GALETECH
ENERGY SERVICES

Cush Wind Farm
Phase II

# Environmental Impact Assessment Report

# **Annex 5.6: Baseline Bat Survey Report**

Cush Wind Limited

# Baseline Bat Survey Report

## Cush Wind Farm Phase II

### Cush Wind Limited

Galros West Co. Offaly

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# Basis of Report

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# Executive Summary

SLR Environmental Consulting (Ireland) Ltd was commissioned by Cush Wind Limited to undertake a baseline bat survey to inform the Environmental Impact Assessment Report (EIAR) for the proposed Cush Wind Farm Phase II in County Offaly. The survey programme comprised a desk study, habitat and roost suitability assessment, and seasonal static bat detector surveys undertaken between spring and autumn 2025. Three automated full-spectrum bat detectors were deployed at the proposed turbine locations to quantify bat activity and species composition across the site. Existing records from the National Biodiversity Data Centre (NBDC), Bat Conservation Ireland (BCI), designated site databases and published distribution datasets were also reviewed.

The purpose of the surveys was to establish a robust baseline of bat populations and their use of the site, identify any roosting, commuting or foraging habitats that may be affected by the proposed development, and assess the relative level of bat activity within the project area. The results will be used to inform the ecological impact assessment, refine project design where necessary, and support the development of appropriate mitigation measures for bats in accordance with Irish and European wildlife legislation and current industry guidance.

Eight bat species were recorded during the surveys: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat, Daubenton's bat, Natterer's bat and whiskered bat. Common pipistrelle was the most frequently recorded species, followed by Leisler's bat and soprano pipistrelle. Activity levels were highest during the spring survey period and lowest during summer.

No buildings, structures or significant tree roosts were identified within the turbine study area, and no evidence of bat roosts was recorded during field surveys. The wider site is dominated by open PB4 cut bog habitat with limited ecological connectivity and relatively few features likely to support regular commuting or concentrated foraging by bats. A single tree with limited roosting potential was recorded adjacent to the proposed underground electricity line route.

The species considered to be at greatest risk of collision with wind turbines in Ireland, namely common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle and Leisler's bat, were all recorded.

The proposed development is located within a landscape that generally offers limited habitat suitability for bats, with low levels of connectivity and an absence of important roosting features within the turbine area. However, surveys confirmed regular use of the site by several bat species, including all four species considered to be at higher risk of turbine collision.

Based on the NatureScot assessment framework, the project is considered to represent a medium-risk site for bats, reflecting the combination of a medium-sized wind farm development and moderate habitat risk. Although overall bat activity is concentrated in a small number of locations and periods, the presence of high collision-risk species means that bats must be considered carefully during the impact assessment process. Appropriate mitigation and operational measures will therefore be required to ensure that potential effects on bats are avoided, reduced or managed in accordance with best practice and relevant legislation.

Overall, the surveys indicate that the site supports a typical assemblage of Irish bat species, with no significant roost resource identified within the turbine development area, but with sufficient activity by high-risk species to warrant further consideration during the EIAR and mitigation design process.

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B.1 Criteria for Assessing Habitat Risk for Bats

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# Acronyms and Abbreviations

| | |
|---|---|
| BCI | Bat Conservation Ireland |
| BCT | Bat Conservation Trust |
| CIEEM | Chartered Institute of Ecology and Environmental Management |
| CSZ | Core Sustenance Zone |
| EIA | Environmental Impact Assessment |
| EIAR | Environmental Impact Assessment Report |
| EPA | Environmental Protection Agency |
| EU | European Union |
| UGL | Underground Electricity Line |
| ITM | Irish Transverse Mercator |
| NBDC | National Biodiversity Data Centre |
| NHA | Natural Heritage Area |
| NPWS | National Parks and Wildlife Service |
| NS | NatureScot |
| OD | Ordnance Datum |
| pNHA | proposed Natural Heritage Area |
| PRF | Potential Roost Feature |
| PRF-I | Potential Roost Feature suitable for individual bats only |
| PRF-M | Potential Roost Feature suitable for multiple bats and potentially a maternity roost |
| QI | Qualifying Interest |
| SAC | Special Area of Conservation |
| SLR | SLR Environmental Consulting (Ireland) Ltd |
| SM4-FS | Wildlife Acoustics Song Meter 4 Full Spectrum Bat Detector |
| THR | Turbine Haul Route |
| T9, T10, T11 | Turbine/Detector Locations 9, 10 and 11 |

# 1.0 Introduction

## 1.1 Background

SLR Consulting Ireland Ltd (hereafter 'SLR') was commissioned by Cush Wind Limited in July 2024 to undertake baseline bat surveys necessary to inform the Environmental Impact Assessment (EIA) for the proposed Cush Wind Farm Phase II (hereafter 'the project'). The project will be situated in west County Offaly, ca. 4km north of Birr and ca. 28km west of Tullamore (hereafter "the project site"). This baseline report provides the results of surveys for bats, carried out between May to September 2025.

## 1.2 Project Overview

The project assessed within this EIAR comprises a 3 no. wind turbine extension to the permitted Cush Wind Farm Phase I[1], together with all associated and ancillary infrastructure and works.

The proposed turbines will be selected from within the turbine dimension range assessed in the EIAR, comprising:

- an overall tip height of 199.1m to 200m;
- a hub height of 111.6m to 120.9m; and
- a rotor diameter of 158m to 175m.

The project also includes turbine foundations and crane hardstanding areas; new and upgraded access tracks; internal underground electrical and communications cabling; site drainage and rehabilitation works; peat and spoil management measures; a proposed electrical switch room building and associated compound; and a c.5km underground electricity line extending from the proposed electrical switch room to facilitate connection of the proposed wind farm to the national electricity network[2].

Temporary and permanent accommodation works will also be required at locations along the turbine component haul route to facilitate the delivery of abnormal loads.

The proposed wind farm site is located in rural County Offaly, approximately 4km north of Birr and c.28km south-west of Tullamore. The proposed turbines are located within the townlands of Galros East, Whigsborough, Ballycollin, and Eglish,.

For the purposes of the bat surveys and assessment, the relevant project components comprise the proposed turbine locations and associated wind farm infrastructure, together with the underground electricity line route. References within this report to individual components of the project are made to assist in describing the survey areas and potential ecological interactions and do not alter the overall definition of the project assessed within the EIAR.

A full description of the project is provided at **Chapter 3** of the EIAR.

For clarity, where individual components of the project are referred to separately within this report, such references are used only to assist the reader in understanding the particular

[1] An Coimisiún Pleanála Reference: ABP-318816-24

[2] The proposed Mullanafawnia 110kV substation is being promoted separately by a third party developer and does not form part of the project for which planning permission is sought. However, having regard to the functional relationship between the project and the proposed substation, the proposed Mullanafawnia 110kV substation is assessed cumulatively throughout this EIAR, where relevant.

element under assessment. They do not alter the overall definition of the project assessed in this EIAR. These include:

- Wind Farm or Main Project Site – Refers to that within the red line boundary only;
- Underground electricity line (UGL) – Refers to the proposed underground electricity cable;
- Substation – Refers to the proposed substation;
- Haul route – Refers to the turbine delivery route.

## 1.3 Site Description

The project is located in rural County Offaly, approximately 4km north of the town of Birr and c.28km south-west of Tullamore, County Offaly.

For the purposes of this report, the project is described by reference to the proposed wind farm site and the underground electricity line route. These references are used to assist in describing the bat survey areas and ecological characteristics of individual elements of the project and do not alter the overall definition of the project assessed within the EIAR.

The proposed wind farm site is located in the townlands of Galros East, Whigsborough, Ballycollin, and Eglish. The 3 no. proposed turbine locations are situated on Galros Bog, an area historically subject to industrial peat production which is now predominantly characterised by cutaway raised bog. The bog is generally flat to gently sloping and is extensively drained by a network of open drains. Ground elevations across Galros Bog range from approximately 47m to 56m OD.

The N62 national road extends along the western side of Galros Bog. Areas of conifer plantation occur adjacent to the southern part of the bog and the West Galros Stream, a tributary of the Rapemills River, flows along the south-western side of the bog. The wider landscape comprises a mixture of former industrial peatland, agricultural grassland, hedgerows, drainage channels, forestry and dispersed rural residential development.

The c.5km underground electricity line route extends from the proposed electrical switch room through predominantly private agricultural grassland. The route crosses the N52 national road and L7006 local road and runs adjacent to the Rapemills River for approximately 2.5km, crossing the river at 2 no. locations. Ground elevations along the route generally range from approximately 50m to 65m OD.

A full description of the project and its geographical context is provided in Chapter 3 of the EIAR.

## 1.4 Scope of Study

The main aim of the surveys is to provide baseline data to inform the wind farm design process and inform the Environmental Impact Assessment (EIA) Report. More specifically, this report aims to:

- Identify the locations of any bat roosts, swarming sites, and key commuting or foraging habitat features that could be affected by the project;
- Determine the bat assemblage using the project site for foraging or commuting purposes;
- Compare levels of bat activity between recording locations both within the project site and between seasons, to identify locations that may be of most importance to commuting or foraging bats, or indicate the nearby presence of a roost; and

- Undertake analysis to determine, if possible, relative levels of activity compared with other sites, using the online Ecobat tool[3].

The survey methodology was designed in accordance with current NatureScot wind farm-specific guidance[4] (hereafter 'NS'; while this guidance is Scottish, the guidance has been adopted in Ireland as industry-standard) and CIEEM-recommended bat survey methodology[5] (see Section 2.2.6 for specific limitations). In addition, Bat Conservation Ireland guidance published in 2012[6] was also used where NS guidance was considered inappropriate in an Irish context e.g. defining the appropriate weather conditions for bat activity.

This report presents the findings of the bat surveys only. The assessment of impacts resulting from the project and the subsequent application of the mitigation hierarchy is beyond the scope of this report but will be addressed in the EIAR.

NS guidance[4] suggests a standardised format for presenting bat data and specifically, quantifying activity and species vulnerability, which relies on use of the Ecobat tool.

## 1.5 Relevant Legislation

### 1.5.1 Irish Legislation

Under Schedule 5 of the Wildlife Acts 1976 to 2021[7] (and as strengthened by the Wildlife Amendment Act, 2000[8]), all bat species and their roosts are protected by law. It is an offence to disturb bats or their roosts without an appropriate licence from the National Parks and Wildlife Service (NPWS).

The Wildlife Amendment Act (2000) is also the legal instrument through which Natural Heritage Areas (NHAs) are protected. These are areas containing habitats or species that require legal protection from damage, which can include bats. Not all NHAs have received statutory designation, and these are termed proposed Natural Heritage Areas (pNHAs). While lacking the same level of legal protection as NHAs, pNHAs are subject to limited protection via agri-environmental planning schemes and the recognition of the ecological value of pNHAs by planning and licencing authorities.

### 1.5.2 EU Legislation

Under the Habitats Directive 1992 (92/43/EEC)[9], member states of the European Union must designate Special Areas of Conservation (SACs), which form part of the EU-wide Natura 2000 protected area network. The aim of this network is to safeguard biodiversity against potentially damaging developments. SACs are designated based on the presence of habitats or species (known as 'qualifying interests' or QIs) listed under Annex I or Annex II of

[3] The Mammal Society. EcoBat. An EcoStat tool. Available online: http://www.mammal.org.uk/science-research/ecostat/ [Last accessed 23/10/2026].

[4] NatureScot (formerly 'Scottish Natural Heritage' or SNH), Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, University of Exeter & Bat Conservation Trust (2021) Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. Available online at: https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation [Last accessed 23/10/2026]

[5] Collins, J. (ed.) (2023, updated 2024) Bat Surveys for Professional Ecologists: Good Practice Guidance (4th dn). The Bat Conservation Trust, London.

[6] Bat Conservation Ireland (2012) Wind Turbine/Wind Farm Development Bat Survey Guidance, Version 2.8, December 2012. Bat Conservation Ireland, www.batconservationireland.org.

[7] https://www.irishstatutebook.ie/eli/1976/act/39/enacted/en/html#zza39y1976 [Last accessed 23/10/2026]

[8] https://www.irishstatutebook.ie/eli/2000/act/38/enacted/en/print.html [Last accessed 23/10/2026]

[9] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043 [Last accessed 23/10/2026]

the Habitats Directives, respectively. The only species of bat in Ireland that is listed under Annex II of the Habitats Directives is the lesser horseshoe bat *Rhinolophus hipposideros*.

While strict protection is afforded SACs, all species of bat in Ireland also receive additional protection under Annex IV of the Habitats Directive. This prohibits the deliberate disturbance of bat species (particularly during the periods of breeding, nursing, and hibernation), as well as the deterioration and/or destruction of roosts across their entire natural range within the EU, both within and outside Natura 2000 sites.

### 1.5.3 Other International Legislation

Ireland has ratified two international wildlife laws pertaining to bats:

- The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention, 1982)[10]. Part of this convention stipulates that all bat species and their habitats are conserved; and
- The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979)[11]. The aim of this convention was to protect migratory species (which includes some species of bats) across all European borders.

# 2.0 Methodology

## 2.1 Desk Study

A desk-based study has been undertaken to identify sources of pre-existing ecological data of relevance that could inform the EIA.

This included examination of:

- Recent satellite maps to identify features of potential value to bats at the Project Site:
    - Obtained via satellite images available on https://earth.google.com/web/ [Last accessed 23/10/2026]. This was used to conduct an Initial Site Risk Assessment, assigning the habitats within the Project Site to a risk category (low, moderate or high) using criteria provided within NatureScot guidance and reproduced in **Appendix B**. Habitat suitability was assigned to individual features with the exception of areas of conifer plantation that were described as a block. Satellite images were also searched for any potential roost features (e.g. buildings/structures, caves or trees) within 200 m of the planning application red line boundary plus rotor radius.

      The final turbine model has not yet been selected and will be chosen from within the turbine dimension range assessed for the project. For the purposes of defining the bat survey area, the maximum and minimum rotor diameter permutations within that range were considered, as these represent the outer limits of the potential rotor-swept area. These survey extents ensure that the full turbine dimension range has been taken into account for the purposes of the bat survey. The corresponding survey radii were calculated as follows:

        - i. Maximum rotor diameter permutation – 175m rotor diameter (87.5m rotor radius): 287.5m, comprising the 200m survey buffer plus the 87.5m rotor radius; and

[10] https://www.coe.int/en/web/bern-convention?_sm_au_=iVVtWnJSVsMSFDZ5 [Last accessed 23/10/2026]

[11] https://www.cms.int/ [Last accessed 23/10/2026]

    - ii. Minimum rotor diameter permutation – 158m rotor diameter (79m rotor radius): 279m, comprising the 200m survey buffer plus the 79m rotor radius.

  The bat landscapes suitability index for the Project Site[12]:

  - The index ranks landscapes from least (0) to most favourable (100) using records held by Bat Conservation Ireland (BCI) and landscape features to train a predictive model that identifies geographical areas suitable for individual bat species;

- Bat species and roost records within 10 km from the Project Site[13];
- Maps of nationally and internationally designated sites for bats within 10 km from the Project Site[14];
- The location of the Project Site in relation to the edge of bat species' known Irish ranges[15];
- The location of wind energy developments and other projects within 10 km from the Project Site that could contribute to cumulative effects on local bat populations[16]; and
- The Environmental Statements (ES) of wind energy developments or other projects within 10 km of the Project Site containing information relating to bats[16].

## 2.2 Field Survey Methodology and Rationale

The field survey methodology was designed with reference to current wind farm specific guidance[4]. It comprises deployment of a suite of automated full spectrum detectors at three turbine locations at ground level and habitat appraisal for winter and summer roosts.

Similarly, the guidance states that the use of walked transects should be discretionary and site-specific[4]. The choice of methods must be appropriate to identify connections between nearby roosts, linear features and potential key foraging areas across the development footprint. Due to absence of bat roosting habitat at the project site identified during the habitat appraisal and desk-search, transect surveys were not judged as necessary.

Full details of each survey type are provided below; where the methodology deviates from the guidance, a rationale has been provided.

### 2.2.1 Bat Survey Study Areas

The spatial extent of the bat surveys varied according to the survey type and the component of the Proposed Project being assessed. The survey areas are shown in **Figure 2**.

[12] Obtained via Biodiversity Ireland https://maps.biodiversityireland.ie/Map [Last accessed 23/10/2026].

[13] Obtained via data request from Bat Conservation Ireland (BCI) received 25/11/2022 and a search of the records contained in 10 km grid squares N00, N01, N10, N11 by the National Biodiversity Data Centre (NBDC) https://maps.biodiversityireland.ie/Map [Last accessed 23/10/2026].

[14] Obtained via EPA map viewer https://gis.epa.ie/EPAMaps/ [Last accessed 23/10/2026].

[15] Obtained via maps contained under Article 17 reporting https://www.npws.ie/publications/article-17-reports/article-17-reports-2019 [Last accessed 23/10/2026].

[16] Obtained via the EIA portal https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1, myplan: https://myplan.ie/national-planning-application-map-viewer/

Wind Energy Ireland: https://windenergyireland.com/about-wind/interactve-map
Offaly County Council https://www.eplanning.ie/OffalyCC/searchexact [all last accessed 23/10/2026].

#### 2.2.1.1 Preliminary Ecological Appraisal – Daytime Bat Walkover (DBW)

**Wind Farm Site**

NatureScot (2021) guidance states that key features that could support maternity roosts (i.e. summer) and significant hibernation (i.e. winter) and / or swarming sites within 200 m plus rotor radius of the proposed turbines and of the site boundary should be subject to further investigation. For the purpose of the DBW, the study areas for the wind farm site followed NS guidance of 200m plus rotor radius of the proposed development red line boundary. For the two turbine parameter range permutations being considered these were:

- 287m survey area – Based on the maximum rotor diameter permutation of 175m rotor diameter (i.e. 87.5m rotor radius); and
- 279m survey area – Based on the minimum rotor diameter permutation of 158m rotor diameter (i.e. 79m rotor radius).

**Underground Electricity Line**

The study areas for the underground electricity line route was 50m radius of the proposed route where permissible.

**Turbine Haul Route (THR)**

The study areas for the THR was the footprint of works at nodes.

#### 2.2.1.2 Preliminary Roost Assessment (PRA)

**Wind Farm Site**

The study areas for PRA of the wind farm site were the same as those outlined in Section 2.2.1.1. This focussed on any features identified during the DBW.

#### 2.2.1.3 Activity Survey – Static Detector Surveys (Ground-Level)

NS guidance states that survey effort should be focused in areas of the development site where turbines are likely to be located. Detectors should be placed at or close to all known turbine locations at wind farms containing less than ten proposed turbines. Where there are more than ten proposed turbines, detectors should be placed at ten turbine locations plus a third of additional potential turbine sites for up to a maximum of 40 detectors for the largest developments. As the proposed project comprises three turbines, a detector was placed at each of the proposed turbines.

### 2.2.2 Preliminary Ecological Appraisal – Daytime Bat Walkover

A Daytime Bat Walkover (DBW) was undertaken on 04th April 2025. The study area, as identified in Section 2.2.1.1, was walked during daylight hours to characterise the habitats present and assess their suitability for bats. Consideration was given to the availability and distribution of potential foraging habitat, linear features that could facilitate commuting, and connectivity between the Project site and the wider landscape. This data informed an initial site risk assessment following NS guidance, assigning the habitat within the survey area to a risk category (low, moderate or high) as reproduced in Appendix B-1.

**Table 1 Categories of suitability[5] – Potential flight-paths and foraging habitats**

| Suitability | Description |
|---|---|
| None | No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitat that provides continuous lines of |

| Suitability | Description |
|---|---|
| | shade/protection for flight-lines, or generates/shelters insect populations available to foraging bats). |
| Negligible | No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour. |
| Low | Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.<br>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 | Continuous habitat connected to the wider landscape that could be used by bats for flight-paths such as lines of trees and scrub or linked back gardens.<br>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water. |
| High | Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths 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.<br>Site is close to and connected to known roosts |

Potential roosting features (PRFs) were also identified. These were categories as per Table 2 - Table 3 below.

**Table 2 Categories of bat roost suitability[5] - Structures**

| Suitability | Description |
|---|---|
| None | No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/suitable shelter at all ground/underground levels). |
| Negligible | No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.<br>Negligible is defined as 'so small or unimportant as to be not worth considering, insignificant'. This category may be used where there are places that a bat could roost or forage (due to one attribute) but it is unlikely that they actually would (due to another attribute). |
| Low | A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate 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 and not a classic cool/stable hibernation site but could be used by individual hibernating bats). |
| Moderate | A structure 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 large numbers due to conservation status (with respect to roost type only such as maternity or hibernation – categorisation described in table made irrespective of precise conservation status which is established after presence is confirmed). |

| Suitability | Description |
|---|---|
| High | A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions<br>and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/stable hibernation site. |

**Table 3 Categories of describing suitability of PRFs - Trees[5]**

| Suitability | Description |
|---|---|
| None | Either no PRFs in the tree or highly unlikely to be any. |
| FAR | Further Assessment Required to establish if PRFs are present in the tree. |
| PRF | A tree with at least one PRF present. |

### 2.2.3 Preliminary Roost Assessment

Trees, structures and other features identified during the DBW as having potential to support roosting bats were subject to a Preliminary Roost Assessment (PRA) to assess the characteristics of identified Potential Roost Features (PRFs), determine their suitability to support roosting bats and identify any requirement for further survey.

PRFs were inspected externally from ground level, where accessible and visible, using binoculars and a high-powered torch as appropriate. The assessment considered the type and characteristics of each PRF, its accessibility and suitability for bats, and any evidence indicative of bat use, including droppings, staining, feeding remains or other field signs.

Trees were classified according to their suitability to support roosting bats using the categories set out in the BCT Guidelines (Collins, 2023), as reproduced in Table 4.

**Table 4 Categories of bat roost suitability - Trees[5]**

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

If structures were present, an external bat survey was undertaken. This involved a thorough and systematic inspection of the outside of a structure to identify potential or existing bat access points, roosting locations, and any signs of bat activity. Surveyors looked for evidence such as live or dead bats, droppings, urine staining, fur-oil marks, and audible squeaking, with bat specimens and droppings providing the most reliable confirmation of presence. The inspection covered all accessible external features, including the ground beneath likely entry points, windowsills, walls, peeling paint, damaged render, hanging tiles, weatherboarding, eaves, fascias, soffits, flashing around chimneys, roof felt, tiles, slates, bat boxes, and any gaps in brickwork or stonework that could have provided access to cavities.

### 2.2.4 Activity Survey

#### 2.2.4.1 Static Detector Survey (Ground Level)

Detectors were deployed at the specified locations in Section 2.2.1.3.

Table 5 presents the deployment dates for the static detector (ground level) survey.

**Table 5Static Bat Detector Deployment**

| Season | Sampling Location(s) | Dates of Deployment | Length of Recording Period |
|---|---|---|---|
| Spring 2025 | T9, T10, T11 | 06th May 2025 – 15th May 2025 | 10 nights |
| Summer 2025 | T9, T10, T11 | 04th June 2025 – 15th June 2025 | 12 nights |
| Autumn 2025 | T9, T10, T11 | 16th September 2025 – 26th September 2025 | 10 nights |

Detectors (Wildlife Acoustics SM4-FS) were deployed with microphones attached to wooden stakes or trees approximately 1-2m above ground level, with detectors programmed to record from 30 minutes before sunset until 30 minutes after sunrise.

The locations of each static detector are shown in Figure 2 and Table 6.

**Table 6 Static Bat Detector Locations – Description**

| Sample Point | Co-ordinates (ITM) | | Description | Distance from Nearest Turbine Location |
|---|---|---|---|---|
| | Easting | Northing | | |
| T9 | 608636 | 710729 | Open, PB4 cutover bog habitat with no linear features adjacent | At proposed location |
| T10 | 608275 | 711034 | Open, PB4 cutover bog habitat with no linear features adjacent | At proposed location |
| T11 | 608944 | 711100 | Open, PB4 cutover bog habitat with no linear features adjacent | At proposed location |

### Weather Data and Survey Dates

The NS guidance states that 10 nights of data per season should be collected, within appropriate weather conditions, specifically with a sunset temperature of 10°C or above, ground level wind speed of 5m/s or lower, and no rain or very light rain. This guidance is for Scotland, and for Ireland Bat Conservation Ireland guidance[4] state that sunset temperatures should be 7°C or above.

The NS guidance also states that while surveys should aim for 10 consecutive nights, in practice weather conditions may preclude this, particularly early or late in the year and in more northerly latitudes. The guidance also goes on to say that in more northerly latitudes, there will be limitations on the number of suitable nights and some surveys may need to take place over longer periods which sample a range of conditions. In such cases, the survey period should be planned and justified by the ecologist and the effect on bat behaviours considered taking account of weather forecasts.

The reading closest to sunset for each night was used to assess the suitability of temperature following the methodology outlined in NS and CIEEM-recommended guidance.

For wind, an average per night was determined based on the period between sunset and sunrise. This period was then used to work out the average nightly wind speed. If the average was less than 5m/s the night was considered suitable for bat surveys. Weather data was sourced from a combination of online sources.

For the purposes of this assessment, light rain has been classified as total nightly rainfall less than 2 mm and/or less than 1 mm of rainfall in any one-hour period throughout the night. The same protocol for determining night length across deployments was used as described above.

The details of the weather conditions are provided in Table G-1 in Appendix G.

### 2.2.5 Bat Sonogram Analysis

Bat calls were analysed in full spectrum format using Kaleidoscope Pro (version 5.6.3) software. An auto identification filter within Kaleidoscope Pro was used initially to assign calls to likely species, using a Bats of Europe filter (version 5.4.0) for Ireland. This software allows data to be classified automatically with bat species which fit the same call characteristics that each call file provides.

While the auto identification is efficient, it is not totally infallible, therefore the following manual checks by an experienced ecologist skilled in bat call identification were also undertaken with reference to key identification as follows:

- All files classified as 'no ID' were manually checked and assigned to a species, using call parameters within Russ (2021)[17];
- A randomly selected 10% subset of files assigned by the filter as being noise were also checked manually, to ensure no faint calls were missed;
- *Myotis* calls were identified to species level and putative Nathusius' pipistrelle *Pipistrellus nathusii* calls were manually checked, all using the parameters[18] contained within Russ (2021); and
- Social calls were identified to species level using Middleton et al. (2014).

This report refers to "bat passes"; a bat pass has been defined as a single file captured by the bat detector, which contains two or more bat calls (likely attributed to the same bat). The number of bat passes does not relate to the number of bats present in one location (as one bat may make several passes); rather, it gives an indication of the level of bat activity in that location over each recording period. Note that where more than one species was identified within the same bat pass, the pass was manually split into two so an accurate number of bat passes split by species was obtained. The presentation and statistical analysis of all bat call results was completed in Excel.

### 2.2.6 Limitations

In all the deployment sessions, it was not possible to collect 10 consecutive nights of static bat data in suitable weather conditions. However, there were 10, 9, and 7 suitable nights for the spring, summer and autumn sessions, respectively. All 10 nights of the spring season met the optimal weather conditions. In summer, 9 nights met these criteria. However, there was one additional night that exceeded the threshold for appropriate weather conditions by 0.1m/s where average nightly wind speed was 5.1m/s rather than the recommended 5m/s.

[17] Russ, J. (2021) British Bat Calls. A Guide to Species Identification. Pelagic Publishing, Exeter.

[18] Calls with a peak frequency of 41kHz or less were considered to be Nathusius' pipistrelle, which was further confirmed by detailed interrogation to check the absence of common pipistrelle calls immediately before or after the putative Nathusius' pipistrelle calls

However, the BCT (2023) guidelines also allow for up to 5.4 m/s.In the autumn deployment session, there were seven nights that met these criteria. However, there was one additional night that exceeded the threshold for appropriate weather conditions by 0.3m/s where average nightly wind speed was 5.3m/s rather than the recommended 5m/s. However, the BCT (2023) guidelines also allow for up to 5.4 m/s.

However, all survey dates were retained for analysis, as bat calls were still recorded in sub-optimal weather conditions, suggesting that the conditions recorded did not significantly reduce bat activity. Furthermore, nights with suitable weather conditions sometimes had lower levels of bat activity than those with unsuitable weather conditions.

## 2.3 Evidence of Technical Competence and Experience

### 2.3.1 Habitat Appraisal for Potential Bat Roost Features and Assessment of Habitat Risk

Sinéad Clifford carried out searches for potential bat roosts, and habitat mapping.

### 2.3.2 Activity Survey – Static Bat Detector Survey (Ground-Level)

Static detectors were deployed and collected each season. This was carried out by Lorcan Kelly and Kieran Moynihan.

### 2.3.3 Analysis and Reporting

Bat call analysis and reporting was undertaken by Sinéad Clifford. This report was reviewed by Dr Andrew Torsney.

### 2.3.4 Personnel

#### 2.3.4.1 Sinéad Clifford

Sinéad is Energy Sector Lead (Ireland) and an Associate Ecologist with SLR. Sinéad holds a BSc (Hons) Wildlife Biology from Institute of Technology Tralee, and a Certificate in Ecological Consultancy (Distinction) from Ecology Training UK (formerly Acorn Ecology). Sinéad has worked in ecological consultancy since 2018. She has designed and implemented numerous bat surveys for a wide range of diverse projects during her career. Sinéad is highly experienced in the analysis of bat call data, has written multiple baseline bat reports and undertaken impact analysis for bats for many wind farm projects.

#### 2.3.4.2 Kieran Moynihan

Kieran is a Senior Field Ecologist with SLR and has worked in consultancy since 2022. He has a BSc (Hons) in Biological, Earth and Environmental Sciences (Ecology) from University College Cork. Kieran has experience of carrying out bat transects, roost surveys, emergence and re-entry surveys and deployment of static detectors.

#### 2.3.4.3 Michael James

Michael James (MJ) – Michael is a Graduate Ecologist with SLR. Michael holds a BA (Hons) in Zoology from Trinity College Dublin and is a qualifying member of CIEEM. Since starting at SLR, Michael has been involved in various surveys. These include bat surveys for wind farms. He has also conducted bat emergence surveys and habitat surveys for other projects.

#### 2.3.4.4 Andrew Torsney

Dr Andrew Torsney – This report was reviewed by Andrew. He is the Regional Lead for Ecology in Ireland and a seasoned environmental consultant with over 14 years of experience, having spearheaded a diverse range of projects spanning local to national scales. His expertise includes the successful management of high-impact national initiatives, such as the National Grid Implementation Plan for EirGrid and Fáilte Ireland's National Tourism Monitoring Programme. Andrew's proficiency extends beyond project management, showcasing his ability to deliver complex technical reports and provide strategic environmental guidance that aligns with both regulatory frameworks and stakeholder expectations. Andrew is a recognised bat specialist with extensive experience in bat ecology, survey design, impact assessment and mitigation. He authored the bat identification guide for the National Biodiversity Data Centre and has undertaken research developing habitat suitability models for six bat species within the Yorkshire Dales National Park. His research also includes investigations into swarming behaviour and migratory bat movements in Poland, alongside population genetic cluster analyses in Devon. Andrew holds a national bat derogation licence and has acted as Technical Associate and technical lead on numerous complex bat projects, including the offshore bat assessment for the Dublin Array Offshore Wind Farm. His expertise spans roost assessment, activity survey design, collision risk assessment, habitat connectivity, mitigation strategy development and the application of emerging evidence to inform planning and appropriate assessment.

## 2.4 Assessment of Relative Bat Activity Levels

In accordance with NS guidance[2], the relative level of bat activity recorded during the static detector surveys should be analysed through the use of the secure online tool Ecobat[19], initially designed by the University of Exeter and now hosted and developed by the Mammal Society (Lintott et al. (2018))[20]. Ecobat compares data entered by the user with bat survey information collected from similar areas at the same time of year and (where possible) in comparable weather conditions. Ecobat generates a percentile rank for each night of activity and provides a numerical way of interpreting the relative levels of bat activity recorded at a site with other sites across the same regions or across Ireland as a whole.

# 3.0 Results

## 3.1 Desk Study

### 3.1.1 Habitat Assessment

Online satellite images identified no structures/buildings or trees that could be used by roosting bats within 287.5m or 279m of the proposed turbines during the desk study. Similarly, there were no trees identified from satellite imagery within these two search areas.

There was a lack of linear habitats that could be used by foraging and/or commuting bats within 200m plus rotor radii of T10 and T11. There was limited suitability of habitats within the study area of T9, with a linear section of disconnected scrub noted on the southern extent of the search area. This habitat is poorly connected to the wider landscape.

[19] http://www.mammal.org.uk/science-research/ecostat/

[20] Lintott, P. R., Davison, S., Breda, J., Kubasiewicz, L., Dowse, D., Daisley, J. & Mathews, F. (2018). Ecobat: An online resource to facilitate transparent, evidence-based interpretation of bat activity data. Ecology and Evolution 8(2): 935- 941.

#### 3.1.1.1 Bat Landscapes

For the proposed wind farm site and the third of the proposed underground electricity line closest to the wind farm, the score is 26.56 (out of a maximum score of 100). For the remainder of the proposed UGL the score is 33.78 (out of a maximum score of 100). A full breakdown is provided in Table 7 with an explanation provided below.

The area within which T9, T10, T11 are located has a high bat landscapes suitability index for soprano pipistrelle, brown long-eared bat, common pipistrelle, and Leisler's bat. There is moderate suitability for whiskered bat, Daubenton's bat, and Natterer's bat. The bat landscapes suitability index is classified as low for lesser horseshoe bat, and Nathuisus' pipistrelle.

The area within which the remainder of the UGL is located has a high bat landscapes suitability index for soprano pipistrelle, brown long-eared bat, common pipistrelle, Leisler's bat, and Natterer's bat. There is moderate suitability for Daubenton's bat, and whiskered bat. The bat landscapes suitability index is classified as low for lesser horseshoe bat, and Nathuisus' pipistrelle.

**Table 7 Bat Landscape Suitability Index at Project Site**

| Location and Species | Landscape Suitability Index (out of maximum 100) |
|---|---|
| T9, T10, T11, part of UGL | |
| All Bats | 26.56 |
| Pipistrellus pygmaeus | 36 |
| Plecotus auritus | 36 |
| Pipistrellus pipistrellus | 39 |
| Rhinolophus hipposideros | 1 |
| Nyctalus leisleri | 36 |
| Myotis mystacinus | 29 |
| Myotis daubentonii | 26 |
| Pipistrellus nathusii | 1 |
| Myotis nattereri | 35 |
| **Part of UGL** | |
| All Bats | 33.78 |
| Pipistrellus pygmaeus | 45 |
| Plecotus auritus | 44 |
| Pipistrellus pipistrellus | 52 |
| Rhinolophus hipposideros | 2 |
| Nyctalus leisleri | 48 |
| Myotis mystacinus | 29 |
| Myotis daubentonii | 36 |
| Pipistrellus nathusii | 1 |
| Myotis nattereri | 47 |

### 3.1.2 Bat / Roost Records

#### 3.1.2.1 NBDC Data

NBDC has records for five bat species recorded within the 10 km grid squares (N01, N10, N11) that overlaps the project site as shown in Table 8. The type of record (i.e. roost, flying, call) is not stated.

**Table 8 Records of Bat Species within 10km of Project Site**

| 10km Grid Square | Bat Species | Records | Last Record |
|---|---|---|---|
| N01 | Common Pipistrelle (Pipistrellus pipistrellus s.s.) | 5 | 12/09/2018 |
| N01 | Daubenton's Bat (*Myotis daubentonii*) | 193 | 04/09/2021 |
| N01 | Leisler's Bat (Nyctalus leisleri) | 2 | 18/05/2012 |
| N01 | Pipistrelle (P. pipistrellus s.l.) | 1 | 18/05/2012 |
| N01 | Soprano Pipistrelle (*Pipistrellus pygmaeus*) | 5 | 12/09/2018 |
| N10 | Brown Long-eared Bat (*Plecotus auritus*) | 3 | 01/07/2018 |
| N10 | Common Pipistrelle (Pipistrellus pipistrellus s.s.) | 29 | 22/05/2019 |
| N10 | Daubenton's Bat (*Myotis daubentonii*) | 4 | 11/07/2018 |
| N10 | Leisler's Bat (Nyctalus leisleri) | 7 | 11/07/2018 |
| N10 | Soprano Pipistrelle (*Pipistrellus pygmaeus*) | 14 | 22/05/2019 |
| N11 | Common Pipistrelle (Pipistrellus pipistrellus s.s.) | 12 | 22/05/2019 |
| N11 | Daubenton's Bat (*Myotis daubentonii*) | 6 | 02/07/2018 |
| N11 | Leisler's Bat (Nyctalus leisleri) | 1 | 02/07/2018 |
| N11 | Soprano Pipistrelle (*Pipistrellus pygmaeus*) | 6 | 22/05/2019 |
| N11 | Pipistrelle (P. pipistrellus s.l.) | 1 | 18/05/2012 |

#### 3.1.2.2 Bat Conservation Ireland Data

Bat Conservation Ireland data (confidential **Appendix D** and **Appendix E**) show that 12 recorded bat roosts are located within 10km from the project site. The closest roost (ca. 4.43km north-east of the nearest turbine (T11) is a brown long-eared bat roost. The remaining roosts are for soprano pipistrelle (two separate roosts), Leisler's bat (five separate roosts), Daubenton's bat (two separate roosts), whiskered bat (one separate roost), common pipistrelle (one separate roost), and a mixed roost for brown long-eared bat and whiskered bat.

None of the recorded roosts have ecological connectivity to the project site i.e., the core sustenance zones (CSZ)[21] as measured from the roost, do not overlap with the project site.

The BCI data showed there were no roosts adjacent to the underground electricity line.

[21] A CSZ as applied to bats, refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roosts. If bat commuting and foraging habitats within the CSZ are affected by the project, then this could affect bats using the roost. Core_Sustenance_Zones_Explained_04.02.16.pdf (bats.org.uk) [Last accessed October 2023]

Seven species were recorded by transects or as ad-hoc observations: Myotis daubentonii, Myotis nattereri, Plecotus auritus, Nyctalus leisleri, Pipistrellus nathusii, Pipistrellus pipistrellus, Pipistrellus pygmaeus, and additionally Myotis spp., and Pipistrellus spp.

### 3.1.3 National and International Designated Sites

Designated sites within 20 km of the Project Site are shown in **Table 9** and **Figure 3**.

There are 19 pNHAs and two NHAs within 10 km of the Project Site. None of the NHAs are designated for bats; however, there are five pNHAs designated for bats.

There are 6 SACs within 10 km of the Project Site, but none are designated for bats.

**Table 9 Designated Sites within 10km of Project Site**

| Site Name | Site Code | Distance from Project Site (km) | Designated for Bats? | Within the CSZ for species? |
|---|---|---|---|---|
| **Internationally Designated Sites** | | | | |
| Ridge Road, SW of Rapemills SAC | 000919 | 4.67 | No | N/A |
| All Saints Bog and Esker SAC | 000566 | 5.53 | No | N/A |
| Island Fen SAC | 002236 | 7.08 | No | N/A |
| River Shannon Callows SAC | 000216 | 7.80 | No | N/A |
| Lisduff Fen SAC | 002147 | 8.79 | No | N/A |
| Ballyduff/Clonfinane Bog SAC | 000641 | 9.42 | No | N/A |
| Nationally Designated Sites | | | | |
| NHA | | | | |
| River Little Brosna Callows NHA | 000564 | 6.37 | No | N/A |
| Killeen Bog NHA | 000648 | 7.73 | No | N/A |
| pNHA | | | | |
| Lough Coura | 000909 | 0.90 | No | N/A |
| Woodville Woods | 000927 | 2.11 | No | N/A |
| Ross And Glenns Eskers | 000920 | 3.25 | No | N/A |
| Dovegrove Callows | 000010 | 4.04 | No | N/A |
| Ridge Road, SW Of Rapemills | 000919 | 4.68 | No | N/A |
| Derrykeel Meadows | 000897 | 5.06 | No | N/A |
| All Saints Bog And Esker | 000566 | 5.52 | No | N/A |
| Birr (Domestic Dwelling No. 2, Occupied) | 000568 | 5.74 | Yes. A nursery roost for Leisler's bat. | No. While the pNHA is 2.97km from the application boundary at it's closest point, this relates to the junction |

| Site Name | Site Code | Distance from Project Site (km) | Designated for Bats? | Within the CSZ for species? |
|---|---|---|---|---|
| | | | | works. The pNHA is actually 4.29km from the main project site. As such, it is outside the CSZ for this species (i.e. 3km). |
| Birr (Domestic Dwelling No.1, Occupied) | 000569 | 5.77 | Yes. A nursery roost for Leisler's bat. | No. While the pNHA is 3.02km from the application boundary at it's closest point, this relates to the junction works. The pNHA is actually 4.17km from the main project site. As such, it is outside the CSZ for this species (i.e. 3km). |
| Banagher (Domestic Dwelling, Occupied) | 000567 | 6.19 | Yes. Summer and possible winter roost of brown long-eared bat. | No. This is outside the CSZ for this species (i.e. 3km). |
| Bracken's Dwelling, Near Whiteford | 002058 | 6.54 | Yes. A nursery roost for Leisler's bat. | No. This is outside the CSZ for this species (i.e. 3km). |
| Kinnitty (Domestic Dwelling, Occupied) | 000579 | 6.64 | Yes. A summer roost for Leisler's bat. | No. This is outside the CSZ for this species (i.e. 3km). |
| River Shannon Callows | 000216 | 7.80 | No | N/A |
| Lough Boora | 001365 | 9.02 | No | N/A |
| Grand Canal | 002104 | 9.08 | No | N/A |
| Ballyduff/Clonfinane Bog | 000641 | 9.43 | No | N/A |

### 3.1.4 Location of Project Site Relative to Bat Range Edges

The location of the project site is at the range edge (the definition of range used here is the Extent of Occurrence[22]) for Nathusius' pipistrelle, Natterer's bat, and whiskered bat. The 10km square (N01) that contains the proposed wind farm site is within the range of these species, but the next 10km square to the east (N11) which contains the UGL is immediately outside the range of Nathusius' pipistrelle and whiskered bat. According to NS guidance[2], the potential for negative impact is likely to increase where there are high risk bat species on the edge of their range. This applies to Nathusius' pipistrelle (high risk) but not for whiskered bat or Natterer's bat (both low risk). However, the range data comes from the latest Article 17 report[15]. That report acknowledged that there is much uncertainty surrounding its range and could be reflective of survey effort rather than true presence.

[22] The area contained within the shortest continuous imaginary boundary that can be drawn to encompass all the known, inferred, or project sites of present occurrence excluding cases of vagrancy.

### 3.1.5 Other Wind Energy Developments or Projects

**Table 10** outlines wind farms have been granted planning consent located within 10km of the project site:

**Table 10 Other Wind Energy Developments**

| Development | Planning Register Reference | Development Description | Status | Distance (km) |
|---|---|---|---|---|
| Cush Wind Farm (Phase I), Co. Offaly | An Coimisiún Pleanála Reference ABP-318816-24 | 8 no. wind turbines and all associated infrastructure. | Permitted | 0 |
| Cush Wind Farm Phase I Section 146B Alteration Request, Co. Offaly. | An Coimisiún Pleanála Reference ACP-324405-26 | Request to alter the permitted Cush Wind Farm Phase I development to provide for design flexibility in respect of the permitted turbine dimensions. | Proposed | 0 |
| Derrinlough Wind Farm<br>Co. Offaly | An Coimisiún Pleanála Reference ABP-306706-20 | 21 no. wind turbines and all associated infrastructure. | Existing | 2 |
| Meenwaun Wind Farm<br>Co. Offaly | 15/44 (An Coimisiún Pleanála Reference PL19.244903) | 4 no. wind turbines and all associated infrastructure | Existing | 3.0 |
| Carrig Renewables Wind Farm Grid Connection, Co. Tipperary & Co. Offaly. | 23/60140 | The development will consist of: (i) The provision of underground electrical cabling (38kV) from the townland of Townparks to the existing Dallow 110kV substation in the townland of Clondallow to facilitate the connection of the proposed Carrig Renewables Wind Farm. | Permitted | 3.5 |
| Cloghan Wind Farm<br>Co. Offaly | 14/188 (An Coimisiún Pleanála Reference PL19.244053), and 19/404 | 9 no. wind turbines and all associated infrastructure. | Existing | 4.0 |
| Cloghan Wind Farm Grid Connection<br>Co. Offaly | 19/555 | Approximately 8km of underground electricity cables. | Existing | 4.0 |
| Derrinlough Wind Farm<br>Co. Offaly | FMR 26/01 (Design Flexibility Request) | Proposed Battery Energy Storage System, consisting of battery container units, transformers, inverters, underground cabling, associated control | Proposed | 7.5 |

| Development | Planning Register Reference | Development Description | Status | Distance (km) |
|---|---|---|---|---|
| | | rooms, access routes, lighting, CCTV, lightning masts, fencing and grid connection to the existing Derrinlough 110kV substation. | | |

There are sixoperational wind farms within 10km of the project site. Apart from the consented wind farms named above, there are no other operational or consented projects located within 10km from the project site boundary that could give rise to cumulative effects on bat populations located within the project site.

## 3.2 Field Survey

### 3.2.1 Preliminary Ecological Appraisal – Daytime Bat Walkover (DBW) Survey

#### 3.2.1.1 Potential Commuting/Foraging Habitat

There was a lack of habitats that could be used by foraging and/or commuting bats within 200m plus rotor radii of T10 and T11. There was limited suitability of habitats within 200m plus rotor radii of T9, with a linear section of disconnected scrub noted on the southern extent of the search area. This habitat is poorly connected to the wider landscape.

Approximately 2.5km of the Rapemills river runs along the underground electricity line route, There were also hedgerows and treelines noted which were classified as FAR, as per Table 3.

#### 3.2.1.2 Potential Roosting Habitat

The DBW identified no structures/buildings or trees that could be used by roosting bats within 287.5m or 279m of the proposed turbines.

There were no structures with roosting potential identified along the underground electricity line route. There were treelines and watercourses along the underground electricity line route that could provide potential commuting and/or foraging habitat.

#### 3.2.1.3 Potential Roost Feature Survey

A map showing the locations of potential roost features is shown in Figure 4 in Confidential **Appendix DAppendix E** along with a full description of each potential roost feature. What follows is a summary of the potential roost feature survey.

**Structures**

The DBW identified no structures with roosting suitability within the 287.5m or 279m search radii or along the proposed UGL search radius. Thus, no further investigation was required.

**Trees**

The DBW identified no tree with roosting suitability within the 287.5m or 279m search radii of the proposed turbines. Thus, no further investigation was required.

The majority of the trees along the underground electricity line route were assessed as having no roosting potential above ‘low potential’, consisting predominantly of scrub, conifer or broadleaved species lacking potential roosting features. One PRF-I tree was recorded ca.

11m from the proposed UGL. This was a mature, ash with light ivy cover and some minor areas of peeling bark. However, it lacked sufficient shelter and the appropriate conditions to support larger numbers or for maternity and/or winter roosts. The majority of the hedgerows along the proposed UGL are quite low, having been regularly cut back or consisting of low-growing disconnected scrub. As a result, there is limited potential roosting features present along the route.

#### 3.2.1.4 Habitat Risk Assessment

The majority of the proposed wind farm site comprises PB4 cutover bog habitat (proposed wind farm site) and agricultural grassland habitats (proposed UGL), which are generally considered to be of lower value for foraging bats. The PB4 cutover bog has been subject to industrial peat harvesting historically. The absence of prominent linear features mean there is a lack of connectivity to the wider landscape, which further reduces roosting opportunities for roosting bats.

The habitats at the project site are therefore considered to be of **moderate** risk for bats according to table 3a of NS guidance[2] and reproduced below (the risk assessment category is provided for each point and the overall category is the mean of these categories):

- No potential roost features of low quality present within the proposed wind farm site (low).
- Low quality foraging habitat that could be used by small numbers of foraging bats (low);
- Isolated site not connected to the wider landscape by prominent linear features (low); and
- Project Site is located the edge of the ranges for Nathusius' pipistrelle, Natterer's bat, and whiskered bat (high).

The Project is judged as being of **medium** size according to table 3a of NS guidance[2] and reproduced below (the size assessment category is provided for each point and the overall category is the mean of these categories):

- Small scale development (3 turbines) (small);
- Six other consented wind developments are located within 5 km of Project Site (medium); and
- Project comprises turbines >100 m in height (large).

Overall, the Project Site is judged to pose a **medium (3)** risk to bats.

### 3.2.2 Activity Survey – Static Detector Survey (Ground-Level) – All Species

Eight species were recorded during the static bat detector surveys:

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

- Brown long-eared bat;

#### 3.2.2.1 Temporal Distribution

A summary of the results per survey season is provided in Table 11 to illustrate any seasonal variation. Note that while there are differences in detectability between species, raw data have been presented for all species. Between-species comparisons should not be made without adjustments to the raw data to account for these differences in detectability.

**Table 11** eports the maximum, mean and median bat passes per night at all locations, for all species combined, for each survey season. The table shows that:

- The highest maximum and median activity level per night was recorded in spring;
- The highest mean activity level per night was recorded in spring;
- The lowest maximum and mean activity level per night was recorded in summer; and
- The lowest median activity level per night was recorded in Autumn.

**Table 11 Summary of Results per Season Across All Sample Locations**

| Season | Maximum Bat Passes per Night | Mean Bat Passes per Night | Median Bat Passes per Night |
|---|---|---|---|
| Spring | 1185 | 381 | 282 |
| Summer | 94 | 35 | 28 |
| Autumn | 414 | 48 | 26 |

Notwithstanding differences in species detectability, Chart 1 shows that the most frequently recorded species across all survey locations in spring was consistently common pipistrelle, with peak activity recorded on the 13th May 2025. The next most frequently recorded species were Leisler's bat and soprano pipistrelle. Eight species of bat were recorded in spring.

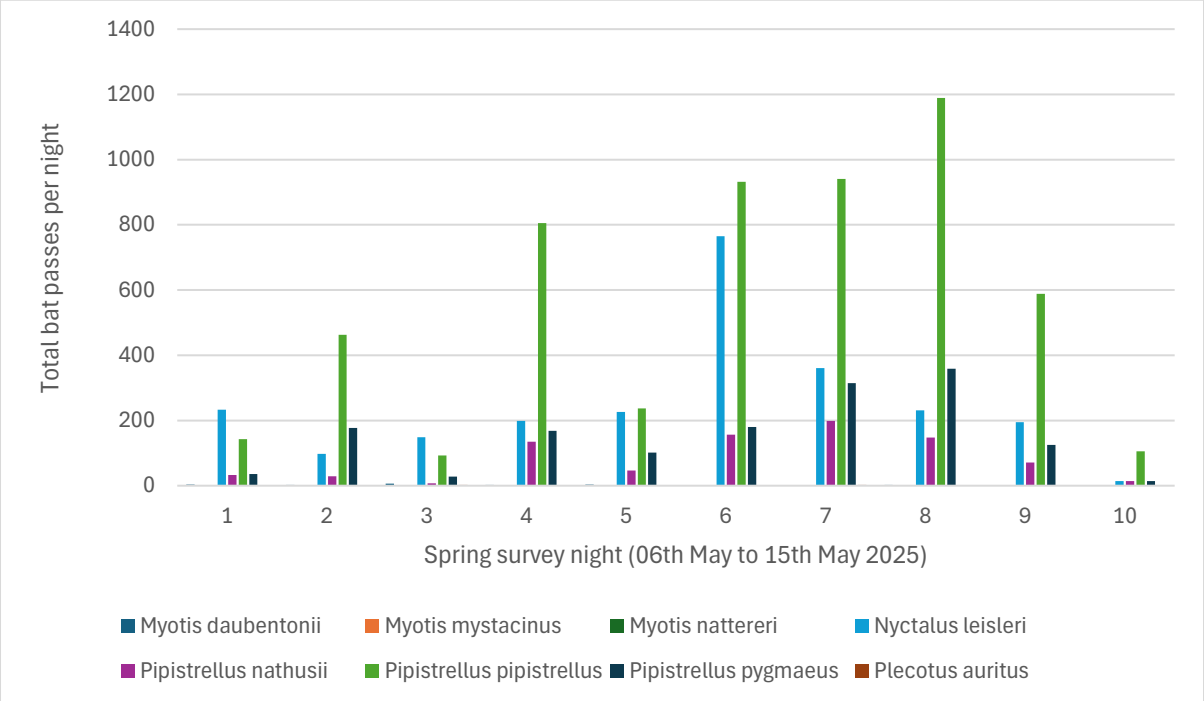

**Chart 1 Total Bat Passes Per Night in Spring Across All Detector Locations**

Notwithstanding differences in species detectability, Chart 2 shows that the most frequently recorded species across all survey locations in summer was consistently common pipistrelle, with peak activity recorded on the 08th June 2025. The next most frequently recorded species was common pipistrelle. Eight species of bat were recorded in summer.

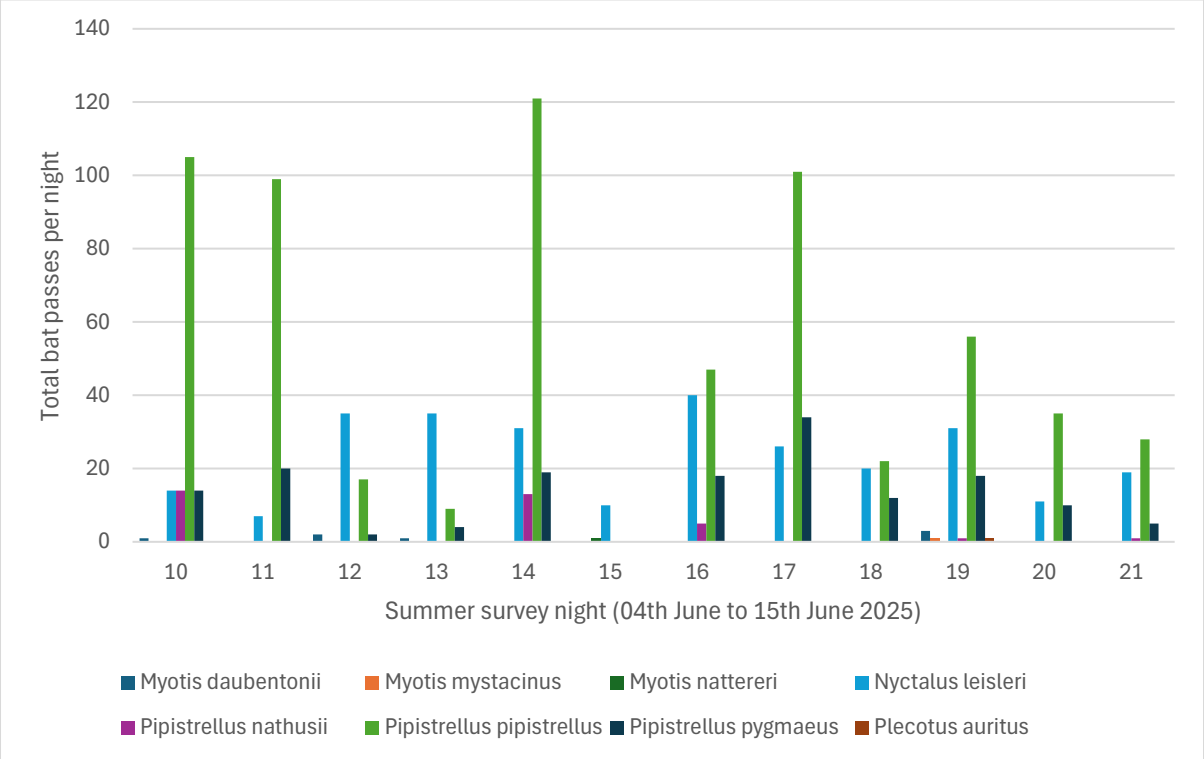


**Chart 2 Total Bat Passes Per Night in Summer Across All Detector Locations**

Notwithstanding differences in species detectability, Chart 3 shows that the most frequently recorded species across all survey locations in autumn was consistently Leisler's bat, with peak activity recorded on the 20th September 2025. Eight species of bat were recorded in autumn.

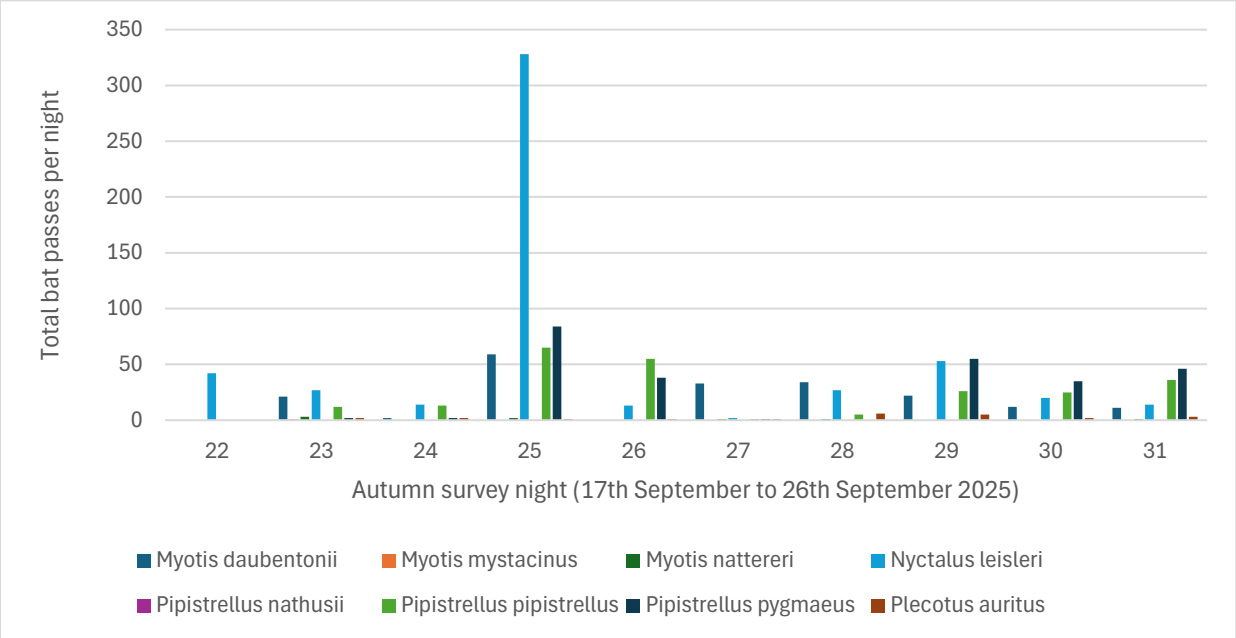


**Chart 3 Total Bat Passes Per Night in Autumn Across All Detector Locations**

### 3.2.2.2 Spatial Distribution

**Table 12** reports the maximum, mean and median bat passes per night and total bat passes across all nights at each location, for all species combined, across all seasons combined. The total number of bat passes recorded at each location is also provided. The table shows that:

- The highest mean and median activity level per night was recorded at sample location T10;
- The lowest mean and median activity level per night was recorded at sample location T11;
- The greatest amount of activity in any one night (maximum bat passes per night) was recorded at sample location T10, while the lowest was sample location T11.

**Table 12 Summary of Results per Sample Location Across All Seasons**

| Sample Location | Maximum Bat Passes per Night | Mean Bat Passes per Night | Median Bat Passes per Night |
|---|---|---|---|
| T9 | 780 | 161 | 37 |
| T10 | 1185 | 198 | 71 |
| T11 | 506 | 59 | 28 |

Chart 4 displays the mean number of bat passes per night for all locations split by bat species. Notwithstanding differences in species detectability, it shows that:

- For all locations, common pipistrelle was the most frequently recorded bat species across all seasons combined; and
- The only location where any other bat species was even half as common as common pipistrelle was at sample location T9, where Leisler's bat was the second most frequently recorded bat species.

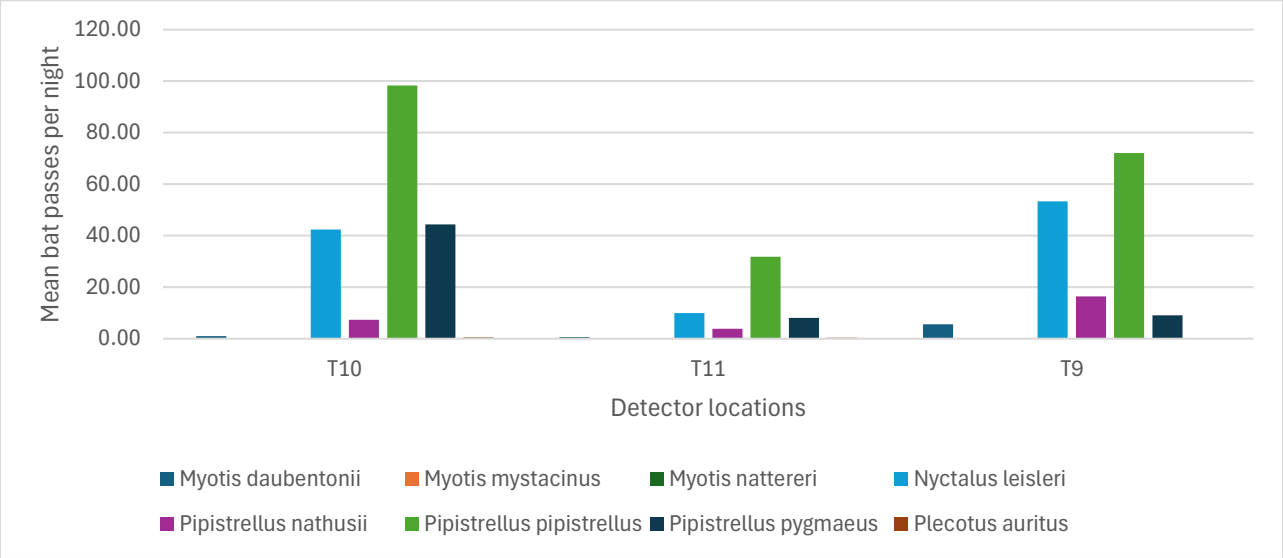


**Chart 4 Bat passes at each detector location for each species recorded.**

### 3.2.3 Activity Surveys – Static Bat Detector Survey – High Collision Risk Species

Species considered to be at a higher risk of collision in Ireland, as adapted from current NS guidance[2], include:

- Common pipistrelle;
- Soprano pipistrelle;
- Nathusius' pipistrelle; and
- Leisler's bat.

All four species were recorded at the project site.

Below each species recorded by the automated bat activity survey has been further analysed with reference to their spatial and temporal distributions.

#### 3.2.3.1 Common Pipistrelle

**Temporal Distribution**

A summary of the common pipistrelle activity results per survey season is provided in **Table 13**, to illustrate any seasonal variation. **Table 13** reports the maximum, mean and median bat passes per night at all locations, for common pipistrelles, for each survey season. The table shows that:

- Common pipistrelle was recorded across all seasons.
- The highest mean and median activity level per night was recorded in spring;
- The lowest mean and median activity level per night was recorded in autumn; and
- The greatest amount of activity in any one night (maximum bat passes per night) was recorded in spring.

**Table 13 Summary of Common Pipistrelle Activity Results Per Season Across All Sample Locations**

| Season | Maximum Bat Passes per Night | Mean Bat Passes per Night | Median Bat Passes per Night |
|---|---|---|---|
| Spring | 1189 | 599 | 588 |
| Summer | 121 | 49.54 | 35 |
| Autumn | 65 | 24.60 | 19.5 |

### Spatial Distribution

A summary of the common pipistrelle activity results per sample location is provided in **Table 14** and Chart 5 to illustrate any spatial variation within the project site.

**Table 14** reports the maximum, mean and median bat passes per night at each location, for common pipistrelles, across all seasons combined. The table shows that:

- Common pipistrelle were recorded across all locations.
- The highest mean and median activity level per night was recorded at location T10;
- The lowest mean and median activity level per night was recorded at location T11; and
- The greatest amount of activity in any one night (maximum bat passes per night) was recorded at location T10.

**Table 14 Summary of Common Pipistrelle Results per Sample Location Across All Seasons**

| Sample Location | Maximum Bat Passes per Night | Mean Bat Passes per Night | Median Passes per Night |
|---|---|---|---|
| T9 | 527 | 72 | 10 |
| T10 | 620 | 98 | 29 |
| T11 | 270 | 32 | 14 |

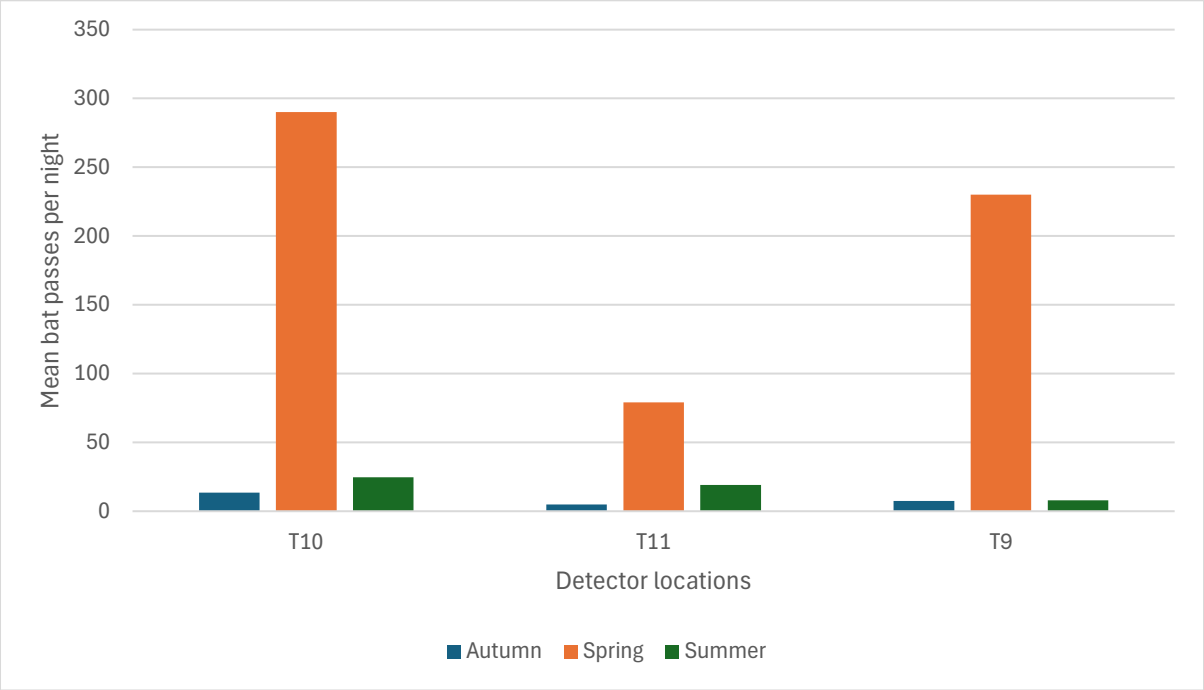


**Chart 5 Average Common Pipistrelle Activity Per Sample Location and Season**

It is evident from Chart 5 that common pipistrelle was scarcely recorded at locations T9, T10, and T11 in summer and autumn. Activity was highest at location T9, T10, and T11 in spring. Common pipistrelle was recorded across all locations and all seasons.

#### 3.2.3.2 Soprano Pipistrelle

**Temporal Distribution**

A summary of the Soprano pipistrelle activity results per survey season is provided in **Table 15** to illustrate any seasonal variation. **Table 15** reports the maximum, mean and median bat passes per night at all locations, for soprano pipistrelle, for each survey season. The table shows that:

- Soprano pipistrelle was recorded across all seasons;
- The highest mean and median activity level per night was recorded in spring;
- The lowest mean and median activity level per night was recorded in summer; and
- The greatest amount of activity in any one night (maximum bat passes per night) was recorded in spring.

**Table 15 Summary of Soprano Pipistrelle Activity Results Per Season Across All Sample Locations**

| Season | Maximum Bat Passes per Night | Mean Bat Passes per Night | Median Bat Passes per Night |
|---|---|---|---|
| Spring | 359 | 165 | 168 |
| Summer | 34 | 13 | 12 |
| Autumn | 84 | 27 | 20 |

### Spatial Distribution

A summary of the soprano pipistrelle activity results per sample location is provided in **Table 16** and Chart 6 to illustrate any spatial variation within the project site.

**Table 16** reports the maximum, mean and median bat passes per night at each location, for soprano pipistrelles, across all seasons combined. The table shows that:

- Soprano pipistrelle were recorded across all locations;
- The highest mean and median activity level per night was recorded at locations T10;
- The lowest mean and median activity level per night was recorded at location T11 and T9 respectively; and
- The greatest amount of activity in any one night (maximum bat passes per night) was recorded at location T10.

