FEHILY TIMONEY

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

GORTLOUGHRA WIND FARM

BAT SURVEY 2020/2021 REPORT

Prepared for: EMPower Ltd.

EMPower

Date: December 2021

NOTE: THIS REPORT CONTAINS SENSITIVE INFORMATION ON LOCATIONS OF BAT ROOSTS

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1. EXECUTIVE SUMMARY

The methodology for the 2020 and 2021 bat survey at Gortloughra Wind Farm adhered to Scottish National Heritage guidance (SNH 2019) for assessing the impact of proposed wind farm developments on bat species. The guidance has been updated since the surveys took place, however the changes to the guidance were minor and the survey methodology is in line with the 2021 NatureScot guidance. Roost surveys were undertaken in 2020 and 2021 (refer to Appendix A for the full report). Activity surveys were undertaken in June, July and September in 2020 and 2021. Three rounds of static detectors were also deployed during April/May, June and September/October 2020 for at least ten nights per round per detector. A further three rounds of static detector surveys were undertaken in April/May, July and August 2021.

During the preliminary roost assessment, no trees or buildings suitable as roosting or resting places for bats were recorded at this site. Five culverts were identified on site, with two of these supporting some crevices with limited bat roosting potential. However, no evidence of bats was observed at any culvert during roost surveys within the proposed site (refer to Appendix A).

During activity surveys in 2020, a total of three species of bats were recorded: common pipistrelle, soprano pipistrelle, and Leisler's bat. The most recorded species was common pipistrelle, followed by Leisler's and soprano pipistrelle. No bat species were recorded within the site during the 2021 activity surveys.

During static surveys, a total of nine species of bats were recorded in 2020 and 2021: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, Natterer's bat, Daubenton's bat, whiskered bat, brown long-eared bat and lesser horseshoe bat. The most commonly recorded species for 2020 and 2021 was common pipistrelle, followed by Leisler's and soprano pipistrelle, with lower levels brown long-eared bat and *myotis* spp. (Daubenton's bat, Natterer's bat and whiskered bat) detected.

The proposed turbine locations are all within open upland heath and bog areas, distant to any forestry stands or mature hedgerow and treelines. Therefore, the existing habitat will not be altered during the construction phase and the habitats present in the operational phase will be reflective of the baseline habitats. There was a change in proposed turbine locations between the 2020 and 2021 static detector surveys. These changes were only slight, turbine T08 2020, now T04 2021, moved the furthest, 138m. As the habitats at the 2021 turbine locations are the same as the 2020 locations, as is the surrounding landscape features, the 2020 results are representative of the current turbine locations.

All bats recorded during surveys are classified as 'Least Concern' on the Irish Red List No. 12 (Marnell 2019) and protected under the EU Habitats Directive Annex IV and Wildlife Acts. The EU Habitats Directive Annex II listed species lesser horseshoe bat was recorded onsite during the 2020 static surveys.

2. INTRODUCTION

This report details the results of the bat surveys carried out during 2020 and 2021. In addition to the desktop study, the following surveys were undertaken within the study area[1] of the proposed development:

- roost surveys;
- bat activity (walked transects); and
- static detector (three survey rounds 2020 and three survey rounds 2021).

All surveys adhered to SNH (2019) guidelines at the time of survey, which are still compliant with the updated NatureScot guidance for 2021.

Roost surveys were undertaken in 2020 and 2021 (refer to Appendix A for the full report). Activity surveys were undertaken in June, July and September in 2020 and again in 2021. Three rounds of static detectors were also deployed during April/May, June and September/October 2020 for at least ten nights per round per detector. A further three rounds of static detector surveys were undertaken in April/May, July and August 2021.

The survey types were determined most appropriate to establish a baseline species assemblage, along with spatial and temporal distribution of species activity within the proposed planning boundary.

2.1 Site Location

The proposed Gortloughra Wind Farm is located c. 8 km northwest of Dunmanway, Co. Cork near the Co. Cork/Co. Kerry border, refer to Figure 2-1. The study area encompasses parts of the townlands of Shehy Beg, Shehy More, Cloghboola, Gortloughra, Coomclough, Shanacrane West, and Tooreen.

Surrounding habitats and land uses are described by Corine 2018 as: Pastures (code 231), land principally occupied by agriculture with significant areas of natural vegetation (code 243), mixed forest (code 313), transitional woodland-shrub (324) and coniferous forests (code 312). The turbine locations themselves are all are all on land described by Corine 2018 as peat bogs (code 412).

Much of the lower/mid slopes are characterised by peatland habitats that include intact, active blanket bog, cutover blanket bog, wet heath, dry heath, siliceous rock and a mosaic of the above habitats in places. Grazing by sheep is widespread with grazing intensity varying within the overall land holding.

There are two European designated sites within 15km and five national designated sites (one Natural Heritage Area (NHA) and four proposed Natural Heritage Areas (pNHA)) present within 10 km of the proposed planning boundary.

[1] The study area comprises the land ownership boundary plus a survey buffer of 200m plus rotor radius as per SNH 2019 and 2021 guidance

Path: R:\Map Production\2019\P2220\Workspace\P2220_GIS_Fig2-1_Gortaloughra_SiteLocation_A3.mxd

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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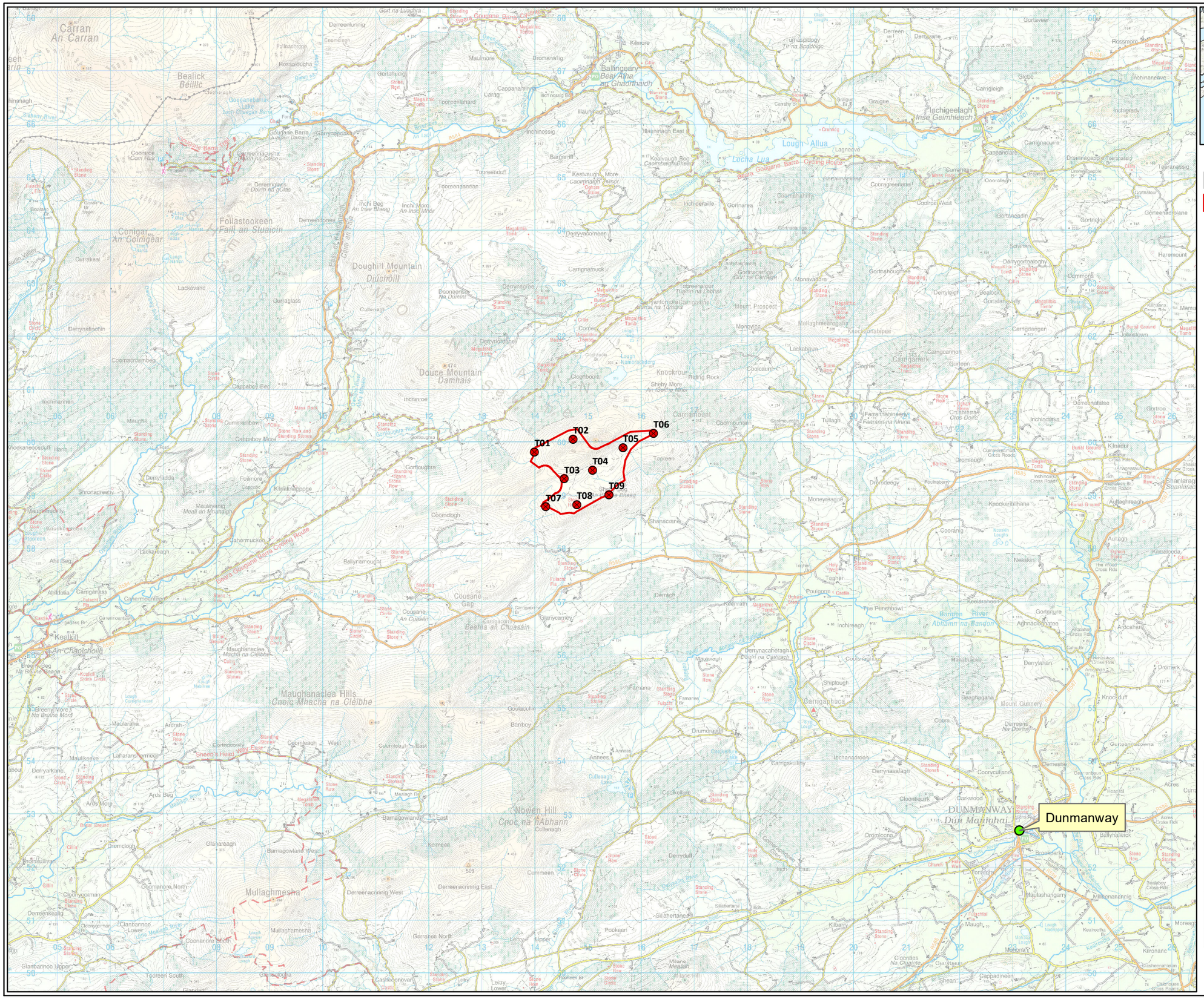

Legend

- County Boundary
- Buildable Area
- Proposed Turbine Layout

TITLE:	Site Location		
PROJECT:	Gortaloughra Wind Farm, Co. Cork		
FIGURE NO:	2.1		
CLIENT:	EMPower		
SCALE:	1:70000	**REVISION:**	0
DATE:	14/12/2021	**PAGE SIZE:**	A3

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2.2 Bat Species

Bats belong to the Order Chiroptera and to date, nine species are recorded as resident in Ireland. These nine species are divided into two families:

1. Vespertilionidae, which contains eight Irish species (Daubenton's bat, Natterer's bat, whiskered bat, Leisler's bat, brown long-eared bat, soprano pipistrelle, common pipistrelle and Nathusius's pipistrelle; and;
2. Rhinolophidae, which contain one Irish species, the lesser horseshoe bat.

See Appendix B for species details.

Brandt's bat *Myotis brandii* has only been recorded once in Ireland from a site in Co. Wicklow and is classified as a vagrant. In 2013, a single male greater horseshoe bat *Rhinolophus ferrumequinum* was recorded in Co. Wexford. In 2020 an individual was also recorded in Glendalough, Co. Wicklow. Both were considered to be vagrants.

2.3 Legislation

Irish Legislation

In the Republic of Ireland, under Schedule 5 of the Wildlife Acts 1976 to 2019, all bats and their roosts are protected by law. It is an offence to disturb either without the appropriate licence. This Act was further strengthened by the Wildlife Amendment Act 2000.

E.U. Legislation

Under the Habitats Directive 1992 (EEC 92/43), each member state of the E.U. was requested to identify habitats of national importance and priority species of flora and fauna. These habitats are now designated as Special Areas of Conservation (SAC).

In Ireland, all bat species are classified as Annex IV species under the Habitats Directive. Annex IV species are species in need of strict protection. Lesser Horseshoe bat is also classified as an Annex II species (Priority Species). Annex II species require the designation of Special Areas of Conservation specifically for their protection.

All species of bat in Ireland are strictly protected under the Habitats Directive to include deliberate disturbance of these species, particularly during the rounds of breeding, rearing and hibernation. It also specifies deterioration or destruction of breeding or resting places.

International Legislation

Ireland has ratified two international wildlife laws pertaining to bats:

a) The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention, 1982) – part of this convention stipulates that all bat species and their habitats are to be conserved.

b) The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, Enacted 1983). This was instigated to protect migrant species across all European boundaries.

2.4 Relevant Guidance Documents

This report will draw on guidelines already available in Europe and will use the following documents:

- National Roads Authority (2006) Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes
- Collins, J. (Editor) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust, London
- McAney, K. (2006) A conservation plan for Irish vesper bats, Irish Wildlife Manual No. 20 National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- The status of EU protected habitats and species in Ireland: Conservation status in Ireland of habitats and species listed in the European Council Directive on the Conservation of Habitats, Flora and Fauna 92/43/EEC. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government.
- NRA (2006b). Guidelines for the Treatment of Bats during the Construction of National Road Schemes. National Roads Authority (now named Transport Infrastructure Ireland), Ireland.
- Aughney, T., Kelleher, C. & Mullen, D. (2008). Bat Survey Guidelines: Traditional Farm Buildings Scheme. The Heritage Council, Áras na hOidhreachta, Church Lane, Kilkenny.
- BTHK (2018). Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-Care and Ecology Professionals. Pelagic Publishing, Exeter UK.
- European Commission (2021). Commission notice. Guidance document on the strict protection of animal species of Community interest under the Habitats Directive
- CIEEM (2021). Bat Mitigation Guidelines. A guide to impact assessment, mitigation and compensation for developments affecting bats. Beta version 1.0.
- NIEA, Natural Environment Division (2021). Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland.

2.4.1 Relevant Wind Farm Guidance Documents

A large array of publications has been produced to date on the potential impact of wind turbines on bats.

It is important to be aware of these publications to understand the recommended survey protocols and accepted bat mitigation measures implemented across Europe to address potential impacts of wind turbines on local bat populations.

These include:

- Bats and onshore wind turbines: Survey, Assessment and Mitigations. Scottish Natural Heritage January 2019.
- Bats and onshore wind turbines - survey, assessment and mitigation. NatureScot. August 2021
- UNEP/EUROBATS: Guideline for consideration of bats in wind farm projects, Publication Series No. 3.
- Natural England Technical Information Note TIN051: Bats and onshore wind turbines – Interim Report
- Guide to Turbines and Wind Farms. Bat Conservation Ireland 2012.
- Bat Conservation Ireland Guidelines for consideration of bats in wind farm projects - Revision 2014
- Wind Turbine/Wind Farm Development Bat Survey Guidelines (BCI, 2012);
- NIEA (2011). Bat survey – specific requirements for wind farm proposals. Northern Ireland Environment Agency, Department of the Environment, Belfast.
- European Commission (2020). Guidance document on wind energy developments and EU nature legislation. Brussels, 18.11.2020 C(2020) 7730 final.

3. METHODOLOGY

3.1 Desktop Study

A data search was conducted in December 2021 to collate existing information from the footprint of the proposed planning boundary. The data search comprised the following information sources:

- Collation of known bat records within a 4km radius[2] of the proposed sites from the National Bat Database held by the National Biodiversity Data Centre (www.biodiversityireland.ie) ;
- Review of Ordnance Survey mapping and aerial photography of the proposed wind farm boundaries and their environs (i.e., 200 m plus rotor radius of the boundary of the proposed development[3]);
- Records of designated sites within a 15 km radius of the proposed sites where bats form part or all of the reason for designation (https://www.npws.ie/protected-sites);
- Collation of Lesser Horseshoe bat records within a 15 km radius of the proposed sites from the National Parks and Wildlife Service Lesser Horseshoe bat database (https://www.npws.ie);
- Collation of data on known caves within a 4 km radius of the proposed sites from the Cave Database for the Republic of Ireland, compiled by Trinity College (http://www.ubss.org.uk/search_irishcaves.php); and
- Review of bat survey data from Ecological Impact Assessments from proposed and permitted developments within the wider environs of the site.

3.1.1 Bat Landscapes

Bat Conservation Ireland produced a landscape conservation guide for Irish bat species using their database of species records collated during the 2000-2009 survey seasons. An analysis of the habitat and landscape associations of all bat species deemed resident in Ireland was undertaken and reported in Lundy *et al.*, 2011. The degree of favourability ranges from 0 – 100, with 0 being least favourable and 100 most favourable for bats. The values of the grid squares represent the range of habitat suitability values the bat species can tolerate within each individual square.

A caveat is attached to the model and it is that the model is based on records held on the Bat Conservation Ireland database, while core areas have been identified, areas outside the core area should not be discounted as unimportant as bats are a landscape species and can travel many kilometres between roosts and foraging areas nightly and seasonally.

[2] A 4km radius search distance was selected to encompass records of bat roosts within Core Sustenance Zones (CSZ) of the study area for Irish species of bat. A CSZ refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the conservation status of the colony using the roost (Collins, 2016).

[3] As per SNH (2021) guidance.

3.1.2 Designated Sites

A search was made for designated sites within 15 km of the proposed planning boundary. These included sites designated at the European level (in the context for bats, this refers to Special Areas for Conservation or SACs) and the Irish level (Natural Heritage Areas or NHAs and proposed Natural Heritage Areas or pNHAs). The Habitats Directive (Article 6) forms a basis for the designation of SACs. Further information on the context of SACs for bats is given in section 2.3.

NHAs are areas considered important for the habitats present or which holds species of plants and animals whose habitat needs protection. Under the Wildlife Amendment Act (2000), NHAs are legally protected from damage from the date they are formally proposed for designation.

All pNHAs were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, for the purposes of this assessment all pNHAs have been considered as fully designated sites.

Both NHAs and pNHAs may be designated due to the presence of bats.

3.2 Field Study

The 2020 and 2021 bat surveys were undertaken in accordance with SNH 2019 guidance (and compliant with the later updated NatureScot 2021), Rodrigues et al (2015) , Collins (2016) and BTHK (2018).

A total of six no. bat activity surveys, three in 2020, and three in 2021, and three rounds of static detector surveys in 2020, and again in 2021, were carried out (refer to Table 3-1 for details) within the study area. Further surveys included roost surveys within the study area (refer to Appendix A):

Table 3-1: Bat Surveys 2020 and 2021

Survey Type	Survey Date	Surveyor
Preliminary Roost Assessment	23/03/2020	Karen Banks
Potential Roosting Feature Inspections	March and August 2020, July 2021	Karen Banks
Bat Activity Survey 1 - Dusk	29/06/2020	Karen Banks
Bat Activity Survey 2 – Dusk	23/07/2020	Karen Banks
Bat Activity Survey 3 – Dusk	11/09/2020	Karen Banks
Bat Activity Survey 4 – Dusk	03/06/2021	Karen Banks
Bat Activity Survey 5 – Dusk	24/07/2021	Karen Banks
Bat Activity Survey 6 – Dusk	28/09/2021	Karen Banks
Static Detector Survey 2020 – 1	22/04/2020 – 04/05/2020	Sinead Clifford
Static Detector Survey 2020 – 2	22/06/2020 – 30/06/2020	Sinead Clifford
Static Detector Survey 2020 - 3	16/09/2020 – 13/10/2020	Sinead Clifford

Survey Type	Survey Date	Surveyor
Static Detector Survey 2021 - 1	22/04/2021 – 16/05/2021	Kate Mahony
Static Detector Survey 2021 - 2	08/07/2021 – 19/07/2021	Kate Mahony
Static Detector Survey 2021 - 3	19/08/2021 – 30/08/2021	Kate Mahony

3.2.1 Surveyor Information

The preliminary roost assessment and activity surveys were undertaken by Karen Banks of Greenleaf Ecology. Karen is an ecologist with 15 years' experience in the field of ecological assessment. She holds a BSc in Environment and Development from Durham University and is a full member of the Chartered Institute of Ecology and Environmental Management. Karen specialises in ecological field surveys, is a skilled botanical surveyor and a licensed bat surveyor. Within her career Karen has completed Appropriate Assessments (AA) covering the transport, energy and land use sectors, with work including assessment of Plans at the national, regional and local level; and numerous AAs of projects. She has also completed Ecological Impact Assessments (EcIA) including those for housing developments, flood alleviation schemes, wind farms and transport infrastructure.

The 2020 static detector surveys deployment was carried out and analysed by Jason Guile. Jason has over 10 years' experience and holds a BSc in Marine Biology/Oceanography from the University of Wales, Bangor and a HND in Coastal Conservation with Marine Biology from Blackpool and Fylde College. He was the lead ecologist on a range of projects in the UK, including large scale infrastructural, such as HS2 phase 2b and Midland Mainline Electrification. Since moving to Ireland he has been lead ecologist / author (Environmental Impact Assessment Reports, Appropriate Assessment Screening reports and Natura Impact Statements) for a number of projects including urban planning applications and commercial regeneration sites. With FT, Jason is lead ecologist for a number of renewable energy projects including Smithstown Solar Farm and Croaghaun Wind Farm. Jason is an experienced bat surveyor, first gaining a class license to observe bats from Natural England in 2017 was, and currently is, licensed by NPWS for roost disturbance (Ref: DER/BAT 2020-88).

The 2021 static detector surveys deployment was carried out by Sean Ronayne, Leigh Doyle and Kate Mahony. Kate holds a PhD in Zoology and MSc in Marine Biology from University College Cork. Kate is experienced in both terrestrial and aquatic ecology. Kate has experience in habitat surveying, mapping and qualitative assessments of peatland, woodland and grassland. She has also carried out mammal surveys, including bat activity surveys.

The 2021 data was analysed by, and this report compiled by David Daly. David holds a BSc in Ecology from University College Cork and an MSc in Species Identification and Survey Skills from University of Reading. David has experience in the ecology sector in both the UK and Ireland. He was the lead ecologist on several bat related projects, ranging from building renovations works to wind farm developments. He has been granted bat disturbance and derogation licences by NPWS for previous projects.

3.2.2 Preliminary Roost Assessment

A walkover survey of the site to identify any potential roosting features in trees or buildings/ structures was undertaken in March 2020. Detailed external and internal inspections of potential roosting features within or on trees, buildings or other structures onsite were carried out in March and August 2020 and July 2021. Refer to Appendix A for methodology.

3.2.3 Bat activity surveys

Transects of bat favourable habitats within the study area were walked and driven, and activity recorded using an Echo Meter Touch Pro (Full Spectrum). Transects were undertaken in June, July and September of both 2020 and 2021 (Table 3-1).

Surveys targeted a range of foraging and commuting habitats present within the study area, those associated with linear features such as roadside margins, woodland plantation edges, hedgerows, treelines and waterbodies. Full details of transects are shown in Table 3-2 and Figure 3-1 below.

Bat surveying was conducted using a Frequency Division Detector System. Frequency Division detectors record bat ultrasonic calls on a continuous basis and stores the information onto an internal SD memory card. Frequency Division is a technique used to convert the inaudible bat echolocation calls to audible sounds. The bat detectors used a Full Spectrum Analysis to make the real-time recorded calls visible for display purposes. It is these sonograms (2-d sound pictures) that are digitally stored on a SD card and downloaded for analysis. Each time a bat is detected, an individual time and GPS stamped (date and time to the second) file is recorded.

Bat activity is governed by the activity of their insect prey and insect abundance is in turn governed by weather conditions and climate. Insects, and therefore bats, are unlikely to be present at temperatures below 7°C or during rounds of strong winds or heavy rainfall so surveying in such conditions is not possible. All field surveys were undertaken within the active bat season and during good weather conditions (dry conditions and temperature at 8°C and greater).

Nocturnal bat activity is mainly bi-modal taking advantage of increased insect numbers on the wing in the rounds after dusk and before dawn, with a lull in activity in the middle of the night. This is particularly true of 'hawking' species – i.e., bats which capture prey in the open air. However, 'gleaning' species remain active throughout the night as prey is available on foliage for longer rounds. Gleaning is the term for taking prey from foliage or the ground.

Bats were identified by their ultrasonic calls coupled with behavioural and flight observations and on computer by sound analysis of recorded echolocation and social calls with dedicated software (BatExplorer spectrogram sound analysis software Version 2.1.6.0).

Table 3-2: Transect Details

Transect Name		Start Time	End Time
1	29/06/2020	21:40	23:30
2	23/07/2020	21:35	23:30
3	11/09/2020	19:50	21:30
4	03/06/2021	21:40	23:33
5	24/07/2021	21:35	23:30
6	28/09/2021	19:15	21:12

Path: R:\Map Production\2019\P2220\Workspace\P2220_GIS_Fig3-1_GortaloughraBatSurveyTransects_A3.mxd

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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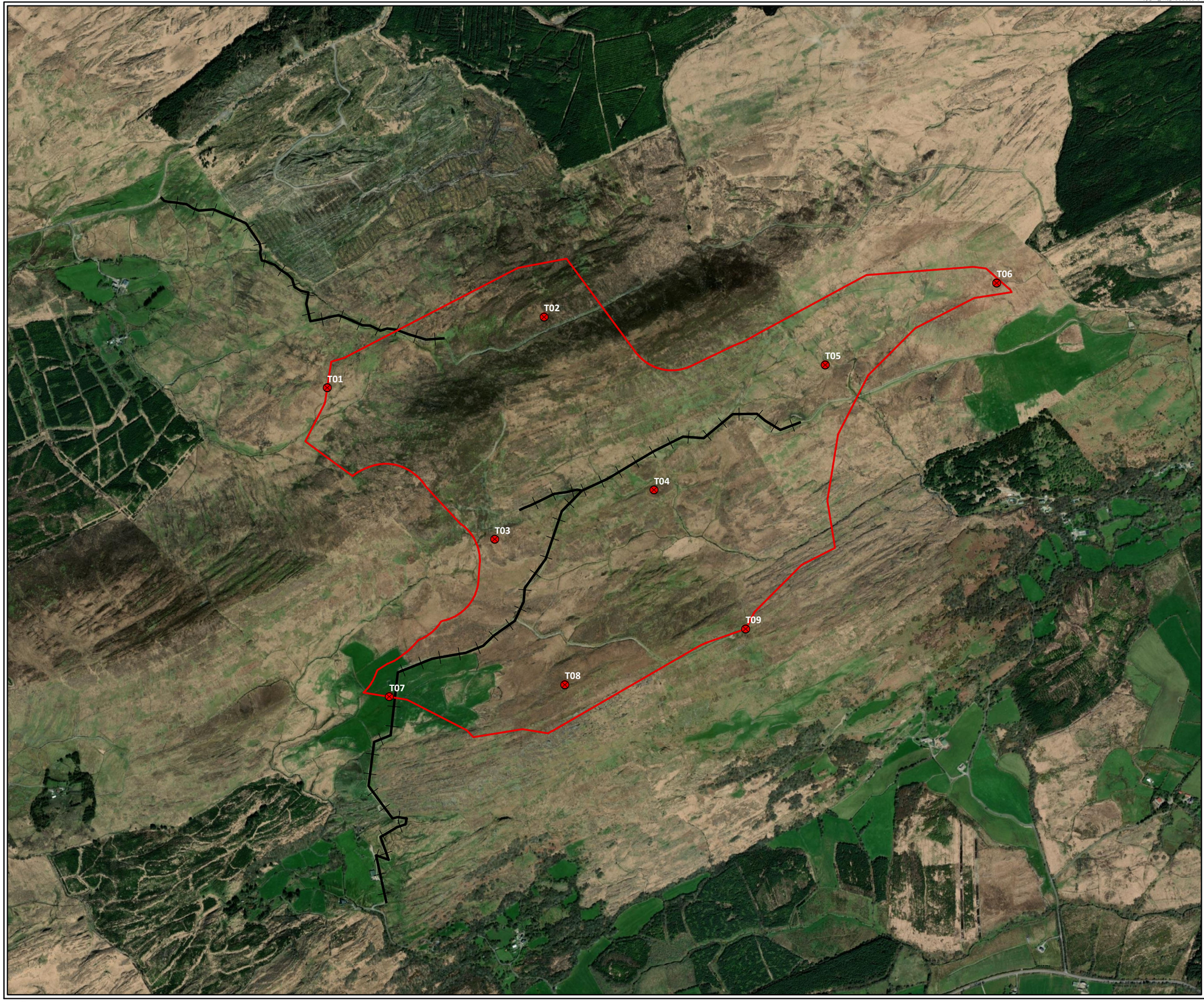

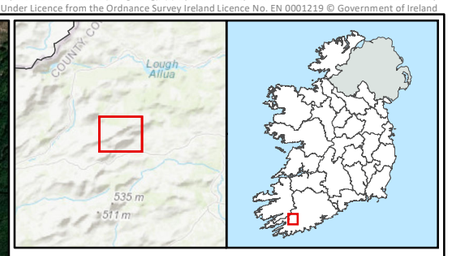

Legend

- Buildable Area
- Proposed Turbine Layout
- Transect Route

N
W E
S

0 0.25 0.5 1 Kilometers

TITLE:	Bat Activity Transect Route		
PROJECT:	Gortaloughra Wind Farm, Co. Galway		
FIGURE NO:	3.1		
CLIENT:	EMPower		
SCALE:	1:12500	**REVISION:**	0
DATE:	14/12/2021	**PAGE SIZE:**	A3

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3.2.4 Static Detector Surveys

Passive Static Bat Surveys involve leaving a static bat detector unit (with ultrasonic microphone) in a specific location and set to record for a specified round of time (i.e., a bat detector is left in the field, there is no observer present and bats which pass the monitoring unit are recorded and their calls are stored for analysis post surveying). The bat detector is effectively used as a bat activity data logger. This results in a far greater sampling effort over a shorter round of time. Bat detectors with ultrasonic microphones are used as the ultrasonic calls produced by bats cannot be heard by human hearing.

Song Meter SM4BAT Full spectrum bat recorders use Real Time recording as a technique to record bat echolocation calls and using specific software, the recorded calls are identified. It is these sonograms (2-d sound pictures) that are digitally stored on the SD card (or micro SD cards depending on the model) and downloaded for analysis. Full spectrum bat recorders were utilised for all the static surveys as recommended in the revised SNH (2021) guidelines. These results are depicted on a graph showing the number of bat passes per species per hour/night. Each bat pass does not correlate to an individual bat but is representative of bat activity levels. Some species such as the pipistrelles will continuously fly around a habitat and therefore it is likely that a series of bat passes within a similar time frame is one individual bat. On the other hand, Leisler's bats tend to travel through an area quickly and therefore an individual sequence or bat pass is more likely to be indicative of individual bats.

Per SNH 2019, and the updated NautreScot 2021 guidance, static units (Song Meter SM4BAT) were programmed to commence half an hour before sunset and finish half an hour after sunrise to ensure that bat species that emerge early in the evening and return to roosts late are recorded. Detectors were left out for a minimum of 10 consecutive nights across three survey rounds: spring (April-May), summer (June-mid-August) and autumn (mid-August-October). See Table 3-3 below for further details.

SNH (2021) guidance states that "Detectors should be placed at all known turbine locations at wind farms containing less than ten proposed turbines. Where developments have more than ten turbines, detectors should be placed within the developable area at ten potential turbine locations plus a third of additional potential turbine sites up to a maximum of 40 detectors for the largest developments".

The locations of the static detectors are presented in Figure 3-2 below.

The data was analysed with Kaleidoscope 5.3.9g software (Bats of Europe 5.2.1).

Table 3-3: Details of static detector deployment 2020/2021

Static Detector ID.	Habitat types at static location	Closest turbine number (current design)	Habitat types at turbine location	Spring		Summer		Autumn	
				Start Date	Number of nights deployed[4]	Start Date	Number of nights deployed	Start Date	Number of nights deployed
GL1	Upland heath and bog	2	Upland heath and bog	22/04/20	13	24/06/20	29	15/09/20	29
GL2	Upland heath and bog, proximate to a first order stream	1	Upland heath and bog, proximate to a first order stream						
GL3	Improved grassland	7	Improved grassland						
GL4	Upland heath and bog	8	Upland heath and bog						
GL5	Upland heath and bog	9	Upland heath and bog						
GL6	Upland heath and bog, proximate to a first order stream	5	Upland heath and bog, proximate to a first order stream						
GL7	Upland heath and bog	6	Upland heath and bog						
GL8	Upland heath and bog, proximate to a first order stream	4	Upland heath and bog, proximate to a first order stream						
GL9	Upland heath and bog	3	Upland heath and bog						
GL1	Upland heath and bog, proximate to a first order stream	1	Upland heath and bog, proximate to a first order stream	22/04/21	25	08/07/21	12	19/08/21	12

[4] Note that data will be recorded for the morning on the date of collection. Thus, if a detector was left out on 09/05/2020 and collected on 20/05/2020, the detector will have been left out for a total of 11 complete nights. However, there will be 12 unique dates where data was (potentially) recorded.

Static Detector ID.	Habitat types at static location	Closest turbine number (current design)	Habitat types at turbine location	Spring		Summer		Autumn	
				Start Date	Number of nights deployed[4]	Start Date	Number of nights deployed	Start Date	Number of nights deployed
GL2	Upland heath and bog	2	Upland heath and bog						
GL3	Upland heath and bog	3	Upland heath and bog						
GL4	Upland heath and bog, proximate to a first order stream	4	Upland heath and bog, proximate to a first order stream						
GL5	Upland heath and bog, proximate to a first order stream	5	Upland heath and bog, proximate to a first order stream						
GL6	Upland heath and bog	6	Upland heath and bog						
GL7	Improved grassland	7	Improved grassland						
GL8	Upland heath and bog	8	Upland heath and bog						
GL9	Upland heath and bog	9	Upland heath and bog						

Path: R:\Map Production\2019\P2220\Workspace\P2220_GIS_Fig3-2_Gortaloughra_StaticDetectors_A3.mxd

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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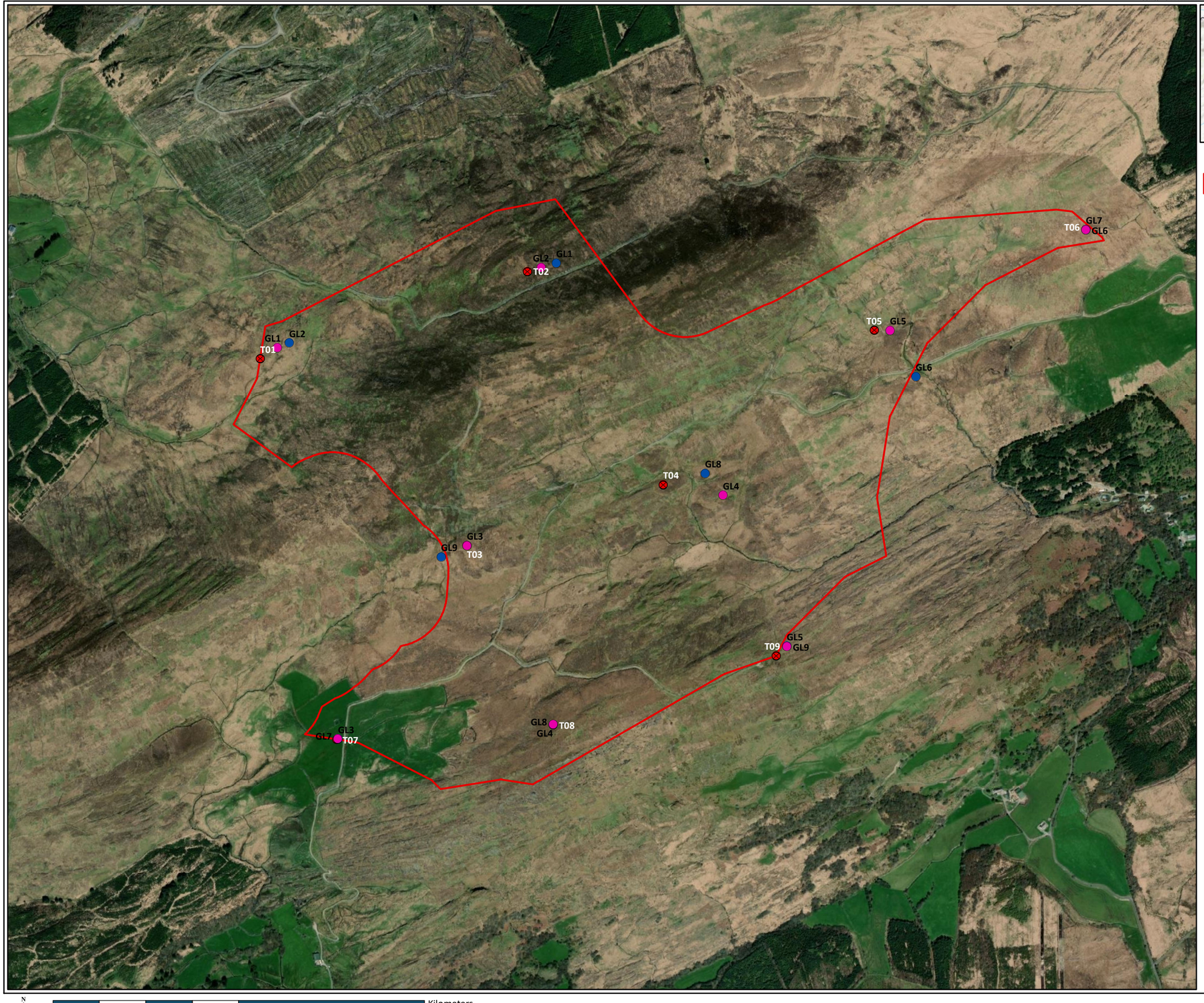

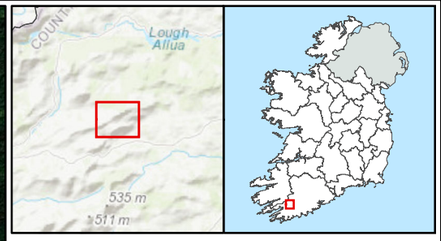

Legend

- Buildable Area
- Proposed Turbine Layout
- Static Detector Location 2020
- Static Detector Location 2021

N W E S

0 0.25 0.5 1 Kilometers

TITLE: Static Detector Locations 2020/2021			
PROJECT: Gortaloughra Wind Farm, Co. Galway			
FIGURE NO:	3.2		
CLIENT:	EMPower		
SCALE:	1:10000	**REVISION:**	0
DATE:	16/12/2021	**PAGE SIZE:**	A3

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3.3 Data Analysis

3.3.1 Ecobat

All recordings were made in full spectrum, retaining all amplitude and harmonic information from the original bat call for subsequent analysis. Bat calls were analysed using Kaleidoscope Pro (5.3.9) Software. All files were split to a maximum duration of 15 seconds and automatically identified to species level, or genus level as appropriate, using auto-ID bat classifiers (Bats of Europe 5.2.1).

In order to determine appropriate quality assurance a randomly generated 10% sample of the files were manually checked (including noise and noID files).

The data was then entered into Ecobat [5] and a report was subsequently generated. Ecobat is an online tool which makes assessments of bat activity levels by comparing data entered by the user with bat survey information from similar areas at the same time of year. Specifically, a median bat activity level is calculated which corresponds to a bat activity category.

An individual bat can pass a particular feature on several occasions while foraging. It is therefore not possible to estimate the number of individual bats. In accordance with best practice guidance (Collins, 2016) an activity index is used; calculated from bat records per hour which allows analysis of bat activity to estimate abundance and/ or activity. The calculation is as follows:

BAI (Bat Activity Index) = Total number of bat records / number of hours of recording.

3.4 Survey and Analysis Limitations

- It is not always possible to identify a bat call to species level due to the recorded call not being clear. Recorded files from automated detectors may contain only fragments of a call, or the bat may be calling from a distance (from the detector) in which case it may not be clear enough to assign the call to a specific species. In these cases, the call has been assigned to genus level for the 2020/2021 survey results;
- Some caution must be taken when comparing activity levels between species, as bias can be shown towards those species with 'louder' or 'lower frequency' echolocation calls. For example, *Nyctalus* species have louder and low frequency echolocation calls which carry further than the quieter and more broad-band brown long-eared bat echolocation calls;
- A bat contact is defined as a single detector file which contains at least one bat call. Multiple contacts at any given detector location do not necessarily indicate the presence of more than one bat and should therefore be interpreted as a level of activity rather than the number of bats recorded;
- For the purposes of this analysis, if more than 1 species was present within the recorded files the prominent species was identified as the species for the Ecobat analysis, therefore some species numbers may be under recorded;
- Guidelines in the use of Ecobat recommend a Reference Range of 200+ files of bat data to be confident in the relative activity level. The reference range is the stratified dataset of bat results recorded in the same region, at the same time of year, by which percentile outputs can be generated.

[5] http://www.ecobat.org.uk/

This comprises all records of nightly bat activity across Ireland. Although there is an increased uptake in the use of Ecobat in Ireland, some of the reference ranges remain below 200, therefore the results are more conservative.

- Ecobat analysis regarding genus level identification is currently flawed. If a genus level ID has been entered into the spreadsheets, for example "*Pipistrellus*" then all identified *pipistrellus* species (including *pipistrellus, pygmeaus* and *nathusius*) will be included in the total for the date of the Pipistrellus genus entry. Therefore, all genus level results have been omitted from the 2020 and 2021 results.

- Static detector locations 2020 GL1 and GL3 failed to record during the autumn survey round 2020, therefore there are no results available. The impact assessment of the 2020 results at this location is based on the spring and summer results only.

4. RESULTS

4.1 Desktop Survey

The review of existing BCI records of bat species in the area of the site indicates that at least six of the nine known Irish species of bat have been recorded within a 10km radius of the proposed site. These bats include *Pipistrellus* sp. soprano pipistrelle, Leisler's, brown long-eared, Daubenton's, Myotis species (unidentified to species) and lesser horseshoe bat. Of these species, *Pipistrellus* sp., soprano pipistrelle, brown long-eared bat, Daubenton's bat and lesser horseshoe bat have been recorded roosting within a 10km radius of the proposed site. Review of NBDC (10km grid squares W15 and W16) indicates that soprano pipistrelle, unidentified *Pipistrellus* sp., Leisler's bat, Daubenton's bat, whiskered bat, and lesser horseshoe bat have previously been recorded within 10 km of the proposed wind farm site boundary.

Review of the NPWS Lesser Horseshoe bat database indicates that there are no records of roosts within a 2.5 km buffer (Core Sustenance Zone (CSZ)) of the proposed wind farm site boundary (NPWS 2018).

The Cave Database for the Republic of Ireland does not hold any records of caves within a 4 km radius of the proposed wind farm site boundary.

Survey work undertaken for Carrigarierk Wind Farm, located c.5.5km to the east of the proposed Gortloughra Wind Farm at its closest point, recorded common pipistrelle, soprano pipistrelle, Leisler's, whiskered/ Brandt's, brown long-eared and lesser horseshoe bat[6]

4.1.1 Bat Landscapes

The bat landscape association model (Lundy *et al,* 2011) suggests that the proposed wind farm site is part of a landscape that is of low-moderate suitability for bats including common pipistrelle, soprano pipistrelle, brown long-eared, Leisler's, Daubenton's, Natterer's and whiskered bat. The proposed site and its environs are of low suitability for lesser horseshoe bat and Nathusius' pipistrelle. Refer to Plate 1 below for the NBDC map highlighting the bat landscape for all bats.

[6] McCarthy Keville O'Sullivan (2015) Environmental Impact Statement Carrigarierk Wind Farm.

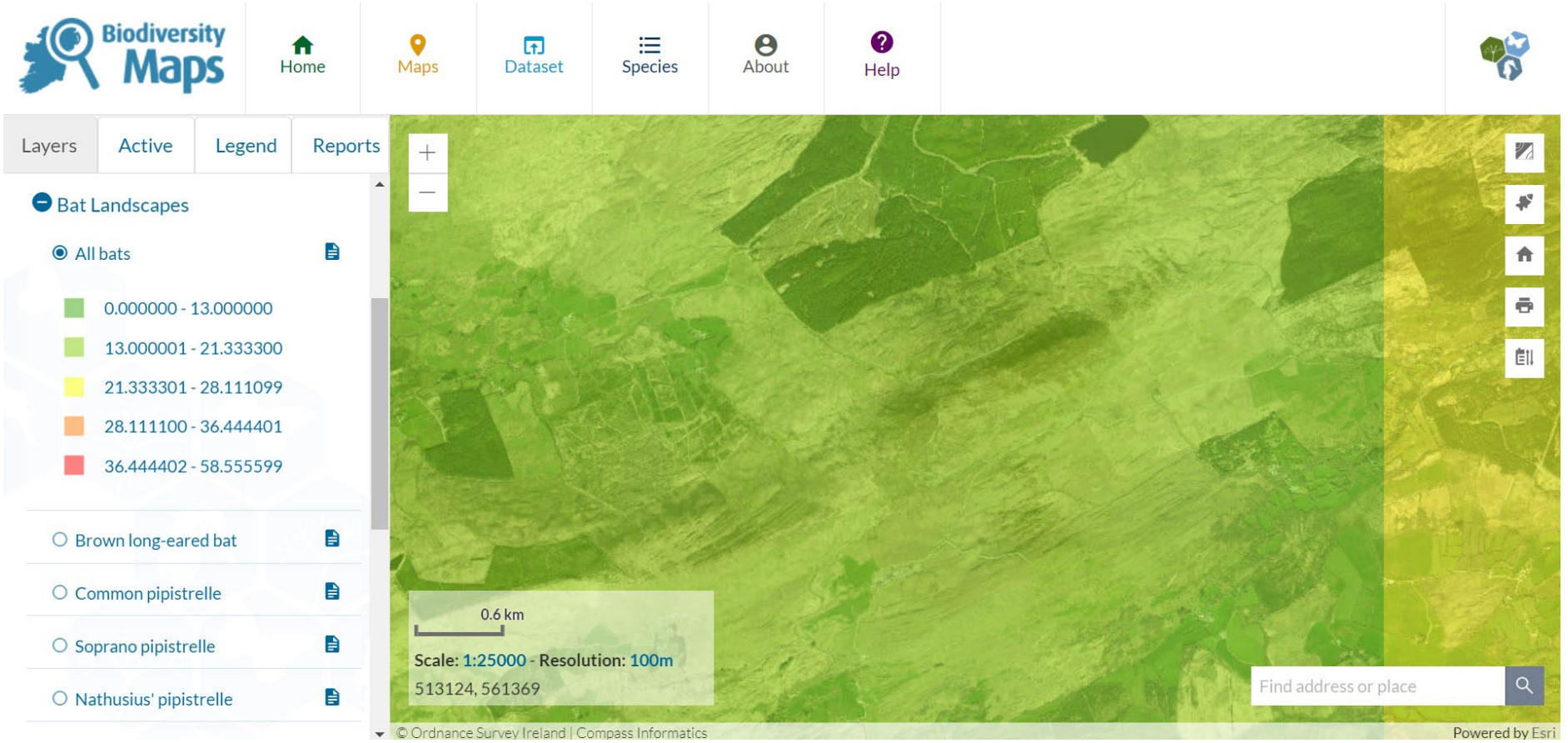

Plate 1: NBDC map highlighting the bat landscape for all bats (accessed December 2021)

4.1.2 Designated Sites

European Sites

There are two European sites within 15km of the proposed wind farm site boundary, namely: Bandon River SAC (002171), and Derryclogher (Knockboy) Bog SAC (001873).

No European site designated for bats are located within 15km of the proposed wind farm site boundary.

National Sites

There is one NHA, Conigar Bog NHA (002386), and four pNHA's present within 10 km of the proposed wind farm site boundary, Lough Allua pNHA (001065), Gouganebarra Lake pNHA (001057), Ballagh Bog pNHA (001886), and Derrclogher (Knockboy) Bog pNHA (001873).

There are no Nationally designated sites within 10km of the proposed planning boundary for which bats are a qualifying feature.

4.2 Bat Roost surveys

4.2.1 Bat Roost Inspection Survey

4.2.1.1 Trees

The cover of broadleaved trees at the proposed site at Gortloughra is low; no large mature trees were recorded during the site surveys. No trees with suitability as roosting or resting places for bats were recorded at this site.

4.2.1.2 Structures

No dwellings or other buildings are present within the proposed site at Gortloughra and its environs. Structures present within the site are limited to five culverts over the small watercourses draining the site. Three of the culverts did not support any features of potential use by roosting bats. Two of the culverts supported some crevices that would be of potential use by bats but neither culvert had any associated habitat features such as scrub or riparian woodland that would be favoured by roosting bats (Table 4-1). No evidence of bats was observed at any culvert within the proposed site.

Table 4-1: Suitability of culverts at the proposed site and its environs for bats

Culvert number and location (ITM)		Description	Grade[7]
1	514649 559070	Small concrete pipe culvert with no associated habitat features such as riparian woodland	0
2	514769 559026	Very low-lying stone culvert with little clearance for bats and no associated habitat features such as riparian woodland	0
3	514675 559243	Small concrete pipe culvert with no associated habitat features such as riparian woodland	1
4	514888 559563	Very low-lying stone culvert with little clearance for bats and no associated habitat features such as riparian woodland	1
5	515745 559851	Small concrete pipe culvert with no associated habitat features such as riparian woodland	0

4.3 Bat Activity Surveys

The results of the six bat activity surveys, three carried out in 2020 and three in 2021, are presented below in Table 4-3, Plate 2 and Figure 4-1 to Figure 4-3. Weather conditions for each of the survey dates are presented in Table 4-2

Overall, three bat species were recorded (common pipistrelle, soprano pipistrelle and Leisler's bat).

[7] *0 = no potential (no suitable crevices); 1 = crevices present may be of use to bats; 2 = crevices ideal for bats but no evidence of usage; and 3 = evidence of bats (e.g., bats present, droppings, grease marks, urine staining, claw marks or the presence of bat fly pupae) (Billington and Norman, 1997).

The most recorded species over the three no. surveys in 2020 was common pipistrelle, followed by Leisler's and soprano pipistrelle. There were no bat species recorded during any of the three no. bat activity surveys carried out in 2021.

The highest level of activity recorded for common pipistrelle was during the transects on 11th September 2020 (nine passes). The highest level of activity recorded for Leisler's bat was during the transect on 11th September 2020 with three passes, while the highest level of activity recorded for soprano pipistrelle was during the transect on 23rd July 2020 with two passes.

Table 4-2: Weather Conditions per Survey

Date	Sunset	Start	Finish	Temp (°C)	Wind (Beaufort)	Cloud (Oktas)	Precipitation
29/06/2020	21:58	21:40	23:30	10	3	3	None
23/07/2020	19:20	21:35	23:30	17	2	2	None
11/09/2020	N/A	19:50	21:00	9	3	3	None
03/06/2021	21:47	21:40	23:33	11	3	3	None
24/07/2021	21:39	21:35	23:30	20	2	2	None
28/09/2021	19:20	19:15	21:12	10	3	5	one short rain shower

Table 4-3: Analysis BatLogger Data - Survey Results

	29/06/2020	23/07/2020	11/09/2020	03/06/2021	24/07/2021	28/09/2021
Common pipistrelle (CP)	5	6	9	0	0	0
Soprano pipistrelle (SP)	0	2	0	0	0	0
Leisler's (Lei)	0	0	3	0	0	0
Total	**5**	**8**	**12**	**0**	**0**	**0**

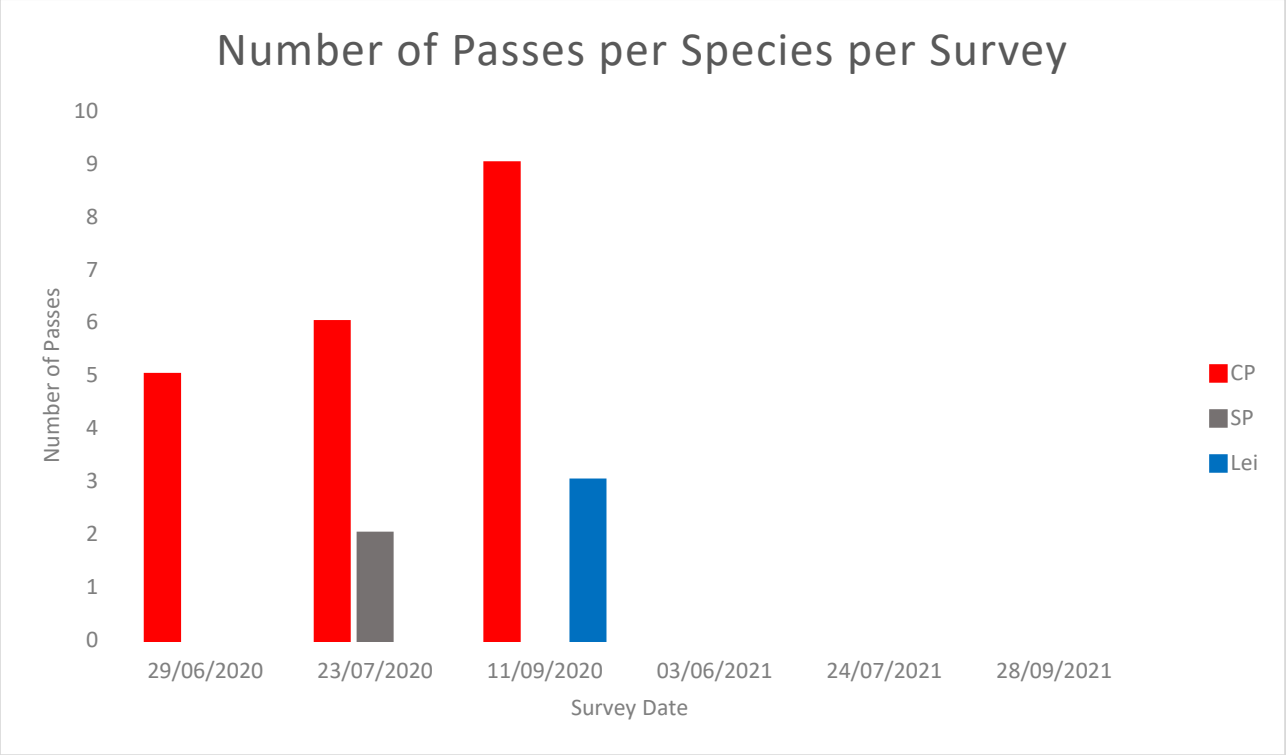

Plate 2: 2020 and 2021 Activity Survey Results

Path: R:\Map Production\2019\P2220\Workspace\P2220_GIS_Fig4-1_Gortaloughra_BatActivity_A3.mxd

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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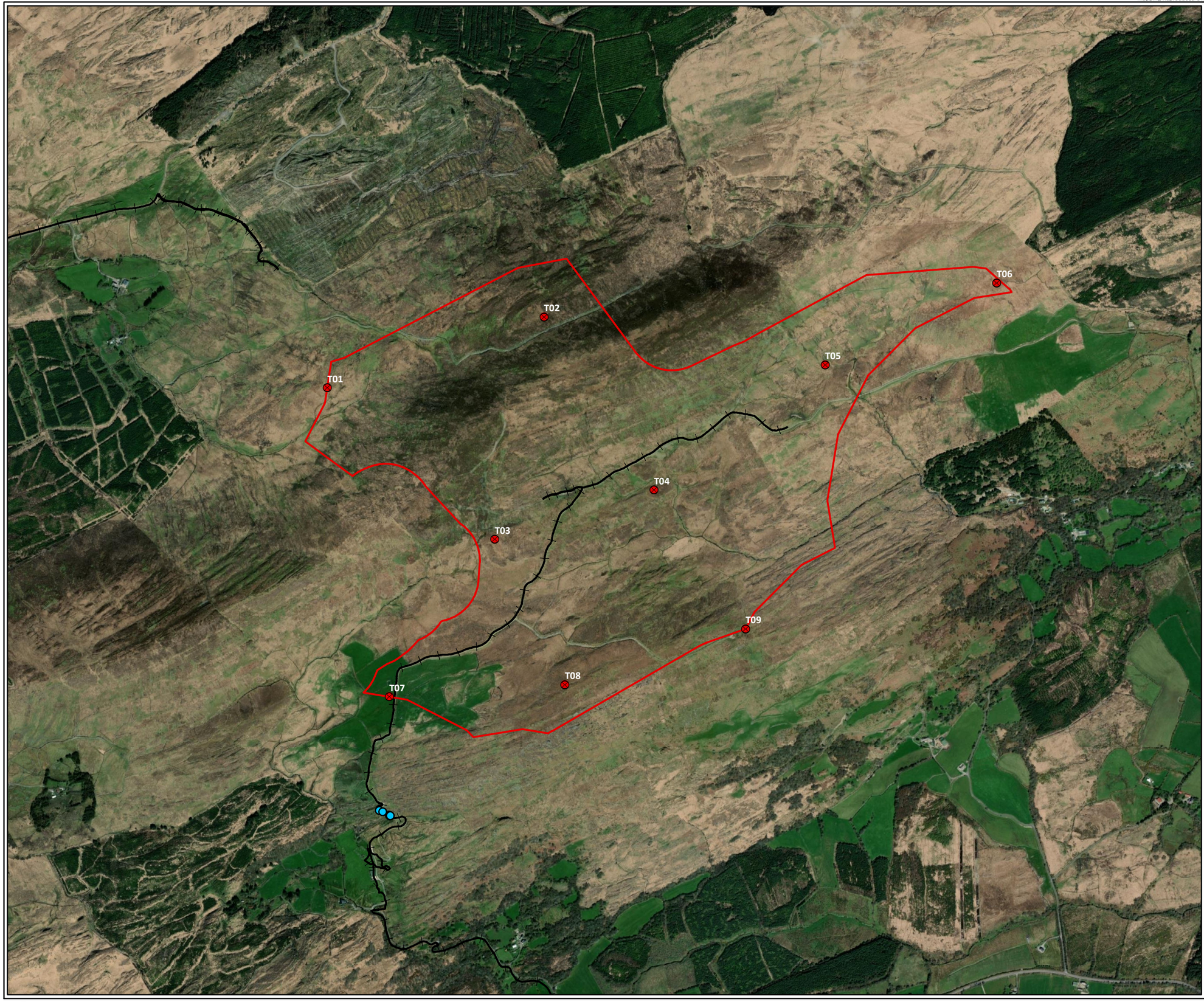

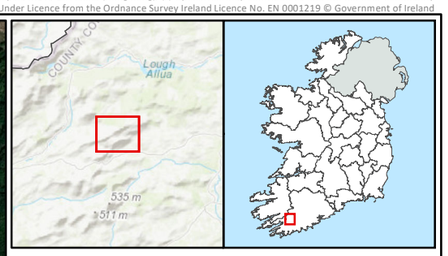

Legend

- Buildable Area
- Proposed Turbine Layout
- 29/06/2020 Transect

Bat Activity:

- Ppip

N
W E
S

0 0.25 0.5 1 Kilometers

TITLE: Bat Activity 29/06/2020			
PROJECT: Gortaloughra Wind Farm, Co. Galway			
FIGURE NO:	4.1		
CLIENT:	EMPower		
SCALE:	1:12500	**REVISION:**	0
DATE:	14/12/2021	**PAGE SIZE:**	A3

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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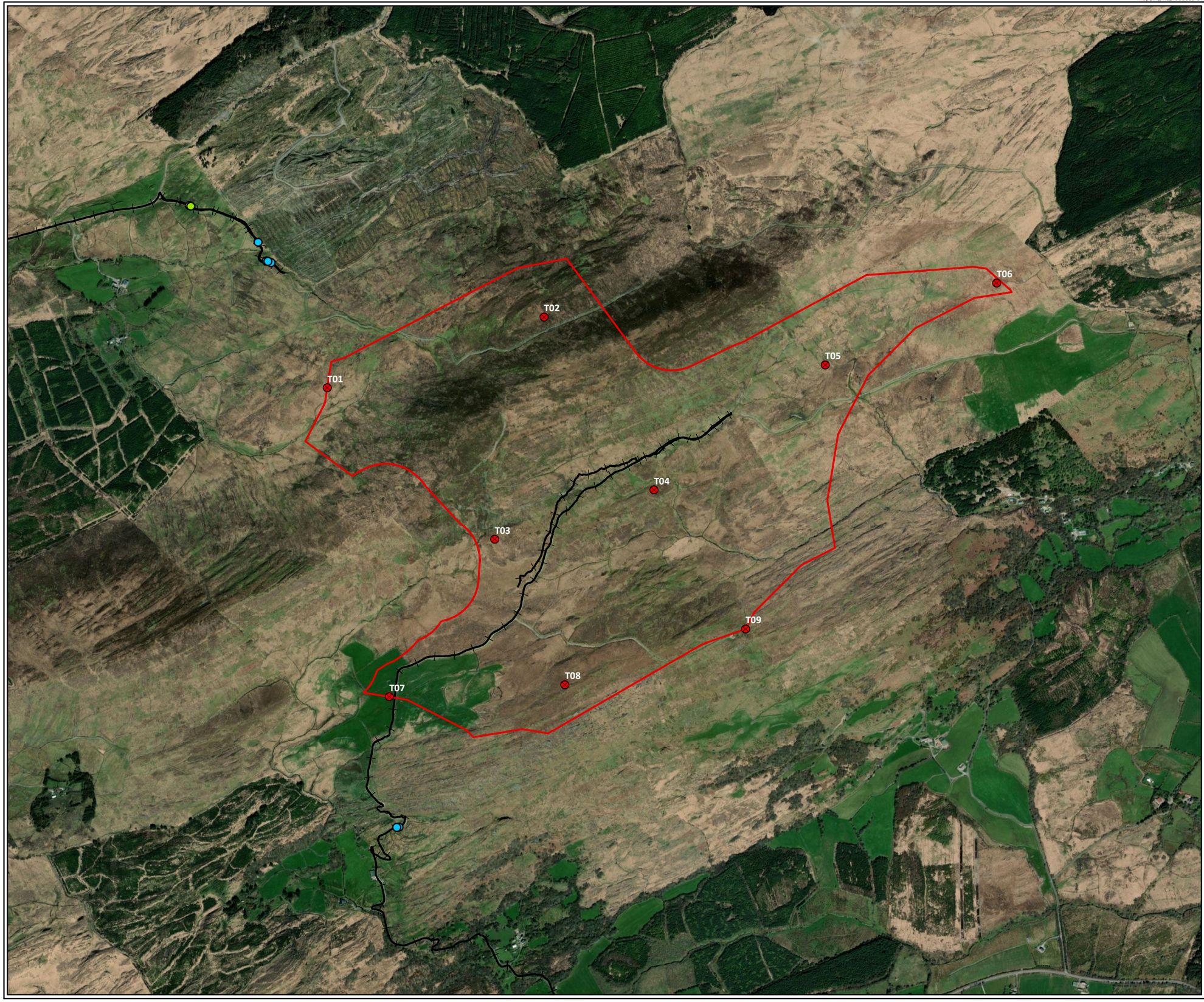

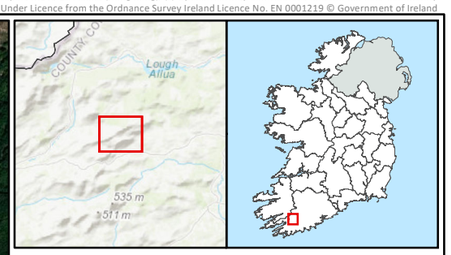

Legend

- Buildable Area
- Proposed Turbine Layout
- 23/07/2020 Transect

Bat Activity:

- Ppip
- Ppyg

N
W E
S

0 0.25 0.5 1 Kilometers

TITLE:	Bat Activity 23/07/2020		
PROJECT:	Gortaloughra Wind Farm, Co. Galway		
FIGURE NO:	4.2		
CLIENT:	EMPower		
SCALE:	1:12500	**REVISION:**	0
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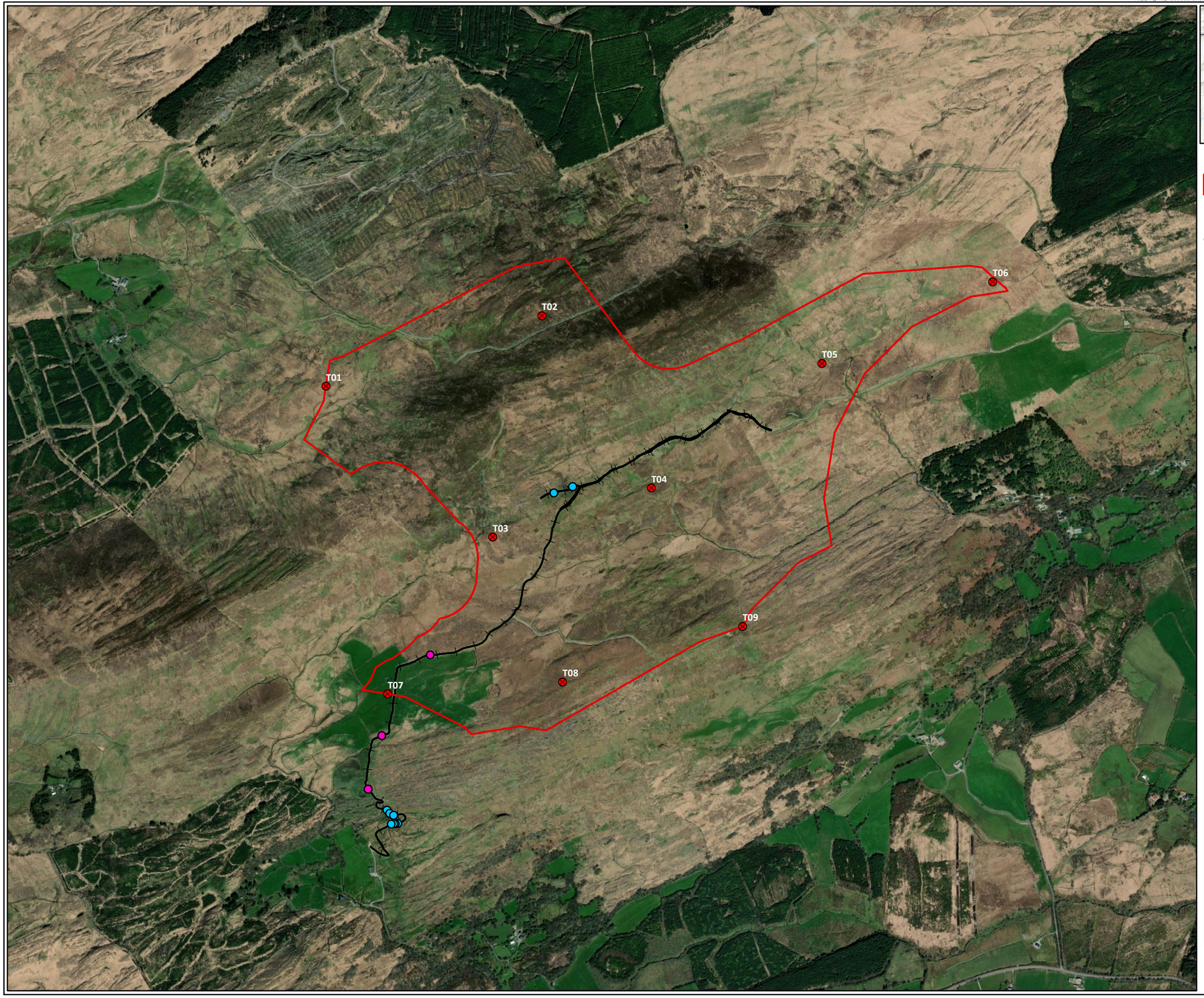

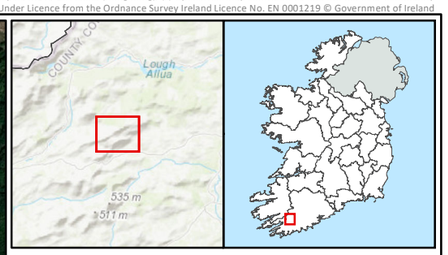

Legend

- Buildable Area
- Proposed Turbine Layout
- 11/09/2020 Transect

Bat Activity:

- NSL
- Ppip

TITLE: Bat Activity 11/09/2020			
PROJECT: Gortaloughra Wind Farm, Co. Galway			
FIGURE NO:	4.3		
CLIENT:	EMPower		
SCALE:	1:12500	**REVISION:**	0
DATE:	14/12/2021	**PAGE SIZE:**	A3

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N W E S

0 0.25 0.5 1 Kilometers

4.4 Bat Static Detector Surveys 2020

Table 4-4 below summarises the results, in relation to bat species, recorded on the static detectors deployed in 2020. Nine static units were deployed during each survey round, GL1 and GL3 failed to record during the round 3 deployment. Overall, nine bat species were recorded (common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat, Natterer's bat, Daubenton's bat, whiskered bat and lesser horseshoe bat). The graphs within Plates 3 to Plate 11 below show the number of bat passes (per species) recorded at each static detector location over the three surveillance rounds.

Table 4-4: Summary results of Static Bat Detectors deployed during 2020 survey rounds 1 to 3

Static Detector No., associated final turbine, and location habitats	Species detected during Round 1 22nd April to 4th May 2020 (Night 1.1 – 1.13)	Species detected during Round 2 24th June to 22nd July 2020 (Night 2.1 – 2.29)	Species detected during Round 3 15th September to 13th October 2020 (Night 3.1 – 3.29)
GL1 T02 Upland heath and bog	Daubenton's bat Whiskered bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Leisler's bat Common pipistrelle	N/A
GL2 T01 Upland heath and bog, proximate to a first order stream	Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Leisler's bat Common pipistrelle Soprano pipistrelle	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
GL3 T07 Improved grassland	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat Lesser horseshoe bat	Daubenton's bat Leisler's bat Pipistrelle sp. Common pipistrelle Soprano pipistrelle Brown long-eared bat	N/A
GL4 T08	Leisler's bat Nathusius' pipistrelle Brown long-eared bat Lesser horseshoe bat	Leisler's bat Common pipistrelle Soprano pipistrelle	Daubenton's bat Natterer's bat Leisler's bat Nathusius' pipistrelle

Static Detector No., associated final turbine, and location habitats	Species detected during Round 1 22nd April to 4th May 2020 (Night 1.1 – 1.13)	Species detected during Round 2 24th June to 22nd July 2020 (Night 2.1 – 2.29)	Species detected during Round 3 15th September to 13th October 2020 (Night 3.1 – 3.29)
Upland heath and bog			Common pipistrelle Soprano pipistrelle Brown long-eared bat
GL5 T09 Upland heath and bog	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat Lesser horseshoe bat	Daubenton's bat Leisler's bat Pipistrelle sp. Common pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat Lesser horseshoe bat
GL6 T05 Upland heath and bog, proximate to a first order stream	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat
GL7 T06 Upland heath and bog	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat	Nathusius' pipistrelle	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat Lesser horseshoe bat
GL8 T04 Upland heath and bog, proximate to a first order stream	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat

Static Detector No., associated final turbine, and location habitats	Species detected during Round 1 22nd April to 4th May 2020 (Night 1.1 – 1.13)	Species detected during Round 2 24th June to 22nd July 2020 (Night 2.1 – 2.29)	Species detected during Round 3 15th September to 13th October 2020 (Night 3.1 – 3.29)
GL9 T05 Upland heath and bog, proximate to a first order stream	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Common pipistrelle Brown long-eared bat	Leisler's bat Common pipistrelle Soprano pipistrelle	Daubenton's bat Whiskered bat Natterer's bat Leisler's bat Nathusius' pipistrelle Common pipistrelle Soprano pipistrelle Brown long-eared bat

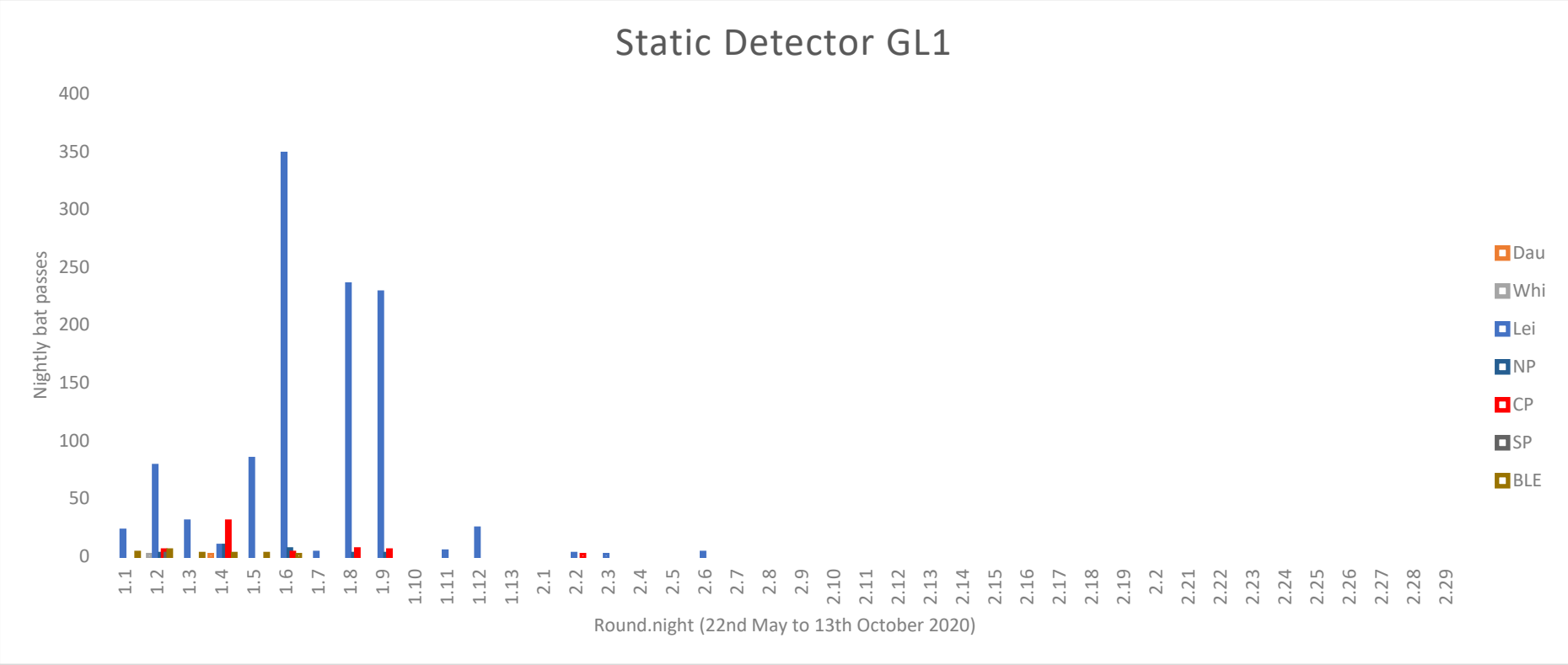


Plate 3: Total number of nightly bat passes recorded at static location GL1

The static unit GL1 recorded seven species of bat. A higher level of activity was recorded in round 1. During round 1 Leisler's had a spike in activity on day 6 (27/04/2020) with 348 passes, while the next highest species was common pipistrelle, with a peak of 30 passes on day 4 (25/04/2020). A much lower level of bat activity for all bat species recorded was noted during Round 2.

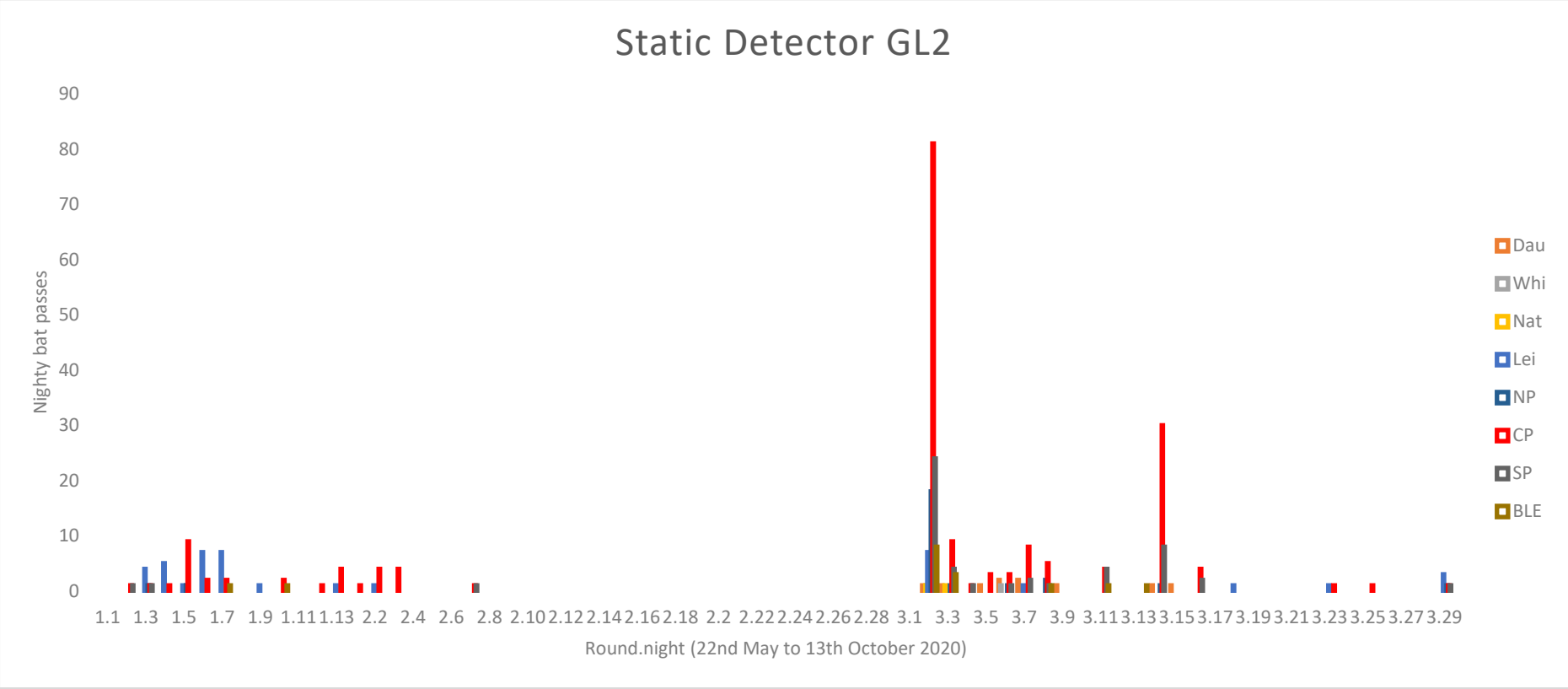


Plate 4: Total number of nightly bat passes recorded at static location GL2

The static unit GL2 recorded eight species of bat. A higher level of activity was recorded in round 1 and round 3 compared to round 2. Leisler's bat had a particularly high peak of activity during round 3 on day 3 (16/09/2020). A much lower level of bat activity for all bat species recorded was noted during round 2.

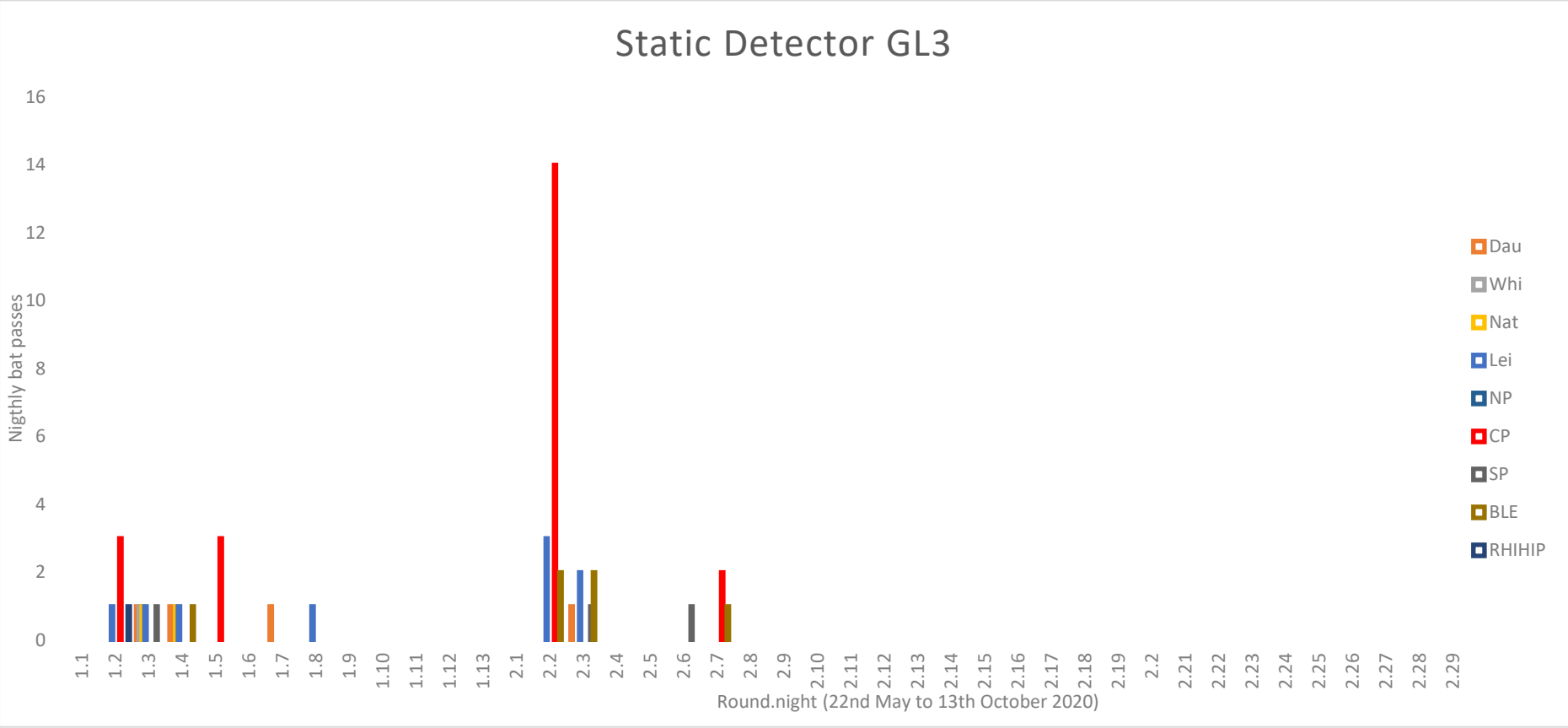


Plate 5: Total number of nightly bat passes recorded at static location GL3

The static unit GL3 recorded nine species of bat. A higher level of activity was recorded for common pipistrelle compared to the rest of the bat species for all rounds. The highest level of activity for common pipistrelle was recorded in round 2 on day 2 (25/06/2020) with 14 passes.

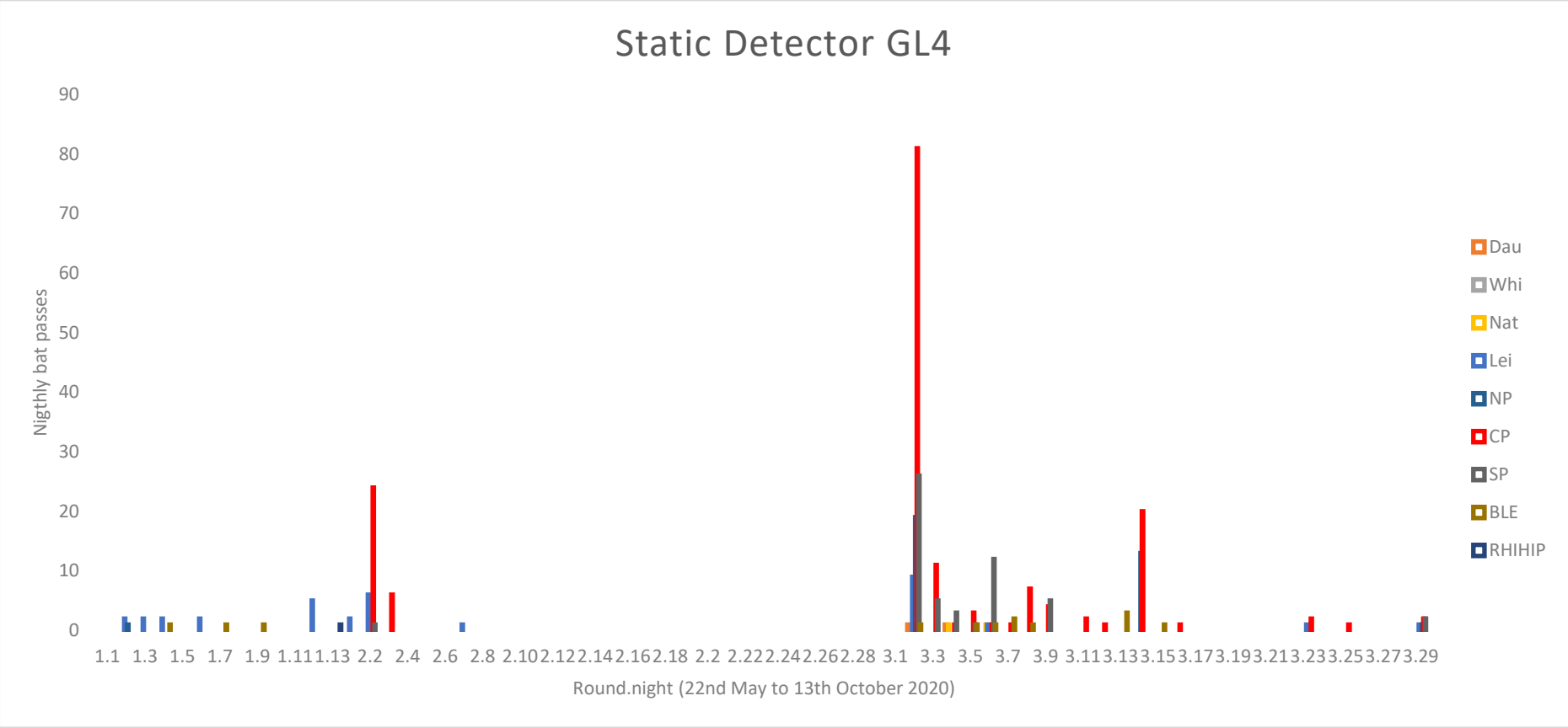


Plate 6: Total number of nightly bat passes recorded at static location GL4

The static unit GL4 recorded nine species of bat. A higher level of activity was recorded in round 3 for common pipistrelle with a peak in activity on day 2 (16/09/2020), with 81 passes. Soprano pipistrelle peaked on the same night with 26 passes.

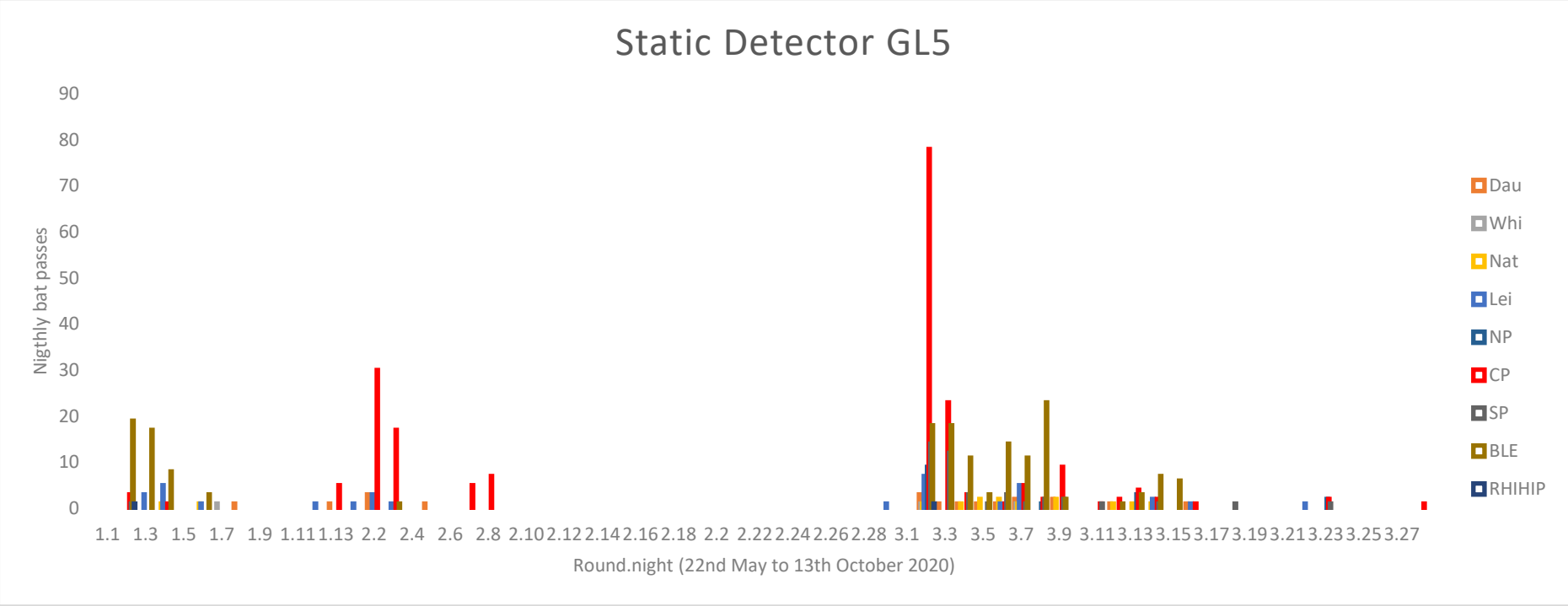


Plate 7: Total number of nightly bat passes recorded at static location GL5

The static unit GL5 recorded nine species of bat. During round 2 and round 3 a higher level of common pipistrelle with a particularly high peak of activity in round 3 on day 2 (16/09/2020) with 78 passes. There was a much lower level of bat activity for all other bat species.

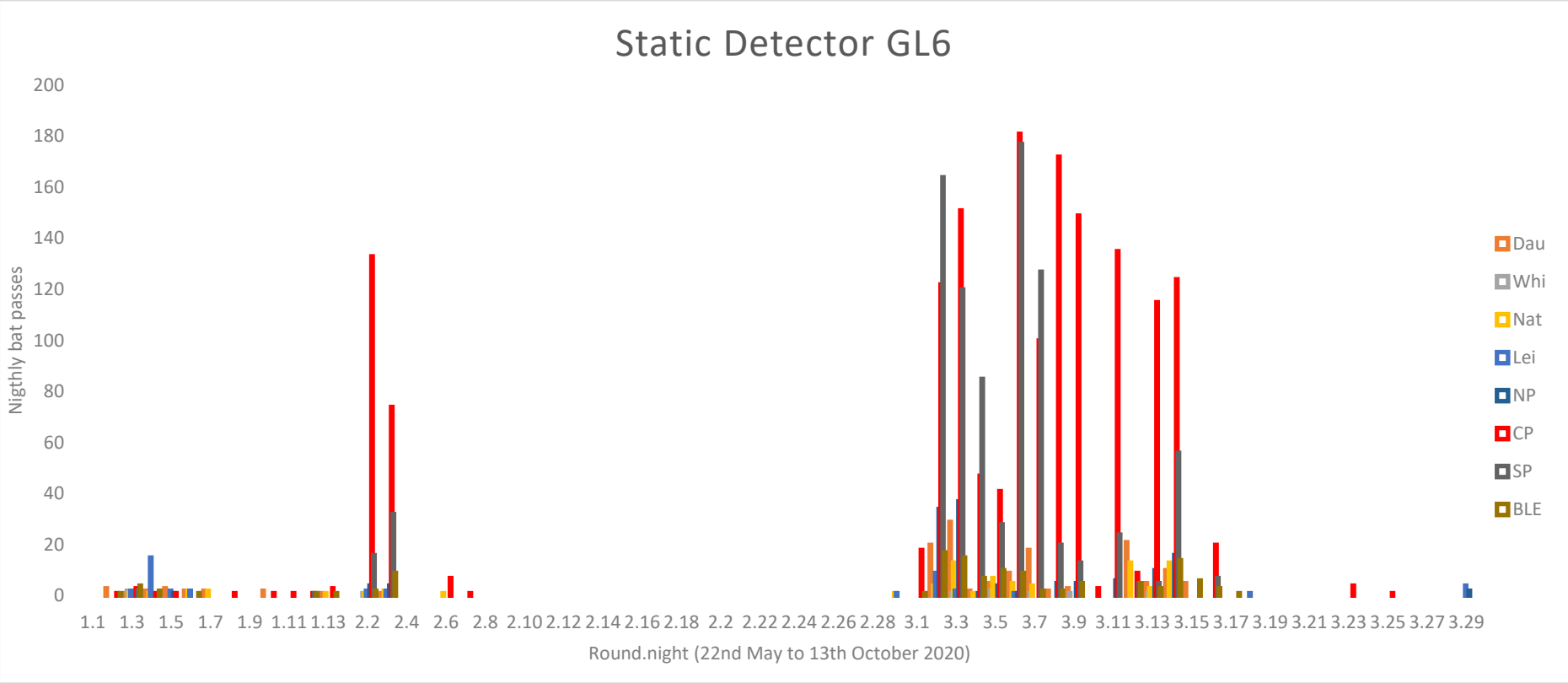


Plate 8: Total number of nightly bat passes recorded at static location GL6

The static unit GL6 recorded eight species of bat. The highest activity was recorded for common pipistrelle and soprano pipistrelle in round 1 and round 3 with a particularly high peak in round 3 on day 6 (20/09/2020) with 181common pipistrelle passes and 177 soprano pipistrelle passes.

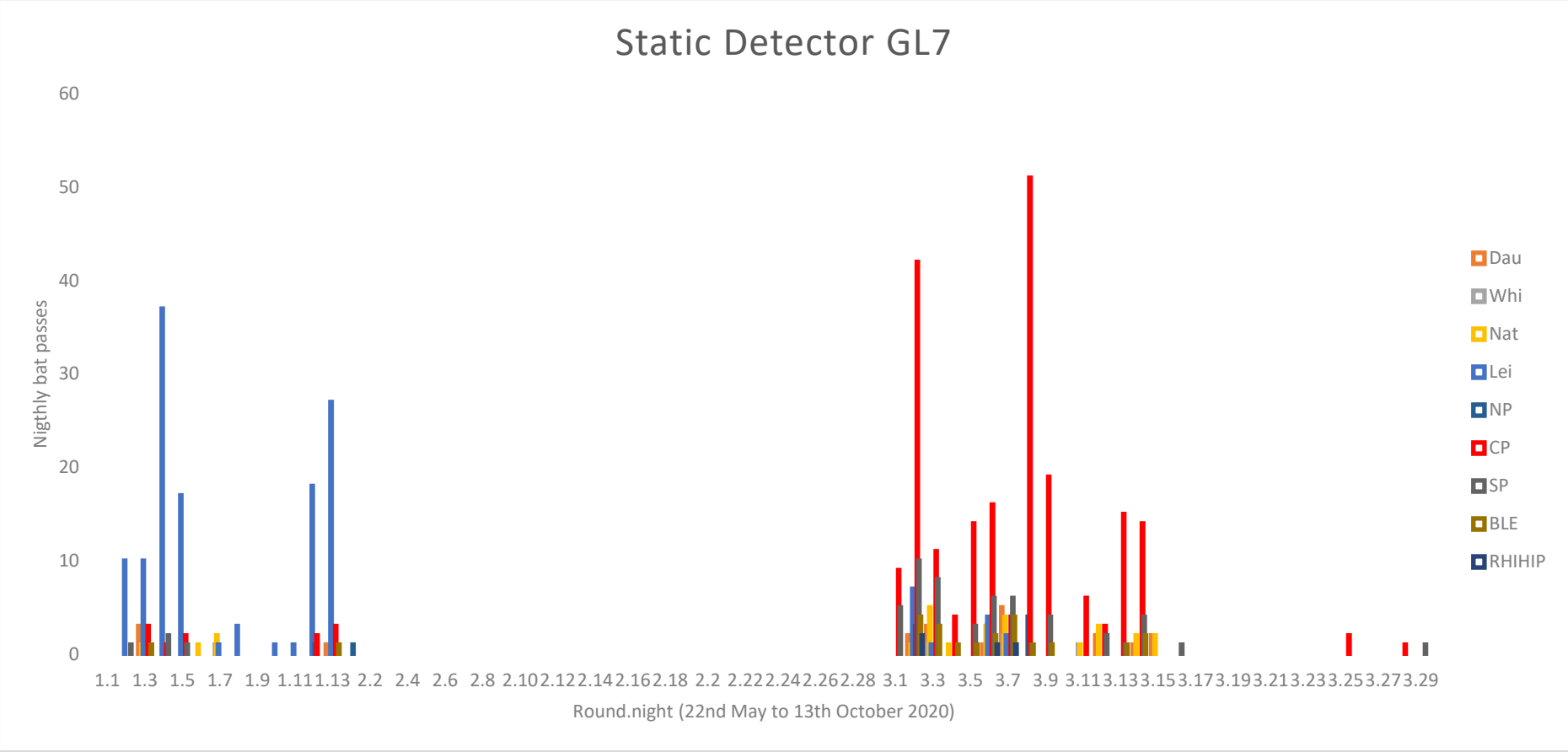


Plate 9: Total number of nightly bat passes recorded at static location GL7

The static unit GL7 recorded nine species of bat. There were much higher levels of activity of Leisler's bat during round 1 and common pipistrelle during round 3. The highest activity was recorded for Leisler's bat in round 1 on day 4 (24/04/2020) with 37 passes. The highest activity was recorded for common pipistrelle in round 3 on day 8 (22/09/2020) with 51 passes.

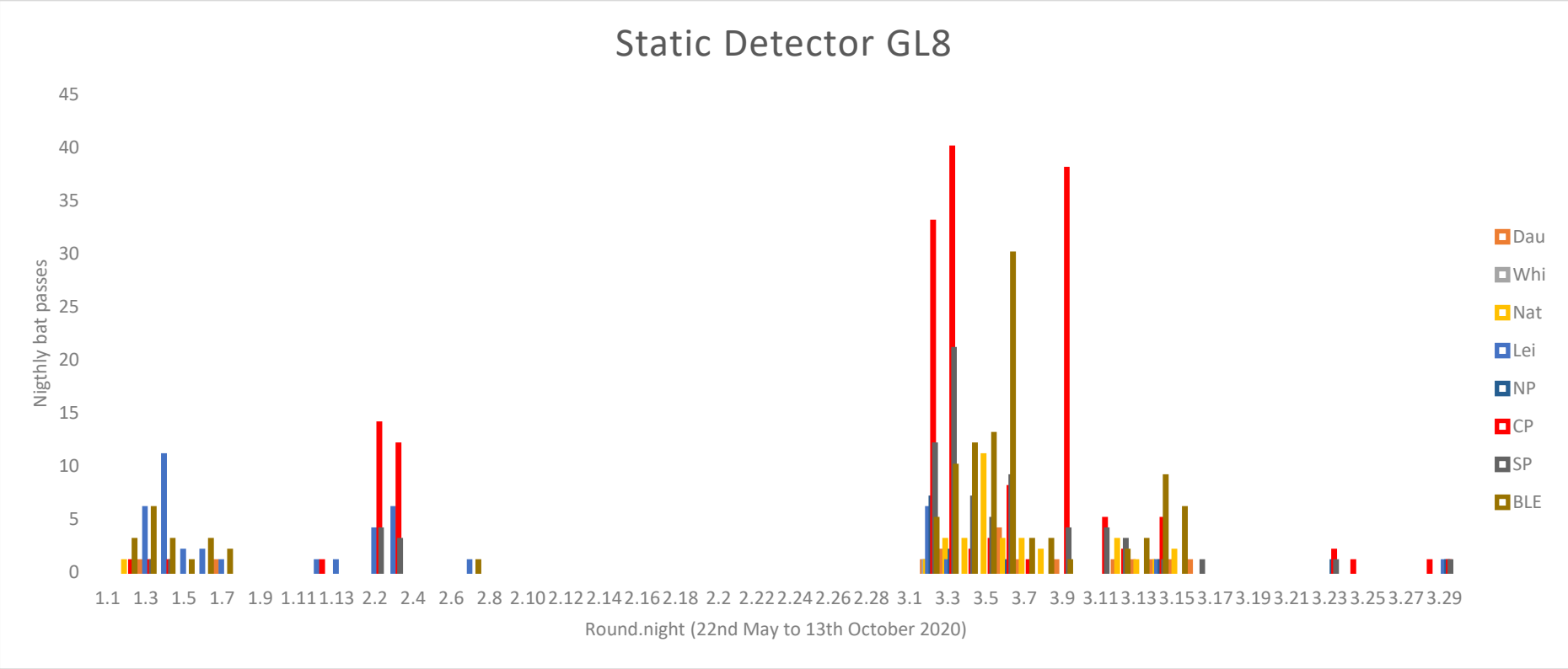


Plate 10: Total number of nightly bat passes recorded at static location GL8

The static unit GL8 recorded eight species of bat. There were much higher levels of activity of common pipistrelle during round 3. The highest activity was recorded for common pipistrelle in round 3 on day 3 (17/09/2020) with 40 passes and day 9 (23/09/2020) with 38 passes.

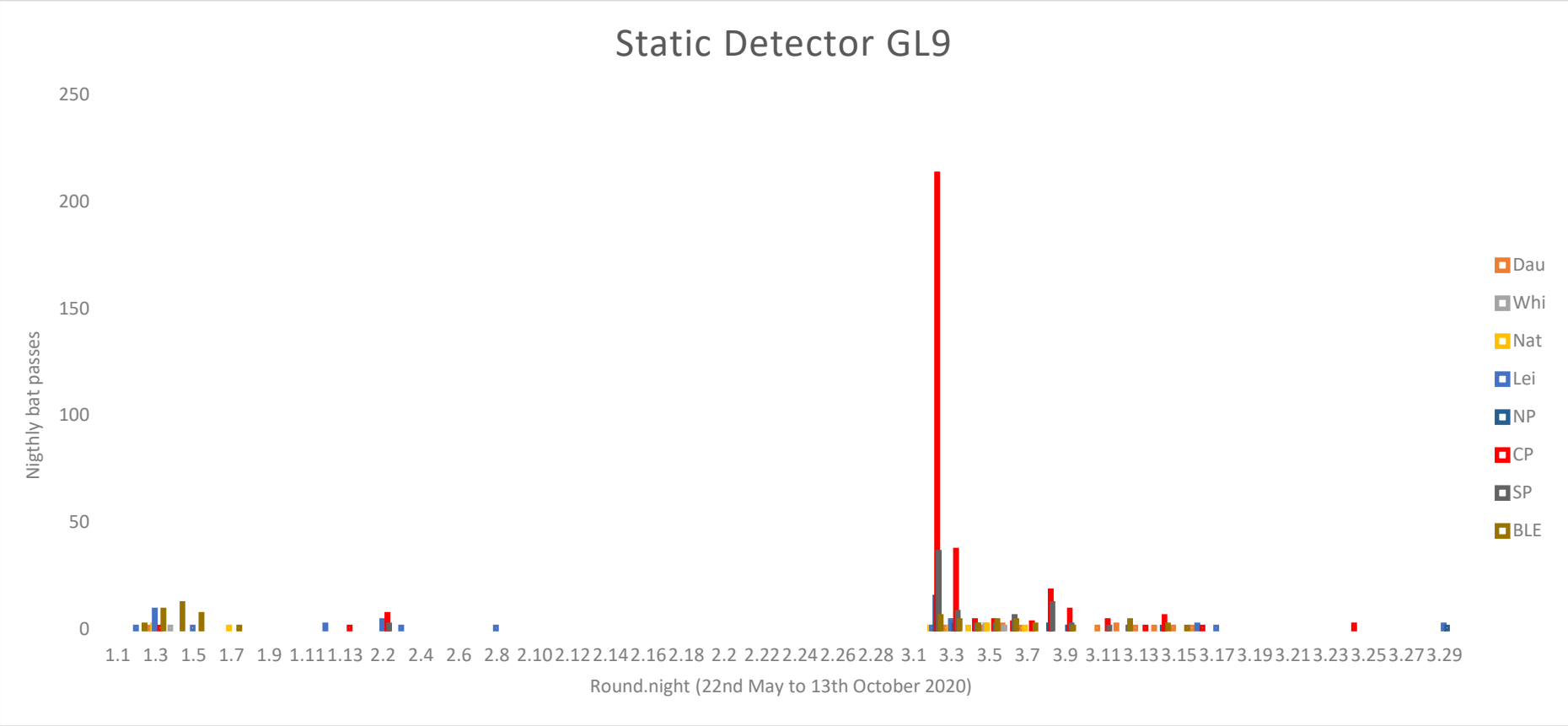


Plate 11: Total number of nightly bat passes recorded at static location GL9

The static unit GL9 recorded eight species of bat. There were much higher levels of activity of common pipistrelle during round 3. There was a distinct peak in activity for common pipistrelle in round 3 on day 2 (16/09/2020) with 213 passes. Activity levels for all other species was much lower.

Nine species of bats were recorded during the three survey rounds with a total of 5,254 recordings over the three survey rounds. The most commonly recorded species was common pipistrelle, followed by Leisler's and soprano pipistrelle. Much lower levels of activity of brown long-eared bat, Daubenton's bat, Nathusius' pipistrelle, Natterer's bat, and whiskered bat were detected. Brown long-eared bat is present on-site, but this species is very quiet and sometimes hunts without echolocating, therefore this species may be under-recorded by the static detectors.

The graphs within Plates 12 to Plate 14 show the number of passes for individual species (common pipistrelle, soprano pipistrelle and Leisler's bat) at each static detector location for the full survey round of 2020. Location GL6 has the highest number of passes of common pipistrelle and soprano pipistrelle, while GL1 has the highest number of passes of Leisler's bat.

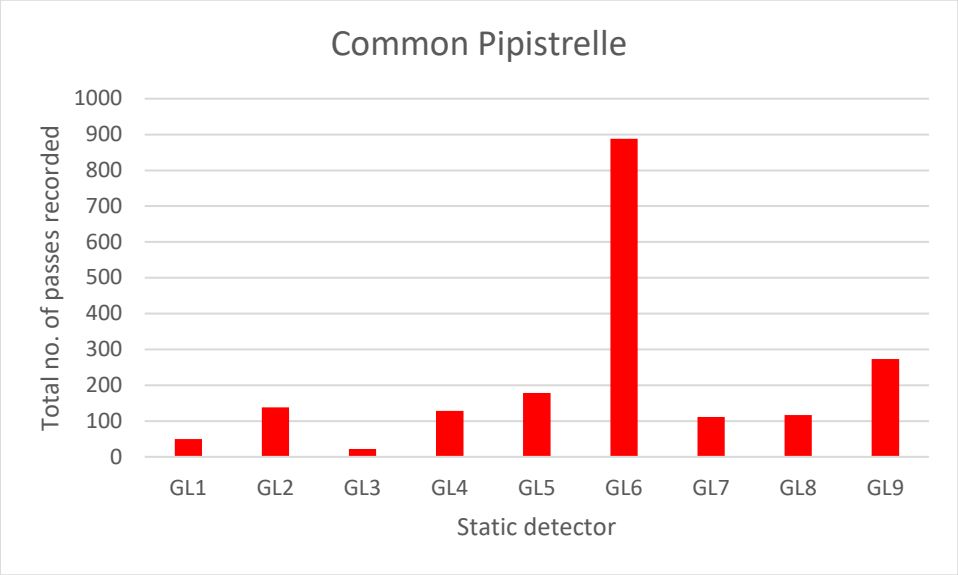


Plate 12: **Total number of bat passes recorded for common pipistrelles at each of the static detector locations during 2020.**

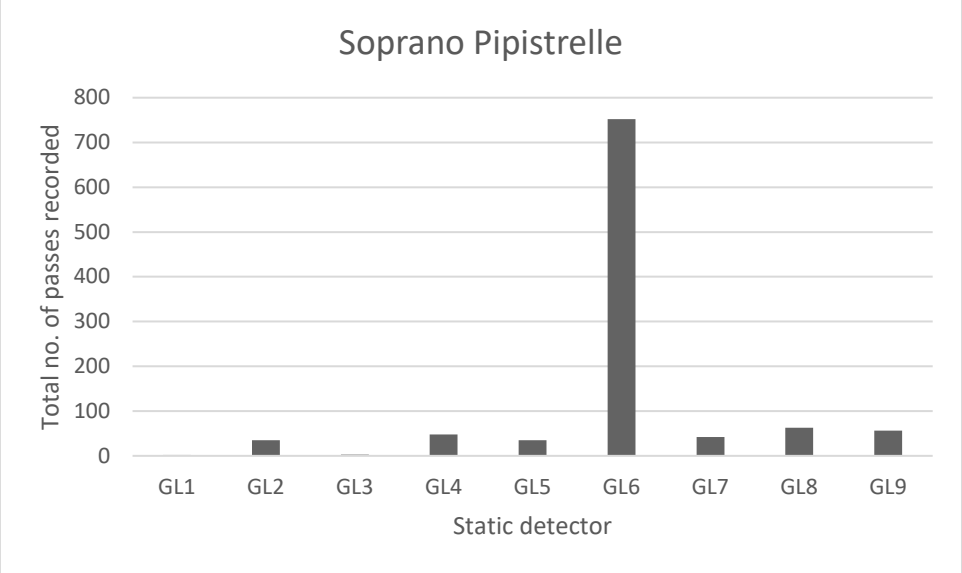


Plate 13: **Total number of bat passes recorded for soprano pipistrelles at each of the static detector locations during 2020.**

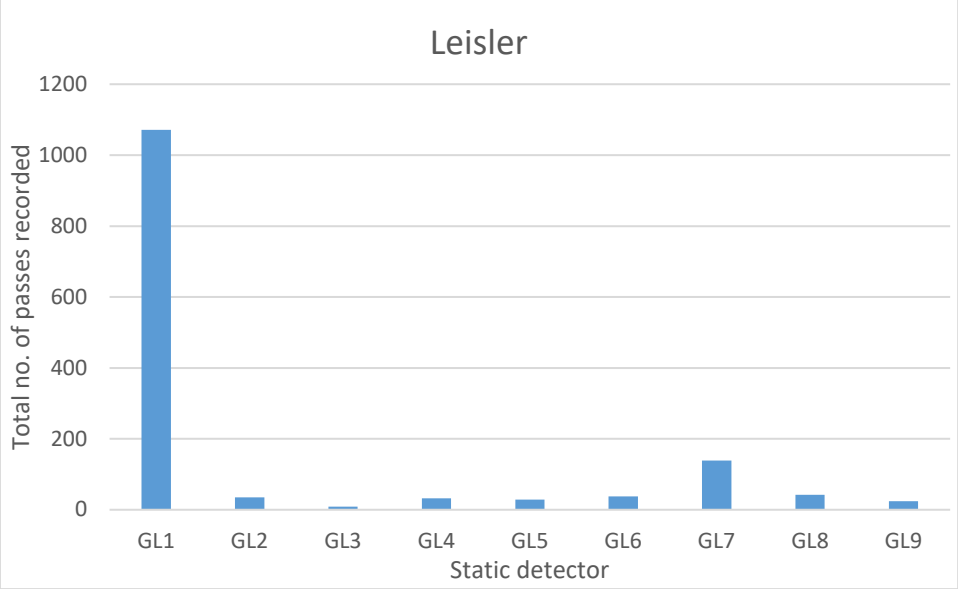


Plate 14: **Total number of bat passes recorded for Leisler's bat at each of the static detector locations during 2020**

Static location GL5 had the highest number of passes for brown long-eared bat recorded during the surveillance surveys (n= 123 passes). Static locations GL6 had the highest number of passes for Daubenton's bat, Nathusius' pipistrelle, Natterer's bat and whiskered bat recorded during the surveillance surveys (n= 100 passes, n =86, n= 46 passes and n-=7 passes respectively). While static location GL7 had the highest number of passes for the lesser horseshoe bat (n= 4 passes). Refer to Plate 15 for all remaining bat species results.

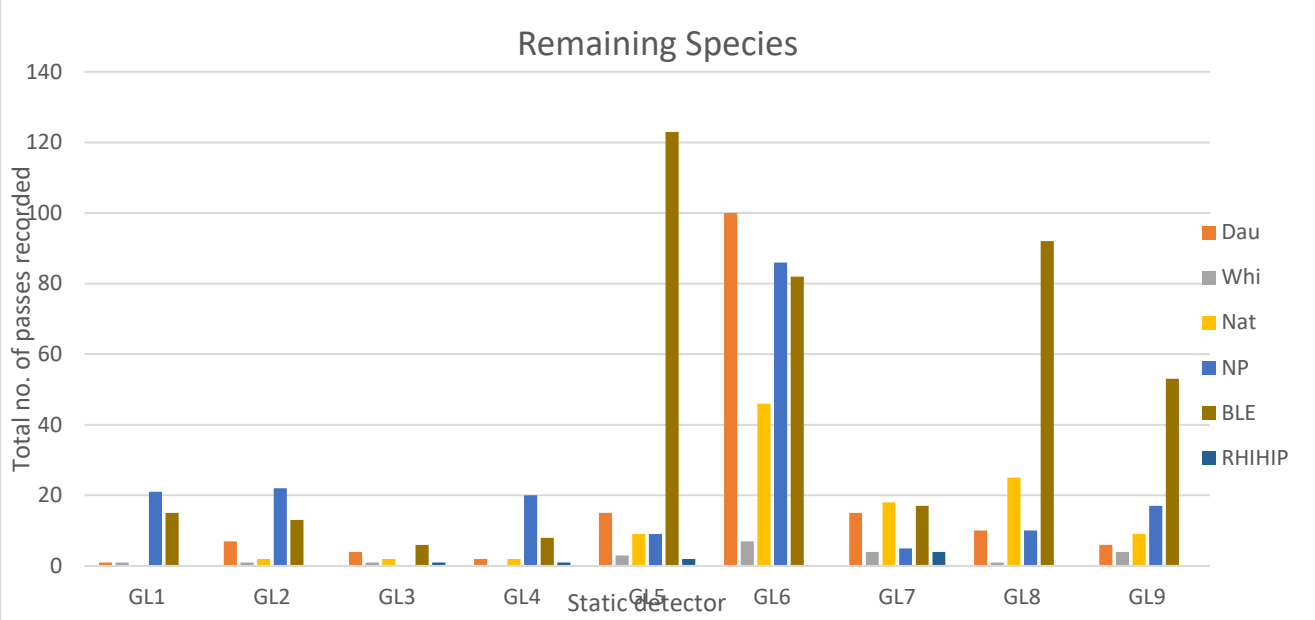


Plate 15: **Total number of bat passes recorded for remaining bat species at each of the static detector locations in 2020.**

4.5 Bat Static Detector Surveys 2021

Table 4-4 below summarises the results, in relation to bat species, recorded on the static detectors deployed in 2021. Nine static units were deployed during each survey round. Overall, eight bat species were recorded (common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat, Natterer's bat, Daubenton's bat and whiskered bat). The graphs within Plate 16 to Plate 24 below show the number of bat passes (per species) recorded at each static detector location over the three surveillance rounds.

Table 4-5: Summary results of Static Bat Detectors deployed during 2021 survey rounds 1 to 3

Static detector No., associated final turbine, and location habitats	Species detected during Round 1 22nd April to 16th May 2020 (Night 1.1 – 1.25)	Species detected during Round 2 08th to 19th July 2021 (Night 2.1 – 2.12)	Species detected during Round 3 19th to 30th August 2021 (Night 3.1 – 3.12) [8]
GL1 T01 Upland heath and bog, proximate to a first order stream	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
GL2 T02 Upland heath and bog	Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
GL3 T03 Upland heath and bog	Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat

[8] Note: The static detectors A6, A7 and A8 were deployed for 10 nights during round 3 (15th to 24th September), while the remaining static detectors A2, A3 and A5, were deployed for a further seven nights over (15th September to 1st October). Analysis is based on the number of nights the bats were detected on each recorder.

Static detector No., associated final turbine, and location habitats	Species detected during Round 1 22nd April to 16th May 2020 (Night 1.1 – 1.25)	Species detected during Round 2 08th to 19th July 2021 (Night 2.1 – 2.12)	Species detected during Round 3 19th to 30th August 2021 (Night 3.1 – 3.12) [8]
GL4 T04 Upland heath and bog, proximate to a first order stream	Daubenton's bat Whiskered bat Leisler's bat Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
GL5 T05 Upland heath and bog, proximate to a first order stream	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
GL6 T06 Upland heath and bog	Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
GL7 T07 Improved grassland	Daubenton's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat
GL8	Leisler's bat Brown long-eared bat	Daubenton's bat Natterer's bat Leisler's bat Common pipistrelle	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat

Static detector No., associated final turbine, and location habitats	Species detected during Round 1 22nd April to 16th May 2020 (Night 1.1 – 1.25)	Species detected during Round 2 08th to 19th July 2021 (Night 2.1 – 2.12)	Species detected during Round 3 19th to 30th August 2021 (Night 3.1 – 3.12) [8]
T08 Upland heath and bog		Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat	Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat
GL9 T09 Upland heath and bog	Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Nathusius pipistrelle Brown long-eared bat	Daubenton's bat Natterer's bat Whiskered bat Leisler's bat Common pipistrelle Soprano pipistrelle Brown long-eared bat

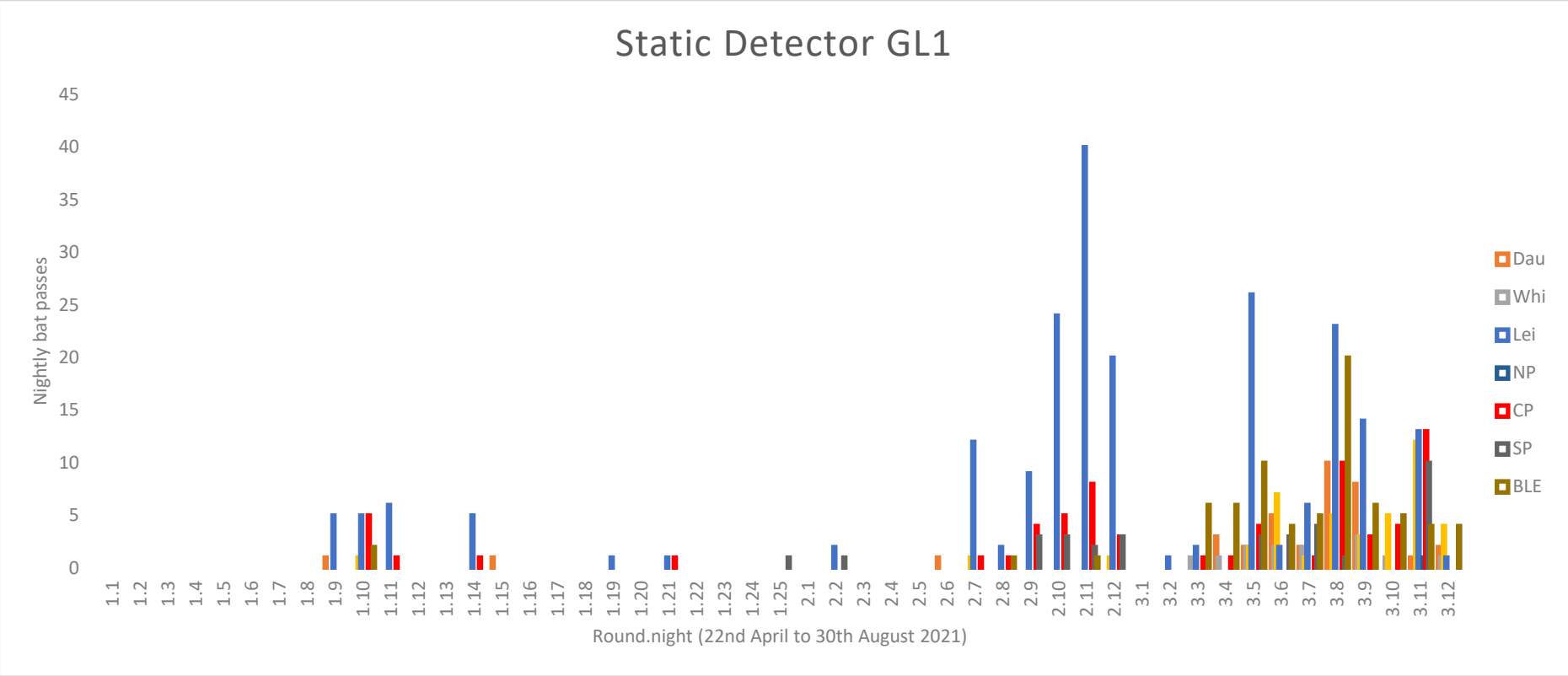


Plate 16: Total number of nightly bat passes recorded at static location GL1

The static unit GL1, recorded eight species of bat. Leisler's bat shows the highest activity level for the round 2which spiked in activity on day 11 (18/07/2021) with 40 passes. A lower level of bat activity can be seen for the remaining bat species. Round 1 shows a much lower activity of all species.

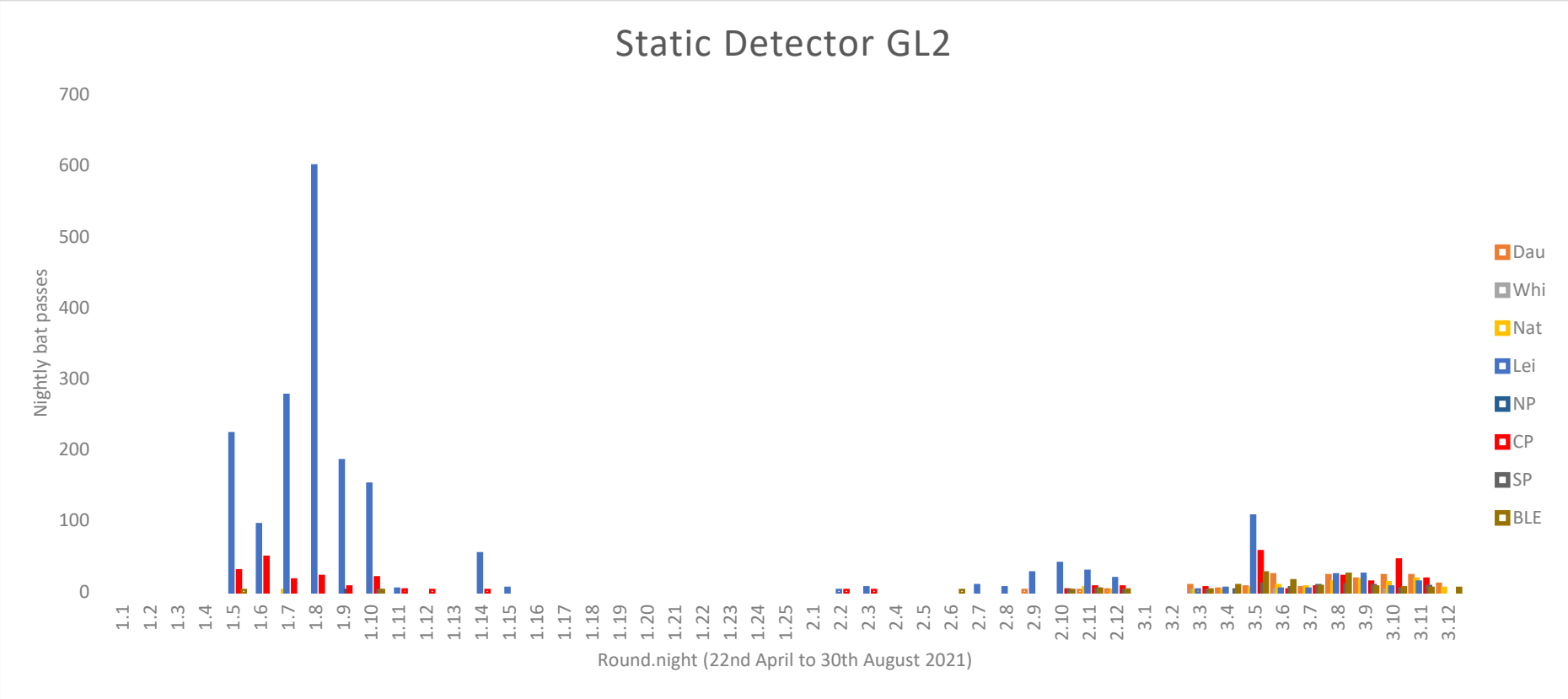


Plate 17: Total number of nightly bat passes recorded at static location GL2

The static unit GL2 recorded eight species of bat. Leisler's bat shows the highest activity level for during round 2, which shows spikes in activity in round 1on day 8 (04/08/2021) with 599 passes. Round 2 shows a much lower level of activity for the species. Although a much lower level of activity is recorded for common pipistrelle (next highest activity levels) there is a spike in activity on in round 1 on day 6 (27/04/2021), and round 3 day 5 (23/08/2021) with 48 and 56 passes respectively. A much lower level of bat activity can be seen for the remaining bat species.

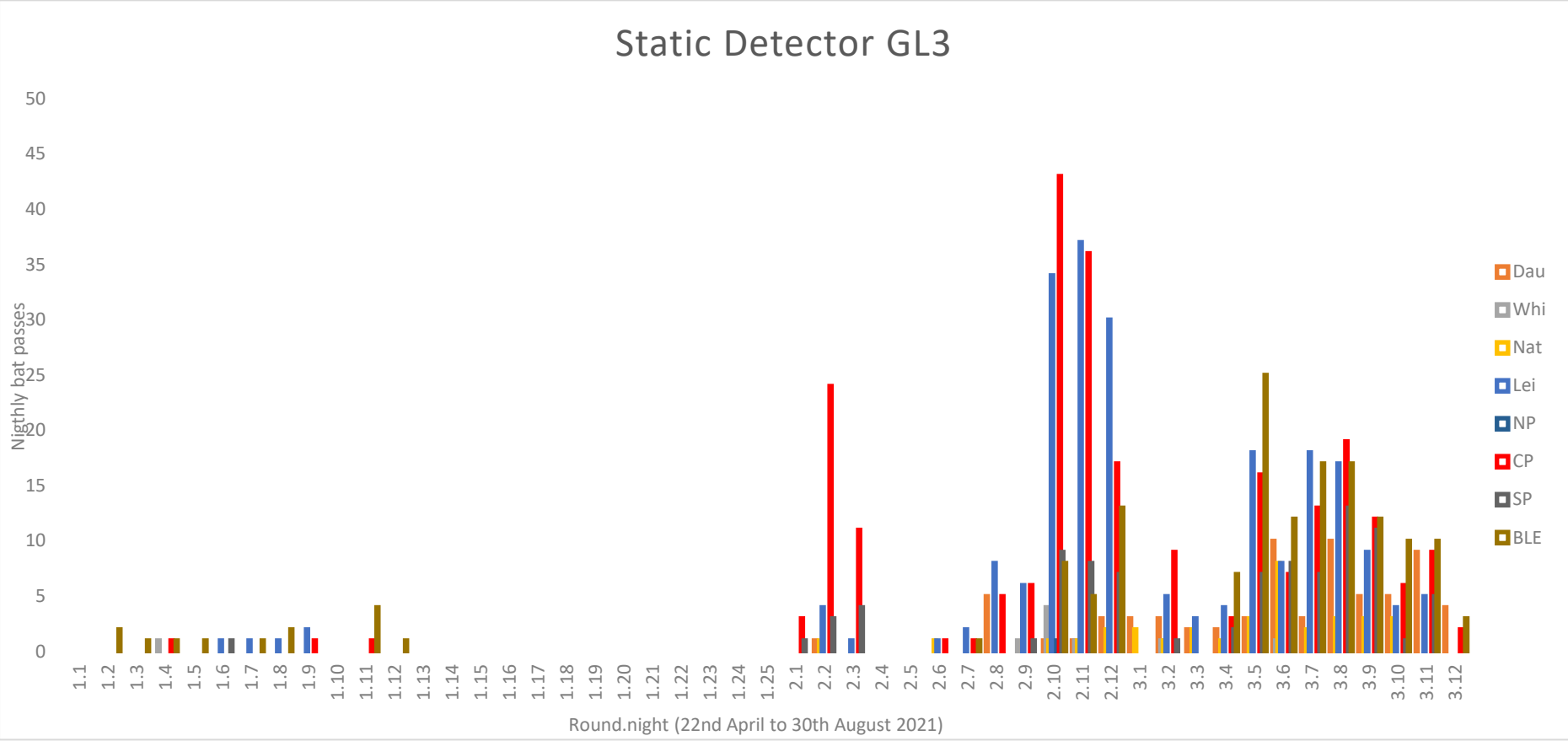


Plate 18: Total number of nightly bat passes recorded at static location GL3

The static unit GL3, recorded eight species of bat. Common pipistrelle show the highest activity level for round 2, with a spike in activity on days 10 (17/08/2021) and 11 (18/07/2021) with 43 and 36 passes respectively. Leisler activity peak in round 2 on days 10 (17/08/2021) and 11 (18/07/2021) with 34 and 37 passes respectively. Brown long eared bat had a peak activity in round 3 on day 5 with 25 passes. Round 1 had a generally lower activity level for all species.

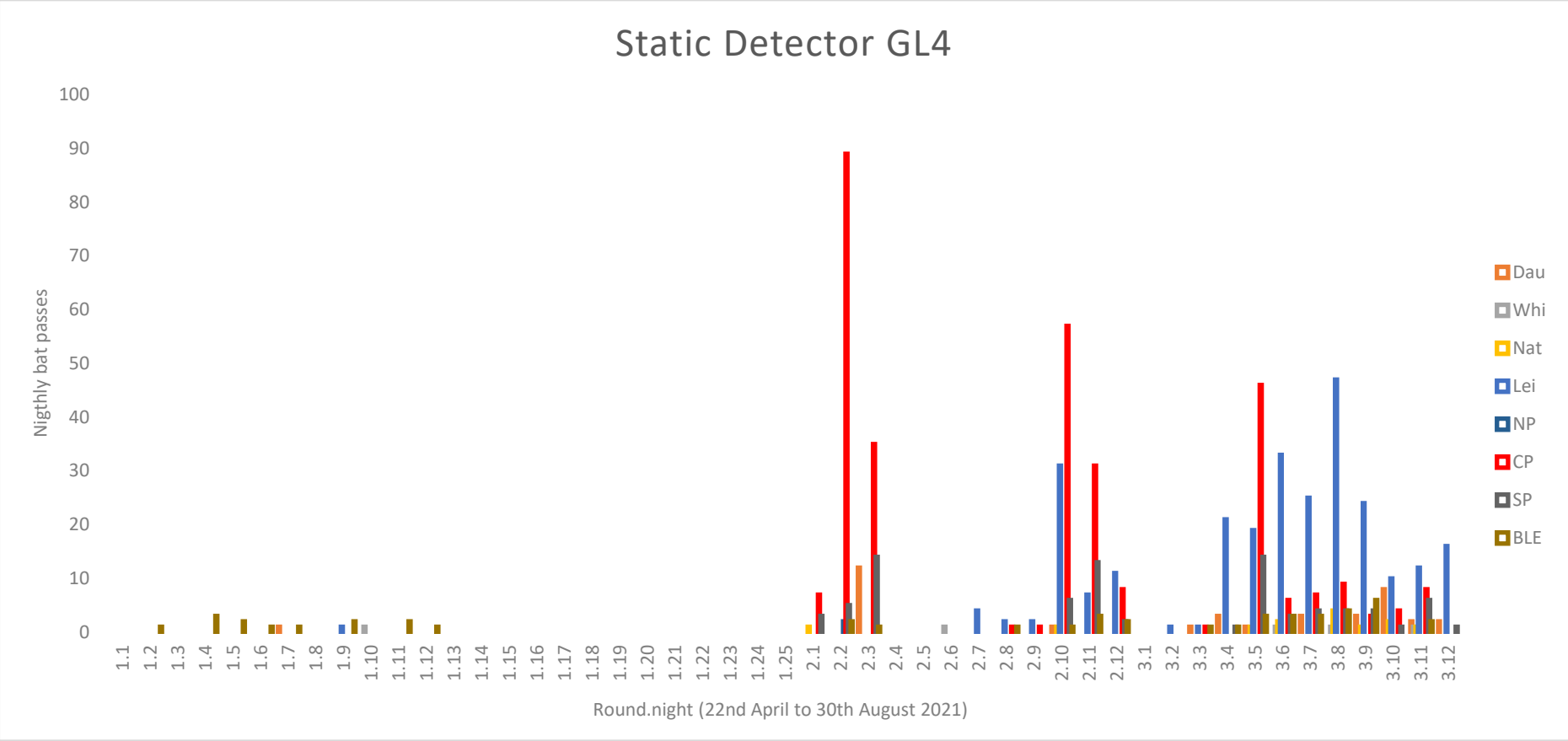


Plate 19: Total number of nightly bat passes recorded at static location GL4

The static unit GL4, recorded eight species of bat. Common pipistrelle show the highest activity level for round 2, with a spike in activity on day 2 (09/07/2021) and 10 (18/07/2021) with 89 and 57 passes respectively. Leisler activity peak in round 3 on day 8 (26/08/2021) with 47 passes. Round 1 had a generally lower activity level for all species.

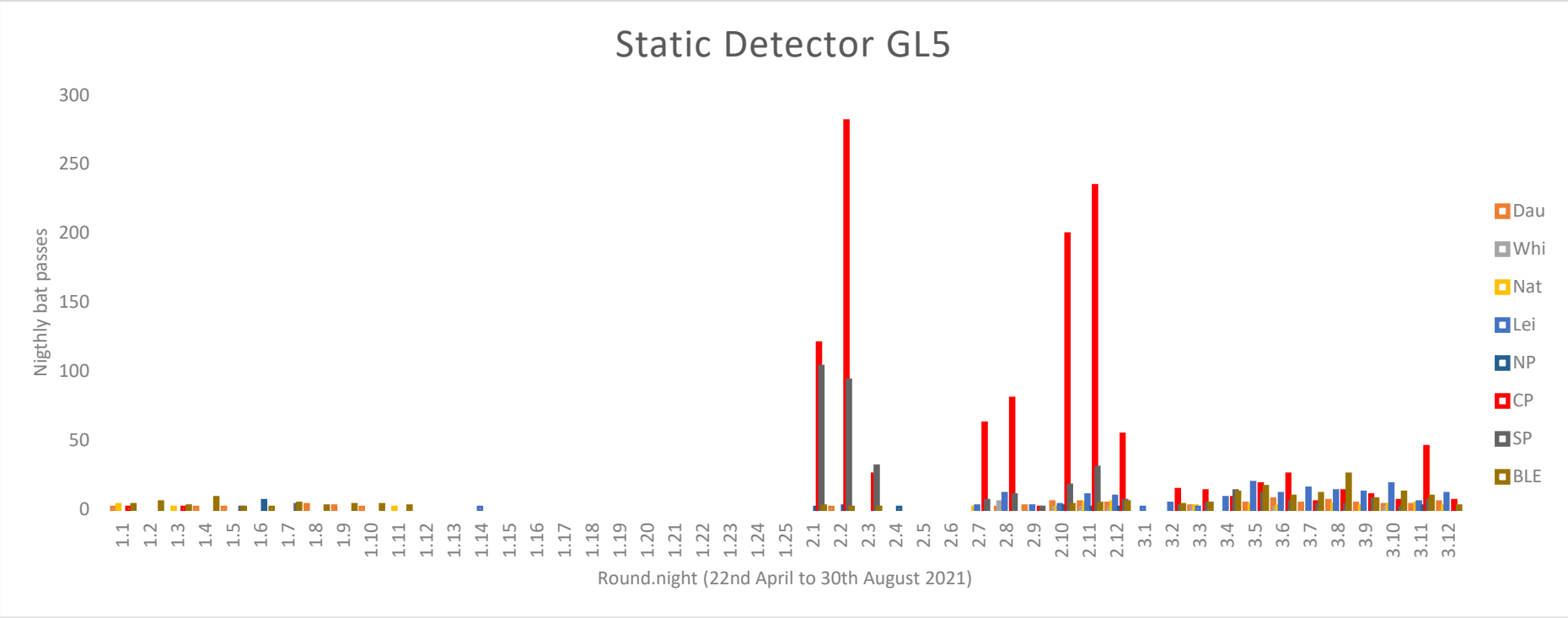


Plate 20: Total number of nightly bat passes recorded at static location GL5

The static unit GL5, recorded eight species of bat. Common pipistrelle shows the highest activity levels, with spikes in activity in round 2 on days 2 (09/07/2021), 10 (17/07/2021) and 11 (18/07/2021) with 281, 199 and 234 passes respectively. Soprano pipistrelle peak in round 2 on day 1 (08/07/2021) with 103 passes. Round 1 and 2 shows a much lower level of activity for the species. A much lower level of bat activity can be seen for the remaining bat species for the survey rounds. Survey round 1 shows a much lower level of activity at this location than the other rounds.

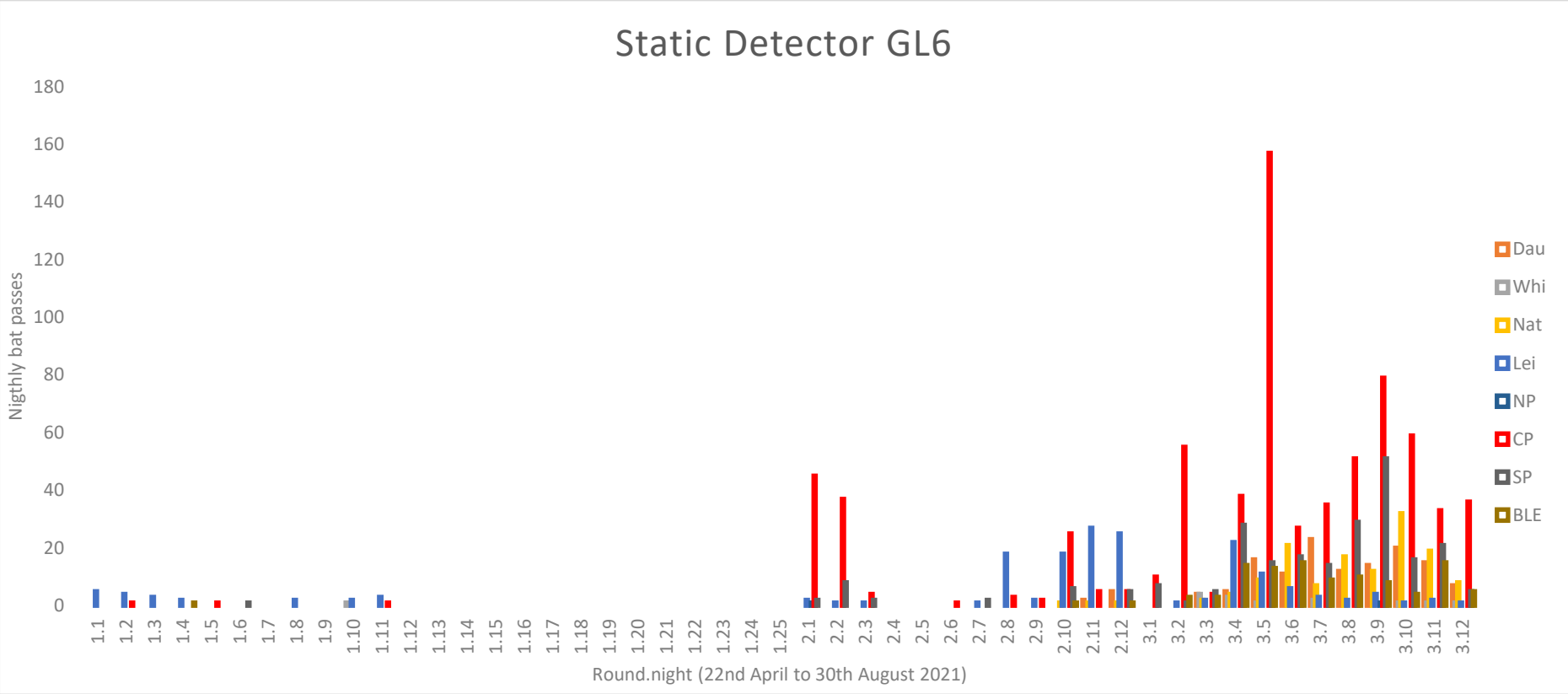


Plate 21: Total number of nightly bat passes recorded at static location GL6

The static unit GL6, recorded eight species of bat. Common pipistrelle shows the highest activity level for during round 2 and 3, with a spike in activity on day 5 round 3 (23/08/2021) with 157 passes and round 2 day 1 with 45 passes with 157 passes. Round 1 and 2 shows a much lower level of activity for the species. Soprano pipistrelle peaked on day 9 of round 3 (27/08/2021) with 51 passes. A much lower level of bat activity can be seen for the remaining bat species for the survey rounds. Survey round 1 shows a much lower level of activity at this location than the other rounds.

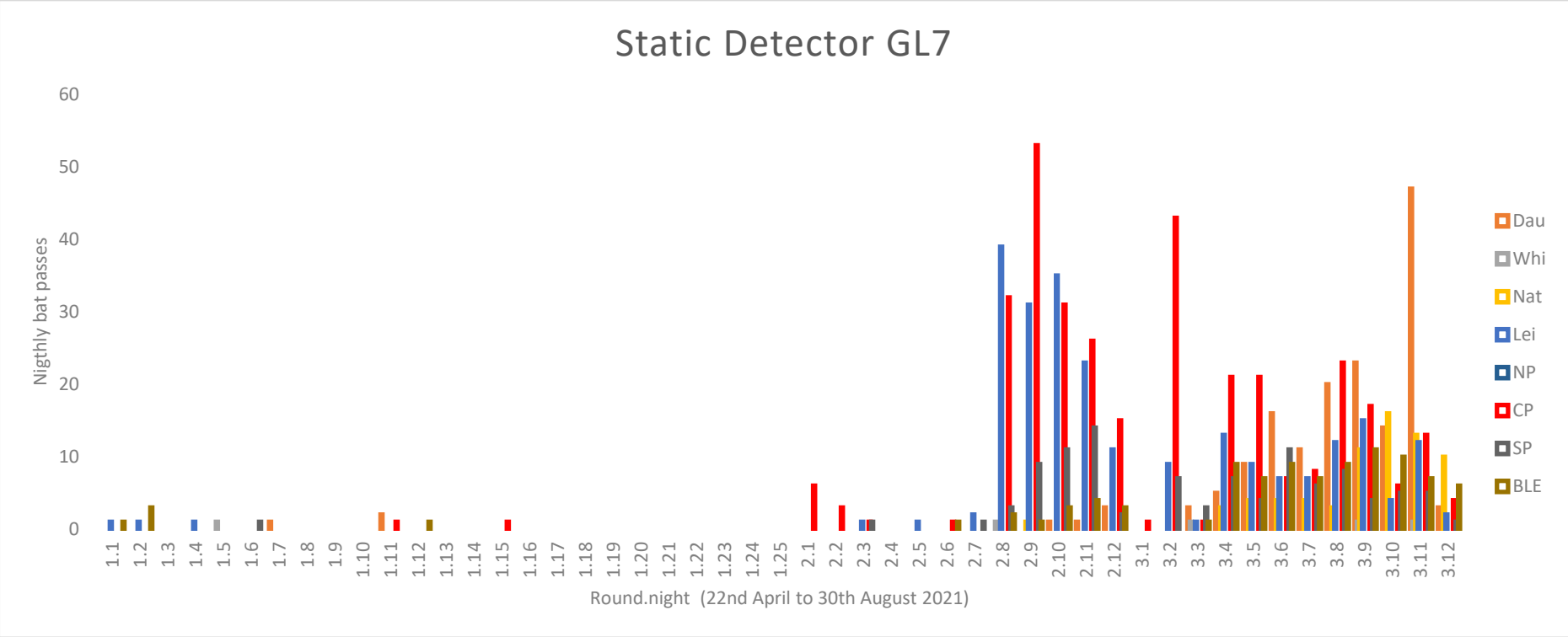


Plate 22: Total number of nightly bat passes recorded at static location GL7

The static unit GL7, recorded eight species of bat. Common pipistrelle show the highest activity level for round 2, with a spike in activity on day 9 (16/07/2021) with 52 passes. Daubenton's bat show the highest activity level for round 3, with a spike in activity on day 11 (29/08/2021) with 47 passes. Round 1 had much lower activity level for all species.

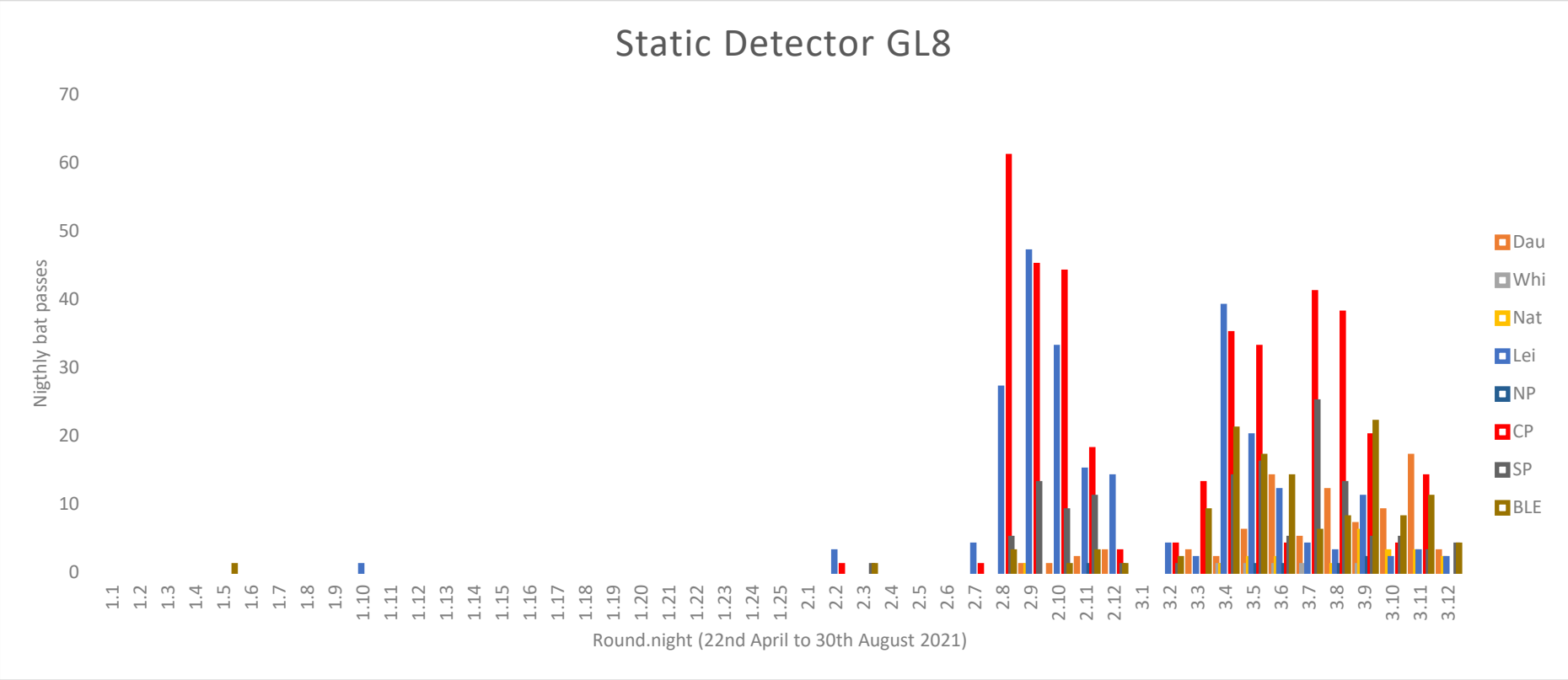


Plate 23: Total number of nightly bat passes recorded at static location GL8

The static unit GL8, recorded eight species of bat. Common pipistrelle show the highest activity level for round 2, with a spike in activity on day 8 (15/07/2021) with 61 passes. Leisler activity peaked in round 2 on day 9 (16/07/2021) with 45 passes. Round 1 had a much lower activity level for all species.

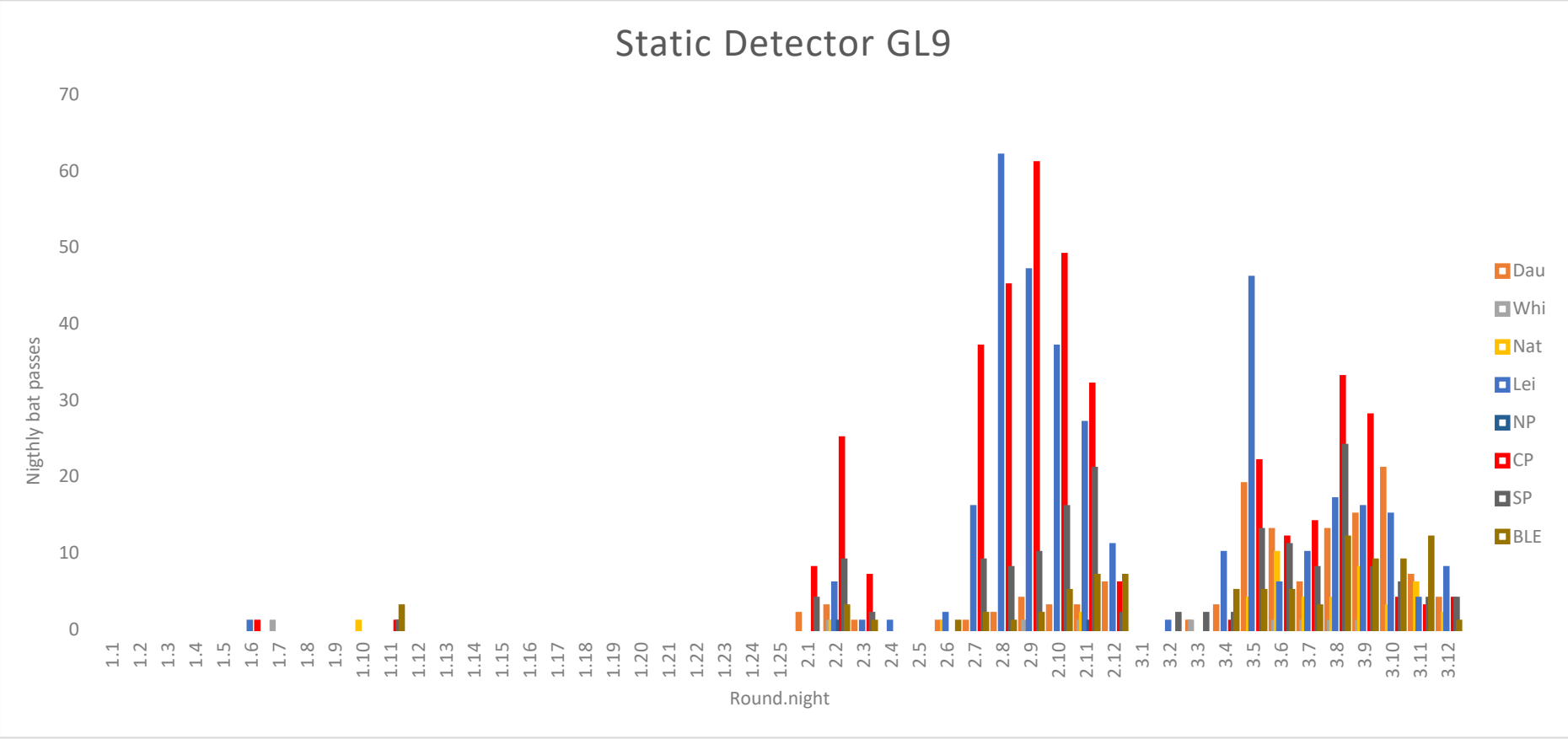


Plate 24: Total number of nightly bat passes recorded at static location GL9

The static unit GL9, recorded eight species of bat. Leisler activity peak in round 2 on day 8 (15/07/2021) with 62 passes. Common pipistrelle show the highest activity level for round 2, with a spike in activity on day 9 (16/07/2021) with 61 passes. Round 1 had much lower activity level for all species.

Eight species of bats were recorded during the three survey rounds with a total of 11,418 recordings. The most commonly recorded species was common pipistrelle, followed by Leisler's bat and soprano pipistrelle. Lower levels of activity of brown long-eared bat, Daubenton's bat, Natterer's bat, whiskered bat, and Nathusius' pipistrelle were detected. Brown long-eared bat is present on-site, but this species is very quiet and sometimes hunts without echolocating, therefore this species may be under-recorded by the static detectors.

The graphs within Plates 25 to Plate 27 show the number of passes for individual species (common pipistrelle, soprano pipistrelle and Leisler's bat) at each static detector location for the full survey round of 2021. Locations GL5 has the highest number of passes for common pipistrelle and soprano pipistrelle, while GL2 has the highest number of passes of Leisler's bat.

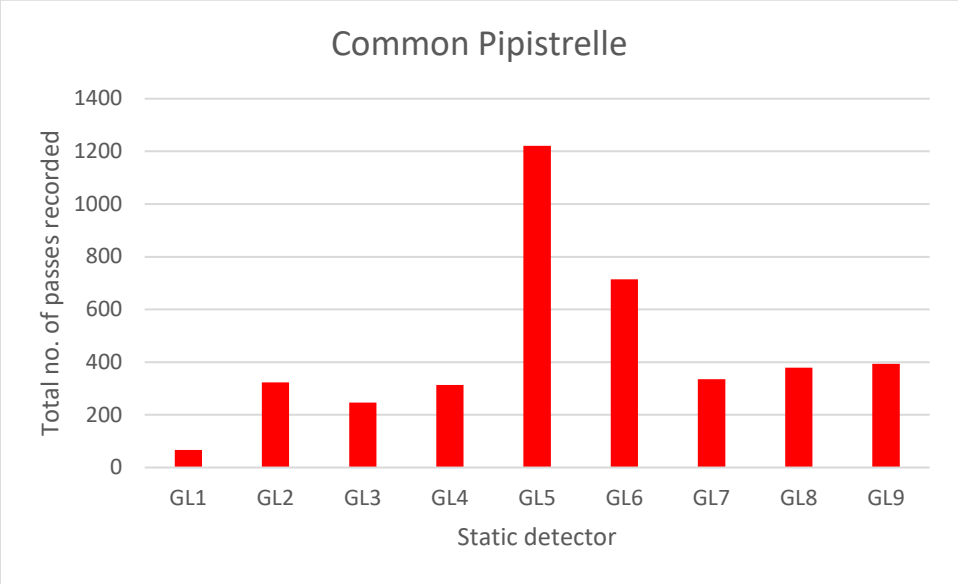


Plate 25: Total number of bat passes recorded for common pipistrelle at each of the static detector locations during 2021.

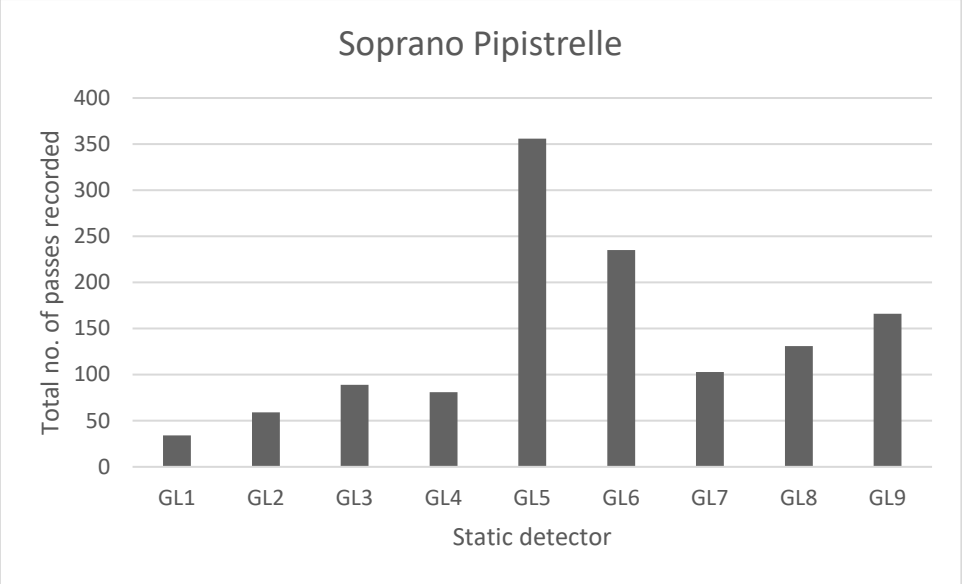


Plate 26: **Total number of bat passes recorded for soprano pipistrelles at each of the static detector locations during 2021.**

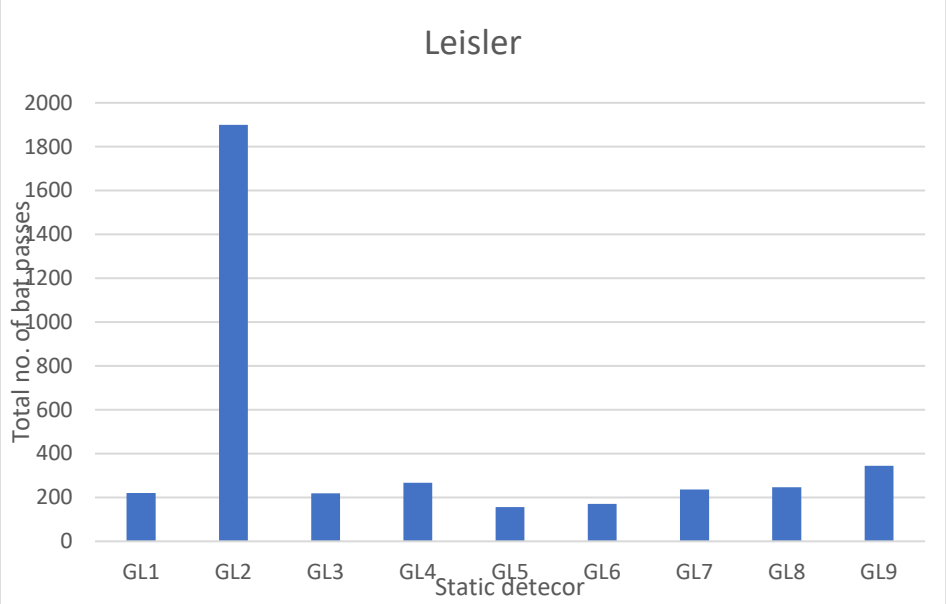


Plate 27: **Total number of bat passes recorded for Leisler's bat at each of the static detector locations during 2021**

Static location GL5 has the highest number of passes, recorded during the surveillance surveys of 2021, for brown long-eared bat (n=160 passes), and Nathusius pipistrelle (n=16 passes), GL6 for Natterer's bat (n=134 passes), and whiskered bat (n=14 passes) and GL7 for Daubenton's bat (n=159 passes). Refer to Plate 28.

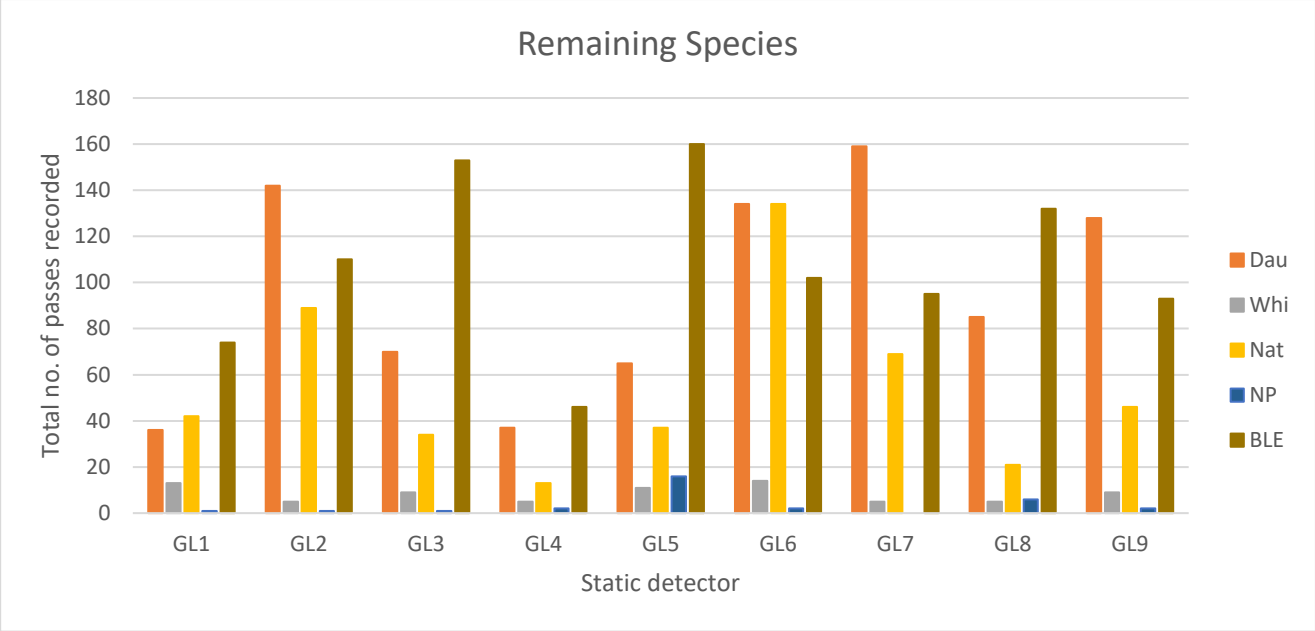


Plate 28: Total number of bat passes recorded for remaining bat species at each of the static detector locations in 2021.

4.6 Ecobat

The static data for each survey round were uploaded and analysed using the Ecobat tool. This analysis was undertaken for each survey round of 2020 and 2021 separately. Where groups of detectors were deployed for different dates within a survey round, those that were deployed for the same dates were analysed together (details are provided for each survey round below). The reference range datasets were stratified to include:

- Only records from within 30 days of the survey date.
- Only records from within 100 km^2 of the survey location.
- Records using any make of bat detector.

The Ecobat tool provides a series of summary tables to enable analysis of the bat activity level at each static location. The categorisation of activity level is based on Table 4-6.

Table 4-6: Percentile Score and Categorised Level of Bat Activity

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

4.6.1 Survey Round 1 2020

A summary showing the number of nights recorded bat activity within each activity band for each species is presented below in Table 4-7. Refer to Appendix C for the full Ecobat analysis report

Bat surveys were conducted for 13 nights between 22/04/2020 and 04/05/2020**,** using Wildlife Acoustics static bat detectors.

Based on the Median Percentile, two Static locations are deemed to have a High Bat Activity, GL1 and GL7, both for Leisler's bat.

Refer to Plates 29 and 30 below.

Table 4-8, along with Plates 31 and 32 show the number of nights recorded bat activity fell into each activity band for each species across all of the detectors.

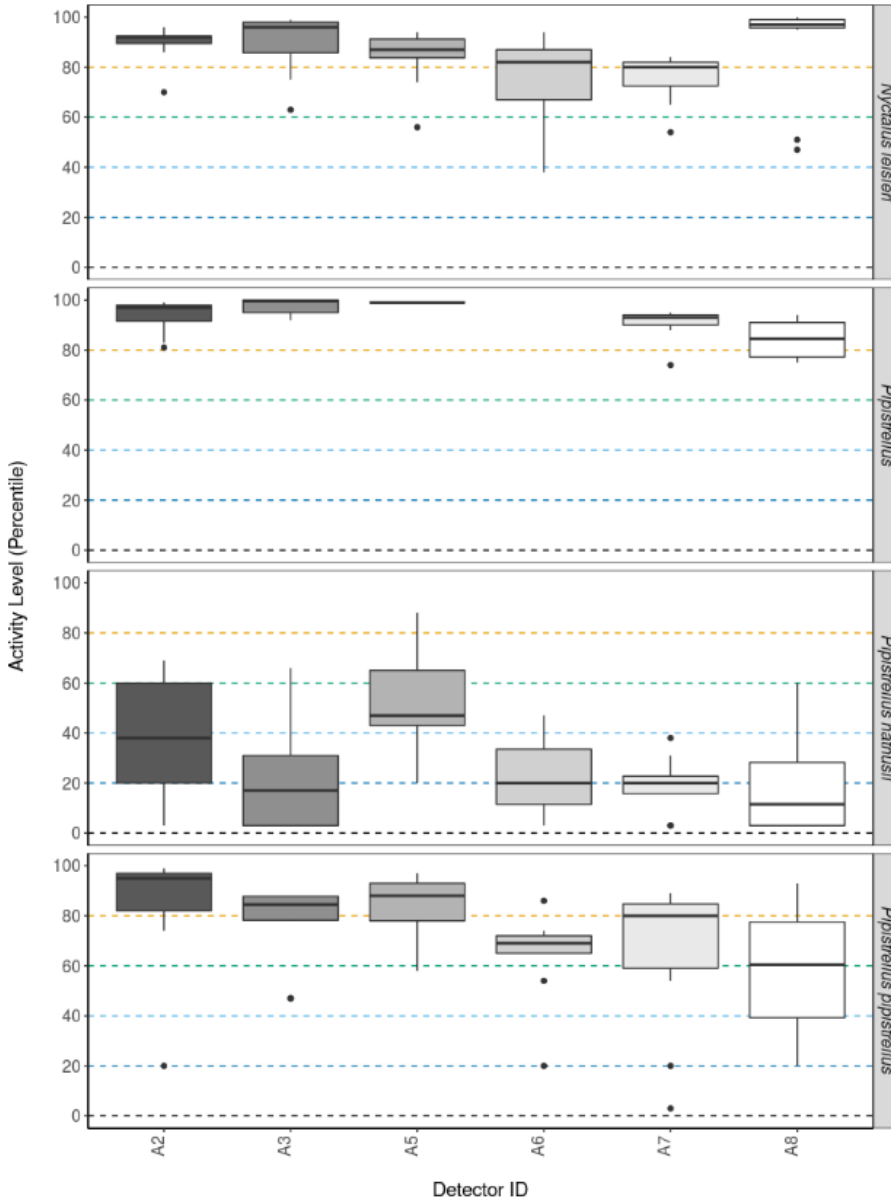
Table 4-7: Bat activity within each activity band for each species – Survey round 1

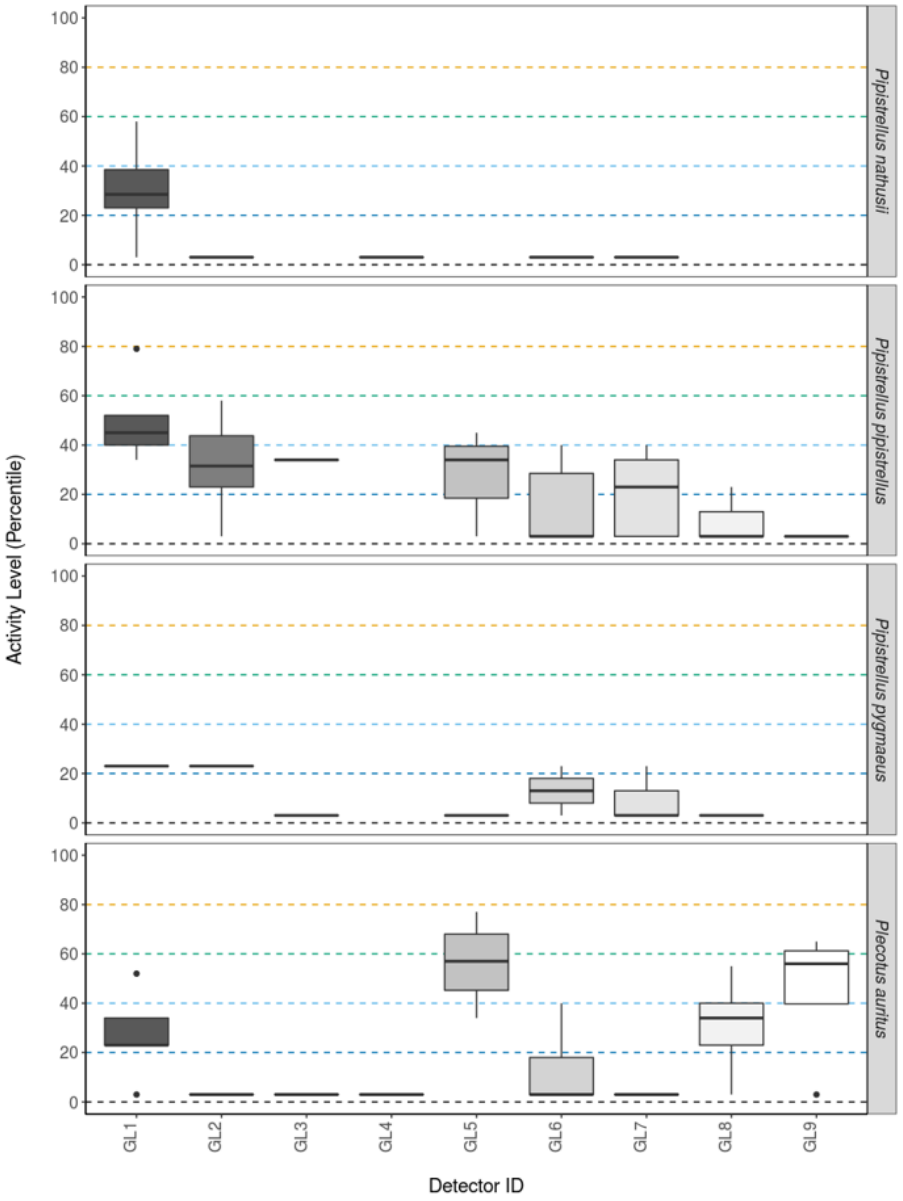
Location	Species/ Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity Category
GL1	*Myotis daubentonii*	0	0	0	0	1	3	Low
GL1	*Myotis mystacinus*	0	0	0	0	1	3	Low
GL1	*Nyctalus leisleri*	5	2	2	0	0	84	High
GL1	*Pipistrellus nathusii*	0	0	1	4	1	29	Low to Moderate
GL1	*Pipistrellus pipistrellus*	0	1	2	2	0	45	Moderate
GL1	*Pipistrellus pygmaeus*	0	0	0	1	0	23	Low to Moderate
GL1	*Plecotus auritus*	0	0	1	3	1	23	Low to Moderate
GL2	*Nyctalus leisleri*	0	1	1	1	4	3	Low
GL2	*Pipistrellus nathusii*	0	0	0	0	2	3	Low
GL2	*Pipistrellus pipistrellus*	0	0	2	3	1	32	Low to Moderate
GL2	*Pipistrellus pygmaeus*	0	0	0	1	0	23	Low to Moderate

Location	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	Median Percentile	Bat Activity Category
GL2	*Plecotus auritus*	0	0	0	0	2	3	Low
GL3	*Myotis daubentonii*	0	0	0	0	3	3	Low
GL3	*Myotis mystacinus*	0	0	0	0	1	3	Low
GL3	*Myotis nattereri*	0	0	0	0	2	3	Low
GL3	*Nyctalus leisleri*	0	0	0	1	2	3	Low
GL3	*Pipistrellus pipistrellus*	0	0	0	2	0	34	Low to Moderate
GL3	*Pipistrellus pygmaeus*	0	0	0	0	1	3	Low
GL3	*Plecotus auritus*	0	0	0	0	1	3	Low
GL3	*Rhinolophus hipposideros*	0	0	0	0	1	3	Low
GL4	*Nyctalus leisleri*	0	0	0	5	0	34	Low to Moderate
GL4	*Pipistrellus nathusii*	0	0	0	0	1	3	Low
GL4	*Plecotus auritus*	0	0	0	0	3	3	Low
GL4	*Rhinolophus hipposideros*	0	0	0	0	1	3	Low
GL5	*Myotis daubentonii*	0	0	0	0	2	3	Low
GL5	*Myotis mystacinus*	0	0	0	0	1	3	Low
GL5	*Myotis nattereri*	0	0	0	0	2	3	Low
GL5	*Nyctalus leisleri*	0	0	1	1	3	3	Low
GL5	*Pipistrellus pipistrellus*	0	0	1	1	1	34	Low to Moderate
GL5	*Pipistrellus pygmaeus*	0	0	0	0	1	3	Low

Location	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	Median Percentile	Bat Activity Category
GL5	*Plecotus auritus*	0	2	1	1	0	57	Moderate
GL5	*Rhinolophus hipposideros*	0	0	0	0	1	3	Low
GL6	*Myotis daubentonii*	0	0	0	3	4	3	Low
GL6	*Myotis mystacinus*	0	0	0	1	0	23	Low to Moderate
GL6	*Myotis nattereri*	0	0	0	1	5	3	Low
GL6	*Nyctalus leisleri*	0	1	0	0	4	3	Low
GL6	*Pipistrellus nathusii*	0	0	0	0	1	3	Low
GL6	*Pipistrellus pipistrellus*	0	0	0	3	4	3	Low
GL6	*Pipistrellus pygmaeus*	0	0	0	1	1	13	Low
GL6	*Plecotus auritus*	0	0	0	2	4	3	Low
GL7	*Myotis daubentonii*	0	0	0	1	2	3	Low
GL7	*Myotis mystacinus*	0	0	0	0	1	3	Low
GL7	*Myotis nattereri*	0	0	0	1	2	3	Low
GL7	*Nyctalus leisleri*	2	2	1	1	1	62	Moderate to High
GL7	*Pipistrellus nathusii*	0	0	0	0	1	3	Low
GL7	*Pipistrellus pipistrellus*	0	0	0	3	2	23	Low to Moderate
GL7	*Pipistrellus pygmaeus*	0	0	0	1	2	3	Low
GL7	*Plecotus auritus*	0	0	0	0	2	3	Low
GL8	*Myotis daubentonii*	0	0	0	0	2	3	Low

Location	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	Median Percentile	Bat Activity Category
GL8	*Myotis nattereri*	0	0	0	0	1	3	Low
GL8	*Nyctalus leisleri*	0	1	1	2	1	34	Low to Moderate
GL8	*Pipistrellus pipistrellus*	0	0	0	1	2	3	Low
GL8	*Pipistrellus pygmaeus*	0	0	0	0	2	3	Low
GL8	*Plecotus auritus*	0	0	1	3	1	34	Low to Moderate
GL9	*Myotis daubentonii*	0	0	0	0	1	3	Low
GL9	*Myotis mystacinus*	0	0	0	0	1	3	Low
GL9	*Myotis nattereri*	0	0	0	1	1	13	Low
GL9	*Nyctalus leisleri*	0	0	1	1	2	13	Low
GL9	*Pipistrellus pipistrellus*	0	0	0	0	2	3	Low
GL9	*Plecotus auritus*	0	2	1	0	1	56	Moderate


Activity Level (Percentile)
Nyctalus leisleri
Pipistrellus
Pipistrellus nathusii
Pipistrellus pipistrellus
A2
A3
A5
A6
A7
A8
Detector ID


Activity Level (Percentile)
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

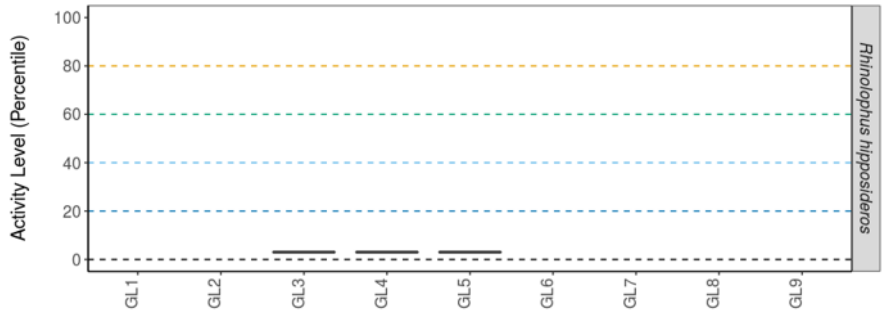
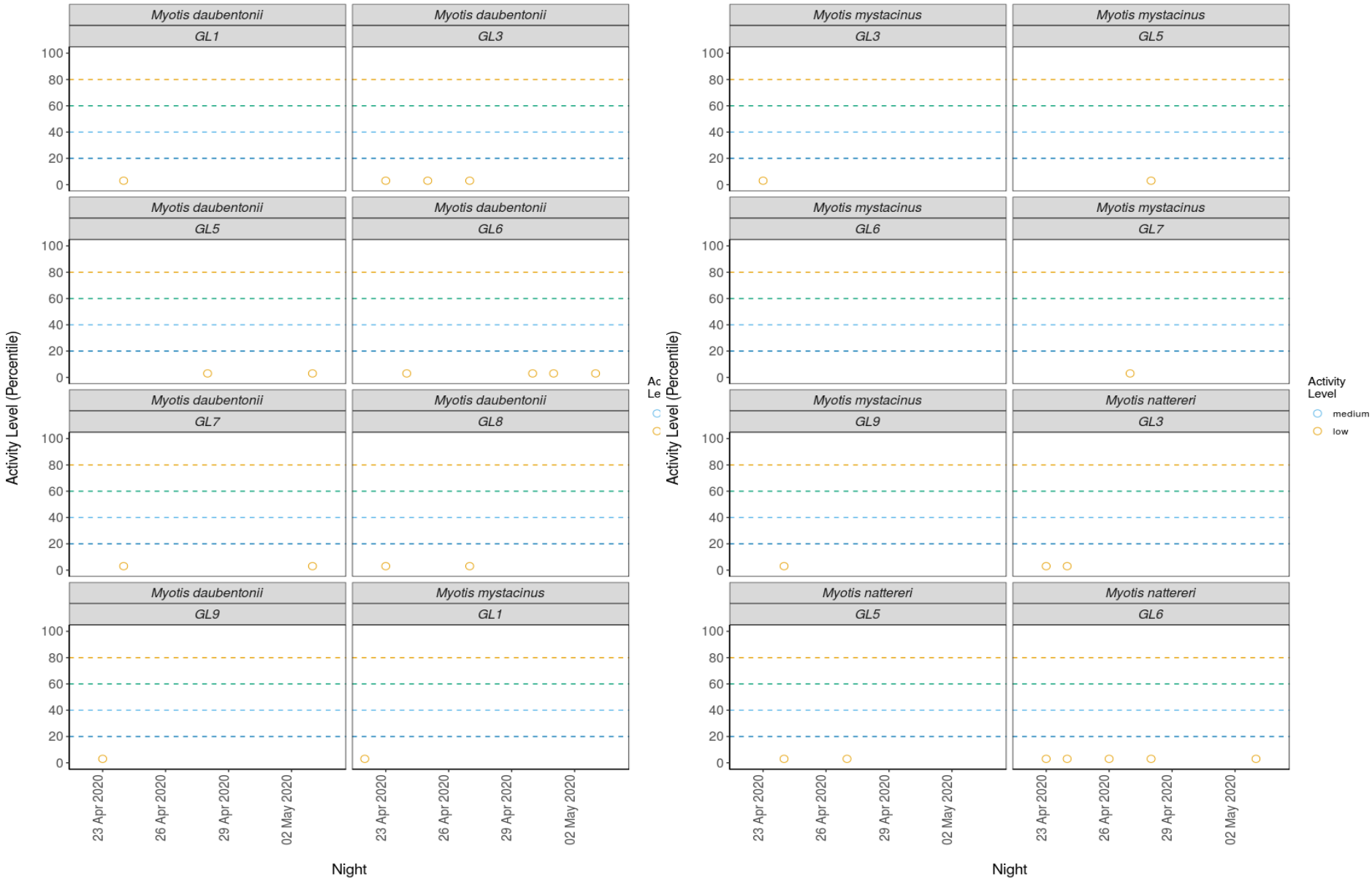
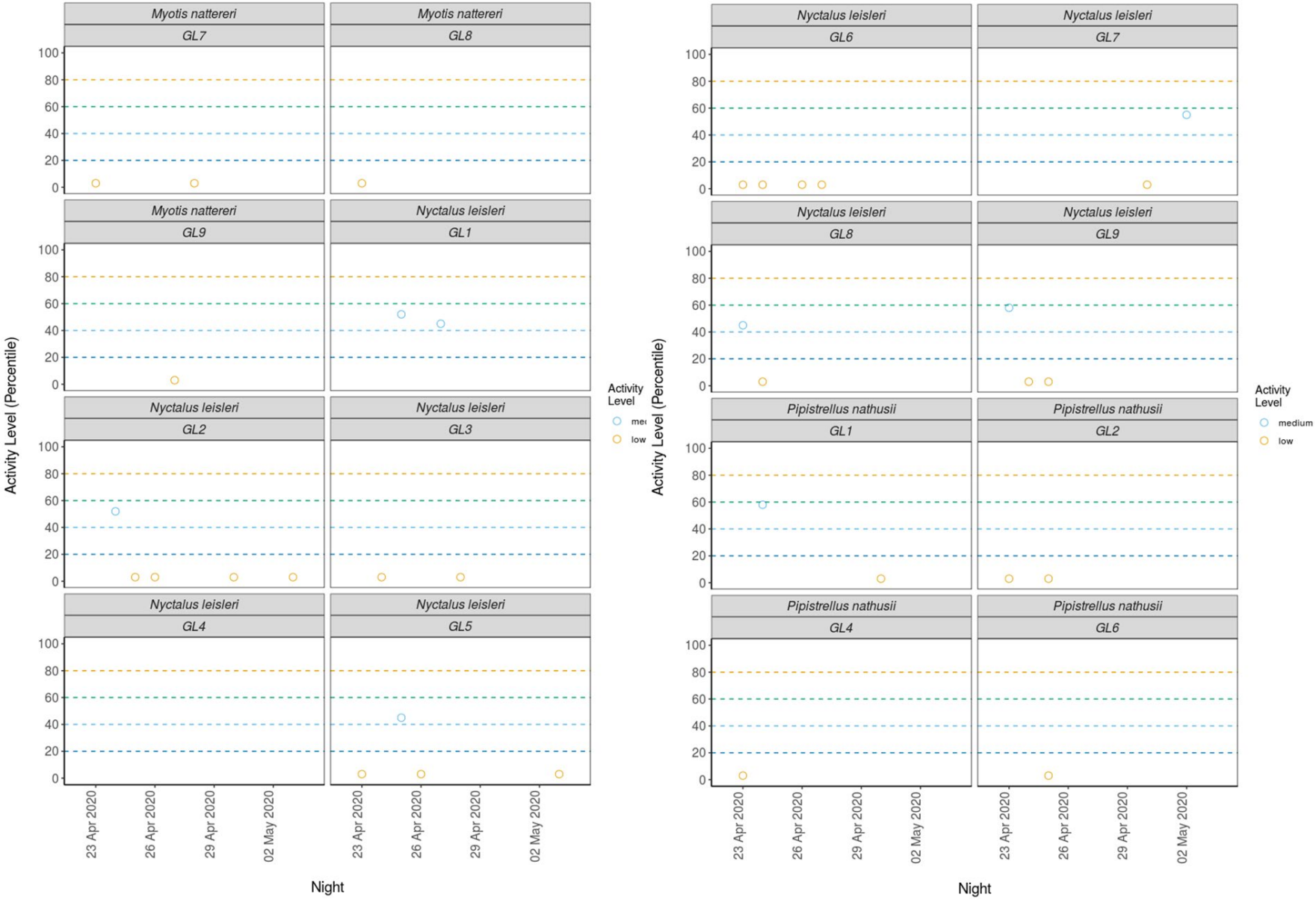


Plate 29: **Differences in activity between static detector locations, split by species and location. The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity)**


Myotis daubentonii
GL1
Myotis daubentonii
GL3
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Myotis daubentonii
GL7
Myotis daubentonii
GL8
Myotis daubentonii
GL9
Myotis mystacinus
GL1
Myotis mystacinus
GL3
Myotis mystacinus
GL5
Myotis mystacinus
GL6
Myotis mystacinus
GL7
Myotis mystacinus
GL9
Myotis nattereri
GL3
Myotis nattereri
GL5
Myotis nattereri
GL6
Activity Level (Percentile)
0
20
40
60
80
100
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Night
Activity Level
medium
low


Myotis nattereri
GL7
Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL1
Pipistrellus nathusii
GL2
Pipistrellus nathusii
GL4
Pipistrellus nathusii
GL6
Activity Level (Percentile)
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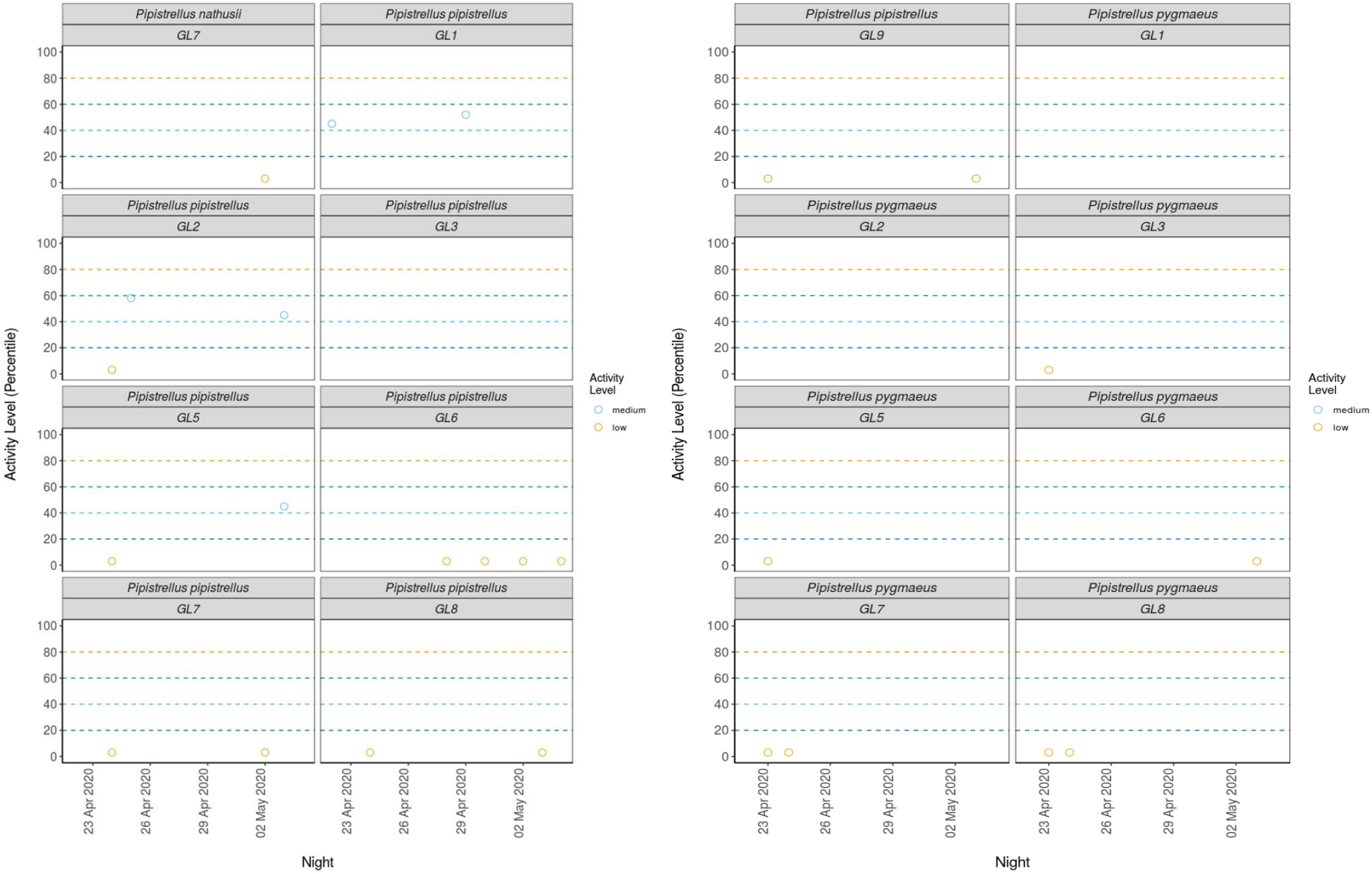
20
40
60
80
100
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Night
Activity Level
medium
low


Pipistrellus nathusii
GL7
Pipistrellus pipistrellus
GL1
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL8
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL8
Activity Level (Percentile)
0
20
40
60
80
100
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Night
Activity Level
medium
low

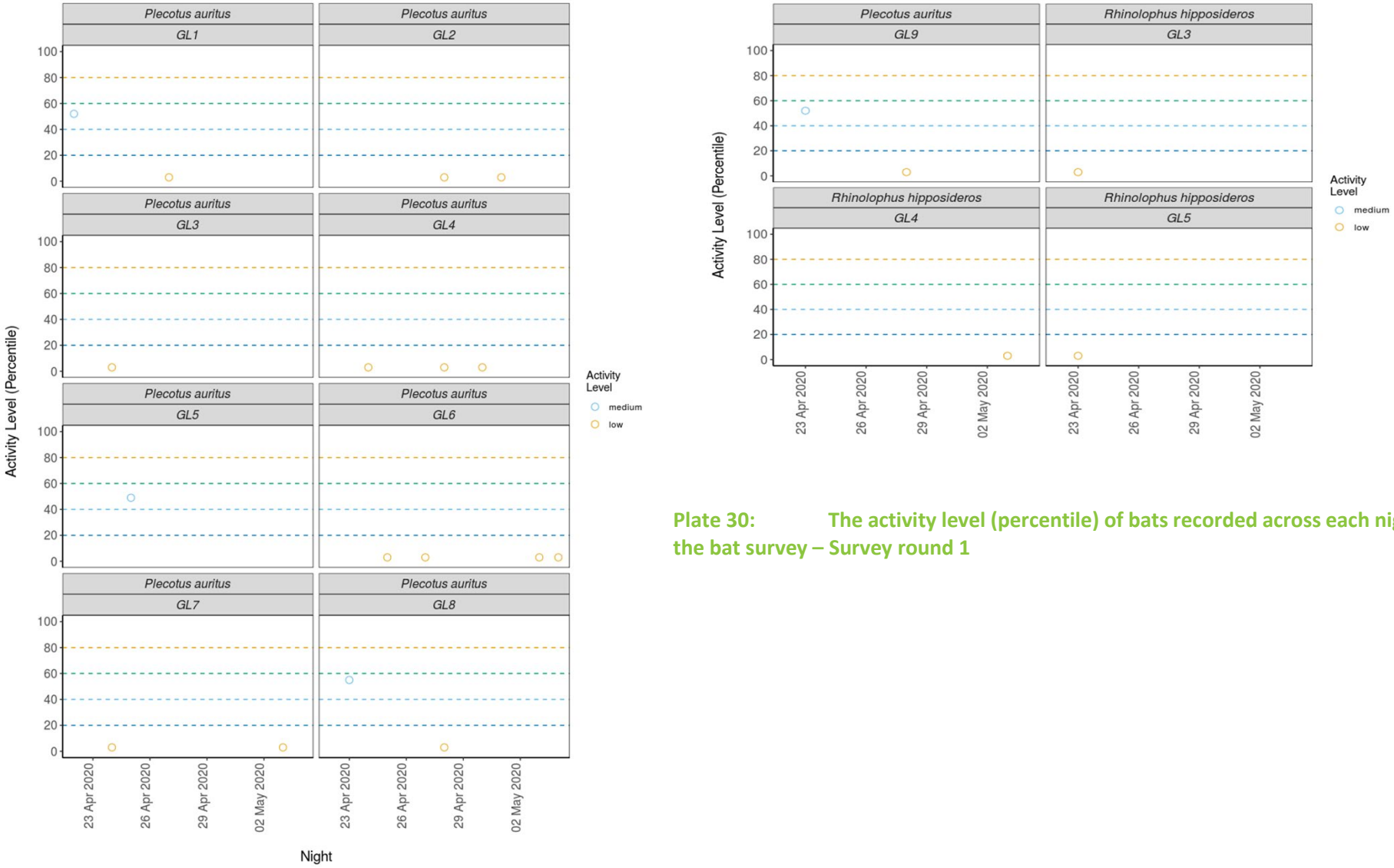


Plate 30: The activity level (percentile) of bats recorded across each night of the bat survey – Survey round 1

Table 4-8: Summary showing the number of nights recorded bat activity fell into each activity band for each species across all the detectors – Survey round 1

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	Median Percentile	Bat Activity Category
Myotis daubentonii	0	0	0	4	15	3	Low
Myotis mystacinus	0	0	0	1	5	3	Low
Myotis nattereri	0	0	0	3	13	3	Low
Nyctalus leisleri	7	7	7	12	17	34	Low to Moderate
Pipistrellus nathusii	0	0	1	4	6	3	Low
Pipistrellus pipistrellus	0	1	5	15	12	23	Low to Moderate
Pipistrellus pygmaeus	0	0	0	4	7	3	Low
Plecotus auritus	0	4	4	9	15	23	Low to Moderate
Rhinolophus hipposideros	0	0	0	0	3	3	Low

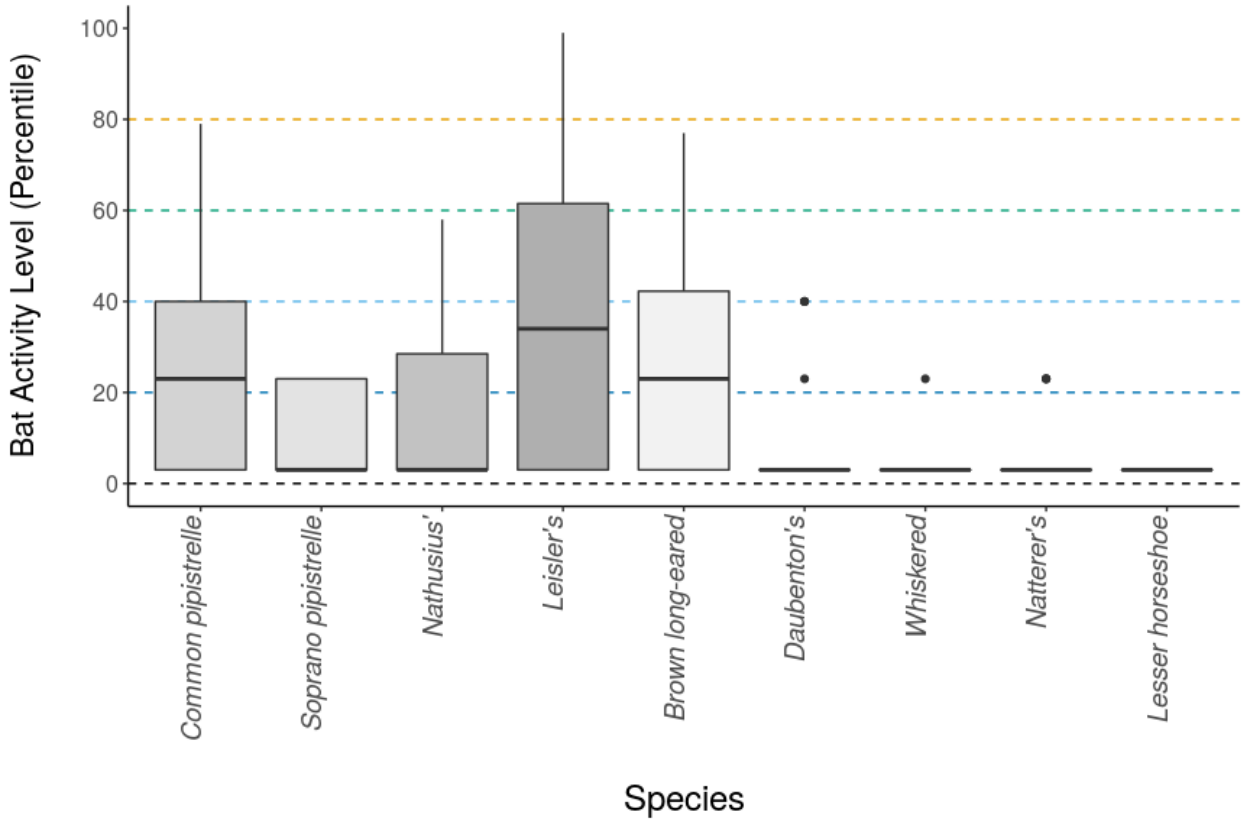
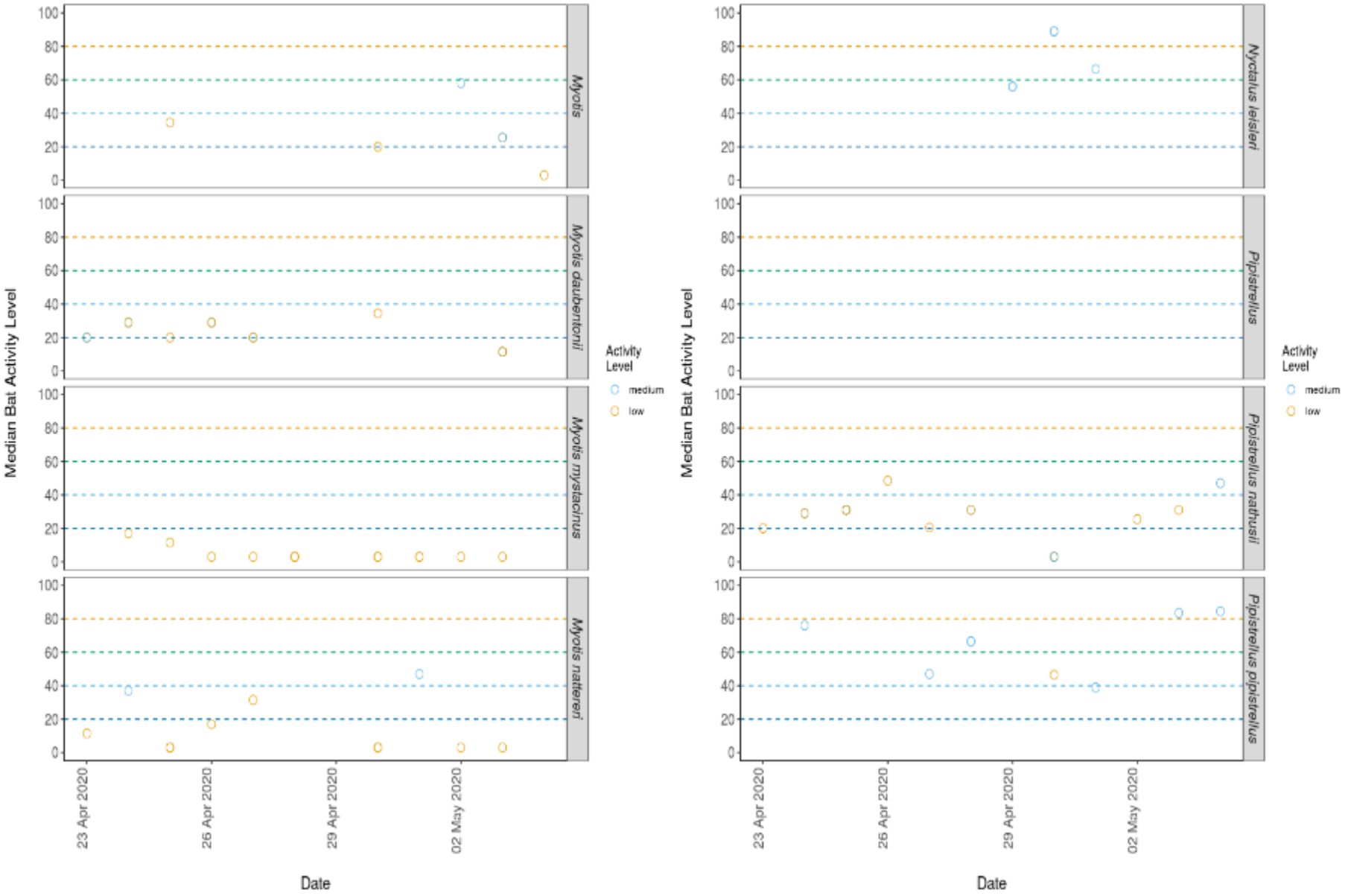


Plate 31: **The activity level (percentile) of bats recorded across each night of the bat survey for the entire site – Survey round 1.**


Median Bat Activity Level
Myotis
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus
Pipistrellus nathusii
Pipistrellus pipistrellus
Activity Level
medium
low
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Date

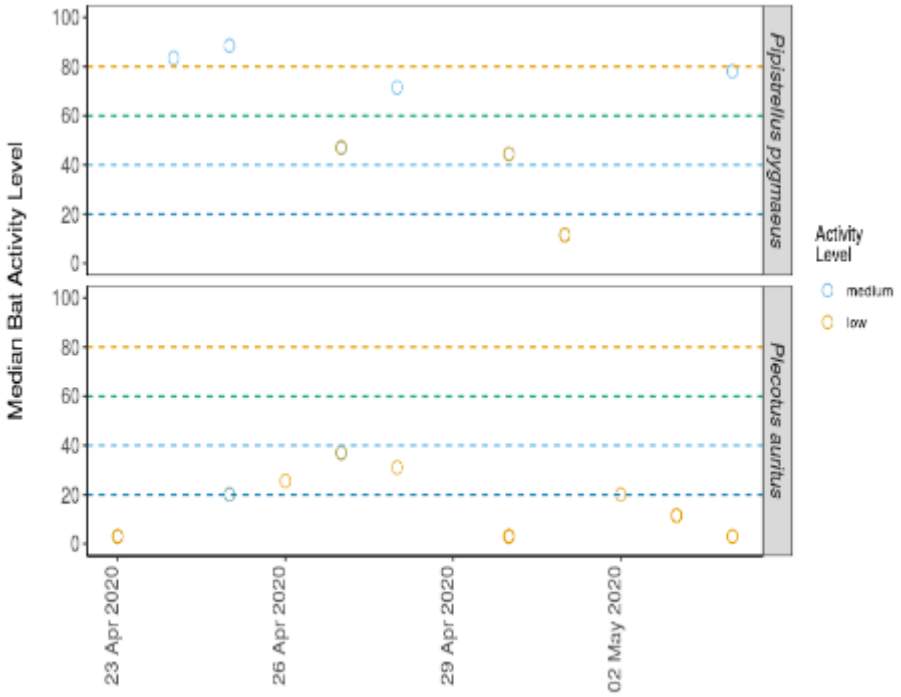


Plate 32: The median activity levels of bats recorded across all detectors each night – Survey round 1.

4.6.2 Survey Round 2 2020

A summary showing the number of nights recorded bat activity within each activity band for each species is presented below in Table 4-9. Refer to Appendix C for the full Ecobat analysis report

Bat surveys were conducted for 29 nights between 24/06/2020 and 22/07/2020 using Wildlife Acoustics static bat detectors.

Static location GL6 had one night of High Activity during the survey round, for common pipistrelle and soprano pipistrelle.

Refer to Plates 33 and 34 below.

Table 4-10, along with Plates 35 and 36 show the number of nights recorded bat activity fell into each activity band for each species across all of the detectors.

Table 4-9: Bat activity within each activity band for each species – Survey round 2

Location	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	Median Percentile	Bat Activity Category
GL1	*Nyctalus leisleri*	0	0	0	1	2	19	Low

Location	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	Median Percentile	Bat Activity Category
GL1	*Pipistrellus pipistrellus*	0	0	0	0	1	2	Low
GL2	*Nyctalus leisleri*	0	0	0	0	1	2	Low
GL2	*Pipistrellus pipistrellus*	0	0	1	0	2	2	Low
GL2	*Pipistrellus pygmaeus*	0	0	0	0	1	2	Low
GL3	*Myotis daubentonii*	0	0	0	0	1	2	High
GL3	*Nyctalus leisleri*	0	0	1	0	0	41	Moderate
GL3	*Pipistrellus pipistrellus*	0	0	2	0	1	45	Moderate
GL3	*Pipistrellus pygmaeus*	0	0	0	0	2	2	Low
GL3	*Plecotus auritus*	0	0	0	0	3	19	Low
GL4	*Nyctalus leisleri*	0	0	0	1	3	19	Low
GL4	*Pipistrellus pipistrellus*	0	1	0	0	1	40	Low to Moderate
GL4	*Pipistrellus pygmaeus*	0	0	0	0	1	2	Low
GL5	*Myotis daubentonii*	0	0	0	1	1	16	Low
GL5	*Nyctalus leisleri*	0	0	0	1	2	2	Low
GL5	*Pipistrellus pipistrellus*	0	2	2	0	0	60	Moderate
GL5	*Plecotus auritus*	0	0	0	0	1	2	Low
GL6	*Myotis daubentonii*	0	0	0	0	1	2	Low
GL6	*Myotis mystacinus*	0	0	0	0	1	2	Low
GL6	*Myotis nattereri*	0	0	0	0	4	2	Low

Location	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	Median Percentile	Bat Activity Category
GL6	*Nyctalus leisleri*	0	0	0	1	1	19	Low
GL6	*Pipistrellus nathusii*	0	0	1	0	0	51	Moderate
GL6	*Pipistrellus pipistrellus*	1	0	1	0	2	25	Low to Moderate
GL6	*Pipistrellus pygmaeus*	1	0	0	0	0	86	High
GL6	*Plecotus auritus*	0	0	1	0	0	58	Moderate
GL7	*Pipistrellus nathusii*	0	0	0	0	1	2	Low
GL8	*Nyctalus leisleri*	0	0	1	0	1	29	Low to Moderate
GL8	*Pipistrellus pipistrellus*	0	1	0	0	0	76	Moderate to High
GL8	*Pipistrellus pygmaeus*	0	0	1	0	0	48	Moderate
GL8	*Plecotus auritus*	0	0	0	0	1	2	Low
GL9	*Nyctalus leisleri*	0	0	1	0	1	22	Low to Moderate
GL9	*Pipistrellus pipistrellus*	0	0	1	0	0	48	Moderate
GL9	*Pipistrellus pygmaeus*	0	0	0	0	1	19	Low

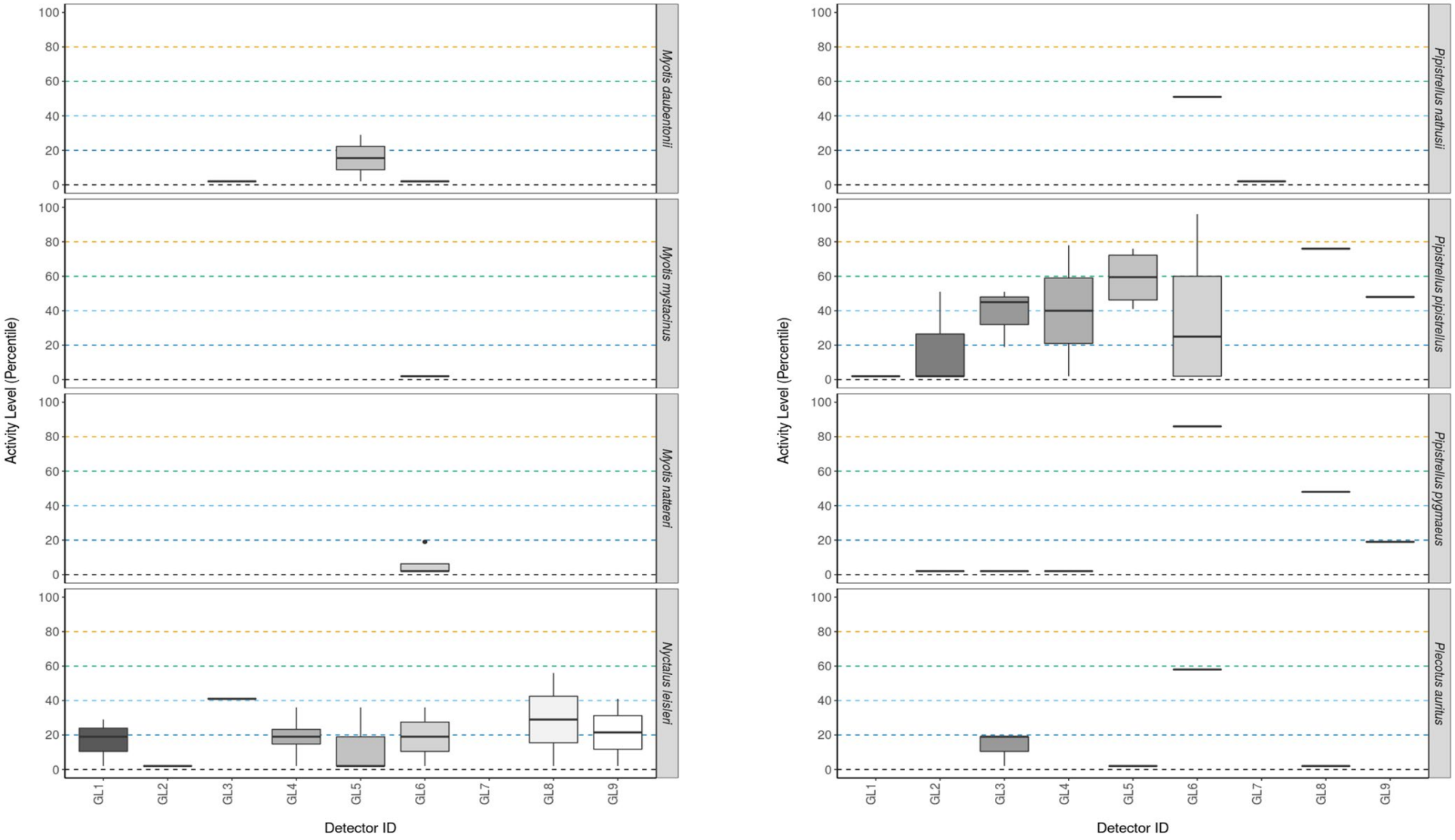
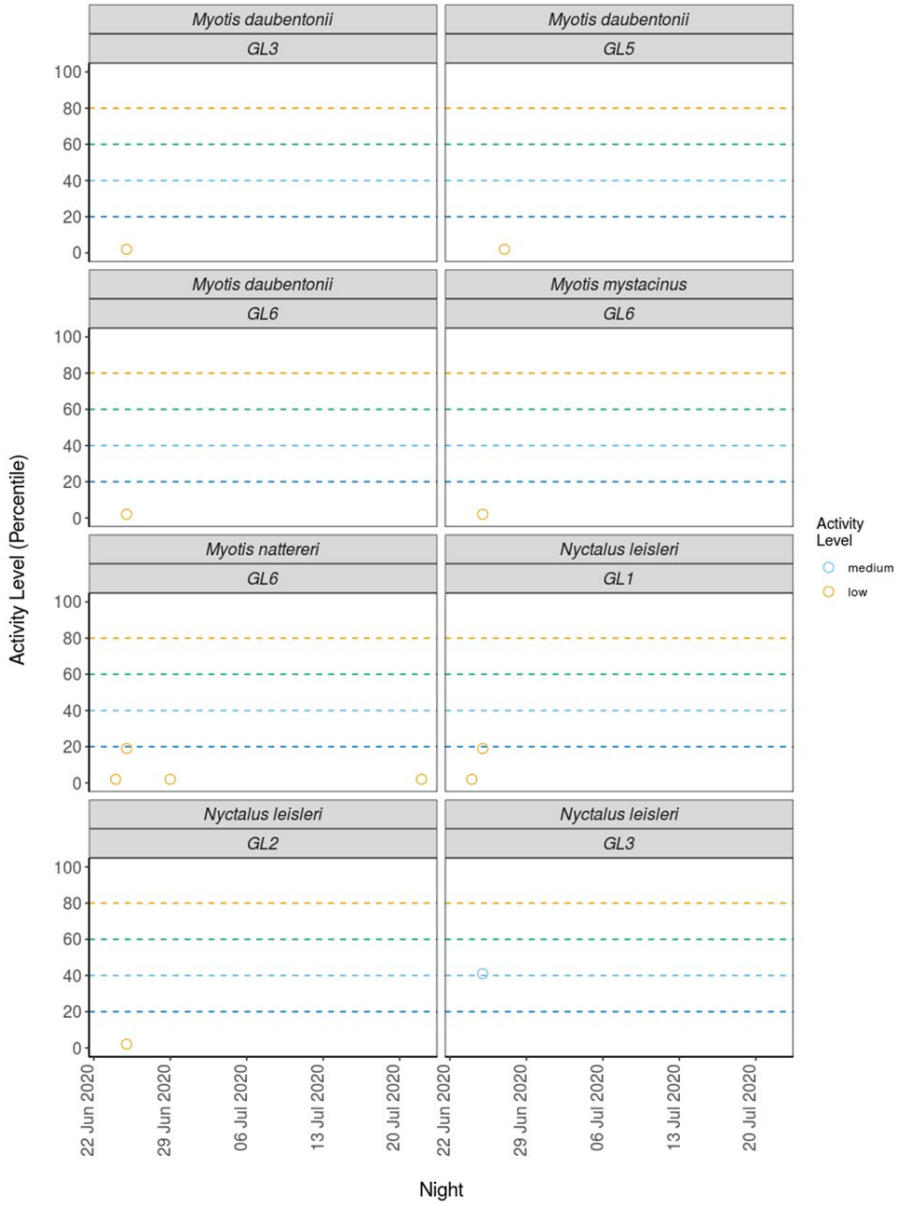
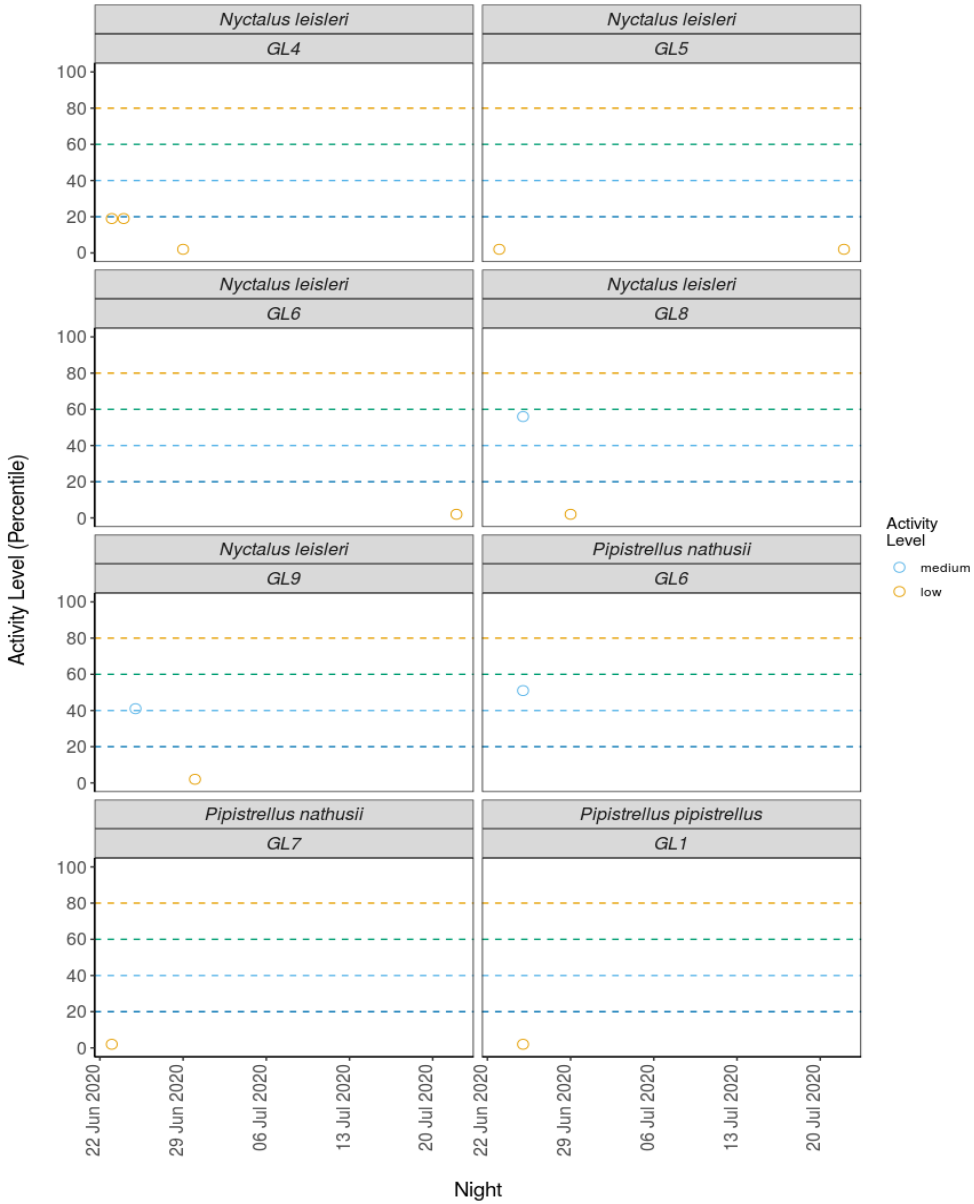
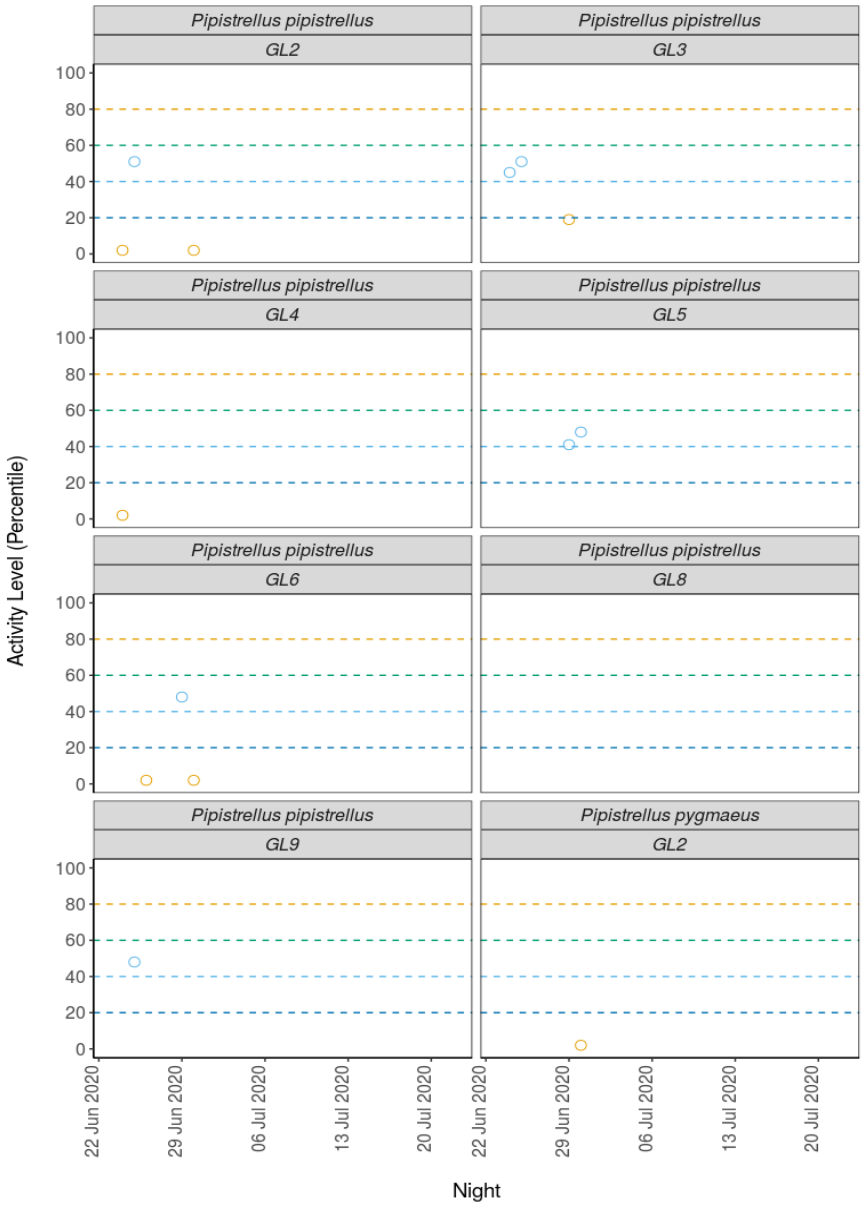
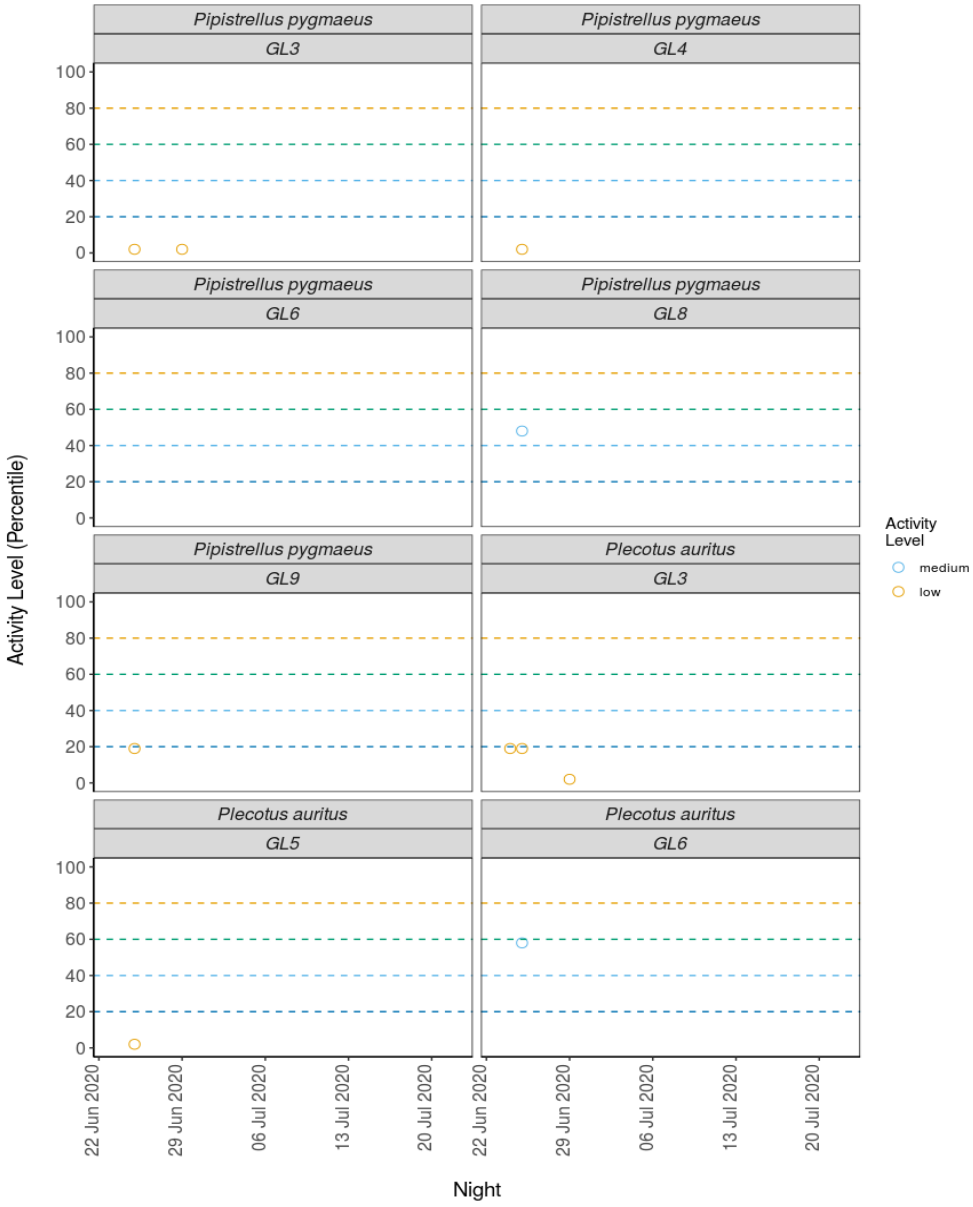


Plate 33: Differences in activity between static detector locations, split by species and location. The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity)


Myotis daubentonii
GL3
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Myotis mystacinus
GL6
Myotis nattereri
GL6
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Activity Level (Percentile)
Night
Activity Level
medium
low
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 2020


Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL7
Pipistrellus pipistrellus
GL1
Activity Level (Percentile)
Night
Activity Level
medium
low
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 2020


Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL4
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL8
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL2
Activity Level (Percentile)
0
20
40
60
80
100
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 2020
Night
Activity Level
medium
low


Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL4
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL8
Pipistrellus pygmaeus
GL9
Plecotus auritus
GL3
Plecotus auritus
GL5
Plecotus auritus
GL6
Activity Level (Percentile)
0
20
40
60
80
100
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 2020
Night
Activity Level
medium
low

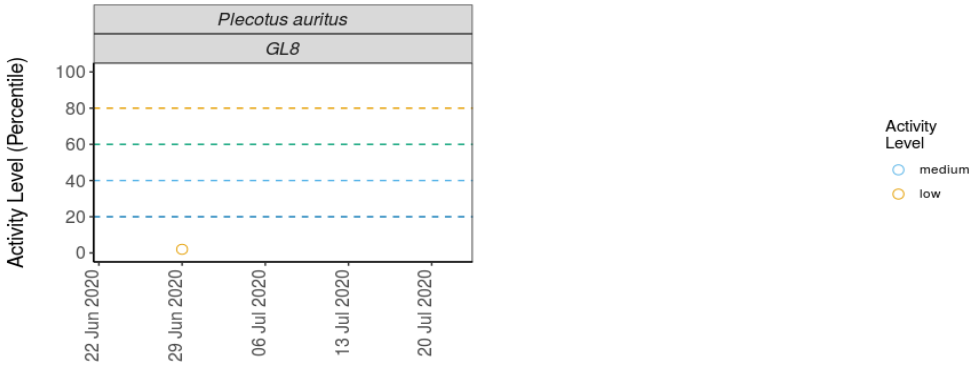


Plate 34: The activity level (percentile) of bats recorded across each night of the bat survey – Survey round 2

Table 4-10: Summary showing the number of nights recorded bat activity fell into each activity band for each species across all of the detectors – Survey round 2

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	Median Percentile	Bat Activity Category
Myotis daubentonii	0	0	0	1	3	2	Low
Myotis mystacinus	0	0	0	0	1	2	Low
Myotis nattereri	0	0	0	0	4	2	Low
Nyctalus leisleri	0	0	3	4	11	19	Low
Pipistrellus nathusii	0	0	1	0	1	27	Low to Moderate
Pipistrellus pipistrellus	1	4	7	0	7	48	Moderate
Pipistrellus pygmaeus	1	0	1	0	5	2	Low
Plecotus auritus	0	0	1	0	5	11	Low

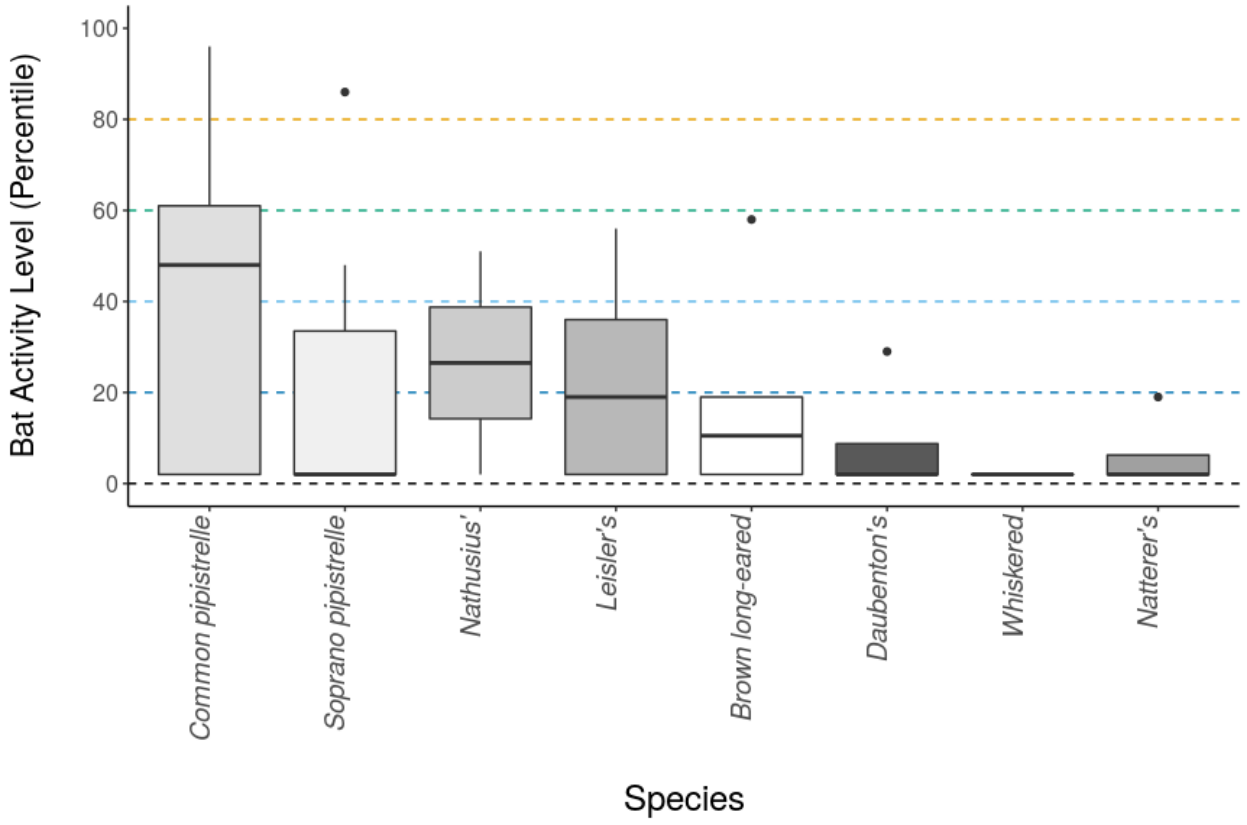


Plate 35: **The activity level (percentile) of bats recorded across each night of the bat survey for the entire site – Survey round 2**

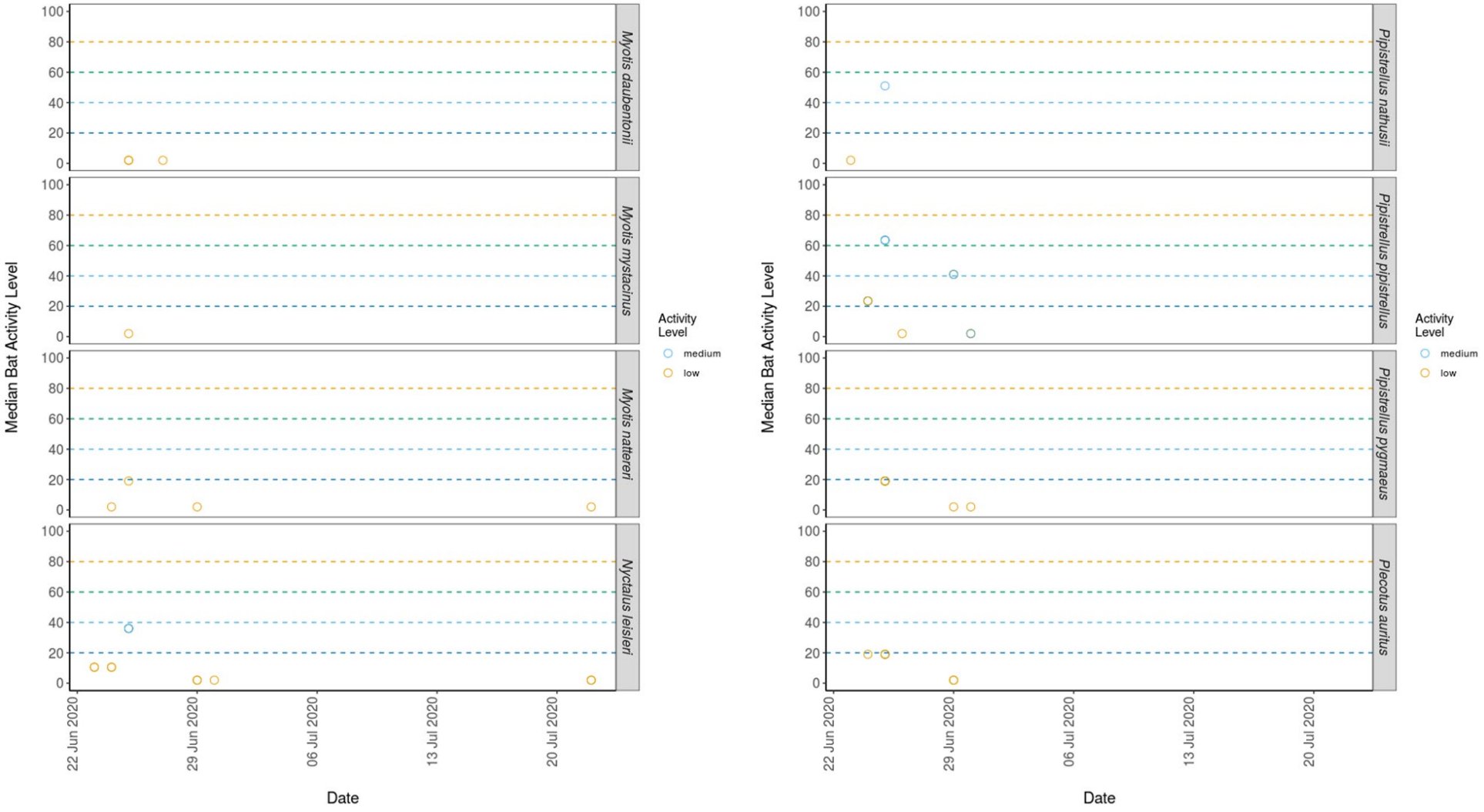


Plate 36: The median activity levels of bats recorded across all detectors each night – Survey round 2.

4.6.3 Survey Round 3 2020

A summary showing the number of nights recorded bat activity within each activity band for each species is presented below in Table 4-11. Refer to Appendix C for the full Ecobat analysis report

Bat surveys were conducted for 29 nights between 15/09/2020 and 13/10/2020 using Wildlife Acoustics static bat detectors. Detectors at GL1 and GL3 failed to record during round 3 2020, so are not considered. Analysis is based on the number of nights the bats were detected on each recorder, therefore the nights no bats were detected have not been provided within the analysis.

All the six static locations had at least one night of High Activity during the survey round.

The Static location GL6 are deemed to have a High Bat Activity (for specific bat species) level based on the Median Percentile value, for common and soprano pipistrelle.

Refer to Plates 37 and 38 below.

Table 4-12, along with Plates 39 and 40 show the number of nights recorded bat activity fell into each activity band for each species across all of the detectors.

