Appendix 9.7: Bat Survey Report

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Shepherds' Rig Wind Farm

Bat Survey Report

Appendix 9.7

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Contents

1 Introduction

Proposed Varied Development Background

1.1 SETT Wind Development Limited ('the Applicant') gained Section 36 consent and deemed planning permission from Scottish Minsters in August 2023 to construct and operate Shepherds' Rig Wind Farm ('the Consented Development'). The Consented Development comprises 17 turbines (15 turbines with a maximum blade tip height of 149.9 metres (m) and two turbines with a maximum blade tip height of 125 m) and associated infrastructure.

1.2 The Applicant is now applying to Scottish Minsters for consent under Section 36C of the *Electricity Act 1989 (as amended*) and the *Town and Country Planning (Scotland) Act 1997* to vary the Consented Development. The proposed variations include:

- Removal of six turbines and associated crane hard standings;
- Increase in the maximum blade tip height of the remaining 11 turbines to 220 m;
- Increase in size of associated crane hardstandings to accommodate the larger turbines;
- Relocation of eight turbines beyond the micrositing allowance of the Consented Development, but within the same pattern of development;
- Amendments to part of the track layout to reflect turbine removal and relocation (as outlined above);
- Change to the number and location of required watercourse crossings to accommodate the amended track layout;
- Increase in size and capacity of the associated Battery Energy Storage System (BESS);
- Relocation of the temporary construction compound slightly beyond micrositing allowance;
- Removal of the previously proposed anemometer mast; and
- Increase to the period of consent from 30 to 40 years.

1.3 Collectively, the proposed variations listed above are referred to as the 'Proposed Varied Development'.

1.4 The key element of the Proposed Varied Development is that the number of proposed turbines are reduced. The locations of three turbines (turbines 5, 6 and 7) are unchanged (within micrositing allowance) from the Consented Development. Locations of most of the remaining turbines are only slightly adjusted (within 200 m of a consented turbine position) to incorporate the constraints associated with larger turbines. Four turbines (turbines 1, 2, 4 and 11) are over 200 m from a consented location; however no turbine is over 500 m from a consented location and all turbines are located within the same habitat types as the original application. No significant additional impacts are therefore predicted. The revised turbine layout, displaying the 11 adjusted turbine locations, is presented in Figure 1.

1.5 A suite of ecological survey data was gathered by Bear Environmental Limited and Arcus Consultancy Services Limited in 2018 to support the Consented Development's Section 36 application, submitted in 2018. The application was determined based on the ecological baseline gathered in 2018, the ecology chapter of the Environmental Impact Assessment (EIA) having determined that no significant impacts would occur due to the Consented Development. Due to the age of the data collected in 2018, updated ecological surveys have been undertaken to support the Proposed Varied Development, to determine if the conditions on-site have remained unchanged.

1.6 BSG Ecology have been commissioned by the Applicant to provide the terrestrial ecology chapter for the Proposed Varied Development's EIA Report, as well as updated baseline habitat and protected species survey data for the site, to support the Section 36C application.

Site description

1.7 The site remains the same as the Consented Development and is centred on British National Grid (BNG) 262319 593591, approximately 5 km east of the village of Carsphairn, Dumfries and Galloway. The site totals approximately 752 hectares (ha), and encompasses predominantly coniferous plantation in various stages of maturity interspersed with poor condition marshy grassland rides. The site is displayed in Figure 1.

1.8 The site is surrounded by wet grassland habitats (some of which are in current grazing use), heathland, and other coniferous plantations. Several burns flow through the site. These are tributaries of the Water of Ken, located approximately 0.3 km east of site.

Purpose of report

1.9 This report details the method and results of the updated bat surveys completed in 2024 and 2025.

1.10 A summary review of the Consented Development's 2018 data for comparison to results collected in the updated surveys for the Proposed Varied Development is considered in more detail along with the updated data in Chapter 9: Ecology of the EIA Report.

Personnel

1.11 2024 surveys and subsequent bat call analysis were undertaken by Rozanna Shah ACIEEM, Robert Mansbridge ACIEEM and Sarah Parkin ACIEEM, Associate Ecologists at Solway Ecology. The surveyor team has a wide range of protected species survey experience, including all target species, on several renewables projects in England and Scotland.

1.12 2025 surveys were undertaken by Matthew Breadin, freelance ecologist at Derwent Valley Ecology, who has worked as a professional ecologist for over 8 years. Matt has a depth of experience in professional bat activity survey and holds a level 1 Natural England bat license (reference 2023-10997-CLS-17).

1.13 2025 bat call analysis was undertaken by Harry Glass, Ecologist at BSG Ecology. Harry has been working in professional consultancy since 2022 and has completed the BatAbility Certificate of Bat Acoustics Analysis training, achieving a Grade B in the Technician Level assessment.

1.14 This report was written by Harry Glass, Ecologist at BSG Ecology. Harry has experience drafting protected species reports for a variety of renewables projects across the UK.

1.15 The report was technically reviewed by Gareth Lang MSc, MCIEEM. Gareth has over 13 years of experience carrying out ecological surveys and assessments. Gareth holds survey and mitigation licences for bats in Wales and England, and co-ordinates large programmes of bat survey and monitoring at wind farm sites throughout the UK.

2 Methods

Desk study

2.1 A desk study was carried out in December 2024. This included:

- A data request to the South West Scotland Environmental Information Centre (SWSEIC) for bat records (including those shared by the Dumfries and Galloway Bat Group) and information on non-statutory sites of nature conservation interest within a 10 km buffer of the Site.
- A review of the Multi Agency Geographic Information for the Countryside (MAGIC) website (http://magic.defra.gov.uk/[1]) for statutory designated sites notified for their bat interest within 10 km of the site.
- Use of Google Earth[2] to view aerial photographs of the site and surrounding area to identify features of potential value for bats and to provide ecological context for the results of the site assessment.

2.2 Open access data sources were re-reviewed in March 2026 to provide further ecological context for the assessment. A repeat data request was not undertaken.

Review of previous ecological baseline assessments

2.3 To support the Consented Development, several ecological baseline assessments were undertaken as part of the EIA. These included:

- Shepherds' Rig Wind Farm EIA Report – Chapter 9: Ecology
- Shepherds' Rig Wind Farm Additional Environmental Information Report – Chapter 9 Ecology;
- Shepherds' Rig Wind Farm EIA Report – Appendix 9.3: Bats

2.4 A review of the above sources was undertaken to inform the approach of the updated surveys in 2024 and 2025.

Field survey

2024

2.5 Current industry standard guidance as set out in NatureScot *et al* (2021) recommends that static bat detectors are deployed at all turbine locations for wind farms of up to ten turbines, with one additional detector for every three turbines thereafter. A total of 11 Wildlife Acoustics Song Meter Mini 2 detectors were deployed as close as possible to the planned turbine locations earlier in the design process for the Proposed Varied Development (2024).

2.6 Detectors were numbered according to their closest turbine based on the most current layout at the time of deployment (see Figure 1). Static bat detector locations are displayed in Figure 1 and described in Table 1 below.

Table 1: *Static deployments and habitat descriptions*

Static reference	Grid reference	Habitat type
1	NX6193595552	Linear marshy grassland ride within mature coniferous woodland plantation.
3	NX6166995283	Wide marshy grassland ride within mature coniferous woodland plantation.

[1] Most recently accessed in March 2026
[2] https://earth.google.co.uk

Static reference	Grid reference	Habitat type
4	NX6288095436	Edge between felled and immature/semi-mature coniferous plantation.
5	NX6202594764	Edge between felled and mature coniferous plantation.
6	NX6206893952	Edge between felled and mature coniferous plantation.
8	NX6205593279	Edge between felled and immature/semi-mature coniferous plantation.
9	NX6252093572	Edge between mature and immature/semi-mature coniferous woodland plantation.
10	NX6177793079	Edge between mature and immature/semi-mature coniferous woodland plantation.
11	NX6237092739	Edge between mature and immature/semi-mature coniferous woodland plantation.
12	NX6176292813	Edge between mature and immature/semi-mature coniferous woodland plantation.
13	NX6212692288	Linear ride within mature coniferous woodland plantation.

2.7 The detectors used built-in microphones configured to record above the level of ambient noise, such as from wind or rain, using an adaptive trigger set to 6 decibels (dB). They were set to define a bat pass as a call note of >2 milliseconds (ms) separated from another by more than one second. The detectors were placed adjacent open habitat, such as within forest clearings or rides, attached to a pole or tree approximately 1.5 - 2 m above ground level.

2.8 Static bat detectors were deployed in spring, summer and autumn 2024[3], for a minimum of ten consecutive nights of data collection per season, and programmed to record nightly commencing 30 minutes before sunset and cease recording 30 minutes after sunrise. A Davis Advantage Vue 6250UK weather station was deployed alongside the detectors to collect data on wind speed, temperature, and precipitation during the recording period; however, this failed to record weather data for the full deployment period. Historic weather data was sourced from Ventusky (2025) to address data gaps (see 'Limitations to methods', below). Table 2 below summarises the deployment periods in 2024.

Table 2: *Static monitoring periods (2024)*

Season	Static reference	Deployment dates
Spring	All locations	19/05/2024 – 01/06/2024
Summer	All locations	23/07/2024 – 02/08/2024
Autumn	1, 3, 4 & 5	04/10/2024 – 17/10/2024
	6, 8, 9, 10, 11, 12, 13	25/09/2024 – 04/10/2024

2.9 Autumn static deployments were undertaken across two periods to avoid felling operations in the southern areas of the site.

2025

2.10 In 2025, the detectors were re-deployed to the same locations as in 2024. Detectors were deployed in spring, summer and autumn, for a minimum of ten consecutive nights of data collection per season,

[3] Spring is defined as April and May, summer as June to mid-August inclusive, and autumn as mid-August to October inclusive in industry standard guidance.

and programmed to record nightly commencing 30 minutes before sunset and cease recording 30 minutes after sunrise. Table 3 below summarises the deployment periods in 2025.

Table 3: *Static monitoring periods (2025)*

Season	Static reference	Deployment dates
Spring	All locations	20/05/2025 – 30/05/2025
Summer	All locations	21/07/2025 – 31/07/2025
Autumn	All locations	16/09/2025 – 26/09/2025

2.11 Detectors were configured to use the same recording and detection parameters as 2024.

Bat call analysis

2.12 For further specific details on bat data analysis see Appendix 1.

2.13 Bat call data was initially run through Wildlife Acoustics Kaleidoscope Pro v.5.6.3 auto-identification software, with each file then checked manually by an experienced ecologist using AnalookW software v.4.5z (produced by Titley Scientific) and Kaleidoscope Viewer v.5.6.3. The species analysis follows the call parameters described in Russ (2012). An updated version of the Wildlife Acoustics Kaleidoscope Pro software (v5.9.0) was used in the analysis of the 2025 bat data.

Assessing bat activity

2.14 A measure of relative bat activity was obtained using the secure online tool EcoBat[4], which compares activity recorded on-site to EcoBat's own reference data set to determine the relative level of bat activity on Site, scoring each night from 'Low' to 'Exceptional' per species. Meaningful comparison can only be made where EcoBat's reference data set is large enough (minimum 2000+ survey nights). All species recorded during the 2024 surveys had a reference data set above this minimum therefore all comparisons are considered valid. The full EcoBat report is presented as Appendix 9.9 of the EIA Report.

2.15 As part of the analysis of nocturnal patterns of behaviour for bats, the data was split into discrete time periods (Time Codes) relating to their proximity to sunset or sunrise. Time Codes are described in detail in Appendix 1.

Consideration of potential limitations

2024

2.16 In 2024, several static bat detectors failed to record data during the recording periods. Detectors recorded 71 nights of data in spring, 9 nights of data in summer and 26 nights of data in autumn. No data was collected for Detector 13. Details are shown in Table 5 in Section 3. This constraint was addressed through repeat survey in 2025 to gather the 10 nights of data per detector per season as stipulated in guidance.

2.17 The successful static bat detectors collected a total of 921 hours of data in 2024, and sampled all habitats found on-site (mature, immature/semi-mature and felled coniferous plantation and marshy grassland rides). The data collected was analysed to infer bat activity at similar habitats on-Site. To control for the difference in survey effort between detectors and recording periods, analysis and comparison has been undertaken using bat passes (P) per hour (P/h)).

2.18 The weather station deployed alongside the static bat detectors failed to record weather data for all nights of deployment. Historic weather data was gathered from Ventusky (2025) to address gaps in data. This is not considered to be a significant limitation to the assessment as Ventusky is based on

[4] https://ecobat.mammal.org.uk/ [Most recently accessed 22 April 2026]

automatically gathered meteorological data and models provided by Deutscher Wetterdienst and accurate to 7 km.

2025

2.19 In January 2026, the design of the proposed development was amended to reduce the number of turbines further, and slightly alter turbine positions (see Figure 1). Consequently, one detector (Detector 8) is redundant (as the associated turbine was removed from the layout). Nonetheless, the data collected from this detector has been considered in the assessment of bat activity at the Site as it is located within habitats representative of other (retained) turbine locations. The design iteration of the Proposed Varied Development is described in detail in Chapter 3: Alternatives and Scheme Evolution of the EIA Report.

2.20 The alteration of turbine positions has resulted in some bat detector locations being further separated from the associated turbine centres. This is not considered to be a significant constraint, as survey guidance (NatureScot, 2021) acknowledges that turbine locations are often subject to change. Guidance therefore recommends that statics are deployed at the most representative areas possible, where habitat and topographic features align closely with the foreseen final turbine locations. In addition, the habitats at the turbine locations are likely to be different during operation of the wind farm to those present at baseline (as felling of turbine 'keyholes' in afforested areas will be required). This will result in the creation of open ground and new woodland edge habitats that will be used differently by commuting and foraging bats. The deployed statics capture representative habitat types and features (including existing woodland edge and clear fell) and it is therefore considered that the data they present is a representative sample for bat activity on site as a whole.

3 Results

Desk study

3.1 No statutory or non-statutory sites within the desk study area are designated for bats.

3.2 SWSEIC returned 197 records of bats across ten species within the 10 km search area[5]. These are summarised below in Table 4, with reference to guidance from NatureScot *et al* (2021) on bat species vulnerable to onshore wind farms.

Table 4 *Bat records within 10 km of the site*

Vulnerability	Species	Number of records returned	Records on-Site
Low	Daubenton's bat *Myotis daubentonii*	6	0
	Natterer's bat *Myotis nattereri*	11	2
	Brown long-eared bat *Plecotus auritus*	5	0
Low/Medium	Unidentified Myotis bat species	20	0
Medium	Whiskered/Brandt's bat *Myotis mystancus/brandtii*	5	0
High	Common pipistrelle *Pipistrellus pipistrellus*	41	3
	Soprano pipistrelle *Pipistrellus pygmaeus*	53	2
	Nathusius' pipistrelle *Pipistrellus nathusii*	1	0
	Unidentified pipistrelle bat species	30	3
	Noctule *Nyctalus noctula*	5	0
	Leisler's bat *Nyctalus leisleri*	12	0
	Unidentified nyctalus bat species	2	0
N/A	Unidentified bat species	6	0

3.3 Ten of the records were from within the site, all of which relate to foraging or commuting activity dated August 2016. The records comprise two Natterer's bat, three common pipistrelle, and five soprano pipistrelle. The records appear to have been recorded during a survey run by British Trust for Ornithology, which targeted the marshy grassland rides between woodland along the southern and eastern boundary of the site.

3.4 There were 12 records returned by SWSEIC pertaining to bat roosts. The closest record to site is of a soprano pipistrelle maternity roost of over 600 bats approximately 4 km south-west of site at Kendoon power station, dated July 2016. An abundance of suitable habitat is present between the record and the site including Kendoon Loch, the Water of Ken watercourse and woodland edge habitats at other coniferous woodland south of the site.

Field surveys

2024

3.5 Static bat detectors recorded a total of 921 hours of survey time across spring, summer and autumn 2024.

[5] Comprising the site boundary plus a 10 km buffer.

3.6 A total of 9,260 bat calls (10.05 P/h overall) were recorded across a minimum of seven species[6]: these were common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, Leisler's bat, noctule and myotis species.

2025

3.7 Static bat detectors recorded a total of 2,932 hours of survey time across spring, summer and autumn 2025.

3.8 A total of 43,769 bat calls (14.93 overall) were recorded across a minimum of seven species[6]: these were common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, Leisler's bat, noctule and myotis species, the same assemblage as was recorded in 2024.

Activity by detector location

2024

3.9 Overall bat activity per detector location, across all species and periods in 2024, is presented below in Table 5 and shown on Figure 2 and Figures 3a-c. Where detectors failed to record sufficient bat pass data to determine activity, this is indicated by N/A.

Table 5: *Bat activity (P/h) at each detector location (2024)*

Static reference	Spring bat activity	Summer bat activity	Autumn bat activity
1	0.40	0.13	N/A
3	4.92	N/A	0.79
4	15.25	22.87	3.31
5	67.93	N/A	5.34
6	N/A	4.36	N/A
8	2.32	5.45	N/A
9	4.53	N/A	N/A
10	14.10	N/A	N/A
11	1.76	N/A	N/A
12	5.63	N/A	N/A
13	N/A	N/A	N/A

3.10 Detector 5 recorded the highest amount of bat activity; located in the centre of the site in suitable foraging and commuting habitat for bats along edge habitat between felled and mature coniferous woodland plantation. The detector has direct sheltered connectivity through woodland to nearby watercourses (with further off-site connectivity via these watercourses to the Water of Ken).

3.11 All other detectors recorded low amounts of activity, with the lowest activity recorded at Detector 1. Detector 1 captures a narrow woodland ride within a block of mature coniferous plantation. The area

[6] More than one species of the genus Myotis may have been recorded; however, calls could not be identified to species level due to overlapping call parameters.

features lower value foraging and commuting habitat compared to the resources (such as woodland edge) found elsewhere.

2025

3.12 Overall bat activity per detector location, across all species and periods in 2025, is presented below in Table 6 and shown on Figure 4 and Figures 5a-c.

Table 6: *Bat activity (P/h) at each detector location*

Static reference	Spring bat activity	Summer bat activity	Autumn bat activity
1	5.98	0.38	0.08
3	9.58	0.10	0.33
4	16.48	45.71	8.14
5	74.94	121.56	6.60
6	12.92	63.63	24.00
8	4.69	12.05	3.90
9	1.55	4.69	2.45
10	13.57	32.28	6.92
11	1.65	24.87	1.29
12	15.58	14.20	3.30
13	4.06	6.46	2.52

3.13 Detector 6 was the only detector to display a noticeable change in activity between the 2024 and 2025 surveys (not considering gaps in the 2024 data). Summer activity at Detector 6 in 2025 was notably higher than recorded in 2024 (+59.27 P/h) and the data indicates a seasonal peak in activity during summer.

3.14 Activity at all other detectors was largely consistent with the findings of the 2024 survey: Detector 5 recorded the highest activity and Detector 1 the lowest.

3.15 Detectors 4, 5, 6, 10, and 11 show seasonal peaks of activity in summer, and a sharp decline in autumn. This is likely due to seasonal changes in invertebrate prey item availability at these locations.

3.16 Detectors 1 and 3 showed a seasonal peak in activity in spring and almost no activity in summer and autumn. These locations appear to be of less importance to bats as the season progresses.

3.17 All other detectors recorded low amounts of activity, too low to interpret seasonal variation. This is consistent with the findings of the 2024 survey.

All species

3.18 NatureScot *et al* (2021) has assessed the vulnerability of each bat species to turbine collision according to their risk of collision and their rarity in Scotland. This is presented below in Table 7.

Table 7: *Bat vulnerability to wind turbines.*

Species rarity (Scotland)	Low collision risk	Medium collision risk	High collision risk
Common species	None	None	Common pipistrelle Soprano pipistrelle **Medium vulnerability**
Rarer species	Brown long-eared bat Daubenton's bat Natterer's bat **Low vulnerability**	None	None
Rarest species	Whiskered bat Brandt's bat **Medium vulnerability**	None	Nathusius' pipistrelle Noctule Leisler's bat **High vulnerability**

2024

3.19 Overall bat activity per species, across all locations and periods in 2024, is presented below in Table 8 and visualised in Figures 3a – 3c.

Table 8: *Bat activity (P/h) per species.*

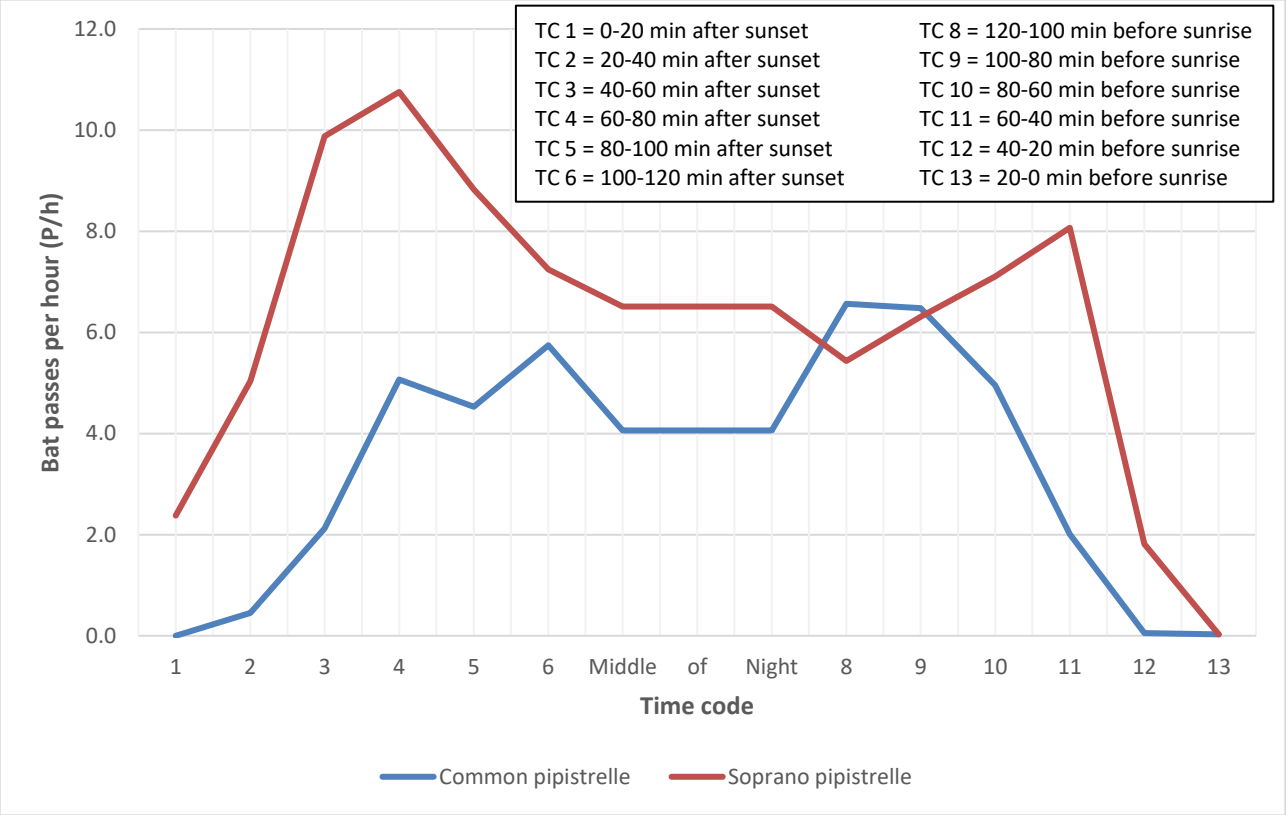
Species name	Spring bat activity	Summer bat activity	Autumn bat activity
Common pipistrelle	6.18	0.96	0.13
Soprano pipistrelle	6.49	5.25	5.86
Nathusius' pipistrelle	<0.01	0	0
Myotis sp.	0.23	0.16	0.03
Brown long-eared	0.01	0.03	<0.01
Noctule	0.02	0.03	0.01
Leisler's bat	0.02	0.16	0.01
Noctule / Leisler's bat[7]	0.01	0.01	<0.01
Common / Nathusius' pipistrelle[7]	0.03	0	0
Common / soprano pipistrelle[7]	6.49	0.06	0.03

[7] This relates to calls that could not be identified to species level due to overlapping call parameters.

3.20 Soprano pipistrelle was the most frequently recorded species, accounting for 61% of all passes recorded, followed by common pipistrelle (35%) and *Myotis* species (1%). The remaining species all accounted for <1% of all passes recorded.

3.21 Graph 1 shows the activity of common and soprano pipistrelle throughout the night over the entire survey period. Other species' activity was too low to discern distinct peaks, and are therefore not included.

Graph 1: *Activity of common and soprano pipistrelle throughout the night, across all detectors and seasons*



2025

3.22 Overall bat activity per species, across all locations and periods, is presented below in Table 9 and visualised in Figures 5a – 5c.

Table 9: *Bat activity (P/h) per species.*

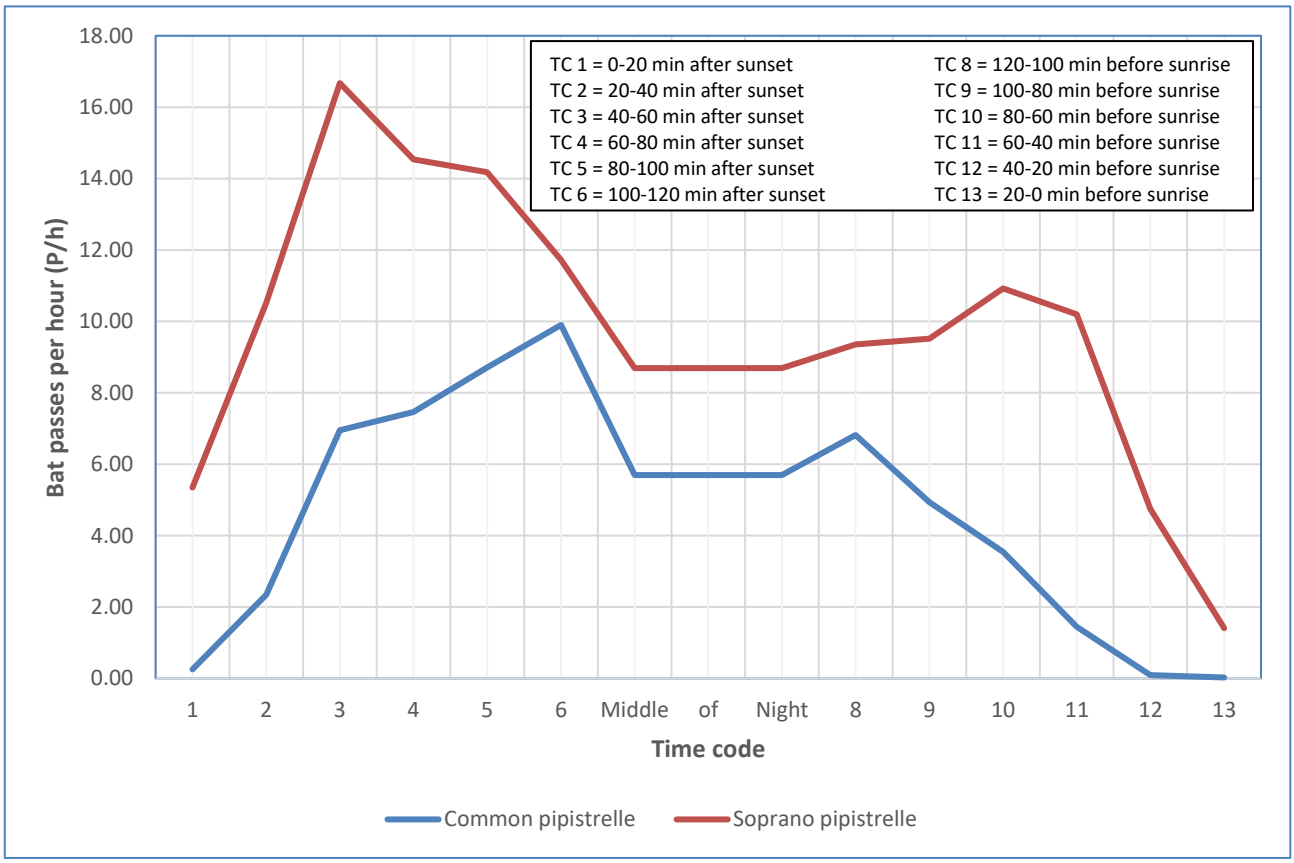
Species name	Spring bat activity	Summer bat activity	Autumn bat activity
Common pipistrelle	5.51	11.56	0.58
Soprano pipistrelle	8.55	17.24	4.55
Nathusius' pipistrelle	<0.01	0	0
Myotis sp.	0.52	0.72	0.19
Brown long-eared	<0.01	0.06	0.02
Noctule	0.05	0.04	0.06

Species name	Spring bat activity	Summer bat activity	Autumn bat activity
Leisler's bat	0.01	0.01	<0.01

3.23 Soprano pipistrelle was the most frequently recorded species, accounting for 62% of all passes recorded, followed by common pipistrelle (34%) and *Myotis* species (3%). The remaining species all accounted for <1% of all passes recorded. This is consistent with the findings of the 2024 survey.

3.24 Graph 2 shows the activity of common and soprano pipistrelle throughout the night over the entire survey period. Other species' activity was too low to discern distinct peaks, and are therefore not included.

Graph 2: *Activity of common and soprano pipistrelle throughout the night, across all detectors and seasons*



3.25 An outline of activity for all bat species recorded is given below. Guidance produced by NatureScot *et al.* (2021) categorises bat species by collision risk with operational wind turbines and then by the vulnerability of bat species populations to individual fatalities. Bat species are discussed below in order of their population vulnerability.

High population vulnerability species

Noctule

3.26 Noctule bats are considered to be at high risk of collision with wind turbine blades due to their high flight, hawking feeding strategy and preference for using open habitats (NatureScot *et al.*, 2021). At

the population level, noctule has been classed as a high vulnerability species to wind farm development, given their relatively uncommon and widespread status and their longevity (relatively long life expectancy), which suggest that recruitment to the breeding population is low (Bat Conservation Trust, 2020; NatureScot *et al.*, 2021). Woodland edge, mature and young/semi-mature coniferous woodland habitats provide suitable foraging and commuting habitats for noctule (Collins, 2023).

2024

3.27 Noctule were recorded in low numbers throughout the site across all periods, with activity remaining uniform across all periods between 0.02 and 0.03 P/h. Noctules were most frequently recorded at Detector 4 (0.03 P/h).

3.28 The earliest noctule pass was recorded 32 minutes after sunset (Time Code 2) and the latest pass was recorded 29 minutes before sunrise. The mean emergence time for noctule is approximately 8 minutes after sunset (Andrews and Pearson, 2022), which suggests that noctule did not roost on or near the site in 2024. Given the timing and low number of passes recorded, and the small number of records returned during the desk study, it is considered unlikely that the bats recorded roost on or near the site.

3.29 An additional eight passes were recorded that could not be confidently attributed to either noctule or Leisler's bat due to overlapping call parameters. Five of these were recorded during the spring period at Detector 5. The earliest of the passes was recorded at 69 minutes after sunset (Time Code 4), and the latest at 43 minutes before sunrise (Time Code 11). The overlapping calls match the activity patterns of both species.

2025

3.30 Noctule were recorded in low numbers throughout the Site across all periods, with activity remaining uniform across all periods between 0.25 and 0.01 P/h. This is consistent with the findings of the 2024 survey.

3.31 EcoBat analysis determined that noctule activity did not exceed 'Low' on any survey night at any detector or period in 2025.

3.32 Noctules were most frequently recorded at Detector 6, which captures edge habitat between felled and mature conifer plantation. This contrasts from the 2024 survey which captured peak noctule activity at Detector 4, but given the low numbers of noctule calls recorded overall, the change may simply be due to incidental movements of noctule throughout the Site in response to external factors such as routine felling. Both detectors capture suitable foraging / commuting habitat for the species (Collins, 2023).

3.33 A total of eight passes were recorded between five and 18 minutes after sunset, which is during the typical emergence time for the species, as set out in Andrews and Pearson (2022). The early calls were recorded during the spring and autumn deployments at Detectors 6, 10, 12 and 13.

3.34 Early calls recorded in 2025 do not show any seasonal or spatial trend. Given the lack of early passes recorded in 2024, and the low number of early passes recorded in 2025, it is considered that the Site may provide an incidental noctule roosting resource only.

Leisler's bat

3.35 Leisler's bats are considered to be at high risk of collision with wind turbine blades due to their high flight, hawking feeding strategy and preference for using open habitats (NatureScot *et al.*, 2021). At the population level, Leisler's bat has been classed as a high vulnerability species to wind farm development, given their relatively uncommon and widespread status and their longevity, which suggest that recruitment to the breeding population is low (Bat Conservation Trust, 2020; NatureScot *et al.*, 2021). Woodland edge, mature and young/semi-mature coniferous woodland habitats provide suitable foraging and commuting habitats for Leisler's bat (Collins, 2023).

2024

3.36 Leisler's bats were recorded in low numbers throughout the Site across all periods, with activity peaking in summer (0.16 P/h) but lower in spring (0.02 P/h) and autumn (0.01 P/h). Leisler's bats were most frequently recorded at Detector 8.

3.37 The earliest Leisler's bat recording was at 48 minutes after sunset (Time Code 3) and the latest pass was recorded 37 before sunrise (Time Code 2).

3.38 Given the timing and low number of passes recorded, and the small number of records returned during the desk study, it is considered unlikely that the bats recorded roost on or near the Site.

2025

3.39 Leisler's bats were recorded in low numbers throughout the Site across all periods (0.01 P/h or below), with activity showing no seasonal or spatial trend. This is a slight reduction in activity compared to the results of the 2024 survey.

3.40 EcoBat analysis determined that Leisler's bat activity did not exceed 'Low' on any survey night at any detector or period in 2025.

3.41 A total of four passes were recorded between 21 and 33 minutes after sunset, which is during the typical emergence time for the species. All of the calls occurred at Detector 9 in the autumn period, three of which were within one minute on the same night (and therefore likely to be the same bat). Given this and the fact that no early calls were recorded during the 2024 survey, it is considered that there may be an incidental Leisler's roosting resource near Detector 9.

Nathusius' pipistrelle

3.42 Nathusius' pipistrelle is considered a high collision risk species due to its fast flight and hawking feeding strategy, and has also been classed as a high vulnerability species to wind farm development at population level, as it is relatively scarce in Scotland (and the rest of the UK) (NatureScot *et al.*, 2021).

2024

3.43 One call of Nathusius' pipistrelle was recorded during the survey work (in spring at Detector 3). Nathusius' pipistrelle is typically considered to be a long-distance migrant and exhibits seasonal patterns of activity, with the peak migration period for this species in late summer / autumn or in spring with an influx of bats entering the UK from continental Europe (Collins, 2023).

3.44 A total of 18 passes were recorded that could not be confidently attributed to either common or Nathusius' pipistrelle due to overlapping call parameters. All of these were recorded during the spring period at Detectors 4 and 5. The earliest of these passes was recorded at 56 minutes after sunset (Time Code 3) and the latest at 57 minutes before sunrise (Time Code 11). The overlapping calls match the activity patterns of both species; however, it is considered likely that these passes are low-calling common pipistrelle, given that common pipistrelle are more likely to be encountered.

2025

3.45 One Nathusius' pipistrelle pass was also recorded during the entire 2025 survey (at Detector 5 during the spring deployment period).

3.46 EcoBat analysis determined that Nathusius' pipistrelle activity did not exceed 'Low' on any survey night at any detector or period in 2025.

3.47 The Nathusius' pipistrelle pass was recorded 96 minutes after sunset, which is later than the typical emergence time for the species and does not suggest that the bat roosted locally. This is consistent with the findings of the 2024 survey.

Medium population vulnerability species

Common pipistrelle

3.48 Common pipistrelles are considered to be at high risk of collision with wind turbines (NatureScot *et al.*, 2021). This assessment is based on evidence from the National Bats & Wind Turbines study (Mathews *et al.* 2016) and Eurobats data, and the physical and behavioural characteristics of this species. However, this species is common and widespread in the UK (Wray *et al.* 2010). Guidance therefore considers common pipistrelle to be of medium vulnerability to population level effects (Table 7).

2024

3.49 Common pipistrelle activity peaked in spring (6.18 P/h) and declined throughout the remainder of the survey period to <1.0 P/h. Common pipistrelle were recorded at all locations within the Site, but were most frequently recorded at Detectors 4 and 5: common pipistrelle bat calls at these locations account for 31.6% of all recorded bat calls during the update surveys. These detectors capture edge habitat between felled and mature or immature/semi-mature coniferous plantation, with immediate or direct connectivity to watercourse habitat. Common pipistrelles have broad habitat requirements, and are one of the most widespread species in the UK.

3.50 The earliest common pipistrelle pass was recorded 25 minutes after sunset (Time Code 2). There were 15 early common pipistrelle passes recorded between 25 and 38 minutes after sunset throughout the survey period.

3.51 A peak in common pipistrelle activity occurred 100-120 minutes after sunset (Time Code 6), and activity remained consistent throughout the night, reaching an overall peak at 120-100 minutes before sunrise (Time Code 8). Activity declined after 100-80 minutes before sunrise (Time Code 9) (Graph 1).

3.52 The latest common pipistrelle pass was recorded 17 minutes before sunrise (Time Code 13). There were three late common pipistrelle passes, attributable to three bats, recorded between 39 and 17 minutes before sunrise.

2025

3.53 Common pipistrelle activity levels in spring (5.51 P/h) were consistent with the 2024 survey, but overall activity peaked in summer (11.56 P/h) rather than declining after spring. Activity once again fell in autumn (0.58 P/h). Spatially, Detector 5 recorded the highest number of passes, consistent with the 2024 survey.

3.54 Activity throughout the night was consistent with the 2024 surveys, with activity peaking at Time Codes 6 and 8.

3.55 EcoBat analysis indicates that eight nights of 'moderate' common pipistrelle activity were recorded: six of which were at Detector 5 and two at Detector 6, all within the summer period. Activity levels on all other nights were determined to be below moderate.

3.56 A total of 287 passes were recorded during typical emergence times for the species (Andrews and Pearson, 2022), at all locations except Detectors 3 and 11. Early passes show no discernible seasonality. The earliest recorded pass was 7 minutes before sunset, at Detector 1 in the autumn period.

3.57 Common pipistrelles typically select buildings (of which there are none within the site) for their larger roosts but can also roost in crevices in trees. The coniferous woodland on-site is unlikely to be an important roosting resource, although it may provide roosting opportunities for a smaller number of individuals (Collins, 2023). Early passes and the timings of the peaks in common pipistrelle activity indicate that there may be infrequent local roosting of small numbers of bats near the site.

Soprano pipistrelle

3.58 Soprano pipistrelles are considered to be at high risk of collision with wind turbines (NatureScot *et al.*, 2021). This assessment is based on evidence from the National Bats & Wind Turbines study (Mathews *et al.* 2016) and Eurobats data, and the physical and behavioural characteristics of this species. However, this species is common and widespread in the UK (Wray *et al.* 2010). Guidance therefore considers common pipistrelle to be of medium vulnerability to population level effects (Table 7).

2024

3.59 Soprano pipistrelle activity peaked in spring (6.18 P/h), declined slightly in the summer (5.25 P/h) and rallied slightly in autumn (5.86 P/h). Soprano pipistrelle were recorded at all locations within the site, but were most frequently recorded at Detectors 4 and 5: soprano pipistrelle bat calls at these locations account for 51.1% of all recorded bat calls during the update surveys. These detectors capture edge habitat between felled and mature or immature/semi-mature coniferous plantation, with immediate or direct connectivity to watercourse habitat. Soprano pipistrelles have broad habitat requirements, and are one of the most widespread species in the UK but are known to preferentially feed over wetland habitats such as rivers compared to common pipistrelles (Collins, 2023), which could explain their higher proportion in recordings at these locations.

3.60 The earliest soprano pipistrelle pass was recorded eight minutes before sunset (Time Code 0). There were 274 early soprano pipistrelle passes, recorded between eight minutes before sunrise and 40 minutes after sunset throughout the survey period. The highest number of early passes occurred in autumn (207 P), followed by spring (54 P) and summer (13 P). Early passes were recorded at all Detectors except 1 and 6, with the majority recorded at Detector 5 (189 P).

3.61 A peak in soprano pipistrelle activity occurred 60-80 minutes after sunset (Time Code 4), and activity declined steadily throughout the remainder of the night, before climbing to a second peak at 60-40 minutes before sunrise (Time Code 8). Activity then sharply declined before sunrise.

3.62 The latest soprano pipistrelle pass was recorded 17 minutes before sunrise (Time Code 13). There were 65 late common pipistrelle passes, recorded between 39 and 17 minutes before sunrise. The highest number of late passes occurred in autumn (44P), followed by summer (13 P) and spring (8 P). Late passes were recorded at Detectors 4, 5, 8, 9 and 11, with the majority recorded at Detector 5 (44 P).

3.63 91 passes were recorded that could not be confidently attributed to either common or soprano pipistrelle due to overlapping call parameters. 81 of these were recorded at Detectors 4 and 5. The earliest of the unidentified passes was recorded at 57 minutes after sunset (Time Code 3) and the latest at 37 minutes before sunrise (Time Code 12). The overlapping calls match the activity patterns of both species, however it is considered likely that these passes are low-calling soprano pipistrelle, given that the majority of the passes were recorded in open habitat at the edge of felled plantation woodland with direct sheltered connectivity to watercourse habitats.

2025

3.64 Unlike the 2024 survey results, soprano pipistrelle activity in 2025 was highest during the summer period (17.24 P/h). Spatially, Detector 5 recorded the highest number of passes, consistent with the 2024 survey.

3.65 Activity throughout the night was elevated over the 2024 survey across all time codes but overall showed similar bimodal distribution, with peaks occurring at Time Codes 3 and 10 (both slightly earlier than in 2024).

3.66 EcoBat analysis identified 10 nights of 'Moderate/High' soprano pipistrelle activity: three nights in spring and two in summer at Detector 5, and two nights in summer and three in autumn at Detector 6. A further 23 nights of 'Moderate' activity were recorded, comprising: two nights in summer at Detector 11; two nights in spring and seven nights in summer at Detector 4; six nights in summer at

Detector 5; and five nights in summer plus one night in autumn at Detector 6. Activity on all other nights was below 'Moderate'.

3.67 A total of 1,919 passes were recorded during the typical emergence times for the species (Andrews and Pearson, 2022), at all locations. The majority of early passes were recorded in autumn. The earliest recorded pass was 24 minutes before sunset, at Detector 12 in the spring period.

3.68 Soprano pipistrelles typically select buildings (of which there are none within the site) for their larger roosts but can also roost in crevices in trees. The coniferous woodland on-site is unlikely to be an important roosting resource, although it may provide roosting opportunities for a smaller number of individuals (Collins, 2023). Early passes and the timings of the peaks in soprano pipistrelle activity indicate that there is some roosting resource on the site, but the majority of soprano pipistrelle activity is resultant from bats commuting onto the site, possibly from a local roost near the site.

Medium / low population vulnerability species

Myotis species

3.69 Daubenton's bat, Natterer's bat, Brandt's bat and whiskered bats are the only Myotis species known to be resident in Scotland. Daubenton's and Natterer's bat are assessed as species of low vulnerability to wind turbines by NatureScot *et al* (2021) due to their low collision risk and population distribution in Scotland. Whiskered and Brandt's bat are assessed as species of medium vulnerability due to being among the rarest bats in Scotland; though their collision risk is the same as the other myotis species. Myotis species were aggregated due the difficulty in separating the species due to overlapping call parameters (Appendix 1). Given the foraging habitats and roosting resource on-site it is likely that a large proportion of the calls were Natterer's and Daubenton's bats.

2024

3.70 Myotis species were recorded in very low numbers at most locations sampled within the site throughout the survey period, but were not recorded at Detector 1. Myotis species were recorded most by the detectors in the central areas of site (Detectors 4 and 5), which include woodland edge habitat with direct connectivity to watercourse habitats on- and off-site. Myotis activity peaked in spring (0.23 P/h) and declined in autumn (0.03 P/h).

3.71 The earliest myotis pass was recorded 18 minutes after sunset, at Detector 3 in spring. There was one other early myotis pass, recorded 23 minutes after sunset, at the same detector and also in spring. There were no late myotis passes.

2025

3.72 Myotis species were again recorded in low numbers at all locations sampled within the site in 2025, including Detector 1. Myotis bats were recorded most at Detectors 6 and 12, which include mature coniferous woodland edge habitat. Activity was generally too low to discern a seasonal trend but did decline in autumn.

3.73 EcoBat analysis identified four nights of 'Moderate' myotis activity: one night in spring at Detector 1, one night in summer at Detector 6. one night in summer at Detector 11, and one night in spring at Detector 12. Activity on all other nights was below 'Moderate'.

3.74 A total of 107 passes were recorded at or before typical emergence times for the species, at all locations except Detector 3. Early passes showed no seasonal trend. The earliest recorded pass was 32 minutes after sunset, at Detector 13 in the summer period.

3.75 Although activity was broadly consistent between years, the survey results suggest that incidental myotis roosting resource is available throughout the site given that low numbers of early passes were recorded at all locations (considering both 2024 and 2025 surveys).

Low population vulnerability species

Brown long-eared bat

3.76 Brown long-eared bats are assessed as species of low vulnerability to wind turbines by NatureScot *et al* (2021) due to their low collision risk and population distribution in Scotland. Brown long-eared bats readily roost in trees and forage in mixed woodland and among conifers (Collins, 2023). However, the Sitka spruce that dominates the mature coniferous plantation woodland is unlikely to provide suitable roosting opportunities for this cavity-dwelling species.

2024

3.77 Brown long-eared bats were recorded in very low numbers across the different habitats on-site throughout the survey period (total of 11 P), and did not display preference for any one area or habitat type. There were no early or late passes.

2025

3.78 Brown long-eared bats were once again recorded in low numbers across the habitat types on-site throughout the survey period. In 2025, however, most brown long-eared passes were recorded at Detector 5, which is located at edge habitat between felled and mature coniferous plantation, with direct connectivity to watercourses leading off-site.

3.79 Only one pass was recorded during the typical emergence time for the species: a pass at Detector 4, 52 minutes after sunset in the autumn period. There may be infrequent roosting resource for brown long-eared bat near Detector 4.

Meteorological data

2024

3.80 Weather data (wind speed, temperature and rainfall) was gathered during spring, summer and autumn 2024. Table 10 shows the maximum and minimum figures for wind speed, temperature and rainfall when bats were recorded, and also over the entire survey period (including when no bats were recorded).

Table 10: Minimum and maximum weather variables (2024)

	Wind Speed (m/s)	Ambient temperature (mean) (°C)	Rainfall (mean) (mm)
Maximum values	9	18	12
Maximum values that bats were recorded	9	14	6
Minimum values	0	0	0
Minimum values that bats were recorded	0	1	0

3.81 Bat passes were recorded in all wind speeds, even during the maximum wind speed recorded, up to 9 m/s. No bat passes were recorded when rainfall exceeded 6 mm (12 mm was the maximum recorded value). Bats were recorded in temperatures as low as 1 °C, and no bats were recorded over 14 °C (18 °C was the maximum value recorded for ambient temperature during the survey period).

3.82 Correlation coefficients (Pearson's) were run to assess the importance of the relationship between bat activity and individual weather variables. Table 11 gives the R values for the correlations, with a brief description of what these mean, as well as the p-value (a p-value of <0.05 indicates that the results of a statistical test are significant).

Table 11: Correlation coefficients of wind speed, ambient temperature and rainfall (+1 = 100% positive correlation, -1 = 100% negative correlation)

Weather variable	Wind Speed	Ambient temperature	Rainfall
R value	-0.157	0.200	-0.066
Correlation	15.74 % negative correlation	20.01 % positive correlation	6.58 % negative correlation
P Value	0.177441585	0.085262489	0.574940711
Explanation	Bat activity is lower with higher wind speed	Bat activity is greater with higher temperatures	Bat activity is lower with higher rainfall
Significance	Not significant	Not significant	Not significant

3.83 There are negative correlations between bat activity with higher levels of wind speed and rainfall, and a positive correlation between bat activity and higher temperatures. However, the statistical analysis indicates that there is no statistical significance between bat activity and any of the weather variables. This suggests that it is not possible to confidently associate bat use of the site with weather conditions. Other influencing variables such as life cycle, roost location / availability and prey availability are likely to have more of an effect on activity at the site based on data gathered in 2024.

2025

3.84 Weather data (wind speed, temperature and rainfall) was gathered during spring, summer and autumn 2025. Table 12 shows the maximum and minimum figures for wind speed, temperature and rainfall when bats were recorded, and also over the entire survey period (including when no bats were recorded).

Table 12: Minimum and maximum weather variables (2024)

	Wind Speed (m/s)	Ambient temperature (mean) (°C)	Rainfall (mean) (mm)
Maximum values	8	15	10
Maximum values that bats were recorded	8	15	10
Minimum values	1	2	0
Minimum values that bats were recorded	1	2	0

3.85 Bats were recorded in all wind speeds, temperatures and rainfall levels, including at both the maximum and minimum extremes recorded.

3.86 Correlation coefficients (Pearson's) were run to assess the importance of the relationship between bat activity and individual weather variables. Table 13 gives the R values for the correlations, with a brief description of what these mean, as well as the p-value (a p-value of <0.05 indicates that the results of a statistical test are significant).

3.87 **Table 13:** Correlation coefficients of wind speed, ambient temperature and rainfall (+1 = 100% positive correlation, -1 = 100% negative correlation)

Weather variable	Wind Speed	Ambient temperature	Rainfall
R value	-0.228	0.393	-0.157
Correlation	22.76 % negative correlation	39.35 % positive correlation	15.67 % negative correlation
P Value	0.042328893	0.000305405	0.165027362
Explanation	Bat activity is lower with higher wind speed	Bat activity is greater with higher temperatures	Bat activity is lower with higher rainfall
Significance	Not significant	Significant	Not significant

3.88 As found in the 2024 survey, there are negative correlations between bat activity and higher levels of rainfall and windspeed, but these were once again found to be not statistically significant. The 2025 analysis also found a positive correlation between bat activity and higher temperatures, which was statistically significant, unlike in 2024. It is likely that the difference is due to the more extensive sample size collected in 2025 compared to 2024.

4 Summary

4.1 The recorded activity in both 2024 and 2025 was dominated by common and soprano pipistrelles at most static locations across the site, favouring detectors situated at edge habitat in the central areas of the site with direct connectivity to watercourses. Common and soprano pipistrelle species are assessed as having medium vulnerability to wind turbine developments (NatureScot *et al*, 2021).

4.2 *Nyctalus* sp. bats were recorded in low numbers across the site, and did not display a strong preference for any particular area. Both noctule and Leisler's bat are assessed as having high vulnerability to wind turbine developments (NatureScot *et al*, 2021).

4.3 The value of the site for roosting bats is low given the absence of buildings within it, and habitat dominated by commercially managed Sitka spruce and open ground. This is reflected by the low activity rates recorded for all species except soprano pipistrelle, which were recorded with 'Moderate/High' rates of activity on some nights per EcoBat analysis.

4.4 Soprano pipistrelle typically select buildings for their roosts but can roost in tree features. Sitka spruce plantation does not typically provide roosting opportunities for colonies of bats, but may provide opportunistic roosting for individuals. Given the number of early passes recorded, it is possible that there is soprano pipistrelle roosting resource on or with immediate connectivity to the site.

