Appendix 8.5 Bats

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Appendix 8.5 Bats

Introduction

This Technical Appendix has been prepared to accompany Chapter 8 in Volume 1 of the Knockcronal Wind Farm (hereafter the Proposed Development) EIA Report.

It presents detailed methodologies and results of a desk study and field surveys completed to establish baseline conditions with regards to bats, in order to inform the design and assessment of the Proposed Development.

It should be read with reference to the following specific figures, presented in Volume 2 of the EIA Report:

- Figure 8.1: Non-Ornithological Statutory Designated Sites.
- Figure 8.8: Bat Survey Results.
- Figure 8.9: Bat Roost Survey Plan.

Aims of the Study

The aims of the bat surveys were to:

- Assess the habitats within the site to identify features that have the potential to support maternity roosts and significant hibernation roosts;
- Identify species using the site, and temporal and spatial variations in use;
- Assess the level of activity of bats within the site; and
- Assess the potential risks to bats in line with NatureScot guidance (SNH, 2019).

Site Overview

Land within the Site (defined as land within the red line and blue line boundaries) is shown in Figures 8.1 in Volume 2 of the EIA Report. The site is located approximately 4.8 km south of Straiton, and 17.4 km east of Girvan, in South Ayrshire. There are no designated sites with bat interest within 10 km of the site.

The habitats within the site boundary comprise a mosaic of rough pasture, including acid and marshy grassland, with areas of blanket mire and wet modified bog. Commercial conifer plantations border the site to the west, south and east. There is also a small, isolated stand of mature conifers located on-site.

The lower lying northern extent of the Site consists of gently sloping, to flat, farmland with improved and semi-improved grasslands. The southern extent of the site, on higher elevation, rises to an undulating plateau with prominent small hills, and which supports a more complex association of upland plant communities.

Habitat along the two proposed access routes is principally commercial conifer plantation, both routes including sections of an existing forestry track but only one route will be progressed and utilised.

Full habitat descriptions are provided in Technical Appendix 8.4 in Volume 4 of the EIA Report.

Methodology

Desk Study

A desk study was undertaken to inform the approach to field survey work and provide context for subsequent assessment.

The desk study has included a review of:

- Aerial imagery and Ordnance Survey (OS) maps to identify any features of potential value to foraging, commuting or roosting bats;
- A review of SiteLink to identify the proximity of the Site to any national or internationally designated sites for nature conservation, with bat qualifying interests;
- A review of existing bat records within 10 km of the Site, including species and roost records, obtained from South West Scotland Environmental Information Centre (SWSEIC);
- A review of the Site's location in relation to species' known ranges in Scotland, with reference to the most recent UK Habitats Directive Article 17 Report, based on Mathews et al. (2018); and
- The location of other wind farm developments, including the number of turbines and their size within 10 km of the Site was obtained from Figure 4.2 of the Knockcronal Wind Farm EIA Scoping Report (ITPEnergised, 2020).

Field Survey Methodology

Bat activity surveys were undertaken in accordance with current NatureScot guidance (SNH, 2019) between May 2020 and May 2021, consisting of a habitat assessment, roost surveys and ground-level activity surveys.

Habitat Assessment

An initial habitat assessment of the Site, focusing upon habitats within 200 m of proposed turbine locations, was undertaken in July 2020 to appraise the potential value of habitats present for commuting and foraging bats, using the criteria detailed within Table 2.1 of the Bat Conservation Trust (BCT) guidance (Collins, 2016).

The assessment was informed by a review of aerial imagery and comprised a daylight walkover of potentially suitable habitat features. The assessment was undertaken by Mr M. Wood, a suitably competent ecologist with considerable experience of undertaking bat habitat appraisals.

Preliminary Roost Assessment

Features with the potential to support maternity roosts and significant hibernation and/or swarming sites within a Zone of Influence (ZoI) of the nine proposed turbine locations, were identified through a review of aerial imagery and the habitat assessment. The ZoI was defined as a buffer of 200 m of the proposed turbine locations, plus the candidate turbine tip height (6x 200 m and 3x 180 m) i.e. within a total of 400 m from the proposed turbine locations.

A daylight, ground-level preliminary roost assessment in accordance with Collins guidance (2016), was therefore undertaken in July 2020 and an additional survey along the access route was undertaken in May 2021 by Mr M. Wood an experienced bat surveyor, with extensive experience in undertaking preliminary bat roost assessments.

Identified trees were assessed from ground level and not subject to endoscope inspection or aerial inspection of elevated features.

Ground-level Static Surveys

Automated static detectors were deployed within the site boundary in May, June, July, September and October 2020, sampling the spring, summer and autumn periods (Spring: May to early June,

Summer: June to mid-August, Autumn: September to October) in accordance with NatureScot guidance (SNH, 2019).

The total deployment duration of static monitoring over the spring, summer and autumn sampling periods are detailed in Table 8.1.

A total of 11 static detector locations were used. These are illustrated in Figure 8.8 and detailed in Table 8.2.

Each monitoring location comprised a single Songmeter (SM2) bat detector fitted with a single omnidirectional microphone attached to a 1 m high wooden stake or tree. Activity generated was based on a full spectrum or zero-crossing analysis of the captured sound files.

Automated detectors were programmed to commence recording approximately 30 minutes before sunset and finish recording half an hour after sunrise, with all automated detectors set up to record simultaneously, to allow comparison of activity recorded across the Site for the same monitoring period.

Automated detectors were deployed for a minimum of consecutive ten nights during each monitoring period at the onset of an appropriate weather window for bat activity i.e. forecast temperatures of >8°C (at dusk), maximum ground level wind speeds of 5 m/s and no, or only very light, rainfall.

Table 8.1 – Total duration of static monitoring during each monitoring period

Monitoring Period	Recording Location	Period Start	Period End	Total Deployment Duration (No. of nights)
Spring	LOC 1 -11	19/5/20	5/6/20	17
Summer	LOC 3-6, 8, 9 and 11	24/6/20	12/7/20	18
	LOC 1, 2, 7 and 10	12/7/20	20/7/20	8
Autumn	LOC 1 -11	16/9/20	12/10/20	26

Table 8.2 – Monitoring Locations

Detector I.D.	Grid Ref	Phase 1 Habitat Classification	Linear Feature within 50m	Nearest Turbine	Distance from Turbine (m)	Phase 1 Habitat Classification at Nearest Turbine	No. Nights Recorded		
							Spring	Summer	Autumn
LOC 1	NS3746700584	A2.2 – Forest edge	Coniferous plantation edge	T4	745	E1.6.1 – Blanket bog/wet modified bog mosaic	7	8	9
LOC 2	NS3674500327	B5 – semi-improved acid grassland/marshy grassland mosaic	Coniferous plantation edge	T2	602	B5 – semi-improved acid grassland/marshy grassland mosaic	7	8	26
LOC 3	NX3665299435	B5 – marshy grassland	Cliff face	T1, T9	T1=234 T9=318	T1 = B5 – marshy grassland T9 = E1.6.1 – Blanket bog/wet modified bog mosaic	10	15	12
LOC 4	NX3715699117	B5 – semi-improved acid grassland/marshy grassland mosaic	Coniferous plantation edge	T8, T9	T8=156 T9=338	T8 = B5 – semi-improved acid grassland/marshy grassland mosaic T9 = E1.6.1 – Blanket bog/wet modified bog mosaic	7	8	14
LOC 5	NX3759599216	E1.7 – wet modified bog	n/a	T7	118	B5 – semi-improved acid grassland/marshy grassland mosaic	8	14	24
LOC 6	NX3796899355	B5 – marshy grassland	n/a	T5, T6	T5=159 T6=322	T5 = E1.6.1 – Blanket bog/wet modified bog mosaic	7	15	17

						T6 = B5 – semi-improved acid grassland/marshy grassland mosaic			
LOC 7	NX3815499652	E1.6.1 – Blanket bog/wet modified bog mosaic	n/a	T5	228	E1.6.1 – Blanket bog/wet modified bog mosaic	7	8	16
LOC 8	NS3802400378	B1.2 – Semi-improved acid grassland	n/a	T4	502	E1.6.1 – Blanket bog/wet modified bog mosaic	7	16	16
LOC 9	NS3750600069	B5 – marshy grassland/blanket bog mosaic	n/a	T4	338	E1.6.1 – Blanket bog/wet modified bog mosaic	17	16	26
LOC 10	NX3709299755	B5 – semi-improved acid grassland/marshy grassland mosaic	n/a	T2	115	B5 – semi-improved acid grassland/marshy grassland mosaic	5	8	22
LOC 11	NX3763799697	B1.2 – Semi-improved acid grassland	n/a	T3	167	B5 – semi-improved acid grassland/marshy grassland mosaic	0	16	26

Data Analysis and Assumptions of Bat Activity

Bat sound analysis has been undertaken by A Hulme BSc, who has over four years' experience conducting sound analysis for wind farm developments across the UK and five years' experience completing bat surveys.

Analysis and interpretation of bat activity has followed the principles presented within Collins (2016) and NatureScot guidance (SNH, 2019**Error! Bookmark not defined.**).

Digital sonograms were analysed through Kaleidoscope Pro (Wildlife Acoustics) software using AutoID Version 5.1.9g before being uploaded to the *Ecobat Tool* (Lintott *et al.,* 2018) for analysis. All sonograms were manually checked prior to uploading to Ecobat, through Kaleidoscope Viewer and Analook (Titley Scientific).

Weather data were also analysed to check for any periods of poor weather which could have affected bat activity. In accordance with NatureScot (SNH, 2019) guidelines, bat surveys should be undertaken in appropriate weather: temperatures of >8^{o}C at dusk, maximum ground level wind speed of >5 m/s and no, or only very light rainfall.

Assessment of Relative Activity Levels
In accordance with NatureScot guidance (SNH, 2019), Ecobat was used to provide an objective interpretation of the relative importance of bat activity levels recorded within the Site.

Ecobat is a free online tool provided by the Mammal Society. The tool compares baseline bat activity data collected for a site, with a national database (i.e. the 'reference range'), collected from similar areas at the same time of year. It then provides a percentile rank for each species and provides a numerical way of interpreting the results rather than relying on professional judgement alone. The online tool remains limited by the amount of data in the database on a locational basis; and therefore the results should be regarded as indicative rather than conclusive evidence of the importance of a site for bats.

For each night that bat activity is recorded, *Ecobat* reports the percentile and associated confidence limits of the data against the software's reference range. Table 8.3 presents the percentile and bat activity categories, replicated from NatureScot (SNH, 2019) guidance.

Table 8.3 - Percentile Scope and Categorised Level of Bat Activity

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

For the purposes of analysis in Ecobat, the following parameters were used to stratify the reference range:

- Only records from within 30 days of the survey date.
- Only records from within 100 km^2 of the detector locations.

The reference range for each species is given by Ecobat, and Ecobat recommend a reference range of >200 to be confident in the relative activity level. All species reached this threshold which provides increased confidence to the results:

- Soprano pipistrelle *Pipistrellus pygmaeus* – 2,515
- Common pipistrelle *P. pipistrellus* – 1,647

- Myotis species – 879
- Noctule *Nyctalus noctula* – 747

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

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

Survey Limitations
Occasional detector failures occurred. These are common events and are not considered to affect the overall validity of the data set.

LOC 11 failed to record during the spring period (May 2020).

In the spring period, all but two of the detectors recorded for fewer than the recommended ten nights and four were below ten nights during the summer period. As a result, the detectors in autumn were left out for considerably longer periods to compensate for possible further detector failures (minimum nine nights and maximum of 26 nights in autumn). Deployment periods are shown in Table 8.1.

LOC 1 failed to record for the recommended ten nights during each survey period.

Although many of the detectors failed to record for the recommended ten nights minimum during spring and summer the prolonged autumn recording period resulted in all but two of the detectors (LOC 1; 24 nights and LOC 4; 29 nights) recording over 30 nights when the survey periods are combined. Additionally, 11 detectors were used for nine turbines, which are more detectors than required by the guidance (SNH, 2019) and therefore; the survey constraints outlined above are not considered to be a significant limitation.

With regard to weather data, two nights of sampling were excluded from the analysis as they did not meet the criteria for appropriate weather conditions (SNH, 2019) and no bats were recorded.

Nights were also recorded in weather conditions which did not meet the criteria, but bat activity was still recorded so these have been included within the analysis. Although it is recognised that poor weather can affect bat activity, excluding these data from the analysis skews the dataset and would remove some high collision risk species (noctule) from the dataset. Subsequently inclusion of these nights represents a precautionary approach.

Due to an unforeseen weather station malfunction it was not possible to retrieve the weather data for the three survey periods. Instead, the weather data for this static deployment period was obtained from SEPA and the Time and Date website. Weather masts in this area are very limited with the closest SEPA mast being Maybole c.12 km north-west and the closest Time and Date mast being Penwhapple Reservoir c.12 km west. As a result the weather data may not be totally accurate for the site; however considering that bats were recorded in all but two recording nights, including during nights deemed as having unsuitable weather, this is not considered to represent a significant limitation to the data.

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

The detectability of some bat species, such as brown long-eared, is lower than that of, for example, noctule and pipistrelle. The echolocation calls of brown long-eared are comparatively more difficult to detect with

bat detectors, and their particular hunting strategies take them into less open habitats. Careful interpretation has therefore been applied when comparing survey results across species.

Results

Desk Study

Statutory Designated Sites for Nature Conservation

In review of Sitelink, the Site is not located within 10 km of any national or internationally designated site for nature conservation, with bat qualifying interests.

The records from SWSEIC showed that no non-statutory designated sites for nature conservation with bat interests are located within 2 km of the Site.

Existing Bat Records

SWSEIC returned a total of 21 bat records from 2016 from within 10 km of the Site. Records were attributable to: common pipistrelle (3 records), soprano pipistrelle (3 records), Leisler's bat (2 records), Daubneton's bat (3 records), Natterer's bat (3 records), whiskered bat (1 record) *Pipistrellus* bat species (3 records) and Myotis bat species (3 records).

Full existing bat records are presented in Annex 1.

UK Bat Species Range

In review of the UK Habitats Directive Article 17 Report 'Habitats Directive Report 2019: Species Conservation Status Assessments 2019', the Site is located within the known UK distribution range for the following bat species:

- Common pipistrelle;
- Daubenton's bat;
- Brown long-eared bat;
- Whiskered bat; and
- Leisler's bat.

Habitat Assessment

The habitats within the site boundary are considered to be of low habitat risk for bats, in accordance with criteria presented in NatureScot guidelines (SNH, 2019).

The south of the site, where the proposed turbines are located, is dominated by marshy grassland and blanket bog. The southern and western boundaries of the site consist of commercially managed coniferous woodland. These offer relatively poor foraging opportunities for bats.

The north of the site, beyond the proposed turbine locations, offers higher value habitats for bats. Habitats consisted of improved grassland interspersed by a series of burns, including Palmullan Burn, edged by semi-natural broadleaved woodland. The improved grassland offers poor foraging opportunities, however the burns with woodland offers good foraging opportunities and also connectivity with potentially higher value habitats within the wider landscape.

Preliminary Roost Assessment of Buildings and Trees

Potential roost features within the site were absent; the Site is dominated by open grassland and blanket bog which offers negligible roost opportunities and so is unlikely to support maternity or significant hibernation roosts.

There are three buildings within the site with bat roost potential. These comprise a private dwelling, Knockskae Cottage, located at NS372014; an old brick chimney located at NS385009 and a ruined cottage located at NS387005. Photographs of the buildings (with the exception of Knockskae Cottage) are presented in Annex 2.

Knockskae Cottage is located within proximity of the access track. The roof space appeared suitable for bats, however the building was only observed from a distance.

The old brick chimney had an opening at its base leading into the flue. The flue and any cavities within it could provide opportunities for small numbers of roosting bats and were considered to offer low roosting potential (Plate 1).

The ruined cottage supported a large gable end wall with exposed chimney cavities internally. The cavities could provide opportunities for small numbers of roosting bats and were considered to offer low roosting potential (Plate 2).

Mature ash and oak trees are located along a section of the Palmullan Burn, located at NS373012, with holes and cavities and were considered to offer low roosting potential (Plate 3).

Overall, the site is considered to provide low/negligible bat roosting potential.

Ground-level Activity Surveys

Overall Site Results

Bats were detected on 67 dates between 19/5/20 and 12/10/20, out of a possible 69 recording dates from 11 static bat detectors. LOC 8 recorded no bats during the three survey seasons.

Species identified are presented in Table 8.4 along with potential collision risk and population vulnerability as described in NatureScot guidance (SNH, 2019).

Overall, a total of 8,067 bat passes were recorded over a total of 422 survey nights (all 11 detectors combined), as summarised in Table 8.5.

The full Ecobat output report is included as Annex 3.

Table 8.4 - Species recorded, collision risk and population vulnerability

Species	Collision Risk	Population Vulnerability
Common pipistrelle	High	Medium
Myotis species	Low	Low/Medium
Noctule	High	High
Soprano pipistrelle	High	Medium

Table 8.5 - Total number of bat passes

Species	No. Bat Passes	Percentage of total (%)	Max Passes per Night	Mean Passes per Night
Common pipistrelle	1,230	15.25	225	2.91
Myotis	372	4.6	15	0.88
Noctule	645	8.0	113	1.53
Soprano pipistrelle	5,820	72.15	634	13.79
Total	8,067	100.0	987	19.12

Ecobat Results

Table 8.6 presents the number of nights species activity was recorded at each activity band.

Table 8.7 presents the key metrics of the *Ecobat* output for each species. Data from all monitoring locations are used to provide Site-wide averages/medians.

Table 8.6 – Number of nights recorded bat activity fell into each activity band within the Site

Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Common pipistrelle	14	9	19	23	40
Myotis	0	21	28	19	38
Noctule	8	16	26	21	32
Soprano pipistrelle	31	17	25	18	35

Table 8.7 – Percentiles for each species within the Site

Species/ Species Group	Total Passes	Passes per Night		Median Percentile	95% CIs	Max Percentile	Nights Recorded *
		Recorded	Included in *Ecobat*				
Common Pipistrelle	1230	2.91	5.91	31	42 - 75.5	98	105
Soprano pipistrelle	5820	13.79	27.98	45	56 - 90	99	126
Noctule	645	1.52	3.1	31	36.5 - 68.5	95	103
Myotis spp.	372	0.88	1.79	31	38 - 58.5	79	106

**all detectors combined*

Spatial Distribution

The *Ecobat* output median and mean nightly pass rate (passes per hour, per night) of each species, at each detector for all months is presented in **Error! Reference source not found.** The use of the median value is recognised to provide the more accurate representation of activity, as bat activity levels between nights can be highly variable, and thus the median provides a more reliable value than the mean or maximum (Lintott *et al.*, 2018). In addition, the dataset is unlikely to be normally distributed; therefore the median is the most appropriate metric to report.

Data for 'Includes Absences' and 'Excludes Absences' are included in Table 8.8. Includes absences takes into account nights when no bats were recorded and therefore lowers the overall medians and means (note this does not include any nights when no bats of any species were recorded as these are filtered out by *Ecobat* in the initial data upload to the *Ecobat* tool, see Limitations).

When absences are excluded medians and means are higher and show peaks in the data, which is especially useful for sites with low bat activity when peaks can be easily overlooked in large data sets.

Table 8.8 – Median and mean bat pass rate per species per detector

Species	Detector ID	Total Bat Passes	Median pass Rate (passes per hour/night)		Mean Pass Rate (passes per hour/night	
			Incl. Absences	Excl. Absences	Incl. Absences	Excl. Absences
Common pipistrelle	LOC 1	670	0.3	0.6	4.8	6.1
	LOC 2	33	0.1	0.1	0.1	0.2
	LOC 3	367	0.1	0.3	1.3	2.1
	LOC 4	10	0.0	0.1	0.0	0.1
	LOC 5	21	0.0	0.2	0.1	0.3
	LOC 6	4	0.0	0.2	0.0	0.2
	LOC 7	31	0.1	0.3	0.2	0.4
	LOC 9	77	0.1	0.3	0.5	0.8
	LOC 10	17	0.0	0.1	0.1	0.3
Myotis	LOC 1	50	0.1	0.5	0.3	0.7
	LOC 2	46	0.1	0.2	0.2	0.2
	LOC 3	154	0.5	0.6	0.6	0.7
	LOC 4	56	0.1	0.4	0.3	0.4
	LOC 5	7	0.0	0.2	0.0	0.2
	LOC 6	7	0.0	0.1	0.1	0.1
	LOC 7	6	0.0	0.1	0.0	0.1
	LOC 9	15	0.0	0.2	0.1	0.2
	LOC 10	31	0.0	0.2	0.2	0.4
Noctule	LOC 1	1	0.0	0.1	0.0	0.1
	LOC 2	7	0.0	0.2	0.0	0.3
	LOC 3	290	0.2	0.6	1.1	1.9
	LOC 4	82	0.1	0.2	0.5	0.7
	LOC 5	77	0.3	0.6	0.4	0.5
	LOC 6	22	0.1	0.1	0.3	0.3
	LOC 7	59	0.0	0.4	0.4	1.0
	LOC 9	8	0.0	0.2	0.1	0.2
	LOC 10	34	0.1	0.2	0.2	0.3
	LOC 11	65	0.4	0.4	1.3	1.3
Soprano pipistrelle	LOC 1	2273	2.2	2.2	16.1	17.0
	LOC 2	88	0.2	0.2	0.3	0.4
	LOC 3	3249	0.6	7.9	12.0	16.2
	LOC 4	13	0.0	0.1	0.1	0.2

Species	Detector ID	Total Bat Passes	Median pass Rate (passes per hour/night)		Mean Pass Rate (passes per hour/night	
			Incl. Absences	Excl. Absences	Incl. Absences	Excl. Absences
	LOC 5	35	0.0	0.4	0.2	0.7
	LOC 6	6	0.0	0.1	0.0	0.1
	LOC 7	54	0.1	0.2	0.3	0.4
	LOC 9	77	0.2	0.3	0.5	0.7
	LOC 10	25	0.0	0.4	0.2	0.4

Table 8.9 – Percentiles for each species per detector location for the whole survey period

Species/ Species Group	Detector ID	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level
Common pipistrelle	LOC 1	53	42 - 75.5	98	15	Moderate to High
	LOC 2	16	1 - 37.5	74	14	Low to Moderate
	LOC 3	45	23 - 62.5	95	24	Moderate
	LOC 4	1	1 -27	53	6	Low to Moderate
	LOC 5	1	1 - 32.5	64	9	Low to Moderate
	LOC 6	31	31 - 31	31	2	Low to Moderate
	LOC 7	31	1 - 52.5	74	11	Moderate
	LOC 9	31	16 - 57.5	88	15	Moderate
	LOC 10	1	1 -31	60	9	Low to Moderate
Myotis	LOC 1	53	27 - 68	76	10	Moderate to High
	LOC 2	31	16 - 45.5	64	17	Moderate
	LOC 3	53	38 - 58.5	79	33	Moderate
	LOC 4	60	30.5 - 68	76	11	Moderate to High
	LOC 5	1	1 - 16	31	5	Low
	LOC 6	16	1 - 31	45	4	Low to Moderate
	LOC 7	1	1 - 1	31	5	Low
	LOC 9	1	1 - 16	45	11	Low
	LOC 10	16	1 - 38	74	10	Low to Moderate
Noctule	LOC 1	1	0	1	1	Low
	LOC 2	31	1 - 53	53	3	Moderate
	LOC 3	53	36.5 - 68.5	95	22	Moderate to High
	LOC 4	42	16 - 65	85	14	Moderate to High
	LOC 5	53	35.5 - 56.5	74	19	Moderate
	LOC 6	1	1 - 37.5	74	9	Low to Moderate
	LOC 7	38	16 - 67.5	90	8	Moderate to High

Species/ Species Group	Detector ID	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Activity Level
	LOC 9	1	1 - 1	45	6	Low
	LOC 10	31	16 - 35.5	70	14	Low to Moderate
	LOC 11	45	23 - 79	88	7	Moderate to High
Soprano pipistrelle	LOC 1	81	56 - 90	99	18	High
	LOC 2	45	31 - 56.5	79	20	Moderate
	LOC 3	92	50 - 93.5	99	29	High
	LOC 4	1	1 - 35.5	70	5	Low to Moderate
	LOC 5	38	16 - 67	79	8	Moderate to High
	LOC 6	1	1 - 1	45	4	Low
	LOC 7	31	1 - 38	83	17	Low to Moderate
	LOC 9	31	16 - 53	85	17	Moderate
	LOC 10	45	1 - 56	67	8	Moderate

Table 8.10 - The number of nights sampled (detectors were operational for), the number of nights bats were recorded and the total number of bat recorded per monitoring station. Percentage distribution of no. bats is also presented.

Detector ID	No. Nights Sampled	No. of nights Bats were Recorded	Percentage of Nights Bats were Recorded	Total No. Bats recorded	Percentage Distribution of No. Bats
LOC 1	24	19	79.2	2994	37.1%
LOC 2	41	24	58.5	174	2.1%
LOC 3	37	39	105.4	4060	50.3%
LOC 4	29	19	65.5	161	2.0%
LOC 5	46	24	52.2	140	1.7%
LOC 6	39	10	25.6	39	0.5%
LOC 7	31	21	67.7	150	1.9%
LOC 8	39	0	0.0	0	0.0%
LOC 9	59	23	39.0	177	2.2%
LOC 10	35	22	62.9	107	1.3%
LOC 11	42	7	16.7	65	0.8%

Temporal Activity

Activity levels were calculated by *Ecobat* per species (or species group) per month to allow for temporal variations in bat activity, as presented in **Error! Reference source not found.**11. Median and maximum percentiles and corresponding activity levels are presented.

Table 8.11 – Percentiles for each species each month within the site. Activity Level is based on the median percentile

Species	Month	Median Percentile	95% Confidence Interval (CI)	Max Percentile	Nights Recorded	Activity Level
Common pipistrelle	May	60	42 - 75.5	98	27	Moderate
	Jun	38	23 - 62.5	87	18	Low to Moderate
	Jul	16	42 - 75.5	93	28	Moderate
	Sep	1	31 - 31	53	19	Low to Moderate
	Oct	31	42 - 75.5	74	13	Moderate to High
Myotis	May	42	38 - 58.5	76	22	Moderate
	Jun	49	38 - 58.5	79	10	Moderate
	Jul	31	38 - 58.5	74	35	Moderate
	Sep	31	38 - 58.5	76	27	Moderate
	Oct	16	30.5 - 68	60	12	Low to Moderate
Noctule	May	45	36.5 - 68.5	90	19	Low to Moderate
	Jun	53	36.5 - 68.5	95	19	Low to Moderate
	Jul	45	36.5 - 68.5	88	34	Low to Moderate
	Sep	31	35.5 - 56.5	74	20	Low to Moderate
	Oct	1	16 - 65	53	11	Low to Moderate
Soprano pipistrelle	May	64	56 - 90	99	30	Moderate to High
	Jun	64	50 - 93.5	98	19	Moderate to High
	Jul	57	56 - 90	99	30	Moderate to High
	Sep	31	50 - 93.5	74	30	Moderate to High
	Oct	45	56 - 90	90	17	Moderate to High

Potential Bat Roosts within Close Proximity to Study Area

Ecobat analysis showed that activity was recorded within the species-specific emergence time for nine monitoring locations. This is detailed in Table 8.12.

Table 8.12 – Bat activity recorded within the species-specific emergence time

Detector ID	Species/Species Group	Nights Recorded	Peak Count	Month of Peak Count
LOC 1	Common pipistrelle	1	1	May
LOC 1	Soprano pipistrelle	3	13	October
LOC 1	*Myotis spp*.	1	1	October
LOC 2	Common pipistrelle	1	2	October
LOC 2	Soprano pipistrelle	3	1	September/October
LOC 3	Common pipistrelle	1	2	May
LOC 3	Soprano pipistrelle	1	33	June
LOC 3	*Myotis spp*.	19	4	July
LOC 3	Noctule	2	4	June
LOC 4	Soprano pipistrelle	1	1	October
LOC 5	Noctule	1	1	September
LOC 7	Noctule	3	2	May
LOC 9	Common pipistrelle	3	26	July
LOC 9	Soprano pipistrelle	5	8	July
LOC 9	*Myotis spp*.	1	1	July
LOC 9	Noctule	3	1	July
LOC 10	Noctule	1	2	October
LOC 11	Noctule	1	2	July

Based on the Ecobat analysis above, it is possible that a roost for *Myotis spp*. is located within proximity to LOC 3. Roosts of *Pipistrellus spp*., *Myotis spp.* and noctule may also be present within or in close proximity to the study area.

Weather Data

Where nights were recorded in weather conditions which did not meet the criteria, but bat activity was still recorded, these have been included within the analysis. Whilst it is recognised that poor weather can affect bat activity, excluding these data from the analysis skews the data set and would remove some higher collision risk species (noctule) from the data set.

The majority of survey nights were undertaken in suitable weather conditions and the surveying period was extended beyond the requirements of NatureScot guidance (2019). Subsequently the bat survey data recorded is considered to be representative for the Site.

Weather data are presented in Annex 4.

Assessment of the Potential Risks to Bats

Stage 1 – Initial Site Risk Assessment

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

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

The site has been assessed as having an overall 'Site Risk' of **1**, represent a **Low/Lowest Site Risk**:

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

The site 'Project Size' is classified as being **Small**, comprising a development of 9 turbines of up to 200 m tip height, with two other operational wind farm developments (Dersalloch and Penwhapple Wind Farms) located within 10 km of the Site (distances measures between the nearest turbines).

Stage 2 – Overall Risk Assessment

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

- Noctule bat;
- Common pipistrelle; and
- Soprano pipistrelle.

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

The calculated 'Overall Risk Assessment' per species, both temporally and spatially is presented in Table 8.13. The Overall Risk Category provided is concluded on the basis of the determined *Ecobat* conclusion and professional judgement on the basis of all available information and in recognition of the limitations of *Ecobat*.

As outlined, the *Ecobat* tool is in its infancy and given current limitations in available bat survey data on the database, definitive bat activity for regions are not generated and bat activity representations are instead indicative for each region.

In summary, the Overall Risk Assessment for common pipistrelle and noctule is considered to fall under "Low Site Risk" and under "Low/Medium Site Risk" for soprano pipistrelle.

In recognition of the limitations associated with the *Ecobat* tool, the output of Stage 2 should be treated with caution.