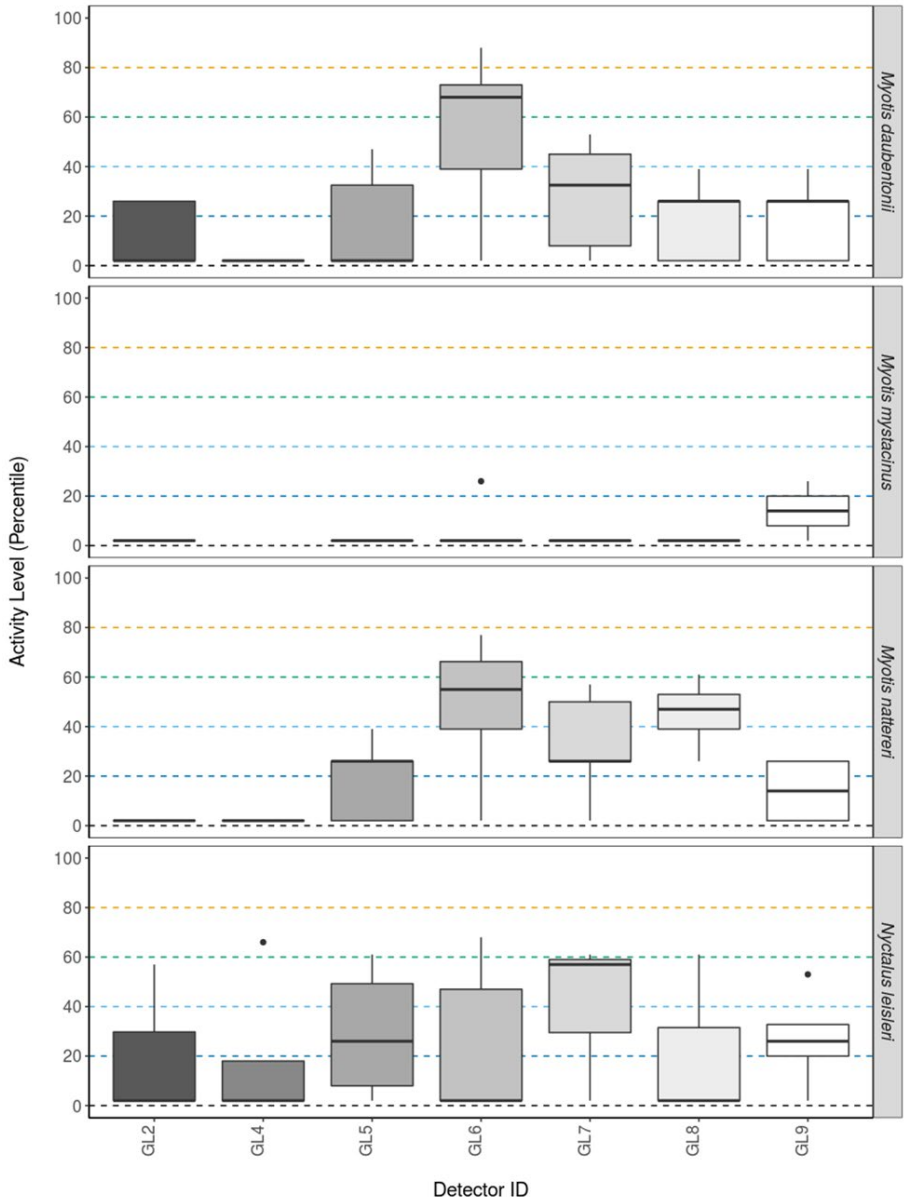
Table 4-11: Summary showing the number of nights recorded bat activity fell into each activity band for each species at each static location and bat activity category based on median percentile – Survey round 3

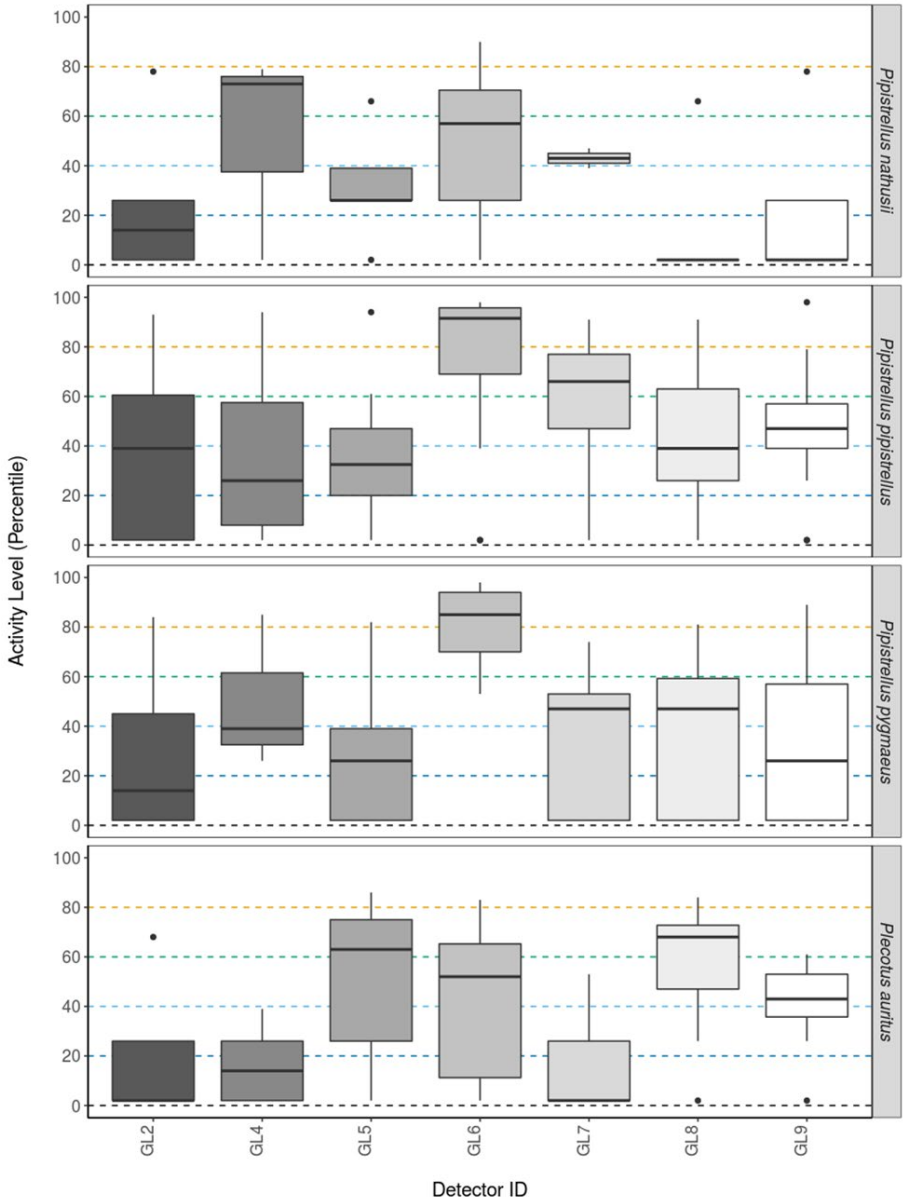
Location	Species/ Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity Category
GL2	*Myotis daubentonii*	0	0	0	3	4	2	Low
GL2	*Myotis mystacinus*	0	0	0	0	1	2	Low
GL2	*Myotis nattereri*	0	0	0	0	2	2	Low
GL2	*Nyctalus leisleri*	0	0	1	1	4	2	Low
GL2	*Pipistrellus nathusii*	0	1	0	2	3	14	Low
GL2	*Pipistrellus pipistrellus*	2	2	2	3	5	39	Low to Moderate
GL2	*Pipistrellus pygmaeus*	1	1	1	2	5	14	Low
GL2	*Plecotus auritus*	0	1	0	2	5	2	Low
GL4	*Myotis daubentonii*	0	0	0	0	2	2	Low

Location	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	Median Percentile	Bat Activity Category
GL4	*Myotis nattereri*	0	0	0	0	2	2	Low
GL4	*Nyctalus leisleri*	0	1	0	0	3	2	Low
GL4	*Pipistrellus nathusii*	0	2	0	0	1	73	Moderate to high
GL4	*Pipistrellus pipistrellus*	2	2	1	5	4	26	Low to Moderate
GL4	*Pipistrellus pygmaeus*	1	1	1	4	0	39	Low to Moderate
GL4	*Plecotus auritus*	0	0	0	3	3	14	Low
GL5	*Myotis daubentonii*	0	0	1	2	4	2	Low
GL5	*Myotis mystacinus*	0	0	0	0	2	2	Low
GL5	*Myotis nattereri*	0	0	0	4	3	26	Low to Moderate
GL5	*Nyctalus leisleri*	0	1	1	2	2	26	Low to Moderate
GL5	*Pipistrellus nathusii*	0	1	0	3	1	26	Low to Moderate
GL5	*Pipistrellus pipistrellus*	1	1	5	5	4	33	Low to Moderate
GL5	*Pipistrellus pygmaeus*	1	0	0	6	5	26	Low to Moderate
GL5	*Plecotus auritus*	2	4	1	2	2	63	Moderate to High
GL5	*Rhinolophus hipposideros*	0	0	0	0	1	2	Low
GL6	*Myotis daubentonii*	1	6	1	3	1	68	Moderate to High
GL6	*Myotis mystacinus*	0	0	0	1	4	2	Low
GL6	*Myotis nattereri*	0	4	2	2	2	55	Moderate
GL6	*Nyctalus leisleri*	0	1	1	0	3	2	Low

Location	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	Median Percentile	Bat Activity Category
GL6	*Pipistrellus nathusii*	2	3	2	2	2	57	Moderate
GL6	*Pipistrellus pipistrellus*	11	3	1	1	2	92	High
GL6	*Pipistrellus pygmaeus*	9	3	1	0	0	85	High
GL6	*Plecotus auritus*	2	3	4	1	4	52	Moderate
GL7	*Myotis daubentonii*	0	0	2	2	2	33	Low to Moderate
GL7	*Myotis mystacinus*	0	0	0	0	4	2	Low
GL7	*Myotis nattereri*	0	0	3	3	1	26	Low to Moderate
GL7	*Nyctalus leisleri*	0	1	1	0	1	57	Moderate
GL7	*Pipistrellus nathusii*	0	0	1	1	0	43	Moderate
GL7	*Pipistrellus pipistrellus*	2	7	3	2	1	66	Moderate to High
GL7	*Pipistrellus pygmaeus*	0	2	5	2	4	47	Moderate
GL7	*Plecotus auritus*	0	0	2	2	6	2	Low
GL7	*Rhinolophus hipposideros*	0	0	0	1	2	2	Moderate
GL8	*Myotis daubentonii*	0	0	0	5	3	26	Low to Moderate
GL8	*Myotis mystacinus*	0	0	0	0	1	2	Low
GL8	*Myotis nattereri*	0	1	4	3	0	47	Moderate
GL8	*Nyctalus leisleri*	0	1	0	0	2	2	Low
GL8	*Pipistrellus nathusii*	0	1	0	0	4	2	Low
GL8	*Pipistrellus pipistrellus*	3	1	2	4	3	39	Low to Moderate

Location	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	Median Percentile	Bat Activity Category
GL8	*Pipistrellus pygmaeus*	1	2	4	1	4	47	Moderate
GL8	*Plecotus auritus*	1	5	2	1	1	68	Moderate to High
GL9	*Myotis daubentonii*	0	0	0	4	3	26	Low to Moderate
GL9	*Myotis mystacinus*	0	0	0	1	1	14	Low
GL9	*Myotis nattereri*	0	0	0	2	2	14	Low
GL9	*Nyctalus leisleri*	0	0	1	2	1	26	Low to Moderate
GL9	*Pipistrellus nathusii*	0	1	0	1	3	2	Low
GL9	*Pipistrellus pipistrellus*	1	2	5	3	2	47	Moderate
GL9	*Pipistrellus pygmaeus*	1	1	1	2	4	26	Low to Moderate
GL9	*Plecotus auritus*	0	1	3	3	1	43	Moderate


Activity Level (Percentile)
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Activity Level (Percentile)
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

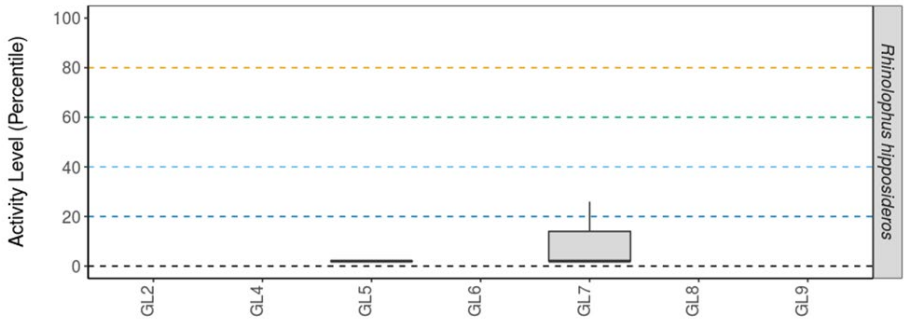
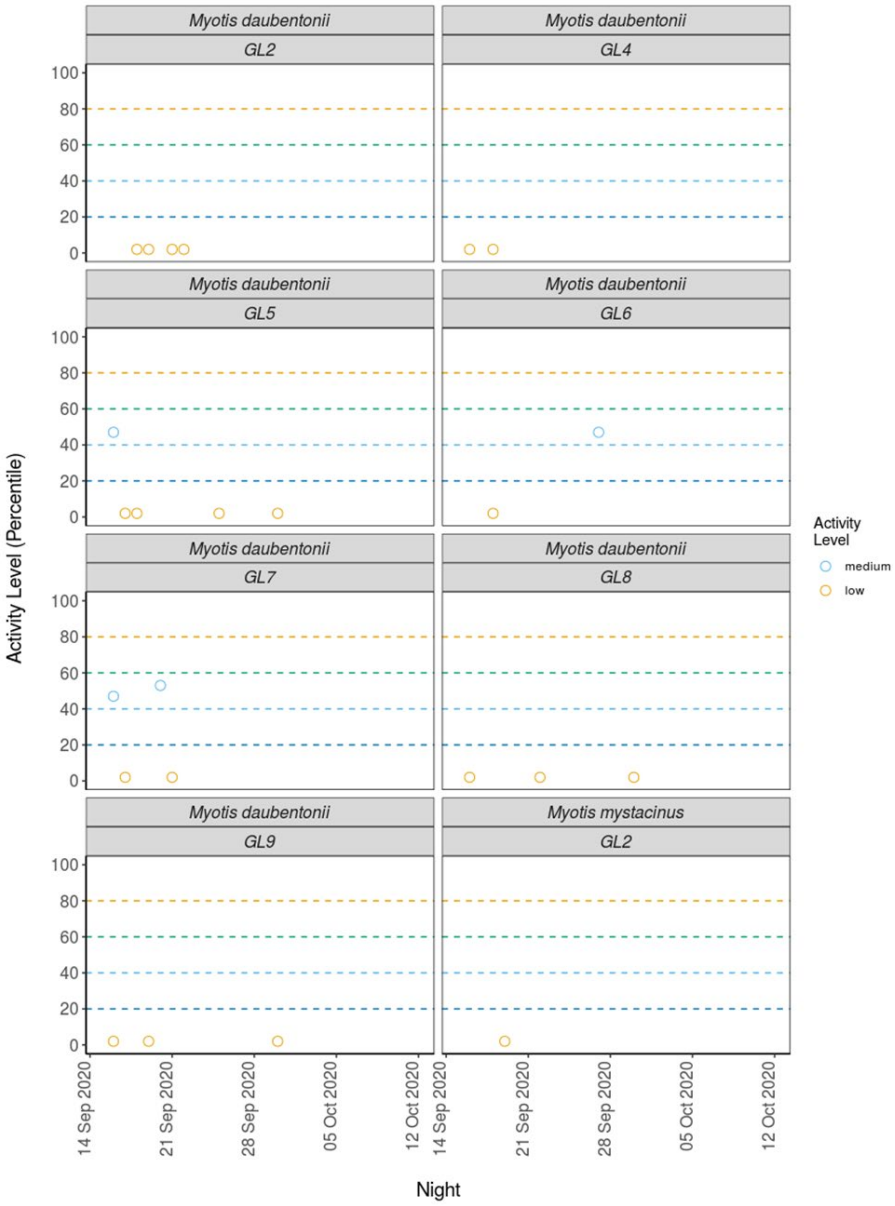
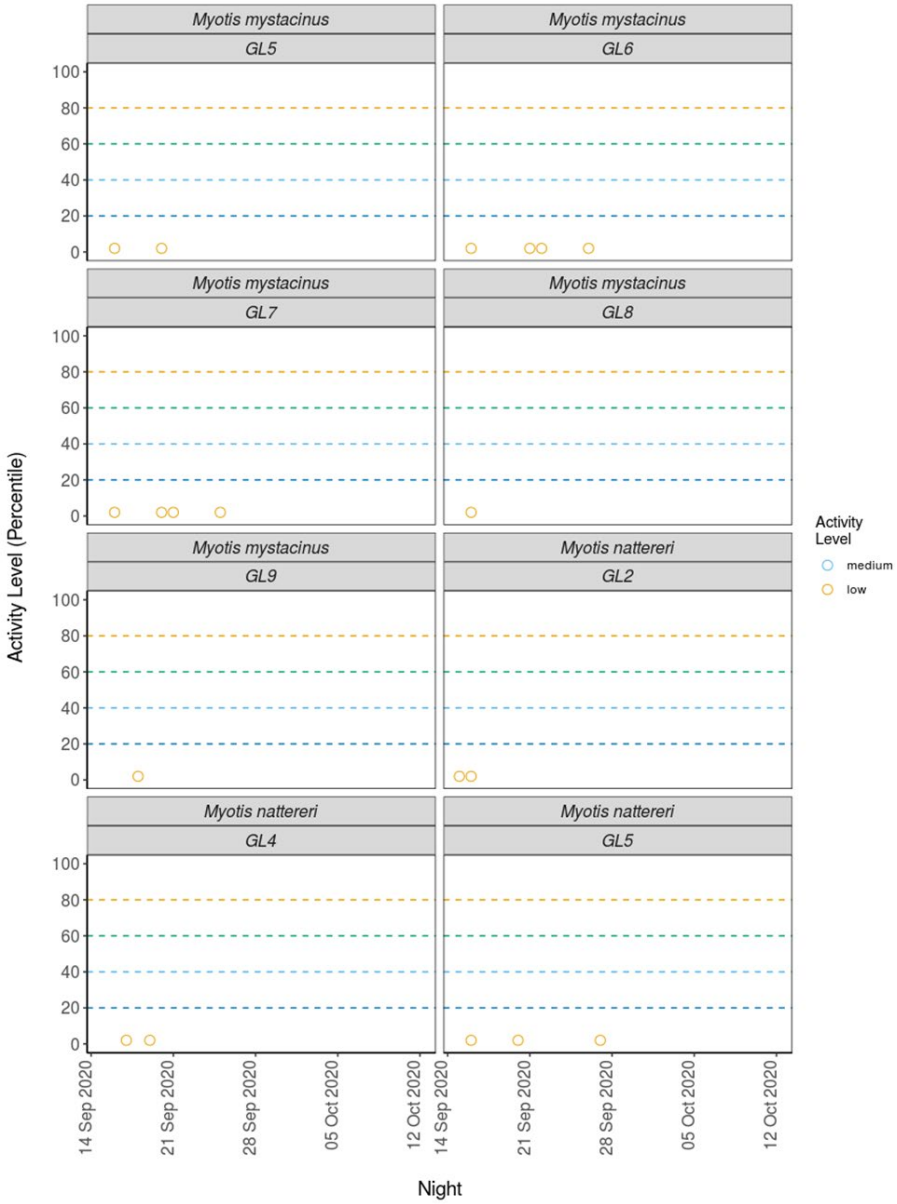
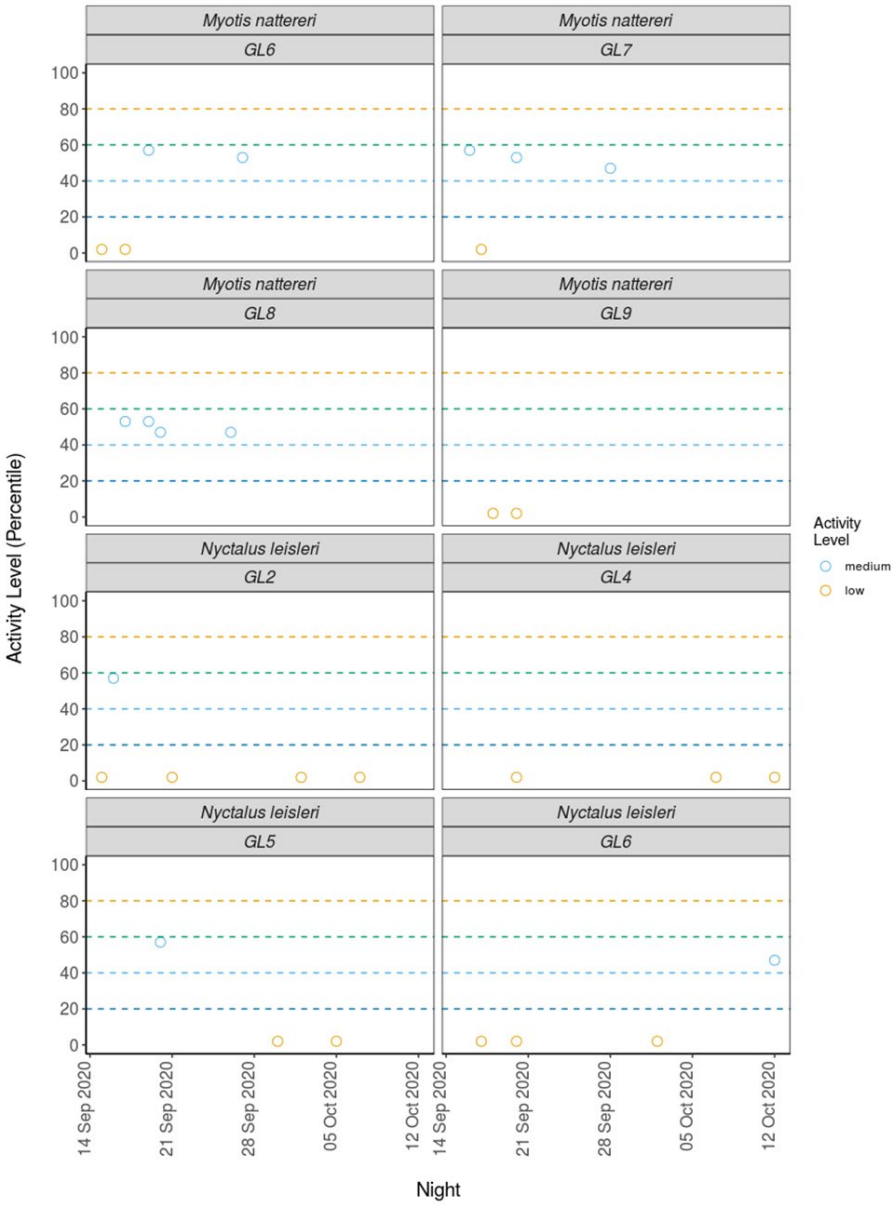
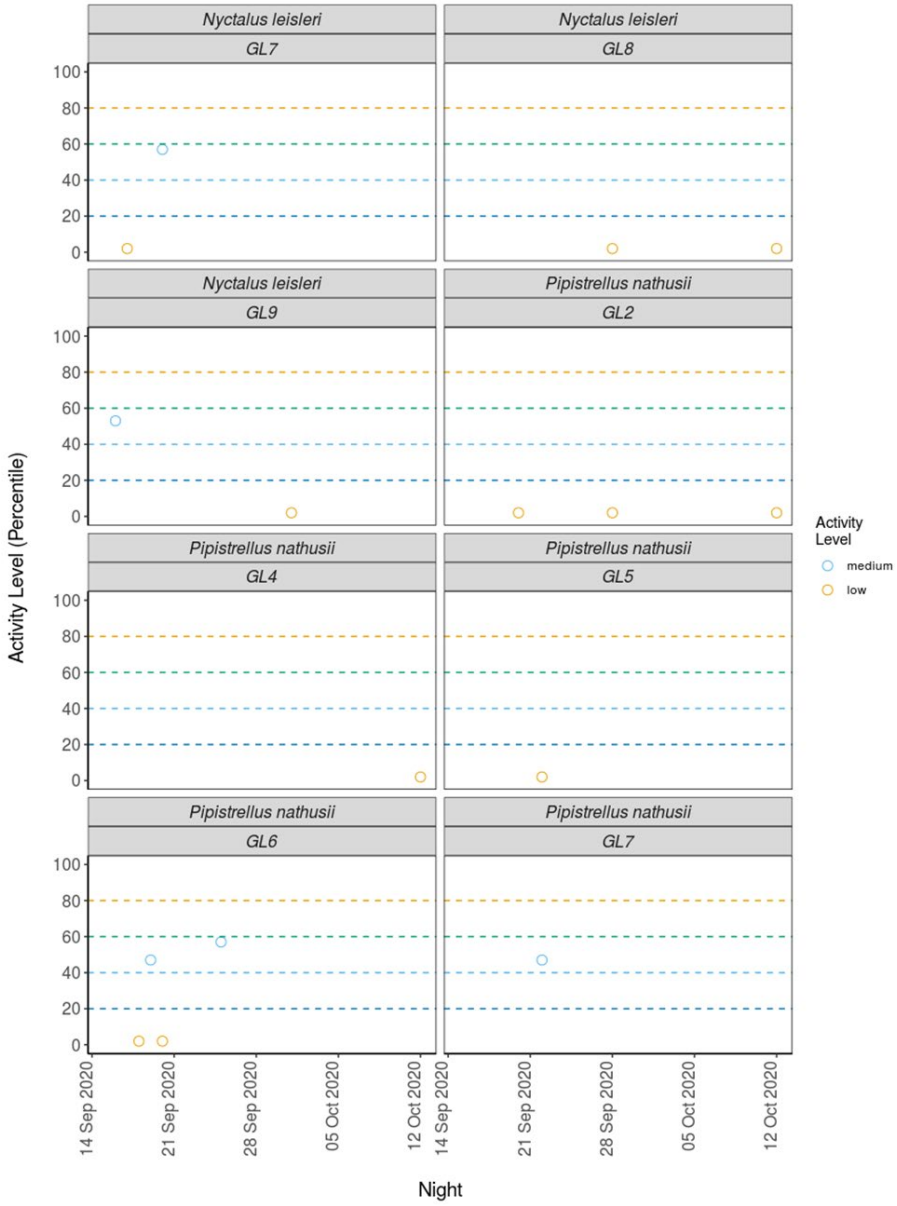


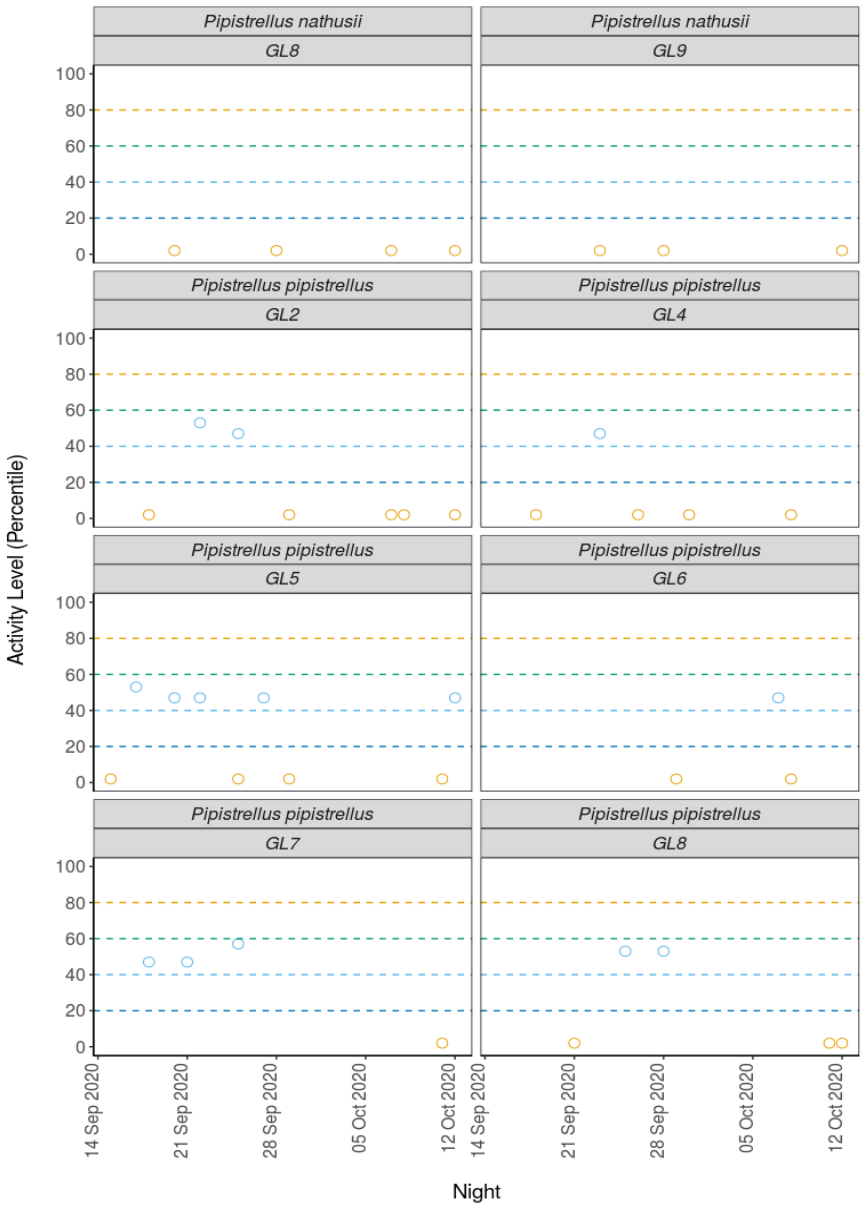
Plate 37: **Differences in activity between static detector locations, split by species and location. The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity) – Survey round 3**

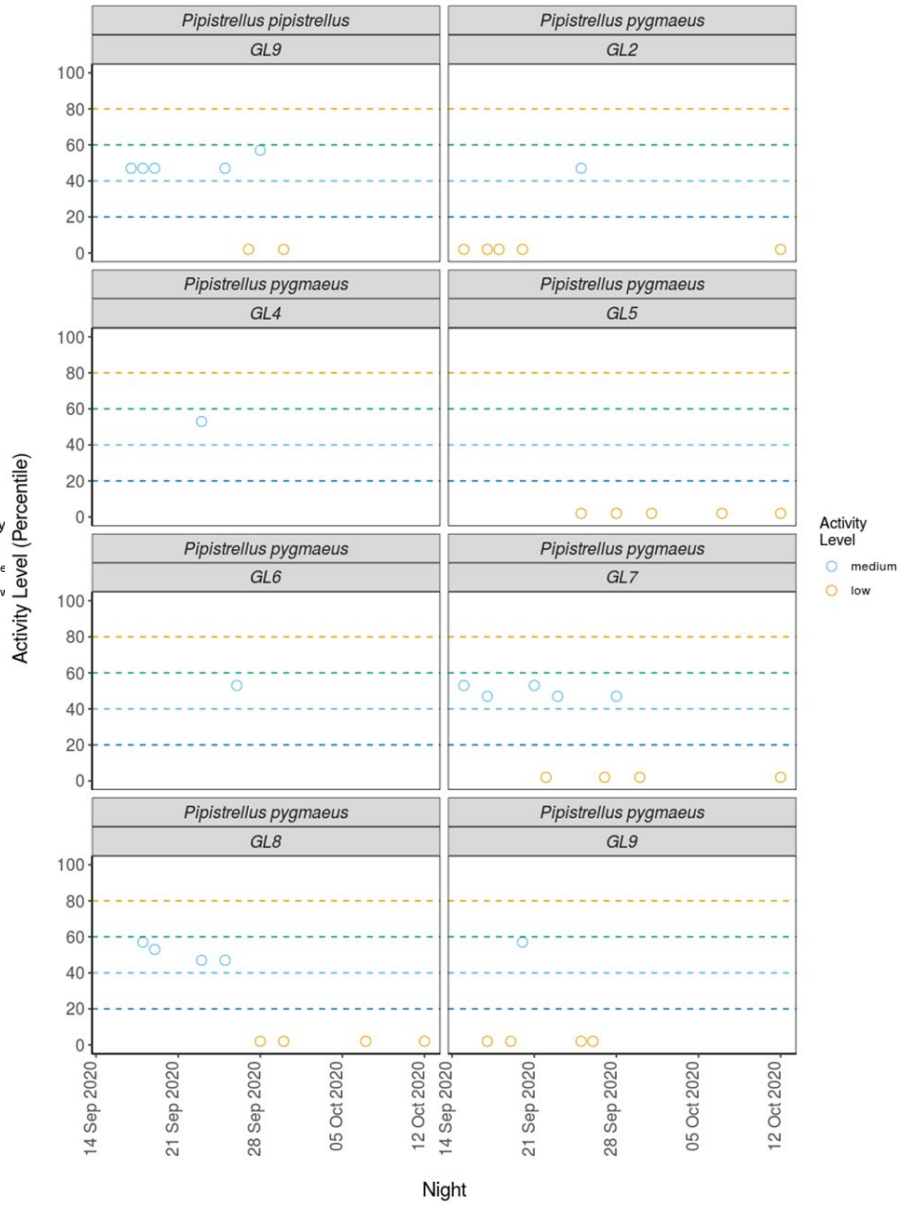

Myotis daubentonii
GL2
Myotis daubentonii
GL4
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Myotis daubentonii
GL7
Myotis daubentonii
GL8
Myotis daubentonii
GL9
Myotis mystacinus
GL2
Activity Level (Percentile)
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low

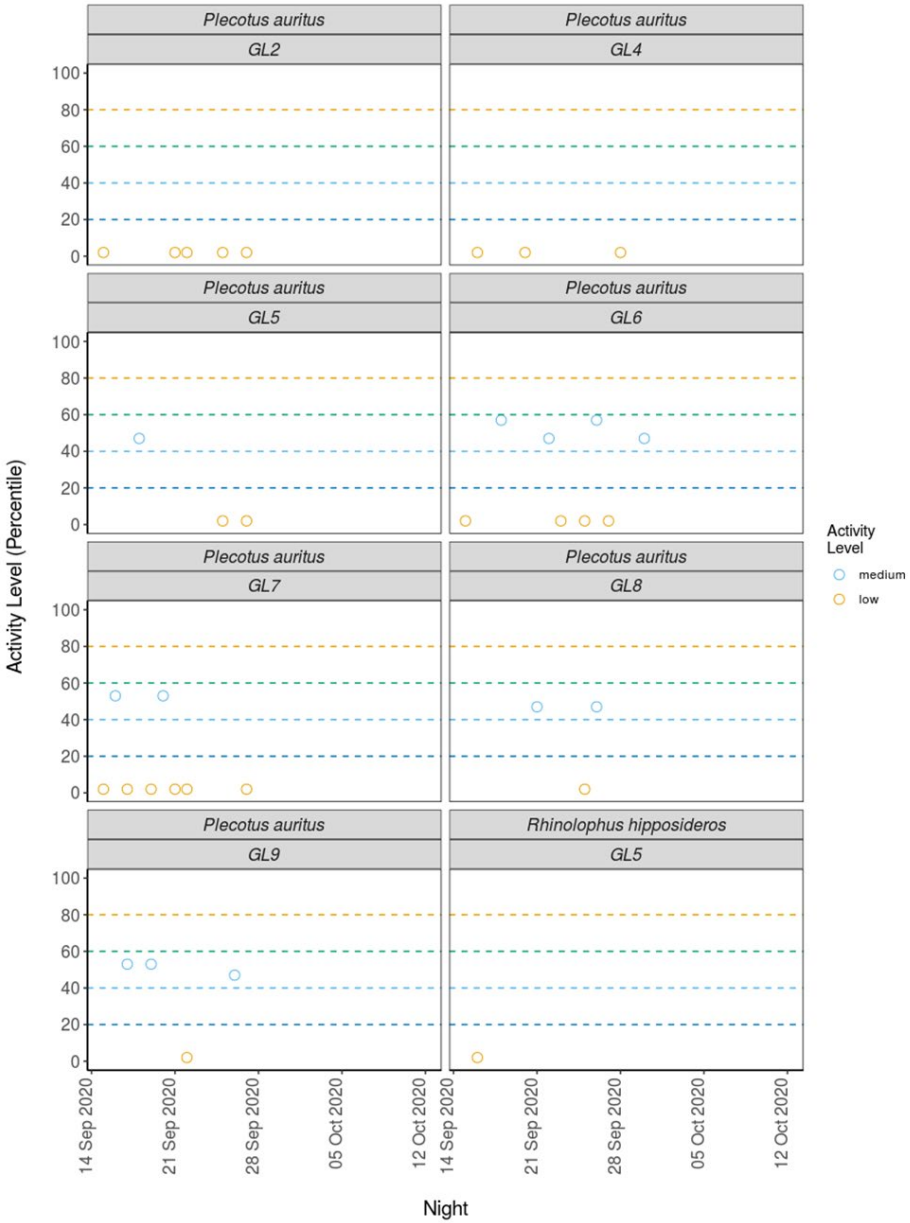

Myotis mystacinus
GL5
Myotis mystacinus
GL6
Myotis mystacinus
GL7
Myotis mystacinus
GL8
Myotis mystacinus
GL9
Myotis nattereri
GL2
Myotis nattereri
GL4
Myotis nattereri
GL5
Activity Level (Percentile)
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low


Myotis nattereri
GL6
Myotis nattereri
GL7
Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL2
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Activity Level (Percentile)
0
20
40
60
80
100
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low


Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL2
Pipistrellus nathusii
GL4
Pipistrellus nathusii
GL5
Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL7
Activity Level (Percentile)
0
20
40
60
80
100
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low


Pipistrellus nathusii
GL8
Pipistrellus nathusii
GL9
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL4
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL8
Activity Level (Percentile)
0
20
40
60
80
100
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
me
lov


Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL4
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL8
Pipistrellus pygmaeus
GL9
Activity Level (Percentile)
0
20
40
60
80
100
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low



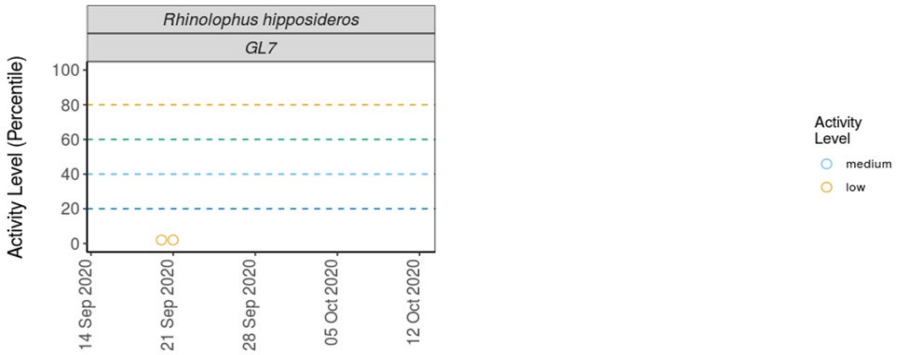


Plate 38: **The activity level (percentile) of bats recorded across each night of the bat survey – Survey round 3**

Table 4-12: Summary showing the number of nights recorded bat activity fell into each activity band for each species across all of the detectors – Survey round 3

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	Median Percentile	Bat Activity Category
Myotis daubentonii	1	6	4	19	19	26	Low to Moderate
Myotis mystacinus	0	0	0	2	13	2	Low
Myotis nattereri	0	5	9	14	12	26	Low to Moderate
Nyctalus leisleri	0	5	5	5	16	2	Low
Pipistrellus nathusii	2	9	3	9	14	26	Low to Moderate
Pipistrellus pipistrellus	22	18	19	23	21	47	Moderate
Pipistrellus pygmaeus	14	10	13	17	22	39	Low to Moderate
Plecotus auritus	5	14	12	14	22	39	Low to Moderate
Rhinolophus hipposideros	0	0	0	1	3	2	Low

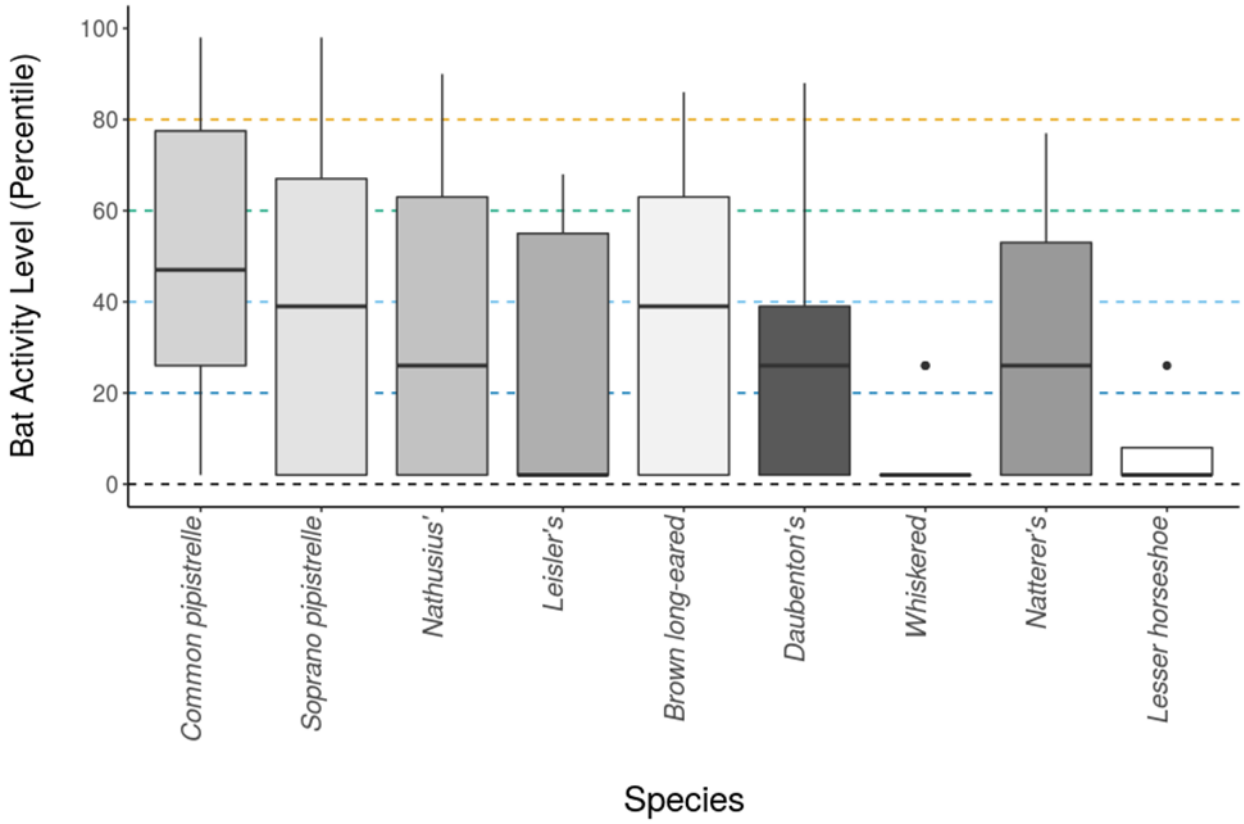
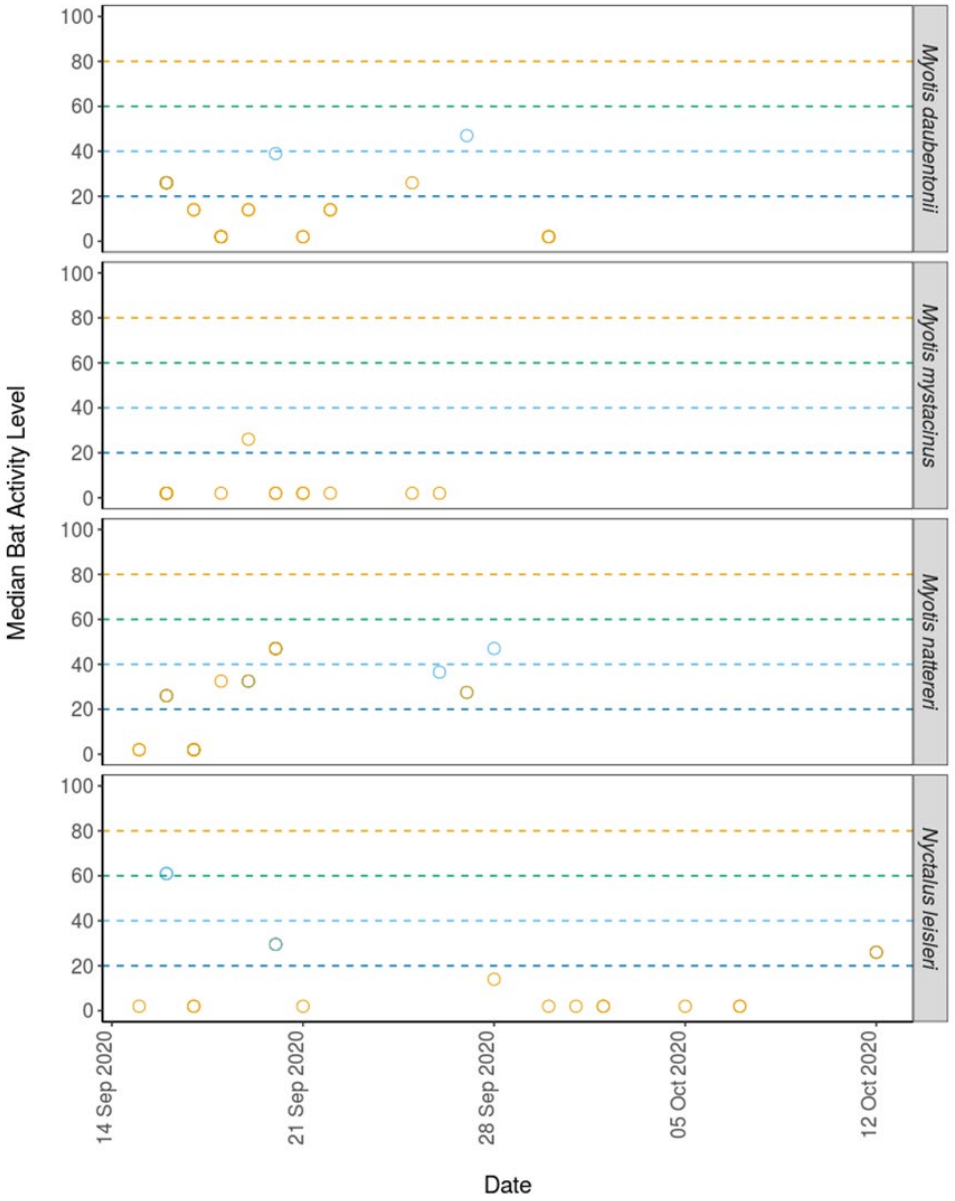
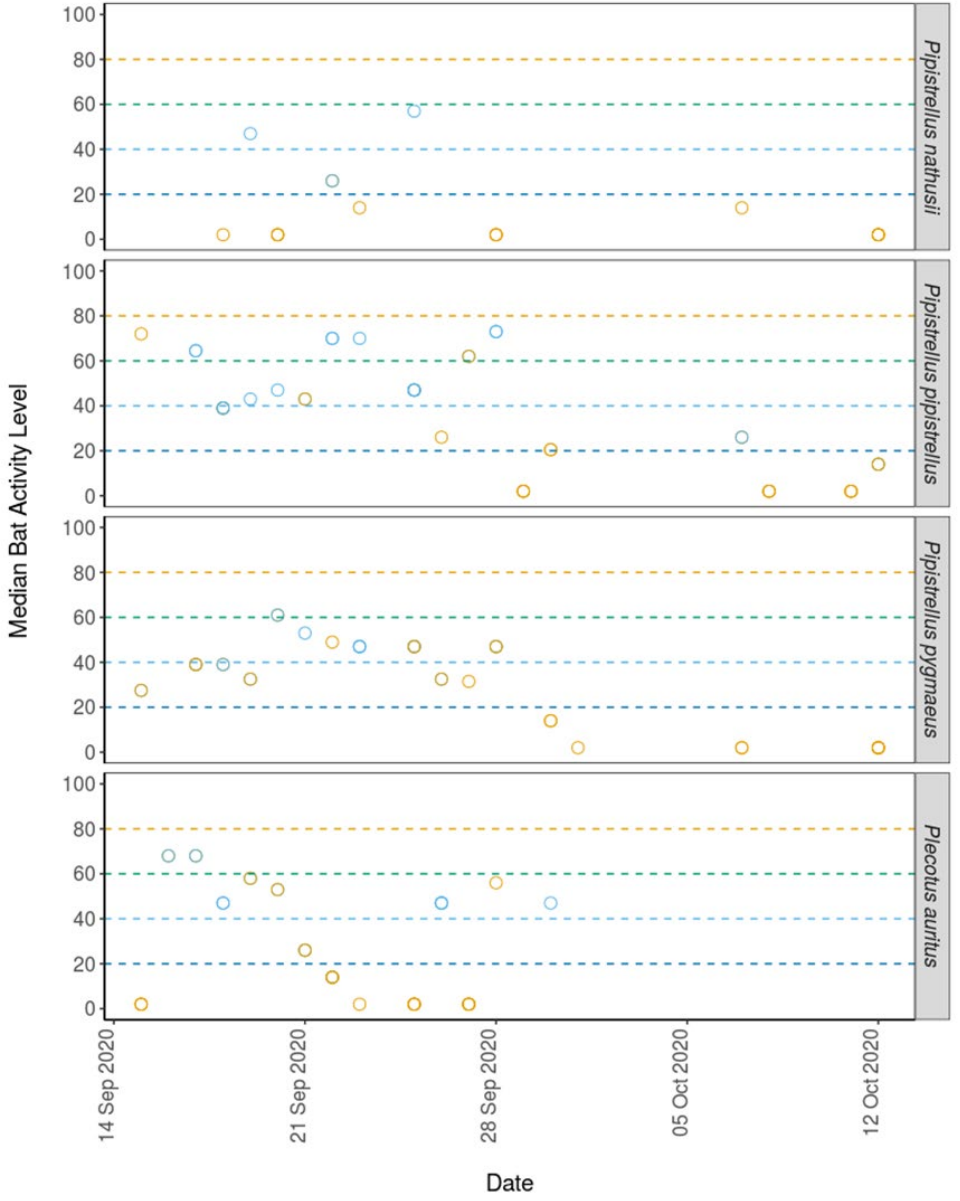


Plate 39: **The activity level (percentile) of bats recorded across each night of the bat survey for the entire site – Survey round 3.**


Median Bat Activity Level
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Date


Median Bat Activity Level
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Date
Activity Level
medium
low

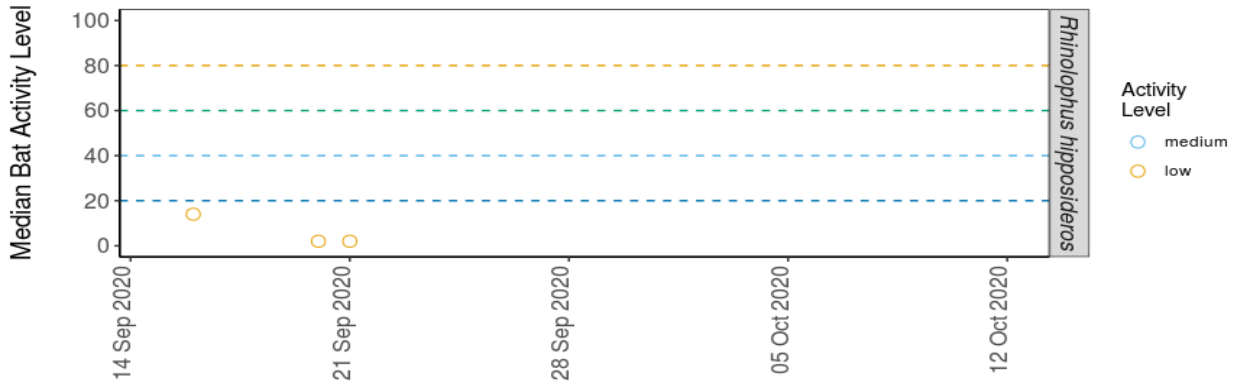
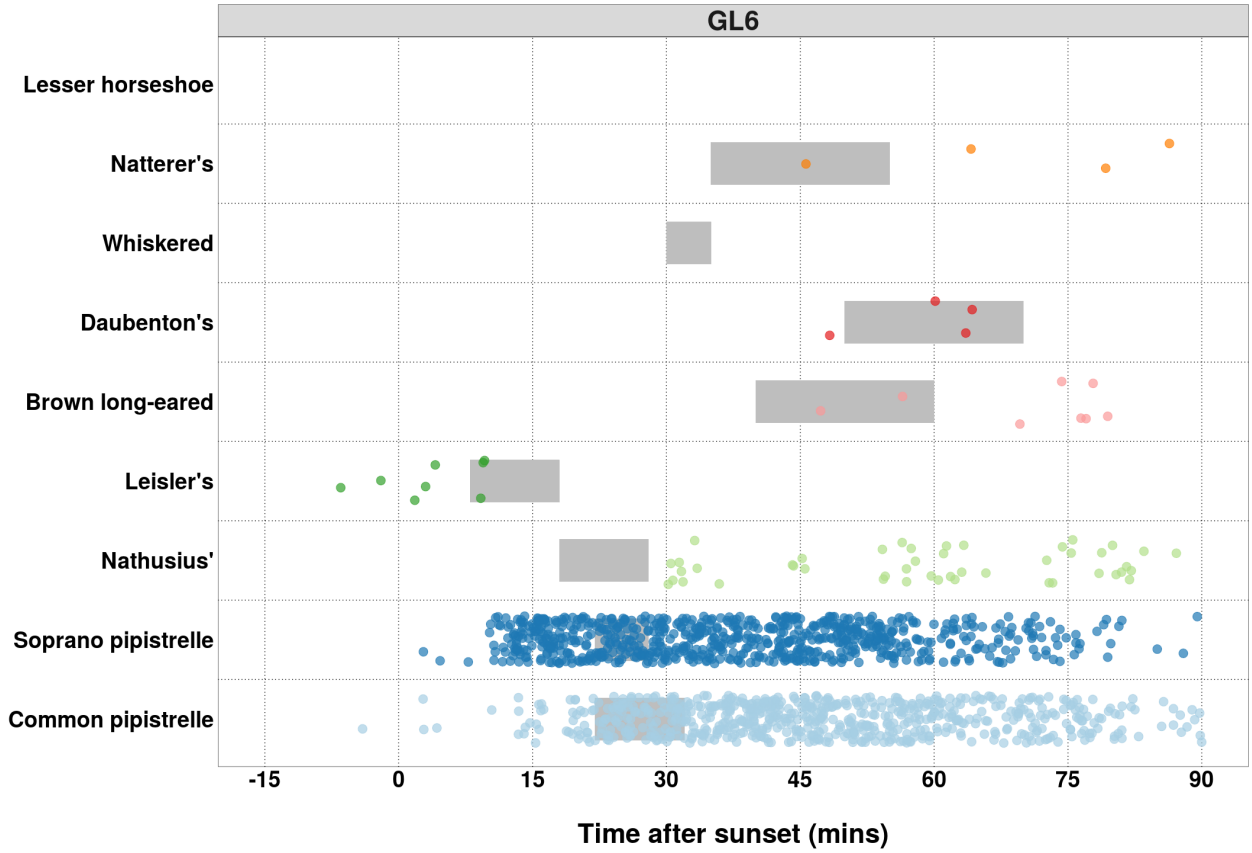
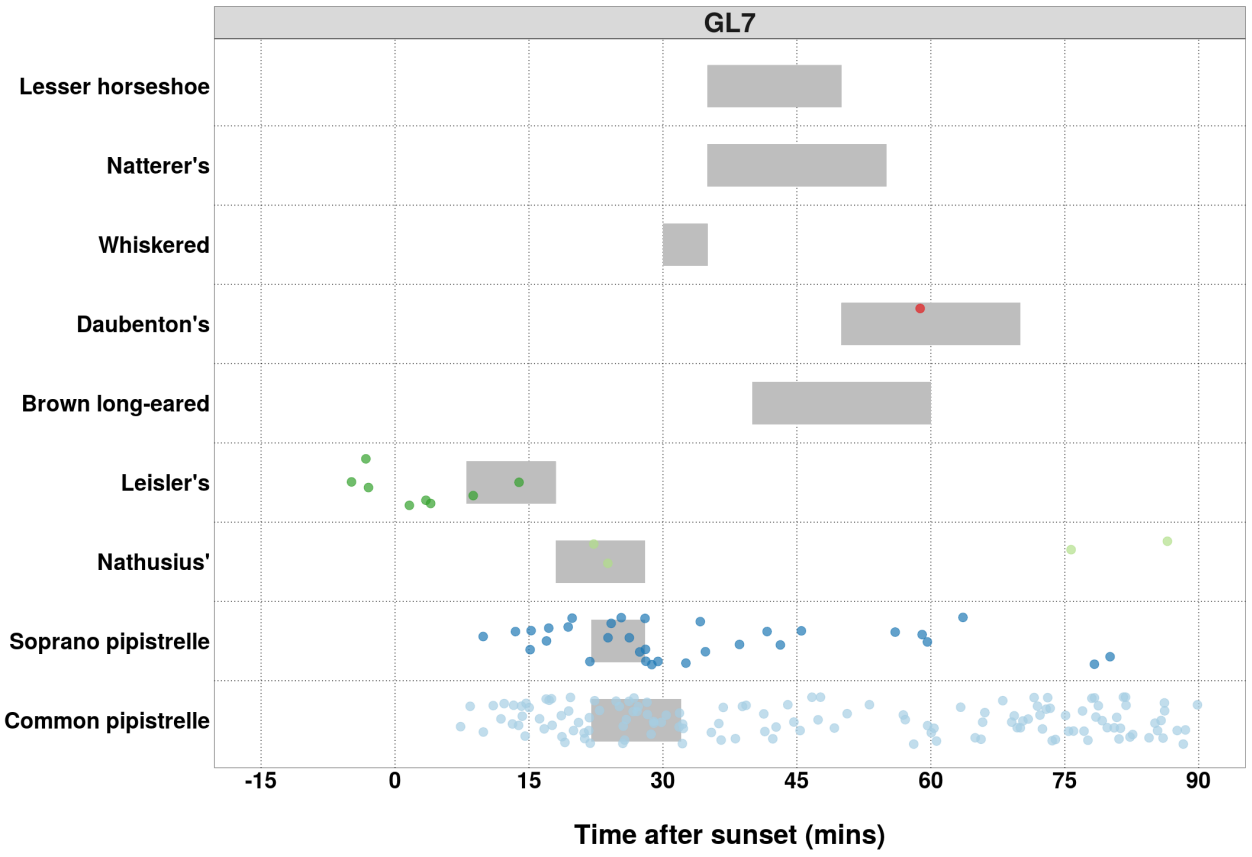


Plate 40: The median activity levels of bats recorded across all detectors each night – Survey round 3.

Due to the number of the recorded passes occurring within the species-specific emergence time ranges based on Russ 2012, the Ecobat analysis has identified a potential roost may be present near static location GL6 (T05), GL7 (T06) and GL8 (T04) for Leisler bat, common pipistrelle and soprano pipistrelle. Refer to Plate 41 which shows passes in relation to the time from 15 minutes before to 90 minutes after sunset.


GL6
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL7
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

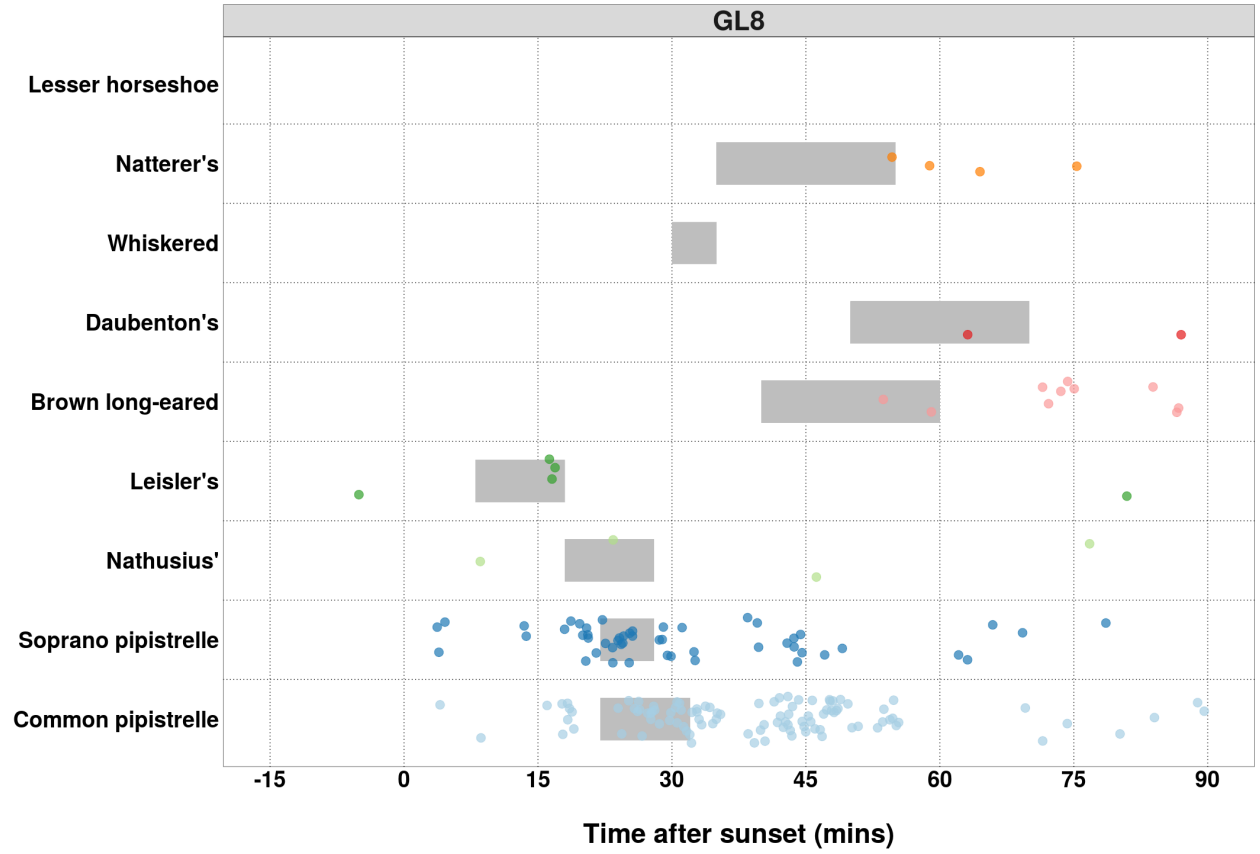


Plate 41: Time from 15 minutes before to 90 minutes after sunset, potentially indicating the presence of a nearby roost – Survey round 3.

4.6.4 Survey Round 1 2021

A summary showing the number of nights recorded bat activity within each activity band for each species is presented below in Table 4-13. Refer to Appendix D for the full Ecobat analysis report

Bat surveys were conducted for 25 nights between 22/04/2021 and 16/05/2021 using Wildlife Acoustics SM4BAT-FS static bat detectors. Analysis is based on the number of nights the bats were detected on each recorder, therefore the nights no bats were detected have not been provided within the analysis, this is available within the Ecobat report in Appendix D.

The static locations GL5 had two nights of High Activity for common pipistrelle during the survey round.

The Static location GL2 is deemed to have a High Bat Activity (for specific bat species) level based on the Median Percentile value for Leisler's bat.

Refer to Plates 42 and 43 below.

Table 4-14, along with Plates 44 and 45 show the number of nights recorded bat activity fell into each activity band for each species across all the detectors.

Table 4-13: Bat activity within each activity band for each species – Survey round 1

Location	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	Median Percentile	Bat Activity Category
GL1	*Myotis daubentonii*	0	0	0	0	2	7	Low
GL1	*Myotis nattereri*	0	0	0	0	1	7	Low
GL1	*Nyctalus leisleri*	0	1	2	0	2	49	Moderate
GL1	*Pipistrellus pipistrellus*	0	0	0	2	3	7	Low
GL1	*Pipistrellus pygmaeus*	0	0	0	0	1	7	Low
GL1	*Plecotus auritus*	0	0	0	0	2	7	Low
GL2	*Myotis nattereri*	0	0	0	0	1	7	Low
GL2	*Nyctalus leisleri*	6	1	0	0	0	94	High
GL2	*Pipistrellus nathusii*	0	0	0	0	1	7	Low

Location	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	Median Percentile	Bat Activity Category
GL2	*Pipistrellus pipistrellus*	2	1	1	1	1	64	Moderate to High
GL2	*Pipistrellus pygmaeus*	0	0	0	0	1	7	Low
GL2	*Plecotus auritus*	0	0	0	0	2	7	Low
GL3	*Myotis mystacinus*	0	0	0	0	1	7	Low
GL3	*Nyctalus leisleri*	0	0	0	2	1	27	Low to Moderate
GL3	*Pipistrellus pipistrellus*	0	0	0	0	3	7	Low
GL3	*Pipistrellus pygmaeus*	0	0	0	0	1	7	Low
GL3	*Plecotus auritus*	0	0	0	4	4	17	Low
GL4	*Myotis daubentonii*	0	0	0	0	1	7	Low
GL4	*Myotis mystacinus*	0	0	0	0	1	7	Low
GL4	*Nyctalus leisleri*	0	0	0	0	1	7	Low
GL4	*Plecotus auritus*	0	0	0	3	6	7	Low
GL5	*Myotis daubentonii*	0	0	0	2	5	7	Low
GL5	*Myotis nattereri*	0	0	0	1	2	7	Low
GL5	*Nyctalus leisleri*	0	0	0	0	1	7	Low
GL5	*Pipistrellus nathusii*	0	0	1	0	0	53	Moderate
GL5	*Pipistrellus pipistrellus*	0	0	0	0	2	7	Low
GL5	*Pipistrellus pygmaeus*	0	0	0	1	1	23	Low to Moderate
GL5	*Plecotus auritus*	0	0	4	5	1	38	Low to Moderate

Location	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	Median Percentile	Bat Activity Category
GL6	*Myotis mystacinus*	0	0	0	0	1	7	Low
GL6	*Nyctalus leisleri*	0	0	2	4	0	33	Low to Moderate
GL6	*Pipistrellus pipistrellus*	0	0	0	0	3	7	Low
GL6	*Pipistrellus pygmaeus*	0	0	0	0	1	7	Low
GL6	*Plecotus auritus*	0	0	0	0	1	7	Low
GL7	*Myotis daubentonii*	0	0	0	0	3	7	Low
GL7	*Myotis mystacinus*	0	0	0	0	1	7	Low
GL7	*Nyctalus leisleri*	0	0	0	0	3	7	Low
GL7	*Pipistrellus pipistrellus*	0	0	0	0	2	7	Low
GL7	*Pipistrellus pygmaeus*	0	0	0	0	1	7	Low
GL7	*Plecotus auritus*	0	0	0	2	1	27	Low to Moderate
GL8	*Nyctalus leisleri*	0	0	0	0	1	7	Low
GL8	*Plecotus auritus*	0	0	0	0	1	7	Low
GL9	*Myotis mystacinus*	0	0	0	0	1	7	Low
GL9	*Myotis nattereri*	0	0	0	0	1	7	Low
GL9	*Nyctalus leisleri*	0	0	0	0	1	7	Low
GL9	*Pipistrellus pipistrellus*	0	0	0	0	2	7	Low
GL9	*Pipistrellus pygmaeus*	0	0	0	0	1	7	Low
GL9	*Plecotus auritus*	0	0	0	1	0	38	Low to Moderate

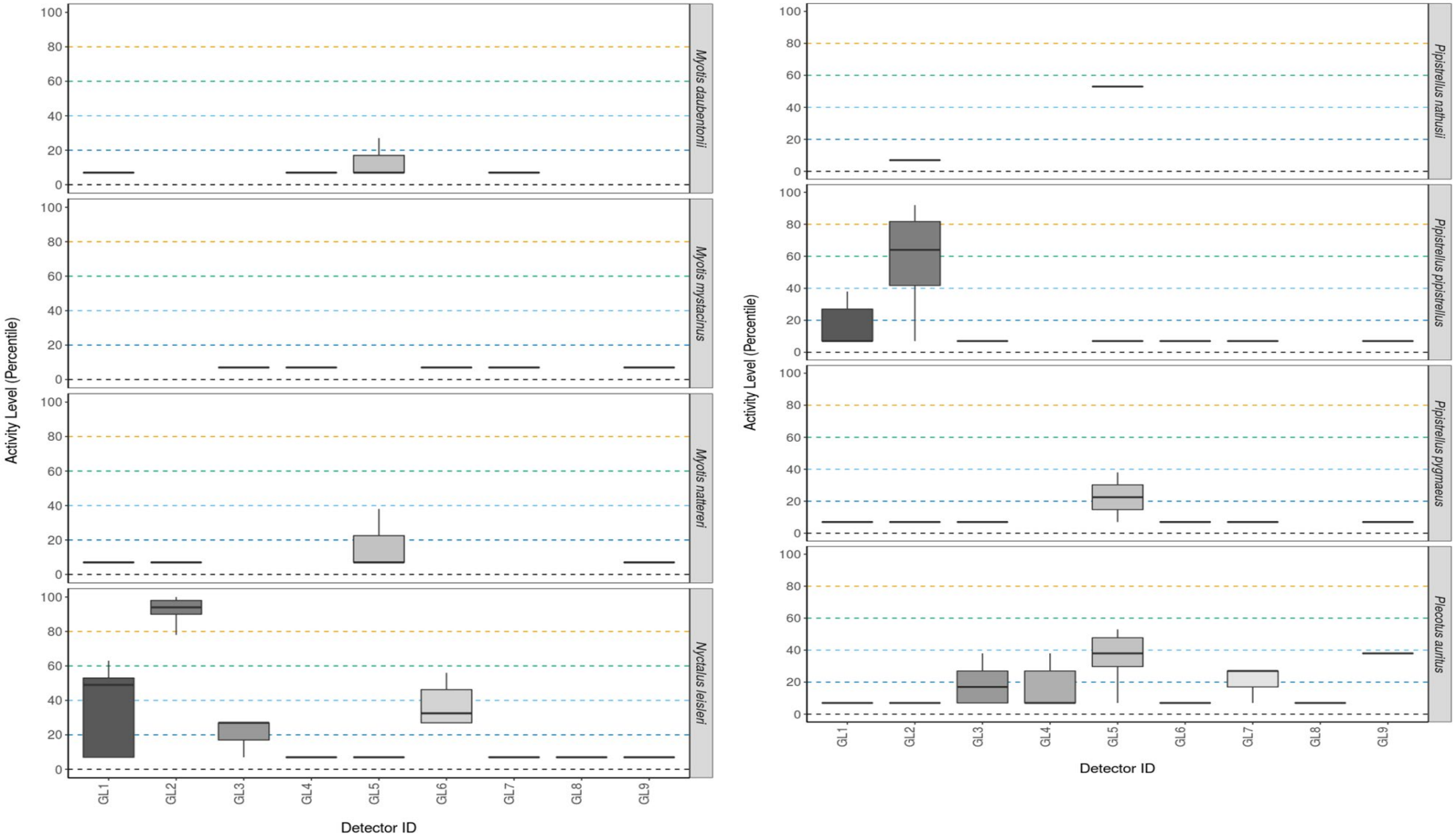
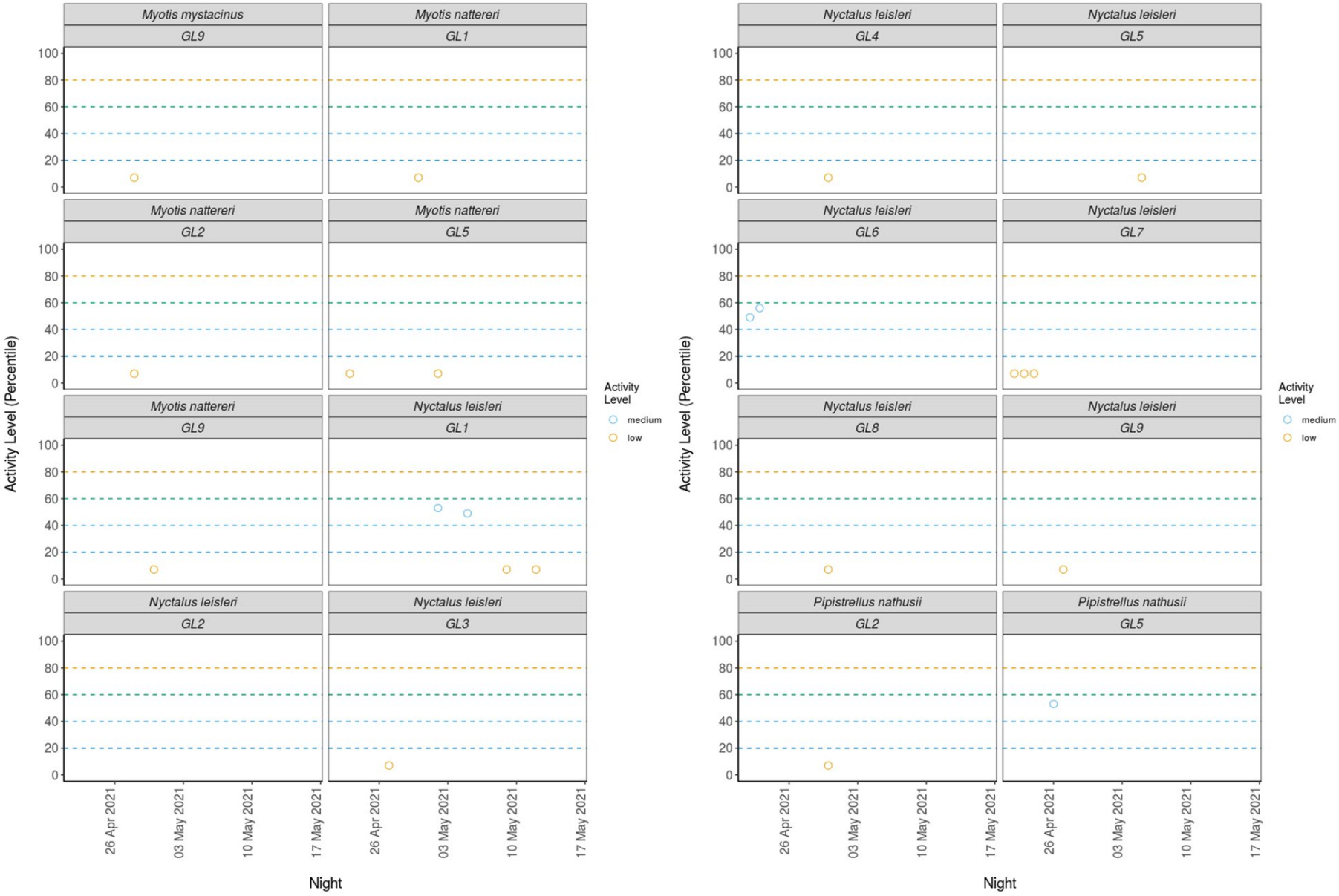
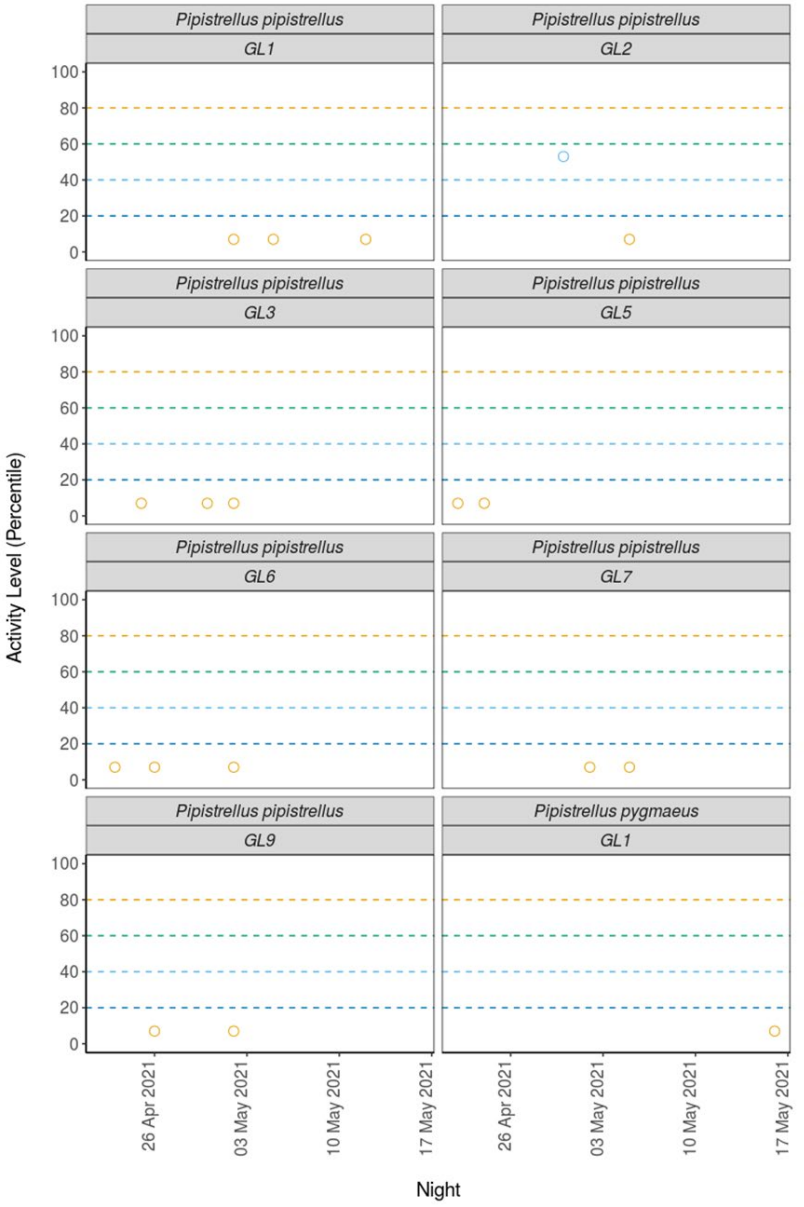
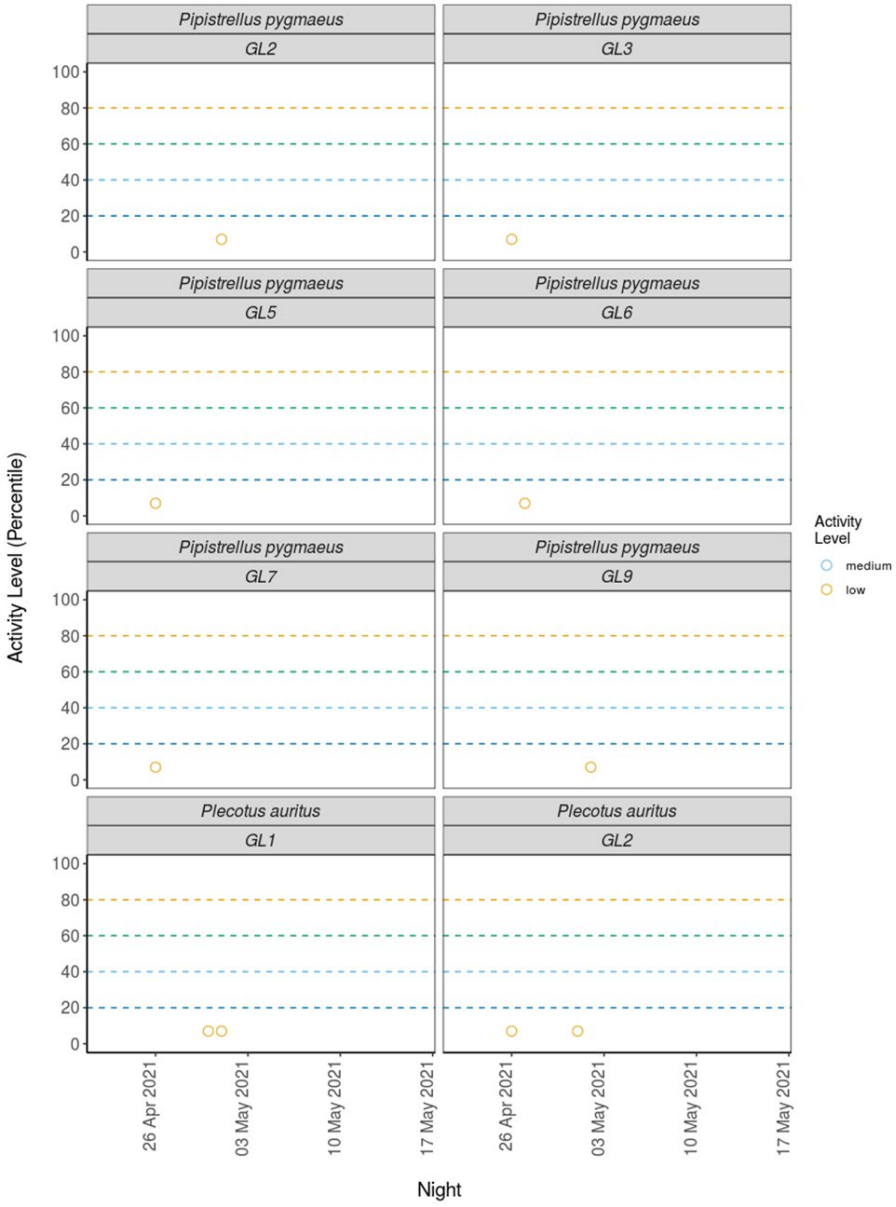


Plate 42: **Differences in activity between static detector locations, split by species and location. The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity) – Survey round 1**


Myotis mystacinus
GL9
Myotis nattereri
GL1
Myotis nattereri
GL2
Myotis nattereri
GL5
Myotis nattereri
GL9
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL2
Pipistrellus nathusii
GL5
Activity Level (Percentile)
0
20
40
60
80
100
26 Apr 2021
03 May 2021
10 May 2021
17 May 2021
Night
Activity Level
medium
low


Pipistrellus pipistrellus
GL1
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Activity Level (Percentile)
100
80
60
40
20
0
26 Apr 2021
03 May 2021
10 May 2021
17 May 2021
Night
Activity Level
medium
low


Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL9
Plecotus auritus
GL1
Plecotus auritus
GL2
Activity Level (Percentile)
100
80
60
40
20
0
26 Apr 2021
03 May 2021
10 May 2021
17 May 2021
Night
Activity Level
medium
low

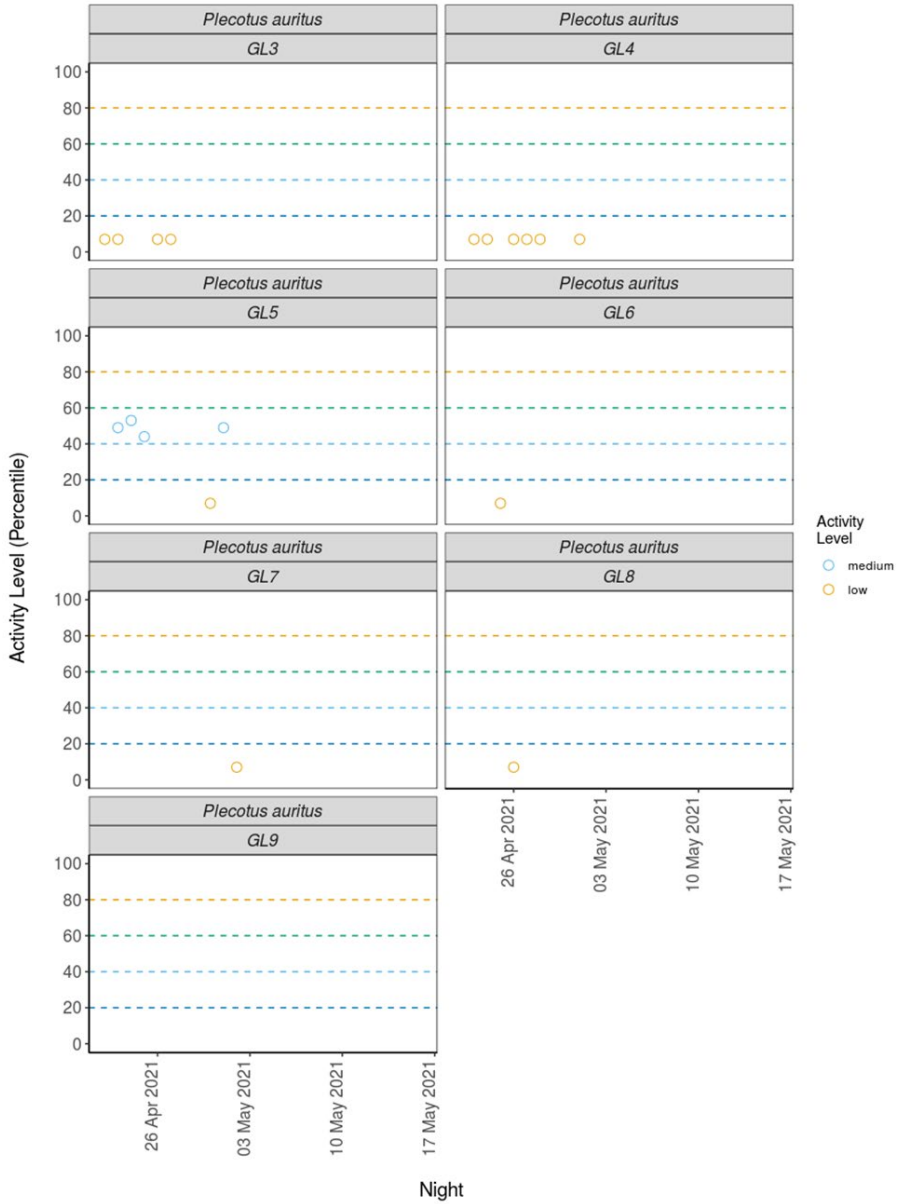


Plate 43: The activity level (percentile) of bats recorded across each night of the bat survey – Survey round 1

Table 4-14: Summary showing the number of nights recorded bat activity fell into each activity band for each species across all of the detectors – Survey round 1

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	Median Percentile	Bat Activity Category
Myotis daubentonii	0	0	0	2	11	7	Low
Myotis mystacinus	0	0	0	0	5	7	Low
Myotis nattereri	0	0	0	1	5	7	Low
Nyctalus leisleri	6	2	4	6	10	27	Low to Moderate
Pipistrellus nathusii	0	0	1	0	1	30	Low to Moderate
Pipistrellus pipistrellus	2	1	1	3	16	7	Low
Pipistrellus pygmaeus	0	0	0	1	7	7	Low
Plecotus auritus	0	0	4	15	18	27	Low to Moderate

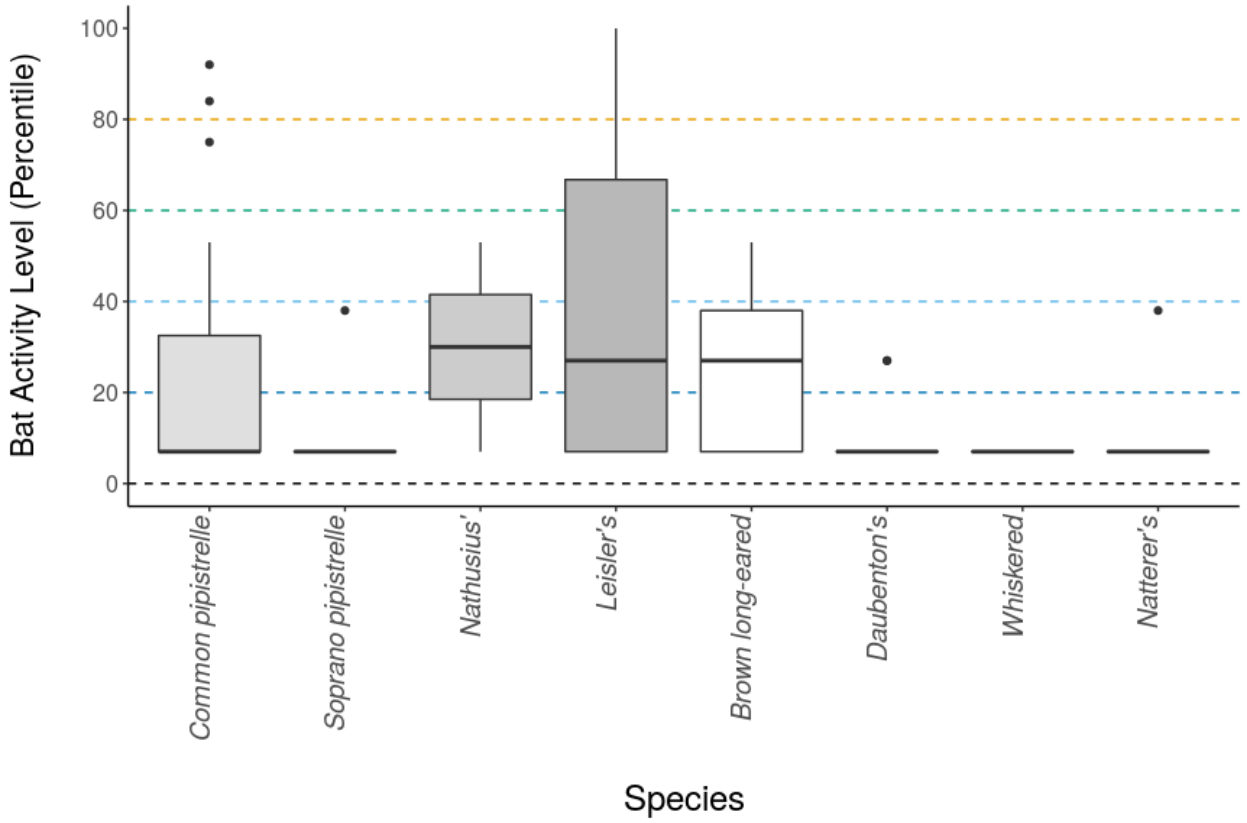


Plate 44: **The activity level (percentile) of bats recorded across each night of the bat survey for the entire site – Survey round 1**

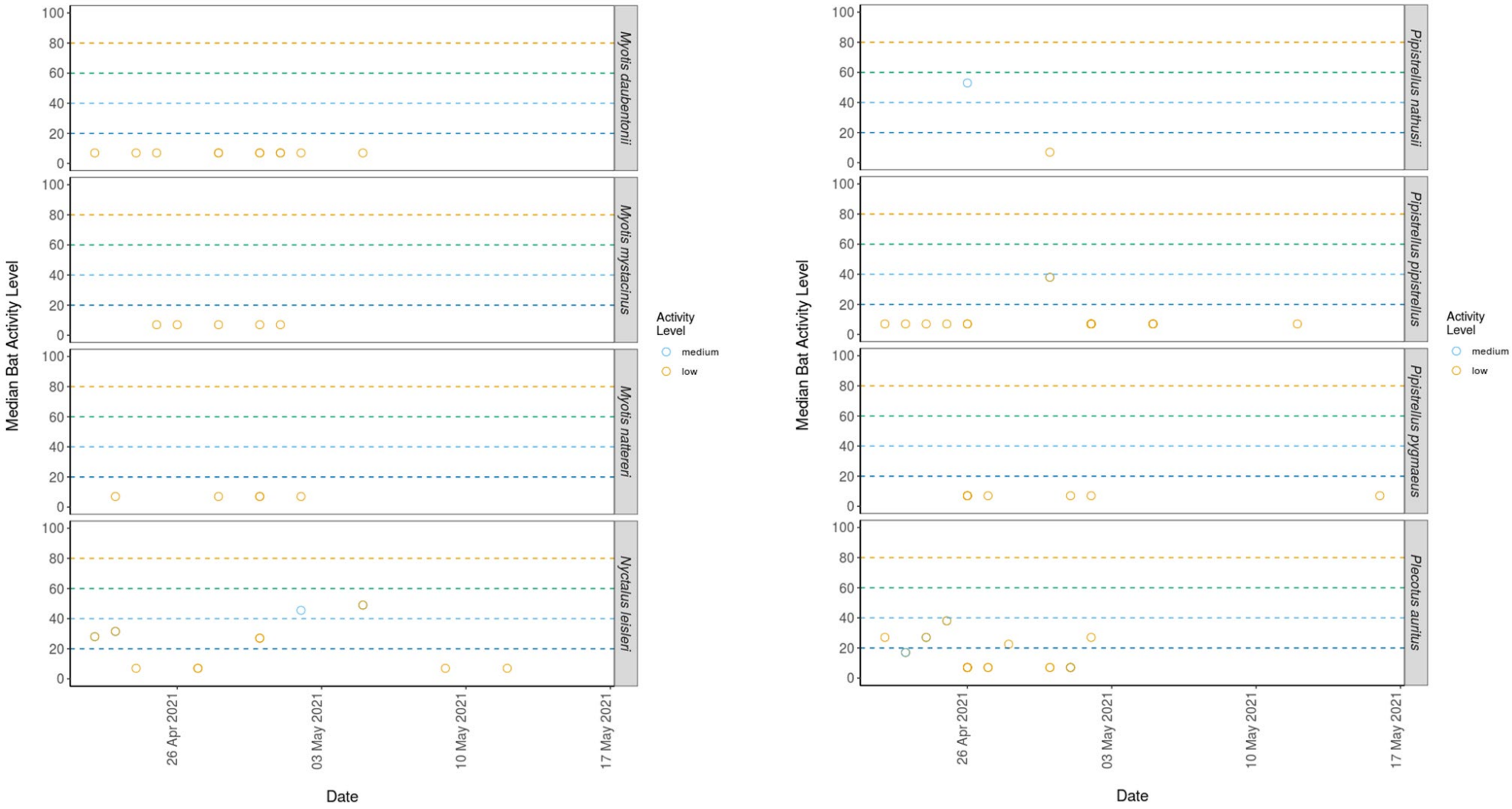


Plate 45: The median activity levels of bats recorded across all detectors each night – Survey round 1.

4.6.5 Survey Round 2 2021

A summary showing the number of nights recorded bat activity within each activity band for each species is presented below in Table 4-15. Refer to Appendix D for the full Ecobat analysis report

Bat surveys were conducted for 12 nights between 08/07/2021 and 19/07/2021 using Wildlife Acoustics SM4BAT-FS static bat detectors. Analysis is based on the number of nights the bats were detected on each recorder, therefore the nights no bats were detected have not been provided within the analysis, this is available within the Ecobat report in Appendix D.

All of the nine static locations had at least one night of High Activity during the survey round.

The static location GL5 is deemed to have a High Bat Activity (for specific bat species) level based on the Median Percentile value for common pipistrelle.

Refer to Plates 46 and 47 below.

Table 4-16, along with Plates 48 and 49 show the number of nights recorded bat activity fell into each activity band for each species across all of the detectors.

Table 4-15: Bat activity within each activity band for each species – Survey round 2

Location	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	Median Percentile	Bat Activity Category
GL1	*Myotis daubentonii*	0	0	0	0	1	4	Low
GL1	*Myotis nattereri*	0	0	0	0	2	4	Low
GL1	*Nyctalus leisleri*	2	2	0	2	1	60	Moderate
GL1	*Pipistrellus pipistrellus*	0	0	3	0	3	24	Low to Moderate
GL1	*Pipistrellus pygmaeus*	0	0	1	2	1	31	Low to Moderate
GL1	*Plecotus auritus*	0	0	0	0	2	4	Low
GL2	*Myotis daubentonii*	0	0	0	1	2	4	Low
GL2	*Myotis nattereri*	0	0	1	0	1	24	Low to Moderate
GL2	*Nyctalus leisleri*	3	1	1	1	0	71	Moderate to High

Location	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	Median Percentile	Bat Activity Category
GL2	*Pipistrellus pipistrellus*	0	0	1	3	0	22	Low to Moderate
GL2	*Pipistrellus pygmaeus*	0	0	0	2	0	27	Low to Moderate
GL2	*Plecotus auritus*	0	0	0	2	2	13	Low
GL3	*Myotis daubentonii*	0	0	1	1	2	22	Low to Moderate
GL3	*Myotis mystacinus*	0	0	1	0	1	24	Low to Moderate
GL3	*Myotis nattereri*	0	0	0	1	3	4	Low
GL3	*Nyctalus leisleri*	1	2	2	1	0	65	Moderate to High
GL3	*Pipistrellus nathusii*	0	0	0	0	1	4	Low
GL3	*Pipistrellus pipistrellus*	3	1	1	1	1	72	Moderate to High
GL3	*Pipistrellus pygmaeus*	0	0	4	0	2	51	Moderate
GL3	*Plecotus auritus*	0	1	2	0	1	48	Moderate
GL4	*Myotis daubentonii*	0	1	0	0	1	33	Low to Moderate
GL4	*Myotis mystacinus*	0	0	0	0	1	4	Low
GL4	*Myotis nattereri*	0	0	0	0	2	4	Low
GL4	*Nyctalus leisleri*	0	3	1	0	1	63	Moderate to High
GL4	*Pipistrellus nathusii*	0	0	0	1	0	22	Low to Moderate
GL4	*Pipistrellus pipistrellus*	2	3	0	0	1	78	Moderate to High
GL4	*Pipistrellus pygmaeus*	0	2	2	1	0	51	Moderate
GL4	*Plecotus auritus*	0	0	0	3	3	13	Low

Location	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	Median Percentile	Bat Activity Category
GL5	*Myotis daubentonii*	0	0	1	3	2	31	Low to Moderate
GL5	*Myotis mystacinus*	0	0	1	1	1	22	Low to Moderate
GL5	*Myotis nattereri*	0	0	1	1	2	22	Low to Moderate
GL5	*Nyctalus leisleri*	0	2	1	1	2	44	Moderate
GL5	*Pipistrellus nathusii*	0	0	0	3	2	22	Low to Moderate
GL5	*Pipistrellus pipistrellus*	7	0	0	0	0	94	High
GL5	*Pipistrellus pygmaeus*	2	2	3	0	0	69	Moderate to High
GL5	*Plecotus auritus*	0	0	1	3	1	31	Low to Moderate
GL6	*Myotis daubentonii*	0	0	1	1	0	33	Low to Moderate
GL6	*Myotis nattereri*	0	0	0	0	3	4	Low
GL6	*Nyctalus leisleri*	1	3	0	2	2	45	Moderate
GL6	*Pipistrellus nathusii*	0	0	0	0	1	4	Low
GL6	*Pipistrellus pipistrellus*	2	1	2	2	2	44	Moderate
GL6	*Pipistrellus pygmaeus*	0	0	4	1	1	44	Moderate
GL6	*Plecotus auritus*	0	0	0	0	2	4	Low
GL7	*Myotis daubentonii*	0	0	0	2	0	27	Low to Moderate
GL7	*Myotis mystacinus*	0	0	0	0	1	4	Low
GL7	*Myotis nattereri*	0	0	0	0	1	4	Low
GL7	*Nyctalus leisleri*	2	3	0	0	2	77	Moderate to High

Location	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	Median Percentile	Bat Activity Category
GL7	*Pipistrellus pipistrellus*	2	2	2	0	2	65	Moderate to High
GL7	*Pipistrellus pygmaeus*	0	1	3	1	1	48	Moderate
GL7	*Plecotus auritus*	0	0	1	3	2	22	Low to Moderate
GL8	*Myotis daubentonii*	0	0	0	2	2	13	Low
GL8	*Myotis nattereri*	0	0	0	0	1	4	Low
GL8	*Nyctalus leisleri*	3	2	0	1	1	70	Moderate to High
GL8	*Pipistrellus nathusii*	0	0	0	0	1	4	Low
GL8	*Pipistrellus pipistrellus*	2	1	2	0	1	65	Moderate to High
GL8	*Pipistrellus pygmaeus*	0	2	1	0	2	48	Moderate
GL8	*Plecotus auritus*	0	0	0	2	3	4	Low
GL9	*Myotis daubentonii*	0	0	1	6	1	31	Low to Moderate
GL9	*Myotis mystacinus*	0	0	0	0	3	4	Low
GL9	*Myotis nattereri*	0	0	0	0	4	4	Low
GL9	*Nyctalus leisleri*	2	3	1	3	1	56	Moderate
GL9	*Pipistrellus nathusii*	0	0	0	0	2	4	Low
GL9	*Pipistrellus pipistrellus*	3	3	1	0	0	77	Moderate to High
GL9	*Pipistrellus pygmaeus*	0	4	0	3	0	62	Moderate to High
GL9	*Plecotus auritus*	0	0	3	2	4	31	Low to Moderate

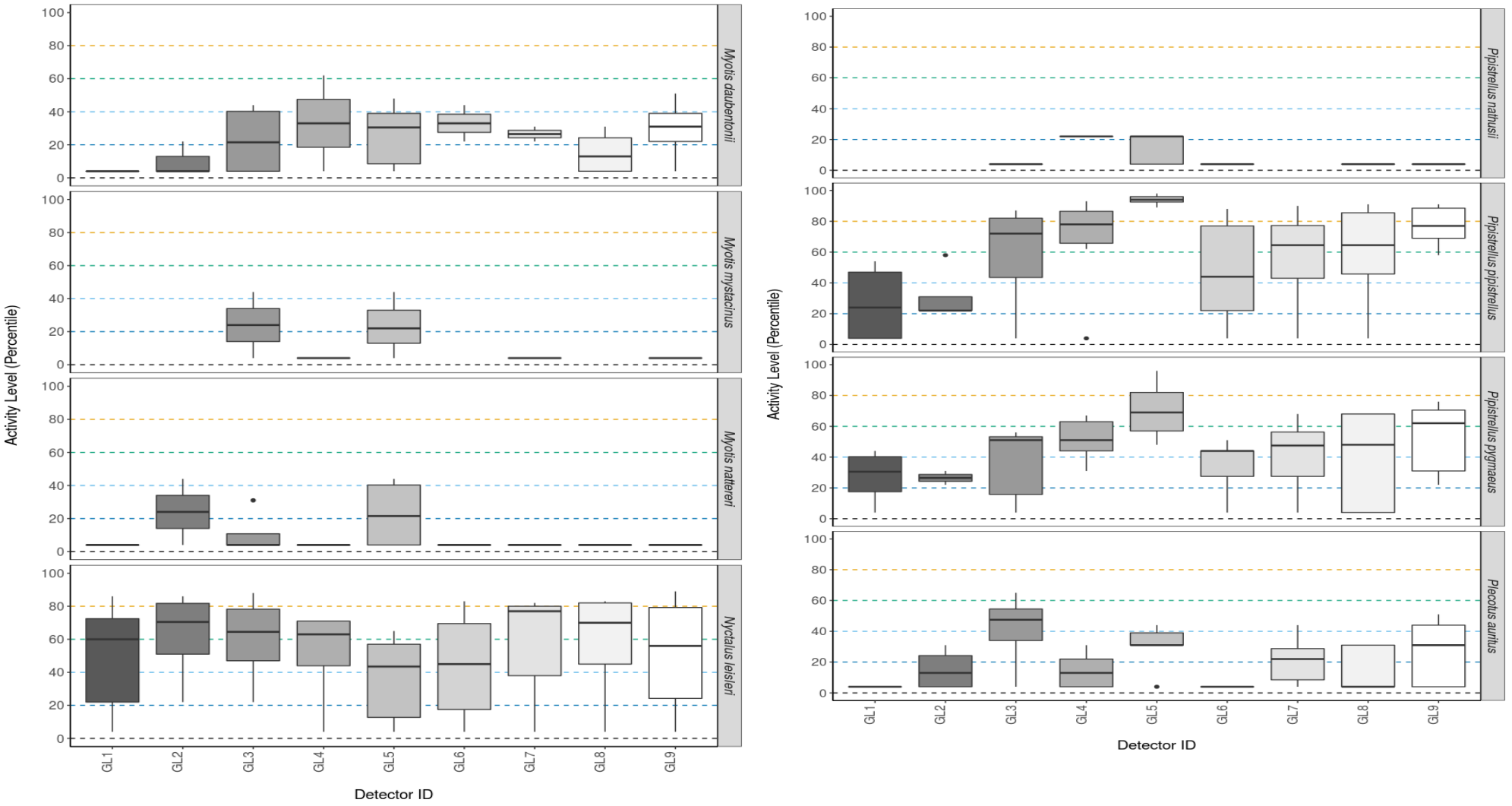
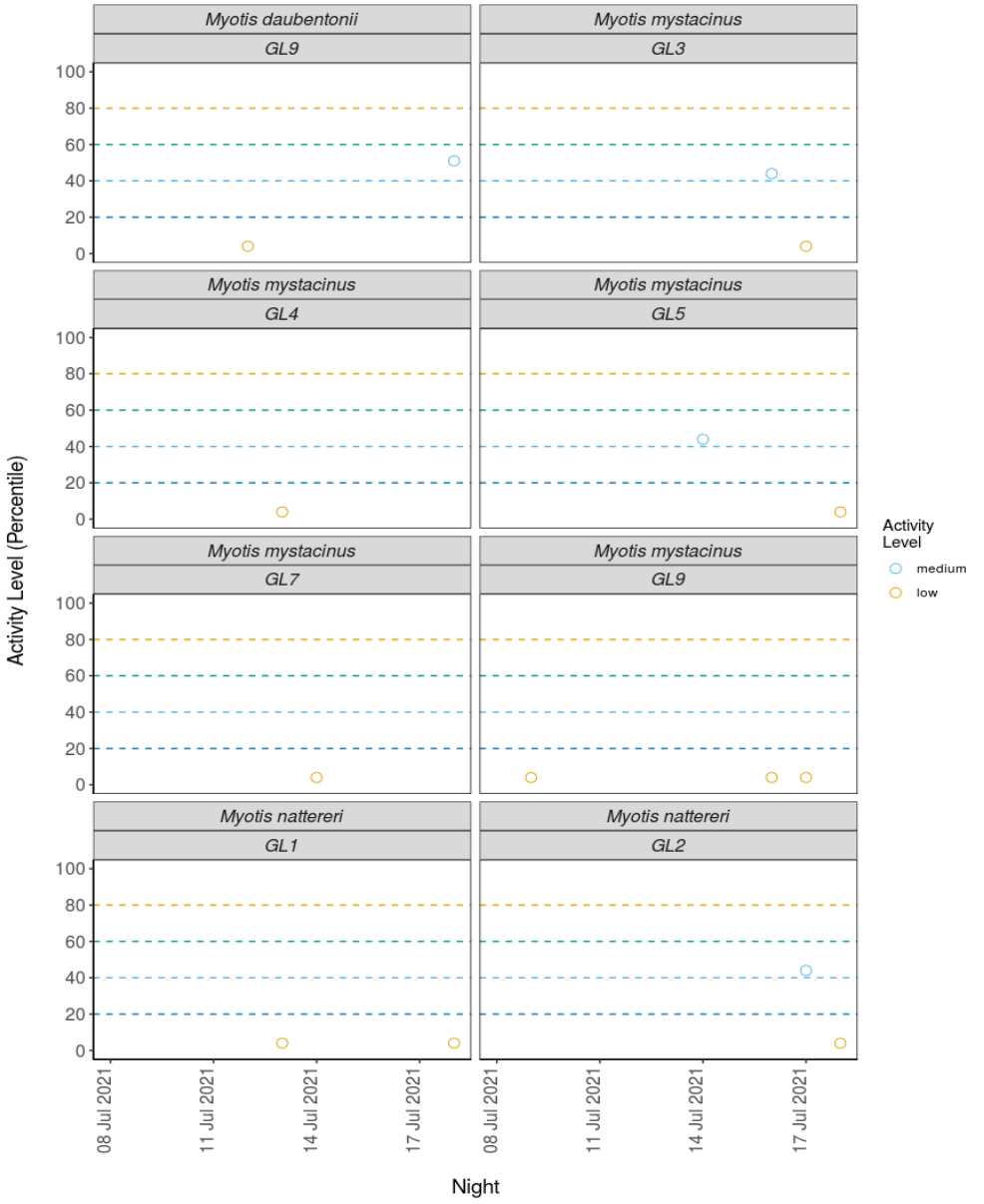
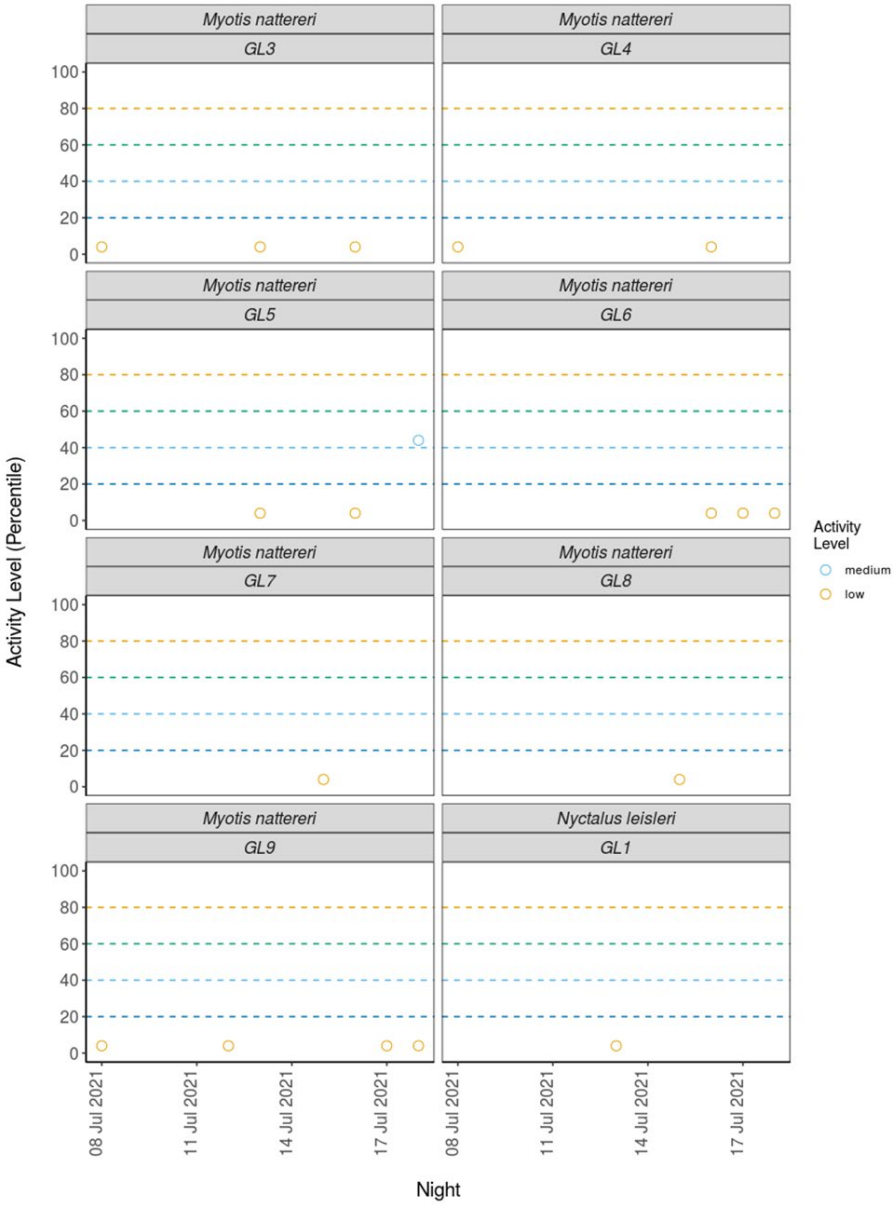
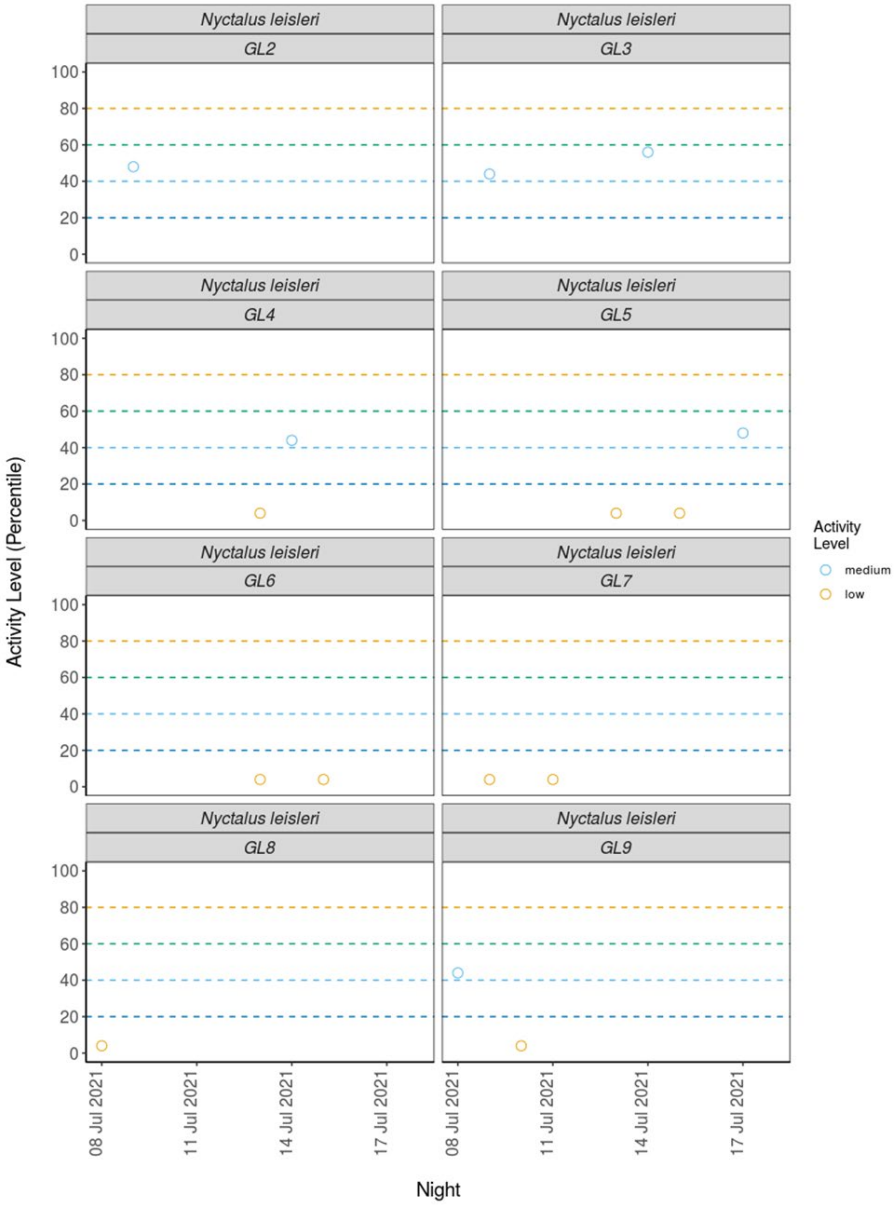
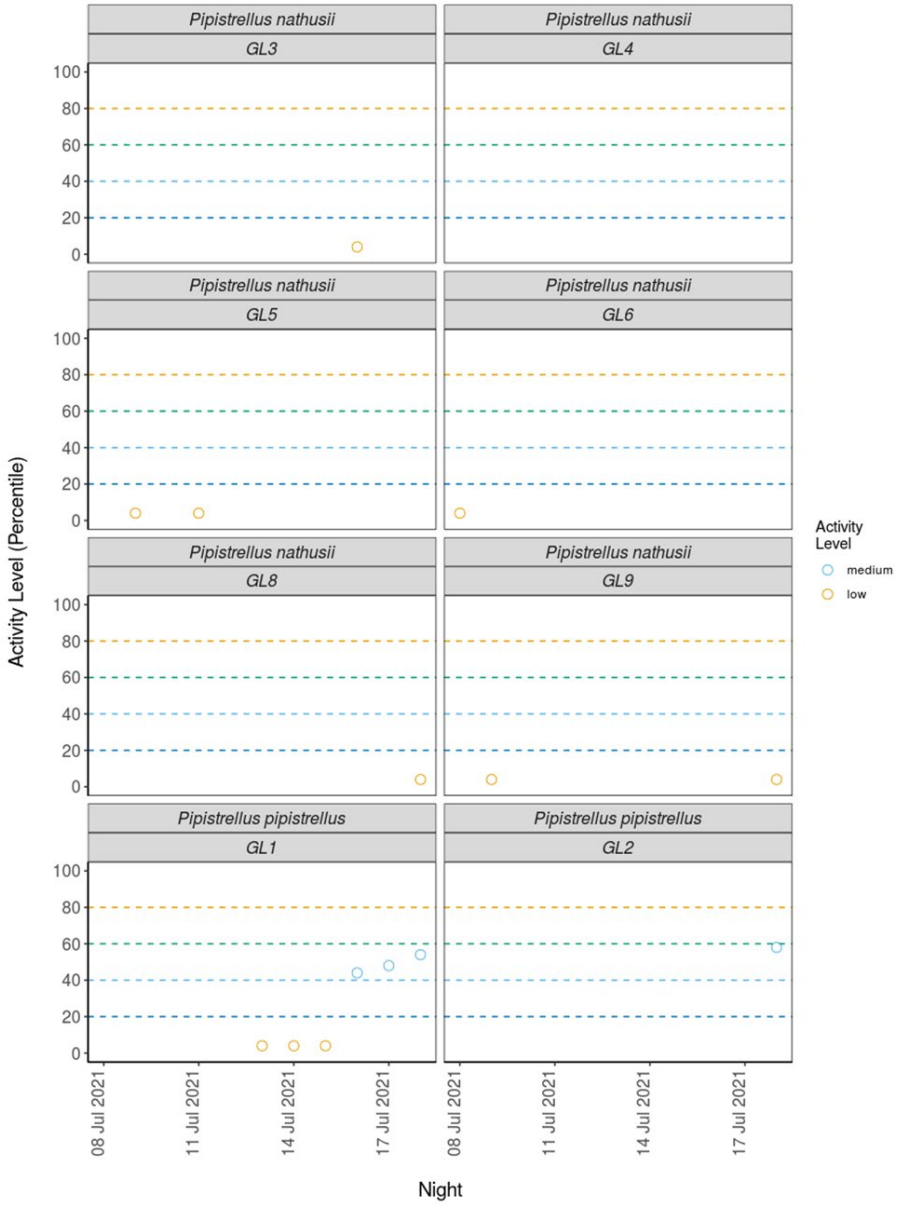


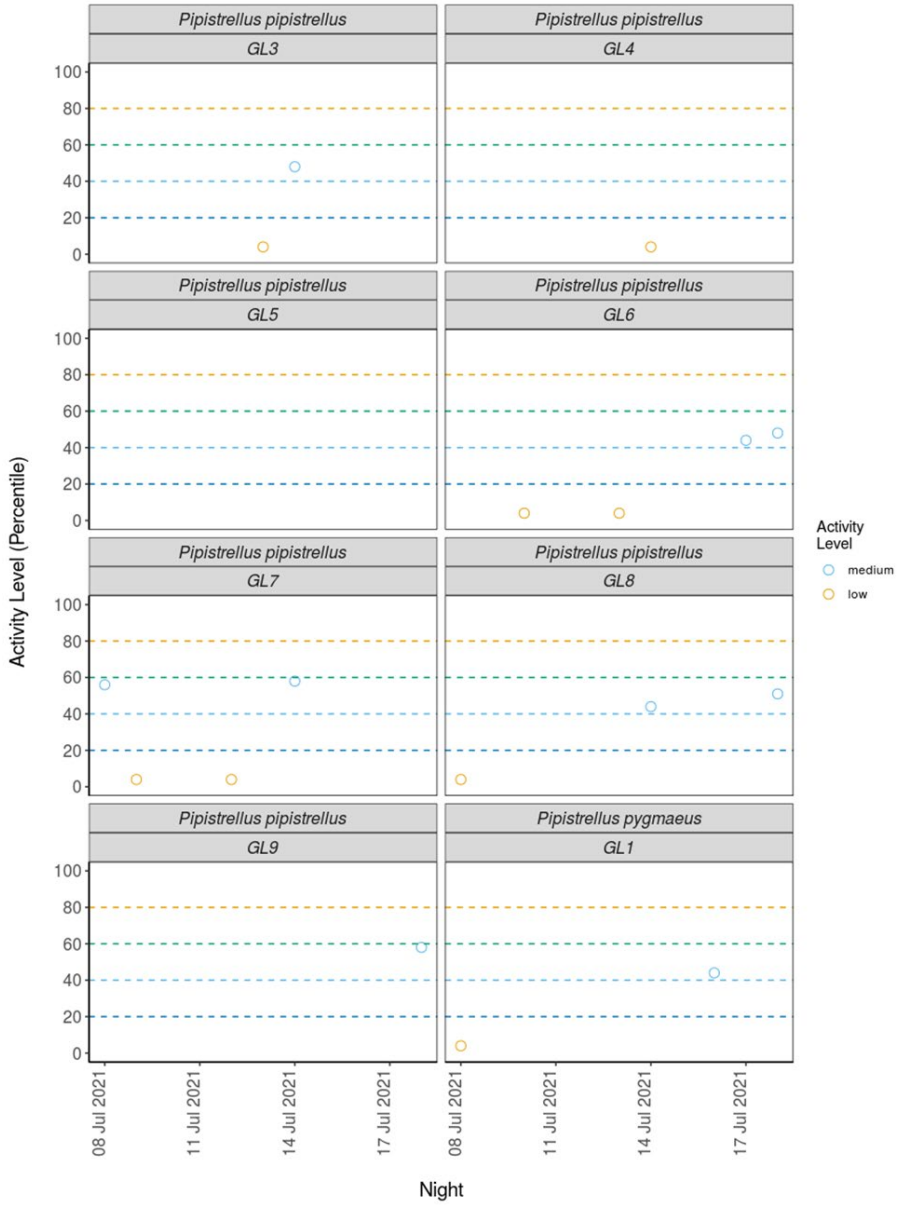
Plate 46: **Differences in activity between static detector locations, split by species and location. The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity) – Survey round 2**

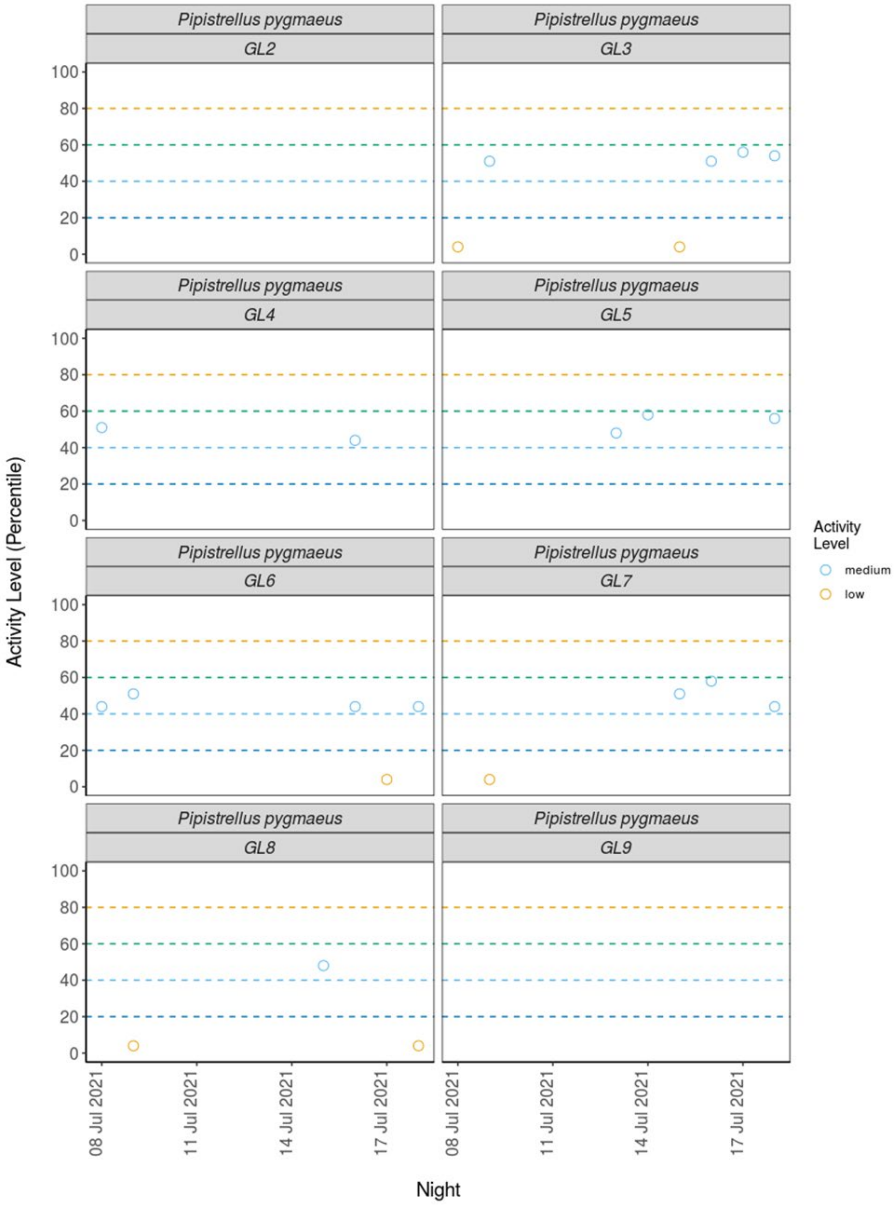

Myotis daubentonii
GL9
Myotis mystacinus
GL3
Myotis mystacinus
GL4
Myotis mystacinus
GL5
Myotis mystacinus
GL7
Myotis mystacinus
GL9
Myotis nattereri
GL1
Myotis nattereri
GL2
Activity Level (Percentile)
0
20
40
60
80
100
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low

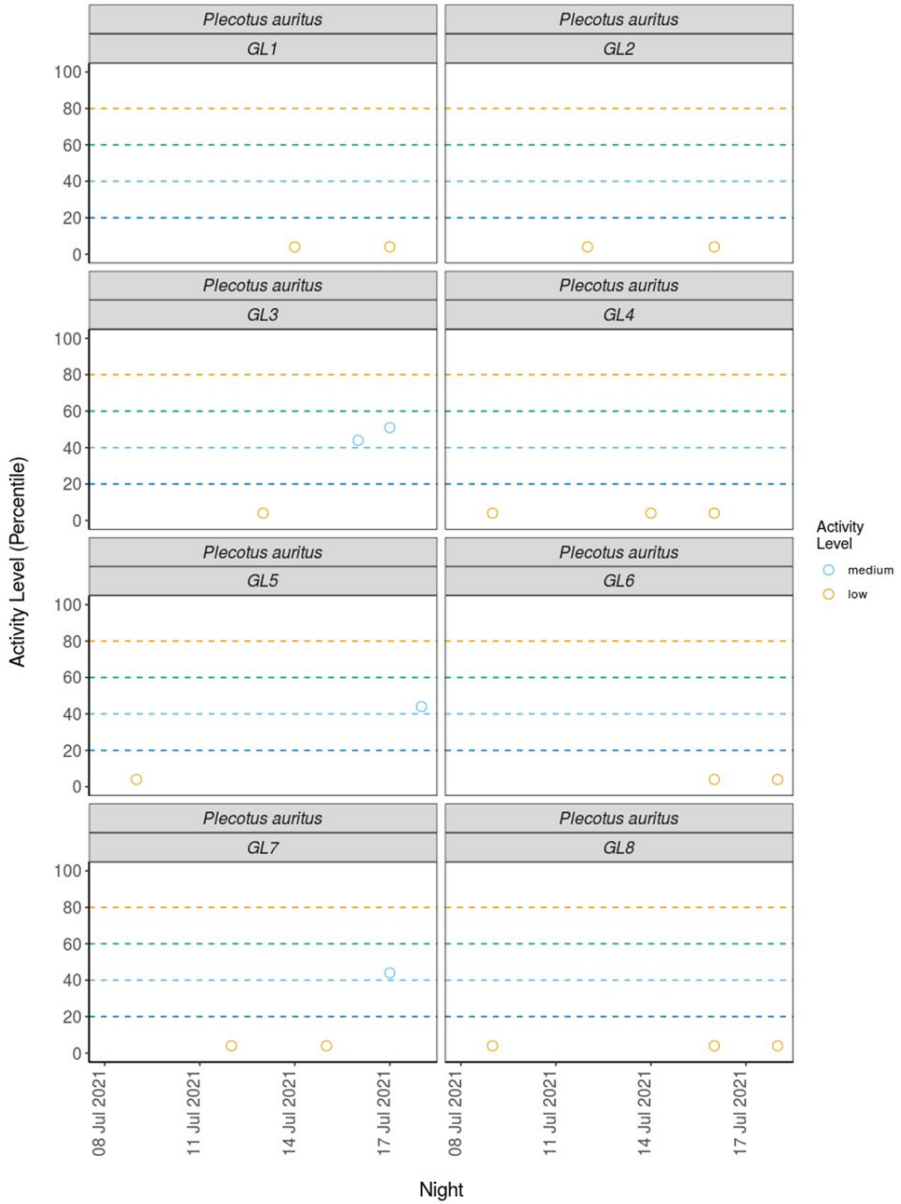

Myotis nattereri
GL3
Myotis nattereri
GL4
Myotis nattereri
GL5
Myotis nattereri
GL6
Myotis nattereri
GL7
Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL1
Activity Level (Percentile)
0
20
40
60
80
100
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low


Nyctalus leisleri
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Activity Level (Percentile)
Night
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Activity Level
medium
low


Pipistrellus nathusii
GL3
GL4
GL5
GL6
GL8
GL9
Pipistrellus pipistrellus
GL1
GL2
Activity Level (Percentile)
Night
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Activity Level
medium
low


Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL4
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL8
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Activity Level (Percentile)
0
20
40
60
80
100
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low


Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL4
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL8
Pipistrellus pygmaeus
GL9
Activity Level (Percentile)
0
20
40
60
80
100
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low



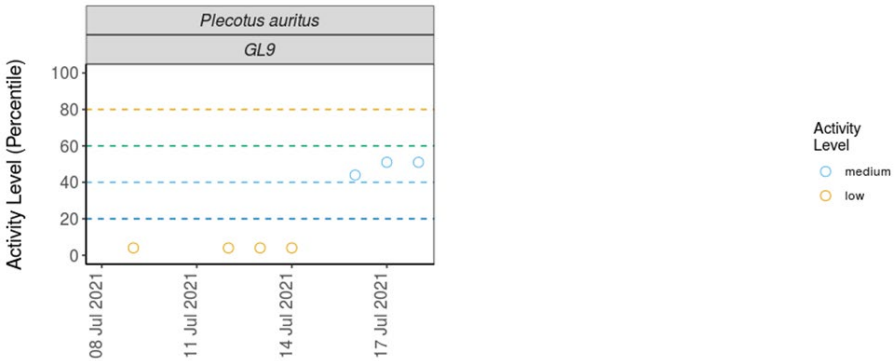


Plate 47: The activity level (percentile) of bats recorded across each night of the bat survey – Survey round 2

Table 4-16: Summary showing the number of nights recorded bat activity fell into each activity band for each species across all of the detectors – Survey round 2

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	Median Percentile	Bat Activity Category
Myotis daubentonii	0	1	4	16	11	22	Low to Moderate
Myotis mystacinus	0	0	2	1	7	4	Low
Myotis nattereri	0	0	2	2	19	4	Low
Nyctalus leisleri	14	21	6	11	10	63	Moderate to High
Pipistrellus nathusii	0	0	0	4	7	4	Low
Pipistrellus pipistrellus	21	11	12	6	10	68	Moderate to High
Pipistrellus pygmaeus	2	11	18	10	7	48	Moderate
Plecotus auritus	0	1	7	15	20	22	Low to Moderate

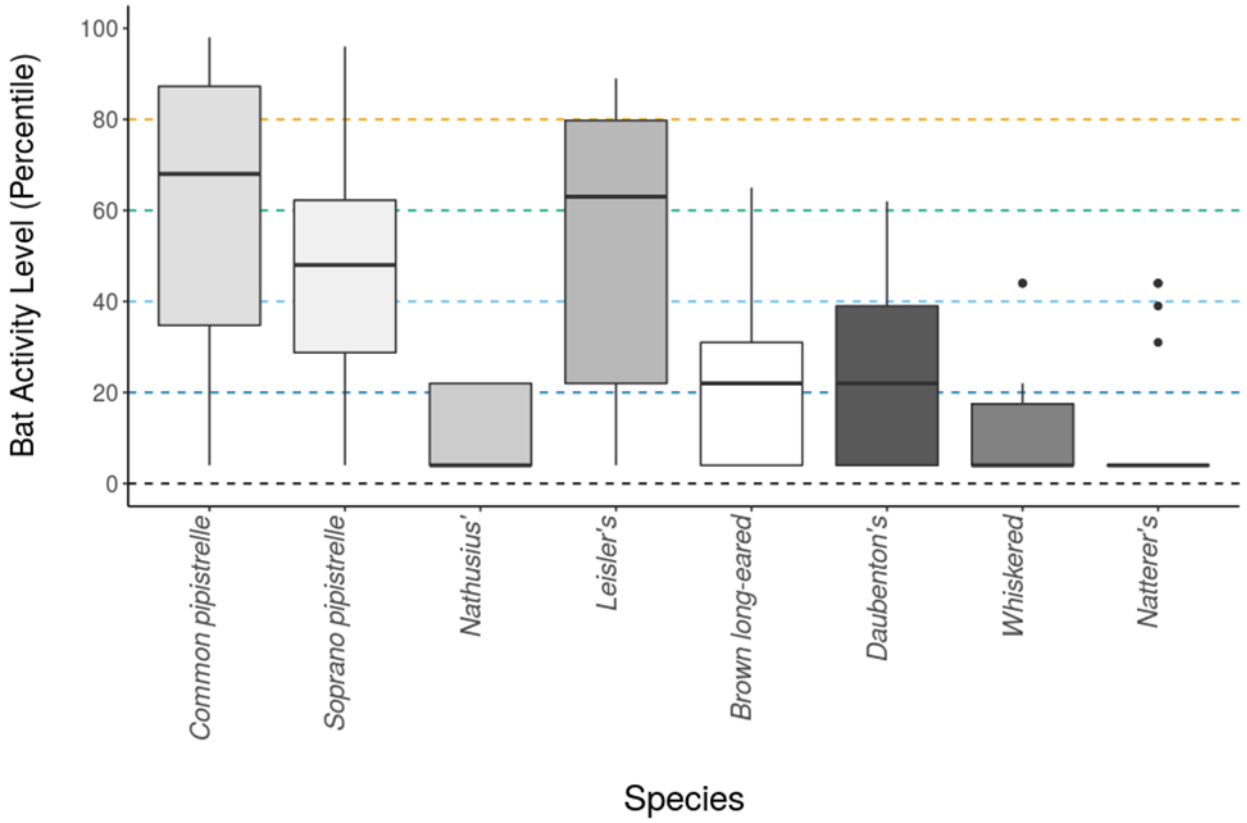


Plate 48: **The activity level (percentile) of bats recorded across each night of the bat survey for the entire site – Survey round 2**

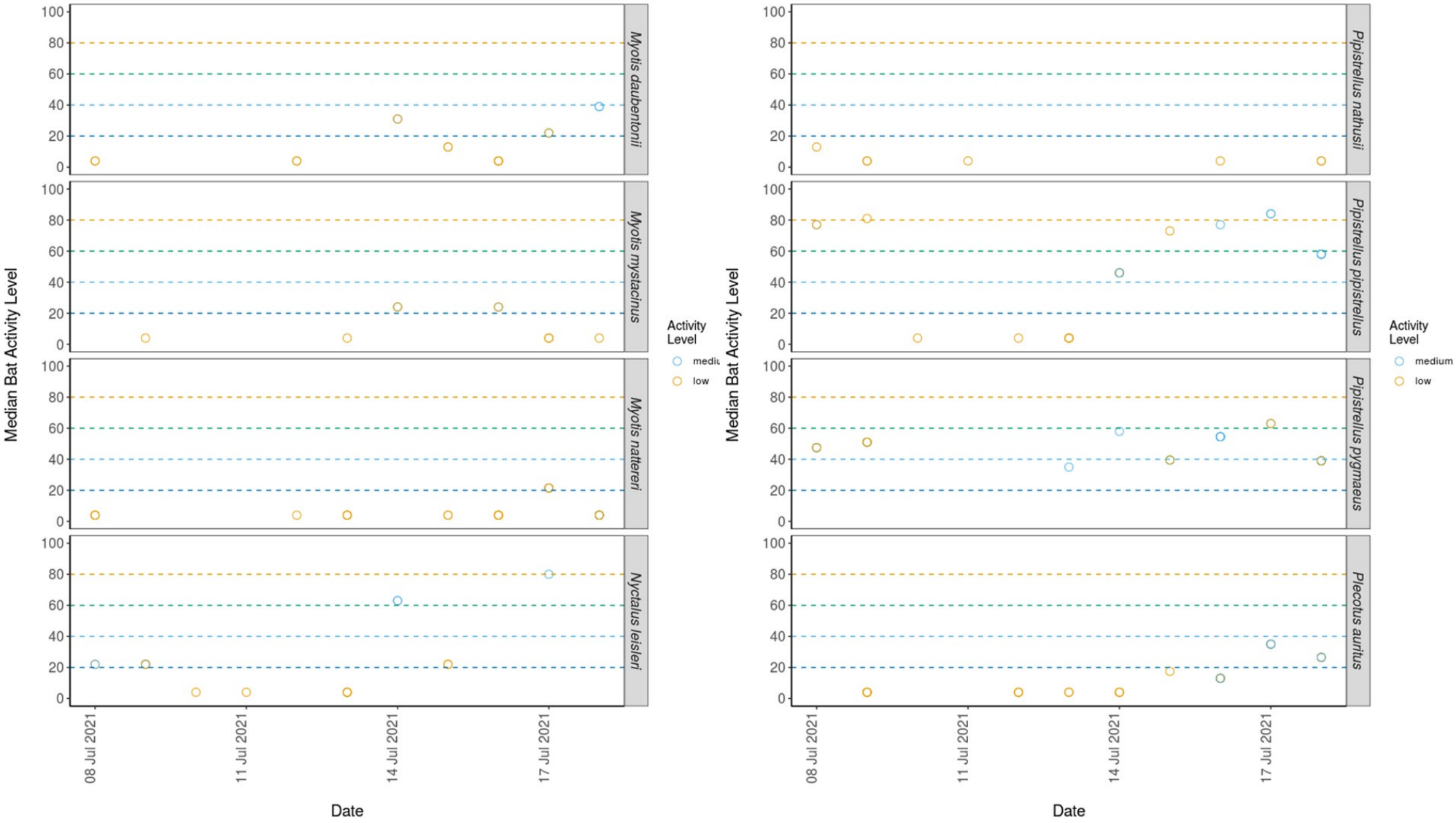


Plate 49: The median activity levels of bats recorded across all detectors each night – Survey round 2.

Due to the number of the recorded passes occurring within the species-specific emergence time ranges based on Russ 2012, the Ecobat analysis has identified a potential roost may be present near static locations GL4 (T04) for common pipistrelle. Refer to Plate 50 which shows passes in relation to the time from 15 minutes before to 90 minutes after sunset.

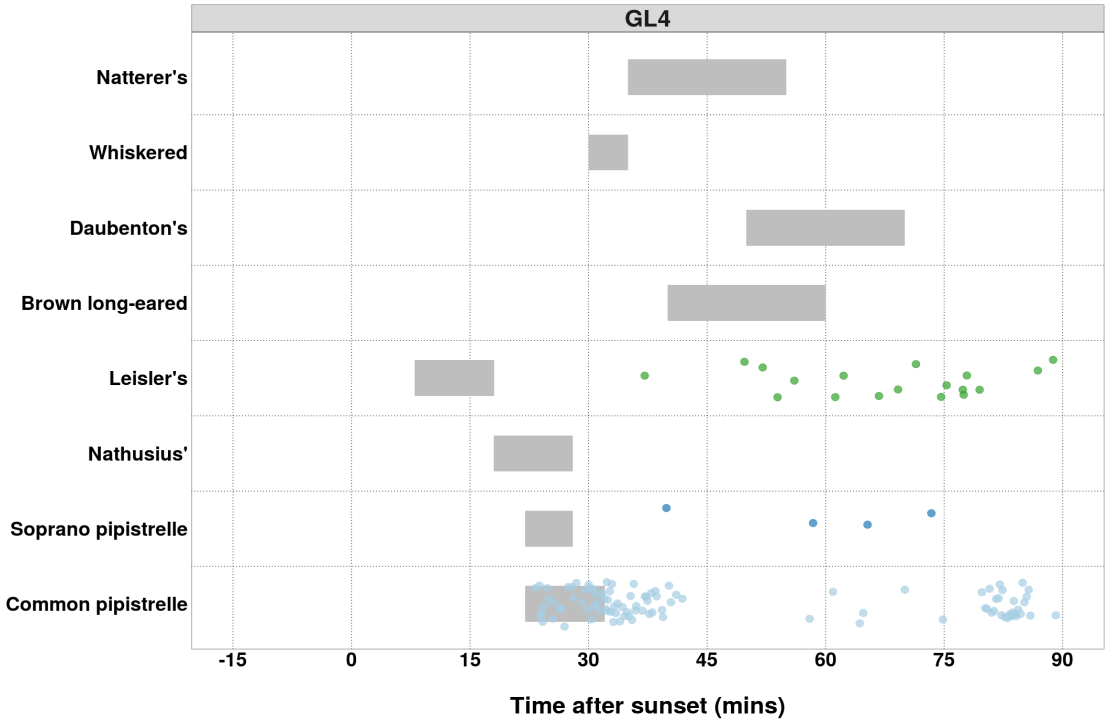


Plate 50: **Time from 15 minutes before to 90 minutes after sunset, potentially indicating the presence of a nearby roost – Survey round 2.**

4.6.6 Survey Round 3 2021

A summary showing the number of nights recorded bat activity within each activity band for each species is presented below in Table 4-17. Refer to Appendix D for the full Ecobat analysis report

Bat surveys were conducted for 12 nights for between 19/08/2021 and 30/08/2021 using Wildlife Acoustics SM4BAT-FS static bat detectors. Analysis is based on the number of nights the bats were detected on each recorder, therefore the nights no bats were detected have not been provided within the analysis, this is available within the Ecobat report in Appendix D.

All the static locations, excluding GL1 and GL3, had at least one night of High Activity during the survey round.

The static location GL6 is deemed to have a High Bat Activity (for specific bat species) level based on the Median Percentile value for common pipistrelle.

Refer to Plates 51 and 52 below.

Table 4-18, along with Plates 53 and 54 show the number of nights recorded bat activity fell into each activity band for each species across all of the detectors.

Table 4-17: Bat activity within each activity band for each species – Survey round 3

Location	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	Median Percentile	Bat Activity Category
GL1	*Myotis daubentonii*	0	0	3	1	3	29	Low to Moderate
GL1	*Myotis mystacinus*	0	0	0	1	7	12	Low
GL1	*Myotis nattereri*	0	1	2	3	1	36	Low to Moderate
GL1	*Nyctalus leisleri*	0	3	3	0	3	48	Moderate
GL1	*Pipistrellus nathusii*	0	0	0	0	1	4	Low
GL1	*Pipistrellus pipistrellus*	0	0	2	4	2	36	Low to Moderate
GL1	*Pipistrellus pygmaeus*	0	0	2	1	3	20	Low
GL1	*Plecotus auritus*	0	1	5	3	1	43	Moderate
GL2	*Myotis daubentonii*	0	5	3	2	0	64	Moderate to High
GL2	*Myotis mystacinus*	0	0	0	0	5	4	Low

Location	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	Median Percentile	Bat Activity Category
GL2	*Myotis nattereri*	0	4	2	1	3	48	Moderate
GL2	*Nyctalus leisleri*	1	3	3	1	0	60	Moderate
GL2	*Pipistrellus pipistrellus*	2	3	2	1	0	66	Moderate to High
GL2	*Pipistrellus pygmaeus*	0	1	5	1	2	48	Moderate
GL2	*Plecotus auritus*	1	4	2	1	1	66	Moderate to High
GL3	*Myotis daubentonii*	0	0	7	2	1	43	Moderate
GL3	*Myotis mystacinus*	0	0	0	0	2	4	Low
GL3	*Myotis nattereri*	0	0	1	4	4	29	Low to Moderate
GL3	*Nyctalus leisleri*	0	3	3	4	0	43	Moderate
GL3	*Pipistrellus pipistrellus*	0	3	3	2	2	55	Moderate
GL3	*Pipistrellus pygmaeus*	0	2	2	1	4	36	Low to Moderate
GL3	*Plecotus auritus*	0	5	4	0	0	60	Moderate
GL4	*Myotis daubentonii*	0	0	1	3	5	19	Low
GL4	*Myotis mystacinus*	0	0	0	0	3	4	Low
GL4	*Myotis nattereri*	0	0	0	1	5	12	Low
GL4	*Nyctalus leisleri*	3	4	2	0	1	71	Moderate to High
GL4	*Pipistrellus pipistrellus*	1	1	3	0	4	48	Moderate
GL4	*Pipistrellus pygmaeus*	0	0	5	0	3	43	Moderate
GL4	*Plecotus auritus*	0	0	2	2	4	24	Low to Moderate

Location	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	Median Percentile	Bat Activity Category
GL5	*Myotis daubentonii*	0	0	4	3	2	36	Low to Moderate
GL5	*Myotis mystacinus*	0	0	0	0	3	4	Low
GL5	*Myotis nattereri*	0	0	0	3	6	19	Low
GL5	*Nyctalus leisleri*	0	5	3	2	1	58	Moderate
GL5	*Pipistrellus nathusii*	0	0	0	0	1	19	Low
GL5	*Pipistrellus pipistrellus*	1	4	3	0	1	60	Moderate
GL5	*Pipistrellus pygmaeus*	0	2	4	0	2	45	Moderate
GL5	*Plecotus auritus*	0	4	4	1	1	53	Moderate
GL6	*Myotis daubentonii*	0	5	3	2	0	60	Moderate
GL6	*Myotis mystacinus*	0	0	0	1	7	4	Low
GL6	*Myotis nattereri*	1	4	3	0	2	60	Moderate
GL6	*Nyctalus leisleri*	0	1	3	3	3	29	Low to Moderate
GL6	*Pipistrellus nathusii*	0	0	0	0	1	4	Low
GL6	*Pipistrellus pipistrellus*	7	2	1	1	0	88	High
GL6	*Pipistrellus pygmaeus*	2	5	2	2	0	64	Moderate to High
GL6	*Plecotus auritus*	0	3	6	1	0	56	Moderate
GL7	*Myotis daubentonii*	1	4	4	0	1	58	Moderate
GL7	*Myotis mystacinus*	0	0	0	0	3	4	Low
GL7	*Myotis nattereri*	0	2	4	1	2	45	Moderate

Location	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	Median Percentile	Bat Activity Category
GL7	*Nyctalus leisleri*	0	3	5	2	0	54	Moderate
GL7	*Pipistrellus pipistrellus*	1	5	3	0	2	66	Moderate to High
GL7	*Pipistrellus pygmaeus*	0	1	5	4	0	41	Moderate
GL7	*Plecotus auritus*	0	0	8	1	1	51	Moderate
GL8	*Myotis daubentonii*	0	1	6	2	0	54	Moderate
GL8	*Myotis mystacinus*	0	0	0	0	4	4	Low
GL8	*Myotis nattereri*	0	0	1	3	3	29	Low to Moderate
GL8	*Nyctalus leisleri*	1	1	3	4	1	39	Low to Moderate
GL8	*Pipistrellus nathusii*	0	0	0	1	1	24	Low to Moderate
GL8	*Pipistrellus pipistrellus*	2	3	4	1	0	58	Moderate
GL8	*Pipistrellus pygmaeus*	0	2	3	3	1	48	Moderate
GL8	*Plecotus auritus*	0	5	3	2	0	59	Moderate
GL9	*Myotis daubentonii*	0	5	2	1	1	62	Moderate to High
GL9	*Myotis mystacinus*	0	0	0	0	4	4	Low
GL9	*Myotis nattereri*	0	0	5	2	1	41	Moderate
GL9	*Nyctalus leisleri*	1	4	2	1	2	61	Moderate to High
GL9	*Pipistrellus pipistrellus*	1	2	4	1	0	57	Moderate
GL9	*Pipistrellus pygmaeus*	0	3	4	2	1	51	Moderate
GL9	*Plecotus auritus*	0	2	2	3	2	36	Low to Moderate

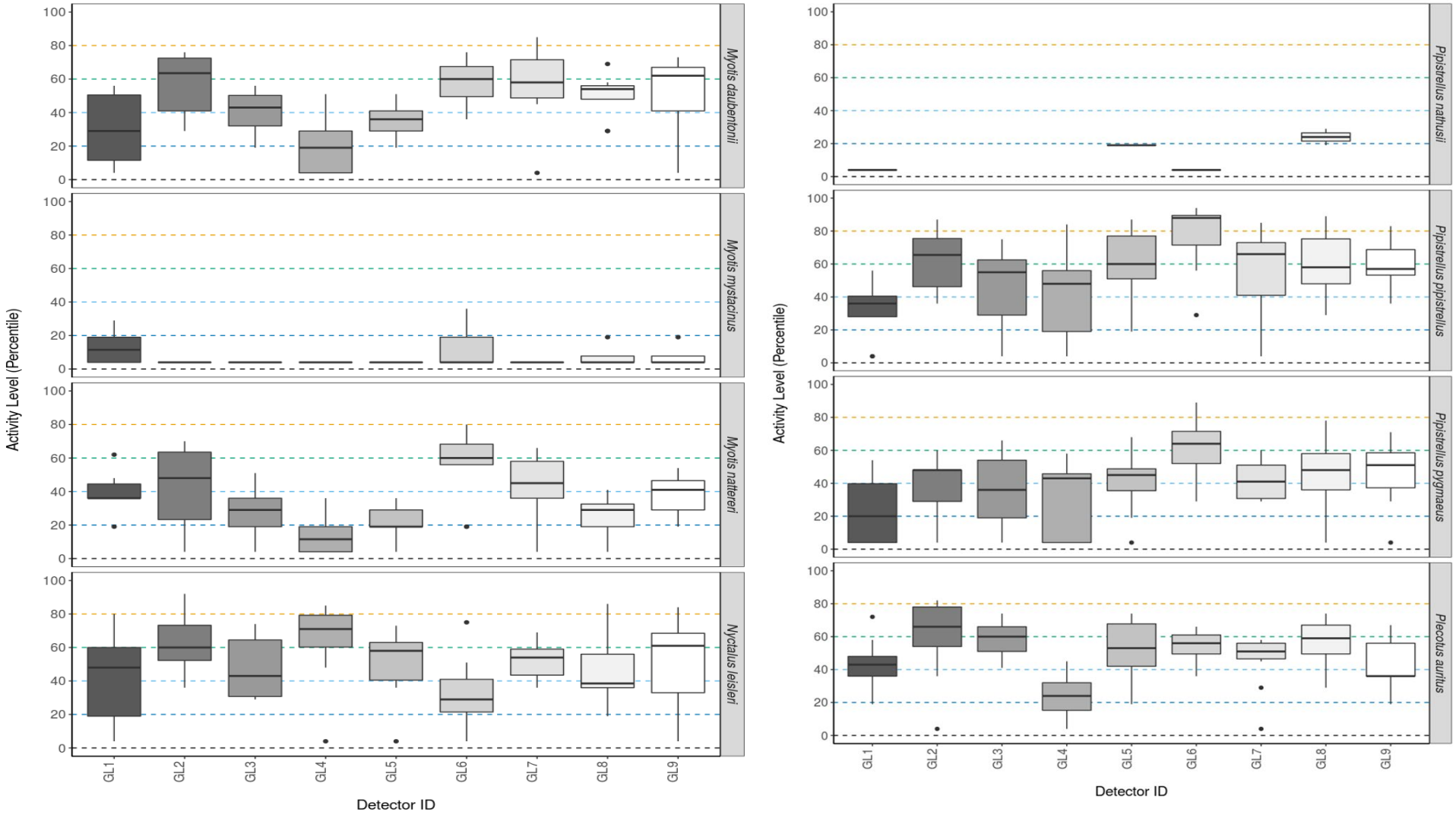
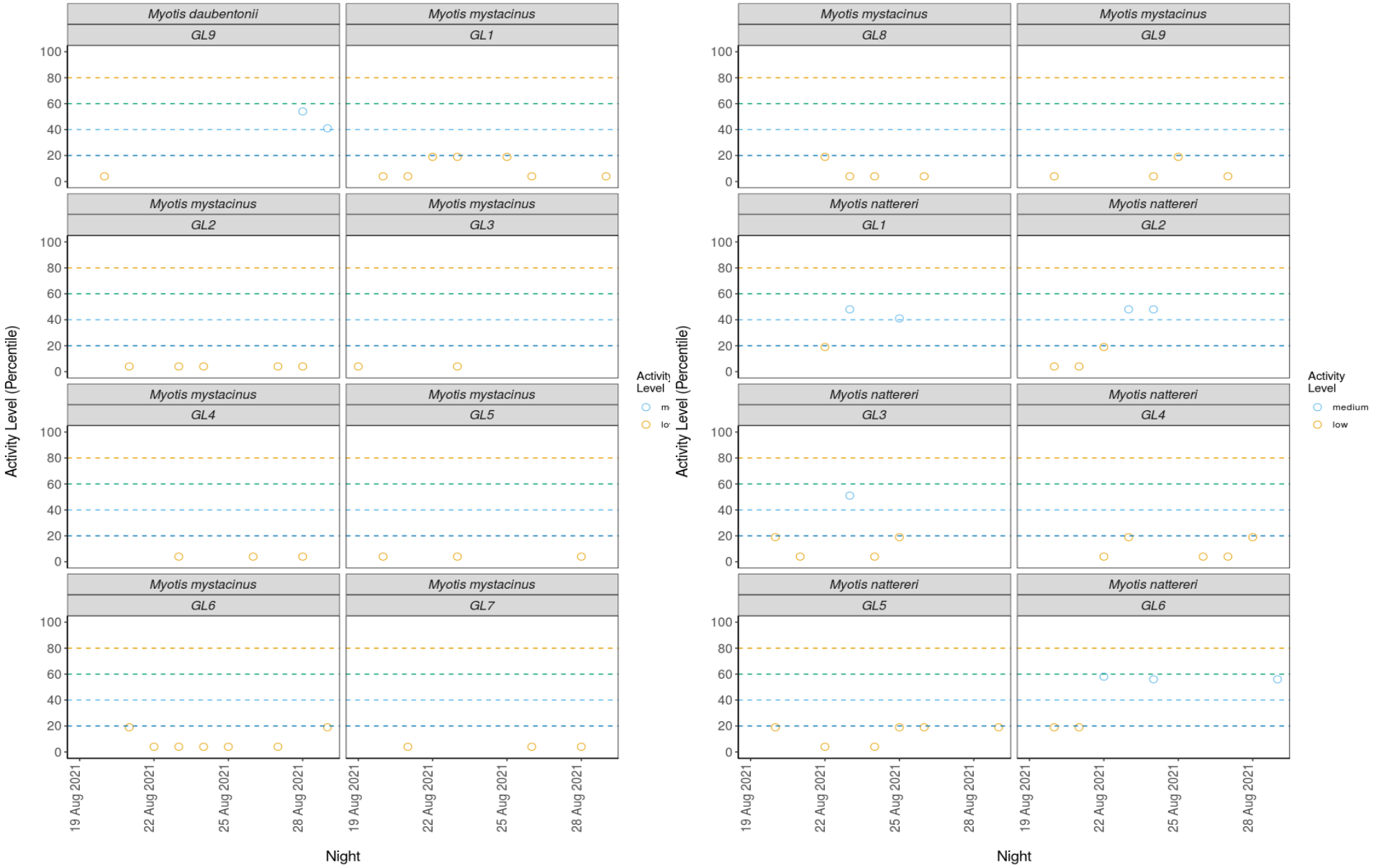
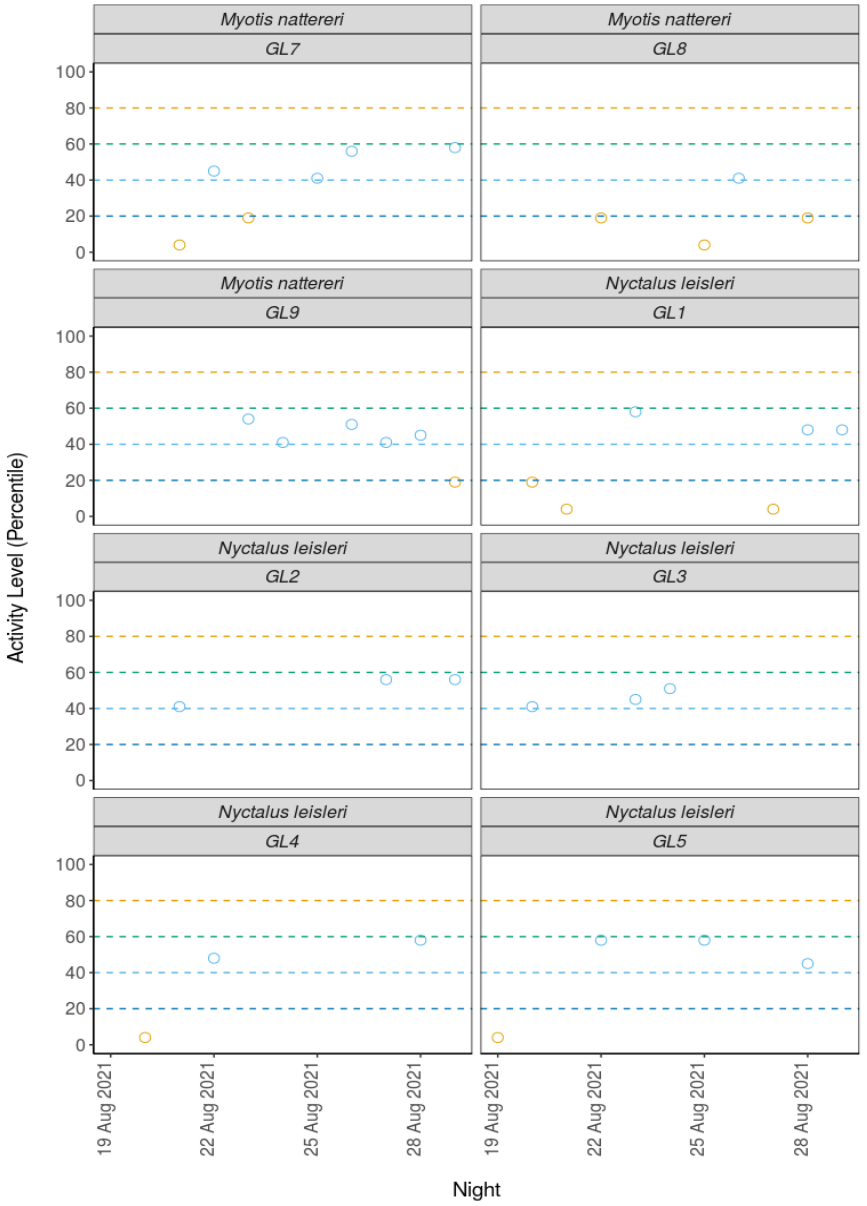
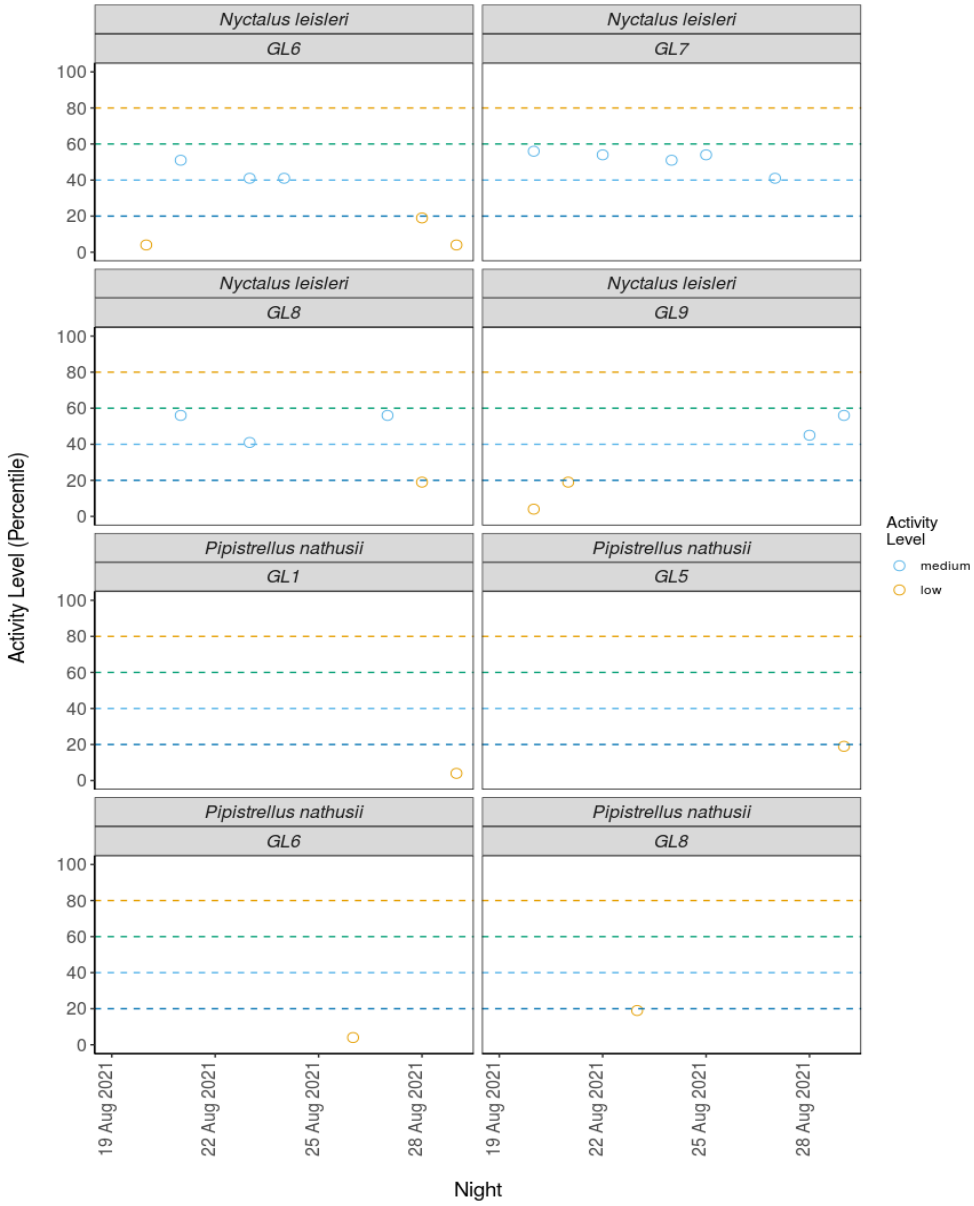
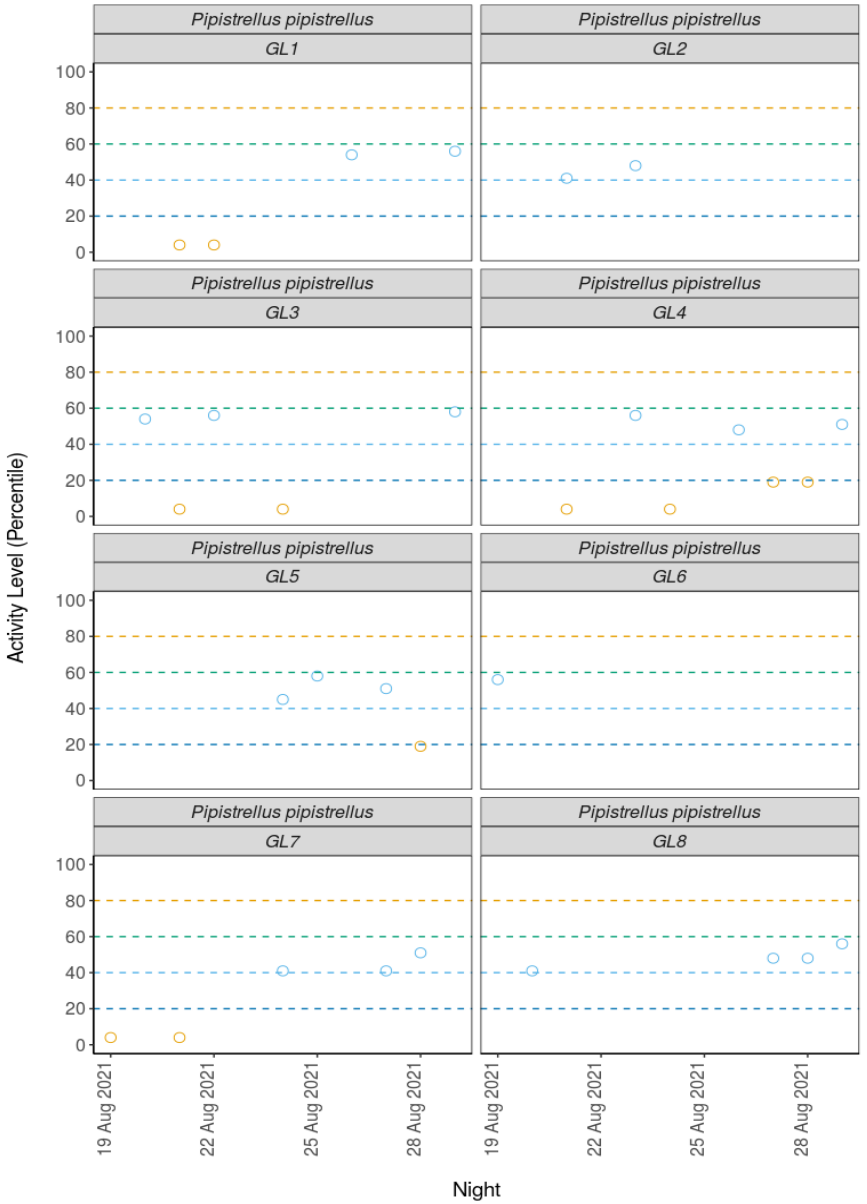


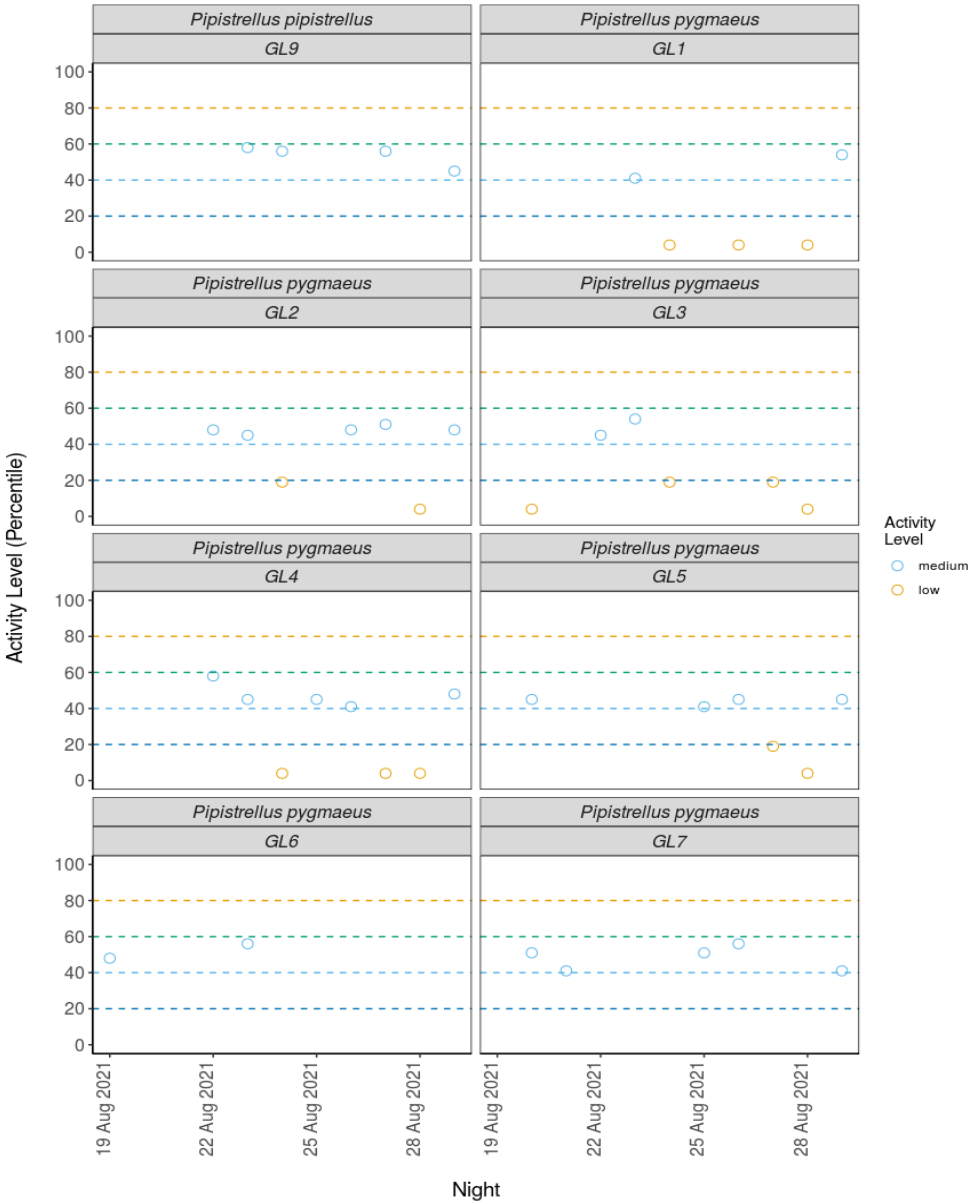
Plate 51: **Differences in activity between static detector locations, split by species and location. The centre line indicates the median activity level whereas the box represents the interquartile range (the spread of the middle 50% of nights of activity) – Survey round 3**

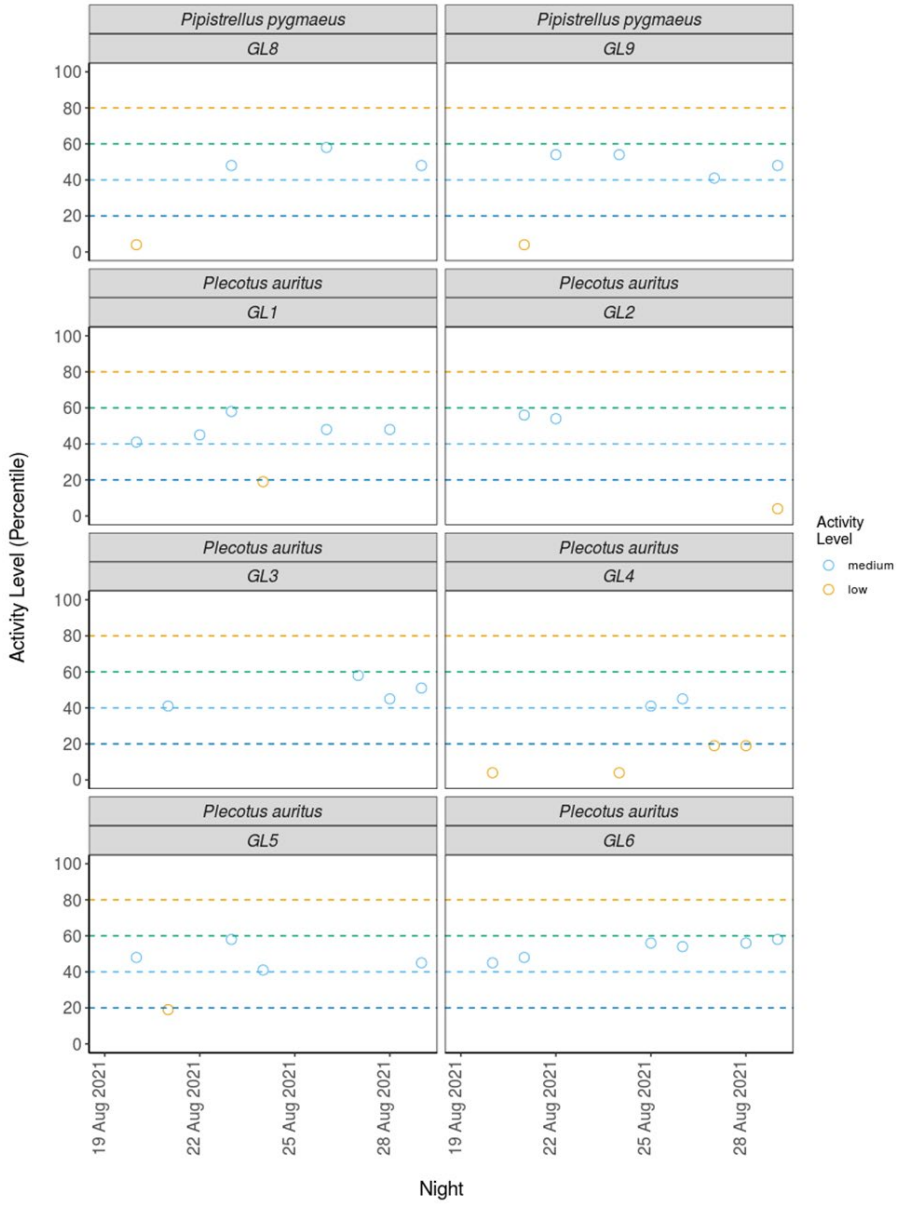

Myotis daubentonii
GL9
Myotis mystacinus
GL1
Myotis mystacinus
GL2
Myotis mystacinus
GL3
Myotis mystacinus
GL4
Myotis mystacinus
GL5
Myotis mystacinus
GL6
Myotis mystacinus
GL7
Myotis mystacinus
GL8
Myotis mystacinus
GL9
Myotis nattereri
GL1
Myotis nattereri
GL2
Myotis nattereri
GL3
Myotis nattereri
GL4
Myotis nattereri
GL5
Myotis nattereri
GL6
Activity Level (Percentile)
0
20
40
60
80
100
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Night
Activity Level
medium
low


Myotis nattereri
GL7
Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Activity Level (Percentile)
0
20
40
60
80
100
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Night


Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL1
Pipistrellus nathusii
GL5
Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL8
Activity Level (Percentile)
0
20
40
60
80
100
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Night
Activity Level
medium
low


Pipistrellus pipistrellus
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
Activity Level (Percentile)
Night
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Activity Level
me
low


Pipistrellus pipistrellus
Pipistrellus pygmaeus
GL9
GL1
GL2
GL3
GL4
GL5
GL6
GL7
Activity Level (Percentile)
Night
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Activity Level
medium
low



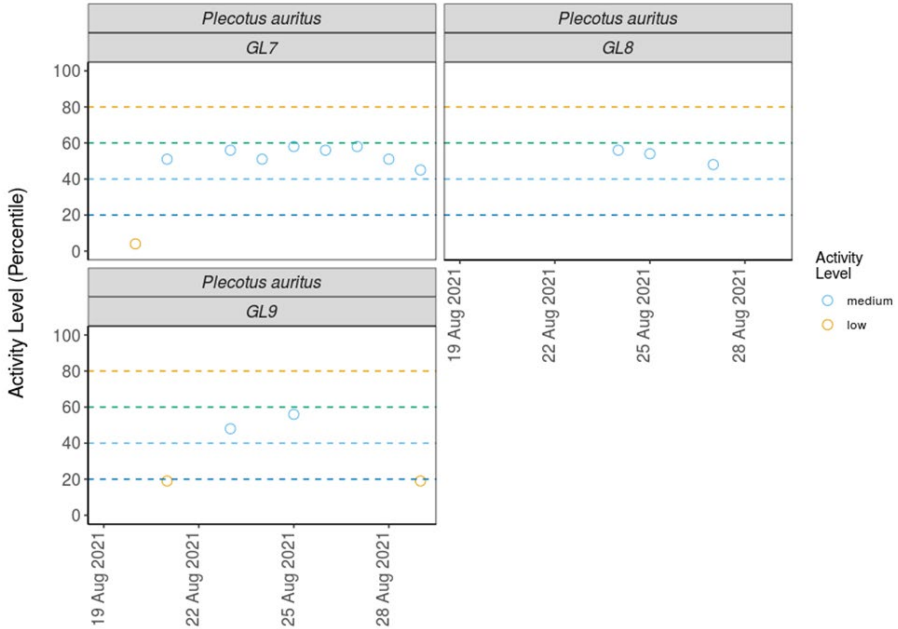


Plate 52: The activity level (percentile) of bats recorded across each night of the bat survey – Survey round 3

Table 4-18: Summary showing the number of nights recorded bat activity fell into each activity band for each species across all of the detectors – Survey round 3

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	Median Percentile	Bat Activity Category
Myotis daubentonii	1	20	33	16	13	48	Moderate
Myotis mystacinus	0	0	0	2	38	4	Low
Myotis nattereri	1	11	18	18	27	36	Low to Moderate
Nyctalus leisleri	6	27	27	17	11	54	Moderate
Pipistrellus nathusii	0	0	0	1	4	19	Low
Pipistrellus pipistrellus	15	23	25	10	11	56	Moderate
Pipistrellus pygmaeus	2	16	32	14	16	45	Moderate
Plecotus auritus	1	24	36	14	10	51	Moderate

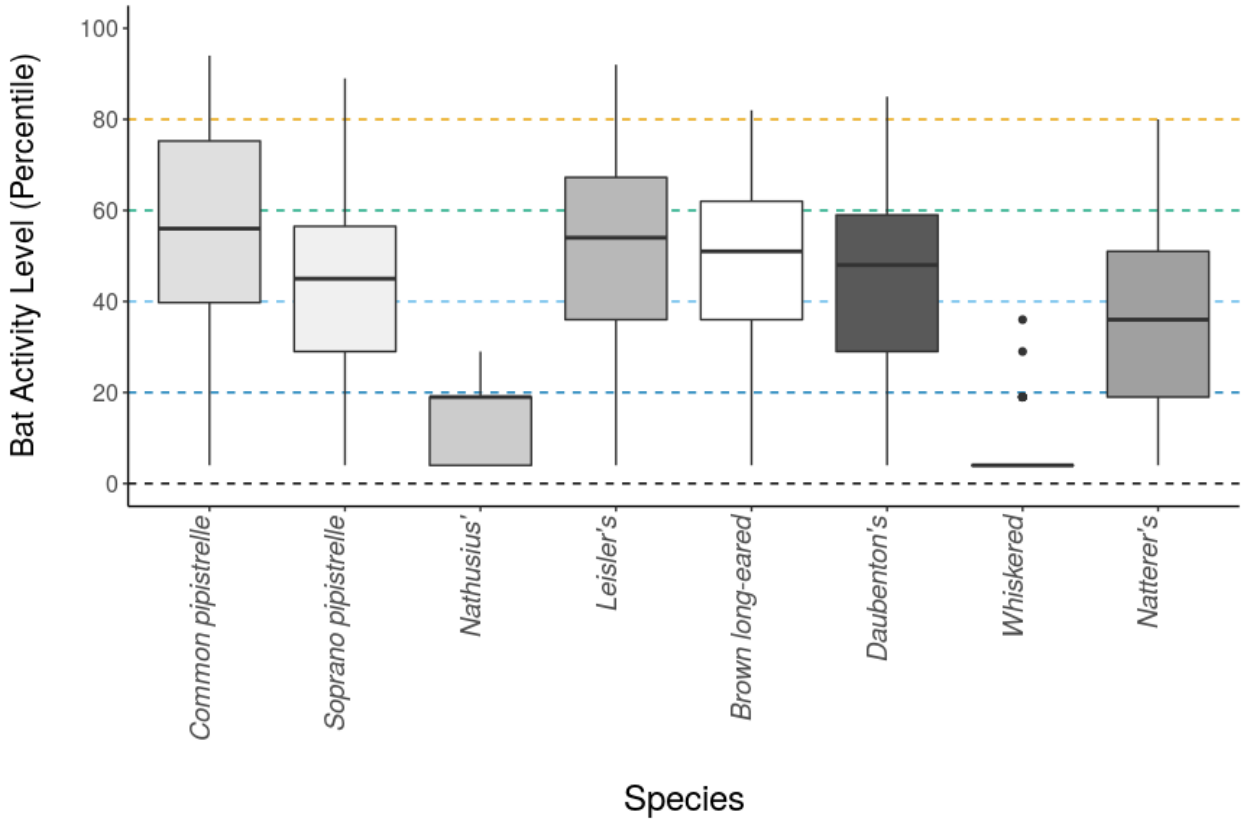


Plate 53: **The activity level (percentile) of bats recorded across each night of the bat survey for the entire site – Survey round 3**

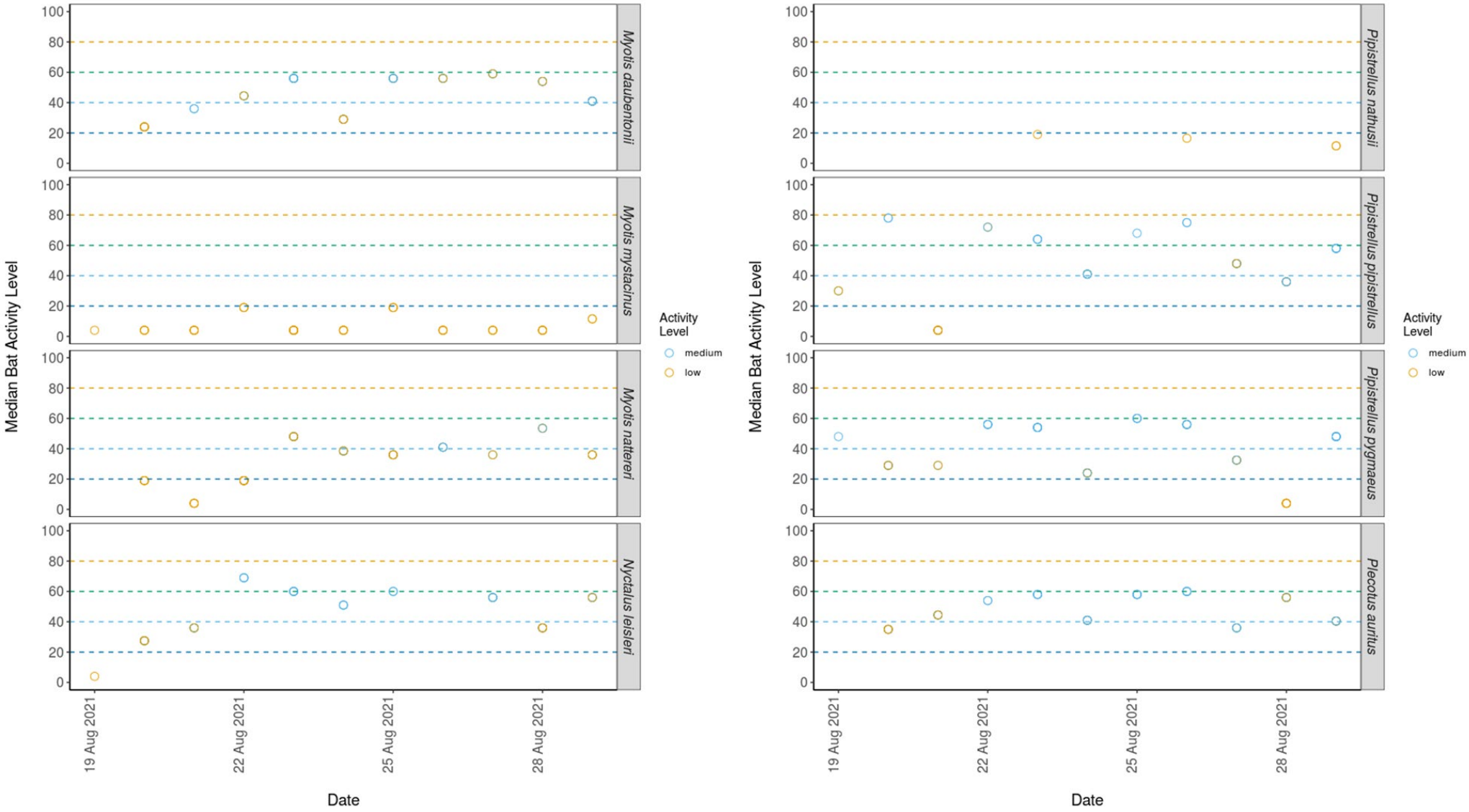
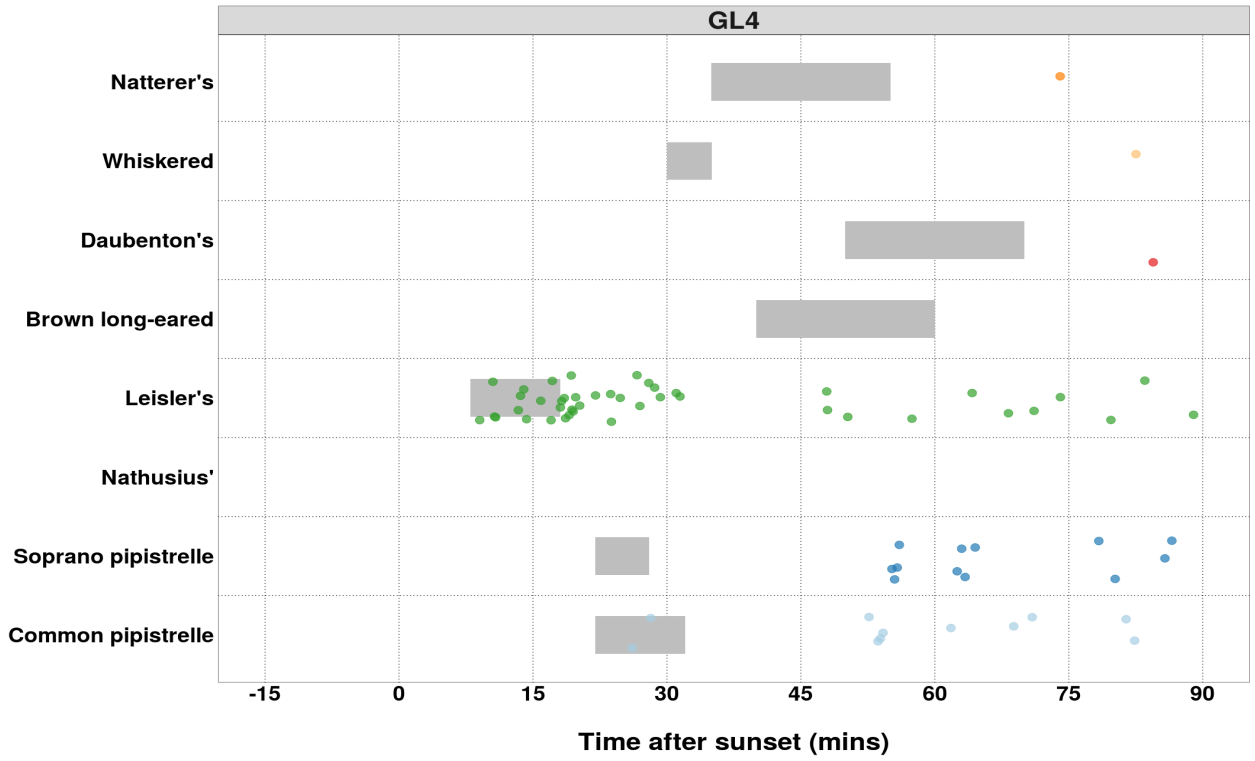
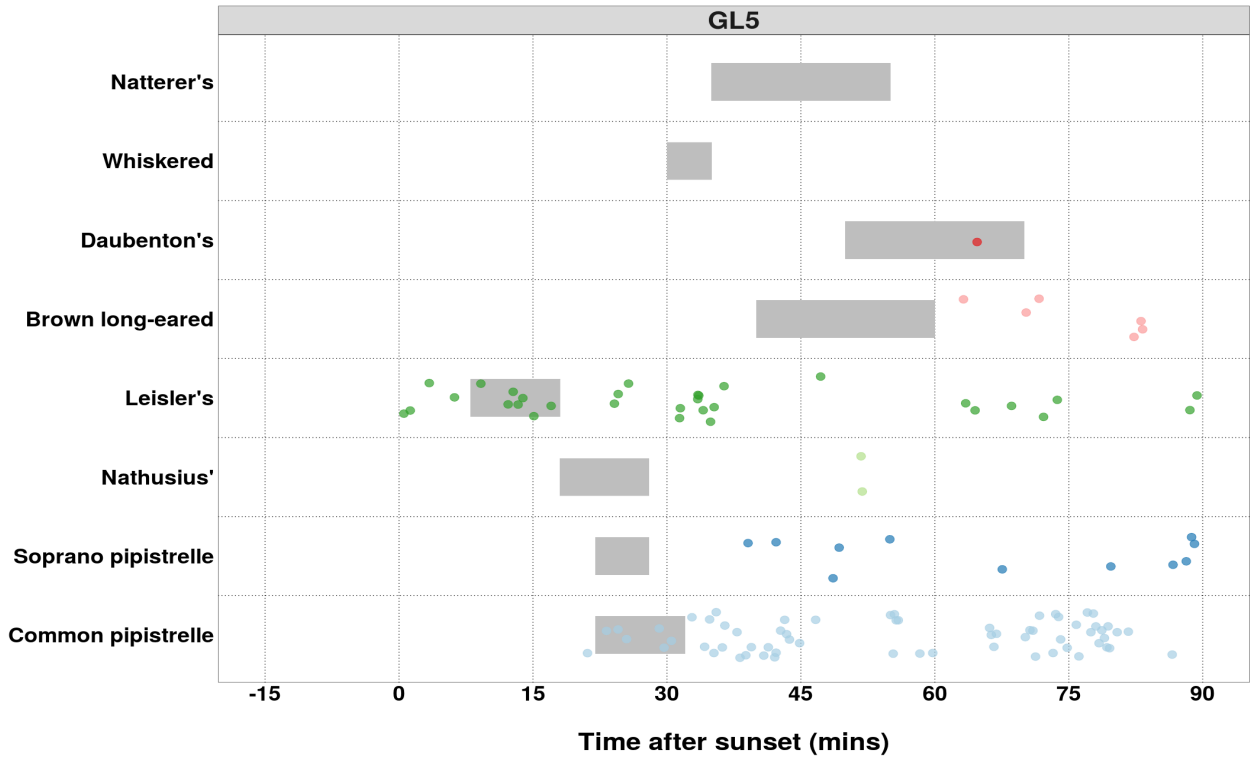
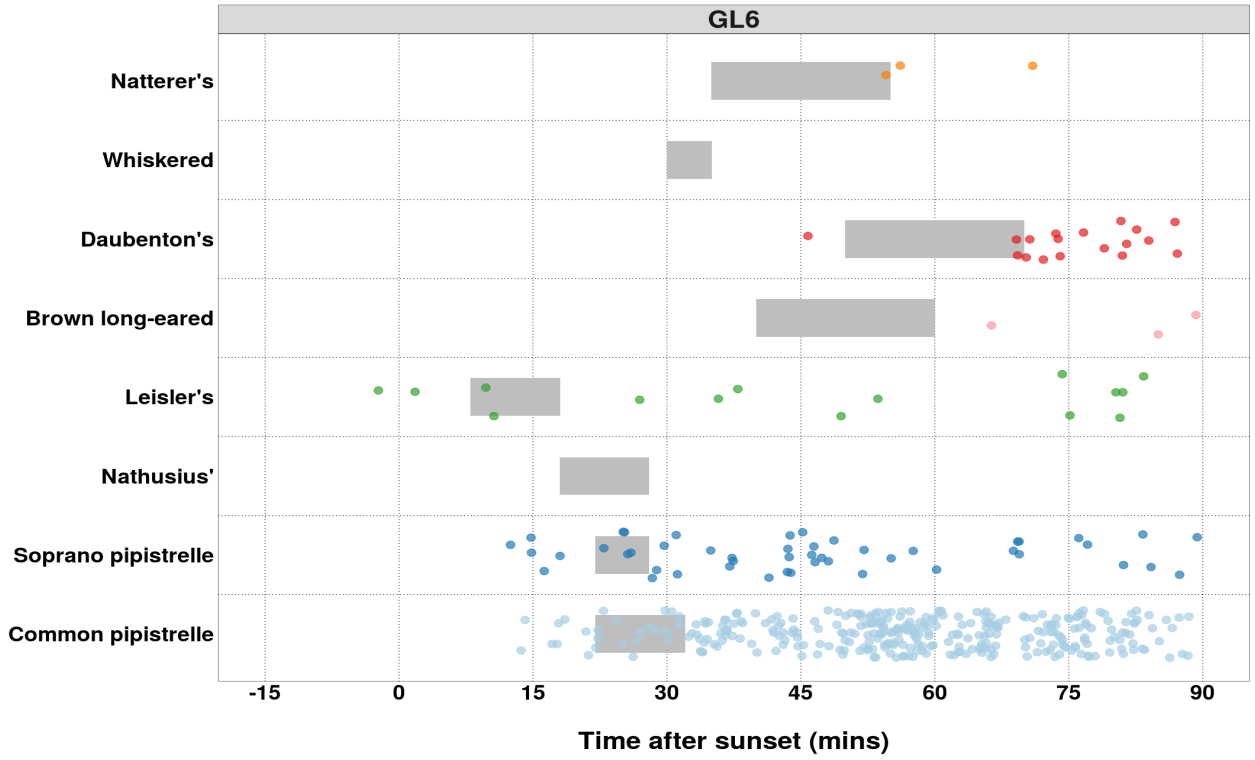


Plate 54: The median activity levels of bats recorded across all detectors each night – Survey round 3.

Due to the number of the recorded passes occurring within the species-specific emergence time ranges based on Russ 2012, the Ecobat analysis has identified a potential roost may be present near GL4, GL5, GL6, GL7 and GL8 static locations for Leisler's bat. Along with a potential roost near static locations GL5, GL6, GL7 and GL8 for common pipistrelle and soprano pipistrelle. Refer to Plate 55 which shows passes in relation to the time from 15 minutes before to 90 minutes after sunset.




GL5
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL6
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

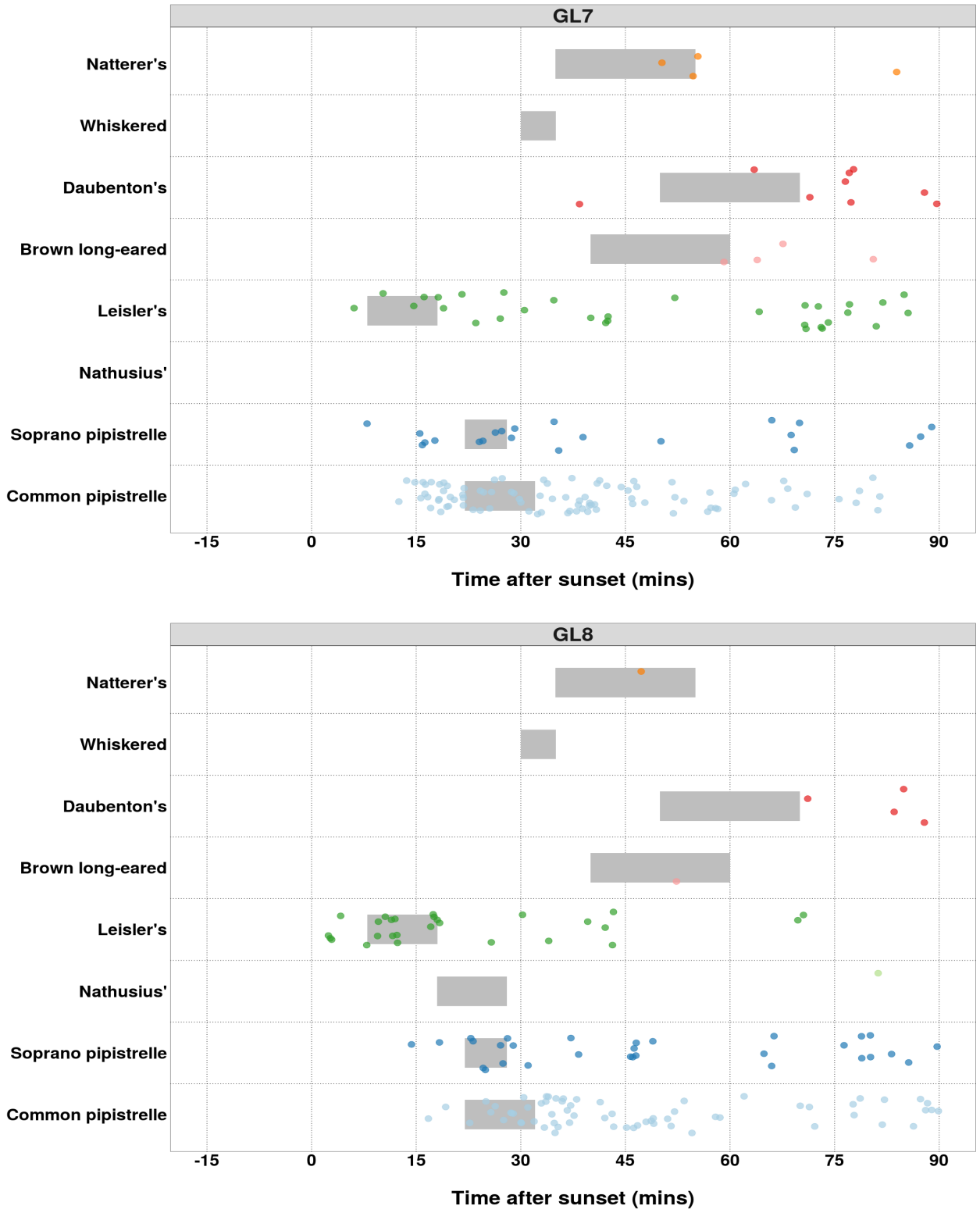


Plate 55: Time from 15 minutes before to 90 minutes after sunset, potentially indicating the presence of a nearby roost – Survey round 3.

5. ECOLOGICAL EVALUATION

A Site Risk Assessment, Impact Assessment and Habitat Assessment have been carried out using all available data for the Site. These assessments are used to determine the level of impact the Site may have on a local bat population if the potential impacts were to remain un-mitigated.

5.1 Site Risk Assessment

Wind farms can affect bats in the following ways (NatureScot 2021):

1. Collision mortality, barotrauma [9] and other injuries (although it is important to consider these in the context of other forms of anthropogenic mortality)
2. Loss or damage to commuting and foraging habitat, (wind farms may form barriers to commuting or seasonal movements, and can result in severance of foraging habitat);
3. Loss of, or damage to, roosts;
4. Displacement of individuals or populations (due to wind farm construction or because bats avoid the wind farm area).

To ensure that bats are protected by minimising the risk of collision, an assessment of impact at a site requires an appraisal of:

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

In addition, further consideration with regards to the local population are included in the assessment process:

- Is the bat species at the edge of its range
- Cumulative effects
- Presence of protected sites
- Proximity of maternity and winter roosts
- Key foraging areas
- Key flight lines
- Possible migration routes.

(9) *It should also be noted that although mortality of bats at wind farms include barotrauma (that results from exposure to the pressure variations caused by rotating turbine blades) as first presented by Baerwald et al. (2008) a number of studies since, including NREL (2012). *Reducing Bat Fatalities From Interactions with Operating Wind Turbines* and Lawson et al. (2020). *An investigation into the potential for wind turbines to cause barotrauma in bats*, dispute the hypothesis that barotrauma is responsible for a significant number of wind-turbine-related bat fatalities. However, the more recent studies have been undertaken on several mammal species (representative of bat species) as there is no data available on pressure change levels that cause barotrauma in bats.

Nine species of bat were recorded during the 2020 and 2021 bat surveys at Gortloughra. The table below provides an ecological valuation of each bat species and the collision risk factor in relation to wind farms. Four of the bat species recorded are High risk (Leisler's bat, Nathusius' pipistrelle, soprano pipistrelle and common pipistrelle).

Table 5-1: Ecological evaluation of the bat species recorded during the bat survey (CIEEM Guidelines, 2021) and "Bat Risk" in relation to Wind Turbines (SNH, 2021 and EC, 2020).

Ecological Value	Geographical Scale of Importance	Bat Risk
International	Leisler's bat	High
Regional	Brown long-eared bat	Low
	Natterer's bat	Low
	Nathusius' pipistrelle	High
	Lesser horseshoe bat	Low
Local	Soprano pipistrelle	High
	Common pipistrelle	High
	Whiskered bat	Low
	Daubenton's bat	Low

Using the NatureScot guidelines outlined in Table 5-2 the risk assessment criteria for the Site was determined to be:

- Project Size = **High** (<10 turbines, however, other wind energy developments within 10km and the turbines >100m in height)
- Habitat Risk = **Low** (Small number of potential roost features, of low quality. Low quality foraging habitat that could be used by small numbers of foraging bats. Isolated site not connected to the wider landscape by prominent linear features)

Therefore, a Site Risk Assessment score value of **3** was applied to the Site as a whole.

Table 5-2: Stage 1 - Initial site risk assessment extracted from NatureScot (2021) guidance documents

Site Risk Level (1-5)*		Project Size		
		Small	Medium	Large
Habitat Risk	Low	1	2	3
	Moderate	2	3	4
	High	3	4	5

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

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

Habitat Risk	Description
Low	Small number of potential roost features, of low quality. Low quality foraging habitat that could be used by small numbers of foraging bats. Isolated site not connected to the wider landscape by prominent linear features.
Moderate	Buildings, trees or other structures with moderate-high potential as roost sites on or near the site. Habitat could be used extensively by foraging bats. Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.
High	Numerous suitable buildings, trees (particularly mature ancient woodland) or other structures with moderate-high potential as roost sites on or near the site, and/or confirmed roosts present close to or on the site. Extensive and diverse habitat mosaic of high quality for foraging bats. Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows. At/near edge of range and/or on an important flyway. Close to key roost and/or swarming site.

Project Size	Description
Small	Small scale development (≤10 turbines). No other wind energy developments within 10km. Comprising turbines <50m in height.
Medium	Larger developments (between 10 and 40 turbines). May have some other wind developments within 5km. Comprising turbines 50-100m in height.
Large	Largest developments (>40 turbines) with other wind energy developments within 5km. Comprising turbines >100m in height.

5.2 Impact Assessment

The Impact assessment is determined by multiplying the Site Risk Assessment value (3 as outlined above) by the Ecobat median (most frequent activity category) and maximum (highest activity category recorded) activity values converted to the percentile score as shown in Table 3-4.

The median activity levels for each of the High Risk (leisler, common pipistrelle, soprano pipistrelle and nathusius' pipistrelle) species were converted to the percentile score and an average taken over the three survey rounds for 2020 and 2021.

The Impact Assessment is then carried out for the individual turbines using the overall site assessment value (4) and compared to the Risk Assessment Matrix (Table 5-3) in order to determine the level of overall risk to the population.

It should be noted that the Impact Assessment is based on the median values to determine overall risk to population.

Table 5-3: Risk Assessment Matrix

	Ecobat activity percentile					
Site Risk	**Nil (0)**	**Low (1)**	**Low – Moderate (2)**	**Moderate (3)**	**Moderate – High (4)**	**High (5)**
Lowest (1)	0	1	2	3	4	5
Low (2)	0	2	4	6	8	10
Medium (3)	0	3	6	9	12	15
High (4)	0	4	8	12	15	18
Highest (5)	0	5	10	15	20	25

Overall assessment value (i.e., Turbine Risk value) is then compared to the ranges below:

Low Overall Risk (0-4)	Medium Overall Risk (5-12)	High Overall Risk (13-25)

Nil (0) means no bat activity was recorded at the location, but caution is needed here, because although the values given in this column are "0", at sites where pre-construction surveys found no bat activity, there remains the possibility that new turbines could attract some bat species, thereby altering the level of risk that applies in reality. SNH (2021)

5.2.1 Evaluation of 2020 survey results

With regards to the 2020 surveys, the Ecobat Median Percentile for Leisler's bat, locations GL1, GL3, GL7, GL8 and GL9 have a Medium Risk Factor, while all others have a Low Risk Factor. All locations have a Medium Risk Factor with regards to the Ecobat maximum percentile. This is presented Table 5-4:

Table 5-4: Risk Assessment for each proposed turbine location – Leisler's Bat

Bat detector ID No.	Site risk value	Ecobat Maximum Percentile	Turbine risk (site risk x Ecobat Maximum Percentile)	Ecobat median Percentile	Turbine risk (site risk x Ecobat Median Percentile)
GL1	3	4	**12**	3	**9**
GL2	3	3	**9**	1	**3**
GL3	3	3	**9**	2	**6**
GL4	3	3	**9**	1	**3**
GL5	3	3	**9**	1	**3**
GL6	3	3	**9**	1	**3**
GL7	3	3	**9**	2	**6**
GL8	3	4	**12**	2	**6**
GL9	3	3	**9**	2	**6**

With regards to the 2020 surveys, the Ecobat Median Percentiles for common pipistrelle, all the locations, excluding GL4 which has a Low Risk Factor, have a Medium Risk factor. All locations have a Medium Risk Factor with regards to the Ecobat maximum percentile. This is presented in Table 5-5:

Table 5-5: Risk assessment for each proposed turbine location – Common pipistrelle

Bat detector ID No.	Site risk value	Ecobat Maximum Percentile	Turbine risk (site risk x Ecobat Maximum Percentile)	Ecobat median Percentile	Turbine risk (site risk x Ecobat Median Percentile)
GL1	3	3	**9**	2	**6**
GL2	3	4	**12**	2	**6**
GL3	3	3	**9**	3	**9**
GL4	3	3	**9**	1	**3**
GL5	3	4	**12**	2	**6**
GL6	3	4	**12**	3	**9**
GL7	3	3	**9**	2	**6**
GL8	3	4	**12**	2	**6**
GL9	3	3	**9**	2	**6**

With regards to the 2020 surveys, the Ecobat Median for soprano pipistrelle, locations GL6 and GL8 have a Medium Risk Factor, while all others have a Low Risk Factor. GL2, GL4, GL5, GL6, GL7, GL8 and GL9 have a Medium Risk Factor with regards to the Ecobat maximum percentile, with GL1 and GL3 having a Low Risk Factor. This is presented in Table 5-6:

Table 5-6: Risk assessment for each proposed turbine location – Soprano pipistrelle

Bat detector ID No.	Site risk value	Ecobat Maximum Percentile	Turbine risk (site risk x Ecobat Maximum Percentile)	Ecobat Median Percentile	Turbine risk (site risk x Ecobat Median Percentile)
GL1	3	1	**3**	1	**3**
GL2	3	3	**9**	1	**3**
GL3	3	1	**3**	1	**3**
GL4	3	2	**6**	1	**3**
GL5	3	2	**6**	1	**3**
GL6	3	4	**12**	4	**12**
GL7	3	2	**6**	1	**3**
GL8	3	3	**9**	2	**6**
GL9	3	2	**6**	1	**3**

With regards to the 2020 surveys, the Ecobat Median for nathusius pipistrelle, locations GL4, GL6 and GL7 have a Medium Risk Factor, while all others have a Low Risk Factor. With regards to the maximum percentile location GL1, GL2, GL4, GL6 and GL7 have a Medium Risk Factor, while all others have a Low Risk Factor. This is presented in Table 5-7:

Table 5-7: Risk assessment for each proposed turbine location – Nathusius' pipistrelle

Bat detector ID No.	Site risk value	Ecobat Maximum Percentile	Turbine risk (site risk x Ecobat Maximum Percentile)	Ecobat Median Percentile	Turbine risk (site risk x Ecobat Median Percentile)
GL1	3	2	**6**	1	**3**
GL2	3	2	**6**	1	**3**
GL3	3	0	**0**	0	**0**
GL4	3	2	**6**	2	**6**
GL5	3	1	**3**	1	**3**
GL6	3	3	**9**	2	**6**
GL7	3	2	**6**	2	**6**
GL8	3	1	**3**	0	**0**
GL9	3	1	**3**	0	**0**

5.2.2 Evaluation of 2021 survey results

With regards to the 2021 surveys, the Ecobat Median Percentile for Leisler's bat, all locations have a Medium Risk Factor. With regards to the Ecobat maximum percentile location GL2 has a High Risk Factor, while the remaining locations have a Medium Risk Factor. This is presented Table 5-8:

Table 5-8: Risk Assessment for each proposed turbine location – Leisler's Bat

Bat detector ID No.	Site risk value	Ecobat Maximum Percentile	Turbine risk (site risk x Ecobat Maximum Percentile)	Ecobat Median Percentile	Turbine risk (site risk x Ecobat Median Percentile)
GL1	3	4	**12**	3	**9**
GL2	3	5	**15**	4	**12**
GL3	3	4	**12**	3	**9**
GL4	3	3	**9**	3	**9**
GL5	3	3	**9**	2	**6**
GL6	3	4	**12**	2	**6**
GL7	3	3	**9**	3	**9**
GL8	3	4	**12**	2	**6**
GL9	3	4	**12**	3	**9**

With regards to the 2021 surveys, the Ecobat Median and Maximum Percentiles for common pipistrelle, all the locations have a Medium Risk factor. This is presented in Table 5-9:

Table 5-9: Risk assessment for each proposed turbine location – Common pipistrelle

Bat detector ID No.	Site risk value	Ecobat Maximum Percentile	Turbine risk (site risk x Ecobat Maximum Percentile)	Ecobat Median Percentile	Turbine risk (site risk x Ecobat Median Percentile)
GL1	3	3	**9**	2	**6**
GL2	3	4	**12**	3	**9**
GL3	3	3	**9**	3	**9**
GL4	3	3	**9**	2	**6**
GL5	3	4	**12**	3	**9**
GL6	3	4	**12**	3	**9**
GL7	3	4	**12**	3	**9**
GL8	3	3	**9**	2	**6**
GL9	3	4	**12**	3	**9**

With regards to the 2021 surveys, the Ecobat Median and Maximum Percentiles for soprano pipistrelle, all the locations have a Moderate Risk factor, excluding GL1 which has a low risk factor for the Median Percentile. This is presented in Table 5-10:

Table 5-10: Risk assessment for each proposed turbine location – Soprano pipistrelle

Bat detector ID No.	Site risk value	Ecobat Maximum Percentile	Turbine risk (site risk x Ecobat Maximum Percentile)	Ecobat Median Percentile	Turbine risk (site risk x Ecobat Median Percentile)
GL1	3	2	**6**	1	**3**
GL2	3	2	**6**	2	**6**
GL3	3	3	**9**	2	**6**
GL4	3	2	**6**	2	**6**
GL5	3	4	**12**	3	**9**
GL6	3	3	**9**	3	**9**
GL7	3	3	**9**	2	**6**
GL8	3	3	**9**	2	**6**
GL9	3	3	**9**	3	**9**

With regards to the 2021 surveys, the Ecobat Median and Maximum Percentile for Nathusius pipistrelle, location GL5 has a Medium Risk Factor, while the remaining locations have a Low risk factor. This is presented in Table 5-11:

Table 5-11: Risk assessment for each proposed turbine location – Nathusius' pipistrelle

Bat detector ID No.	Site risk value	Ecobat Maximum Percentile	Turbine risk (site risk x Ecobat Maximum Percentile)	Ecobat median Percentile	Turbine risk (site risk x Ecobat median Percentile)
GL1	3	0	**0**	0	**0**
GL2	3	0	**0**	0	**0**
GL3	3	0	**0**	0	**0**
GL4	3	1	**3**	1	**3**
GL5	3	2	**6**	2	**6**
GL6	3	1	**3**	1	**3**
GL7	3	0	**0**	0	**0**
GL8	3	1	**3**	1	**3**
GL9	3	0	**0**	0	**0**

5.2.3 Habitat Assessment

The habitat assessment determines the value of the habitat to bat species with regards to potential roosting, commuting or foraging value as indicated by current guidelines and literature including (but not limited to) Collins 2016, Denzinger 2013, Kirkpatrick 2016 and Finch 2020.

Plantation woodland

A study by Kirkpatrick (2016) identified that, although bat associations with plantation habitat features are separated into two broad guilds (those using more complex habitats such as soprano pipistrelle and Myotis spp., and open space foragers such as noctule and to some extent common pipistrelle), all species preferentially used stand edges. Plantation edges may also allow both clutter tolerant and clutter sensitive bats access to navigate both within and around stands of plantation. The study further concluded that a possible reason for the higher activity levels found at forestry edges may be due to providing protection from the wind for weak flying prey or acting as windbreaks collecting airborne insects blown in from adjacent open or felled areas and also providing protection from predators.

The edge ecology is considered as *High Ecological value for bats*, while the dense woodland stands (internal ecology) are of *Low Ecological value* for bats at the Site.

Agricultural field/ open habitat

A study carried out in the UK by Finch *et al*. (2020) found that bat activity for open agricultural habitats is lower than that of linear features and that bats are more likely to be associated with treelines (including mature trees within hedgerows) compared to other linear feature types. The study also found that, of all the records of bat activity, only 10% of the common pipistrelle activity was recorded within open habitats (e.g., agricultural fields). Soprano pipistrelle also showed to statistically favour linear habitats.

The agricultural fields and open heath and bog are considered as *Low Ecological value* for bats.

Hedgerow (with/without treeline)

As highlighted in Fitch *et al.* (2020), bats are more likely to be associated with treelines (including mature trees within hedgerows) compared to other linear feature types. Therefore, the hedgerow bounding the fields are considered *Moderate to High Ecological value* due to the foraging and commuting potential.

Watercourses

As highlighted by Altringham (2003) waterbodies and riparian areas provide foraging, commuting, and roosting habitat for bats. Therefore, the existing first orders streams onsite are considered *Moderate to High Ecological value* due to the foraging and commuting potential.

5.3 Summary of Assessments

Table 5-12: Summary of bat survey data and assessment (Figures provided as an average between the survey periods 2020 and 2021)

Current Turbine Location	Risk Assessment Leisler's Bat[10]		Risk Assessment Common Pipistrelle[10]		Risk Assessment Soprano Pipistrelle[10]		Risk Assessment Nathusius Pipistrelle[10]		Clarifying Comment				If no mitigation is applied, what is the potential impact level to the High Risk species?
Static detector location 2020/2021	Ecobat Maximum Percentile	Ecobat Median Percentile	Ecobat Maximum Percentile	Ecobat Median Percentile	Ecobat Maximum Percentile	Ecobat Median Percentile	Ecobat Maximum Percentile	Ecobat Median Percentile	Is Static at Turbine Location (Y/N)	Bat Habitat within 200m	Bat Habitat along existing access tracks	Bat activity along existing access tracks	Taking into consideration the clarifying comment
T01 (GL2/GL1)	10.5	6	10.5	6	4.5	3	6	3	Y	Y	Y	N	Low
T02 (GL1/GL2)	**13.5**	10.5	10.5	7.5	4.5	4.5	6	3	Y	N	Y	N	Medium
T03 (GL9/GL3)	10.5	7.5	9	7.5	7.5	4.5	3	0	Y	N	Y	N	Low
T04 (GL8/GL4)	10.5	7.5	10.5	6	7.5	6	3	1.5	N	Y	Y	N	Medium
T05 (GL6/GL5)	9	4.5	12	9	12	10.5	7.5	6	N	Y	Y	N	Medium
T06 (GL7/GL6)	10.5	6	10.5	7.5	7.5	6	4.5	4.5	Y	Y	Y	N	Medium

[10] Average of 2020 and 2021 static detector results

Current Turbine Location	Risk Assessment Leisler's Bat[11]		Risk Assessment Common Pipistrelle[10]		Risk Assessment Soprano Pipistrelle[10]		Risk Assessment Nathusius Pipistrelle[10]		Clarifying Comment				If no mitigation is applied, what is the potential impact level to the High Risk species?
T07 (GL3/GL7)	9	7.5	10.5	9	6	4.5	0	0	Y	N	Y	N	Medium
T08 (GL4/GL8)	10.5	7.5	9	4.5	7.5	4.5	4.5	4.5	Y	N	Y	N	Medium
T09 (GL5/GL9)	10.5	6	12	7.5	7.5	6	1.5	1.5	Y	N	Y	N	Medium

The assessments identified an overall potential for impact on the bat population at the Site as low to medium for Leisler's bat, common pipistrelle, soprano pipistrelle and Nathusius' pipistrelle.

[11] Average of 2020 and 2021 static detector results

6. DISCUSSION

The methodology for the 2020 AND 2021 bat surveys at Gotaloughra Wind Farm adhered to SNH (2019) and subsequent NatureScot (2021) guidance for assessing the impact of proposed wind farm developments on local bat species. Activity surveys were undertaken in June, July and September 2020 and 2021. Three rounds of static detectors were also deployed during April/ May, June and September/ October 2020 for a minimum of 10 nights per round per detector. Further survey effort was also undertaken during the 2021 survey round with three rounds of static detector surveillance rounds between April/ May, July and August. Along with roost surveys undertaken in in 2020 and 2021 (refer to Appendix A for the full report).

During the 2020 activity surveys, a total of three species of bats were recorded: common pipistrelle, soprano pipistrelle and Leisler's bat. The most commonly recorded species was common pipistrelle, followed by Leisler's and soprano pipistrelle. No bat species were recorded within the site during the 2021 activity surveys.

During the preliminary roost assessment, no trees or buildings suitable as roosting or resting places for bats were recorded at this site. Five culverts were identified on site, with here of two of these supporting some crevices with limited bat roosting potential. However, no evidence of bats was observed at any culvert during roost surveys within the proposed site (refer to Appendix A).

During static surveys, a total of nine species of bats were recorded in both 2020 and 2021: common pipistrelle, soprano pipistrelle, Nathusius pipistrelle, Leisler's bat, Natterer's bat, Daubenton's bat, whiskered bat, brown long-eared bat and lesser horseshoe bat. The most commonly recorded species for 2020 and 2021 was common pipistrelle, followed by Leisler's and soprano pipistrelle, with lower levels brown long-eared bat and myotis spp. (Daubenton's bat, Natterer's bat and whiskered bat) detected.

The Ecobat analysis of the 2020 results showed all nine of the static detector locations (GL1-GL9) recorded at least one night of high bat activity for at least one species of bat. The species identified as having nights of high activity are Leisler's bat, common pipistrelle, soprano pipistrelle, Daubenton's bat and brown long eared bat.

During static detector surveys of 2021 a total of eight species of bat were recorded, all of which are the same of the previous (2020) year, excluding lesser horseshoe bat. Furthermore, all nine of the static locations (GL1-GL9) recorded at least one night of high bat activity for at least one species of bat. The species identified as having nights of high activity are Leisler's bat, common pipistrelle, soprano pipistrelle, Daubenton's bat, brown long eared bat and Natterer's bat.

The Ecobat analysis of the 2020 and 2021 results, further identified a potential roost for Leisler's bat, common pipistrelle and soprano pipistrelle within the vicinity of the study area. Based on the locations of the detectors that recorded these early emergences, the potential roots for the previously mentioned species are likely beyond, the south east/ eastern area of the site. However, roost assessments carried out in 2020 and 2021 confirmed there are no roosts within or adjacent to the proposed wind farm (Appendix A).

Turbines T02, T03, T06, T08 and T09 are all located within open upland areas of heath and bog. They are distant from any nearby linear features such as forestry edges or streams. T06, in its current location is the closest turbine to a forestry edge, approx. 185m. Static locations GL1, GL9, GL7, GL4 and GL8 2020 and GL2, GL3, GL6, GL8 and GL9 provide representative data of how bats use this open habitat surrounding these turbine locations. The assessments show there is a potential moderate risk for Leisler's bats, a potential low to moderate impact risk for common and soprano pipistrelle and a low impact risk for Nathusius' pipistrelle at these proposed turbine locations in the absence of mitigation, based on this conservative assessment.

Turbine T01, T04 and T05 are located within open upland areas of heath and bog adjacent to first order streams. T05, in its current location, is the closest turbine to a first order stream, approx. 40m from the first order stream. Bat activity along linear features, such as streams, is higher than that of open areas. Static locations GL2, GL8 and GL6 2020 and locations GL1, GL4 and GL5 2021 provide representative data of how bats the first order streams within the study area. The assessments show there is a potential moderate impact risk for common pipistrelle, and a potential low to moderate impact risk for Leisler's bat, soprano pipistrelle and Nathusius' pipistrelle at these proposed turbine locations in the absence of mitigation, based on this conservative assessment.

Turbine 7 was located within improved grassland and moved in 2021 boundary between an agricultural field and plantation bog heath. The assessments show there is a potential moderate impact risk for Leisler's bats and common pipistrelle, and a potential low impact risk for soprano pipistrelle Nathusius' pipistrelle at these proposed turbine locations in the absence of mitigation, based on this conservative assessment.

All bats recorded are classified as 'Least Concern' on the Irish Red List (Marnell *et al*. 2019) and protected under the EU Habitats Directive Annex IV, with lesser horseshoe bat also protected under Annex II, and Wildlife Acts.

6.1 Potential Impacts

As outlined by Scottish Natural Heritage (2021), wind farms can affect bats in the following ways:

- Collision mortality, barotrauma and other injuries
- Loss or damage to commuting and foraging habitat
- Loss of, or damage to roosts
- Displacement of individuals or populations.

Furthermore, as indicated in Richardson *et al* (2021) common pipistrelle bats may be attracted to wind turbines. The study showed common pipistrelle activity was 37% higher at turbines than at control locations. Soprano pipistrelle shows no increase in activity between the turbine and control locations. The study further discussed, the observed higher levels of activity could be because there are more bats around turbines, or because animals spend more time in these locations relative to controls, even if the number of individual common pipistrelles remains the same. We cannot distinguish between these possibilities using acoustic data. However, either way, higher levels of activity around turbines is likely to increase fatality risks and help to explain why fatality rates are often not predicted by acoustic surveys for common pipistrelle activity conducted prior to facility construction.

6.2 Mitigation Measures

6.2.1 Mitigation during Construction Phase

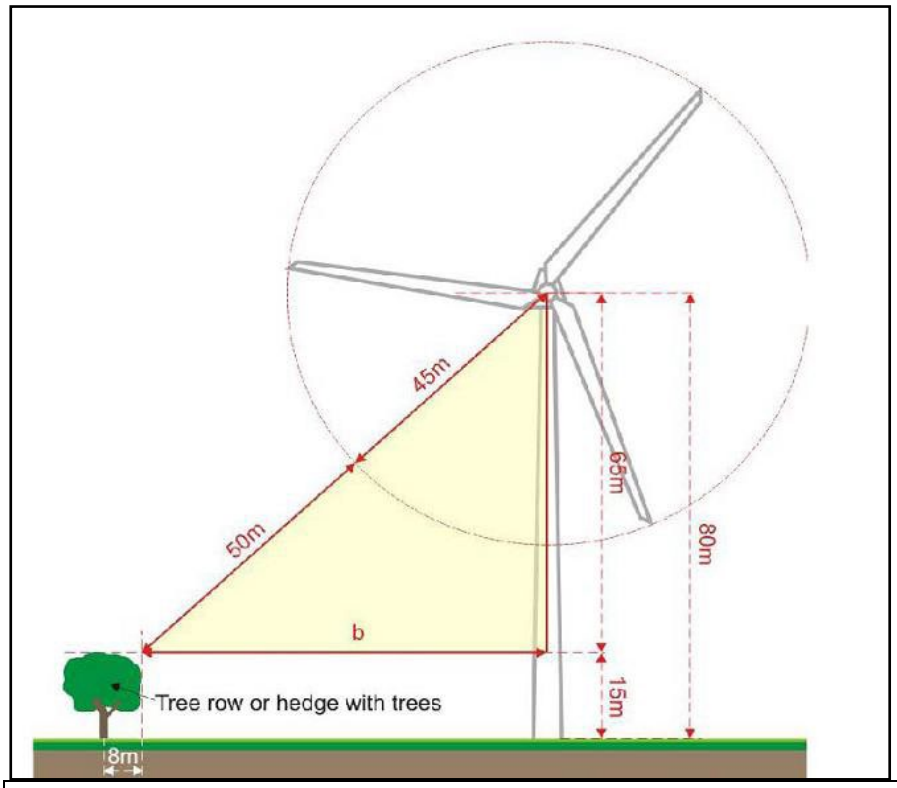
Buffer Zone

To minimize risk to bat populations, a buffer zone is recommended around any treeline, hedgerow, woodland feature, into which no part of the turbine should intrude.

According to SNH (2021 guidance:

> *"The Eurobats guidance recommends a 200m buffer around woodland areas. There is, however, currently no scientific evidence to support this distance in the UK and it is recommended that a distance of 50m between turbine blade tip and nearest woodland (or other key habitat features such as wetlands etc.) is adequate mitigation in most, lower risk situations. Exceptionally, larger buffers may be appropriate, e.g. near major swarming and hibernation sites. The longevity of wind farms should also be taken into account and the maximum growth, or management, of woodland and other relevant habitat features considered in their planning.*

Distances will need to be taken into account during the design phase of the proposed Gortloughra Wind Farm Development. The following formula will be used to calculate the required felling buffer for each turbine (taking into account the height of surrounding woodland/plantations at each turbine location):



$$b = \sqrt{\{(50 + bl)^2 - (hh - fh)^2\}}$$

where: b = the distance on the ground
between the edge of the canopy and the turbine (m)
bl = blade length (m)
hh = hub height (m)
fh = feature height (m)

$$b = \sqrt{\{(50 + 75)^2 - (100 - fh)^2\}}$$

Location's representative of the habitat types and features at turbine locations were surveyed, and the bat activity survey findings recorded informed the application of the 50m blade tip buffer described above at all six proposed turbine locations. To minimize risk to bat populations, a buffer zone is required around any treeline, hedgerow, woodland feature, into which no part of the turbine should intrude.

As all current turbine locations are in open areas, distant from surrounding forestry edges and treelines (T06 being the closest turbine to a forestry edge with a separation distance of 185m), no tree felling is required within the turbine buffer zones.

The following specific mitigation measures for bats are also recommended:

Supervision of vegetation clearance

An ecologist/ECoW will supervise areas where vegetation, scrub and hedgerow removal will occur prior to and during construction as appropriate (e.g., ecologist may be required during some clearance works of areas where vegetation is too dense to check beforehand). This will ensure that any site-specific issues in relation to wildlife not currently present (e.g., Bat roost locations) on site will be discovered prior to commencement of works to allow appropriate mitigation measures to be put in place. In the event that an issue arises, the NPWS will be informed, and the relevant guidelines will be implemented as appropriate (e.g., NRA guidelines).

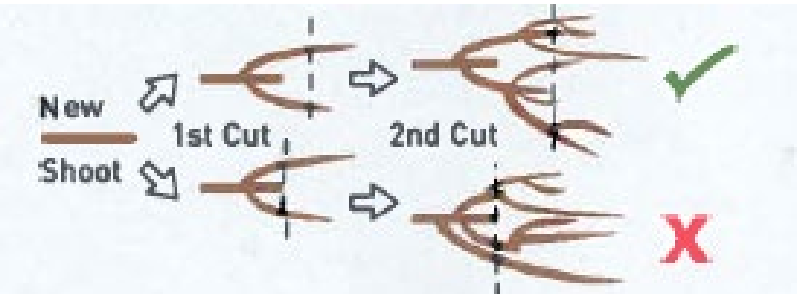
Habitat retention, replacement and landscaping

Habitat replacement and landscaping could compensate for or add to the wildlife value of the area and provide areas of aesthetic as well as wildlife interest. In general, landscape design should aim to retain the quality of the landscape and ensure its protection within the landscaping programme. Existing hedgerows and semi-natural scrub or semi-natural grasslands within the study area outside of the footprint of the development will be retained and incorporated into the landscaping. Disturbed areas will be allowed to recolonise naturally.

All hedgerow planting is required to use plants of native provenance. The landscaping contractor is required to be informed well in advance to allow the acquisition of suitable native stock. 2–3-year-old alder and willow trees may be required for hedgerows to help accelerate establishment. These will be supplemented with planting of whips.

The following fast-growing damp tolerant species are to planted along the inner edges of these hedgerows: grey willow *Salix cinerea,* goat willow *Salix caprea,* and alder *Alnus glutinosa.* The following native fruiting hedgerow species are to planted along the outer edges of these hedgerows: whitethorn *Crataegus monogyna* (75% of total), blackthorn *Prunus spinosa*, bird cherry *Prunus padus,* elder *Sambucus nigra,* dog rose *Rosa canina,* crab apple *Malus sylvestris,* field rose *Rosa arvensis.*

Tightly cut hedgerows with flat tops provide little benefit to wildlife, taller and bulky hedgerows are required as this provides more shelter for wildlife. When the hedgerows are maintained, stems will be cut a little above the last cut (see Plate 6-1) as cutting back to the exact same point depletes the energy of the hedgerow, forms a build-up of scar tissue which discourages new growth.



Source:Teagasc

Plate 6-1: Hedgerow Level of Cut

Light annual cutting of hedgerows is not good for wildlife as it limits the production of flowers and fruit. The sites hedgerows will be cut every three to four years in rotation if cutting is required, as this will leave areas of undisturbed hedgerows. Cutting equipment used will be sharp so as not to shatter or fray the hedge. Shattering and fraying allows for disease to enter plants and can lead to decay and weaken the vigour of the hedgerow.

A finger-bar cutter is recommended as the most appropriate tool to minimise fraying and smashing of branches (Heritage Council, 2017). A flail-type hedge cutter is unsuitable for hedge trimming in situations where hedgerow health is a priority.

Hedgerow maintenance will not be carried out between the 1st of March and 31st of August as this is the nesting round for birds and any maintenance at this time will disturb breeding; this is in keeping with the Wildlife Act 1976 (as amended).

Lighting restrictions

In general, artificial light creates a barrier to bats so lighting should be avoided where possible. Construction operations within the wind farm site will take place during the hours of daylight where possible to minimise disturbances to faunal species at night. Some works along the cable route and wind farm site may occur at night but the project ecologist/ECoW shall limit night-time works to sections of the route / site which avoid sensitive features (e.g., mature treelines). Where lighting is required, directional lighting (i.e., lighting which only shines on work areas and not nearby countryside) will be used to prevent overspill.

This can be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only.

Pre-construction Surveys

If three years lapse from between planning-stage surveys and installation of the wind turbines, it will be necessary to repeat one season of surveys during the activity round (EUROBATS, 2014). Future survey work will be completed according to best practice guidelines available (Hundt, 2012; Collins, 2016; SNH, 2019; 2021) and includes static detector, activity and roost inspection surveys.

6.2.2 Mitigation during Operational Phase

Reduced rotation speed while idling (Feathering of Blades)

Turbines will operate in a manner which restricts the rotation of the blades as far as is practicably possible below the manufacturer's specified cut-in speed (NatureScot 2021). This is usually achieved by feathering the blades during low wind speeds; the angle of the blades is rotated to present the slimmest profile possible towards the wind, ensuring they do not rotate or 'idle' when not generating power.

Turbine blades spinning in low wind can kill bats, however bats cannot be killed by feathered blades which are not spinning (Horn *et al*., 2008). The reduction in speed resulting from feathering compared with normal idling may reduce fatality rates by up to 50% (SNH 2021).

As such, the feathering of blades to prevent 'idling' during low wind speeds is proposed for all turbines.

Cut-in Speeds/Curtailment

Increasing the cut-in speed above that set by the manufacturer can reduce the potential for bat/turbine collisions. A study by Arnett *et al*., (2011) showed a 50% decrease in bat fatality can be achieved by increasing the cut-in speed by 1.5 m/s.

Species with elevated risk of collision (Leisler's bat, soprano and common pipistrelle) in particular would benefit from increasing the cut-in speed of turbines, as dictated on a case-by case basis depending on the activity levels recorded at each turbine.

Although the proposed turbine locations are within areas of open space, and therefore will have lower activity levels than the linear features and edge ecology, all turbine locations recorded moderate activity levels, excluding T01 and T03 which had low levels. Therefore, increased cut-in speeds will be implemented from commencement of operation for all turbines, excluding T01 and T03. Cut-in speeds will be increased during the bat activity season (April-October) and/or where weather conditions are optimal for bat activity (see below) from 30 minutes prior to sunset and to 30 minutes after sunrise at all turbines.

Cut-in speeds restrictions will be operated according to specific weather conditions:

1. When the air temperature is above approximately 10 to 11°C at nacelle height.
2. Generally, bat activity peaks at a wind speed range of 5.0 to 6.5m/s (at nacelle height).

Due to the considerable unnecessary down time resulting from the proposed curtailment and the advances in smart curtailment a focused curtailment regime is further proposed from the year two of operation.

This will focus on times and dates, corresponding with rounds when the highest level of bat activity occur within the Site. This includes the use of the SCADA (Supervisory Control and Data Acquisitions) operating system (or equivalent) to only pause/feather the blades below a specified wind speed and above a specified temperature within specified time rounds.

Post-constructions surveys will be undertaken for the first three years of operation to confirm if curtailment restrictions can be amended in line with post-construction activity levels.

The post construction surveys will be used to update the current curtailment regime (blanket curtailment) designed around the values for the key weather parameters and other factors that are known to influence collision risk. This will include all of the following:

- Wind speed in m/s (measured at nacelle height)
- Time after sunset
- Month of the year
- Temperature (ºC)
- Precipitation (mm/hr)

Post Construction surveys

Monitoring will take place for at least 3 years after construction, providing sufficient data to detect any significant change in bat activity relative to pre-construction levels. It will assess changes in bat activity patterns and the efficacy of mitigation to inform any changes to curtailment.

During years one to three of operation (under curtailment restrictions) bat activity will be measured continuously between April and mid-October at each turbine location, in combination with carcass surveys. In addition, wind speed and temperature data will be continuously recorded at the nacelle height of each turbine.

Modern remotely-operated wind turbines as proposed here allow cut-in speeds to be controlled centrally/automatically, facilitating an operation regime designed to minimise harmful impacts to bats.

The feathering of turbine blades combined with increased cut-in speeds have been shown to reduce bat fatalities from 30% to 90% (Adams et al., 2021, Arnett et al., 2008, 2011, 2013; Baerwald et al., 2009). The most recent of studies showed a 63% decrease in fatalities (Adams et al., 2021).

Monitoring Curtailment

If, following the initial 3 years of post-construction surveys, bat activity increases above the baseline and/or remains consistently high and carcass searches indicate fatalities are occurring (refer below), increased cut-in speeds will continue. This will subsequently be monitored in years 5, 7, 10, 15, 20, 25 and 30 with further review after each monitoring round.

Alternatively, if it is found that the results of bat activity surveys and fatality searches confirm that the level of bat activity at turbine locations is reduced (to low) then consent will be sought from Cork County Council (in consultation with NPWS) for the cessation in the requirement for these cut-in speeds / curtailment measures, or a reduction on the timing restrictions for these measures.

Where post construction acoustic surveys are undertaken, they will utilise full spectrum automatic detectors deployed, as a minimum, for one complete bat activity season.

Acoustic monitoring will be supplemented with thermal imaging cameras etc. to provide more detailed information on bat activity in the vicinity of turbines.

An assessment of static data gathered during operational surveillance will be completed using the online analysis tool Ecobat as recommended by NatureScot (2021) as a minimum, or other equivalent guidance as dictated by up-to date standards and practices.

Buffer zones

The vegetation-free buffer zones (refer to section 6.2.1 above) around the identified turbines will be managed and maintained during the operational life of the development.

Due to the current design, turbines are proposed to be sited at a suitable separation distance from trees. The immediate surroundings of individual turbines should be managed and maintained so that they do not attract insects (i.e. the concentration of insects in the wind turbine vicinity should be reduced as much as possible, but not such that insect abundancies affected elsewhere on the site). This should be achieved through physical management of habitats without the use of toxic substances.

Monitoring of mitigation measures

The success of the implemented mitigation measures for bats on the project should be monitored for a round of no less than three years post construction and appropriate measures taken to enhance these if and where required.

Bat fatality monitoring

Whilst no significant residual impacts on bats are predicted, the proposed development could provide an opportunity to gain baseline data on bat/turbine interaction and it is recommended that the scheme be monitored for bat fatalities for the first three years of operation (post construction surveys) and subsequently in years 5, 7, 10, 15, 20, 25 and 30 as part of the additional curtailment monitoring schedule. A comprehensive onsite fatality monitoring programme is to be undertaken following published best practice (e.g., NatureScot 2021 or equivalent at the time of operation).

The primary components of the mortality programme are outlined below:

a) Carcass removal trials to establish levels of predator removal of possible fatalities. This should be done following best recommended practice and with due cognisance of published effects such as predator swamping, whereby excessive placement of carcasses increases predator presence and consequently skews results. No turbines which are used for carcass removal trials should be used for subsequent fatality monitoring.

b) Turbine searches for fatalities should be undertaken following best practice in terms of search area (focusing on hard standing) and at intervals selected to effectively sample fatality rates as determined by carcass removal trials in (a) above. [12]

c) A standardised approach with a possible control group and/or variation in search techniques such as straight line transects/ randomly selected spiral transects/ dog searches will be undertaken. This will provide a means of robustly estimating the post construction collision fatality impact (if any).

[12] Suitably trained dogs with handlers are significantly more efficient and faster than humans in locating carcasses and should preferably be used to achieve more robust results. Dog searches are, however, resource-demanding and may not always be necessary to identify if a problem exists.

d) Recorded fatalities should be calibrated against known predator removal rates to provide an estimate of overall fatality rates.

Table 6-1: Monitoring schedule recommended for bat mitigation measures

Mitigation measure	Monitoring required	Description	Duration
Newly planted hedgerows	Ensure viable growth of planting	Planted material shall be checked over the growing season to remove dead material. Any dead material shall be replaced within the same season with viable stock according to age/height restrictions already specified in mitigation.	From time of planting to 1 year post construction
Bat boxes and tubes	Monitor bat use	Bat boxes and tubes to be placed at locations removed from wind farm as determined by project ecologist/ECoW at least 1 season before construction start. These shall be examined by a licensed bat specialist according to NPWS recommendations. Records should be submitted to *Bat Conservation Ireland* for inclusion in its bat distribution database. If the boxes / tubes are not used within the first three years of deployment re-site if necessary. Annual cleaning required if well used by bats or if used by birds. Replacement if damaged/lost.	From mounting to 3 years post construction.
Mortality study	Fatality monitoring	Corpse searches beneath turbines to assess the impact of operation on bats.	From initial operation conducted during years 1, 2, 3, 5, 7, 10, 15, 20, 25 and 30 post construction.

7. CONCLUSION

In general (according to Lundy *et al,* 2011), the landscape in which the proposed wind farm is situated is of moderate suitability for common pipistrelle, soprano pipistrelle, brown long eared bat, low-moderate suitability for Leisler's bat, Daubenton's bat and Natterer's bat, and low for whiskered bat, lesser horseshoe bat and Nathusius' Pipistrelle.

Nine species of bats have been recorded as present within the study area during the 2020/ 2021 bat surveys. All are listed as 'Least Concern' on the Irish Red List (2019), and Annex IV (with lesser horseshoe bat also protected under Annex II) of the EU Habitats Directive.

This report identifies that the bat activity levels with the Site (as a worst case scenario) range from low to moderate and the proposed turbines have been sighted within areas of expected lower activity (open space), in order to reduce the potential for impact to the bat population of the area. Furthermore, with the implementation of extensive mitigation outlined above (section 6.2) potential risk of fatality from collision and/or barotrauma events to foraging and/or commuting high risk species such as pipistrelle species and Leisler's bat have been significantly reduced (Behr, O. et al., 2017).

The assessment has been undertaken in regard to all the latest available guidance and the mitigation proposed include those that have been previously described in guidance relating to windfarms and/or have direct evidence supporting their efficacy at reducing / avoiding impacts.

The resulting impact of the proposed project on local bat populations, with implemented mitigation measures, will not affected the favourable conservation status (FCS) of bat species and all species confirmed or expected on or near the study areas are predicted to persist.

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FEHILY TIMONEY

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APPENDIX A

Bat Roost Survey Report

Bat Roost Assessment

Gortloughra Wind Farm Development

Gortloughra

Co. Cork

Draft Report, prepared for Fehily Timoney & Co.

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18th August, 2021

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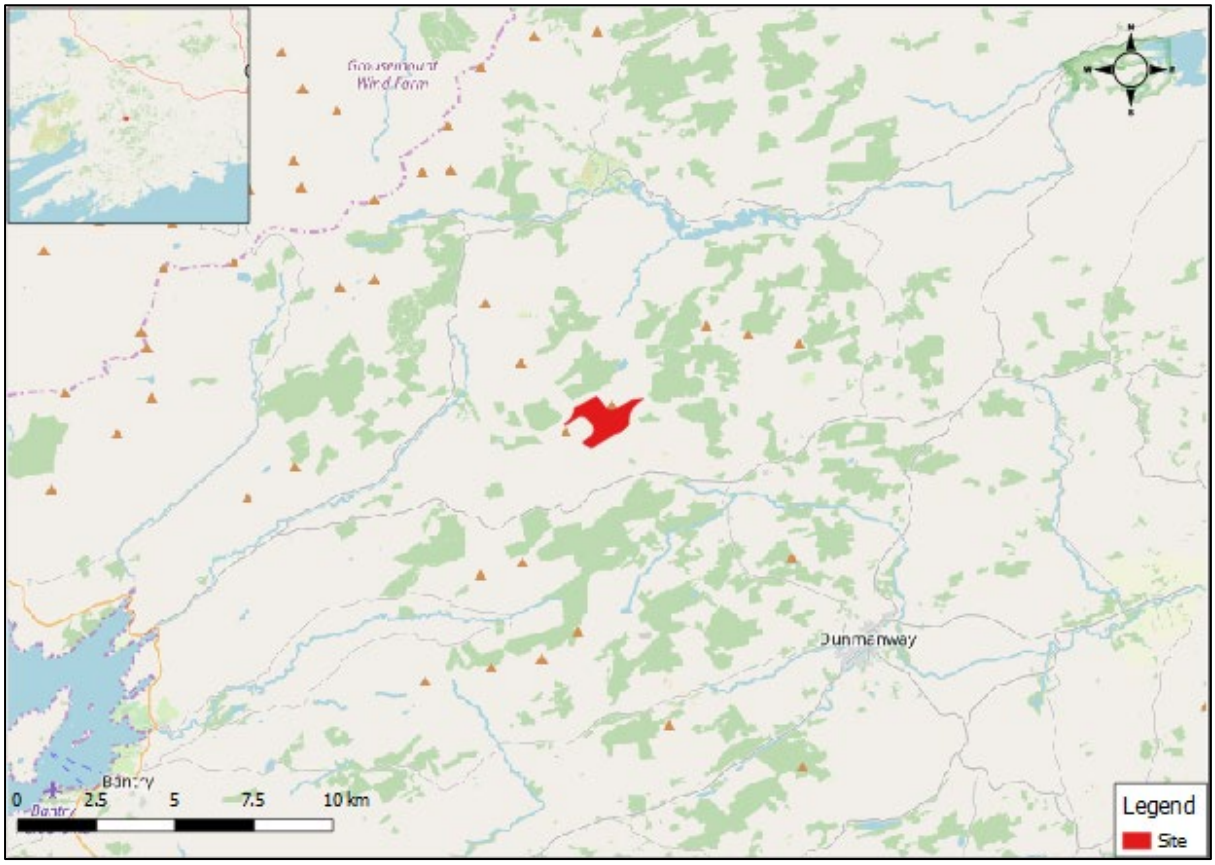
1 Introduction

Greenleaf Ecology were commissioned by Fehily Timoney to undertake a summer and winter bat roost survey and assessment of the proposed Gortloughra Wind Farm development located in the townlands of Gortloughra, Cloghboola and Shehy Beg, Co. Cork. The location of the proposed site is illustrated in Figure 1-1

Figure 1-1: Site location



1.1 Proposed Works

For a description of the proposed development please refer to the EIAR prepared for Gortloughra Wind Farm.

1.2 Legislative Context

All Irish bats are protected under the Wildlife Act (Revised). Also, the EC Directive on The Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive 1992), seeks to protect rare species, including bats, and their habitats, and requires that appropriate monitoring of populations be undertaken. Across Europe they are further protected under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982), which, in relation to bats, exists to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries. The Irish government has ratified both these conventions.

All bats are listed in Annex IV of the EU Habitats Directive (92/43/EC) and the Lesser Horseshoe bat is further listed under Annex II of the same Directive.

Local Planning Authorities are required to give consideration to nature conservation interests under the guidance of the SEA Directive 2001/42/EC. This Directive states that the protected status afforded to bats means that planning authorities must consider their presence in order to reduce the impact of developments through mitigation measures.

Destruction, alteration or evacuation of a known bat roost is a notifiable action under current legislation and a derogation licence has to be obtained from the National Parks and Wildlife Service (NPWS) before works can commence.

In addition, it should be noted that any works interfering with bats and especially their roosts, may only be carried out under a licence to derogate from Regulation 23 of the Habitats Regulations 1997, (which transposed the EU Habitats Directive into Irish law) issued by the NPWS. The details with regards to appropriate assessments, the strict parameters within which derogation licences may be issued and the procedures by which and the order in relation to the planning and development regulations such licences should be obtained, are set out in Circular Letter NPWS 2/07 "Guidance on Compliance with Regulation 23 of the Habitats Regulations 1997 - strict protection of certain species/applications for derogation licences" issued on behalf of the Minister of the Environment, Heritage and Local Government on the 16th of May 2007.

1.3 Objectives

The objectives of the bat survey were to assess:

- Whether actual or potential bat roosts are present, and if so where;
- What species of bat use the site for roosting;
- How many bats do these roosts support; and
- What types of bat roost are present.

2 Methodology

2.1 Desk Study

A pre-survey data search was conducted in order to collate existing information from the footprint of the proposed development site and the surrounding area on bat activity, roosts and landscape features that may be used by bats. The data search comprised the following information sources:

- Collation of known bat records within a 10km radius of the proposed site from Bat Conservation Ireland (BCI). Available bat records were provided by Bat Conservation Ireland on 21/04/2020;
- Review of Ordnance Survey mapping and aerial photography of the proposed wind farm site and its environs (i.e. 200m plus rotor radius of the boundary of the proposed development[1]);
- Records of designated sites within a 15km radius of the proposed site where bats form part or all of the reason for designation (https://www.npws.ie/protected-sites);
- Collation of lesser horseshoe bat records within a 10km radius of the proposed site from the National Parks and Wildlife Service lesser horseshoe bat database (https://www.npws.ie);
- Collation of data on known caves within a 10km radius of the proposed site from the Cave Database for the Republic of Ireland, complied by Trinity College (http://www.ubss.org.uk/search_irishcaves.php); and
- Review of bat survey data from Ecological Impact Assessments from proposed and permitted developments within the wider environs of the site.

2.2 Field Survey

This bat survey and assessment was undertaken in accordance with the following guidelines:-

- Bat Conservation Ireland, (2010). Guidance notes for Planners, Engineers, Architects, and Developers;
- BTHK (2018). Bat Roosts in Trees – A Guide to Identification and Assessment for Tree-Care and Ecology Professionals. Pelagic Publishing, Exeter UK.
- Collins, J. (ed.) (2016). Bat Surveys for Professional ecologists: Good Practice Guidelines (3rd ed.). The Bat Conservation Trust, London; and
- Kelleher, C. & Marnell, F. (2006). Bat Mitigation Guidelines for Ireland.

2.2.1 Surveyor Information

The survey was undertaken by Karen Banks, MCIEEM.

Karen is an ecologist with 15 years' experience in the field of ecological assessment. She holds a BSc in Environment and Development from Durham University, and is a full member of the Chartered Institute of Ecology and Environmental Management. Karen is an experienced and skilled bat surveyor, first gaining a scientific licence to disturb bats from Natural England, UK in 2008. Karen is trained in bat handling and capture methods and currently holds a bat disturbance licence granted by the NPWS. Karen has undertaken bat survey and assessment for numerous projects, including bridge repair and replacement works, domestic dwelling repair and demolition works, wind farm developments and large-scale infrastructure projects such as flood relief schemes, road developments and pipeline schemes. Karen has also represented Cork County Council as an expert witness for bats at an Oral Hearing.

[1] As per SNH (2019)

2.2.2 Bat Roost Survey

2.2.2.1 Preliminary Ecological Appraisal

Walkover surveys of areas identified as potential roosting habitats during the desk top study were undertaken in March 2020, August 2020 and July 2021. Roosting habitat was assessed using the criteria outlined in Table 2-1[2].

Table 2-1: Criteria for Assessing the Potential Suitability of the Proposed Development Site for Bats

Suitability	**Description** **Roosting Habitats**	**Commuting and Foraging Habitats**
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only- the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Continuous, high quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

2.2.2.2 Bat Roost Inspection Survey

Trees

A detailed inspection of the exterior of trees was undertaken on 23rd March 2020 to look for features that bats could use for roosting (Potential Roost Features, or PRFs) from ground level. The aim of the

[2] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London

survey was to determine the actual or potential presence of bats and the need for further survey and/or mitigation.

A detailed inspection of each potential tree roosts within the site were undertaken. The inspection was carried out in daylight hours from ground level, and information was compiled on the tree, PRFs and evidence of bats. All trees surveyed were numbered and marked on a map and a description of each PRF observed was recorded. PRFs that may be used by bats include:

- Rot holes;
- Hazard beams;
- Other horizontal or vertical cracks or splits (e.g. frost cracks) in stems or branches;
- Lifting bark;
- Knotholes arising from naturally shed branches or branches previously pruned back to the branch collar;
- Man-made holes (e.g. flush cuts) or cavities created by branches tearing out from parent stems;
- Cankers in which cavities have developed;
- Other hollows or cavities;
- Double leaders forming compression forks with included bark and potential cavities;
- Gaps between overlapping stems or branches;
- Partially detached ivy with stem diameters in excess of 50mm; and
- Bat or bird boxes.

Signs of a bat roost (excluding the actual presence of bats), include:

- Bat droppings in, around or below a PRF;
- Odour emanating from a PRF;
- Audible squeaking at dusk or in warm weather; and
- Staining below the PRF.

It should be noted that bats or bat droppings are the only conclusive evidence of a roost and many roosts have no external signs. Therefore, this survey and evaluation was relatively basic as only those PRFs at ground level could be inspected closely to ascertain their true potential to support roosting bats. Trees were categorised according to the highest suitability PRF present.

Structures

Derelict/ disused buildings, bridges and culverts within the proposed wind farm site and its environs were subject to a visual inspection for evidence of, and potential for, bats in March 2020, August 2020 and July 2021. The exterior of the structures was visually assessed for potential bat access points and evidence of bat activity using binoculars, a high powered torch and an endoscope (Explorer Premium 8803 with 9mm camera). Features such as crevices and small gaps in the bridge or building structure, such as between the brick or stone work, beneath roofing material, at eaves and around window frames which had potential as bat access points into the buildings were inspected. Evidence that these features/ access points were actively being used by bats includes staining within the gaps, urine staining and bat droppings. Indicators that potential access points are not actively used by bats include general detritus and cobwebs within the access point. A note of potential features used by bats was made where present.

Where possible, internal inspections of these structures was undertaken. Internal inspections involved looking for features that may be suitable for roosting bats, such as joints and crevices in wood, holes

or crevices between stonework in the walls and searching for bat droppings, urine stains and feeding signs on the floor.

2.2.3 Survey Constraints

There were no constraints to the information gathered during this survey.

3 Results

3.1 Existing Bat Data

The review of existing BCI records of bat species in the area of the site indicates that at least six of the nine known Irish species of bat have been recorded within a 10km radius of the proposed site. These bats include pipistrelle (*Pipistrellus pipistrellus sensu lato*), soprano pipistrelle (*P. pygmaeus*), Leisler's (*Nyctalus leisleri*), brown long-eared (*Plecotus auratus*), Daubenton's (*Myotis daubentonii*), *Myotis* species (unidentified to species) and lesser horseshoe bat (*Rhinolophus hipposideros*). Of these species, pipistrelle, soprano pipistrelle, brown long-eared bat, Daubenton's bat and lesser horseshoe bat have been recorded roosting within a 10km radius of the proposed site. A summary of ad-hoc bat activity records from within the 10km OS grid squares located at the proposed site and its environs and records of bat roosts (to a 1km OS grid square resolution) is provided in Table 3-1 below.

Table 3-1: NBDC and NPWS bat records from within a 10km radius of the proposed site

Common Name	**Scientific Name**	**Ad-hoc records**			**Known Roost**
		W05	**W15**	**W25**	
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	√	√	√	W1567, W1165
Soprano pipistrelle	*Pipistrellus pygmaeus*	√	√	√	W2353
Nathusius's pipistrelle	*Pipistrellus nathusii*				
Leisler's bat	*Nyctalus leisleri*		√	√	
Brown long-eared bat	*Plecotus auritus*				W2366, W2369, W0854, W0652
Daubenton's bat	*Myotis daubentonii*		√		W2366, W2453
Whiskered Bat	*Myotis mystacinus*				
Natterer's Bat	*Myotis nattereri*				
Myotis spp	*Myotis* spp		√	√	
Lesser horseshoe bat	*Rhinolophus hipposideros*				W0462, W0456, W0556, W1755, W1965
Brandt's Bat	*Myotis brandtii*				

The bat landscape association model (Lundy *et al,* 2011) suggests that the proposed wind farm site is part of a landscape that is of low-moderate suitability for bats including common pipistrelle, soprano pipistrelle, brown long-eared, Leisler's, Daubenton's, natterer's (*Myotis nattereri*) and whiskered bat (*M. mystacinus*). The proposed site and its environs are of low suitability for lesser horseshoe bat (*Rhinolophus hipposideros*) and Nathusius' pipistrelle (*P. nathusii*).

The Cave Database for the Republic of Ireland does not hold any records of caves within a 10km radius of the proposed site.

Survey work undertaken for Shehy More Windfarm, located c.0.5km to the north of the proposed site at its closest point, recorded five species of bat: Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Leisler's Bat (*Nyctalus leisleri*), Brown Long-eared Bat (*Plecotus auritus*) and Lesser Horseshoe Bat (*Rhinolophus hipposideros*). A small number of recordings of *Myotis* sp. bats were also made[3].

[3] McCarthy Keville O'Sullivan (2013) Environmental Impact Statement Shehy More Windfarm.

Survey work undertaken for Carrigarierk Wind Farm, located c.5.5km to the east of the proposed site at its closest point, recorded common pipistrelle, soprano pipistrelle, Leisler's, Whiskered/ Brandt's, brown long-eared and lesser horseshoe bat[4].

3.1.1 Designated Sites

There are no European sites located within a 15km radius of the proposed site which include bats as a Qualifying Interest (QI). The following nationally designated site located within a 15km radius of the proposed wind farms include bats as a Qualifying Interest (QI):

- Carriganass Castle, Near Kealkill pNHA, designated for the presence of a Daubenton's bat roost is located c.9.2km to the south-west of the proposed site.

3.2 Bat Roost Survey

3.2.1 Preliminary Ecological Appraisal

Review of aerial photography for the proposed wind farm site at Gortloughra indicates that the site comprises upland heath/ bog habitats with a small parcel of improved grassland. A number of small 1st order watercourses are present at the site: the Inchiroe watercourse and an unnamed watercourse to the north of the site; and an unnamed watercourse and the Shehy Beg watercourse to the south of the proposed site.

The site is not well connected to the surrounding landscape and as such is of low suitability for commuting and foraging bats (Table 2-1). A summary of foraging and roosting habitats for Irish bats is included in **Appendix A**.

3.2.2 Bat Roost Inspection Survey

3.2.2.1 Trees

The cover of broadleaved trees at the proposed site at Gortloughra is low; no large mature trees were recorded during the course of the site surveys. No trees with suitability as roosting or resting places for bats were recorded at this site.

3.2.2.2 Structures

No dwellings or other buildings are present within the proposed site at Gortloughra and its environs. Structures present within the site are limited to five culverts over the small watercourses draining the site. Three of the culverts did not support any features of potential use by roosting bats. Two of the culverts supported some crevices that would be of potential use by bats but neither culvert had any associated habitat features such as scrub or riparian woodland that would be favoured by roosting bats (Table 3-2). No evidence of bats was observed at any culvert within the proposed site.

Table 3-2: Suitability of culverts at the proposed site and its environs for bats

Culvert Number	Location	Description	Grade[5]
1	514649 559070	Small concrete pipe culvert with no associated habitat features such as riparian woodland	0
2	514769 559026	Very low lying stone culvert with little clearance for bats and no associated habitat features such as riparian woodland	0

[4] McCarthy Keville O'Sullivan (2015) Environmental Impact Statement Carrigarierk Wind Farm.

[5] *0 = no potential (no suitable crevices); 1 = crevices present may be of use to bats; 2 = crevices ideal for bats but no evidence of usage; and 3 = evidence of bats (e.g. bats present, droppings, grease marks, urine staining, claw marks or the presence of bat fly pupae) (Billington and Norman, 1997).

Culvert Number	Location	Description	Grade[5]
3	514675 559243	Low lying stone culvert with some crevices between the stonework but no associated habitat features such as riparian woodland	1
4	514888 559563	Relatively low lying stone culvert with some crevices between the stonework but no associated habitat features such as riparian woodland	1
5	515745 559851	Double concrete pipe culvert with no associated habitat features such as riparian woodland	0

3.3 Interpretation and Evaluation of Survey Results

Presence/ absence: No bats were recorded during the course of the surveys undertaken in March 2020, August 2020 and July 2021.

Population size class assessment: N/A

Site status assessment: Two culverts at the proposed site are of low suitability for roosting bats, however, no evidence of roosting bats was recorded during the inspection of the culverts.

No potential or actual tree roosts were recorded at the proposed site at Gortloughra.

No caves or other underground features are known to exist at the proposed site and its environs.

4 Assessment

This section provides a general commentary on constraints and potential impacts of the proposed wind farm in relation to bat roosts.

4.1 Constraints

No actual or potential bat roosts were identified within the proposed wind farm site at Gortloughra. As such, no constraints to the proposed development in relation to roosting bats have been identified.

4.2 Potential Impacts

No actual or potential bat roosts were identified within the proposed wind farm site at Gortloughra, therefore no potential impacts on roosting bats have been identified. A more detailed assessment of the potential impact of the proposed wind farm development at Gortloughra on bats can be found in the EIAR for the proposed development.

As outlined by Scottish Natural Heritage (2019), wind farms can affect bats in the following ways:

- Collision mortality, barotrauma and other injuries
- Loss or damage to commuting and foraging habitat
- Loss of, or damage to roosts
- Displacement of individuals or populations

5 Recommendations

No actual or potential bat roosts at the proposed site have been identified, therefore there are no specific recommendations in relation to roosting bats.

6 References

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Appendix A: Description of Irish Bat Species

Ireland has nine known bat species from two distinct families. Each is briefly described below. For a more comprehensive overview see Roche *et al* (2014). The conservation status of each species is derived from NPWS (2019).

Vespertilionidae:

Common pipistrelle (*Pipistrellus pipistrellus*)

This species was only recently separated from its sibling, the soprano or brown pipistrelle *P. pygmaeus*, which is detailed below (Barratt et al, 1997). The common pipistrelle's echolocation calls peak at 45 kHz. The species forages along linear landscape features such as hedgerows and treelines as well as within woodland. The conservation status of this species is Favourable.

Soprano pipistrelle (*Pipistrellus pygmaeus*)

The soprano pipistrelle's echolocation calls peak at 55 kHz, which distinguishes it readily from the common pipistrelle on detector. The pipistrelles are the smallest and most often seen of our bats, flying at head height and taking small prey such as midges and small moths. Summer roost sites are usually in buildings but tree holes and heavy ivy are also used. Roost numbers can exceed 1,500 animals in mid-summer. The conservation status of this species is Favourable.

Nathusius' pipistrelle (*Pipistrellus nathusii*)

Nathusius' pipistrelle is a recent addition to the Irish fauna and has mainly been recorded from the north-east of the island in Counties Antrim and Down (Richardson, 2000) and also in Fermanagh, Longford and Cavan. It has also been recorded in Counties Cork and Kerry (Kelleher, 2005). However, the known resident population is enhanced in the autumn months by an influx of animals from Scandinavian countries. The conservation status of this species is Favourable.

Leisler's bat (*Nyctalus leisleri*)

This species is Ireland's largest bat, with a wingspan of up to 320mm; it is also the third most common bat, preferring to roost in buildings, although it is sometimes found in trees and bat boxes. It is the earliest bat to emerge in the evening, flying fast and high with occasional steep dives to ground level, feeding on moths, caddis-flies and beetles. The echolocation calls are sometimes audible to the human ear being around 15 kHz at their lowest. The audible chatter from their roost on hot summer days is sometimes an aid to location. The conservation status of this species is Favourable.

Brown long-eared bat (*Plecotus auritus*)

This species of bat is a 'gleaner', hunting amongst the foliage of trees and shrubs, and hovering briefly to pick a moth or spider off a leaf, which it then takes to a sheltered perch to consume. They often land on the ground to capture their prey. Using its nose to emit its echolocation, the long-eared bat 'whispers' its calls so that the insects, upon which it preys, cannot hear its approach (and hence, it needs oversize ears to hear the returning echoes). As this is a whispering species, it is extremely difficult to monitor in the field as it is seldom heard on a bat detector. Furthermore, keeping within the foliage, as it does, it is easily overlooked. It prefers to roost in old buildings. The conservation status of this species is Favourable.

Natterer's bat (*Myotis nattereri*)

This species has a slow to medium flight, usually over trees but sometimes over water. It usually follows hedges and treelines to its feeding sites, consuming flies, moths, caddis-flies and spiders. Known roosts are usually in old stone buildings but they have been found in trees and bat boxes. The Natterer's bat is one of our least studied species and further work is required to establish its status in Ireland. The conservation status of this species is Favourable.

Daubenton's bat (*Myotis daubentonii*)

This bat species prefers feeding close to the surface of smooth water, either over rivers, canals, ponds, lakes or reservoirs but it can also be found foraging in woodlands. Flying at 15 kilometres per hour, it gaffs insects with its over-sized feet as they emerge from the surface of the water - feeding on caddis flies, moths, mosquitoes, midges etc. It is often found roosting beneath bridges or in tunnels and also makes use of hollows in trees. The conservation status of this species is Favourable.

Whiskered bat (*Myotis mystacinus*)

This species, although widely distributed, has been rarely recorded in Ireland. It is often found in woodland, frequently near water. Flying high, near the canopy, it maintains a steady beat and sometimes glides as it hunts. It also gleans spiders from the foliage of trees. Whiskered bats prefer to roost in buildings, under slates, lead flashing or exposed beneath the ridge beam within attics. However, they also use cracks and holes in trees and sometimes bat boxes. The conservation status of this species is Favourable.

Rhinolophidae:

Lesser horseshoe bat (*Rhinolophus hipposideros*)

This species is the only representative of the Rhinolophidae or horseshoe bat family in Ireland. It differs from our other species in both habits and looks, having a unique nose leaf with which it projects its echolocation calls. It is also quite small and, at rest, wraps its wings around its body. Lesser horseshoe bats feed close to the ground, gleaning their prey from branches and stones. It often carries its prey to a perch to consume, leaving the remains beneath as an indication of its presence. The echolocation call of this species is of constant frequency and, on a heterodyne bat detector, sounds like a melodious warble. The species is confined to six counties along the Atlantic seaboard: Mayo, Galway, Clare, Limerick, Kerry and Cork. The current Irish national population is estimated at 12,500 animals. This species is listed on Annex II of the EC Habitats Directive and 41 Special Areas of Conservation have been designated in Ireland for its protection. Where it occurs, it is often found roosting within farm buildings. The conservation status of this species is Inadequate.

FEHILY TIMONEY

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APPENDIX B

Description of Irish Bat Species

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This species has a slow to medium flight, usually over trees but sometimes over water. It usually follows hedges and treelines to its feeding sites, consuming flies, moths, caddis-flies and spiders. Known roosts are usually in old stone buildings but they have been found in trees and bat boxes. The Natterer's bat is one of our least studied species and further work is required to establish its status in Ireland. The conservation status of this species is Favourable.

Daubenton's bat (*Myotis daubentonii*)
This bat species prefers feeding close to the surface of smooth water, either over rivers, canals, ponds, lakes or reservoirs but it can also be found foraging in woodlands. Flying at 15 kilometres per hour, it gaffs insects with its over-sized feet as they emerge from the surface of the water - feeding on caddis flies, moths, mosquitoes, midges etc. It is often found roosting beneath bridges or in tunnels and also makes use of hollows in trees. The conservation status of this species is Favourable.

Whiskered bat (*Myotis mystacinus*)
This species, although widely distributed, has been rarely recorded in Ireland. It is often found in woodland, frequently near water. Flying high, near the canopy, it maintains a steady beat and sometimes glides as it hunts. It also gleans spiders from the foliage of trees. Whiskered bats prefer to roost in buildings, under slates, lead flashing or exposed beneath the ridge beam within attics. However, they also use cracks and holes in trees and sometimes bat boxes. The whiskered bat is one of our least studied species and further work is required to establish its status in Ireland.

Brandt's bat (*Myotis brandtii*)
According to NPWS (2013), whiskered and Brandt's bats are cryptic species and can only be told apart using DNA techniques. Brand't bat has been confirmed only once from Ireland; a single specimen found in 2003 in Wicklow (Mullen, 2006). Following this discovery, an intensive re-survey, involving DNA testing, was undertaken of all known whiskered bat roosts in Ireland, by the Centre for Irish Bat Research. Woodland mist-netting was also conducted for the species. Despite the extensive survey-work, no further Brandt's bats were identified. The most recent Red Data List for Irish Mammals (Marnell *et al*. 2009) lists Brandt's bat as data deficient. There is no evidence of any roosts for this species in the country and at present the single record for the species is considered an anomaly. Boston et al (2010) concluded that "*M. brandtii* …. cannot currently be considered a resident species. This species is now considered a vagrant to the country and consequently, a detailed assessment has not been carried out.

<u>Rhinolophidae:</u>
Lesser horseshoe bat (*Rhinolophus hipposideros*)
This species is the only representative of the Rhinolophidae or horseshoe bat family in Ireland. It differs from our other species in both habits and looks, having a unique nose leaf with which it projects its echolocation calls. It is also quite small and, at rest, wraps its wings around its body. Lesser horseshoe bats feed close to the ground, gleaning their prey from branches and stones. It often carries its prey to a perch to consume, leaving the remains beneath as an indication of its presence. The echolocation call of this species is of constant frequency and, on a heterodyne bat detector, sounds like a melodious warble. The species is confined to six counties along the Atlantic seaboard: Mayo, Galway, Clare, Limerick, Kerry and Cork. The current Irish national population is estimated at 12,500 animals. This species is listed on Annex II of the EC Habitats Directive and 41 Special Areas of Conservation have been designated in Ireland for its protection. Where it occurs, it is often found roosting within farm buildings. The conservation status of this species is Favourable.

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

APPENDIX C

Ecobat Analysis Reports for Rounds 1 – 3 2020

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: Gortloughra

Author: Fehily Timoney

24/06/2021

Summary

Bats were detected on **13** nights between **2020-04-22** and **2020-05-04**, using **9** static bat detectors. Throughout this period **9** species were recorded. **Table 1.** Detectors were placed at the following locations:

Detector ID	Latitude	Longitude
GL6	51.78440	-9.221233
GL3	51.77532	-9.243754
GL7	51.78806	-9.214635
GL8	51.78195	-9.229476
GL9	51.77980	-9.239814
GL1	51.78703	-9.235476
GL5	51.77777	-9.226132
GL4	51.77575	-9.235288
GL2	51.78497	-9.245940

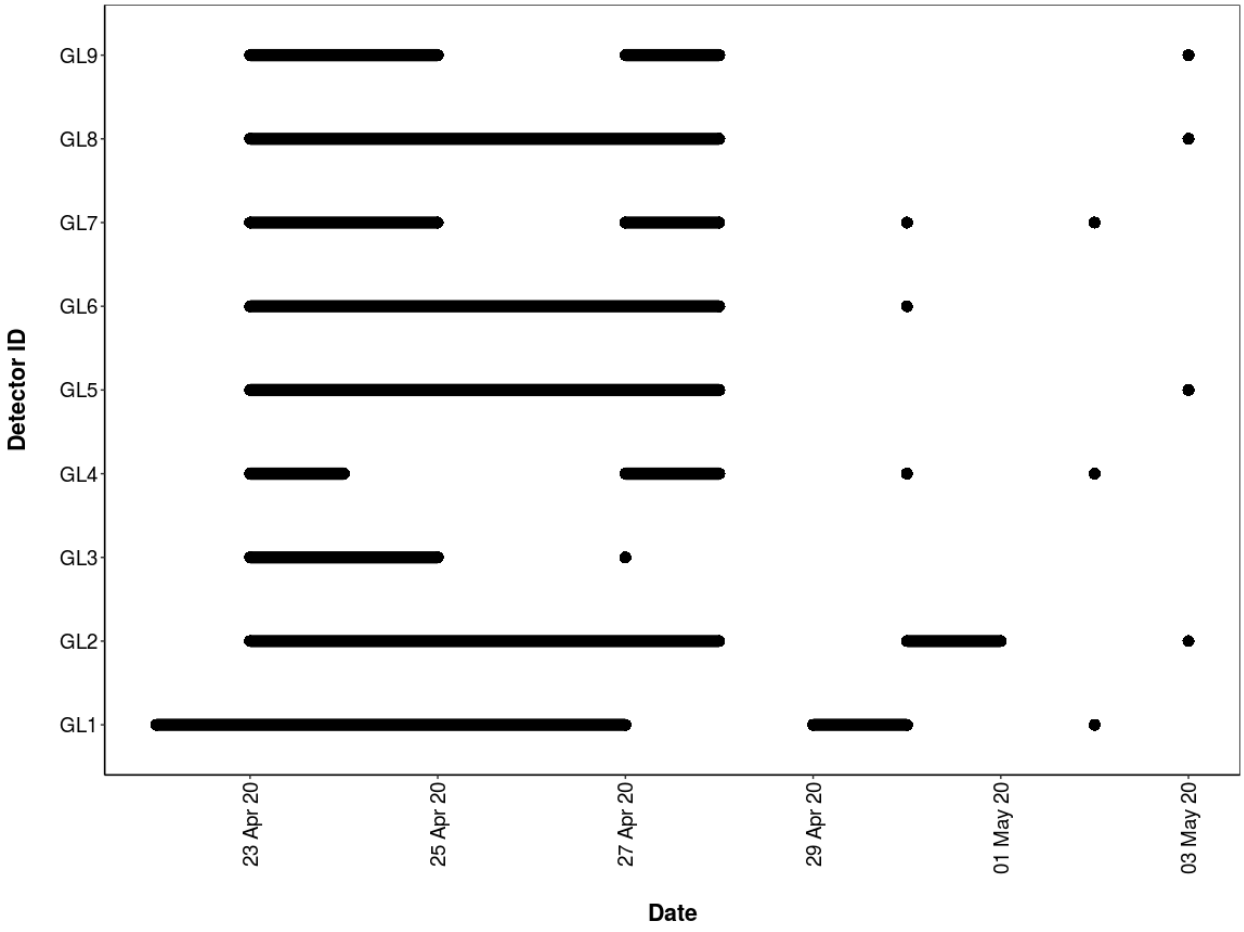
Survey Nights

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
GL1	9
GL2	9
GL3	5
GL4	7
GL5	7
GL6	11
GL7	8
GL8	7
GL9	6

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.
- Records using any make of bat detector.

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
GL1	*Myotis daubentonii*	0	0	0	0	1
GL1	*Myotis mystacinus*	0	0	0	0	1
GL1	*Nyctalus leisleri*	5	2	2	0	0
GL1	*Pipistrellus nathusii*	0	0	1	4	1
GL1	*Pipistrellus pipistrellus*	0	1	2	2	0
GL1	*Pipistrellus pygmaeus*	0	0	0	1	0
GL1	*Plecotus auritus*	0	0	1	3	1
GL2	*Nyctalus leisleri*	0	1	1	1	4
GL2	*Pipistrellus nathusii*	0	0	0	0	2
GL2	*Pipistrellus pipistrellus*	0	0	2	3	1
GL2	*Pipistrellus pygmaeus*	0	0	0	1	0
GL2	*Plecotus auritus*	0	0	0	0	2
GL3	*Myotis daubentonii*	0	0	0	0	3
GL3	*Myotis mystacinus*	0	0	0	0	1
GL3	*Myotis nattereri*	0	0	0	0	2
GL3	*Nyctalus leisleri*	0	0	0	1	2
GL3	*Pipistrellus pipistrellus*	0	0	0	2	0
GL3	*Pipistrellus pygmaeus*	0	0	0	0	1
GL3	*Plecotus auritus*	0	0	0	0	1

GL3	*Rhinolophus hipposideros*	0	0	0	0	1
GL4	*Nyctalus leisleri*	0	0	0	5	0
GL4	*Pipistrellus nathusii*	0	0	0	0	1
GL4	*Plecotus auritus*	0	0	0	0	3
GL4	*Rhinolophus hipposideros*	0	0	0	0	1
GL5	*Myotis daubentonii*	0	0	0	0	2
GL5	*Myotis mystacinus*	0	0	0	0	1
GL5	*Myotis nattereri*	0	0	0	0	2
GL5	*Nyctalus leisleri*	0	0	1	1	3
GL5	*Pipistrellus pipistrellus*	0	0	1	1	1
GL5	*Pipistrellus pygmaeus*	0	0	0	0	1
GL5	*Plecotus auritus*	0	2	1	1	0
GL5	*Rhinolophus hipposideros*	0	0	0	0	1
GL6	*Myotis daubentonii*	0	0	0	3	4
GL6	*Myotis mystacinus*	0	0	0	1	0
GL6	*Myotis nattereri*	0	0	0	1	5
GL6	*Nyctalus leisleri*	0	1	0	0	4
GL6	*Pipistrellus nathusii*	0	0	0	0	1
GL6	*Pipistrellus pipistrellus*	0	0	0	3	4
GL6	*Pipistrellus pygmaeus*	0	0	0	1	1
GL6	*Plecotus auritus*	0	0	0	2	4
GL7	*Myotis daubentonii*	0	0	0	1	2
GL7	*Myotis mystacinus*	0	0	0	0	1
GL7	*Myotis nattereri*	0	0	0	1	2

GL7	*Nyctalus leisleri*	2	2	1	1	1
GL7	*Pipistrellus nathusii*	0	0	0	0	1
GL7	*Pipistrellus pipistrellus*	0	0	0	3	2
GL7	*Pipistrellus pygmaeus*	0	0	0	1	2
GL7	*Plecotus auritus*	0	0	0	0	2
GL8	*Myotis daubentonii*	0	0	0	0	2
GL8	*Myotis nattereri*	0	0	0	0	1
GL8	*Nyctalus leisleri*	0	1	1	2	1
GL8	*Pipistrellus pipistrellus*	0	0	0	1	2
GL8	*Pipistrellus pygmaeus*	0	0	0	0	2
GL8	*Plecotus auritus*	0	0	1	3	1
GL9	*Myotis daubentonii*	0	0	0	0	1
GL9	*Myotis mystacinus*	0	0	0	0	1
GL9	*Myotis nattereri*	0	0	0	1	1
GL9	*Nyctalus leisleri*	0	0	1	1	2
GL9	*Pipistrellus pipistrellus*	0	0	0	0	2
GL9	*Plecotus auritus*	0	2	1	0	1

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.