**Table 16 Summary of Soprano Pipistrelle Results per Sample Location Across All Seasons**

| Sample Location | Maximum Bat Passes per Night | Mean Bat Passes per Night | Median Passes per Night |
|---|---|---|---|
| T9 | 40 | 9 | 3 |
| T10 | 325 | 45 | 9 |
| T11 | 37 | 8 | 5 |

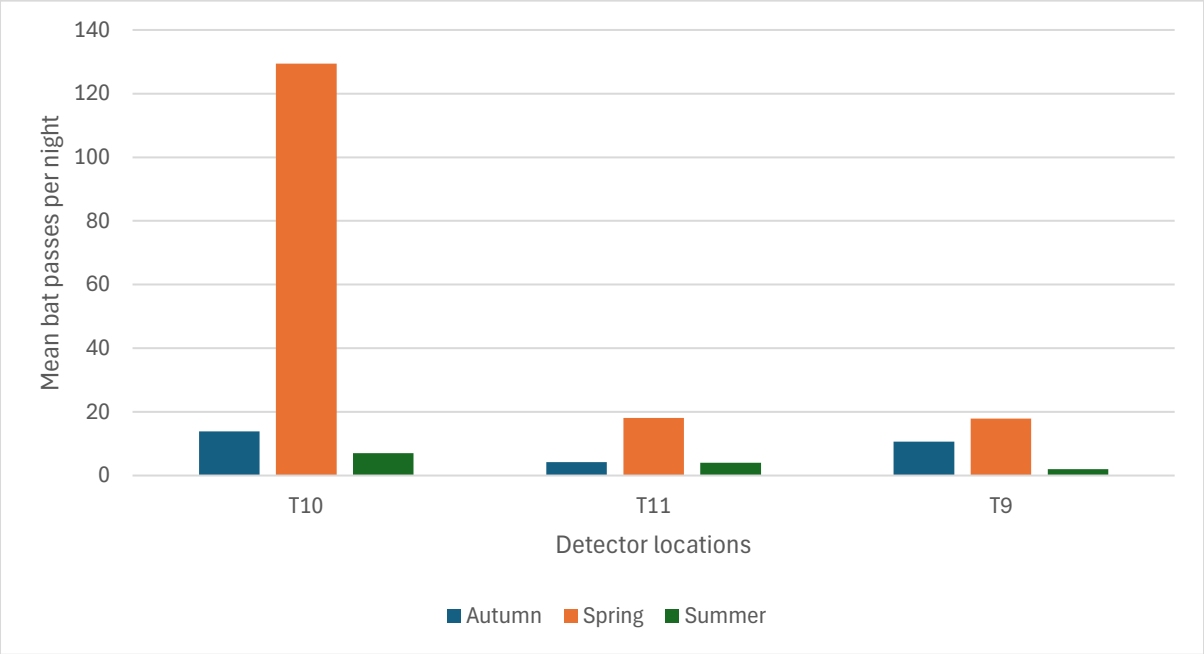


**Chart 6 Average Soprano Pipistrelle Activity Per Sample Location and Season**

It is evident from Chart 6 that soprano pipistrelle was scarcely recorded at locations T9 and T11 across all seasons. Activity was highest at location T10 in spring. Soprano pipistrelle was recorded at very low levels at all locations in summer and autumn. However soprano pipistrelle was recorded across all locations and all seasons.

#### 3.2.3.3 Nathusius' Pipistrelle

**Temporal Distribution**

A summary of the Nathusius' pipistrelle activity results per survey season is provided in **Table 17** to illustrate any seasonal variation. **Table 17** reports the maximum, mean and median bat passes per night at all locations, for Nathusius' pipistrelle, for each survey season. The table shows that:

- Nathusius' pipistrelle was recorded across all seasons;
- The highest mean and median activity level per night was recorded in spring;
- The lowest mean and median activity level per night was recorded in summer and autumn; and
- The greatest amount of activity in any one night was recorded in spring.

**Table 17 Summary of Nathusius' Pipistrelle Activity Results Per Season Across All Sample Locations**

| Season | Maximum Bat Passes per Night | Mean Bat Passes per Night | Median Bat Passes per Night |
|---|---|---|---|
| Spring | 199 | 92 | 71 |
| Summer | 15 | 5 | 3 |
| Autumn | 3 | 3 | 3 |

**Spatial Distribution**

A summary of the Nathusius' pipistrelle activity results per sample location is provided in **Table 18** and Chart 7, to illustrate any spatial variation within project site.

**Table 18** reports the maximum, mean and median bat passes per night at each location, for Nathusius' pipistrelle, across all seasons combined. The table shows that:

- Nathusius' pipistrelle were recorded across all locations;
- The highest mean and median activity level per night was recorded at locations T9 (peatland)
- The lowest mean and median activity level per night was recorded at locations T11, (peatland); and
- The greatest amount of activity in any one night (maximum bat passes per night) was recorded at location T9 (peatland).

**Table 18 Summary of Nathusius' Pipistrelle Results per Sample Location Across All Seasons**

| Sample Location | Maximum Bat Passes per Night | Mean Bat Passes per Night | Median Passes per Night |
|---|---|---|---|
| T9 | 138 | 17 | 1 |
| T10 | 57 | 8 | 1 |
| T11 | 47 | 5 | 1 |

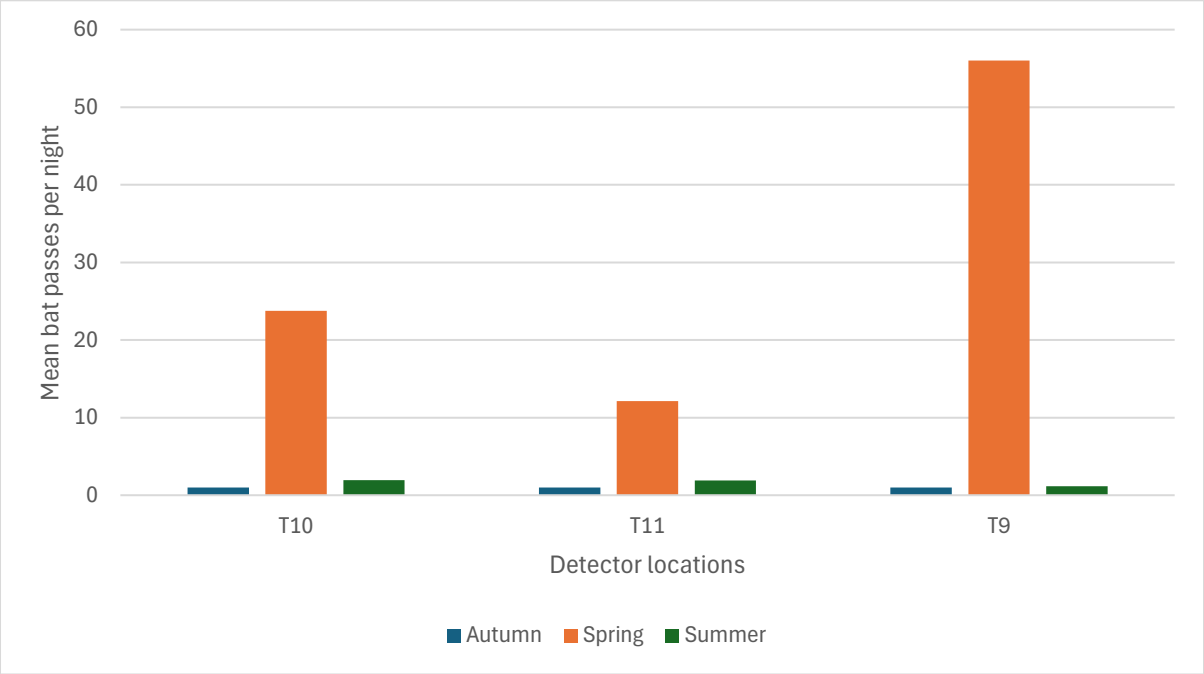


**Chart 7 Average Nathusius' Pipistrelle Activity Per Sample Location and Season**

It is evident from Chart 7 that Nathusius' pipistrelle was scarcely recorded at all locations in summer and autumn. Activity was highest at all locations in spring, although was still very low overall (i.e. mean of <60 bat passes per night).

#### 3.2.3.1 Leisler's Bat

**Temporal Distribution**

A summary of the Leisler's bat activity results per survey season is provided in **Table 19** to illustrate any seasonal variation. **Table 19** reports the maximum, mean and median bat passes per night at all locations, for Leisler's bat, for each survey season. The table shows that:

- Leisler's bat was recorded across all seasons.
- The highest mean and median activity level per night was recorded in spring;
- The lowest mean and median activity level per night was recorded in summer; and
- The greatest amount of activity (maximum bat passes per night) in any one night was recorded in spring.

**Table 19 Summary of Leisler's bat Activity Results Per Season Across All Sample Locations**

| Season | Maximum Bat Passes per Night | Mean Bat Passes per Night | Median Bat Passes per Night |
|---|---|---|---|
| Spring | 765 | 273 | 226 |
| Summer | 40 | 22 | 20 |
| Autumn | 328 | 54 | 24 |

### Spatial Distribution

A summary of the Leisler's bat activity results per sample location is provided in **Table 20** and Chart 8, to illustrate any spatial variation within project site.

**Table 20** reports the maximum, mean and median bat passes per night at each location, for Leisler's bat, across all seasons combined. The table shows that:

- Leisler's bat were recorded across all locations;
- The highest mean and median activity level per night was recorded at locations T9 and T10 respectively;
- The lowest mean and median activity level per night was recorded at location T11; and
- The greatest amount of activity in any one night (maximum bat passes per night) was recorded at location T9.

**Table 20 Summary of Leisler's bat Results per Sample Location Across All Seasons**

| Sample Location | Maximum Bat Passes per Night | Mean Bat Passes per Night | Median Passes per Night |
|---|---|---|---|
| T9 | 374 | 53 | 10 |
| T10 | 241 | 42 | 15 |
| T11 | 150 | 10 | 4 |

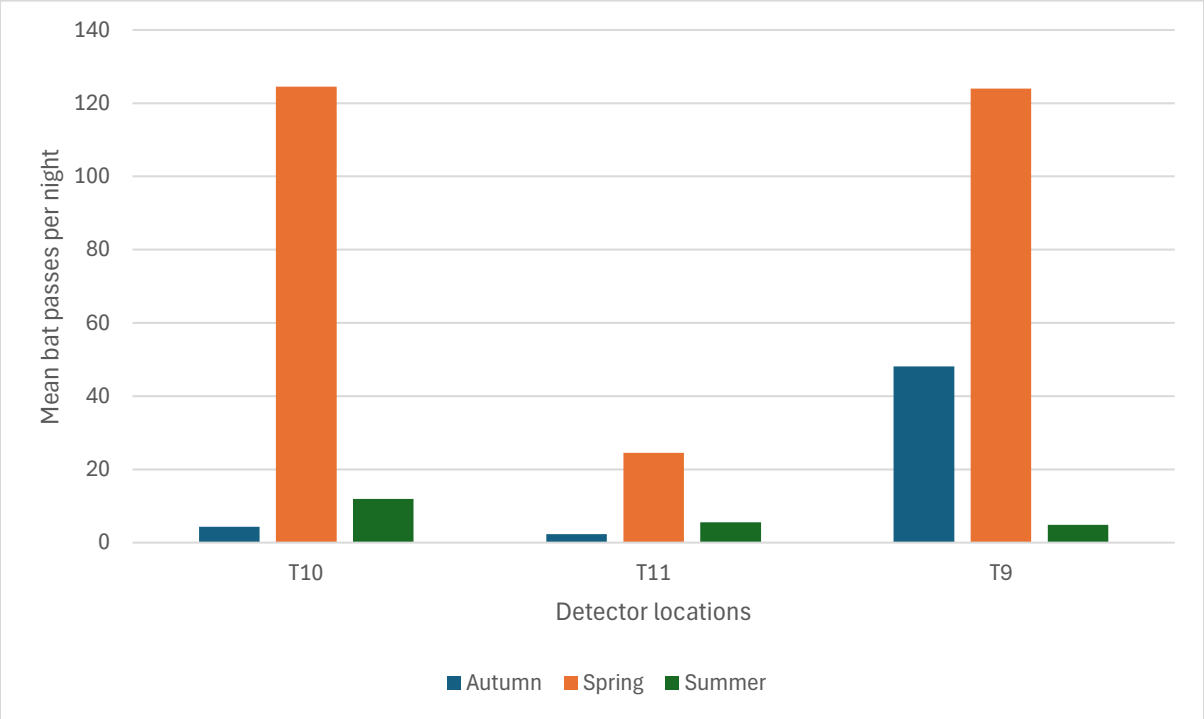


**Chart 8 Average Leisler's Bat Activity Per Sample Location and Season**

It is evident from Chart 8 that Leisler's bat was scarcely recorded at locations T11 across all seasons.

Activity was highest at locations T10 and T9 in spring. Activity across all locations was low in summer and autumn.

### 3.2.4 Activity Surveys – Static Bat Detector Survey – Lower Collision Risk Species

A summary of brown long-eared, Daubenton's bat, Natterer's bat and whiskered bat activity results per sample location is provided in Chart 9 to Chart 12, to illustrate any spatial variation within project site. In general, the mean number of bat calls per night across all seasons and turbine locations is very low (mostly <5 calls per night) for all four species.

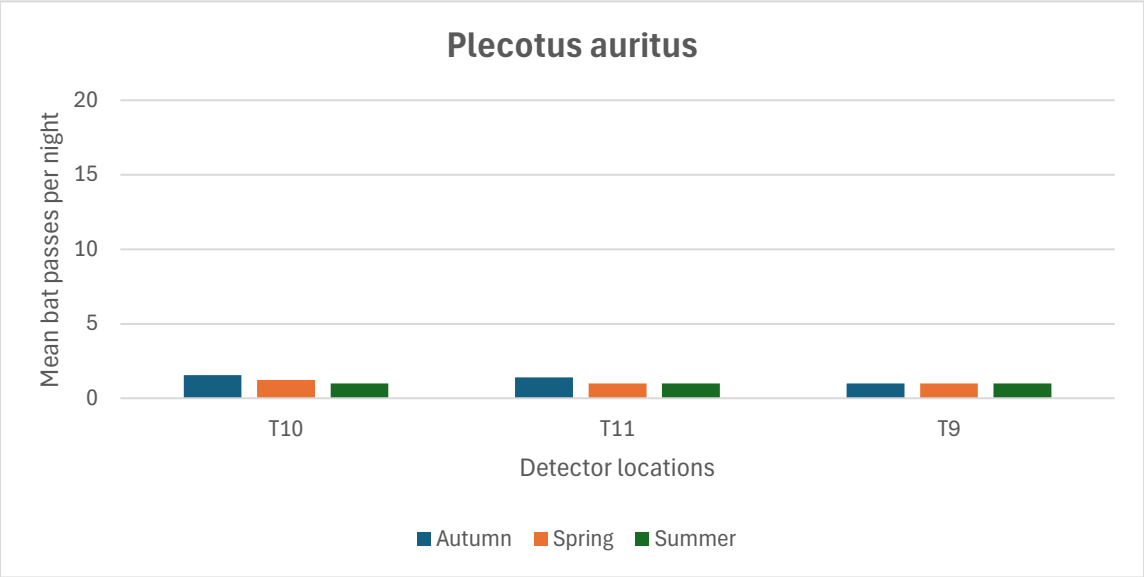


**Chart 9 Mean Brown Long-Eared Bat Activity Per Sample Location and Season**

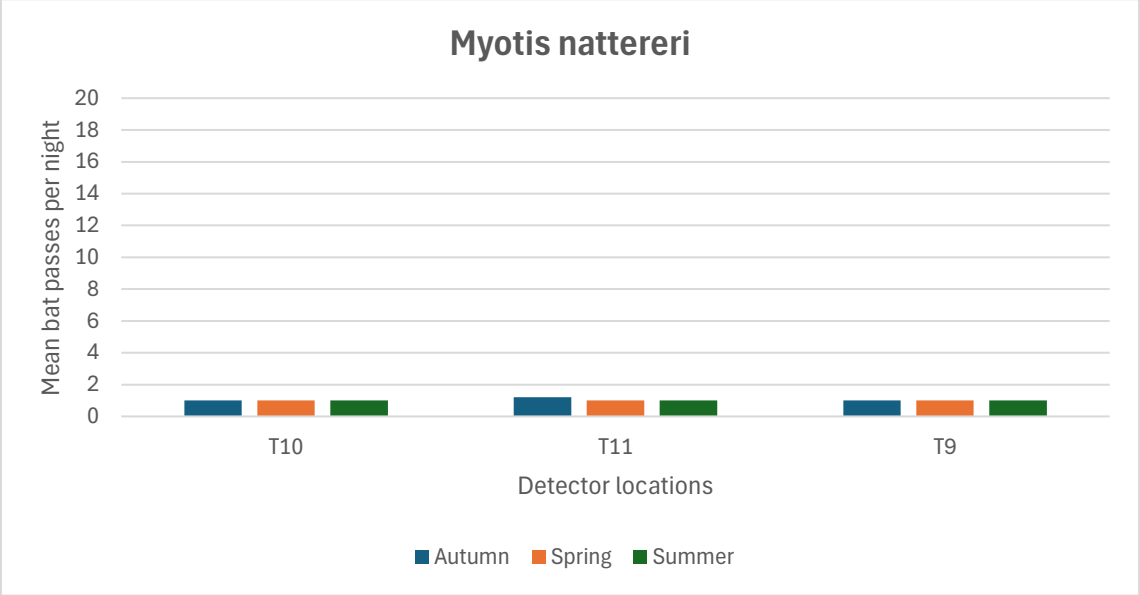


**Chart 10 Mean Natterer's Bat Activity Per Sample Location and Season**

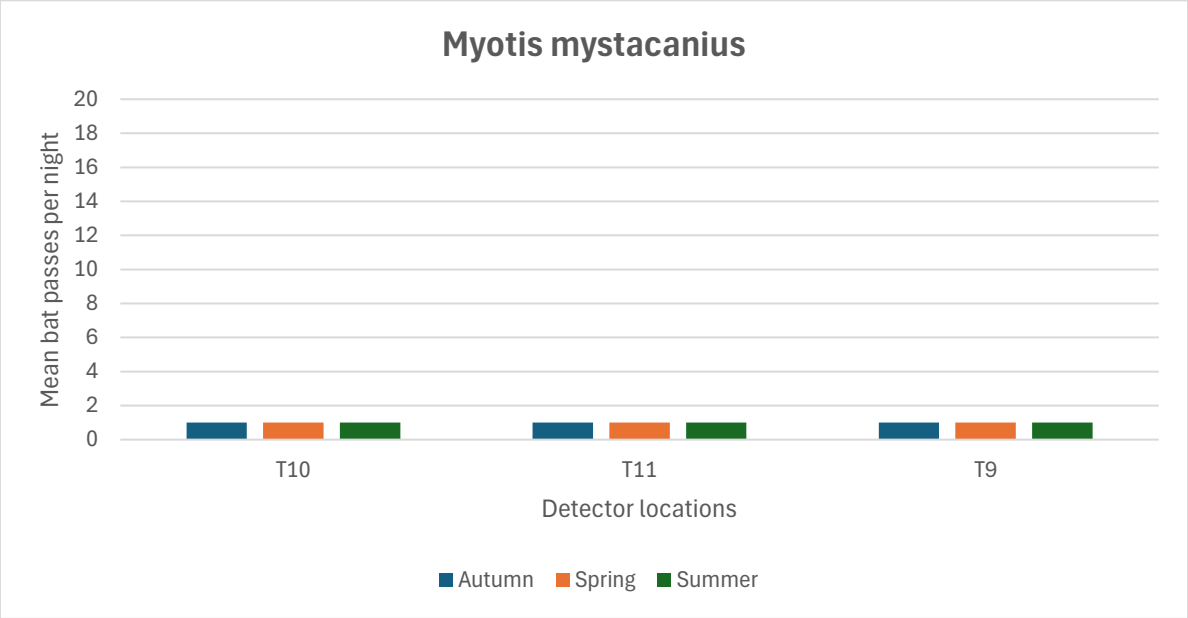


**Chart 11 Mean Whiskered Bat Activity Per Sample Location and Season**

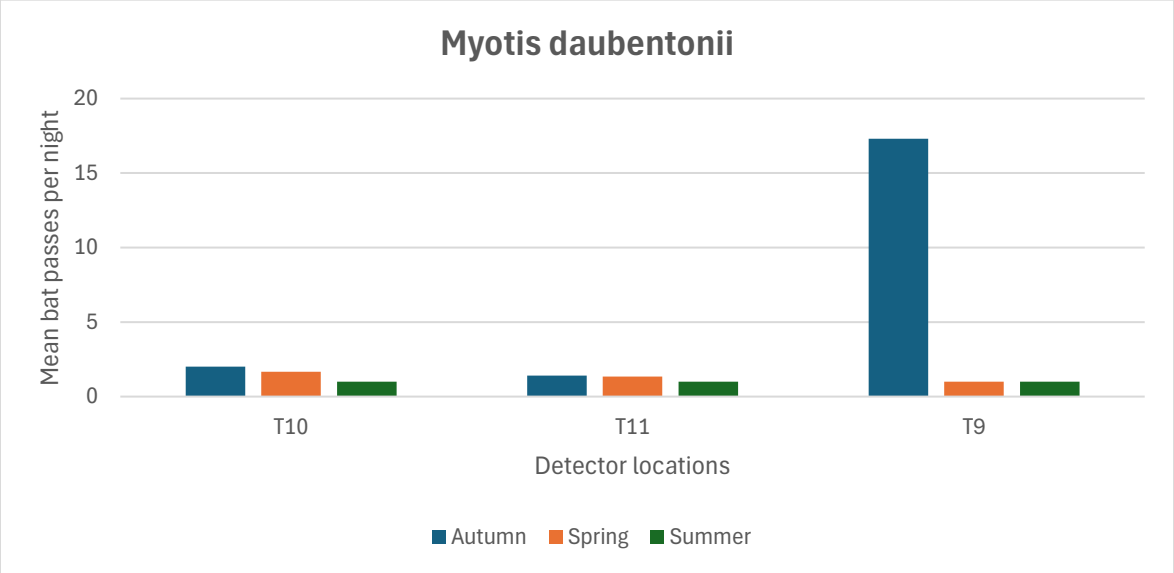


**Chart 12 Mean Daubenton's Bat Activity Per Sample Location and Season**

# 4.0 Discussion and Conclusions

## 4.1 Designated Sites for Bats

There are five pNHAs within 10km of the Site, which are of interest for their populations of Leisler's bat and brown long-eared bat. The distance between these pNHAs and the project site is outside the CSZ for these species. Therefore, the populations for which these pNHAs are designated are not considered to use the Site.

## 4.2 Habitat and Roost Assessment

The Project Site is dominated by PB4 cutover bog with conifer plantation and agricultural grassland to the south. The Project Site is largely void of linear features except for hedgerows to the south. As such, connectivity to the wider landscape is low. The bog drains may offer some foraging opportunities for bats.

A desktop study showed that 12 recorded bat roosts are located within 10km from the project site. However, none of the recorded roosts have ecological connectivity to the project site i.e., the core sustenance zones (CSZ)[23] as measured from the roost, do not overlap with the project site. The BCI data showed there were no roosts adjacent to the proposed underground electricity line.

Seven species were recorded by transects or as ad-hoc observations: Myotis daubentonii, Myotis nattereri, Plecotus auritus, Nyctalus leisleri, Pipistrellus nathusii, Pipistrellus pipistrellus, Pipistrellus pygmaeus, and additionally Myotis spp., and Pipistrellus spp.

Field surveys also identified no structures with suitability for roosting bats, and no evidence of bats was recorded at any of these.

One PRF-I tree was recorded c. 11m from the proposed UGL. This was a mature, ash with light ivy cover and some minor areas of peeling bark. However, it lacked sufficient shelter and the appropriate conditions to support larger numbers or for maternity and/or winter roosts.

Overall, the project itself was judged to be of ‘medium size’, which combined with ‘moderate risk’ habitats within project site, means the Project itself is of ‘medium risk’ to bat species.

## 4.3 Overview of Bat Activity

Eight bat species were recorded during the ground-level automated activity surveys conducted in 2025: brown long-eared bat, common pipistrelle, Daubenton’s bat, Leisler’s bat, Nathusius’ pipistrelle, Natterer’s bat, soprano pipistrelle and whiskered bat.

## 4.4 Temporal Distribution of Bat Activity

Bat activity was highest in spring (a mean of 381 bat passes per night) and lowest in summer (a mean of 35 bat passes per night). The difference in activity between the highest and lowest season was 346 bat passes per night on average.

## 4.5 Spatial Distribution of Bat Activity

Bats were recorded at all detector locations, but generally location T9 and T10 had the greatest number of bat passes per night, across all seasons (161 and 198 mean bat passes per night, respectively). Location T11 had the lowest number of bat passes per night across all seasons (mean of 59 bat passes per night).

[23] A CSZ as applied to bats, refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roosts. If bat commuting and foraging habitats within the CSZ are affected by the project, then this could affect bats using the roost. Core_Sustenance_Zones_Explained_04.02.16.pdf (bats.org.uk) [Last accessed October 2023]

## 4.6 'High Collision Risk' Bat Species

### 4.6.1 Activity Survey – Static Detector (Ground-Level)

All four Irish 'high collision risk' species were recorded during surveys: common pipistrelle, Leisler's bat, Nathusius' pipistrelle and soprano pipistrelle.

Common pipistrelle was the most frequently recorded species, with a peak activity (largest number of calls per night) of 620 calls recorded at location T10 in the spring season, and the greatest mean was 98 calls per night at T10 across all seasons.

Soprano pipistrelle was the next most frequently recorded species, with a peak activity (largest number of calls per night) recorded at location T10 in the spring season and the greatest mean of 165 calls per night in spring.

Leisler's bat was the third most frequently recorded species, with a peak activity (largest number of calls per night) recorded at location T9 in the spring season and the greatest mean of 273 calls per night in spring.

Nathusius' pipistrelle was the most infrequently recorded 'high collision risk' species, with a peak activity (largest number of calls per night) recorded at location T9 in the spring season (199 calls). However, the mean number of calls was relatively low with the greatest mean of 17 calls per night at location T9). Only 3 calls were recorded in the autumn season.

### 4.6.2 Assessment of Relative Bat Activity Levels

To inform any resulting impact assessment, information on bat activity levels and site risk are presented below.

#### 4.6.2.1 Bat Activity Categories

Relative bat activity levels have been assessed following NS guidance[2]. Full Ecobat reports are included in Appendix F.

Below in Table 21 is a summary of key results for high collision risk species, showing all sampling locations with high median and maximum levels of bat activity per season. While both metrics provide useful information on bat activity, the median should be used to determine whether activity is consistently high or not.

**Table 21 Sample Locations with High Bat Activity Levels**

| Sample Location | Season | Species with Moderate-High or High Maximum Activity Levels (* denotes those where the confidence level is <200) | Species with Moderate-High or High Median Activity Levels (* denotes those were the confidence level is <200) |
|---|---|---|---|
| T9 | Spring | Myotis mystacinus*<br>Nyctalus leisleri<br>Pipistrellus nathusii<br>Pipistrellus pipistrellus | Myotis mystacinus*<br>Pipistrellus nathusii |
| | Summer | Plecotus auritus* | Plecotus auritus* |
| | Autumn | Myotis daubentonii*<br>Nyctalus leisleri<br>Pipistrellus pygmaeus | Myotis daubentonii* |
| T10 | Spring | Myotis daubentonii*<br>Nyctalus leisleri | Myotis daubentonii*<br>Plecotus auritus* |

| Sample Location | Season | Species with Moderate-High or High Maximum Activity Levels (* denotes those where the confidence level is <200) | Species with Moderate-High or High Median Activity Levels (* denotes those were the confidence level is <200) |
|---|---|---|---|
| | | Pipistrellus pipistrellus<br>Pipistrellus pygmaeus<br>Plecotus auritus* | |
| | Summer | Myotis daubentonii*<br>Myotis mystacinus*<br>Myotis nattereri*<br>Nyctalus leisleri<br>Pipistrellus nathusii*<br>Pipistrellus pipistrellus<br>Pipistrellus pygmaeus* | Myotis daubentonii*<br>Myotis mystacinus*<br>Myotis nattereri*<br>Nyctalus leisleri<br>Pipistrellus nathusii*<br>Pipistrellus pygmaeus* |
| | Autumn | Pipistrellus pipistrellus<br>Pipistrellus pygmaeus<br>Plecotus auritus* | Pipistrellus pipistrellus<br>Pipistrellus pygmaeus<br>Plecotus auritus* |
| T11 | Spring | Myotis daubentonii*<br>Myotis mystacinus* | Myotis mystacinus* |
| | Summer | Myotis daubentonii*<br>Nyctalus leisleri<br>Pipistrellus nathusii*<br>Pipistrellus pipistrellus<br>Pipistrellus pygmaeus* | Myotis daubentonii*<br>Nyctalus leisleri<br>Pipistrellus nathusii*<br>Pipistrellus pygmaeus* |
| | Autumn | Myotis mystacinus*<br>Myotis nattereri*<br>Pipistrellus pipistrellus<br>Plecotus auritus* | Myotis mystacinus<br>Myotis nattereri |

Consistently high median activity for Nathusius' pipistrelle was recorded at sample location T9 (spring). Consistently high median activity for Leisler's bat was recorded at T10 (summer) and T11 (summer). Consistently high median activity for common pipistrelle was recorded at T10 (autumn). Consistently high median activity for soprano pipistrelle was recorded at T10 (autumn).

High maximum nightly activity was recorded for Nyctalus leisleri at T9 (spring), T10 (spring), and T11 (summer); Pipistrellus nathusii T9 (spring); Pipistrellus pipistrellus T9(spring), T10 (spring and summer), T11 (summer and autumn), and Pipistrellus pygmaeus T9 (autumn) and T10 (spring, autumn).

#### 4.6.2.2 Site Risk – Project Size

The criteria for assessing project size are evaluated below using NS guidance:

- **Number of turbines:** Three turbines, which corresponds with a ‘small’ rating;
- **Presence of other wind energy developments within 5km:** six permitted wind farm projects which corresponds with a ‘medium’ or ‘large’ rating; and
- **Turbine tip height:** 199.1m to 200m, which corresponds to a ‘large’ rating.

Overall, given the criteria above the Project is of ‘**medium’** size.

#### 4.6.2.3 Site Risk – Habitat Risk

The criteria for assessing habitat risk are evaluated below using NS guidance:

- **Roost features:** The closest roost is situated ca. 4.43km west of the nearest turbine. This corresponds to a 'low rating;
- **Foraging habitats:** assessed as 'low' rating, based on habitat data;
- **Connectivity:** Isolated site not connected to the wider landscape by prominent linear features. This corresponds to a 'low' rating;
- **Range edges / flyways:** the project site is at the range edge (the definition of range used here is the Extent of Occurrence ) for Nathusius' pipistrelle, Natterer's bat, and whiskered bat. This corresponds to a 'high' rating; and

Overall, given the criteria above the habitat risk for the Project is '**moderate'** risk.

#### 4.6.2.4 Site Risk – Overall

The overall site risk is based on Table 3a of the NatureScot guidance (reproduced in Table 22 below, which gives an overall stage 1 initial site risk assessment of 3, which corresponds to a '**medium (3)'** site risk for bats.

**Table 22 - Table 3a: Stage 1 - Initial site risk assessment (NatureScot, 2021)**

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

Key: 1-2=low site risk, 3=medium site risk, 4-5=high site risk

#### 4.6.2.5 Overall Risk

The overall risk is obtained by multiplying the site risk by the Ecobat activity category.

Overall, Leisler's bat, common pipistrelle, soprano pipistrelle, and Nathusius' pipistrelle reached the **high** overall risk category.

Leisler's bat reached a high overall risk score at T9 during spring and autumn (overall risk score = 15 using max activity), and T10 in spring and summer (overall risk score = 15 using using max activity), and T11 in summer (overall risk score = 15 using max activity).

Common pipistrelle reached a high overall risk score at T10 in spring, summer and autumn (overall risk score = 15 using max activity), and T11 in summer and autumn (overall risk score = 15 using max activity), and T10 in autumn (overall risk score = 15 using median activity).

Soprano pipistrelle reached a high overall risk score at T10 in spring, and T9 and 10 in autumn (each an overall risk score = 15 using max activity).

Nathusius' pipistrelle reached a high overall risk score at T9 during spring (overall risk score = 15 using max activity).

**Table 23 Overall Risk Score - Max Percentile**

| Season | Detector | Species | Max Percentile | Activity Class | Ecobat Activity Category | Site Risk | Overall Risk |
|---|---|---|---|---|---|---|---|
| Spring | T10 | Nyctalus leisleri | 86 | High | 5 | 3 | 15 |
| | | Pipistrellus pipistrellus | 100 | High | 5 | 3 | 15 |
| | | Pipistrellus pygmaeus | 100 | High | 5 | 3 | 15 |
| | T9 | Nyctalus leisleri | 100 | High | 5 | 3 | 15 |
| | | Pipistrellus nathusii | 100 | High | 5 | 3 | 15 |
| Summer | T10 | Nyctalus leisleri | 100 | High | 5 | 3 | 15 |
| | | Pipistrellus pipistrellus | 100 | High | 5 | 3 | 15 |
| | T11 | Nyctalus leisleri | 100 | High | 5 | 3 | 15 |
| | | Pipistrellus pipistrellus | 100 | High | 5 | 3 | 15 |
| Autumn | T10 | Pipistrellus pipistrellus | 100 | High | 5 | 3 | 15 |
| | | Pipistrellus pygmaeus | 100 | High | 5 | 3 | 15 |
| | T11 | Pipistrellus pipistrellus | 85 | High | 5 | 3 | 15 |
| | T9 | Nyctalus leisleri | 100 | High | 5 | 3 | 15 |
| | | Pipistrellus pygmaeus | 83 | High | 5 | 3 | 15 |

**Table 24 Overall Risk Score - Median Percentile**

| Season | Detector | Species | Max Percentile | Activity Class | Ecobat Activity Category | Site Risk | Overall Risk |
|---|---|---|---|---|---|---|---|
| Autumn | T10 | Pipistrellus pipistrellus | 85 | High | 5 | 3 | 15 |

#### 4.6.2.6 Other Bat Species

While brown long-eared bat, Daubenton's bat, Natterer's bat and whiskered bat were also recorded, these species are at low risk of collision with turbines due to their flight and foraging behaviour. They were all recorded at much lower frequencies than soprano pipistrelle, Leisler's bat or common pipistrelle by both static detector and transect surveys and therefore, project site does not represent important foraging or roosting habitats for them, making them unlikely to be negatively affected by any loss of habitat through wind farm construction or decommissioning.

# 5.0 References

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# Appendix A Figures

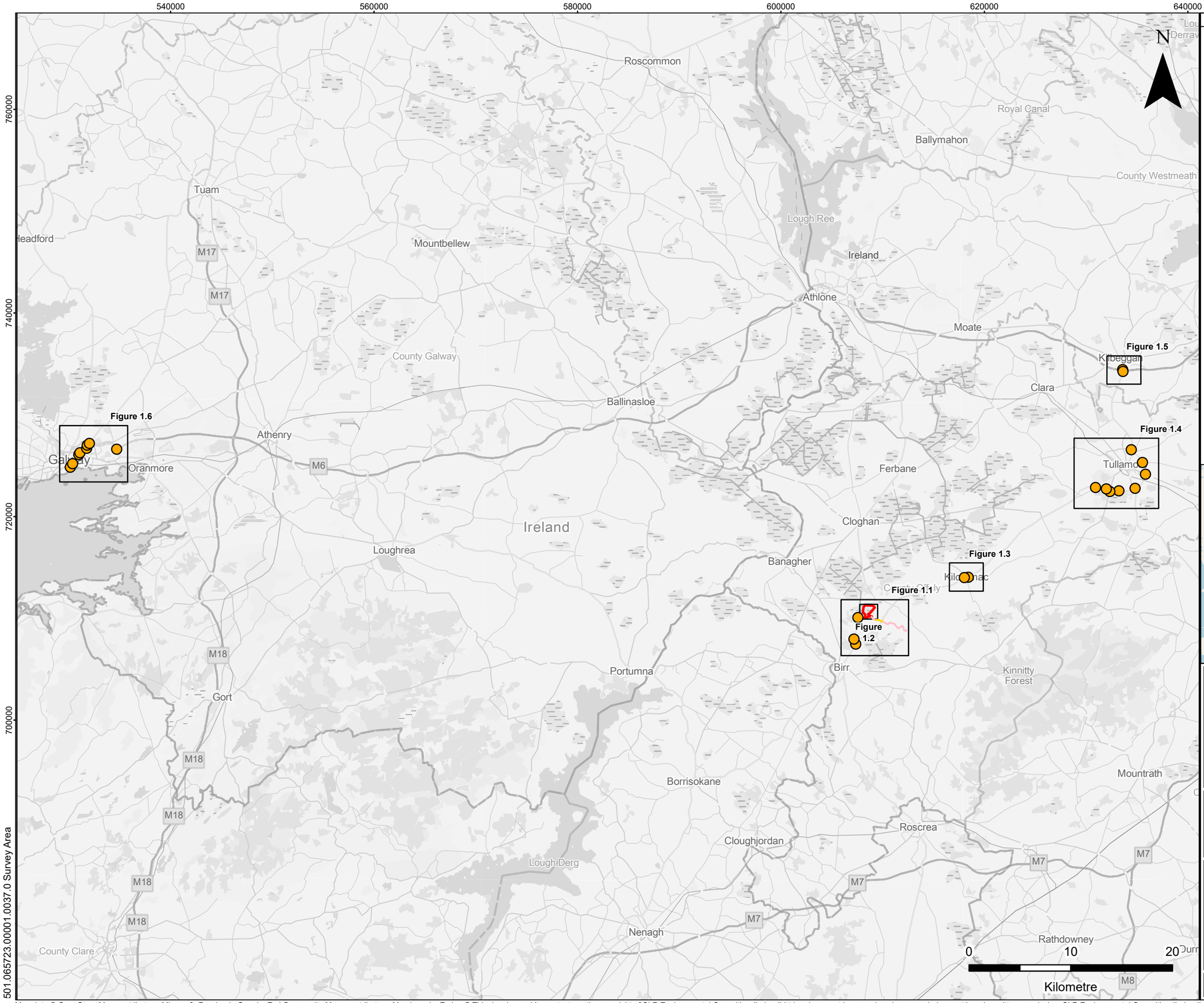
## Baseline Bat Survey Report

**Cush Wind Farm Phase IIII**

**Cush Wind Limited**

SLR Project No.: 501.065723.00001

21 October 2026

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606000
608000
610000
612000
710000
708000

T10
T11
T9
7.5.5
7.5.4
7.5.3
L1092
N52
L3003
N62
Tullamore Road
Woodville Wood
Gallagher Road

N

0
0.5
1
Kilometres

LEGEND

- Planning Boundary
- Turbine Layout
- Turbine 279 m Buffer
- Turbine 287.5 m Buffer
- Underground electricity line
- Underground electricity line 50 m Buffer
- Haul Route Node
- Bat Static Detector Location

GALETECH ENERGY SERVICES

SLR

CUSH WIND FARM

BAT REPORT

**SURVEY AREA**

**FIGURE 1.2**

Scale 1:20,000 @ A3

Date OCTOBER 2026

501.065723.00001.0037.0 Survey Area

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608000
608500
609000
609500
711000
710500
501.065723.00001.0037.0 Survey Area

N62

T10
T11
T9

N

LEGEND

- Planning Boundary
- Turbine Layout
- Turbine 279 m Buffer
- Turbine 287.5 m Buffer
- Underground Electricity Line
- Underground Electricity Line 50 m Buffer
- Bat Static Detector Location

Trooper's Hi

0 150 300
Metres

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BAT REPORT

**SURVEY AREA**

**FIGURE 1.3**

Scale 1:6,000 @ A3

Date OCTOBER 2026

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617000 617500 618000 618500 619000 619500

715000 714500 714000 713500

R437 R437 R437 Silver L6043 Arthur's Well L7023 Silver Kilcormac-Killoughy GAA 7.5.2 7.5.1 Kilcormac N52 L6042 Scoil Mhuire agus Chormaic L2021 St Cormacs Park St. Joseph's Cemetery L6042 L6042 L6041 L6042 N52 N52 The Priory N52 Glendine Pitch 1 Pitch 2 Pitch 3 Pitch 4

N

0 250 500

Metres

501.065723.00001.0037.0 Survey Area

LEGEND

Haul Route Node

Ireland Galway Ireland Limerick Kilkenny

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BAT REPORT

**SURVEY AREA**

**FIGURE 1.4**

Scale 1:10,000 @ A3

Date OCTOBER 2026

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630000 632000 634000 636000

726000 724000

501.065723.00001.0037.0 Survey Area

2013

Ballyduff Wood

Condron Concrete

R421

N52

N

Thornsberry 110kV Substation

R420

Eiscir Meadows

The Hawthorns

Spollens Airstrip

Ballinamere GAA

Athlone Branch

Tinnycross Road

L1025

Leah Victoria Park

Axis Business Park

R443

Ballinamere

Nissan Tullamore

Tullamore Hardware

L2007

R421

L1025

Jackson's Hill

Srah IDA Business and Technology Park

R420

N52

Tyrrells Road

N52

Grand Canal

Grand Canal

Grand Canal

N52

Ballydrohid Farm

Grand Canal

Srah Bridge

Grand Canal

L2025

Cappincur Filling Station

L2025

R420

Tullamore College

Tullamore

Cappincur GAA

N52

R421

R420

Cloncollig Industrial Estate

Tullamore

R443

Tullamore Retail Park

R420

N52

Tullamore

Athlone Branch

Lynally Monastic Site

Clodiagh

Charleville Castle Demesne

R421

R443

N52

Athlone Branch

Big Wood

N52

Mucklagh Cemetery

N52

N52

Tullamore Distillery

N52

N52

N52

Saint Catherine's Cemetery

L2011

Mucklagh Shamrocks GAA

Mucklagh

L2011

L2030

Sugar Hill

St O'Hara's Hill

N80

R421

Derrygolan Wood

0 0.5 1

Kilometres

LEGEND

Haul Route Node

Ireland

Galway

Ireland

Limerick

Kilkenny

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CUSH WIND FARM

BAT REPORT

**SURVEY AREA**

**FIGURE 1.5**

Scale 1:25,000 @ A3

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530000
532000
534000
728000
726000
501.065723.00001.0037.0 Survey Area

N

LEGEND

Haul Route Node

7.2.1
7.2.2
7.2.3
7.2.4
7.2.5
7.2.6
7.2.7
7.2.8

L1005
N84
N83
L5147
N6
R339
L50281
L1004
R338
R865
R866
R336
R921
N67
L5037

Parkmore West Industrial Estate
Parkmore East Business Park
Racecourse Business Park
City North Business Park
Ballybrit
Briarhill Business Park
Ballybrit Business Park
Cluain Riocaird
Baile An Chóiste
Carraig Ban
Sceilg Ard
Crestwood
Ballinfoile Park
Tirellan Heights
Ballybane Industrial Estate
Terryland Forest Park
Eir
Castlelawn Heights
Gleanamail Drive
Mervue Industrial Estate
Mervue
Ballybane
An Sean Bhaile
Galway 20
Liosban Industrial Estate
Tír Oileáin
Dún Na Coiribe
Wellpark
O'Sullivan Park
Wellpark Grove
Bohemore Cemetery
Bohemore
Doughiska
Túr Uisce
An Fiodán
Merlin Woods
Ros Caoin
Roscam
Glasán
Renmore Park
Renmore
Murrough Avenue
Lurgan Park
Murrough
Lios an Uisce
Gleann Na Rí
Aunteen Woods
Lisbeg Lawn
Renmore Barracks
Liam Mellows GAA Club
Ballyloughane Road
Ballyloughane Beach
Galway Harbour
Galway Harbour Enterprise Park
Galway Ceannt
Galway
Claddagh
South Park
University of Galway - South Campus
River Corrib
Eglinton Canal

Ireland
Galway
Limerick
Kilkenny

0 0.5 1
Kilometres

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BAT REPORT

**SURVEY AREA**

**FIGURE 1.7**

Scale 1:20,000 @ A3

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608000

610000

612000

712000

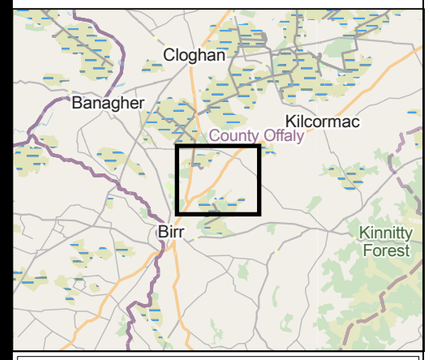
710000

LEGEND

- Planning Boundary
- Turbine Layout
- Turbine 279 m Buffer
- Turbine 287.5 m Buffer
- Underground electricity line
- Underground electricity line 50 m Buffer
- Haul Route Node

**Ground Level Tree Assessment**

- PRF-I (Individual Bats)

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BAT REPORT

**DAYTIME BAT WALKOVER**

**FIGURE 2**

Scale 1:20,000 @ A3

Date OCTOBER 2026

501.065723.00001.0038.0 Daytime Bat Walkover

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600000

608000

616000

712000

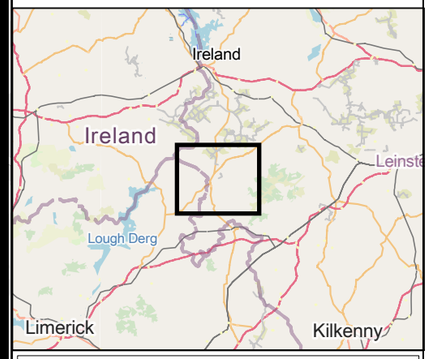
704000

501.065723.00001.0039.0 BCI Data

LEGEND

- Planning Boundary
- Bat Roost Location
- Bat Roost 1 km Core Sustenance Zone
- Bat Roost 2 km Core Sustenance Zone
- Bat Roost 3 km Core Sustenance Zone
- Underground electricity line

**CONFIDENTIAL**

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CUSH WIND FARM

BAT REPORT

**BAT CONSERVATION IRELAND DATA**

**FIGURE 3**

Scale 1:80,000 @ A3

Date OCTOBER 2026

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Copyright © 2026 Bat Conservation Ireland

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600000 608000 616000

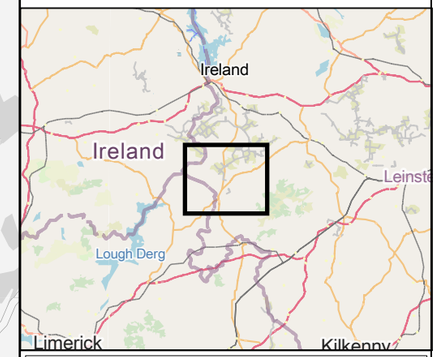
720000 712000

N

LEGEND

- Planning Boundary
- Planning Boundary 10 km Buffer
- Special Area of Conservation (SAC)
- Natural Heritage Areas (NHA)
- Proposed Natural Heritage Areas (pNHA)

**Notes**
Designated sites only labelled within 10 km of site.

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BAT REPORT

**ECOLOGICAL DESIGNATED SITES WITHIN 10 KM OF SITE**

**FIGURE 4**

Scale 1:80,000 @ A3

Date OCTOBER 2026

501.065723.00001.0040.0 Designated Sites

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# Appendix B Criteria for Assessing Habitat Risk for Bats

## Baseline Bat Survey Report

**Cush Wind Farm Phase IIII**

**Cush Wind Limited**

SLR Project No.: 501.065723.00001

21 October 2026

## B.1 Criteria for Assessing Habitat Risk for Bats

Table B 1 was taken from the latest NatureScot guidance[4].

**Table B 1: Bat Habitat Risk**

| Habitat Risk | Description |
|---|---|
| Low | • Small number of potential roost features, of low quality<br>• Low quality foraging habitat that could be used by small numbers of foraging bats<br>• Isolated site not connected to the wider landscape by prominent linear features |
| Moderate | • Buildings, trees or other structures with moderate-high potential as roosts sites on or near the site<br>• Habitats could be used extensively by foraging bats<br>• 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<br>• Extensive and diverse habitat mosaic of high quality for foraging bats<br>• Site is connected to the wider landscape by a network of strong linear features such as rivers, blocks of woodland and mature hedgerows<br>• At/near edge of range and/or on an important flyway<br>• Close to key roost and/or swarming site |

# Appendix C Collision Risk, Relative Abundance and Overall Population Vulnerability of Bat Species in Ireland

## Baseline Bat Survey Report

**Cush Wind Farm Phase IIII**

**Cush Wind Limited**

SLR Project No.: 501.065723.00001

21 October 2026

# C.1 Population Vulnerability of Irish Bat Species

Table C 1 below is adapted from NS guidance[4] using data from the latest Irish red list[24]. Red indicates high population vulnerability, orange medium and yellow low population vulnerability.

**Table C 1: Collision Risk x Relative Abundance**

| Relative abundance | Ireland | Collision Risk | | |
|---|---|---|---|---|
| | | Low | Medium | High |
| | Common species | | | Common pipistrelle<br>Soprano pipistrelle |
| | Rarer species | Brown long eared bat<br>Daubenton's bat<br>Lesser horseshoe | | Leisler's bat |
| | Rarest species | Natterer's bat<br>Whiskered bat | | Nathusius' pipistrelle |

[24] Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

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# Appendix D Confidential Appendix: Confidential Roost Data

## Baseline Bat Survey Report

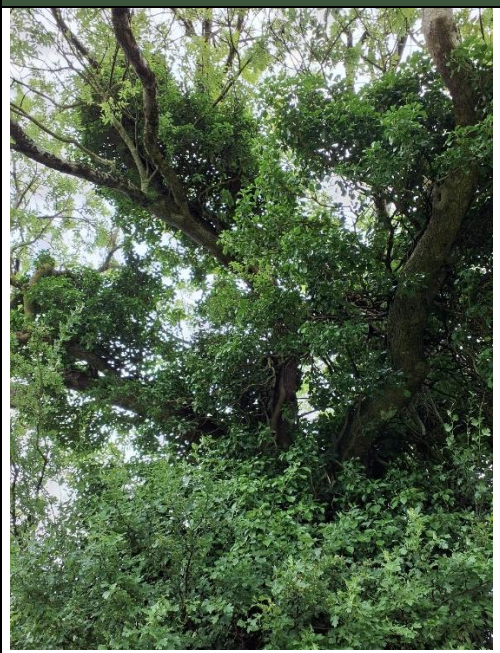
**Cush Wind Farm Phase IIII**

**Cush Wind Limited**

SLR Project No.: 501.065723.00001

21 October 2026

**Table D 1 Potential Roosting Features - Trees**

| Map Ref. | Type | Suitability | Description | Photo | Coordinates (ITM) | |
|---|---|---|---|---|---|---|
| | | | | | X | Y |
| 1 | Tree | PRF-I | Mature ash tree with moderate ivy cover. Spaces behind thicker ivy stems may provide shelter for individual bats in suitable weather conditions, but lacks sufficient shelter or features for multiple bats or maternity/hibernation roosts. |  | [redacted] | [redacted] |

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# Appendix E Confidential Appendix: Bat Conservation Ireland Data

## Baseline Bat Survey Report

**Cush Wind Farm Phase IIII**

**Cush Wind Limited**

SLR Project No.: 501.065723.00001

21 October 2026

SLR

## Table E 1: Bat Conservation Ireland Data – Bat Roosts

| Record No. | Distance from Site (km) | Species |
|---|---|---|
| Roosts | | |
| Private | 4.22 | Plecotus auritus |
| Private | 4.43 | Plecotus auritus, Myotis mystacinus |
| Nursing home | 5.26 | Myotis mystacinus |
| [redacted] | 5.50 | Myotis daubentonii |
| Private | 5.50 | Pipistrellus pipistrellus (45kHz), Pipistrellus pygmaeus, Nyctalus leisleri |
| Private | 5.50 | Nyctalus leisleri |
| [redacted] | 5.60 | Pipistrellus pygmaeus |
| [redacted] | 5.95 | Myotis daubentonii |
| Private | 6.43 | Nyctalus leisleri |
| Private | 6.84 | Nyctalus leisleri |
| Private | 7.12 | Nyctalus leisleri |
| Private | 7.37 | Pipistrellus pygmaeus |
| Private | 12.62 | Nyctalus leisleri |

## Table E 2 Bat Conservation Ireland Data – Transects

| Transect Name | Species |
|---|---|
| [redacted] | Myotis daubentonii,Unidentified bat |
| | Unidentified bat,Myotis daubentonii |
| | Myotis daubentonii |
| | Myotis daubentonii,Unidentified bat |
| | Unidentified bat,Myotis daubentonii |
| | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Pipistrellus nathusii,Pipistrellus spp. (45kHz/55kHz) |
| | Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz) |
| | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Pipistrellus spp. (45kHz/55kHz),Nyctalus leisleri |
| | Myotis daubentonii,Unidentified bat |
| | Myotis daubentonii,Unidentified bat |

## Table E 3 Bat Conservation Ireland Data – Ad-Hoc

| Survey Name | Species |
|---|---|
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
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| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |

| Survey Name | Species |
|---|---|
| Consultancy Surveys | Nyctalus leisleri,Myotis daubentonii,Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis spp. |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri |
| BATLAS 2010 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus |
| BATLAS 2010 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii,Plecotus auritus |
| BATLAS 2010 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii |
| BATLAS 2020 | Pipistrellus pygmaeus,Nyctalus leisleri |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Plecotus auritus |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis daubentonii,Myotis natterreri |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Nyctalus leisleri,Myotis daubentonii |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Nyctalus leisleri,Myotis daubentonii |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz) |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus |
| BATLAS 2020 | Pipistrellus pygmaeus,Myotis daubentonii |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus |
| BATLAS 2020 | Pipistrellus pygmaeus,Plecotus auritus |
| BATLAS 2020 | Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus |
| BATLAS 2020 | Pipistrellus spp. (45kHz/55kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz),Plecotus auritus |
| Consultancy Surveys | Nyctalus leisleri,Pipistrellus pygmaeus,Pipistrellus pipistrellus (45kHz),Myotis natterreri,Plecotus auritus |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |

| Survey Name | Species |
|---|---|
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pipistrellus (45kHz) |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Pipistrellus pygmaeus |
| Consultancy Surveys | Nyctalus leisleri,Myotis daubentonii,Pipistrellus pipistrellus (45kHz),Pipistrellus pygmaeus,Myotis spp. |

# Appendix F Ecobat Reports

## Baseline Bat Survey Report

### Cush Wind Farm Phase IIII

**Cush Wind Limited**

SLR Project No.: 501.065723.00001

21 October 2026

SLR

# Ecobat Report

2025-11-01

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

## Summary

Bats were detected on **10** nights between **06/05/2025** and **15/05/2025**, using **3** static bat detectors. Throughout this period, **7** species were recorded. **Table 1.** Detectors were placed at the following locations:

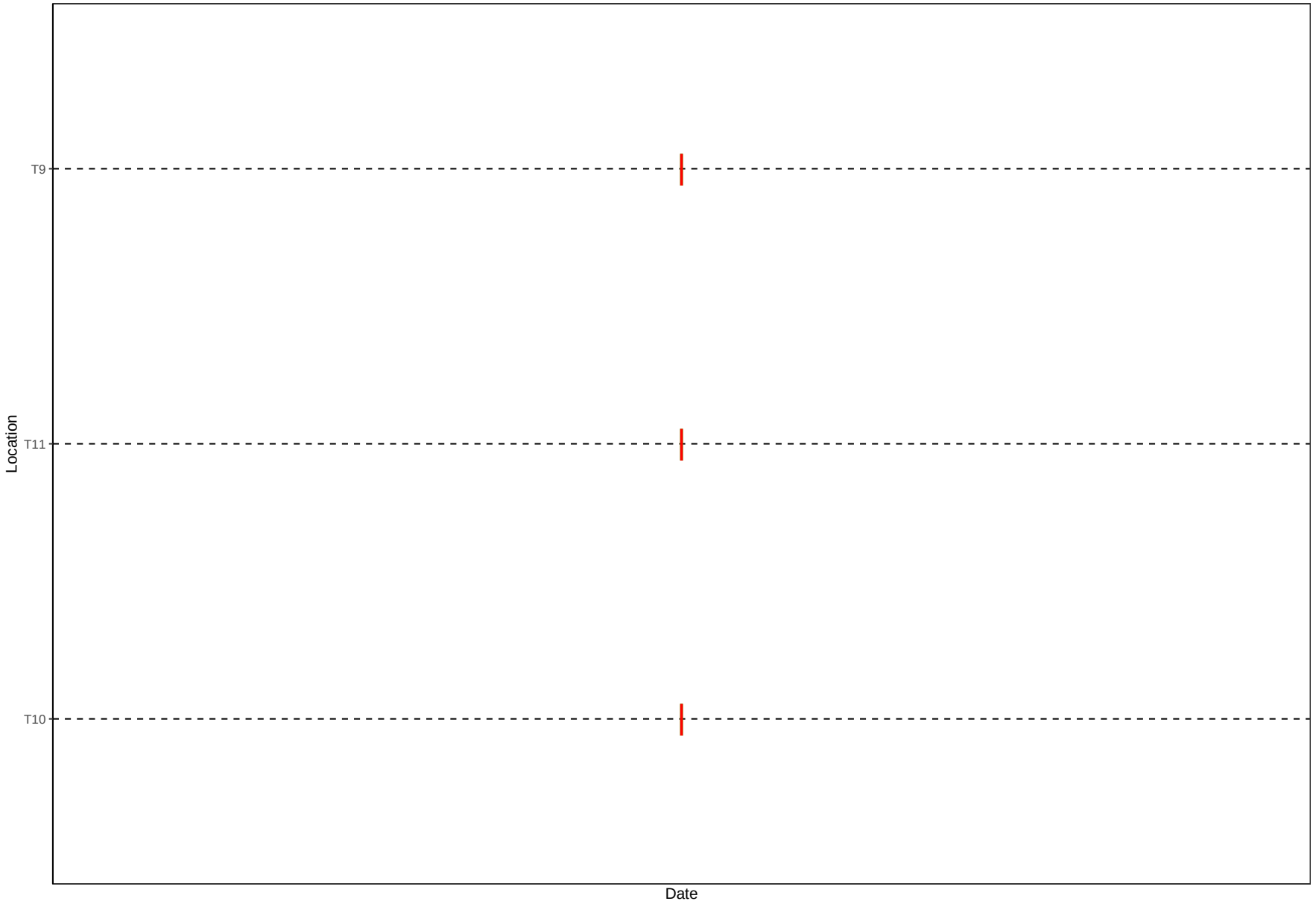
| Detector ID | Latitude | Longitude |
|---|---|---|
| T9 | 53.14700 | -7.870906 |
| T10 | 53.14975 | -7.876294 |
| T11 | 53.15033 | -7.866291 |

# 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 |
|---|---|
| T10 | 10 |
| T11 | 10 |
| T9 | 10 |

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


T9
T11
T10
Location
Date

# Part 1: Percentile Analysis

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

## Per Detector

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

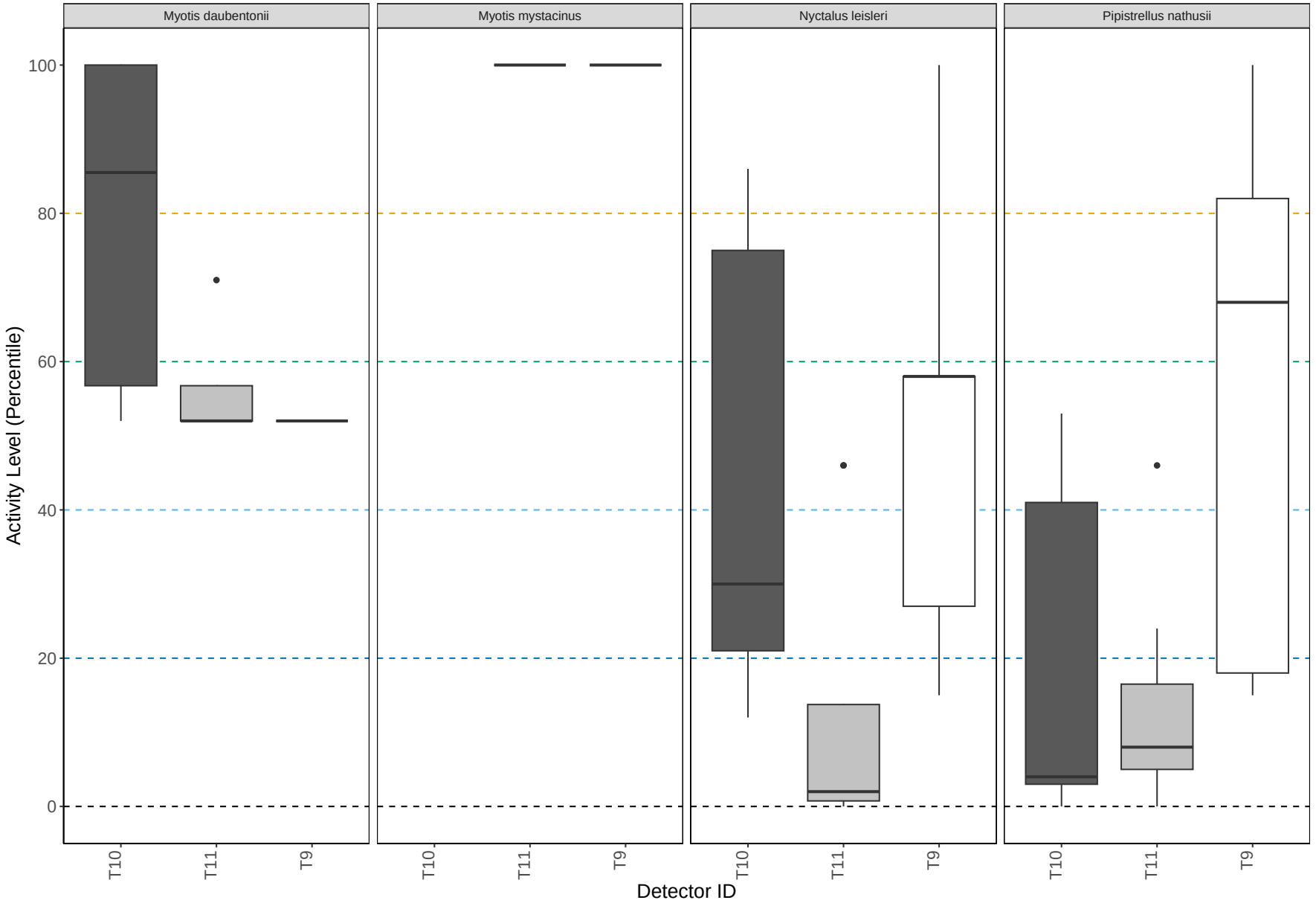
| Detector ID | Species/Species Group | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | 3 | 0 | 1 | 2 | 0 | 0 |
| T10 | Nyctalus leisleri | 0 | 2 | 2 | 0 | 4 | 1 |
| T10 | Pipistrellus nathusii | 0 | 0 | 0 | 3 | 1 | 5 |
| T10 | Pipistrellus pipistrellus | 2 | 1 | 1 | 0 | 4 | 1 |
| T10 | Pipistrellus pygmaeus | 2 | 0 | 1 | 5 | 1 | 0 |
| T10 | Plecotus auritus | 2 | 0 | 0 | 0 | 1 | 0 |
| T11 | Myotis daubentonii | 0 | 0 | 1 | 3 | 0 | 0 |
| T11 | Myotis mystacinus | 1 | 0 | 0 | 0 | 0 | 0 |
| T11 | Nyctalus leisleri | 0 | 0 | 0 | 2 | 0 | 6 |
| T11 | Pipistrellus nathusii | 0 | 0 | 0 | 1 | 1 | 5 |
| T11 | Pipistrellus pipistrellus | 0 | 0 | 0 | 2 | 0 | 7 |
| T11 | Pipistrellus pygmaeus | 0 | 0 | 0 | 0 | 2 | 7 |
| T9 | Myotis daubentonii | 0 | 0 | 0 | 2 | 0 | 0 |
| T9 | Myotis mystacinus | 1 | 0 | 0 | 0 | 0 | 0 |
| T9 | Nyctalus leisleri | 2 | 0 | 0 | 4 | 2 | 1 |
| T9 | Pipistrellus nathusii | 2 | 2 | 1 | 1 | 0 | 3 |
| T9 | Pipistrellus pipistrellus | 0 | 0 | 4 | 1 | 3 | 1 |

| Detector ID | Species/Species Group | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|
| T9 | Pipistrellus pygmaeus | 0 | 0 | 0 | 0 | 2 | 7 |
| T9 | Plecotus auritus | 0 | 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 |
|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | 86 | 61.5 - 100 | 100 | 6 | 21 |
| T10 | Nyctalus leisleri | 30 | 21 - 80.5 | 86 | 9 | 2457 |
| T10 | Pipistrellus nathusii | 4 | 2.5 - 47 | 53 | 9 | 825 |
| T10 | Pipistrellus pipistrellus | 29 | 21 - 88 | 100 | 9 | 5391 |
| T10 | Pipistrellus pygmaeus | 49 | 41 - 79 | 100 | 9 | 1489 |
| T10 | Plecotus auritus | 100 | 100 - 100 | 100 | 3 | 6 |
| T11 | Myotis daubentonii | 52 | 52 - 52 | 71 | 4 | 21 |
| T11 | Myotis mystacinus | 100 | 0 | 100 | 1 | 2 |
| T11 | Nyctalus leisleri | 2 | 1.5 - 46 | 46 | 8 | 2457 |
| T11 | Pipistrellus nathusii | 8 | 5 - 27.5 | 46 | 7 | 825 |
| T11 | Pipistrellus pipistrellus | 12 | 3 - 30 | 42 | 9 | 5391 |
| T11 | Pipistrellus pygmaeus | 9 | 6 - 21 | 28 | 9 | 1489 |
| T9 | Myotis daubentonii | 52 | 52 - 52 | 52 | 2 | 21 |
| T9 | Myotis mystacinus | 100 | 0 | 100 | 1 | 2 |
| T9 | Nyctalus leisleri | 58 | 27 - 79 | 100 | 9 | 2457 |
| T9 | Pipistrellus nathusii | 68 | 18 - 91 | 100 | 9 | 825 |
| T9 | Pipistrellus pipistrellus | 54 | 33.5 - 68.5 | 76 | 9 | 5391 |
| T9 | Pipistrellus pygmaeus | 13 | 8 - 19.5 | 22 | 9 | 1489 |
| T9 | Plecotus auritus | 33 | 0 | 33 | 1 | 6 |

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


Myotis daubentonii
Myotis mystacinus
Nyctalus leisleri
Pipistrellus nathusii
Activity Level (Percentile)
100
80
60
40
20
0
T10
T11
T9
Detector ID

