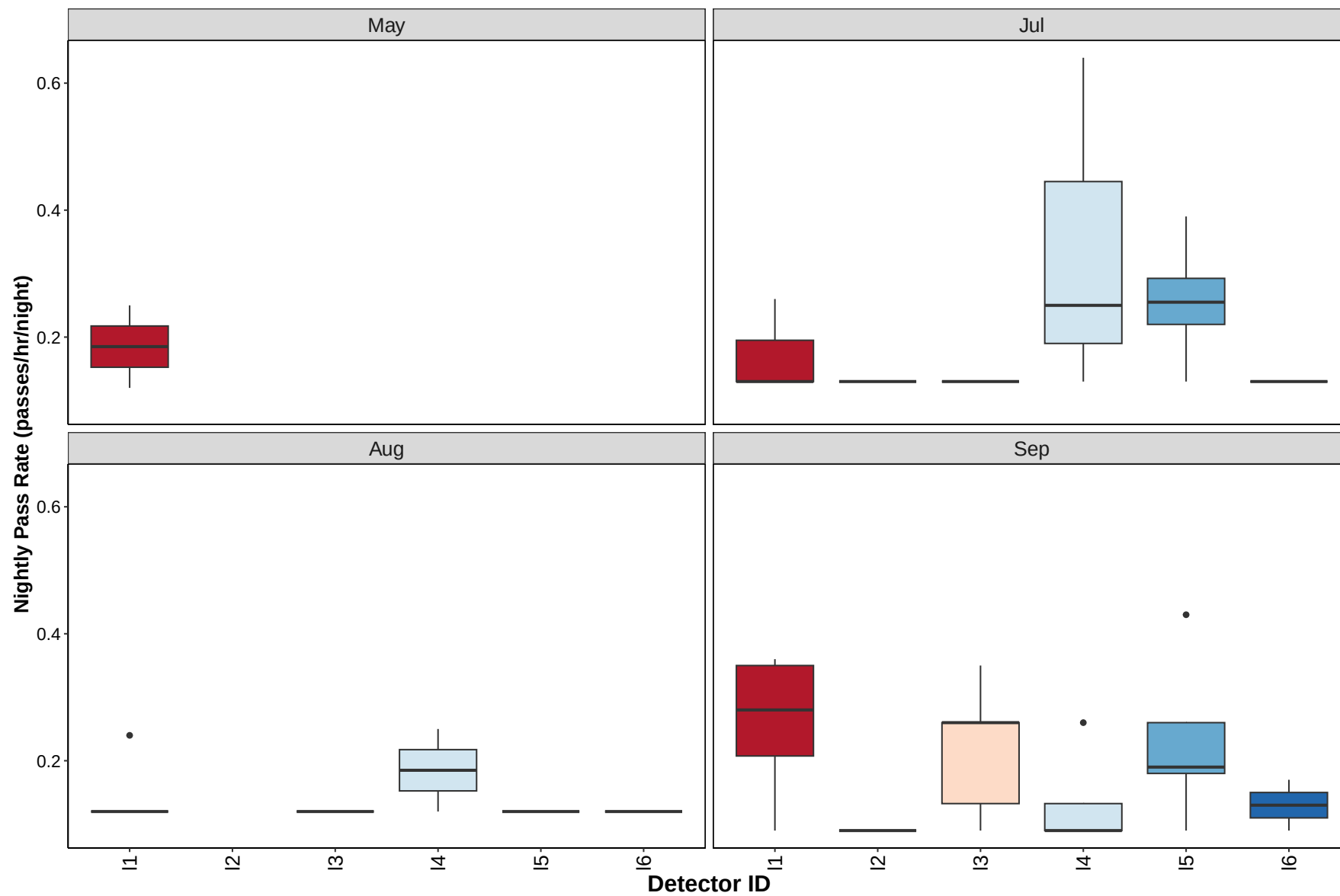
Daubenton's



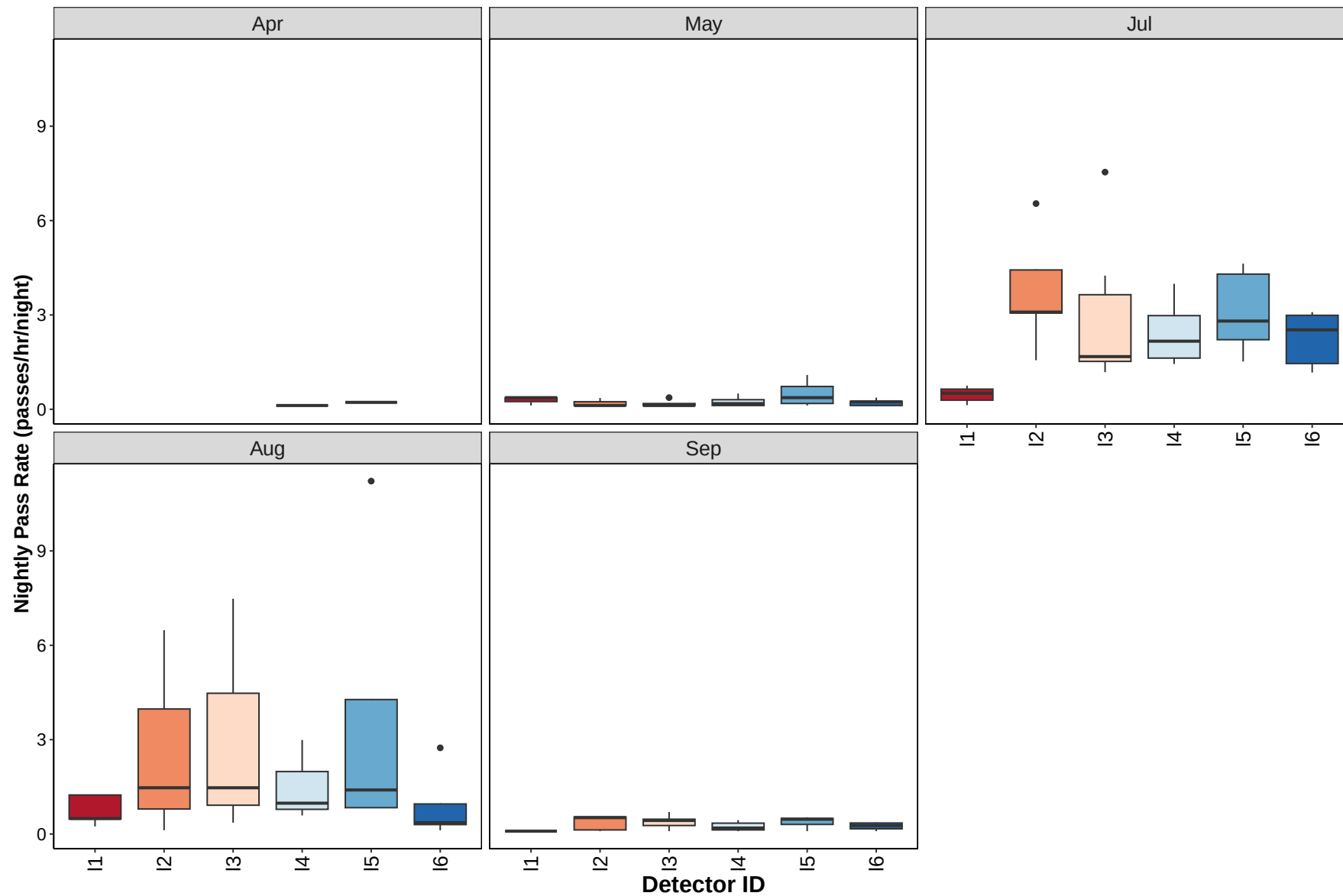
Soprano pipistrelle



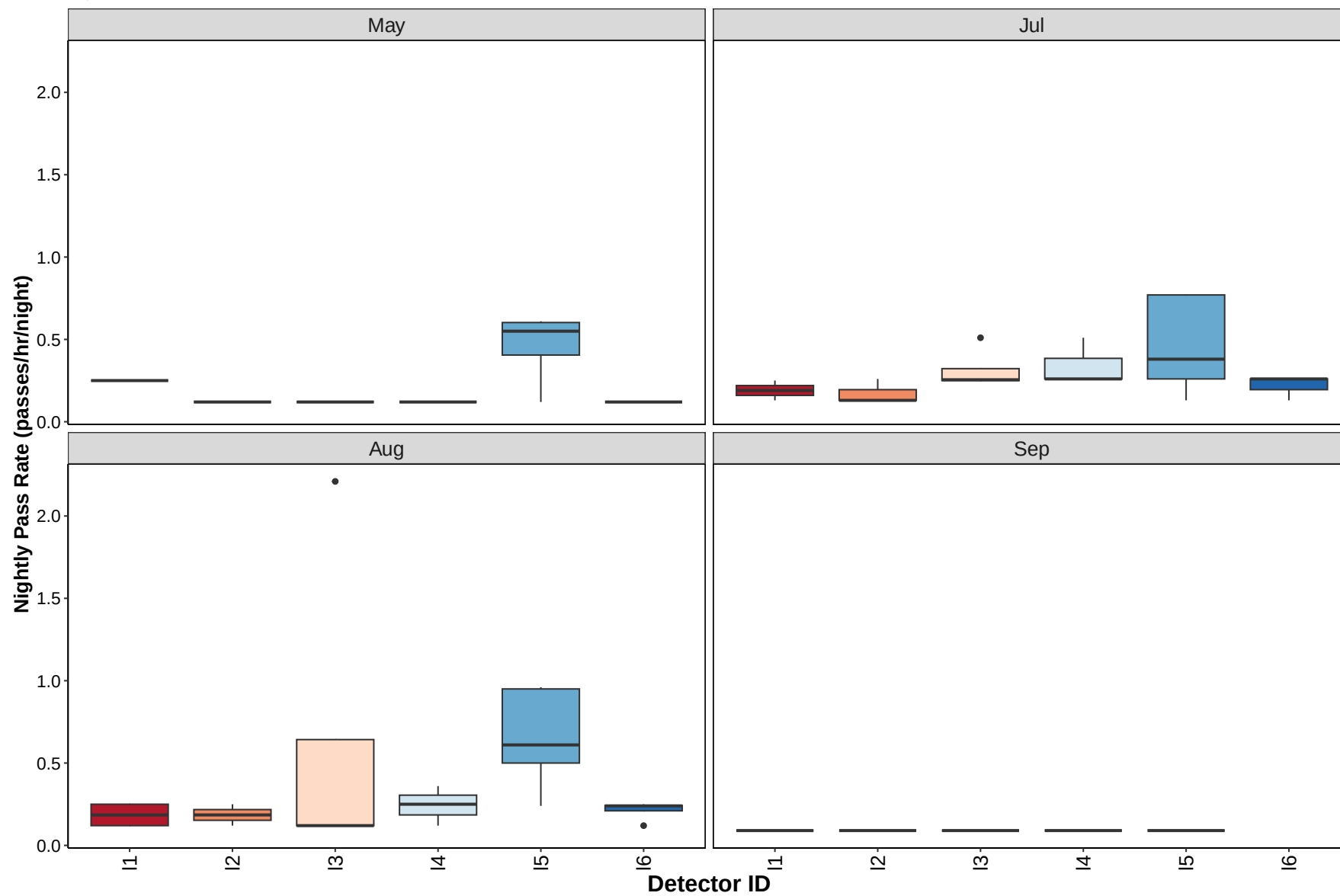
Natterer's



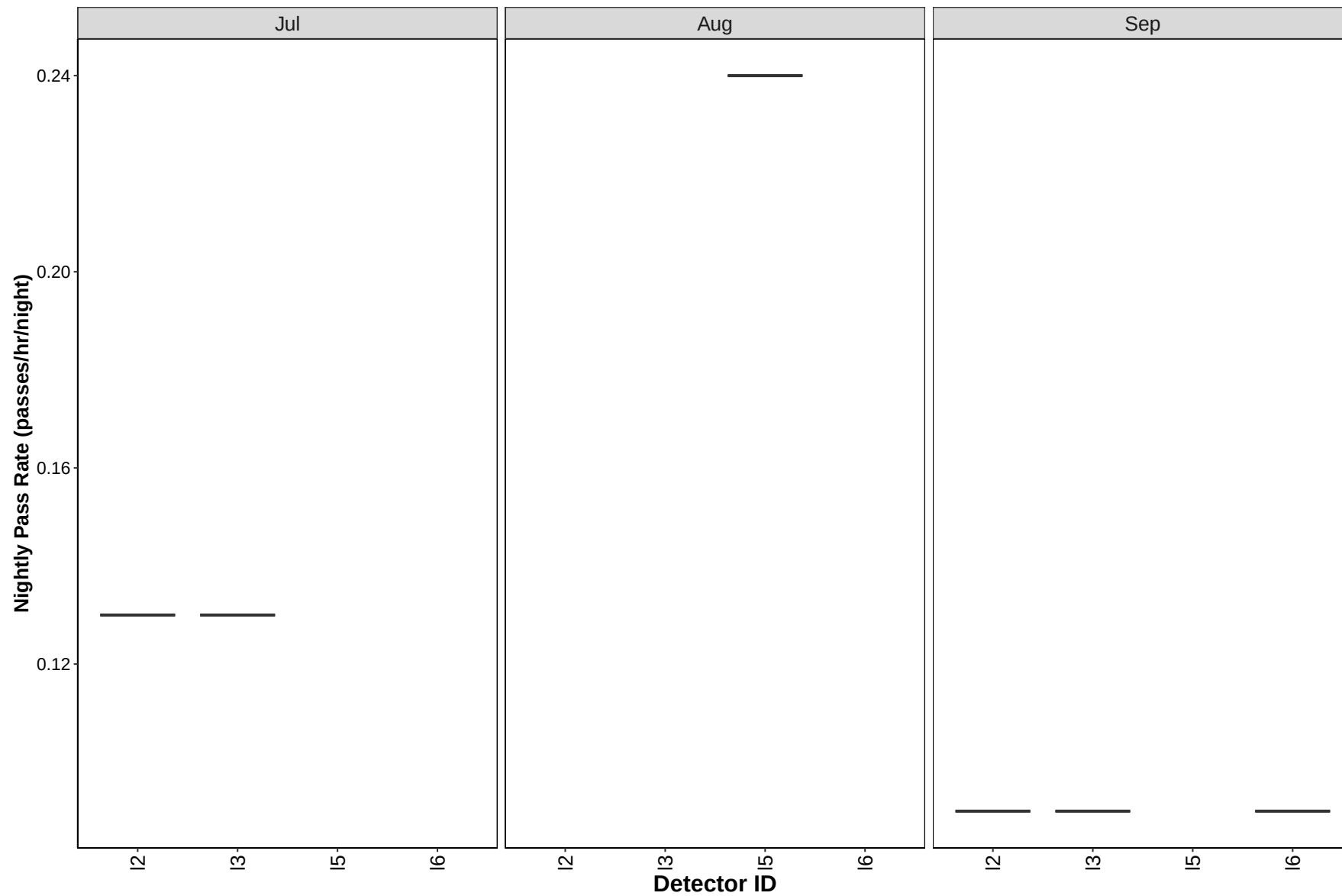
Common pipistrelle



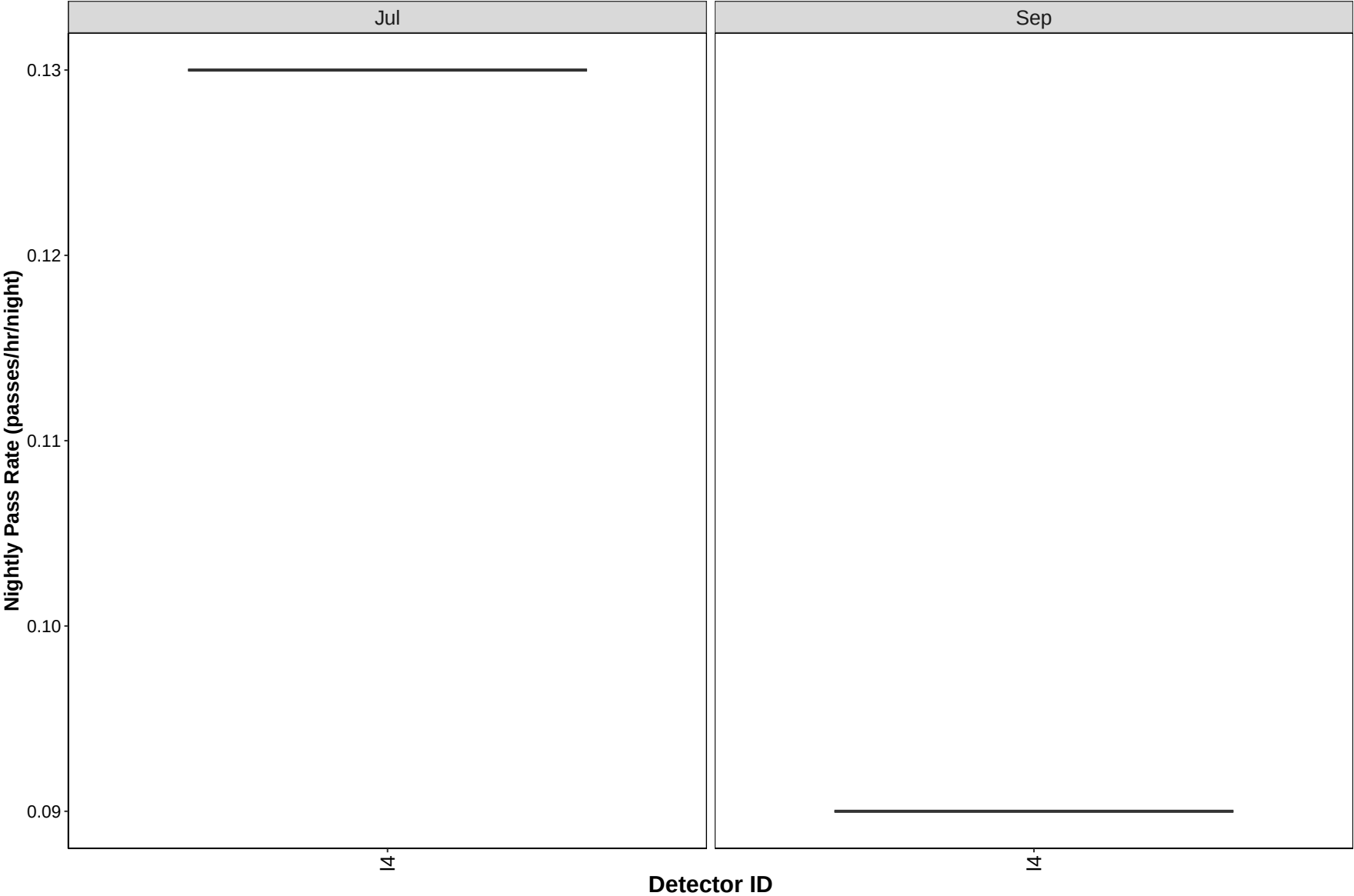