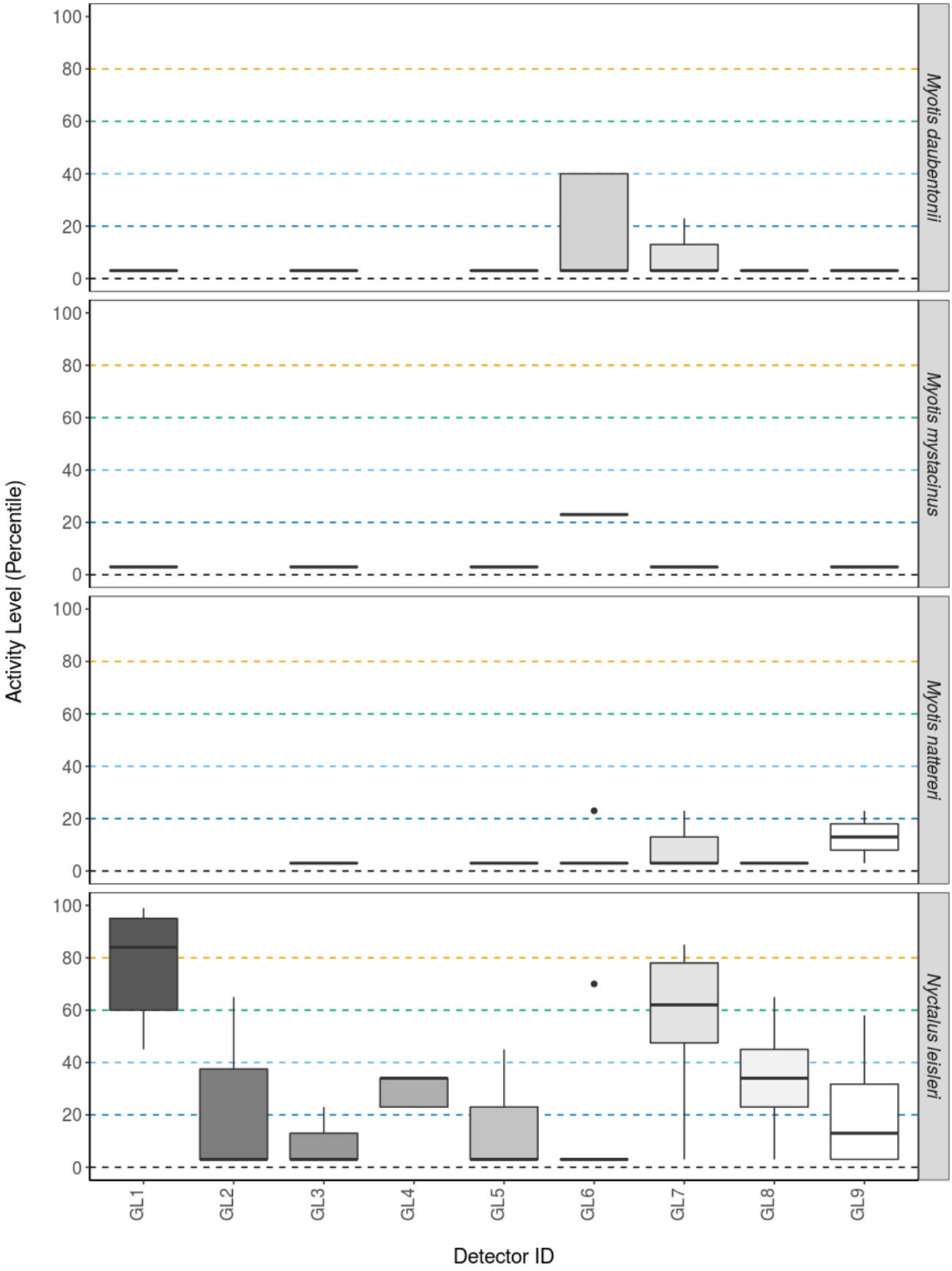
Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
GL1	*Myotis daubentonii*	3	0	3	1	81
GL1	*Myotis mystacinus*	3	0	3	1	28
GL1	*Nyctalus leisleri*	84	60 - 95	99	9	836
GL1	*Pipistrellus nathusii*	29	13 - 46	58	6	190
GL1	*Pipistrellus pipistrellus*	45	39.5 - 62	79	5	807
GL1	*Pipistrellus pygmaeus*	23	0	23	1	634
GL1	*Plecotus auritus*	23	3 - 52	52	5	259
GL2	*Nyctalus leisleri*	3	3 - 34	65	7	836
GL2	*Pipistrellus nathusii*	3	3 - 3	3	2	190
GL2	*Pipistrellus pipistrellus*	32	13 - 49	58	6	807
GL2	*Pipistrellus pygmaeus*	23	0	23	1	634
GL2	*Plecotus auritus*	3	3 - 3	3	2	259
GL3	*Myotis daubentonii*	3	3 - 3	3	3	81
GL3	*Myotis mystacinus*	3	0	3	1	28
GL3	*Myotis nattereri*	3	3 - 3	3	2	42
GL3	*Nyctalus leisleri*	3	3 - 3	23	3	836
GL3	*Pipistrellus pipistrellus*	34	34 - 34	34	2	807
GL3	*Pipistrellus pygmaeus*	3	0	3	1	634
GL3	*Plecotus auritus*	3	0	3	1	259

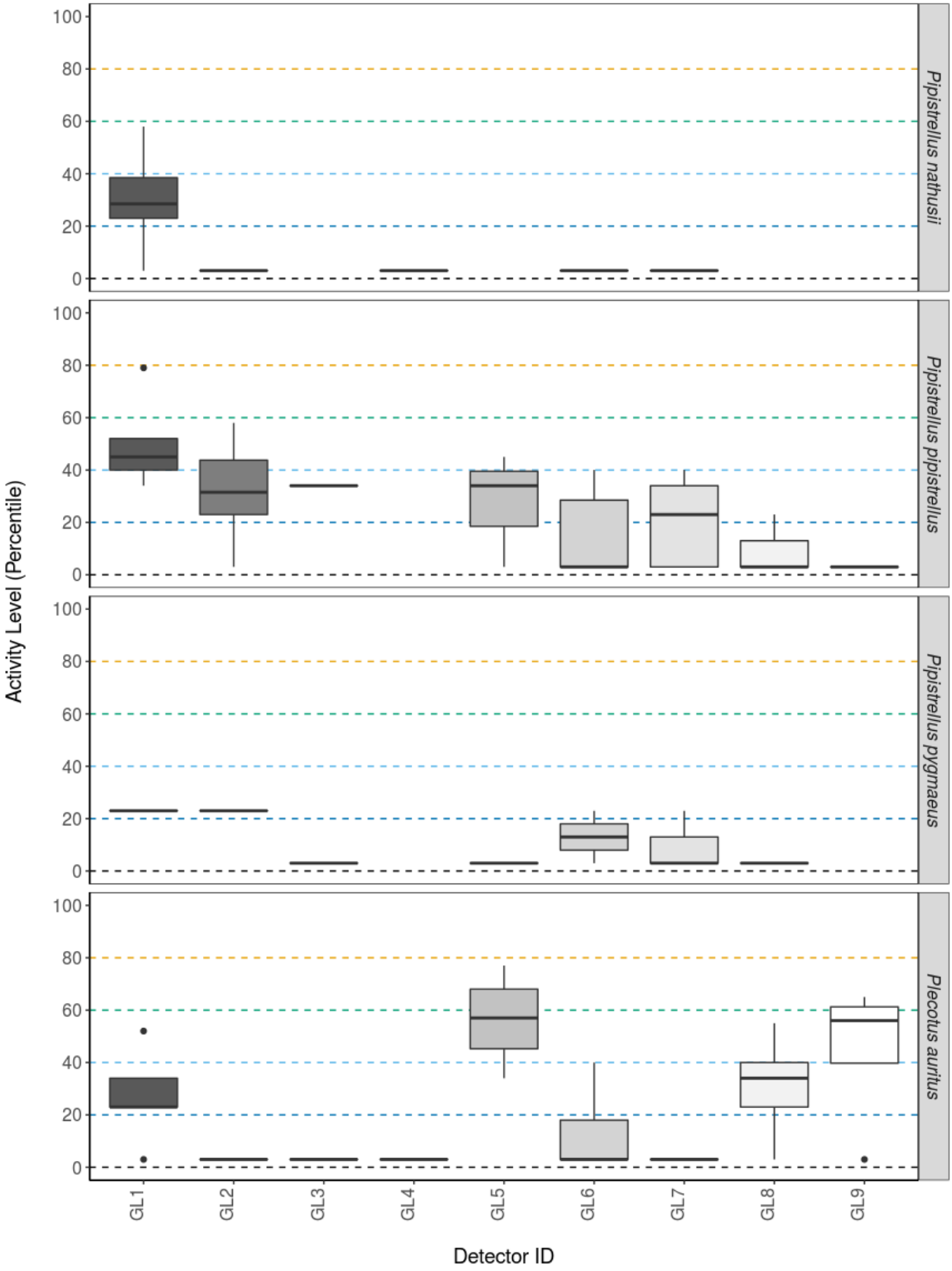
GL3	*Rhinolophus hipposideros*	3	0	3	1	17
GL4	*Nyctalus leisleri*	34	28.5 - 34	34	5	836
GL4	*Pipistrellus nathusii*	3	0	3	1	190
GL4	*Plecotus auritus*	3	3 - 3	3	3	259
GL4	*Rhinolophus hipposideros*	3	0	3	1	17
GL5	*Myotis daubentonii*	3	3 - 3	3	2	81
GL5	*Myotis mystacinus*	3	0	3	1	28
GL5	*Myotis nattereri*	3	3 - 3	3	2	42
GL5	*Nyctalus leisleri*	3	3 - 24	45	5	836
GL5	*Pipistrellus pipistrellus*	34	3 - 45	45	3	807
GL5	*Pipistrellus pygmaeus*	3	0	3	1	634
GL5	*Plecotus auritus*	57	34 - 77	77	4	259
GL5	*Rhinolophus hipposideros*	3	0	3	1	17
GL6	*Myotis daubentonii*	3	3 - 21.5	40	7	81
GL6	*Myotis mystacinus*	23	0	23	1	28
GL6	*Myotis nattereri*	3	3 - 3	23	6	42
GL6	*Nyctalus leisleri*	3	3 - 3	70	5	836
GL6	*Pipistrellus nathusii*	3	0	3	1	190
GL6	*Pipistrellus pipistrellus*	3	3 - 21.5	40	7	807
GL6	*Pipistrellus pygmaeus*	13	13 - 13	23	2	634
GL6	*Plecotus auritus*	3	3 - 21.5	40	6	259
GL7	*Myotis daubentonii*	3	3 - 3	23	3	81

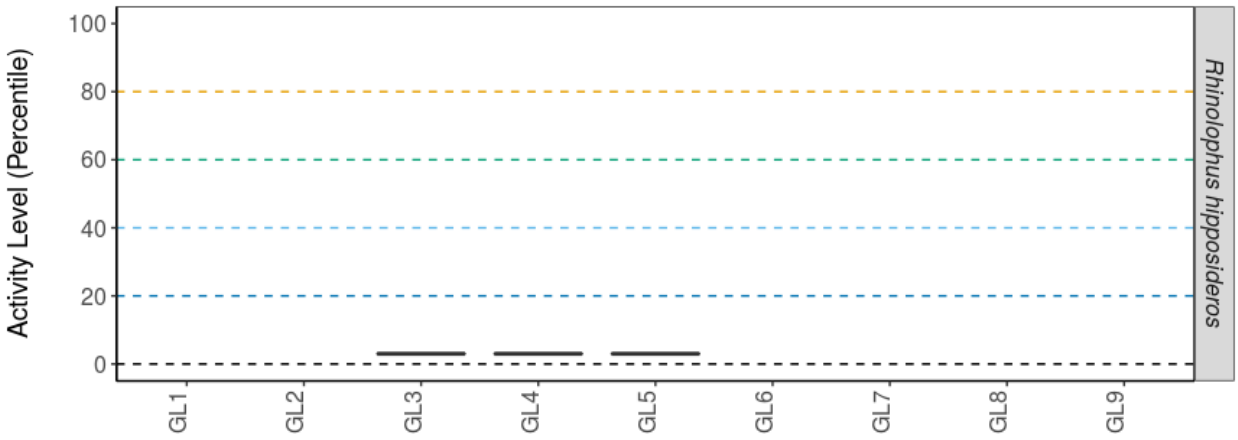
GL7	*Myotis mystacinus*	3	0	3	1	28
GL7	*Myotis nattereri*	3	3 - 3	23	3	42
GL7	*Nyctalus leisleri*	62	21.5 - 84	85	7	836
GL7	*Pipistrellus nathusii*	3	0	3	1	190
GL7	*Pipistrellus pipistrellus*	23	3 - 34	40	5	807
GL7	*Pipistrellus pygmaeus*	3	3 - 3	23	3	634
GL7	*Plecotus auritus*	3	3 - 3	3	2	259
GL8	*Myotis daubentonii*	3	3 - 3	3	2	81
GL8	*Myotis nattereri*	3	0	3	1	42
GL8	*Nyctalus leisleri*	34	18.5 - 49.5	65	5	836
GL8	*Pipistrellus pipistrellus*	3	3 - 3	23	3	807
GL8	*Pipistrellus pygmaeus*	3	3 - 3	3	2	634
GL8	*Plecotus auritus*	34	18.5 - 44.5	55	5	259
GL9	*Myotis daubentonii*	3	0	3	1	81
GL9	*Myotis mystacinus*	3	0	3	1	28
GL9	*Myotis nattereri*	13	13 - 13	23	2	42
GL9	*Nyctalus leisleri*	13	3 - 30.5	58	4	836
GL9	*Pipistrellus pipistrellus*	3	3 - 3	3	2	807
GL9	*Plecotus auritus*	56	3 - 65	65	4	259

###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)

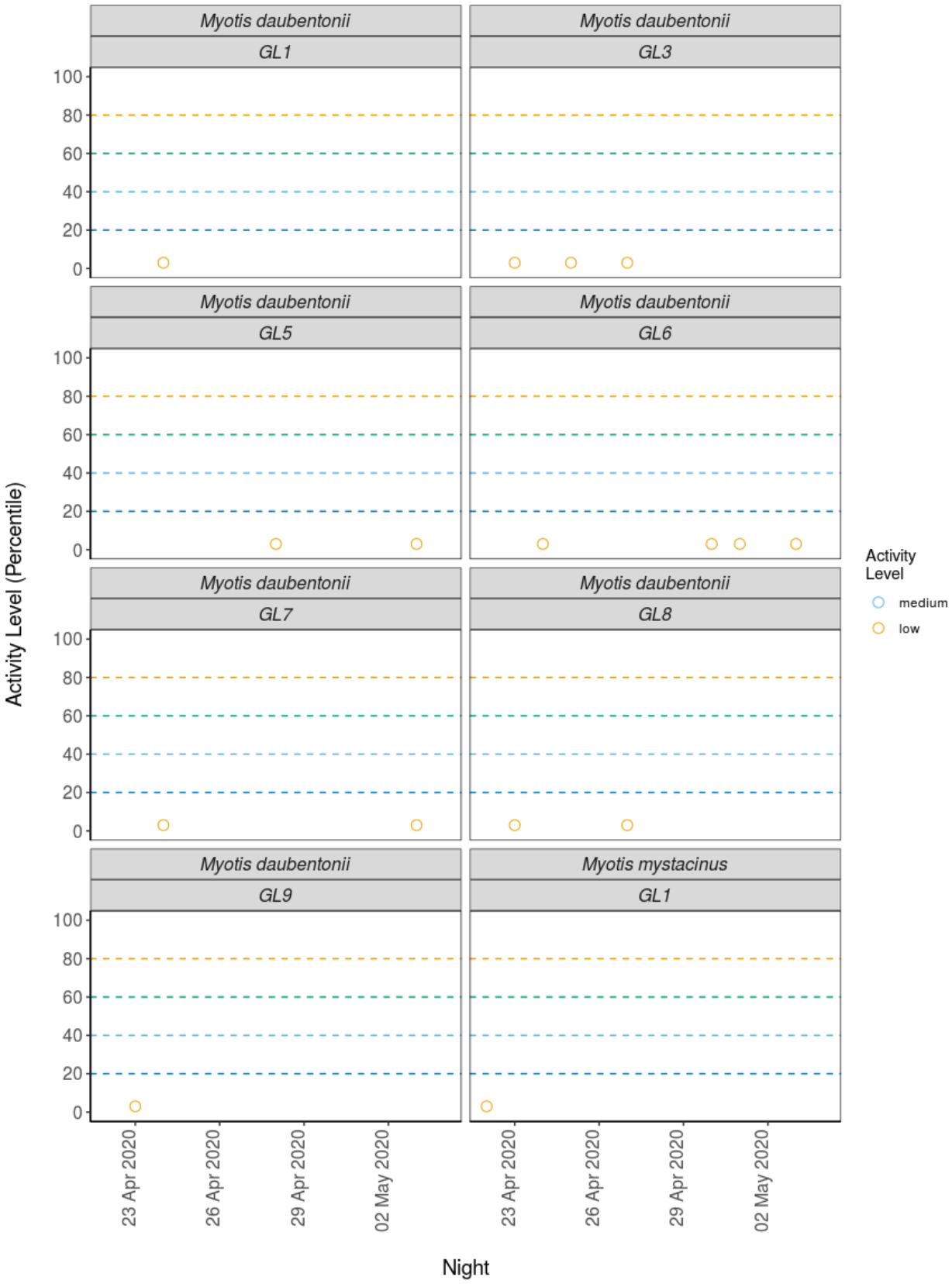

Activity Level (Percentile)
100
80
60
40
20
0
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

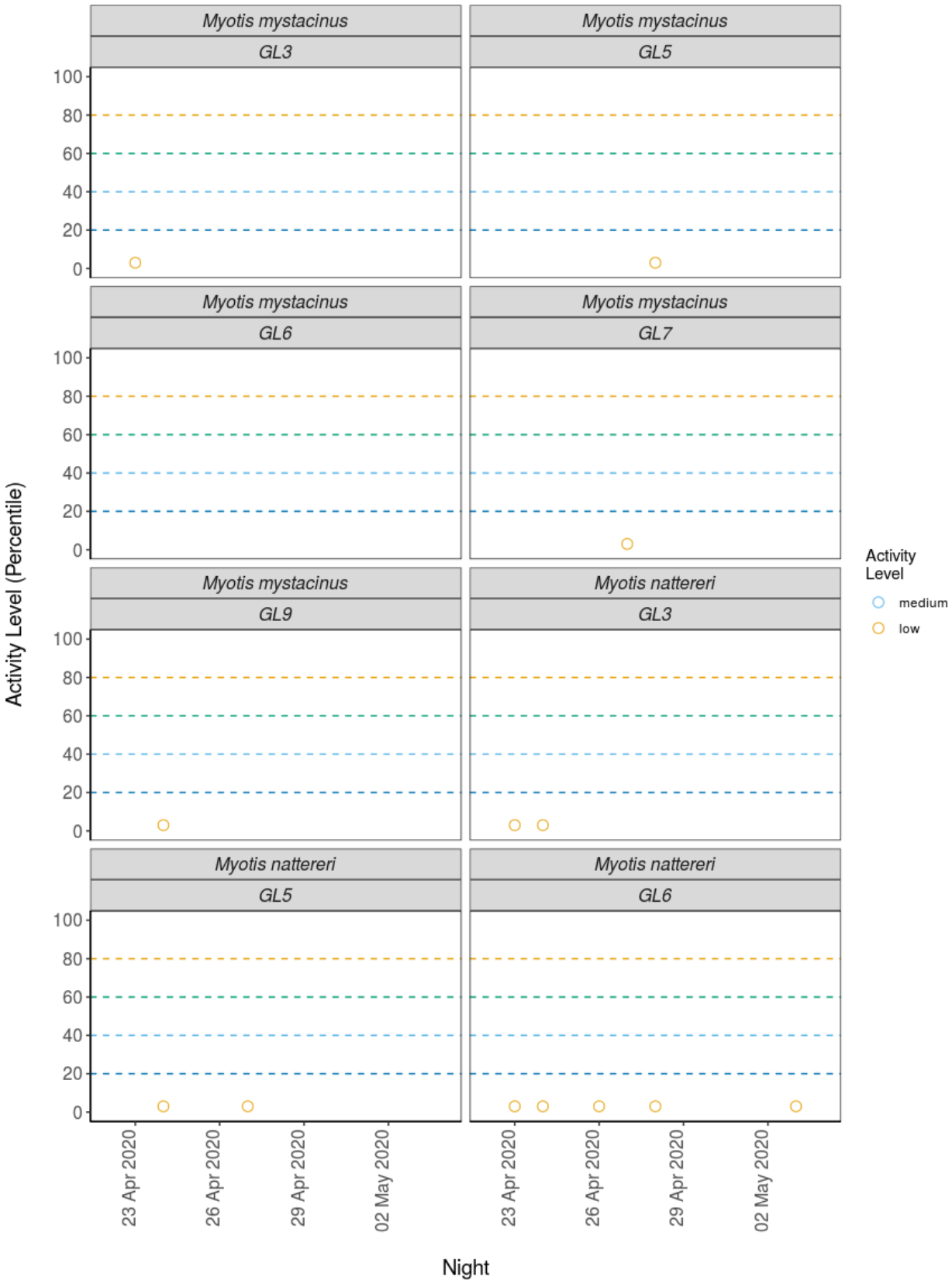

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

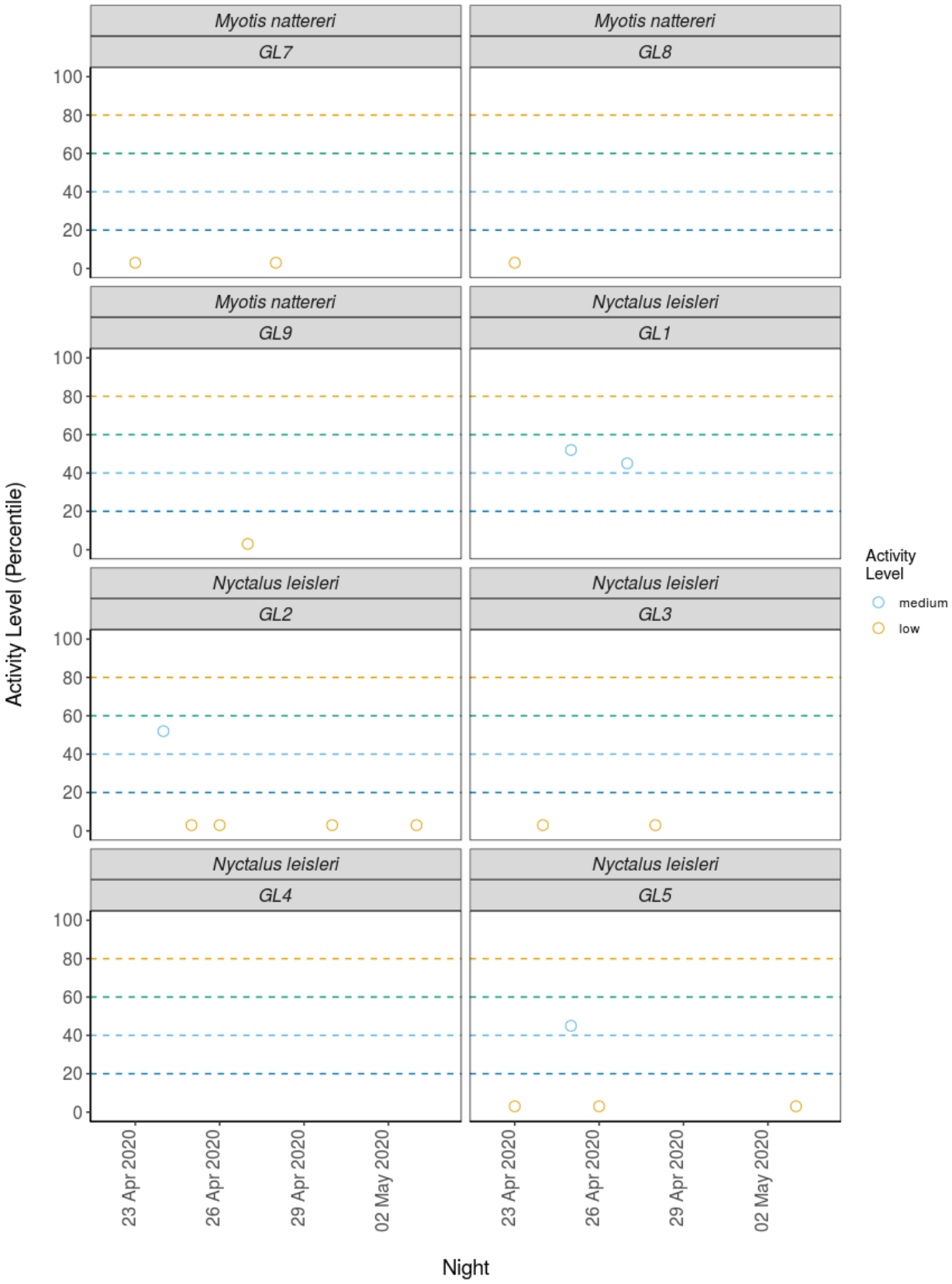

Activity Level (Percentile)
100
80
60
40
20
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Rhinolophus hipposideros

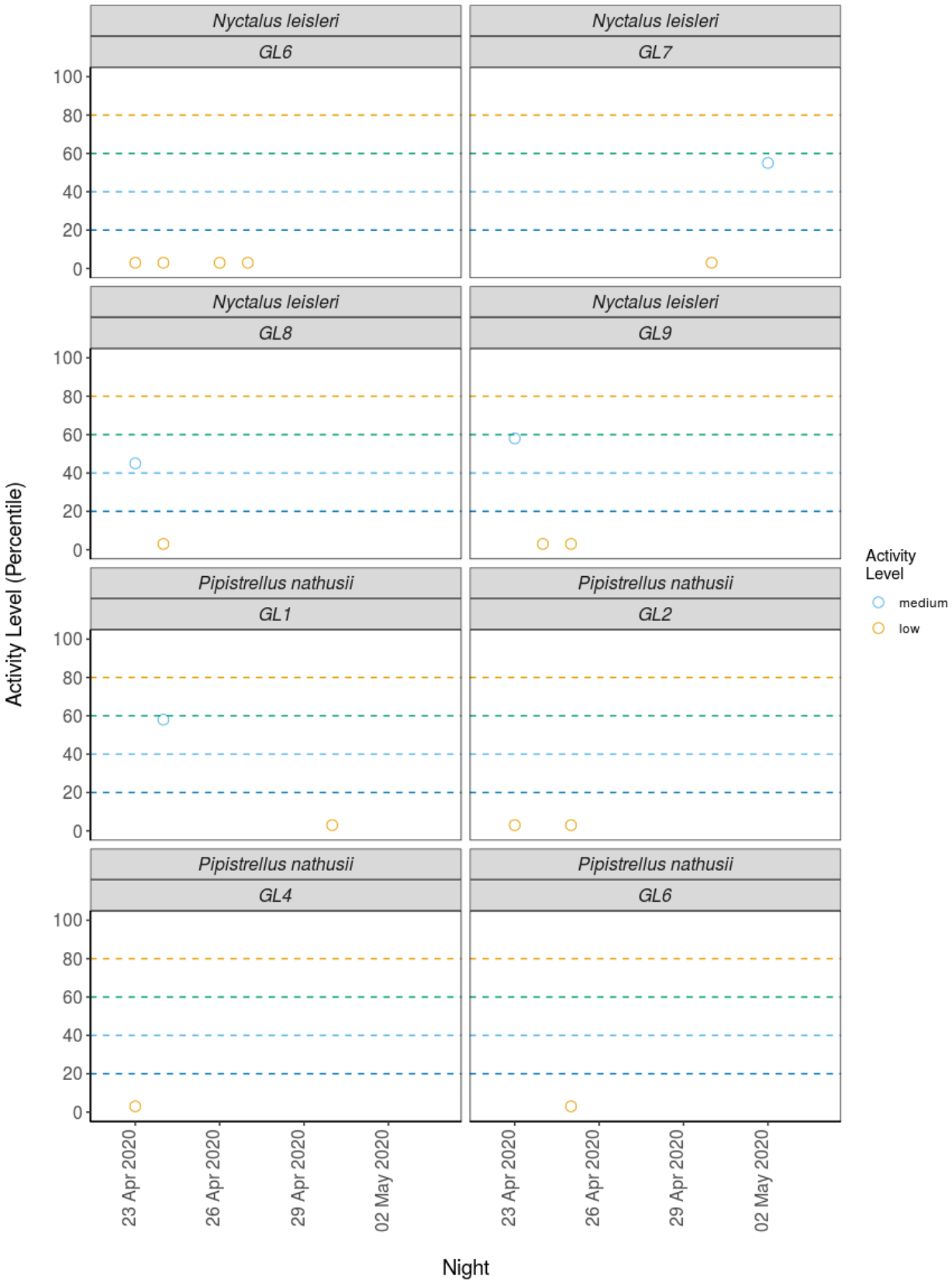
Detector ID

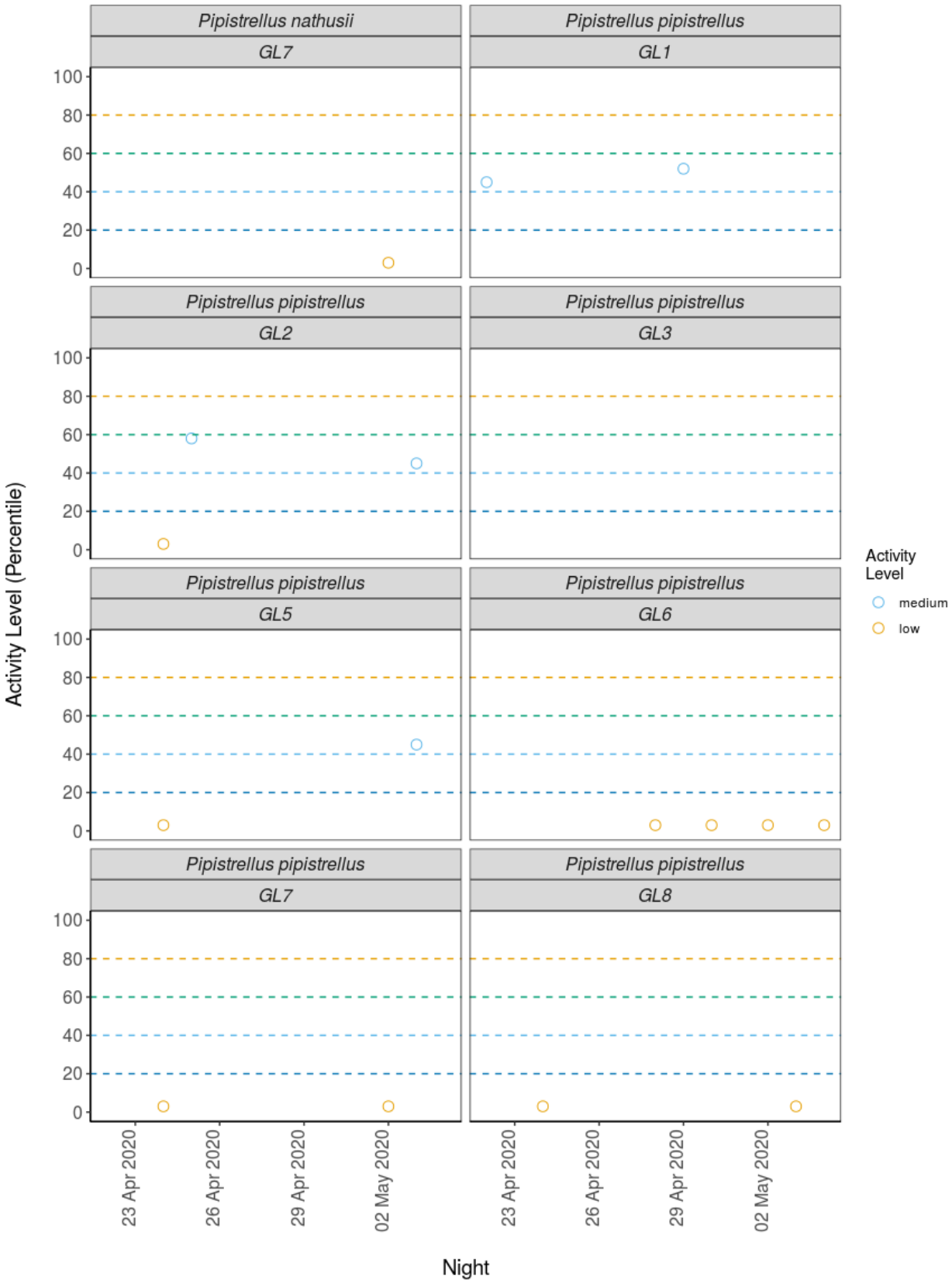
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.

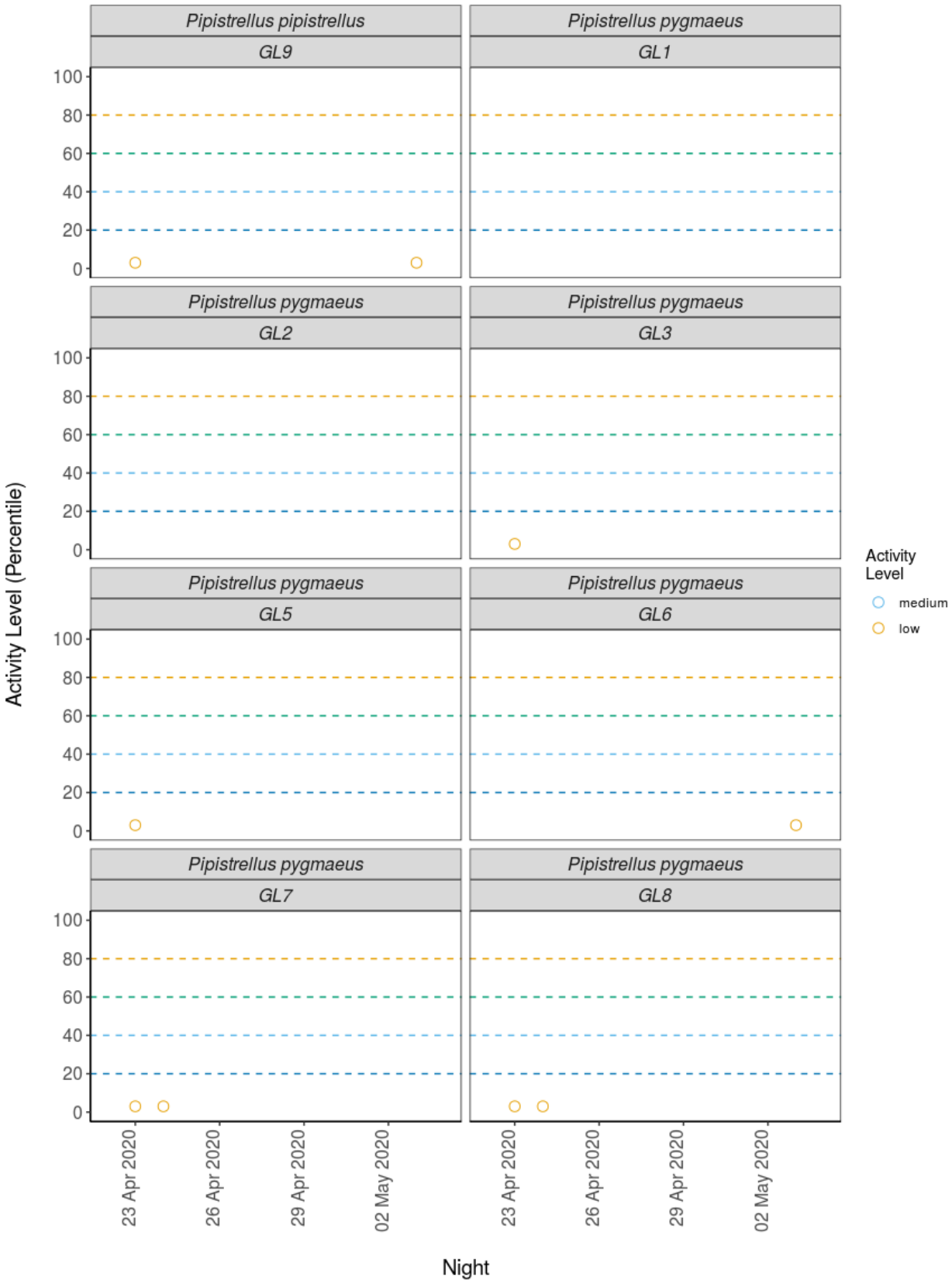

Myotis daubentonii
GL1
Myotis daubentonii
GL3
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Myotis daubentonii
GL7
Myotis daubentonii
GL8
Myotis daubentonii
GL9
Myotis mystacinus
GL1
Activity Level (Percentile)
100
80
60
40
20
0
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Night
Activity Level
medium
low

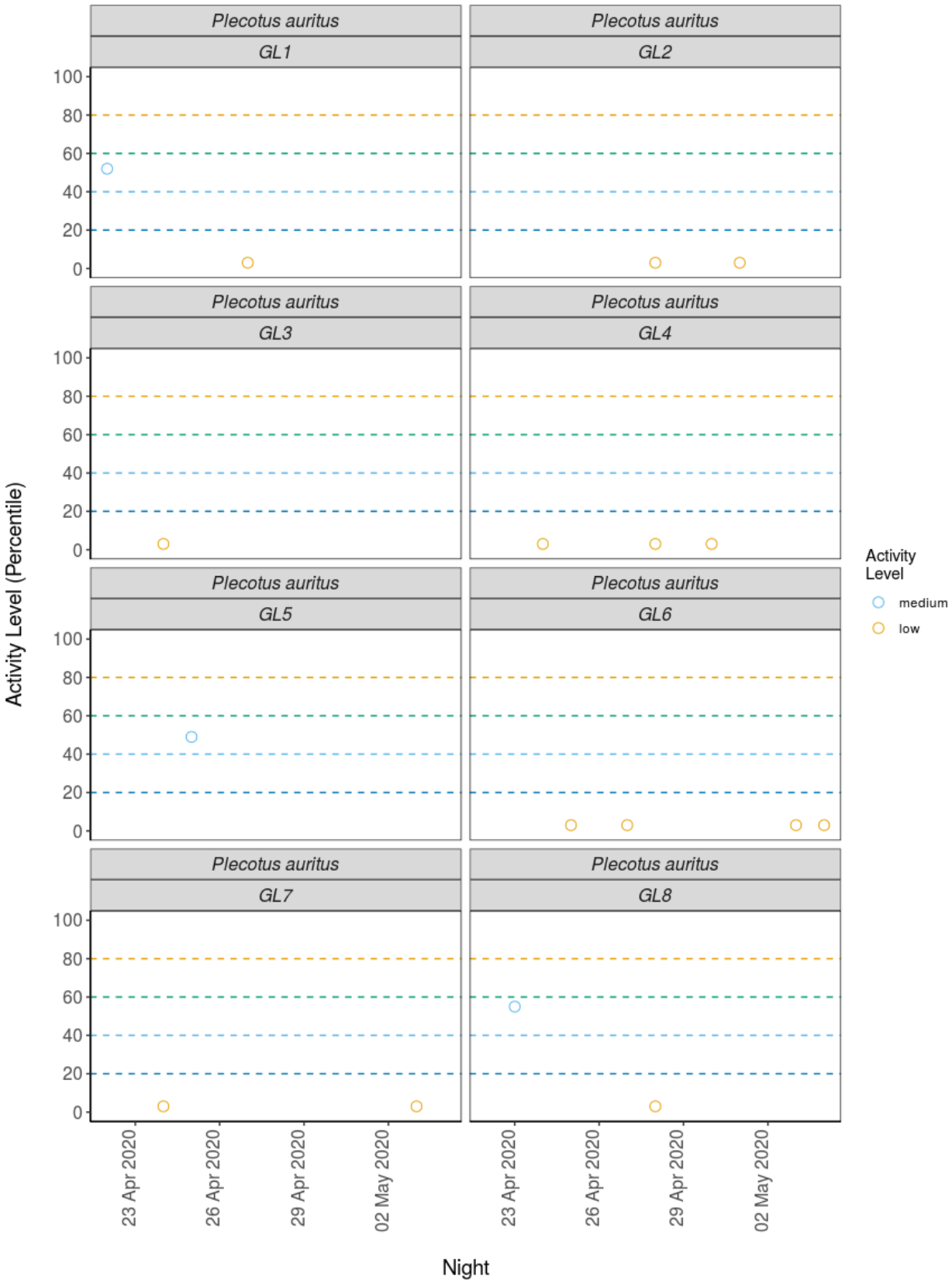

Myotis mystacinus
GL3
Myotis mystacinus
GL5
Myotis mystacinus
GL6
Myotis mystacinus
GL7
Myotis mystacinus
GL9
Myotis nattereri
GL3
Myotis nattereri
GL5
Myotis nattereri
GL6
Activity Level (Percentile)
100
80
60
40
20
0
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Night
Activity Level
medium
low

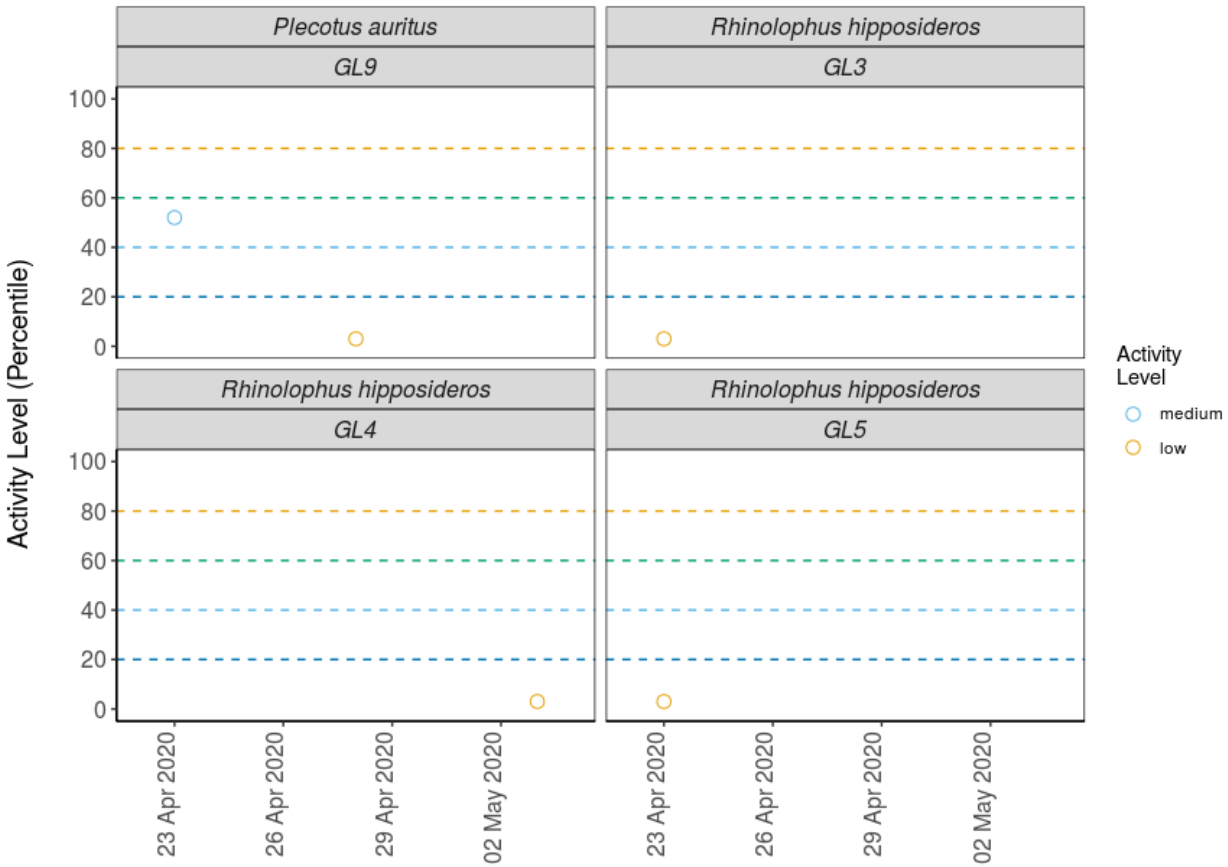

Myotis nattereri
GL7
Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Activity Level (Percentile)
100
80
60
40
20
0
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Night
Activity Level
medium
low


Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL1
Pipistrellus nathusii
GL2
Pipistrellus nathusii
GL4
Pipistrellus nathusii
GL6
Activity Level (Percentile)
100
80
60
40
20
0
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Night
Activity Level
medium
low


Pipistrellus nathusii
GL7
Pipistrellus pipistrellus
GL1
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL8
Activity Level (Percentile)
100
80
60
40
20
0
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Night
Activity Level
medium
low


Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL8
Activity Level (Percentile)
100
80
60
40
20
0
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Night
Activity Level
medium
low


Plecotus auritus
GL1
Plecotus auritus
GL2
Plecotus auritus
GL3
Plecotus auritus
GL4
Plecotus auritus
GL5
Plecotus auritus
GL6
Plecotus auritus
GL7
Plecotus auritus
GL8
Activity Level (Percentile)
100
80
60
40
20
0
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Night
Activity Level
medium
low


Plecotus auritus
GL9
Rhinolophus hipposideros
GL3
Rhinolophus hipposideros
GL4
Rhinolophus hipposideros
GL5
Activity Level (Percentile)
100
80
60
40
20
0
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 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
GL1	*Myotis daubentonii*	Apr	0	0	0	0	1
GL1	*Myotis mystacinus*	Apr	0	0	0	0	1
GL1	*Nyctalus leisleri*	Apr	5	1	2	0	0
GL1	*Nyctalus leisleri*	May	0	1	0	0	0
GL1	*Pipistrellus nathusii*	Apr	0	0	1	4	1
GL1	*Pipistrellus pipistrellus*	Apr	0	1	2	2	0
GL1	*Pipistrellus pygmaeus*	Apr	0	0	0	1	0
GL1	*Plecotus auritus*	Apr	0	0	1	3	1
GL2	*Nyctalus leisleri*	Apr	0	1	1	1	3
GL2	*Nyctalus leisleri*	May	0	0	0	0	1
GL2	*Pipistrellus nathusii*	Apr	0	0	0	0	2
GL2	*Pipistrellus pipistrellus*	Apr	0	0	1	3	1
GL2	*Pipistrellus pipistrellus*	May	0	0	1	0	0
GL2	*Pipistrellus pygmaeus*	Apr	0	0	0	1	0
GL2	*Plecotus auritus*	Apr	0	0	0	0	1
GL2	*Plecotus auritus*	May	0	0	0	0	1
GL3	*Myotis daubentonii*	Apr	0	0	0	0	3

GL3	*Myotis mystacinus*	Apr	0	0	0	0	1
GL3	*Myotis nattereri*	Apr	0	0	0	0	2
GL3	*Nyctalus leisleri*	Apr	0	0	0	1	2
GL3	*Pipistrellus pipistrellus*	Apr	0	0	0	2	0
GL3	*Pipistrellus pygmaeus*	Apr	0	0	0	0	1
GL3	*Plecotus auritus*	Apr	0	0	0	0	1
GL3	*Rhinolophus hipposideros*	Apr	0	0	0	0	1
GL4	*Nyctalus leisleri*	Apr	0	0	0	3	0
GL4	*Nyctalus leisleri*	May	0	0	0	2	0
GL4	*Pipistrellus nathusii*	Apr	0	0	0	0	1
GL4	*Plecotus auritus*	Apr	0	0	0	0	3
GL4	*Rhinolophus hipposideros*	May	0	0	0	0	1
GL5	*Myotis daubentonii*	Apr	0	0	0	0	1
GL5	*Myotis daubentonii*	May	0	0	0	0	1
GL5	*Myotis mystacinus*	Apr	0	0	0	0	1
GL5	*Myotis nattereri*	Apr	0	0	0	0	2
GL5	*Nyctalus leisleri*	Apr	0	0	1	1	2
GL5	*Nyctalus leisleri*	May	0	0	0	0	1
GL5	*Pipistrellus pipistrellus*	Apr	0	0	0	1	1
GL5	*Pipistrellus pipistrellus*	May	0	0	1	0	0
GL5	*Pipistrellus pygmaeus*	Apr	0	0	0	0	1
GL5	*Plecotus auritus*	Apr	0	2	1	1	0

GL5	*Rhinolophus hipposideros*	Apr	0	0	0	0	1
GL6	*Myotis daubentonii*	Apr	0	0	0	3	2
GL6	*Myotis daubentonii*	May	0	0	0	0	2
GL6	*Myotis mystacinus*	Apr	0	0	0	1	0
GL6	*Myotis nattereri*	Apr	0	0	0	1	4
GL6	*Myotis nattereri*	May	0	0	0	0	1
GL6	*Nyctalus leisleri*	Apr	0	1	0	0	4
GL6	*Pipistrellus nathusii*	Apr	0	0	0	0	1
GL6	*Pipistrellus pipistrellus*	Apr	0	0	0	2	2
GL6	*Pipistrellus pipistrellus*	May	0	0	0	1	2
GL6	*Pipistrellus pygmaeus*	Apr	0	0	0	1	0
GL6	*Pipistrellus pygmaeus*	May	0	0	0	0	1
GL6	*Plecotus auritus*	Apr	0	0	0	2	2
GL6	*Plecotus auritus*	May	0	0	0	0	2
GL7	*Myotis daubentonii*	Apr	0	0	0	1	1
GL7	*Myotis daubentonii*	May	0	0	0	0	1
GL7	*Myotis mystacinus*	Apr	0	0	0	0	1
GL7	*Myotis nattereri*	Apr	0	0	0	1	2
GL7	*Nyctalus leisleri*	Apr	1	2	0	1	1
GL7	*Nyctalus leisleri*	May	1	0	1	0	0
GL7	*Pipistrellus nathusii*	May	0	0	0	0	1

GL7	*Pipistrellus pipistrellus*	Apr	0	0	0	2	1
GL7	*Pipistrellus pipistrellus*	May	0	0	0	1	1
GL7	*Pipistrellus pygmaeus*	Apr	0	0	0	1	2
GL7	*Plecotus auritus*	Apr	0	0	0	0	1
GL7	*Plecotus auritus*	May	0	0	0	0	1
GL8	*Myotis daubentonii*	Apr	0	0	0	0	2
GL8	*Myotis nattereri*	Apr	0	0	0	0	1
GL8	*Nyctalus leisleri*	Apr	0	1	1	1	1
GL8	*Nyctalus leisleri*	May	0	0	0	1	0
GL8	*Pipistrellus pipistrellus*	Apr	0	0	0	1	1
GL8	*Pipistrellus pipistrellus*	May	0	0	0	0	1
GL8	*Pipistrellus pygmaeus*	Apr	0	0	0	0	2
GL8	*Plecotus auritus*	Apr	0	0	1	3	1
GL9	*Myotis daubentonii*	Apr	0	0	0	0	1
GL9	*Myotis mystacinus*	Apr	0	0	0	0	1
GL9	*Myotis nattereri*	Apr	0	0	0	1	1
GL9	*Nyctalus leisleri*	Apr	0	0	1	0	2
GL9	*Nyctalus leisleri*	May	0	0	0	1	0
GL9	*Pipistrellus pipistrellus*	Apr	0	0	0	0	1
GL9	*Pipistrellus pipistrellus*	May	0	0	0	0	1
GL9	*Plecotus auritus*	Apr	0	2	1	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
GL1	*Myotis daubentonii*	Apr	3	0	3	1
GL1	*Myotis mystacinus*	Apr	3	0	3	1
GL1	*Nyctalus leisleri*	Apr	88	60 - 95	99	8
GL1	*Nyctalus leisleri*	May	78	60 - 95	78	1
GL1	*Pipistrellus nathusii*	Apr	29	13 - 46	58	6
GL1	*Pipistrellus pipistrellus*	Apr	45	39.5 - 62	79	5
GL1	*Pipistrellus pygmaeus*	Apr	23	0	23	1
GL1	*Plecotus auritus*	Apr	23	3 - 52	52	5
GL2	*Nyctalus leisleri*	Apr	13	3 - 34	65	6
GL2	*Nyctalus leisleri*	May	3	3 - 34	3	1
GL2	*Pipistrellus nathusii*	Apr	3	3 - 3	3	2
GL2	*Pipistrellus pipistrellus*	Apr	23	13 - 49	58	5
GL2	*Pipistrellus pipistrellus*	May	45	13 - 49	45	1
GL2	*Pipistrellus pygmaeus*	Apr	23	0	23	1
GL2	*Plecotus auritus*	Apr	3	3 - 3	3	1
GL2	*Plecotus auritus*	May	3	3 - 3	3	1
GL3	*Myotis daubentonii*	Apr	3	3 - 3	3	3
GL3	*Myotis mystacinus*	Apr	3	0	3	1
GL3	*Myotis nattereri*	Apr	3	3 - 3	3	2
GL3	*Nyctalus leisleri*	Apr	3	3 - 3	23	3
GL3	*Pipistrellus pipistrellus*	Apr	34	34 - 34	34	2

GL3	*Pipistrellus pygmaeus*	Apr	3	0	3	1
GL3	*Plecotus auritus*	Apr	3	0	3	1
GL3	*Rhinolophus hipposideros*	Apr	3	0	3	1
GL4	*Nyctalus leisleri*	Apr	34	28.5 - 34	34	3
GL4	*Nyctalus leisleri*	May	29	28.5 - 34	34	2
GL4	*Pipistrellus nathusii*	Apr	3	0	3	1
GL4	*Plecotus auritus*	Apr	3	3 - 3	3	3
GL4	*Rhinolophus hipposideros*	May	3	0	3	1
GL5	*Myotis daubentonii*	Apr	3	3 - 3	3	1
GL5	*Myotis daubentonii*	May	3	3 - 3	3	1
GL5	*Myotis mystacinus*	Apr	3	0	3	1
GL5	*Myotis nattereri*	Apr	3	3 - 3	3	2
GL5	*Nyctalus leisleri*	Apr	13	3 - 24	45	4
GL5	*Nyctalus leisleri*	May	3	3 - 24	3	1
GL5	*Pipistrellus pipistrellus*	Apr	19	3 - 45	34	2
GL5	*Pipistrellus pipistrellus*	May	45	3 - 45	45	1
GL5	*Pipistrellus pygmaeus*	Apr	3	0	3	1
GL5	*Plecotus auritus*	Apr	57	34 - 77	77	4
GL5	*Rhinolophus hipposideros*	Apr	3	0	3	1
GL6	*Myotis daubentonii*	Apr	40	3 - 21.5	40	5
GL6	*Myotis daubentonii*	May	3	3 - 21.5	3	2
GL6	*Myotis mystacinus*	Apr	23	0	23	1
GL6	*Myotis nattereri*	Apr	3	3 - 3	23	5
GL6	*Myotis nattereri*	May	3	3 - 3	3	1

GL6	*Nyctalus leisleri*	Apr	3	3 - 3	70	5
GL6	*Pipistrellus nathusii*	Apr	3	0	3	1
GL6	*Pipistrellus pipistrellus*	Apr	13	3 - 21.5	40	4
GL6	*Pipistrellus pipistrellus*	May	3	3 - 21.5	34	3
GL6	*Pipistrellus pygmaeus*	Apr	23	13 - 13	23	1
GL6	*Pipistrellus pygmaeus*	May	3	13 - 13	3	1
GL6	*Plecotus auritus*	Apr	13	3 - 21.5	40	4
GL6	*Plecotus auritus*	May	3	3 - 21.5	3	2
GL7	*Myotis daubentonii*	Apr	13	3 - 3	23	2
GL7	*Myotis daubentonii*	May	3	3 - 3	3	1
GL7	*Myotis mystacinus*	Apr	3	0	3	1
GL7	*Myotis nattereri*	Apr	3	3 - 3	23	3
GL7	*Nyctalus leisleri*	Apr	62	21.5 - 84	85	5
GL7	*Nyctalus leisleri*	May	69	21.5 - 84	83	2
GL7	*Pipistrellus nathusii*	May	3	0	3	1
GL7	*Pipistrellus pipistrellus*	Apr	23	3 - 34	34	3
GL7	*Pipistrellus pipistrellus*	May	22	3 - 34	40	2
GL7	*Pipistrellus pygmaeus*	Apr	3	3 - 3	23	3
GL7	*Plecotus auritus*	Apr	3	3 - 3	3	1
GL7	*Plecotus auritus*	May	3	3 - 3	3	1
GL8	*Myotis daubentonii*	Apr	3	3 - 3	3	2
GL8	*Myotis nattereri*	Apr	3	0	3	1
GL8	*Nyctalus leisleri*	Apr	40	18.5 - 49.5	65	4

GL8	*Nyctalus leisleri*	May	23	18.5 - 49.5	23	1
GL8	*Pipistrellus pipistrellus*	Apr	13	3 - 3	23	2
GL8	*Pipistrellus pipistrellus*	May	3	3 - 3	3	1
GL8	*Pipistrellus pygmaeus*	Apr	3	3 - 3	3	2
GL8	*Plecotus auritus*	Apr	34	18.5 - 44.5	55	5
GL9	*Myotis daubentonii*	Apr	3	0	3	1
GL9	*Myotis mystacinus*	Apr	3	0	3	1
GL9	*Myotis nattereri*	Apr	13	13 - 13	23	2
GL9	*Nyctalus leisleri*	Apr	3	3 - 30.5	58	3
GL9	*Nyctalus leisleri*	May	23	3 - 30.5	23	1
GL9	*Pipistrellus pipistrellus*	Apr	3	3 - 3	3	1
GL9	*Pipistrellus pipistrellus*	May	3	3 - 3	3	1
GL9	*Plecotus auritus*	Apr	56	3 - 65	65	4

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 daubentonii	0	0	0	4	15
Myotis mystacinus	0	0	0	1	5
Myotis nattereri	0	0	0	3	13
Nyctalus leisleri	7	7	7	12	17
Pipistrellus nathusii	0	0	1	4	6
Pipistrellus pipistrellus	0	1	5	15	12
Pipistrellus pygmaeus	0	0	0	4	7
Plecotus auritus	0	4	4	9	15
Rhinolophus hipposideros	0	0	0	0	3

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

Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	3	3 - 3	40	19
Myotis mystacinus	3	0	23	6
Myotis nattereri	3	3 - 3	23	16
Nyctalus leisleri	34	60 - 95	99	50
Pipistrellus nathusii	3	3 - 3	58	11
Pipistrellus pipistrellus	23	39.5 - 62	79	33
Pipistrellus pygmaeus	3	3 - 3	23	11
Plecotus auritus	23	34 - 77	77	32
Rhinolophus hipposideros	3	0	3	3

###Figures

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

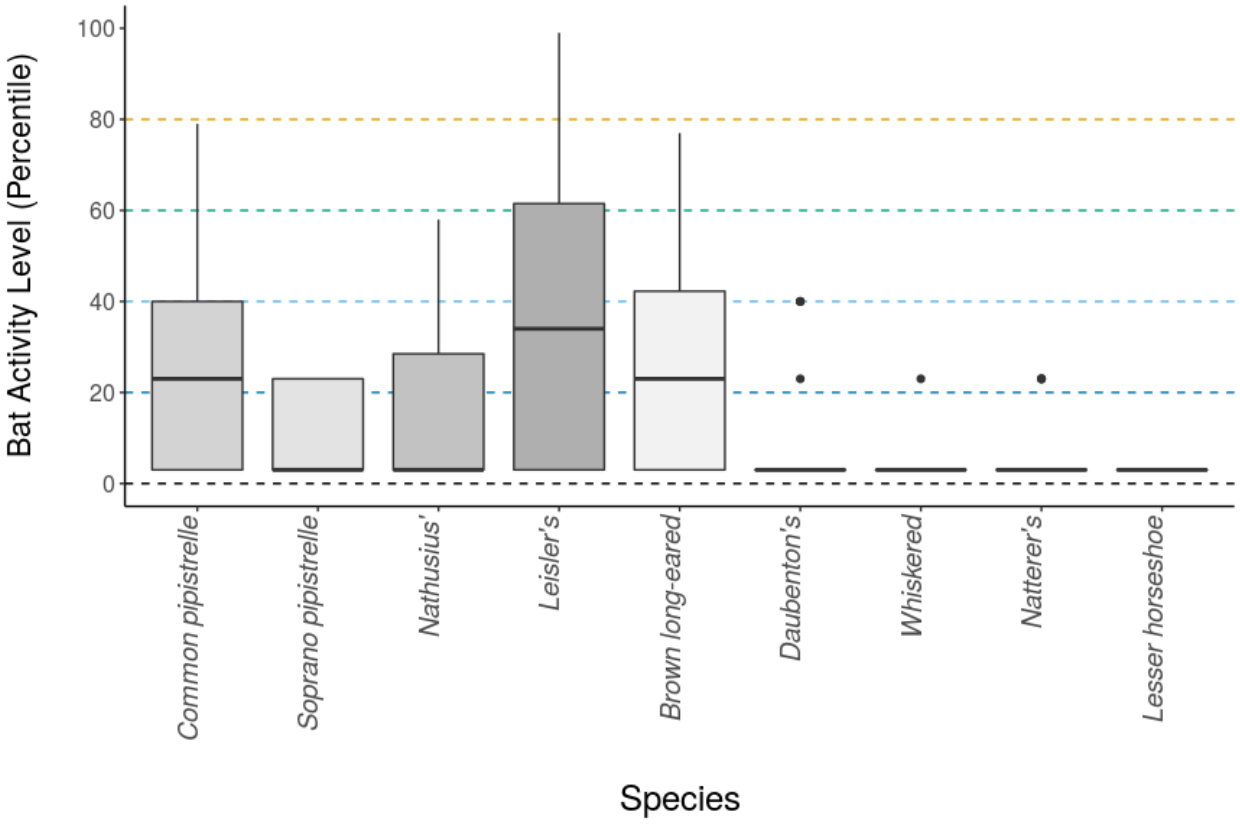
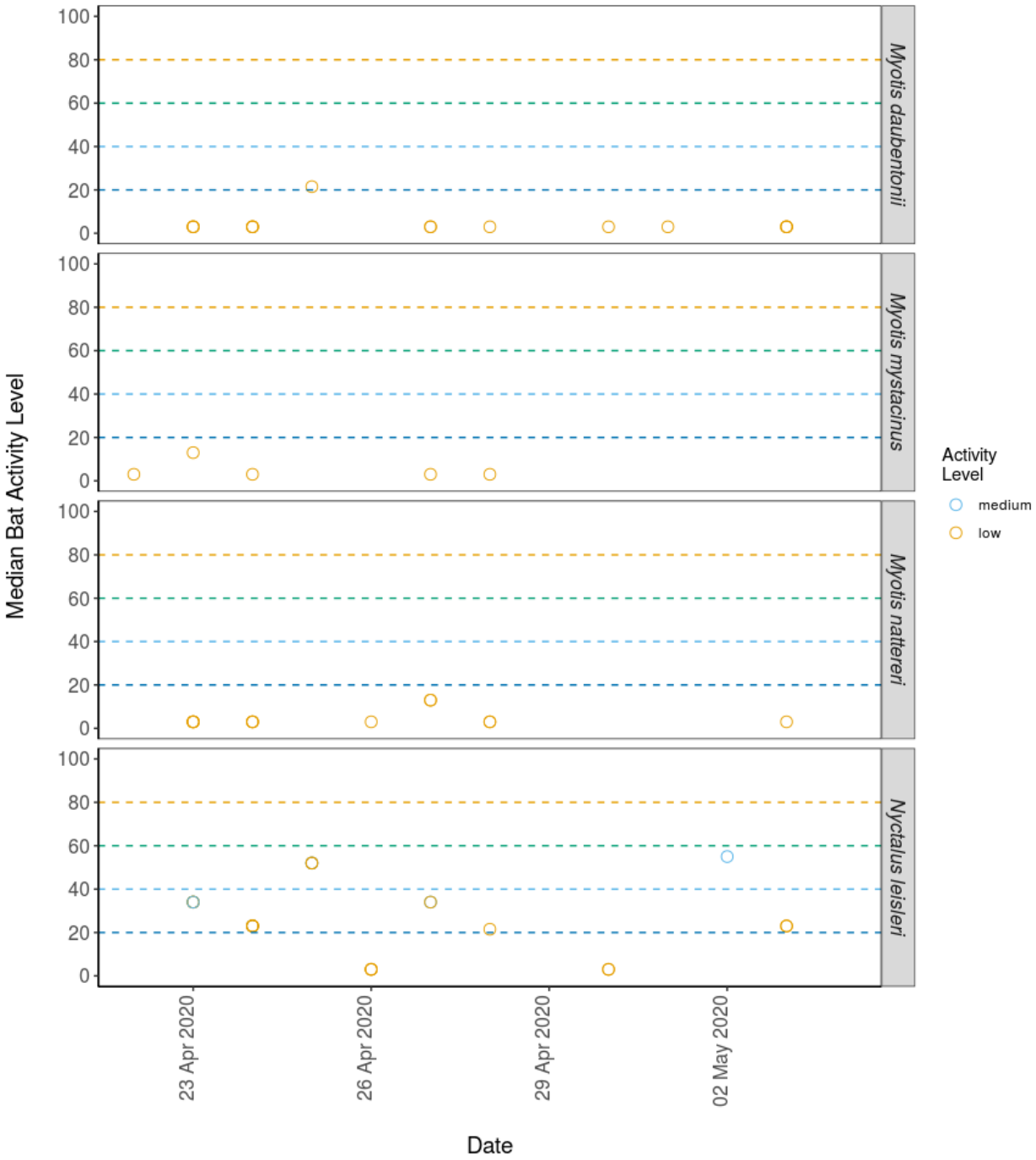
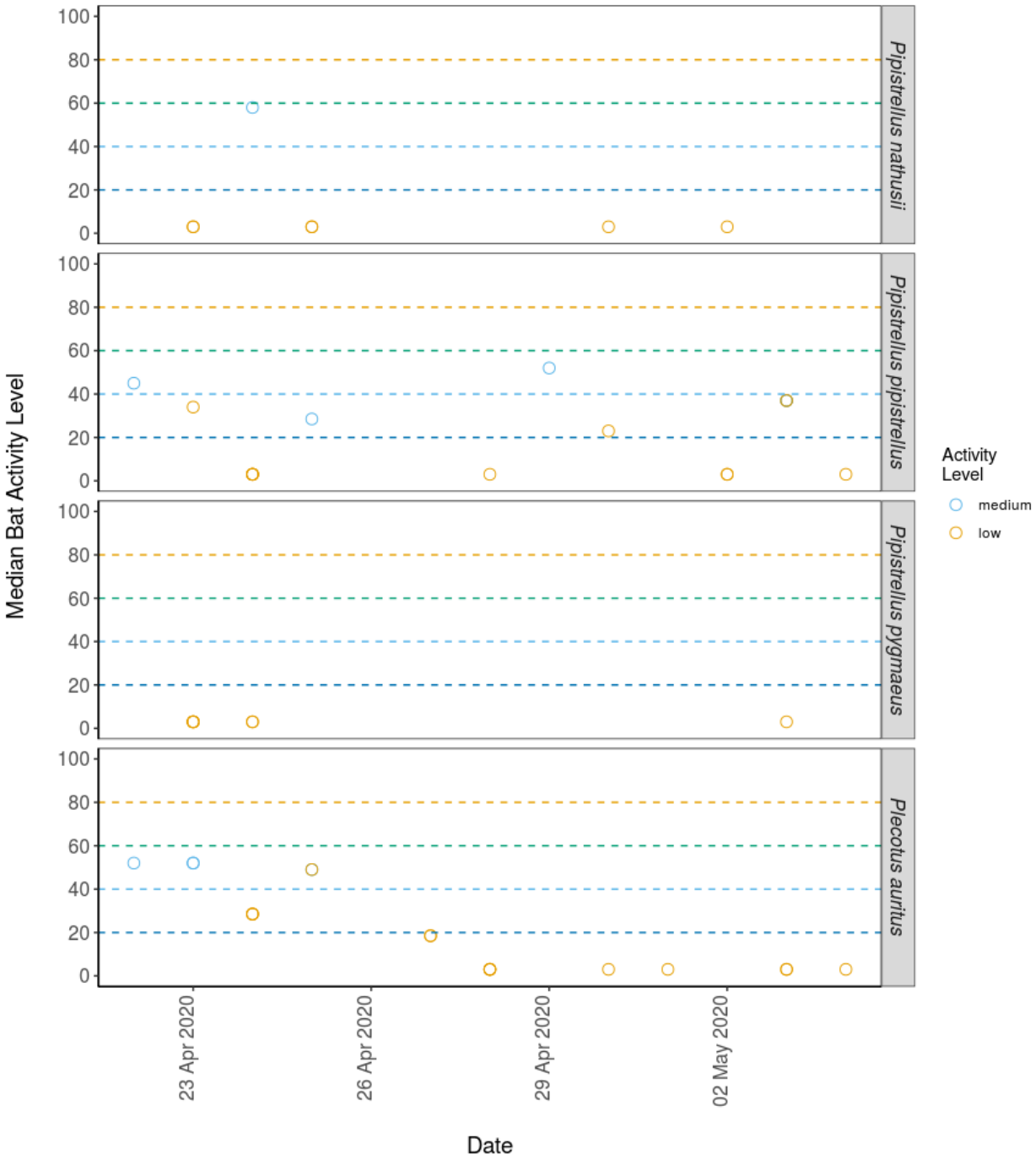
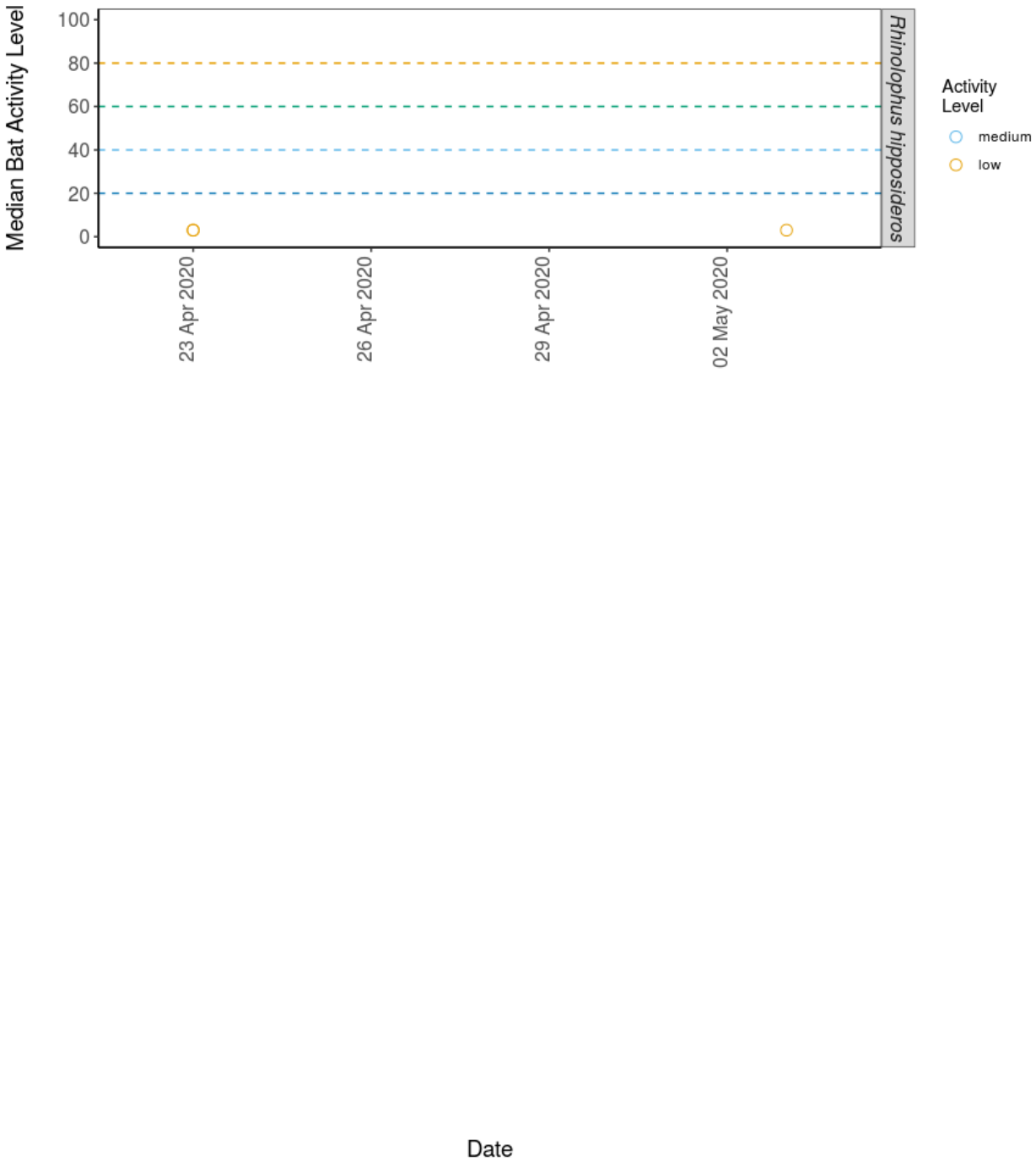


Figure 5. The median activity levels of bats recorded across all detectors each night.


Median Bat Activity Level
100
80
60
40
20
0
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Date
Activity Level
medium
low


Median Bat Activity Level
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Date
Activity Level
medium
low


Median Bat Activity Level
100
80
60
40
20
0
23 Apr 2020
26 Apr 2020
29 Apr 2020
02 May 2020
Rhinolophus hipposideros
Activity Level
medium
low
Date

PER SITE, PER MONTH

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

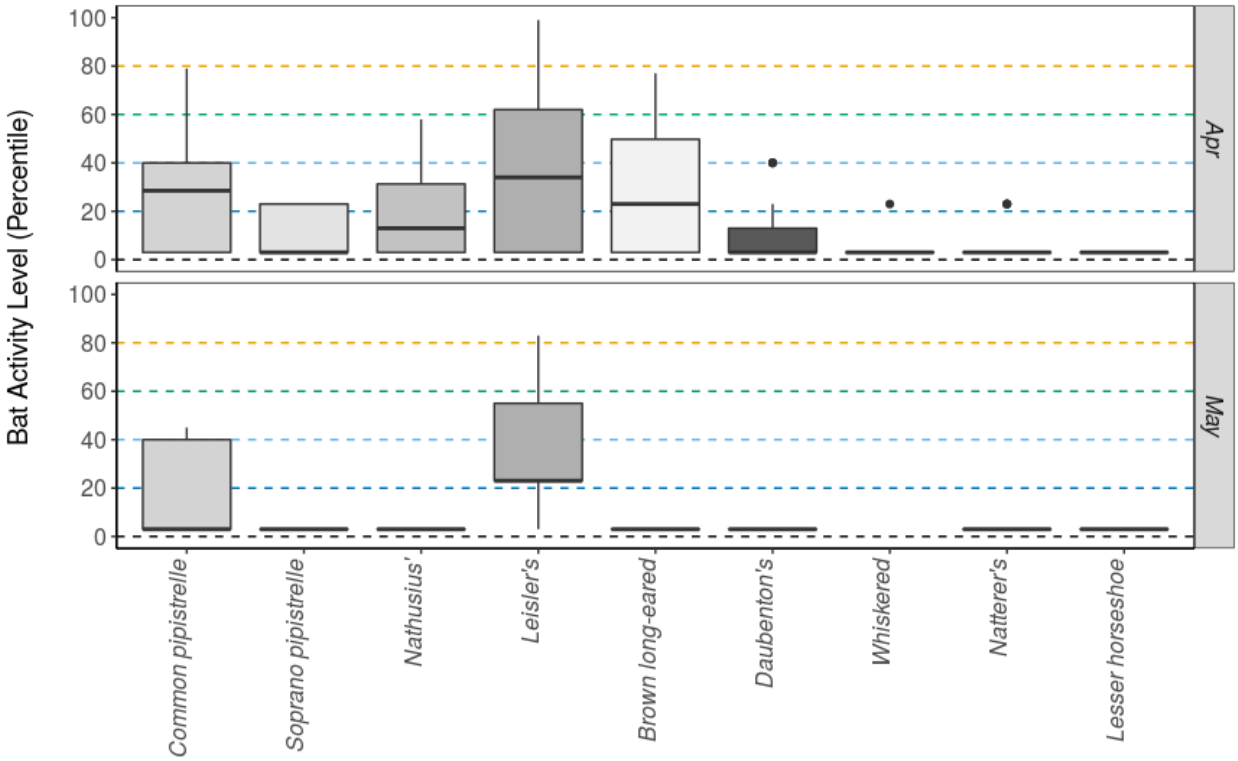
Species/Species Group	Month	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis daubentonii	Apr	0	0	0	4	11
Myotis daubentonii	May	0	0	0	0	4
Myotis mystacinus	Apr	0	0	0	1	5
Myotis nattereri	Apr	0	0	0	3	12
Myotis nattereri	May	0	0	0	0	1
Nyctalus leisleri	Apr	6	6	6	8	15
Nyctalus leisleri	May	1	1	1	4	2
Pipistrellus nathusii	Apr	0	0	1	4	5
Pipistrellus nathusii	May	0	0	0	0	1
Pipistrellus pipistrellus	Apr	0	1	3	13	7
Pipistrellus pipistrellus	May	0	0	2	2	5
Pipistrellus pygmaeus	Apr	0	0	0	4	6
Pipistrellus pygmaeus	May	0	0	0	0	1
Plecotus auritus	Apr	0	4	4	9	11
Plecotus auritus	May	0	0	0	0	4
Rhinolophus hipposideros	Apr	0	0	0	0	2
Rhinolophus hipposideros	May	0	0	0	0	1

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

Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	Apr	3	3 - 3	40	15
Myotis daubentonii	May	3	3 - 3	3	4
Myotis mystacinus	Apr	3	0	23	6
Myotis nattereri	Apr	3	3 - 3	23	15
Myotis nattereri	May	3	3 - 3	3	1
Nyctalus leisleri	Apr	34	60 - 95	99	41
Nyctalus leisleri	May	23	60 - 95	83	9
Pipistrellus nathusii	Apr	13	3 - 3	58	10
Pipistrellus nathusii	May	3	0	3	1
Pipistrellus pipistrellus	Apr	29	39.5 - 62	79	24
Pipistrellus pipistrellus	May	3	3 - 45	45	9
Pipistrellus pygmaeus	Apr	3	3 - 3	23	10
Pipistrellus pygmaeus	May	3	13 - 13	3	1
Plecotus auritus	Apr	23	34 - 77	77	28
Plecotus auritus	May	3	3 - 3	3	4
Rhinolophus hipposideros	Apr	3	0	3	2
Rhinolophus hipposideros	May	3	0	3	1

###Figures

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



PART 2: Nightly Analysis

ENTIRE SURVEY PERIOD

Sunrise and Sunset Times

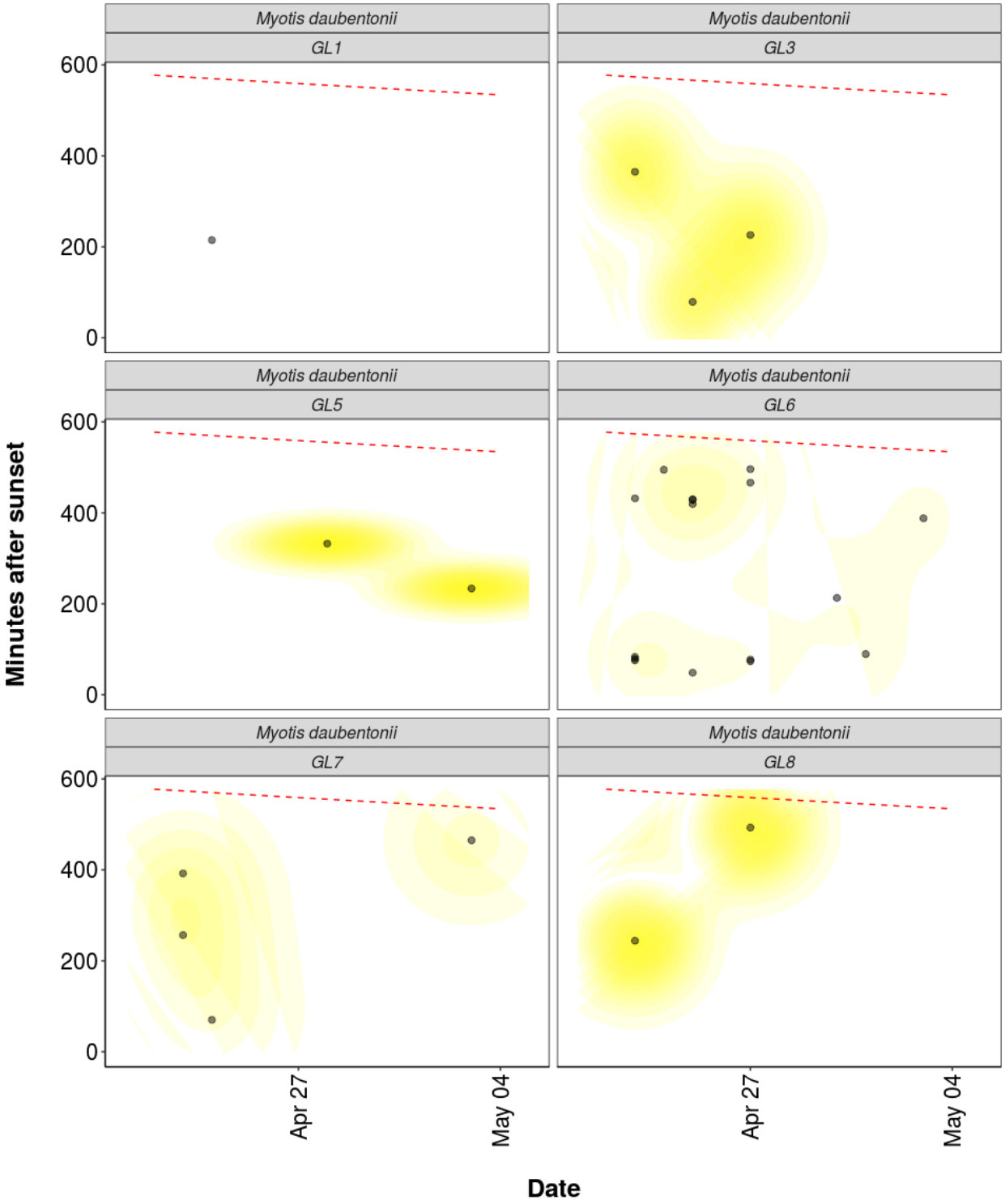
Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.

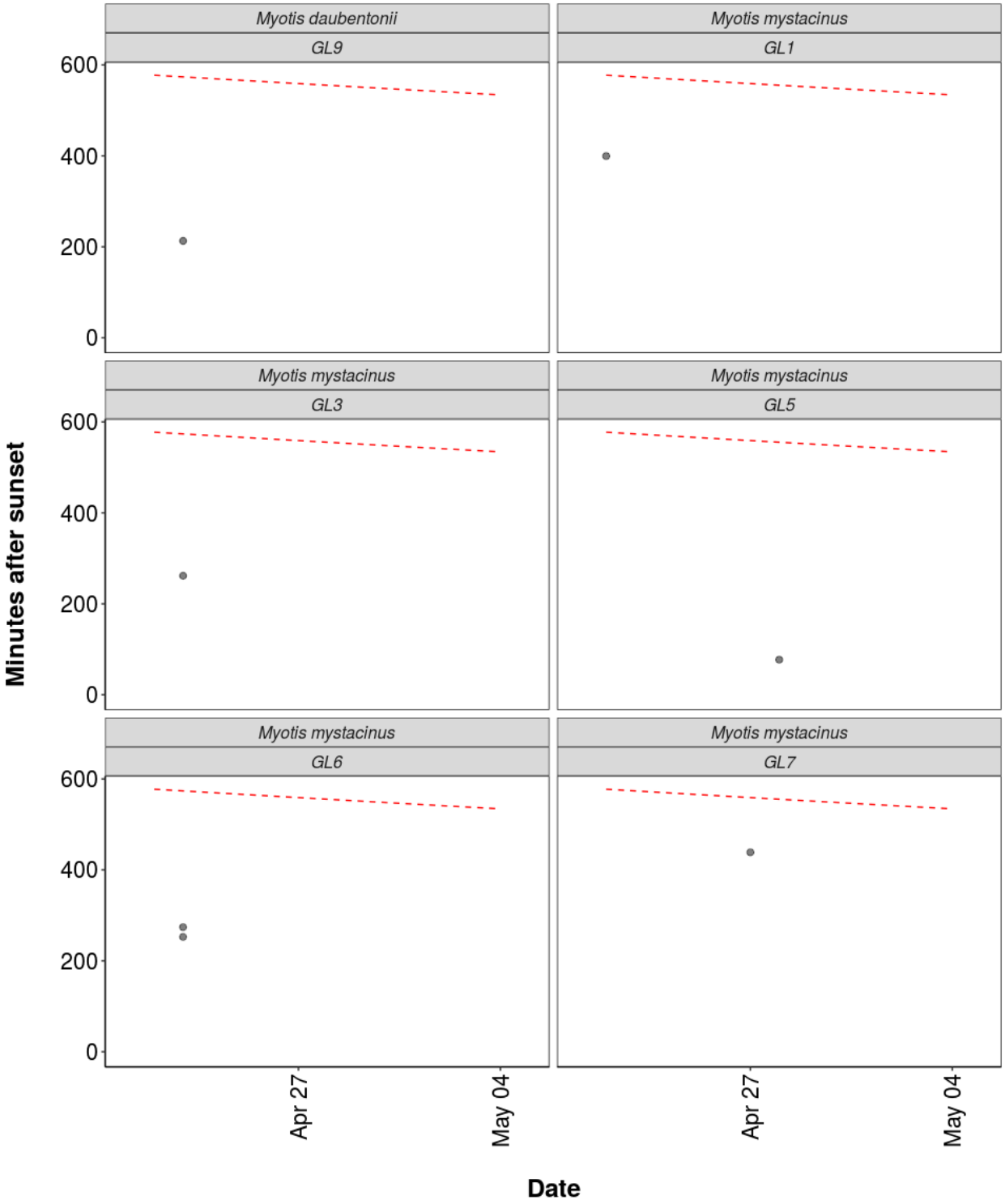
Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)
2020-04-22	20:46	06:24	9.6
2020-04-23	20:48	06:22	9.6
2020-04-24	20:50	06:20	9.5
2020-04-25	20:51	06:18	9.4
2020-04-26	20:53	06:16	9.4
2020-04-27	20:55	06:14	9.3
2020-04-28	20:56	06:12	9.3
2020-04-29	20:58	06:10	9.2
2020-04-30	21:00	06:08	9.1
2020-05-01	21:01	06:06	9.1
2020-05-02	21:03	06:04	9.0
2020-05-03	21:05	06:02	9.0
2020-05-04	21:06	06:01	8.9

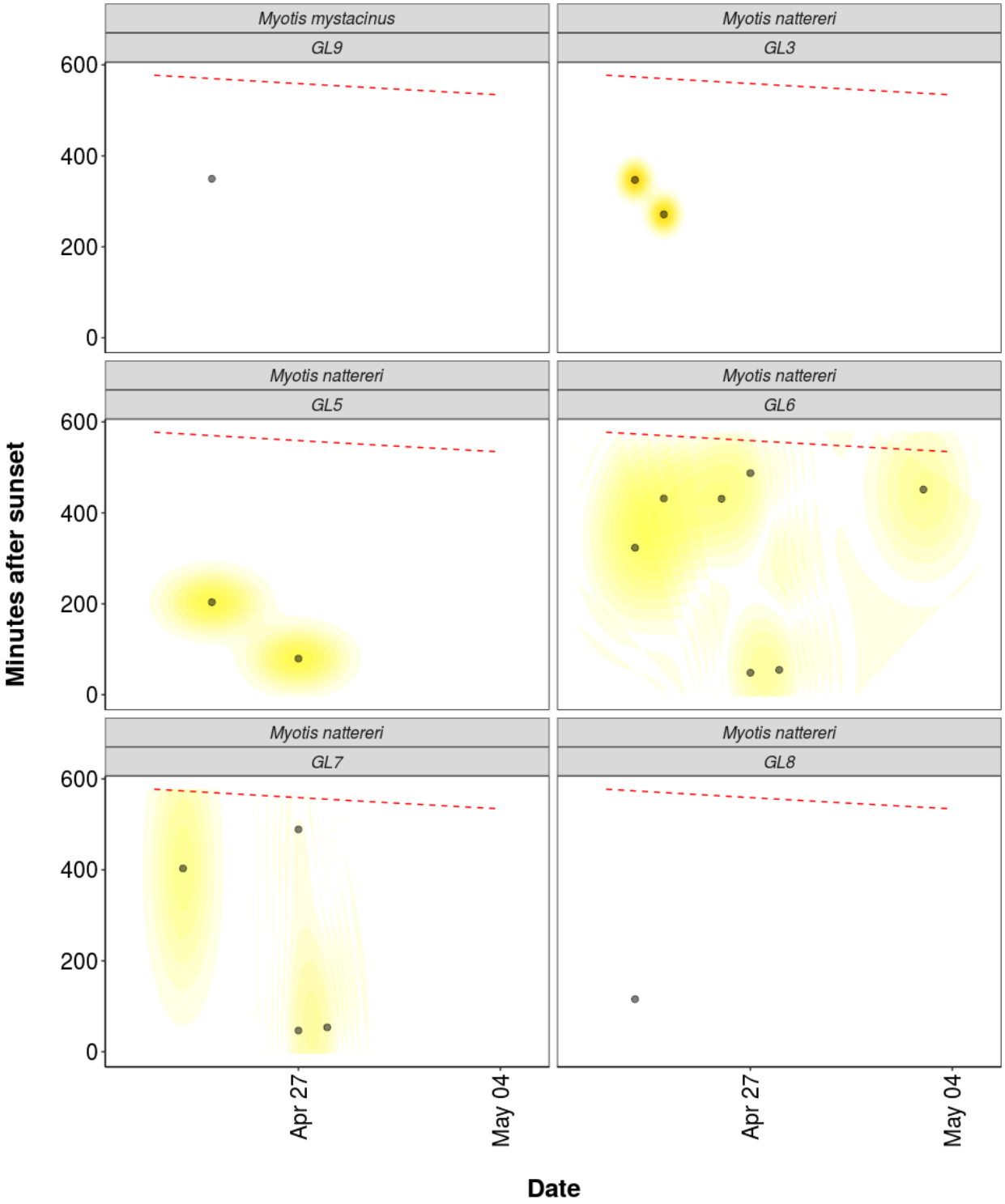
Distribution of Bat Activity Across the Night through Time

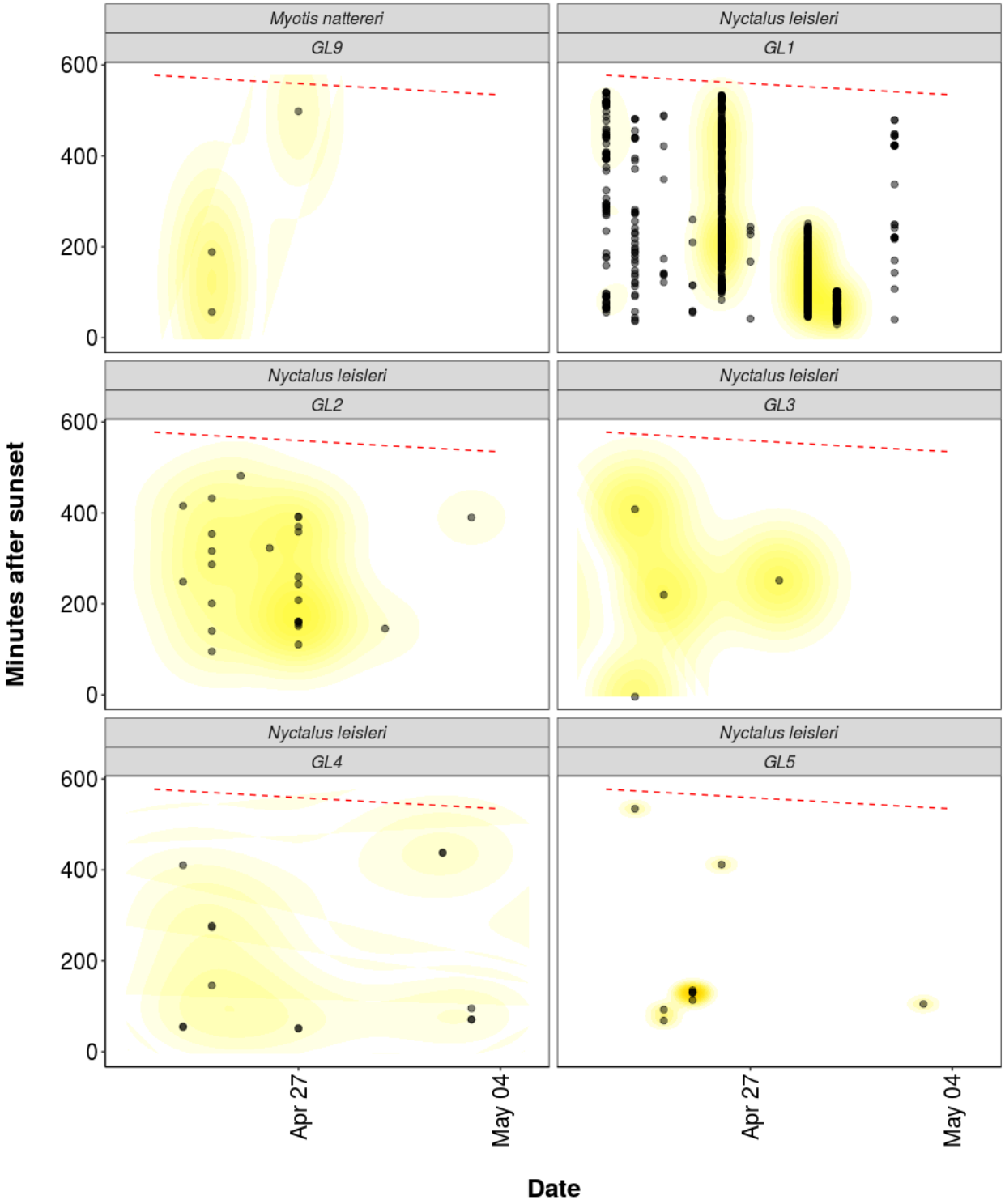
Per Detector

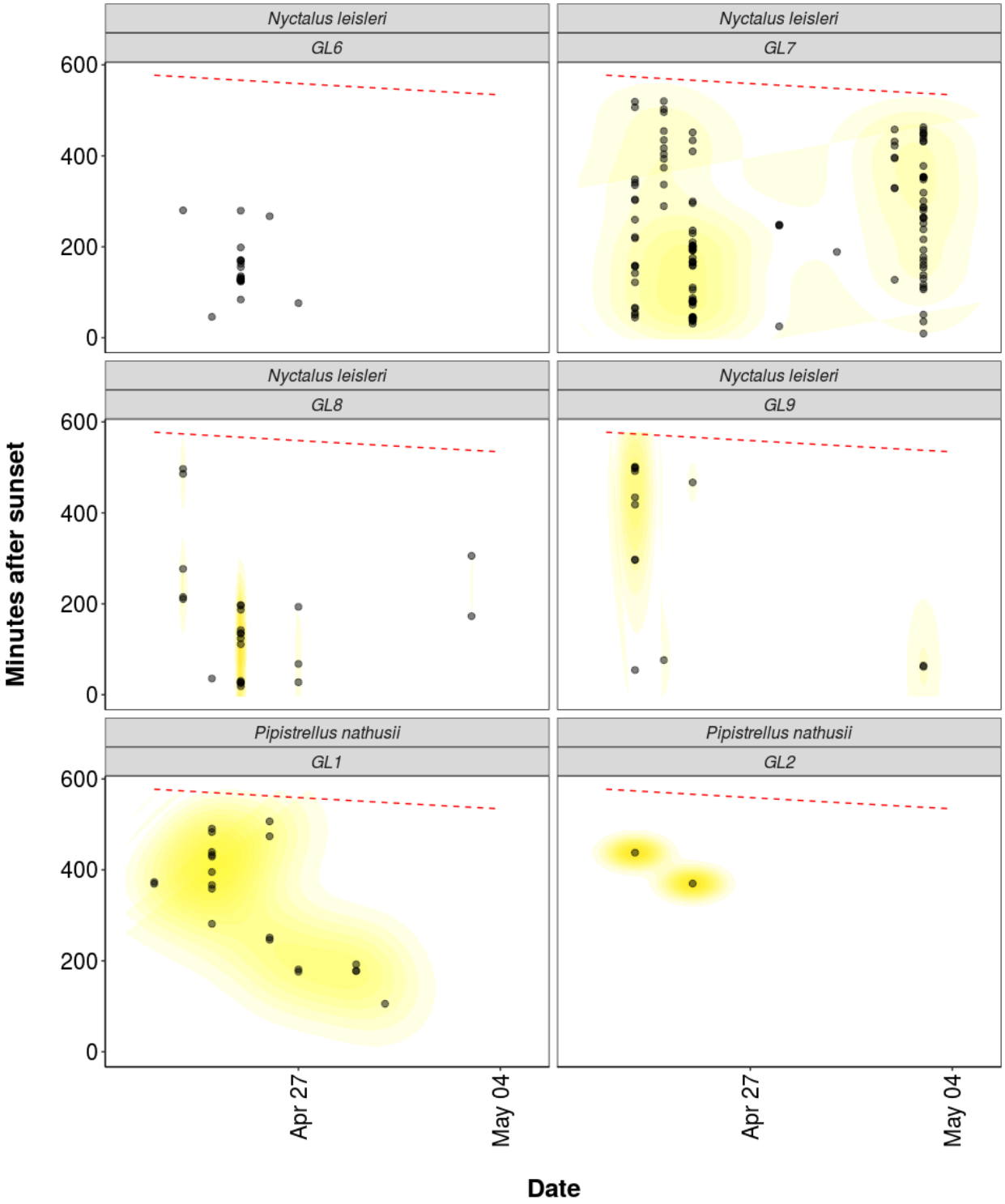
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

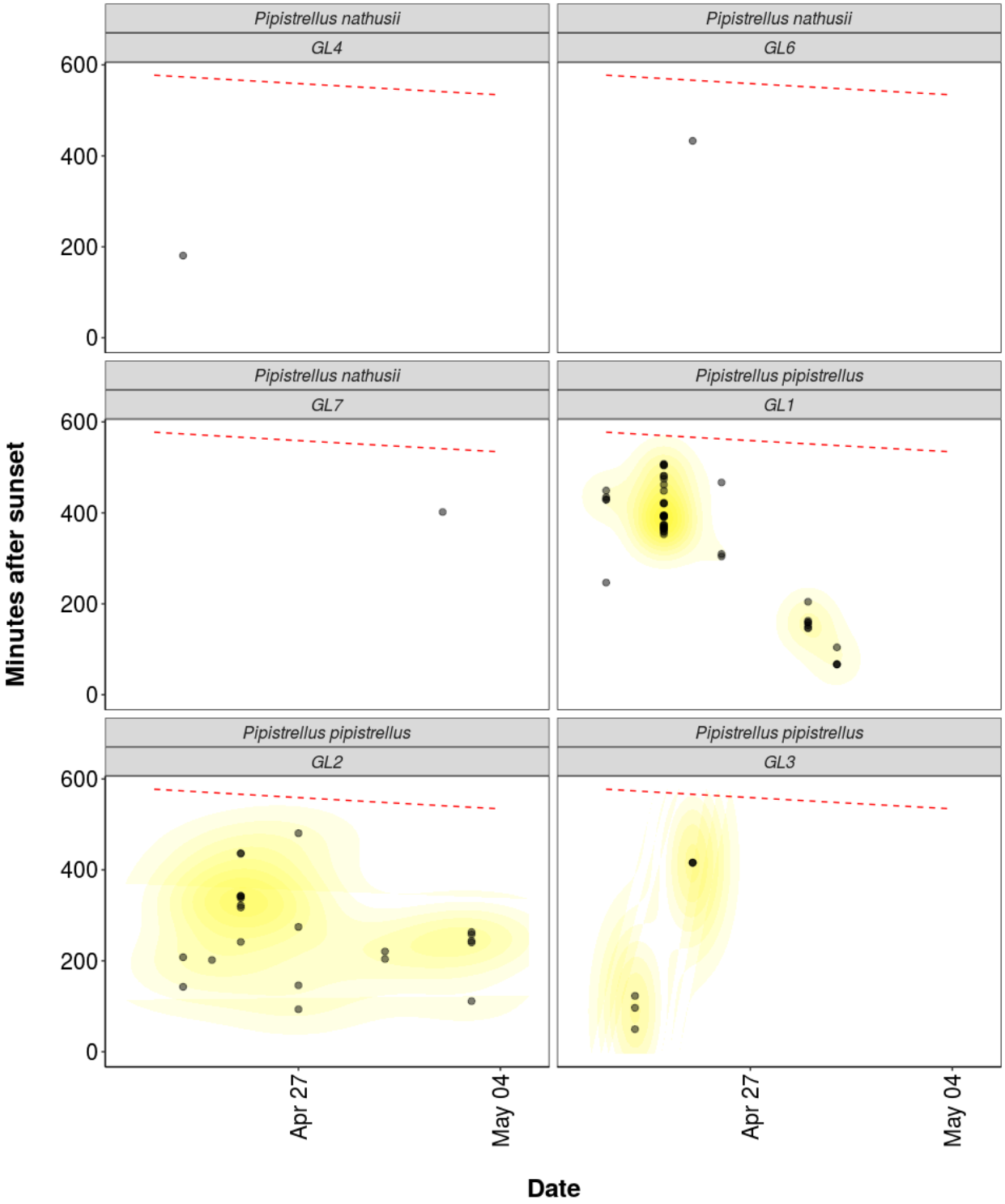

Myotis daubentonii
GL1
Myotis daubentonii
GL3
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Myotis daubentonii
GL7
Myotis daubentonii
GL8
600
400
200
0
Minutes after sunset
Apr 27
May 04
Date

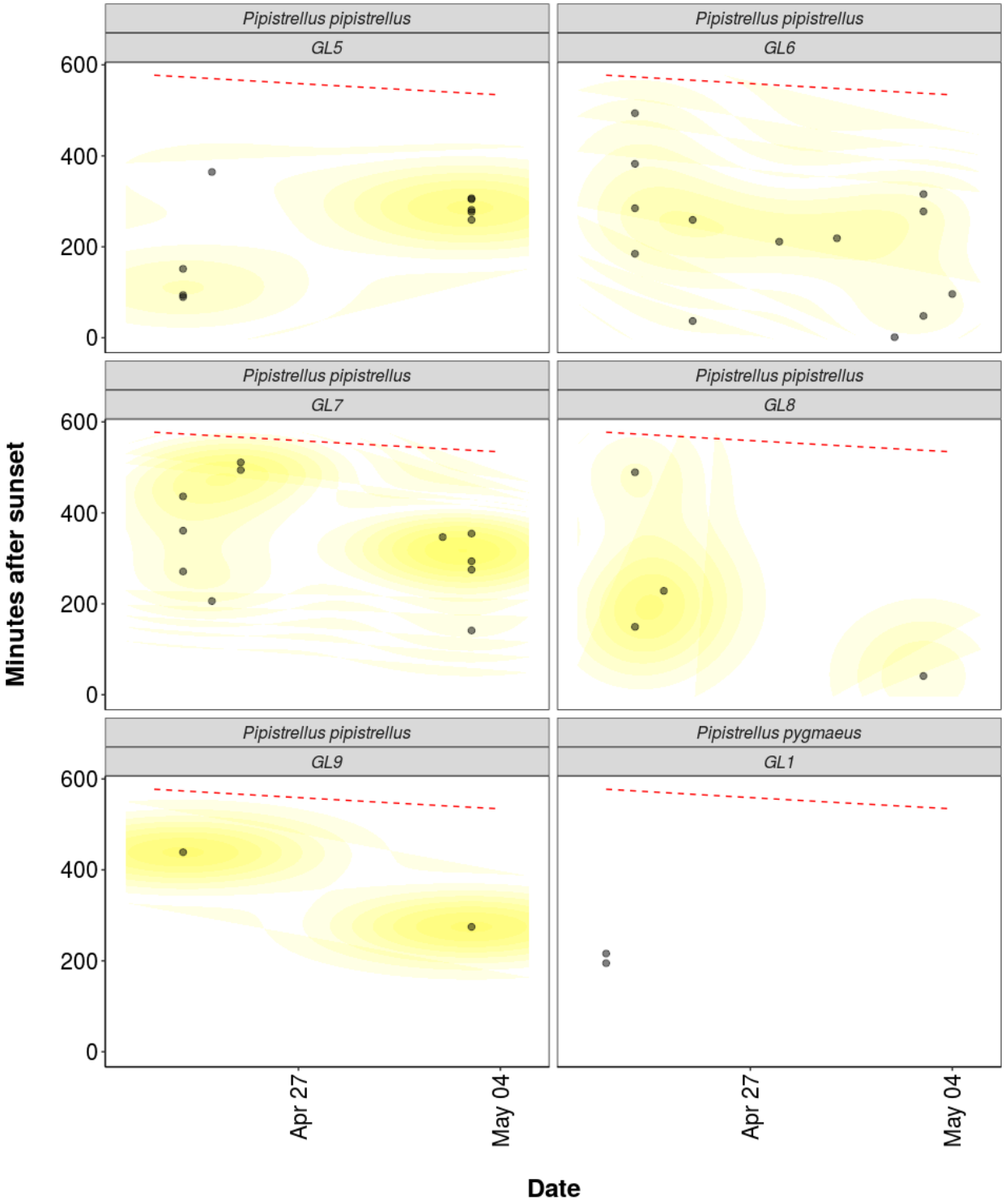

Myotis daubentonii
GL9
Myotis mystacinus
GL1
Myotis mystacinus
GL3
Myotis mystacinus
GL5
Myotis mystacinus
GL6
Myotis mystacinus
GL7
Minutes after sunset
600
400
200
0
Apr 27
May 04
Date

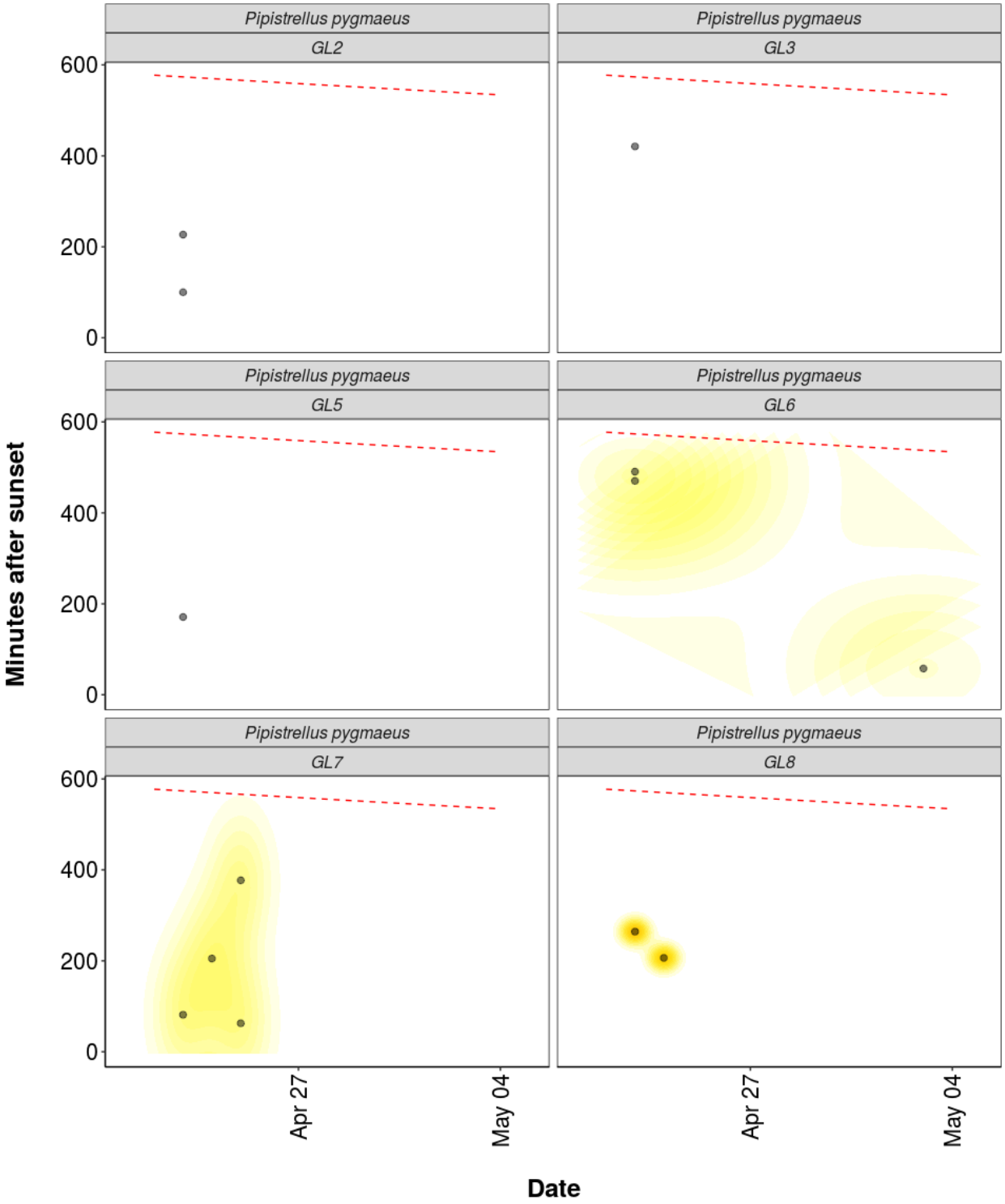

Myotis mystacinus
GL9
Myotis nattereri
GL3
Myotis nattereri
GL5
Myotis nattereri
GL6
Myotis nattereri
GL7
Myotis nattereri
GL8
600
400
200
0
Minutes after sunset
Apr 27
May 04
Date

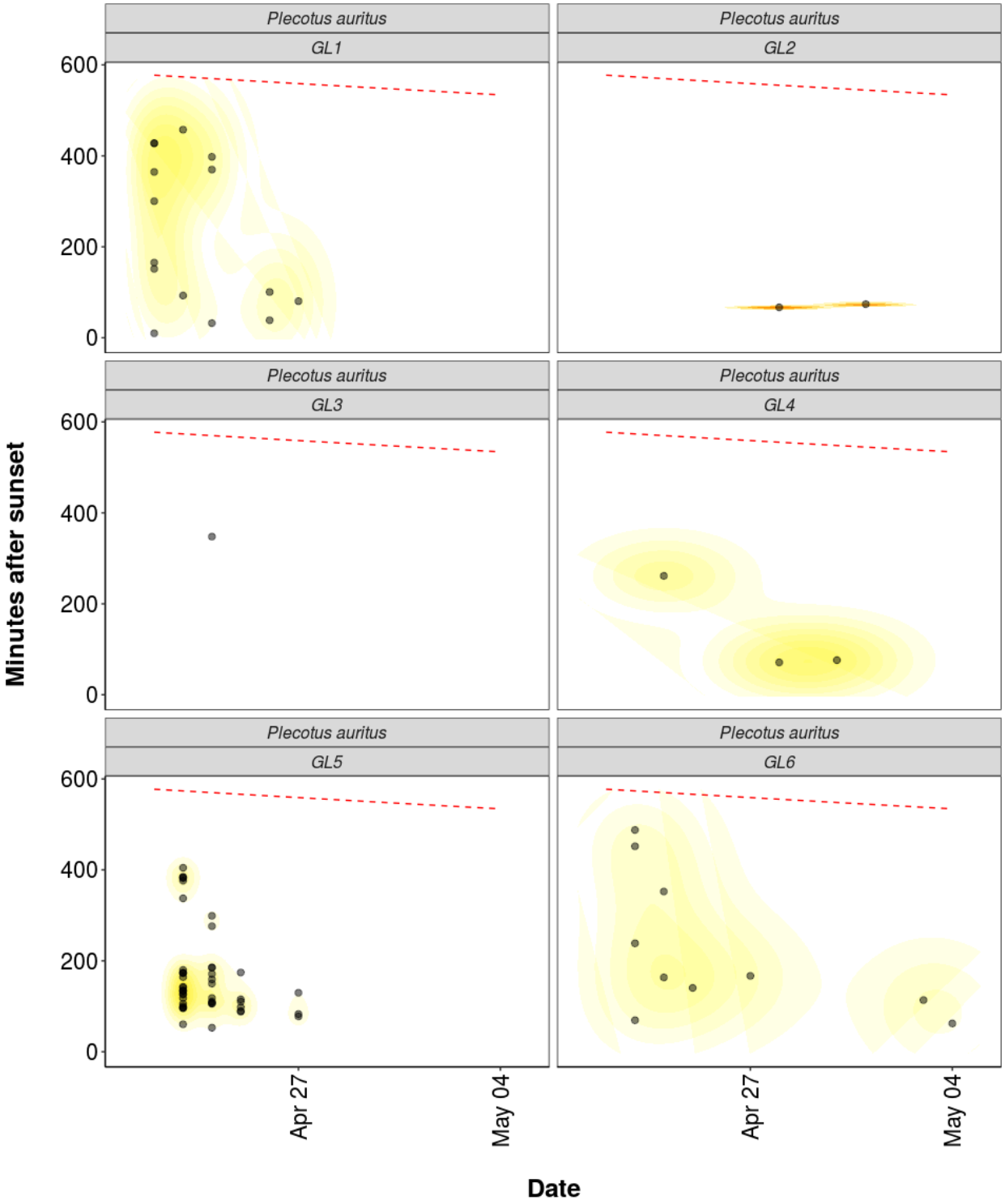

Myotis nattereri
GL9
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Minutes after sunset
600
400
200
0
Apr 27
May 04
Date

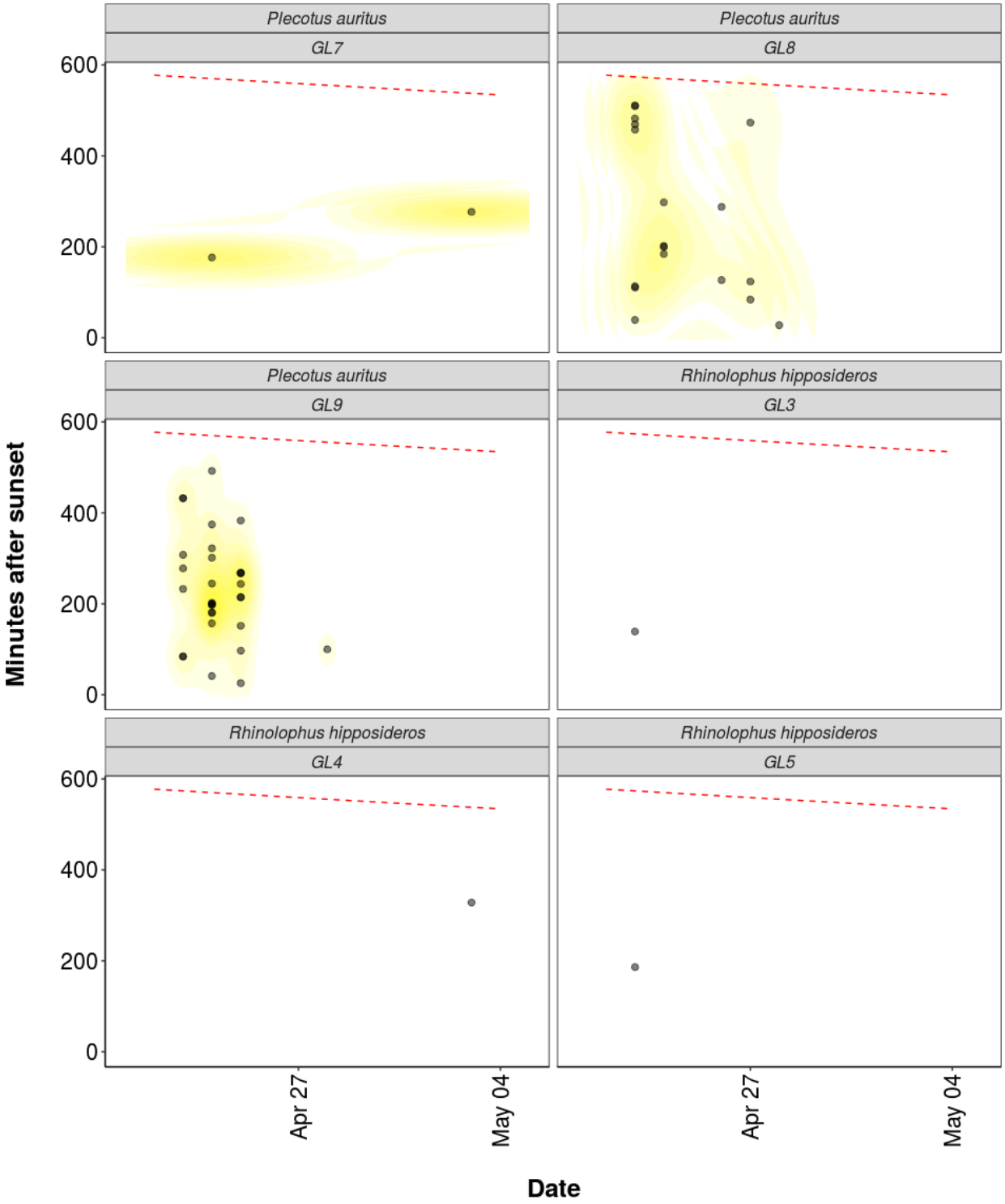

Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL1
Pipistrellus nathusii
GL2
Minutes after sunset
600
400
200
0
Apr 27
May 04
Date


Pipistrellus nathusii
GL4
Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL7
Pipistrellus pipistrellus
GL1
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL3
Minutes after sunset
600
400
200
0
Apr 27
May 04
Date


Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL8
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Minutes after sunset
600
400
200
0
Apr 27
May 04
Date


Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL8
Minutes after sunset
0
200
400
600
Apr 27
May 04
Date


Plecotus auritus
GL1
Plecotus auritus
GL2
Plecotus auritus
GL3
Plecotus auritus
GL4
Plecotus auritus
GL5
Plecotus auritus
GL6
Minutes after sunset
600
400
200
0
Apr 27
May 04
Date


Plecotus auritus
GL7
Plecotus auritus
GL8
Plecotus auritus
GL9
Rhinolophus hipposideros
GL3
Rhinolophus hipposideros
GL4
Rhinolophus hipposideros
GL5
Minutes after sunset
600
400
200
0
Apr 27
May 04
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

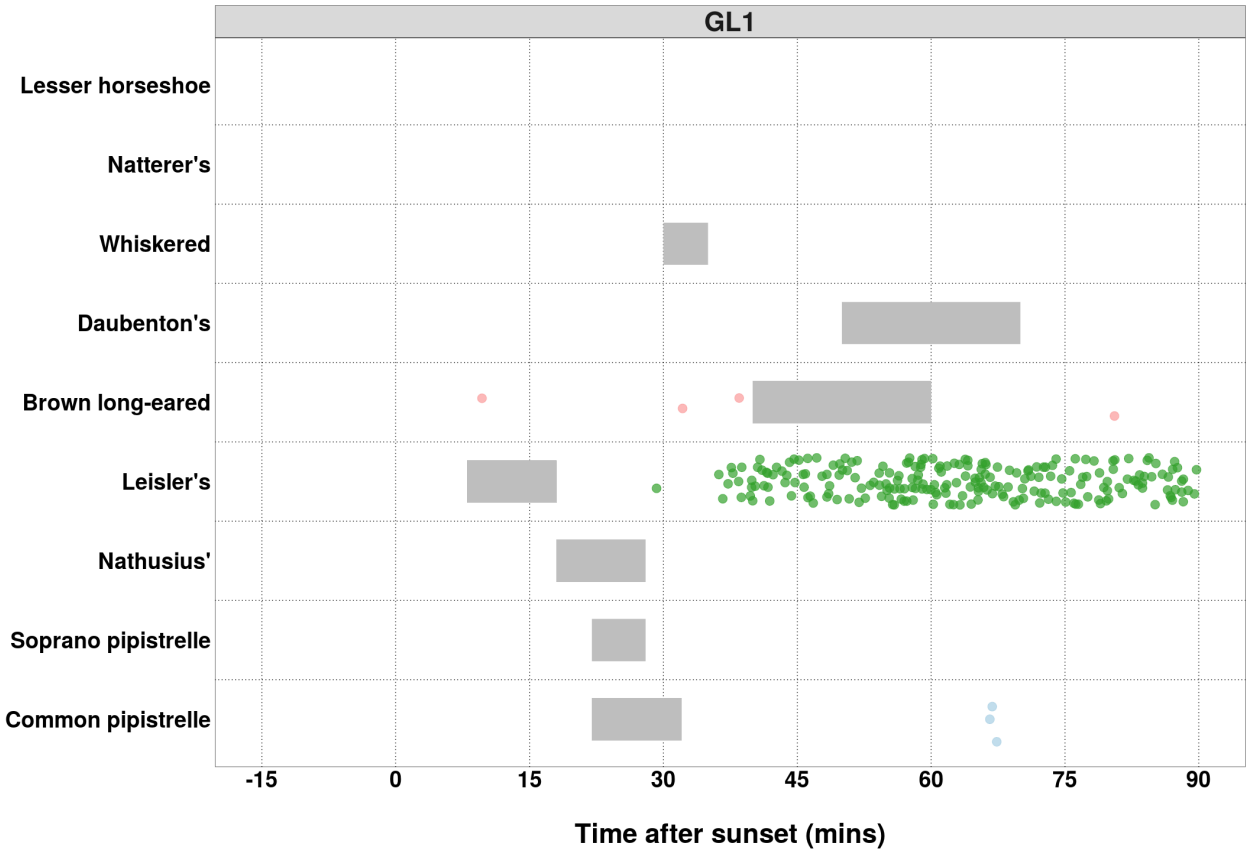
Species	Detector ID	2020-04-22	2020-04-23	2020-04-24	2020-04-25	2020-04-26
Common pipistrelle	GL6	0	0	0	0	0
Leisler's	GL3	0	1	0	0	0
Leisler's	GL7	0	0	0	0	0
Brown long-eared	GL1	1	0	1	0	1
Brown long-eared	GL5	0	0	1	0	0
Brown long-eared	GL8	0	1	0	0	0
Brown long-eared	GL9	0	0	1	1	0
Daubenton's	GL6	0	0	0	1	0
Natterer's	GL6	0	0	0	0	0
Natterer's	GL7	0	0	0	0	0

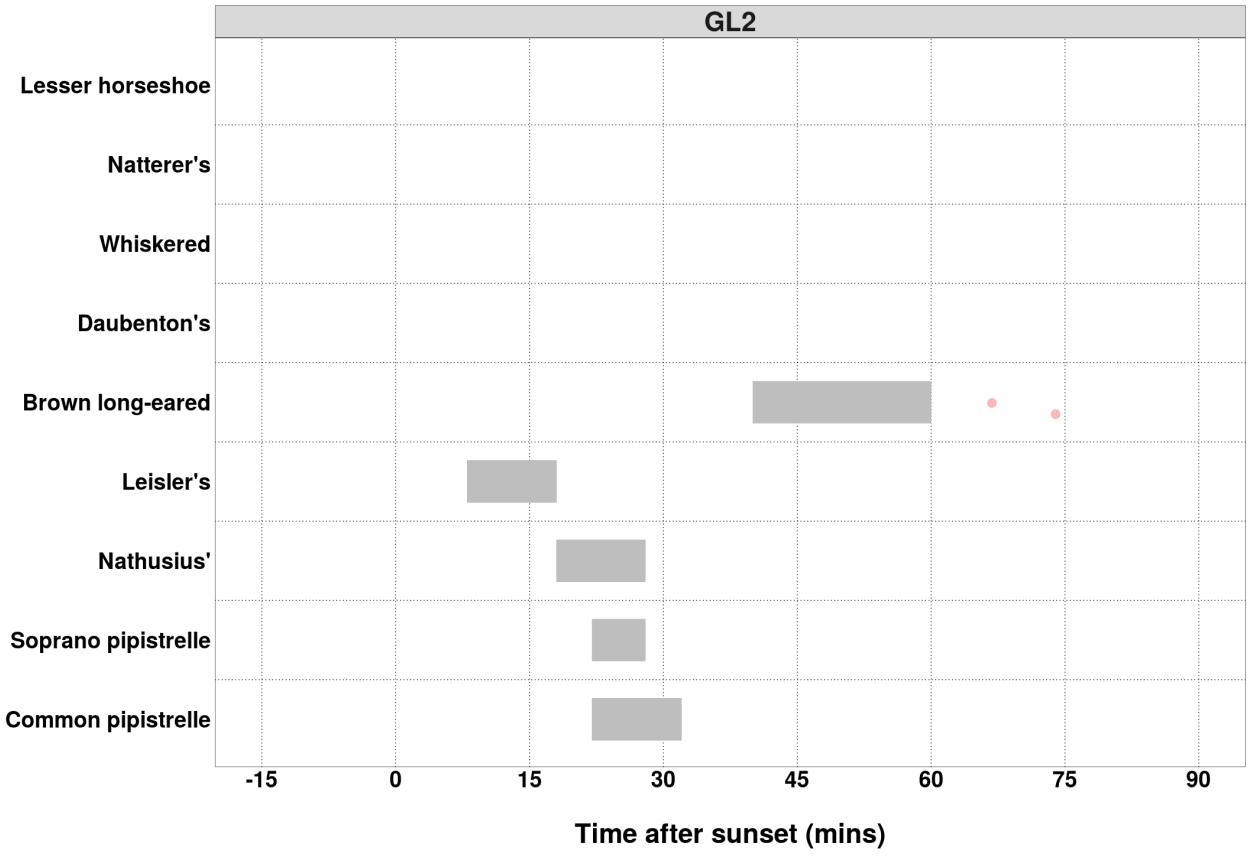
2020-04-27	2020-04-28	2020-05-02	2020-05-03
0	0	1	0
0	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0

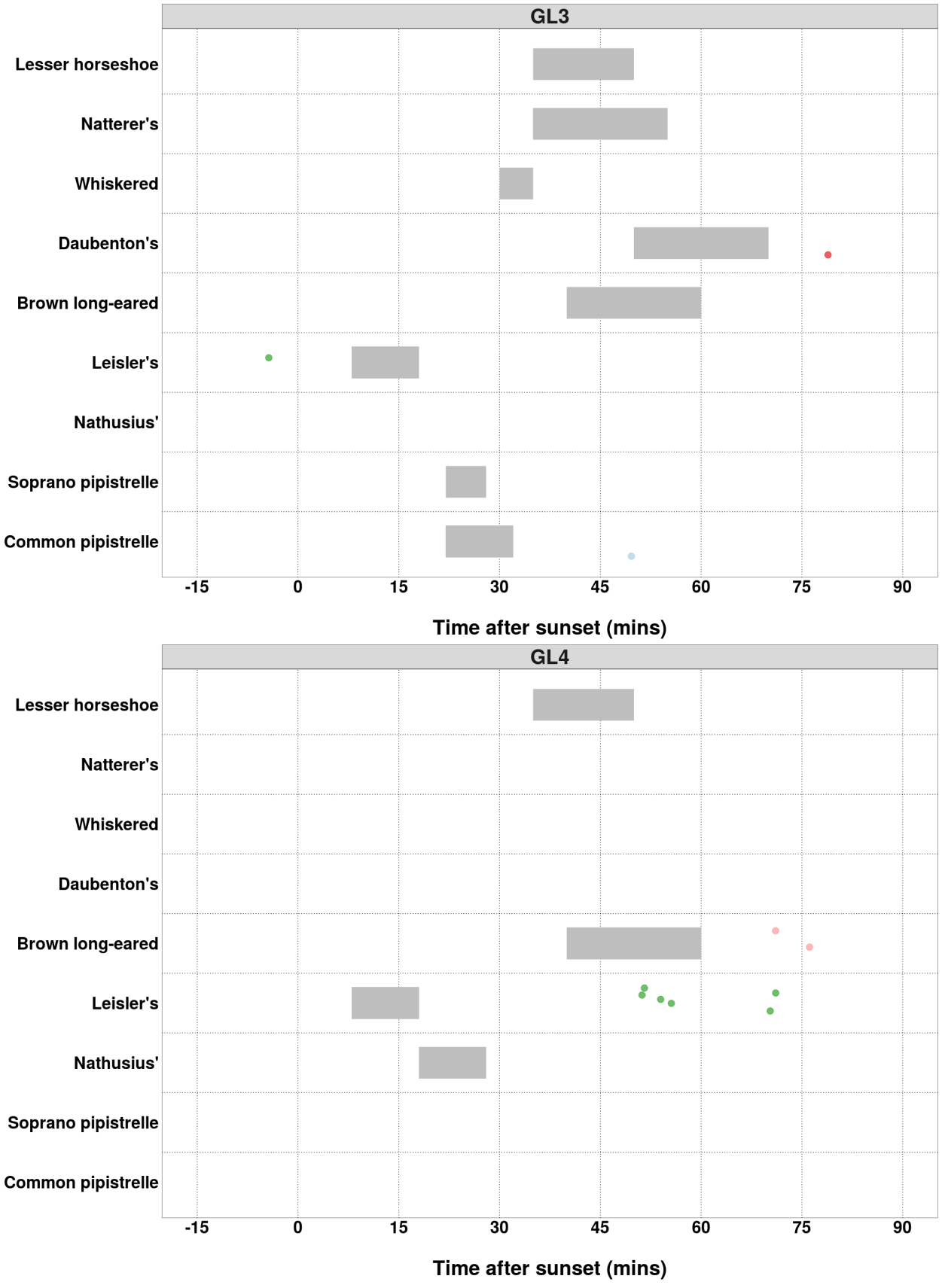
0	1	0	0
0	0	0	0
0	0	0	0
1	1	0	0
1	1	0	0

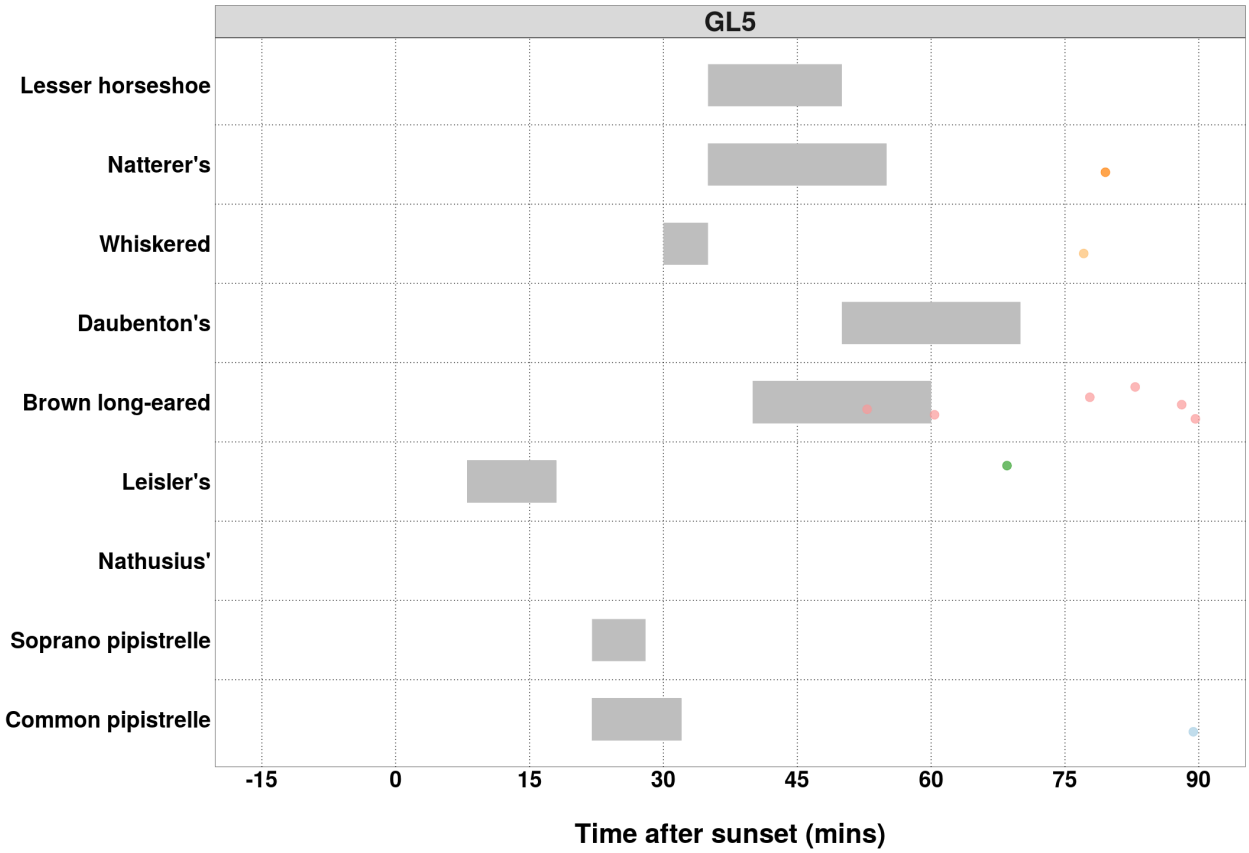
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012) - Figures

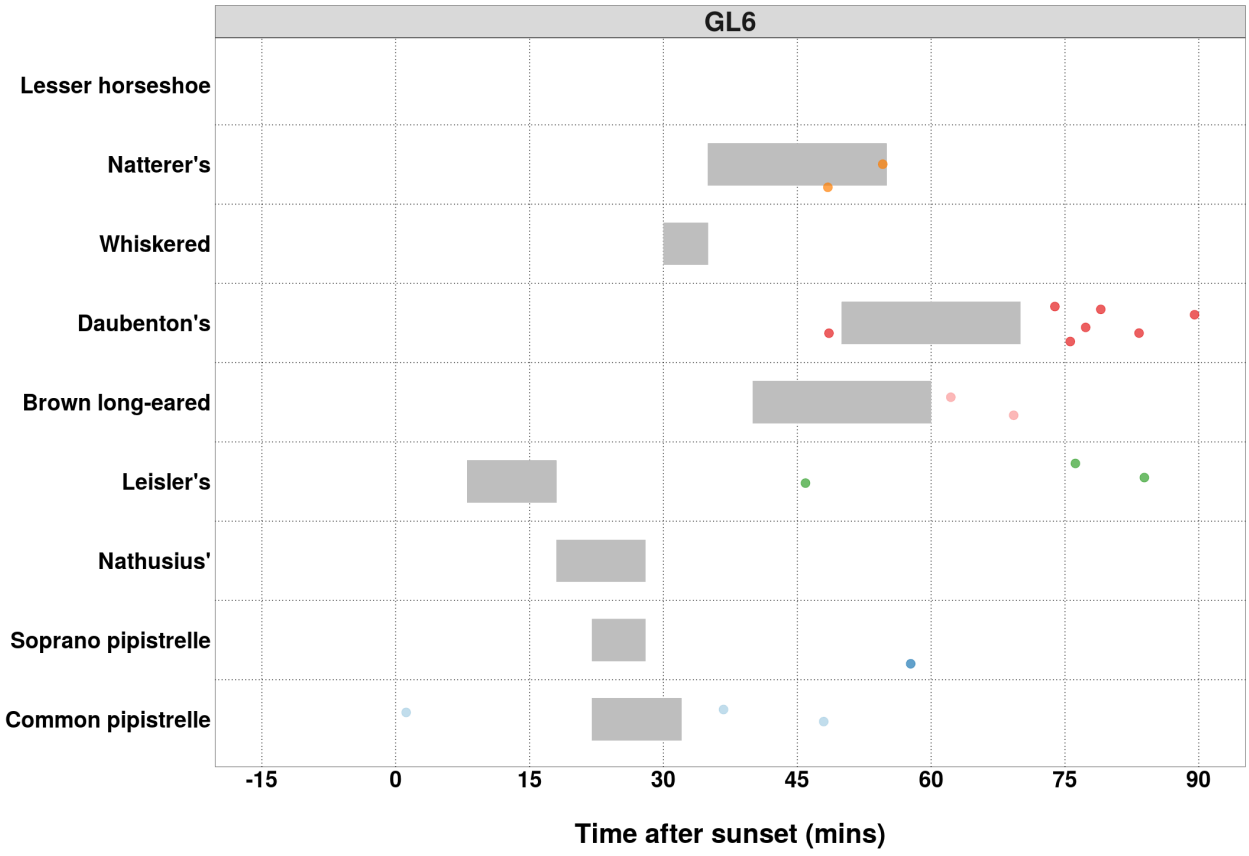
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.

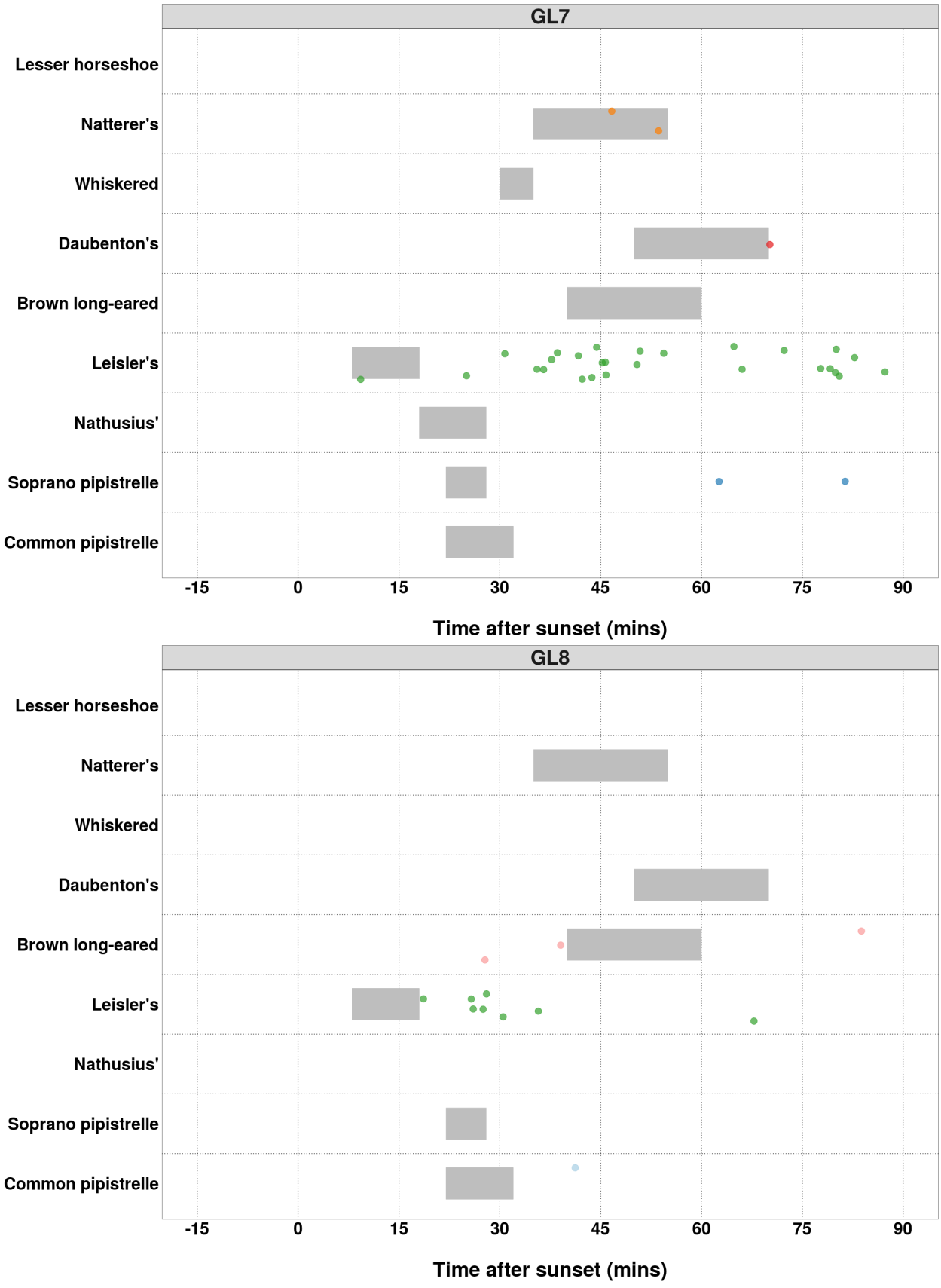

GL1
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

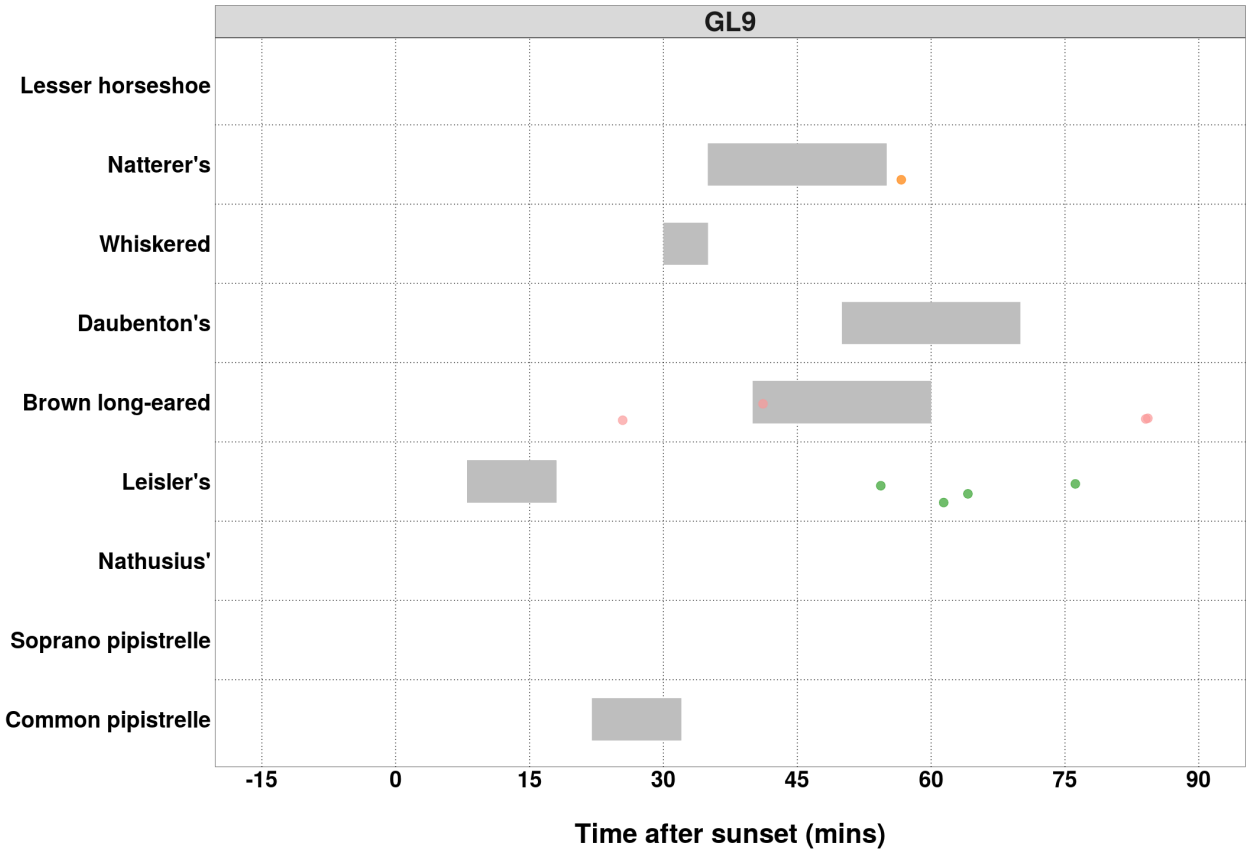

GL2
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL3
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)
GL4
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL5
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL6
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL7
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)
GL8
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL9
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
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	117	7.1
Soprano pipistrelle	15	0.9
Nathusius'	26	1.6
Leisler's	1301	79.0
Brown long-eared	129	7.8
Daubenton's	29	1.8
Whiskered	7	0.4
Natterer's	19	1.2
Lesser horseshoe	3	0.2
Total	1646	100.0

Counts of Bat Passes

Per Detector

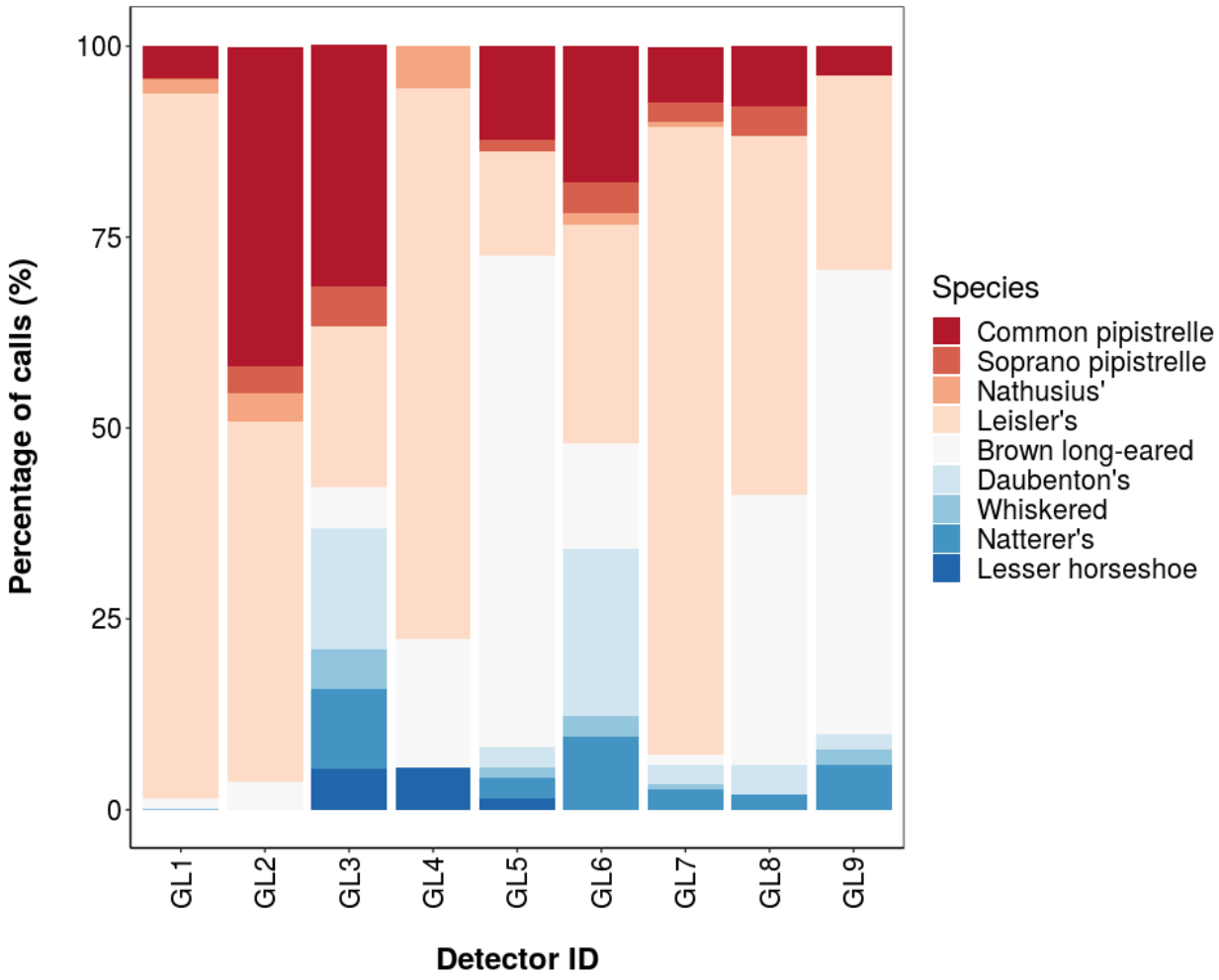
Table 15. The number of passes recorded for each species at each detector.

Species	Detector ID	Count (No)	Percentage by Detector (%)
Common pipistrelle	GL1	49	4.2
Common pipistrelle	GL2	23	41.8
Common pipistrelle	GL3	6	31.6
Common pipistrelle	GL5	9	12.3
Common pipistrelle	GL6	13	17.8
Common pipistrelle	GL7	11	7.2
Common pipistrelle	GL8	4	7.8
Common pipistrelle	GL9	2	3.9
Soprano pipistrelle	GL1	2	0.2
Soprano pipistrelle	GL2	2	3.6
Soprano pipistrelle	GL3	1	5.3
Soprano pipistrelle	GL5	1	1.4
Soprano pipistrelle	GL6	3	4.1
Soprano pipistrelle	GL7	4	2.6
Soprano pipistrelle	GL8	2	3.9
Nathusius'	GL1	21	1.8
Nathusius'	GL2	2	3.6
Nathusius'	GL4	1	5.6
Nathusius'	GL6	1	1.4
Nathusius'	GL7	1	0.7
Leisler's	GL1	1065	92.3
Leisler's	GL2	26	47.3
Leisler's	GL3	4	21.1
Leisler's	GL4	13	72.2
Leisler's	GL5	10	13.7
Leisler's	GL6	21	28.8
Leisler's	GL7	125	82.2
Leisler's	GL8	24	47.1
Leisler's	GL9	13	25.5

Brown long-eared	GL1	15	1.3
Brown long-eared	GL2	2	3.6
Brown long-eared	GL3	1	5.3
Brown long-eared	GL4	3	16.7
Brown long-eared	GL5	47	64.4
Brown long-eared	GL6	10	13.7
Brown long-eared	GL7	2	1.3
Brown long-eared	GL8	18	35.3
Brown long-eared	GL9	31	60.8
Daubenton's	GL1	1	0.1
Daubenton's	GL3	3	15.8
Daubenton's	GL5	2	2.7
Daubenton's	GL6	16	21.9
Daubenton's	GL7	4	2.6
Daubenton's	GL8	2	3.9
Daubenton's	GL9	1	2.0
Whiskered	GL1	1	0.1
Whiskered	GL3	1	5.3
Whiskered	GL5	1	1.4
Whiskered	GL6	2	2.7
Whiskered	GL7	1	0.7
Whiskered	GL9	1	2.0
Natterer's	GL3	2	10.5
Natterer's	GL5	2	2.7
Natterer's	GL6	7	9.6
Natterer's	GL7	4	2.6
Natterer's	GL8	1	2.0
Natterer's	GL9	3	5.9
Lesser horseshoe	GL3	1	5.3
Lesser horseshoe	GL4	1	5.6
Lesser horseshoe	GL5	1	1.4

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	GL1	0.5
Common pipistrelle	GL2	0.3
Common pipistrelle	GL3	0.3
Common pipistrelle	GL5	0.3
Common pipistrelle	GL6	0.1
Common pipistrelle	GL7	0.2
Common pipistrelle	GL8	0.1
Common pipistrelle	GL9	0.1
Soprano pipistrelle	GL1	0.2
Soprano pipistrelle	GL2	0.2
Soprano pipistrelle	GL3	0.1
Soprano pipistrelle	GL5	0.1
Soprano pipistrelle	GL6	0.2
Soprano pipistrelle	GL7	0.1
Soprano pipistrelle	GL8	0.1
Nathusius'	GL1	0.3
Nathusius'	GL2	0.1
Nathusius'	GL4	0.1
Nathusius'	GL6	0.1
Nathusius'	GL7	0.1
Leisler's	GL1	4.3
Leisler's	GL2	0.1
Leisler's	GL3	0.1

Leisler’s	GL4	0.3
Leisler’s	GL5	0.1
Leisler’s	GL6	0.1
Leisler’s	GL7	1.2
Leisler’s	GL8	0.3
Leisler’s	GL9	0.2
Brown long-eared	GL1	0.2
Brown long-eared	GL2	0.1
Brown long-eared	GL3	0.1
Brown long-eared	GL4	0.1
Brown long-eared	GL5	1.0
Brown long-eared	GL6	0.1
Brown long-eared	GL7	0.1
Brown long-eared	GL8	0.3
Brown long-eared	GL9	0.9
Daubenton’s	GL1	0.1
Daubenton’s	GL3	0.1
Daubenton’s	GL5	0.1
Daubenton’s	GL6	0.1
Daubenton’s	GL7	0.1
Daubenton’s	GL8	0.1
Daubenton’s	GL9	0.1
Whiskered	GL1	0.1
Whiskered	GL3	0.1
Whiskered	GL5	0.1
Whiskered	GL6	0.2
Whiskered	GL7	0.1
Whiskered	GL9	0.1
Natterer’s	GL3	0.1
Natterer’s	GL5	0.1
Natterer’s	GL6	0.1
Natterer’s	GL7	0.1
Natterer’s	GL8	0.1
Natterer’s	GL9	0.2
Lesser horseshoe	GL3	0.1
Lesser horseshoe	GL4	0.1

Lesser horseshoe	GL5	0.1

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.

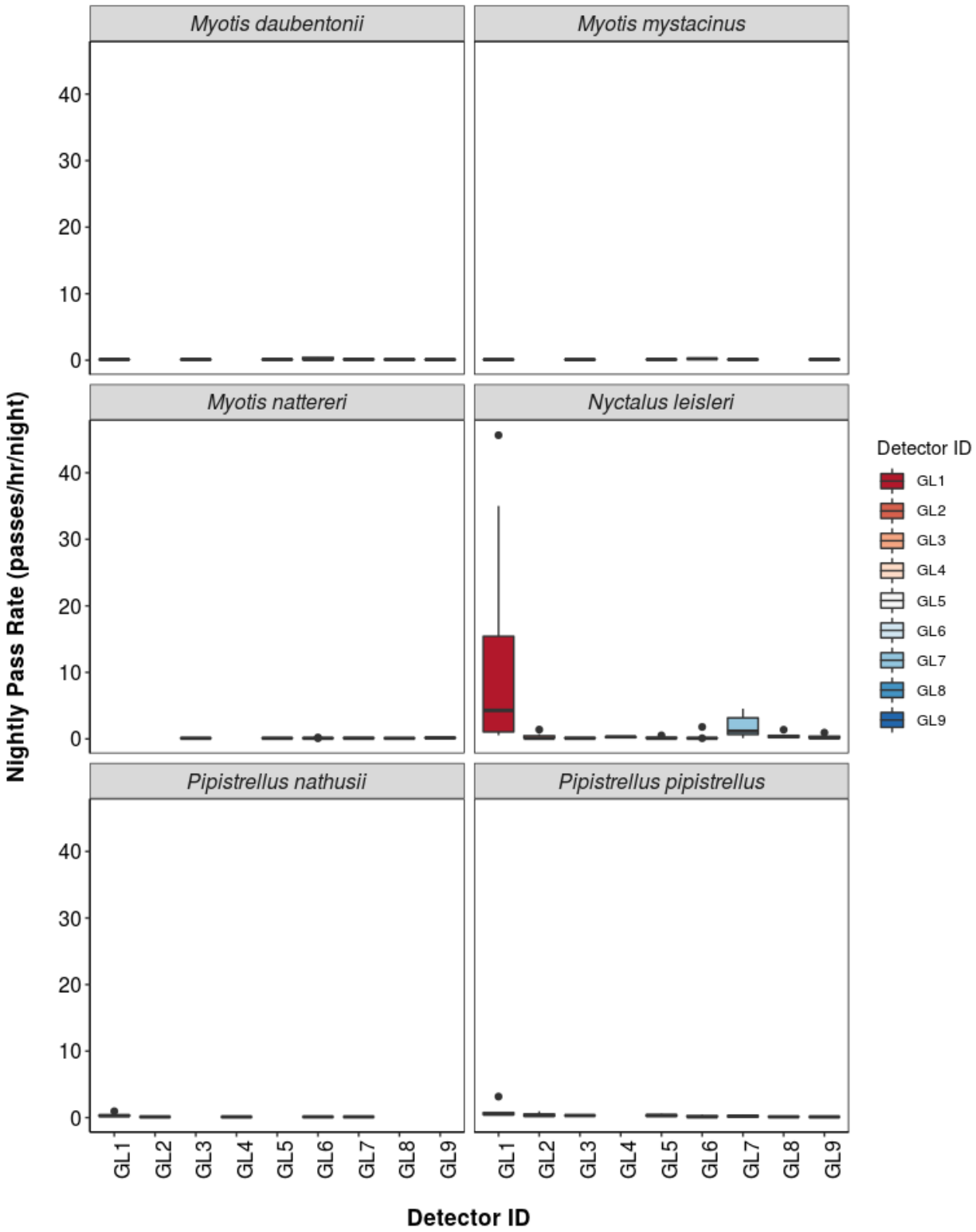
Species	Detector ID	Mean Pass Rate
Common pipistrelle	GL1	1.0
Common pipistrelle	GL2	0.4
Common pipistrelle	GL3	0.3
Common pipistrelle	GL5	0.3
Common pipistrelle	GL6	0.2
Common pipistrelle	GL7	0.2
Common pipistrelle	GL8	0.1
Common pipistrelle	GL9	0.1
Soprano pipistrelle	GL1	0.2
Soprano pipistrelle	GL2	0.2
Soprano pipistrelle	GL3	0.1
Soprano pipistrelle	GL5	0.1
Soprano pipistrelle	GL6	0.2
Soprano pipistrelle	GL7	0.1
Soprano pipistrelle	GL8	0.1
Nathusius'	GL1	0.4
Nathusius'	GL2	0.1
Nathusius'	GL4	0.1
Nathusius'	GL6	0.1
Nathusius'	GL7	0.1
Leisler's	GL1	12.7
Leisler's	GL2	0.4
Leisler's	GL3	0.1
Leisler's	GL4	0.3
Leisler's	GL5	0.2
Leisler's	GL6	0.4

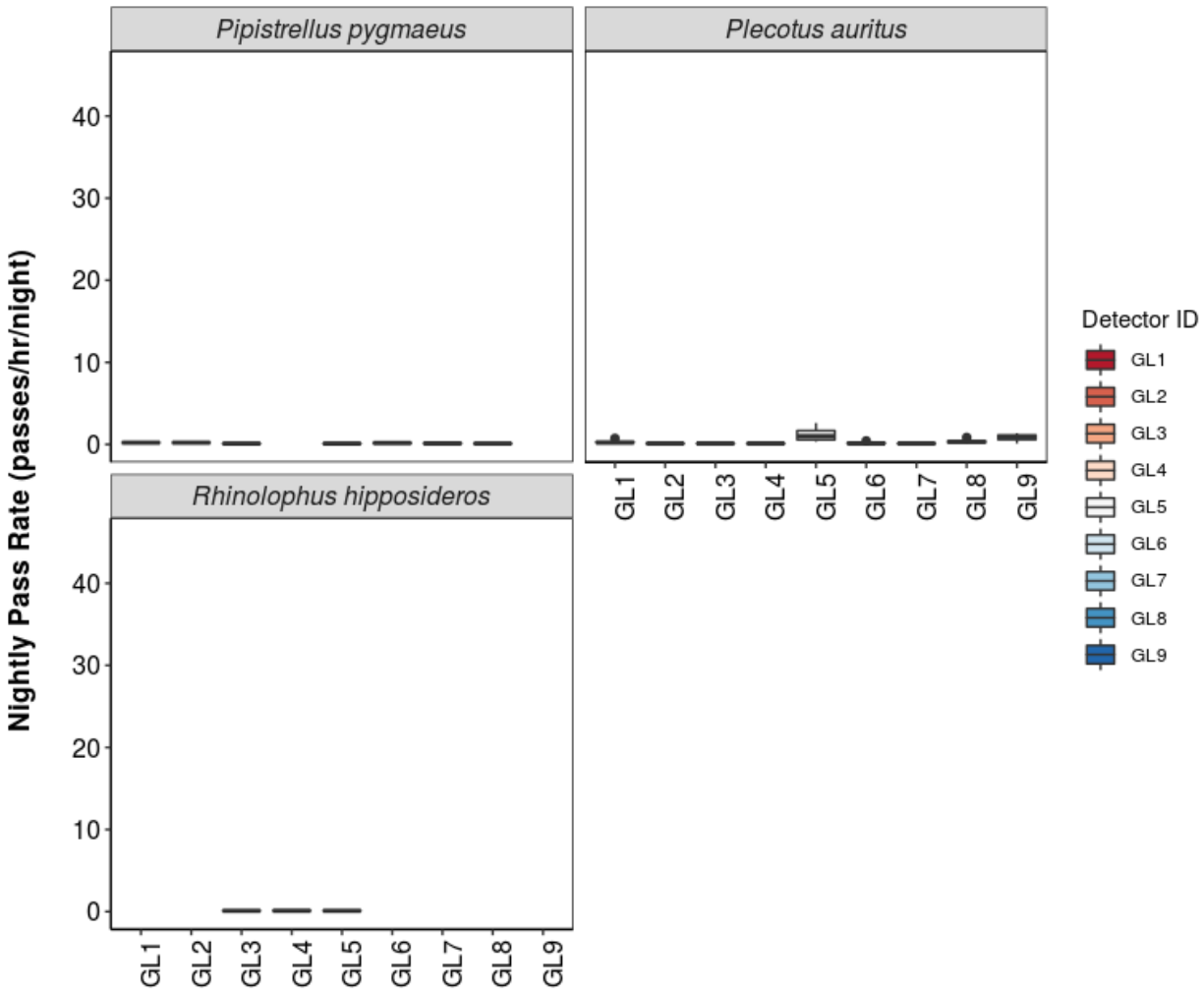
Leisler’s	GL7	1.9
Leisler’s	GL8	0.5
Leisler’s	GL9	0.3
Brown long-eared	GL1	0.3
Brown long-eared	GL2	0.1
Brown long-eared	GL3	0.1
Brown long-eared	GL4	0.1
Brown long-eared	GL5	1.2
Brown long-eared	GL6	0.2
Brown long-eared	GL7	0.1
Brown long-eared	GL8	0.4
Brown long-eared	GL9	0.8
Daubenton’s	GL1	0.1
Daubenton’s	GL3	0.1
Daubenton’s	GL5	0.1
Daubenton’s	GL6	0.2
Daubenton’s	GL7	0.1
Daubenton’s	GL8	0.1
Daubenton’s	GL9	0.1
Whiskered	GL1	0.1
Whiskered	GL3	0.1
Whiskered	GL5	0.1
Whiskered	GL6	0.2
Whiskered	GL7	0.1
Whiskered	GL9	0.1
Natterer’s	GL3	0.1
Natterer’s	GL5	0.1
Natterer’s	GL6	0.1
Natterer’s	GL7	0.1
Natterer’s	GL8	0.1
Natterer’s	GL9	0.2
Lesser horseshoe	GL3	0.1
Lesser horseshoe	GL4	0.1
Lesser horseshoe	GL5	0.1

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
10
20
30
40
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Rhinolophus hipposideros
Nightly Pass Rate (passes/hr/night)
0
10
20
30
40
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
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	Apr	May
Common pipistrelle	GL1	49	0
Common pipistrelle	GL2	18	5
Common pipistrelle	GL3	6	0
Common pipistrelle	GL5	4	5
Common pipistrelle	GL6	8	5
Common pipistrelle	GL7	6	5
Common pipistrelle	GL8	3	1
Common pipistrelle	GL9	1	1
Soprano pipistrelle	GL1	2	0
Soprano pipistrelle	GL2	2	0
Soprano pipistrelle	GL3	1	0
Soprano pipistrelle	GL5	1	0
Soprano pipistrelle	GL6	2	1
Soprano pipistrelle	GL7	4	0
Soprano pipistrelle	GL8	2	0
Nathusius'	GL1	21	0
Nathusius'	GL2	2	0
Nathusius'	GL4	1	0
Nathusius'	GL6	1	0
Nathusius'	GL7	0	1
Leisler's	GL1	1037	28
Leisler's	GL2	25	1
Leisler's	GL3	4	0
Leisler's	GL4	8	5

Leisler's	GL5	9	1
Leisler's	GL6	21	0
Leisler's	GL7	79	46
Leisler's	GL8	22	2
Leisler's	GL9	11	2
Brown long-eared	GL1	15	0
Brown long-eared	GL2	1	1
Brown long-eared	GL3	1	0
Brown long-eared	GL4	3	0
Brown long-eared	GL5	47	0
Brown long-eared	GL6	8	2
Brown long-eared	GL7	1	1
Brown long-eared	GL8	18	0
Brown long-eared	GL9	31	0
Daubenton's	GL1	1	0
Daubenton's	GL3	3	0
Daubenton's	GL5	1	1
Daubenton's	GL6	14	2
Daubenton's	GL7	3	1
Daubenton's	GL8	2	0
Daubenton's	GL9	1	0
Whiskered	GL1	1	0
Whiskered	GL3	1	0
Whiskered	GL5	1	0
Whiskered	GL6	2	0
Whiskered	GL7	1	0
Whiskered	GL9	1	0
Natterer's	GL3	2	0
Natterer's	GL5	2	0
Natterer's	GL6	6	1
Natterer's	GL7	4	0
Natterer's	GL8	1	0
Natterer's	GL9	3	0
Lesser horseshoe	GL3	1	0
Lesser horseshoe	GL4	0	1
Lesser horseshoe	GL5	1	0

Survey Effort

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

Month	Detector ID	No. of Survey Nights
Apr	GL1	8
Apr	GL2	7
Apr	GL3	5
Apr	GL4	5
Apr	GL5	6
Apr	GL6	7
Apr	GL7	6
Apr	GL8	6
Apr	GL9	5
May	GL1	1
May	GL2	2
May	GL4	2
May	GL5	1
May	GL6	4
May	GL7	2
May	GL8	1
May	GL9	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	Apr	May
Common pipistrelle	GL1	0.5	NA
Common pipistrelle	GL2	0.2	0.6
Common pipistrelle	GL3	0.3	NA
Common pipistrelle	GL5	0.2	0.6
Common pipistrelle	GL6	0.2	0.1
Common pipistrelle	GL7	0.2	0.3
Common pipistrelle	GL8	0.2	0.1
Common pipistrelle	GL9	0.1	0.1
Soprano pipistrelle	GL1	0.2	NA
Soprano pipistrelle	GL2	0.2	NA
Soprano pipistrelle	GL3	0.1	NA
Soprano pipistrelle	GL5	0.1	NA
Soprano pipistrelle	GL6	0.2	0.1
Soprano pipistrelle	GL7	0.1	NA
Soprano pipistrelle	GL8	0.1	NA
Nathusius'	GL1	0.3	NA
Nathusius'	GL2	0.1	NA
Nathusius'	GL4	0.1	NA
Nathusius'	GL6	0.1	NA
Nathusius'	GL7	NA	0.1
Leisler's	GL1	6.5	3.1
Leisler's	GL2	0.2	0.1
Leisler's	GL3	0.1	NA

Leisler's	GL4	0.3	0.3
Leisler's	GL5	0.2	0.1
Leisler's	GL6	0.1	NA
Leisler's	GL7	1.2	2.6
Leisler's	GL8	0.4	0.2
Leisler's	GL9	0.1	0.2
Brown long-eared	GL1	0.2	NA
Brown long-eared	GL2	0.1	0.1
Brown long-eared	GL3	0.1	NA
Brown long-eared	GL4	0.1	NA
Brown long-eared	GL5	1.0	NA
Brown long-eared	GL6	0.2	0.1
Brown long-eared	GL7	0.1	0.1
Brown long-eared	GL8	0.3	NA
Brown long-eared	GL9	0.9	NA
Daubenton's	GL1	0.1	NA
Daubenton's	GL3	0.1	NA
Daubenton's	GL5	0.1	0.1
Daubenton's	GL6	0.4	0.1
Daubenton's	GL7	0.2	0.1
Daubenton's	GL8	0.1	NA
Daubenton's	GL9	0.1	NA
Whiskered	GL1	0.1	NA
Whiskered	GL3	0.1	NA
Whiskered	GL5	0.1	NA
Whiskered	GL6	0.2	NA
Whiskered	GL7	0.1	NA
Whiskered	GL9	0.1	NA
Natterer's	GL3	0.1	NA
Natterer's	GL5	0.1	NA
Natterer's	GL6	0.1	0.1
Natterer's	GL7	0.1	NA
Natterer's	GL8	0.1	NA
Natterer's	GL9	0.2	NA
Lesser horseshoe	GL3	0.1	NA
Lesser horseshoe	GL4	NA	0.1

Lesser horseshoe	GL5	0.1	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.

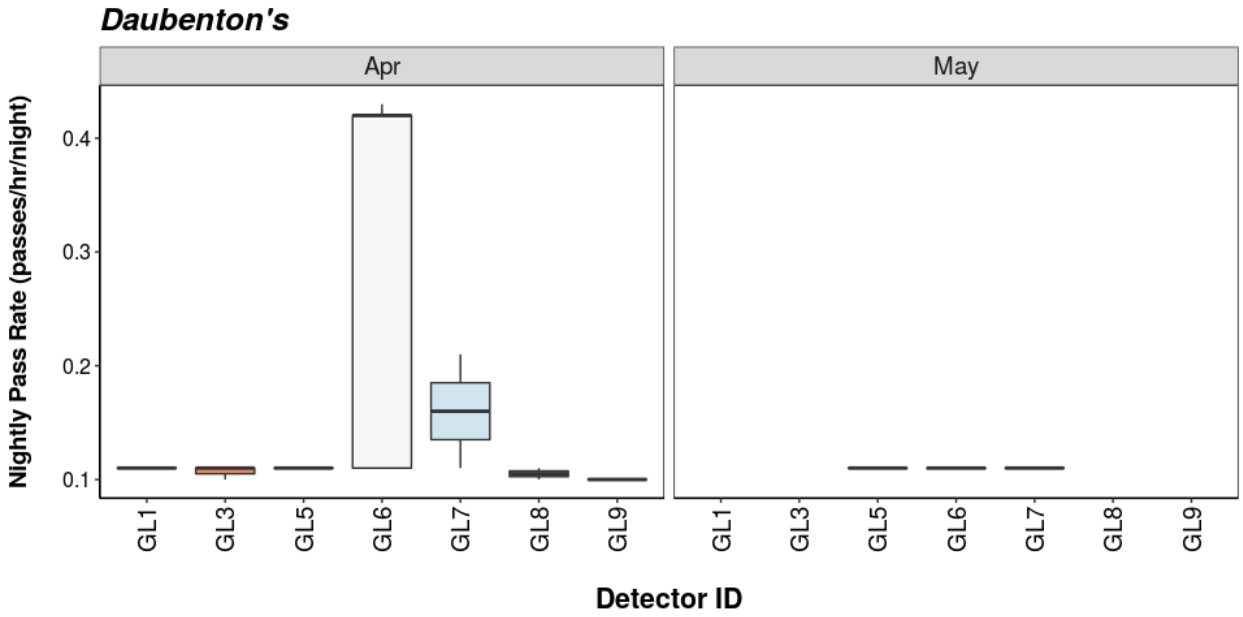
Species	Detector ID	Apr	May
Common pipistrelle	GL1	1.0	NA
Common pipistrelle	GL2	0.4	0.6
Common pipistrelle	GL3	0.3	NA
Common pipistrelle	GL5	0.2	0.6
Common pipistrelle	GL6	0.2	0.2
Common pipistrelle	GL7	0.2	0.3
Common pipistrelle	GL8	0.2	0.1
Common pipistrelle	GL9	0.1	0.1
Soprano pipistrelle	GL1	0.2	NA
Soprano pipistrelle	GL2	0.2	NA
Soprano pipistrelle	GL3	0.1	NA
Soprano pipistrelle	GL5	0.1	NA
Soprano pipistrelle	GL6	0.2	0.1
Soprano pipistrelle	GL7	0.1	NA
Soprano pipistrelle	GL8	0.1	NA
Nathusius'	GL1	0.4	NA
Nathusius'	GL2	0.1	NA
Nathusius'	GL4	0.1	NA
Nathusius'	GL6	0.1	NA
Nathusius'	GL7	NA	0.1
Leisler's	GL1	13.9	3.1
Leisler's	GL2	0.4	0.1
Leisler's	GL3	0.1	NA
Leisler's	GL4	0.3	0.3
Leisler's	GL5	0.2	0.1
Leisler's	GL6	0.4	NA

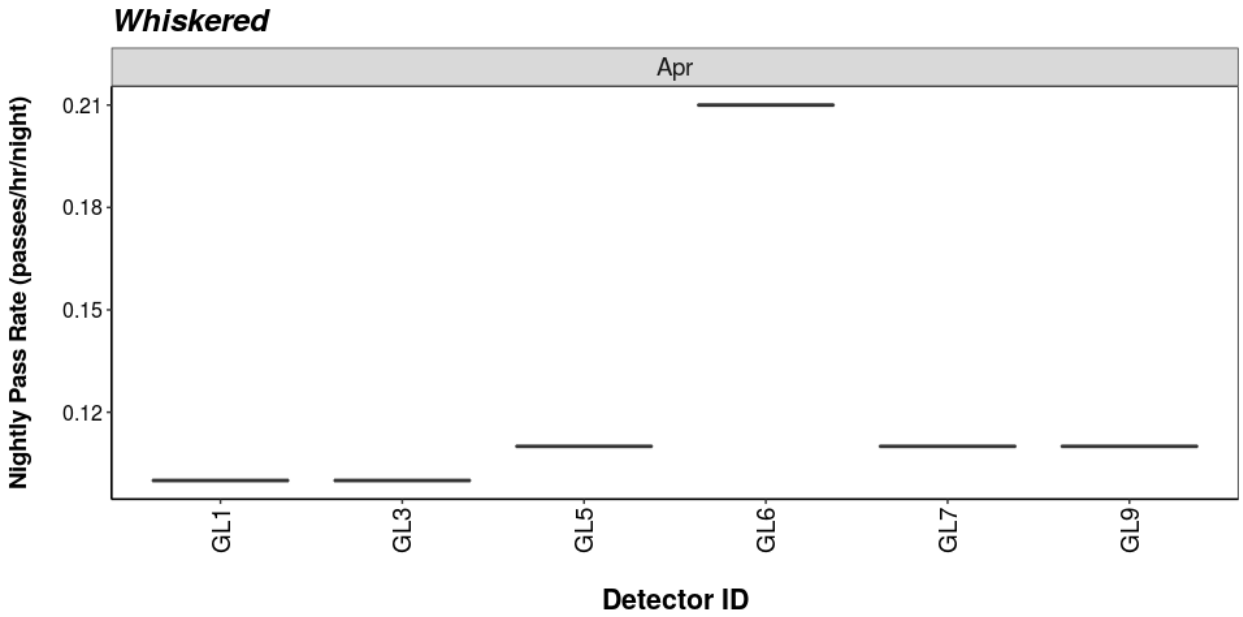
Leisler's	GL7	1.7	2.6
Leisler's	GL8	0.6	0.2
Leisler's	GL9	0.4	0.2
Brown long-eared	GL1	0.3	NA
Brown long-eared	GL2	0.1	0.1
Brown long-eared	GL3	0.1	NA
Brown long-eared	GL4	0.1	NA
Brown long-eared	GL5	1.2	NA
Brown long-eared	GL6	0.2	0.1
Brown long-eared	GL7	0.1	0.1
Brown long-eared	GL8	0.4	NA
Brown long-eared	GL9	0.8	NA
Daubenton's	GL1	0.1	NA
Daubenton's	GL3	0.1	NA
Daubenton's	GL5	0.1	0.1
Daubenton's	GL6	0.3	0.1
Daubenton's	GL7	0.2	0.1
Daubenton's	GL8	0.1	NA
Daubenton's	GL9	0.1	NA
Whiskered	GL1	0.1	NA
Whiskered	GL3	0.1	NA
Whiskered	GL5	0.1	NA
Whiskered	GL6	0.2	NA
Whiskered	GL7	0.1	NA
Whiskered	GL9	0.1	NA
Natterer's	GL3	0.1	NA
Natterer's	GL5	0.1	NA
Natterer's	GL6	0.1	0.1
Natterer's	GL7	0.1	NA
Natterer's	GL8	0.1	NA
Natterer's	GL9	0.2	NA
Lesser horseshoe	GL3	0.1	NA
Lesser horseshoe	GL4	NA	0.1
Lesser horseshoe	GL5	0.1	NA

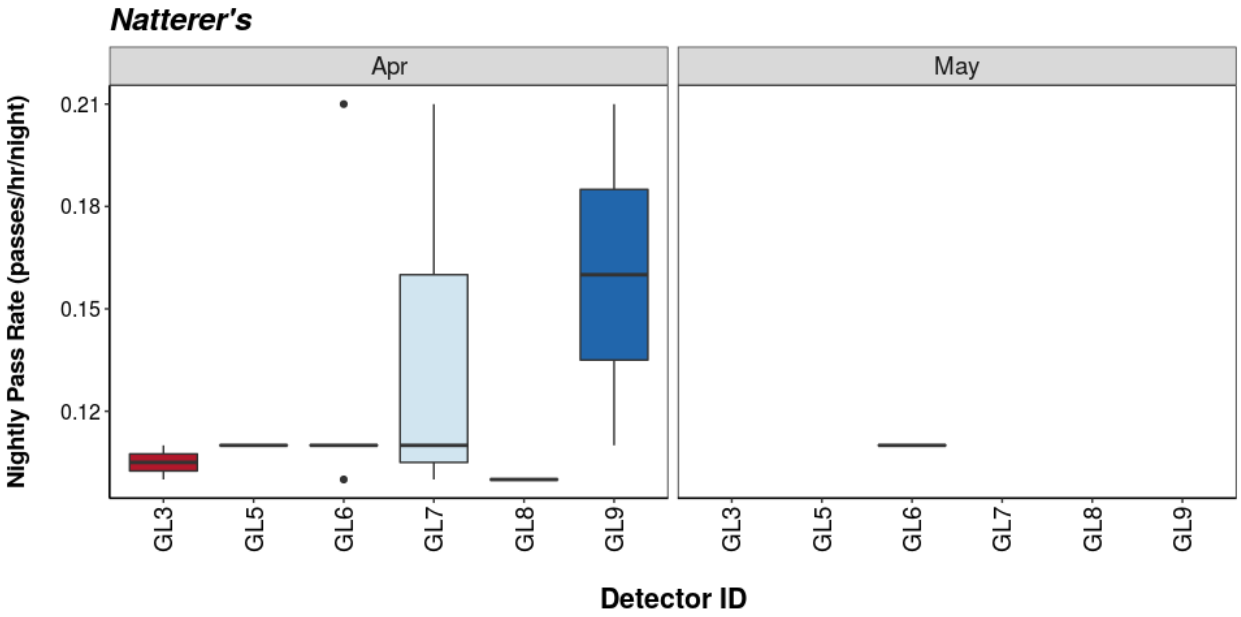
Nightly Bat Pass Rate for each Month

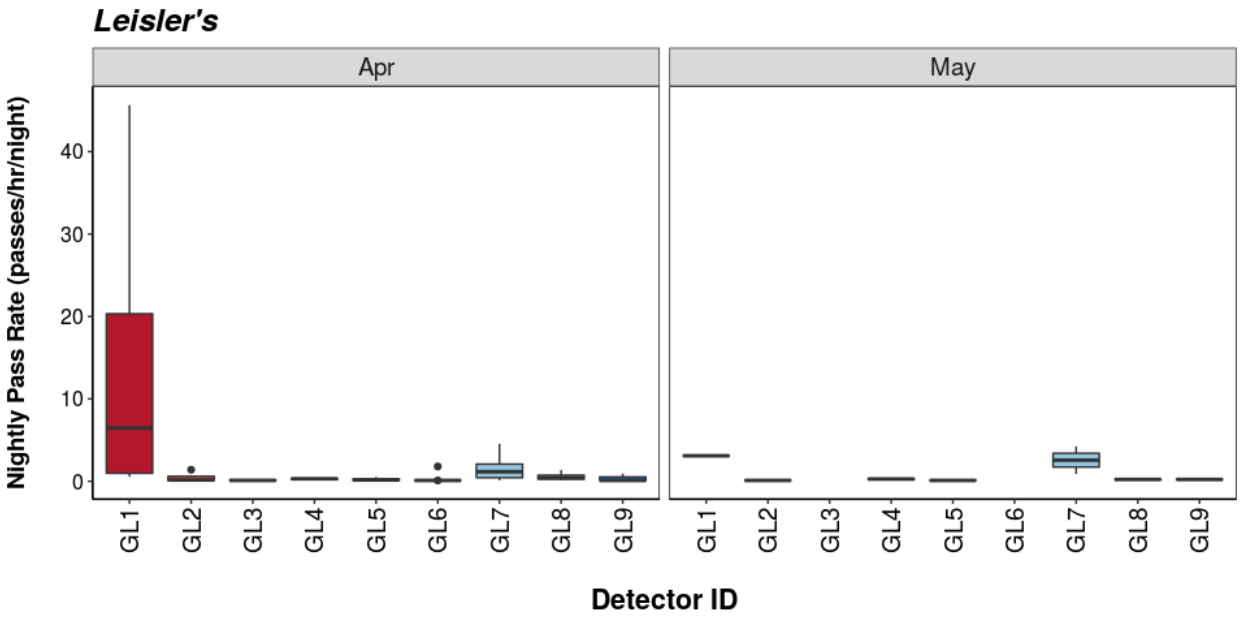
Per Detector - Figures

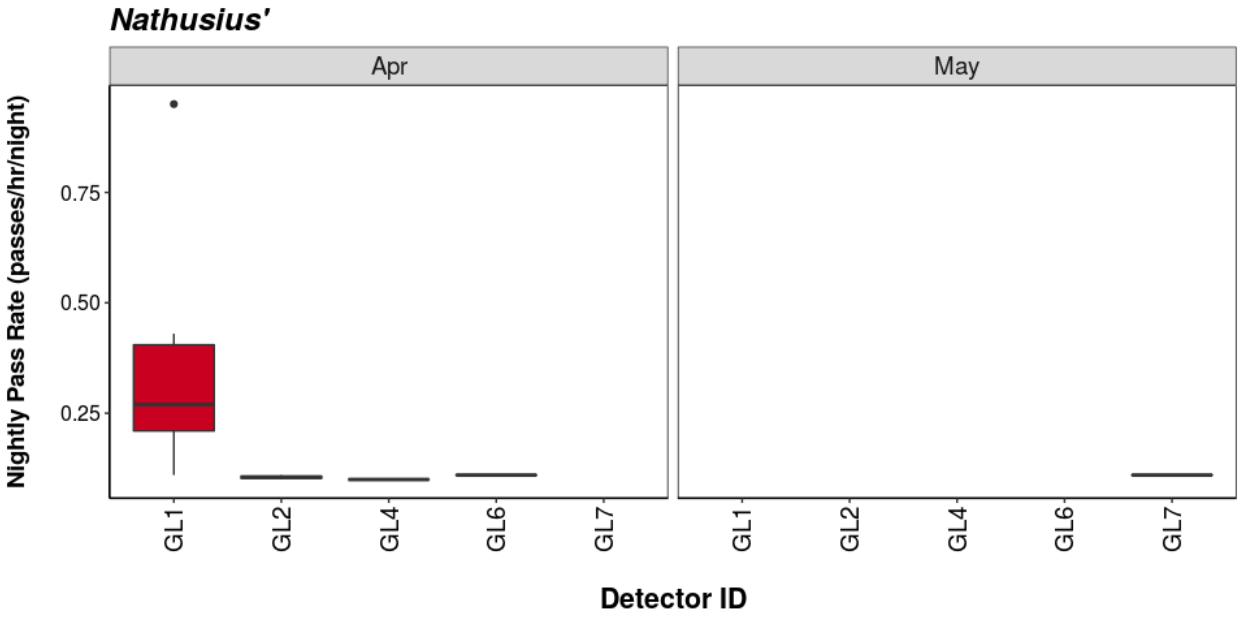
Figure 12. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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

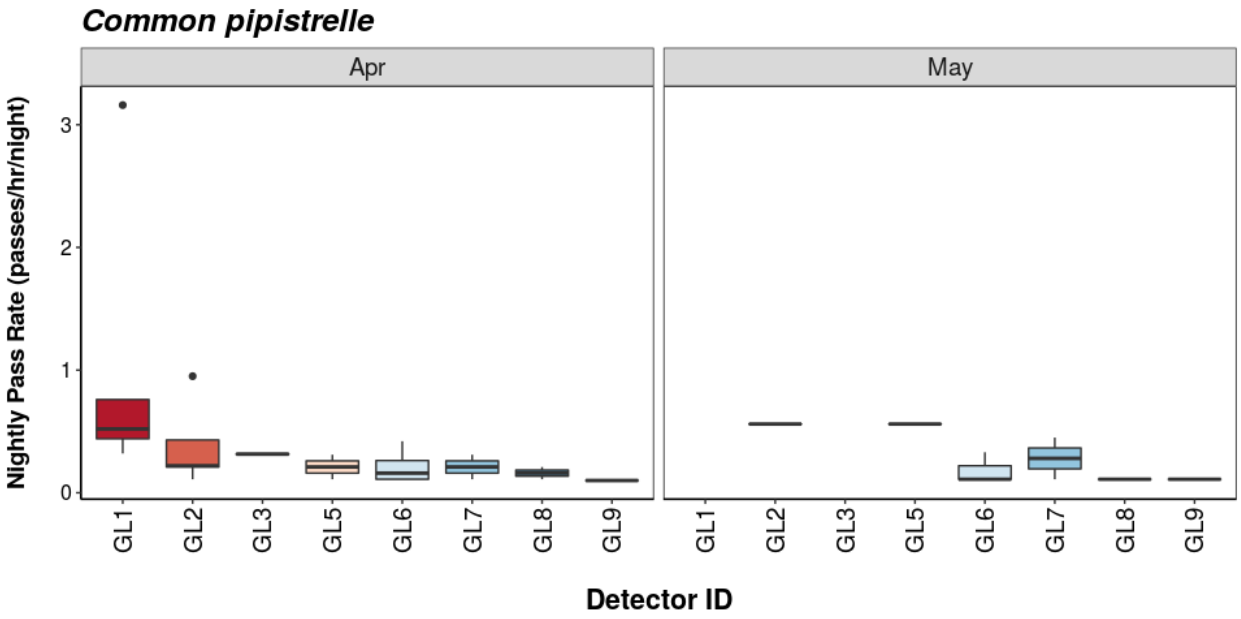


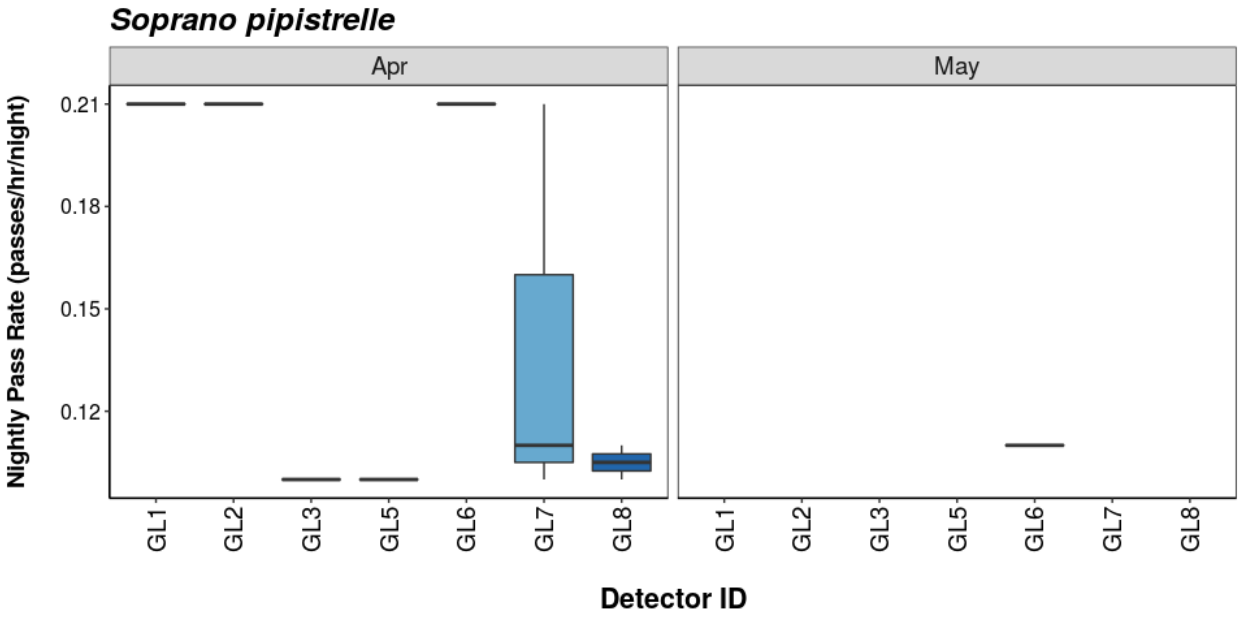


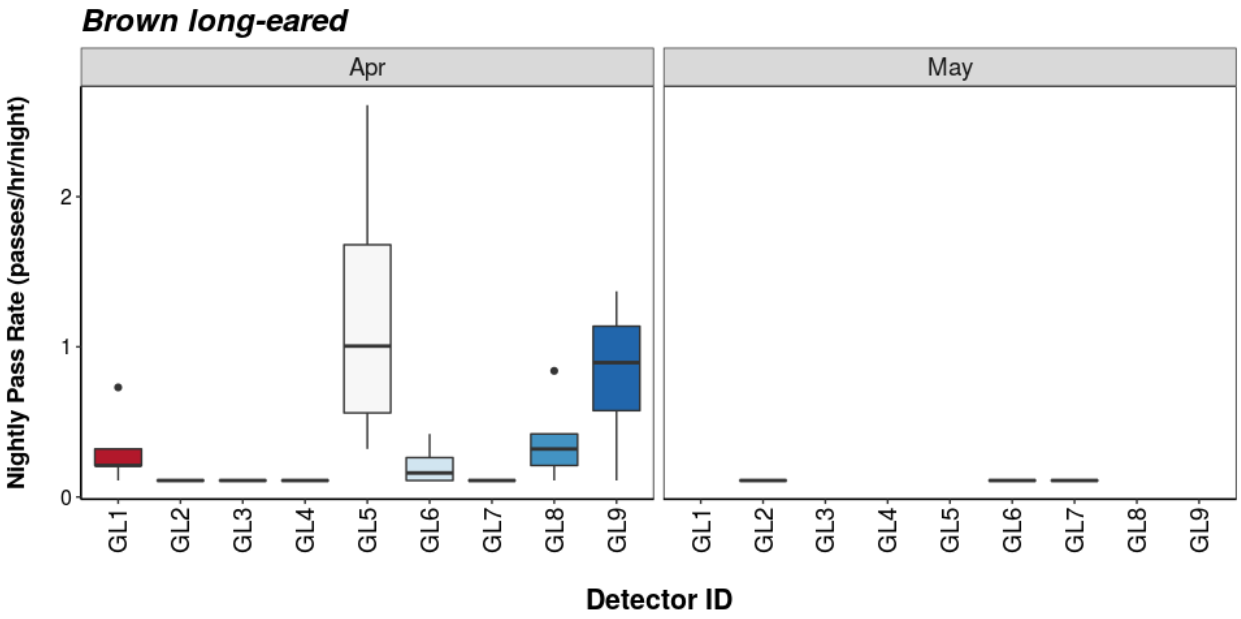

Natterer's
Apr
May
Nightly Pass Rate (passes/hr/night)
0.21
0.18
0.15
0.12
GL3
GL5
GL6
GL7
GL8
GL9
Detector ID

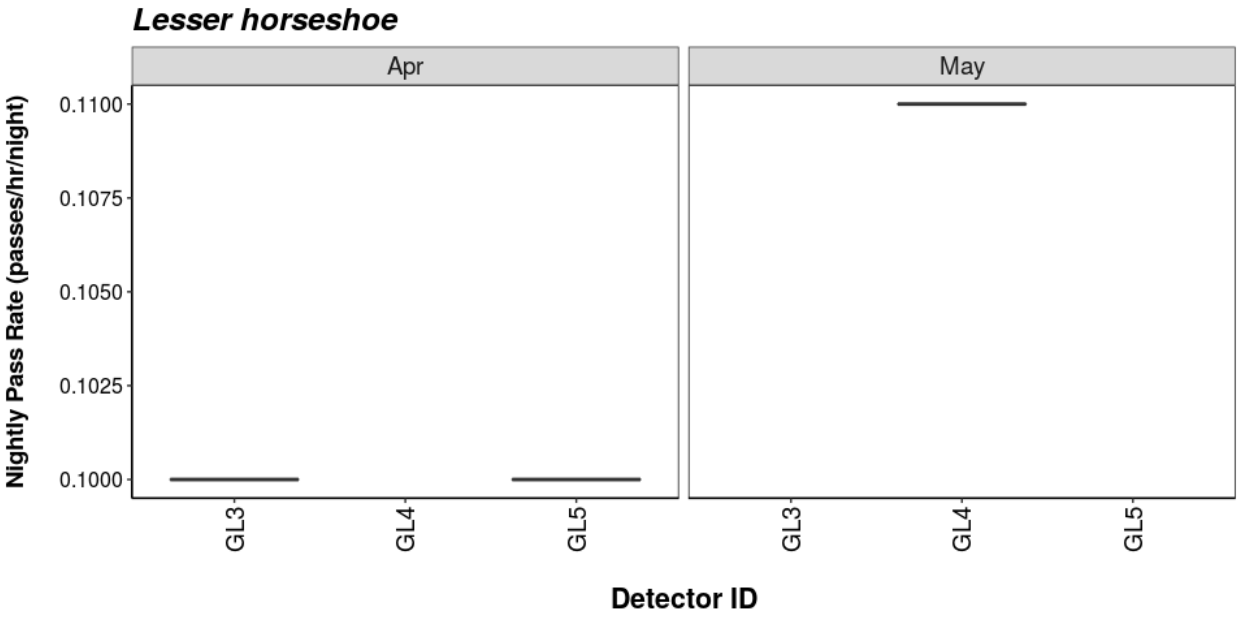

Leisler's
Apr
May
Nightly Pass Rate (passes/hr/night)
40
30
20
10
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Nathusius'
Apr
May
Nightly Pass Rate (passes/hr/night)
0.75
0.50
0.25
GL1
GL2
GL4
GL6
GL7
Detector ID


Common pipistrelle
Apr
May
Nightly Pass Rate (passes/hr/night)
3
2
1
0
GL1
GL2
GL3
GL5
GL6
GL7
GL8
GL9
Detector ID


Soprano pipistrelle
Apr
May
Nightly Pass Rate (passes/hr/night)
0.21
0.18
0.15
0.12
GL1
GL2
GL3
GL5
GL6
GL7
GL8
Detector ID


Brown long-eared
Apr
May
Nightly Pass Rate (passes/hr/night)
2
1
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Lesser horseshoe
Apr
May
Nightly Pass Rate (passes/hr/night)
0.1100
0.1075
0.1050
0.1025
0.1000
GL3
GL4
GL5
GL3
GL4
GL5
Detector ID

Bat Activity per Detector Location

Figure 13. Detector ID reference:

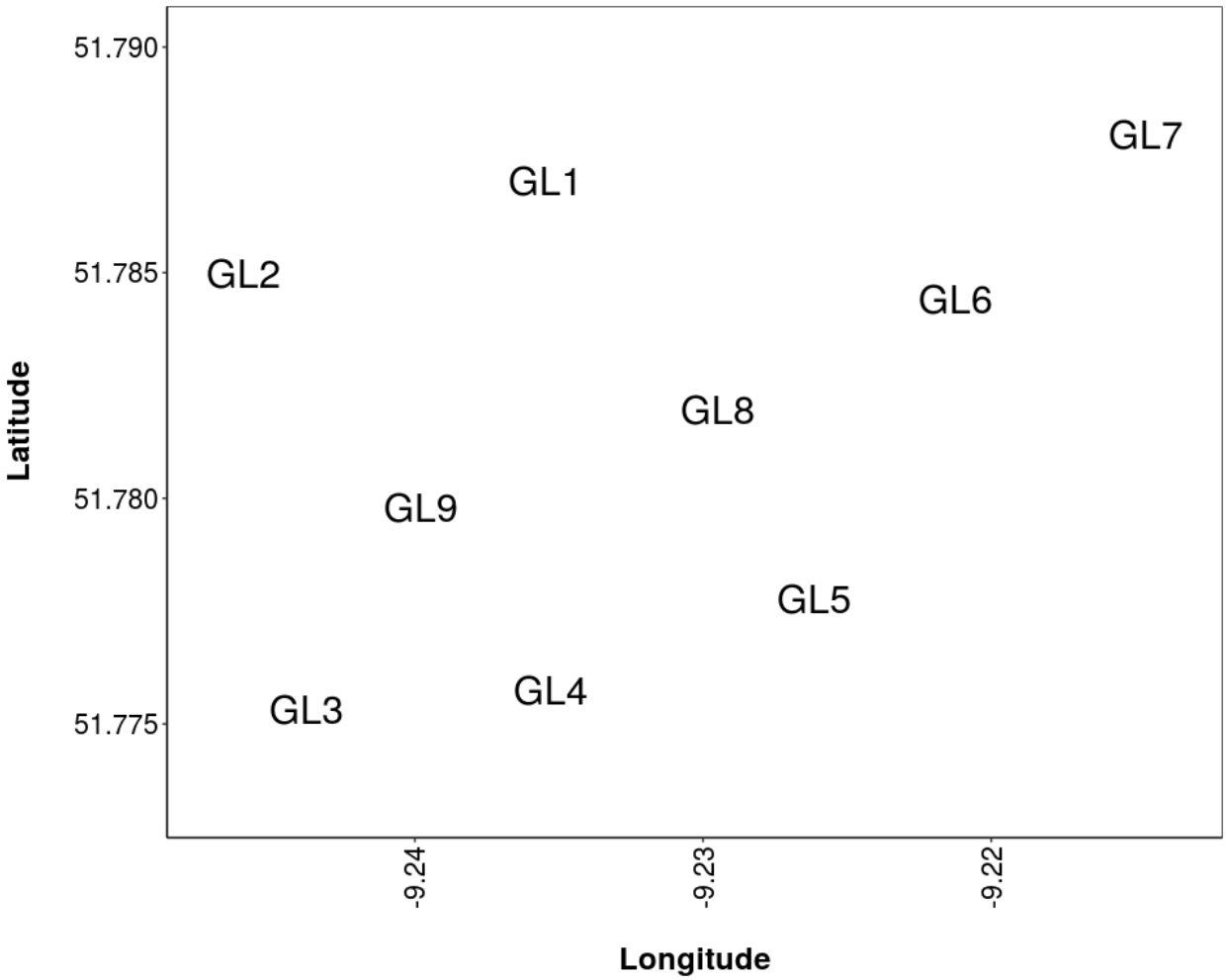
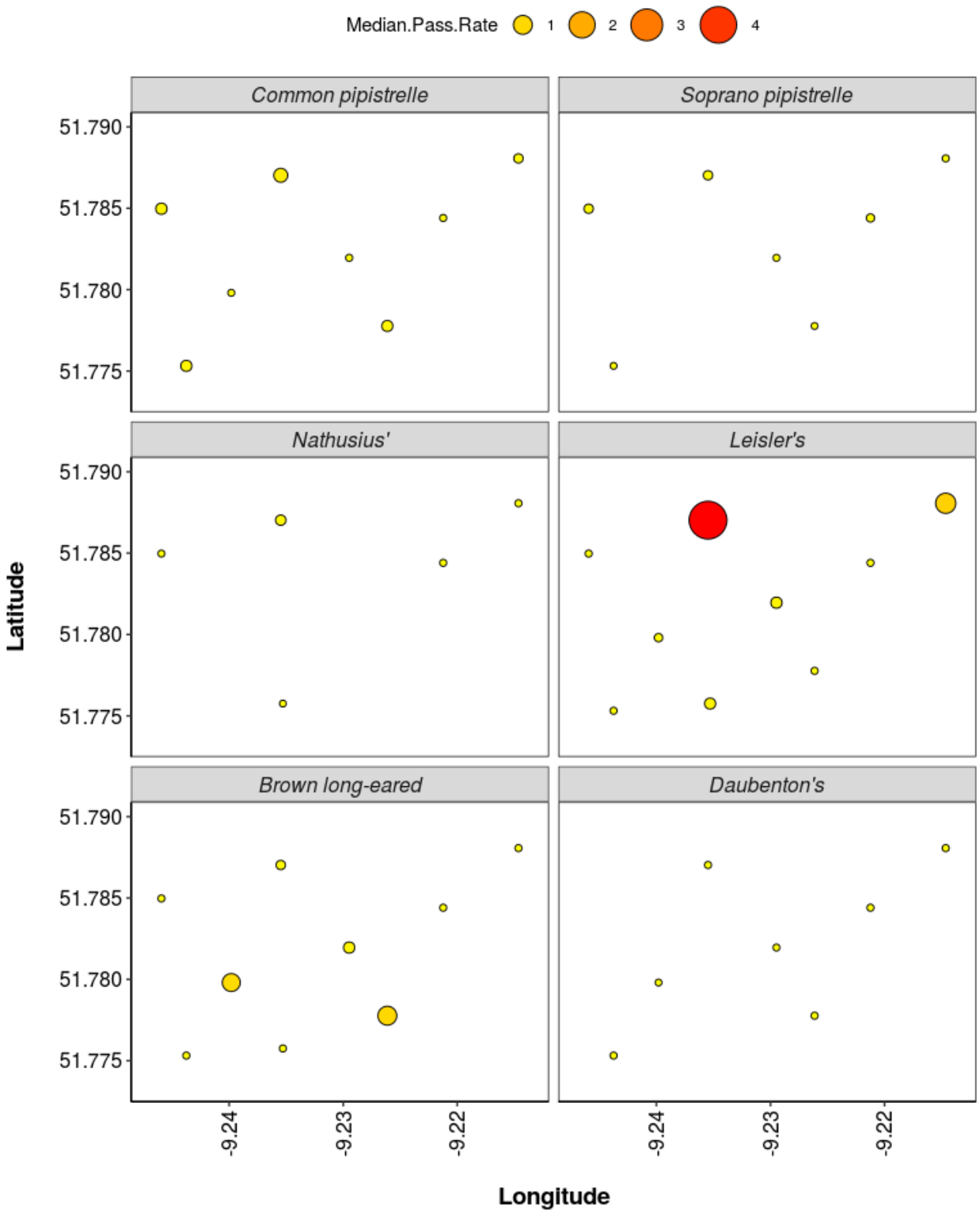


Figure 14. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
1
2
3
4
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

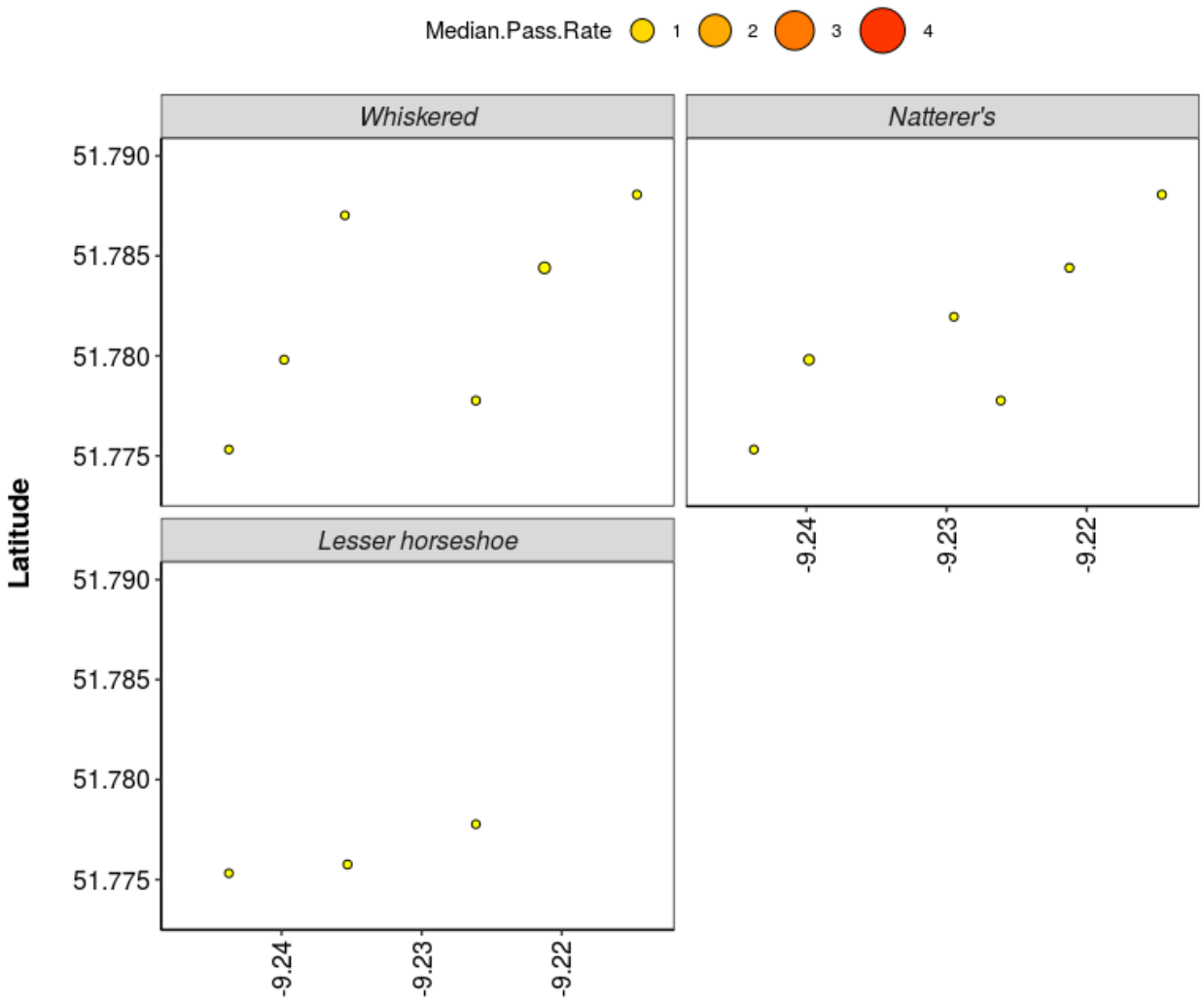
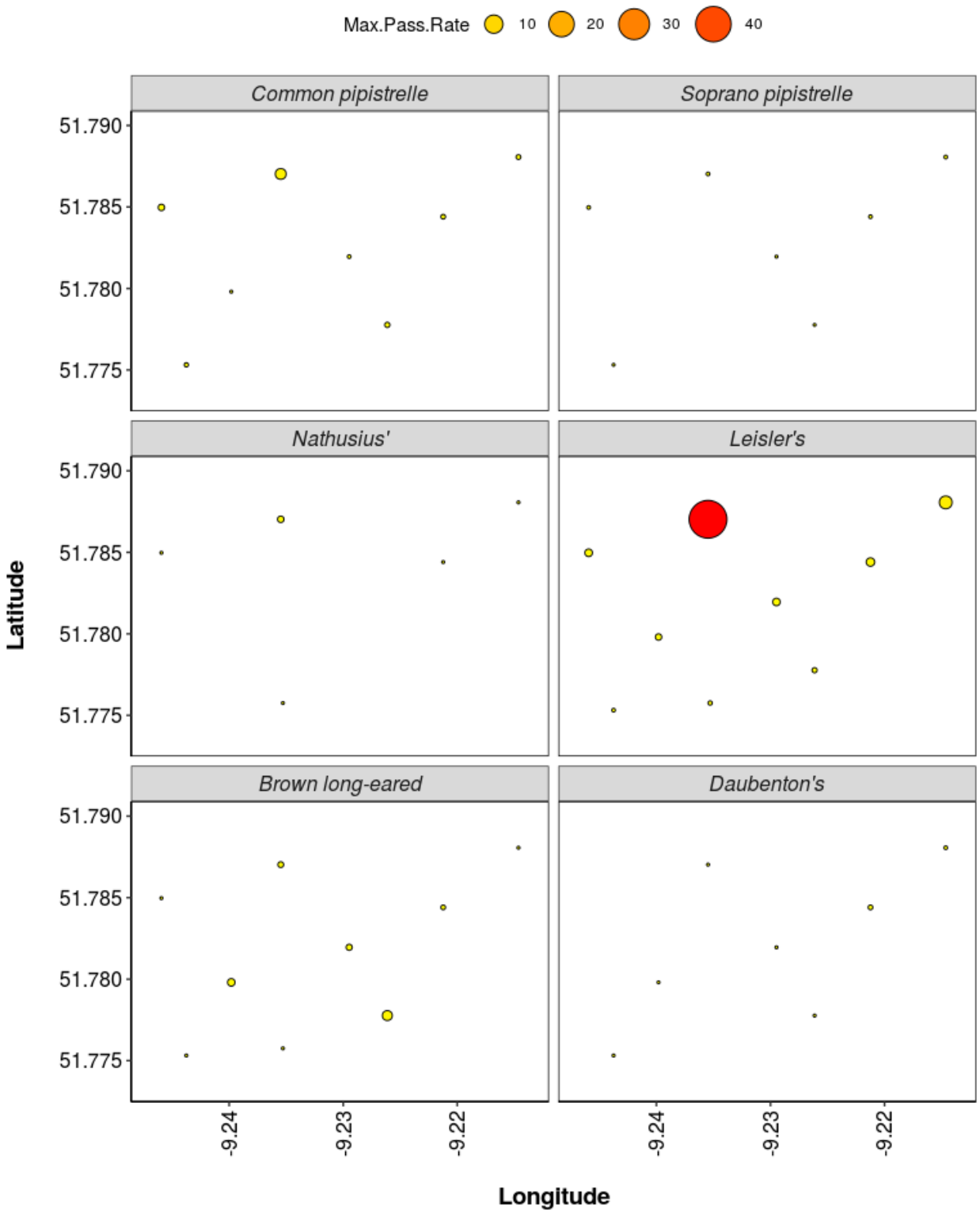
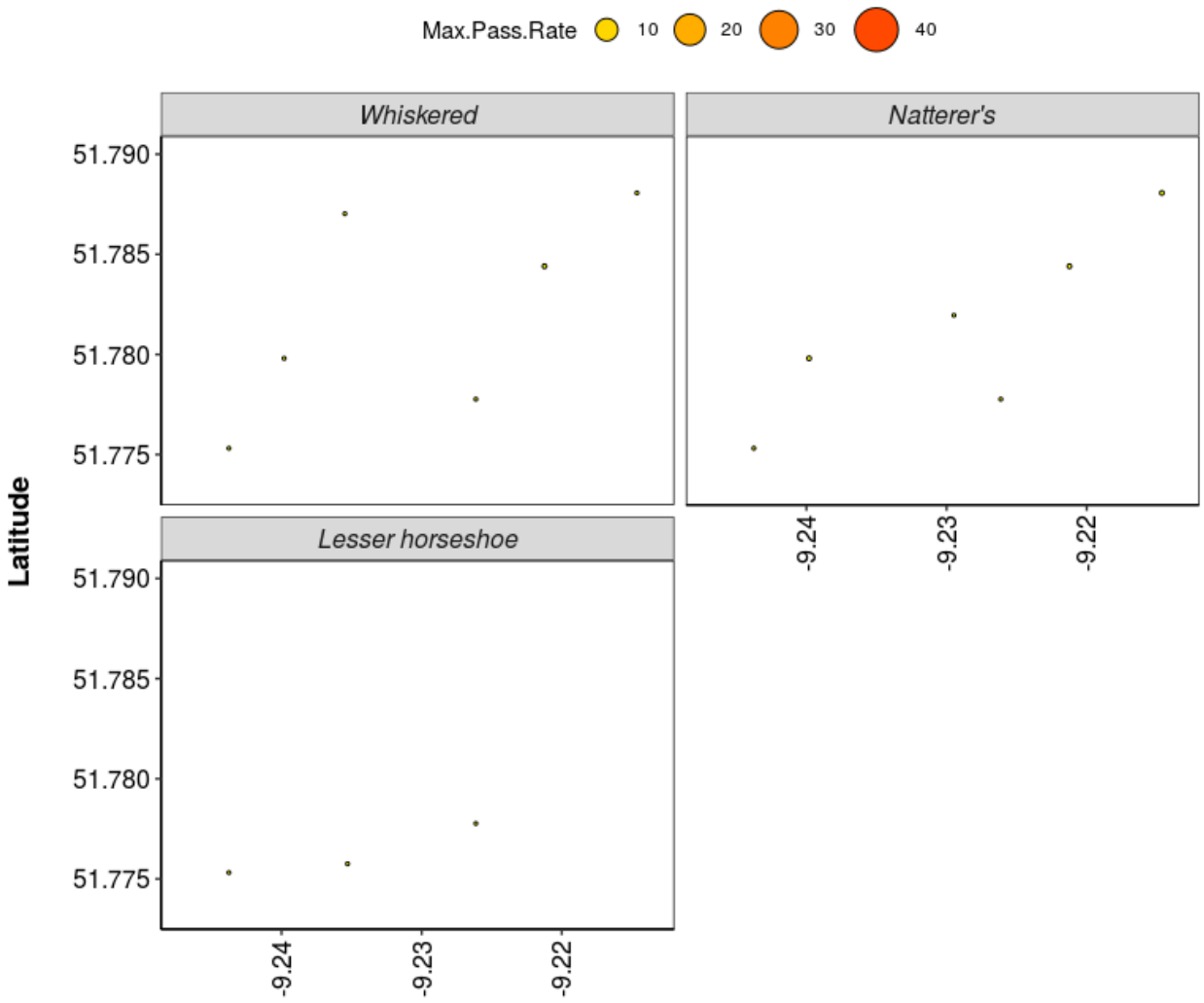

Median.Pass.Rate
1
2
3
4
Whiskered
Natterer's
Lesser horseshoe
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
10
20
30
40
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude


Max.Pass.Rate
10
20
30
40
Whiskered
Natterer's
Lesser horseshoe
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

PART 2B: Includes absences

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

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Brown long-eared	GL1	0.1
Brown long-eared	GL2	0.0
Brown long-eared	GL3	0.0
Brown long-eared	GL4	0.0
Brown long-eared	GL5	0.3
Brown long-eared	GL6	0.1
Brown long-eared	GL7	0.0
Brown long-eared	GL8	0.2
Brown long-eared	GL9	0.4
Common pipistrelle	GL1	0.3
Common pipistrelle	GL2	0.2
Common pipistrelle	GL3	0.0
Common pipistrelle	GL4	0.0
Common pipistrelle	GL5	0.0
Common pipistrelle	GL6	0.1
Common pipistrelle	GL7	0.1
Common pipistrelle	GL8	0.0
Common pipistrelle	GL9	0.0
Daubenton's	GL1	0.0
Daubenton's	GL2	0.0
Daubenton's	GL3	0.1
Daubenton's	GL4	0.0
Daubenton's	GL5	0.0

Daubenton's	GL6	0.1
Daubenton's	GL7	0.0
Daubenton's	GL8	0.0
Daubenton's	GL9	0.0
Leisler's	GL1	4.3
Leisler's	GL2	0.1
Leisler's	GL3	0.1
Leisler's	GL4	0.2
Leisler's	GL5	0.1
Leisler's	GL6	0.0
Leisler's	GL7	1.0
Leisler's	GL8	0.2
Leisler's	GL9	0.1
Lesser horseshoe	GL1	0.0
Lesser horseshoe	GL2	0.0
Lesser horseshoe	GL3	0.0
Lesser horseshoe	GL4	0.0
Lesser horseshoe	GL5	0.0
Lesser horseshoe	GL6	0.0
Lesser horseshoe	GL7	0.0
Lesser horseshoe	GL8	0.0
Lesser horseshoe	GL9	0.0
Nathusius'	GL1	0.2
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.0
Nathusius'	GL6	0.0
Nathusius'	GL7	0.0
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.0
Natterer's	GL2	0.0
Natterer's	GL3	0.0
Natterer's	GL4	0.0
Natterer's	GL5	0.0

Natterer’s	GL6	0.1
Natterer’s	GL7	0.0
Natterer’s	GL8	0.0
Natterer’s	GL9	0.0
Soprano pipistrelle	GL1	0.0
Soprano pipistrelle	GL2	0.0
Soprano pipistrelle	GL3	0.0
Soprano pipistrelle	GL4	0.0
Soprano pipistrelle	GL5	0.0
Soprano pipistrelle	GL6	0.0
Soprano pipistrelle	GL7	0.0
Soprano pipistrelle	GL8	0.0
Soprano pipistrelle	GL9	0.0
Whiskered	GL1	0.0
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

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

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

Species	Detector ID	Mean Pass Rate
Brown long-eared	GL1	0.2
Brown long-eared	GL2	0.0
Brown long-eared	GL3	0.0
Brown long-eared	GL4	0.0
Brown long-eared	GL5	0.7
Brown long-eared	GL6	0.1
Brown long-eared	GL7	0.0
Brown long-eared	GL8	0.3
Brown long-eared	GL9	0.5
Common pipistrelle	GL1	0.6
Common pipistrelle	GL2	0.3
Common pipistrelle	GL3	0.1
Common pipistrelle	GL4	0.0
Common pipistrelle	GL5	0.1
Common pipistrelle	GL6	0.1
Common pipistrelle	GL7	0.1
Common pipistrelle	GL8	0.1
Common pipistrelle	GL9	0.0
Daubenton's	GL1	0.0
Daubenton's	GL2	0.0
Daubenton's	GL3	0.1
Daubenton's	GL4	0.0
Daubenton's	GL5	0.0
Daubenton's	GL6	0.2
Daubenton's	GL7	0.1
Daubenton's	GL8	0.0

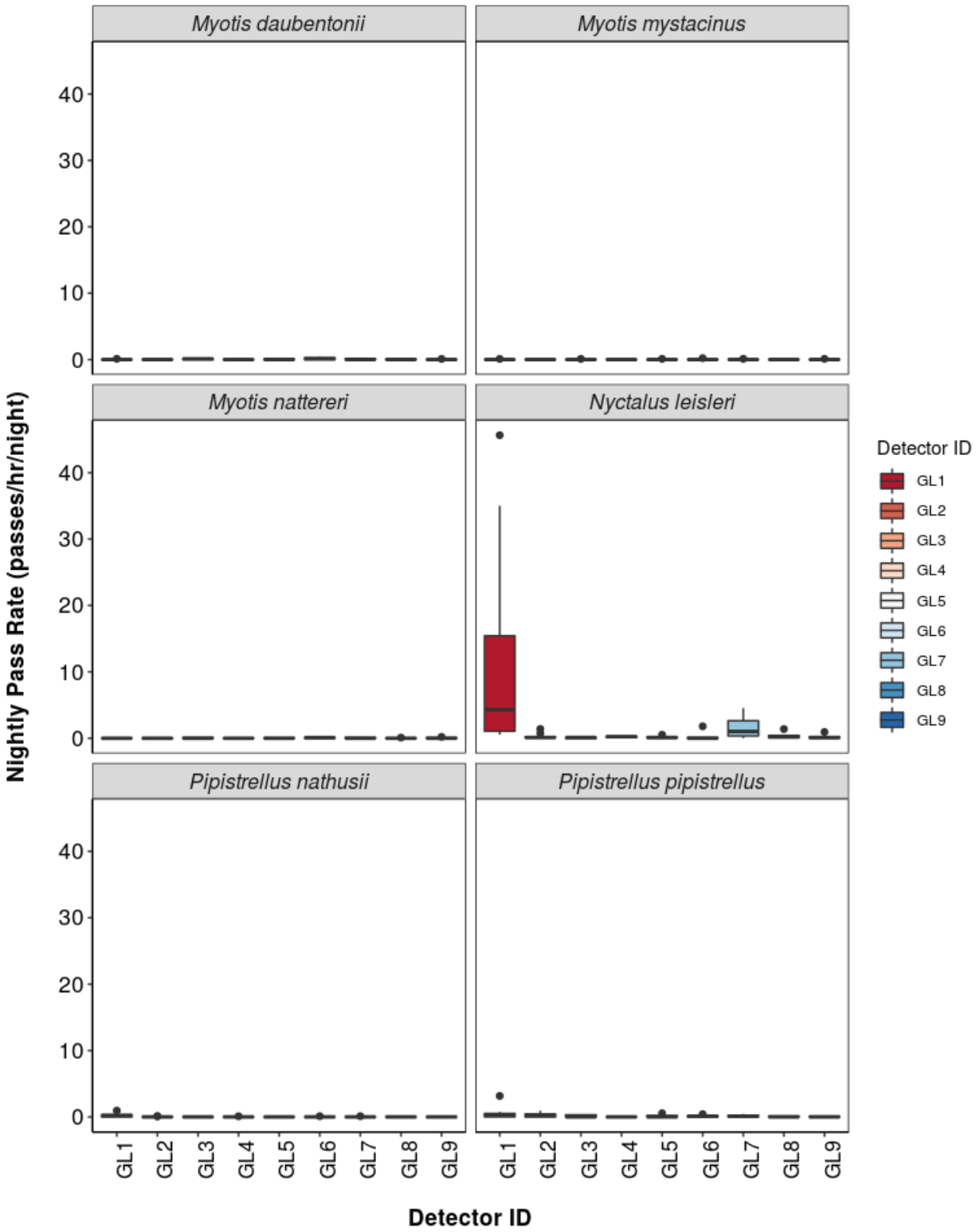
Daubenton's	GL9	0.0
Leisler's	GL1	12.7
Leisler's	GL2	0.3
Leisler's	GL3	0.1
Leisler's	GL4	0.2
Leisler's	GL5	0.2
Leisler's	GL6	0.2
Leisler's	GL7	1.7
Leisler's	GL8	0.4
Leisler's	GL9	0.2
Lesser horseshoe	GL1	0.0
Lesser horseshoe	GL2	0.0
Lesser horseshoe	GL3	0.0
Lesser horseshoe	GL4	0.0
Lesser horseshoe	GL5	0.0
Lesser horseshoe	GL6	0.0
Lesser horseshoe	GL7	0.0
Lesser horseshoe	GL8	0.0
Lesser horseshoe	GL9	0.0
Nathusius'	GL1	0.2
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.0
Nathusius'	GL6	0.0
Nathusius'	GL7	0.0
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.0
Natterer's	GL2	0.0
Natterer's	GL3	0.0
Natterer's	GL4	0.0
Natterer's	GL5	0.0
Natterer's	GL6	0.1
Natterer's	GL7	0.1
Natterer's	GL8	0.0

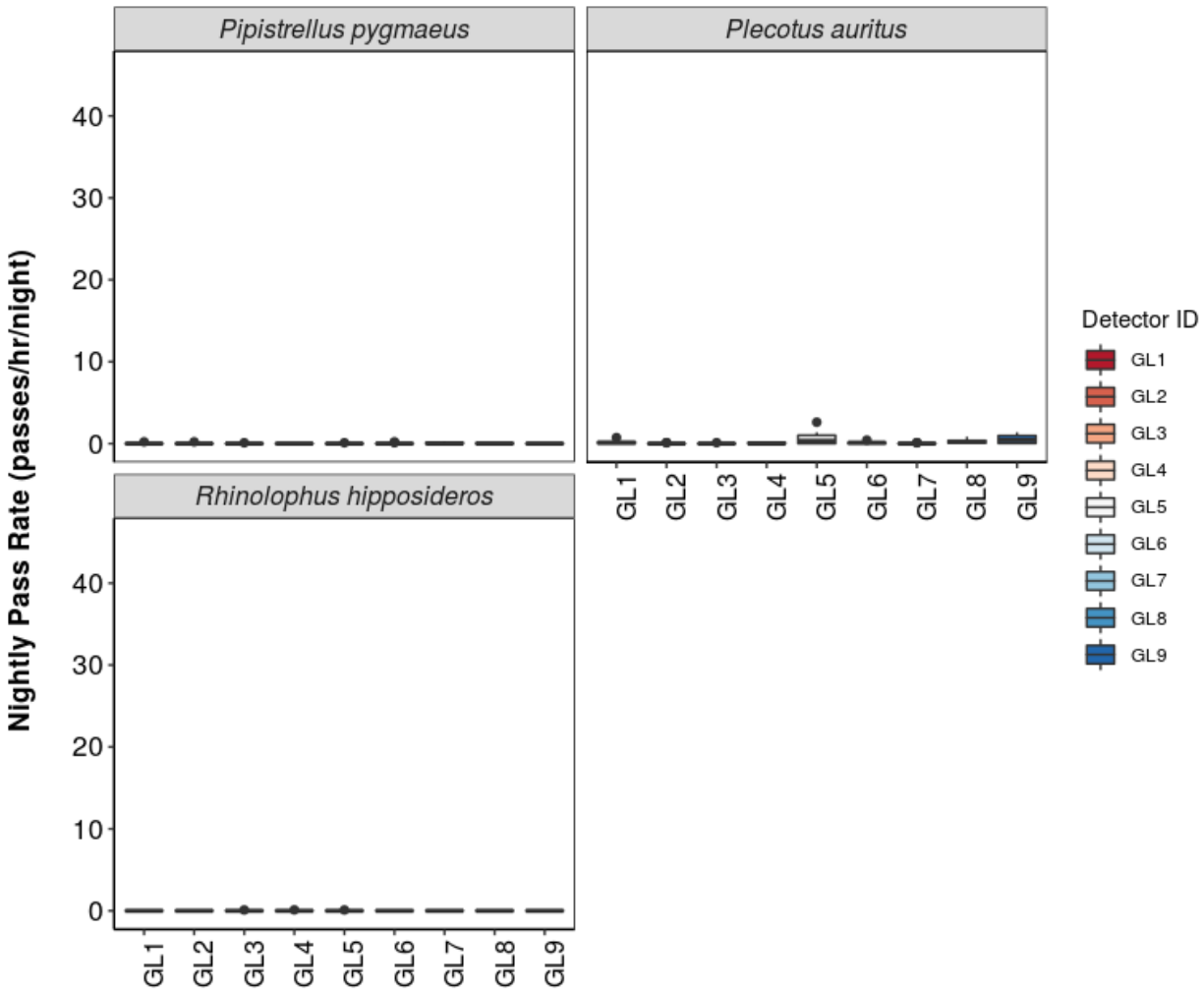
Natterer's	GL9	0.1
Soprano pipistrelle	GL1	0.0
Soprano pipistrelle	GL2	0.0
Soprano pipistrelle	GL3	0.0
Soprano pipistrelle	GL4	0.0
Soprano pipistrelle	GL5	0.0
Soprano pipistrelle	GL6	0.0
Soprano pipistrelle	GL7	0.1
Soprano pipistrelle	GL8	0.0
Soprano pipistrelle	GL9	0.0
Whiskered	GL1	0.0
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
10
20
30
40
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Rhinolophus hipposideros
Nightly Pass Rate (passes/hr/night)
0
10
20
30
40
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID

Survey Effort

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

Month	Detector ID	No of Survey Nights
Apr	GL1	8
Apr	GL2	7
Apr	GL3	5
Apr	GL4	5
Apr	GL5	6
Apr	GL6	7
Apr	GL7	6
Apr	GL8	6
Apr	GL9	5
May	GL1	1
May	GL2	2
May	GL4	2
May	GL5	1
May	GL6	4
May	GL7	2
May	GL8	1
May	GL9	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	Apr	May
Brown long-eared	GL1	0.2	0.0
Brown long-eared	GL2	0.0	0.1
Brown long-eared	GL3	0.0	NA
Brown long-eared	GL4	0.1	0.0
Brown long-eared	GL5	0.5	0.0
Brown long-eared	GL6	0.1	0.1
Brown long-eared	GL7	0.0	0.1
Brown long-eared	GL8	0.3	0.0
Brown long-eared	GL9	0.7	0.0
Common pipistrelle	GL1	0.4	0.0
Common pipistrelle	GL2	0.2	0.3
Common pipistrelle	GL3	0.0	NA
Common pipistrelle	GL4	0.0	0.0
Common pipistrelle	GL5	0.0	0.6
Common pipistrelle	GL6	0.1	0.1
Common pipistrelle	GL7	0.1	0.3
Common pipistrelle	GL8	0.0	0.1
Common pipistrelle	GL9	0.0	0.1
Daubenton's	GL1	0.0	0.0
Daubenton's	GL2	0.0	0.0
Daubenton's	GL3	0.1	NA
Daubenton's	GL4	0.0	0.0
Daubenton's	GL5	0.0	0.1

Daubenton's	GL6	0.1	0.1
Daubenton's	GL7	0.0	0.1
Daubenton's	GL8	0.0	0.0
Daubenton's	GL9	0.0	0.0
Leisler's	GL1	6.5	3.1
Leisler's	GL2	0.1	0.1
Leisler's	GL3	0.1	NA
Leisler's	GL4	0.2	0.3
Leisler's	GL5	0.1	0.1
Leisler's	GL6	0.1	0.0
Leisler's	GL7	0.8	2.6
Leisler's	GL8	0.2	0.2
Leisler's	GL9	0.1	0.2
Lesser horseshoe	GL1	0.0	0.0
Lesser horseshoe	GL2	0.0	0.0
Lesser horseshoe	GL3	0.0	NA
Lesser horseshoe	GL4	0.0	0.1
Lesser horseshoe	GL5	0.0	0.0
Lesser horseshoe	GL6	0.0	0.0
Lesser horseshoe	GL7	0.0	0.0
Lesser horseshoe	GL8	0.0	0.0
Lesser horseshoe	GL9	0.0	0.0
Nathusius'	GL1	0.2	0.0
Nathusius'	GL2	0.0	0.0
Nathusius'	GL3	0.0	NA
Nathusius'	GL4	0.0	0.0
Nathusius'	GL5	0.0	0.0
Nathusius'	GL6	0.0	0.0
Nathusius'	GL7	0.0	0.1
Nathusius'	GL8	0.0	0.0
Nathusius'	GL9	0.0	0.0
Natterer's	GL1	0.0	0.0
Natterer's	GL2	0.0	0.0
Natterer's	GL3	0.0	NA
Natterer's	GL4	0.0	0.0
Natterer's	GL5	0.0	0.0

Natterer’s	GL6	0.1	0.0
Natterer’s	GL7	0.0	0.0
Natterer’s	GL8	0.0	0.0
Natterer’s	GL9	0.0	0.0
Soprano pipistrelle	GL1	0.0	0.0
Soprano pipistrelle	GL2	0.0	0.0
Soprano pipistrelle	GL3	0.0	NA
Soprano pipistrelle	GL4	0.0	0.0
Soprano pipistrelle	GL5	0.0	0.0
Soprano pipistrelle	GL6	0.0	0.0
Soprano pipistrelle	GL7	0.0	0.0
Soprano pipistrelle	GL8	0.0	0.0
Soprano pipistrelle	GL9	0.0	0.0
Whiskered	GL1	0.0	0.0
Whiskered	GL2	0.0	0.0
Whiskered	GL3	0.0	NA
Whiskered	GL4	0.0	0.0
Whiskered	GL5	0.0	0.0
Whiskered	GL6	0.0	0.0
Whiskered	GL7	0.0	0.0
Whiskered	GL8	0.0	0.0
Whiskered	GL9	0.0	0.0

Nightly Bat Pass Rate for each Month

Mean per Detector

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

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

Species	Detector ID	Apr	May
Brown long-eared	GL1	0.2	0.0
Brown long-eared	GL2	0.0	0.1
Brown long-eared	GL3	0.0	NA
Brown long-eared	GL4	0.1	0.0
Brown long-eared	GL5	0.8	0.0
Brown long-eared	GL6	0.1	0.1
Brown long-eared	GL7	0.0	0.1
Brown long-eared	GL8	0.3	0.0
Brown long-eared	GL9	0.7	0.0
Common pipistrelle	GL1	0.6	0.0
Common pipistrelle	GL2	0.3	0.3
Common pipistrelle	GL3	0.1	NA
Common pipistrelle	GL4	0.0	0.0
Common pipistrelle	GL5	0.1	0.6
Common pipistrelle	GL6	0.1	0.1
Common pipistrelle	GL7	0.1	0.3
Common pipistrelle	GL8	0.1	0.1
Common pipistrelle	GL9	0.0	0.1
Daubenton's	GL1	0.0	0.0
Daubenton's	GL2	0.0	0.0
Daubenton's	GL3	0.1	NA
Daubenton's	GL4	0.0	0.0
Daubenton's	GL5	0.0	0.1
Daubenton's	GL6	0.2	0.1
Daubenton's	GL7	0.1	0.1
Daubenton's	GL8	0.0	0.0

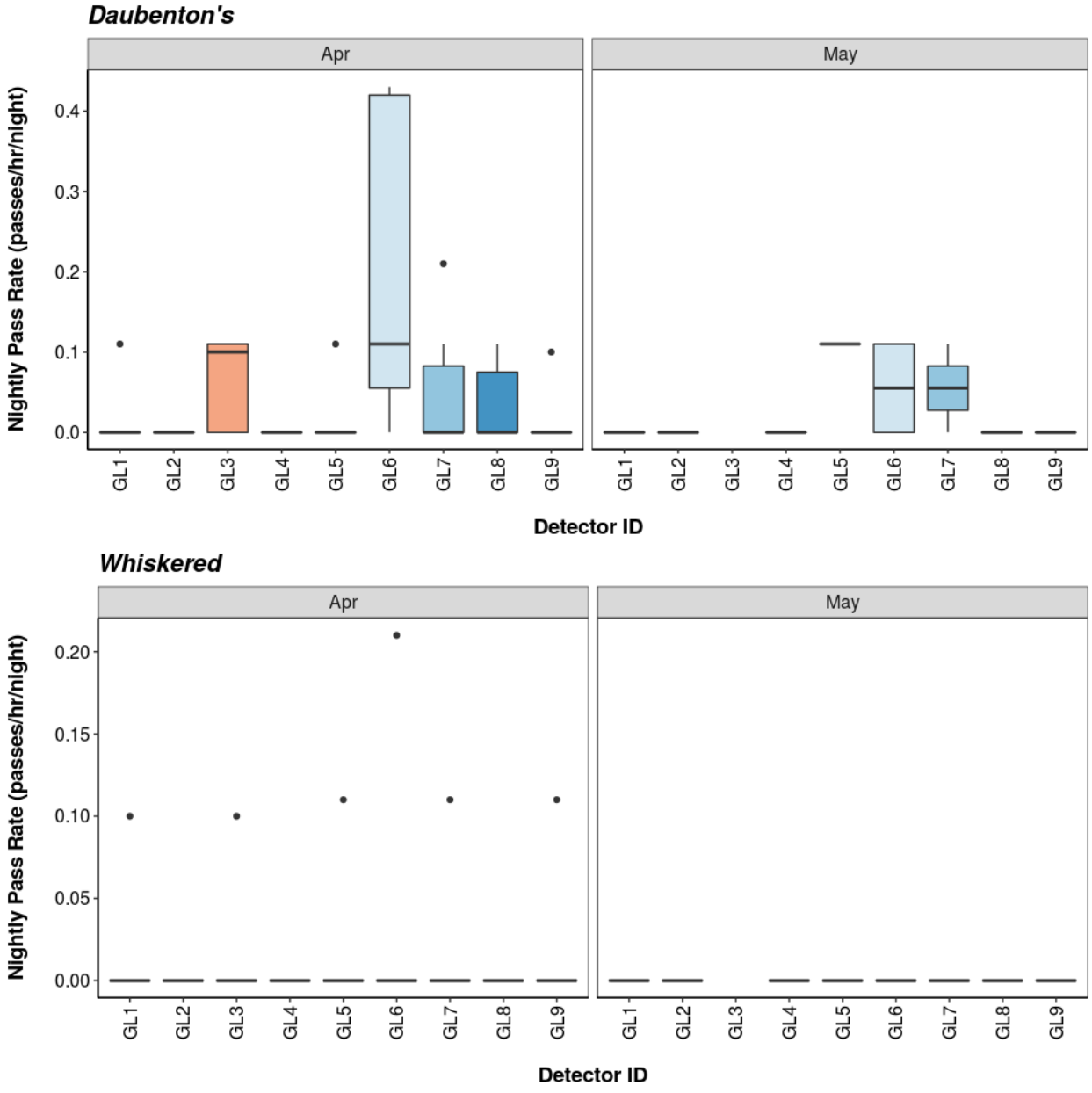
Daubenton's	GL9	0.0	0.0
Leisler's	GL1	13.9	3.1
Leisler's	GL2	0.4	0.1
Leisler's	GL3	0.1	NA
Leisler's	GL4	0.2	0.3
Leisler's	GL5	0.2	0.1
Leisler's	GL6	0.3	0.0
Leisler's	GL7	1.4	2.6
Leisler's	GL8	0.4	0.2
Leisler's	GL9	0.2	0.2
Lesser horseshoe	GL1	0.0	0.0
Lesser horseshoe	GL2	0.0	0.0
Lesser horseshoe	GL3	0.0	NA
Lesser horseshoe	GL4	0.0	0.1
Lesser horseshoe	GL5	0.0	0.0
Lesser horseshoe	GL6	0.0	0.0
Lesser horseshoe	GL7	0.0	0.0
Lesser horseshoe	GL8	0.0	0.0
Lesser horseshoe	GL9	0.0	0.0
Nathusius'	GL1	0.3	0.0
Nathusius'	GL2	0.0	0.0
Nathusius'	GL3	0.0	NA
Nathusius'	GL4	0.0	0.0
Nathusius'	GL5	0.0	0.0
Nathusius'	GL6	0.0	0.0
Nathusius'	GL7	0.0	0.1
Nathusius'	GL8	0.0	0.0
Nathusius'	GL9	0.0	0.0
Natterer's	GL1	0.0	0.0
Natterer's	GL2	0.0	0.0
Natterer's	GL3	0.0	NA
Natterer's	GL4	0.0	0.0
Natterer's	GL5	0.0	0.0
Natterer's	GL6	0.1	0.0
Natterer's	GL7	0.1	0.0
Natterer's	GL8	0.0	0.0

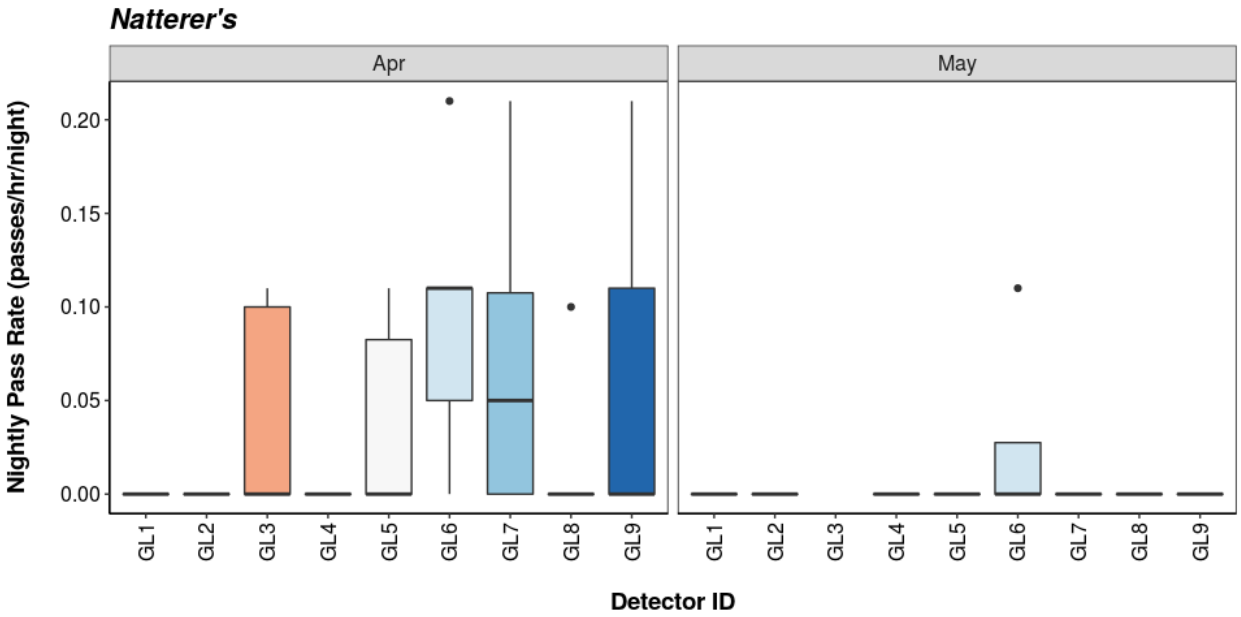
Natterer's	GL9	0.1	0.0
Soprano pipistrelle	GL1	0.0	0.0
Soprano pipistrelle	GL2	0.0	0.0
Soprano pipistrelle	GL3	0.0	NA
Soprano pipistrelle	GL4	0.0	0.0
Soprano pipistrelle	GL5	0.0	0.0
Soprano pipistrelle	GL6	0.0	0.0
Soprano pipistrelle	GL7	0.1	0.0
Soprano pipistrelle	GL8	0.0	0.0
Soprano pipistrelle	GL9	0.0	0.0
Whiskered	GL1	0.0	0.0
Whiskered	GL2	0.0	0.0
Whiskered	GL3	0.0	NA
Whiskered	GL4	0.0	0.0
Whiskered	GL5	0.0	0.0
Whiskered	GL6	0.0	0.0
Whiskered	GL7	0.0	0.0
Whiskered	GL8	0.0	0.0
Whiskered	GL9	0.0	0.0

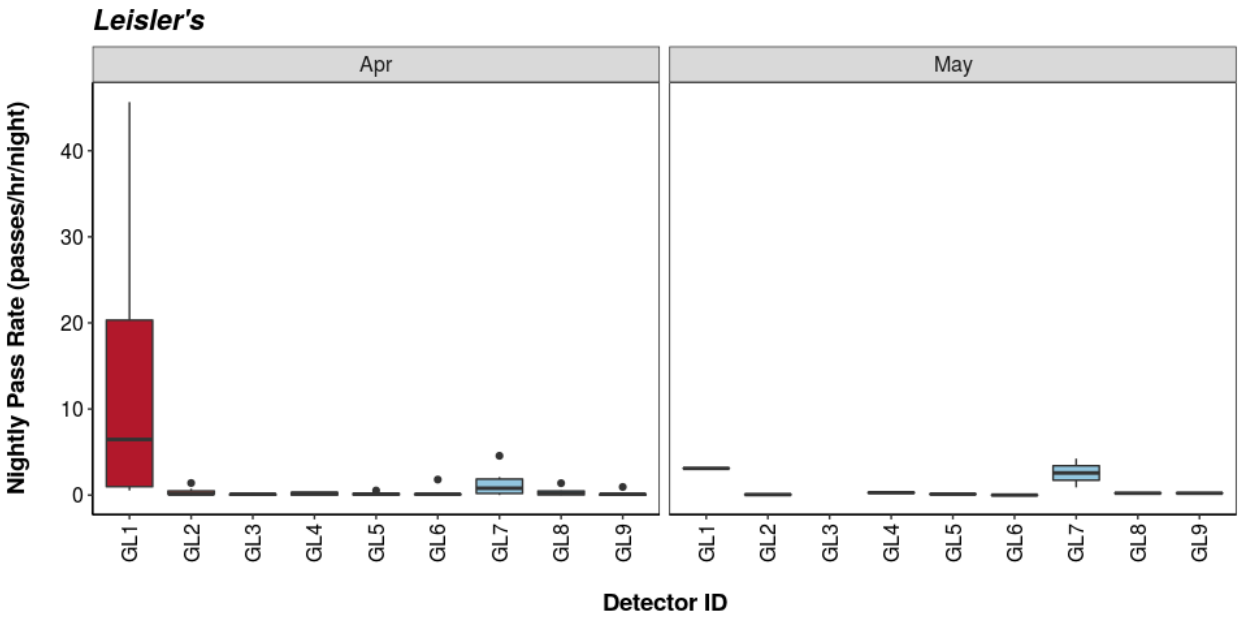
Nightly Bat Pass Rate for each Month

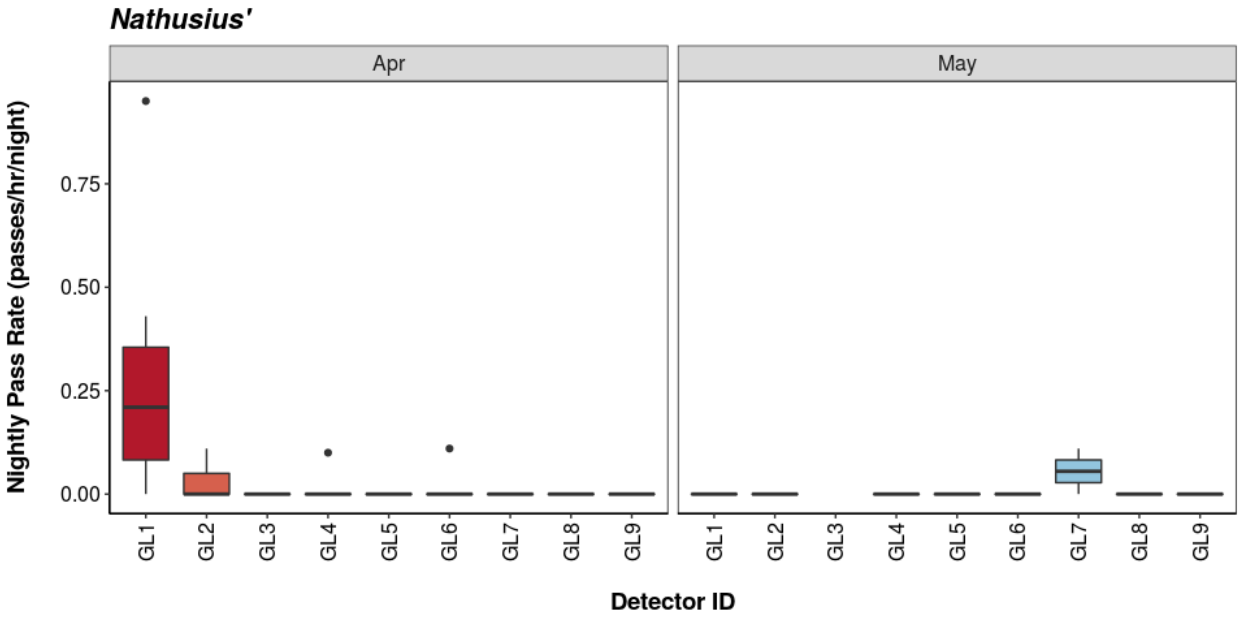
Per Detector - Figures

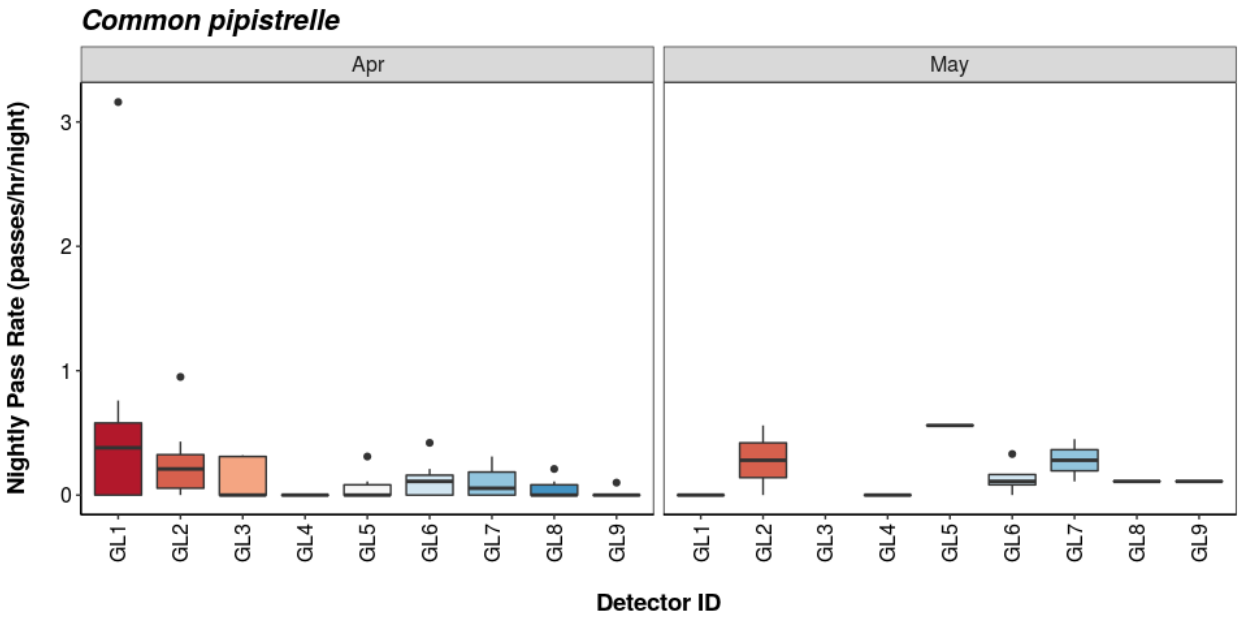
Figure 17. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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

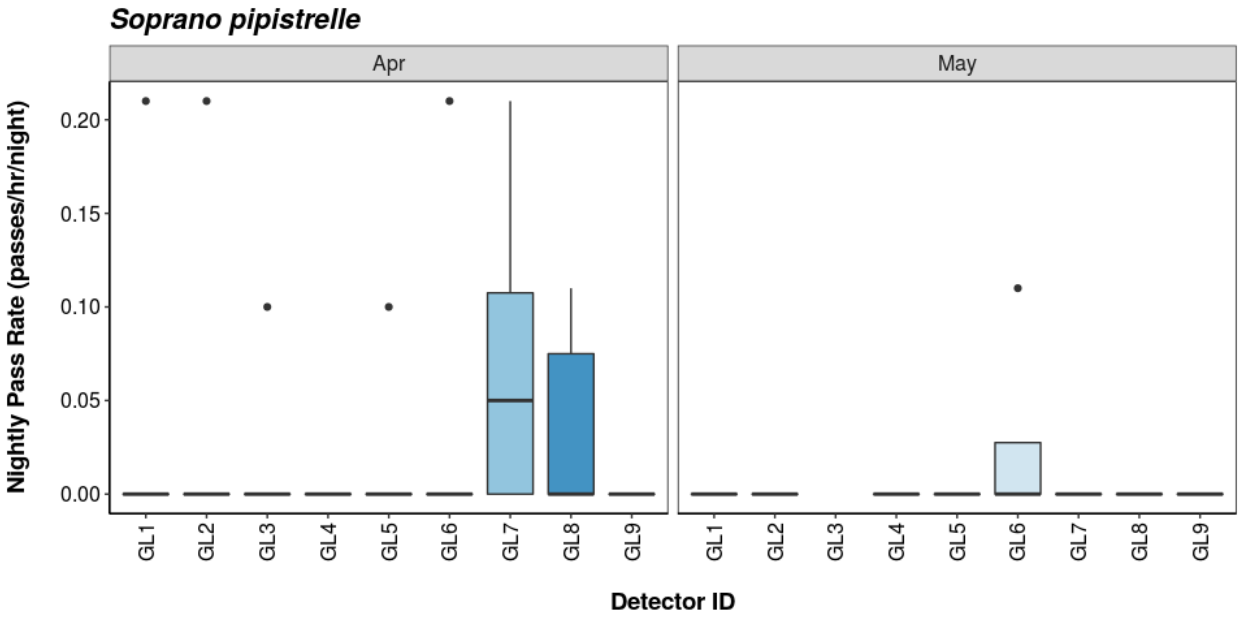


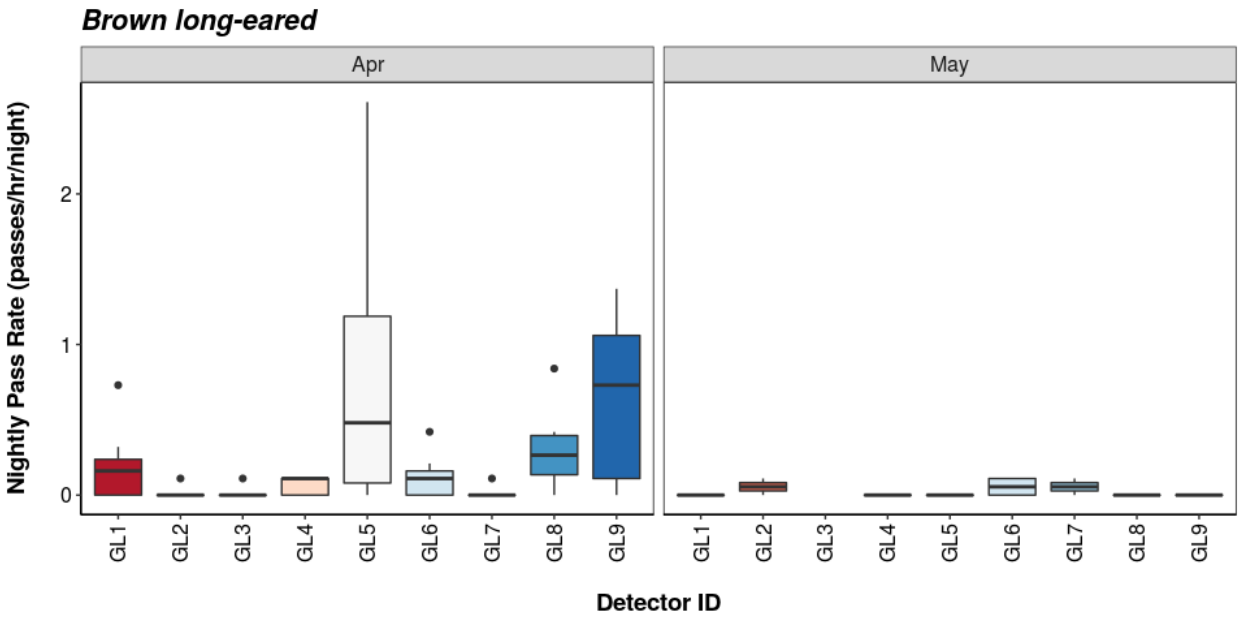

Natterer's
Apr
May
Nightly Pass Rate (passes/hr/night)
0.20
0.15
0.10
0.05
0.00
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

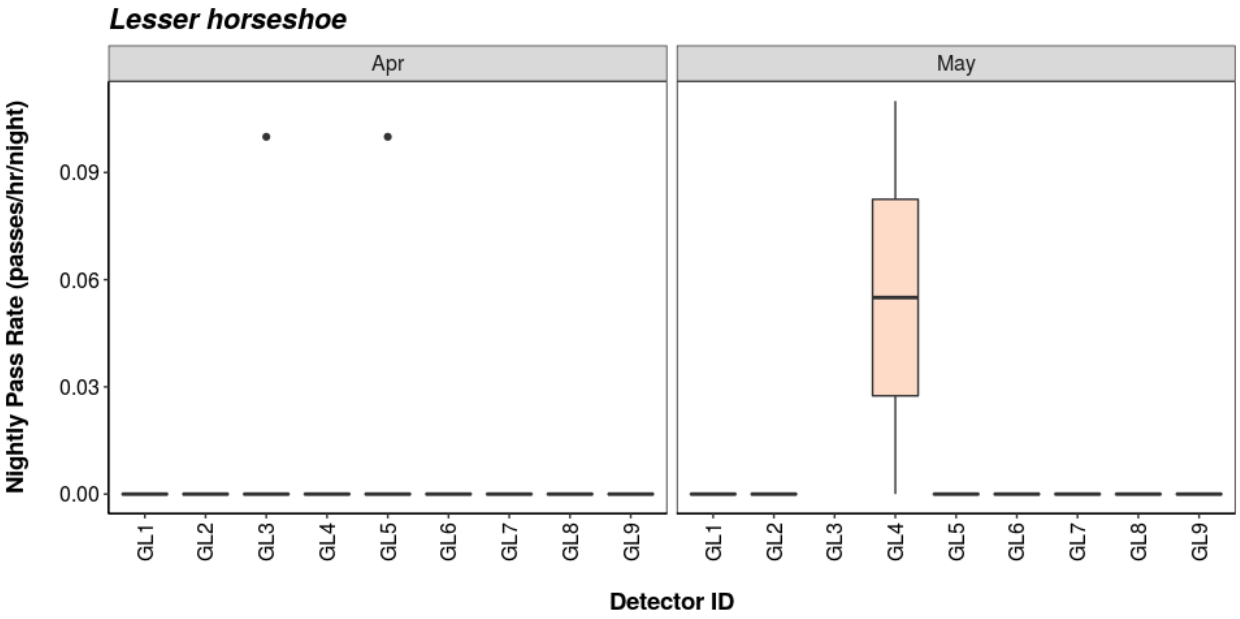

Leisler's
Apr
May
Nightly Pass Rate (passes/hr/night)
40
30
20
10
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Nathusius'
Apr
May
Nightly Pass Rate (passes/hr/night)
0.00
0.25
0.50
0.75
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Common pipistrelle
Apr
May
Nightly Pass Rate (passes/hr/night)
0
1
2
3
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Soprano pipistrelle
Apr
May
Nightly Pass Rate (passes/hr/night)
0.20
0.15
0.10
0.05
0.00
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Brown long-eared
Apr
May
Nightly Pass Rate (passes/hr/night)
2
1
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Lesser horseshoe
Apr
May
Nightly Pass Rate (passes/hr/night)
0.09
0.06
0.03
0.00
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

Bat Activity per Detector Location

Figure 18. Detector ID reference:

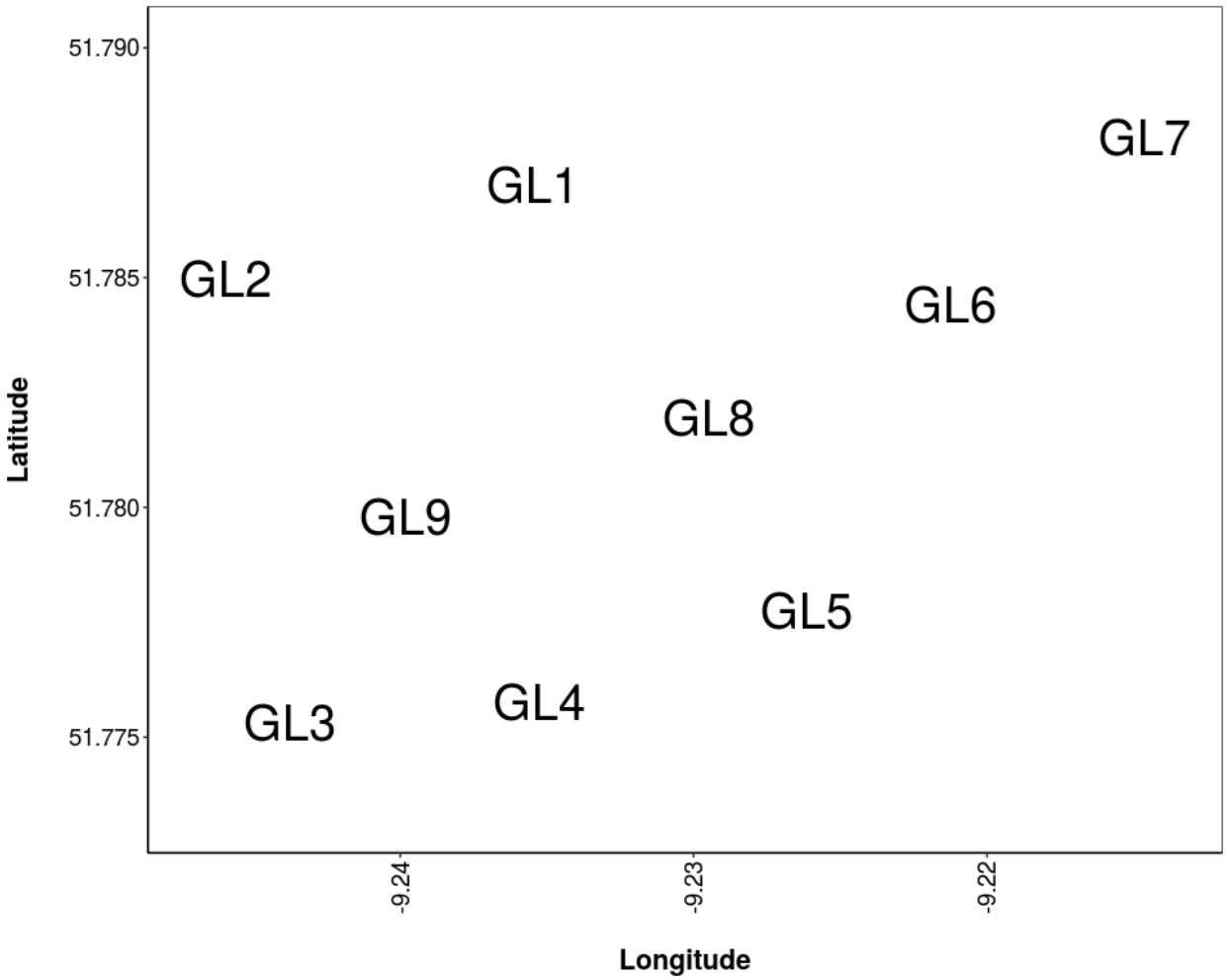
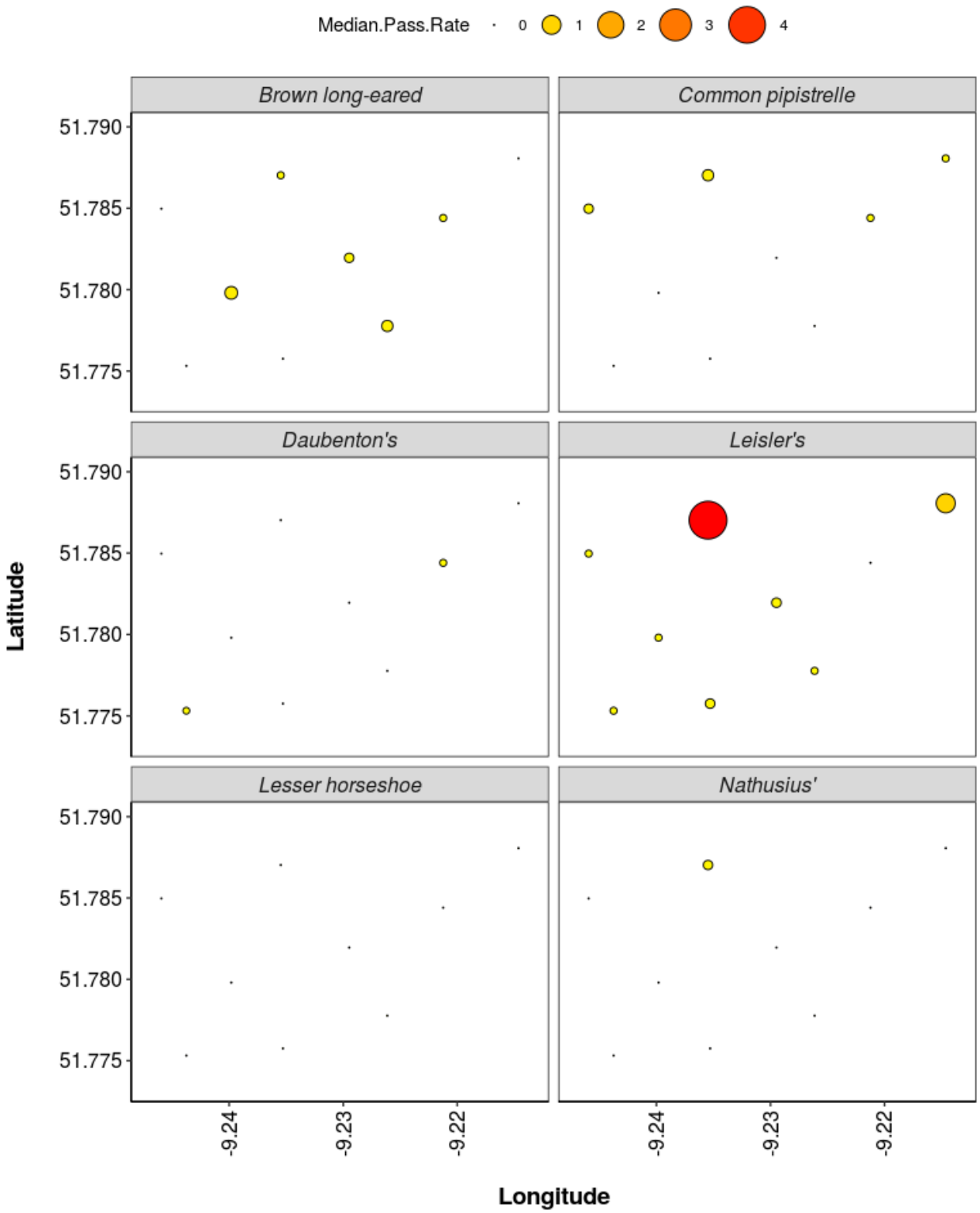


Figure 19. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
0
1
2
3
4
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Lesser horseshoe
Nathusius'
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

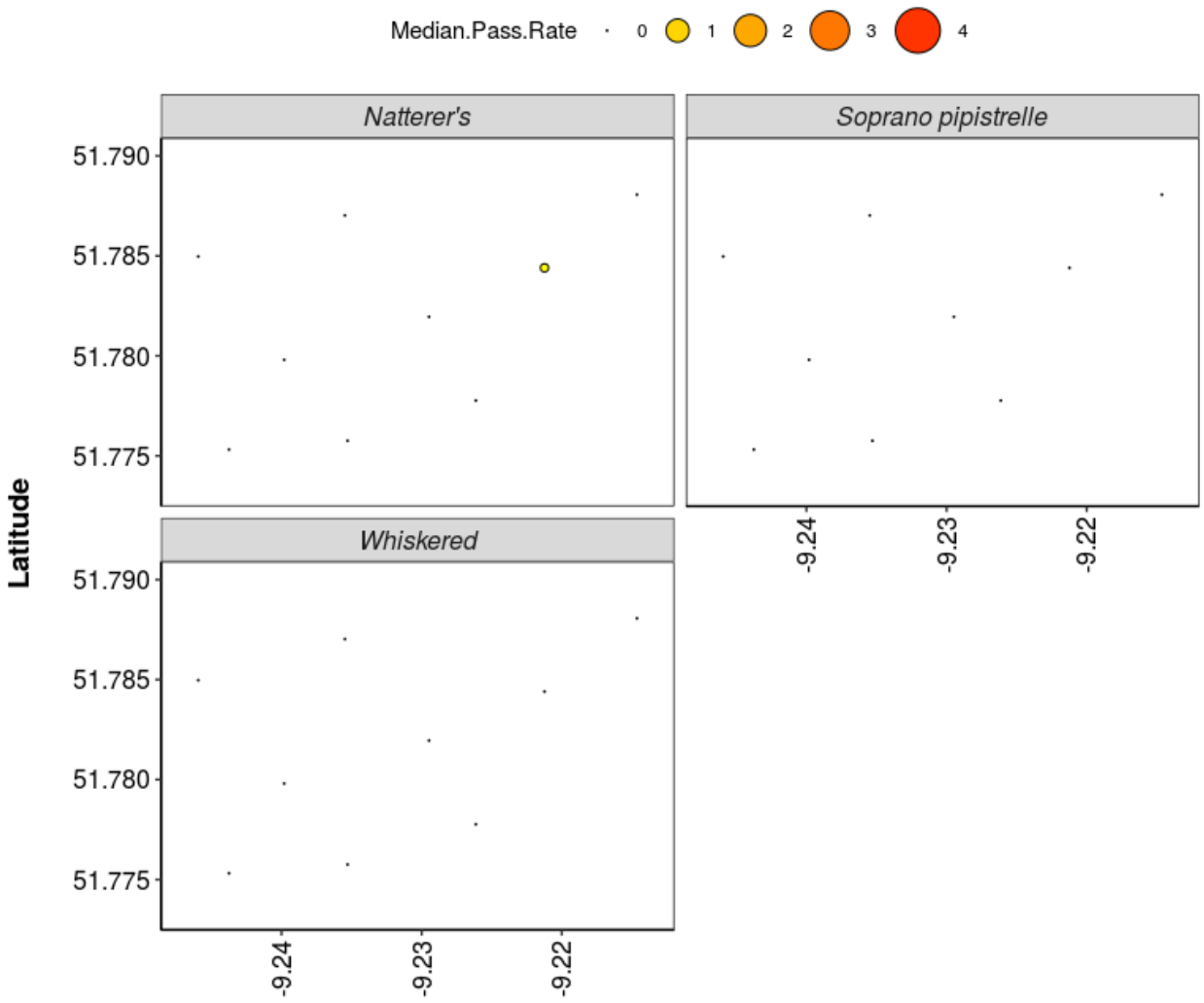
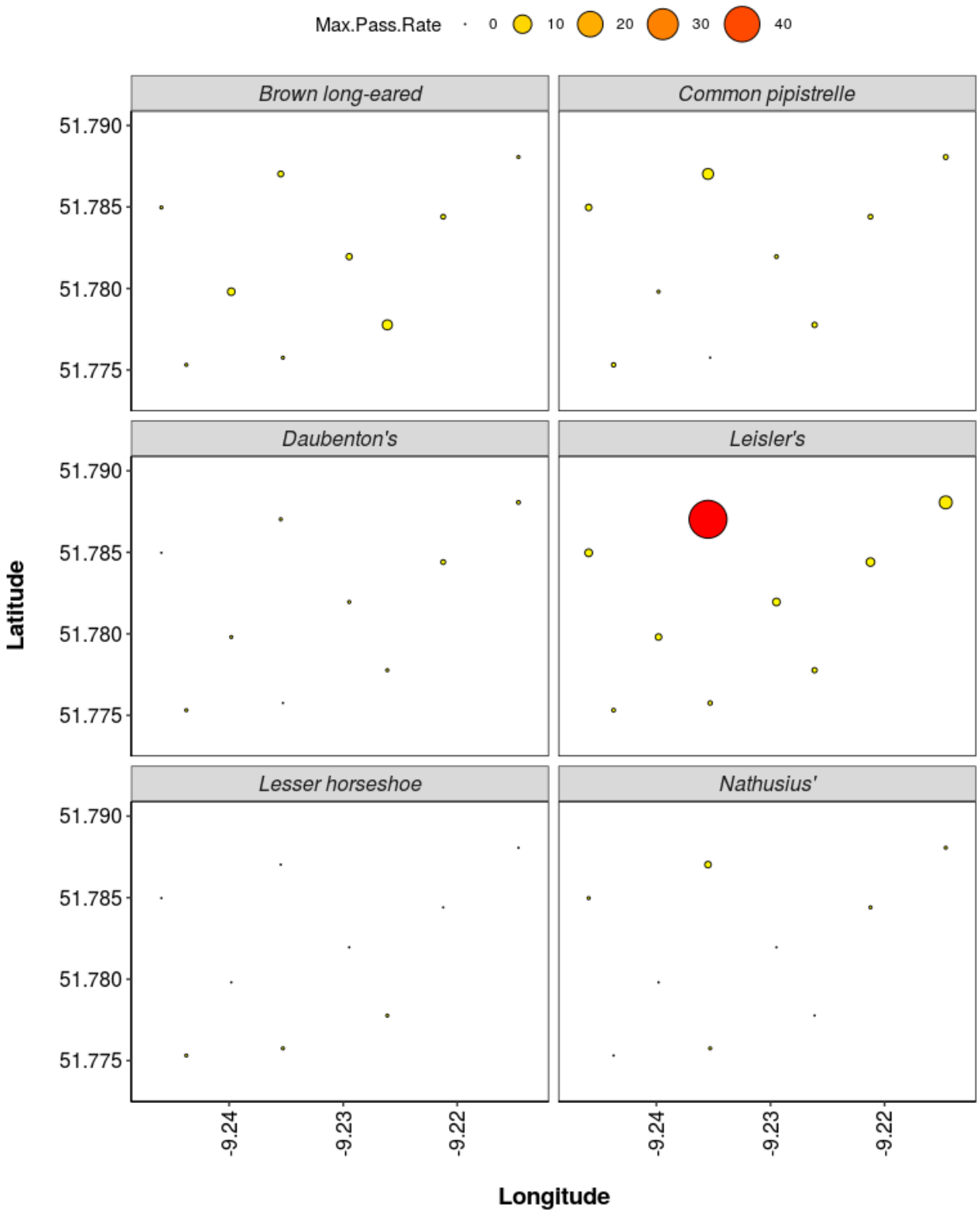
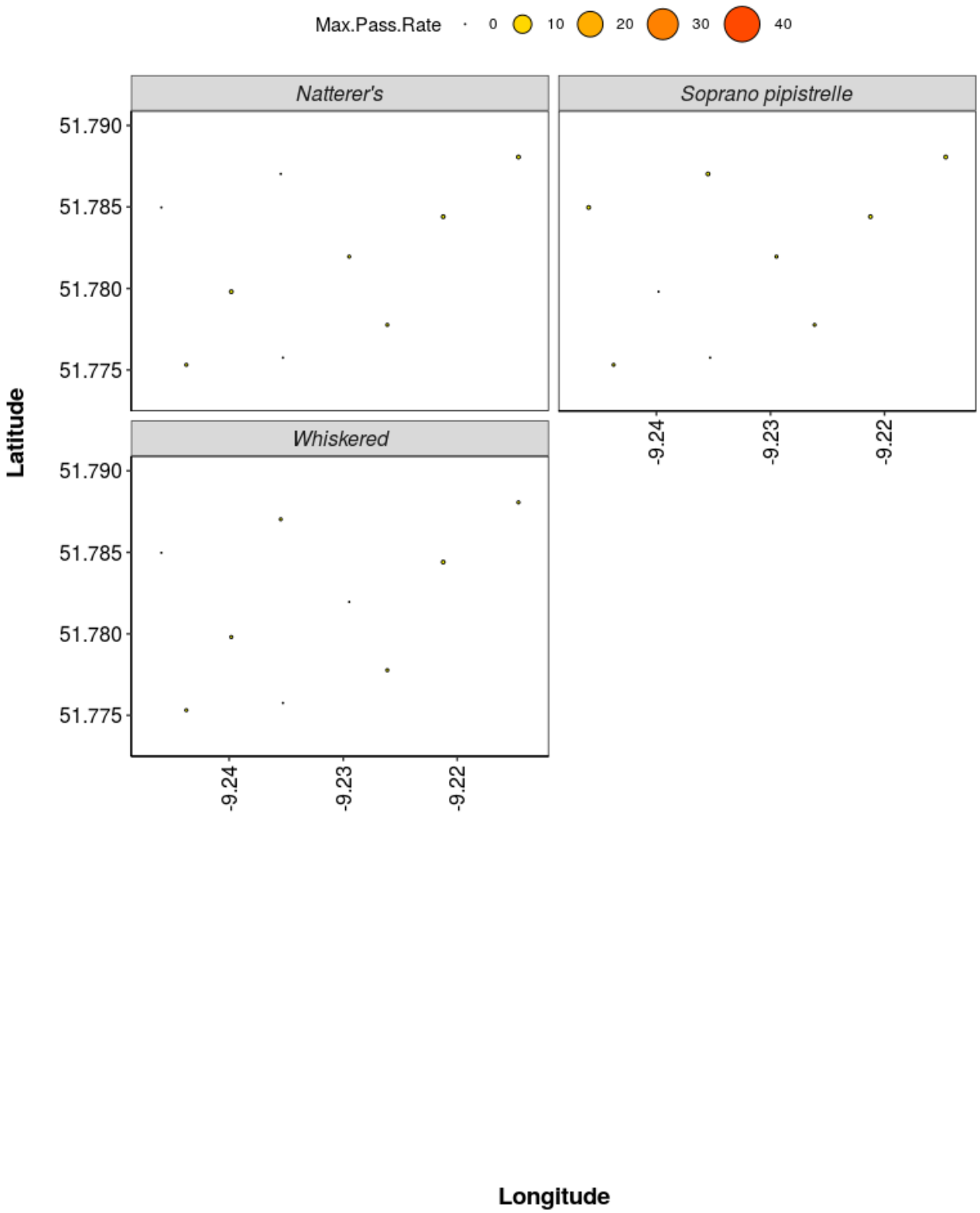

Median.Pass.Rate
0
1
2
3
4
Natterer's
Soprano pipistrelle
Whiskered
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
0
10
20
30
40
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Lesser horseshoe
Nathusius'
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude



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

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: Gortloughra

Author: Fehily Timoney

24/06/2021

Summary

Bats were detected on **8** nights between **2020-06-23** and **2020-07-22**, using **9** static bat detectors. Throughout this period **8** species were recorded. **Table 1.** Detectors were placed at the following locations:

Detector ID	Latitude	Longitude
GL5	51.77777	-9.226132
GL3	51.77532	-9.243754
GL6	51.78440	-9.221233
GL4	51.77575	-9.235288
GL1	51.78703	-9.235476
GL2	51.78497	-9.245940
GL8	51.78195	-9.229476
GL9	51.77980	-9.239814
GL7	51.78806	-9.214635

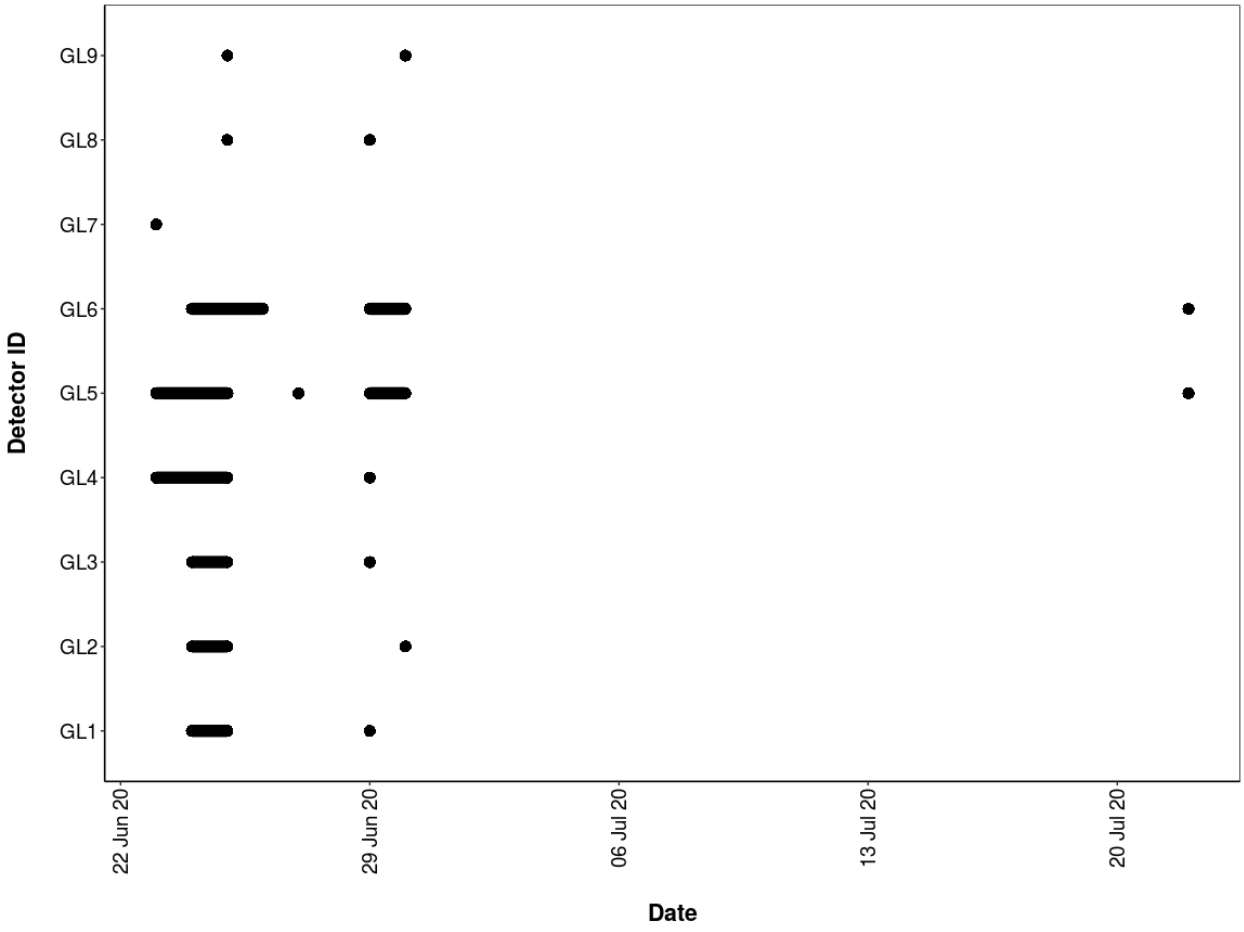
Survey Nights

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
GL1	3
GL2	3
GL3	3
GL4	4
GL5	7
GL6	6
GL7	1
GL8	2
GL9	2

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.
- Records using any make of bat detector.