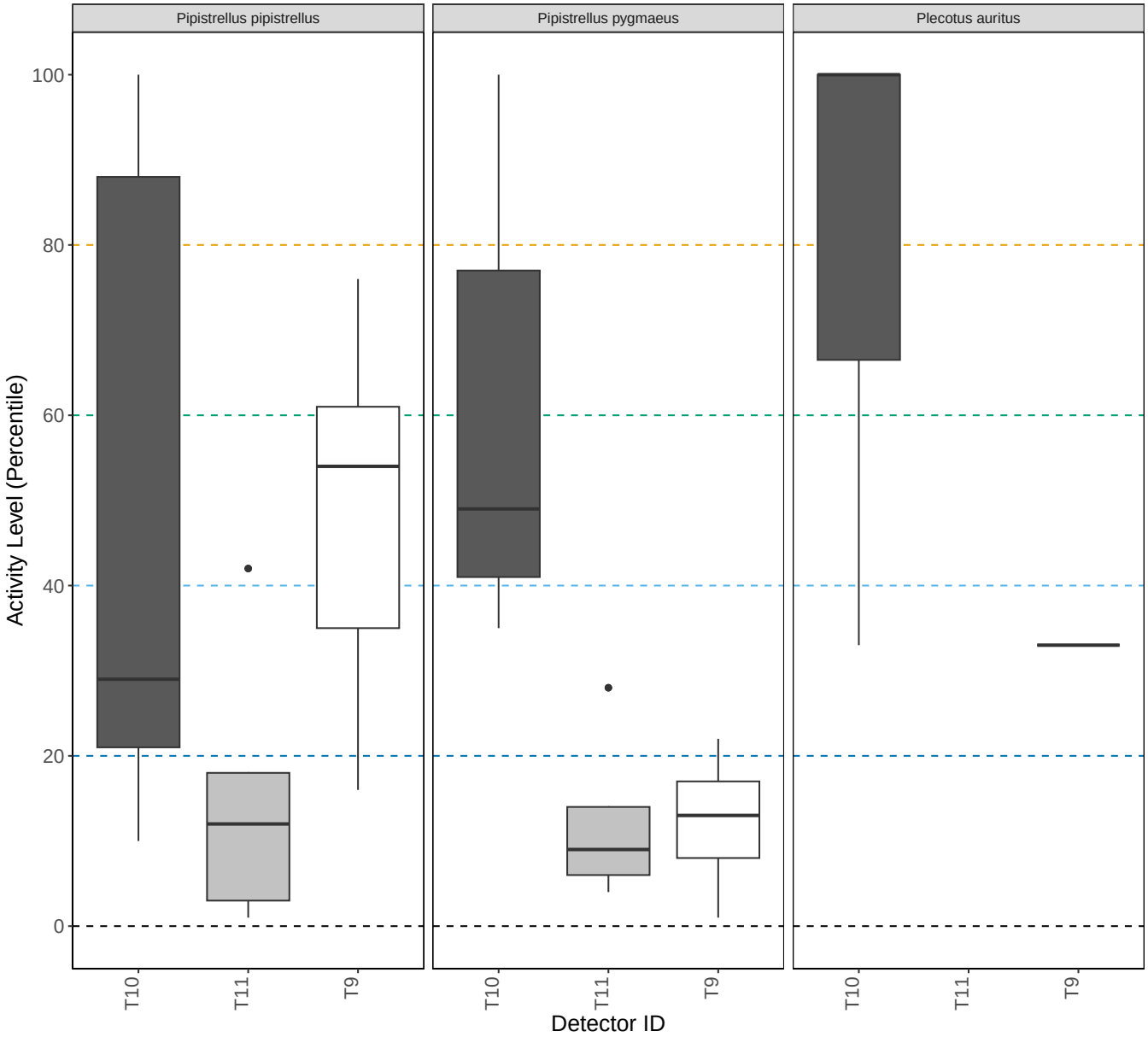
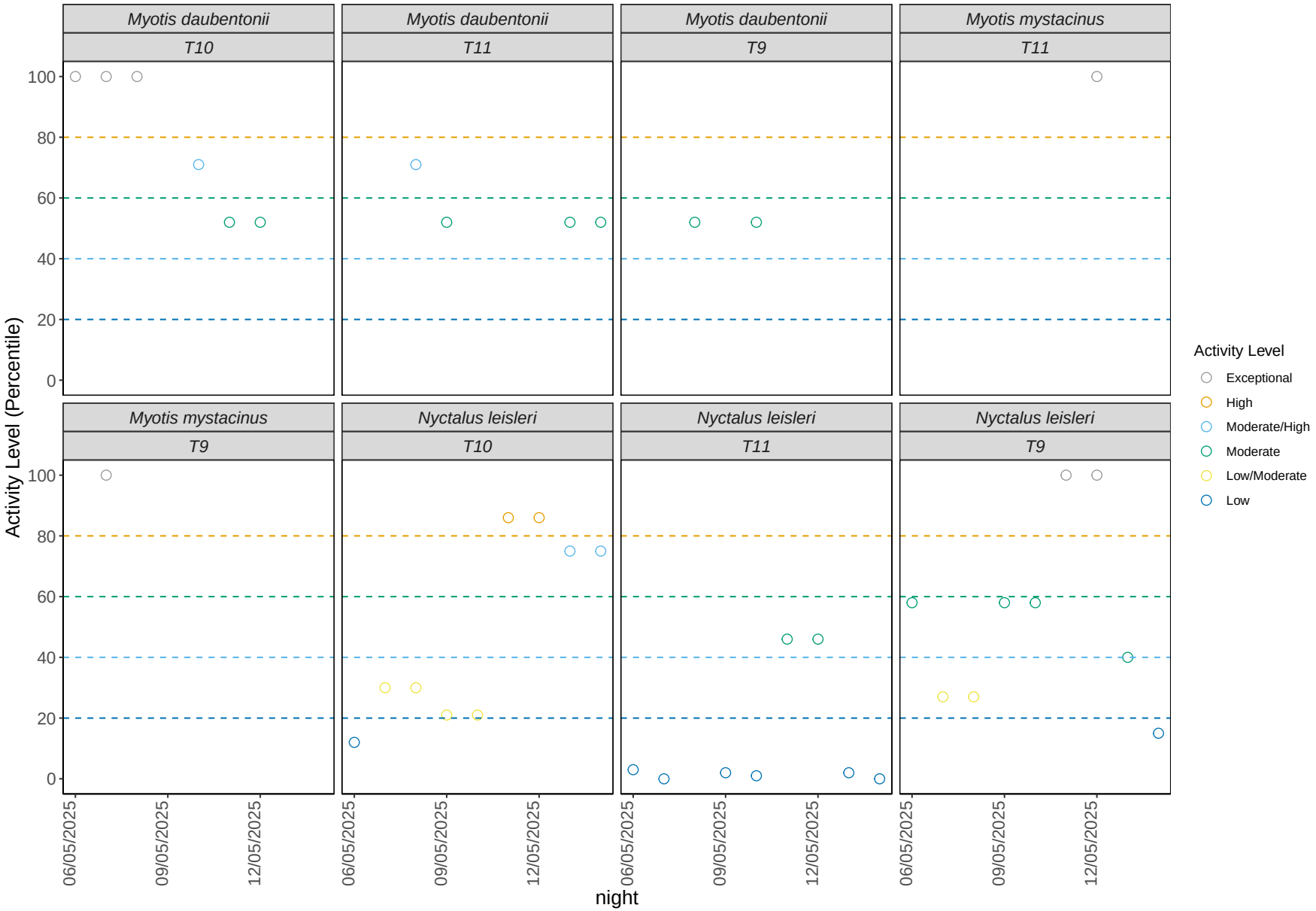
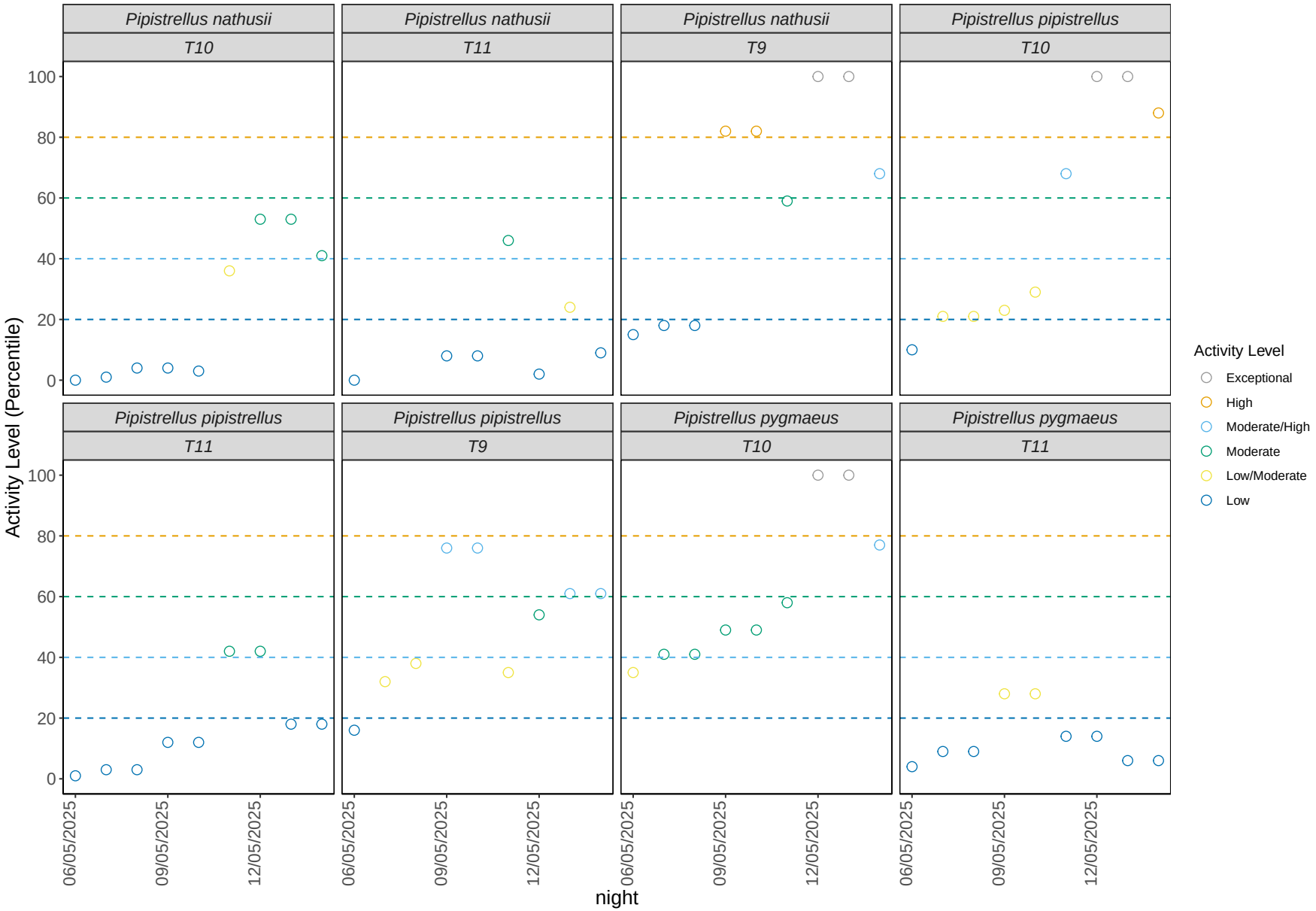
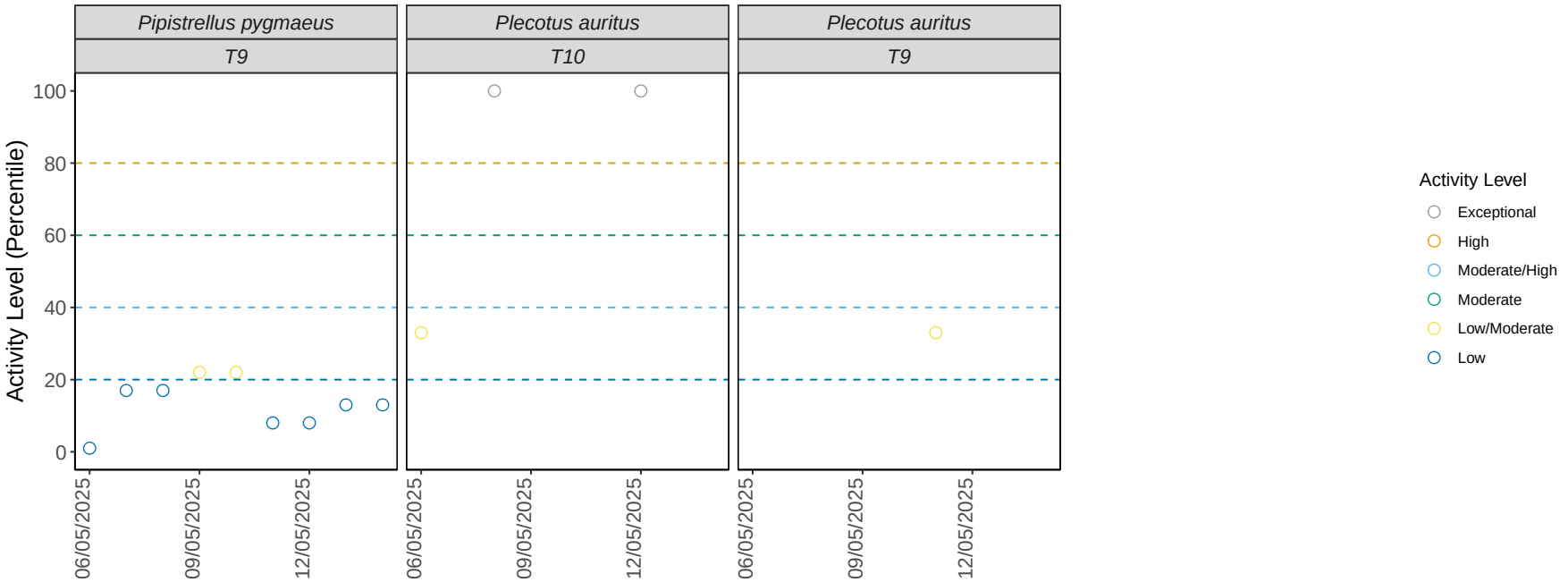

Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Activity Level (Percentile)
100
80
60
40
20
0
T10
T11
T9
Detector ID

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


Myotis daubentonii
T10
Myotis daubentonii
T11
Myotis daubentonii
T9
Myotis mystacinus
T11
Myotis mystacinus
T9
Nyctalus leisleri
T10
Nyctalus leisleri
T11
Nyctalus leisleri
T9
Activity Level (Percentile)
100
80
60
40
20
0
06/05/2025
09/05/2025
12/05/2025
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


Pipistrellus nathusii
T10
Pipistrellus nathusii
T11
Pipistrellus nathusii
T9
Pipistrellus pipistrellus
T10
Pipistrellus pipistrellus
T11
Pipistrellus pipistrellus
T9
Pipistrellus pygmaeus
T10
Pipistrellus pygmaeus
T11
Activity Level (Percentile)
100
80
60
40
20
0
06/05/2025
09/05/2025
12/05/2025
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


Pipistrellus pygmaeus
T9
Plecotus auritus
T10
Plecotus auritus
T9
Activity Level (Percentile)
100
80
60
40
20
0
06/05/2025
09/05/2025
12/05/2025
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
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 Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | May | 3 | 0 | 1 | 2 | 0 | 0 |
| T10 | Nyctalus leisleri | May | 0 | 2 | 2 | 0 | 4 | 1 |
| T10 | Pipistrellus nathusii | May | 0 | 0 | 0 | 3 | 1 | 5 |
| T10 | Pipistrellus pipistrellus | May | 2 | 1 | 1 | 0 | 4 | 1 |
| T10 | Pipistrellus pygmaeus | May | 2 | 0 | 1 | 5 | 1 | 0 |
| T10 | Plecotus auritus | May | 2 | 0 | 0 | 0 | 1 | 0 |
| T11 | Myotis daubentonii | May | 0 | 0 | 1 | 3 | 0 | 0 |
| T11 | Myotis mystacinus | May | 1 | 0 | 0 | 0 | 0 | 0 |
| T11 | Nyctalus leisleri | May | 0 | 0 | 0 | 2 | 0 | 6 |
| T11 | Pipistrellus nathusii | May | 0 | 0 | 0 | 1 | 1 | 5 |
| T11 | Pipistrellus pipistrellus | May | 0 | 0 | 0 | 2 | 0 | 7 |
| T11 | Pipistrellus pygmaeus | May | 0 | 0 | 0 | 0 | 2 | 7 |
| T9 | Myotis daubentonii | May | 0 | 0 | 0 | 2 | 0 | 0 |
| T9 | Myotis mystacinus | May | 1 | 0 | 0 | 0 | 0 | 0 |
| T9 | Nyctalus leisleri | May | 2 | 0 | 0 | 4 | 2 | 1 |
| T9 | Pipistrellus nathusii | May | 2 | 2 | 1 | 1 | 0 | 3 |
| T9 | Pipistrellus pipistrellus | May | 0 | 0 | 4 | 1 | 3 | 1 |

| Detector ID | Species/Species Group | month | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|---|
| T9 | Pipistrellus pygmaeus | May | 0 | 0 | 0 | 0 | 2 | 7 |
| T9 | Plecotus auritus | May | 0 | 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 |
|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | May | 86 | 61.5 - 100 | 100 | 6 |
| T10 | Nyctalus leisleri | May | 30 | 21 - 80.5 | 86 | 9 |
| T10 | Pipistrellus nathusii | May | 4 | 2.5 - 47 | 53 | 9 |
| T10 | Pipistrellus pipistrellus | May | 29 | 21 - 88 | 100 | 9 |
| T10 | Pipistrellus pygmaeus | May | 49 | 41 - 79 | 100 | 9 |
| T10 | Plecotus auritus | May | 100 | 100 - 100 | 100 | 3 |
| T11 | Myotis daubentonii | May | 52 | 52 - 52 | 71 | 4 |
| T11 | Myotis mystacinus | May | 100 | 0 | 100 | 1 |
| T11 | Nyctalus leisleri | May | 2 | 1.5 - 46 | 46 | 8 |
| T11 | Pipistrellus nathusii | May | 8 | 5 - 27.5 | 46 | 7 |
| T11 | Pipistrellus pipistrellus | May | 12 | 3 - 30 | 42 | 9 |
| T11 | Pipistrellus pygmaeus | May | 9 | 6 - 21 | 28 | 9 |
| T9 | Myotis daubentonii | May | 52 | 52 - 52 | 52 | 2 |
| T9 | Myotis mystacinus | May | 100 | 0 | 100 | 1 |
| T9 | Nyctalus leisleri | May | 58 | 27 - 79 | 100 | 9 |
| T9 | Pipistrellus nathusii | May | 68 | 18 - 91 | 100 | 9 |
| T9 | Pipistrellus pipistrellus | May | 54 | 33.5 - 68.5 | 76 | 9 |
| T9 | Pipistrellus pygmaeus | May | 13 | 8 - 19.5 | 22 | 9 |
| T9 | Plecotus auritus | May | 33 | 0 | 33 | 1 |

## Per Site

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

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

| Species/Species Group | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|
| Myotis daubentonii | 3 | 0 | 2 | 7 | 0 | 0 |
| Myotis mystacinus | 2 | 0 | 0 | 0 | 0 | 0 |
| Nyctalus leisleri | 2 | 2 | 2 | 6 | 6 | 8 |
| Pipistrellus nathusii | 2 | 2 | 1 | 5 | 2 | 13 |
| Pipistrellus pipistrellus | 2 | 1 | 5 | 3 | 7 | 9 |
| Pipistrellus pygmaeus | 2 | 0 | 1 | 5 | 5 | 14 |
| Plecotus auritus | 2 | 0 | 0 | 0 | 2 | 0 |

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

| Species/Species Group | Median Percentile | 95% CIs | Max. Percentile | Nights Recorded |
|---|---|---|---|---|
| Myotis daubentonii | 52 | 61.5 - 100 | 100 | 12 |
| Myotis mystacinus | 100 | 0 | 100 | 2 |
| Nyctalus leisleri | 30 | 27 - 79 | 100 | 26 |
| Pipistrellus nathusii | 18 | 5 - 27.5 | 100 | 25 |
| Pipistrellus pipistrellus | 32 | 33.5 - 68.5 | 100 | 27 |
| Pipistrellus pygmaeus | 17 | 8 - 19.5 | 100 | 27 |
| Plecotus auritus | 67 | 100 - 100 | 100 | 4 |

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

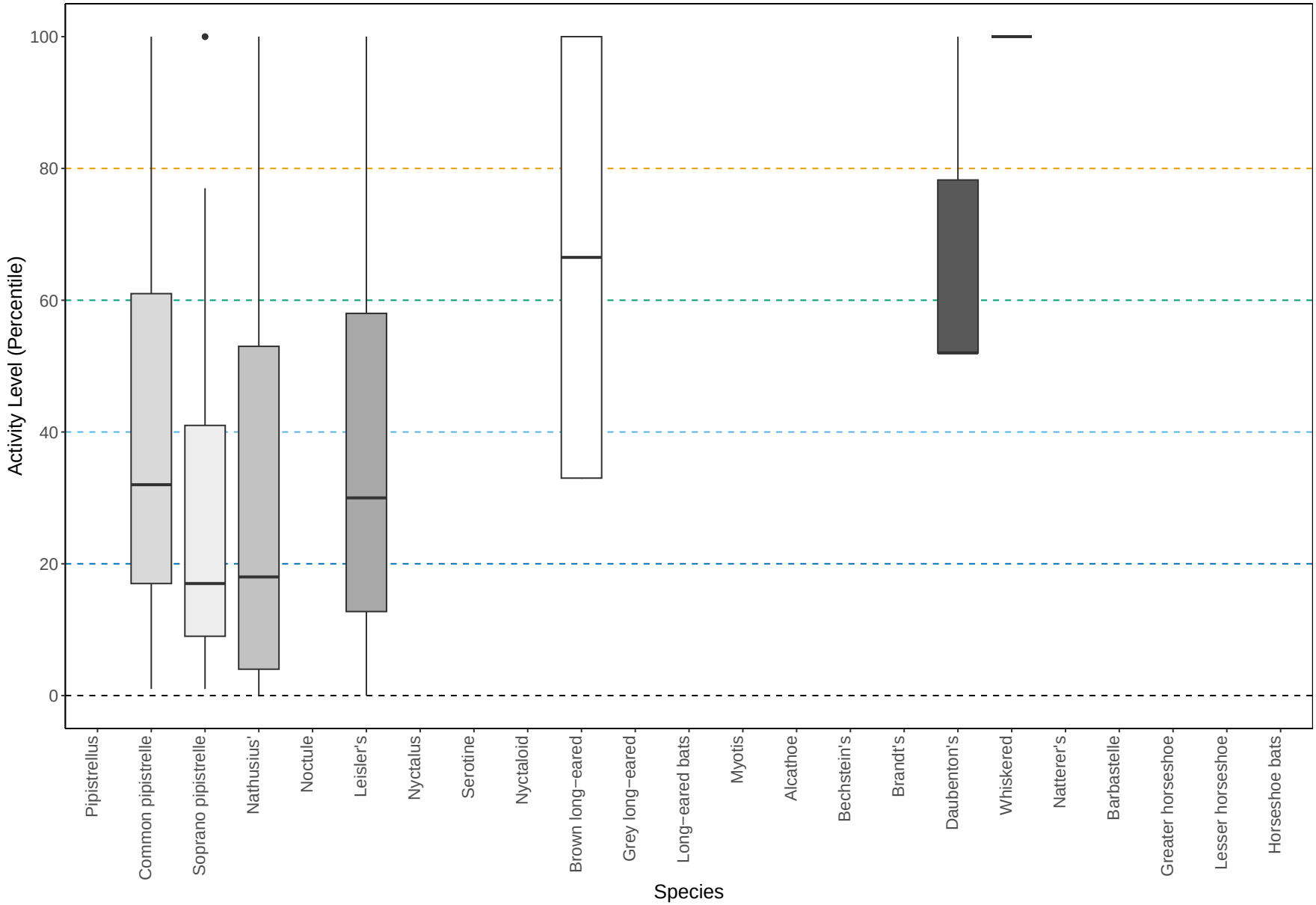

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Leisler's
Nyctalus
Serotine
Nyctaloid
Brown long−eared
Grey long−eared
Long−eared bats
Myotis
Alcathoe
Bechstein's
Brandt's
Daubenton's
Whiskered
Natterer's
Barbastelle
Greater horseshoe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

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

## Per Site, Per Month

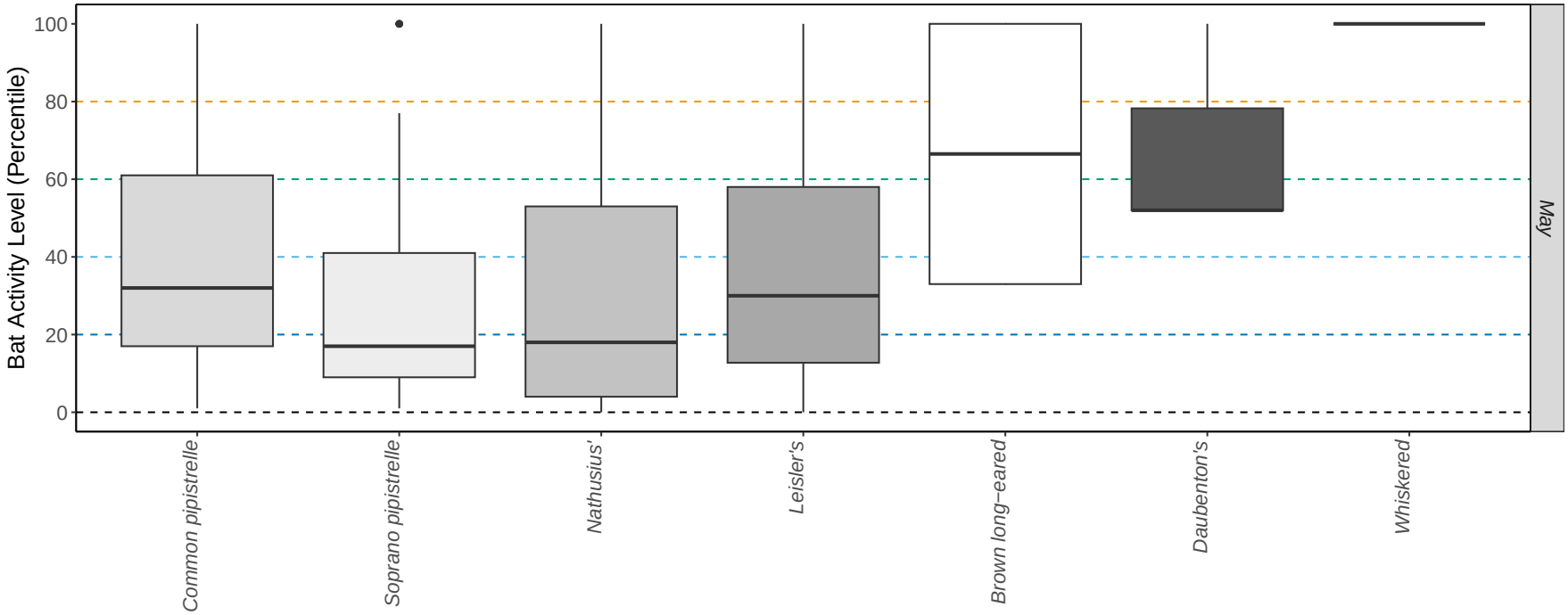
**Table 9.** Summary table showing the number of nights recorded bat activity fell into each activity band for each species during each month.

| Species/Species Group | month | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|
| Myotis daubentonii | May | 3 | 0 | 2 | 7 | 0 | 0 |
| Myotis mystacinus | May | 2 | 0 | 0 | 0 | 0 | 0 |
| Nyctalus leisleri | May | 2 | 2 | 2 | 6 | 6 | 8 |
| Pipistrellus nathusii | May | 2 | 2 | 1 | 5 | 2 | 13 |
| Pipistrellus pipistrellus | May | 2 | 1 | 5 | 3 | 7 | 9 |
| Pipistrellus pygmaeus | May | 2 | 0 | 1 | 5 | 5 | 14 |
| Plecotus auritus | May | 2 | 0 | 0 | 0 | 2 | 0 |

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

| Species/Species Group | month | Median Percentile | 95% CIs | Max. Percentile | Nights Recorded |
|---|---|---|---|---|---|
| Myotis daubentonii | May | 52 | 61.5 - 100 | 100 | 12 |
| Myotis mystacinus | May | 100 | 0 | 100 | 2 |
| Nyctalus leisleri | May | 30 | 27 - 79 | 100 | 26 |
| Pipistrellus nathusii | May | 18 | 5 - 27.5 | 100 | 25 |
| Pipistrellus pipistrellus | May | 32 | 33.5 - 68.5 | 100 | 27 |
| Pipistrellus pygmaeus | May | 17 | 8 - 19.5 | 100 | 27 |
| Plecotus auritus | May | 67 | 100 - 100 | 100 | 4 |

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


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

## Part 2: Nightly Analysis

# Entire Survey Period

### Sunrise and Sunset Times

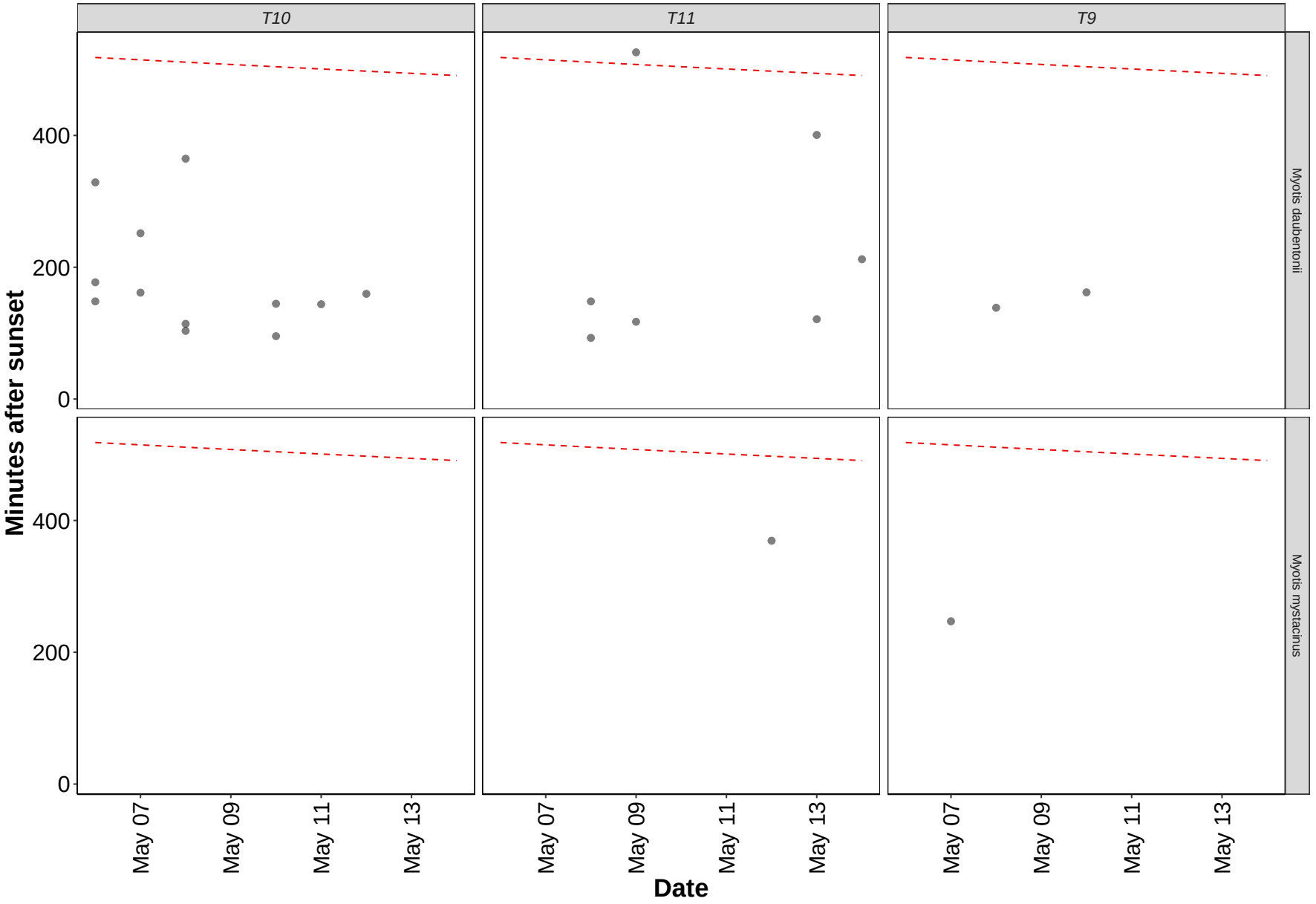
**Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.**

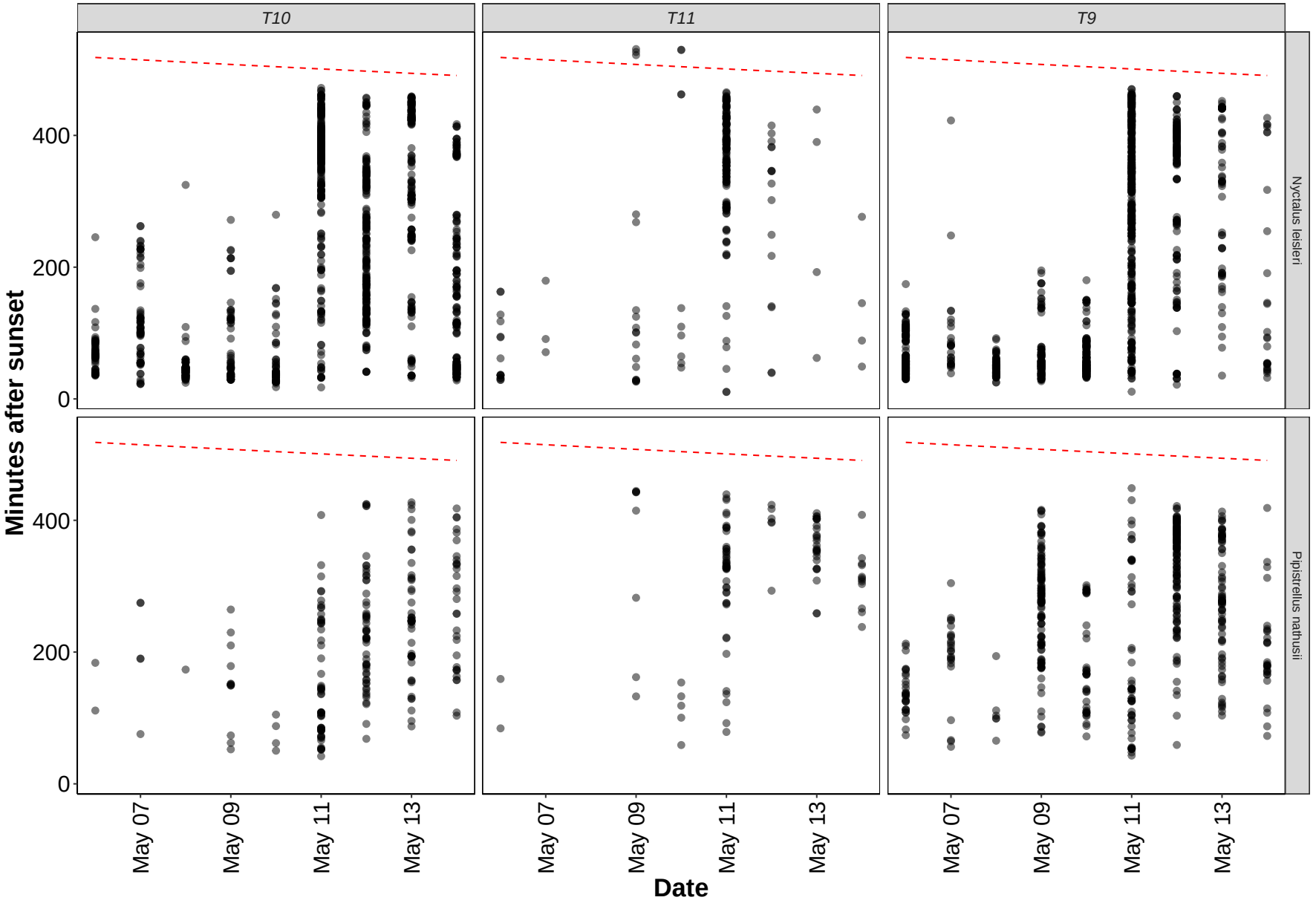
| Night (y-m-d) | Sunset (h:m) | Sunrise (h:m) | Night Length (hours) |
|---|---|---|---|
| 2025-05-06 | 21:09 | 05:47 | 8.6 |
| 2025-05-07 | 21:11 | 05:45 | 8.6 |
| 2025-05-08 | 21:12 | 05:43 | 8.5 |
| 2025-05-09 | 21:14 | 05:42 | 8.5 |
| 2025-05-10 | 21:16 | 05:40 | 8.4 |
| 2025-05-11 | 21:17 | 05:38 | 8.3 |
| 2025-05-12 | 21:19 | 05:37 | 8.3 |
| 2025-05-13 | 21:21 | 05:35 | 8.2 |
| 2025-05-14 | 21:22 | 05:33 | 8.2 |
| 2025-05-15 | 21:27 | 05:43 | 8.2 |

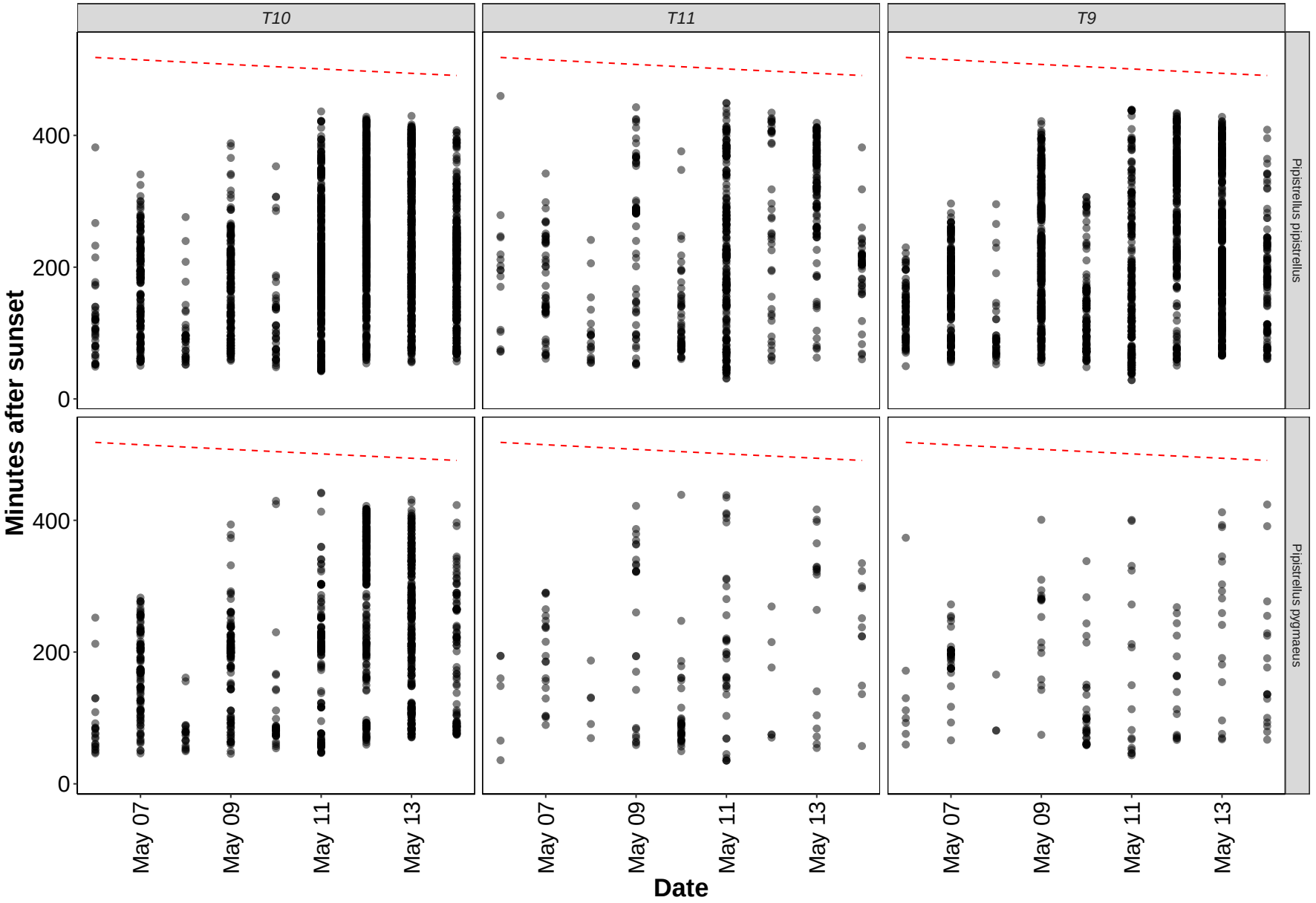
# Distribution of Bat Activity Across the Night through Time

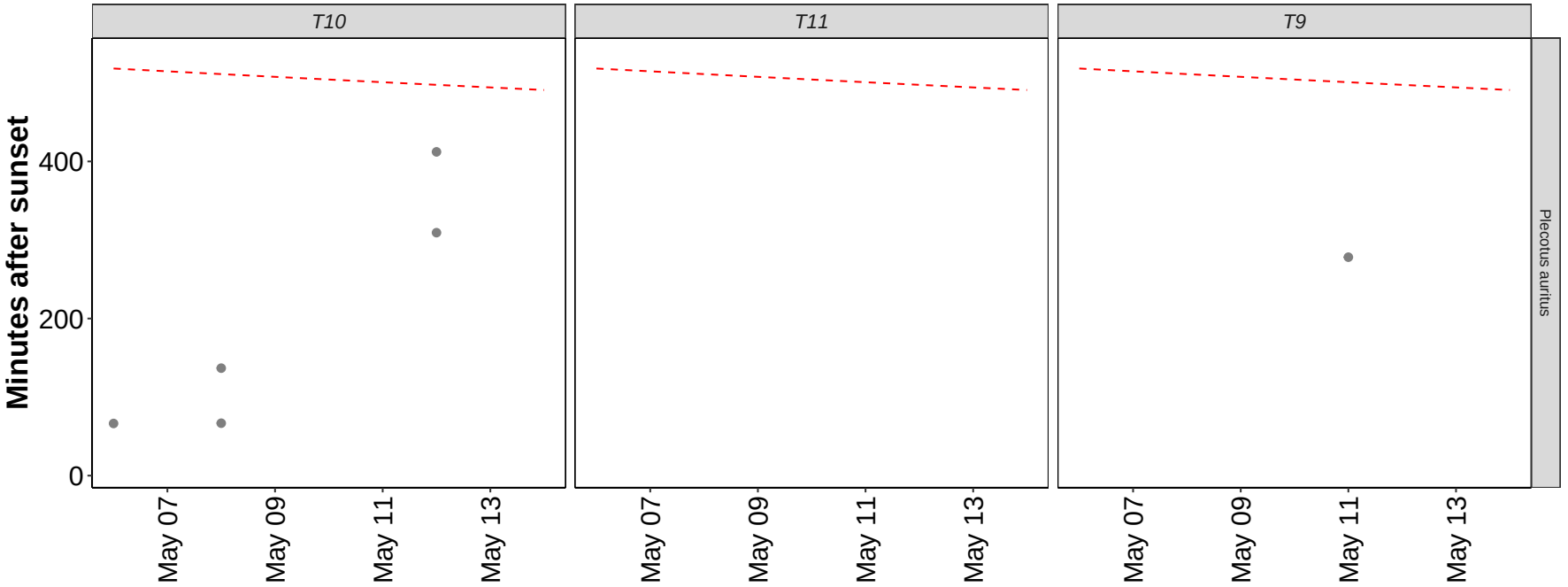
## Per Detector

**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.


T10
T11
T9
Myotis daubentonii
Myotis mystacinus
Minutes after sunset
0
200
400
May 07
May 09
May 11
May 13
Date


T10
T11
T9
Nyctalus leisleri
Pipistrellus nathusii
Minutes after sunset
0
200
400
May 07
May 09
May 11
May 13
Date


T10
T11
T9
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Minutes after sunset
0
200
400
May 07
May 09
May 11
May 13
Date


T10
T11
T9
Minutes after sunset
0
200
400
May 07
May 09
May 11
May 13
Plecotus auritus

**Date**

# Roost Emergence Time and Bat Observation

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

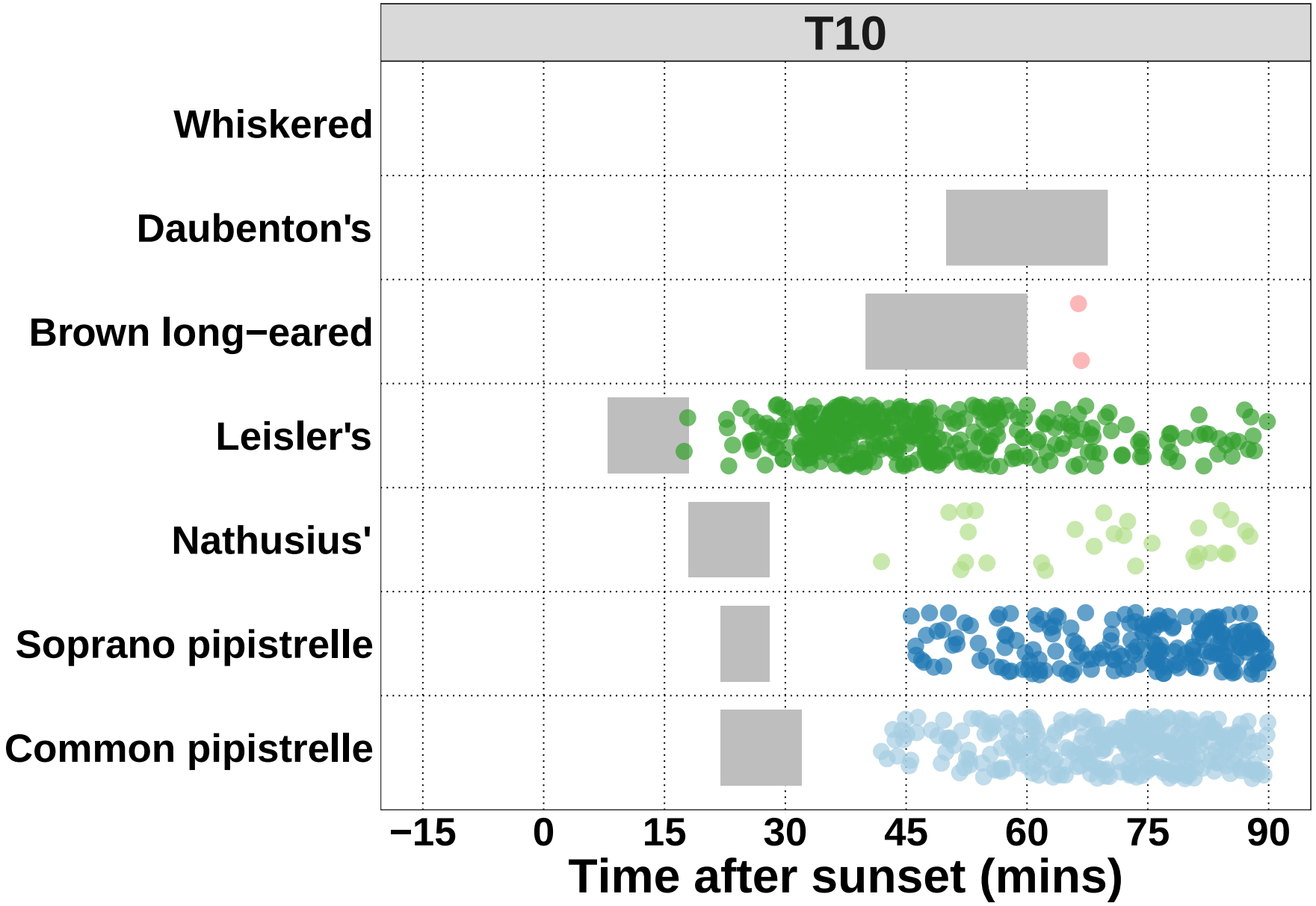
## Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012)

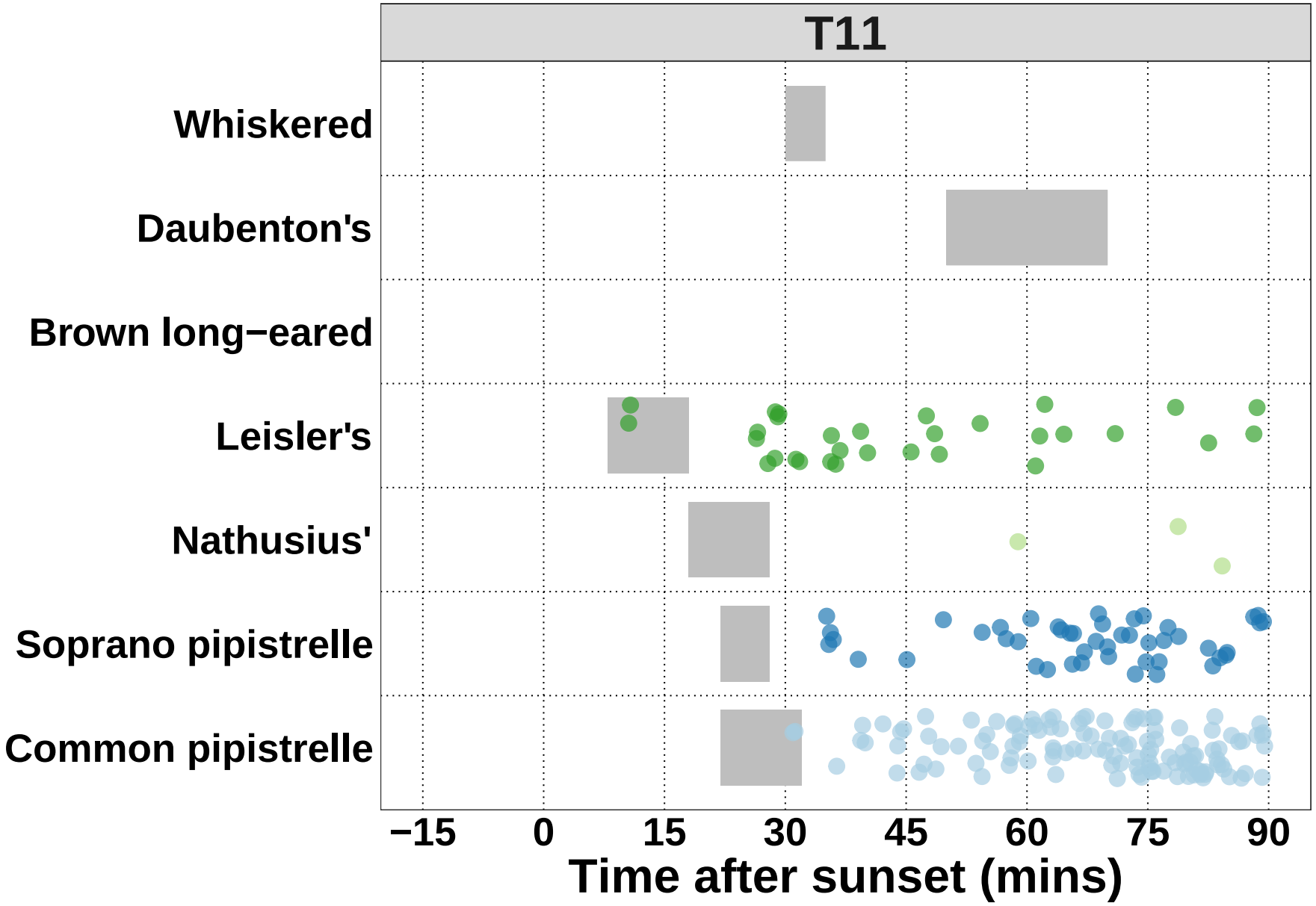
**Table 12. Number of bat calls recorded before the upper time of the species-specific emergence time range, and which therefore may potentially indicate the presence of a nearby roost.**

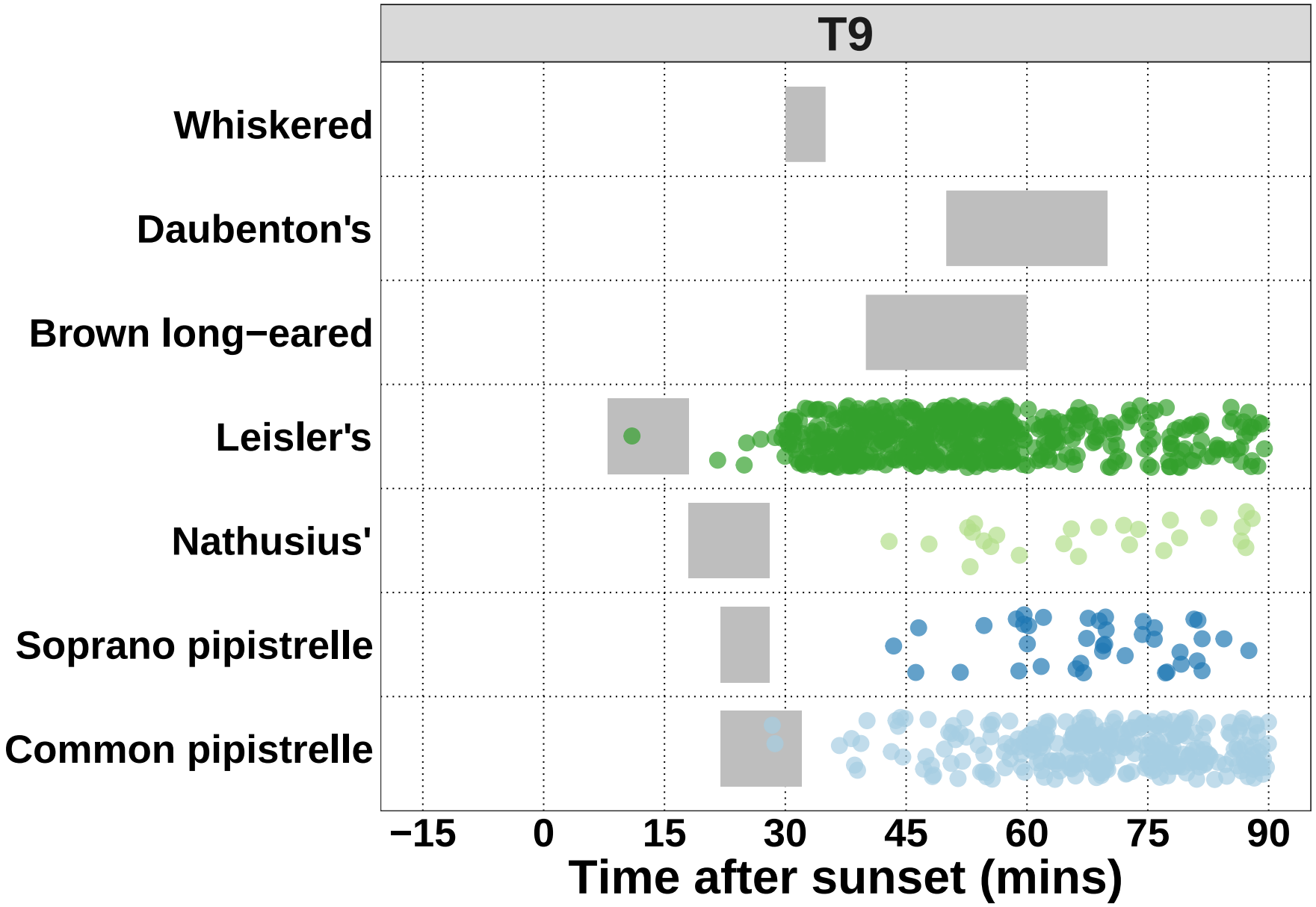
| Species | Detector ID | 2025-05-10 | 2025-05-11 |
|---|---|---|---|
| Common pipistrelle | T11 | 0 | 2 |
| Common pipistrelle | T9 | 0 | 2 |
| Leisler's | T10 | 1 | 1 |
| Leisler's | T11 | 0 | 2 |
| Leisler's | T9 | 0 | 1 |

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

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


T10
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)


T11
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)


T9
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)

# Count of Bat Passes

## All Detectors

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

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

| Species | Passes (no.) | Percentage of Total (%) |
|---|---|---|
| Myotis daubentonii | 21 | 0.2 |
| Myotis mystacinus | 2 | 0.0 |
| Nyctalus leisleri | 2457 | 24.1 |
| Pipistrellus nathusii | 825 | 8.1 |
| Pipistrellus pipistrellus | 5391 | 52.9 |
| Pipistrellus pygmaeus | 1489 | 14.6 |
| Plecotus auritus | 6 | 0.1 |
| Total | 10191 | 100.0 |

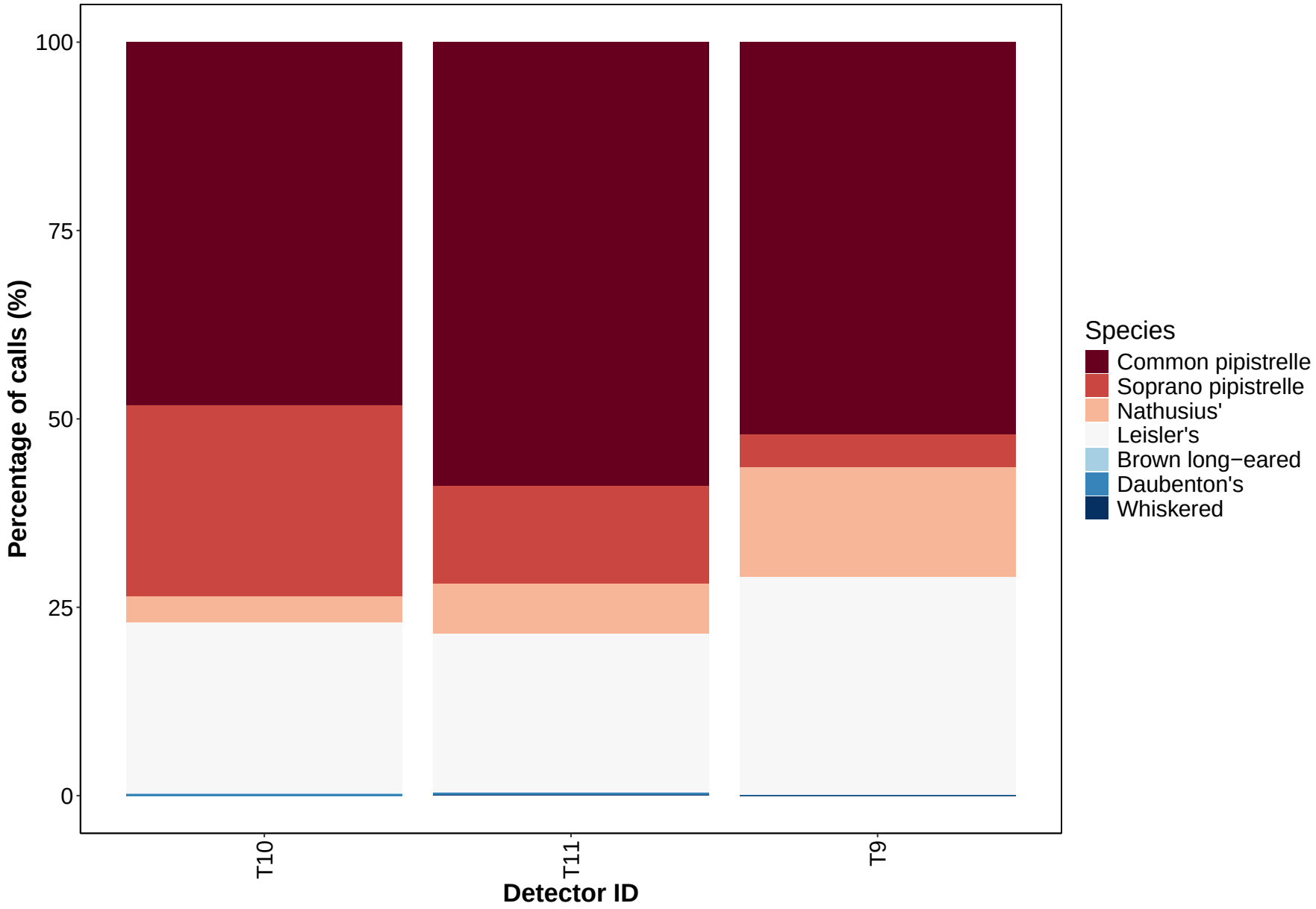
## Per Detector

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

| Species | Detector ID | Count (no.) | Percentage by Detector (%) |
|---|---|---|---|
| Common pipistrelle | T10 | 2610 | 50.9069631 |
| Common pipistrelle | T11 | 711 | 58.8089330 |
| Common pipistrelle | T9 | 2070 | 53.6964981 |
| Soprano pipistrelle | T10 | 1165 | 22.7228399 |
| Soprano pipistrelle | T11 | 163 | 13.4822167 |
| Soprano pipistrelle | T9 | 161 | 4.1763943 |
| Nathusius' | T10 | 214 | 4.1739809 |
| Nathusius' | T11 | 107 | 8.8502895 |
| Nathusius' | T9 | 504 | 13.0739300 |
| Leisler's | T10 | 1121 | 21.8646382 |
| Leisler's | T11 | 220 | 18.1968569 |
| Leisler's | T9 | 1116 | 28.9494163 |
| Brown long-eared | T10 | 5 | 0.0975229 |
| Brown long-eared | T9 | 1 | 0.0259403 |
| Daubenton's | T10 | 12 | 0.2340550 |
| Daubenton's | T11 | 7 | 0.5789909 |
| Daubenton's | T9 | 2 | 0.0518807 |
| Whiskered | T11 | 1 | 0.0827130 |
| Whiskered | T9 | 1 | 0.0259403 |

## Species Composition

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


100
75
50
25
0
Percentage of calls (%)
T10
T11
T9
Detector ID
Species
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long−eared
Daubenton's
Whiskered

## Part 2a: Presence Only

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

### Nighlty Bat Passes Per Hour

# Median Per Detector

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

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

| Species | Detector ID | Median Pass Rate |
|---|---|---|
| Common pipistrelle | T10 | 18.1 |
| Common pipistrelle | T11 | 12.3 |
| Common pipistrelle | T9 | 41.9 |
| Soprano pipistrelle | T10 | 14.0 |
| Soprano pipistrelle | T11 | 2.0 |
| Soprano pipistrelle | T9 | 2.6 |
| Nathusius' | T10 | 1.1 |
| Nathusius' | T11 | 1.3 |
| Nathusius' | T9 | 8.6 |
| Leisler's | T10 | 10.2 |
| Leisler's | T11 | 1.6 |
| Leisler's | T9 | 17.9 |
| Brown long-eared | T10 | 0.2 |
| Brown long-eared | T9 | 0.1 |
| Daubenton's | T10 | 0.3 |
| Daubenton's | T11 | 0.1 |
| Daubenton's | T9 | 0.1 |
| Whiskered | T11 | 0.1 |
| Whiskered | T9 | 0.1 |

# Mean Per Detector

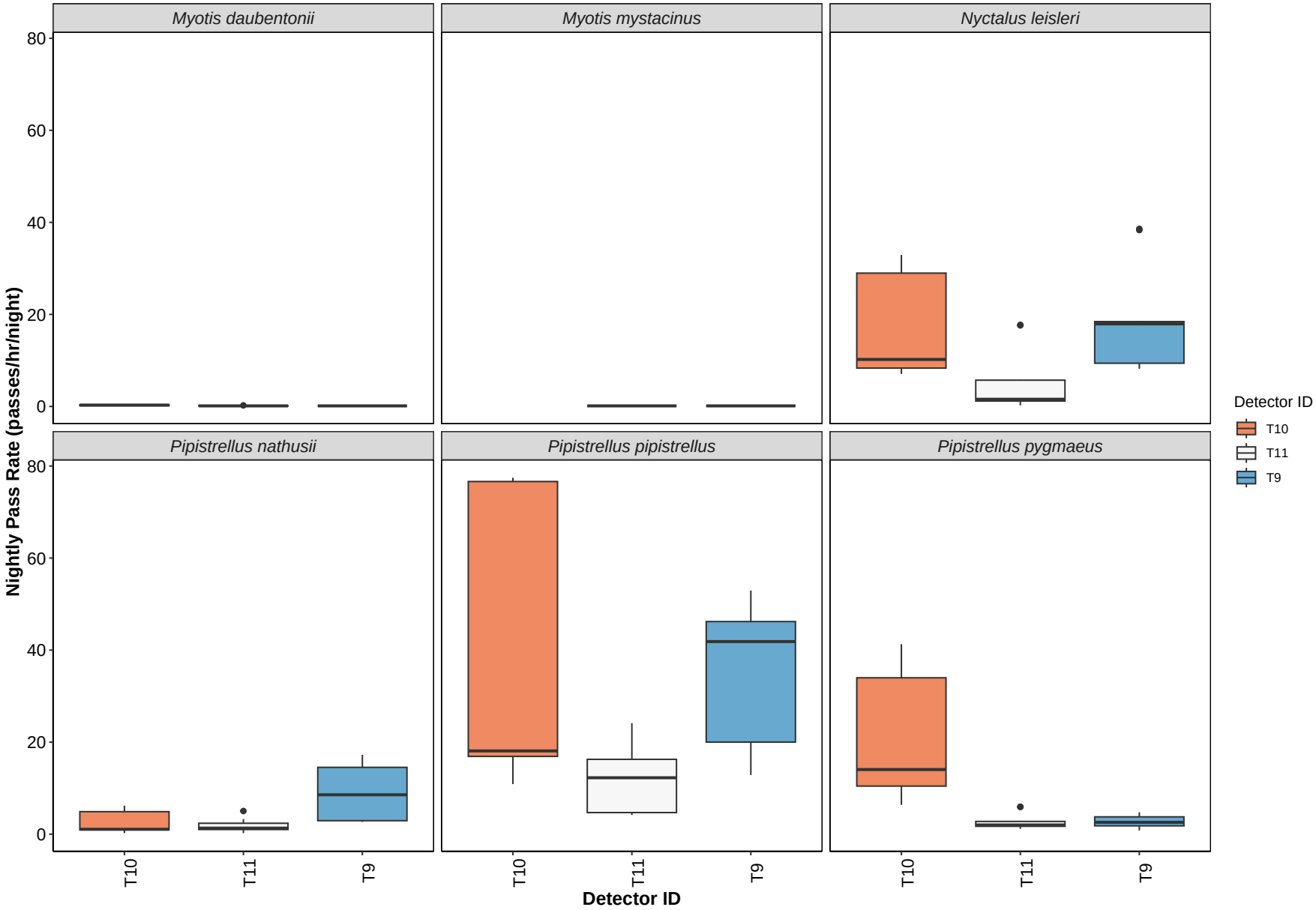
**Table 17. The mean Nightly Pass Rate (bat passes per hour, per night) of each species at each detector. Values are given to 1 decimal place.**

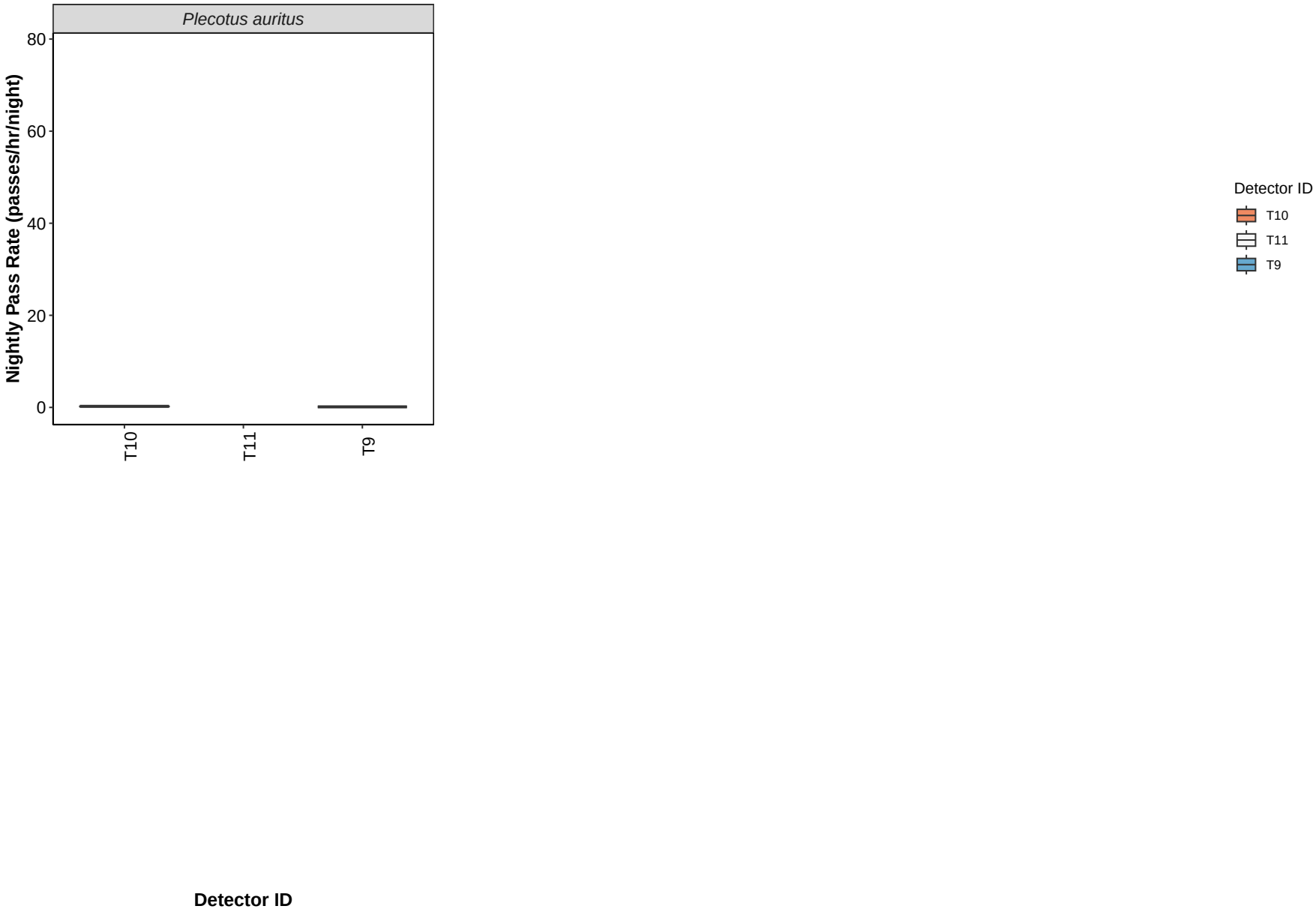
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

| Species | Detector ID | Mean Pass Rate |
|---|---|---|
| Common pipistrelle | T10 | 39.6 |
| Common pipistrelle | T11 | 13.2 |
| Common pipistrelle | T9 | 34.6 |
| Soprano pipistrelle | T10 | 20.8 |
| Soprano pipistrelle | T11 | 2.9 |
| Soprano pipistrelle | T9 | 2.9 |
| Nathusius' | T10 | 2.8 |
| Nathusius' | T11 | 1.9 |
| Nathusius' | T9 | 9.6 |
| Leisler's | T10 | 18.6 |
| Leisler's | T11 | 5.3 |
| Leisler's | T9 | 19.2 |
| Brown long-eared | T10 | 0.2 |
| Brown long-eared | T9 | 0.1 |
| Daubenton's | T10 | 0.3 |
| Daubenton's | T11 | 0.1 |
| Daubenton's | T9 | 0.1 |
| Whiskered | T11 | 0.1 |
| Whiskered | T9 | 0.1 |

## Per Detector

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


Myotis daubentonii
Myotis mystacinus
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Nightly Pass Rate (passes/hr/night)
0
20
40
60
80
T10
T11
T9
Detector ID
Detector ID
T10
T11
T9


Plecotus auritus
Nightly Pass Rate (passes/hr/night)
80
60
40
20
0
T10
T11
T9
Detector ID
Detector ID
T10
T11
T9

# Split by Month

## Total Bat Passes per Detector each Month

**Table 18. The total number of bat passes of each species in each month at each detector.**

This table simply tells you how many bats of each species were recorded passing each detector during each month. These numbers are not standardised by the night length, or how many nights each detector was active for during each month.

| Species | Detector ID | May |
|---|---|---|
| Common pipistrelle | T10 | 2962 |
| Common pipistrelle | T11 | 988 |
| Common pipistrelle | T9 | 2605 |
| Soprano pipistrelle | T10 | 1556 |
| Soprano pipistrelle | T11 | 218 |
| Soprano pipistrelle | T9 | 223 |
| Nathusius' | T10 | 210 |
| Nathusius' | T11 | 111 |
| Nathusius' | T9 | 724 |
| Leisler's | T10 | 1395 |
| Leisler's | T11 | 354 |
| Leisler's | T9 | 1450 |
| Brown long-eared | T10 | 5 |
| Brown long-eared | T9 | 1 |
| Daubenton's | T10 | 13 |
| Daubenton's | T11 | 5 |
| Daubenton's | T9 | 2 |
| Whiskered | T11 | 1 |
| Whiskered | T9 | 1 |