Nyctalus



Nathusius'



Brown long-eared



Bat Activity per Detector Location

Figure 13. Detector ID reference:

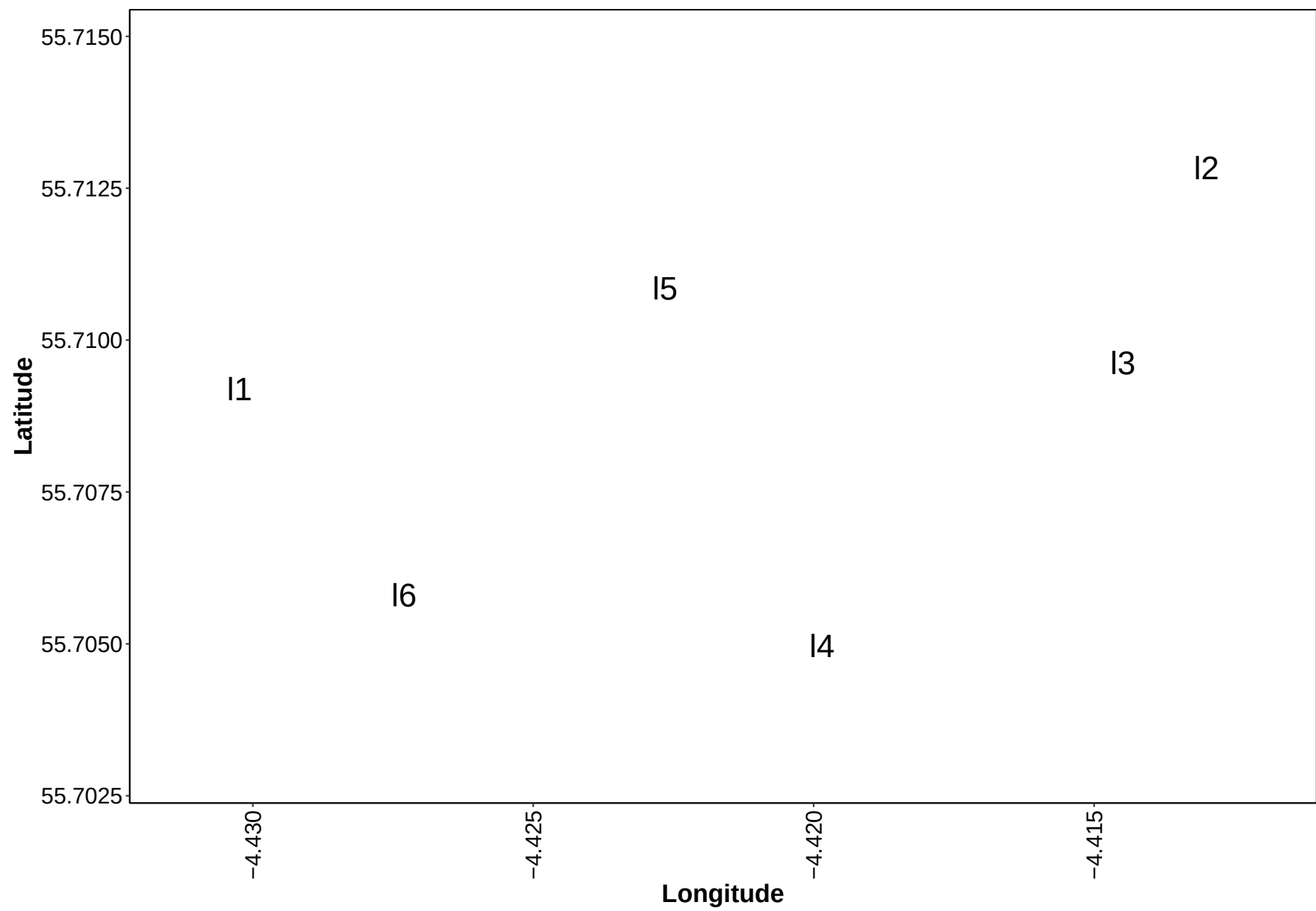
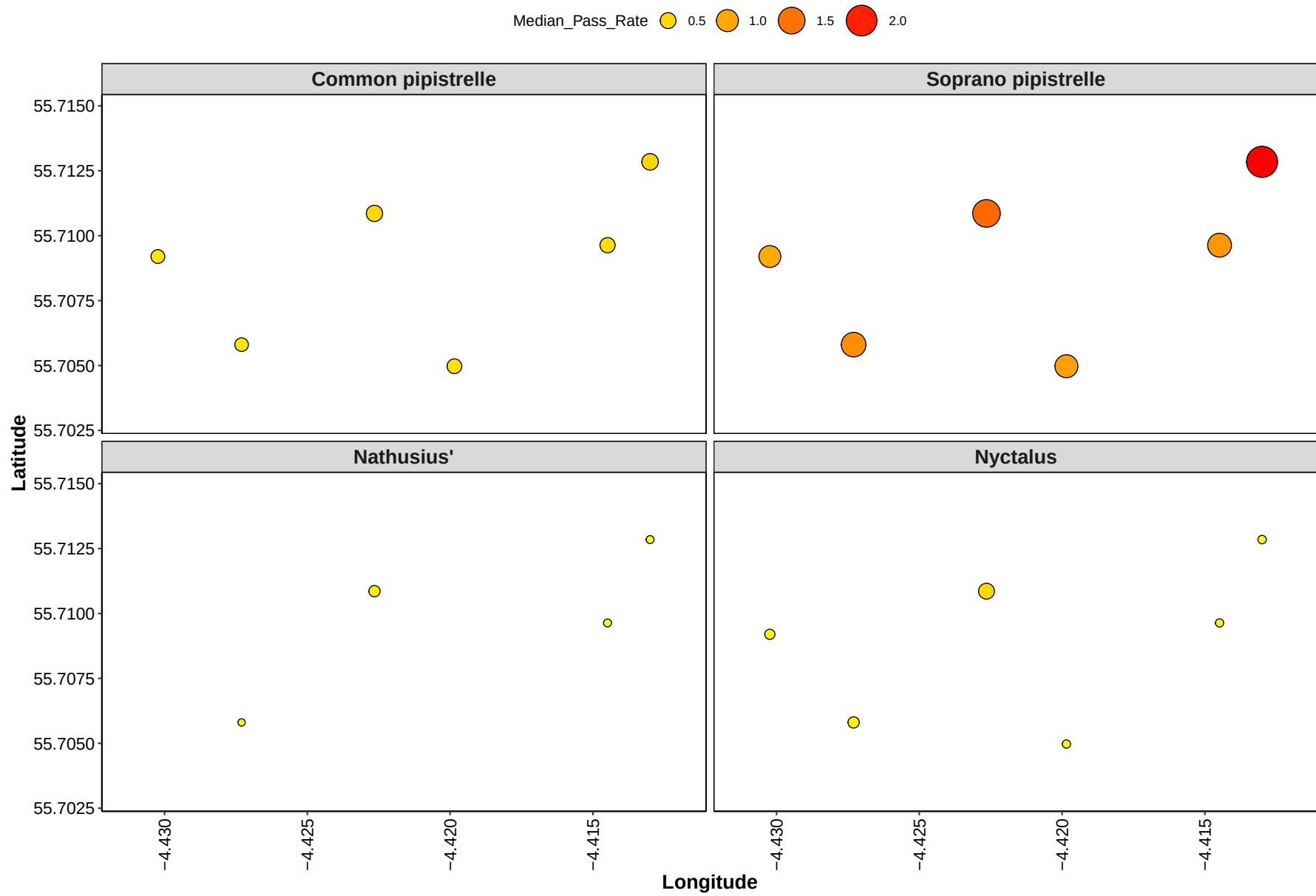


Figure 14. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.