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
GL1	*Nyctalus leisleri*	0	0	0	1	2
GL1	*Pipistrellus pipistrellus*	0	0	0	0	1
GL2	*Nyctalus leisleri*	0	0	0	0	1
GL2	*Pipistrellus pipistrellus*	0	0	1	0	2
GL2	*Pipistrellus pygmaeus*	0	0	0	0	1
GL3	*Myotis daubentonii*	0	0	0	0	1
GL3	*Nyctalus leisleri*	0	0	1	0	0
GL3	*Pipistrellus pipistrellus*	0	0	2	0	1
GL3	*Pipistrellus pygmaeus*	0	0	0	0	2
GL3	*Plecotus auritus*	0	0	0	0	3
GL4	*Nyctalus leisleri*	0	0	0	1	3
GL4	*Pipistrellus pipistrellus*	0	1	0	0	1
GL4	*Pipistrellus pygmaeus*	0	0	0	0	1
GL5	*Myotis daubentonii*	0	0	0	1	1
GL5	*Nyctalus leisleri*	0	0	0	1	2
GL5	*Pipistrellus pipistrellus*	0	2	2	0	0
GL5	*Plecotus auritus*	0	0	0	0	1
GL6	*Myotis daubentonii*	0	0	0	0	1
GL6	*Myotis mystacinus*	0	0	0	0	1

GL6	*Myotis nattereri*	0	0	0	0	4
GL6	*Nyctalus leisleri*	0	0	0	1	1
GL6	*Pipistrellus nathusii*	0	0	1	0	0
GL6	*Pipistrellus pipistrellus*	1	0	1	0	2
GL6	*Pipistrellus pygmaeus*	1	0	0	0	0
GL6	*Plecotus auritus*	0	0	1	0	0
GL7	*Pipistrellus nathusii*	0	0	0	0	1
GL8	*Nyctalus leisleri*	0	0	1	0	1
GL8	*Pipistrellus pipistrellus*	0	1	0	0	0
GL8	*Pipistrellus pygmaeus*	0	0	1	0	0
GL8	*Plecotus auritus*	0	0	0	0	1
GL9	*Nyctalus leisleri*	0	0	1	0	1
GL9	*Pipistrellus pipistrellus*	0	0	1	0	0
GL9	*Pipistrellus pygmaeus*	0	0	0	0	1

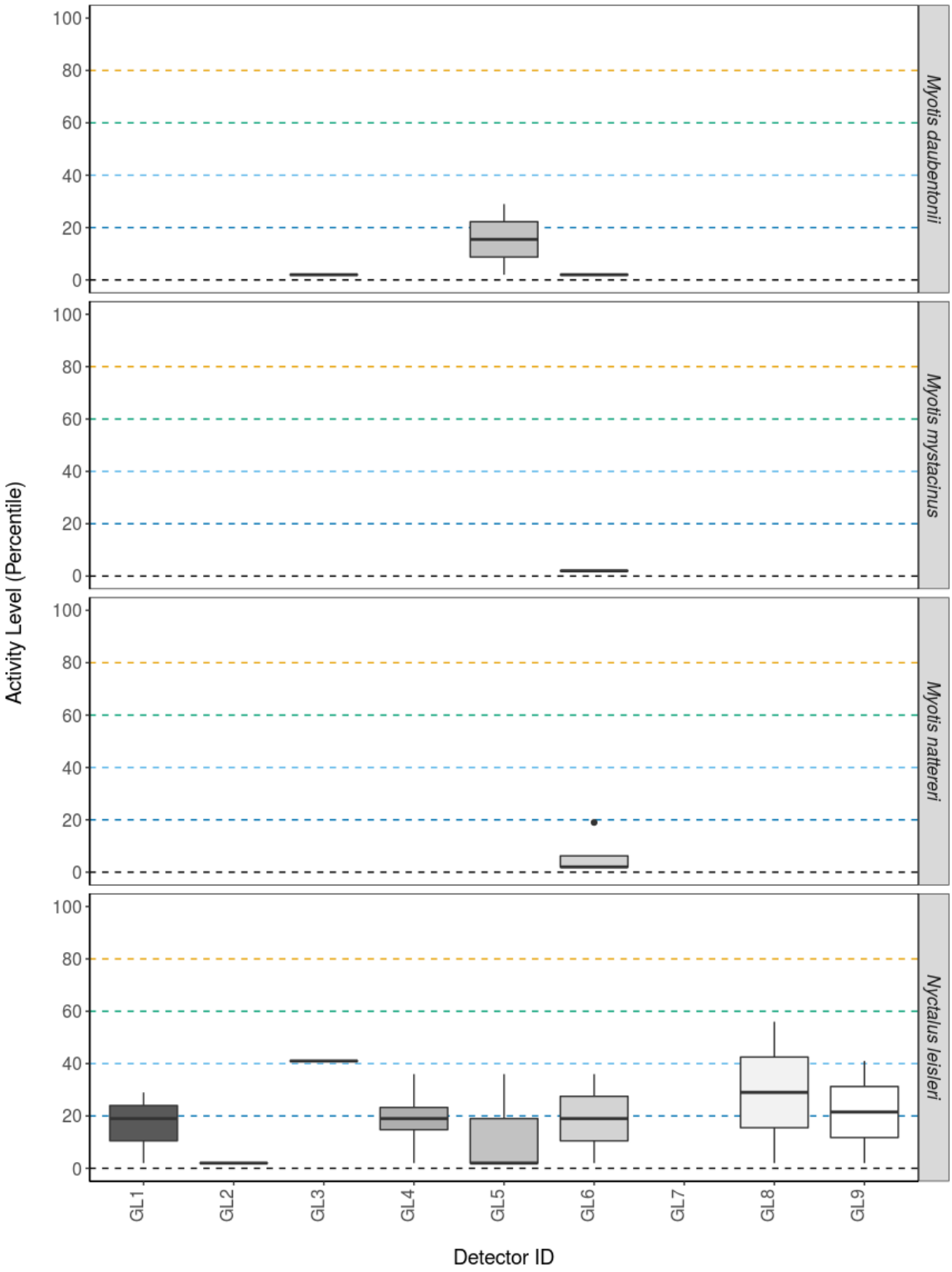
Table 4. Summary table showing key metrics for each species recorded. The reference range is the number of nights for each species that your data were compared to. We recommend a Reference Range of 200+ to be confident in the relative activity level.

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
GL1	*Nyctalus leisleri*	19	2 - 29	29	3	1266
GL1	*Pipistrellus pipistrellus*	2	0	2	1	1462
GL2	*Nyctalus leisleri*	2	0	2	1	1266
GL2	*Pipistrellus pipistrellus*	2	2 - 2	51	3	1462
GL2	*Pipistrellus pygmaeus*	2	0	2	1	1210
GL3	*Myotis daubentonii*	2	0	2	1	110
GL3	*Nyctalus leisleri*	41	0	41	1	1266
GL3	*Pipistrellus pipistrellus*	45	19 - 51	51	3	1462
GL3	*Pipistrellus pygmaeus*	2	2 - 2	2	2	1210
GL3	*Plecotus auritus*	19	19 - 19	19	3	588
GL4	*Nyctalus leisleri*	19	10.5 - 27.5	36	4	1266
GL4	*Pipistrellus pipistrellus*	40	40 - 40	78	2	1462
GL4	*Pipistrellus pygmaeus*	2	0	2	1	1210
GL5	*Myotis daubentonii*	16	15.5 - 15.5	29	2	110
GL5	*Nyctalus leisleri*	2	2 - 2	36	3	1266
GL5	*Pipistrellus pipistrellus*	60	41 - 76	76	4	1462
GL5	*Plecotus auritus*	2	0	2	1	588
GL6	*Myotis daubentonii*	2	0	2	1	110
GL6	*Myotis mystacinus*	2	0	2	1	45
GL6	*Myotis nattereri*	2	2 - 2	19	4	81

GL6	*Nyctalus leisleri*	19	19 - 19	36	2	1266
GL6	*Pipistrellus nathusii*	51	0	51	1	177
GL6	*Pipistrellus pipistrellus*	25	2 - 49	96	4	1462
GL6	*Pipistrellus pygmaeus*	86	0	86	1	1210
GL6	*Plecotus auritus*	58	0	58	1	588
GL7	*Pipistrellus nathusii*	2	0	2	1	177
GL8	*Nyctalus leisleri*	29	29 - 29	56	2	1266
GL8	*Pipistrellus pipistrellus*	76	0	76	1	1462
GL8	*Pipistrellus pygmaeus*	48	0	48	1	1210
GL8	*Plecotus auritus*	2	0	2	1	588
GL9	*Nyctalus leisleri*	22	21.5 - 21.5	41	2	1266
GL9	*Pipistrellus pipistrellus*	48	0	48	1	1462
GL9	*Pipistrellus pygmaeus*	19	0	19	1	1210

###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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

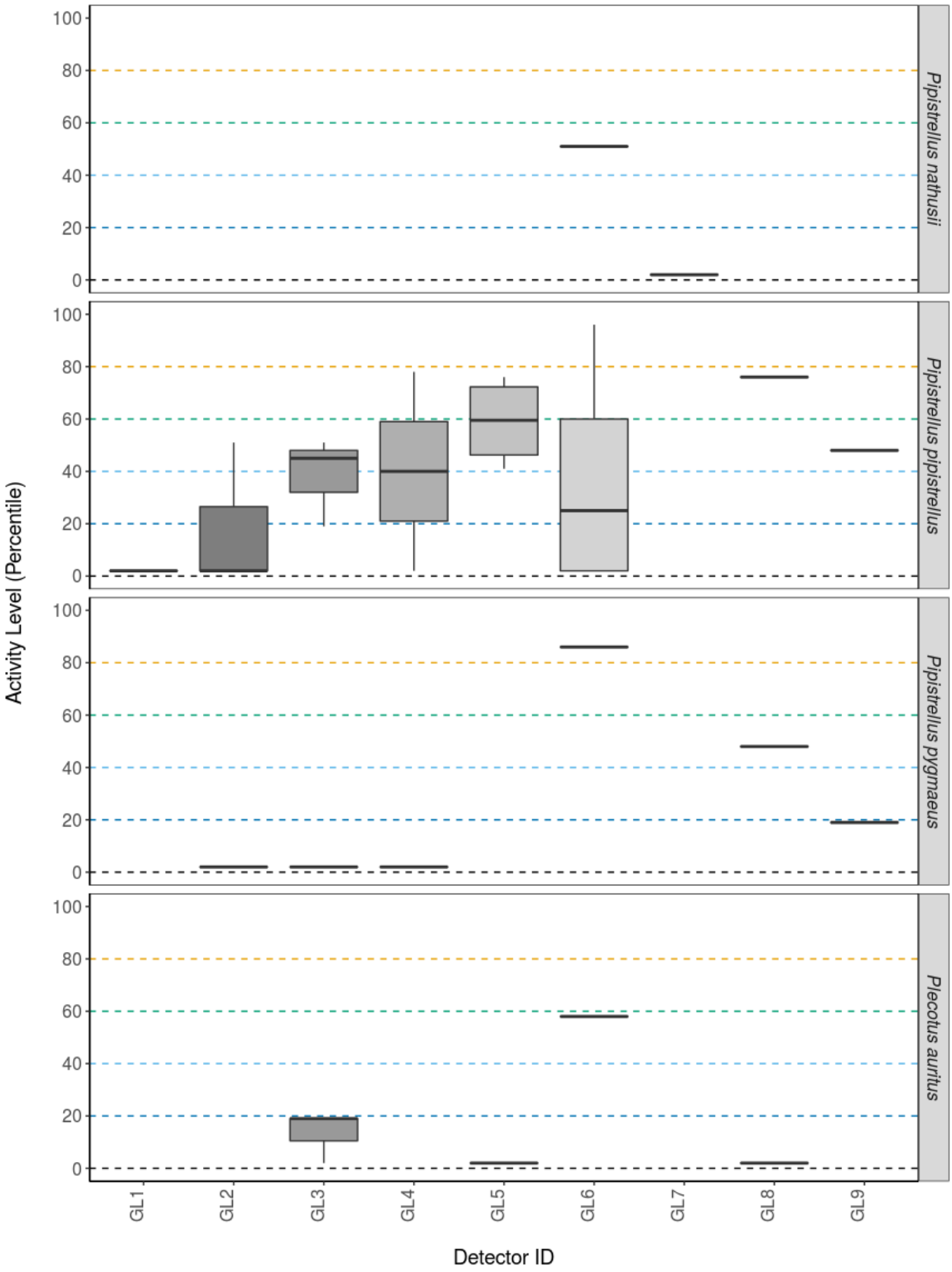
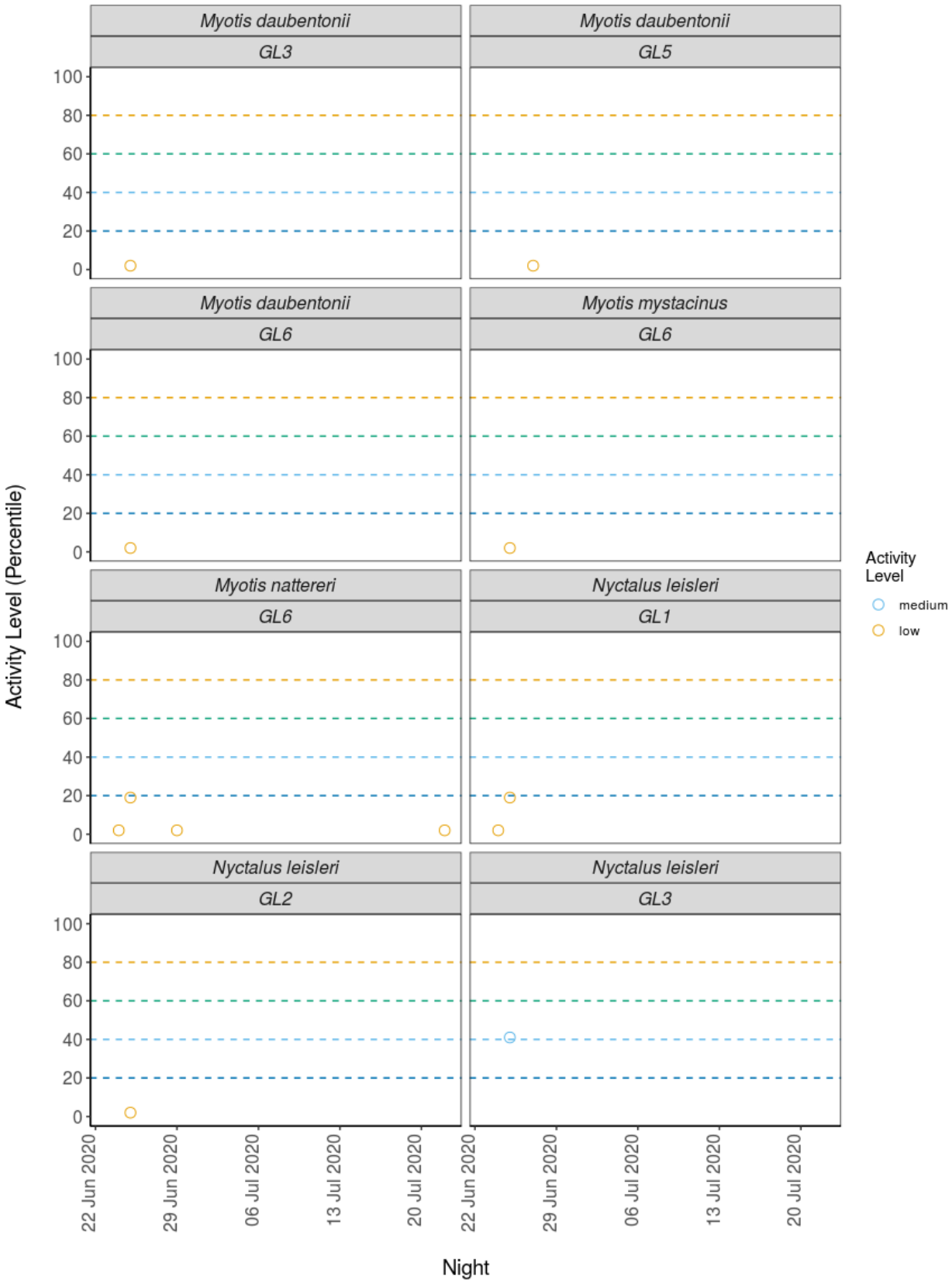
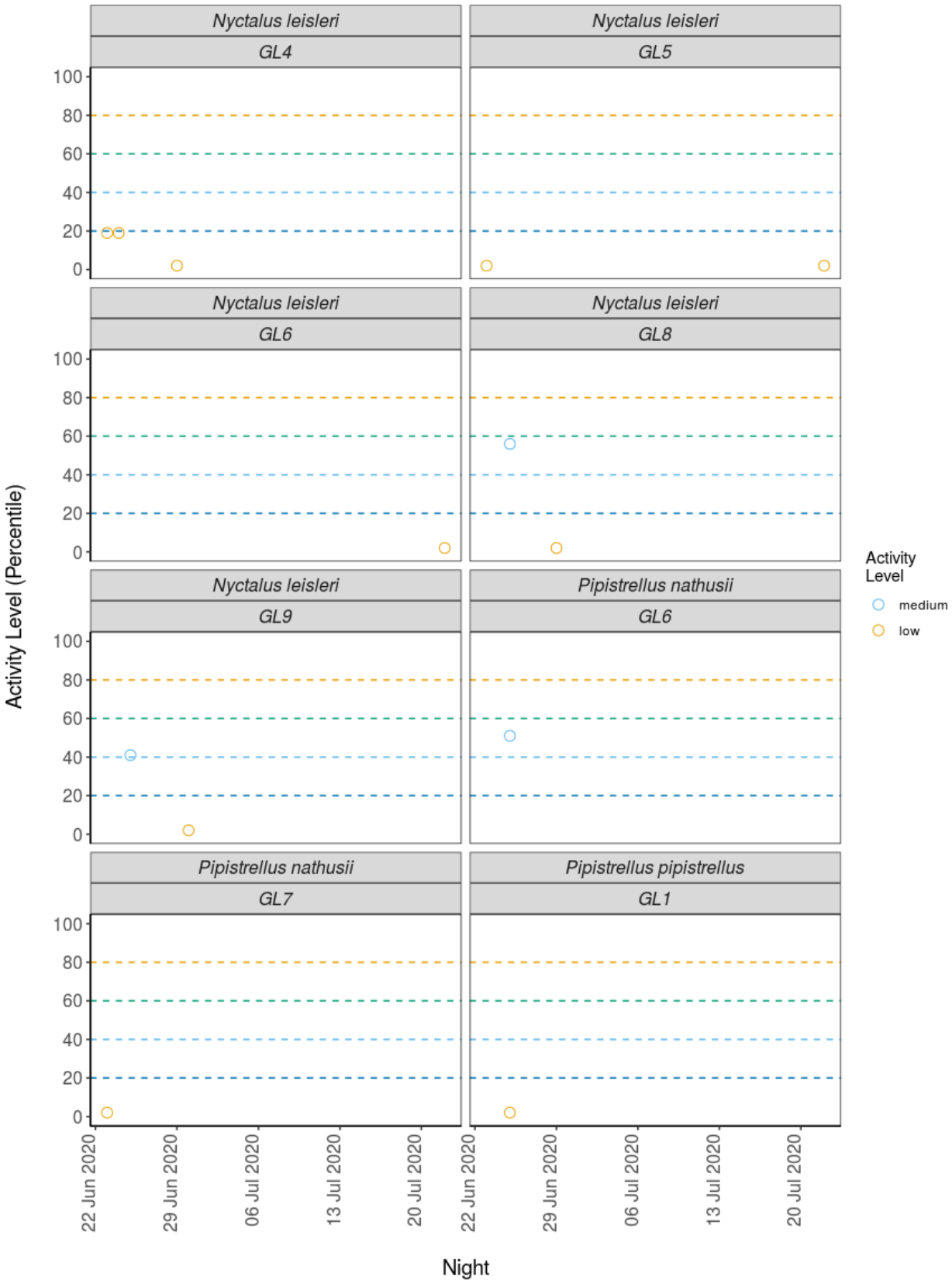
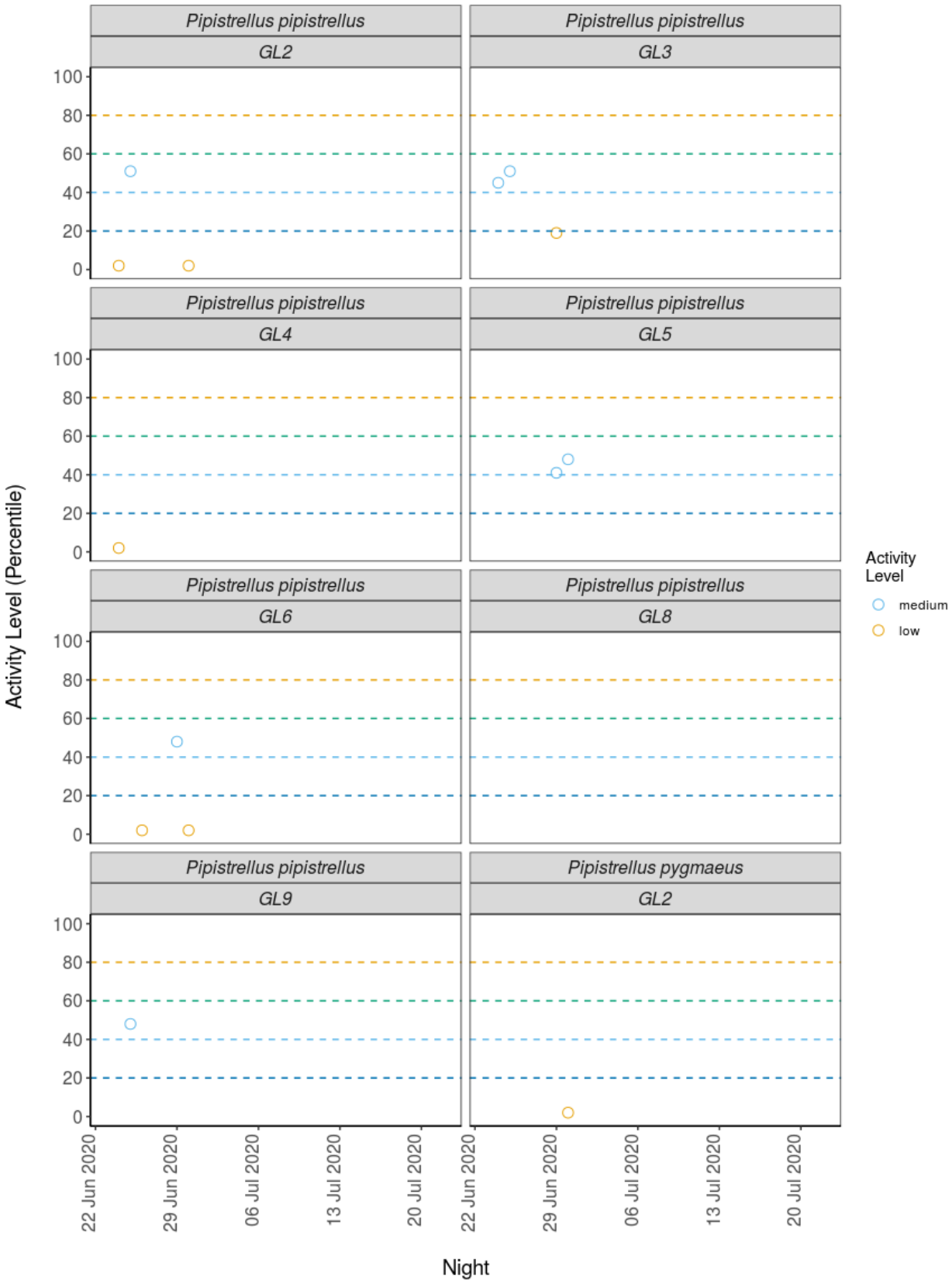
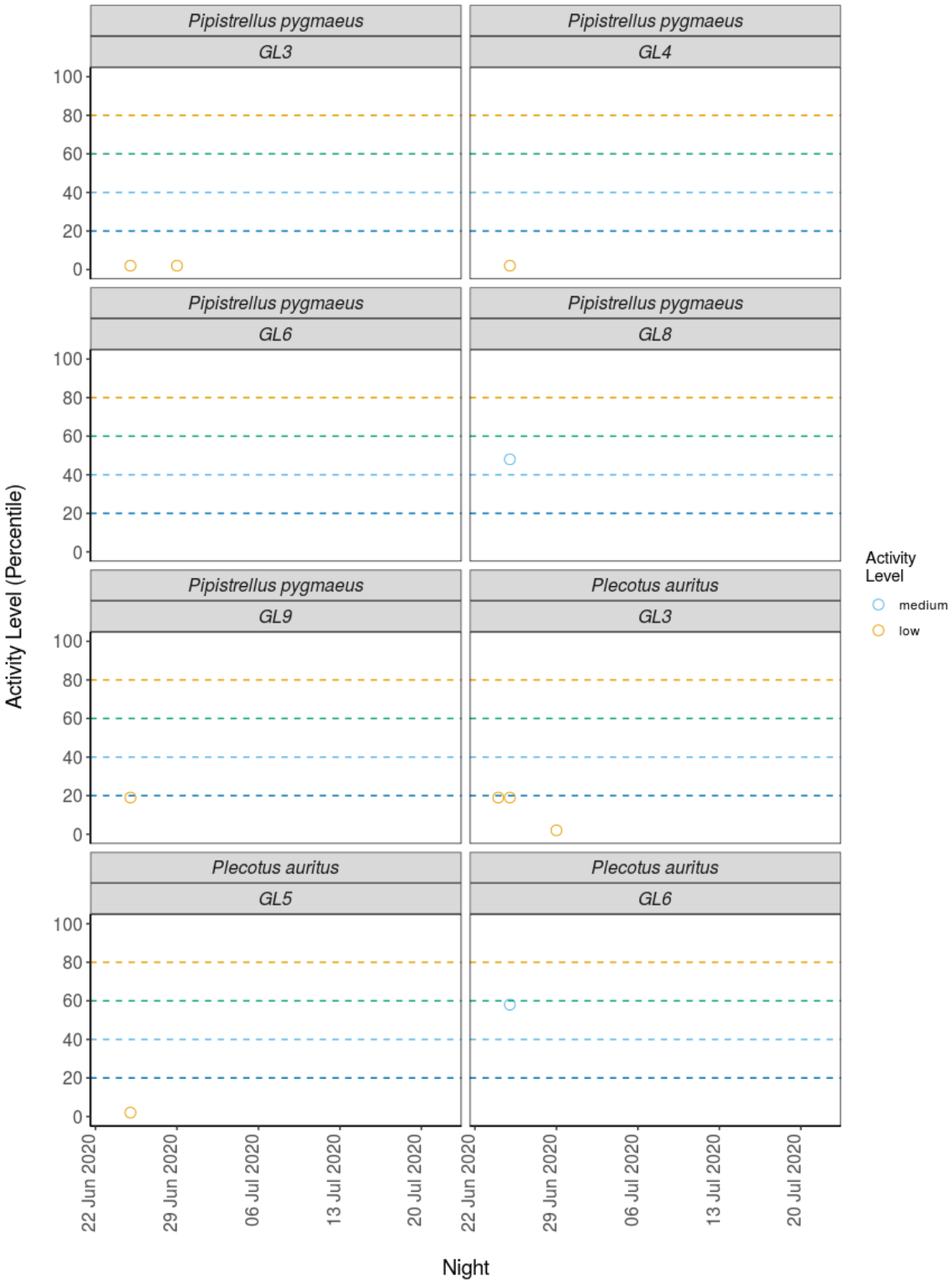

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

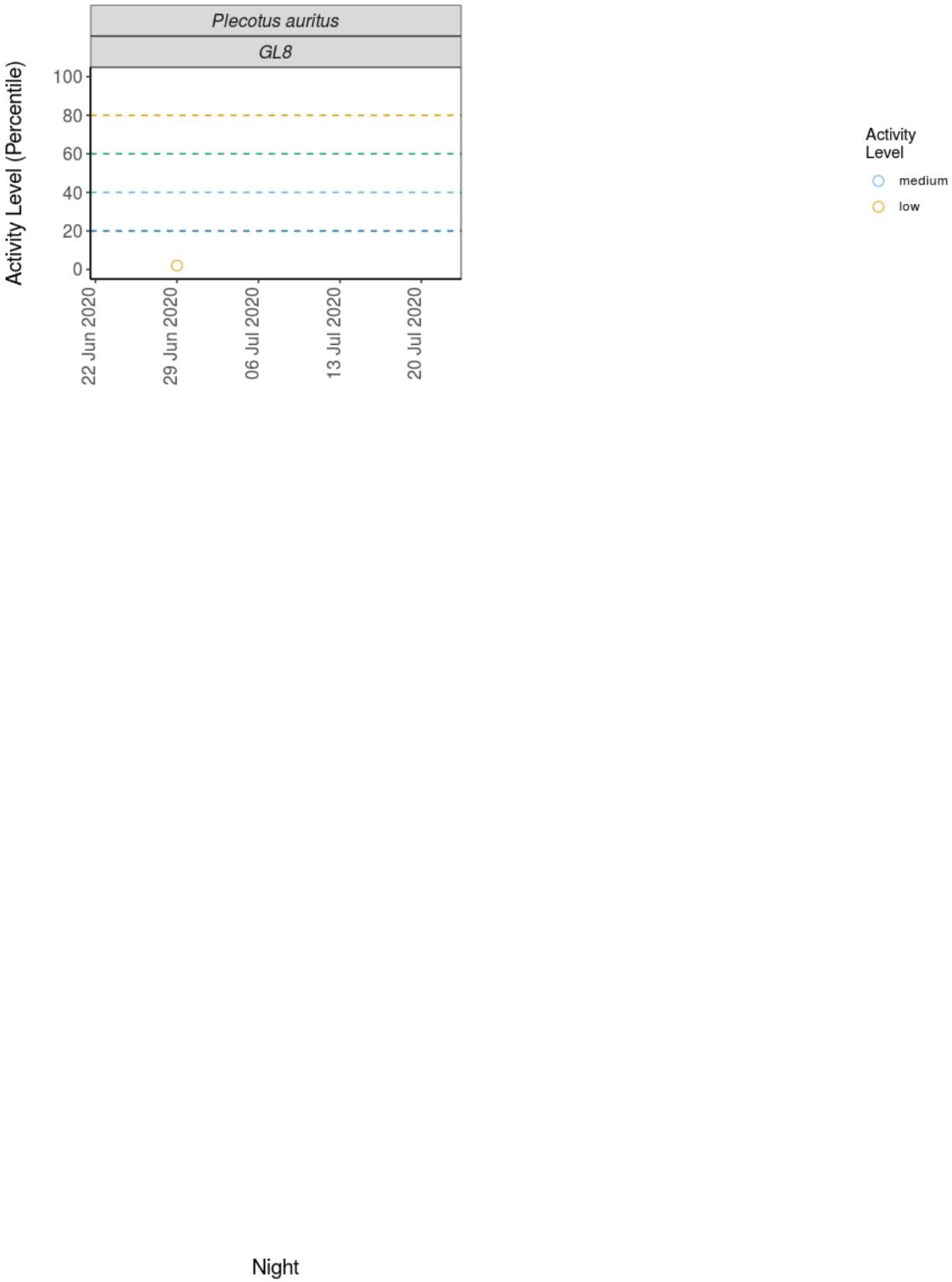
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.


Myotis daubentonii
GL3
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Myotis mystacinus
GL6
Myotis nattereri
GL6
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Activity Level (Percentile)
0
20
40
60
80
100
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 2020
Night
Activity Level
medium
low


Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL7
Pipistrellus pipistrellus
GL1
Activity Level (Percentile)
100
80
60
40
20
0
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 2020
Night
Activity Level
medium
low


Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL4
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL8
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL2
Activity Level (Percentile)
100
80
60
40
20
0
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 2020
Night
Activity Level
medium
low


Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL4
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL8
Pipistrellus pygmaeus
GL9
Plecotus auritus
GL3
Plecotus auritus
GL5
Plecotus auritus
GL6
Activity Level (Percentile)
100
80
60
40
20
0
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 2020
Night
Activity Level
medium
low


Plecotus auritus
GL8
Activity Level (Percentile)
100
80
60
40
20
0
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 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
GL1	*Nyctalus leisleri*	Jun	0	0	0	1	2
GL1	*Pipistrellus pipistrellus*	Jun	0	0	0	0	1
GL2	*Nyctalus leisleri*	Jun	0	0	0	0	1
GL2	*Pipistrellus pipistrellus*	Jun	0	0	1	0	2
GL2	*Pipistrellus pygmaeus*	Jun	0	0	0	0	1
GL3	*Myotis daubentonii*	Jun	0	0	0	0	1
GL3	*Nyctalus leisleri*	Jun	0	0	1	0	0
GL3	*Pipistrellus pipistrellus*	Jun	0	0	2	0	1
GL3	*Pipistrellus pygmaeus*	Jun	0	0	0	0	2
GL3	*Plecotus auritus*	Jun	0	0	0	0	3
GL4	*Nyctalus leisleri*	Jun	0	0	0	1	3
GL4	*Pipistrellus pipistrellus*	Jun	0	1	0	0	1
GL4	*Pipistrellus pygmaeus*	Jun	0	0	0	0	1
GL5	*Myotis daubentonii*	Jun	0	0	0	1	1
GL5	*Nyctalus leisleri*	Jun	0	0	0	1	1
GL5	*Nyctalus leisleri*	Jul	0	0	0	0	1
GL5	*Pipistrellus pipistrellus*	Jun	0	2	2	0	0
GL5	*Plecotus auritus*	Jun	0	0	0	0	1

GL6	*Myotis daubentonii*	Jun	0	0	0	0	1
GL6	*Myotis mystacinus*	Jun	0	0	0	0	1
GL6	*Myotis nattereri*	Jun	0	0	0	0	3
GL6	*Myotis nattereri*	Jul	0	0	0	0	1
GL6	*Nyctalus leisleri*	Jun	0	0	0	1	0
GL6	*Nyctalus leisleri*	Jul	0	0	0	0	1
GL6	*Pipistrellus nathusii*	Jun	0	0	1	0	0
GL6	*Pipistrellus pipistrellus*	Jun	1	0	1	0	2
GL6	*Pipistrellus pygmaeus*	Jun	1	0	0	0	0
GL6	*Plecotus auritus*	Jun	0	0	1	0	0
GL7	*Pipistrellus nathusii*	Jun	0	0	0	0	1
GL8	*Nyctalus leisleri*	Jun	0	0	1	0	1
GL8	*Pipistrellus pipistrellus*	Jun	0	1	0	0	0
GL8	*Pipistrellus pygmaeus*	Jun	0	0	1	0	0
GL8	*Plecotus auritus*	Jun	0	0	0	0	1
GL9	*Nyctalus leisleri*	Jun	0	0	1	0	1
GL9	*Pipistrellus pipistrellus*	Jun	0	0	1	0	0
GL9	*Pipistrellus pygmaeus*	Jun	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
GL1	*Nyctalus leisleri*	Jun	19	2 - 29	29	3
GL1	*Pipistrellus pipistrellus*	Jun	2	0	2	1
GL2	*Nyctalus leisleri*	Jun	2	0	2	1
GL2	*Pipistrellus pipistrellus*	Jun	2	2 - 2	51	3
GL2	*Pipistrellus pygmaeus*	Jun	2	0	2	1
GL3	*Myotis daubentonii*	Jun	2	0	2	1
GL3	*Nyctalus leisleri*	Jun	41	0	41	1
GL3	*Pipistrellus pipistrellus*	Jun	45	19 - 51	51	3
GL3	*Pipistrellus pygmaeus*	Jun	2	2 - 2	2	2
GL3	*Plecotus auritus*	Jun	19	19 - 19	19	3
GL4	*Nyctalus leisleri*	Jun	19	10.5 - 27.5	36	4
GL4	*Pipistrellus pipistrellus*	Jun	40	40 - 40	78	2
GL4	*Pipistrellus pygmaeus*	Jun	2	0	2	1
GL5	*Myotis daubentonii*	Jun	16	15.5 - 15.5	29	2
GL5	*Nyctalus leisleri*	Jun	19	2 - 2	36	2
GL5	*Nyctalus leisleri*	Jul	2	2 - 2	2	1
GL5	*Pipistrellus pipistrellus*	Jun	60	41 - 76	76	4
GL5	*Plecotus auritus*	Jun	2	0	2	1
GL6	*Myotis daubentonii*	Jun	2	0	2	1
GL6	*Myotis mystacinus*	Jun	2	0	2	1
GL6	*Myotis nattereri*	Jun	2	2 - 2	19	3

GL6	*Myotis nattereri*	Jul	2	2 - 2	2	1
GL6	*Nyctalus leisleri*	Jun	36	19 - 19	36	1
GL6	*Nyctalus leisleri*	Jul	2	19 - 19	2	1
GL6	*Pipistrellus nathusii*	Jun	51	0	51	1
GL6	*Pipistrellus pipistrellus*	Jun	25	2 - 49	96	4
GL6	*Pipistrellus pygmaeus*	Jun	86	0	86	1
GL6	*Plecotus auritus*	Jun	58	0	58	1
GL7	*Pipistrellus nathusii*	Jun	2	0	2	1
GL8	*Nyctalus leisleri*	Jun	29	29 - 29	56	2
GL8	*Pipistrellus pipistrellus*	Jun	76	0	76	1
GL8	*Pipistrellus pygmaeus*	Jun	48	0	48	1
GL8	*Plecotus auritus*	Jun	2	0	2	1
GL9	*Nyctalus leisleri*	Jun	22	21.5 - 21.5	41	2
GL9	*Pipistrellus pipistrellus*	Jun	48	0	48	1
GL9	*Pipistrellus pygmaeus*	Jun	19	0	19	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 daubentonii	0	0	0	1	3
Myotis mystacinus	0	0	0	0	1
Myotis nattereri	0	0	0	0	4
Nyctalus leisleri	0	0	3	4	11
Pipistrellus nathusii	0	0	1	0	1
Pipistrellus pipistrellus	1	4	7	0	7
Pipistrellus pygmaeus	1	0	1	0	5
Plecotus auritus	0	0	1	0	5

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

Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	2	15.5 - 15.5	29	4
Myotis mystacinus	2	0	2	1
Myotis nattereri	2	2 - 2	19	4
Nyctalus leisleri	19	29 - 29	56	18
Pipistrellus nathusii	27	0	51	2
Pipistrellus pipistrellus	48	41 - 76	96	19
Pipistrellus pygmaeus	2	2 - 2	86	7
Plecotus auritus	11	19 - 19	58	6

###Figures

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

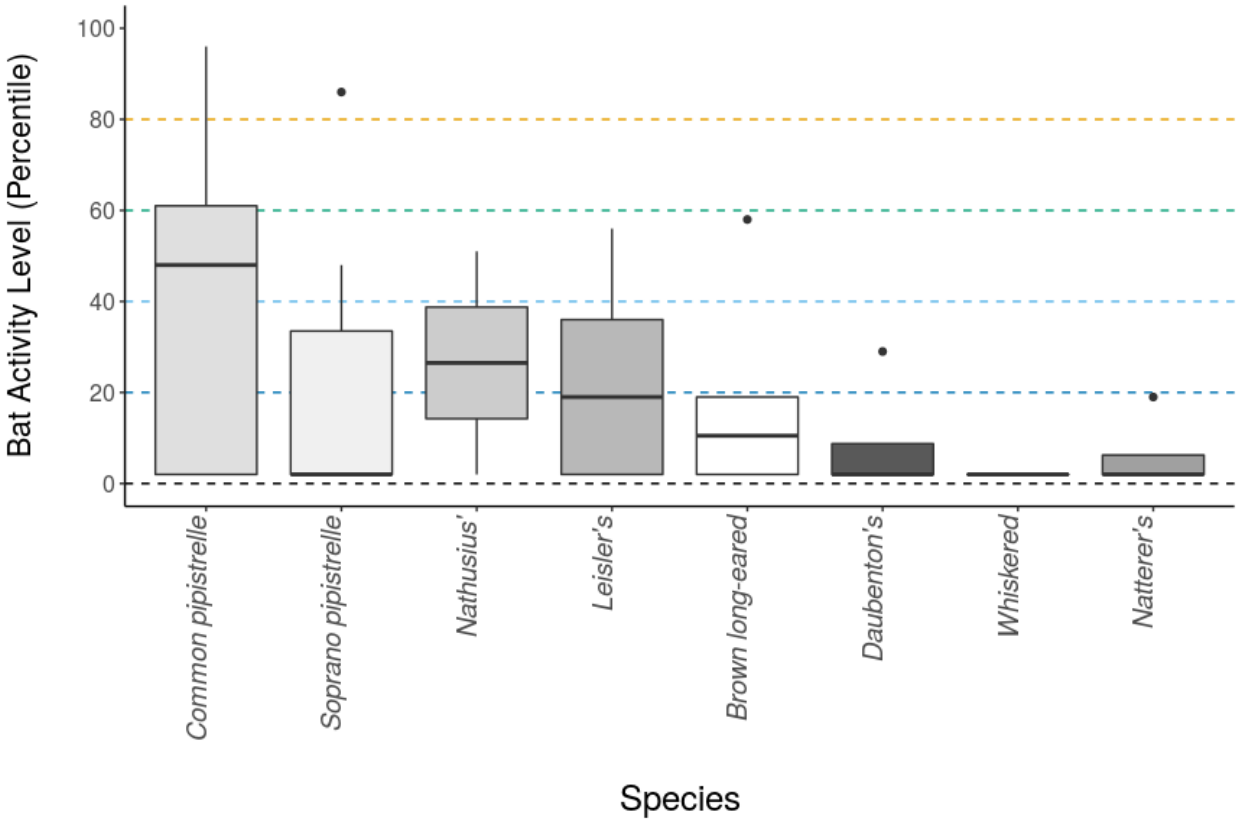
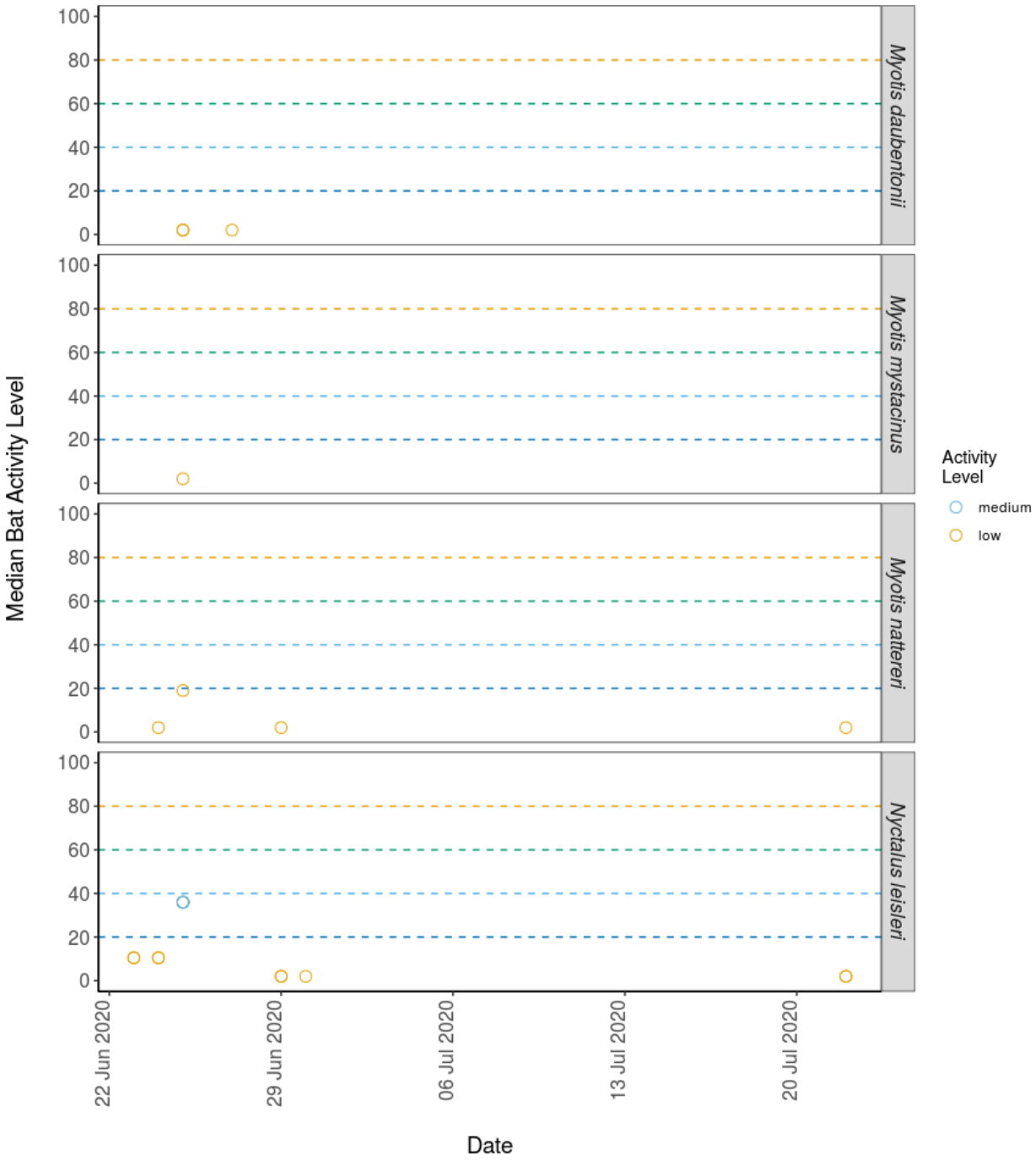
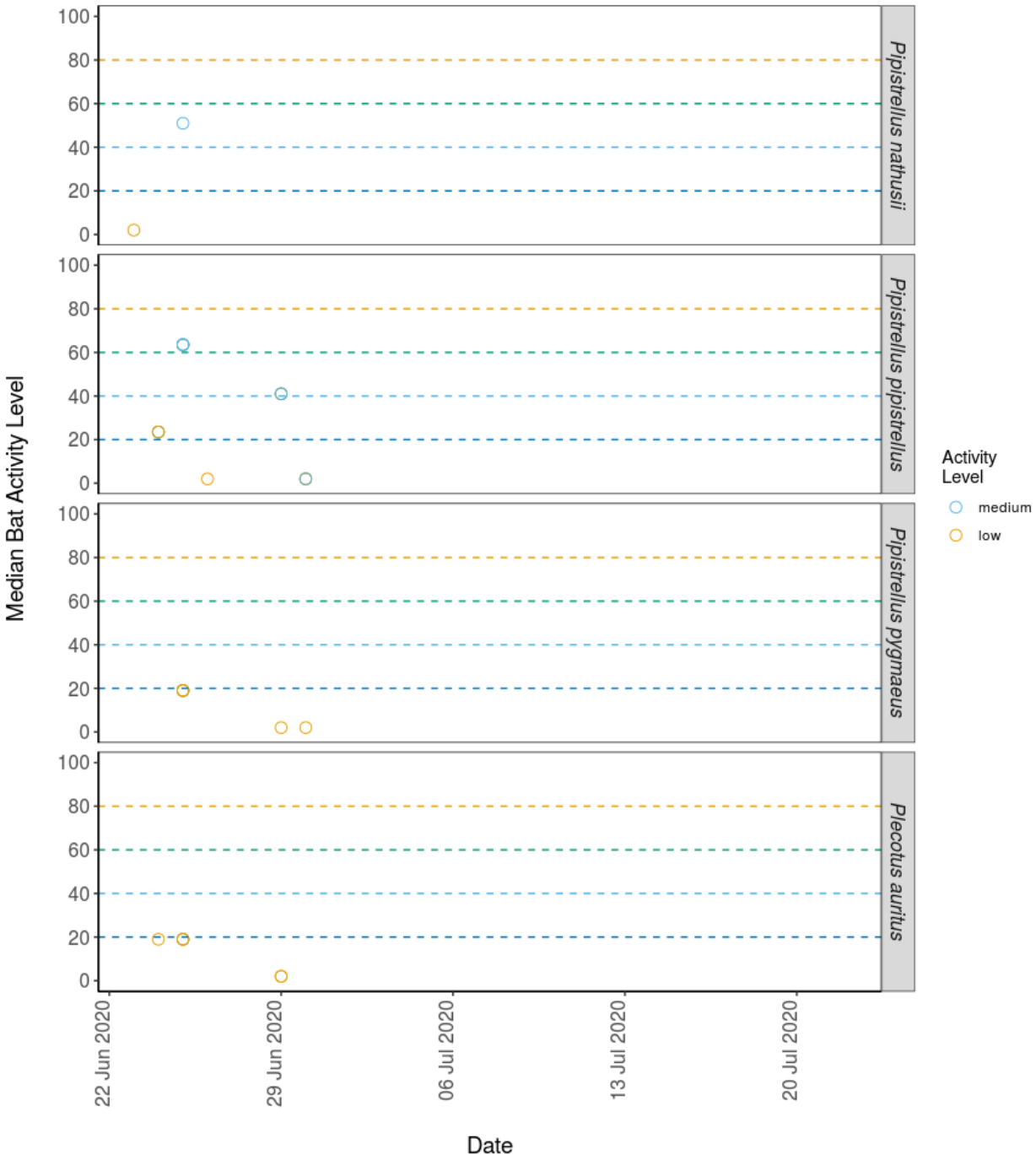


Figure 5. The median activity levels of bats recorded across all detectors each night.


Median Bat Activity Level
100
80
60
40
20
0
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 2020
Date
Activity Level
medium
low


Median Bat Activity Level
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
22 Jun 2020
29 Jun 2020
06 Jul 2020
13 Jul 2020
20 Jul 2020
Date
Activity Level
medium
low

PER SITE, PER MONTH

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

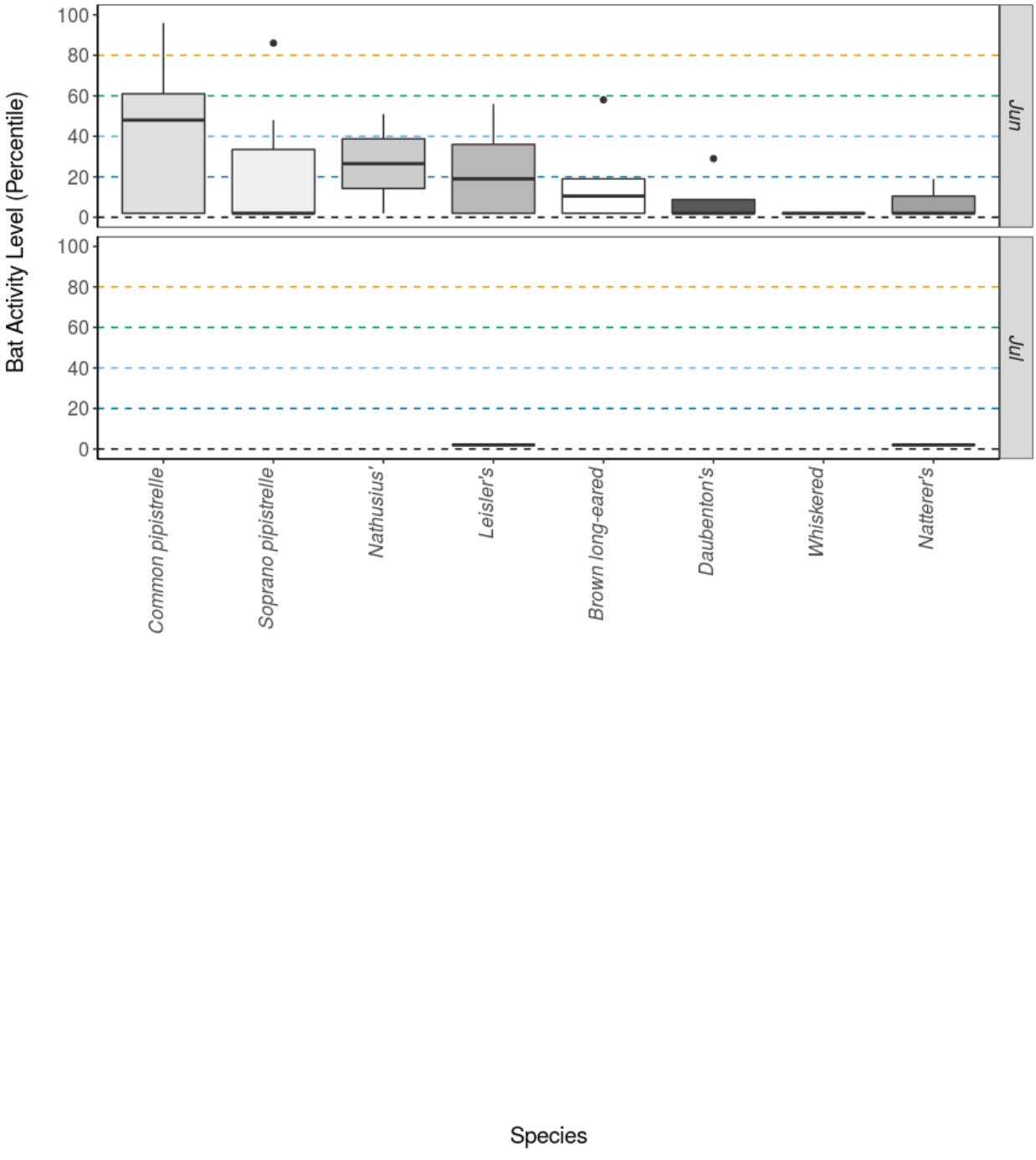
Species/Species Group	Month	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis daubentonii	Jun	0	0	0	1	3
Myotis mystacinus	Jun	0	0	0	0	1
Myotis nattereri	Jun	0	0	0	0	3
Myotis nattereri	Jul	0	0	0	0	1
Nyctalus leisleri	Jun	0	0	3	4	9
Nyctalus leisleri	Jul	0	0	0	0	2
Pipistrellus nathusii	Jun	0	0	1	0	1
Pipistrellus pipistrellus	Jun	1	4	7	0	7
Pipistrellus pygmaeus	Jun	1	0	1	0	5
Plecotus auritus	Jun	0	0	1	0	5

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

Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	Jun	2	15.5 - 15.5	29	4
Myotis mystacinus	Jun	2	0	2	1
Myotis nattereri	Jun	2	2 - 2	19	3
Myotis nattereri	Jul	2	2 - 2	2	1
Nyctalus leisleri	Jun	19	29 - 29	56	16
Nyctalus leisleri	Jul	2	2 - 2	2	2
Pipistrellus nathusii	Jun	27	0	51	2
Pipistrellus pipistrellus	Jun	48	41 - 76	96	19
Pipistrellus pygmaeus	Jun	2	2 - 2	86	7
Plecotus auritus	Jun	11	19 - 19	58	6

###Figures

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



PART 2: Nightly Analysis

ENTIRE SURVEY PERIOD

Sunrise and Sunset Times

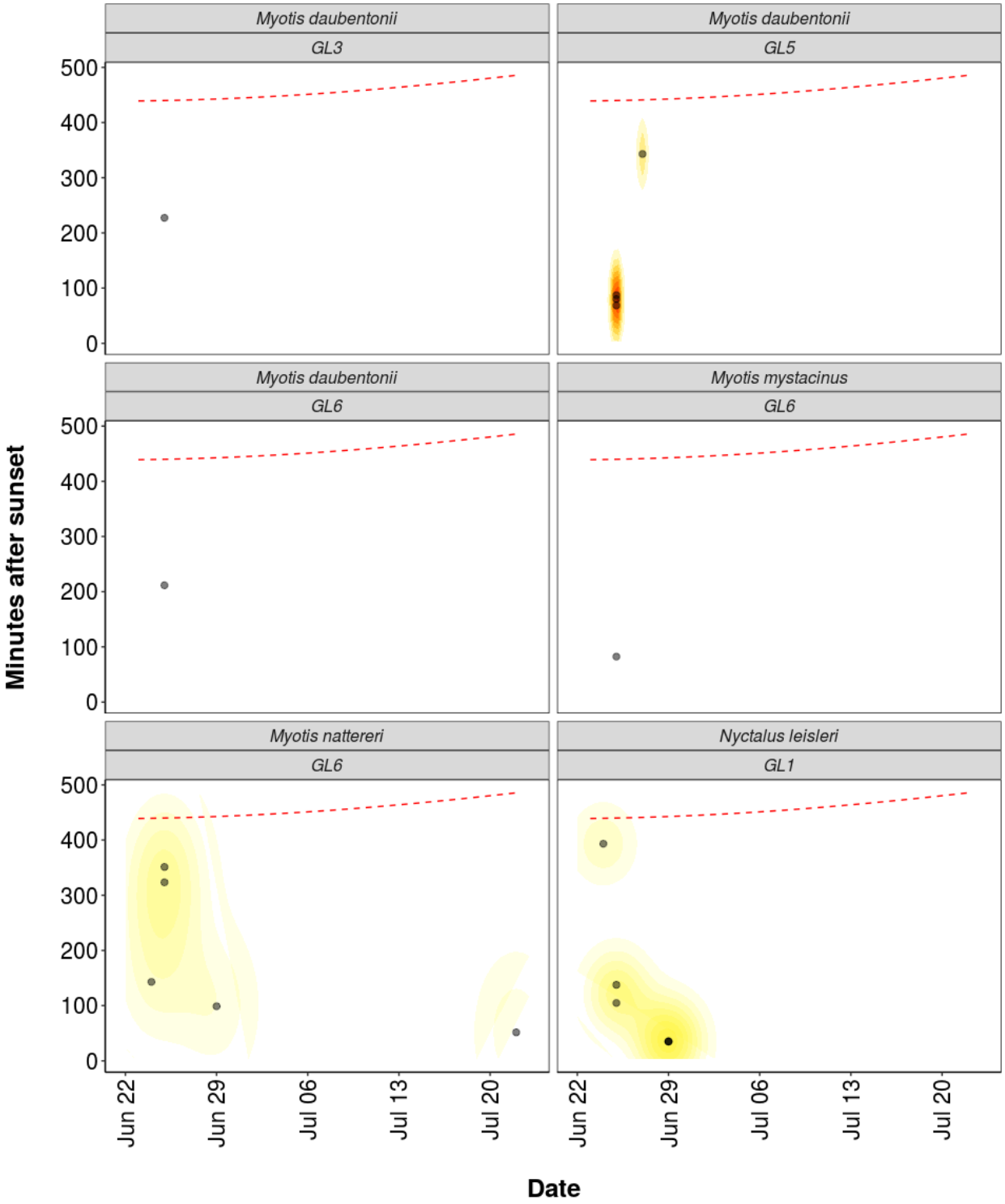
Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.

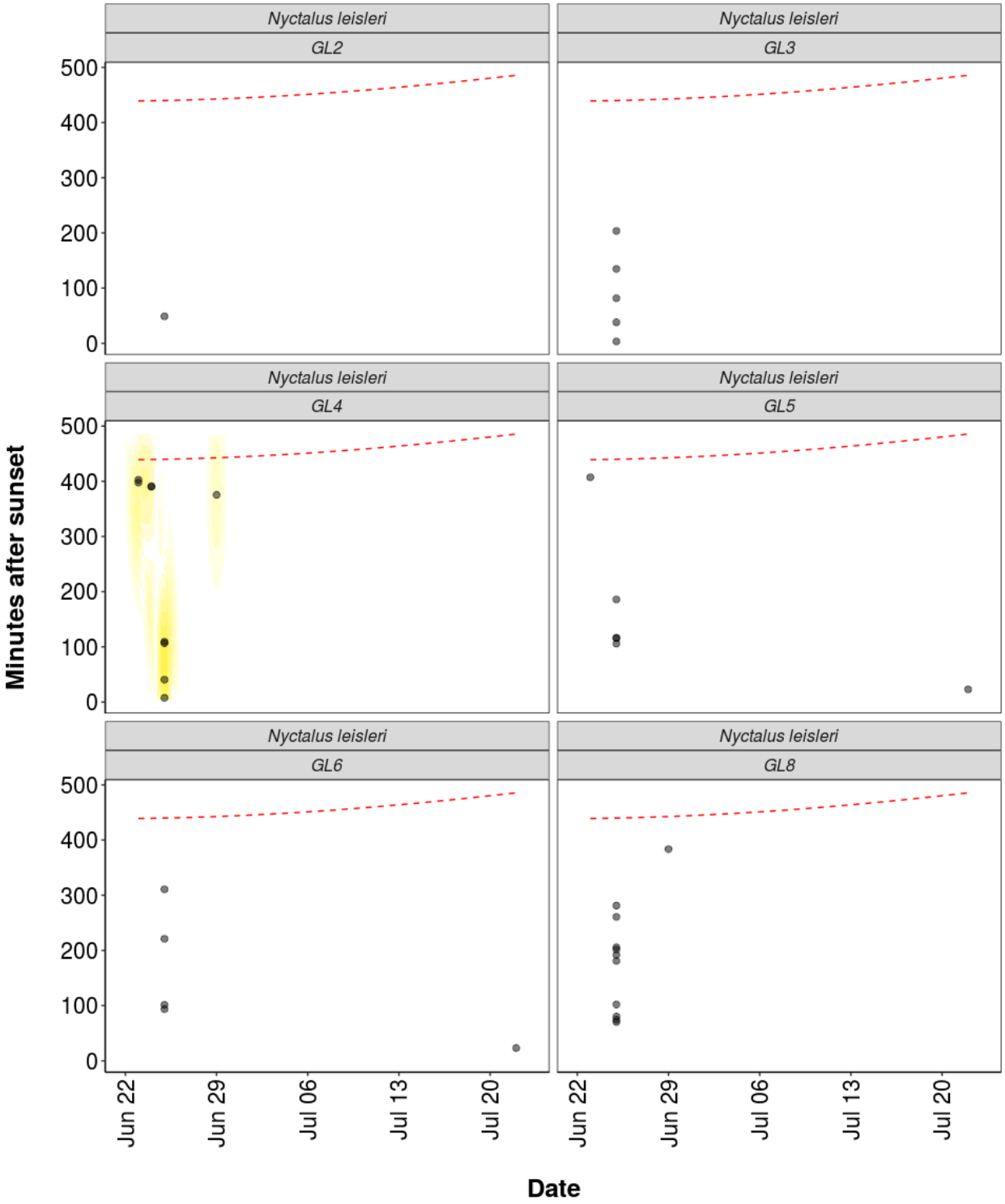
Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)
2020-06-23	22:01	05:20	7.3
2020-06-24	22:01	05:20	7.3
2020-06-25	22:01	05:20	7.3
2020-06-26	22:01	05:21	7.3
2020-06-27	22:00	05:21	7.4
2020-06-29	22:00	05:23	7.4
2020-06-30	22:00	05:23	7.4
2020-07-22	21:42	05:47	8.1

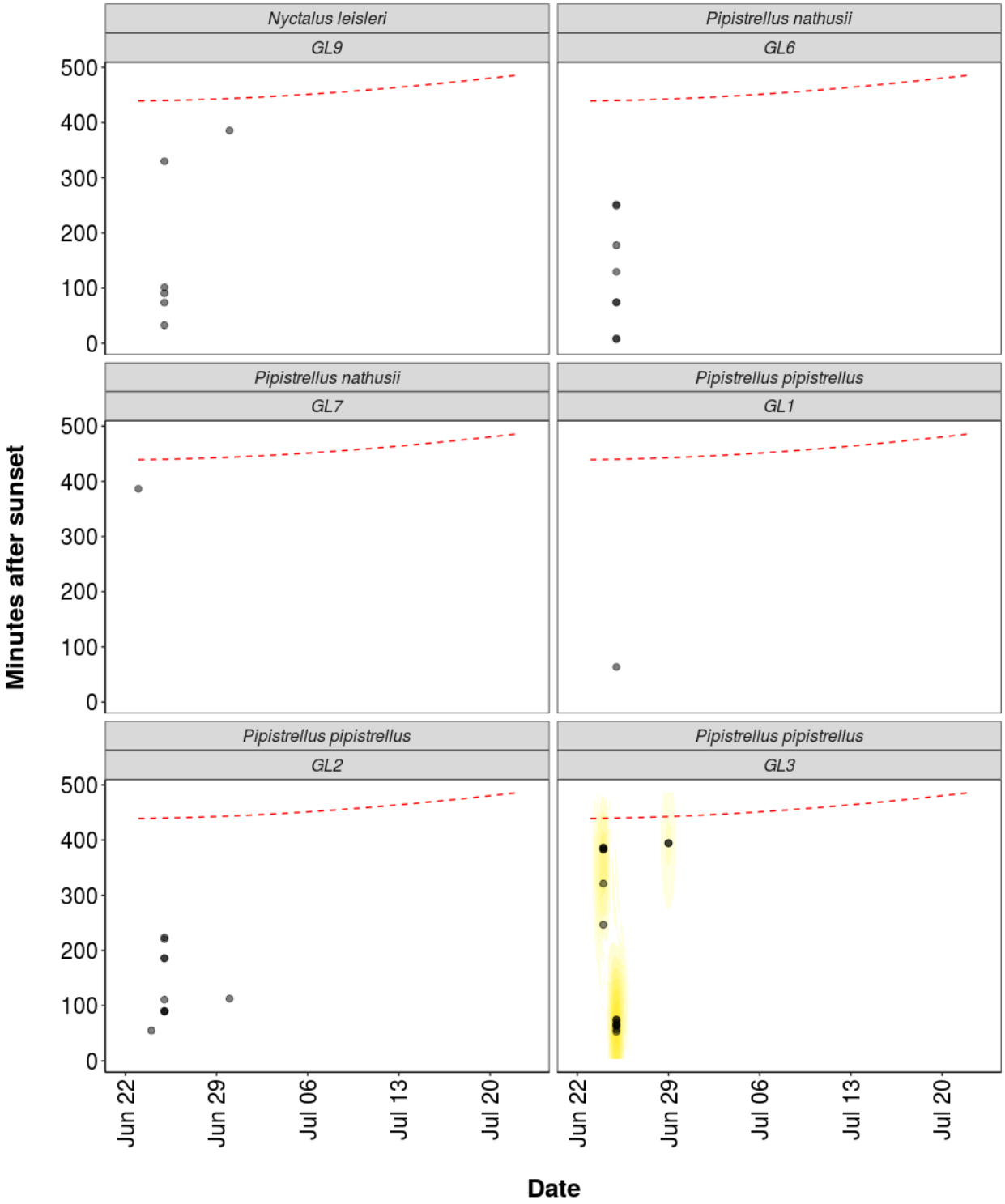
Distribution of Bat Activity Across the Night through Time

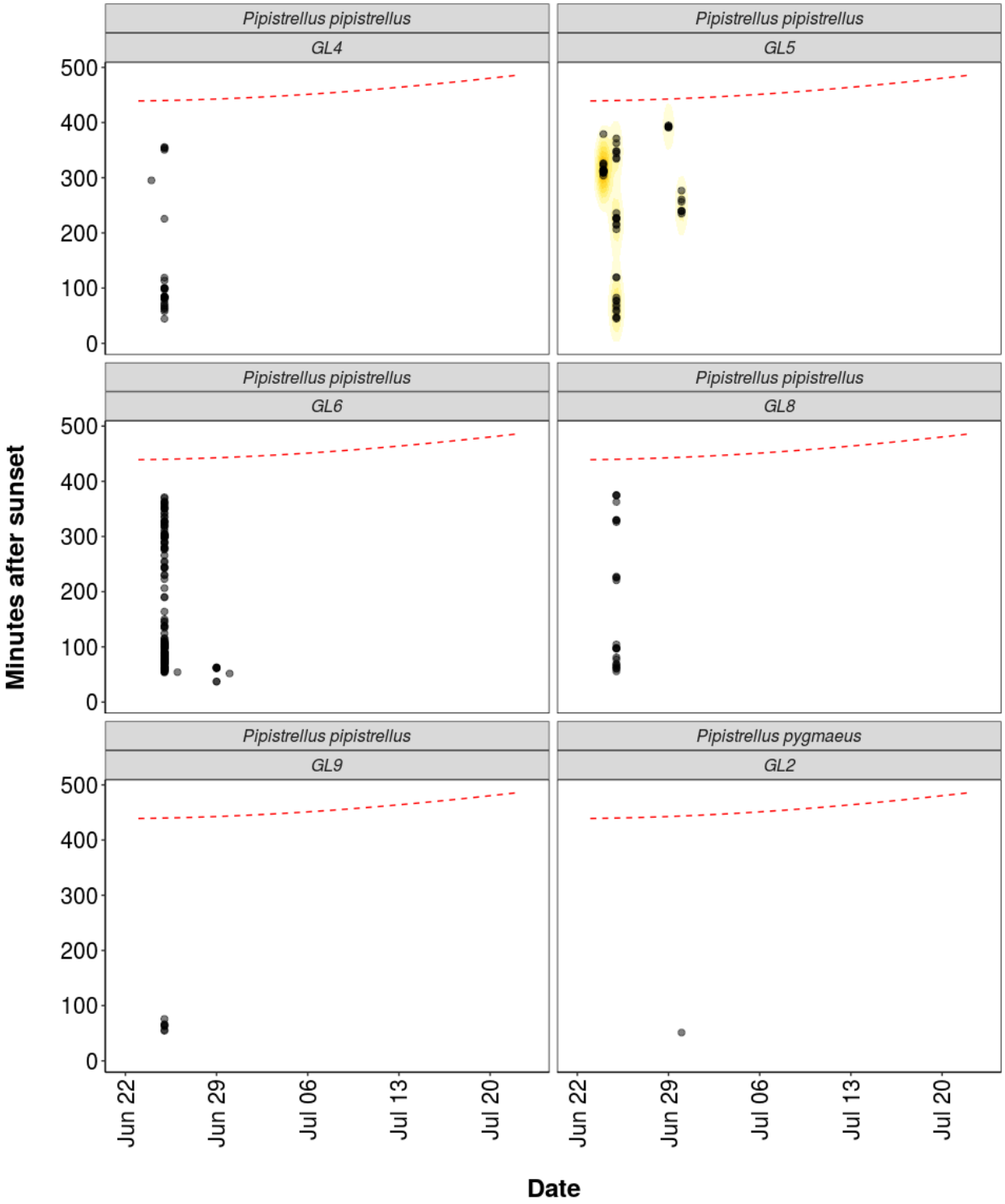
Per Detector

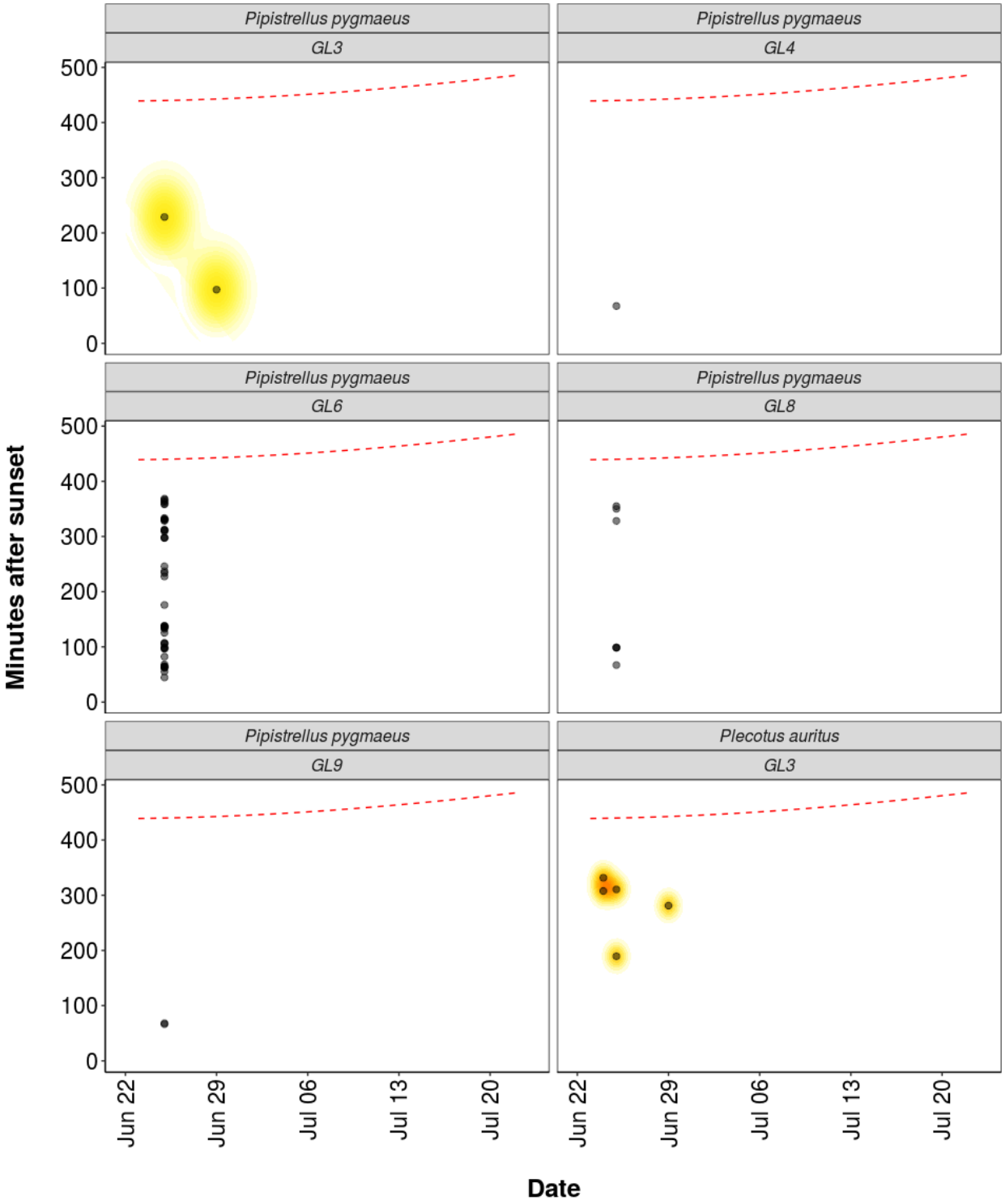
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

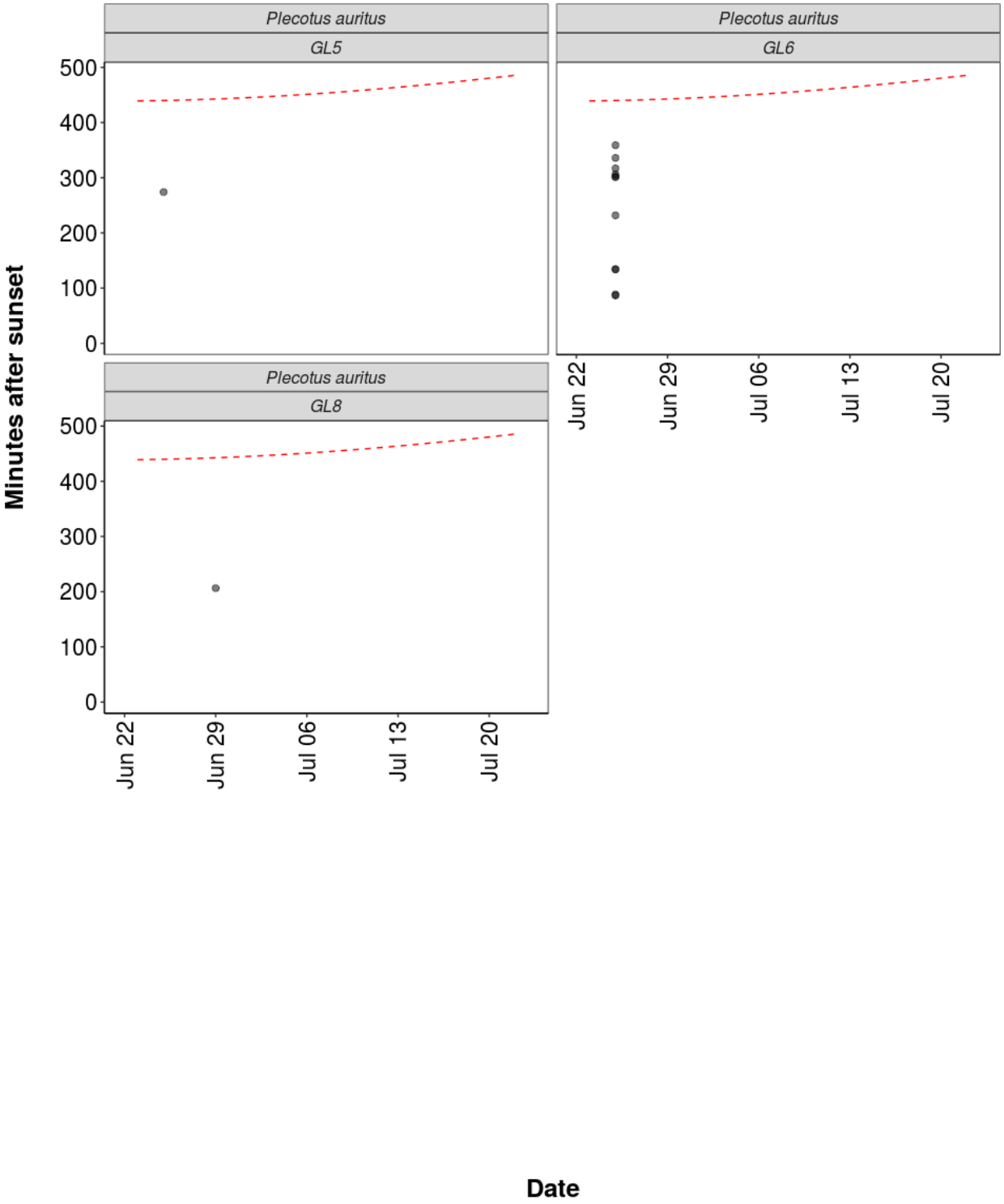

Myotis daubentonii
GL3
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Myotis mystacinus
GL6
Myotis nattereri
GL6
Nyctalus leisleri
GL1
Minutes after sunset
0
100
200
300
400
500
Jun 22
Jun 29
Jul 06
Jul 13
Jul 20
Date


Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Nyctalus leisleri
GL8
Minutes after sunset
0
100
200
300
400
500
Jun 22
Jun 29
Jul 06
Jul 13
Jul 20
Date


Nyctalus leisleri
GL9
Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL7
Pipistrellus pipistrellus
GL1
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL3
Minutes after sunset
0
100
200
300
400
500
Jun 22
Jun 29
Jul 06
Jul 13
Jul 20
Date


Pipistrellus pipistrellus
GL4
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL8
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL2
Minutes after sunset
0
100
200
300
400
500
Jun 22
Jun 29
Jul 06
Jul 13
Jul 20
Date


Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL4
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL8
Pipistrellus pygmaeus
GL9
Plecotus auritus
GL3
Minutes after sunset
0
100
200
300
400
500
Jun 22
Jun 29
Jul 06
Jul 13
Jul 20
Date


Plecotus auritus
GL5
Plecotus auritus
GL6
Plecotus auritus
GL8
Minutes after sunset
0
100
200
300
400
500
Jun 22
Jun 29
Jul 06
Jul 13
Jul 20
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/

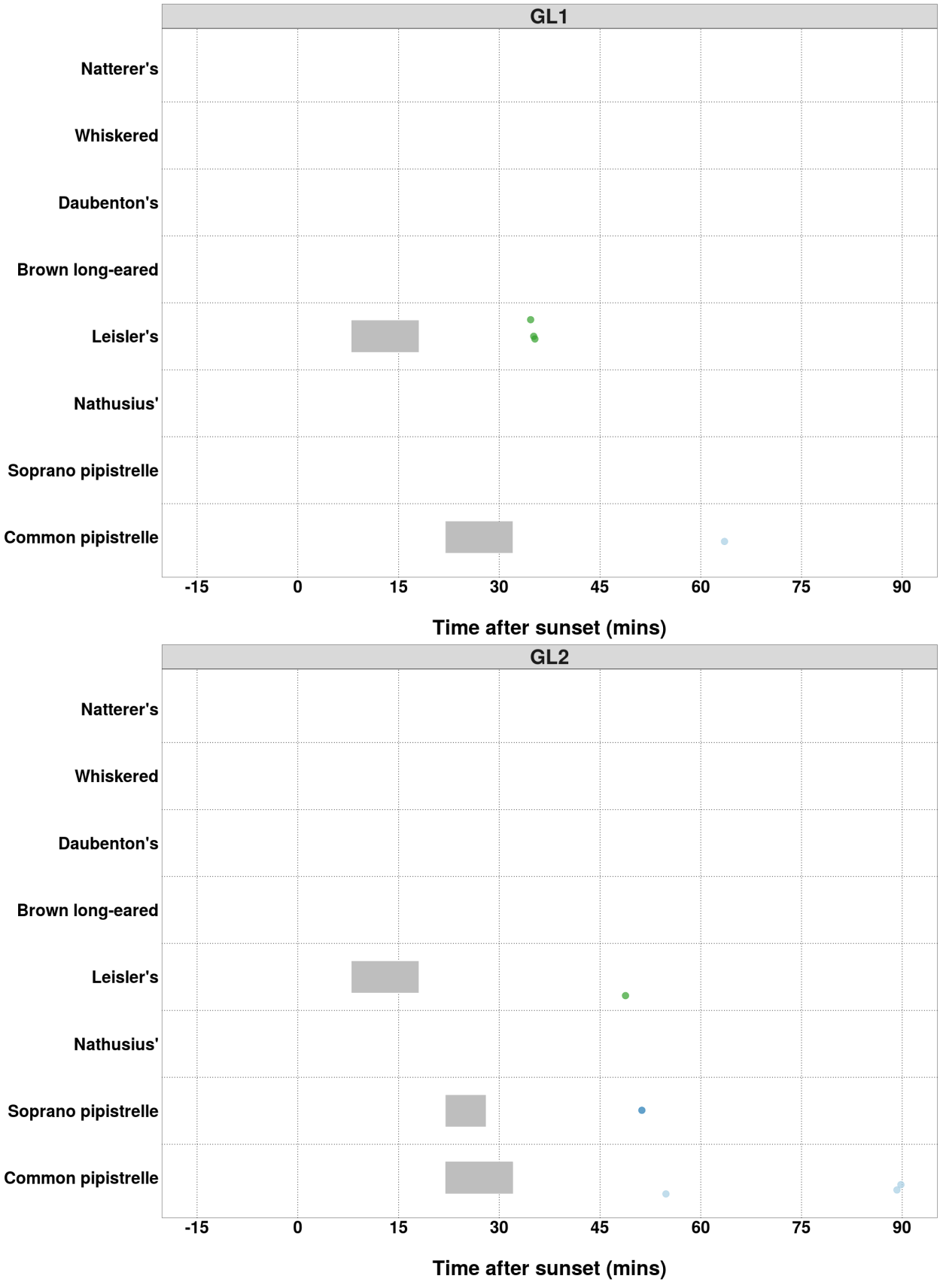
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012) - Table

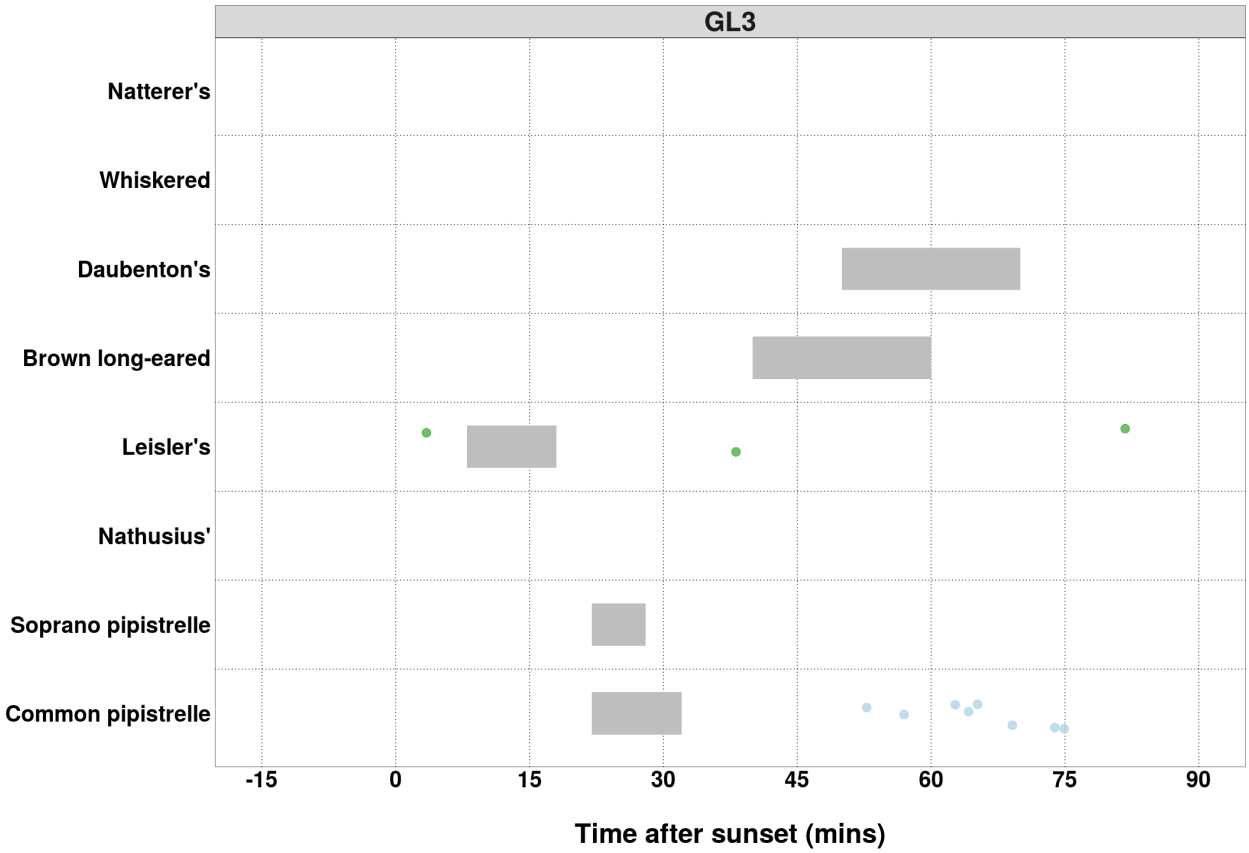
Table 12. Number of bat calls recorded before the upper time of the species-specific emergence time range, and which therefore may potentially indicate the presence of a nearby roost.

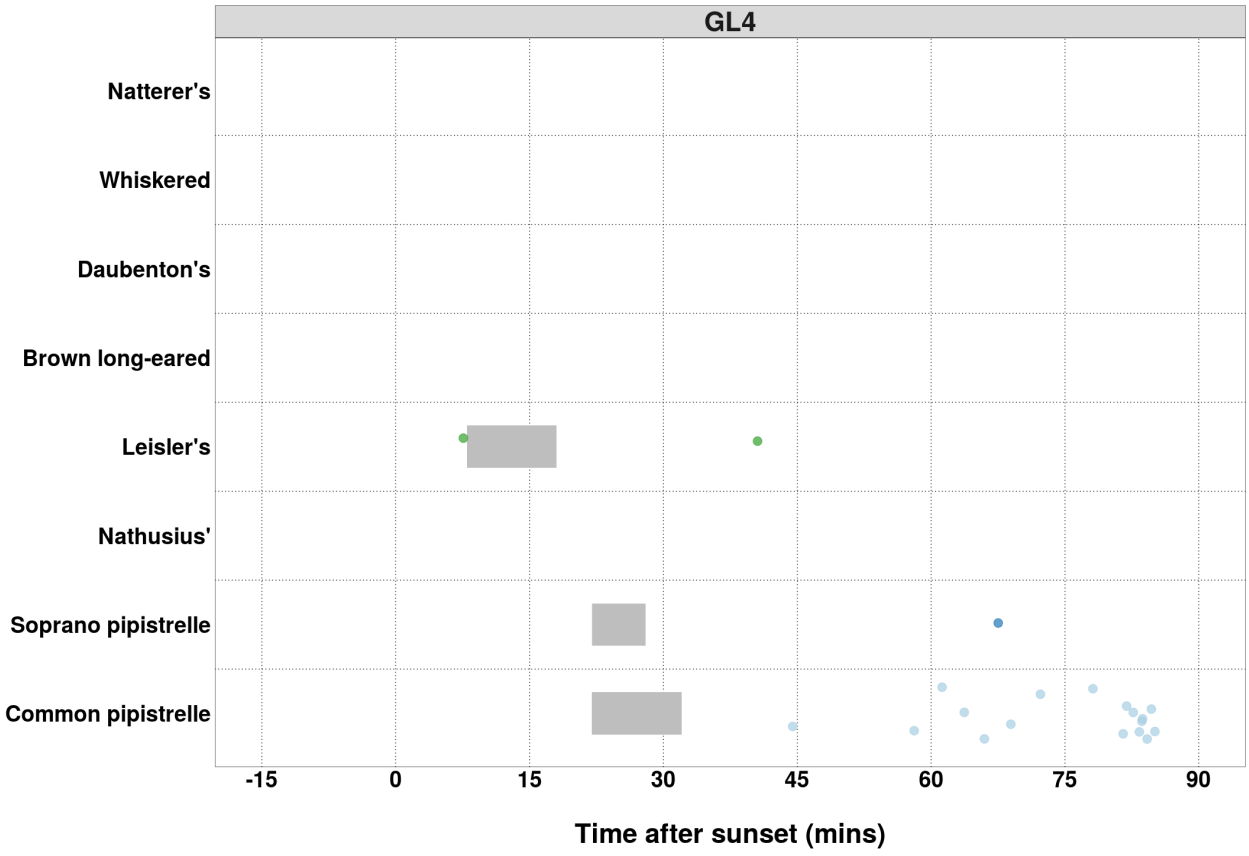
Species	Detector ID	2020-06-25	2020-07-22
Nathusius'	GL6	2	0
Leisler's	GL3	1	0
Leisler's	GL4	1	0
Daubenton's	GL5	1	0
Natterer's	GL6	0	1

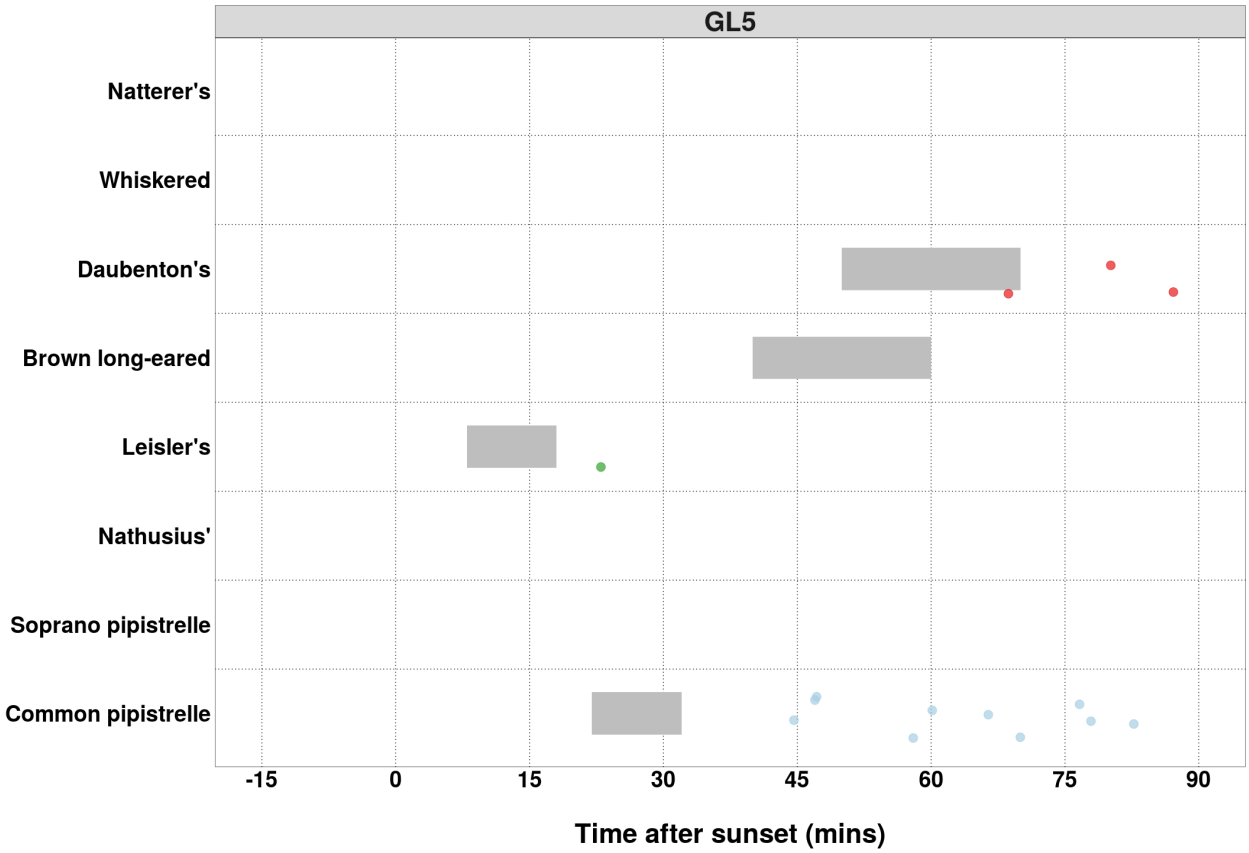
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012) - Figures

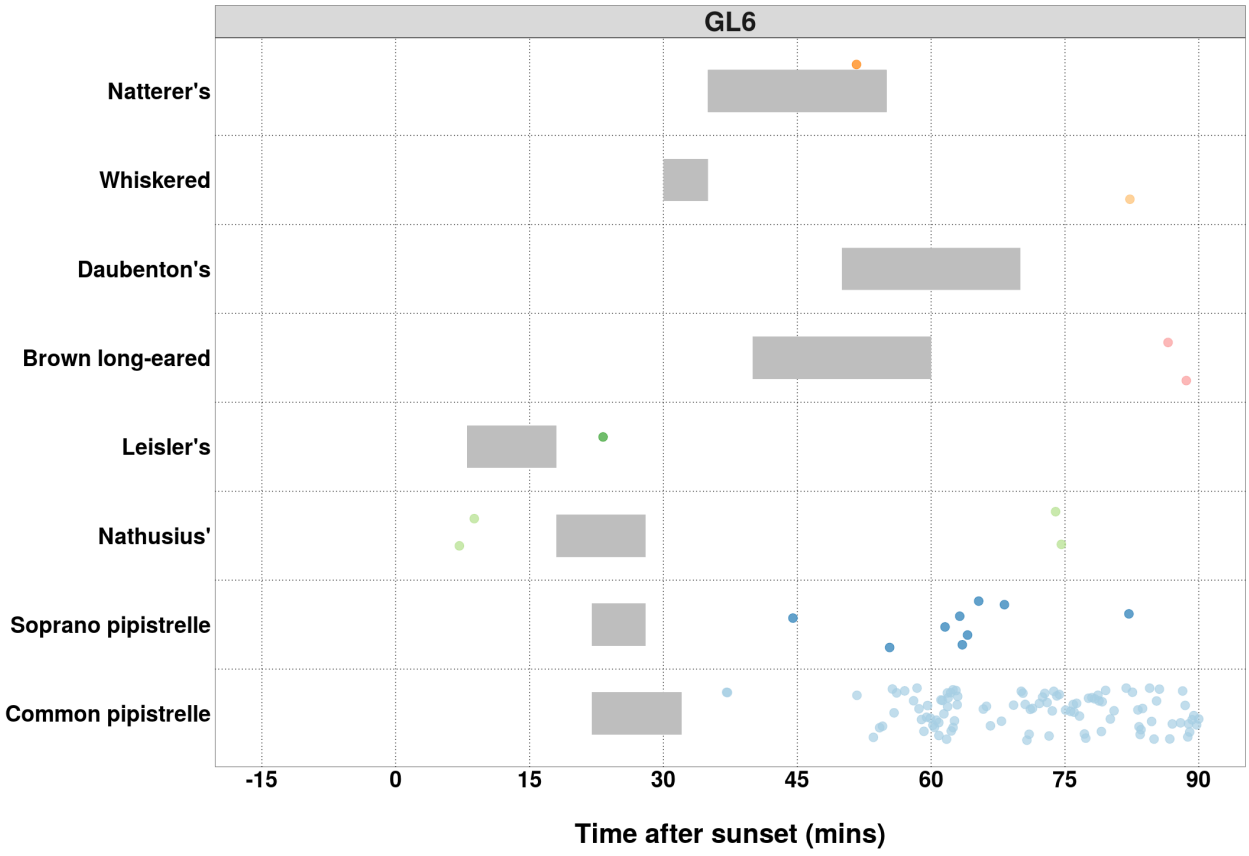
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.

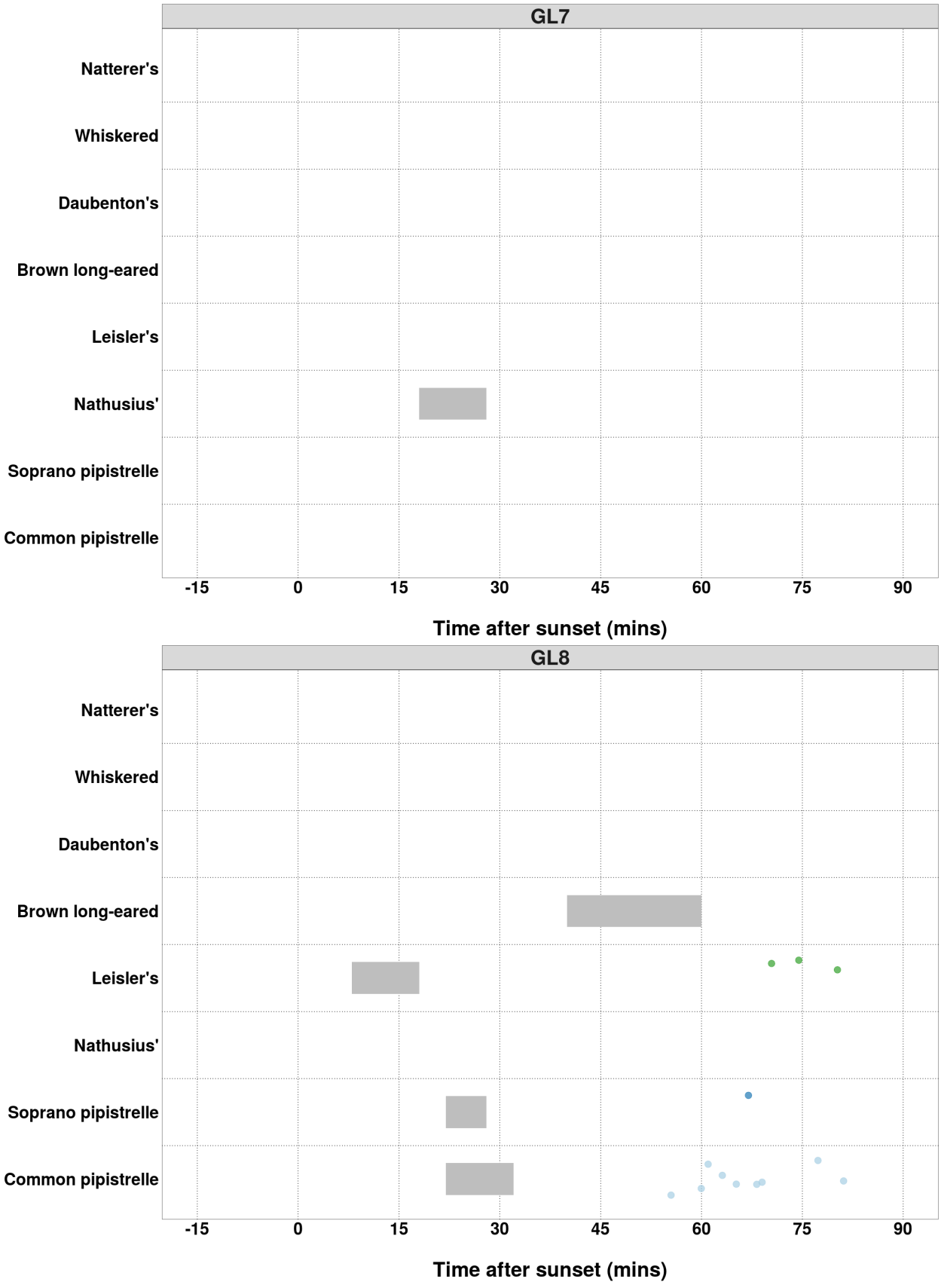

GL1
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)
GL2
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

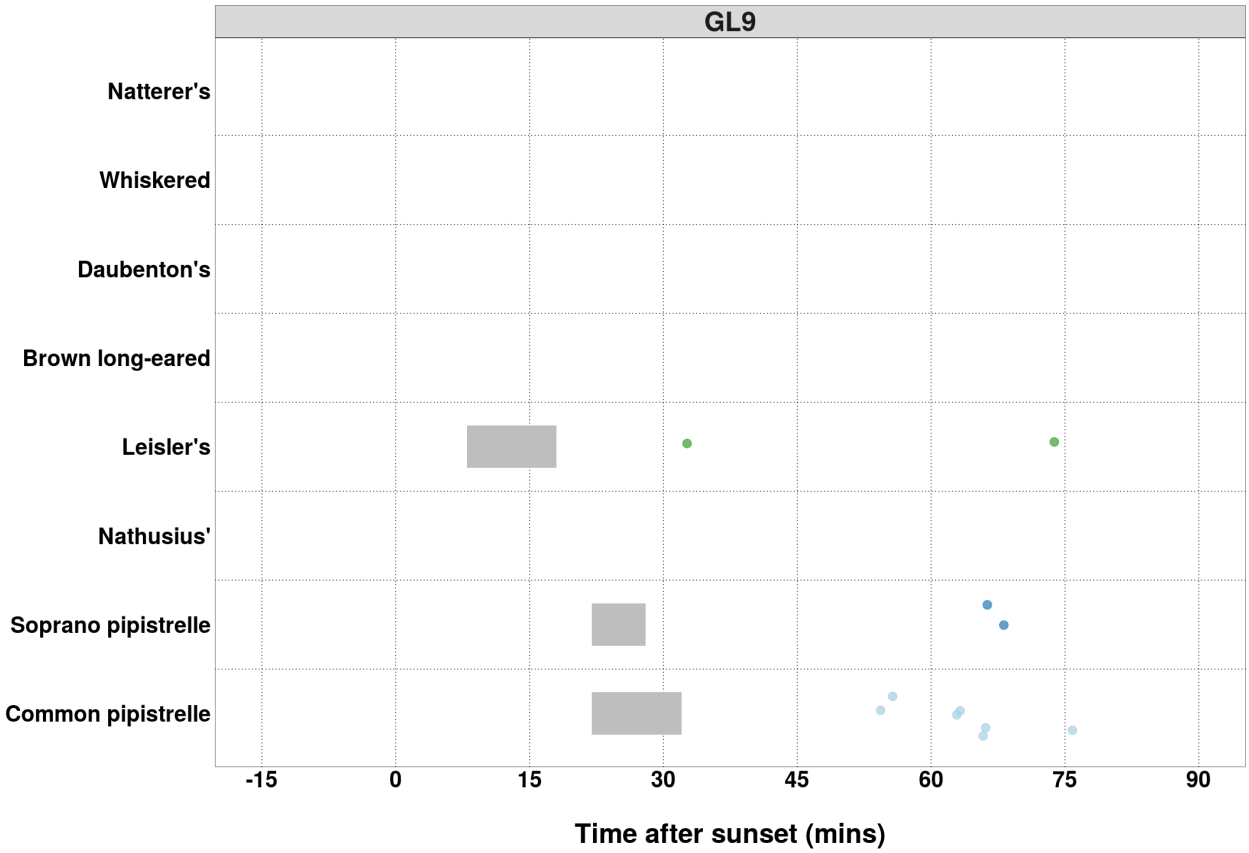

GL3
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL4
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL5
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL6
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL7
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)
GL8
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL9
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
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	364	71.0
Soprano pipistrelle	61	11.9
Nathusius'	9	1.8
Leisler's	49	9.6
Brown long-eared	18	3.5
Daubenton's	6	1.2
Whiskered	1	0.2
Natterer's	5	1.0
Total	513	100.2

Counts of Bat Passes

Per Detector

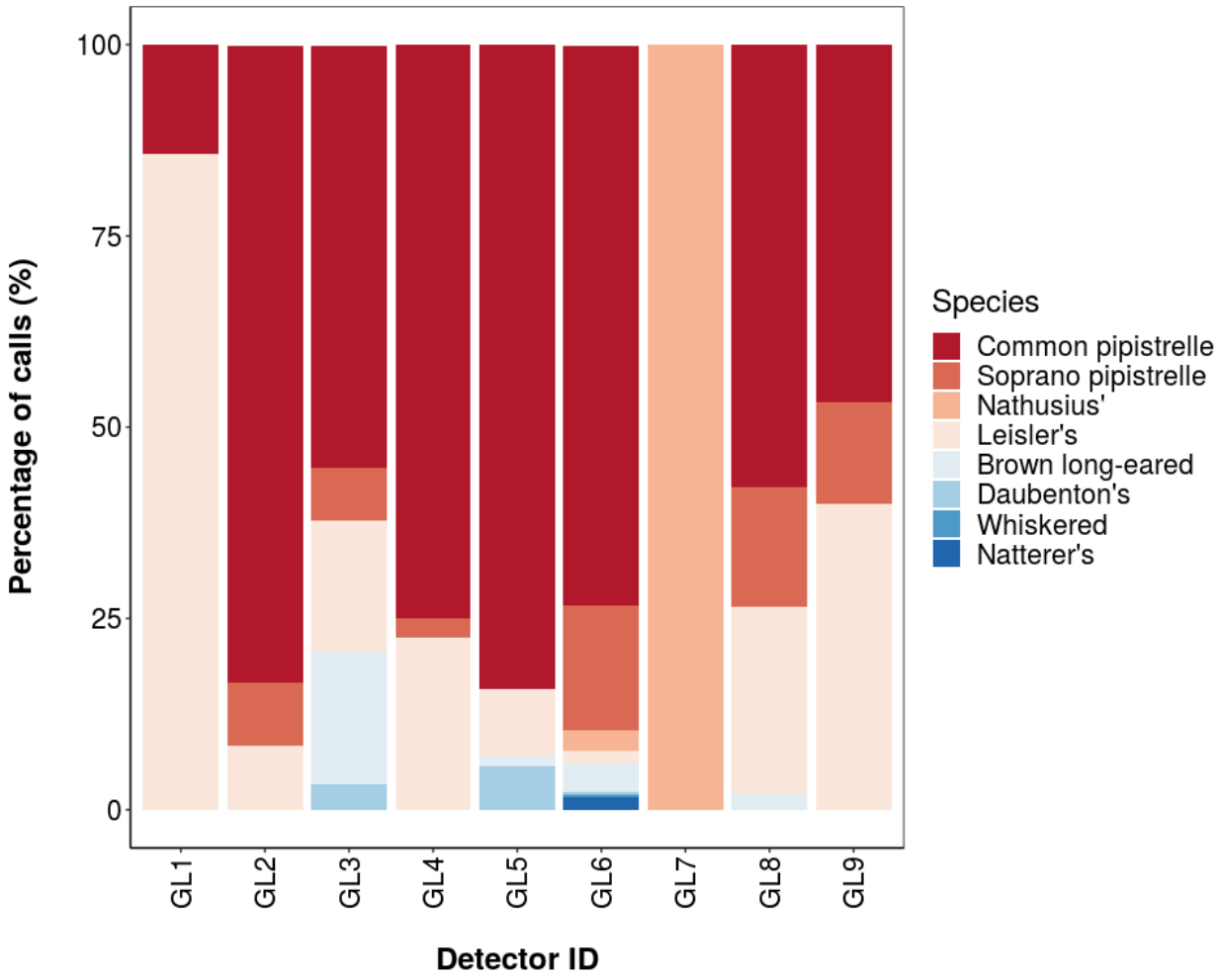
Table 15. The number of passes recorded for each species at each detector.

Species	Detector ID	Count (No)	Percentage by Detector (%)
Common pipistrelle	GL1	1	14.3
Common pipistrelle	GL2	10	83.3
Common pipistrelle	GL3	16	55.2
Common pipistrelle	GL4	30	75.0
Common pipistrelle	GL5	59	84.3
Common pipistrelle	GL6	215	73.1
Common pipistrelle	GL8	26	57.8
Common pipistrelle	GL9	7	46.7
Soprano pipistrelle	GL2	1	8.3
Soprano pipistrelle	GL3	2	6.9
Soprano pipistrelle	GL4	1	2.5
Soprano pipistrelle	GL6	48	16.3
Soprano pipistrelle	GL8	7	15.6
Soprano pipistrelle	GL9	2	13.3
Nathusius'	GL6	8	2.7
Nathusius'	GL7	1	100.0
Leisler's	GL1	6	85.7
Leisler's	GL2	1	8.3
Leisler's	GL3	5	17.2
Leisler's	GL4	9	22.5
Leisler's	GL5	6	8.6
Leisler's	GL6	5	1.7
Leisler's	GL8	11	24.4
Leisler's	GL9	6	40.0
Brown long-eared	GL3	5	17.2
Brown long-eared	GL5	1	1.4
Brown long-eared	GL6	11	3.7
Brown long-eared	GL8	1	2.2
Daubenton's	GL3	1	3.4

Daubenton's	GL5	4	5.7
Daubenton's	GL6	1	0.3
Whiskered	GL6	1	0.3
Natterer's	GL6	5	1.7

Species Composition

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



PART 2a: Presence Only

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

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Common pipistrelle	GL1	0.1
Common pipistrelle	GL2	0.1
Common pipistrelle	GL3	0.8
Common pipistrelle	GL4	2.0
Common pipistrelle	GL5	1.8
Common pipistrelle	GL6	0.5
Common pipistrelle	GL8	3.5
Common pipistrelle	GL9	1.0
Soprano pipistrelle	GL2	0.1
Soprano pipistrelle	GL3	0.1
Soprano pipistrelle	GL4	0.1
Soprano pipistrelle	GL6	6.5
Soprano pipistrelle	GL8	1.0
Soprano pipistrelle	GL9	0.3
Nathusius'	GL6	1.1
Nathusius'	GL7	0.1
Leisler's	GL1	0.3
Leisler's	GL2	0.1
Leisler's	GL3	0.7
Leisler's	GL4	0.3
Leisler's	GL5	0.1
Leisler's	GL6	0.3
Leisler's	GL8	0.8

Leisler's	GL9	0.4
Brown long-eared	GL3	0.3
Brown long-eared	GL5	0.1
Brown long-eared	GL6	1.5
Brown long-eared	GL8	0.1
Daubenton's	GL3	0.1
Daubenton's	GL5	0.3
Daubenton's	GL6	0.1
Whiskered	GL6	0.1
Natterer's	GL6	0.1

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.

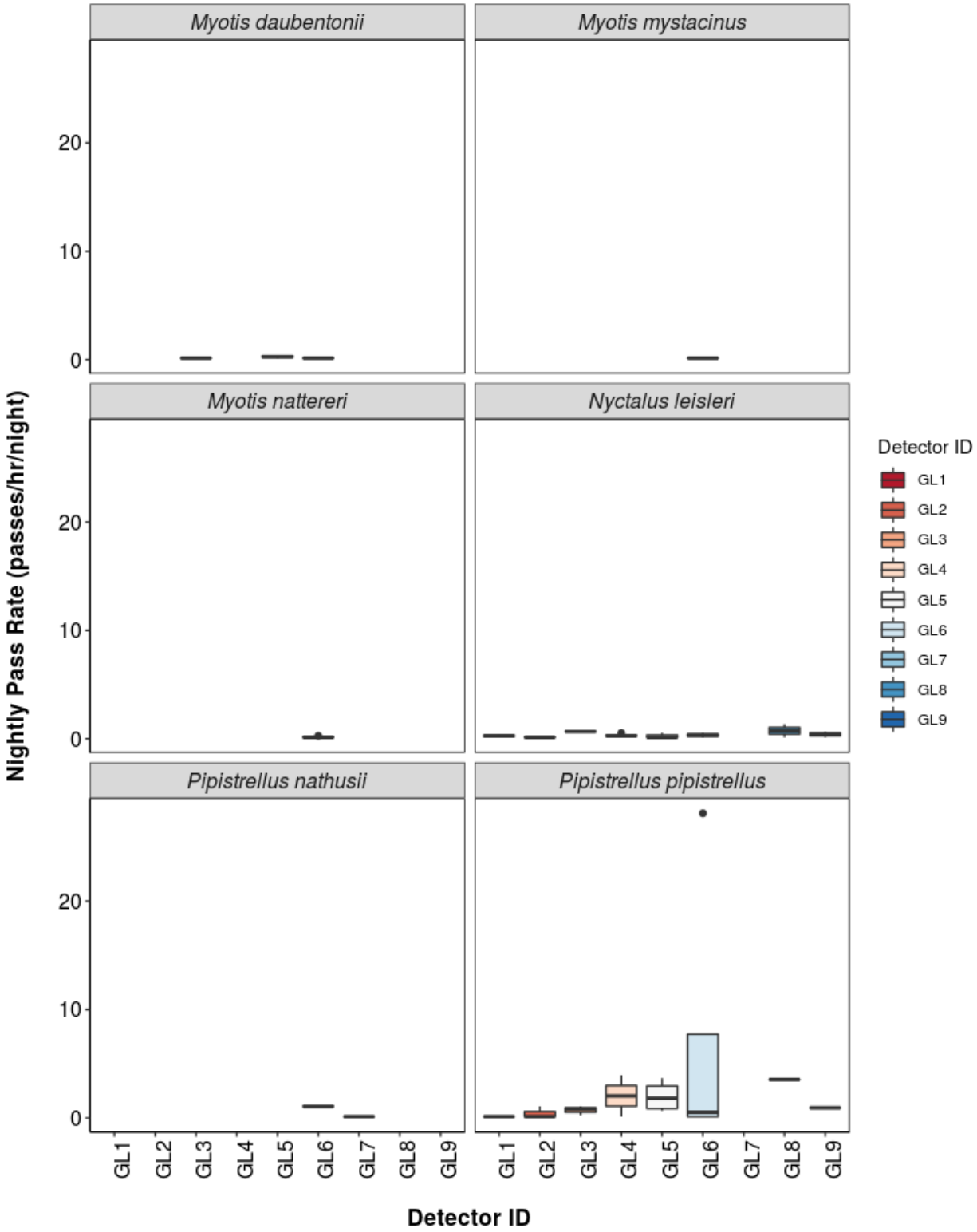
Species	Detector ID	Mean Pass Rate
Common pipistrelle	GL1	0.1
Common pipistrelle	GL2	0.5
Common pipistrelle	GL3	0.7
Common pipistrelle	GL4	2.0
Common pipistrelle	GL5	2.0
Common pipistrelle	GL6	7.3
Common pipistrelle	GL8	3.5
Common pipistrelle	GL9	1.0
Soprano pipistrelle	GL2	0.1
Soprano pipistrelle	GL3	0.1
Soprano pipistrelle	GL4	0.1
Soprano pipistrelle	GL6	6.5
Soprano pipistrelle	GL8	1.0
Soprano pipistrelle	GL9	0.3
Nathusius'	GL6	1.1
Nathusius'	GL7	0.1
Leisler's	GL1	0.3
Leisler's	GL2	0.1
Leisler's	GL3	0.7
Leisler's	GL4	0.3
Leisler's	GL5	0.3
Leisler's	GL6	0.3
Leisler's	GL8	0.8
Leisler's	GL9	0.4
Brown long-eared	GL3	0.2
Brown long-eared	GL5	0.1

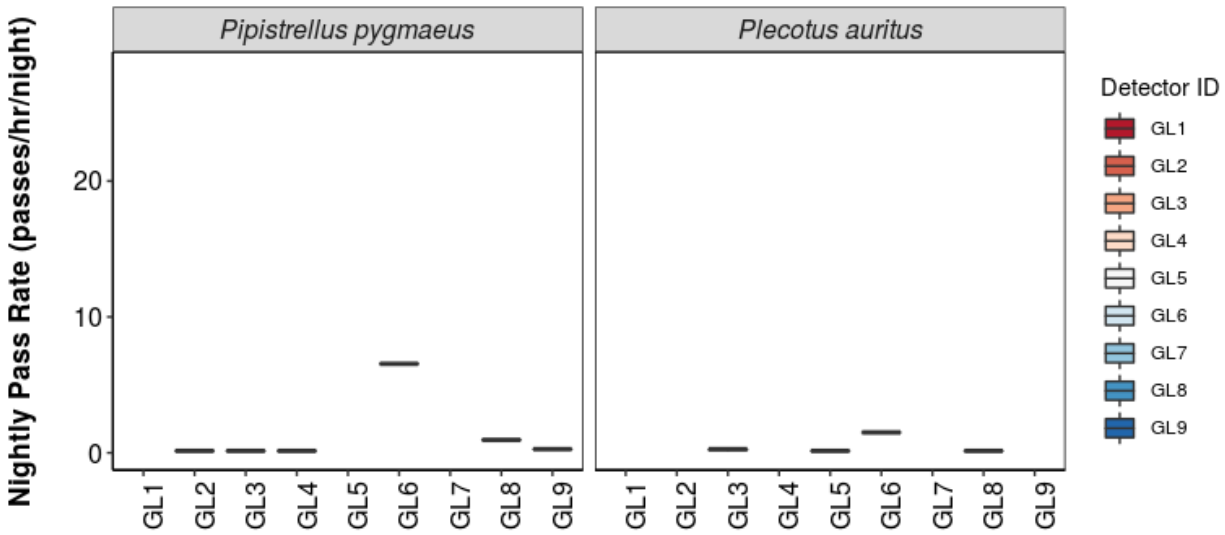
Brown long-eared	GL6	1.5
Brown long-eared	GL8	0.1
Daubenton's	GL3	0.1
Daubenton's	GL5	0.3
Daubenton's	GL6	0.1
Whiskered	GL6	0.1
Natterer's	GL6	0.2

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
10
20
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
0
10
20
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
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	Jun	Jul
Common pipistrelle	GL1	1	0
Common pipistrelle	GL2	10	0
Common pipistrelle	GL3	16	0
Common pipistrelle	GL4	30	0
Common pipistrelle	GL5	59	0
Common pipistrelle	GL6	215	0
Common pipistrelle	GL8	26	0
Common pipistrelle	GL9	7	0
Soprano pipistrelle	GL2	1	0
Soprano pipistrelle	GL3	2	0
Soprano pipistrelle	GL4	1	0
Soprano pipistrelle	GL6	48	0
Soprano pipistrelle	GL8	7	0
Soprano pipistrelle	GL9	2	0
Nathusius'	GL6	8	0
Nathusius'	GL7	1	0
Leisler's	GL1	6	0
Leisler's	GL2	1	0
Leisler's	GL3	5	0
Leisler's	GL4	9	0
Leisler's	GL5	5	1
Leisler's	GL6	4	1
Leisler's	GL8	11	0
Leisler's	GL9	6	0

Brown long-eared	GL3	5	0
Brown long-eared	GL5	1	0
Brown long-eared	GL6	11	0
Brown long-eared	GL8	1	0
Daubenton's	GL3	1	0
Daubenton's	GL5	4	0
Daubenton's	GL6	1	0
Whiskered	GL6	1	0
Natterer's	GL6	4	1

Survey Effort

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

Month	Detector ID	No. of Survey Nights
Jun	GL1	3
Jun	GL2	3
Jun	GL3	3
Jun	GL4	4
Jun	GL5	6
Jun	GL6	5
Jun	GL7	1
Jun	GL8	2
Jun	GL9	2
Jul	GL5	1
Jul	GL6	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	Jun	Jul
Common pipistrelle	GL1	0.1	NA
Common pipistrelle	GL2	0.1	NA
Common pipistrelle	GL3	0.8	NA
Common pipistrelle	GL4	2.0	NA
Common pipistrelle	GL5	1.8	NA
Common pipistrelle	GL6	0.5	NA
Common pipistrelle	GL8	3.5	NA
Common pipistrelle	GL9	1.0	NA
Soprano pipistrelle	GL2	0.1	NA
Soprano pipistrelle	GL3	0.1	NA
Soprano pipistrelle	GL4	0.1	NA
Soprano pipistrelle	GL6	6.5	NA
Soprano pipistrelle	GL8	1.0	NA
Soprano pipistrelle	GL9	0.3	NA
Nathusius'	GL6	1.1	NA
Nathusius'	GL7	0.1	NA
Leisler's	GL1	0.3	NA
Leisler's	GL2	0.1	NA
Leisler's	GL3	0.7	NA
Leisler's	GL4	0.3	NA
Leisler's	GL5	0.3	0.1
Leisler's	GL6	0.6	0.1
Leisler's	GL8	0.8	NA

Leisler's	GL9	0.4	NA
Brown long-eared	GL3	0.3	NA
Brown long-eared	GL5	0.1	NA
Brown long-eared	GL6	1.5	NA
Brown long-eared	GL8	0.1	NA
Daubenton's	GL3	0.1	NA
Daubenton's	GL5	0.3	NA
Daubenton's	GL6	0.1	NA
Whiskered	GL6	0.1	NA
Natterer's	GL6	0.1	0.1

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.

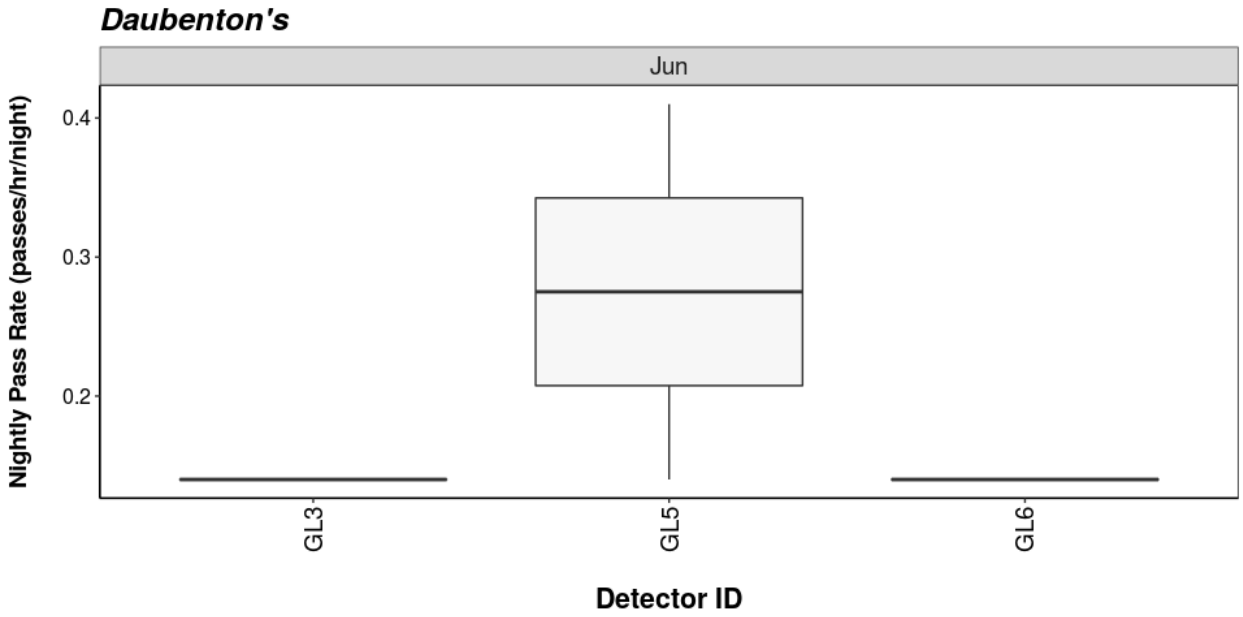
Species	Detector ID	Jun	Jul
Common pipistrelle	GL1	0.1	NA
Common pipistrelle	GL2	0.5	NA
Common pipistrelle	GL3	0.7	NA
Common pipistrelle	GL4	2.0	NA
Common pipistrelle	GL5	2.0	NA
Common pipistrelle	GL6	7.3	NA
Common pipistrelle	GL8	3.5	NA
Common pipistrelle	GL9	1.0	NA
Soprano pipistrelle	GL2	0.1	NA
Soprano pipistrelle	GL3	0.1	NA
Soprano pipistrelle	GL4	0.1	NA
Soprano pipistrelle	GL6	6.5	NA
Soprano pipistrelle	GL8	1.0	NA
Soprano pipistrelle	GL9	0.3	NA
Nathusius'	GL6	1.1	NA
Nathusius'	GL7	0.1	NA
Leisler's	GL1	0.3	NA
Leisler's	GL2	0.1	NA
Leisler's	GL3	0.7	NA
Leisler's	GL4	0.3	NA
Leisler's	GL5	0.3	0.1
Leisler's	GL6	0.6	0.1
Leisler's	GL8	0.8	NA
Leisler's	GL9	0.4	NA
Brown long-eared	GL3	0.2	NA
Brown long-eared	GL5	0.1	NA

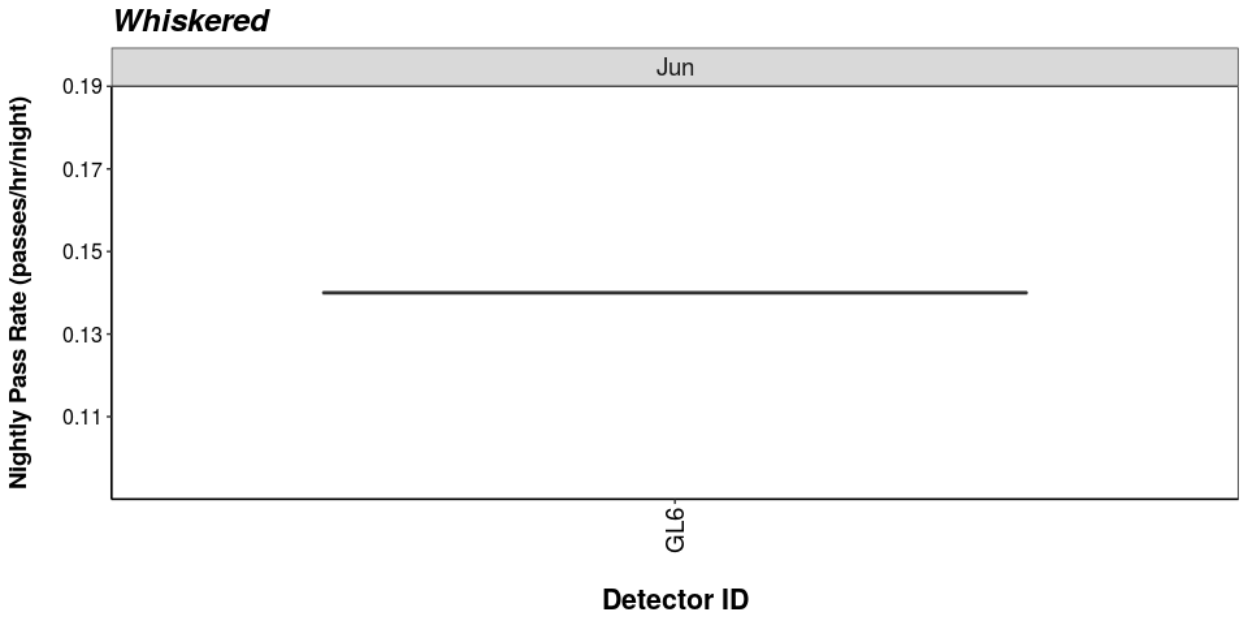
Brown long-eared	GL6	1.5	NA
Brown long-eared	GL8	0.1	NA
Daubenton's	GL3	0.1	NA
Daubenton's	GL5	0.3	NA
Daubenton's	GL6	0.1	NA
Whiskered	GL6	0.1	NA
Natterer's	GL6	0.2	0.1

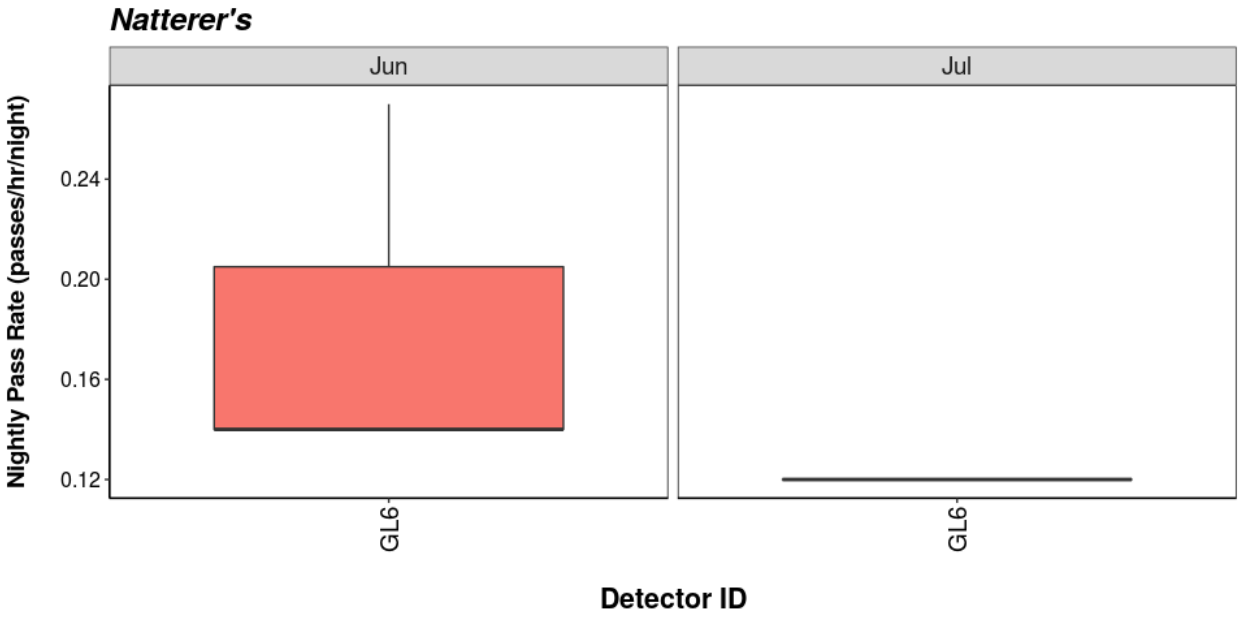
Nightly Bat Pass Rate for each Month

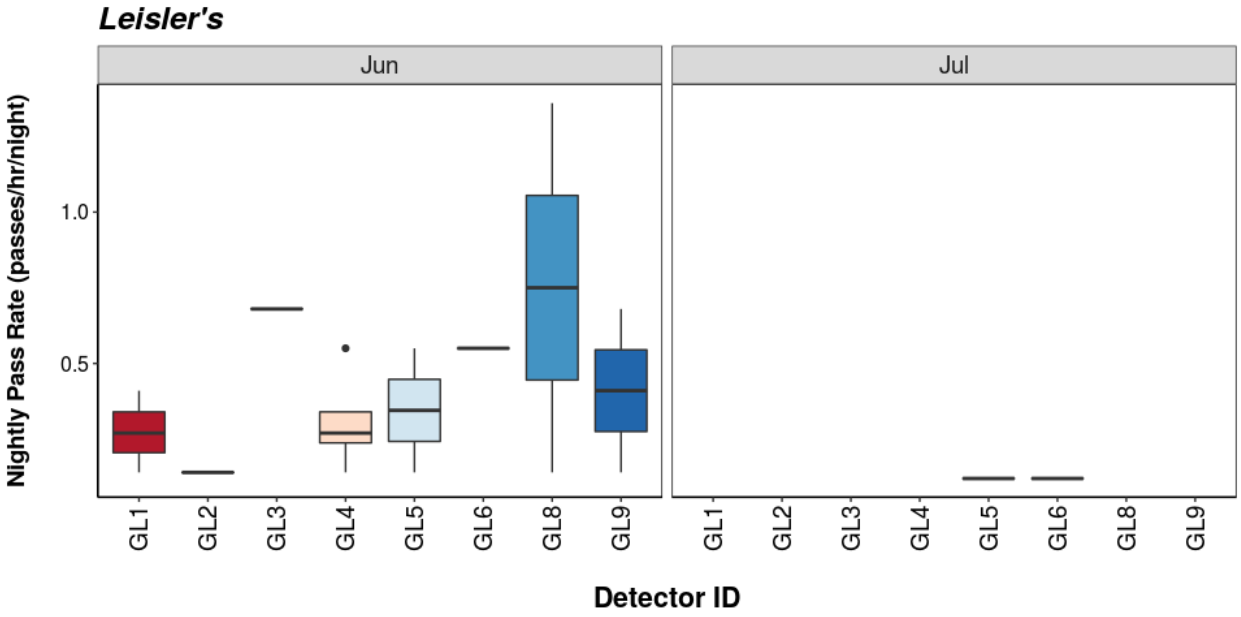
Per Detector - Figures

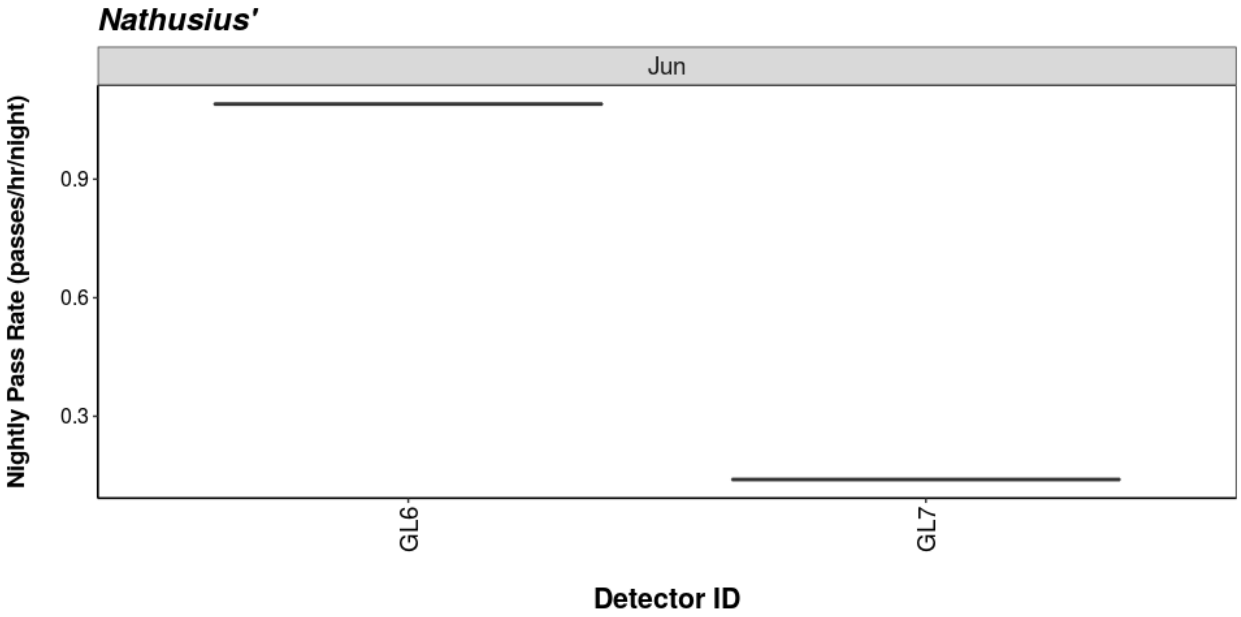
Figure 12. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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

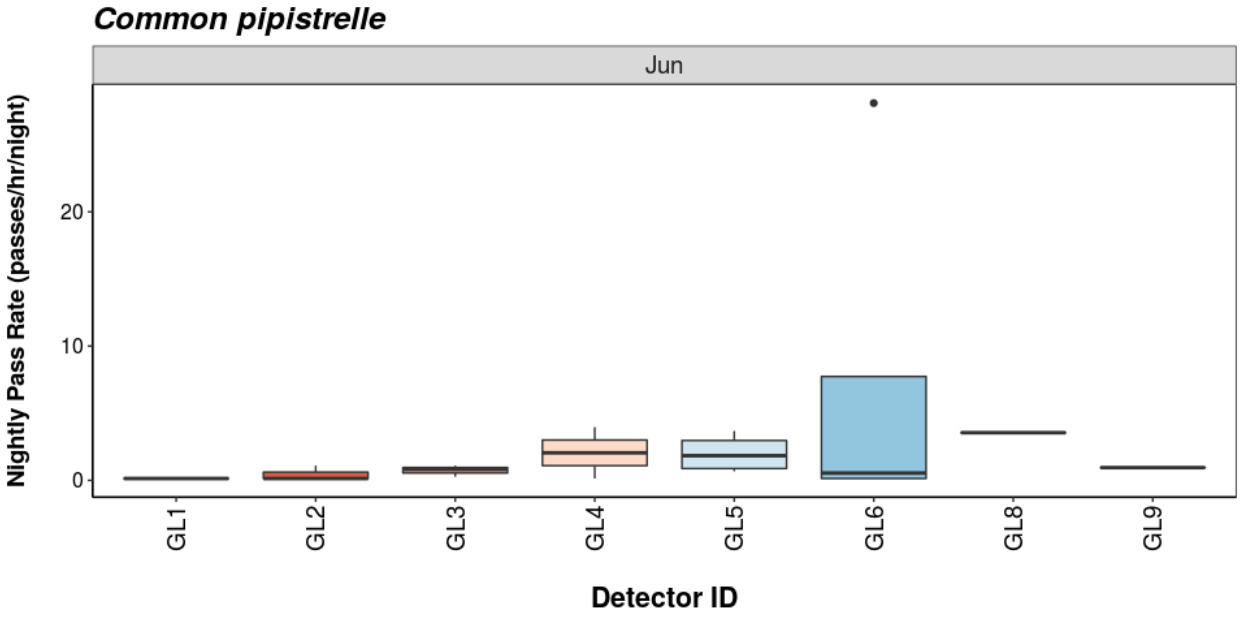




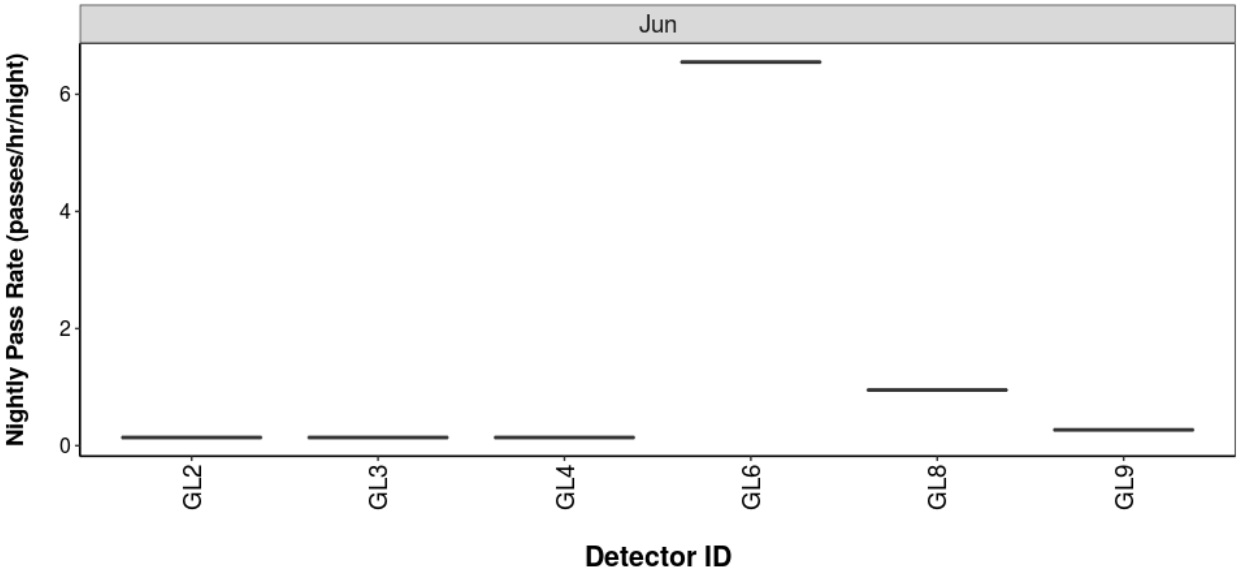

Natterer's
Jun
Jul
Nightly Pass Rate (passes/hr/night)
0.24
0.20
0.16
0.12
GL6
GL6
Detector ID


Leisler's
Jun
Jul
Nightly Pass Rate (passes/hr/night)
1.0
0.5
GL1
GL2
GL3
GL4
GL5
GL6
GL8
GL9
GL1
GL2
GL3
GL4
GL5
GL6
GL8
GL9
Detector ID

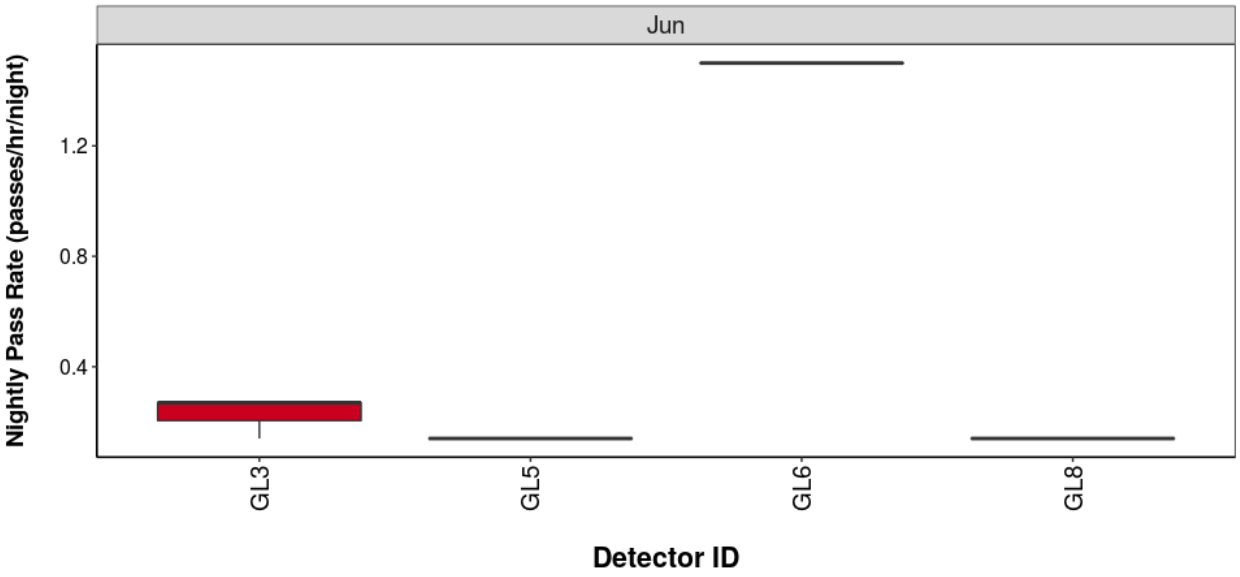

Nathusius'
Jun
Nightly Pass Rate (passes/hr/night)
0.9
0.6
0.3
GL6
GL7
Detector ID


Common pipistrelle
Jun
Nightly Pass Rate (passes/hr/night)
20
10
0
GL1
GL2
GL3
GL4
GL5
GL6
GL8
GL9
Detector ID

Soprano pipistrelle



Brown long-eared



Bat Activity per Detector Location

Figure 13. Detector ID reference:

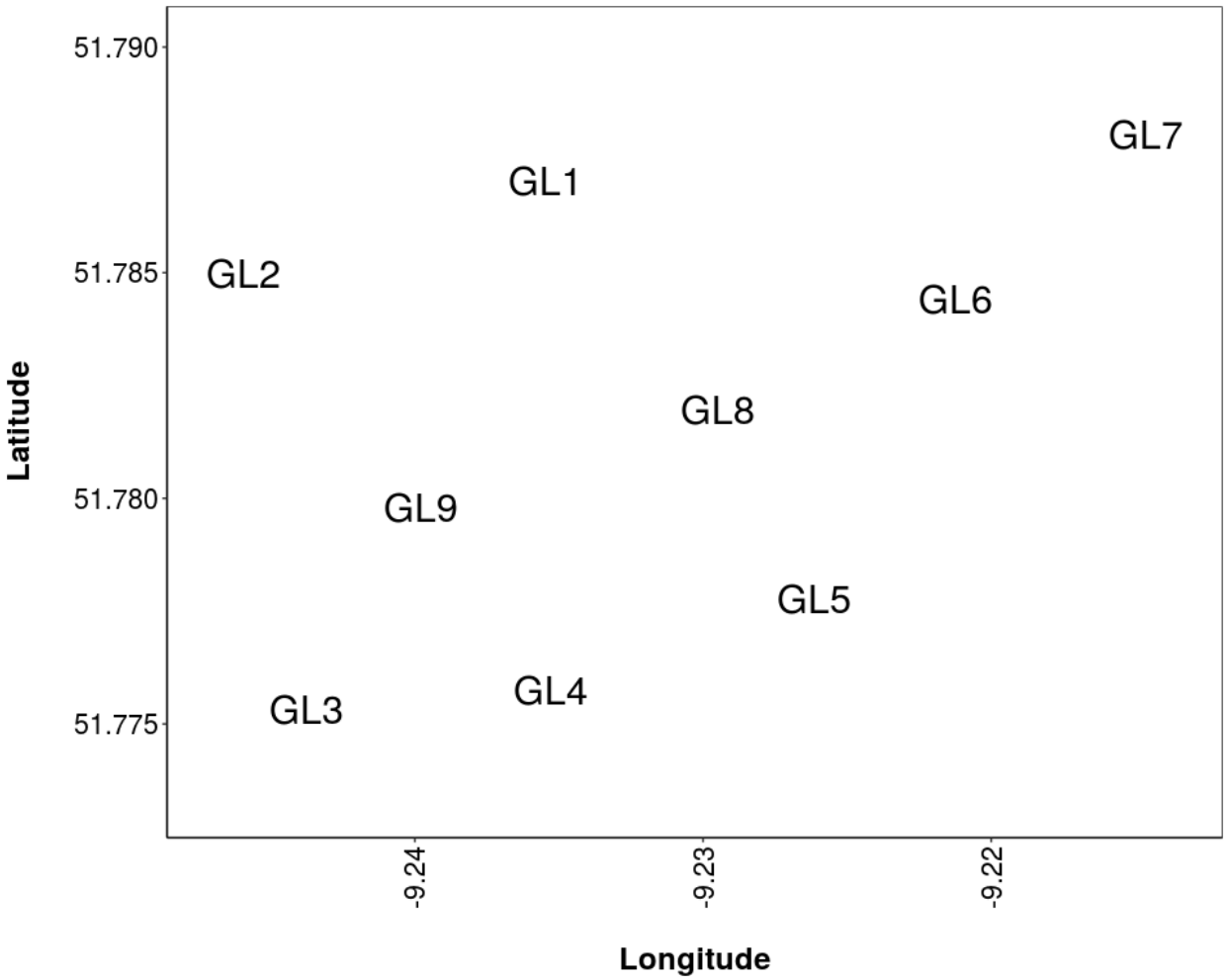
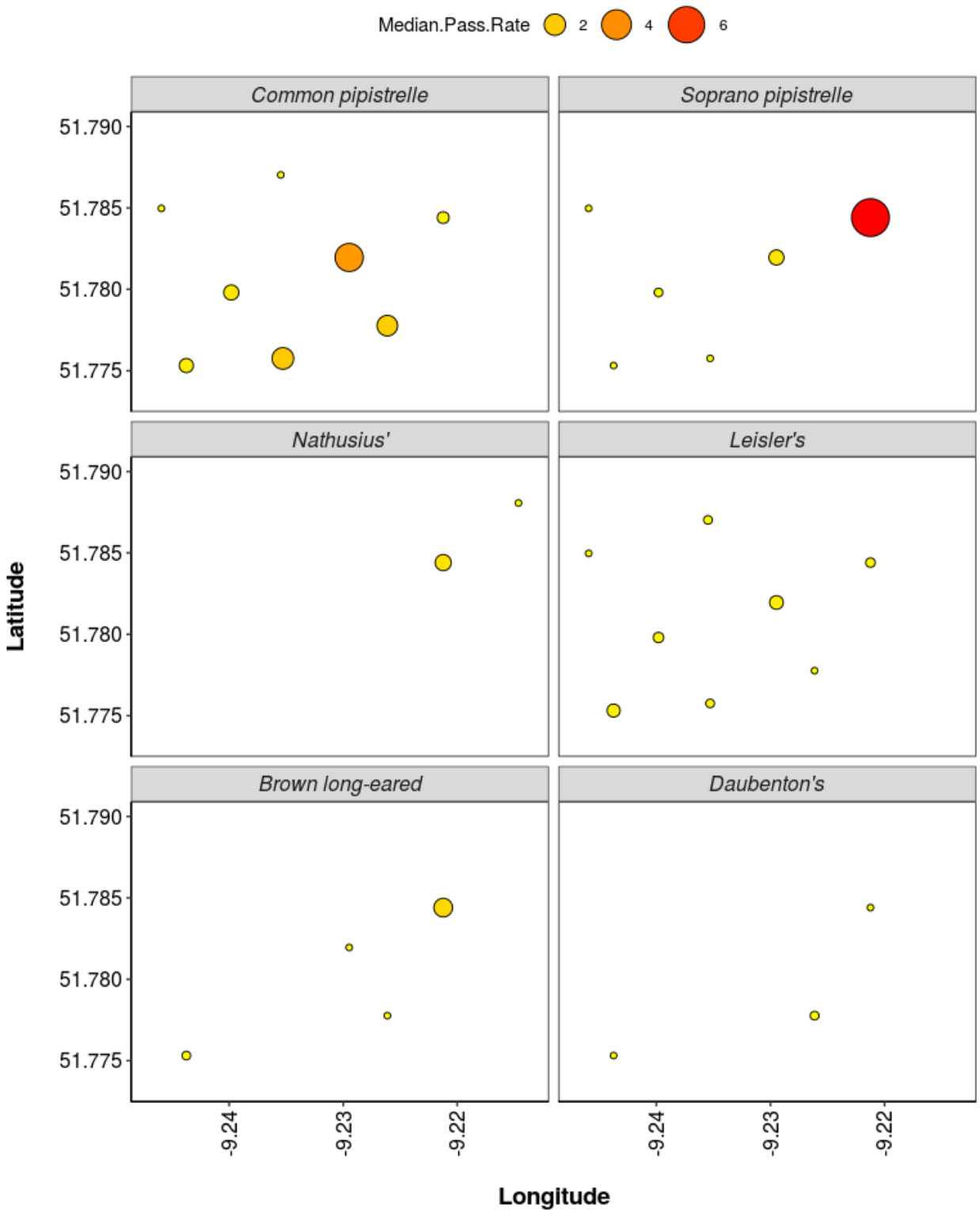


Figure 14. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
2
4
6
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

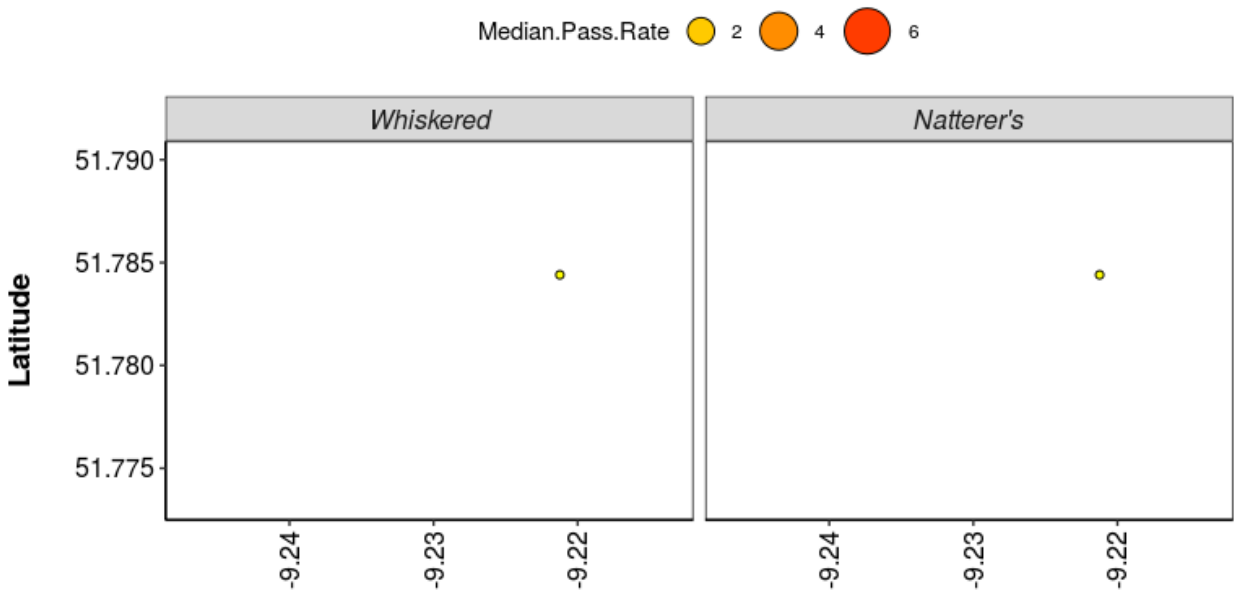
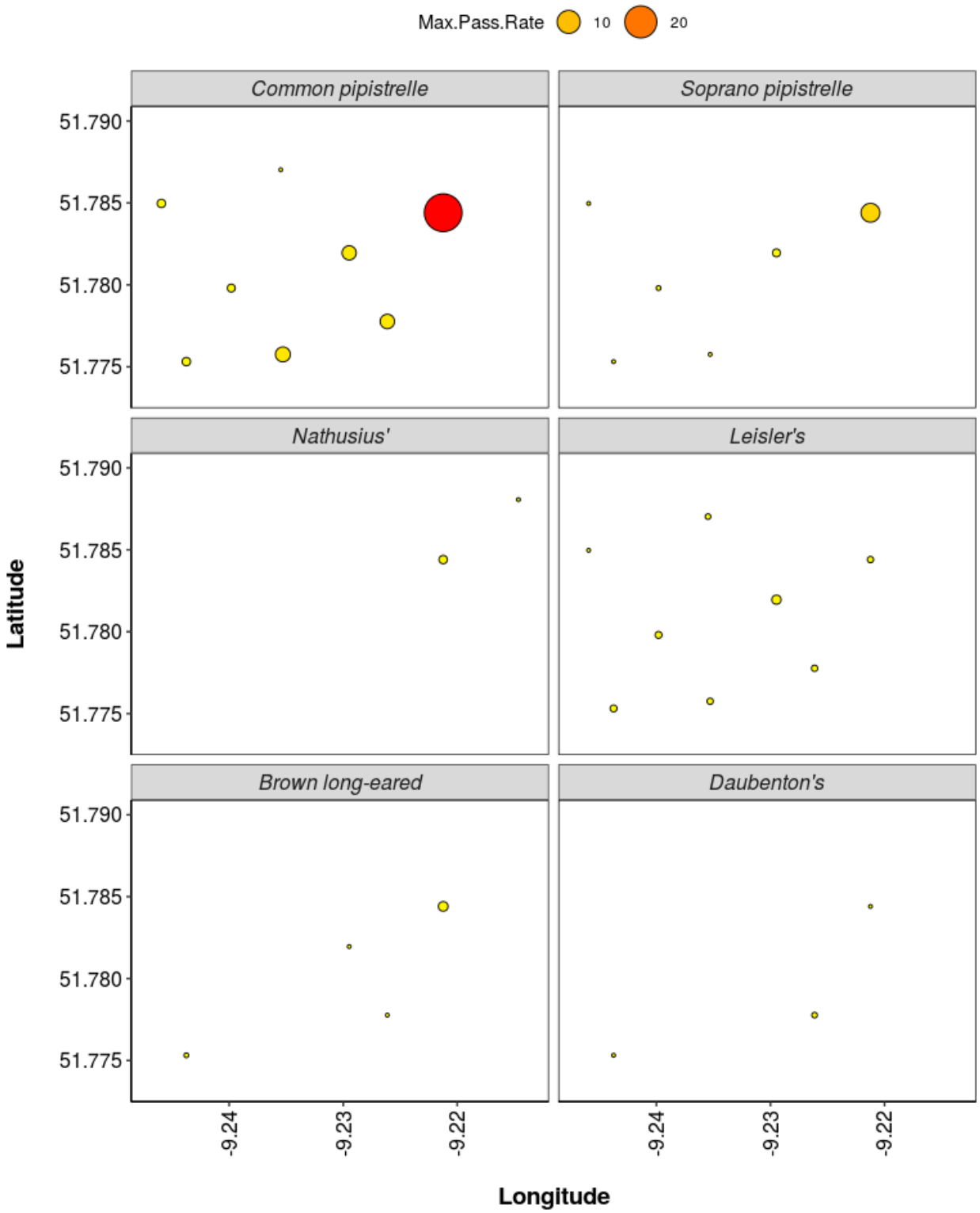
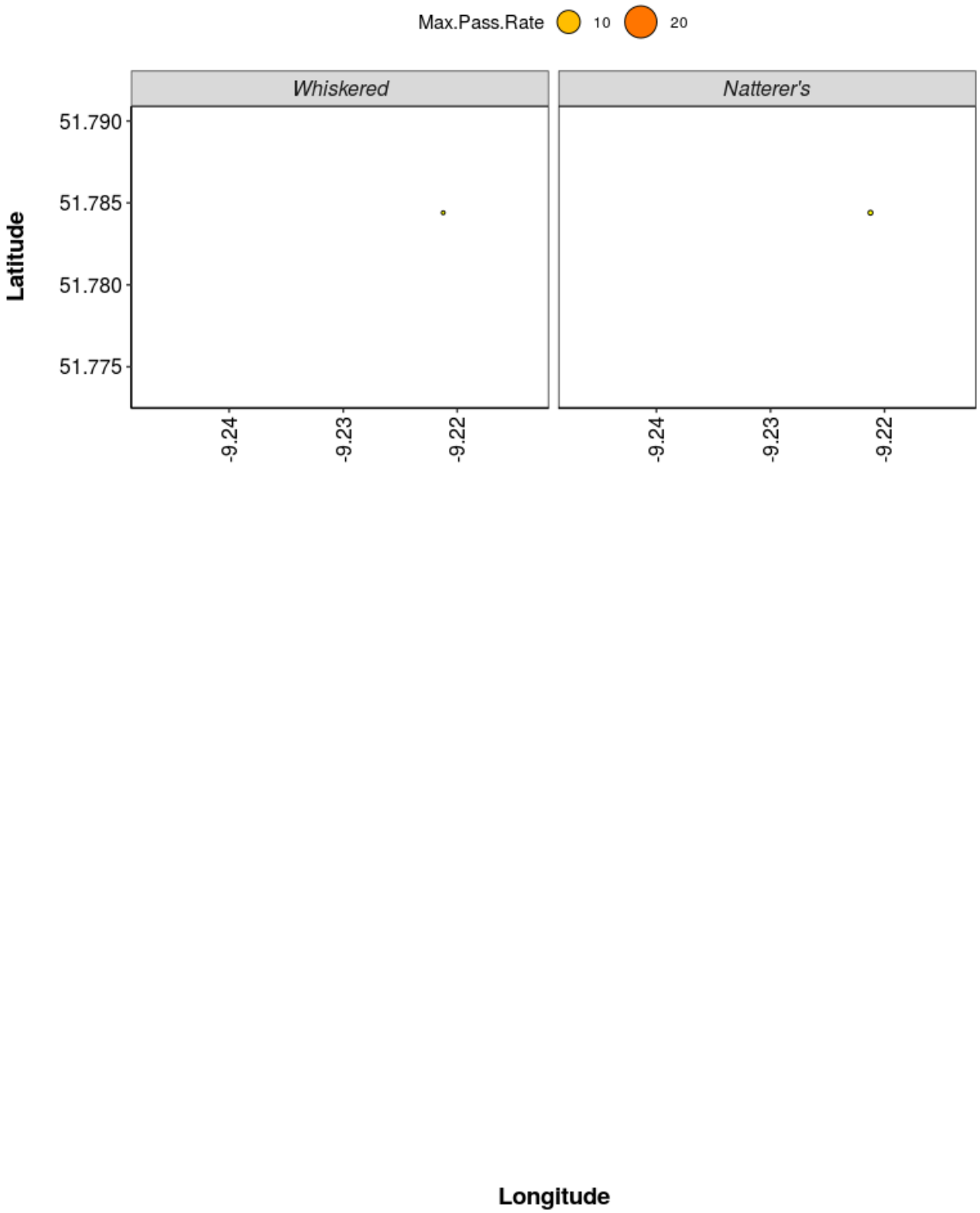

Median.Pass.Rate
2
4
6
Whiskered
Natterer's
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
10
20
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude


Max.Pass.Rate
10
20
Whiskered
Natterer's
51.790
51.785
51.780
51.775
Latitude
-9.24
-9.23
-9.22
-9.24
-9.23
-9.22
Longitude

PART 2B: Includes absences

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

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Brown long-eared	GL1	0.0
Brown long-eared	GL2	0.0
Brown long-eared	GL3	0.3
Brown long-eared	GL4	0.0
Brown long-eared	GL5	0.0
Brown long-eared	GL6	0.0
Brown long-eared	GL7	0.0
Brown long-eared	GL8	0.1
Brown long-eared	GL9	0.0
Common pipistrelle	GL1	0.0
Common pipistrelle	GL2	0.1
Common pipistrelle	GL3	0.8
Common pipistrelle	GL4	0.1
Common pipistrelle	GL5	0.7
Common pipistrelle	GL6	0.1
Common pipistrelle	GL7	0.0
Common pipistrelle	GL8	1.8
Common pipistrelle	GL9	0.5
Daubenton's	GL1	0.0
Daubenton's	GL2	0.0
Daubenton's	GL3	0.0
Daubenton's	GL4	0.0
Daubenton's	GL5	0.0

Daubenton’s	GL6	0.0
Daubenton’s	GL7	0.0
Daubenton’s	GL8	0.0
Daubenton’s	GL9	0.0
Leisler’s	GL1	0.3
Leisler’s	GL2	0.0
Leisler’s	GL3	0.0
Leisler’s	GL4	0.3
Leisler’s	GL5	0.0
Leisler’s	GL6	0.0
Leisler’s	GL7	0.0
Leisler’s	GL8	0.8
Leisler’s	GL9	0.4
Nathusius’	GL1	0.0
Nathusius’	GL2	0.0
Nathusius’	GL3	0.0
Nathusius’	GL4	0.0
Nathusius’	GL5	0.0
Nathusius’	GL6	0.0
Nathusius’	GL7	0.1
Nathusius’	GL8	0.0
Nathusius’	GL9	0.0
Natterer’s	GL1	0.0
Natterer’s	GL2	0.0
Natterer’s	GL3	0.0
Natterer’s	GL4	0.0
Natterer’s	GL5	0.0
Natterer’s	GL6	0.1
Natterer’s	GL7	0.0
Natterer’s	GL8	0.0
Natterer’s	GL9	0.0
Soprano pipistrelle	GL1	0.0
Soprano pipistrelle	GL2	0.0
Soprano pipistrelle	GL3	0.1
Soprano pipistrelle	GL4	0.0
Soprano pipistrelle	GL5	0.0

Soprano pipistrelle	GL6	0.0
Soprano pipistrelle	GL7	0.0
Soprano pipistrelle	GL8	0.5
Soprano pipistrelle	GL9	0.1
Whiskered	GL1	0.0
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

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

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

Species	Detector ID	Mean Pass Rate
Brown long-eared	GL1	0.0
Brown long-eared	GL2	0.0
Brown long-eared	GL3	0.2
Brown long-eared	GL4	0.0
Brown long-eared	GL5	0.0
Brown long-eared	GL6	0.2
Brown long-eared	GL7	0.0
Brown long-eared	GL8	0.1
Brown long-eared	GL9	0.0
Common pipistrelle	GL1	0.0
Common pipistrelle	GL2	0.5
Common pipistrelle	GL3	0.7
Common pipistrelle	GL4	1.0
Common pipistrelle	GL5	1.1
Common pipistrelle	GL6	4.9
Common pipistrelle	GL7	0.0
Common pipistrelle	GL8	1.8
Common pipistrelle	GL9	0.5
Daubenton's	GL1	0.0
Daubenton's	GL2	0.0
Daubenton's	GL3	0.0
Daubenton's	GL4	0.0
Daubenton's	GL5	0.1
Daubenton's	GL6	0.0
Daubenton's	GL7	0.0
Daubenton's	GL8	0.0

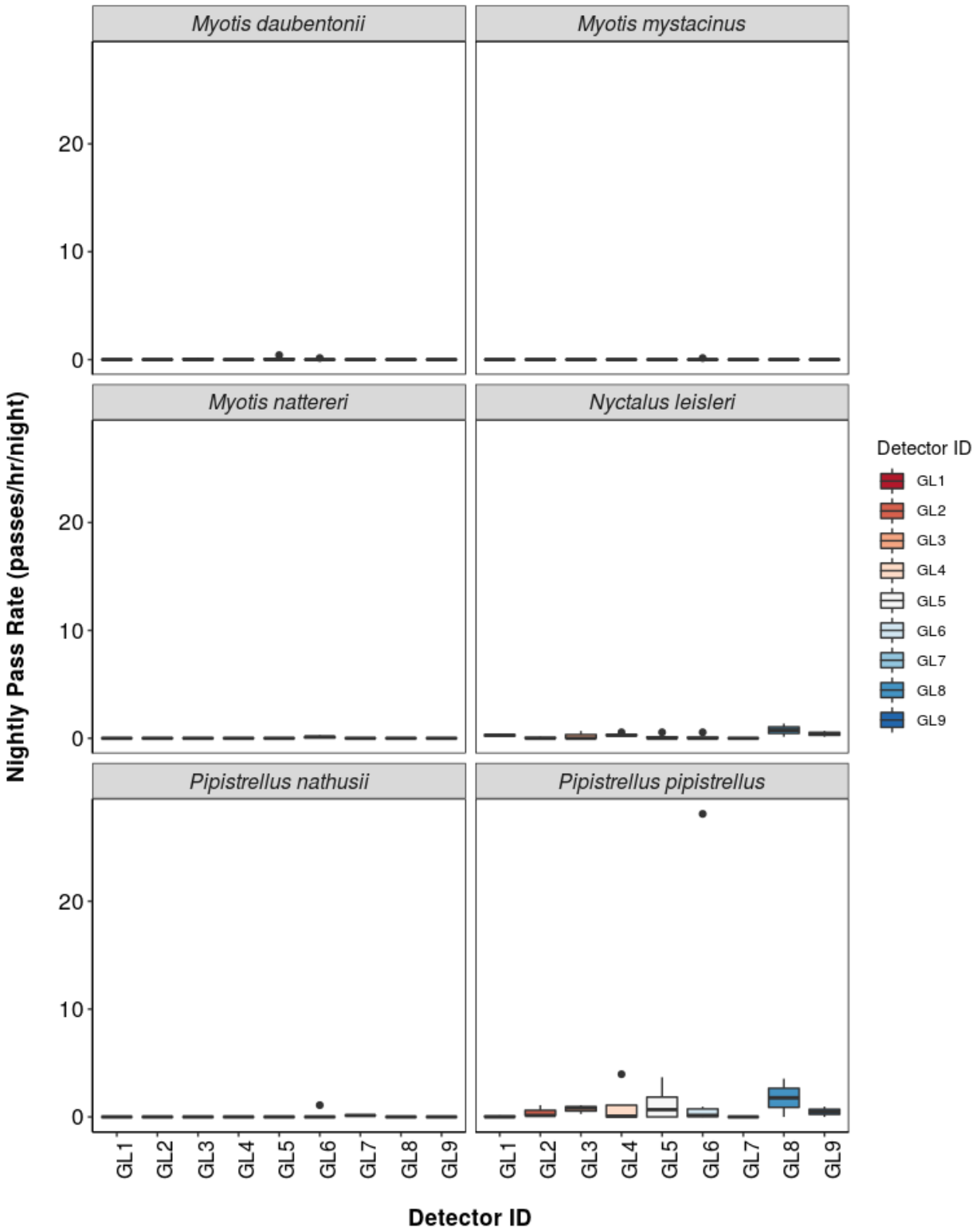
Daubenton's	GL9	0.0
Leisler's	GL1	0.3
Leisler's	GL2	0.0
Leisler's	GL3	0.2
Leisler's	GL4	0.3
Leisler's	GL5	0.1
Leisler's	GL6	0.1
Leisler's	GL7	0.0
Leisler's	GL8	0.8
Leisler's	GL9	0.4
Nathusius'	GL1	0.0
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.0
Nathusius'	GL6	0.2
Nathusius'	GL7	0.1
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.0
Natterer's	GL2	0.0
Natterer's	GL3	0.0
Natterer's	GL4	0.0
Natterer's	GL5	0.0
Natterer's	GL6	0.1
Natterer's	GL7	0.0
Natterer's	GL8	0.0
Natterer's	GL9	0.0
Soprano pipistrelle	GL1	0.0
Soprano pipistrelle	GL2	0.0
Soprano pipistrelle	GL3	0.1
Soprano pipistrelle	GL4	0.0
Soprano pipistrelle	GL5	0.0
Soprano pipistrelle	GL6	1.1
Soprano pipistrelle	GL7	0.0
Soprano pipistrelle	GL8	0.5

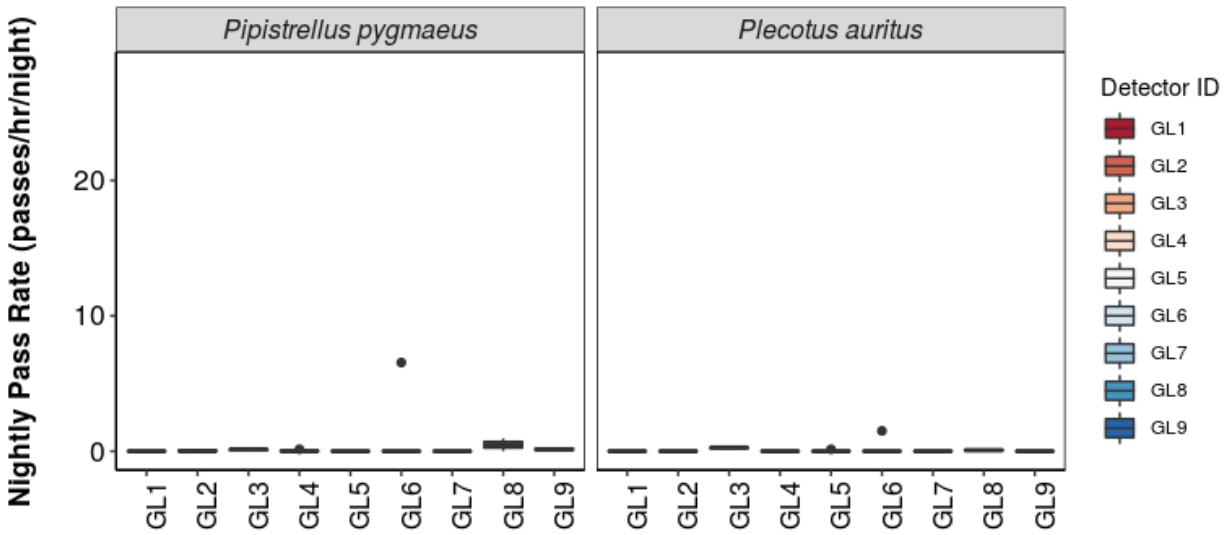
Soprano pipistrelle	GL9	0.1
Whiskered	GL1	0.0
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
10
20
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
0
10
20
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
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
Jun	GL1	3
Jun	GL2	3
Jun	GL3	3
Jun	GL4	4
Jun	GL5	6
Jun	GL6	5
Jun	GL7	1
Jun	GL8	2
Jun	GL9	2
Jul	GL5	1
Jul	GL6	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
Brown long-eared	GL1	NA	0.0
Brown long-eared	GL2	NA	0.0
Brown long-eared	GL3	NA	0.3
Brown long-eared	GL4	NA	0.0
Brown long-eared	GL5	0.0	0.0
Brown long-eared	GL6	0.0	0.0
Brown long-eared	GL7	NA	0.0
Brown long-eared	GL8	NA	0.1
Brown long-eared	GL9	NA	0.0
Common pipistrelle	GL1	NA	0.0
Common pipistrelle	GL2	NA	0.1
Common pipistrelle	GL3	NA	0.8
Common pipistrelle	GL4	NA	0.1
Common pipistrelle	GL5	0.0	0.8
Common pipistrelle	GL6	0.0	0.1
Common pipistrelle	GL7	NA	0.0
Common pipistrelle	GL8	NA	1.8
Common pipistrelle	GL9	NA	0.5
Daubenton's	GL1	NA	0.0
Daubenton's	GL2	NA	0.0
Daubenton's	GL3	NA	0.0
Daubenton's	GL4	NA	0.0
Daubenton's	GL5	0.0	0.0

Daubenton’s	GL6	0.0	0.0
Daubenton’s	GL7	NA	0.0
Daubenton’s	GL8	NA	0.0
Daubenton’s	GL9	NA	0.0
Leisler’s	GL1	NA	0.3
Leisler’s	GL2	NA	0.0
Leisler’s	GL3	NA	0.0
Leisler’s	GL4	NA	0.3
Leisler’s	GL5	0.1	0.0
Leisler’s	GL6	0.1	0.0
Leisler’s	GL7	NA	0.0
Leisler’s	GL8	NA	0.8
Leisler’s	GL9	NA	0.4
Nathusius’	GL1	NA	0.0
Nathusius’	GL2	NA	0.0
Nathusius’	GL3	NA	0.0
Nathusius’	GL4	NA	0.0
Nathusius’	GL5	0.0	0.0
Nathusius’	GL6	0.0	0.0
Nathusius’	GL7	NA	0.1
Nathusius’	GL8	NA	0.0
Nathusius’	GL9	NA	0.0
Natterer’s	GL1	NA	0.0
Natterer’s	GL2	NA	0.0
Natterer’s	GL3	NA	0.0
Natterer’s	GL4	NA	0.0
Natterer’s	GL5	0.0	0.0
Natterer’s	GL6	0.1	0.1
Natterer’s	GL7	NA	0.0
Natterer’s	GL8	NA	0.0
Natterer’s	GL9	NA	0.0
Soprano pipistrelle	GL1	NA	0.0
Soprano pipistrelle	GL2	NA	0.0
Soprano pipistrelle	GL3	NA	0.1
Soprano pipistrelle	GL4	NA	0.0
Soprano pipistrelle	GL5	0.0	0.0

Soprano pipistrelle	GL6	0.0	0.0
Soprano pipistrelle	GL7	NA	0.0
Soprano pipistrelle	GL8	NA	0.5
Soprano pipistrelle	GL9	NA	0.1
Whiskered	GL1	NA	0.0
Whiskered	GL2	NA	0.0
Whiskered	GL3	NA	0.0
Whiskered	GL4	NA	0.0
Whiskered	GL5	0.0	0.0
Whiskered	GL6	0.0	0.0
Whiskered	GL7	NA	0.0
Whiskered	GL8	NA	0.0
Whiskered	GL9	NA	0.0

Nightly Bat Pass Rate for each Month

Mean per Detector

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

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

Species	Detector ID	Jul	Jun
Brown long-eared	GL1	NA	0.0
Brown long-eared	GL2	NA	0.0
Brown long-eared	GL3	NA	0.2
Brown long-eared	GL4	NA	0.0
Brown long-eared	GL5	0.0	0.0
Brown long-eared	GL6	0.0	0.3
Brown long-eared	GL7	NA	0.0
Brown long-eared	GL8	NA	0.1
Brown long-eared	GL9	NA	0.0
Common pipistrelle	GL1	NA	0.0
Common pipistrelle	GL2	NA	0.5
Common pipistrelle	GL3	NA	0.7
Common pipistrelle	GL4	NA	1.0
Common pipistrelle	GL5	0.0	1.3
Common pipistrelle	GL6	0.0	5.9
Common pipistrelle	GL7	NA	0.0
Common pipistrelle	GL8	NA	1.8
Common pipistrelle	GL9	NA	0.5
Daubenton's	GL1	NA	0.0
Daubenton's	GL2	NA	0.0
Daubenton's	GL3	NA	0.0
Daubenton's	GL4	NA	0.0
Daubenton's	GL5	0.0	0.1
Daubenton's	GL6	0.0	0.0
Daubenton's	GL7	NA	0.0
Daubenton's	GL8	NA	0.0

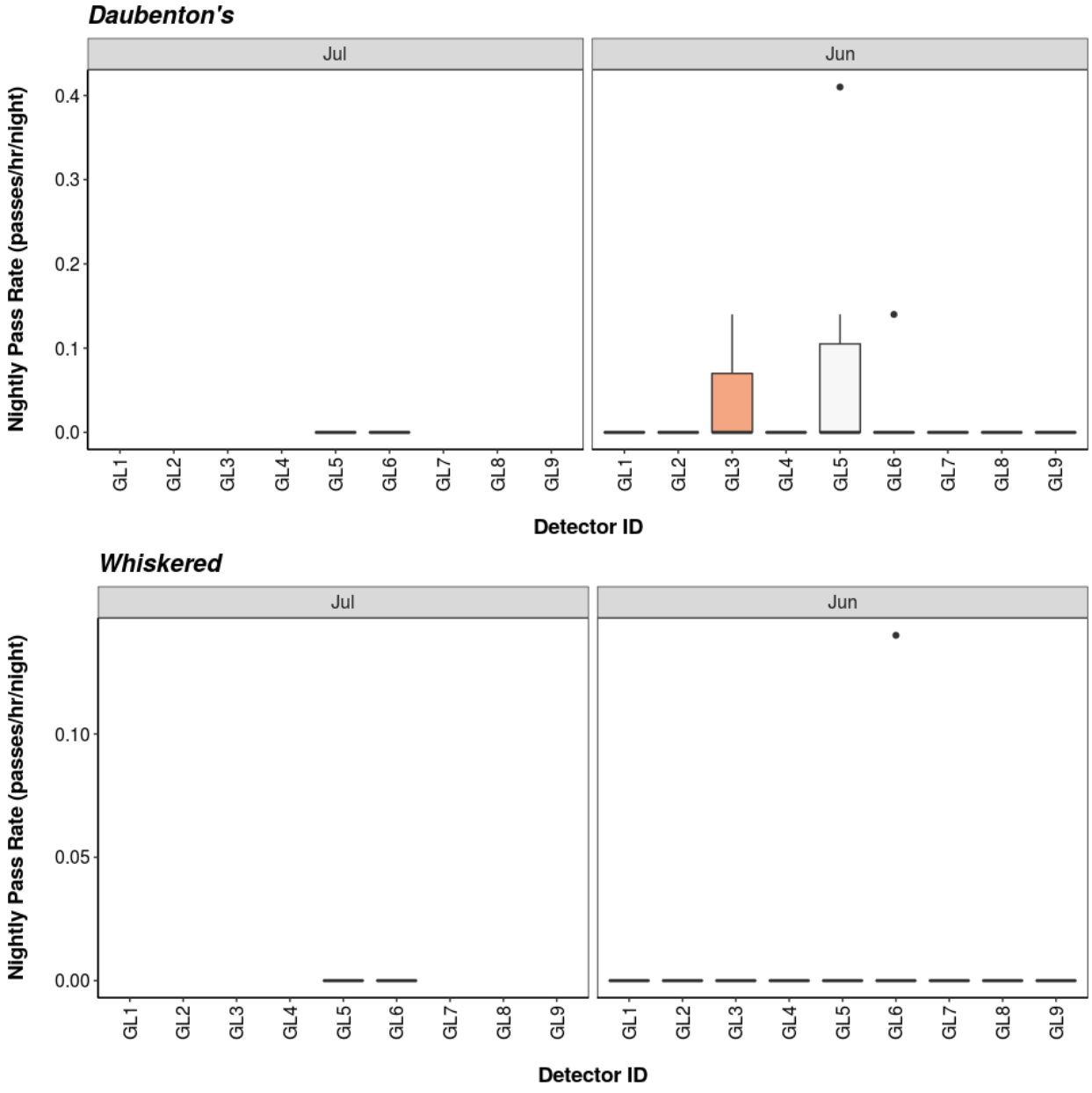
Daubenton's	GL9	NA	0.0
Leisler's	GL1	NA	0.3
Leisler's	GL2	NA	0.0
Leisler's	GL3	NA	0.2
Leisler's	GL4	NA	0.3
Leisler's	GL5	0.1	0.1
Leisler's	GL6	0.1	0.1
Leisler's	GL7	NA	0.0
Leisler's	GL8	NA	0.8
Leisler's	GL9	NA	0.4
Nathusius'	GL1	NA	0.0
Nathusius'	GL2	NA	0.0
Nathusius'	GL3	NA	0.0
Nathusius'	GL4	NA	0.0
Nathusius'	GL5	0.0	0.0
Nathusius'	GL6	0.0	0.2
Nathusius'	GL7	NA	0.1
Nathusius'	GL8	NA	0.0
Nathusius'	GL9	NA	0.0
Natterer's	GL1	NA	0.0
Natterer's	GL2	NA	0.0
Natterer's	GL3	NA	0.0
Natterer's	GL4	NA	0.0
Natterer's	GL5	0.0	0.0
Natterer's	GL6	0.1	0.1
Natterer's	GL7	NA	0.0
Natterer's	GL8	NA	0.0
Natterer's	GL9	NA	0.0
Soprano pipistrelle	GL1	NA	0.0
Soprano pipistrelle	GL2	NA	0.0
Soprano pipistrelle	GL3	NA	0.1
Soprano pipistrelle	GL4	NA	0.0
Soprano pipistrelle	GL5	0.0	0.0
Soprano pipistrelle	GL6	0.0	1.3
Soprano pipistrelle	GL7	NA	0.0
Soprano pipistrelle	GL8	NA	0.5

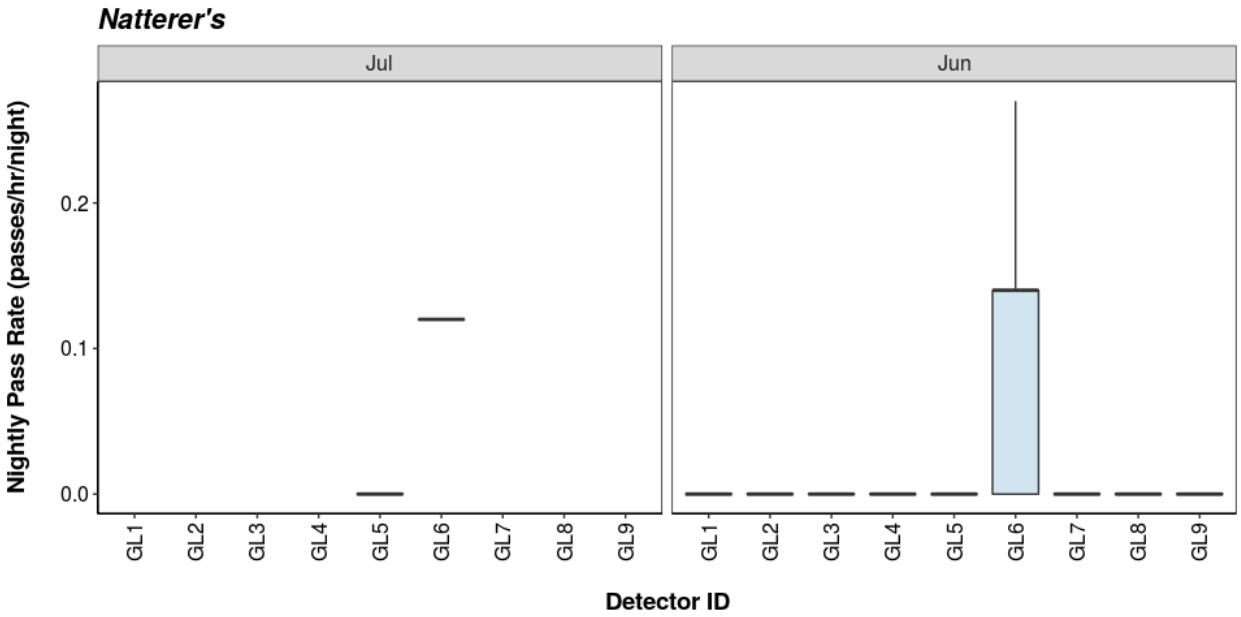
Soprano pipistrelle	GL9	NA	0.1
Whiskered	GL1	NA	0.0
Whiskered	GL2	NA	0.0
Whiskered	GL3	NA	0.0
Whiskered	GL4	NA	0.0
Whiskered	GL5	0.0	0.0
Whiskered	GL6	0.0	0.0
Whiskered	GL7	NA	0.0
Whiskered	GL8	NA	0.0
Whiskered	GL9	NA	0.0

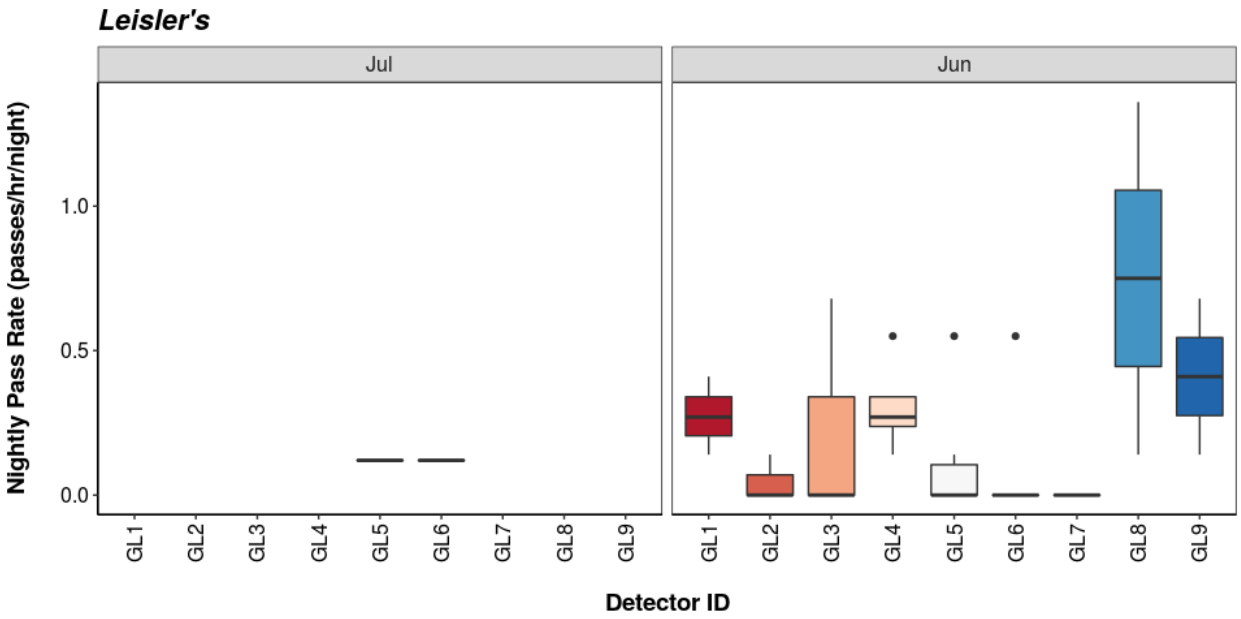
Nightly Bat Pass Rate for each Month

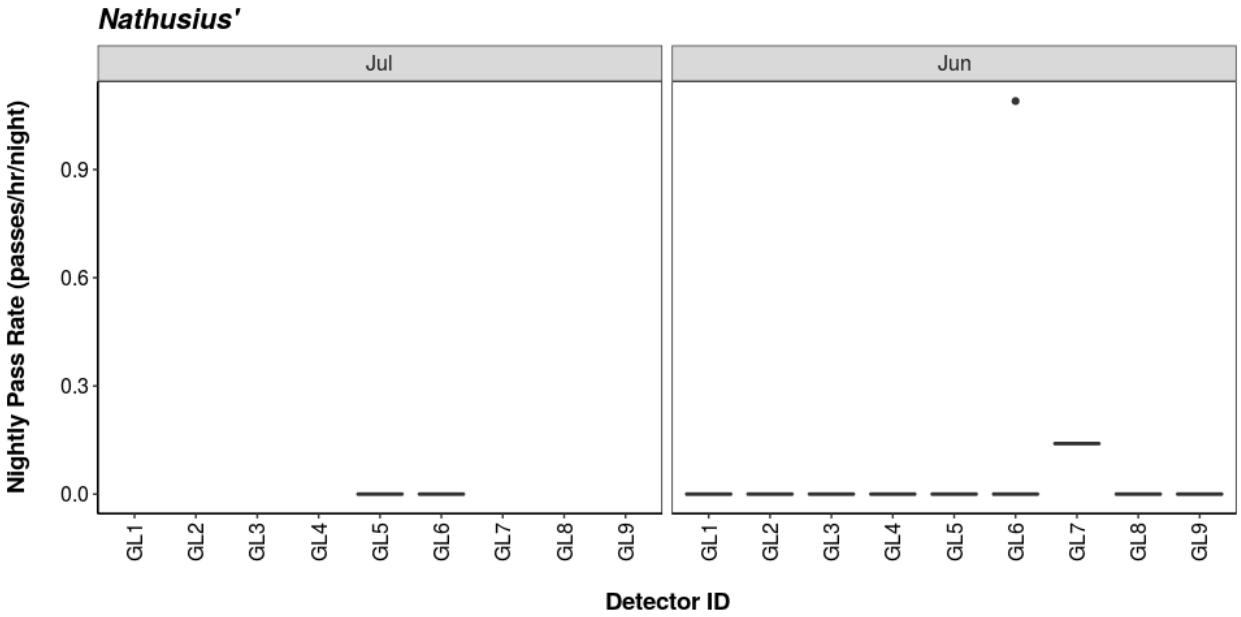
Per Detector - Figures

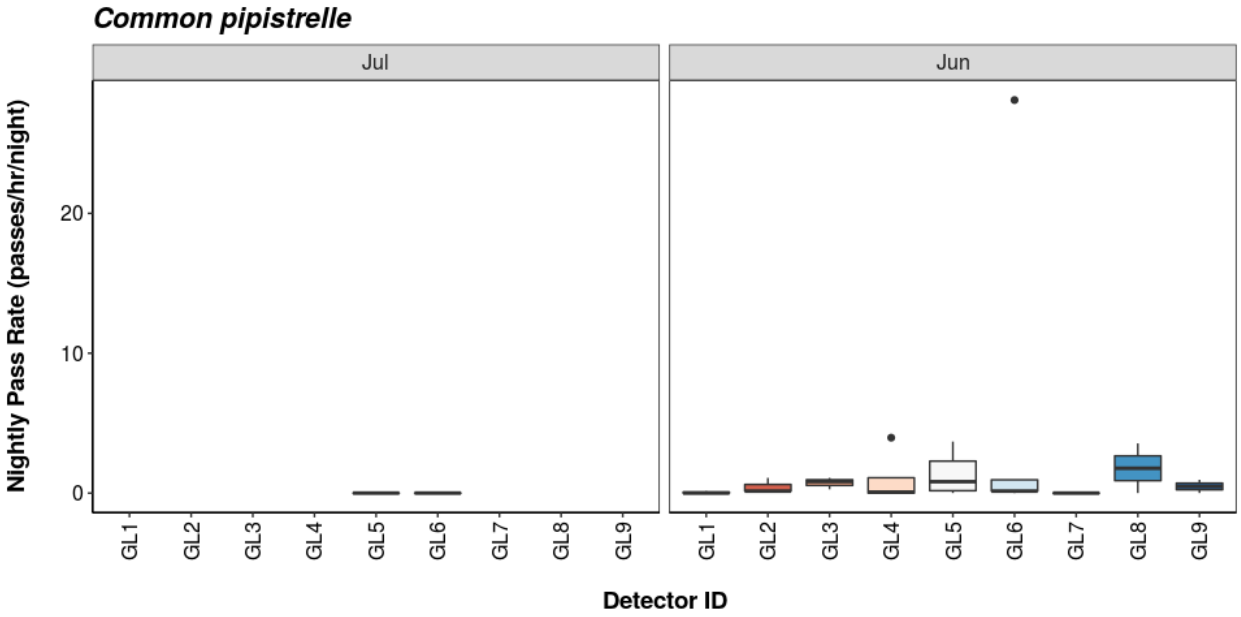
Figure 17. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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

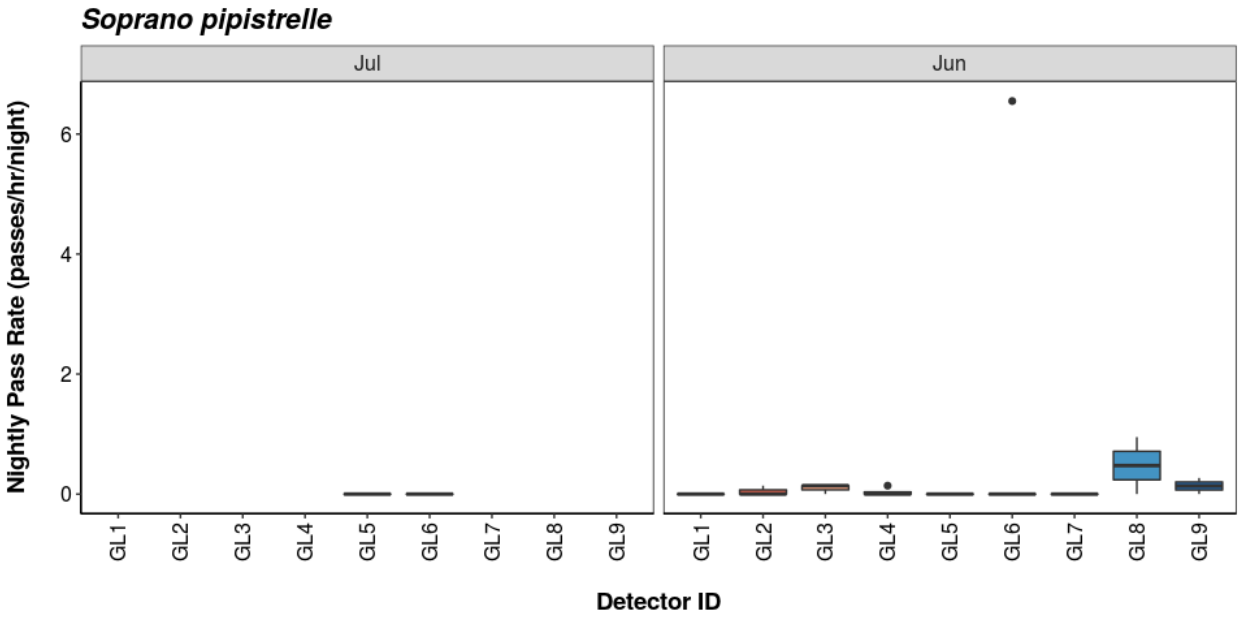


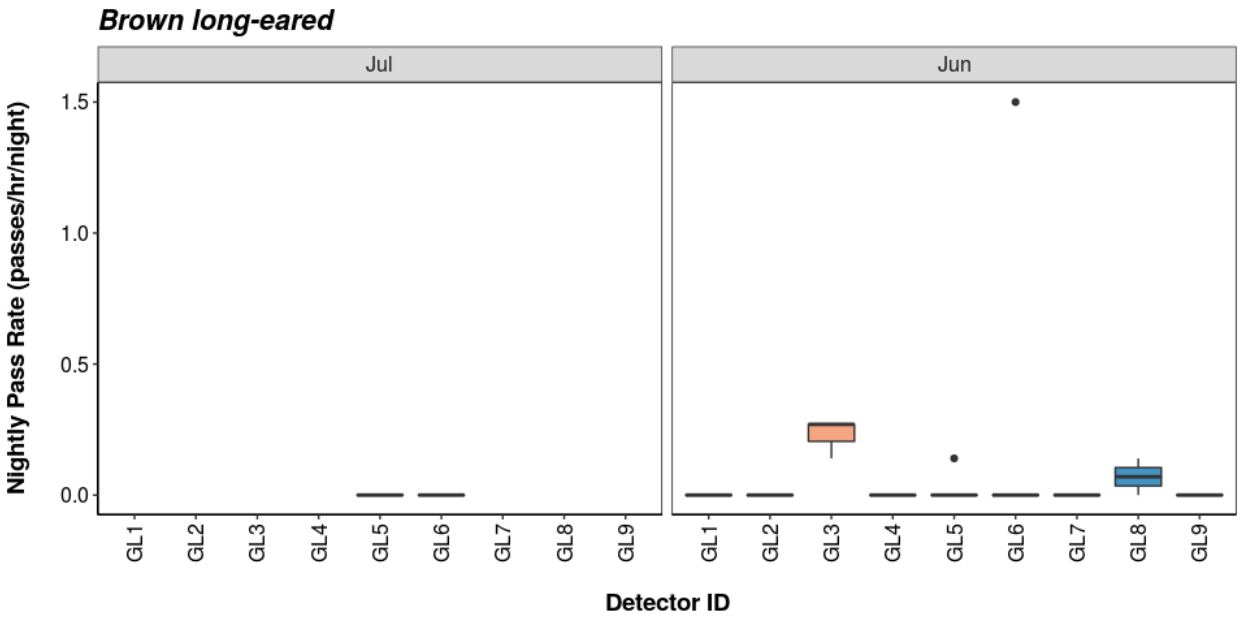

Natterer's
Jul
Jun
Nightly Pass Rate (passes/hr/night)
0.0
0.1
0.2
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Leisler's
Jul
Jun
Nightly Pass Rate (passes/hr/night)
0.0
0.5
1.0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Nathusius'
Jul
Jun
Nightly Pass Rate (passes/hr/night)
0.0
0.3
0.6
0.9
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Common pipistrelle
Jul
Jun
Nightly Pass Rate (passes/hr/night)
0
10
20
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Soprano pipistrelle
Jul
Jun
Nightly Pass Rate (passes/hr/night)
0
2
4
6
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Brown long-eared
Jul
Jun
Nightly Pass Rate (passes/hr/night)
0.0
0.5
1.0
1.5
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

Bat Activity per Detector Location

Figure 18. Detector ID reference:

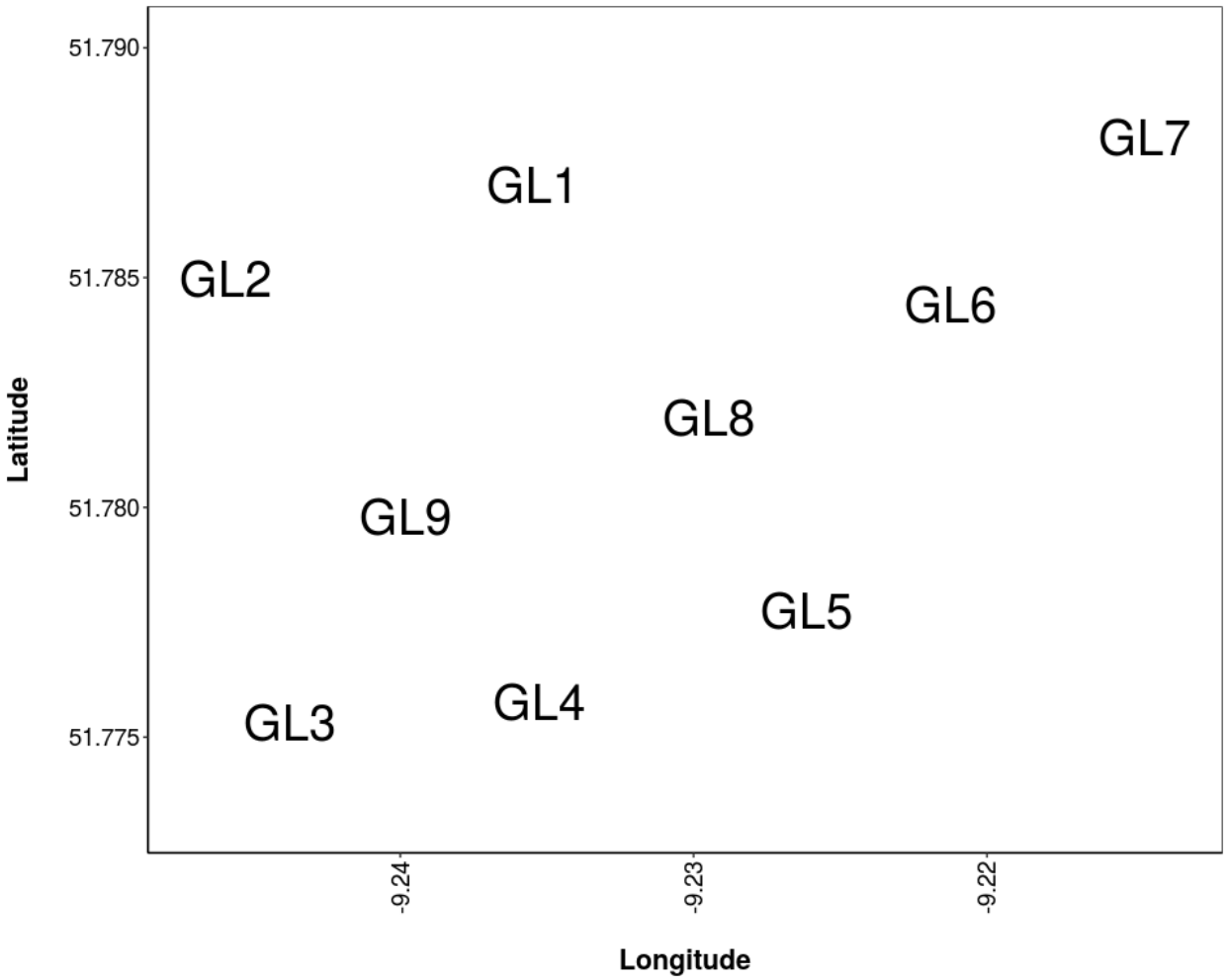
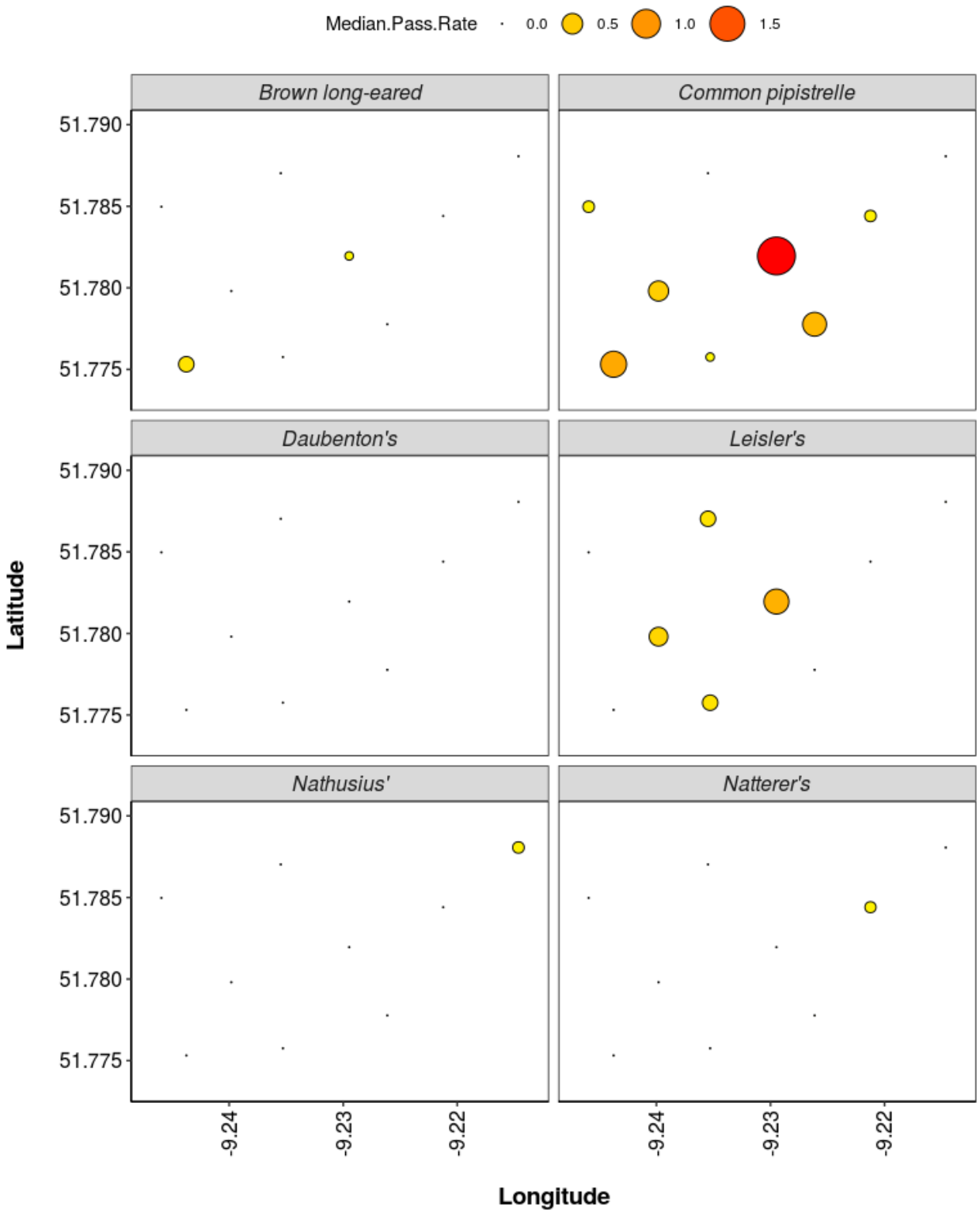


Figure 19. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
0.0
0.5
1.0
1.5
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Nathusius'
Natterer's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

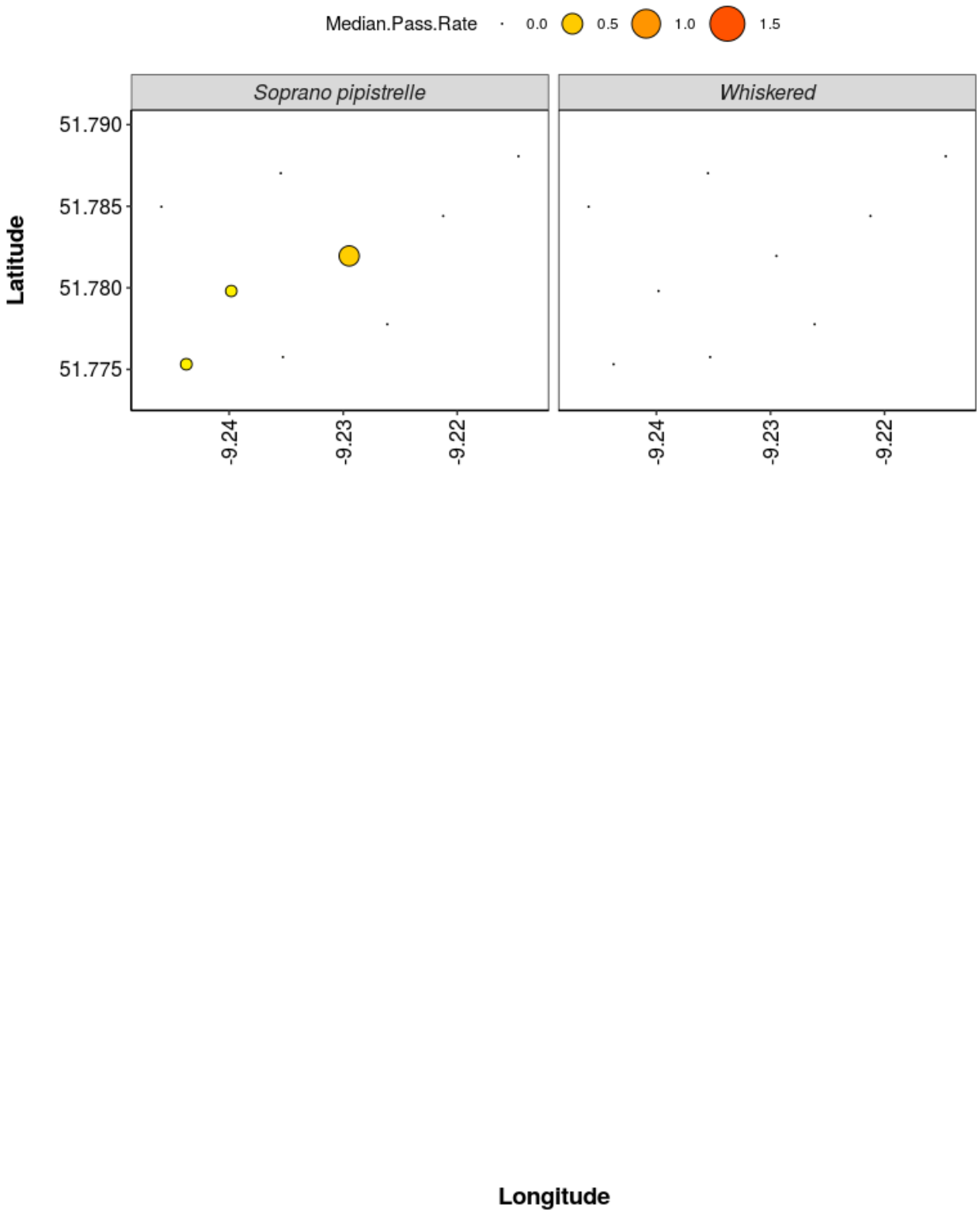
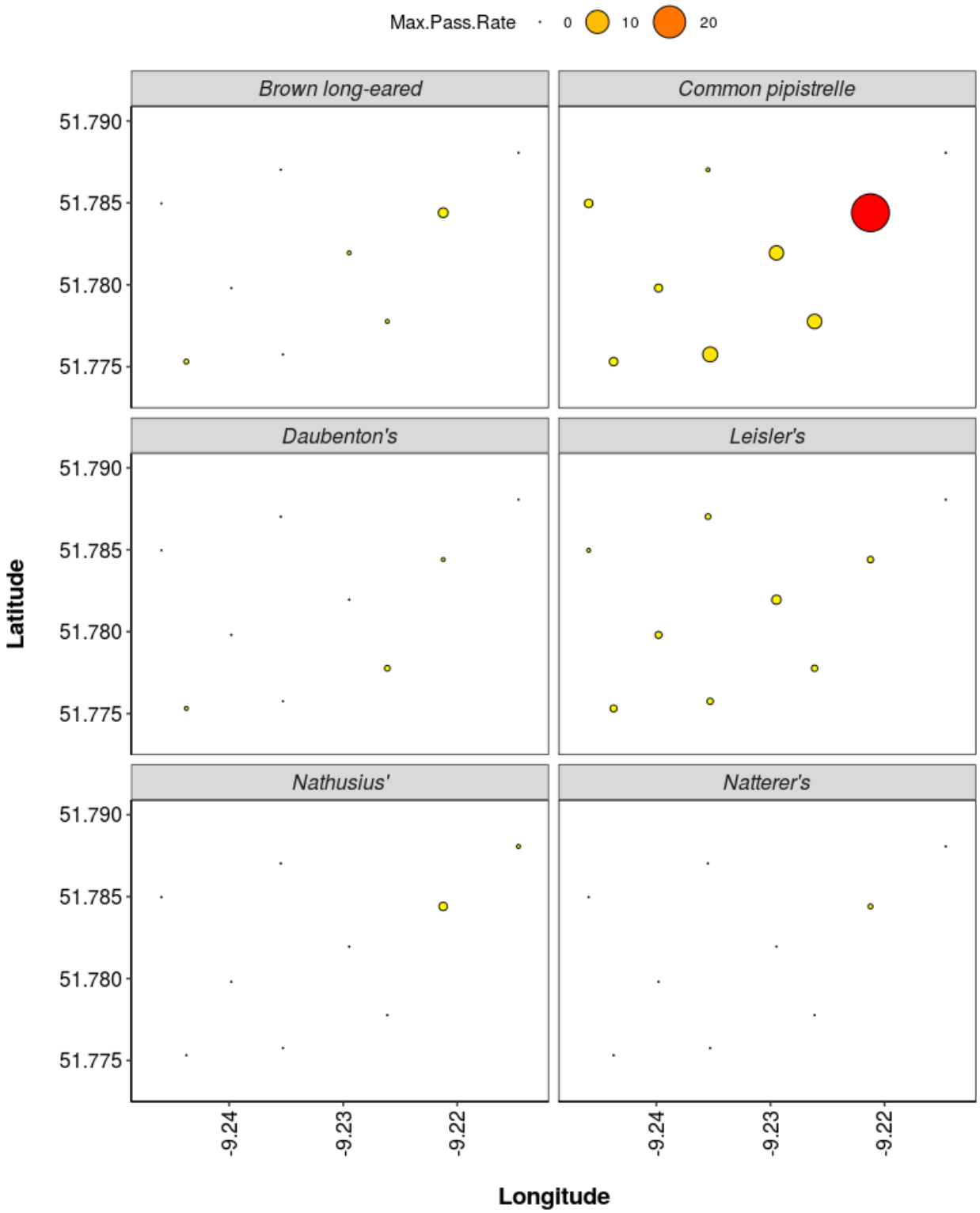
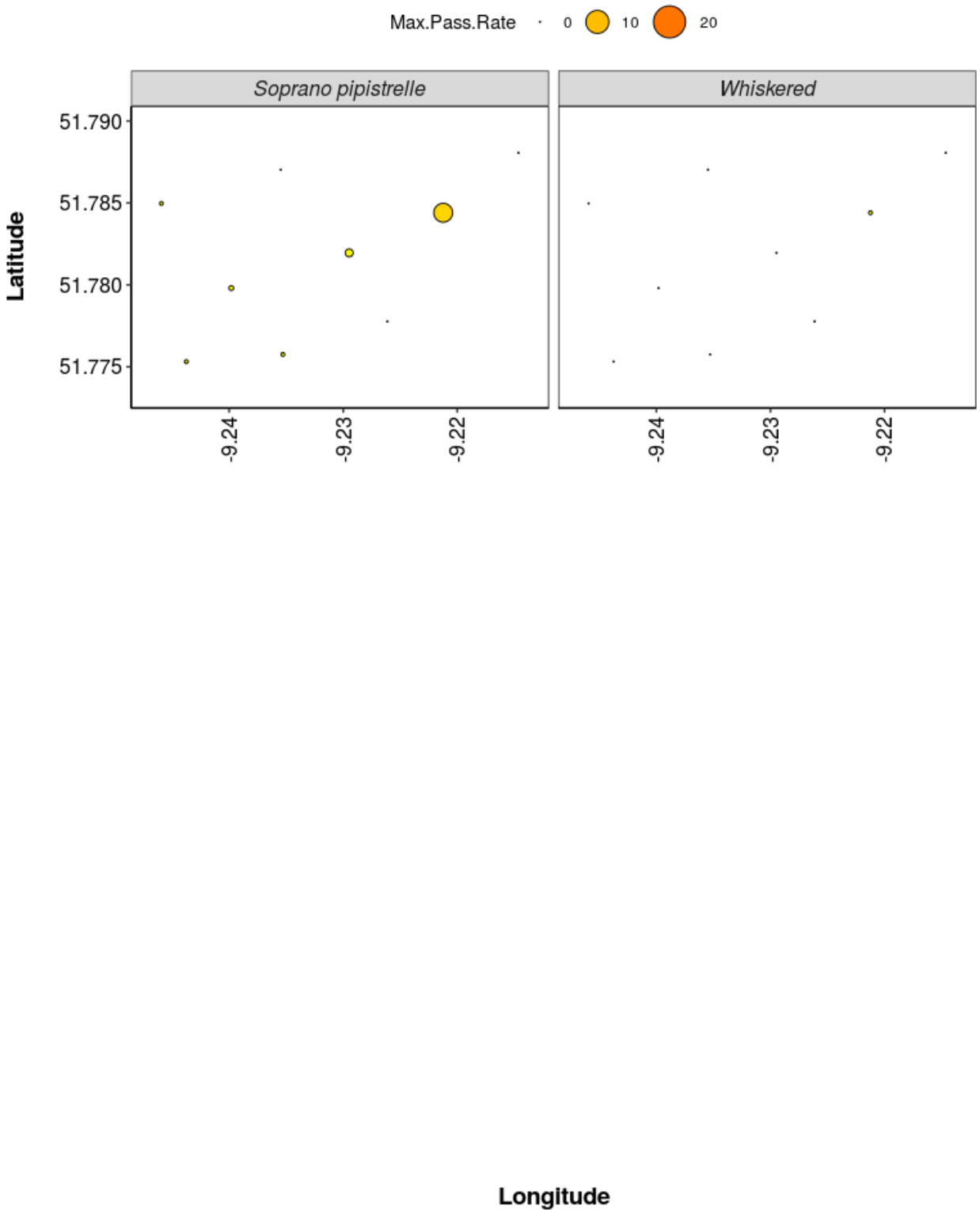

Median.Pass.Rate
0.0
0.5
1.0
1.5
Soprano pipistrelle
Whiskered
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
0
10
20
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Nathusius'
Natterer's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude



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

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: Gortloughra

Author: Fehily Timoney

24/06/2021

Summary

Bats were detected on **23** nights between **2020-09-15** and **2020-10-12**, using **7** static bat detectors. Throughout this period **9** species were recorded. **Table 1.** Detectors were placed at the following locations:

Detector ID	Latitude	Longitude
GL2	51.78497	-9.245940
GL4	51.77575	-9.235288
GL5	51.77777	-9.226132
GL6	51.78440	-9.221233
GL7	51.78806	-9.214635
GL8	51.78195	-9.229476
GL9	51.77980	-9.239814

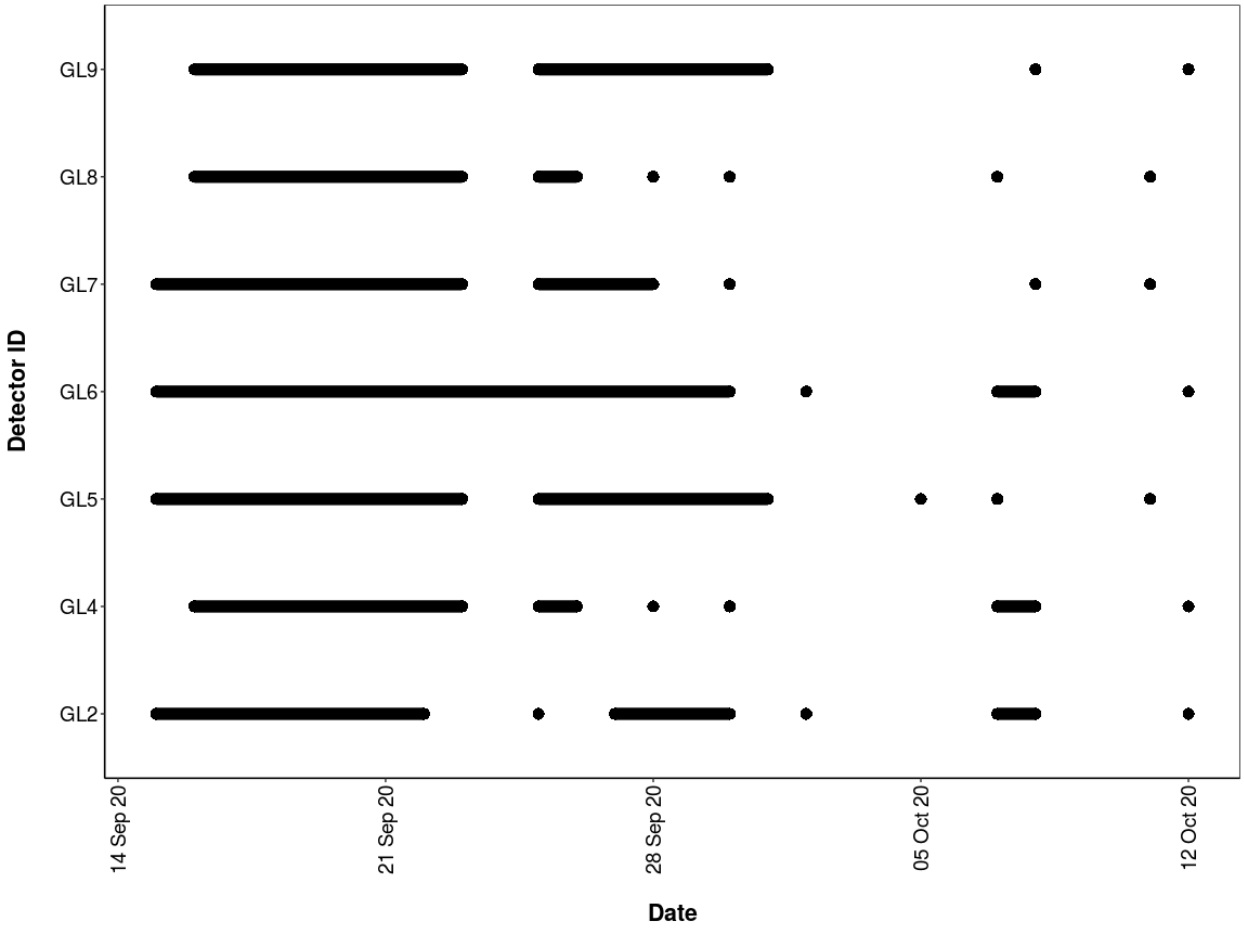
Survey Nights

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
GL2	17
GL4	15
GL5	20
GL6	20
GL7	17
GL8	15
GL9	17

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.
- Records using any make of bat detector.

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
GL2	*Myotis daubentonii*	0	0	0	3	4
GL2	*Myotis mystacinus*	0	0	0	0	1
GL2	*Myotis nattereri*	0	0	0	0	2
GL2	*Nyctalus leisleri*	0	0	1	1	4
GL2	*Pipistrellus nathusii*	0	1	0	2	3
GL2	*Pipistrellus pipistrellus*	2	2	2	3	5
GL2	*Pipistrellus pygmaeus*	1	1	1	2	5
GL2	*Plecotus auritus*	0	1	0	2	5
GL4	*Myotis daubentonii*	0	0	0	0	2
GL4	*Myotis nattereri*	0	0	0	0	2
GL4	*Nyctalus leisleri*	0	1	0	0	3
GL4	*Pipistrellus nathusii*	0	2	0	0	1
GL4	*Pipistrellus pipistrellus*	2	2	1	5	4
GL4	*Pipistrellus pygmaeus*	1	1	1	4	0
GL4	*Plecotus auritus*	0	0	0	3	3
GL5	*Myotis daubentonii*	0	0	1	2	4
GL5	*Myotis mystacinus*	0	0	0	0	2
GL5	*Myotis nattereri*	0	0	0	4	3
GL5	*Nyctalus leisleri*	0	1	1	2	2

GL5	*Pipistrellus nathusii*	0	1	0	3	1
GL5	*Pipistrellus pipistrellus*	1	1	5	5	4
GL5	*Pipistrellus pygmaeus*	1	0	0	6	5
GL5	*Plecotus auritus*	2	4	1	2	2
GL5	*Rhinolophus hipposideros*	0	0	0	0	1
GL6	*Myotis daubentonii*	1	6	1	3	1
GL6	*Myotis mystacinus*	0	0	0	1	4
GL6	*Myotis nattereri*	0	4	2	2	2
GL6	*Nyctalus leisleri*	0	1	1	0	3
GL6	*Pipistrellus nathusii*	2	3	2	2	2
GL6	*Pipistrellus pipistrellus*	11	3	1	1	2
GL6	*Pipistrellus pygmaeus*	9	3	1	0	0
GL6	*Plecotus auritus*	2	3	4	1	4
GL7	*Myotis daubentonii*	0	0	2	2	2
GL7	*Myotis mystacinus*	0	0	0	0	4
GL7	*Myotis nattereri*	0	0	3	3	1
GL7	*Nyctalus leisleri*	0	1	1	0	1
GL7	*Pipistrellus nathusii*	0	0	1	1	0
GL7	*Pipistrellus pipistrellus*	2	7	3	2	1
GL7	*Pipistrellus pygmaeus*	0	2	5	2	4
GL7	*Plecotus auritus*	0	0	2	2	6
GL7	*Rhinolophus hipposideros*	0	0	0	1	2
GL8	*Myotis daubentonii*	0	0	0	5	3

GL8	*Myotis mystacinus*	0	0	0	0	1
GL8	*Myotis nattereri*	0	1	4	3	0
GL8	*Nyctalus leisleri*	0	1	0	0	2
GL8	*Pipistrellus nathusii*	0	1	0	0	4
GL8	*Pipistrellus pipistrellus*	3	1	2	4	3
GL8	*Pipistrellus pygmaeus*	1	2	4	1	4
GL8	*Plecotus auritus*	1	5	2	1	1
GL9	*Myotis daubentonii*	0	0	0	4	3
GL9	*Myotis mystacinus*	0	0	0	1	1
GL9	*Myotis nattereri*	0	0	0	2	2
GL9	*Nyctalus leisleri*	0	0	1	2	1
GL9	*Pipistrellus nathusii*	0	1	0	1	3
GL9	*Pipistrellus pipistrellus*	1	2	5	3	2
GL9	*Pipistrellus pygmaeus*	1	1	1	2	4
GL9	*Plecotus auritus*	0	1	3	3	1

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
GL2	*Myotis daubentonii*	2	2 - 14	26	7	116
GL2	*Myotis mystacinus*	2	0	2	1	64
GL2	*Myotis nattereri*	2	2 - 2	2	2	96
GL2	*Nyctalus leisleri*	2	2 - 29.5	57	6	731
GL2	*Pipistrellus nathusii*	14	2 - 40	78	6	121
GL2	*Pipistrellus pipistrellus*	39	20.5 - 62.5	93	14	1054
GL2	*Pipistrellus pygmaeus*	14	2 - 43	84	10	993
GL2	*Plecotus auritus*	2	2 - 26	68	8	576
GL4	*Myotis daubentonii*	2	2 - 2	2	2	116
GL4	*Myotis nattereri*	2	2 - 2	2	2	96
GL4	*Nyctalus leisleri*	2	2 - 2	66	4	731
GL4	*Pipistrellus nathusii*	73	2 - 79	79	3	121
GL4	*Pipistrellus pipistrellus*	26	14 - 53	94	14	1054
GL4	*Pipistrellus pygmaeus*	39	32.5 - 69	85	7	993
GL4	*Plecotus auritus*	14	2 - 26	39	6	576
GL5	*Myotis daubentonii*	2	2 - 24.5	47	7	116
GL5	*Myotis mystacinus*	2	2 - 2	2	2	64
GL5	*Myotis nattereri*	26	2 - 32.5	39	7	96

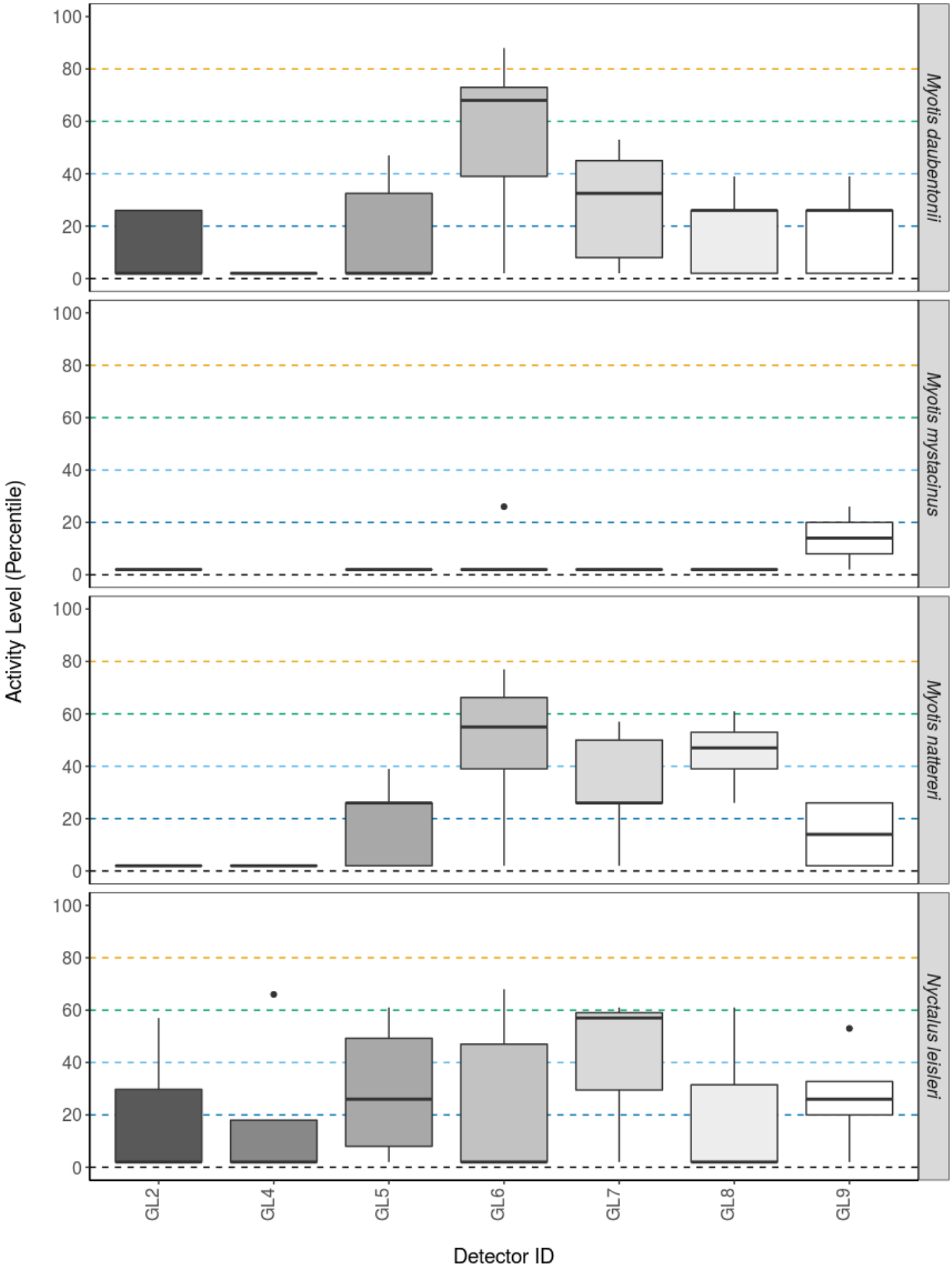
GL5	*Nyctalus leisleri*	26	2 - 57	61	6	731
GL5	*Pipistrellus nathusii*	26	2 - 66	66	5	121
GL5	*Pipistrellus pipistrellus*	33	20.5 - 47	94	16	1054
GL5	*Pipistrellus pygmaeus*	26	2 - 39	82	12	993
GL5	*Plecotus auritus*	63	26 - 75	86	11	576
GL5	*Rhinolophus hipposideros*	2	0	2	1	39
GL6	*Myotis daubentonii*	68	37.5 - 73	88	12	116
GL6	*Myotis mystacinus*	2	2 - 2	26	5	64
GL6	*Myotis nattereri*	55	27.5 - 67	77	10	96
GL6	*Nyctalus leisleri*	2	2 - 35	68	5	731
GL6	*Pipistrellus nathusii*	57	26 - 72	90	11	121
GL6	*Pipistrellus pipistrellus*	92	58.5 - 94	98	18	1054
GL6	*Pipistrellus pygmaeus*	85	71.5 - 94	98	13	993
GL6	*Plecotus auritus*	52	24.5 - 63.5	83	14	576
GL7	*Myotis daubentonii*	33	14 - 46	53	6	116
GL7	*Myotis mystacinus*	2	2 - 2	2	4	64
GL7	*Myotis nattereri*	26	14 - 55	57	7	96
GL7	*Nyctalus leisleri*	57	2 - 61	61	3	731
GL7	*Pipistrellus nathusii*	43	43 - 43	47	2	121

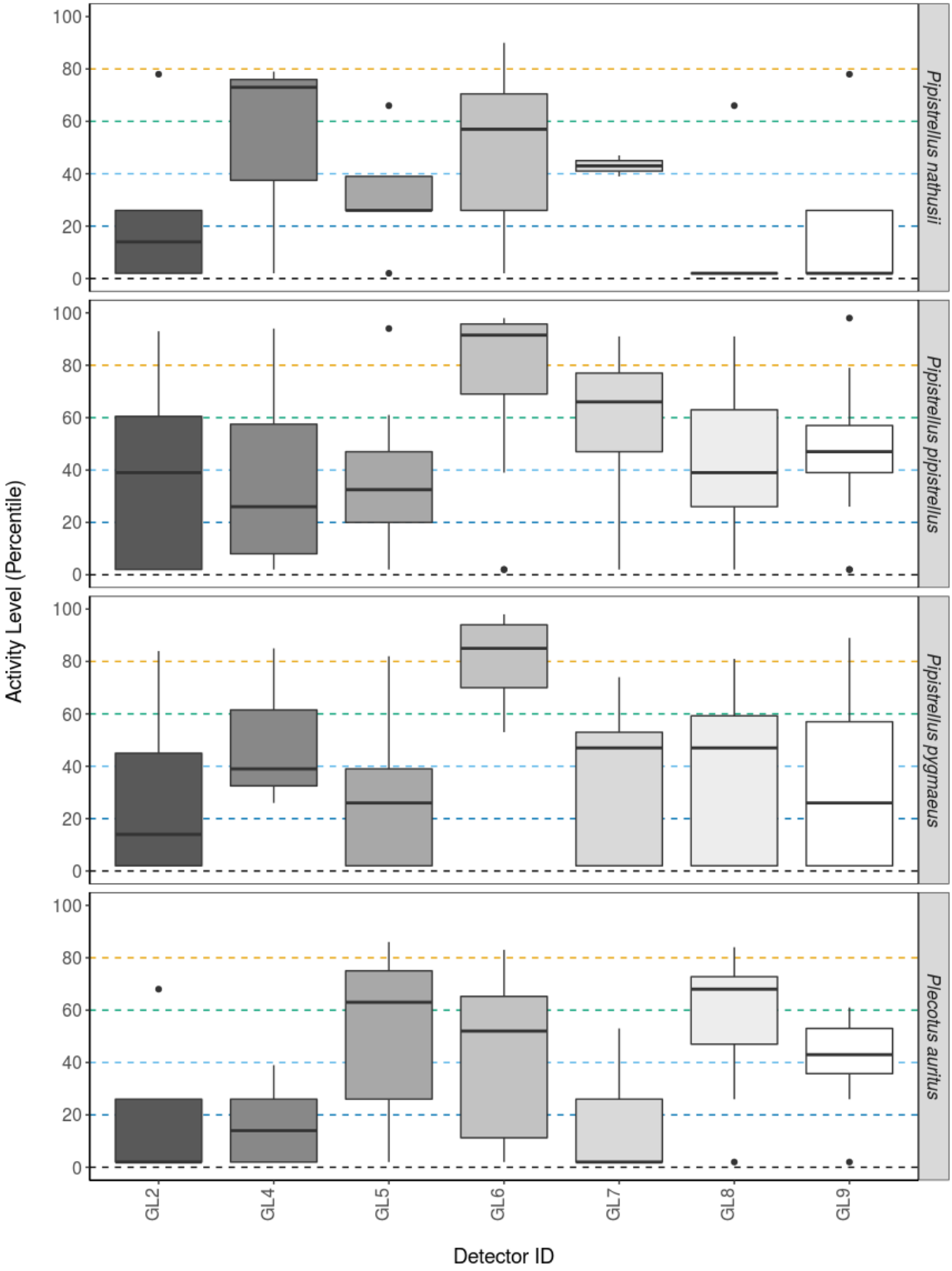
GL7	*Pipistrellus pipistrellus*	66	47 - 75.5	91	15	1054
GL7	*Pipistrellus pygmaeus*	47	20.5 - 50	74	13	993
GL7	*Plecotus auritus*	2	2 - 27.5	53	10	576
GL7	*Rhinolophus hipposideros*	2	2 - 2	26	3	39
GL8	*Myotis daubentonii*	26	2 - 32.5	39	8	116
GL8	*Myotis mystacinus*	2	0	2	1	64
GL8	*Myotis nattereri*	47	36.5 - 54	61	8	96
GL8	*Nyctalus leisleri*	2	2 - 2	61	3	731
GL8	*Pipistrellus nathusii*	2	2 - 2	66	5	121
GL8	*Pipistrellus pipistrellus*	39	20.5 - 63.5	91	13	1054
GL8	*Pipistrellus pygmaeus*	47	20.5 - 60	81	12	993
GL8	*Plecotus auritus*	68	36.5 - 74.5	84	10	576
GL9	*Myotis daubentonii*	26	2 - 32.5	39	7	116
GL9	*Myotis mystacinus*	14	14 - 14	26	2	64
GL9	*Myotis nattereri*	14	2 - 26	26	4	96
GL9	*Nyctalus leisleri*	26	14 - 39.5	53	4	731
GL9	*Pipistrellus nathusii*	2	2 - 40	78	5	121
GL9	*Pipistrellus pipistrellus*	47	26 - 63	98	13	1054
GL9	*Pipistrellus pygmaeus*	26	2 - 55.5	89	9	993

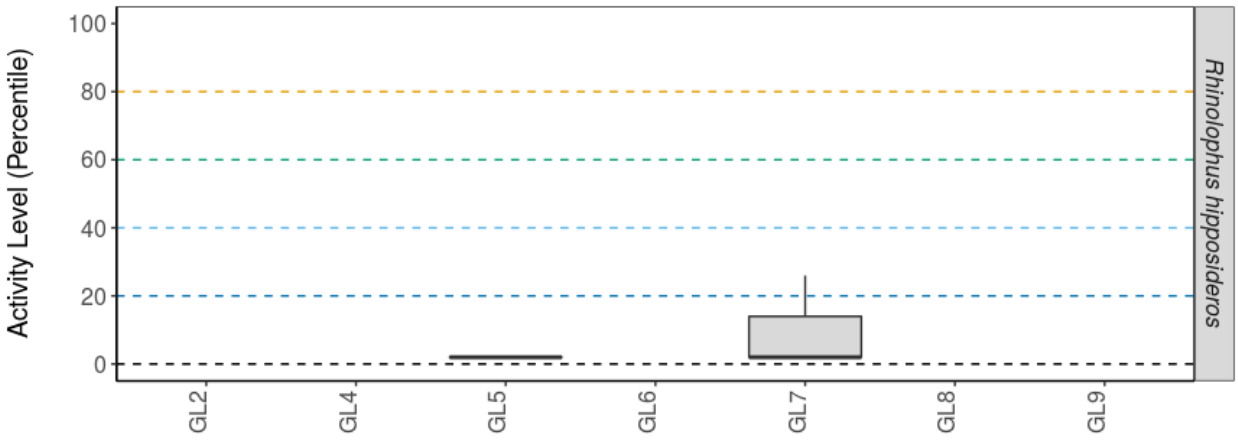
GL9	*Plecotus auritus*	43	20.5 - 54	61	8	576

###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)

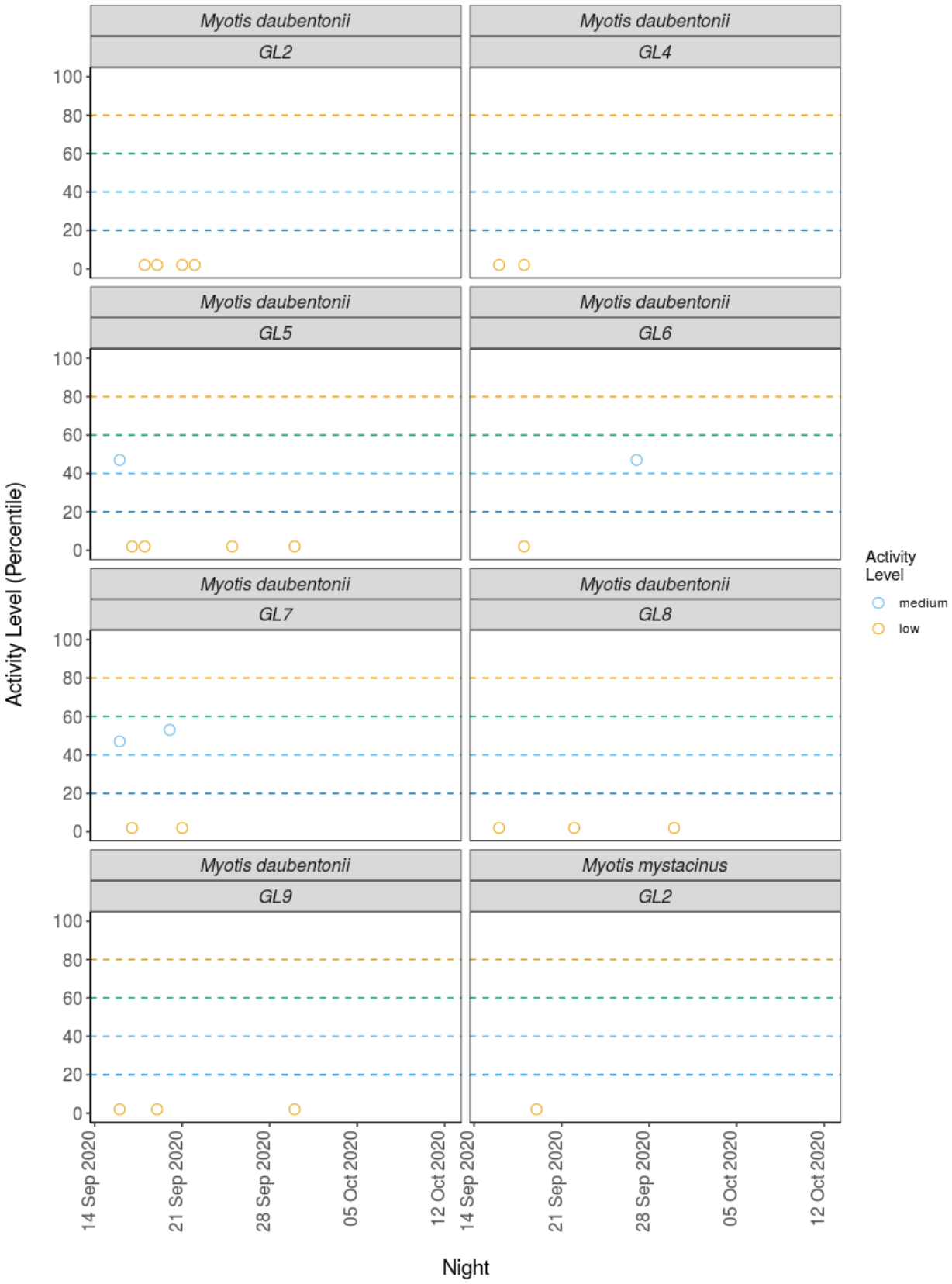

Activity Level (Percentile)
100
80
60
40
20
0
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

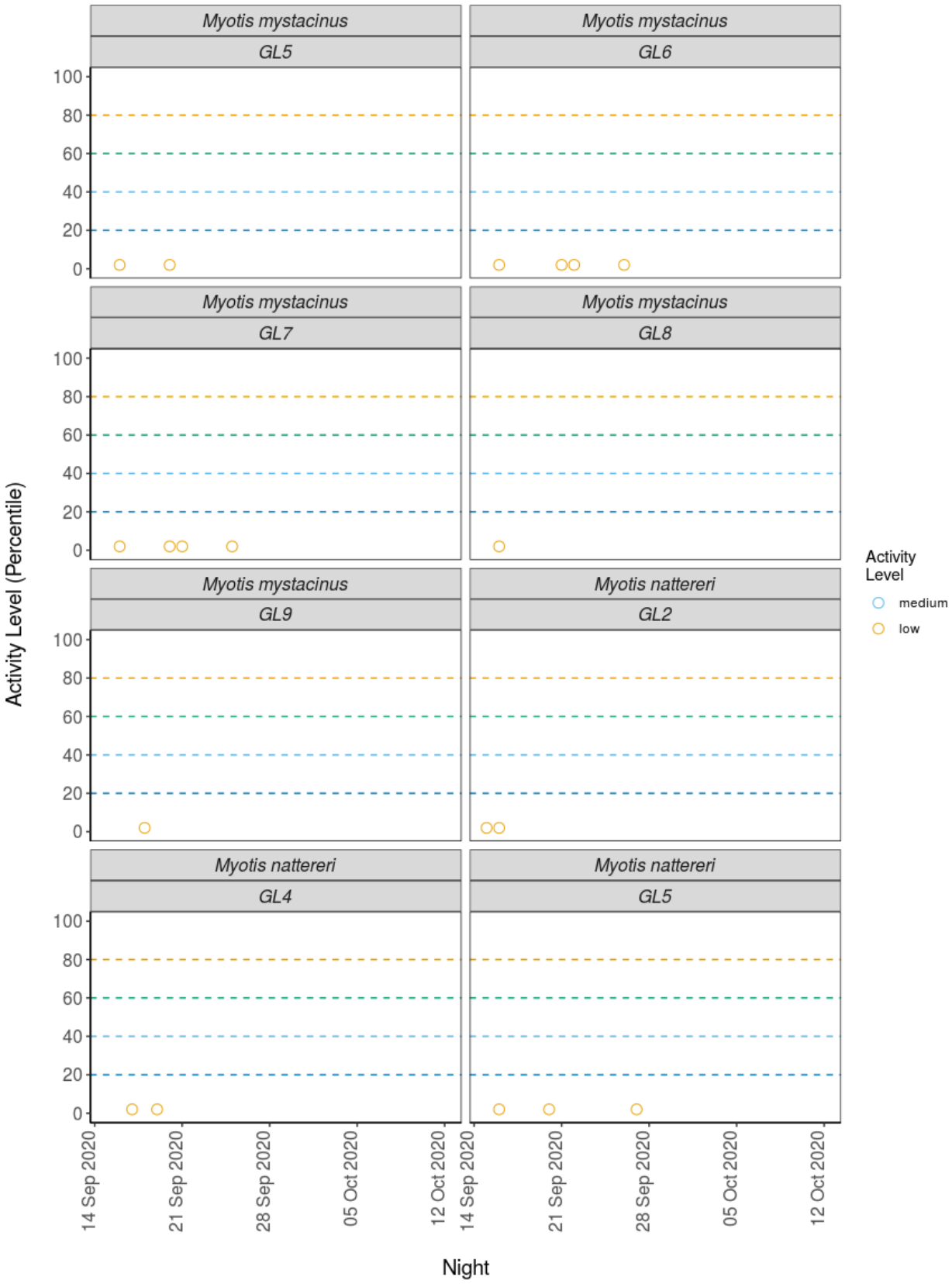

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

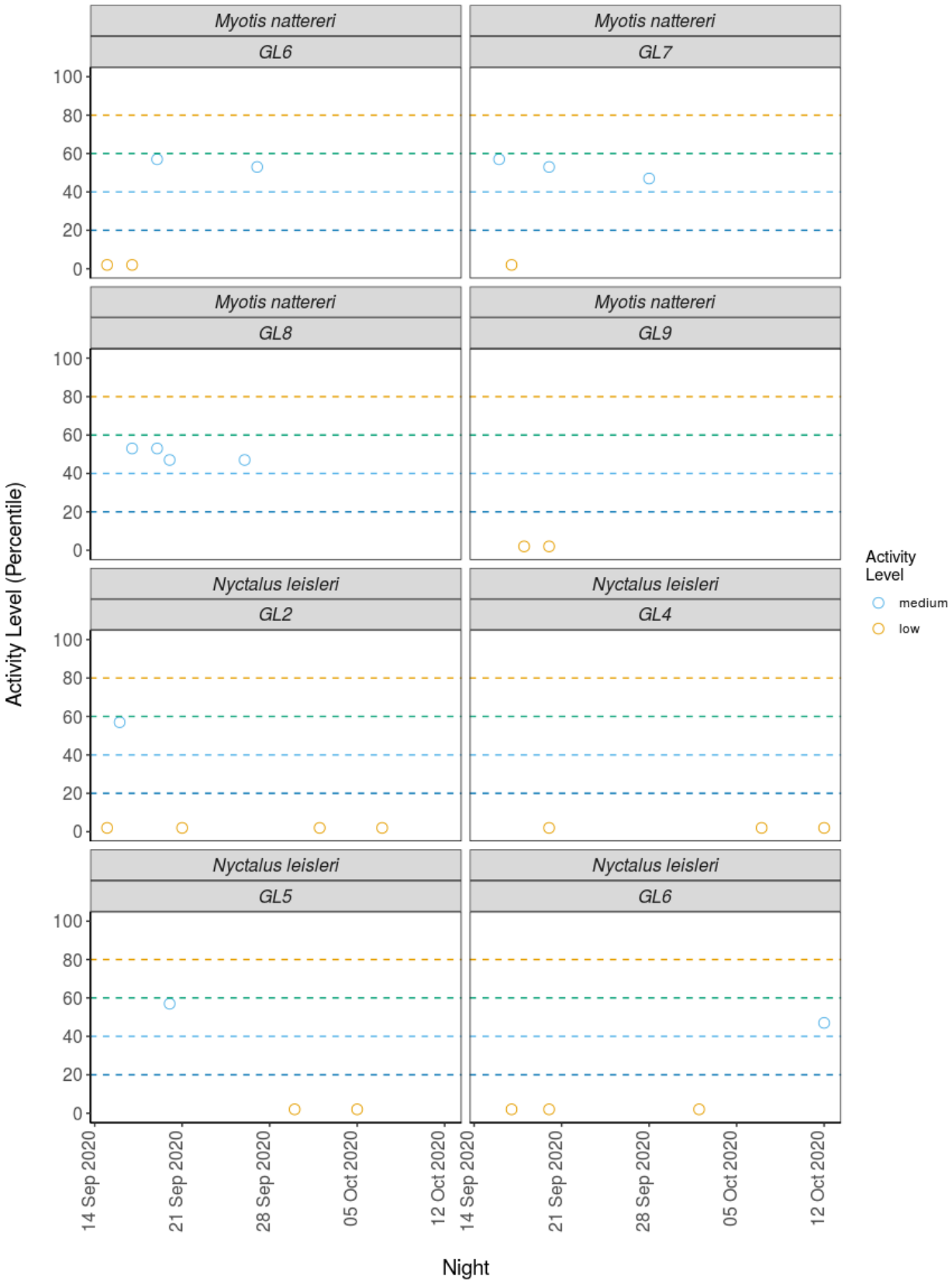

Activity Level (Percentile)
100
80
60
40
20
0
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Rhinolophus hipposideros

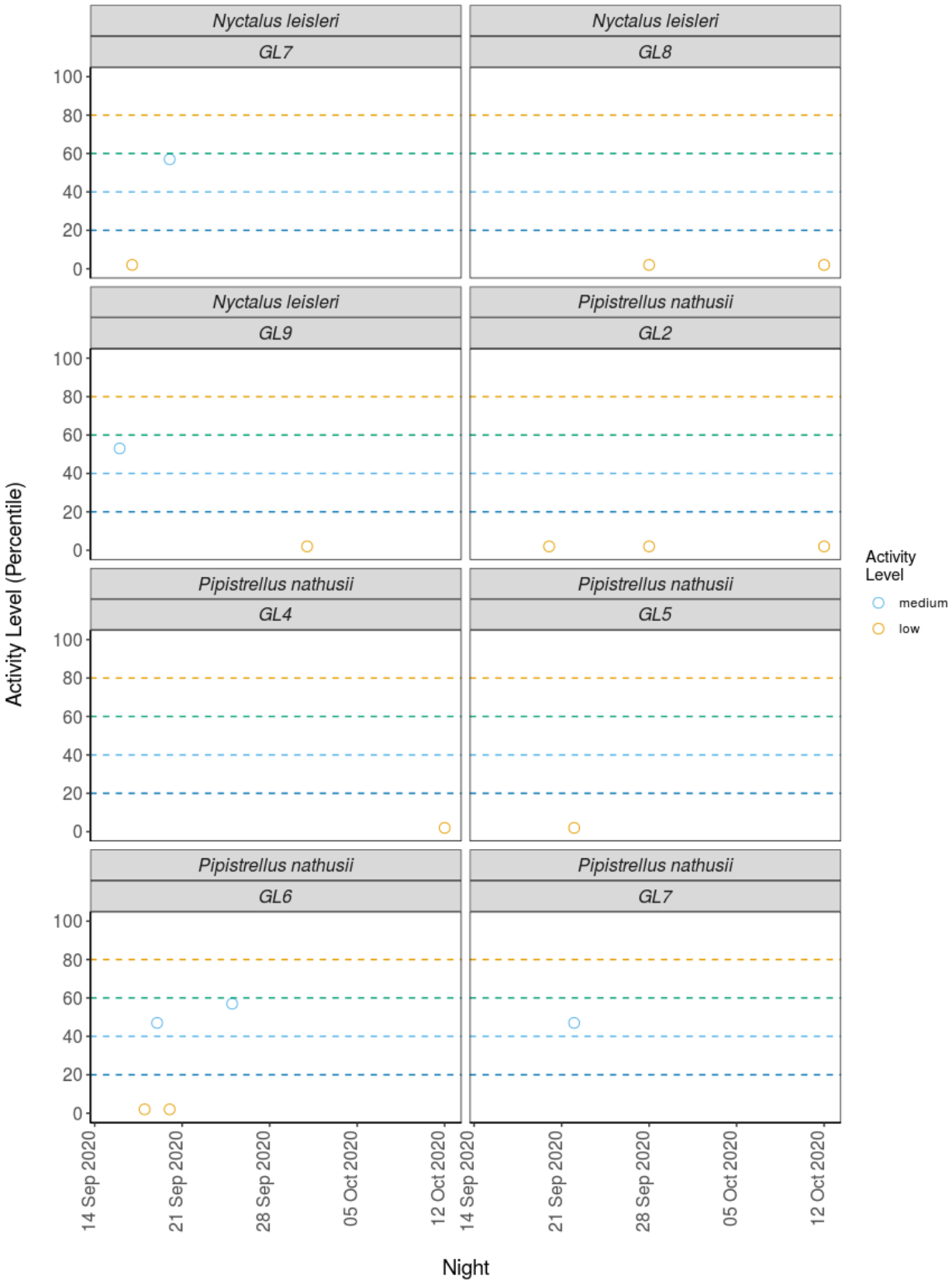
Detector ID

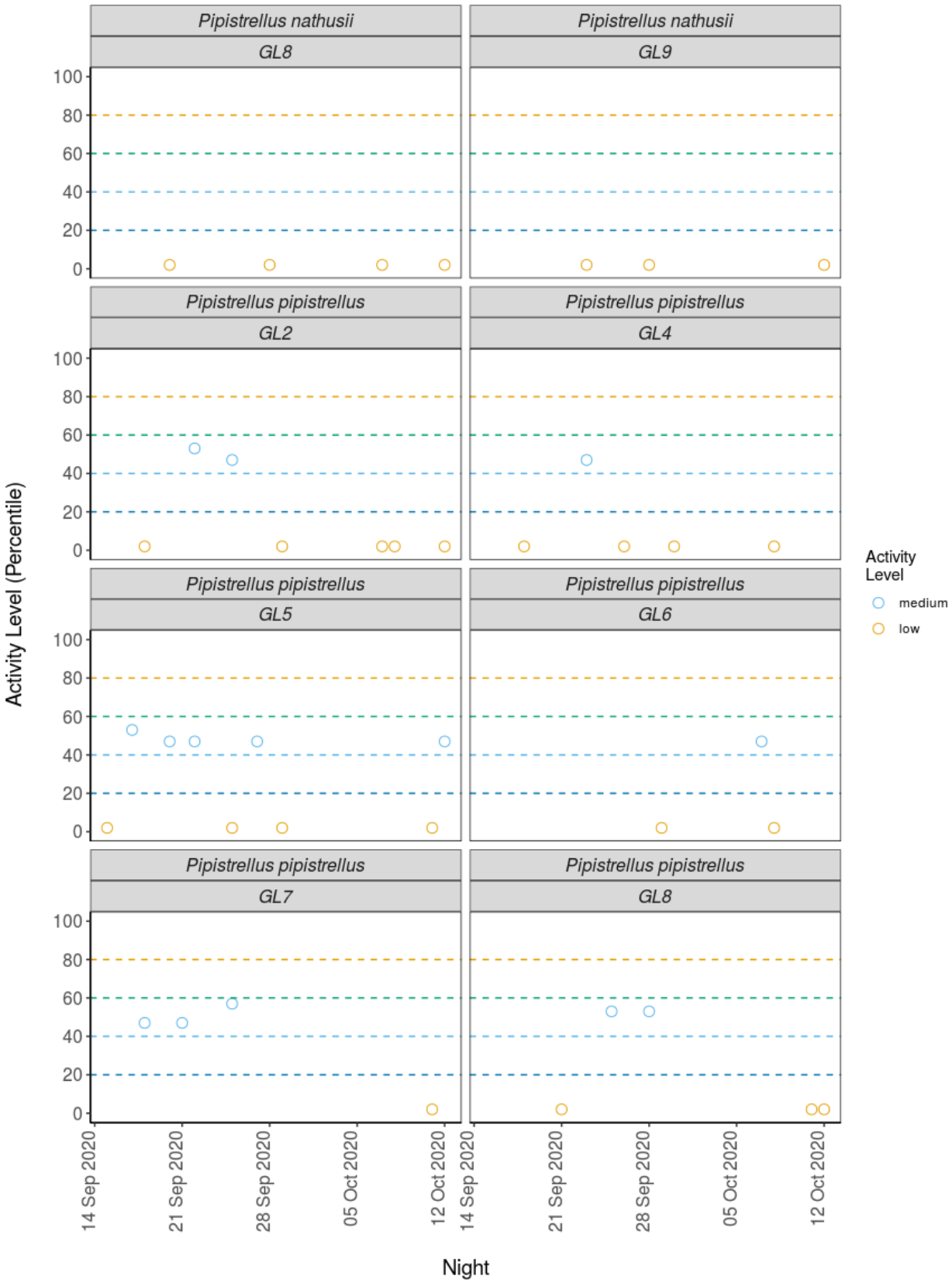
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.