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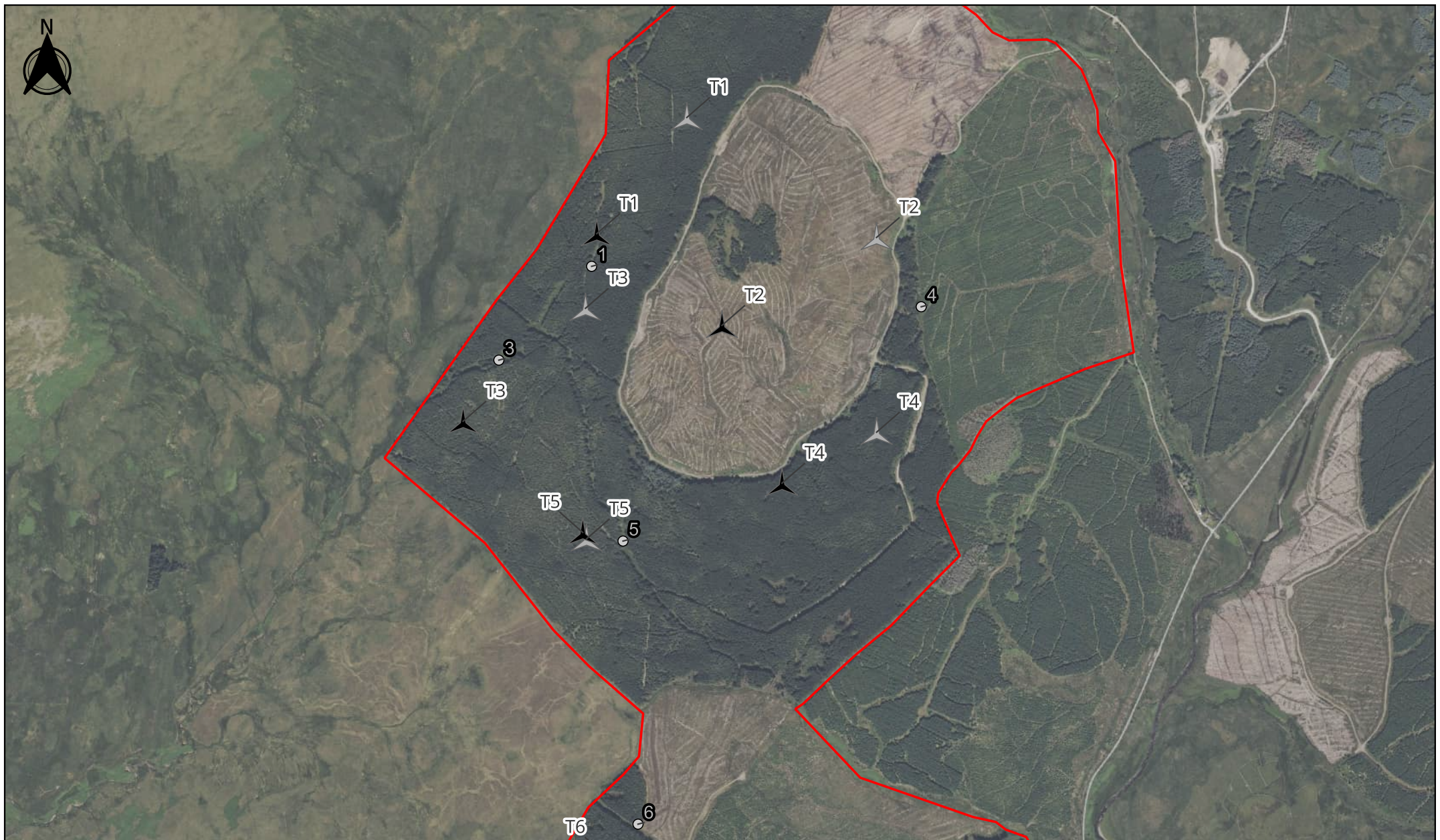
6 Figures

(overleaf)



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JOB REF: P24-144

PROJECT TITLE

SHEPHERDS RIG WIND FARM

DRAWING TITLE

Figure 1: Static detector locations and proposed turbine layouts

DATE: 26/03/2026	CHECKED: HG	SCALE: 1:14,500
DRAWN: BH	APPROVED: IH	VERSION:1.0

Legend

- Site boundary
- Static locations
- 2026 Turbine Proposal Layout
- 2025 Turbine Proposal Layout

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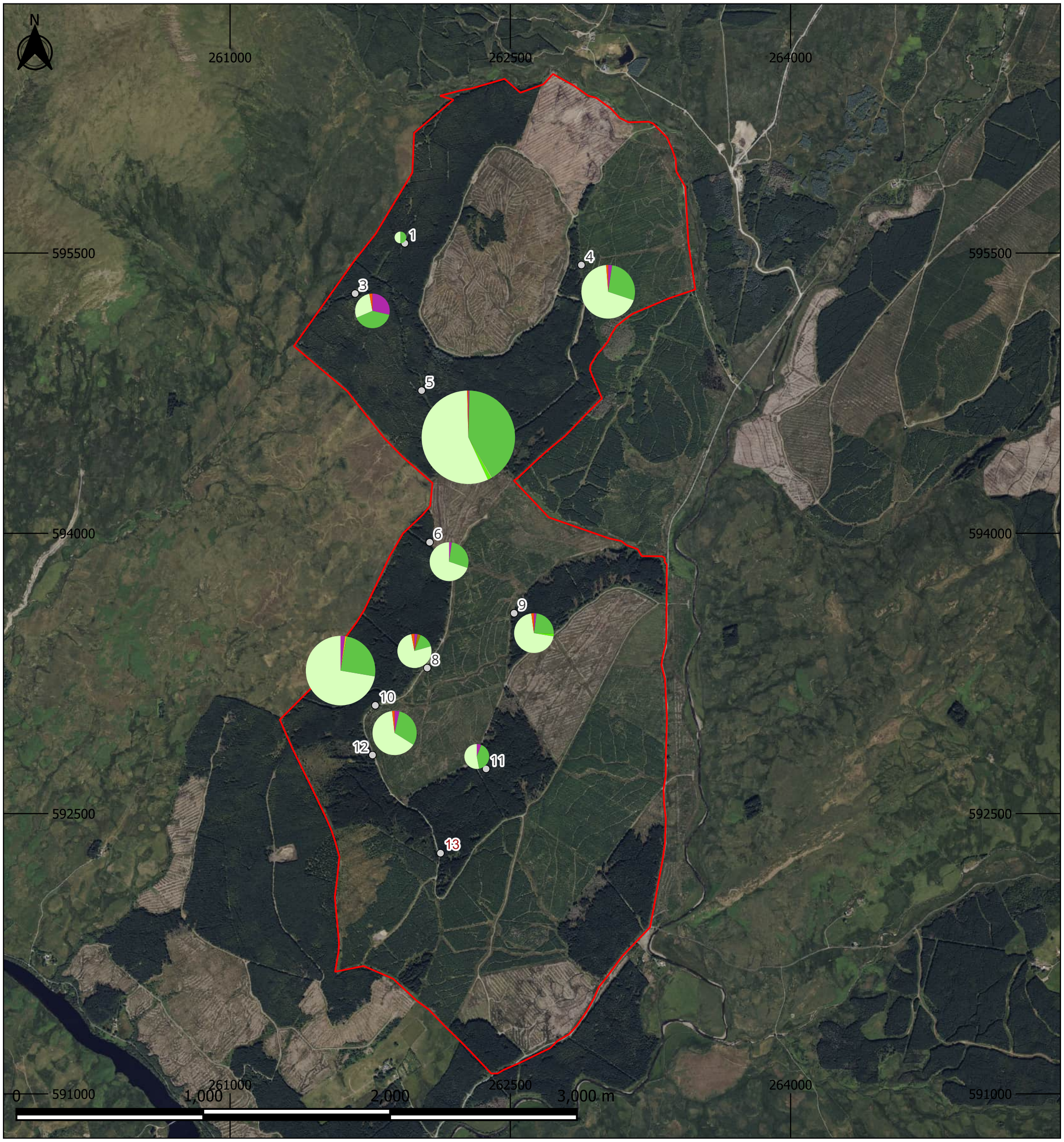

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Figure 2: Bat activity results (all seasons)

DATE: 20/03/2025 CHECKED: HG SCALE: 1:20,000

DRAWN: MZ APPROVED: HG VERSION:1.2

Legend

- Site boundary
- Static Point
- Myotis sp.
- Leisler's
- Noctule
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared
- All other species

Bat Activity

25
20
15
10
5
2
0.1

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Graphics Ref. No.: 09366

N

261000 262500 264000

595500 595500

1 3 4 5

594000 594000

6 8 9 10 11 12 13

592500 592500

0 591000 1,000 261000 2,000 262500 3,000 m 264000 591000

Graphics Ref. No.: 09366

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DRAWING TITLE

Figure 3a: Bat activity results (spring)

DATE: 20/03/2025 CHECKED: HG SCALE: 1:20,000

DRAWN: MZ APPROVED: HG VERSION:1.2

Legend

- Site boundary
- Static Point
- Myotis sp.
- Leisler's
- Noctule
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared
- All other species

Bat Activity

68
40
20
5
1
0.1

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Sources: BSG Ecology survey data

N

261000 262500 264000

595500 595500

1 4 3 5

594000 594000

6 9 8 10 12 11

592500 592500

13

0 591000 1,000 261000 2,000 262500 3,000 m 264000 591000

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PROJECT TITLE

SHEPHERDS RIG WIND FARM

DRAWING TITLE

Figure 3b: Bat activity results (summer)

DATE: 20/03/2025 CHECKED: HG SCALE: 1:20,000

DRAWN: MZ APPROVED: HG VERSION:1.2

Legend

- Site boundary
- Static Point
- Static Point failed
- Myotis sp.
- Leisler's
- Noctule
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared
- All other species

Bat Activity

23
5
2
1
0.4

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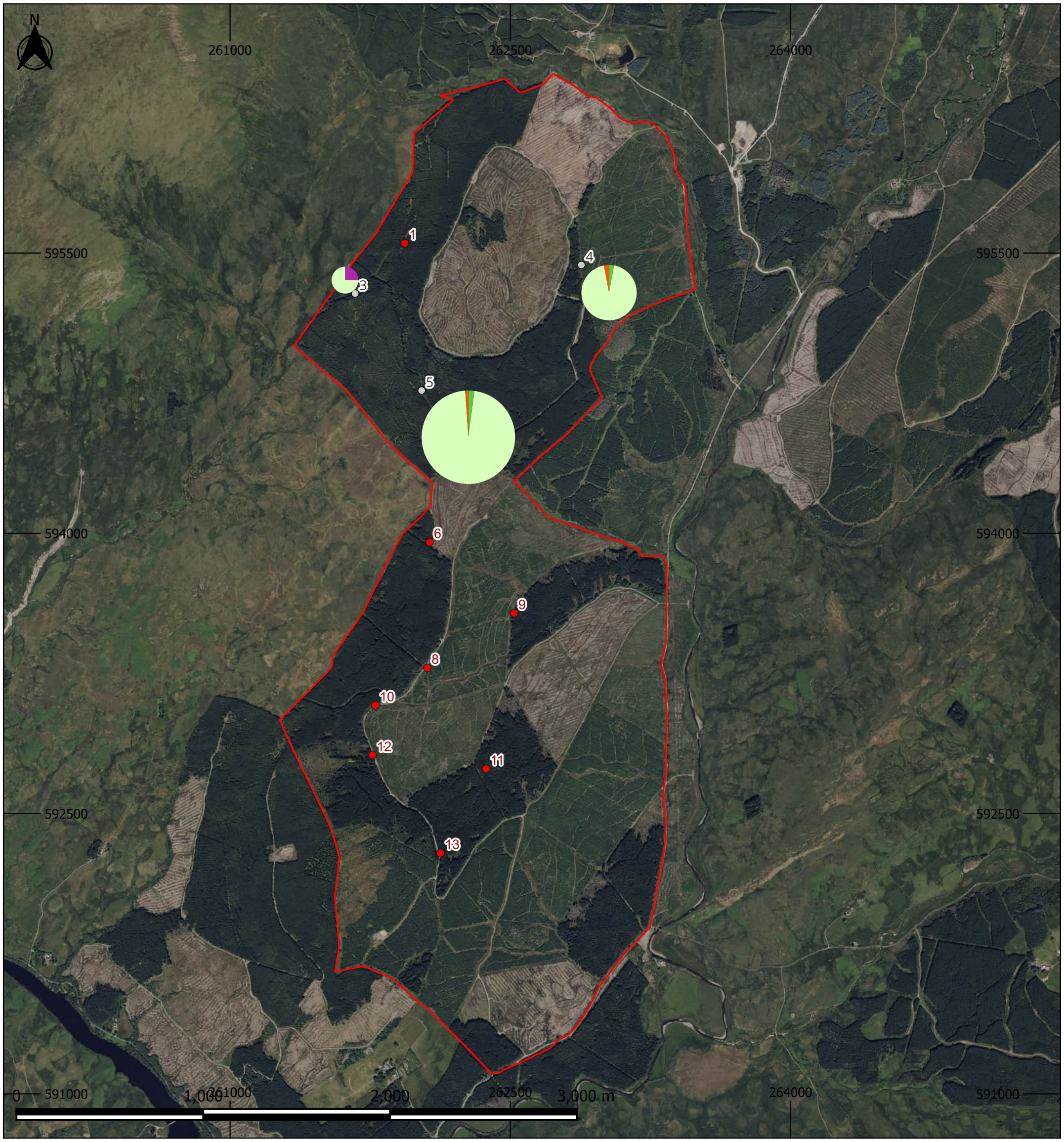

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PROJECT TITLE

SHEPHERDS RIG WIND FARM

DRAWING TITLE

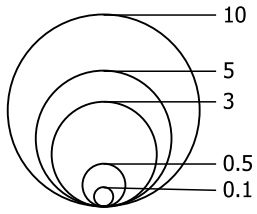
Figure 3c: Bat activity results (autumn)

DATE: 20/03/2025	CHECKED: HG	SCALE: 1:20,000
DRAWN: MZ	APPROVED: HG	VERSION:1.2

Legend

- Site boundary
- Static Point
- Static Point failed
- Myotis sp.
- Leisler's
- Noctule
- Common pipistrelle
- Soprano pipistrelle
- Brown long-eared
- All other species

Bat Activity



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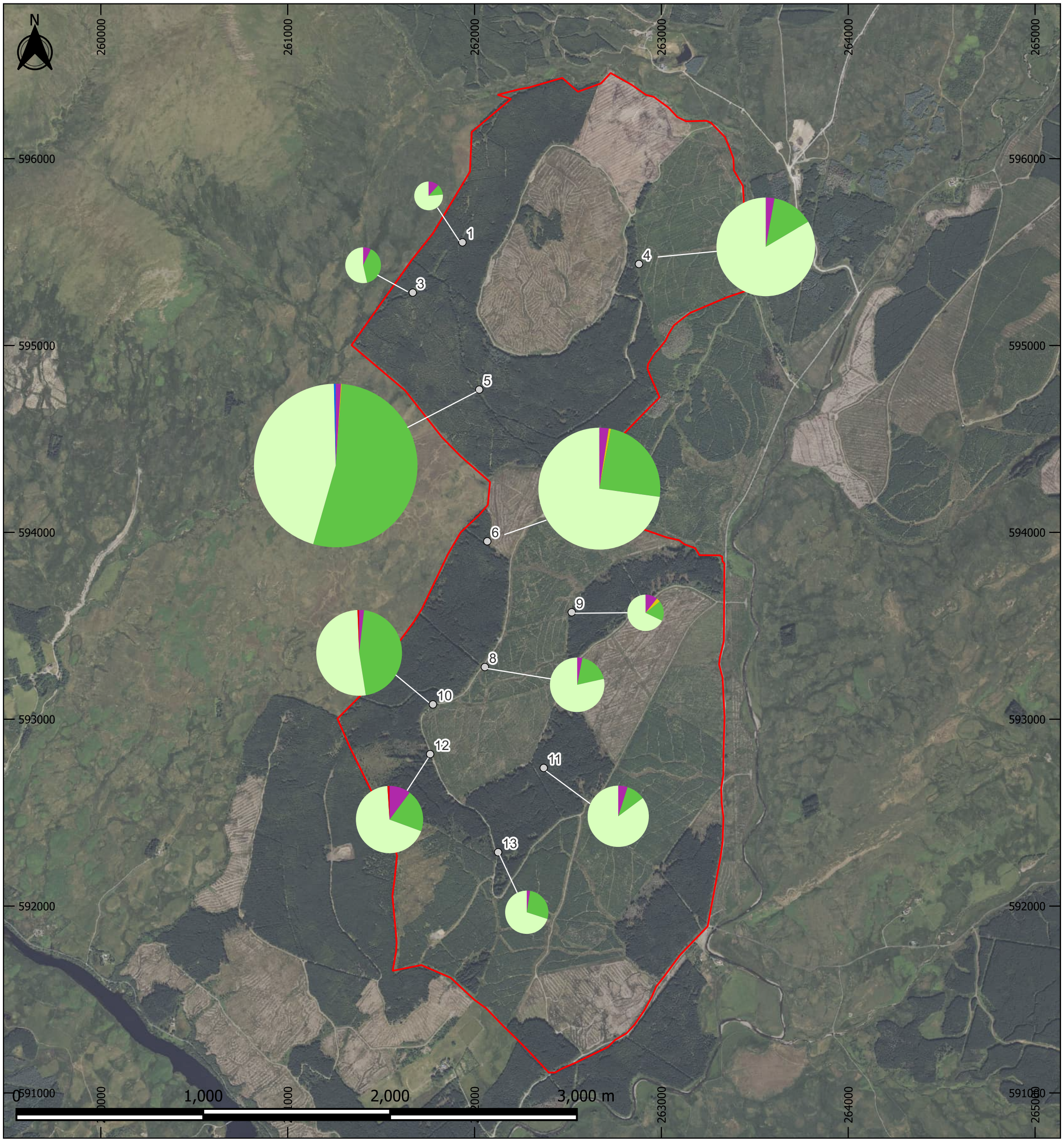
Sources: BSG Ecology survey data

Graphics Ref. No.: 09366



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PROJECT TITLE

SHEPHERDS RIG WIND FARM

DRAWING TITLE

Figure 4: Bat activity results (all seasons)

DATE: 26/03/2026 CHECKED: HG SCALE: 1:20,000

DRAWN: BH APPROVED: IH VERSION:1.0

Legend

- Site boundary
- Static Point
- Myotis sp.
- Leisler's
- Noctule
- Common pipistrelle
- Soprano pipistrelle
- Nathusius' pipistrelle
- Brown long-eared
- All other species

Total Passes

9.9
8
6
4
2

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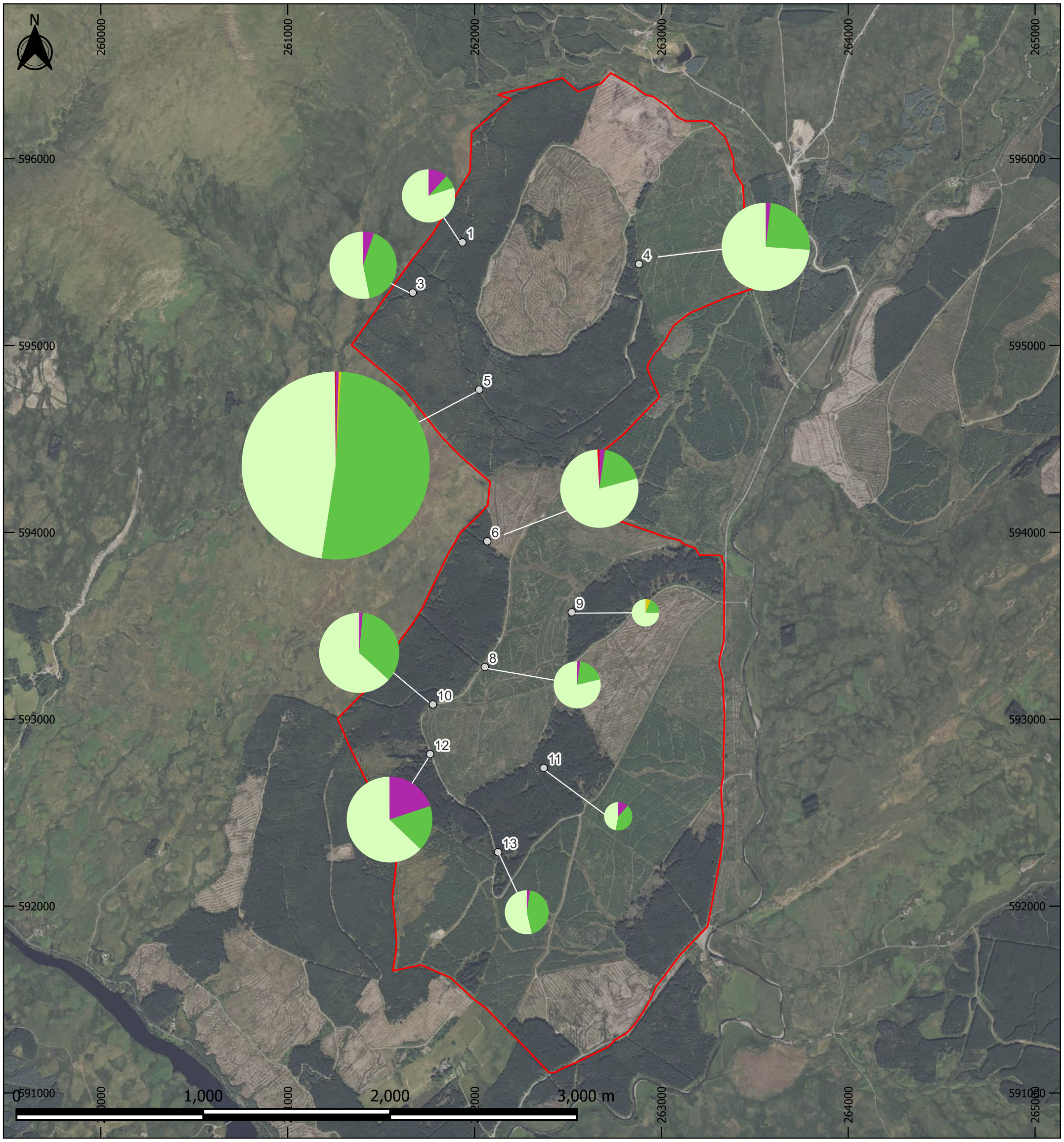
Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 14362



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PROJECT TITLE

SHEPHERDS RIG WIND FARM

DRAWING TITLE

Figure 5a: Bat activity results - Spring

DATE: 26/03/2026 CHECKED: HG SCALE: 1:20,000

DRAWN: BH APPROVED: IH VERSION:1.0

Legend

- Site boundary
- Static Point
- Myotis sp.
- Leisler's
- Noctule
- Common pipistrelle
- Soprano pipistrelle
- Nathusius' pipistrelle
- Brown long-eared
- All other species

Total Passes

9.6
8
6
4
2

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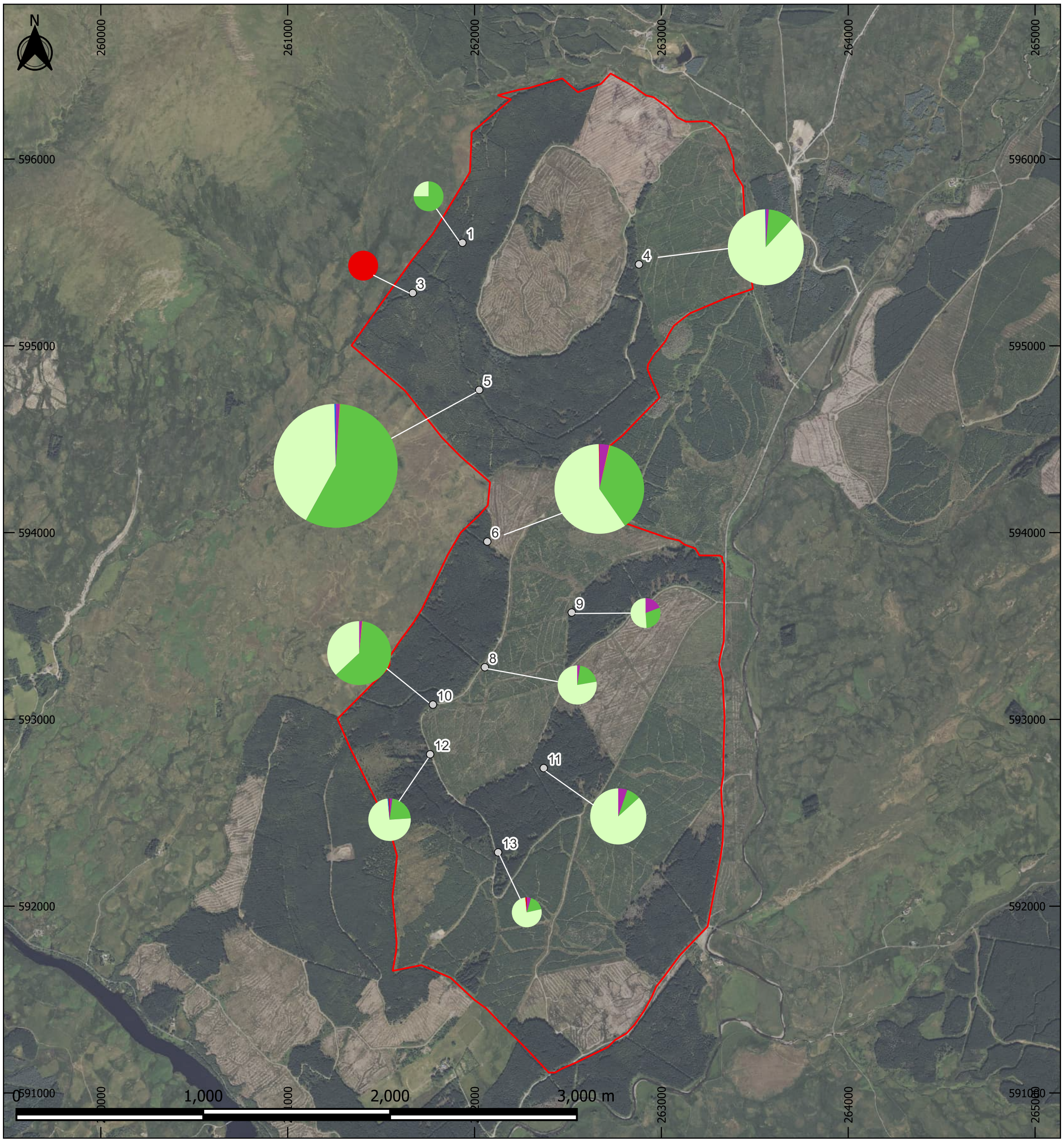
Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 14363



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JOB REF: P24-144

PROJECT TITLE

SHEPHERDS RIG WIND FARM

DRAWING TITLE

Figure 5b: Bat activity results - Summer

DATE: 26/03/2026 | CHECKED: HG | SCALE: 1:20,000

DRAWN: BH | APPROVED: IH | VERSION:1.0

Legend

- Site boundary
- Static Point
- Myotis sp.
- Leisler's
- Noctule
- Common pipistrelle
- Soprano pipistrelle
- Nathusius' pipistrelle
- Brown long-eared
- All other species

Total Passes

63.7
60
40
20

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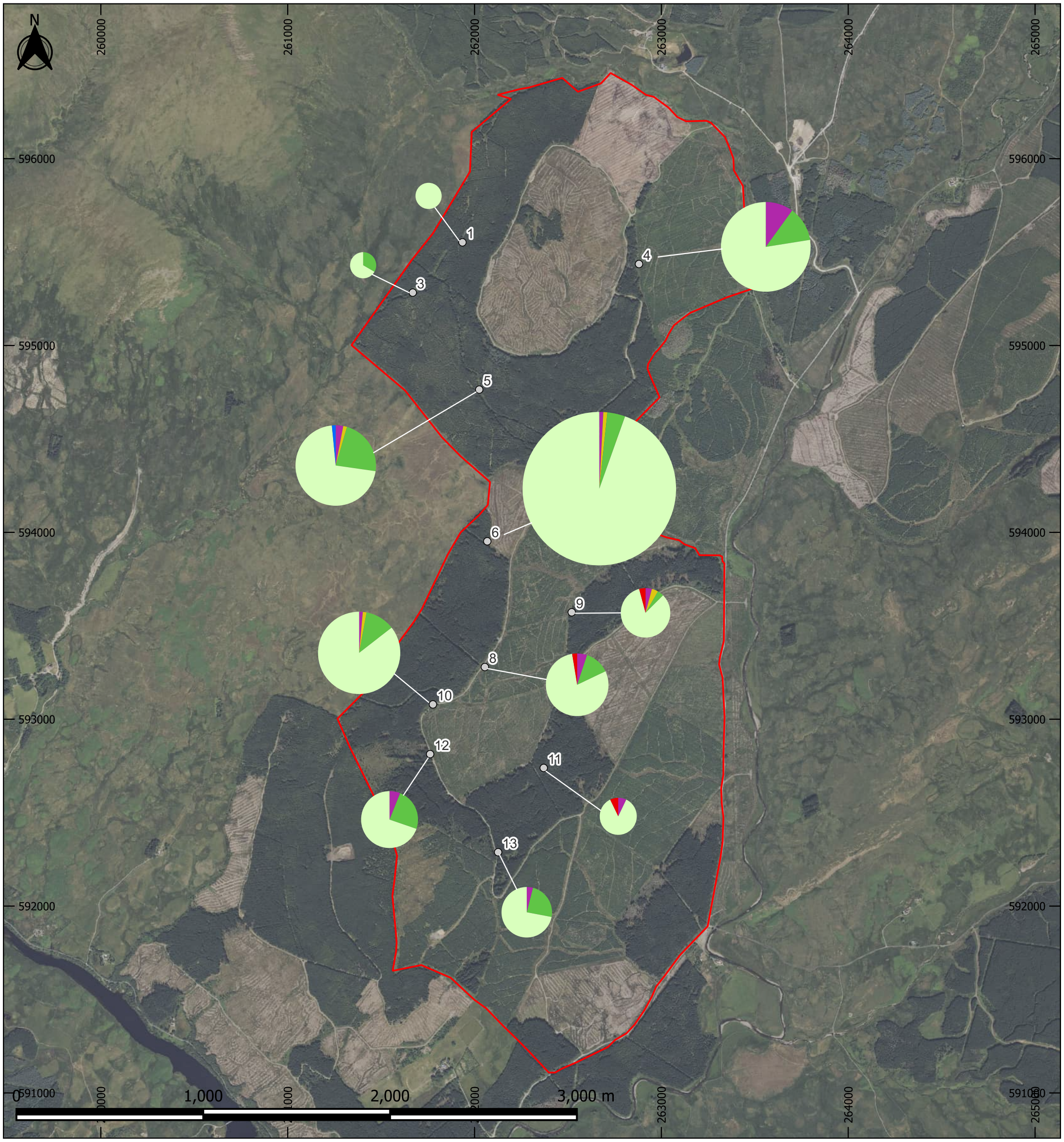
Sources: BSG Ecology survey data

Graphics Ref. No.: 14364



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JOB REF: P24-144

PROJECT TITLE

SHEPHERDS RIG WIND FARM

DRAWING TITLE

Figure 5c: Bat activity results - Autumn

DATE: 26/03/2026 CHECKED: HG SCALE: 1:20,000

DRAWN: BH APPROVED: IH VERSION:1.0

Legend

- Site boundary
- Static Point
- Myotis sp.
- Leisler's
- Noctule
- Common pipistrelle
- Soprano pipistrelle
- Nathusius' pipistrelle
- Brown long-eared
- All other species

Total Passes

8.2
8
6
4
2

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Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 14365

Appendix 1: Bat call identification

Recorded bat calls (full spectrum .wav files) were run through Wildlife Acoustics Kaleidoscope Pro auto-identification software, and then the zero-crossings output files were analysed / verified using the Analook software to confirm the identity of the bats present. Where a zero-crossings file was empty, the original full-spectrum (wav) file was checked, to confirm whether or not a bat pass had been recorded. Where possible, the bat was identified to species level. Species of the genera *Myotis* and *Plecotus* were analysed to genus level as overlapping call parameters make species identification problematic (Hundt, 2012).

For pipistrelle species the following criteria, based on measurements of peak frequency, were used to classify calls:

- Common pipistrelle ≥42 and <49 kHz
- Soprano pipistrelle ≥51 kHz
- Nathusius' pipistrelle <39 kHz
- Common pipistrelle / Soprano pipistrelle ≥49 and <51 kHz
- Common pipistrelle / Nathusius' pipistrelle ≥39 and <42 kHz

Bat calls which could not be ascribed to any of these categories were not used in the analysis.

Calculation of relative activity

The detectors were configured to record above the level of ambient noise, such as from wind or rain, and set to define a bat pass (P) as a call note of >2 milliseconds (ms) separated from another by more than one second.

AnalookW (Version 4.2, 2017) software was used to verify bat calls. The software enables analysis of the relative activity (referred to as 'activity' in the text below) of different species of bats by counting the number of bat passes (P) recorded within a unit of time – hour (h) was used. More than one pass of the same species was counted within a sound file if multiple bats were recorded calling simultaneously. During analysis of sound files, it was possible to estimate the minimum number of bats recorded on individual sound files but not whether consecutive sound files had recorded, for example, a number of individual bats passing as they commute to a feeding habitat or one bat calling repeatedly as it flies up and down the edge of forestry cannot be distinguished. Although relative abundance cannot therefore be estimated from this analysis, the number of bat passes does provide an indication of the importance of features/habitats to bats by assigning a level of bat activity that is associated with that feature, regardless of the type of activity.

Analysis by sunset-sunrise times

As part of the analysis of nocturnal patterns of behaviour for bats the data were split into discrete time periods relating to their proximity to sunset or sunrise. The time categories (time codes: TC) were as follows:

- TC 0 = before sunset
- TC 1 = 0-20 min after sunset
- TC 2 = 20-40 min after sunset
- TC 3 = 40-60 min after sunset
- TC 4 = 60-80 min after sunset
- TC 5 = 80-100 min after sunset
- TC 6 = 100-120 min after sunset
- TC 7 = Middle of night (varies across seasons)
- TC 8 = 120-100 min before sunrise
- TC 9 = 100-80 min before sunrise

- TC 10 = 80-60 min before sunrise
- TC 11 = 60-40 min before sunrise
- TC 12 = 40-20 min before sunrise
- TC 13 = 20-0 min before sunrise

For each of these categories P/h was calculated to allow a comparison between the activity level recorded in different time periods, and a correction factor was applied to TC7 data to allow for variation in night length throughout the survey season.

Ecobat Report
2026-03-19

Geo filter: all, Time filter: all

Summary

Bats were detected on **30** nights between **20/05/2025** and **25/09/2025**, using **11** static bat detectors. Throughout this period, **7** species were recorded. **Table 1.** Detectors were placed at the following locations:

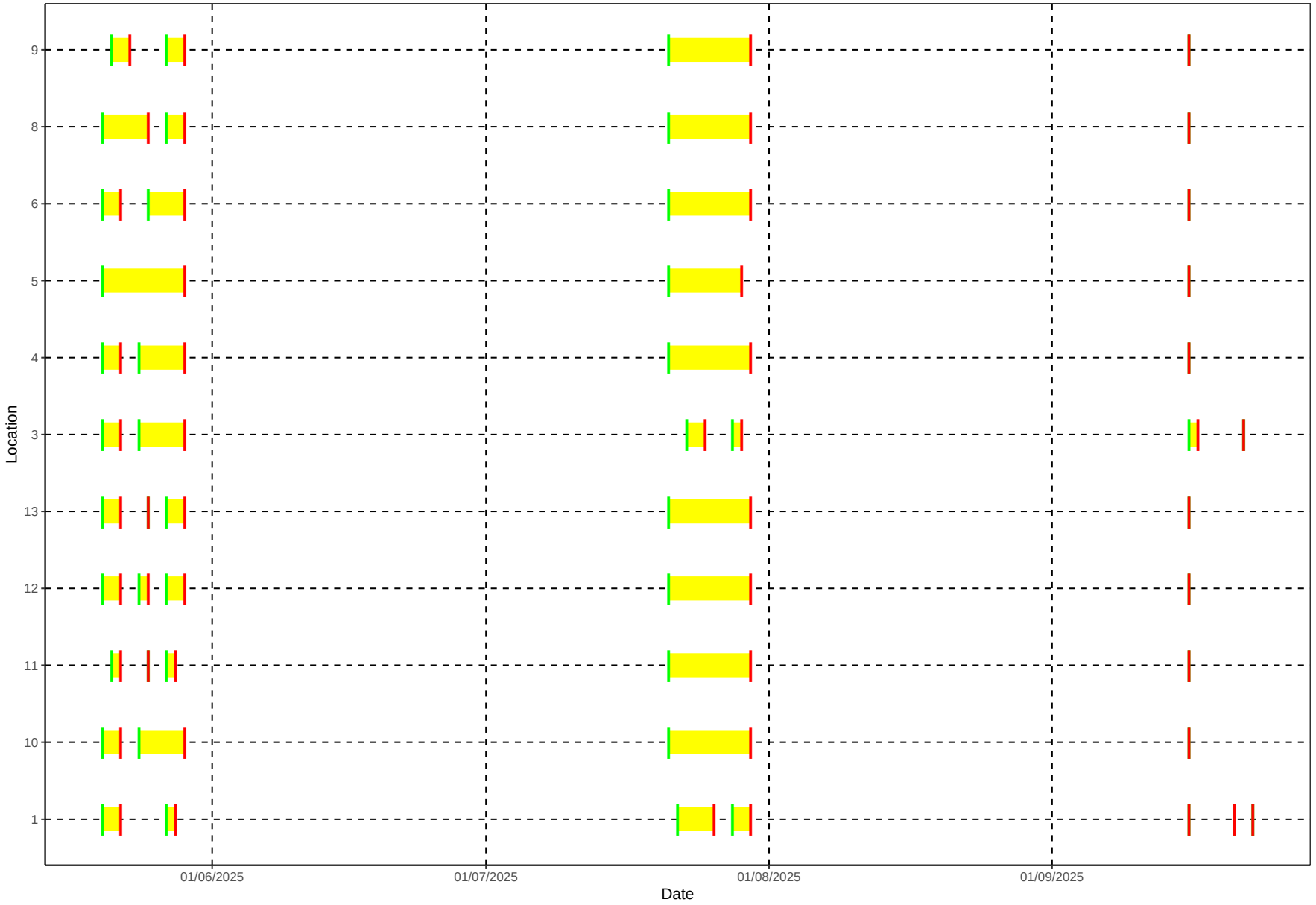
Detector ID	Latitude	Longitude
10	55.213	-4.174
5	55.228	-4.171
13	55.205	-4.168
6	55.211	-4.171
8	55.214	-4.171
3	55.232	-4.177
4	55.234	-4.158
12	55.211	-4.174
1	55.235	-4.173
11	55.211	-4.164
9	55.217	-4.163
9	54.217	-5.163

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
1	17
3	18
4	29
5	29
6	28
8	29
9	26
10	29
11	25
12	28
13	27

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


Location
9
8
6
5
4
3
13
12
11
10
1
01/06/2025
01/07/2025
01/08/2025
01/09/2025
Date

Part 1: Percentile Analysis

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

Per Detector

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

Detector ID	Species/Species Group	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
1	Myotis	0	0	0	1	0	1
1	Pipistrellus pipistrellus	0	0	0	0	0	16
1	Pipistrellus pygmaeus	0	0	0	0	2	7
10	Myotis	0	0	0	0	2	19
10	Nyctalus leisleri	0	0	0	0	0	1
10	Nyctalus noctula	0	0	0	0	0	7
10	Pipistrellus pipistrellus	0	0	0	0	2	25
10	Pipistrellus pygmaeus	0	0	0	0	9	20
10	Plecotus auritus	0	0	0	0	0	3
11	Myotis	0	0	0	1	0	13
11	Nyctalus noctula	0	0	0	0	0	4
11	Pipistrellus pipistrellus	0	0	0	0	0	13
11	Pipistrellus pygmaeus	0	0	0	2	4	18
12	Myotis	0	0	0	1	5	18
12	Nyctalus leisleri	0	0	0	0	0	3
12	Nyctalus noctula	0	0	0	0	0	7
12	Pipistrellus pipistrellus	0	0	0	0	0	27
12	Pipistrellus pygmaeus	0	0	0	0	6	22
12	Plecotus auritus	0	0	0	0	0	3
13	Myotis	0	0	0	0	0	18
13	Nyctalus leisleri	0	0	0	0	0	1
13	Nyctalus noctula	0	0	0	0	0	4

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
13	Pipistrellus pipistrellus	0	0	0	0	0	26
13	Pipistrellus pygmaeus	0	0	0	0	0	26
13	Plecotus auritus	0	0	0	0	0	3
3	Myotis	0	0	0	0	0	9
3	Nyctalus noctula	0	0	0	0	0	2
3	Pipistrellus pipistrellus	0	0	0	0	0	13
3	Pipistrellus pygmaeus	0	0	0	0	2	9
3	Plecotus auritus	0	0	0	0	0	1
4	Myotis	0	0	0	0	0	23
4	Nyctalus noctula	0	0	0	0	0	2
4	Pipistrellus pipistrellus	0	0	0	0	0	28
4	Pipistrellus pygmaeus	0	0	0	9	7	10
4	Plecotus auritus	0	0	0	0	0	2
5	Myotis	0	0	0	0	4	22
5	Nyctalus leisleri	0	0	0	0	0	3
5	Nyctalus noctula	0	0	0	0	0	13
5	Pipistrellus nathusii	0	0	0	0	0	1
5	Pipistrellus pipistrellus	0	0	0	6	7	15
5	Pipistrellus pygmaeus	0	0	5	6	6	11
5	Plecotus auritus	0	0	0	1	0	3
6	Myotis	0	0	0	1	1	15
6	Nyctalus leisleri	0	0	0	0	0	4
6	Nyctalus noctula	0	0	0	0	0	8
6	Pipistrellus pipistrellus	0	0	0	2	0	23

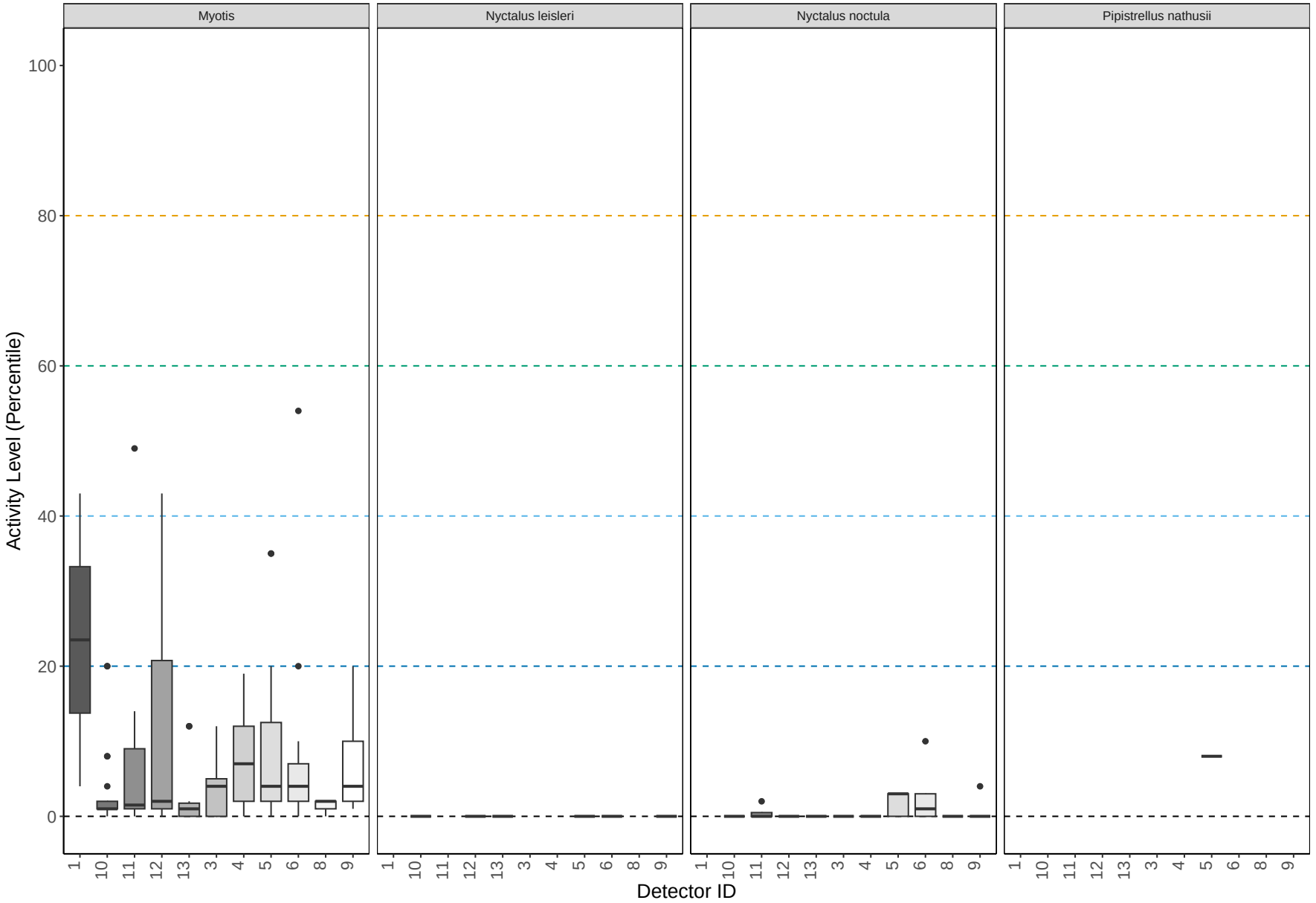
Detector ID	Species/Species Group	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
6	Pipistrellus pygmaeus	0	0	5	6	8	9
6	Plecotus auritus	0	0	0	0	0	6
8	Myotis	0	0	0	0	0	18
8	Nyctalus noctula	0	0	0	0	0	4
8	Pipistrellus pipistrellus	0	0	0	0	0	20
8	Pipistrellus pygmaeus	0	0	0	0	8	21
8	Plecotus auritus	0	0	0	0	0	4
9	Myotis	0	0	0	0	2	14
9	Nyctalus leisleri	0	0	0	0	0	2
9	Nyctalus noctula	0	0	0	0	0	6
9	Pipistrellus pipistrellus	0	0	0	0	0	19
9	Pipistrellus pygmaeus	0	0	0	0	0	24
9	Plecotus auritus	0	0	0	0	0	2

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
1	Myotis	24	23.5 - 23.5	43	2	85206
1	Pipistrellus pipistrellus	0	0 - 0	0	16	1548085
1	Pipistrellus pygmaeus	0	37 - 37	37	9	431578
10	Myotis	1	1.5 - 5	20	21	85206
10	Nyctalus leisleri	0	0	0	1	58983
10	Nyctalus noctula	0	0 - 0	0	7	67993
10	Pipistrellus pipistrellus	1	3.5 - 15	27	27	1548085
10	Pipistrellus pygmaeus	12	11.5 - 18.5	33	29	431578
10	Plecotus auritus	1	1 - 1	1	3	23164
11	Myotis	2	1.5 - 25	49	14	85206
11	Nyctalus noctula	0	0 - 0	2	4	67993
11	Pipistrellus pipistrellus	0	2.5 - 2.5	4	13	1548085
11	Pipistrellus pygmaeus	3	7 - 26.5	49	24	431578
12	Myotis	2	2.5 - 19.5	43	24	85206
12	Nyctalus leisleri	0	0 - 0	0	3	58983
12	Nyctalus noctula	0	0 - 0	0	7	67993
12	Pipistrellus pipistrellus	0	1.5 - 2	2	27	1548085
12	Pipistrellus pygmaeus	11	8 - 17	33	28	431578
12	Plecotus auritus	8	8 - 8	8	3	23164
13	Myotis	1	1 - 6.5	12	18	85206
13	Nyctalus leisleri	0	0	0	1	58983
13	Nyctalus noctula	0	0 - 0	0	4	67993
13	Pipistrellus pipistrellus	0	1 - 2	2	26	1548085
13	Pipistrellus pygmaeus	5	4.5 - 9	19	26	431578
13	Plecotus auritus	1	1 - 1	1	3	23164
3	Myotis	4	3 - 8.5	12	9	85206
3	Nyctalus noctula	0	0 - 0	0	2	67993
3	Pipistrellus pipistrellus	0	2 - 2.5	3	13	1548085
3	Pipistrellus pygmaeus	2	7 - 21.5	27	11	431578
3	Plecotus auritus	1	0	1	1	23164
4	Myotis	7	5 - 11	19	23	85206
4	Nyctalus noctula	0	0 - 0	0	2	67993
4	Pipistrellus pipistrellus	1	1.5 - 2.5	3	28	1548085

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
4	Pipistrellus pygmaeus	26	20 - 37.5	59	26	431578
4	Plecotus auritus	5	4.5 - 4.5	8	2	23164
5	Myotis	4	3 - 11	35	26	85206
5	Nyctalus leisleri	0	0 - 0	0	3	58983
5	Nyctalus noctula	3	3 - 3	3	13	67993
5	Pipistrellus nathusii	8	0	8	1	3146
5	Pipistrellus pipistrellus	15	17 - 34	54	28	1548085
5	Pipistrellus pygmaeus	27	19.5 - 41	69	28	431578
5	Plecotus auritus	4	4 - 4	46	4	23164
6	Myotis	4	2.5 - 10.5	54	17	85206
6	Nyctalus leisleri	0	0 - 0	0	4	58983
6	Nyctalus noctula	1	2.5 - 6.5	10	8	67993
6	Pipistrellus pipistrellus	1	1.5 - 22	43	25	1548085
6	Pipistrellus pygmaeus	33	24 - 42.5	69	28	431578
6	Plecotus auritus	1	1 - 2.5	4	6	23164
8	Myotis	2	1.5 - 2	2	18	85206
8	Nyctalus noctula	0	0 - 0	0	4	67993
8	Pipistrellus pipistrellus	0	1 - 1.5	2	20	1548085
8	Pipistrellus pygmaeus	9	8 - 15.5	26	29	431578
8	Plecotus auritus	1	1 - 1	1	4	23164
9	Myotis	4	2.5 - 11	20	16	85206
9	Nyctalus leisleri	0	0 - 0	0	2	58983
9	Nyctalus noctula	0	0 - 0	4	6	67993
9	Pipistrellus pipistrellus	0	0 - 0	1	19	1548085
9	Pipistrellus pygmaeus	5	4 - 6	8	24	431578
9	Plecotus auritus	1	1 - 1	1	2	23164

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


Myotis
Nyctalus leisleri
Nyctalus noctula
Pipistrellus nathusii
Activity Level (Percentile)
100
80
60
40
20
0
1
10
11
12
13
3
4
5
6
8
9
Detector ID

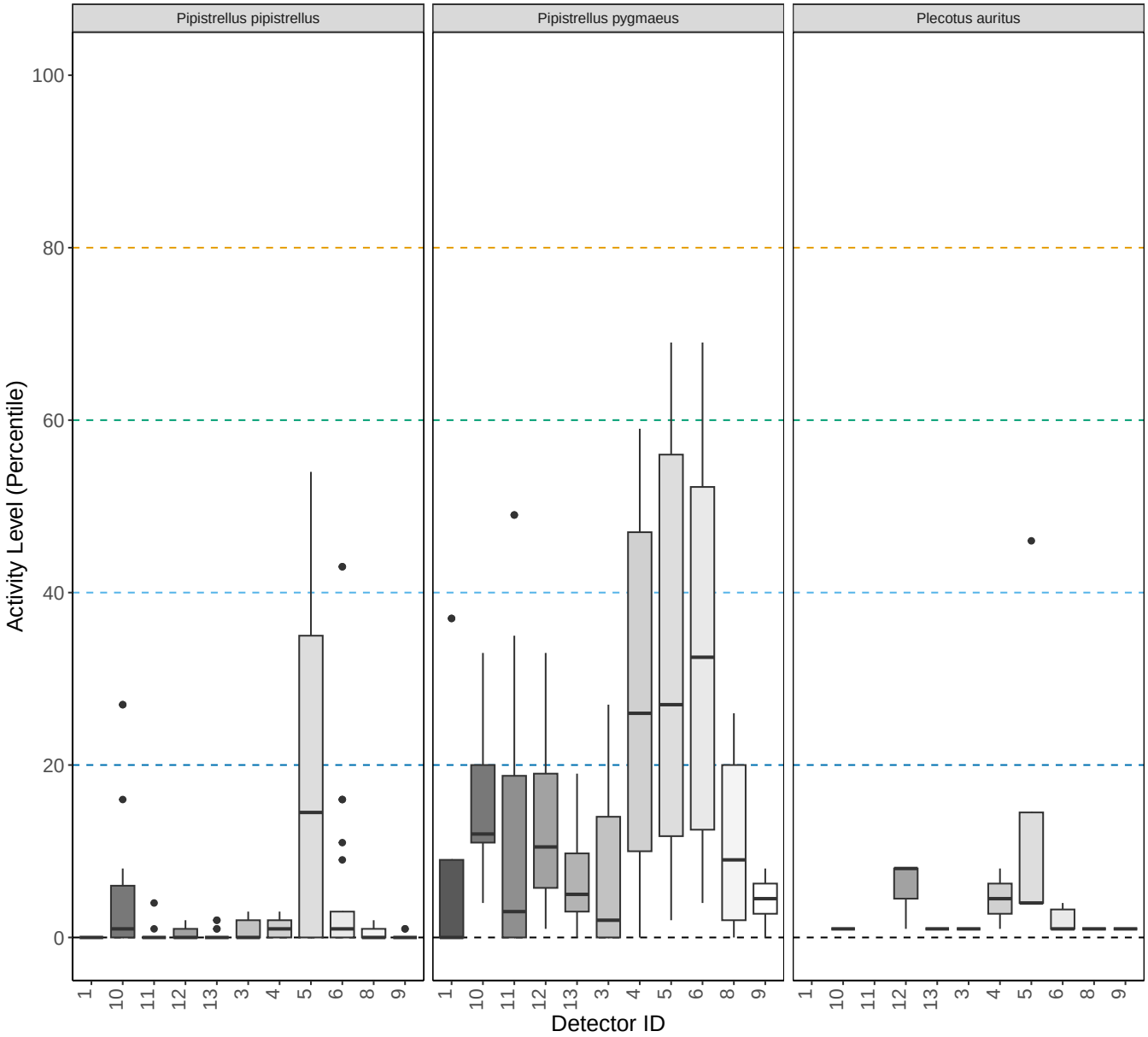
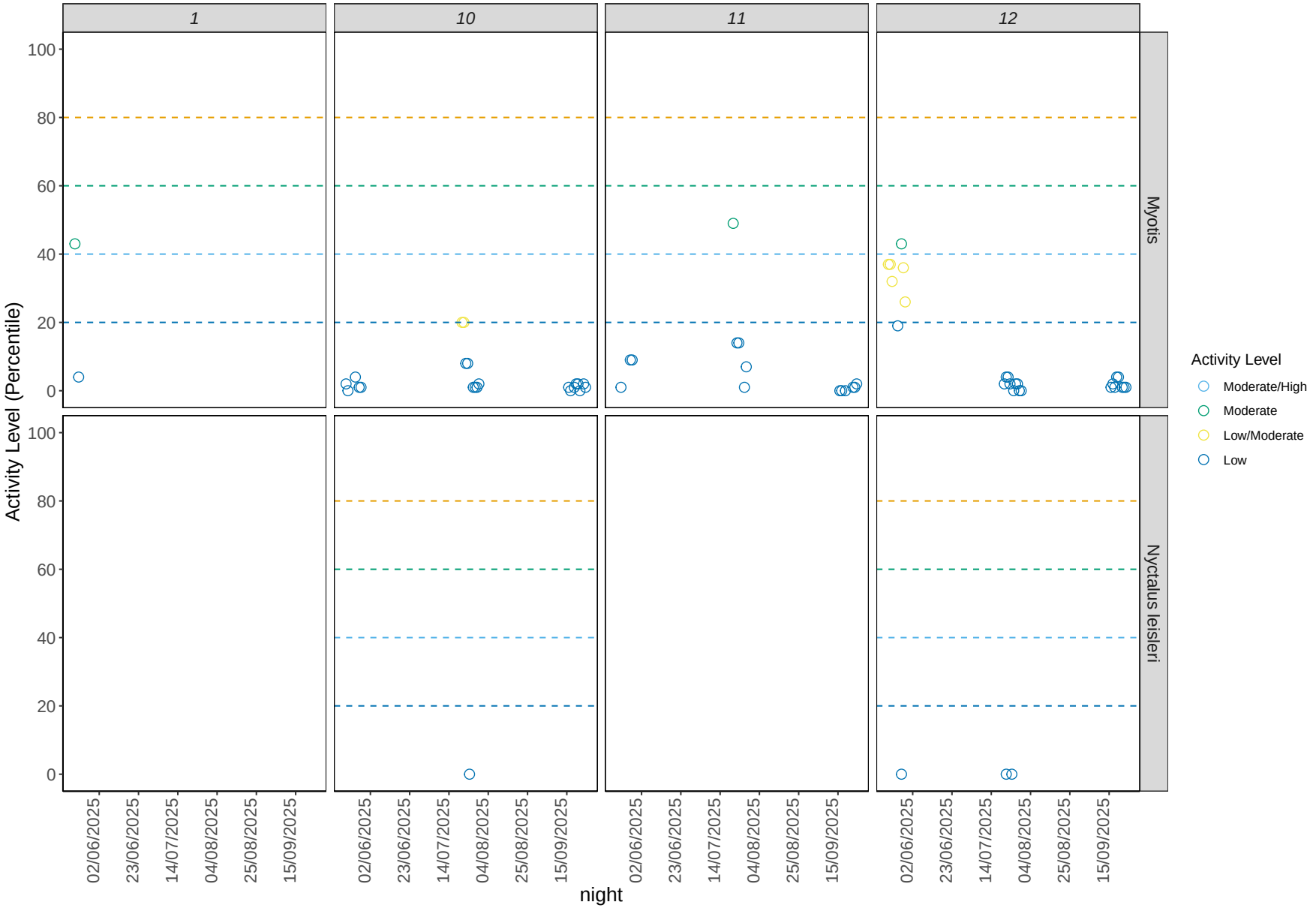
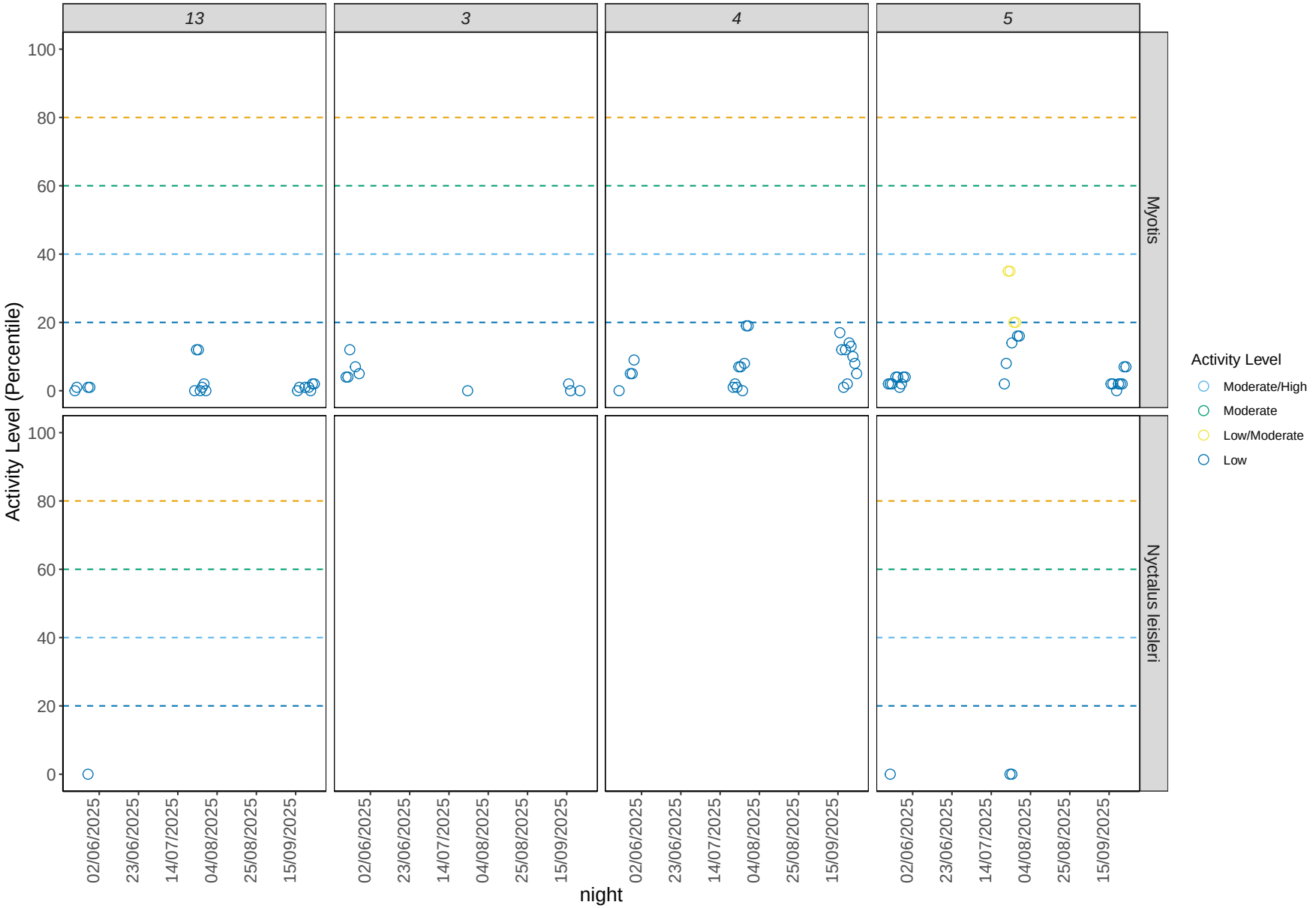
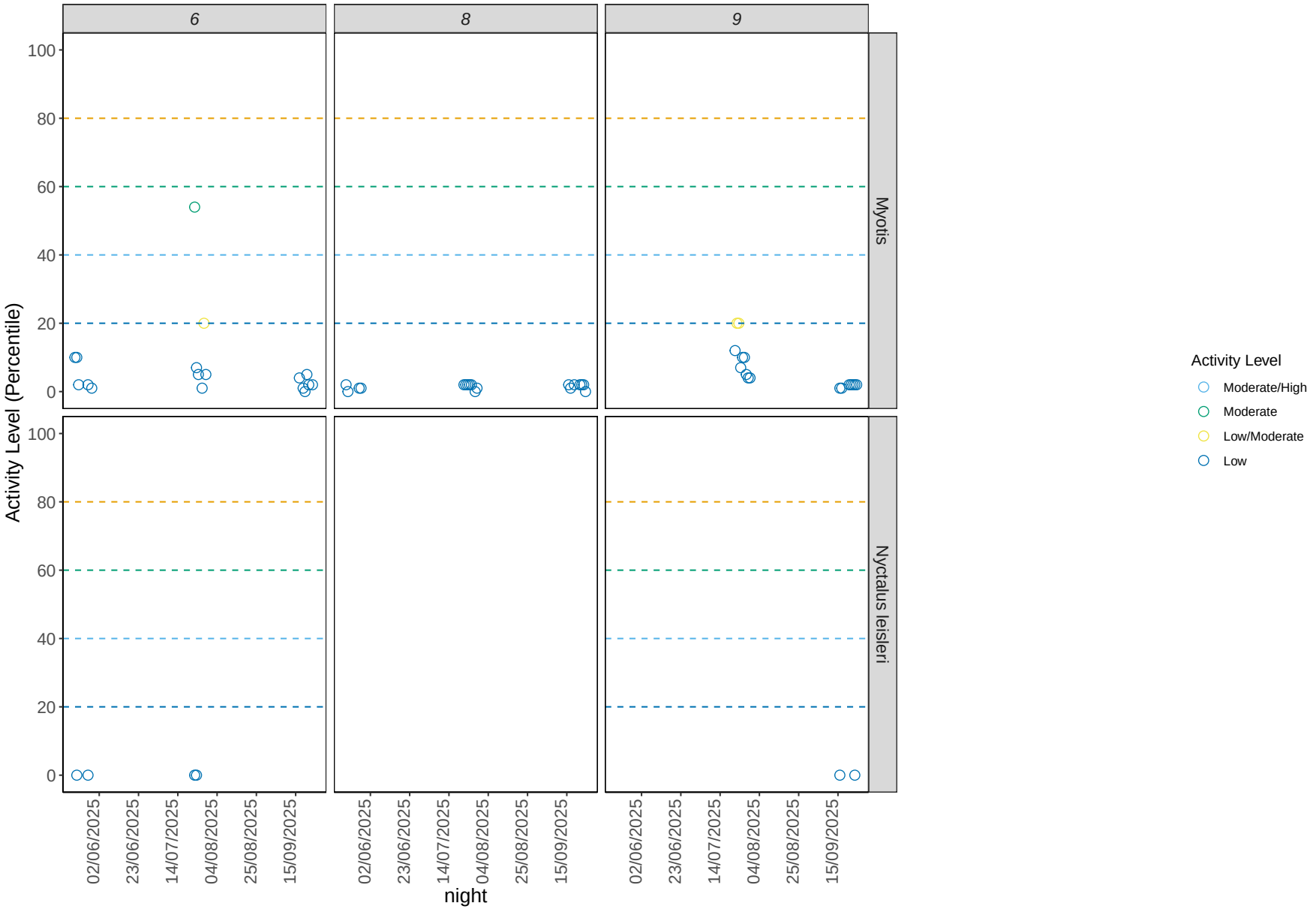
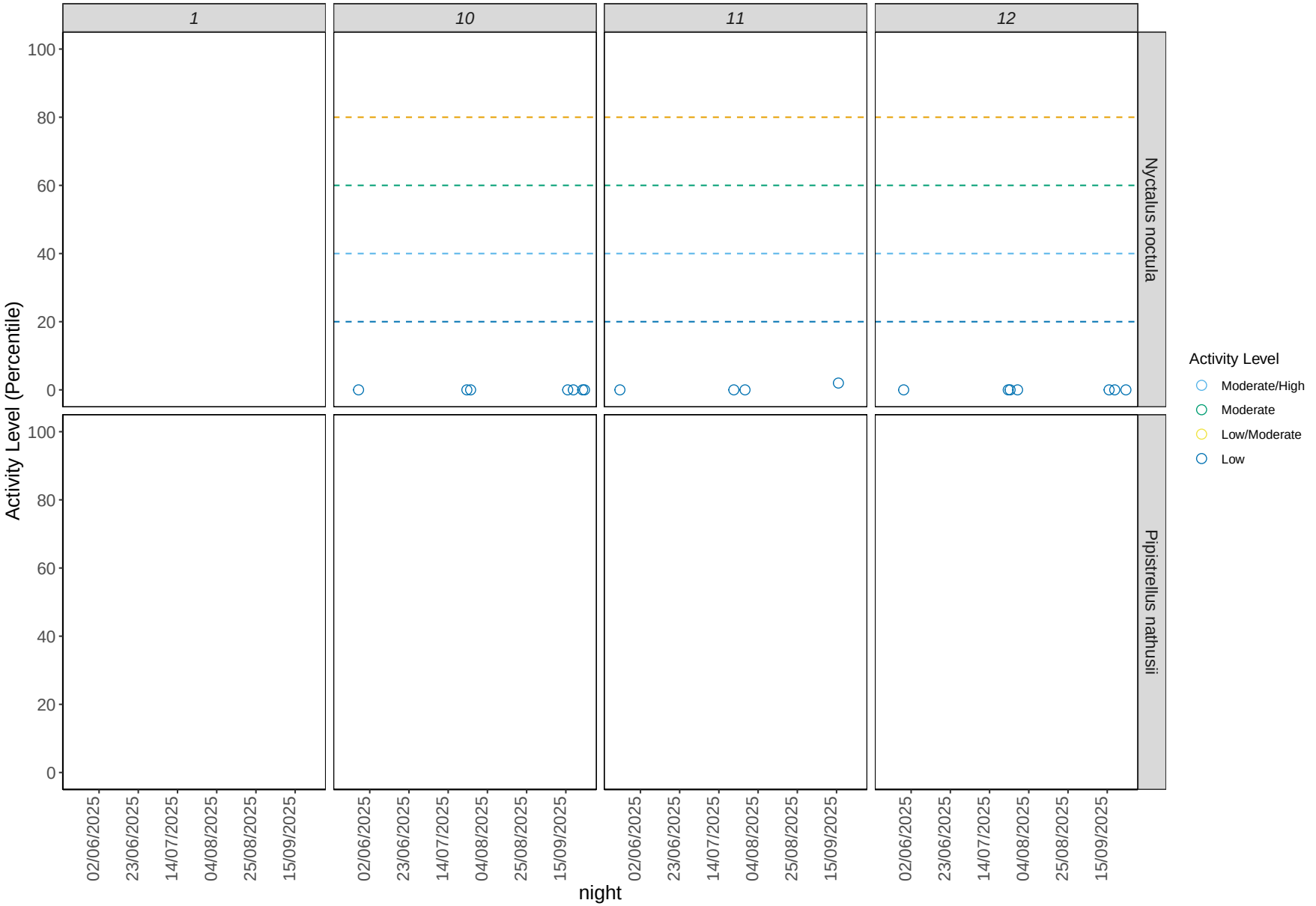

Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Activity Level (Percentile)
100
80
60
40
20
0
1
10
11
12
13
3
4
5
6
8
9
Detector ID

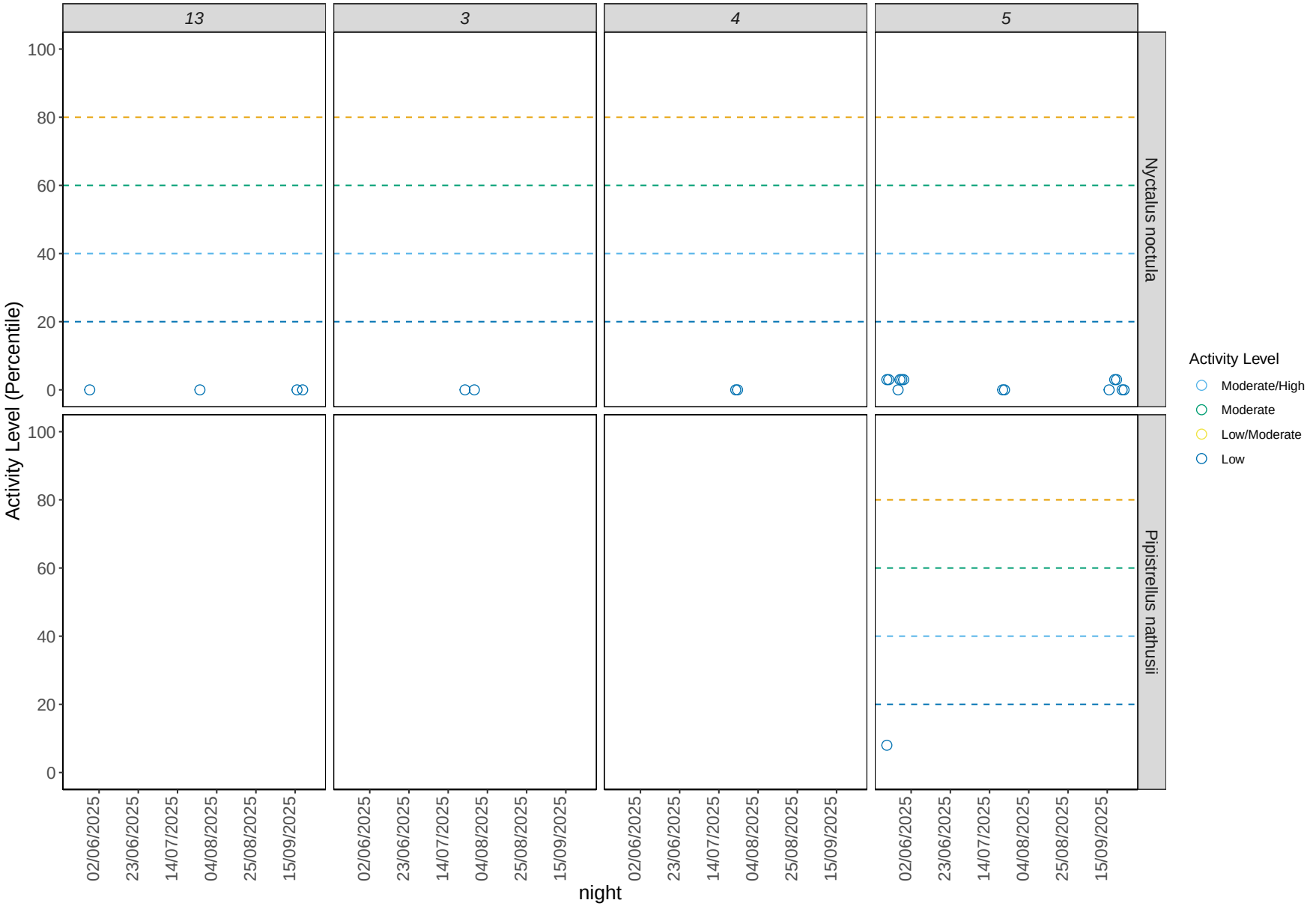
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.

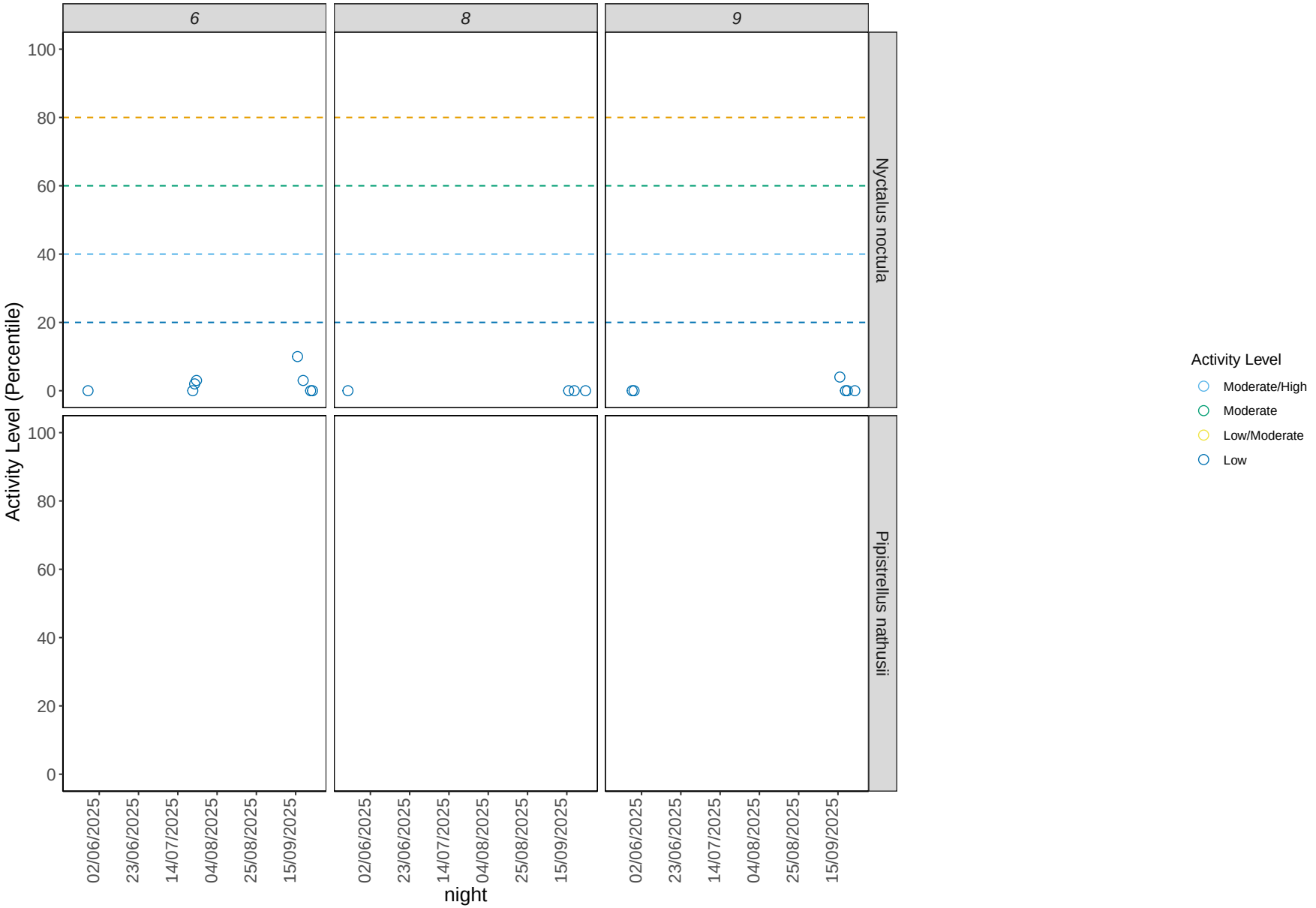

1
10
11
12
Myotis
Nyctalus leisleri
Activity Level (Percentile)
100
80
60
40
20
0
02/06/2025
23/06/2025
14/07/2025
04/08/2025
25/08/2025
15/09/2025
night
Activity Level
Moderate/High
Moderate
Low/Moderate
Low

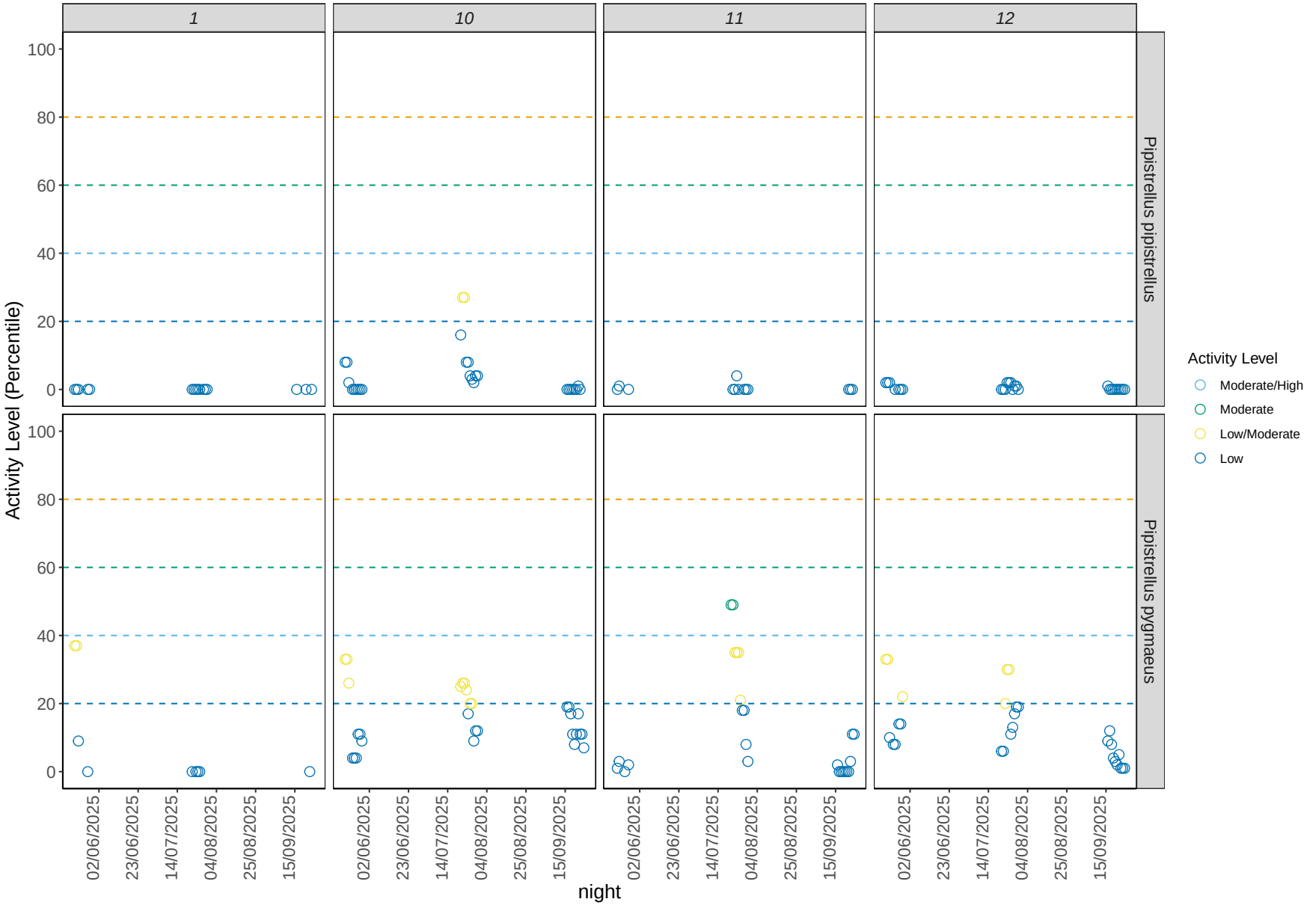

13
3
4
5
Myotis
Nyctalus leisleri
Activity Level (Percentile)
100
80
60
40
20
0
02/06/2025
23/06/2025
14/07/2025
04/08/2025
25/08/2025
15/09/2025
night
Activity Level
Moderate/High
Moderate
Low/Moderate
Low

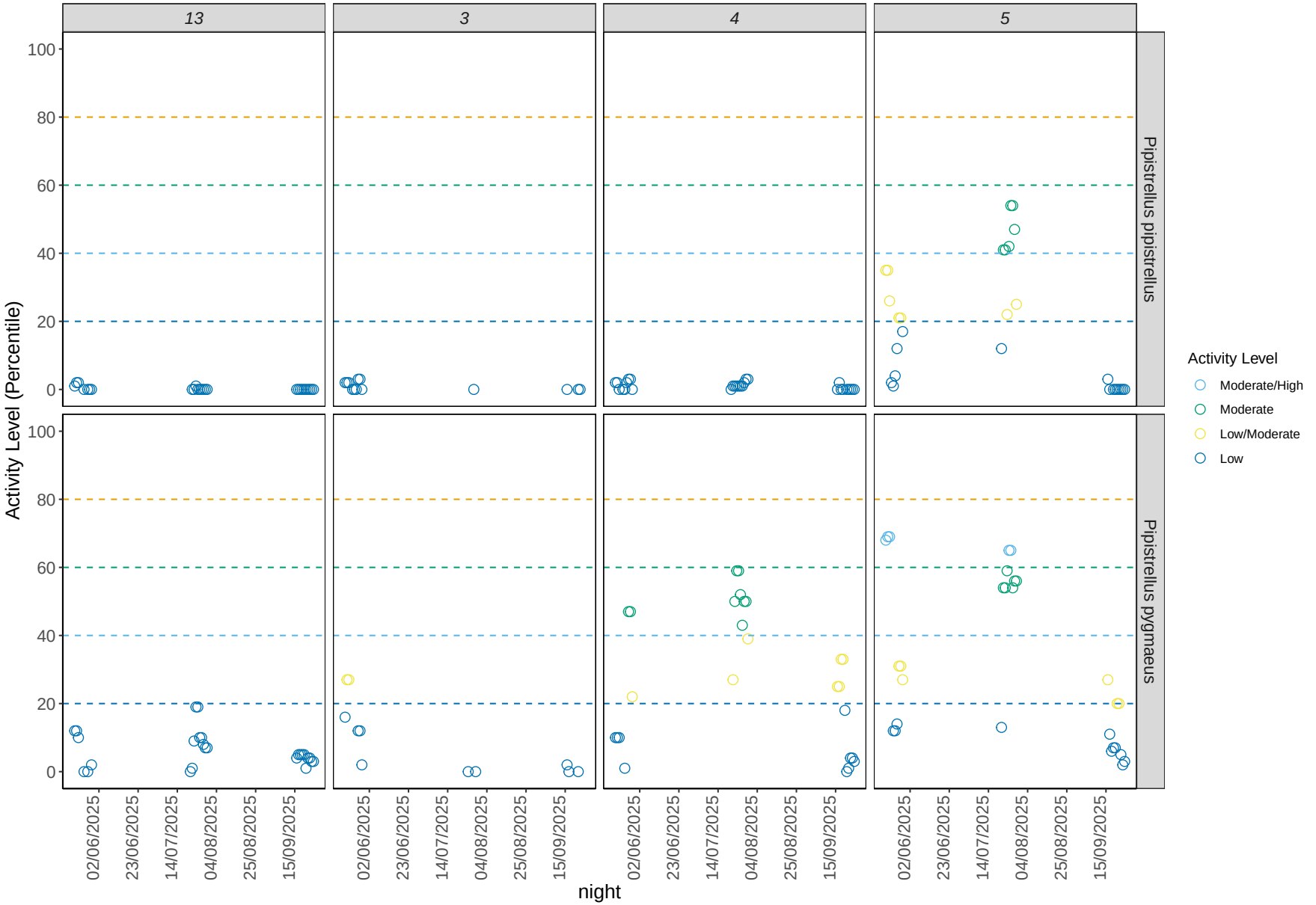

6
8
9
Myotis
Nyctalus leisleri
Activity Level (Percentile)
100
80
60
40
20
0
02/06/2025
23/06/2025
14/07/2025
04/08/2025
25/08/2025
15/09/2025
night
Activity Level
Moderate/High
Moderate
Low/Moderate
Low


1
10
11
12
Nyctalus noctula
Pipistrellus nathusii
Activity Level (Percentile)
100
80
60
40
20
0
02/06/2025
23/06/2025
14/07/2025
04/08/2025
25/08/2025
15/09/2025
night
Activity Level
Moderate/High
Moderate
Low/Moderate
Low


13
3
4
5
Nyctalus noctula
Pipistrellus nathusii
Activity Level (Percentile)
100
80
60
40
20
0
02/06/2025
23/06/2025
14/07/2025
04/08/2025
25/08/2025
15/09/2025
night
Activity Level
Moderate/High
Moderate
Low/Moderate
Low


6
8
9
Nyctalus noctula
Pipistrellus nathusii
Activity Level (Percentile)
100
80
60
40
20
0
02/06/2025
23/06/2025
14/07/2025
04/08/2025
25/08/2025
15/09/2025
night
Activity Level
Moderate/High
Moderate
Low/Moderate
Low


1
10
11
12
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Activity Level (Percentile)
100
80
60
40
20
0
02/06/2025
23/06/2025
14/07/2025
04/08/2025
25/08/2025
15/09/2025
night
Activity Level
Moderate/High
Moderate
Low/Moderate
Low


13
3
4
5
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Activity Level (Percentile)
100
80
60
40
20
0
02/06/2025
23/06/2025
14/07/2025
04/08/2025
25/08/2025
15/09/2025
night
Activity Level
Moderate/High
Moderate
Low/Moderate
Low

Per Detector, Per Month

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

Detector ID	Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
1	Myotis	May	0	0	0	1	0	1
1	Pipistrellus pipistrellus	May	0	0	0	0	0	5
1	Pipistrellus pipistrellus	Jul	0	0	0	0	0	8
1	Pipistrellus pipistrellus	Sep	0	0	0	0	0	3
1	Pipistrellus pygmaeus	May	0	0	0	0	2	2
1	Pipistrellus pygmaeus	Jul	0	0	0	0	0	4
1	Pipistrellus pygmaeus	Sep	0	0	0	0	0	1
10	Myotis	May	0	0	0	0	0	5
10	Myotis	Jul	0	0	0	0	2	6
10	Myotis	Sep	0	0	0	0	0	8
10	Nyctalus leisleri	Jul	0	0	0	0	0	1
10	Nyctalus noctula	May	0	0	0	0	0	1
10	Nyctalus noctula	Jul	0	0	0	0	0	2
10	Nyctalus noctula	Sep	0	0	0	0	0	4
10	Pipistrellus pipistrellus	May	0	0	0	0	0	9
10	Pipistrellus pipistrellus	Jul	0	0	0	0	2	8
10	Pipistrellus pipistrellus	Sep	0	0	0	0	0	8
10	Pipistrellus pygmaeus	May	0	0	0	0	3	6
10	Pipistrellus pygmaeus	Jul	0	0	0	0	6	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
10	Pipistrellus pygmaeus	Sep	0	0	0	0	0	10
10	Plecotus auritus	Jul	0	0	0	0	0	1
10	Plecotus auritus	Sep	0	0	0	0	0	2
11	Myotis	May	0	0	0	0	0	3
11	Myotis	Jul	0	0	0	1	0	4
11	Myotis	Sep	0	0	0	0	0	6
11	Nyctalus noctula	May	0	0	0	0	0	1
11	Nyctalus noctula	Jul	0	0	0	0	0	2
11	Nyctalus noctula	Sep	0	0	0	0	0	1
11	Pipistrellus pipistrellus	May	0	0	0	0	0	3
11	Pipistrellus pipistrellus	Jul	0	0	0	0	0	7
11	Pipistrellus pipistrellus	Sep	0	0	0	0	0	3
11	Pipistrellus pygmaeus	May	0	0	0	0	0	4
11	Pipistrellus pygmaeus	Jul	0	0	0	2	4	4
11	Pipistrellus pygmaeus	Sep	0	0	0	0	0	10
12	Myotis	May	0	0	0	1	5	1
12	Myotis	Jul	0	0	0	0	0	9
12	Myotis	Sep	0	0	0	0	0	8
12	Nyctalus leisleri	May	0	0	0	0	0	1
12	Nyctalus leisleri	Jul	0	0	0	0	0	2
12	Nyctalus noctula	May	0	0	0	0	0	1
12	Nyctalus noctula	Jul	0	0	0	0	0	3
12	Nyctalus noctula	Sep	0	0	0	0	0	3
12	Pipistrellus pipistrellus	May	0	0	0	0	0	7
12	Pipistrellus pipistrellus	Jul	0	0	0	0	0	10

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
12	Pipistrellus pipistrellus	Sep	0	0	0	0	0	10
12	Pipistrellus pygmaeus	May	0	0	0	0	3	5
12	Pipistrellus pygmaeus	Jul	0	0	0	0	3	7
12	Pipistrellus pygmaeus	Sep	0	0	0	0	0	10
12	Plecotus auritus	Jul	0	0	0	0	0	3
13	Myotis	May	0	0	0	0	0	4
13	Myotis	Jul	0	0	0	0	0	7
13	Myotis	Sep	0	0	0	0	0	7
13	Nyctalus leisleri	May	0	0	0	0	0	1
13	Nyctalus noctula	May	0	0	0	0	0	1
13	Nyctalus noctula	Jul	0	0	0	0	0	1
13	Nyctalus noctula	Sep	0	0	0	0	0	2
13	Pipistrellus pipistrellus	May	0	0	0	0	0	7
13	Pipistrellus pipistrellus	Jul	0	0	0	0	0	9
13	Pipistrellus pipistrellus	Sep	0	0	0	0	0	10
13	Pipistrellus pygmaeus	May	0	0	0	0	0	6
13	Pipistrellus pygmaeus	Jul	0	0	0	0	0	10
13	Pipistrellus pygmaeus	Sep	0	0	0	0	0	10
13	Plecotus auritus	Jul	0	0	0	0	0	2
13	Plecotus auritus	Sep	0	0	0	0	0	1
3	Myotis	May	0	0	0	0	0	5
3	Myotis	Jul	0	0	0	0	0	1
3	Myotis	Sep	0	0	0	0	0	3
3	Nyctalus noctula	Jul	0	0	0	0	0	2

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
3	Pipistrellus pipistrellus	May	0	0	0	0	0	9
3	Pipistrellus pipistrellus	Jul	0	0	0	0	0	1
3	Pipistrellus pipistrellus	Sep	0	0	0	0	0	3
3	Pipistrellus pygmaeus	May	0	0	0	0	2	4
3	Pipistrellus pygmaeus	Jul	0	0	0	0	0	2
3	Pipistrellus pygmaeus	Sep	0	0	0	0	0	3
3	Plecotus auritus	Jul	0	0	0	0	0	1
4	Myotis	May	0	0	0	0	0	4
4	Myotis	Jul	0	0	0	0	0	9
4	Myotis	Sep	0	0	0	0	0	10
4	Nyctalus noctula	Jul	0	0	0	0	0	2
4	Pipistrellus pipistrellus	May	0	0	0	0	0	9
4	Pipistrellus pipistrellus	Jul	0	0	0	0	0	10
4	Pipistrellus pipistrellus	Sep	0	0	0	0	0	9
4	Pipistrellus pygmaeus	May	0	0	0	2	1	4
4	Pipistrellus pygmaeus	Jul	0	0	0	7	2	0
4	Pipistrellus pygmaeus	Sep	0	0	0	0	4	6
4	Plecotus auritus	Jul	0	0	0	0	0	2
5	Myotis	May	0	0	0	0	0	9
5	Myotis	Jul	0	0	0	0	4	5
5	Myotis	Sep	0	0	0	0	0	8
5	Nyctalus leisleri	May	0	0	0	0	0	1

Detector ID	Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
5	Nyctalus leisleri	Jul	0	0	0	0	0	2
5	Nyctalus noctula	May	0	0	0	0	0	6
5	Nyctalus noctula	Jul	0	0	0	0	0	2
5	Nyctalus noctula	Sep	0	0	0	0	0	5
5	Pipistrellus nathusii	May	0	0	0	0	0	1
5	Pipistrellus pipistrellus	May	0	0	0	0	5	5
5	Pipistrellus pipistrellus	Jul	0	0	0	6	2	1
5	Pipistrellus pipistrellus	Sep	0	0	0	0	0	9
5	Pipistrellus pygmaeus	May	0	0	3	0	3	3
5	Pipistrellus pygmaeus	Jul	0	0	2	6	0	1
5	Pipistrellus pygmaeus	Sep	0	0	0	0	3	7
5	Plecotus auritus	May	0	0	0	0	0	1
5	Plecotus auritus	Jul	0	0	0	1	0	2
6	Myotis	May	0	0	0	0	0	5
6	Myotis	Jul	0	0	0	1	1	4
6	Myotis	Sep	0	0	0	0	0	6
6	Nyctalus leisleri	May	0	0	0	0	0	2
6	Nyctalus leisleri	Jul	0	0	0	0	0	2
6	Nyctalus noctula	May	0	0	0	0	0	1
6	Nyctalus noctula	Jul	0	0	0	0	0	3
6	Nyctalus noctula	Sep	0	0	0	0	0	4
6	Pipistrellus pipistrellus	May	0	0	0	0	0	8
6	Pipistrellus pipistrellus	Jul	0	0	0	2	0	8
6	Pipistrellus pipistrellus	Sep	0	0	0	0	0	7

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
6	Pipistrellus pygmaeus	May	0	0	0	0	3	5
6	Pipistrellus pygmaeus	Jul	0	0	2	5	3	0
6	Pipistrellus pygmaeus	Sep	0	0	3	1	2	4
6	Plecotus auritus	Jul	0	0	0	0	0	3
6	Plecotus auritus	Sep	0	0	0	0	0	3
8	Myotis	May	0	0	0	0	0	4
8	Myotis	Jul	0	0	0	0	0	7
8	Myotis	Sep	0	0	0	0	0	7
8	Nyctalus noctula	May	0	0	0	0	0	1
8	Nyctalus noctula	Sep	0	0	0	0	0	3
8	Pipistrellus pipistrellus	May	0	0	0	0	0	6
8	Pipistrellus pipistrellus	Jul	0	0	0	0	0	9
8	Pipistrellus pipistrellus	Sep	0	0	0	0	0	5
8	Pipistrellus pygmaeus	May	0	0	0	0	0	9
8	Pipistrellus pygmaeus	Jul	0	0	0	0	5	5
8	Pipistrellus pygmaeus	Sep	0	0	0	0	3	7
8	Plecotus auritus	Jul	0	0	0	0	0	1
8	Plecotus auritus	Sep	0	0	0	0	0	3
9	Myotis	Jul	0	0	0	0	2	7
9	Myotis	Sep	0	0	0	0	0	7
9	Nyctalus leisleri	Sep	0	0	0	0	0	2
9	Nyctalus noctula	May	0	0	0	0	0	2
9	Nyctalus noctula	Sep	0	0	0	0	0	4
9	Pipistrellus pipistrellus	May	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
9	Pipistrellus pipistrellus	Jul	0	0	0	0	0	9
9	Pipistrellus pipistrellus	Sep	0	0	0	0	0	6
9	Pipistrellus pygmaeus	May	0	0	0	0	0	6
9	Pipistrellus pygmaeus	Jul	0	0	0	0	0	8
9	Pipistrellus pygmaeus	Sep	0	0	0	0	0	10
9	Plecotus auritus	May	0	0	0	0	0	1
9	Plecotus auritus	Sep	0	0	0	0	0	1

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
1	Myotis	May	24	23.5 - 23.5	43	2
1	Pipistrellus pipistrellus	May	0	0 - 0	0	5
1	Pipistrellus pipistrellus	Jul	0	0 - 0	0	8
1	Pipistrellus pipistrellus	Sep	0	0 - 0	0	3
1	Pipistrellus pygmaeus	May	23	37 - 37	37	4
1	Pipistrellus pygmaeus	Jul	0	37 - 37	0	4
1	Pipistrellus pygmaeus	Sep	0	37 - 37	0	1
10	Myotis	May	1	1.5 - 5	4	5
10	Myotis	Jul	5	1.5 - 5	20	8
10	Myotis	Sep	1	1.5 - 5	2	8
10	Nyctalus leisleri	Jul	0	0	0	1
10	Nyctalus noctula	May	0	0 - 0	0	1
10	Nyctalus noctula	Jul	0	0 - 0	0	2
10	Nyctalus noctula	Sep	0	0 - 0	0	4
10	Pipistrellus pipistrellus	May	0	3.5 - 15	8	9
10	Pipistrellus pipistrellus	Jul	6	3.5 - 15	27	10
10	Pipistrellus pipistrellus	Sep	0	3.5 - 15	1	8
10	Pipistrellus pygmaeus	May	11	11.5 - 18.5	33	9
10	Pipistrellus pygmaeus	Jul	20	11.5 - 18.5	26	10
10	Pipistrellus pygmaeus	Sep	11	11.5 - 18.5	19	10
10	Plecotus auritus	Jul	1	1 - 1	1	1
10	Plecotus auritus	Sep	1	1 - 1	1	2
11	Myotis	May	9	1.5 - 25	9	3
11	Myotis	Jul	14	1.5 - 25	49	5
11	Myotis	Sep	1	1.5 - 25	2	6
11	Nyctalus noctula	May	0	0 - 0	0	1
11	Nyctalus noctula	Jul	0	0 - 0	0	2
11	Nyctalus noctula	Sep	2	0 - 0	2	1
11	Pipistrellus pipistrellus	May	0	2.5 - 2.5	1	3
11	Pipistrellus pipistrellus	Jul	0	2.5 - 2.5	4	7
11	Pipistrellus pipistrellus	Sep	0	2.5 - 2.5	0	3
11	Pipistrellus pygmaeus	May	2	7 - 26.5	3	4
11	Pipistrellus pygmaeus	Jul	28	7 - 26.5	49	10

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
11	Pipistrellus pygmaeus	Sep	0	7 - 26.5	11	10
12	Myotis	May	36	2.5 - 19.5	43	7
12	Myotis	Jul	2	2.5 - 19.5	4	9
12	Myotis	Sep	1	2.5 - 19.5	4	8
12	Nyctalus leisleri	May	0	0 - 0	0	1
12	Nyctalus leisleri	Jul	0	0 - 0	0	2
12	Nyctalus noctula	May	0	0 - 0	0	1
12	Nyctalus noctula	Jul	0	0 - 0	0	3
12	Nyctalus noctula	Sep	0	0 - 0	0	3
12	Pipistrellus pipistrellus	May	0	1.5 - 2	2	7
12	Pipistrellus pipistrellus	Jul	1	1.5 - 2	2	10
12	Pipistrellus pipistrellus	Sep	0	1.5 - 2	1	10
12	Pipistrellus pygmaeus	May	14	8 - 17	33	8
12	Pipistrellus pygmaeus	Jul	18	8 - 17	30	10
12	Pipistrellus pygmaeus	Sep	4	8 - 17	12	10
12	Plecotus auritus	Jul	8	8 - 8	8	3
13	Myotis	May	1	1 - 6.5	1	4
13	Myotis	Jul	1	1 - 6.5	12	7
13	Myotis	Sep	1	1 - 6.5	2	7
13	Nyctalus leisleri	May	0	0	0	1
13	Nyctalus noctula	May	0	0 - 0	0	1
13	Nyctalus noctula	Jul	0	0 - 0	0	1
13	Nyctalus noctula	Sep	0	0 - 0	0	2
13	Pipistrellus pipistrellus	May	0	1 - 2	2	7
13	Pipistrellus pipistrellus	Jul	0	1 - 2	1	9
13	Pipistrellus pipistrellus	Sep	0	1 - 2	0	10
13	Pipistrellus pygmaeus	May	6	4.5 - 9	12	6
13	Pipistrellus pygmaeus	Jul	9	4.5 - 9	19	10
13	Pipistrellus pygmaeus	Sep	4	4.5 - 9	5	10
13	Plecotus auritus	Jul	1	1 - 1	1	2
13	Plecotus auritus	Sep	1	1 - 1	1	1
3	Myotis	May	5	3 - 8.5	12	5
3	Myotis	Jul	0	3 - 8.5	0	1
3	Myotis	Sep	0	3 - 8.5	2	3
3	Nyctalus noctula	Jul	0	0 - 0	0	2
3	Pipistrellus pipistrellus	May	2	2 - 2.5	3	9

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
3	Pipistrellus pipistrellus	Jul	0	2 - 2.5	0	1
3	Pipistrellus pipistrellus	Sep	0	2 - 2.5	0	3
3	Pipistrellus pygmaeus	May	14	7 - 21.5	27	6
3	Pipistrellus pygmaeus	Jul	0	7 - 21.5	0	2
3	Pipistrellus pygmaeus	Sep	0	7 - 21.5	2	3
3	Plecotus auritus	Jul	1	0	1	1
4	Myotis	May	5	5 - 11	9	4
4	Myotis	Jul	7	5 - 11	19	9
4	Myotis	Sep	11	5 - 11	17	10
4	Nyctalus noctula	Jul	0	0 - 0	0	2
4	Pipistrellus pipistrellus	May	2	1.5 - 2.5	3	9
4	Pipistrellus pipistrellus	Jul	1	1.5 - 2.5	3	10
4	Pipistrellus pipistrellus	Sep	0	1.5 - 2.5	2	9
4	Pipistrellus pygmaeus	May	10	20 - 37.5	47	7
4	Pipistrellus pygmaeus	Jul	50	20 - 37.5	59	9
4	Pipistrellus pygmaeus	Sep	11	20 - 37.5	33	10
4	Plecotus auritus	Jul	5	4.5 - 4.5	8	2
5	Myotis	May	2	3 - 11	4	9
5	Myotis	Jul	16	3 - 11	35	9
5	Myotis	Sep	2	3 - 11	7	8
5	Nyctalus leisleri	May	0	0 - 0	0	1
5	Nyctalus leisleri	Jul	0	0 - 0	0	2
5	Nyctalus noctula	May	3	3 - 3	3	6
5	Nyctalus noctula	Jul	0	3 - 3	0	2
5	Nyctalus noctula	Sep	0	3 - 3	3	5
5	Pipistrellus nathusii	May	8	0	8	1
5	Pipistrellus pipistrellus	May	19	17 - 34	35	10
5	Pipistrellus pipistrellus	Jul	41	17 - 34	54	9
5	Pipistrellus pipistrellus	Sep	0	17 - 34	3	9
5	Pipistrellus pygmaeus	May	31	19.5 - 41	69	9
5	Pipistrellus pygmaeus	Jul	56	19.5 - 41	65	9
5	Pipistrellus pygmaeus	Sep	7	19.5 - 41	27	10
5	Plecotus auritus	May	4	4 - 4	4	1
5	Plecotus auritus	Jul	4	4 - 4	46	3
6	Myotis	May	2	2.5 - 10.5	10	5
6	Myotis	Jul	6	2.5 - 10.5	54	6

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
6	Myotis	Sep	2	2.5 - 10.5	5	6
6	Nyctalus leisleri	May	0	0 - 0	0	2
6	Nyctalus leisleri	Jul	0	0 - 0	0	2
6	Nyctalus noctula	May	0	2.5 - 6.5	0	1
6	Nyctalus noctula	Jul	2	2.5 - 6.5	3	3
6	Nyctalus noctula	Sep	2	2.5 - 6.5	10	4
6	Pipistrellus pipistrellus	May	0	1.5 - 22	2	8
6	Pipistrellus pipistrellus	Jul	10	1.5 - 22	43	10
6	Pipistrellus pipistrellus	Sep	0	1.5 - 22	1	7
6	Pipistrellus pygmaeus	May	13	24 - 42.5	35	8
6	Pipistrellus pygmaeus	Jul	50	24 - 42.5	63	10
6	Pipistrellus pygmaeus	Sep	34	24 - 42.5	69	10
6	Plecotus auritus	Jul	1	1 - 2.5	1	3
6	Plecotus auritus	Sep	4	1 - 2.5	4	3
8	Myotis	May	1	1.5 - 2	2	4
8	Myotis	Jul	2	1.5 - 2	2	7
8	Myotis	Sep	2	1.5 - 2	2	7
8	Nyctalus noctula	May	0	0 - 0	0	1
8	Nyctalus noctula	Sep	0	0 - 0	0	3
8	Pipistrellus pipistrellus	May	0	1 - 1.5	1	6
8	Pipistrellus pipistrellus	Jul	0	1 - 1.5	2	9
8	Pipistrellus pipistrellus	Sep	0	1 - 1.5	1	5
8	Pipistrellus pygmaeus	May	6	8 - 15.5	17	9
8	Pipistrellus pygmaeus	Jul	18	8 - 15.5	26	10
8	Pipistrellus pygmaeus	Sep	2	8 - 15.5	20	10
8	Plecotus auritus	Jul	1	1 - 1	1	1
8	Plecotus auritus	Sep	1	1 - 1	1	3
9	Myotis	Jul	10	2.5 - 11	20	9
9	Myotis	Sep	2	2.5 - 11	2	7
9	Nyctalus leisleri	Sep	0	0 - 0	0	2
9	Nyctalus noctula	May	0	0 - 0	0	2
9	Nyctalus noctula	Sep	0	0 - 0	4	4
9	Pipistrellus pipistrellus	May	0	0 - 0	0	4
9	Pipistrellus pipistrellus	Jul	0	0 - 0	1	9
9	Pipistrellus pipistrellus	Sep	0	0 - 0	0	6
9	Pipistrellus pygmaeus	May	4	4 - 6	7	6

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
9	Pipistrellus pygmaeus	Jul	6	4 - 6	7	8
9	Pipistrellus pygmaeus	Sep	5	4 - 6	8	10
9	Plecotus auritus	May	1	1 - 1	1	1
9	Plecotus auritus	Sep	1	1 - 1	1	1

Per Site

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

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

Species/Species Group	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
Myotis	0	0	0	4	14	170
Nyctalus leisleri	0	0	0	0	0	14
Nyctalus noctula	0	0	0	0	0	57
Pipistrellus nathusii	0	0	0	0	0	1
Pipistrellus pipistrellus	0	0	0	8	9	225
Pipistrellus pygmaeus	0	0	10	23	52	177
Plecotus auritus	0	0	0	1	0	27

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

Species/Species Group	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
Myotis	2	5 - 11	54	188
Nyctalus leisleri	0	0 - 0	0	14
Nyctalus noctula	0	3 - 3	10	57
Pipistrellus nathusii	8	0	8	1
Pipistrellus pipistrellus	0	3.5 - 15	54	242
Pipistrellus pygmaeus	10	8 - 17	69	262
Plecotus auritus	1	8 - 8	46	28

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

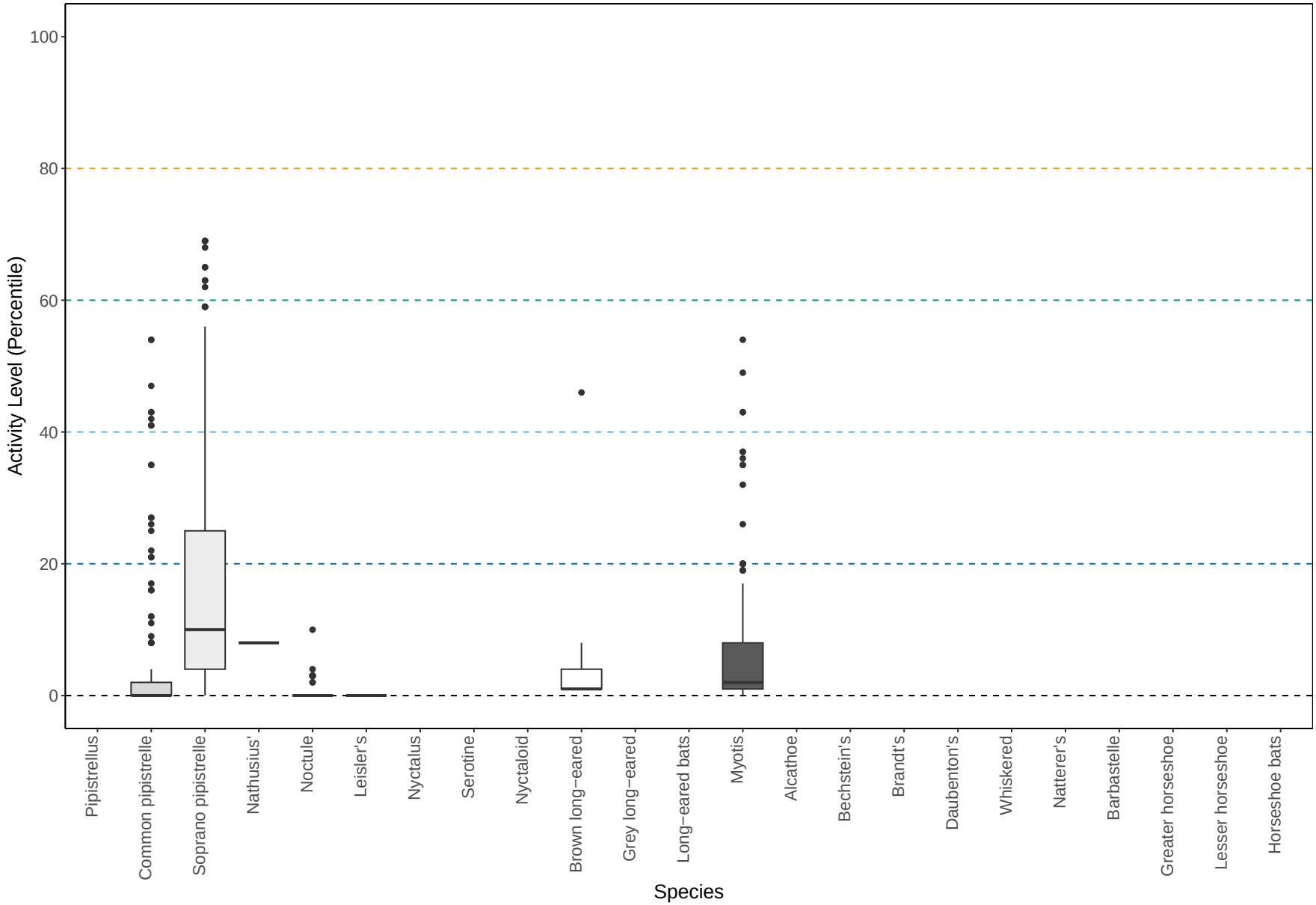
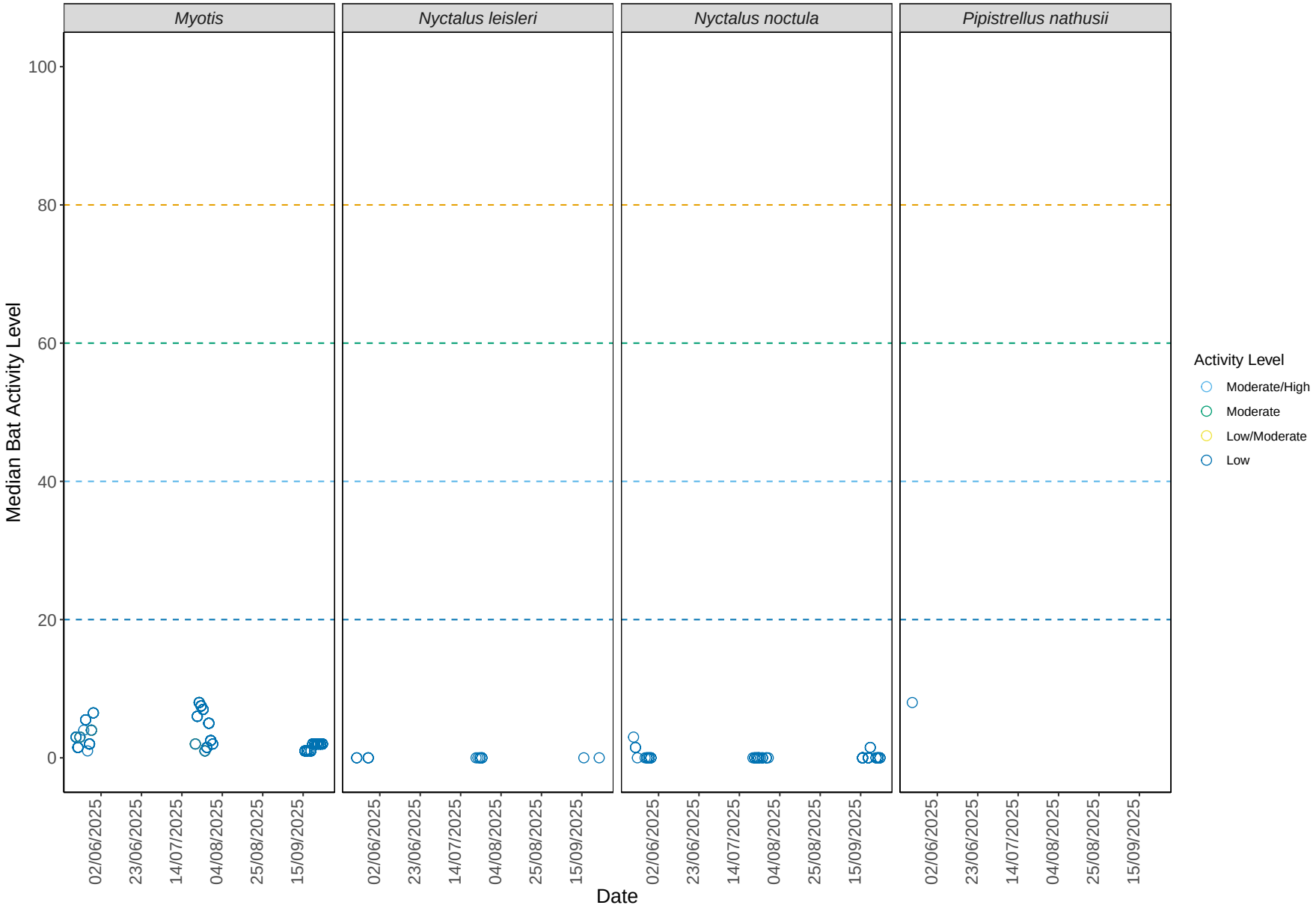
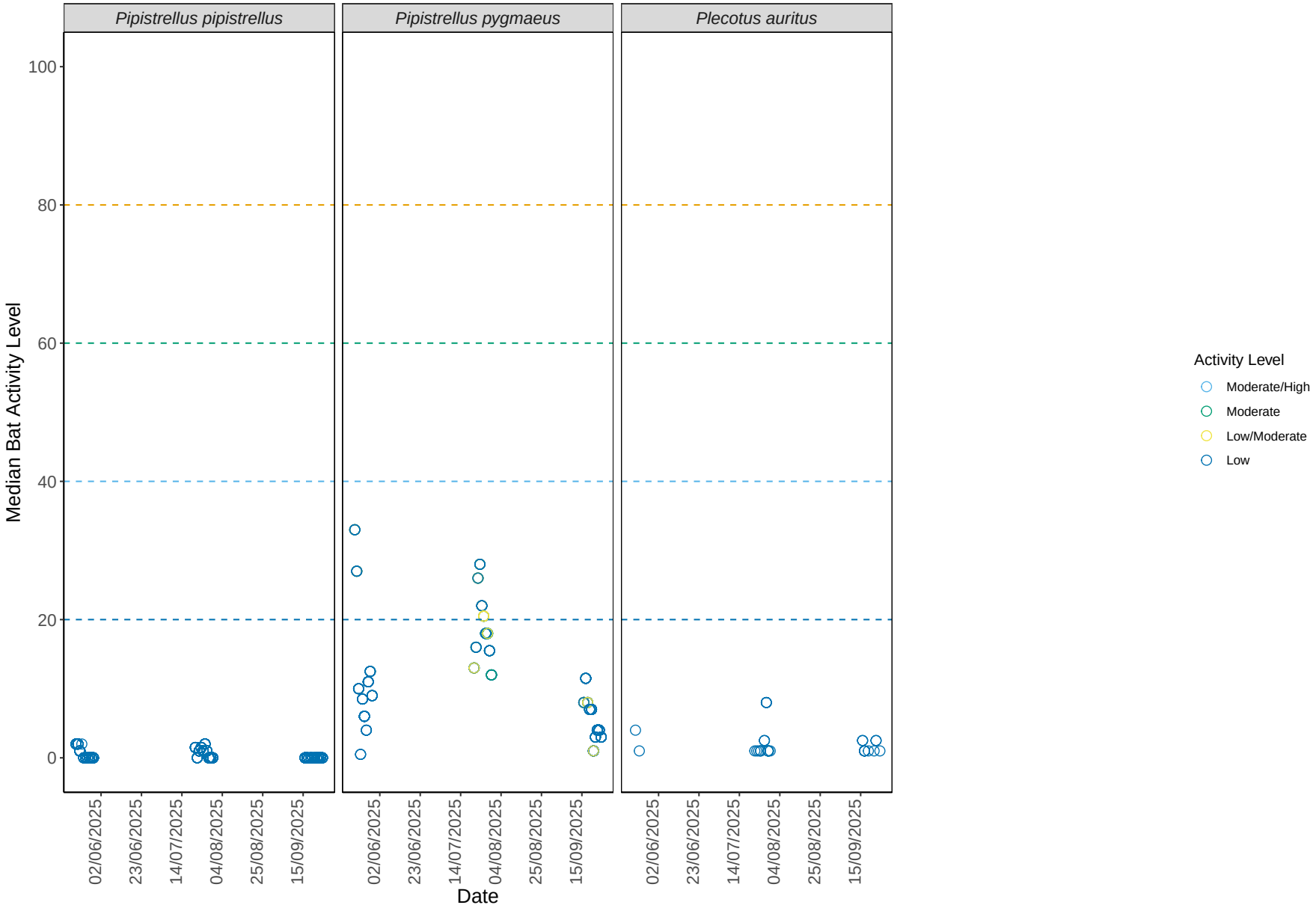

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Leisler's
Nyctalus
Serotine
Nyctaloid
Brown long−eared
Grey long−eared
Long−eared bats
Myotis
Alcathoe
Bechstein's
Brandt's
Daubenton's
Whiskered
Natterer's
Barbastelle
Greater horseshoe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

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


Myotis
Nyctalus leisleri
Nyctalus noctula
Pipistrellus nathusii
Median Bat Activity Level
100
80
60
40
20
0
02/06/2025
23/06/2025
14/07/2025
04/08/2025
25/08/2025
15/09/2025
Date
Activity Level
Moderate/High
Moderate
Low/Moderate
Low


Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Median Bat Activity Level
100
80
60
40
20
0
02/06/2025
23/06/2025
14/07/2025
04/08/2025
25/08/2025
15/09/2025
Date
Activity Level
Moderate/High
Moderate
Low/Moderate
Low

Per Site, Per Month

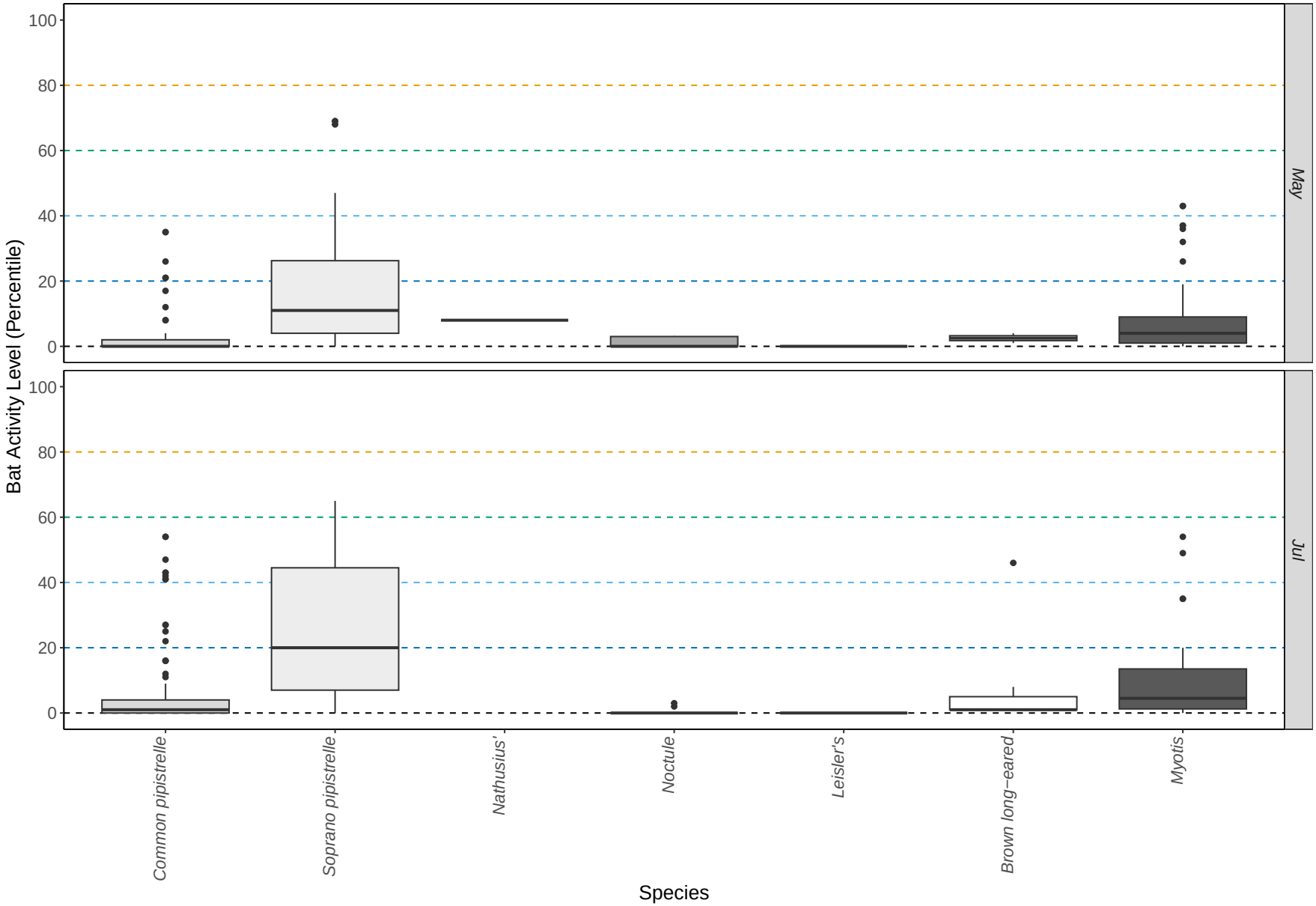
Table 9. Summary table showing the number of nights recorded bat activity fell into each activity band for each species during each month.

Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
Myotis	May	0	0	0	2	5	41
Myotis	Jul	0	0	0	2	9	59
Myotis	Sep	0	0	0	0	0	70
Nyctalus leisleri	May	0	0	0	0	0	5
Nyctalus leisleri	Jul	0	0	0	0	0	7
Nyctalus leisleri	Sep	0	0	0	0	0	2
Nyctalus noctula	May	0	0	0	0	0	14
Nyctalus noctula	Jul	0	0	0	0	0	17
Nyctalus noctula	Sep	0	0	0	0	0	26
Pipistrellus nathusii	May	0	0	0	0	0	1
Pipistrellus pipistrellus	May	0	0	0	0	5	72
Pipistrellus pipistrellus	Jul	0	0	0	8	4	80
Pipistrellus pipistrellus	Sep	0	0	0	0	0	73
Pipistrellus pygmaeus	May	0	0	3	2	17	54
Pipistrellus pygmaeus	Jul	0	0	4	20	23	45
Pipistrellus pygmaeus	Sep	0	0	3	1	12	78
Plecotus auritus	May	0	0	0	0	0	2
Plecotus auritus	Jul	0	0	0	1	0	15
Plecotus auritus	Sep	0	0	0	0	0	10

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

Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
Myotis	May	4	5 - 11	43	48
Myotis	Jul	5	5 - 11	54	70
Myotis	Sep	2	5 - 11	17	70
Nyctalus leisleri	May	0	0 - 0	0	5
Nyctalus leisleri	Jul	0	0 - 0	0	7
Nyctalus leisleri	Sep	0	0 - 0	0	2
Nyctalus noctula	May	0	3 - 3	3	14
Nyctalus noctula	Jul	0	3 - 3	3	17
Nyctalus noctula	Sep	0	3 - 3	10	26
Pipistrellus nathusii	May	8	0	8	1
Pipistrellus pipistrellus	May	0	3.5 - 15	35	77
Pipistrellus pipistrellus	Jul	1	3.5 - 15	54	92
Pipistrellus pipistrellus	Sep	0	3.5 - 15	3	73
Pipistrellus pygmaeus	May	11	8 - 17	69	76
Pipistrellus pygmaeus	Jul	20	8 - 17	65	92
Pipistrellus pygmaeus	Sep	5	8 - 17	69	94
Plecotus auritus	May	3	4 - 4	4	2
Plecotus auritus	Jul	1	8 - 8	46	16
Plecotus auritus	Sep	1	1 - 2.5	4	10

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


Bat Activity Level (Percentile)
100
80
60
40
20
0
May
Jul
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Leisler's
Brown long−eared
Myotis
Species

Part 2: Nightly Analysis

Entire Survey Period

Sunrise and Sunset Times

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

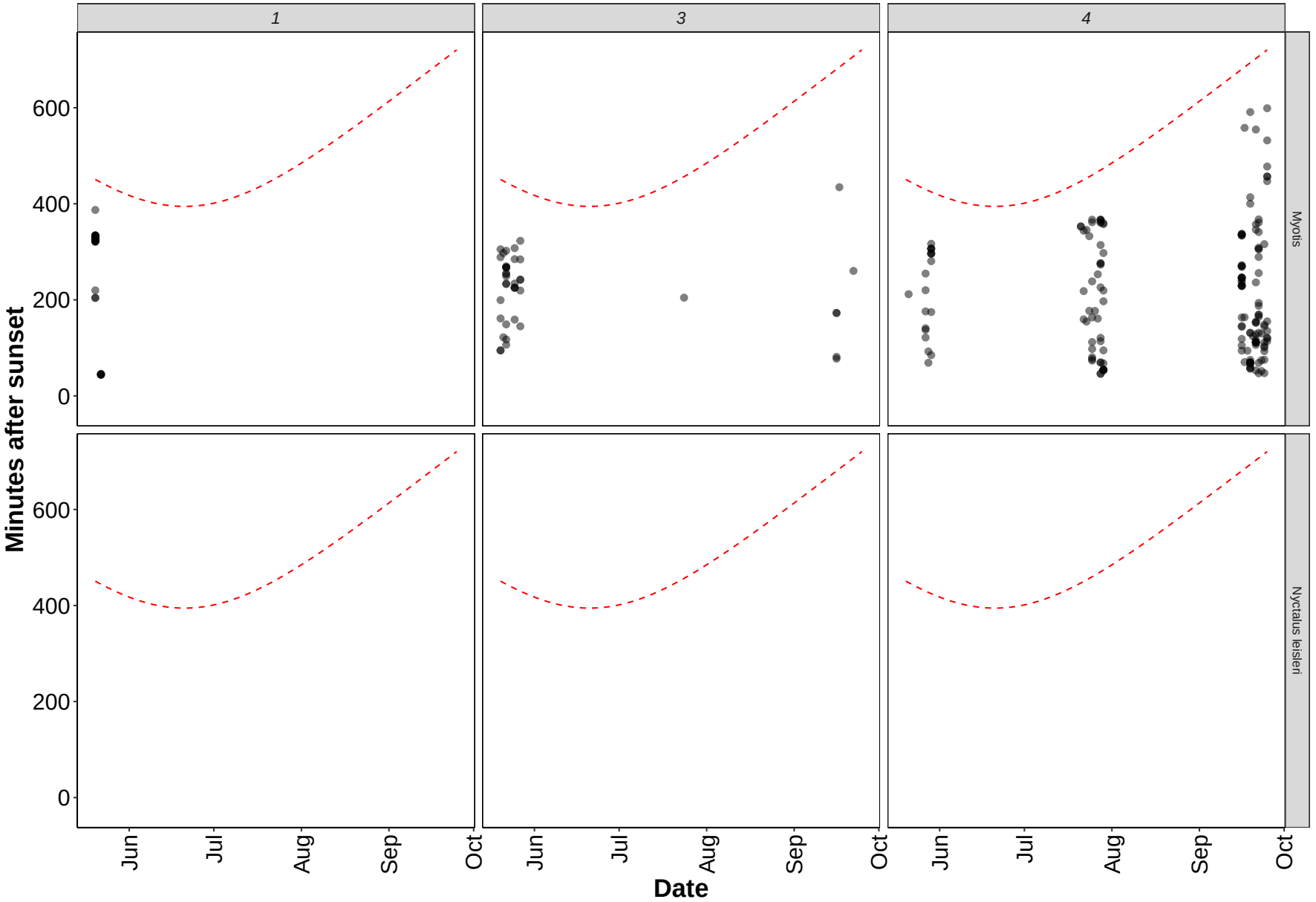
Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2025-05-20	21:28	04:59	7.5
2025-05-21	21:30	04:57	7.5
2025-05-22	21:31	04:56	7.4
2025-05-23	21:33	04:54	7.4
2025-05-24	21:35	04:53	7.3
2025-05-25	21:36	04:52	7.3
2025-05-26	21:38	04:50	7.2
2025-05-27	21:39	04:49	7.2
2025-05-28	21:41	04:48	7.1
2025-05-29	21:42	04:47	7.1
2025-07-21	21:41	05:08	7.4
2025-07-22	21:40	05:10	7.5
2025-07-23	21:38	05:11	7.6
2025-07-24	21:36	05:13	7.6
2025-07-25	21:35	05:15	7.7
2025-07-26	21:33	05:16	7.7
2025-07-27	21:31	05:18	7.8
2025-07-28	21:30	05:20	7.8
2025-07-29	21:28	05:22	7.9
2025-07-30	21:26	05:23	8.0
2025-09-16	19:33	06:53	11.3
2025-09-17	19:31	06:55	11.4
2025-09-18	19:28	06:57	11.5
2025-09-19	19:25	06:59	11.6
2025-09-20	19:23	07:01	11.6
2025-09-21	19:20	07:03	11.7
2025-09-22	19:18	07:05	11.8
2025-09-23	19:15	07:07	11.9

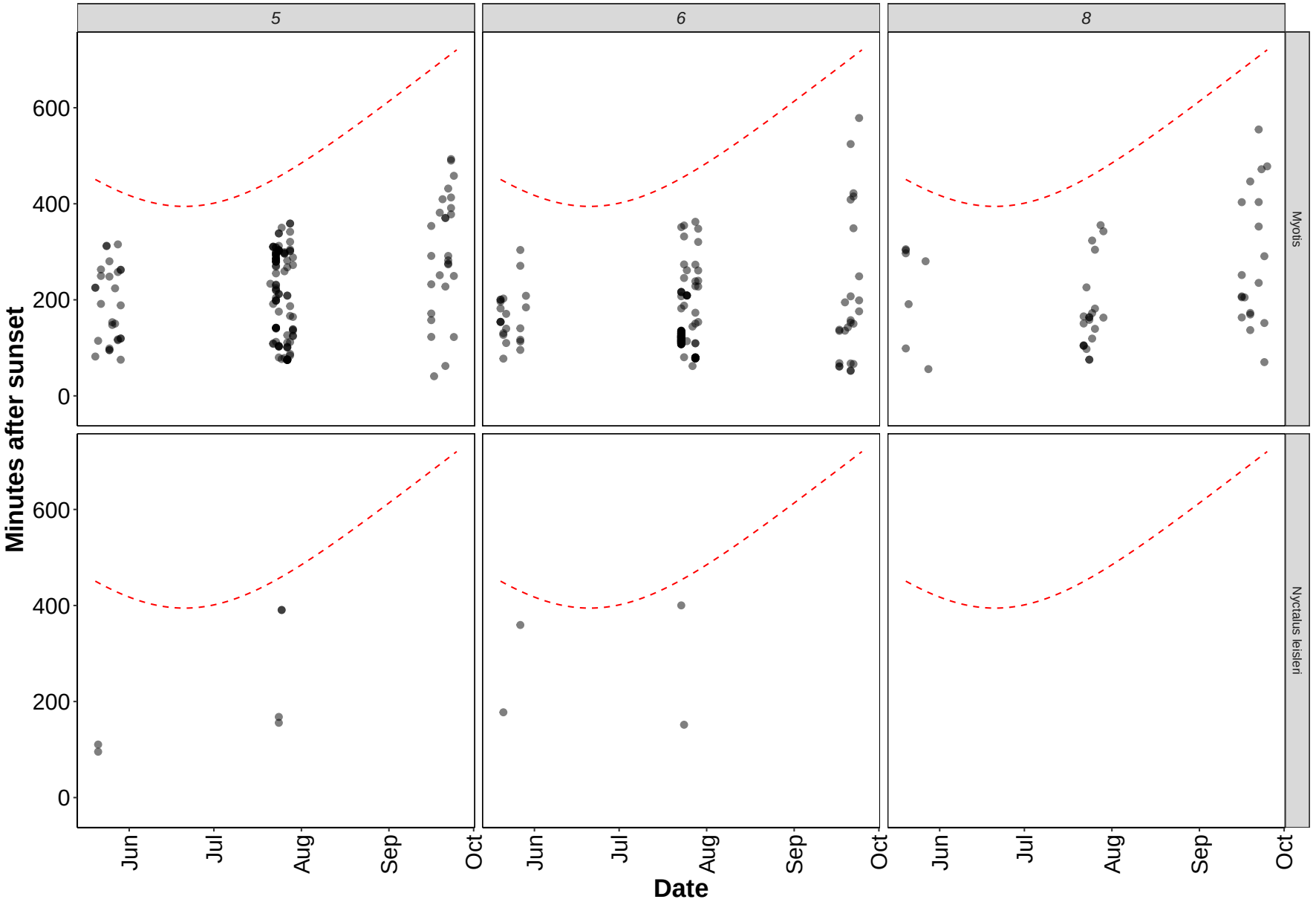
Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2025-09-24	19:12	07:08	11.9
2025-09-25	19:10	07:10	12.0

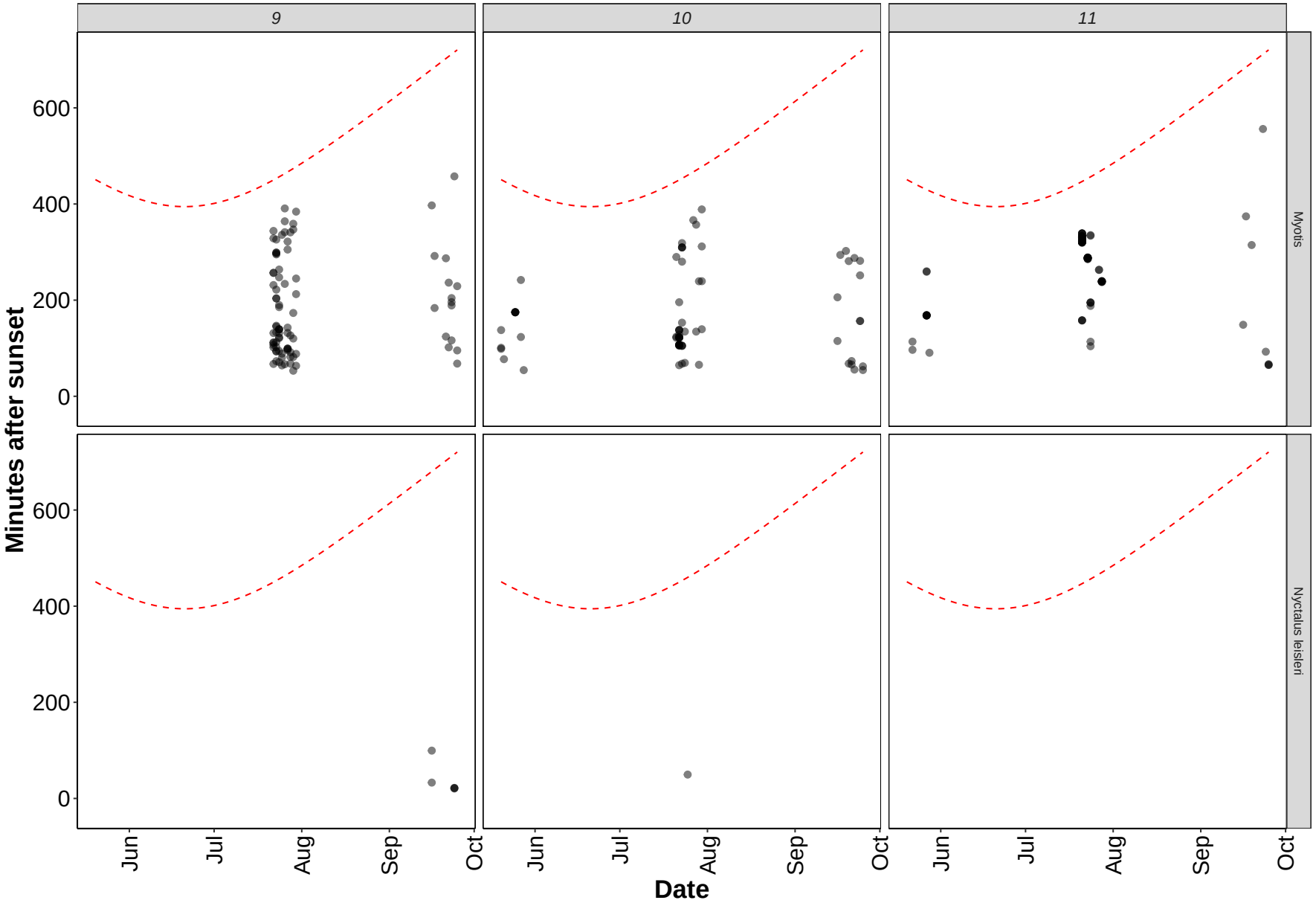
Distribution of Bat Activity Across the Night through Time

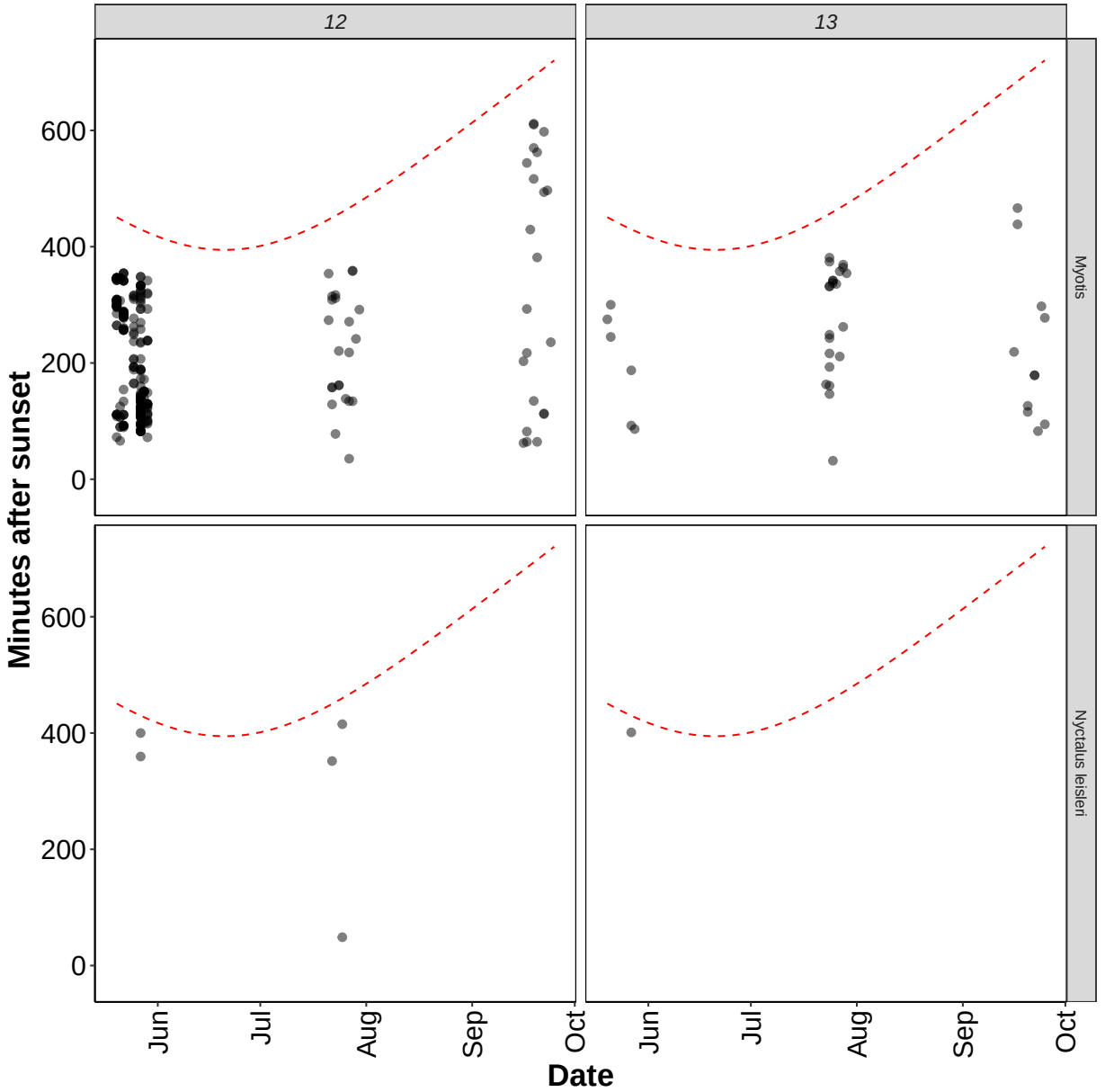
Per Detector

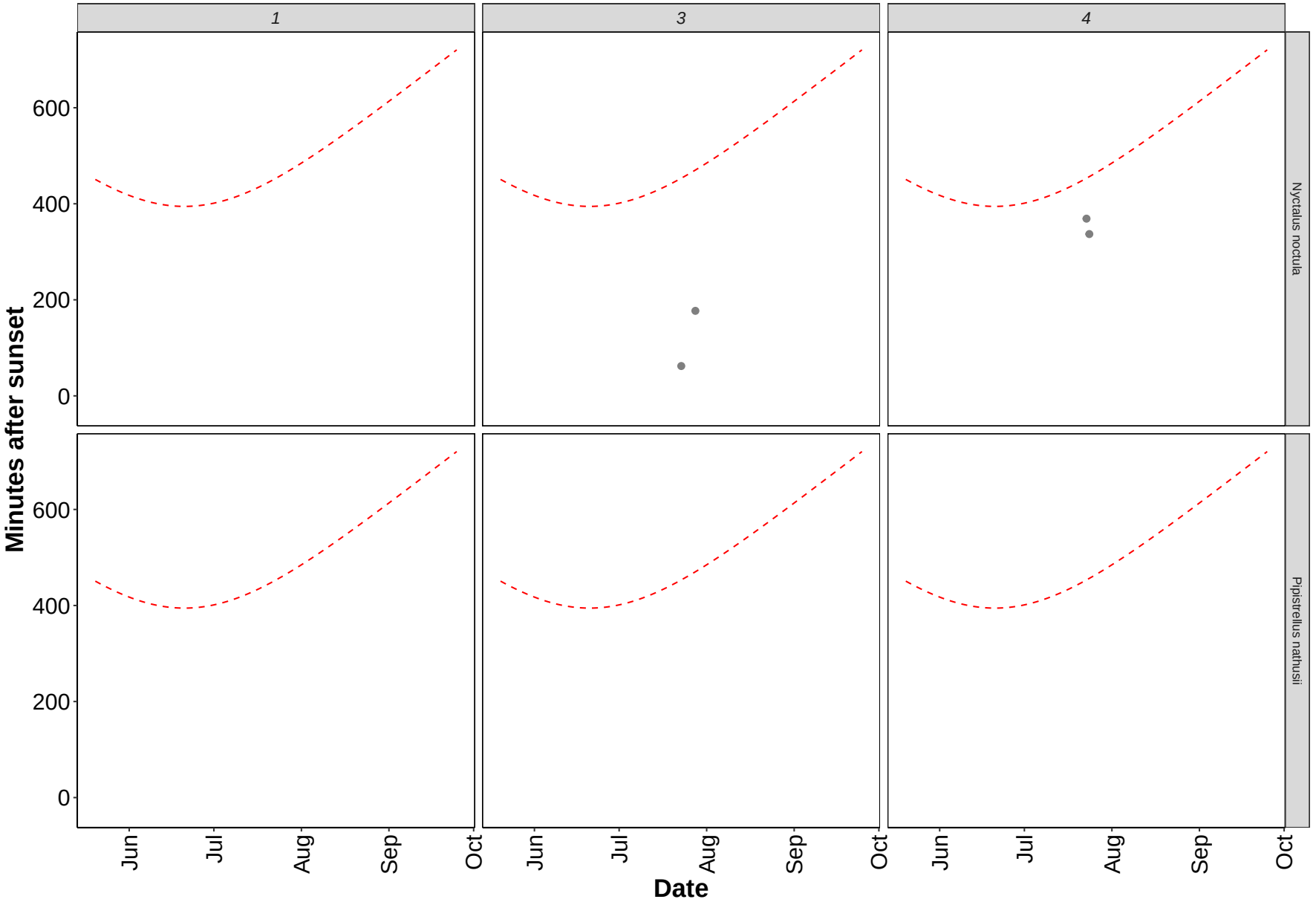
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

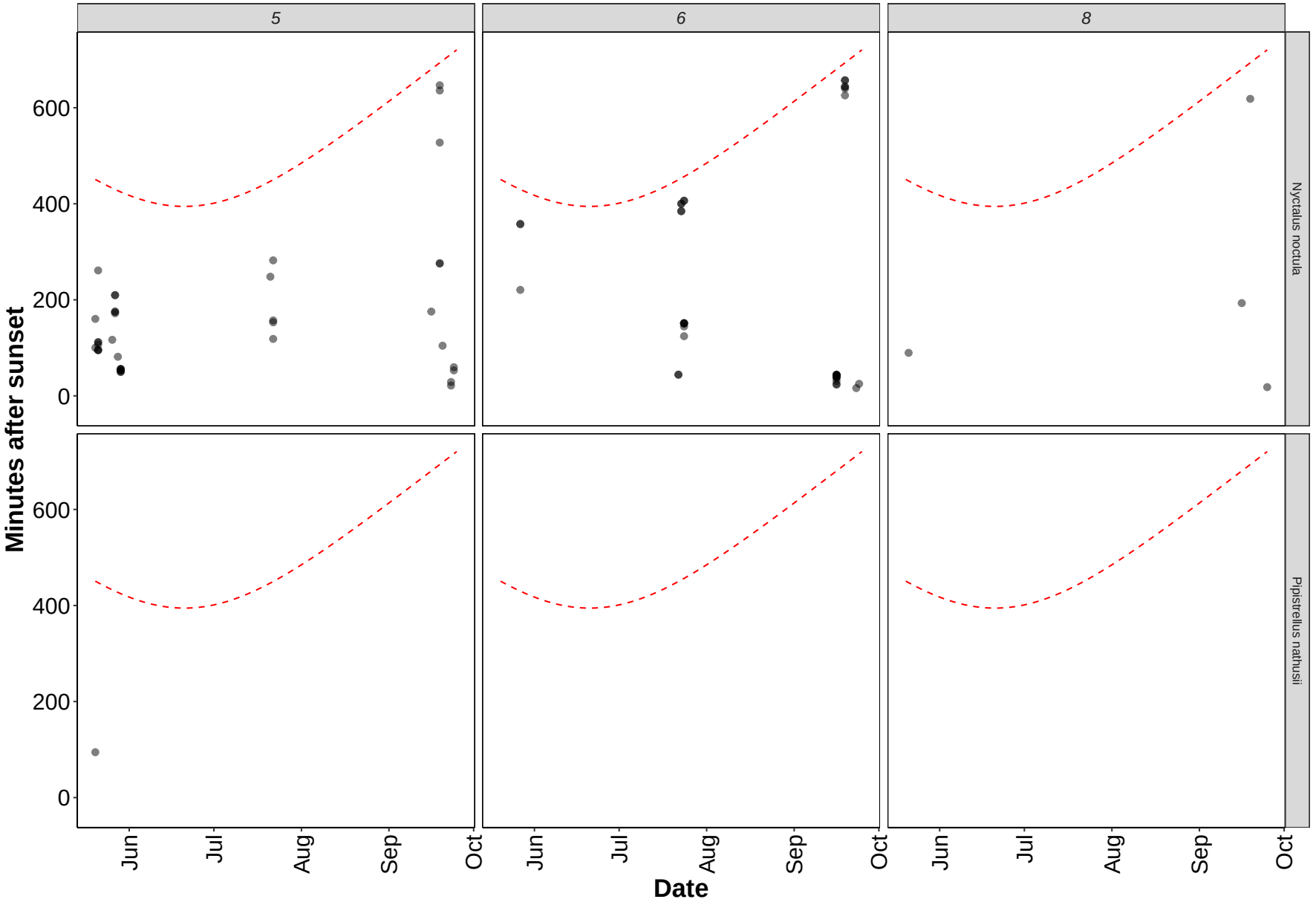

1
3
4
Myotis
Nyctalus leisleri
Minutes after sunset
0
200
400
600
Jun
Jul
Aug
Sep
Oct
Date

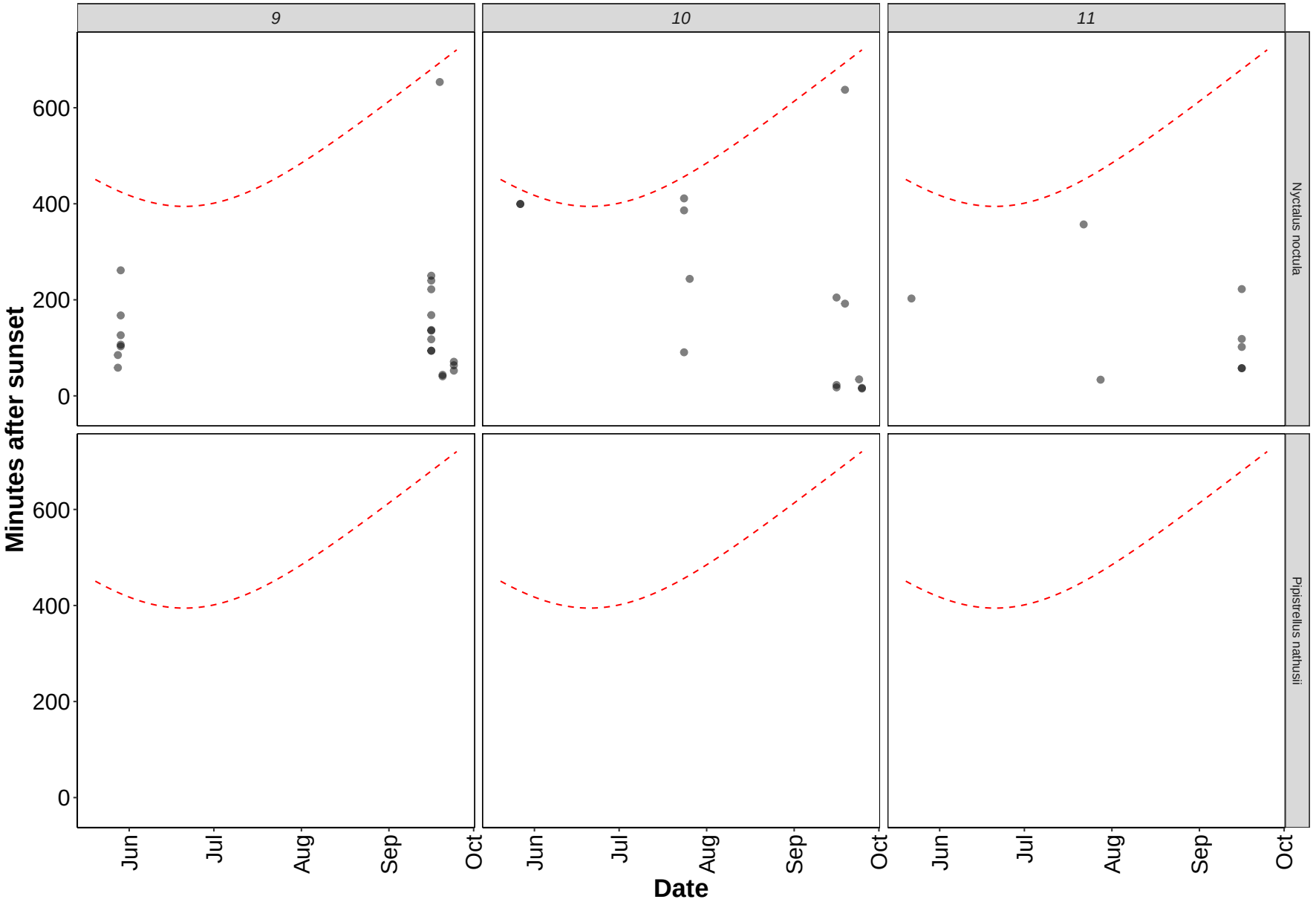

5
6
8
Myotis
Nyctalus leisleri
Minutes after sunset
0
200
400
600
Jun
Jul
Aug
Sep
Oct
Date

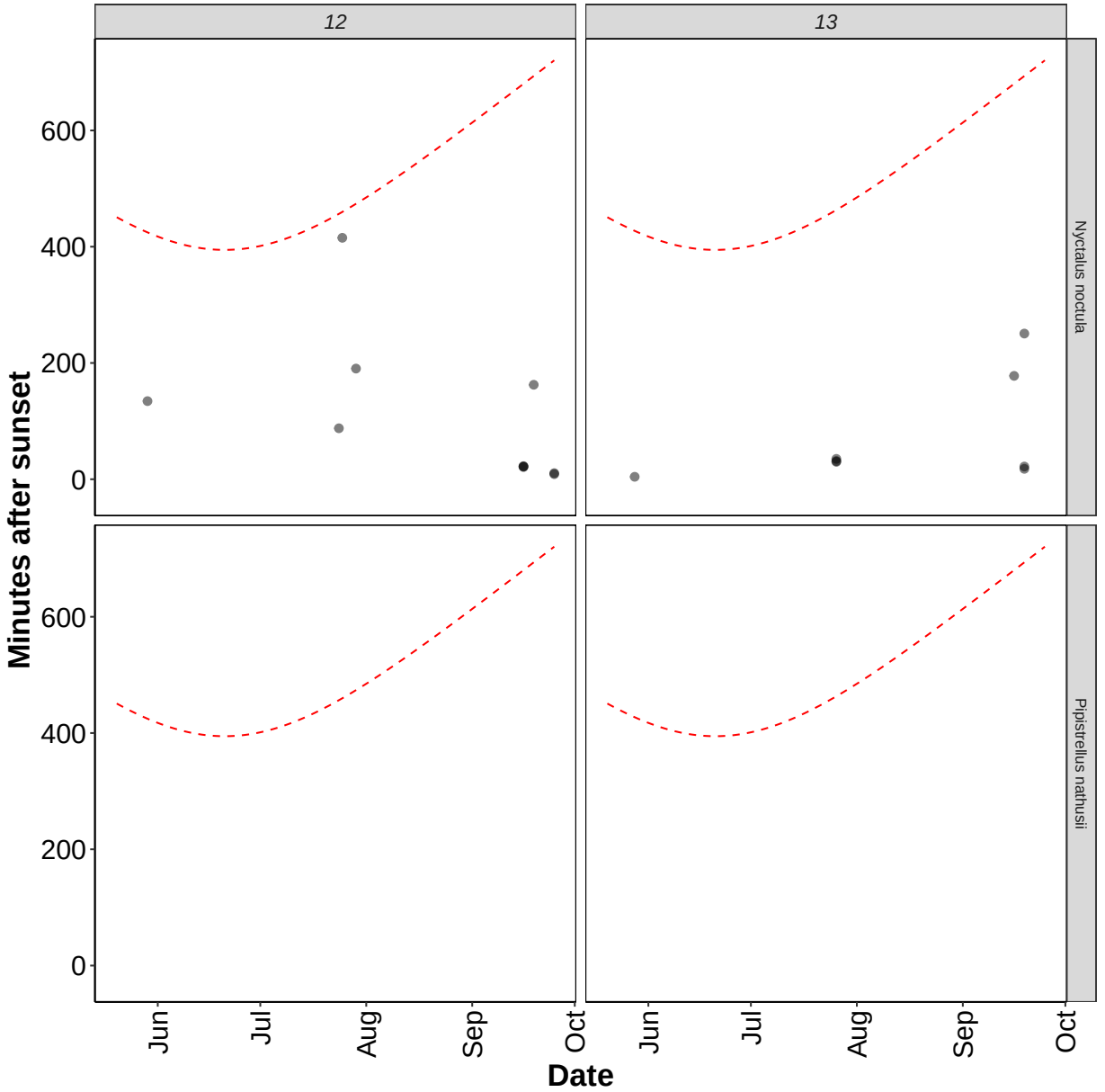

9
10
11
Myotis
Nyctalus leisleri
Minutes after sunset
0
200
400
600
Jun
Jul
Aug
Sep
Oct
Date

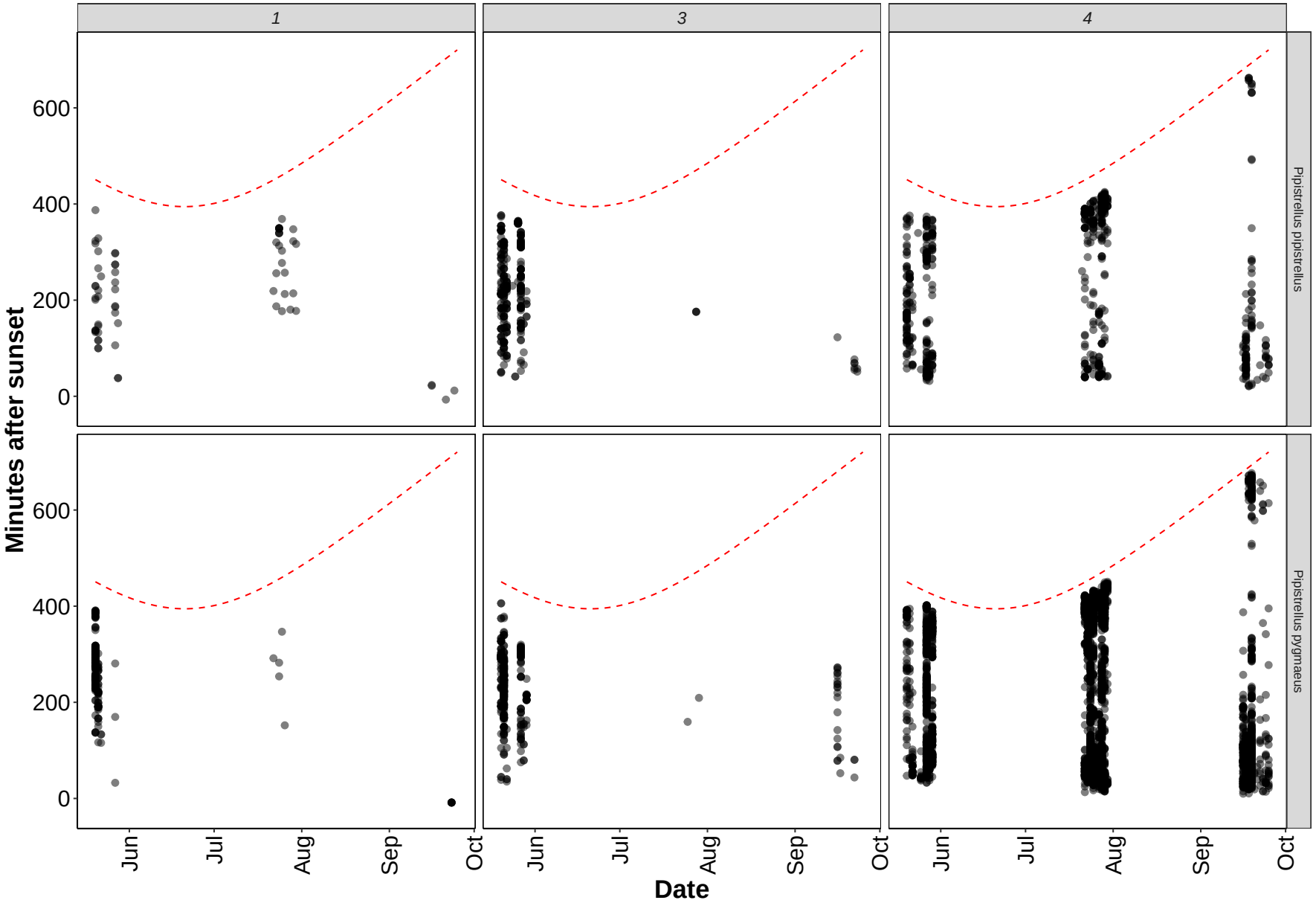

12
13
Myotis
Nyctalus leisleri
Minutes after sunset
0
200
400
600
Jun
Jul
Aug
Sep
Oct
Date

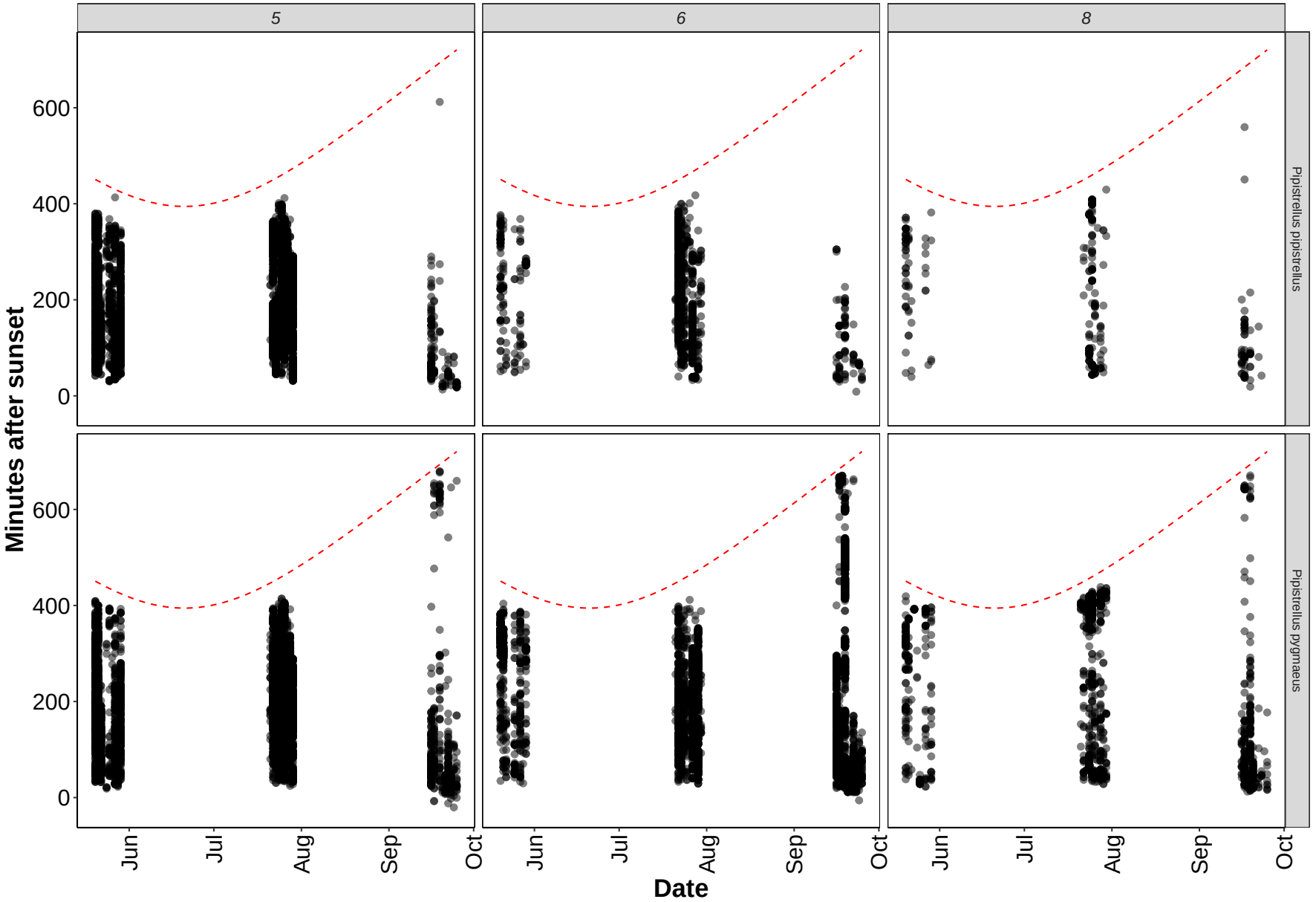

1
3
4
Nyctalus noctula
Pipistrellus nathusii
Minutes after sunset
0
200
400
600
Jun
Jul
Aug
Sep
Oct
Date


5
6
8
Nyctalus noctula
Pipistrellus nathusii
Minutes after sunset
0
200
400
600
Jun
Jul
Aug
Sep
Oct
Date


9
10
11
Nyctalus noctula
Pipistrellus nathusii
Minutes after sunset
0
200
400
600
Jun
Jul
Aug
Sep
Oct
Date


12
13
Nyctalus noctula
Pipistrellus nathusii
Minutes after sunset
0
200
400
600
Jun
Jul
Aug
Sep
Oct
Date


1
3
4
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Minutes after sunset
0
200
400
600
Jun
Jul
Aug
Sep
Oct
Date


5
6
8
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Minutes after sunset
0
200
400
600
Jun
Jul
Aug
Sep
Oct
Date

Roost Emergence Time and Bat Observation

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

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

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

Table 12: Table continues below

Species	Detector ID	2025-05-20	2025-05-21	2025-05-22	2025-05-24	2025-05-25
Common pipistrelle	1	0	0	0	0	0
Common pipistrelle	4	0	0	0	0	0
Common pipistrelle	5	0	0	0	0	4
Common pipistrelle	6	0	0	0	0	0
Common pipistrelle	8	0	0	0	0	0
Common pipistrelle	9	0	0	0	0	0
Common pipistrelle	10	0	0	0	0	0
Common pipistrelle	12	0	0	0	0	0
Common pipistrelle	13	0	0	0	0	0
Soprano pipistrelle	1	0	0	0	0	0
Soprano pipistrelle	4	0	0	0	0	0
Soprano pipistrelle	5	0	0	0	4	0
Soprano pipistrelle	6	0	0	0	0	0
Soprano pipistrelle	8	0	0	0	0	0
Soprano pipistrelle	9	0	0	0	0	0
Soprano pipistrelle	10	13	7	13	0	12
Soprano pipistrelle	11	0	5	0	0	0
Soprano pipistrelle	12	0	0	2	0	23
Soprano pipistrelle	13	0	0	0	0	1
Noctule	12	0	0	0	0	0
Noctule	13	0	0	0	0	0
Myotis	1	0	0	5	0	0
Myotis	4	0	0	0	0	0
Myotis	5	0	0	0	0	0
Myotis	6	0	0	0	0	0

Species	Detector ID	2025-05-20	2025-05-21	2025-05-22	2025-05-24	2025-05-25
Myotis	8	0	0	0	0	0
Myotis	9	0	0	0	0	0
Myotis	10	0	0	0	0	0
Myotis	11	0	0	0	0	0
Myotis	12	0	1	0	0	0
Myotis	13	0	0	0	0	0

Table 13: Table continues below

2025-05-27	2025-05-28	2025-05-29	2025-07-22	2025-07-23	2025-07-24	2025-07-25
0	0	0	0	0	0	0
0	1	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	0	0	0	0	0
0	0	0	2	0	0	5
4	3	0	0	0	0	0
0	0	0	0	0	0	0
2	0	0	0	0	0	0
2	2	0	0	0	0	0
1	9	0	85	102	27	1
1	0	0	0	0	1	0
12	0	3	0	0	0	5
0	0	1	0	0	0	1
0	0	0	0	0	0	0
0	1	0	0	0	0	0
0	0	0	0	0	0	0
0	1	0	0	0	0	0
0	0	0	0	0	0	0

2025-05-27	2025-05-28	2025-05-29	2025-07-22	2025-07-23	2025-07-24	2025-07-25
0	0	0	0	0	0	0
0	1	0	0	0	0	0
0	0	0	1	0	0	1
0	1	0	1	1	1	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	1

Table 14: Table continues below

2025-07-26	2025-07-27	2025-07-28	2025-07-29	2025-07-30	2025-09-16	2025-09-17
0	0	0	0	0	2	0
0	0	0	0	0	0	0
0	0	0	4	0	1	0
0	0	0	0	0	0	1
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	2	0	1	2
0	0	0	0	3	0	0
0	1	0	0	0	1	2
0	0	0	0	0	0	0
0	4	8	25	0	9	4
0	0	1	1	0	9	4
0	0	0	0	0	4	25
0	0	0	0	0	0	10
0	5	1	1	0	2	0
0	0	0	1	0	0	8
0	0	1	0	3	1	0
1	0	0	6	4	0	2
0	0	0	0	0	6	5
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	4	6	0	0	0

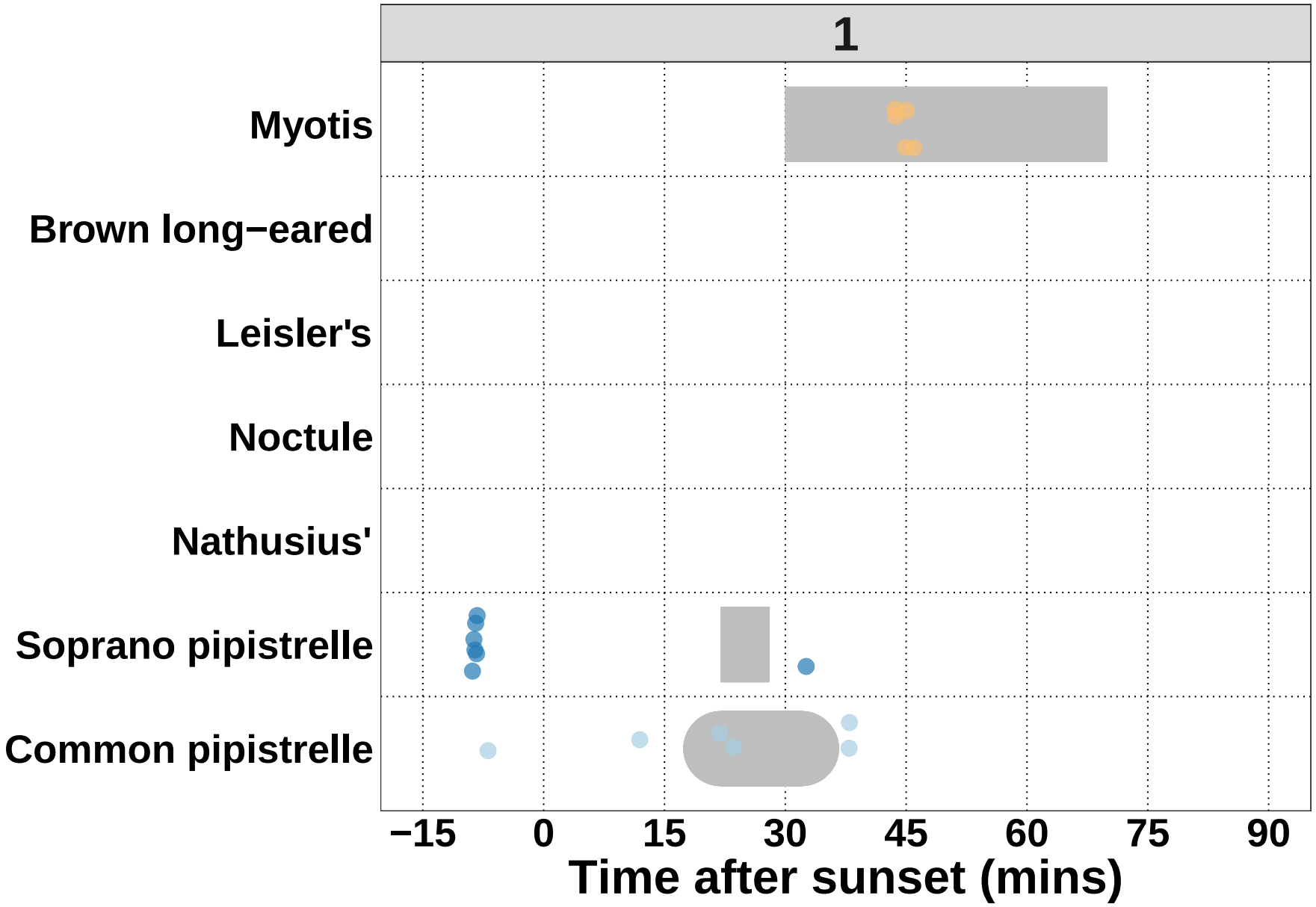
2025-07-26	2025-07-27	2025-07-28	2025-07-29	2025-07-30	2025-09-16	2025-09-17
0	0	0	0	0	0	1
0	1	0	0	0	0	3
0	0	0	0	0	0	0
1	0	1	1	1	0	0
0	0	0	1	0	0	0
0	0	0	0	0	0	0
0	1	0	0	0	1	1
0	0	0	0	0	0	0