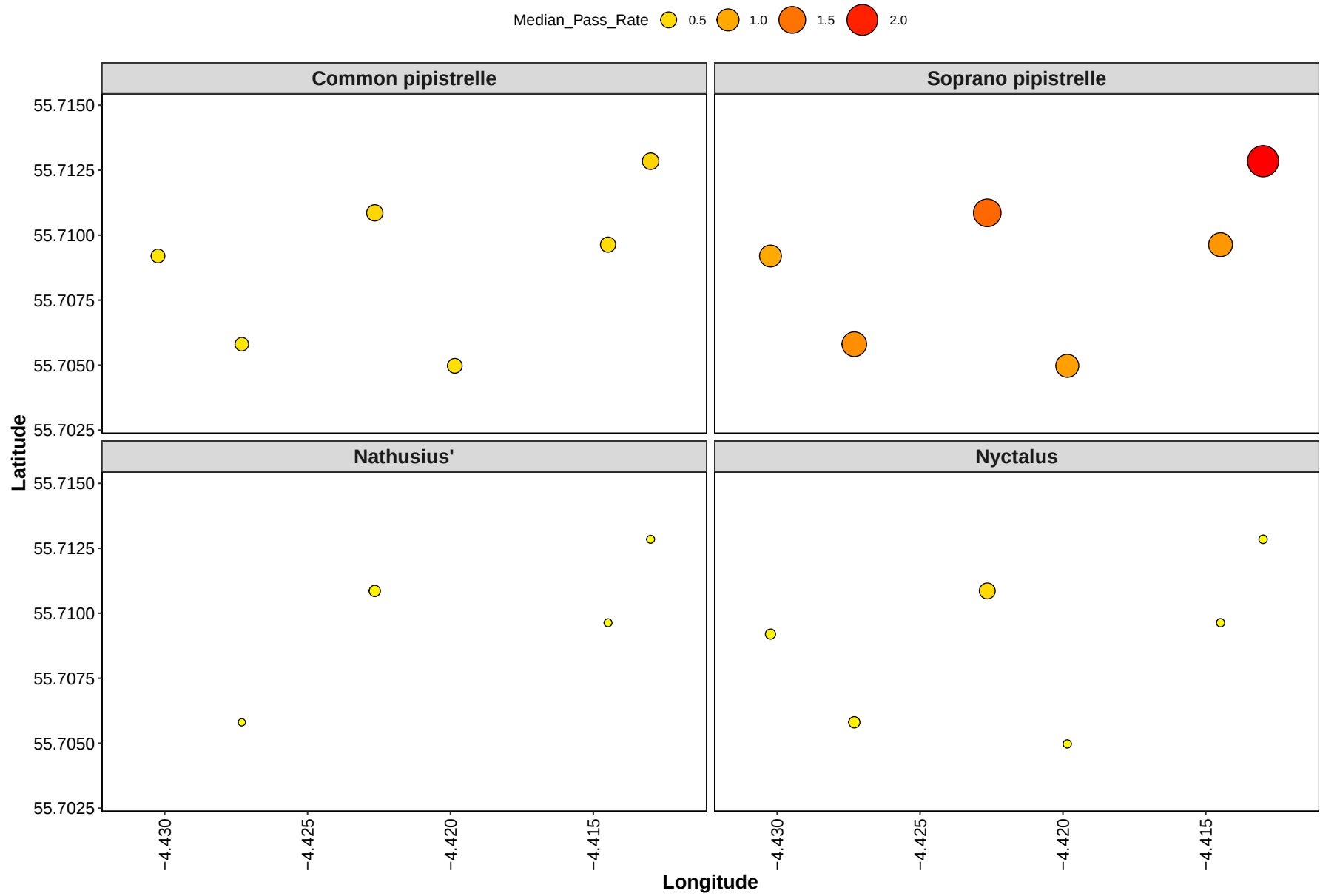
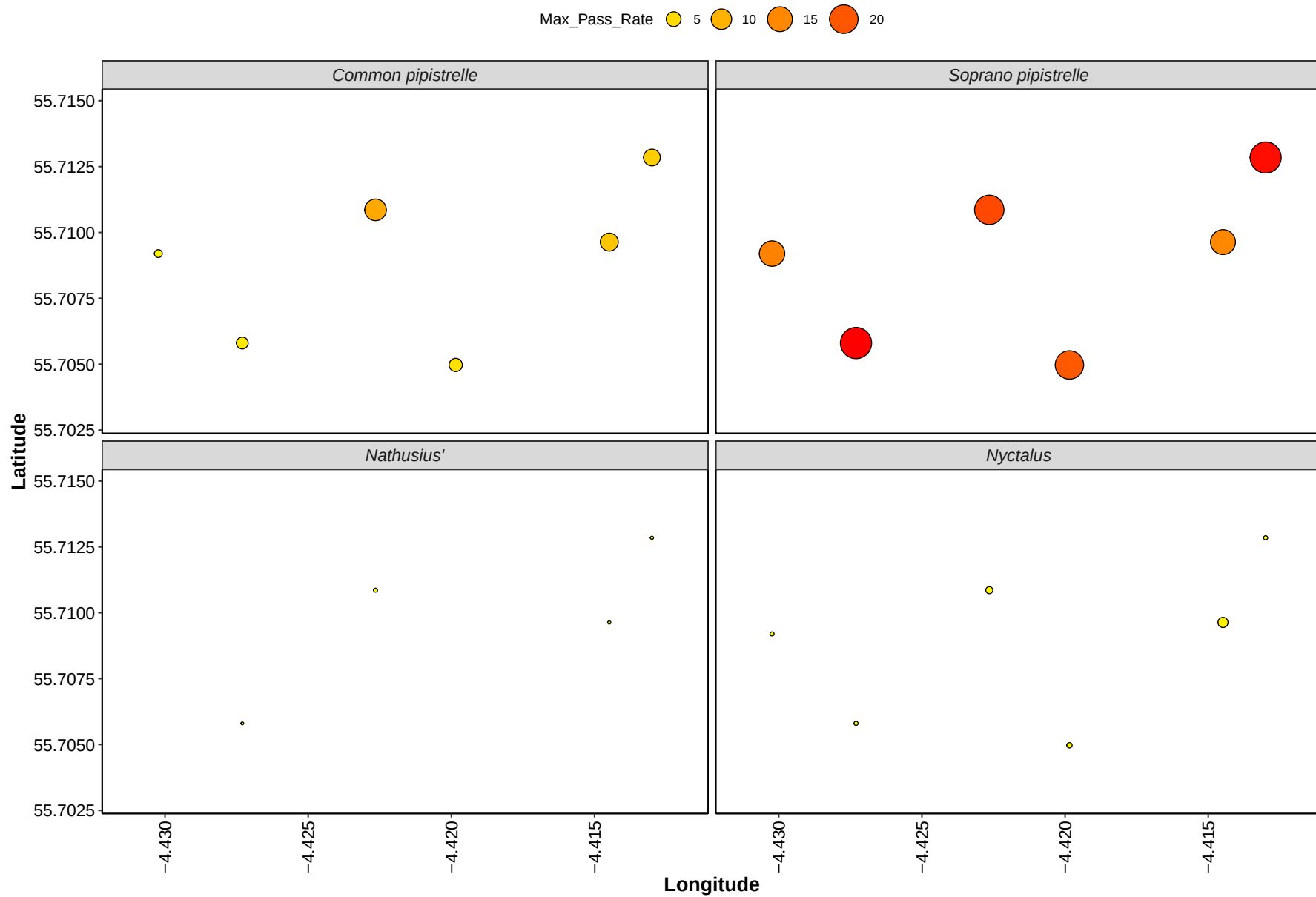
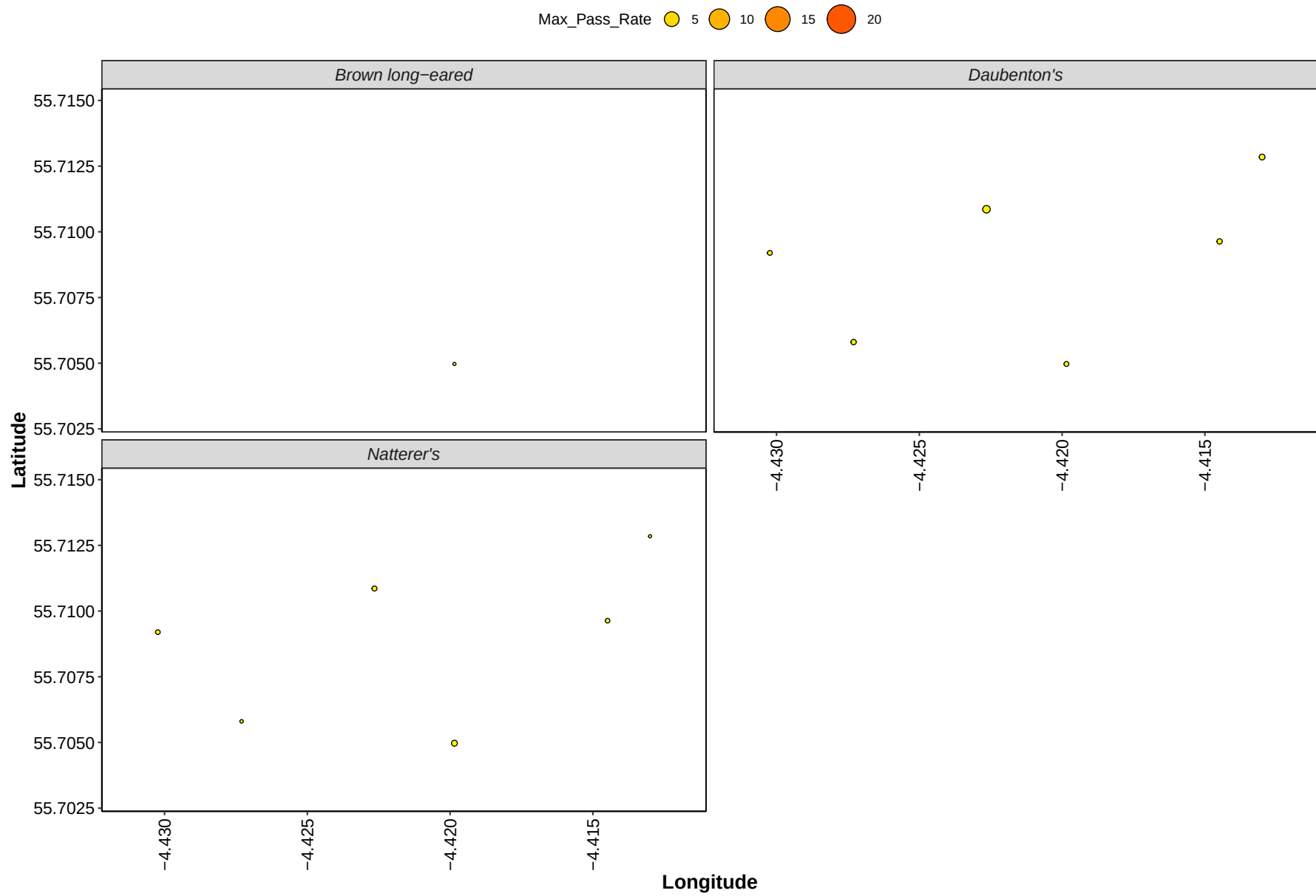


Figure 15. Maximum Nightly Pass Rate (bat passes/hr/night) recorded in a single night throughout the survey period - represented by the size and colour of the point at each detector location.