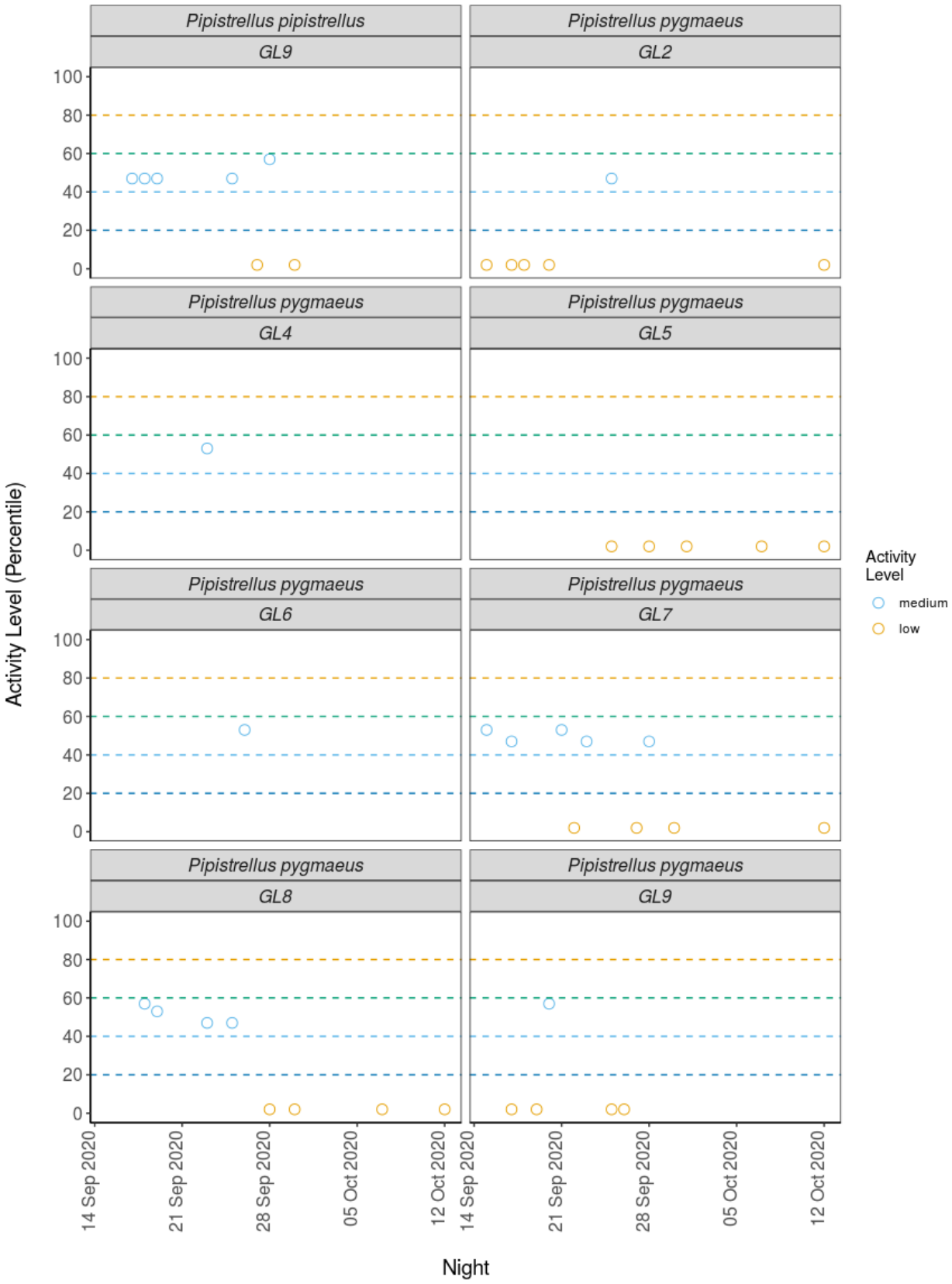

Myotis daubentonii
GL2
Myotis daubentonii
GL4
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Myotis daubentonii
GL7
Myotis daubentonii
GL8
Myotis daubentonii
GL9
Myotis mystacinus
GL2
Activity Level (Percentile)
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low

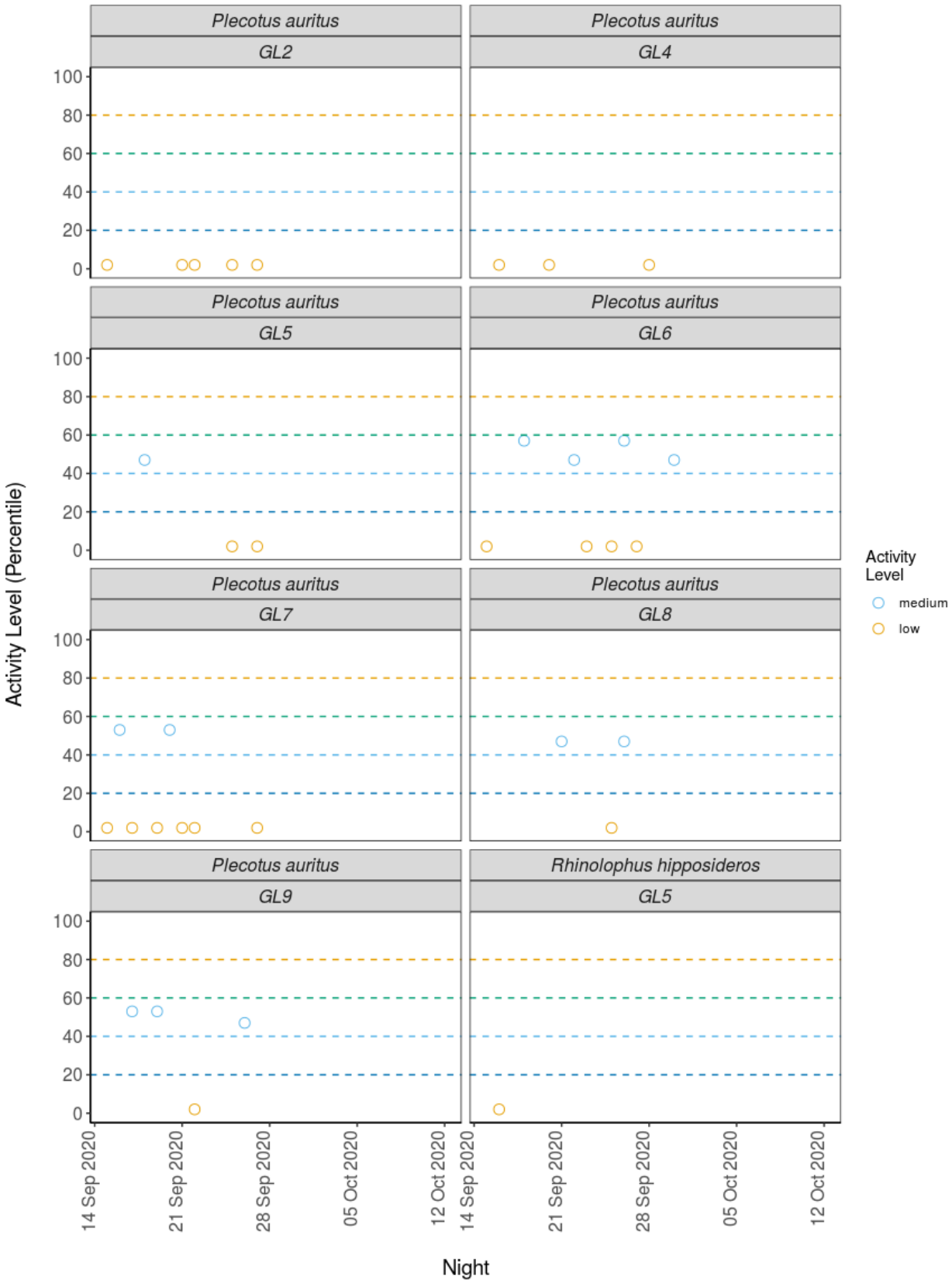

Myotis mystacinus
GL5
Myotis mystacinus
GL6
Myotis mystacinus
GL7
Myotis mystacinus
GL8
Myotis mystacinus
GL9
Myotis nattereri
GL2
Myotis nattereri
GL4
Myotis nattereri
GL5
Activity Level (Percentile)
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low

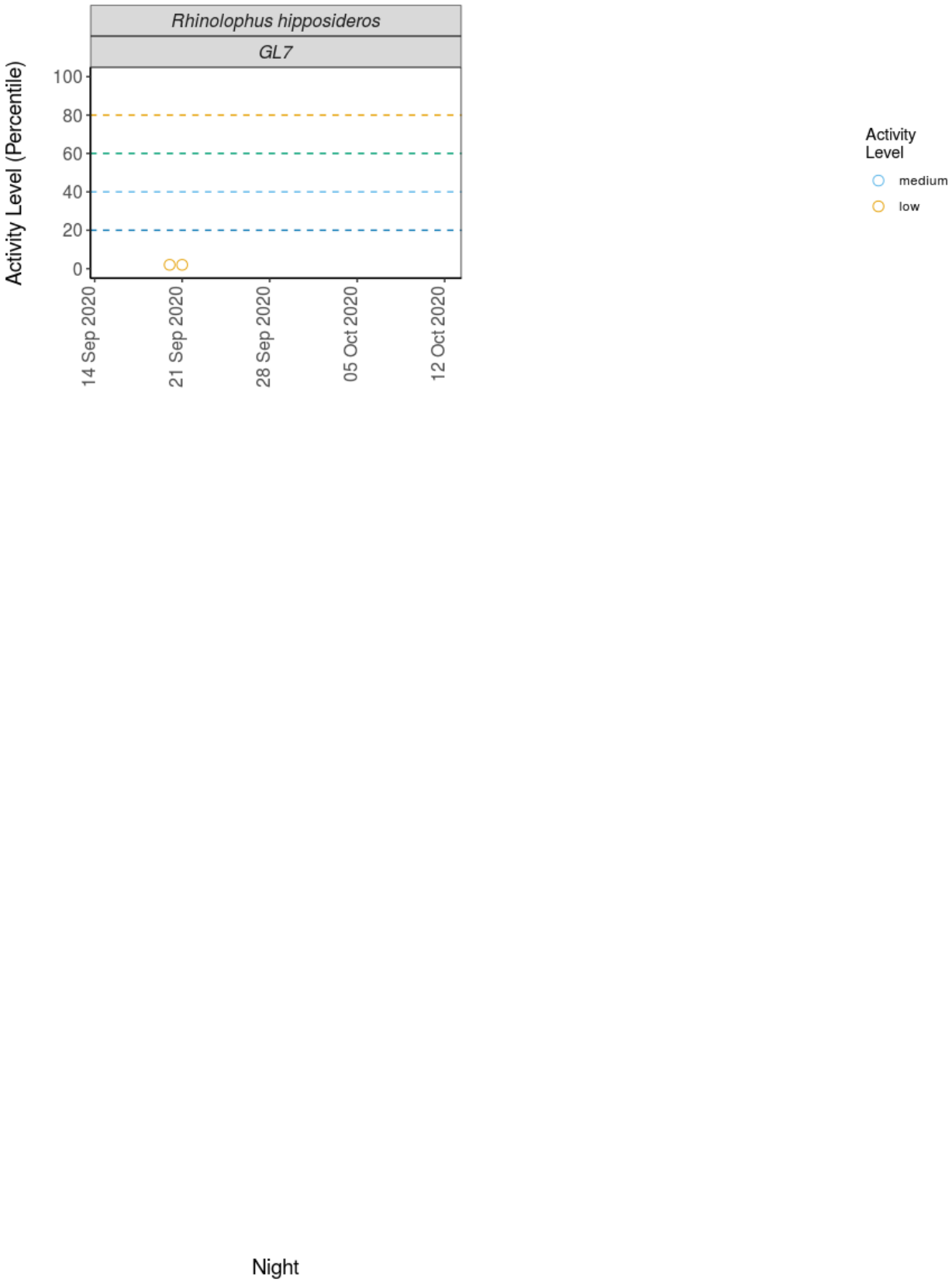

Myotis nattereri
GL6
Myotis nattereri
GL7
Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL2
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Activity Level (Percentile)
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low


Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL2
Pipistrellus nathusii
GL4
Pipistrellus nathusii
GL5
Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL7
Activity Level (Percentile)
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low


Pipistrellus nathusii
GL8
Pipistrellus nathusii
GL9
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL4
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL8
Activity Level (Percentile)
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low


Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL4
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL8
Pipistrellus pygmaeus
GL9
Activity Level (Percentile)
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low


Plecotus auritus
GL2
Plecotus auritus
GL4
Plecotus auritus
GL5
Plecotus auritus
GL6
Plecotus auritus
GL7
Plecotus auritus
GL8
Plecotus auritus
GL9
Rhinolophus hipposideros
GL5
Activity Level (Percentile)
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low


Rhinolophus hipposideros
GL7
Activity Level (Percentile)
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Night
Activity Level
medium
low

PER DETECTOR, PER MONTH

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

Detector ID	Species/Species Group	Month	Nights of High Activity	Nights of Moderate / High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
GL2	*Myotis daubentonii*	Sep	0	0	0	3	4
GL2	*Myotis mystacinus*	Sep	0	0	0	0	1
GL2	*Myotis nattereri*	Sep	0	0	0	0	2
GL2	*Nyctalus leisleri*	Sep	0	0	1	0	2
GL2	*Nyctalus leisleri*	Oct	0	0	0	1	2
GL2	*Pipistrellus nathusii*	Sep	0	1	0	2	2
GL2	*Pipistrellus nathusii*	Oct	0	0	0	0	1
GL2	*Pipistrellus pipistrellus*	Sep	2	2	2	3	2
GL2	*Pipistrellus pipistrellus*	Oct	0	0	0	0	3
GL2	*Pipistrellus pygmaeus*	Sep	1	1	1	2	4
GL2	*Pipistrellus pygmaeus*	Oct	0	0	0	0	1
GL2	*Plecotus auritus*	Sep	0	1	0	2	5
GL4	*Myotis daubentonii*	Sep	0	0	0	0	2
GL4	*Myotis nattereri*	Sep	0	0	0	0	2
GL4	*Nyctalus leisleri*	Sep	0	1	0	0	1
GL4	*Nyctalus leisleri*	Oct	0	0	0	0	2
GL4	*Pipistrellus nathusii*	Sep	0	2	0	0	0

GL4	*Pipistrellus nathusii*	Oct	0	0	0	0	1
GL4	*Pipistrellus pipistrellus*	Sep	2	2	1	3	3
GL4	*Pipistrellus pipistrellus*	Oct	0	0	0	2	1
GL4	*Pipistrellus pygmaeus*	Sep	1	1	1	3	0
GL4	*Pipistrellus pygmaeus*	Oct	0	0	0	1	0
GL4	*Plecotus auritus*	Sep	0	0	0	3	3
GL5	*Myotis daubentonii*	Sep	0	0	1	2	4
GL5	*Myotis mystacinus*	Sep	0	0	0	0	2
GL5	*Myotis nattereri*	Sep	0	0	0	4	3
GL5	*Nyctalus leisleri*	Sep	0	1	1	1	1
GL5	*Nyctalus leisleri*	Oct	0	0	0	1	1
GL5	*Pipistrellus nathusii*	Sep	0	1	0	1	1
GL5	*Pipistrellus nathusii*	Oct	0	0	0	2	0
GL5	*Pipistrellus pipistrellus*	Sep	1	1	4	4	3
GL5	*Pipistrellus pipistrellus*	Oct	0	0	1	1	1
GL5	*Pipistrellus pygmaeus*	Sep	1	0	0	6	2
GL5	*Pipistrellus pygmaeus*	Oct	0	0	0	0	3
GL5	*Plecotus auritus*	Sep	2	4	1	2	2
GL5	*Rhinolophus hipposideros*	Sep	0	0	0	0	1
GL6	*Myotis daubentonii*	Sep	1	6	1	3	1
GL6	*Myotis mystacinus*	Sep	0	0	0	1	4

GL6	*Myotis nattereri*	Sep	0	4	2	2	2
GL6	*Nyctalus leisleri*	Sep	0	1	0	0	2
GL6	*Nyctalus leisleri*	Oct	0	0	1	0	1
GL6	*Pipistrellus nathusii*	Sep	2	3	2	1	2
GL6	*Pipistrellus nathusii*	Oct	0	0	0	1	0
GL6	*Pipistrellus pipistrellus*	Sep	11	3	0	1	1
GL6	*Pipistrellus pipistrellus*	Oct	0	0	1	0	1
GL6	*Pipistrellus pygmaeus*	Sep	9	3	1	0	0
GL6	*Plecotus auritus*	Sep	2	3	4	1	4
GL7	*Myotis daubentonii*	Sep	0	0	2	2	2
GL7	*Myotis mystacinus*	Sep	0	0	0	0	4
GL7	*Myotis nattereri*	Sep	0	0	3	3	1
GL7	*Nyctalus leisleri*	Sep	0	1	1	0	1
GL7	*Pipistrellus nathusii*	Sep	0	0	1	1	0
GL7	*Pipistrellus pipistrellus*	Sep	2	7	3	1	0
GL7	*Pipistrellus pipistrellus*	Oct	0	0	0	1	1
GL7	*Pipistrellus pygmaeus*	Sep	0	2	5	2	3
GL7	*Pipistrellus pygmaeus*	Oct	0	0	0	0	1
GL7	*Plecotus auritus*	Sep	0	0	2	2	6
GL7	*Rhinolophus hipposideros*	Sep	0	0	0	1	2
GL8	*Myotis daubentonii*	Sep	0	0	0	5	3

GL8	*Myotis mystacinus*	Sep	0	0	0	0	1
GL8	*Myotis nattereri*	Sep	0	1	4	3	0
GL8	*Nyctalus leisleri*	Sep	0	1	0	0	1
GL8	*Nyctalus leisleri*	Oct	0	0	0	0	1
GL8	*Pipistrellus nathusii*	Sep	0	1	0	0	2
GL8	*Pipistrellus nathusii*	Oct	0	0	0	0	2
GL8	*Pipistrellus pipistrellus*	Sep	3	1	2	3	1
GL8	*Pipistrellus pipistrellus*	Oct	0	0	0	1	2
GL8	*Pipistrellus pygmaeus*	Sep	1	2	4	1	2
GL8	*Pipistrellus pygmaeus*	Oct	0	0	0	0	2
GL8	*Plecotus auritus*	Sep	1	5	2	1	1
GL9	*Myotis daubentonii*	Sep	0	0	0	4	3
GL9	*Myotis mystacinus*	Sep	0	0	0	1	1
GL9	*Myotis nattereri*	Sep	0	0	0	2	2
GL9	*Nyctalus leisleri*	Sep	0	0	1	1	0
GL9	*Nyctalus leisleri*	Oct	0	0	0	1	1
GL9	*Pipistrellus nathusii*	Sep	0	1	0	1	2
GL9	*Pipistrellus nathusii*	Oct	0	0	0	0	1
GL9	*Pipistrellus pipistrellus*	Sep	1	2	5	2	2
GL9	*Pipistrellus pipistrellus*	Oct	0	0	0	1	0
GL9	*Pipistrellus pygmaeus*	Sep	1	1	1	2	4
GL9	*Plecotus auritus*	Sep	0	1	3	3	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
GL2	*Myotis daubentonii*	Sep	2	2 - 14	26	7
GL2	*Myotis mystacinus*	Sep	2	0	2	1
GL2	*Myotis nattereri*	Sep	2	2 - 2	2	2
GL2	*Nyctalus leisleri*	Sep	2	2 - 29.5	57	3
GL2	*Nyctalus leisleri*	Oct	2	2 - 29.5	39	3
GL2	*Pipistrellus nathusii*	Sep	26	2 - 40	78	5
GL2	*Pipistrellus nathusii*	Oct	2	2 - 40	2	1
GL2	*Pipistrellus pipistrellus*	Sep	47	20.5 - 62.5	93	11
GL2	*Pipistrellus pipistrellus*	Oct	2	20.5 - 62.5	2	3
GL2	*Pipistrellus pygmaeus*	Sep	26	2 - 43	84	9
GL2	*Pipistrellus pygmaeus*	Oct	2	2 - 43	2	1
GL2	*Plecotus auritus*	Sep	2	2 - 26	68	8
GL4	*Myotis daubentonii*	Sep	2	2 - 2	2	2
GL4	*Myotis nattereri*	Sep	2	2 - 2	2	2
GL4	*Nyctalus leisleri*	Sep	34	2 - 2	66	2
GL4	*Nyctalus leisleri*	Oct	2	2 - 2	2	2
GL4	*Pipistrellus nathusii*	Sep	76	2 - 79	79	2
GL4	*Pipistrellus nathusii*	Oct	2	2 - 79	2	1
GL4	*Pipistrellus pipistrellus*	Sep	39	14 - 53	94	11
GL4	*Pipistrellus pipistrellus*	Oct	26	14 - 53	26	3

GL4	*Pipistrellus pygmaeus*	Sep	46	32.5 - 69	85	6
GL4	*Pipistrellus pygmaeus*	Oct	26	32.5 - 69	26	1
GL4	*Plecotus auritus*	Sep	14	2 - 26	39	6
GL5	*Myotis daubentonii*	Sep	2	2 - 24.5	47	7
GL5	*Myotis mystacinus*	Sep	2	2 - 2	2	2
GL5	*Myotis nattereri*	Sep	26	2 - 32.5	39	7
GL5	*Nyctalus leisleri*	Sep	42	2 - 57	61	4
GL5	*Nyctalus leisleri*	Oct	14	2 - 57	26	2
GL5	*Pipistrellus nathusii*	Sep	39	2 - 66	66	3
GL5	*Pipistrellus nathusii*	Oct	26	2 - 66	26	2
GL5	*Pipistrellus pipistrellus*	Sep	39	20.5 - 47	94	13
GL5	*Pipistrellus pipistrellus*	Oct	26	20.5 - 47	47	3
GL5	*Pipistrellus pygmaeus*	Sep	26	2 - 39	82	9
GL5	*Pipistrellus pygmaeus*	Oct	2	2 - 39	2	3
GL5	*Plecotus auritus*	Sep	63	26 - 75	86	11
GL5	*Rhinolophus hipposideros*	Sep	2	0	2	1
GL6	*Myotis daubentonii*	Sep	68	37.5 - 73	88	12
GL6	*Myotis mystacinus*	Sep	2	2 - 2	26	5
GL6	*Myotis nattereri*	Sep	55	27.5 - 67	77	10
GL6	*Nyctalus leisleri*	Sep	2	2 - 35	68	3
GL6	*Nyctalus leisleri*	Oct	25	2 - 35	47	2
GL6	*Pipistrellus nathusii*	Sep	60	26 - 72	90	10
GL6	*Pipistrellus nathusii*	Oct	26	26 - 72	26	1

GL6	*Pipistrellus pipistrellus*	Sep	94	58.5 - 94	98	16
GL6	*Pipistrellus pipistrellus*	Oct	25	58.5 - 94	47	2
GL6	*Pipistrellus pygmaeus*	Sep	85	71.5 - 94	98	13
GL6	*Plecotus auritus*	Sep	52	24.5 - 63.5	83	14
GL7	*Myotis daubentonii*	Sep	33	14 - 46	53	6
GL7	*Myotis mystacinus*	Sep	2	2 - 2	2	4
GL7	*Myotis nattereri*	Sep	26	14 - 55	57	7
GL7	*Nyctalus leisleri*	Sep	57	2 - 61	61	3
GL7	*Pipistrellus nathusii*	Sep	43	43 - 43	47	2
GL7	*Pipistrellus pipistrellus*	Sep	73	47 - 75.5	91	13
GL7	*Pipistrellus pipistrellus*	Oct	14	47 - 75.5	26	2
GL7	*Pipistrellus pygmaeus*	Sep	47	20.5 - 50	74	12
GL7	*Pipistrellus pygmaeus*	Oct	2	20.5 - 50	2	1
GL7	*Plecotus auritus*	Sep	2	2 - 27.5	53	10
GL7	*Rhinolophus hipposideros*	Sep	2	2 - 2	26	3
GL8	*Myotis daubentonii*	Sep	26	2 - 32.5	39	8
GL8	*Myotis mystacinus*	Sep	2	0	2	1
GL8	*Myotis nattereri*	Sep	47	36.5 - 54	61	8
GL8	*Nyctalus leisleri*	Sep	32	2 - 2	61	2
GL8	*Nyctalus leisleri*	Oct	2	2 - 2	2	1
GL8	*Pipistrellus nathusii*	Sep	2	2 - 2	66	3
GL8	*Pipistrellus nathusii*	Oct	2	2 - 2	2	2

GL8	*Pipistrellus pipistrellus*	Sep	53	20.5 - 63.5	91	10
GL8	*Pipistrellus pipistrellus*	Oct	2	20.5 - 63.5	39	3
GL8	*Pipistrellus pygmaeus*	Sep	50	20.5 - 60	81	10
GL8	*Pipistrellus pygmaeus*	Oct	2	20.5 - 60	2	2
GL8	*Plecotus auritus*	Sep	68	36.5 - 74.5	84	10
GL9	*Myotis daubentonii*	Sep	26	2 - 32.5	39	7
GL9	*Myotis mystacinus*	Sep	14	14 - 14	26	2
GL9	*Myotis nattereri*	Sep	14	2 - 26	26	4
GL9	*Nyctalus leisleri*	Sep	40	14 - 39.5	53	2
GL9	*Nyctalus leisleri*	Oct	14	14 - 39.5	26	2
GL9	*Pipistrellus nathusii*	Sep	14	2 - 40	78	4
GL9	*Pipistrellus nathusii*	Oct	2	2 - 40	2	1
GL9	*Pipistrellus pipistrellus*	Sep	47	26 - 63	98	12
GL9	*Pipistrellus pipistrellus*	Oct	26	26 - 63	26	1
GL9	*Pipistrellus pygmaeus*	Sep	26	2 - 55.5	89	9
GL9	*Plecotus auritus*	Sep	43	20.5 - 54	61	8

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 daubentonii	1	6	4	19	19
Myotis mystacinus	0	0	0	2	13
Myotis nattereri	0	5	9	14	12
Nyctalus leisleri	0	5	5	5	16
Pipistrellus nathusii	2	9	3	9	14
Pipistrellus pipistrellus	22	18	19	23	21
Pipistrellus pygmaeus	14	10	13	17	22
Plecotus auritus	5	14	12	14	22
Rhinolophus hipposideros	0	0	0	1	3

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

Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	26	37.5 - 73	88	49
Myotis mystacinus	2	2 - 2	26	15
Myotis nattereri	26	36.5 - 54	77	40
Nyctalus leisleri	2	2 - 61	68	31
Pipistrellus nathusii	26	43 - 43	90	37
Pipistrellus pipistrellus	47	58.5 - 94	98	103
Pipistrellus pygmaeus	39	71.5 - 94	98	76
Plecotus auritus	39	36.5 - 74.5	86	67
Rhinolophus hipposideros	2	2 - 2	26	4

###Figures

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

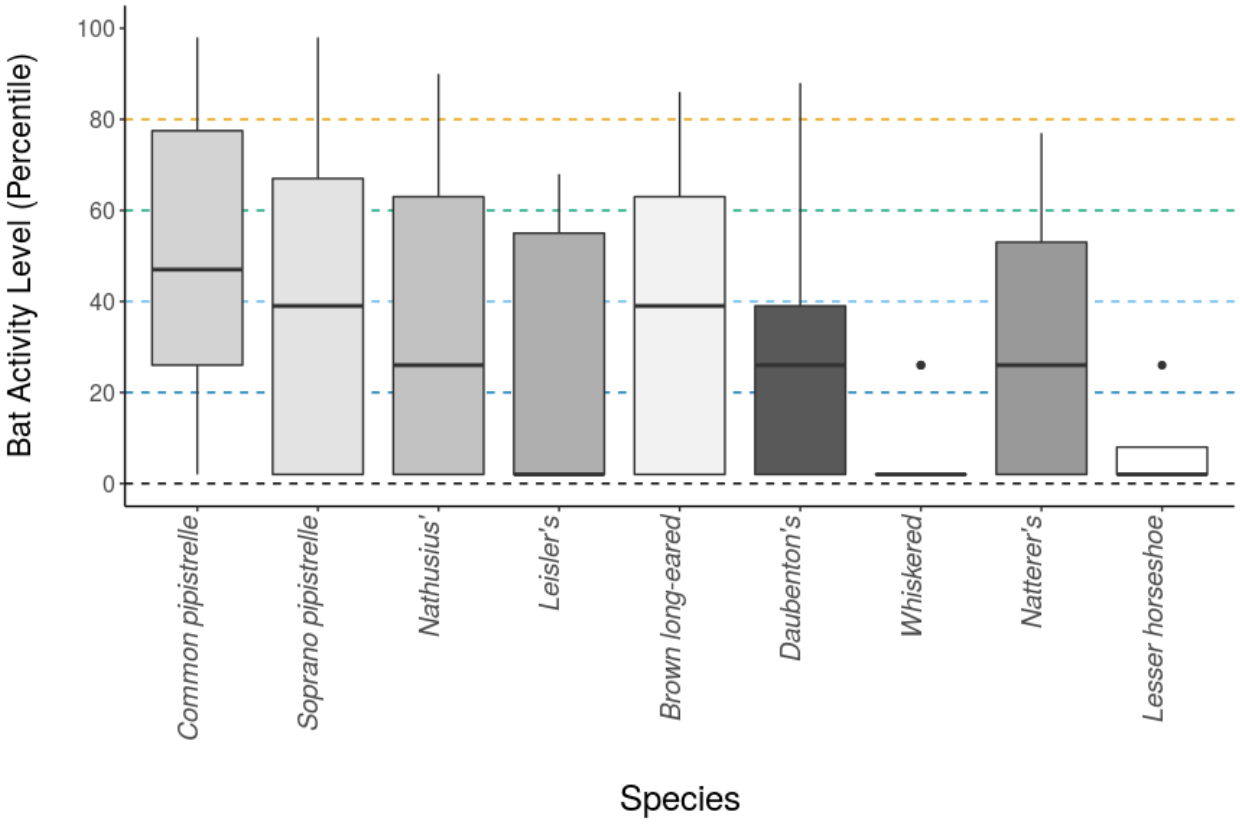
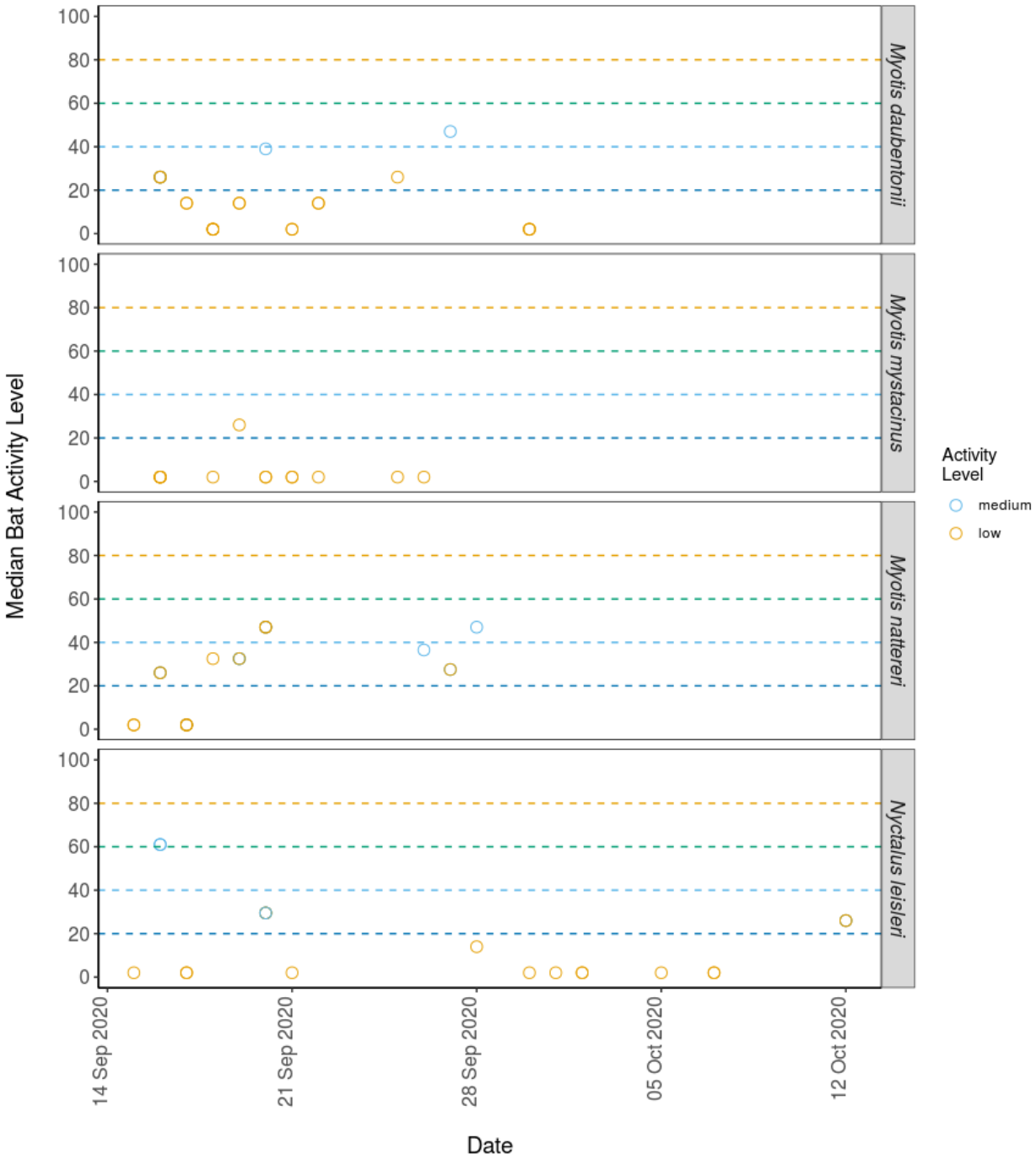
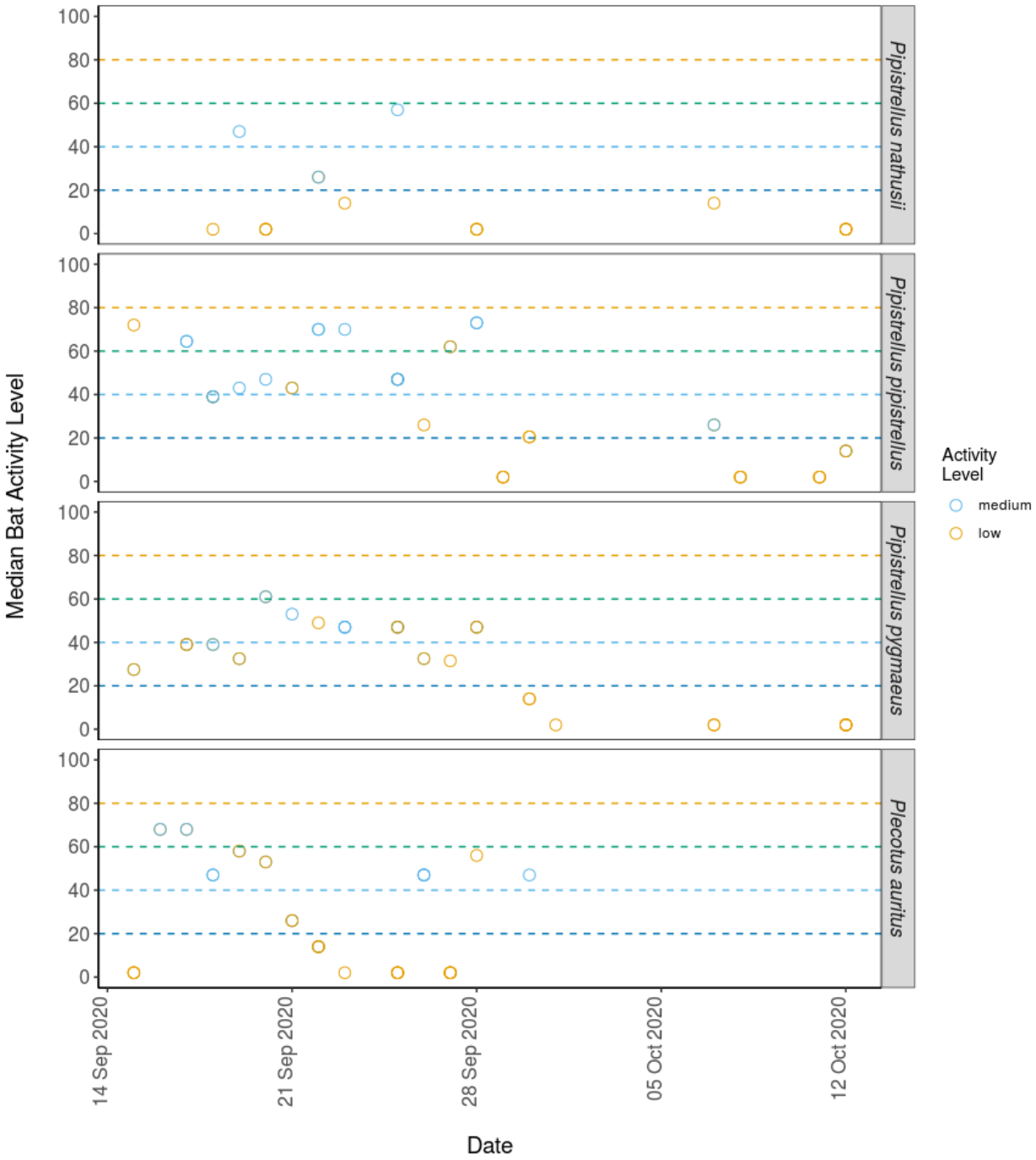
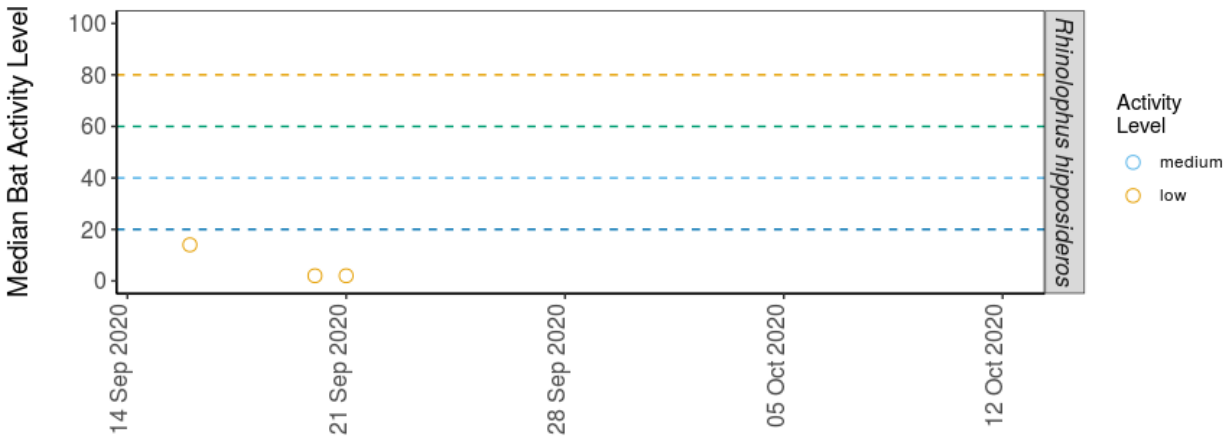


Figure 5. The median activity levels of bats recorded across all detectors each night.


Median Bat Activity Level
100
80
60
40
20
0
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Date
Activity Level
medium
low


Median Bat Activity Level
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Date
Activity Level
medium
low


Median Bat Activity Level
100
80
60
40
20
0
14 Sep 2020
21 Sep 2020
28 Sep 2020
05 Oct 2020
12 Oct 2020
Rhinolophus hipposideros
Activity Level
medium
low

Date

PER SITE, PER MONTH

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

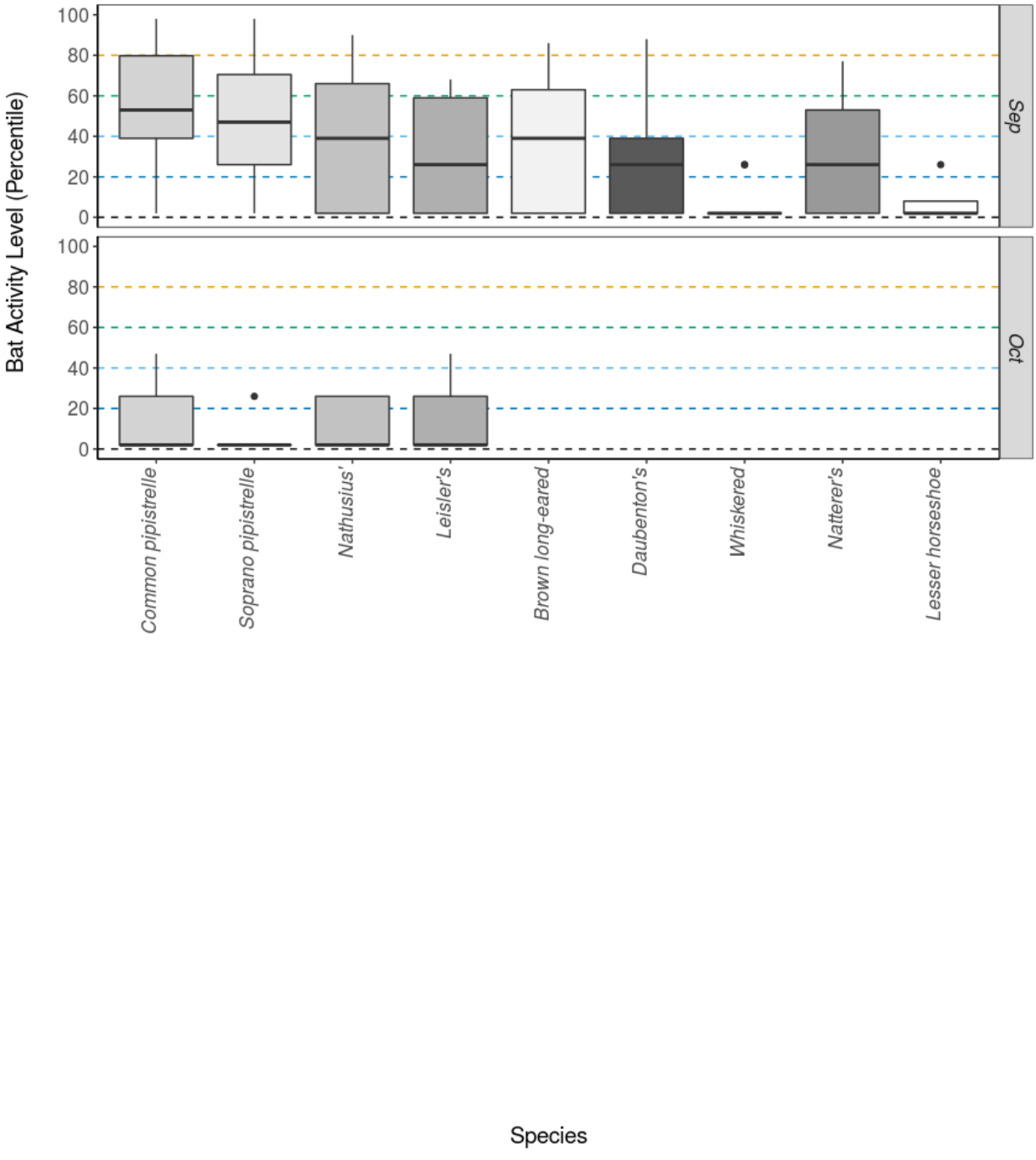
Species/Species Group	Month	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis daubentonii	Sep	1	6	4	19	19
Myotis mystacinus	Sep	0	0	0	2	13
Myotis nattereri	Sep	0	5	9	14	12
Nyctalus leisleri	Sep	0	5	4	2	8
Nyctalus leisleri	Oct	0	0	1	3	8
Pipistrellus nathusii	Sep	2	9	3	6	9
Pipistrellus nathusii	Oct	0	0	0	3	5
Pipistrellus pipistrellus	Sep	22	18	17	17	12
Pipistrellus pipistrellus	Oct	0	0	2	6	9
Pipistrellus pygmaeus	Sep	14	10	13	16	15
Pipistrellus pygmaeus	Oct	0	0	0	1	7
Plecotus auritus	Sep	5	14	12	14	22
Rhinolophus hipposideros	Sep	0	0	0	1	3

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

Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	Sep	26	37.5 - 73	88	49
Myotis mystacinus	Sep	2	2 - 2	26	15
Myotis nattereri	Sep	26	36.5 - 54	77	40
Nyctalus leisleri	Sep	26	2 - 61	68	19
Nyctalus leisleri	Oct	2	2 - 57	47	12
Pipistrellus nathusii	Sep	39	43 - 43	90	29
Pipistrellus nathusii	Oct	2	26 - 72	26	8
Pipistrellus pipistrellus	Sep	53	58.5 - 94	98	86
Pipistrellus pipistrellus	Oct	2	58.5 - 94	47	17
Pipistrellus pygmaeus	Sep	47	71.5 - 94	98	68
Pipistrellus pygmaeus	Oct	2	32.5 - 69	26	8
Plecotus auritus	Sep	39	36.5 - 74.5	86	67
Rhinolophus hipposideros	Sep	2	2 - 2	26	4

###Figures

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



PART 2: Nightly Analysis

ENTIRE SURVEY PERIOD

Sunrise and Sunset Times

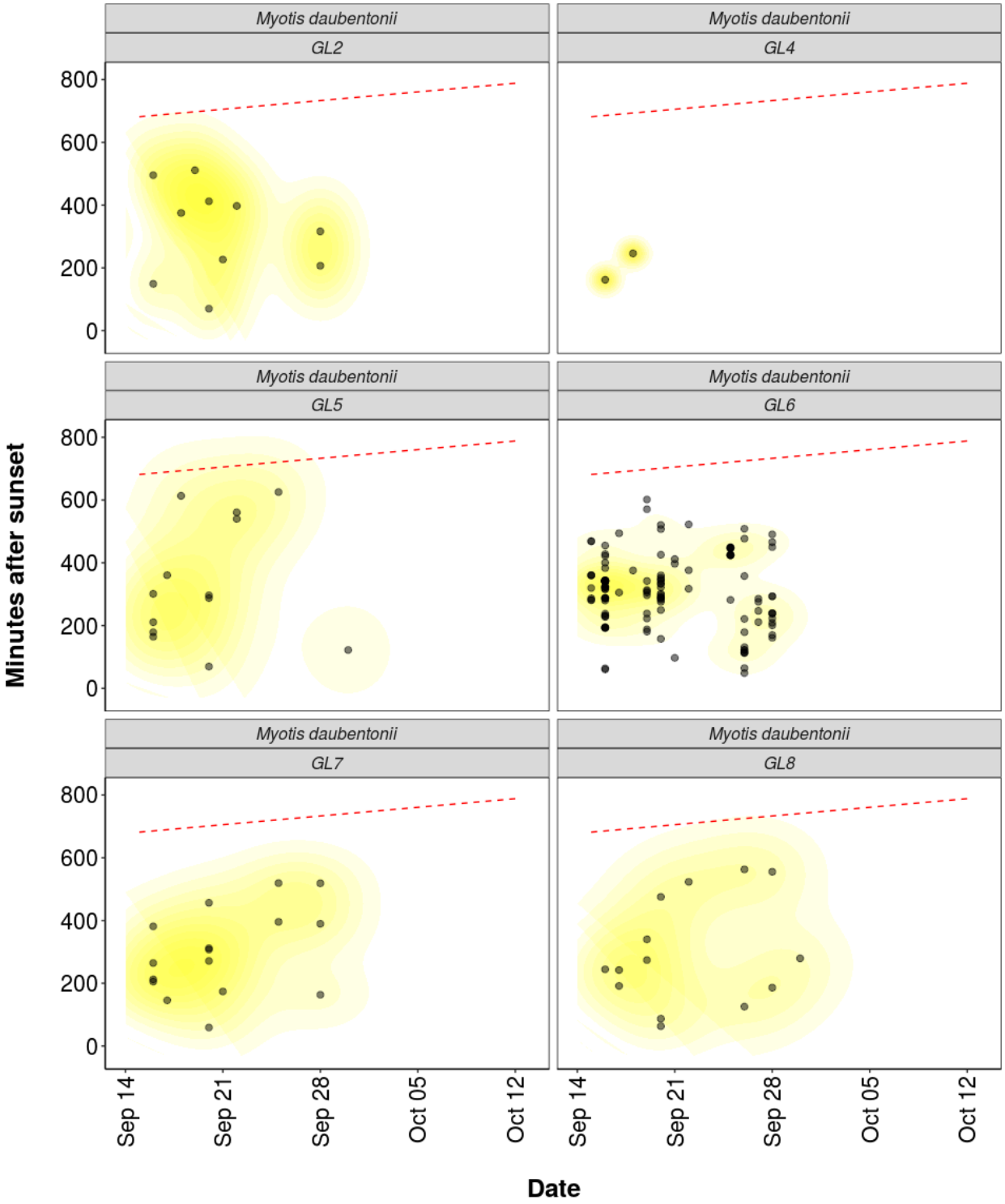
Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.

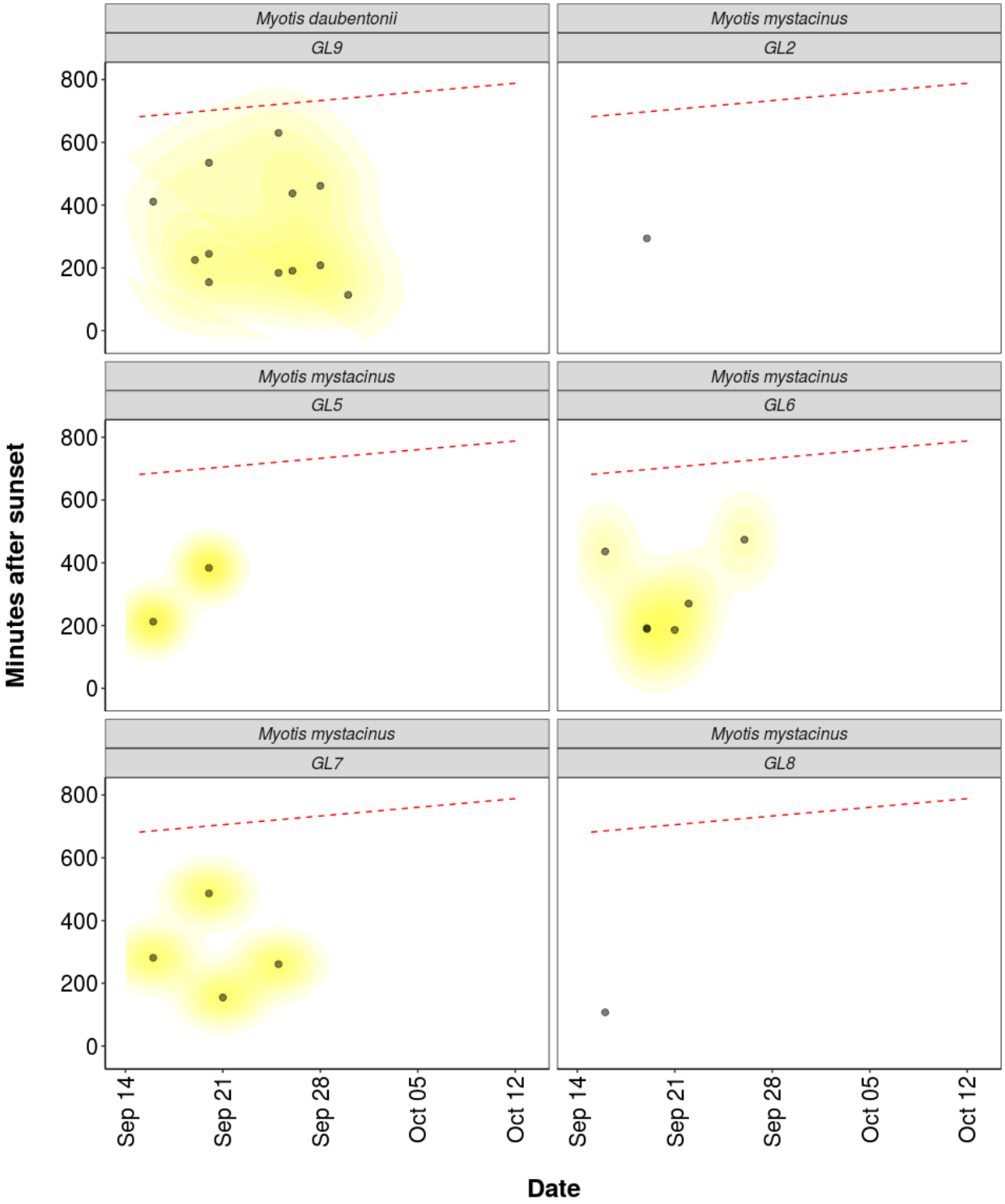
Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)
2020-09-15	19:53	07:15	11.4
2020-09-16	19:51	07:16	11.4
2020-09-17	19:48	07:18	11.5
2020-09-18	19:46	07:19	11.6
2020-09-19	19:44	07:21	11.6
2020-09-20	19:41	07:23	11.7
2020-09-21	19:39	07:24	11.8
2020-09-22	19:36	07:26	11.8
2020-09-23	19:34	07:27	11.9
2020-09-24	19:32	07:29	12.0
2020-09-25	19:29	07:31	12.0
2020-09-26	19:27	07:32	12.1
2020-09-27	19:25	07:34	12.2
2020-09-28	19:22	07:36	12.2
2020-09-29	19:20	07:37	12.3
2020-09-30	19:18	07:39	12.3
2020-10-01	19:16	07:40	12.4
2020-10-02	19:13	07:42	12.5
2020-10-05	19:06	07:47	12.7
2020-10-07	19:02	07:50	12.8
2020-10-08	19:00	07:52	12.9
2020-10-11	18:53	07:57	13.1
2020-10-12	18:51	07:59	13.1

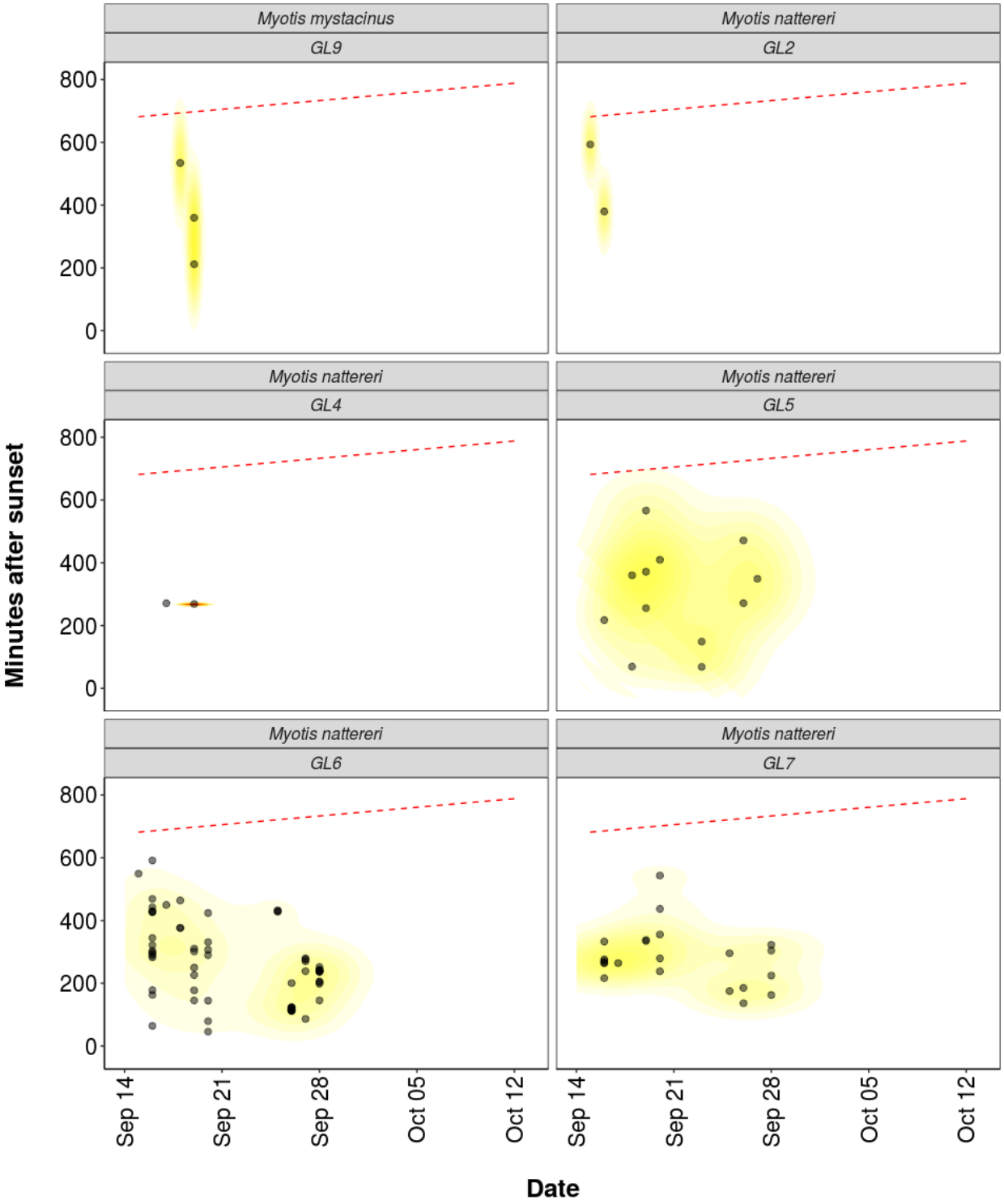
Distribution of Bat Activity Across the Night through Time

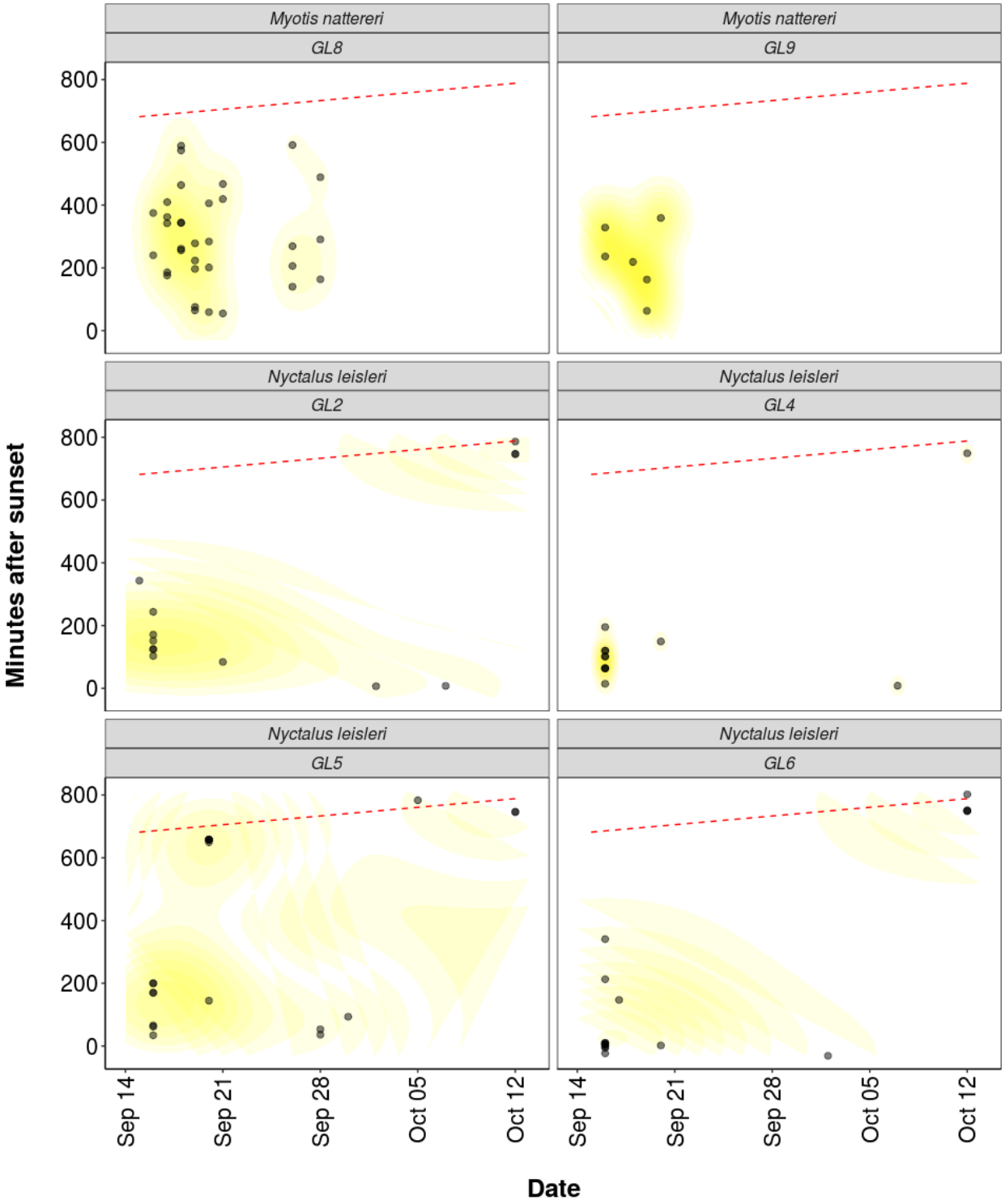
Per Detector

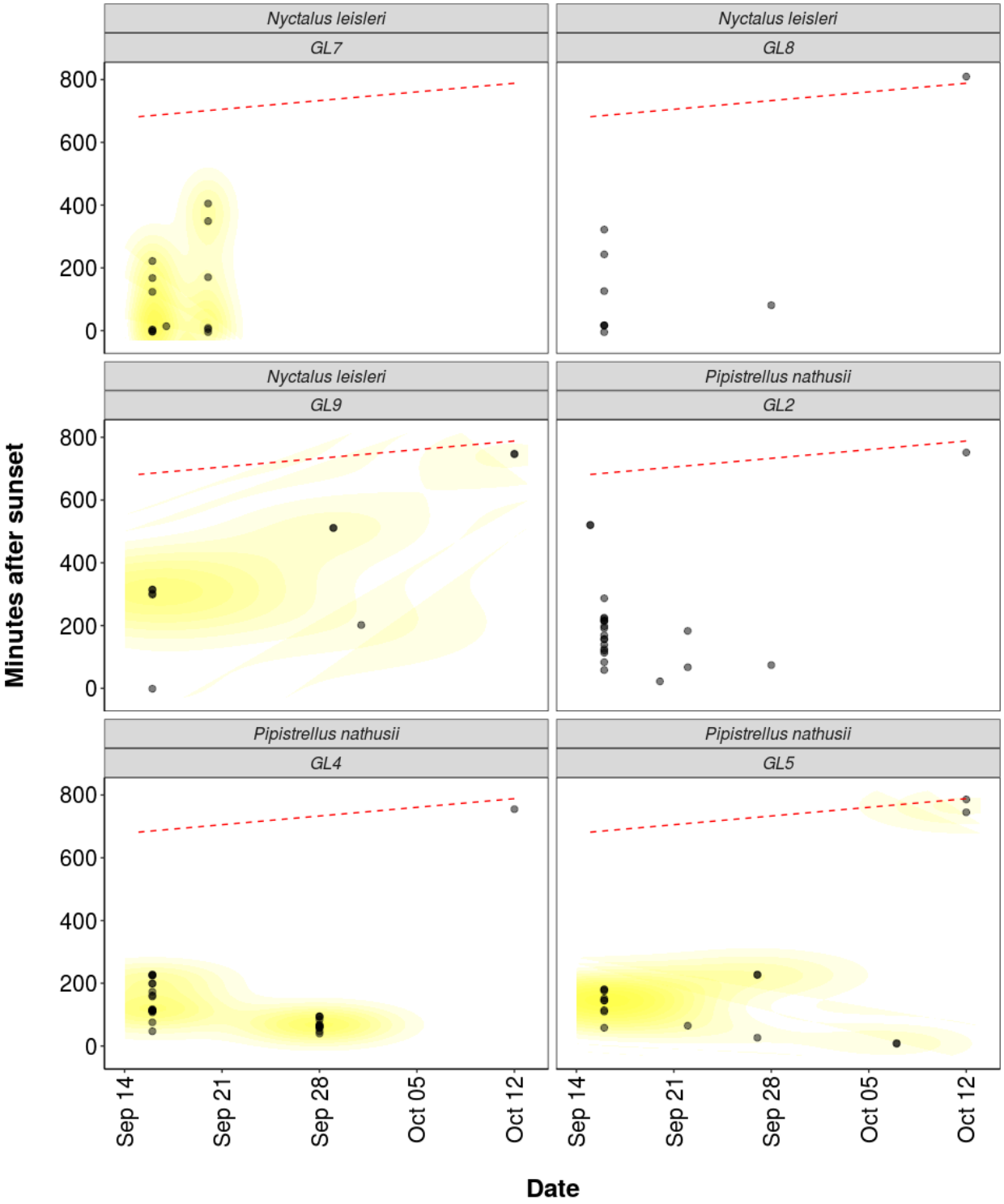
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

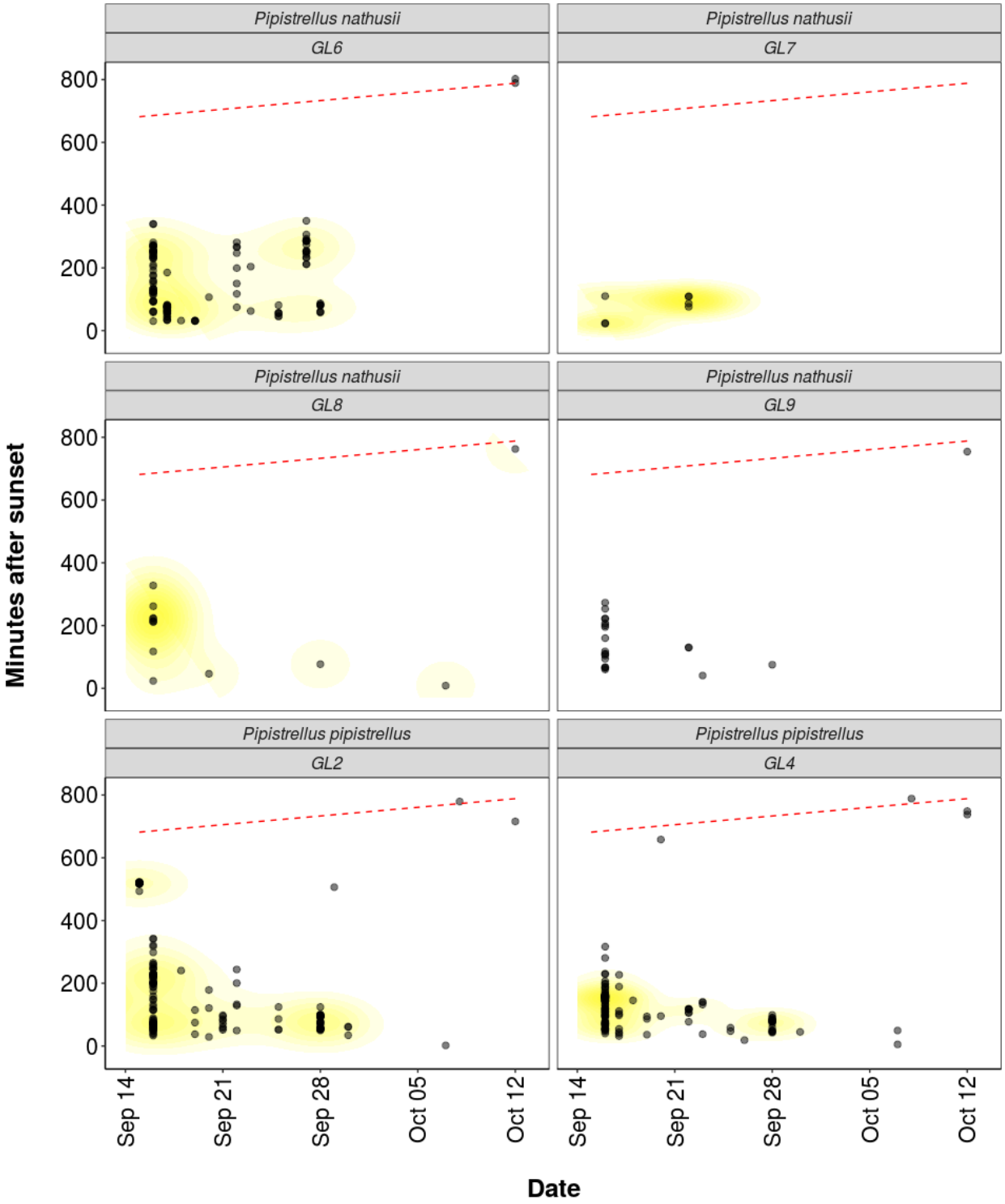

Myotis daubentonii
GL2
Myotis daubentonii
GL4
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Myotis daubentonii
GL7
Myotis daubentonii
GL8
Minutes after sunset
0
200
400
600
800
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
Date

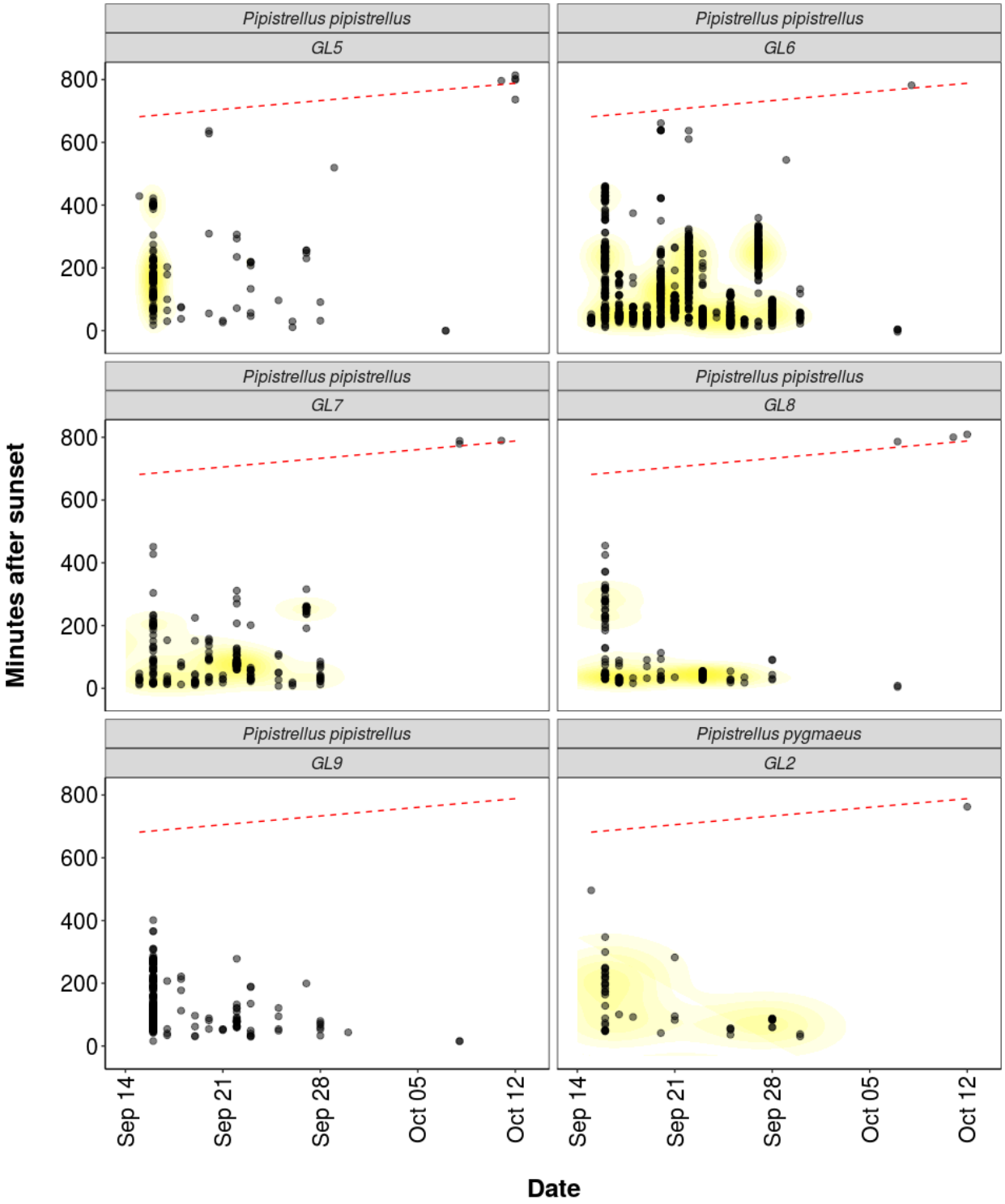

Myotis daubentonii
GL9
Myotis mystacinus
GL2
Myotis mystacinus
GL5
Myotis mystacinus
GL6
Myotis mystacinus
GL7
Myotis mystacinus
GL8
Minutes after sunset
0
200
400
600
800
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
Date

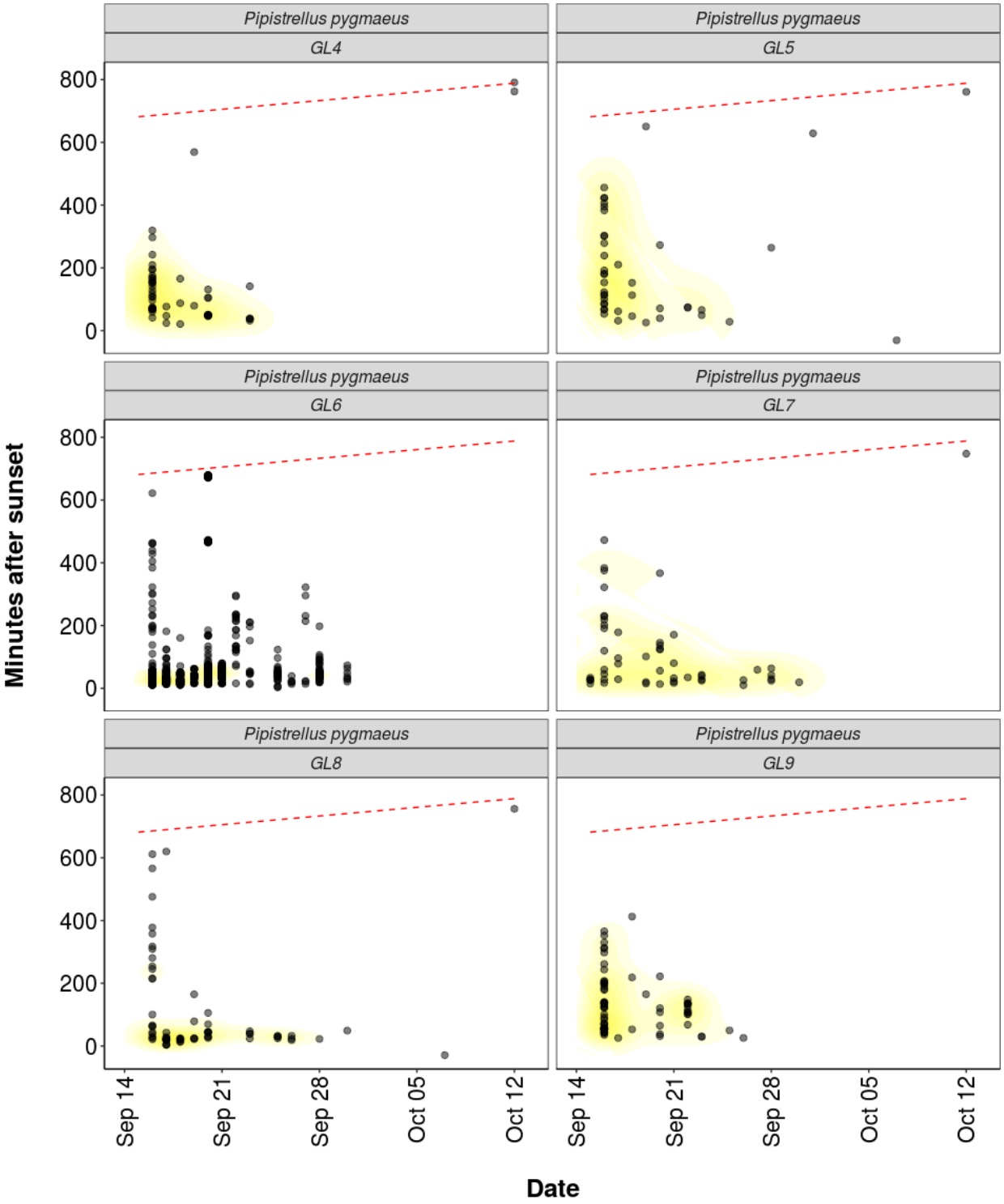

Myotis mystacinus
GL9
Myotis nattereri
GL2
Myotis nattereri
GL4
Myotis nattereri
GL5
Myotis nattereri
GL6
Myotis nattereri
GL7
Minutes after sunset
0
200
400
600
800
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
Date

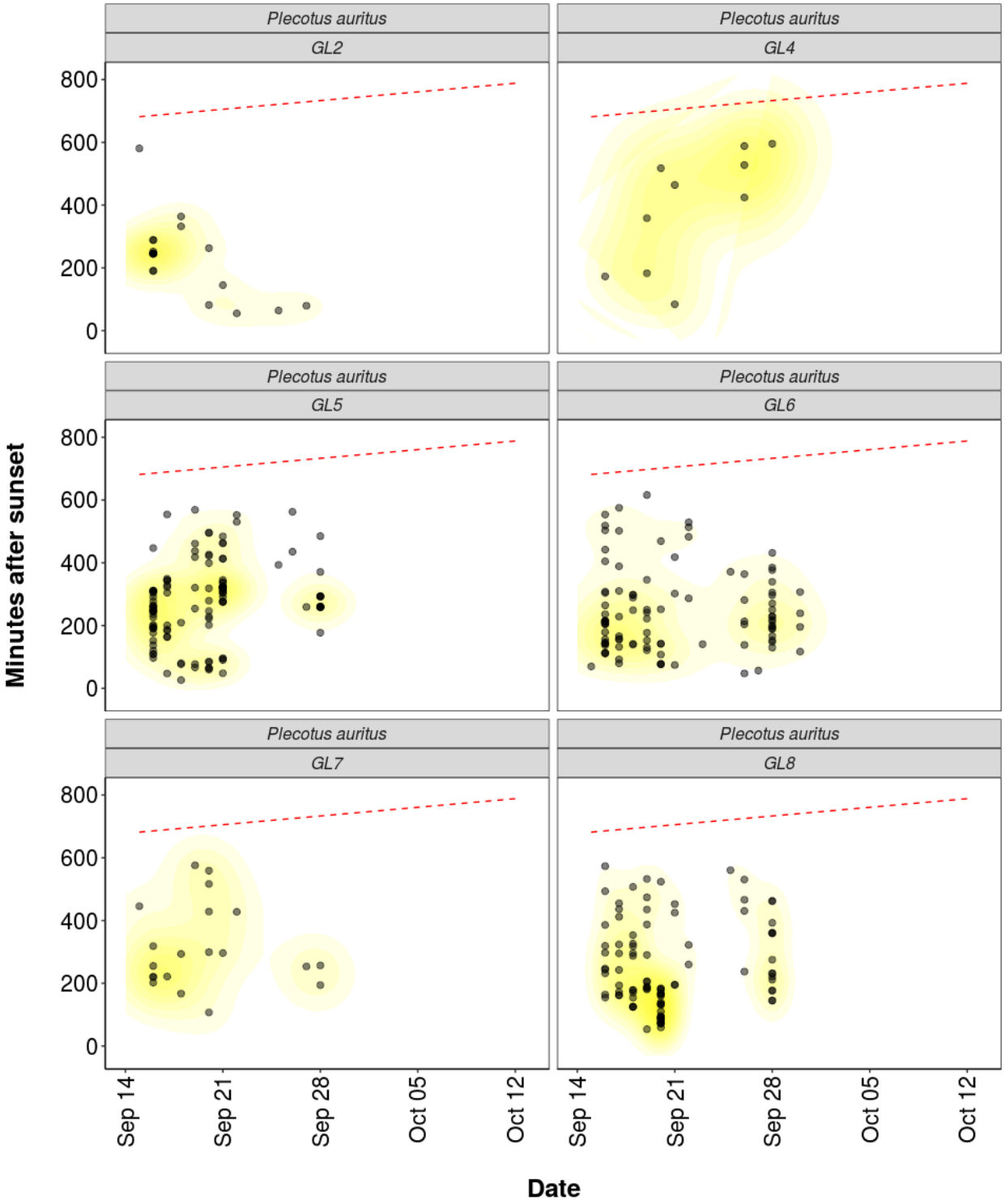

Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL2
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Minutes after sunset
0
200
400
600
800
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
Date

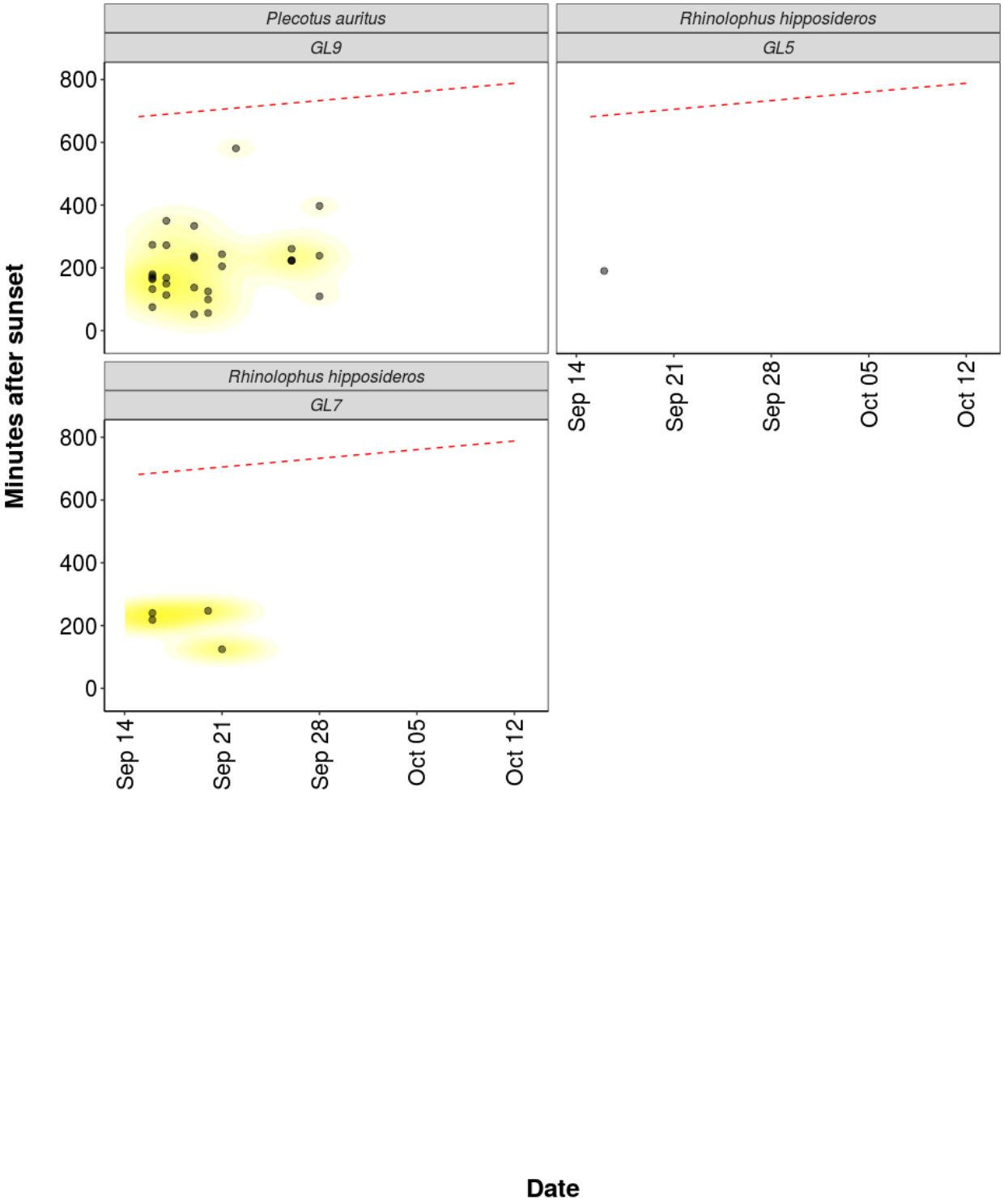

Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL2
Pipistrellus nathusii
GL4
Pipistrellus nathusii
GL5
Minutes after sunset
0
200
400
600
800
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
Date


Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL7
Pipistrellus nathusii
GL8
Pipistrellus nathusii
GL9
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL4
Minutes after sunset
0
200
400
600
800
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
Date


Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL8
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL2
Minutes after sunset
0
200
400
600
800
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
Date


Pipistrellus pygmaeus
GL4
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL8
Pipistrellus pygmaeus
GL9
Minutes after sunset
0
200
400
600
800
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
Date


Plecotus auritus
GL2
Plecotus auritus
GL4
Plecotus auritus
GL5
Plecotus auritus
GL6
Plecotus auritus
GL7
Plecotus auritus
GL8
Minutes after sunset
0
200
400
600
800
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
Date


Plecotus auritus
GL9
Rhinolophus hipposideros
GL5
Rhinolophus hipposideros
GL7
Minutes after sunset
0
200
400
600
800
Sep 14
Sep 21
Sep 28
Oct 05
Oct 12
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	2020-09-15	2020-09-16	2020-09-17	2020-09-18	2020-09-19
Common pipistrelle	GL2	0	0	0	0	0
Common pipistrelle	GL4	0	0	1	0	0
Common pipistrelle	GL5	0	2	1	0	0
Common pipistrelle	GL6	4	5	5	4	10
Common pipistrelle	GL7	7	9	6	1	10
Common pipistrelle	GL8	0	5	13	1	0
Common pipistrelle	GL9	0	1	0	0	1
Soprano pipistrelle	GL4	0	0	1	1	0
Soprano pipistrelle	GL5	0	0	0	0	1
Soprano pipistrelle	GL6	0	67	49	52	6
Soprano pipistrelle	GL7	3	2	0	0	2
Soprano pipistrelle	GL8	0	2	10	6	3

Soprano pipistrelle	GL9	0	0	1	0	0
Nathusius'	GL2	0	0	0	0	0
Nathusius'	GL5	0	0	0	0	0
Nathusius'	GL7	0	2	0	0	0
Nathusius'	GL8	0	1	0	0	0
Leisler's	GL2	0	0	0	0	0
Leisler's	GL4	0	1	0	0	0
Leisler's	GL6	0	8	0	0	0
Leisler's	GL7	0	4	1	0	0
Leisler's	GL8	0	4	0	0	0
Leisler's	GL9	0	1	0	0	0
Brown long-eared	GL2	0	0	0	0	0
Brown long-eared	GL5	0	0	1	1	0
Brown long-eared	GL6	0	0	0	0	0
Brown long-eared	GL8	0	0	0	0	1
Brown long-eared	GL9	0	0	0	0	1
Daubenton's	GL5	0	0	0	0	0
Daubenton's	GL6	0	2	0	0	0
Daubenton's	GL7	0	0	0	0	0
Daubenton's	GL8	0	0	0	0	0
Natterer's	GL6	0	0	0	0	0
Natterer's	GL8	0	0	0	0	0

Table continues below

2020-09-20	2020-09-21	2020-09-22	2020-09-23	2020-09-25	2020-09-26	2020-09-27
1	0	0	0	0	0	0
0	0	0	0	0	1	0
0	2	0	0	0	2	0
12	0	2	31	41	5	4
3	3	0	5	2	3	0
3	0	0	4	4	1	0

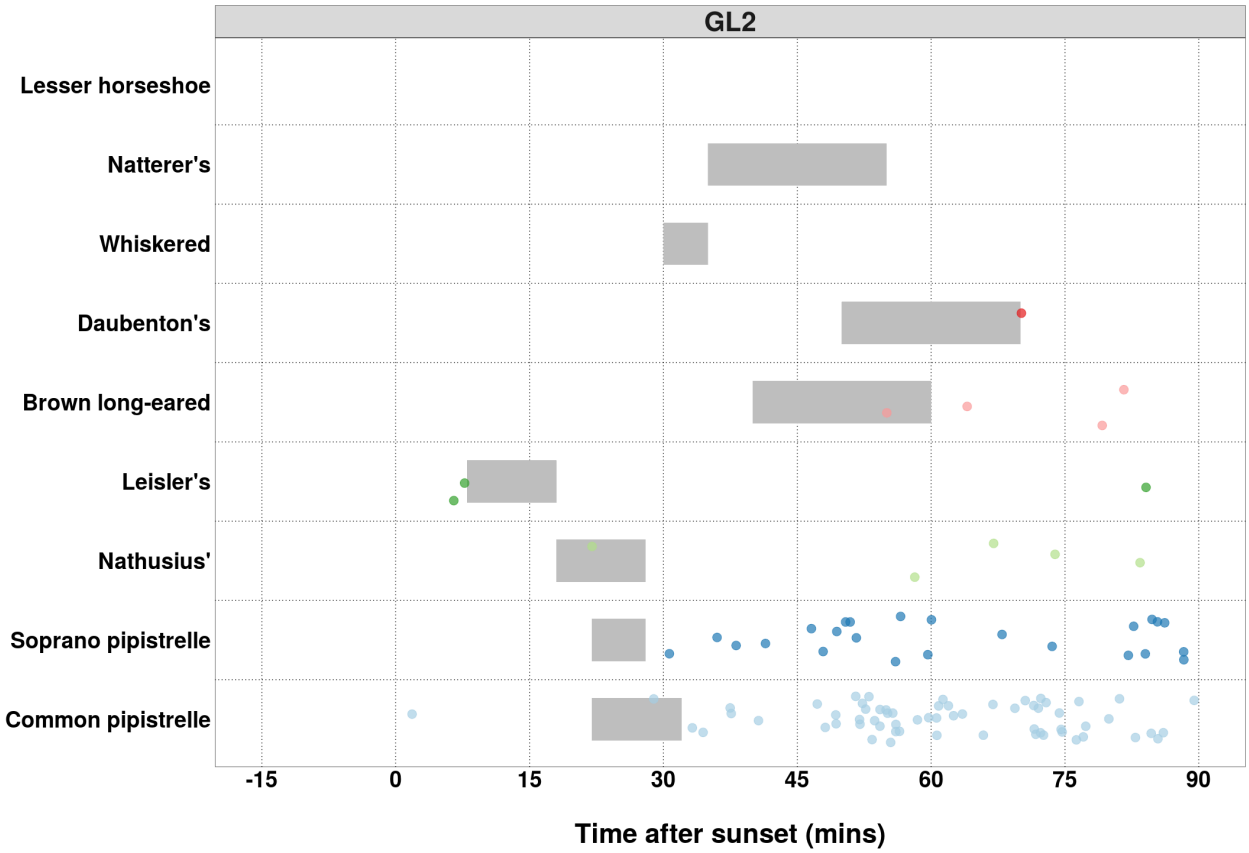
0	0	0	2	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
35	8	1	2	6	4	3
1	2	0	1	0	2	0
1	0	0	1	1	2	0
0	0	0	0	0	1	0
1	0	0	0	0	0	0
0	0	0	0	0	0	1
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
1	0	0	0	0	0	0
3	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	1	0	0	0	0
1	1	0	0	0	0	0
0	0	0	0	0	1	1
1	0	0	0	0	0	0
1	0	0	0	0	0	0
1	0	0	0	0	0	0
0	0	0	0	0	2	0
1	0	0	0	0	0	0
1	0	0	0	0	0	0
1	0	0	0	0	0	0
0	1	0	0	0	0	0

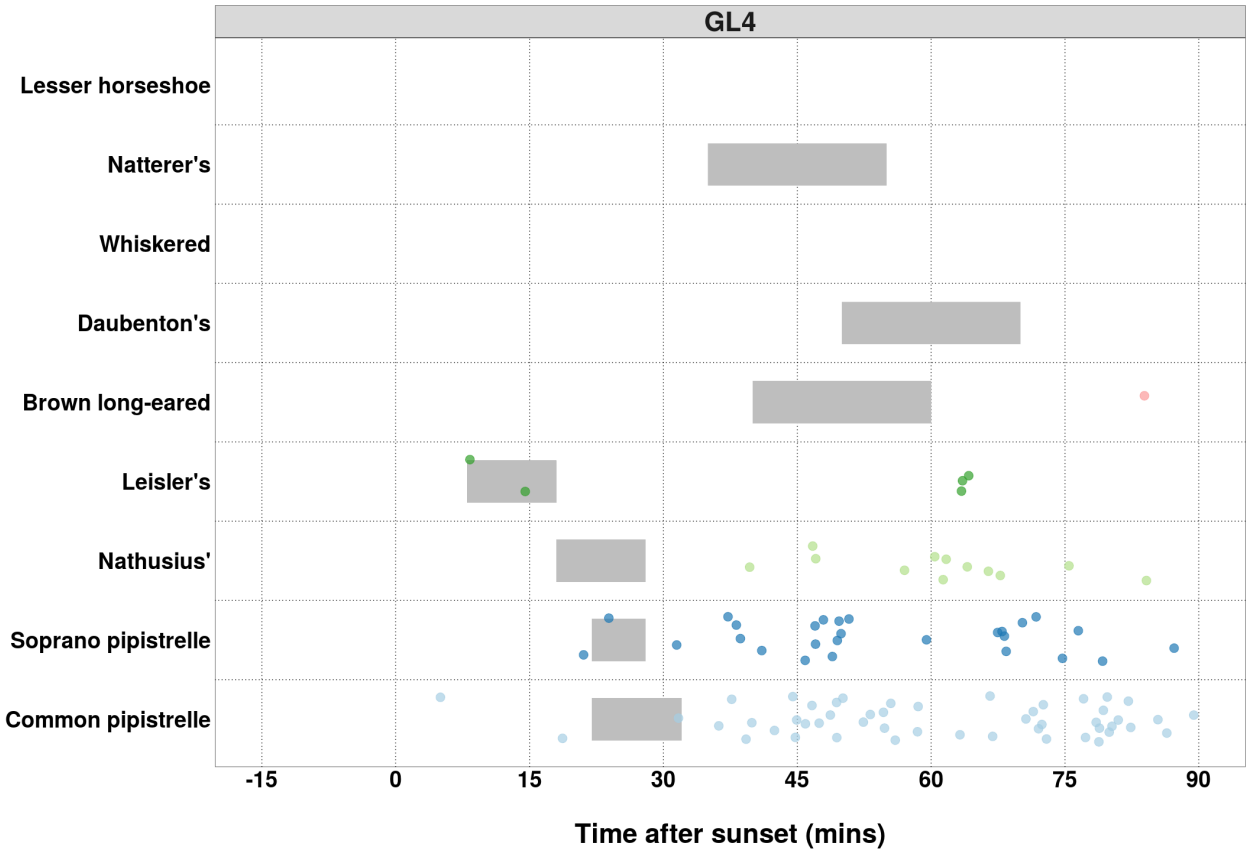
2020-09-28	2020-09-30	2020-10-02	2020-10-07	2020-10-08
0	0	0	1	0
0	0	0	1	0
1	0	0	2	0
11	2	0	4	0
5	0	0	0	0
2	0	0	2	0

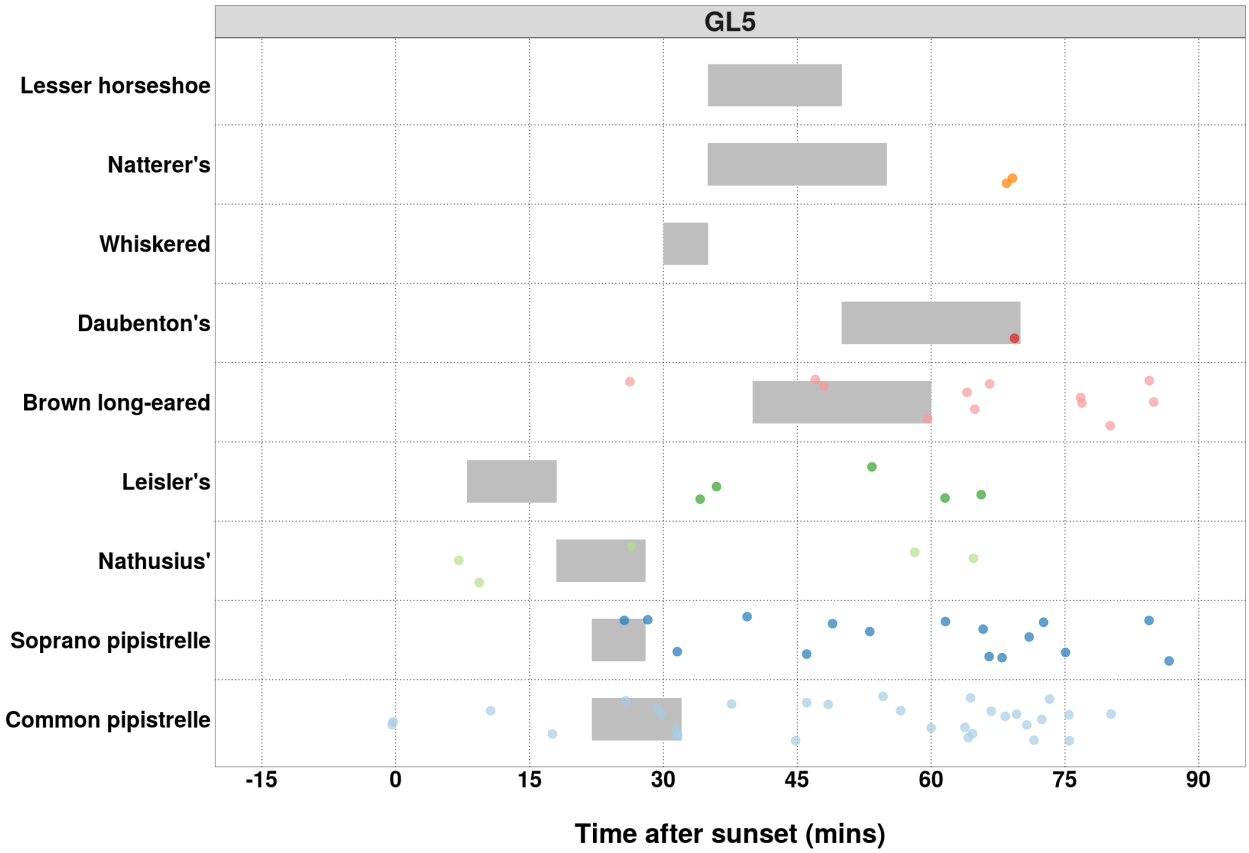
0	0	0	0	2
0	0	0	0	0
0	0	0	1	0
4	1	0	0	0
1	1	0	0	0
1	0	0	1	0
0	0	0	0	0
0	0	0	0	0
0	0	0	2	0
0	0	0	0	0
0	0	0	1	0
0	0	1	1	0
0	0	0	1	0
0	0	1	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

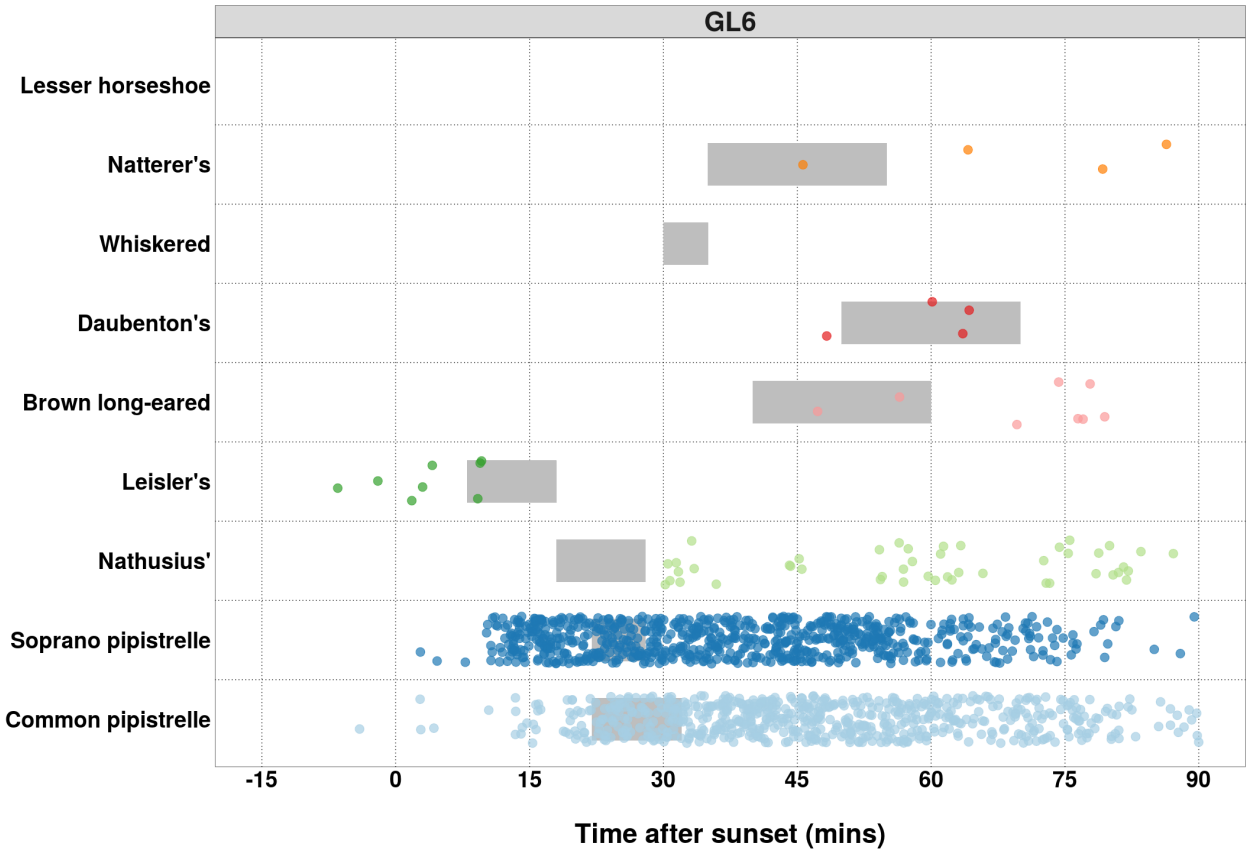
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012) - Figures

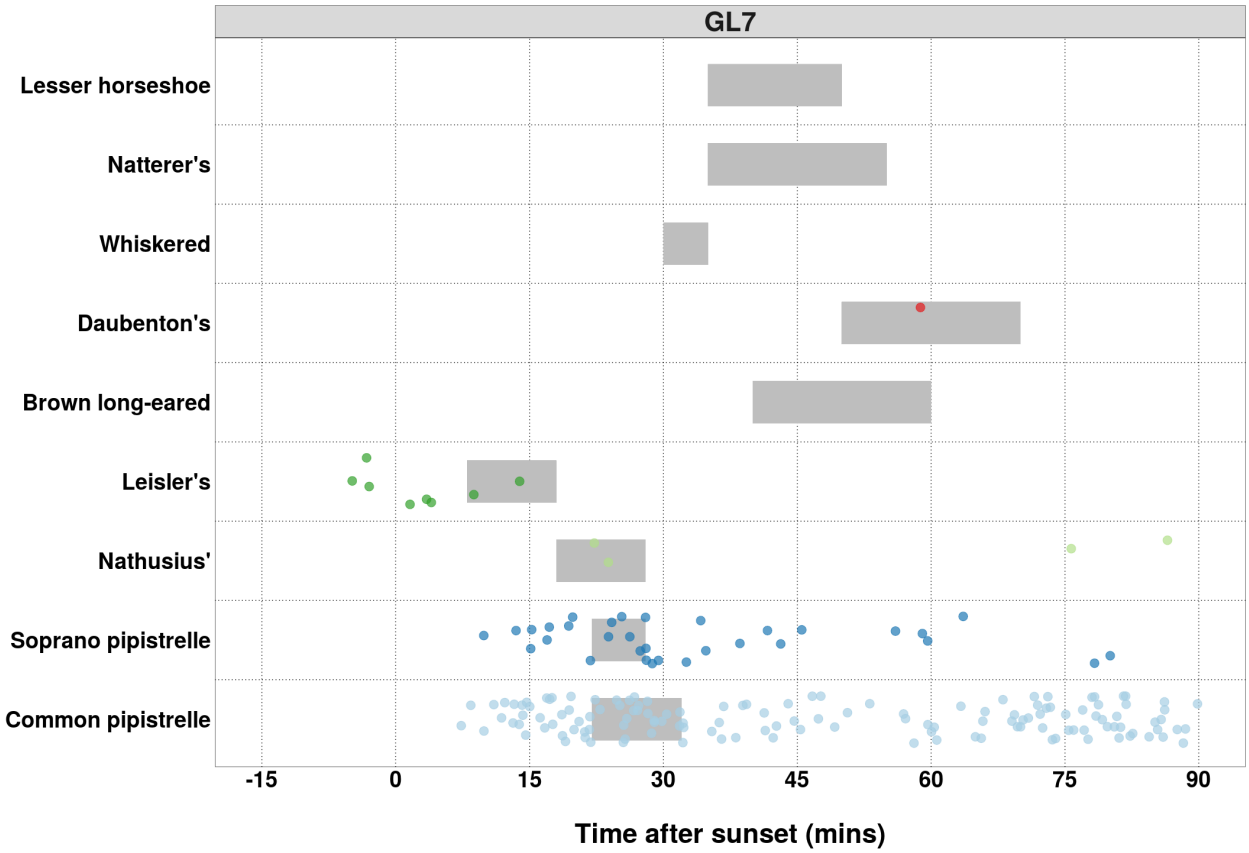
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.

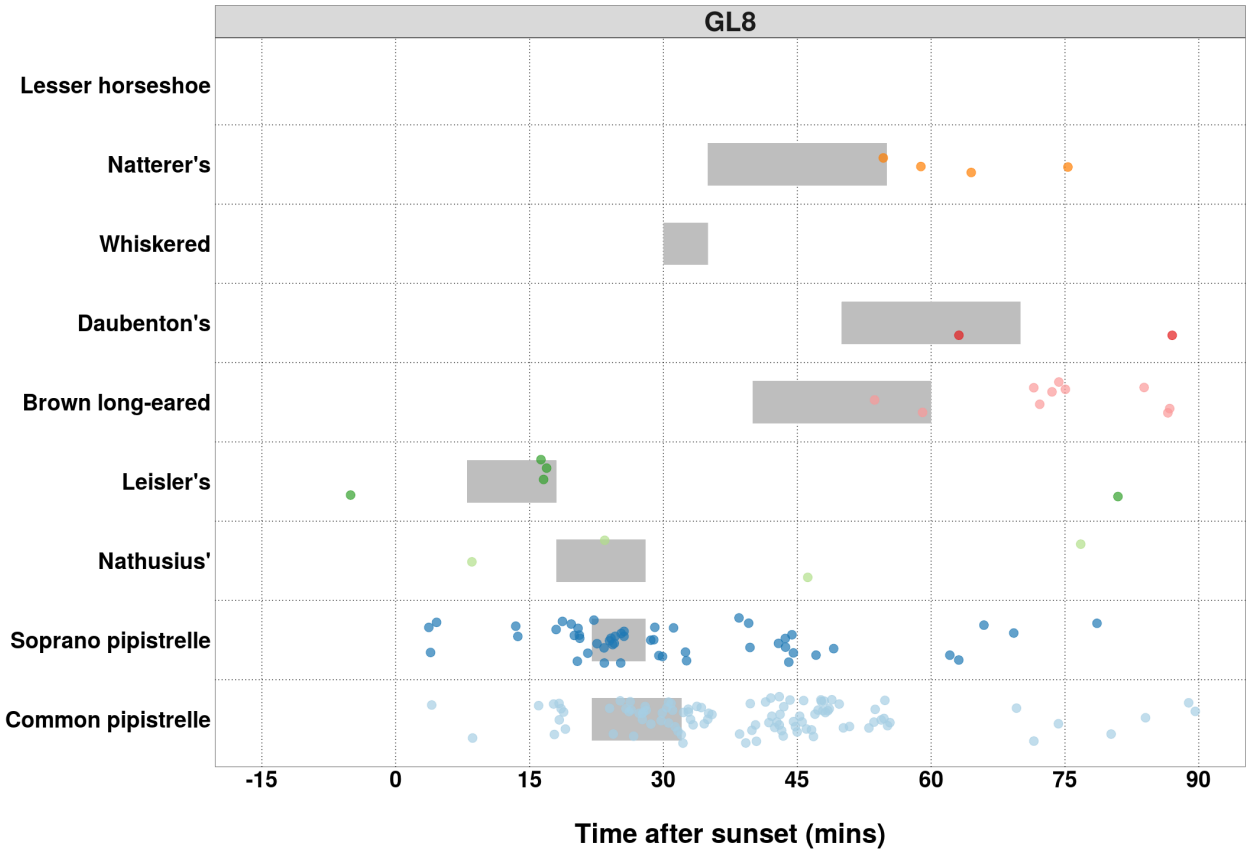

GL2
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

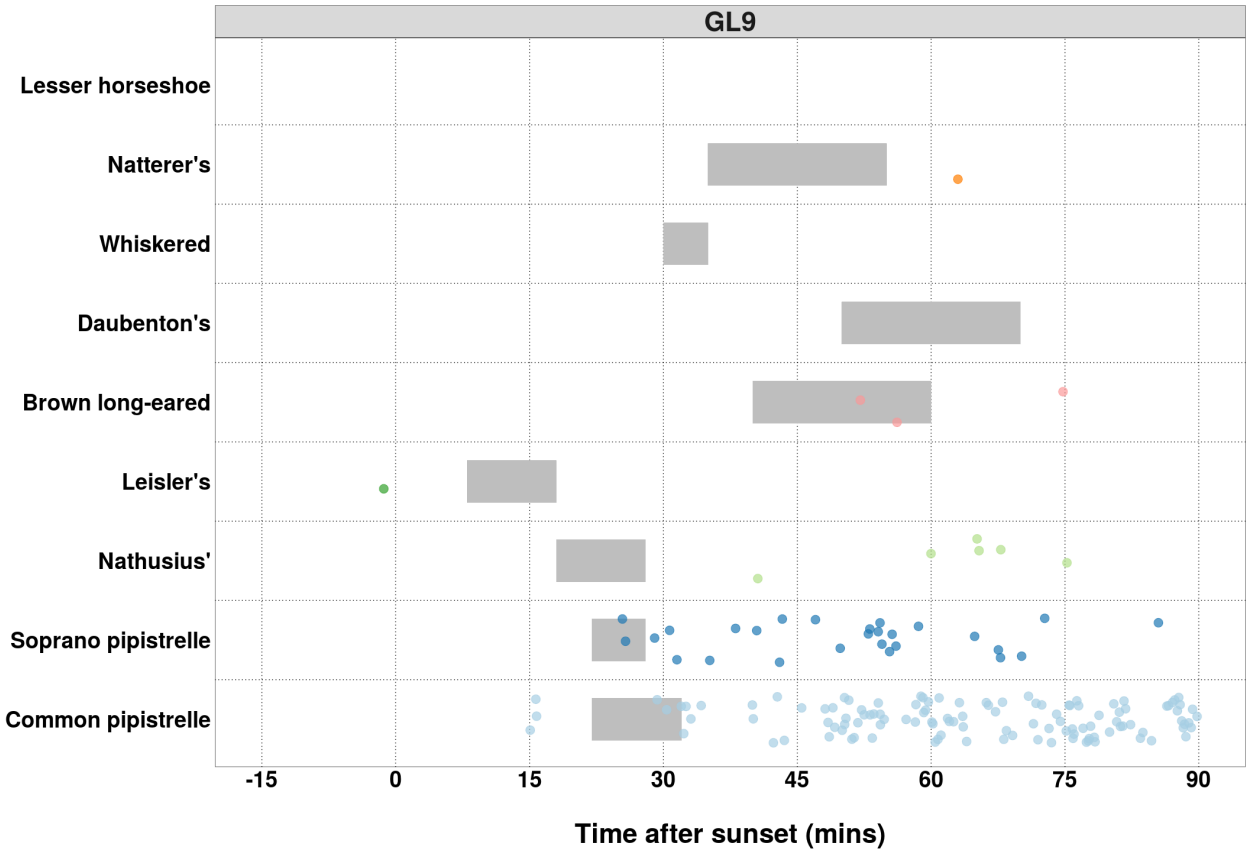

GL4
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL5
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL6
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL7
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL8
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL9
Lesser horseshoe
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
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	2477	52.4
Soprano pipistrelle	1167	24.7
Nathusius'	237	5.0
Leisler's	94	2.0
Brown long-eared	393	8.3
Daubenton's	196	4.1
Whiskered	17	0.4
Natterer's	140	3.0
Lesser horseshoe	5	0.1
Total	4726	100.0

Counts of Bat Passes

Per Detector

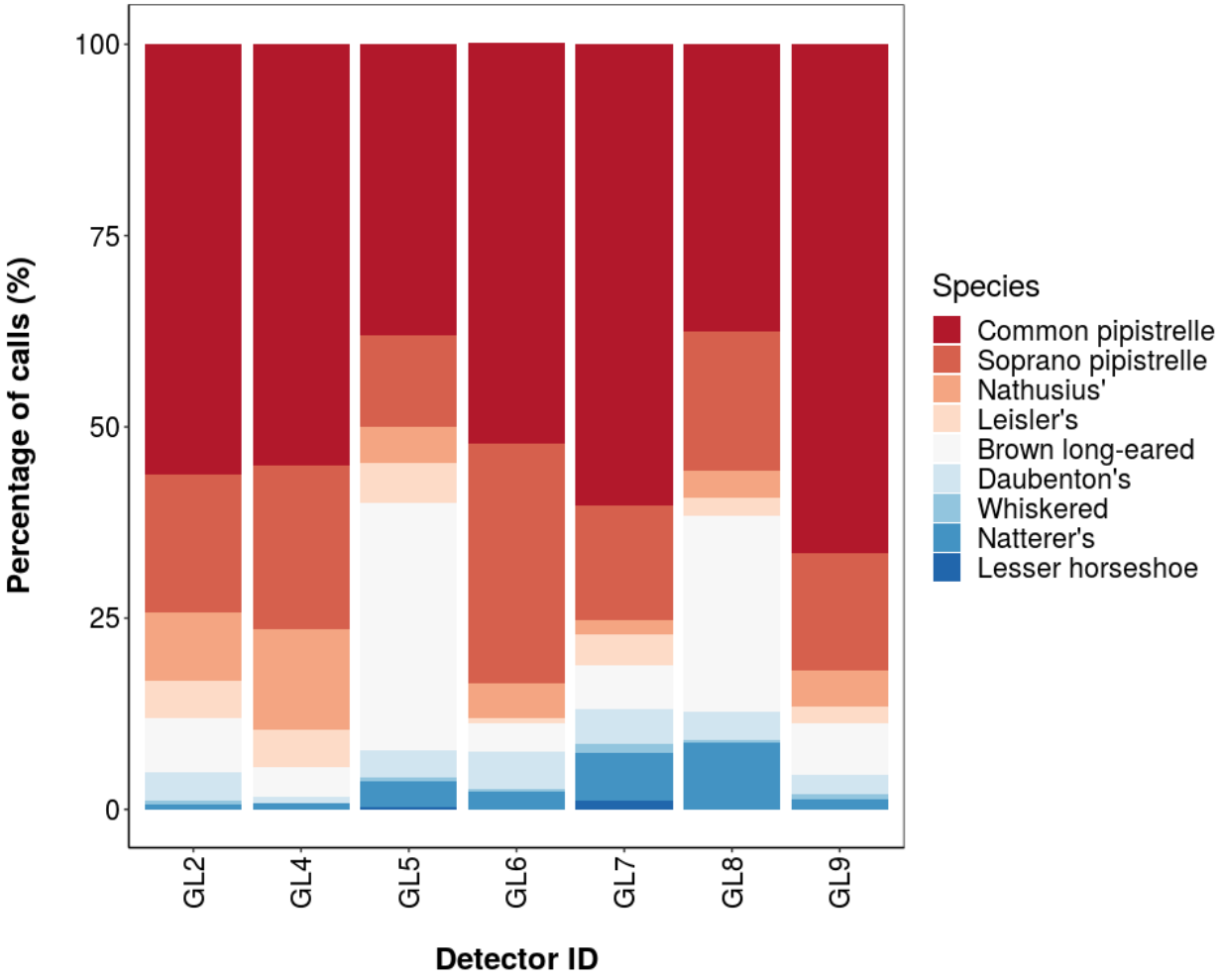
Table 15. The number of passes recorded for each species at each detector.

Species	Detector ID	Count (No)	Percentage by Detector (%)
Common pipistrelle	GL2	151	56.3
Common pipistrelle	GL4	138	55.0
Common pipistrelle	GL5	138	38.1
Common pipistrelle	GL6	1392	52.4
Common pipistrelle	GL7	211	60.3
Common pipistrelle	GL8	142	37.6
Common pipistrelle	GL9	305	66.6
Soprano pipistrelle	GL2	48	17.9
Soprano pipistrelle	GL4	54	21.5
Soprano pipistrelle	GL5	43	11.9
Soprano pipistrelle	GL6	831	31.3
Soprano pipistrelle	GL7	52	14.9
Soprano pipistrelle	GL8	69	18.3
Soprano pipistrelle	GL9	70	15.3
Nathusius'	GL2	24	9.0
Nathusius'	GL4	33	13.1
Nathusius'	GL5	17	4.7
Nathusius'	GL6	121	4.6
Nathusius'	GL7	7	2.0
Nathusius'	GL8	13	3.4
Nathusius'	GL9	22	4.8
Leisler's	GL2	13	4.9
Leisler's	GL4	12	4.8
Leisler's	GL5	19	5.2
Leisler's	GL6	17	0.6
Leisler's	GL7	14	4.0
Leisler's	GL8	9	2.4
Leisler's	GL9	10	2.2
Brown long-eared	GL2	19	7.1

Brown long-eared	GL4	10	4.0
Brown long-eared	GL5	117	32.3
Brown long-eared	GL6	100	3.8
Brown long-eared	GL7	20	5.7
Brown long-eared	GL8	97	25.7
Brown long-eared	GL9	30	6.6
Daubenton's	GL2	10	3.7
Daubenton's	GL4	2	0.8
Daubenton's	GL5	13	3.6
Daubenton's	GL6	129	4.9
Daubenton's	GL7	16	4.6
Daubenton's	GL8	14	3.7
Daubenton's	GL9	12	2.6
Whiskered	GL2	1	0.4
Whiskered	GL5	2	0.6
Whiskered	GL6	6	0.2
Whiskered	GL7	4	1.1
Whiskered	GL8	1	0.3
Whiskered	GL9	3	0.7
Natterer's	GL2	2	0.7
Natterer's	GL4	2	0.8
Natterer's	GL5	12	3.3
Natterer's	GL6	63	2.4
Natterer's	GL7	22	6.3
Natterer's	GL8	33	8.7
Natterer's	GL9	6	1.3
Lesser horseshoe	GL5	1	0.3
Lesser horseshoe	GL7	4	1.1

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	GL2	0.3
Common pipistrelle	GL4	0.2
Common pipistrelle	GL5	0.2
Common pipistrelle	GL6	5.5
Common pipistrelle	GL7	0.8
Common pipistrelle	GL8	0.3
Common pipistrelle	GL9	0.3
Soprano pipistrelle	GL2	0.1
Soprano pipistrelle	GL4	0.3
Soprano pipistrelle	GL5	0.2
Soprano pipistrelle	GL6	2.4
Soprano pipistrelle	GL7	0.3
Soprano pipistrelle	GL8	0.3
Soprano pipistrelle	GL9	0.2
Nathusius'	GL2	0.1
Nathusius'	GL4	1.1
Nathusius'	GL5	0.2
Nathusius'	GL6	0.5
Nathusius'	GL7	0.3
Nathusius'	GL8	0.1
Nathusius'	GL9	0.1
Leisler's	GL2	0.1
Leisler's	GL4	0.1

Leisler’s	GL5	0.2
Leisler’s	GL6	0.1
Leisler’s	GL7	0.5
Leisler’s	GL8	0.1
Leisler’s	GL9	0.2
Brown long-eared	GL2	0.1
Brown long-eared	GL4	0.1
Brown long-eared	GL5	0.7
Brown long-eared	GL6	0.4
Brown long-eared	GL7	0.1
Brown long-eared	GL8	0.9
Brown long-eared	GL9	0.3
Daubenton’s	GL2	0.1
Daubenton’s	GL4	0.1
Daubenton’s	GL5	0.1
Daubenton’s	GL6	0.9
Daubenton’s	GL7	0.2
Daubenton’s	GL8	0.2
Daubenton’s	GL9	0.2
Whiskered	GL2	0.1
Whiskered	GL5	0.1
Whiskered	GL6	0.1
Whiskered	GL7	0.1
Whiskered	GL8	0.1
Whiskered	GL9	0.1
Natterer’s	GL2	0.1
Natterer’s	GL4	0.1
Natterer’s	GL5	0.2
Natterer’s	GL6	0.5
Natterer’s	GL7	0.2
Natterer’s	GL8	0.3
Natterer’s	GL9	0.1
Lesser horseshoe	GL5	0.1
Lesser horseshoe	GL7	0.1

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.

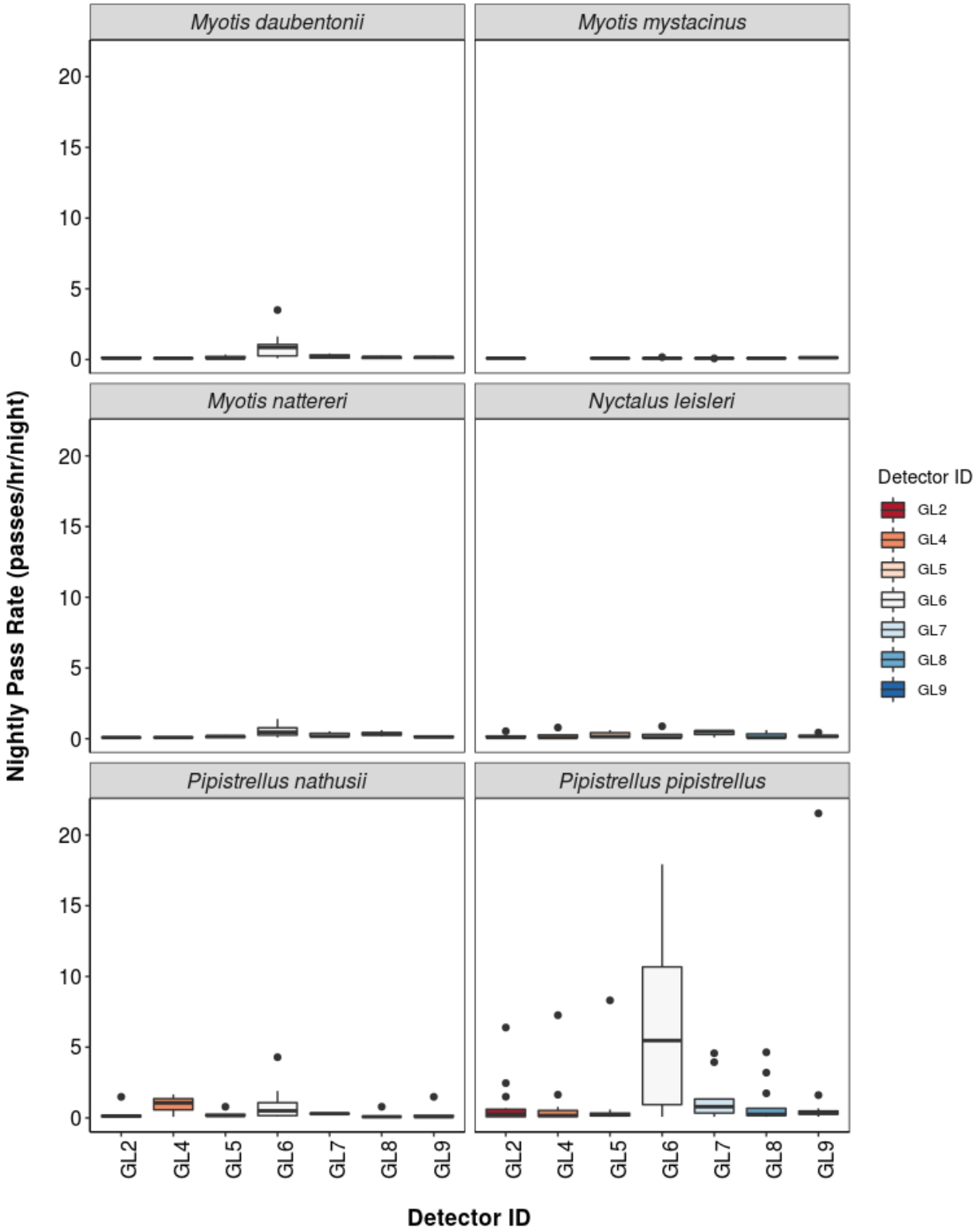
Species	Detector ID	Mean Pass Rate
Common pipistrelle	GL2	0.9
Common pipistrelle	GL4	0.8
Common pipistrelle	GL5	0.7
Common pipistrelle	GL6	6.6
Common pipistrelle	GL7	1.2
Common pipistrelle	GL8	0.9
Common pipistrelle	GL9	2.0
Soprano pipistrelle	GL2	0.4
Soprano pipistrelle	GL4	0.7
Soprano pipistrelle	GL5	0.3
Soprano pipistrelle	GL6	5.5
Soprano pipistrelle	GL7	0.3
Soprano pipistrelle	GL8	0.5
Soprano pipistrelle	GL9	0.7
Nathusius'	GL2	0.3
Nathusius'	GL4	0.9
Nathusius'	GL5	0.3
Nathusius'	GL6	0.9
Nathusius'	GL7	0.3
Nathusius'	GL8	0.2
Nathusius'	GL9	0.4
Leisler's	GL2	0.2
Leisler's	GL4	0.3
Leisler's	GL5	0.3
Leisler's	GL6	0.3
Leisler's	GL7	0.4

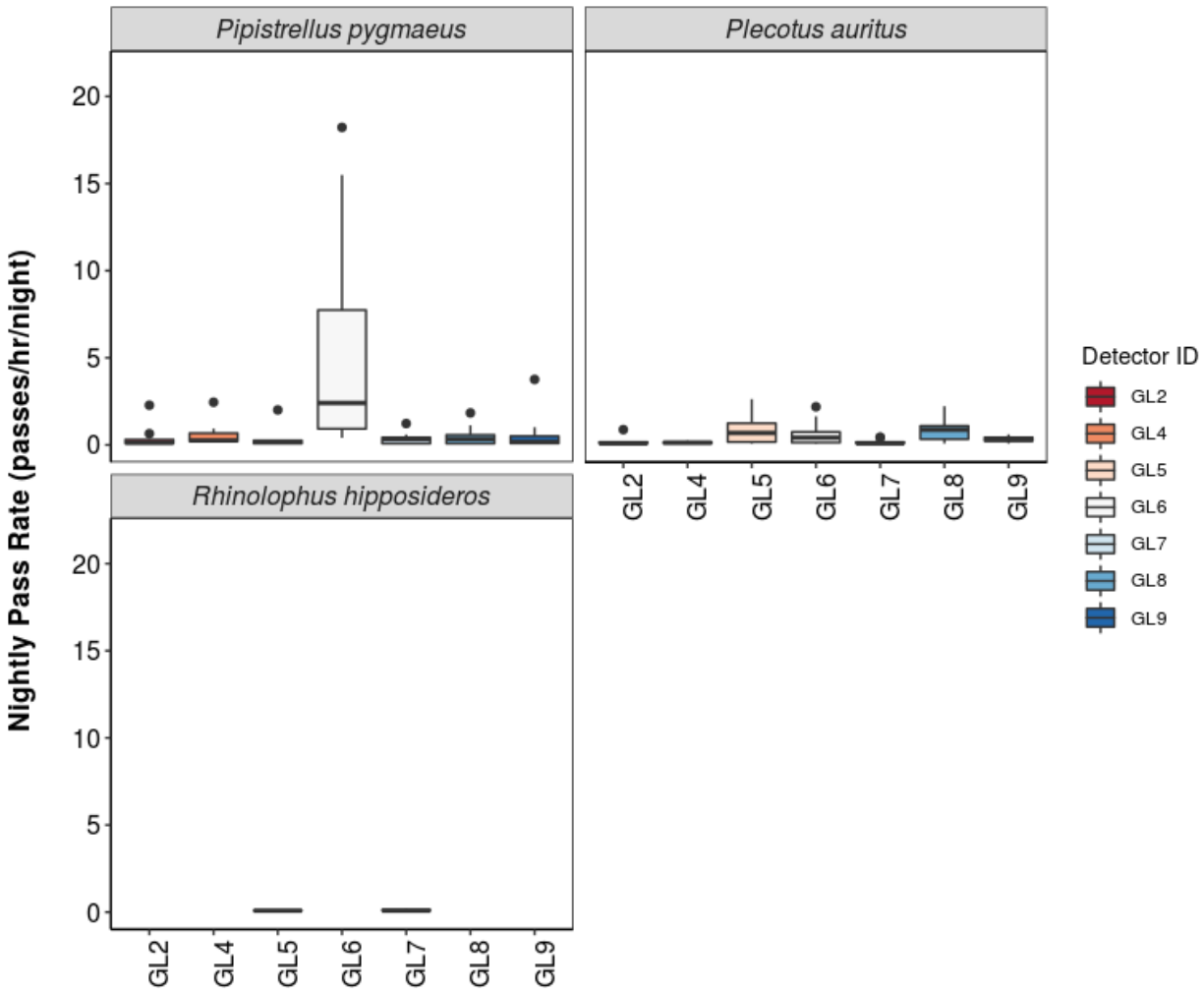
Leisler's	GL8	0.3
Leisler's	GL9	0.2
Brown long-eared	GL2	0.2
Brown long-eared	GL4	0.1
Brown long-eared	GL5	0.9
Brown long-eared	GL6	0.6
Brown long-eared	GL7	0.2
Brown long-eared	GL8	0.8
Brown long-eared	GL9	0.3
Daubenton's	GL2	0.1
Daubenton's	GL4	0.1
Daubenton's	GL5	0.2
Daubenton's	GL6	0.9
Daubenton's	GL7	0.2
Daubenton's	GL8	0.1
Daubenton's	GL9	0.1
Whiskered	GL2	0.1
Whiskered	GL5	0.1
Whiskered	GL6	0.1
Whiskered	GL7	0.1
Whiskered	GL8	0.1
Whiskered	GL9	0.1
Natterer's	GL2	0.1
Natterer's	GL4	0.1
Natterer's	GL5	0.1
Natterer's	GL6	0.5
Natterer's	GL7	0.3
Natterer's	GL8	0.4
Natterer's	GL9	0.1
Lesser horseshoe	GL5	0.1
Lesser horseshoe	GL7	0.1

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Rhinolophus hipposideros
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
GL2
GL4
GL5
GL6
GL7
GL8
GL9
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	Sep	Oct
Common pipistrelle	GL2	148	3
Common pipistrelle	GL4	133	5
Common pipistrelle	GL5	131	7
Common pipistrelle	GL6	1387	5
Common pipistrelle	GL7	208	3
Common pipistrelle	GL8	137	5
Common pipistrelle	GL9	303	2
Soprano pipistrelle	GL2	47	1
Soprano pipistrelle	GL4	52	2
Soprano pipistrelle	GL5	40	3
Soprano pipistrelle	GL6	831	0
Soprano pipistrelle	GL7	51	1
Soprano pipistrelle	GL8	67	2
Soprano pipistrelle	GL9	70	0
Nathusius'	GL2	23	1
Nathusius'	GL4	32	1
Nathusius'	GL5	13	4
Nathusius'	GL6	119	2
Nathusius'	GL7	7	0
Nathusius'	GL8	11	2
Nathusius'	GL9	21	1
Leisler's	GL2	8	5
Leisler's	GL4	10	2
Leisler's	GL5	16	3

Leisler’s	GL6	12	5
Leisler’s	GL7	14	0
Leisler’s	GL8	8	1
Leisler’s	GL9	7	3
Brown long-eared	GL2	19	0
Brown long-eared	GL4	10	0
Brown long-eared	GL5	117	0
Brown long-eared	GL6	100	0
Brown long-eared	GL7	20	0
Brown long-eared	GL8	97	0
Brown long-eared	GL9	30	0
Daubenton’s	GL2	10	0
Daubenton’s	GL4	2	0
Daubenton’s	GL5	13	0
Daubenton’s	GL6	129	0
Daubenton’s	GL7	16	0
Daubenton’s	GL8	14	0
Daubenton’s	GL9	12	0
Whiskered	GL2	1	0
Whiskered	GL5	2	0
Whiskered	GL6	6	0
Whiskered	GL7	4	0
Whiskered	GL8	1	0
Whiskered	GL9	3	0
Natterer’s	GL2	2	0
Natterer’s	GL4	2	0
Natterer’s	GL5	12	0
Natterer’s	GL6	63	0
Natterer’s	GL7	22	0
Natterer’s	GL8	33	0
Natterer’s	GL9	6	0
Lesser horseshoe	GL5	1	0
Lesser horseshoe	GL7	4	0

Survey Effort

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

Month	Detector ID	No. of Survey Nights
Sep	GL2	13
Sep	GL4	12
Sep	GL5	15
Sep	GL6	16
Sep	GL7	14
Sep	GL8	12
Sep	GL9	14
Oct	GL2	4
Oct	GL4	3
Oct	GL5	5
Oct	GL6	4
Oct	GL7	3
Oct	GL8	3
Oct	GL9	3

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	Sep	Oct
Common pipistrelle	GL2	0.3	0.1
Common pipistrelle	GL4	0.3	0.2
Common pipistrelle	GL5	0.3	0.2
Common pipistrelle	GL6	7.1	0.2
Common pipistrelle	GL7	1.1	0.1
Common pipistrelle	GL8	0.4	0.1
Common pipistrelle	GL9	0.3	0.2
Soprano pipistrelle	GL2	0.2	0.1
Soprano pipistrelle	GL4	0.3	0.2
Soprano pipistrelle	GL5	0.2	0.1
Soprano pipistrelle	GL6	2.4	NA
Soprano pipistrelle	GL7	0.3	0.1
Soprano pipistrelle	GL8	0.4	0.1
Soprano pipistrelle	GL9	0.2	NA
Nathusius'	GL2	0.2	0.1
Nathusius'	GL4	1.4	0.1
Nathusius'	GL5	0.2	0.2
Nathusius'	GL6	0.6	0.2
Nathusius'	GL7	0.3	NA
Nathusius'	GL8	0.1	0.1
Nathusius'	GL9	0.1	0.1
Leisler's	GL2	0.1	0.1
Leisler's	GL4	0.4	0.1

Leisler's	GL5	0.3	0.1
Leisler's	GL6	0.1	0.2
Leisler's	GL7	0.5	NA
Leisler's	GL8	0.3	0.1
Leisler's	GL9	0.3	0.1
Brown long-eared	GL2	0.1	NA
Brown long-eared	GL4	0.1	NA
Brown long-eared	GL5	0.7	NA
Brown long-eared	GL6	0.4	NA
Brown long-eared	GL7	0.1	NA
Brown long-eared	GL8	0.9	NA
Brown long-eared	GL9	0.3	NA
Daubenton's	GL2	0.1	NA
Daubenton's	GL4	0.1	NA
Daubenton's	GL5	0.1	NA
Daubenton's	GL6	0.9	NA
Daubenton's	GL7	0.2	NA
Daubenton's	GL8	0.2	NA
Daubenton's	GL9	0.2	NA
Whiskered	GL2	0.1	NA
Whiskered	GL5	0.1	NA
Whiskered	GL6	0.1	NA
Whiskered	GL7	0.1	NA
Whiskered	GL8	0.1	NA
Whiskered	GL9	0.1	NA
Natterer's	GL2	0.1	NA
Natterer's	GL4	0.1	NA
Natterer's	GL5	0.2	NA
Natterer's	GL6	0.5	NA
Natterer's	GL7	0.2	NA
Natterer's	GL8	0.3	NA
Natterer's	GL9	0.1	NA
Lesser horseshoe	GL5	0.1	NA
Lesser horseshoe	GL7	0.1	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.

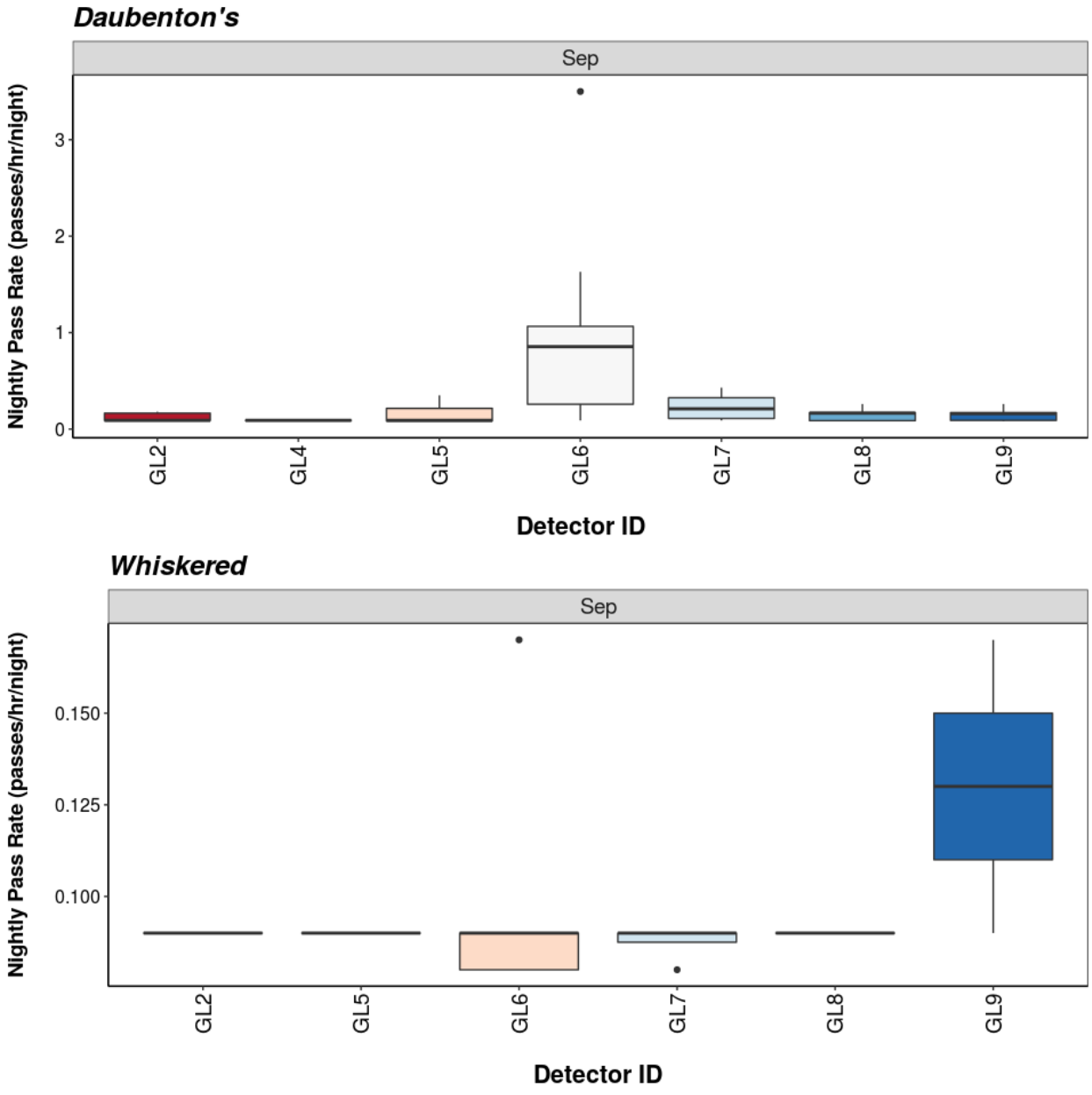
Species	Detector ID	Sep	Oct
Common pipistrelle	GL2	1.2	0.1
Common pipistrelle	GL4	1.0	0.1
Common pipistrelle	GL5	0.9	0.2
Common pipistrelle	GL6	7.3	0.2
Common pipistrelle	GL7	1.4	0.1
Common pipistrelle	GL8	1.2	0.1
Common pipistrelle	GL9	2.2	0.2
Soprano pipistrelle	GL2	0.4	0.1
Soprano pipistrelle	GL4	0.8	0.2
Soprano pipistrelle	GL5	0.4	0.1
Soprano pipistrelle	GL6	5.5	NA
Soprano pipistrelle	GL7	0.4	0.1
Soprano pipistrelle	GL8	0.6	0.1
Soprano pipistrelle	GL9	0.7	NA
Nathusius'	GL2	0.4	0.1
Nathusius'	GL4	1.4	0.1
Nathusius'	GL5	0.4	0.2
Nathusius'	GL6	1.0	0.2
Nathusius'	GL7	0.3	NA
Nathusius'	GL8	0.3	0.1
Nathusius'	GL9	0.5	0.1
Leisler's	GL2	0.2	0.1
Leisler's	GL4	0.4	0.1
Leisler's	GL5	0.3	0.1
Leisler's	GL6	0.4	0.2
Leisler's	GL7	0.4	NA

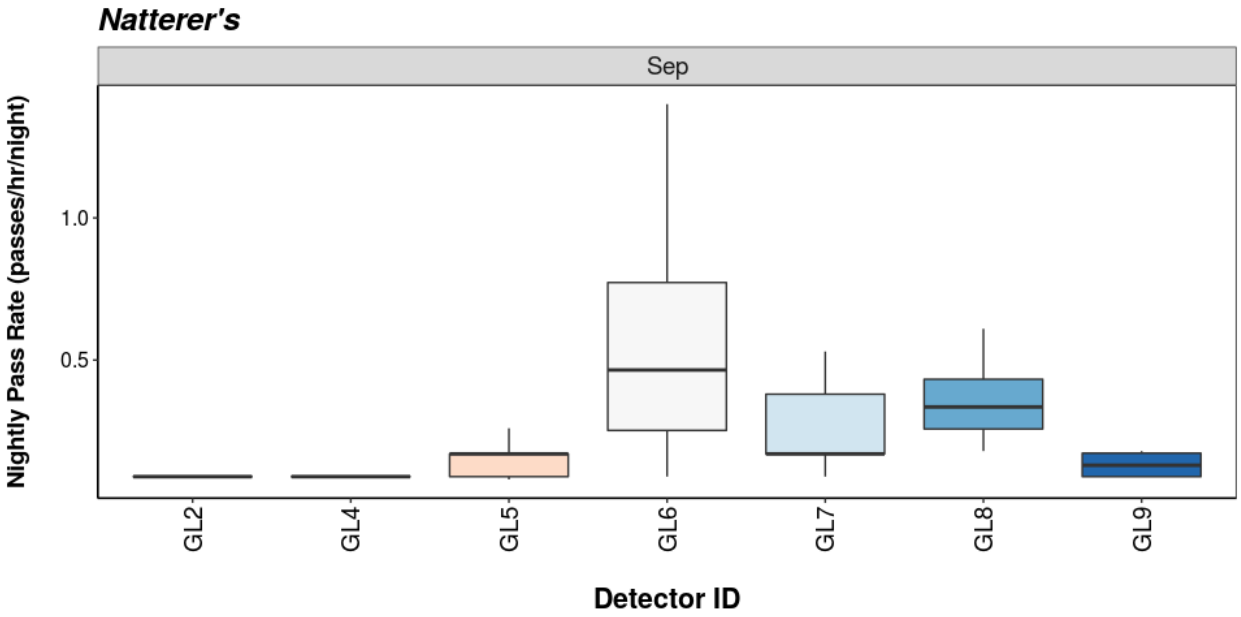
Leisler's	GL8	0.3	0.1
Leisler's	GL9	0.3	0.1
Brown long-eared	GL2	0.2	NA
Brown long-eared	GL4	0.1	NA
Brown long-eared	GL5	0.9	NA
Brown long-eared	GL6	0.6	NA
Brown long-eared	GL7	0.2	NA
Brown long-eared	GL8	0.8	NA
Brown long-eared	GL9	0.3	NA
Daubenton's	GL2	0.1	NA
Daubenton's	GL4	0.1	NA
Daubenton's	GL5	0.2	NA
Daubenton's	GL6	0.9	NA
Daubenton's	GL7	0.2	NA
Daubenton's	GL8	0.1	NA
Daubenton's	GL9	0.1	NA
Whiskered	GL2	0.1	NA
Whiskered	GL5	0.1	NA
Whiskered	GL6	0.1	NA
Whiskered	GL7	0.1	NA
Whiskered	GL8	0.1	NA
Whiskered	GL9	0.1	NA
Natterer's	GL2	0.1	NA
Natterer's	GL4	0.1	NA
Natterer's	GL5	0.1	NA
Natterer's	GL6	0.5	NA
Natterer's	GL7	0.3	NA
Natterer's	GL8	0.4	NA
Natterer's	GL9	0.1	NA
Lesser horseshoe	GL5	0.1	NA
Lesser horseshoe	GL7	0.1	NA

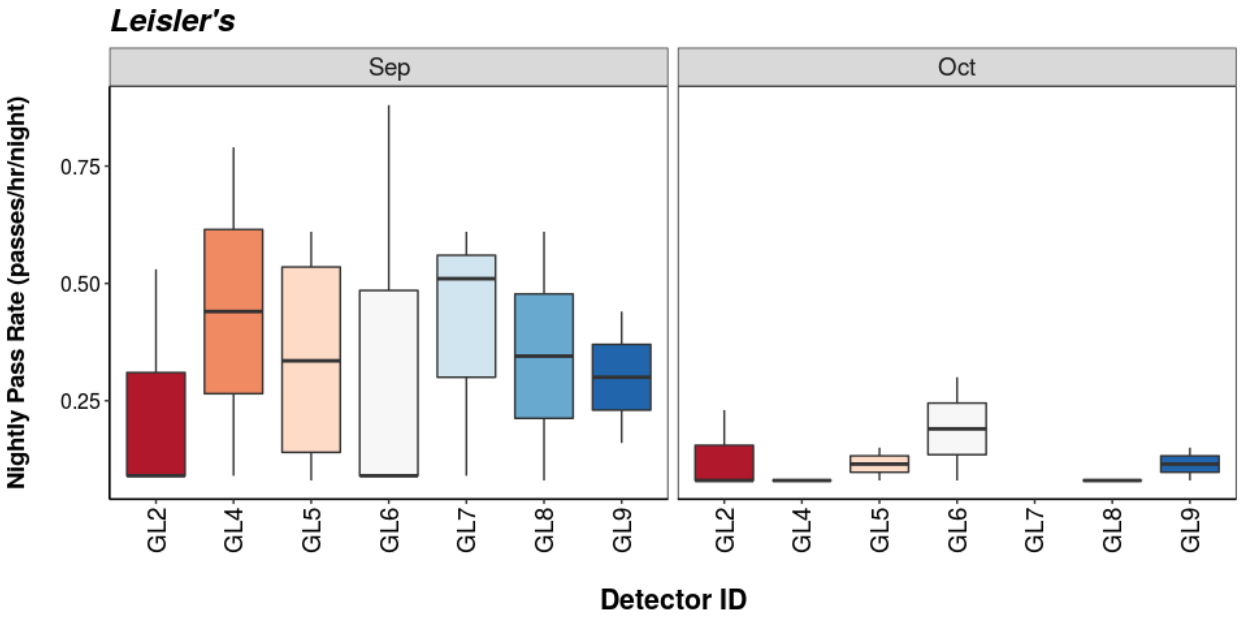
Nightly Bat Pass Rate for each Month

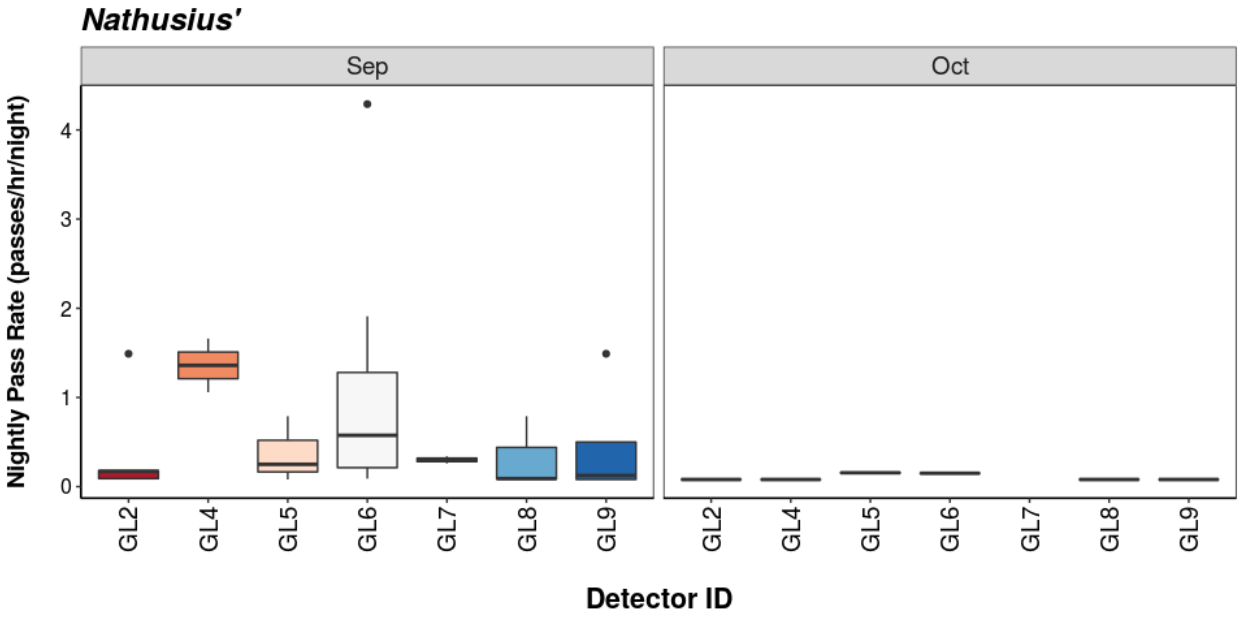
Per Detector - Figures

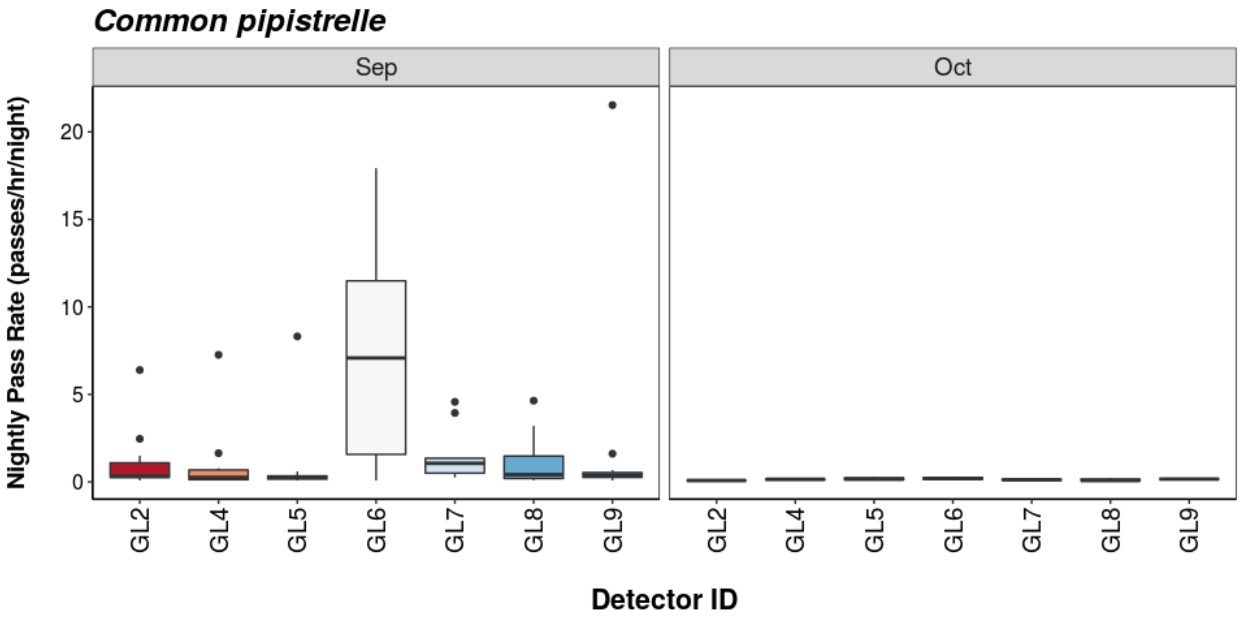
Figure 12. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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

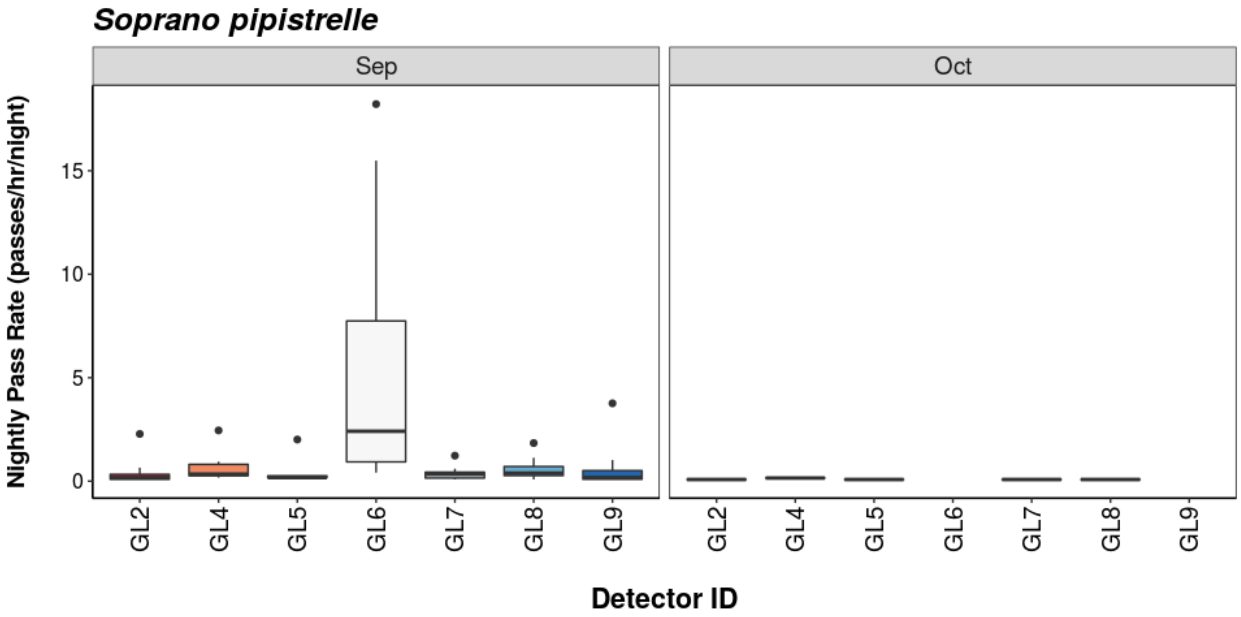


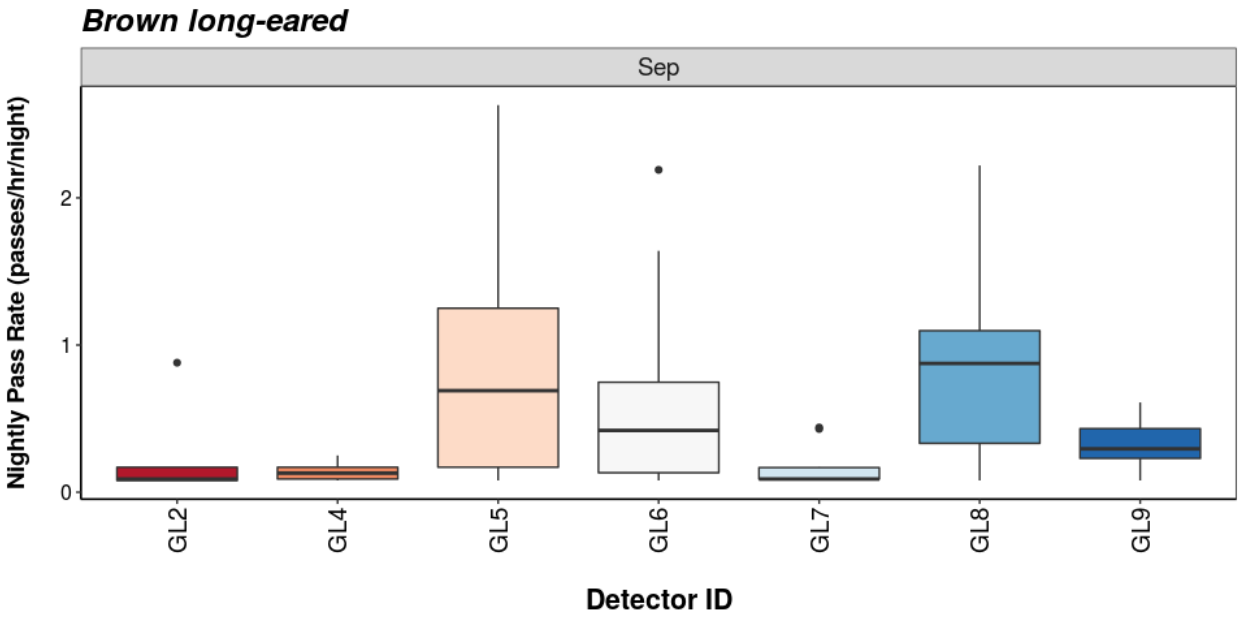

Natterer's
Sep
Nightly Pass Rate (passes/hr/night)
1.0
0.5
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

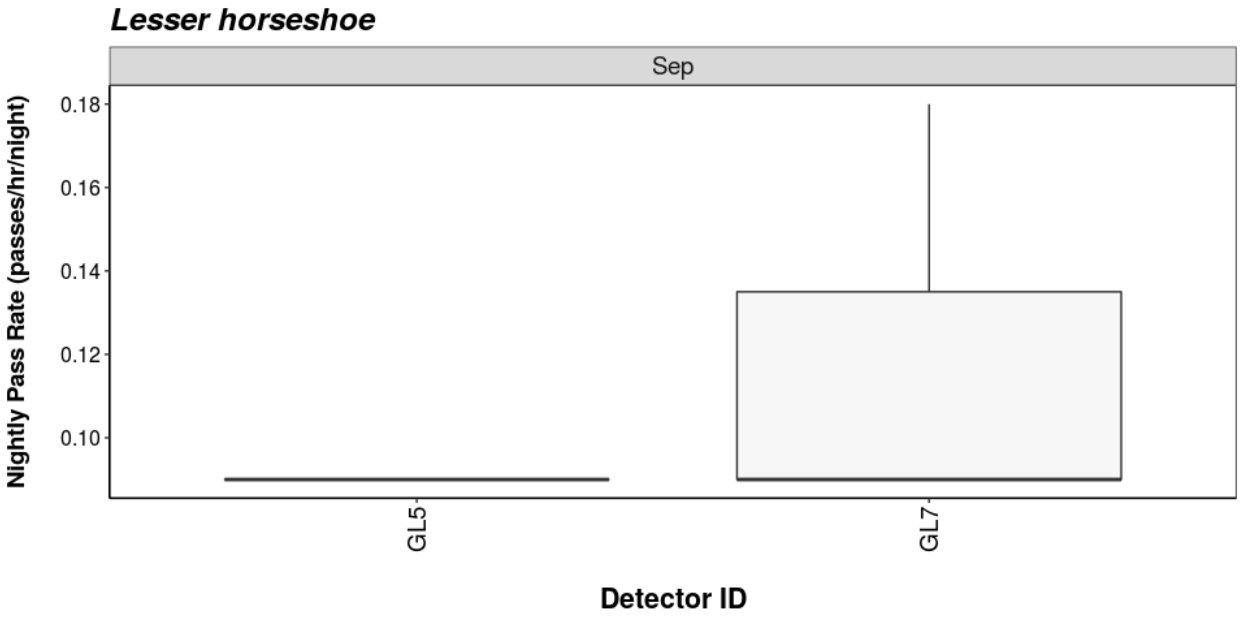

Leisler's
Sep
Oct
Nightly Pass Rate (passes/hr/night)
0.75
0.50
0.25
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Nathusius'
Sep
Oct
Nightly Pass Rate (passes/hr/night)
0
1
2
3
4
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Common pipistrelle
Sep
Oct
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Soprano pipistrelle
Sep
Oct
Nightly Pass Rate (passes/hr/night)
0
5
10
15
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Brown long-eared
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Lesser horseshoe
Sep
Nightly Pass Rate (passes/hr/night)
0.18
0.16
0.14
0.12
0.10
GL5
GL7
Detector ID

Bat Activity per Detector Location

Figure 13. Detector ID reference:

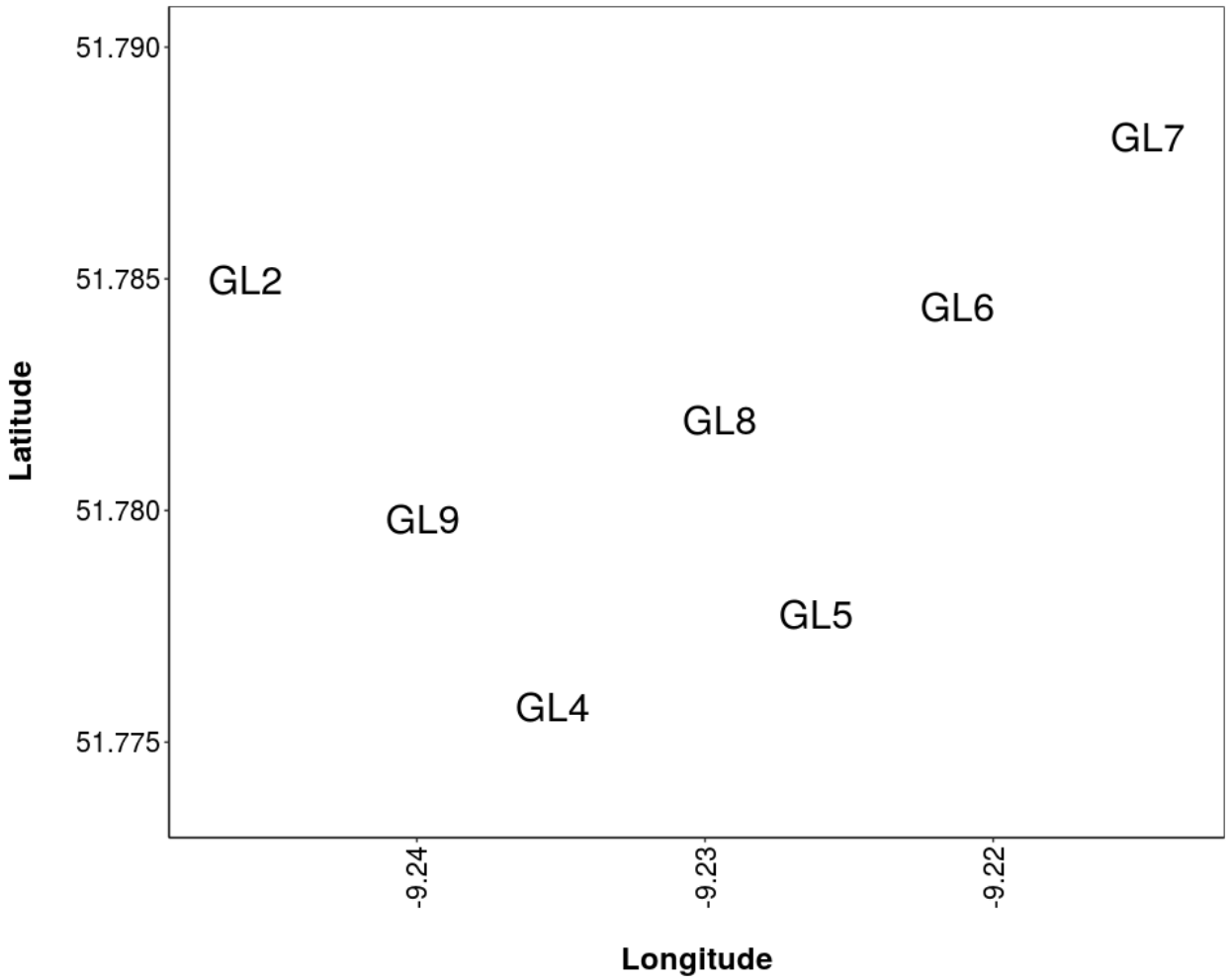
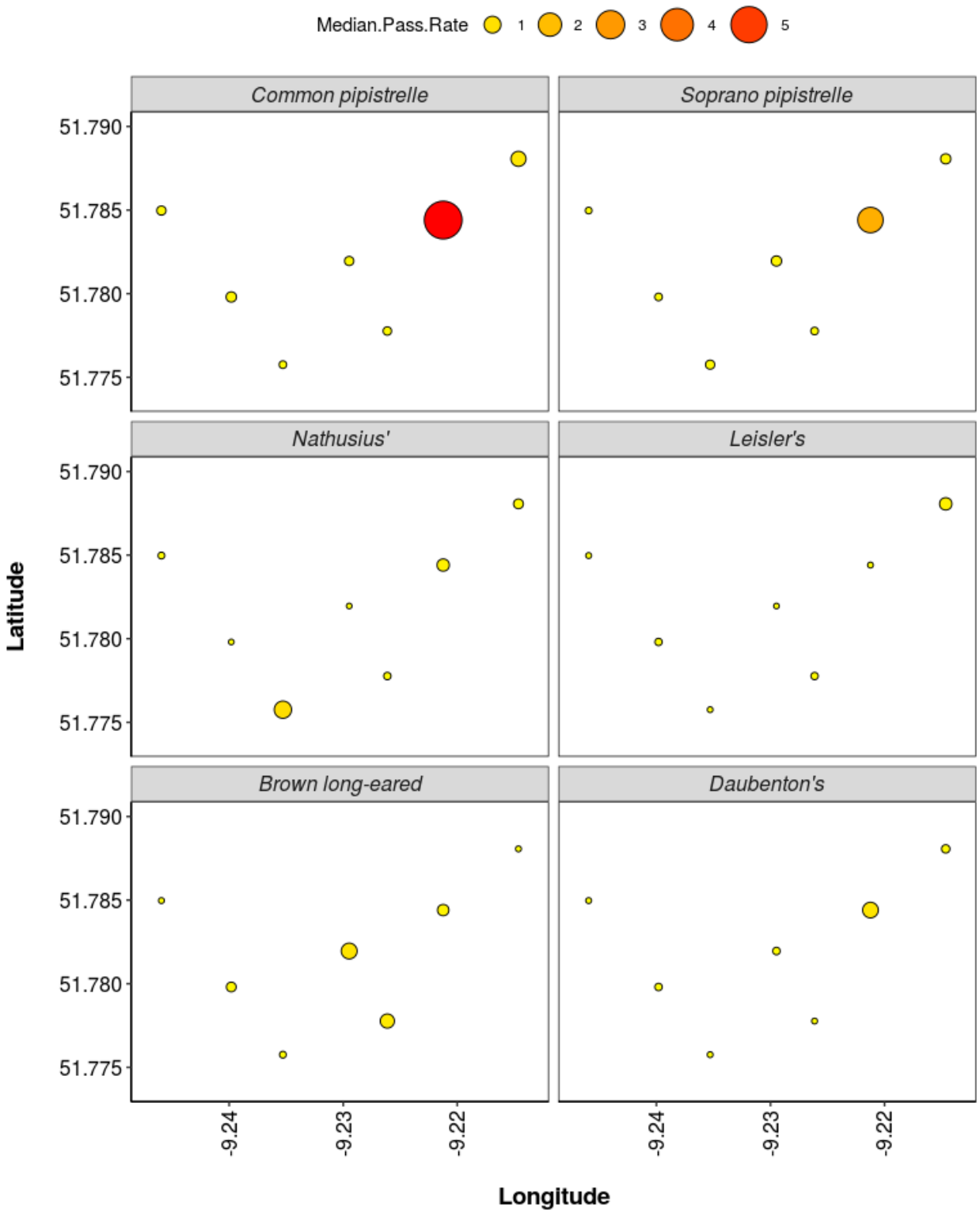


Figure 14. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
1
2
3
4
5
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

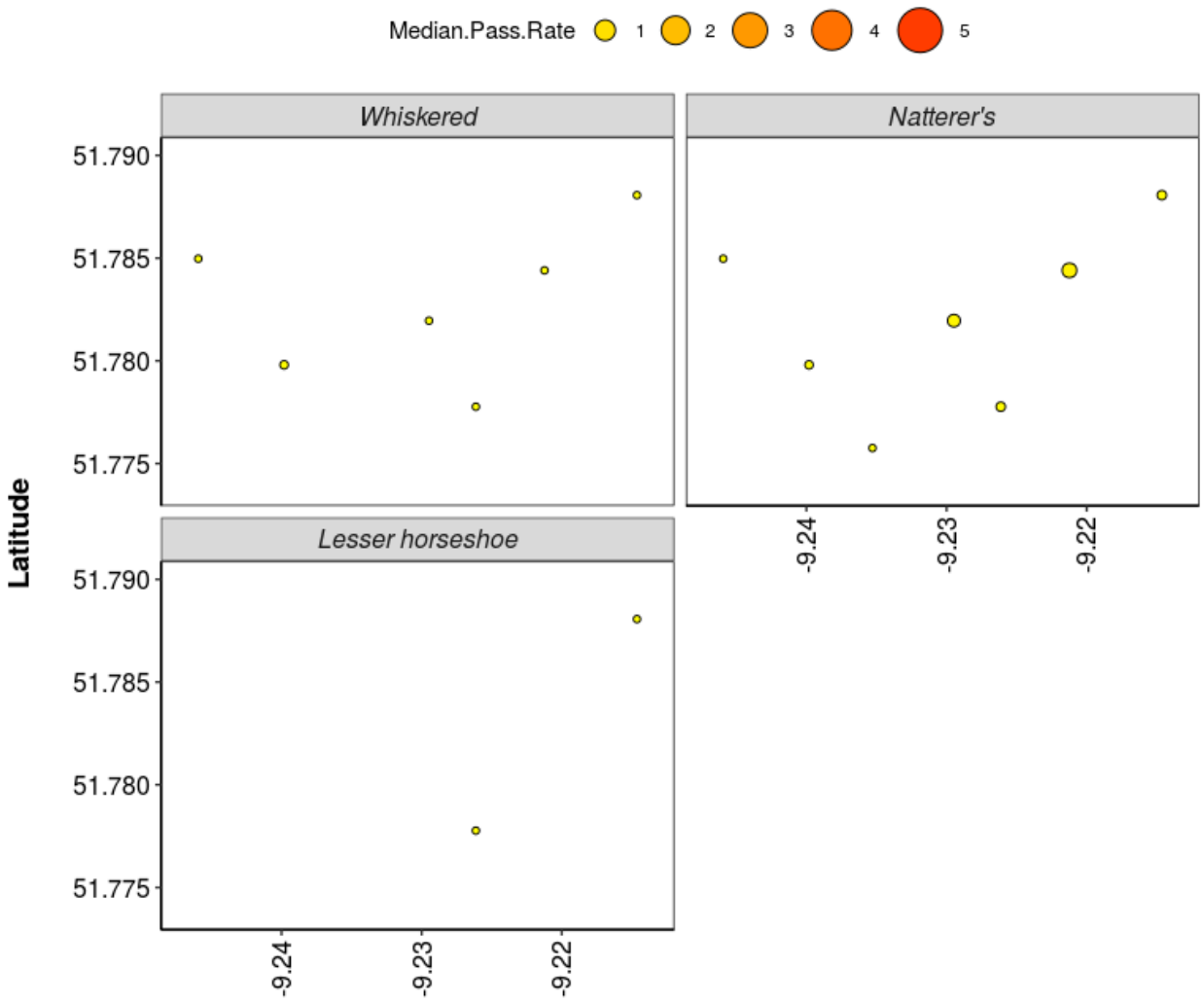
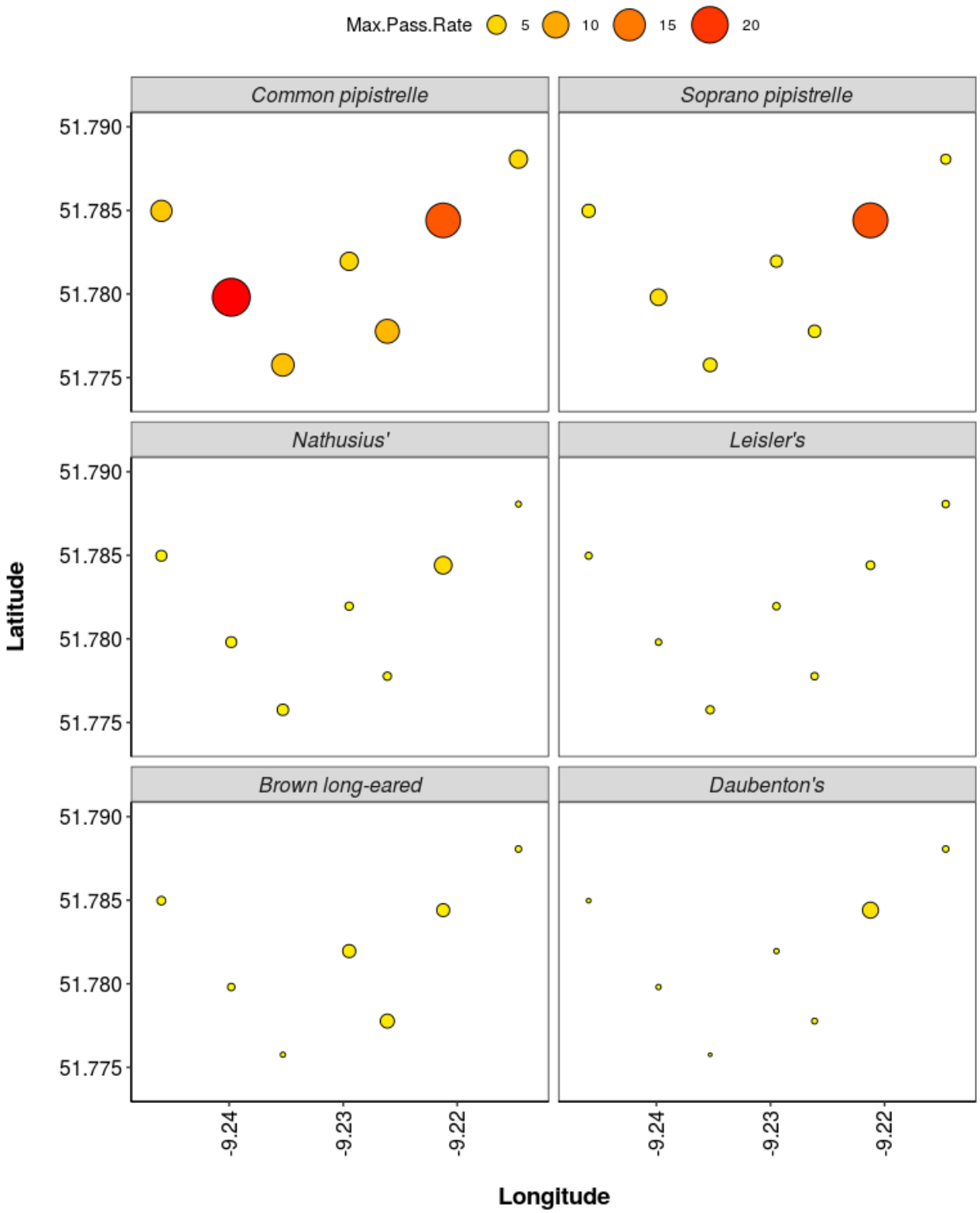
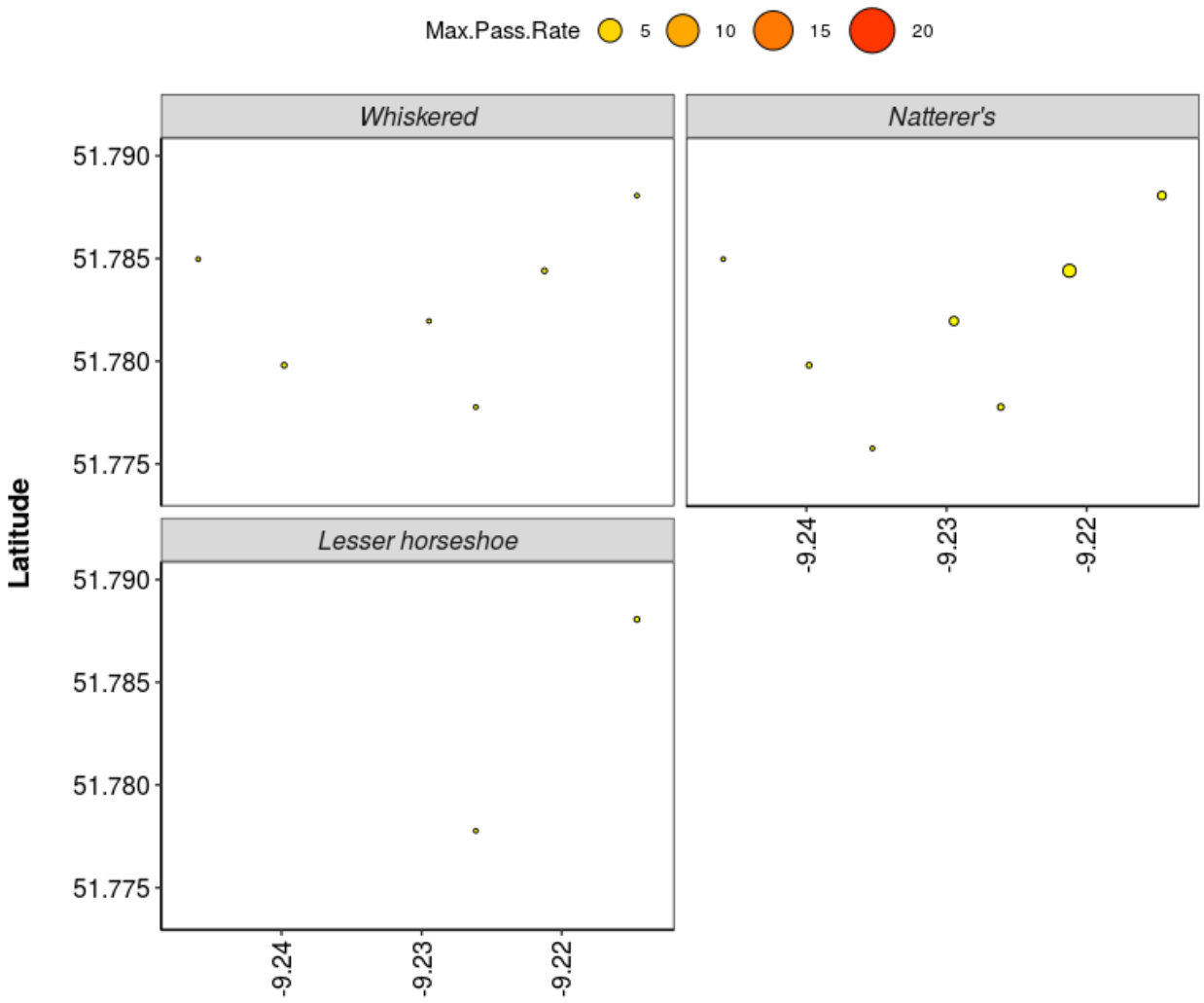

Median.Pass.Rate
1
2
3
4
5
Whiskered
Natterer's
Lesser horseshoe
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
5
10
15
20
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude


Max.Pass.Rate
5
10
15
20
Whiskered
Natterer's
Lesser horseshoe
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

PART 2B: Includes absences

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

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Brown long-eared	GL2	0.0
Brown long-eared	GL4	0.0
Brown long-eared	GL5	0.1
Brown long-eared	GL6	0.2
Brown long-eared	GL7	0.1
Brown long-eared	GL8	0.3
Brown long-eared	GL9	0.0
Common pipistrelle	GL2	0.2
Common pipistrelle	GL4	0.2
Common pipistrelle	GL5	0.2
Common pipistrelle	GL6	3.8
Common pipistrelle	GL7	0.7
Common pipistrelle	GL8	0.2
Common pipistrelle	GL9	0.3
Daubenton's	GL2	0.0
Daubenton's	GL4	0.0
Daubenton's	GL5	0.0
Daubenton's	GL6	0.2
Daubenton's	GL7	0.0
Daubenton's	GL8	0.1
Daubenton's	GL9	0.0
Leisler's	GL2	0.0
Leisler's	GL4	0.0

Leisler’s	GL5	0.0
Leisler’s	GL6	0.0
Leisler’s	GL7	0.0
Leisler’s	GL8	0.0
Leisler’s	GL9	0.0
Lesser horseshoe	GL2	0.0
Lesser horseshoe	GL4	0.0
Lesser horseshoe	GL5	0.0
Lesser horseshoe	GL6	0.0
Lesser horseshoe	GL7	0.0
Lesser horseshoe	GL8	0.0
Lesser horseshoe	GL9	0.0
Nathusius’	GL2	0.0
Nathusius’	GL4	0.0
Nathusius’	GL5	0.0
Nathusius’	GL6	0.1
Nathusius’	GL7	0.0
Nathusius’	GL8	0.0
Nathusius’	GL9	0.0
Natterer’s	GL2	0.0
Natterer’s	GL4	0.0
Natterer’s	GL5	0.0
Natterer’s	GL6	0.0
Natterer’s	GL7	0.0
Natterer’s	GL8	0.2
Natterer’s	GL9	0.0
Soprano pipistrelle	GL2	0.1
Soprano pipistrelle	GL4	0.0
Soprano pipistrelle	GL5	0.1
Soprano pipistrelle	GL6	0.8
Soprano pipistrelle	GL7	0.2
Soprano pipistrelle	GL8	0.2
Soprano pipistrelle	GL9	0.1
Whiskered	GL2	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0

Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

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

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

Species	Detector ID	Mean Pass Rate
Brown long-eared	GL2	0.1
Brown long-eared	GL4	0.1
Brown long-eared	GL5	0.5
Brown long-eared	GL6	0.4
Brown long-eared	GL7	0.1
Brown long-eared	GL8	0.6
Brown long-eared	GL9	0.2
Common pipistrelle	GL2	0.8
Common pipistrelle	GL4	0.8
Common pipistrelle	GL5	0.6
Common pipistrelle	GL6	5.9
Common pipistrelle	GL7	1.1
Common pipistrelle	GL8	0.8
Common pipistrelle	GL9	1.6
Daubenton's	GL2	0.1
Daubenton's	GL4	0.0
Daubenton's	GL5	0.1
Daubenton's	GL6	0.6
Daubenton's	GL7	0.1
Daubenton's	GL8	0.1
Daubenton's	GL9	0.1
Leisler's	GL2	0.1
Leisler's	GL4	0.1
Leisler's	GL5	0.1
Leisler's	GL6	0.1
Leisler's	GL7	0.1

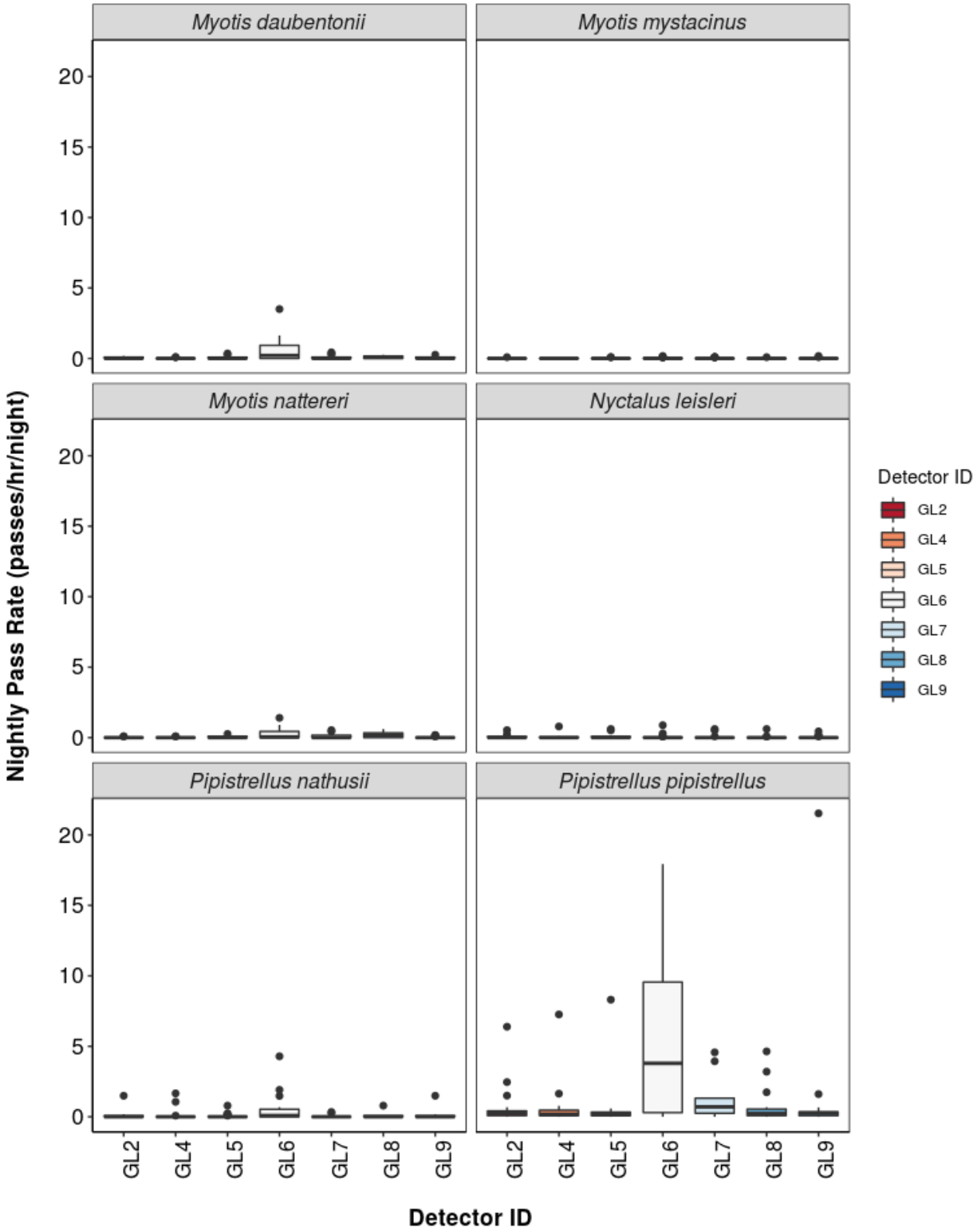
Leisler’s	GL8	0.1
Leisler’s	GL9	0.0
Lesser horseshoe	GL2	0.0
Lesser horseshoe	GL4	0.0
Lesser horseshoe	GL5	0.0
Lesser horseshoe	GL6	0.0
Lesser horseshoe	GL7	0.0
Lesser horseshoe	GL8	0.0
Lesser horseshoe	GL9	0.0
Nathusius’	GL2	0.1
Nathusius’	GL4	0.2
Nathusius’	GL5	0.1
Nathusius’	GL6	0.5
Nathusius’	GL7	0.0
Nathusius’	GL8	0.1
Nathusius’	GL9	0.1
Natterer’s	GL2	0.0
Natterer’s	GL4	0.0
Natterer’s	GL5	0.1
Natterer’s	GL6	0.3
Natterer’s	GL7	0.1
Natterer’s	GL8	0.2
Natterer’s	GL9	0.0
Soprano pipistrelle	GL2	0.2
Soprano pipistrelle	GL4	0.3
Soprano pipistrelle	GL5	0.2
Soprano pipistrelle	GL6	3.6
Soprano pipistrelle	GL7	0.3
Soprano pipistrelle	GL8	0.4
Soprano pipistrelle	GL9	0.4
Whiskered	GL2	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0

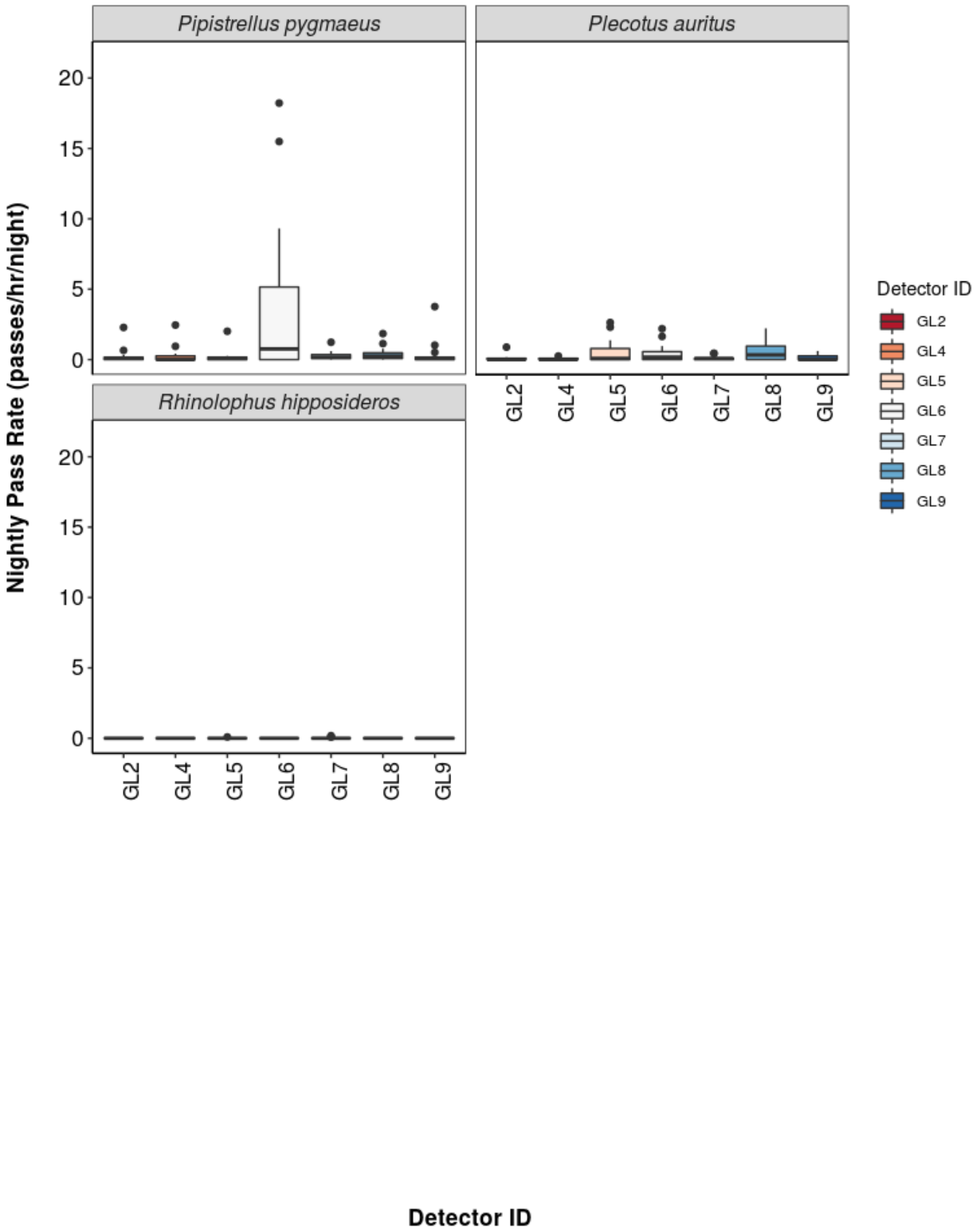
Whiskered	GL9	0.0

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Rhinolophus hipposideros
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
GL2
GL4
GL5
GL6
GL7
GL8
GL9
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
Sep	GL2	13
Sep	GL4	12
Sep	GL5	15
Sep	GL6	16
Sep	GL7	14
Sep	GL8	12
Sep	GL9	14
Oct	GL2	4
Oct	GL4	3
Oct	GL5	5
Oct	GL6	4
Oct	GL7	3
Oct	GL8	3
Oct	GL9	3

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	Oct	Sep
Brown long-eared	GL2	0.0	0.1
Brown long-eared	GL4	0.0	0.0
Brown long-eared	GL5	0.0	0.2
Brown long-eared	GL6	0.0	0.3
Brown long-eared	GL7	0.0	0.1
Brown long-eared	GL8	0.0	0.6
Brown long-eared	GL9	0.0	0.1
Common pipistrelle	GL2	0.1	0.3
Common pipistrelle	GL4	0.2	0.2
Common pipistrelle	GL5	0.1	0.2
Common pipistrelle	GL6	0.0	7.1
Common pipistrelle	GL7	0.1	0.9
Common pipistrelle	GL8	0.1	0.3
Common pipistrelle	GL9	0.0	0.3
Daubenton's	GL2	0.0	0.1
Daubenton's	GL4	0.0	0.0
Daubenton's	GL5	0.0	0.0
Daubenton's	GL6	0.0	0.3
Daubenton's	GL7	0.0	0.0
Daubenton's	GL8	0.0	0.1
Daubenton's	GL9	0.0	0.0
Leisler's	GL2	0.1	0.0
Leisler's	GL4	0.1	0.0

Leisler’s	GL5	0.0	0.0
Leisler’s	GL6	0.0	0.0
Leisler’s	GL7	0.0	0.0
Leisler’s	GL8	0.0	0.0
Leisler’s	GL9	0.1	0.0
Lesser horseshoe	GL2	0.0	0.0
Lesser horseshoe	GL4	0.0	0.0
Lesser horseshoe	GL5	0.0	0.0
Lesser horseshoe	GL6	0.0	0.0
Lesser horseshoe	GL7	0.0	0.0
Lesser horseshoe	GL8	0.0	0.0
Lesser horseshoe	GL9	0.0	0.0
Nathusius’	GL2	0.0	0.0
Nathusius’	GL4	0.0	0.0
Nathusius’	GL5	0.0	0.0
Nathusius’	GL6	0.0	0.1
Nathusius’	GL7	0.0	0.0
Nathusius’	GL8	0.1	0.0
Nathusius’	GL9	0.0	0.0
Natterer’s	GL2	0.0	0.0
Natterer’s	GL4	0.0	0.0
Natterer’s	GL5	0.0	0.0
Natterer’s	GL6	0.0	0.2
Natterer’s	GL7	0.0	0.0
Natterer’s	GL8	0.0	0.3
Natterer’s	GL9	0.0	0.0
Soprano pipistrelle	GL2	0.0	0.1
Soprano pipistrelle	GL4	0.0	0.1
Soprano pipistrelle	GL5	0.1	0.1
Soprano pipistrelle	GL6	0.0	1.9
Soprano pipistrelle	GL7	0.0	0.3
Soprano pipistrelle	GL8	0.1	0.3
Soprano pipistrelle	GL9	0.0	0.1
Whiskered	GL2	0.0	0.0
Whiskered	GL4	0.0	0.0
Whiskered	GL5	0.0	0.0

Whiskered	GL6	0.0	0.0
Whiskered	GL7	0.0	0.0
Whiskered	GL8	0.0	0.0
Whiskered	GL9	0.0	0.0

Nightly Bat Pass Rate for each Month

Mean per Detector

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

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

Species	Detector ID	Oct	Sep
Brown long-eared	GL2	0.0	0.1
Brown long-eared	GL4	0.0	0.1
Brown long-eared	GL5	0.0	0.7
Brown long-eared	GL6	0.0	0.5
Brown long-eared	GL7	0.0	0.1
Brown long-eared	GL8	0.0	0.7
Brown long-eared	GL9	0.0	0.2
Common pipistrelle	GL2	0.1	1.0
Common pipistrelle	GL4	0.1	1.0
Common pipistrelle	GL5	0.1	0.8
Common pipistrelle	GL6	0.1	7.3
Common pipistrelle	GL7	0.1	1.3
Common pipistrelle	GL8	0.1	1.0
Common pipistrelle	GL9	0.1	1.9
Daubenton's	GL2	0.0	0.1
Daubenton's	GL4	0.0	0.0
Daubenton's	GL5	0.0	0.1
Daubenton's	GL6	0.0	0.7
Daubenton's	GL7	0.0	0.1
Daubenton's	GL8	0.0	0.1
Daubenton's	GL9	0.0	0.1
Leisler's	GL2	0.1	0.1
Leisler's	GL4	0.1	0.1
Leisler's	GL5	0.0	0.1
Leisler's	GL6	0.1	0.1
Leisler's	GL7	0.0	0.1

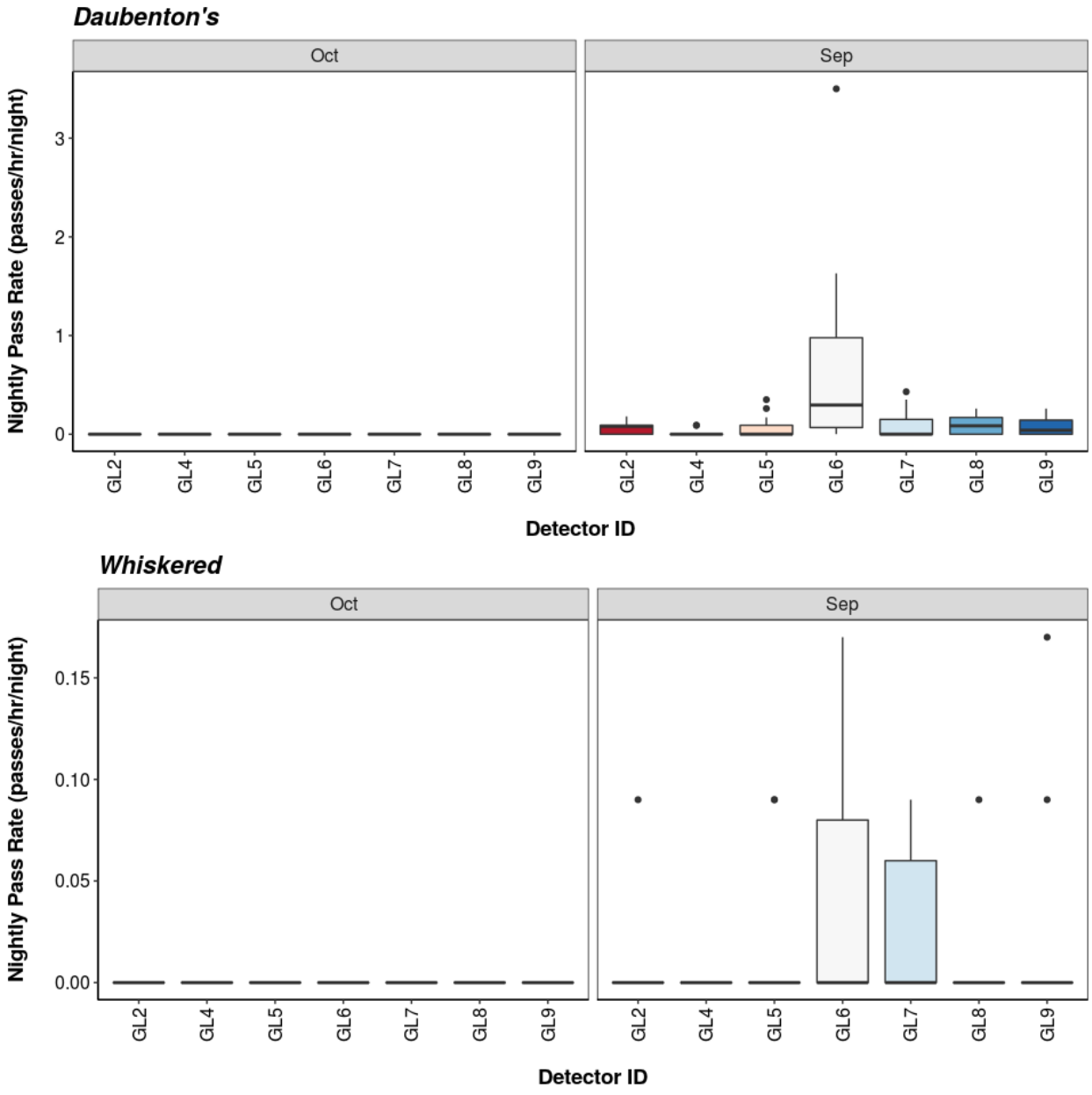
Leisler’s	GL8	0.0	0.1
Leisler’s	GL9	0.1	0.0
Lesser horseshoe	GL2	0.0	0.0
Lesser horseshoe	GL4	0.0	0.0
Lesser horseshoe	GL5	0.0	0.0
Lesser horseshoe	GL6	0.0	0.0
Lesser horseshoe	GL7	0.0	0.0
Lesser horseshoe	GL8	0.0	0.0
Lesser horseshoe	GL9	0.0	0.0
Nathusius’	GL2	0.0	0.2
Nathusius’	GL4	0.0	0.2
Nathusius’	GL5	0.1	0.1
Nathusius’	GL6	0.0	0.6
Nathusius’	GL7	0.0	0.0
Nathusius’	GL8	0.1	0.1
Nathusius’	GL9	0.0	0.1
Natterer’s	GL2	0.0	0.0
Natterer’s	GL4	0.0	0.0
Natterer’s	GL5	0.0	0.1
Natterer’s	GL6	0.0	0.3
Natterer’s	GL7	0.0	0.1
Natterer’s	GL8	0.0	0.2
Natterer’s	GL9	0.0	0.0
Soprano pipistrelle	GL2	0.0	0.3
Soprano pipistrelle	GL4	0.0	0.4
Soprano pipistrelle	GL5	0.0	0.2
Soprano pipistrelle	GL6	0.0	4.5
Soprano pipistrelle	GL7	0.0	0.3
Soprano pipistrelle	GL8	0.1	0.5
Soprano pipistrelle	GL9	0.0	0.4
Whiskered	GL2	0.0	0.0
Whiskered	GL4	0.0	0.0
Whiskered	GL5	0.0	0.0
Whiskered	GL6	0.0	0.0
Whiskered	GL7	0.0	0.0
Whiskered	GL8	0.0	0.0

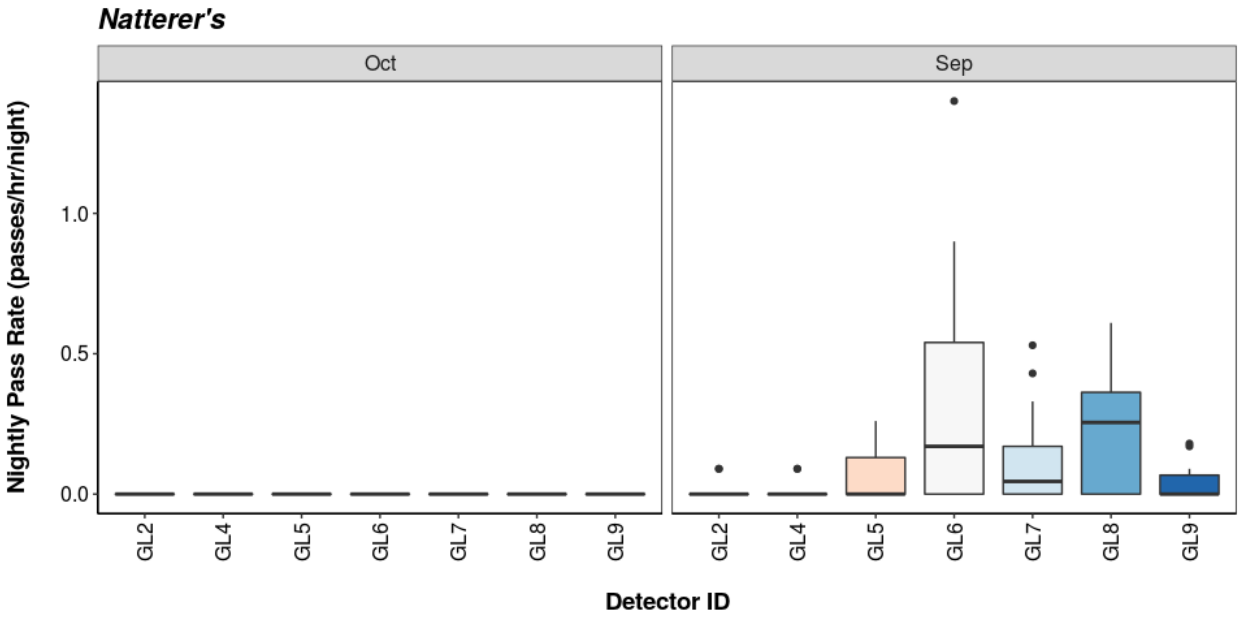
Whiskered	GL9	0.0	0.0

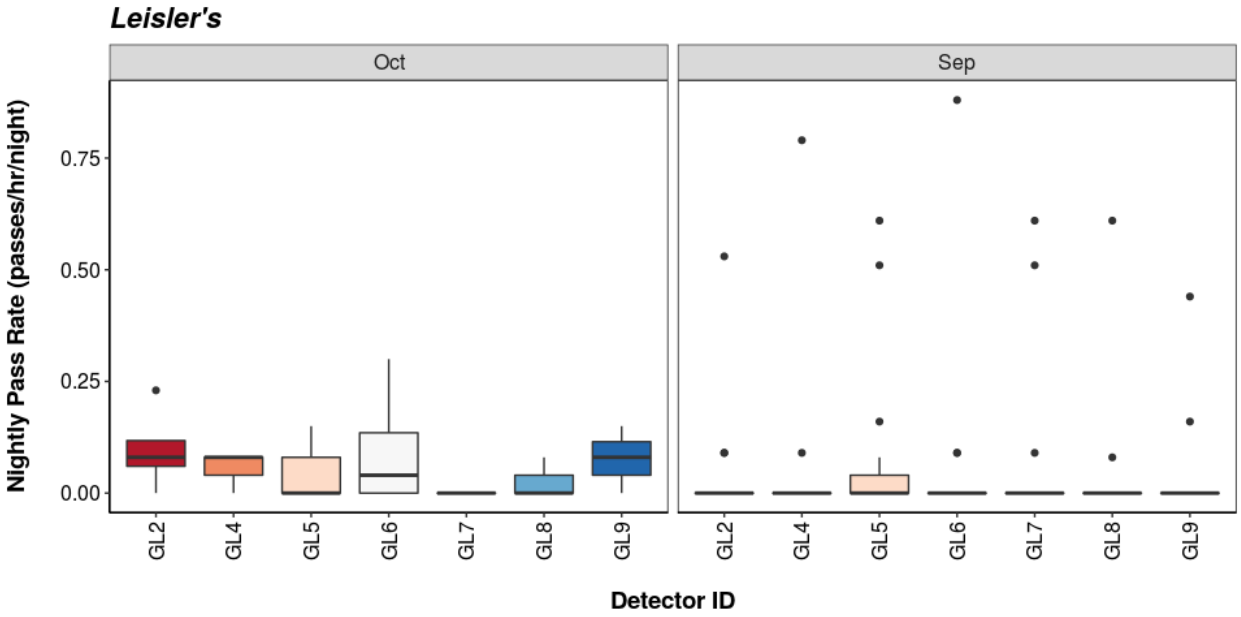
Nightly Bat Pass Rate for each Month

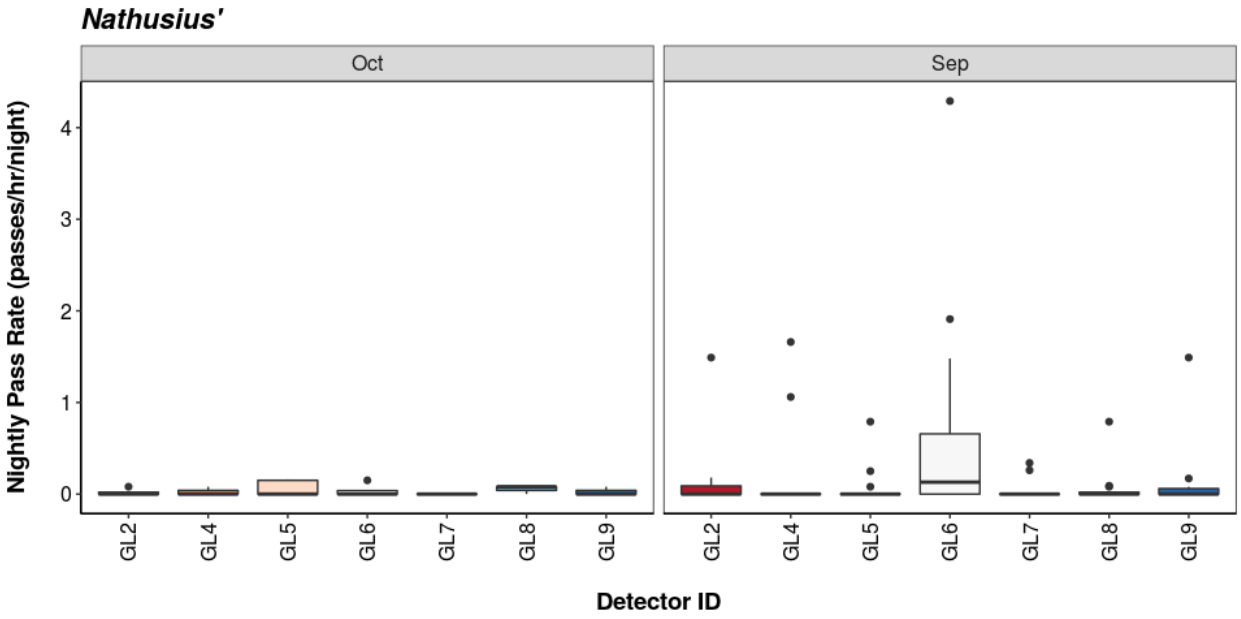
Per Detector - Figures

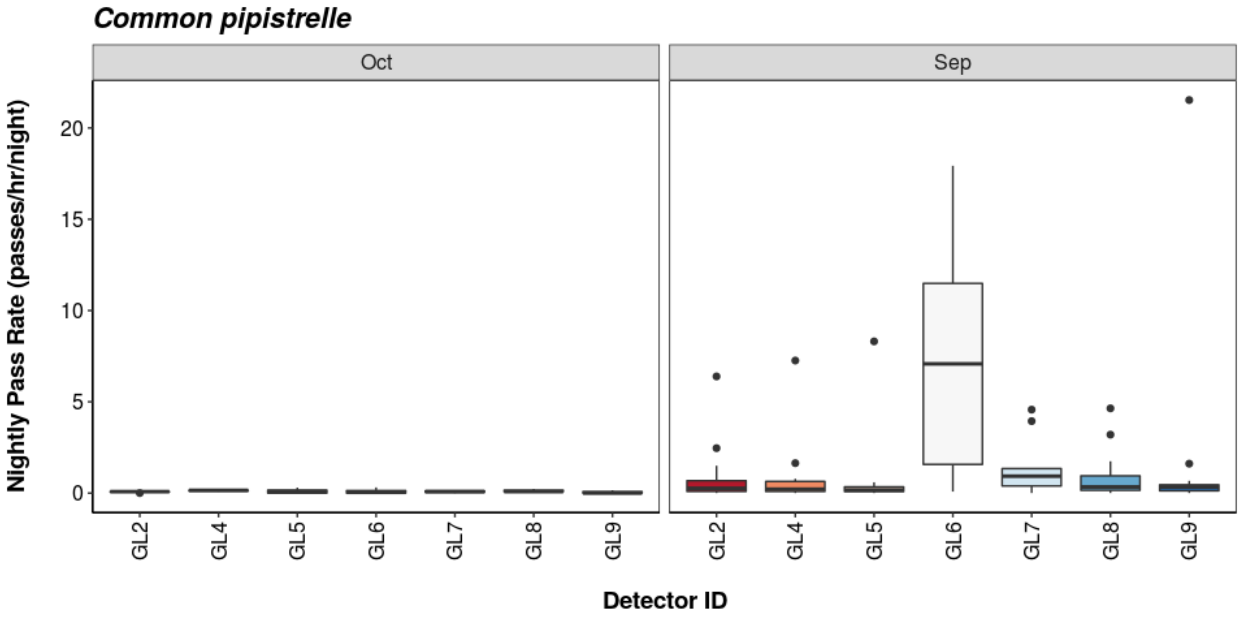
Figure 17. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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

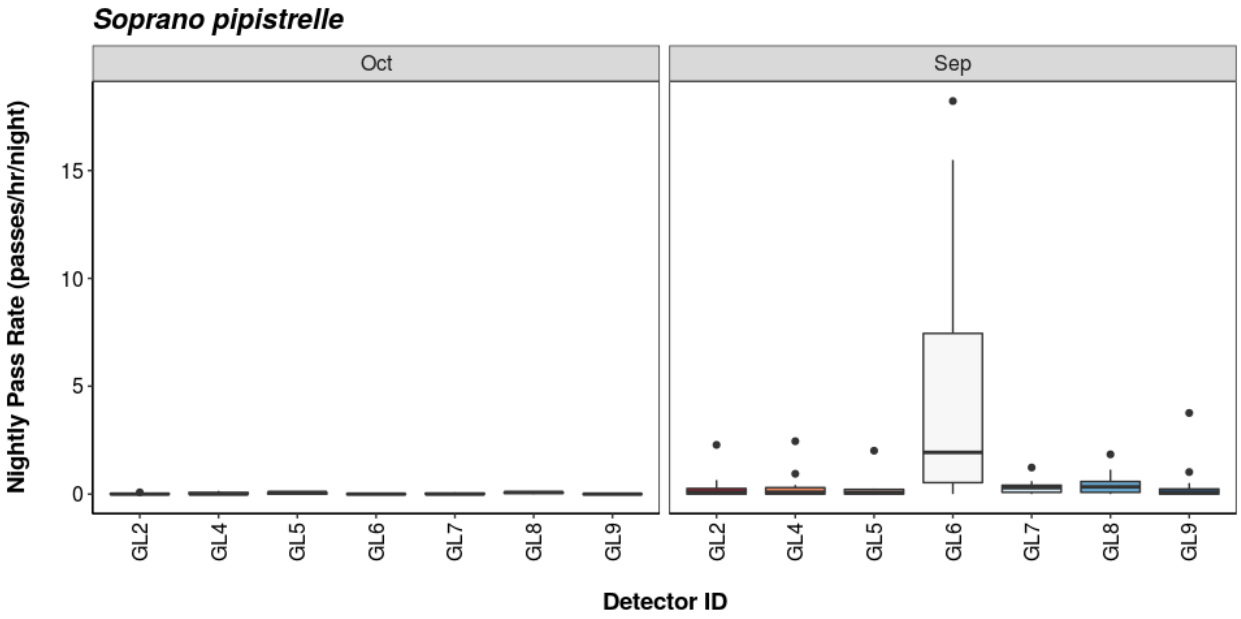


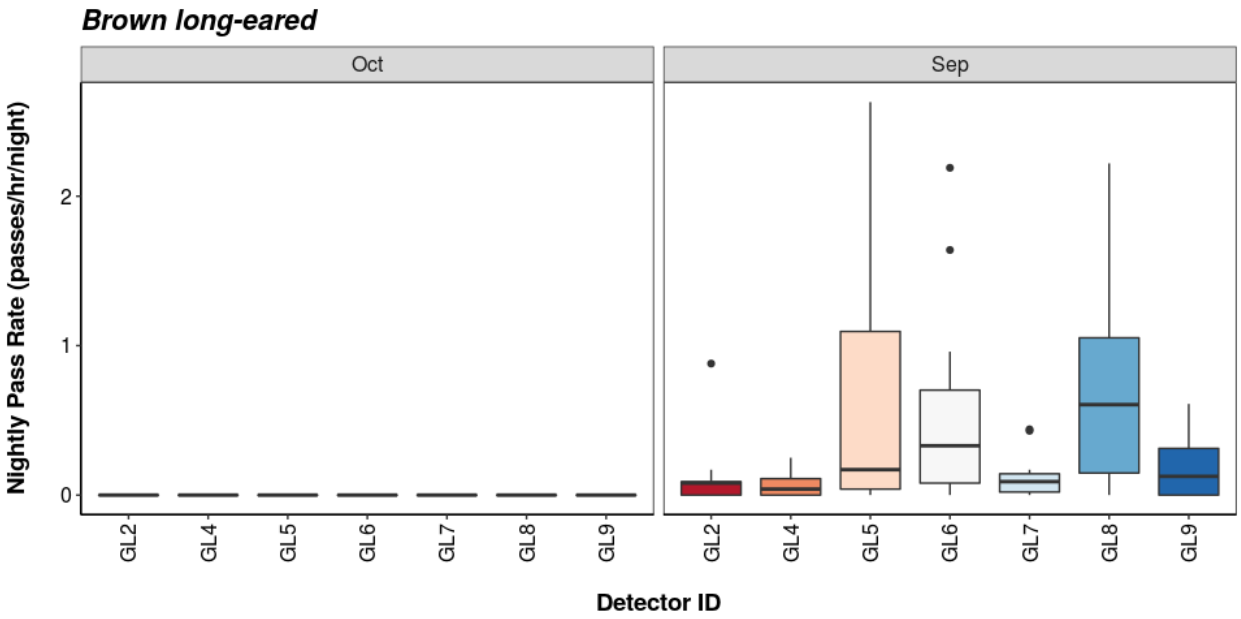

Natterer's
Oct
Sep
Nightly Pass Rate (passes/hr/night)
1.0
0.5
0.0
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

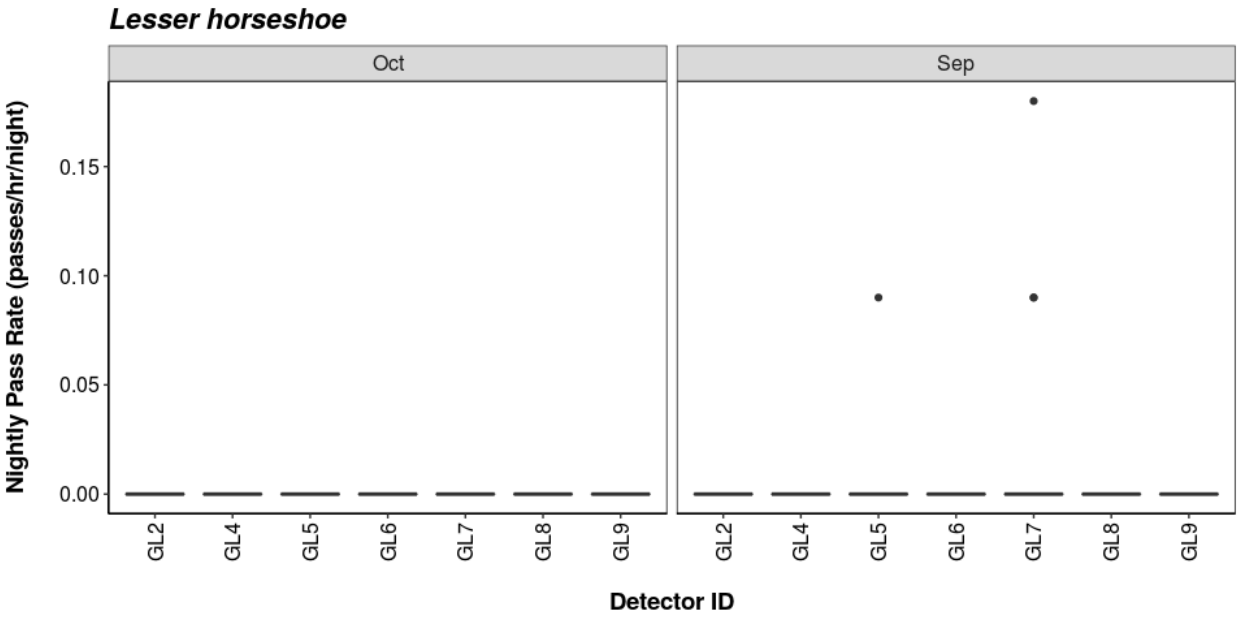

Leisler's
Oct
Sep
Nightly Pass Rate (passes/hr/night)
0.75
0.50
0.25
0.00
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Nathusius'
Oct
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
4
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Common pipistrelle
Oct
Sep
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Soprano pipistrelle
Oct
Sep
Nightly Pass Rate (passes/hr/night)
0
5
10
15
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Brown long-eared
Oct
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Lesser horseshoe
Oct
Sep
Nightly Pass Rate (passes/hr/night)
0.15
0.10
0.05
0.00
GL2
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

Bat Activity per Detector Location

Figure 18. Detector ID reference:

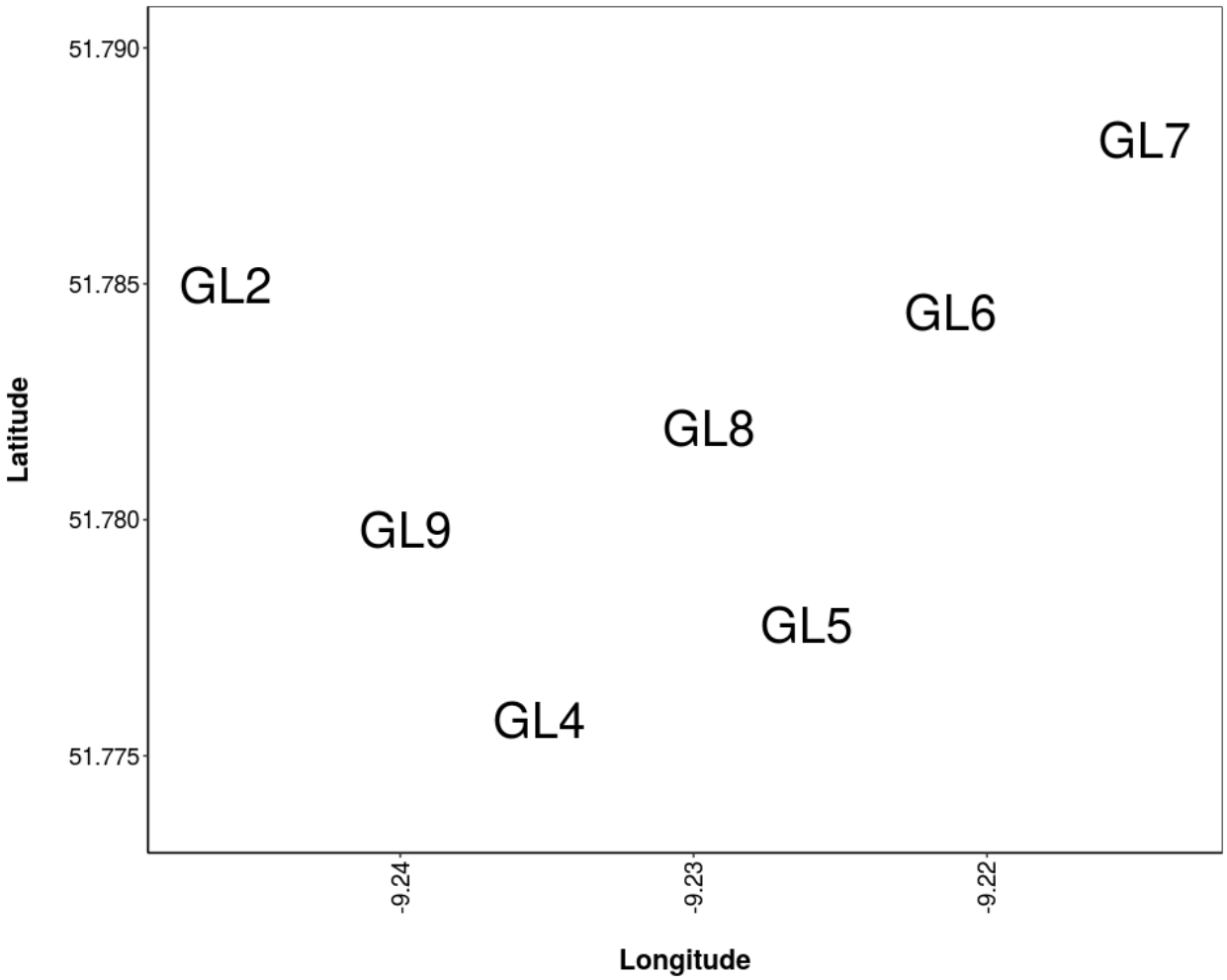
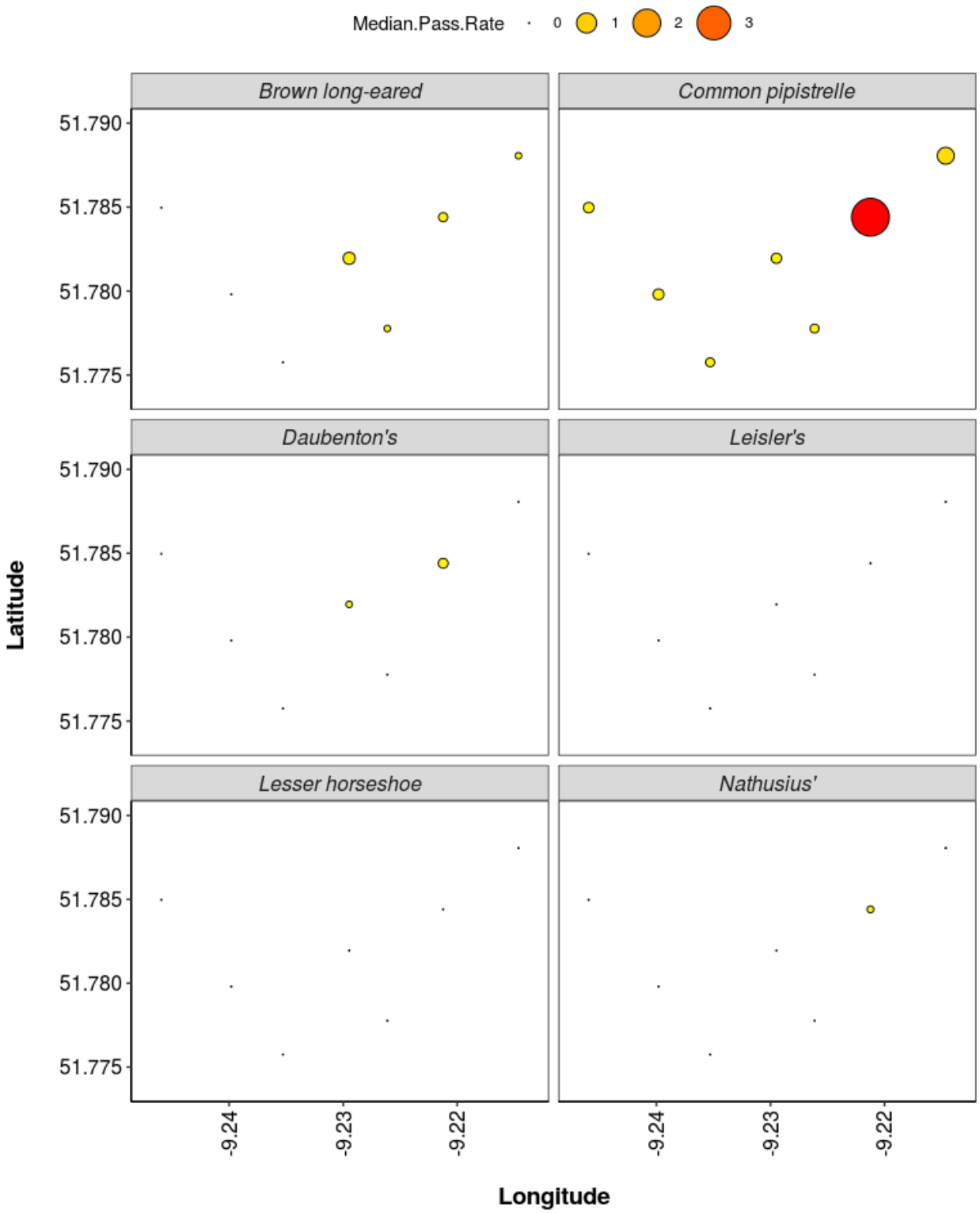


Figure 19. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
0
1
2
3
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Lesser horseshoe
Nathusius'
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

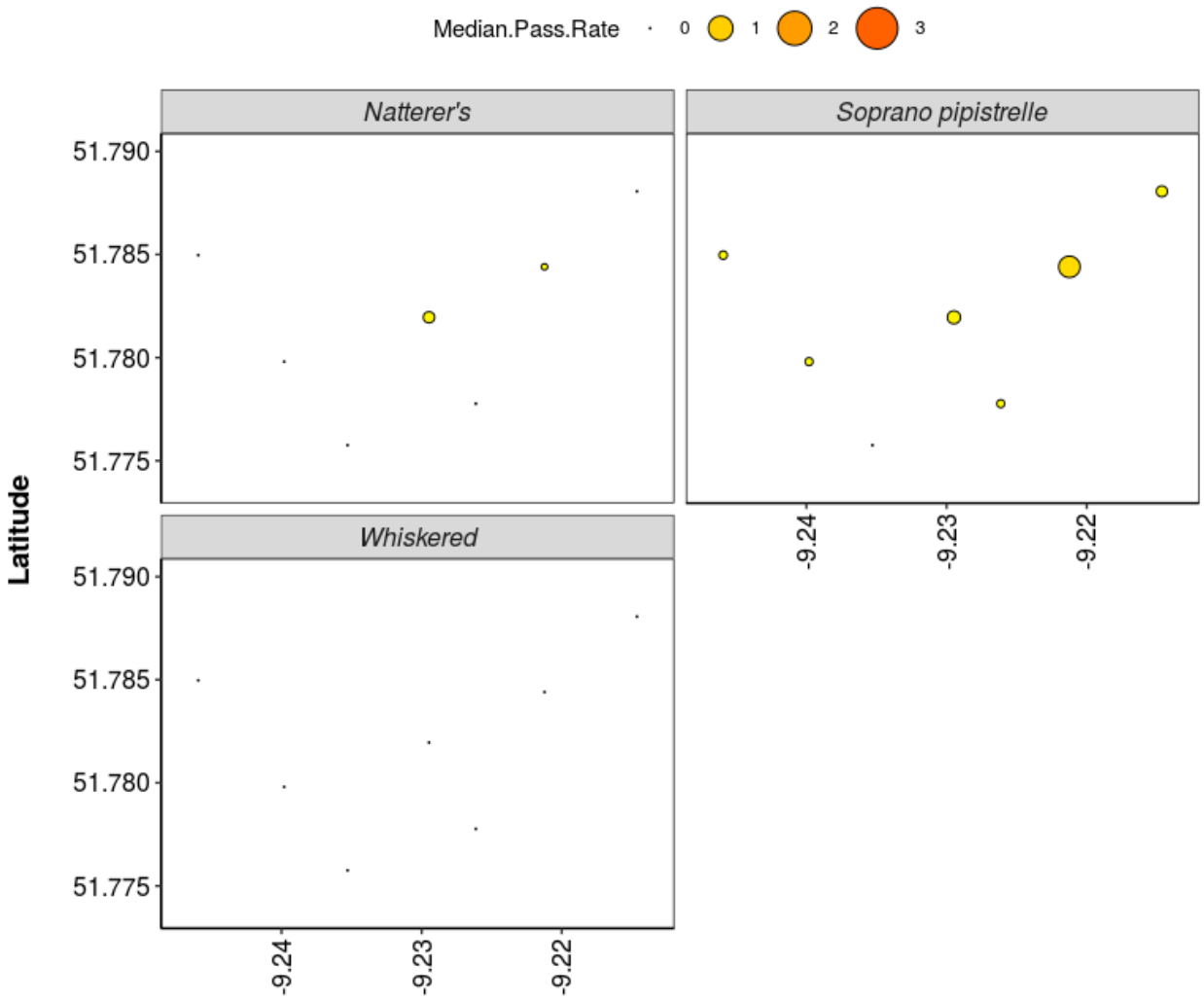
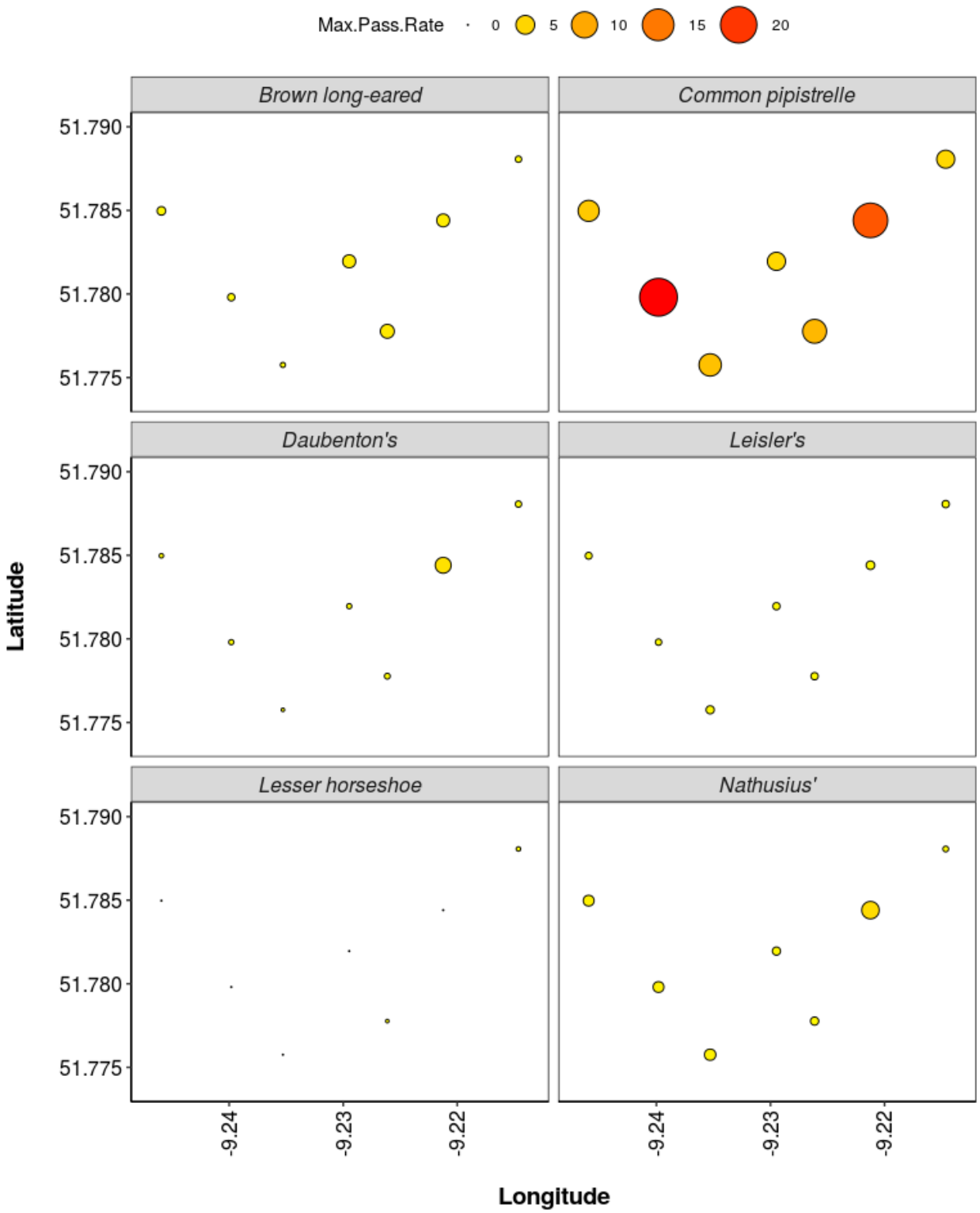
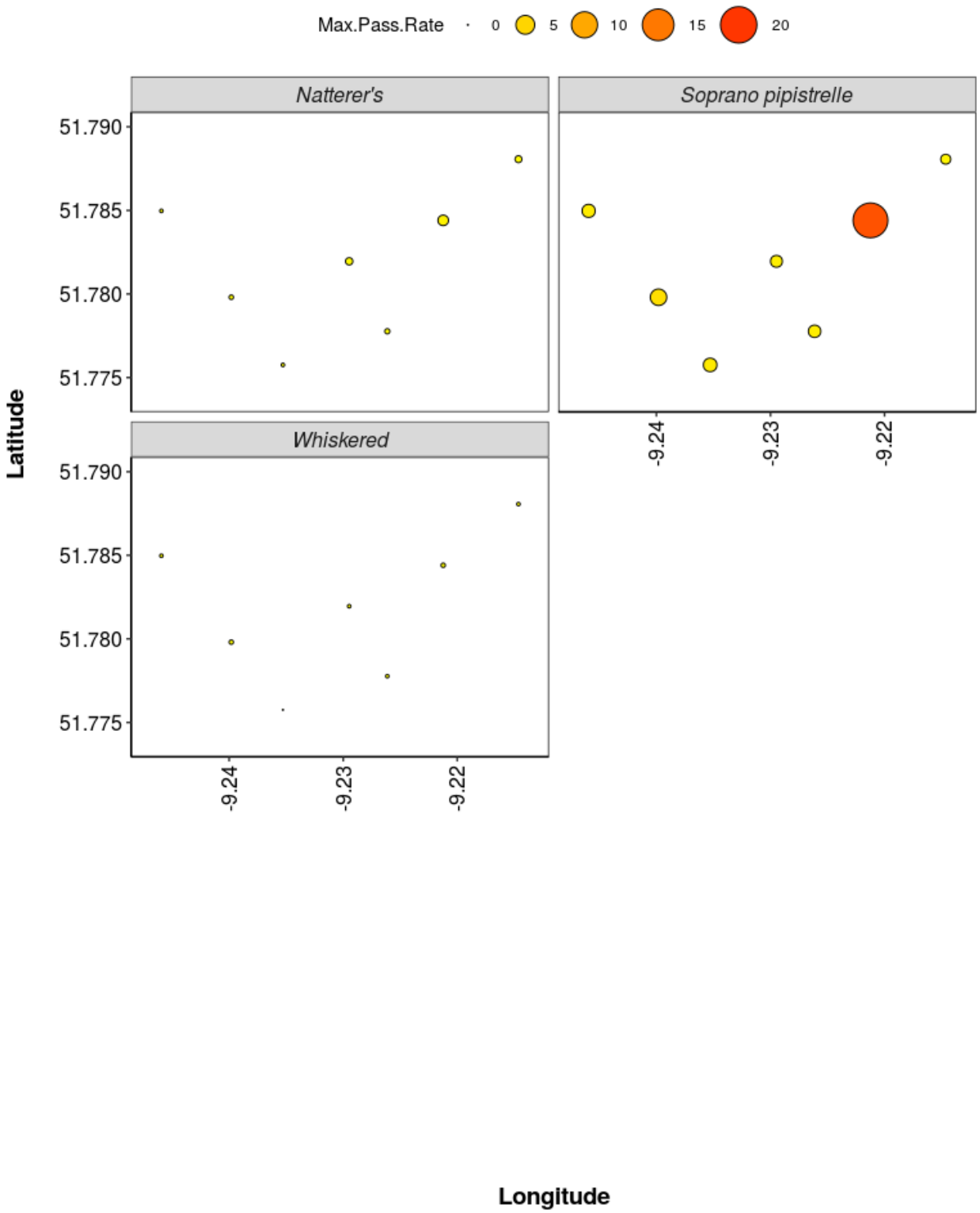

Median.Pass.Rate
0
1
2
3
Natterer's
Soprano pipistrelle
Whiskered
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

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


Max.Pass.Rate
0
5
10
15
20
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Lesser horseshoe
Nathusius'
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude



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

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

APPENDIX D

Ecobat Analysis Reports for Rounds 1 - 3 2021

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: Gortaloughra

Author: Fehily Timoney

24/11/2021

Summary

Bats were detected on **15** nights between **2021-04-22** and **2021-05-16**, using **9** static bat detectors. Throughout this period **8** species were recorded. **Table 1.** Detectors were placed at the following locations:

Detector ID	Latitude	Longitude
GL5	51.78552	-9.222899
GL4	51.78143	-9.228749
GL7	51.77531	-9.243753
GL1	51.78485	-9.246406
GL3	51.78010	-9.238801
GL9	51.77777	-9.226132
GL6	51.78806	-9.214634
GL2	51.78692	-9.236052
GL8	51.77575	-9.235288

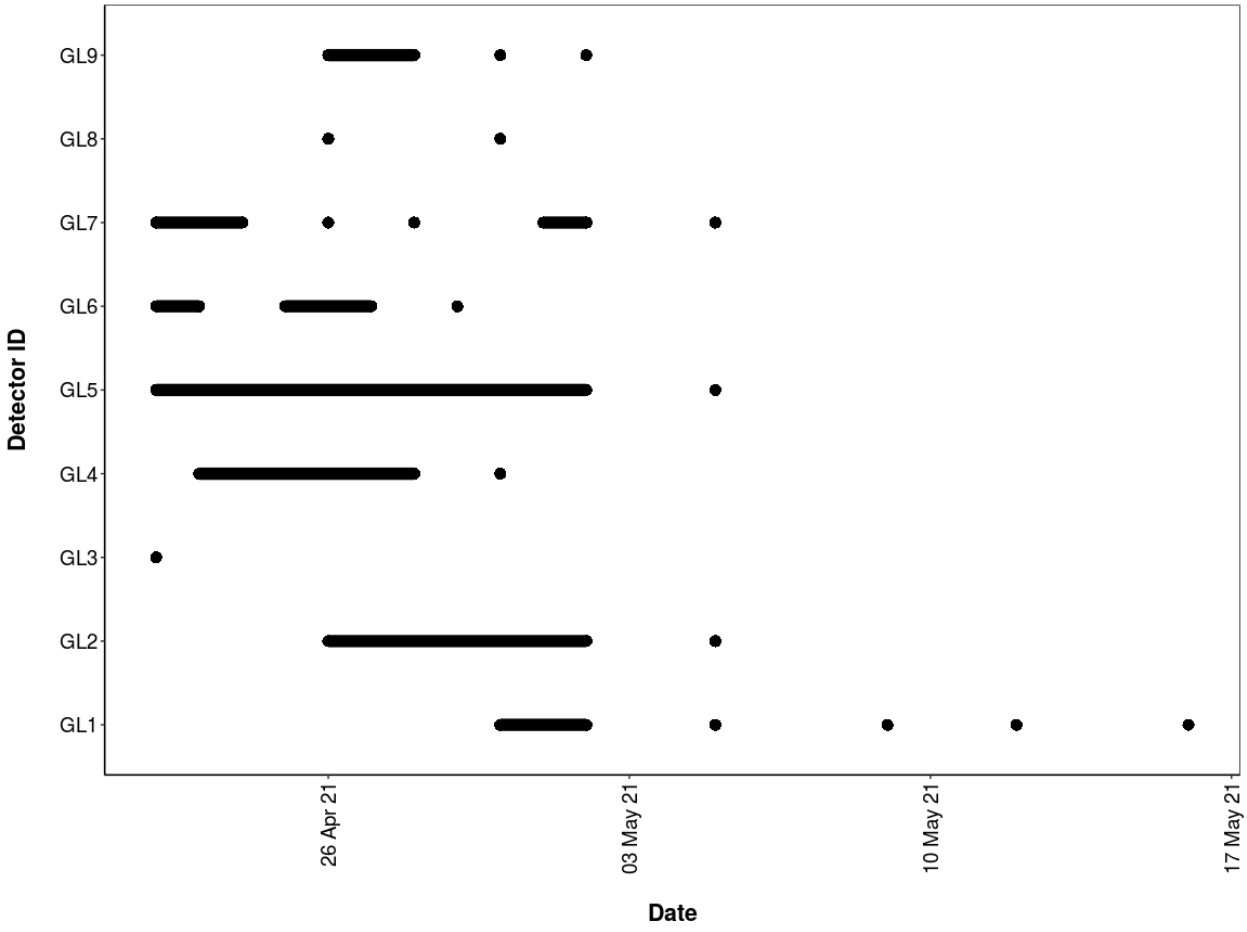
Survey Nights

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
GL1	7
GL2	8
GL3	11
GL4	9
GL5	12
GL6	9
GL7	8
GL8	2
GL9	5

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.
- Records using any make of bat detector.