# Survey Effort

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

| month | Detector ID | No. of Survey Nights |
|---|---|---|
| May | T10 | 9 |
| May | T11 | 9 |
| May | T9 | 9 |

## Nightly Bat Passes for Each Month

# Median Per Detector

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

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

| Species | Detector ID | May |
|---|---|---|
| Common pipistrelle | T10 | 18.1 |
| Common pipistrelle | T11 | 12.3 |
| Common pipistrelle | T9 | 41.9 |
| Soprano pipistrelle | T10 | 14.0 |
| Soprano pipistrelle | T11 | 2.0 |
| Soprano pipistrelle | T9 | 2.6 |
| Nathusius' | T10 | 1.1 |
| Nathusius' | T11 | 1.3 |
| Nathusius' | T9 | 8.6 |
| Leisler's | T10 | 10.2 |
| Leisler's | T11 | 1.6 |
| Leisler's | T9 | 17.9 |
| Brown long-eared | T10 | 0.2 |
| Brown long-eared | T9 | 0.1 |
| Daubenton's | T10 | 0.3 |
| Daubenton's | T11 | 0.1 |
| Daubenton's | T9 | 0.1 |
| Whiskered | T11 | 0.1 |
| Whiskered | T9 | 0.1 |

# Mean Per Detector

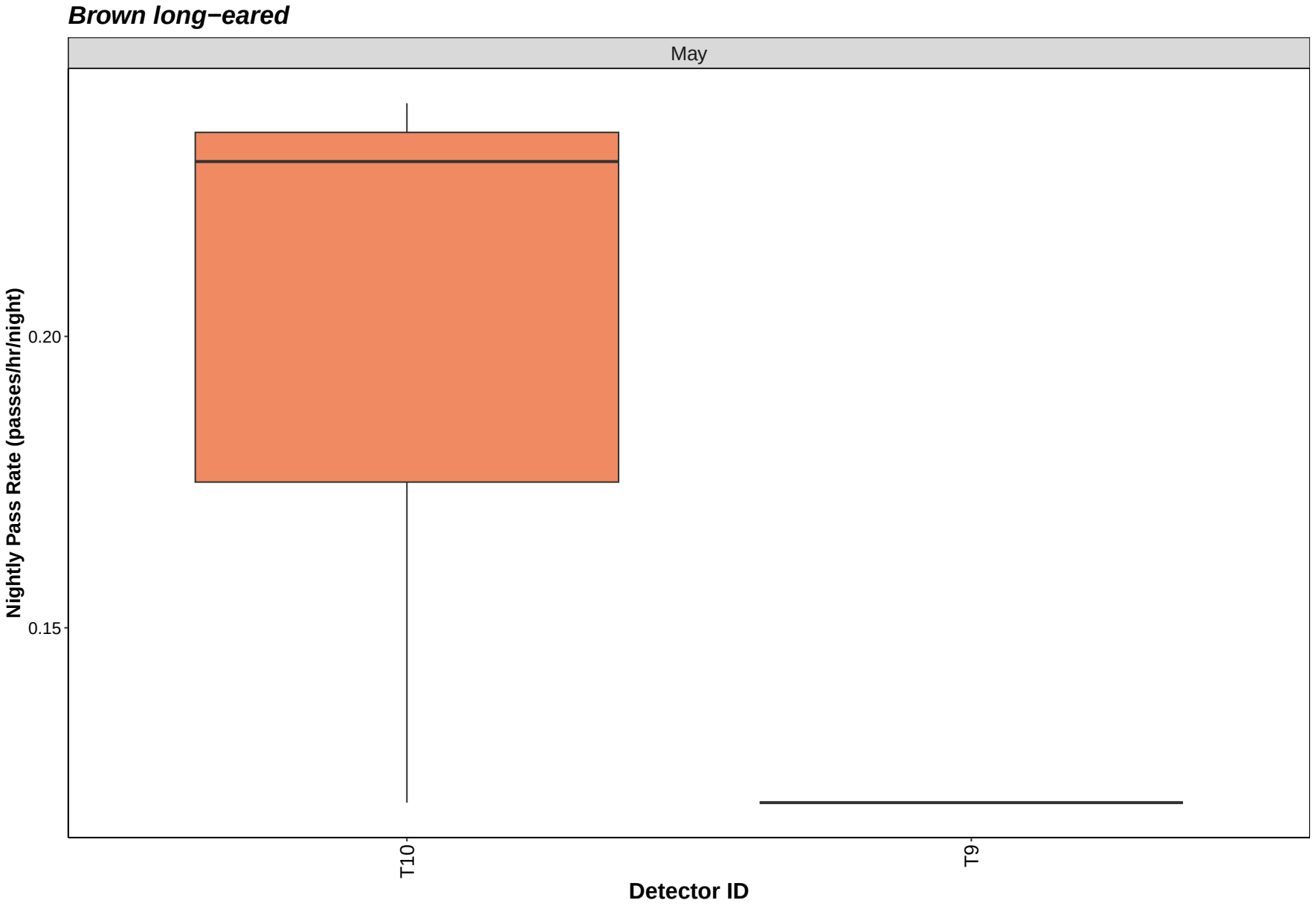
**Table 21: The mean Nightly Pass Rate (bat passes per hour, per night) of each species throughout each month. Values are given to 1 decimal place.**

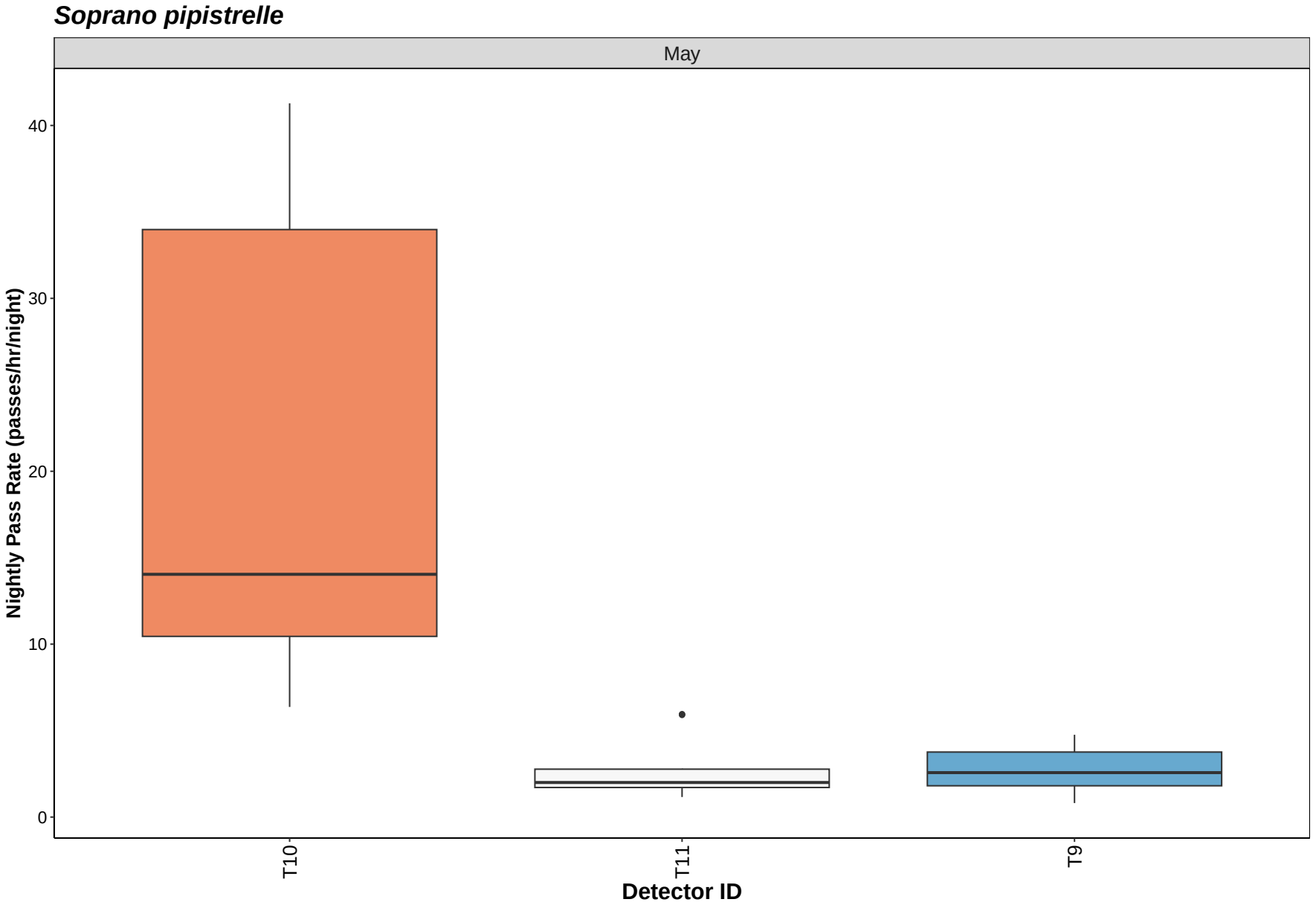
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

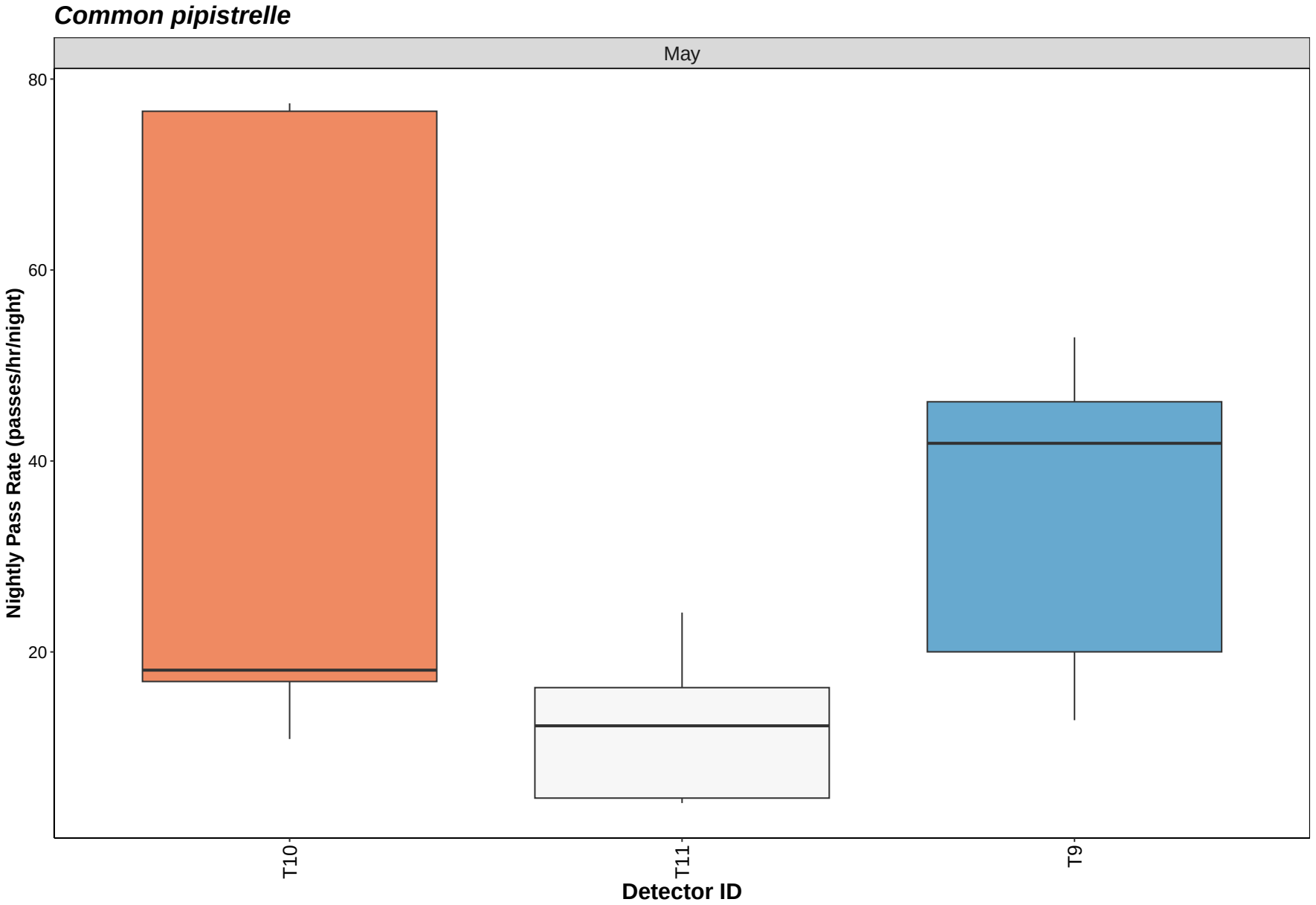
| Species | Detector ID | May |
|---|---|---|
| Common pipistrelle | T10 | 39.6 |
| Common pipistrelle | T11 | 13.2 |
| Common pipistrelle | T9 | 34.6 |
| Soprano pipistrelle | T10 | 20.8 |
| Soprano pipistrelle | T11 | 2.9 |
| Soprano pipistrelle | T9 | 2.9 |
| Nathusius' | T10 | 2.8 |
| Nathusius' | T11 | 1.9 |
| Nathusius' | T9 | 9.6 |
| Leisler's | T10 | 18.6 |
| Leisler's | T11 | 5.3 |
| Leisler's | T9 | 19.2 |
| Brown long-eared | T10 | 0.2 |
| Brown long-eared | T9 | 0.1 |
| Daubenton's | T10 | 0.3 |
| Daubenton's | T11 | 0.1 |
| Daubenton's | T9 | 0.1 |
| Whiskered | T11 | 0.1 |
| Whiskered | T9 | 0.1 |

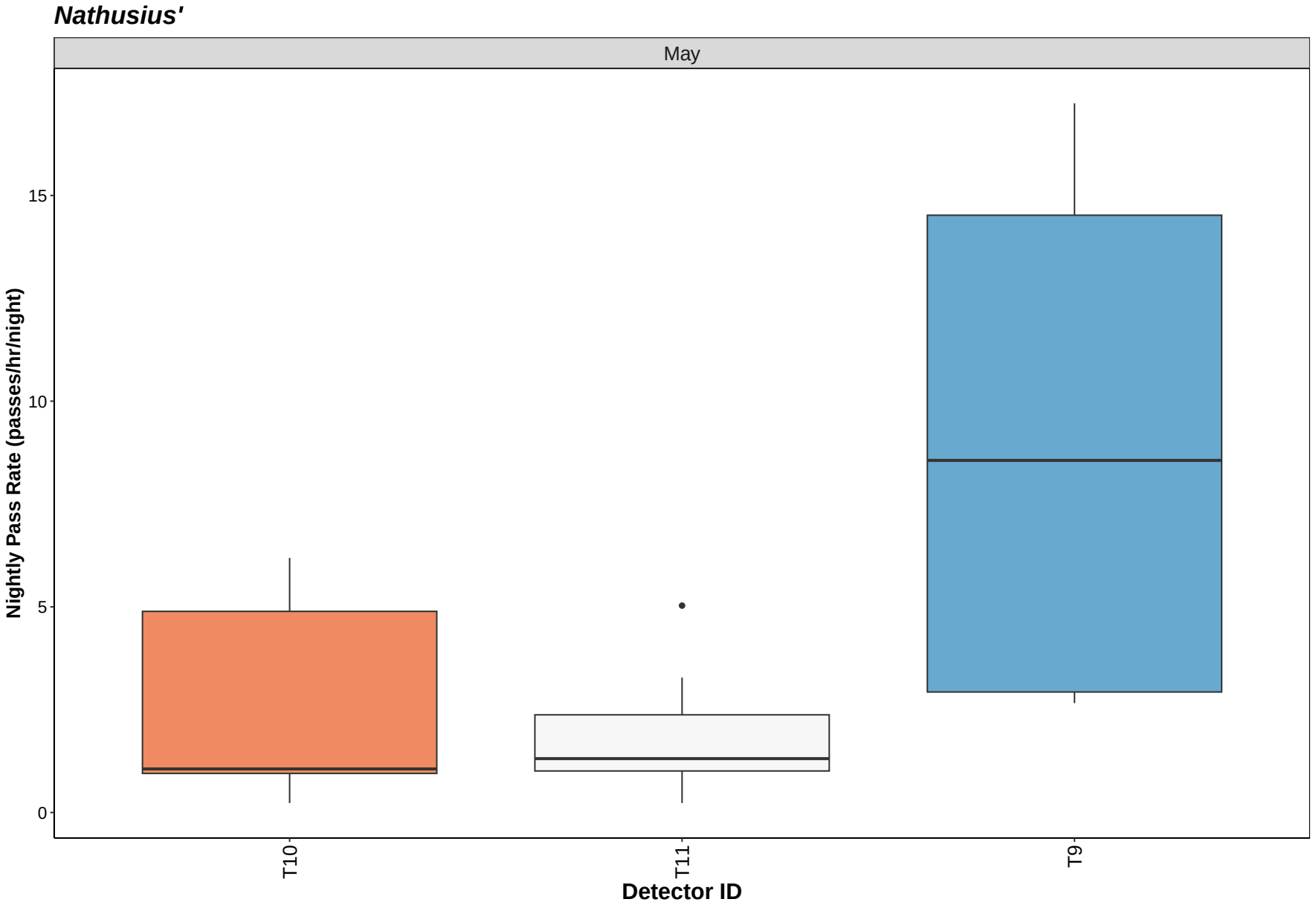
## Per Detector

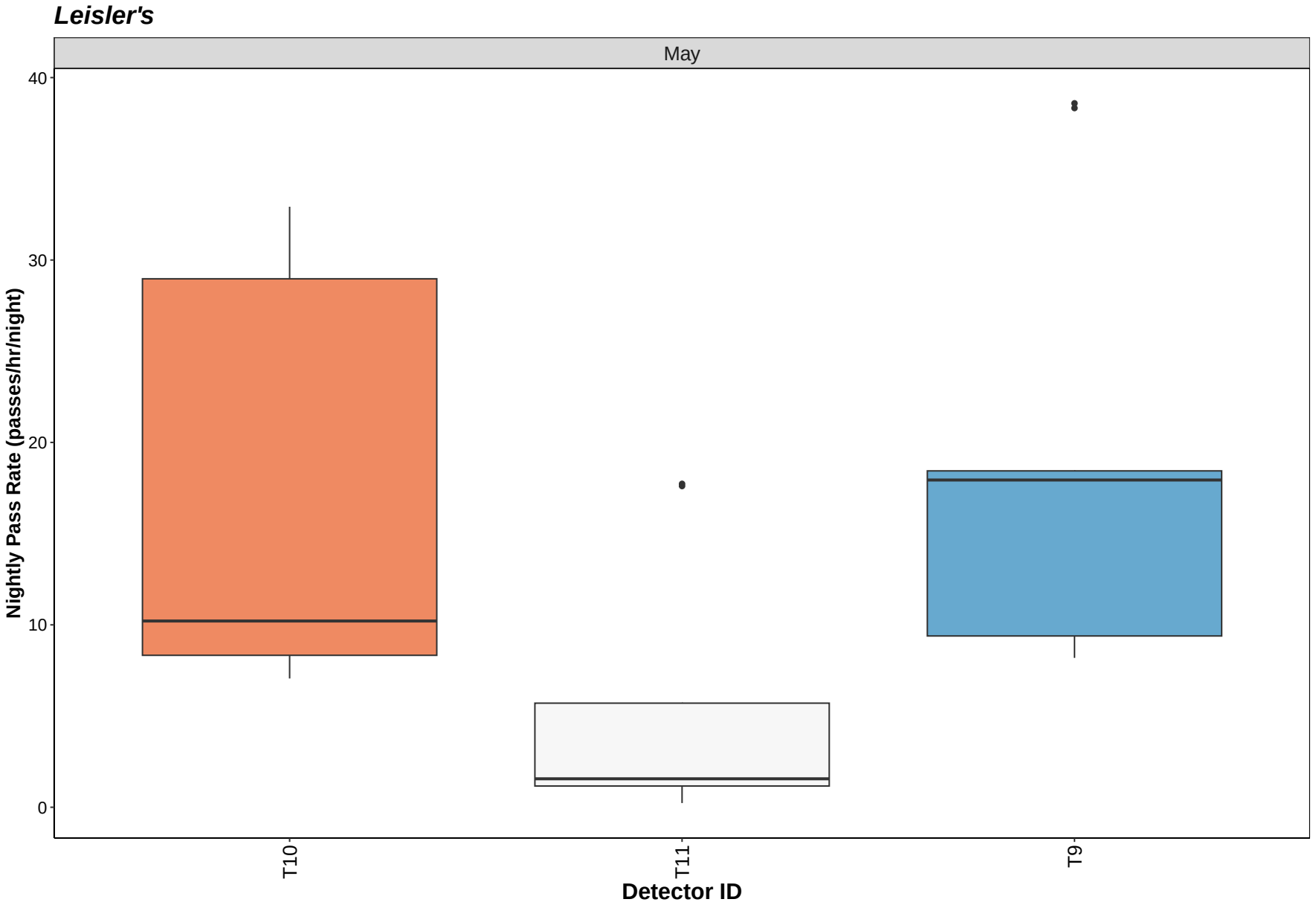
**Figure 12.** Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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

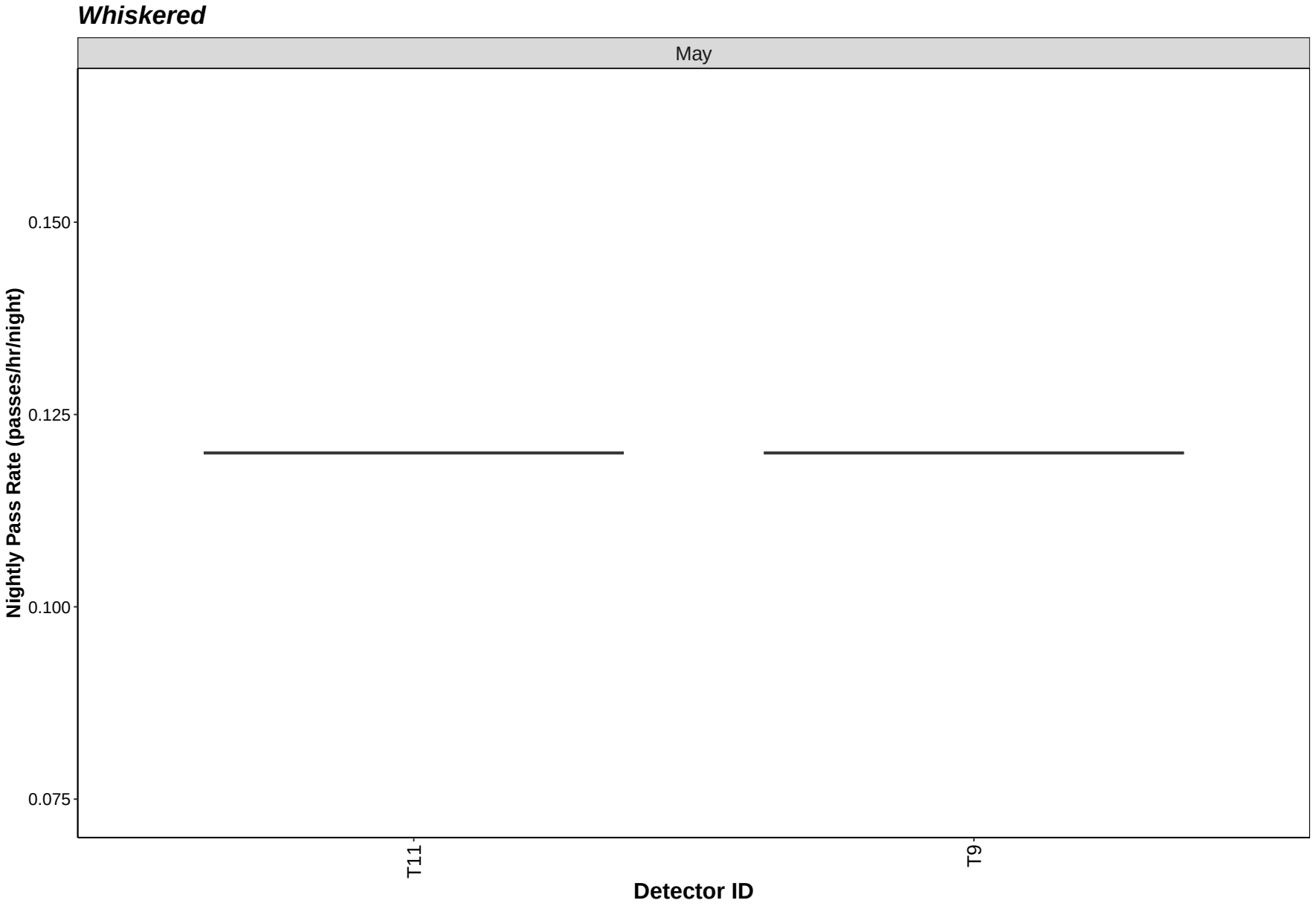

Brown long−eared
May
Nightly Pass Rate (passes/hr/night)
0.20
0.15
T10
T9
Detector ID

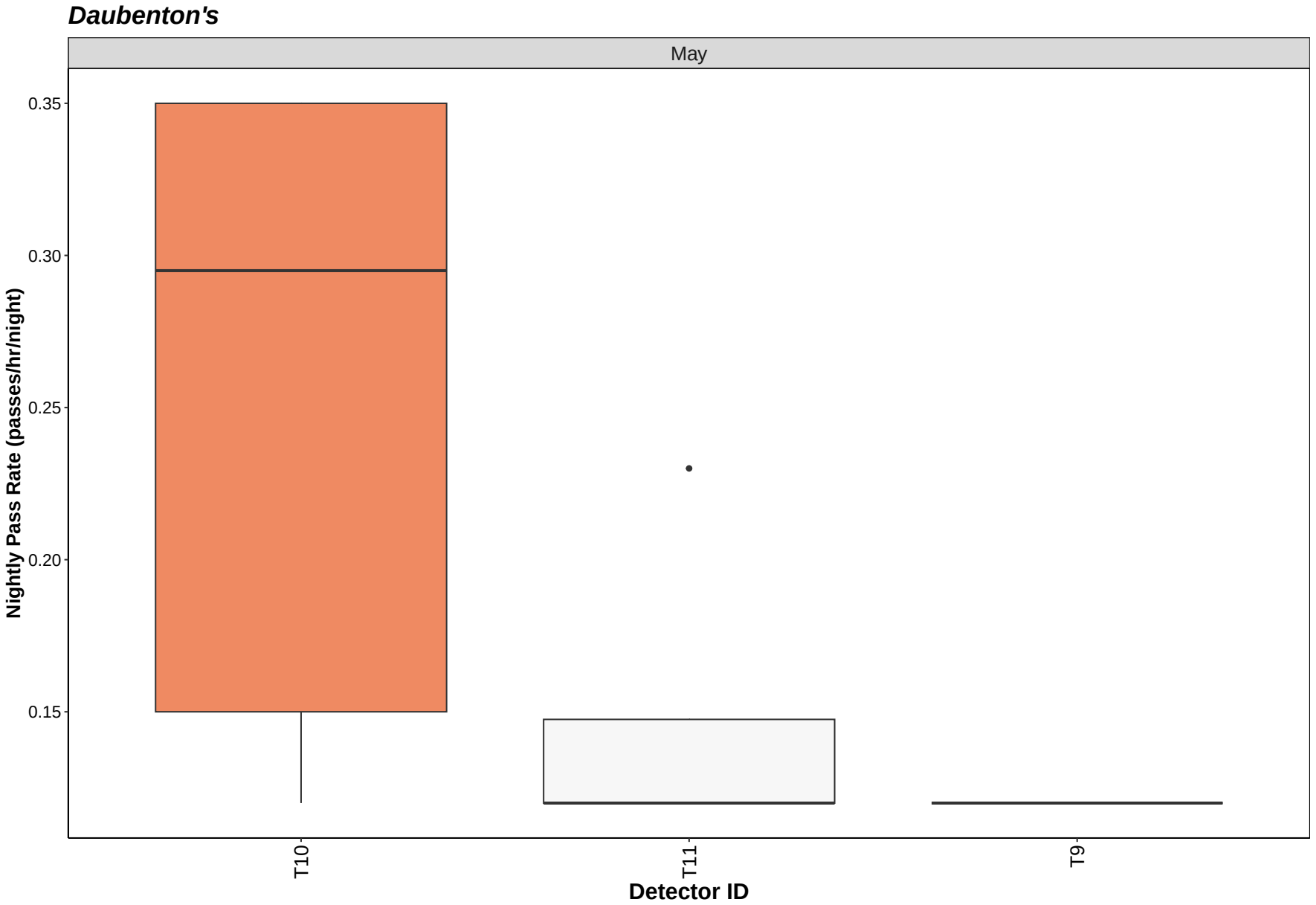

Soprano pipistrelle
May
Nightly Pass Rate (passes/hr/night)
0
10
20
30
40
T10
T11
T9
Detector ID


Common pipistrelle
May
80
60
40
20
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID


Nathusius'
May
Nightly Pass Rate (passes/hr/night)
15
10
5
0
T10
T11
T9
Detector ID


Leisler's
May
40
30
20
10
0
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID


Whiskered
May
0.150
0.125
0.100
0.075
Nightly Pass Rate (passes/hr/night)
T11
T9
Detector ID


Daubenton's
May
0.35
0.30
0.25
0.20
0.15
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID

## Bat Activity per Detector Location

**Figure 13.** Detector ID reference:

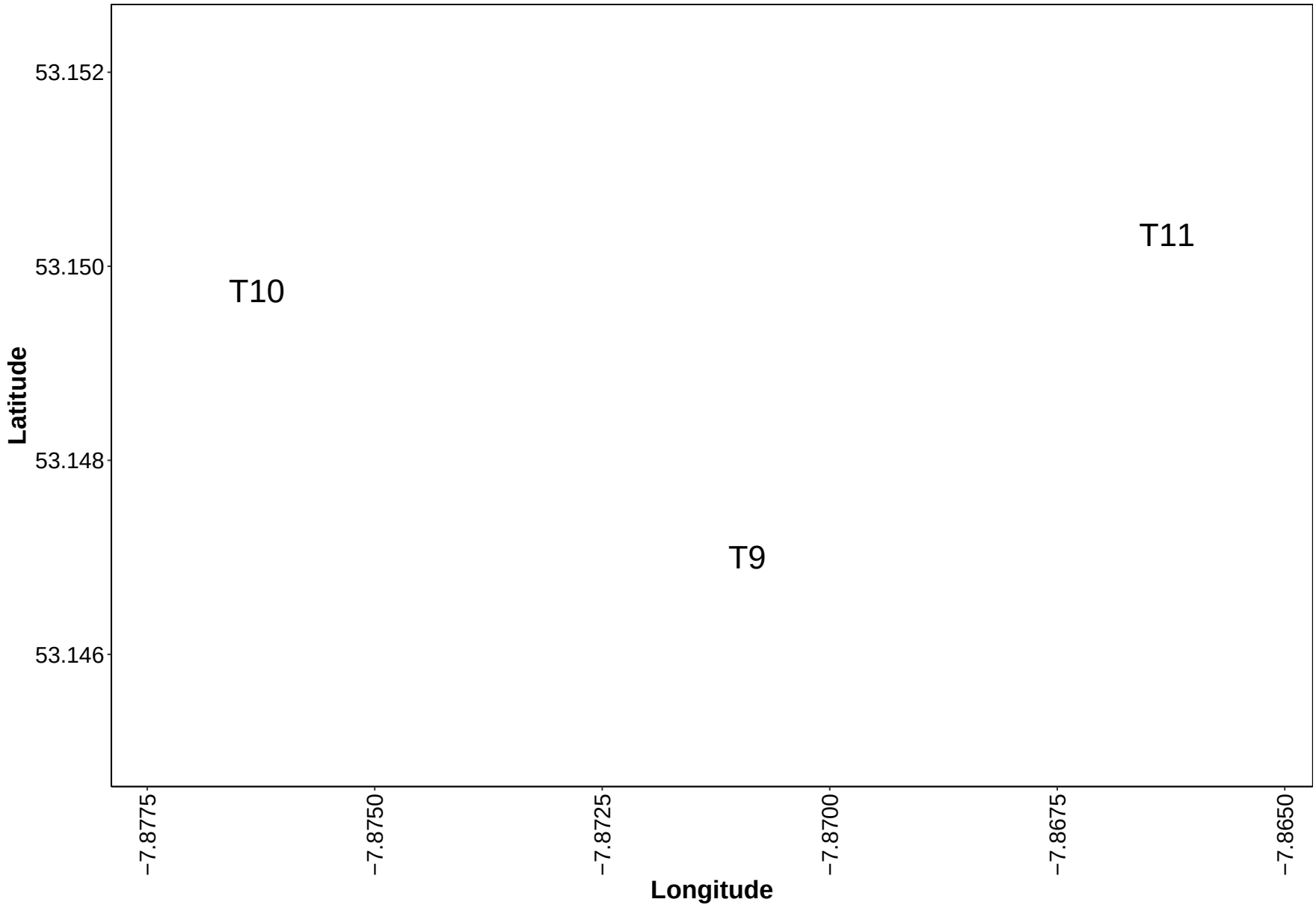
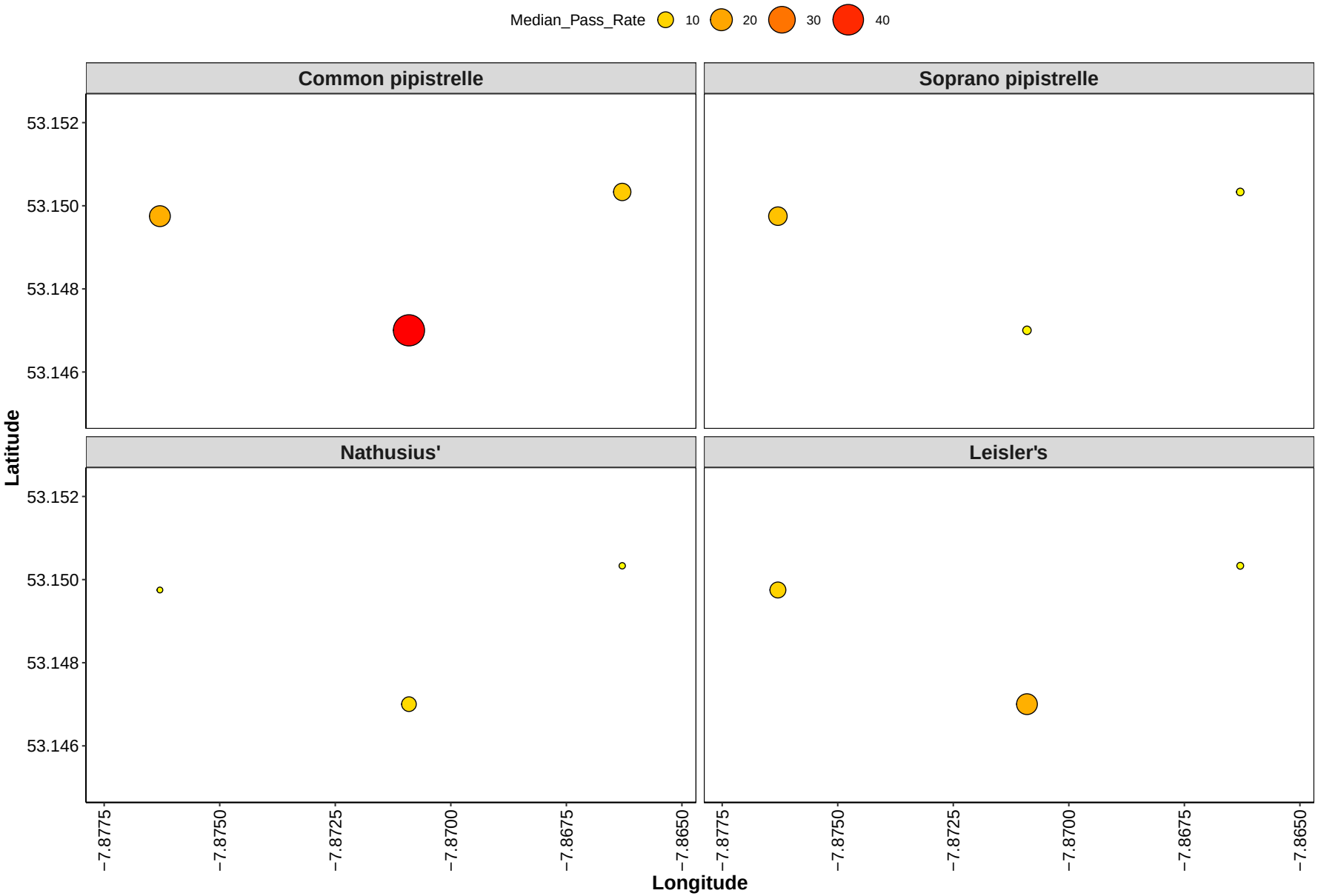

T10
T11
T9
53.152
53.150
53.148
53.146
Latitude
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

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


Median_Pass_Rate
10
20
30
40
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

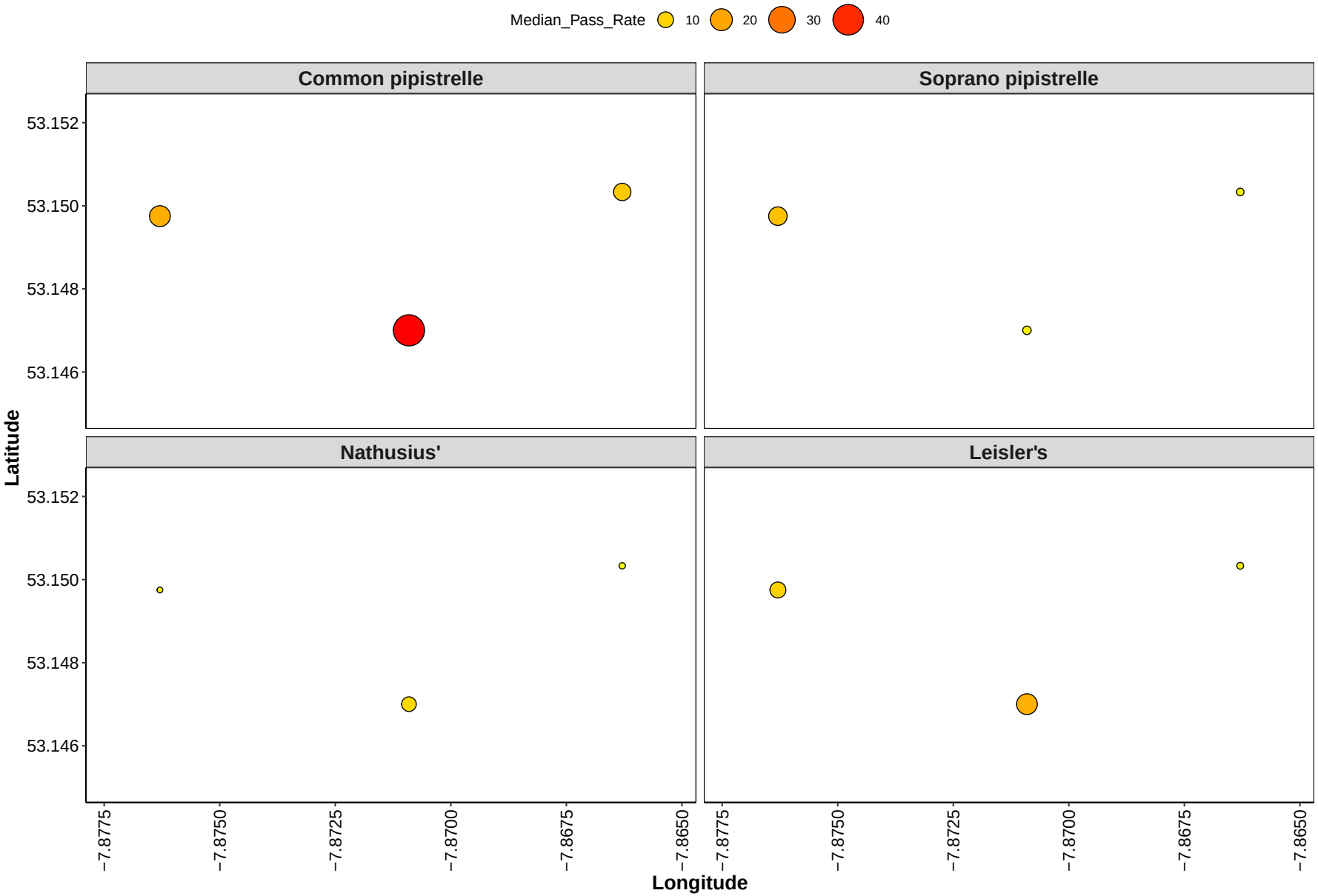
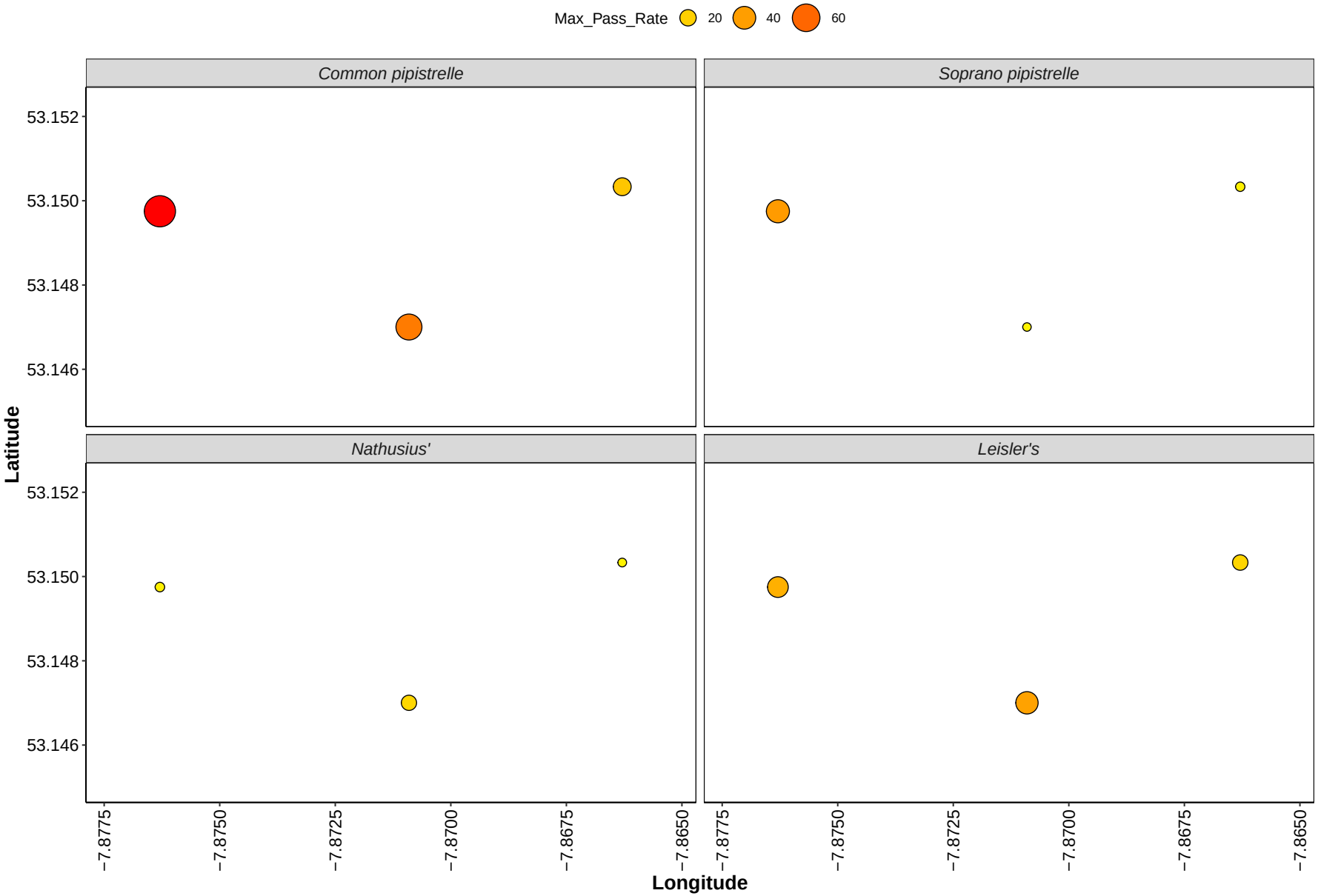
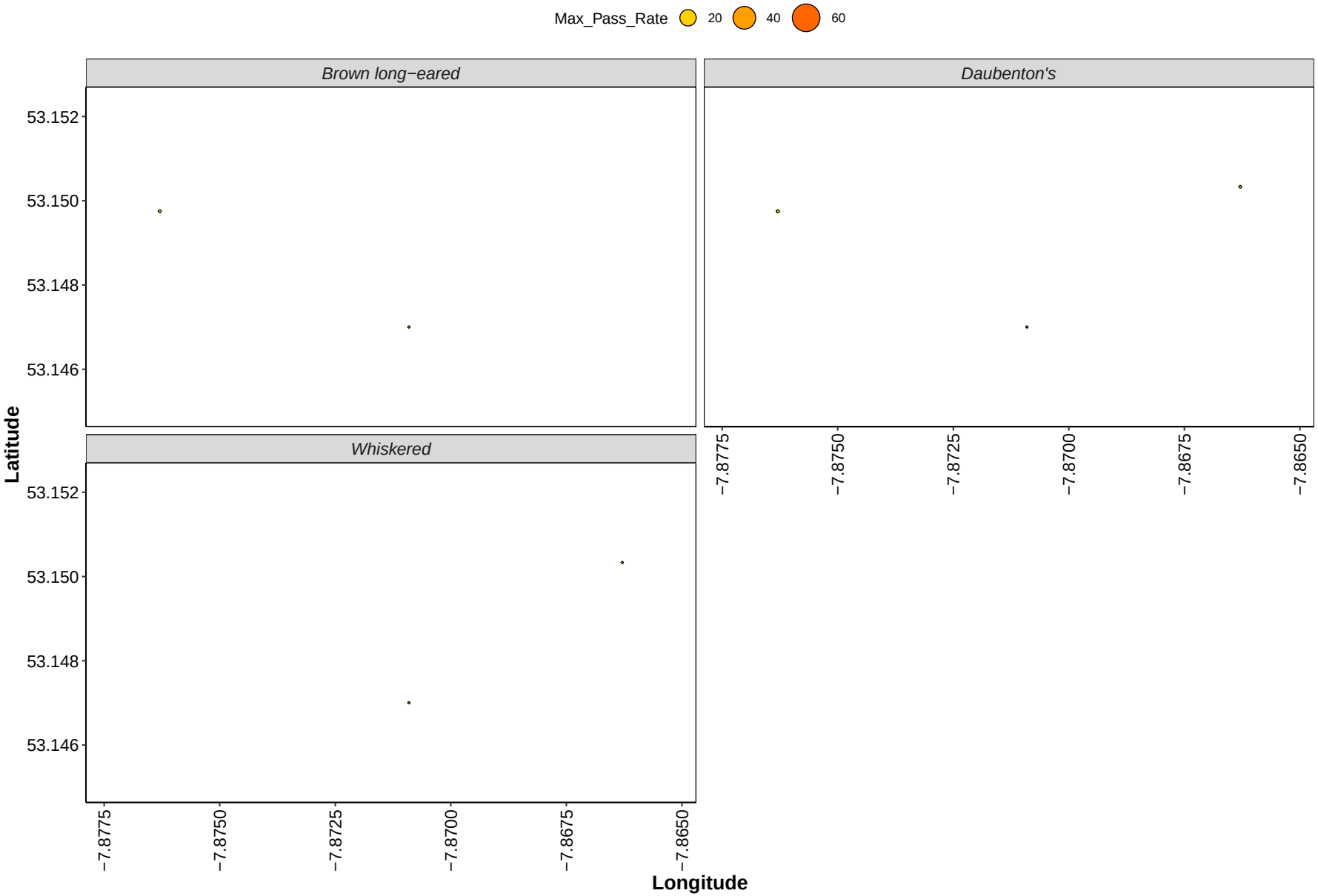

Median_Pass_Rate
10
20
30
40
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

**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
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude


Max_Pass_Rate
20
40
60
Brown long−eared
Daubenton's
Whiskered
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

## Part 2b: Includes Absences

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

### Nightly Bat Pass Rate

# Median per Detector

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

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

| Species | Detector ID | Median Pass Rate |
|---|---|---|
| Brown long-eared | T10 | 0.0 |
| Brown long-eared | T11 | 0.0 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 18.1 |
| Common pipistrelle | T11 | 12.3 |
| Common pipistrelle | T9 | 41.9 |
| Daubenton's | T10 | 0.1 |
| Daubenton's | T11 | 0.0 |
| Daubenton's | T9 | 0.0 |
| Leisler's | T10 | 10.2 |
| Leisler's | T11 | 1.5 |
| Leisler's | T9 | 17.9 |
| Nathusius' | T10 | 1.1 |
| Nathusius' | T11 | 1.3 |
| Nathusius' | T9 | 8.6 |
| Soprano pipistrelle | T10 | 14.0 |
| Soprano pipistrelle | T11 | 2.0 |
| Soprano pipistrelle | T9 | 2.6 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

# Mean per Detector

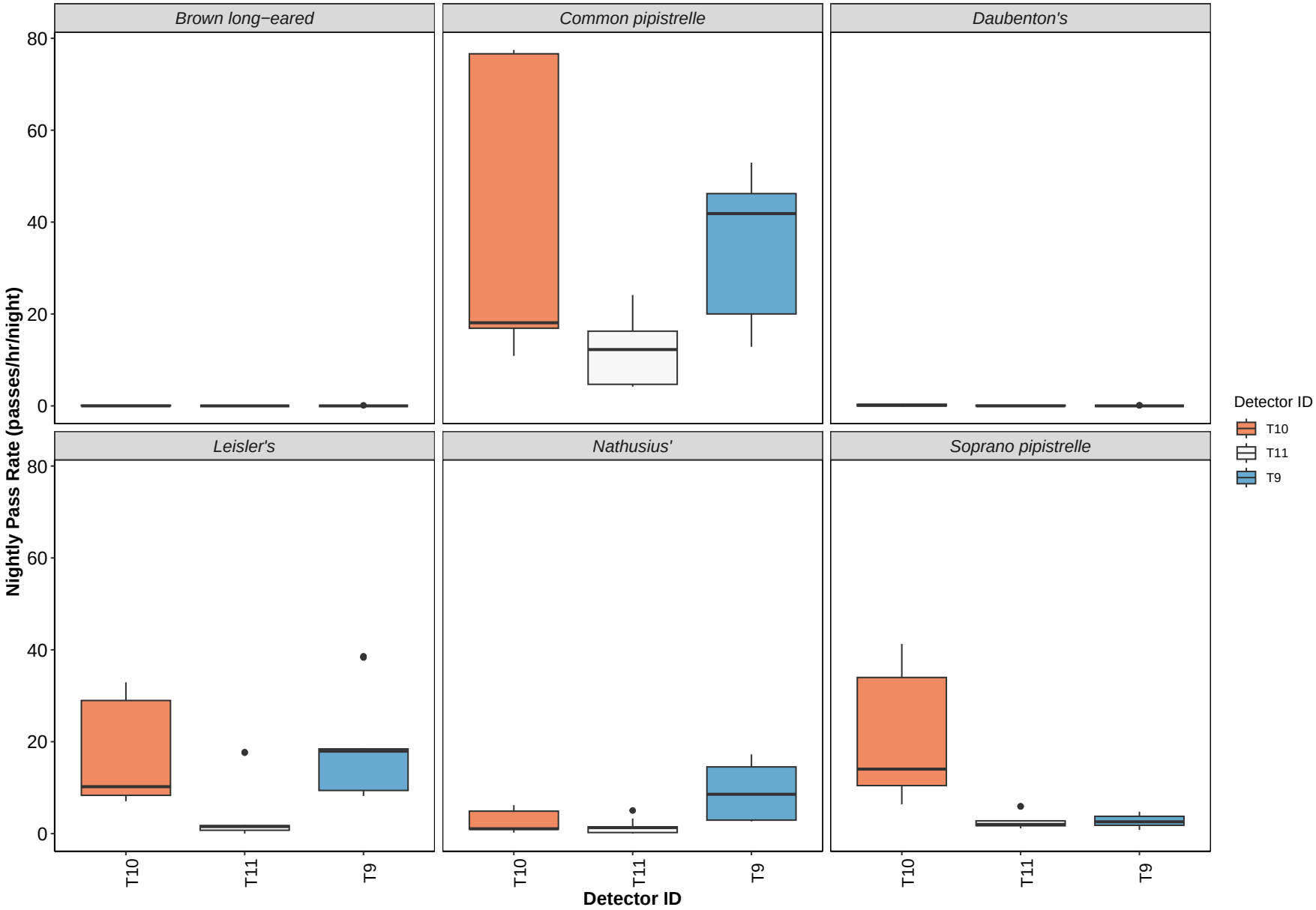
**Table 23. The mean Nightly Pass Rate (bat passes per hour, per night) of each species at each detector. Values are given to 1 decimal place.**

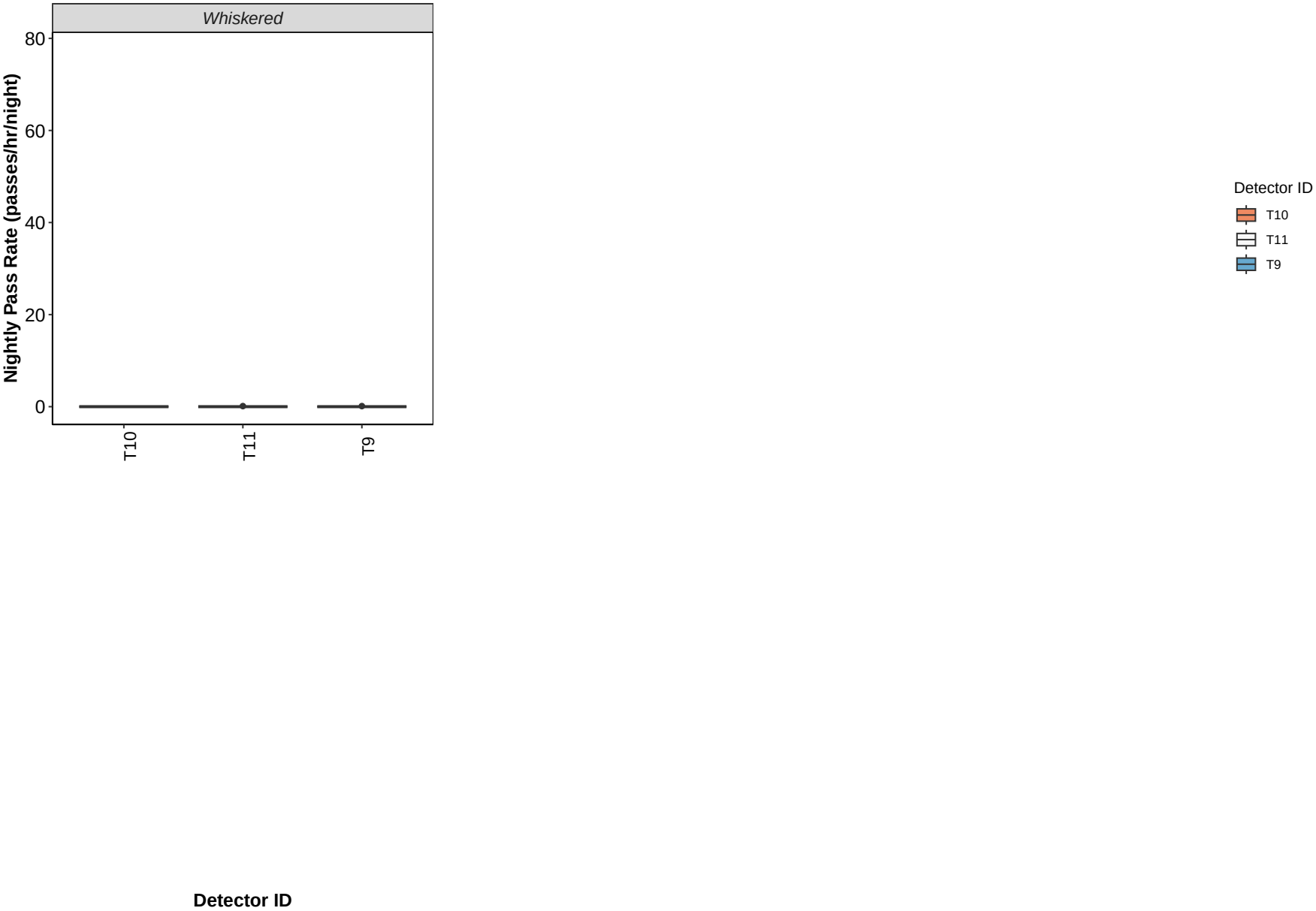
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

| Species | Detector ID | Mean Pass Rate |
|---|---|---|
| Brown long-eared | T10 | 0.1 |
| Brown long-eared | T11 | 0.0 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 39.6 |
| Common pipistrelle | T11 | 13.2 |
| Common pipistrelle | T9 | 34.6 |
| Daubenton's | T10 | 0.2 |
| Daubenton's | T11 | 0.1 |
| Daubenton's | T9 | 0.0 |
| Leisler's | T10 | 18.6 |
| Leisler's | T11 | 4.7 |
| Leisler's | T9 | 19.2 |
| Nathusius' | T10 | 2.8 |
| Nathusius' | T11 | 1.5 |
| Nathusius' | T9 | 9.6 |
| Soprano pipistrelle | T10 | 20.8 |
| Soprano pipistrelle | T11 | 2.9 |
| Soprano pipistrelle | T9 | 2.9 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

## Per Detector

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


Brown long−eared
Common pipistrelle
Daubenton's
Leisler's
Nathusius'
Soprano pipistrelle
Nightly Pass Rate (passes/hr/night)
0
20
40
60
80
T10
T11
T9
Detector ID
Detector ID
T10
T11
T9


Whiskered
Nightly Pass Rate (passes/hr/night)
80
60
40
20
0
T10
T11
T9
Detector ID
Detector ID
T10
T11
T9

# Survey Effort

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

| month | Detector ID | No. of Survey Nights |
|---|---|---|
| May | T10 | 9 |
| May | T11 | 9 |
| May | T9 | 9 |

## Nighlty Bat Pass Rate for Each Month

# Median per Detector

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

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

| Species | Detector ID | May |
|---|---|---|
| Brown long-eared | T10 | 0.0 |
| Brown long-eared | T11 | 0.0 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 18.1 |
| Common pipistrelle | T11 | 12.3 |
| Common pipistrelle | T9 | 41.9 |
| Daubenton's | T10 | 0.1 |
| Daubenton's | T11 | 0.0 |
| Daubenton's | T9 | 0.0 |
| Leisler's | T10 | 10.2 |
| Leisler's | T11 | 1.5 |
| Leisler's | T9 | 17.9 |
| Nathusius' | T10 | 1.1 |
| Nathusius' | T11 | 1.3 |
| Nathusius' | T9 | 8.6 |
| Soprano pipistrelle | T10 | 14.0 |
| Soprano pipistrelle | T11 | 2.0 |
| Soprano pipistrelle | T9 | 2.6 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

# Mean per Detector

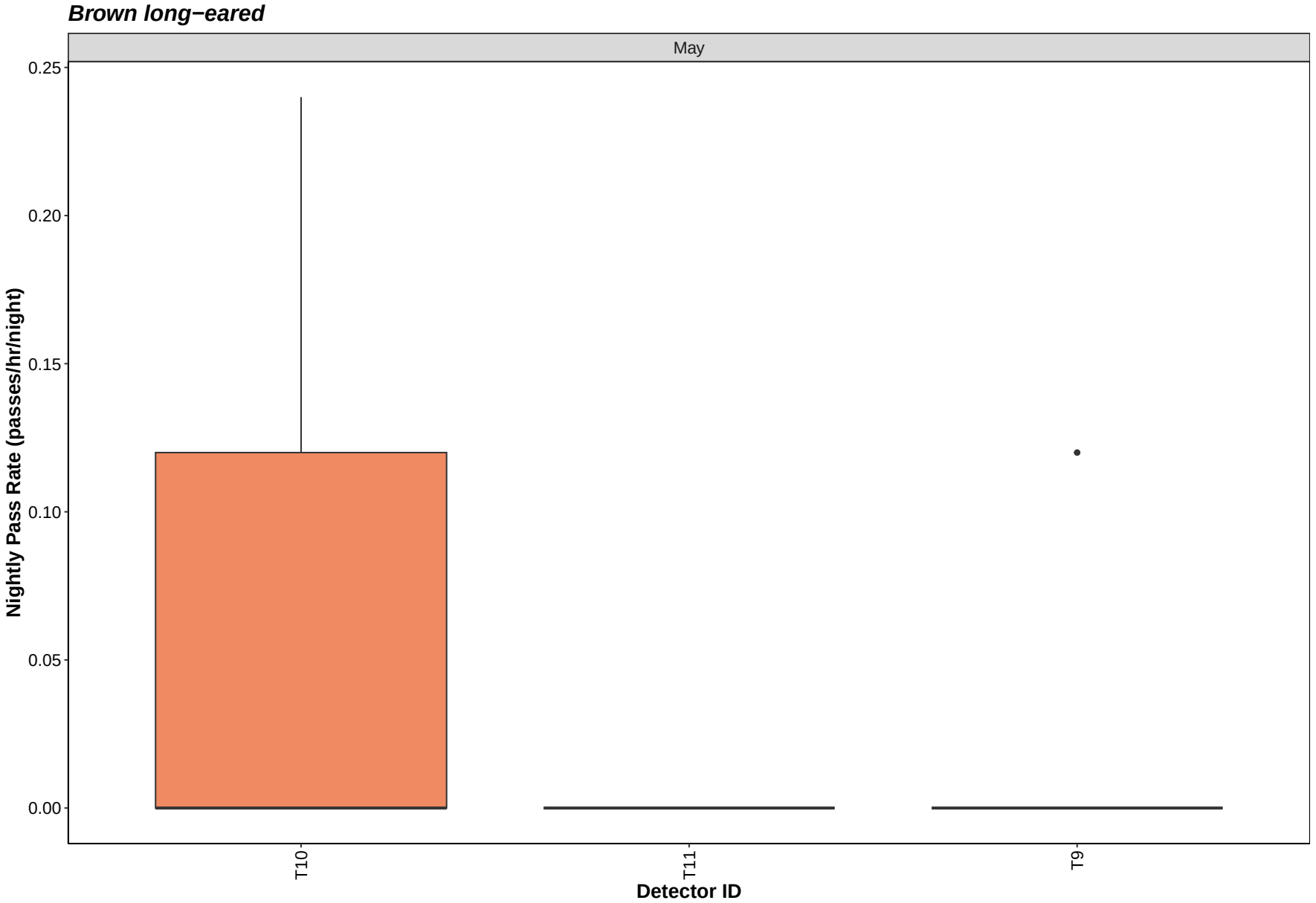
**Table 26. The mean Nightly Pass Rate (bat passes per hour, per night) of each species throughout each month. Values are given to 1 decimal place.**

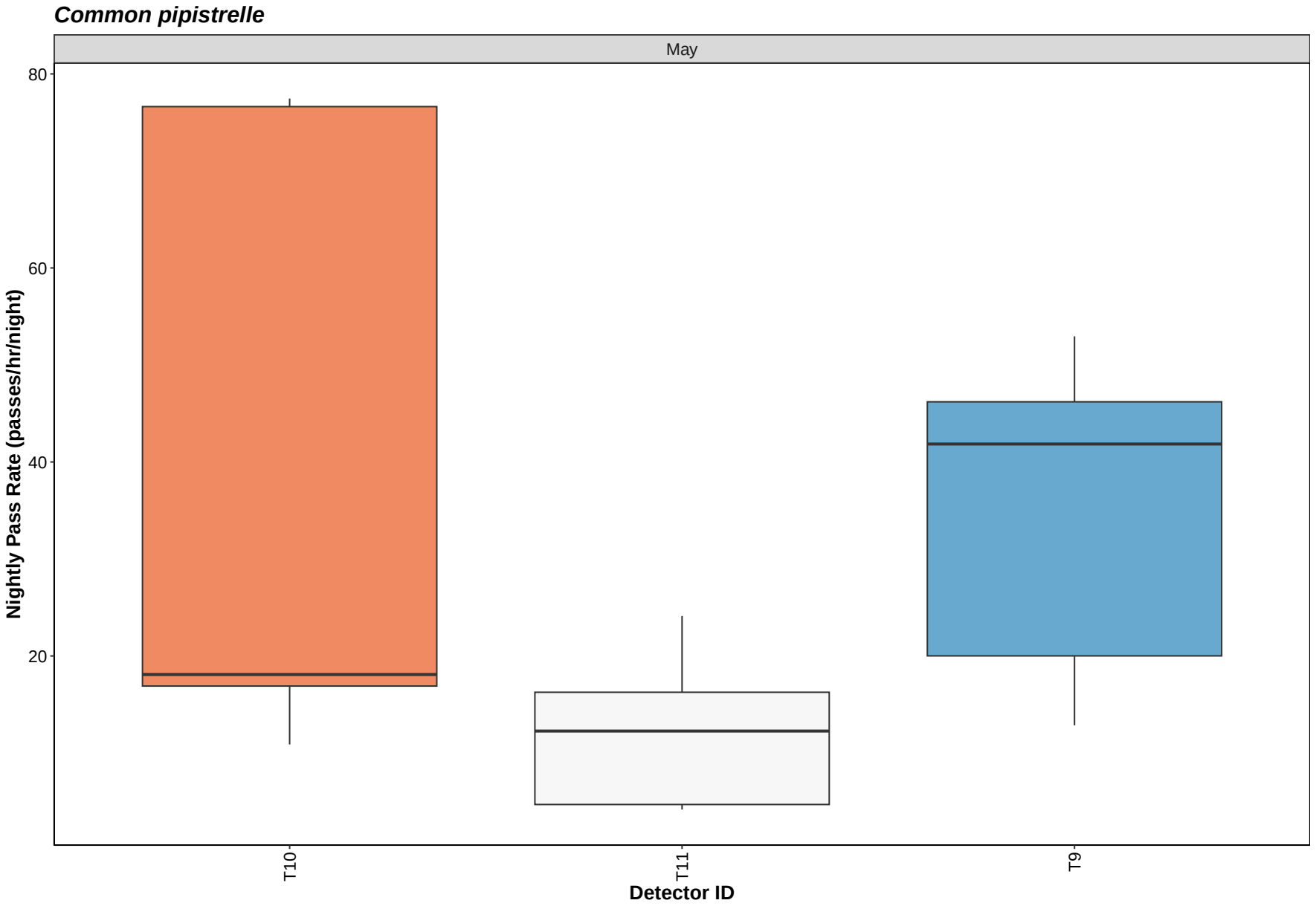
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

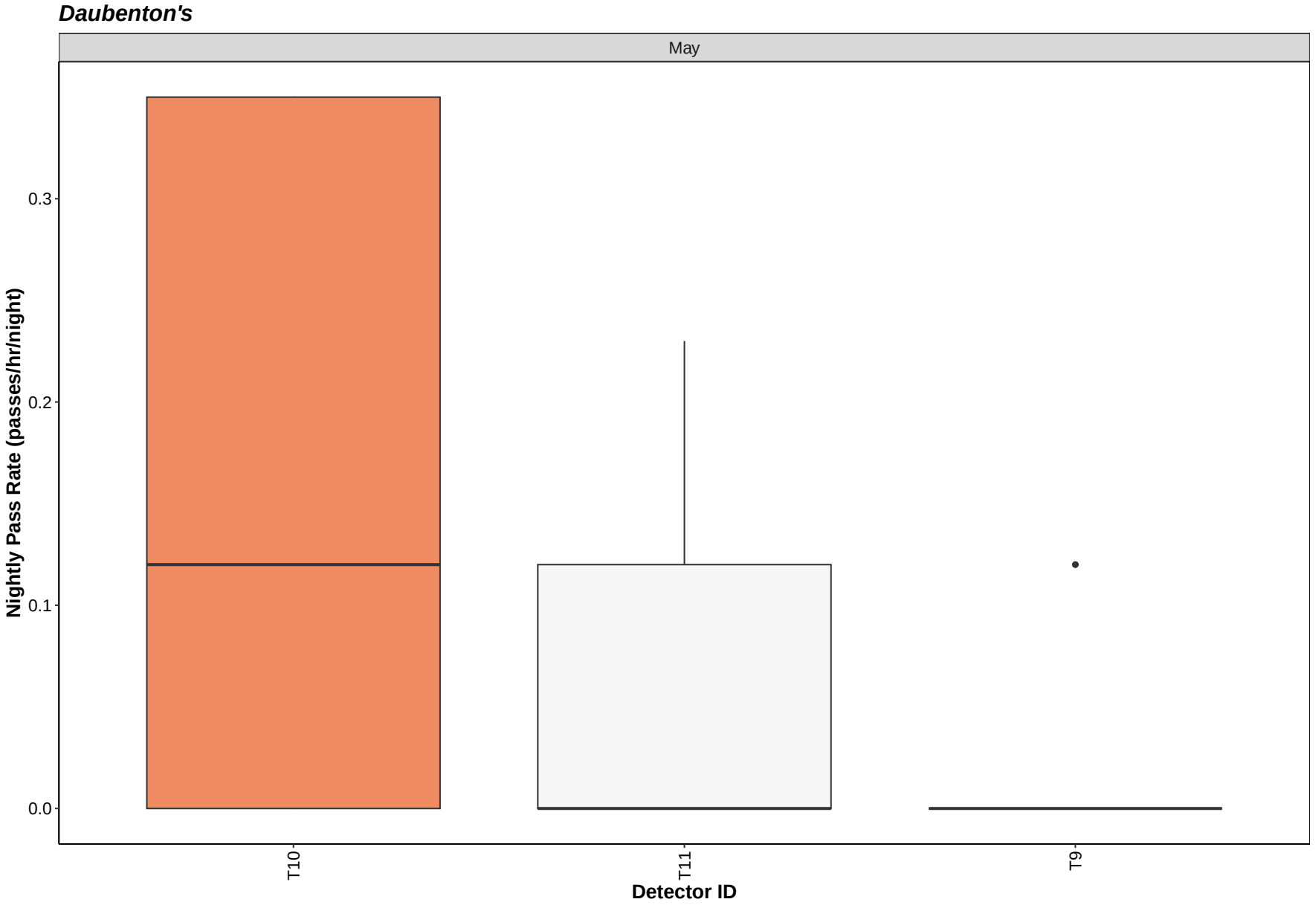
| Species | Detector ID | May |
|---|---|---|
| Brown long-eared | T10 | 0.1 |
| Brown long-eared | T11 | 0.0 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 39.6 |
| Common pipistrelle | T11 | 13.2 |
| Common pipistrelle | T9 | 34.6 |
| Daubenton's | T10 | 0.2 |
| Daubenton's | T11 | 0.1 |
| Daubenton's | T9 | 0.0 |
| Leisler's | T10 | 18.6 |
| Leisler's | T11 | 4.7 |
| Leisler's | T9 | 19.2 |
| Nathusius' | T10 | 2.8 |
| Nathusius' | T11 | 1.5 |
| Nathusius' | T9 | 9.6 |
| Soprano pipistrelle | T10 | 20.8 |
| Soprano pipistrelle | T11 | 2.9 |
| Soprano pipistrelle | T9 | 2.9 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