Part 2b: Includes Absences

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

Nightly Bat Pass Rate

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	I1	0.0
Brown long-eared	I2	0.0
Brown long-eared	I3	0.0
Brown long-eared	I4	0.0
Brown long-eared	I5	0.0
Brown long-eared	I6	0.0
Common pipistrelle	I1	0.1
Common pipistrelle	I2	0.3
Common pipistrelle	I3	0.4
Common pipistrelle	I4	0.2
Common pipistrelle	I5	0.4
Common pipistrelle	I6	0.2
Daubenton's	I1	0.1
Daubenton's	I2	0.0
Daubenton's	I3	0.0
Daubenton's	I4	0.0
Daubenton's	I5	0.1
Daubenton's	I6	0.0
Nathusius'	I1	0.0
Nathusius'	I2	0.0
Nathusius'	I3	0.0
Nathusius'	I4	0.0
Nathusius'	I5	0.0
Nathusius'	I6	0.0
Natterer's	I1	0.1
Natterer's	I2	0.0
Natterer's	I3	0.0
Natterer's	I4	0.0
Natterer's	I5	0.0
Natterer's	I6	0.0
Nyctalus	I1	0.0
Nyctalus	I2	0.0
Nyctalus	I3	0.0
Nyctalus	I4	0.0
Nyctalus	I5	0.0
Nyctalus	I6	0.0

Species	Detector ID	Median Pass Rate
Soprano pipistrelle	I1	0.9
Soprano pipistrelle	I2	2.1
Soprano pipistrelle	I3	0.6
Soprano pipistrelle	I4	1.0
Soprano pipistrelle	I5	1.5
Soprano pipistrelle	I6	1.3

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.

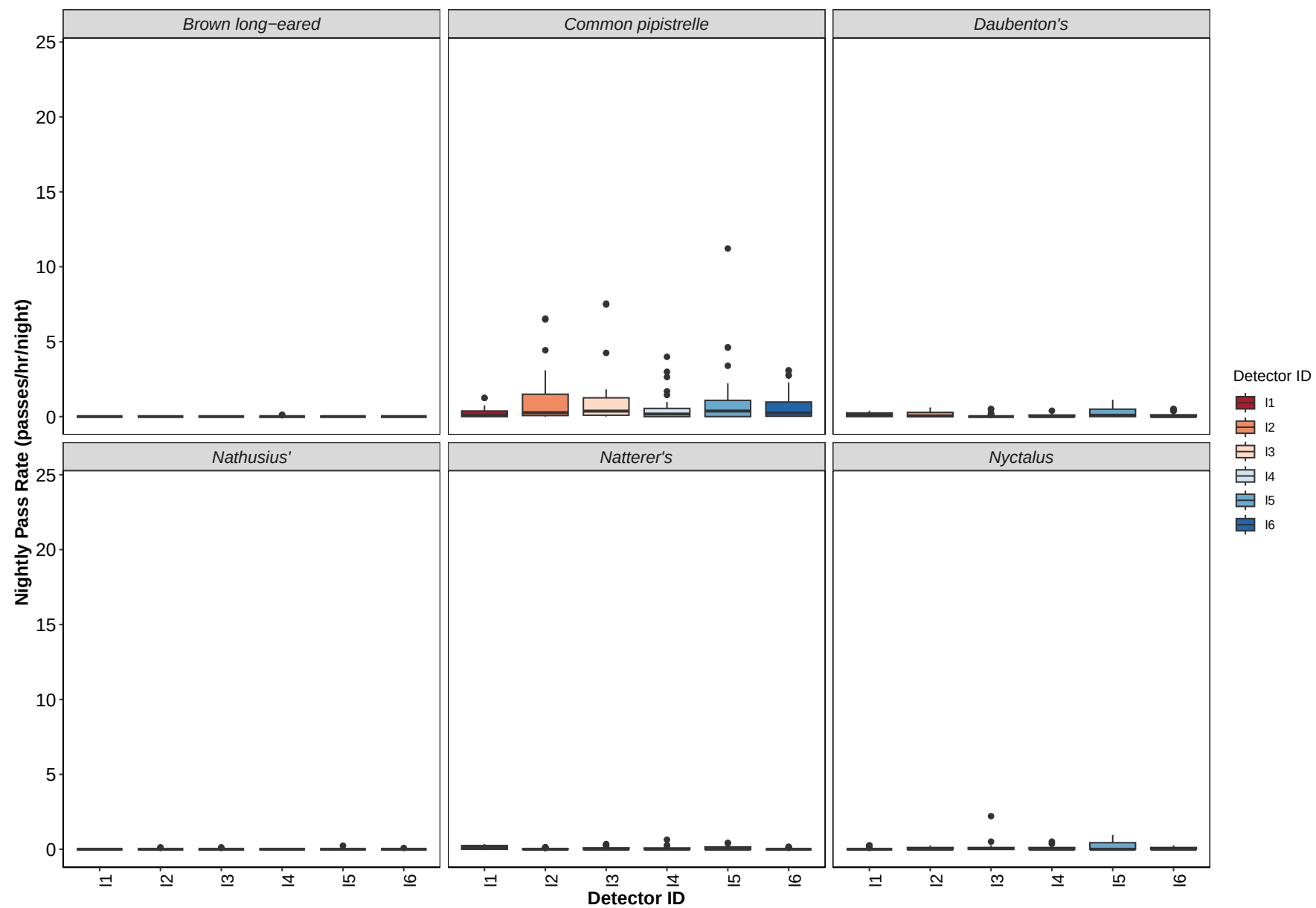
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

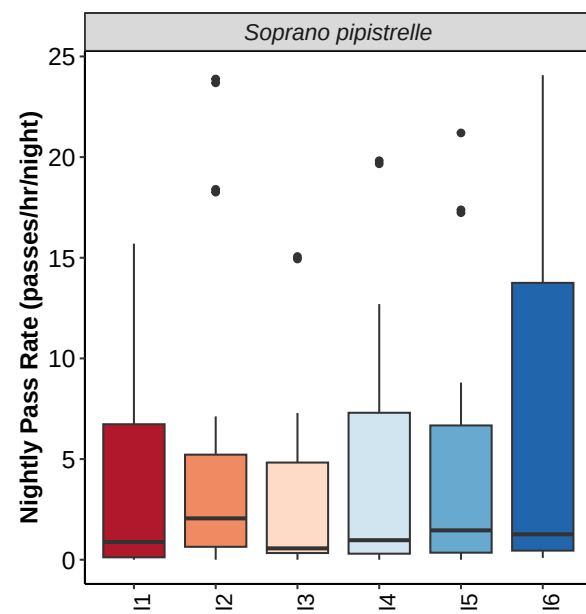
Species	Detector ID	Mean Pass Rate
Brown long-eared	I1	0.0
Brown long-eared	I2	0.0
Brown long-eared	I3	0.0
Brown long-eared	I4	0.0
Brown long-eared	I5	0.0
Brown long-eared	I6	0.0
Common pipistrelle	I1	0.2
Common pipistrelle	I2	1.2
Common pipistrelle	I3	1.1
Common pipistrelle	I4	0.6
Common pipistrelle	I5	1.1
Common pipistrelle	I6	0.7
Daubenton's	I1	0.1
Daubenton's	I2	0.1
Daubenton's	I3	0.1
Daubenton's	I4	0.0
Daubenton's	I5	0.3
Daubenton's	I6	0.1
Nathusius'	I1	0.0
Nathusius'	I2	0.0
Nathusius'	I3	0.0
Nathusius'	I4	0.0
Nathusius'	I5	0.0
Nathusius'	I6	0.0
Natterer's	I1	0.1
Natterer's	I2	0.0
Natterer's	I3	0.1
Natterer's	I4	0.1
Natterer's	I5	0.1
Natterer's	I6	0.0
Nyctalus	I1	0.0
Nyctalus	I2	0.1
Nyctalus	I3	0.2
Nyctalus	I4	0.1
Nyctalus	I5	0.2
Nyctalus	I6	0.1

Species	Detector ID	Mean Pass Rate
Soprano pipistrelle	I1	3.6
Soprano pipistrelle	I2	5.1
Soprano pipistrelle	I3	3.0
Soprano pipistrelle	I4	4.4
Soprano pipistrelle	I5	4.0
Soprano pipistrelle	I6	7.1

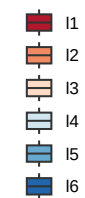
Per Detector

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.





Detector ID



Detector ID

Survey Effort

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

month	Detector ID	No. of Survey Nights
Apr	I1	3
Apr	I4	1
Apr	I5	3
Apr	I6	1
May	I1	7
May	I2	6
May	I3	5
May	I4	6
May	I5	8
May	I6	6
Jul	I1	6
Jul	I2	6
Jul	I3	6
Jul	I4	6
Jul	I5	6
Jul	I6	6
Aug	I1	7
Aug	I2	3
Aug	I3	6
Aug	I4	4
Aug	I5	6
Aug	I6	4
Sep	I1	10
Sep	I2	9
Sep	I3	11
Sep	I4	10
Sep	I5	12
Sep	I6	9

Nightly Bat Pass Rate for Each Month

Median per Detector

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

Bat pass rates are often highly variable between nights, with some nights having few or no passes and other nights having high activity. In these circumstances, the median is likely to be a more useful summary of the 'average' activity than is the mean. For further information see: Lintott, P. R., & Mathews, F. (2018). Basic mathematical errors may make ecological assessments unreliable. *Biodiversity and Conservation*, 27(1), 265-267. <https://doi.org/10.1007/s10531-017-1418-5>

Species	Detector ID	Apr	Aug	Jul	May	Sep
Brown long-eared	I1	0.0	0.0	0.0	0.0	0.0
Brown long-eared	I2	NA	0.0	0.0	0.0	0.0
Brown long-eared	I3	NA	0.0	0.0	0.0	0.0
Brown long-eared	I4	0.0	0.0	0.0	0.0	0.0
Brown long-eared	I5	0.0	0.0	0.0	0.0	0.0
Brown long-eared	I6	0.0	0.0	0.0	0.0	0.0
Common pipistrelle	I1	0.0	0.5	0.5	0.0	0.0
Common pipistrelle	I2	NA	1.5	3.1	0.1	0.2
Common pipistrelle	I3	NA	0.2	1.7	0.1	0.3
Common pipistrelle	I4	0.1	0.8	1.6	0.1	0.1
Common pipistrelle	I5	0.0	0.8	2.8	0.3	0.2
Common pipistrelle	I6	0.0	0.4	2.5	0.2	0.0
Daubenton's	I1	0.0	0.2	0.3	0.0	0.0
Daubenton's	I2	NA	0.2	0.4	0.0	0.0
Daubenton's	I3	NA	0.1	0.1	0.0	0.0
Daubenton's	I4	0.1	0.1	0.1	0.0	0.0
Daubenton's	I5	0.0	0.4	0.8	0.0	0.0
Daubenton's	I6	0.0	0.1	0.4	0.0	0.0
Nathusius'	I1	0.0	0.0	0.0	0.0	0.0
Nathusius'	I2	NA	0.0	0.0	0.0	0.0
Nathusius'	I3	NA	0.0	0.0	0.0	0.0
Nathusius'	I4	0.0	0.0	0.0	0.0	0.0
Nathusius'	I5	0.0	0.0	0.0	0.0	0.0
Nathusius'	I6	0.0	0.0	0.0	0.0	0.0
Natterer's	I1	0.0	0.1	0.1	0.0	0.3
Natterer's	I2	NA	0.0	0.1	0.0	0.0
Natterer's	I3	NA	0.0	0.0	0.0	0.1
Natterer's	I4	0.0	0.1	0.1	0.0	0.0
Natterer's	I5	0.0	0.0	0.2	0.0	0.1
Natterer's	I6	0.0	0.0	0.1	0.0	0.0
Nyctalus	I1	0.0	0.1	0.0	0.0	0.0
Nyctalus	I2	NA	0.1	0.1	0.0	0.0
Nyctalus	I3	NA	0.1	0.2	0.1	0.0
Nyctalus	I4	0.0	0.2	0.1	0.1	0.0
Nyctalus	I5	0.0	0.6	0.3	0.1	0.0
Nyctalus	I6	0.0	0.2	0.1	0.0	0.0

Species	Detector ID	Apr	Aug	Jul	May	Sep
Soprano pipistrelle	I1	0.1	6.7	11.1	0.8	0.3
Soprano pipistrelle	I2	NA	7.1	12.0	0.5	0.8
Soprano pipistrelle	I3	NA	4.0	6.8	0.0	0.4
Soprano pipistrelle	I4	0.1	12.0	7.3	0.4	0.8
Soprano pipistrelle	I5	0.3	6.6	8.4	0.7	0.4
Soprano pipistrelle	I6	0.3	13.7	21.6	0.5	1.0

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.