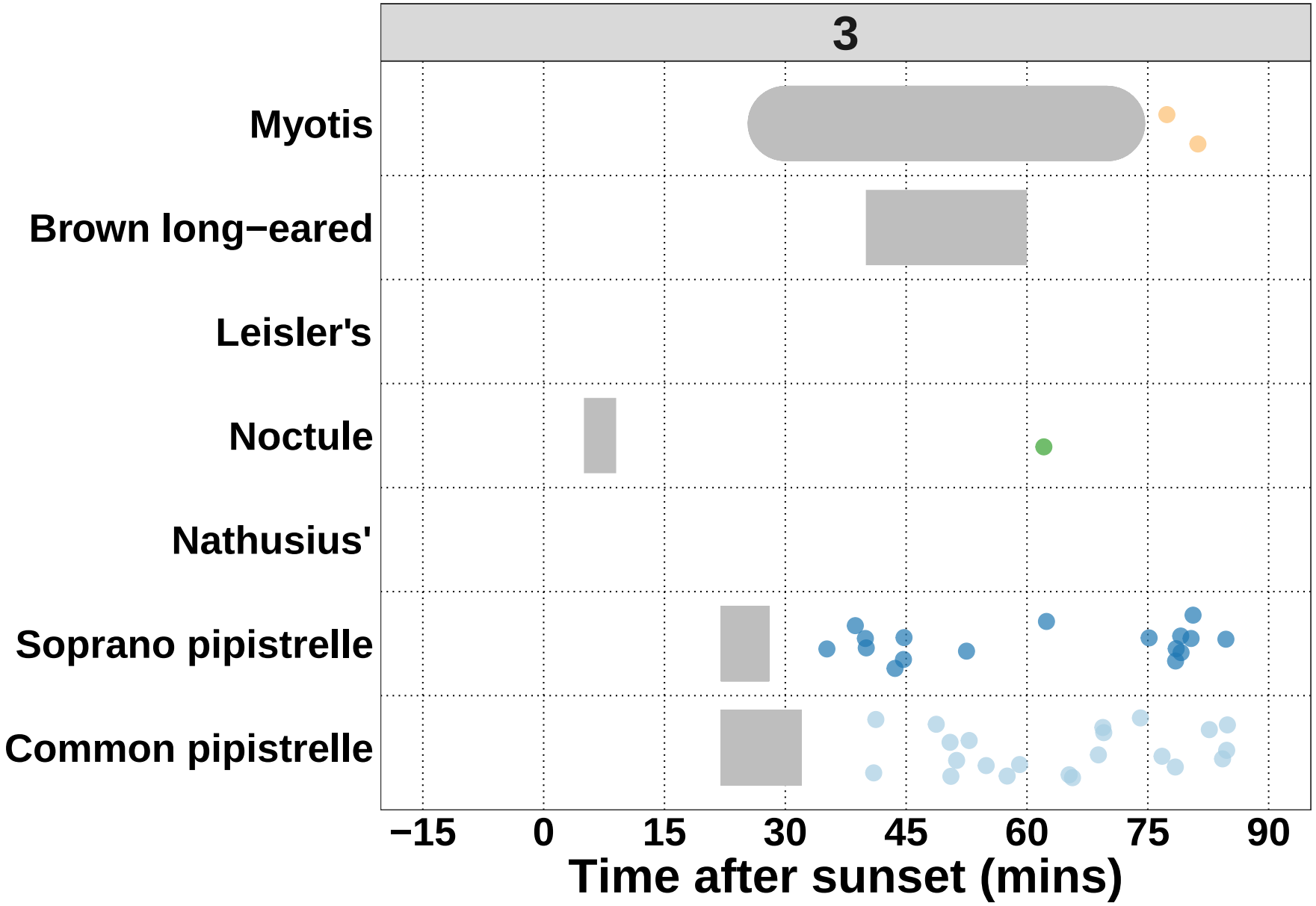
2025-09-18	2025-09-19	2025-09-20	2025-09-21	2025-09-22	2025-09-23	2025-09-24	2025-09-25
0	0	0	1	0	0	1	0
3	2	0	0	0	0	0	0
0	0	6	3	0	2	0	21
0	0	0	0	0	1	0	0
0	1	0	0	0	0	0	0
0	0	0	0	0	1	0	0
1	2	0	0	0	1	0	0
1	0	0	0	0	1	0	1
0	0	2	6	7	3	7	0
0	0	0	0	0	6	0	0
23	9	1	0	1	2	1	3
0	1	4	10	27	11	3	10
3	9	65	8	22	10	4	0
5	13	6	0	3	0	0	5
0	0	5	2	1	4	13	14
0	23	6	21	21	32	49	6
4	1	2	0	0	10	8	60
0	2	6	8	7	0	3	0
6	0	3	4	4	15	0	4
0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	7	0	1	2	1	1	0
0	0	0	1	0	0	0	0

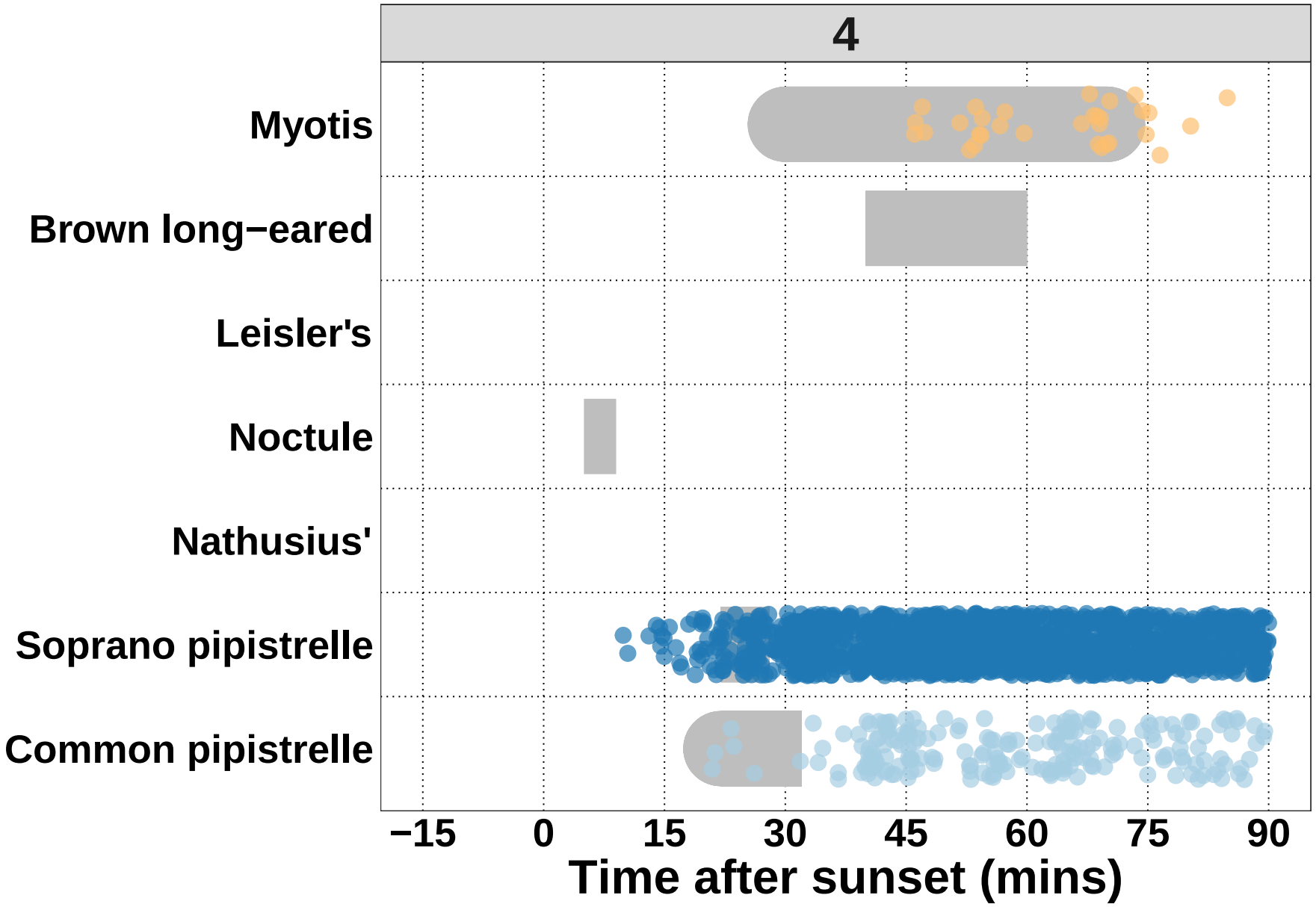
2025-09-18	2025-09-19	2025-09-20	2025-09-21	2025-09-22	2025-09-23	2025-09-24	2025-09-25
0	0	0	3	1	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1
0	0	1	1	1	0	0	2
0	0	0	0	0	0	0	3
0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0

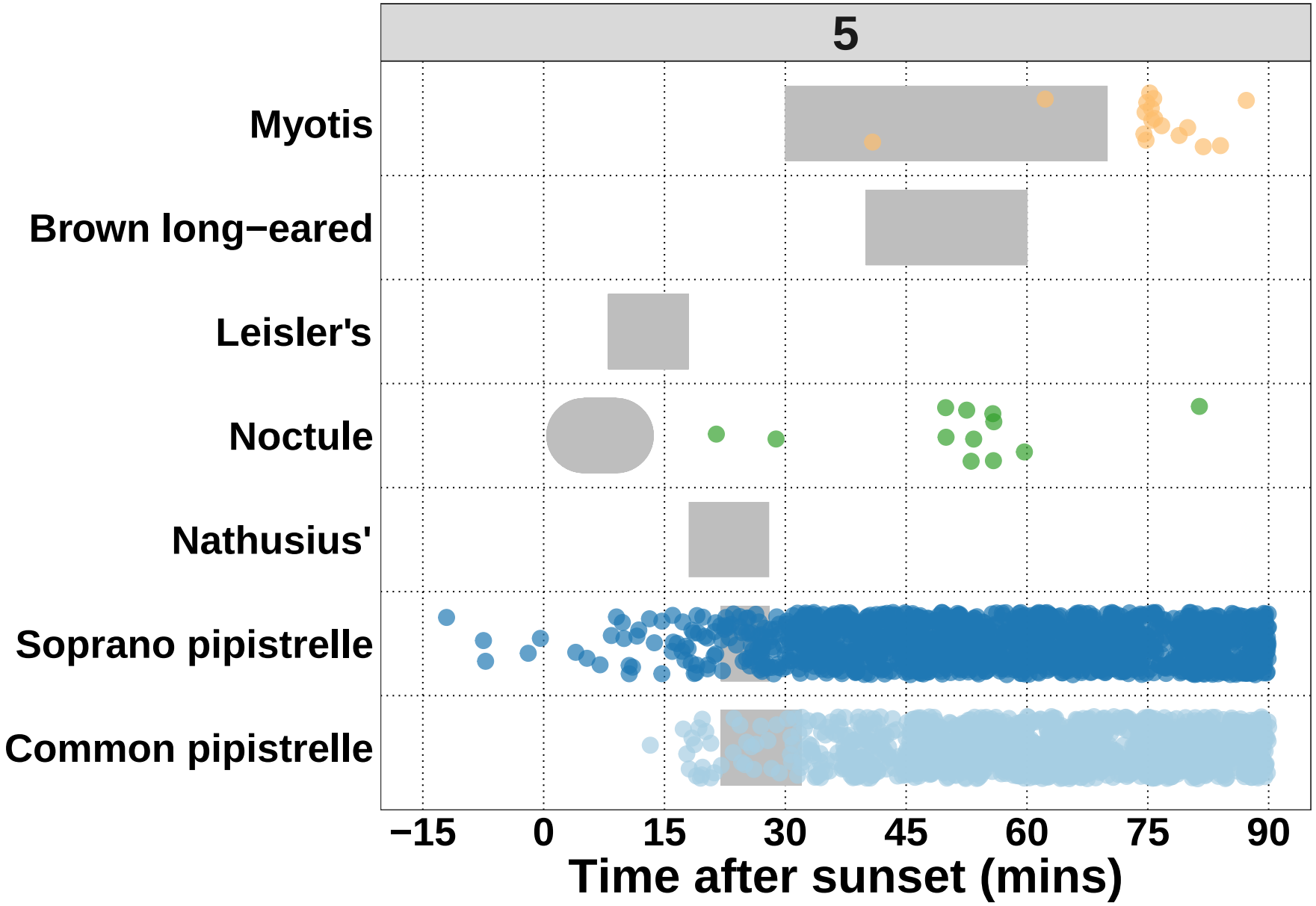
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012)

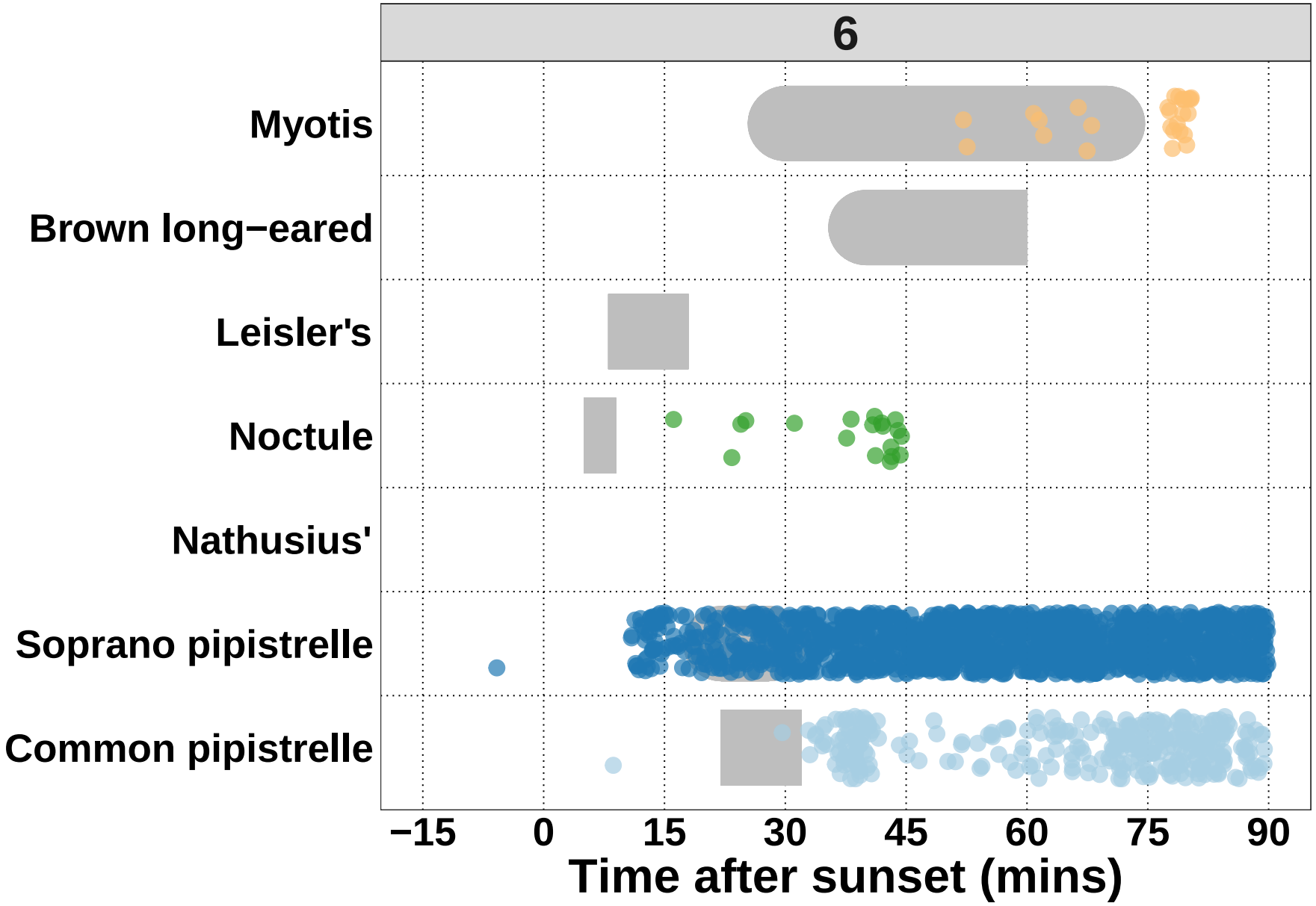
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.

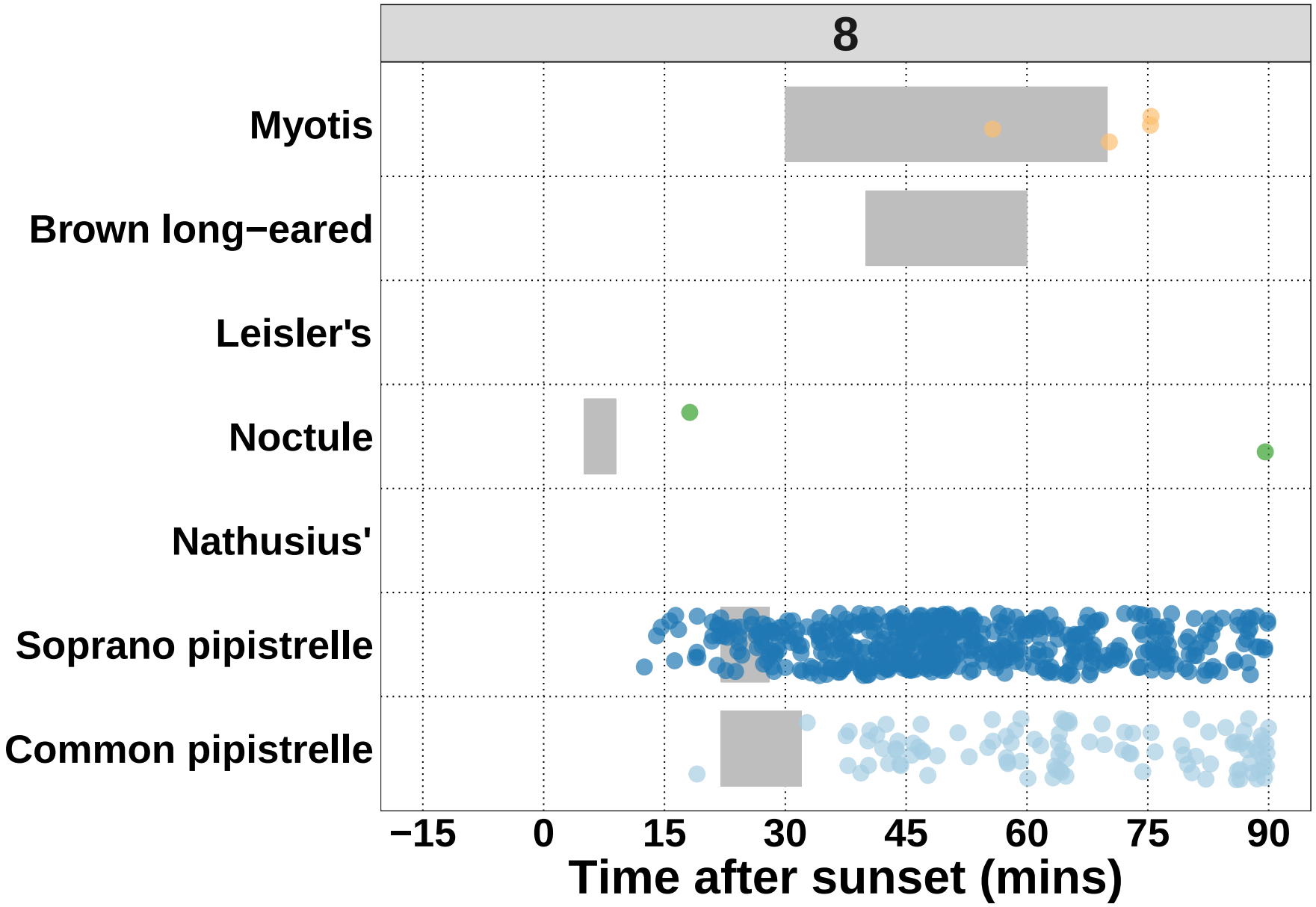

1
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

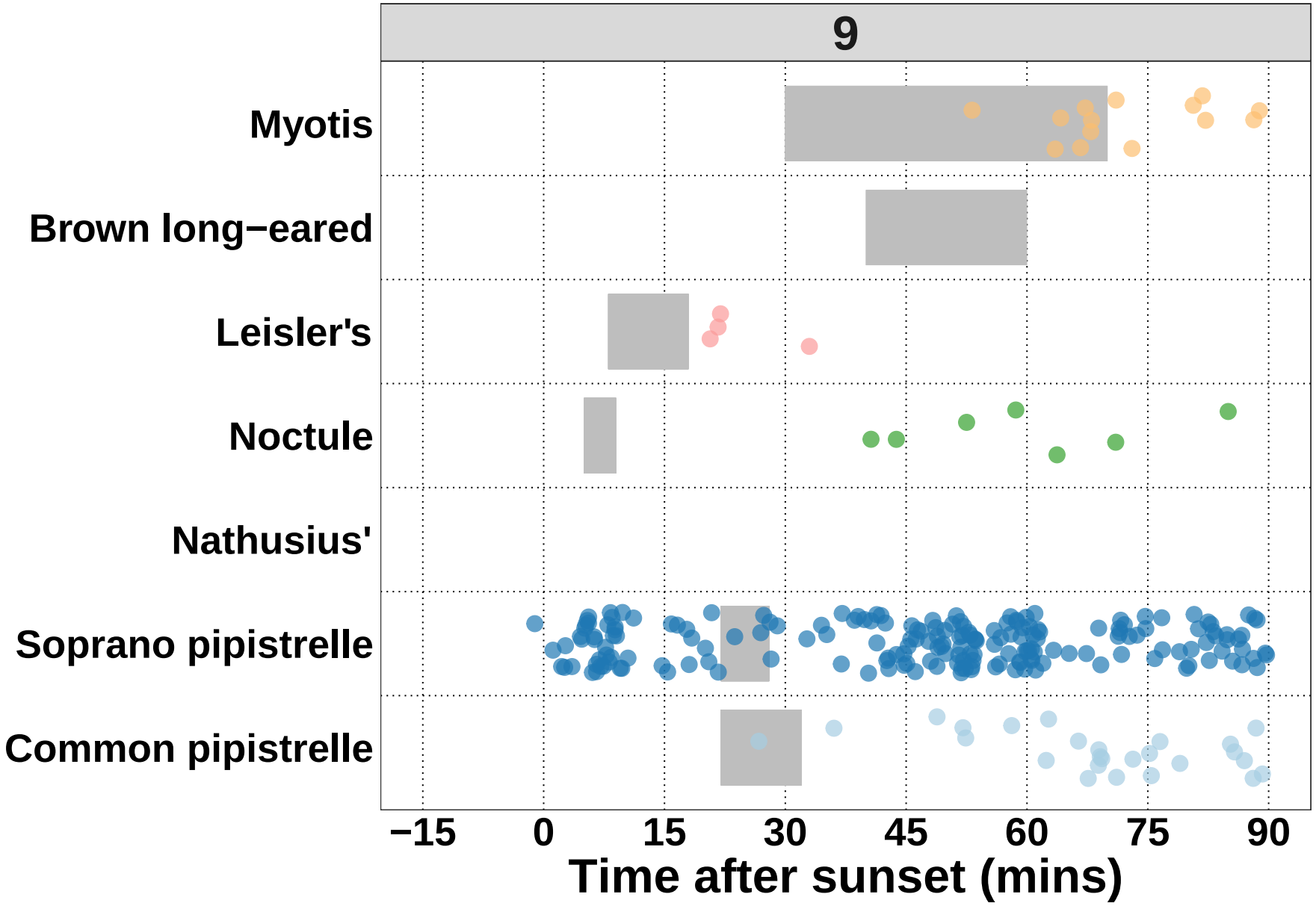

3
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

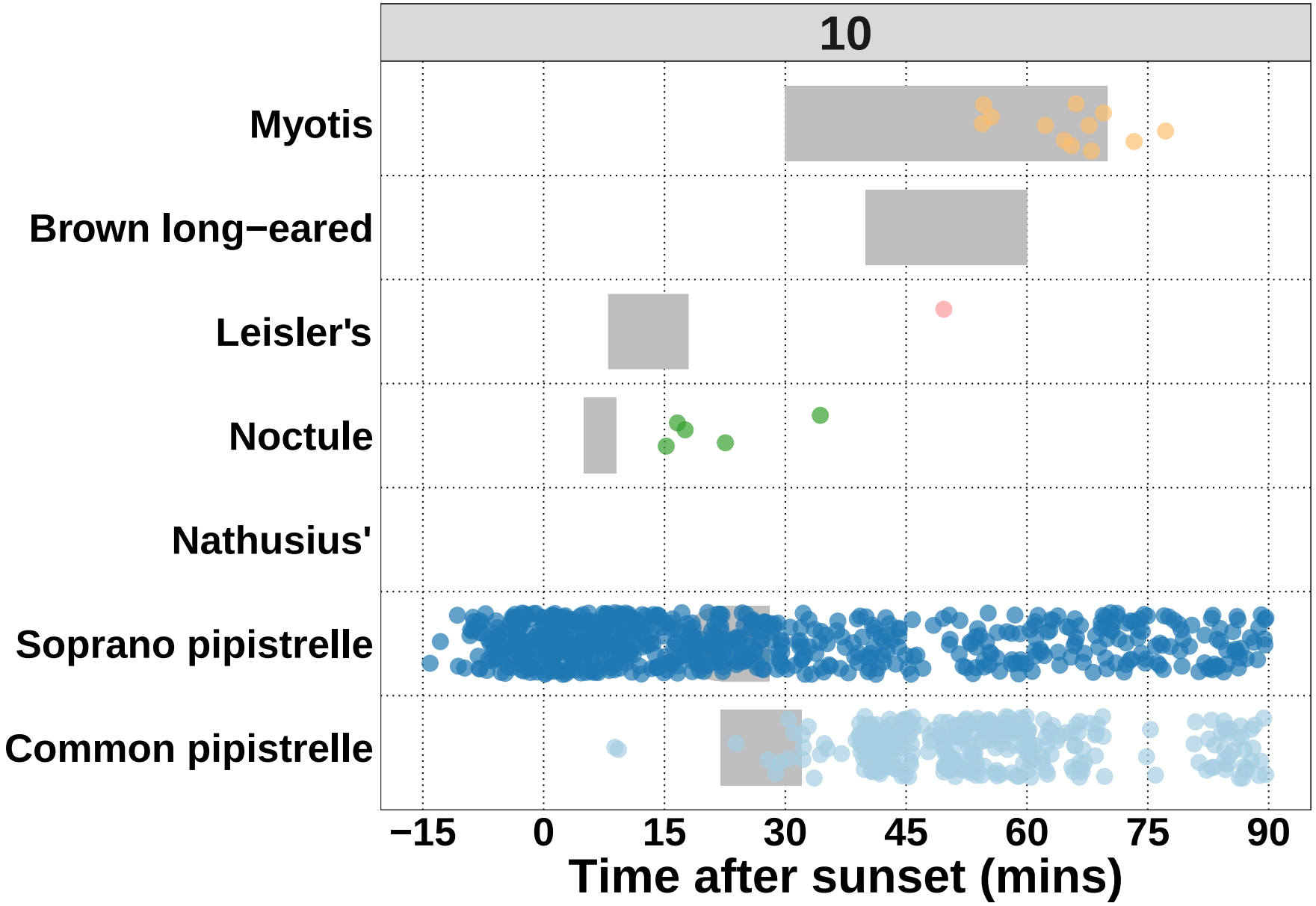

4
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

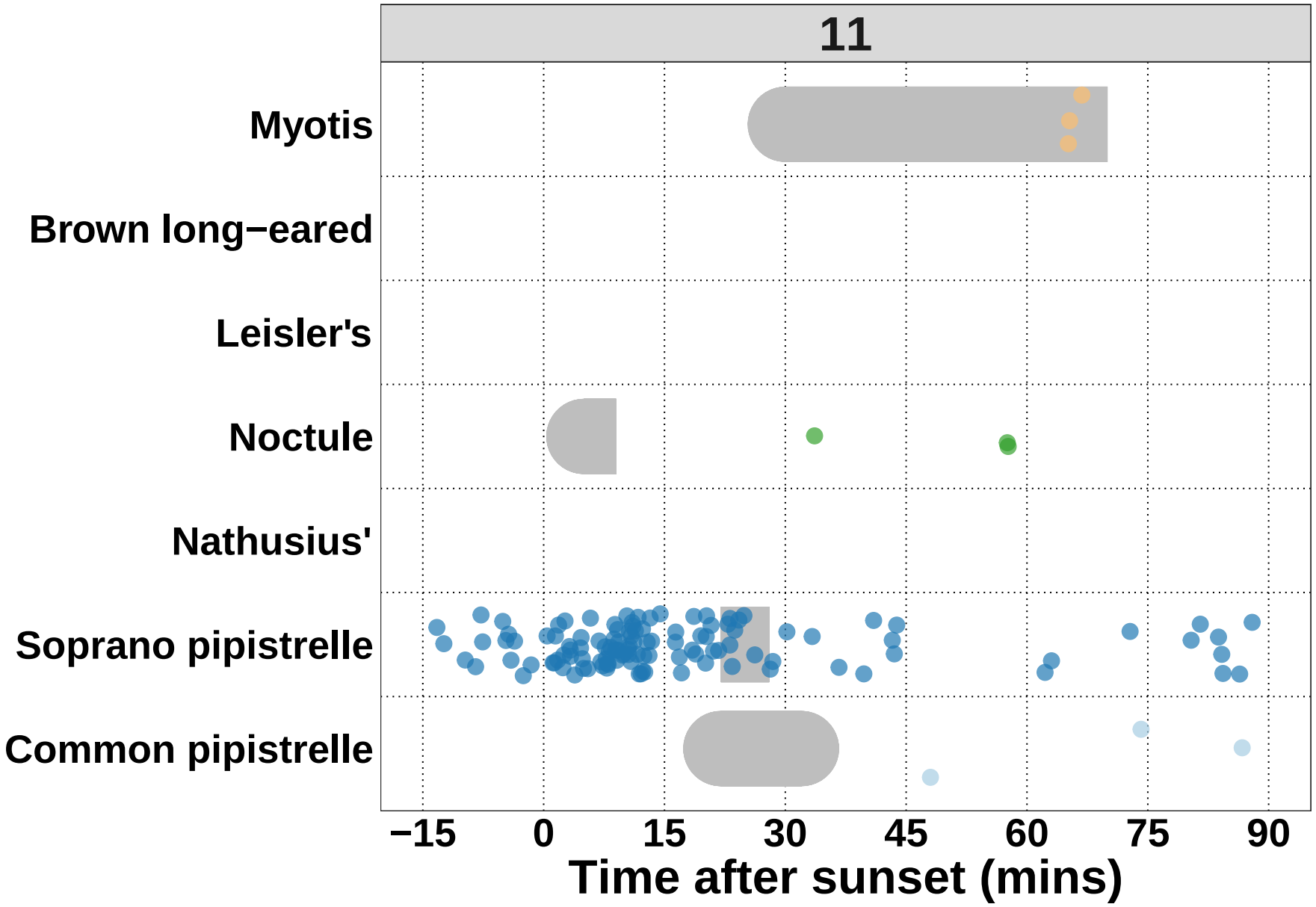

5
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

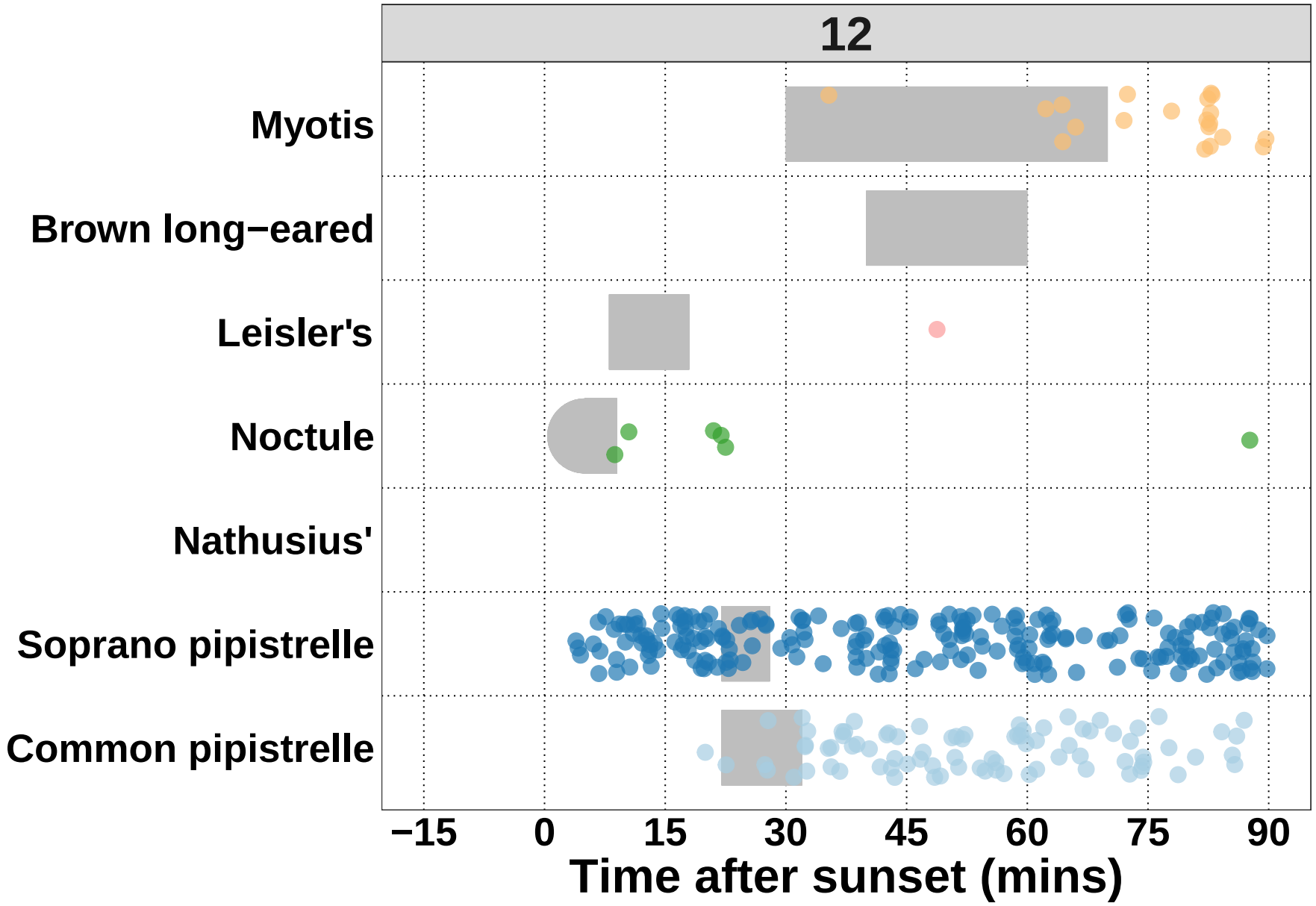

6
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

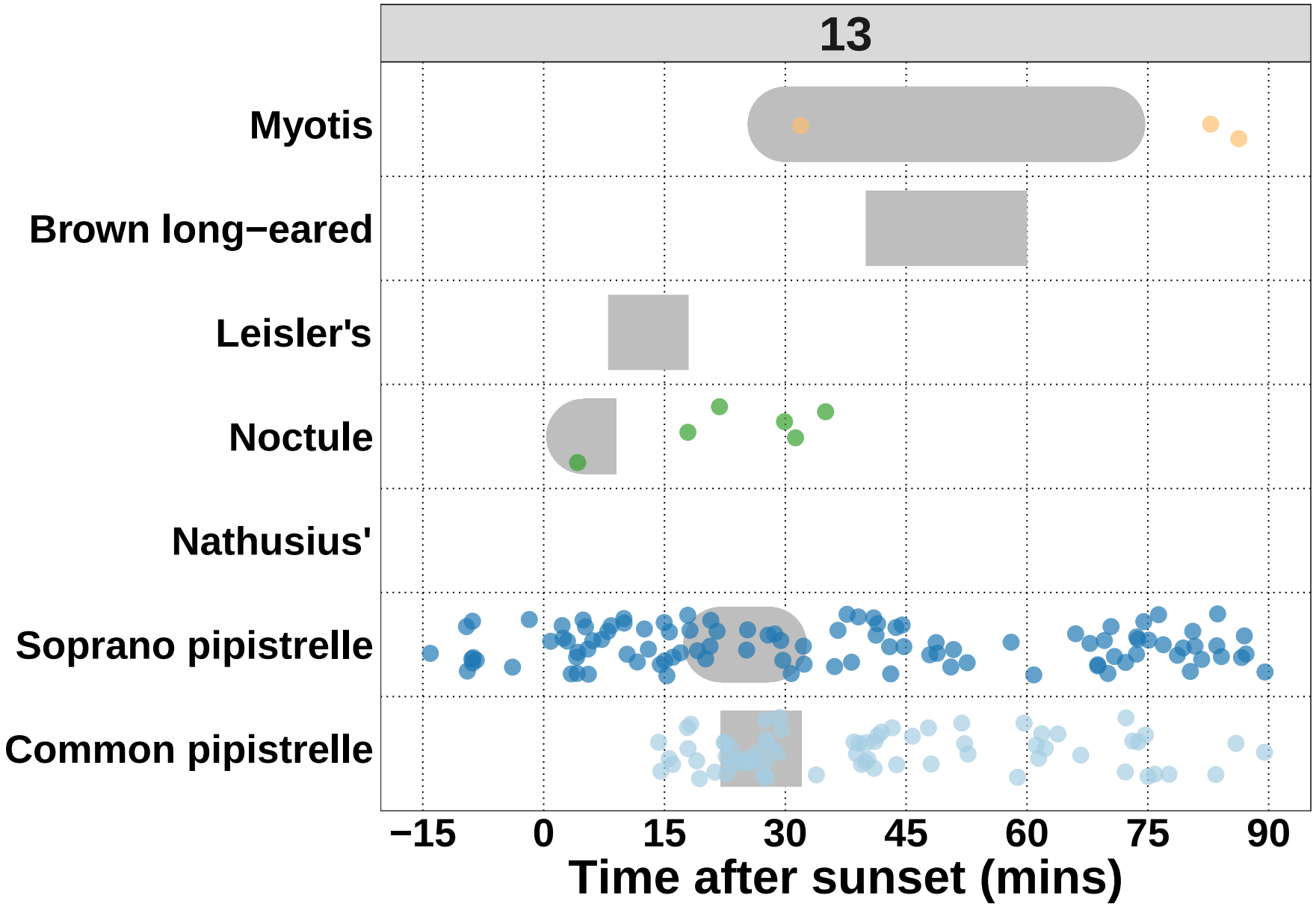

8
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


9
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


10
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


11
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


12
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


13
Myotis
Brown long−eared
Leisler's
Noctule
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

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

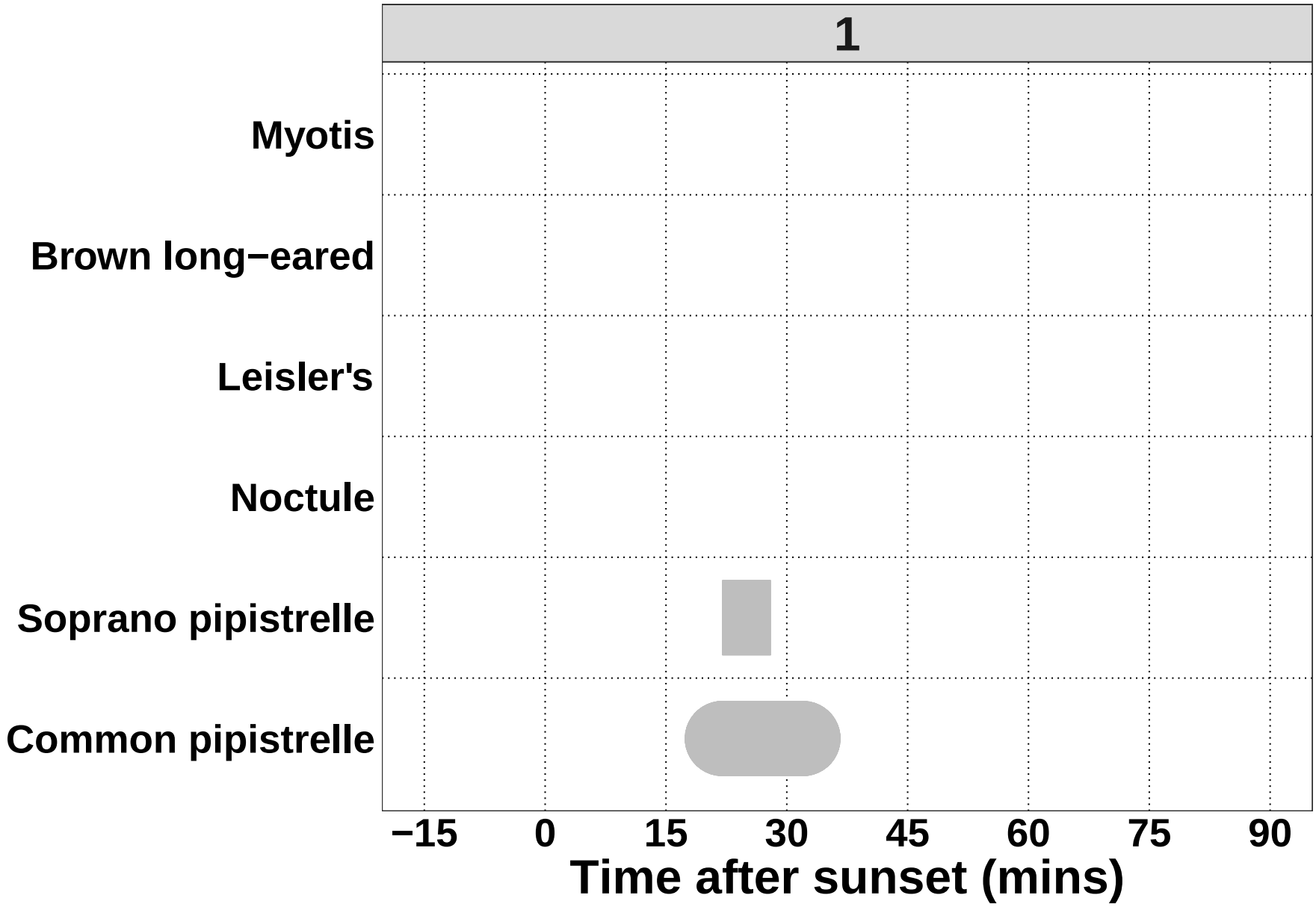
Table 16: Table continues below

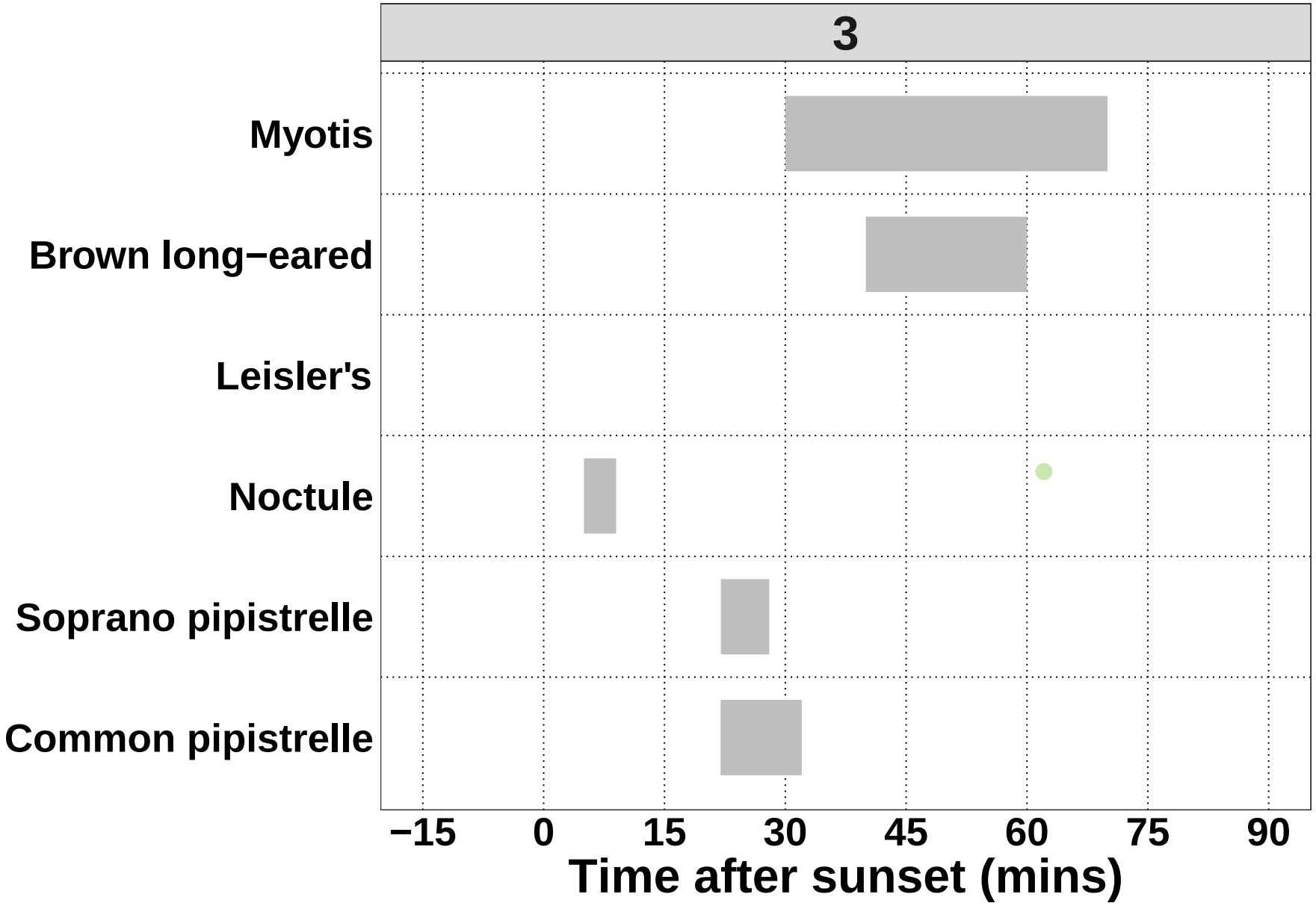
Species	Detector ID	2025-07-22	2025-07-23	2025-07-24	2025-07-25	2025-07-26
Common pipistrelle	5	0	0	0	0	0
Common pipistrelle	10	0	0	0	0	0
Common pipistrelle	12	0	0	0	0	0
Common pipistrelle	13	0	0	1	0	0
Soprano pipistrelle	4	2	0	0	5	0
Soprano pipistrelle	5	0	0	0	0	0
Soprano pipistrelle	9	0	0	0	0	0
Soprano pipistrelle	10	85	102	27	1	0
Soprano pipistrelle	11	0	0	1	0	0
Soprano pipistrelle	12	0	0	0	5	1
Soprano pipistrelle	13	0	0	0	1	0
Myotis	4	0	0	0	0	0
Myotis	6	0	0	0	0	0
Myotis	9	1	0	0	1	1
Myotis	10	1	1	1	0	0
Myotis	12	0	0	0	0	0
Myotis	13	0	0	0	1	0

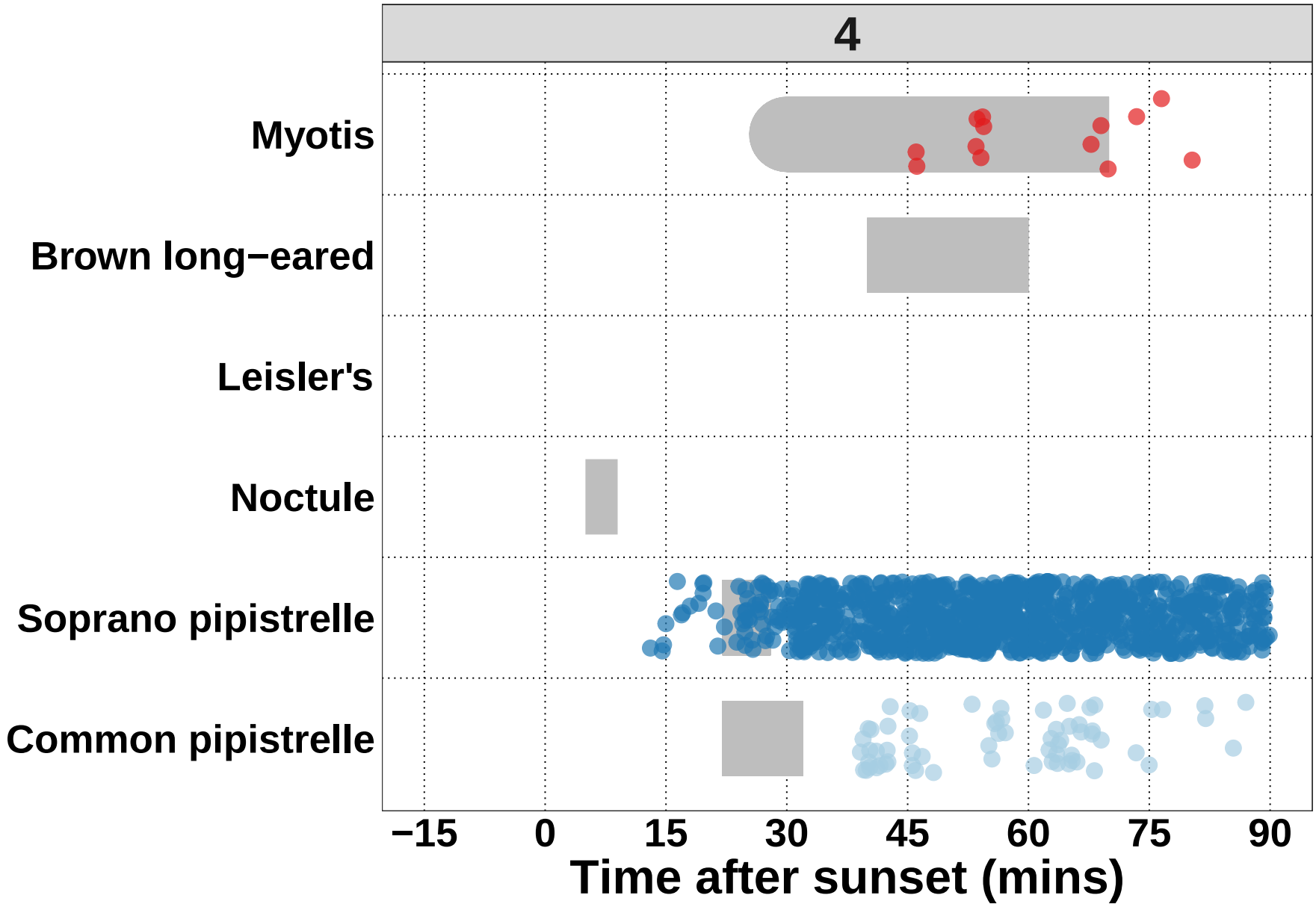
2025-07-27	2025-07-28	2025-07-29	2025-07-30
0	0	4	0
0	0	2	0
0	0	0	3
1	0	0	0
4	8	25	0
0	1	1	0
5	1	1	0
0	0	1	0
0	1	0	3
0	0	6	4
0	0	0	0

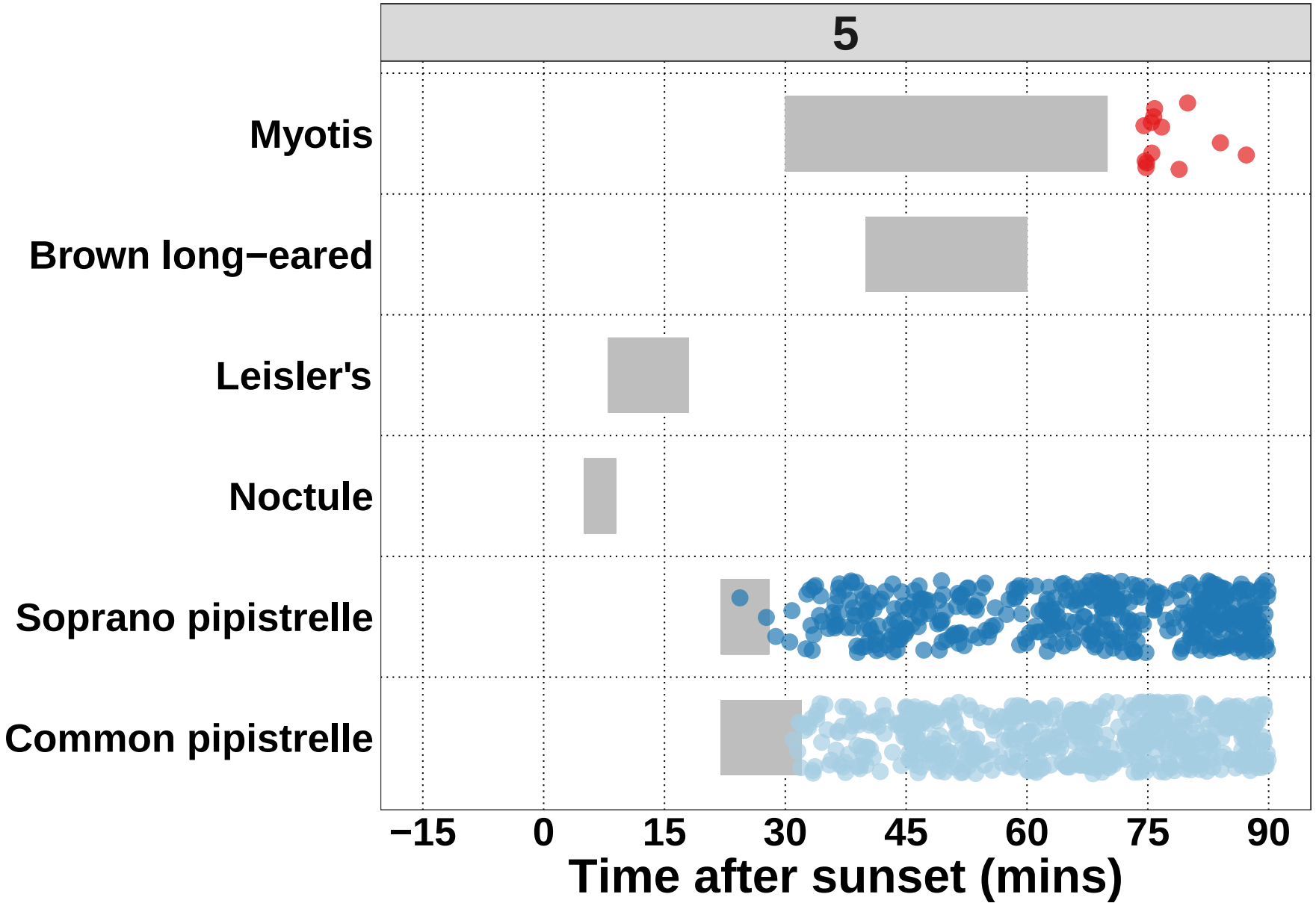
2025-07-27	2025-07-28	2025-07-29	2025-07-30
0	4	6	0
1	0	0	0
0	1	1	1
0	0	1	0
1	0	0	0
0	0	0	0

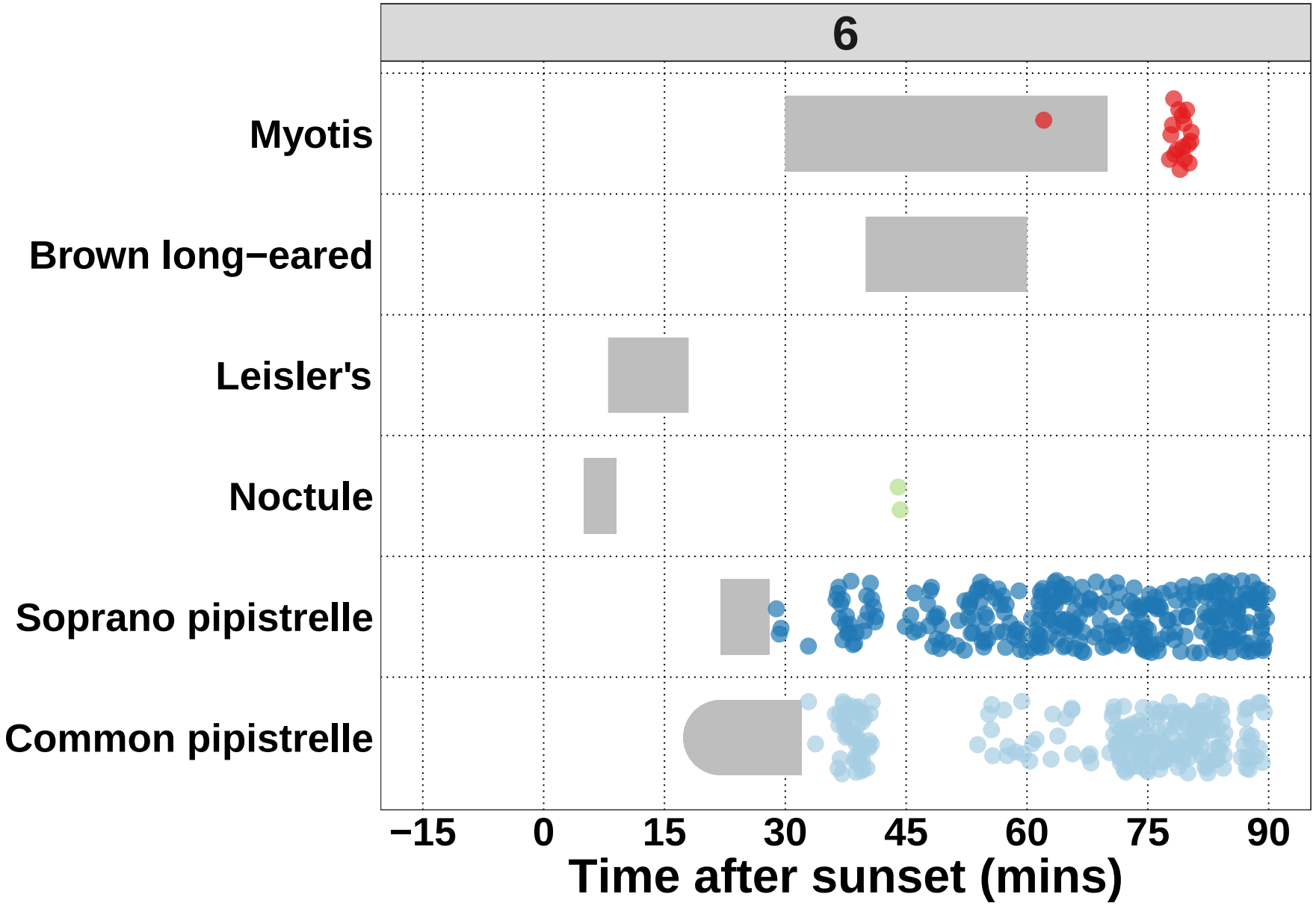
Bat Passes Potentially Indicating Close Proximity to a Roost (Maternity Period Only) - Maternity period defined as 15th June - 30th July.