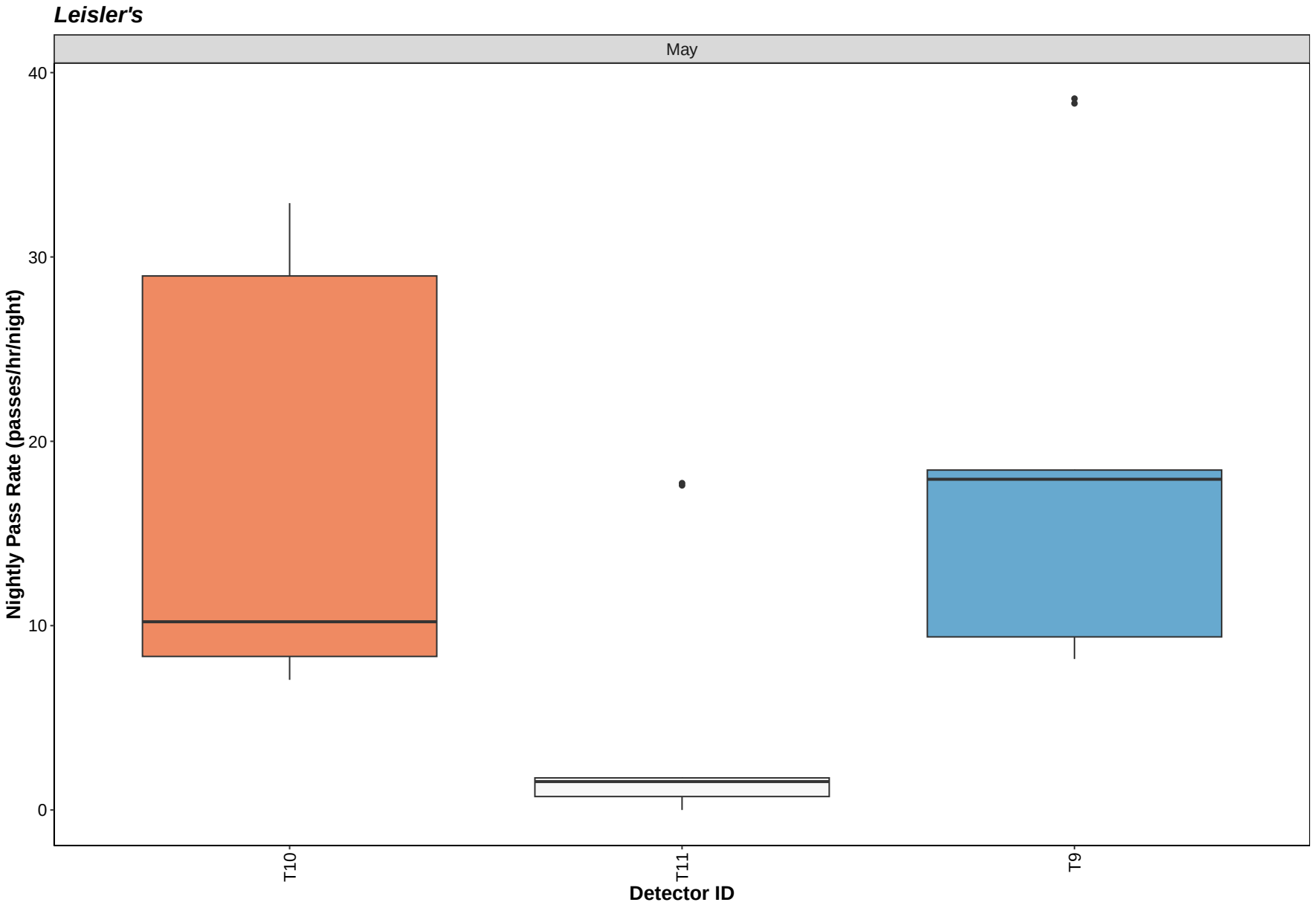
## Per Detector

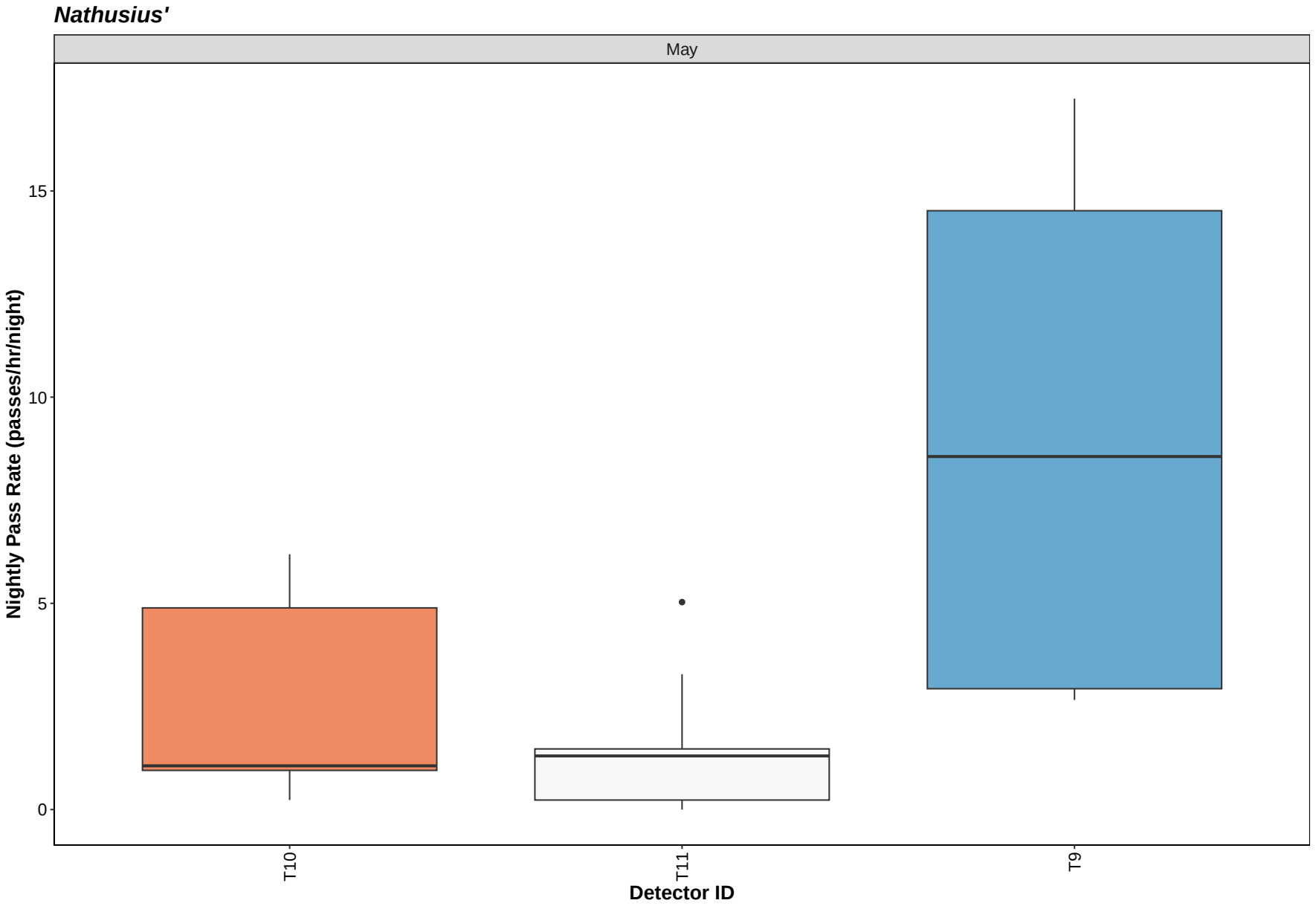
**Figure 17.** Figures show boxplots for the number of bat passes per hour by detector, for each month. The ‘box’ shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The ‘whiskers’ extend from the box and represent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

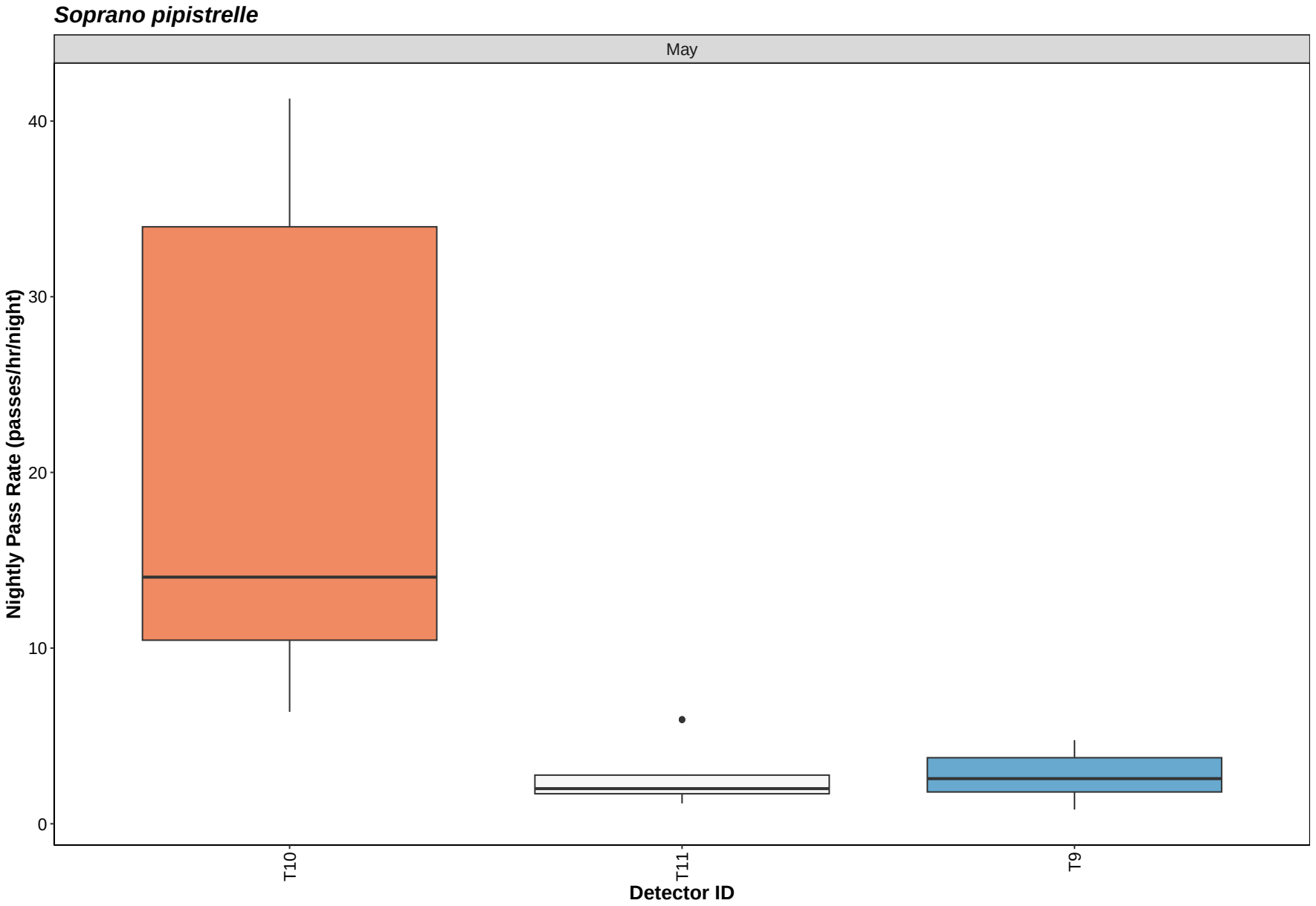

Brown long−eared
May
0.25
0.20
0.15
0.10
0.05
0.00
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID

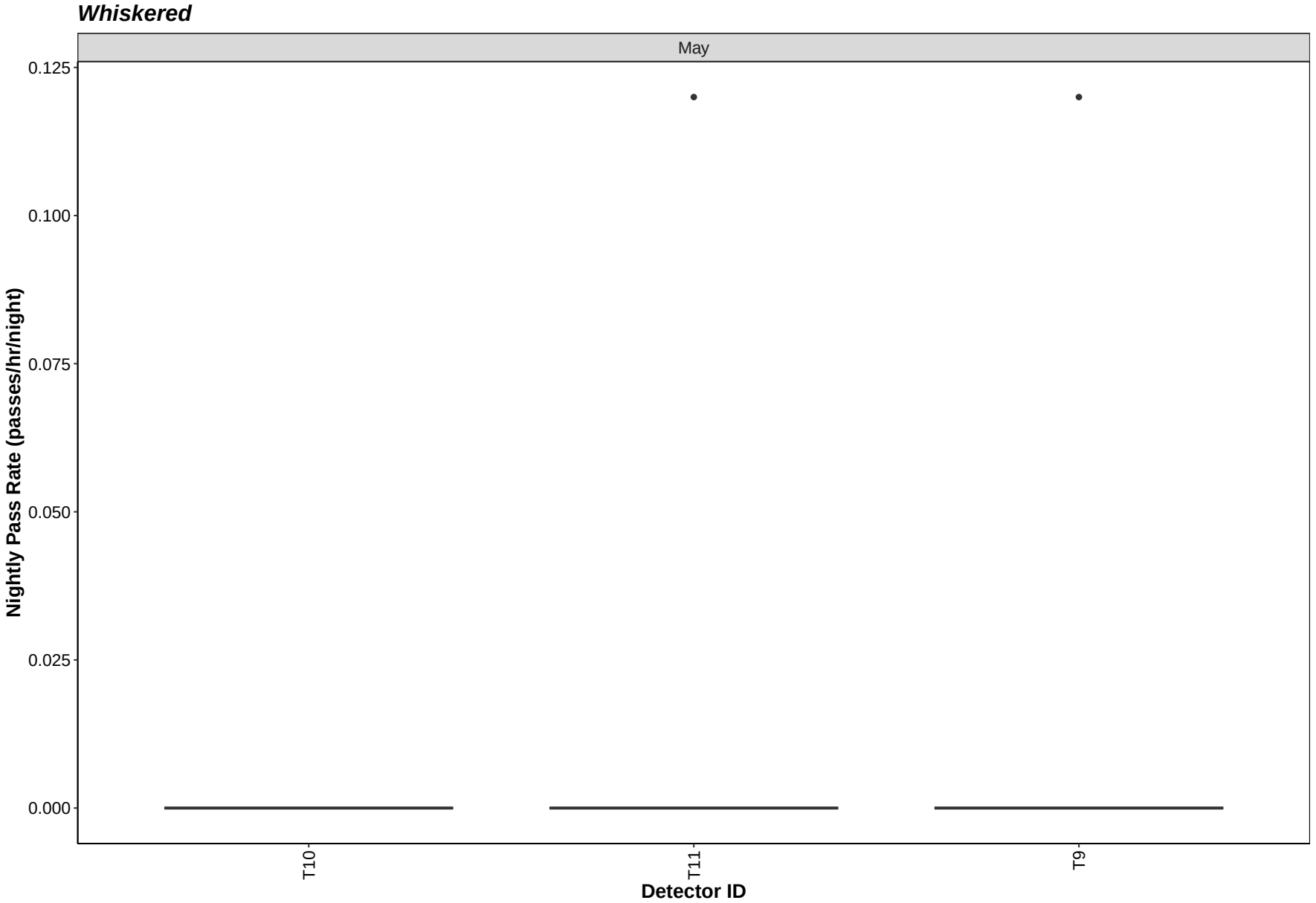

Common pipistrelle
May
80
60
40
20
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID


Daubenton's
May
Nightly Pass Rate (passes/hr/night)
0.0
0.1
0.2
0.3
T10
T11
T9
Detector ID


Leisler's
May
40
30
20
10
0
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID


Nathusius'
May
Nightly Pass Rate (passes/hr/night)
15
10
5
0
T10
T11
T9
Detector ID


Soprano pipistrelle
May
Nightly Pass Rate (passes/hr/night)
40
30
20
10
0
T10
T11
T9
Detector ID


Whiskered
May
0.125
0.100
0.075
0.050
0.025
0.000
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID

## Bat Activity per Detector Location

**Figure 18.** Detector ID reference:

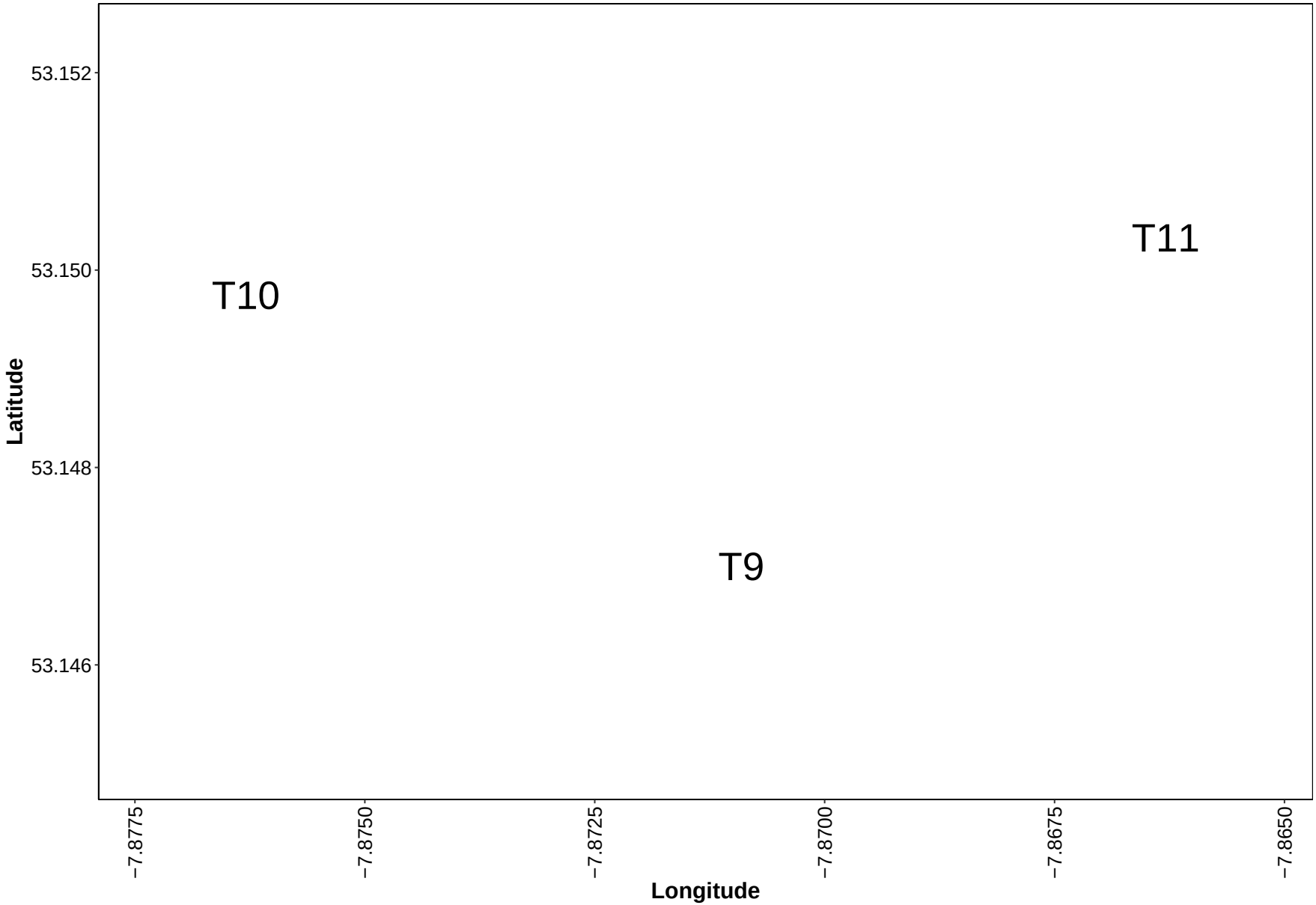
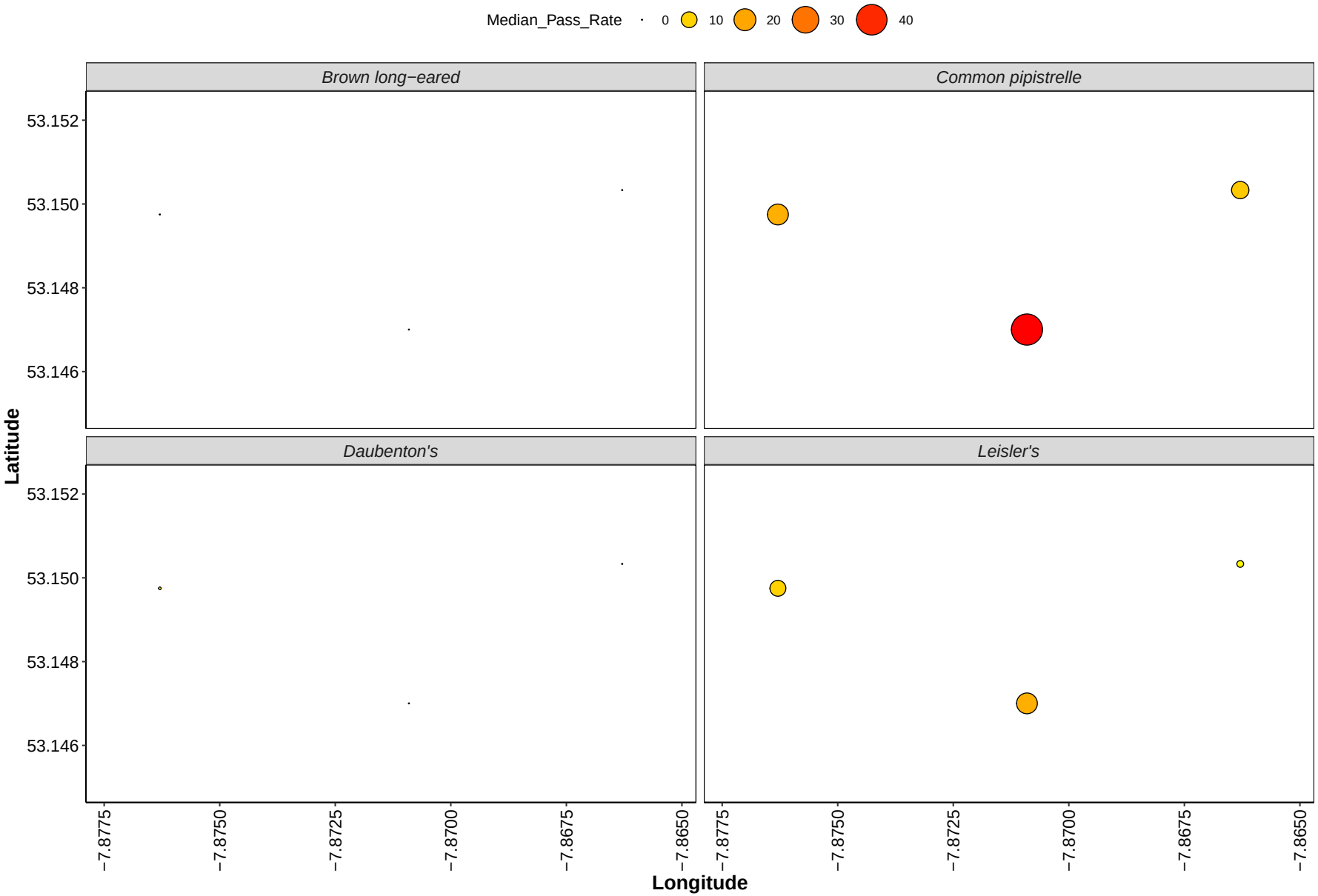

53.152
53.150
53.148
53.146
Latitude
T10
T11
T9
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

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


Median_Pass_Rate
0
10
20
30
40
Brown long−eared
Common pipistrelle
Daubenton's
Leisler's
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

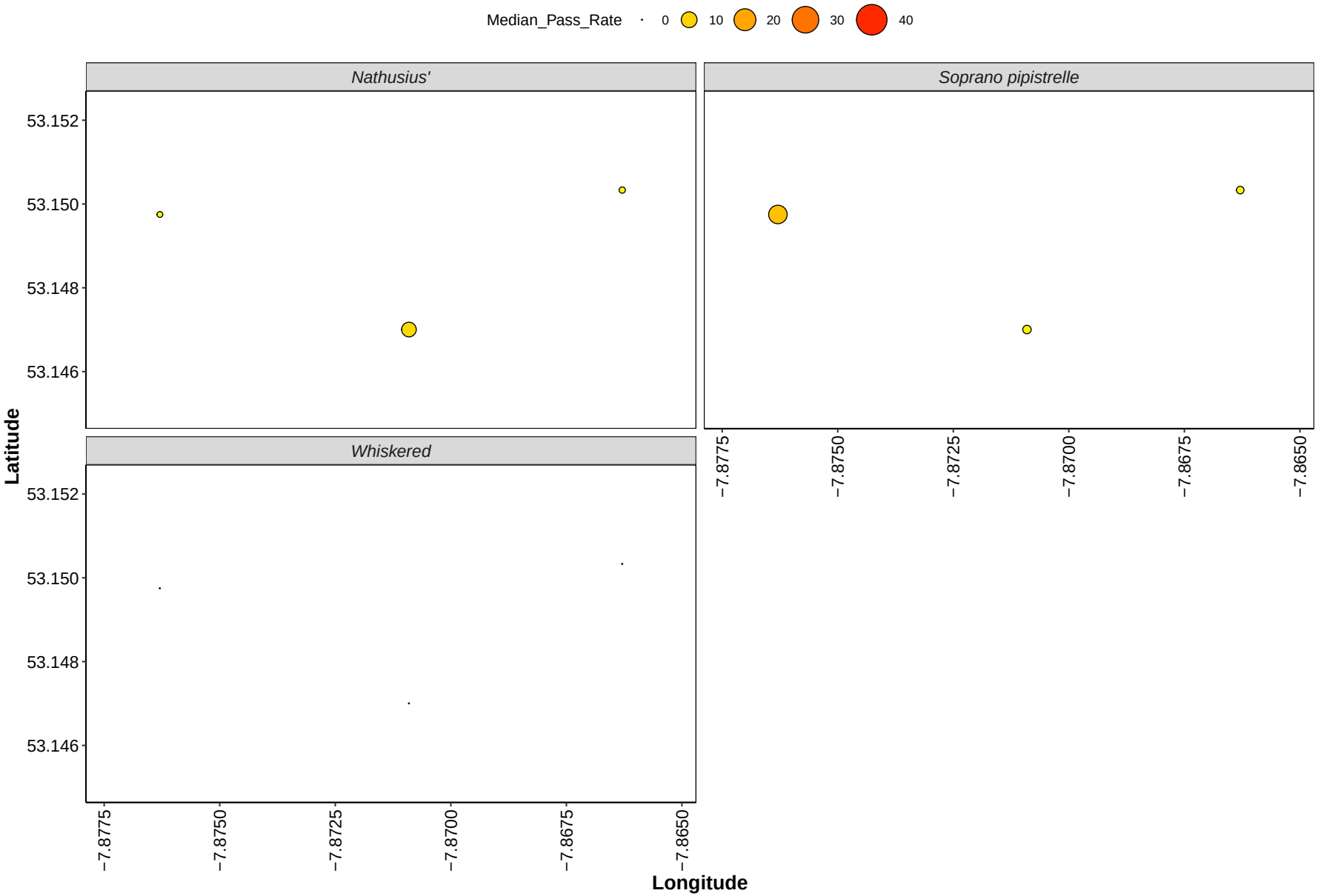
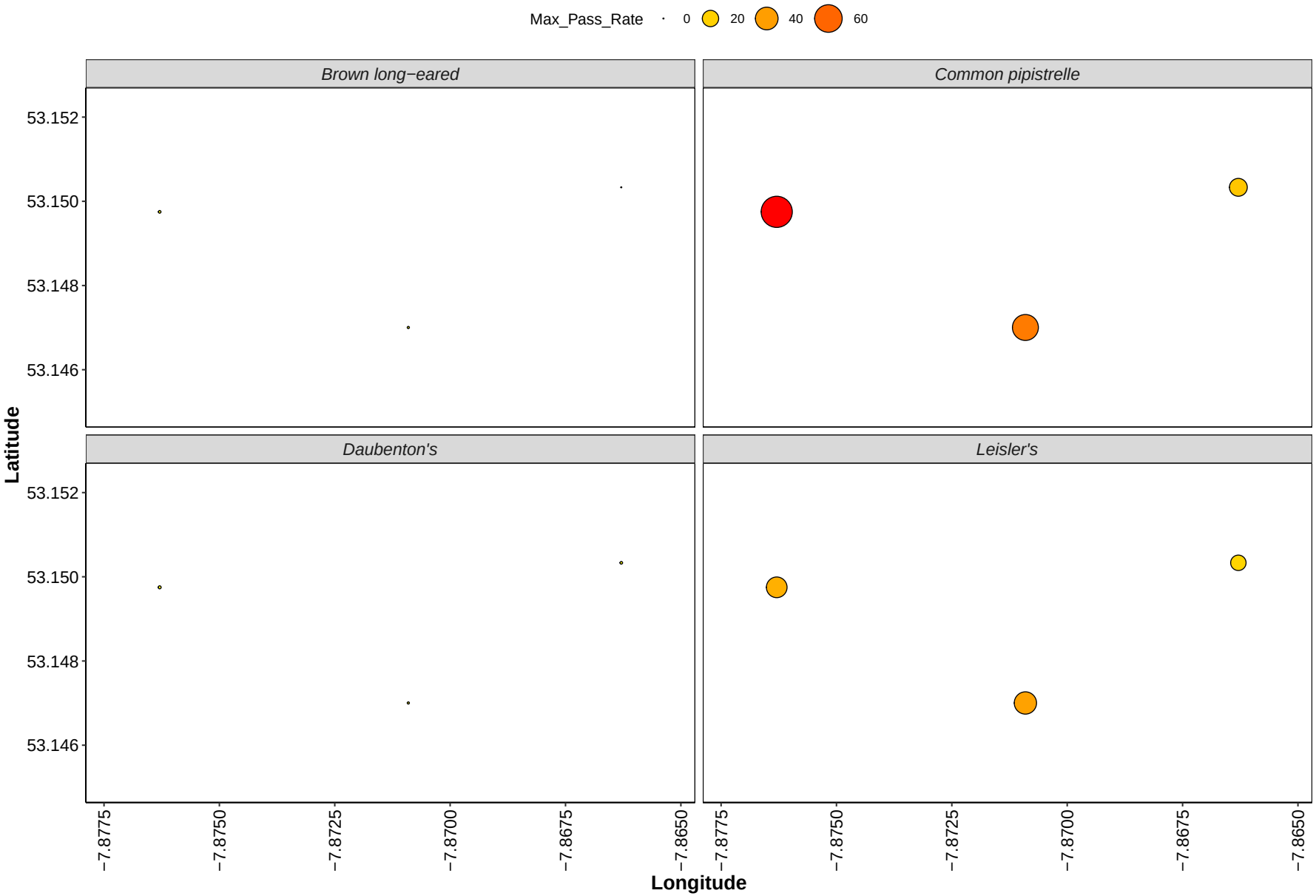
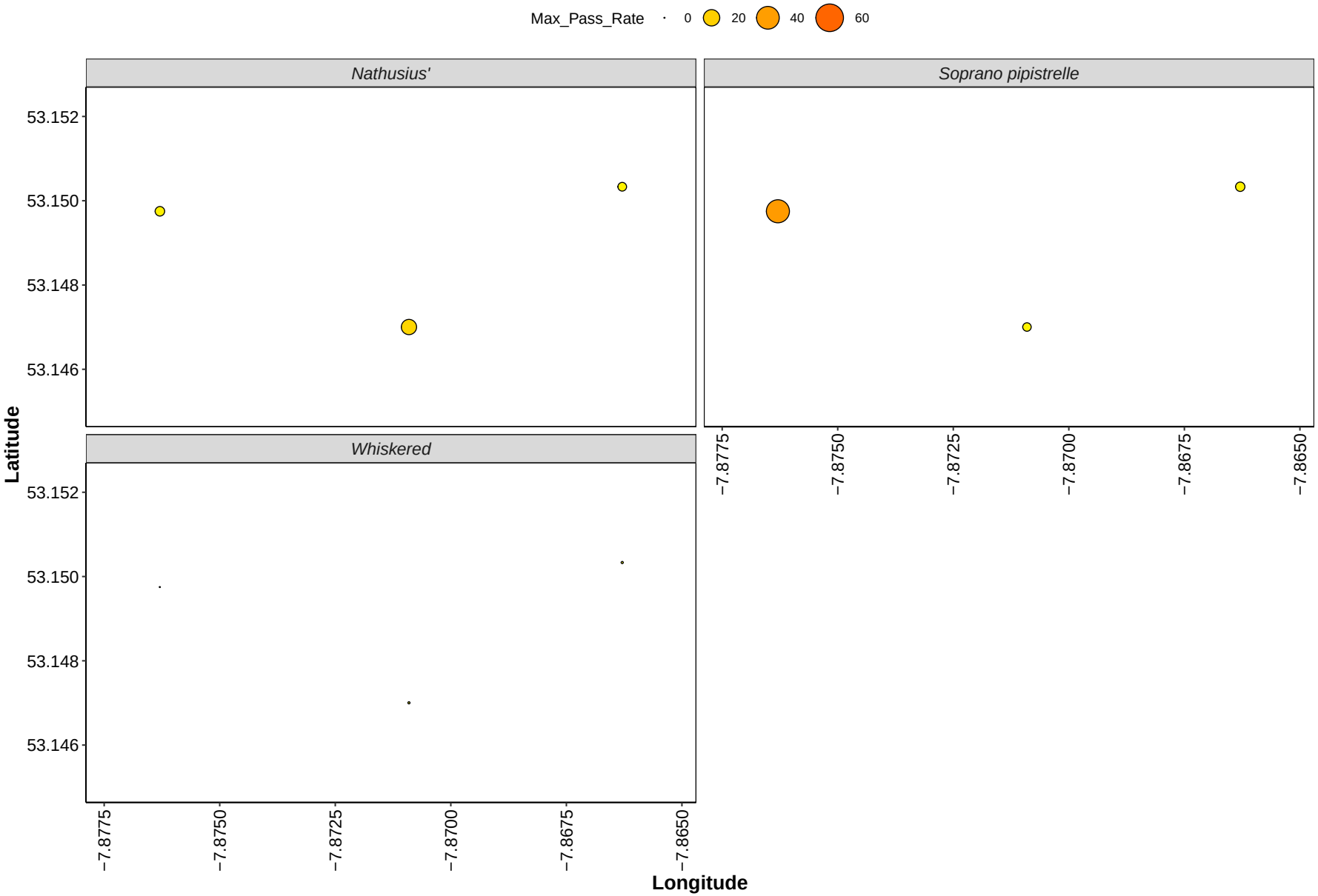

Median_Pass_Rate
0
10
20
30
40
Nathusius'
Soprano pipistrelle
Whiskered
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

**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
Brown long−eared
Common pipistrelle
Daubenton's
Leisler's
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude


Max_Pass_Rate
0
20
40
60
Nathusius'
Soprano pipistrelle
Whiskered
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Latitude
Longitude

**Thank you for using Ecobat!**

# Ecobat Report

2025-11-01

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

## Summary

Bats were detected on **12** nights between **04/06/2025** and **15/06/2025**, using **3** static bat detectors. Throughout this period, **8** species were recorded. **Table 1.** Detectors were placed at the following locations:

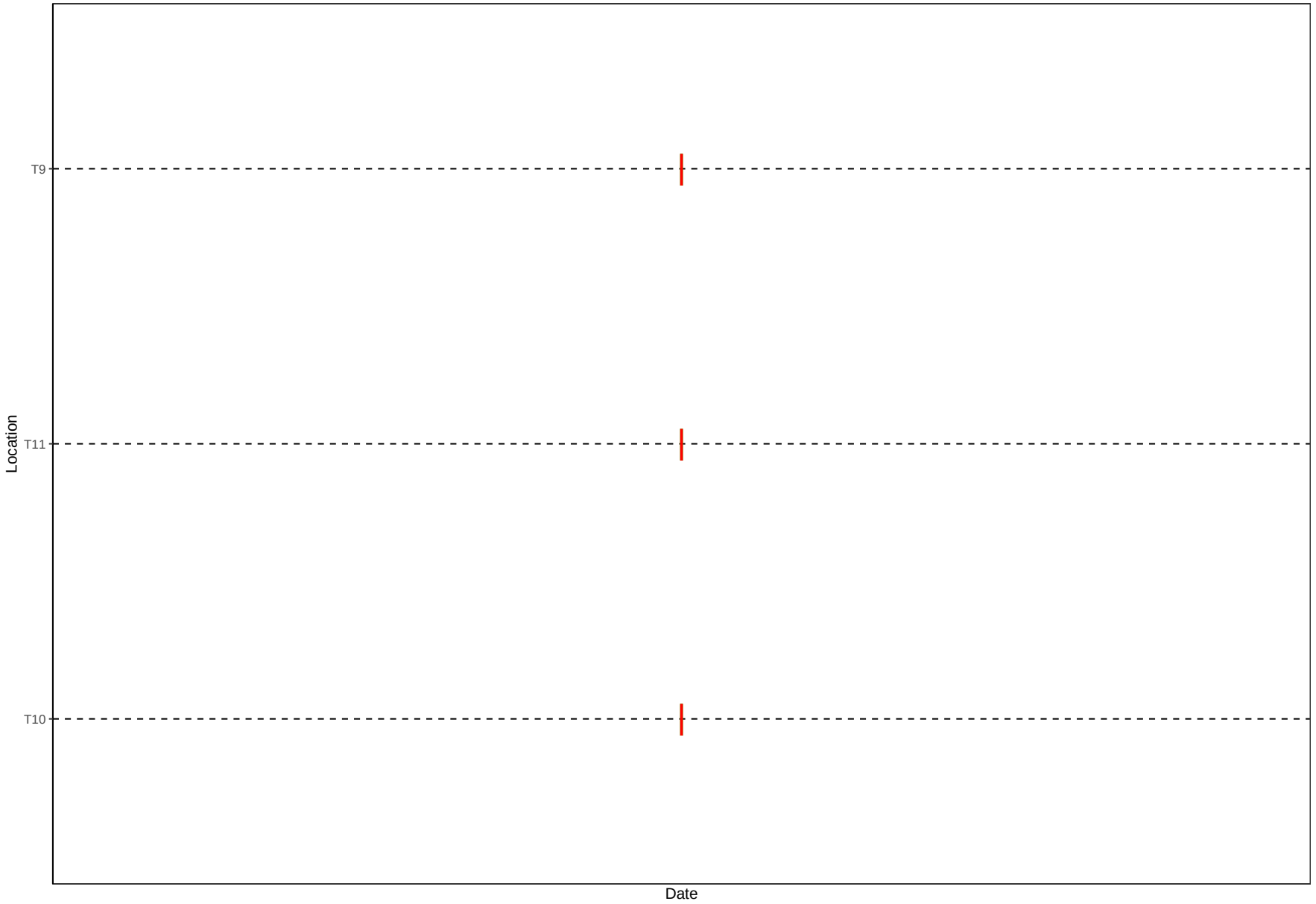
| Detector ID | Latitude | Longitude |
|---|---|---|
| T9 | 53.14700 | -7.870906 |
| T10 | 53.14975 | -7.876294 |
| T10 | 53.15033 | -7.866291 |
| T11 | 53.15033 | -7.866291 |

# 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 |
|---|---|
| T10 | 12 |
| T11 | 12 |
| T9 | 12 |

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


T9
T11
T10
Location
Date

# Part 1: Percentile Analysis

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

## Per Detector

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

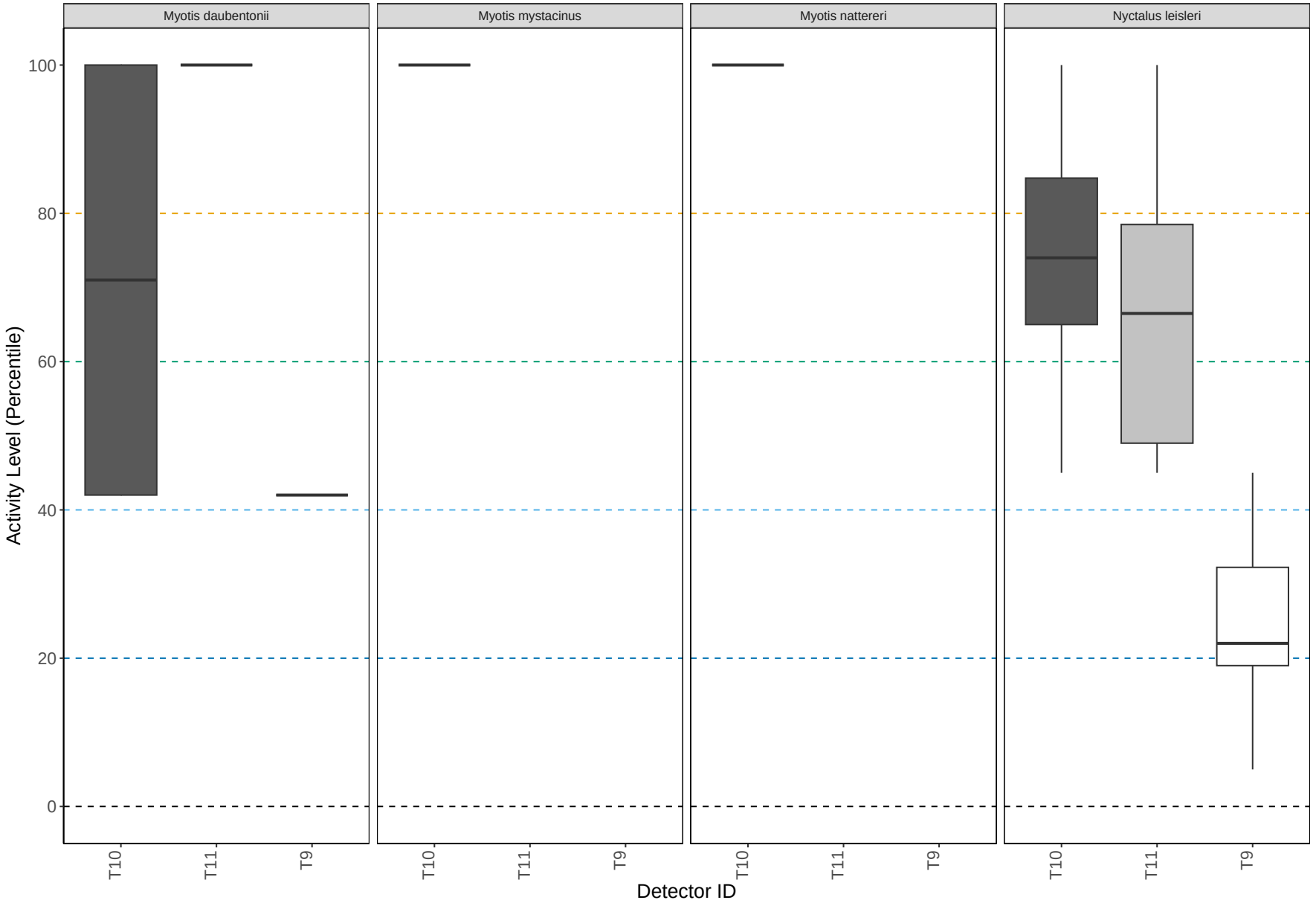
| Detector ID | Species/Species Group | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | 2 | 0 | 0 | 0 | 2 | 0 |
| T10 | Myotis mystacinus | 1 | 0 | 0 | 0 | 0 | 0 |
| T10 | Myotis nattereri | 1 | 0 | 0 | 0 | 0 | 0 |
| T10 | Nyctalus leisleri | 1 | 4 | 5 | 2 | 0 | 0 |
| T10 | Pipistrellus nathusii | 1 | 0 | 1 | 0 | 0 | 1 |
| T10 | Pipistrellus pipistrellus | 2 | 3 | 0 | 3 | 0 | 3 |
| T10 | Pipistrellus pygmaeus | 2 | 2 | 3 | 2 | 2 | 0 |
| T11 | Myotis daubentonii | 2 | 0 | 0 | 0 | 0 | 0 |
| T11 | Nyctalus leisleri | 1 | 2 | 5 | 4 | 0 | 0 |
| T11 | Pipistrellus nathusii | 1 | 0 | 1 | 0 | 0 | 1 |
| T11 | Pipistrellus pipistrellus | 2 | 3 | 0 | 2 | 1 | 3 |
| T11 | Pipistrellus pygmaeus | 2 | 2 | 3 | 2 | 1 | 0 |
| T9 | Myotis daubentonii | 0 | 0 | 0 | 0 | 1 | 0 |
| T9 | Nyctalus leisleri | 0 | 0 | 0 | 3 | 3 | 6 |
| T9 | Pipistrellus nathusii | 0 | 0 | 0 | 0 | 1 | 2 |
| T9 | Pipistrellus pipistrellus | 0 | 0 | 0 | 0 | 5 | 6 |
| T9 | Pipistrellus pygmaeus | 0 | 0 | 0 | 0 | 3 | 6 |

| Detector ID | Species/Species Group | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|
| T9 | Plecotus auritus | 1 | 0 | 0 | 0 | 0 | 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 |
|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | 71 | 42 - 100 | 100 | 4 | 7 |
| T10 | Myotis mystacinus | 100 | 0 | 100 | 1 | 1 |
| T10 | Myotis nattereri | 100 | 0 | 100 | 1 | 1 |
| T10 | Nyctalus leisleri | 74 | 62 - 85.5 | 100 | 12 | 279 |
| T10 | Pipistrellus nathusii | 64 | 20 - 100 | 100 | 3 | 34 |
| T10 | Pipistrellus pipistrellus | 48 | 30 - 85 | 100 | 11 | 640 |
| T10 | Pipistrellus pygmaeus | 65 | 47.5 - 84 | 100 | 11 | 156 |
| T11 | Myotis daubentonii | 100 | 100 - 100 | 100 | 2 | 7 |
| T11 | Nyctalus leisleri | 67 | 53.5 - 77 | 100 | 12 | 279 |
| T11 | Pipistrellus nathusii | 64 | 20 - 100 | 100 | 3 | 34 |
| T11 | Pipistrellus pipistrellus | 48 | 30 - 85 | 100 | 11 | 640 |
| T11 | Pipistrellus pygmaeus | 70 | 52 - 87 | 100 | 10 | 156 |
| T9 | Myotis daubentonii | 42 | 0 | 42 | 1 | 7 |
| T9 | Nyctalus leisleri | 22 | 19 - 35 | 45 | 12 | 279 |
| T9 | Pipistrellus nathusii | 8 | 8 - 8 | 29 | 3 | 34 |
| T9 | Pipistrellus pipistrellus | 18 | 12 - 32 | 32 | 11 | 640 |
| T9 | Pipistrellus pygmaeus | 15 | 9 - 30 | 30 | 9 | 156 |
| T9 | Plecotus auritus | 100 | 0 | 100 | 1 | 1 |

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


Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Activity Level (Percentile)
100
80
60
40
20
0
T10
T11
T9
Detector ID

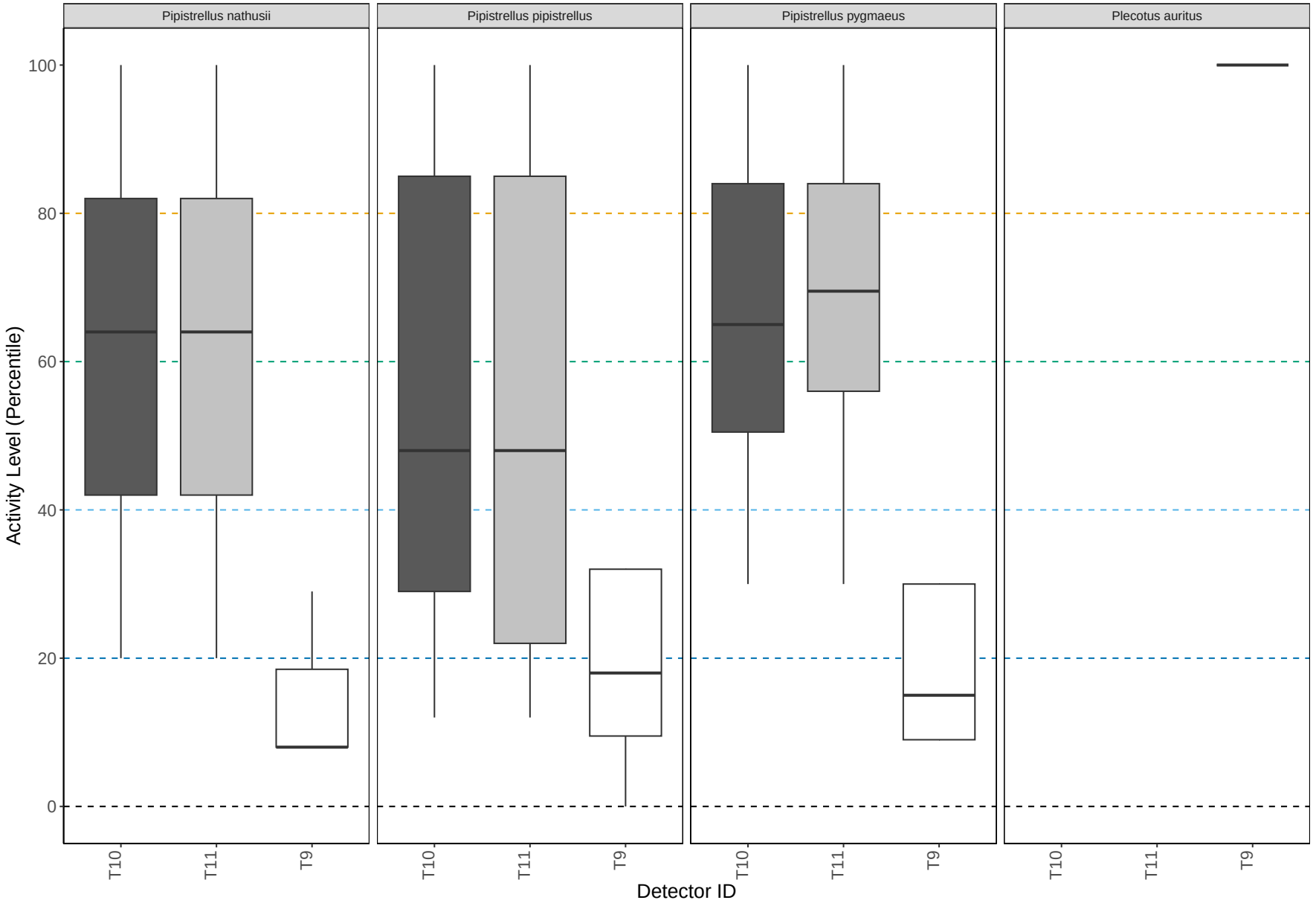
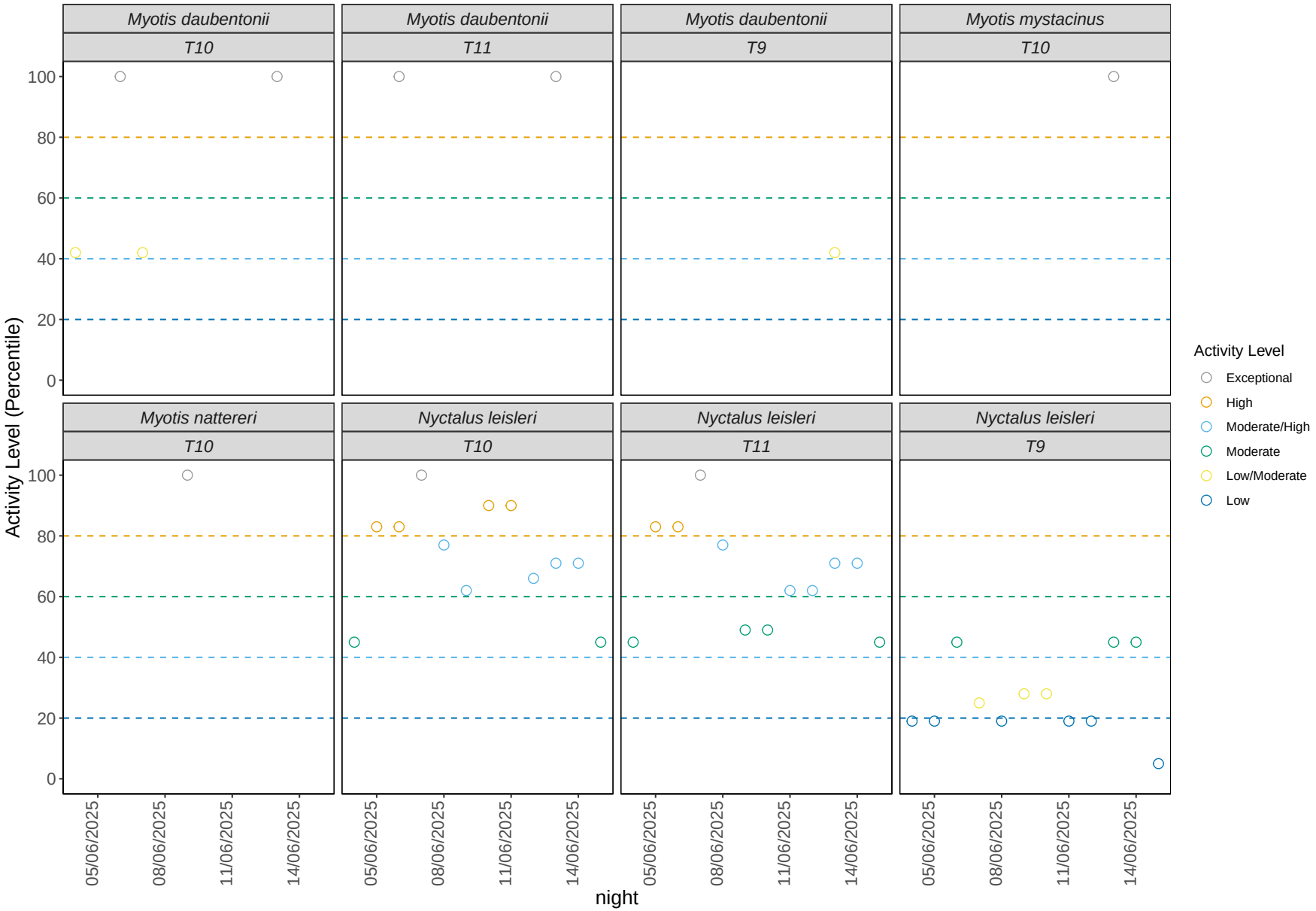
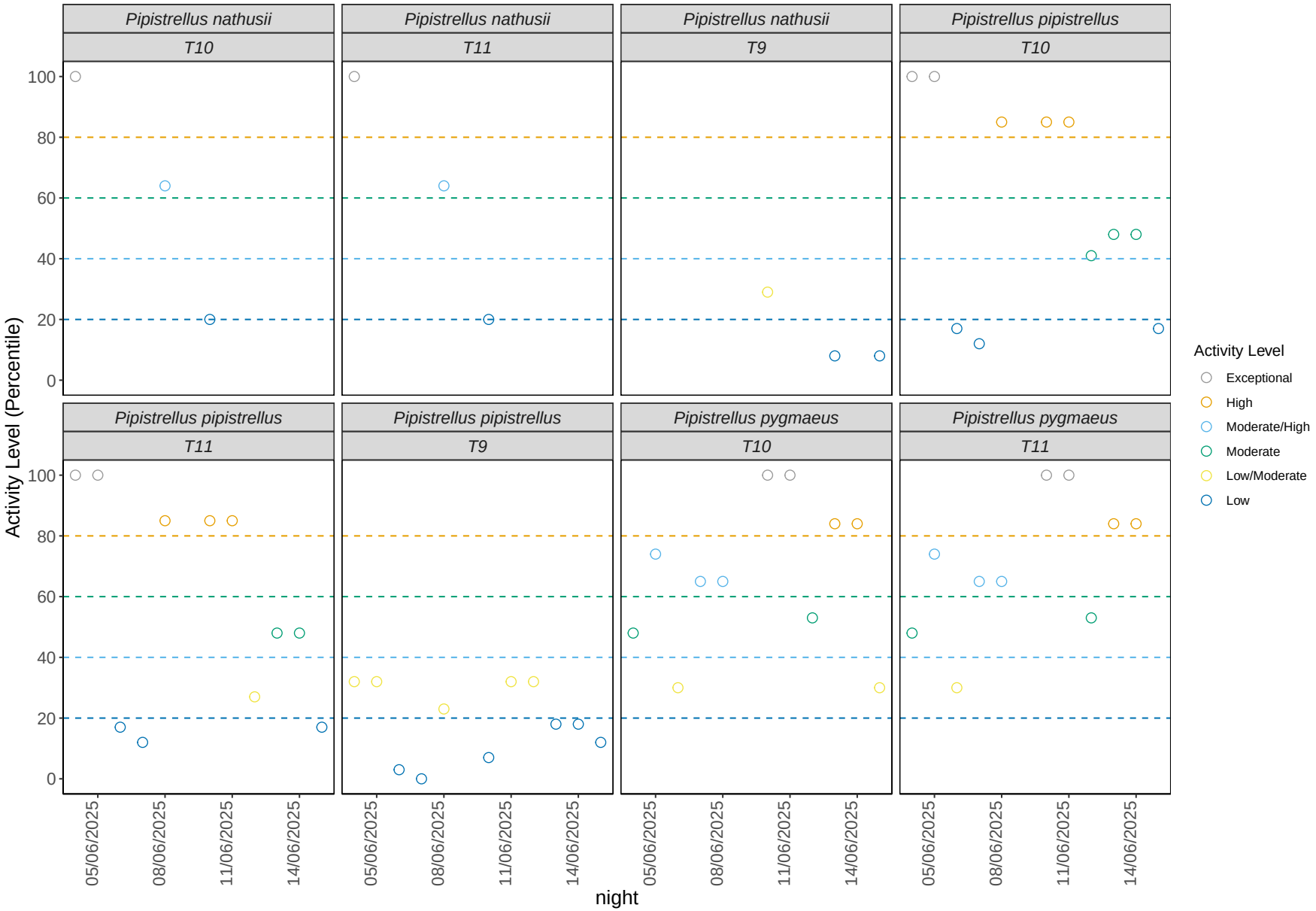
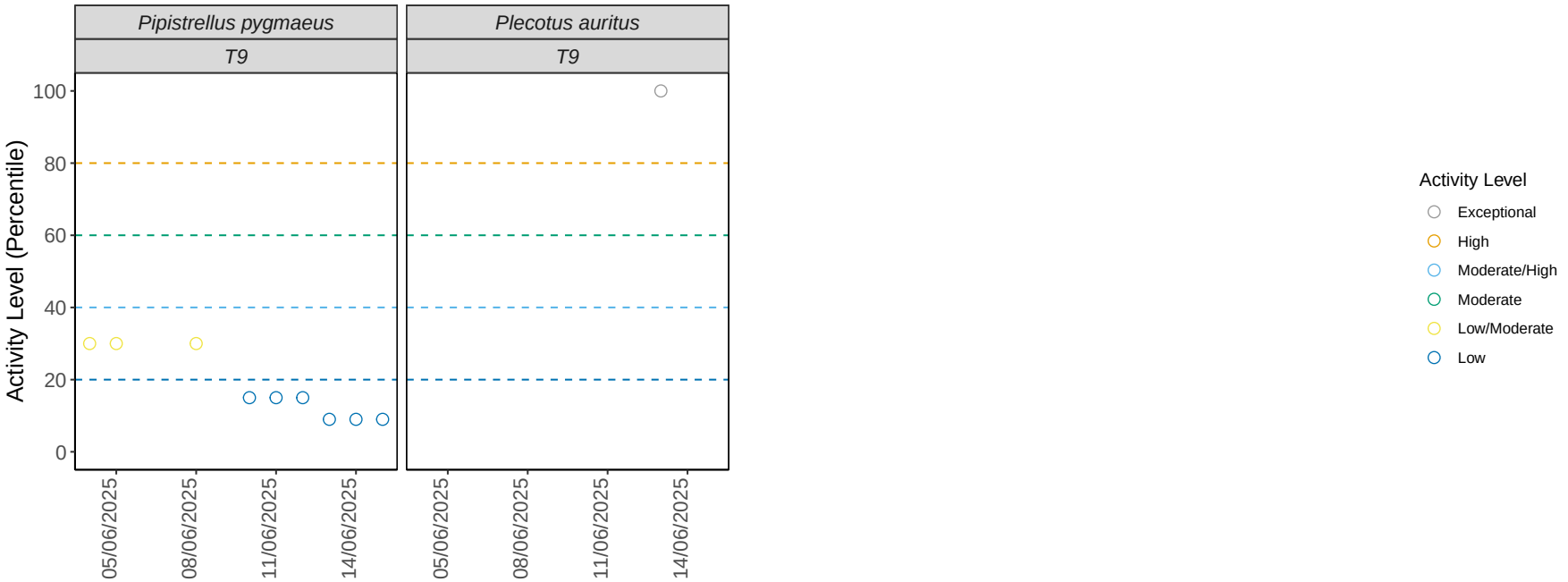

Pipistrellus nathusii
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Activity Level (Percentile)
100
80
60
40
20
0
T10
T11
T9
Detector ID

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


Myotis daubentonii
T10
Myotis daubentonii
T11
Myotis daubentonii
T9
Myotis mystacinus
T10
Myotis nattereri
T10
Nyctalus leisleri
T10
Nyctalus leisleri
T11
Nyctalus leisleri
T9
Activity Level (Percentile)
100
80
60
40
20
0
05/06/2025
08/06/2025
11/06/2025
14/06/2025
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


Pipistrellus nathusii
T10
Pipistrellus nathusii
T11
Pipistrellus nathusii
T9
Pipistrellus pipistrellus
T10
Pipistrellus pipistrellus
T11
Pipistrellus pipistrellus
T9
Pipistrellus pygmaeus
T10
Pipistrellus pygmaeus
T11
Activity Level (Percentile)
100
80
60
40
20
0
05/06/2025
08/06/2025
11/06/2025
14/06/2025
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


Pipistrellus pygmaeus
Plecotus auritus
T9
T9
Activity Level (Percentile)
100
80
60
40
20
0
05/06/2025
08/06/2025
11/06/2025
14/06/2025
05/06/2025
08/06/2025
11/06/2025
14/06/2025
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
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 Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | Jun | 2 | 0 | 0 | 0 | 2 | 0 |
| T10 | Myotis mystacinus | Jun | 1 | 0 | 0 | 0 | 0 | 0 |
| T10 | Myotis nattereri | Jun | 1 | 0 | 0 | 0 | 0 | 0 |
| T10 | Nyctalus leisleri | Jun | 1 | 4 | 5 | 2 | 0 | 0 |
| T10 | Pipistrellus nathusii | Jun | 1 | 0 | 1 | 0 | 0 | 1 |
| T10 | Pipistrellus pipistrellus | Jun | 2 | 3 | 0 | 3 | 0 | 3 |
| T10 | Pipistrellus pygmaeus | Jun | 2 | 2 | 3 | 2 | 2 | 0 |
| T11 | Myotis daubentonii | Jun | 2 | 0 | 0 | 0 | 0 | 0 |
| T11 | Nyctalus leisleri | Jun | 1 | 2 | 5 | 4 | 0 | 0 |
| T11 | Pipistrellus nathusii | Jun | 1 | 0 | 1 | 0 | 0 | 1 |
| T11 | Pipistrellus pipistrellus | Jun | 2 | 3 | 0 | 2 | 1 | 3 |
| T11 | Pipistrellus pygmaeus | Jun | 2 | 2 | 3 | 2 | 1 | 0 |
| T9 | Myotis daubentonii | Jun | 0 | 0 | 0 | 0 | 1 | 0 |
| T9 | Nyctalus leisleri | Jun | 0 | 0 | 0 | 3 | 3 | 6 |
| T9 | Pipistrellus nathusii | Jun | 0 | 0 | 0 | 0 | 1 | 2 |
| T9 | Pipistrellus pipistrellus | Jun | 0 | 0 | 0 | 0 | 5 | 6 |
| T9 | Pipistrellus pygmaeus | Jun | 0 | 0 | 0 | 0 | 3 | 6 |

| Detector ID | Species/Species Group | month | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|---|
| T9 | Plecotus auritus | Jun | 1 | 0 | 0 | 0 | 0 | 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 |
|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | Jun | 71 | 42 - 100 | 100 | 4 |
| T10 | Myotis mystacinus | Jun | 100 | 0 | 100 | 1 |
| T10 | Myotis nattereri | Jun | 100 | 0 | 100 | 1 |
| T10 | Nyctalus leisleri | Jun | 74 | 62 - 85.5 | 100 | 12 |
| T10 | Pipistrellus nathusii | Jun | 64 | 20 - 100 | 100 | 3 |
| T10 | Pipistrellus pipistrellus | Jun | 48 | 30 - 85 | 100 | 11 |
| T10 | Pipistrellus pygmaeus | Jun | 65 | 47.5 - 84 | 100 | 11 |
| T11 | Myotis daubentonii | Jun | 100 | 100 - 100 | 100 | 2 |
| T11 | Nyctalus leisleri | Jun | 67 | 53.5 - 77 | 100 | 12 |
| T11 | Pipistrellus nathusii | Jun | 64 | 20 - 100 | 100 | 3 |
| T11 | Pipistrellus pipistrellus | Jun | 48 | 30 - 85 | 100 | 11 |
| T11 | Pipistrellus pygmaeus | Jun | 70 | 52 - 87 | 100 | 10 |
| T9 | Myotis daubentonii | Jun | 42 | 0 | 42 | 1 |
| T9 | Nyctalus leisleri | Jun | 22 | 19 - 35 | 45 | 12 |
| T9 | Pipistrellus nathusii | Jun | 8 | 8 - 8 | 29 | 3 |
| T9 | Pipistrellus pipistrellus | Jun | 18 | 12 - 32 | 32 | 11 |
| T9 | Pipistrellus pygmaeus | Jun | 15 | 9 - 30 | 30 | 9 |
| T9 | Plecotus auritus | Jun | 100 | 0 | 100 | 1 |

## Per Site

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

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

| Species/Species Group | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|
| Myotis daubentonii | 4 | 0 | 0 | 0 | 3 | 0 |
| Myotis mystacinus | 1 | 0 | 0 | 0 | 0 | 0 |
| Myotis nattereri | 1 | 0 | 0 | 0 | 0 | 0 |
| Nyctalus leisleri | 2 | 6 | 10 | 9 | 3 | 6 |
| Pipistrellus nathusii | 2 | 0 | 2 | 0 | 1 | 4 |
| Pipistrellus pipistrellus | 4 | 6 | 0 | 5 | 6 | 12 |
| Pipistrellus pygmaeus | 4 | 4 | 6 | 4 | 6 | 6 |
| Plecotus auritus | 1 | 0 | 0 | 0 | 0 | 0 |

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

| Species/Species Group | Median Percentile | 95% CIs | Max. Percentile | Nights Recorded |
|---|---|---|---|---|
| Myotis daubentonii | 100 | 42 - 100 | 100 | 7 |
| Myotis mystacinus | 100 | 0 | 100 | 1 |
| Myotis nattereri | 100 | 0 | 100 | 1 |
| Nyctalus leisleri | 56 | 62 - 85.5 | 100 | 36 |
| Pipistrellus nathusii | 29 | 8 - 8 | 100 | 9 |
| Pipistrellus pipistrellus | 32 | 30 - 85 | 100 | 33 |
| Pipistrellus pygmaeus | 53 | 9 - 30 | 100 | 30 |
| Plecotus auritus | 100 | 0 | 100 | 1 |