Table 8.13 – Overall Risk Assessment (Table 3b from SNH (2019) guidance). Key: green = Low, amber = Medium, red = High

Species / species group	I.D	Median Percentile	Percentile Category	Overall Risk Assessment (Stage 2)	Species / species group	Month	Median Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
Common pipistrelle	LOC 1	53	Moderate to High	Low	Common pipistrelle	May	60	Moderate	Low
	LOC 2	16	Low to Moderate	Low		Jun	38	Low to Moderate	Low
	LOC 3	45	Moderate	Low		Jul	16	Moderate	Low
	LOC 4	1	Low to Moderate	Low		Sep	1	Low to Moderate	Low
	LOC 5	1	Low to Moderate	Low		Oct	31	Moderate to High	Low
	LOC 6	31	Low to Moderate	Low	Soprano pipistrelle	May	64	Moderate to High	Low
	LOC 7	31	Moderate	Low		Jun	64	Moderate to High	Low
	LOC 9	31	Moderate	Low		Jul	57	Moderate to High	Low
	LOC 10	1	Low to Moderate	Low		Sep	31	Moderate to High	Low
Soprano pipistrelle	LOC 1	81	High	Medium		Oct	45	Moderate to High	Low
	LOC 2	45	Moderate	Low	Noctule	May	45	Low to Moderate	Low
	LOC 3	92	High	Medium		Jun	53	Low to Moderate	Low
	LOC 4	1	Low to Moderate	Low		Jul	45	Low to Moderate	Low
	LOC 5	38	Moderate to High	Low		Sep	31	Low to Moderate	Low
	LOC 6	1	Low	Low		Oct	1	Low to Moderate	Low
	LOC 7	31	Low to Moderate	Low					

Species / species group	I.D	Median Percentile	Percentile Category	Overall Risk Assessment (Stage 2)	Species / species group	Month	Median Percentile	Percentile Category	Overall Risk Assessment (Stage 2)
	LOC 9	31	Moderate	Low					
	LOC 10	45	Moderate	Low					
Noctule	LOC 1	1	Low	Low					
	LOC 2	31	Moderate	Low					
	LOC 3	53	Moderate to High	Low					
	LOC 4	42	Moderate to High	Low					
	LOC 5	53	Moderate	Low					
	LOC 6	1	Low to Moderate	Low					
	LOC 7	38	Moderate to High	Low					
	LOC 9	1	Low	Low					
	LOC 10	31	Low to Moderate	Low					
	LOC 11	45	Moderate to High	Low					

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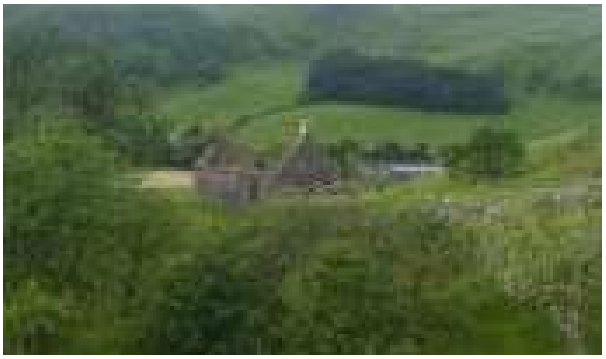
Annex 1 – Existing Bat Records – SWSEIC

Species	Date	Grid Reference	Abundances	Comment
Myotis bat species *Myotis*	28/05/2016	NS3990300905	1 Non-social call	-
Myotis bat species *Myotis*	30/05/2016	NS3998700869	3 Non-social call	-
Myotis bat species *Myotis*	29/05/2016	NS3966300973	2 Non-social call	-
Whiskered bat (*Myotis mystacinus*)	30/05/2016	NS3998700869	22 Non-social call	-
Daubenton's bat (*Myotis daubentoniid*)	30/05/2016	NS3998700869	14 Non-social call	-
Daubenton's bat (*Myotis daubentoniid*)	29/05/2016	NS3966300973	6 Non-social call	-
Daubenton's bat (*Myotis daubentoniid*)	28/05/2016	NS3990300905	1 Non-social call	-
Natterer's bat (*Myotis nattereri*)	29/05/2016	NS3966300973	4 Non-social call	-
Natterer's bat (*Myotis nattereri*)	28/05/2016	NS3990300905	1 Non-social call	-
Natterer's bat (*Myotis nattereri*)	30/05/2016	NS3998700869	1 Non-social call	-
Leisler's bat (*Nyctalus leisleri*)	30/05/2016	NS3998700869	1 Non-social call	-
Leisler's bat (*Nyctalus leisleri*)	28/05/2016	NS3990300905	2 Non-social call	-
Pipistrellus bat species (*Pipistrellus* sp.)	30/05/2016	NS3998700869	12 unspecified calls	-
Pipistrellus bat species	29/05/2016	NS3966300973	40 unspecified calls	-

Species	Date	Grid Reference	Abundances	Comment
(*Pipistrellus* sp.)				
Pipistrellus bat species (*Pipistrellus* sp.)	28/05/2016	NS3990300905	9 unspecified calls	-
Common pipistrelle (*Pipistrellus pipistrellus*)	30/05/2016	NS3998700869	7 unspecified calls	-
Common pipistrelle (*Pipistrellus pipistrellus*)	29/05/2016	NS3966300973	7 unspecified calls	-
Common pipistrelle (*Pipistrellus pipistrellus*)	28/05/2016	NS3990300905	27 unspecified calls	-
Soprano pipistrelle (*Pipistrellus pygmaeus*)	29/05/2016	NS3966300973	36 unspecified calls	-
Soprano pipistrelle (*Pipistrellus pygmaeus*)	28/05/2016	NS3990300905	32 unspecified calls	-
Soprano pipistrelle (*Pipistrellus pygmaeus*)	30/05/2016	NS3998700869	59 unspecified calls	-

Annex 2 – Photographic Plates

	**Plate 1** Old brick chimney with low bat roost potential located at NS385009.
	**Plate 2** Ruined cottage with low bat roost potential located at NS387005.
	**Plate 3** Mature ash and oak trees located along Palmullan Burn with low bat roost potential located at NS373012.

Annex 3 – Ecobat Full Output Report

This report was produced free of charge by the Mammal Society to support evidence-based conservation of bats.

The following analyses are based on data supplied by the user to the Mammal Society's Ecobat website. The outputs are designed to assist decision-making, but do not replace expert interpretation by the user. The creation of the Ecobat tool was supported by the Natural Environment Research Council (NERC).

Bat Activity Analysis

Site Name: Knockcronal

Author: Andrew Hulme

29/06/2021

Summary

Bats were detected on **67** nights between **2020-05-19** and **2020-10-11**, using **10** static bat detectors. Throughout this period **4** species were recorded. **Table 1.** Detectors were placed at the following locations:

Detector ID	Latitude	Longitude
LOC 1	55.27252	-4.559963
LOC 9	55.26791	-4.559052
LOC 10	55.26495	-4.565379
LOC 3	55.26193	-4.572111
LOC 7	55.26438	-4.548625
LOC 5	55.26028	-4.557161
LOC 2	55.26997	-4.571166
LOC 4	55.25925	-4.564004
LOC 6	55.26165	-4.551378
LOC 11	55.26461	-4.556778

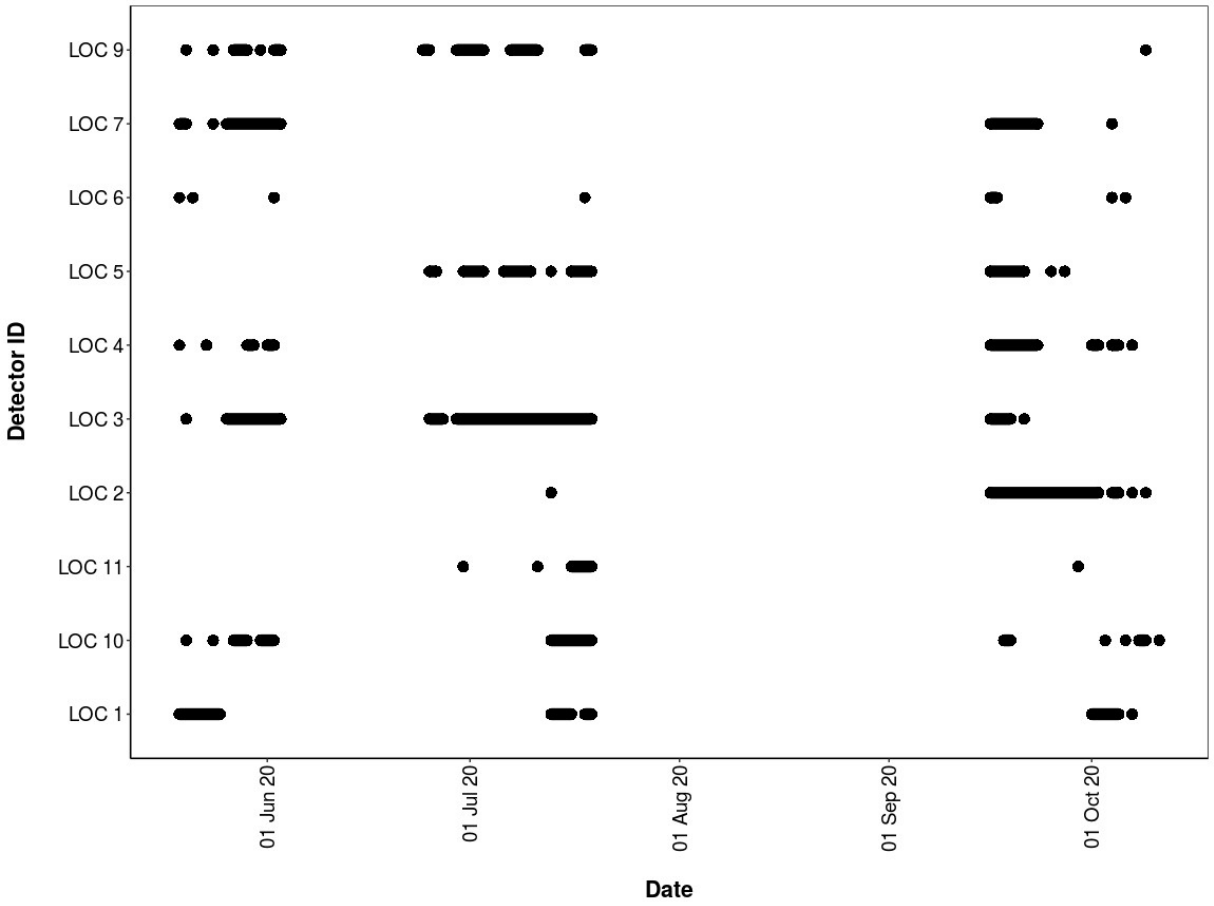
Survey Nights

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
LOC 1	19
LOC 10	22
LOC 11	7
LOC 2	24
LOC 3	39
LOC 4	19
LOC 5	24
LOC 6	10
LOC 7	21
LOC 9	23

Survey Nights

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



PART 1: Percentiles Analysis

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

The reference range dataset was stratified to include:

- Only records from within 30 days of the survey date.
- Only records from within 100km radius of the survey location.

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 High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
LOC 1	*Myotis*	0	3	3	2	2
LOC 1	*Nyctalus noctula*	0	0	0	0	1
LOC 1	*Pipistrellus pipistrellus*	6	0	3	6	0
LOC 1	*Pipistrellus pygmaeus*	10	2	3	2	1
LOC 10	*Myotis*	0	2	1	2	5
LOC 10	*Nyctalus noctula*	0	2	1	5	6
LOC 10	*Pipistrellus pipistrellus*	0	0	2	2	5
LOC 10	*Pipistrellus pygmaeus*	0	1	4	0	3
LOC 11	*Nyctalus noctula*	1	2	2	0	2
LOC 2	*Myotis*	0	1	6	3	7
LOC 2	*Nyctalus noctula*	0	0	1	1	1
LOC 2	*Pipistrellus pipistrellus*	0	1	2	4	7
LOC 2	*Pipistrellus pygmaeus*	0	6	6	4	4
LOC 3	*Myotis*	0	11	13	4	5
LOC 3	*Nyctalus noctula*	4	5	6	3	4
LOC 3	*Pipistrellus pipistrellus*	7	3	3	3	8
LOC 3	*Pipistrellus pygmaeus*	19	0	3	3	4
LOC 4	*Myotis*	0	4	3	2	2
LOC 4	*Nyctalus noctula*	2	3	2	2	5
LOC 4	*Pipistrellus pipistrellus*	0	0	1	1	4
LOC 4	*Pipistrellus*	0	1	0	1	3

	pygmaeus					
LOC 5	*Myotis*	0	0	0	2	3
LOC 5	*Nyctalus noctula*	0	3	9	5	2
LOC 5	*Pipistrellus pipistrellus*	0	2	1	0	6
LOC 5	*Pipistrellus pygmaeus*	0	2	2	2	2
LOC 6	*Myotis*	0	0	1	1	2
LOC 6	*Nyctalus noctula*	0	1	1	2	5
LOC 6	*Pipistrellus pipistrellus*	0	0	0	2	0
LOC 6	*Pipistrellus pygmaeus*	0	0	1	0	3
LOC 7	*Myotis*	0	0	0	1	4
LOC 7	*Nyctalus noctula*	1	0	3	3	1
LOC 7	*Pipistrellus pipistrellus*	0	1	3	2	5
LOC 7	*Pipistrellus pygmaeus*	1	1	3	4	8
LOC 9	*Myotis*	0	0	1	2	8
LOC 9	*Nyctalus noctula*	0	0	1	0	5
LOC 9	*Pipistrellus pipistrellus*	1	2	4	3	5
LOC 9	*Pipistrellus pygmaeus*	1	4	3	2	7

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
LOC 1	*Myotis*	53	27 - 68	76	10	879
LOC 1	*Nyctalus noctula*	1	0	1	1	747
LOC 1	*Pipistrellus pipistrellus*	53	42 - 75.5	98	15	1647
LOC 1	*Pipistrellus pygmaeus*	81	56 - 90	99	18	2515
LOC 10	*Myotis*	16	1 - 38	74	10	879
LOC 10	*Nyctalus noctula*	31	16 - 35.5	70	14	747
LOC 10	*Pipistrellus pipistrellus*	1	1 - 31	60	9	1647
LOC 10	*Pipistrellus pygmaeus*	45	1 - 56	67	8	2515
LOC 11	*Nyctalus noctula*	45	23 - 79	88	7	747
LOC 2	*Myotis*	31	16 - 45.5	64	17	879
LOC 2	*Nyctalus noctula*	31	1 - 53	53	3	747
LOC 2	*Pipistrellus pipistrellus*	16	1 - 37.5	74	14	1647
LOC 2	*Pipistrellus pygmaeus*	45	31 - 56.5	79	20	2515
LOC 3	*Myotis*	53	38 - 58.5	79	33	879
LOC 3	*Nyctalus noctula*	53	36.5 - 68.5	95	22	747
LOC 3	*Pipistrellus pipistrellus*	45	23 - 62.5	95	24	1647
LOC 3	*Pipistrellus pygmaeus*	92	50 - 93.5	99	29	2515
LOC 4	*Myotis*	60	30.5 - 68	76	11	879

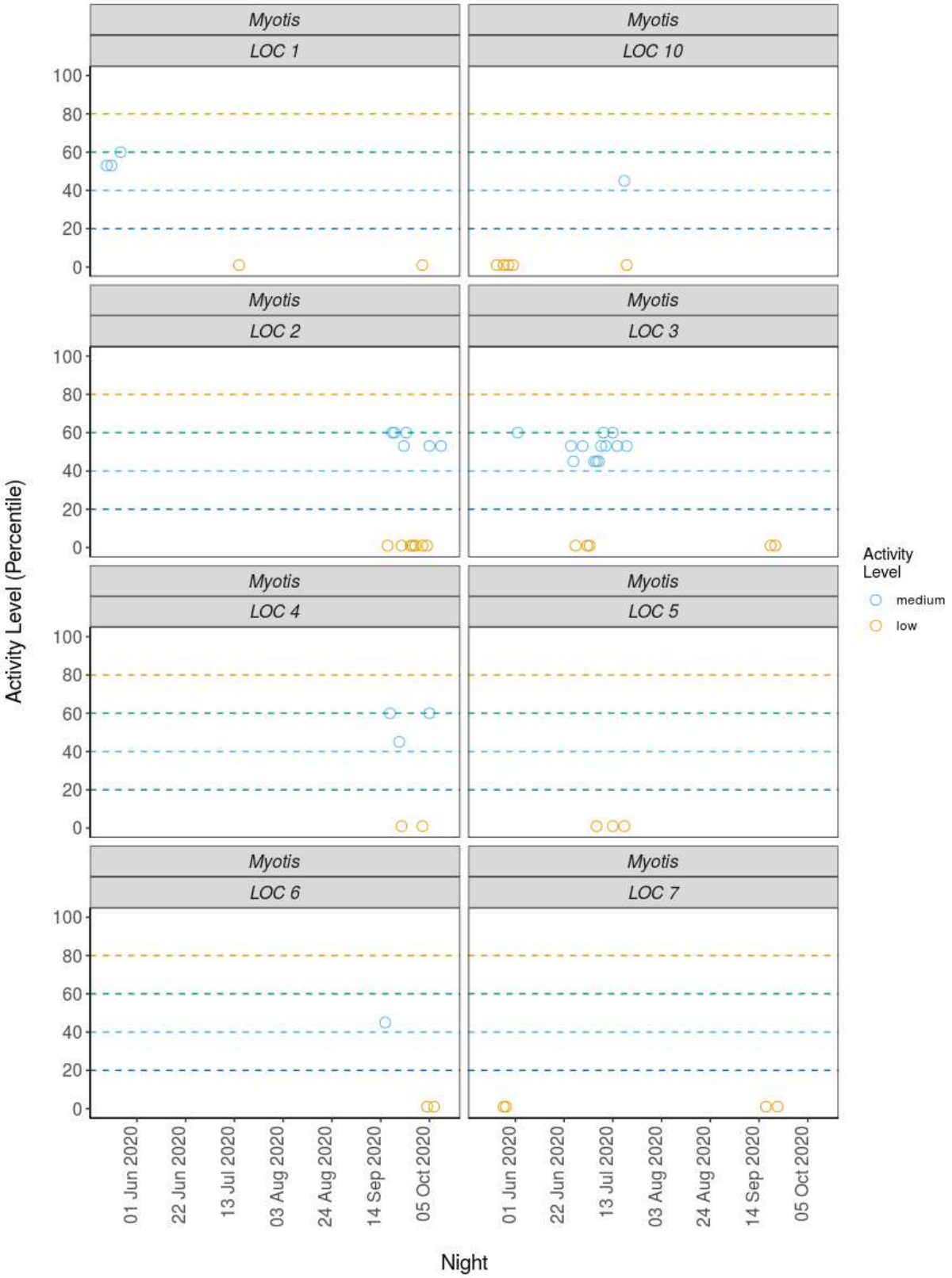
LOC 4	*Nyctalus noctula*	42	16 - 65	85	14	747
LOC 4	*Pipistrellus pipistrellus*	1	1 - 27	53	6	1647
LOC 4	*Pipistrellus pygmaeus*	1	1 - 35.5	70	5	2515
LOC 5	*Myotis*	1	1 - 16	31	5	879
LOC 5	*Nyctalus noctula*	53	35.5 - 56.5	74	19	747
LOC 5	*Pipistrellus pipistrellus*	1	1 - 32.5	64	9	1647
LOC 5	*Pipistrellus pygmaeus*	38	16 - 67	79	8	2515
LOC 6	*Myotis*	16	1 - 31	45	4	879
LOC 6	*Nyctalus noctula*	1	1 - 37.5	74	9	747
LOC 6	*Pipistrellus pipistrellus*	31	31 - 31	31	2	1647
LOC 6	*Pipistrellus pygmaeus*	1	1 - 1	45	4	2515
LOC 7	*Myotis*	1	1 - 1	31	5	879
LOC 7	*Nyctalus noctula*	38	16 - 67.5	90	8	747
LOC 7	*Pipistrellus pipistrellus*	31	1 - 52.5	74	11	1647
LOC 7	*Pipistrellus pygmaeus*	31	1 - 38	83	17	2515
LOC 9	*Myotis*	1	1 - 16	45	11	879
LOC 9	*Nyctalus noctula*	1	1 - 1	45	6	747
LOC 9	*Pipistrellus pipistrellus*	31	16 - 57.5	88	15	1647
LOC 9	*Pipistrellus pygmaeus*	31	16 - 53	85	17	2515

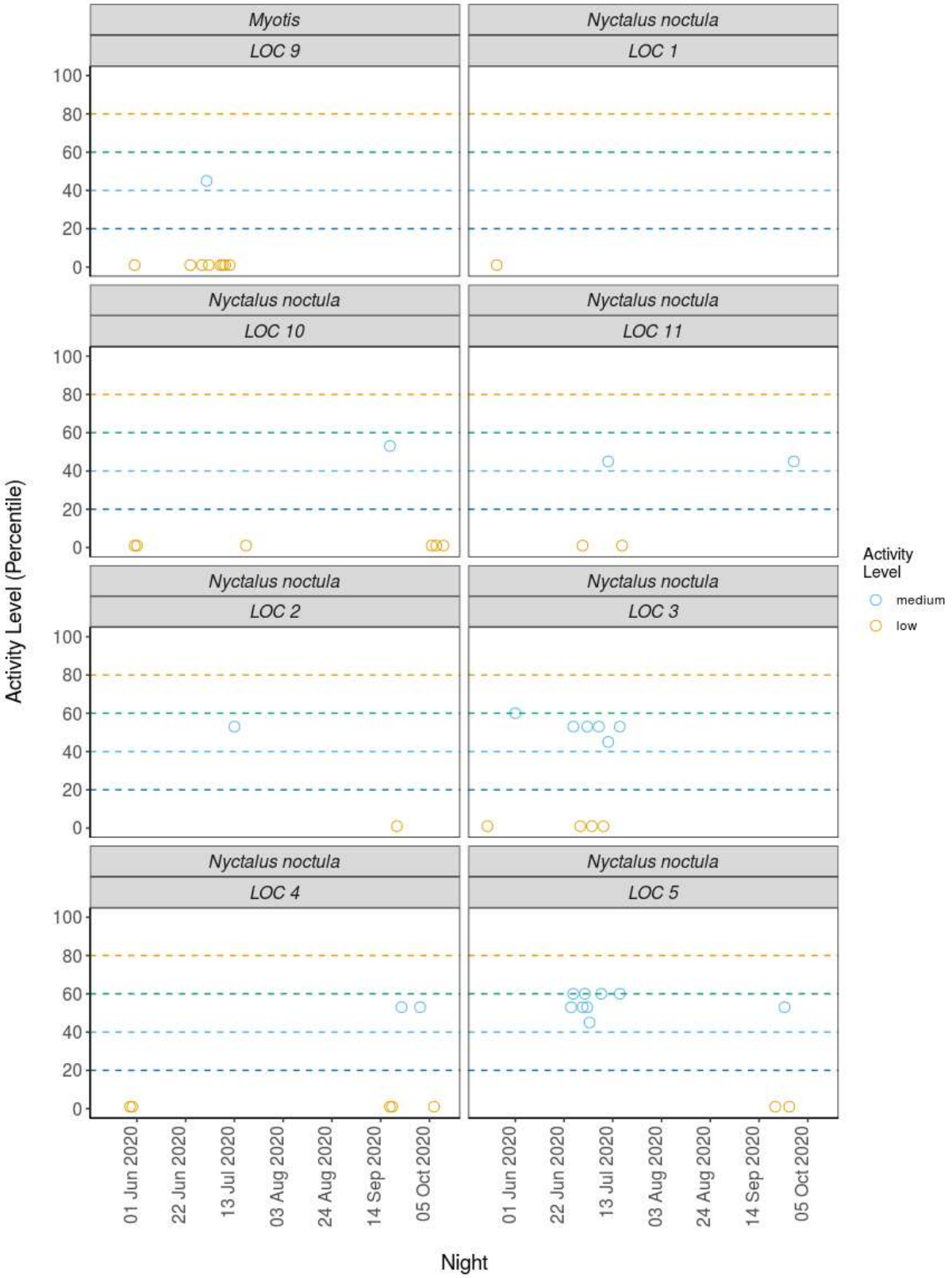
###Figures

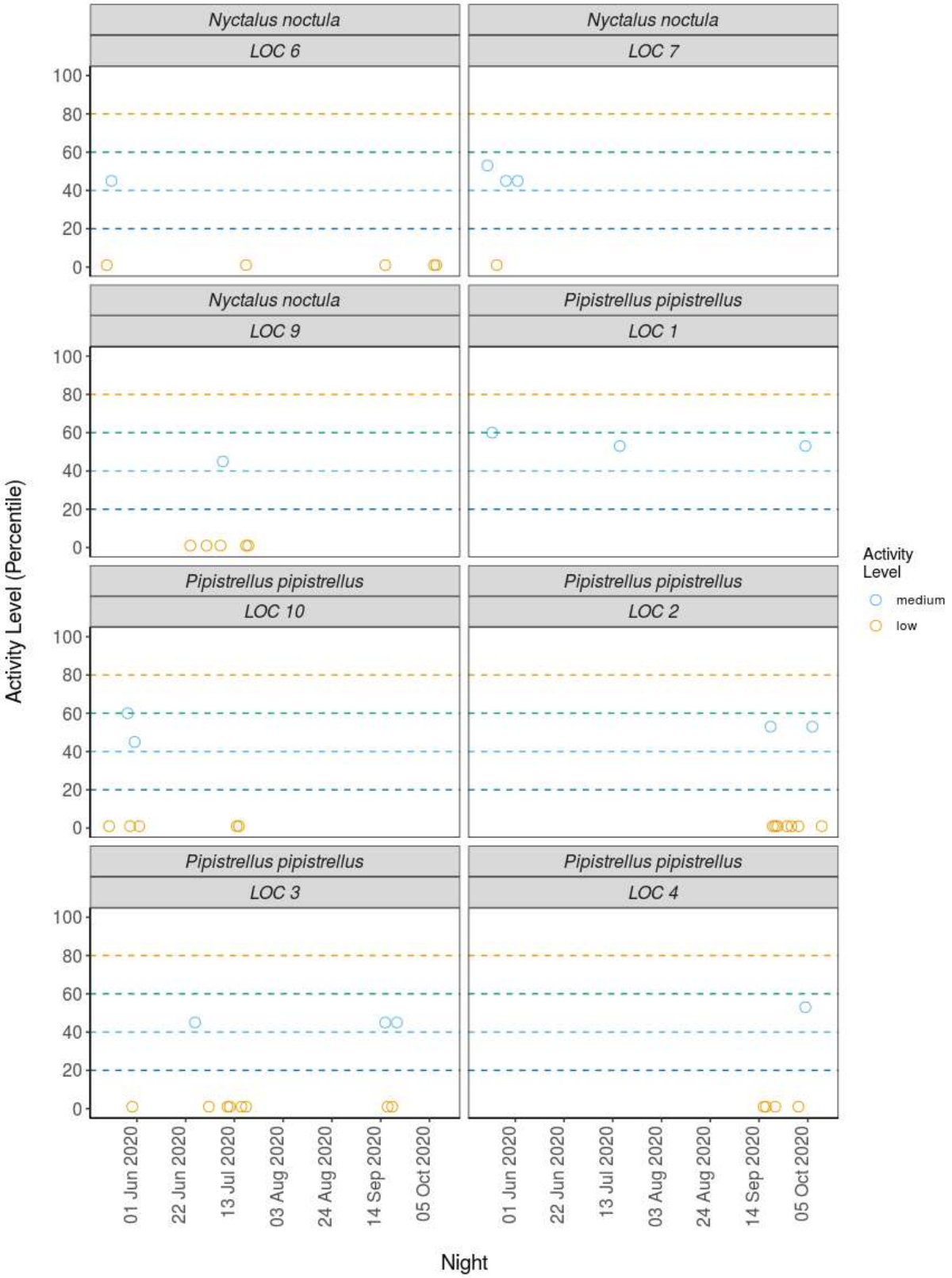
Figure 2. The recorded activity of bats during the survey. The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity)

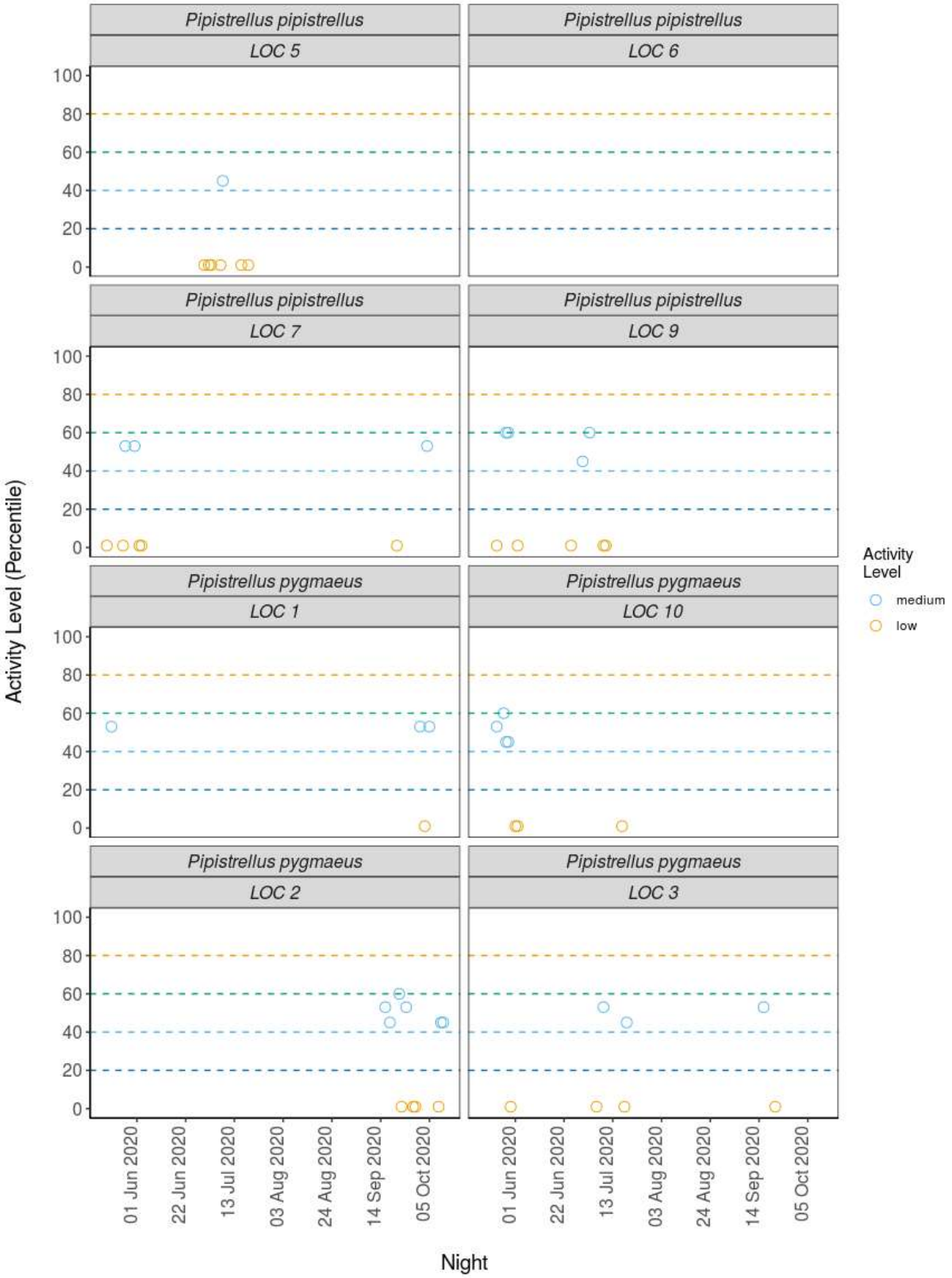
Activity Level (Percentile)
100
80
60
40
20
0
Myotis
Nyctalus noctula
Pipistrellus pipistrellus
Pipistrellus pygmaeus
LOC 1
LOC 10
LOC 11
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID

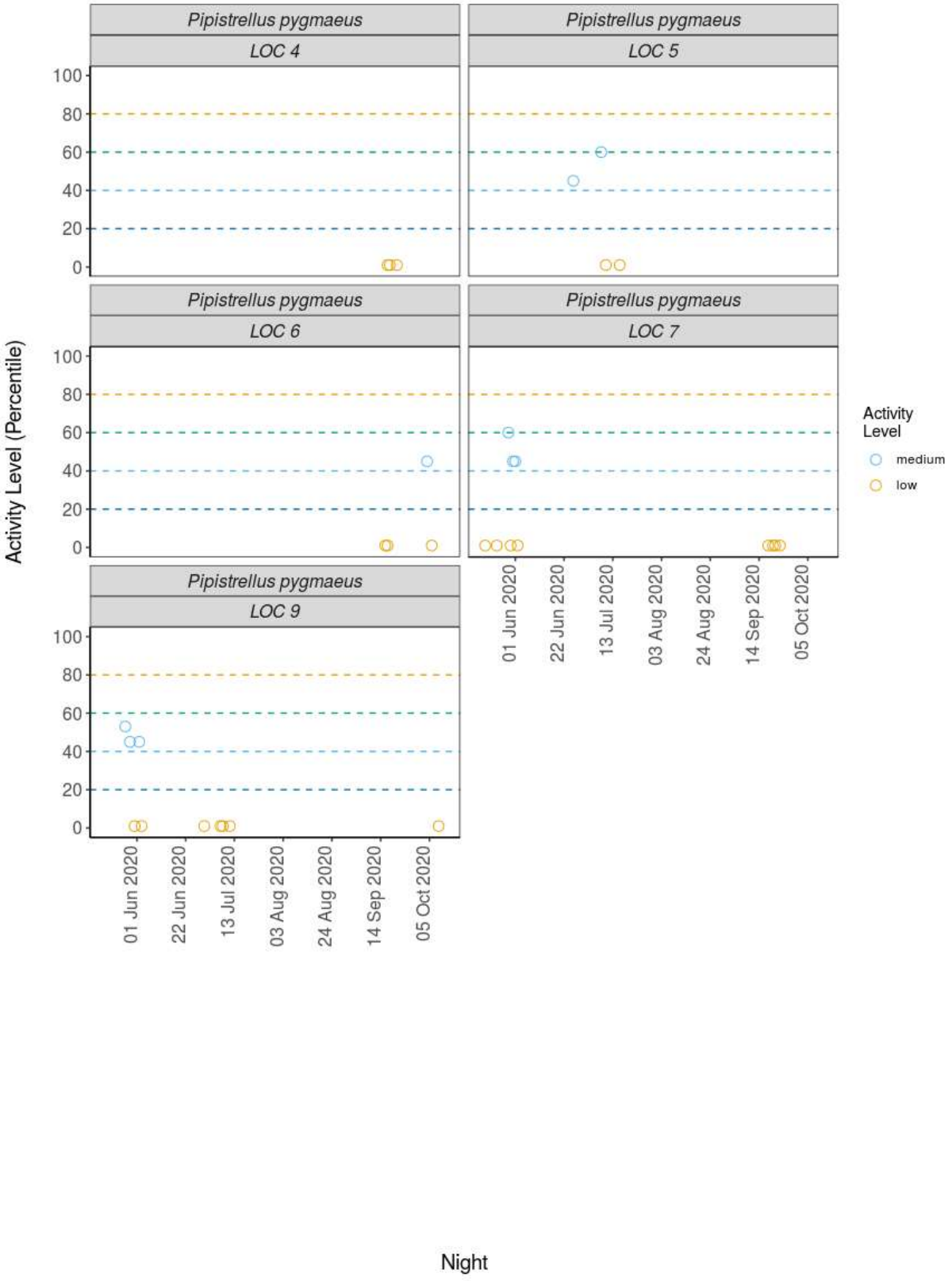
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.