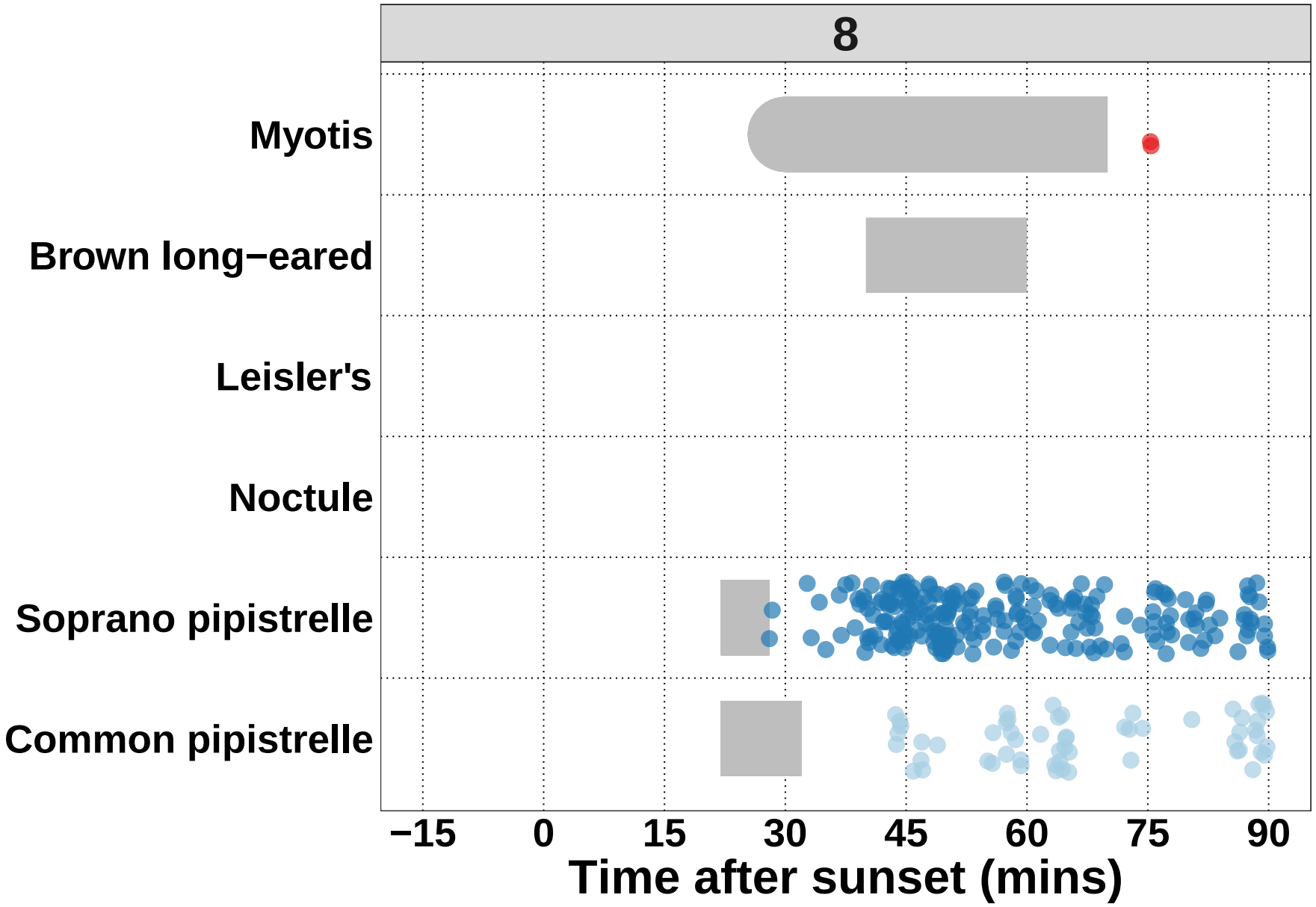

1
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

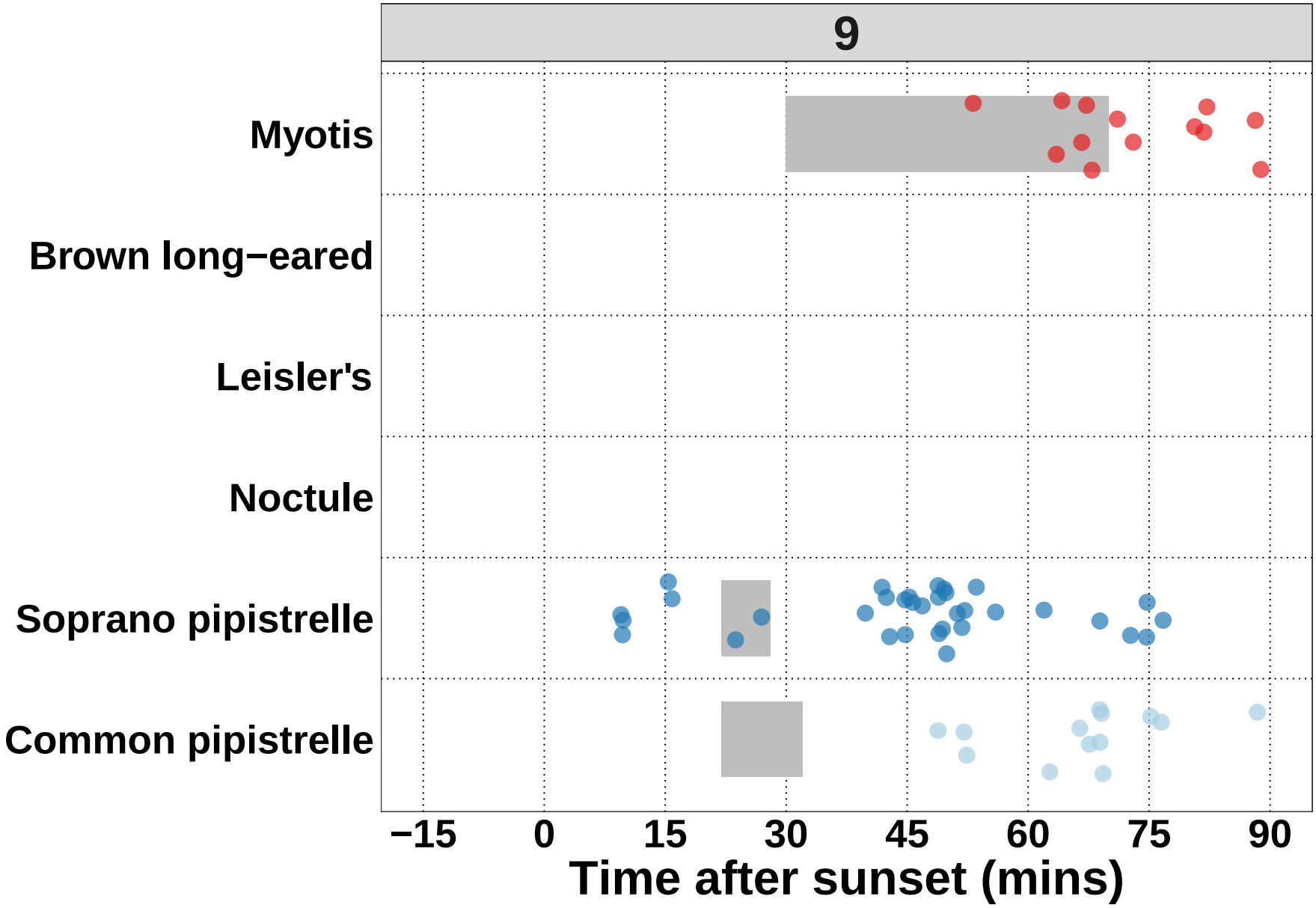

3
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

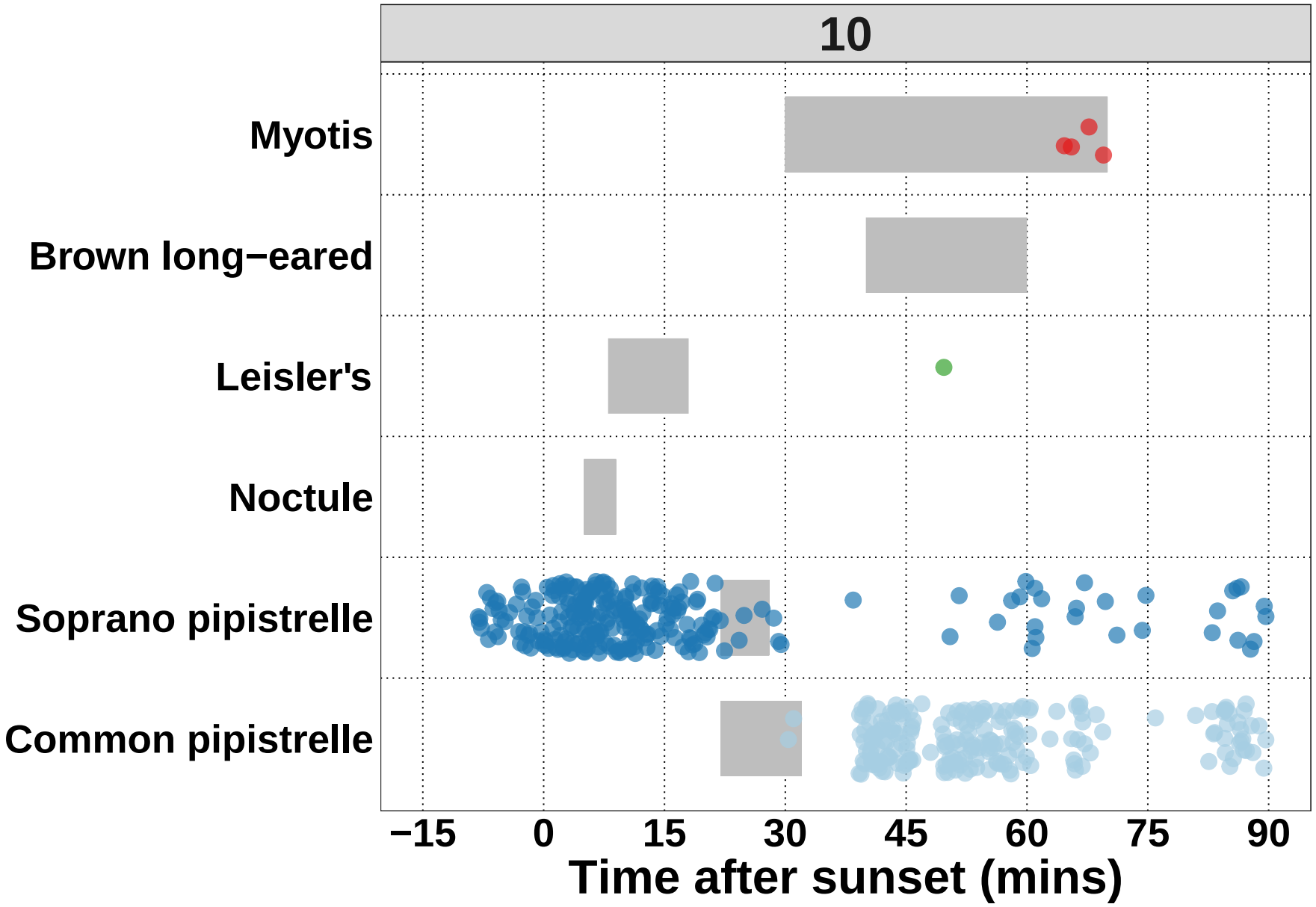

4
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

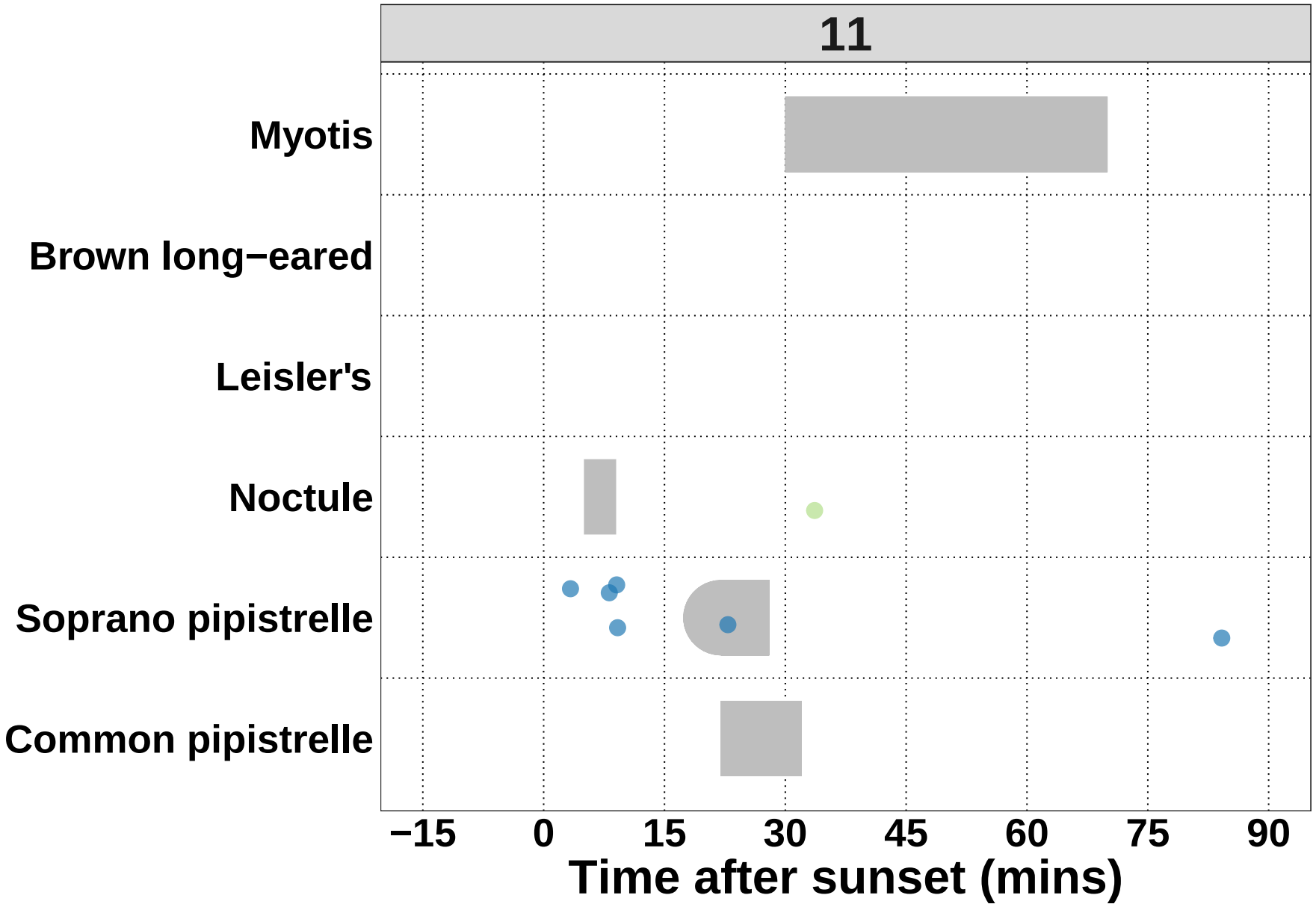

5
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

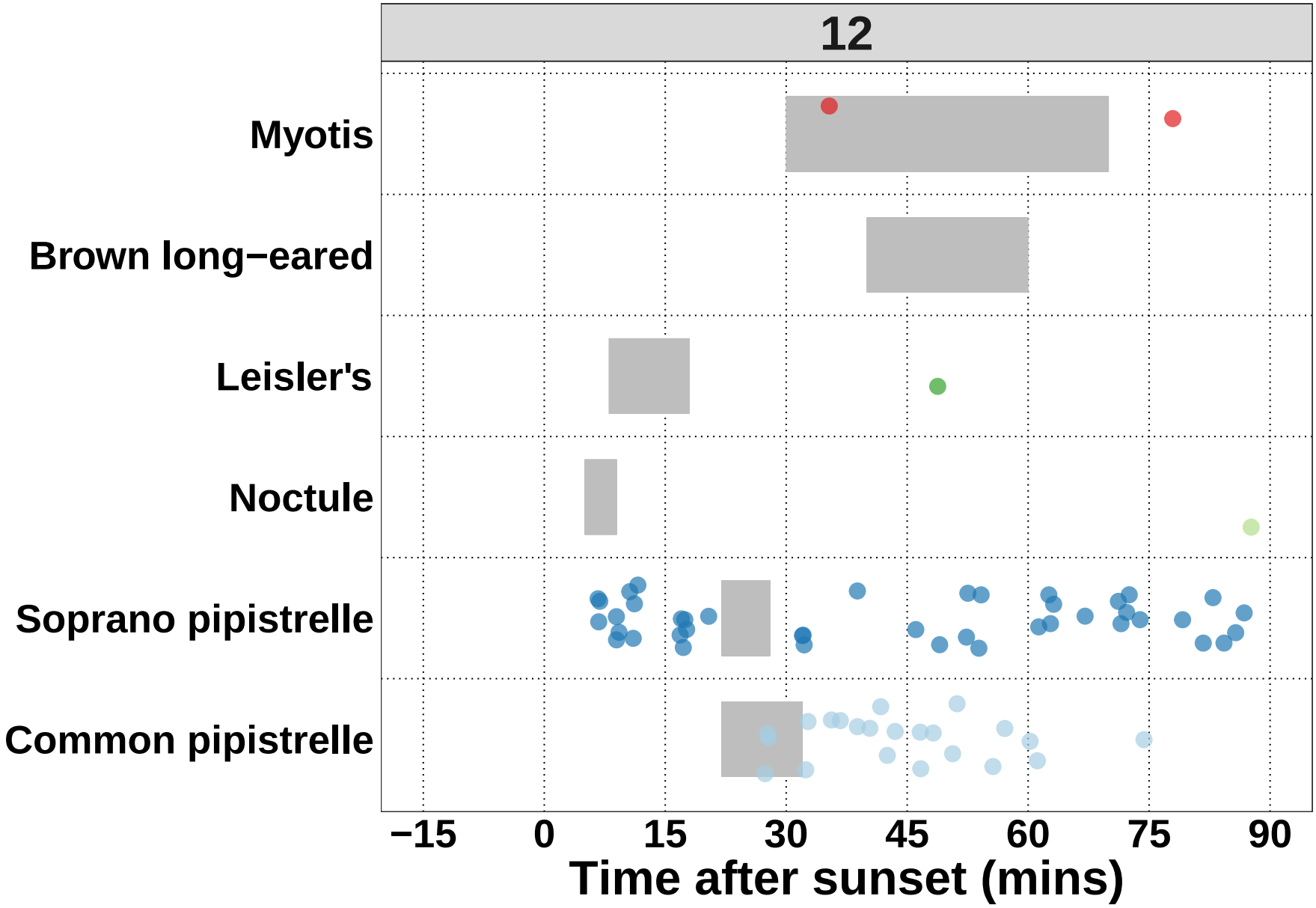

6
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

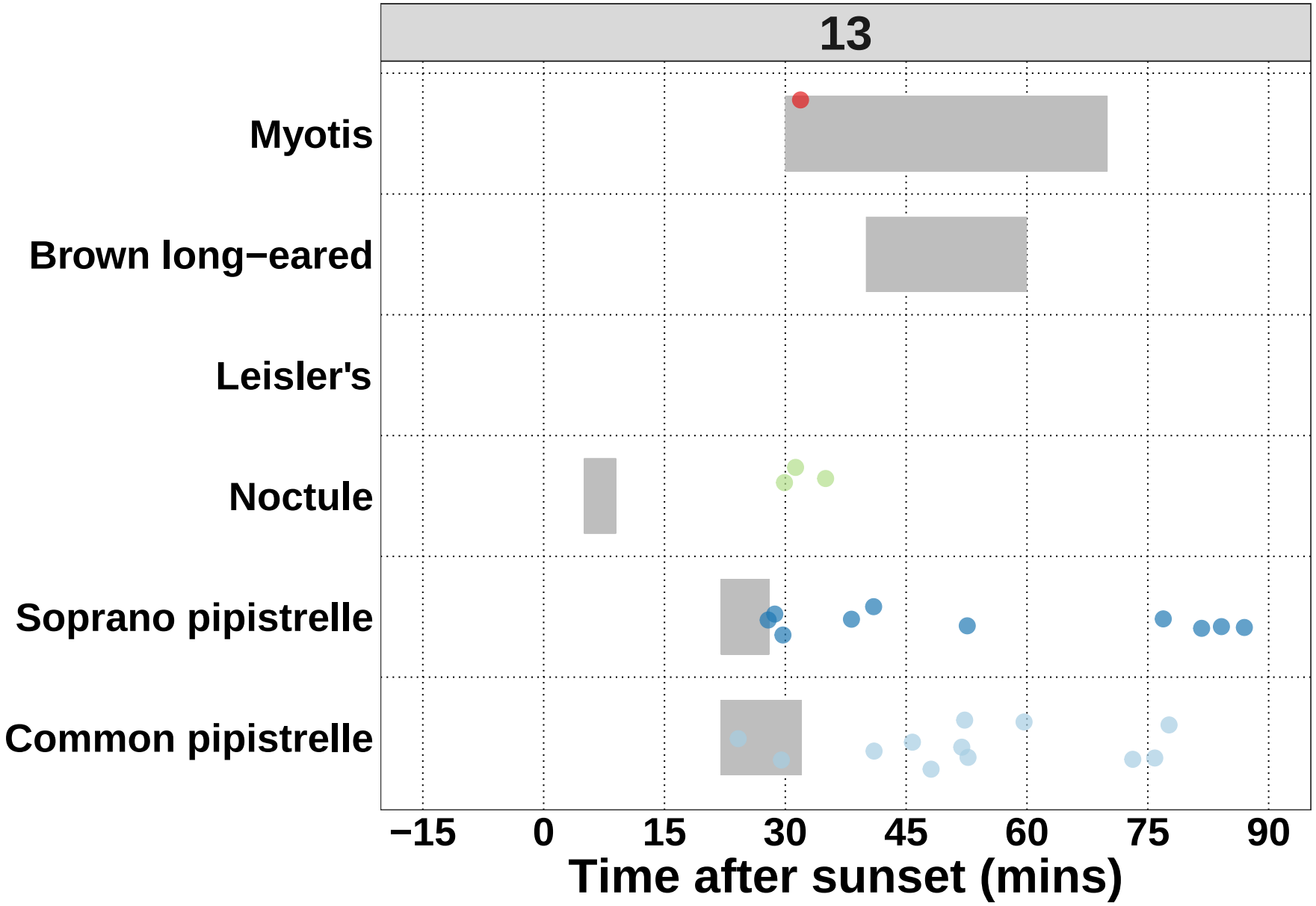

8
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


9
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


10
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


11
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


12
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


13
Myotis
Brown long−eared
Leisler's
Noctule
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

Count of Bat Passes

All Detectors

Table 14. The total number of passes recorded for each species across all of the detectors.

The 'Total' percentage may not be exactly 100% due to rounding of the percentages per species.

Species	Passes (no.)	Percentage of Total (%)
Myotis	1272	2.9
Nyctalus leisleri	22	0.1
Nyctalus noctula	149	0.3
Pipistrellus nathusii	1	0.0
Pipistrellus pipistrellus	14960	34.2
Pipistrellus pygmaeus	27332	62.4
Plecotus auritus	65	0.1
Total	43801	100.0

Per Detector

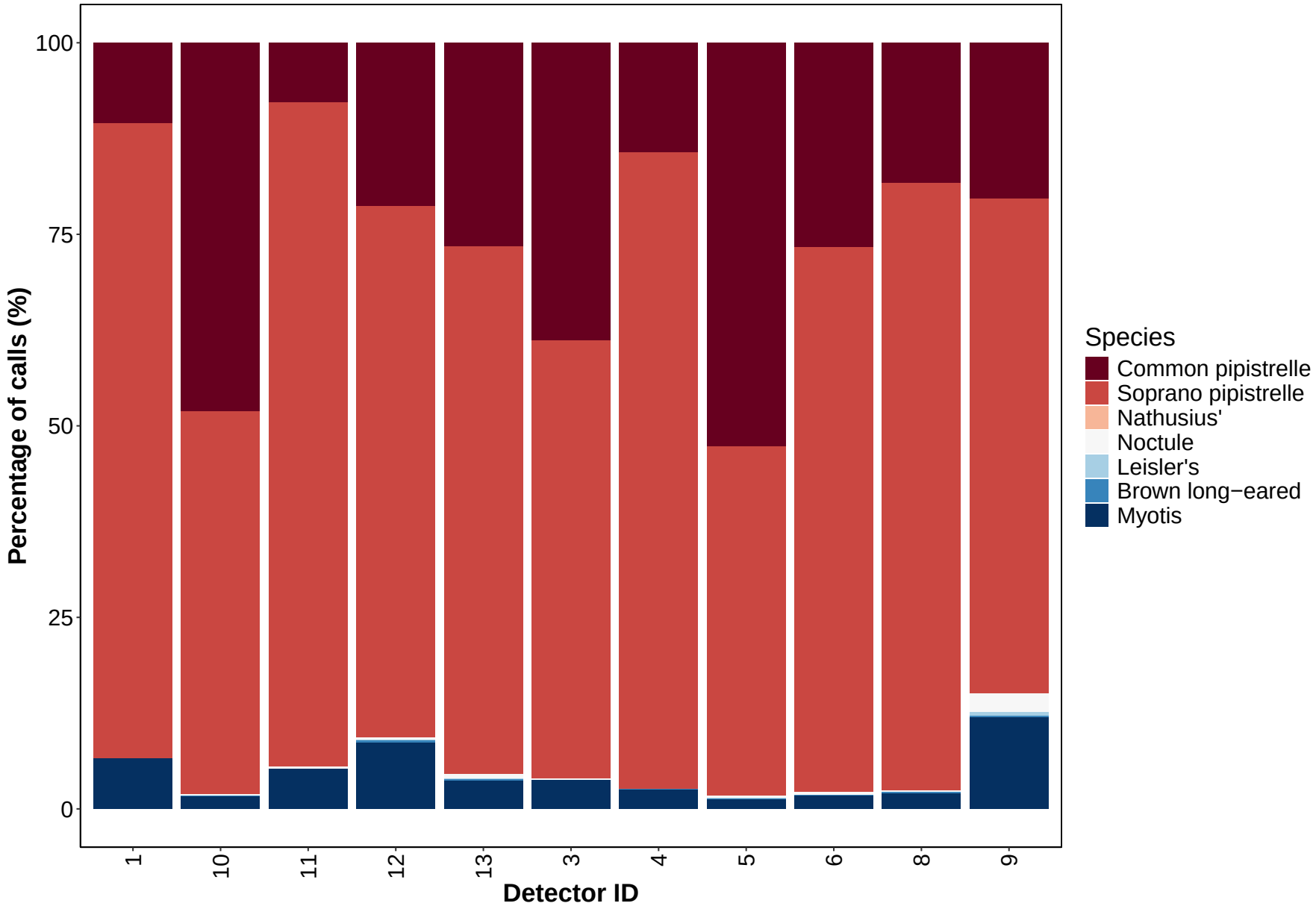
The number of passes recorded for each species at each detector.

Species	Detector ID	Count (no.)	Percentage by Detector (%)
Common pipistrelle	1	67	14.0461216
Common pipistrelle	3	306	40.9090909
Common pipistrelle	4	780	13.7517630
Common pipistrelle	5	8300	53.2290130
Common pipistrelle	6	2070	23.9527887
Common pipistrelle	8	312	18.0660104
Common pipistrelle	9	142	18.6107471
Common pipistrelle	10	1962	45.7983193
Common pipistrelle	11	209	9.5521024
Common pipistrelle	12	526	20.0993504
Common pipistrelle	13	286	26.2385321
Soprano pipistrelle	1	359	75.2620545
Soprano pipistrelle	3	398	53.2085561
Soprano pipistrelle	4	4719	83.1981664
Soprano pipistrelle	5	7056	45.2510742
Soprano pipistrelle	6	6297	72.8650775
Soprano pipistrelle	8	1360	78.7492762
Soprano pipistrelle	9	504	66.0550459
Soprano pipistrelle	10	2233	52.1241830
Soprano pipistrelle	11	1852	84.6435101
Soprano pipistrelle	12	1801	68.8192587
Soprano pipistrelle	13	753	69.0825688
Nathusius'	5	1	0.0064131
Noctule	3	2	0.2673797
Noctule	4	2	0.0352609
Noctule	5	39	0.2501122
Noctule	6	40	0.4628558
Noctule	8	4	0.2316155
Noctule	9	22	2.8833552
Noctule	10	14	0.3267974
Noctule	11	8	0.3656307
Noctule	12	10	0.3821169

Species	Detector ID	Count (no.)	Percentage by Detector (%)
Noctule	13	8	0.7339450
Leisler's	5	6	0.0384788
Leisler's	6	4	0.0462856
Leisler's	9	5	0.6553080
Leisler's	10	1	0.0233427
Leisler's	12	5	0.1910585
Leisler's	13	1	0.0917431
Brown long-eared	3	1	0.1336898
Brown long-eared	4	4	0.0705219
Brown long-eared	5	33	0.2116334
Brown long-eared	6	8	0.0925712
Brown long-eared	8	4	0.2316155
Brown long-eared	9	3	0.3931848
Brown long-eared	10	4	0.0933707
Brown long-eared	12	5	0.1910585
Brown long-eared	13	3	0.2752294
Myotis	1	51	10.6918239
Myotis	3	41	5.4812834
Myotis	4	167	2.9442877
Myotis	5	158	1.0132752
Myotis	6	223	2.5804212
Myotis	8	47	2.7214823
Myotis	9	87	11.4023591
Myotis	10	70	1.6339869
Myotis	11	119	5.4387569
Myotis	12	270	10.3171571
Myotis	13	39	3.5779817

Species Composition

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


Percentage of calls (%)
100
75
50
25
0
1
10
11
12
13
3
4
5
6
8
9
Detector ID
Species
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Leisler's
Brown long−eared
Myotis

Part 2a: Presence Only

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

Nighlty Bat Passes Per Hour

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Common pipistrelle	1	0.3
Common pipistrelle	10	3.8
Common pipistrelle	11	0.8
Common pipistrelle	12	1.5
Common pipistrelle	13	0.8
Common pipistrelle	3	0.8
Common pipistrelle	4	4.3
Common pipistrelle	5	40.7
Common pipistrelle	6	3.7
Common pipistrelle	8	1.4
Common pipistrelle	9	0.5
Soprano pipistrelle	1	0.3
Soprano pipistrelle	10	8.6
Soprano pipistrelle	11	2.5
Soprano pipistrelle	12	7.0
Soprano pipistrelle	13	2.6
Soprano pipistrelle	3	2.3
Soprano pipistrelle	4	20.3
Soprano pipistrelle	5	20.5
Soprano pipistrelle	6	28.0
Soprano pipistrelle	8	4.9
Soprano pipistrelle	9	2.8
Nathusius'	5	0.1
Noctule	10	0.2
Noctule	11	0.1
Noctule	12	0.1
Noctule	13	0.2
Noctule	3	0.1
Noctule	4	0.1
Noctule	5	0.5
Noctule	6	0.5
Noctule	8	0.1
Noctule	9	0.3
Leisler's	10	0.1
Leisler's	12	0.1
Leisler's	13	0.1

Species	Detector ID	Median Pass Rate
Leisler's	5	0.3
Leisler's	6	0.1
Leisler's	9	0.2
Brown long-eared	10	0.1
Brown long-eared	12	0.4
Brown long-eared	13	0.1
Brown long-eared	3	0.1
Brown long-eared	4	0.3
Brown long-eared	5	0.3
Brown long-eared	6	0.1
Brown long-eared	8	0.1
Brown long-eared	9	0.1
Myotis	1	3.4
Myotis	10	0.3
Myotis	11	0.3
Myotis	12	0.4
Myotis	13	0.2
Myotis	3	0.7
Myotis	4	0.8
Myotis	5	0.6
Myotis	6	0.4
Myotis	8	0.3
Myotis	9	0.6

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.

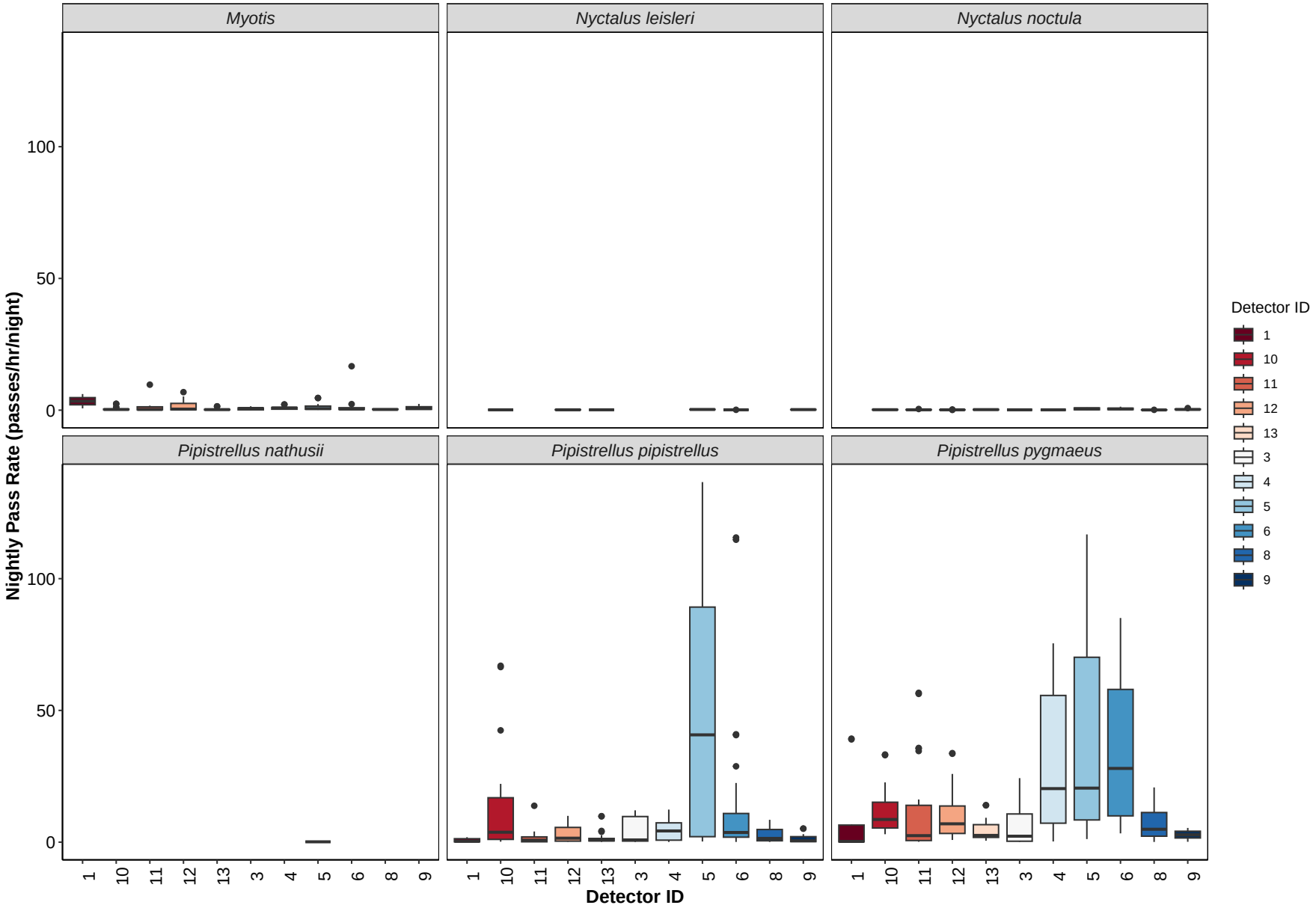
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

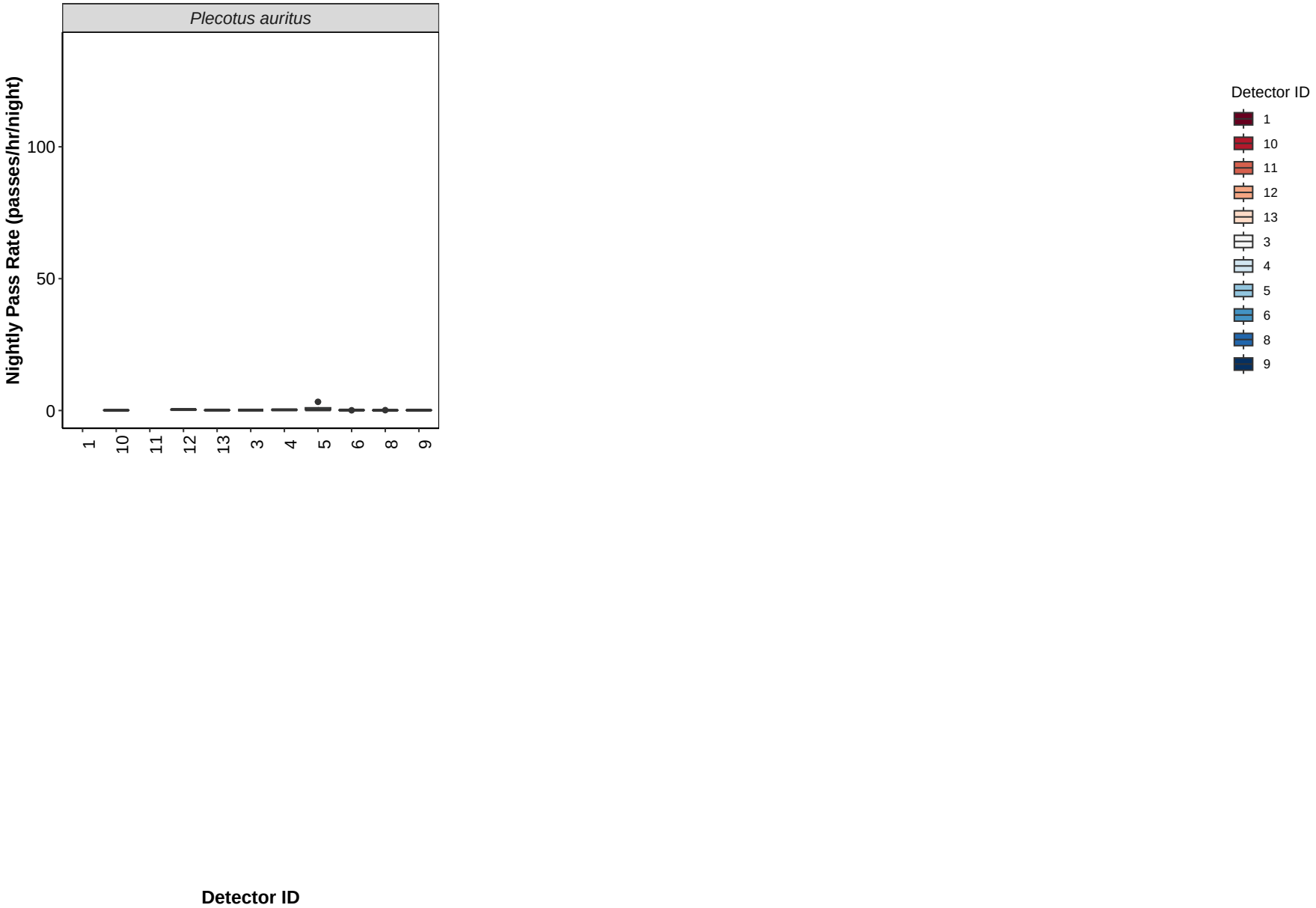
Species	Detector ID	Mean Pass Rate
Common pipistrelle	1	0.7
Common pipistrelle	10	13.0
Common pipistrelle	11	2.1
Common pipistrelle	12	3.2
Common pipistrelle	13	1.8
Common pipistrelle	3	4.5
Common pipistrelle	4	4.6
Common pipistrelle	5	47.1
Common pipistrelle	6	17.2
Common pipistrelle	8	2.6
Common pipistrelle	9	1.3
Soprano pipistrelle	1	9.6
Soprano pipistrelle	10	11.5
Soprano pipistrelle	11	12.1
Soprano pipistrelle	12	10.2
Soprano pipistrelle	13	4.4
Soprano pipistrelle	3	7.6
Soprano pipistrelle	4	28.1
Soprano pipistrelle	5	40.0
Soprano pipistrelle	6	35.6
Soprano pipistrelle	8	7.6
Soprano pipistrelle	9	2.9
Nathusius'	5	0.1
Noctule	10	0.2
Noctule	11	0.2
Noctule	12	0.1
Noctule	13	0.2
Noctule	3	0.1
Noctule	4	0.1
Noctule	5	0.5

Species	Detector ID	Mean Pass Rate
Noctule	6	0.5
Noctule	8	0.1
Noctule	9	0.4
Leisler's	10	0.1
Leisler's	12	0.2
Leisler's	13	0.1
Leisler's	5	0.3
Leisler's	6	0.1
Leisler's	9	0.2
Brown long-eared	10	0.1
Brown long-eared	12	0.3
Brown long-eared	13	0.1
Brown long-eared	3	0.1
Brown long-eared	4	0.3
Brown long-eared	5	1.0
Brown long-eared	6	0.1
Brown long-eared	8	0.1
Brown long-eared	9	0.1
Myotis	1	3.4
Myotis	10	0.5
Myotis	11	1.3
Myotis	12	1.6
Myotis	13	0.3
Myotis	3	0.6
Myotis	4	0.8
Myotis	5	1.1
Myotis	6	1.6
Myotis	8	0.3
Myotis	9	0.9

Per Detector

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


Myotis
Nyctalus leisleri
Nyctalus noctula
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Nightly Pass Rate (passes/hr/night)
0
50
100
1
10
11
12
13
3
4
5
6
8
9
Detector ID
Detector ID


Plecotus auritus
Nightly Pass Rate (passes/hr/night)
100
50
0
1
10
11
12
13
3
4
5
6
8
9
Detector ID
Detector ID
1
10
11
12
13
3
4
5
6
8
9

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	May	Jul	Sep
Common pipistrelle	1	53	25	4
Common pipistrelle	10	505	2078	97
Common pipistrelle	11	48	153	3
Common pipistrelle	12	254	350	89
Common pipistrelle	13	203	92	75
Common pipistrelle	3	417	3	8
Common pipistrelle	4	399	490	126
Common pipistrelle	5	3364	6485	179
Common pipistrelle	6	235	2934	130
Common pipistrelle	8	102	258	62
Common pipistrelle	9	37	140	15
Soprano pipistrelle	1	636	5	6
Soprano pipistrelle	10	900	1137	739
Soprano pipistrelle	11	41	2043	194
Soprano pipistrelle	12	939	1038	271
Soprano pipistrelle	13	215	503	242
Soprano pipistrelle	3	601	2	25
Soprano pipistrelle	4	1107	3806	971
Soprano pipistrelle	5	3328	4706	646
Soprano pipistrelle	6	1037	4273	3491
Soprano pipistrelle	8	412	967	455
Soprano pipistrelle	9	129	226	253
Nathusius'	5	1	0	0
Noctule	10	2	3	7
Noctule	11	1	2	5
Noctule	12	1	3	6
Noctule	13	1	3	4
Noctule	3	0	2	0
Noctule	4	0	2	0
Noctule	5	34	5	17
Noctule	6	3	14	23
Noctule	8	1	0	3
Noctule	9	5	0	18
Leisler's	10	0	1	0
Leisler's	12	2	2	0
Leisler's	13	1	0	0

Species	Detector ID	May	Jul	Sep
Leisler's	5	2	4	0
Leisler's	6	2	2	0
Leisler's	9	0	0	5
Brown long-eared	10	0	1	2
Brown long-eared	12	0	7	0
Brown long-eared	13	0	2	1
Brown long-eared	3	0	1	0
Brown long-eared	4	0	4	0
Brown long-eared	5	2	30	0
Brown long-eared	6	0	3	5
Brown long-eared	8	0	1	3
Brown long-eared	9	1	0	1
Myotis	1	51	0	0
Myotis	10	13	61	18
Myotis	11	20	107	10
Myotis	12	233	25	23
Myotis	13	7	30	14
Myotis	3	34	1	6
Myotis	4	22	64	93
Myotis	5	35	158	33
Myotis	6	28	165	21
Myotis	8	8	20	19
Myotis	9	0	90	22

Survey Effort

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

month	Detector ID	No. of Survey Nights
May	1	5
May	10	9
May	11	5
May	12	8
May	13	7
May	3	9
May	4	9
May	5	10
May	6	8
May	8	9
May	9	6
Jul	1	8
Jul	10	10
Jul	11	10
Jul	12	10
Jul	13	10
Jul	3	5
Jul	4	10
Jul	5	9
Jul	6	10
Jul	8	10
Jul	9	10
Sep	1	4
Sep	10	10
Sep	11	10
Sep	12	10
Sep	13	10
Sep	3	4
Sep	4	10
Sep	5	10
Sep	6	10
Sep	8	10

month	Detector ID	No. of Survey Nights
Sep	9	10

Nightly Bat Passes for Each Month

Median Per Detector

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

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

Species	Detector ID	May	Jul	Sep
Common pipistrelle	1	1.7	0.3	0.1
Common pipistrelle	10	3.7	16.9	0.5
Common pipistrelle	11	2.3	0.8	0.1
Common pipistrelle	12	3.2	3.6	0.3
Common pipistrelle	13	1.4	0.8	0.5
Common pipistrelle	3	8.5	0.4	0.2
Common pipistrelle	4	7.3	5.8	0.5
Common pipistrelle	5	50.4	103.5	0.9
Common pipistrelle	6	2.8	25.6	0.9
Common pipistrelle	8	1.4	1.7	1.1
Common pipistrelle	9	1.3	0.9	0.2
Soprano pipistrelle	1	22.7	0.1	0.5
Soprano pipistrelle	10	8.7	15.1	5.4
Soprano pipistrelle	11	1.5	25.4	0.6
Soprano pipistrelle	12	11.3	13.1	1.8
Soprano pipistrelle	13	4.6	6.1	2.1
Soprano pipistrelle	3	10.7	0.1	0.4
Soprano pipistrelle	4	7.8	57.7	5.5
Soprano pipistrelle	5	31.3	70.0	3.2
Soprano pipistrelle	6	10.4	59.3	21.0
Soprano pipistrelle	8	4.3	13.5	1.1
Soprano pipistrelle	9	3.2	4.2	2.2
Nathusius'	5	0.1	NA	NA
Noctule	10	0.3	0.2	0.1
Noctule	11	0.1	0.1	0.4
Noctule	12	0.1	0.1	0.2
Noctule	13	0.1	0.4	0.2
Noctule	3	NA	0.1	NA
Noctule	4	NA	0.1	NA
Noctule	5	0.9	0.3	0.2
Noctule	6	0.4	0.7	0.3
Noctule	8	0.1	NA	0.1
Noctule	9	0.3	NA	0.3
Leisler's	10	NA	0.1	NA
Leisler's	12	0.3	0.1	NA
Leisler's	13	0.1	NA	NA

Species	Detector ID	May	Jul	Sep
Leisler's	5	0.3	0.3	NA
Leisler's	6	0.1	0.1	NA
Leisler's	9	NA	NA	0.2
Brown long-eared	10	NA	0.1	0.1
Brown long-eared	12	NA	0.4	NA
Brown long-eared	13	NA	0.1	0.1
Brown long-eared	3	NA	0.1	NA
Brown long-eared	4	NA	0.3	NA
Brown long-eared	5	0.3	0.3	NA
Brown long-eared	6	NA	0.1	0.2
Brown long-eared	8	NA	0.1	0.1
Brown long-eared	9	0.1	NA	0.1
Myotis	1	3.4	NA	NA
Myotis	10	0.3	0.7	0.2
Myotis	11	1.3	1.7	0.1
Myotis	12	5.1	0.4	0.2
Myotis	13	0.3	0.3	0.2
Myotis	3	0.8	0.1	0.1
Myotis	4	0.8	0.9	0.9
Myotis	5	0.6	1.8	0.3
Myotis	6	0.4	0.9	0.3
Myotis	8	0.3	0.4	0.2
Myotis	9	NA	1.3	0.3

Mean Per Detector

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

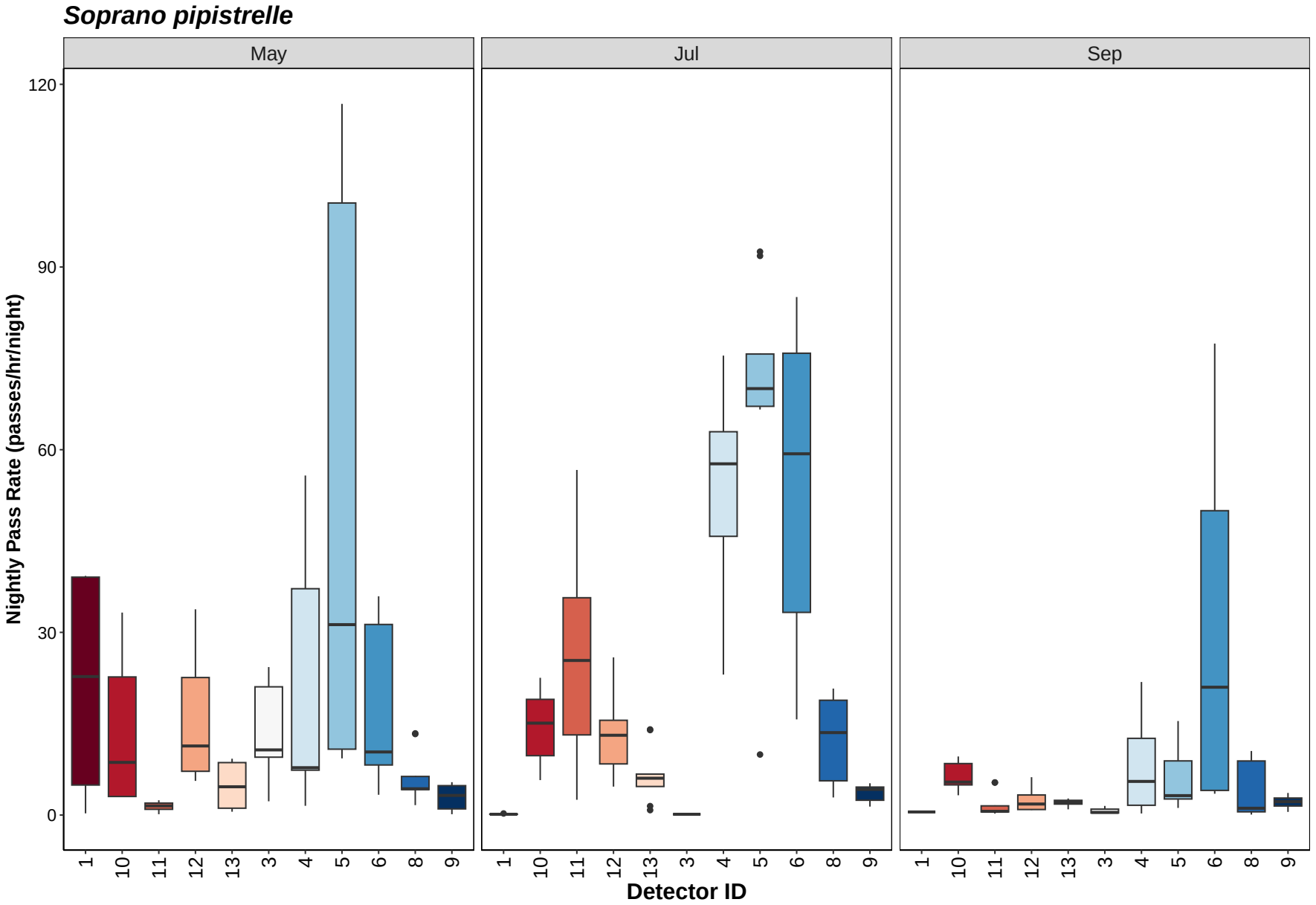
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

Species	Detector ID	May	Jul	Sep
Common pipistrelle	1	1.4	0.4	0.1
Common pipistrelle	10	7.6	27.4	1.0
Common pipistrelle	11	2.2	2.9	0.1
Common pipistrelle	12	4.9	4.5	0.8
Common pipistrelle	13	3.9	1.3	0.6
Common pipistrelle	3	6.3	0.4	0.2
Common pipistrelle	4	6.1	6.3	1.2
Common pipistrelle	5	46.0	93.7	1.7
Common pipistrelle	6	4.0	38.6	1.6
Common pipistrelle	8	2.3	3.7	1.1
Common pipistrelle	9	1.3	2.0	0.2
Soprano pipistrelle	1	21.3	0.2	0.5
Soprano pipistrelle	10	13.5	14.9	6.4
Soprano pipistrelle	11	1.4	26.9	1.6
Soprano pipistrelle	12	16.0	13.5	2.3
Soprano pipistrelle	13	4.8	6.5	2.1
Soprano pipistrelle	3	13.6	0.1	0.7
Soprano pipistrelle	4	22.0	54.8	8.4
Soprano pipistrelle	5	50.1	68.0	5.6
Soprano pipistrelle	6	17.6	55.5	30.2
Soprano pipistrelle	8	6.2	12.5	3.9
Soprano pipistrelle	9	2.9	3.7	2.2
Nathusius'	5	0.1	NA	NA
Noctule	10	0.3	0.2	0.1
Noctule	11	0.1	0.1	0.4
Noctule	12	0.1	0.1	0.2
Noctule	13	0.1	0.4	0.2
Noctule	3	NA	0.1	NA
Noctule	4	NA	0.1	NA
Noctule	5	0.8	0.3	0.3