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
GL1	*Myotis daubentonii*	0	0	0	0	2
GL1	*Myotis nattereri*	0	0	0	0	1
GL1	*Nyctalus leisleri*	0	1	2	0	2
GL1	*Pipistrellus pipistrellus*	0	0	0	2	3
GL1	*Pipistrellus pygmaeus*	0	0	0	0	1
GL1	*Plecotus auritus*	0	0	0	0	2
GL2	*Myotis nattereri*	0	0	0	0	1
GL2	*Nyctalus leisleri*	6	1	0	0	0
GL2	*Pipistrellus nathusii*	0	0	0	0	1
GL2	*Pipistrellus pipistrellus*	2	1	1	1	1
GL2	*Pipistrellus pygmaeus*	0	0	0	0	1
GL2	*Plecotus auritus*	0	0	0	0	2
GL3	*Myotis mystacinus*	0	0	0	0	1
GL3	*Nyctalus leisleri*	0	0	0	2	1
GL3	*Pipistrellus pipistrellus*	0	0	0	0	3
GL3	*Pipistrellus pygmaeus*	0	0	0	0	1
GL3	*Plecotus auritus*	0	0	0	4	4
GL4	*Myotis daubentonii*	0	0	0	0	1
GL4	*Myotis mystacinus*	0	0	0	0	1
GL4	*Nyctalus leisleri*	0	0	0	0	1

GL4	*Plecotus auritus*	0	0	0	3	6
GL5	*Myotis daubentonii*	0	0	0	2	5
GL5	*Myotis nattereri*	0	0	0	1	2
GL5	*Nyctalus leisleri*	0	0	0	0	1
GL5	*Pipistrellus nathusii*	0	0	1	0	0
GL5	*Pipistrellus pipistrellus*	0	0	0	0	2
GL5	*Pipistrellus pygmaeus*	0	0	0	1	1
GL5	*Plecotus auritus*	0	0	4	5	1
GL6	*Myotis mystacinus*	0	0	0	0	1
GL6	*Nyctalus leisleri*	0	0	2	4	0
GL6	*Pipistrellus pipistrellus*	0	0	0	0	3
GL6	*Pipistrellus pygmaeus*	0	0	0	0	1
GL6	*Plecotus auritus*	0	0	0	0	1
GL7	*Myotis daubentonii*	0	0	0	0	3
GL7	*Myotis mystacinus*	0	0	0	0	1
GL7	*Nyctalus leisleri*	0	0	0	0	3
GL7	*Pipistrellus pipistrellus*	0	0	0	0	2
GL7	*Pipistrellus pygmaeus*	0	0	0	0	1
GL7	*Plecotus auritus*	0	0	0	2	1
GL8	*Nyctalus leisleri*	0	0	0	0	1
GL8	*Plecotus auritus*	0	0	0	0	1
GL9	*Myotis mystacinus*	0	0	0	0	1
GL9	*Myotis nattereri*	0	0	0	0	1
GL9	*Nyctalus leisleri*	0	0	0	0	1
GL9	*Pipistrellus pipistrellus*	0	0	0	0	2

GL9	*Pipistrellus pygmaeus*	0	0	0	0	1
GL9	*Plecotus auritus*	0	0	0	1	0

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

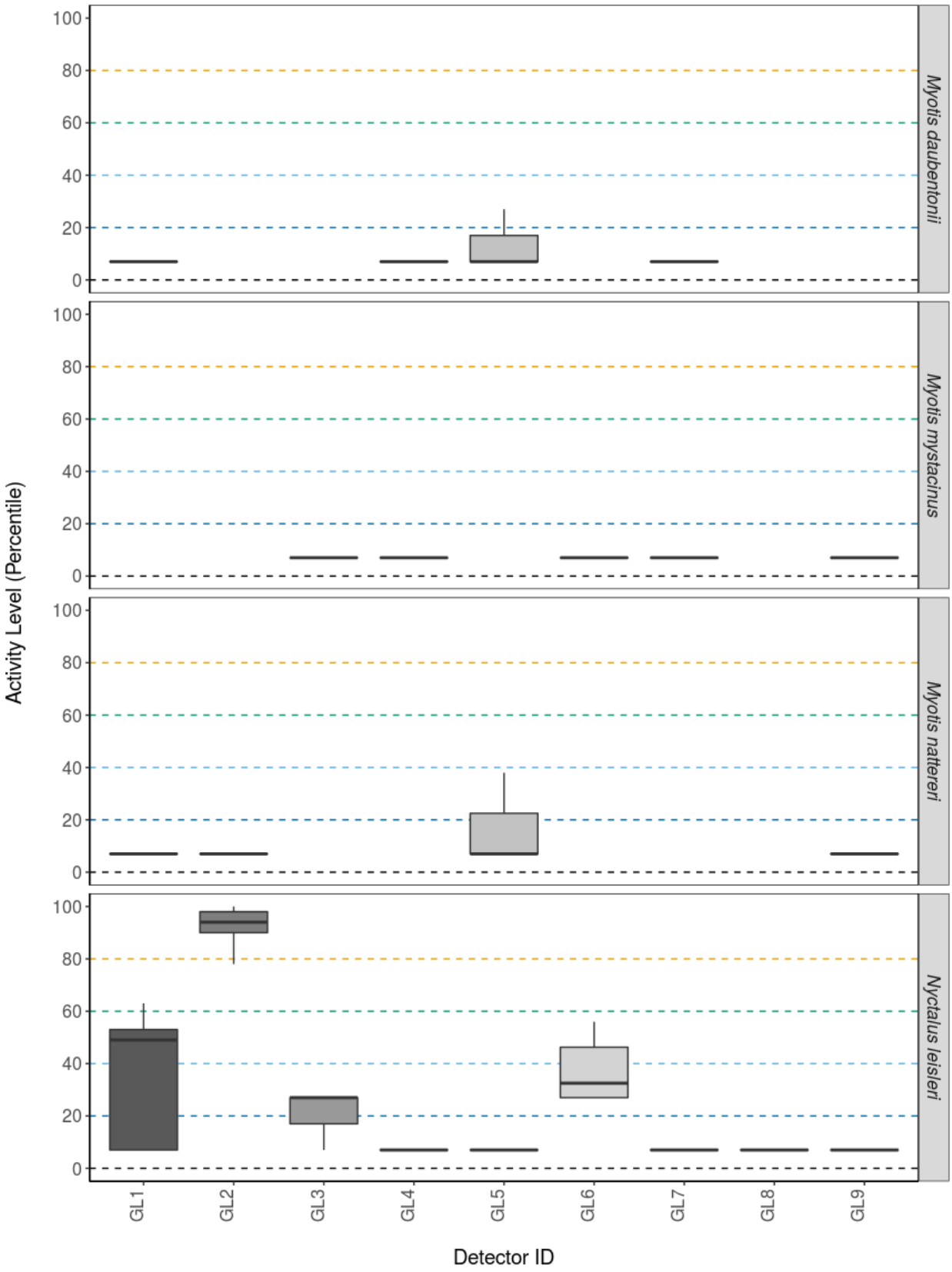
Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
GL1	*Myotis daubentonii*	7	7 - 7	7	2	110
GL1	*Myotis nattereri*	7	0	7	1	77
GL1	*Nyctalus leisleri*	49	7 - 56	63	5	1044
GL1	*Pipistrellus pipistrellus*	7	7 - 22.5	38	5	1038
GL1	*Pipistrellus pygmaeus*	7	0	7	1	793
GL1	*Plecotus auritus*	7	7 - 7	7	2	361
GL2	*Myotis nattereri*	7	0	7	1	77
GL2	*Nyctalus leisleri*	94	83.5 - 99	100	7	1044
GL2	*Pipistrellus nathusii*	7	0	7	1	247
GL2	*Pipistrellus pipistrellus*	64	30 - 84	92	6	1038
GL2	*Pipistrellus pygmaeus*	7	0	7	1	793
GL2	*Plecotus auritus*	7	7 - 7	7	2	361
GL3	*Myotis mystacinus*	7	0	7	1	36
GL3	*Nyctalus leisleri*	27	27 - 27	27	3	1044
GL3	*Pipistrellus pipistrellus*	7	7 - 7	7	3	1038
GL3	*Pipistrellus pygmaeus*	7	0	7	1	793
GL3	*Plecotus auritus*	17	7 - 27	38	8	361
GL4	*Myotis daubentonii*	7	0	7	1	110
GL4	*Myotis mystacinus*	7	0	7	1	36
GL4	*Nyctalus leisleri*	7	0	7	1	1044

GL4	*Plecotus auritus*	7	7 - 22.5	38	9	361
GL5	*Myotis daubentonii*	7	7 - 17	27	7	110
GL5	*Myotis nattereri*	7	7 - 7	38	3	77
GL5	*Nyctalus leisleri*	7	0	7	1	1044
GL5	*Pipistrellus nathusii*	53	0	53	1	247
GL5	*Pipistrellus pipistrellus*	7	7 - 7	7	2	1038
GL5	*Pipistrellus pygmaeus*	23	22.5 - 22.5	38	2	793
GL5	*Plecotus auritus*	38	27 - 46.5	53	10	361
GL6	*Myotis mystacinus*	7	0	7	1	36
GL6	*Nyctalus leisleri*	33	27 - 47	56	6	1044
GL6	*Pipistrellus pipistrellus*	7	7 - 7	7	3	1038
GL6	*Pipistrellus pygmaeus*	7	0	7	1	793
GL6	*Plecotus auritus*	7	0	7	1	361
GL7	*Myotis daubentonii*	7	7 - 7	7	3	110
GL7	*Myotis mystacinus*	7	0	7	1	36
GL7	*Nyctalus leisleri*	7	7 - 7	7	3	1044
GL7	*Pipistrellus pipistrellus*	7	7 - 7	7	2	1038
GL7	*Pipistrellus pygmaeus*	7	0	7	1	793
GL7	*Plecotus auritus*	27	27 - 27	27	3	361
GL8	*Nyctalus leisleri*	7	0	7	1	1044
GL8	*Plecotus auritus*	7	0	7	1	361
GL9	*Myotis mystacinus*	7	0	7	1	36
GL9	*Myotis nattereri*	7	0	7	1	77

GL9	*Nyctalus leisleri*	7	0	7	1	1044
GL9	*Pipistrellus pipistrellus*	7	7 - 7	7	2	1038
GL9	*Pipistrellus pygmaeus*	7	0	7	1	793
GL9	*Plecotus auritus*	38	0	38	1	361

###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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

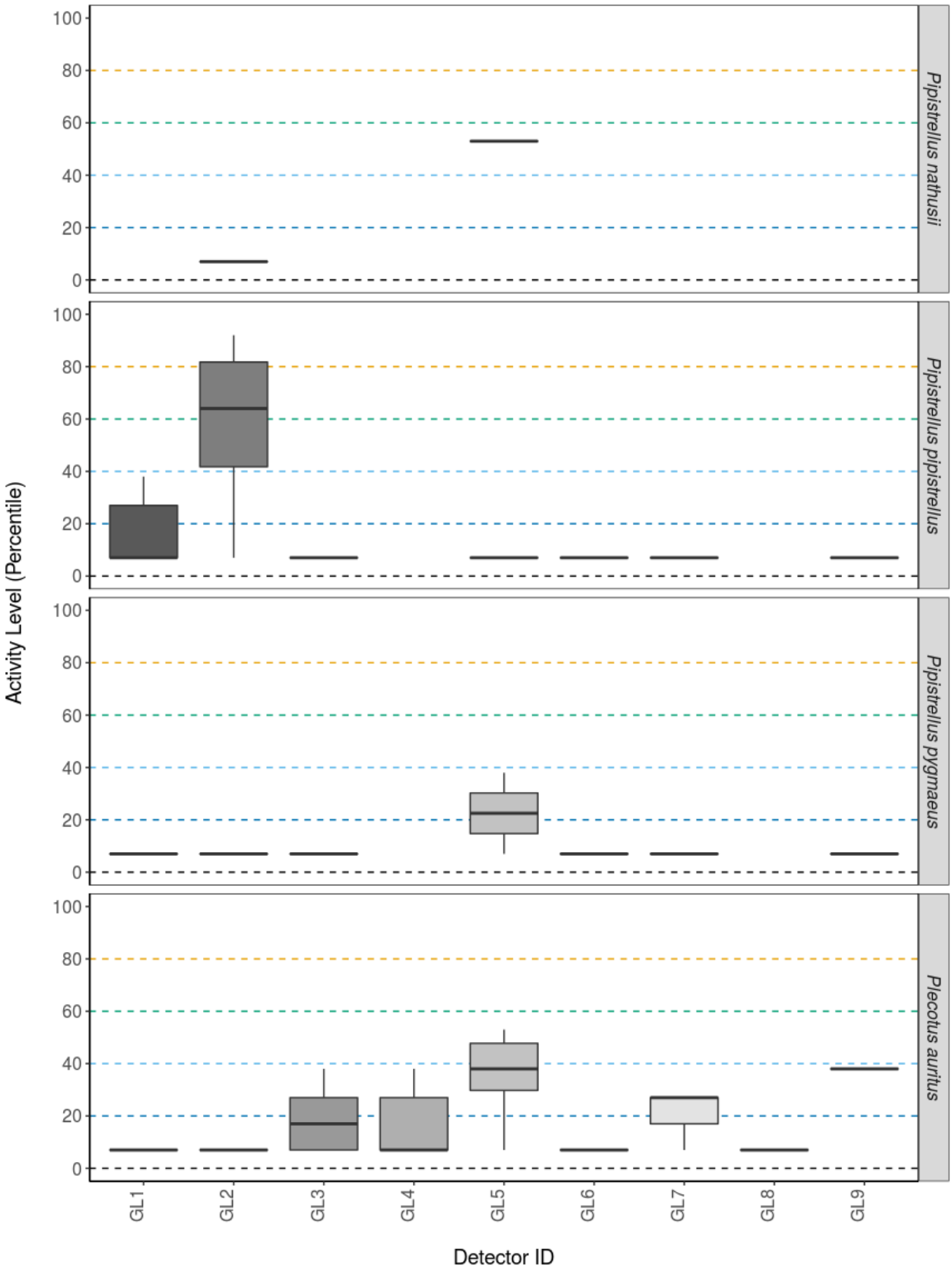
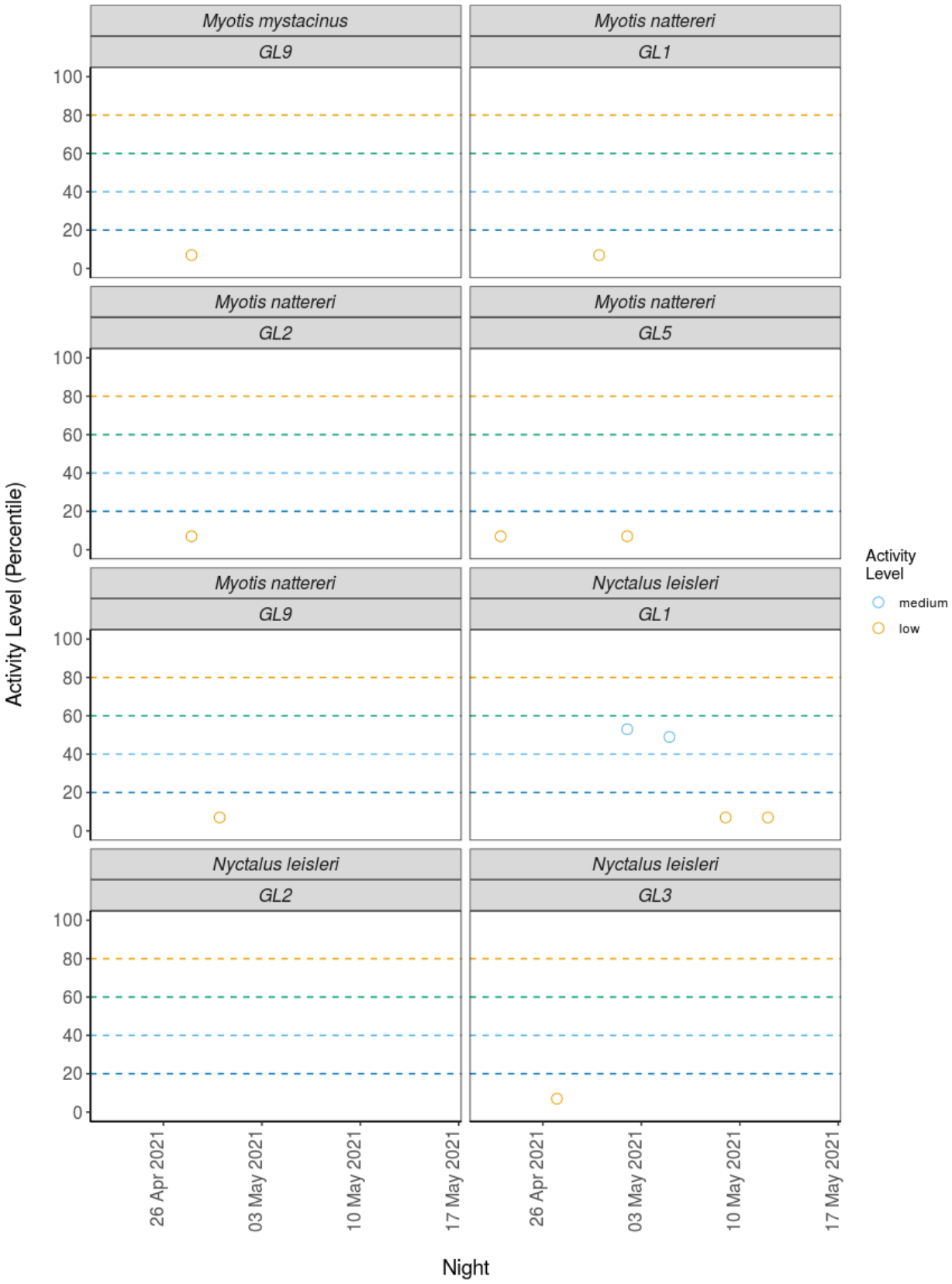
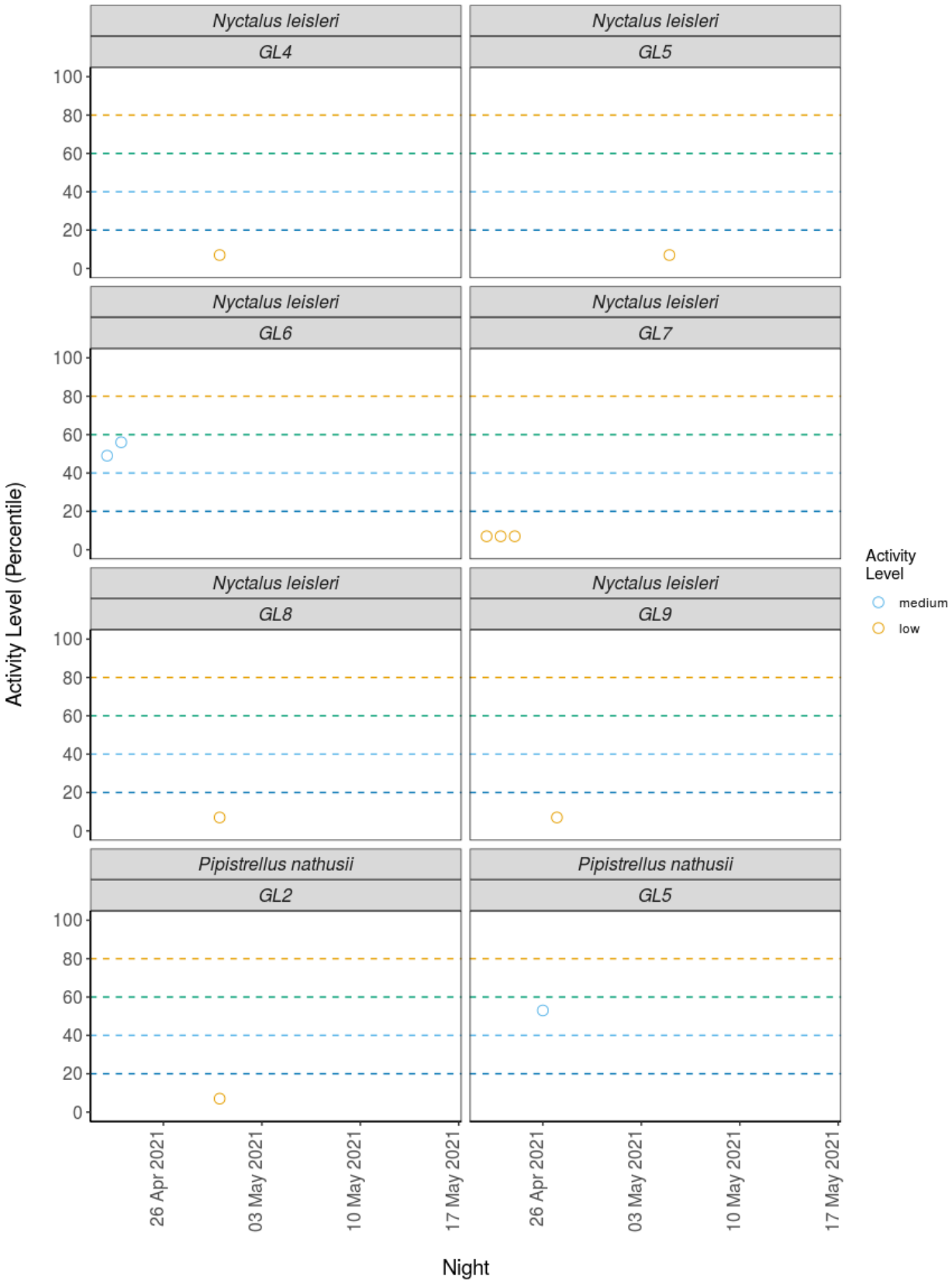
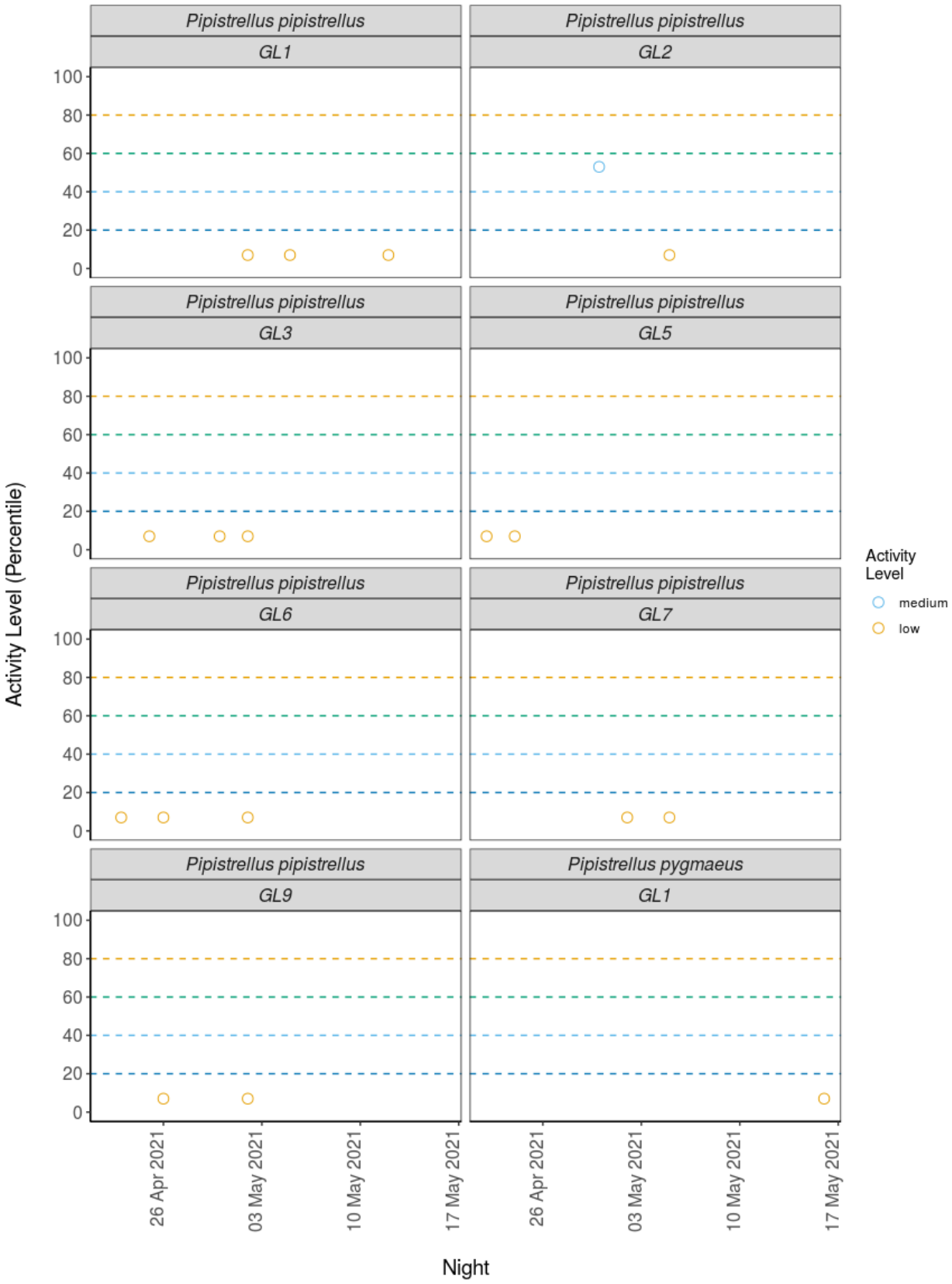
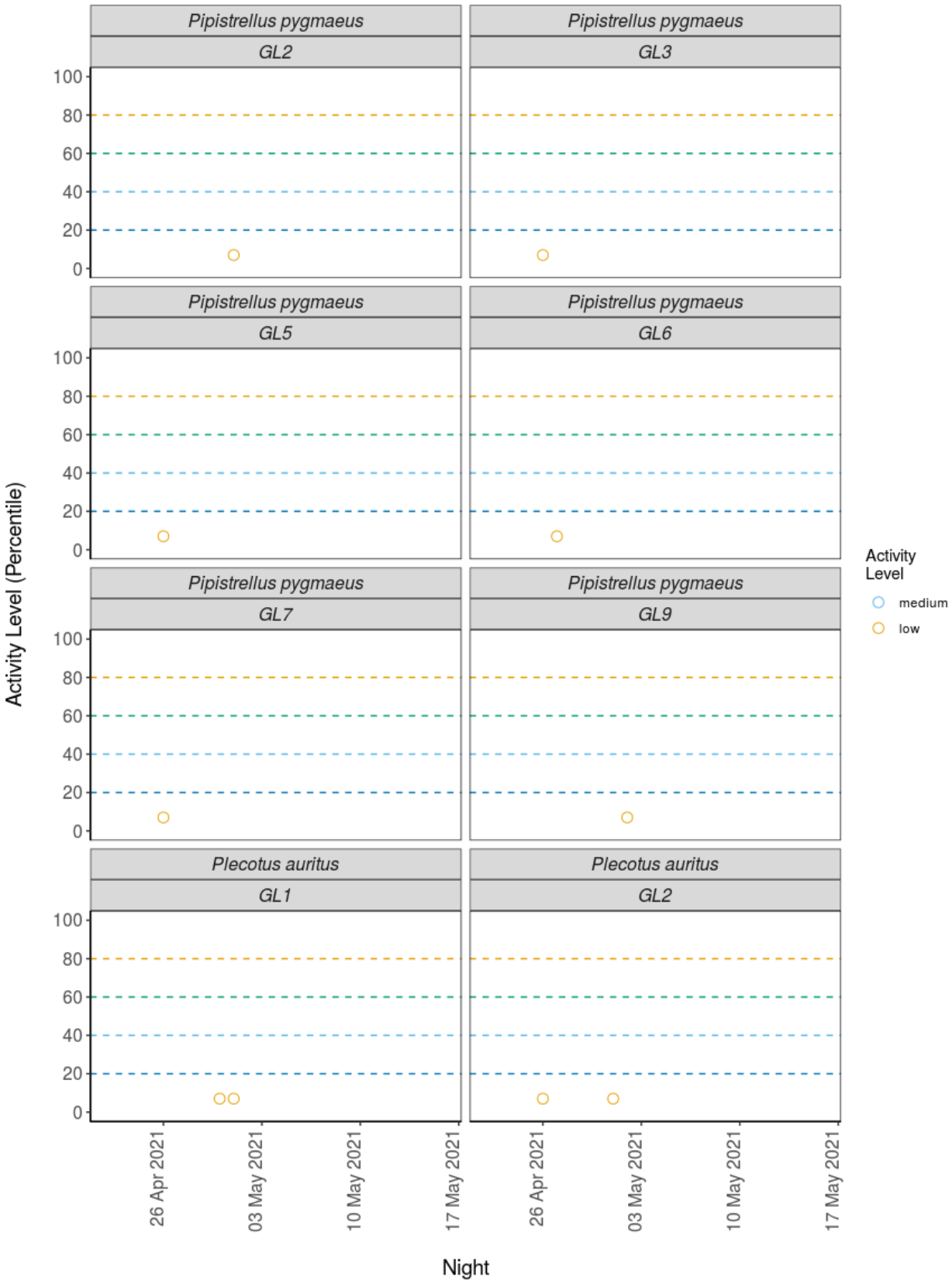

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

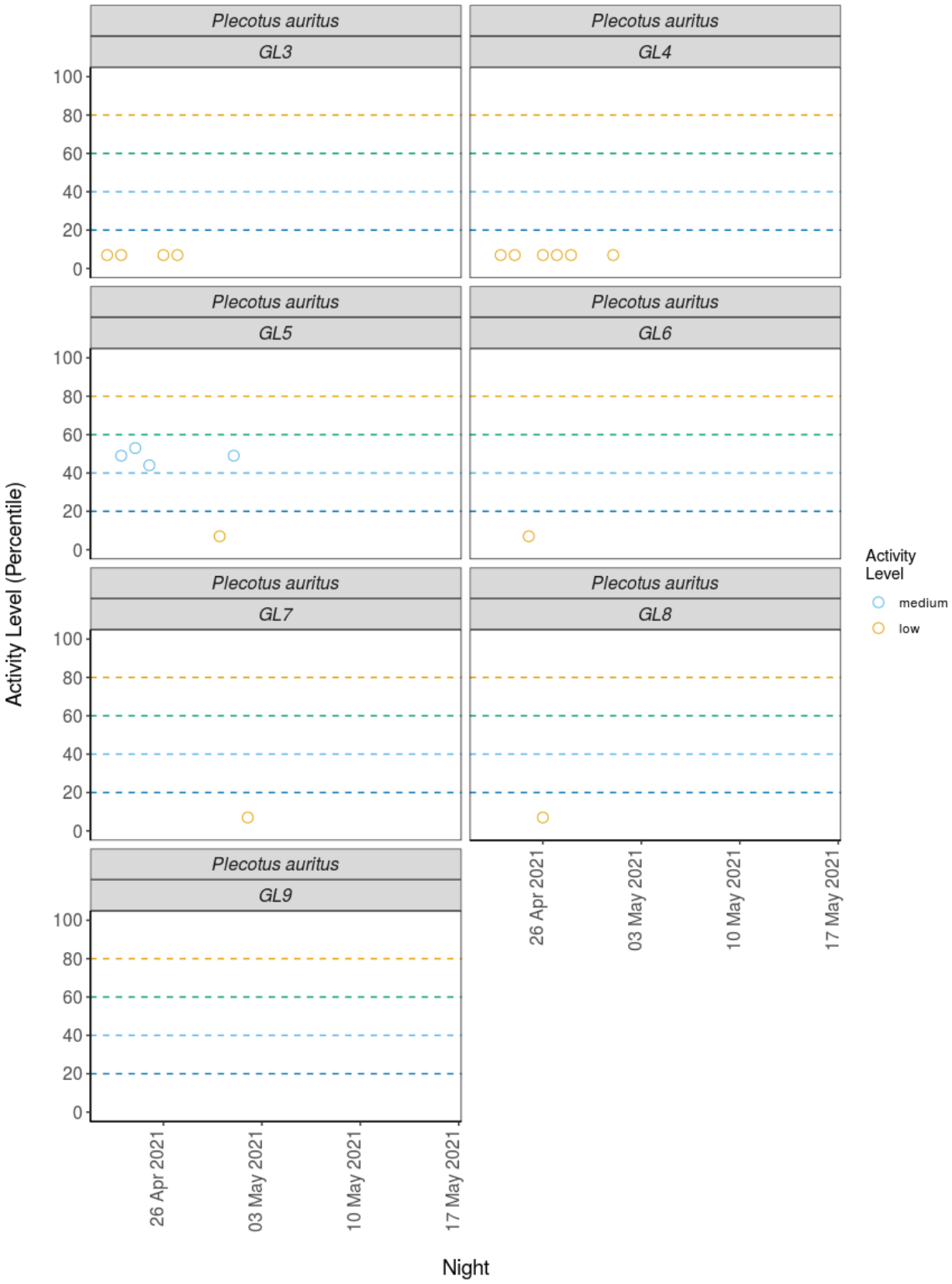
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.


Myotis mystacinus
GL9
Myotis nattereri
GL1
Myotis nattereri
GL2
Myotis nattereri
GL5
Myotis nattereri
GL9
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Activity Level (Percentile)
100
80
60
40
20
0
26 Apr 2021
03 May 2021
10 May 2021
17 May 2021
Night
Activity Level
medium
low


Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL2
Pipistrellus nathusii
GL5
Activity Level (Percentile)
100
80
60
40
20
0
26 Apr 2021
03 May 2021
10 May 2021
17 May 2021
Night
Activity Level
medium
low


Pipistrellus pipistrellus
GL1
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Activity Level (Percentile)
100
80
60
40
20
0
26 Apr 2021
03 May 2021
10 May 2021
17 May 2021
Night
Activity Level
medium
low


Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL9
Plecotus auritus
GL1
Plecotus auritus
GL2
100
80
60
40
20
0
Activity Level (Percentile)
26 Apr 2021
03 May 2021
10 May 2021
17 May 2021
Night
Activity Level
medium
low


Plecotus auritus
GL3
Plecotus auritus
GL4
Plecotus auritus
GL5
Plecotus auritus
GL6
Plecotus auritus
GL7
Plecotus auritus
GL8
Plecotus auritus
GL9
100
80
60
40
20
0
Activity Level (Percentile)
26 Apr 2021
03 May 2021
10 May 2021
17 May 2021
Night
Activity Level
medium
low

PER DETECTOR, PER MONTH

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

Detector ID	Species/Species Group	Month	Nights of High Activity	Nights of Moderate / High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
GL1	*Myotis daubentonii*	Apr	0	0	0	0	1
GL1	*Myotis daubentonii*	May	0	0	0	0	1
GL1	*Myotis nattereri*	Apr	0	0	0	0	1
GL1	*Nyctalus leisleri*	Apr	0	1	0	0	0
GL1	*Nyctalus leisleri*	May	0	0	2	0	2
GL1	*Pipistrellus pipistrellus*	Apr	0	0	0	1	0
GL1	*Pipistrellus pipistrellus*	May	0	0	0	1	3
GL1	*Pipistrellus pygmaeus*	May	0	0	0	0	1
GL1	*Plecotus auritus*	Apr	0	0	0	0	1
GL1	*Plecotus auritus*	May	0	0	0	0	1
GL2	*Myotis nattereri*	Apr	0	0	0	0	1
GL2	*Nyctalus leisleri*	Apr	4	1	0	0	0
GL2	*Nyctalus leisleri*	May	2	0	0	0	0
GL2	*Pipistrellus nathusii*	Apr	0	0	0	0	1
GL2	*Pipistrellus pipistrellus*	Apr	2	0	1	0	0
GL2	*Pipistrellus pipistrellus*	May	0	1	0	1	1
GL2	*Pipistrellus pygmaeus*	May	0	0	0	0	1

GL2	*Plecotus auritus*	Apr	0	0	0	0	1
GL2	*Plecotus auritus*	May	0	0	0	0	1
GL3	*Myotis mystacinus*	Apr	0	0	0	0	1
GL3	*Nyctalus leisleri*	Apr	0	0	0	2	1
GL3	*Pipistrellus pipistrellus*	Apr	0	0	0	0	2
GL3	*Pipistrellus pipistrellus*	May	0	0	0	0	1
GL3	*Pipistrellus pygmaeus*	Apr	0	0	0	0	1
GL3	*Plecotus auritus*	Apr	0	0	0	2	4
GL3	*Plecotus auritus*	May	0	0	0	2	0
GL4	*Myotis daubentonii*	Apr	0	0	0	0	1
GL4	*Myotis mystacinus*	Apr	0	0	0	0	1
GL4	*Nyctalus leisleri*	Apr	0	0	0	0	1
GL4	*Plecotus auritus*	Apr	0	0	0	2	5
GL4	*Plecotus auritus*	May	0	0	0	1	1
GL5	*Myotis daubentonii*	Apr	0	0	0	2	4
GL5	*Myotis daubentonii*	May	0	0	0	0	1
GL5	*Myotis nattereri*	Apr	0	0	0	1	1
GL5	*Myotis nattereri*	May	0	0	0	0	1
GL5	*Nyctalus leisleri*	May	0	0	0	0	1
GL5	*Pipistrellus nathusii*	Apr	0	0	1	0	0
GL5	*Pipistrellus pipistrellus*	Apr	0	0	0	0	2

GL5	*Pipistrellus pygmaeus*	Apr	0	0	0	1	1
GL5	*Plecotus auritus*	Apr	0	0	3	5	1
GL5	*Plecotus auritus*	May	0	0	1	0	0
GL6	*Myotis mystacinus*	May	0	0	0	0	1
GL6	*Nyctalus leisleri*	Apr	0	0	2	3	0
GL6	*Nyctalus leisleri*	May	0	0	0	1	0
GL6	*Pipistrellus pipistrellus*	Apr	0	0	0	0	2
GL6	*Pipistrellus pipistrellus*	May	0	0	0	0	1
GL6	*Pipistrellus pygmaeus*	Apr	0	0	0	0	1
GL6	*Plecotus auritus*	Apr	0	0	0	0	1
GL7	*Myotis daubentonii*	Apr	0	0	0	0	1
GL7	*Myotis daubentonii*	May	0	0	0	0	2
GL7	*Myotis mystacinus*	Apr	0	0	0	0	1
GL7	*Nyctalus leisleri*	Apr	0	0	0	0	3
GL7	*Pipistrellus pipistrellus*	May	0	0	0	0	2
GL7	*Pipistrellus pygmaeus*	Apr	0	0	0	0	1
GL7	*Plecotus auritus*	Apr	0	0	0	2	0
GL7	*Plecotus auritus*	May	0	0	0	0	1
GL8	*Nyctalus leisleri*	Apr	0	0	0	0	1
GL8	*Plecotus auritus*	Apr	0	0	0	0	1
GL9	*Myotis mystacinus*	Apr	0	0	0	0	1
GL9	*Myotis nattereri*	Apr	0	0	0	0	1

GL9	*Nyctalus leisleri*	Apr	0	0	0	0	1
GL9	*Pipistrellus pipistrellus*	Apr	0	0	0	0	1
GL9	*Pipistrellus pipistrellus*	May	0	0	0	0	1
GL9	*Pipistrellus pygmaeus*	May	0	0	0	0	1
GL9	*Plecotus auritus*	May	0	0	0	1	0

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

Detector ID	Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
GL1	*Myotis daubentonii*	Apr	7	7 - 7	7	1
GL1	*Myotis daubentonii*	May	7	7 - 7	7	1
GL1	*Myotis nattereri*	Apr	7	0	7	1
GL1	*Nyctalus leisleri*	Apr	63	7 - 56	63	1
GL1	*Nyctalus leisleri*	May	28	7 - 56	53	4
GL1	*Pipistrellus pipistrellus*	Apr	38	7 - 22.5	38	1
GL1	*Pipistrellus pipistrellus*	May	7	7 - 22.5	27	4
GL1	*Pipistrellus pygmaeus*	May	7	0	7	1
GL1	*Plecotus auritus*	Apr	7	7 - 7	7	1
GL1	*Plecotus auritus*	May	7	7 - 7	7	1
GL2	*Myotis nattereri*	Apr	7	0	7	1
GL2	*Nyctalus leisleri*	Apr	98	83.5 - 99	100	5
GL2	*Nyctalus leisleri*	May	90	83.5 - 99	91	2
GL2	*Pipistrellus nathusii*	Apr	7	0	7	1
GL2	*Pipistrellus pipistrellus*	Apr	84	30 - 84	92	3
GL2	*Pipistrellus pipistrellus*	May	38	30 - 84	75	3
GL2	*Pipistrellus pygmaeus*	May	7	0	7	1
GL2	*Plecotus auritus*	Apr	7	7 - 7	7	1
GL2	*Plecotus auritus*	May	7	7 - 7	7	1
GL3	*Myotis mystacinus*	Apr	7	0	7	1
GL3	*Nyctalus leisleri*	Apr	27	27 - 27	27	3

GL3	*Pipistrellus pipistrellus*	Apr	7	7 - 7	7	2
GL3	*Pipistrellus pipistrellus*	May	7	7 - 7	7	1
GL3	*Pipistrellus pygmaeus*	Apr	7	0	7	1
GL3	*Plecotus auritus*	Apr	7	7 - 27	27	6
GL3	*Plecotus auritus*	May	33	7 - 27	38	2
GL4	*Myotis daubentonii*	Apr	7	0	7	1
GL4	*Myotis mystacinus*	Apr	7	0	7	1
GL4	*Nyctalus leisleri*	Apr	7	0	7	1
GL4	*Plecotus auritus*	Apr	7	7 - 22.5	38	7
GL4	*Plecotus auritus*	May	17	7 - 22.5	27	2
GL5	*Myotis daubentonii*	Apr	7	7 - 17	27	6
GL5	*Myotis daubentonii*	May	7	7 - 17	7	1
GL5	*Myotis nattereri*	Apr	23	7 - 7	38	2
GL5	*Myotis nattereri*	May	7	7 - 7	7	1
GL5	*Nyctalus leisleri*	May	7	0	7	1
GL5	*Pipistrellus nathusii*	Apr	53	0	53	1
GL5	*Pipistrellus pipistrellus*	Apr	7	7 - 7	7	2
GL5	*Pipistrellus pygmaeus*	Apr	23	22.5 - 22.5	38	2
GL5	*Plecotus auritus*	Apr	38	27 - 46.5	53	9
GL5	*Plecotus auritus*	May	49	27 - 46.5	49	1
GL6	*Myotis mystacinus*	May	7	0	7	1
GL6	*Nyctalus leisleri*	Apr	27	27 - 47	56	5
GL6	*Nyctalus leisleri*	May	38	27 - 47	38	1

GL6	*Pipistrellus pipistrellus*	Apr	7	7 - 7	7	2
GL6	*Pipistrellus pipistrellus*	May	7	7 - 7	7	1
GL6	*Pipistrellus pygmaeus*	Apr	7	0	7	1
GL6	*Plecotus auritus*	Apr	7	0	7	1
GL7	*Myotis daubentonii*	Apr	7	7 - 7	7	1
GL7	*Myotis daubentonii*	May	7	7 - 7	7	2
GL7	*Myotis mystacinus*	Apr	7	0	7	1
GL7	*Nyctalus leisleri*	Apr	7	7 - 7	7	3
GL7	*Pipistrellus pipistrellus*	May	7	7 - 7	7	2
GL7	*Pipistrellus pygmaeus*	Apr	7	0	7	1
GL7	*Plecotus auritus*	Apr	27	27 - 27	27	2
GL7	*Plecotus auritus*	May	7	27 - 27	7	1
GL8	*Nyctalus leisleri*	Apr	7	0	7	1
GL8	*Plecotus auritus*	Apr	7	0	7	1
GL9	*Myotis mystacinus*	Apr	7	0	7	1
GL9	*Myotis nattereri*	Apr	7	0	7	1
GL9	*Nyctalus leisleri*	Apr	7	0	7	1
GL9	*Pipistrellus pipistrellus*	Apr	7	7 - 7	7	1
GL9	*Pipistrellus pipistrellus*	May	7	7 - 7	7	1
GL9	*Pipistrellus pygmaeus*	May	7	0	7	1
GL9	*Plecotus auritus*	May	38	0	38	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 daubentonii	0	0	0	2	11
Myotis mystacinus	0	0	0	0	5
Myotis nattereri	0	0	0	1	5
Nyctalus leisleri	6	2	4	6	10
Pipistrellus nathusii	0	0	1	0	1
Pipistrellus pipistrellus	2	1	1	3	16
Pipistrellus pygmaeus	0	0	0	1	7
Plecotus auritus	0	0	4	15	18

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

Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	7	7 - 7	27	13
Myotis mystacinus	7	0	7	5
Myotis nattereri	7	7 - 7	38	6
Nyctalus leisleri	27	83.5 - 99	100	28
Pipistrellus nathusii	30	0	53	2
Pipistrellus pipistrellus	7	7 - 7	92	23
Pipistrellus pygmaeus	7	22.5 - 22.5	38	8
Plecotus auritus	27	7 - 7	53	37

###Figures

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

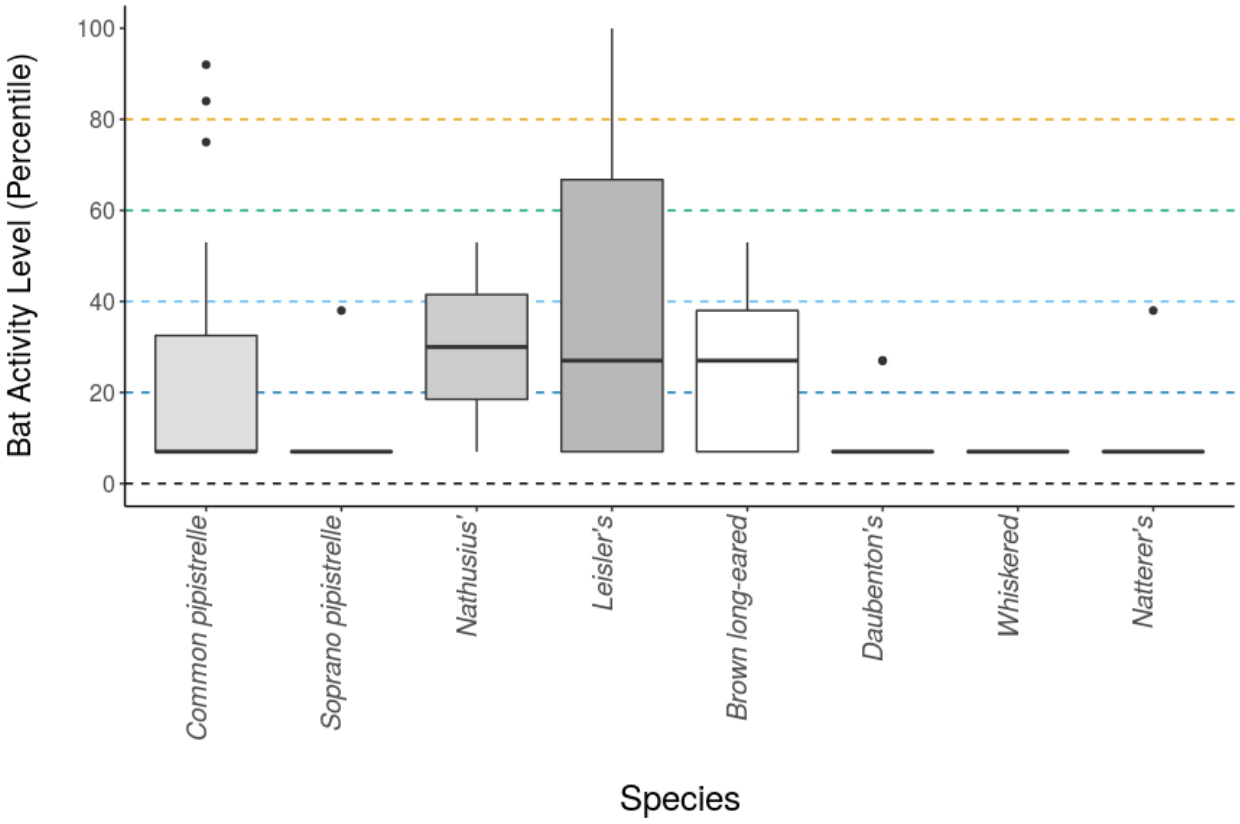
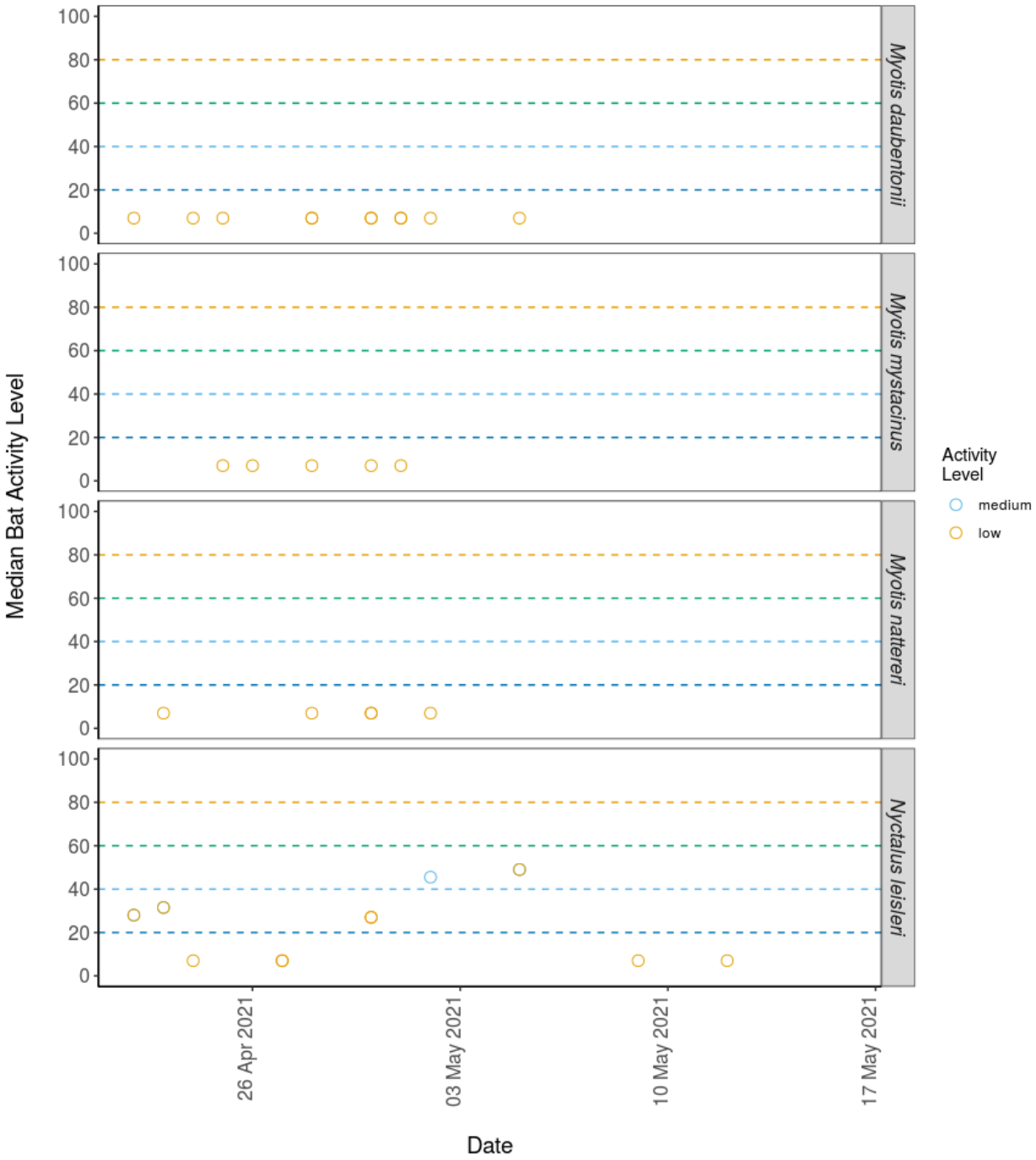
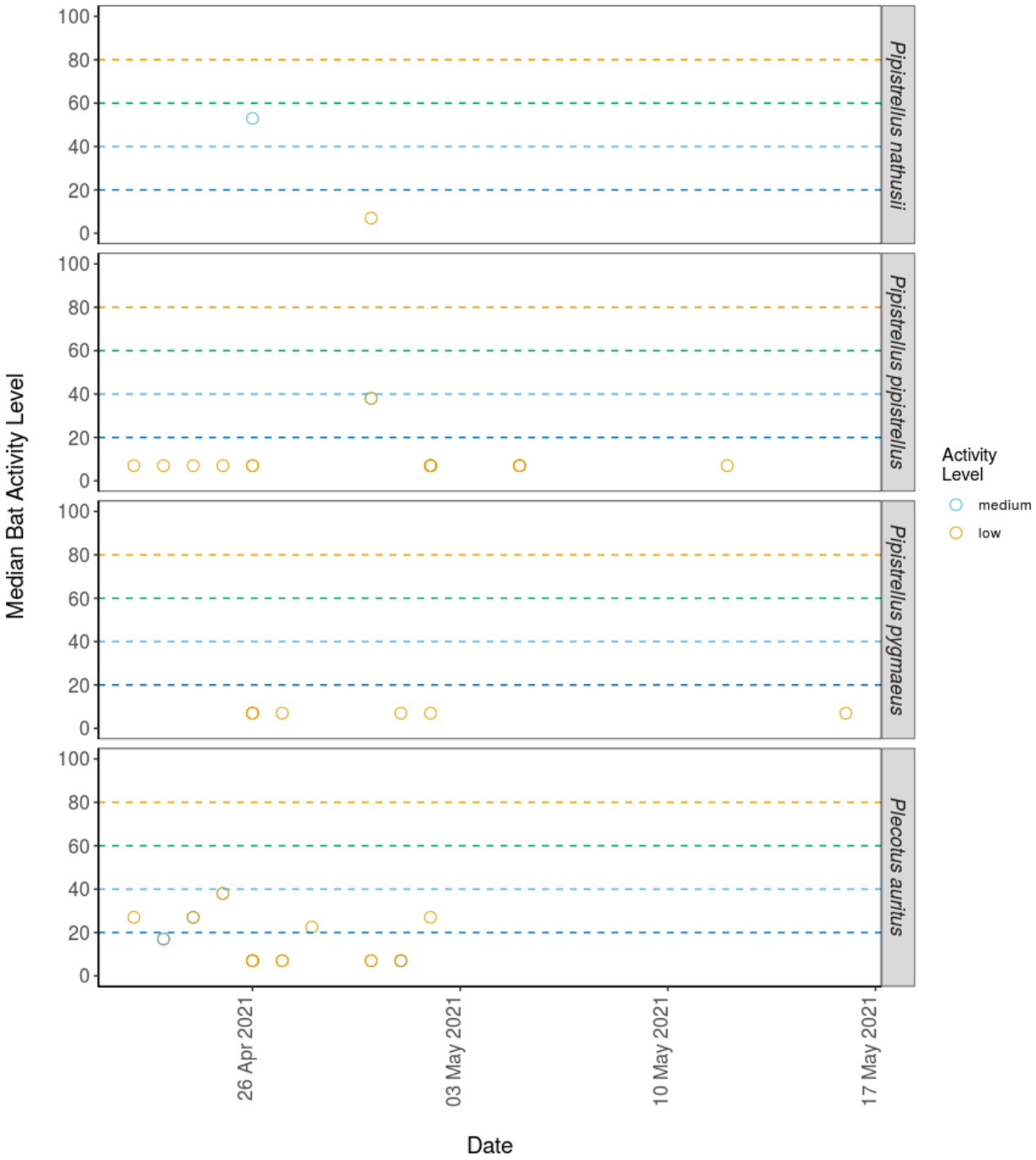


Figure 5. The median activity levels of bats recorded across all detectors each night.


Median Bat Activity Level
100
80
60
40
20
0
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
26 Apr 2021
03 May 2021
10 May 2021
17 May 2021
Date
Activity Level
medium
low


Median Bat Activity Level
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
26 Apr 2021
03 May 2021
10 May 2021
17 May 2021
Date
Activity Level
medium
low

PER SITE, PER MONTH

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

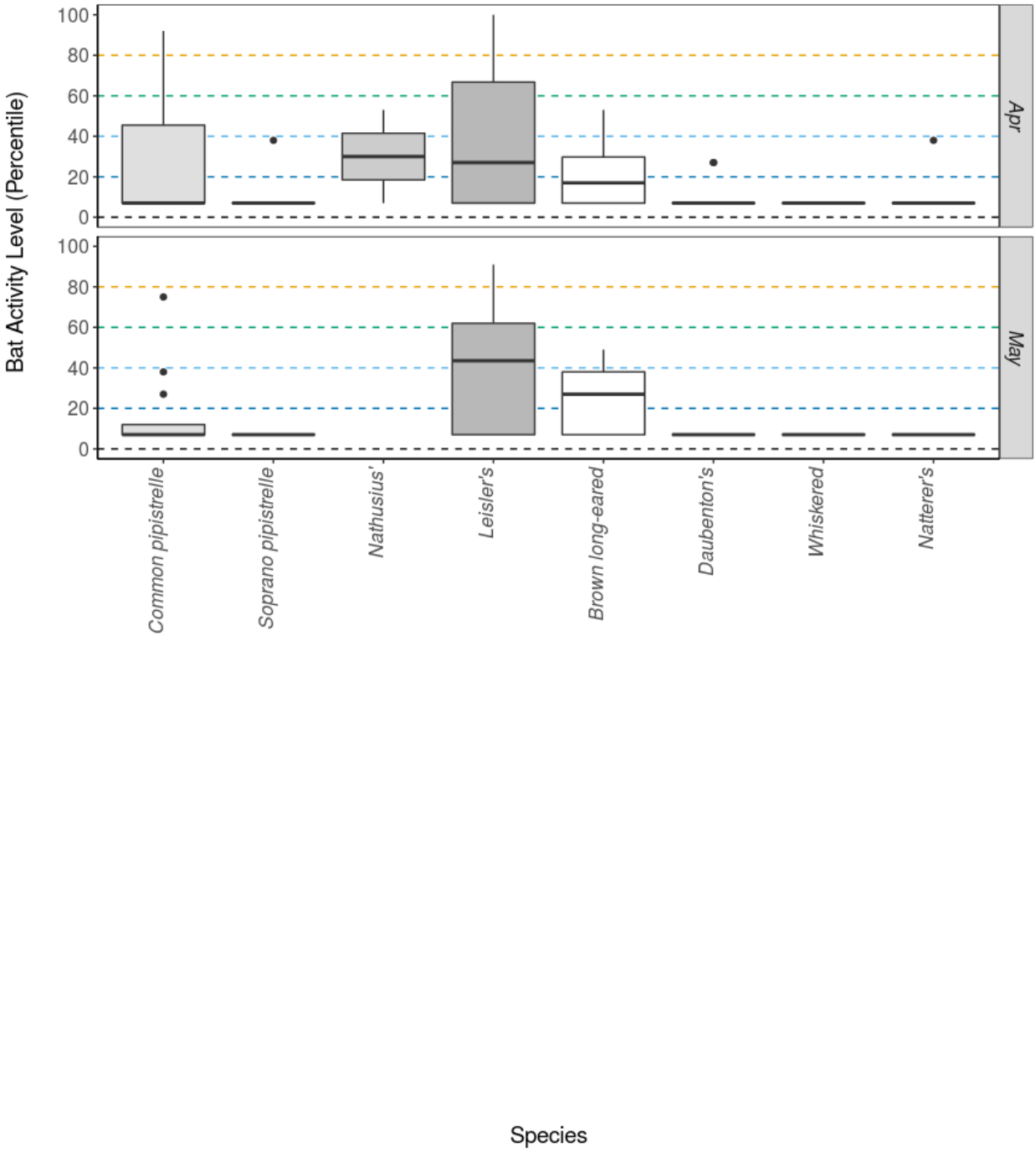
Species/Species Group	Month	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis daubentonii	Apr	0	0	0	2	7
Myotis daubentonii	May	0	0	0	0	4
Myotis mystacinus	Apr	0	0	0	0	4
Myotis mystacinus	May	0	0	0	0	1
Myotis nattereri	Apr	0	0	0	1	4
Myotis nattereri	May	0	0	0	0	1
Nyctalus leisleri	Apr	4	2	2	5	7
Nyctalus leisleri	May	2	0	2	1	3
Pipistrellus nathusii	Apr	0	0	1	0	1
Pipistrellus pipistrellus	Apr	2	0	1	1	7
Pipistrellus pipistrellus	May	0	1	0	2	9
Pipistrellus pygmaeus	Apr	0	0	0	1	4
Pipistrellus pygmaeus	May	0	0	0	0	3
Plecotus auritus	Apr	0	0	3	11	14
Plecotus auritus	May	0	0	1	4	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 daubentonii	Apr	7	7 - 7	27	9
Myotis daubentonii	May	7	7 - 7	7	4
Myotis mystacinus	Apr	7	0	7	4
Myotis mystacinus	May	7	0	7	1
Myotis nattereri	Apr	7	7 - 7	38	5
Myotis nattereri	May	7	7 - 7	7	1
Nyctalus leisleri	Apr	27	83.5 - 99	100	20
Nyctalus leisleri	May	44	83.5 - 99	91	8
Pipistrellus nathusii	Apr	30	0	53	2
Pipistrellus pipistrellus	Apr	7	7 - 7	92	11
Pipistrellus pipistrellus	May	7	7 - 7	75	12
Pipistrellus pygmaeus	Apr	7	22.5 - 22.5	38	5
Pipistrellus pygmaeus	May	7	0	7	3
Plecotus auritus	Apr	17	7 - 7	53	28
Plecotus auritus	May	27	7 - 7	49	9

###Figures

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



PART 2: Nightly Analysis

ENTIRE SURVEY PERIOD

Sunrise and Sunset Times

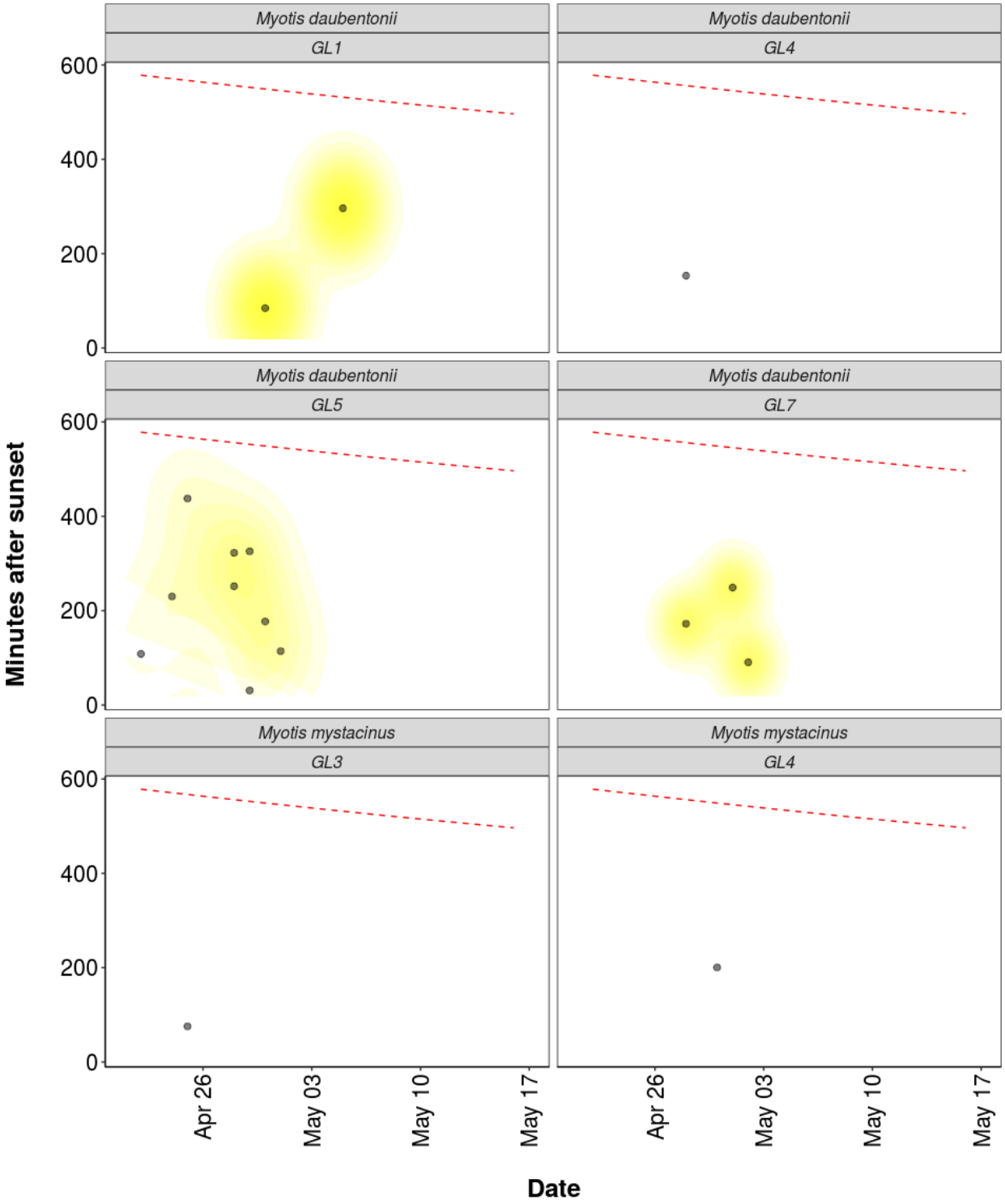
Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.

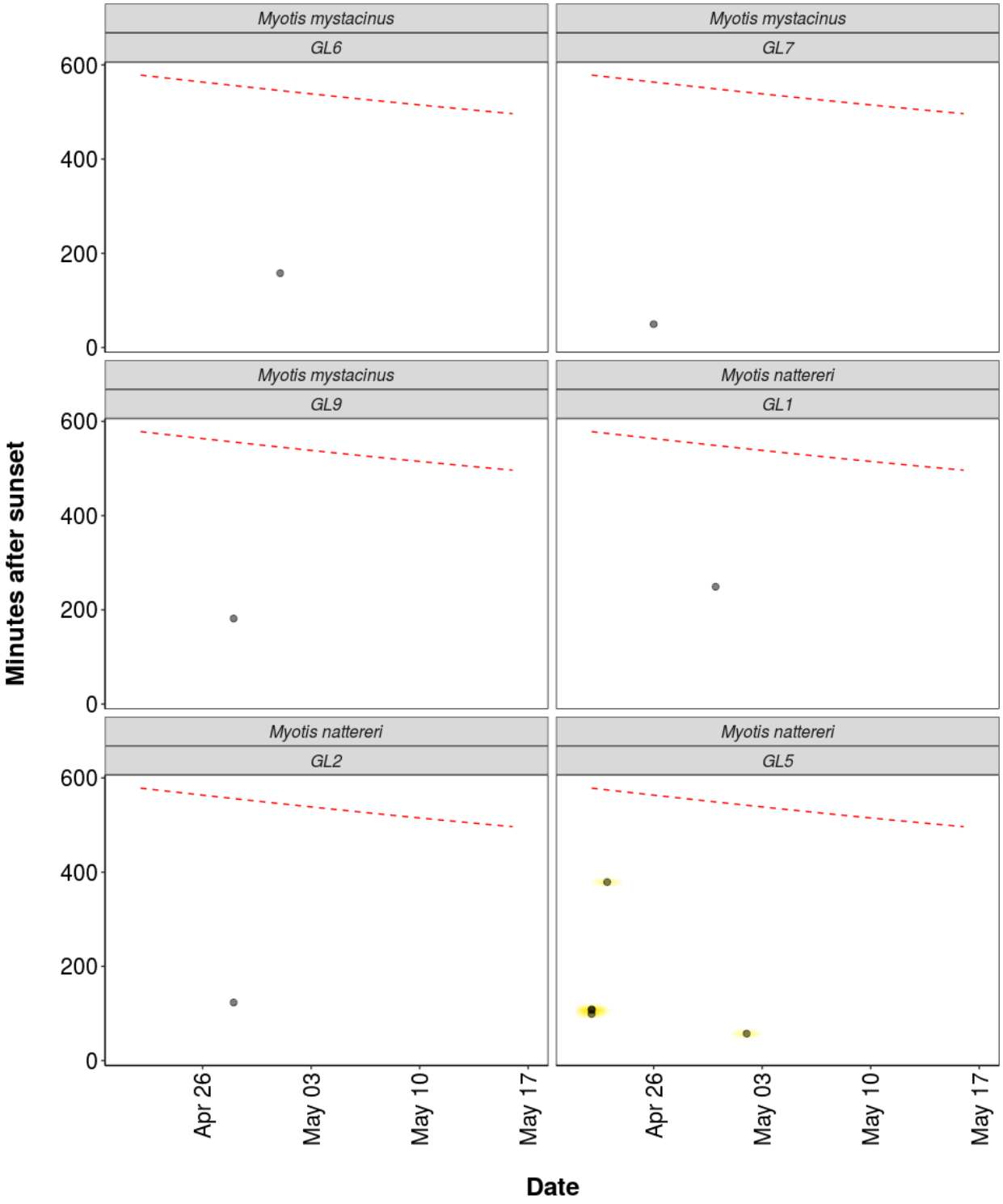
Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)
2021-04-22	20:46	06:24	9.6
2021-04-23	20:48	06:22	9.6
2021-04-24	20:49	06:20	9.5
2021-04-25	20:51	06:18	9.5
2021-04-26	20:53	06:16	9.4
2021-04-27	20:54	06:14	9.3
2021-04-28	20:56	06:12	9.3
2021-04-29	20:58	06:10	9.2
2021-04-30	20:59	06:08	9.2
2021-05-01	21:01	06:07	9.1
2021-05-02	21:03	06:05	9.0
2021-05-05	21:08	05:59	8.9
2021-05-09	21:14	05:53	8.6
2021-05-12	21:19	05:48	8.5
2021-05-16	21:25	05:42	8.3

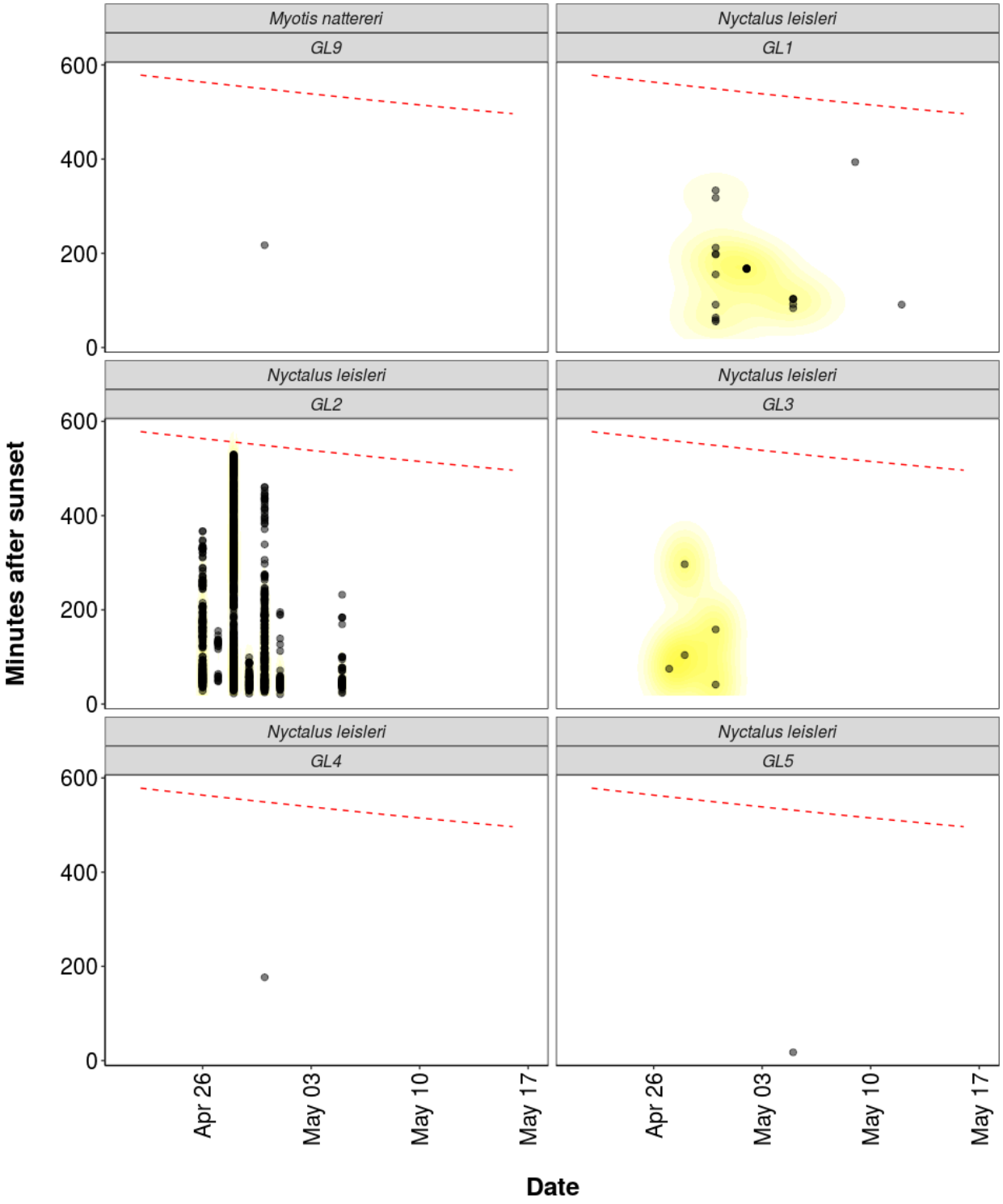
Distribution of Bat Activity Across the Night through Time

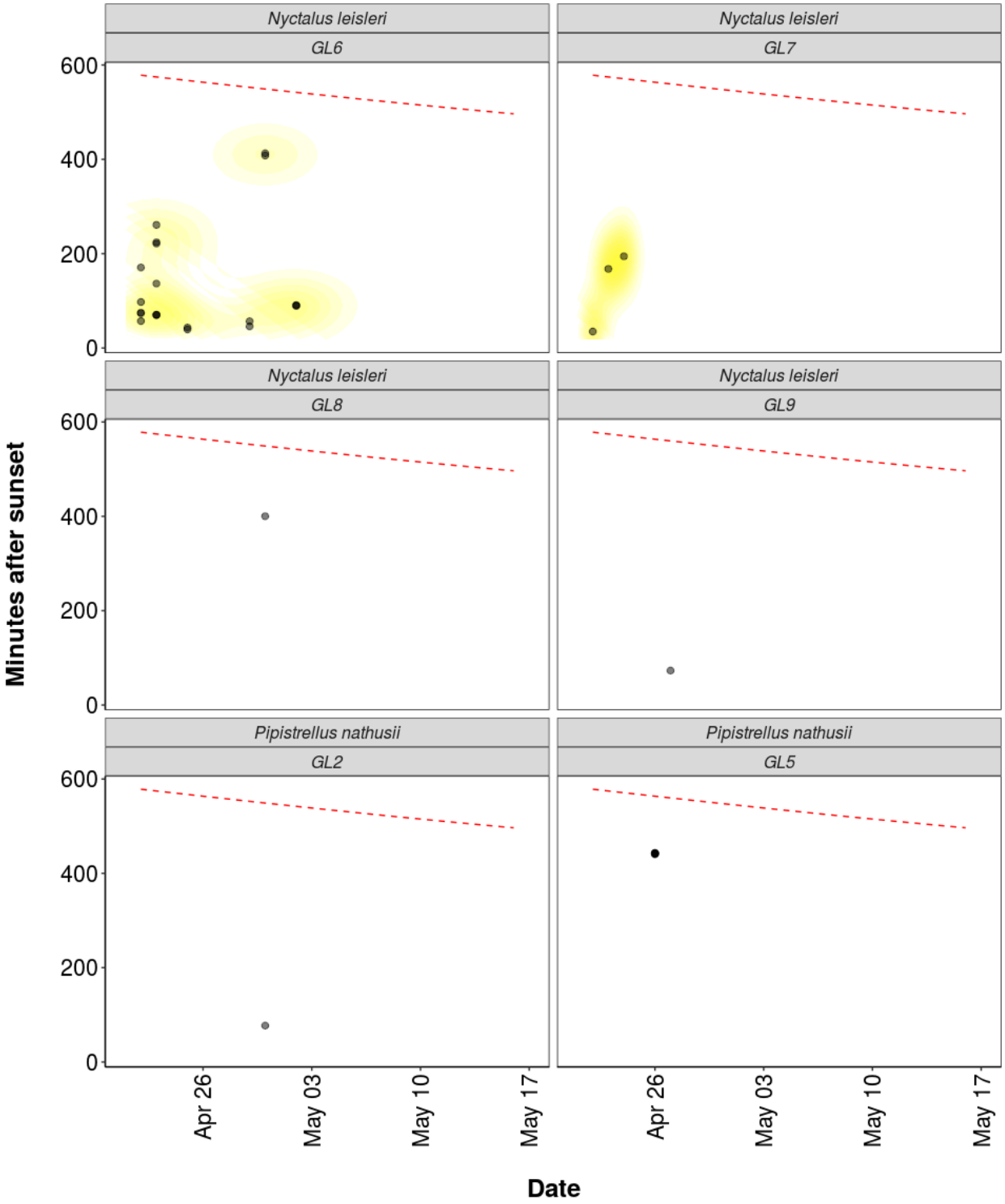
Per Detector

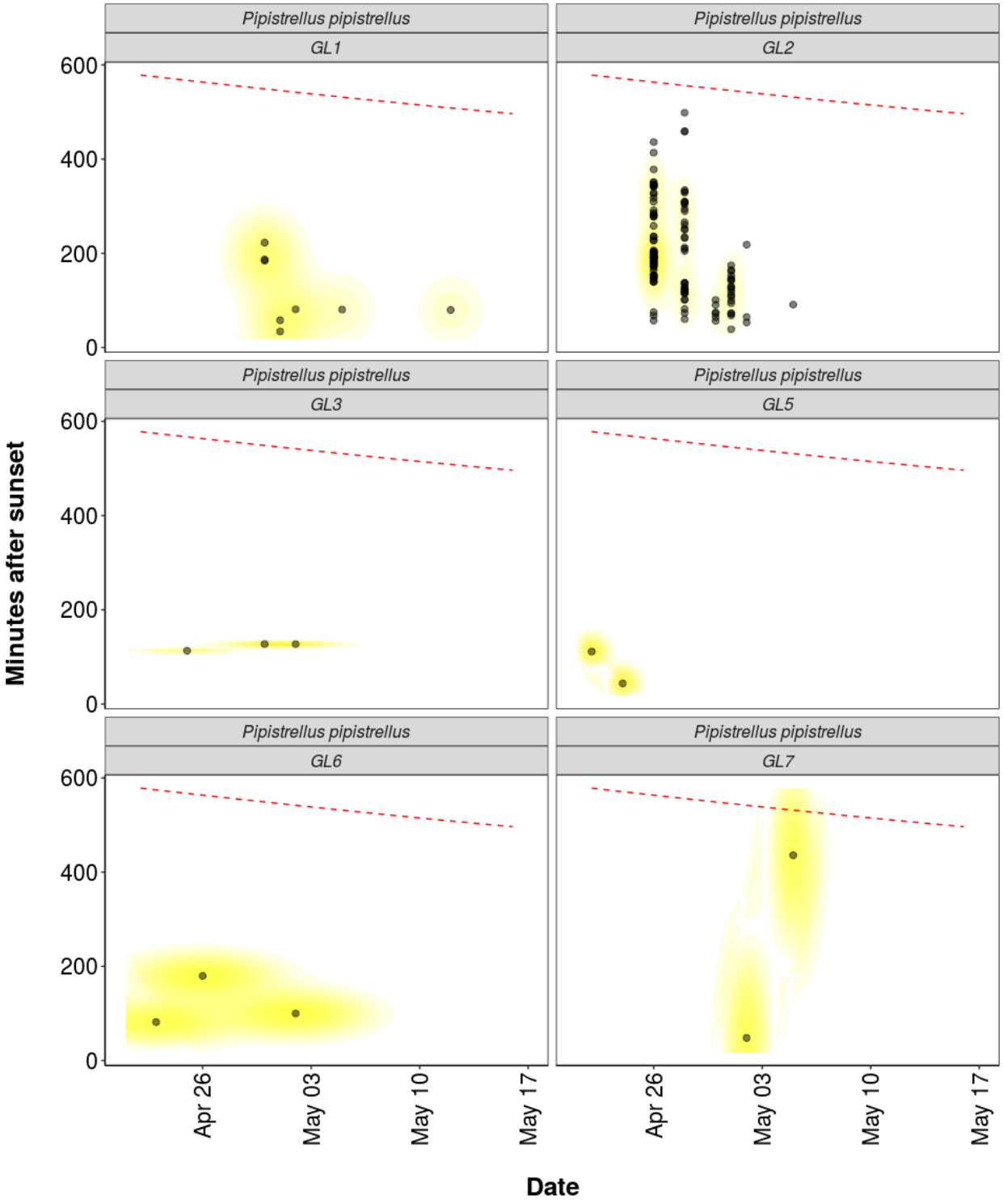
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

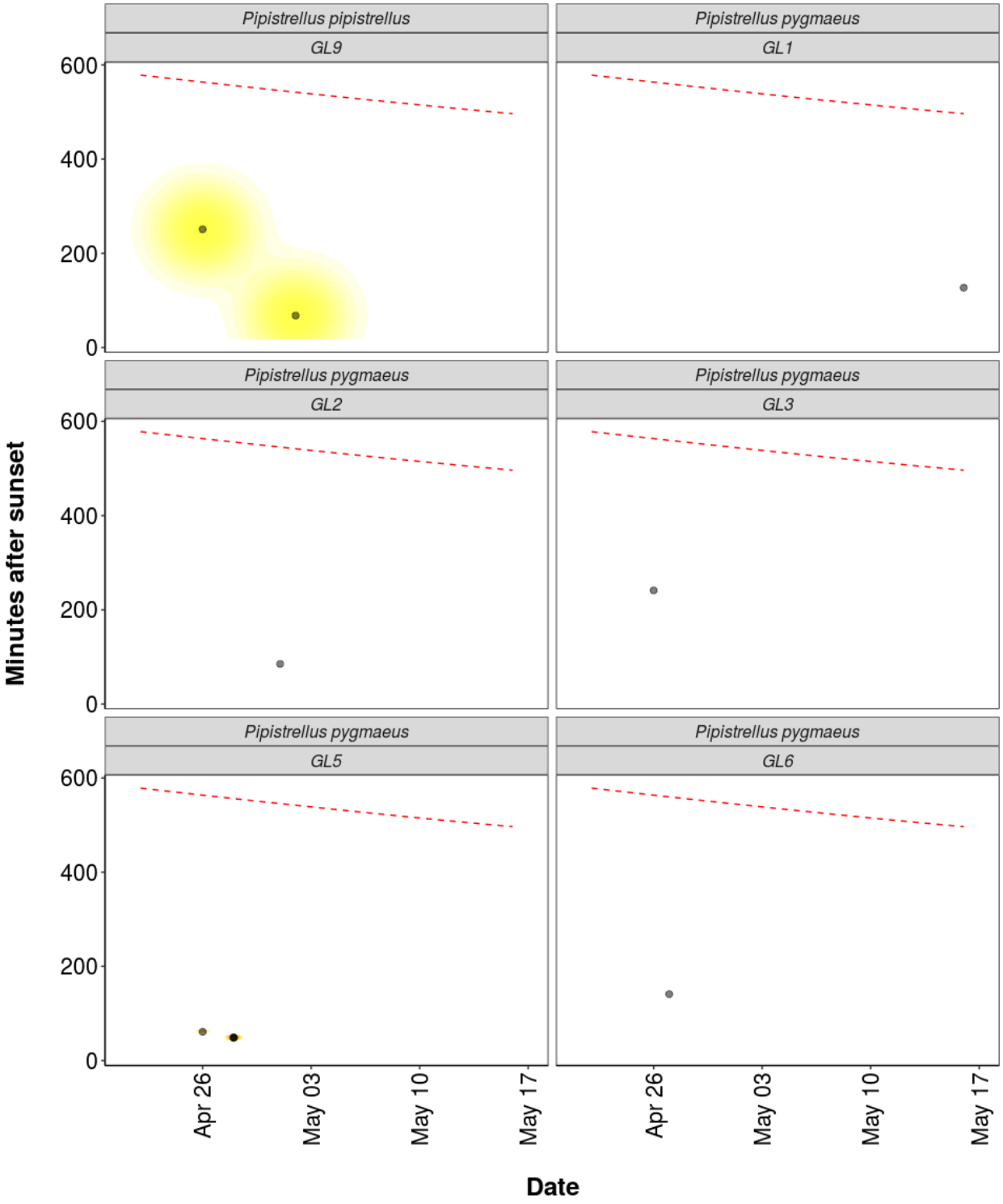

Myotis daubentonii
GL1
Myotis daubentonii
GL4
Myotis daubentonii
GL5
Myotis daubentonii
GL7
Myotis mystacinus
GL3
Myotis mystacinus
GL4
Minutes after sunset
0
200
400
600
Apr 26
May 03
May 10
May 17
Date

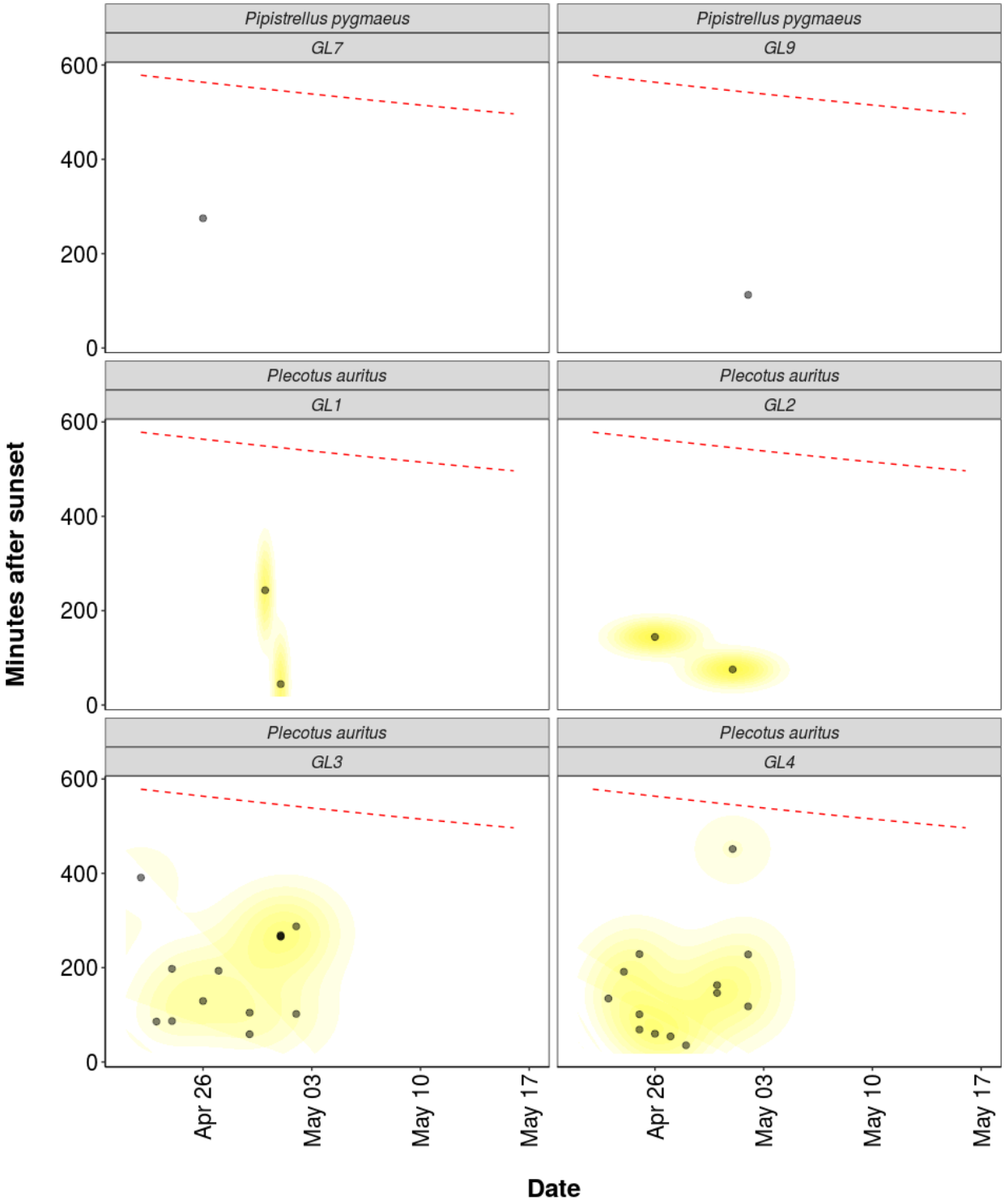

Myotis mystacinus
GL6
Myotis mystacinus
GL7
Myotis mystacinus
GL9
Myotis nattereri
GL1
Myotis nattereri
GL2
Myotis nattereri
GL5
Minutes after sunset
0
200
400
600
Apr 26
May 03
May 10
May 17
Date

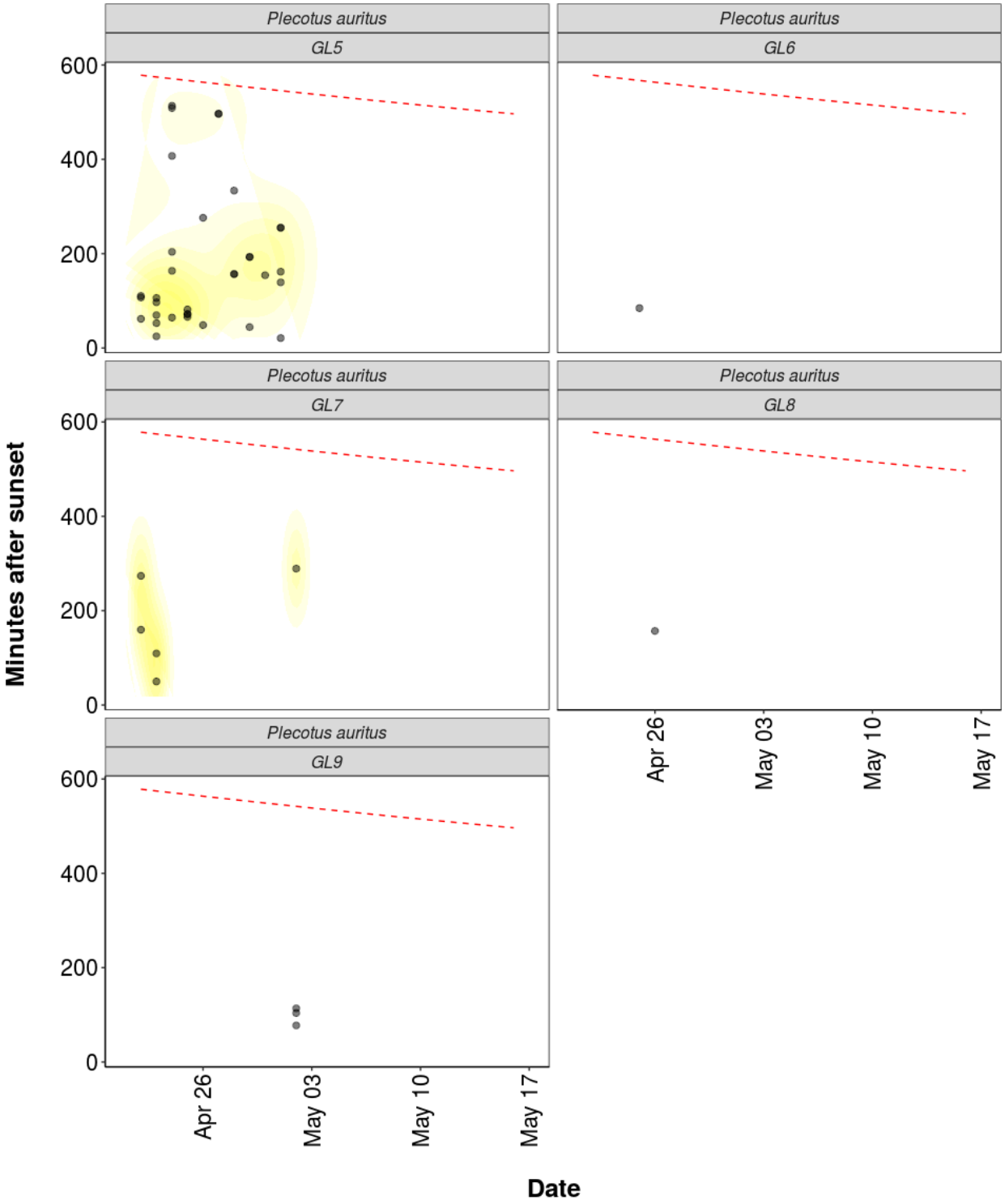

Myotis nattereri
GL9
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Minutes after sunset
600
400
200
0
Apr 26
May 03
May 10
May 17
Date


Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL2
Pipistrellus nathusii
GL5
Minutes after sunset
0
200
400
600
Apr 26
May 03
May 10
May 17
Date


Pipistrellus pipistrellus
GL1
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Minutes after sunset
0
200
400
600
Apr 26
May 03
May 10
May 17
Date


Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Minutes after sunset
0
200
400
600
Apr 26
May 03
May 10
May 17
Date


Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL9
Plecotus auritus
GL1
Plecotus auritus
GL2
Plecotus auritus
GL3
Plecotus auritus
GL4
Minutes after sunset
0
200
400
600
Apr 26
May 03
May 10
May 17
Date


Plecotus auritus
GL5
Plecotus auritus
GL6
Plecotus auritus
GL7
Plecotus auritus
GL8
Plecotus auritus
GL9
Minutes after sunset
0
200
400
600
Apr 26
May 03
May 10
May 17
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.

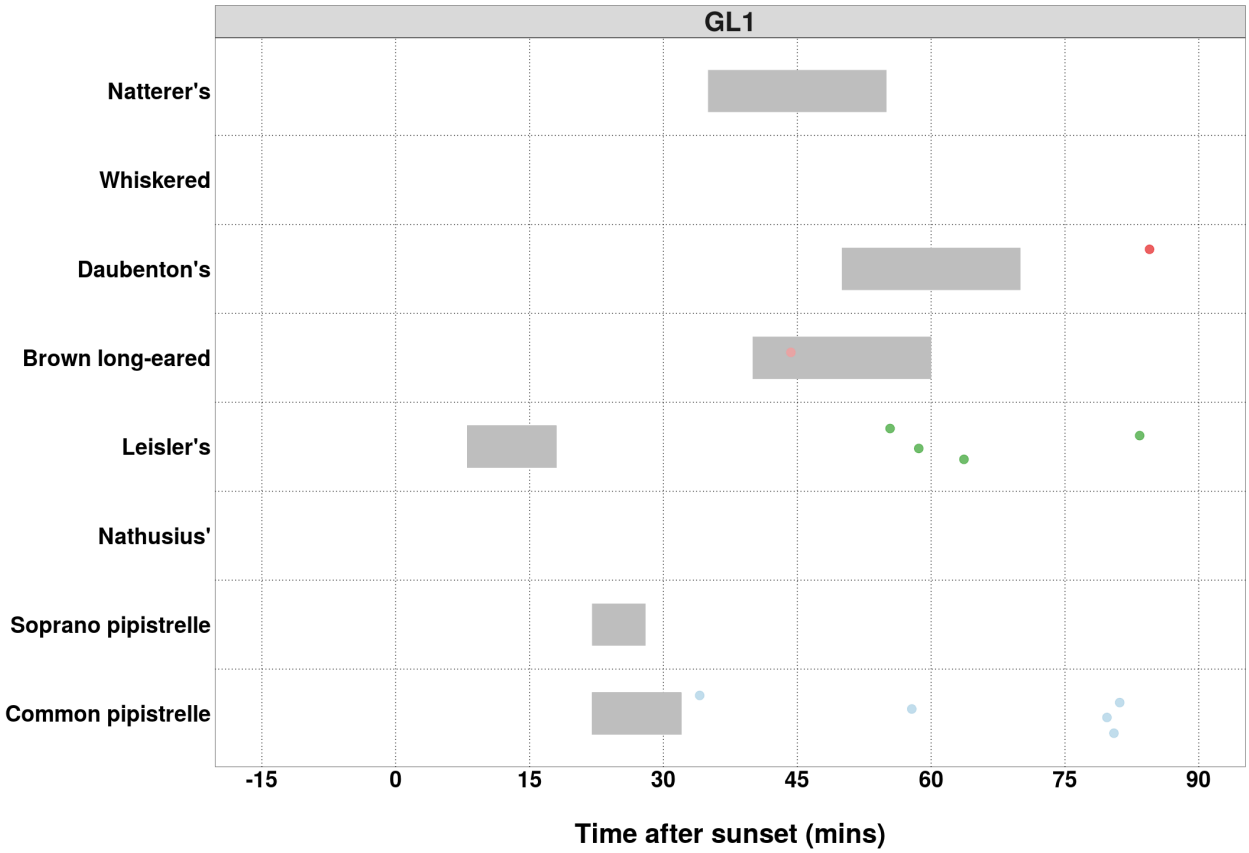
Table continues below

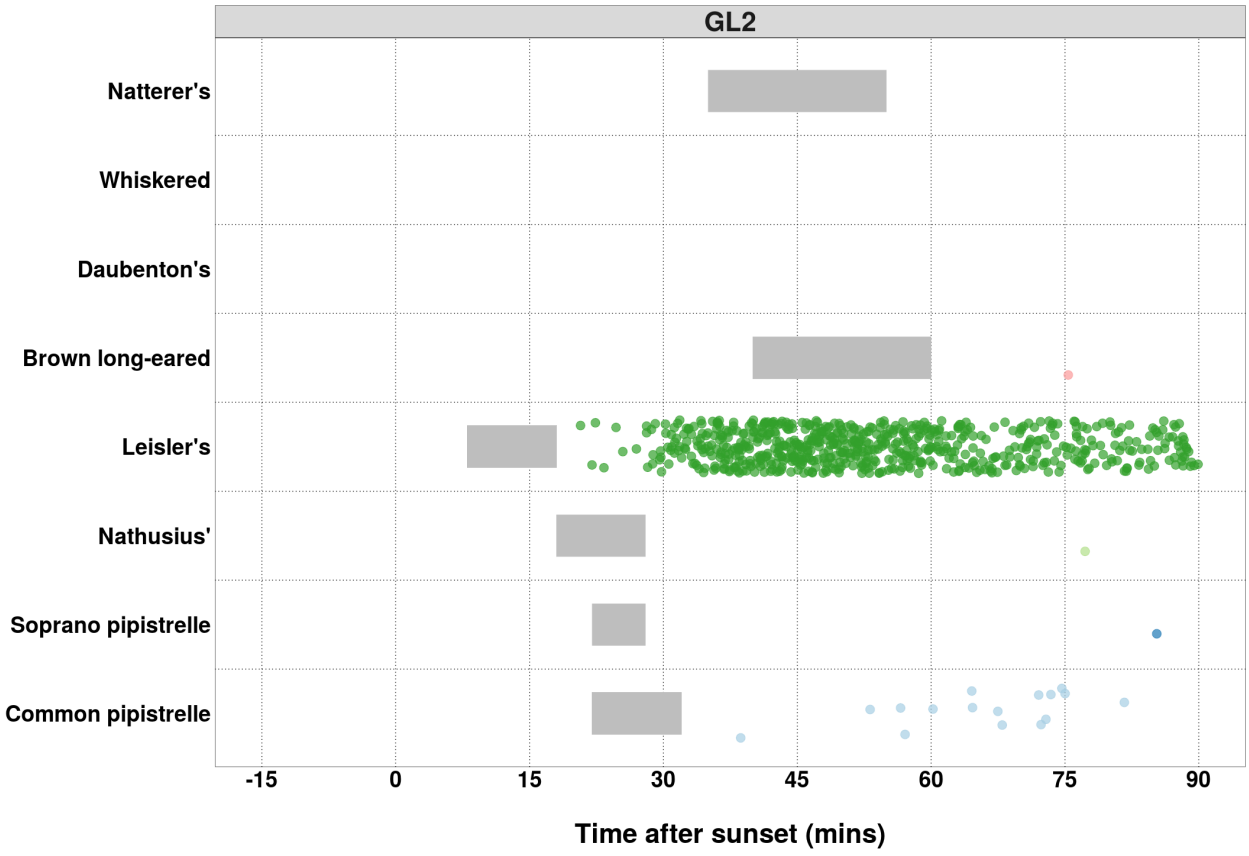
Species	Detector ID	2021-04-23	2021-04-26	2021-04-27	2021-04-28	2021-04-29
Leisler's	GL5	0	0	0	0	0
Brown long-eared	GL1	0	0	0	0	0
Brown long-eared	GL3	0	0	0	0	1
Brown long-eared	GL4	0	1	1	1	0
Brown long-eared	GL5	2	1	0	0	1
Brown long-eared	GL7	1	0	0	0	0
Daubenton's	GL5	0	0	0	0	1

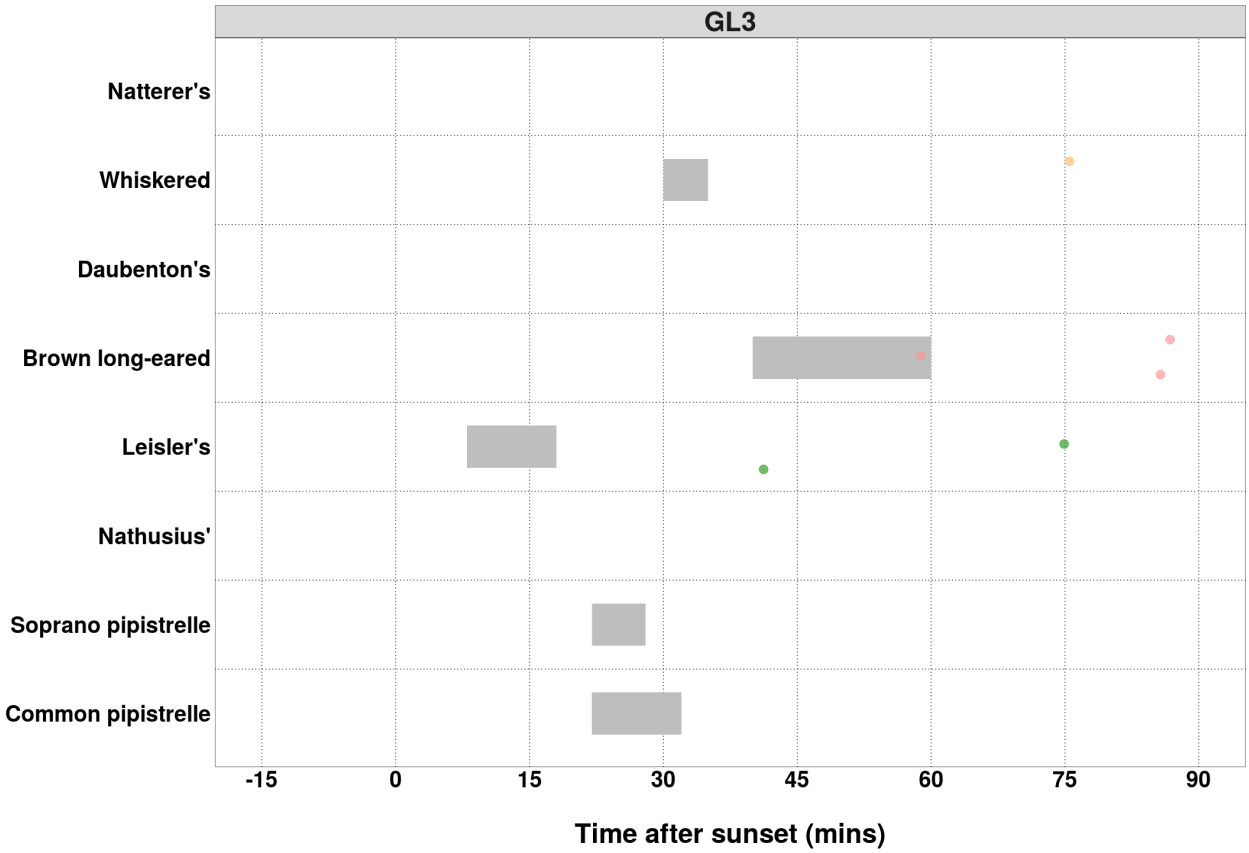
2021-05-01	2021-05-05
0	1
1	0
0	0
0	0
1	0
0	0
0	0

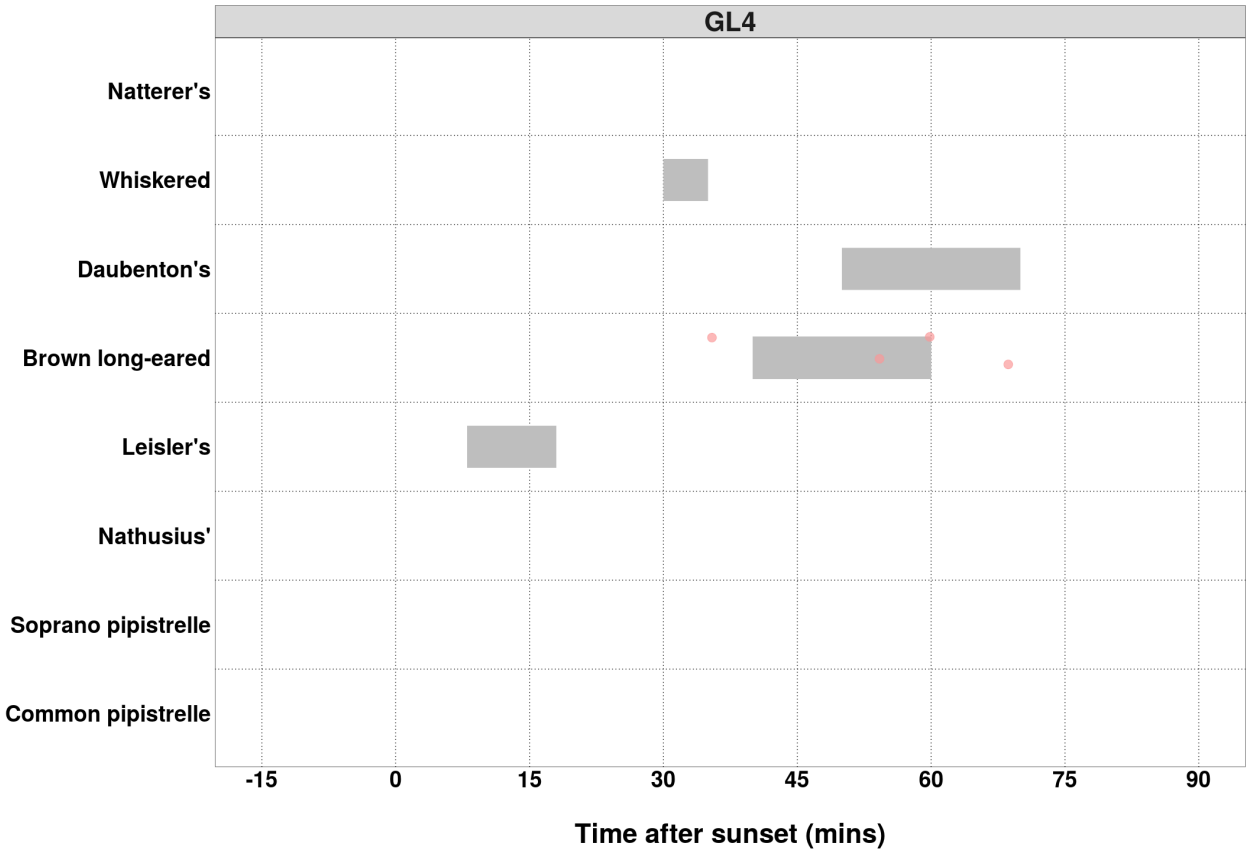
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012) - Figures

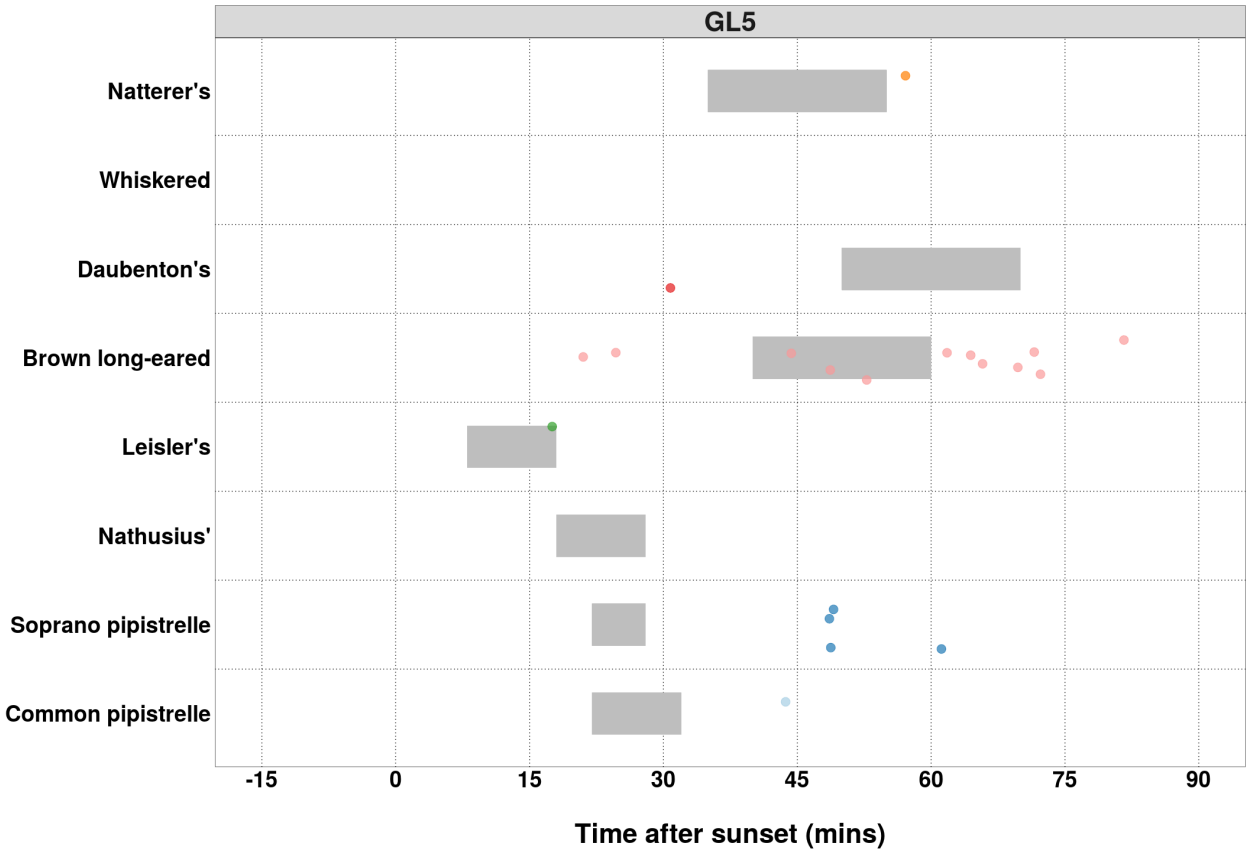
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.

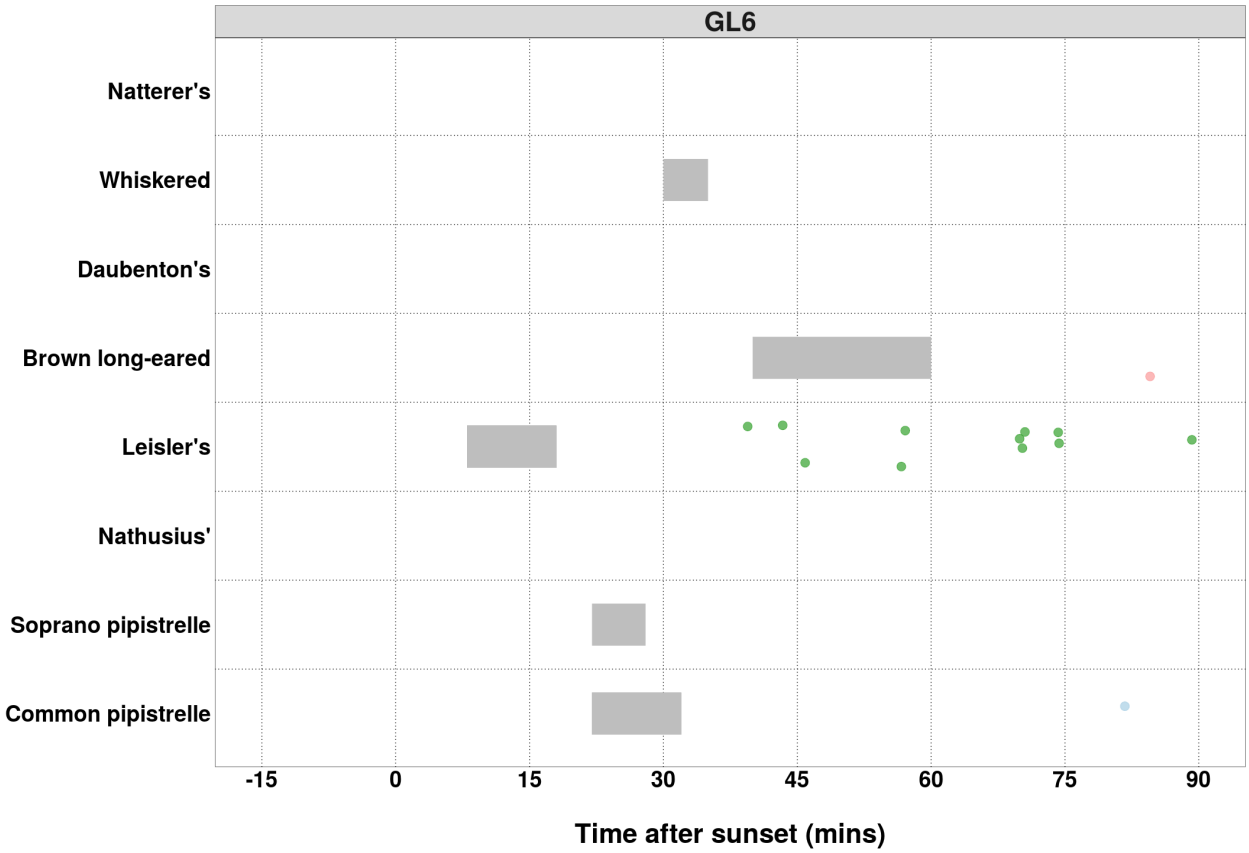

GL1
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

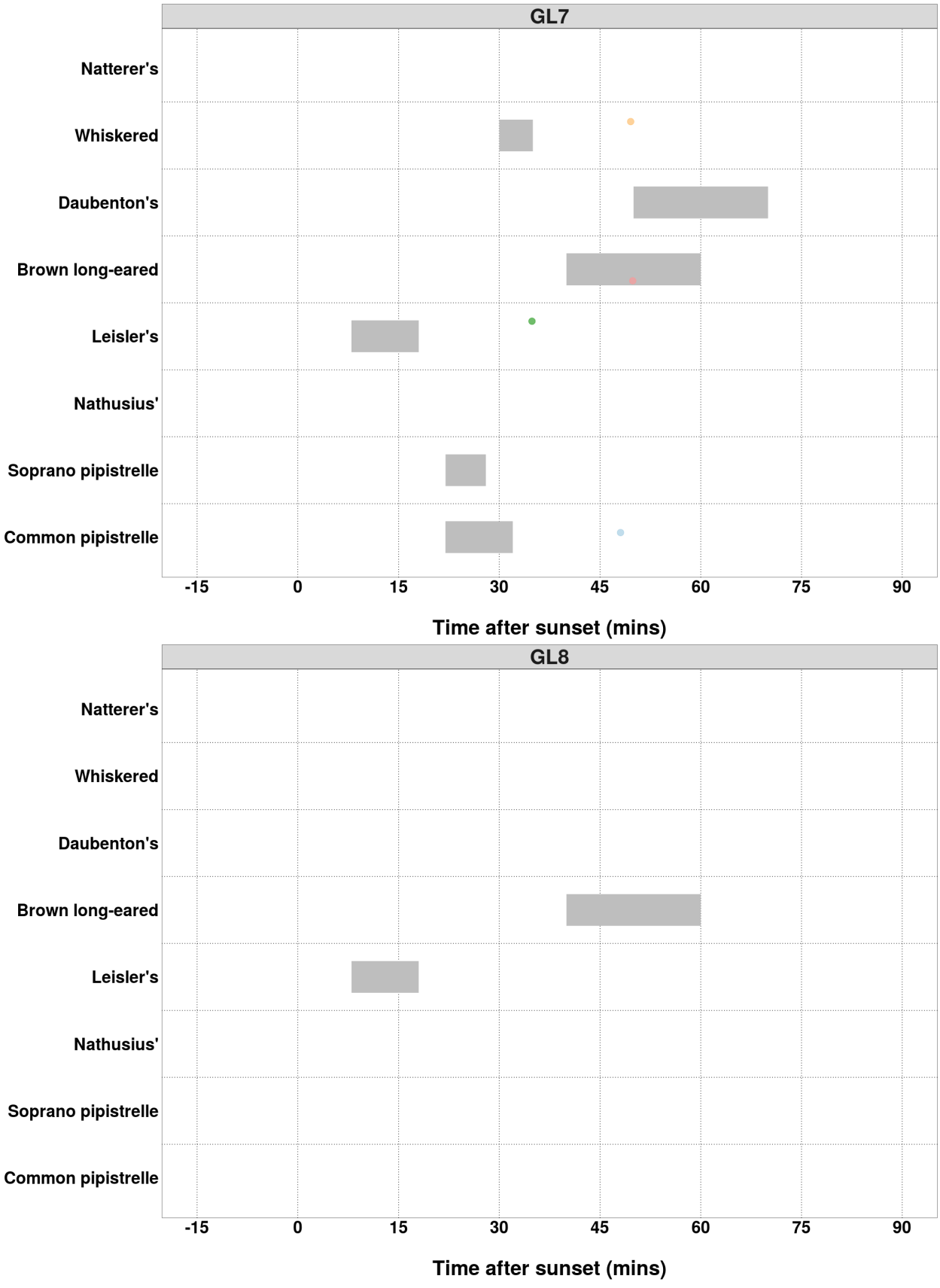

GL2
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

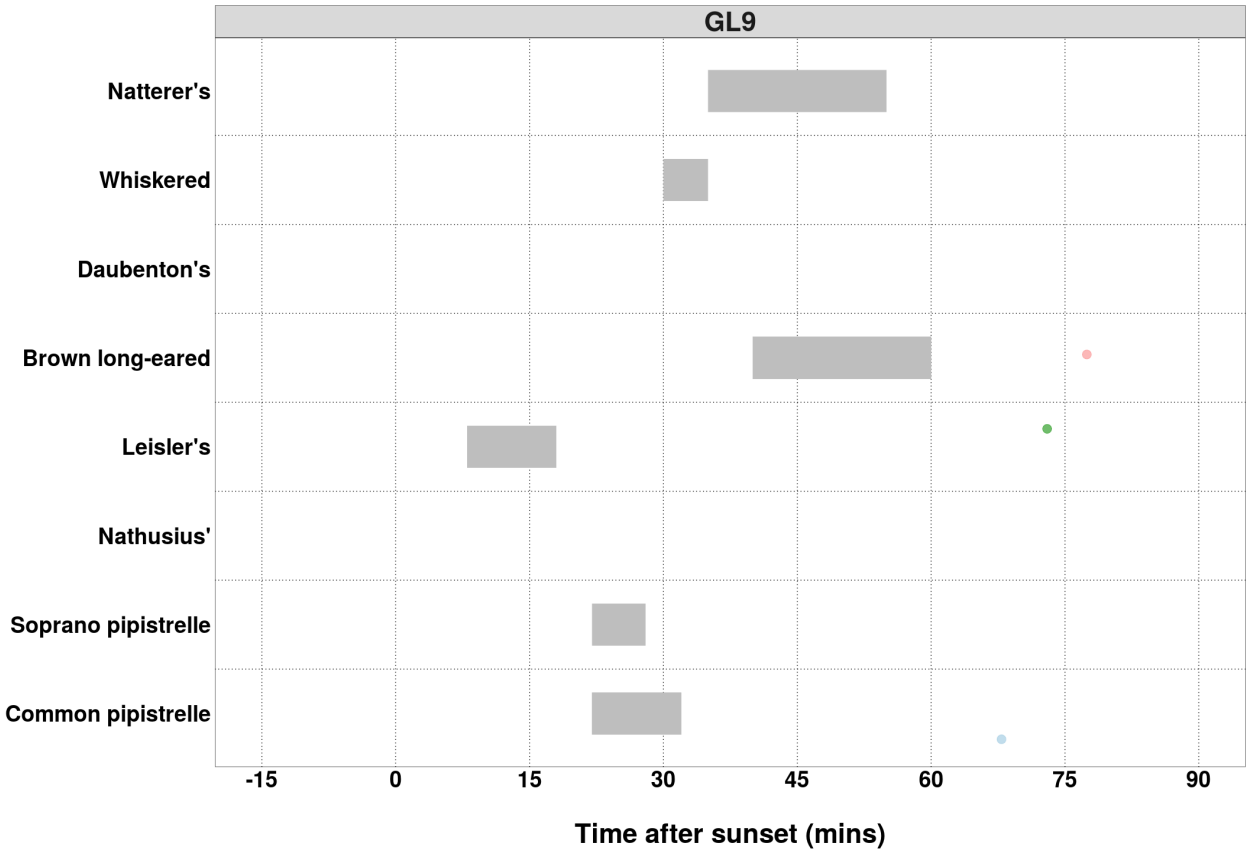

GL3
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL4
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL5
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL6
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL7
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)
GL8
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL9
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
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	163	8.5
Soprano pipistrelle	10	0.5
Nathusius'	7	0.4
Leisler's	1642	85.3
Brown long-eared	74	3.8
Daubenton's	15	0.8
Whiskered	5	0.3
Natterer's	8	0.4
Total	1924	100.0

Counts of Bat Passes

Per Detector

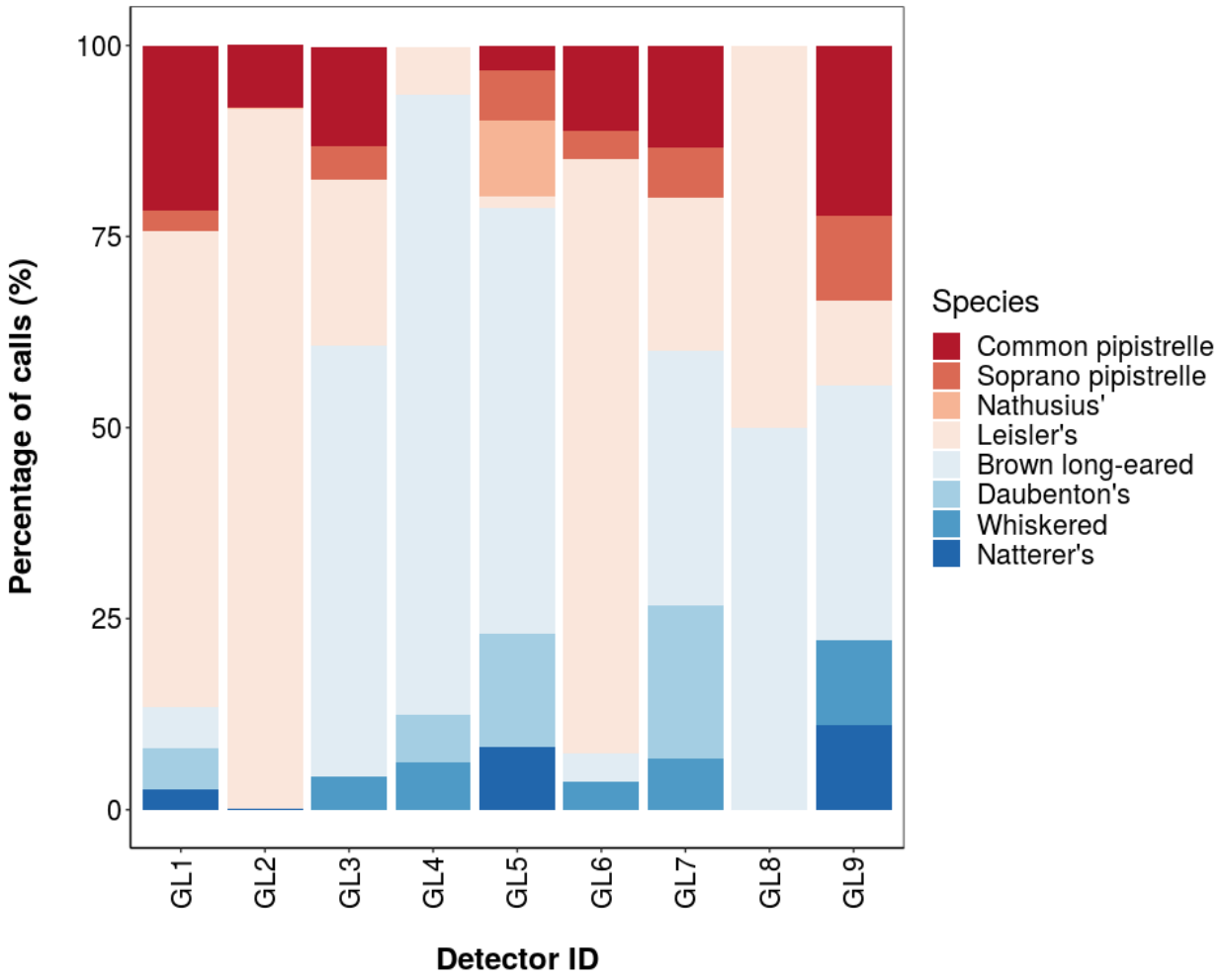
Table 15. The number of passes recorded for each species at each detector.

Species	Detector ID	Count (No)	Percentage by Detector (%)
Common pipistrelle	GL1	8	21.6
Common pipistrelle	GL2	143	8.2
Common pipistrelle	GL3	3	13.0
Common pipistrelle	GL5	2	3.3
Common pipistrelle	GL6	3	11.1
Common pipistrelle	GL7	2	13.3
Common pipistrelle	GL9	2	22.2
Soprano pipistrelle	GL1	1	2.7
Soprano pipistrelle	GL2	1	0.1
Soprano pipistrelle	GL3	1	4.3
Soprano pipistrelle	GL5	4	6.6
Soprano pipistrelle	GL6	1	3.7
Soprano pipistrelle	GL7	1	6.7
Soprano pipistrelle	GL9	1	11.1
Nathusius'	GL2	1	0.1
Nathusius'	GL5	6	9.8
Leisler's	GL1	23	62.2
Leisler's	GL2	1586	91.5
Leisler's	GL3	5	21.7
Leisler's	GL4	1	6.2
Leisler's	GL5	1	1.6
Leisler's	GL6	21	77.8
Leisler's	GL7	3	20.0
Leisler's	GL8	1	50.0
Leisler's	GL9	1	11.1
Brown long-eared	GL1	2	5.4
Brown long-eared	GL2	2	0.1
Brown long-eared	GL3	13	56.5
Brown long-eared	GL4	13	81.2

Brown long-eared	GL5	34	55.7
Brown long-eared	GL6	1	3.7
Brown long-eared	GL7	5	33.3
Brown long-eared	GL8	1	50.0
Brown long-eared	GL9	3	33.3
Daubenton's	GL1	2	5.4
Daubenton's	GL4	1	6.2
Daubenton's	GL5	9	14.8
Daubenton's	GL7	3	20.0
Whiskered	GL3	1	4.3
Whiskered	GL4	1	6.2
Whiskered	GL6	1	3.7
Whiskered	GL7	1	6.7
Whiskered	GL9	1	11.1
Natterer's	GL1	1	2.7
Natterer's	GL2	1	0.1
Natterer's	GL5	5	8.2
Natterer's	GL9	1	11.1

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	GL1	0.1
Common pipistrelle	GL2	1.4
Common pipistrelle	GL3	0.1
Common pipistrelle	GL5	0.1
Common pipistrelle	GL6	0.1
Common pipistrelle	GL7	0.1
Common pipistrelle	GL9	0.1
Soprano pipistrelle	GL1	0.1
Soprano pipistrelle	GL2	0.1
Soprano pipistrelle	GL3	0.1
Soprano pipistrelle	GL5	0.2
Soprano pipistrelle	GL6	0.1
Soprano pipistrelle	GL7	0.1
Soprano pipistrelle	GL9	0.1
Nathusius'	GL2	0.1
Nathusius'	GL5	0.6
Leisler's	GL1	0.6
Leisler's	GL2	11.0
Leisler's	GL3	0.2
Leisler's	GL4	0.1
Leisler's	GL5	0.1
Leisler's	GL6	0.3
Leisler's	GL7	0.1

Leisler's	GL8	0.1
Leisler's	GL9	0.1
Brown long-eared	GL1	0.1
Brown long-eared	GL2	0.1
Brown long-eared	GL3	0.2
Brown long-eared	GL4	0.1
Brown long-eared	GL5	0.3
Brown long-eared	GL6	0.1
Brown long-eared	GL7	0.2
Brown long-eared	GL8	0.1
Brown long-eared	GL9	0.3
Daubenton's	GL1	0.1
Daubenton's	GL4	0.1
Daubenton's	GL5	0.1
Daubenton's	GL7	0.1
Whiskered	GL3	0.1
Whiskered	GL4	0.1
Whiskered	GL6	0.1
Whiskered	GL7	0.1
Whiskered	GL9	0.1
Natterer's	GL1	0.1
Natterer's	GL2	0.1
Natterer's	GL5	0.1
Natterer's	GL9	0.1

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.

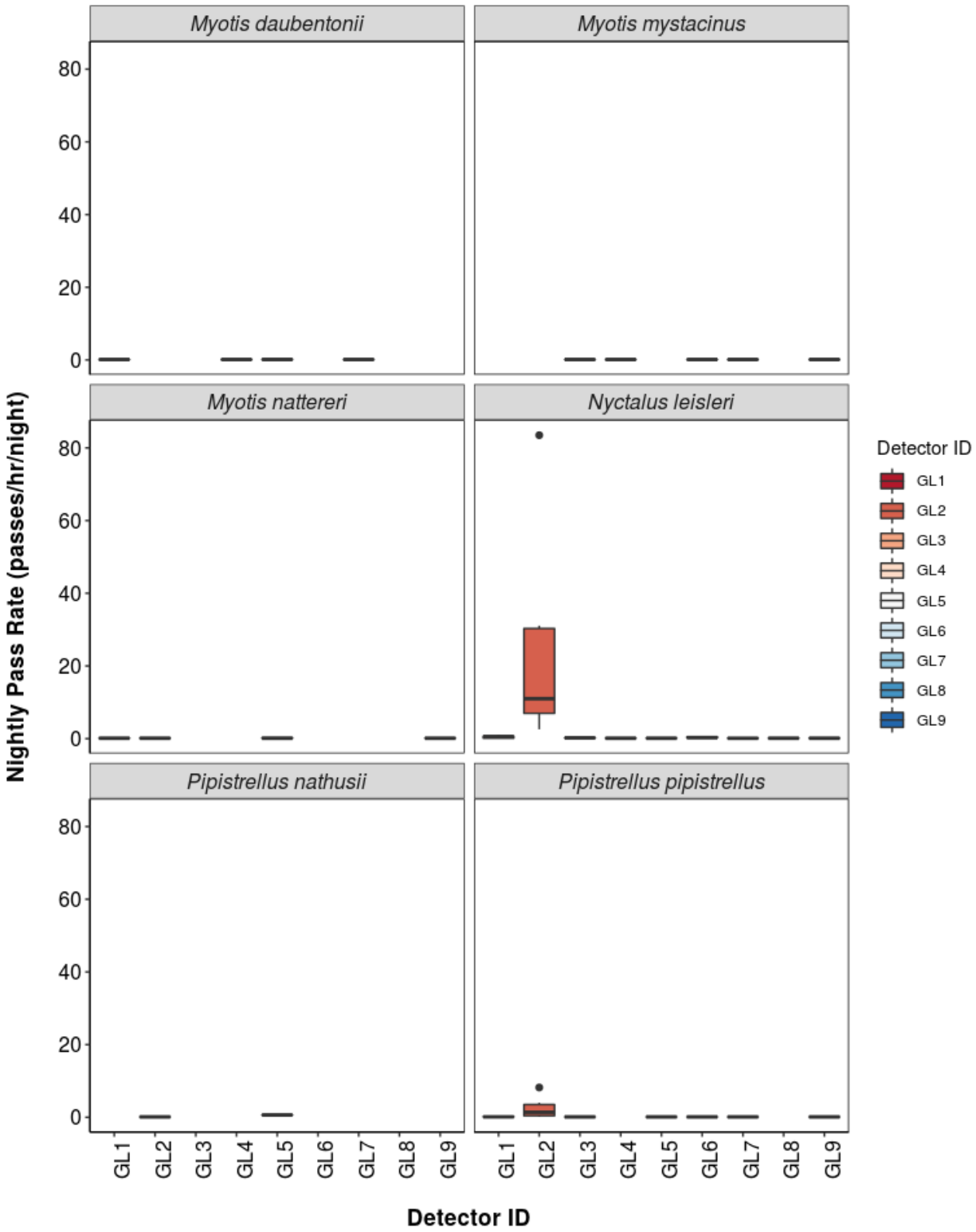
Species	Detector ID	Mean Pass Rate
Common pipistrelle	GL1	0.2
Common pipistrelle	GL2	2.6
Common pipistrelle	GL3	0.1
Common pipistrelle	GL5	0.1
Common pipistrelle	GL6	0.1
Common pipistrelle	GL7	0.1
Common pipistrelle	GL9	0.1
Soprano pipistrelle	GL1	0.1
Soprano pipistrelle	GL2	0.1
Soprano pipistrelle	GL3	0.1
Soprano pipistrelle	GL5	0.2
Soprano pipistrelle	GL6	0.1
Soprano pipistrelle	GL7	0.1
Soprano pipistrelle	GL9	0.1
Nathusius'	GL2	0.1
Nathusius'	GL5	0.6
Leisler's	GL1	0.5
Leisler's	GL2	24.5
Leisler's	GL3	0.2
Leisler's	GL4	0.1
Leisler's	GL5	0.1
Leisler's	GL6	0.4
Leisler's	GL7	0.1
Leisler's	GL8	0.1
Leisler's	GL9	0.1
Brown long-eared	GL1	0.1

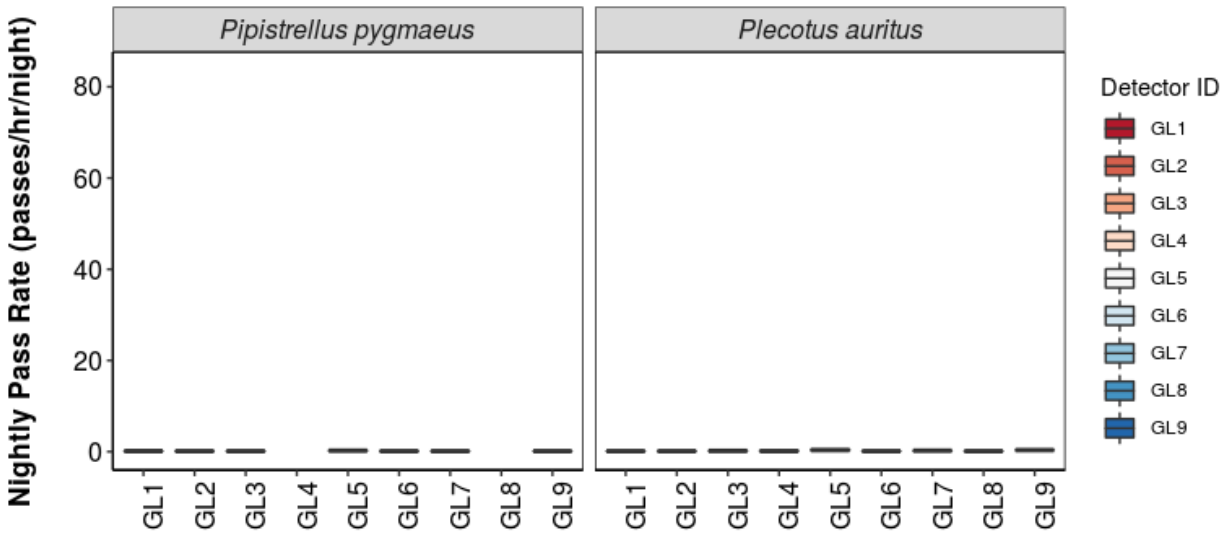
Brown long-eared	GL2	0.1
Brown long-eared	GL3	0.2
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.4
Brown long-eared	GL6	0.1
Brown long-eared	GL7	0.2
Brown long-eared	GL8	0.1
Brown long-eared	GL9	0.3
Daubenton's	GL1	0.1
Daubenton's	GL4	0.1
Daubenton's	GL5	0.1
Daubenton's	GL7	0.1
Whiskered	GL3	0.1
Whiskered	GL4	0.1
Whiskered	GL6	0.1
Whiskered	GL7	0.1
Whiskered	GL9	0.1
Natterer's	GL1	0.1
Natterer's	GL2	0.1
Natterer's	GL5	0.2
Natterer's	GL9	0.1

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
20
40
60
80
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
0
20
40
60
80
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
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	Apr	May
Common pipistrelle	GL1	3	5
Common pipistrelle	GL2	120	23
Common pipistrelle	GL3	2	1
Common pipistrelle	GL5	2	0
Common pipistrelle	GL6	2	1
Common pipistrelle	GL7	0	2
Common pipistrelle	GL9	1	1
Soprano pipistrelle	GL1	0	1
Soprano pipistrelle	GL2	0	1
Soprano pipistrelle	GL3	1	0
Soprano pipistrelle	GL5	4	0
Soprano pipistrelle	GL6	1	0
Soprano pipistrelle	GL7	1	0
Soprano pipistrelle	GL9	0	1
Nathusius'	GL2	1	0
Nathusius'	GL5	6	0
Leisler's	GL1	10	13
Leisler's	GL2	1461	125
Leisler's	GL3	5	0
Leisler's	GL4	1	0
Leisler's	GL5	0	1
Leisler's	GL6	18	3
Leisler's	GL7	3	0
Leisler's	GL8	1	0

Leisler's	GL9	1	0
Brown long-eared	GL1	1	1
Brown long-eared	GL2	1	1
Brown long-eared	GL3	8	5
Brown long-eared	GL4	10	3
Brown long-eared	GL5	29	5
Brown long-eared	GL6	1	0
Brown long-eared	GL7	4	1
Brown long-eared	GL8	1	0
Brown long-eared	GL9	0	3
Daubenton's	GL1	1	1
Daubenton's	GL4	1	0
Daubenton's	GL5	8	1
Daubenton's	GL7	1	2
Whiskered	GL3	1	0
Whiskered	GL4	1	0
Whiskered	GL6	0	1
Whiskered	GL7	1	0
Whiskered	GL9	1	0
Natterer's	GL1	1	0
Natterer's	GL2	1	0
Natterer's	GL5	4	1
Natterer's	GL9	1	0

Survey Effort

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

Month	Detector ID	No. of Survey Nights
Apr	GL1	1
Apr	GL2	5
Apr	GL3	9
Apr	GL4	7
Apr	GL5	9
Apr	GL6	7
Apr	GL7	5
Apr	GL8	2
Apr	GL9	4
May	GL1	6
May	GL2	3
May	GL3	2
May	GL4	2
May	GL5	3
May	GL6	2
May	GL7	3
May	GL9	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	Apr	May
Common pipistrelle	GL1	0.3	0.1
Common pipistrelle	GL2	4.0	0.3
Common pipistrelle	GL3	0.1	0.1
Common pipistrelle	GL5	0.1	NA
Common pipistrelle	GL6	0.1	0.1
Common pipistrelle	GL7	NA	0.1
Common pipistrelle	GL9	0.1	0.1
Soprano pipistrelle	GL1	NA	0.1
Soprano pipistrelle	GL2	NA	0.1
Soprano pipistrelle	GL3	0.1	NA
Soprano pipistrelle	GL5	0.2	NA
Soprano pipistrelle	GL6	0.1	NA
Soprano pipistrelle	GL7	0.1	NA
Soprano pipistrelle	GL9	NA	0.1
Nathusius'	GL2	0.1	NA
Nathusius'	GL5	0.6	NA
Leisler's	GL1	1.1	0.3
Leisler's	GL2	29.5	7.0
Leisler's	GL3	0.2	NA
Leisler's	GL4	0.1	NA
Leisler's	GL5	NA	0.1
Leisler's	GL6	0.2	0.3
Leisler's	GL7	0.1	NA

Leisler's	GL8	0.1	NA
Leisler's	GL9	0.1	NA
Brown long-eared	GL1	0.1	0.1
Brown long-eared	GL2	0.1	0.1
Brown long-eared	GL3	0.1	0.3
Brown long-eared	GL4	0.1	0.2
Brown long-eared	GL5	0.3	0.6
Brown long-eared	GL6	0.1	NA
Brown long-eared	GL7	0.2	0.1
Brown long-eared	GL8	0.1	NA
Brown long-eared	GL9	NA	0.3
Daubenton's	GL1	0.1	0.1
Daubenton's	GL4	0.1	NA
Daubenton's	GL5	0.1	0.1
Daubenton's	GL7	0.1	0.1
Whiskered	GL3	0.1	NA
Whiskered	GL4	0.1	NA
Whiskered	GL6	NA	0.1
Whiskered	GL7	0.1	NA
Whiskered	GL9	0.1	NA
Natterer's	GL1	0.1	NA
Natterer's	GL2	0.1	NA
Natterer's	GL5	0.2	0.1
Natterer's	GL9	0.1	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.

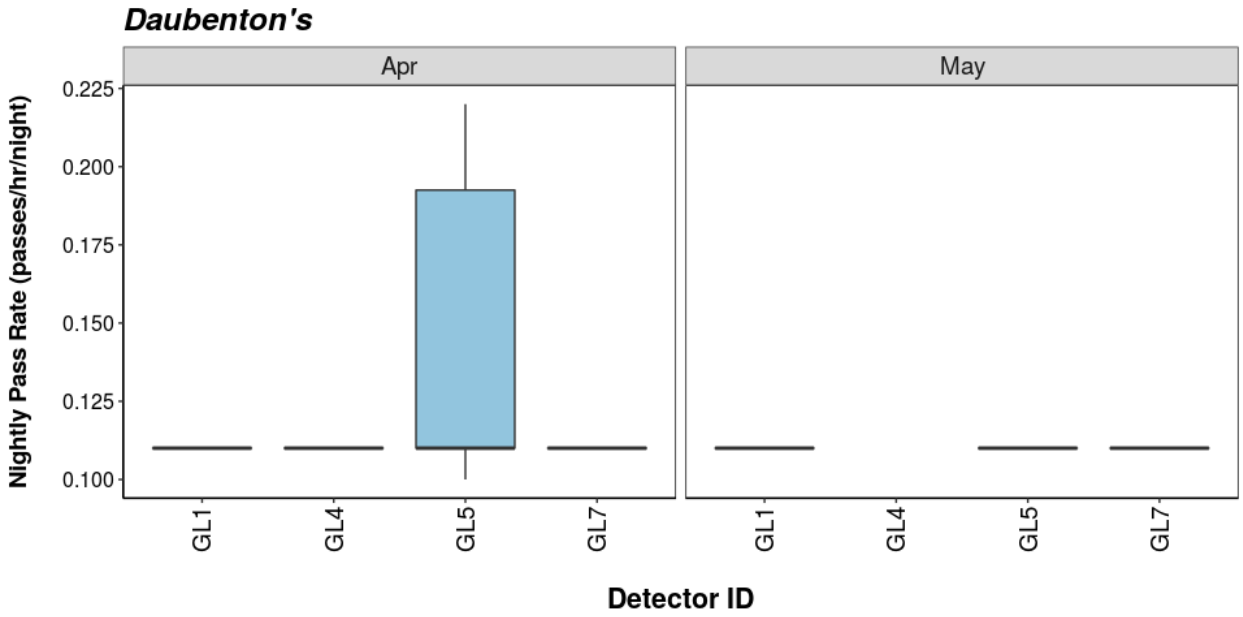
Species	Detector ID	Apr	May
Common pipistrelle	GL1	0.3	0.1
Common pipistrelle	GL2	4.3	0.8
Common pipistrelle	GL3	0.1	0.1
Common pipistrelle	GL5	0.1	NA
Common pipistrelle	GL6	0.1	0.1
Common pipistrelle	GL7	NA	0.1
Common pipistrelle	GL9	0.1	0.1
Soprano pipistrelle	GL1	NA	0.1
Soprano pipistrelle	GL2	NA	0.1
Soprano pipistrelle	GL3	0.1	NA
Soprano pipistrelle	GL5	0.2	NA
Soprano pipistrelle	GL6	0.1	NA
Soprano pipistrelle	GL7	0.1	NA
Soprano pipistrelle	GL9	NA	0.1
Nathusius'	GL2	0.1	NA
Nathusius'	GL5	0.6	NA
Leisler's	GL1	1.1	0.4
Leisler's	GL2	31.5	7.0
Leisler's	GL3	0.2	NA
Leisler's	GL4	0.1	NA
Leisler's	GL5	NA	0.1
Leisler's	GL6	0.4	0.3
Leisler's	GL7	0.1	NA
Leisler's	GL8	0.1	NA
Leisler's	GL9	0.1	NA
Brown long-eared	GL1	0.1	0.1

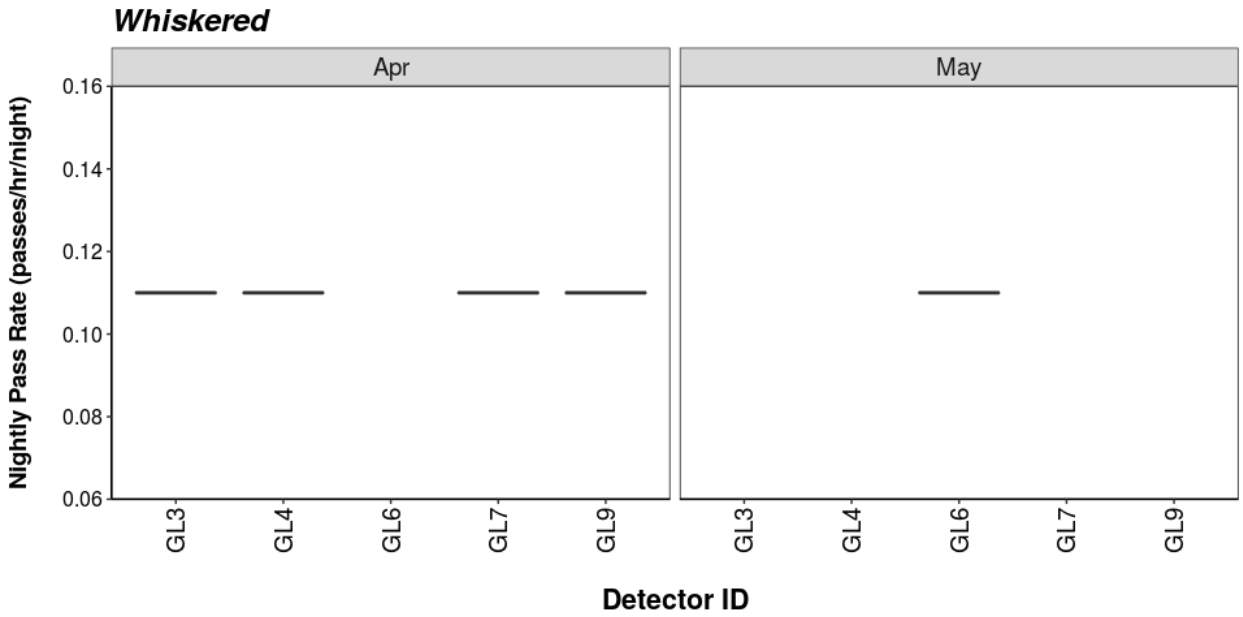
Brown long-eared	GL2	0.1	0.1
Brown long-eared	GL3	0.1	0.3
Brown long-eared	GL4	0.2	0.2
Brown long-eared	GL5	0.3	0.6
Brown long-eared	GL6	0.1	NA
Brown long-eared	GL7	0.2	0.1
Brown long-eared	GL8	0.1	NA
Brown long-eared	GL9	NA	0.3
Daubenton's	GL1	0.1	0.1
Daubenton's	GL4	0.1	NA
Daubenton's	GL5	0.1	0.1
Daubenton's	GL7	0.1	0.1
Whiskered	GL3	0.1	NA
Whiskered	GL4	0.1	NA
Whiskered	GL6	NA	0.1
Whiskered	GL7	0.1	NA
Whiskered	GL9	0.1	NA
Natterer's	GL1	0.1	NA
Natterer's	GL2	0.1	NA
Natterer's	GL5	0.2	0.1
Natterer's	GL9	0.1	NA

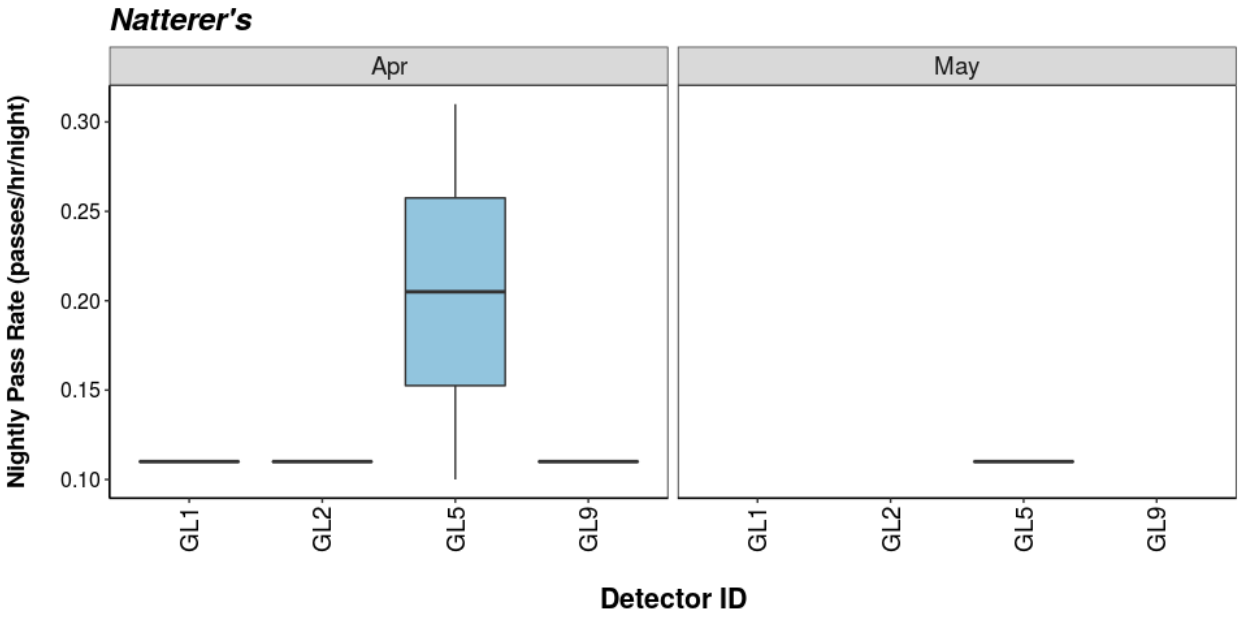
Nightly Bat Pass Rate for each Month

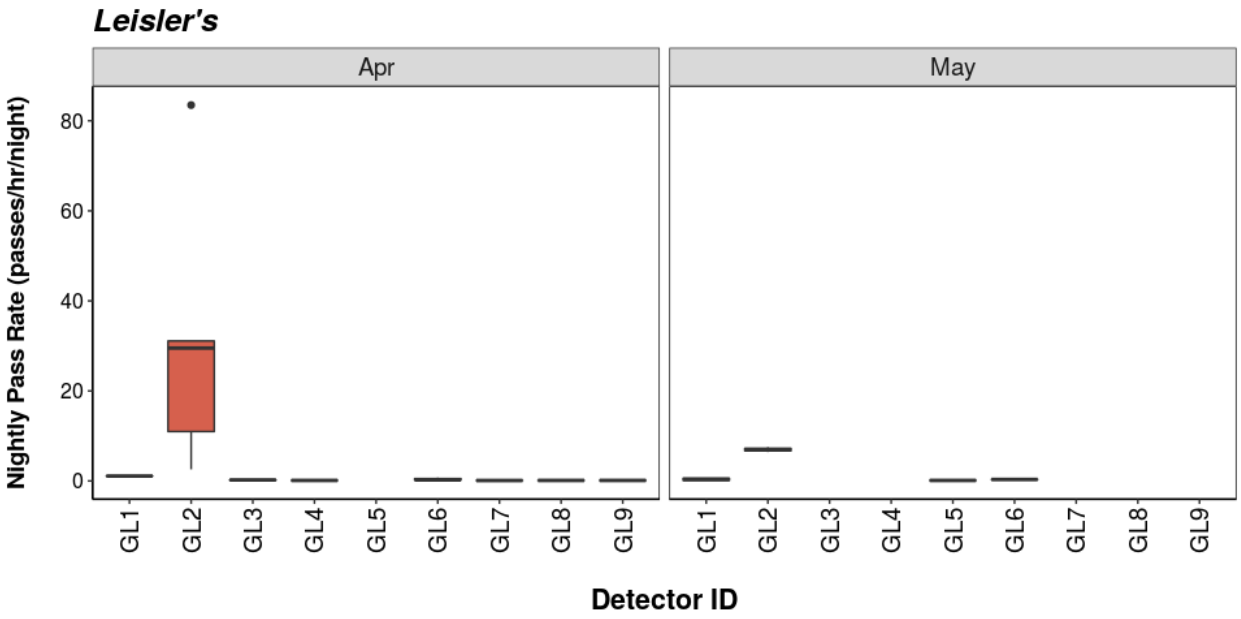
Per Detector - Figures

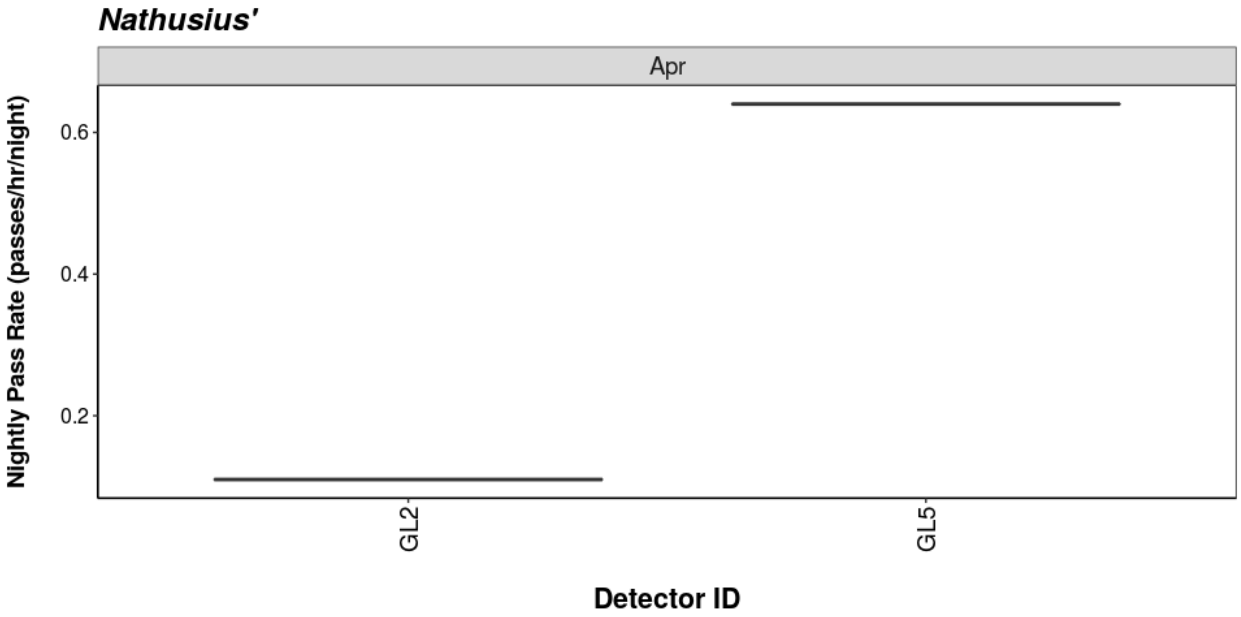
Figure 12. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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

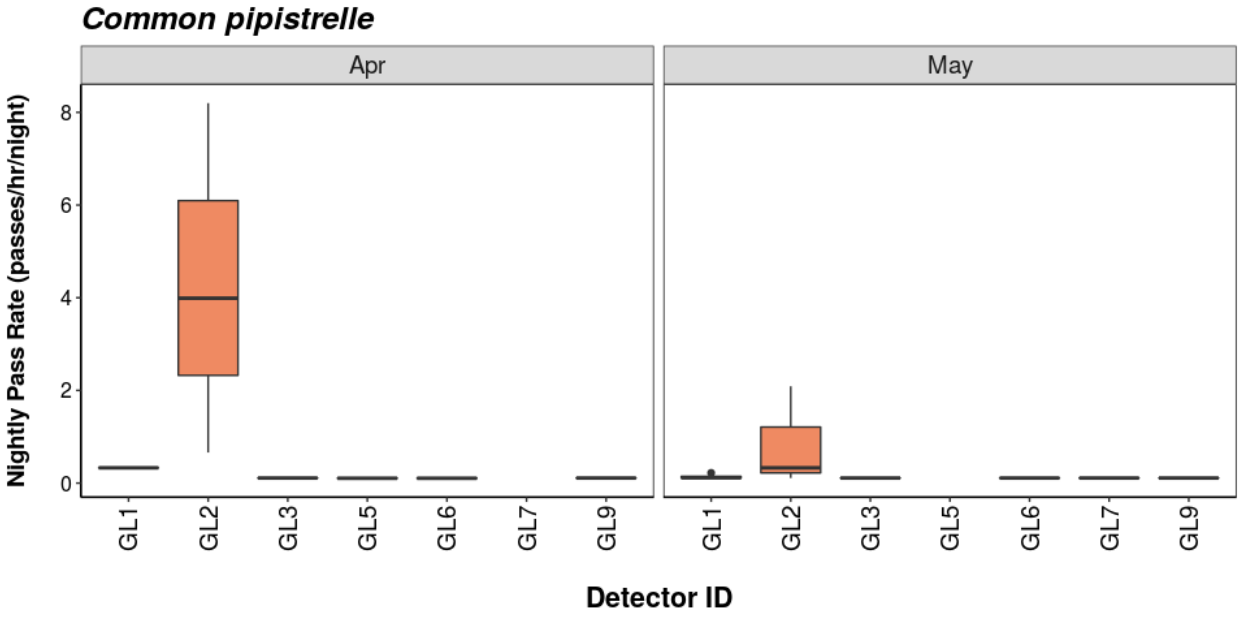


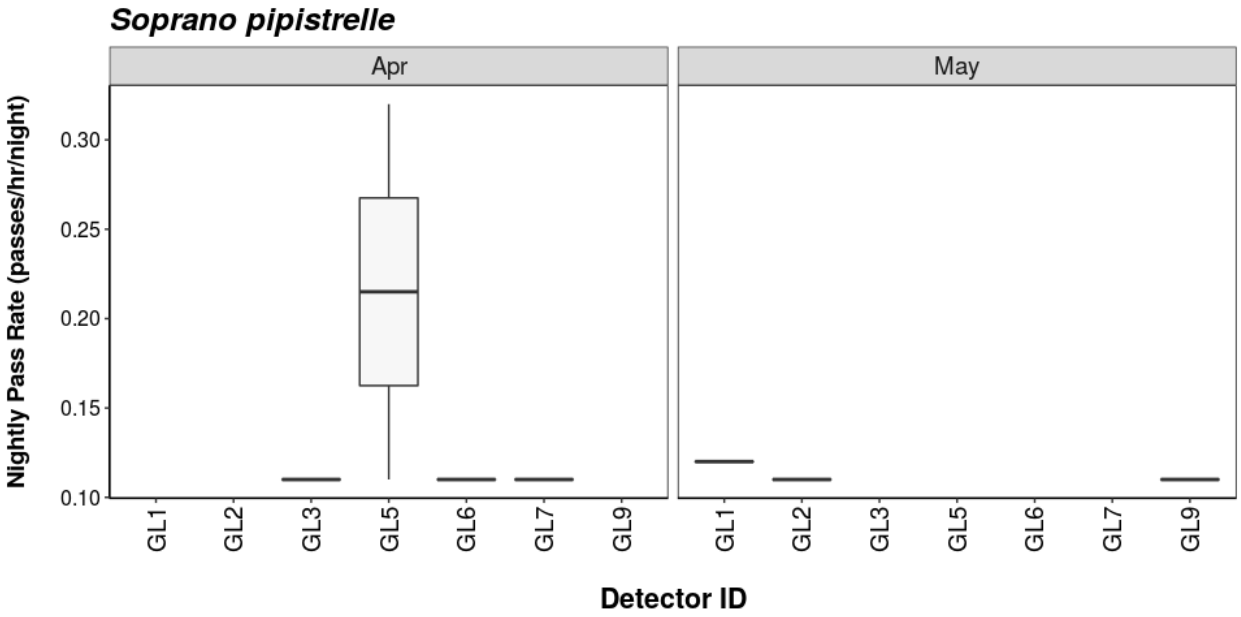


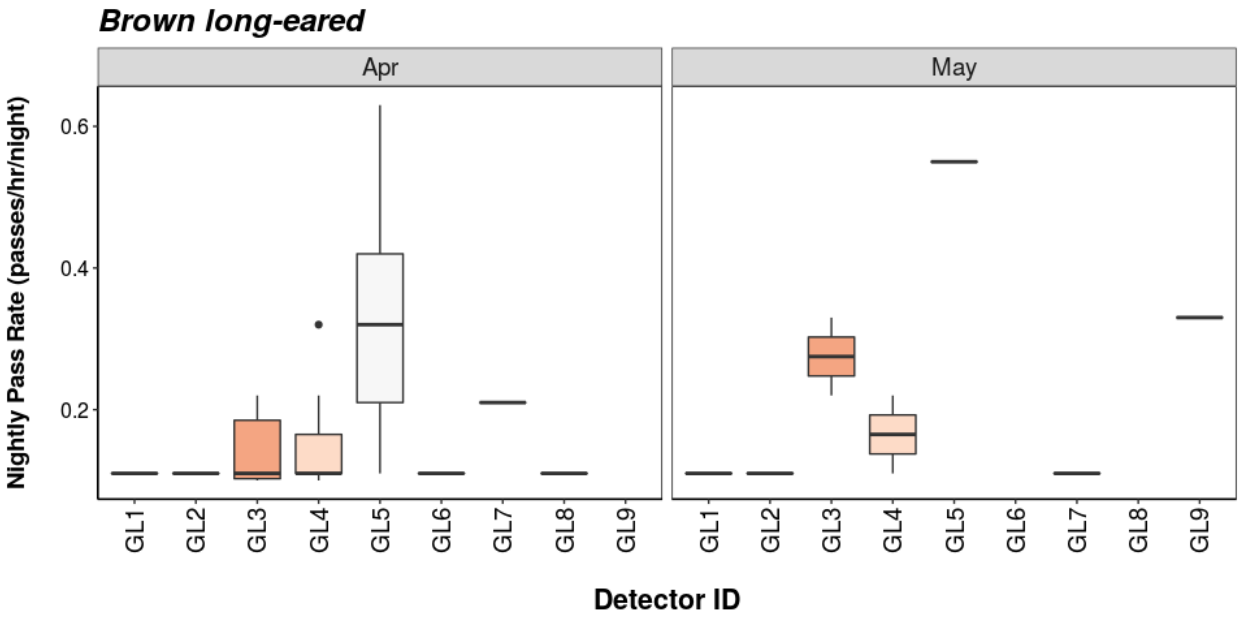

Natterer's
Apr
May
Nightly Pass Rate (passes/hr/night)
0.30
0.25
0.20
0.15
0.10
GL1
GL2
GL5
GL9
Detector ID


Leisler's
Apr
May
Nightly Pass Rate (passes/hr/night)
80
60
40
20
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Nathusius'
Apr
Nightly Pass Rate (passes/hr/night)
0.6
0.4
0.2
GL2
GL5
Detector ID


Common pipistrelle
Apr
May
Nightly Pass Rate (passes/hr/night)
8
6
4
2
0
GL1
GL2
GL3
GL5
GL6
GL7
GL9
Detector ID


Soprano pipistrelle
Apr
May
Nightly Pass Rate (passes/hr/night)
0.30
0.25
0.20
0.15
0.10
GL1
GL2
GL3
GL5
GL6
GL7
GL9
Detector ID


Brown long-eared
Apr
May
Nightly Pass Rate (passes/hr/night)
0.6
0.4
0.2
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

Bat Activity per Detector Location

Figure 13. Detector ID reference:

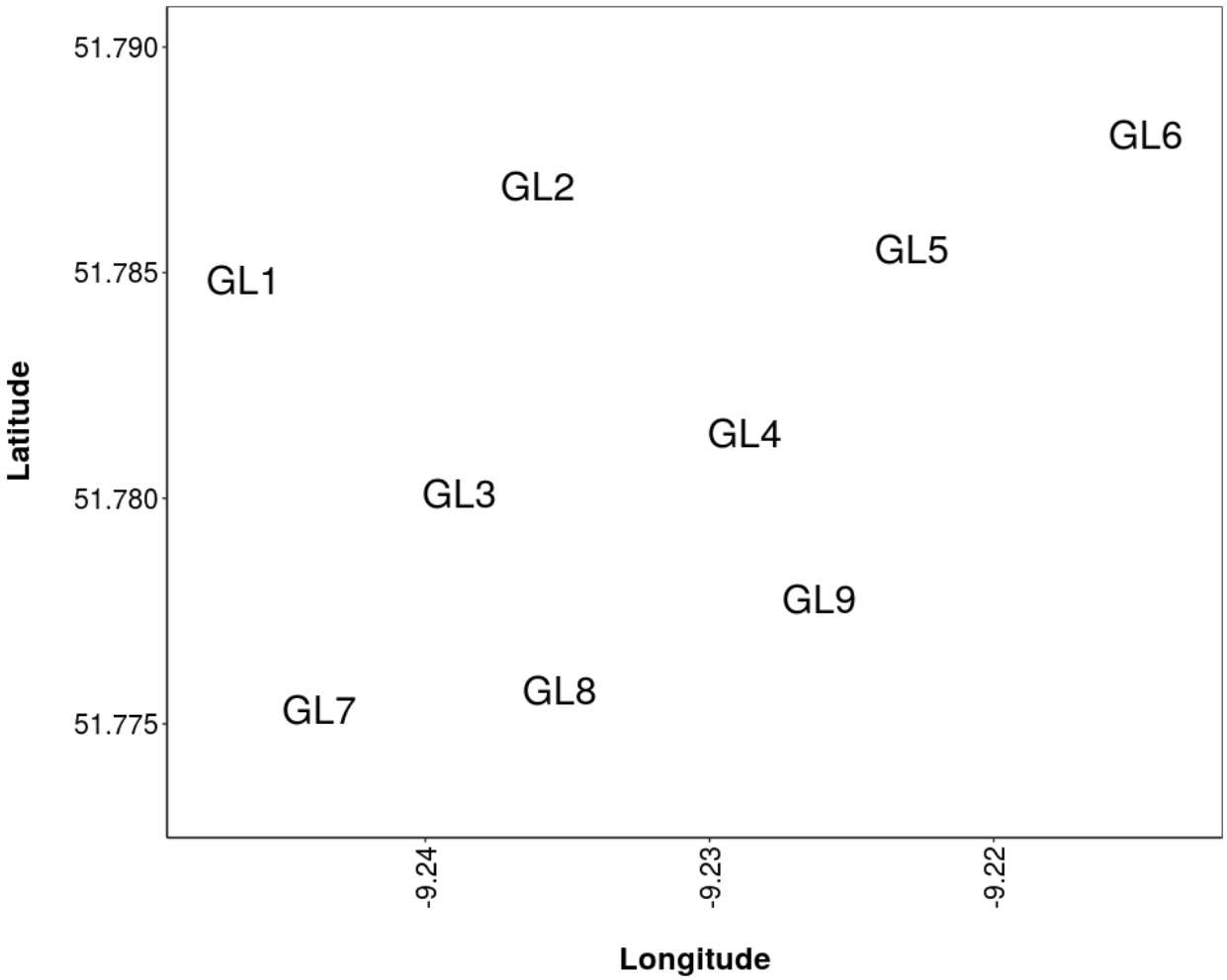
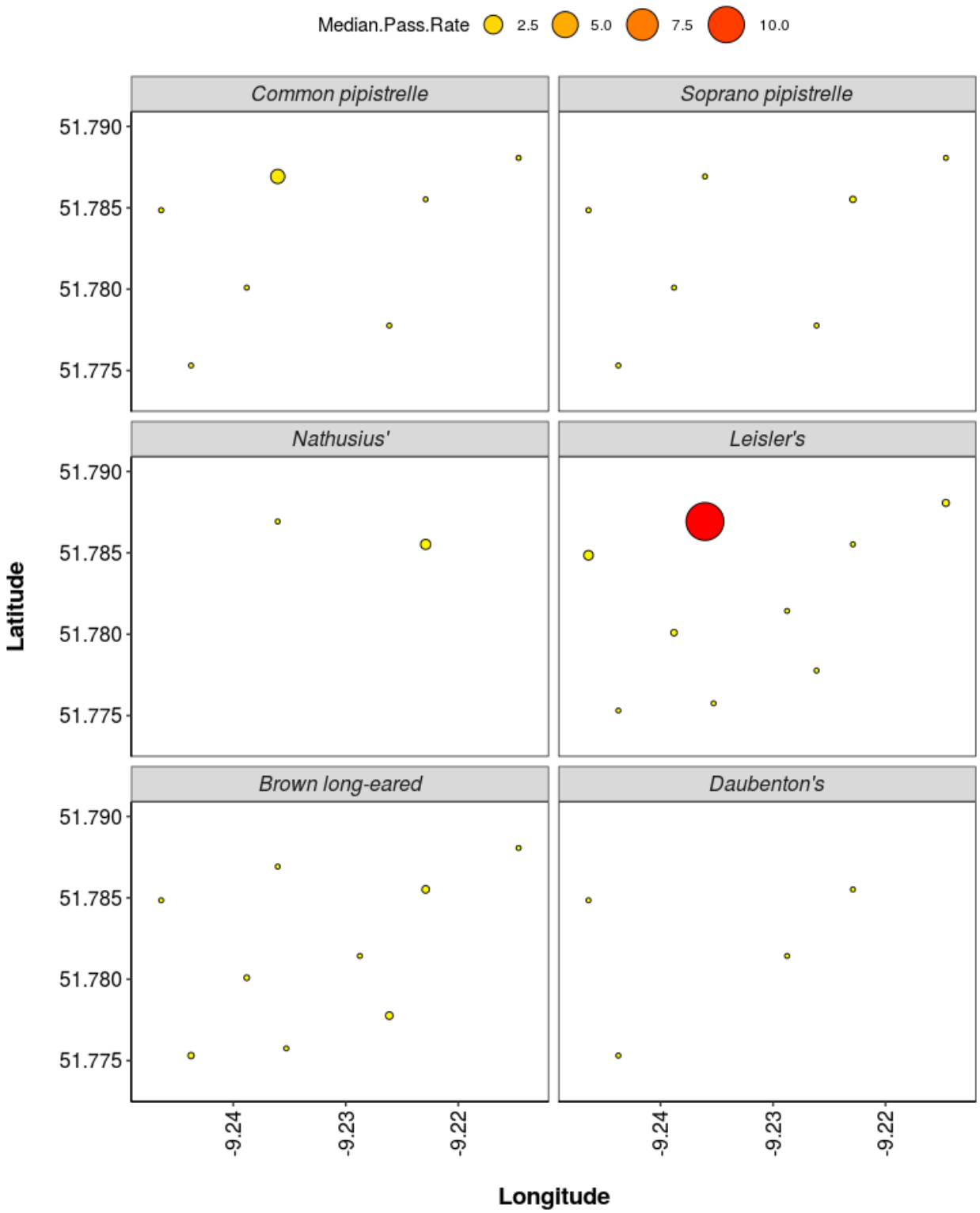


Figure 14. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
2.5
5.0
7.5
10.0
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

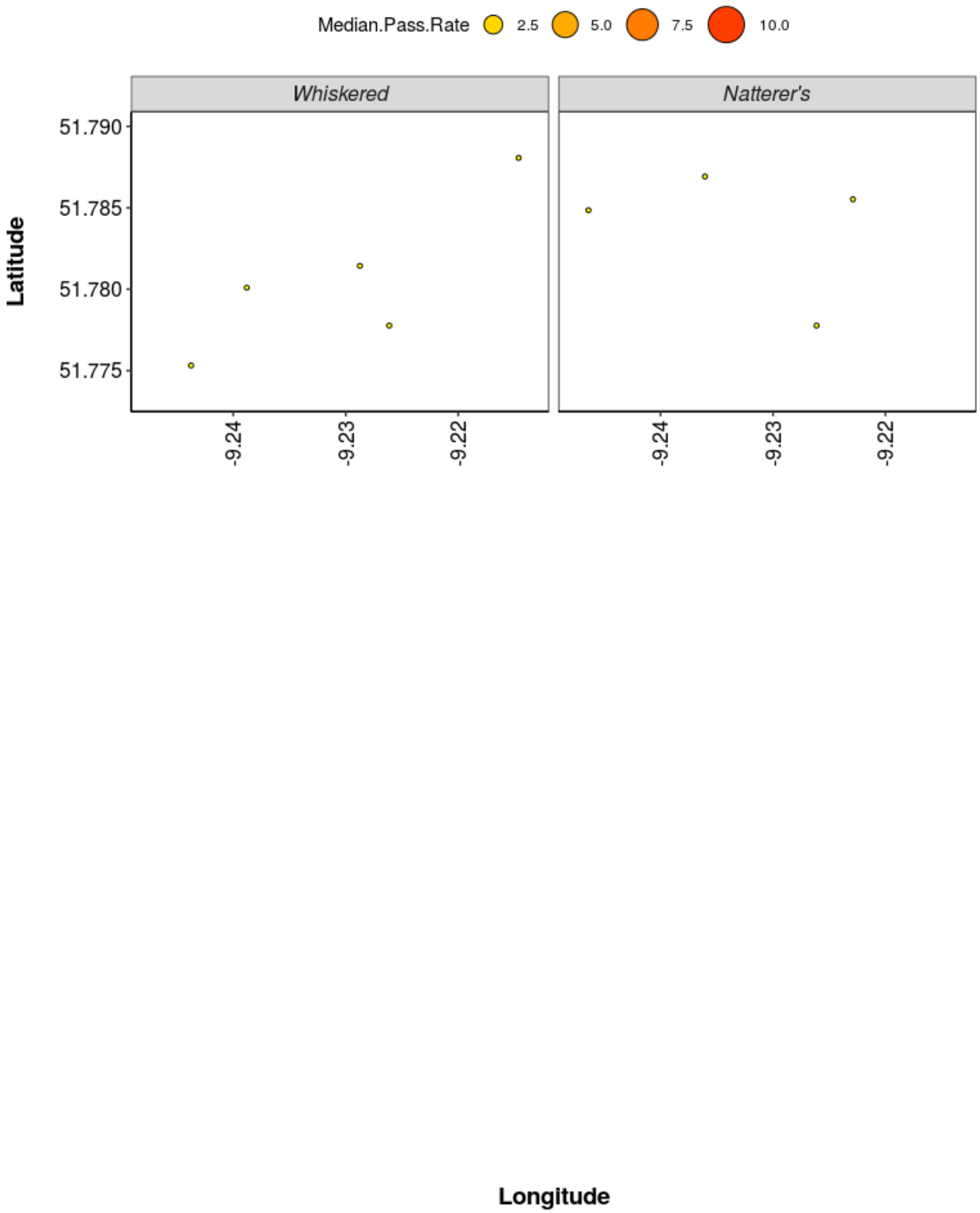
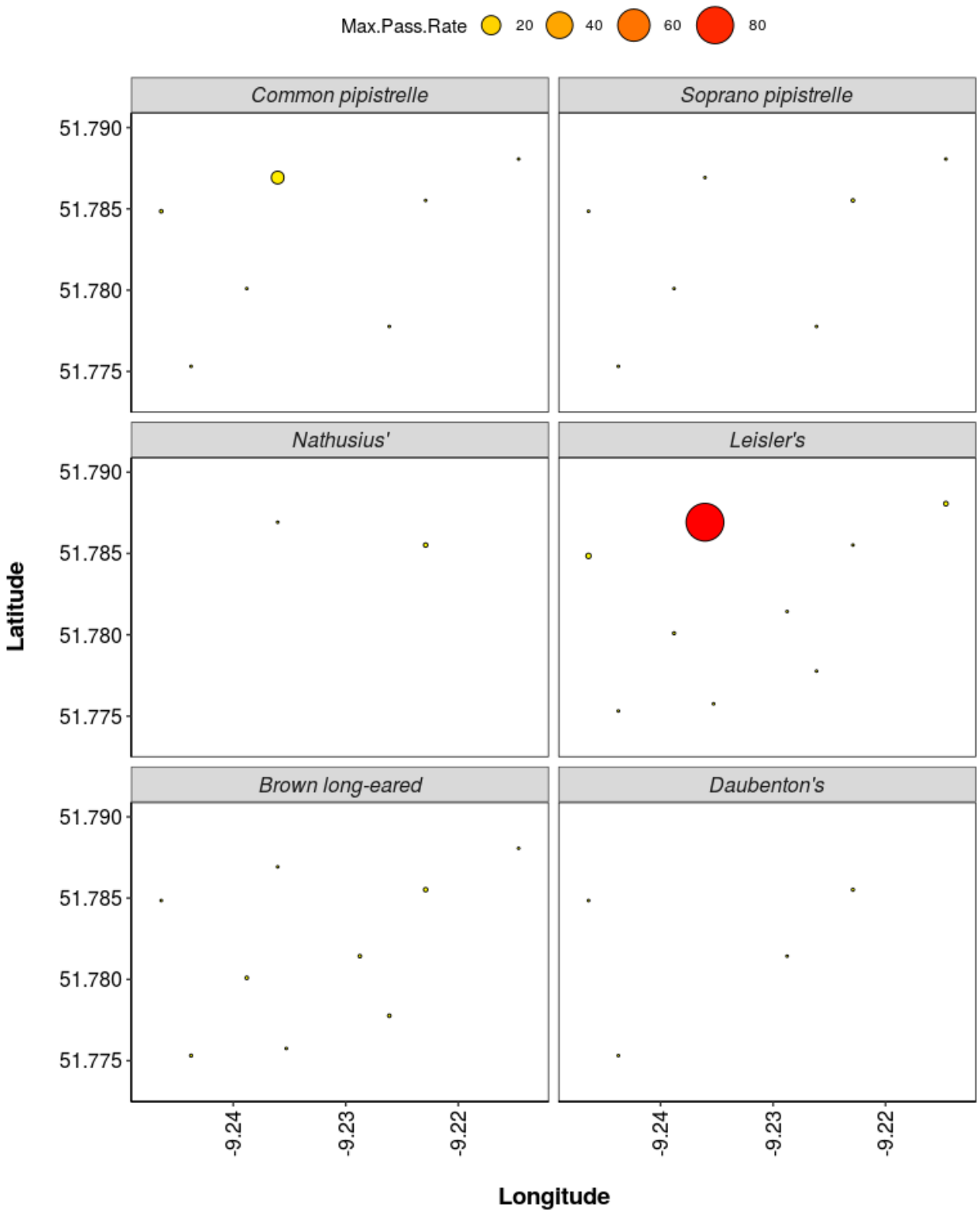
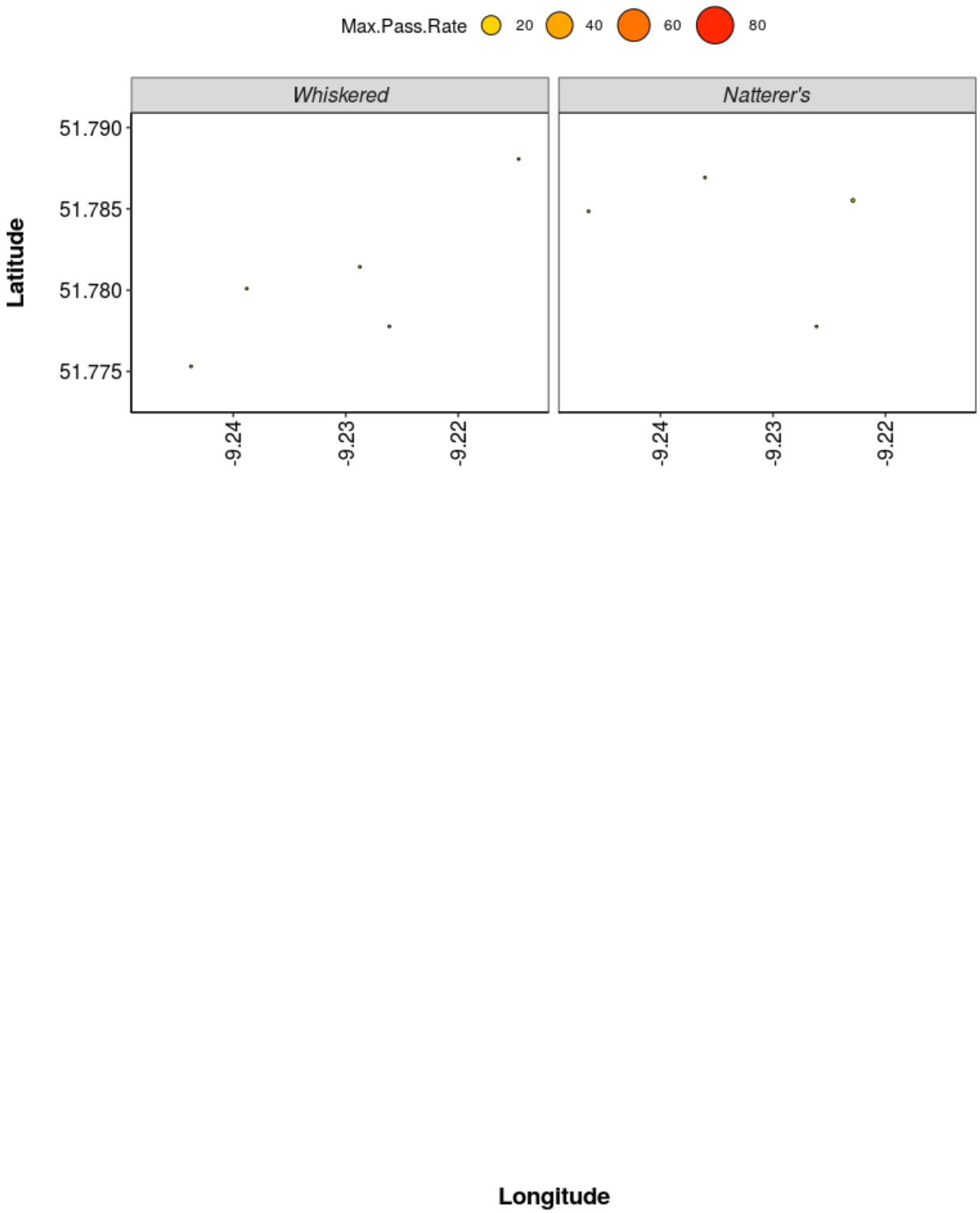

Median.Pass.Rate
2.5
5.0
7.5
10.0
Whiskered
Natterer's
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
20
40
60
80
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude


Max.Pass.Rate
20
40
60
80
Whiskered
Natterer's
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
-9.24
-9.23
-9.22
Longitude

PART 2B: Includes absences

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

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Brown long-eared	GL1	0.0
Brown long-eared	GL2	0.0
Brown long-eared	GL3	0.1
Brown long-eared	GL4	0.1
Brown long-eared	GL5	0.3
Brown long-eared	GL6	0.0
Brown long-eared	GL7	0.0
Brown long-eared	GL8	0.1
Brown long-eared	GL9	0.0
Common pipistrelle	GL1	0.1
Common pipistrelle	GL2	0.5
Common pipistrelle	GL3	0.0
Common pipistrelle	GL4	0.0
Common pipistrelle	GL5	0.0
Common pipistrelle	GL6	0.0
Common pipistrelle	GL7	0.0
Common pipistrelle	GL8	0.0
Common pipistrelle	GL9	0.0
Daubenton's	GL1	0.0
Daubenton's	GL2	0.0
Daubenton's	GL3	0.0
Daubenton's	GL4	0.0
Daubenton's	GL5	0.1

Daubenton’s	GL6	0.0
Daubenton’s	GL7	0.0
Daubenton’s	GL8	0.0
Daubenton’s	GL9	0.0
Leisler’s	GL1	0.1
Leisler’s	GL2	9.2
Leisler’s	GL3	0.0
Leisler’s	GL4	0.0
Leisler’s	GL5	0.0
Leisler’s	GL6	0.2
Leisler’s	GL7	0.0
Leisler’s	GL8	0.1
Leisler’s	GL9	0.0
Nathusius’	GL1	0.0
Nathusius’	GL2	0.0
Nathusius’	GL3	0.0
Nathusius’	GL4	0.0
Nathusius’	GL5	0.0
Nathusius’	GL6	0.0
Nathusius’	GL7	0.0
Nathusius’	GL8	0.0
Nathusius’	GL9	0.0
Natterer’s	GL1	0.0
Natterer’s	GL2	0.0
Natterer’s	GL3	0.0
Natterer’s	GL4	0.0
Natterer’s	GL5	0.0
Natterer’s	GL6	0.0
Natterer’s	GL7	0.0
Natterer’s	GL8	0.0
Natterer’s	GL9	0.0
Soprano pipistrelle	GL1	0.0
Soprano pipistrelle	GL2	0.0
Soprano pipistrelle	GL3	0.0
Soprano pipistrelle	GL4	0.0
Soprano pipistrelle	GL5	0.0

Soprano pipistrelle	GL6	0.0
Soprano pipistrelle	GL7	0.0
Soprano pipistrelle	GL8	0.0
Soprano pipistrelle	GL9	0.0
Whiskered	GL1	0.0
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

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

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

Species	Detector ID	Mean Pass Rate
Brown long-eared	GL1	0.0
Brown long-eared	GL2	0.0
Brown long-eared	GL3	0.1
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.3
Brown long-eared	GL6	0.0
Brown long-eared	GL7	0.1
Brown long-eared	GL8	0.1
Brown long-eared	GL9	0.1
Common pipistrelle	GL1	0.1
Common pipistrelle	GL2	1.9
Common pipistrelle	GL3	0.0
Common pipistrelle	GL4	0.0
Common pipistrelle	GL5	0.0
Common pipistrelle	GL6	0.0
Common pipistrelle	GL7	0.0
Common pipistrelle	GL8	0.0
Common pipistrelle	GL9	0.0
Daubenton's	GL1	0.0
Daubenton's	GL2	0.0
Daubenton's	GL3	0.0
Daubenton's	GL4	0.0
Daubenton's	GL5	0.1
Daubenton's	GL6	0.0
Daubenton's	GL7	0.0
Daubenton's	GL8	0.0

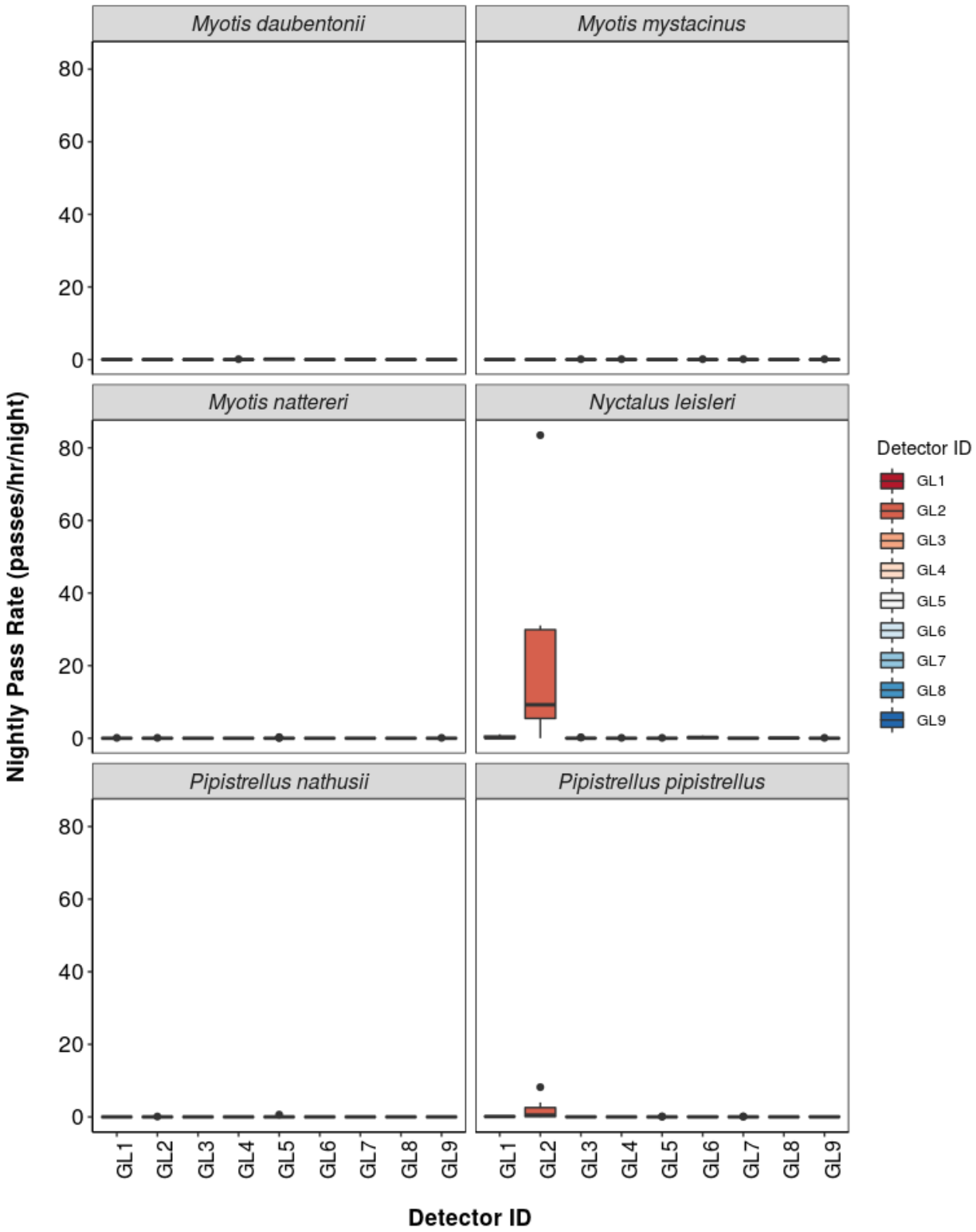
Daubenton's	GL9	0.0
Leisler's	GL1	0.4
Leisler's	GL2	21.4
Leisler's	GL3	0.0
Leisler's	GL4	0.0
Leisler's	GL5	0.0
Leisler's	GL6	0.2
Leisler's	GL7	0.0
Leisler's	GL8	0.1
Leisler's	GL9	0.0
Nathusius'	GL1	0.0
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.1
Nathusius'	GL6	0.0
Nathusius'	GL7	0.0
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.0
Natterer's	GL2	0.0
Natterer's	GL3	0.0
Natterer's	GL4	0.0
Natterer's	GL5	0.0
Natterer's	GL6	0.0
Natterer's	GL7	0.0
Natterer's	GL8	0.0
Natterer's	GL9	0.0
Soprano pipistrelle	GL1	0.0
Soprano pipistrelle	GL2	0.0
Soprano pipistrelle	GL3	0.0
Soprano pipistrelle	GL4	0.0
Soprano pipistrelle	GL5	0.0
Soprano pipistrelle	GL6	0.0
Soprano pipistrelle	GL7	0.0
Soprano pipistrelle	GL8	0.0

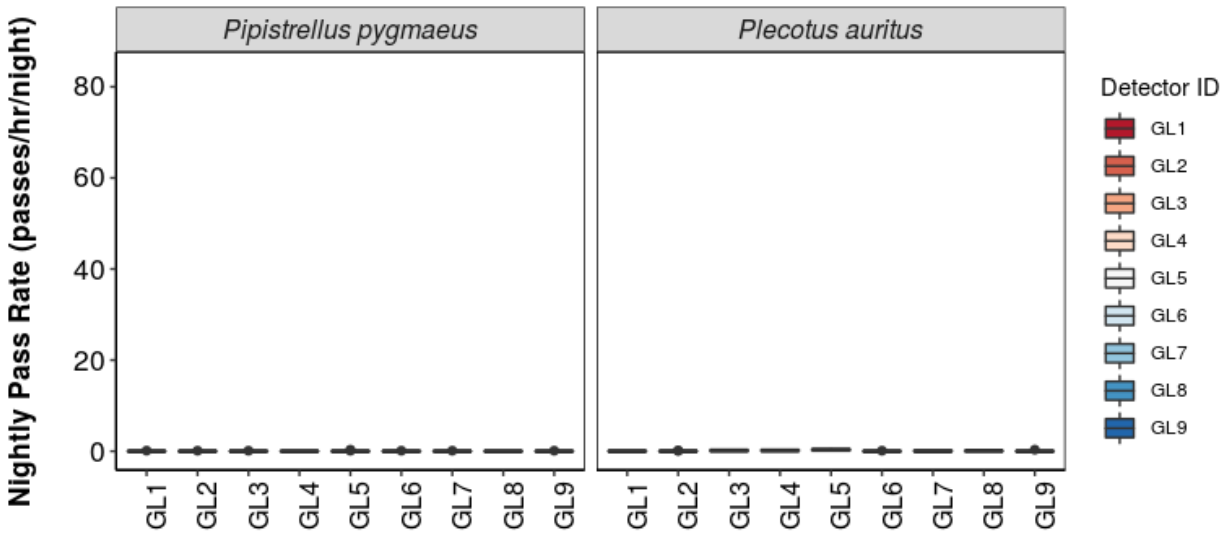
Soprano pipistrelle	GL9	0.0
Whiskered	GL1	0.0
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
20
40
60
80
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
80
60
40
20
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9

Detector ID

Survey Effort

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

Month	Detector ID	No of Survey Nights
Apr	GL1	1
Apr	GL2	5
Apr	GL3	9
Apr	GL4	7
Apr	GL5	9
Apr	GL6	7
Apr	GL7	5
Apr	GL8	2
Apr	GL9	4
May	GL1	6
May	GL2	3
May	GL3	2
May	GL4	2
May	GL5	3
May	GL6	2
May	GL7	3
May	GL9	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	Apr	May
Brown long-eared	GL1	0.1	0.0
Brown long-eared	GL2	0.0	0.0
Brown long-eared	GL3	0.1	0.3
Brown long-eared	GL4	0.1	0.2
Brown long-eared	GL5	0.3	0.0
Brown long-eared	GL6	0.0	0.0
Brown long-eared	GL7	0.0	0.0
Brown long-eared	GL8	0.1	NA
Brown long-eared	GL9	0.0	0.3
Common pipistrelle	GL1	0.3	0.1
Common pipistrelle	GL2	0.7	0.3
Common pipistrelle	GL3	0.0	0.1
Common pipistrelle	GL4	0.0	0.0
Common pipistrelle	GL5	0.0	0.0
Common pipistrelle	GL6	0.0	0.1
Common pipistrelle	GL7	0.0	0.1
Common pipistrelle	GL8	0.0	NA
Common pipistrelle	GL9	0.0	0.1
Daubenton's	GL1	0.1	0.0
Daubenton's	GL2	0.0	0.0
Daubenton's	GL3	0.0	0.0
Daubenton's	GL4	0.0	0.0
Daubenton's	GL5	0.1	0.0

Daubenton’s	GL6	0.0	0.0
Daubenton’s	GL7	0.0	0.1
Daubenton’s	GL8	0.0	NA
Daubenton’s	GL9	0.0	0.0
Leisler’s	GL1	1.1	0.1
Leisler’s	GL2	29.5	6.4
Leisler’s	GL3	0.0	0.0
Leisler’s	GL4	0.0	0.0
Leisler’s	GL5	0.0	0.0
Leisler’s	GL6	0.2	0.2
Leisler’s	GL7	0.1	0.0
Leisler’s	GL8	0.1	NA
Leisler’s	GL9	0.0	0.0
Nathusius’	GL1	0.0	0.0
Nathusius’	GL2	0.0	0.0
Nathusius’	GL3	0.0	0.0
Nathusius’	GL4	0.0	0.0
Nathusius’	GL5	0.0	0.0
Nathusius’	GL6	0.0	0.0
Nathusius’	GL7	0.0	0.0
Nathusius’	GL8	0.0	NA
Nathusius’	GL9	0.0	0.0
Natterer’s	GL1	0.1	0.0
Natterer’s	GL2	0.0	0.0
Natterer’s	GL3	0.0	0.0
Natterer’s	GL4	0.0	0.0
Natterer’s	GL5	0.0	0.0
Natterer’s	GL6	0.0	0.0
Natterer’s	GL7	0.0	0.0
Natterer’s	GL8	0.0	NA
Natterer’s	GL9	0.0	0.0
Soprano pipistrelle	GL1	0.0	0.0
Soprano pipistrelle	GL2	0.0	0.0
Soprano pipistrelle	GL3	0.0	0.0
Soprano pipistrelle	GL4	0.0	0.0
Soprano pipistrelle	GL5	0.0	0.0

Soprano pipistrelle	GL6	0.0	0.0
Soprano pipistrelle	GL7	0.0	0.0
Soprano pipistrelle	GL8	0.0	NA
Soprano pipistrelle	GL9	0.0	0.1
Whiskered	GL1	0.0	0.0
Whiskered	GL2	0.0	0.0
Whiskered	GL3	0.0	0.0
Whiskered	GL4	0.0	0.0
Whiskered	GL5	0.0	0.0
Whiskered	GL6	0.0	0.1
Whiskered	GL7	0.0	0.0
Whiskered	GL8	0.0	NA
Whiskered	GL9	0.0	0.0

Nightly Bat Pass Rate for each Month

Mean per Detector

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

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

Species	Detector ID	Apr	May
Brown long-eared	GL1	0.1	0.0
Brown long-eared	GL2	0.0	0.0
Brown long-eared	GL3	0.1	0.3
Brown long-eared	GL4	0.2	0.2
Brown long-eared	GL5	0.3	0.2
Brown long-eared	GL6	0.0	0.0
Brown long-eared	GL7	0.1	0.0
Brown long-eared	GL8	0.1	NA
Brown long-eared	GL9	0.0	0.3
Common pipistrelle	GL1	0.3	0.1
Common pipistrelle	GL2	2.6	0.8
Common pipistrelle	GL3	0.0	0.1
Common pipistrelle	GL4	0.0	0.0
Common pipistrelle	GL5	0.0	0.0
Common pipistrelle	GL6	0.0	0.1
Common pipistrelle	GL7	0.0	0.1
Common pipistrelle	GL8	0.0	NA
Common pipistrelle	GL9	0.0	0.1
Daubenton's	GL1	0.1	0.0
Daubenton's	GL2	0.0	0.0
Daubenton's	GL3	0.0	0.0
Daubenton's	GL4	0.0	0.0
Daubenton's	GL5	0.1	0.0
Daubenton's	GL6	0.0	0.0
Daubenton's	GL7	0.0	0.1
Daubenton's	GL8	0.0	NA

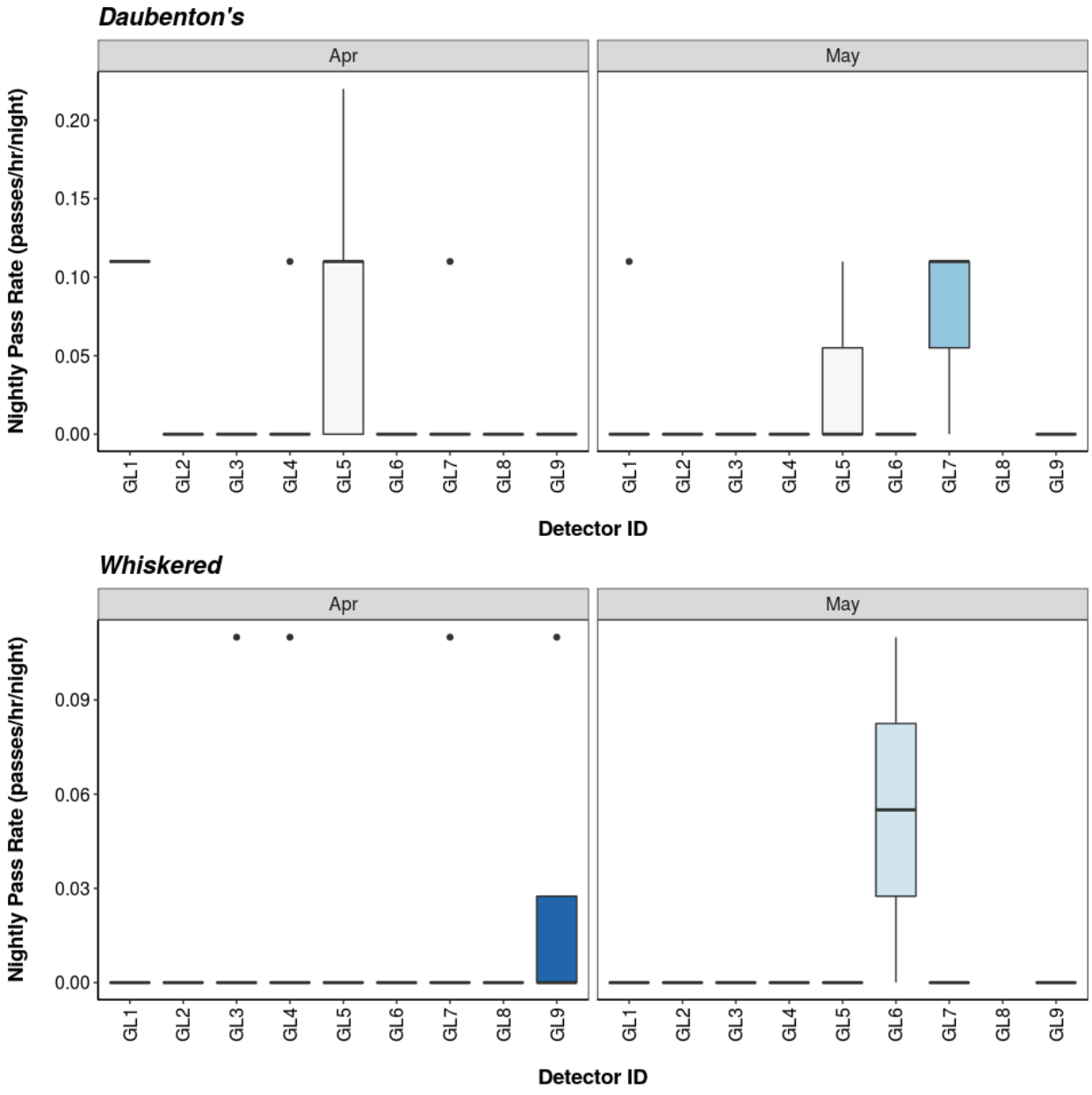
Daubenton's	GL9	0.0	0.0
Leisler's	GL1	1.1	0.2
Leisler's	GL2	31.5	4.6
Leisler's	GL3	0.1	0.0
Leisler's	GL4	0.0	0.0
Leisler's	GL5	0.0	0.0
Leisler's	GL6	0.3	0.2
Leisler's	GL7	0.1	0.0
Leisler's	GL8	0.1	NA
Leisler's	GL9	0.0	0.0
Nathusius'	GL1	0.0	0.0
Nathusius'	GL2	0.0	0.0
Nathusius'	GL3	0.0	0.0
Nathusius'	GL4	0.0	0.0
Nathusius'	GL5	0.1	0.0
Nathusius'	GL6	0.0	0.0
Nathusius'	GL7	0.0	0.0
Nathusius'	GL8	0.0	NA
Nathusius'	GL9	0.0	0.0
Natterer's	GL1	0.1	0.0
Natterer's	GL2	0.0	0.0
Natterer's	GL3	0.0	0.0
Natterer's	GL4	0.0	0.0
Natterer's	GL5	0.0	0.0
Natterer's	GL6	0.0	0.0
Natterer's	GL7	0.0	0.0
Natterer's	GL8	0.0	NA
Natterer's	GL9	0.0	0.0
Soprano pipistrelle	GL1	0.0	0.0
Soprano pipistrelle	GL2	0.0	0.0
Soprano pipistrelle	GL3	0.0	0.0
Soprano pipistrelle	GL4	0.0	0.0
Soprano pipistrelle	GL5	0.0	0.0
Soprano pipistrelle	GL6	0.0	0.0
Soprano pipistrelle	GL7	0.0	0.0
Soprano pipistrelle	GL8	0.0	NA

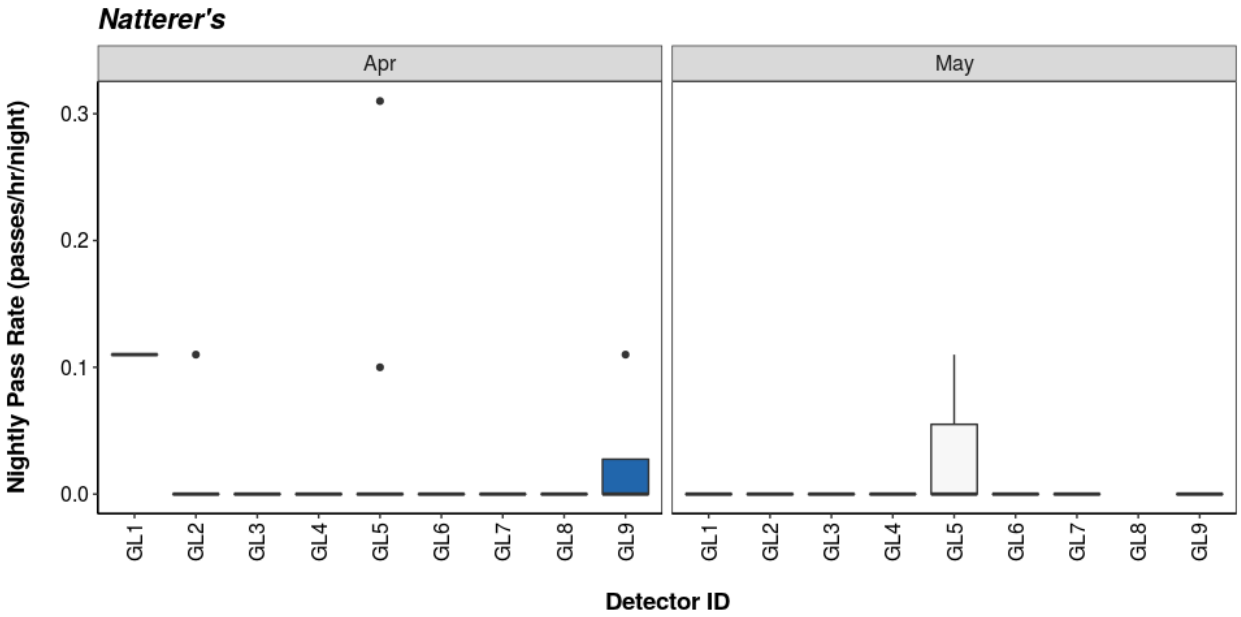
Soprano pipistrelle	GL9	0.0	0.1
Whiskered	GL1	0.0	0.0
Whiskered	GL2	0.0	0.0
Whiskered	GL3	0.0	0.0
Whiskered	GL4	0.0	0.0
Whiskered	GL5	0.0	0.0
Whiskered	GL6	0.0	0.1
Whiskered	GL7	0.0	0.0
Whiskered	GL8	0.0	NA
Whiskered	GL9	0.0	0.0

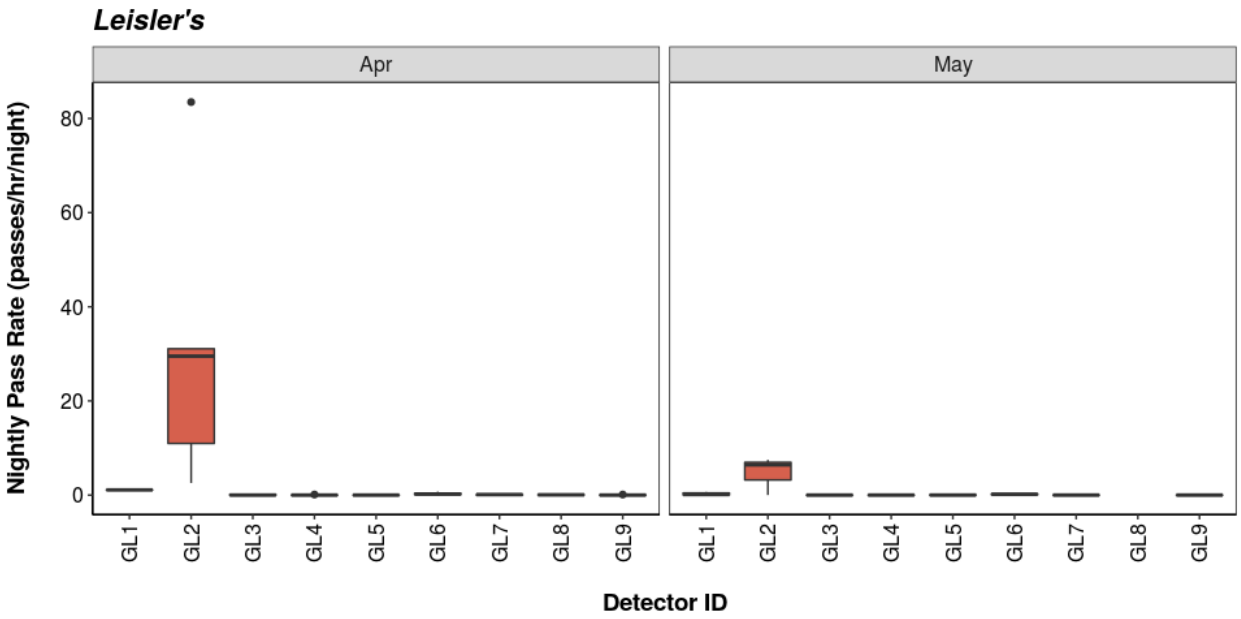
Nightly Bat Pass Rate for each Month

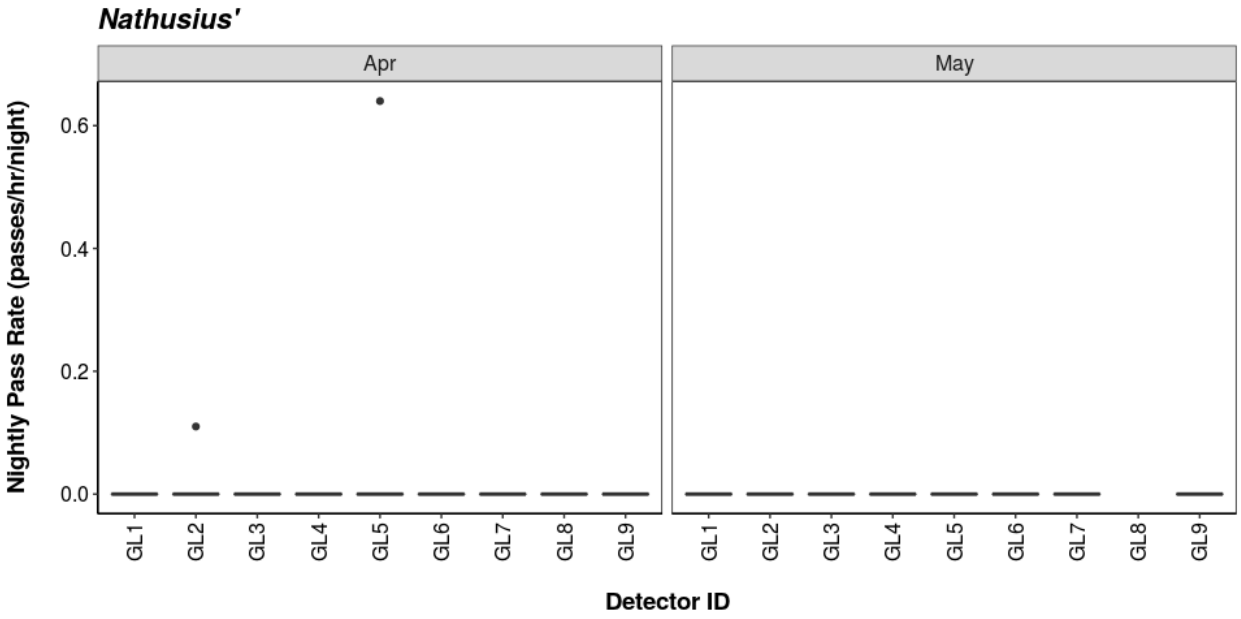
Per Detector - Figures

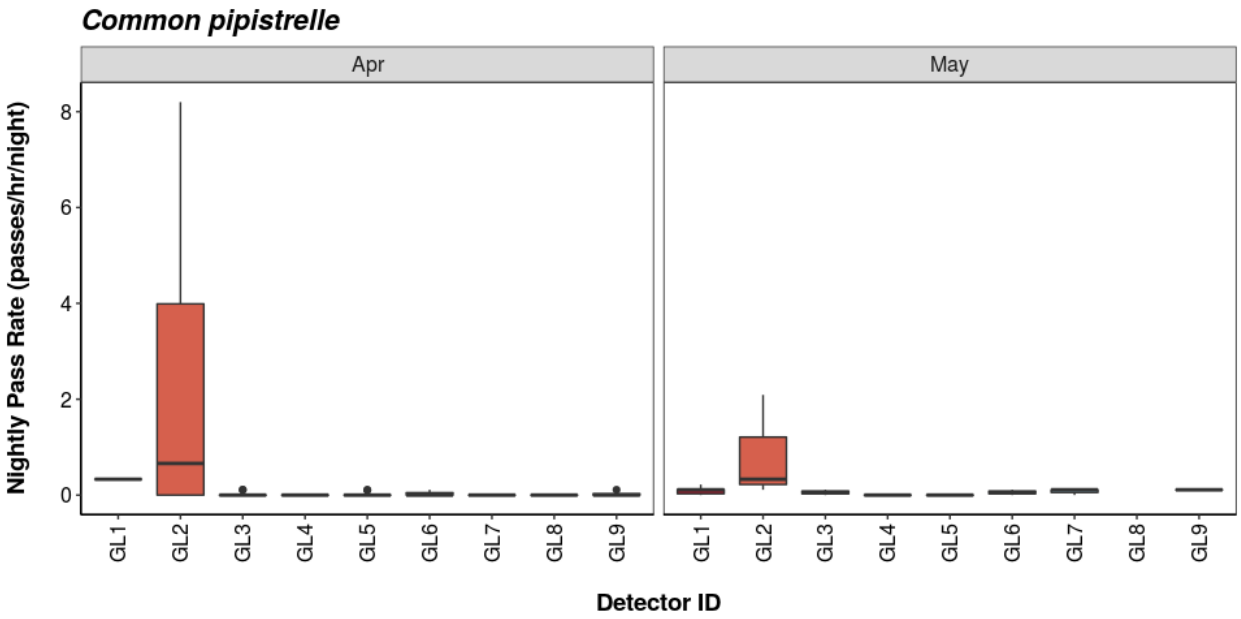
Figure 17. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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

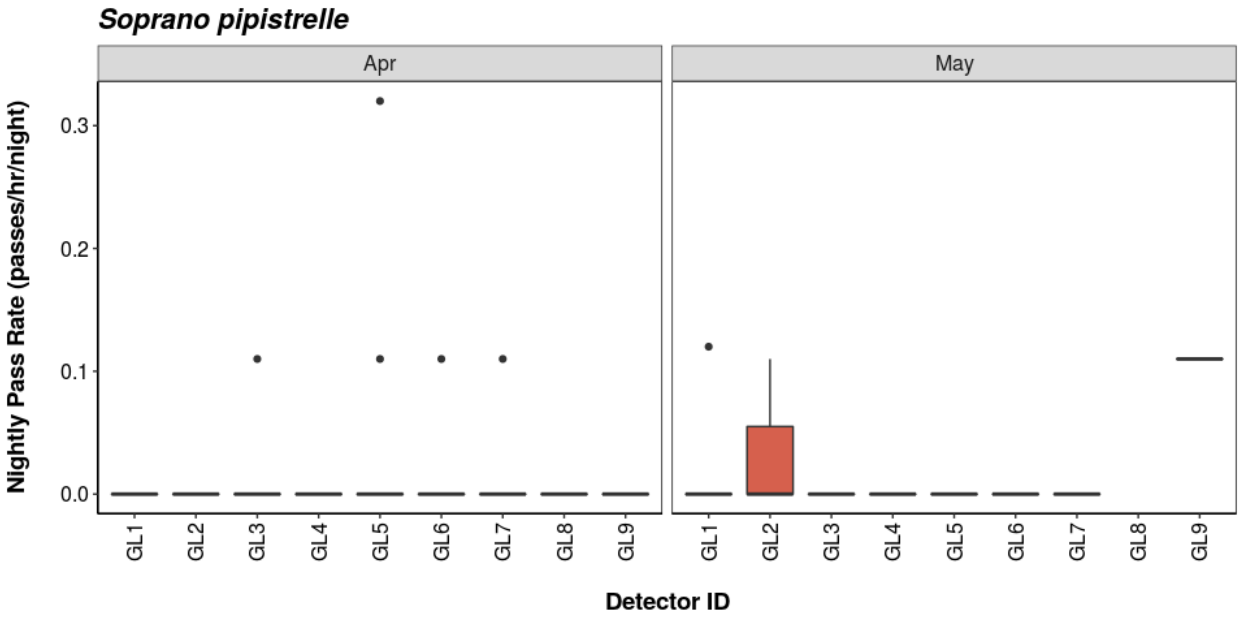


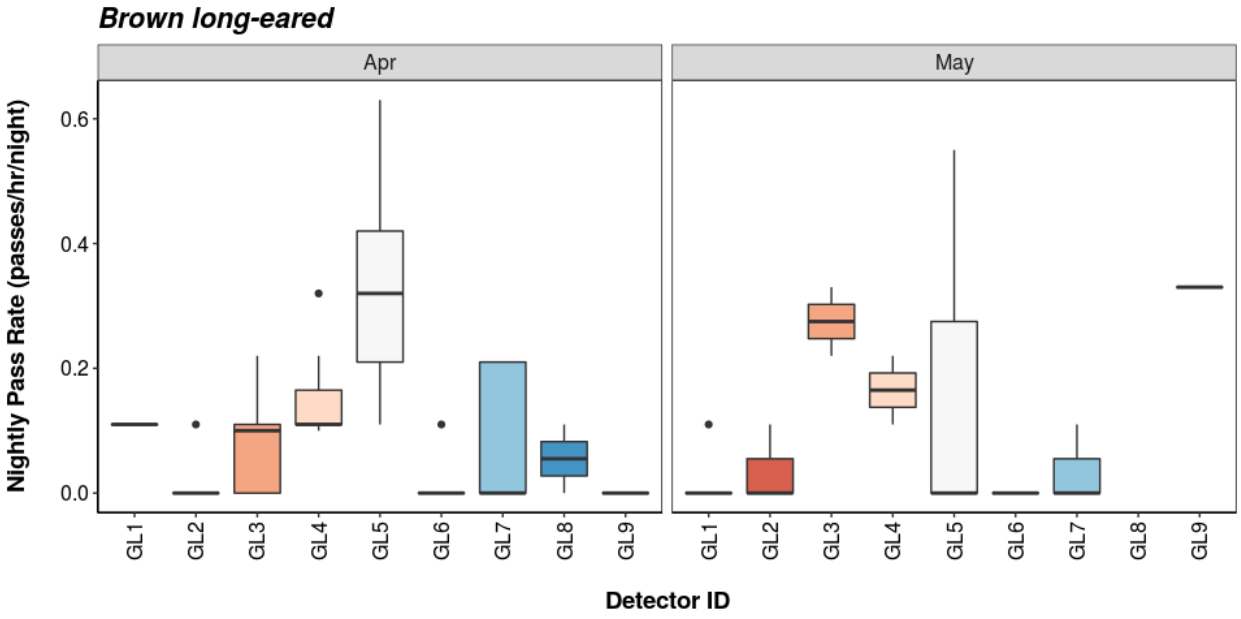

Natterer's
Apr
May
Nightly Pass Rate (passes/hr/night)
0.3
0.2
0.1
0.0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Leisler's
Apr
May
Nightly Pass Rate (passes/hr/night)
80
60
40
20
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Nathusius'
Apr
May
Nightly Pass Rate (passes/hr/night)
0.0
0.2
0.4
0.6
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Common pipistrelle
Apr
May
Nightly Pass Rate (passes/hr/night)
0
2
4
6
8
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Soprano pipistrelle
Apr
May
Nightly Pass Rate (passes/hr/night)
0.0
0.1
0.2
0.3
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Brown long-eared
Apr
May
Nightly Pass Rate (passes/hr/night)
0.0
0.2
0.4
0.6
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

Bat Activity per Detector Location

Figure 18. Detector ID reference:

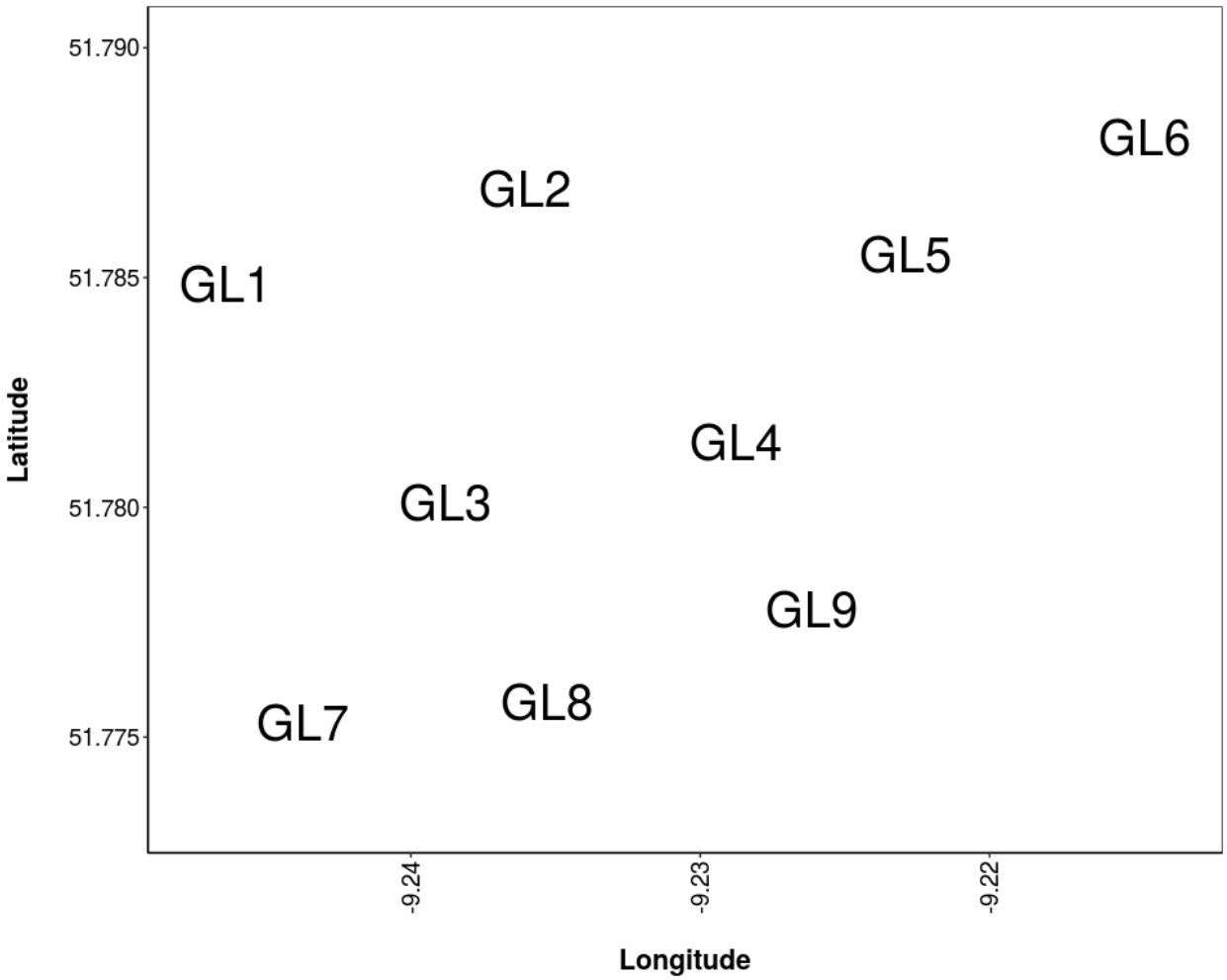
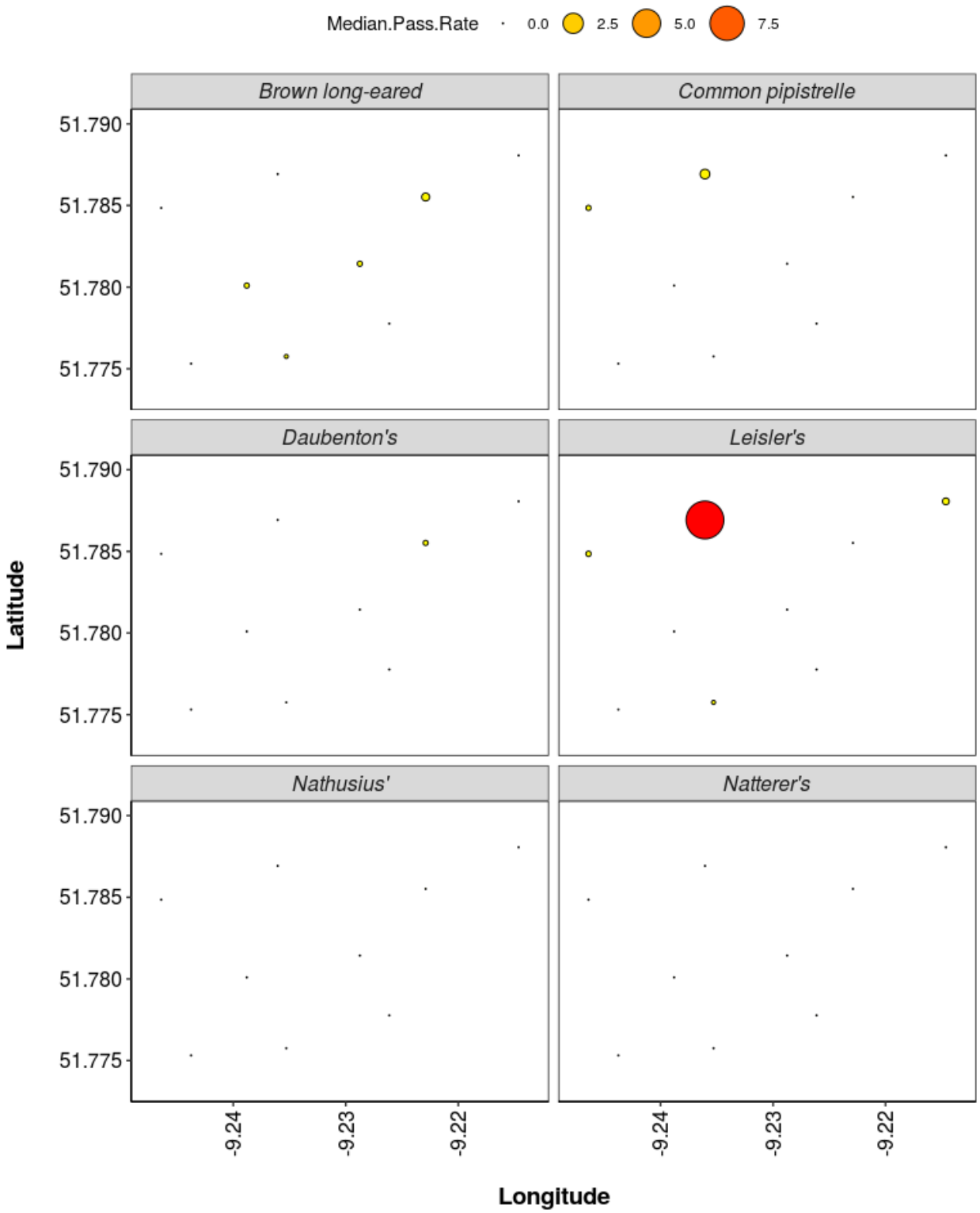


Figure 19. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
0.0
2.5
5.0
7.5
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Nathusius'
Natterer's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

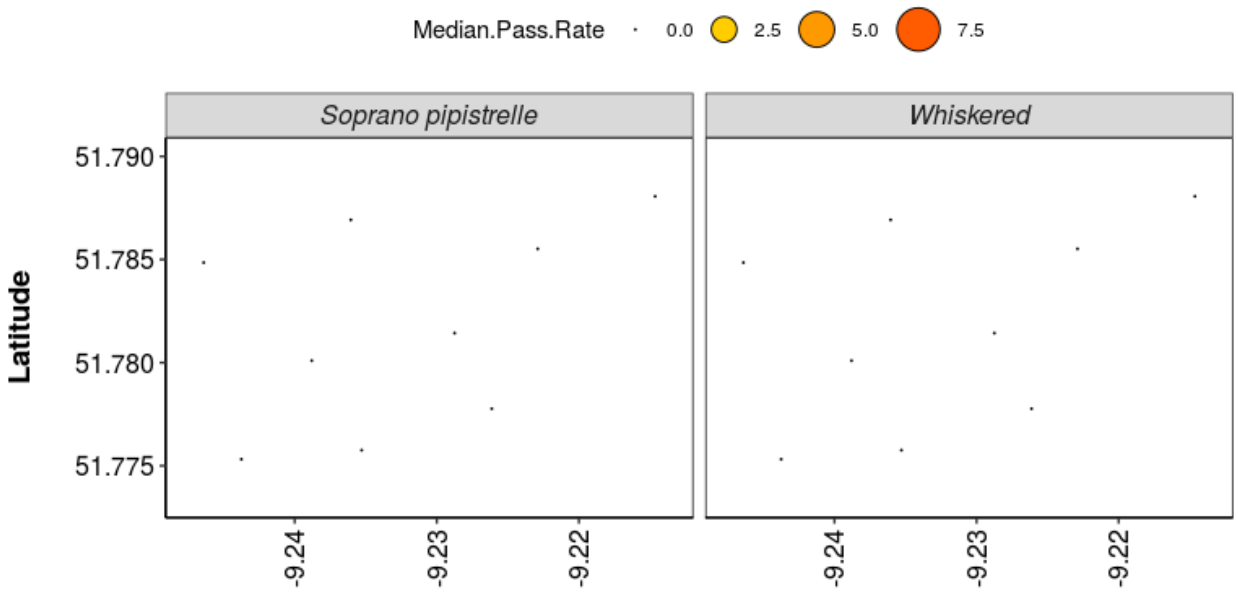
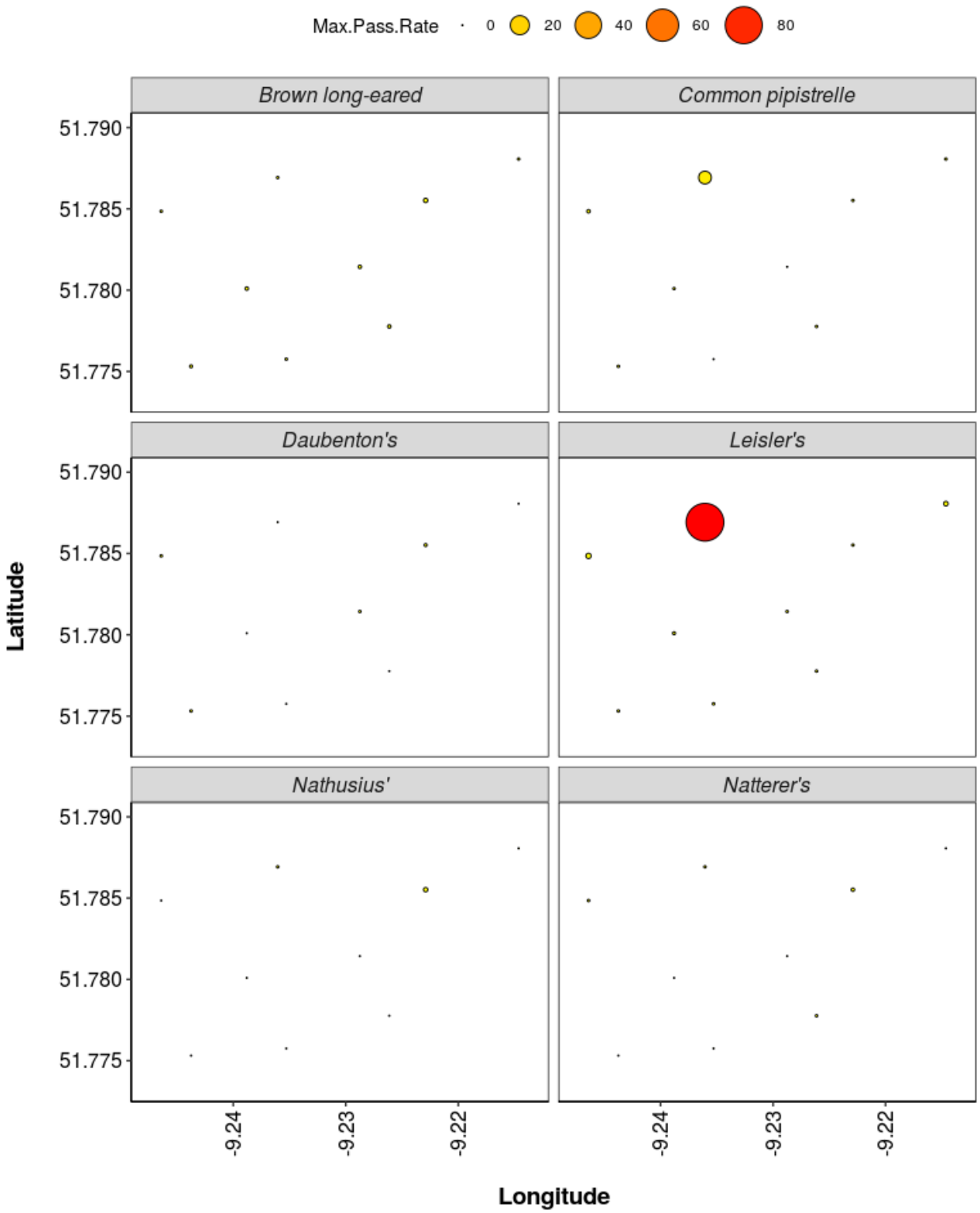
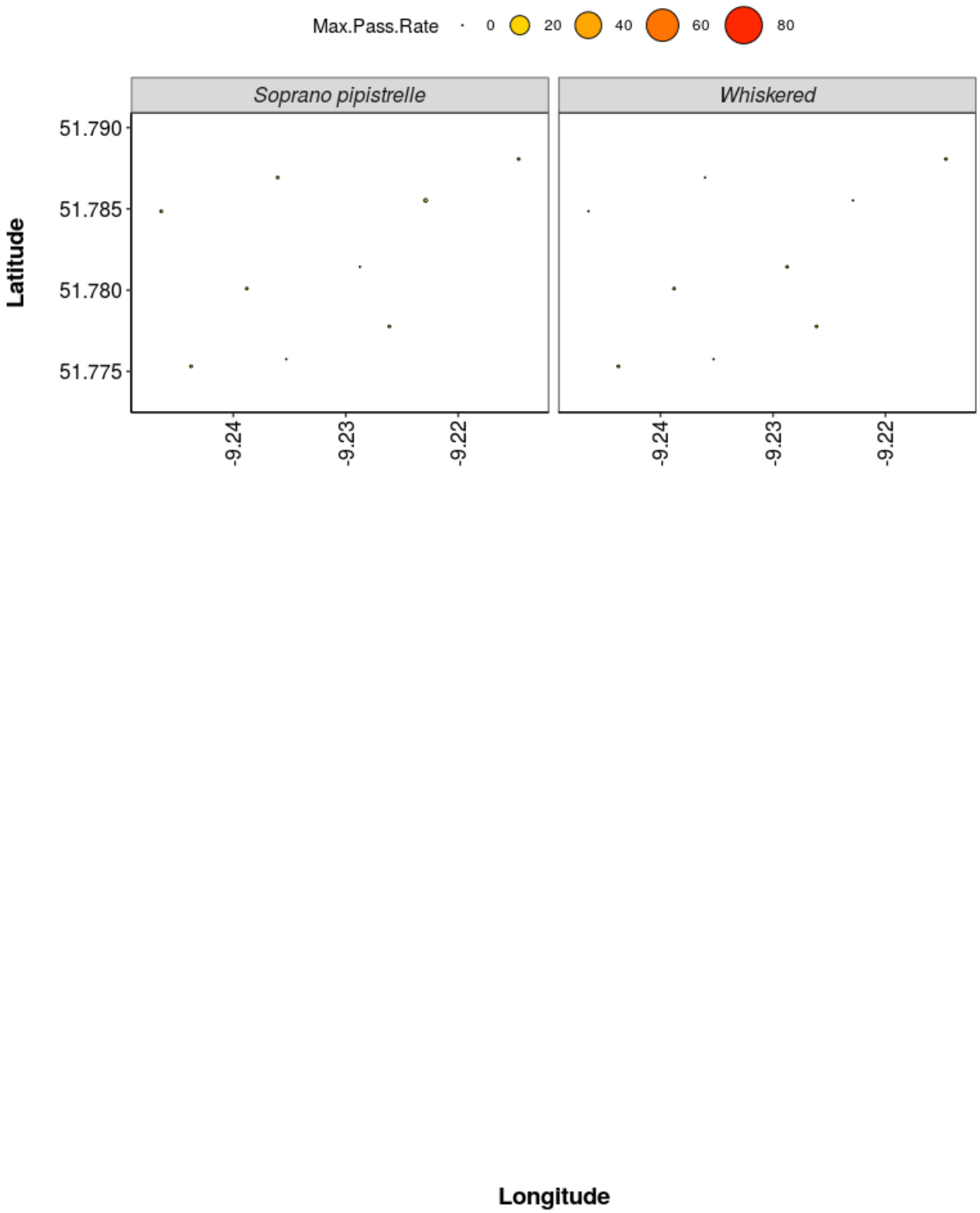

Median.Pass.Rate
0.0
2.5
5.0
7.5
Soprano pipistrelle
Whiskered
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
0
20
40
60
80
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Nathusius'
Natterer's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude



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

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: Gortaloughra

Author: Fehily Timoney

24/11/2021

Summary

Bats were detected on **11** nights between **2021-07-08** and **2021-07-18**, using **9** static bat detectors. Throughout this period **8** species were recorded. **Table 1.** Detectors were placed at the following locations:

Detector ID	Latitude	Longitude
GL9	51.77777	-9.226131
GL3	51.78010	-9.238801
GL5	51.78553	-9.222278
GL4	51.78143	-9.228751
GL1	51.78485	-9.246411
GL2	51.78692	-9.236051
GL8	51.77576	-9.235291
GL7	51.77532	-9.243751
GL6	51.78806	-9.214631

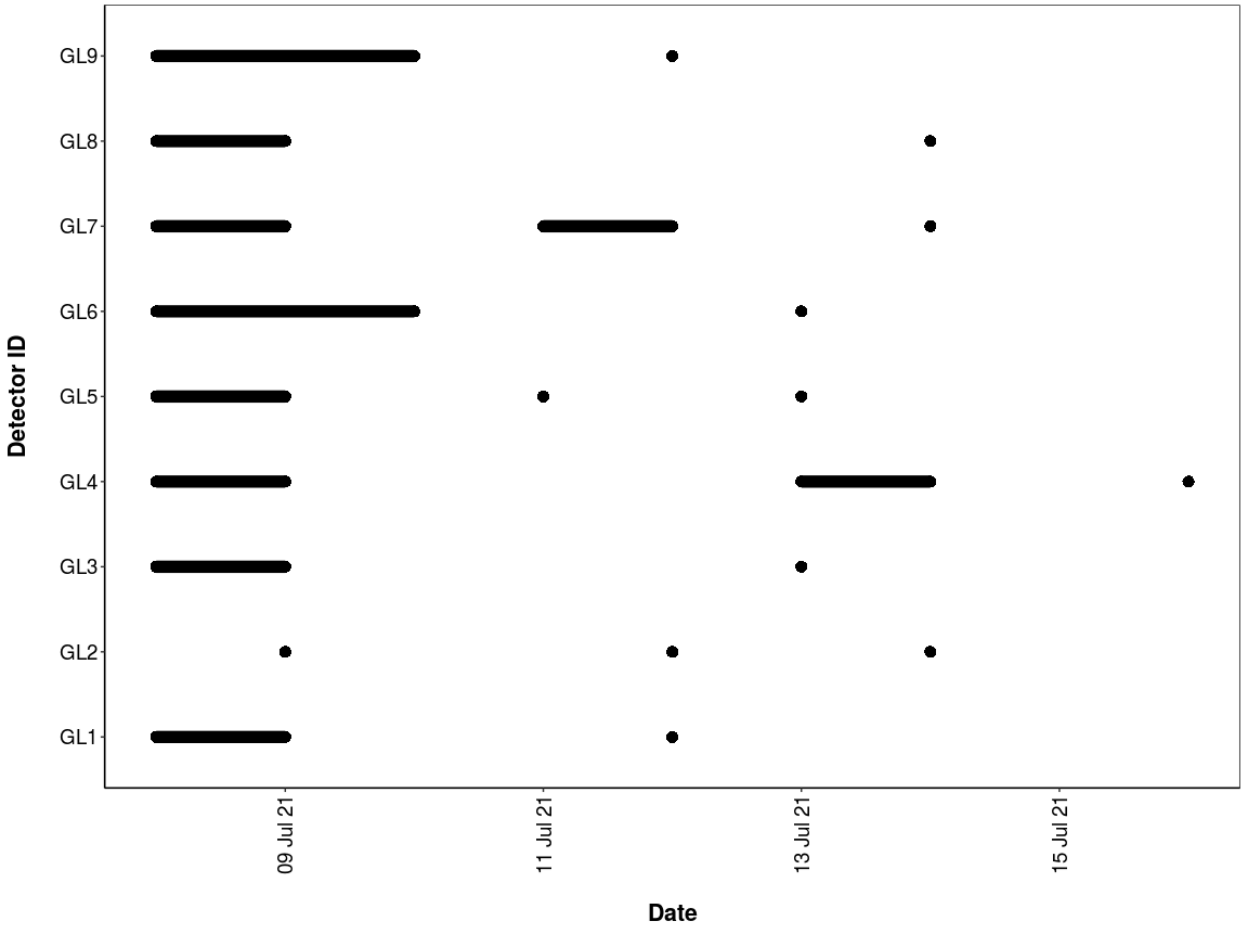
Survey Nights

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
GL1	9
GL2	7
GL3	8
GL4	7
GL5	9
GL6	9
GL7	9
GL8	7
GL9	10

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.
- Records using any make of bat detector.

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
GL1	*Myotis daubentonii*	0	0	0	0	1
GL1	*Myotis nattereri*	0	0	0	0	2
GL1	*Nyctalus leisleri*	2	2	0	2	1
GL1	*Pipistrellus pipistrellus*	0	0	3	0	3
GL1	*Pipistrellus pygmaeus*	0	0	1	2	1
GL1	*Plecotus auritus*	0	0	0	0	2
GL2	*Myotis daubentonii*	0	0	0	1	2
GL2	*Myotis nattereri*	0	0	1	0	1
GL2	*Nyctalus leisleri*	3	1	1	1	0
GL2	*Pipistrellus pipistrellus*	0	0	1	3	0
GL2	*Pipistrellus pygmaeus*	0	0	0	2	0
GL2	*Plecotus auritus*	0	0	0	2	2
GL3	*Myotis daubentonii*	0	0	1	1	2
GL3	*Myotis mystacinus*	0	0	1	0	1
GL3	*Myotis nattereri*	0	0	0	1	3
GL3	*Nyctalus leisleri*	1	2	2	1	0
GL3	*Pipistrellus nathusii*	0	0	0	0	1
GL3	*Pipistrellus pipistrellus*	3	1	1	1	1
GL3	*Pipistrellus pygmaeus*	0	0	4	0	2
GL3	*Plecotus auritus*	0	1	2	0	1

GL4	*Myotis daubentonii*	0	1	0	0	1
GL4	*Myotis mystacinus*	0	0	0	0	1
GL4	*Myotis nattereri*	0	0	0	0	2
GL4	*Nyctalus leisleri*	0	3	1	0	1
GL4	*Pipistrellus nathusii*	0	0	0	1	0
GL4	*Pipistrellus pipistrellus*	2	3	0	0	1
GL4	*Pipistrellus pygmaeus*	0	2	2	1	0
GL4	*Plecotus auritus*	0	0	0	3	3
GL5	*Myotis daubentonii*	0	0	1	3	2
GL5	*Myotis mystacinus*	0	0	1	1	1
GL5	*Myotis nattereri*	0	0	1	1	2
GL5	*Nyctalus leisleri*	0	2	1	1	2
GL5	*Pipistrellus nathusii*	0	0	0	3	2
GL5	*Pipistrellus pipistrellus*	7	0	0	0	0
GL5	*Pipistrellus pygmaeus*	2	2	3	0	0
GL5	*Plecotus auritus*	0	0	1	3	1
GL6	*Myotis daubentonii*	0	0	1	1	0
GL6	*Myotis nattereri*	0	0	0	0	3
GL6	*Nyctalus leisleri*	1	3	0	2	2
GL6	*Pipistrellus nathusii*	0	0	0	0	1
GL6	*Pipistrellus pipistrellus*	2	1	2	2	2
GL6	*Pipistrellus pygmaeus*	0	0	4	1	1
GL6	*Plecotus auritus*	0	0	0	0	2
GL7	*Myotis daubentonii*	0	0	0	2	0

GL7	*Myotis mystacinus*	0	0	0	0	1
GL7	*Myotis nattereri*	0	0	0	0	1
GL7	*Nyctalus leisleri*	2	3	0	0	2
GL7	*Pipistrellus pipistrellus*	2	2	2	0	2
GL7	*Pipistrellus pygmaeus*	0	1	3	1	1
GL7	*Plecotus auritus*	0	0	1	3	2
GL8	*Myotis daubentonii*	0	0	0	2	2
GL8	*Myotis nattereri*	0	0	0	0	1
GL8	*Nyctalus leisleri*	3	2	0	1	1
GL8	*Pipistrellus nathusii*	0	0	0	0	1
GL8	*Pipistrellus pipistrellus*	2	1	2	0	1
GL8	*Pipistrellus pygmaeus*	0	2	1	0	2
GL8	*Plecotus auritus*	0	0	0	2	3
GL9	*Myotis daubentonii*	0	0	1	6	1
GL9	*Myotis mystacinus*	0	0	0	0	3
GL9	*Myotis nattereri*	0	0	0	0	4
GL9	*Nyctalus leisleri*	2	3	1	3	1
GL9	*Pipistrellus nathusii*	0	0	0	0	2
GL9	*Pipistrellus pipistrellus*	3	3	1	0	0
GL9	*Pipistrellus pygmaeus*	0	4	0	3	0
GL9	*Plecotus auritus*	0	0	3	2	4

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.