Myotis
LOC 1
Myotis
LOC 10
Myotis
LOC 2
Myotis
LOC 3
Myotis
LOC 4
Myotis
LOC 5
Myotis
LOC 6
Myotis
LOC 7
Activity Level (Percentile)
100
80
60
40
20
0
01 Jun 2020
22 Jun 2020
13 Jul 2020
03 Aug 2020
24 Aug 2020
14 Sep 2020
05 Oct 2020
Night
Activity Level
medium
low


Myotis
LOC 9
Nyctalus noctula
LOC 1
Nyctalus noctula
LOC 10
Nyctalus noctula
LOC 11
Nyctalus noctula
LOC 2
Nyctalus noctula
LOC 3
Nyctalus noctula
LOC 4
Nyctalus noctula
LOC 5
Activity Level (Percentile)
0
20
40
60
80
100
01 Jun 2020
22 Jun 2020
13 Jul 2020
03 Aug 2020
24 Aug 2020
14 Sep 2020
05 Oct 2020
Night
Activity Level
medium
low


Nyctalus noctula
LOC 6
Nyctalus noctula
LOC 7
Nyctalus noctula
LOC 9
Pipistrellus pipistrellus
LOC 1
Pipistrellus pipistrellus
LOC 10
Pipistrellus pipistrellus
LOC 2
Pipistrellus pipistrellus
LOC 3
Pipistrellus pipistrellus
LOC 4
Activity Level (Percentile)
0
20
40
60
80
100
01 Jun 2020
22 Jun 2020
13 Jul 2020
03 Aug 2020
24 Aug 2020
14 Sep 2020
05 Oct 2020
Night
Activity Level
medium
low


Pipistrellus pipistrellus
LOC 5
Pipistrellus pipistrellus
LOC 6
Pipistrellus pipistrellus
LOC 7
Pipistrellus pipistrellus
LOC 9
Pipistrellus pygmaeus
LOC 1
Pipistrellus pygmaeus
LOC 10
Pipistrellus pygmaeus
LOC 2
Pipistrellus pygmaeus
LOC 3
Activity Level (Percentile)
100
80
60
40
20
0
01 Jun 2020
22 Jun 2020
13 Jul 2020
03 Aug 2020
24 Aug 2020
14 Sep 2020
05 Oct 2020
Night
Activity Level
medium
low


Pipistrellus pygmaeus
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Activity Level (Percentile)
100
80
60
40
20
0
01 Jun 2020
22 Jun 2020
13 Jul 2020
03 Aug 2020
24 Aug 2020
14 Sep 2020
05 Oct 2020
Activity Level
medium
low
Night

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 High Activity	Nights of Moderate / High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
LOC 1	*Myotis*	May	0	3	3	1	0
LOC 1	*Myotis*	Jul	0	0	0	0	1
LOC 1	*Myotis*	Oct	0	0	0	1	1
LOC 1	*Nyctalus noctula*	May	0	0	0	0	1
LOC 1	*Pipistrellus pipistrellus*	May	4	0	1	1	0
LOC 1	*Pipistrellus pipistrellus*	Jul	2	0	1	2	0
LOC 1	*Pipistrellus pipistrellus*	Oct	0	0	1	3	0
LOC 1	*Pipistrellus pygmaeus*	May	6	0	1	0	0
LOC 1	*Pipistrellus pygmaeus*	Jul	3	1	0	1	0
LOC 1	*Pipistrellus pygmaeus*	Oct	1	1	2	1	1
LOC 10	*Myotis*	May	0	0	0	0	4
LOC 10	*Myotis*	Jul	0	2	1	2	1
LOC 10	*Nyctalus noctula*	May	0	0	0	1	1
LOC 10	*Nyctalus noctula*	Jun	0	0	0	0	1
LOC 10	*Nyctalus noctula*	Jul	0	1	0	2	1
LOC 10	*Nyctalus noctula*	Sep	0	1	1	0	0
LOC 10	*Nyctalus noctula*	Oct	0	0	0	2	3
LOC 10	*Pipistrellus pipistrellus*	May	0	0	2	1	2

LOC 10	*Pipistrellus pipistrellus*	Jun	0	0	0	1	1
LOC 10	*Pipistrellus pipistrellus*	Jul	0	0	0	0	2
LOC 10	*Pipistrellus pygmaeus*	May	0	1	4	0	0
LOC 10	*Pipistrellus pygmaeus*	Jun	0	0	0	0	2
LOC 10	*Pipistrellus pygmaeus*	Jul	0	0	0	0	1
LOC 11	*Nyctalus noctula*	Jun	0	0	0	0	1
LOC 11	*Nyctalus noctula*	Jul	1	2	1	0	1
LOC 11	*Nyctalus noctula*	Sep	0	0	1	0	0
LOC 2	*Myotis*	Sep	0	1	4	2	5
LOC 2	*Myotis*	Oct	0	0	2	1	2
LOC 2	*Nyctalus noctula*	Jul	0	0	1	0	0
LOC 2	*Nyctalus noctula*	Sep	0	0	0	0	1
LOC 2	*Nyctalus noctula*	Oct	0	0	0	1	0
LOC 2	*Pipistrellus pipistrellus*	Sep	0	0	1	3	5
LOC 2	*Pipistrellus pipistrellus*	Oct	0	1	1	1	2
LOC 2	*Pipistrellus pygmaeus*	Sep	0	4	4	3	3
LOC 2	*Pipistrellus pygmaeus*	Oct	0	2	2	1	1
LOC 3	*Myotis*	May	0	5	0	1	0
LOC 3	*Myotis*	Jun	0	2	4	0	1
LOC 3	*Myotis*	Jul	0	4	9	2	2
LOC 3	*Myotis*	Sep	0	0	0	1	2
LOC 3	*Nyctalus noctula*	May	2	2	0	0	1
LOC 3	*Nyctalus noctula*	Jun	2	2	2	0	1

LOC 3	*Nyctalus noctula*	Jul	0	1	4	3	2
LOC 3	*Pipistrellus pipistrellus*	May	5	0	0	0	1
LOC 3	*Pipistrellus pipistrellus*	Jun	2	3	1	0	0
LOC 3	*Pipistrellus pipistrellus*	Jul	0	0	0	3	5
LOC 3	*Pipistrellus pipistrellus*	Sep	0	0	2	0	2
LOC 3	*Pipistrellus pygmaeus*	May	5	0	0	0	1
LOC 3	*Pipistrellus pygmaeus*	Jun	6	0	0	0	0
LOC 3	*Pipistrellus pygmaeus*	Jul	8	0	2	1	2
LOC 3	*Pipistrellus pygmaeus*	Sep	0	0	1	2	1
LOC 4	*Myotis*	Sep	0	4	2	1	1
LOC 4	*Myotis*	Oct	0	0	1	1	1
LOC 4	*Nyctalus noctula*	May	0	2	0	0	2
LOC 4	*Nyctalus noctula*	Jun	2	0	0	0	0
LOC 4	*Nyctalus noctula*	Sep	0	1	1	2	2
LOC 4	*Nyctalus noctula*	Oct	0	0	1	0	1
LOC 4	*Pipistrellus pipistrellus*	Sep	0	0	0	1	3
LOC 4	*Pipistrellus pipistrellus*	Oct	0	0	1	0	1
LOC 4	*Pipistrellus pygmaeus*	Sep	0	0	0	1	3
LOC 4	*Pipistrellus pygmaeus*	Oct	0	1	0	0	0
LOC 5	*Myotis*	Jul	0	0	0	2	3
LOC 5	*Nyctalus noctula*	Jun	0	0	3	0	0
LOC 5	*Nyctalus*	Jul	0	2	5	1	0

	noctula						
LOC 5	*Nyctalus noctula*	Sep	0	1	1	4	2
LOC 5	*Pipistrellus pipistrellus*	Jun	0	1	0	0	1
LOC 5	*Pipistrellus pipistrellus*	Jul	0	1	1	0	5
LOC 5	*Pipistrellus pygmaeus*	Jun	0	2	1	0	0
LOC 5	*Pipistrellus pygmaeus*	Jul	0	0	1	2	2
LOC 6	*Myotis*	Sep	0	0	1	1	0
LOC 6	*Myotis*	Oct	0	0	0	0	2
LOC 6	*Nyctalus noctula*	May	0	0	1	0	1
LOC 6	*Nyctalus noctula*	Jun	0	1	0	0	0
LOC 6	*Nyctalus noctula*	Jul	0	0	0	0	1
LOC 6	*Nyctalus noctula*	Sep	0	0	0	1	1
LOC 6	*Nyctalus noctula*	Oct	0	0	0	1	2
LOC 6	*Pipistrellus pipistrellus*	Sep	0	0	0	1	0
LOC 6	*Pipistrellus pipistrellus*	Oct	0	0	0	1	0
LOC 6	*Pipistrellus pygmaeus*	Sep	0	0	0	0	2
LOC 6	*Pipistrellus pygmaeus*	Oct	0	0	1	0	1
LOC 7	*Myotis*	May	0	0	0	1	2
LOC 7	*Myotis*	Sep	0	0	0	0	2
LOC 7	*Nyctalus noctula*	May	1	0	2	1	1
LOC 7	*Nyctalus noctula*	Jun	0	0	1	2	0
LOC 7	*Pipistrellus pipistrellus*	May	0	1	2	1	2
LOC 7	*Pipistrellus*	Jun	0	0	0	1	2

	pipistrellus						
LOC 7	*Pipistrellus pipistrellus*	Sep	0	0	0	0	1
LOC 7	*Pipistrellus pipistrellus*	Oct	0	0	1	0	0
LOC 7	*Pipistrellus pygmaeus*	May	1	1	2	0	3
LOC 7	*Pipistrellus pygmaeus*	Jun	0	0	1	1	1
LOC 7	*Pipistrellus pygmaeus*	Sep	0	0	0	2	4
LOC 7	*Pipistrellus pygmaeus*	Oct	0	0	0	1	0
LOC 9	*Myotis*	May	0	0	0	1	1
LOC 9	*Myotis*	Jun	0	0	0	1	2
LOC 9	*Myotis*	Jul	0	0	1	0	5
LOC 9	*Nyctalus noctula*	Jun	0	0	0	0	1
LOC 9	*Nyctalus noctula*	Jul	0	0	1	0	4
LOC 9	*Pipistrellus pipistrellus*	May	0	0	2	1	1
LOC 9	*Pipistrellus pipistrellus*	Jun	0	1	1	1	2
LOC 9	*Pipistrellus pipistrellus*	Jul	1	1	1	1	2
LOC 9	*Pipistrellus pygmaeus*	May	1	0	2	1	1
LOC 9	*Pipistrellus pygmaeus*	Jun	0	2	1	0	2
LOC 9	*Pipistrellus pygmaeus*	Jul	0	2	0	1	3
LOC 9	*Pipistrellus pygmaeus*	Oct	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
LOC 1	*Myotis*	May	60	27 - 68	76	7
LOC 1	*Myotis*	Jul	1	27 - 68	1	1
LOC 1	*Myotis*	Oct	16	27 - 68	31	2
LOC 1	*Nyctalus noctula*	May	1	0	1	1
LOC 1	*Pipistrellus pipistrellus*	May	90	42 - 75.5	98	6
LOC 1	*Pipistrellus pipistrellus*	Jul	53	42 - 75.5	93	5
LOC 1	*Pipistrellus pipistrellus*	Oct	31	42 - 75.5	53	4
LOC 1	*Pipistrellus pygmaeus*	May	99	56 - 90	99	7
LOC 1	*Pipistrellus pygmaeus*	Jul	81	56 - 90	96	5
LOC 1	*Pipistrellus pygmaeus*	Oct	53	56 - 90	90	6
LOC 10	*Myotis*	May	1	1 - 38	1	4
LOC 10	*Myotis*	Jul	38	1 - 38	74	6
LOC 10	*Nyctalus noctula*	May	16	16 - 35.5	31	2
LOC 10	*Nyctalus noctula*	Jun	1	16 - 35.5	1	1
LOC 10	*Nyctalus noctula*	Jul	31	16 - 35.5	70	4
LOC 10	*Nyctalus noctula*	Sep	59	16 - 35.5	64	2
LOC 10	*Nyctalus noctula*	Oct	1	16 - 35.5	31	5
LOC 10	*Pipistrellus pipistrellus*	May	31	1 - 31	60	5

LOC 10	*Pipistrellus pipistrellus*	Jun	16	1 - 31	31	2
LOC 10	*Pipistrellus pipistrellus*	Jul	1	1 - 31	1	2
LOC 10	*Pipistrellus pygmaeus*	May	53	1 - 56	67	5
LOC 10	*Pipistrellus pygmaeus*	Jun	1	1 - 56	1	2
LOC 10	*Pipistrellus pygmaeus*	Jul	1	1 - 56	1	1
LOC 11	*Nyctalus noctula*	Jun	1	23 - 79	1	1
LOC 11	*Nyctalus noctula*	Jul	77	23 - 79	88	5
LOC 11	*Nyctalus noctula*	Sep	45	23 - 79	45	1
LOC 2	*Myotis*	Sep	31	16 - 45.5	64	12
LOC 2	*Myotis*	Oct	31	16 - 45.5	53	5
LOC 2	*Nyctalus noctula*	Jul	53	1 - 53	53	1
LOC 2	*Nyctalus noctula*	Sep	1	1 - 53	1	1
LOC 2	*Nyctalus noctula*	Oct	31	1 - 53	31	1
LOC 2	*Pipistrellus pipistrellus*	Sep	1	1 - 37.5	53	9
LOC 2	*Pipistrellus pipistrellus*	Oct	31	1 - 37.5	74	5
LOC 2	*Pipistrellus pygmaeus*	Sep	49	31 - 56.5	74	14
LOC 2	*Pipistrellus pygmaeus*	Oct	45	31 - 56.5	79	6
LOC 3	*Myotis*	May	64	38 - 58.5	72	6
LOC 3	*Myotis*	Jun	53	38 - 58.5	79	7
LOC 3	*Myotis*	Jul	53	38 - 58.5	74	17
LOC 3	*Myotis*	Sep	1	38 - 58.5	31	3
LOC 3	*Nyctalus noctula*	May	70	36.5 -	90	5

				68.5		
LOC 3	*Nyctalus noctula*	Jun	70	36.5 - 68.5	95	7
LOC 3	*Nyctalus noctula*	Jul	38	36.5 - 68.5	78	10
LOC 3	*Pipistrellus pipistrellus*	May	88	23 - 62.5	95	6
LOC 3	*Pipistrellus pipistrellus*	Jun	76	23 - 62.5	87	6
LOC 3	*Pipistrellus pipistrellus*	Jul	1	23 - 62.5	31	8
LOC 3	*Pipistrellus pipistrellus*	Sep	23	23 - 62.5	45	4
LOC 3	*Pipistrellus pygmaeus*	May	93	50 - 93.5	95	6
LOC 3	*Pipistrellus pygmaeus*	Jun	96	50 - 93.5	98	6
LOC 3	*Pipistrellus pygmaeus*	Jul	90	50 - 93.5	99	13
LOC 3	*Pipistrellus pygmaeus*	Sep	31	50 - 93.5	53	4
LOC 4	*Myotis*	Sep	65	30.5 - 68	76	8
LOC 4	*Myotis*	Oct	31	30.5 - 68	60	3
LOC 4	*Nyctalus noctula*	May	34	16 - 65	77	4
LOC 4	*Nyctalus noctula*	Jun	83	16 - 65	85	2
LOC 4	*Nyctalus noctula*	Sep	31	16 - 65	67	6
LOC 4	*Nyctalus noctula*	Oct	27	16 - 65	53	2
LOC 4	*Pipistrellus pipistrellus*	Sep	1	1 - 27	31	4
LOC 4	*Pipistrellus pipistrellus*	Oct	27	1 - 27	53	2
LOC 4	*Pipistrellus pygmaeus*	Sep	1	1 - 35.5	31	4
LOC 4	*Pipistrellus*	Oct	70	1 -	70	1

	pygmaeus			35.5		
LOC 5	*Myotis*	Jul	1	1 - 16	31	5
LOC 5	*Nyctalus noctula*	Jun	53	35.5 - 56.5	60	3
LOC 5	*Nyctalus noctula*	Jul	60	35.5 - 56.5	70	8
LOC 5	*Nyctalus noctula*	Sep	31	35.5 - 56.5	74	8
LOC 5	*Pipistrellus pipistrellus*	Jun	33	1 - 32.5	64	2
LOC 5	*Pipistrellus pipistrellus*	Jul	1	1 - 32.5	64	7
LOC 5	*Pipistrellus pygmaeus*	Jun	67	16 - 67	79	3
LOC 5	*Pipistrellus pygmaeus*	Jul	31	16 - 67	60	5
LOC 6	*Myotis*	Sep	38	1 - 31	45	2
LOC 6	*Myotis*	Oct	1	1 - 31	1	2
LOC 6	*Nyctalus noctula*	May	23	1 - 37.5	45	2
LOC 6	*Nyctalus noctula*	Jun	74	1 - 37.5	74	1
LOC 6	*Nyctalus noctula*	Jul	1	1 - 37.5	1	1
LOC 6	*Nyctalus noctula*	Sep	16	1 - 37.5	31	2
LOC 6	*Nyctalus noctula*	Oct	1	1 - 37.5	31	3
LOC 6	*Pipistrellus pipistrellus*	Sep	31	31 - 31	31	1
LOC 6	*Pipistrellus pipistrellus*	Oct	31	31 - 31	31	1
LOC 6	*Pipistrellus pygmaeus*	Sep	1	1 - 1	1	2
LOC 6	*Pipistrellus pygmaeus*	Oct	23	1 - 1	45	2
LOC 7	*Myotis*	May	1	1 - 1	31	3
LOC 7	*Myotis*	Sep	1	1 - 1	1	2
LOC 7	*Nyctalus noctula*	May	45	16 - 67.5	90	5

LOC 7	*Nyctalus noctula*	Jun	31	16 - 67.5	45	3
LOC 7	*Pipistrellus pipistrellus*	May	42	1 - 52.5	74	6
LOC 7	*Pipistrellus pipistrellus*	Jun	1	1 - 52.5	31	3
LOC 7	*Pipistrellus pipistrellus*	Sep	1	1 - 52.5	1	1
LOC 7	*Pipistrellus pipistrellus*	Oct	53	1 - 52.5	53	1
LOC 7	*Pipistrellus pygmaeus*	May	45	1 - 38	83	7
LOC 7	*Pipistrellus pygmaeus*	Jun	31	1 - 38	45	3
LOC 7	*Pipistrellus pygmaeus*	Sep	1	1 - 38	31	6
LOC 7	*Pipistrellus pygmaeus*	Oct	31	1 - 38	31	1
LOC 9	*Myotis*	May	16	1 - 16	31	2
LOC 9	*Myotis*	Jun	1	1 - 16	31	3
LOC 9	*Myotis*	Jul	1	1 - 16	45	6
LOC 9	*Nyctalus noctula*	Jun	1	1 - 1	1	1
LOC 9	*Nyctalus noctula*	Jul	1	1 - 1	45	5
LOC 9	*Pipistrellus pipistrellus*	May	46	16 - 57.5	60	4
LOC 9	*Pipistrellus pipistrellus*	Jun	31	16 - 57.5	70	5
LOC 9	*Pipistrellus pipistrellus*	Jul	46	16 - 57.5	88	6
LOC 9	*Pipistrellus pygmaeus*	May	45	16 - 53	85	5
LOC 9	*Pipistrellus pygmaeus*	Jun	45	16 - 53	76	5
LOC 9	*Pipistrellus pygmaeus*	Jul	16	16 - 53	70	6
LOC 9	*Pipistrellus pygmaeus*	Oct	1	16 - 53	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 High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis	0	21	28	19	38
Nyctalus noctula	8	16	26	21	32
Pipistrellus pipistrellus	14	9	19	23	40
Pipistrellus pygmaeus	31	17	25	18	35

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

Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis	31	38 - 58.5	79	106
Nyctalus noctula	31	36.5 - 68.5	95	103
Pipistrellus pipistrellus	31	42 - 75.5	98	105
Pipistrellus pygmaeus	45	56 - 90	99	126

###Figures

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

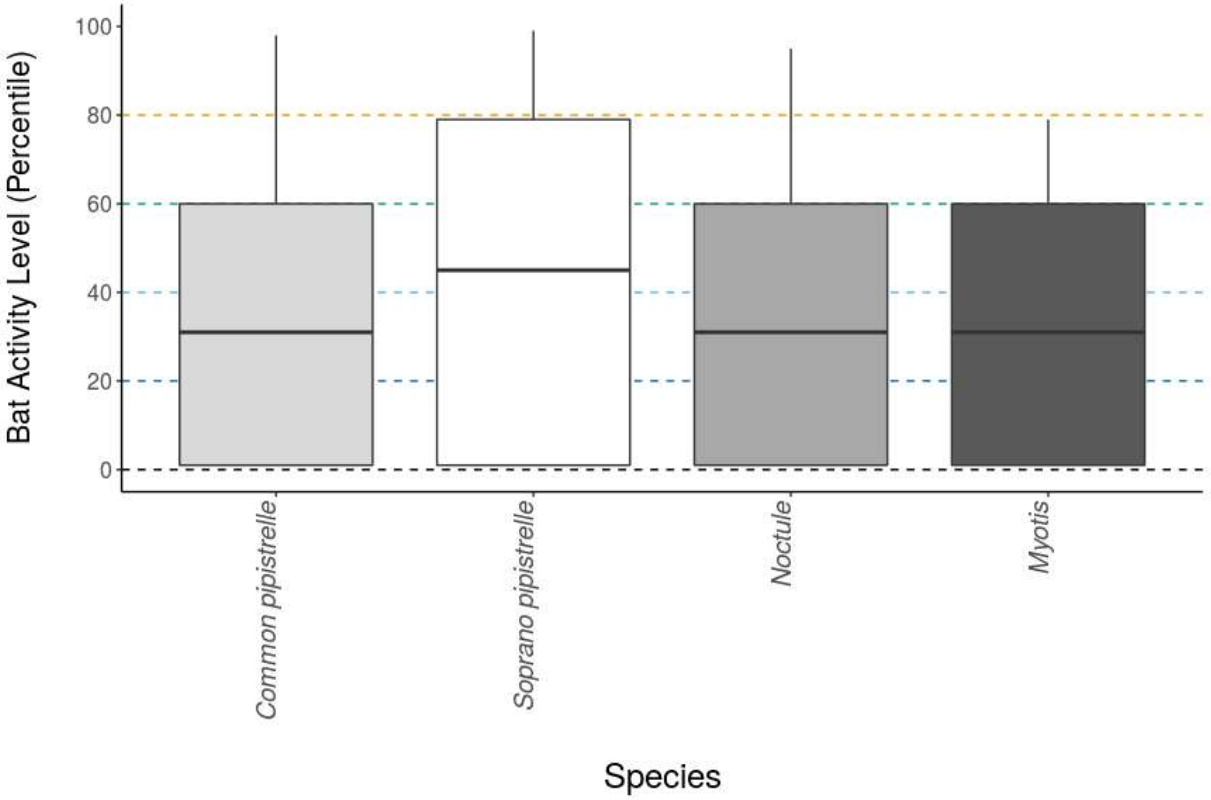
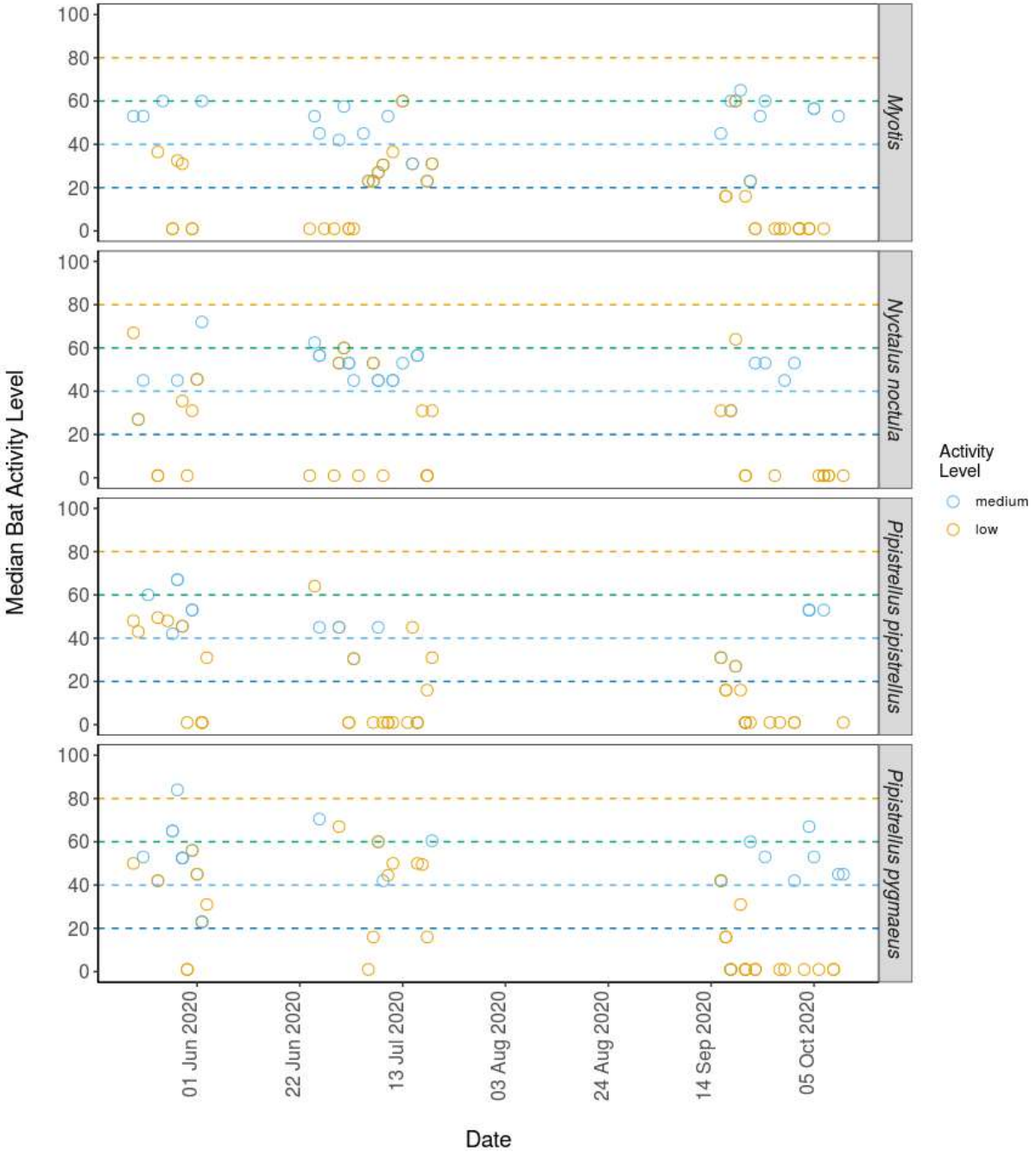


Figure 5. The median activity levels of bats recorded across all detectors each night.