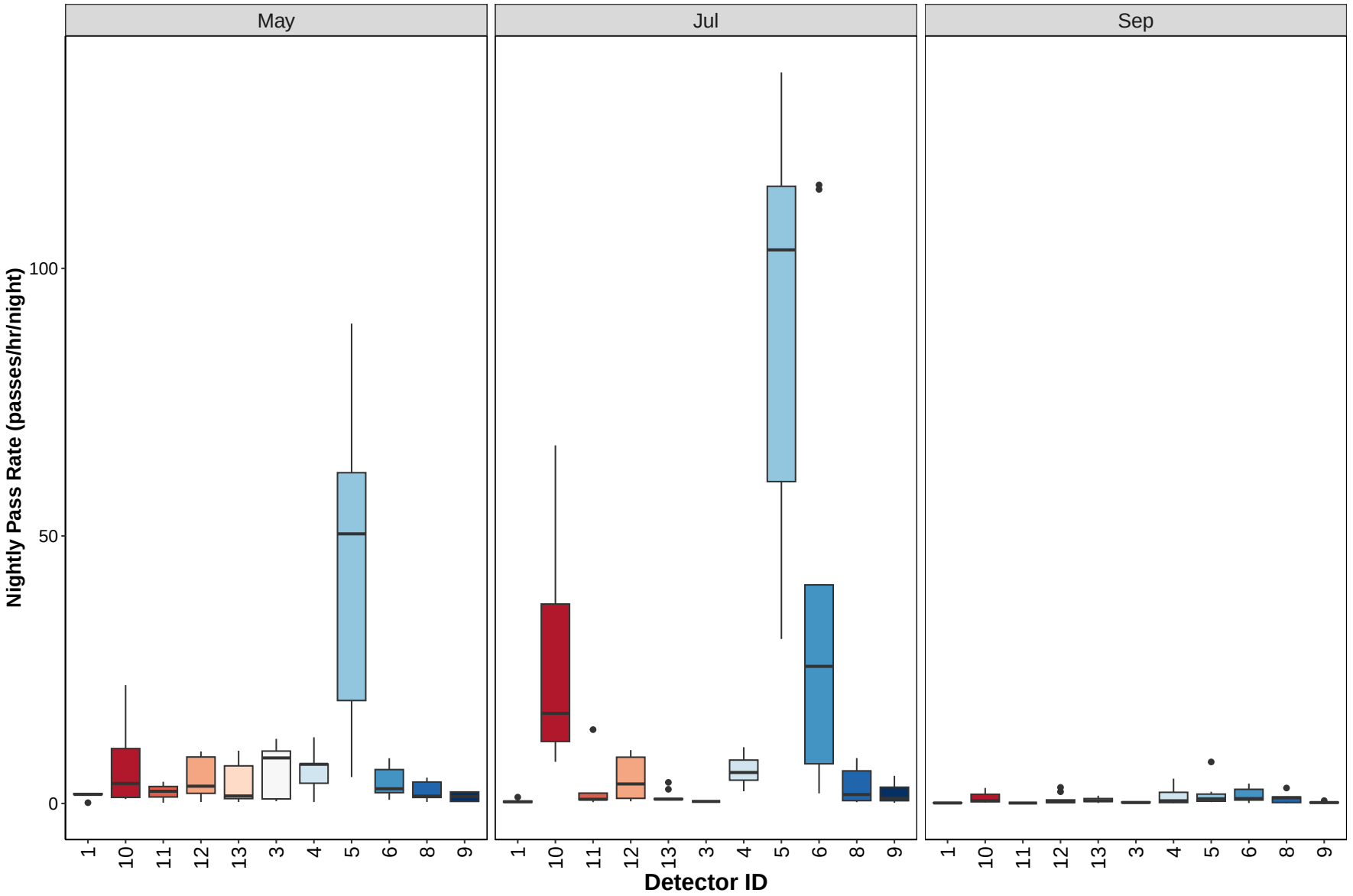
Species	Detector ID	May	Jul	Sep
Noctule	6	0.4	0.6	0.5
Noctule	8	0.1	NA	0.1
Noctule	9	0.3	NA	0.4
Leisler's	10	NA	0.1	NA
Leisler's	12	0.3	0.1	NA
Leisler's	13	0.1	NA	NA
Leisler's	5	0.3	0.3	NA
Leisler's	6	0.1	0.1	NA
Leisler's	9	NA	NA	0.2
Brown long-eared	10	NA	0.1	0.1
Brown long-eared	12	NA	0.3	NA
Brown long-eared	13	NA	0.1	0.1
Brown long-eared	3	NA	0.1	NA
Brown long-eared	4	NA	0.3	NA
Brown long-eared	5	0.3	1.3	NA
Brown long-eared	6	NA	0.1	0.1
Brown long-eared	8	NA	0.1	0.1
Brown long-eared	9	0.1	NA	0.1
Myotis	1	3.4	NA	NA
Myotis	10	0.4	1.0	0.2
Myotis	11	0.9	2.9	0.1
Myotis	12	4.6	0.4	0.2
Myotis	13	0.2	0.6	0.2
Myotis	3	0.9	0.1	0.2
Myotis	4	0.8	0.9	0.8
Myotis	5	0.5	2.3	0.4
Myotis	6	0.8	3.6	0.3
Myotis	8	0.3	0.4	0.2
Myotis	9	NA	1.3	0.3

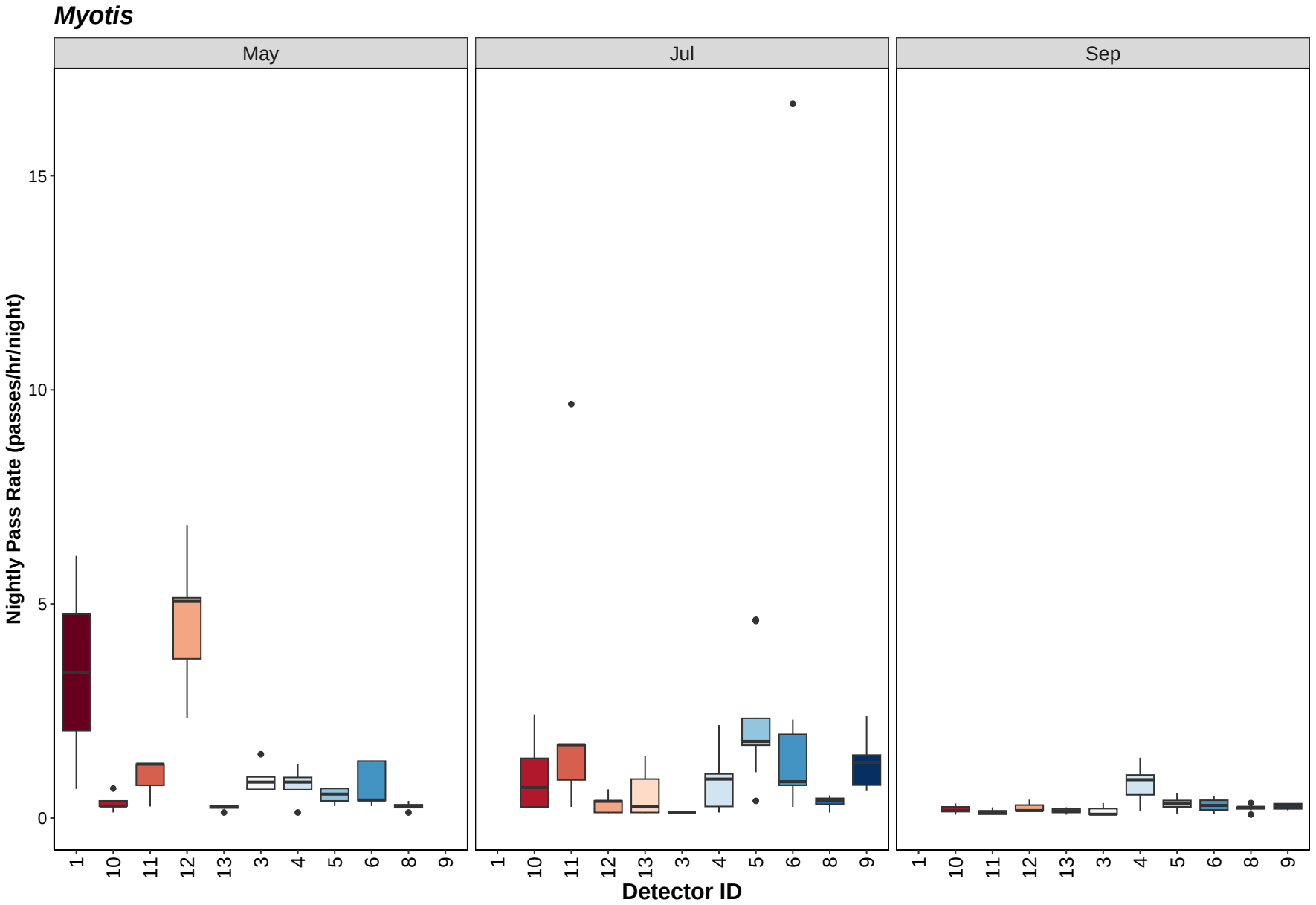
Per Detector

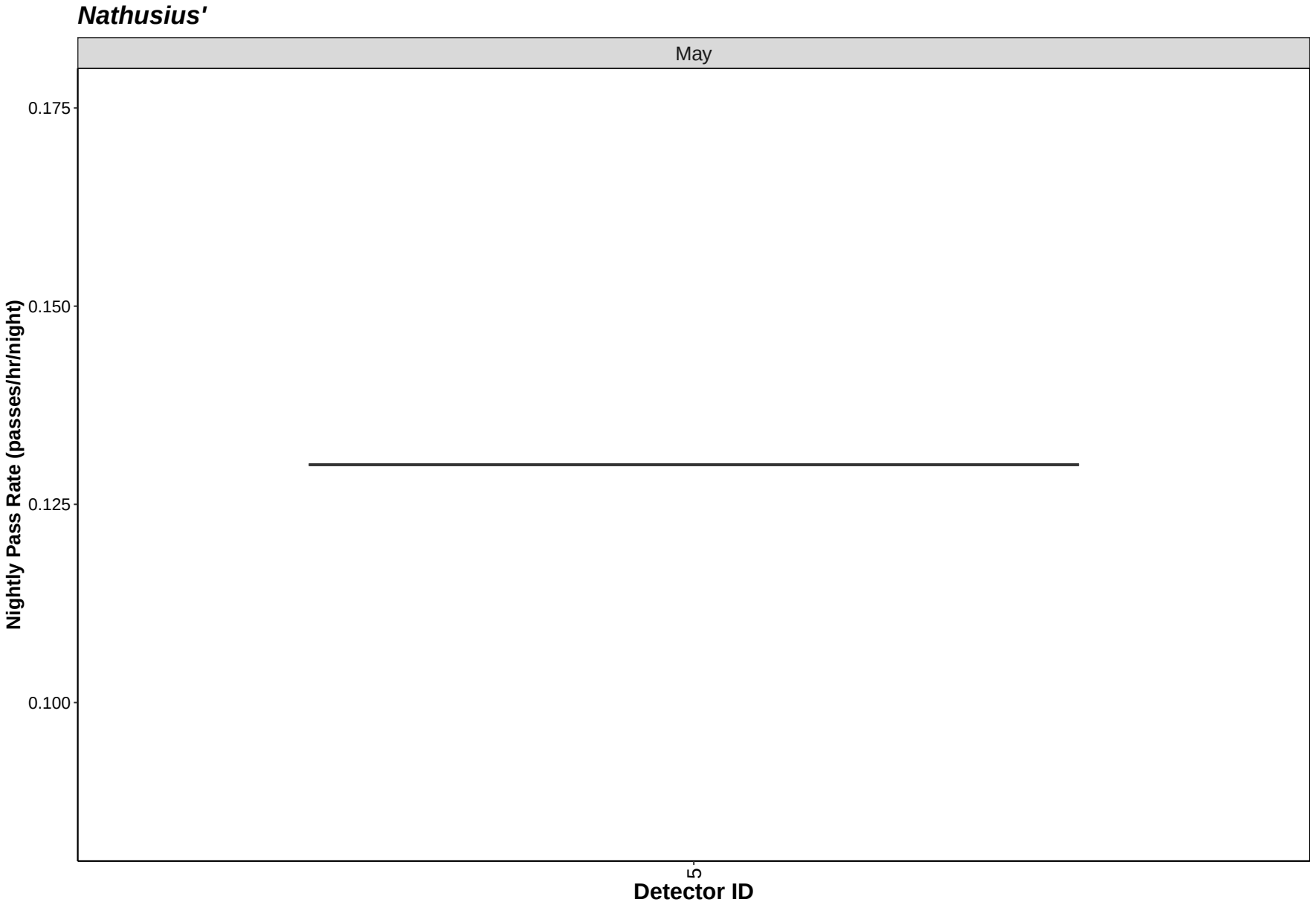
Figure 12. Figures show boxplots for the number of bat passes per hour by detector, for each month. The ‘box’ shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The ‘whiskers’ extend from the box and represent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

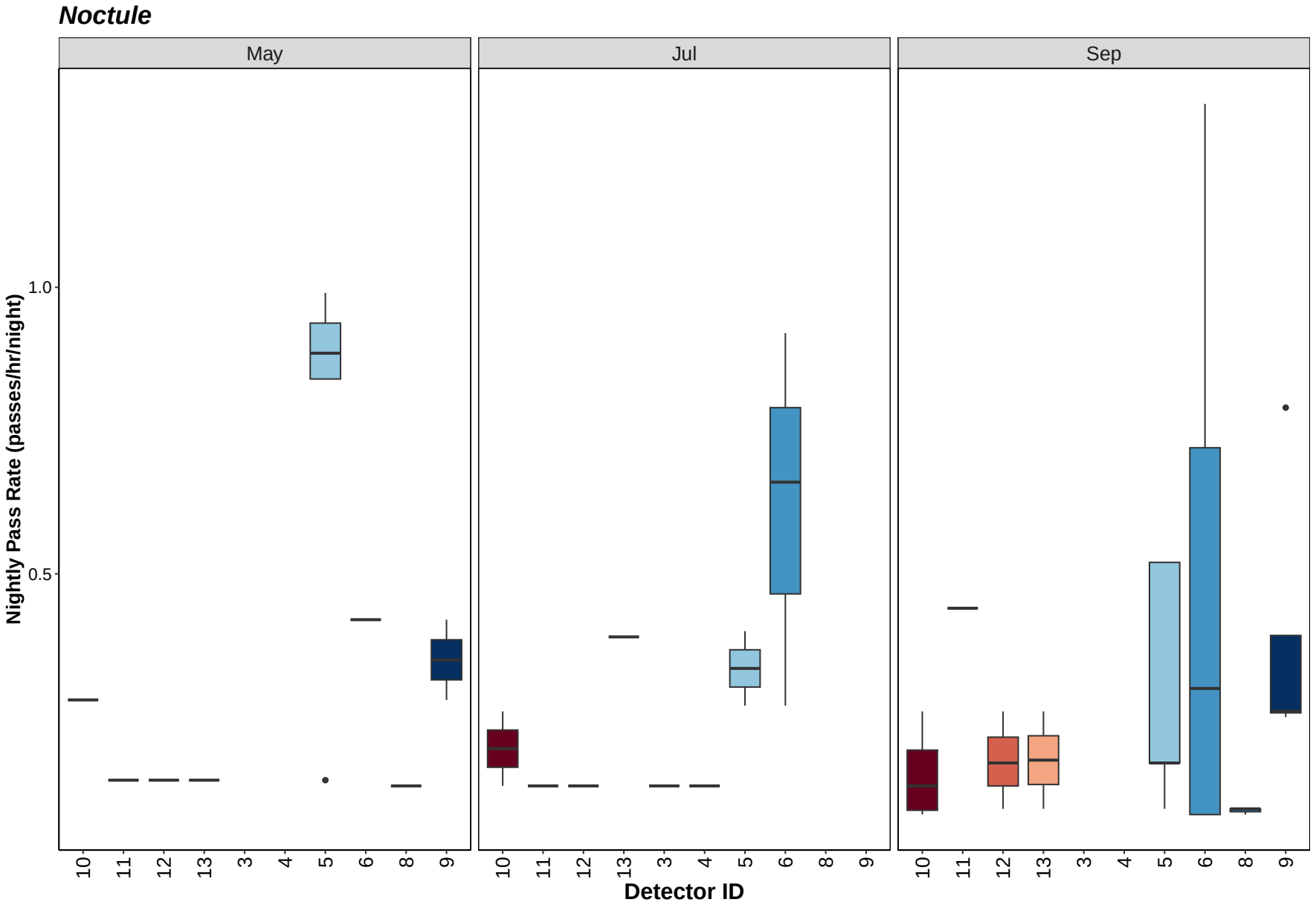

Soprano pipistrelle
May
Jul
Sep
Nightly Pass Rate (passes/hr/night)
120
90
60
30
0
1
10
11
12
13
3
4
5
6
8
9
Detector ID

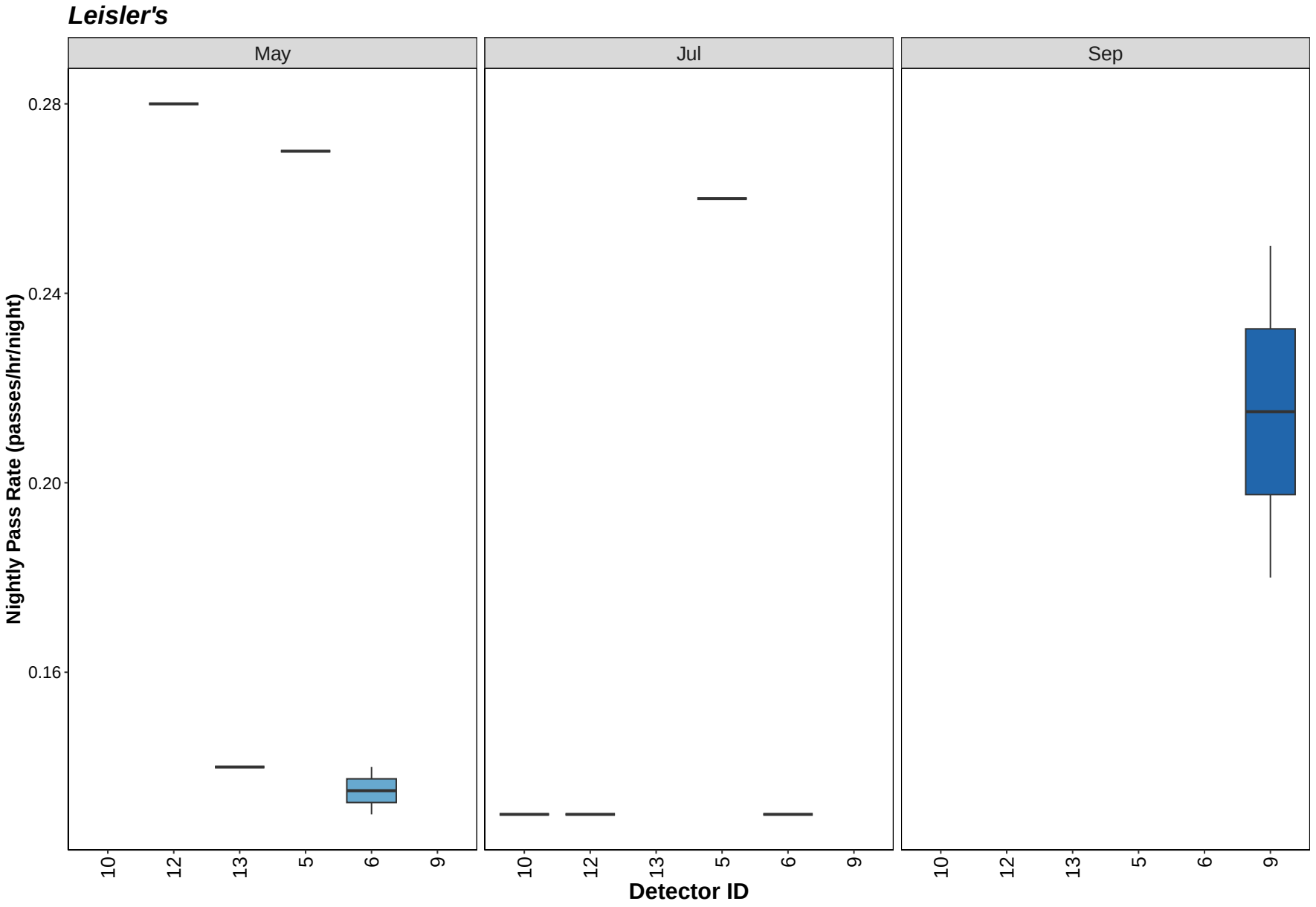
Common pipistrelle

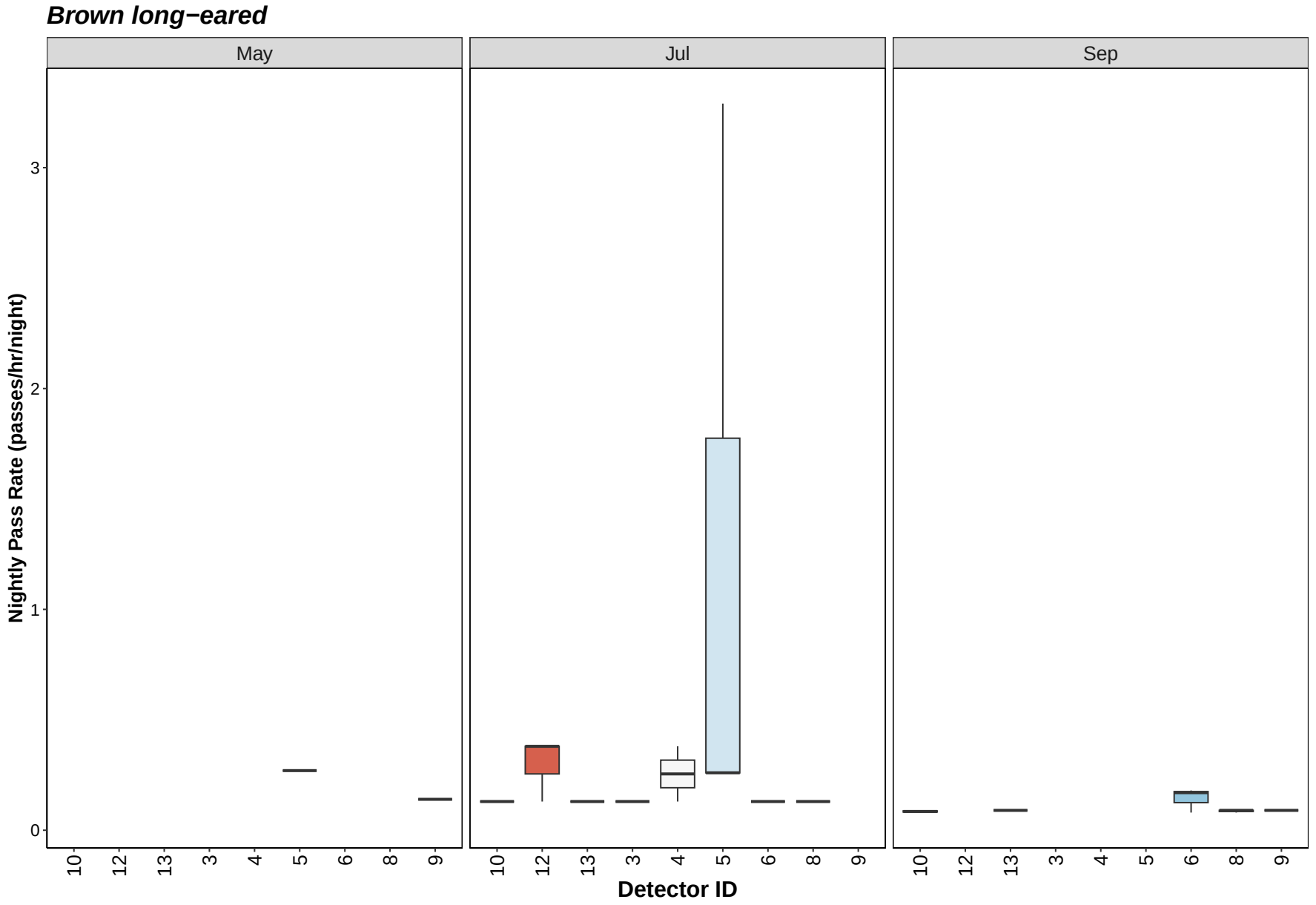



Myotis
May
Jul
Sep
Nightly Pass Rate (passes/hr/night)
0
5
10
15
1
10
11
12
13
3
4
5
6
8
9
Detector ID


Nathusius'
May
0.175
0.150
0.125
0.100
Nightly Pass Rate (passes/hr/night)
5
Detector ID


Noctule
May
Jul
Sep
Nightly Pass Rate (passes/hr/night)
1.0
0.5
10
11
12
13
3
4
5
6
8
9
Detector ID


Leisler's
May
Jul
Sep
Nightly Pass Rate (passes/hr/night)
0.28
0.24
0.20
0.16
10
12
13
5
6
9
Detector ID


Brown long−eared
May
Jul
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
10
12
13
3
4
5
6
8
9
Detector ID

Bat Activity per Detector Location

Figure 13. Detector ID reference:

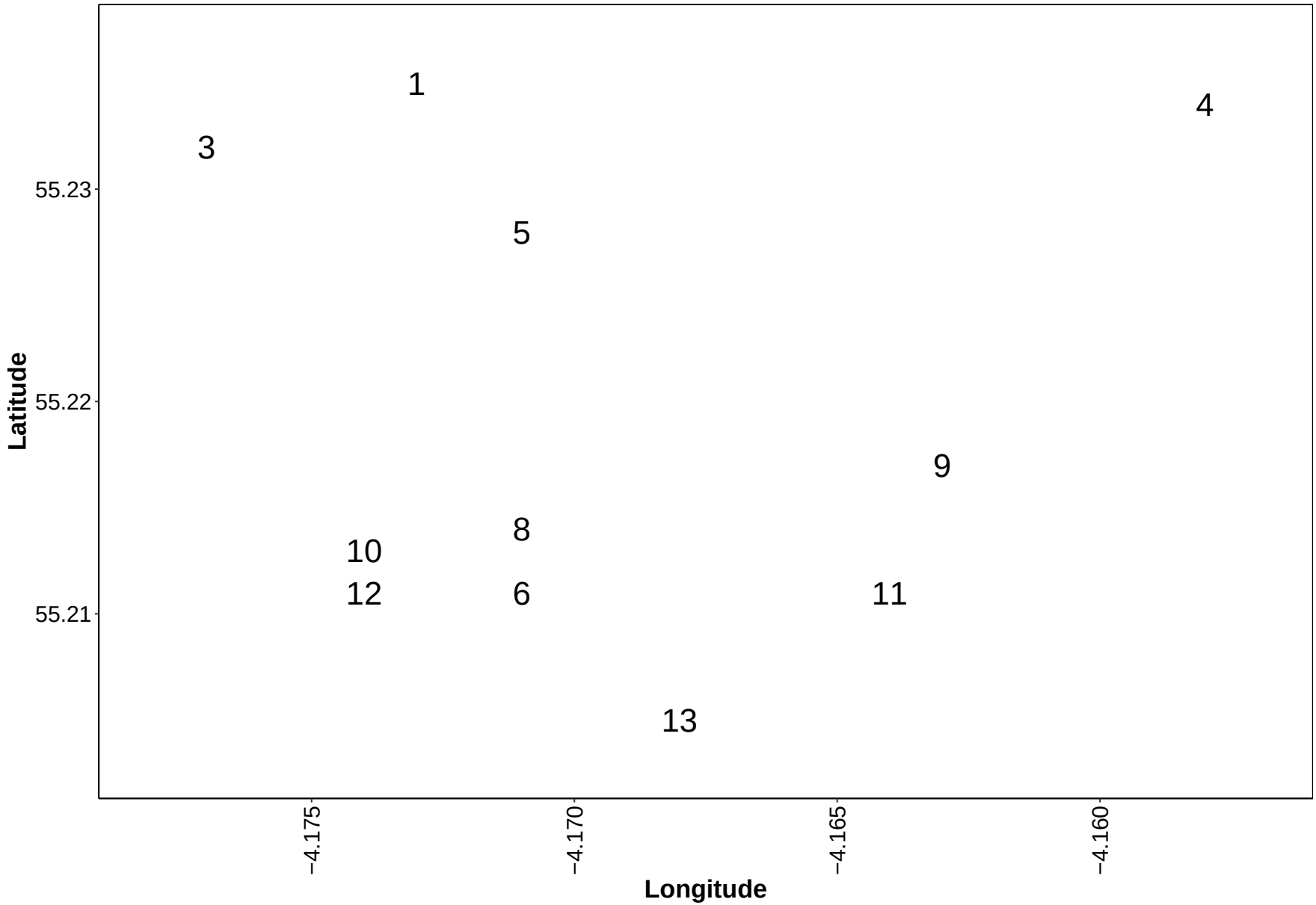
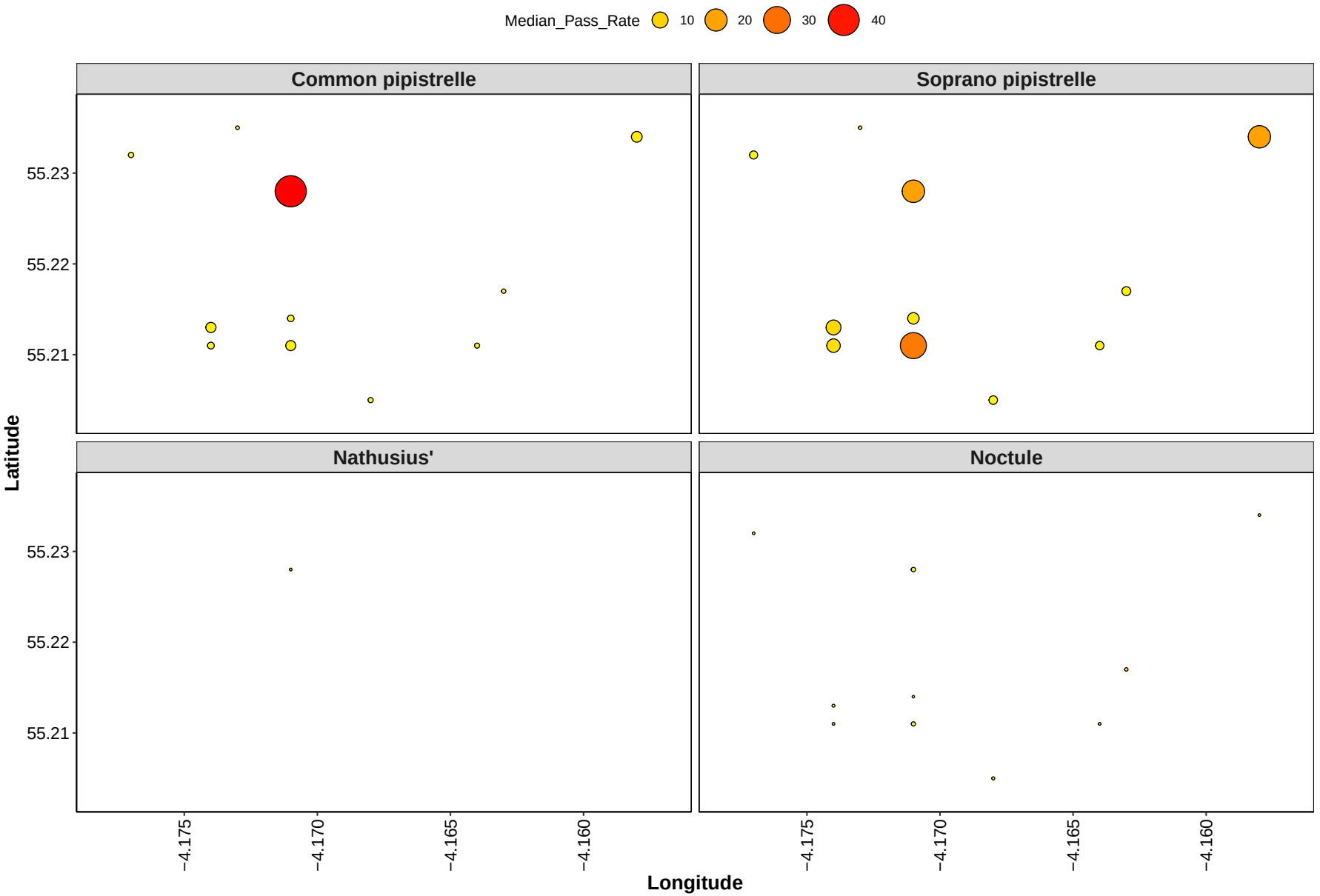

1
3
4
5
9
8
10
12
6
11
13
55.23
55.22
55.21
Latitude
−4.175
−4.170
−4.165
−4.160
Longitude
123

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


Median_Pass_Rate
10
20
30
40
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Latitude
55.23
55.22
55.21
−4.175
−4.170
−4.165
−4.160
Longitude

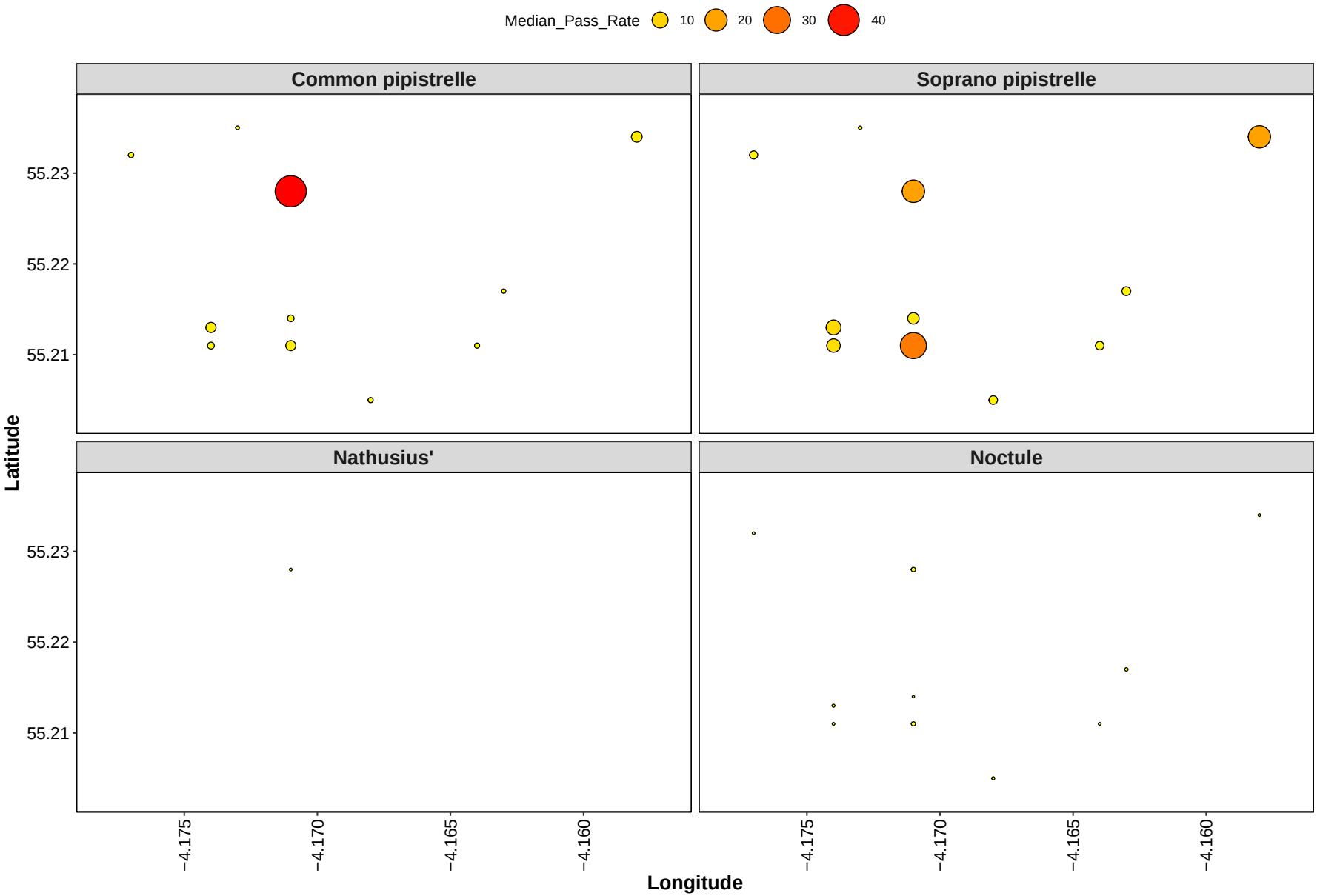
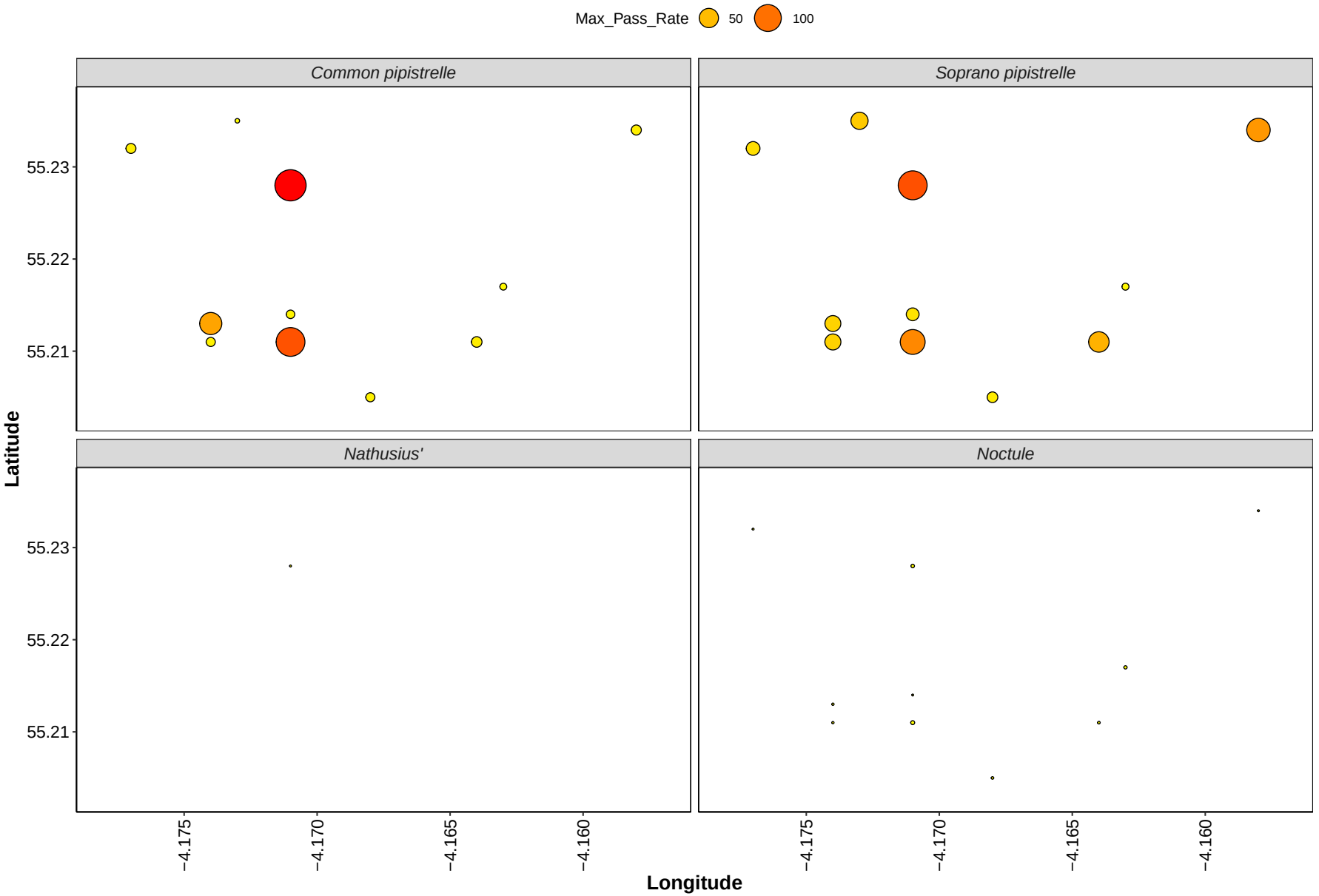
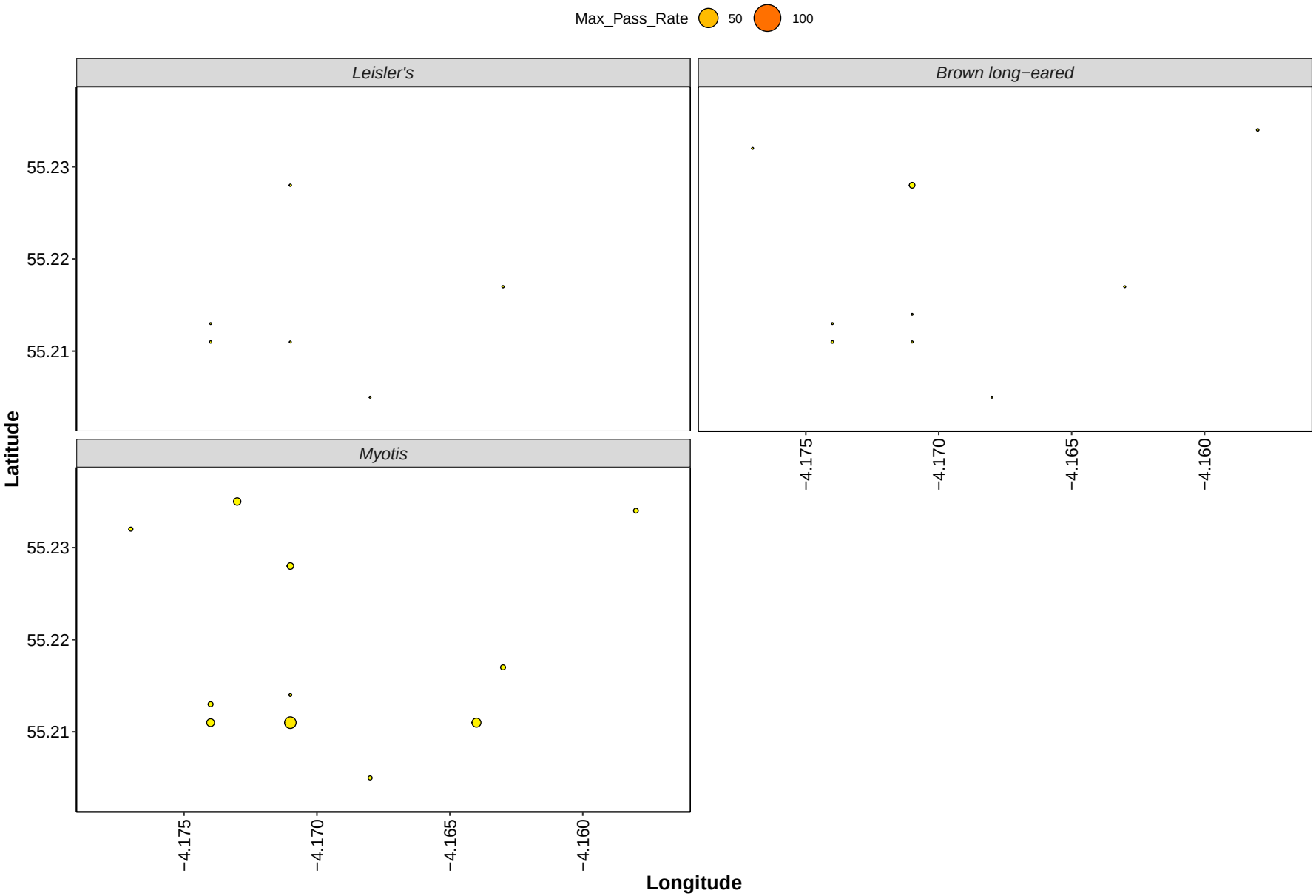

Median_Pass_Rate
10
20
30
40
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Latitude
55.23
55.22
55.21
−4.175
−4.170
−4.165
−4.160
Longitude

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


Max_Pass_Rate
50
100
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Latitude
55.23
55.22
55.21
−4.175
−4.170
−4.165
−4.160
Longitude


Max_Pass_Rate
50
100
Leisler's
Brown long−eared
Myotis
Latitude
55.23
55.22
55.21
−4.175
−4.170
−4.165
−4.160
Longitude

Part 2b: Includes Absences

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

Nightly Bat Pass Rate

Median per Detector

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

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

Species	Detector ID	Median Pass Rate
Brown long-eared	1	0.0
Brown long-eared	10	0.0
Brown long-eared	11	0.0
Brown long-eared	12	0.0
Brown long-eared	13	0.0
Brown long-eared	3	0.0
Brown long-eared	4	0.0
Brown long-eared	5	0.0
Brown long-eared	6	0.0
Brown long-eared	8	0.0
Brown long-eared	9	0.0
Common pipistrelle	1	0.3
Common pipistrelle	10	3.7
Common pipistrelle	11	0.1
Common pipistrelle	12	1.1
Common pipistrelle	13	0.8
Common pipistrelle	3	0.4
Common pipistrelle	4	4.2
Common pipistrelle	5	34.8
Common pipistrelle	6	2.9
Common pipistrelle	8	0.5
Common pipistrelle	9	0.3
Leisler's	1	0.0
Leisler's	10	0.0
Leisler's	11	0.0
Leisler's	12	0.0
Leisler's	13	0.0
Leisler's	3	0.0
Leisler's	4	0.0
Leisler's	5	0.0
Leisler's	6	0.0
Leisler's	8	0.0
Leisler's	9	0.0
Myotis	1	0.0
Myotis	10	0.2
Myotis	11	0.1

Species	Detector ID	Median Pass Rate
Myotis	12	0.4
Myotis	13	0.1
Myotis	3	0.0
Myotis	4	0.7
Myotis	5	0.6
Myotis	6	0.3
Myotis	8	0.2
Myotis	9	0.3
Nathusius’	1	0.0
Nathusius’	10	0.0
Nathusius’	11	0.0
Nathusius’	12	0.0
Nathusius’	13	0.0
Nathusius’	3	0.0
Nathusius’	4	0.0
Nathusius’	5	0.0
Nathusius’	6	0.0
Nathusius’	8	0.0
Nathusius’	9	0.0
Noctule	1	0.0
Noctule	10	0.0
Noctule	11	0.0
Noctule	12	0.0
Noctule	13	0.0
Noctule	3	0.0
Noctule	4	0.0
Noctule	5	0.0
Noctule	6	0.0
Noctule	8	0.0
Noctule	9	0.0
Soprano pipistrelle	1	0.1
Soprano pipistrelle	10	8.6
Soprano pipistrelle	11	2.4
Soprano pipistrelle	12	7.0
Soprano pipistrelle	13	2.4
Soprano pipistrelle	3	0.2

Species	Detector ID	Median Pass Rate
Soprano pipistrelle	4	12.6
Soprano pipistrelle	5	15.4
Soprano pipistrelle	6	28.0
Soprano pipistrelle	8	4.9
Soprano pipistrelle	9	2.8

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.

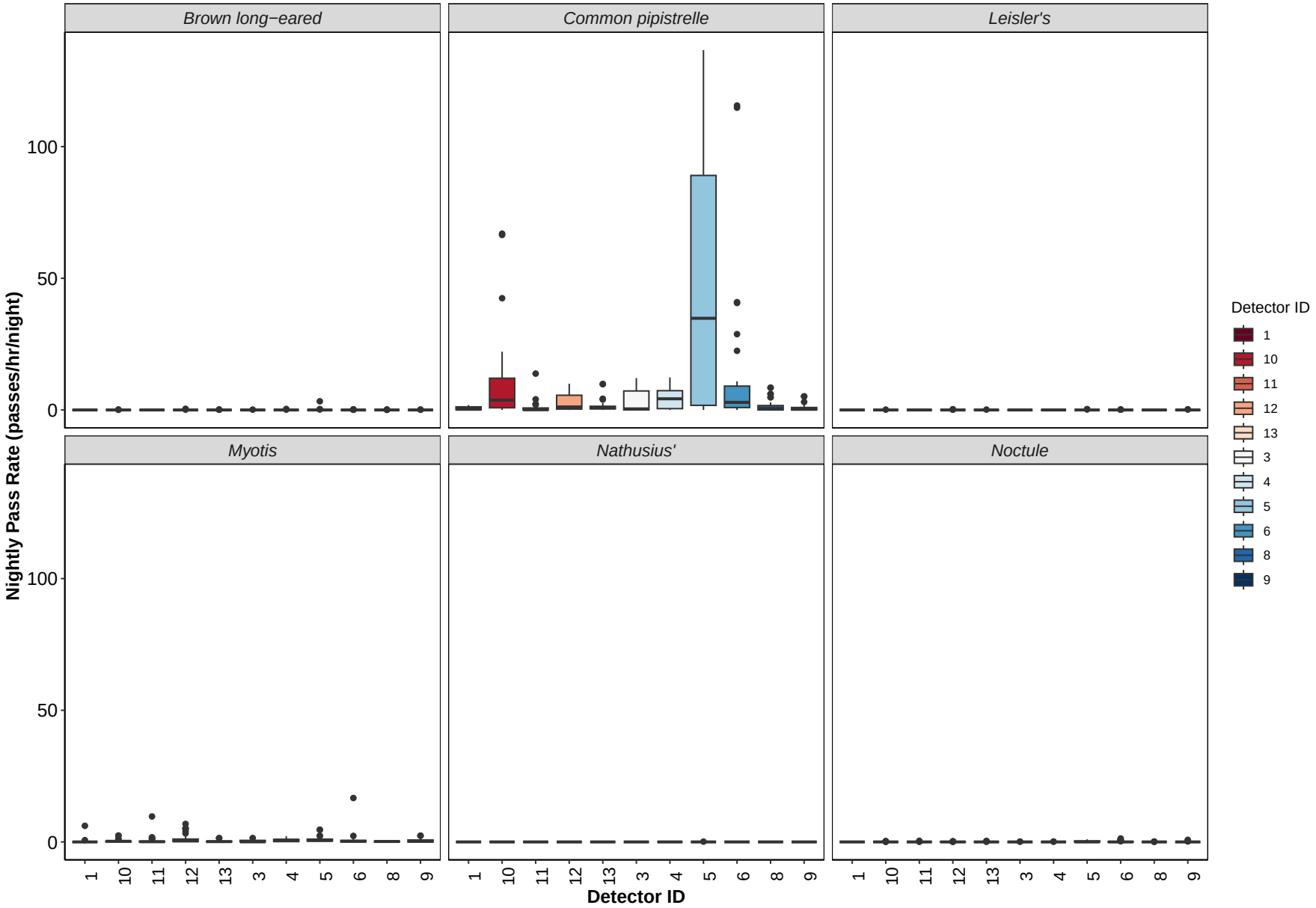
Species	Detector ID	Mean Pass Rate
Brown long-eared	1	0.0
Brown long-eared	10	0.0
Brown long-eared	11	0.0
Brown long-eared	12	0.0
Brown long-eared	13	0.0
Brown long-eared	3	0.0
Brown long-eared	4	0.0
Brown long-eared	5	0.1
Brown long-eared	6	0.0
Brown long-eared	8	0.0
Brown long-eared	9	0.0
Common pipistrelle	1	0.6
Common pipistrelle	10	12.1
Common pipistrelle	11	1.1
Common pipistrelle	12	3.1
Common pipistrelle	13	1.7
Common pipistrelle	3	3.2
Common pipistrelle	4	4.5
Common pipistrelle	5	45.5
Common pipistrelle	6	15.3
Common pipistrelle	8	1.8
Common pipistrelle	9	0.9
Leisler's	1	0.0
Leisler's	10	0.0
Leisler's	11	0.0
Leisler's	12	0.0
Leisler's	13	0.0
Leisler's	3	0.0
Leisler's	4	0.0
Leisler's	5	0.0
Leisler's	6	0.0
Leisler's	8	0.0
Leisler's	9	0.0
Myotis	1	0.4
Myotis	10	0.4
Myotis	11	0.7

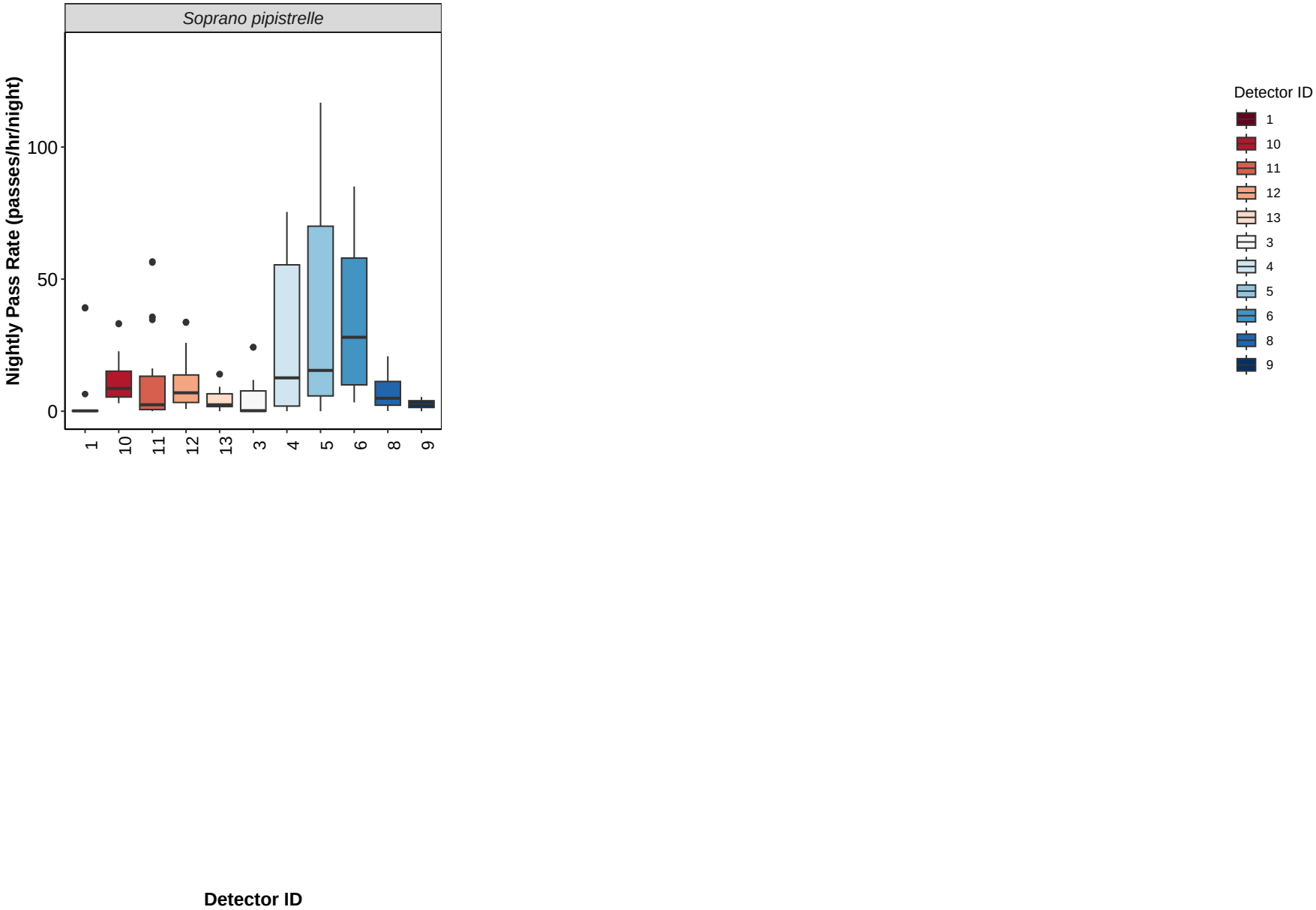
Species	Detector ID	Mean Pass Rate
Myotis	12	1.3
Myotis	13	0.2
Myotis	3	0.3
Myotis	4	0.7
Myotis	5	1.0
Myotis	6	1.0
Myotis	8	0.2
Myotis	9	0.5
Nathusius'	1	0.0
Nathusius'	10	0.0
Nathusius'	11	0.0
Nathusius'	12	0.0
Nathusius'	13	0.0
Nathusius'	3	0.0
Nathusius'	4	0.0
Nathusius'	5	0.0
Nathusius'	6	0.0
Nathusius'	8	0.0
Nathusius'	9	0.0
Noctule	1	0.0
Noctule	10	0.0
Noctule	11	0.0
Noctule	12	0.0
Noctule	13	0.0
Noctule	3	0.0
Noctule	4	0.0
Noctule	5	0.2
Noctule	6	0.2
Noctule	8	0.0
Noctule	9	0.1
Soprano pipistrelle	1	5.1
Soprano pipistrelle	10	11.5
Soprano pipistrelle	11	11.7
Soprano pipistrelle	12	10.2
Soprano pipistrelle	13	4.3
Soprano pipistrelle	3	4.7

Species	Detector ID	Mean Pass Rate
Soprano pipistrelle	4	25.2
Soprano pipistrelle	5	38.6
Soprano pipistrelle	6	35.6
Soprano pipistrelle	8	7.6
Soprano pipistrelle	9	2.6

Per Detector

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


Brown long−eared
Common pipistrelle
Leisler's
Myotis
Nathusius'
Noctule
Nightly Pass Rate (passes/hr/night)
0
50
100
1
10
11
12
13
3
4
5
6
8
9
Detector ID
Detector ID


Soprano pipistrelle
Nightly Pass Rate (passes/hr/night)
100
50
0
1
10
11
12
13
3
4
5
6
8
9
Detector ID
Detector ID
1
10
11
12
13
3
4
5
6
8
9

Survey Effort

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

month	Detector ID	No. of Survey Nights
May	1	5
May	10	9
May	11	5
May	12	8
May	13	7
May	3	9
May	4	9
May	5	10
May	6	8
May	8	9
May	9	6
Jul	1	8
Jul	10	10
Jul	11	10
Jul	12	10
Jul	13	10
Jul	3	5
Jul	4	10
Jul	5	9
Jul	6	10
Jul	8	10
Jul	9	10
Sep	1	4
Sep	10	10
Sep	11	10
Sep	12	10
Sep	13	10
Sep	3	4
Sep	4	10
Sep	5	10
Sep	6	10
Sep	8	10

month	Detector ID	No. of Survey Nights
Sep	9	10

Nighlty Bat Pass Rate for Each Month

Median per Detector

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

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

Species	Detector ID	Jul	May	Sep
Brown long-eared	1	0.0	0.0	0.0
Brown long-eared	10	0.0	0.0	0.0
Brown long-eared	11	0.0	0.0	0.0
Brown long-eared	12	0.0	0.0	0.0
Brown long-eared	13	0.0	0.0	0.0
Brown long-eared	3	0.0	0.0	0.0
Brown long-eared	4	0.0	0.0	0.0
Brown long-eared	5	0.0	0.0	0.0
Brown long-eared	6	0.0	0.0	0.0
Brown long-eared	8	0.0	0.0	0.0
Brown long-eared	9	0.0	0.0	0.0
Common pipistrelle	1	0.3	1.7	0.1
Common pipistrelle	10	16.9	3.7	0.4
Common pipistrelle	11	0.7	0.1	0.0
Common pipistrelle	12	3.6	3.2	0.3
Common pipistrelle	13	0.8	1.4	0.5
Common pipistrelle	3	0.0	8.5	0.1
Common pipistrelle	4	5.8	7.3	0.5
Common pipistrelle	5	103.5	50.4	0.9
Common pipistrelle	6	25.6	2.8	0.6
Common pipistrelle	8	1.7	1.1	0.0
Common pipistrelle	9	0.9	0.3	0.1
Leisler's	1	0.0	0.0	0.0
Leisler's	10	0.0	0.0	0.0
Leisler's	11	0.0	0.0	0.0
Leisler's	12	0.0	0.0	0.0
Leisler's	13	0.0	0.0	0.0
Leisler's	3	0.0	0.0	0.0
Leisler's	4	0.0	0.0	0.0
Leisler's	5	0.0	0.0	0.0
Leisler's	6	0.0	0.0	0.0
Leisler's	8	0.0	0.0	0.0
Leisler's	9	0.0	0.0	0.0
Myotis	1	0.0	0.0	0.0
Myotis	10	0.3	0.1	0.2
Myotis	11	0.1	0.3	0.1

Species	Detector ID	Jul	May	Sep
Myotis	12	0.4	4.6	0.2
Myotis	13	0.1	0.1	0.1
Myotis	3	0.0	0.7	0.1
Myotis	4	0.7	0.0	0.9
Myotis	5	1.8	0.5	0.3
Myotis	6	0.5	0.3	0.1
Myotis	8	0.3	0.0	0.2
Myotis	9	1.1	0.0	0.2
Nathusius’	1	0.0	0.0	0.0
Nathusius’	10	0.0	0.0	0.0
Nathusius’	11	0.0	0.0	0.0
Nathusius’	12	0.0	0.0	0.0
Nathusius’	13	0.0	0.0	0.0
Nathusius’	3	0.0	0.0	0.0
Nathusius’	4	0.0	0.0	0.0
Nathusius’	5	0.0	0.0	0.0
Nathusius’	6	0.0	0.0	0.0
Nathusius’	8	0.0	0.0	0.0
Nathusius’	9	0.0	0.0	0.0
Noctule	1	0.0	0.0	0.0
Noctule	10	0.0	0.0	0.0
Noctule	11	0.0	0.0	0.0
Noctule	12	0.0	0.0	0.0
Noctule	13	0.0	0.0	0.0
Noctule	3	0.0	0.0	0.0
Noctule	4	0.0	0.0	0.0
Noctule	5	0.0	0.5	0.0
Noctule	6	0.0	0.0	0.0
Noctule	8	0.0	0.0	0.0
Noctule	9	0.0	0.0	0.0
Soprano pipistrelle	1	0.1	6.5	0.0
Soprano pipistrelle	10	15.1	8.7	5.4
Soprano pipistrelle	11	25.4	1.2	0.6
Soprano pipistrelle	12	13.1	11.3	1.8
Soprano pipistrelle	13	6.1	2.4	2.1
Soprano pipistrelle	3	0.0	9.5	0.3

Species	Detector ID	Jul	May	Sep
Soprano pipistrelle	4	57.5	7.7	5.5
Soprano pipistrelle	5	70.0	28.4	3.2
Soprano pipistrelle	6	59.3	10.4	21.0
Soprano pipistrelle	8	13.5	4.3	1.1
Soprano pipistrelle	9	3.3	3.2	2.2

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.