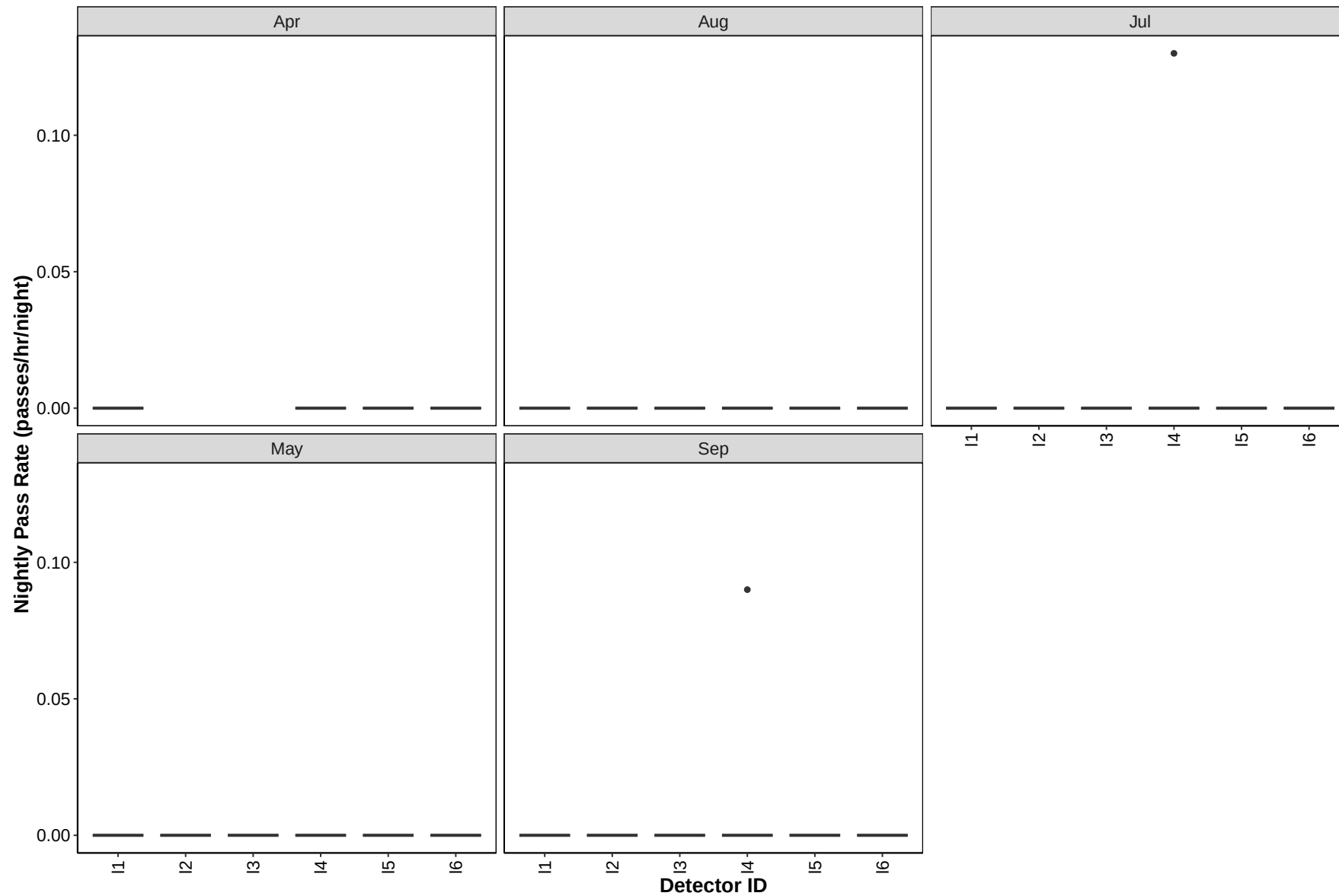
Species	Detector ID	Apr	Aug	Jul	May	Sep
Brown long-eared	I1	0.0	0.0	0.0	0.0	0.0
Brown long-eared	I2	NA	0.0	0.0	0.0	0.0
Brown long-eared	I3	NA	0.0	0.0	0.0	0.0
Brown long-eared	I4	0.0	0.0	0.0	0.0	0.0
Brown long-eared	I5	0.0	0.0	0.0	0.0	0.0
Brown long-eared	I6	0.0	0.0	0.0	0.0	0.0
Common pipistrelle	I1	0.0	0.5	0.5	0.1	0.0
Common pipistrelle	I2	NA	2.7	3.1	0.1	0.3
Common pipistrelle	I3	NA	1.6	3.0	0.1	0.3
Common pipistrelle	I4	0.1	1.1	1.6	0.2	0.2
Common pipistrelle	I5	0.1	2.5	3.1	0.4	0.2
Common pipistrelle	I6	0.0	0.9	2.3	0.2	0.1
Daubenton's	I1	0.0	0.2	0.3	0.1	0.0
Daubenton's	I2	NA	0.3	0.4	0.0	0.0
Daubenton's	I3	NA	0.1	0.2	0.0	0.0
Daubenton's	I4	0.1	0.1	0.1	0.0	0.0
Daubenton's	I5	0.0	0.5	0.8	0.1	0.1
Daubenton's	I6	0.0	0.1	0.3	0.0	0.0
Nathusius'	I1	0.0	0.0	0.0	0.0	0.0
Nathusius'	I2	NA	0.0	0.0	0.0	0.0
Nathusius'	I3	NA	0.0	0.0	0.0	0.0
Nathusius'	I4	0.0	0.0	0.0	0.0	0.0
Nathusius'	I5	0.0	0.0	0.0	0.0	0.0
Nathusius'	I6	0.0	0.0	0.0	0.0	0.0
Natterer's	I1	0.0	0.1	0.1	0.1	0.3
Natterer's	I2	NA	0.0	0.1	0.0	0.0
Natterer's	I3	NA	0.0	0.0	0.0	0.1
Natterer's	I4	0.0	0.1	0.2	0.0	0.1
Natterer's	I5	0.0	0.0	0.2	0.0	0.1
Natterer's	I6	0.0	0.0	0.1	0.0	0.0
Nyctalus	I1	0.0	0.1	0.1	0.0	0.0
Nyctalus	I2	NA	0.1	0.1	0.0	0.0
Nyctalus	I3	NA	0.4	0.2	0.1	0.0
Nyctalus	I4	0.0	0.2	0.2	0.1	0.0
Nyctalus	I5	0.0	0.5	0.4	0.2	0.0
Nyctalus	I6	0.0	0.2	0.1	0.0	0.0

Species	Detector ID	Apr	Aug	Jul	May	Sep
Soprano pipistrelle	I1	0.1	5.7	11.5	0.6	0.4
Soprano pipistrelle	I2	NA	11.1	12.5	0.4	1.2
Soprano pipistrelle	I3	NA	4.4	8.8	0.1	0.4
Soprano pipistrelle	I4	0.1	11.4	10.0	0.4	1.0
Soprano pipistrelle	I5	0.3	7.9	10.7	0.9	1.8
Soprano pipistrelle	I6	0.3	13.6	19.9	0.6	0.8

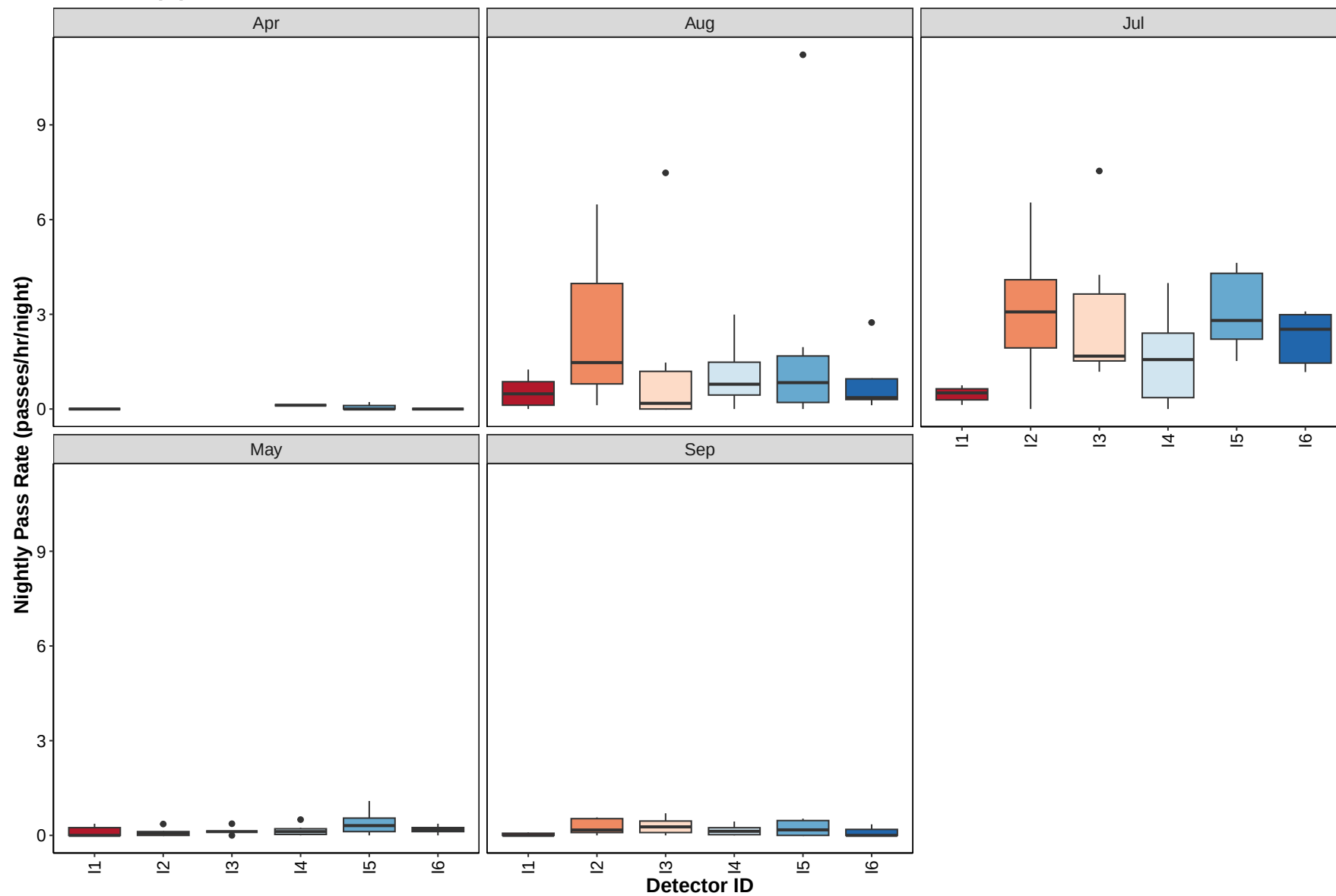
Per Detector

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.