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.

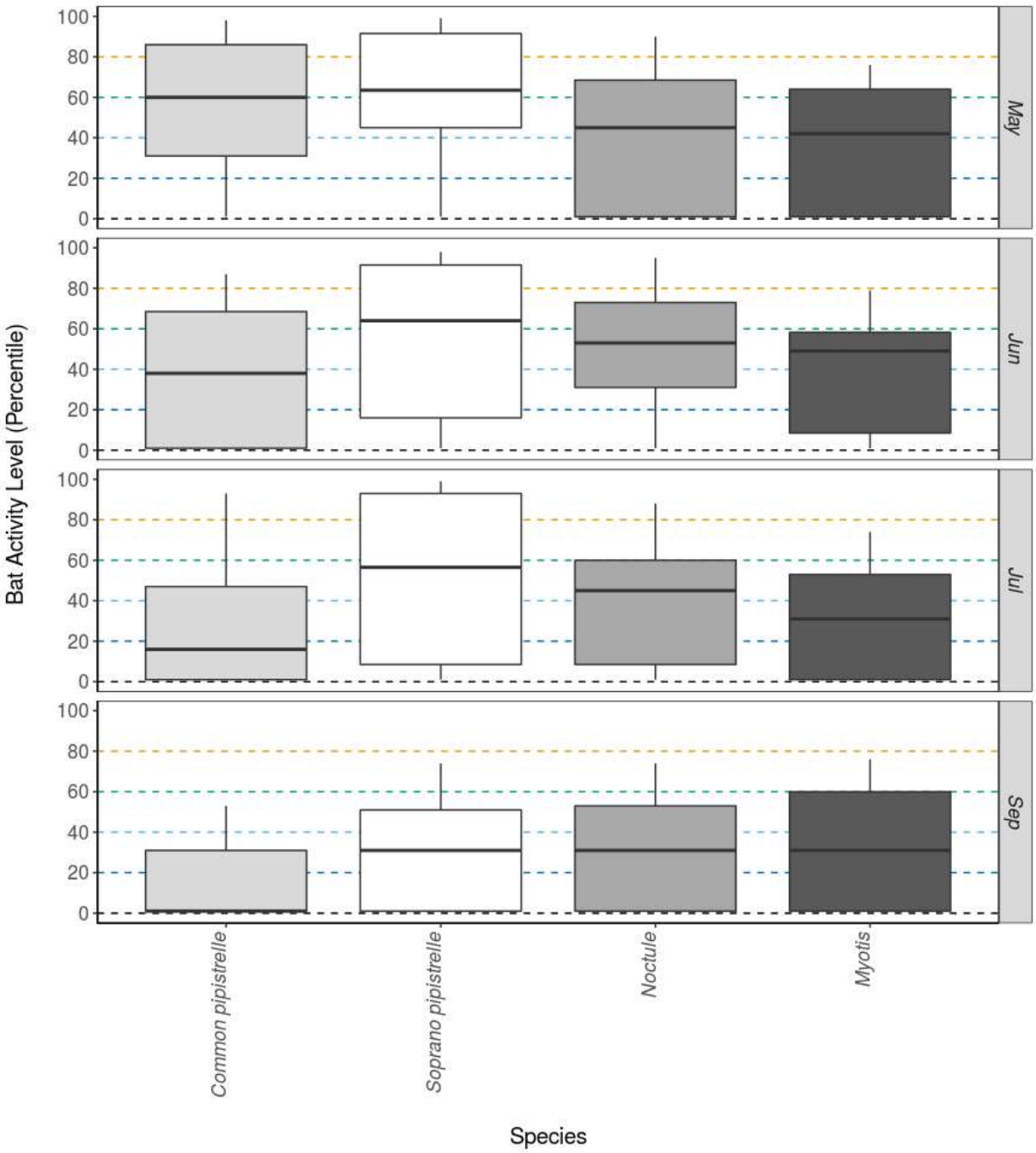
Species/Species Group	Month	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis	May	0	8	3	4	7
Myotis	Jun	0	2	4	1	3
Myotis	Jul	0	6	11	6	12
Myotis	Sep	0	5	7	5	10
Myotis	Oct	0	0	3	3	6
Nyctalus noctula	May	3	4	3	2	7
Nyctalus noctula	Jun	4	3	6	2	4
Nyctalus noctula	Jul	1	6	12	6	9
Nyctalus noctula	Sep	0	3	4	7	6
Nyctalus noctula	Oct	0	0	1	4	6
Pipistrellus pipistrellus	May	9	1	7	4	6
Pipistrellus pipistrellus	Jun	2	5	2	3	6
Pipistrellus pipistrellus	Jul	3	2	3	6	14
Pipistrellus pipistrellus	Sep	0	0	3	5	11
Pipistrellus pipistrellus	Oct	0	1	4	5	3
Pipistrellus pygmaeus	May	13	2	9	1	5
Pipistrellus pygmaeus	Jun	6	4	3	1	5
Pipistrellus pygmaeus	Jul	11	3	3	5	8
Pipistrellus pygmaeus	Sep	0	4	5	8	13
Pipistrellus pygmaeus	Oct	1	4	5	3	4

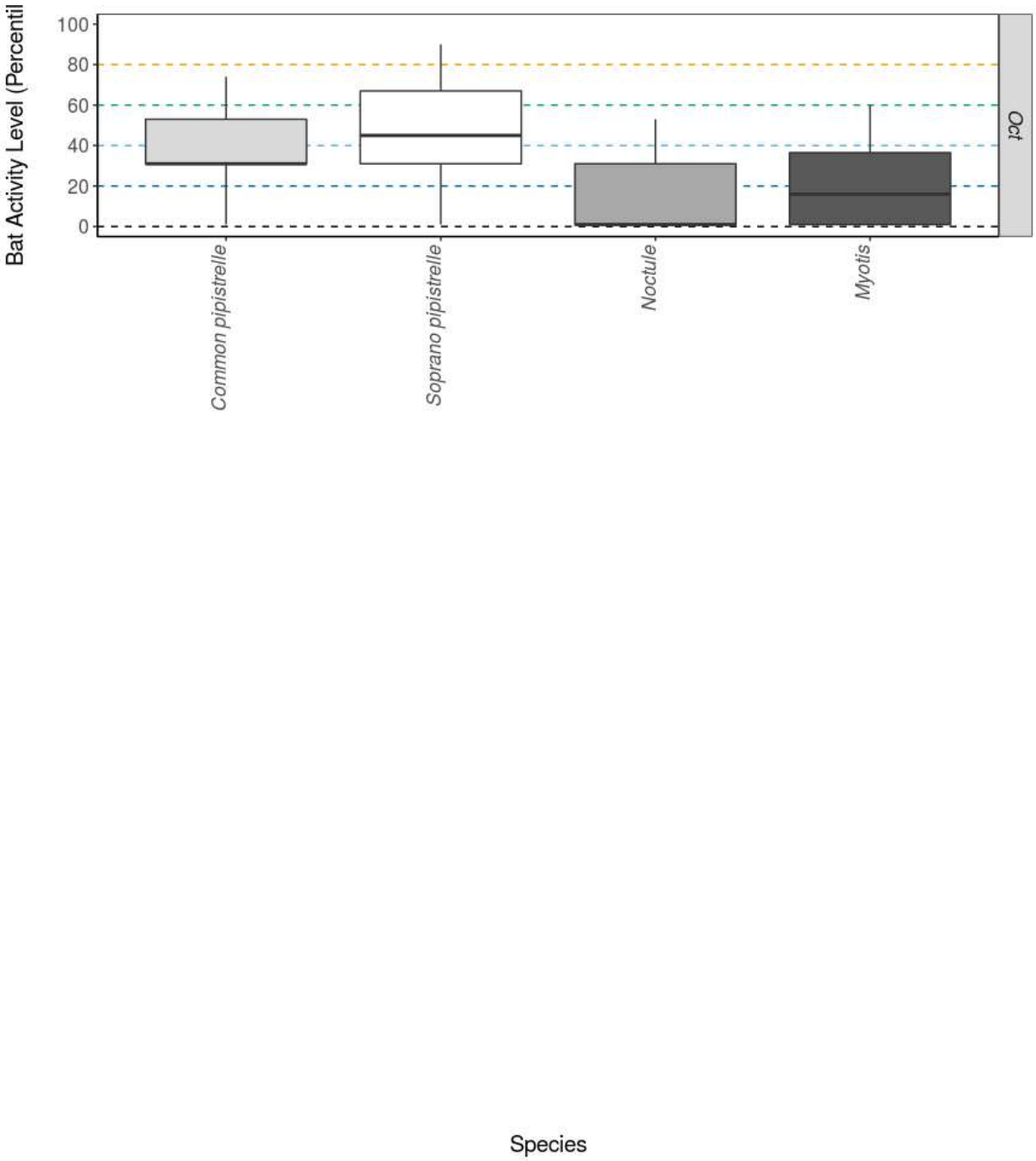
Table 10. Summary table showing key metrics for each species recorded per month.

Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis	May	42	38 - 58.5	76	22
Myotis	Jun	49	38 - 58.5	79	10
Myotis	Jul	31	38 - 58.5	74	35
Myotis	Sep	31	38 - 58.5	76	27
Myotis	Oct	16	30.5 - 68	60	12
Nyctalus noctula	May	45	36.5 - 68.5	90	19
Nyctalus noctula	Jun	53	36.5 - 68.5	95	19
Nyctalus noctula	Jul	45	36.5 - 68.5	88	34
Nyctalus noctula	Sep	31	35.5 - 56.5	74	20
Nyctalus noctula	Oct	1	16 - 65	53	11
Pipistrellus pipistrellus	May	60	42 - 75.5	98	27
Pipistrellus pipistrellus	Jun	38	23 - 62.5	87	18
Pipistrellus pipistrellus	Jul	16	42 - 75.5	93	28
Pipistrellus pipistrellus	Sep	1	31 - 31	53	19
Pipistrellus pipistrellus	Oct	31	42 - 75.5	74	13
Pipistrellus pygmaeus	May	64	56 - 90	99	30
Pipistrellus pygmaeus	Jun	64	50 - 93.5	98	19
Pipistrellus pygmaeus	Jul	57	56 - 90	99	30
Pipistrellus pygmaeus	Sep	31	50 - 93.5	74	30
Pipistrellus pygmaeus	Oct	45	56 - 90	90	17

###Figures

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
Jun
Jul
Sep
Common pipistrelle
Soprano pipistrelle
Noctule
Myotis
Species


Bat Activity Level (Percentil
100
80
60
40
20
0
Oct
Common pipistrelle
Soprano pipistrelle
Noctule
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 (hh:mm)	Sunrise (hh:mm)	Night Length (hours)
2020-05-19	21:29	05:01	7.5
2020-05-20	21:30	05:00	7.5
2020-05-21	21:32	04:58	7.4
2020-05-22	21:34	04:57	7.4
2020-05-23	21:35	04:55	7.3
2020-05-24	21:37	04:54	7.3
2020-05-25	21:38	04:53	7.2
2020-05-26	21:40	04:51	7.2
2020-05-27	21:42	04:50	7.1
2020-05-28	21:43	04:49	7.1
2020-05-29	21:44	04:48	7.1
2020-05-30	21:46	04:47	7.0
2020-05-31	21:47	04:46	7.0
2020-06-01	21:48	04:45	6.9
2020-06-02	21:50	04:44	6.9
2020-06-03	21:51	04:43	6.9
2020-06-24	22:04	04:39	6.6
2020-06-25	22:04	04:40	6.6
2020-06-26	22:04	04:40	6.6
2020-06-27	22:04	04:41	6.6
2020-06-29	22:03	04:42	6.6
2020-06-30	22:03	04:43	6.7
2020-07-01	22:03	04:44	6.7
2020-07-02	22:02	04:45	6.7
2020-07-03	22:02	04:46	6.7
2020-07-04	22:01	04:47	6.8
2020-07-05	22:00	04:48	6.8

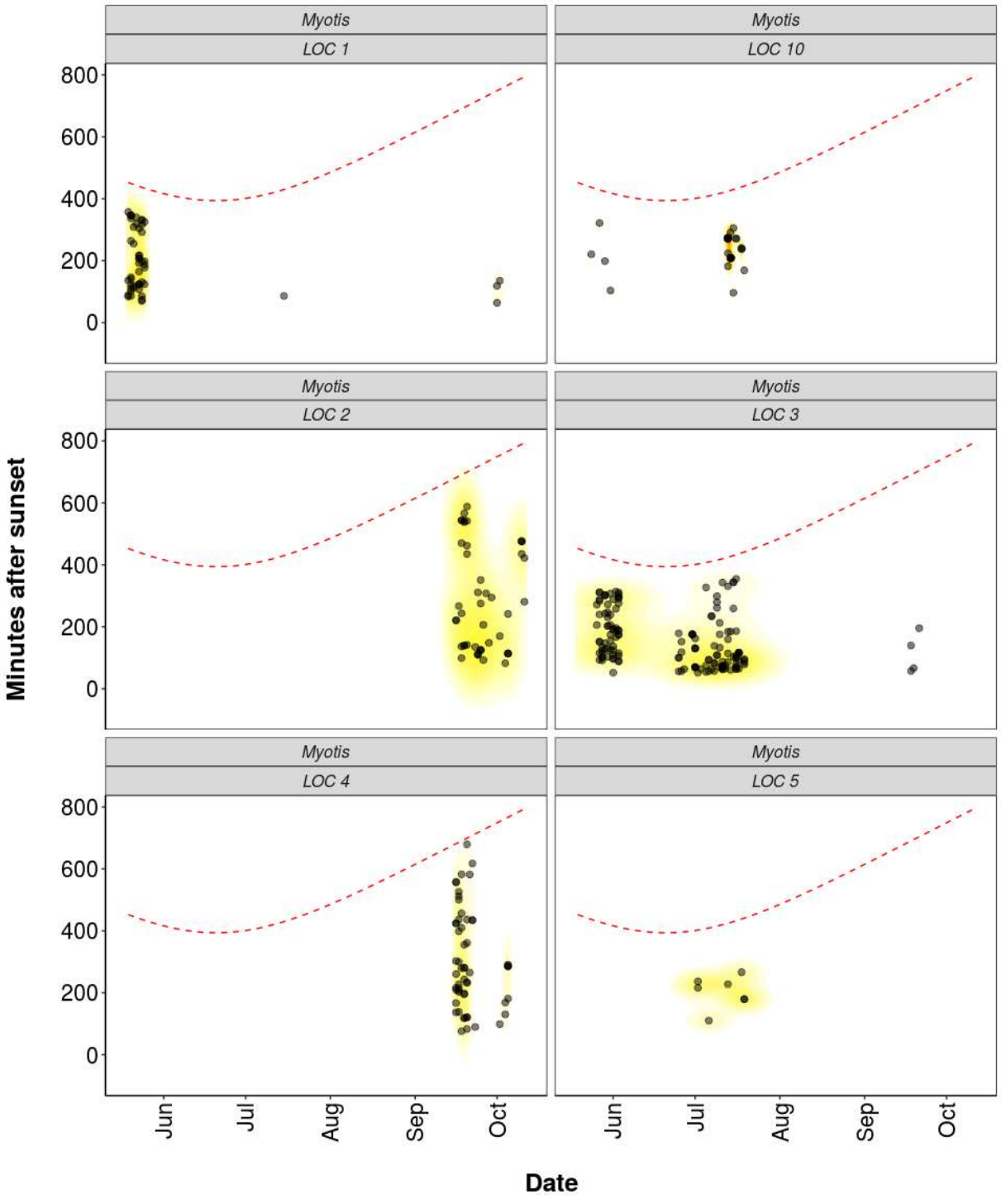
2020-07-06	22:00	04:49	6.8
2020-07-07	21:59	04:50	6.8
2020-07-08	21:58	04:51	6.9
2020-07-09	21:57	04:52	6.9
2020-07-10	21:56	04:54	7.0
2020-07-11	21:55	04:55	7.0
2020-07-12	21:54	04:56	7.0
2020-07-13	21:53	04:58	7.1
2020-07-14	21:52	04:59	7.1
2020-07-15	21:51	05:00	7.2
2020-07-16	21:49	05:02	7.2
2020-07-17	21:48	05:03	7.3
2020-07-18	21:47	05:05	7.3
2020-07-19	21:45	05:07	7.4
2020-09-16	19:34	06:56	11.4
2020-09-17	19:32	06:57	11.4
2020-09-18	19:29	06:59	11.5
2020-09-19	19:26	07:01	11.6
2020-09-20	19:24	07:03	11.7
2020-09-21	19:21	07:05	11.7
2020-09-22	19:18	07:07	11.8
2020-09-23	19:16	07:09	11.9
2020-09-24	19:13	07:11	12.0
2020-09-25	19:11	07:13	12.0
2020-09-26	19:08	07:14	12.1
2020-09-27	19:05	07:16	12.2
2020-09-28	19:03	07:18	12.3
2020-09-29	19:00	07:20	12.3
2020-09-30	18:58	07:22	12.4
2020-10-01	18:55	07:24	12.5
2020-10-02	18:53	07:26	12.6
2020-10-03	18:50	07:28	12.6
2020-10-04	18:47	07:30	12.7
2020-10-05	18:45	07:32	12.8
2020-10-06	18:42	07:34	12.9
2020-10-07	18:40	07:36	12.9

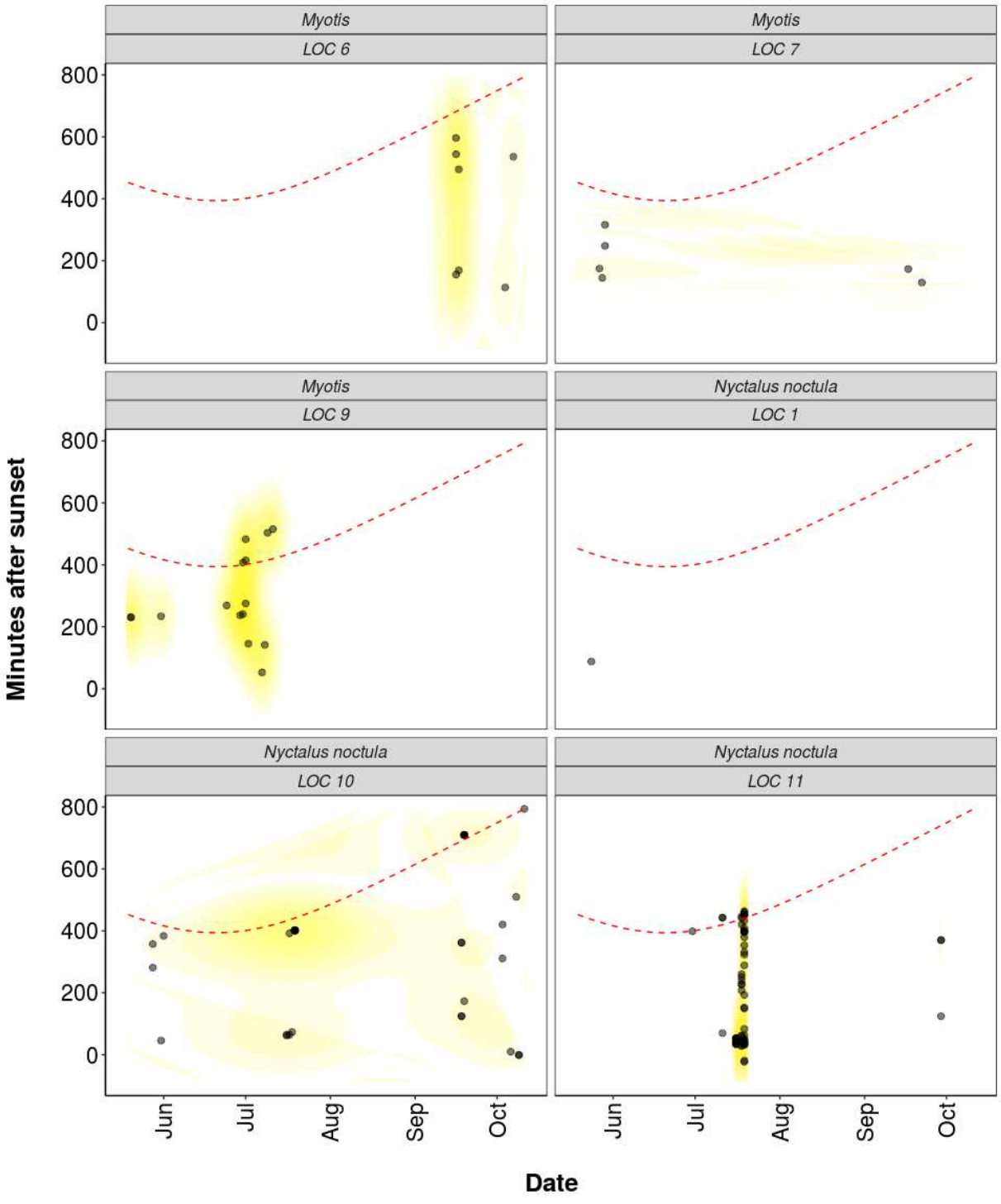
2020-10-08	18:37	07:38	13.0
2020-10-09	18:35	07:39	13.1
2020-10-10	18:32	07:41	13.2
2020-10-11	18:30	07:43	13.2

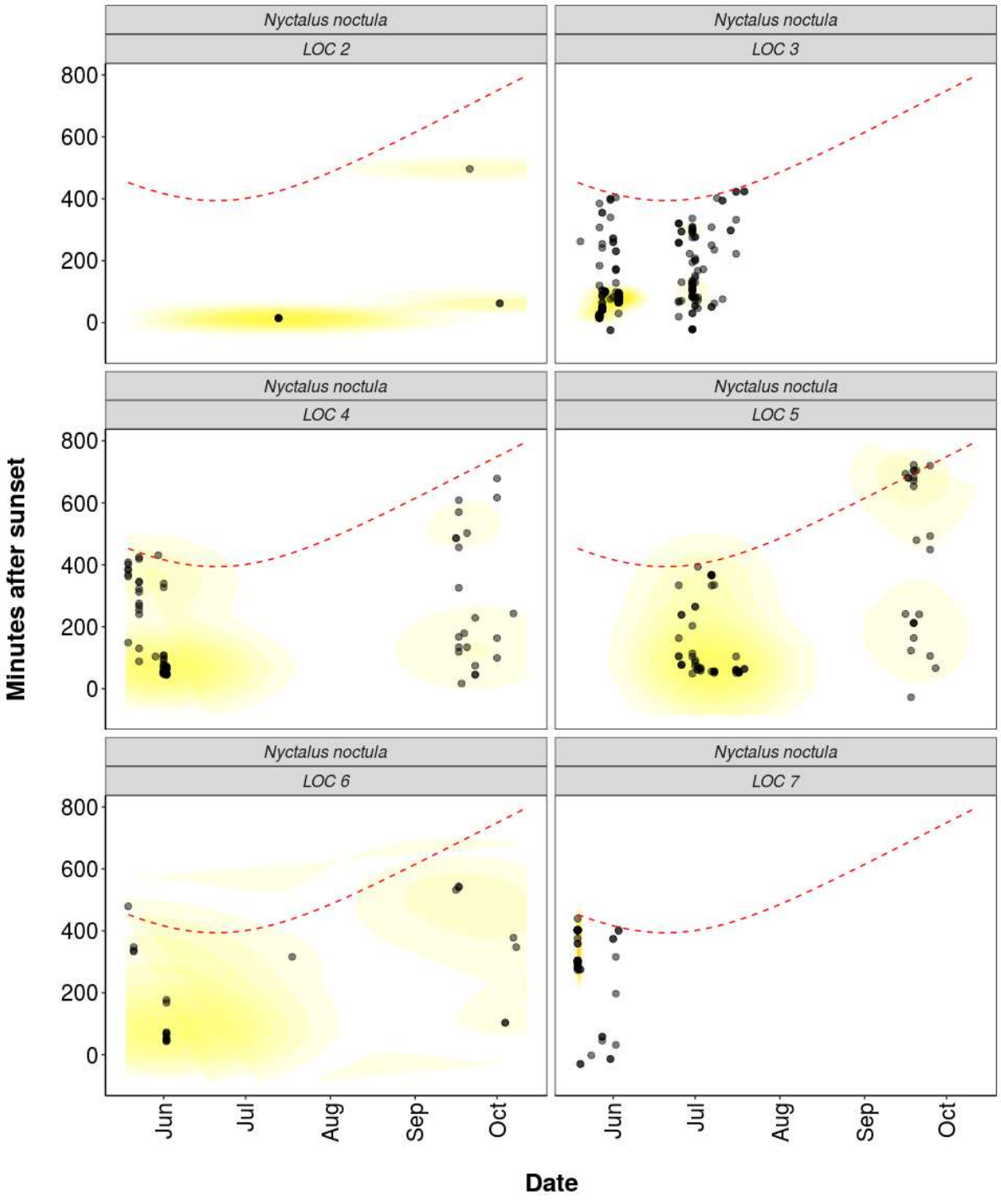
Distribution of Bat Activity Across the Night through Time

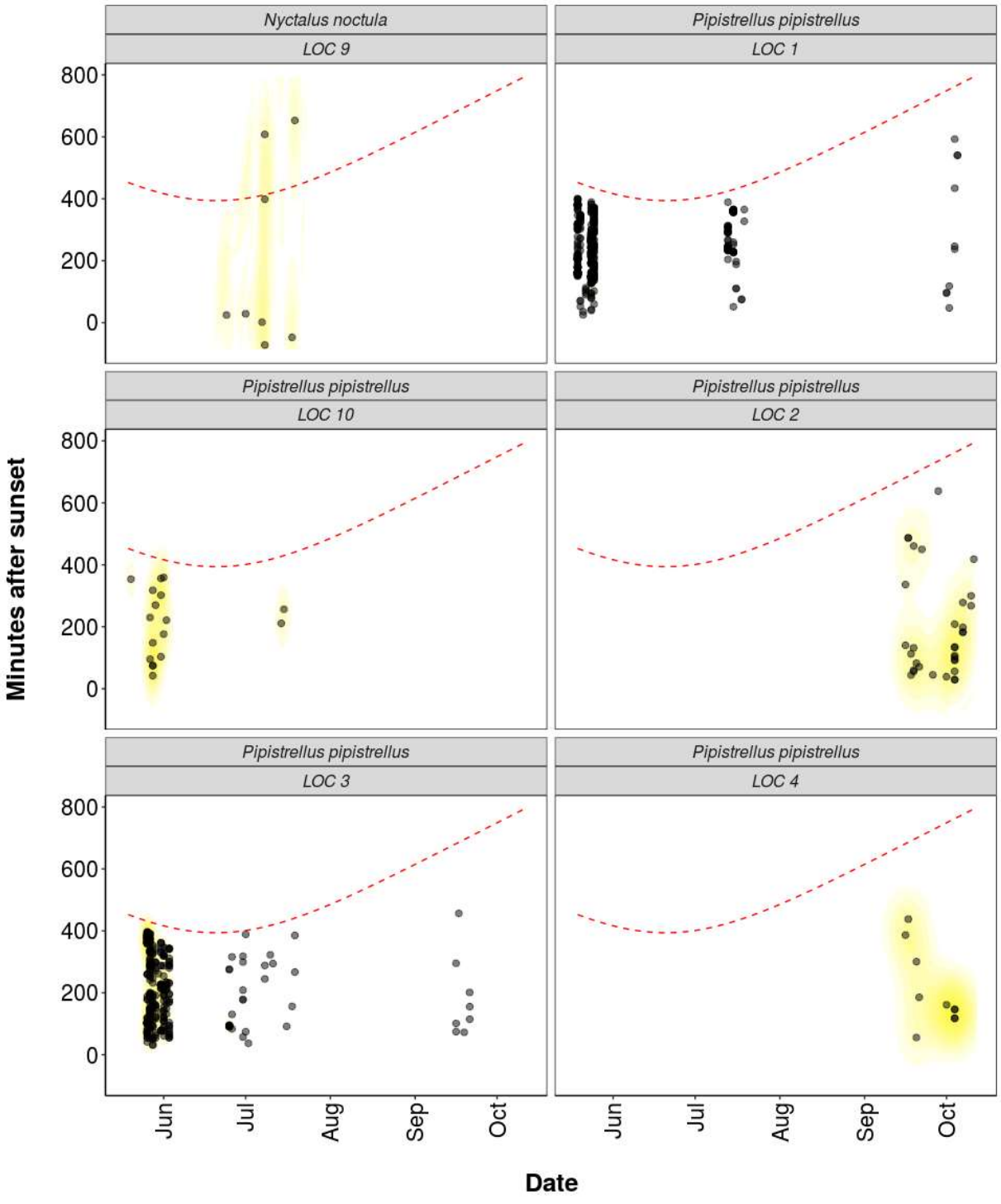
Per Detector

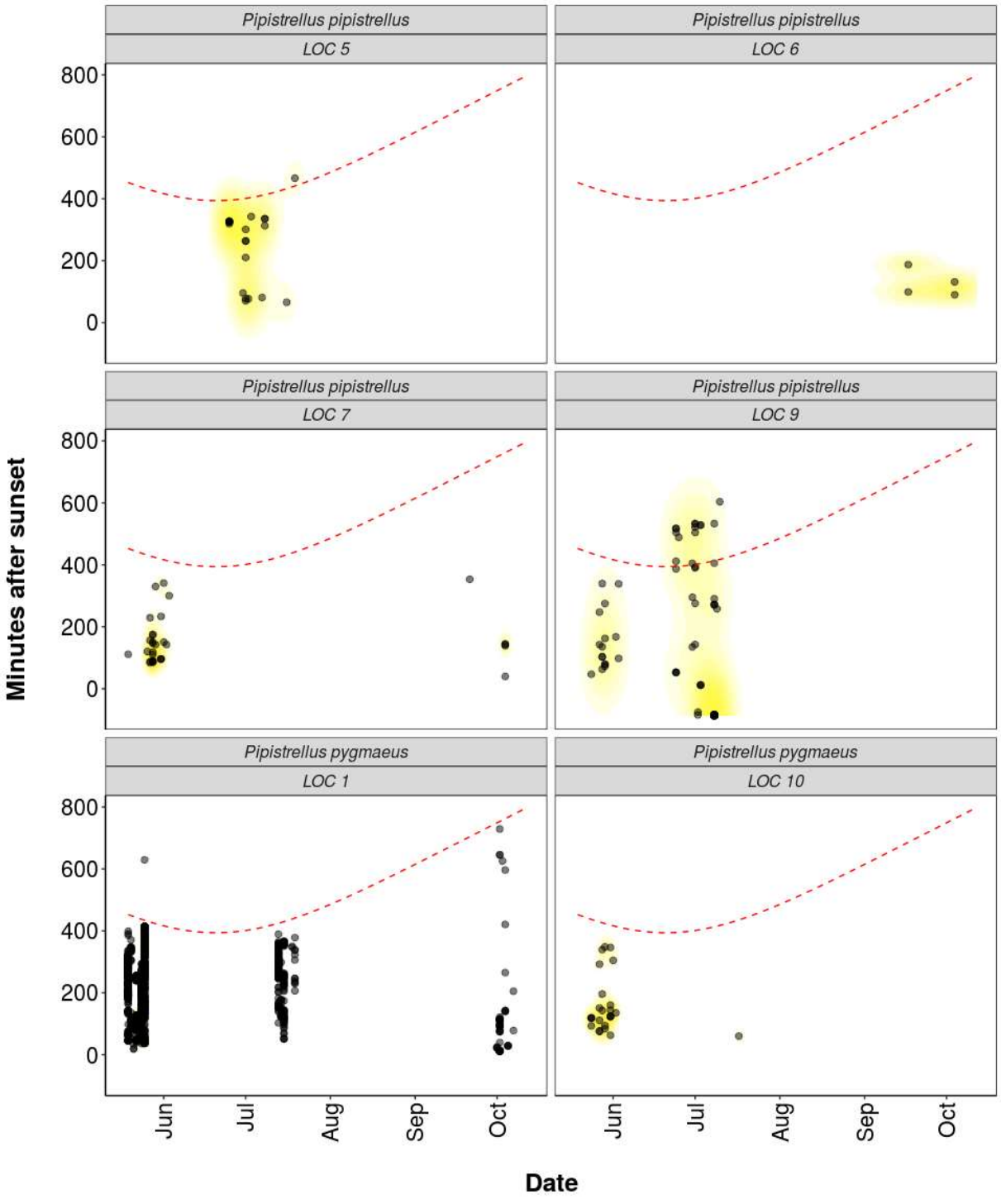
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