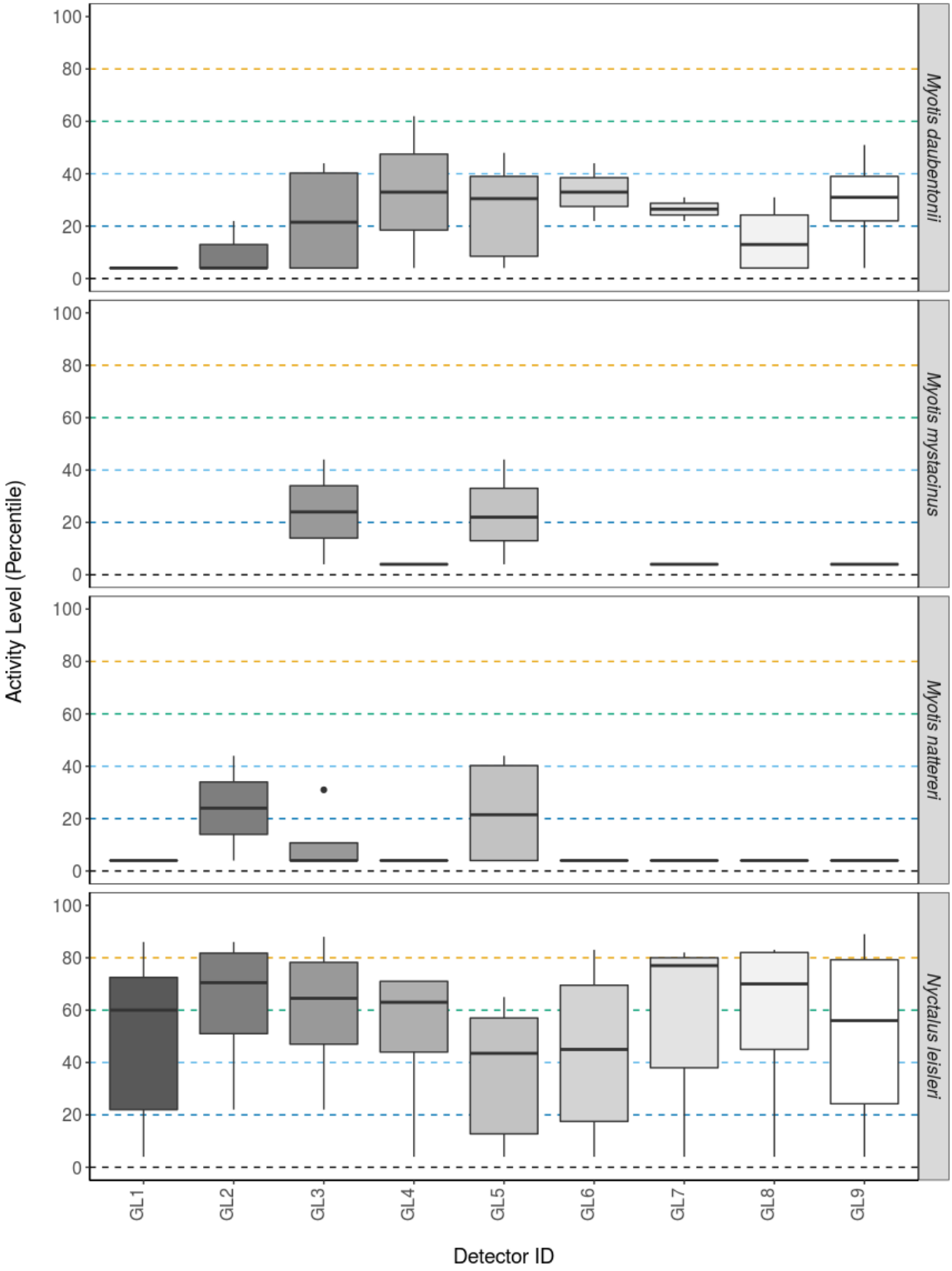
Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
GL1	*Myotis daubentonii*	4	0	4	1	122
GL1	*Myotis nattereri*	4	4 - 4	4	2	91
GL1	*Nyctalus leisleri*	60	13 - 84	86	7	1263
GL1	*Pipistrellus pipistrellus*	24	4 - 48	54	6	1433
GL1	*Pipistrellus pygmaeus*	31	4 - 44	44	4	1189
GL1	*Plecotus auritus*	4	4 - 4	4	2	648
GL2	*Myotis daubentonii*	4	4 - 4	22	3	122
GL2	*Myotis nattereri*	24	24 - 24	44	2	91
GL2	*Nyctalus leisleri*	71	41 - 83.5	86	6	1263
GL2	*Pipistrellus pipistrellus*	22	22 - 22	58	4	1433
GL2	*Pipistrellus pygmaeus*	27	26.5 - 26.5	31	2	1189
GL2	*Plecotus auritus*	13	4 - 22	31	4	648
GL3	*Myotis daubentonii*	22	4 - 39	44	4	122
GL3	*Myotis mystacinus*	24	24 - 24	44	2	48
GL3	*Myotis nattereri*	4	4 - 4	31	4	91
GL3	*Nyctalus leisleri*	65	39 - 80.5	88	6	1263
GL3	*Pipistrellus nathusii*	4	0	4	1	231
GL3	*Pipistrellus pipistrellus*	72	21.5 - 84.5	87	7	1433
GL3	*Pipistrellus pyg maeus*	51	4 - 54	56	6	1189

GL3	*Plecotus auritus*	48	4 - 65	65	4	648
GL4	*Myotis daubentonii*	33	33 - 33	62	2	122
GL4	*Myotis mystacinus*	4	0	4	1	48
GL4	*Myotis nattereri*	4	4 - 4	4	2	91
GL4	*Nyctalus leisleri*	63	33.5 - 71	71	5	1263
GL4	*Pipistrellus nathusii*	22	0	22	1	231
GL4	*Pipistrellus pipistrellus*	78	40.5 - 89	93	6	1433
GL4	*Pipistrellus pygmaeus*	51	41 - 63	67	5	1189
GL4	*Plecotus auritus*	13	4 - 22	31	6	648
GL5	*Myotis daubentonii*	31	4 - 43.5	48	6	122
GL5	*Myotis mystacinus*	22	4 - 44	44	3	48
GL5	*Myotis nattereri*	22	4 - 39	44	4	91
GL5	*Nyctalus leisleri*	44	21.5 - 56.5	65	6	1263
GL5	*Pipistrellus nathusii*	22	13 - 22	22	5	231
GL5	*Pipistrellus pipistrellus*	94	90.5 - 97.5	98	7	1433
GL5	*Pipistrellus pygmaeus*	69	52 - 90.5	96	7	1189
GL5	*Plecotus auritus*	31	4 - 44	44	5	648
GL6	*Myotis daubentonii*	33	33 - 33	44	2	122
GL6	*Myotis nattereri*	4	4 - 4	4	3	91
GL6	*Nyctalus leisleri*	45	13 - 75.5	83	8	1263
GL6	*Pipistrellus nathusii*	4	0	4	1	231
GL6	*Pipistrellus pipistrellus*	44	13 - 77	88	9	1433
GL6	*Pipistrellus pygmaeus*	44	22 - 47.5	51	6	1189

GL6	*Plecotus auritus*	4	4 - 4	4	2	648
GL7	*Myotis daubentonii*	27	26.5 - 26.5	31	2	122
GL7	*Myotis mystacinus*	4	0	4	1	48
GL7	*Myotis nattereri*	4	0	4	1	91
GL7	*Nyctalus leisleri*	77	38 - 80.5	82	7	1263
GL7	*Pipistrellus pipistrellus*	65	30 - 82.5	90	8	1433
GL7	*Pipistrellus pygmaeus*	48	22 - 59.5	68	6	1189
GL7	*Plecotus auritus*	22	4 - 33	44	6	648
GL8	*Myotis daubentonii*	13	4 - 22	31	4	122
GL8	*Myotis nattereri*	4	0	4	1	91
GL8	*Nyctalus leisleri*	70	36 - 82	83	7	1263
GL8	*Pipistrellus nathusii*	4	0	4	1	231
GL8	*Pipistrellus pipistrellus*	65	27.5 - 88	91	6	1433
GL8	*Pipistrellus pygmaeus*	48	4 - 68	68	5	1189
GL8	*Plecotus auritus*	4	4 - 17.5	31	5	648
GL9	*Myotis daubentonii*	31	17.5 - 41	51	8	122
GL9	*Myotis mystacinus*	4	4 - 4	4	3	48
GL9	*Myotis nattereri*	4	4 - 4	4	4	91
GL9	*Nyctalus leisleri*	56	24 - 80	89	10	1263
GL9	*Pipistrellus nathusii*	4	4 - 4	4	2	231
GL9	*Pipistrellus pipistrellus*	77	65.5 - 88.5	91	7	1433
GL9	*Pipistrellus pygmaeus*	62	26.5 - 74.5	76	7	1189
GL9	*Plecotus auritus*	31	4 - 41	51	9	648

###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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

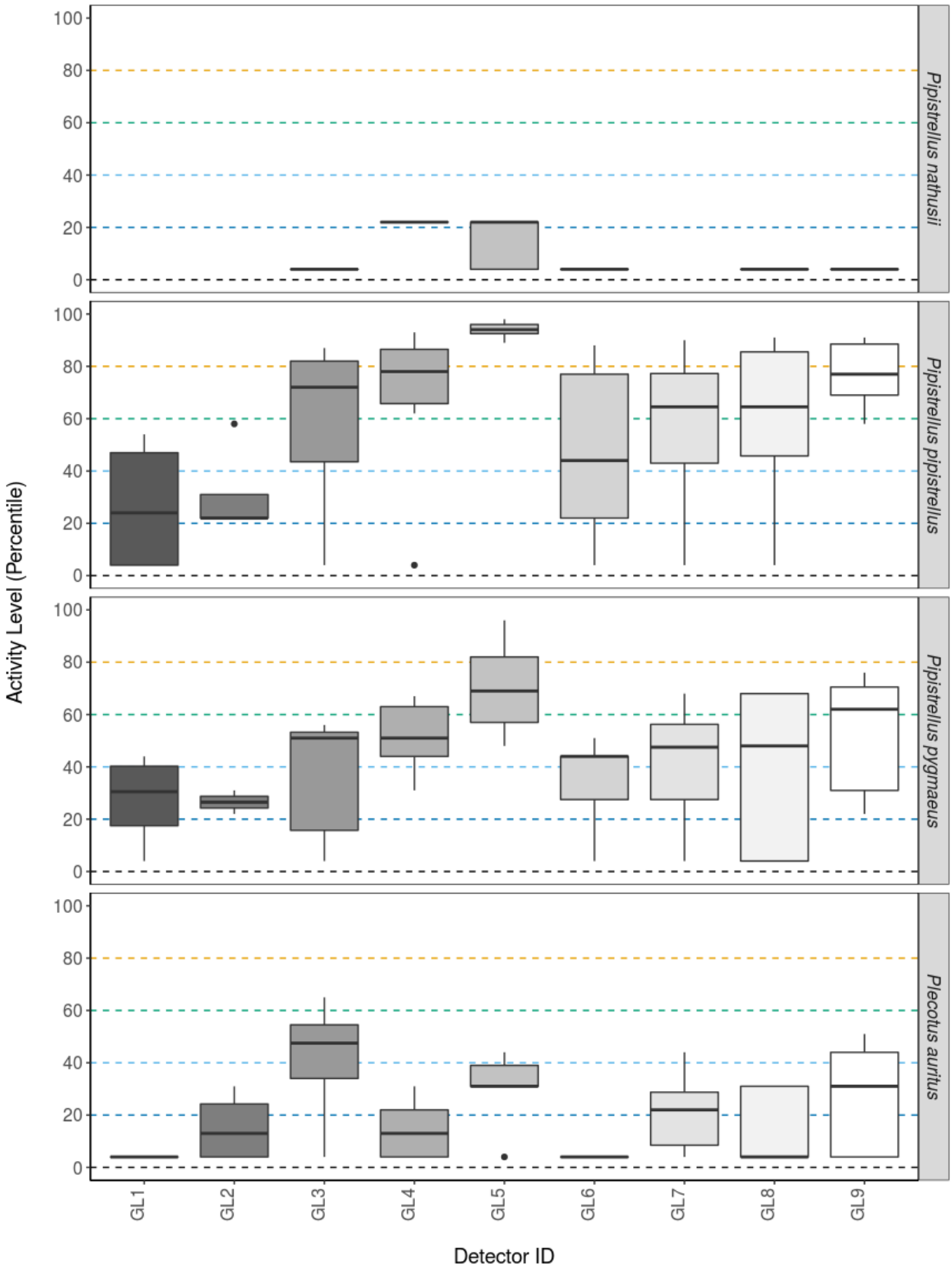
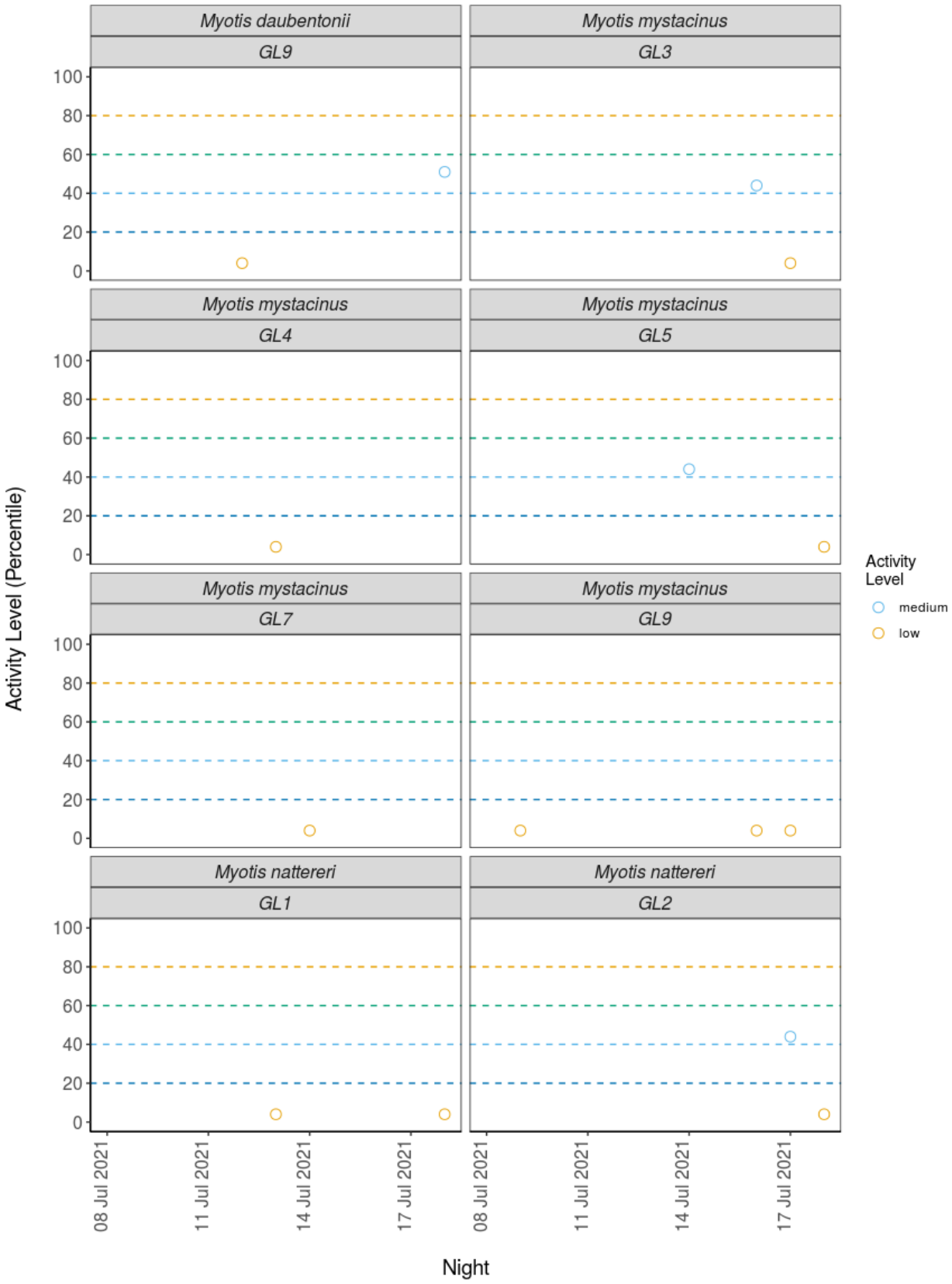
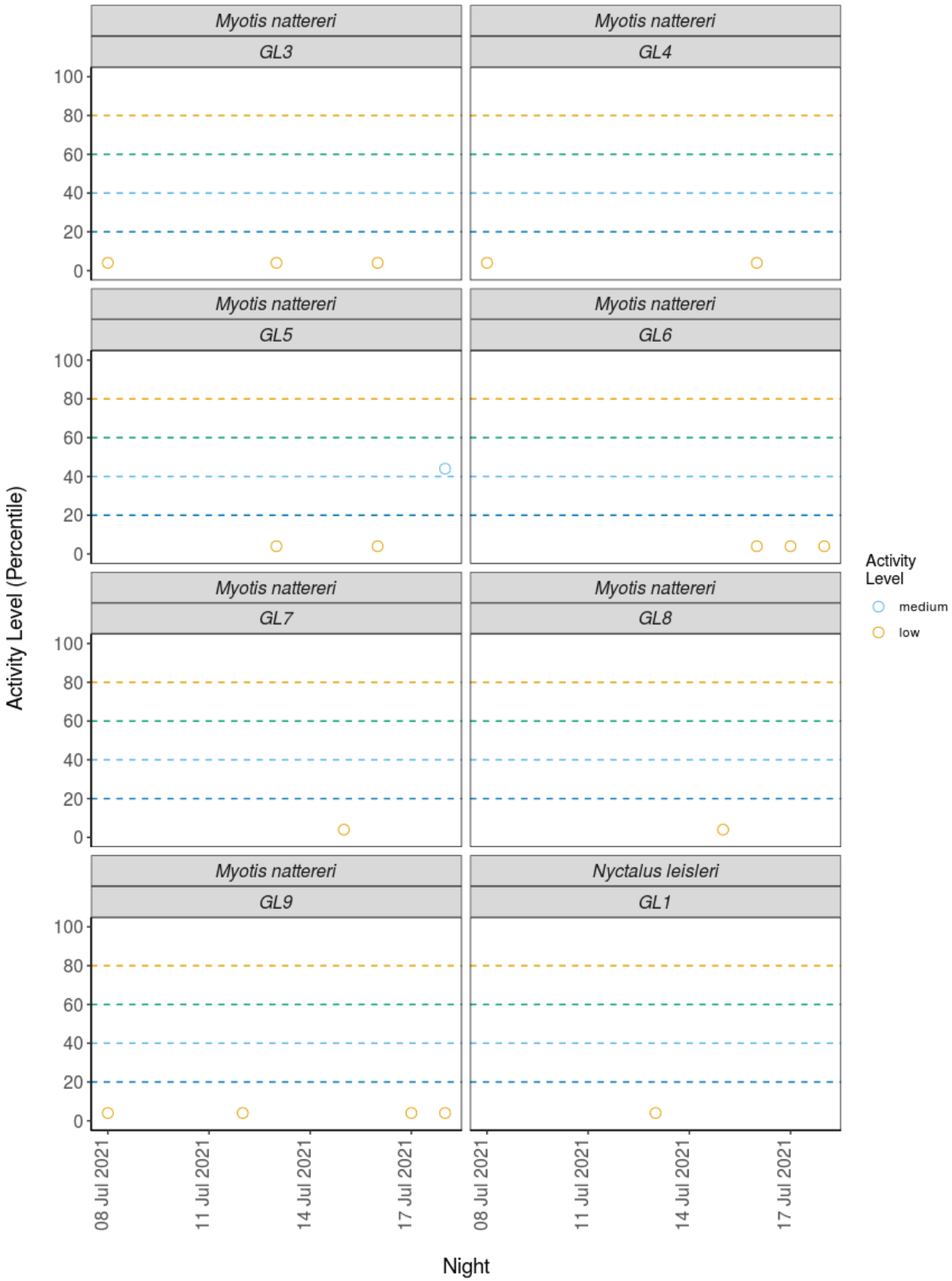
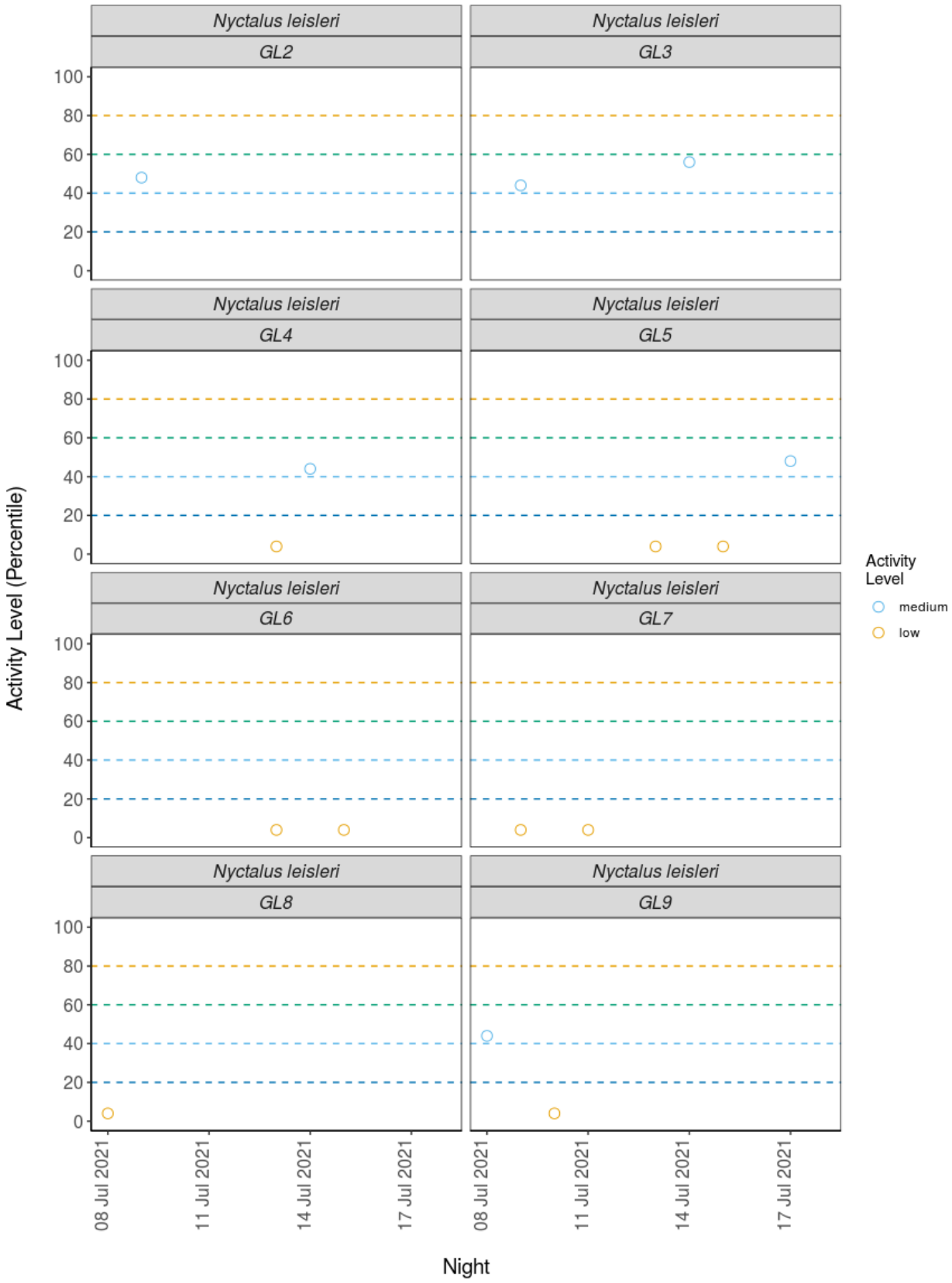
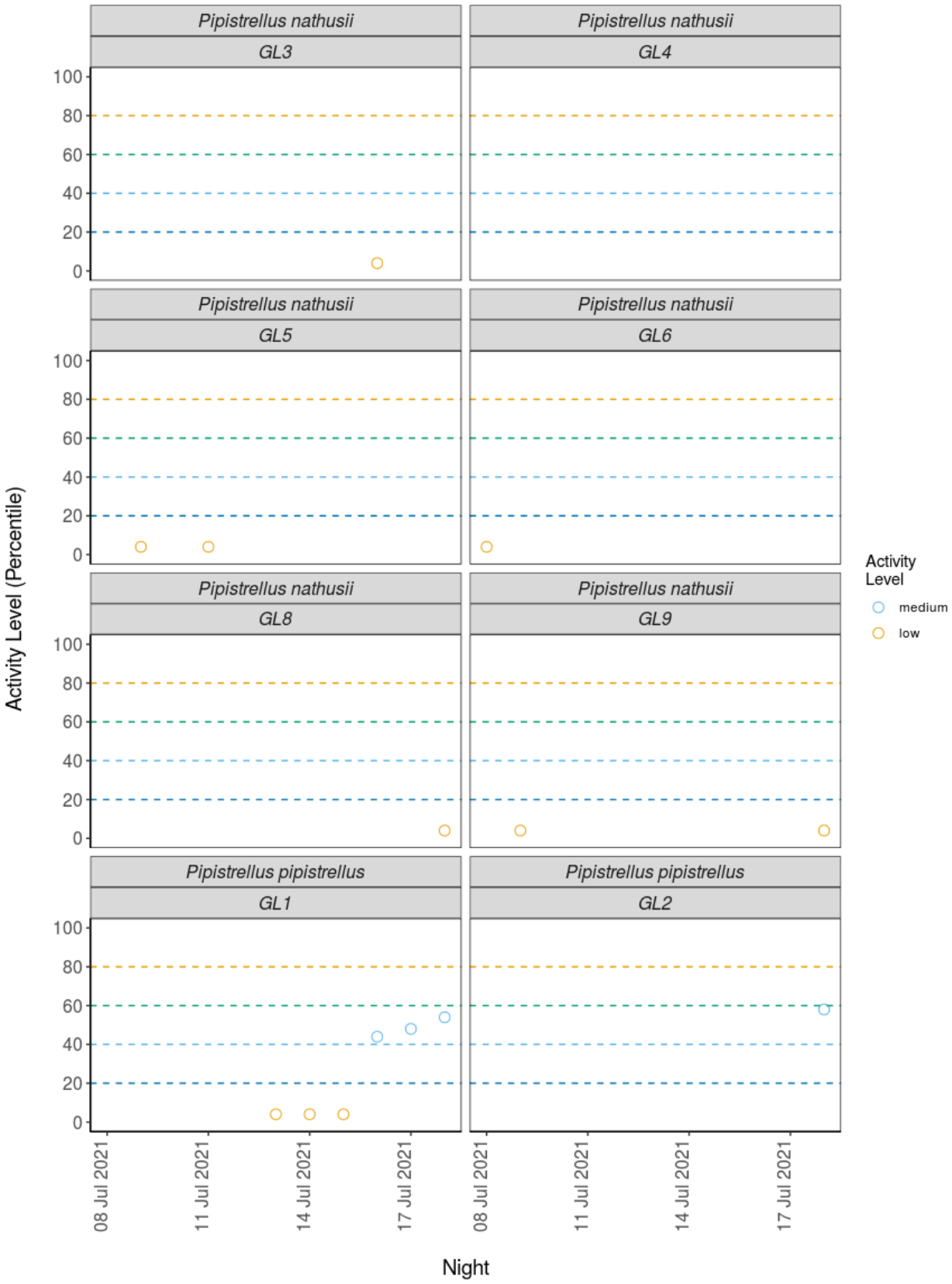

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

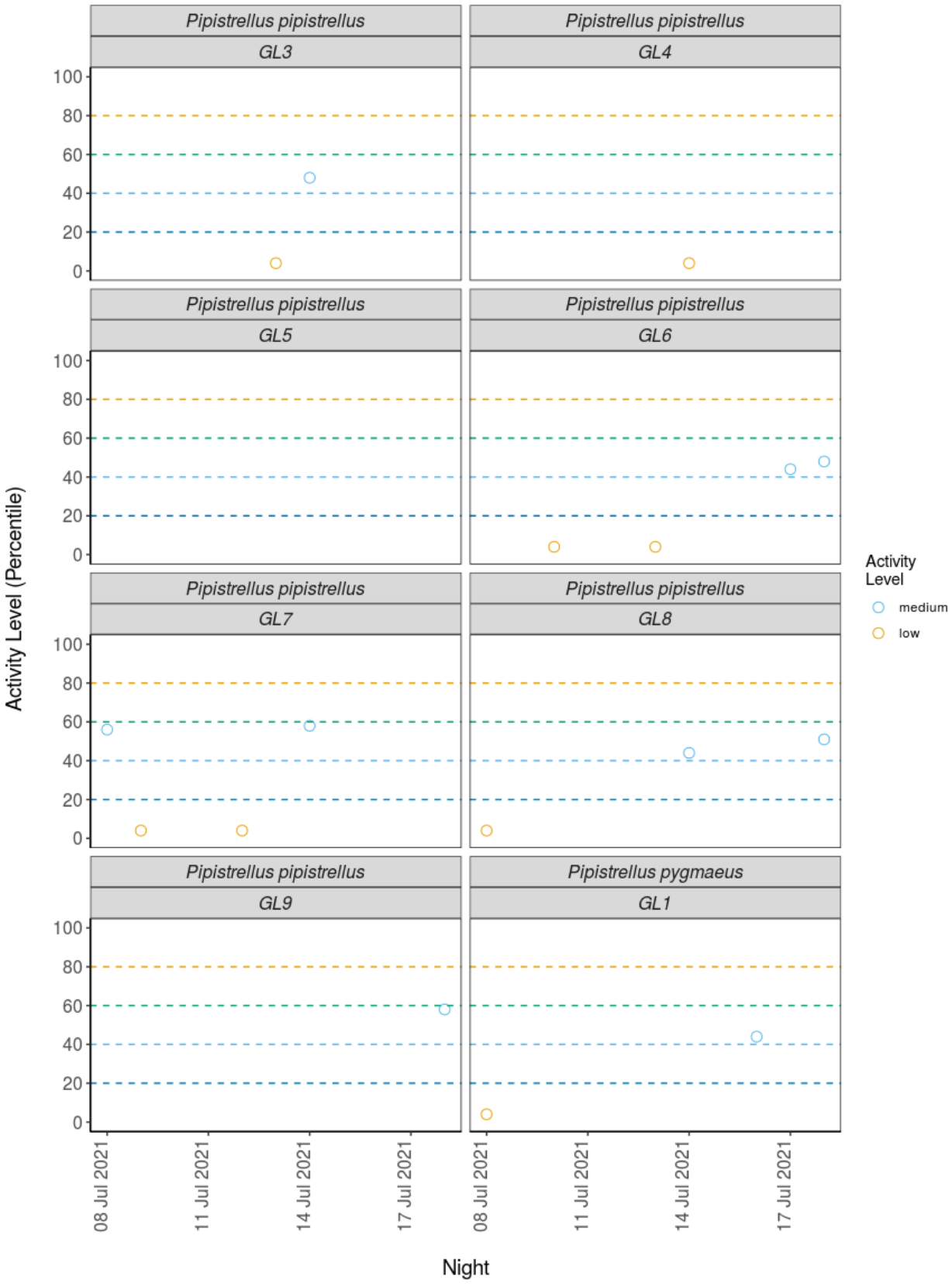
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.

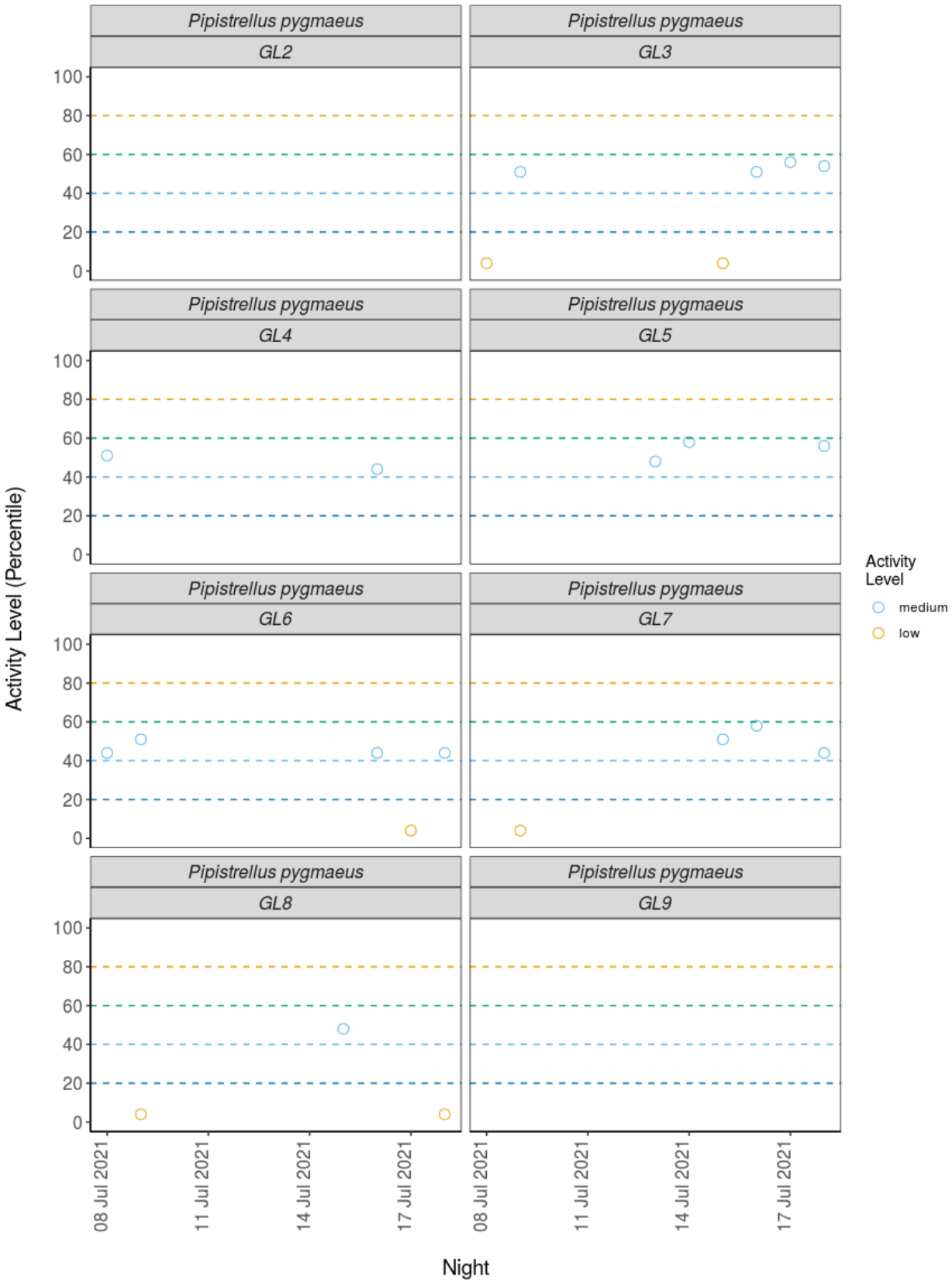

Myotis daubentonii
GL9
Myotis mystacinus
GL3
Myotis mystacinus
GL4
Myotis mystacinus
GL5
Myotis mystacinus
GL7
Myotis mystacinus
GL9
Myotis nattereri
GL1
Myotis nattereri
GL2
Activity Level (Percentile)
100
80
60
40
20
0
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low

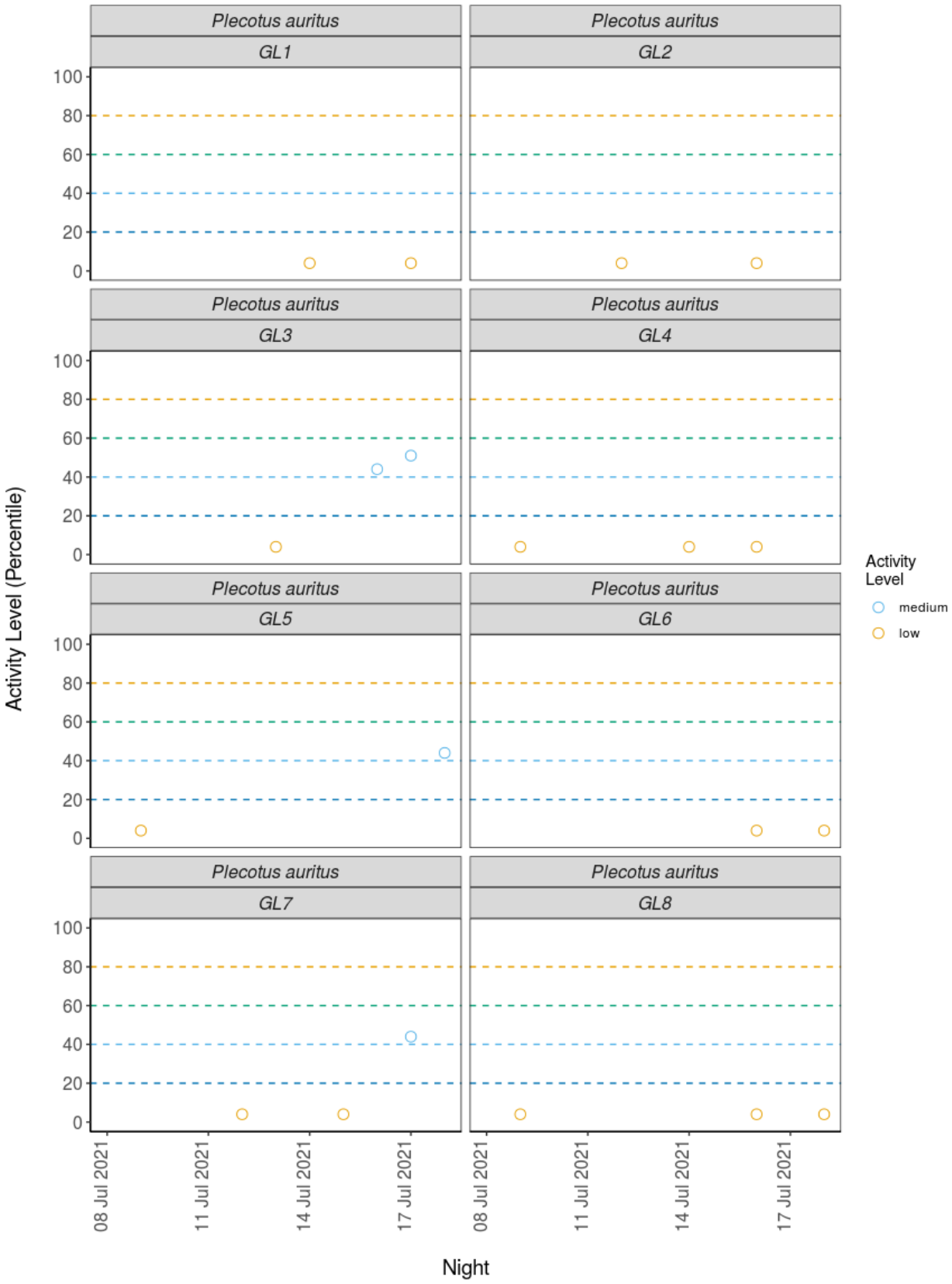

Myotis nattereri
GL3
Myotis nattereri
GL4
Myotis nattereri
GL5
Myotis nattereri
GL6
Myotis nattereri
GL7
Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL1
Activity Level (Percentile)
0
20
40
60
80
100
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low

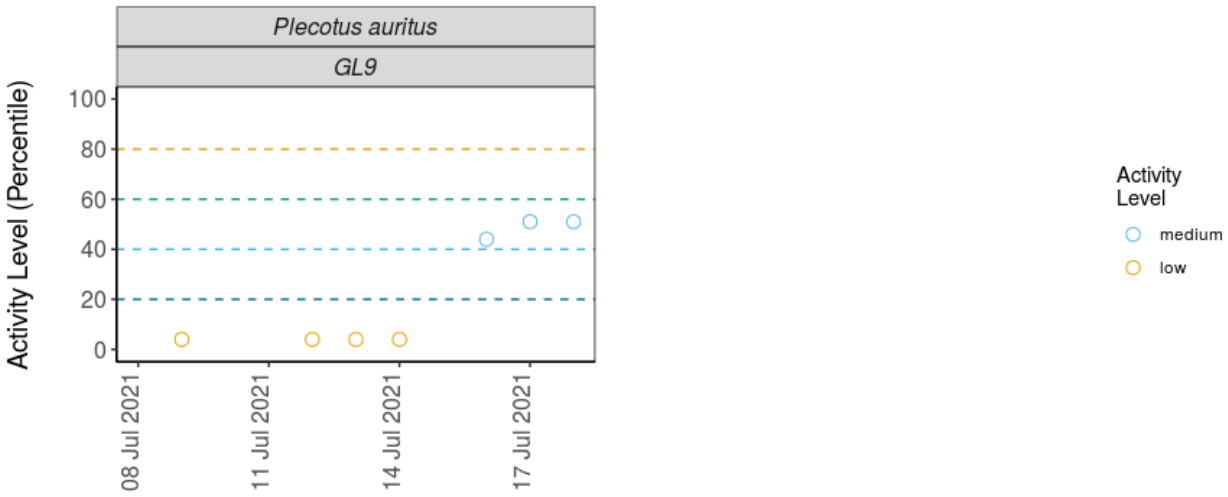

Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Activity Level (Percentile)
100
80
60
40
20
0
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low


Pipistrellus nathusii
GL3
Pipistrellus nathusii
GL4
Pipistrellus nathusii
GL5
Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL8
Pipistrellus nathusii
GL9
Pipistrellus pipistrellus
GL1
Pipistrellus pipistrellus
GL2
Activity Level (Percentile)
0
20
40
60
80
100
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low


Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL4
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL8
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Activity Level (Percentile)
0
20
40
60
80
100
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low


Pipistrellus pygmaeus
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Activity Level (Percentile)
100
80
60
40
20
0
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low


Plecotus auritus
GL1
Plecotus auritus
GL2
Plecotus auritus
GL3
Plecotus auritus
GL4
Plecotus auritus
GL5
Plecotus auritus
GL6
Plecotus auritus
GL7
Plecotus auritus
GL8
Activity Level (Percentile)
100
80
60
40
20
0
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Night
Activity Level
medium
low


Plecotus auritus
GL9
Activity Level (Percentile)
100
80
60
40
20
0
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
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
GL1	*Myotis daubentonii*	Jul	0	0	0	0	1
GL1	*Myotis nattereri*	Jul	0	0	0	0	2
GL1	*Nyctalus leisleri*	Jul	2	2	0	2	1
GL1	*Pipistrellus pipistrellus*	Jul	0	0	3	0	3
GL1	*Pipistrellus pygmaeus*	Jul	0	0	1	2	1
GL1	*Plecotus auritus*	Jul	0	0	0	0	2
GL2	*Myotis daubentonii*	Jul	0	0	0	1	2
GL2	*Myotis nattereri*	Jul	0	0	1	0	1
GL2	*Nyctalus leisleri*	Jul	3	1	1	1	0
GL2	*Pipistrellus pipistrellus*	Jul	0	0	1	3	0
GL2	*Pipistrellus pygmaeus*	Jul	0	0	0	2	0
GL2	*Plecotus auritus*	Jul	0	0	0	2	2
GL3	*Myotis daubentonii*	Jul	0	0	1	1	2
GL3	*Myotis mystacinus*	Jul	0	0	1	0	1
GL3	*Myotis nattereri*	Jul	0	0	0	1	3
GL3	*Nyctalus leisleri*	Jul	1	2	2	1	0
GL3	*Pipistrellus nathusii*	Jul	0	0	0	0	1

GL3	*Pipistrellus pipistrellus*	Jul	3	1	1	1	1
GL3	*Pipistrellus pygmaeus*	Jul	0	0	4	0	2
GL3	*Plecotus auritus*	Jul	0	1	2	0	1
GL4	*Myotis daubentonii*	Jul	0	1	0	0	1
GL4	*Myotis mystacinus*	Jul	0	0	0	0	1
GL4	*Myotis nattereri*	Jul	0	0	0	0	2
GL4	*Nyctalus leisleri*	Jul	0	3	1	0	1
GL4	*Pipistrellus nathusii*	Jul	0	0	0	1	0
GL4	*Pipistrellus pipistrellus*	Jul	2	3	0	0	1
GL4	*Pipistrellus pygmaeus*	Jul	0	2	2	1	0
GL4	*Plecotus auritus*	Jul	0	0	0	3	3
GL5	*Myotis daubentonii*	Jul	0	0	1	3	2
GL5	*Myotis mystacinus*	Jul	0	0	1	1	1
GL5	*Myotis nattereri*	Jul	0	0	1	1	2
GL5	*Nyctalus leisleri*	Jul	0	2	1	1	2
GL5	*Pipistrellus nathusii*	Jul	0	0	0	3	2
GL5	*Pipistrellus pipistrellus*	Jul	7	0	0	0	0
GL5	*Pipistrellus pygmaeus*	Jul	2	2	3	0	0
GL5	*Plecotus auritus*	Jul	0	0	1	3	1
GL6	*Myotis daubentonii*	Jul	0	0	1	1	0
GL6	*Myotis nattereri*	Jul	0	0	0	0	3

GL6	*Nyctalus leisleri*	Jul	1	3	0	2	2
GL6	*Pipistrellus nathusii*	Jul	0	0	0	0	1
GL6	*Pipistrellus pipistrellus*	Jul	2	1	2	2	2
GL6	*Pipistrellus pygmaeus*	Jul	0	0	4	1	1
GL6	*Plecotus auritus*	Jul	0	0	0	0	2
GL7	*Myotis daubentonii*	Jul	0	0	0	2	0
GL7	*Myotis mystacinus*	Jul	0	0	0	0	1
GL7	*Myotis nattereri*	Jul	0	0	0	0	1
GL7	*Nyctalus leisleri*	Jul	2	3	0	0	2
GL7	*Pipistrellus pipistrellus*	Jul	2	2	2	0	2
GL7	*Pipistrellus pygmaeus*	Jul	0	1	3	1	1
GL7	*Plecotus auritus*	Jul	0	0	1	3	2
GL8	*Myotis daubentonii*	Jul	0	0	0	2	2
GL8	*Myotis nattereri*	Jul	0	0	0	0	1
GL8	*Nyctalus leisleri*	Jul	3	2	0	1	1
GL8	*Pipistrellus nathusii*	Jul	0	0	0	0	1
GL8	*Pipistrellus pipistrellus*	Jul	2	1	2	0	1
GL8	*Pipistrellus pygmaeus*	Jul	0	2	1	0	2
GL8	*Plecotus auritus*	Jul	0	0	0	2	3
GL9	*Myotis daubentonii*	Jul	0	0	1	6	1
GL9	*Myotis mystacinus*	Jul	0	0	0	0	3

GL9	*Myotis nattereri*	Jul	0	0	0	0	4
GL9	*Nyctalus leisleri*	Jul	2	3	1	3	1
GL9	*Pipistrellus nathusii*	Jul	0	0	0	0	2
GL9	*Pipistrellus pipistrellus*	Jul	3	3	1	0	0
GL9	*Pipistrellus pygmaeus*	Jul	0	4	0	3	0
GL9	*Plecotus auritus*	Jul	0	0	3	2	4

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
GL1	*Myotis daubentonii*	Jul	4	0	4	1
GL1	*Myotis nattereri*	Jul	4	4 - 4	4	2
GL1	*Nyctalus leisleri*	Jul	60	13 - 84	86	7
GL1	*Pipistrellus pipistrellus*	Jul	24	4 - 48	54	6
GL1	*Pipistrellus pygmaeus*	Jul	31	4 - 44	44	4
GL1	*Plecotus auritus*	Jul	4	4 - 4	4	2
GL2	*Myotis daubentonii*	Jul	4	4 - 4	22	3
GL2	*Myotis nattereri*	Jul	24	24 - 24	44	2
GL2	*Nyctalus leisleri*	Jul	71	41 - 83.5	86	6
GL2	*Pipistrellus pipistrellus*	Jul	22	22 - 22	58	4
GL2	*Pipistrellus pygmaeus*	Jul	27	26.5 - 26.5	31	2
GL2	*Plecotus auritus*	Jul	13	4 - 22	31	4
GL3	*Myotis daubentonii*	Jul	22	4 - 39	44	4
GL3	*Myotis mystacinus*	Jul	24	24 - 24	44	2
GL3	*Myotis nattereri*	Jul	4	4 - 4	31	4
GL3	*Nyctalus leisleri*	Jul	65	39 - 80.5	88	6
GL3	*Pipistrellus nathusii*	Jul	4	0	4	1
GL3	*Pipistrellus pipistrellus*	Jul	72	21.5 - 84.5	87	7
GL3	*Pipistrellus pygmaeus*	Jul	51	4 - 54	56	6

GL3	*Plecotus auritus*	Jul	48	4 - 65	65	4
GL4	*Myotis daubentonii*	Jul	33	33 - 33	62	2
GL4	*Myotis mystacinus*	Jul	4	0	4	1
GL4	*Myotis nattereri*	Jul	4	4 - 4	4	2
GL4	*Nyctalus leisleri*	Jul	63	33.5 - 71	71	5
GL4	*Pipistrellus nathusii*	Jul	22	0	22	1
GL4	*Pipistrellus pipistrellus*	Jul	78	40.5 - 89	93	6
GL4	*Pipistrellus pygmaeus*	Jul	51	41 - 63	67	5
GL4	*Plecotus auritus*	Jul	13	4 - 22	31	6
GL5	*Myotis daubentonii*	Jul	31	4 - 43.5	48	6
GL5	*Myotis mystacinus*	Jul	22	4 - 44	44	3
GL5	*Myotis nattereri*	Jul	22	4 - 39	44	4
GL5	*Nyctalus leisleri*	Jul	44	21.5 - 56.5	65	6
GL5	*Pipistrellus nathusii*	Jul	22	13 - 22	22	5
GL5	*Pipistrellus pipistrellus*	Jul	94	90.5 - 97.5	98	7
GL5	*Pipistrellus pygmaeus*	Jul	69	52 - 90.5	96	7
GL5	*Plecotus auritus*	Jul	31	4 - 44	44	5
GL6	*Myotis daubentonii*	Jul	33	33 - 33	44	2
GL6	*Myotis nattereri*	Jul	4	4 - 4	4	3
GL6	*Nyctalus leisleri*	Jul	45	13 - 75.5	83	8
GL6	*Pipistrellus nathusii*	Jul	4	0	4	1
GL6	*Pipistrellus pipistrellus*	Jul	44	13 - 77	88	9
GL6	*Pipistrellus pygmaeus*	Jul	44	22 - 47.5	51	6
GL6	*Plecotus auritus*	Jul	4	4 - 4	4	2

GL7	*Myotis daubentonii*	Jul	27	26.5 - 26.5	31	2
GL7	*Myotis mystacinus*	Jul	4	0	4	1
GL7	*Myotis nattereri*	Jul	4	0	4	1
GL7	*Nyctalus leisleri*	Jul	77	38 - 80.5	82	7
GL7	*Pipistrellus pipistrellus*	Jul	65	30 - 82.5	90	8
GL7	*Pipistrellus pygmaeus*	Jul	48	22 - 59.5	68	6
GL7	*Plecotus auritus*	Jul	22	4 - 33	44	6
GL8	*Myotis daubentonii*	Jul	13	4 - 22	31	4
GL8	*Myotis nattereri*	Jul	4	0	4	1
GL8	*Nyctalus leisleri*	Jul	70	36 - 82	83	7
GL8	*Pipistrellus nathusii*	Jul	4	0	4	1
GL8	*Pipistrellus pipistrellus*	Jul	65	27.5 - 88	91	6
GL8	*Pipistrellus pygmaeus*	Jul	48	4 - 68	68	5
GL8	*Plecotus auritus*	Jul	4	4 - 17.5	31	5
GL9	*Myotis daubentonii*	Jul	31	17.5 - 41	51	8
GL9	*Myotis mystacinus*	Jul	4	4 - 4	4	3
GL9	*Myotis nattereri*	Jul	4	4 - 4	4	4
GL9	*Nyctalus leisleri*	Jul	56	24 - 80	89	10
GL9	*Pipistrellus nathusii*	Jul	4	4 - 4	4	2
GL9	*Pipistrellus pipistrellus*	Jul	77	65.5 - 88.5	91	7
GL9	*Pipistrellus pygmaeus*	Jul	62	26.5 - 74.5	76	7
GL9	*Plecotus auritus*	Jul	31	4 - 41	51	9

PER SITE

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

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

Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis daubentonii	0	1	4	16	11
Myotis mystacinus	0	0	2	1	7
Myotis nattereri	0	0	2	2	19
Nyctalus leisleri	14	21	6	11	10
Pipistrellus nathusii	0	0	0	4	7
Pipistrellus pipistrellus	21	11	12	6	10
Pipistrellus pygmaeus	2	11	18	10	7
Plecotus auritus	0	1	7	15	20

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

Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	22	4 - 43.5	62	32
Myotis mystacinus	4	4 - 44	44	10
Myotis nattereri	4	4 - 4	44	23
Nyctalus leisleri	63	41 - 83.5	89	62
Pipistrellus nathusii	4	4 - 4	22	11
Pipistrellus pipistrellus	68	90.5 - 97.5	98	60
Pipistrellus pygmaeus	48	52 - 90.5	96	48
Plecotus auritus	22	4 - 65	65	43

###Figures

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

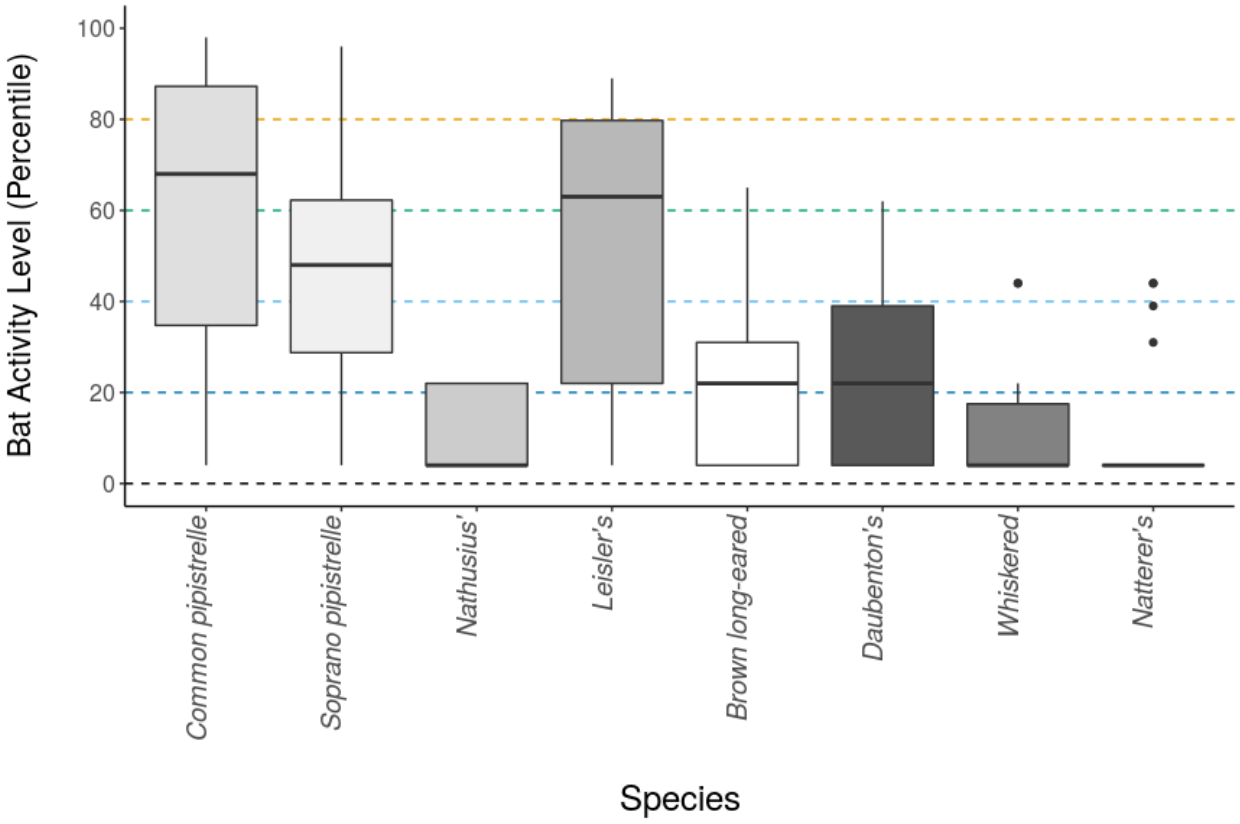
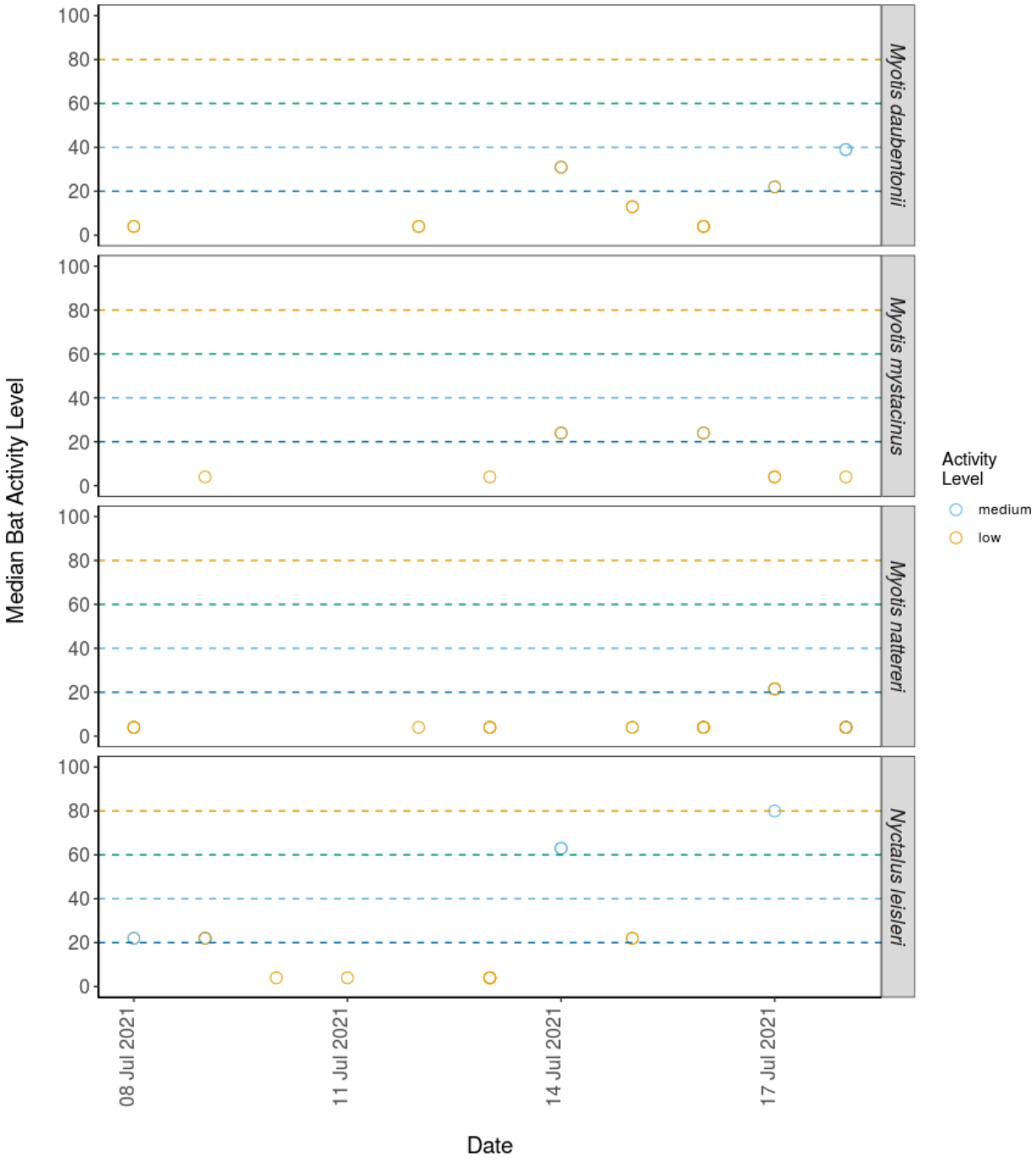
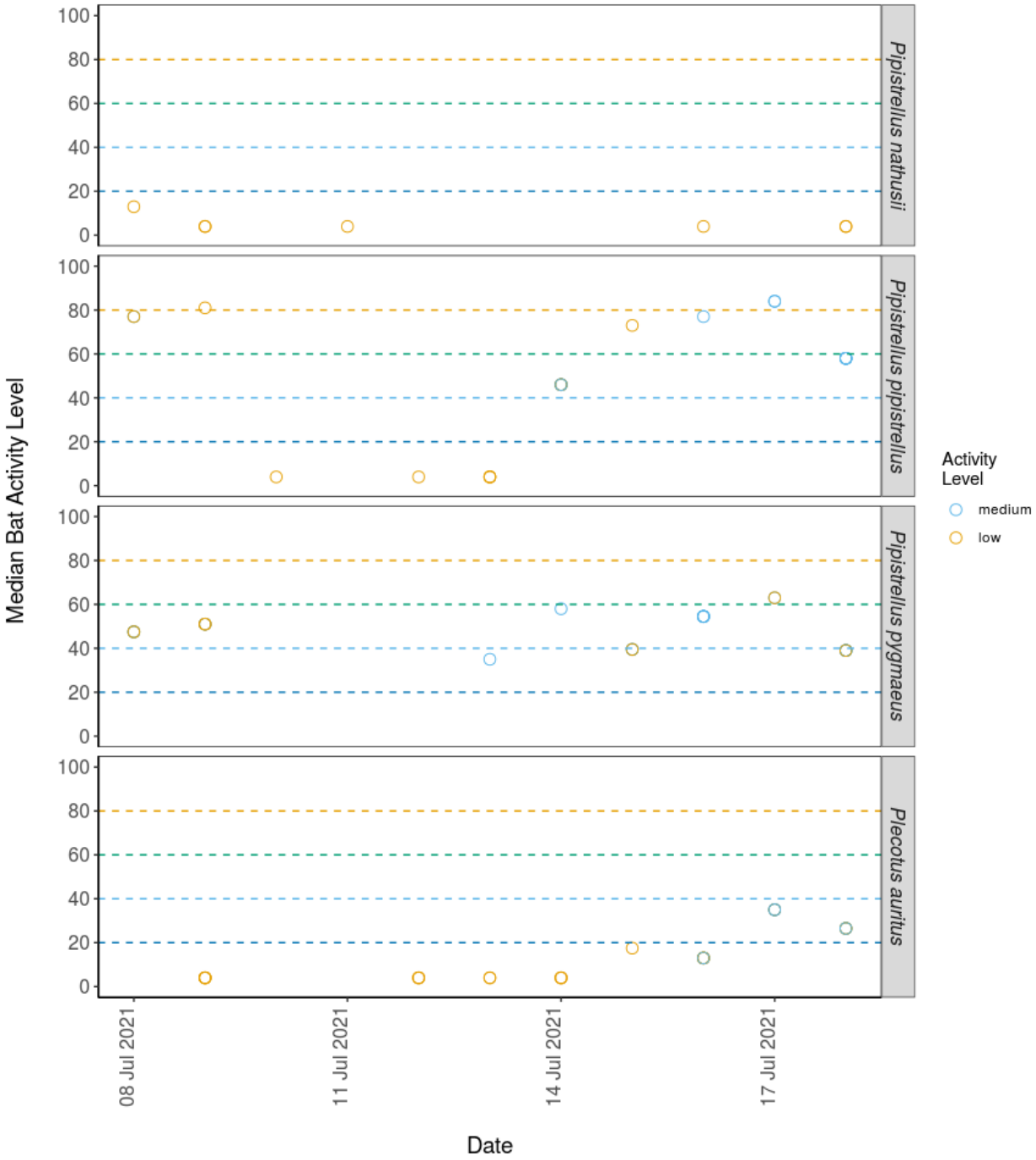


Figure 5. The median activity levels of bats recorded across all detectors each night.


Median Bat Activity Level
100
80
60
40
20
0
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Date
Activity Level
medium
low


Median Bat Activity Level
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
08 Jul 2021
11 Jul 2021
14 Jul 2021
17 Jul 2021
Date
Activity Level
medium
low

PER SITE, PER MONTH

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

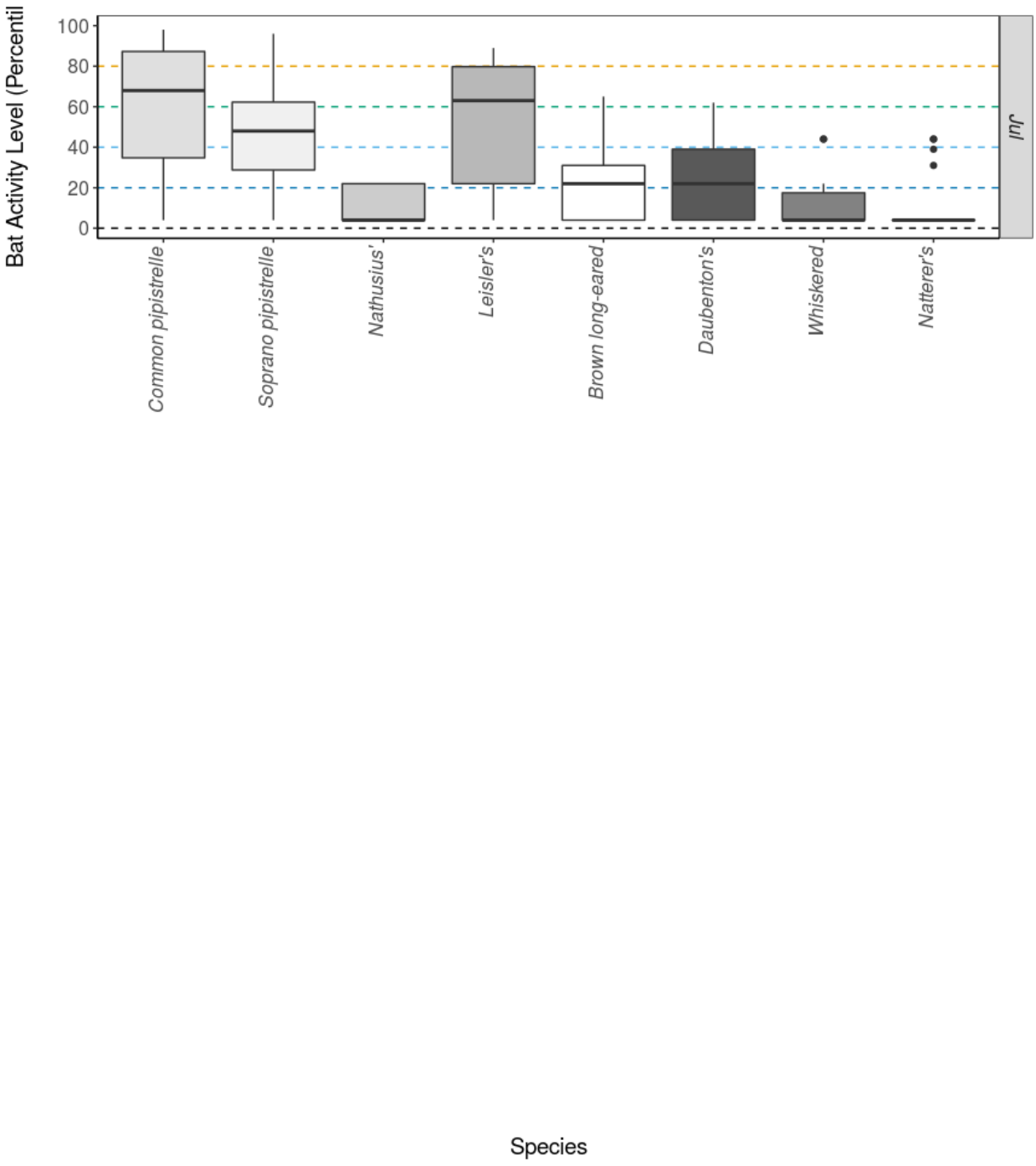
Species/Species Group	Month	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis daubentonii	Jul	0	1	4	16	11
Myotis mystacinus	Jul	0	0	2	1	7
Myotis nattereri	Jul	0	0	2	2	19
Nyctalus leisleri	Jul	14	21	6	11	10
Pipistrellus nathusii	Jul	0	0	0	4	7
Pipistrellus pipistrellus	Jul	21	11	12	6	10
Pipistrellus pygmaeus	Jul	2	11	18	10	7
Plecotus auritus	Jul	0	1	7	15	20

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

Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	Jul	22	4 - 43.5	62	32
Myotis mystacinus	Jul	4	4 - 44	44	10
Myotis nattereri	Jul	4	4 - 4	44	23
Nyctalus leisleri	Jul	63	41 - 83.5	89	62
Pipistrellus nathusii	Jul	4	4 - 4	22	11
Pipistrellus pipistrellus	Jul	68	90.5 - 97.5	98	60
Pipistrellus pygmaeus	Jul	48	52 - 90.5	96	48
Plecotus auritus	Jul	22	4 - 65	65	43

###Figures

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



PART 2: Nightly Analysis

ENTIRE SURVEY PERIOD

Sunrise and Sunset Times

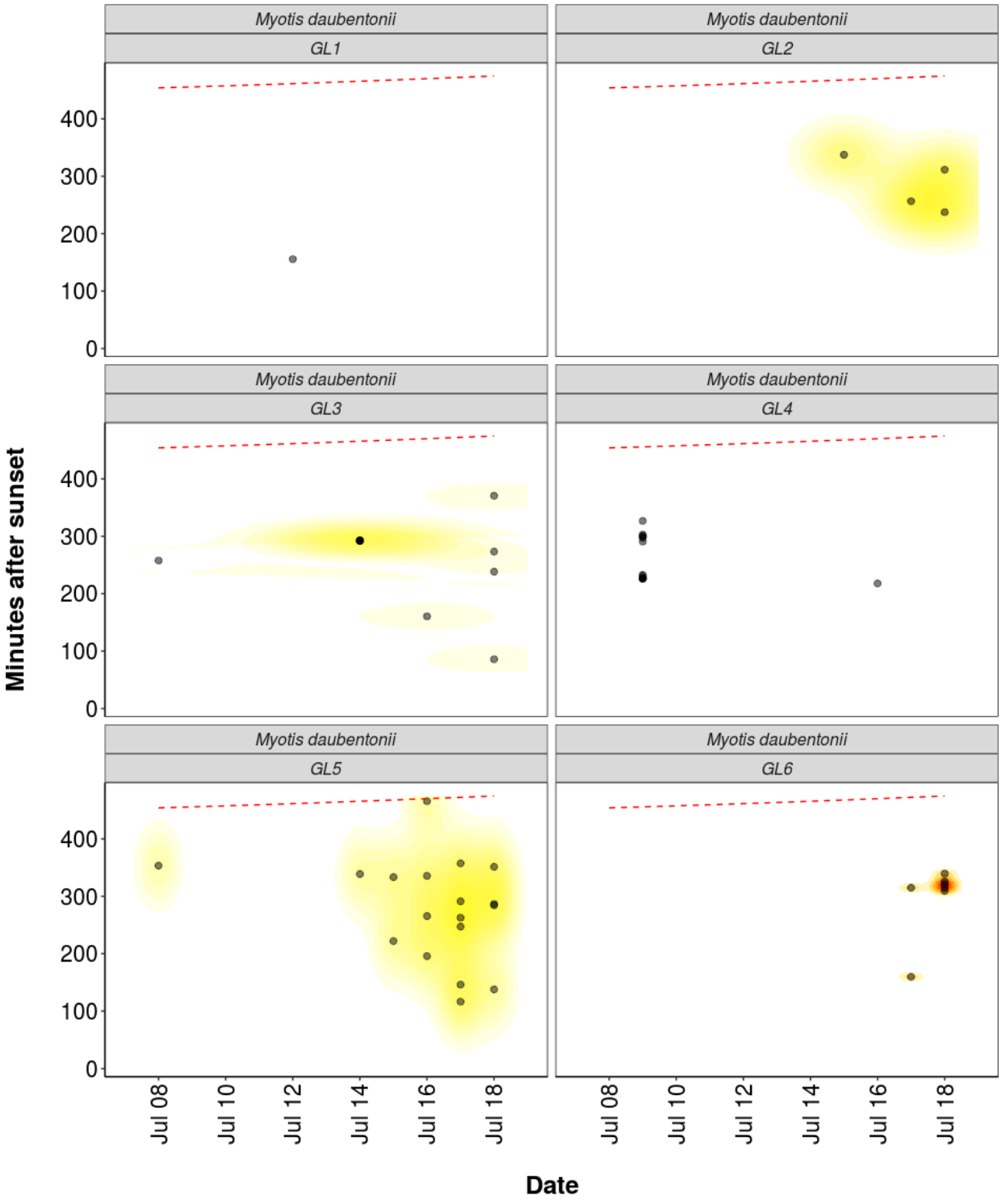
Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.

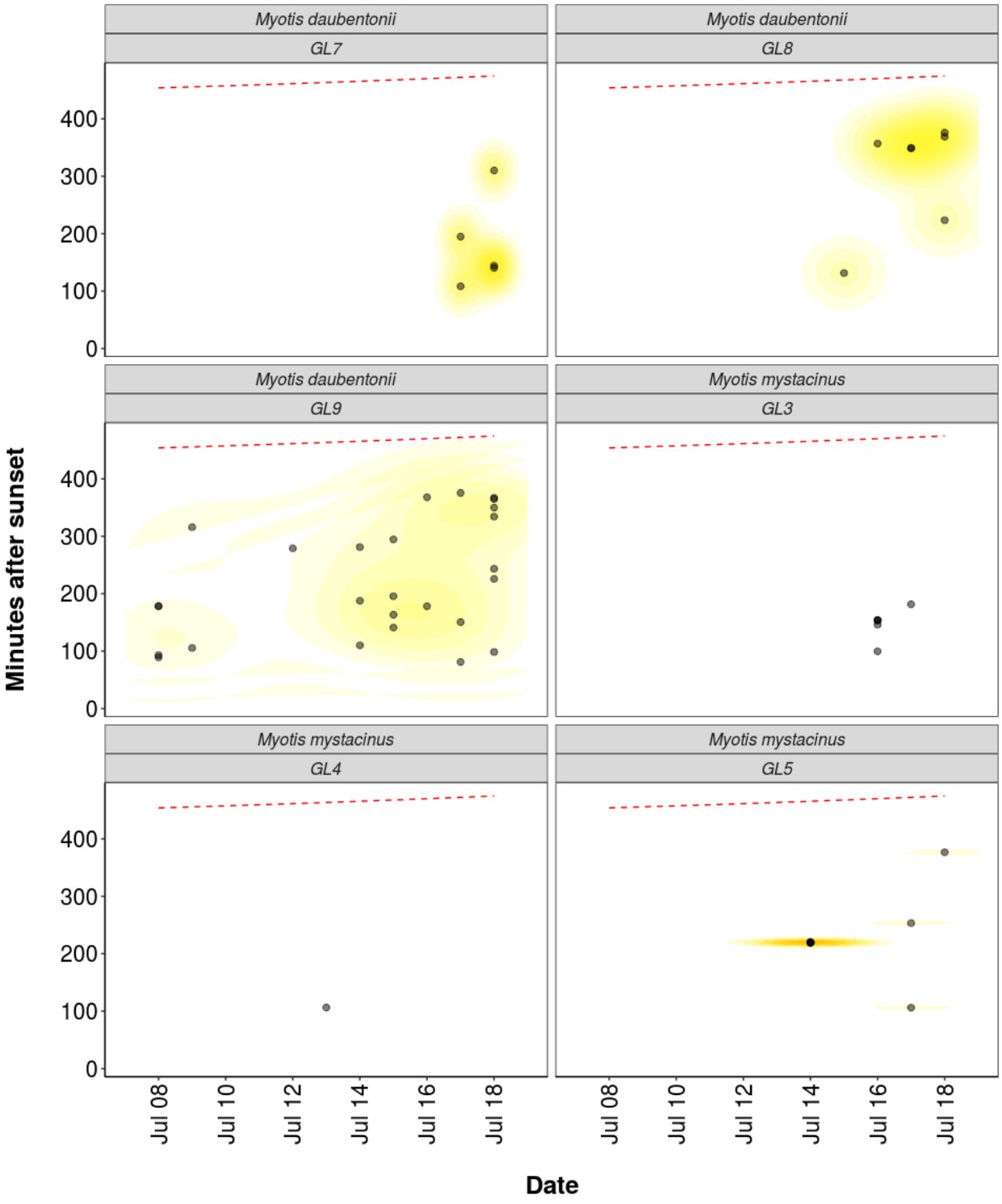
Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)
2021-07-08	21:56	05:30	7.6
2021-07-09	21:55	05:31	7.6
2021-07-10	21:55	05:32	7.6
2021-07-11	21:54	05:33	7.7
2021-07-12	21:53	05:34	7.7
2021-07-13	21:52	05:35	7.7
2021-07-14	21:51	05:37	7.8
2021-07-15	21:50	05:38	7.8
2021-07-16	21:49	05:39	7.8
2021-07-17	21:48	05:40	7.9
2021-07-18	21:47	05:42	7.9

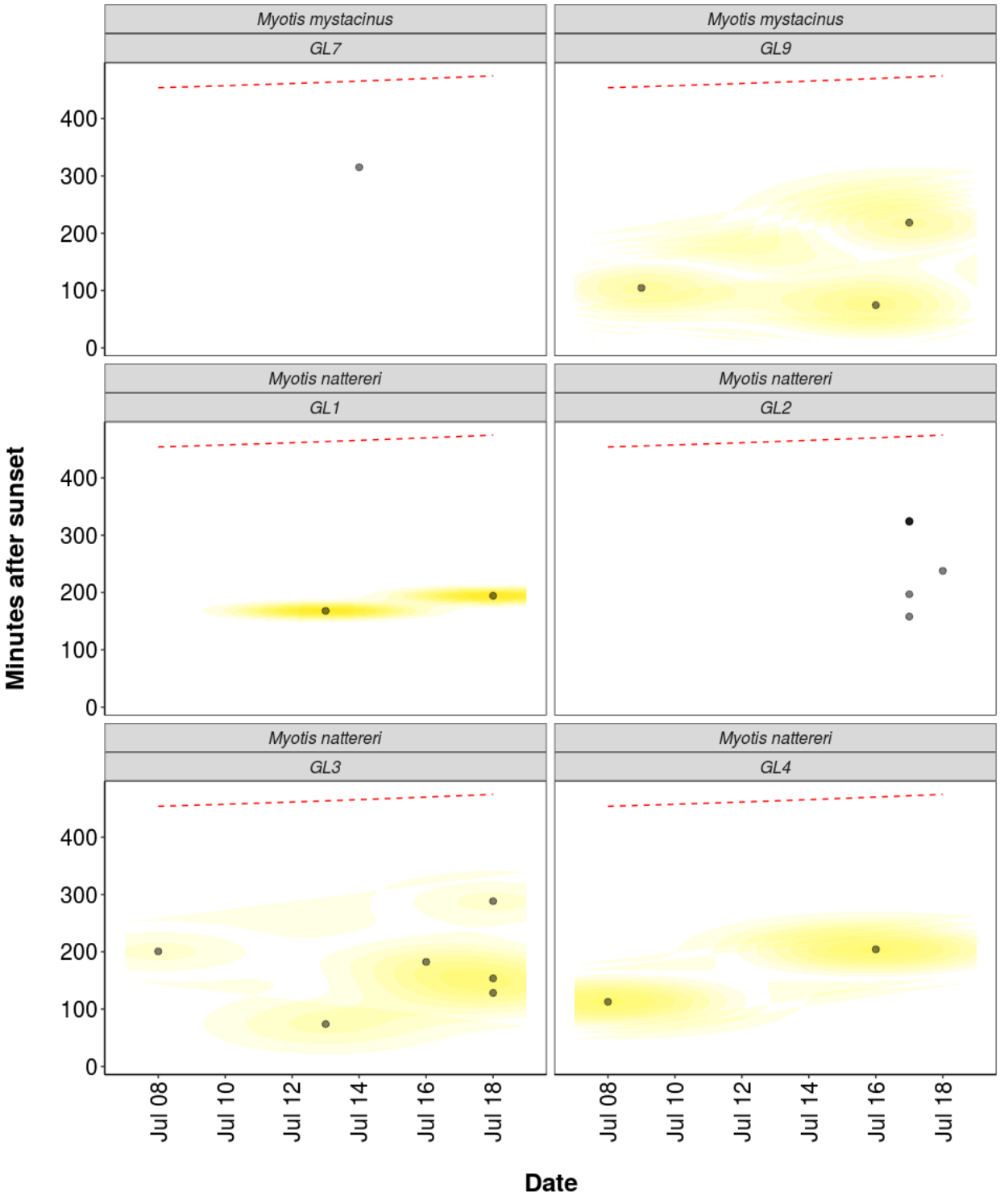
Distribution of Bat Activity Across the Night through Time

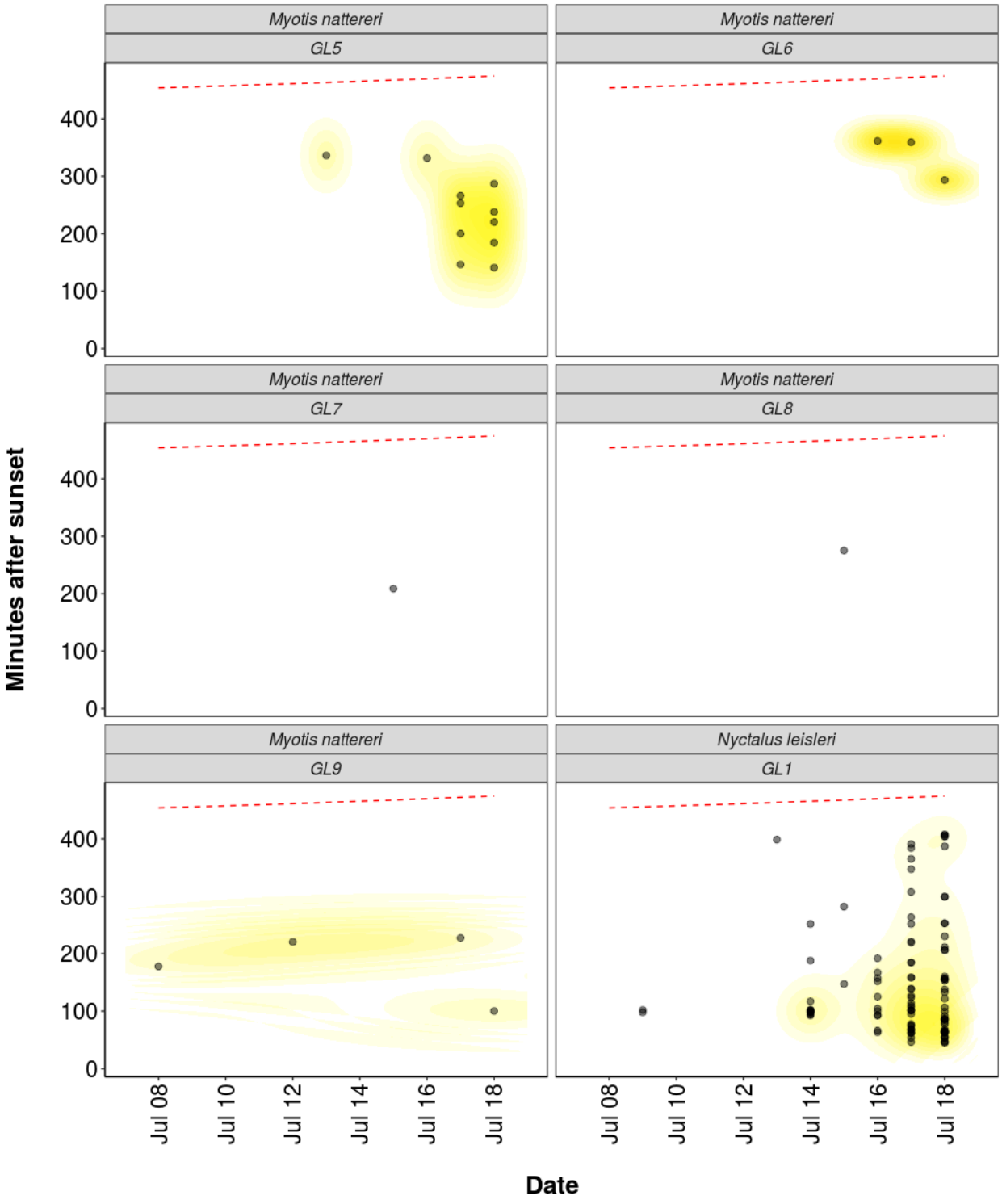
Per Detector

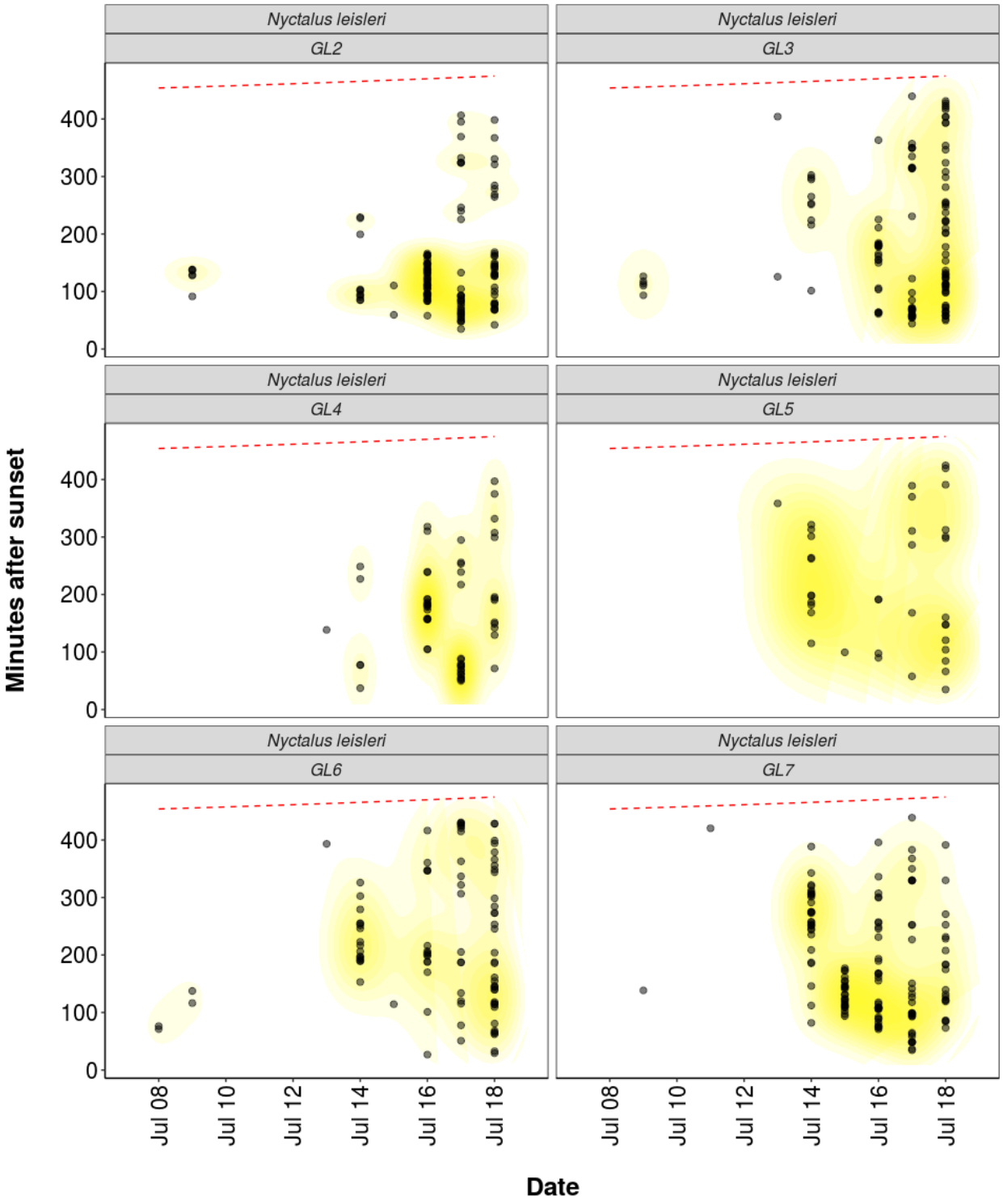
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

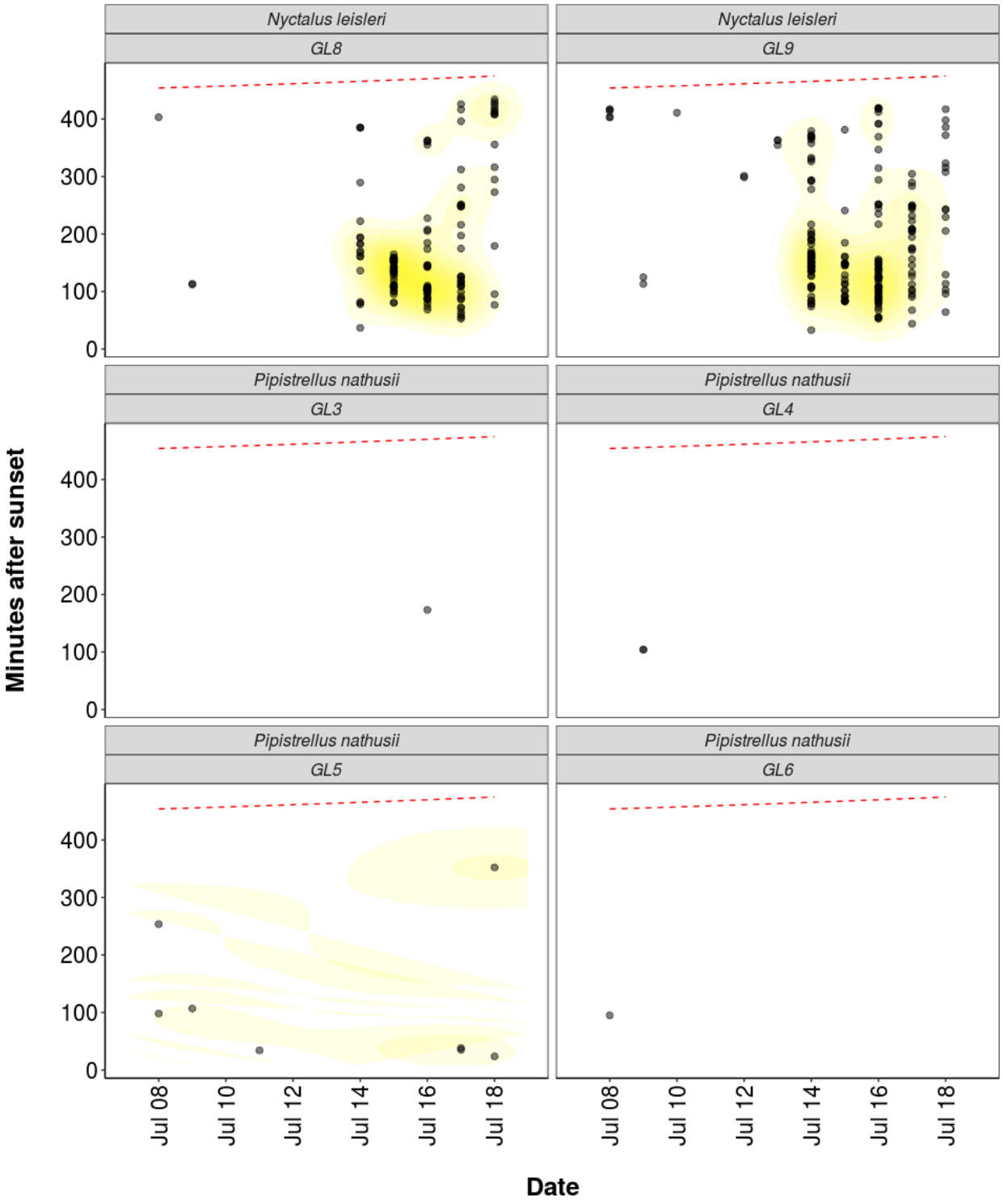

Myotis daubentonii
GL1
Myotis daubentonii
GL2
Myotis daubentonii
GL3
Myotis daubentonii
GL4
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Date

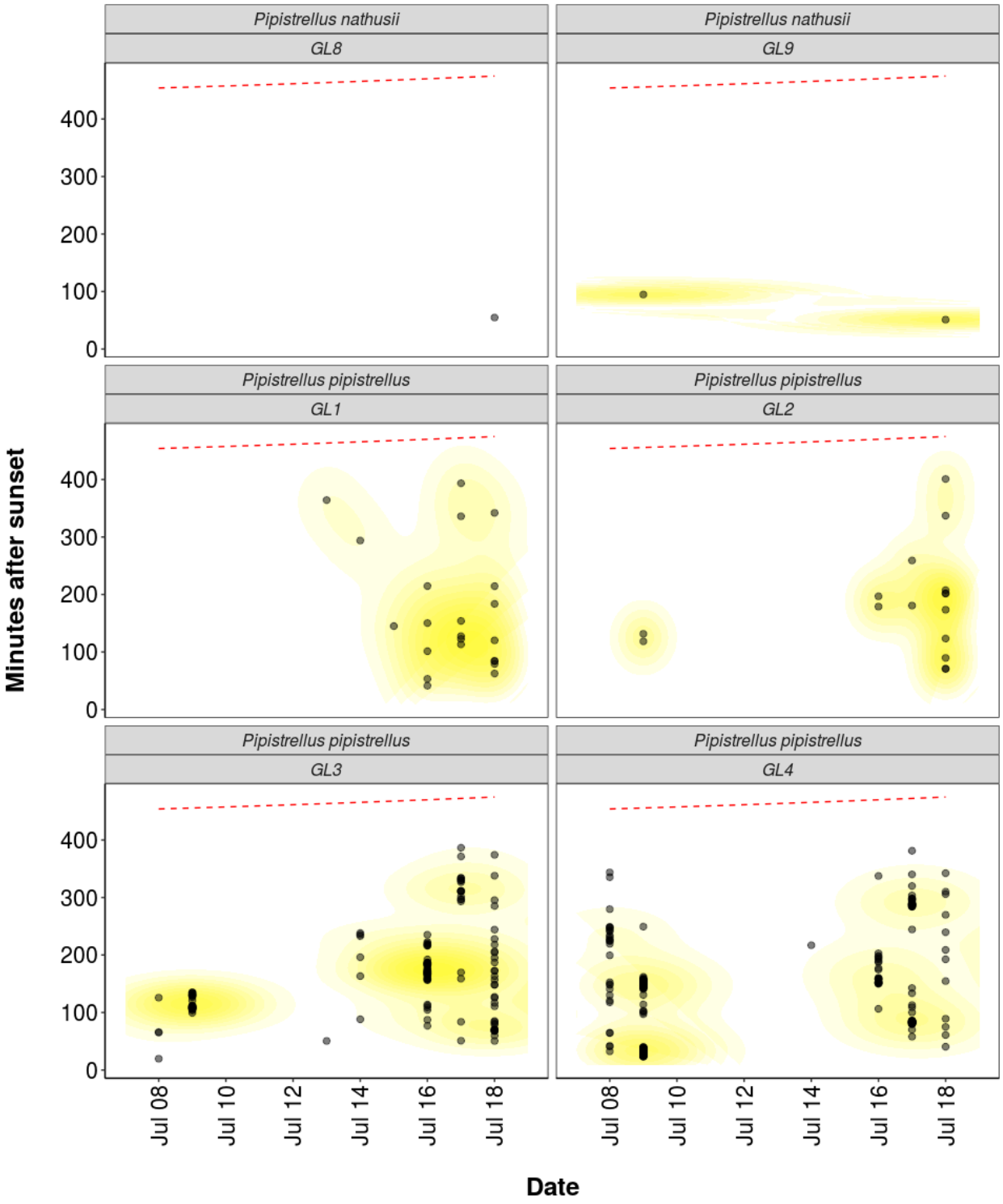

Myotis daubentonii
GL7
Myotis daubentonii
GL8
Myotis daubentonii
GL9
Myotis mystacinus
GL3
Myotis mystacinus
GL4
Myotis mystacinus
GL5
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Date

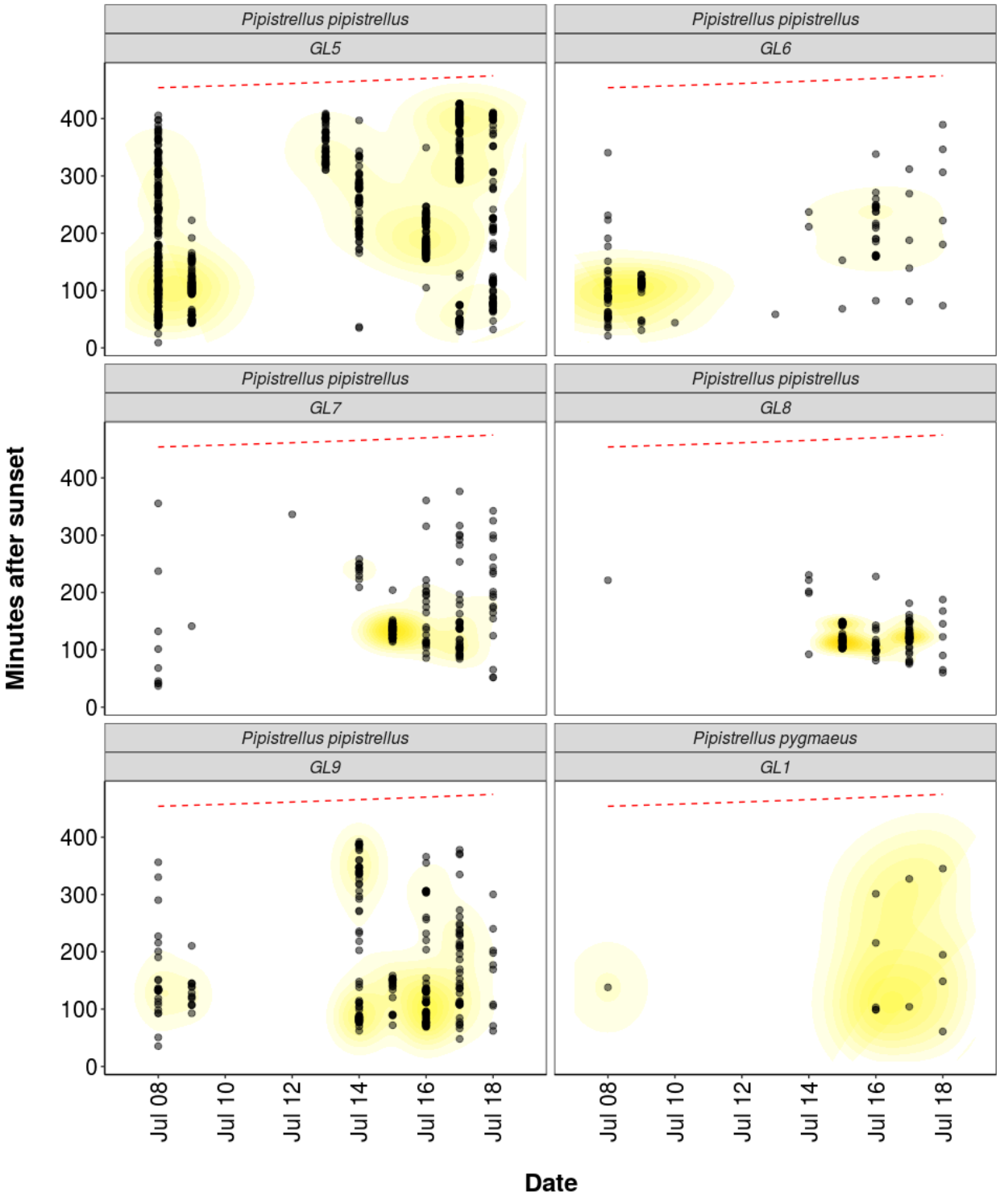

Myotis mystacinus
GL7
Myotis mystacinus
GL9
Myotis nattereri
GL1
Myotis nattereri
GL2
Myotis nattereri
GL3
Myotis nattereri
GL4
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Date

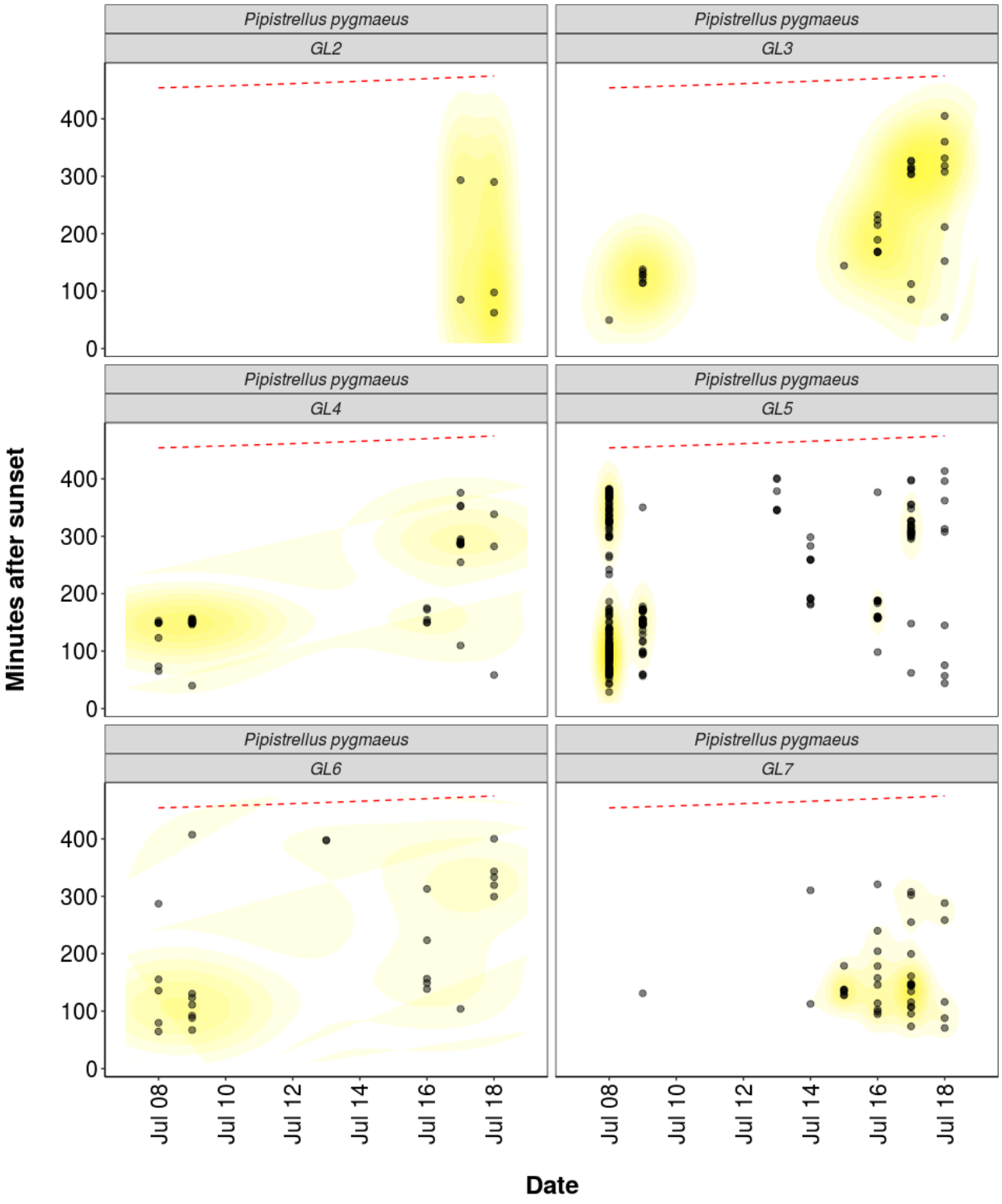

Myotis nattereri
GL5
Myotis nattereri
GL6
Myotis nattereri
GL7
Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL1
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Date

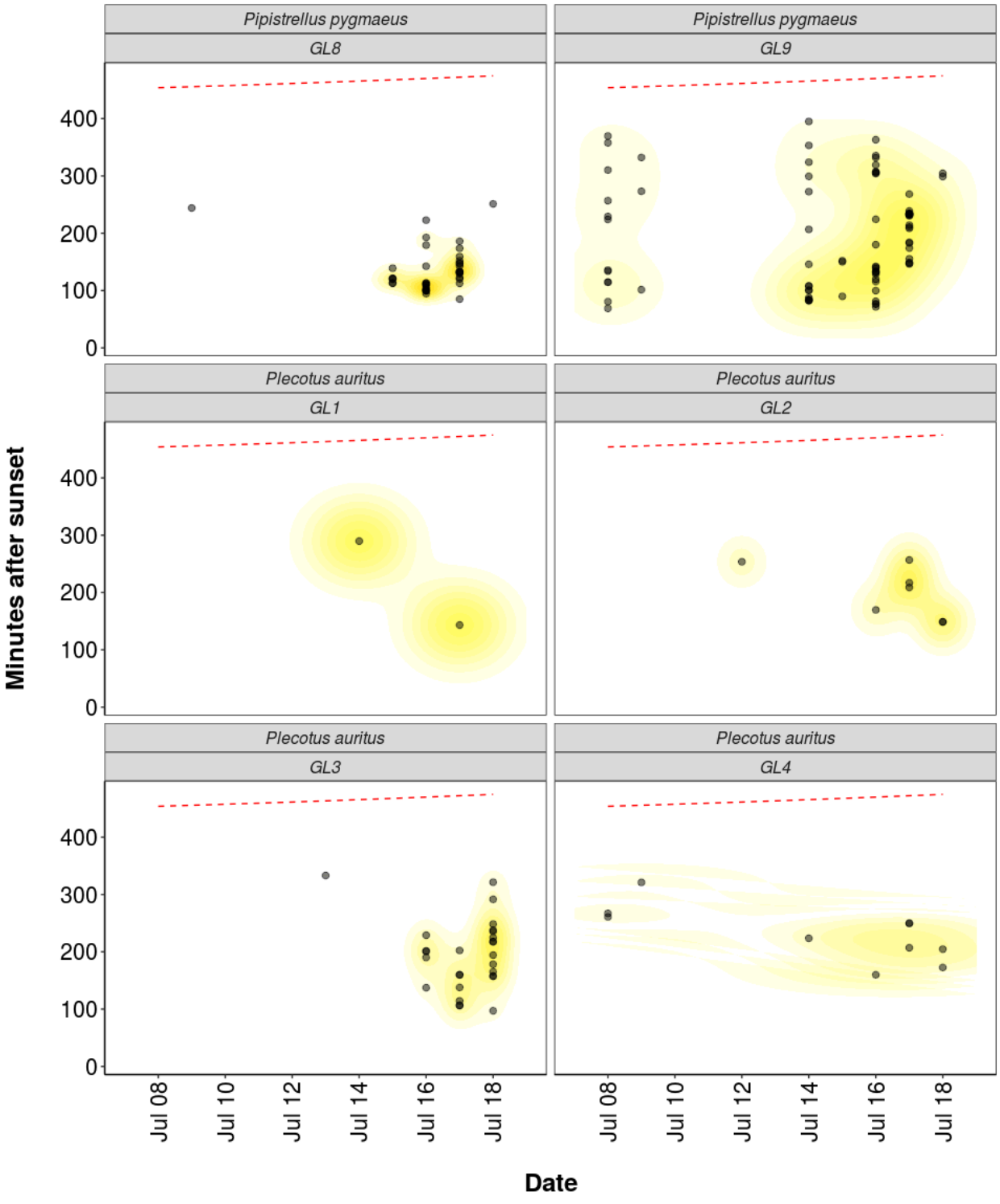

Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Date

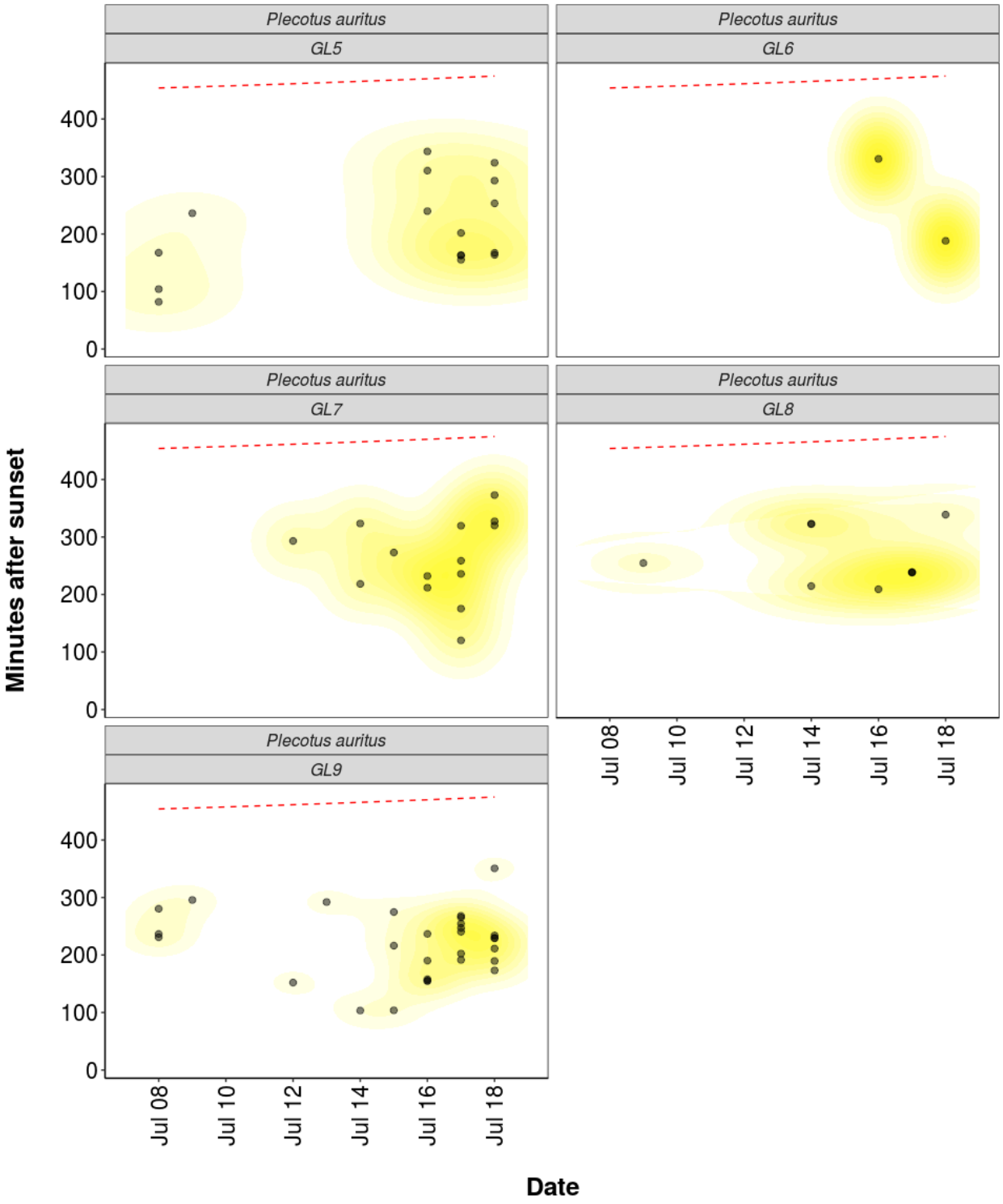

Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL3
Pipistrellus nathusii
GL4
Pipistrellus nathusii
GL5
Pipistrellus nathusii
GL6
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Date


Pipistrellus nathusii
GL8
Pipistrellus nathusii
GL9
Pipistrellus pipistrellus
GL1
Pipistrellus pipistrellus
GL2
Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL4
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Date


Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL8
Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Date


Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL4
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Date


Pipistrellus pygmaeus
GL8
Pipistrellus pygmaeus
GL9
Plecotus auritus
GL1
Plecotus auritus
GL2
Plecotus auritus
GL3
Plecotus auritus
GL4
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
Date


Plecotus auritus
GL5
Plecotus auritus
GL6
Plecotus auritus
GL7
Plecotus auritus
GL8
Plecotus auritus
GL9
Minutes after sunset
0
100
200
300
400
Jul 08
Jul 10
Jul 12
Jul 14
Jul 16
Jul 18
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/

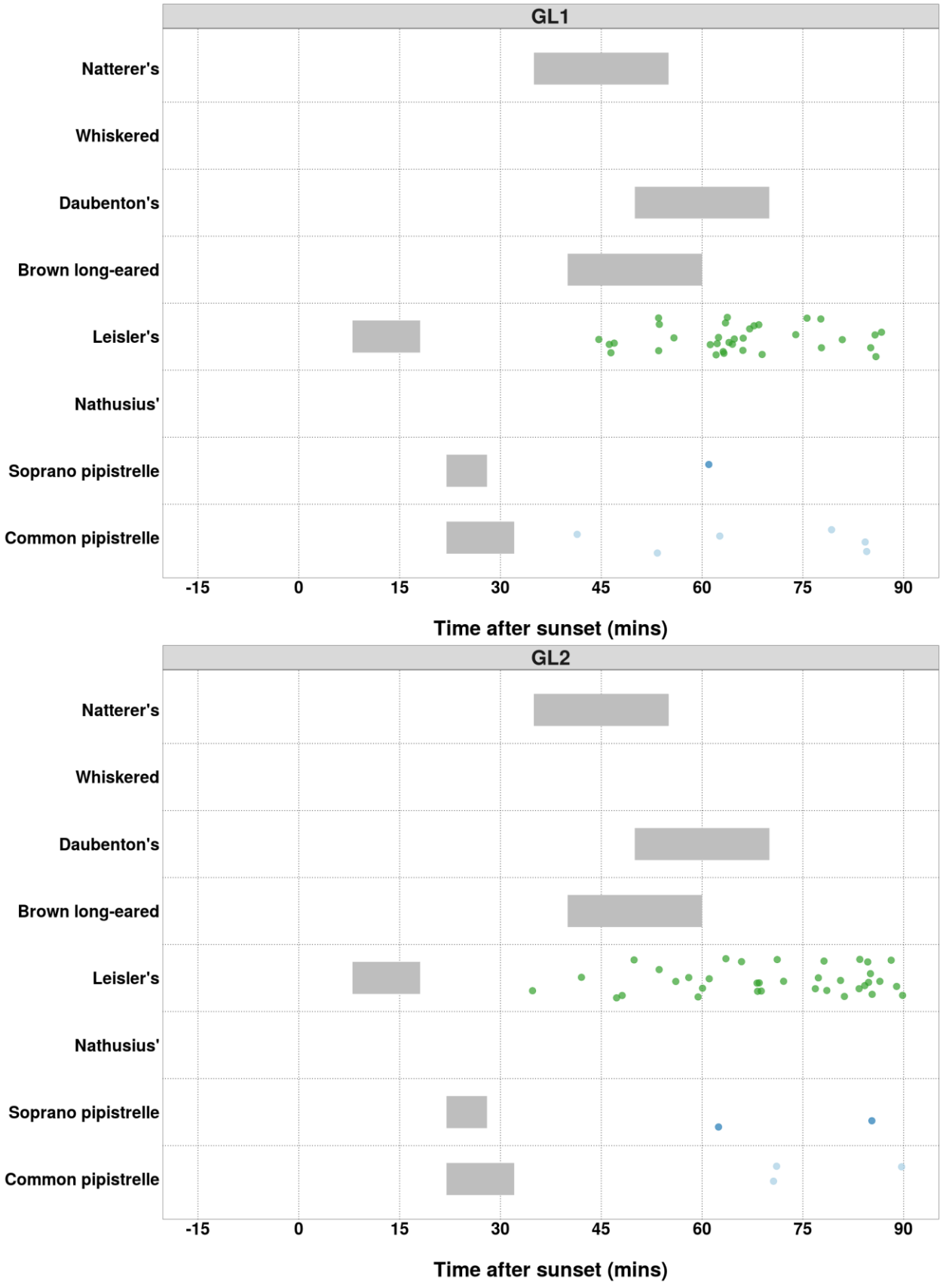
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012) - Table

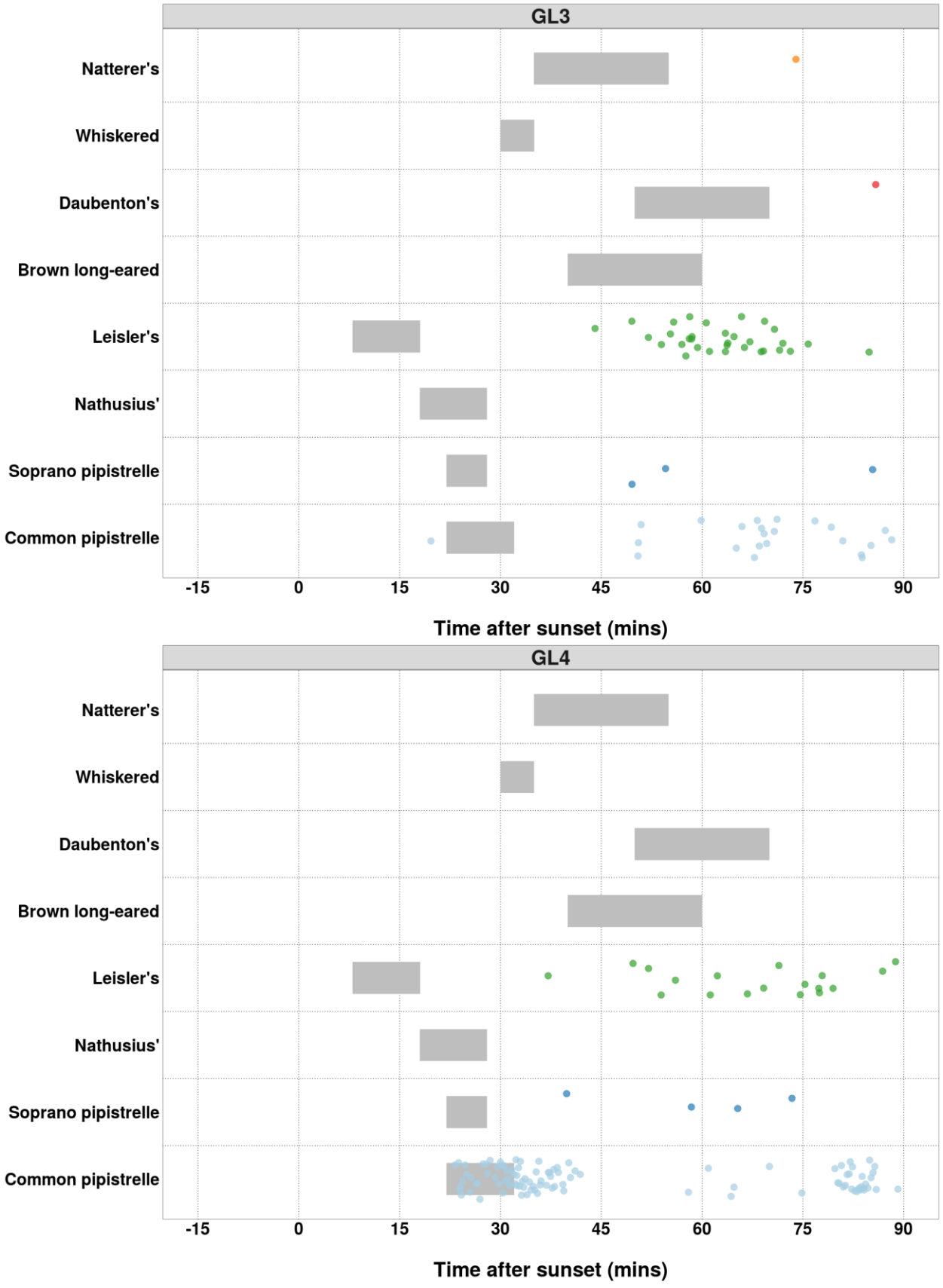
Table 12. Number of bat calls recorded before the upper time of the species-specific emergence time range, and which therefore may potentially indicate the presence of a nearby roost.

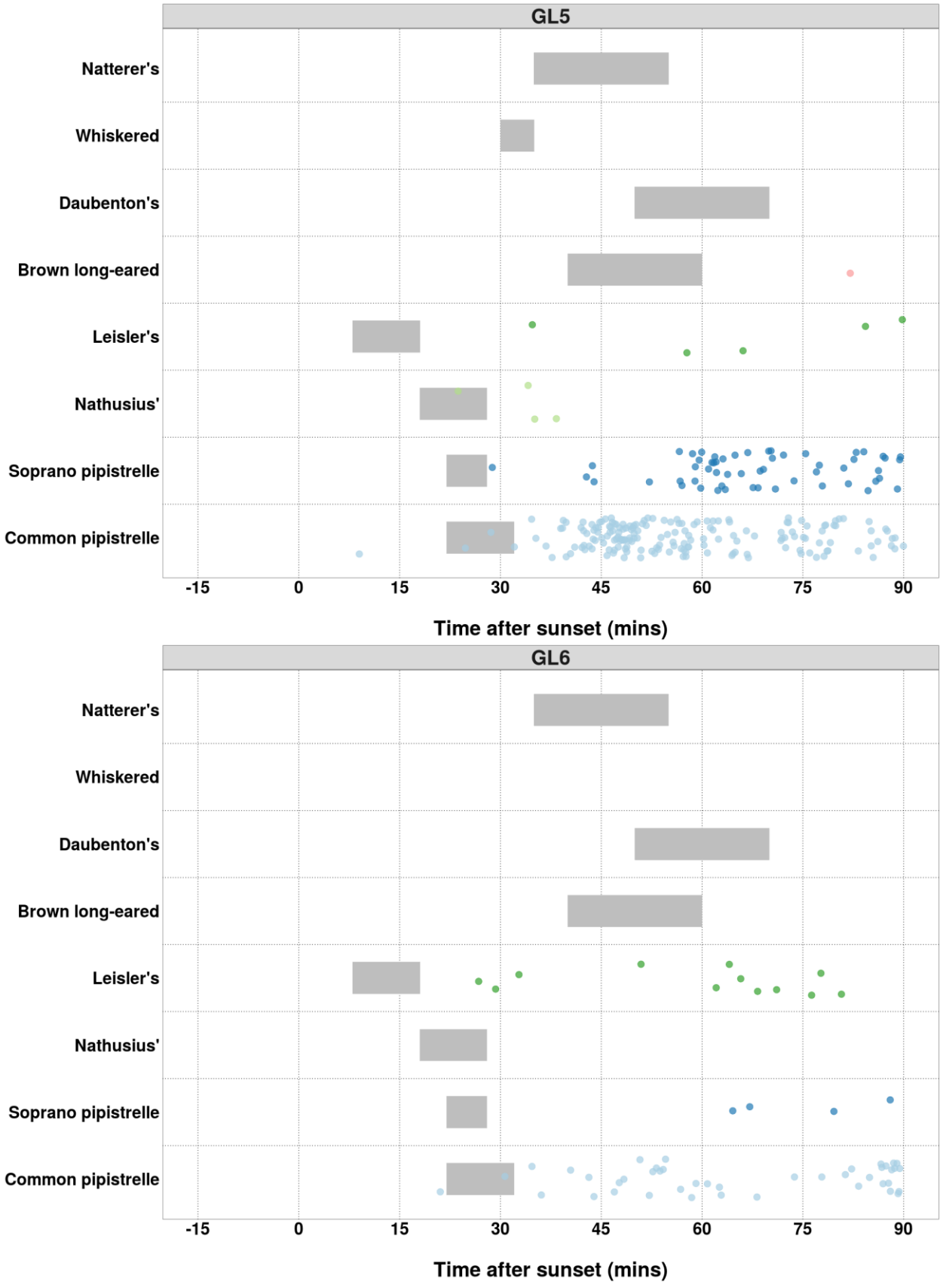
Species	Detector ID	2021-07-08	2021-07-09	2021-07-17	2021-07-18
Common pipistrelle	GL3	1	0	0	0
Common pipistrelle	GL4	0	29	0	0
Common pipistrelle	GL5	2	0	1	0
Common pipistrelle	GL6	1	1	0	0
Nathusius'	GL5	0	0	0	1

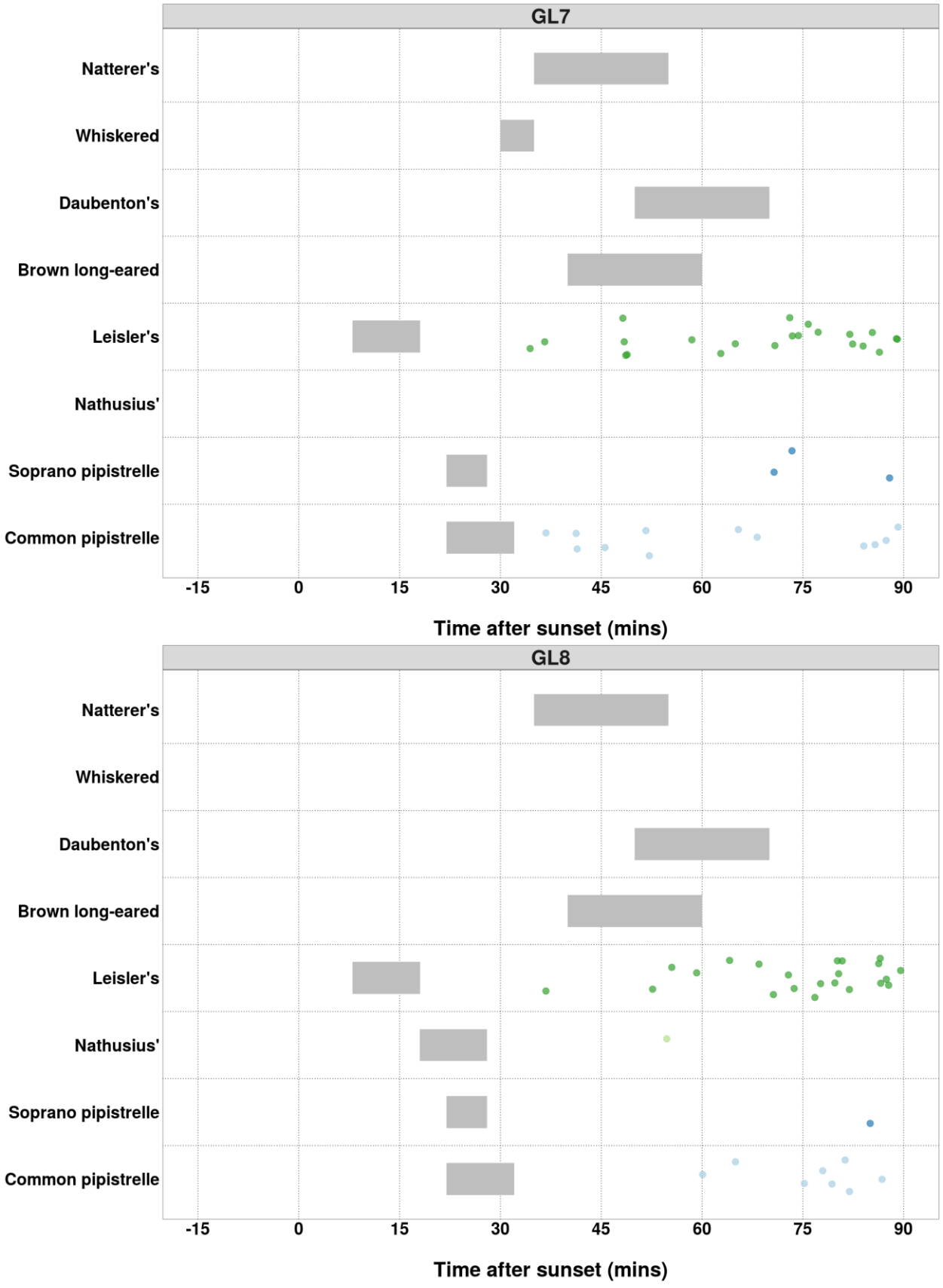
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012) - Figures

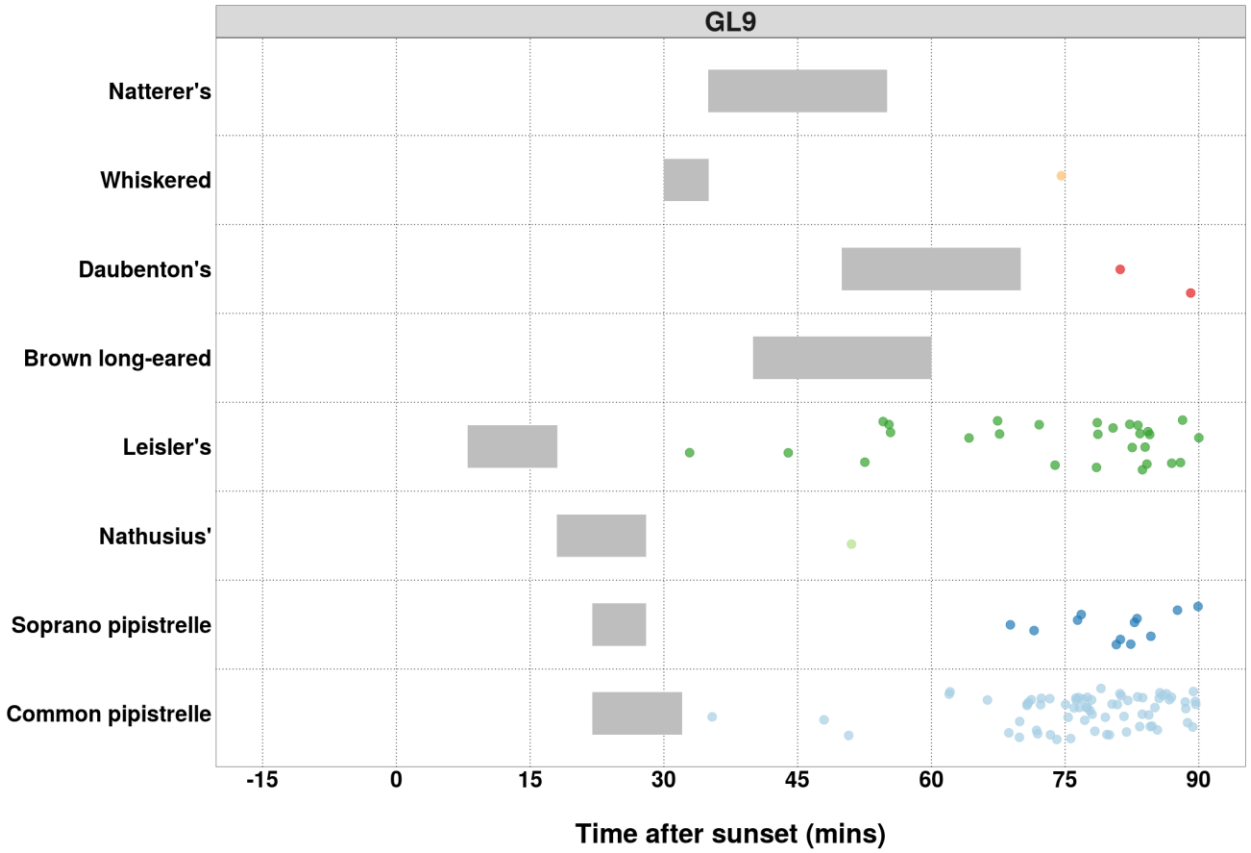
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.


GL1
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)
GL2
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL3
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)
GL4
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL5
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)
GL6
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL7
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)
GL8
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL9
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
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	2208	53.7
Soprano pipistrelle	577	14.0
Nathusius'	15	0.4
Leisler's	1047	25.5
Brown long-eared	116	2.8
Daubenton's	92	2.2
Whiskered	19	0.5
Natterer's	36	0.9
Total	4110	100.0

Counts of Bat Passes

Per Detector

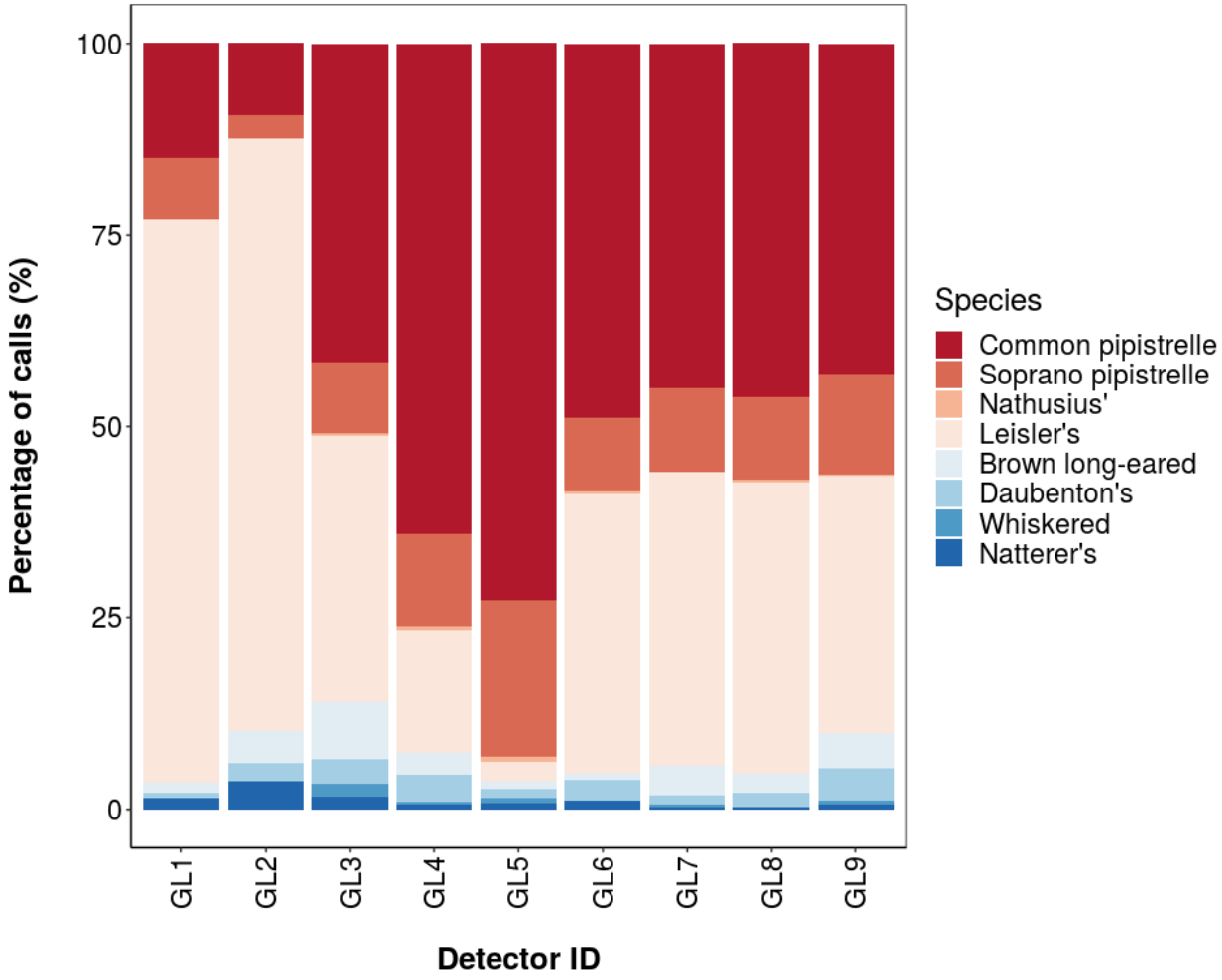
Table 15. The number of passes recorded for each species at each detector.

Species	Detector ID	Count (No)	Percentage by Detector (%)
Common pipistrelle	GL1	22	14.9
Common pipistrelle	GL2	16	9.5
Common pipistrelle	GL3	147	41.5
Common pipistrelle	GL4	229	64.1
Common pipistrelle	GL5	1056	72.8
Common pipistrelle	GL6	127	48.8
Common pipistrelle	GL7	168	45.0
Common pipistrelle	GL8	173	46.3
Common pipistrelle	GL9	270	43.2
Soprano pipistrelle	GL1	12	8.1
Soprano pipistrelle	GL2	5	3.0
Soprano pipistrelle	GL3	33	9.3
Soprano pipistrelle	GL4	43	12.0
Soprano pipistrelle	GL5	297	20.5
Soprano pipistrelle	GL6	25	9.6
Soprano pipistrelle	GL7	41	11.0
Soprano pipistrelle	GL8	40	10.7
Soprano pipistrelle	GL9	81	13.0
Nathusius'	GL3	1	0.3
Nathusius'	GL4	2	0.6
Nathusius'	GL5	8	0.6
Nathusius'	GL6	1	0.4
Nathusius'	GL8	1	0.3
Nathusius'	GL9	2	0.3
Leisler's	GL1	109	73.6
Leisler's	GL2	130	77.4
Leisler's	GL3	123	34.7
Leisler's	GL4	57	16.0
Leisler's	GL5	37	2.5

Leisler’s	GL6	95	36.5
Leisler’s	GL7	143	38.3
Leisler’s	GL8	143	38.2
Leisler’s	GL9	210	33.6
Brown long-eared	GL1	2	1.4
Brown long-eared	GL2	7	4.2
Brown long-eared	GL3	27	7.6
Brown long-eared	GL4	10	2.8
Brown long-eared	GL5	16	1.1
Brown long-eared	GL6	2	0.8
Brown long-eared	GL7	14	3.8
Brown long-eared	GL8	9	2.4
Brown long-eared	GL9	29	4.6
Daubenton’s	GL1	1	0.7
Daubenton’s	GL2	4	2.4
Daubenton’s	GL3	11	3.1
Daubenton’s	GL4	13	3.6
Daubenton’s	GL5	18	1.2
Daubenton’s	GL6	7	2.7
Daubenton’s	GL7	5	1.3
Daubenton’s	GL8	7	1.9
Daubenton’s	GL9	26	4.2
Whiskered	GL3	6	1.7
Whiskered	GL4	1	0.3
Whiskered	GL5	8	0.6
Whiskered	GL7	1	0.3
Whiskered	GL9	3	0.5
Natterer’s	GL1	2	1.4
Natterer’s	GL2	6	3.6
Natterer’s	GL3	6	1.7
Natterer’s	GL4	2	0.6
Natterer’s	GL5	11	0.8
Natterer’s	GL6	3	1.2
Natterer’s	GL7	1	0.3
Natterer’s	GL8	1	0.3
Natterer’s	GL9	4	0.6

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	GL1	0.4
Common pipistrelle	GL2	0.3
Common pipistrelle	GL3	2.5
Common pipistrelle	GL4	3.6
Common pipistrelle	GL5	17.6
Common pipistrelle	GL6	0.6
Common pipistrelle	GL7	1.8
Common pipistrelle	GL8	2.2
Common pipistrelle	GL9	3.4
Soprano pipistrelle	GL1	0.4
Soprano pipistrelle	GL2	0.3
Soprano pipistrelle	GL3	0.9
Soprano pipistrelle	GL4	0.9
Soprano pipistrelle	GL5	2.2
Soprano pipistrelle	GL6	0.6
Soprano pipistrelle	GL7	0.8
Soprano pipistrelle	GL8	0.8
Soprano pipistrelle	GL9	1.6
Nathusius'	GL3	0.1
Nathusius'	GL4	0.3
Nathusius'	GL5	0.2
Nathusius'	GL6	0.1
Nathusius'	GL8	0.1

Nathusius'	GL9	0.1
Leisler's	GL1	1.4
Leisler's	GL2	2.7
Leisler's	GL3	1.9
Leisler's	GL4	1.6
Leisler's	GL5	0.6
Leisler's	GL6	1.1
Leisler's	GL7	3.2
Leisler's	GL8	2.3
Leisler's	GL9	1.3
Brown long-eared	GL1	0.1
Brown long-eared	GL2	0.2
Brown long-eared	GL3	0.8
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.4
Brown long-eared	GL6	0.1
Brown long-eared	GL7	0.3
Brown long-eared	GL8	0.1
Brown long-eared	GL9	0.4
Daubenton's	GL1	0.1
Daubenton's	GL2	0.1
Daubenton's	GL3	0.3
Daubenton's	GL4	0.9
Daubenton's	GL5	0.4
Daubenton's	GL6	0.4
Daubenton's	GL7	0.3
Daubenton's	GL8	0.2
Daubenton's	GL9	0.4
Whiskered	GL3	0.4
Whiskered	GL4	0.1
Whiskered	GL5	0.2
Whiskered	GL7	0.1
Whiskered	GL9	0.1
Natterer's	GL1	0.1
Natterer's	GL2	0.4
Natterer's	GL3	0.1

Natterer’s	GL4	0.1
Natterer’s	GL5	0.3
Natterer’s	GL6	0.1
Natterer’s	GL7	0.1
Natterer’s	GL8	0.1
Natterer’s	GL9	0.1

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	GL1	0.5
Common pipistrelle	GL2	0.5
Common pipistrelle	GL3	2.7
Common pipistrelle	GL4	5.0
Common pipistrelle	GL5	19.5
Common pipistrelle	GL6	1.8
Common pipistrelle	GL7	2.7
Common pipistrelle	GL8	3.7
Common pipistrelle	GL9	5.0
Soprano pipistrelle	GL1	0.4
Soprano pipistrelle	GL2	0.3
Soprano pipistrelle	GL3	0.7
Soprano pipistrelle	GL4	1.1
Soprano pipistrelle	GL5	5.6
Soprano pipistrelle	GL6	0.5
Soprano pipistrelle	GL7	0.9
Soprano pipistrelle	GL8	1.0
Soprano pipistrelle	GL9	1.5
Nathusius'	GL3	0.1
Nathusius'	GL4	0.3
Nathusius'	GL5	0.2
Nathusius'	GL6	0.1
Nathusius'	GL8	0.1
Nathusius'	GL9	0.1
Leisler's	GL1	2.0
Leisler's	GL2	2.8

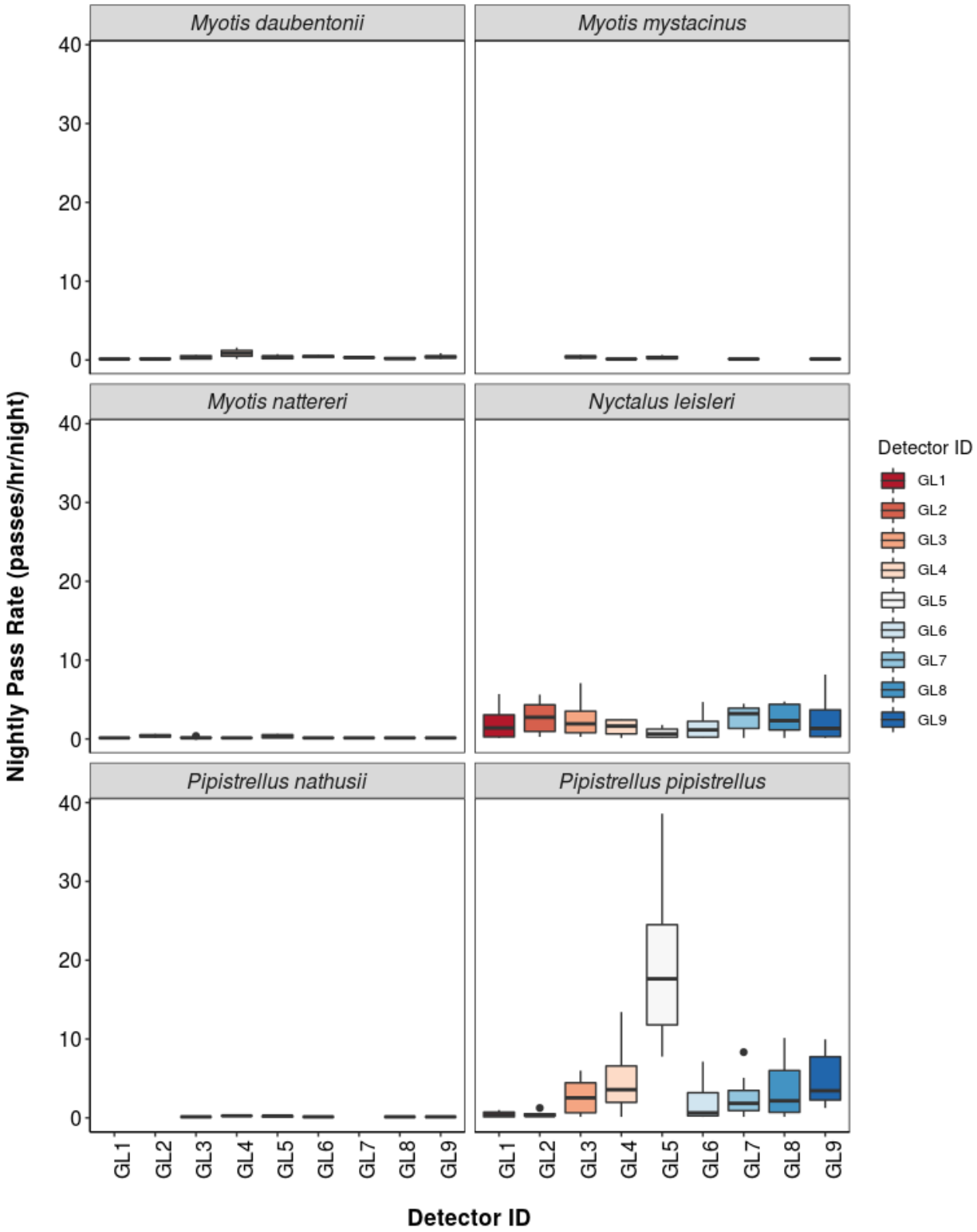
Leisler’s	GL3	2.6
Leisler’s	GL4	1.4
Leisler’s	GL5	0.8
Leisler’s	GL6	1.5
Leisler’s	GL7	2.6
Leisler’s	GL8	2.6
Leisler’s	GL9	2.7
Brown long-eared	GL1	0.1
Brown long-eared	GL2	0.2
Brown long-eared	GL3	0.9
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.4
Brown long-eared	GL6	0.1
Brown long-eared	GL7	0.3
Brown long-eared	GL8	0.2
Brown long-eared	GL9	0.4
Daubenton’s	GL1	0.1
Daubenton’s	GL2	0.2
Daubenton’s	GL3	0.4
Daubenton’s	GL4	0.9
Daubenton’s	GL5	0.4
Daubenton’s	GL6	0.4
Daubenton’s	GL7	0.3
Daubenton’s	GL8	0.2
Daubenton’s	GL9	0.4
Whiskered	GL3	0.4
Whiskered	GL4	0.1
Whiskered	GL5	0.3
Whiskered	GL7	0.1
Whiskered	GL9	0.1
Natterer’s	GL1	0.1
Natterer’s	GL2	0.4
Natterer’s	GL3	0.2
Natterer’s	GL4	0.1
Natterer’s	GL5	0.4
Natterer’s	GL6	0.1

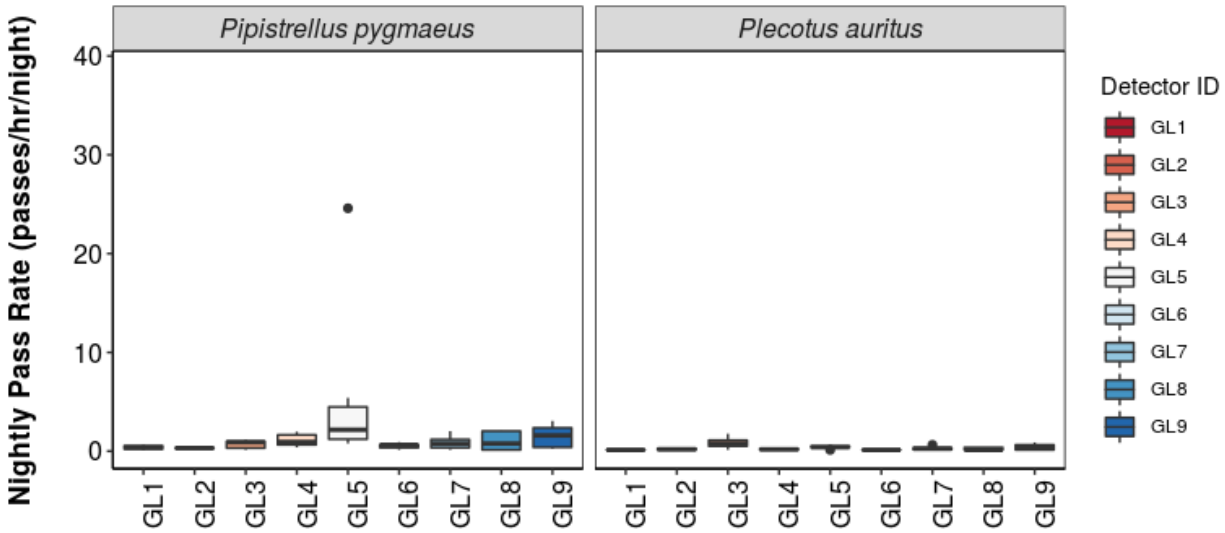
Natterer’s	GL7	0.1
Natterer’s	GL8	0.1
Natterer’s	GL9	0.1

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
10
20
30
40
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
40
30
20
10
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
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	Jul
Common pipistrelle	GL1	22
Common pipistrelle	GL2	16
Common pipistrelle	GL3	147
Common pipistrelle	GL4	229
Common pipistrelle	GL5	1056
Common pipistrelle	GL6	127
Common pipistrelle	GL7	168
Common pipistrelle	GL8	173
Common pipistrelle	GL9	270
Soprano pipistrelle	GL1	12
Soprano pipistrelle	GL2	5
Soprano pipistrelle	GL3	33
Soprano pipistrelle	GL4	43
Soprano pipistrelle	GL5	297
Soprano pipistrelle	GL6	25
Soprano pipistrelle	GL7	41
Soprano pipistrelle	GL8	40
Soprano pipistrelle	GL9	81
Nathusius'	GL3	1
Nathusius'	GL4	2
Nathusius'	GL5	8
Nathusius'	GL6	1
Nathusius'	GL8	1
Nathusius'	GL9	2

Leisler’s	GL1	109
Leisler’s	GL2	130
Leisler’s	GL3	123
Leisler’s	GL4	57
Leisler’s	GL5	37
Leisler’s	GL6	95
Leisler’s	GL7	143
Leisler’s	GL8	143
Leisler’s	GL9	210
Brown long-eared	GL1	2
Brown long-eared	GL2	7
Brown long-eared	GL3	27
Brown long-eared	GL4	10
Brown long-eared	GL5	16
Brown long-eared	GL6	2
Brown long-eared	GL7	14
Brown long-eared	GL8	9
Brown long-eared	GL9	29
Daubenton’s	GL1	1
Daubenton’s	GL2	4
Daubenton’s	GL3	11
Daubenton’s	GL4	13
Daubenton’s	GL5	18
Daubenton’s	GL6	7
Daubenton’s	GL7	5
Daubenton’s	GL8	7
Daubenton’s	GL9	26
Whiskered	GL3	6
Whiskered	GL4	1
Whiskered	GL5	8
Whiskered	GL7	1
Whiskered	GL9	3
Natterer’s	GL1	2
Natterer’s	GL2	6
Natterer’s	GL3	6
Natterer’s	GL4	2

Natterer’s	GL5	11
Natterer’s	GL6	3
Natterer’s	GL7	1
Natterer’s	GL8	1
Natterer’s	GL9	4

Survey Effort

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

Month	Detector ID	No. of Survey Nights
Jul	GL1	9
Jul	GL2	7
Jul	GL3	8
Jul	GL4	7
Jul	GL5	9
Jul	GL6	9
Jul	GL7	9
Jul	GL8	7
Jul	GL9	10

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	Jul
Common pipistrelle	GL1	0.4
Common pipistrelle	GL2	0.3
Common pipistrelle	GL3	2.5
Common pipistrelle	GL4	3.6
Common pipistrelle	GL5	17.6
Common pipistrelle	GL6	0.6
Common pipistrelle	GL7	1.8
Common pipistrelle	GL8	2.2
Common pipistrelle	GL9	3.4
Soprano pipistrelle	GL1	0.4
Soprano pipistrelle	GL2	0.3
Soprano pipistrelle	GL3	0.9
Soprano pipistrelle	GL4	0.9
Soprano pipistrelle	GL5	2.2
Soprano pipistrelle	GL6	0.6
Soprano pipistrelle	GL7	0.8
Soprano pipistrelle	GL8	0.8
Soprano pipistrelle	GL9	1.6
Nathusius'	GL3	0.1
Nathusius'	GL4	0.3
Nathusius'	GL5	0.2
Nathusius'	GL6	0.1
Nathusius'	GL8	0.1

Nathusius'	GL9	0.1
Leisler's	GL1	1.4
Leisler's	GL2	2.7
Leisler's	GL3	1.9
Leisler's	GL4	1.6
Leisler's	GL5	0.6
Leisler's	GL6	1.1
Leisler's	GL7	3.2
Leisler's	GL8	2.3
Leisler's	GL9	1.3
Brown long-eared	GL1	0.1
Brown long-eared	GL2	0.2
Brown long-eared	GL3	0.8
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.4
Brown long-eared	GL6	0.1
Brown long-eared	GL7	0.3
Brown long-eared	GL8	0.1
Brown long-eared	GL9	0.4
Daubenton's	GL1	0.1
Daubenton's	GL2	0.1
Daubenton's	GL3	0.3
Daubenton's	GL4	0.9
Daubenton's	GL5	0.4
Daubenton's	GL6	0.4
Daubenton's	GL7	0.3
Daubenton's	GL8	0.2
Daubenton's	GL9	0.4
Whiskered	GL3	0.4
Whiskered	GL4	0.1
Whiskered	GL5	0.2
Whiskered	GL7	0.1
Whiskered	GL9	0.1
Natterer's	GL1	0.1
Natterer's	GL2	0.4
Natterer's	GL3	0.1

Natterer’s	GL4	0.1
Natterer’s	GL5	0.3
Natterer’s	GL6	0.1
Natterer’s	GL7	0.1
Natterer’s	GL8	0.1
Natterer’s	GL9	0.1

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	Jul
Common pipistrelle	GL1	0.5
Common pipistrelle	GL2	0.5
Common pipistrelle	GL3	2.7
Common pipistrelle	GL4	5.0
Common pipistrelle	GL5	19.5
Common pipistrelle	GL6	1.8
Common pipistrelle	GL7	2.7
Common pipistrelle	GL8	3.7
Common pipistrelle	GL9	5.0
Soprano pipistrelle	GL1	0.4
Soprano pipistrelle	GL2	0.3
Soprano pipistrelle	GL3	0.7
Soprano pipistrelle	GL4	1.1
Soprano pipistrelle	GL5	5.6
Soprano pipistrelle	GL6	0.5
Soprano pipistrelle	GL7	0.9
Soprano pipistrelle	GL8	1.0
Soprano pipistrelle	GL9	1.5
Nathusius'	GL3	0.1
Nathusius'	GL4	0.3
Nathusius'	GL5	0.2
Nathusius'	GL6	0.1
Nathusius'	GL8	0.1
Nathusius'	GL9	0.1
Leisler's	GL1	2.0
Leisler's	GL2	2.8

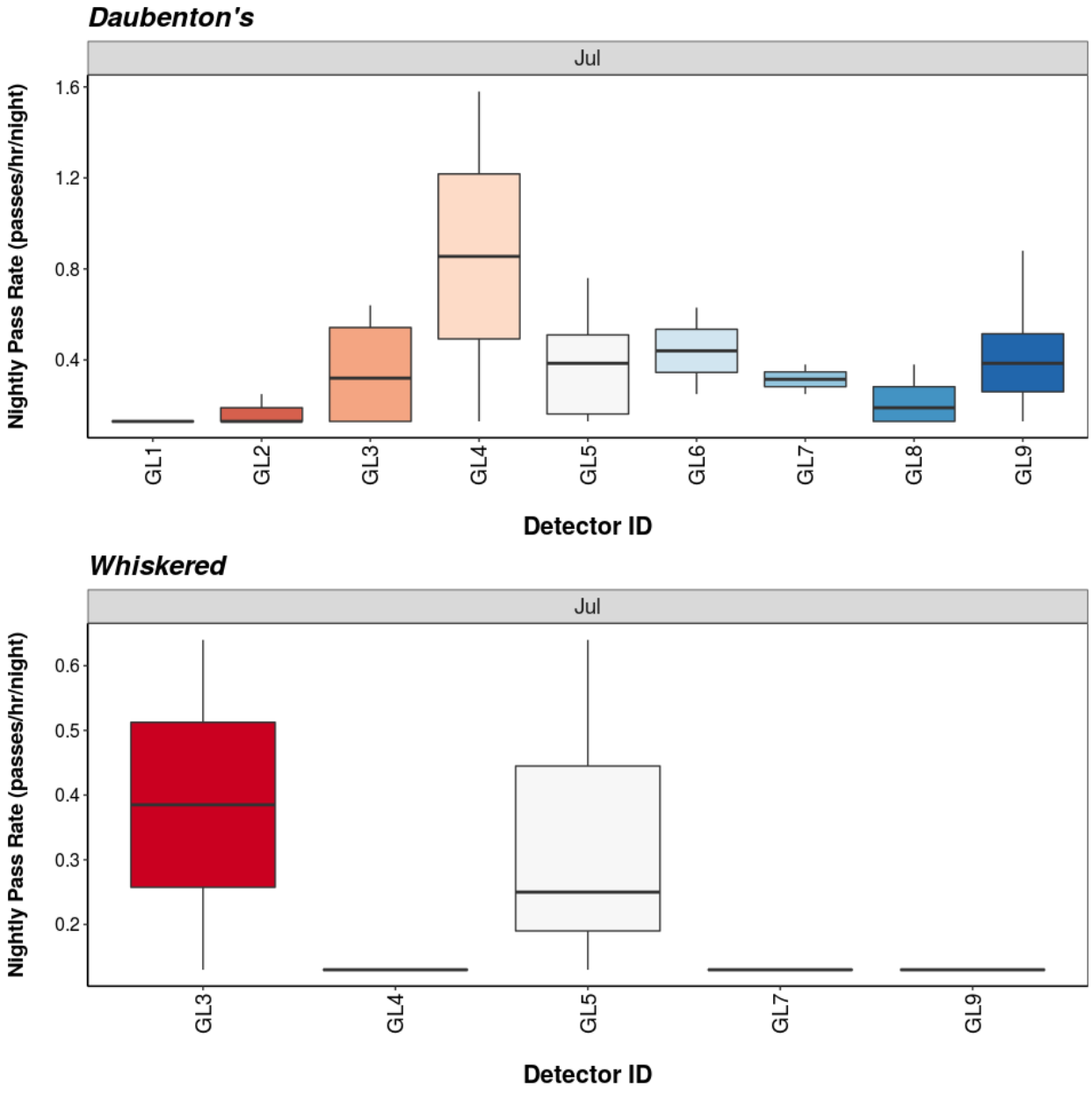
Leisler's	GL3	2.6
Leisler's	GL4	1.4
Leisler's	GL5	0.8
Leisler's	GL6	1.5
Leisler's	GL7	2.6
Leisler's	GL8	2.6
Leisler's	GL9	2.7
Brown long-eared	GL1	0.1
Brown long-eared	GL2	0.2
Brown long-eared	GL3	0.9
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.4
Brown long-eared	GL6	0.1
Brown long-eared	GL7	0.3
Brown long-eared	GL8	0.2
Brown long-eared	GL9	0.4
Daubenton's	GL1	0.1
Daubenton's	GL2	0.2
Daubenton's	GL3	0.4
Daubenton's	GL4	0.9
Daubenton's	GL5	0.4
Daubenton's	GL6	0.4
Daubenton's	GL7	0.3
Daubenton's	GL8	0.2
Daubenton's	GL9	0.4
Whiskered	GL3	0.4
Whiskered	GL4	0.1
Whiskered	GL5	0.3
Whiskered	GL7	0.1
Whiskered	GL9	0.1
Natterer's	GL1	0.1
Natterer's	GL2	0.4
Natterer's	GL3	0.2
Natterer's	GL4	0.1
Natterer's	GL5	0.4
Natterer's	GL6	0.1

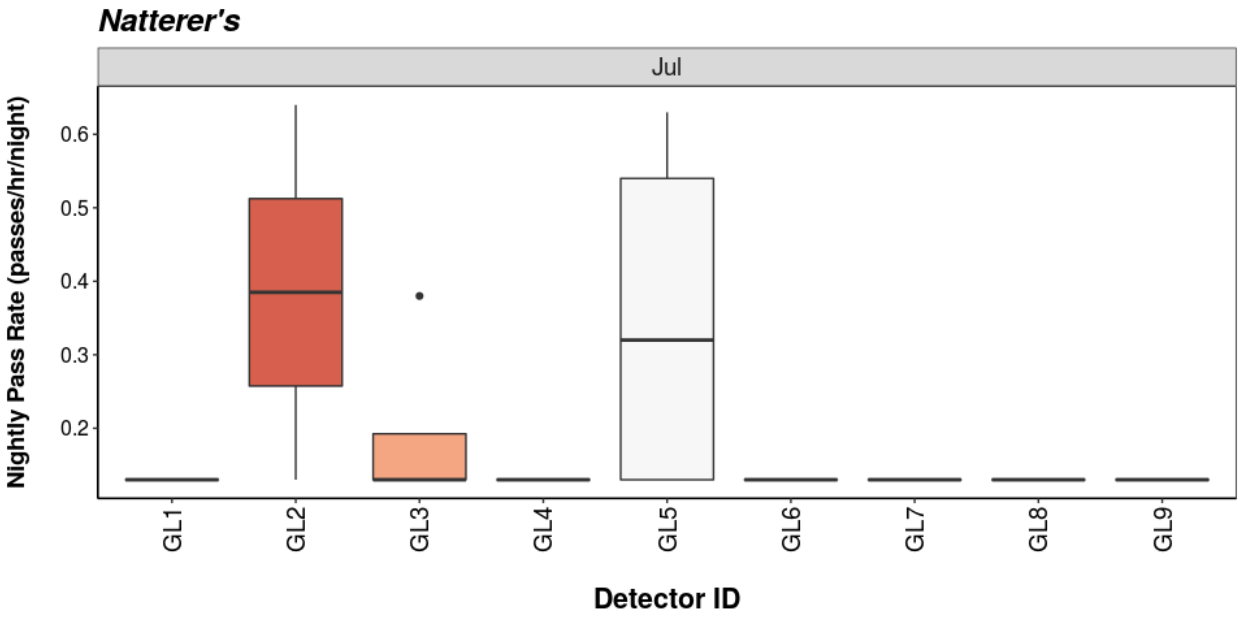
Natterer’s	GL7	0.1
Natterer’s	GL8	0.1
Natterer’s	GL9	0.1

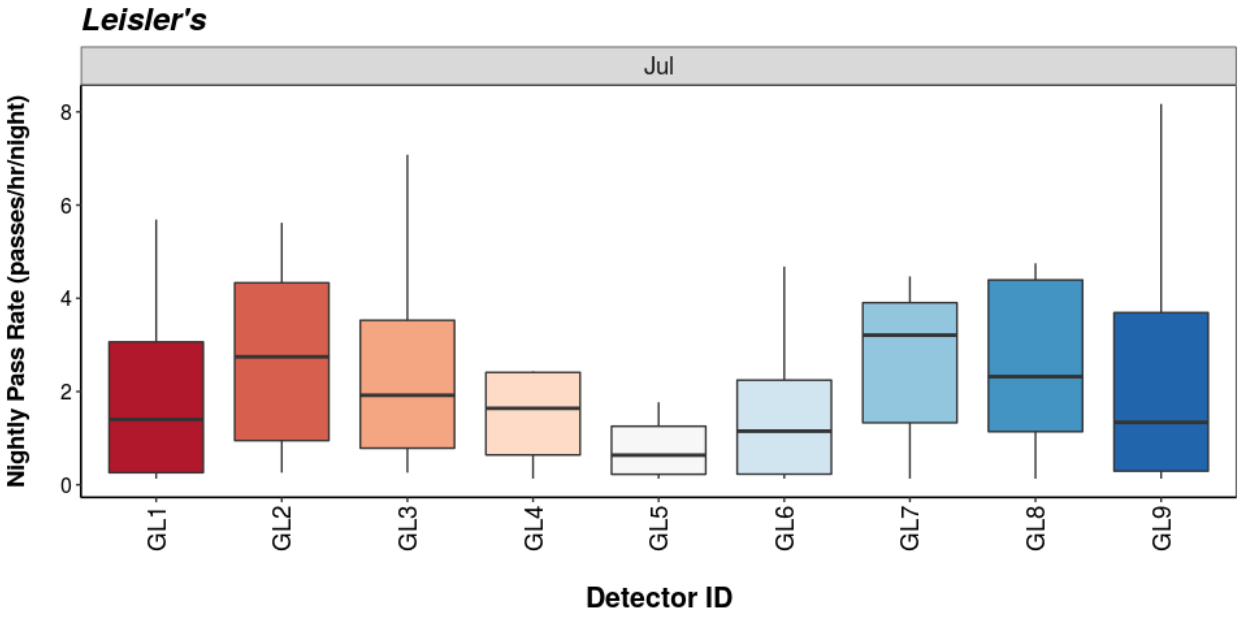
Nightly Bat Pass Rate for each Month

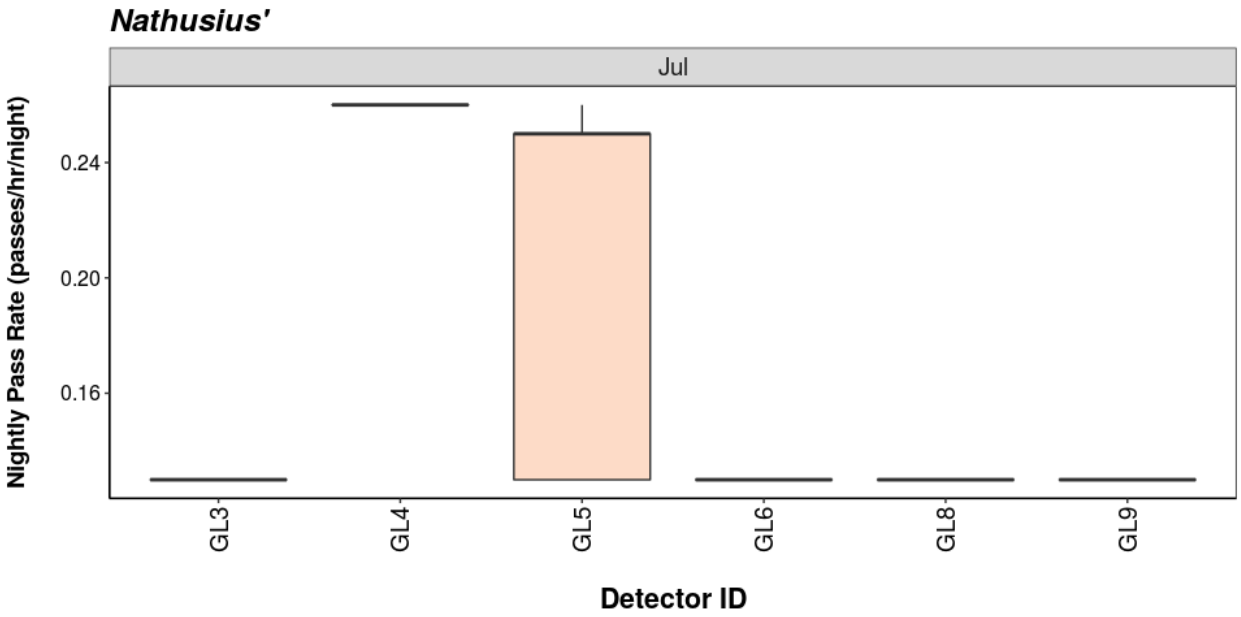
Per Detector - Figures

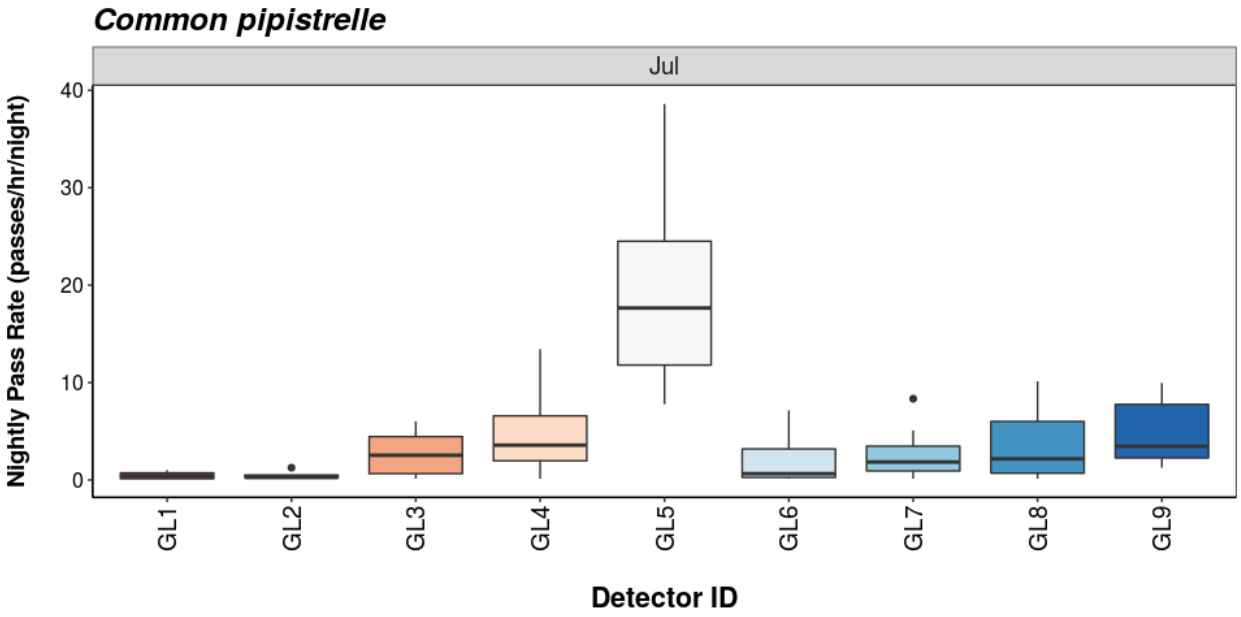
Figure 12. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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



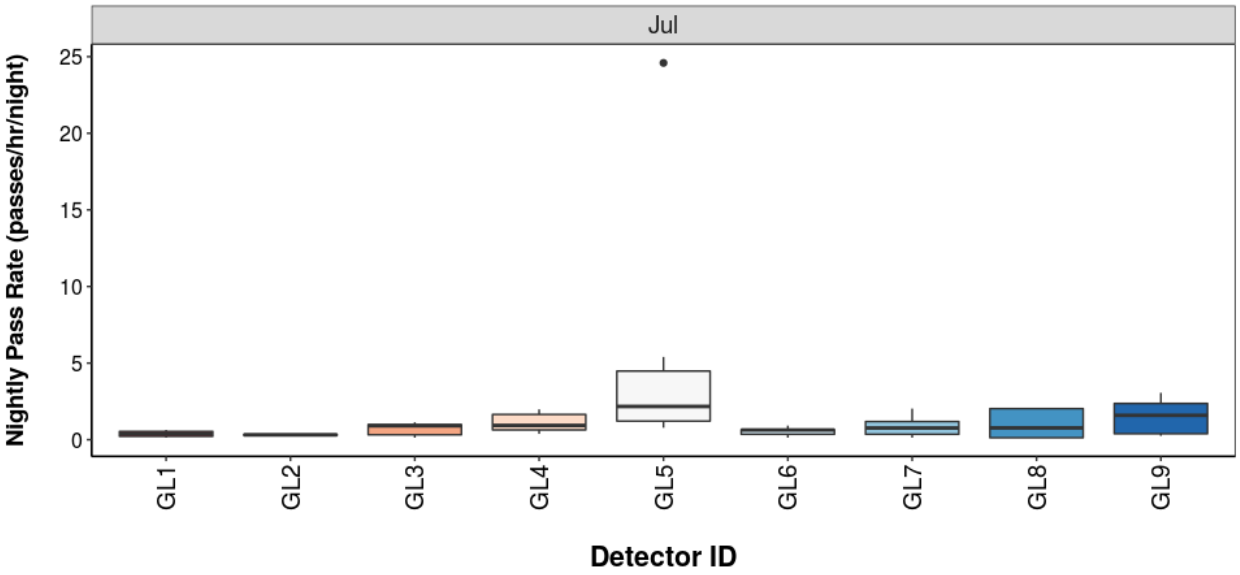

Natterer's
Jul
Nightly Pass Rate (passes/hr/night)
0.6
0.5
0.4
0.3
0.2
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Leisler's
Jul
Nightly Pass Rate (passes/hr/night)
8
6
4
2
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

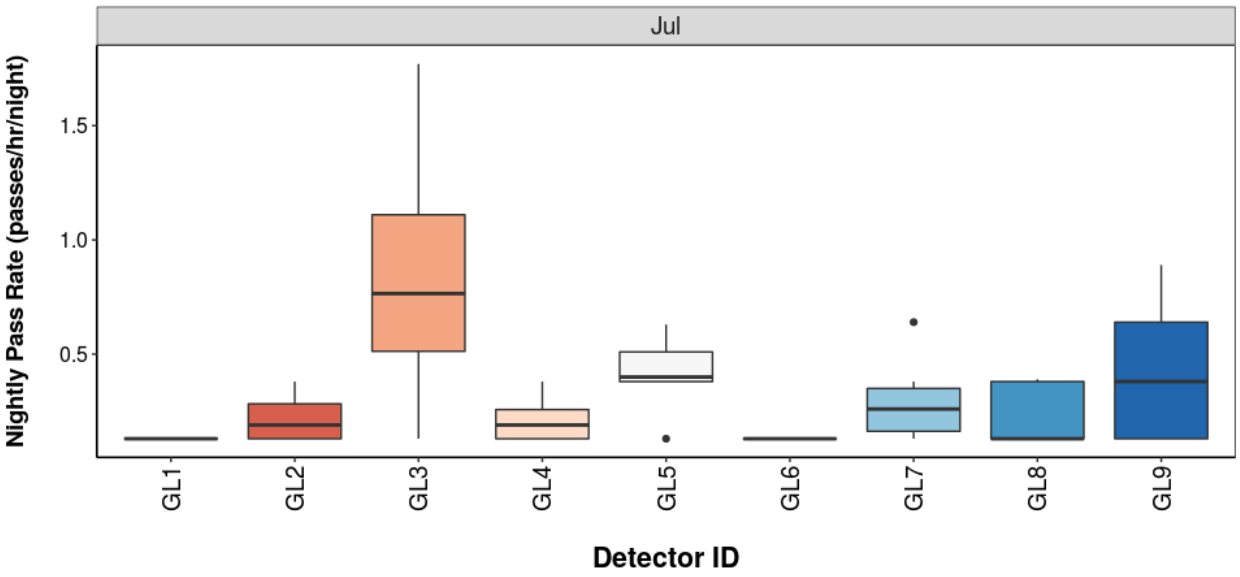

Nathusius'
Jul
Nightly Pass Rate (passes/hr/night)
0.24
0.20
0.16
GL3
GL4
GL5
GL6
GL8
GL9
Detector ID


Common pipistrelle
Jul
Nightly Pass Rate (passes/hr/night)
40
30
20
10
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

Soprano pipistrelle



Brown long-eared



Bat Activity per Detector Location

Figure 13. Detector ID reference:

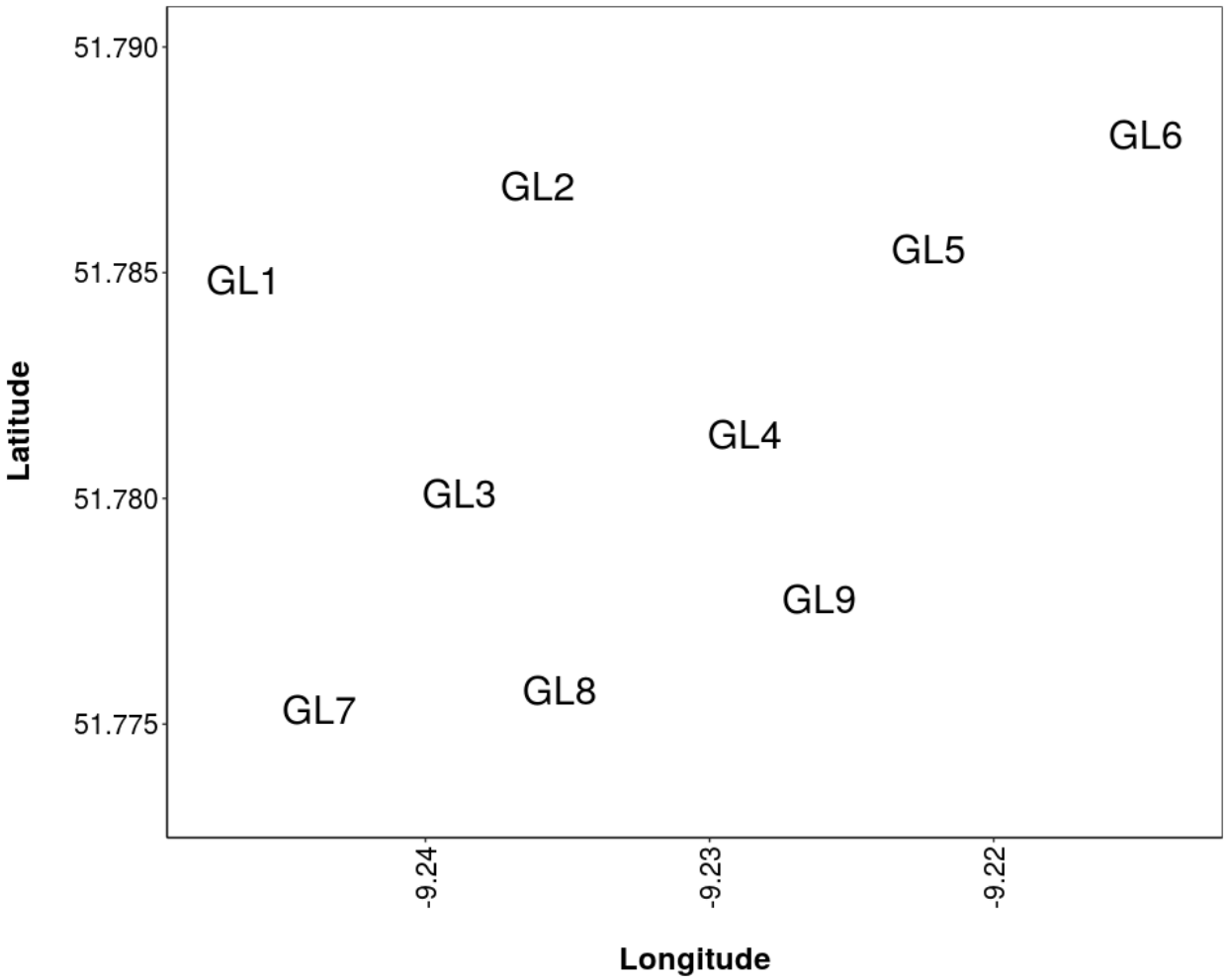
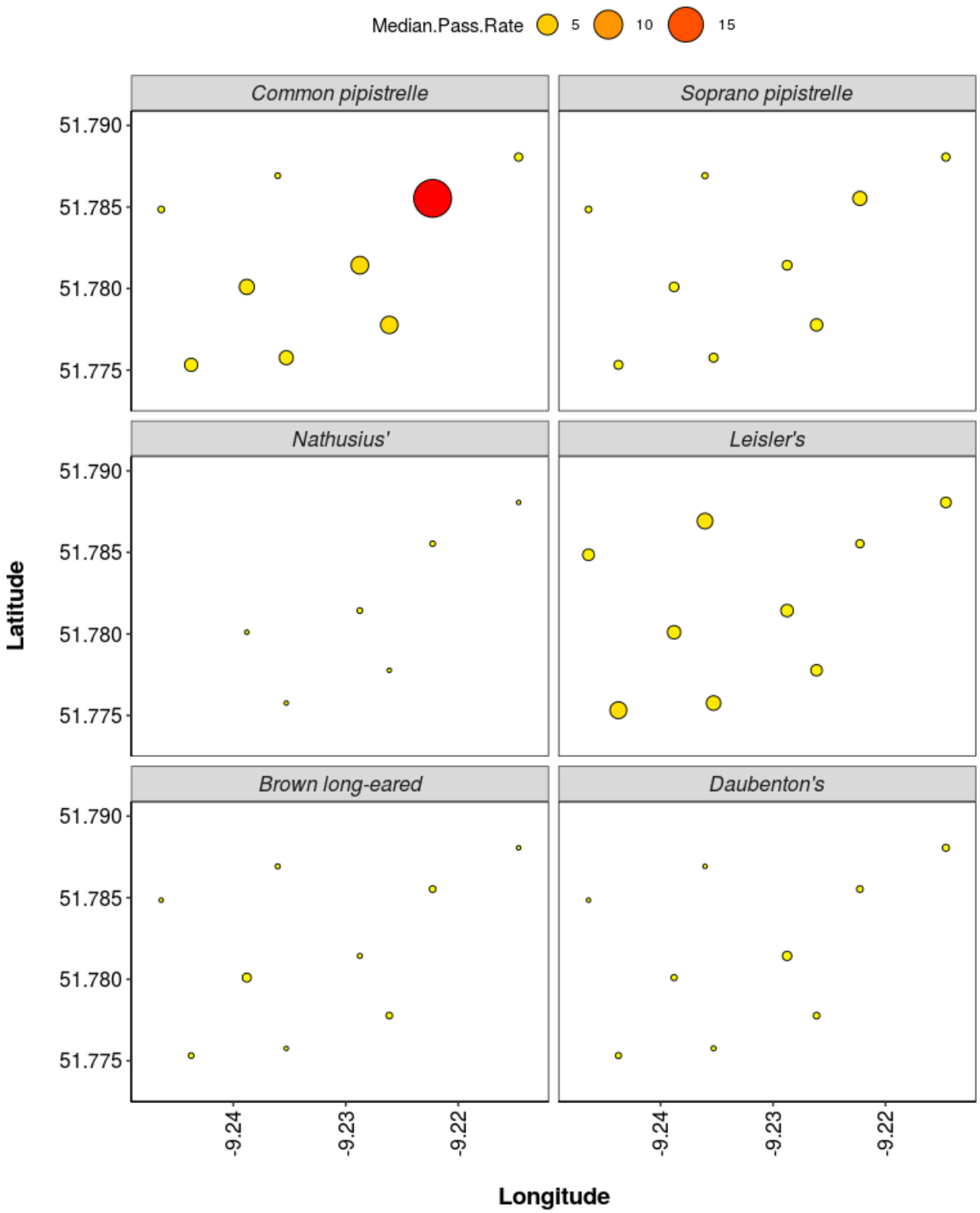


Figure 14. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
5
10
15
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

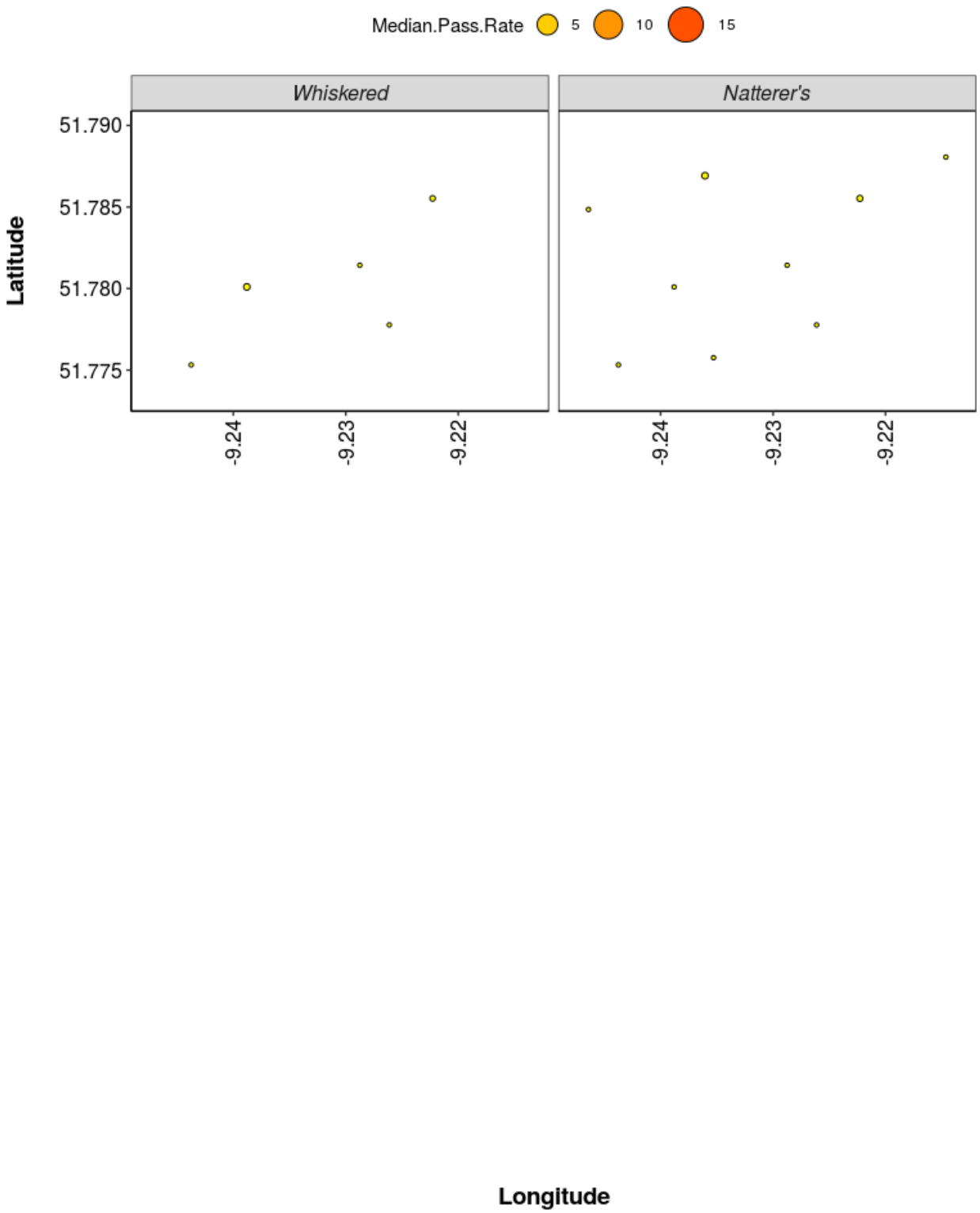
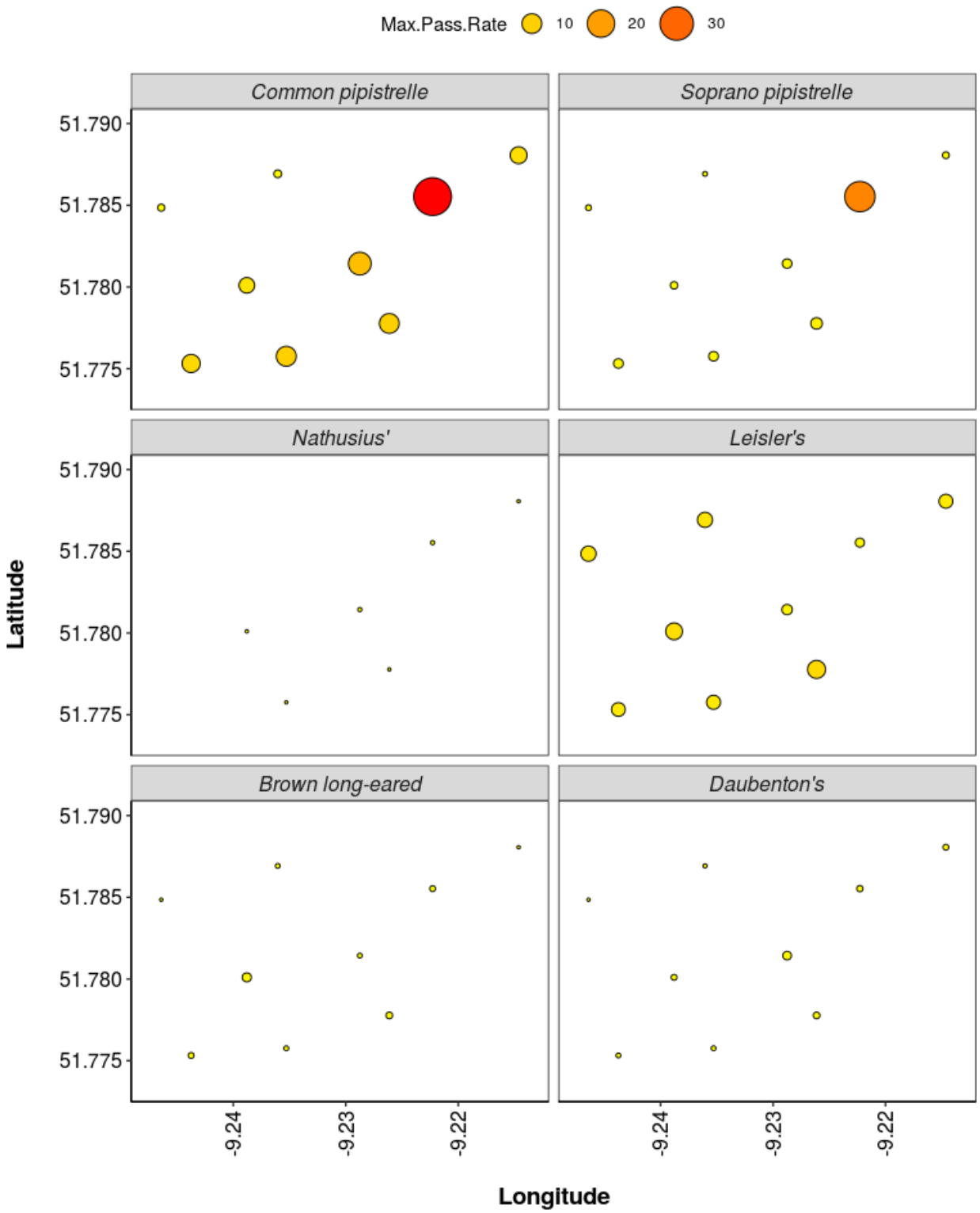
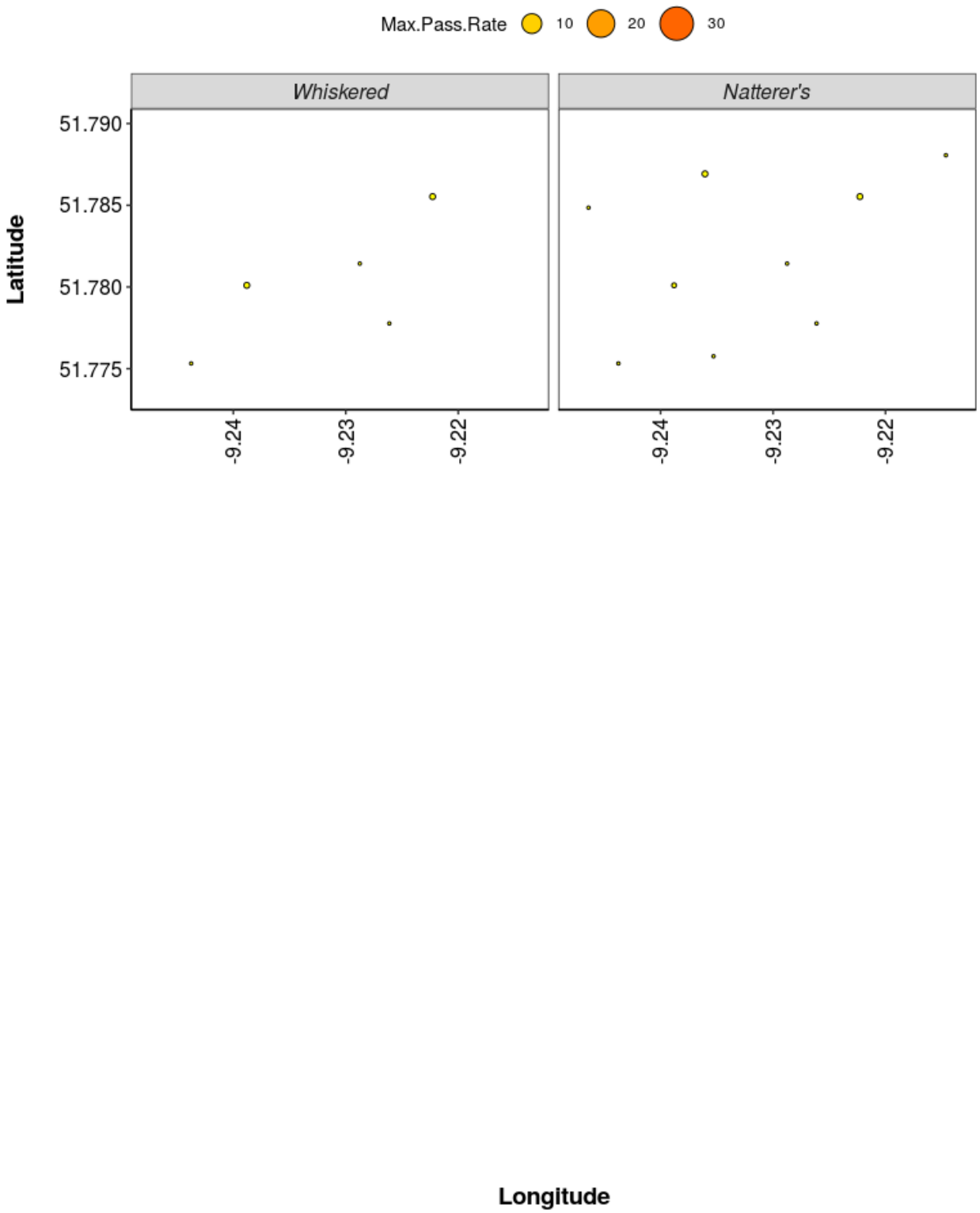

Median.Pass.Rate
5
10
15
Whiskered
Natterer's
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
10
20
30
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude


Max.Pass.Rate
10
20
30
Whiskered
Natterer's
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

PART 2B: Includes absences

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

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Brown long-eared	GL1	0.0
Brown long-eared	GL2	0.1
Brown long-eared	GL3	0.1
Brown long-eared	GL4	0.1
Brown long-eared	GL5	0.1
Brown long-eared	GL6	0.0
Brown long-eared	GL7	0.1
Brown long-eared	GL8	0.1
Brown long-eared	GL9	0.3
Common pipistrelle	GL1	0.1
Common pipistrelle	GL2	0.2
Common pipistrelle	GL3	1.7
Common pipistrelle	GL4	3.3
Common pipistrelle	GL5	13.0
Common pipistrelle	GL6	0.6
Common pipistrelle	GL7	1.3
Common pipistrelle	GL8	0.9
Common pipistrelle	GL9	2.3
Daubenton's	GL1	0.0
Daubenton's	GL2	0.0
Daubenton's	GL3	0.1
Daubenton's	GL4	0.0
Daubenton's	GL5	0.1

Daubenton's	GL6	0.0
Daubenton's	GL7	0.0
Daubenton's	GL8	0.1
Daubenton's	GL9	0.3
Leisler's	GL1	0.3
Leisler's	GL2	1.4
Leisler's	GL3	0.9
Leisler's	GL4	0.6
Leisler's	GL5	0.1
Leisler's	GL6	0.3
Leisler's	GL7	2.5
Leisler's	GL8	2.3
Leisler's	GL9	1.3
Nathusius'	GL1	0.0
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.1
Nathusius'	GL6	0.0
Nathusius'	GL7	0.0
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.0
Natterer's	GL2	0.0
Natterer's	GL3	0.1
Natterer's	GL4	0.0
Natterer's	GL5	0.0
Natterer's	GL6	0.0
Natterer's	GL7	0.0
Natterer's	GL8	0.0
Natterer's	GL9	0.0
Soprano pipistrelle	GL1	0.0
Soprano pipistrelle	GL2	0.0
Soprano pipistrelle	GL3	0.5
Soprano pipistrelle	GL4	0.6
Soprano pipistrelle	GL5	1.3

Soprano pipistrelle	GL6	0.3
Soprano pipistrelle	GL7	0.3
Soprano pipistrelle	GL8	0.1
Soprano pipistrelle	GL9	0.4
Whiskered	GL1	0.0
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

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

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

Species	Detector ID	Mean Pass Rate
Brown long-eared	GL1	0.0
Brown long-eared	GL2	0.1
Brown long-eared	GL3	0.4
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.2
Brown long-eared	GL6	0.0
Brown long-eared	GL7	0.2
Brown long-eared	GL8	0.2
Brown long-eared	GL9	0.4
Common pipistrelle	GL1	0.3
Common pipistrelle	GL2	0.3
Common pipistrelle	GL3	2.4
Common pipistrelle	GL4	4.2
Common pipistrelle	GL5	15.2
Common pipistrelle	GL6	1.8
Common pipistrelle	GL7	2.4
Common pipistrelle	GL8	3.2
Common pipistrelle	GL9	3.5
Daubenton's	GL1	0.0
Daubenton's	GL2	0.1
Daubenton's	GL3	0.2
Daubenton's	GL4	0.2
Daubenton's	GL5	0.3
Daubenton's	GL6	0.1
Daubenton's	GL7	0.1
Daubenton's	GL8	0.1

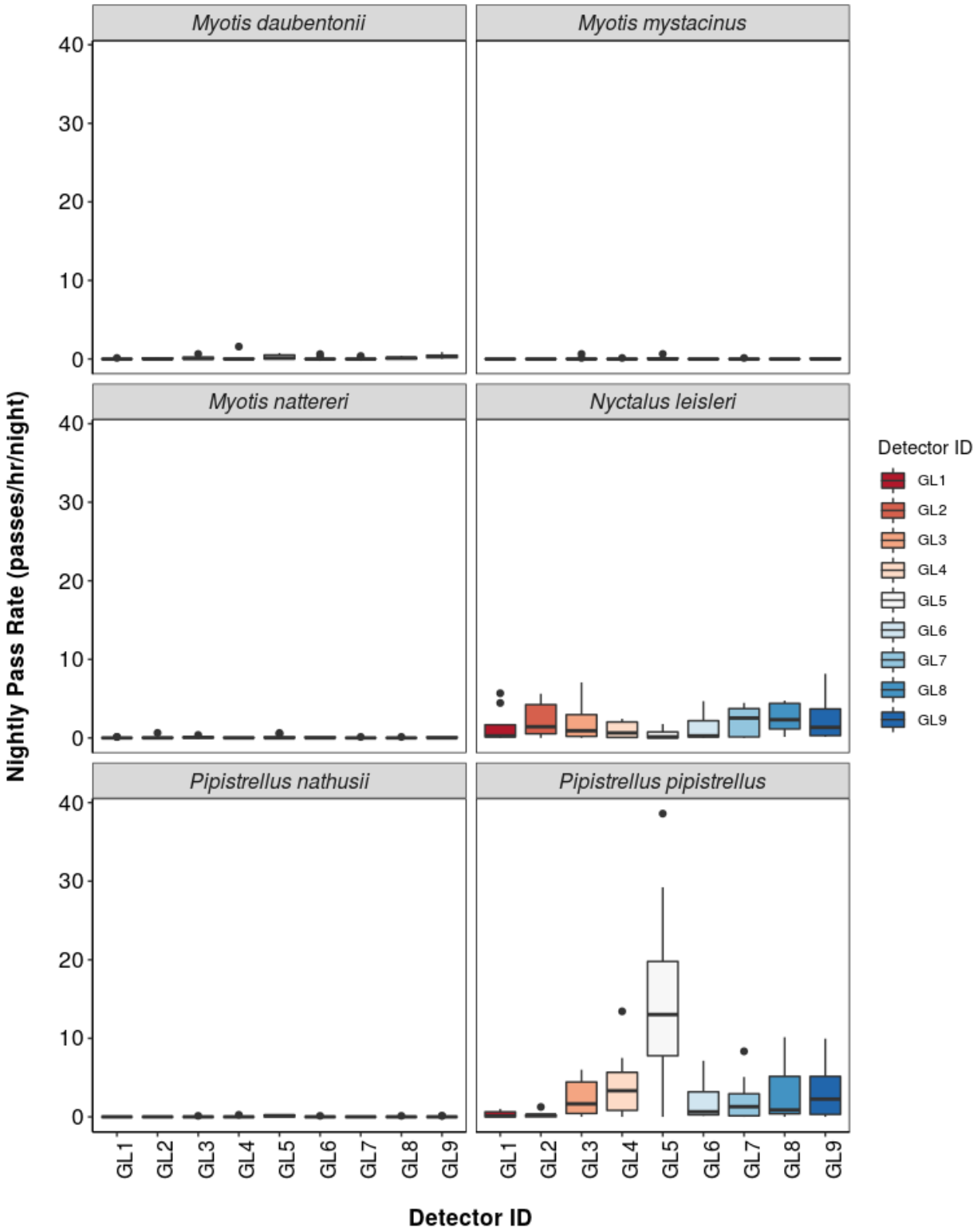
Daubenton's	GL9	0.3
Leisler's	GL1	1.5
Leisler's	GL2	2.4
Leisler's	GL3	2.0
Leisler's	GL4	1.0
Leisler's	GL5	0.5
Leisler's	GL6	1.3
Leisler's	GL7	2.0
Leisler's	GL8	2.6
Leisler's	GL9	2.7
Nathusius'	GL1	0.0
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.1
Nathusius'	GL6	0.0
Nathusius'	GL7	0.0
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.0
Natterer's	GL2	0.1
Natterer's	GL3	0.1
Natterer's	GL4	0.0
Natterer's	GL5	0.2
Natterer's	GL6	0.0
Natterer's	GL7	0.0
Natterer's	GL8	0.0
Natterer's	GL9	0.1
Soprano pipistrelle	GL1	0.2
Soprano pipistrelle	GL2	0.1
Soprano pipistrelle	GL3	0.5
Soprano pipistrelle	GL4	0.8
Soprano pipistrelle	GL5	4.3
Soprano pipistrelle	GL6	0.4
Soprano pipistrelle	GL7	0.6
Soprano pipistrelle	GL8	0.7

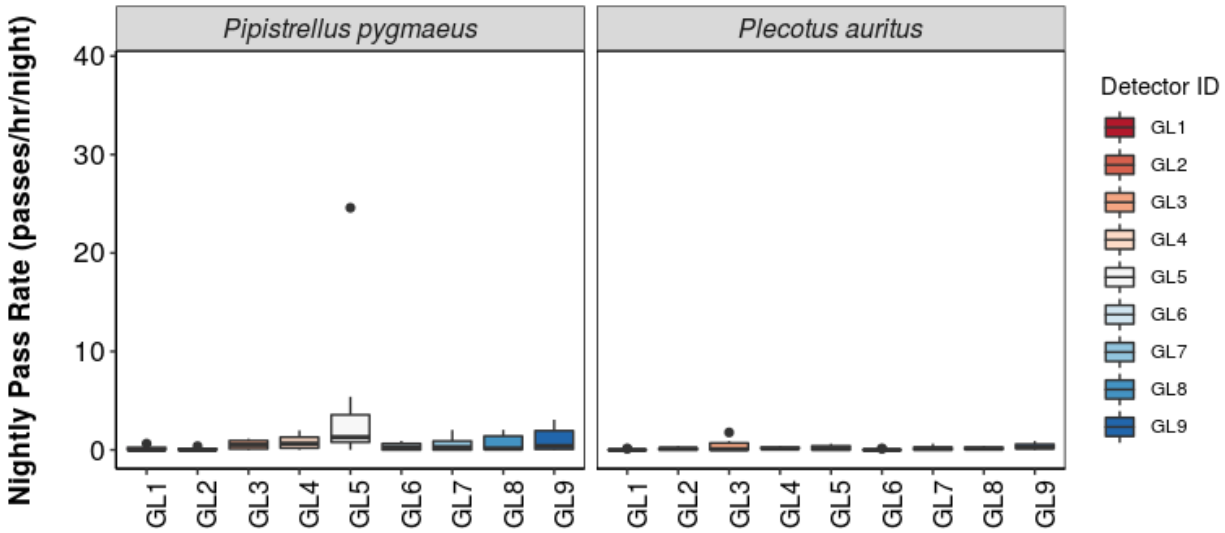
Soprano pipistrelle	GL9	1.0
Whiskered	GL1	0.0
Whiskered	GL2	0.0
Whiskered	GL3	0.1
Whiskered	GL4	0.0
Whiskered	GL5	0.1
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
10
20
30
40
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
40
30
20
10
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
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
Jul	GL1	9
Jul	GL2	7
Jul	GL3	8
Jul	GL4	7
Jul	GL5	9
Jul	GL6	9
Jul	GL7	9
Jul	GL8	7
Jul	GL9	10

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
Brown long-eared	GL1	0.0
Brown long-eared	GL2	0.1
Brown long-eared	GL3	0.1
Brown long-eared	GL4	0.1
Brown long-eared	GL5	0.1
Brown long-eared	GL6	0.0
Brown long-eared	GL7	0.1
Brown long-eared	GL8	0.1
Brown long-eared	GL9	0.3
Common pipistrelle	GL1	0.1
Common pipistrelle	GL2	0.2
Common pipistrelle	GL3	1.7
Common pipistrelle	GL4	3.3
Common pipistrelle	GL5	13.0
Common pipistrelle	GL6	0.6
Common pipistrelle	GL7	1.3
Common pipistrelle	GL8	0.9
Common pipistrelle	GL9	2.3
Daubenton's	GL1	0.0
Daubenton's	GL2	0.0
Daubenton's	GL3	0.1
Daubenton's	GL4	0.0
Daubenton's	GL5	0.1

Daubenton’s	GL6	0.0
Daubenton’s	GL7	0.0
Daubenton’s	GL8	0.1
Daubenton’s	GL9	0.3
Leisler’s	GL1	0.3
Leisler’s	GL2	1.4
Leisler’s	GL3	0.9
Leisler’s	GL4	0.6
Leisler’s	GL5	0.1
Leisler’s	GL6	0.3
Leisler’s	GL7	2.5
Leisler’s	GL8	2.3
Leisler’s	GL9	1.3
Nathusius’	GL1	0.0
Nathusius’	GL2	0.0
Nathusius’	GL3	0.0
Nathusius’	GL4	0.0
Nathusius’	GL5	0.1
Nathusius’	GL6	0.0
Nathusius’	GL7	0.0
Nathusius’	GL8	0.0
Nathusius’	GL9	0.0
Natterer’s	GL1	0.0
Natterer’s	GL2	0.0
Natterer’s	GL3	0.1
Natterer’s	GL4	0.0
Natterer’s	GL5	0.0
Natterer’s	GL6	0.0
Natterer’s	GL7	0.0
Natterer’s	GL8	0.0
Natterer’s	GL9	0.0
Soprano pipistrelle	GL1	0.0
Soprano pipistrelle	GL2	0.0
Soprano pipistrelle	GL3	0.5
Soprano pipistrelle	GL4	0.6
Soprano pipistrelle	GL5	1.3

Soprano pipistrelle	GL6	0.3
Soprano pipistrelle	GL7	0.3
Soprano pipistrelle	GL8	0.1
Soprano pipistrelle	GL9	0.4
Whiskered	GL1	0.0
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

Nightly Bat Pass Rate for each Month

Mean per Detector

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

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

Species	Detector ID	Jul
Brown long-eared	GL1	0.0
Brown long-eared	GL2	0.1
Brown long-eared	GL3	0.4
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.2
Brown long-eared	GL6	0.0
Brown long-eared	GL7	0.2
Brown long-eared	GL8	0.2
Brown long-eared	GL9	0.4
Common pipistrelle	GL1	0.3
Common pipistrelle	GL2	0.3
Common pipistrelle	GL3	2.4
Common pipistrelle	GL4	4.2
Common pipistrelle	GL5	15.2
Common pipistrelle	GL6	1.8
Common pipistrelle	GL7	2.4
Common pipistrelle	GL8	3.2
Common pipistrelle	GL9	3.5
Daubenton's	GL1	0.0
Daubenton's	GL2	0.1
Daubenton's	GL3	0.2
Daubenton's	GL4	0.2
Daubenton's	GL5	0.3
Daubenton's	GL6	0.1
Daubenton's	GL7	0.1
Daubenton's	GL8	0.1

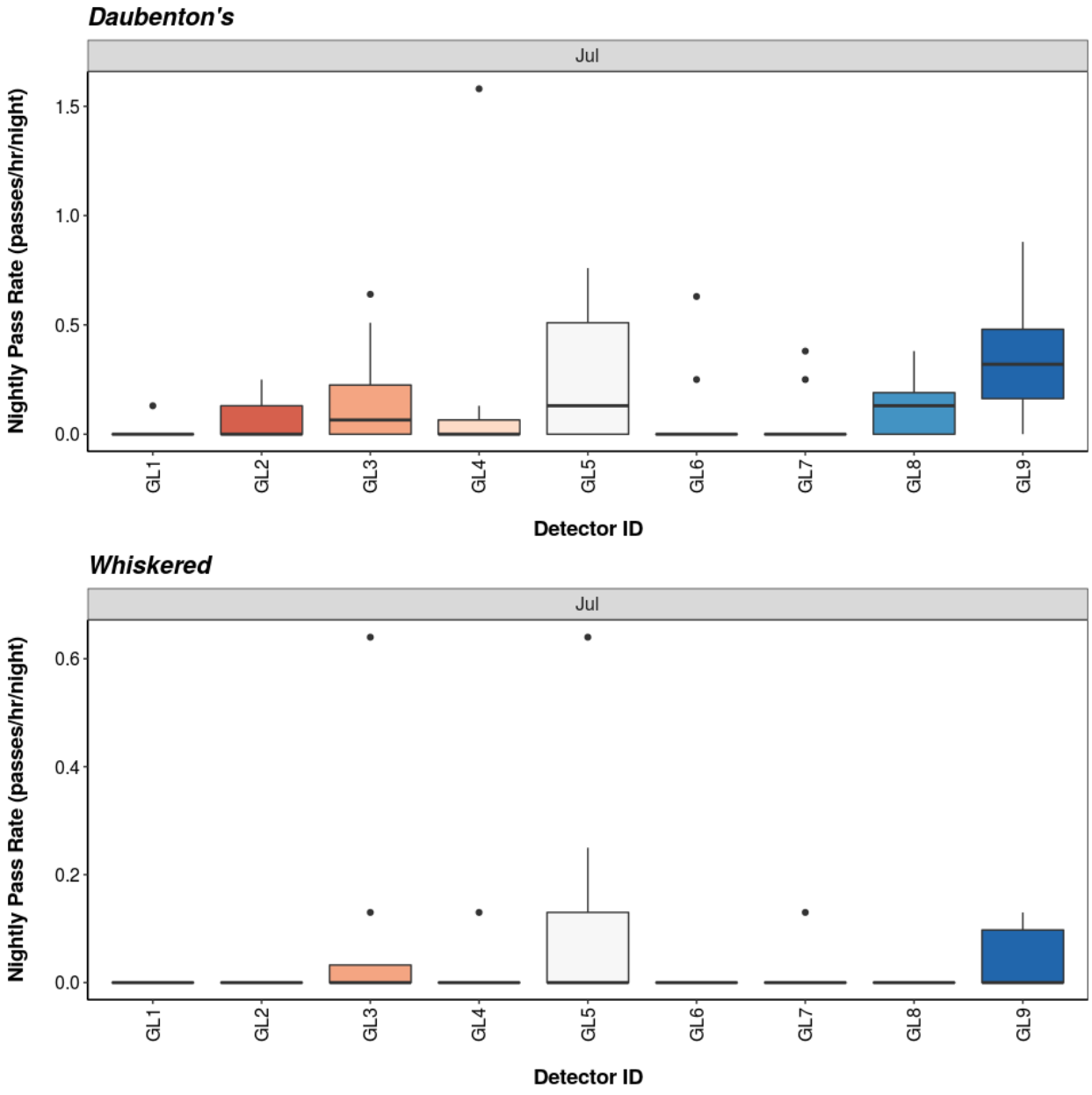
Daubenton's	GL9	0.3
Leisler's	GL1	1.5
Leisler's	GL2	2.4
Leisler's	GL3	2.0
Leisler's	GL4	1.0
Leisler's	GL5	0.5
Leisler's	GL6	1.3
Leisler's	GL7	2.0
Leisler's	GL8	2.6
Leisler's	GL9	2.7
Nathusius'	GL1	0.0
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.1
Nathusius'	GL6	0.0
Nathusius'	GL7	0.0
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.0
Natterer's	GL2	0.1
Natterer's	GL3	0.1
Natterer's	GL4	0.0
Natterer's	GL5	0.2
Natterer's	GL6	0.0
Natterer's	GL7	0.0
Natterer's	GL8	0.0
Natterer's	GL9	0.1
Soprano pipistrelle	GL1	0.2
Soprano pipistrelle	GL2	0.1
Soprano pipistrelle	GL3	0.5
Soprano pipistrelle	GL4	0.8
Soprano pipistrelle	GL5	4.3
Soprano pipistrelle	GL6	0.4
Soprano pipistrelle	GL7	0.6
Soprano pipistrelle	GL8	0.7

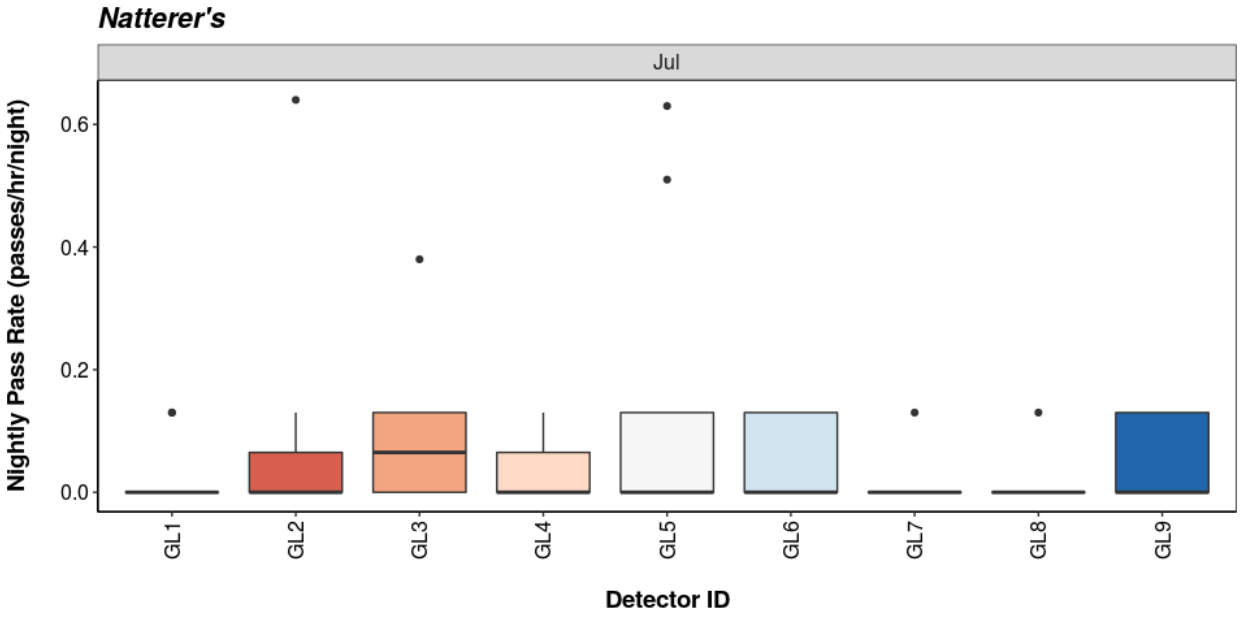
Soprano pipistrelle	GL9	1.0
Whiskered	GL1	0.0
Whiskered	GL2	0.0
Whiskered	GL3	0.1
Whiskered	GL4	0.0
Whiskered	GL5	0.1
Whiskered	GL6	0.0
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

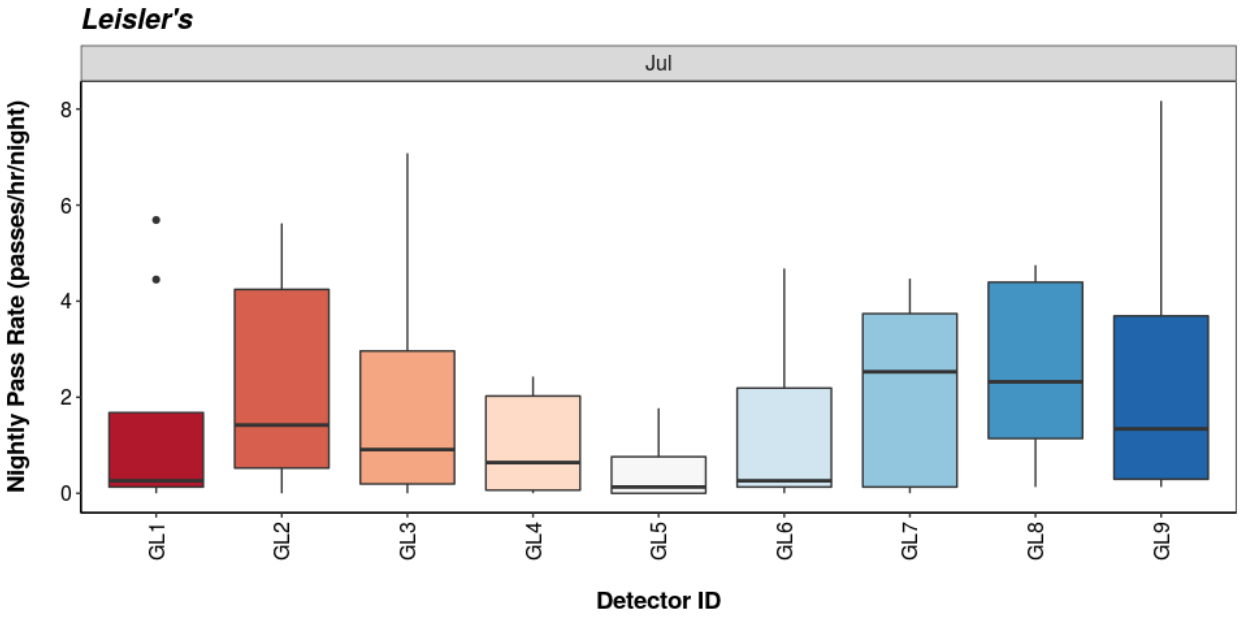
Nightly Bat Pass Rate for each Month

Per Detector - Figures

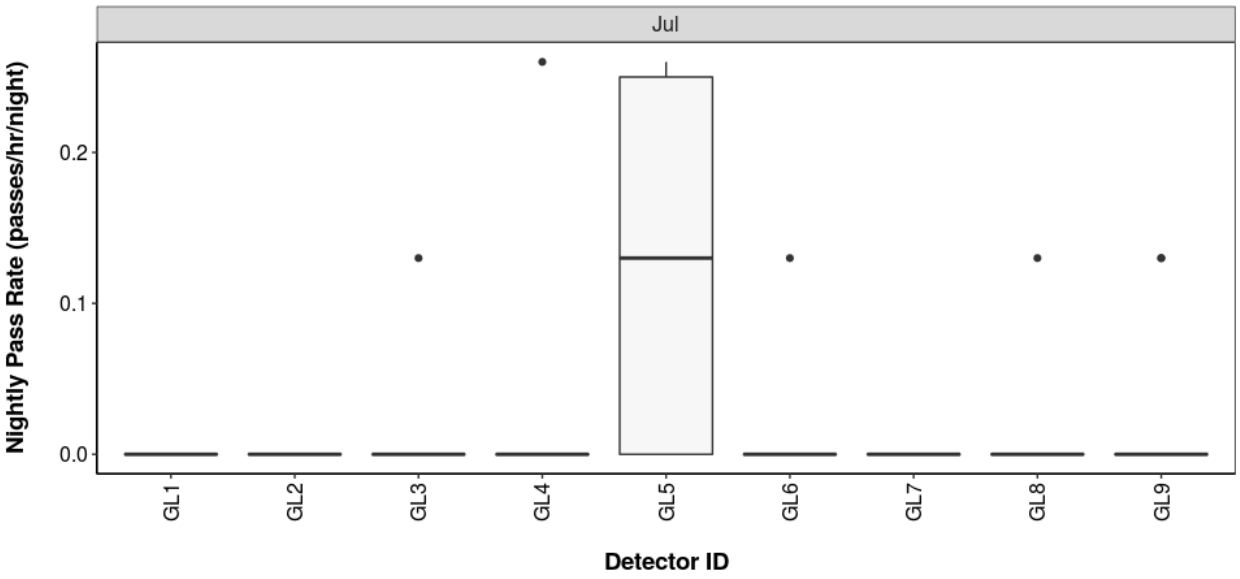
Figure 17. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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



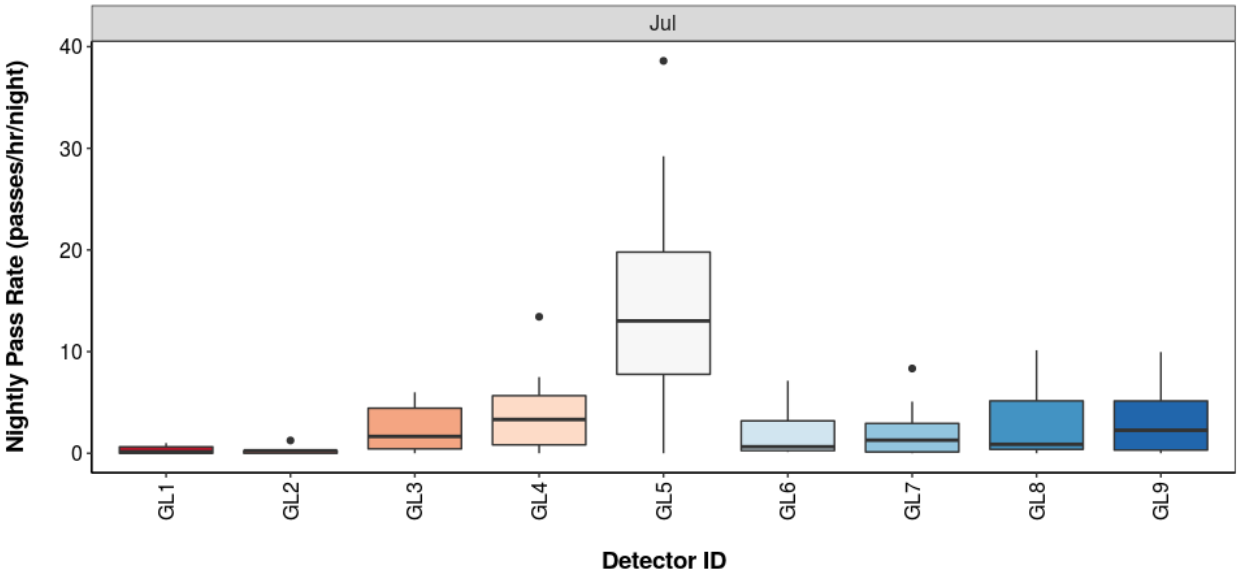

Natterer's
Jul
Nightly Pass Rate (passes/hr/night)
0.0
0.2
0.4
0.6
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

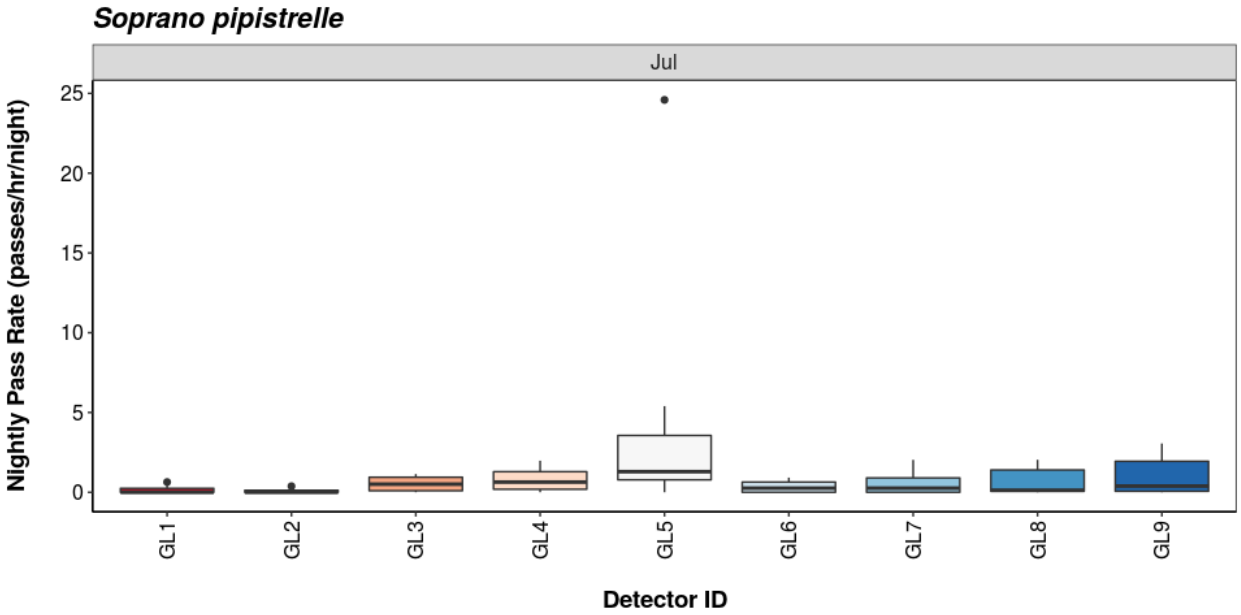

Leisler's
Jul
Nightly Pass Rate (passes/hr/night)
0
2
4
6
8
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

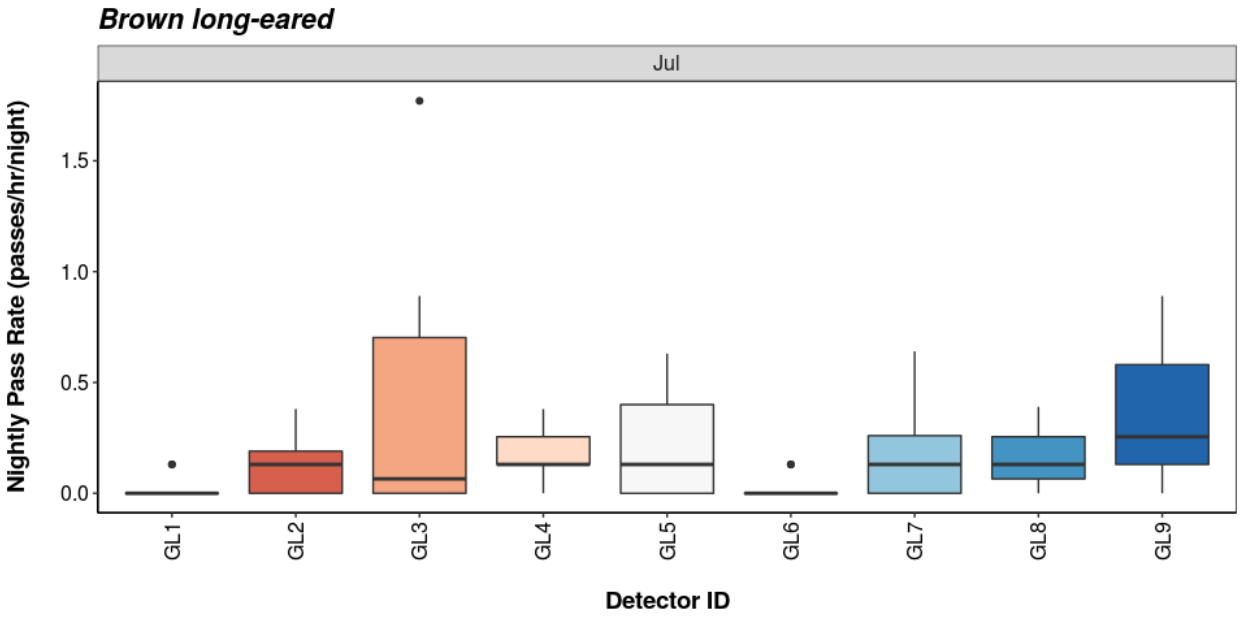
Nathusius'



Common pipistrelle




Soprano pipistrelle
Jul
Nightly Pass Rate (passes/hr/night)
25
20
15
10
5
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Brown long-eared
Jul
Nightly Pass Rate (passes/hr/night)
1.5
1.0
0.5
0.0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

Bat Activity per Detector Location

Figure 18. Detector ID reference:

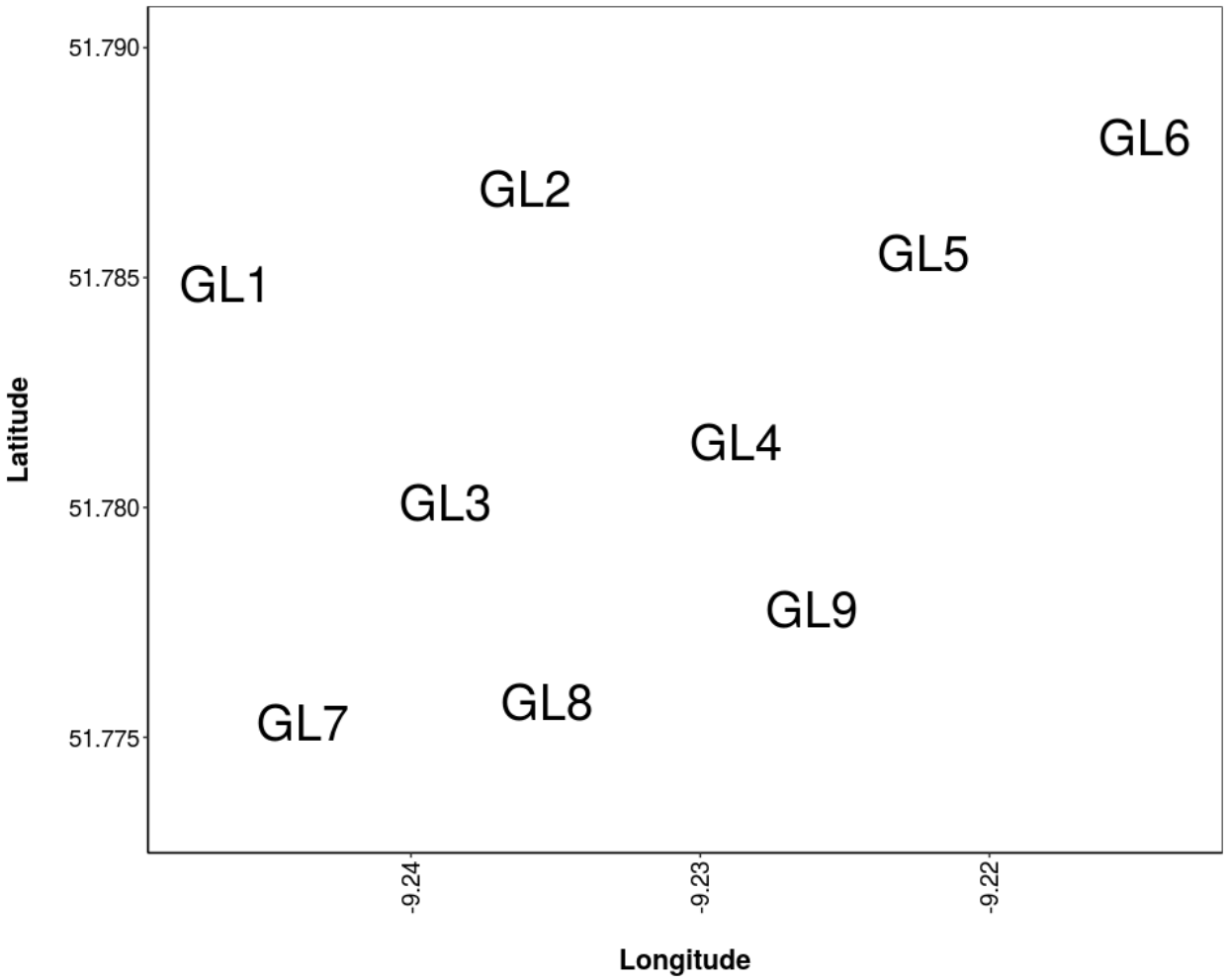
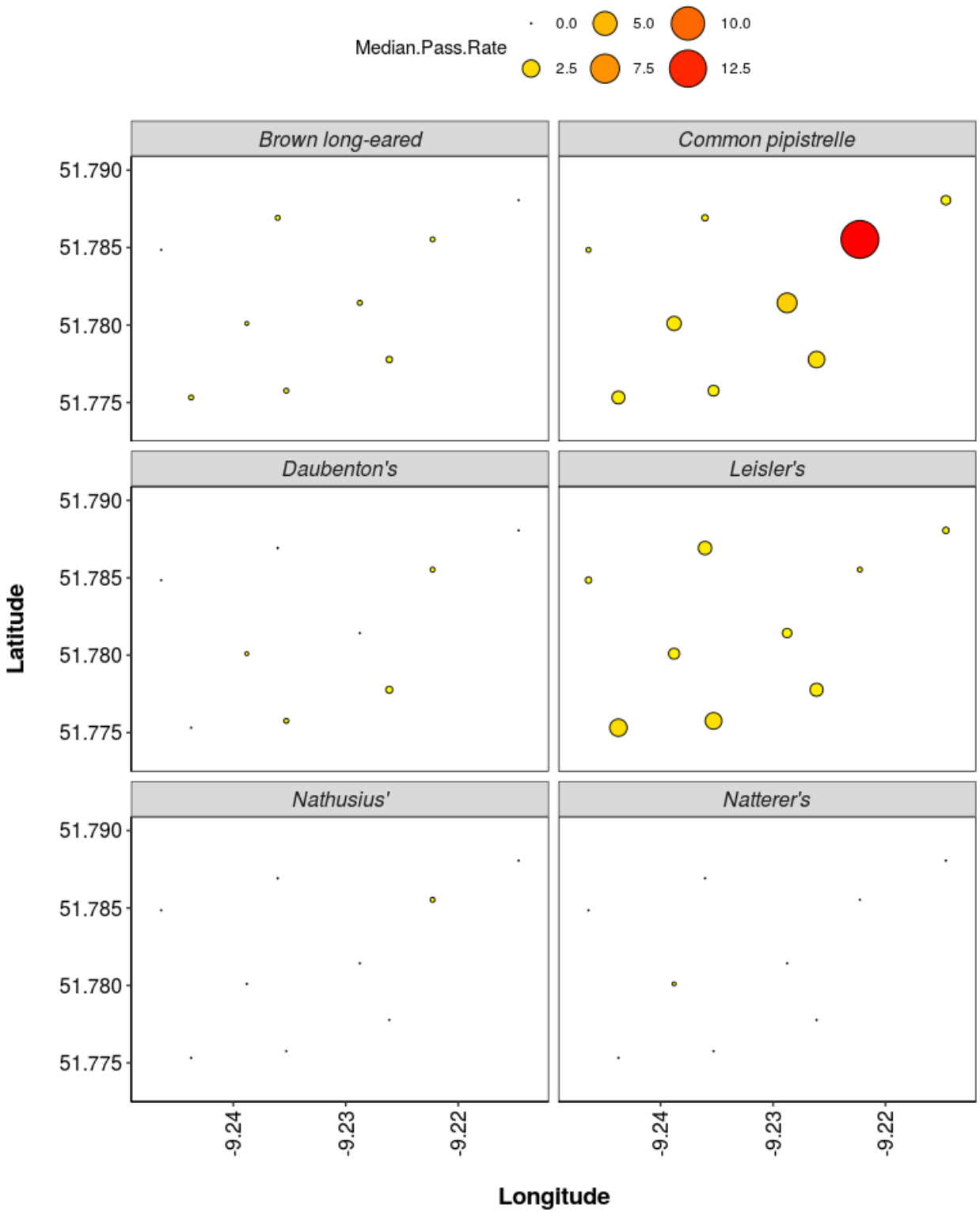


Figure 19. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
0.0
2.5
5.0
7.5
10.0
12.5
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Nathusius'
Natterer's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

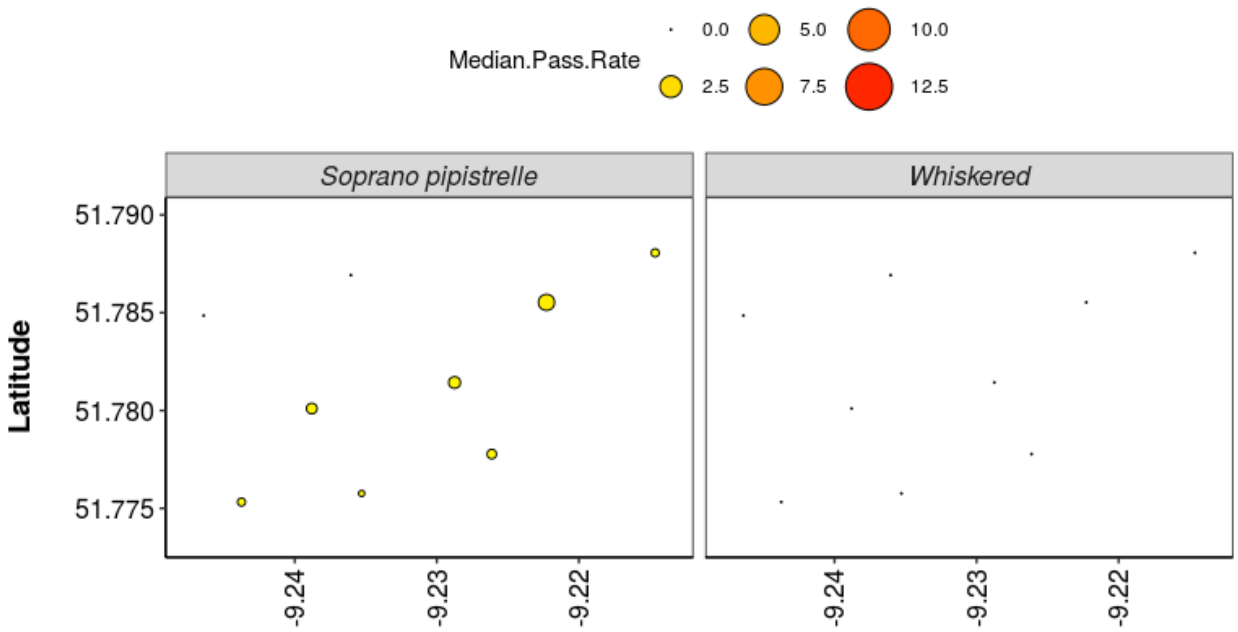
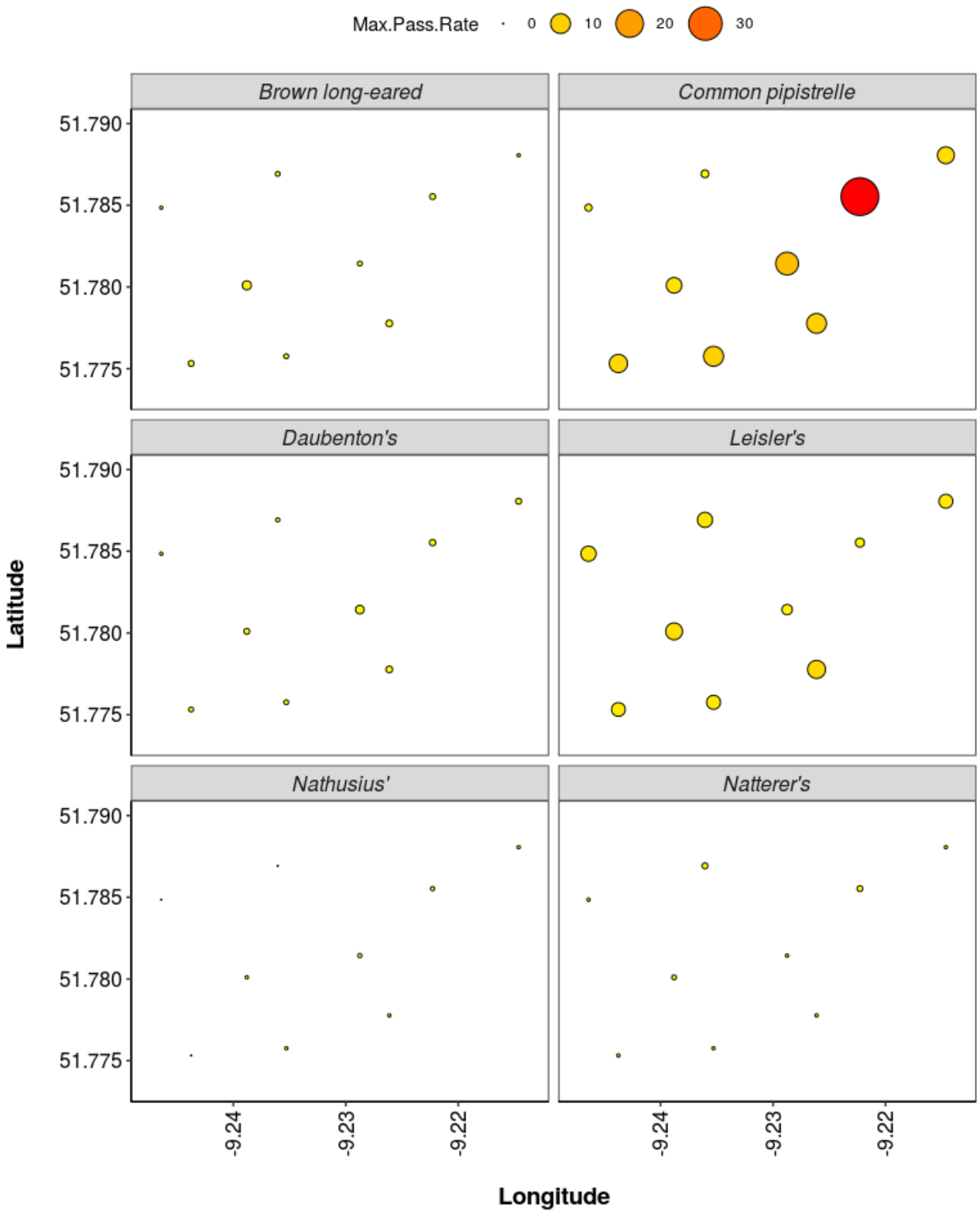
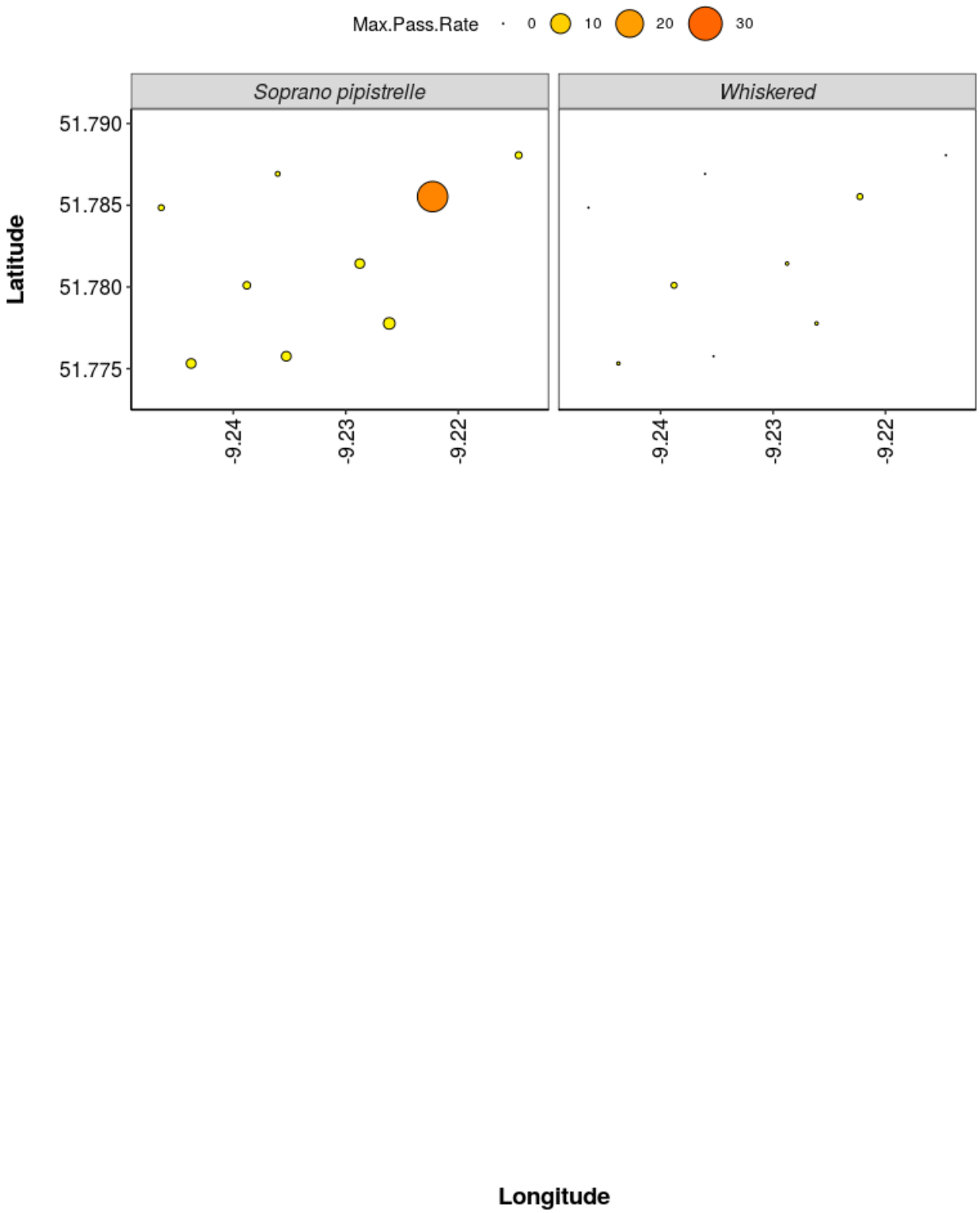

Median.Pass.Rate
0.0
2.5
5.0
7.5
10.0
12.5
Soprano pipistrelle
Whiskered
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
0
10
20
30
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Nathusius'
Natterer's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude



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

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: Gortaloughra

Author: Fehily Timoney

24/11/2021

Summary

Bats were detected on **11** nights between **2021-08-19** and **2021-08-29**, using **9** static bat detectors. Throughout this period **8** species were recorded. **Table 1.** Detectors were placed at the following locations:

Detector ID	Latitude	Longitude
GL3	51.77532	-9.243754
GL2	51.78497	-9.245941
GL4	51.77575	-9.235288
GL5	51.77777	-9.226132
GL6	51.78440	-9.221233
GL7	51.78808	-9.214936
GL8	51.78195	-9.229476
GL9	51.77980	-9.239814
GL1	51.78703	-9.235476

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
GL1	10
GL2	10
GL3	11
GL4	10
GL5	11
GL6	11
GL7	11
GL8	10
GL9	10

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.
- Records using any make of bat detector.