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

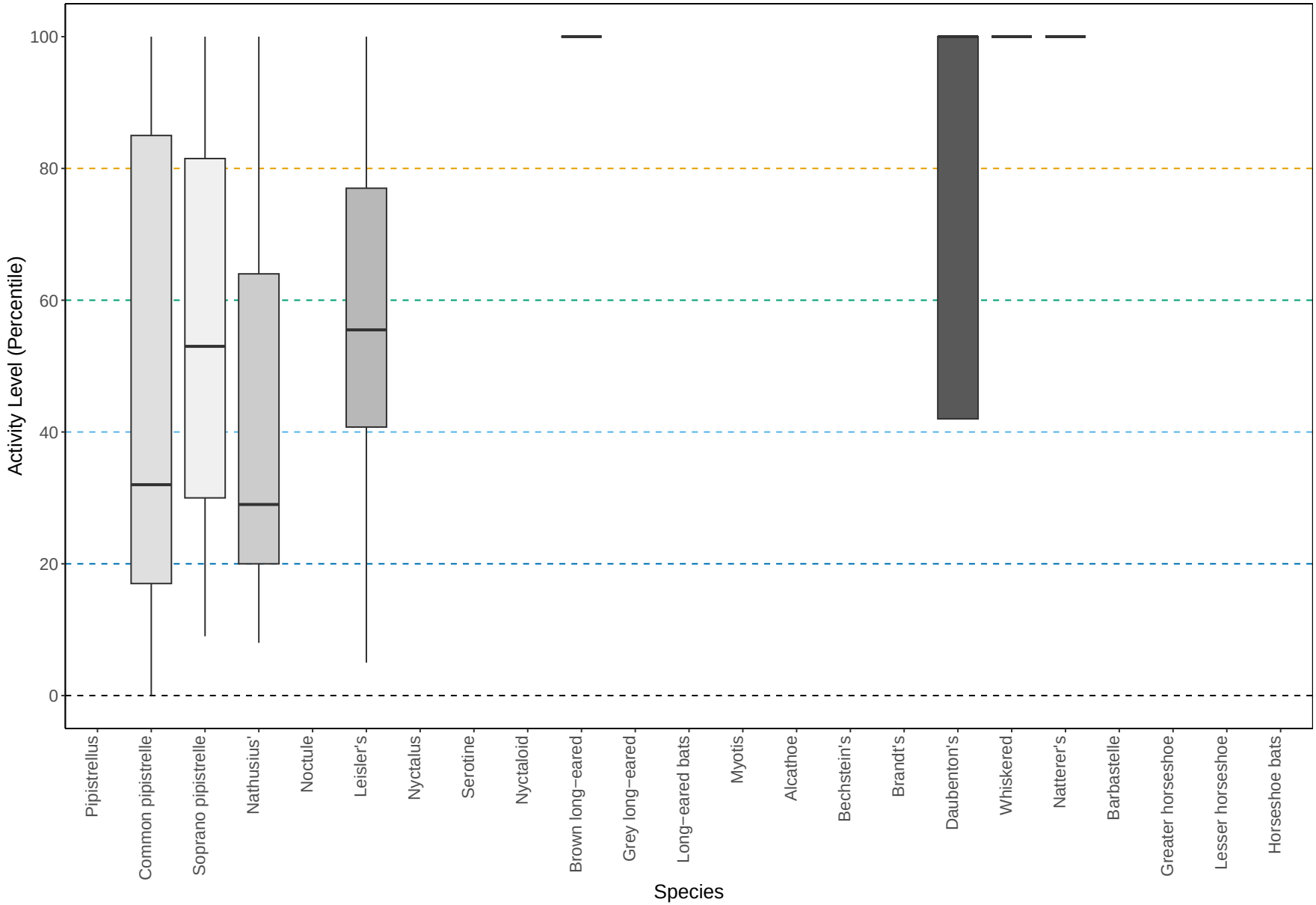

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Leisler's
Nyctalus
Serotine
Nyctaloid
Brown long−eared
Grey long−eared
Long−eared bats
Myotis
Alcathoe
Bechstein's
Brandt's
Daubenton's
Whiskered
Natterer's
Barbastelle
Greater horseshoe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

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

## Per Site, Per Month

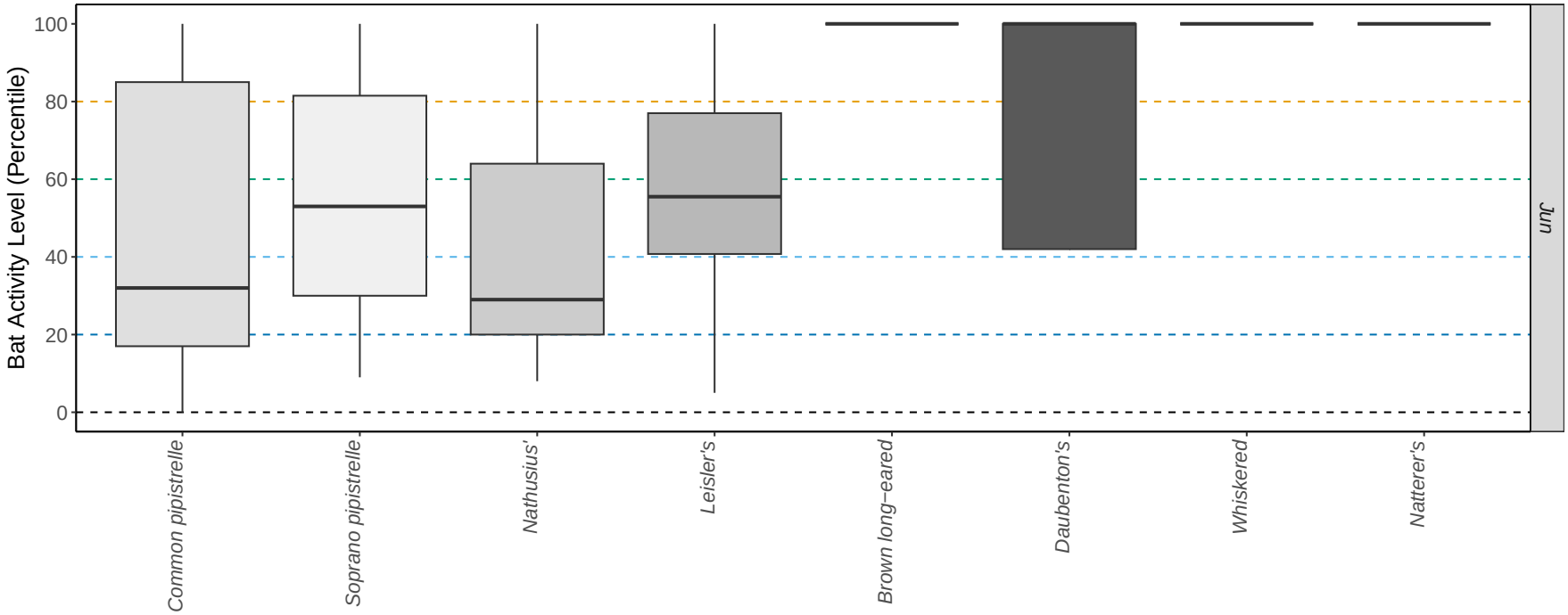
**Table 9.** Summary table showing the number of nights recorded bat activity fell into each activity band for each species during each month.

| Species/Species Group | month | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|
| Myotis daubentonii | Jun | 4 | 0 | 0 | 0 | 3 | 0 |
| Myotis mystacinus | Jun | 1 | 0 | 0 | 0 | 0 | 0 |
| Myotis nattereri | Jun | 1 | 0 | 0 | 0 | 0 | 0 |
| Nyctalus leisleri | Jun | 2 | 6 | 10 | 9 | 3 | 6 |
| Pipistrellus nathusii | Jun | 2 | 0 | 2 | 0 | 1 | 4 |
| Pipistrellus pipistrellus | Jun | 4 | 6 | 0 | 5 | 6 | 12 |
| Pipistrellus pygmaeus | Jun | 4 | 4 | 6 | 4 | 6 | 6 |
| Plecotus auritus | Jun | 1 | 0 | 0 | 0 | 0 | 0 |

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

| Species/Species Group | month | Median Percentile | 95% CIs | Max. Percentile | Nights Recorded |
|---|---|---|---|---|---|
| Myotis daubentonii | Jun | 100 | 42 - 100 | 100 | 7 |
| Myotis mystacinus | Jun | 100 | 0 | 100 | 1 |
| Myotis nattereri | Jun | 100 | 0 | 100 | 1 |
| Nyctalus leisleri | Jun | 56 | 62 - 85.5 | 100 | 36 |
| Pipistrellus nathusii | Jun | 29 | 8 - 8 | 100 | 9 |
| Pipistrellus pipistrellus | Jun | 32 | 30 - 85 | 100 | 33 |
| Pipistrellus pygmaeus | Jun | 53 | 9 - 30 | 100 | 30 |
| Plecotus auritus | Jun | 100 | 0 | 100 | 1 |

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


Bat Activity Level (Percentile)
100
80
60
40
20
0
Jun
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long−eared
Daubenton's
Whiskered
Natterer's
Species

## Part 2: Nightly Analysis

# Entire Survey Period

### Sunrise and Sunset Times

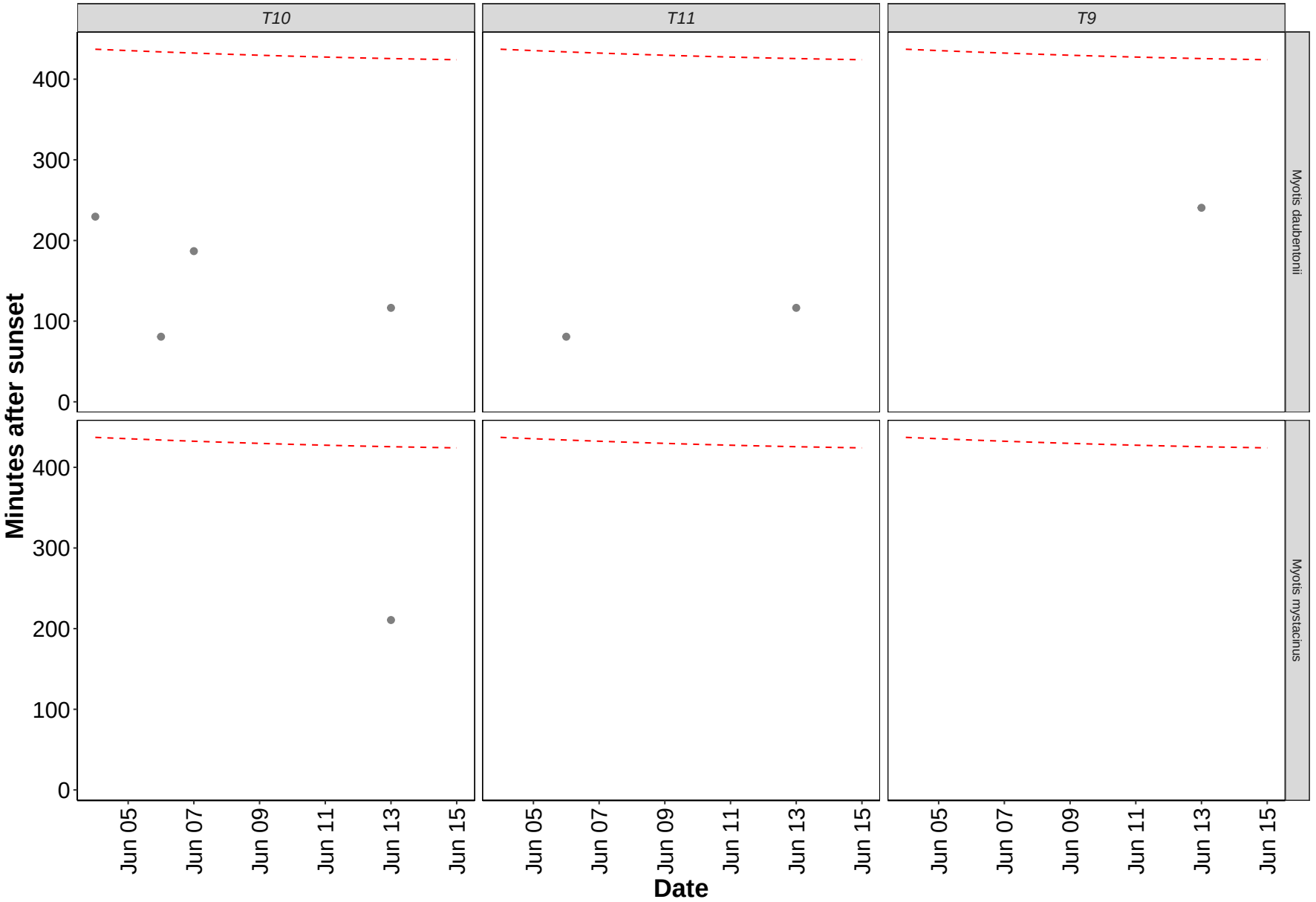
**Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.**

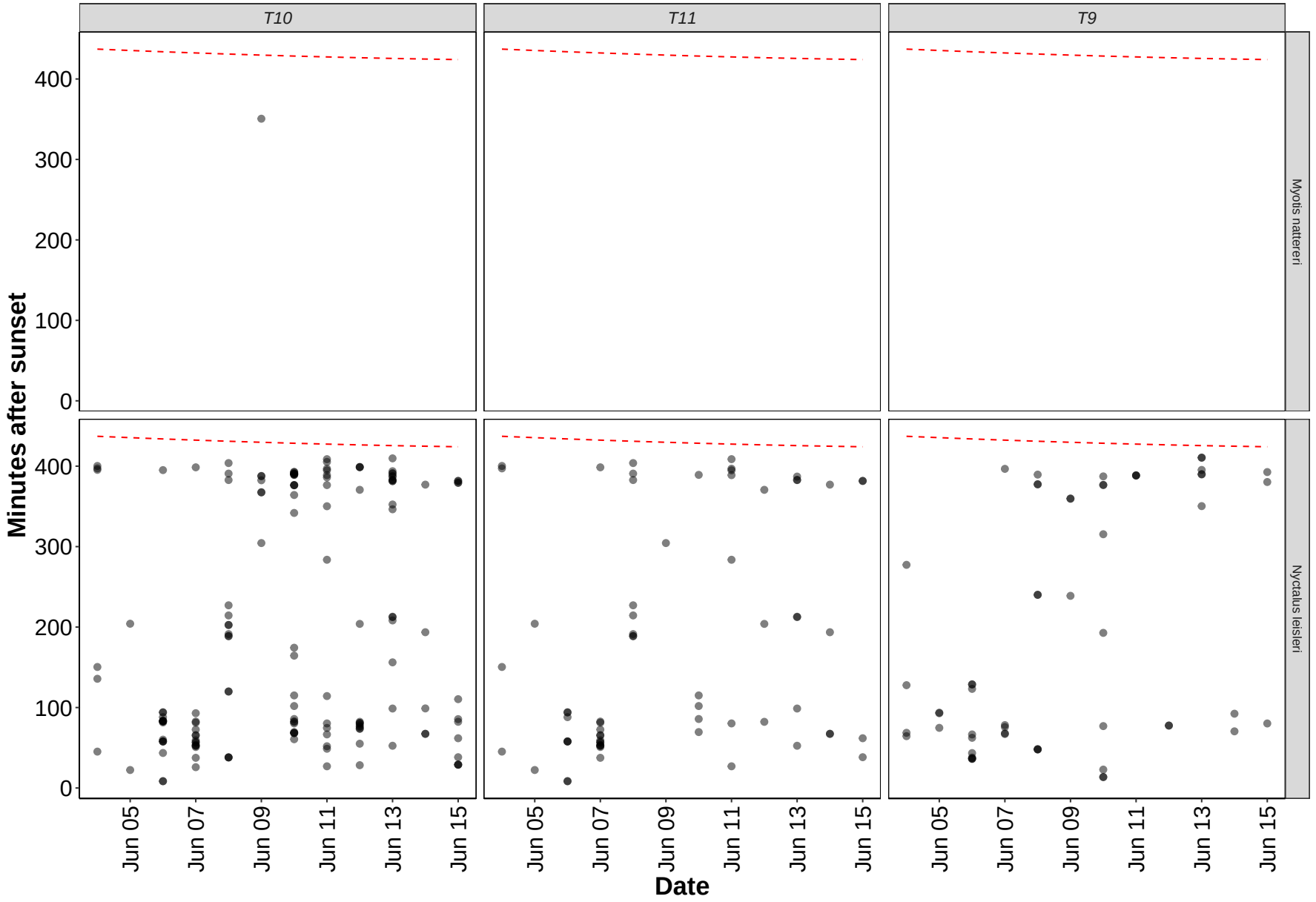
| Night (y-m-d) | Sunset (h:m) | Sunrise (h:m) | Night Length (hours) |
|---|---|---|---|
| 2025-06-04 | 21:52 | 05:09 | 7.3 |
| 2025-06-05 | 21:53 | 05:08 | 7.3 |
| 2025-06-06 | 21:54 | 05:08 | 7.2 |
| 2025-06-07 | 21:55 | 05:07 | 7.2 |
| 2025-06-08 | 21:56 | 05:07 | 7.2 |
| 2025-06-09 | 21:57 | 05:06 | 7.2 |
| 2025-06-10 | 21:57 | 05:06 | 7.1 |
| 2025-06-11 | 21:58 | 05:06 | 7.1 |
| 2025-06-12 | 21:59 | 05:05 | 7.1 |
| 2025-06-13 | 22:00 | 05:05 | 7.1 |
| 2025-06-14 | 22:00 | 05:05 | 7.1 |
| 2025-06-15 | 22:01 | 05:05 | 7.1 |

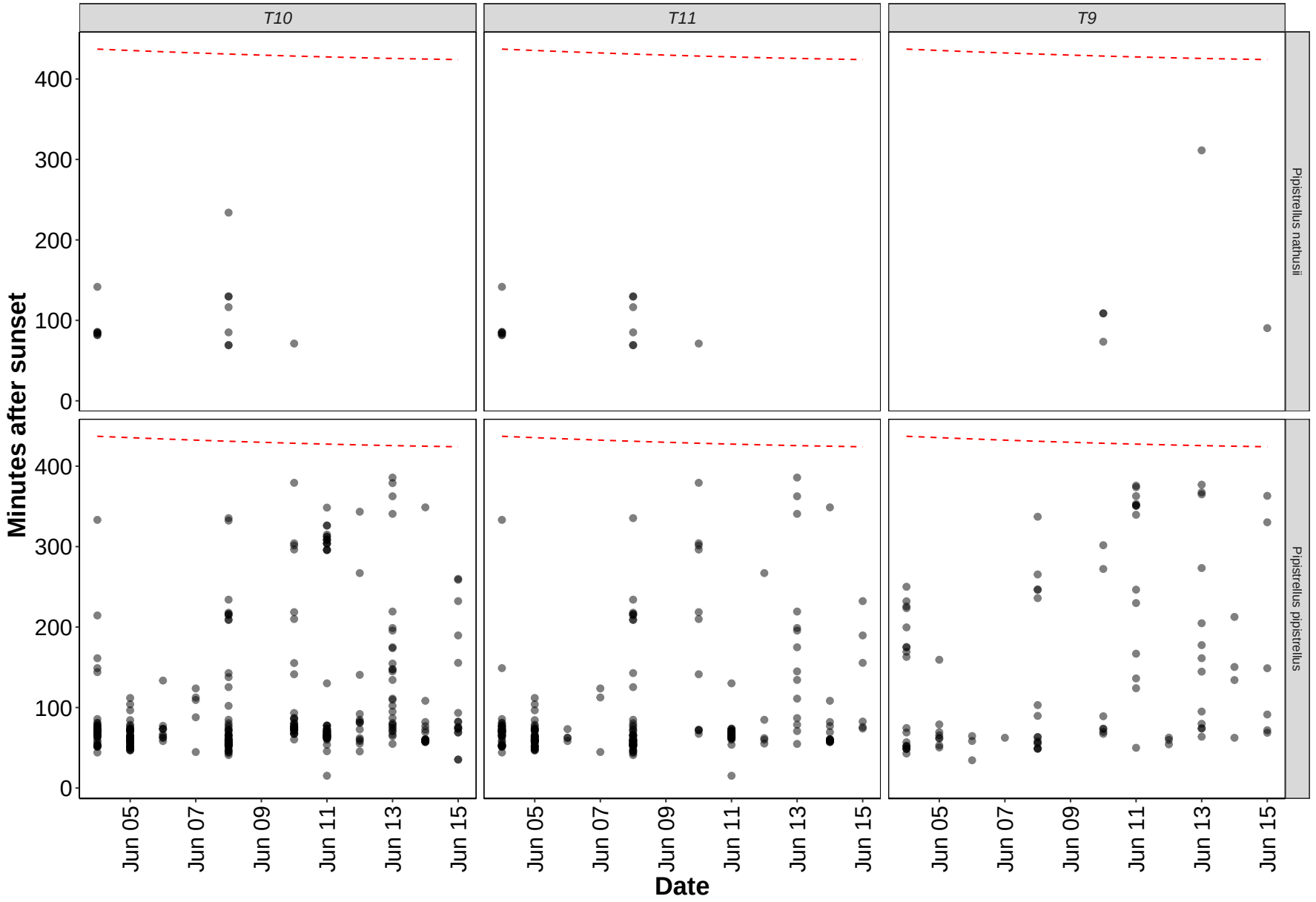
# Distribution of Bat Activity Across the Night through Time

## 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.


T10
T11
T9
Myotis daubentonii
Myotis mystacinus
Minutes after sunset
0
100
200
300
400
Jun 05
Jun 07
Jun 09
Jun 11
Jun 13
Jun 15
Date


T10
T11
T9
Myotis nattereri
Nyctalus leisleri
Minutes after sunset
0
100
200
300
400
Jun 05
Jun 07
Jun 09
Jun 11
Jun 13
Jun 15
Date


T10
T11
T9
Pipistrellus nathusii
Pipistrellus pipistrellus
Minutes after sunset
0
100
200
300
400
Jun 05
Jun 07
Jun 09
Jun 11
Jun 13
Jun 15
Date

# Roost Emergence Time and Bat Observation

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

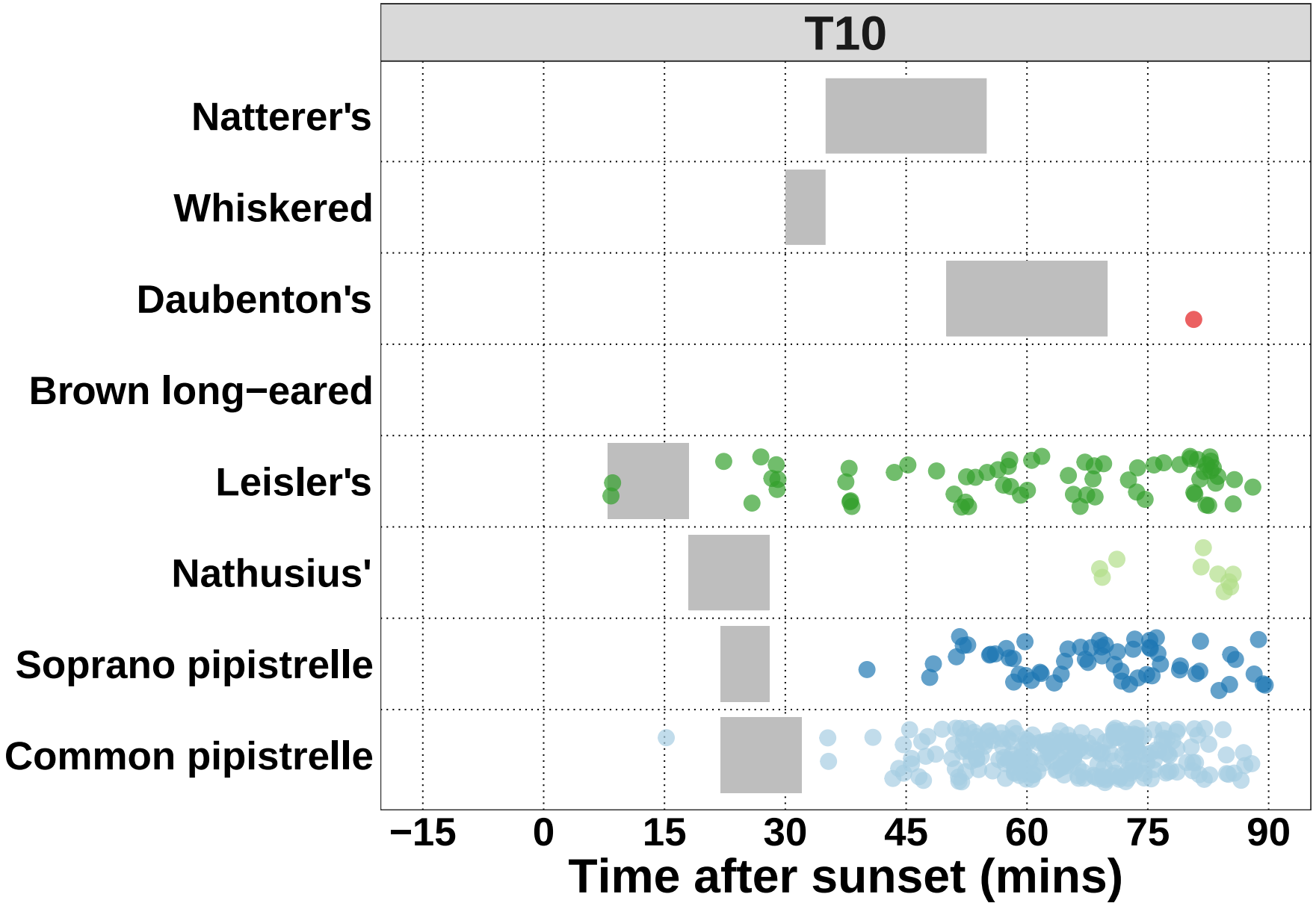
## Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012)

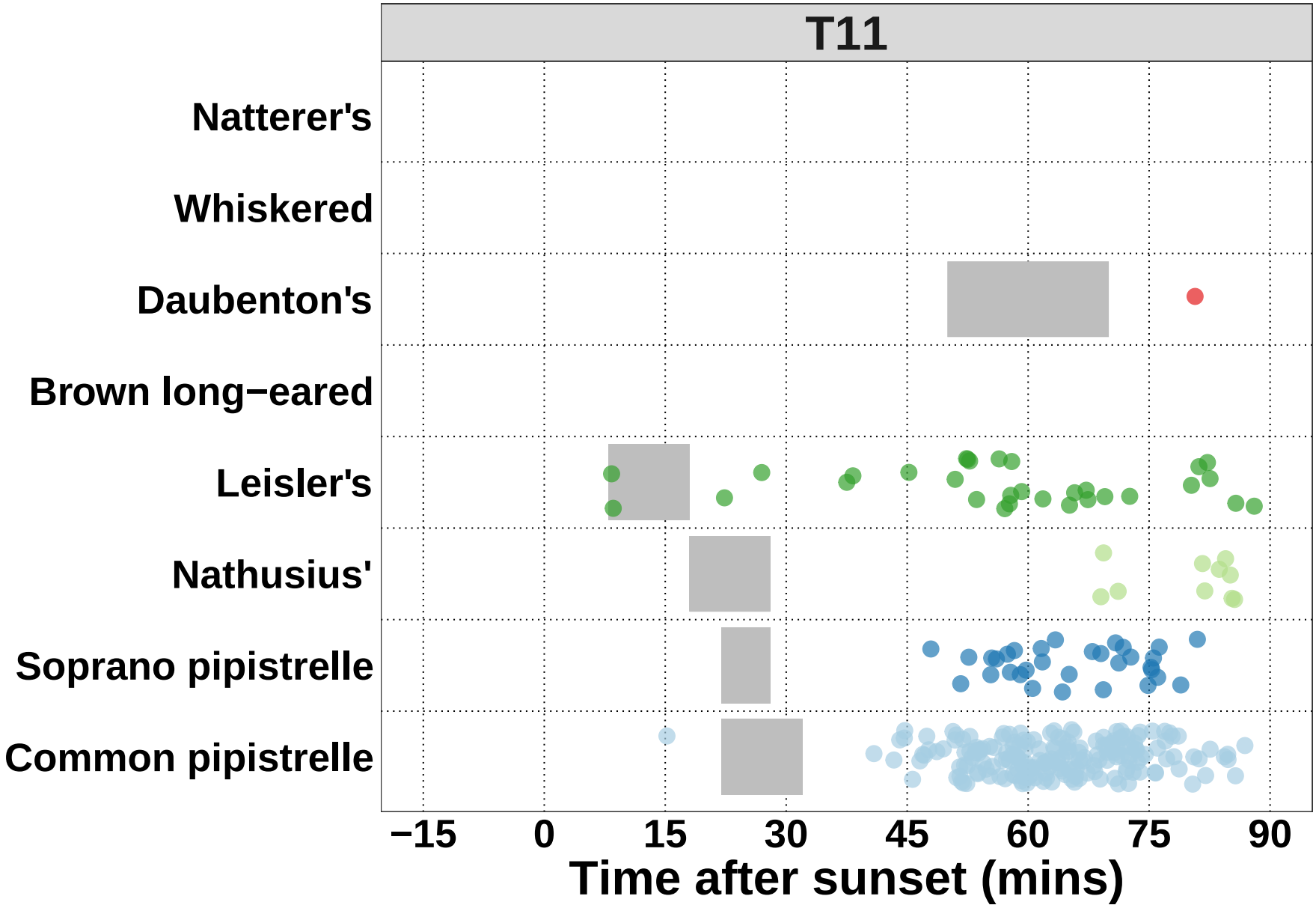
**Table 12. Number of bat calls recorded before the upper time of the species-specific emergence time range, and which therefore may potentially indicate the presence of a nearby roost.**

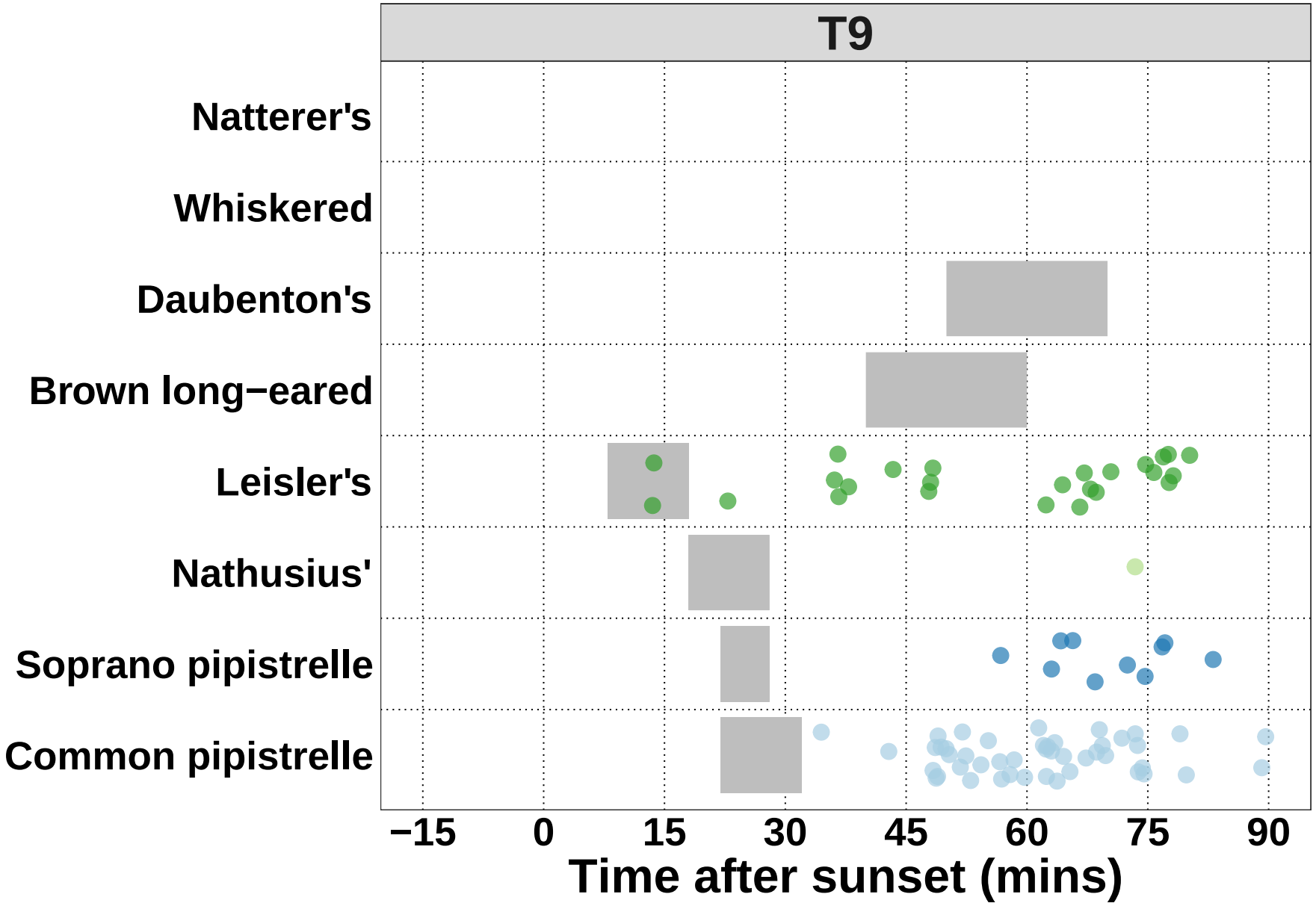
| Species | Detector ID | 2025-06-06 | 2025-06-10 | 2025-06-11 |
|---|---|---|---|---|
| Common pipistrelle | T10 | 0 | 0 | 1 |
| Common pipistrelle | T11 | 0 | 0 | 1 |
| Leisler's | T10 | 2 | 0 | 0 |
| Leisler's | T11 | 2 | 0 | 0 |
| Leisler's | T9 | 0 | 2 | 0 |

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

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


T10
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)

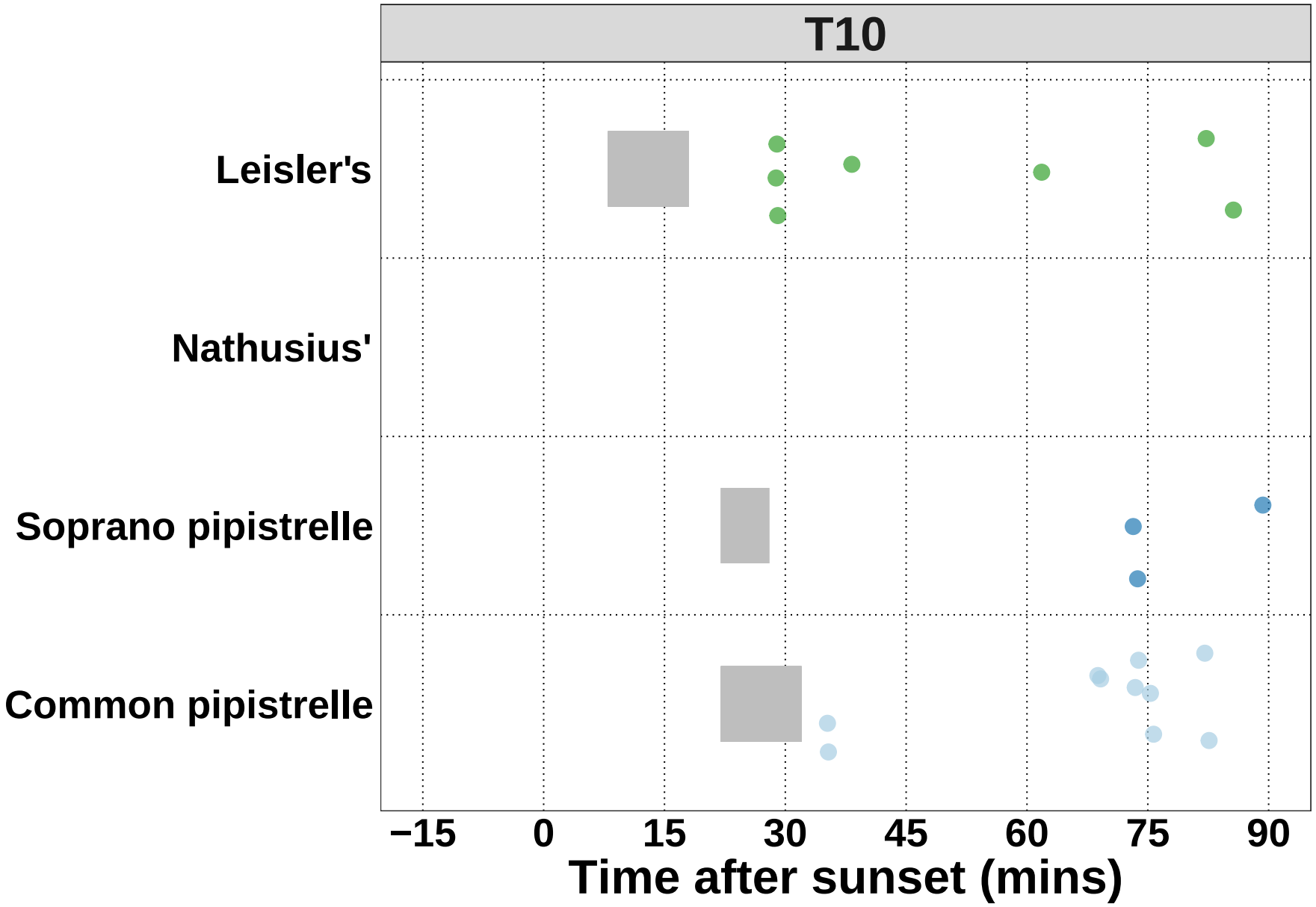

T11
Natterer's
Whiskered
Daubenton's
Brown long−eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

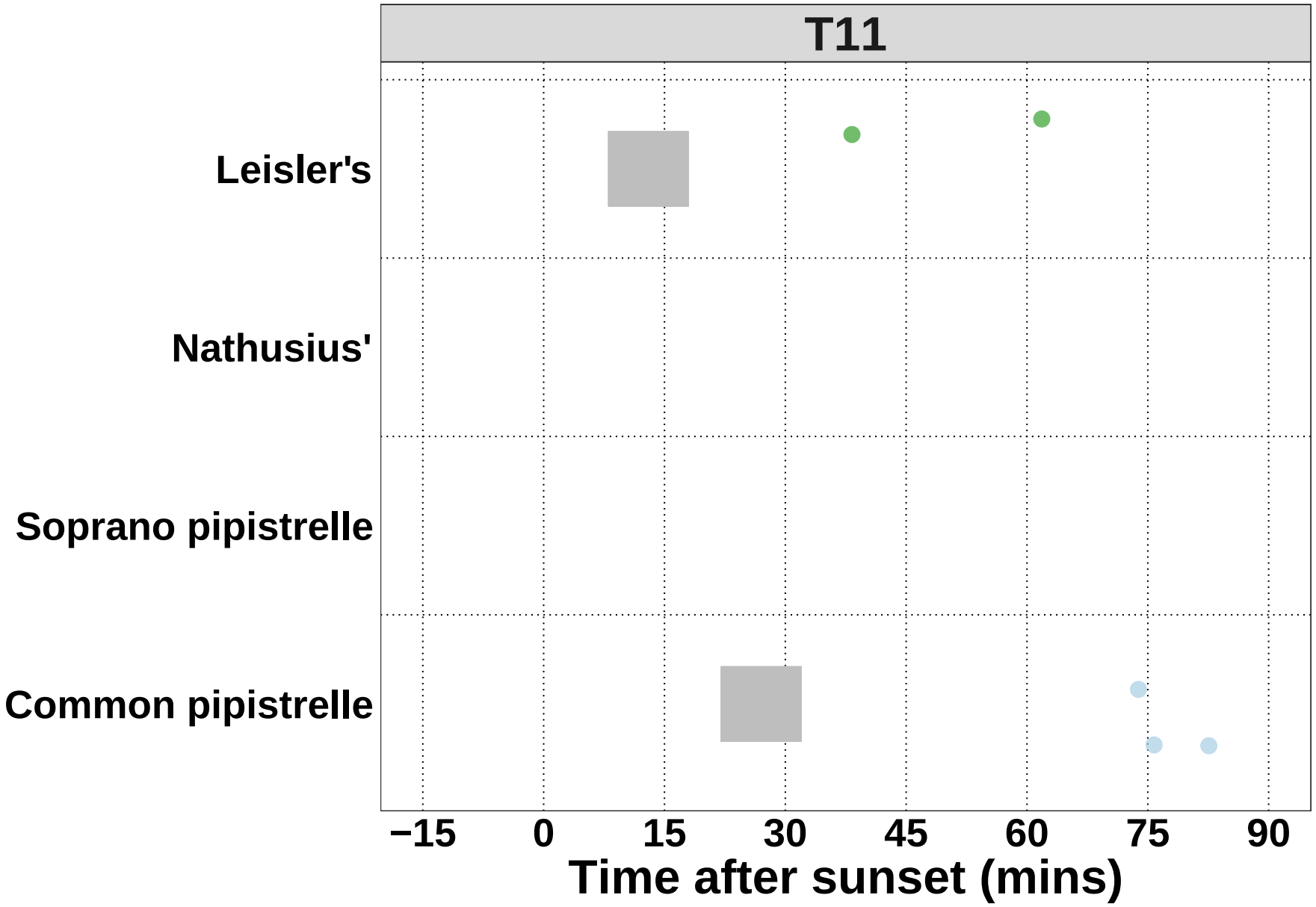

T9
Natterer's
Whiskered
Daubenton's
Brown long−eared
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

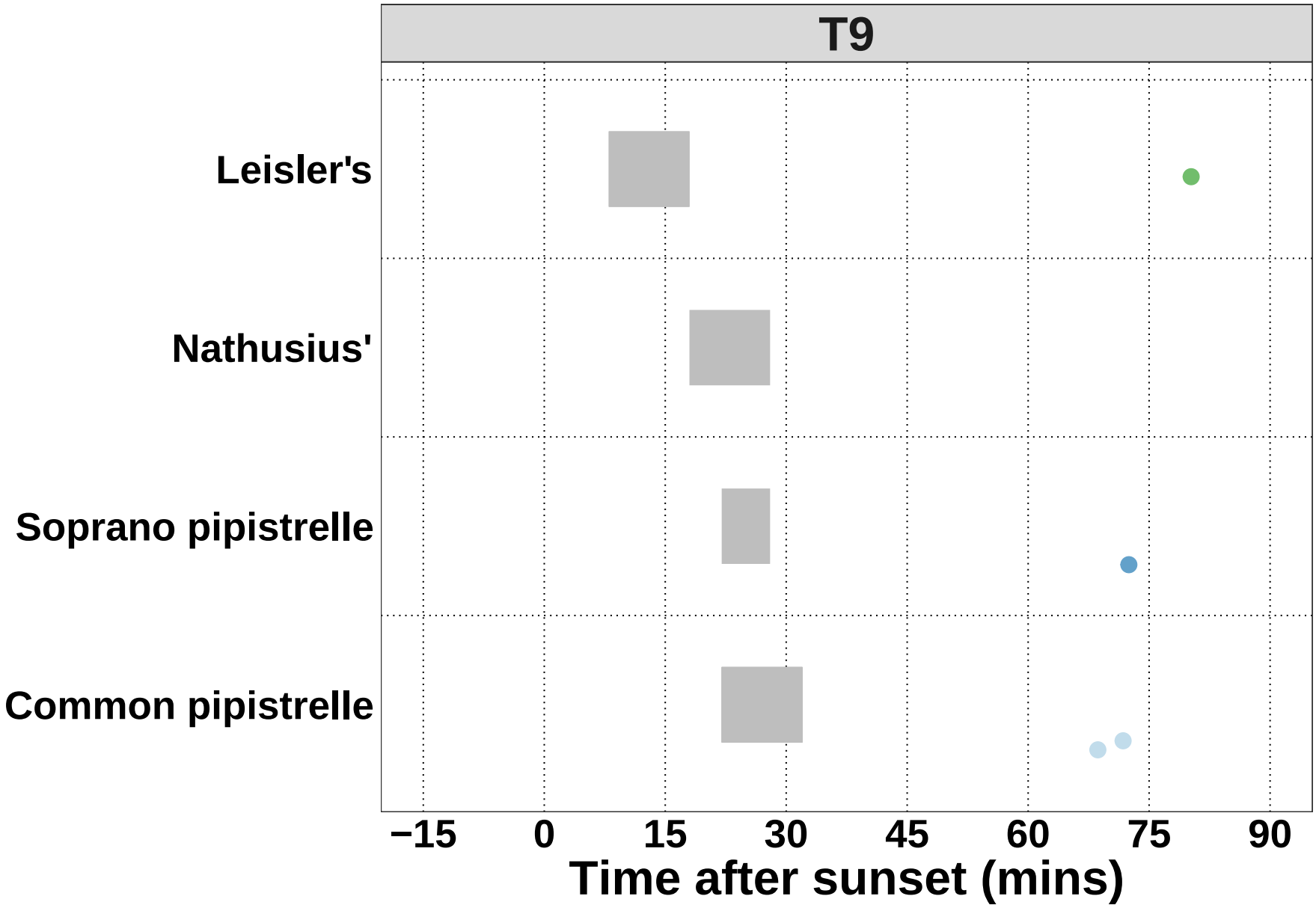
Bat Passes Potentially Indicating Close Proximity to a Roost (Maternity Period Only) - *Maternity period defined as 15th June - 30th July.

| Species | Detector ID |
|---|---|

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


T10
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


T11
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


T9
Leisler's
Nathusius'
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

# Count of Bat Passes

## All Detectors

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

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

| Species | Passes (no.) | Percentage of Total (%) |
|---|---|---|
| Myotis daubentonii | 7 | 0.6 |
| Myotis mystacinus | 1 | 0.1 |
| Myotis nattereri | 1 | 0.1 |
| Nyctalus leisleri | 279 | 24.9 |
| Pipistrellus nathusii | 34 | 3.0 |
| Pipistrellus pipistrellus | 640 | 57.2 |
| Pipistrellus pygmaeus | 156 | 13.9 |
| Plecotus auritus | 1 | 0.1 |
| Total | 1119 | 99.9 |

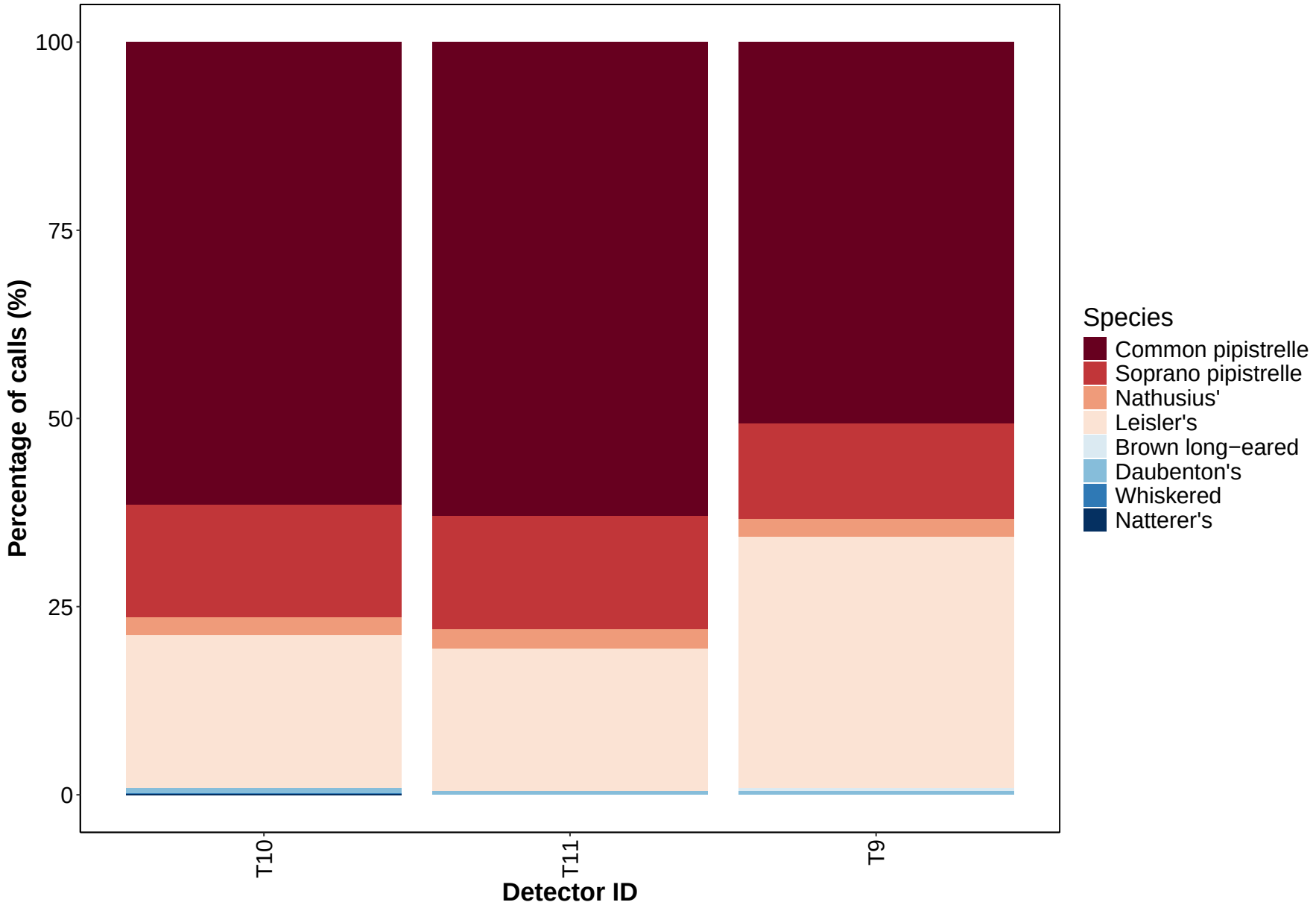
## Per Detector

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

| Species | Detector ID | Count (no.) | Percentage by Detector (%) |
|---|---|---|---|
| Common pipistrelle | T10 | 320 | 54.7945205 |
| Common pipistrelle | T11 | 227 | 63.7640449 |
| Common pipistrelle | T9 | 93 | 51.9553073 |
| Soprano pipistrelle | T10 | 89 | 15.2397260 |
| Soprano pipistrelle | T11 | 46 | 12.9213483 |
| Soprano pipistrelle | T9 | 21 | 11.7318436 |
| Nathusius' | T10 | 15 | 2.5684932 |
| Nathusius' | T11 | 14 | 3.9325843 |
| Nathusius' | T9 | 5 | 2.7932961 |
| Leisler's | T10 | 154 | 26.3698630 |
| Leisler's | T11 | 67 | 18.8202247 |
| Leisler's | T9 | 58 | 32.4022346 |
| Brown long-eared | T9 | 1 | 0.5586592 |
| Daubenton's | T10 | 4 | 0.6849315 |
| Daubenton's | T11 | 2 | 0.5617978 |
| Daubenton's | T9 | 1 | 0.5586592 |
| Whiskered | T10 | 1 | 0.1712329 |
| Natterer's | T10 | 1 | 0.1712329 |

## Species Composition

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


100
75
50
25
0
Percentage of calls (%)
T10
T11
T9
Detector ID
Species
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Brown long−eared
Daubenton's
Whiskered
Natterer's

## Part 2a: Presence Only

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

### Nighlty Bat Passes Per Hour

# Median Per Detector

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

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

| Species | Detector ID | Median Pass Rate |
|---|---|---|
| Common pipistrelle | T10 | 6.5 |
| Common pipistrelle | T11 | 6.5 |
| Common pipistrelle | T9 | 1.3 |
| Soprano pipistrelle | T10 | 1.4 |
| Soprano pipistrelle | T11 | 1.7 |
| Soprano pipistrelle | T9 | 0.4 |
| Nathusius' | T10 | 1.1 |
| Nathusius' | T11 | 1.1 |
| Nathusius' | T9 | 0.1 |
| Leisler's | T10 | 2.1 |
| Leisler's | T11 | 1.8 |
| Leisler's | T9 | 0.8 |
| Brown long-eared | T9 | 0.1 |
| Daubenton's | T10 | 0.2 |
| Daubenton's | T11 | 0.3 |
| Daubenton's | T9 | 0.1 |
| Whiskered | T10 | 0.1 |
| Natterer's | T10 | 0.1 |

# Mean Per Detector

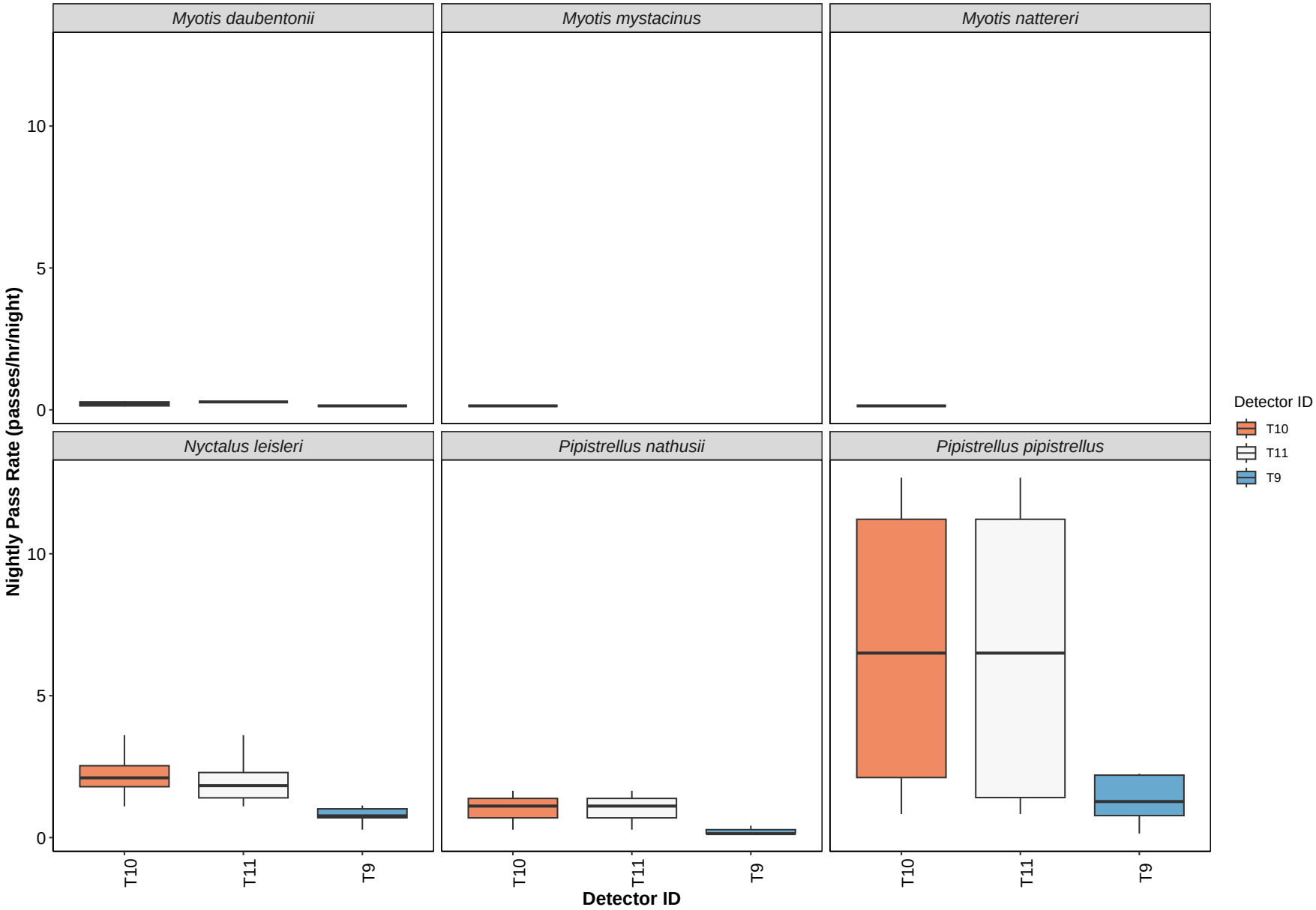
**Table 17. The mean Nightly Pass Rate (bat passes per hour, per night) of each species at each detector. Values are given to 1 decimal place.**

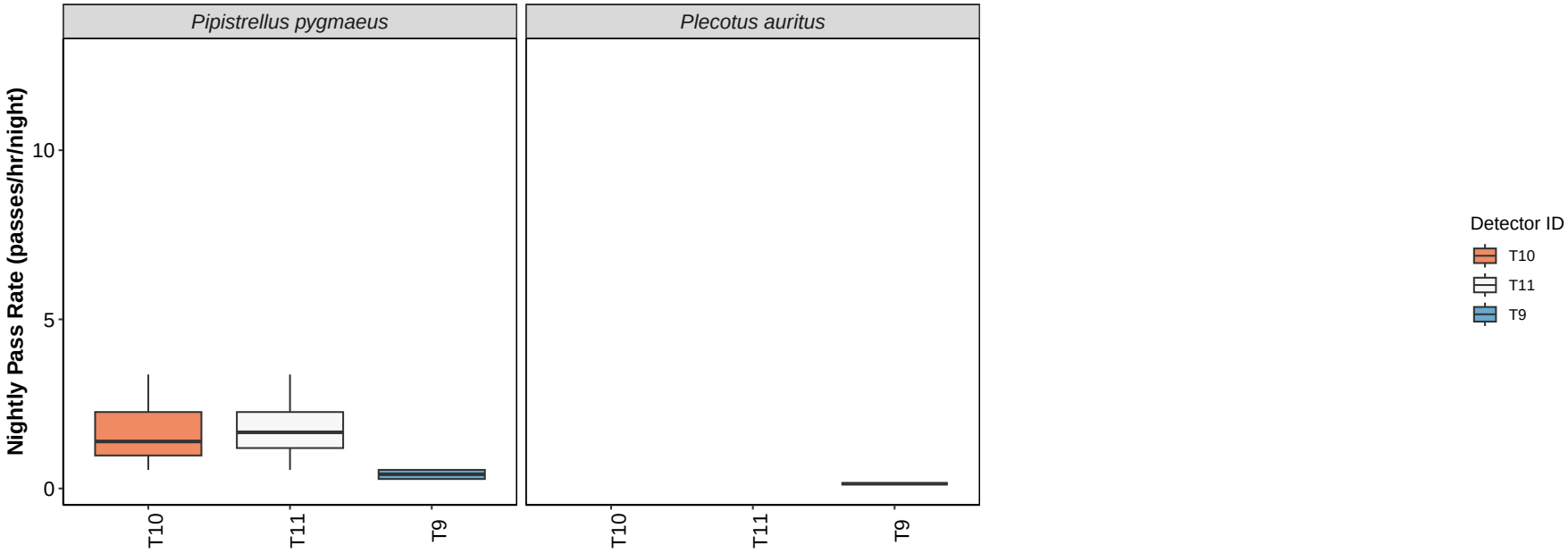
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

| Species | Detector ID | Mean Pass Rate |
|---|---|---|
| Common pipistrelle | T10 | 7.1 |
| Common pipistrelle | T11 | 7.0 |
| Common pipistrelle | T9 | 1.4 |
| Soprano pipistrelle | T10 | 1.7 |
| Soprano pipistrelle | T11 | 1.8 |
| Soprano pipistrelle | T9 | 0.4 |
| Nathusius' | T10 | 1.0 |
| Nathusius' | T11 | 1.0 |
| Nathusius' | T9 | 0.2 |
| Leisler's | T10 | 2.2 |
| Leisler's | T11 | 1.9 |
| Leisler's | T9 | 0.8 |
| Brown long-eared | T9 | 0.1 |
| Daubenton's | T10 | 0.2 |
| Daubenton's | T11 | 0.3 |
| Daubenton's | T9 | 0.1 |
| Whiskered | T10 | 0.1 |
| Natterer's | T10 | 0.1 |

## Per Detector

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


Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus nathusii
Pipistrellus pipistrellus
Nightly Pass Rate (passes/hr/night)
0
5
10
T10
T11
T9
Detector ID
Detector ID
T10
T11
T9


Pipistrellus pygmaeus
Plecotus auritus
Nightly Pass Rate (passes/hr/night)
10
5
0
T10
T11
T9
T10
T11
T9
Detector ID
T10
T11
T9

**Detector ID**

# Split by Month

## Total Bat Passes per Detector each Month

**Table 18. The total number of bat passes of each species in each month at each detector.**

This table simply tells you how many bats of each species were recorded passing each detector during each month. These numbers are not standardised by the night length, or how many nights each detector was active for during each month.

| Species | Detector ID | Jun |
|---|---|---|
| Common pipistrelle | T10 | 560 |
| Common pipistrelle | T11 | 550 |
| Common pipistrelle | T9 | 108 |
| Soprano pipistrelle | T10 | 136 |
| Soprano pipistrelle | T11 | 132 |
| Soprano pipistrelle | T9 | 27 |
| Nathusius' | T10 | 22 |
| Nathusius' | T11 | 22 |
| Nathusius' | T9 | 5 |
| Leisler's | T10 | 185 |
| Leisler's | T11 | 166 |
| Leisler's | T9 | 71 |
| Brown long-eared | T9 | 1 |
| Daubenton's | T10 | 6 |
| Daubenton's | T11 | 4 |
| Daubenton's | T9 | 1 |
| Whiskered | T10 | 1 |
| Natterer's | T10 | 1 |

# Survey Effort

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

| month | Detector ID | No. of Survey Nights |
|---|---|---|
| Jun | T10 | 12 |
| Jun | T11 | 12 |
| Jun | T9 | 12 |

## Nightly Bat Passes for Each Month

# Median Per Detector

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

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

| Species | Detector ID | Jun |
|---|---|---|
| Common pipistrelle | T10 | 6.5 |
| Common pipistrelle | T11 | 6.5 |
| Common pipistrelle | T9 | 1.3 |
| Soprano pipistrelle | T10 | 1.4 |
| Soprano pipistrelle | T11 | 1.7 |
| Soprano pipistrelle | T9 | 0.4 |
| Nathusius' | T10 | 1.1 |
| Nathusius' | T11 | 1.1 |
| Nathusius' | T9 | 0.1 |
| Leisler's | T10 | 2.1 |
| Leisler's | T11 | 1.8 |
| Leisler's | T9 | 0.8 |
| Brown long-eared | T9 | 0.1 |
| Daubenton's | T10 | 0.2 |
| Daubenton's | T11 | 0.3 |
| Daubenton's | T9 | 0.1 |
| Whiskered | T10 | 0.1 |
| Natterer's | T10 | 0.1 |

# Mean Per Detector

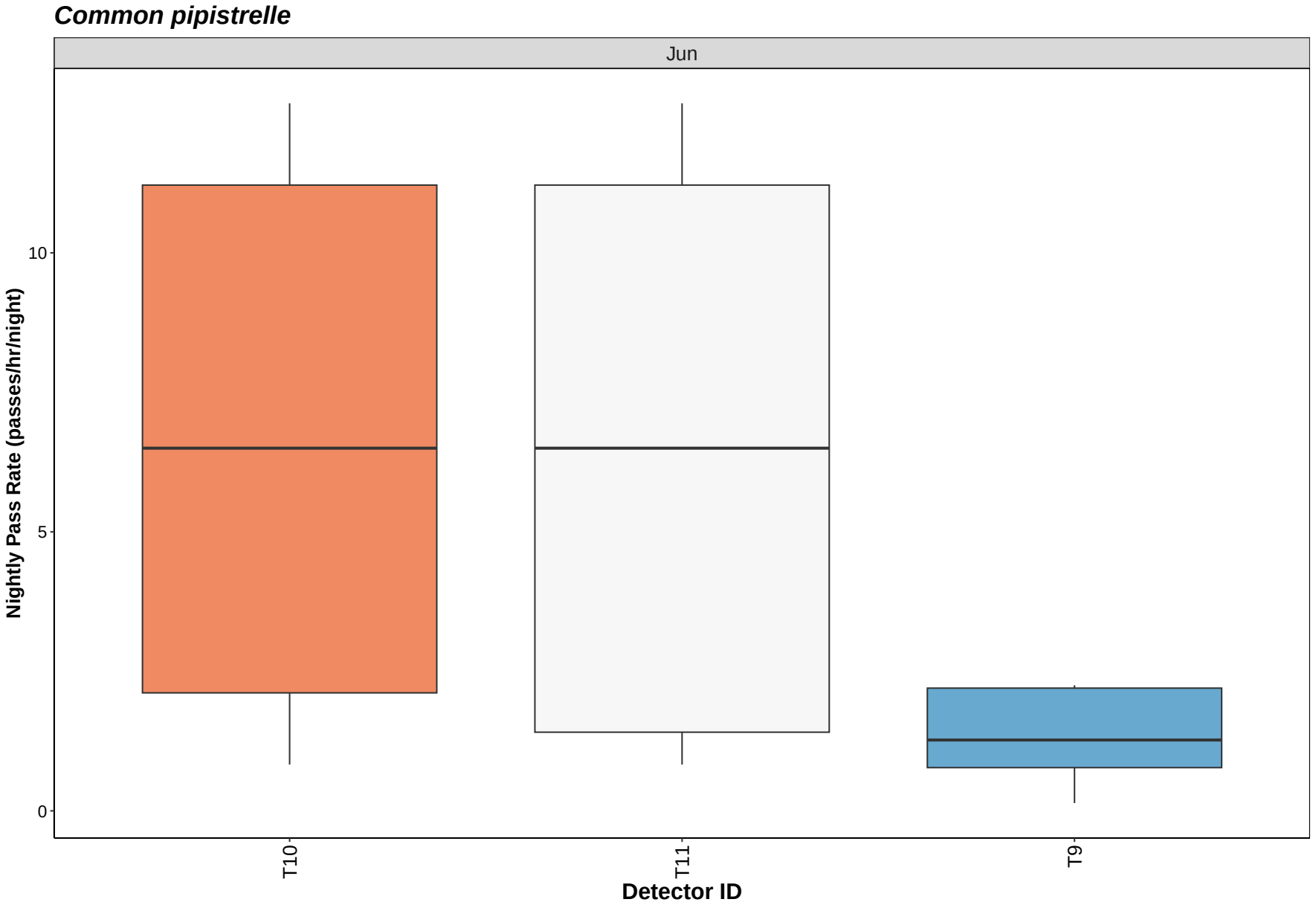
**Table 21: The mean Nightly Pass Rate (bat passes per hour, per night) of each species throughout each month. Values are given to 1 decimal place.**

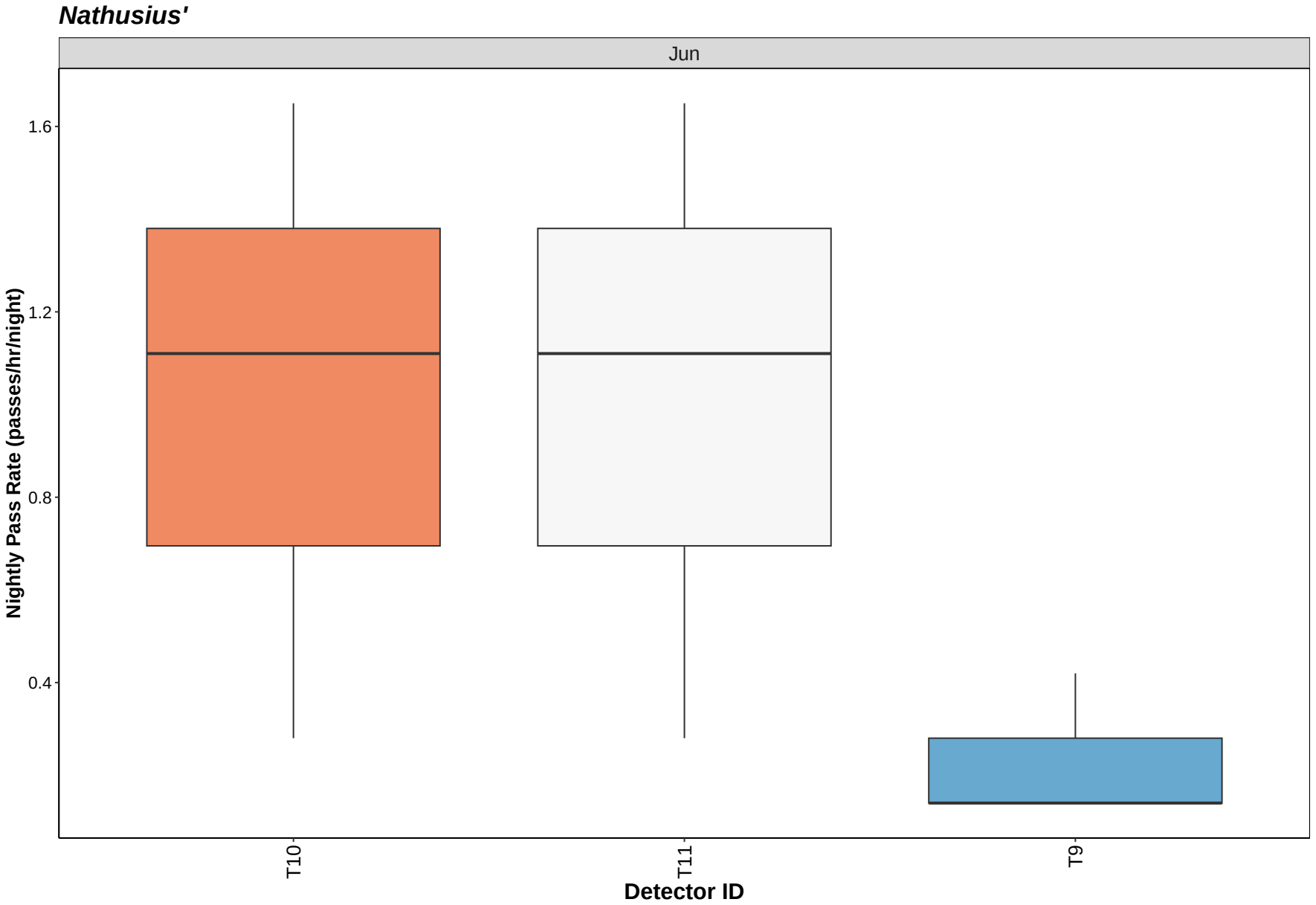
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