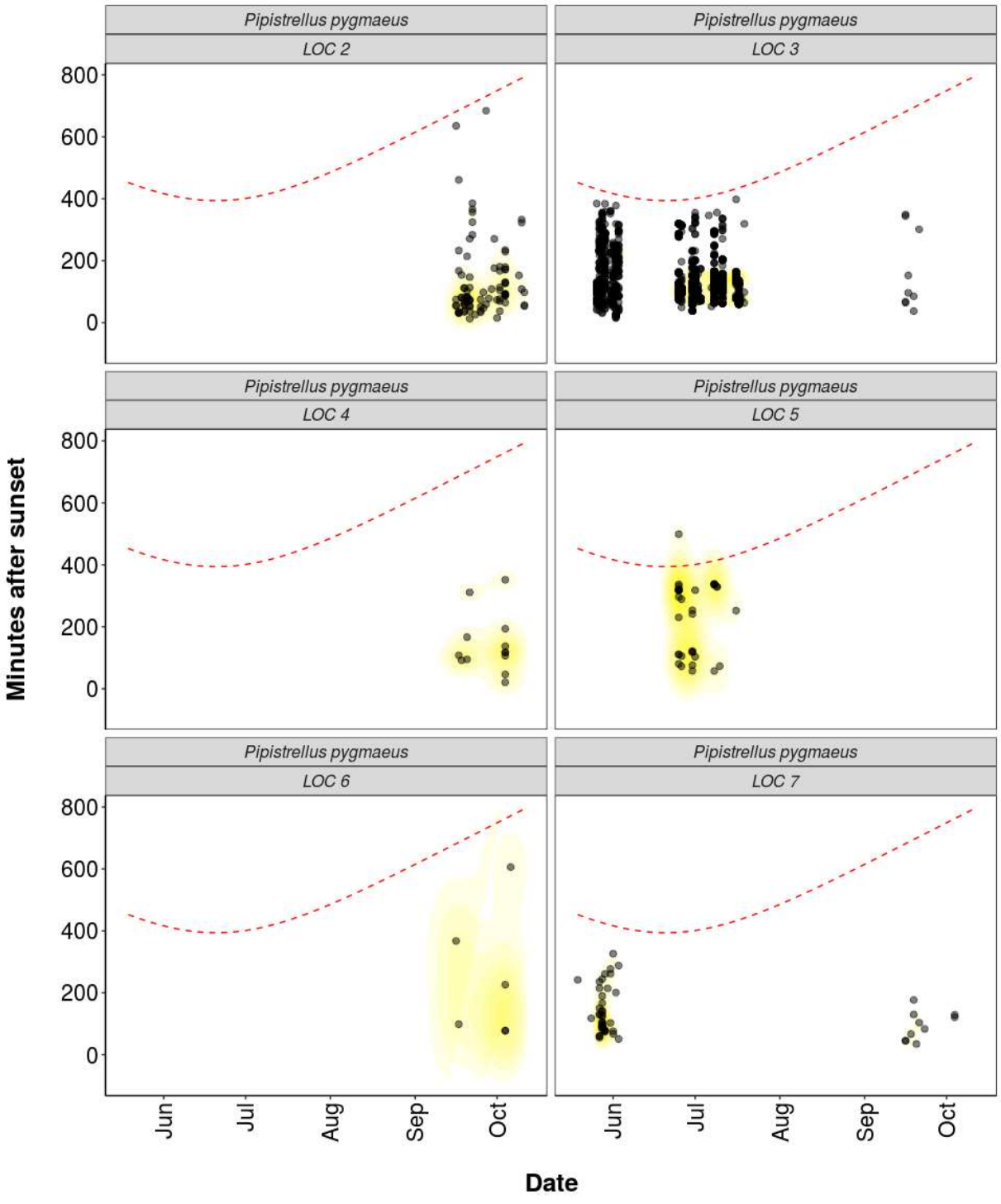

Myotis
LOC 1
Myotis
LOC 10
Myotis
LOC 2
Myotis
LOC 3
Myotis
LOC 4
Myotis
LOC 5
800
600
400
200
0
Minutes after sunset
Jun
Jul
Aug
Sep
Oct
Date

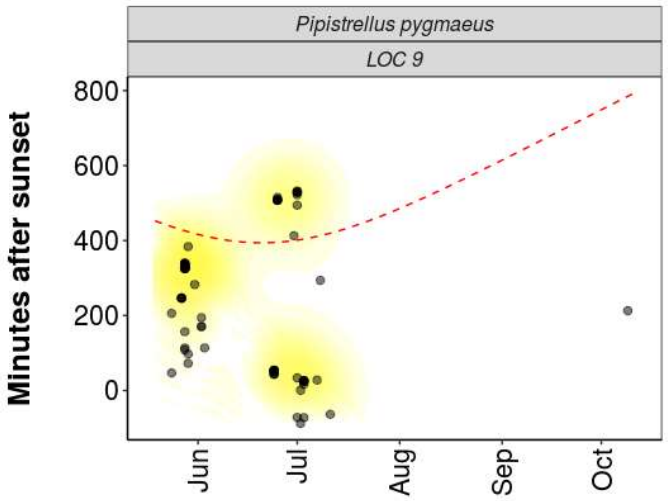

Myotis
LOC 6
Myotis
LOC 7
Myotis
LOC 9
Nyctalus noctula
LOC 1
Nyctalus noctula
LOC 10
Nyctalus noctula
LOC 11
Minutes after sunset
0
200
400
600
800
Jun
Jul
Aug
Sep
Oct
Date


Nyctalus noctula
LOC 2
Nyctalus noctula
LOC 3
Nyctalus noctula
LOC 4
Nyctalus noctula
LOC 5
Nyctalus noctula
LOC 6
Nyctalus noctula
LOC 7
Minutes after sunset
800
600
400
200
0
Jun
Jul
Aug
Sep
Oct
Date


Nyctalus noctula
LOC 9
Pipistrellus pipistrellus
LOC 1
Pipistrellus pipistrellus
LOC 10
Pipistrellus pipistrellus
LOC 2
Pipistrellus pipistrellus
LOC 3
Pipistrellus pipistrellus
LOC 4
Minutes after sunset
0
200
400
600
800
Jun
Jul
Aug
Sep
Oct
Date


Pipistrellus pipistrellus
LOC 5
Pipistrellus pipistrellus
LOC 6
Pipistrellus pipistrellus
LOC 7
Pipistrellus pipistrellus
LOC 9
Pipistrellus pygmaeus
LOC 1
Pipistrellus pygmaeus
LOC 10
Minutes after sunset
800
600
400
200
0
Jun
Jul
Aug
Sep
Oct
Date


Pipistrellus pygmaeus
LOC 2
Pipistrellus pygmaeus
LOC 3
Pipistrellus pygmaeus
LOC 4
Pipistrellus pygmaeus
LOC 5
Pipistrellus pygmaeus
LOC 6
Pipistrellus pygmaeus
LOC 7
Minutes after sunset
800
600
400
200
0
Jun
Jul
Aug
Sep
Oct
Date


Pipistrellus pygmaeus
LOC 9
Minutes after sunset
800
600
400
200
0
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.*

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

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

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

Table continues below

Species	Detector ID	2020-05-20	2020-05-21	2020-05-24	2020-05-28	2020-05-31
Common pipistrelle	LOC 1	0	1	0	0	0
Common pipistrelle	LOC 2	0	0	0	0	0
Common pipistrelle	LOC 3	0	0	0	2	0
Common pipistrelle	LOC 9	0	0	0	0	0
Soprano pipistrelle	LOC 1	0	2	0	0	0
Soprano pipistrelle	LOC 2	0	0	0	0	0
Soprano pipistrelle	LOC 3	0	0	0	0	0
Soprano pipistrelle	LOC 4	0	0	0	0	0
Soprano pipistrelle	LOC 9	0	0	0	0	0
Noctule	LOC 10	0	0	0	0	0
Noctule	LOC 11	0	0	0	0	0
Noctule	LOC 3	0	0	0	0	2
Noctule	LOC 5	0	0	0	0	0
Noctule	LOC 7	2	0	1	0	2

Noctule	LOC 9	0	0	0	0	0
Myotis	LOC 1	0	0	0	0	0
Myotis	LOC 3	0	0	0	0	0
Myotis	LOC 9	0	0	0	0	0

Table continues below

2020-06-01	2020-06-02	2020-06-25	2020-06-26	2020-06-27	2020-06-30	2020-07-01
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	33	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	1
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	4	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	1	1	1	0	4
0	0	0	0	0	0	0

Table continues below

2020-07-02	2020-07-03	2020-07-05	2020-07-06	2020-07-07	2020-07-08	2020-07-10
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
2	3	0	0	0	26	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

2	8	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	1	1	0
0	0	0	0	0	0	0
1	1	1	1	1	1	1
0	0	0	0	1	0	0

Table continues below

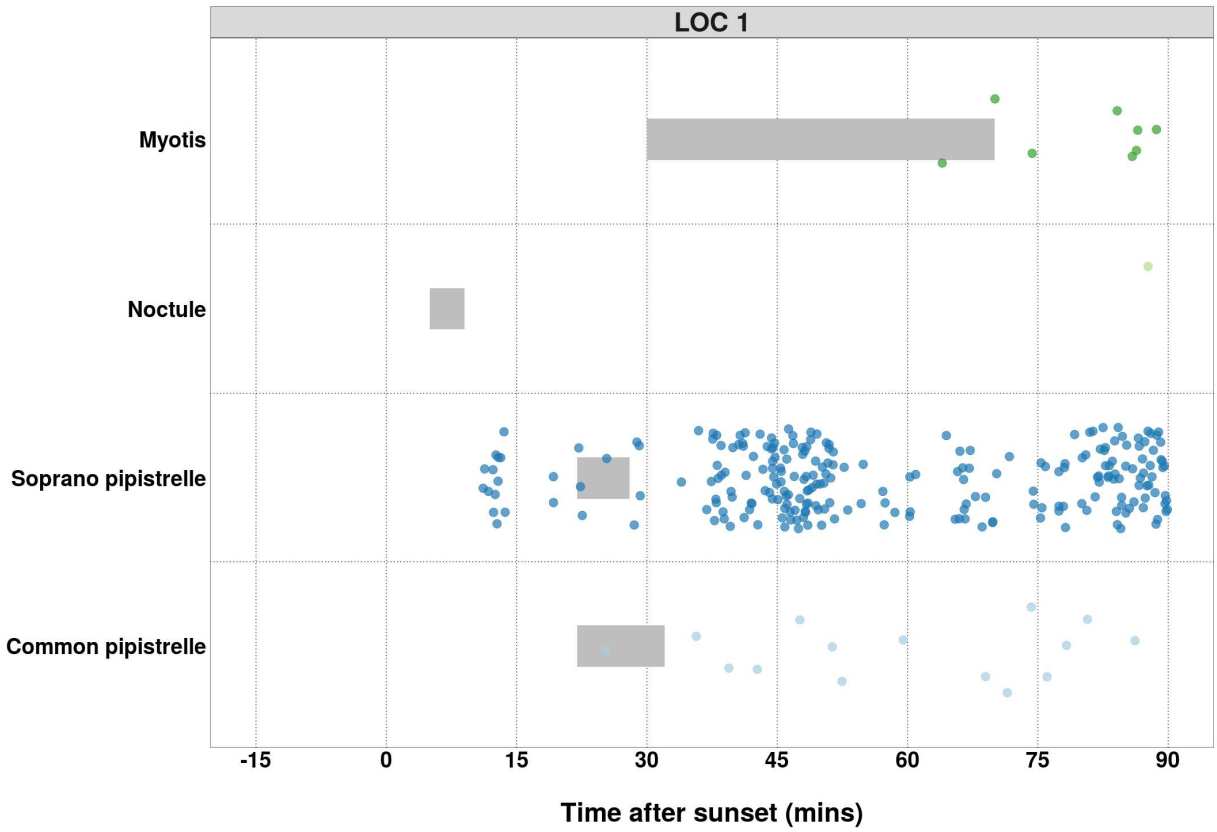
2020-07-11	2020-07-12	2020-07-14	2020-07-16	2020-07-17	2020-07-18	2020-07-19
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
1	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	2
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	0	0	0	0	0
3	1	1	4	1	0	0
0	0	0	0	0	0	0

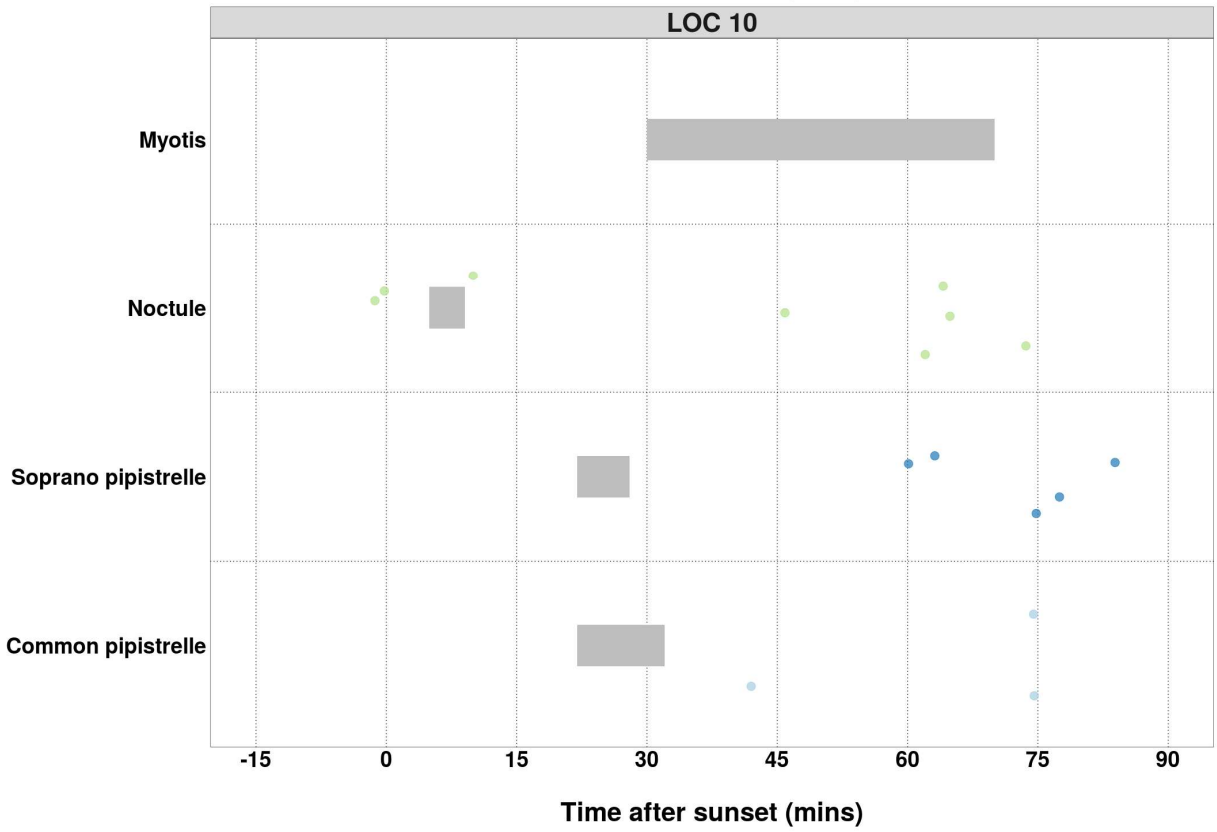
2020-09-18	2020-09-19	2020-09-21	2020-09-23	2020-10-01	2020-10-02	2020-10-04	2020-10-09
0	0	0	0	0	0	0	0
0	0	0	0	0	0	2	0
0	0	0	0	0	0	0	0

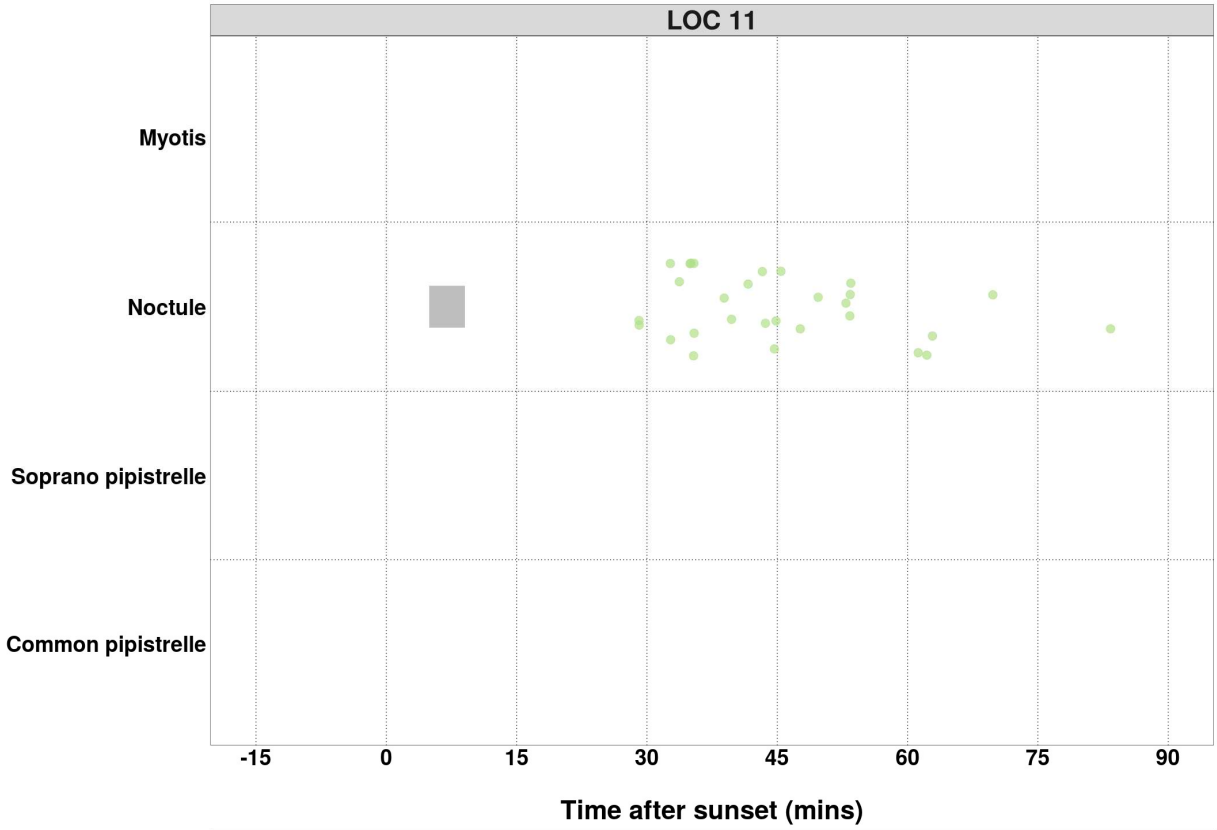
0	0	0	0	0	0	0	0
0	0	0	0	4	13	0	0
0	0	1	1	1	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	1	0	0	0
1	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0

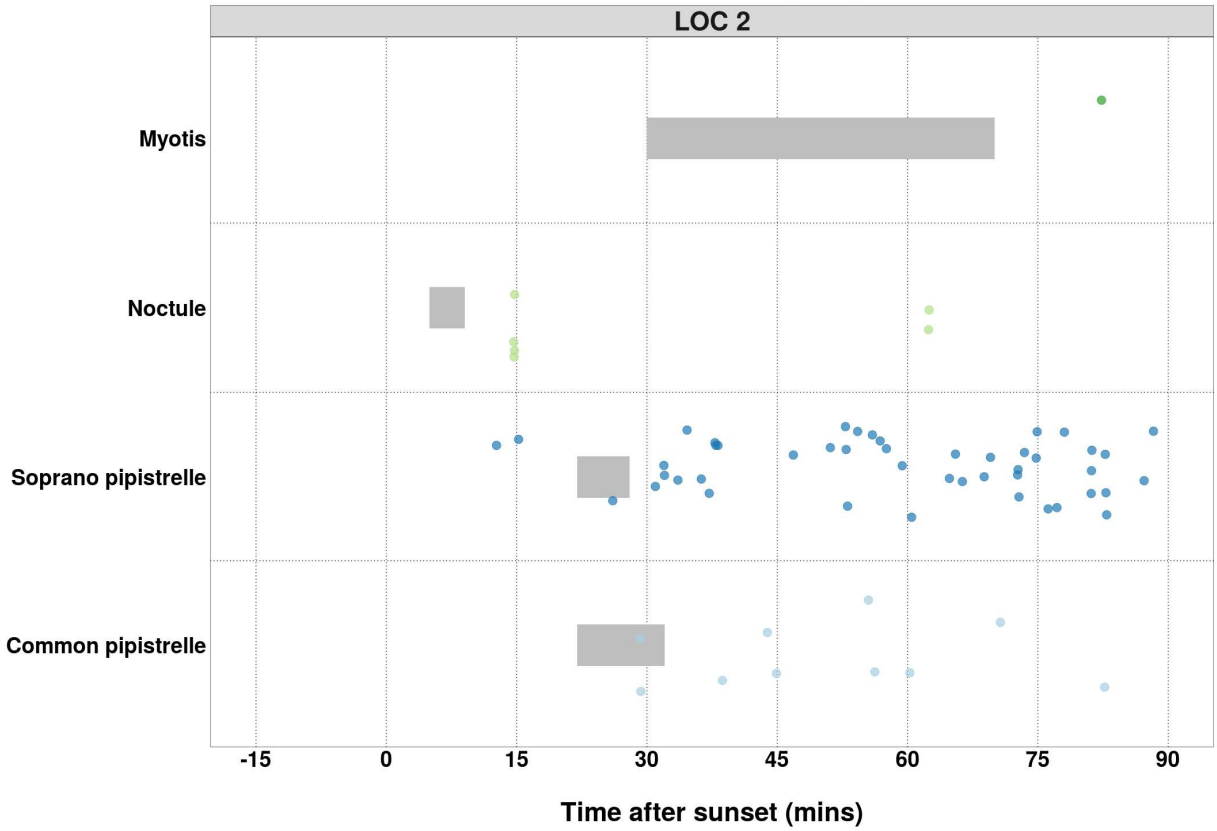
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012) - Figures

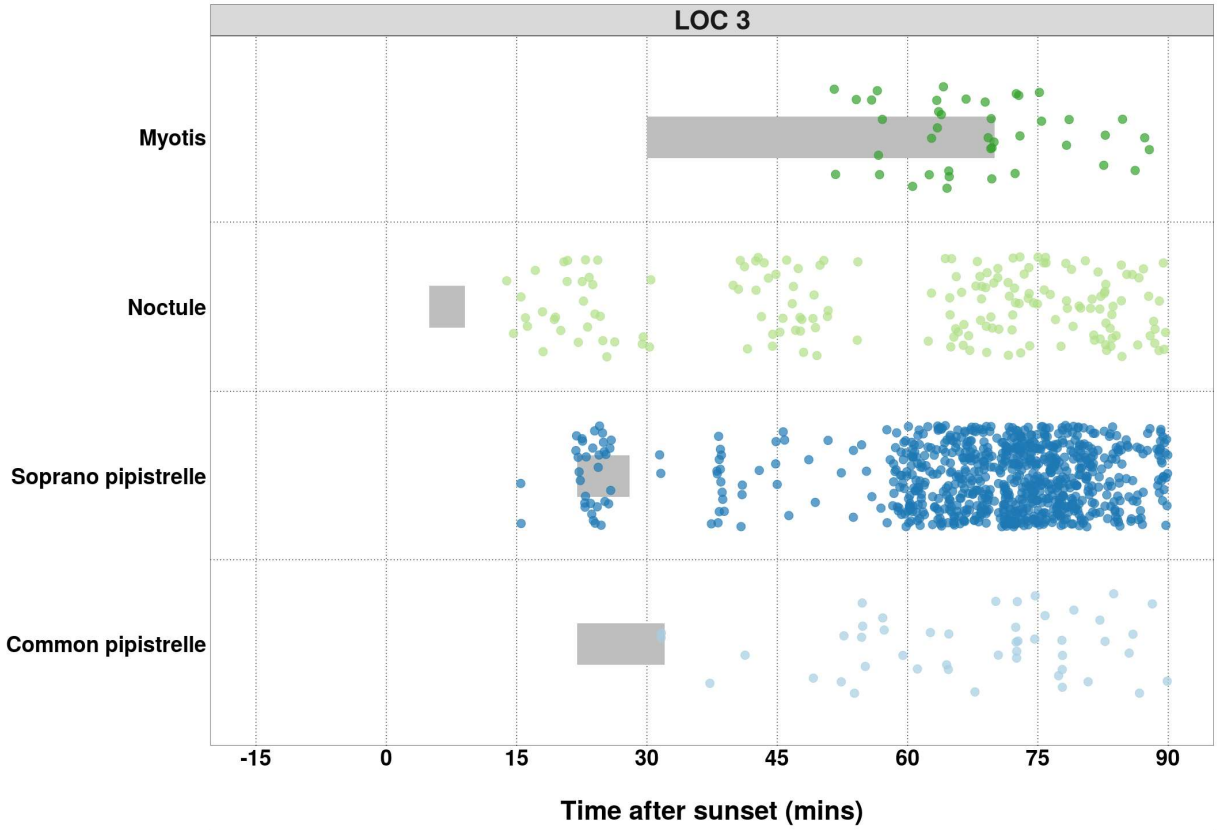
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.