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
GL1	*Myotis daubentonii*	0	0	3	1	3
GL1	*Myotis mystacinus*	0	0	0	1	7
GL1	*Myotis nattereri*	0	1	2	3	1
GL1	*Nyctalus leisleri*	0	3	3	0	3
GL1	*Pipistrellus nathusii*	0	0	0	0	1
GL1	*Pipistrellus pipistrellus*	0	0	2	4	2
GL1	*Pipistrellus pygmaeus*	0	0	2	1	3
GL1	*Plecotus auritus*	0	1	5	3	1
GL2	*Myotis daubentonii*	0	5	3	2	0
GL2	*Myotis mystacinus*	0	0	0	0	5
GL2	*Myotis nattereri*	0	4	2	1	3
GL2	*Nyctalus leisleri*	1	3	3	1	0
GL2	*Pipistrellus pipistrellus*	2	3	2	1	0
GL2	*Pipistrellus pygmaeus*	0	1	5	1	2
GL2	*Plecotus auritus*	1	4	2	1	1
GL3	*Myotis daubentonii*	0	0	7	2	1
GL3	*Myotis mystacinus*	0	0	0	0	2
GL3	*Myotis nattereri*	0	0	1	4	4
GL3	*Nyctalus leisleri*	0	3	3	4	0

GL3	*Pipistrellus pipistrellus*	0	3	3	2	2
GL3	*Pipistrellus pygmaeus*	0	2	2	1	4
GL3	*Plecotus auritus*	0	5	4	0	0
GL4	*Myotis daubentonii*	0	0	1	3	5
GL4	*Myotis mystacinus*	0	0	0	0	3
GL4	*Myotis nattereri*	0	0	0	1	5
GL4	*Nyctalus leisleri*	3	4	2	0	1
GL4	*Pipistrellus pipistrellus*	1	1	3	0	4
GL4	*Pipistrellus pygmaeus*	0	0	5	0	3
GL4	*Plecotus auritus*	0	0	2	2	4
GL5	*Myotis daubentonii*	0	0	4	3	2
GL5	*Myotis mystacinus*	0	0	0	0	3
GL5	*Myotis nattereri*	0	0	0	3	6
GL5	*Nyctalus leisleri*	0	5	3	2	1
GL5	*Pipistrellus nathusii*	0	0	0	0	1
GL5	*Pipistrellus pipistrellus*	1	4	3	0	1
GL5	*Pipistrellus pygmaeus*	0	2	4	0	2
GL5	*Plecotus auritus*	0	4	4	1	1
GL6	*Myotis daubentonii*	0	5	3	2	0
GL6	*Myotis mystacinus*	0	0	0	1	7
GL6	*Myotis nattereri*	1	4	3	0	2
GL6	*Nyctalus leisleri*	0	1	3	3	3
GL6	*Pipistrellus nathusii*	0	0	0	0	1
GL6	*Pipistrellus pipistrellus*	7	2	1	1	0

GL6	*Pipistrellus pygmaeus*	2	5	2	2	0
GL6	*Plecotus auritus*	0	3	6	1	0
GL7	*Myotis daubentonii*	1	4	4	0	1
GL7	*Myotis mystacinus*	0	0	0	0	3
GL7	*Myotis nattereri*	0	2	4	1	2
GL7	*Nyctalus leisleri*	0	3	5	2	0
GL7	*Pipistrellus pipistrellus*	1	5	3	0	2
GL7	*Pipistrellus pygmaeus*	0	1	5	4	0
GL7	*Plecotus auritus*	0	0	8	1	1
GL8	*Myotis daubentonii*	0	1	6	2	0
GL8	*Myotis mystacinus*	0	0	0	0	4
GL8	*Myotis nattereri*	0	0	1	3	3
GL8	*Nyctalus leisleri*	1	1	3	4	1
GL8	*Pipistrellus nathusii*	0	0	0	1	1
GL8	*Pipistrellus pipistrellus*	2	3	4	1	0
GL8	*Pipistrellus pygmaeus*	0	2	3	3	1
GL8	*Plecotus auritus*	0	5	3	2	0
GL9	*Myotis daubentonii*	0	5	2	1	1
GL9	*Myotis mystacinus*	0	0	0	0	4
GL9	*Myotis nattereri*	0	0	5	2	1
GL9	*Nyctalus leisleri*	1	4	2	1	2
GL9	*Pipistrellus pipistrellus*	1	2	4	1	0
GL9	*Pipistrellus pygmaeus*	0	3	4	2	1
GL9	*Plecotus auritus*	0	2	2	3	2

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

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
GL1	*Myotis daubentonii*	29	11.5 - 50.5	56	7	256
GL1	*Myotis mystacinus*	12	4 - 19	29	8	151
GL1	*Myotis nattereri*	36	27.5 - 55	62	7	301
GL1	*Nyctalus leisleri*	48	19 - 64	80	9	1444
GL1	*Pipistrellus nathusii*	4	0	4	1	277
GL1	*Pipistrellus pipistrellus*	36	20 - 46	56	8	1589
GL1	*Pipistrellus pygmaeus*	20	4 - 41	54	6	1528
GL1	*Plecotus auritus*	43	32.5 - 54	72	10	960
GL2	*Myotis daubentonii*	64	41 - 73	76	10	256
GL2	*Myotis mystacinus*	4	4 - 4	4	5	151
GL2	*Myotis nattereri*	48	20 - 63	70	10	301
GL2	*Nyctalus leisleri*	60	46 - 78	92	8	1444
GL2	*Pipistrellus pipistrellus*	66	42 - 79.5	87	8	1589
GL2	*Pipistrellus pygmaeus*	48	24.5 - 52.5	60	9	1528
GL2	*Plecotus auritus*	66	36 - 78	82	9	960
GL3	*Myotis daubentonii*	43	30 - 51	56	10	256
GL3	*Myotis mystacinus*	4	4 - 4	4	2	151

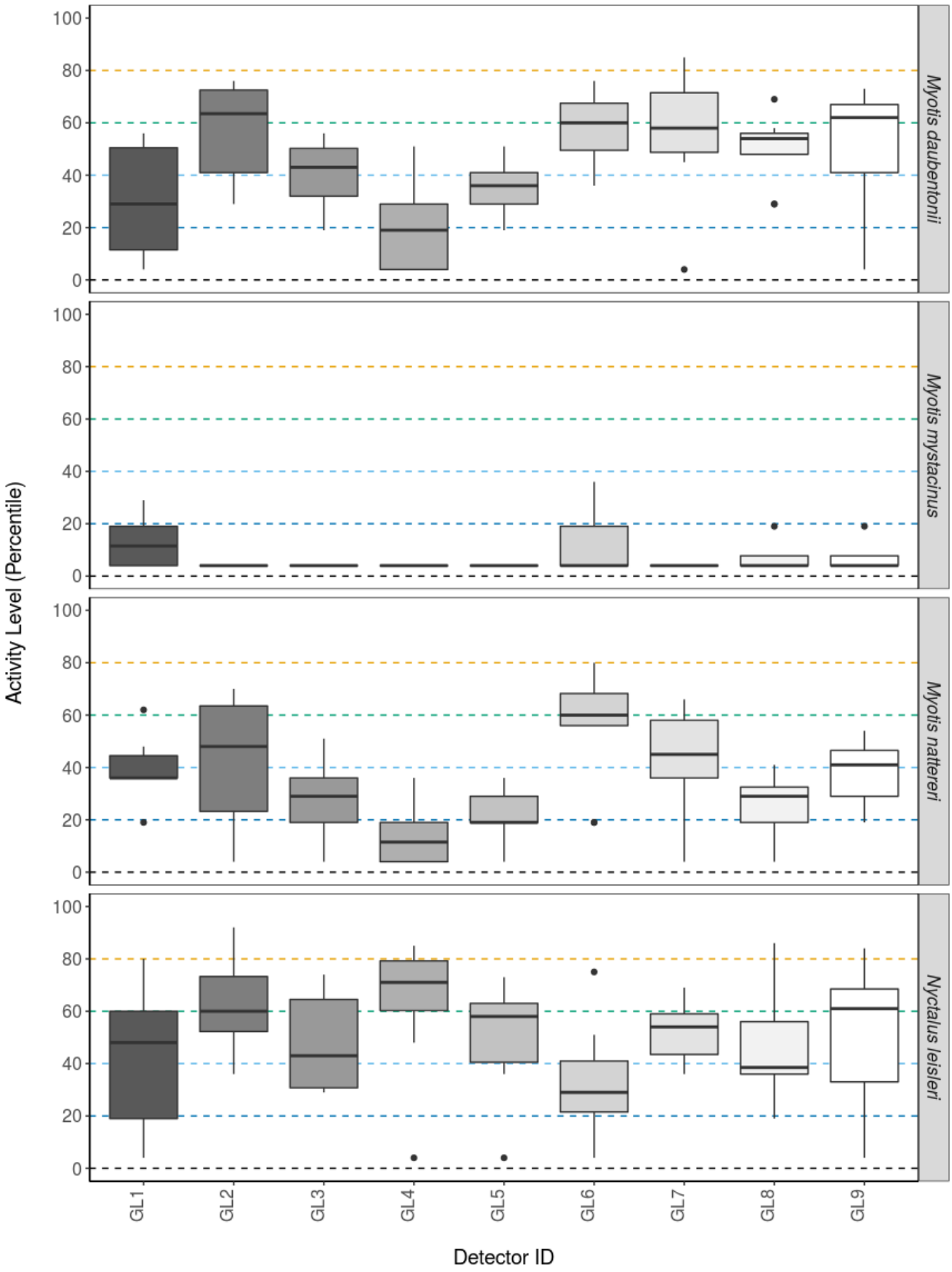
GL3	*Myotis nattereri*	29	11.5 - 36	51	9	301
GL3	*Nyctalus leisleri*	43	32.5 - 60	74	10	1444
GL3	*Pipistrellus pipistrellus*	55	29 - 64.5	75	10	1589
GL3	*Pipistrellus pygmaeus*	36	11.5 - 55.5	66	9	1528
GL3	*Plecotus auritus*	60	49.5 - 68	74	9	960
GL4	*Myotis daubentonii*	19	4 - 29	51	9	256
GL4	*Myotis mystacinus*	4	4 - 4	4	3	151
GL4	*Myotis nattereri*	12	4 - 20	36	6	301
GL4	*Nyctalus leisleri*	71	42 - 79	85	10	1444
GL4	*Pipistrellus pipistrellus*	48	11.5 - 60	84	9	1589
GL4	*Pipistrellus pygmaeus*	43	4 - 48	58	8	1528
GL4	*Plecotus auritus*	24	11.5 - 37	45	8	960
GL5	*Myotis daubentonii*	36	24 - 43.5	51	9	256
GL5	*Myotis mystacinus*	4	4 - 4	4	3	151
GL5	*Myotis nattereri*	19	11.5 - 29	36	9	301
GL5	*Nyctalus leisleri*	58	36 - 65.5	73	11	1444
GL5	*Pipistrellus nathusii*	19	0	19	1	277
GL5	*Pipistrellus pipistrellus*	60	45 - 77.5	87	9	1589
GL5	*Pipistrellus pygmaeus*	45	22.5 - 56.5	68	8	1528
GL5	*Plecotus auritus*	53	37 - 68	74	10	960

GL6	*Myotis daubentonii*	60	47 - 69	76	10	256
GL6	*Myotis mystacinus*	4	4 - 19	36	8	151
GL6	*Myotis nattereri*	60	38.5 - 69	80	10	301
GL6	*Nyctalus leisleri*	29	16.5 - 51	75	10	1444
GL6	*Pipistrellus nathusii*	4	0	4	1	277
GL6	*Pipistrellus pipistrellus*	88	60.5 - 90	94	11	1589
GL6	*Pipistrellus pygmaeus*	64	46.5 - 73	89	11	1528
GL6	*Plecotus auritus*	56	46.5 - 61	66	10	960
GL7	*Myotis daubentonii*	58	39 - 72.5	85	10	256
GL7	*Myotis mystacinus*	4	4 - 4	4	3	151
GL7	*Myotis nattereri*	45	24.5 - 61	66	9	301
GL7	*Nyctalus leisleri*	54	43.5 - 60	69	10	1444
GL7	*Pipistrellus pipistrellus*	66	35 - 73	85	11	1589
GL7	*Pipistrellus pygmaeus*	41	32.5 - 51	60	10	1528
GL7	*Plecotus auritus*	51	30 - 56	58	10	960
GL8	*Myotis daubentonii*	54	38.5 - 58.5	69	9	256
GL8	*Myotis mystacinus*	4	4 - 4	19	4	151
GL8	*Myotis nattereri*	29	11.5 - 38.5	41	7	301
GL8	*Nyctalus leisleri*	39	32.5 - 61	86	10	1444
GL8	*Pipistrellus nathusii*	24	24 - 24	29	2	277

GL8	*Pipistrellus pipistrellus*	58	44.5 - 77	89	10	1589
GL8	*Pipistrellus pygmaeus*	48	26 - 63	78	9	1528
GL8	*Plecotus auritus*	59	45 - 68	74	10	960
GL9	*Myotis daubentonii*	62	33 - 68	73	9	256
GL9	*Myotis mystacinus*	4	4 - 4	19	4	151
GL9	*Myotis nattereri*	41	29 - 49.5	54	8	301
GL9	*Nyctalus leisleri*	61	30 - 70	84	10	1444
GL9	*Pipistrellus pipistrellus*	57	46 - 74.5	83	8	1589
GL9	*Pipistrellus pygmaeus*	51	29 - 60	71	10	1528
GL9	*Plecotus auritus*	36	27.5 - 57.5	67	9	960

###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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

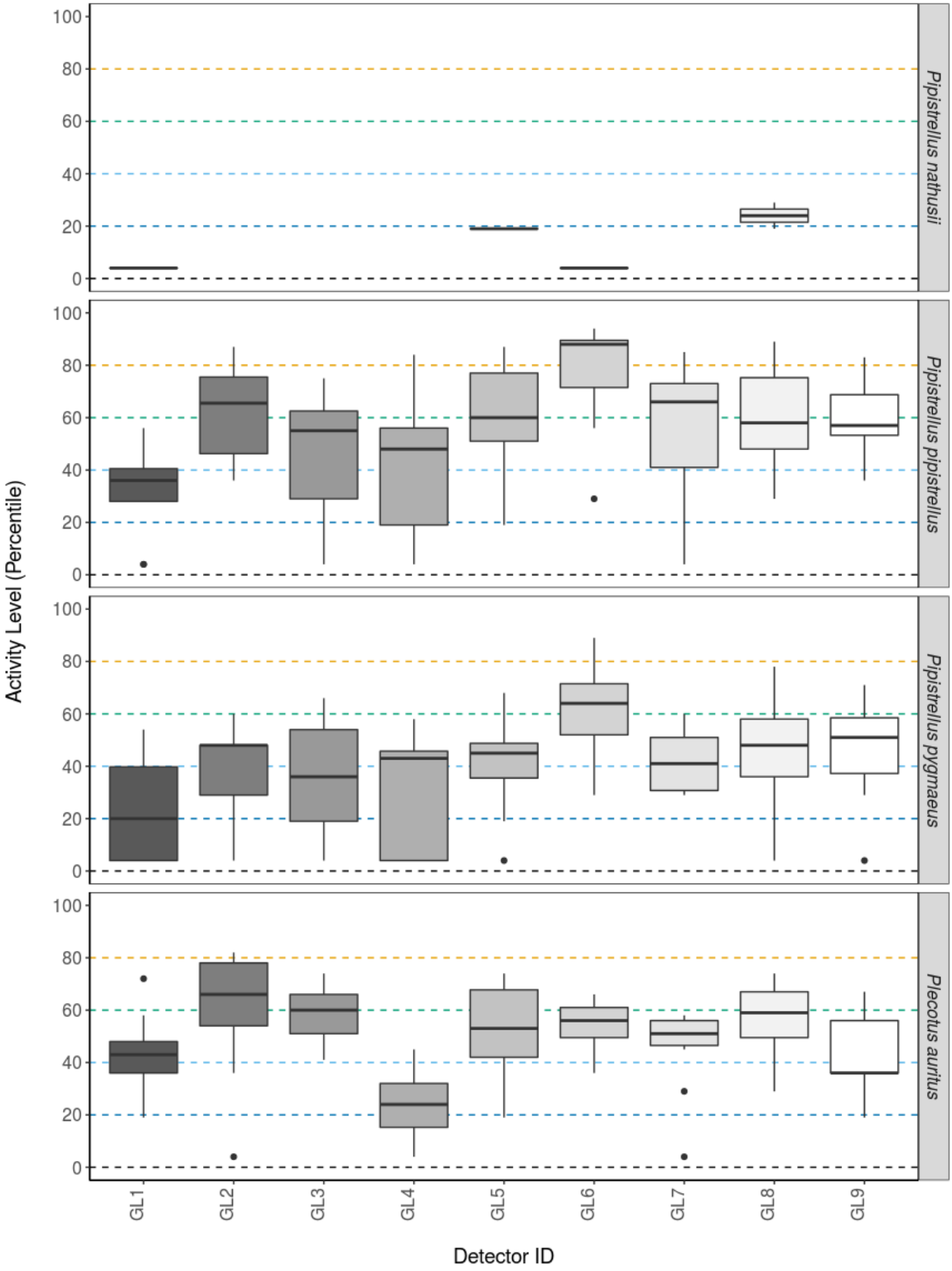
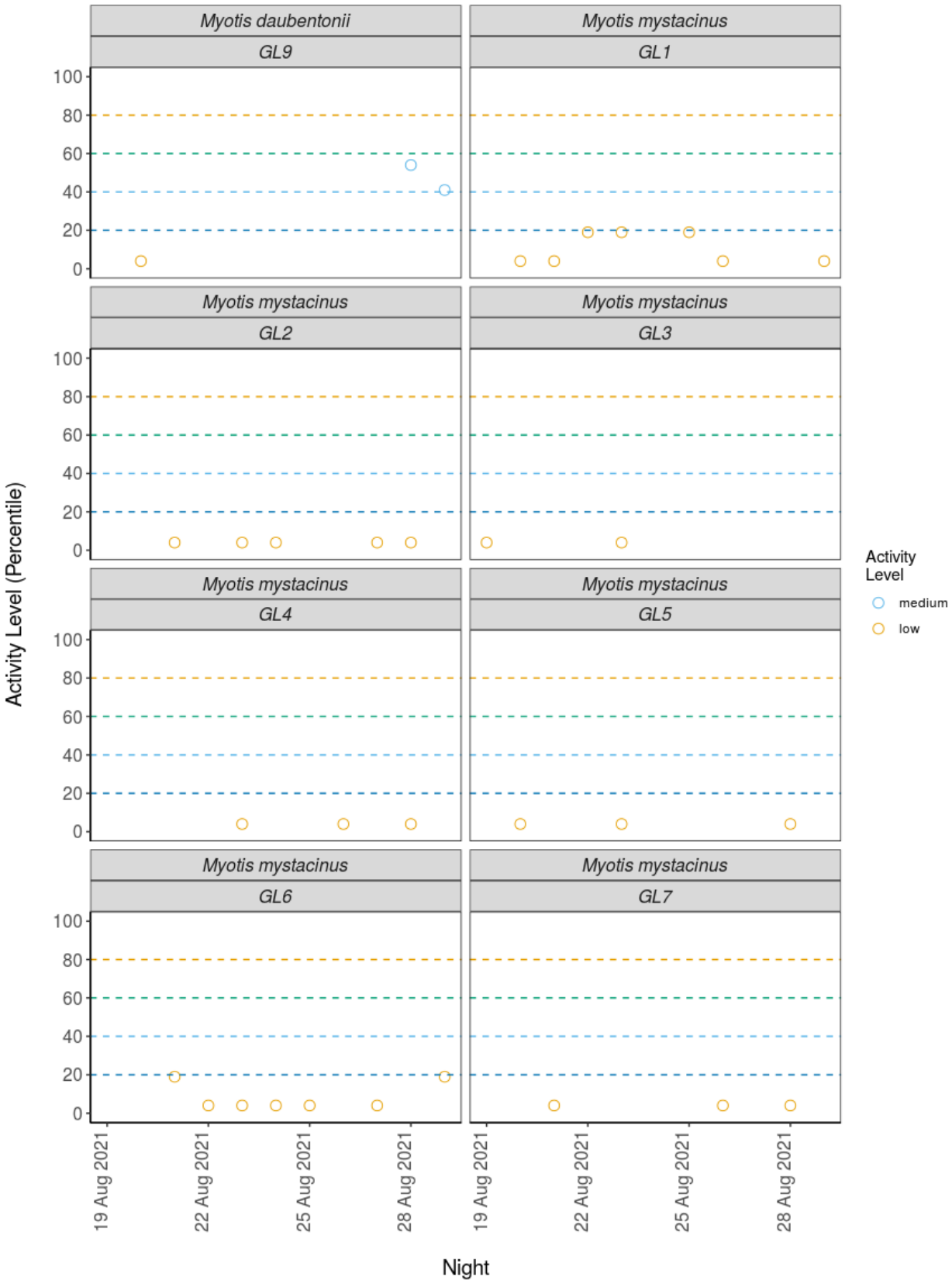
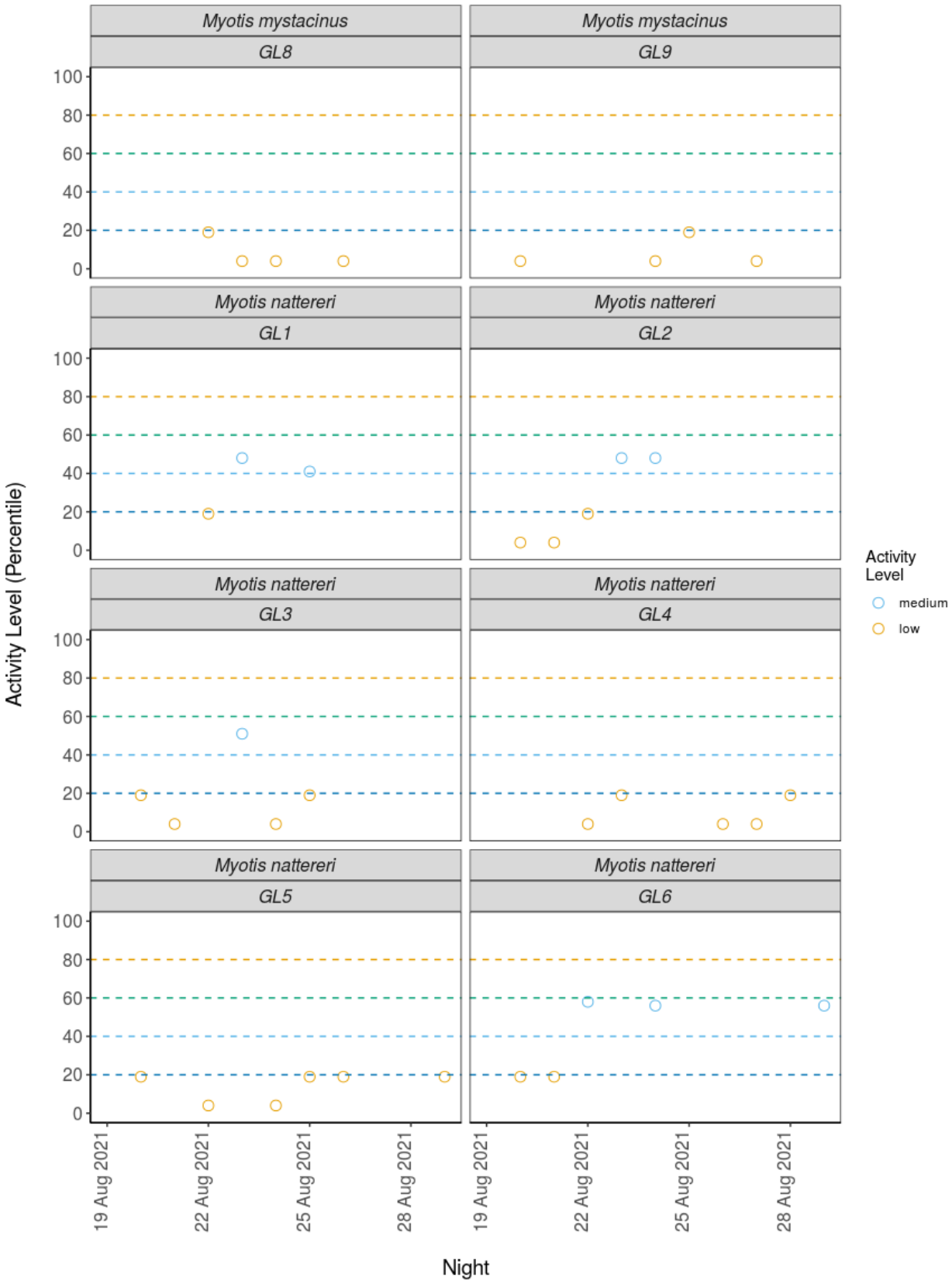
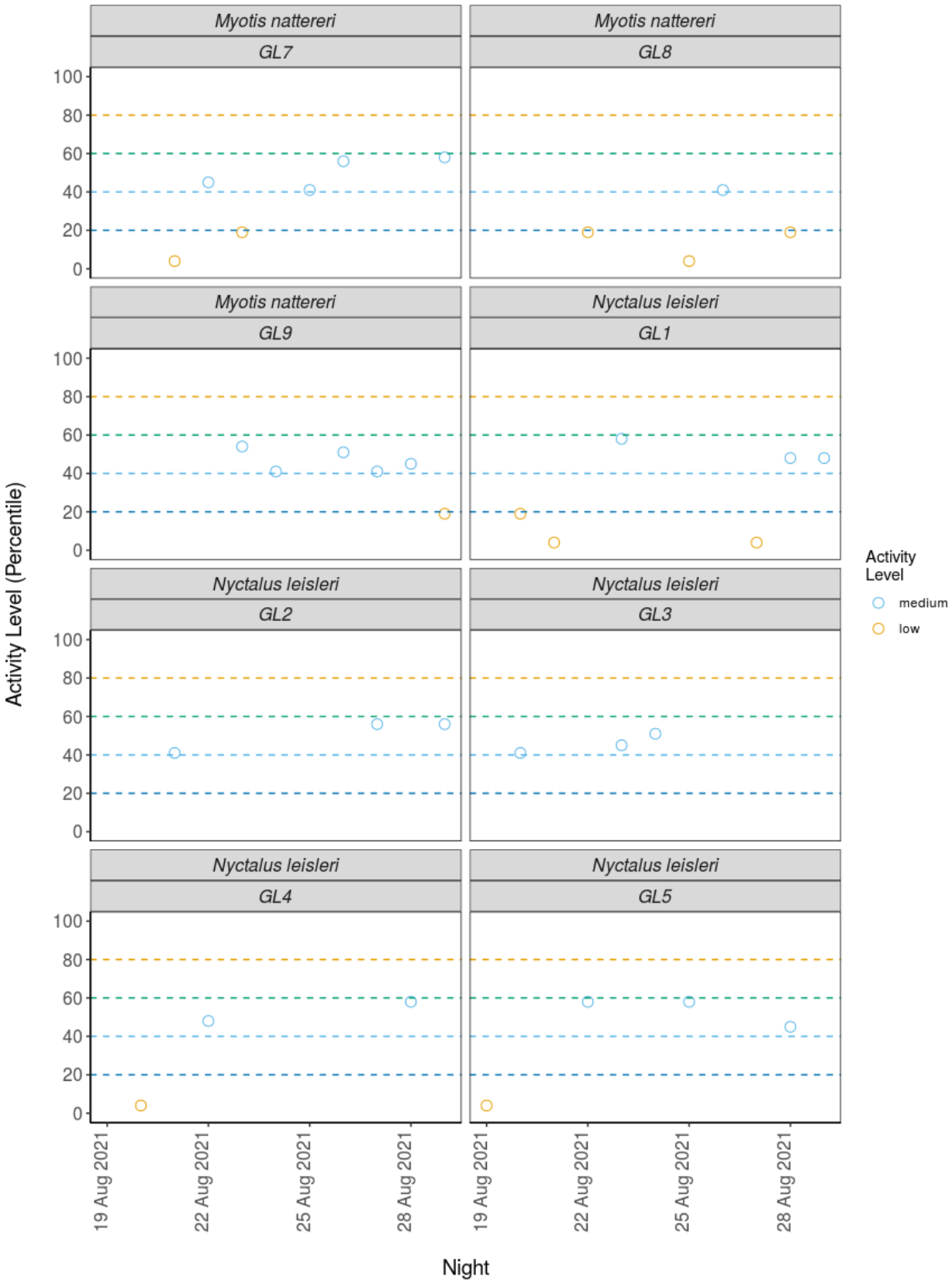
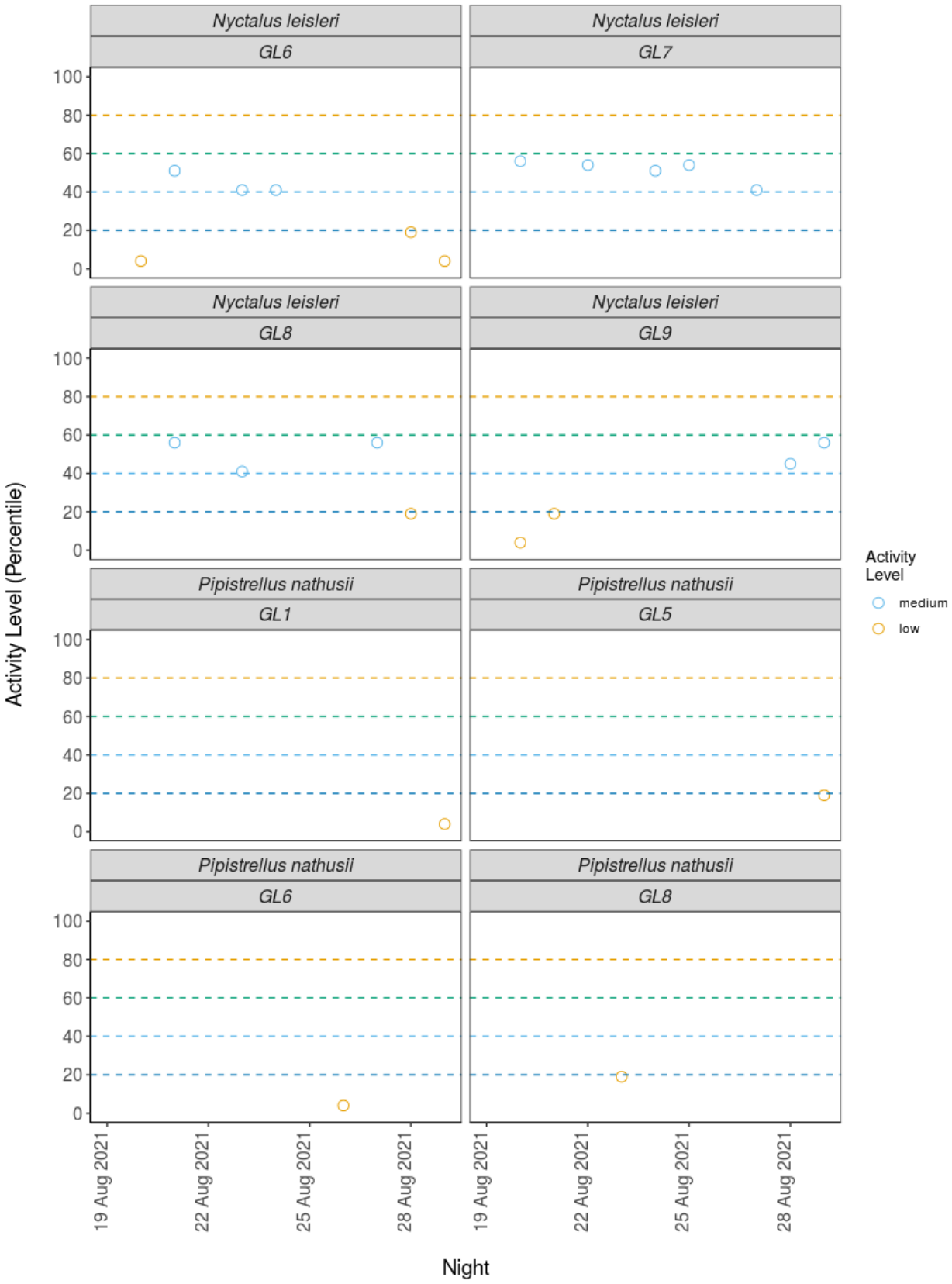

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

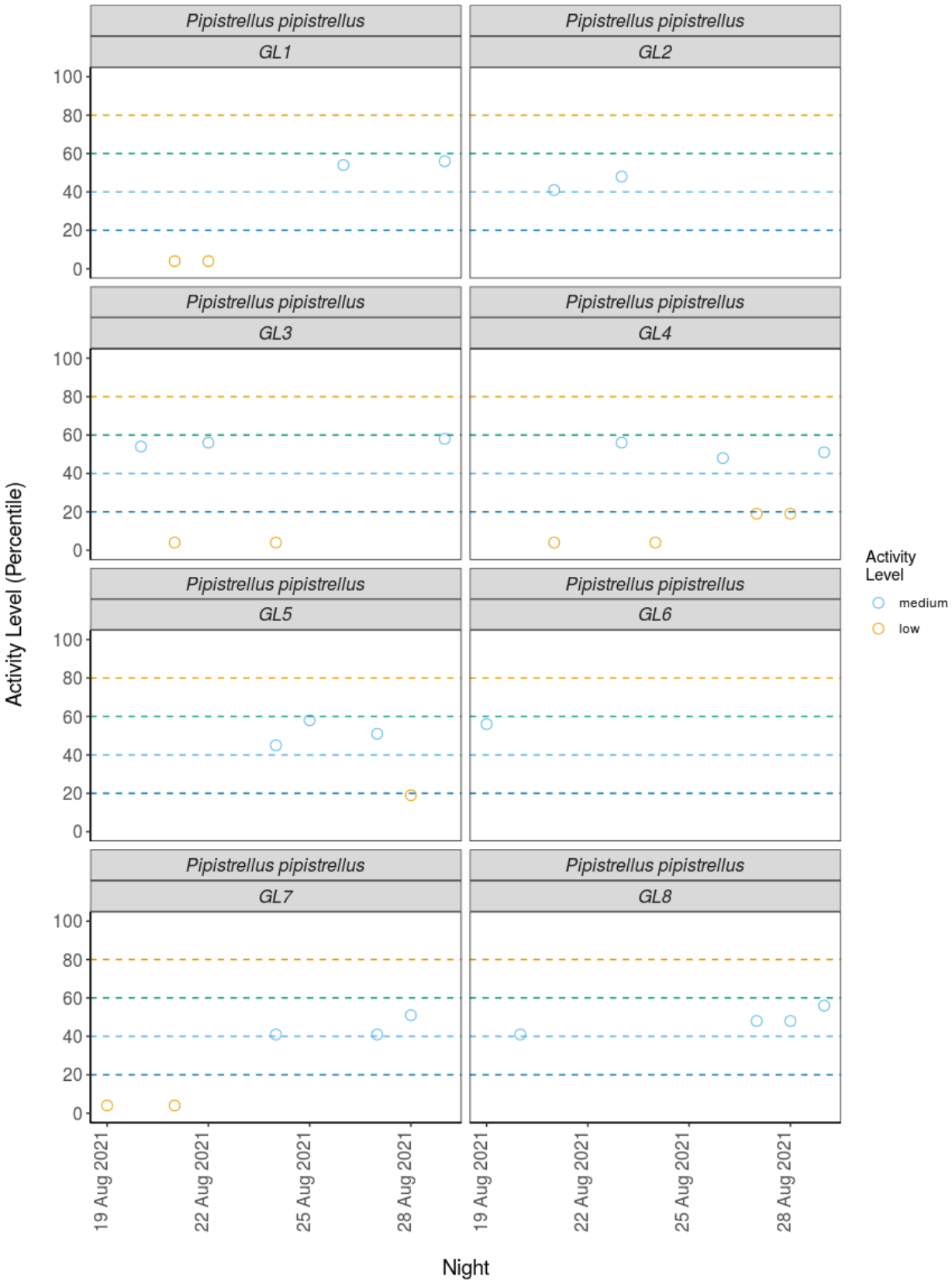
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.

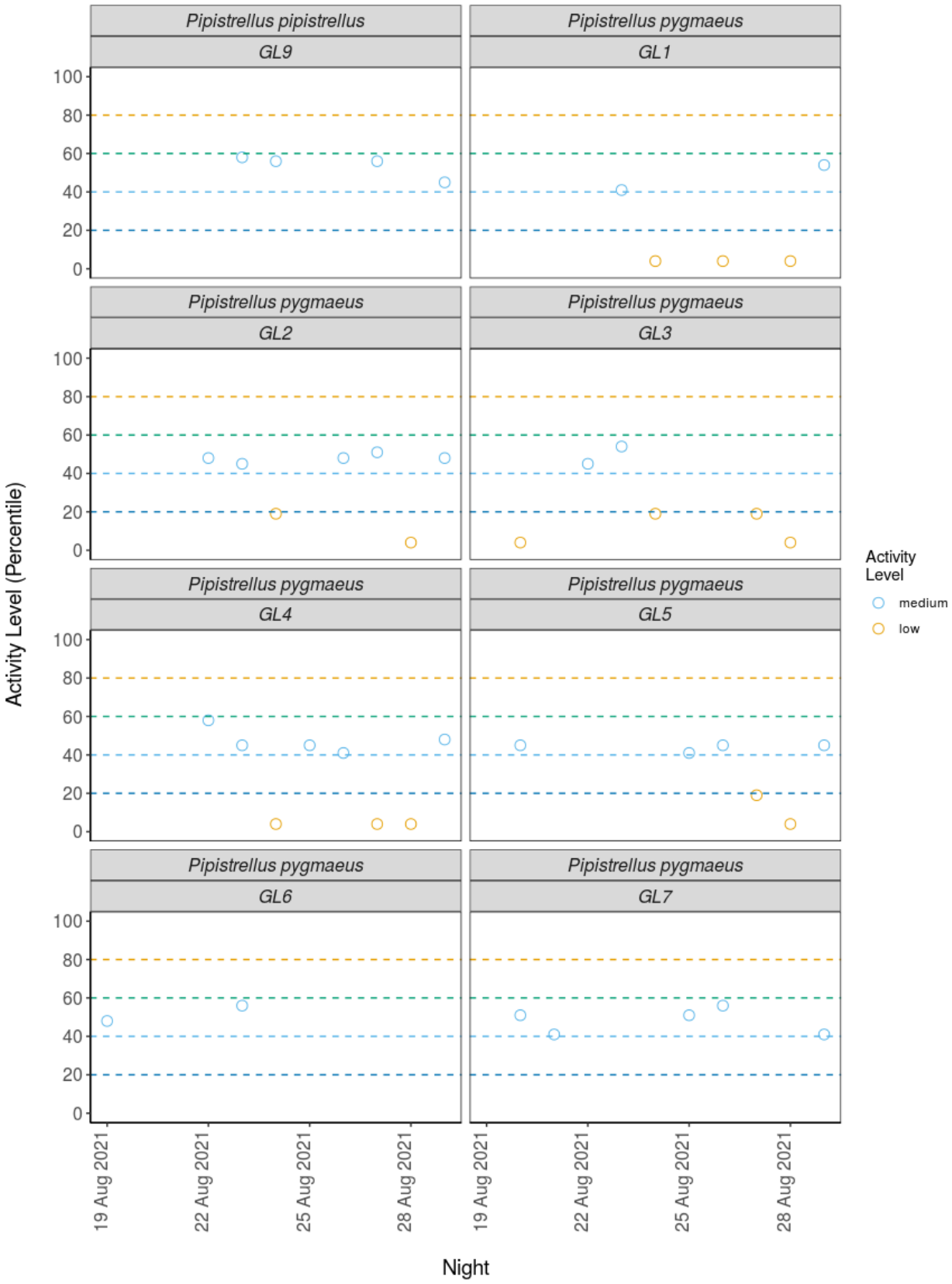

Myotis daubentonii
GL9
Myotis mystacinus
GL1
Myotis mystacinus
GL2
Myotis mystacinus
GL3
Myotis mystacinus
GL4
Myotis mystacinus
GL5
Myotis mystacinus
GL6
Myotis mystacinus
GL7
Activity Level (Percentile)
100
80
60
40
20
0
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Night
Activity Level
medium
low

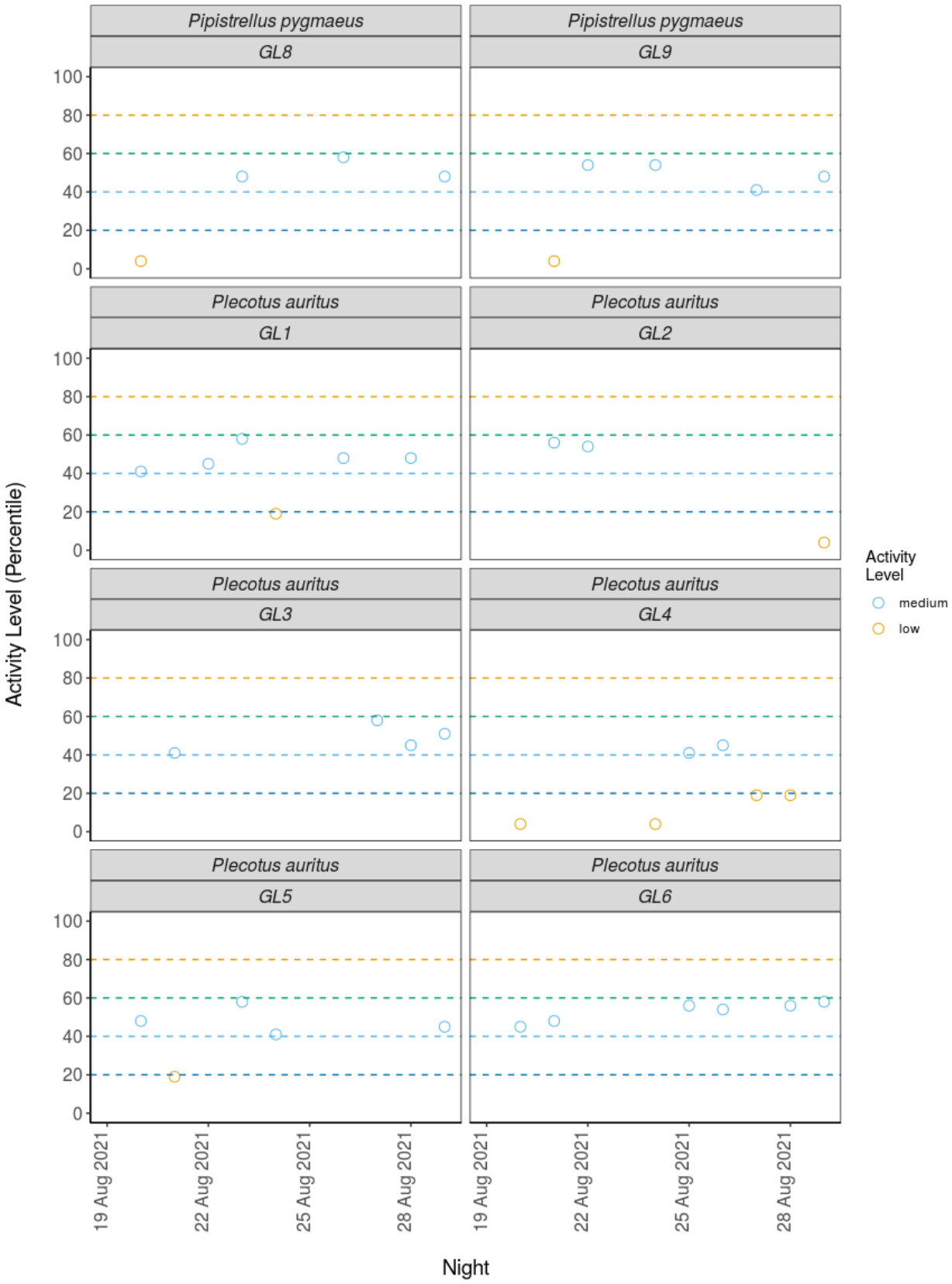

Myotis mystacinus
GL8
Myotis mystacinus
GL9
Myotis nattereri
GL1
Myotis nattereri
GL2
Myotis nattereri
GL3
Myotis nattereri
GL4
Myotis nattereri
GL5
Myotis nattereri
GL6
Activity Level (Percentile)
100
80
60
40
20
0
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Night
Activity Level
medium
low

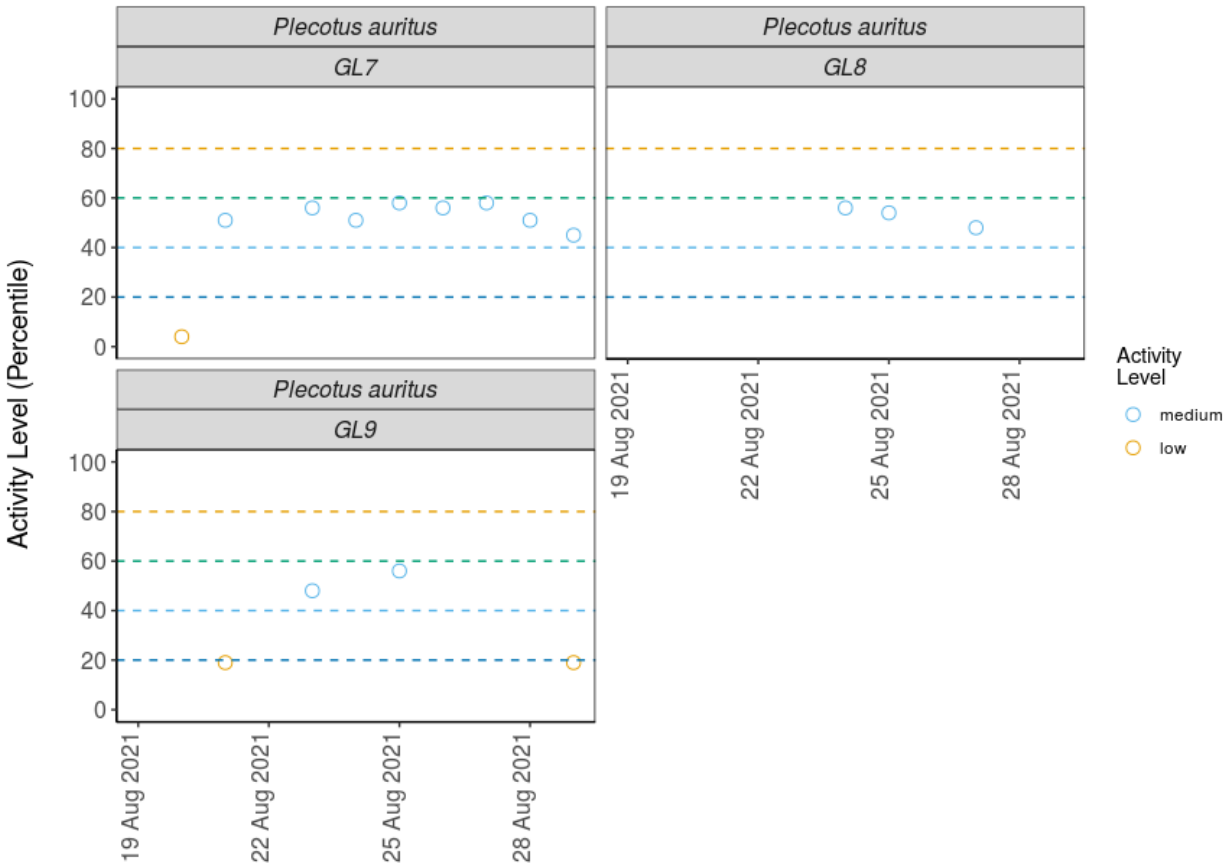

Myotis nattereri
GL7
Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Activity Level (Percentile)
100
80
60
40
20
0
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Night
Activity Level
medium
low


Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Pipistrellus nathusii
GL1
Pipistrellus nathusii
GL5
Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL8
Activity Level (Percentile)
0
20
40
60
80
100
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Night
Activity Level
medium
low


Pipistrellus pipistrellus
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
Activity Level (Percentile)
100
80
60
40
20
0
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Night
Activity Level
medium
low


Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL4
Pipistrellus pygmaeus
GL5
Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Activity Level (Percentile)
100
80
60
40
20
0
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Night
Activity Level
medium
low


Pipistrellus pygmaeus
GL8
Pipistrellus pygmaeus
GL9
Plecotus auritus
GL1
Plecotus auritus
GL2
Plecotus auritus
GL3
Plecotus auritus
GL4
Plecotus auritus
GL5
Plecotus auritus
GL6
Activity Level (Percentile)
100
80
60
40
20
0
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Night
Activity Level
medium
low


Plecotus auritus
GL7
Plecotus auritus
GL8
Plecotus auritus
GL9
Activity Level (Percentile)
100
80
60
40
20
0
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
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
GL1	*Myotis daubentonii*	Aug	0	0	3	1	3
GL1	*Myotis mystacinus*	Aug	0	0	0	1	7
GL1	*Myotis nattereri*	Aug	0	1	2	3	1
GL1	*Nyctalus leisleri*	Aug	0	3	3	0	3
GL1	*Pipistrellus nathusii*	Aug	0	0	0	0	1
GL1	*Pipistrellus pipistrellus*	Aug	0	0	2	4	2
GL1	*Pipistrellus pygmaeus*	Aug	0	0	2	1	3
GL1	*Plecotus auritus*	Aug	0	1	5	3	1
GL2	*Myotis daubentonii*	Aug	0	5	3	2	0
GL2	*Myotis mystacinus*	Aug	0	0	0	0	5
GL2	*Myotis nattereri*	Aug	0	4	2	1	3
GL2	*Nyctalus leisleri*	Aug	1	3	3	1	0
GL2	*Pipistrellus pipistrellus*	Aug	2	3	2	1	0
GL2	*Pipistrellus pygmaeus*	Aug	0	1	5	1	2
GL2	*Plecotus auritus*	Aug	1	4	2	1	1
GL3	*Myotis daubentonii*	Aug	0	0	7	2	1

GL3	*Myotis mystacinus*	Aug	0	0	0	0	2
GL3	*Myotis nattereri*	Aug	0	0	1	4	4
GL3	*Nyctalus leisleri*	Aug	0	3	3	4	0
GL3	*Pipistrellus pipistrellus*	Aug	0	3	3	2	2
GL3	*Pipistrellus pygmaeus*	Aug	0	2	2	1	4
GL3	*Plecotus auritus*	Aug	0	5	4	0	0
GL4	*Myotis daubentonii*	Aug	0	0	1	3	5
GL4	*Myotis mystacinus*	Aug	0	0	0	0	3
GL4	*Myotis nattereri*	Aug	0	0	0	1	5
GL4	*Nyctalus leisleri*	Aug	3	4	2	0	1
GL4	*Pipistrellus pipistrellus*	Aug	1	1	3	0	4
GL4	*Pipistrellus pygmaeus*	Aug	0	0	5	0	3
GL4	*Plecotus auritus*	Aug	0	0	2	2	4
GL5	*Myotis daubentonii*	Aug	0	0	4	3	2
GL5	*Myotis mystacinus*	Aug	0	0	0	0	3
GL5	*Myotis nattereri*	Aug	0	0	0	3	6
GL5	*Nyctalus leisleri*	Aug	0	5	3	2	1
GL5	*Pipistrellus nathusii*	Aug	0	0	0	0	1
GL5	*Pipistrellus pipistrellus*	Aug	1	4	3	0	1
GL5	*Pipistrellus pygmaeus*	Aug	0	2	4	0	2
GL5	*Plecotus auritus*	Aug	0	4	4	1	1

GL6	*Myotis daubentonii*	Aug	0	5	3	2	0
GL6	*Myotis mystacinus*	Aug	0	0	0	1	7
GL6	*Myotis nattereri*	Aug	1	4	3	0	2
GL6	*Nyctalus leisleri*	Aug	0	1	3	3	3
GL6	*Pipistrellus nathusii*	Aug	0	0	0	0	1
GL6	*Pipistrellus pipistrellus*	Aug	7	2	1	1	0
GL6	*Pipistrellus pygmaeus*	Aug	2	5	2	2	0
GL6	*Plecotus auritus*	Aug	0	3	6	1	0
GL7	*Myotis daubentonii*	Aug	1	4	4	0	1
GL7	*Myotis mystacinus*	Aug	0	0	0	0	3
GL7	*Myotis nattereri*	Aug	0	2	4	1	2
GL7	*Nyctalus leisleri*	Aug	0	3	5	2	0
GL7	*Pipistrellus pipistrellus*	Aug	1	5	3	0	2
GL7	*Pipistrellus pygmaeus*	Aug	0	1	5	4	0
GL7	*Plecotus auritus*	Aug	0	0	8	1	1
GL8	*Myotis daubentonii*	Aug	0	1	6	2	0
GL8	*Myotis mystacinus*	Aug	0	0	0	0	4
GL8	*Myotis nattereri*	Aug	0	0	1	3	3
GL8	*Nyctalus leisleri*	Aug	1	1	3	4	1
GL8	*Pipistrellus nathusii*	Aug	0	0	0	1	1
GL8	*Pipistrellus pipistrellus*	Aug	2	3	4	1	0

GL8	*Pipistrellus pygmaeus*	Aug	0	2	3	3	1
GL8	*Plecotus auritus*	Aug	0	5	3	2	0
GL9	*Myotis daubentonii*	Aug	0	5	2	1	1
GL9	*Myotis mystacinus*	Aug	0	0	0	0	4
GL9	*Myotis nattereri*	Aug	0	0	5	2	1
GL9	*Nyctalus leisleri*	Aug	1	4	2	1	2
GL9	*Pipistrellus pipistrellus*	Aug	1	2	4	1	0
GL9	*Pipistrellus pygmaeus*	Aug	0	3	4	2	1
GL9	*Plecotus auritus*	Aug	0	2	2	3	2

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
GL1	*Myotis daubentonii*	Aug	29	11.5 - 50.5	56	7
GL1	*Myotis mystacinus*	Aug	12	4 - 19	29	8
GL1	*Myotis nattereri*	Aug	36	27.5 - 55	62	7
GL1	*Nyctalus leisleri*	Aug	48	19 - 64	80	9
GL1	*Pipistrellus nathusii*	Aug	4	0	4	1
GL1	*Pipistrellus pipistrellus*	Aug	36	20 - 46	56	8
GL1	*Pipistrellus pygmaeus*	Aug	20	4 - 41	54	6
GL1	*Plecotus auritus*	Aug	43	32.5 - 54	72	10
GL2	*Myotis daubentonii*	Aug	64	41 - 73	76	10
GL2	*Myotis mystacinus*	Aug	4	4 - 4	4	5
GL2	*Myotis nattereri*	Aug	48	20 - 63	70	10
GL2	*Nyctalus leisleri*	Aug	60	46 - 78	92	8
GL2	*Pipistrellus pipistrellus*	Aug	66	42 - 79.5	87	8
GL2	*Pipistrellus pygmaeus*	Aug	48	24.5 - 52.5	60	9
GL2	*Plecotus auritus*	Aug	66	36 - 78	82	9
GL3	*Myotis daubentonii*	Aug	43	30 - 51	56	10
GL3	*Myotis mystacinus*	Aug	4	4 - 4	4	2
GL3	*Myotis nattereri*	Aug	29	11.5 - 36	51	9

GL3	*Nyctalus leisleri*	Aug	43	32.5 - 60	74	10
GL3	*Pipistrellus pipistrellus*	Aug	55	29 - 64.5	75	10
GL3	*Pipistrellus pygmaeus*	Aug	36	11.5 - 55.5	66	9
GL3	*Plecotus auritus*	Aug	60	49.5 - 68	74	9
GL4	*Myotis daubentonii*	Aug	19	4 - 29	51	9
GL4	*Myotis mystacinus*	Aug	4	4 - 4	4	3
GL4	*Myotis nattereri*	Aug	12	4 - 20	36	6
GL4	*Nyctalus leisleri*	Aug	71	42 - 79	85	10
GL4	*Pipistrellus pipistrellus*	Aug	48	11.5 - 60	84	9
GL4	*Pipistrellus pygmaeus*	Aug	43	4 - 48	58	8
GL4	*Plecotus auritus*	Aug	24	11.5 - 37	45	8
GL5	*Myotis daubentonii*	Aug	36	24 - 43.5	51	9
GL5	*Myotis mystacinus*	Aug	4	4 - 4	4	3
GL5	*Myotis nattereri*	Aug	19	11.5 - 29	36	9
GL5	*Nyctalus leisleri*	Aug	58	36 - 65.5	73	11
GL5	*Pipistrellus nathusii*	Aug	19	0	19	1
GL5	*Pipistrellus pipistrellus*	Aug	60	45 - 77.5	87	9
GL5	*Pipistrellus pygmaeus*	Aug	45	22.5 - 56.5	68	8
GL5	*Plecotus auritus*	Aug	53	37 - 68	74	10
GL6	*Myotis daubentonii*	Aug	60	47 - 69	76	10
GL6	*Myotis mystacinus*	Aug	4	4 - 19	36	8
GL6	*Myotis nattereri*	Aug	60	38.5 - 69	80	10

GL6	*Nyctalus leisleri*	Aug	29	16.5 - 51	75	10
GL6	*Pipistrellus nathusii*	Aug	4	0	4	1
GL6	*Pipistrellus pipistrellus*	Aug	88	60.5 - 90	94	11
GL6	*Pipistrellus pygmaeus*	Aug	64	46.5 - 73	89	11
GL6	*Plecotus auritus*	Aug	56	46.5 - 61	66	10
GL7	*Myotis daubentonii*	Aug	58	39 - 72.5	85	10
GL7	*Myotis mystacinus*	Aug	4	4 - 4	4	3
GL7	*Myotis nattereri*	Aug	45	24.5 - 61	66	9
GL7	*Nyctalus leisleri*	Aug	54	43.5 - 60	69	10
GL7	*Pipistrellus pipistrellus*	Aug	66	35 - 73	85	11
GL7	*Pipistrellus pygmaeus*	Aug	41	32.5 - 51	60	10
GL7	*Plecotus auritus*	Aug	51	30 - 56	58	10
GL8	*Myotis daubentonii*	Aug	54	38.5 - 58.5	69	9
GL8	*Myotis mystacinus*	Aug	4	4 - 4	19	4
GL8	*Myotis nattereri*	Aug	29	11.5 - 38.5	41	7
GL8	*Nyctalus leisleri*	Aug	39	32.5 - 61	86	10
GL8	*Pipistrellus nathusii*	Aug	24	24 - 24	29	2
GL8	*Pipistrellus pipistrellus*	Aug	58	44.5 - 77	89	10
GL8	*Pipistrellus pygmaeus*	Aug	48	26 - 63	78	9
GL8	*Plecotus auritus*	Aug	59	45 - 68	74	10
GL9	*Myotis daubentonii*	Aug	62	33 - 68	73	9

GL9	*Myotis mystacinus*	Aug	4	4 - 4	19	4
GL9	*Myotis nattereri*	Aug	41	29 - 49.5	54	8
GL9	*Nyctalus leisleri*	Aug	61	30 - 70	84	10
GL9	*Pipistrellus pipistrellus*	Aug	57	46 - 74.5	83	8
GL9	*Pipistrellus pygmaeus*	Aug	51	29 - 60	71	10
GL9	*Plecotus auritus*	Aug	36	27.5 - 57.5	67	9

PER SITE

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

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

Species/Species Group	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis daubentonii	1	20	33	16	13
Myotis mystacinus	0	0	0	2	38
Myotis nattereri	1	11	18	18	27
Nyctalus leisleri	6	27	27	17	11
Pipistrellus nathusii	0	0	0	1	4
Pipistrellus pipistrellus	15	23	25	10	11
Pipistrellus pygmaeus	2	16	32	14	16
Plecotus auritus	1	24	36	14	10

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

Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	48	47 - 69	85	83
Myotis mystacinus	4	4 - 4	36	40
Myotis nattereri	36	4 - 20	80	75
Nyctalus leisleri	54	46 - 78	92	88
Pipistrellus nathusii	19	24 - 24	29	5
Pipistrellus pipistrellus	56	60.5 - 90	94	84
Pipistrellus pygmaeus	45	46.5 - 73	89	80
Plecotus auritus	51	49.5 - 68	82	85

###Figures

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

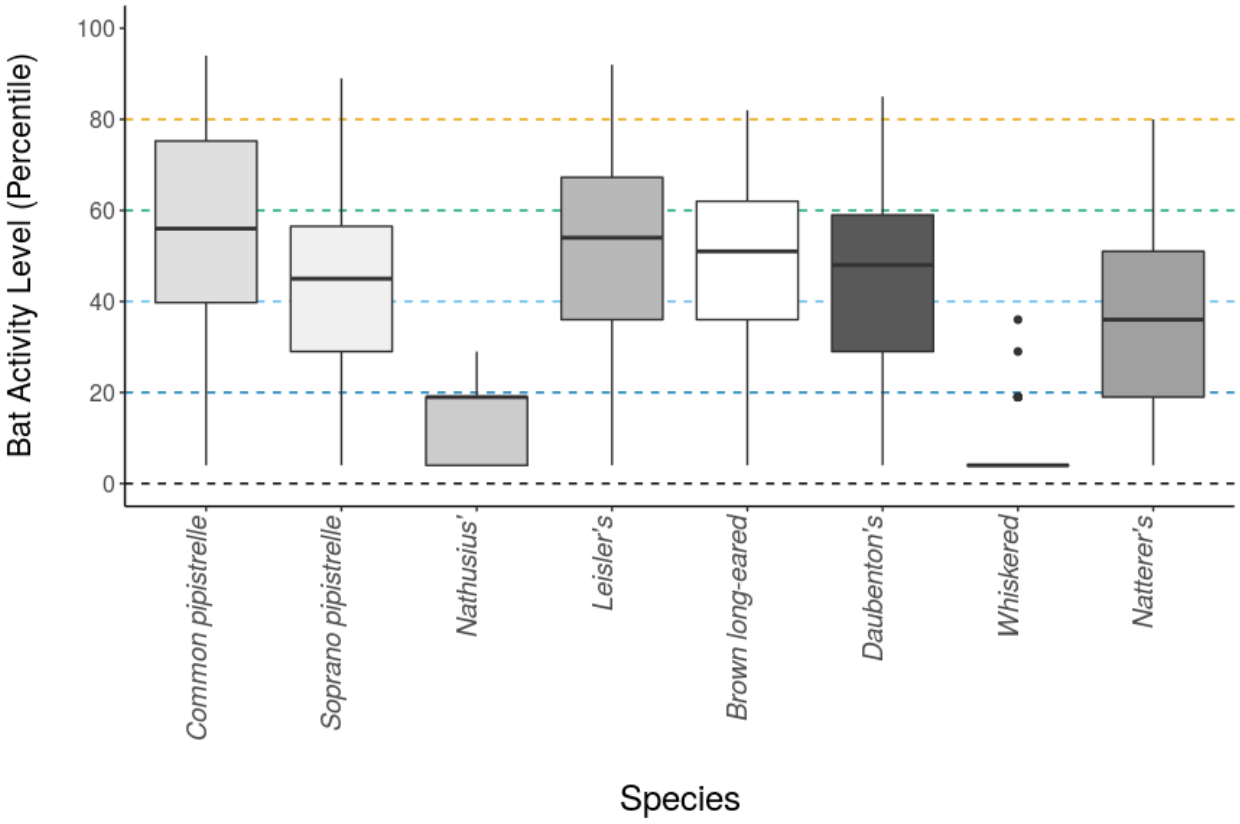
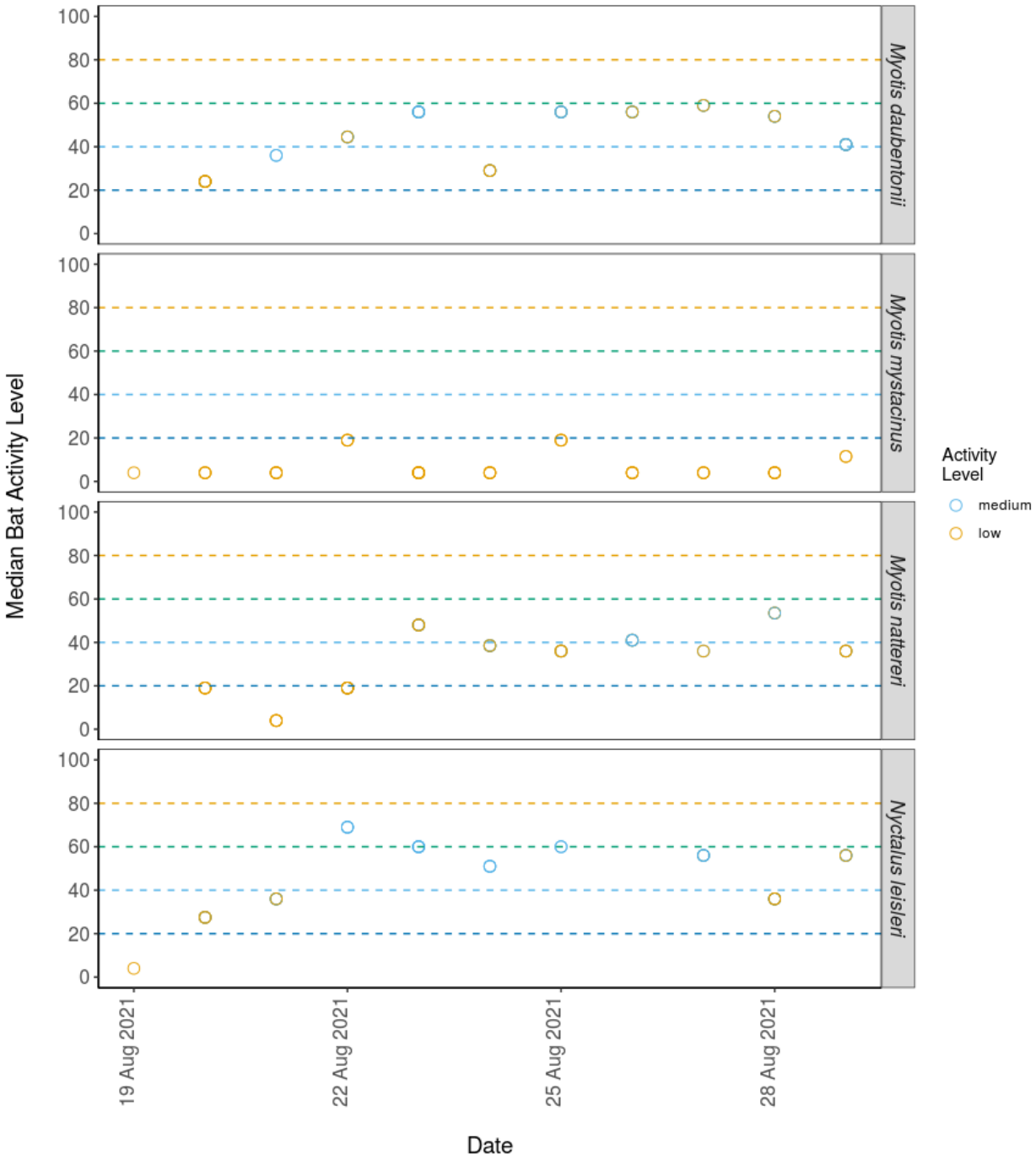
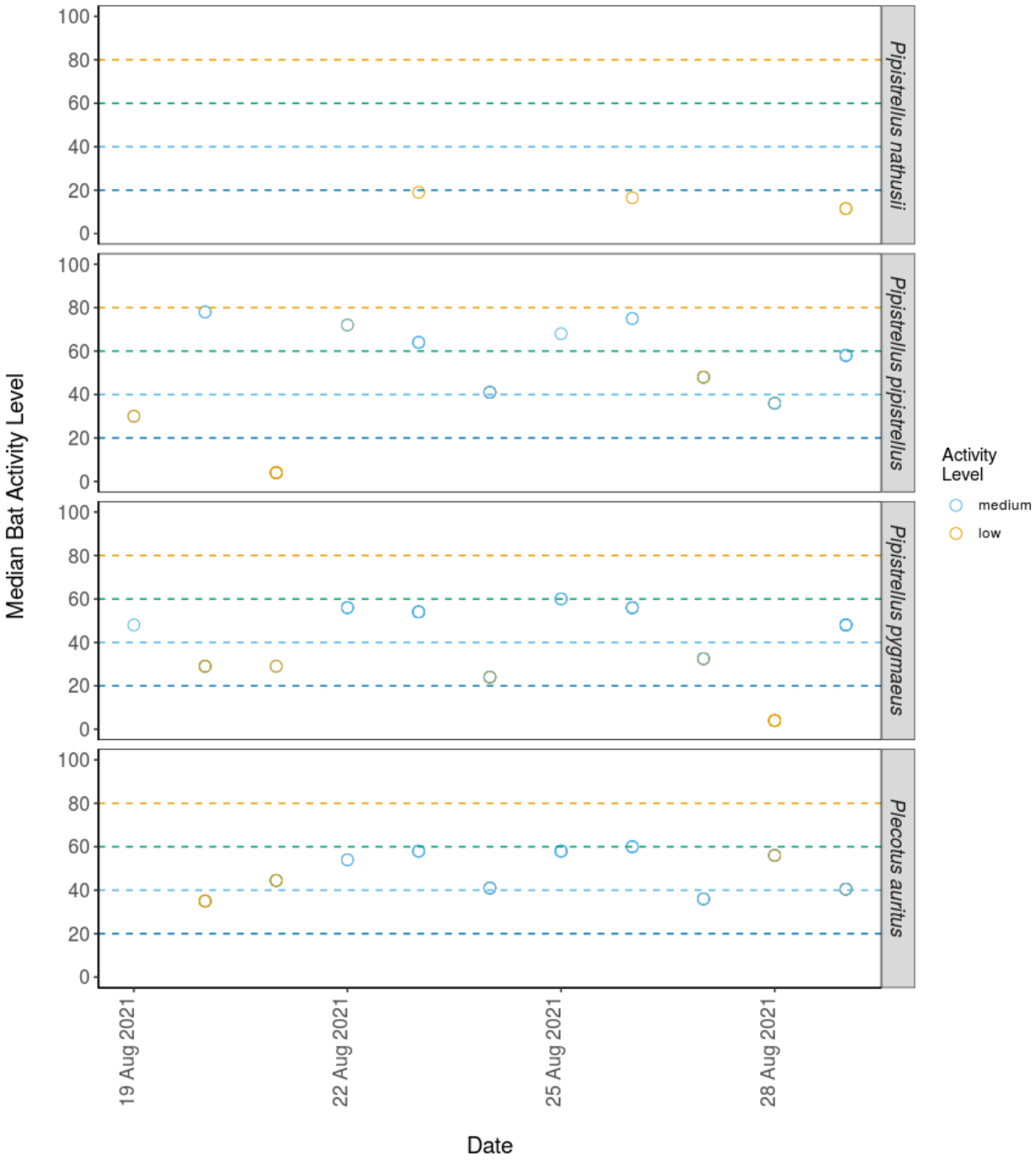


Figure 5. The median activity levels of bats recorded across all detectors each night.


Median Bat Activity Level
100
80
60
40
20
0
Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Activity Level
medium
low
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Date


Median Bat Activity Level
100
80
60
40
20
0
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
19 Aug 2021
22 Aug 2021
25 Aug 2021
28 Aug 2021
Date
Activity Level
medium
low

PER SITE, PER MONTH

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

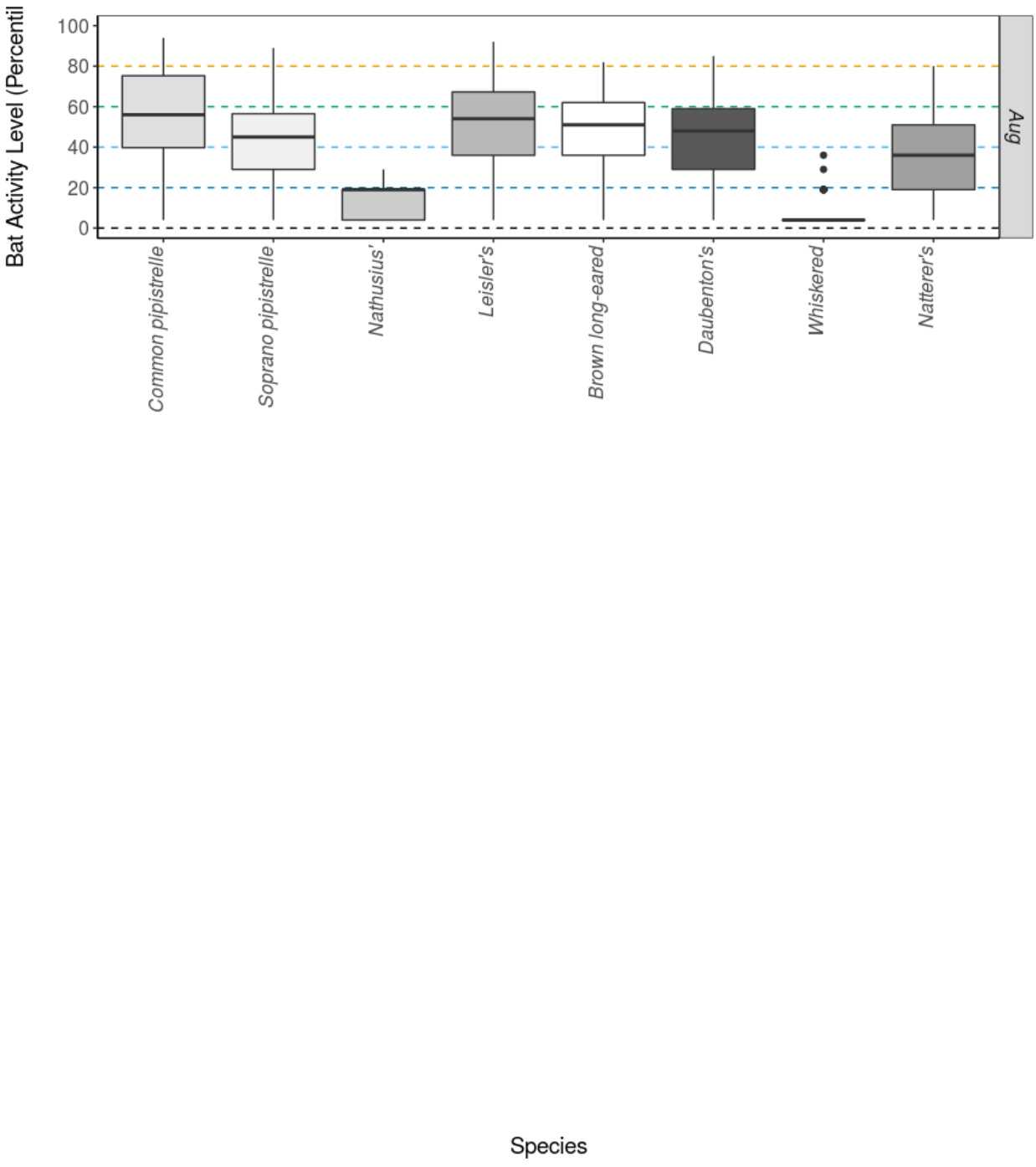
Species/Species Group	Month	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity
Myotis daubentonii	Aug	1	20	33	16	13
Myotis mystacinus	Aug	0	0	0	2	38
Myotis nattereri	Aug	1	11	18	18	27
Nyctalus leisleri	Aug	6	27	27	17	11
Pipistrellus nathusii	Aug	0	0	0	1	4
Pipistrellus pipistrellus	Aug	15	23	25	10	11
Pipistrellus pygmaeus	Aug	2	16	32	14	16
Plecotus auritus	Aug	1	24	36	14	10

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

Species/Species Group	Month	Median Percentile	95% CIs	Max Percentile	Nights Recorded
Myotis daubentonii	Aug	48	47 - 69	85	83
Myotis mystacinus	Aug	4	4 - 4	36	40
Myotis nattereri	Aug	36	4 - 20	80	75
Nyctalus leisleri	Aug	54	46 - 78	92	88
Pipistrellus nathusii	Aug	19	24 - 24	29	5
Pipistrellus pipistrellus	Aug	56	60.5 - 90	94	84
Pipistrellus pygmaeus	Aug	45	46.5 - 73	89	80
Plecotus auritus	Aug	51	49.5 - 68	82	85

###Figures

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



PART 2: Nightly Analysis

ENTIRE SURVEY PERIOD

Sunrise and Sunset Times

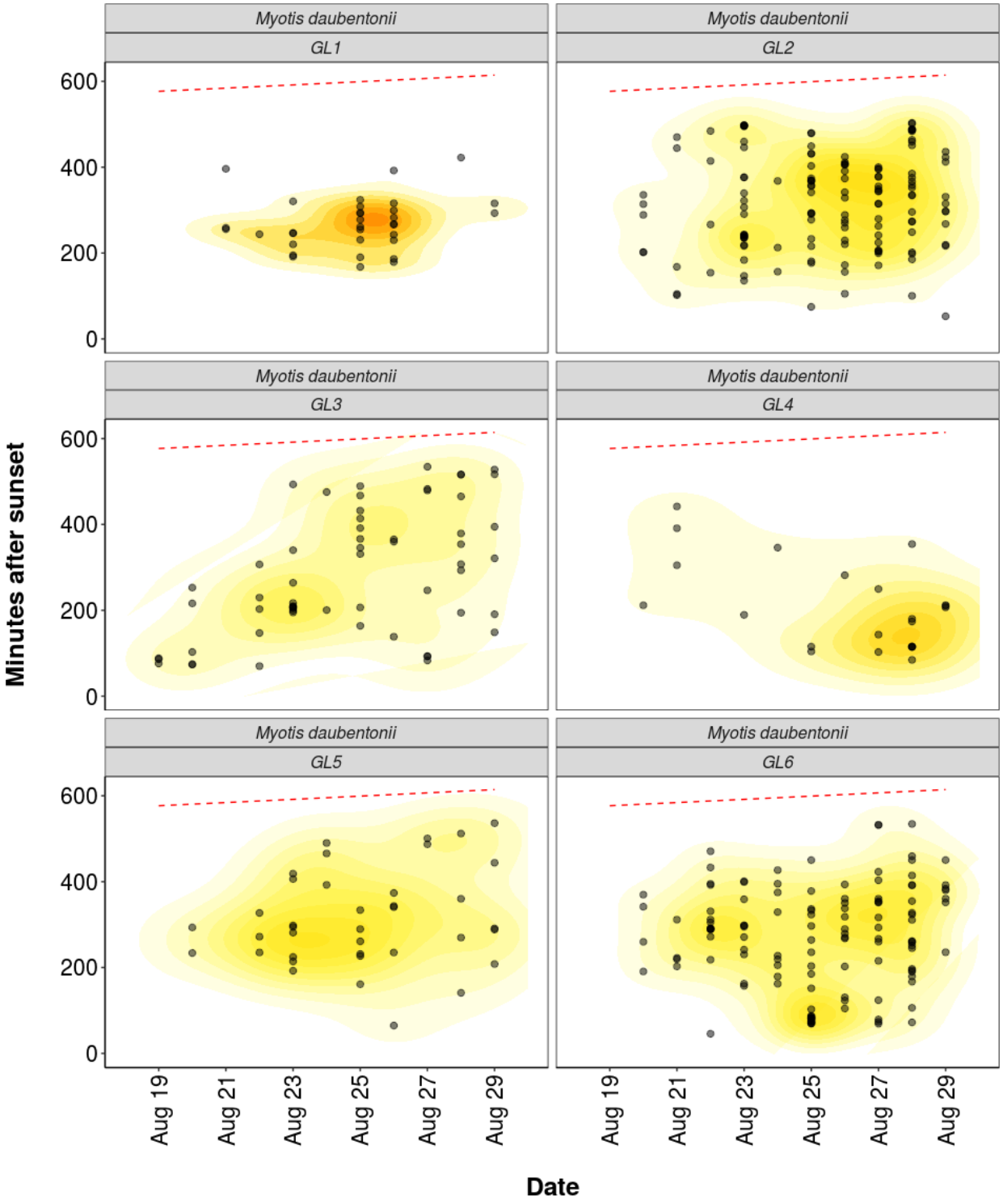
Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.

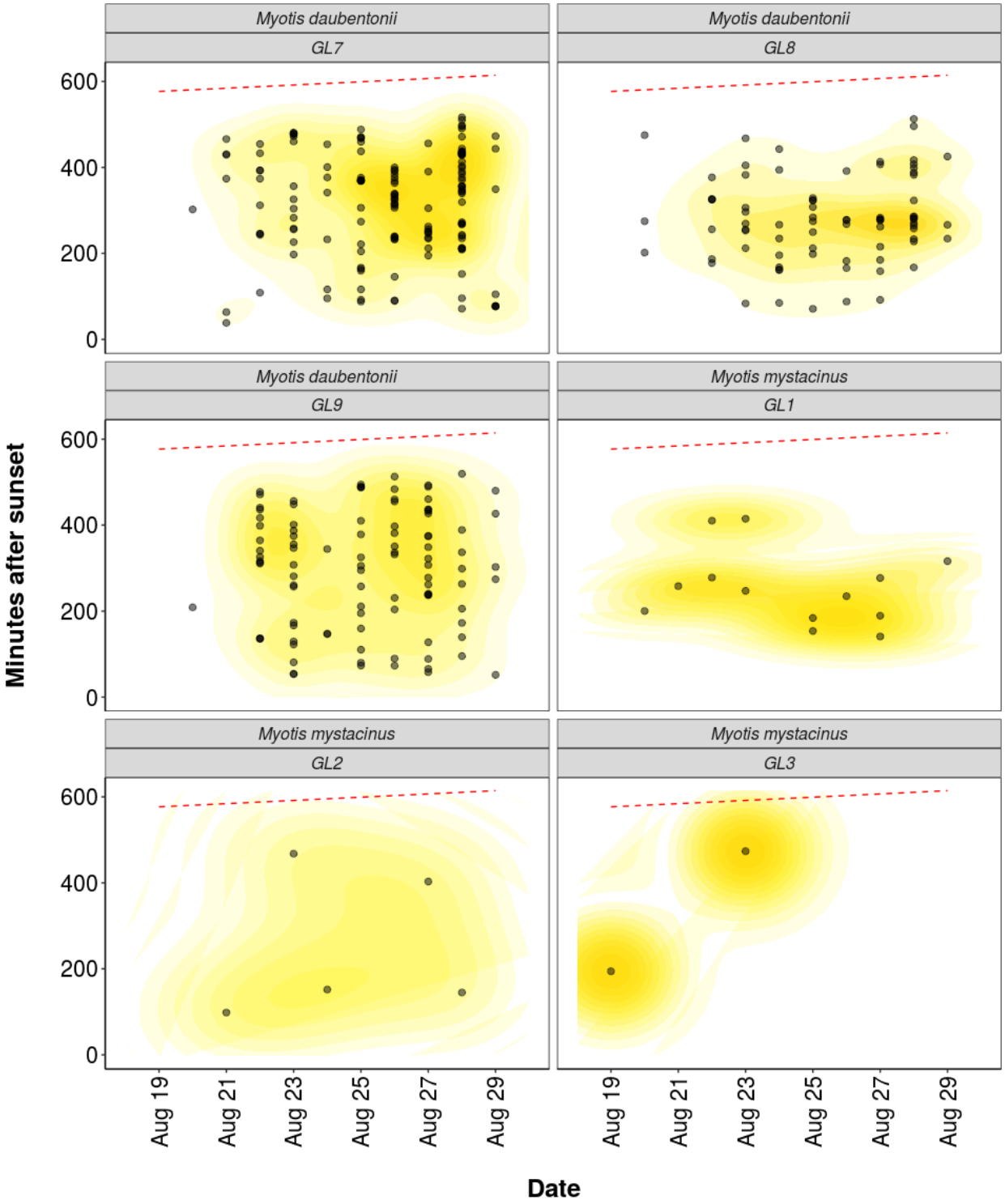
Night (y-m-d)	Sunset (hh:mm)	Sunrise (hh:mm)	Night Length (hours)
2021-08-19	20:54	06:31	9.6
2021-08-20	20:52	06:32	9.7
2021-08-21	20:50	06:34	9.7
2021-08-22	20:48	06:36	9.8
2021-08-23	20:46	06:37	9.9
2021-08-24	20:43	06:39	9.9
2021-08-25	20:41	06:40	10.0
2021-08-26	20:39	06:42	10.0
2021-08-27	20:37	06:44	10.1
2021-08-28	20:35	06:45	10.2
2021-08-29	20:32	06:47	10.2

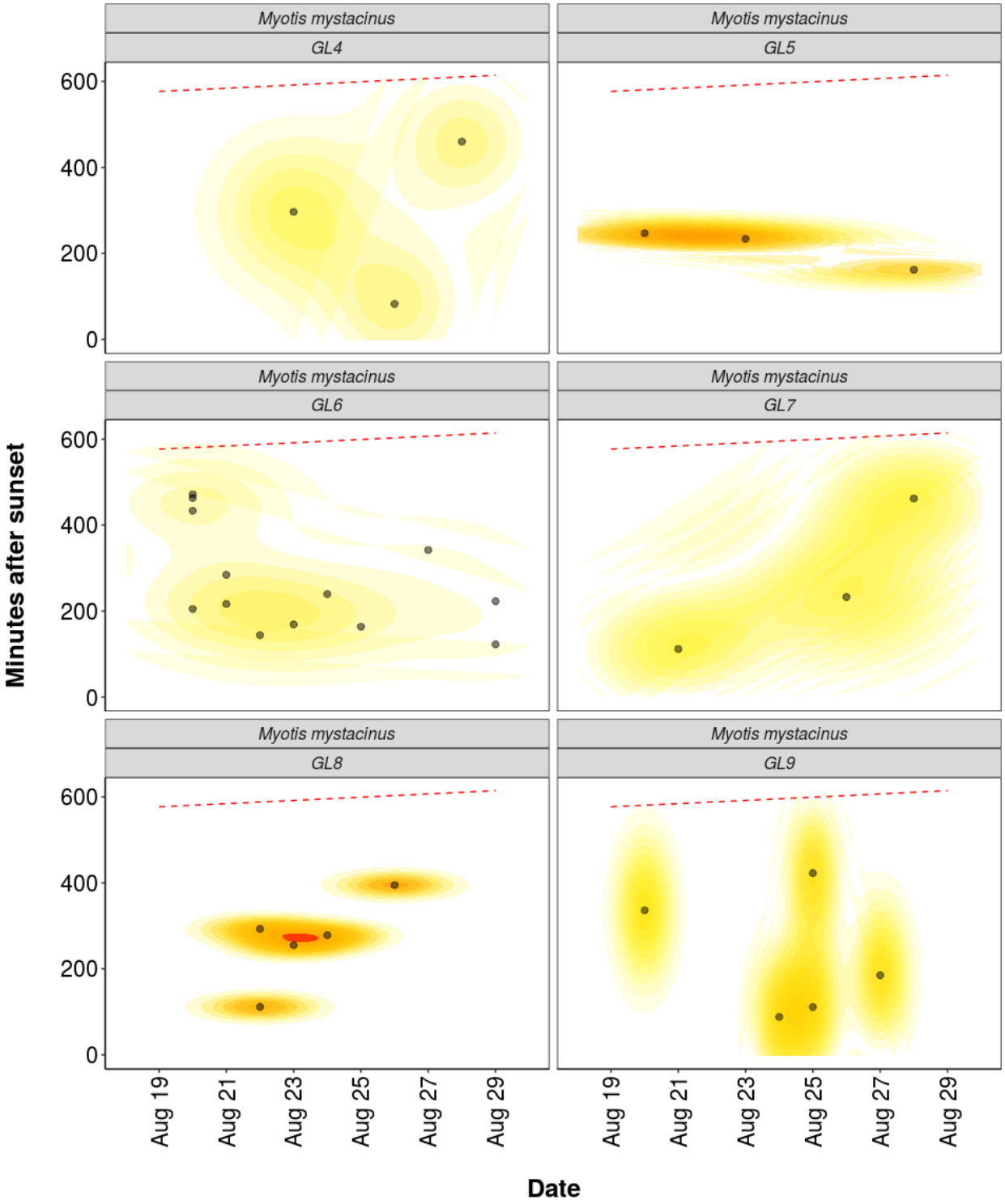
Distribution of Bat Activity Across the Night through Time

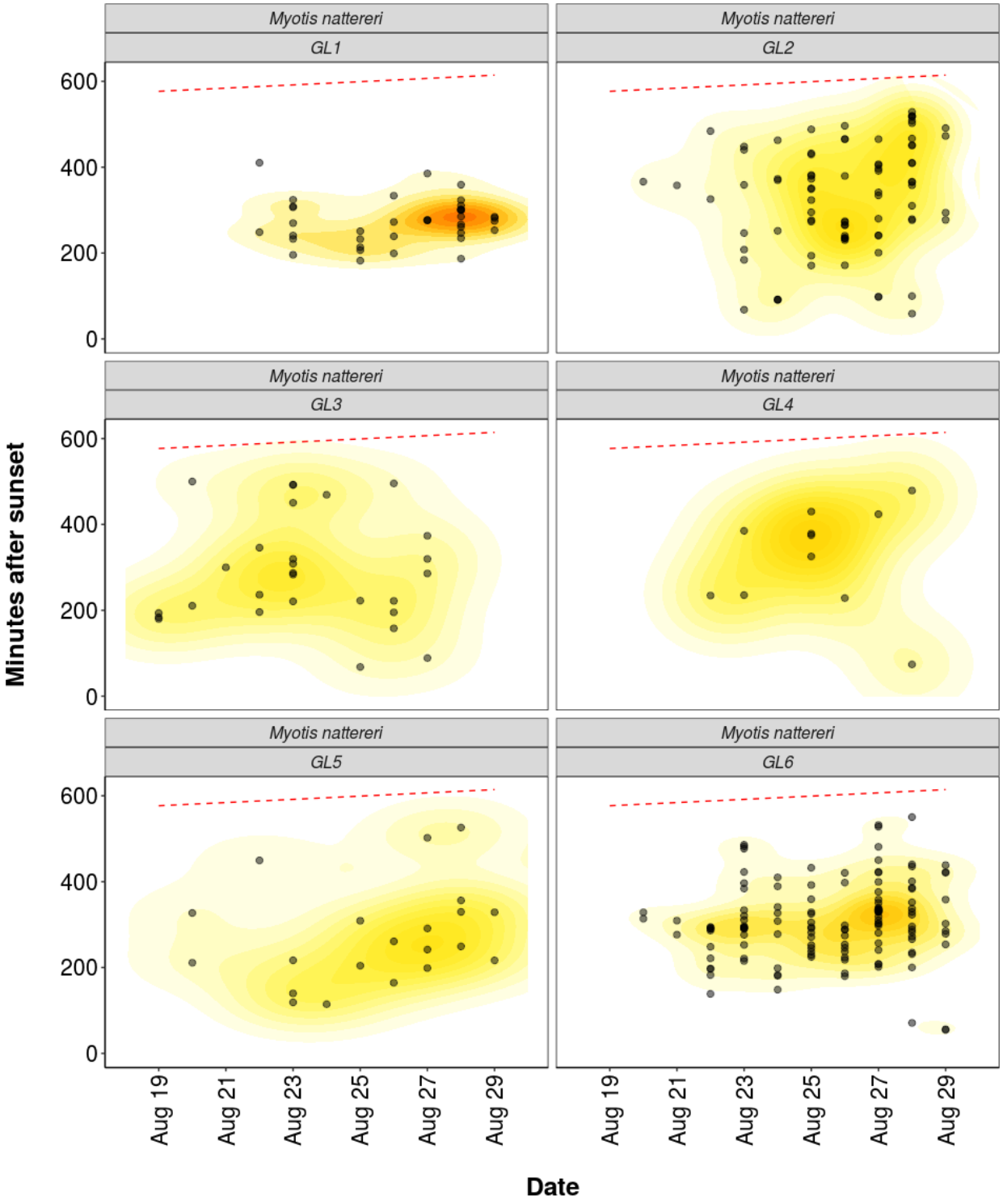
Per Detector

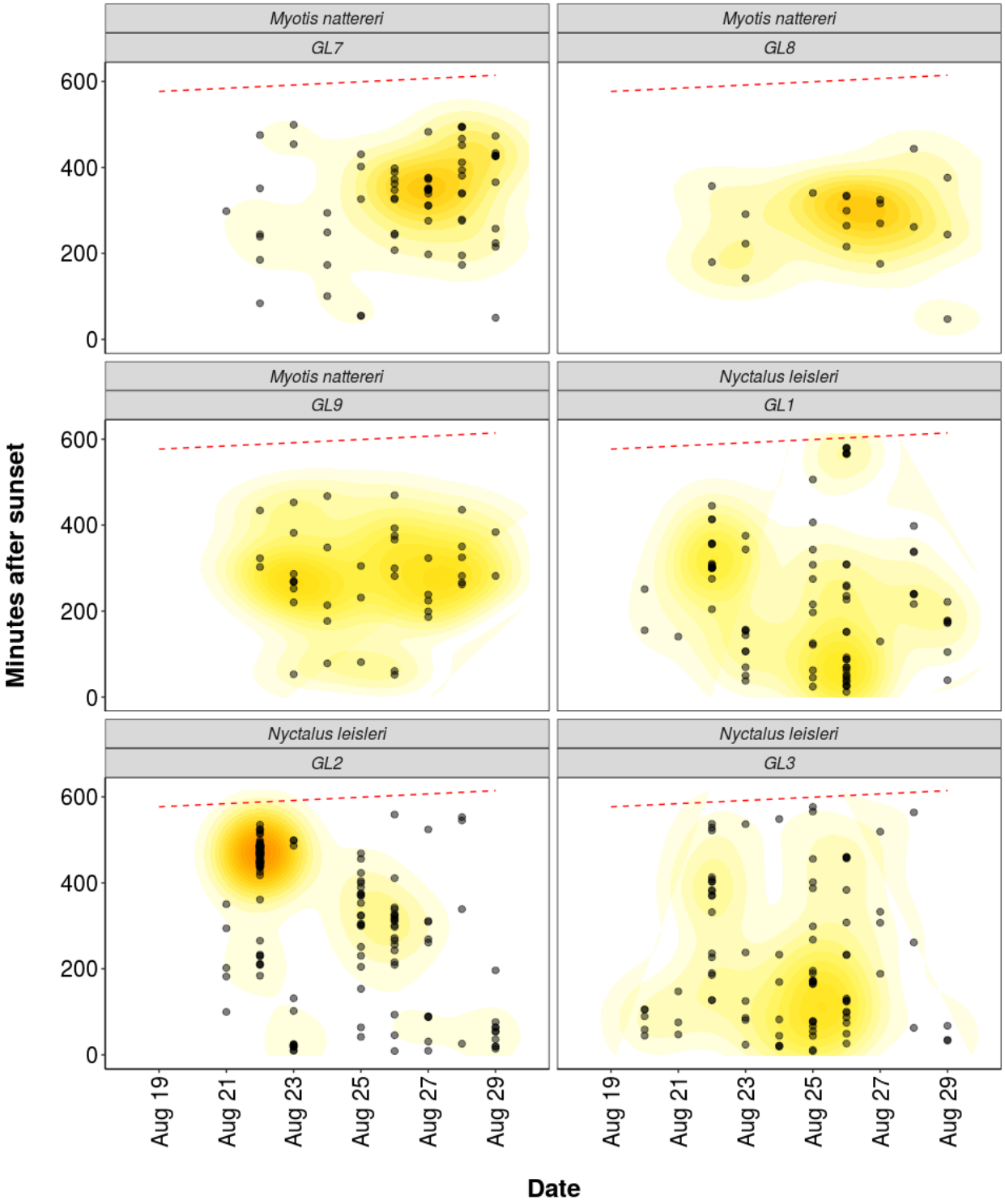
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

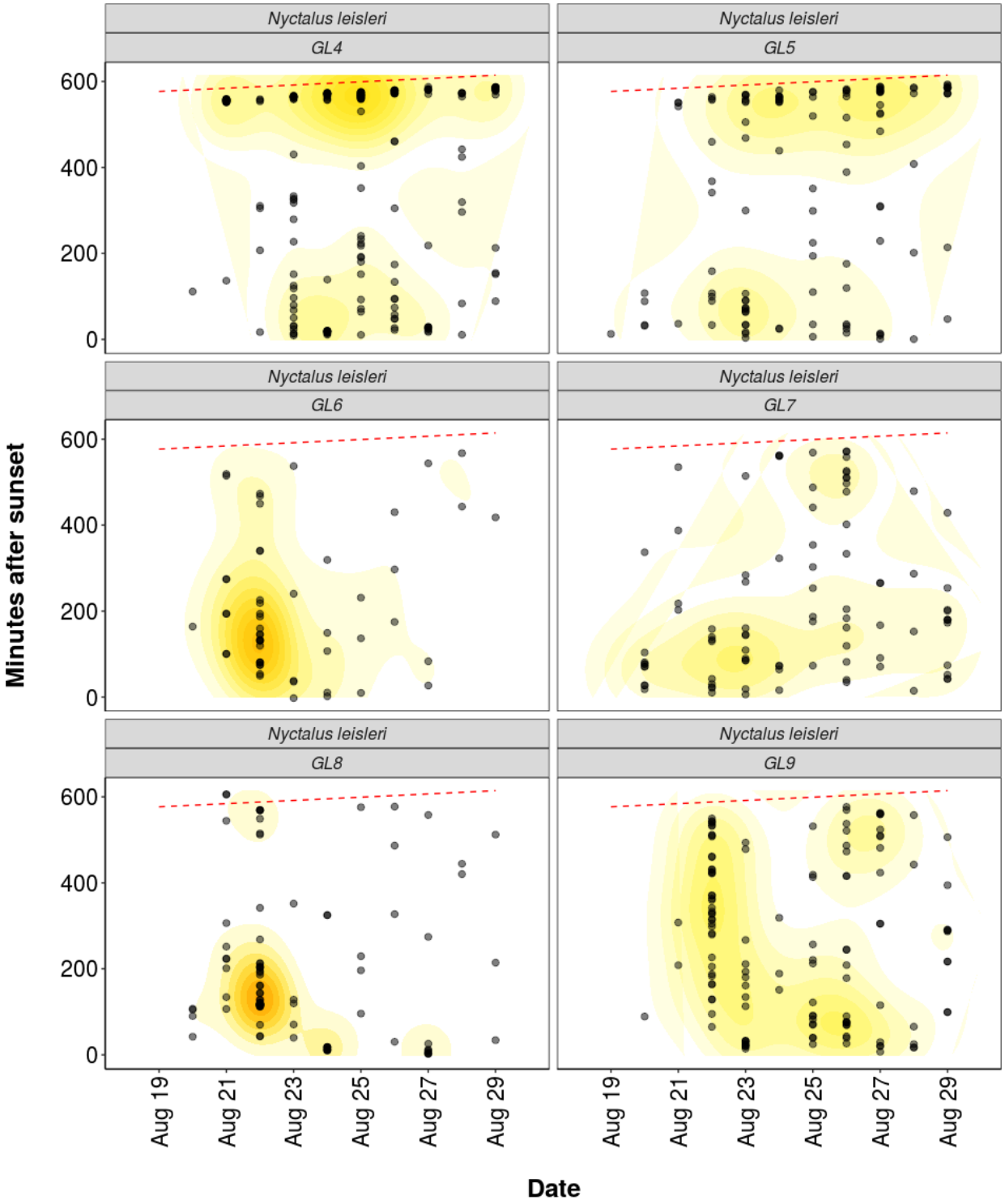

Myotis daubentonii
GL1
Myotis daubentonii
GL2
Myotis daubentonii
GL3
Myotis daubentonii
GL4
Myotis daubentonii
GL5
Myotis daubentonii
GL6
Minutes after sunset
0
200
400
600
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date

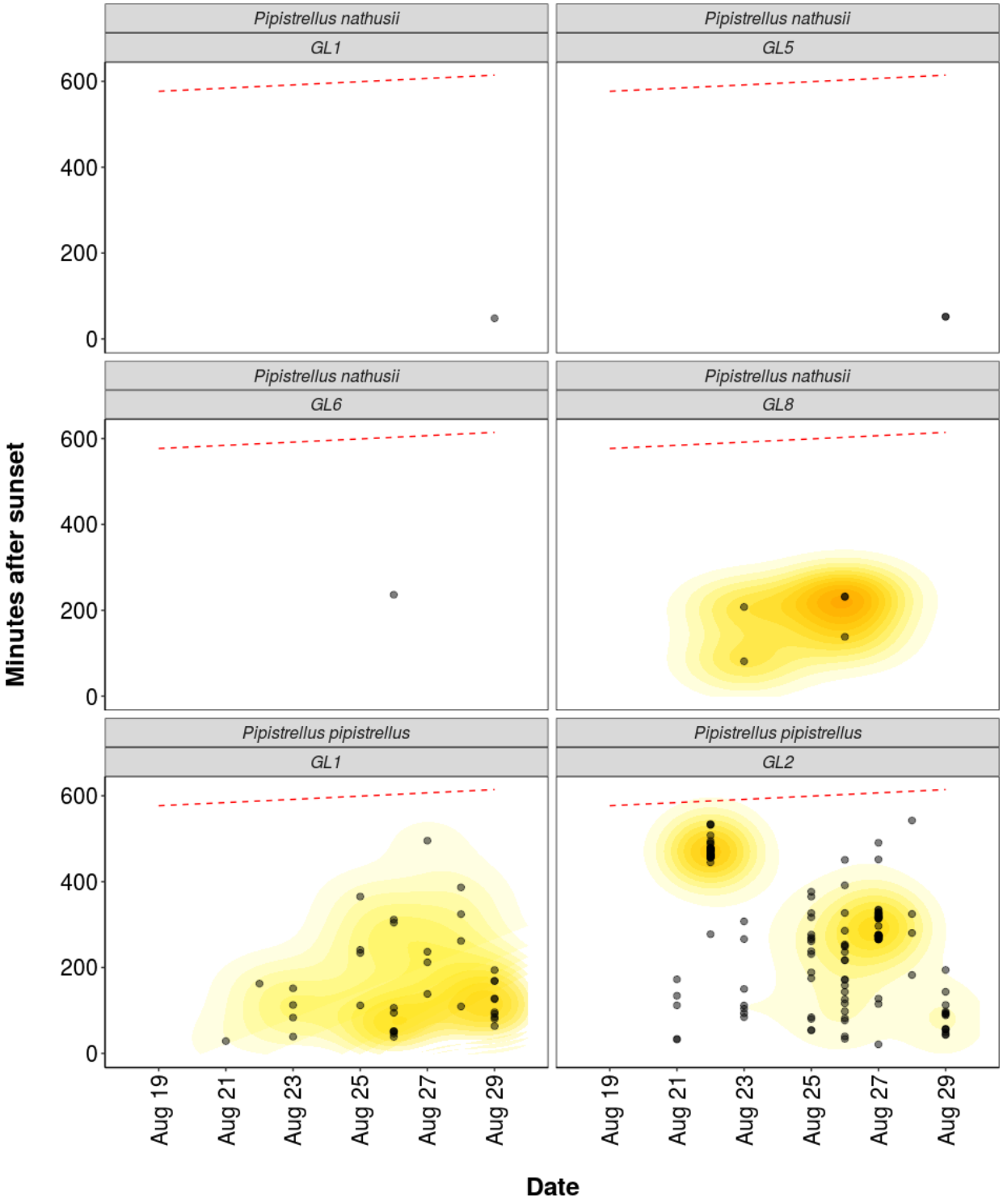

Myotis daubentonii
GL7
Myotis daubentonii
GL8
Myotis daubentonii
GL9
Myotis mystacinus
GL1
Myotis mystacinus
GL2
Myotis mystacinus
GL3
Minutes after sunset
0
200
400
600
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date

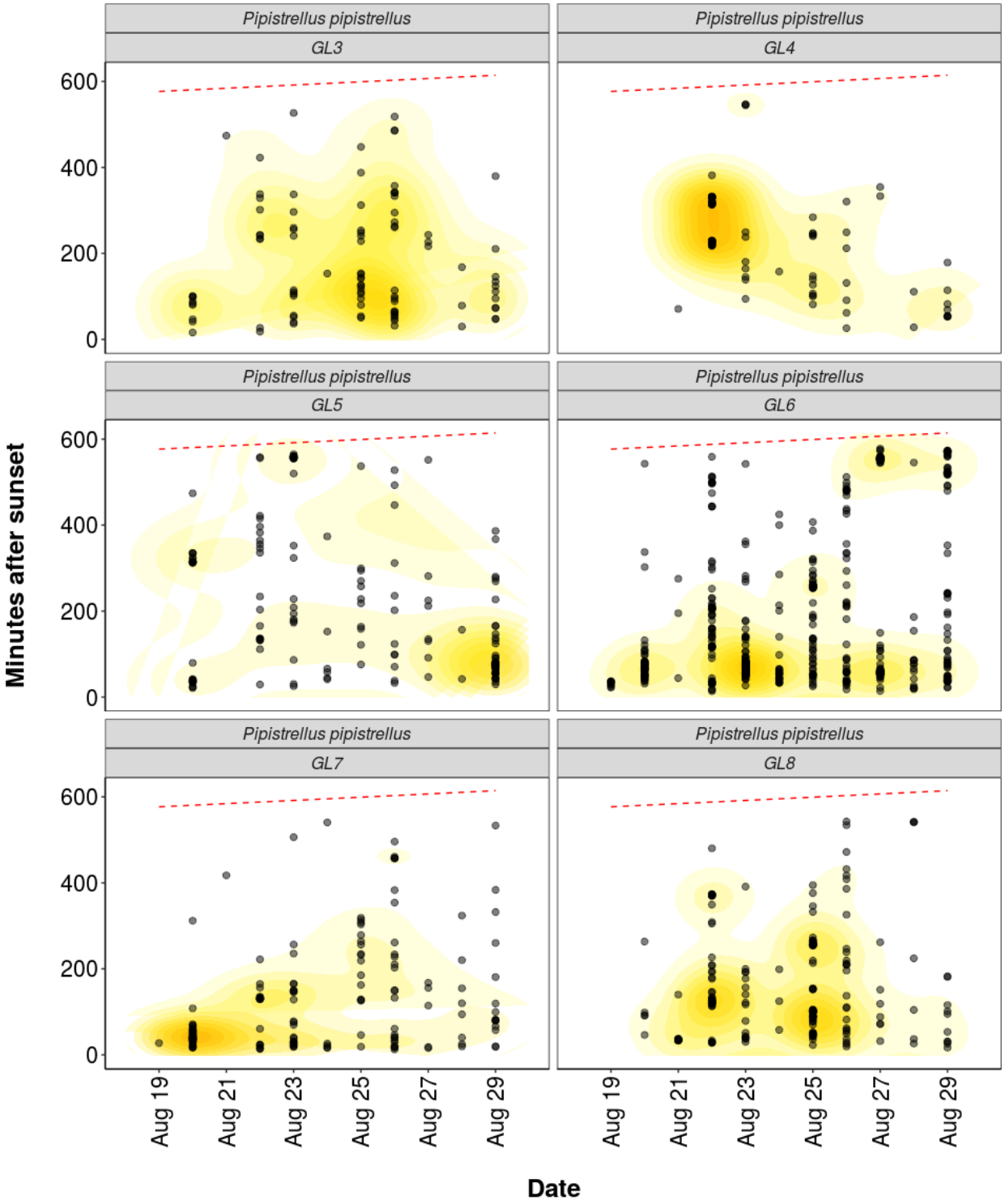

Myotis mystacinus
GL4
Myotis mystacinus
GL5
Myotis mystacinus
GL6
Myotis mystacinus
GL7
Myotis mystacinus
GL8
Myotis mystacinus
GL9
Minutes after sunset
0
200
400
600
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date

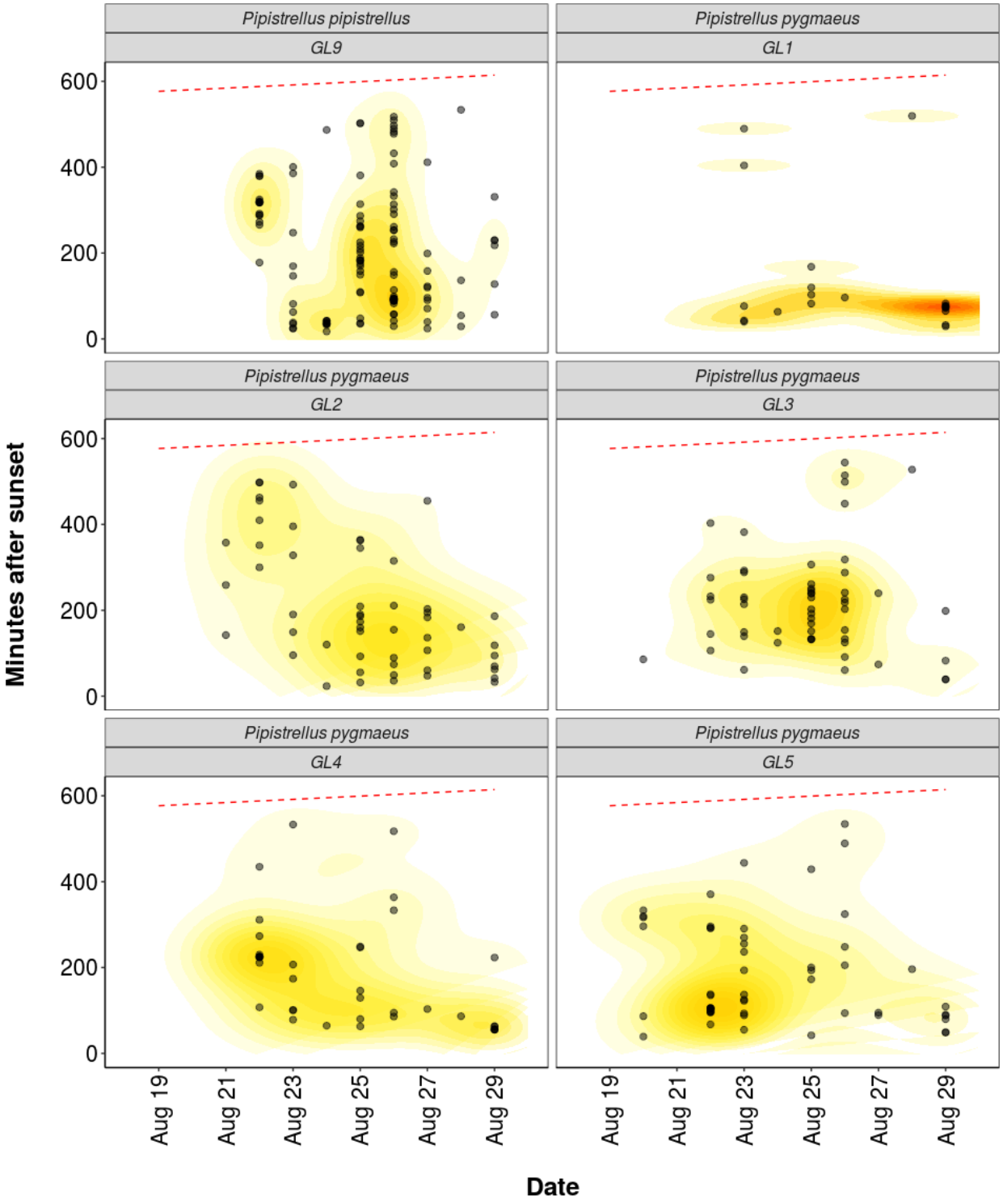

Myotis nattereri
GL1
Myotis nattereri
GL2
Myotis nattereri
GL3
Myotis nattereri
GL4
Myotis nattereri
GL5
Myotis nattereri
GL6
Minutes after sunset
0
200
400
600
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date

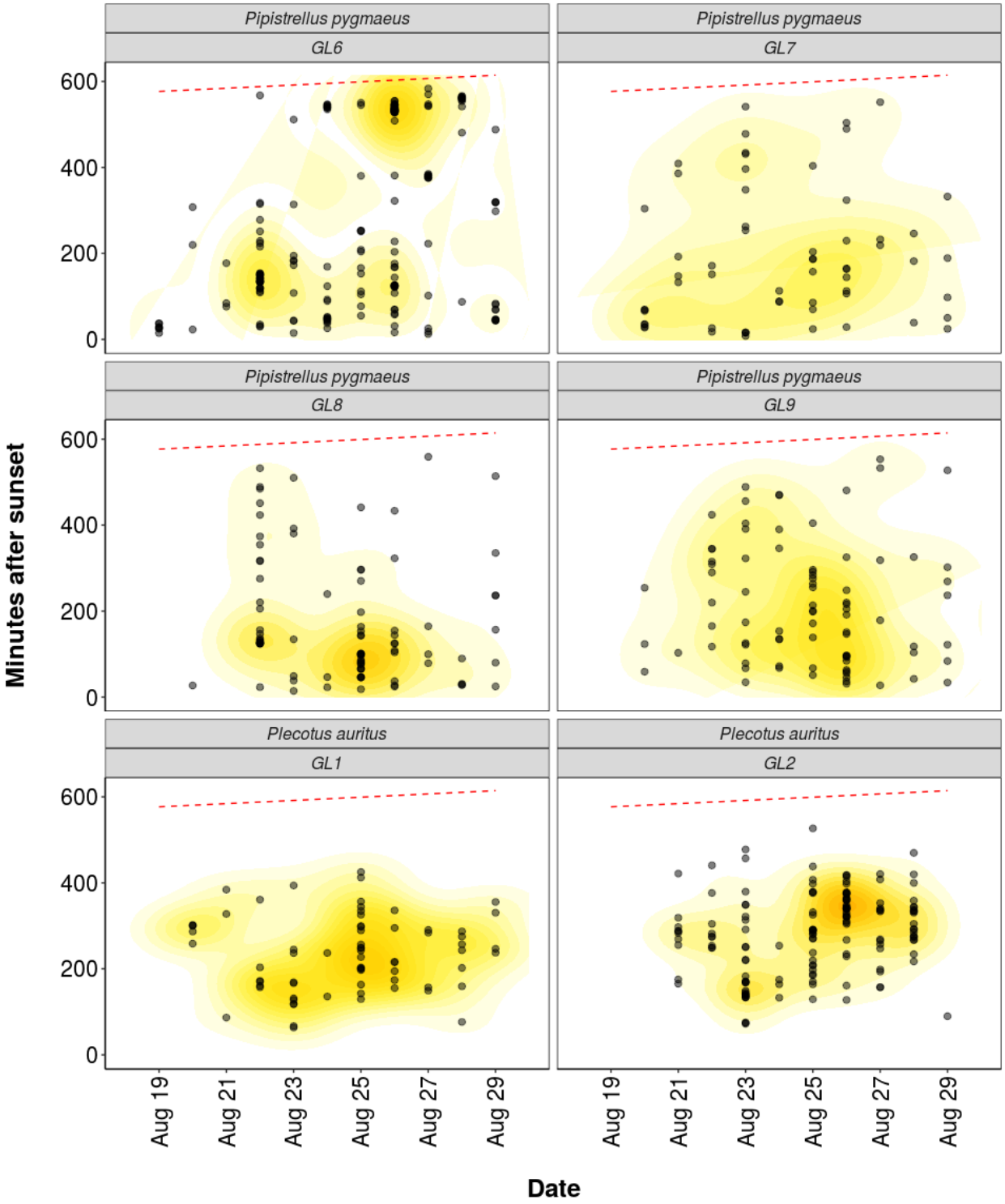

Myotis nattereri
GL7
Myotis nattereri
GL8
Myotis nattereri
GL9
Nyctalus leisleri
GL1
Nyctalus leisleri
GL2
Nyctalus leisleri
GL3
Minutes after sunset
600
400
200
0
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date

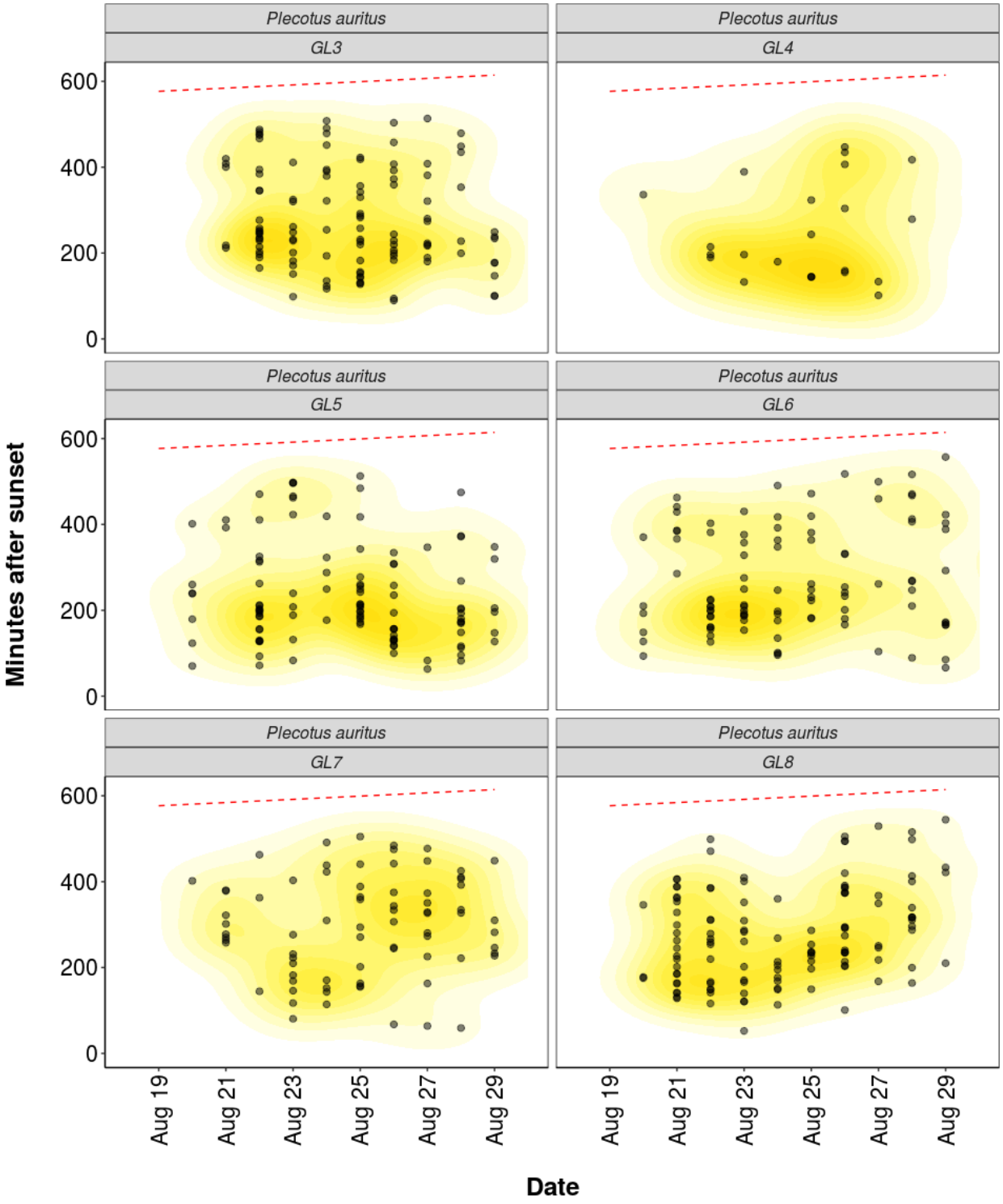

Nyctalus leisleri
GL4
Nyctalus leisleri
GL5
Nyctalus leisleri
GL6
Nyctalus leisleri
GL7
Nyctalus leisleri
GL8
Nyctalus leisleri
GL9
Minutes after sunset
0
200
400
600
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date

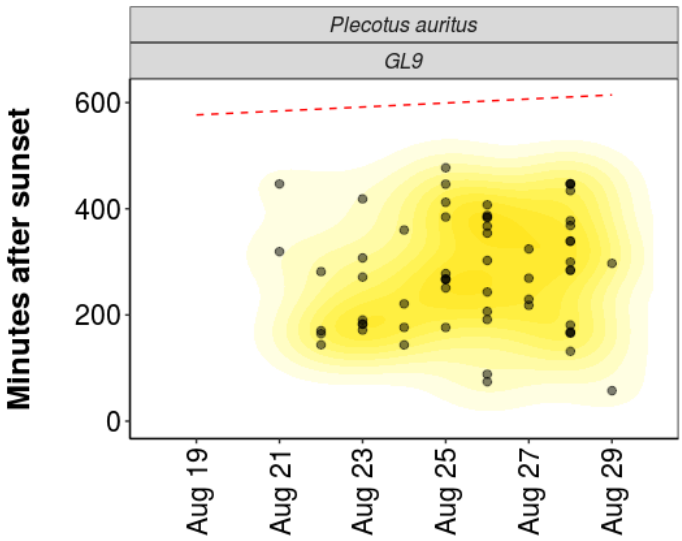

Pipistrellus nathusii
GL1
Pipistrellus nathusii
GL5
Pipistrellus nathusii
GL6
Pipistrellus nathusii
GL8
Pipistrellus pipistrellus
GL1
Pipistrellus pipistrellus
GL2
Minutes after sunset
0
200
400
600
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date


Pipistrellus pipistrellus
GL3
Pipistrellus pipistrellus
GL4
Pipistrellus pipistrellus
GL5
Pipistrellus pipistrellus
GL6
Pipistrellus pipistrellus
GL7
Pipistrellus pipistrellus
GL8
Minutes after sunset
0
200
400
600
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date


Pipistrellus pipistrellus
GL9
Pipistrellus pygmaeus
GL1
Pipistrellus pygmaeus
GL2
Pipistrellus pygmaeus
GL3
Pipistrellus pygmaeus
GL4
Pipistrellus pygmaeus
GL5
Minutes after sunset
0
200
400
600
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date


Pipistrellus pygmaeus
GL6
Pipistrellus pygmaeus
GL7
Pipistrellus pygmaeus
GL8
Pipistrellus pygmaeus
GL9
Plecotus auritus
GL1
Plecotus auritus
GL2
Minutes after sunset
0
200
400
600
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date


Plecotus auritus
GL3
Plecotus auritus
GL4
Plecotus auritus
GL5
Plecotus auritus
GL6
Plecotus auritus
GL7
Plecotus auritus
GL8
Minutes after sunset
0
200
400
600
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
Date


Plecotus auritus
GL9
Minutes after sunset
600
400
200
0
Aug 19
Aug 21
Aug 23
Aug 25
Aug 27
Aug 29
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	2021-08-19	2021-08-20	2021-08-21	2021-08-22	2021-08-23
Common pipistrelle	GL1	0	0	1	0	0
Common pipistrelle	GL2	0	0	0	0	0
Common pipistrelle	GL3	0	1	0	2	0
Common pipistrelle	GL4	0	0	0	0	0
Common pipistrelle	GL5	0	3	0	1	2
Common pipistrelle	GL6	4	1	0	6	1
Common pipistrelle	GL7	1	7	0	6	8
Common pipistrelle	GL8	0	0	0	4	1
Common pipistrelle	GL9	0	0	0	0	2
Soprano pipistrelle	GL2	0	0	0	0	0
Soprano pipistrelle	GL6	3	1	0	0	1
Soprano pipistrelle	GL7	0	1	0	2	4

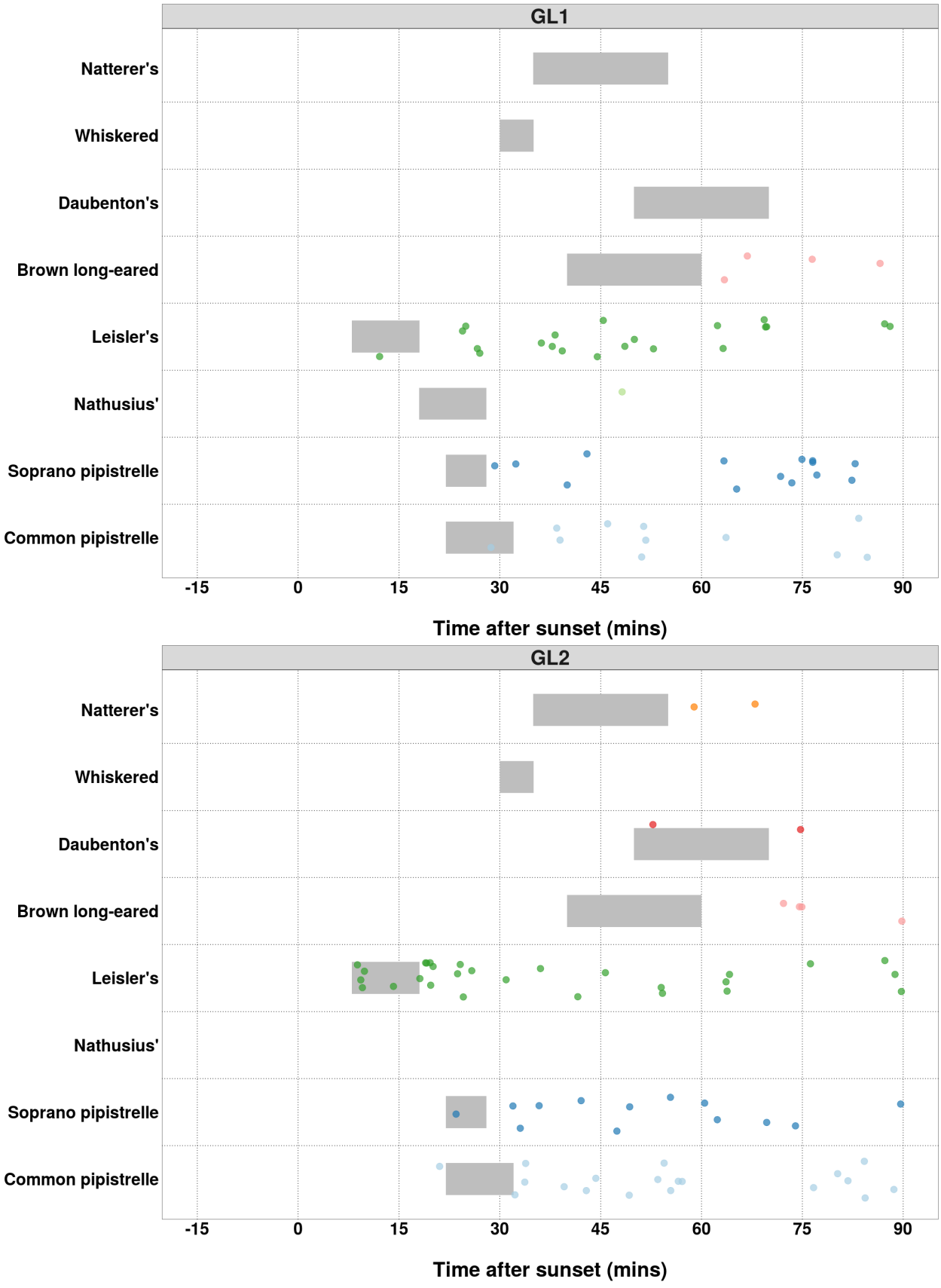
Soprano pipistrelle	GL8	0	1	0	1	1
Soprano pipistrelle	GL9	0	0	0	0	0
Leisler’s	GL1	0	0	0	0	0
Leisler’s	GL2	0	0	0	0	2
Leisler’s	GL3	0	0	0	0	0
Leisler’s	GL4	0	0	0	1	3
Leisler’s	GL5	1	0	0	0	3
Leisler’s	GL6	0	0	0	0	1
Leisler’s	GL7	0	0	0	1	1
Leisler’s	GL8	0	0	0	0	0
Leisler’s	GL9	0	0	0	0	1
Brown long-eared	GL7	0	0	0	0	0
Brown long-eared	GL8	0	0	0	0	1
Brown long-eared	GL9	0	0	0	0	0
Daubenton’s	GL2	0	0	0	0	0
Daubenton’s	GL3	0	0	0	1	0
Daubenton’s	GL5	0	0	0	0	0
Daubenton’s	GL6	0	0	0	1	0
Daubenton’s	GL7	0	0	2	0	0
Daubenton’s	GL9	0	0	0	0	2
Natterer’s	GL6	0	0	0	0	0
Natterer’s	GL7	0	0	0	0	0
Natterer’s	GL8	0	0	0	0	0
Natterer’s	GL9	0	0	0	0	1

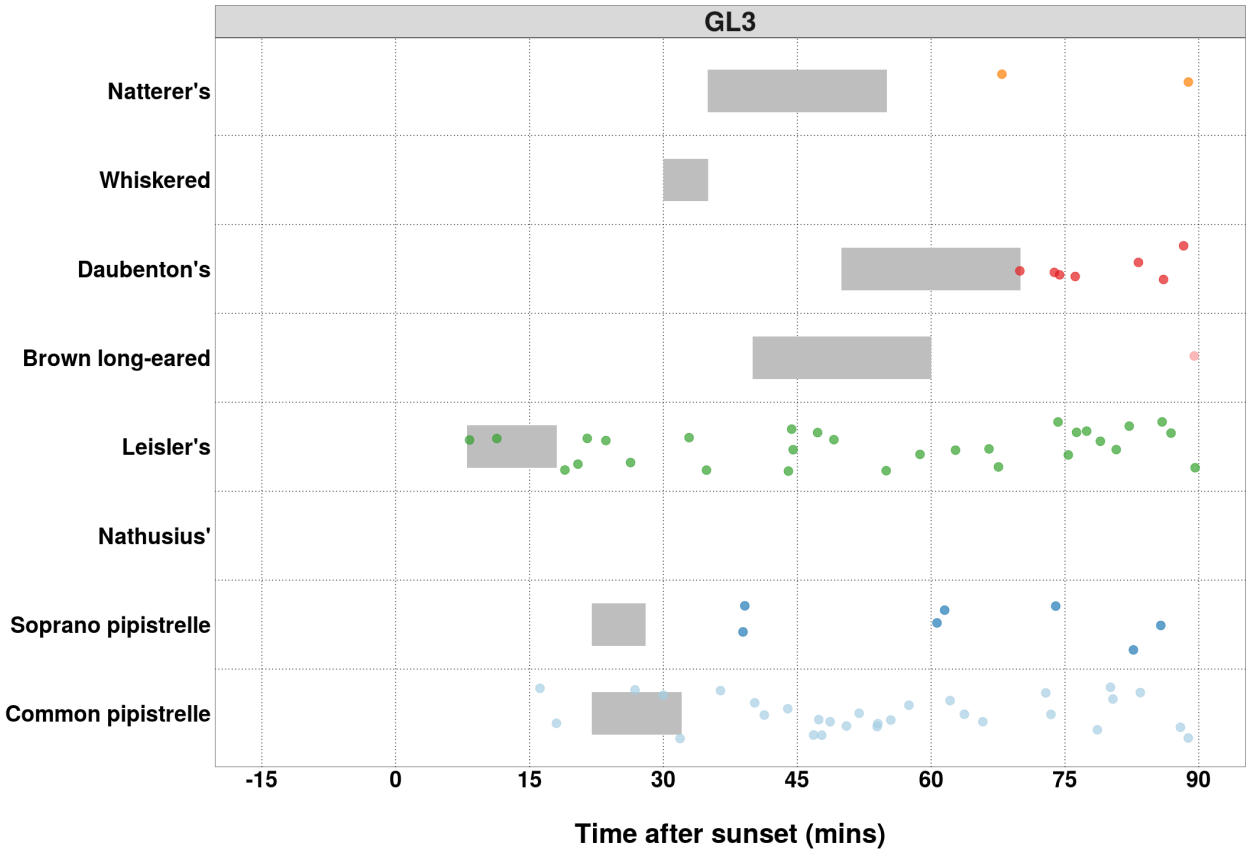
2021-08-24	2021-08-25	2021-08-26	2021-08-27	2021-08-28	2021-08-29
0	0	0	0	0	0
0	0	0	1	0	0
0	0	1	0	1	0
0	0	1	0	1	0
0	0	0	0	0	1
0	2	3	2	4	2

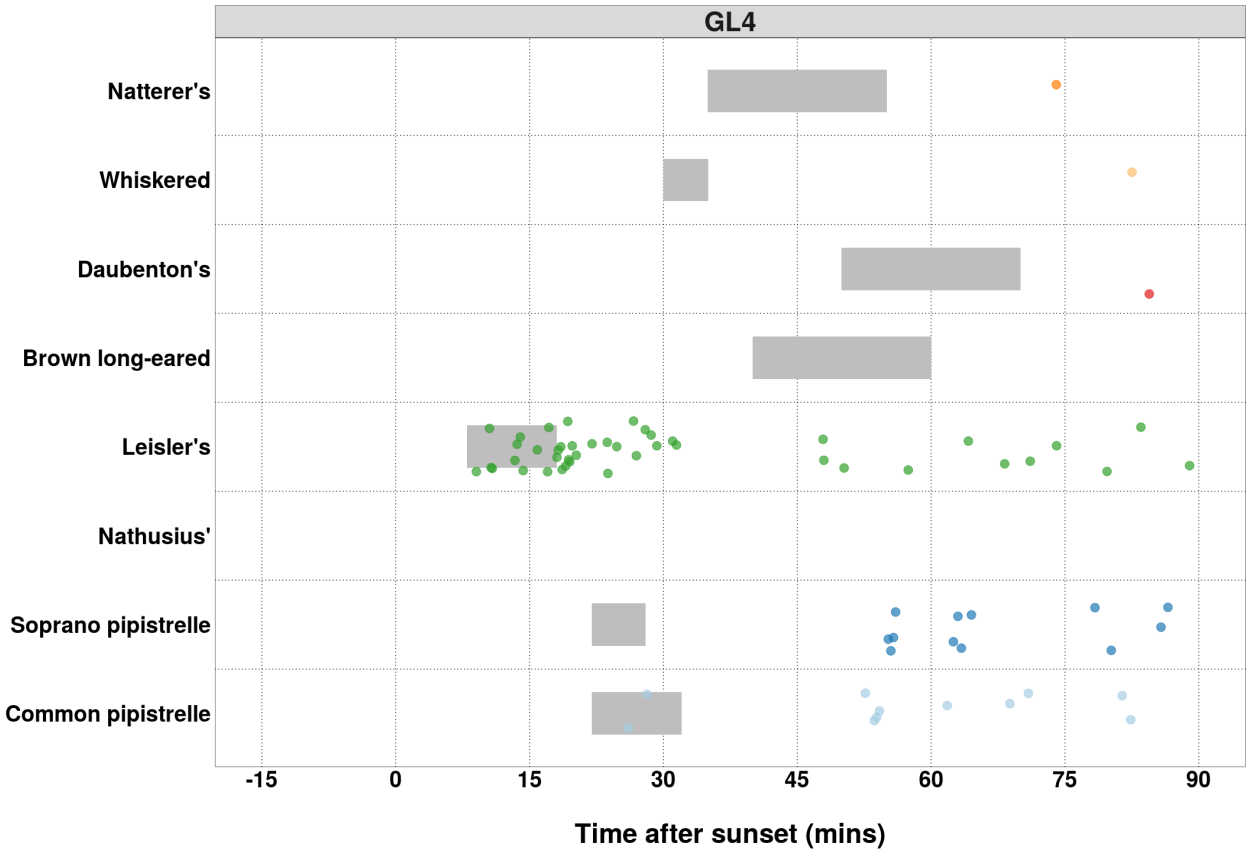
4	1	5	2	2	2
0	1	3	1	1	4
1	0	1	1	1	0
1	0	0	0	0	0
1	0	1	3	0	0
0	1	0	0	0	1
1	1	2	0	0	1
0	0	0	1	0	0
0	0	1	0	0	0
0	0	1	1	0	1
0	2	0	0	0	0
4	1	0	1	1	0
0	1	1	4	1	0
2	1	0	0	0	0
1	0	0	0	1	0
9	0	0	7	0	0
0	0	0	1	2	0
0	0	0	0	1	0
0	0	0	0	0	0
0	0	0	0	0	1
0	0	0	0	0	1
0	0	0	0	0	0
0	0	1	0	0	0
0	1	0	1	0	0
0	0	0	0	0	0
0	0	0	2	0	1
0	0	0	0	0	1
0	1	0	0	0	1
0	0	0	0	0	1
0	0	1	0	0	0

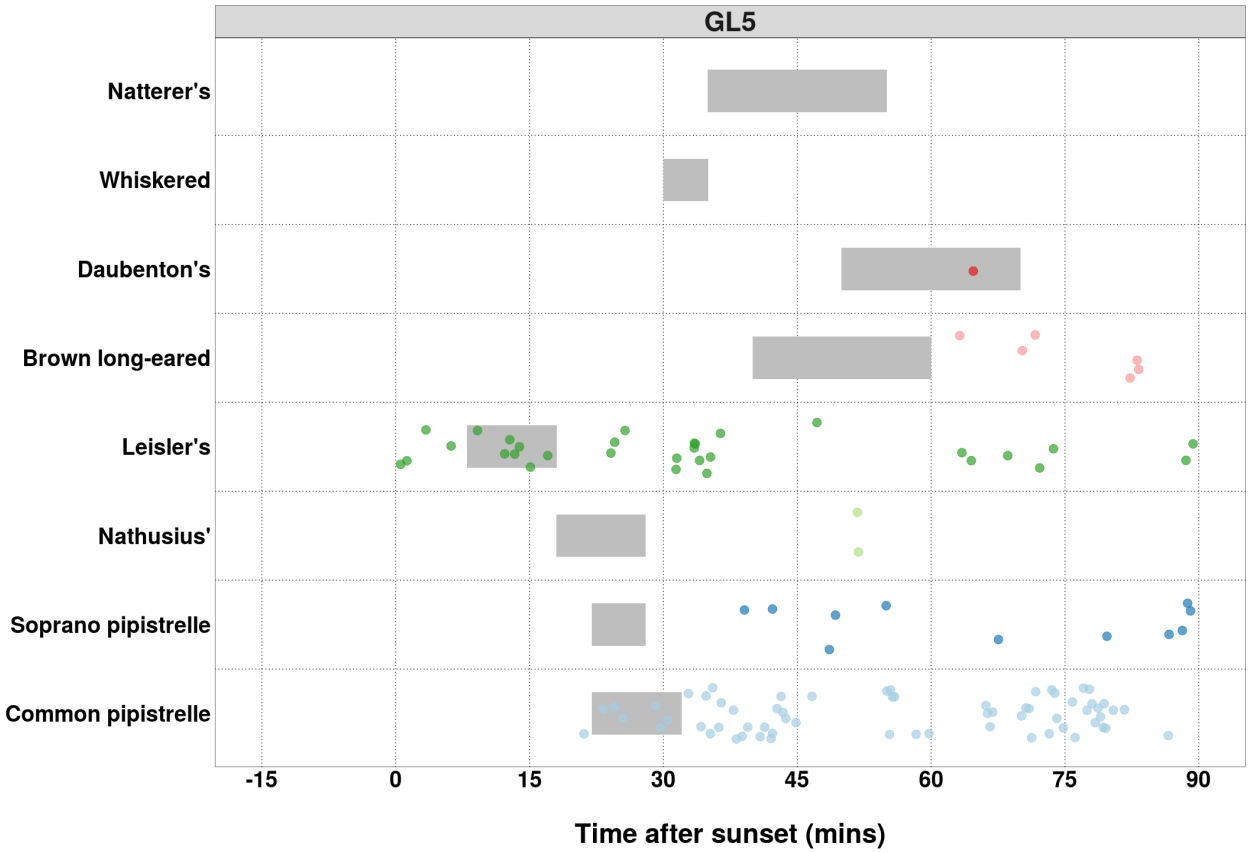
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012) - Figures

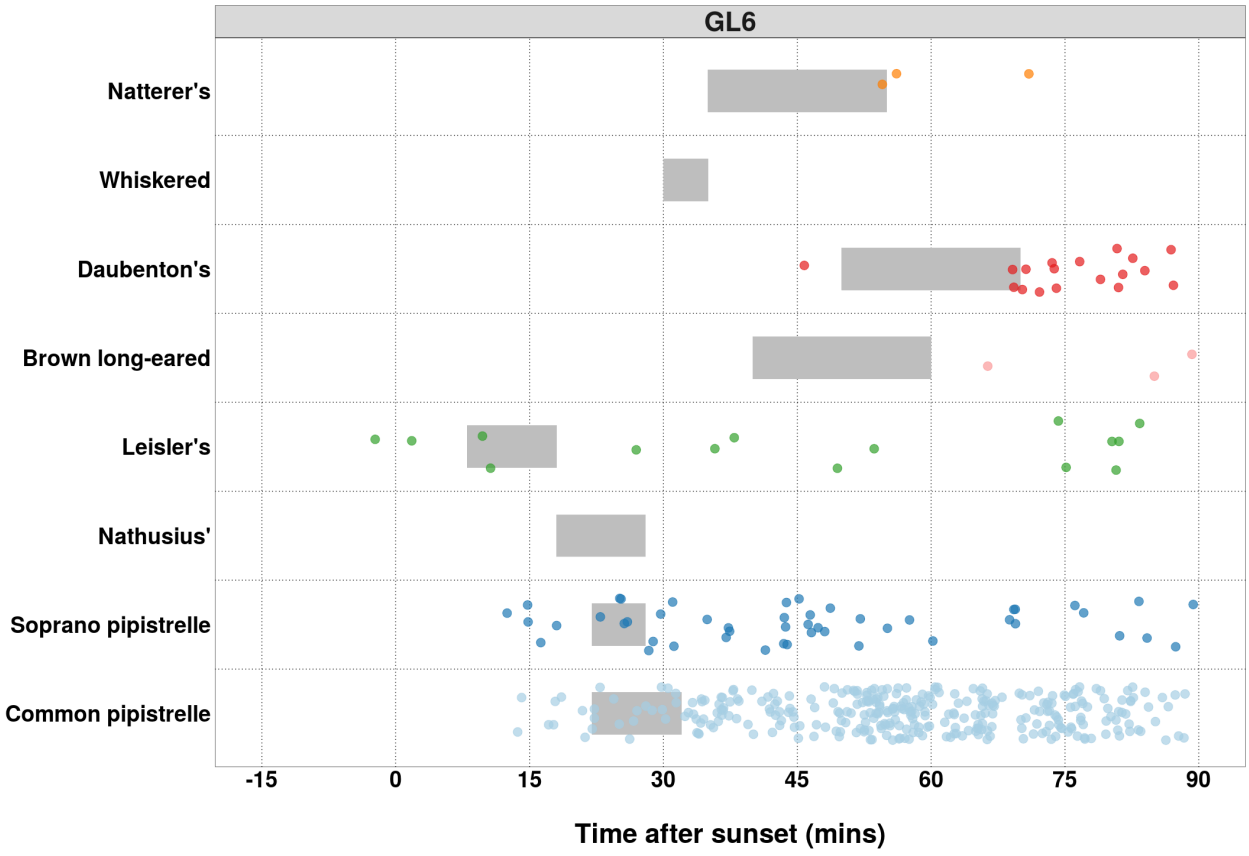
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occuring earlier than this time range, may potentially indicate the presence of a nearby roost.

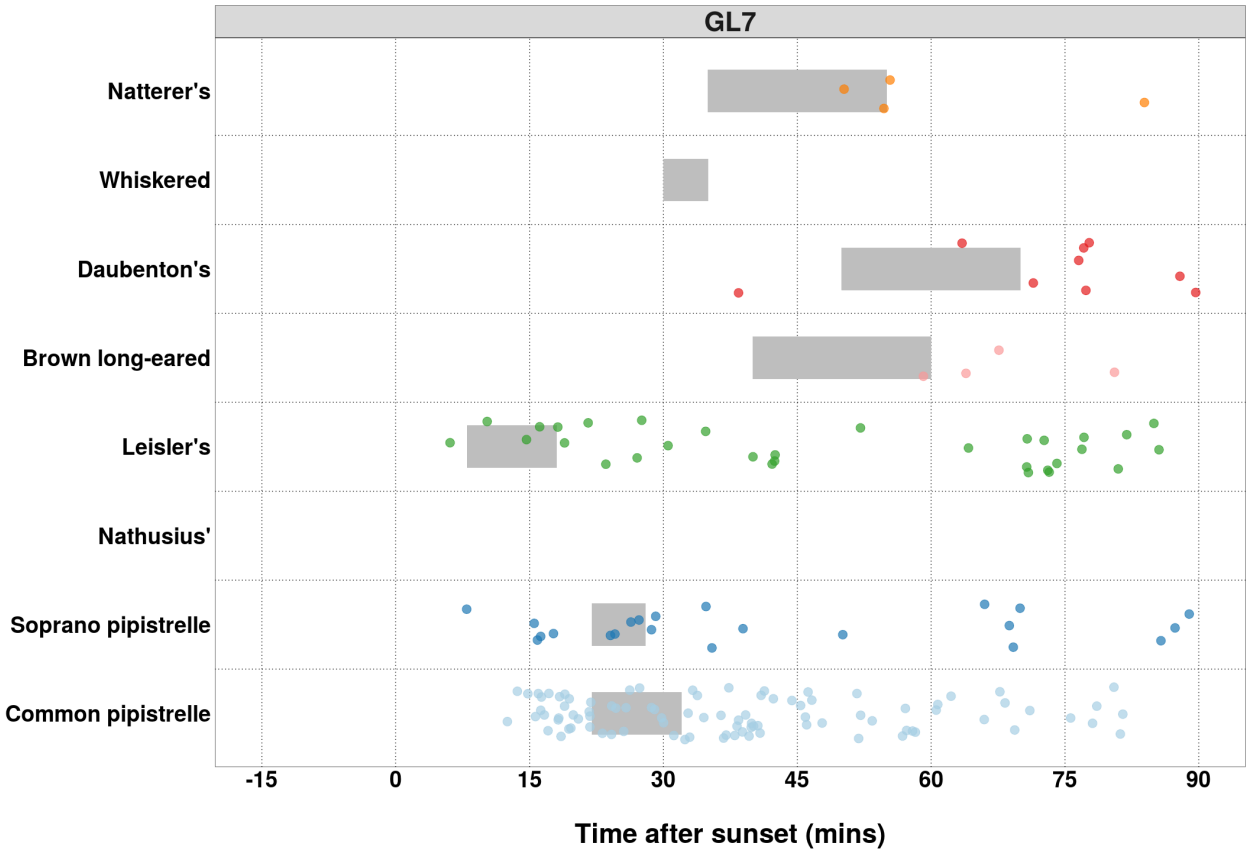

GL1
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)
GL2
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

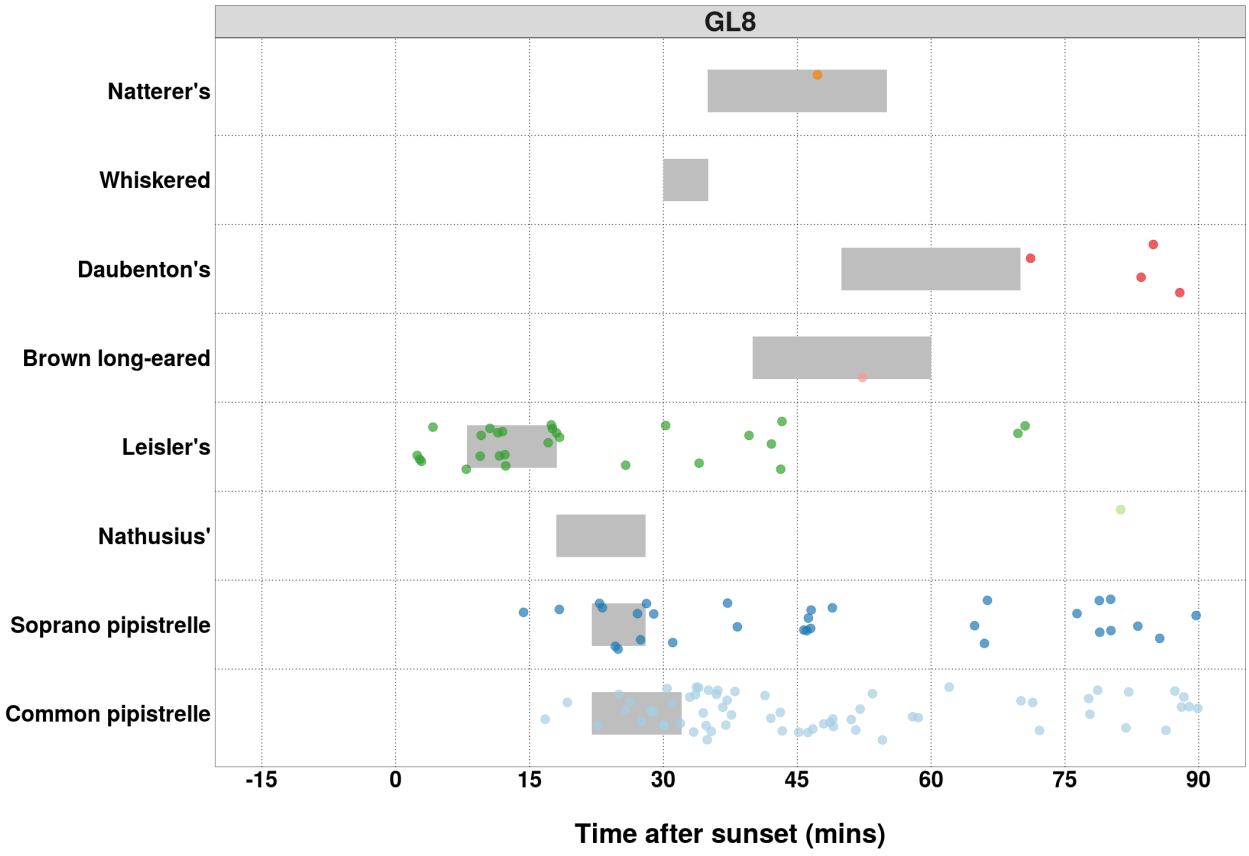

GL3
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)

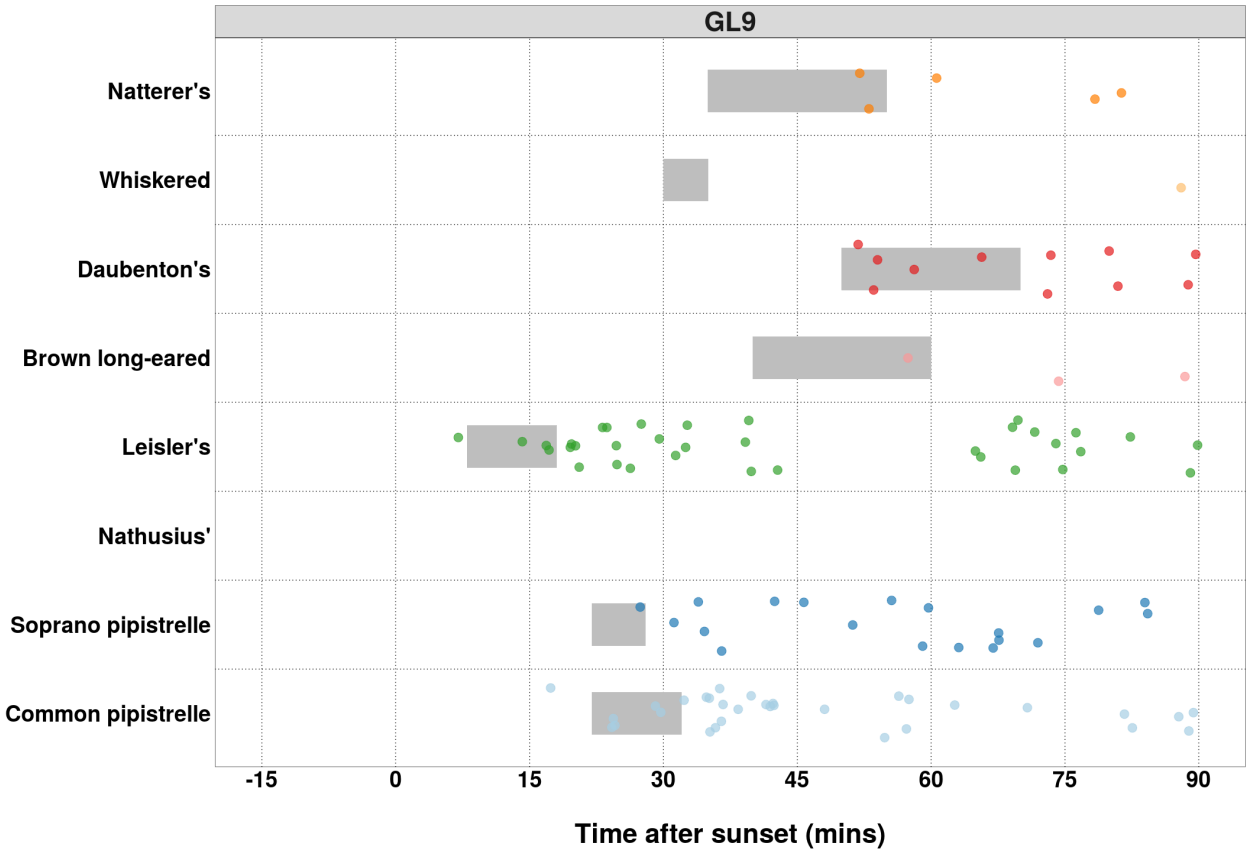

GL4
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL5
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL6
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL7
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL8
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
-15
0
15
30
45
60
75
90
Time after sunset (mins)


GL9
Natterer's
Whiskered
Daubenton's
Brown long-eared
Leisler's
Nathusius'
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	1620	29.8
Soprano pipistrelle	667	12.3
Nathusius'	9	0.2
Leisler's	1071	19.7
Brown long-eared	827	15.2
Daubenton's	749	13.8
Whiskered	52	1.0
Natterer's	441	8.1
Total	5436	100.1

Counts of Bat Passes

Per Detector

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

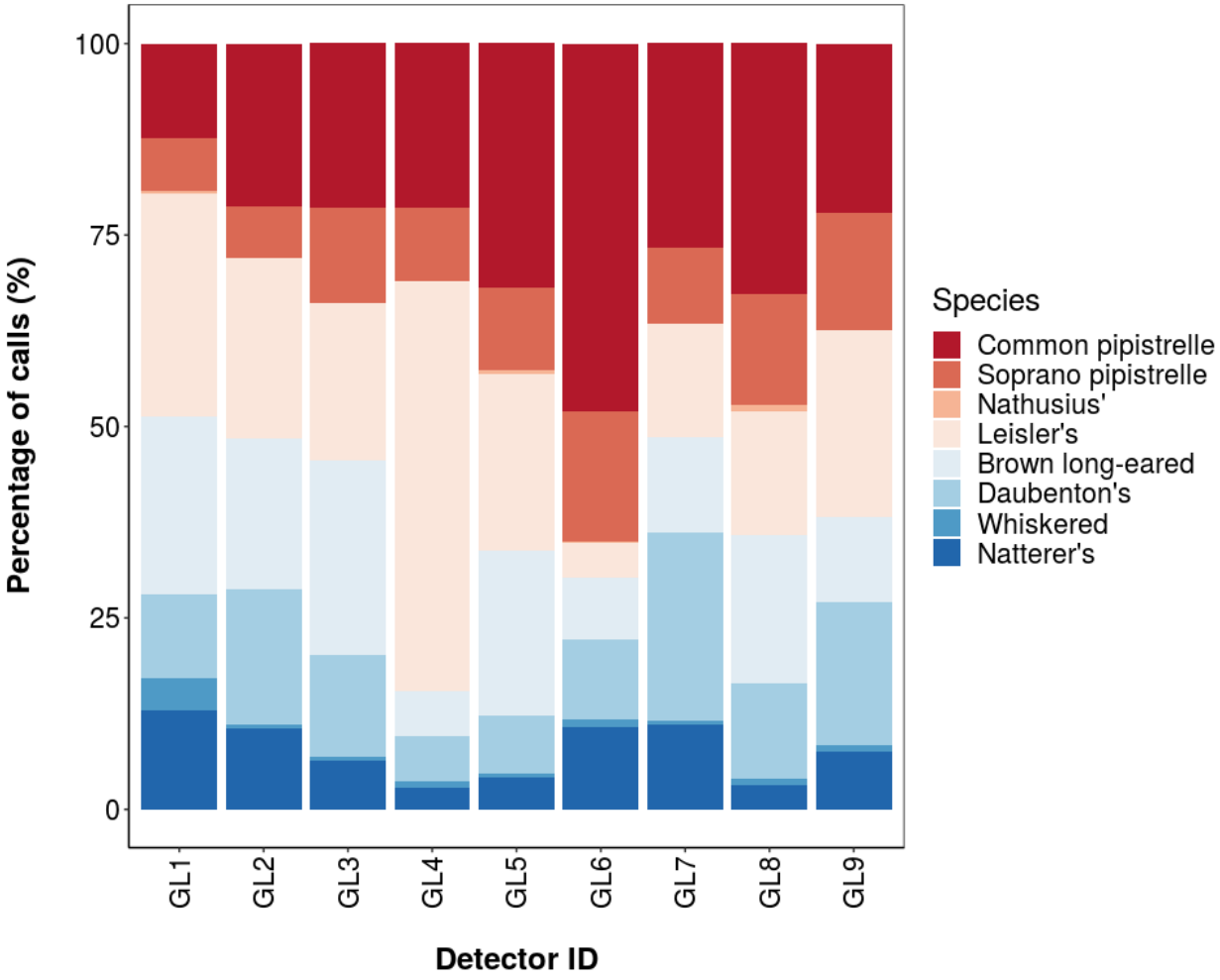
Species	Detector ID	Count (No)	Percentage by Detector (%)
Common pipistrelle	GL1	37	12.3
Common pipistrelle	GL2	164	21.1
Common pipistrelle	GL3	96	21.6
Common pipistrelle	GL4	84	21.5
Common pipistrelle	GL5	163	32.0
Common pipistrelle	GL6	584	47.9
Common pipistrelle	GL7	165	26.8
Common pipistrelle	GL8	206	32.8
Common pipistrelle	GL9	121	22.1
Soprano pipistrelle	GL1	21	7.0
Soprano pipistrelle	GL2	53	6.8
Soprano pipistrelle	GL3	55	12.4
Soprano pipistrelle	GL4	38	9.7
Soprano pipistrelle	GL5	55	10.8
Soprano pipistrelle	GL6	209	17.1
Soprano pipistrelle	GL7	61	9.9
Soprano pipistrelle	GL8	91	14.5
Soprano pipistrelle	GL9	84	15.4
Nathusius'	GL1	1	0.3
Nathusius'	GL5	2	0.4
Nathusius'	GL6	1	0.1
Nathusius'	GL8	5	0.8
Leisler's	GL1	88	29.1
Leisler's	GL2	184	23.6
Leisler's	GL3	91	20.5
Leisler's	GL4	209	53.5
Leisler's	GL5	118	23.1
Leisler's	GL6	55	4.5
Leisler's	GL7	91	14.8

Leisler's	GL8	102	16.2
Leisler's	GL9	133	24.3
Brown long-eared	GL1	70	23.2
Brown long-eared	GL2	153	19.6
Brown long-eared	GL3	113	25.5
Brown long-eared	GL4	23	5.9
Brown long-eared	GL5	110	21.6
Brown long-eared	GL6	99	8.1
Brown long-eared	GL7	76	12.4
Brown long-eared	GL8	122	19.4
Brown long-eared	GL9	61	11.2
Daubenton's	GL1	33	10.9
Daubenton's	GL2	138	17.7
Daubenton's	GL3	59	13.3
Daubenton's	GL4	23	5.9
Daubenton's	GL5	38	7.5
Daubenton's	GL6	127	10.4
Daubenton's	GL7	151	24.6
Daubenton's	GL8	78	12.4
Daubenton's	GL9	102	18.6
Whiskered	GL1	13	4.3
Whiskered	GL2	5	0.6
Whiskered	GL3	2	0.5
Whiskered	GL4	3	0.8
Whiskered	GL5	3	0.6
Whiskered	GL6	13	1.1
Whiskered	GL7	3	0.5
Whiskered	GL8	5	0.8
Whiskered	GL9	5	0.9
Natterer's	GL1	39	12.9
Natterer's	GL2	82	10.5
Natterer's	GL3	28	6.3
Natterer's	GL4	11	2.8
Natterer's	GL5	21	4.1
Natterer's	GL6	131	10.7
Natterer's	GL7	68	11.1

Natterer’s	GL8	20	3.2
Natterer’s	GL9	41	7.5

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	GL1	0.4
Common pipistrelle	GL2	1.5
Common pipistrelle	GL3	1.0
Common pipistrelle	GL4	0.7
Common pipistrelle	GL5	1.2
Common pipistrelle	GL6	5.9
Common pipistrelle	GL7	1.5
Common pipistrelle	GL8	1.1
Common pipistrelle	GL9	1.1
Soprano pipistrelle	GL1	0.2
Soprano pipistrelle	GL2	0.7
Soprano pipistrelle	GL3	0.4
Soprano pipistrelle	GL4	0.6
Soprano pipistrelle	GL5	0.6
Soprano pipistrelle	GL6	1.4
Soprano pipistrelle	GL7	0.5
Soprano pipistrelle	GL8	0.7
Soprano pipistrelle	GL9	0.8
Nathusius'	GL1	0.1
Nathusius'	GL5	0.2
Nathusius'	GL6	0.1
Nathusius'	GL8	0.2
Leisler's	GL1	0.7

Leisler’s	GL2	1.2
Leisler’s	GL3	0.6
Leisler’s	GL4	2.0
Leisler’s	GL5	1.1
Leisler’s	GL6	0.3
Leisler’s	GL7	0.9
Leisler’s	GL8	0.5
Leisler’s	GL9	1.2
Brown long-eared	GL1	0.6
Brown long-eared	GL2	1.5
Brown long-eared	GL3	1.2
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.9
Brown long-eared	GL6	1.0
Brown long-eared	GL7	0.8
Brown long-eared	GL8	1.1
Brown long-eared	GL9	0.4
Daubenton’s	GL1	0.3
Daubenton’s	GL2	1.4
Daubenton’s	GL3	0.6
Daubenton’s	GL4	0.2
Daubenton’s	GL5	0.4
Daubenton’s	GL6	1.2
Daubenton’s	GL7	1.1
Daubenton’s	GL8	0.9
Daubenton’s	GL9	1.3
Whiskered	GL1	0.2
Whiskered	GL2	0.1
Whiskered	GL3	0.1
Whiskered	GL4	0.1
Whiskered	GL5	0.1
Whiskered	GL6	0.1
Whiskered	GL7	0.1
Whiskered	GL8	0.1
Whiskered	GL9	0.1
Natterer’s	GL1	0.4

Natterer’s	GL2	0.7
Natterer’s	GL3	0.3
Natterer’s	GL4	0.2
Natterer’s	GL5	0.2
Natterer’s	GL6	1.2
Natterer’s	GL7	0.6
Natterer’s	GL8	0.3
Natterer’s	GL9	0.5

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

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

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

Species	Detector ID	Mean Pass Rate
Common pipistrelle	GL1	0.5
Common pipistrelle	GL2	2.1
Common pipistrelle	GL3	1.0
Common pipistrelle	GL4	0.9
Common pipistrelle	GL5	1.8
Common pipistrelle	GL6	5.3
Common pipistrelle	GL7	1.5
Common pipistrelle	GL8	2.1
Common pipistrelle	GL9	1.5
Soprano pipistrelle	GL1	0.3
Soprano pipistrelle	GL2	0.6
Soprano pipistrelle	GL3	0.6
Soprano pipistrelle	GL4	0.5
Soprano pipistrelle	GL5	0.7
Soprano pipistrelle	GL6	1.9
Soprano pipistrelle	GL7	0.6
Soprano pipistrelle	GL8	1.0
Soprano pipistrelle	GL9	0.8
Nathusius'	GL1	0.1
Nathusius'	GL5	0.2
Nathusius'	GL6	0.1
Nathusius'	GL8	0.2
Leisler's	GL1	1.0
Leisler's	GL2	2.3
Leisler's	GL3	0.9
Leisler's	GL4	2.1

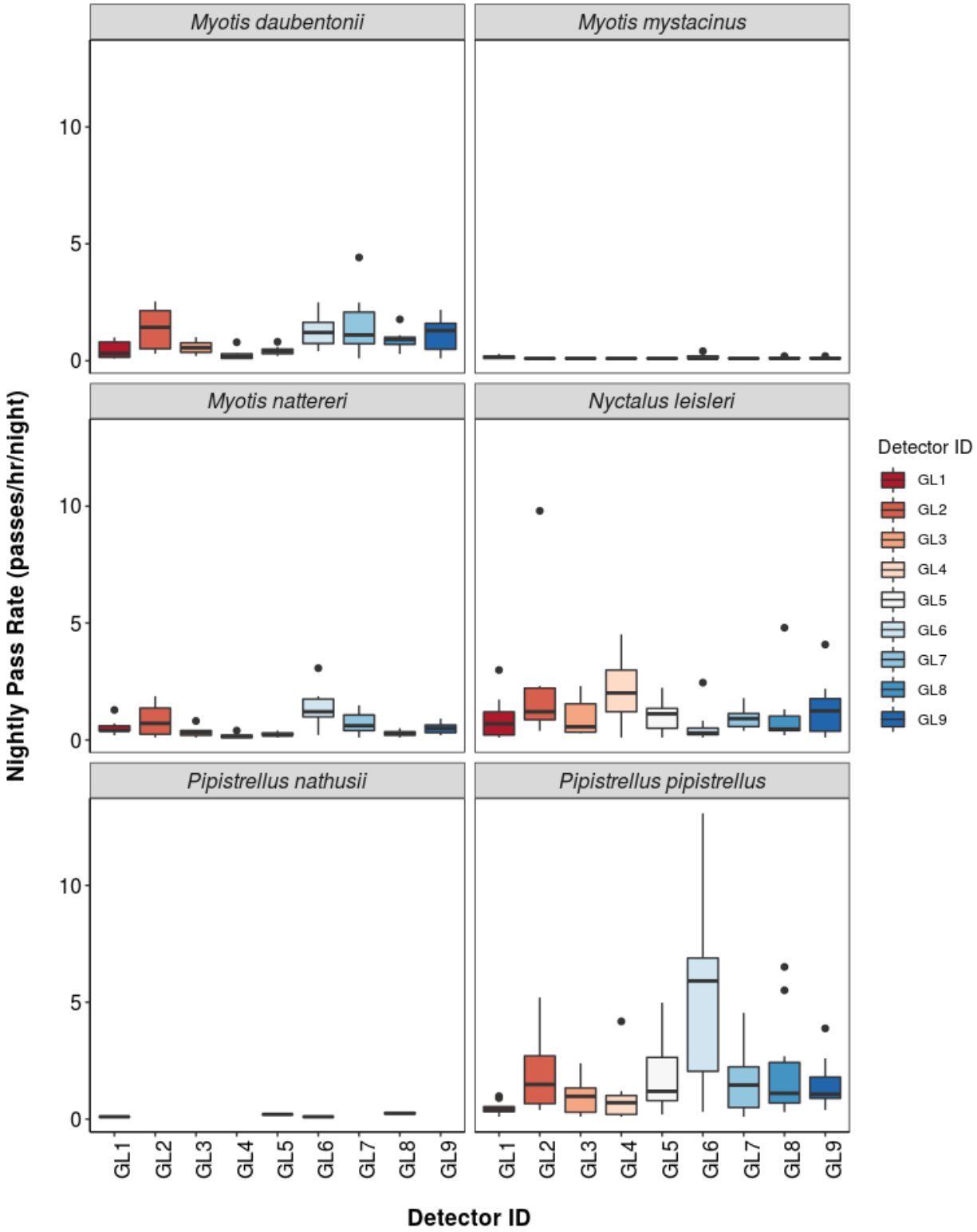
Leisler’s	GL5	1.1
Leisler’s	GL6	0.6
Leisler’s	GL7	0.9
Leisler’s	GL8	1.0
Leisler’s	GL9	1.3
Brown long-eared	GL1	0.7
Brown long-eared	GL2	1.7
Brown long-eared	GL3	1.3
Brown long-eared	GL4	0.3
Brown long-eared	GL5	1.1
Brown long-eared	GL6	1.0
Brown long-eared	GL7	0.8
Brown long-eared	GL8	1.2
Brown long-eared	GL9	0.7
Daubenton’s	GL1	0.5
Daubenton’s	GL2	1.4
Daubenton’s	GL3	0.6
Daubenton’s	GL4	0.3
Daubenton’s	GL5	0.4
Daubenton’s	GL6	1.3
Daubenton’s	GL7	1.5
Daubenton’s	GL8	0.9
Daubenton’s	GL9	1.1
Whiskered	GL1	0.2
Whiskered	GL2	0.1
Whiskered	GL3	0.1
Whiskered	GL4	0.1
Whiskered	GL5	0.1
Whiskered	GL6	0.2
Whiskered	GL7	0.1
Whiskered	GL8	0.1
Whiskered	GL9	0.1
Natterer’s	GL1	0.6
Natterer’s	GL2	0.8
Natterer’s	GL3	0.3
Natterer’s	GL4	0.2

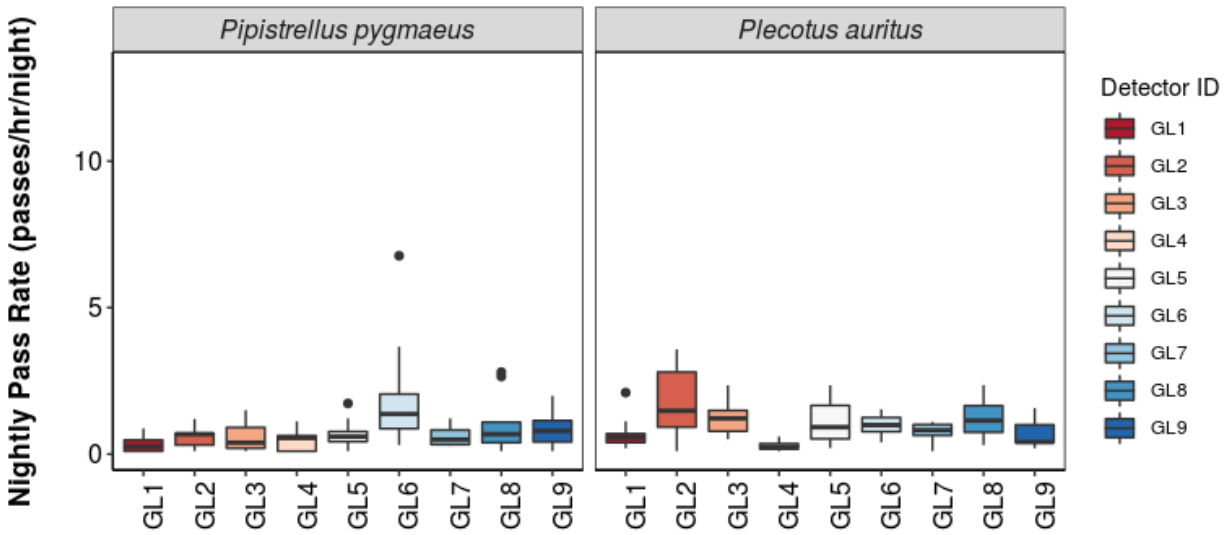
Natterer’s	GL5	0.2
Natterer’s	GL6	1.3
Natterer’s	GL7	0.7
Natterer’s	GL8	0.3
Natterer’s	GL9	0.5

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
5
10
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
10
5
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9

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	Aug
Common pipistrelle	GL1	37
Common pipistrelle	GL2	164
Common pipistrelle	GL3	96
Common pipistrelle	GL4	84
Common pipistrelle	GL5	163
Common pipistrelle	GL6	584
Common pipistrelle	GL7	165
Common pipistrelle	GL8	206
Common pipistrelle	GL9	121
Soprano pipistrelle	GL1	21
Soprano pipistrelle	GL2	53
Soprano pipistrelle	GL3	55
Soprano pipistrelle	GL4	38
Soprano pipistrelle	GL5	55
Soprano pipistrelle	GL6	209
Soprano pipistrelle	GL7	61
Soprano pipistrelle	GL8	91
Soprano pipistrelle	GL9	84
Nathusius'	GL1	1
Nathusius'	GL5	2
Nathusius'	GL6	1
Nathusius'	GL8	5
Leisler's	GL1	88
Leisler's	GL2	184

Leisler’s	GL3	91
Leisler’s	GL4	209
Leisler’s	GL5	118
Leisler’s	GL6	55
Leisler’s	GL7	91
Leisler’s	GL8	102
Leisler’s	GL9	133
Brown long-eared	GL1	70
Brown long-eared	GL2	153
Brown long-eared	GL3	113
Brown long-eared	GL4	23
Brown long-eared	GL5	110
Brown long-eared	GL6	99
Brown long-eared	GL7	76
Brown long-eared	GL8	122
Brown long-eared	GL9	61
Daubenton’s	GL1	33
Daubenton’s	GL2	138
Daubenton’s	GL3	59
Daubenton’s	GL4	23
Daubenton’s	GL5	38
Daubenton’s	GL6	127
Daubenton’s	GL7	151
Daubenton’s	GL8	78
Daubenton’s	GL9	102
Whiskered	GL1	13
Whiskered	GL2	5
Whiskered	GL3	2
Whiskered	GL4	3
Whiskered	GL5	3
Whiskered	GL6	13
Whiskered	GL7	3
Whiskered	GL8	5
Whiskered	GL9	5
Natterer’s	GL1	39
Natterer’s	GL2	82

Natterer’s	GL3	28
Natterer’s	GL4	11
Natterer’s	GL5	21
Natterer’s	GL6	131
Natterer’s	GL7	68
Natterer’s	GL8	20
Natterer’s	GL9	41

Survey Effort

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

Month	Detector ID	No. of Survey Nights
Aug	GL1	10
Aug	GL2	10
Aug	GL3	11
Aug	GL4	10
Aug	GL5	11
Aug	GL6	11
Aug	GL7	11
Aug	GL8	10
Aug	GL9	10

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	Aug
Common pipistrelle	GL1	0.4
Common pipistrelle	GL2	1.5
Common pipistrelle	GL3	1.0
Common pipistrelle	GL4	0.7
Common pipistrelle	GL5	1.2
Common pipistrelle	GL6	5.9
Common pipistrelle	GL7	1.5
Common pipistrelle	GL8	1.1
Common pipistrelle	GL9	1.1
Soprano pipistrelle	GL1	0.2
Soprano pipistrelle	GL2	0.7
Soprano pipistrelle	GL3	0.4
Soprano pipistrelle	GL4	0.6
Soprano pipistrelle	GL5	0.6
Soprano pipistrelle	GL6	1.4
Soprano pipistrelle	GL7	0.5
Soprano pipistrelle	GL8	0.7
Soprano pipistrelle	GL9	0.8
Nathusius'	GL1	0.1
Nathusius'	GL5	0.2
Nathusius'	GL6	0.1
Nathusius'	GL8	0.2
Leisler's	GL1	0.7

Leisler’s	GL2	1.2
Leisler’s	GL3	0.6
Leisler’s	GL4	2.0
Leisler’s	GL5	1.1
Leisler’s	GL6	0.3
Leisler’s	GL7	0.9
Leisler’s	GL8	0.5
Leisler’s	GL9	1.2
Brown long-eared	GL1	0.6
Brown long-eared	GL2	1.5
Brown long-eared	GL3	1.2
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.9
Brown long-eared	GL6	1.0
Brown long-eared	GL7	0.8
Brown long-eared	GL8	1.1
Brown long-eared	GL9	0.4
Daubenton’s	GL1	0.3
Daubenton’s	GL2	1.4
Daubenton’s	GL3	0.6
Daubenton’s	GL4	0.2
Daubenton’s	GL5	0.4
Daubenton’s	GL6	1.2
Daubenton’s	GL7	1.1
Daubenton’s	GL8	0.9
Daubenton’s	GL9	1.3
Whiskered	GL1	0.2
Whiskered	GL2	0.1
Whiskered	GL3	0.1
Whiskered	GL4	0.1
Whiskered	GL5	0.1
Whiskered	GL6	0.1
Whiskered	GL7	0.1
Whiskered	GL8	0.1
Whiskered	GL9	0.1
Natterer’s	GL1	0.4

Natterer’s	GL2	0.7
Natterer’s	GL3	0.3
Natterer’s	GL4	0.2
Natterer’s	GL5	0.2
Natterer’s	GL6	1.2
Natterer’s	GL7	0.6
Natterer’s	GL8	0.3
Natterer’s	GL9	0.5

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	Aug
Common pipistrelle	GL1	0.5
Common pipistrelle	GL2	2.1
Common pipistrelle	GL3	1.0
Common pipistrelle	GL4	0.9
Common pipistrelle	GL5	1.8
Common pipistrelle	GL6	5.3
Common pipistrelle	GL7	1.5
Common pipistrelle	GL8	2.1
Common pipistrelle	GL9	1.5
Soprano pipistrelle	GL1	0.3
Soprano pipistrelle	GL2	0.6
Soprano pipistrelle	GL3	0.6
Soprano pipistrelle	GL4	0.5
Soprano pipistrelle	GL5	0.7
Soprano pipistrelle	GL6	1.9
Soprano pipistrelle	GL7	0.6
Soprano pipistrelle	GL8	1.0
Soprano pipistrelle	GL9	0.8
Nathusius'	GL1	0.1
Nathusius'	GL5	0.2
Nathusius'	GL6	0.1
Nathusius'	GL8	0.2
Leisler's	GL1	1.0
Leisler's	GL2	2.3
Leisler's	GL3	0.9
Leisler's	GL4	2.1

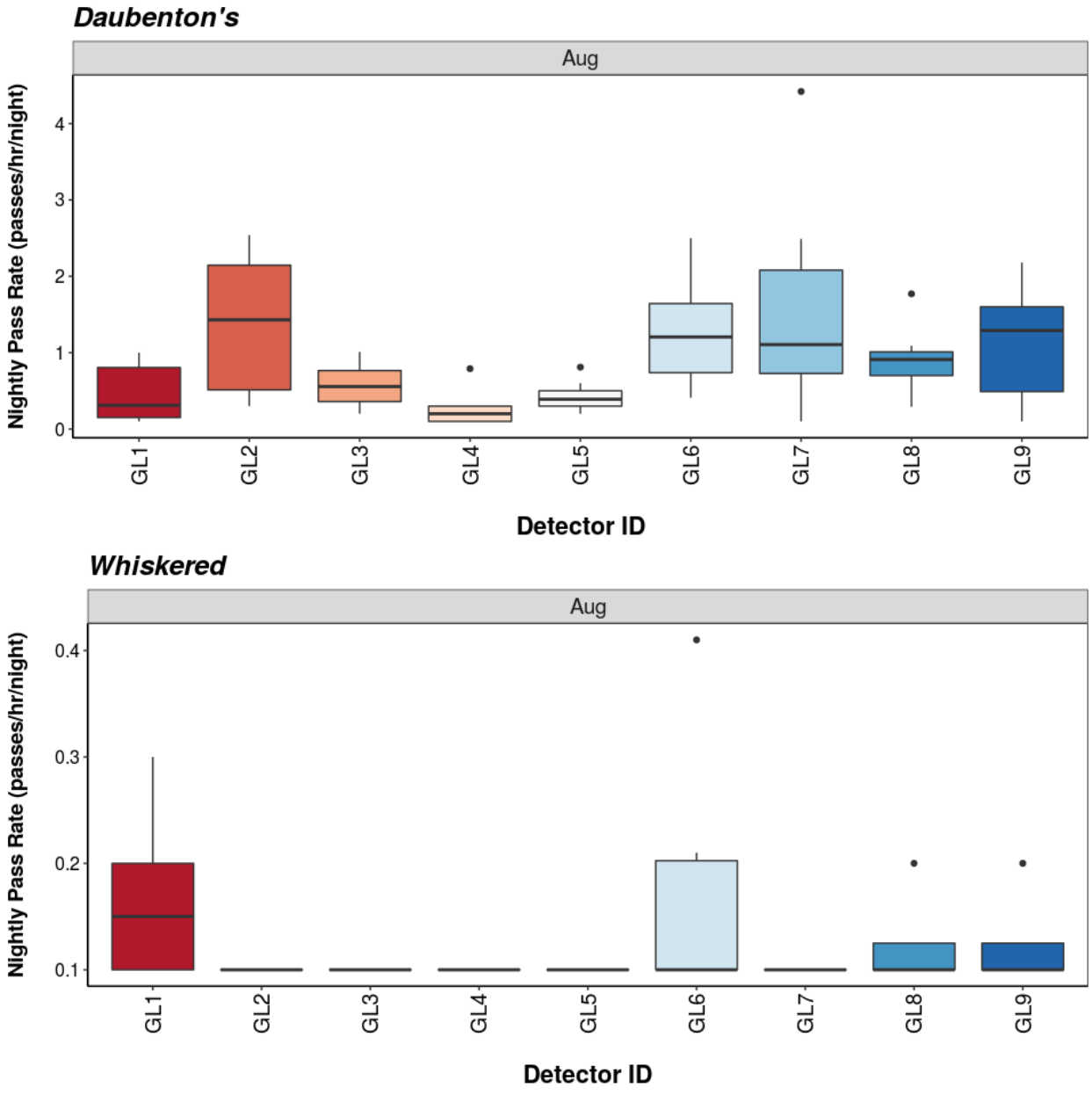
Leisler’s	GL5	1.1
Leisler’s	GL6	0.6
Leisler’s	GL7	0.9
Leisler’s	GL8	1.0
Leisler’s	GL9	1.3
Brown long-eared	GL1	0.7
Brown long-eared	GL2	1.7
Brown long-eared	GL3	1.3
Brown long-eared	GL4	0.3
Brown long-eared	GL5	1.1
Brown long-eared	GL6	1.0
Brown long-eared	GL7	0.8
Brown long-eared	GL8	1.2
Brown long-eared	GL9	0.7
Daubenton’s	GL1	0.5
Daubenton’s	GL2	1.4
Daubenton’s	GL3	0.6
Daubenton’s	GL4	0.3
Daubenton’s	GL5	0.4
Daubenton’s	GL6	1.3
Daubenton’s	GL7	1.5
Daubenton’s	GL8	0.9
Daubenton’s	GL9	1.1
Whiskered	GL1	0.2
Whiskered	GL2	0.1
Whiskered	GL3	0.1
Whiskered	GL4	0.1
Whiskered	GL5	0.1
Whiskered	GL6	0.2
Whiskered	GL7	0.1
Whiskered	GL8	0.1
Whiskered	GL9	0.1
Natterer’s	GL1	0.6
Natterer’s	GL2	0.8
Natterer’s	GL3	0.3
Natterer’s	GL4	0.2

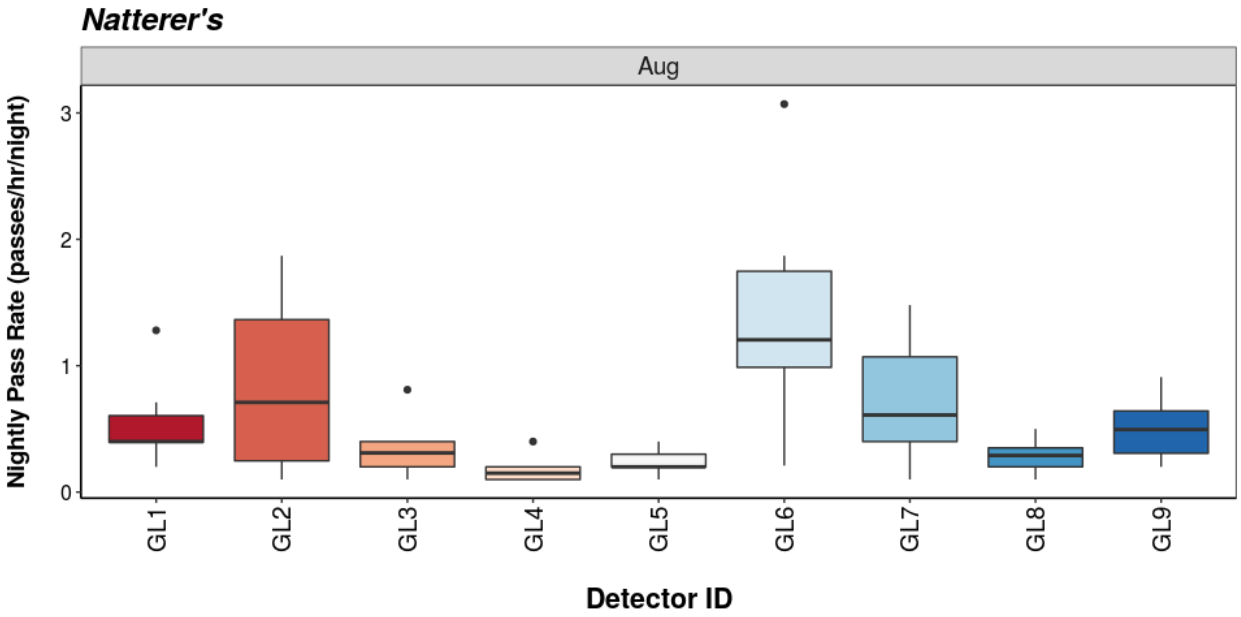
Natterer’s	GL5	0.2
Natterer’s	GL6	1.3
Natterer’s	GL7	0.7
Natterer’s	GL8	0.3
Natterer’s	GL9	0.5

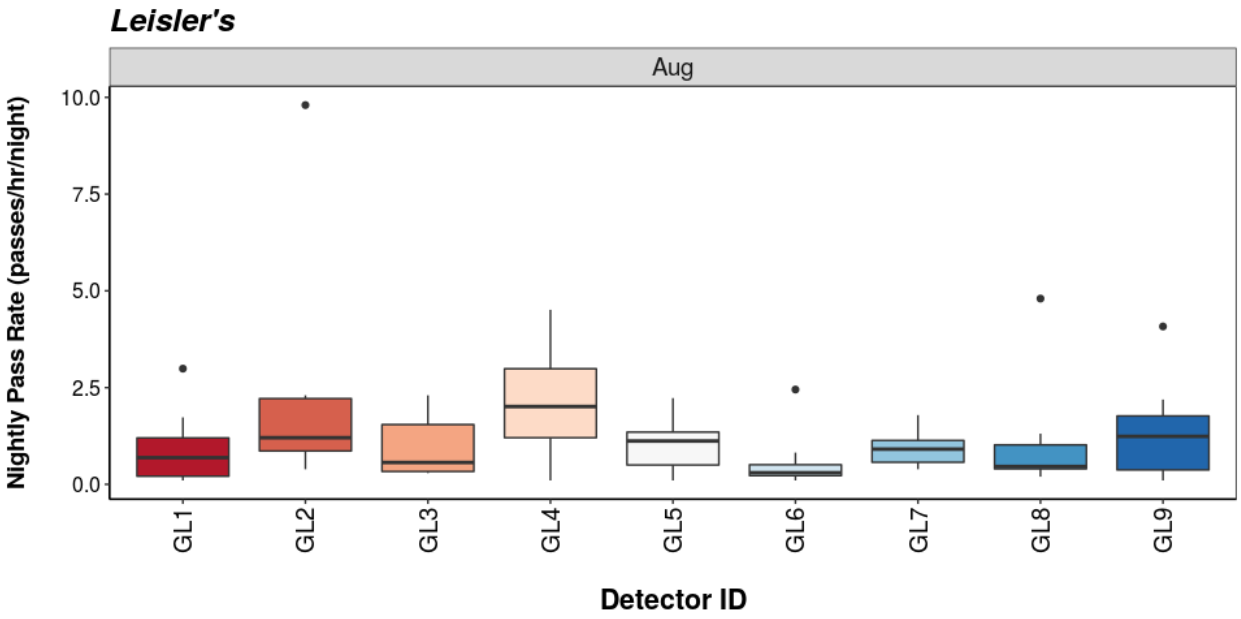
Nightly Bat Pass Rate for each Month

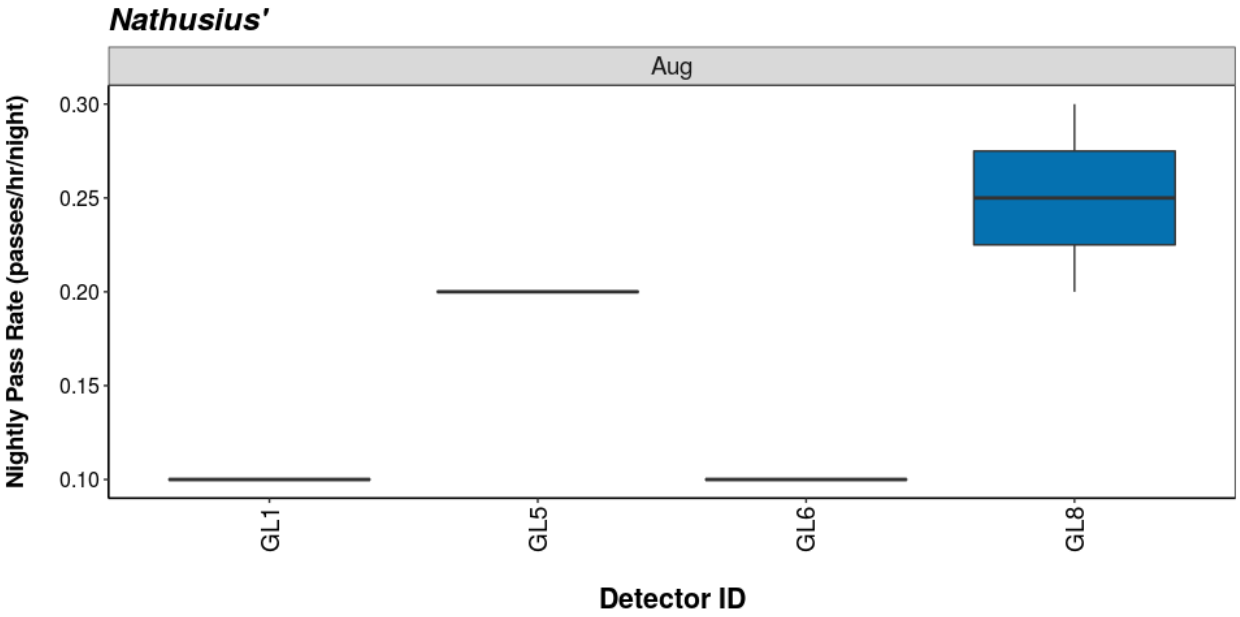
Per Detector - Figures

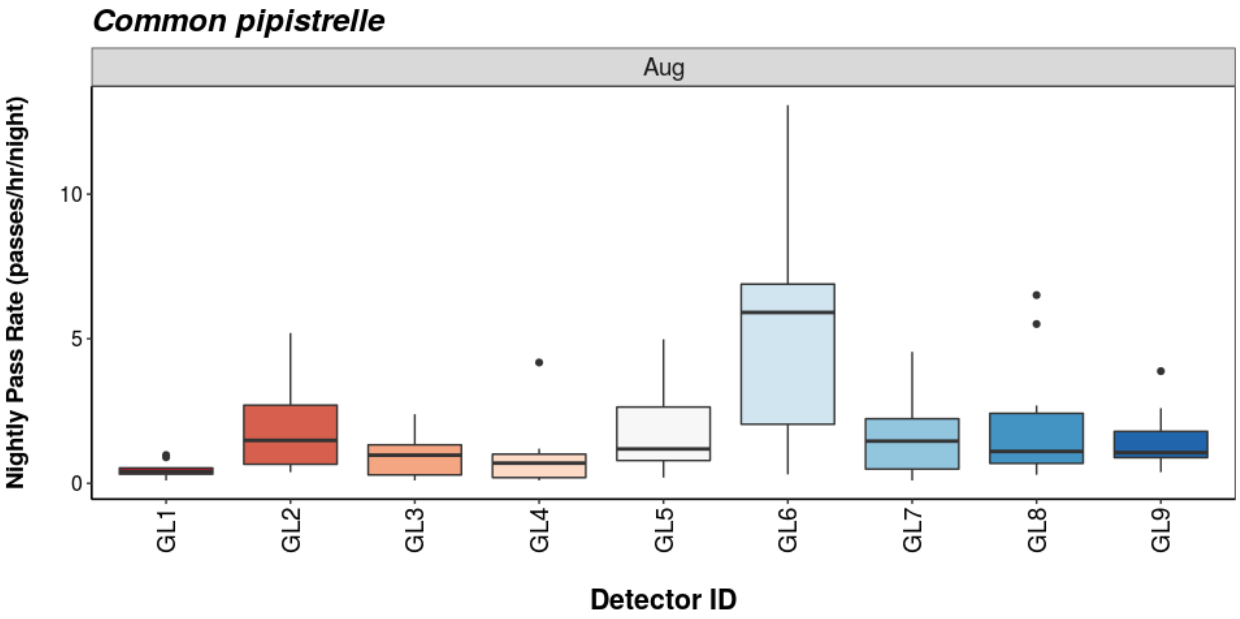
Figure 12. Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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



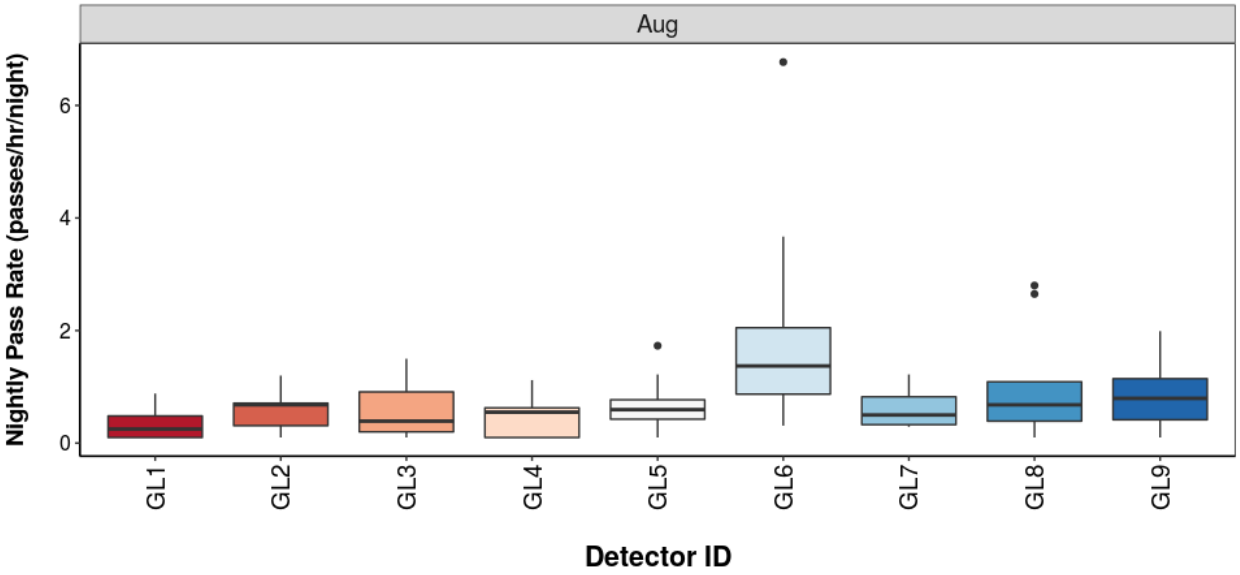

Natterer's
Aug
Nightly Pass Rate (passes/hr/night)
0
1
2
3
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Leisler's
Aug
Nightly Pass Rate (passes/hr/night)
0.0
2.5
5.0
7.5
10.0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

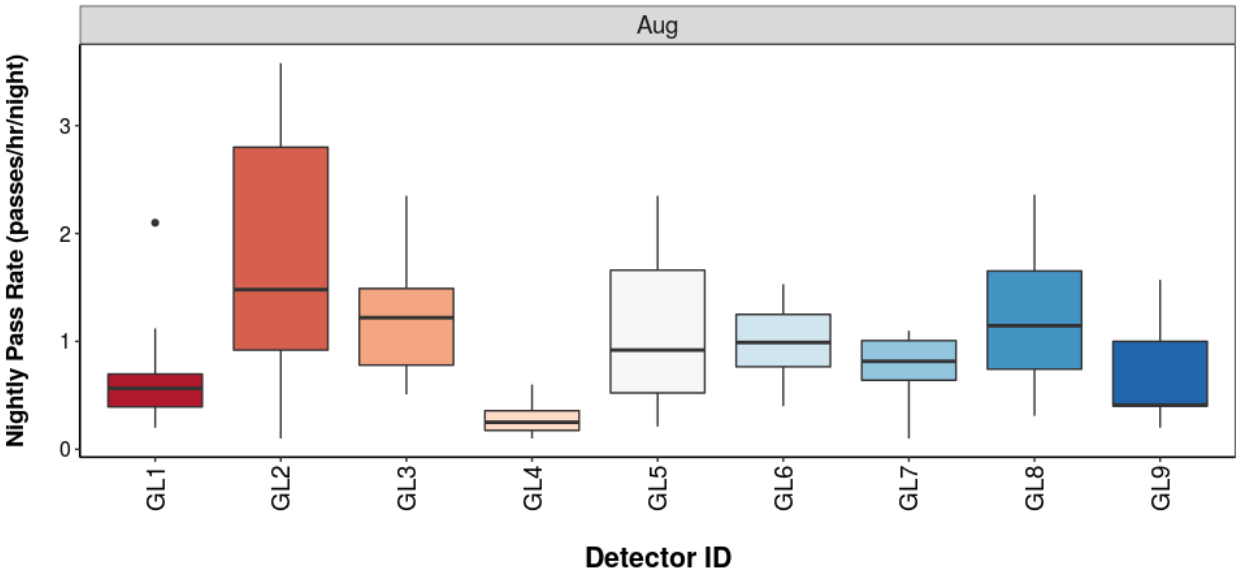

Nathusius'
Aug
Nightly Pass Rate (passes/hr/night)
0.30
0.25
0.20
0.15
0.10
GL1
GL5
GL6
GL8
Detector ID


Common pipistrelle
Aug
Nightly Pass Rate (passes/hr/night)
10
5
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

Soprano pipistrelle



Brown long-eared



Bat Activity per Detector Location

Figure 13. Detector ID reference:

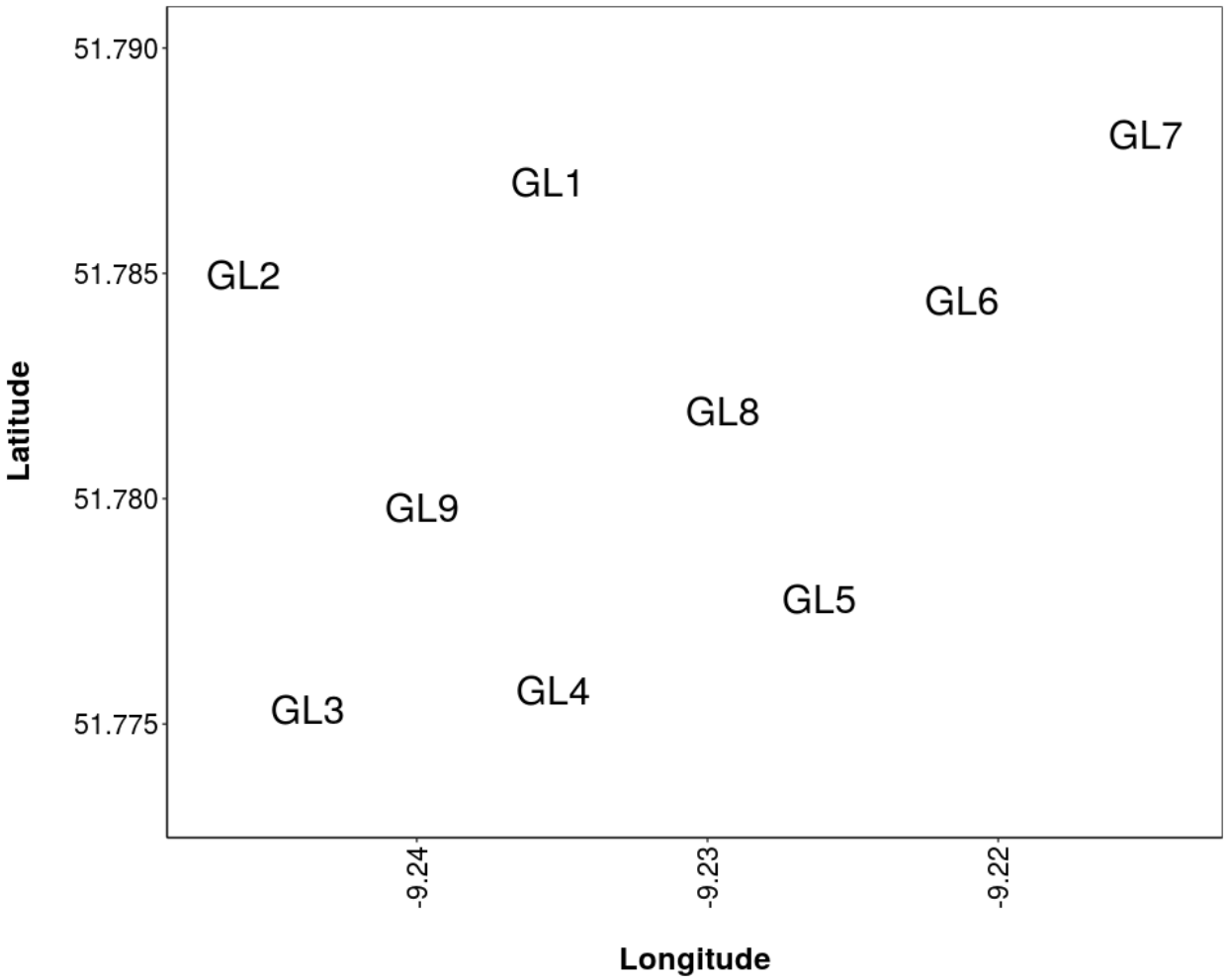
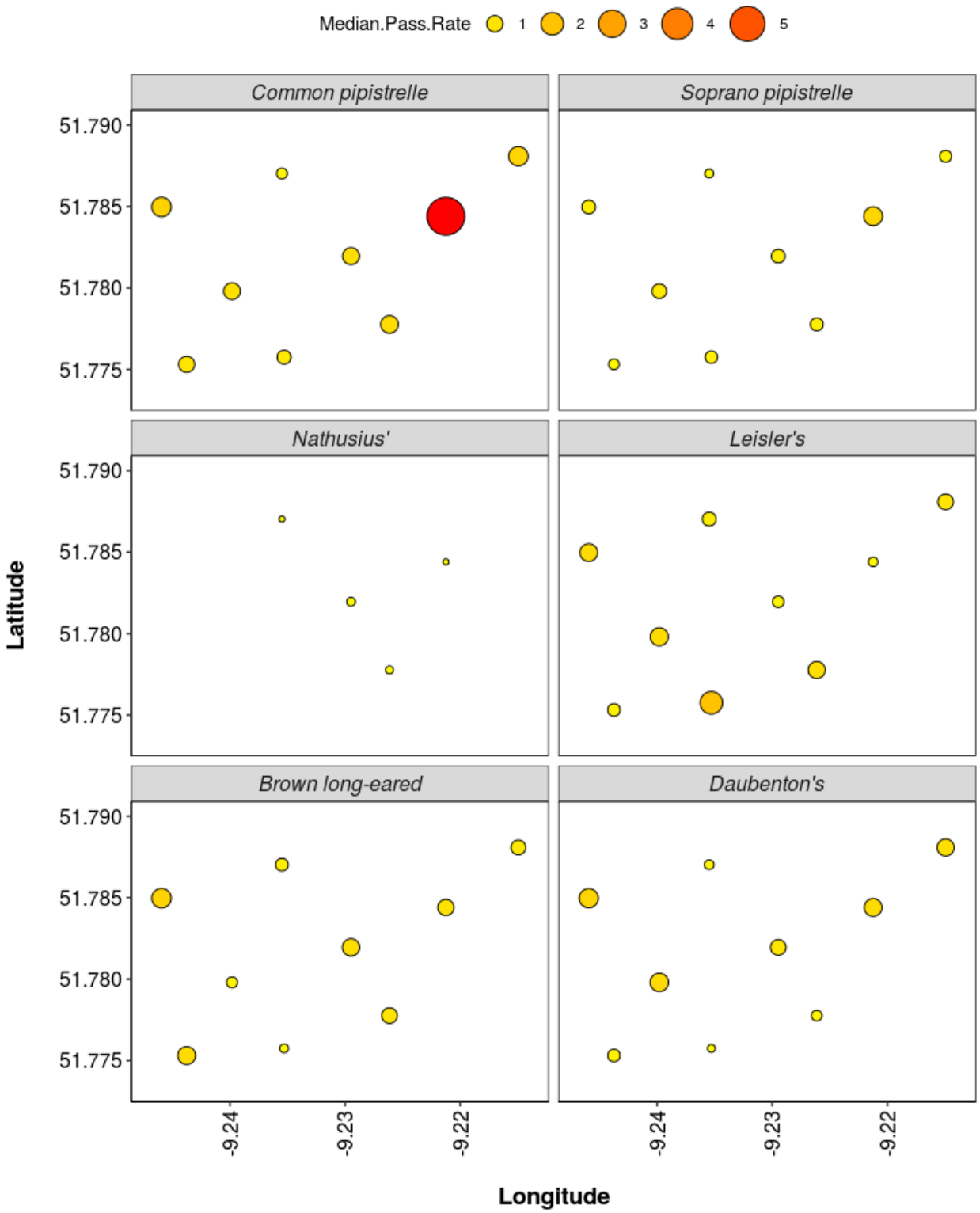


Figure 14. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
1
2
3
4
5
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

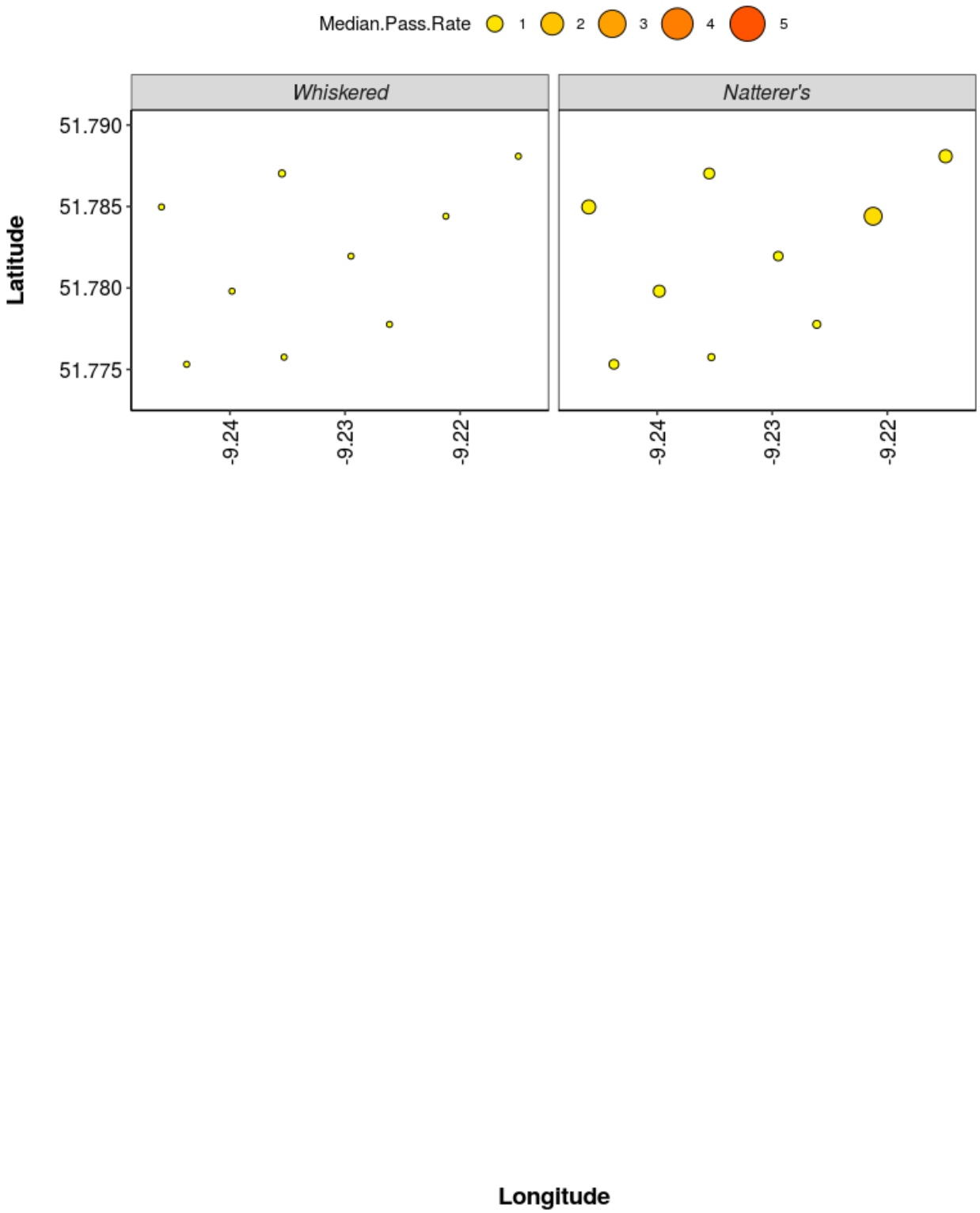
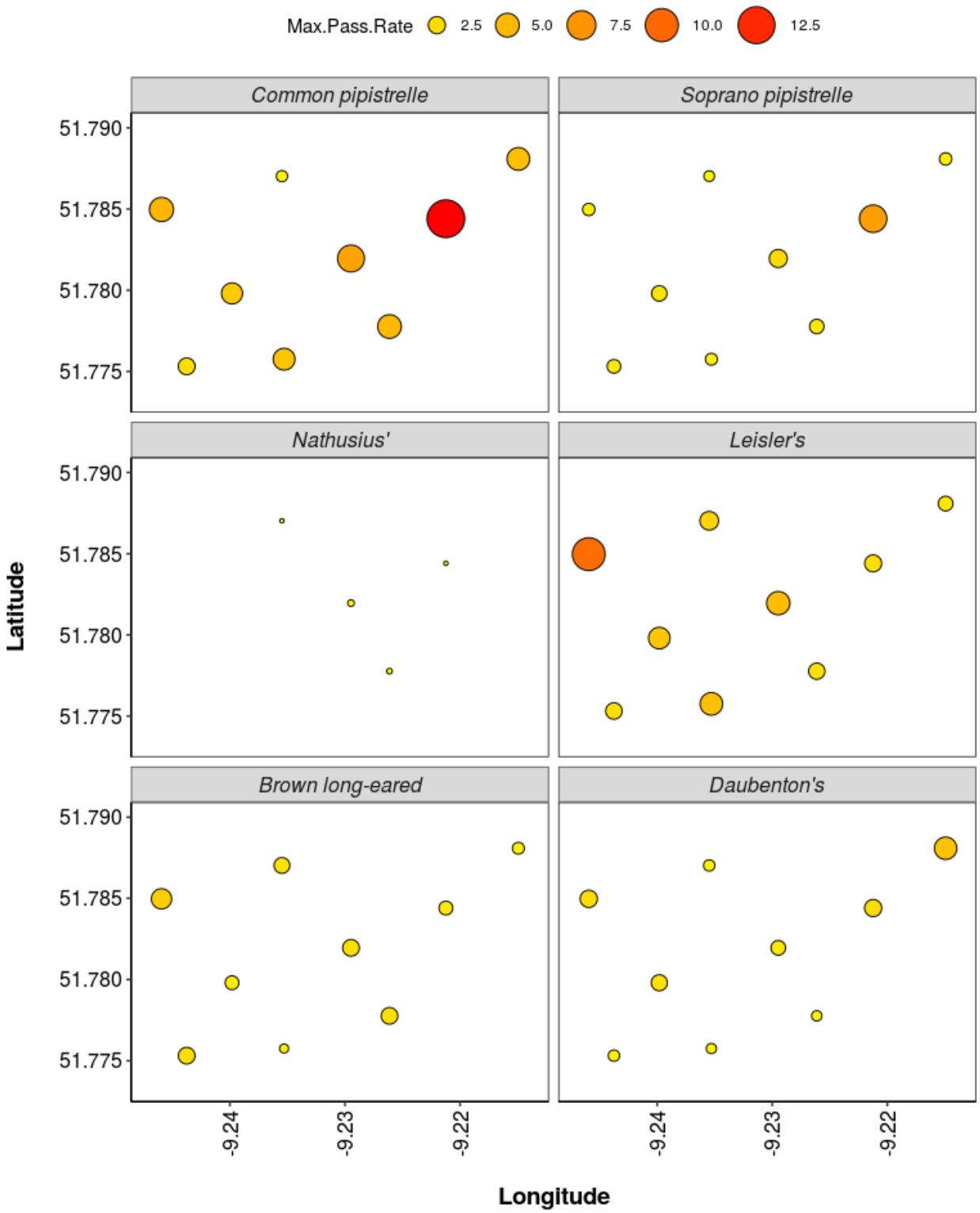
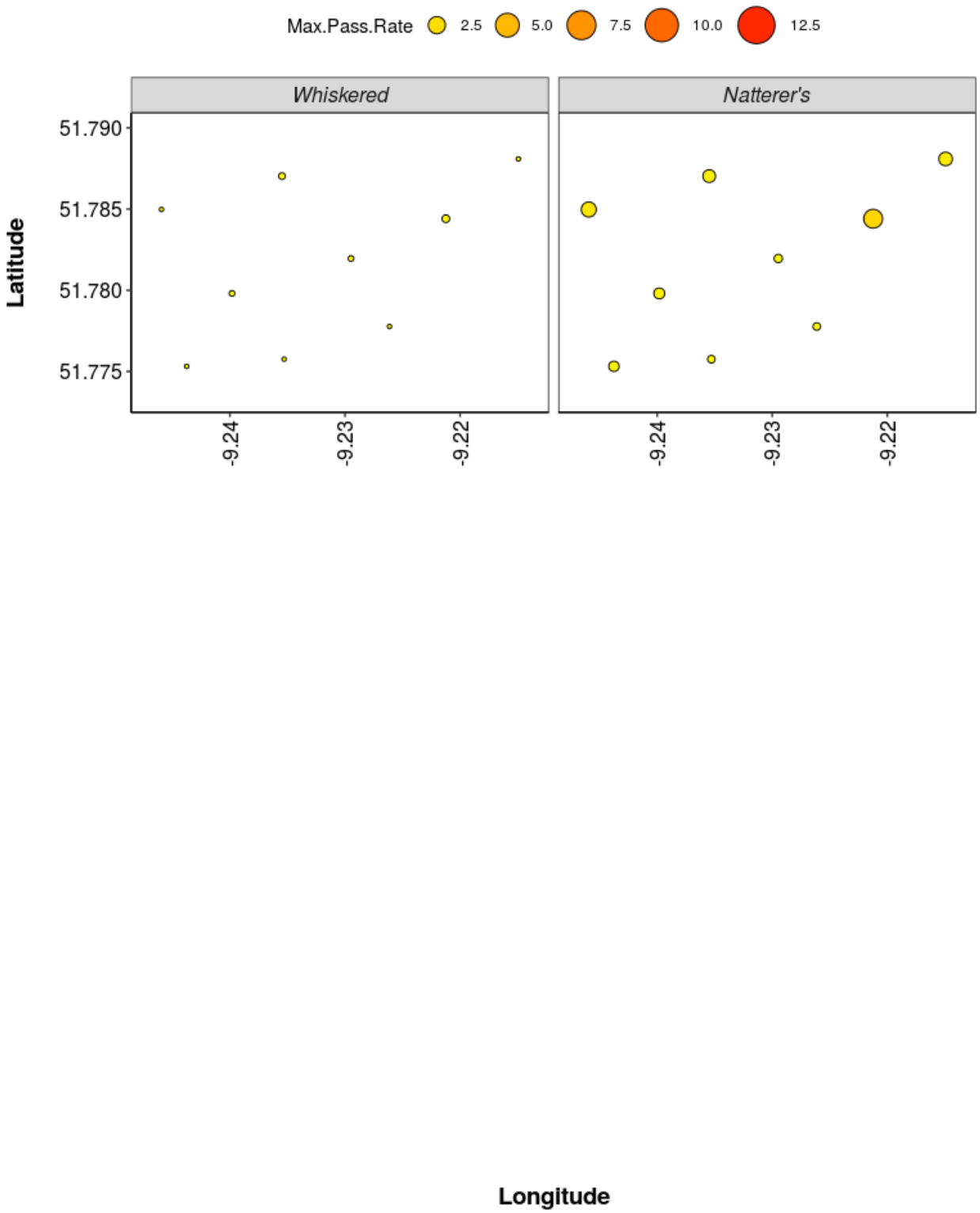

Median.Pass.Rate
1
2
3
4
5
Whiskered
Natterer's
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
2.5
5.0
7.5
10.0
12.5
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long-eared
Daubenton's
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude


Max.Pass.Rate
2.5
5.0
7.5
10.0
12.5
Whiskered
Natterer's
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

PART 2B: Includes absences

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

Nightly Bat Pass Rate (Bat passes per hour)

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Brown long-eared	GL1	0.6
Brown long-eared	GL2	1.3
Brown long-eared	GL3	1.1
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.7
Brown long-eared	GL6	1.0
Brown long-eared	GL7	0.8
Brown long-eared	GL8	1.1
Brown long-eared	GL9	0.4
Common pipistrelle	GL1	0.4
Common pipistrelle	GL2	1.0
Common pipistrelle	GL3	0.9
Common pipistrelle	GL4	0.4
Common pipistrelle	GL5	1.1
Common pipistrelle	GL6	5.9
Common pipistrelle	GL7	1.5
Common pipistrelle	GL8	1.1
Common pipistrelle	GL9	1.0
Daubenton's	GL1	0.2
Daubenton's	GL2	1.4
Daubenton's	GL3	0.5
Daubenton's	GL4	0.2
Daubenton's	GL5	0.3

Daubenton's	GL6	1.1
Daubenton's	GL7	1.0
Daubenton's	GL8	0.8
Daubenton's	GL9	1.1
Leisler's	GL1	0.7
Leisler's	GL2	1.0
Leisler's	GL3	0.5
Leisler's	GL4	2.0
Leisler's	GL5	1.1
Leisler's	GL6	0.3
Leisler's	GL7	0.9
Leisler's	GL8	0.5
Leisler's	GL9	1.2
Nathusius'	GL1	0.0
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.0
Nathusius'	GL6	0.0
Nathusius'	GL7	0.0
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.4
Natterer's	GL2	0.7
Natterer's	GL3	0.2
Natterer's	GL4	0.1
Natterer's	GL5	0.2
Natterer's	GL6	1.1
Natterer's	GL7	0.5
Natterer's	GL8	0.2
Natterer's	GL9	0.4
Soprano pipistrelle	GL1	0.1
Soprano pipistrelle	GL2	0.6
Soprano pipistrelle	GL3	0.2
Soprano pipistrelle	GL4	0.3
Soprano pipistrelle	GL5	0.5

Soprano pipistrelle	GL6	1.4
Soprano pipistrelle	GL7	0.5
Soprano pipistrelle	GL8	0.5
Soprano pipistrelle	GL9	0.8
Whiskered	GL1	0.1
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.1
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

Nightly Bat Pass Rate (Bat passes per hour)

Mean per Detector

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

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

Species	Detector ID	Mean Pass Rate
Brown long-eared	GL1	0.7
Brown long-eared	GL2	1.5
Brown long-eared	GL3	1.0
Brown long-eared	GL4	0.2
Brown long-eared	GL5	1.0
Brown long-eared	GL6	0.9
Brown long-eared	GL7	0.7
Brown long-eared	GL8	1.2
Brown long-eared	GL9	0.6
Common pipistrelle	GL1	0.4
Common pipistrelle	GL2	1.6
Common pipistrelle	GL3	0.9
Common pipistrelle	GL4	0.8
Common pipistrelle	GL5	1.5
Common pipistrelle	GL6	5.3
Common pipistrelle	GL7	1.5
Common pipistrelle	GL8	2.1
Common pipistrelle	GL9	1.2
Daubenton's	GL1	0.3
Daubenton's	GL2	1.4
Daubenton's	GL3	0.5
Daubenton's	GL4	0.2
Daubenton's	GL5	0.3
Daubenton's	GL6	1.2
Daubenton's	GL7	1.4
Daubenton's	GL8	0.8

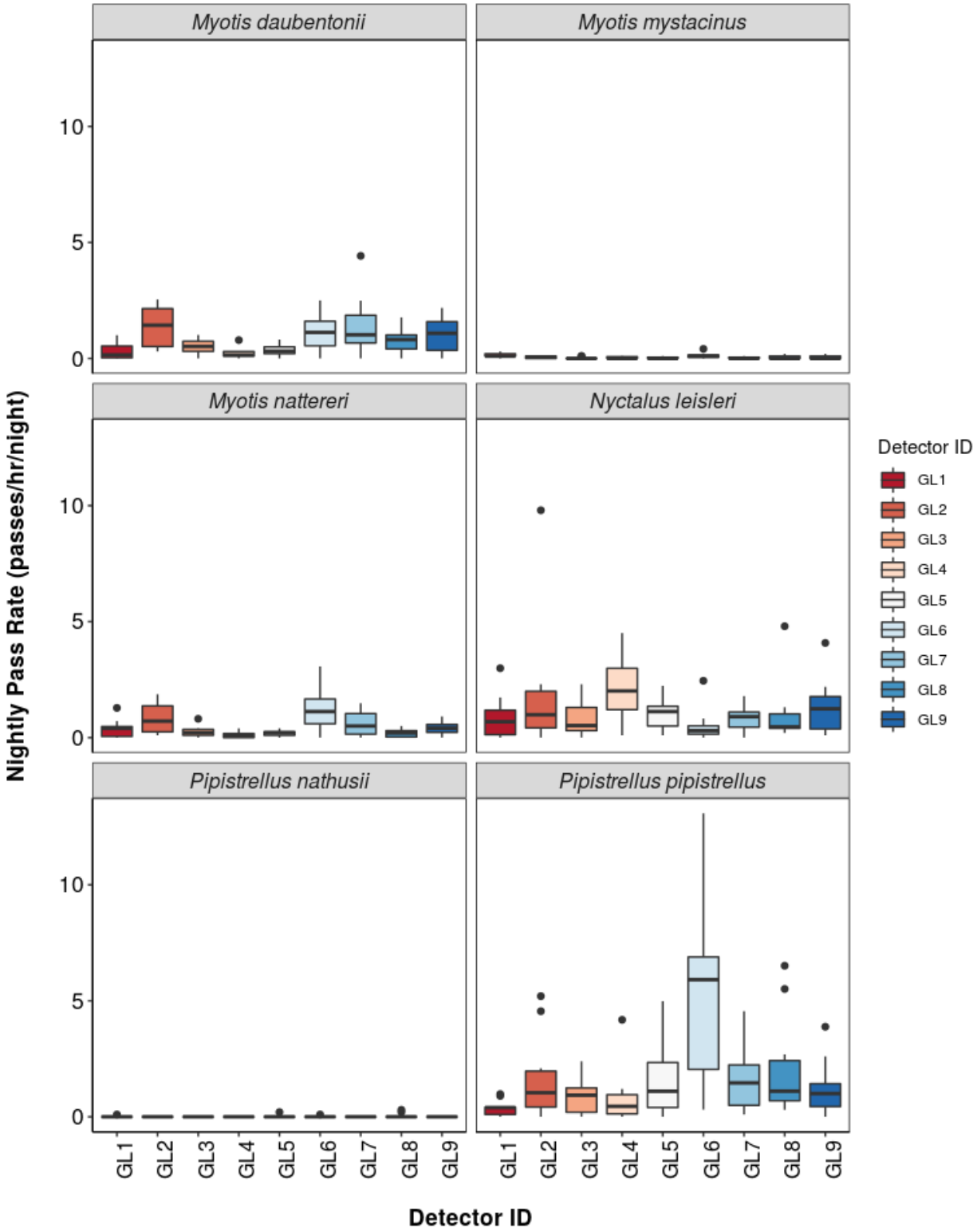
Daubenton's	GL9	1.0
Leisler's	GL1	0.9
Leisler's	GL2	1.9
Leisler's	GL3	0.8
Leisler's	GL4	2.1
Leisler's	GL5	1.1
Leisler's	GL6	0.5
Leisler's	GL7	0.8
Leisler's	GL8	1.0
Leisler's	GL9	1.3
Nathusius'	GL1	0.0
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.0
Nathusius'	GL6	0.0
Nathusius'	GL7	0.0
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.4
Natterer's	GL2	0.8
Natterer's	GL3	0.3
Natterer's	GL4	0.1
Natterer's	GL5	0.2
Natterer's	GL6	1.2
Natterer's	GL7	0.6
Natterer's	GL8	0.2
Natterer's	GL9	0.4
Soprano pipistrelle	GL1	0.2
Soprano pipistrelle	GL2	0.5
Soprano pipistrelle	GL3	0.5
Soprano pipistrelle	GL4	0.4
Soprano pipistrelle	GL5	0.5
Soprano pipistrelle	GL6	1.9
Soprano pipistrelle	GL7	0.6
Soprano pipistrelle	GL8	0.9

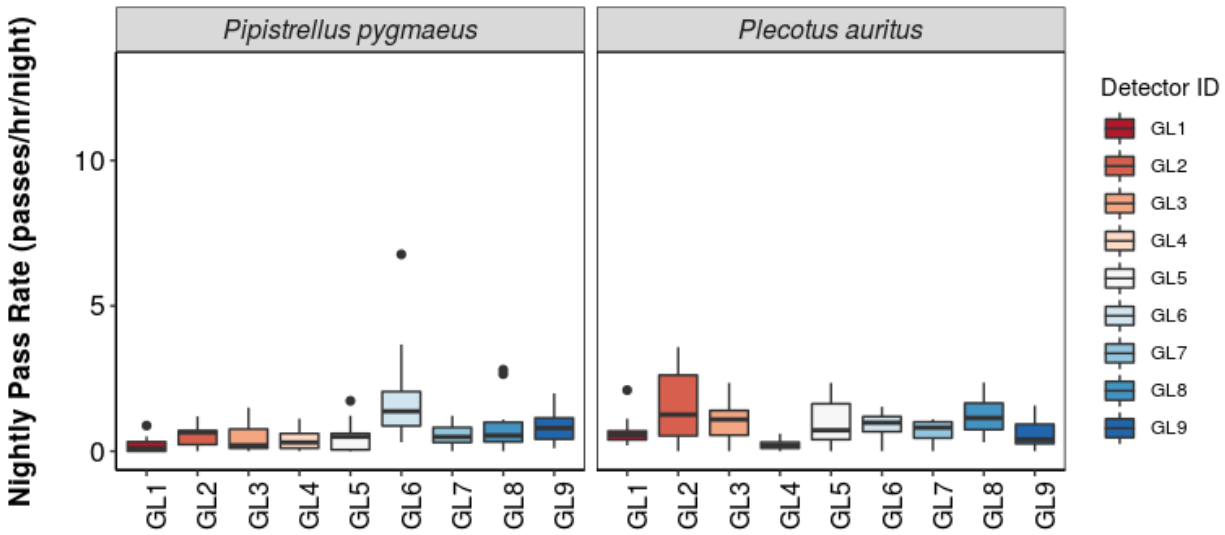
Soprano pipistrelle	GL9	0.8
Whiskered	GL1	0.1
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.1
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

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 daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
5
10
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID
Detector ID


Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
10
5
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
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
Aug	GL1	10
Aug	GL2	10
Aug	GL3	11
Aug	GL4	10
Aug	GL5	11
Aug	GL6	11
Aug	GL7	11
Aug	GL8	10
Aug	GL9	10

Nightly Bat Pass Rate for each Month

Median Per Detector

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

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

Species	Detector ID	Aug
Brown long-eared	GL1	0.6
Brown long-eared	GL2	1.3
Brown long-eared	GL3	1.1
Brown long-eared	GL4	0.2
Brown long-eared	GL5	0.7
Brown long-eared	GL6	1.0
Brown long-eared	GL7	0.8
Brown long-eared	GL8	1.1
Brown long-eared	GL9	0.4
Common pipistrelle	GL1	0.4
Common pipistrelle	GL2	1.0
Common pipistrelle	GL3	0.9
Common pipistrelle	GL4	0.4
Common pipistrelle	GL5	1.1
Common pipistrelle	GL6	5.9
Common pipistrelle	GL7	1.5
Common pipistrelle	GL8	1.1
Common pipistrelle	GL9	1.0
Daubenton's	GL1	0.2
Daubenton's	GL2	1.4
Daubenton's	GL3	0.5
Daubenton's	GL4	0.2
Daubenton's	GL5	0.3

Daubenton's	GL6	1.1
Daubenton's	GL7	1.0
Daubenton's	GL8	0.8
Daubenton's	GL9	1.1
Leisler's	GL1	0.7
Leisler's	GL2	1.0
Leisler's	GL3	0.5
Leisler's	GL4	2.0
Leisler's	GL5	1.1
Leisler's	GL6	0.3
Leisler's	GL7	0.9
Leisler's	GL8	0.5
Leisler's	GL9	1.2
Nathusius'	GL1	0.0
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.0
Nathusius'	GL6	0.0
Nathusius'	GL7	0.0
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.4
Natterer's	GL2	0.7
Natterer's	GL3	0.2
Natterer's	GL4	0.1
Natterer's	GL5	0.2
Natterer's	GL6	1.1
Natterer's	GL7	0.5
Natterer's	GL8	0.2
Natterer's	GL9	0.4
Soprano pipistrelle	GL1	0.1
Soprano pipistrelle	GL2	0.6
Soprano pipistrelle	GL3	0.2
Soprano pipistrelle	GL4	0.3
Soprano pipistrelle	GL5	0.5

Soprano pipistrelle	GL6	1.4
Soprano pipistrelle	GL7	0.5
Soprano pipistrelle	GL8	0.5
Soprano pipistrelle	GL9	0.8
Whiskered	GL1	0.1
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.1
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

Nightly Bat Pass Rate for each Month

Mean per Detector

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

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

Species	Detector ID	Aug
Brown long-eared	GL1	0.7
Brown long-eared	GL2	1.5
Brown long-eared	GL3	1.0
Brown long-eared	GL4	0.2
Brown long-eared	GL5	1.0
Brown long-eared	GL6	0.9
Brown long-eared	GL7	0.7
Brown long-eared	GL8	1.2
Brown long-eared	GL9	0.6
Common pipistrelle	GL1	0.4
Common pipistrelle	GL2	1.6
Common pipistrelle	GL3	0.9
Common pipistrelle	GL4	0.8
Common pipistrelle	GL5	1.5
Common pipistrelle	GL6	5.3
Common pipistrelle	GL7	1.5
Common pipistrelle	GL8	2.1
Common pipistrelle	GL9	1.2
Daubenton's	GL1	0.3
Daubenton's	GL2	1.4
Daubenton's	GL3	0.5
Daubenton's	GL4	0.2
Daubenton's	GL5	0.3
Daubenton's	GL6	1.2
Daubenton's	GL7	1.4
Daubenton's	GL8	0.8

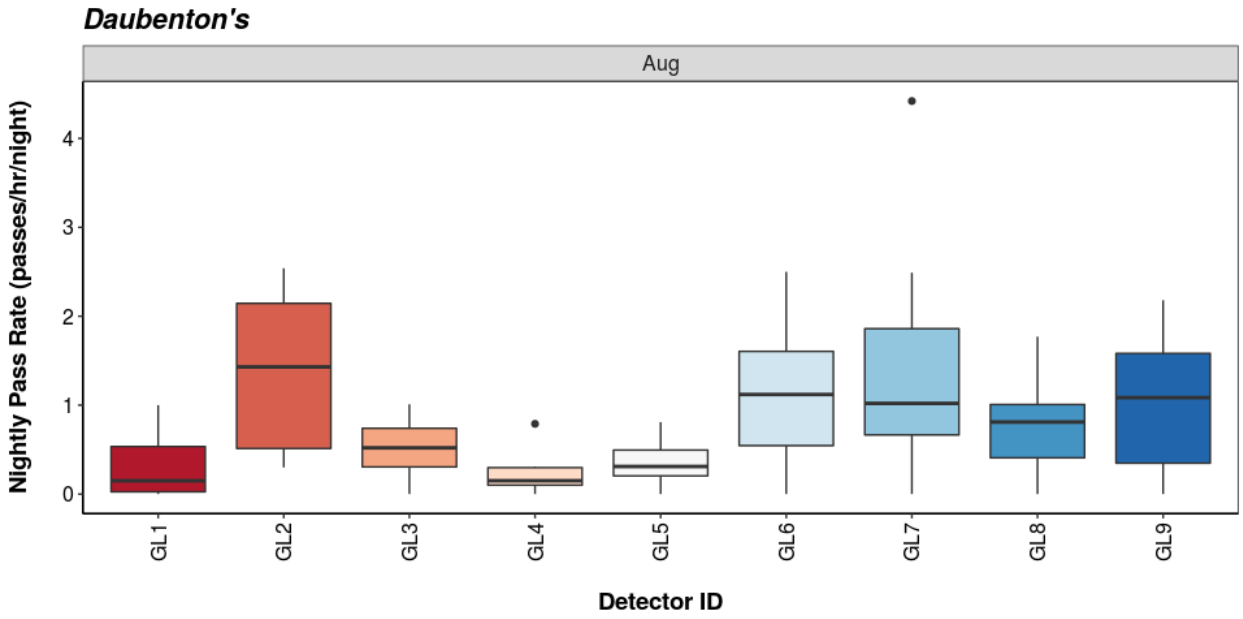
Daubenton's	GL9	1.0
Leisler's	GL1	0.9
Leisler's	GL2	1.9
Leisler's	GL3	0.8
Leisler's	GL4	2.1
Leisler's	GL5	1.1
Leisler's	GL6	0.5
Leisler's	GL7	0.8
Leisler's	GL8	1.0
Leisler's	GL9	1.3
Nathusius'	GL1	0.0
Nathusius'	GL2	0.0
Nathusius'	GL3	0.0
Nathusius'	GL4	0.0
Nathusius'	GL5	0.0
Nathusius'	GL6	0.0
Nathusius'	GL7	0.0
Nathusius'	GL8	0.0
Nathusius'	GL9	0.0
Natterer's	GL1	0.4
Natterer's	GL2	0.8
Natterer's	GL3	0.3
Natterer's	GL4	0.1
Natterer's	GL5	0.2
Natterer's	GL6	1.2
Natterer's	GL7	0.6
Natterer's	GL8	0.2
Natterer's	GL9	0.4
Soprano pipistrelle	GL1	0.2
Soprano pipistrelle	GL2	0.5
Soprano pipistrelle	GL3	0.5
Soprano pipistrelle	GL4	0.4
Soprano pipistrelle	GL5	0.5
Soprano pipistrelle	GL6	1.9
Soprano pipistrelle	GL7	0.6
Soprano pipistrelle	GL8	0.9

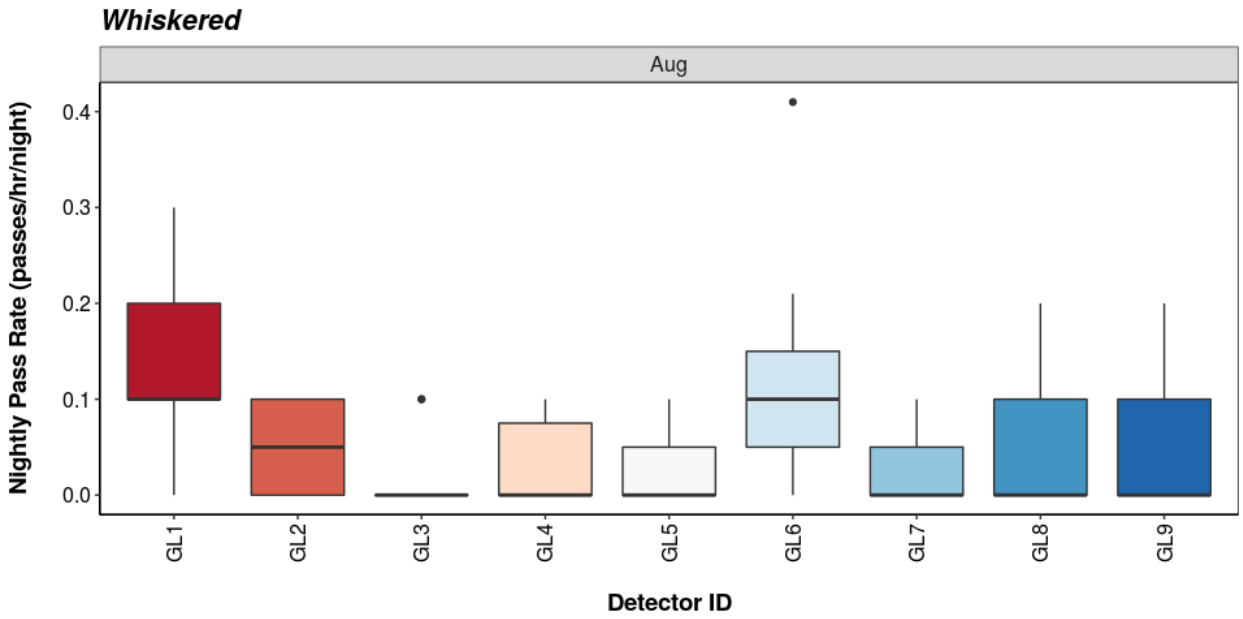
Soprano pipistrelle	GL9	0.8
Whiskered	GL1	0.1
Whiskered	GL2	0.0
Whiskered	GL3	0.0
Whiskered	GL4	0.0
Whiskered	GL5	0.0
Whiskered	GL6	0.1
Whiskered	GL7	0.0
Whiskered	GL8	0.0
Whiskered	GL9	0.0

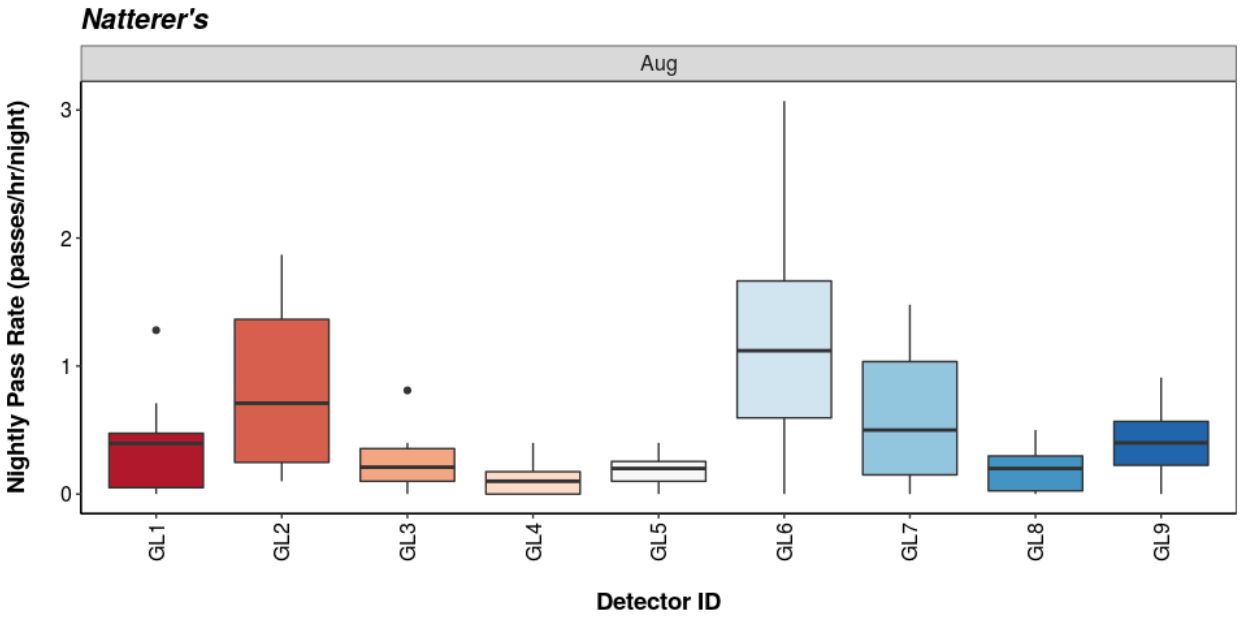
Nightly Bat Pass Rate for each Month

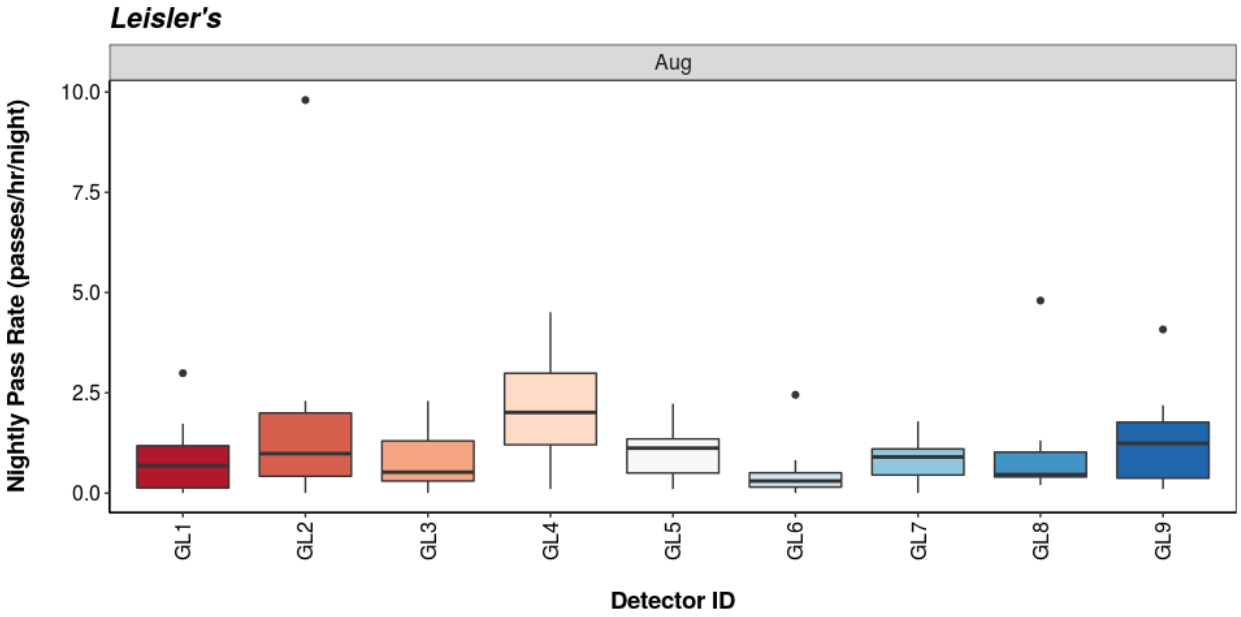
Per Detector - Figures

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

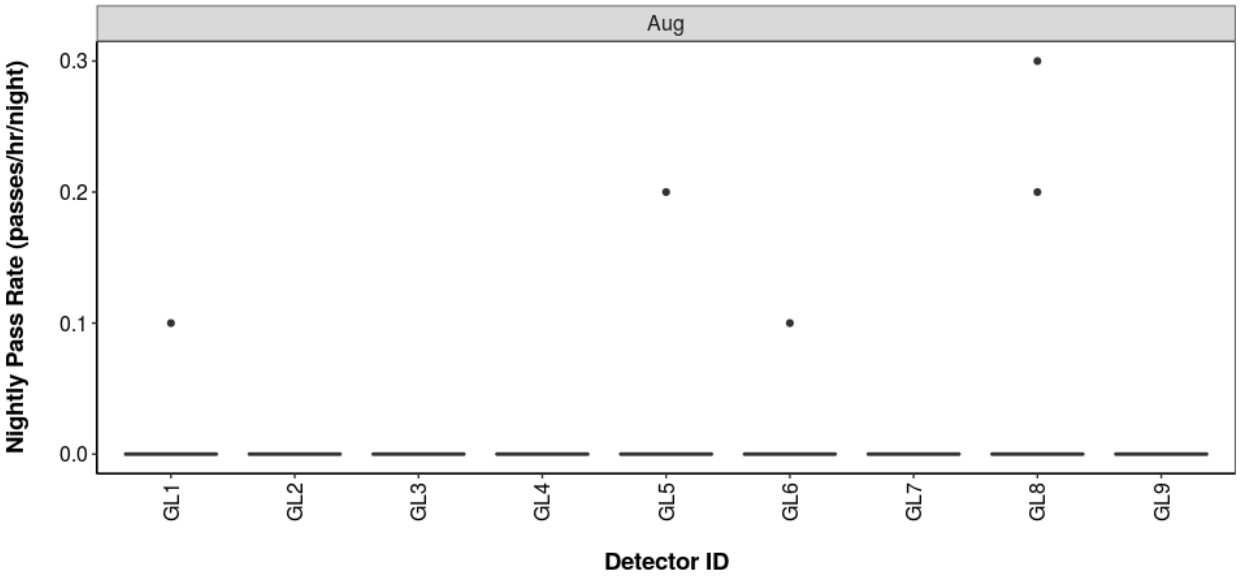




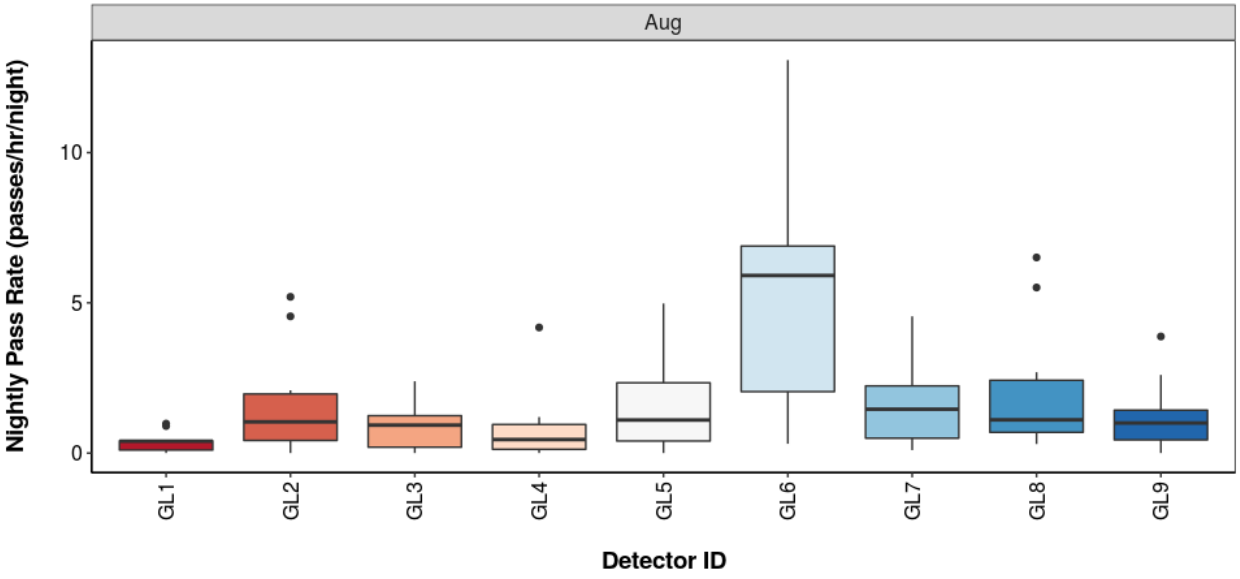

Natterer's
Aug
Nightly Pass Rate (passes/hr/night)
3
2
1
0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID


Leisler's
Aug
Nightly Pass Rate (passes/hr/night)
10.0
7.5
5.0
2.5
0.0
GL1
GL2
GL3
GL4
GL5
GL6
GL7
GL8
GL9
Detector ID

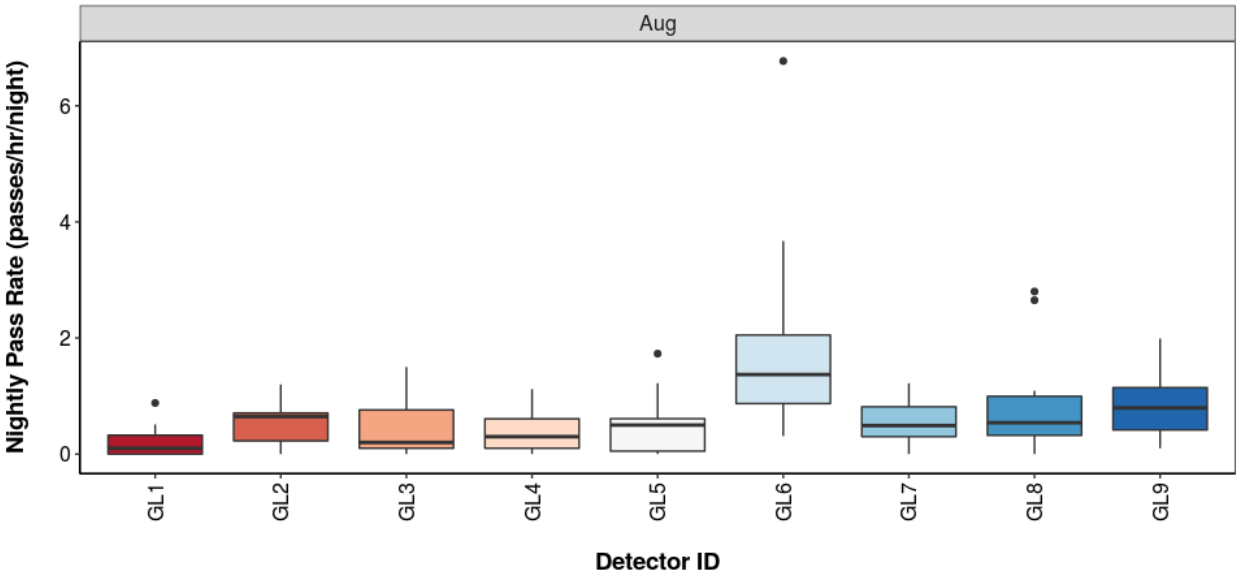
Nathusius'



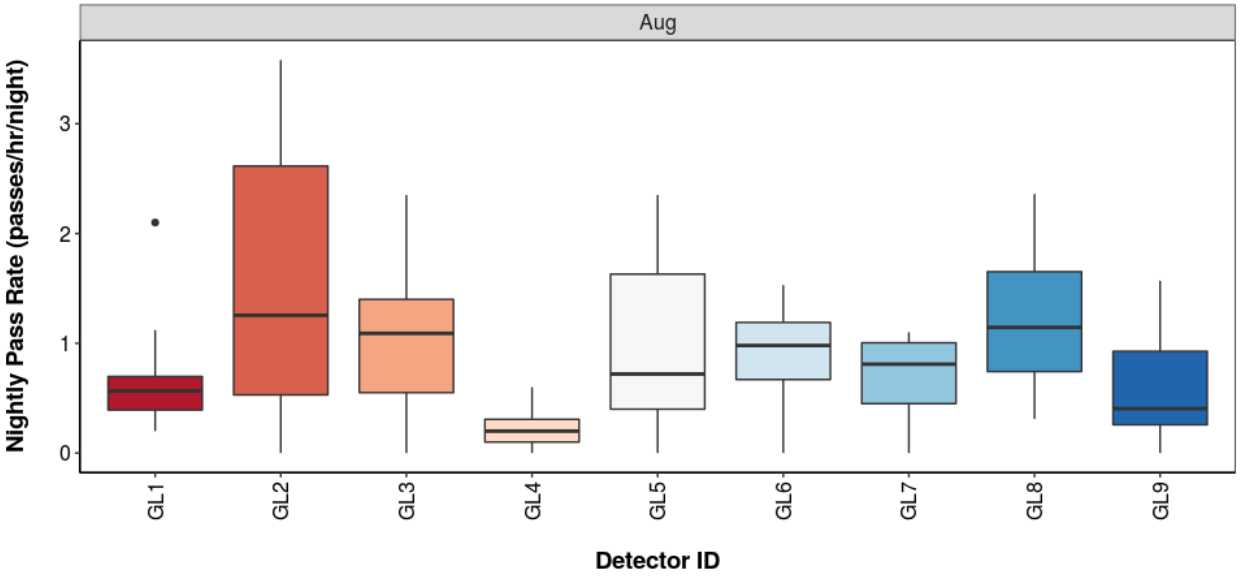
Common pipistrelle



Soprano pipistrelle



Brown long-eared



Bat Activity per Detector Location

Figure 18. Detector ID reference:

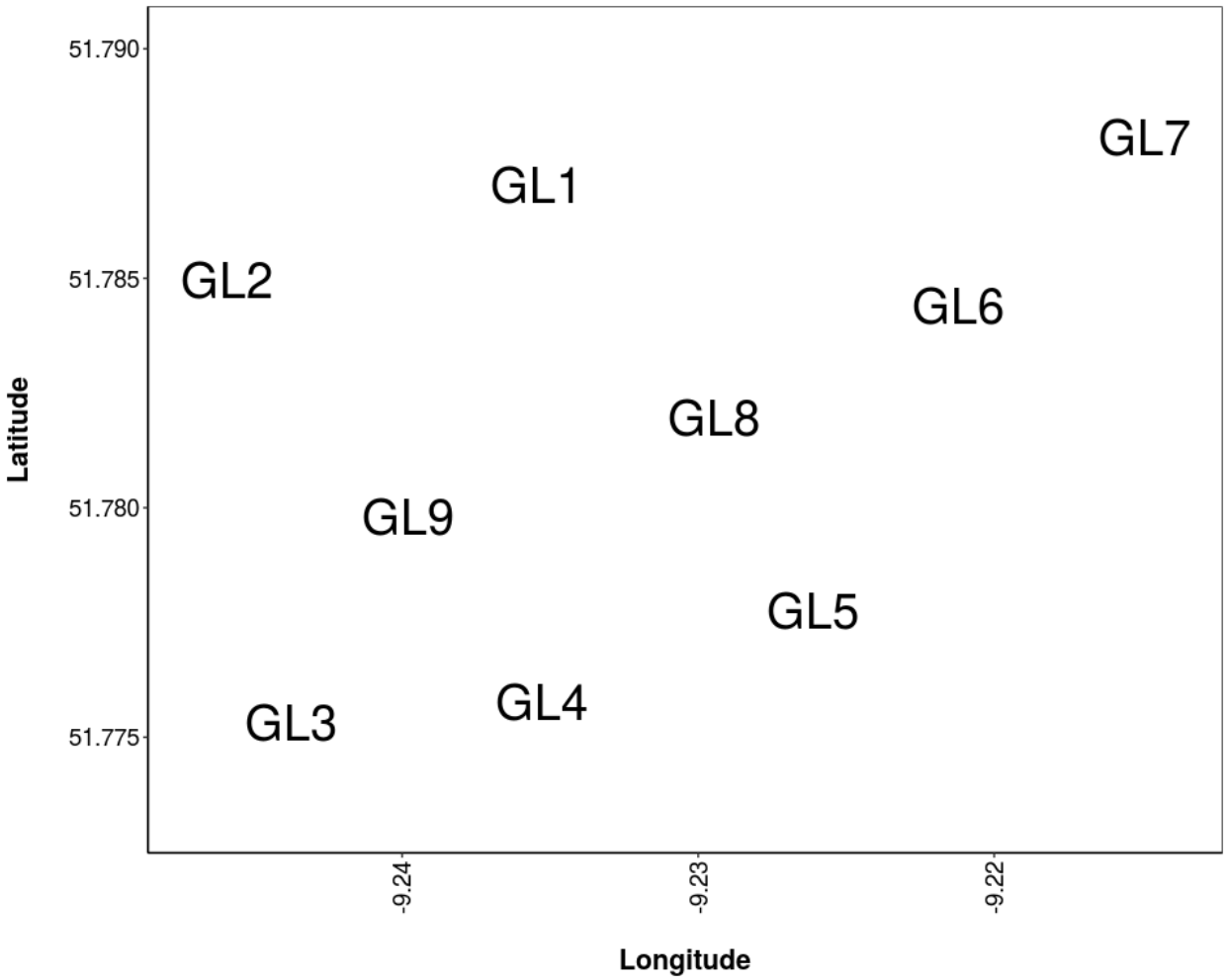
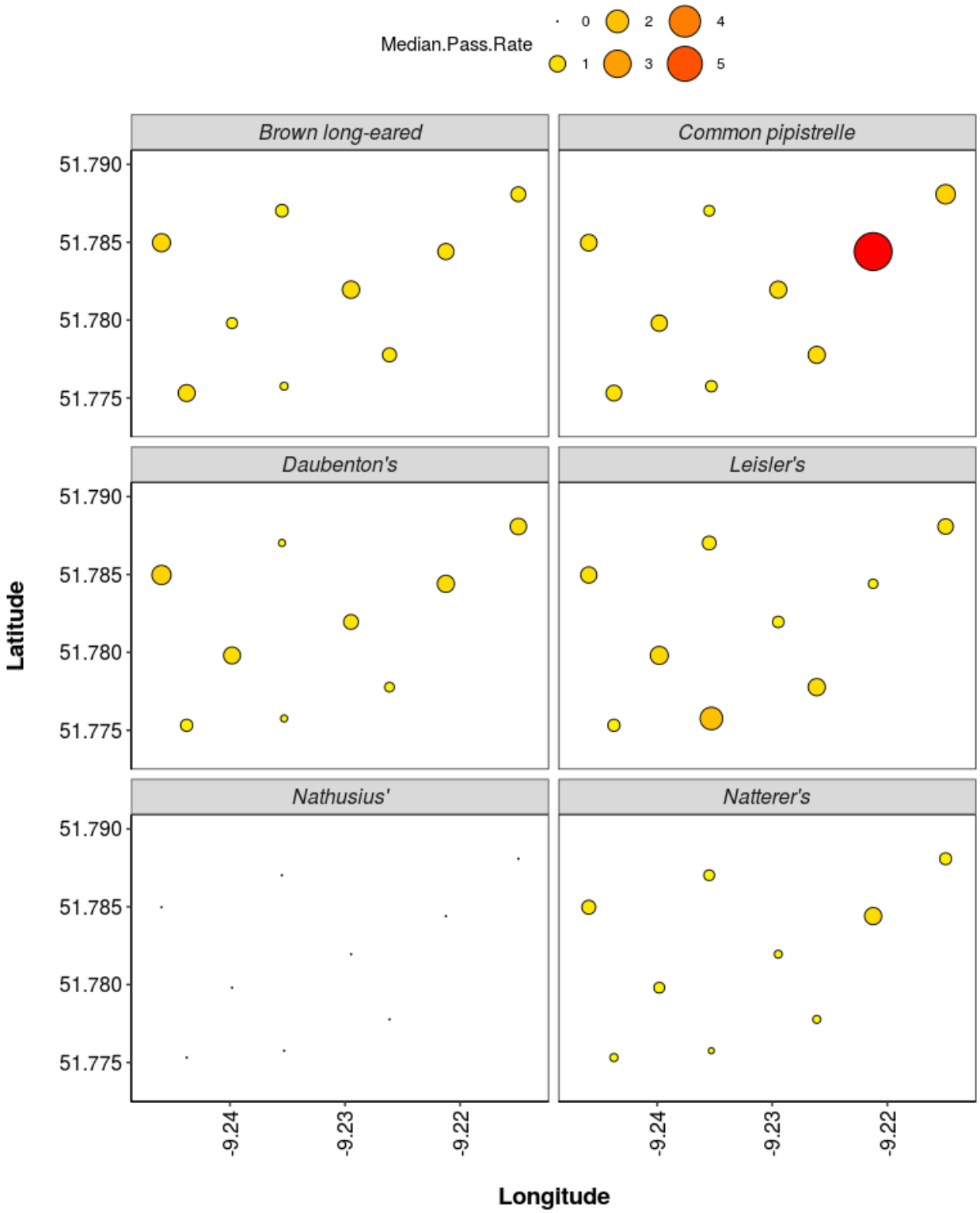


Figure 19. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.


Median.Pass.Rate
0
1
2
3
4
5
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Nathusius'
Natterer's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude

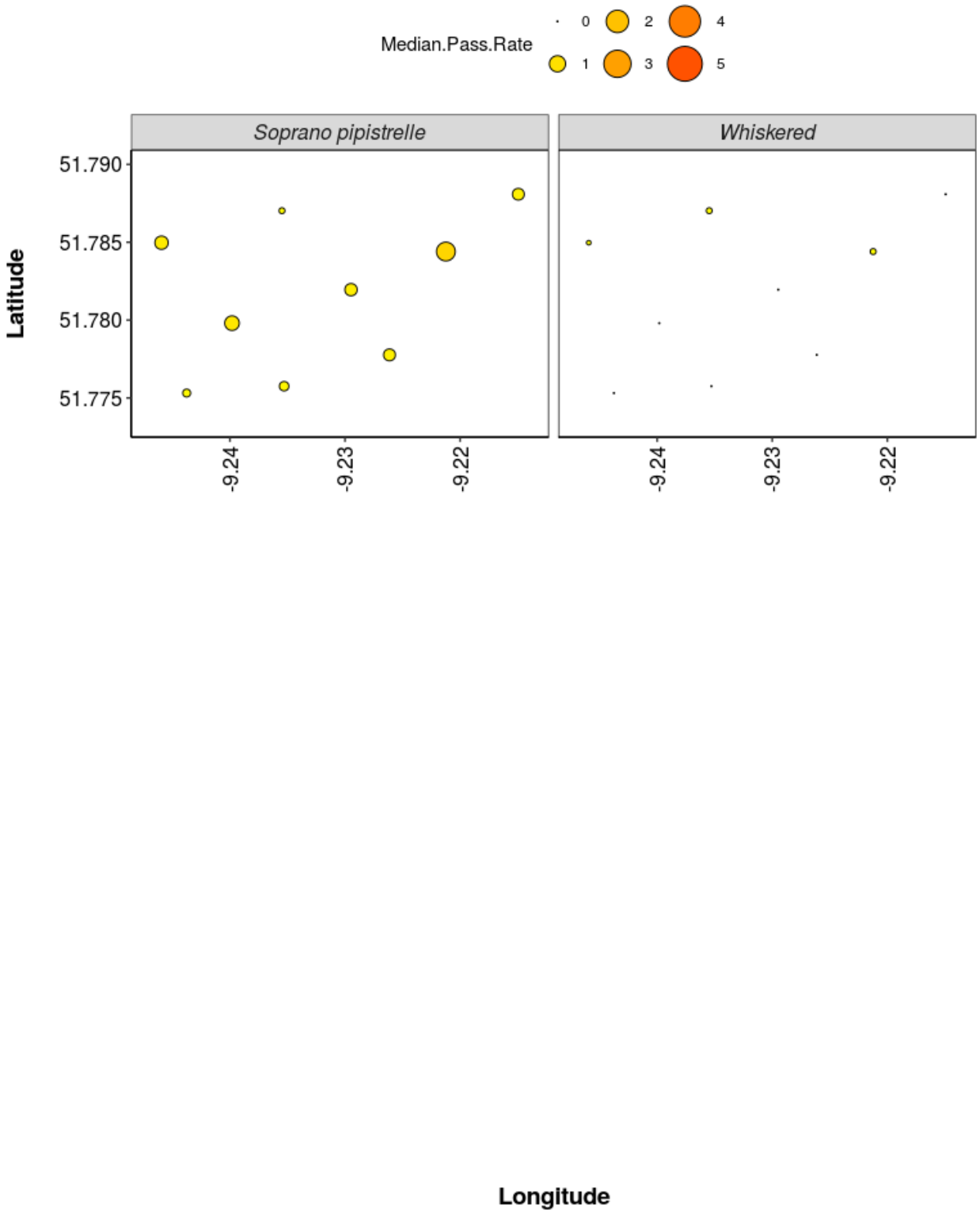
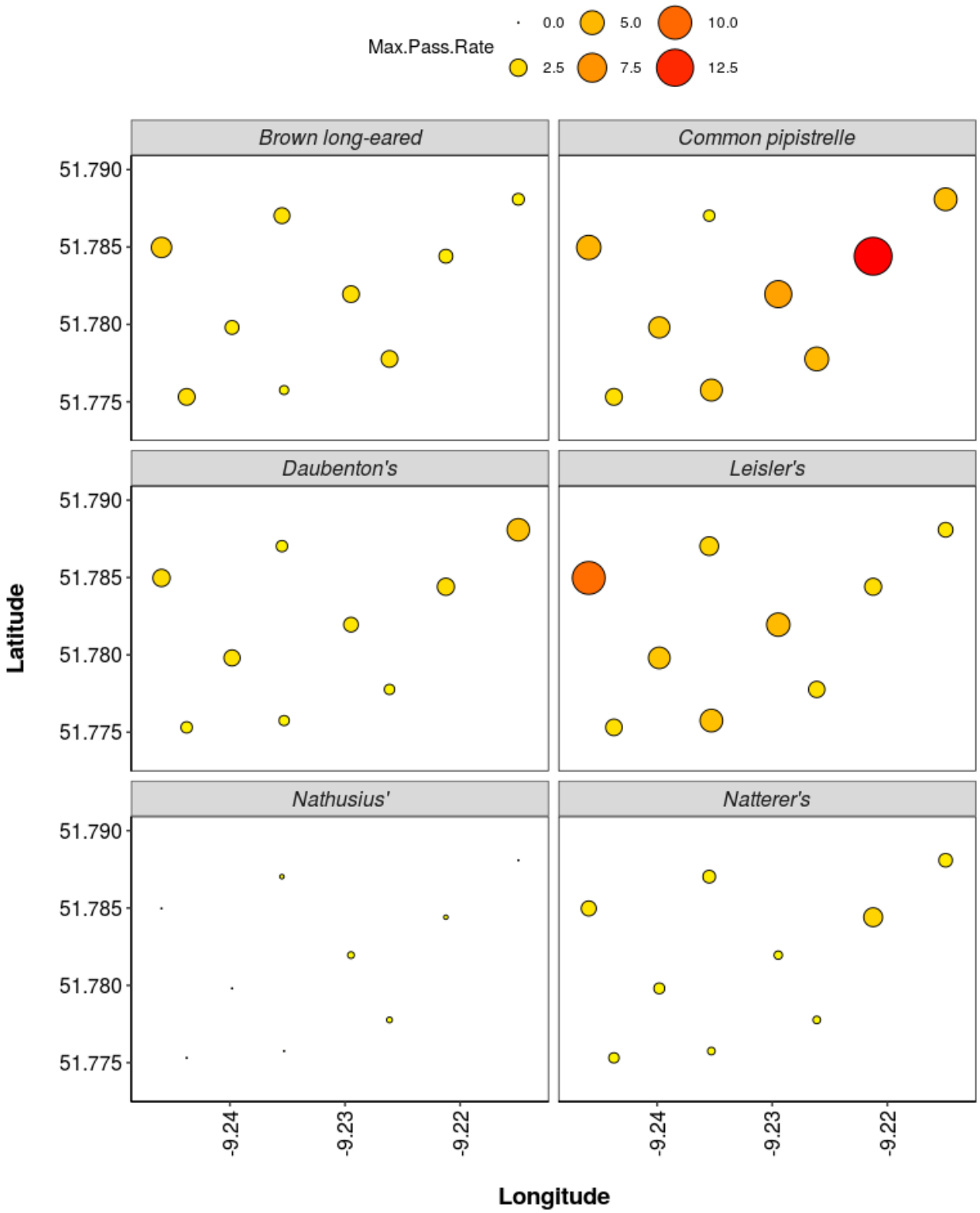
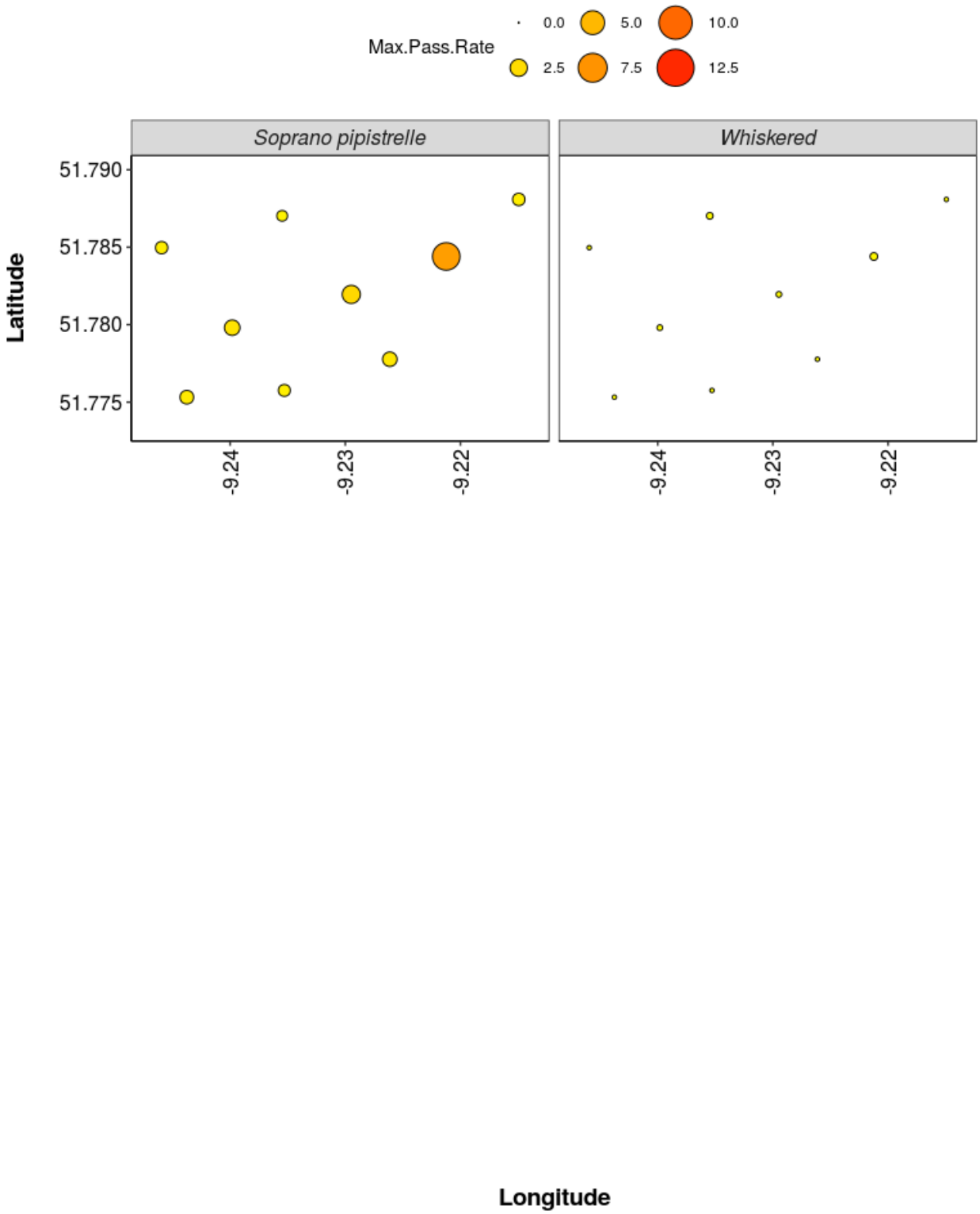

Median.Pass.Rate
0
1
2
3
4
5
Soprano pipistrelle
Whiskered
Latitude
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Longitude

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


Max.Pass.Rate
0.0
2.5
5.0
7.5
10.0
12.5
Brown long-eared
Common pipistrelle
Daubenton's
Leisler's
Nathusius'
Natterer's
51.790
51.785
51.780
51.775
-9.24
-9.23
-9.22
Latitude
Longitude



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