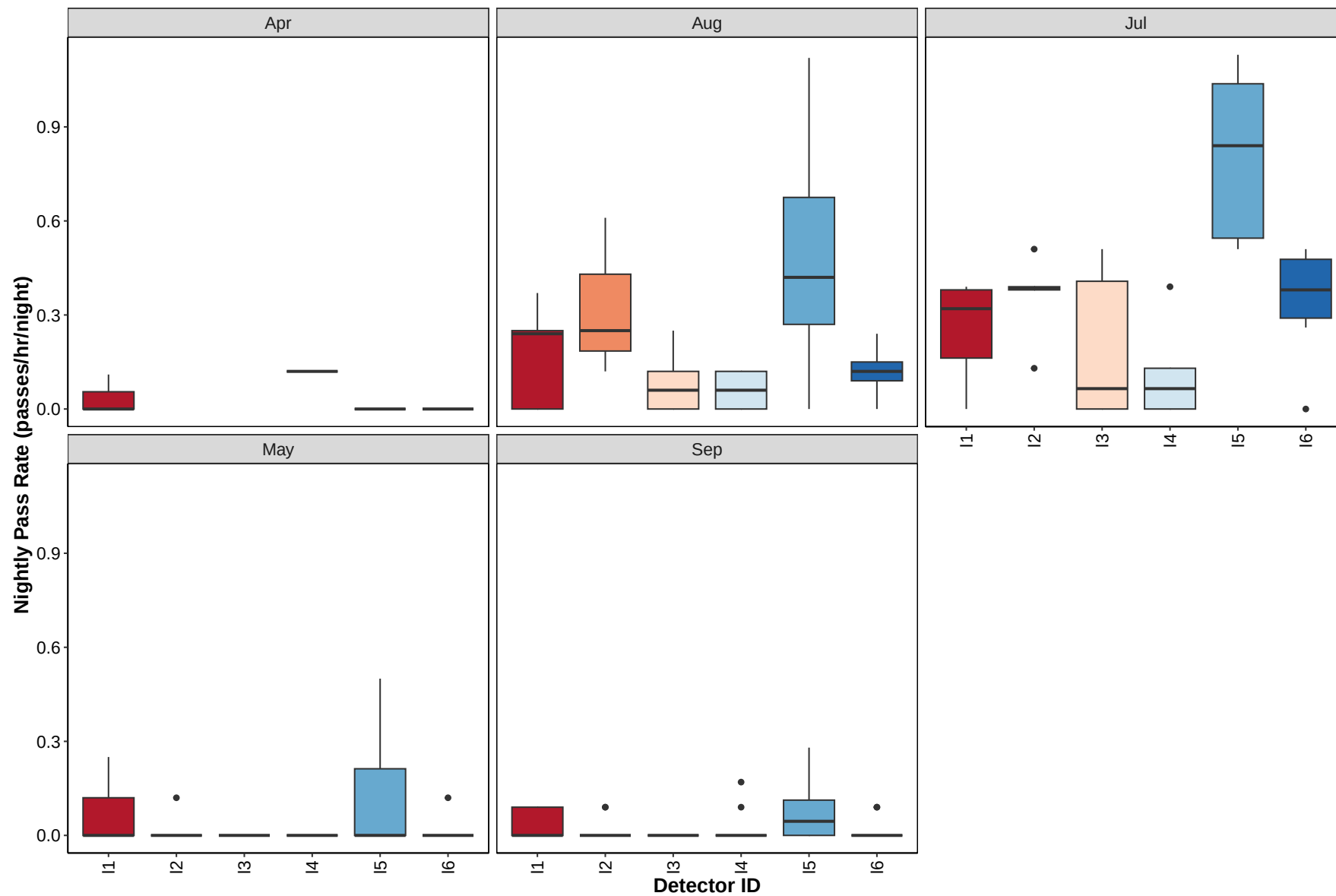
Brown long-eared



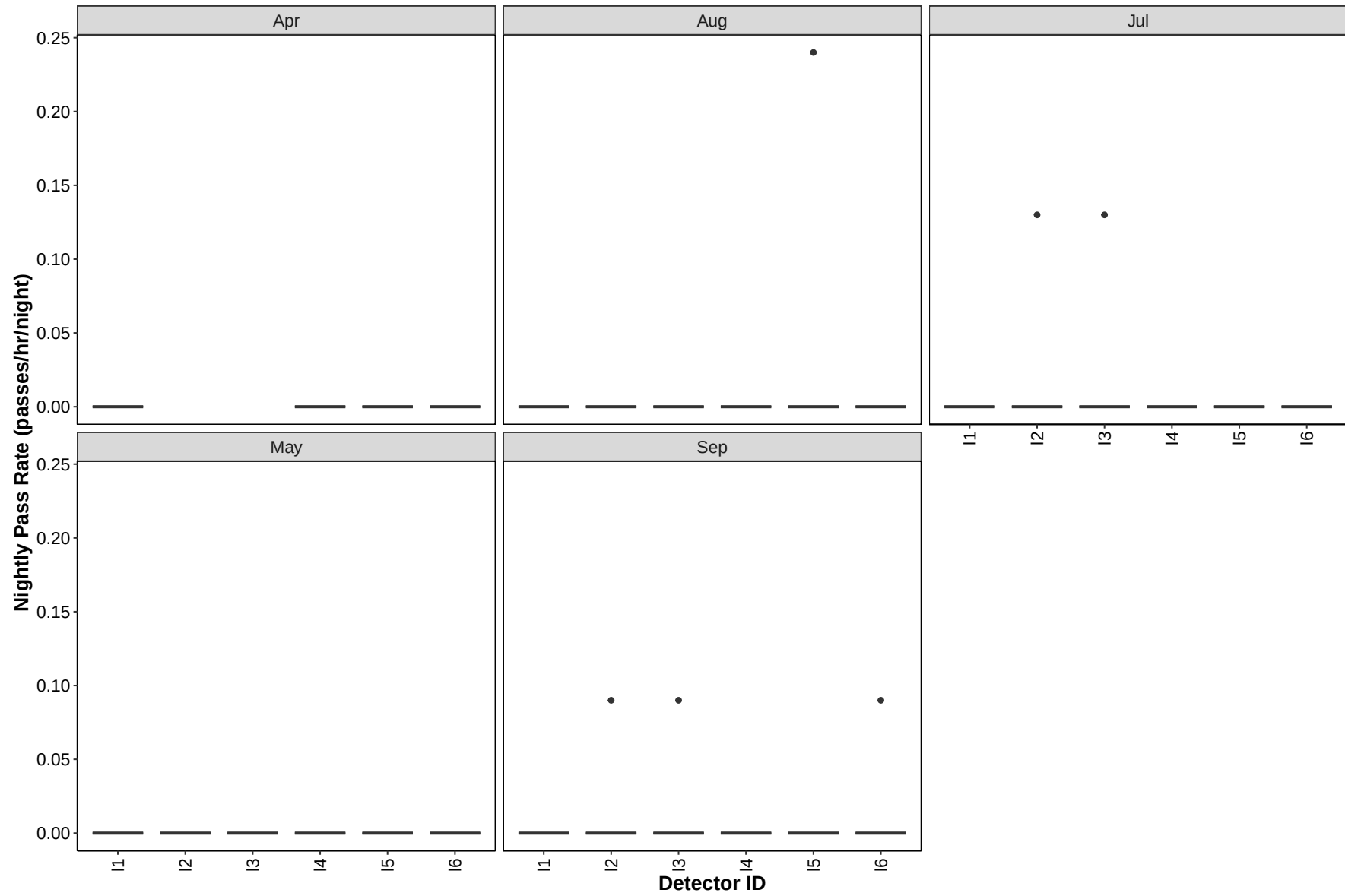
Common pipistrelle



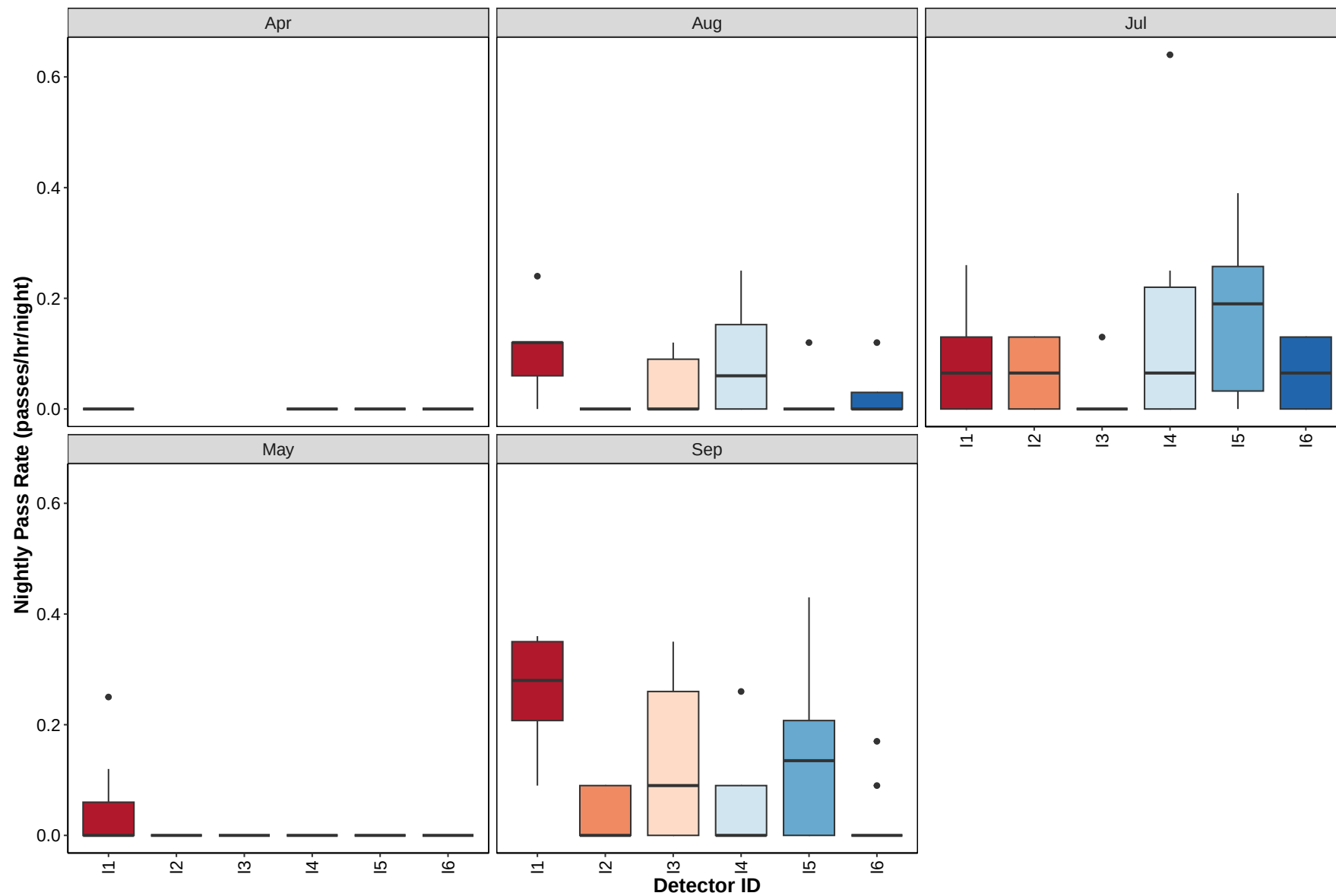
Daubenton's



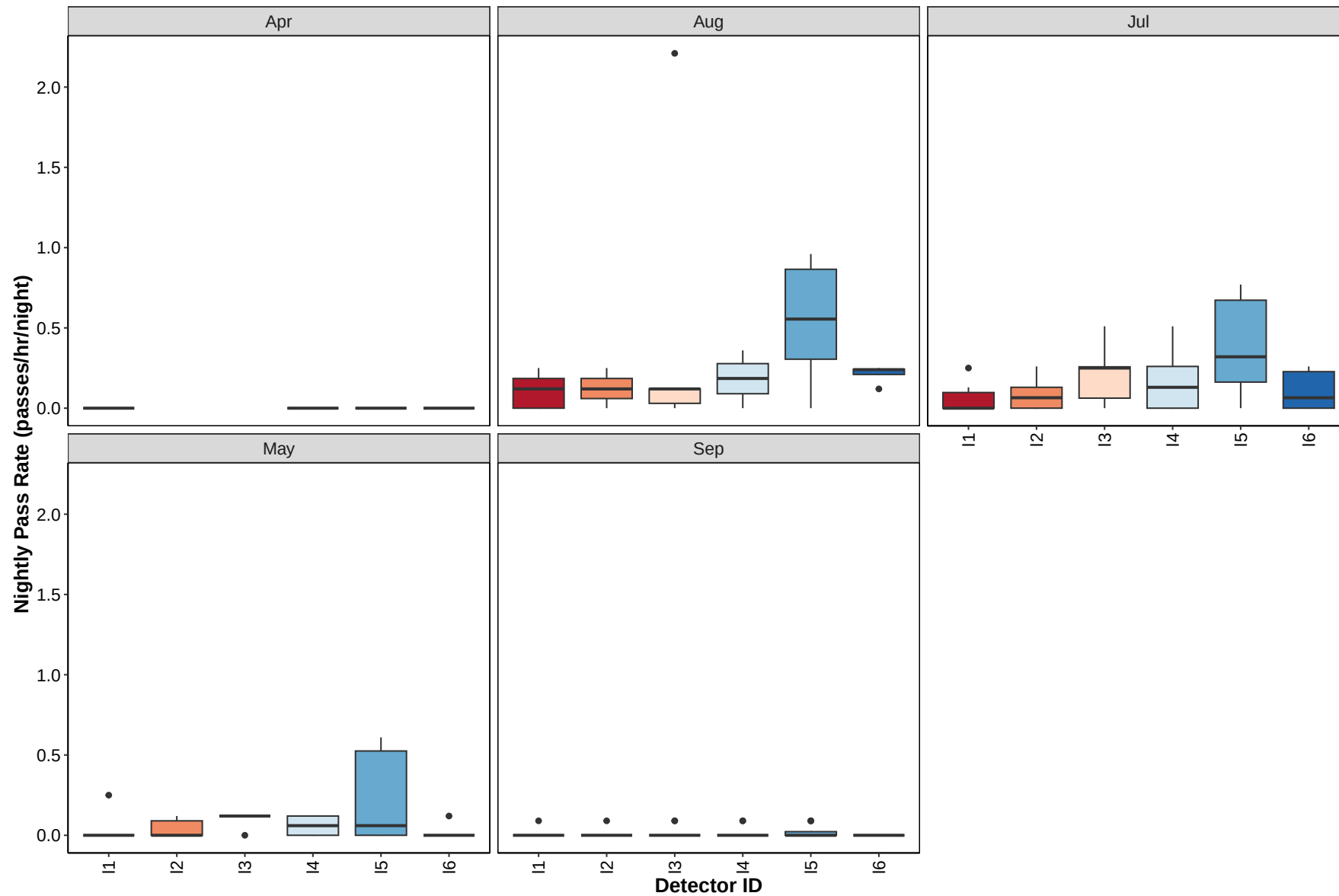
Nathusius'



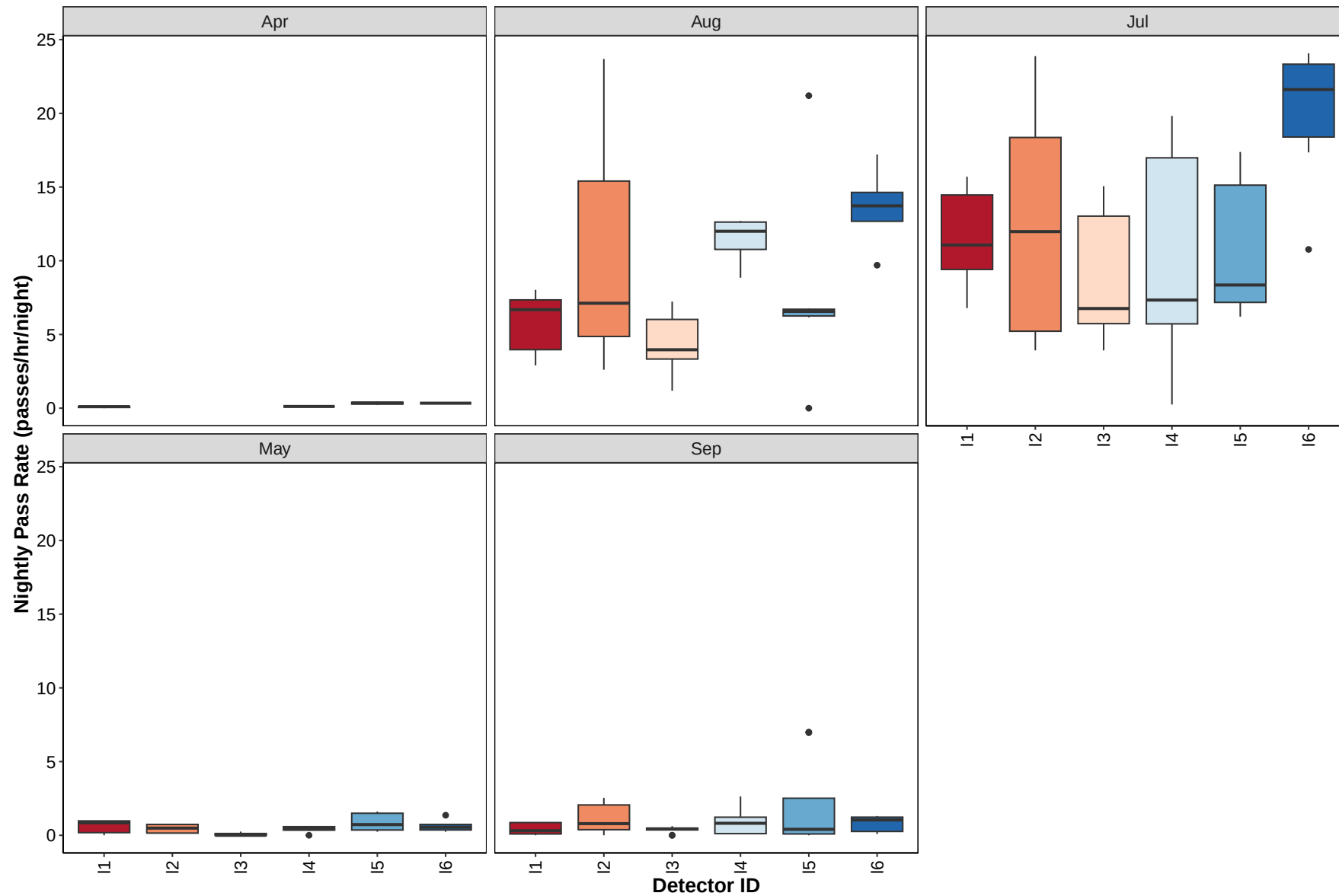