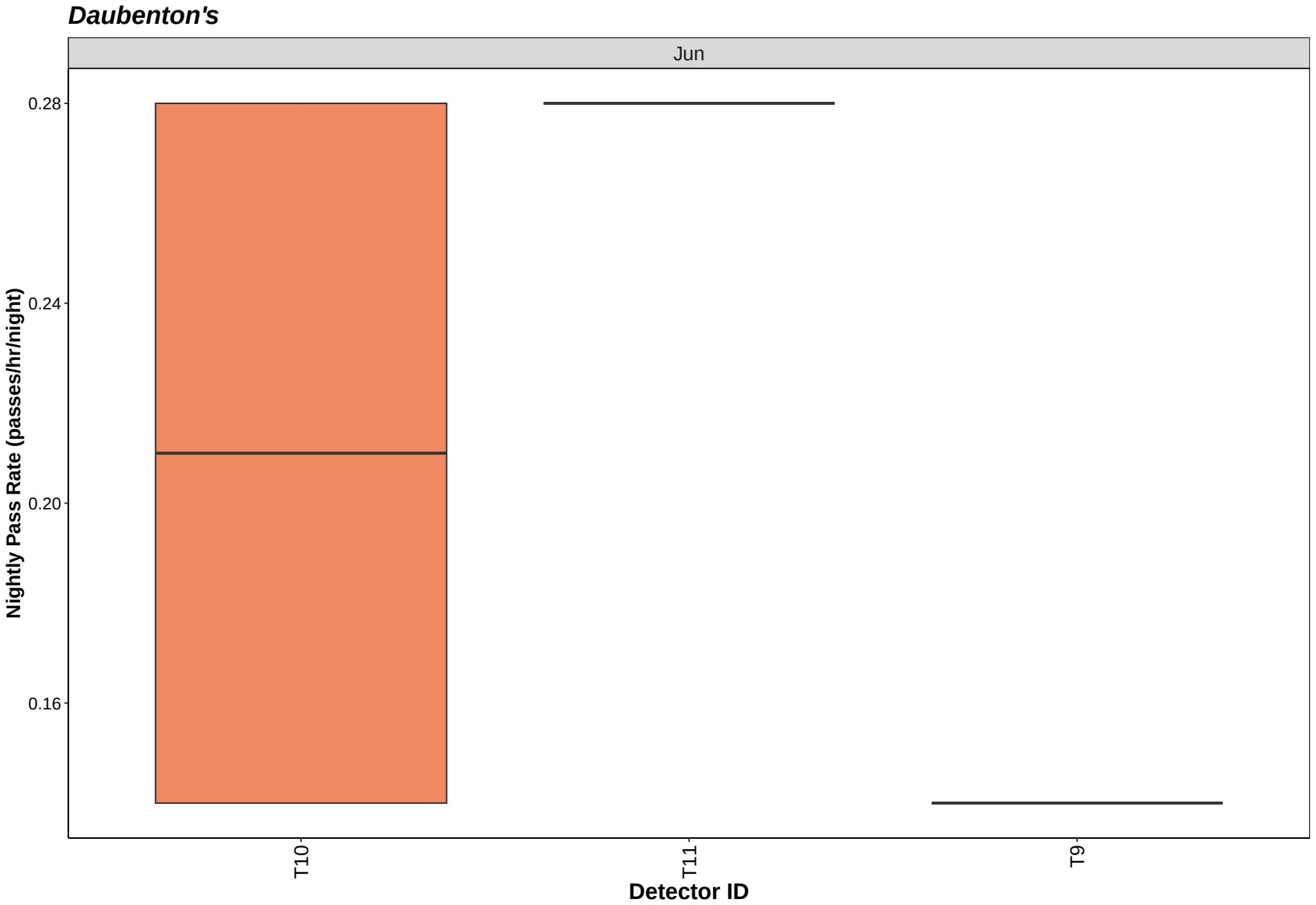
| Species | Detector ID | Jun |
|---|---|---|
| Common pipistrelle | T10 | 7.1 |
| Common pipistrelle | T11 | 7.0 |
| Common pipistrelle | T9 | 1.4 |
| Soprano pipistrelle | T10 | 1.7 |
| Soprano pipistrelle | T11 | 1.8 |
| Soprano pipistrelle | T9 | 0.4 |
| Nathusius' | T10 | 1.0 |
| Nathusius' | T11 | 1.0 |
| Nathusius' | T9 | 0.2 |
| Leisler's | T10 | 2.2 |
| Leisler's | T11 | 1.9 |
| Leisler's | T9 | 0.8 |
| Brown long-eared | T9 | 0.1 |
| Daubenton's | T10 | 0.2 |
| Daubenton's | T11 | 0.3 |
| Daubenton's | T9 | 0.1 |
| Whiskered | T10 | 0.1 |
| Natterer's | T10 | 0.1 |

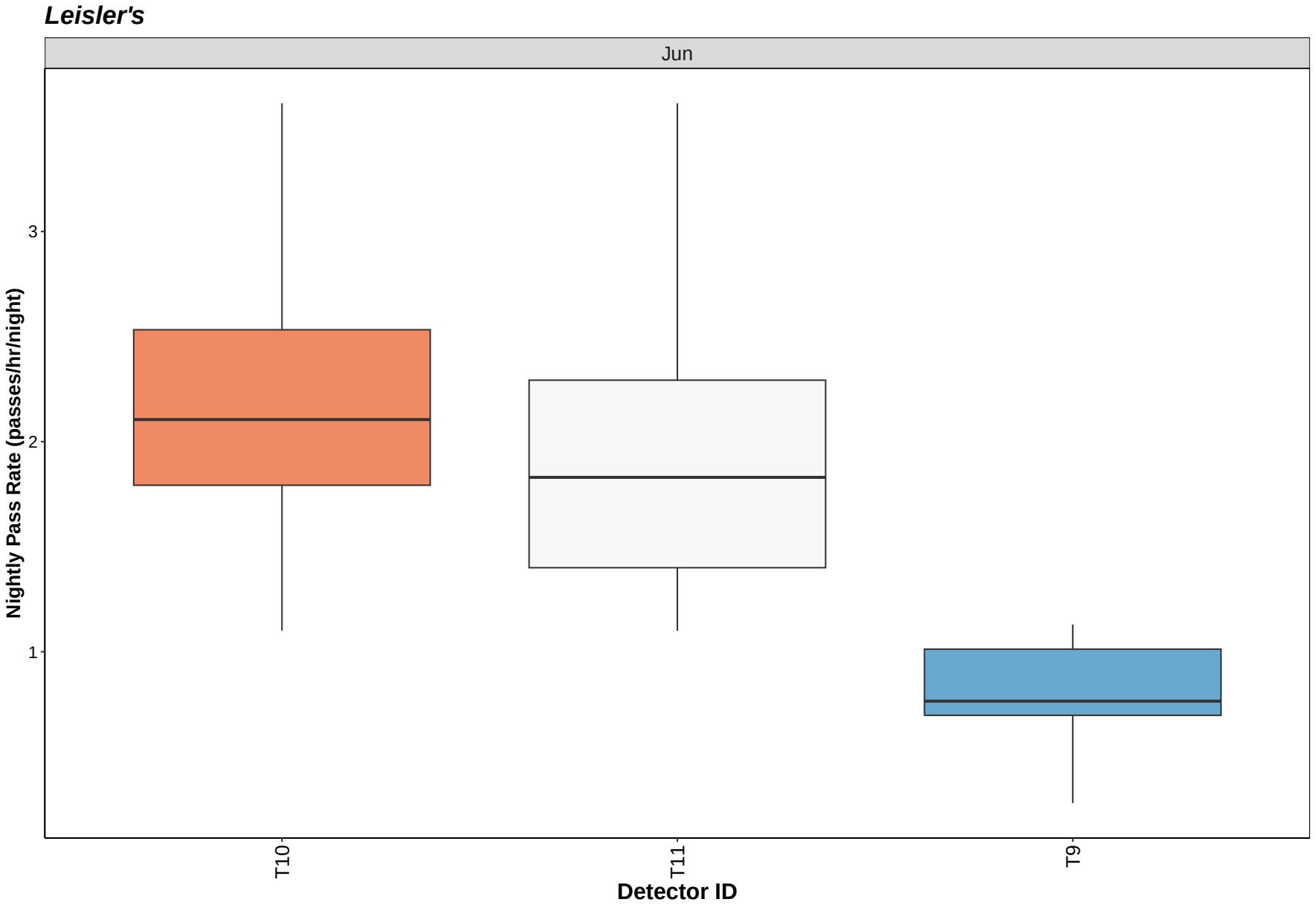
## Per Detector

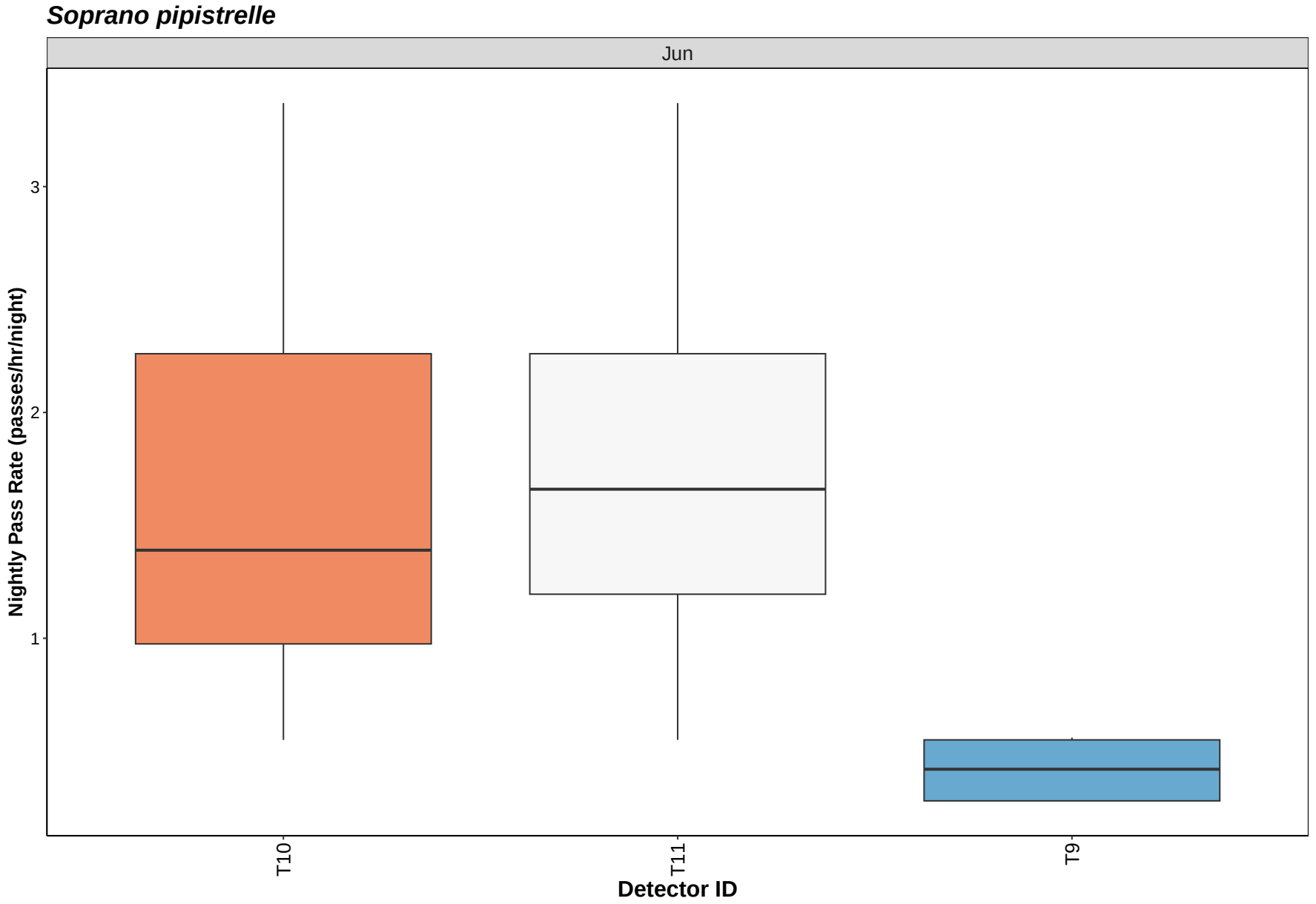
**Figure 12.** Figures show boxplots for the number of bat passes per hour by detector, for each month. The 'box' shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The 'whiskers' extend from the box and represent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

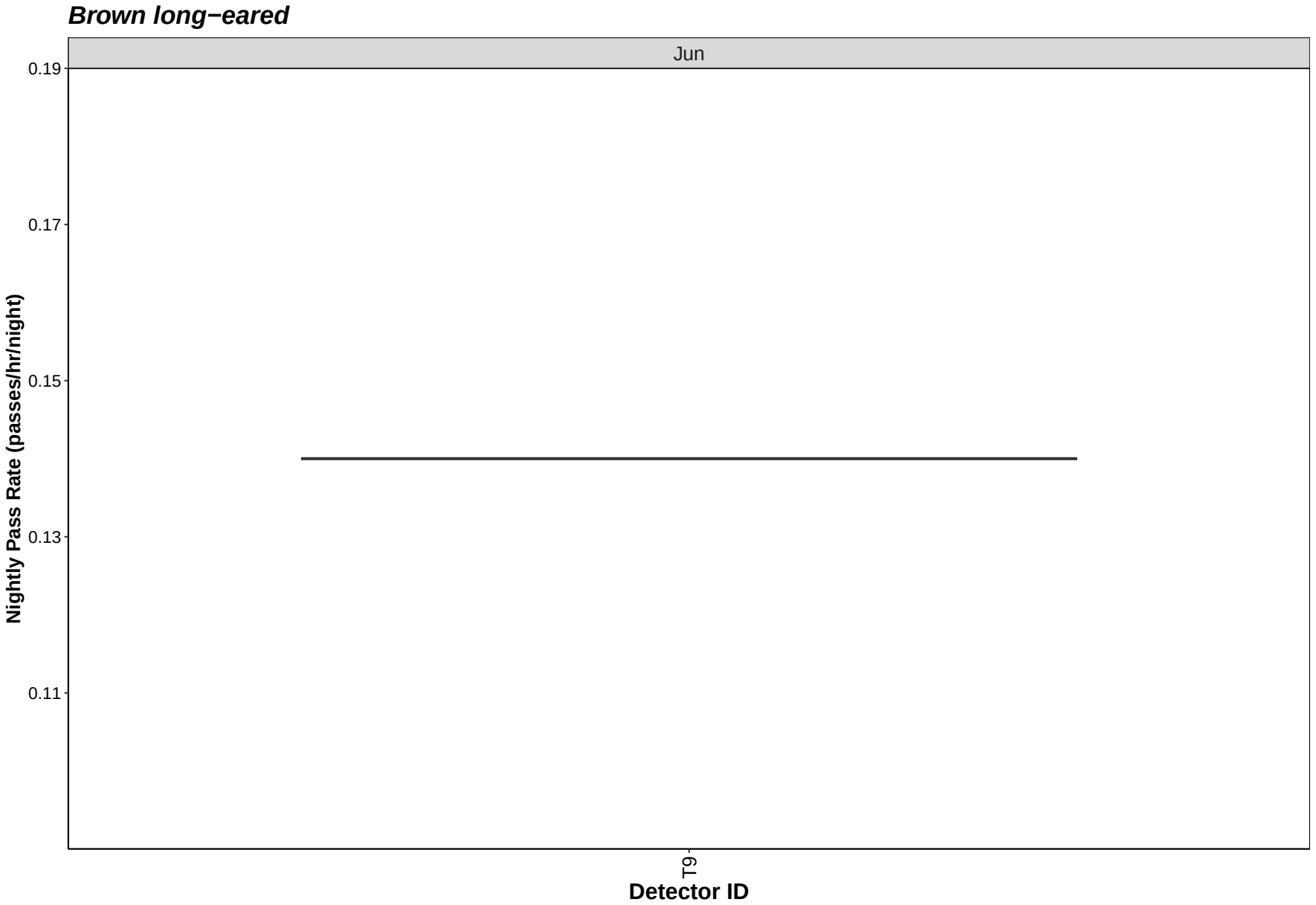

Common pipistrelle
Jun
Nightly Pass Rate (passes/hr/night)
10
5
0
T10
T11
T9
Detector ID

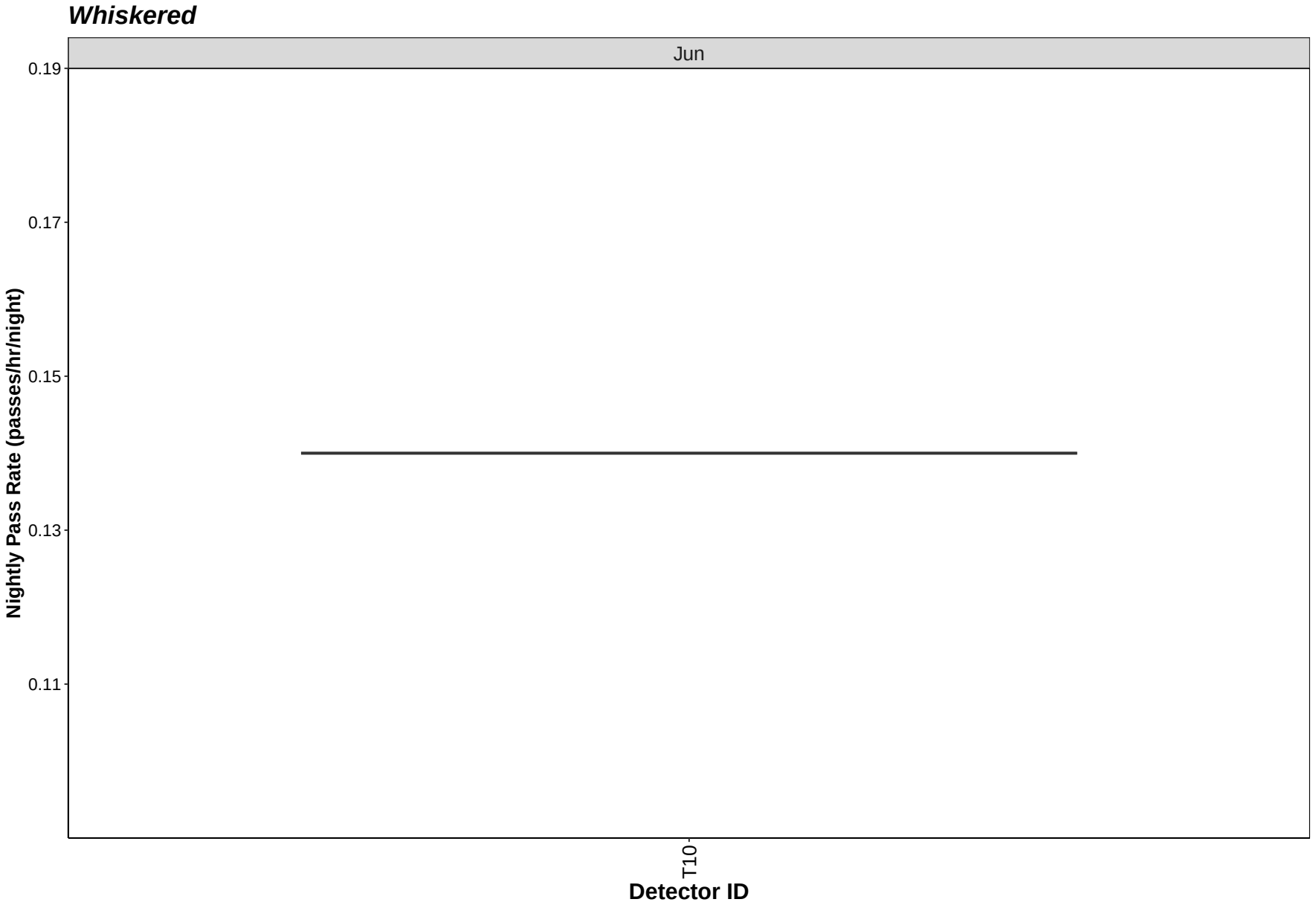

Nathusius'
Jun
1.6
1.2
0.8
0.4
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID

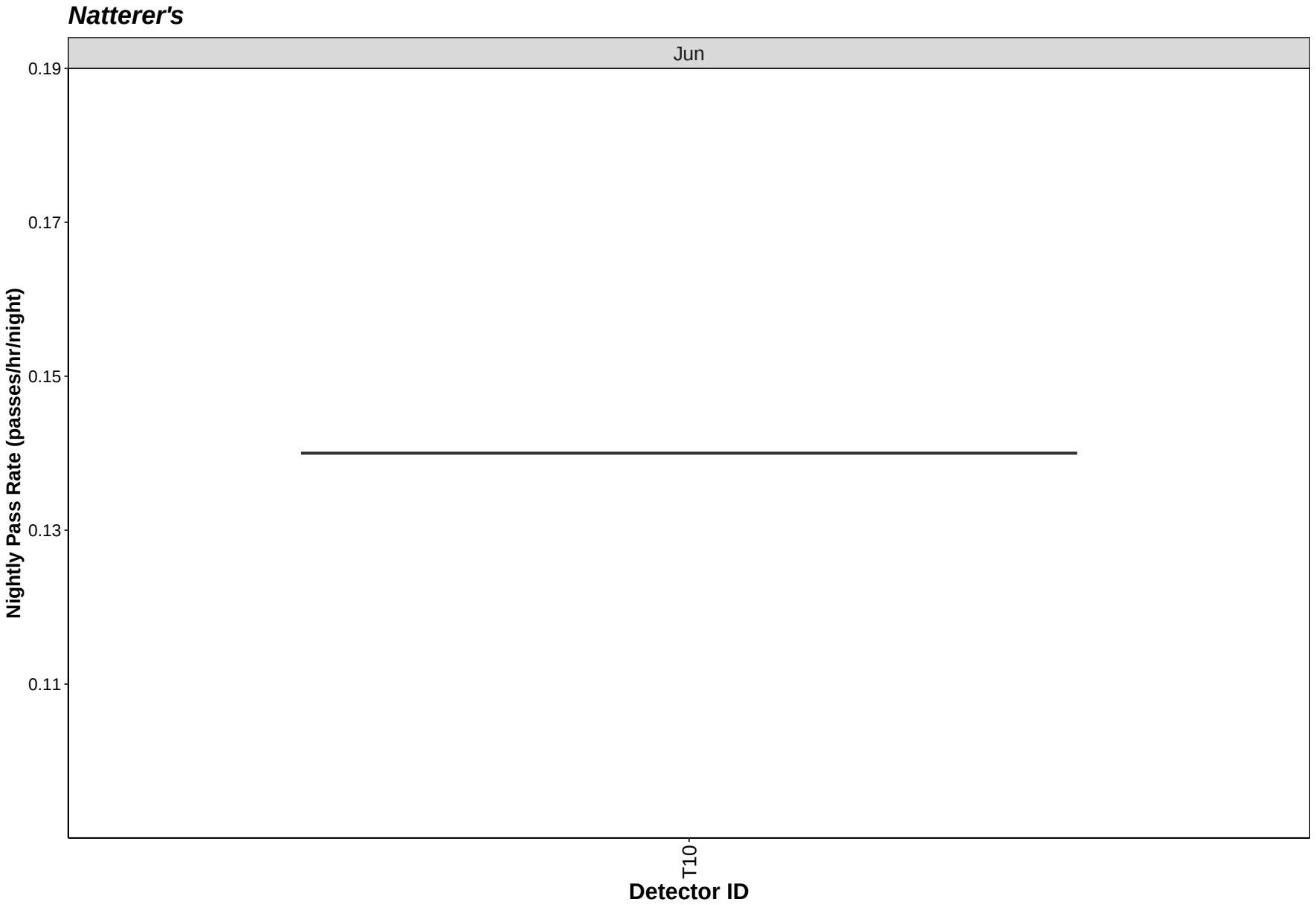

Daubenton's
Jun
0.28
0.24
0.20
0.16
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID


Leisler's
Jun
Nightly Pass Rate (passes/hr/night)
3
2
1
T10
T11
T9
Detector ID


Soprano pipistrelle
Jun
Nightly Pass Rate (passes/hr/night)
3
2
1
T10
T11
T9
Detector ID


Brown long−eared
Jun
0.19
0.17
0.15
0.13
0.11
Nightly Pass Rate (passes/hr/night)
T9
Detector ID


Whiskered
Jun
0.19
0.17
0.15
0.13
0.11
Nightly Pass Rate (passes/hr/night)
T10
Detector ID


Natterer's
Jun
0.19
0.17
0.15
0.13
0.11
Nightly Pass Rate (passes/hr/night)
T10
Detector ID

## Bat Activity per Detector Location

**Figure 13.** Detector ID reference:

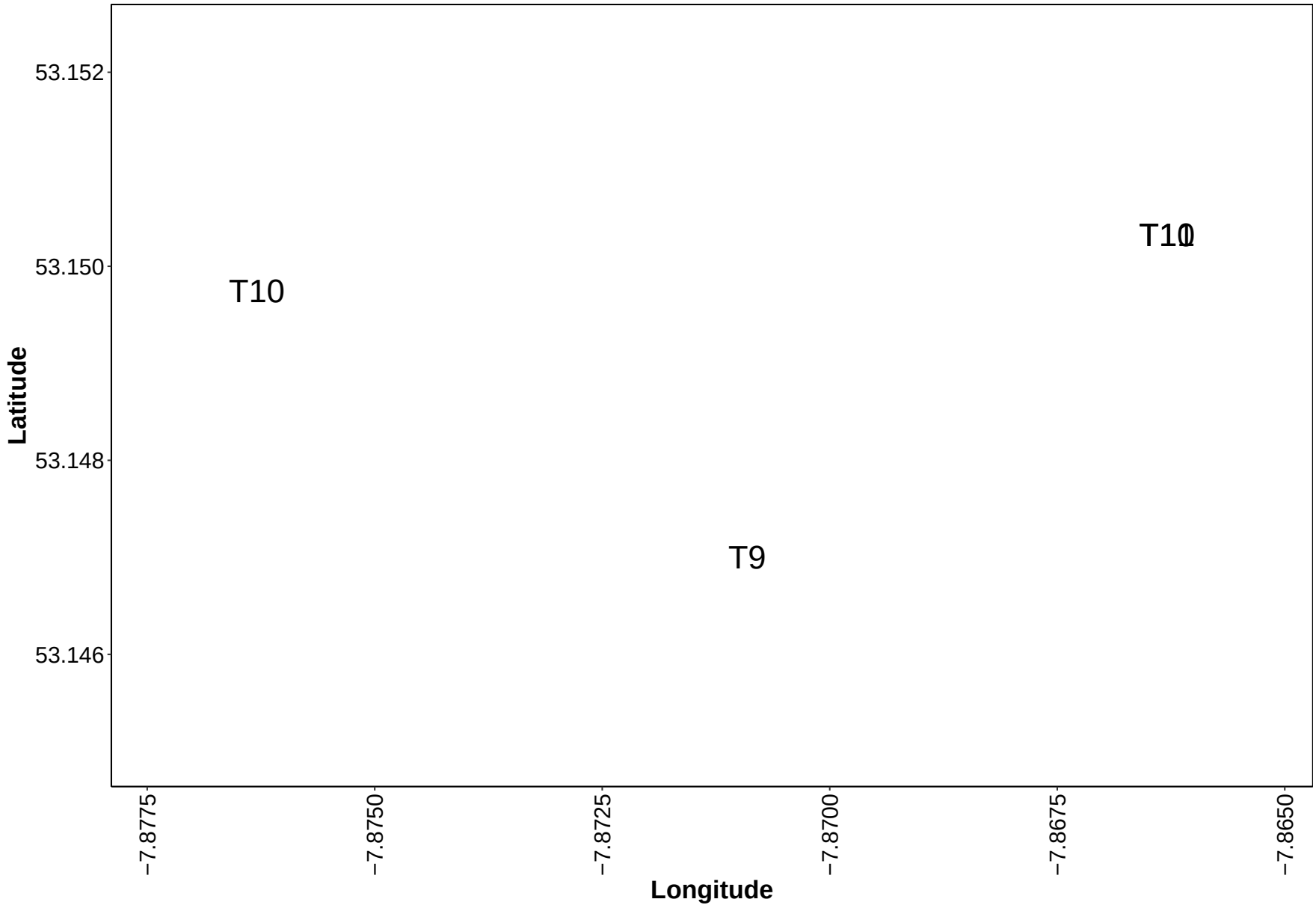
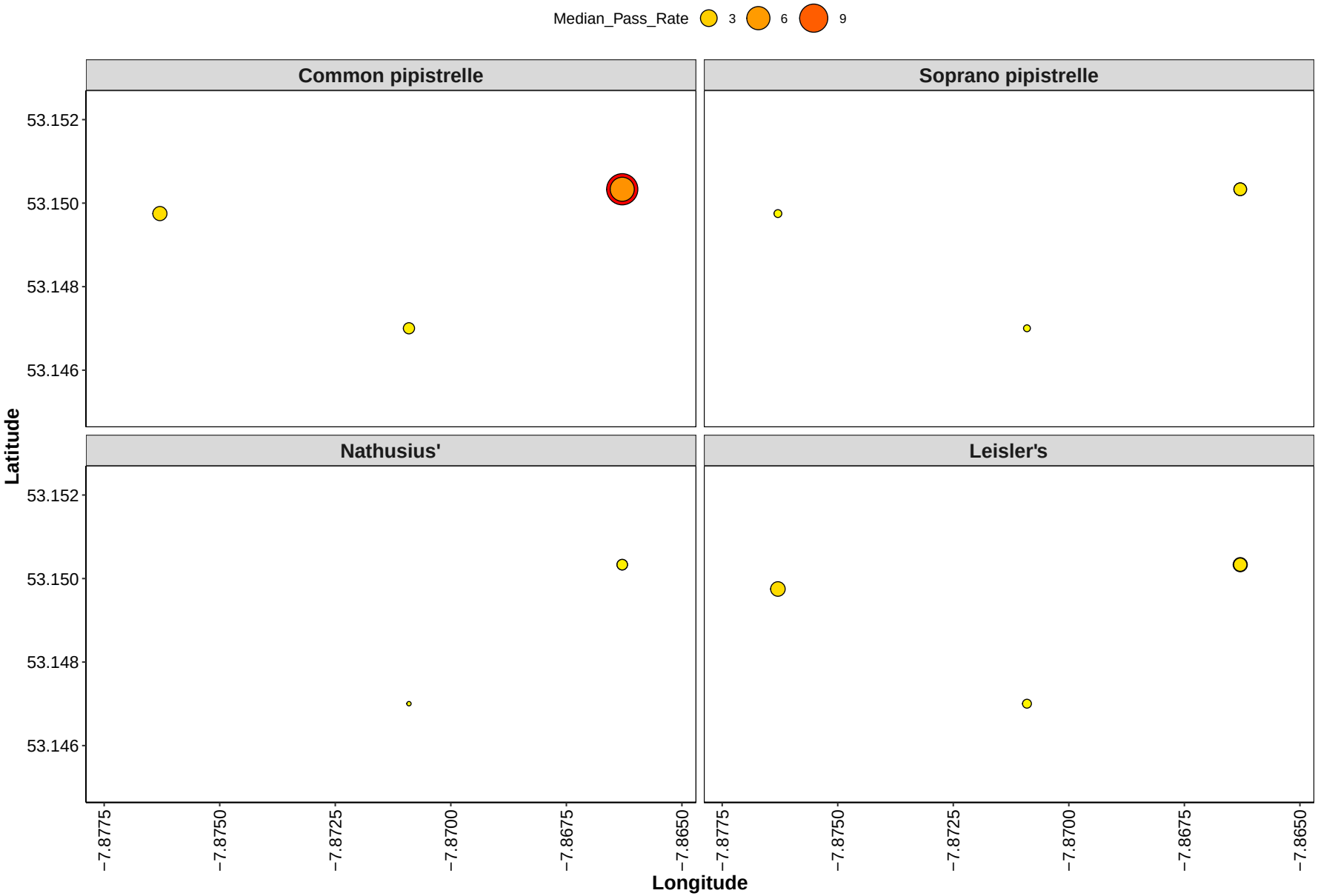

53.152
53.150
53.148
53.146
Latitude
T10
T9
T10
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

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


Median_Pass_Rate
3
6
9
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

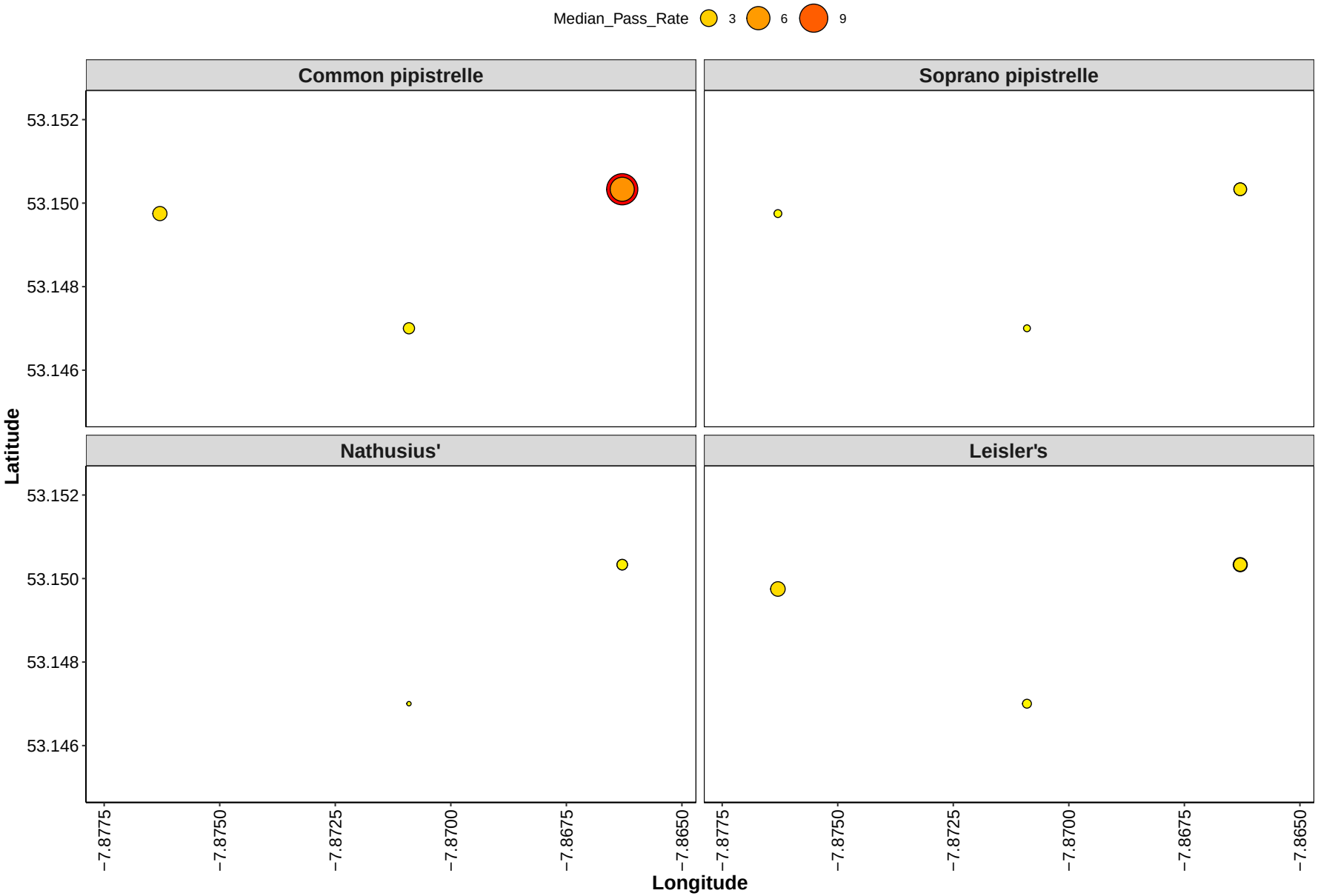
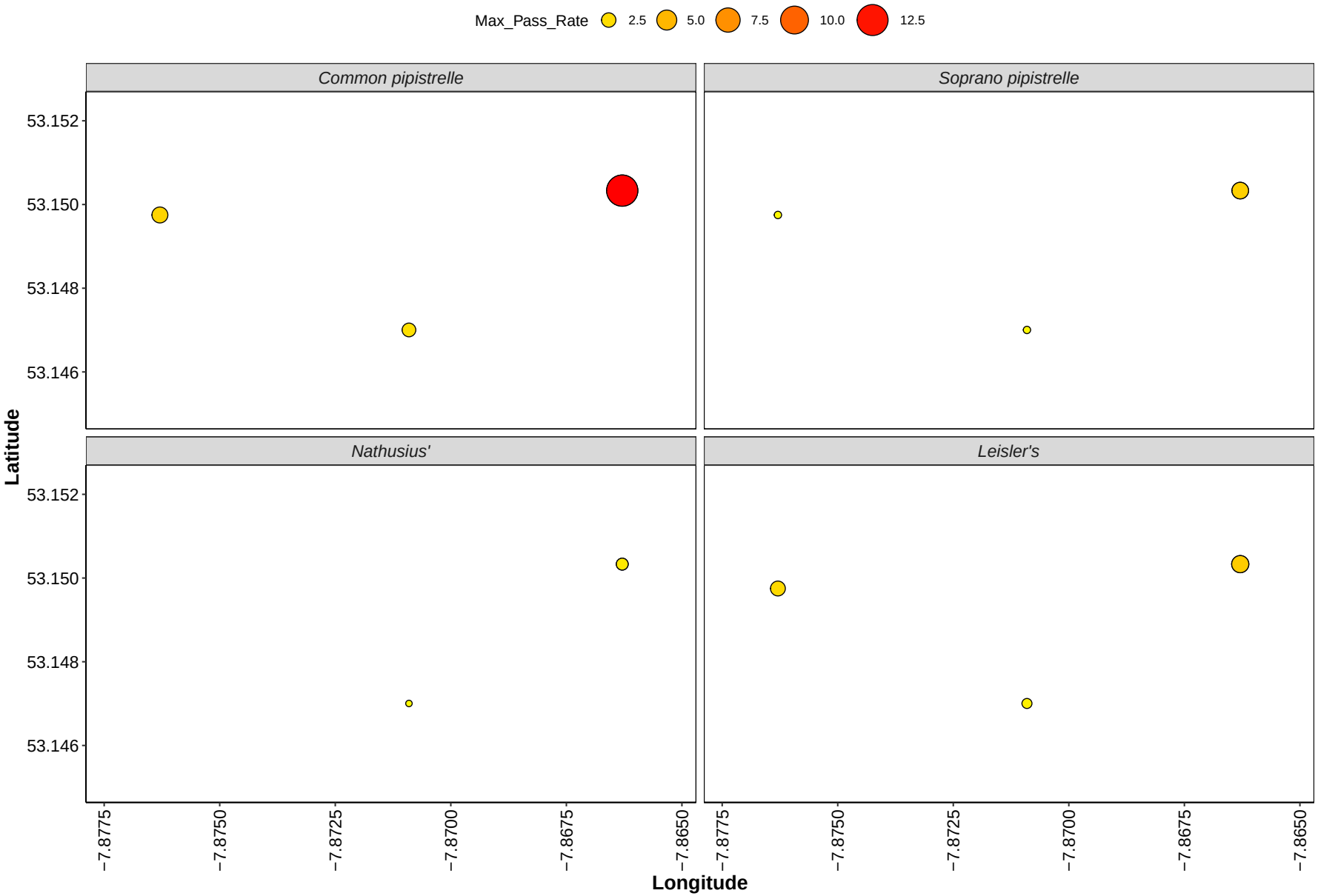
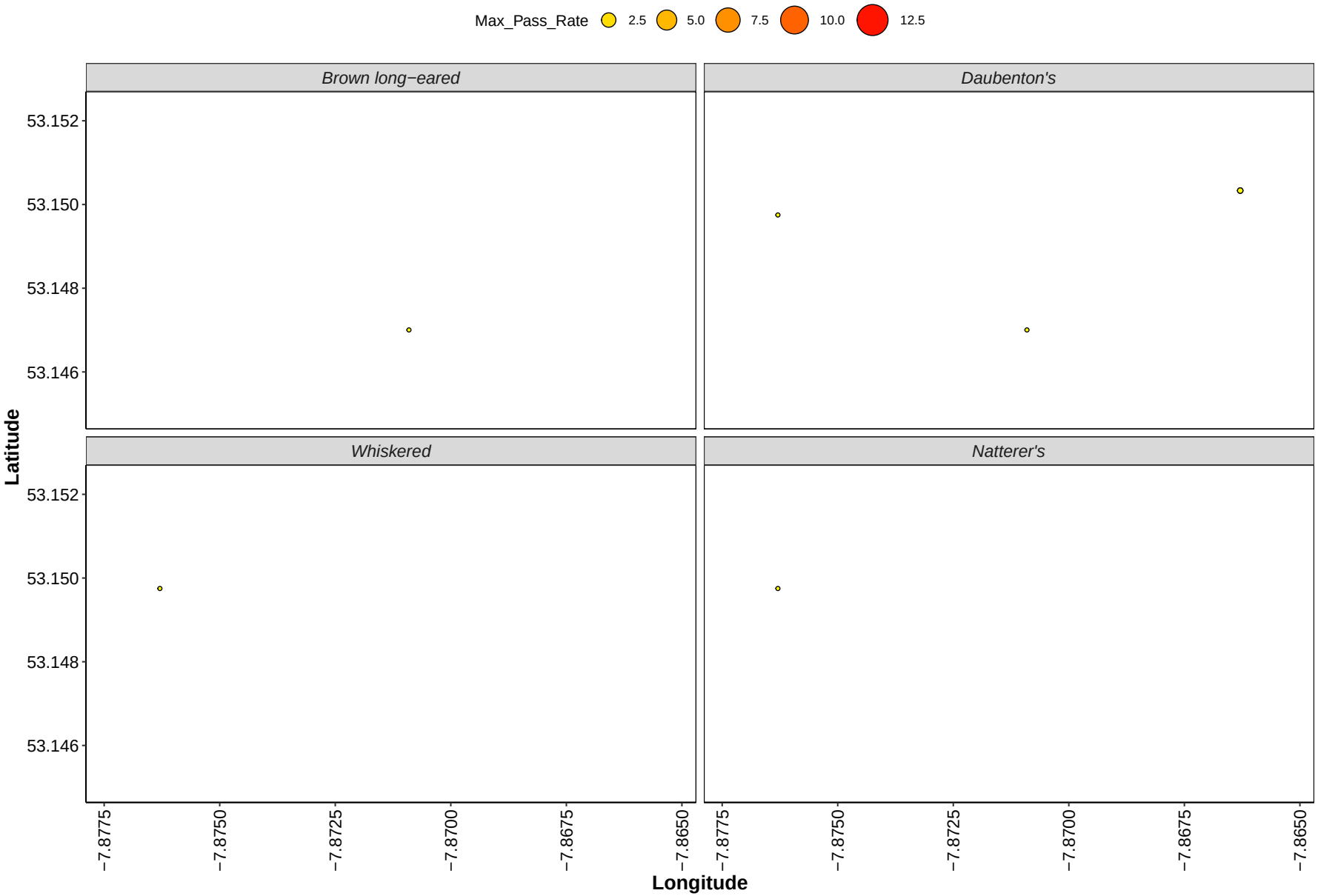

Median_Pass_Rate
3
6
9
Common pipistrelle
Soprano pipistrelle
Nathusius'
Leisler's
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

**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
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude


Max_Pass_Rate
2.5
5.0
7.5
10.0
12.5
Brown long−eared
Daubenton's
Whiskered
Natterer's
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

## Part 2b: Includes Absences

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

### Nightly Bat Pass Rate

# Median per Detector

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

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

| Species | Detector ID | Median Pass Rate |
|---|---|---|
| Brown long-eared | T10 | 0.0 |
| Brown long-eared | T11 | 0.0 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 1.1 |
| Common pipistrelle | T11 | 6.5 |
| Common pipistrelle | T9 | 1.3 |
| Daubenton's | T10 | 0.0 |
| Daubenton's | T11 | 0.0 |
| Daubenton's | T9 | 0.0 |
| Leisler's | T10 | 1.7 |
| Leisler's | T11 | 1.8 |
| Leisler's | T9 | 0.8 |
| Nathusius' | T10 | 0.0 |
| Nathusius' | T11 | 0.0 |
| Nathusius' | T9 | 0.0 |
| Natterer's | T10 | 0.0 |
| Natterer's | T11 | 0.0 |
| Natterer's | T9 | 0.0 |
| Soprano pipistrelle | T10 | 0.6 |
| Soprano pipistrelle | T11 | 1.4 |
| Soprano pipistrelle | T9 | 0.3 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

# Mean per Detector

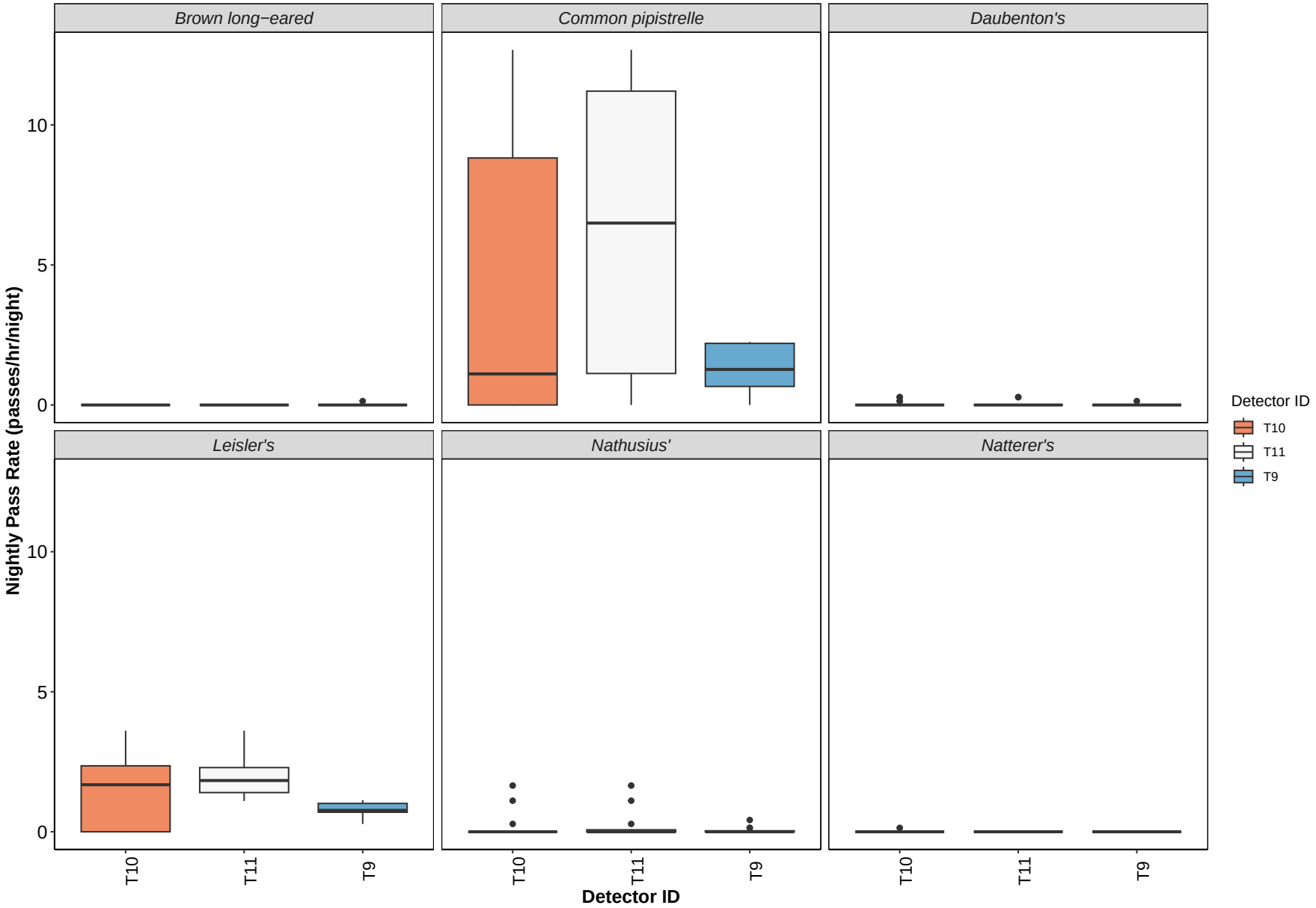
**Table 23. The mean Nightly Pass Rate (bat passes per hour, per night) of each species at each detector. Values are given to 1 decimal place.**

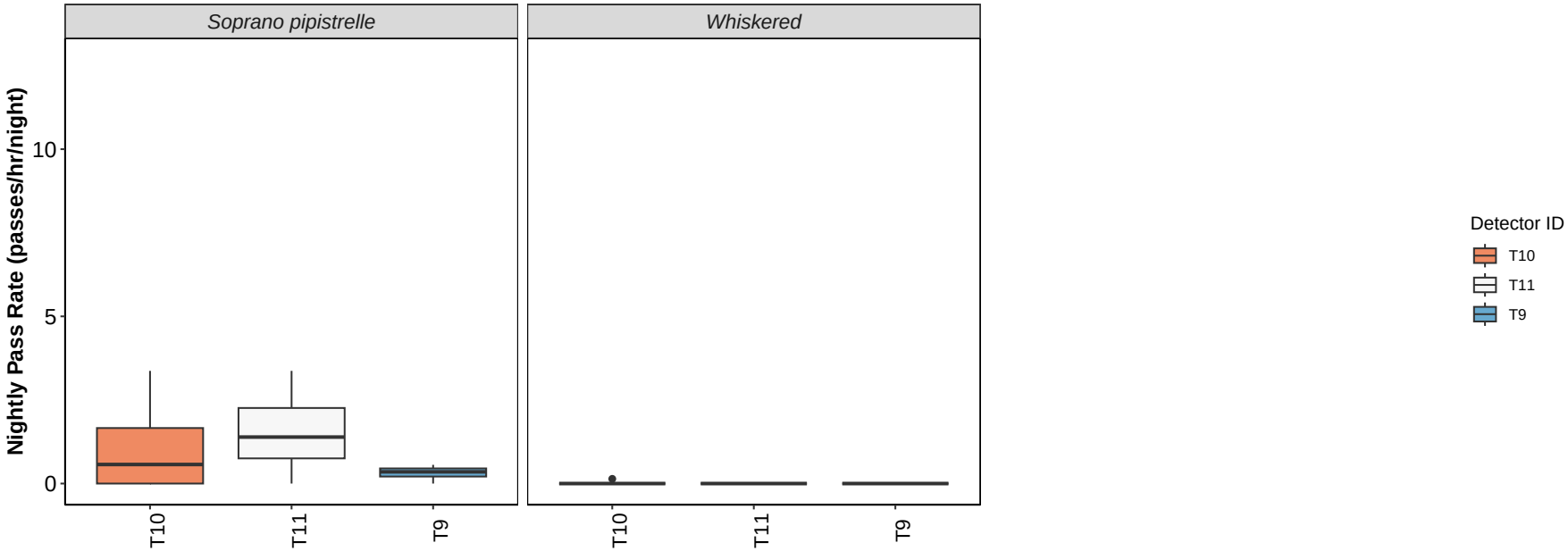
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

| Species | Detector ID | Mean Pass Rate |
|---|---|---|
| Brown long-eared | T10 | 0.0 |
| Brown long-eared | T11 | 0.0 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 4.1 |
| Common pipistrelle | T11 | 6.4 |
| Common pipistrelle | T9 | 1.3 |
| Daubenton's | T10 | 0.0 |
| Daubenton's | T11 | 0.0 |
| Daubenton's | T9 | 0.0 |
| Leisler's | T10 | 1.4 |
| Leisler's | T11 | 1.9 |
| Leisler's | T9 | 0.8 |
| Nathusius' | T10 | 0.2 |
| Nathusius' | T11 | 0.3 |
| Nathusius' | T9 | 0.1 |
| Natterer's | T10 | 0.0 |
| Natterer's | T11 | 0.0 |
| Natterer's | T9 | 0.0 |
| Soprano pipistrelle | T10 | 1.0 |
| Soprano pipistrelle | T11 | 1.5 |
| Soprano pipistrelle | T9 | 0.3 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

## Per Detector

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


Brown long−eared
Common pipistrelle
Daubenton's
Leisler's
Nathusius'
Natterer's
Nightly Pass Rate (passes/hr/night)
0
5
10
T10
T11
T9
Detector ID
Detector ID
T10
T11
T9


Soprano pipistrelle
Whiskered
Nightly Pass Rate (passes/hr/night)
10
5
0
T10
T11
T9
T10
T11
T9
Detector ID
T10
T11
T9
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 | T10 | 12 |
| Jun | T11 | 12 |
| Jun | T9 | 12 |

## Nighlty Bat Pass Rate for Each Month

# Median per Detector

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

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

| Species | Detector ID | Jun |
|---|---|---|
| Brown long-eared | T10 | 0.0 |
| Brown long-eared | T11 | 0.0 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 1.1 |
| Common pipistrelle | T11 | 6.5 |
| Common pipistrelle | T9 | 1.3 |
| Daubenton's | T10 | 0.0 |
| Daubenton's | T11 | 0.0 |
| Daubenton's | T9 | 0.0 |
| Leisler's | T10 | 1.7 |
| Leisler's | T11 | 1.8 |
| Leisler's | T9 | 0.8 |
| Nathusius' | T10 | 0.0 |
| Nathusius' | T11 | 0.0 |
| Nathusius' | T9 | 0.0 |
| Natterer's | T10 | 0.0 |
| Natterer's | T11 | 0.0 |
| Natterer's | T9 | 0.0 |
| Soprano pipistrelle | T10 | 0.6 |
| Soprano pipistrelle | T11 | 1.4 |
| Soprano pipistrelle | T9 | 0.3 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

# Mean per Detector

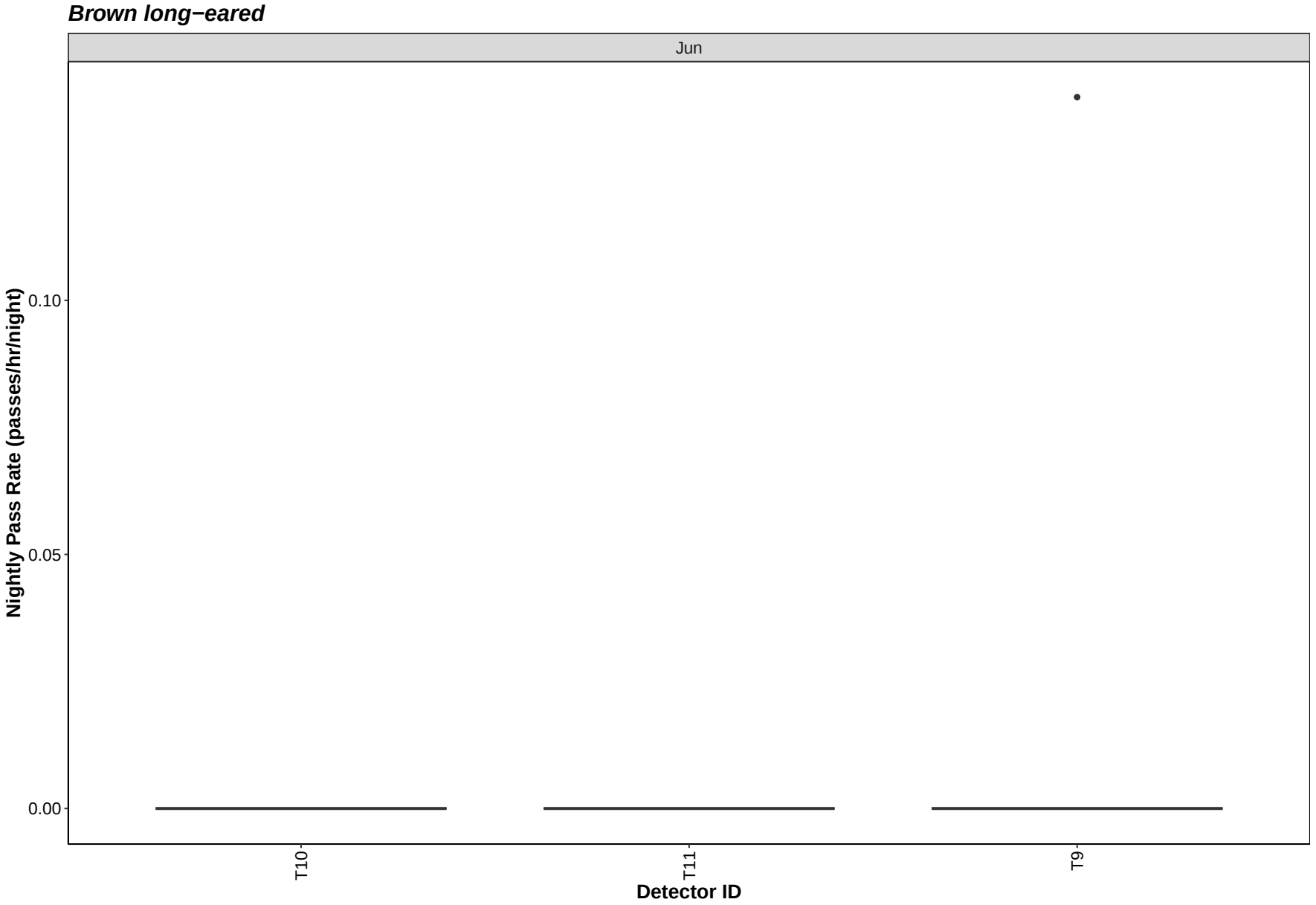
**Table 26. The mean Nightly Pass Rate (bat passes per hour, per night) of each species throughout each month. Values are given to 1 decimal place.**

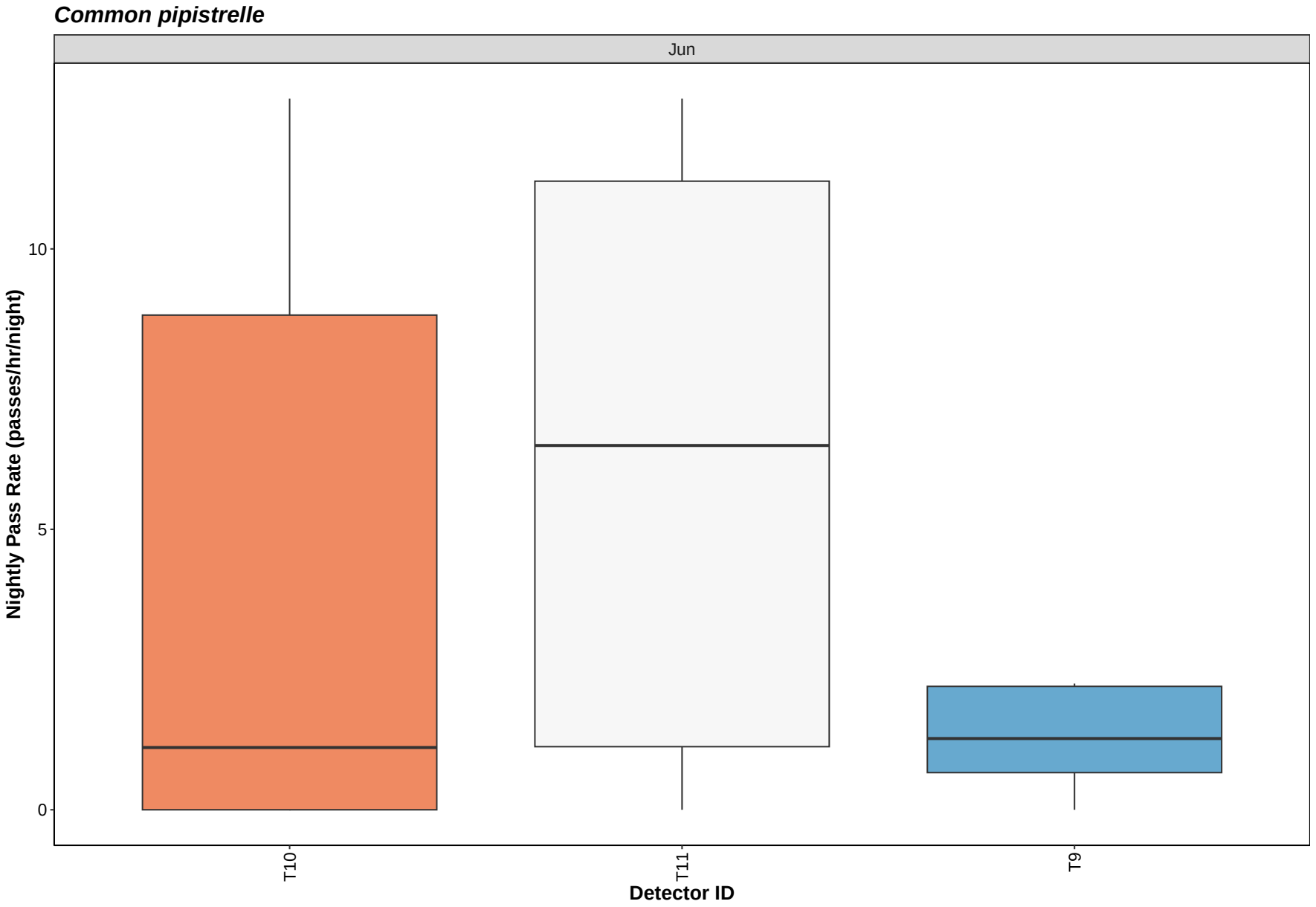
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

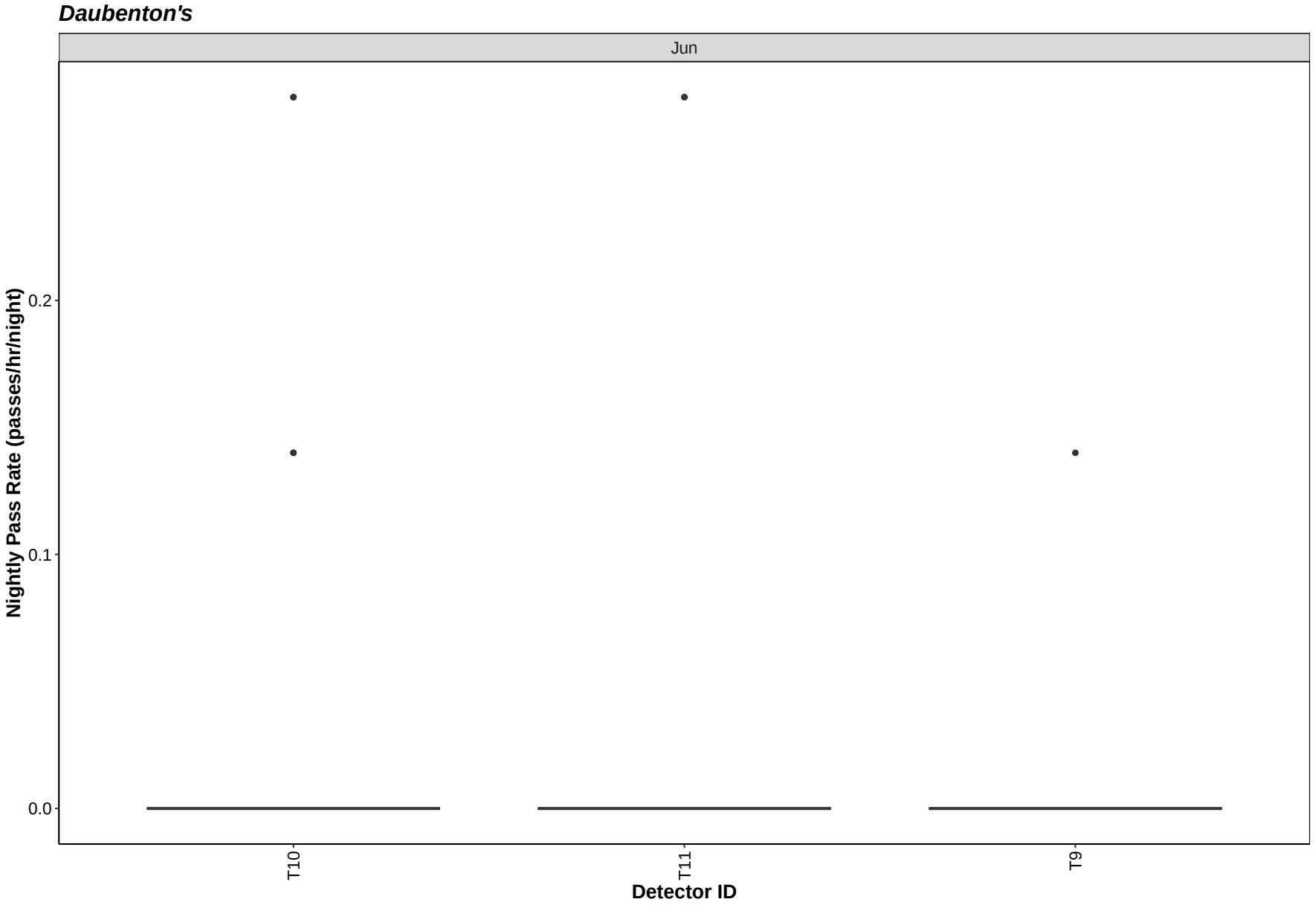
| Species | Detector ID | Jun |
|---|---|---|
| Brown long-eared | T10 | 0.0 |
| Brown long-eared | T11 | 0.0 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 4.1 |
| Common pipistrelle | T11 | 6.4 |
| Common pipistrelle | T9 | 1.3 |
| Daubenton's | T10 | 0.0 |
| Daubenton's | T11 | 0.0 |
| Daubenton's | T9 | 0.0 |
| Leisler's | T10 | 1.4 |
| Leisler's | T11 | 1.9 |
| Leisler's | T9 | 0.8 |
| Nathusius' | T10 | 0.2 |
| Nathusius' | T11 | 0.3 |
| Nathusius' | T9 | 0.1 |
| Natterer's | T10 | 0.0 |
| Natterer's | T11 | 0.0 |
| Natterer's | T9 | 0.0 |
| Soprano pipistrelle | T10 | 1.0 |
| Soprano pipistrelle | T11 | 1.5 |
| Soprano pipistrelle | T9 | 0.3 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