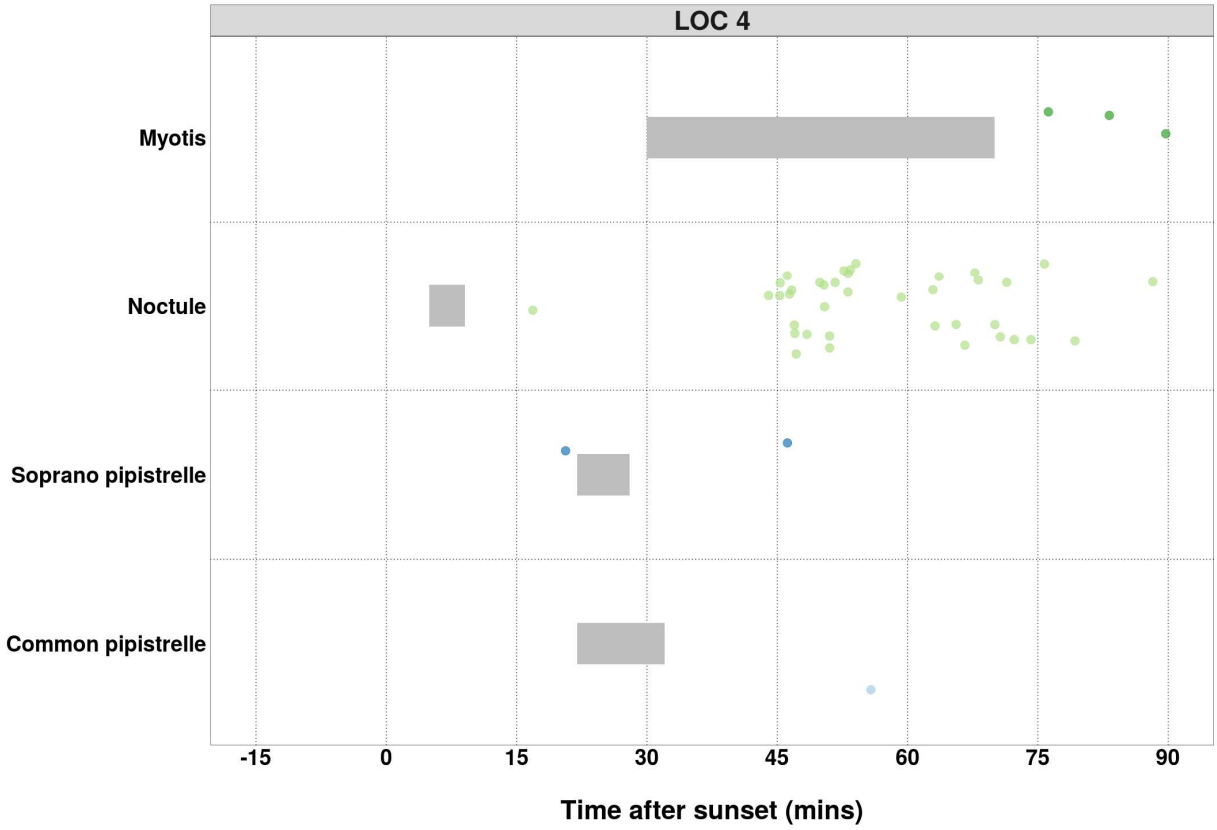

LOC 1
Myotis
Noctule
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

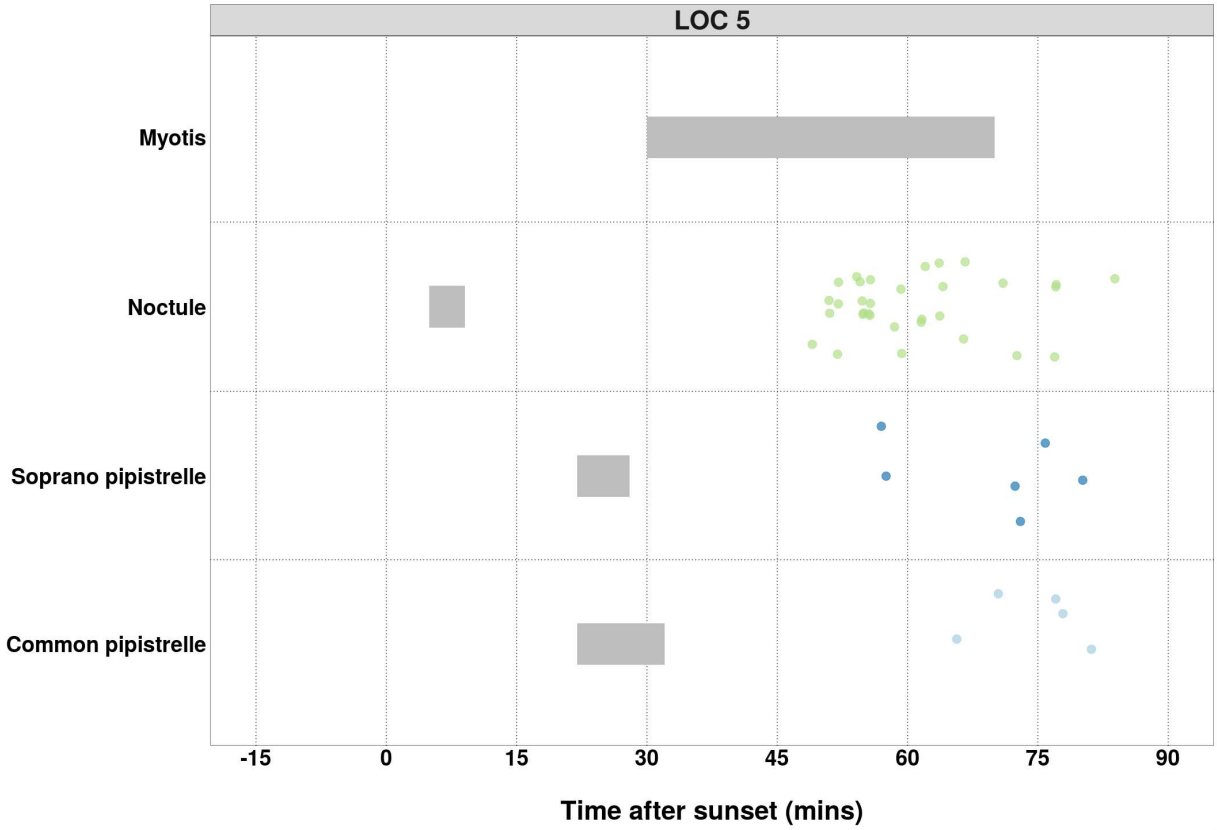

LOC 10
Myotis
Noctule
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

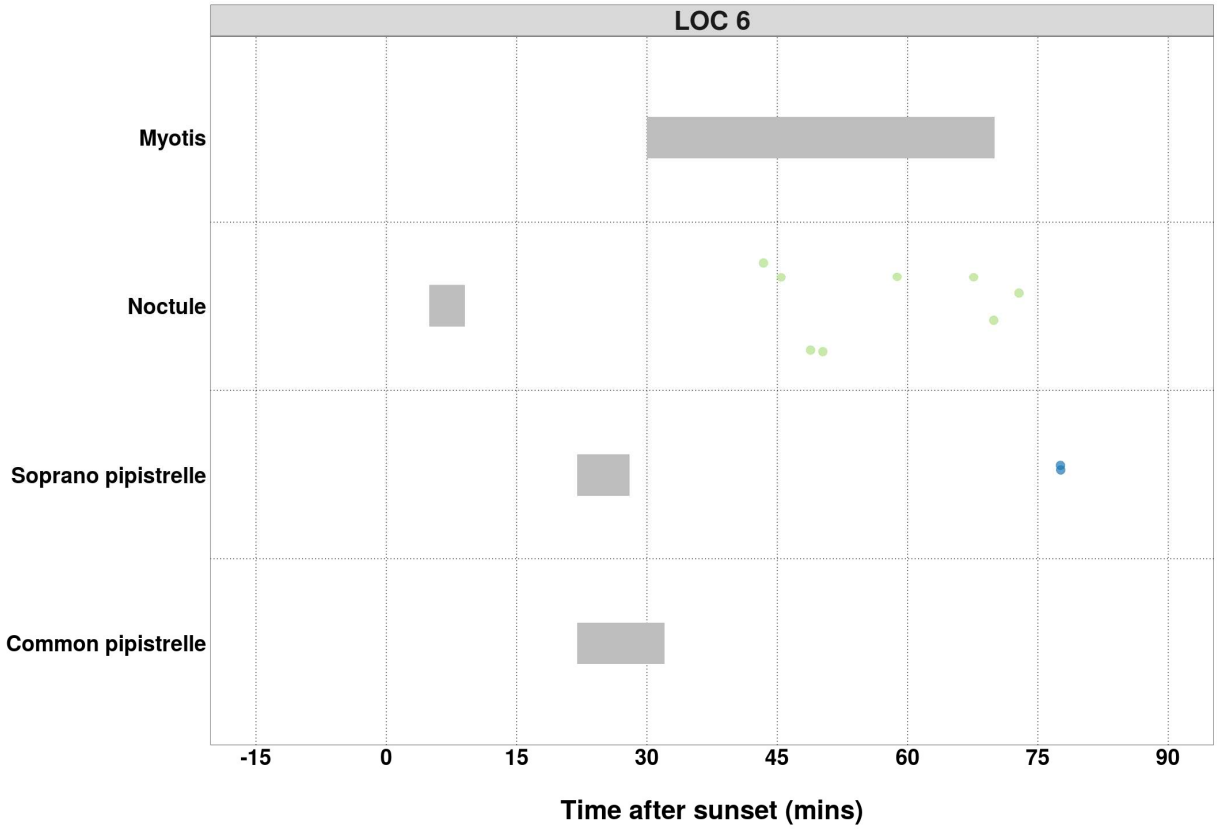

LOC 11
Myotis
Noctule
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

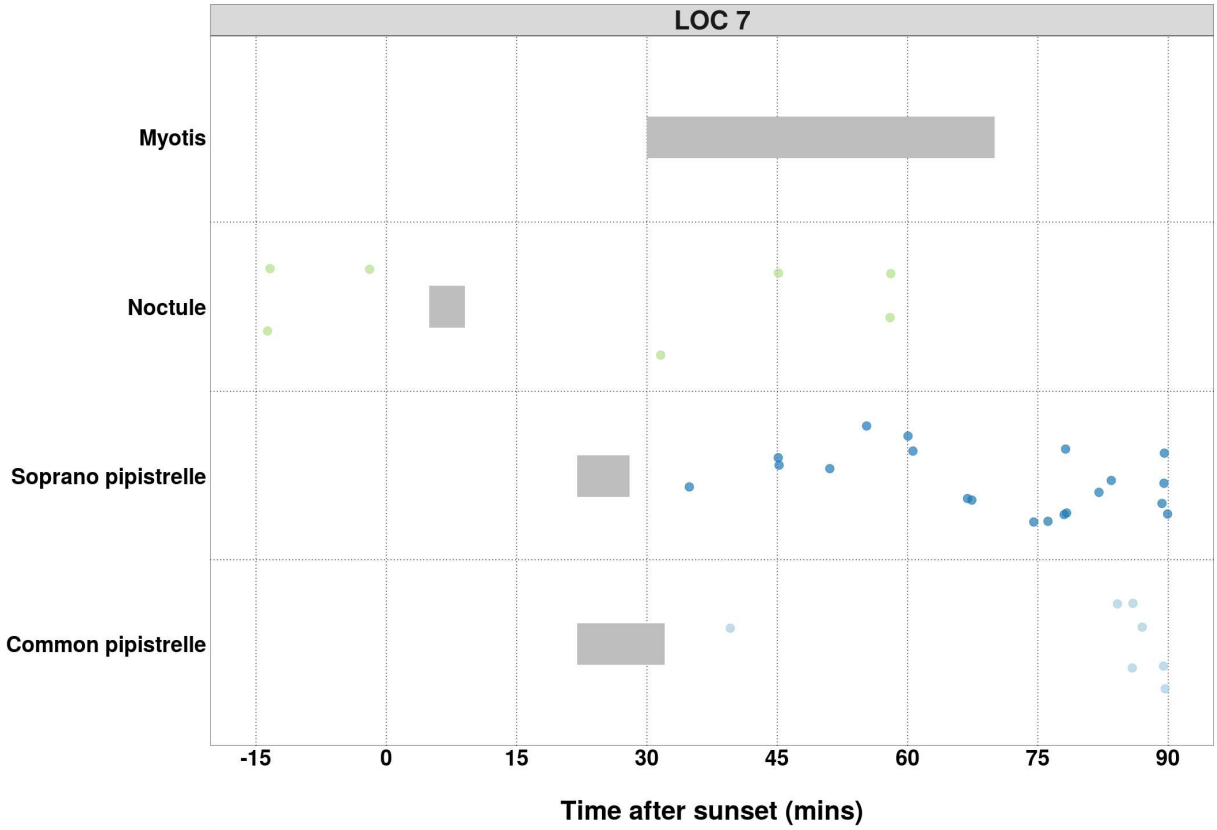

LOC 2
Myotis
Noctule
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

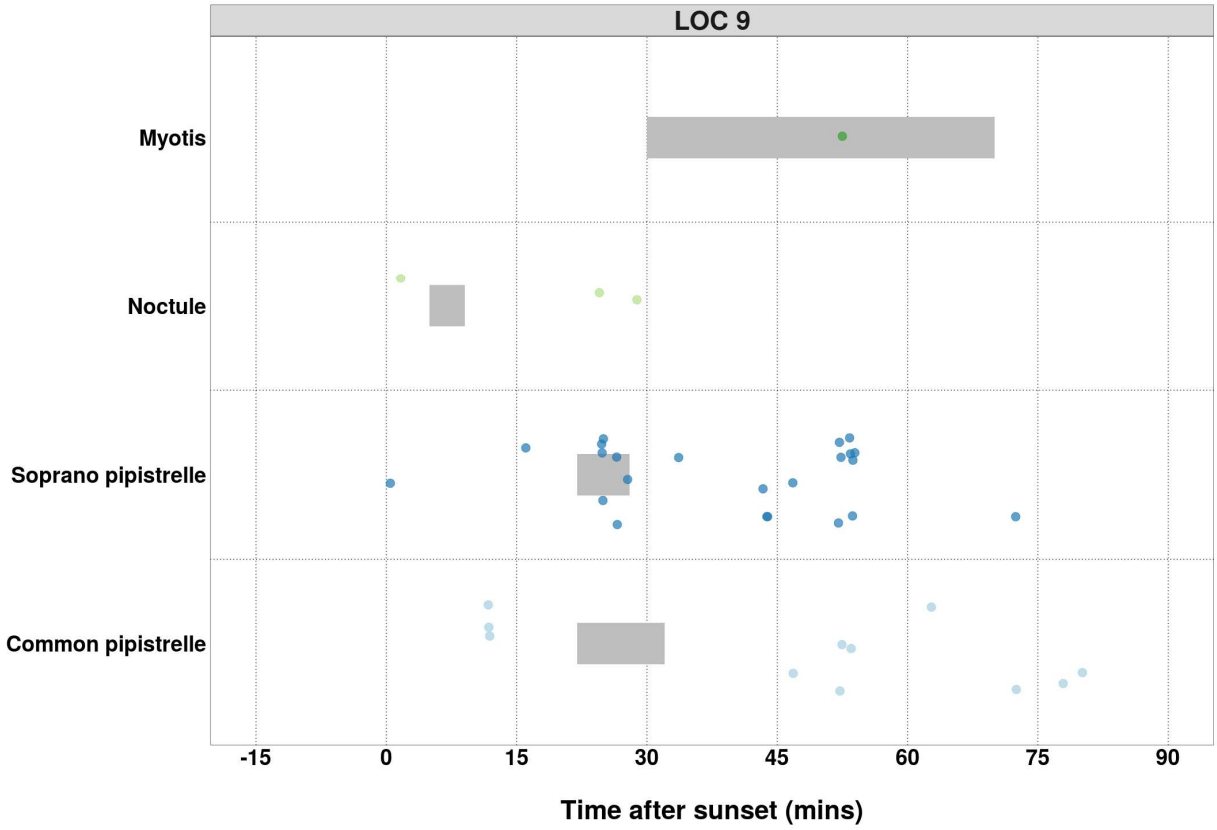

LOC 3
Myotis
Noctule
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


LOC 4
Myotis
Noctule
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


LOC 5
Myotis
Noctule
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


LOC 6
Myotis
Noctule
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


LOC 7
Myotis
Noctule
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


LOC 9
Myotis
Noctule
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

Counts of Bat Passes

All detectors

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

Species	Passes (No.)	Percentage of total (%)
Common pipistrelle	1230	15.2
Soprano pipistrelle	5820	72.1
Noctule	645	8.0
Myotis	372	4.6
Total	8067	99.9

Counts of Bat Passes

Per Detector

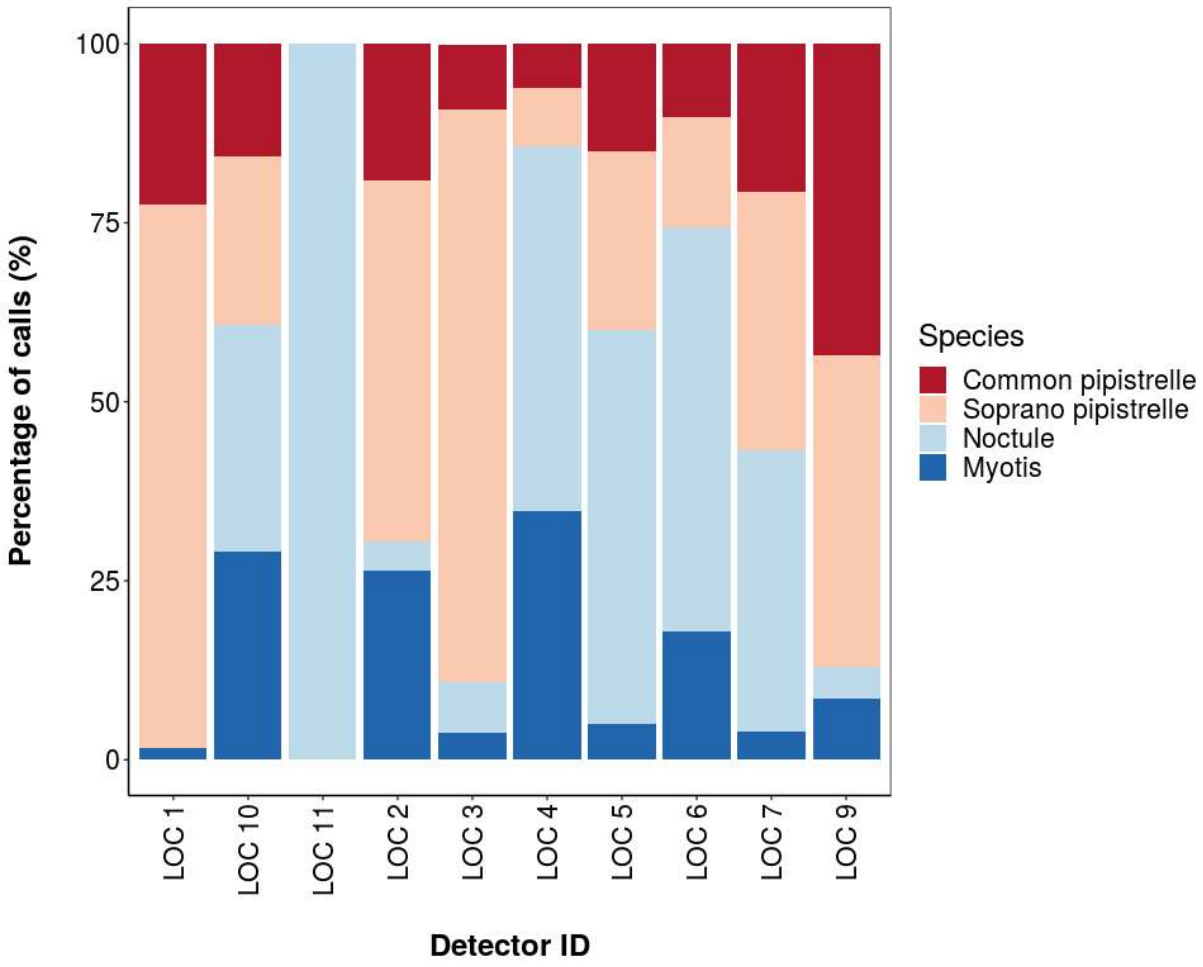
Table 15. The number of passes recorded for each species at each detector.

Species	Detector ID	Count (No)	Percentage by Detector (%)
Common pipistrelle	LOC 1	670	22.4
Common pipistrelle	LOC 10	17	15.9
Common pipistrelle	LOC 2	33	19.0
Common pipistrelle	LOC 3	367	9.0
Common pipistrelle	LOC 4	10	6.2
Common pipistrelle	LOC 5	21	15.0
Common pipistrelle	LOC 6	4	10.3
Common pipistrelle	LOC 7	31	20.7
Common pipistrelle	LOC 9	77	43.5
Soprano pipistrelle	LOC 1	2273	75.9
Soprano pipistrelle	LOC 10	25	23.4
Soprano pipistrelle	LOC 2	88	50.6
Soprano pipistrelle	LOC 3	3249	80.0
Soprano pipistrelle	LOC 4	13	8.1
Soprano pipistrelle	LOC 5	35	25.0
Soprano pipistrelle	LOC 6	6	15.4
Soprano pipistrelle	LOC 7	54	36.0
Soprano pipistrelle	LOC 9	77	43.5
Noctule	LOC 1	1	0.0
Noctule	LOC 10	34	31.8
Noctule	LOC 11	65	100.0
Noctule	LOC 2	7	4.0
Noctule	LOC 3	290	7.1
Noctule	LOC 4	82	50.9
Noctule	LOC 5	77	55.0
Noctule	LOC 6	22	56.4
Noctule	LOC 7	59	39.3
Noctule	LOC 9	8	4.5
Myotis	LOC 1	50	1.7

Myotis	LOC 10	31	29.0
Myotis	LOC 2	46	26.4
Myotis	LOC 3	154	3.8
Myotis	LOC 4	56	34.8
Myotis	LOC 5	7	5.0
Myotis	LOC 6	7	17.9
Myotis	LOC 7	6	4.0
Myotis	LOC 9	15	8.5

Species Composition

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



PART 2a: Presence Only

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

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Common pipistrelle	LOC 1	0.6
Common pipistrelle	LOC 10	0.1
Common pipistrelle	LOC 2	0.1
Common pipistrelle	LOC 3	0.3
Common pipistrelle	LOC 4	0.1
Common pipistrelle	LOC 5	0.2
Common pipistrelle	LOC 6	0.2
Common pipistrelle	LOC 7	0.3
Common pipistrelle	LOC 9	0.3
Soprano pipistrelle	LOC 1	2.2
Soprano pipistrelle	LOC 10	0.4
Soprano pipistrelle	LOC 2	0.2
Soprano pipistrelle	LOC 3	7.9
Soprano pipistrelle	LOC 4	0.1
Soprano pipistrelle	LOC 5	0.4
Soprano pipistrelle	LOC 6	0.1
Soprano pipistrelle	LOC 7	0.2
Soprano pipistrelle	LOC 9	0.3
Noctule	LOC 1	0.1
Noctule	LOC 10	0.2
Noctule	LOC 11	0.4
Noctule	LOC 2	0.2
Noctule	LOC 3	0.6

Noctule	LOC 4	0.2
Noctule	LOC 5	0.6
Noctule	LOC 6	0.1
Noctule	LOC 7	0.4
Noctule	LOC 9	0.2
Myotis	LOC 1	0.5
Myotis	LOC 10	0.2
Myotis	LOC 2	0.2
Myotis	LOC 3	0.6
Myotis	LOC 4	0.4
Myotis	LOC 5	0.2
Myotis	LOC 6	0.1
Myotis	LOC 7	0.1
Myotis	LOC 9	0.2

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

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

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

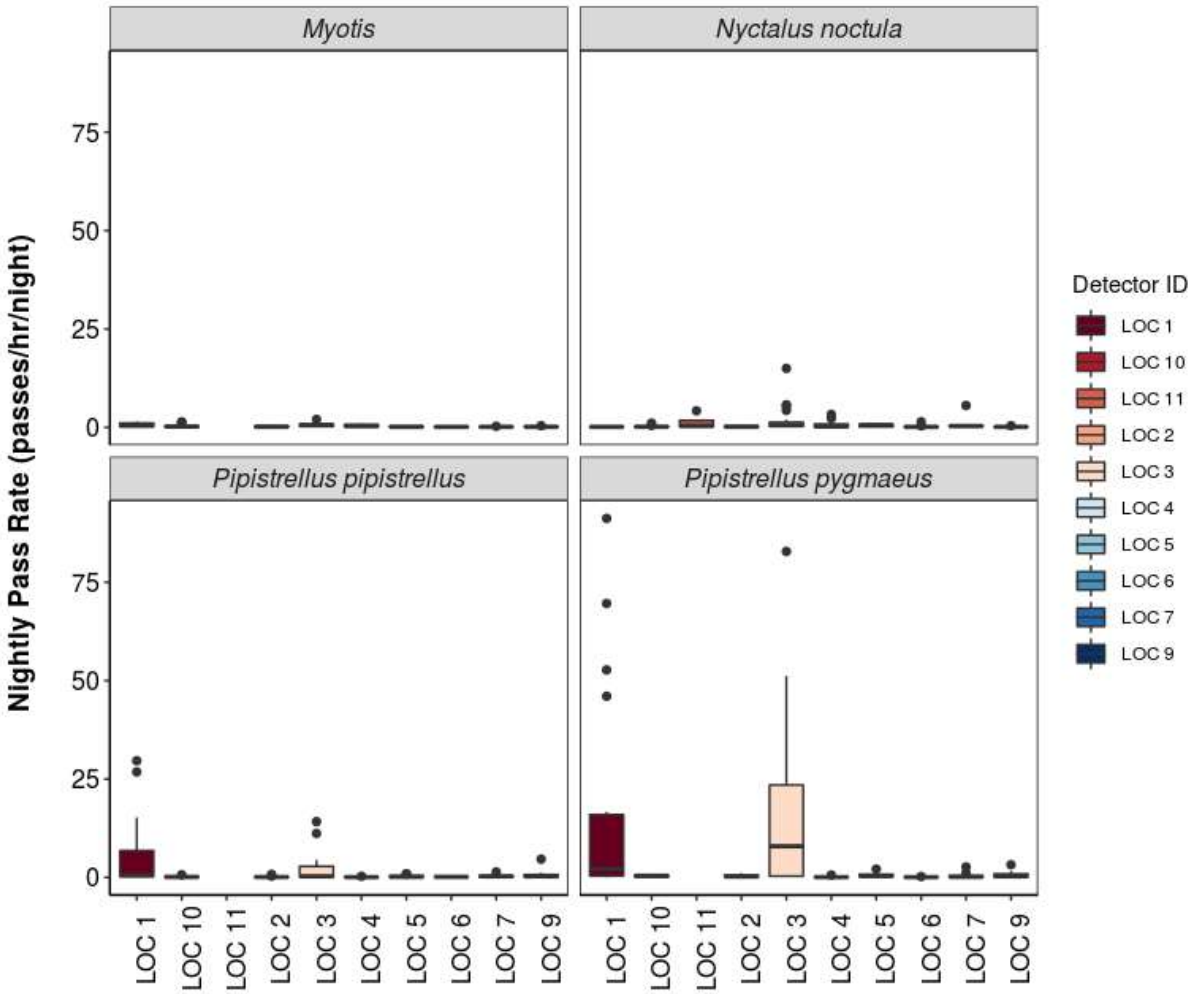
Species	Detector ID	Mean Pass Rate
Common pipistrelle	LOC 1	6.1
Common pipistrelle	LOC 10	0.3
Common pipistrelle	LOC 2	0.2
Common pipistrelle	LOC 3	2.1
Common pipistrelle	LOC 4	0.1
Common pipistrelle	LOC 5	0.3
Common pipistrelle	LOC 6	0.2
Common pipistrelle	LOC 7	0.4
Common pipistrelle	LOC 9	0.8
Soprano pipistrelle	LOC 1	17.0
Soprano pipistrelle	LOC 10	0.4
Soprano pipistrelle	LOC 2	0.4
Soprano pipistrelle	LOC 3	16.2
Soprano pipistrelle	LOC 4	0.2
Soprano pipistrelle	LOC 5	0.7
Soprano pipistrelle	LOC 6	0.1
Soprano pipistrelle	LOC 7	0.4
Soprano pipistrelle	LOC 9	0.7
Noctule	LOC 1	0.1
Noctule	LOC 10	0.3
Noctule	LOC 11	1.3
Noctule	LOC 2	0.3
Noctule	LOC 3	1.9
Noctule	LOC 4	0.7
Noctule	LOC 5	0.5
Noctule	LOC 6	0.3

Noctule	LOC 7	1.0
Noctule	LOC 9	0.2
Myotis	LOC 1	0.7
Myotis	LOC 10	0.4
Myotis	LOC 2	0.2
Myotis	LOC 3	0.7
Myotis	LOC 4	0.4
Myotis	LOC 5	0.2
Myotis	LOC 6	0.1
Myotis	LOC 7	0.1
Myotis	LOC 9	0.2

Nightly Bat Passes (Bat passes per hour)

Per Detector - Figures

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


Myotis
Nyctalus noctula
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Nightly Pass Rate (passes/hr/night)
0
25
50
75
LOC 1
LOC 10
LOC 11
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID
Detector ID

SPLIT BY MONTH

Total Bat Passes per Detector, each Month

Per Detector

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

Species	Detector ID	May	Jun	Jul	Sep	Oct
Common pipistrelle	LOC 1	555	0	105	0	10
Common pipistrelle	LOC 10	12	3	2	0	0
Common pipistrelle	LOC 2	0	0	0	15	18
Common pipistrelle	LOC 3	260	88	11	8	0
Common pipistrelle	LOC 4	0	0	0	5	5
Common pipistrelle	LOC 5	0	7	14	0	0
Common pipistrelle	LOC 6	0	0	0	2	2
Common pipistrelle	LOC 7	22	4	0	1	4
Common pipistrelle	LOC 9	13	15	49	0	0
Soprano pipistrelle	LOC 1	1970	0	246	0	57
Soprano pipistrelle	LOC 10	22	2	1	0	0
Soprano pipistrelle	LOC 2	0	0	0	58	30
Soprano pipistrelle	LOC 3	343	803	2094	9	0
Soprano pipistrelle	LOC 4	0	0	0	5	8
Soprano pipistrelle	LOC 5	0	24	11	0	0
Soprano pipistrelle	LOC 6	0	0	0	2	4
Soprano pipistrelle	LOC 7	38	6	0	8	2
Soprano pipistrelle	LOC 9	33	22	21	0	1
Noctule	LOC 1	1	0	0	0	0
Noctule	LOC 10	3	1	13	10	7
Noctule	LOC 11	0	1	61	3	0
Noctule	LOC 2	0	0	4	1	2
Noctule	LOC 3	88	166	36	0	0
Noctule	LOC 4	21	39	0	17	5

Noctule	LOC 5	0	13	40	24	0
Noctule	LOC 6	4	10	1	3	4
Noctule	LOC 7	52	7	0	0	0
Noctule	LOC 9	0	1	7	0	0
Myotis	LOC 1	46	0	1	0	3
Myotis	LOC 10	4	0	27	0	0
Myotis	LOC 2	0	0	0	34	12
Myotis	LOC 3	36	40	74	4	0
Myotis	LOC 4	0	0	0	48	8
Myotis	LOC 5	0	0	7	0	0
Myotis	LOC 6	0	0	0	5	2
Myotis	LOC 7	4	0	0	2	0
Myotis	LOC 9	3	4	8	0	0

Survey Effort

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

Month	Detector ID	No. of Survey Nights
May	LOC 1	7
May	LOC 10	6
May	LOC 3	7
May	LOC 4	4
May	LOC 6	2
May	LOC 7	9
May	LOC 9	6
Jun	LOC 10	2
Jun	LOC 11	1
Jun	LOC 3	8
Jun	LOC 4	2
Jun	LOC 5	3
Jun	LOC 6	1
Jun	LOC 7	3
Jun	LOC 9	6
Jul	LOC 1	6
Jul	LOC 10	7
Jul	LOC 11	5
Jul	LOC 2	1
Jul	LOC 3	19
Jul	LOC 5	13
Jul	LOC 6	1
Jul	LOC 9	10
Sep	LOC 10	2
Sep	LOC 11	1
Sep	LOC 2	15
Sep	LOC 3	5
Sep	LOC 4	8
Sep	LOC 5	8
Sep	LOC 6	2

Sep	LOC 7	8
Oct	LOC 1	6
Oct	LOC 10	5
Oct	LOC 2	8
Oct	LOC 4	5
Oct	LOC 6	4
Oct	LOC 7	1
Oct	LOC 9	1

Nightly Bat Pass Rate for each Month

Median Per Detector

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

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

Species	Detector ID	May	Jun	Jul	Sep	Oct
Common pipistrelle	LOC 1	9.2	NA	0.6	NA	0.2
Common pipistrelle	LOC 10	0.3	0.2	0.1	NA	NA
Common pipistrelle	LOC 2	NA	NA	NA	0.1	0.2
Common pipistrelle	LOC 3	4.3	1.6	0.1	0.2	NA
Common pipistrelle	LOC 4	NA	NA	NA	0.1	0.2
Common pipistrelle	LOC 5	NA	0.5	0.2	NA	NA
Common pipistrelle	LOC 6	NA	NA	NA	0.2	0.2
Common pipistrelle	LOC 7	0.4	0.2	NA	0.1	0.3
Common pipistrelle	LOC 9	0.5	0.3	0.5	NA	NA
Soprano pipistrelle	LOC 1	46.0	NA	2.2	NA	0.3
Soprano pipistrelle	LOC 10	0.6	0.1	0.1	NA	NA
Soprano pipistrelle	LOC 2	NA	NA	NA	0.3	0.2
Soprano pipistrelle	LOC 3	8.9	20.2	5.5	0.2	NA
Soprano pipistrelle	LOC 4	NA	NA	NA	0.1	0.6
Soprano pipistrelle	LOC 5	NA	1.1	0.3	NA	NA
Soprano pipistrelle	LOC 6	NA	NA	NA	0.1	0.2
Soprano pipistrelle	LOC 7	0.4	0.3	NA	0.1	0.2
Soprano pipistrelle	LOC 9	0.4	0.4	0.2	NA	0.1
Noctule	LOC 1	0.1	NA	NA	NA	NA
Noctule	LOC 10	0.2	0.1	0.3	0.4	0.1
Noctule	LOC 11	NA	0.2	1.7	0.2	NA
Noctule	LOC 2	NA	NA	0.6	0.1	0.2
Noctule	LOC 3	1.1	1.2	0.4	NA	NA