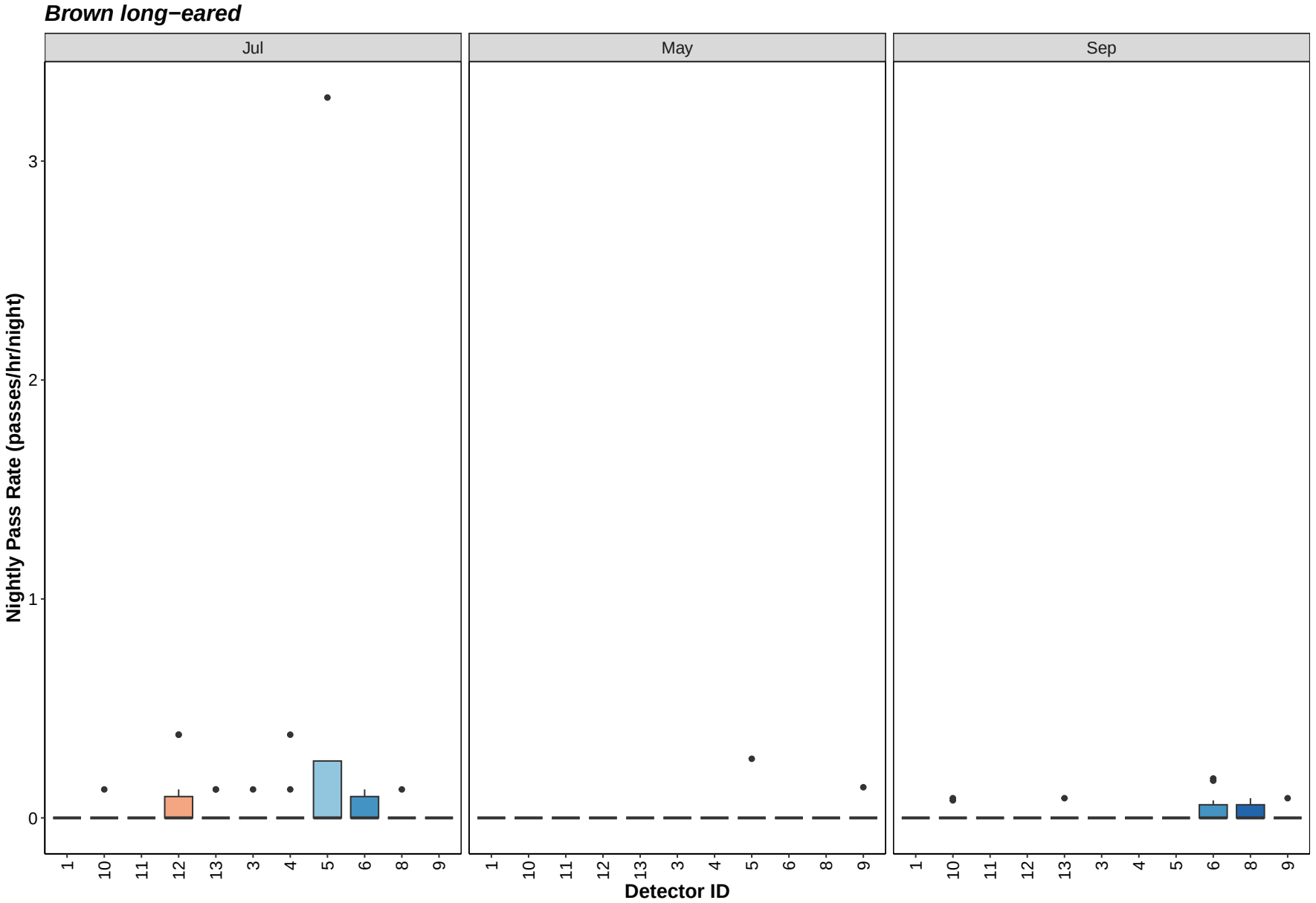
Species	Detector ID	Jul	May	Sep
Brown long-eared	1	0.0	0.0	0.0
Brown long-eared	10	0.0	0.0	0.0
Brown long-eared	11	0.0	0.0	0.0
Brown long-eared	12	0.1	0.0	0.0
Brown long-eared	13	0.0	0.0	0.0
Brown long-eared	3	0.0	0.0	0.0
Brown long-eared	4	0.1	0.0	0.0
Brown long-eared	5	0.4	0.0	0.0
Brown long-eared	6	0.0	0.0	0.0
Brown long-eared	8	0.0	0.0	0.0
Brown long-eared	9	0.0	0.0	0.0
Common pipistrelle	1	0.4	1.4	0.1
Common pipistrelle	10	27.4	7.6	0.8
Common pipistrelle	11	2.0	1.3	0.0
Common pipistrelle	12	4.5	4.3	0.8
Common pipistrelle	13	1.2	3.9	0.6
Common pipistrelle	3	0.1	6.3	0.2
Common pipistrelle	4	6.3	6.1	1.1
Common pipistrelle	5	93.7	46.0	1.6
Common pipistrelle	6	38.6	4.0	1.1
Common pipistrelle	8	3.4	1.5	0.5
Common pipistrelle	9	1.8	0.8	0.1
Leisler's	1	0.0	0.0	0.0
Leisler's	10	0.0	0.0	0.0
Leisler's	11	0.0	0.0	0.0
Leisler's	12	0.0	0.0	0.0
Leisler's	13	0.0	0.0	0.0
Leisler's	3	0.0	0.0	0.0
Leisler's	4	0.0	0.0	0.0
Leisler's	5	0.1	0.0	0.0
Leisler's	6	0.0	0.0	0.0
Leisler's	8	0.0	0.0	0.0
Leisler's	9	0.0	0.0	0.0
Myotis	1	0.0	1.4	0.0
Myotis	10	0.8	0.2	0.2
Myotis	11	1.4	0.6	0.1

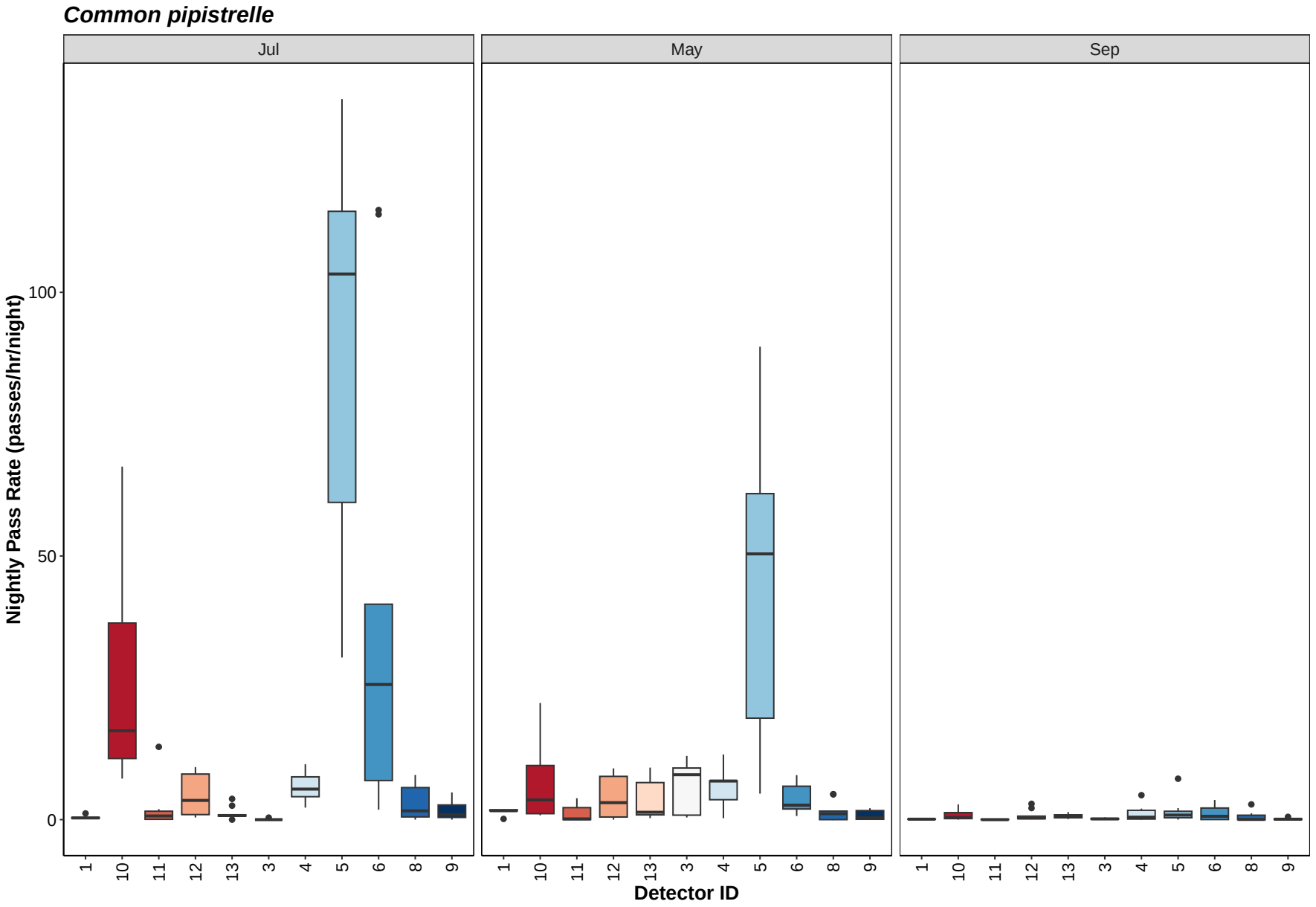
Species	Detector ID	Jul	May	Sep
Myotis	12	0.3	4.0	0.2
Myotis	13	0.4	0.1	0.1
Myotis	3	0.0	0.5	0.1
Myotis	4	0.8	0.3	0.8
Myotis	5	2.3	0.5	0.3
Myotis	6	2.2	0.5	0.2
Myotis	8	0.3	0.1	0.2
Myotis	9	1.2	0.0	0.2
Nathusius'	1	0.0	0.0	0.0
Nathusius'	10	0.0	0.0	0.0
Nathusius'	11	0.0	0.0	0.0
Nathusius'	12	0.0	0.0	0.0
Nathusius'	13	0.0	0.0	0.0
Nathusius'	3	0.0	0.0	0.0
Nathusius'	4	0.0	0.0	0.0
Nathusius'	5	0.0	0.0	0.0
Nathusius'	6	0.0	0.0	0.0
Nathusius'	8	0.0	0.0	0.0
Nathusius'	9	0.0	0.0	0.0
Noctule	1	0.0	0.0	0.0
Noctule	10	0.0	0.0	0.1
Noctule	11	0.0	0.0	0.0
Noctule	12	0.0	0.0	0.1
Noctule	13	0.0	0.0	0.0
Noctule	3	0.1	0.0	0.0
Noctule	4	0.0	0.0	0.0
Noctule	5	0.1	0.5	0.1
Noctule	6	0.2	0.1	0.2
Noctule	8	0.0	0.0	0.0
Noctule	9	0.0	0.1	0.2
Soprano pipistrelle	1	0.1	17.0	0.1
Soprano pipistrelle	10	14.9	13.5	6.4
Soprano pipistrelle	11	26.9	1.1	1.6
Soprano pipistrelle	12	13.5	16.0	2.3
Soprano pipistrelle	13	6.5	4.1	2.1
Soprano pipistrelle	3	0.1	9.1	0.5

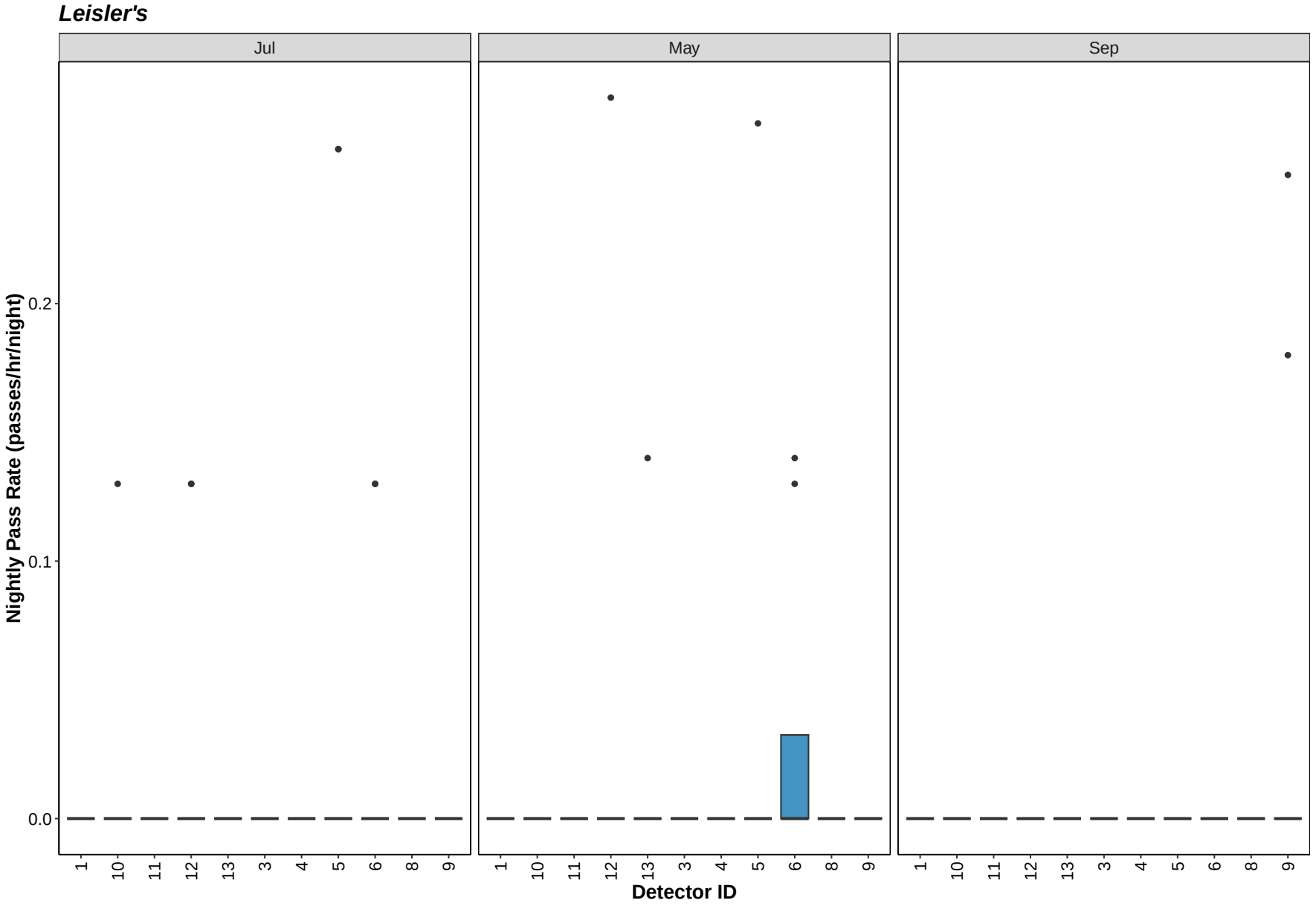
Species	Detector ID	Jul	May	Sep
Soprano pipistrelle	4	49.3	17.1	8.4
Soprano pipistrelle	5	68.0	45.1	5.6
Soprano pipistrelle	6	55.5	17.6	30.2
Soprano pipistrelle	8	12.5	6.2	3.9
Soprano pipistrelle	9	2.9	2.9	2.2

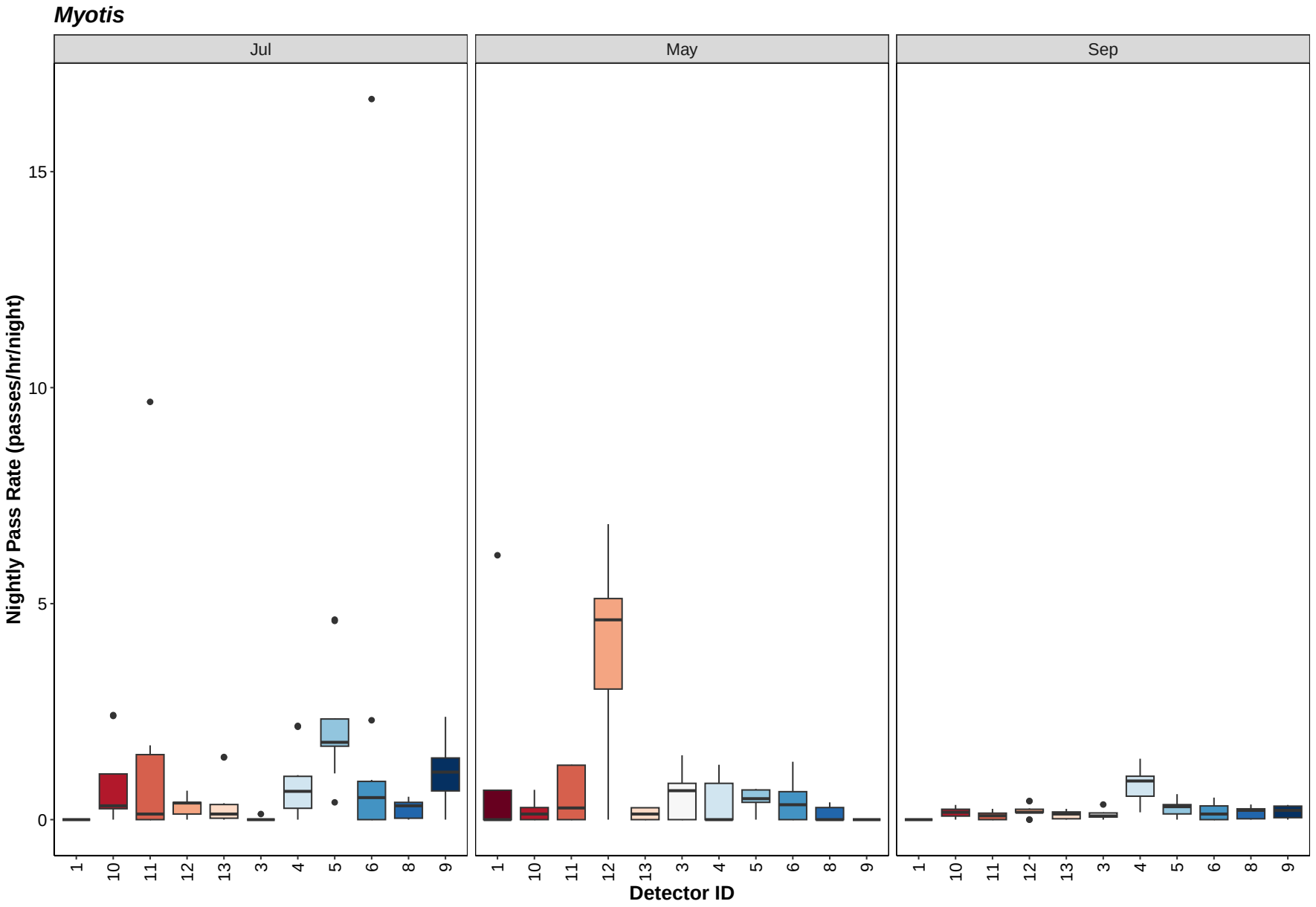
Per Detector

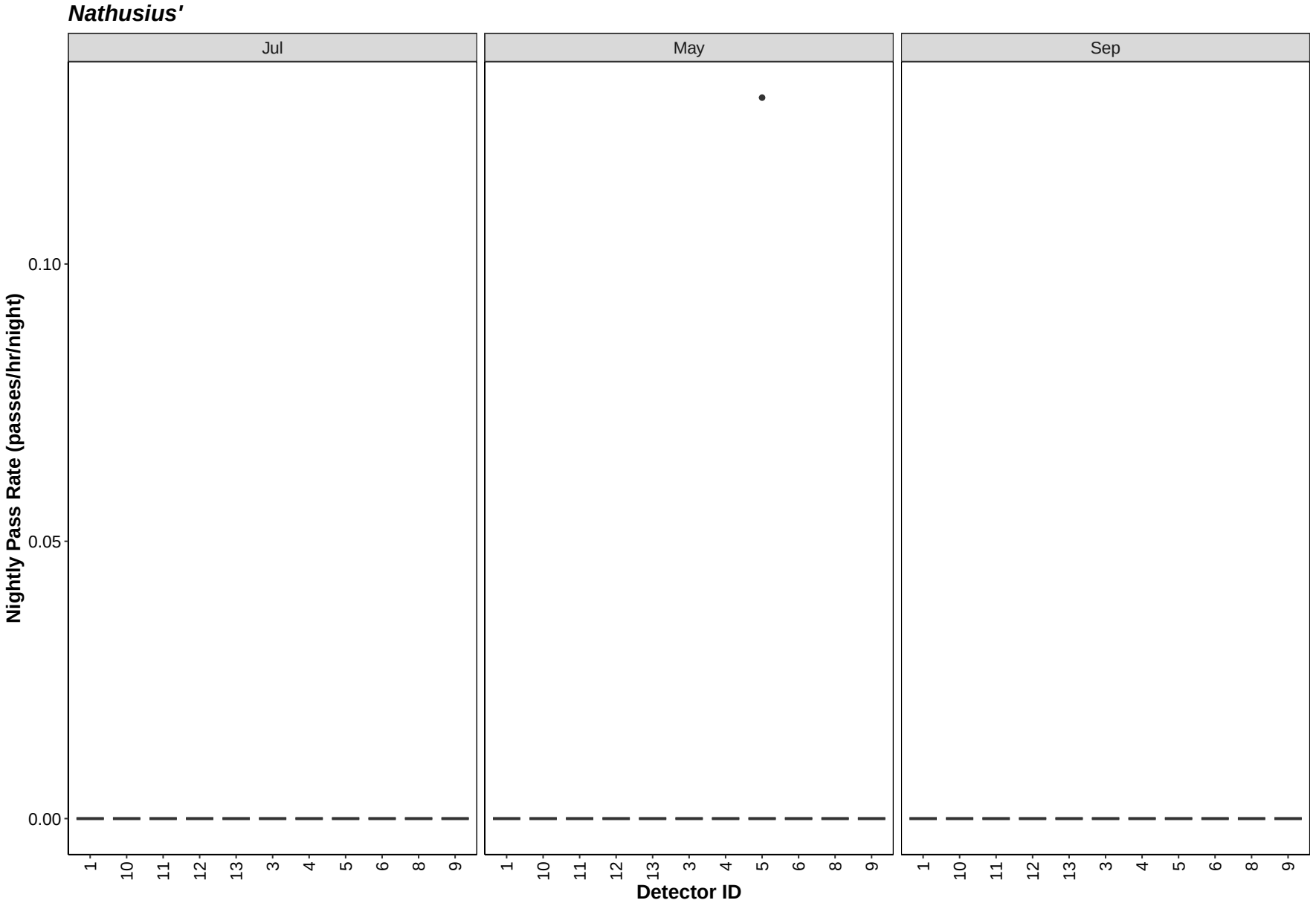
Figure 17. Figures show boxplots for the number of bat passes per hour by detector, for each month. The ‘box’ shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The ‘whiskers’ extend from the box and represent 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.

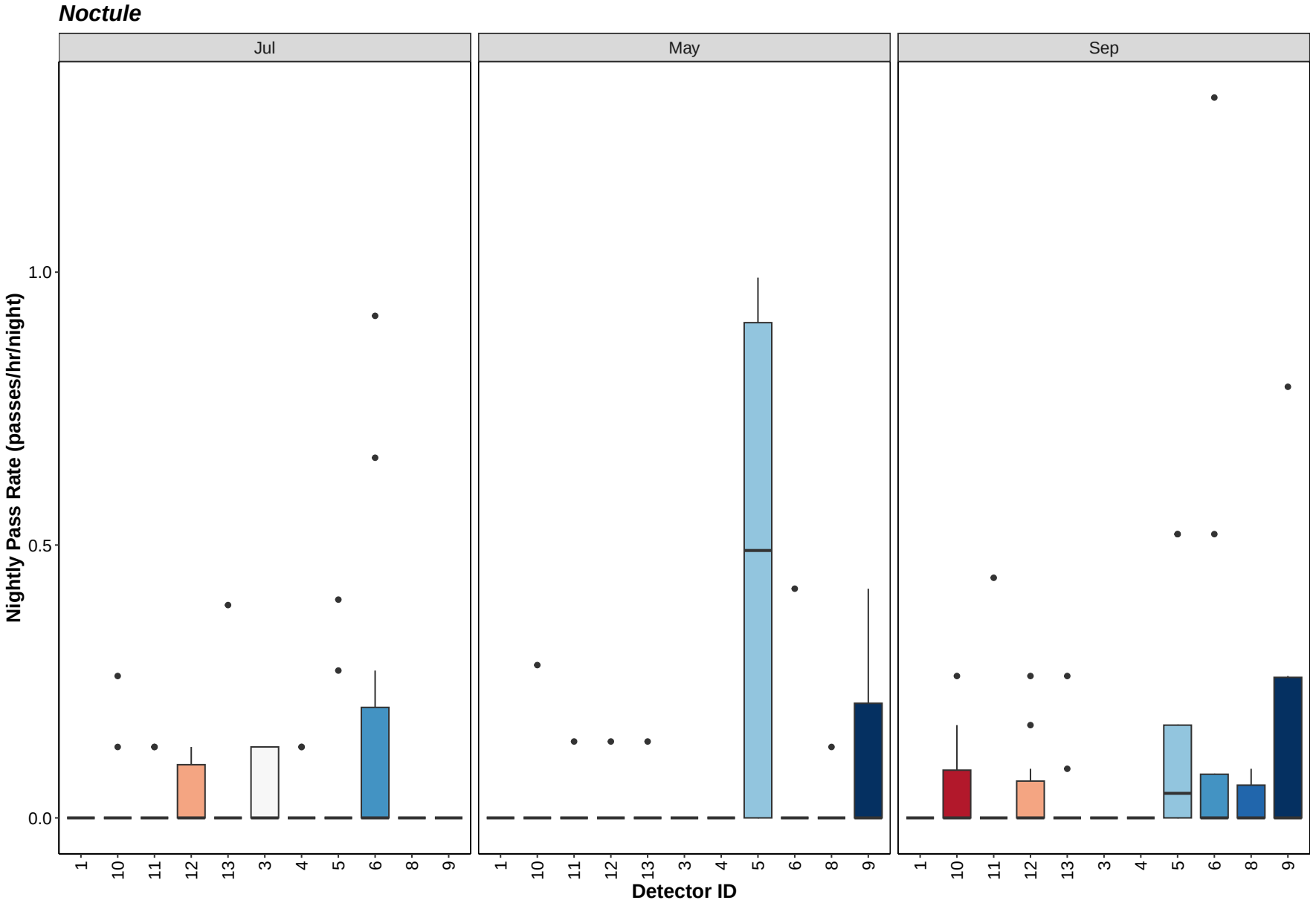

Brown long−eared
Jul
May
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
1
10
11
12
13
3
4
5
6
8
9
Detector ID

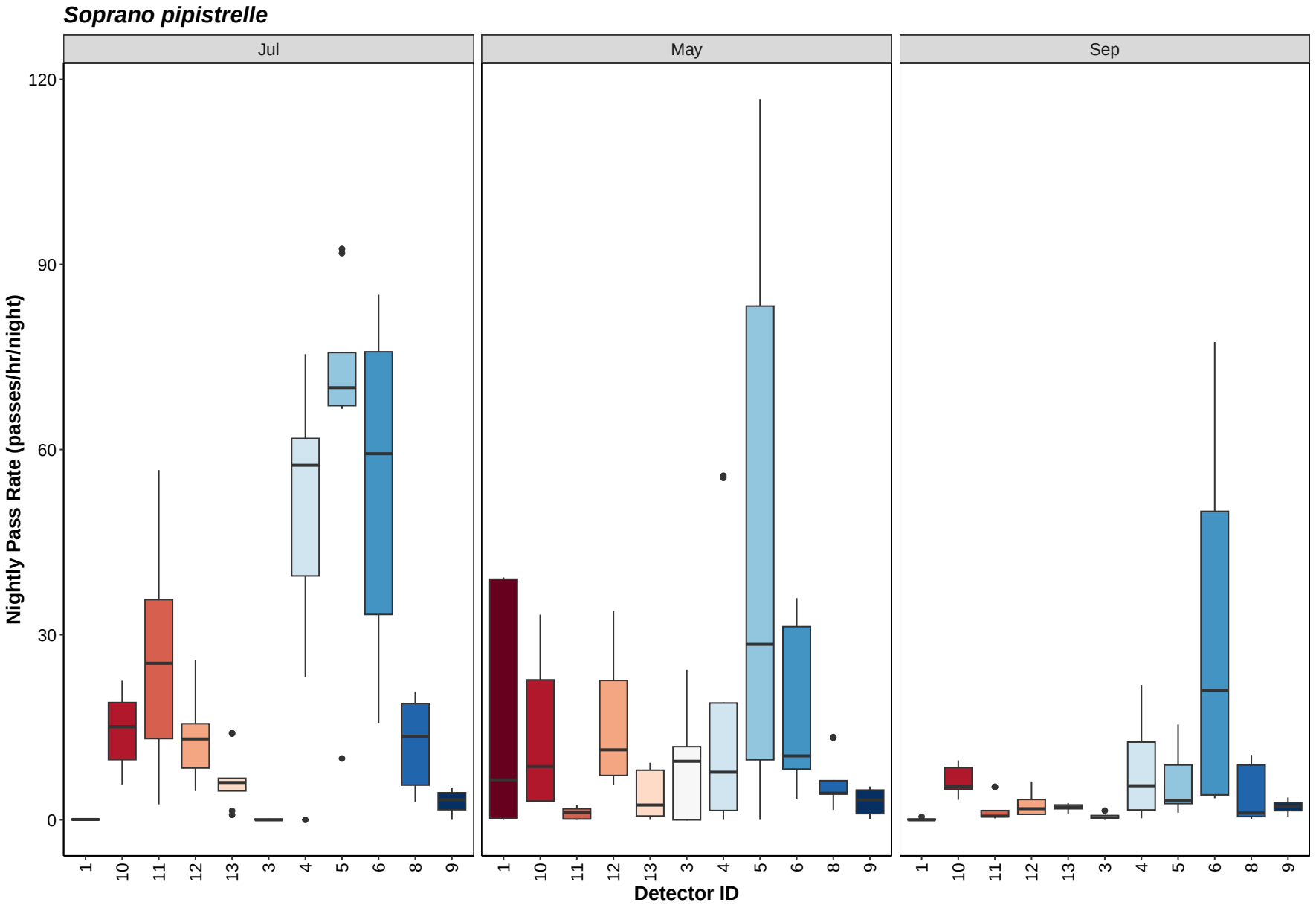

Common pipistrelle
Jul
May
Sep
Nightly Pass Rate (passes/hr/night)
100
50
0
1
10
11
12
13
3
4
5
6
8
9
Detector ID


Leisler's
Jul
May
Sep
Nightly Pass Rate (passes/hr/night)
0.0
0.1
0.2
1
10
11
12
13
3
4
5
6
8
9
Detector ID


Myotis
Jul
May
Sep
Nightly Pass Rate (passes/hr/night)
0
5
10
15
1
10
11
12
13
3
4
5
6
8
9
Detector ID


Nathusius'
Jul
May
Sep
Nightly Pass Rate (passes/hr/night)
0.10
0.05
0.00
1
10
11
12
13
3
4
5
6
8
9
Detector ID


Noctule
Jul
May
Sep
Nightly Pass Rate (passes/hr/night)
1.0
0.5
0.0
1
10
11
12
13
3
4
5
6
8
9
Detector ID


Soprano pipistrelle
Jul
May
Sep
Nightly Pass Rate (passes/hr/night)
120
90
60
30
0
1
10
11
12
13
3
4
5
6
8
9
Detector ID

Bat Activity per Detector Location

Figure 18. Detector ID reference:

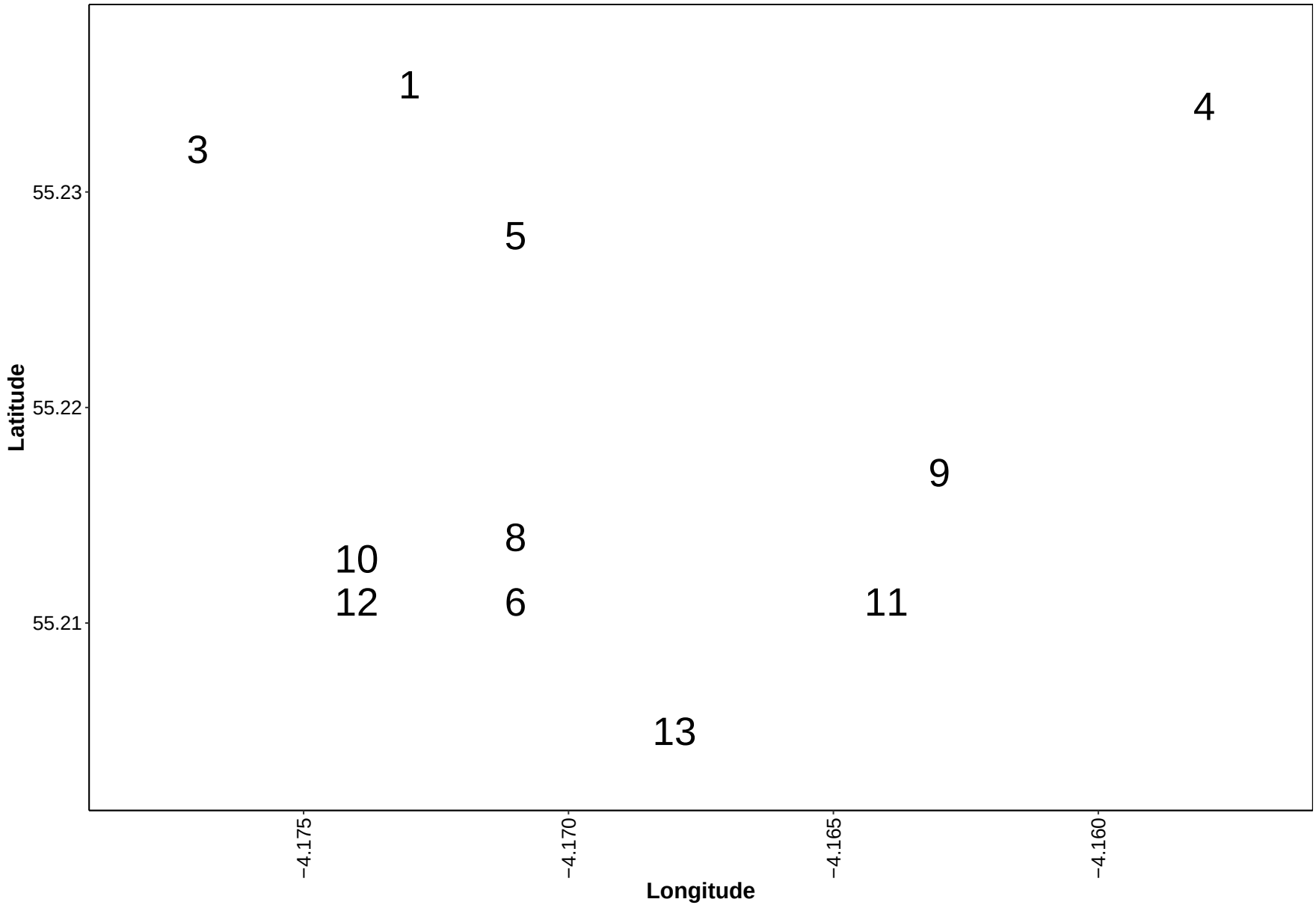
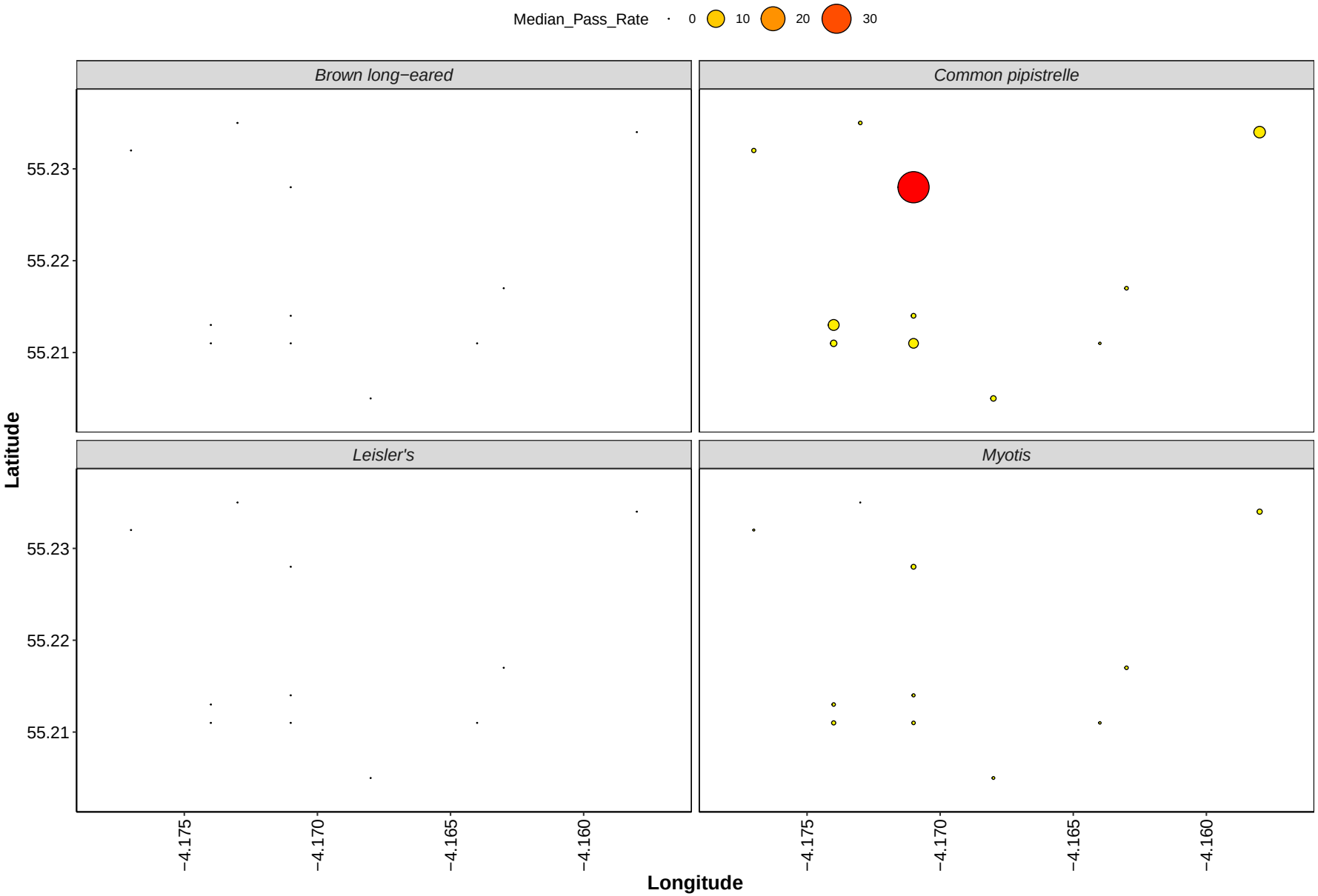

1
4
3
55.23
5
Latitude
55.22
9
8
10
12
6
11
55.21
13
−4.175
−4.170
−4.165
−4.160
Longitude

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


Median_Pass_Rate
0
10
20
30
Brown long−eared
Common pipistrelle
Leisler's
Myotis
55.23
55.22
55.21
Latitude
−4.175
−4.170
−4.165
−4.160
Longitude

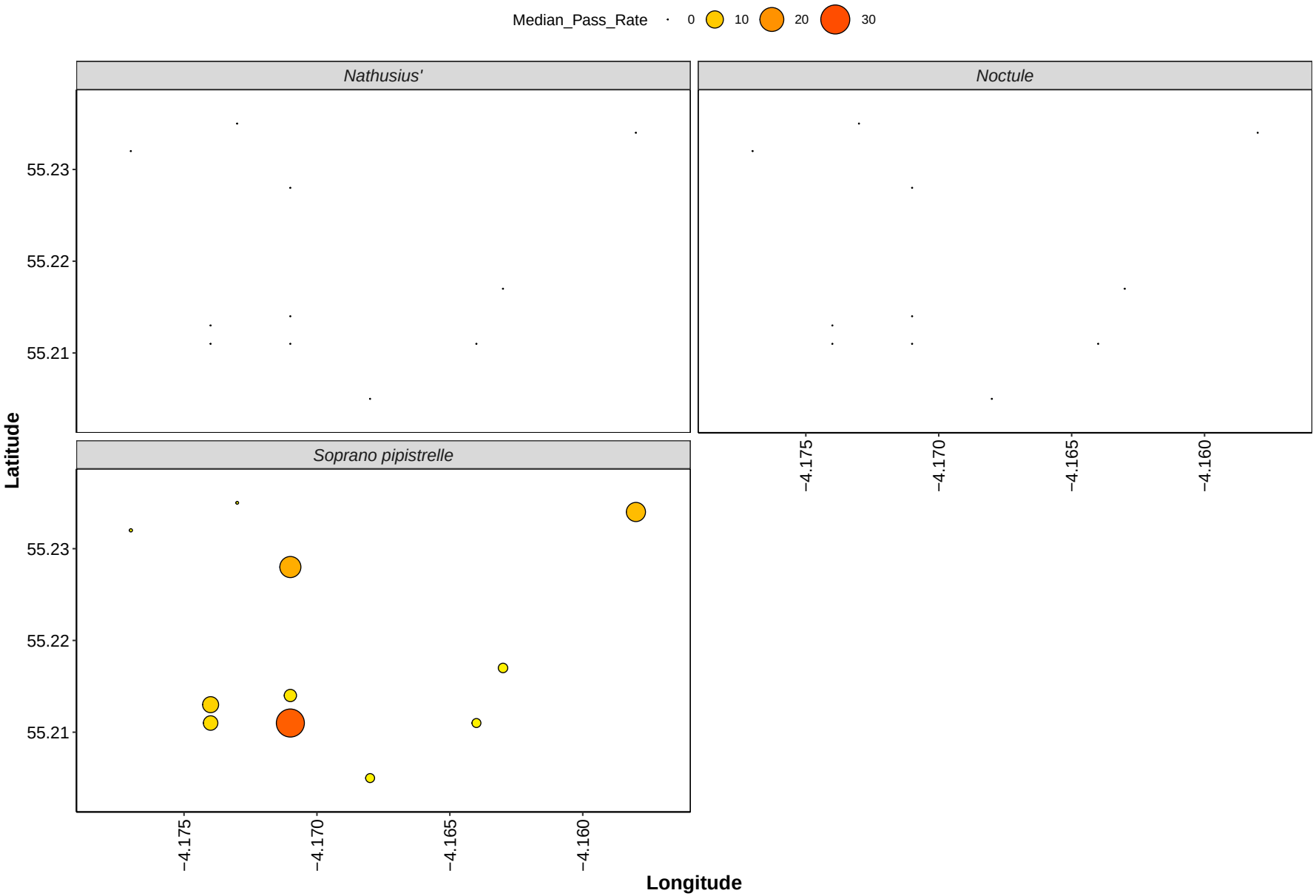
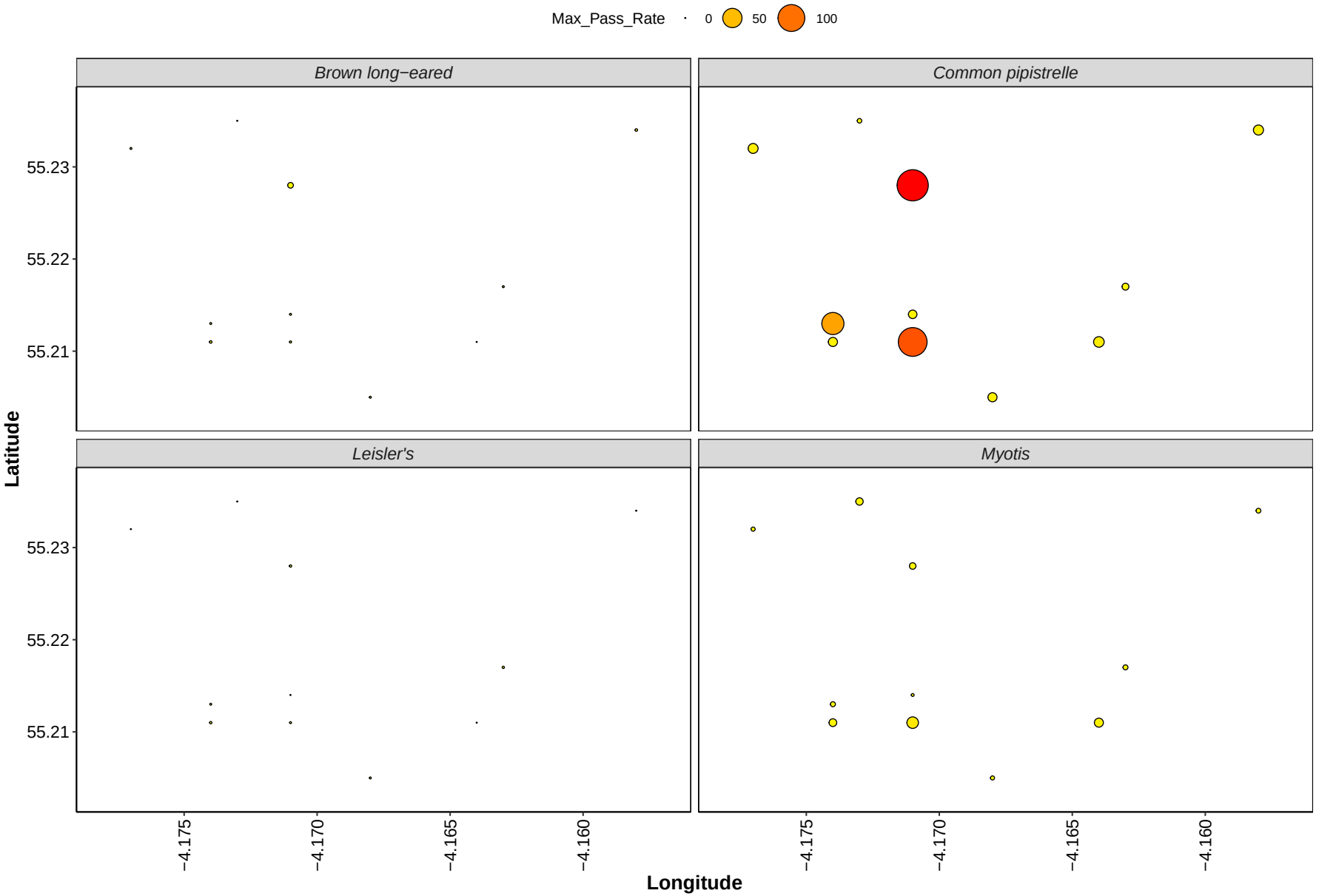
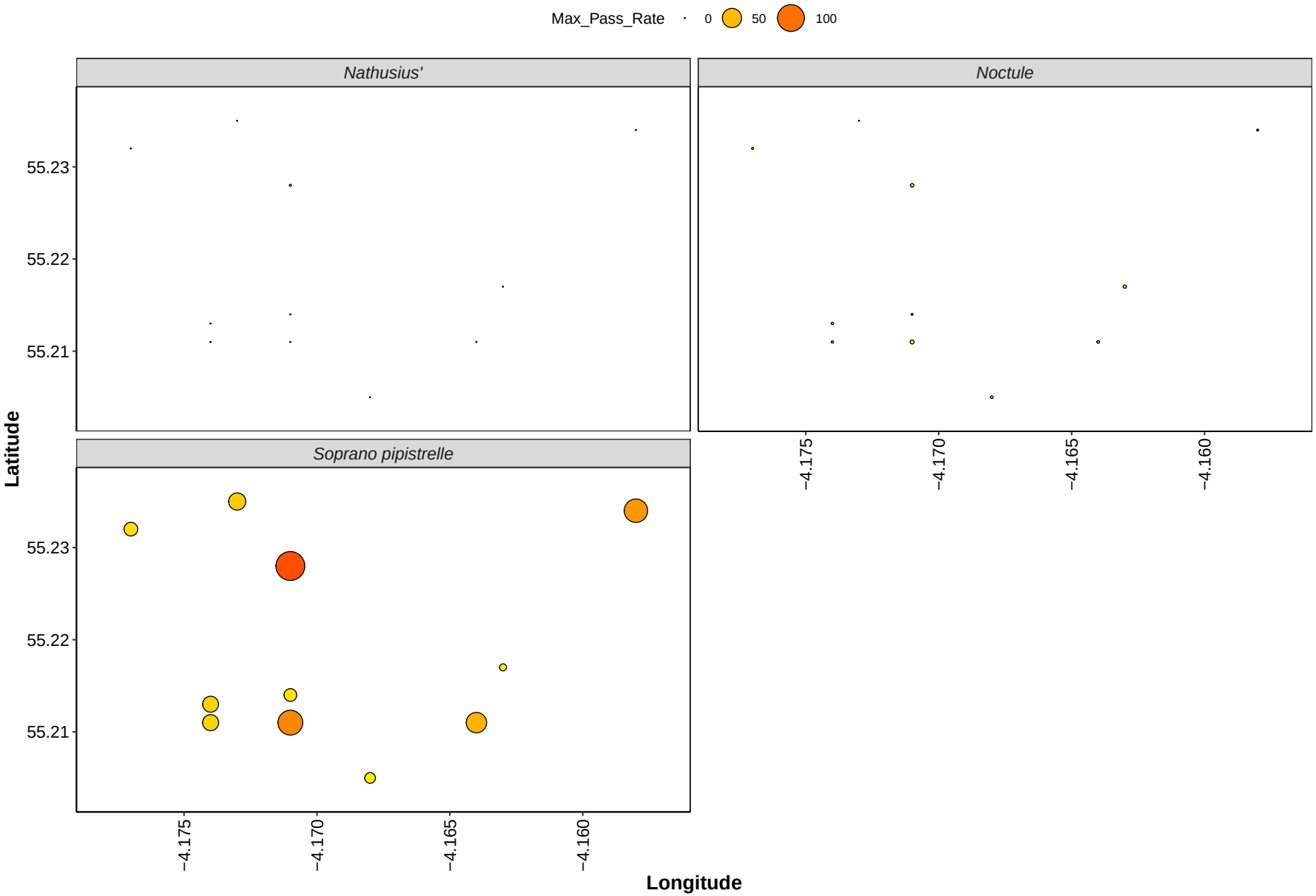

Median_Pass_Rate
0
10
20
30
Nathusius'
Noctule
Soprano pipistrelle
55.23
55.22
55.21
−4.175
−4.170
−4.165
−4.160
Latitude
Longitude

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


Max_Pass_Rate
0
50
100
Brown long−eared
Common pipistrelle
Leisler's
Myotis
Latitude
55.23
55.22
55.21
−4.175
−4.170
−4.165
−4.160
Longitude


Max_Pass_Rate
0
50
100
Nathusius'
Noctule
Soprano pipistrelle
55.23
55.22
55.21
−4.175
−4.170
−4.165
−4.160
Latitude
Longitude

Thank you for using Ecobat!