Natterer's



Nyctalus



Soprano pipistrelle



Bat Activity per Detector Location

Figure 18. Detector ID reference:

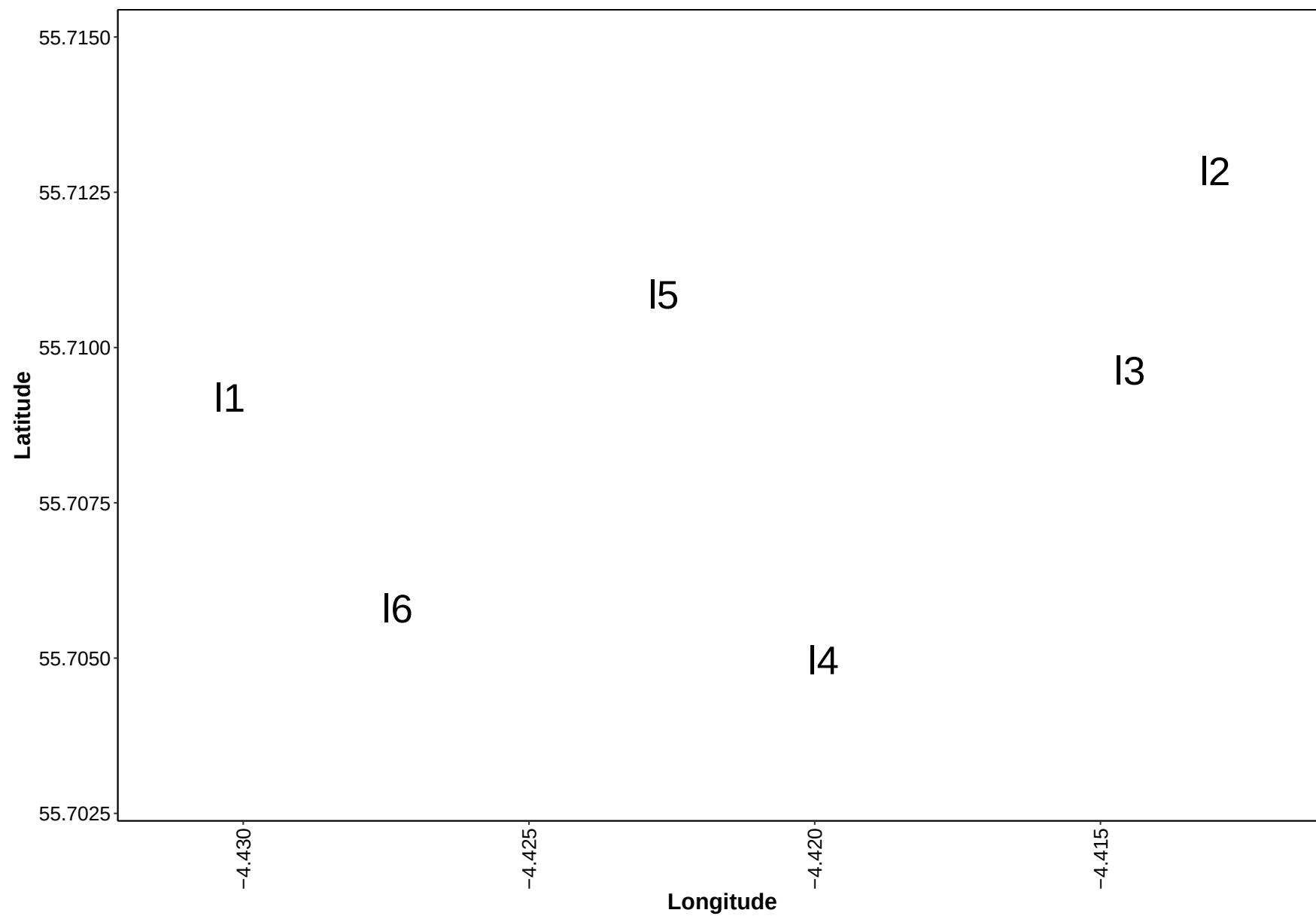
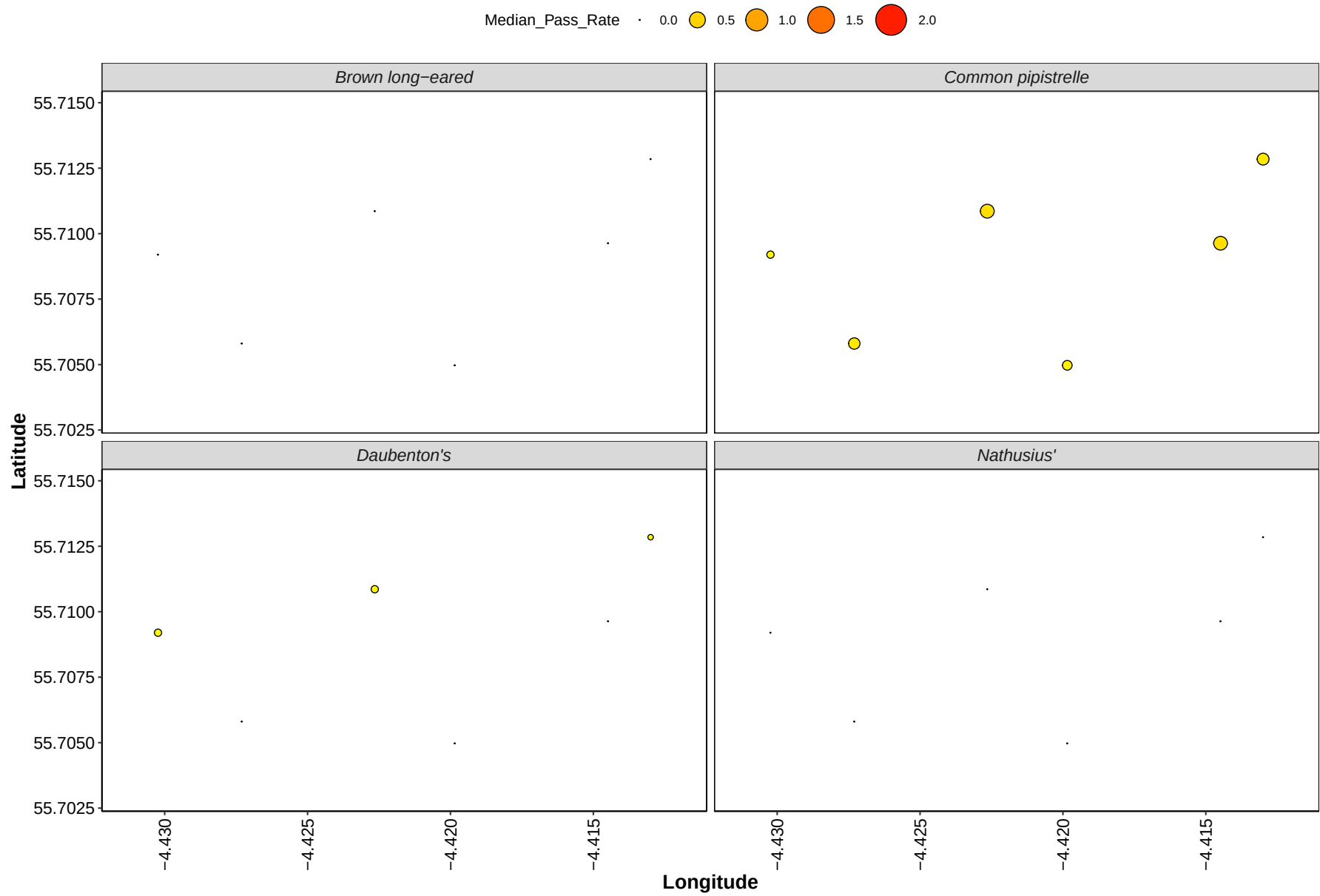


Figure 19. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.