Noctule	LOC 4	0.5	2.8	NA	0.2	0.2
Noctule	LOC 5	NA	0.6	0.7	0.2	NA
Noctule	LOC 6	0.3	1.4	0.1	0.1	0.1
Noctule	LOC 7	0.4	0.3	NA	NA	NA
Noctule	LOC 9	NA	0.2	0.2	NA	NA
Myotis	LOC 1	0.7	NA	0.1	NA	0.1
Myotis	LOC 10	0.1	NA	0.3	NA	NA
Myotis	LOC 2	NA	NA	NA	0.2	0.2
Myotis	LOC 3	0.9	0.6	0.6	0.1	NA
Myotis	LOC 4	NA	NA	NA	0.6	0.2
Myotis	LOC 5	NA	NA	0.2	NA	NA
Myotis	LOC 6	NA	NA	NA	0.2	0.1
Myotis	LOC 7	0.1	NA	NA	0.1	NA
Myotis	LOC 9	0.2	0.2	0.2	NA	NA

Nightly Bat Pass Rate for each Month

Mean per Detector

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

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

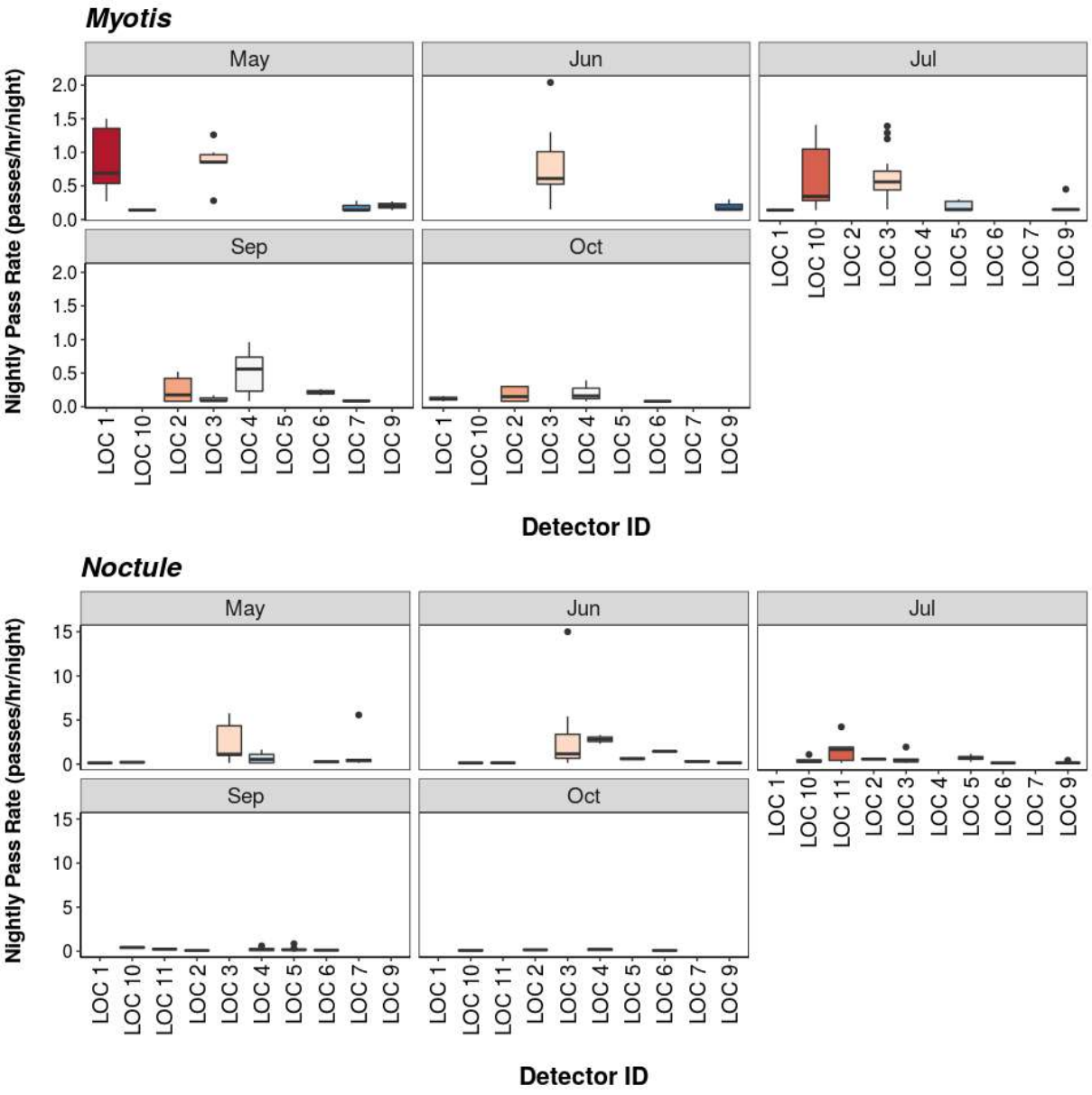
Species	Detector ID	May	Jun	Jul	Sep	Oct
Common pipistrelle	LOC 1	12.6	NA	3.0	NA	0.2
Common pipistrelle	LOC 10	0.3	0.2	0.1	NA	NA
Common pipistrelle	LOC 2	NA	NA	NA	0.1	0.3
Common pipistrelle	LOC 3	6.1	2.1	0.2	0.2	NA
Common pipistrelle	LOC 4	NA	NA	NA	0.1	0.2
Common pipistrelle	LOC 5	NA	0.5	0.3	NA	NA
Common pipistrelle	LOC 6	NA	NA	NA	0.2	0.2
Common pipistrelle	LOC 7	0.5	0.2	NA	0.1	0.3
Common pipistrelle	LOC 9	0.5	0.4	1.2	NA	NA
Soprano pipistrelle	LOC 1	38.3	NA	6.9	NA	0.8
Soprano pipistrelle	LOC 10	0.6	0.1	0.1	NA	NA
Soprano pipistrelle	LOC 2	NA	NA	NA	0.4	0.4
Soprano pipistrelle	LOC 3	8.0	19.9	23.1	0.2	NA
Soprano pipistrelle	LOC 4	NA	NA	NA	0.1	0.6
Soprano pipistrelle	LOC 5	NA	1.2	0.3	NA	NA
Soprano pipistrelle	LOC 6	NA	NA	NA	0.1	0.2
Soprano pipistrelle	LOC 7	0.8	0.3	NA	0.1	0.2
Soprano pipistrelle	LOC 9	0.9	0.7	0.5	NA	0.1
Noctule	LOC 1	0.1	NA	NA	NA	NA
Noctule	LOC 10	0.2	0.1	0.4	0.4	0.1
Noctule	LOC 11	NA	0.2	1.7	0.2	NA
Noctule	LOC 2	NA	NA	0.6	0.1	0.2
Noctule	LOC 3	2.5	3.5	0.5	NA	NA
Noctule	LOC 4	0.7	2.8	NA	0.2	0.2
Noctule	LOC 5	NA	0.7	0.7	0.3	NA
Noctule	LOC 6	0.3	1.4	0.1	0.1	0.1

Noctule	LOC 7	1.4	0.3	NA	NA	NA
Noctule	LOC 9	NA	0.2	0.2	NA	NA
Myotis	LOC 1	0.9	NA	0.1	NA	0.1
Myotis	LOC 10	0.1	NA	0.6	NA	NA
Myotis	LOC 2	NA	NA	NA	0.2	0.2
Myotis	LOC 3	0.8	0.8	0.6	0.1	NA
Myotis	LOC 4	NA	NA	NA	0.5	0.2
Myotis	LOC 5	NA	NA	0.2	NA	NA
Myotis	LOC 6	NA	NA	NA	0.2	0.1
Myotis	LOC 7	0.2	NA	NA	0.1	NA
Myotis	LOC 9	0.2	0.2	0.2	NA	NA

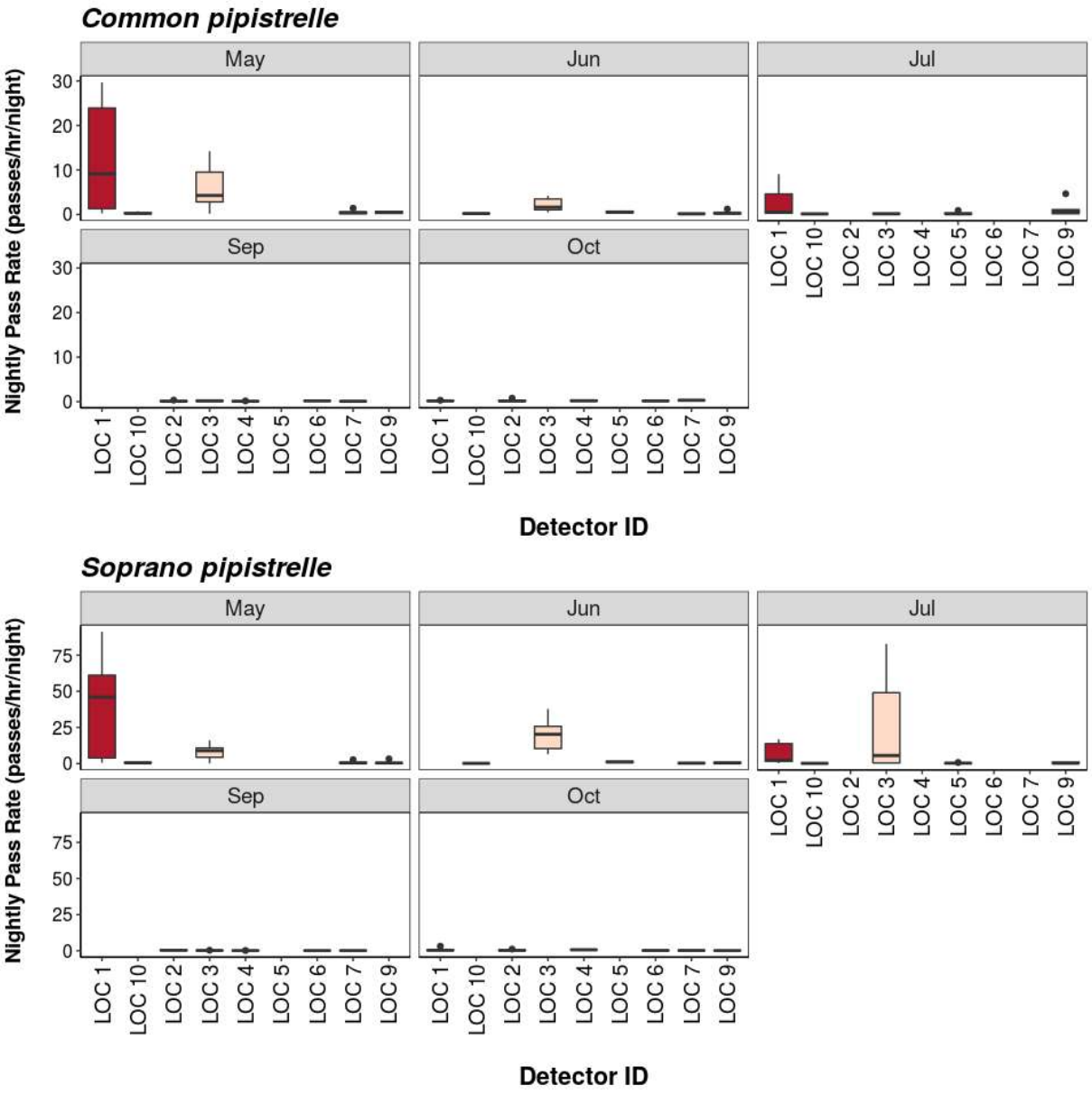
Nightly Bat Pass Rate for each Month

Per Detector - Figures

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


Myotis
May
Jun
Jul
Sep
Oct
Nightly Pass Rate (passes/hr/night)
0.0
0.5
1.0
1.5
2.0
LOC 1
LOC 10
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID

Noctule
May
Jun
Jul
Sep
Oct
Nightly Pass Rate (passes/hr/night)
0
5
10
15
LOC 1
LOC 10
LOC 11
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID


Common pipistrelle
May
Jun
Jul
Sep
Oct
Nightly Pass Rate (passes/hr/night)
0
10
20
30
LOC 1
LOC 10
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID

Soprano pipistrelle
May
Jun
Jul
Sep
Oct
Nightly Pass Rate (passes/hr/night)
0
25
50
75
LOC 1
LOC 10
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID

Bat Activity per Detector Location

Figure 13. Detector ID reference:

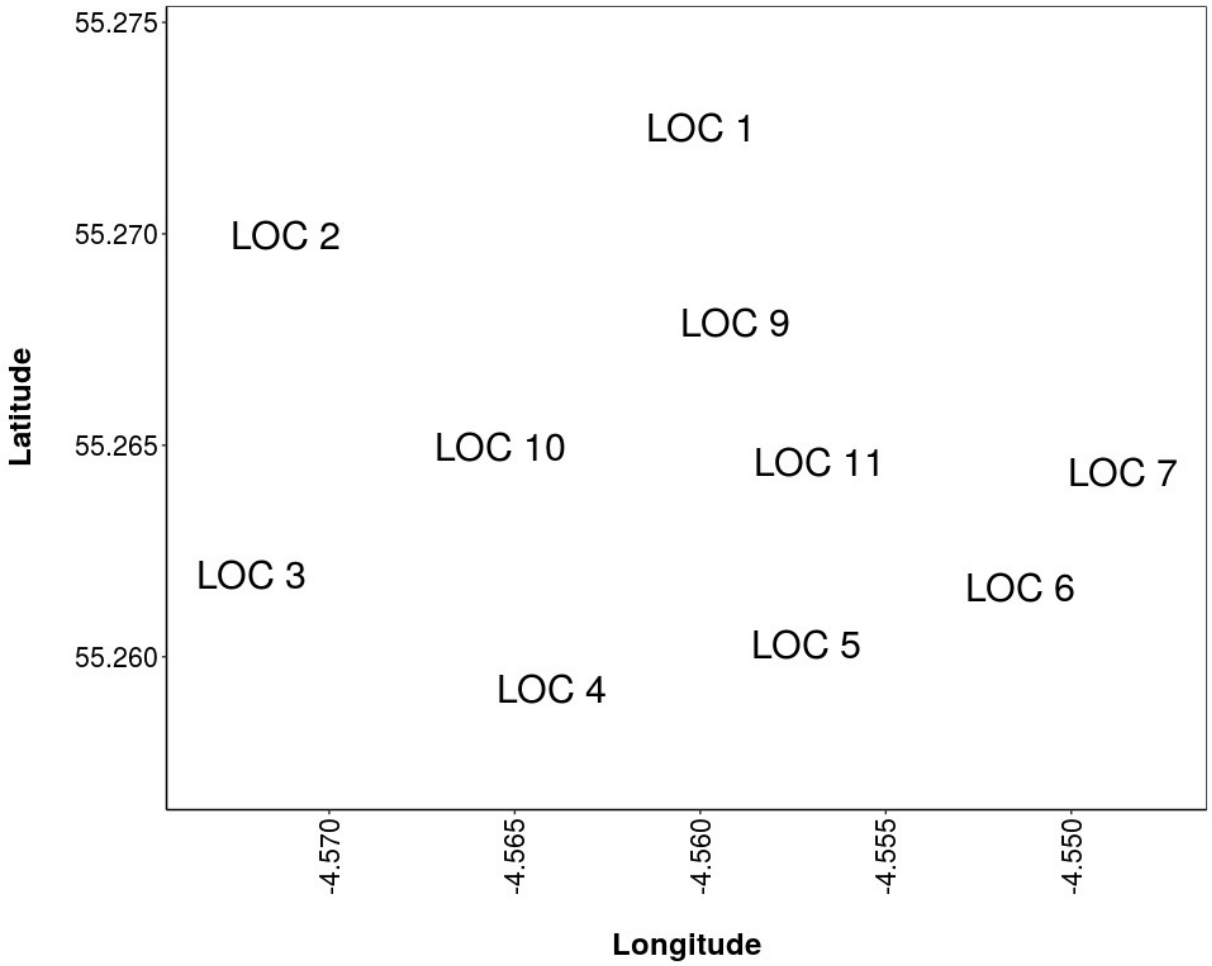


Figure 14. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.

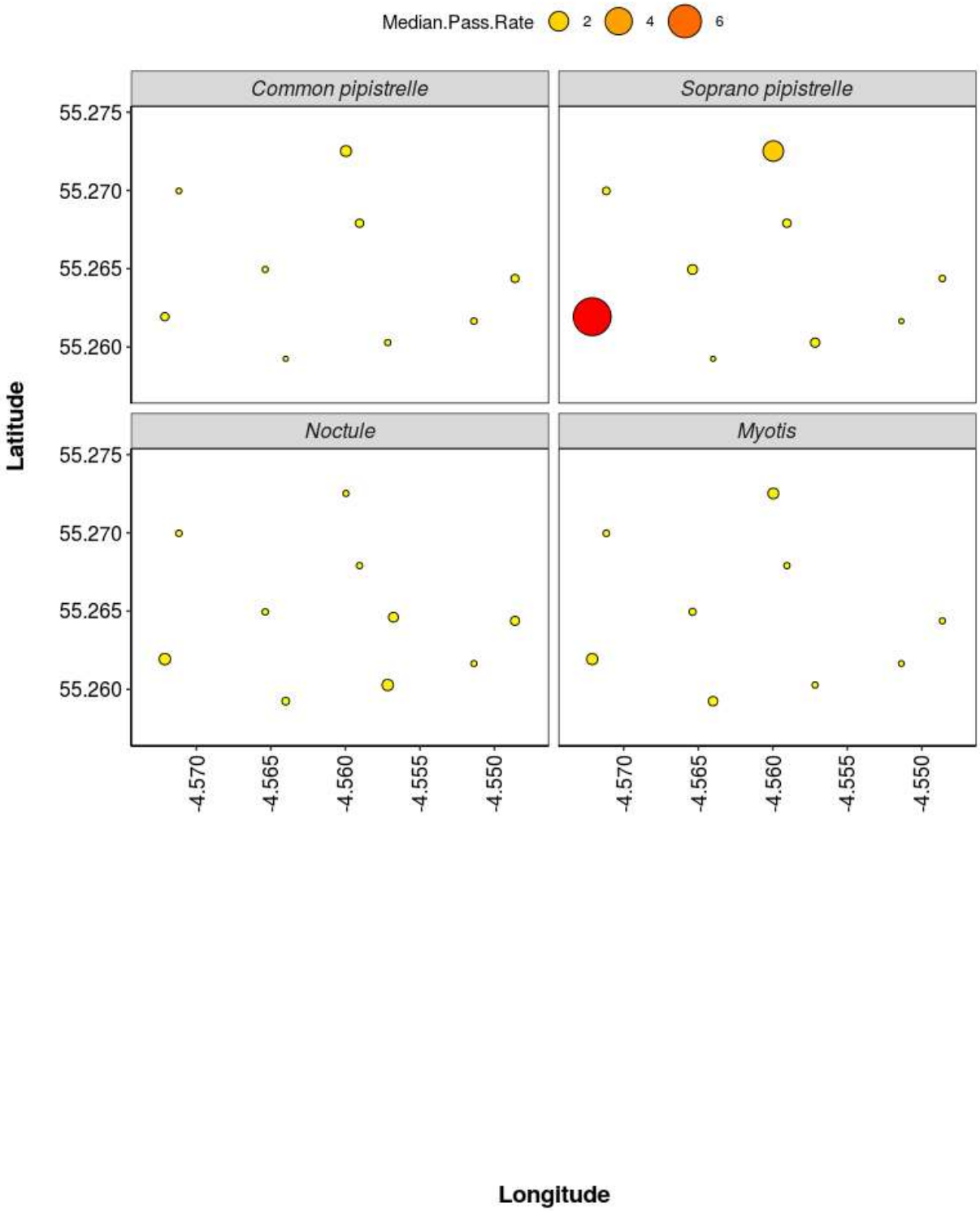
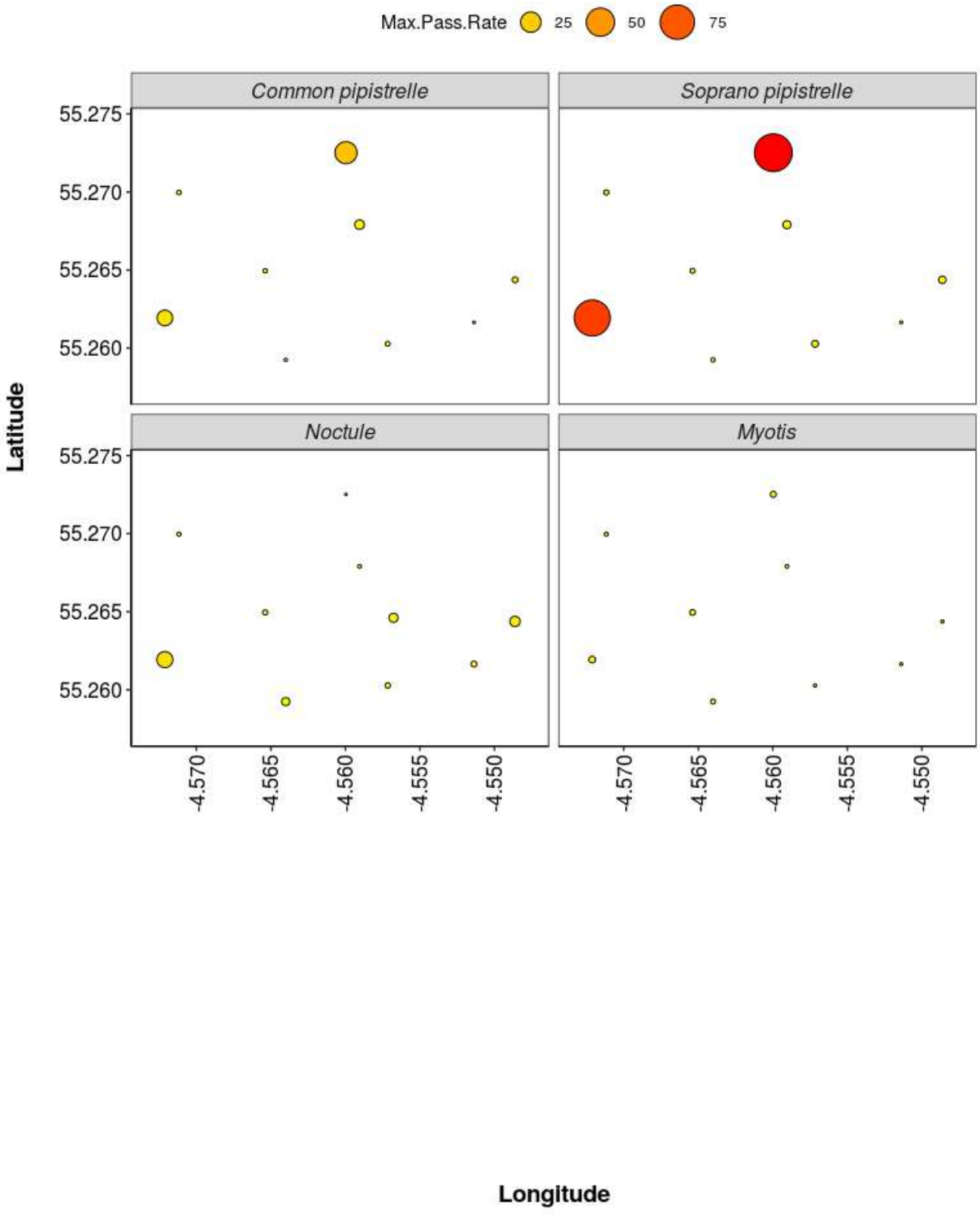


Figure 15. Maximum Nightly Pass Rate (bat passes/hr/night) recorded in a single night throughout the survey period - represented by the size and colour of the point at each detector location.



PART 2B: Includes absences

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

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Common pipistrelle	LOC 1	0.3
Common pipistrelle	LOC 10	0.0
Common pipistrelle	LOC 11	0.0
Common pipistrelle	LOC 2	0.1
Common pipistrelle	LOC 3	0.1
Common pipistrelle	LOC 4	0.0
Common pipistrelle	LOC 5	0.0
Common pipistrelle	LOC 6	0.0
Common pipistrelle	LOC 7	0.1
Common pipistrelle	LOC 9	0.1
Myotis	LOC 1	0.1
Myotis	LOC 10	0.0
Myotis	LOC 11	0.0
Myotis	LOC 2	0.1
Myotis	LOC 3	0.5
Myotis	LOC 4	0.1
Myotis	LOC 5	0.0
Myotis	LOC 6	0.0
Myotis	LOC 7	0.0
Myotis	LOC 9	0.0
Noctule	LOC 1	0.0
Noctule	LOC 10	0.1
Noctule	LOC 11	0.4

Noctule	LOC 2	0.0
Noctule	LOC 3	0.2
Noctule	LOC 4	0.1
Noctule	LOC 5	0.3
Noctule	LOC 6	0.1
Noctule	LOC 7	0.0
Noctule	LOC 9	0.0
Soprano pipistrelle	LOC 1	2.2
Soprano pipistrelle	LOC 10	0.0
Soprano pipistrelle	LOC 11	0.0
Soprano pipistrelle	LOC 2	0.2
Soprano pipistrelle	LOC 3	0.6
Soprano pipistrelle	LOC 4	0.0
Soprano pipistrelle	LOC 5	0.0
Soprano pipistrelle	LOC 6	0.0
Soprano pipistrelle	LOC 7	0.1
Soprano pipistrelle	LOC 9	0.2

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

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

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

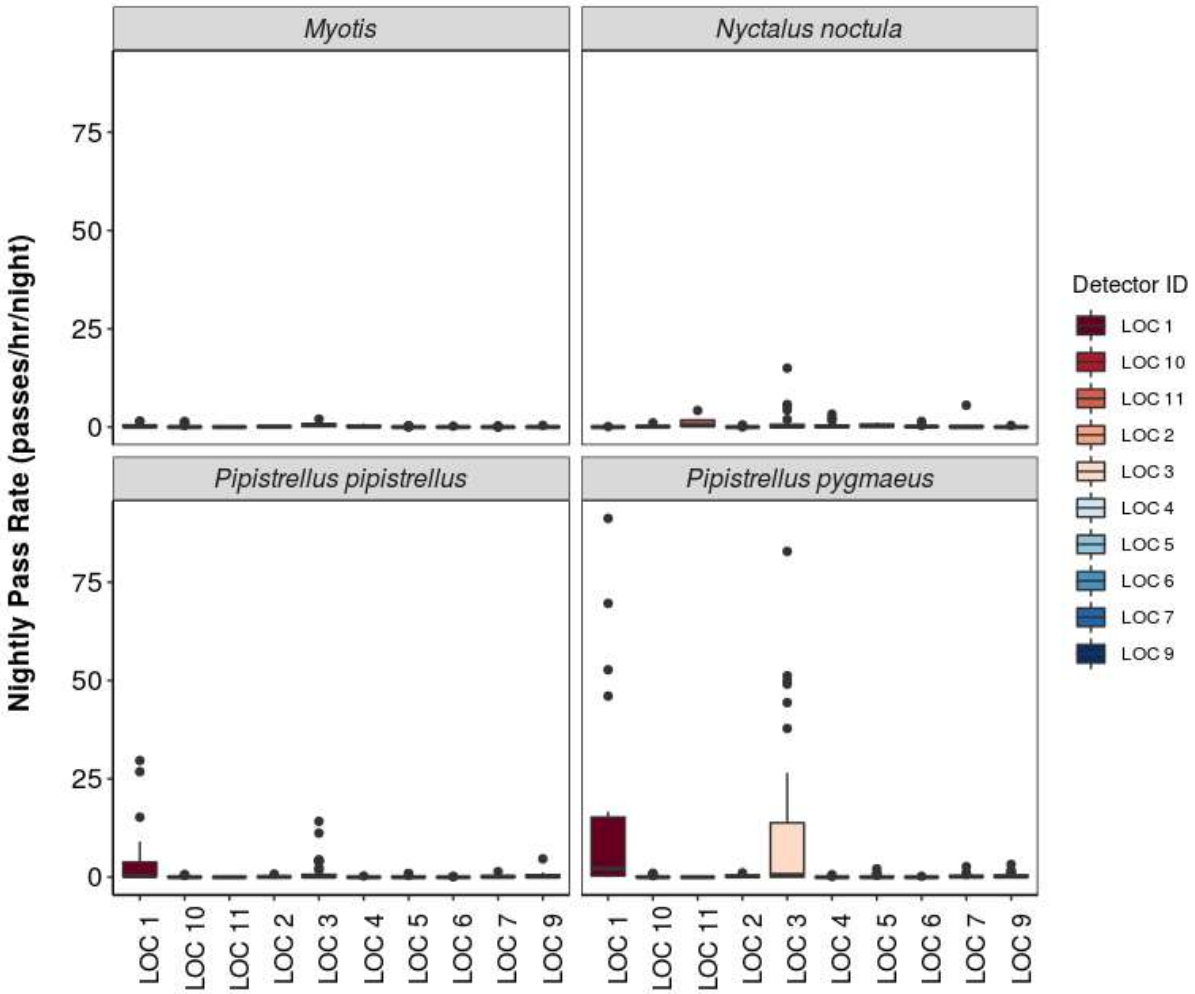
Species	Detector ID	Mean Pass Rate
Common pipistrelle	LOC 1	4.8
Common pipistrelle	LOC 10	0.1
Common pipistrelle	LOC 11	0.0
Common pipistrelle	LOC 2	0.1
Common pipistrelle	LOC 3	1.3
Common pipistrelle	LOC 4	0.0
Common pipistrelle	LOC 5	0.1
Common pipistrelle	LOC 6	0.0
Common pipistrelle	LOC 7	0.2
Common pipistrelle	LOC 9	0.5
Myotis	LOC 1	0.3
Myotis	LOC 10	0.2
Myotis	LOC 11	0.0
Myotis	LOC 2	0.2
Myotis	LOC 3	0.6
Myotis	LOC 4	0.3
Myotis	LOC 5	0.0
Myotis	LOC 6	0.1
Myotis	LOC 7	0.0
Myotis	LOC 9	0.1
Noctule	LOC 1	0.0
Noctule	LOC 10	0.2
Noctule	LOC 11	1.3
Noctule	LOC 2	0.0
Noctule	LOC 3	1.1
Noctule	LOC 4	0.5

Noctule	LOC 5	0.4
Noctule	LOC 6	0.3
Noctule	LOC 7	0.4
Noctule	LOC 9	0.1
Soprano pipistrelle	LOC 1	16.1
Soprano pipistrelle	LOC 10	0.2
Soprano pipistrelle	LOC 11	0.0
Soprano pipistrelle	LOC 2	0.3
Soprano pipistrelle	LOC 3	12.0
Soprano pipistrelle	LOC 4	0.1
Soprano pipistrelle	LOC 5	0.2
Soprano pipistrelle	LOC 6	0.0
Soprano pipistrelle	LOC 7	0.3
Soprano pipistrelle	LOC 9	0.5

Nightly Bat Passes (Bat passes per hour)

Per Detector - Figures

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


Myotis
Nyctalus noctula
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Nightly Pass Rate (passes/hr/night)
0
25
50
75
LOC 1
LOC 10
LOC 11
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID
Detector ID

Survey Effort

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

Month	Detector ID	No of Survey Nights
May	LOC 1	7
May	LOC 10	6
May	LOC 3	7
May	LOC 4	4
May	LOC 6	2
May	LOC 7	9
May	LOC 9	6
Jun	LOC 10	2
Jun	LOC 11	1
Jun	LOC 3	8
Jun	LOC 4	2
Jun	LOC 5	3
Jun	LOC 6	1
Jun	LOC 7	3
Jun	LOC 9	6
Jul	LOC 1	6
Jul	LOC 10	7
Jul	LOC 11	5
Jul	LOC 2	1
Jul	LOC 3	19
Jul	LOC 5	13
Jul	LOC 6	1
Jul	LOC 9	10
Sep	LOC 10	2
Sep	LOC 11	1
Sep	LOC 2	15
Sep	LOC 3	5
Sep	LOC 4	8
Sep	LOC 5	8
Sep	LOC 6	2
Sep	LOC 7	8

Oct	LOC 1	6
Oct	LOC 10	5
Oct	LOC 2	8
Oct	LOC 4	5
Oct	LOC 6	4
Oct	LOC 7	1
Oct	LOC 9	1

Nightly Bat Pass Rate for each Month

Median Per Detector

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

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

Species	Detector ID	Jul	Jun	May	Oct	Sep
Common pipistrelle	LOC 1	0.4	NA	3.1	0.2	NA
Common pipistrelle	LOC 10	0.0	0.2	0.2	0.0	0.0
Common pipistrelle	LOC 11	0.0	0.0	NA	NA	0.0
Common pipistrelle	LOC 2	0.0	NA	NA	0.1	0.1
Common pipistrelle	LOC 3	0.0	1.2	4.1	NA	0.1
Common pipistrelle	LOC 4	NA	0.0	0.0	0.0	0.0
Common pipistrelle	LOC 5	0.1	0.2	NA	NA	0.0
Common pipistrelle	LOC 6	0.0	0.0	0.0	0.0	0.1
Common pipistrelle	LOC 7	NA	0.2	0.1	0.3	0.0
Common pipistrelle	LOC 9	0.1	0.2	0.2	0.0	NA
Myotis	LOC 1	0.0	NA	0.7	0.0	NA
Myotis	LOC 10	0.3	0.0	0.1	0.0	0.0
Myotis	LOC 11	0.0	0.0	NA	NA	0.0
Myotis	LOC 2	0.0	NA	NA	0.1	0.1
Myotis	LOC 3	0.5	0.6	0.8	NA	0.1
Myotis	LOC 4	NA	0.0	0.0	0.1	0.6
Myotis	LOC 5	0.0	0.0	NA	NA	0.0
Myotis	LOC 6	0.0	0.0	0.0	0.0	0.2
Myotis	LOC 7	NA	0.0	0.0	0.0	0.0
Myotis	LOC 9	0.1	0.1	0.0	0.0	NA
Noctule	LOC 1	0.0	NA	0.0	0.0	NA
Noctule	LOC 10	0.1	0.1	0.0	0.1	0.4
Noctule	LOC 11	1.7	0.2	NA	NA	0.2

Noctule	LOC 2	0.6	NA	NA	0.0	0.0
Noctule	LOC 3	0.1	0.9	1.0	NA	0.0
Noctule	LOC 4	NA	2.8	0.5	0.0	0.1
Noctule	LOC 5	0.4	0.6	NA	NA	0.2
Noctule	LOC 6	0.1	1.4	0.3	0.1	0.1
Noctule	LOC 7	NA	0.3	0.1	0.0	0.0
Noctule	LOC 9	0.1	0.0	0.0	0.0	NA
Soprano pipistrelle	LOC 1	1.9	NA	46.0	0.3	NA
Soprano pipistrelle	LOC 10	0.0	0.1	0.5	0.0	0.0
Soprano pipistrelle	LOC 11	0.0	0.0	NA	NA	0.0
Soprano pipistrelle	LOC 2	0.0	NA	NA	0.2	0.3
Soprano pipistrelle	LOC 3	0.4	12.6	7.9	NA	0.2
Soprano pipistrelle	LOC 4	NA	0.0	0.0	0.0	0.0
Soprano pipistrelle	LOC 5	0.0	1.1	NA	NA	0.0
Soprano pipistrelle	LOC 6	0.0	0.0	0.0	0.0	0.1
Soprano pipistrelle	LOC 7	NA	0.3	0.1	0.2	0.1
Soprano pipistrelle	LOC 9	0.1	0.3	0.4	0.1	NA

Nightly Bat Pass Rate for each Month

Mean per Detector

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

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

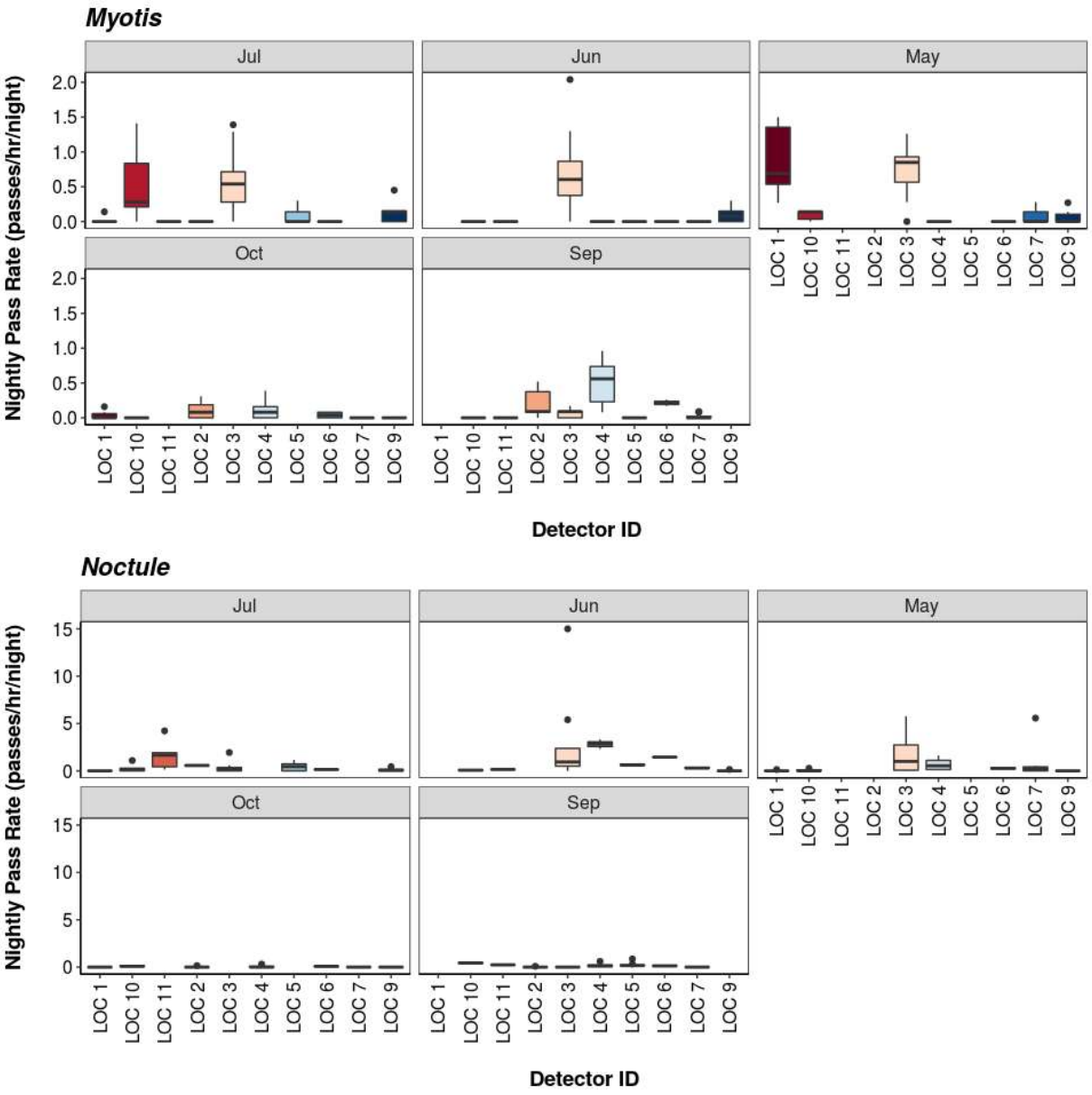
Species	Detector ID	Jul	Jun	May	Oct	Sep
Common pipistrelle	LOC 1	2.5	NA	10.8	0.1	NA
Common pipistrelle	LOC 10	0.0	0.2	0.3	0.0	0.0
Common pipistrelle	LOC 11	0.0	0.0	NA	NA	0.0
Common pipistrelle	LOC 2	0.0	NA	NA	0.2	0.1
Common pipistrelle	LOC 3	0.1	1.6	5.2	NA	0.1
Common pipistrelle	LOC 4	NA	0.0	0.0	0.1	0.1
Common pipistrelle	LOC 5	0.2	0.4	NA	NA	0.0
Common pipistrelle	LOC 6	0.0	0.0	0.0	0.0	0.1
Common pipistrelle	LOC 7	NA	0.2	0.3	0.3	0.0
Common pipistrelle	LOC 9	0.7	0.4	0.3	0.0	NA
Myotis	LOC 1	0.0	NA	0.9	0.0	NA
Myotis	LOC 10	0.5	0.0	0.1	0.0	0.0
Myotis	LOC 11	0.0	0.0	NA	NA	0.0
Myotis	LOC 2	0.0	NA	NA	0.1	0.2
Myotis	LOC 3	0.6	0.7	0.7	NA	0.1
Myotis	LOC 4	NA	0.0	0.0	0.1	0.5
Myotis	LOC 5	0.1	0.0	NA	NA	0.0
Myotis	LOC 6	0.0	0.0	0.0	0.0	0.2
Myotis	LOC 7	NA	0.0	0.1	0.0	0.0
Myotis	LOC 9	0.1	0.1	0.1	0.0	NA
Noctule	LOC 1	0.0	NA	0.0	0.0	NA
Noctule	LOC 10	0.3	0.1	0.1	0.1	0.4
Noctule	LOC 11	1.7	0.2	NA	NA	0.2
Noctule	LOC 2	0.6	NA	NA	0.0	0.0
Noctule	LOC 3	0.3	3.1	1.8	NA	0.0
Noctule	LOC 4	NA	2.8	0.7	0.1	0.2

Noctule	LOC 5	0.4	0.7	NA	NA	0.3
Noctule	LOC 6	0.1	1.4	0.3	0.1	0.1
Noctule	LOC 7	NA	0.3	0.8	0.0	0.0
Noctule	LOC 9	0.1	0.0	0.0	0.0	NA
Soprano pipistrelle	LOC 1	5.8	NA	38.3	0.8	NA
Soprano pipistrelle	LOC 10	0.0	0.1	0.5	0.0	0.0
Soprano pipistrelle	LOC 11	0.0	0.0	NA	NA	0.0
Soprano pipistrelle	LOC 2	0.0	NA	NA	0.3	0.3
Soprano pipistrelle	LOC 3	15.8	14.9	6.9	NA	0.2
Soprano pipistrelle	LOC 4	NA	0.0	0.0	0.1	0.1
Soprano pipistrelle	LOC 5	0.1	1.2	NA	NA	0.0
Soprano pipistrelle	LOC 6	0.0	0.0	0.0	0.1	0.1
Soprano pipistrelle	LOC 7	NA	0.3	0.6	0.2	0.1
Soprano pipistrelle	LOC 9	0.3	0.6	0.8	0.1	NA

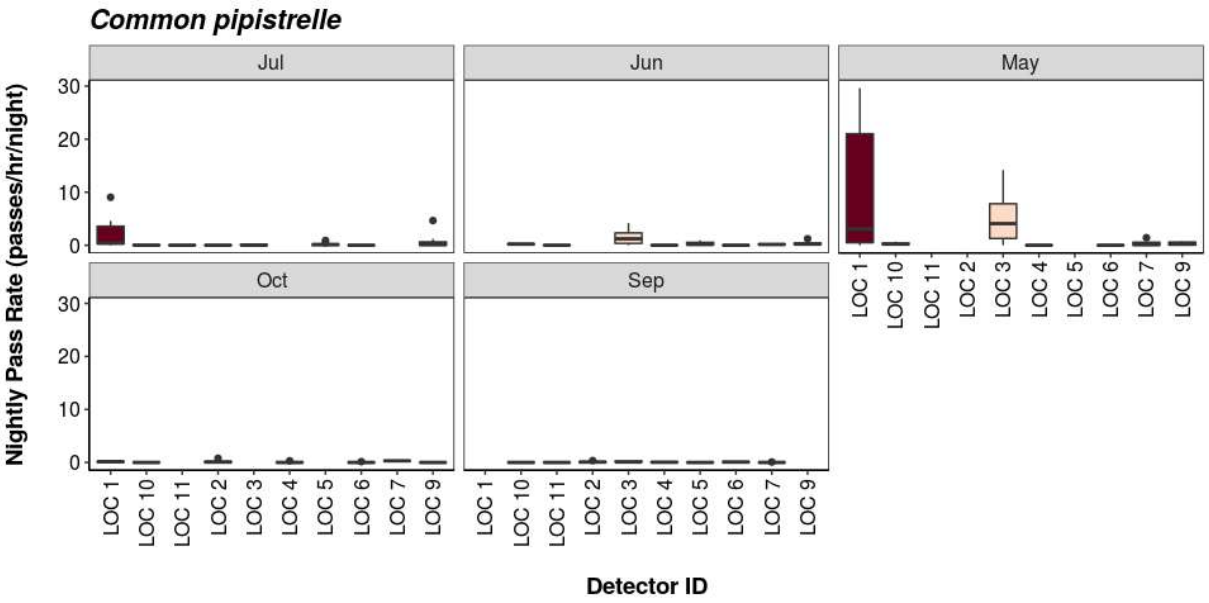
Nightly Bat Pass Rate for each Month

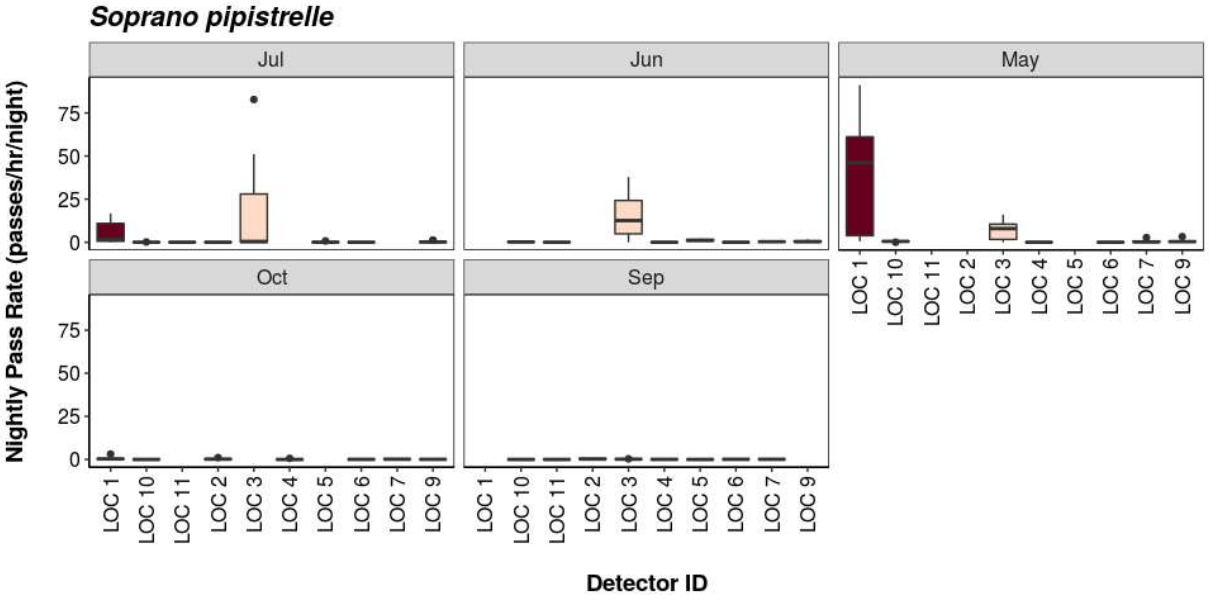
Per Detector - Figures

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


Myotis
Jul
Jun
May
Oct
Sep
Nightly Pass Rate (passes/hr/night)
0.0
0.5
1.0
1.5
2.0
LOC 1
LOC 10
LOC 11
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID

Noctule
Jul
Jun
May
Oct
Sep
Nightly Pass Rate (passes/hr/night)
0
5
10
15
LOC 1
LOC 10
LOC 11
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID


Common pipistrelle
Jul
Jun
May
Oct
Sep
Nightly Pass Rate (passes/hr/night)
0
10
20
30
LOC 1
LOC 10
LOC 11
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID


Soprano pipistrelle
Jul
Jun
May
Oct
Sep
Nightly Pass Rate (passes/hr/night)
0
25
50
75
LOC 1
LOC 10
LOC 11
LOC 2
LOC 3
LOC 4
LOC 5
LOC 6
LOC 7
LOC 9
Detector ID

Bat Activity per Detector Location

Figure 18. Detector ID reference:

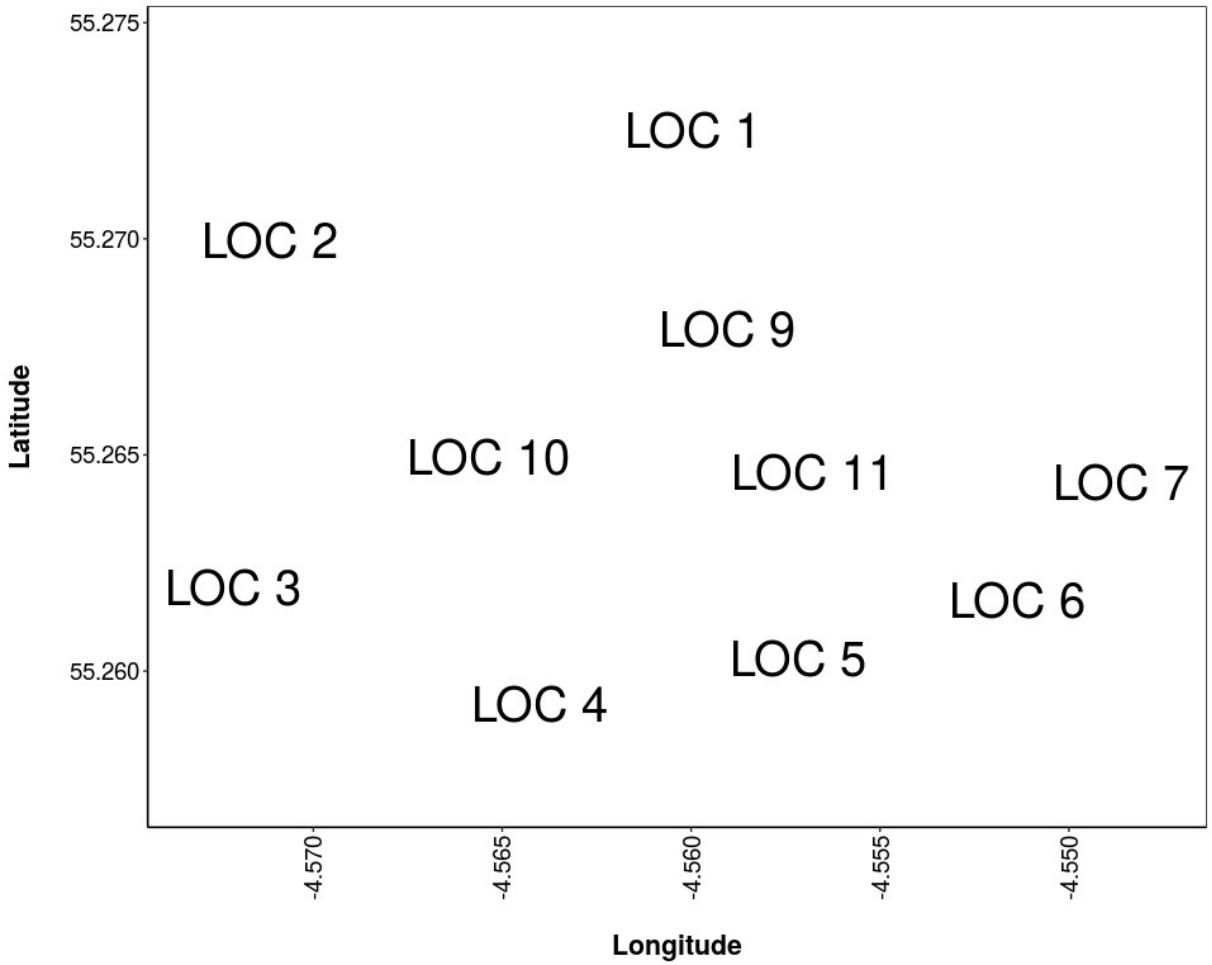


Figure 19. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.

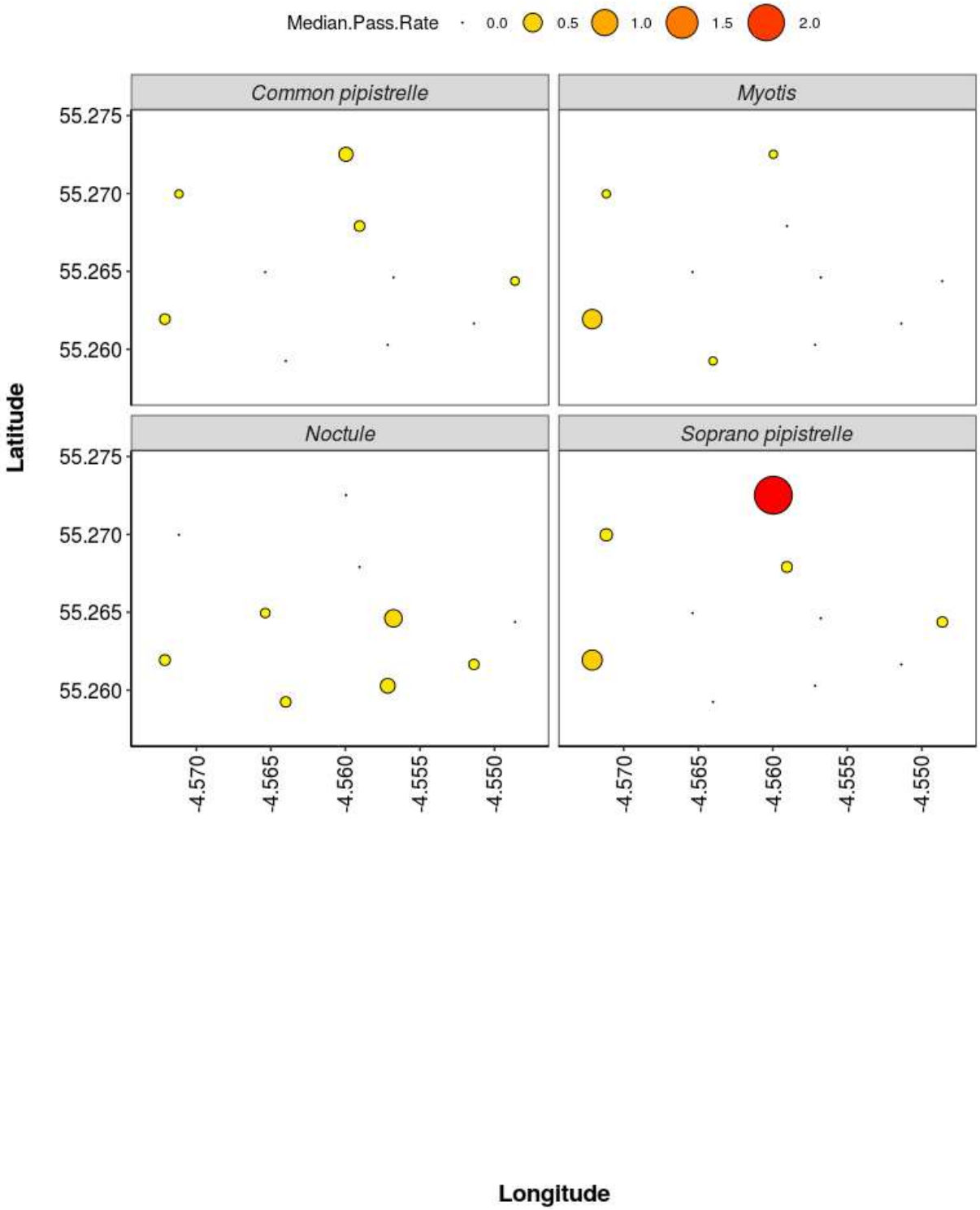
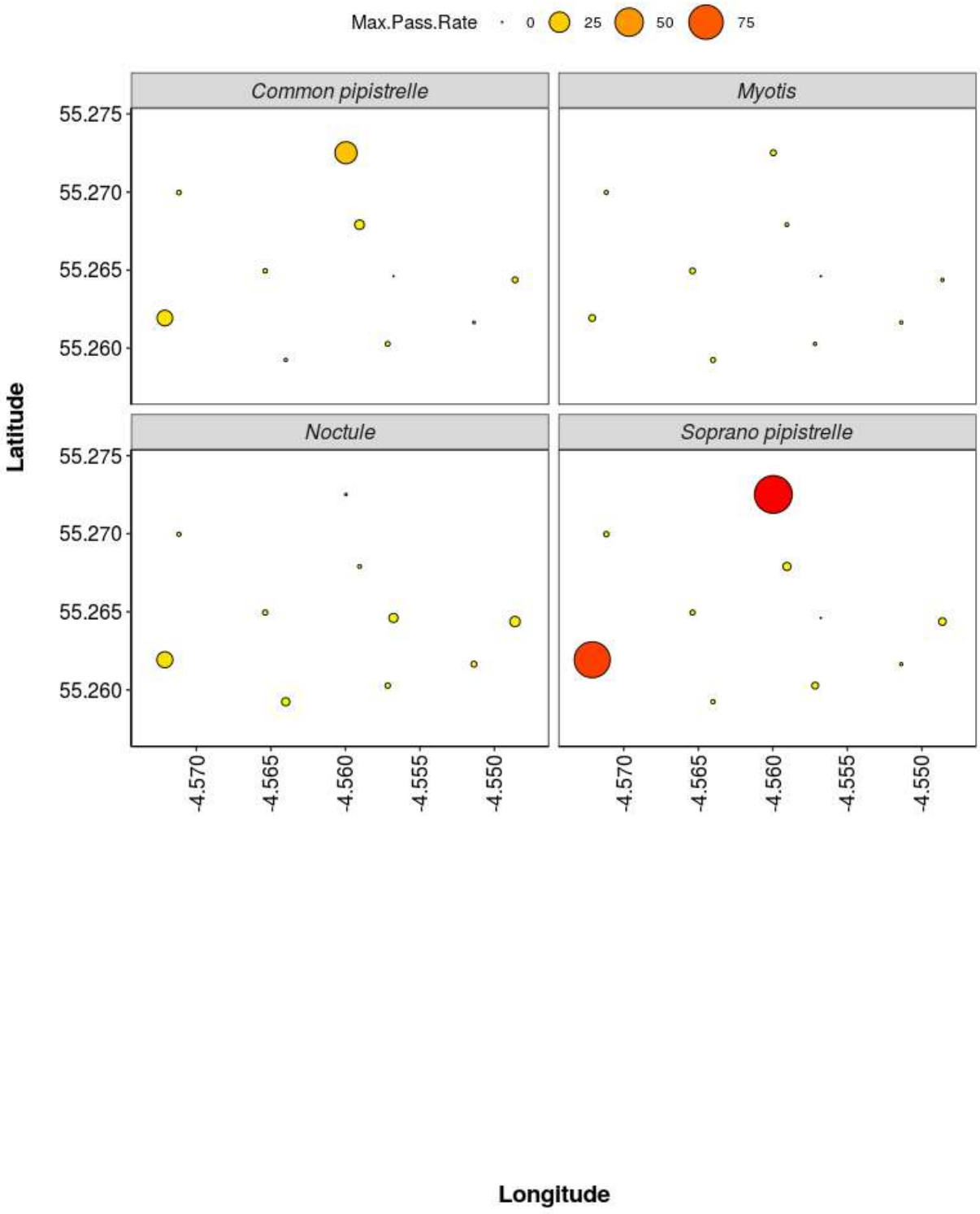


Figure 20. Maximum Nightly Pass Rate (bat passes/hr/night) recorded in a single night throughout the survey period - represented by the size and colour of the point at each detector location.



Thank you for using Ecobat! If you have any questions please email info@themammalsociety.org.uk

Annex 4 – Weather Data

Date	Temperature at sunset (C°)	Rainfall	Maximum wind speed (mph)*
19/05/2020	14	0	0
20/05/2020	12	0	2
21/05/2020	14	0	5
22/05/2020	13	0	20
23/05/2020	11	0	15
24/05/2020	12	0	0
25/05/2020	13	0	3
26/05/2020	12	0	3
27/05/2020	14	0	5
28/05/2020	17	0	0
29/05/2020	18	0	0
30/05/2020	17	0	0
31/05/2020	16	0	0
01/06/2020	17	0	5
02/06/2020	16	Light	10
03/06/2020	13	Light	8
04/06/2020	12	Light	7
24/06/2020	16	0	2
25/06/2020	24	Light	5
26/06/2020	17	Light	9
27/06/2020	13	Heavy	14
28/06/2020	12	Heavy	18
29/06/2020	12	Light	21
30/06/2020	13	Light	3
01/07/2020	13	Light	7
02/07/2020	13	Heavy	8
03/07/2020	12	Heavy	6
04/07/2020	15	Moderate	9
05/07/2020	13	Light	20
06/07/2020	13	Light	9
07/07/2020	12	0	3
08/07/2020	13	0	0
09/07/2020	13	0	14
10/07/2020	13	Light	17
11/07/2020	13	0	7
12/07/2020	16	Moderate	12
13/07/2020	13	Light	8
14/07/2020	13	Moderate	12
15/07/2020	14	Light	10
16/07/2020	17	Light	8
17/07/2020	13	Moderate	5

Date	Temperature at sunset (C°)	Rainfall	Maximum wind speed (mph)*
18/07/2020	14	0	13
19/07/2020	13	Light	13
20/07/2020	12	0	8
16/09/2020	14	0	7
17/09/2020	16	0	3
18/09/2020	16	0	0
19/09/2020	17	0	8
20/09/2020	14	0	3
21/09/2020	14	0	8
22/09/2020	14	0	14
23/09/2020	12	0	2
24/09/2020	10	0	3
25/09/2020	10	0	6
26/09/2020	12	0	2
27/09/2020	10	0	0
28/09/2020	13	0	5
29/09/2020	12	0	7
30/09/2020	11	0	13
01/10/2020	11	0	5
02/10/2020	15	0	5
03/10/2020	9	0	0
04/10/2020	14	0	2
05/10/2020	13	0	6
06/10/2020	12	0	9
07/10/2020	11	0	9
08/10/2020	10	0	7
09/10/2020	7	0	15
10/10/2020	11	0	13
11/10/2020	11	0	6
12/10/2020	11	0	15

**5 m/sec maximum ground wind speed as specified in the guidance (NatureScot, 2019) is equivalent to 11.18 mph*