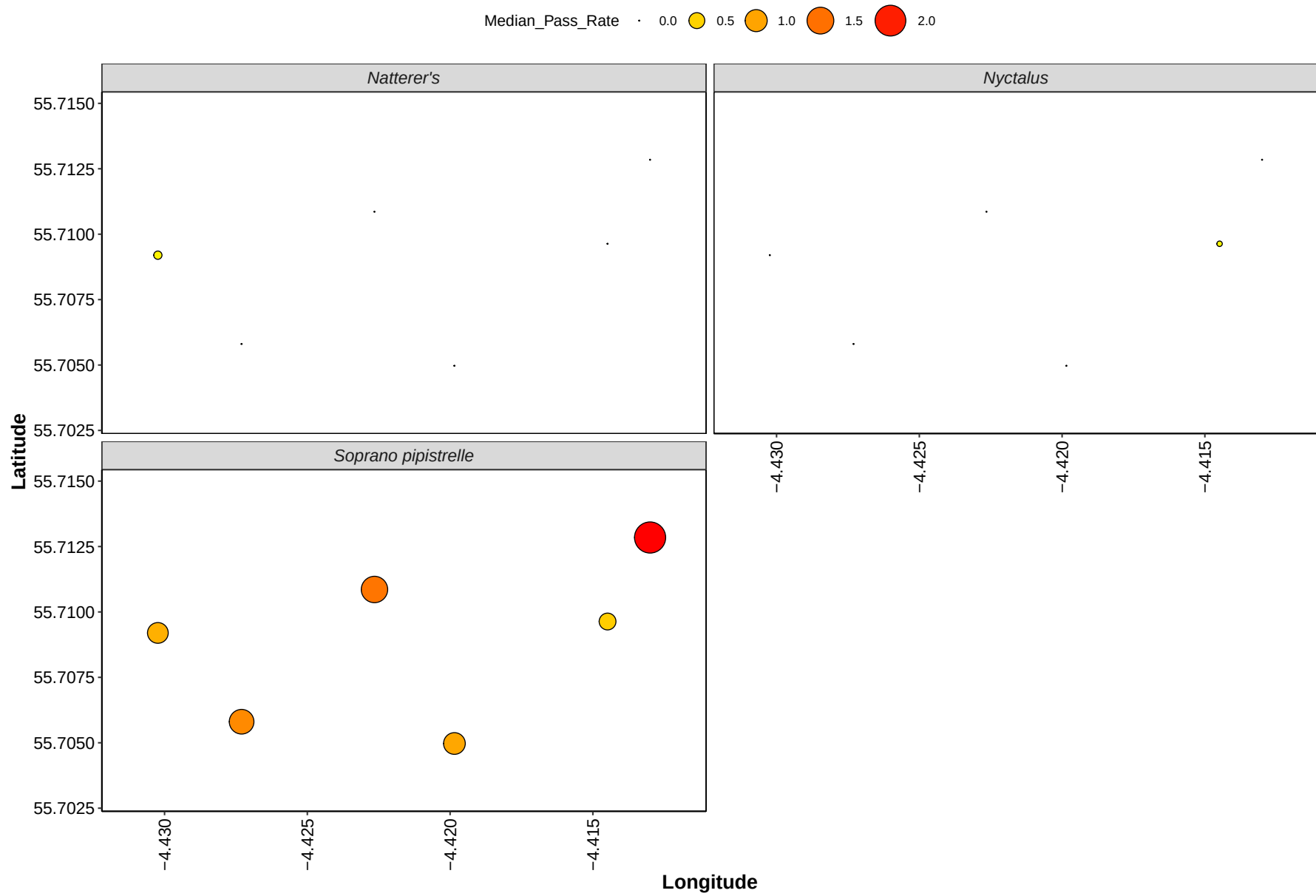
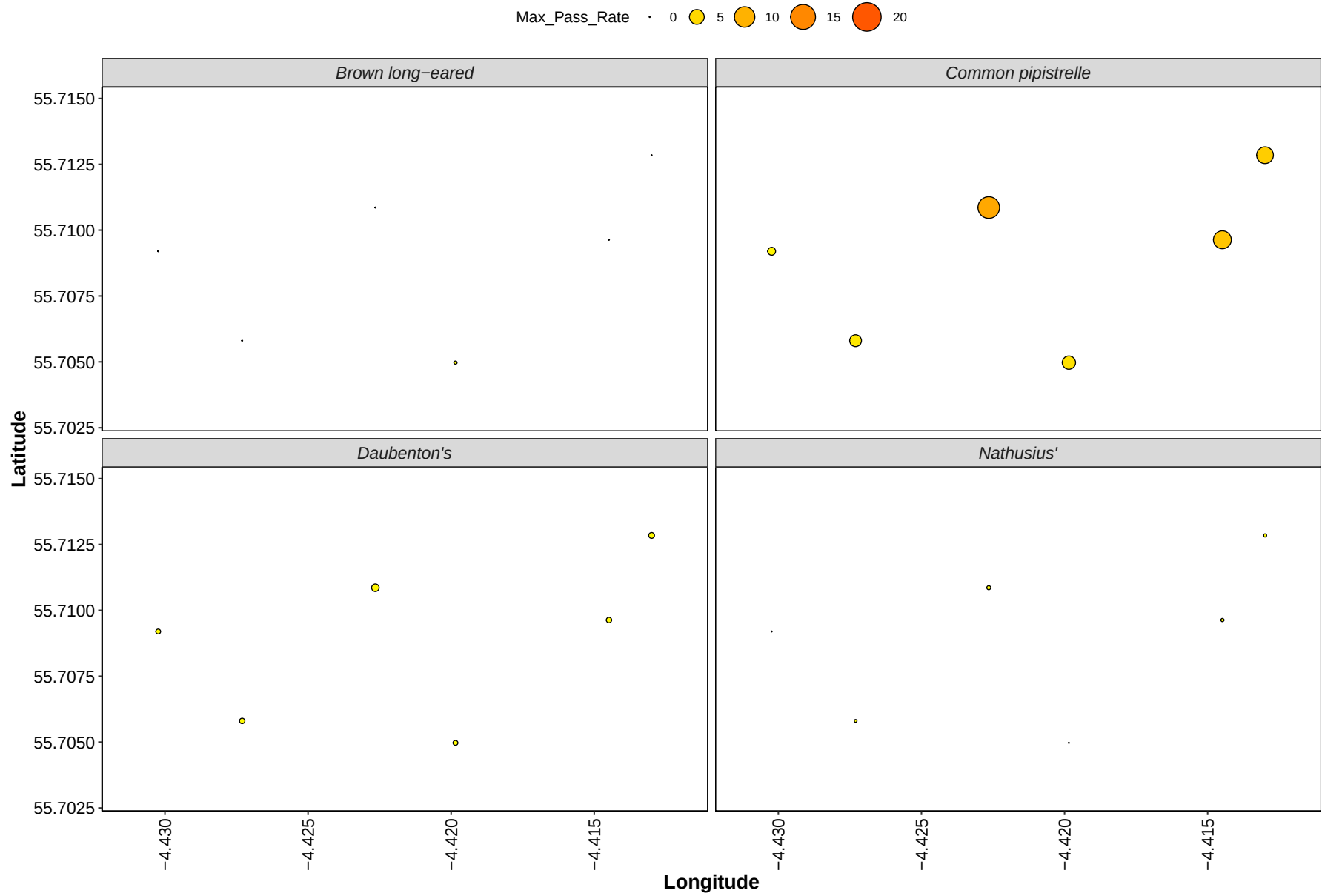
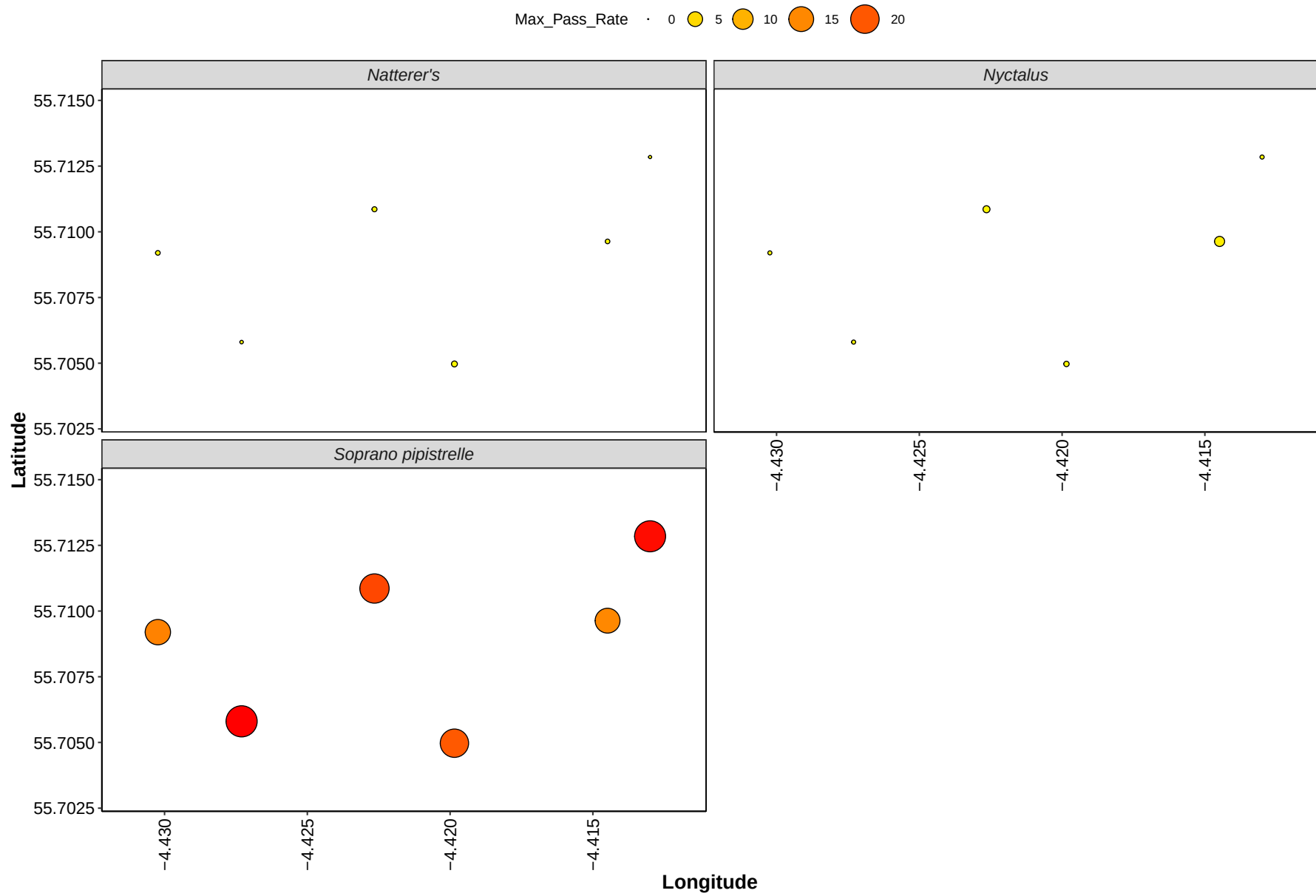


Figure 20. Maximum Nightly Pass Rate (bat passes/hr/night) recorded in a single night throughout the survey period - represented by the size and colour of the point at each detector location.





Thank you for using Ecobat!