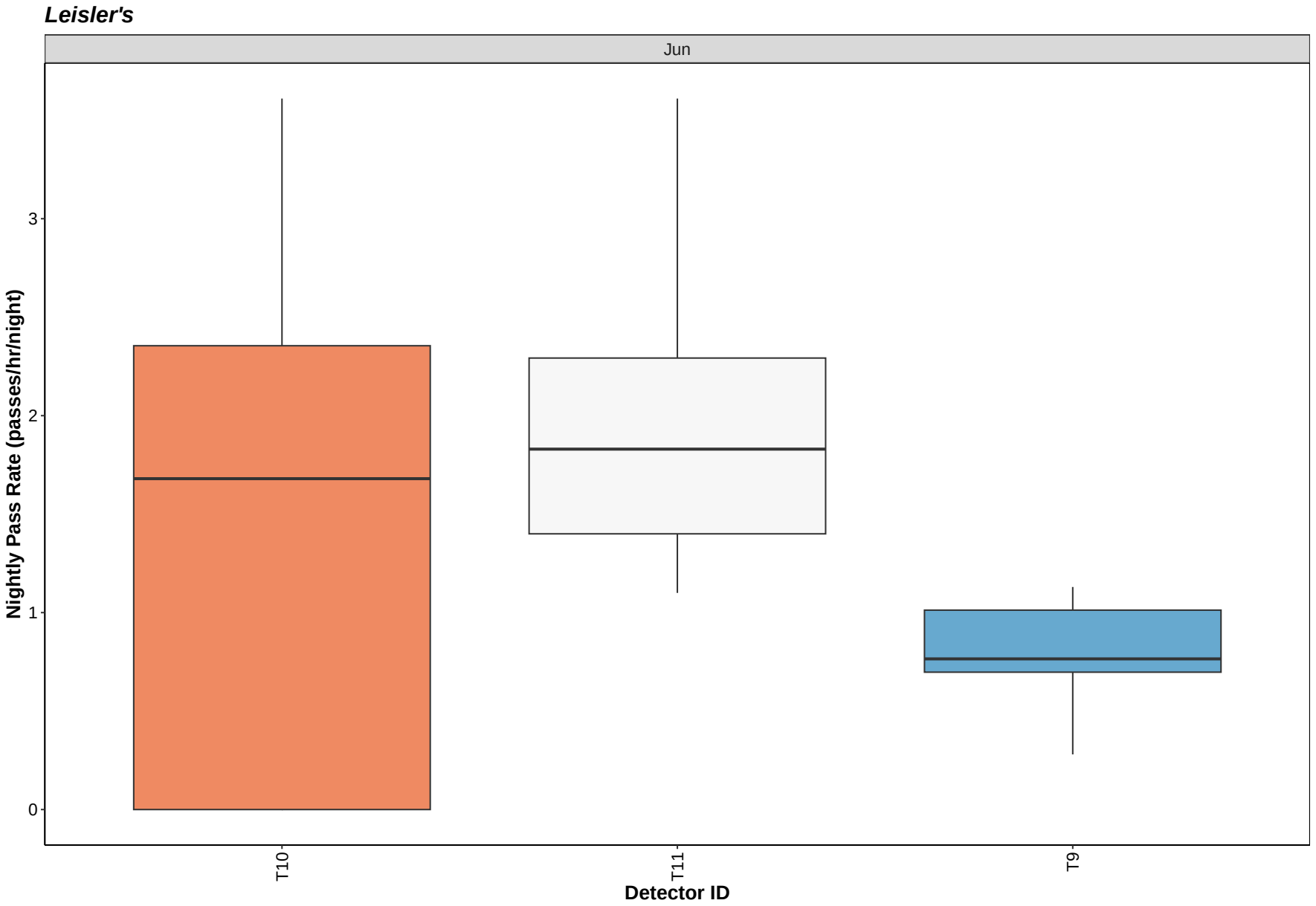
## Per Detector

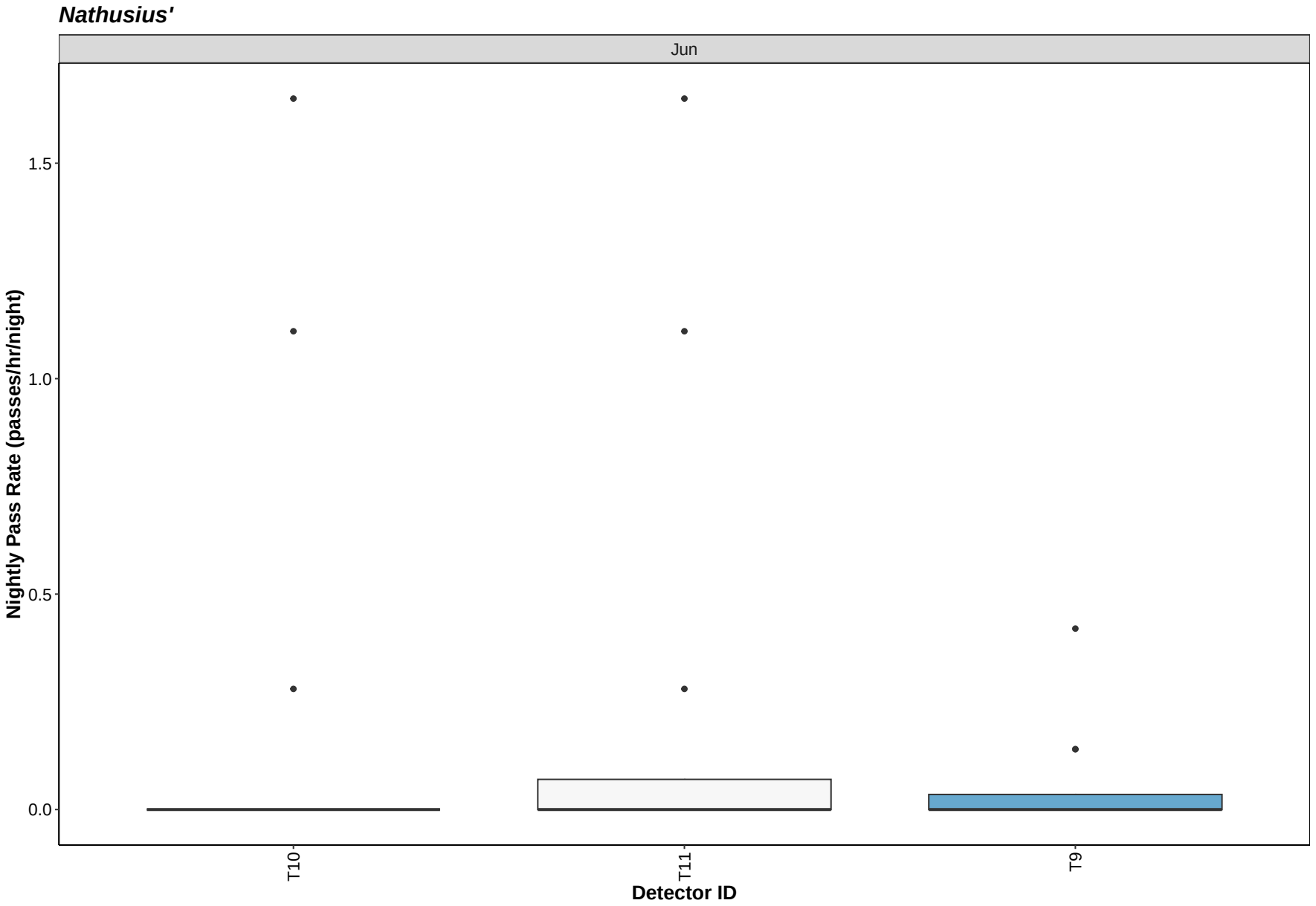
**Figure 17.** Figures show boxplots for the number of bat passes per hour by detector, for each month. The ‘box’ shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The ‘whiskers’ extend from the box and represent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

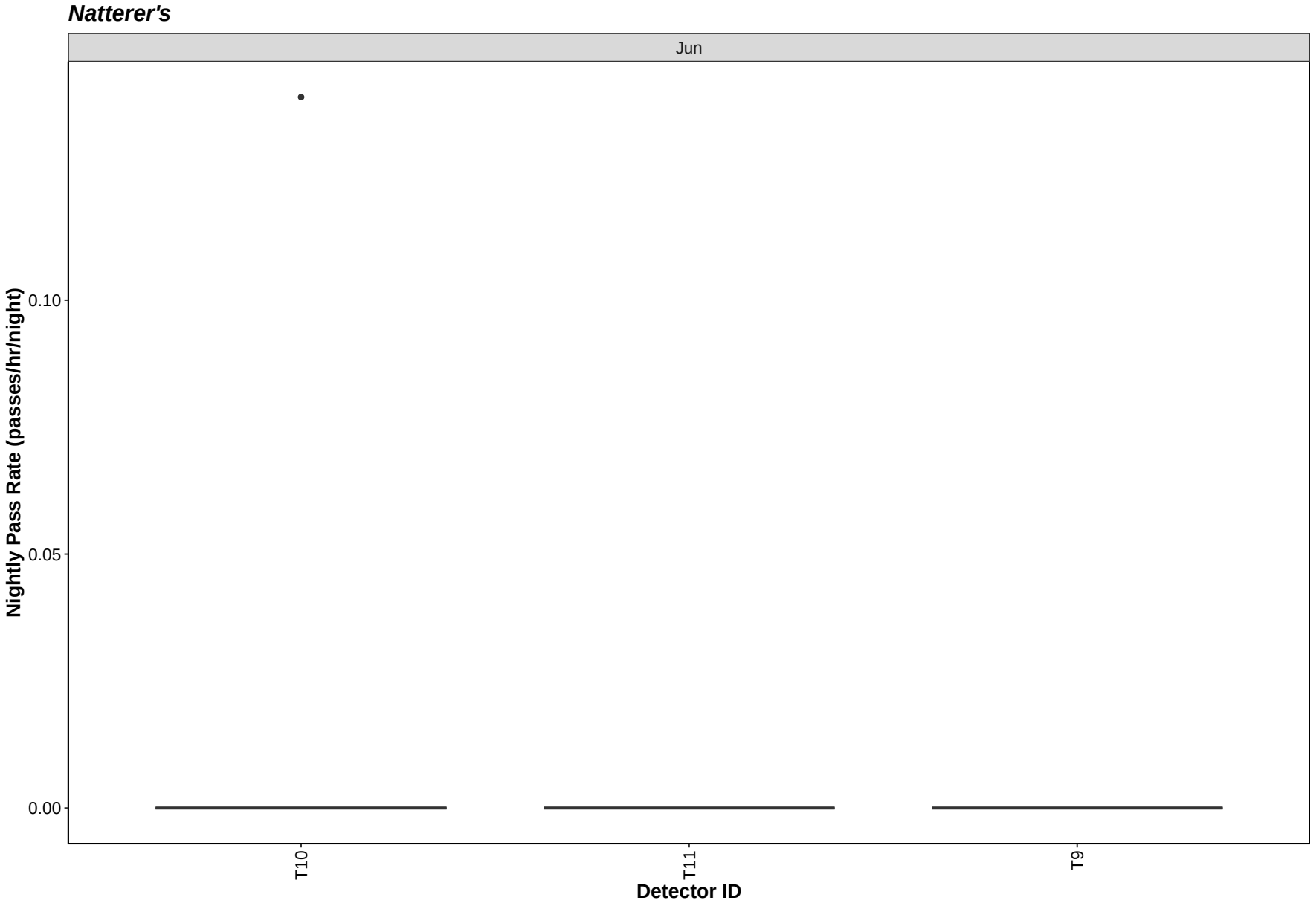

Brown long−eared
Jun
Nightly Pass Rate (passes/hr/night)
0.10
0.05
0.00
T10
T11
T9
Detector ID

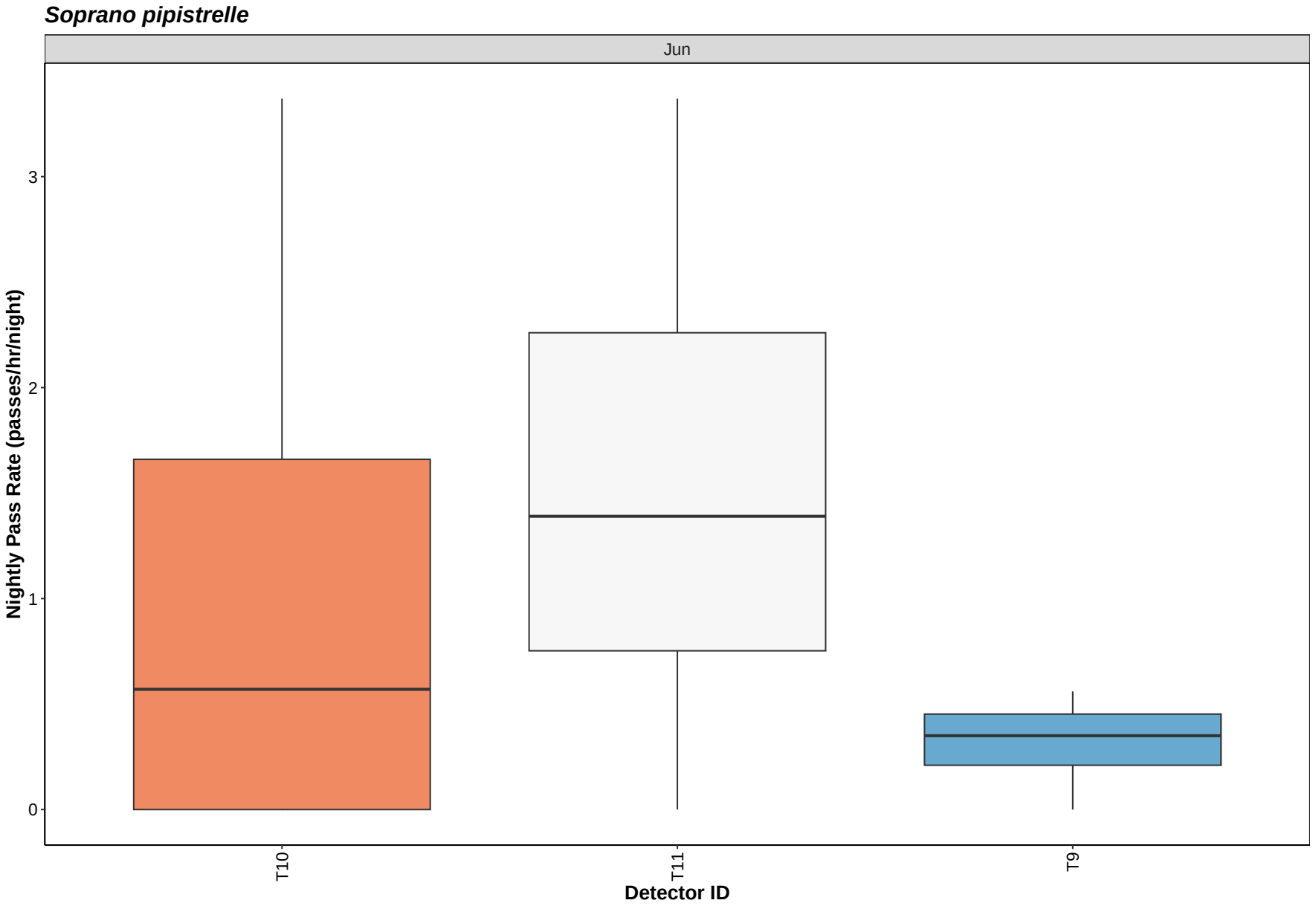

Common pipistrelle
Jun
Nightly Pass Rate (passes/hr/night)
10
5
0
T10
T11
T9
Detector ID

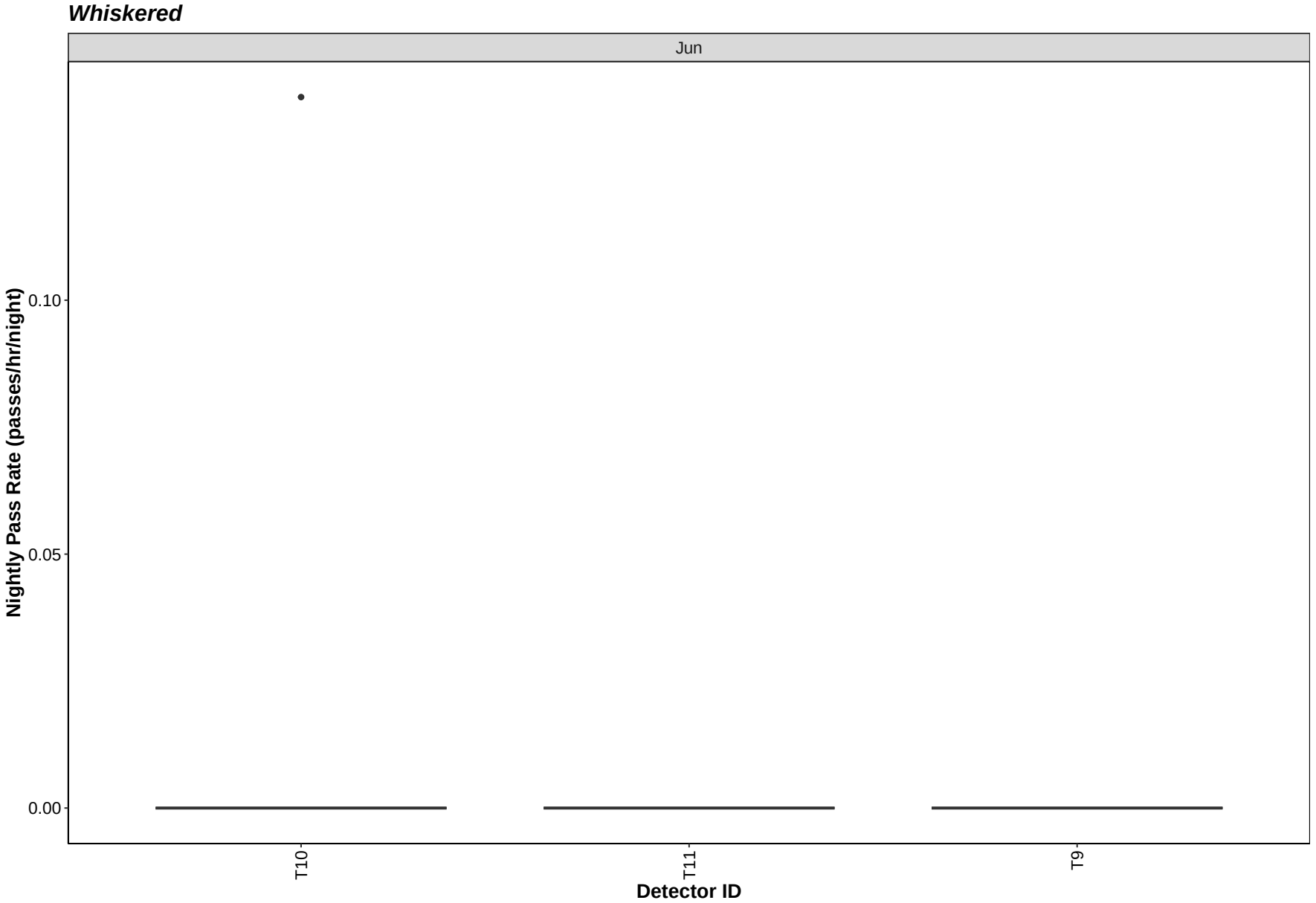

Daubenton's
Jun
Nightly Pass Rate (passes/hr/night)
0.2
0.1
0.0
T10
T11
T9
Detector ID


Leisler's
Jun
Nightly Pass Rate (passes/hr/night)
0
1
2
3
T10
T11
T9
Detector ID


*Nathusius'*
Jun
Nightly Pass Rate (passes/hr/night)
1.5
1.0
0.5
0.0
T10
T11
T9
Detector ID


Natterer's
Jun
Nightly Pass Rate (passes/hr/night)
0.10
0.05
0.00
T10
T11
T9
Detector ID


Soprano pipistrelle
Jun
Nightly Pass Rate (passes/hr/night)
0
1
2
3
T10
T11
T9
Detector ID


Whiskered
Jun
Nightly Pass Rate (passes/hr/night)
0.10
0.05
0.00
T10
T11
T9
Detector ID

## Bat Activity per Detector Location

**Figure 18.** Detector ID reference:

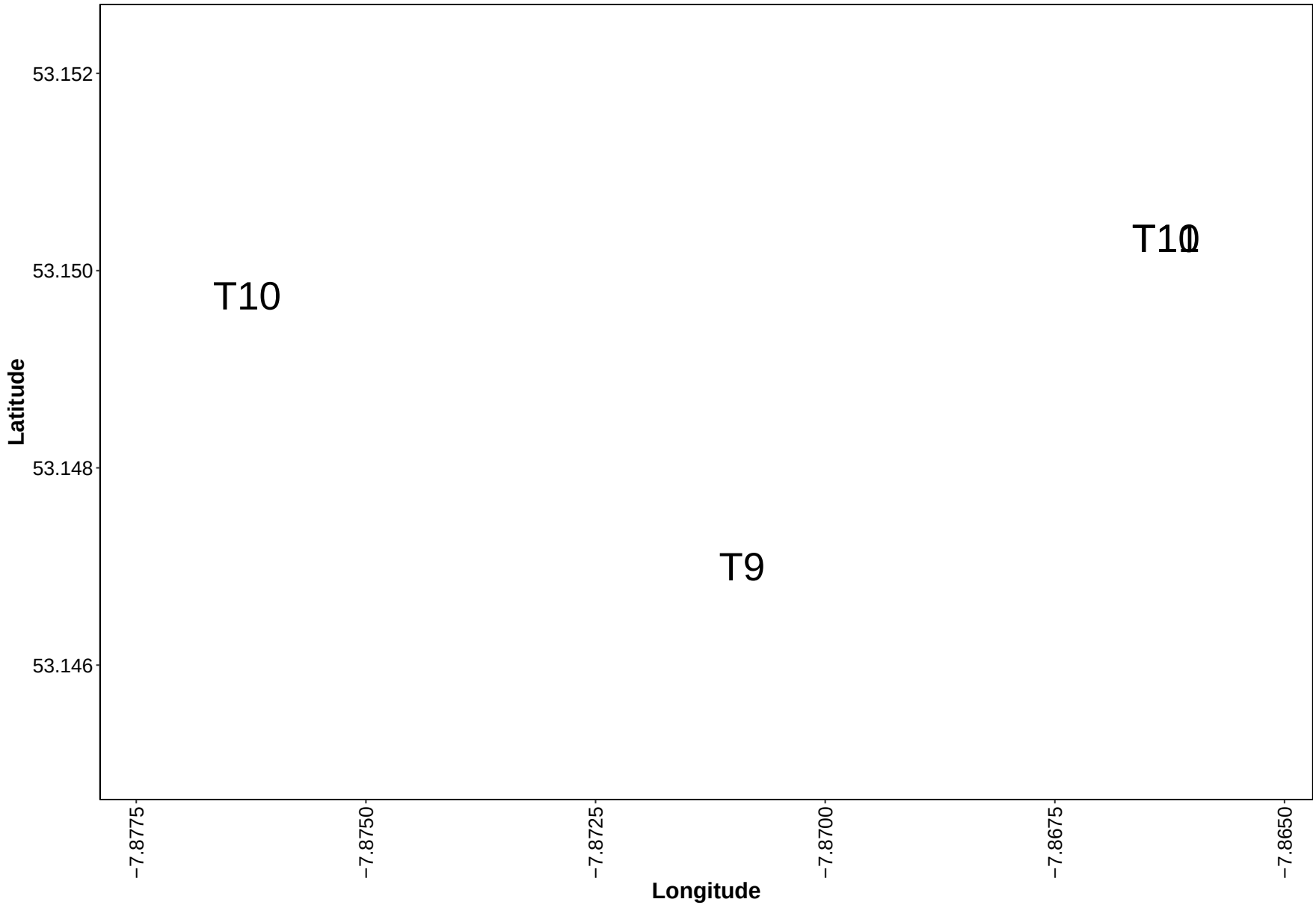
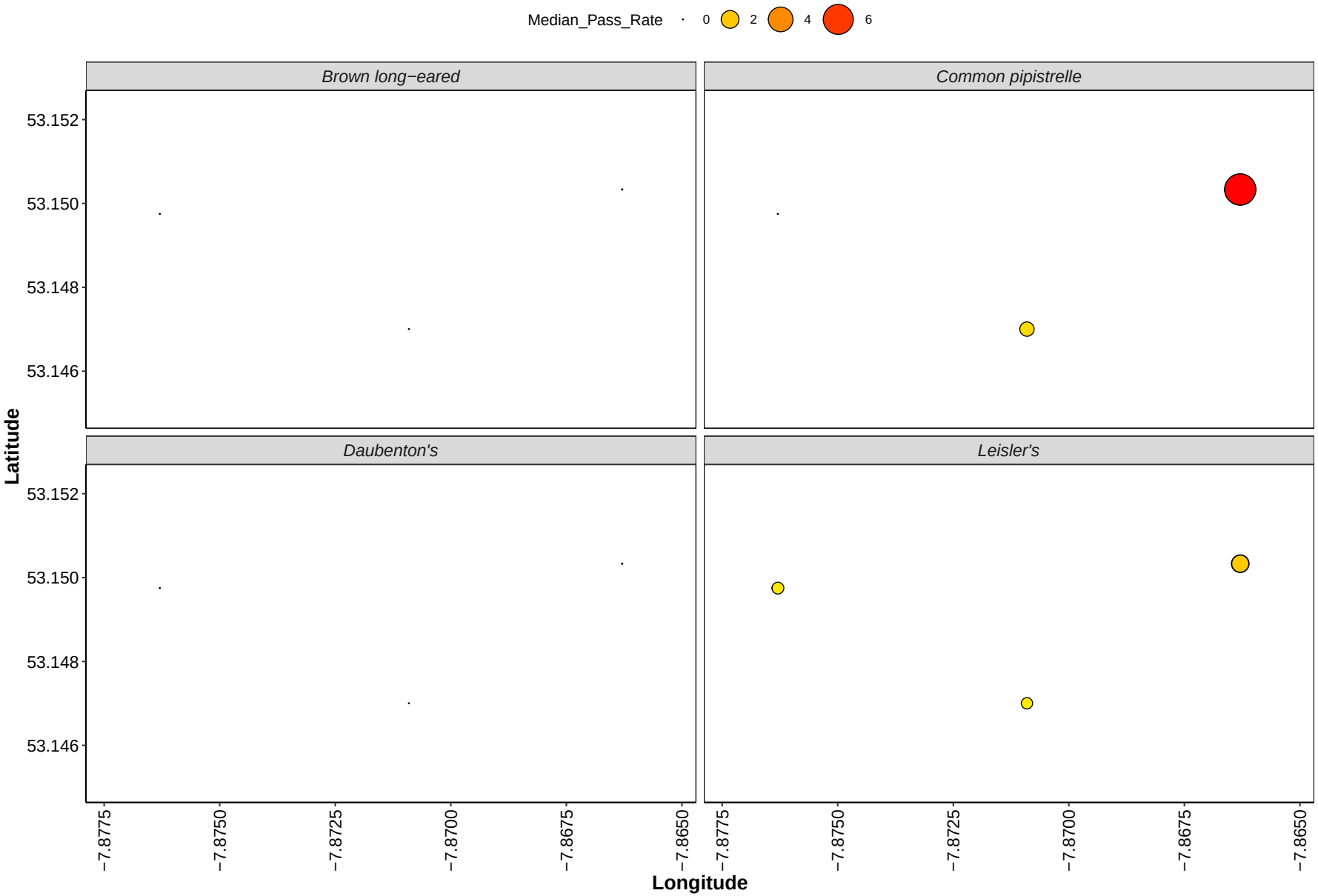

53.152
53.150
53.148
53.146
Latitude
T10
T10
T9
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

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


Median_Pass_Rate
0
2
4
6
Brown long−eared
Common pipistrelle
Daubenton's
Leisler's
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

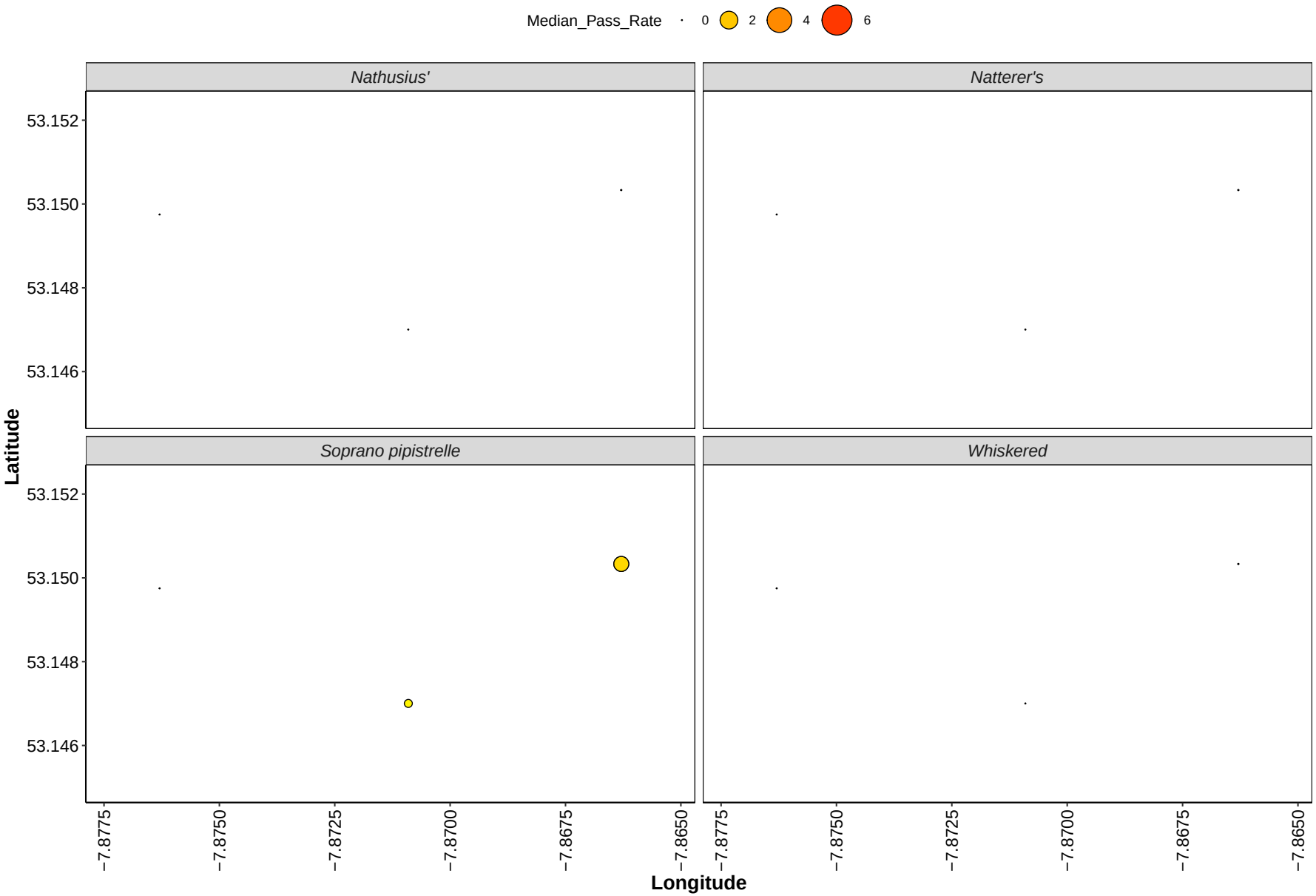
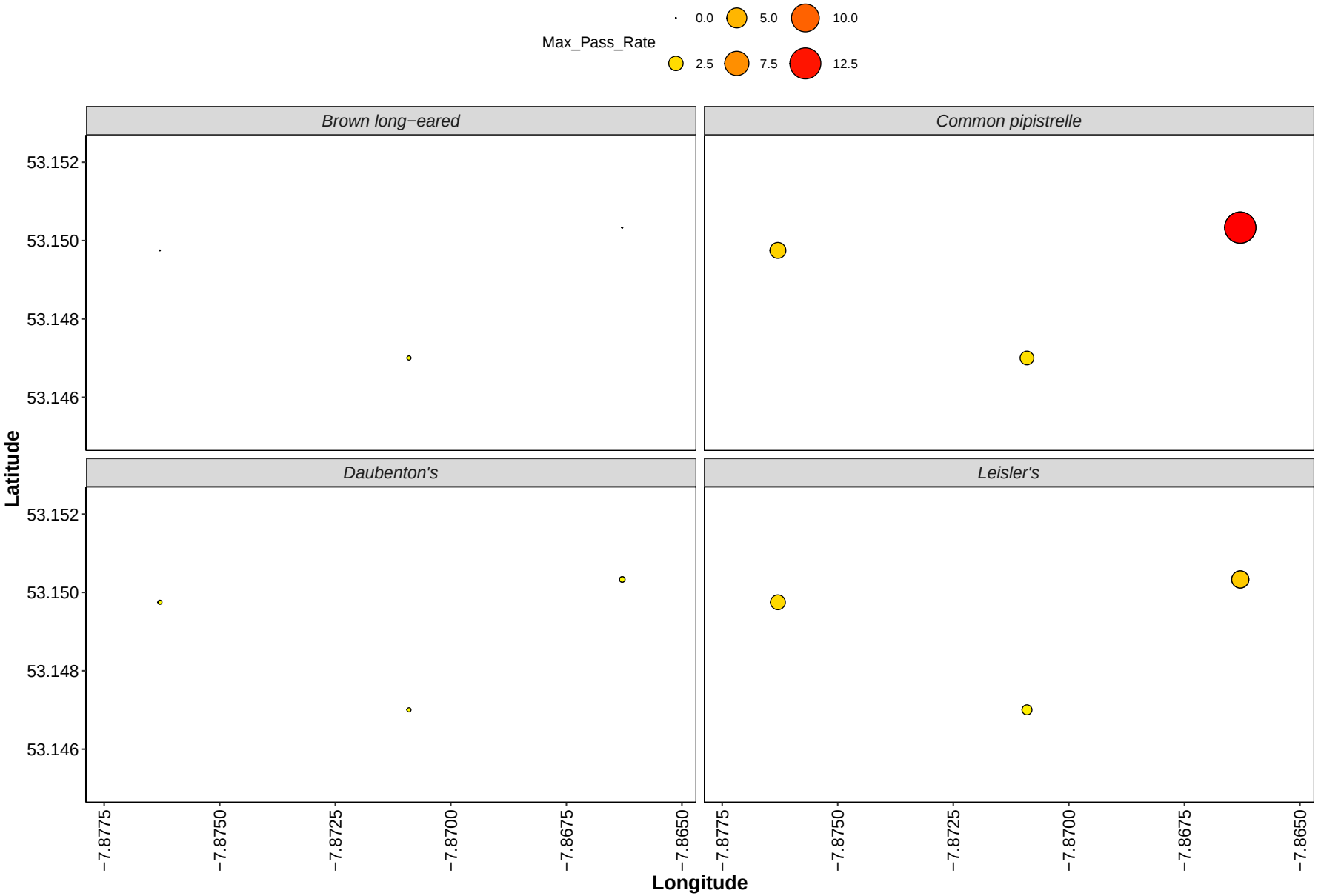
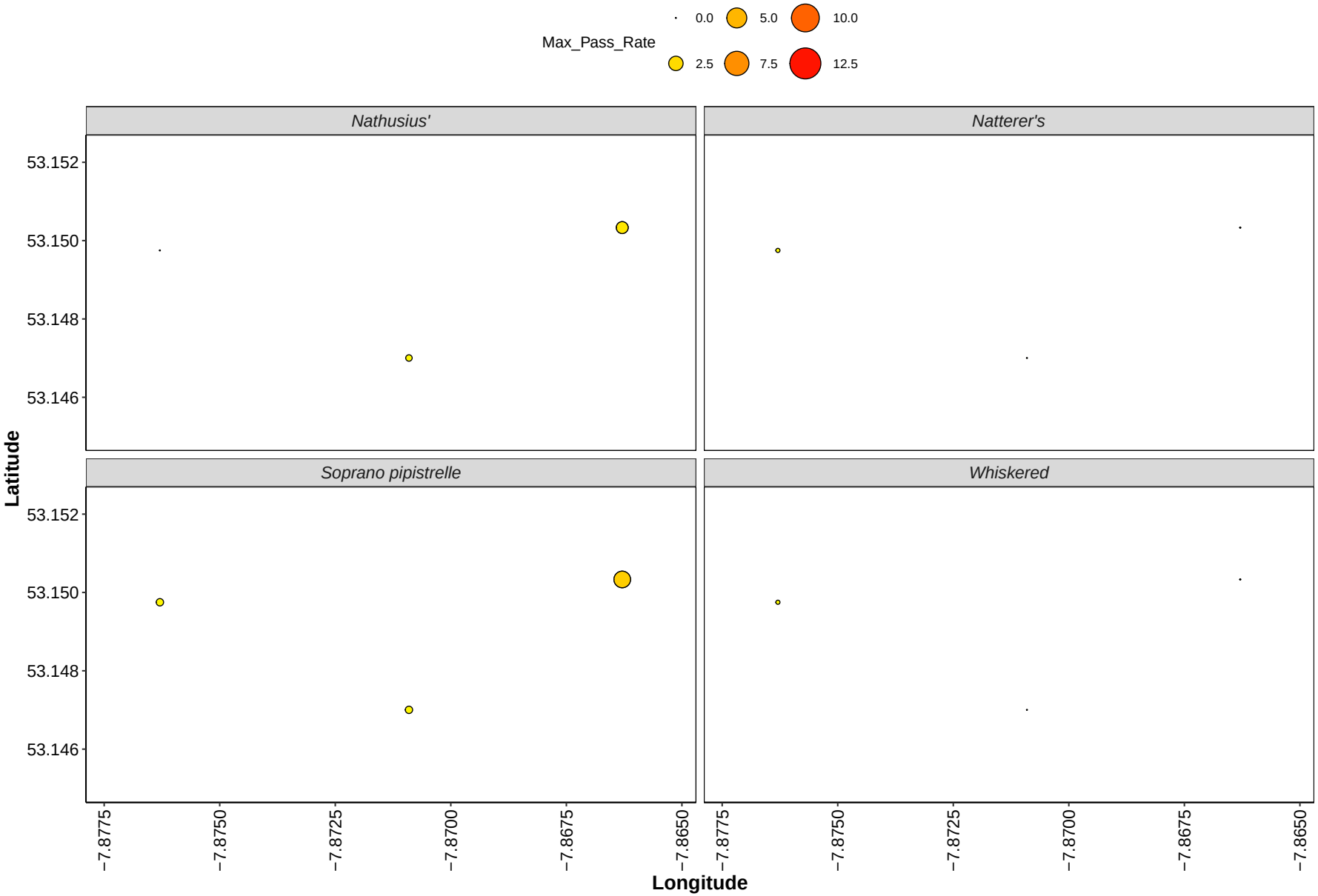

Median_Pass_Rate
0
2
4
6
Nathusius'
Natterer's
Soprano pipistrelle
Whiskered
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

**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
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude


Max_Pass_Rate
0.0
2.5
5.0
7.5
10.0
12.5
Nathusius'
Natterer's
Soprano pipistrelle
Whiskered
Latitude
53.152
53.150
53.148
53.146
Longitude
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650

**Thank you for using Ecobat!**

# Ecobat Report

2025-11-03

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

## Summary

Bats were detected on **10** nights between **16/09/2025** and **25/09/2025**, using **3** static bat detectors. Throughout this period, **7** species were recorded. **Table 1.** Detectors were placed at the following locations:

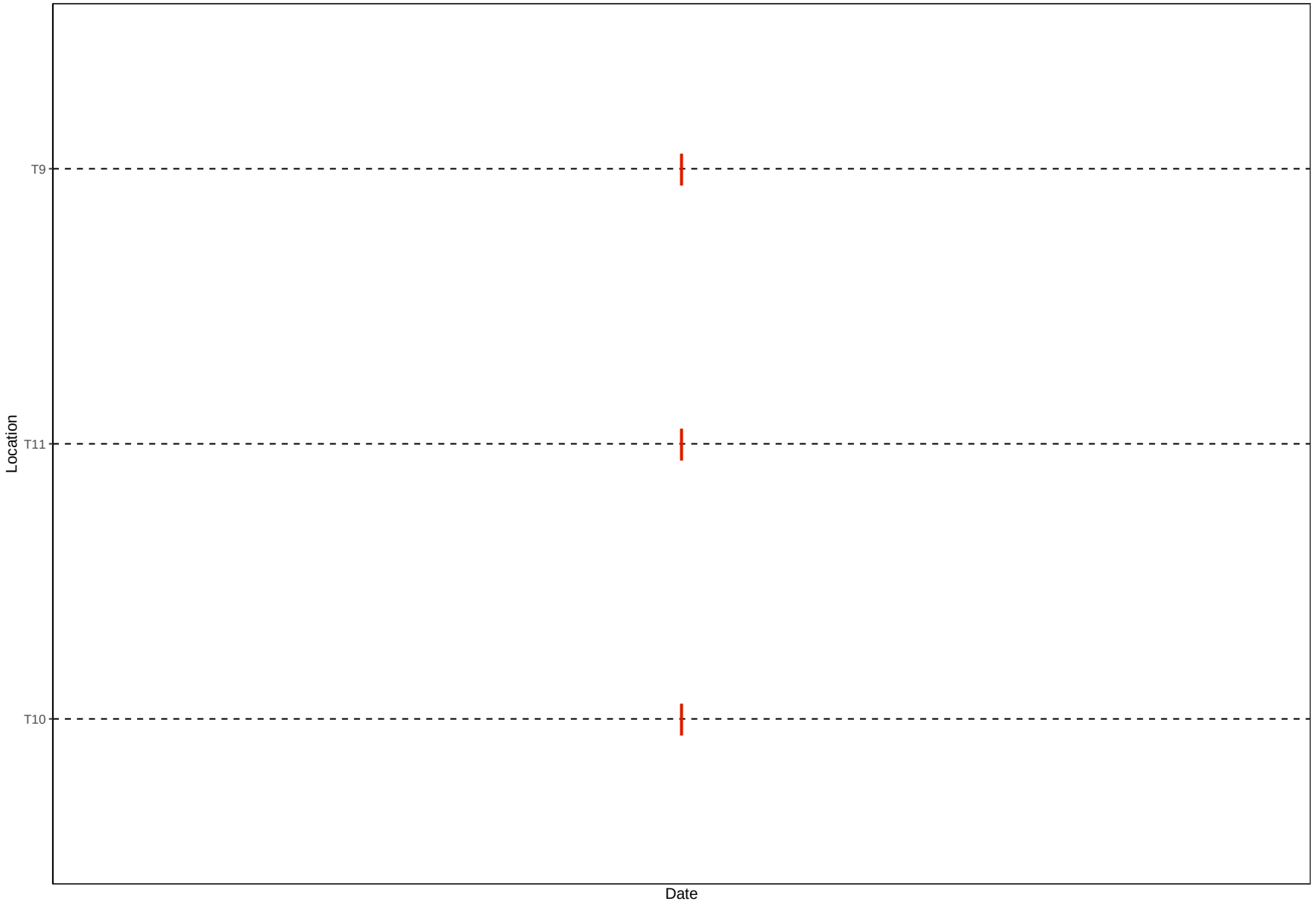
| Detector ID | Latitude | Longitude |
|---|---|---|
| T9 | 53.14700 | -7.870906 |
| T10 | 53.14975 | -7.876294 |
| T11 | 53.15033 | -7.866291 |

# 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 |
|---|---|
| T10 | 10 |
| T11 | 10 |
| T9 | 10 |

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


T9
T11
T10
Location
Date

# Part 1: Percentile Analysis

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

## Per Detector

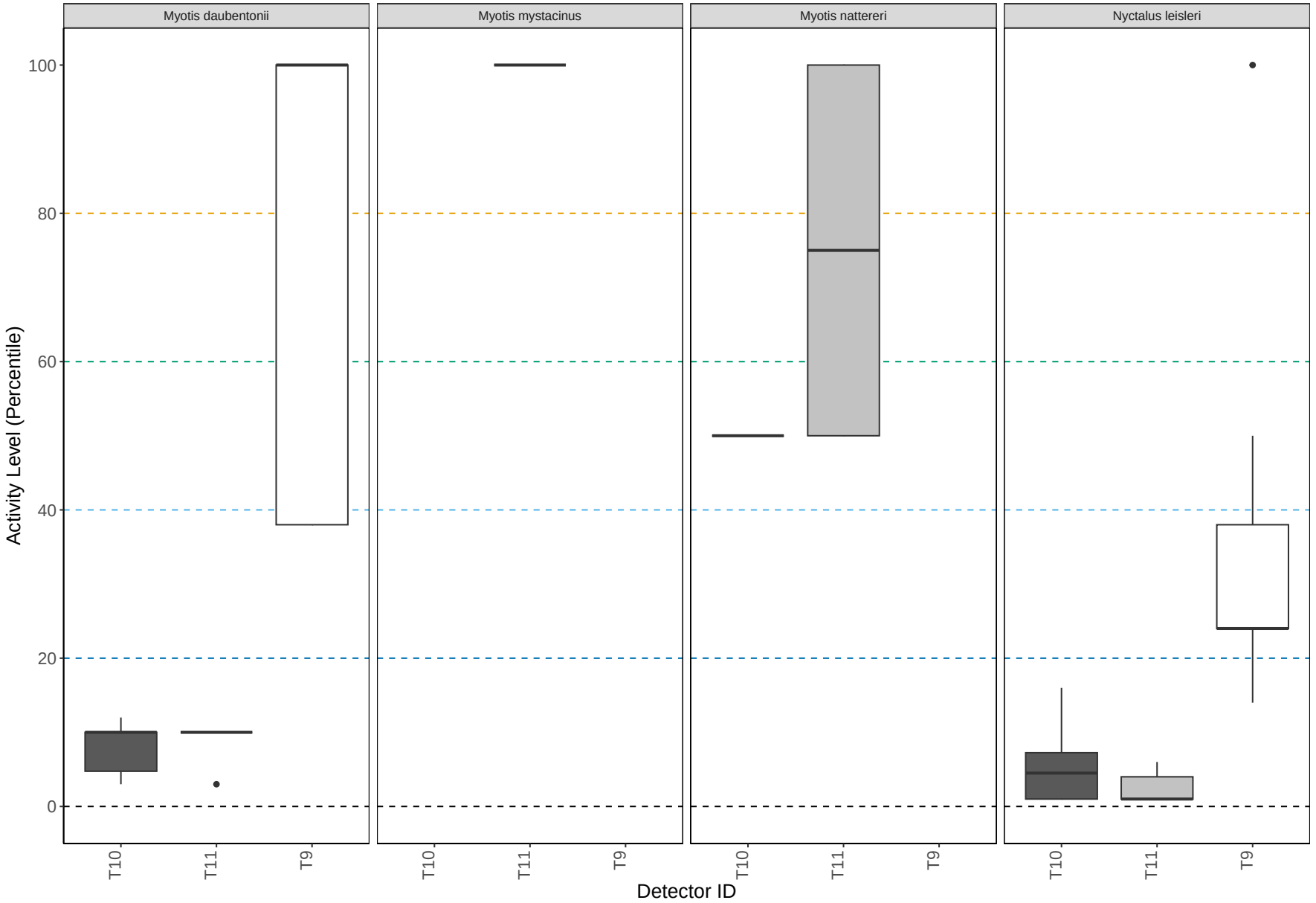
**Table 3.** Summary table showing the number of nights recorded bat activity fell into each activity band for each species.

| Detector ID | Species/Species Group | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | 0 | 0 | 0 | 0 | 0 | 6 |
| T10 | Myotis nattereri | 0 | 0 | 0 | 2 | 0 | 0 |
| T10 | Nyctalus leisleri | 0 | 0 | 0 | 0 | 0 | 8 |
| T10 | Pipistrellus pipistrellus | 2 | 2 | 1 | 0 | 0 | 2 |
| T10 | Pipistrellus pygmaeus | 2 | 0 | 2 | 0 | 0 | 3 |
| T10 | Plecotus auritus | 2 | 2 | 0 | 1 | 2 | 0 |
| T11 | Myotis daubentonii | 0 | 0 | 0 | 0 | 0 | 5 |
| T11 | Myotis mystacinus | 1 | 0 | 0 | 0 | 0 | 0 |
| T11 | Myotis nattereri | 2 | 0 | 0 | 2 | 0 | 0 |
| T11 | Nyctalus leisleri | 0 | 0 | 0 | 0 | 0 | 9 |
| T11 | Pipistrellus pipistrellus | 0 | 2 | 0 | 0 | 0 | 7 |
| T11 | Pipistrellus pygmaeus | 0 | 0 | 0 | 0 | 0 | 8 |
| T11 | Plecotus auritus | 0 | 3 | 0 | 0 | 4 | 0 |
| T9 | Myotis daubentonii | 4 | 0 | 0 | 0 | 3 | 0 |
| T9 | Nyctalus leisleri | 1 | 0 | 0 | 1 | 5 | 2 |
| T9 | Pipistrellus pipistrellus | 0 | 0 | 0 | 4 | 0 | 1 |
| T9 | Pipistrellus pygmaeus | 0 | 1 | 0 | 2 | 0 | 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 |
|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | 10 | 3 - 11 | 12 | 6 | 194 |
| T10 | Myotis nattereri | 50 | 50 - 50 | 50 | 2 | 8 |
| T10 | Nyctalus leisleri | 5 | 1 - 8.5 | 16 | 8 | 540 |
| T10 | Pipistrellus pipistrellus | 85 | 33 - 92.5 | 100 | 7 | 238 |
| T10 | Pipistrellus pygmaeus | 68 | 3.5 - 84 | 100 | 7 | 263 |
| T10 | Plecotus auritus | 82 | 38.5 - 91 | 100 | 7 | 23 |
| T11 | Myotis daubentonii | 10 | 10 - 10 | 10 | 5 | 194 |
| T11 | Myotis mystacinus | 100 | 0 | 100 | 1 | 1 |
| T11 | Myotis nattereri | 75 | 50 - 100 | 100 | 4 | 8 |
| T11 | Nyctalus leisleri | 1 | 1 - 3.5 | 6 | 9 | 540 |
| T11 | Pipistrellus pipistrellus | 3 | 3 - 50 | 85 | 9 | 238 |
| T11 | Pipistrellus pygmaeus | 7 | 1.5 - 16 | 19 | 8 | 263 |
| T11 | Plecotus auritus | 34 | 34 - 58 | 82 | 7 | 23 |
| T9 | Myotis daubentonii | 100 | 69 - 100 | 100 | 7 | 194 |
| T9 | Nyctalus leisleri | 24 | 19 - 62 | 100 | 9 | 540 |
| T9 | Pipistrellus pipistrellus | 41 | 41 - 41 | 41 | 5 | 238 |
| T9 | Pipistrellus pygmaeus | 41 | 41 - 41 | 83 | 3 | 263 |

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


Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Activity Level (Percentile)
100
80
60
40
20
0
T10
T11
T9
Detector ID

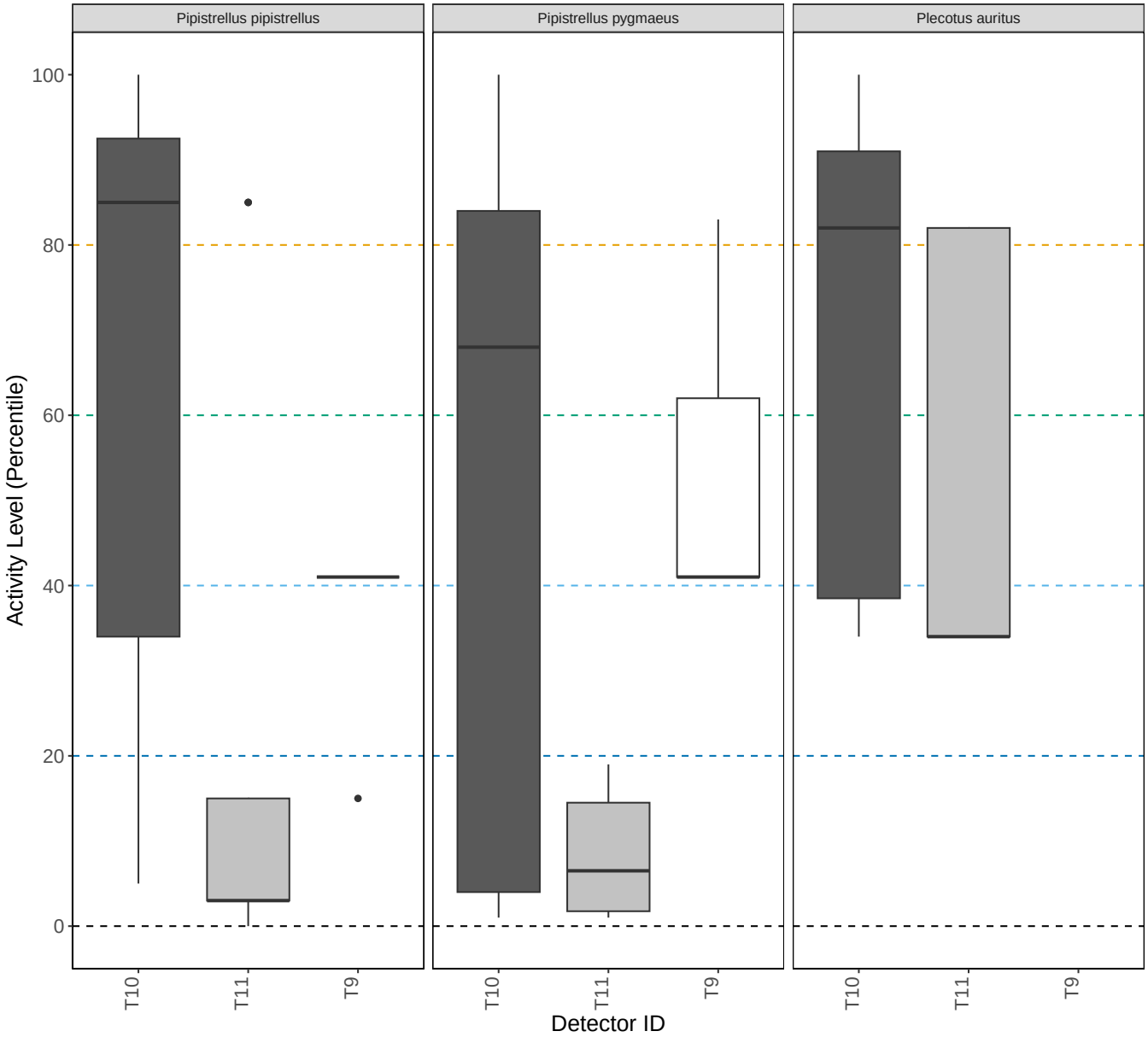
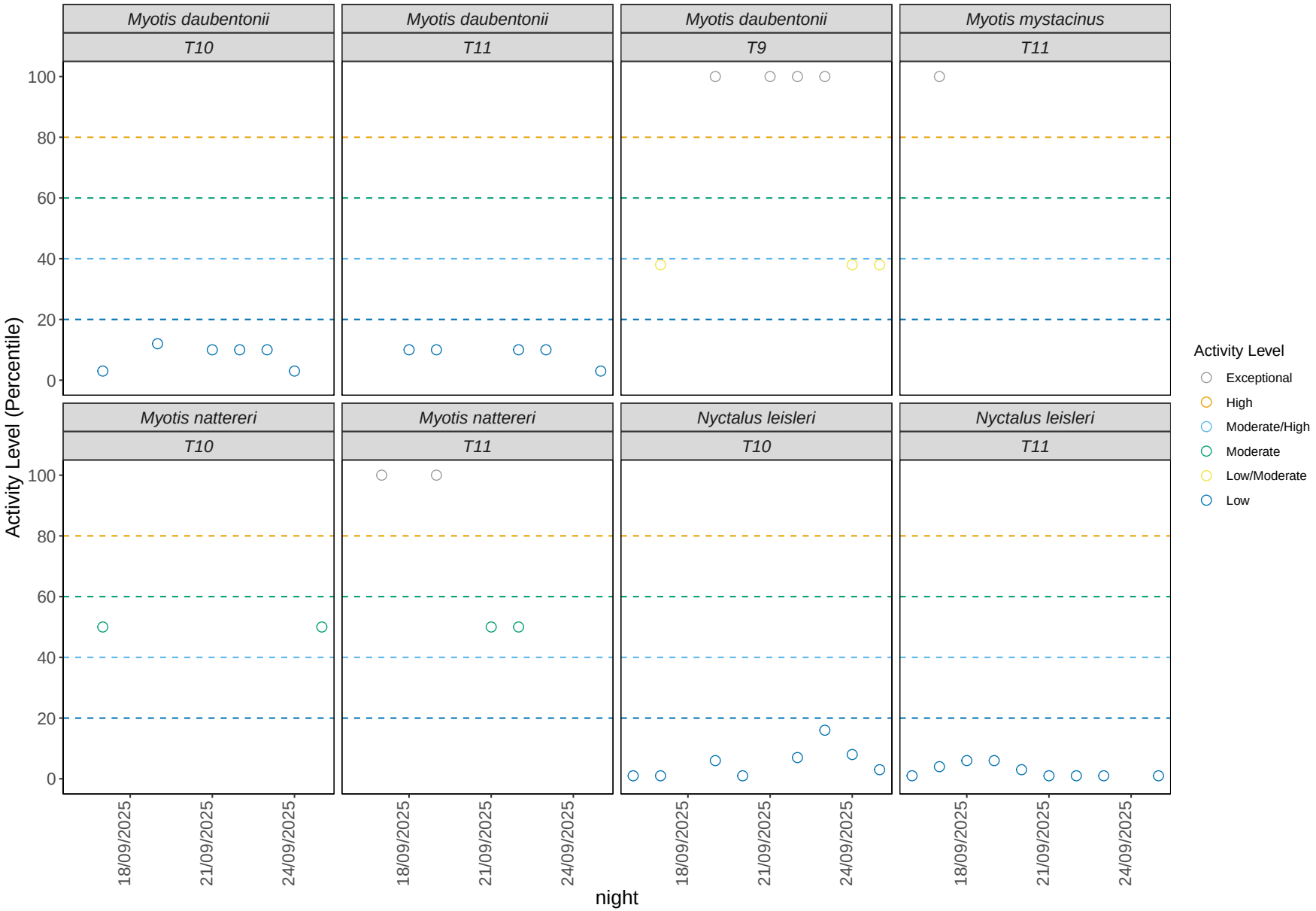
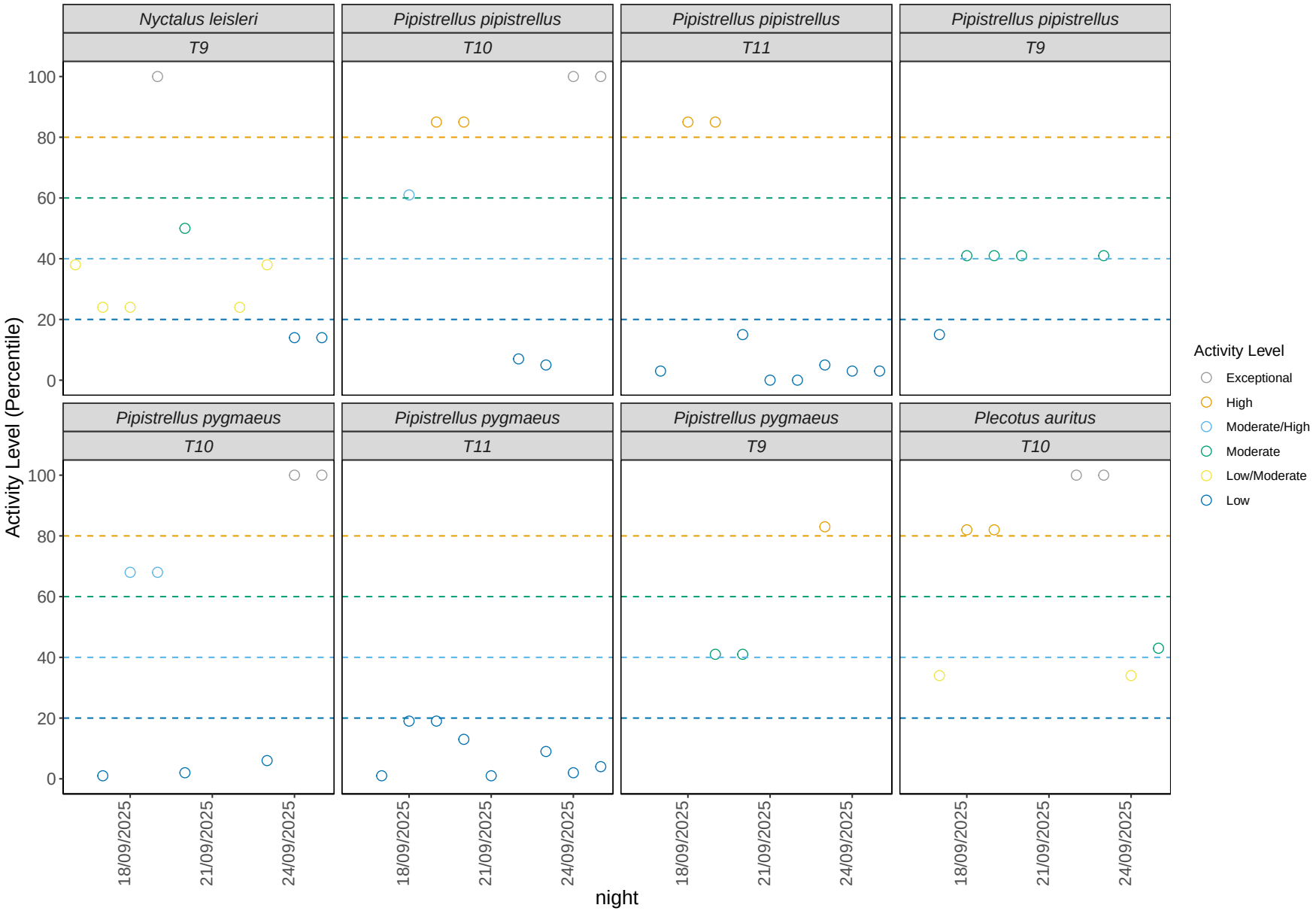
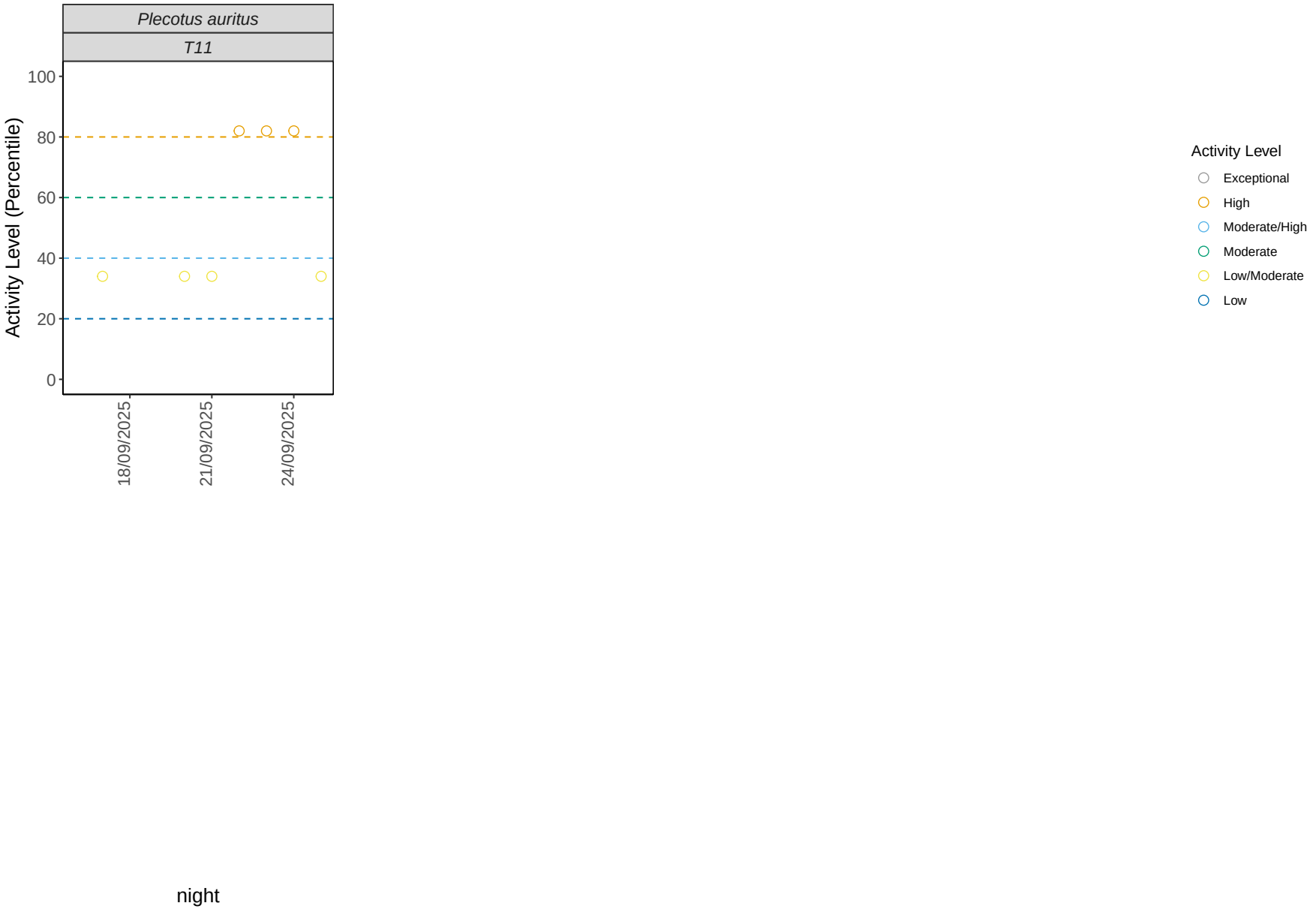

Pipistrellus pipistrellus
Pipistrellus pygmaeus
Plecotus auritus
Activity Level (Percentile)
100
80
60
40
20
0
T10
T11
T9
Detector ID

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


Myotis daubentonii
T10
Myotis daubentonii
T11
Myotis daubentonii
T9
Myotis mystacinus
T11
Myotis nattereri
T10
Myotis nattereri
T11
Nyctalus leisleri
T10
Nyctalus leisleri
T11
Activity Level (Percentile)
100
80
60
40
20
0
18/09/2025
21/09/2025
24/09/2025
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


Nyctalus leisleri
T9
Pipistrellus pipistrellus
T10
Pipistrellus pipistrellus
T11
Pipistrellus pipistrellus
T9
Pipistrellus pygmaeus
T10
Pipistrellus pygmaeus
T11
Pipistrellus pygmaeus
T9
Plecotus auritus
T10
Activity Level (Percentile)
100
80
60
40
20
0
18/09/2025
21/09/2025
24/09/2025
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low


Plecotus auritus
T11
Activity Level (Percentile)
100
80
60
40
20
0
18/09/2025
21/09/2025
24/09/2025
night
Activity Level
Exceptional
High
Moderate/High
Moderate
Low/Moderate
Low

## Per Detector, Per Month

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

| Detector ID | Species/Species Group | month | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | Sep | 0 | 0 | 0 | 0 | 0 | 6 |
| T10 | Myotis nattereri | Sep | 0 | 0 | 0 | 2 | 0 | 0 |
| T10 | Nyctalus leisleri | Sep | 0 | 0 | 0 | 0 | 0 | 8 |
| T10 | Pipistrellus pipistrellus | Sep | 2 | 2 | 1 | 0 | 0 | 2 |
| T10 | Pipistrellus pygmaeus | Sep | 2 | 0 | 2 | 0 | 0 | 3 |
| T10 | Plecotus auritus | Sep | 2 | 2 | 0 | 1 | 2 | 0 |
| T11 | Myotis daubentonii | Sep | 0 | 0 | 0 | 0 | 0 | 5 |
| T11 | Myotis mystacinus | Sep | 1 | 0 | 0 | 0 | 0 | 0 |
| T11 | Myotis nattereri | Sep | 2 | 0 | 0 | 2 | 0 | 0 |
| T11 | Nyctalus leisleri | Sep | 0 | 0 | 0 | 0 | 0 | 9 |
| T11 | Pipistrellus pipistrellus | Sep | 0 | 2 | 0 | 0 | 0 | 7 |
| T11 | Pipistrellus pygmaeus | Sep | 0 | 0 | 0 | 0 | 0 | 8 |
| T11 | Plecotus auritus | Sep | 0 | 3 | 0 | 0 | 4 | 0 |
| T9 | Myotis daubentonii | Sep | 4 | 0 | 0 | 0 | 3 | 0 |
| T9 | Nyctalus leisleri | Sep | 1 | 0 | 0 | 1 | 5 | 2 |
| T9 | Pipistrellus pipistrellus | Sep | 0 | 0 | 0 | 4 | 0 | 1 |
| T9 | Pipistrellus pygmaeus | Sep | 0 | 1 | 0 | 2 | 0 | 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 |
|---|---|---|---|---|---|---|
| T10 | Myotis daubentonii | Sep | 10 | 3 - 11 | 12 | 6 |
| T10 | Myotis nattereri | Sep | 50 | 50 - 50 | 50 | 2 |
| T10 | Nyctalus leisleri | Sep | 5 | 1 - 8.5 | 16 | 8 |
| T10 | Pipistrellus pipistrellus | Sep | 85 | 33 - 92.5 | 100 | 7 |
| T10 | Pipistrellus pygmaeus | Sep | 68 | 3.5 - 84 | 100 | 7 |
| T10 | Plecotus auritus | Sep | 82 | 38.5 - 91 | 100 | 7 |
| T11 | Myotis daubentonii | Sep | 10 | 10 - 10 | 10 | 5 |
| T11 | Myotis mystacinus | Sep | 100 | 0 | 100 | 1 |
| T11 | Myotis nattereri | Sep | 75 | 50 - 100 | 100 | 4 |
| T11 | Nyctalus leisleri | Sep | 1 | 1 - 3.5 | 6 | 9 |
| T11 | Pipistrellus pipistrellus | Sep | 3 | 3 - 50 | 85 | 9 |
| T11 | Pipistrellus pygmaeus | Sep | 7 | 1.5 - 16 | 19 | 8 |
| T11 | Plecotus auritus | Sep | 34 | 34 - 58 | 82 | 7 |
| T9 | Myotis daubentonii | Sep | 100 | 69 - 100 | 100 | 7 |
| T9 | Nyctalus leisleri | Sep | 24 | 19 - 62 | 100 | 9 |
| T9 | Pipistrellus pipistrellus | Sep | 41 | 41 - 41 | 41 | 5 |
| T9 | Pipistrellus pygmaeus | Sep | 41 | 41 - 41 | 83 | 3 |

## Per Site

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

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

| Species/Species Group | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|
| Myotis daubentonii | 4 | 0 | 0 | 0 | 3 | 11 |
| Myotis mystacinus | 1 | 0 | 0 | 0 | 0 | 0 |
| Myotis nattereri | 2 | 0 | 0 | 4 | 0 | 0 |
| Nyctalus leisleri | 1 | 0 | 0 | 1 | 5 | 19 |
| Pipistrellus pipistrellus | 2 | 4 | 1 | 4 | 0 | 10 |
| Pipistrellus pygmaeus | 2 | 1 | 2 | 2 | 0 | 11 |
| Plecotus auritus | 2 | 5 | 0 | 1 | 6 | 0 |

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

| Species/Species Group | Median Percentile | 95% CIs | Max. Percentile | Nights Recorded |
|---|---|---|---|---|
| Myotis daubentonii | 10 | 69 - 100 | 100 | 18 |
| Myotis mystacinus | 100 | 0 | 100 | 1 |
| Myotis nattereri | 50 | 50 - 50 | 100 | 6 |
| Nyctalus leisleri | 6 | 19 - 62 | 100 | 26 |
| Pipistrellus pipistrellus | 41 | 41 - 41 | 100 | 21 |
| Pipistrellus pygmaeus | 16 | 41 - 41 | 100 | 18 |
| Plecotus auritus | 63 | 38.5 - 91 | 100 | 14 |

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

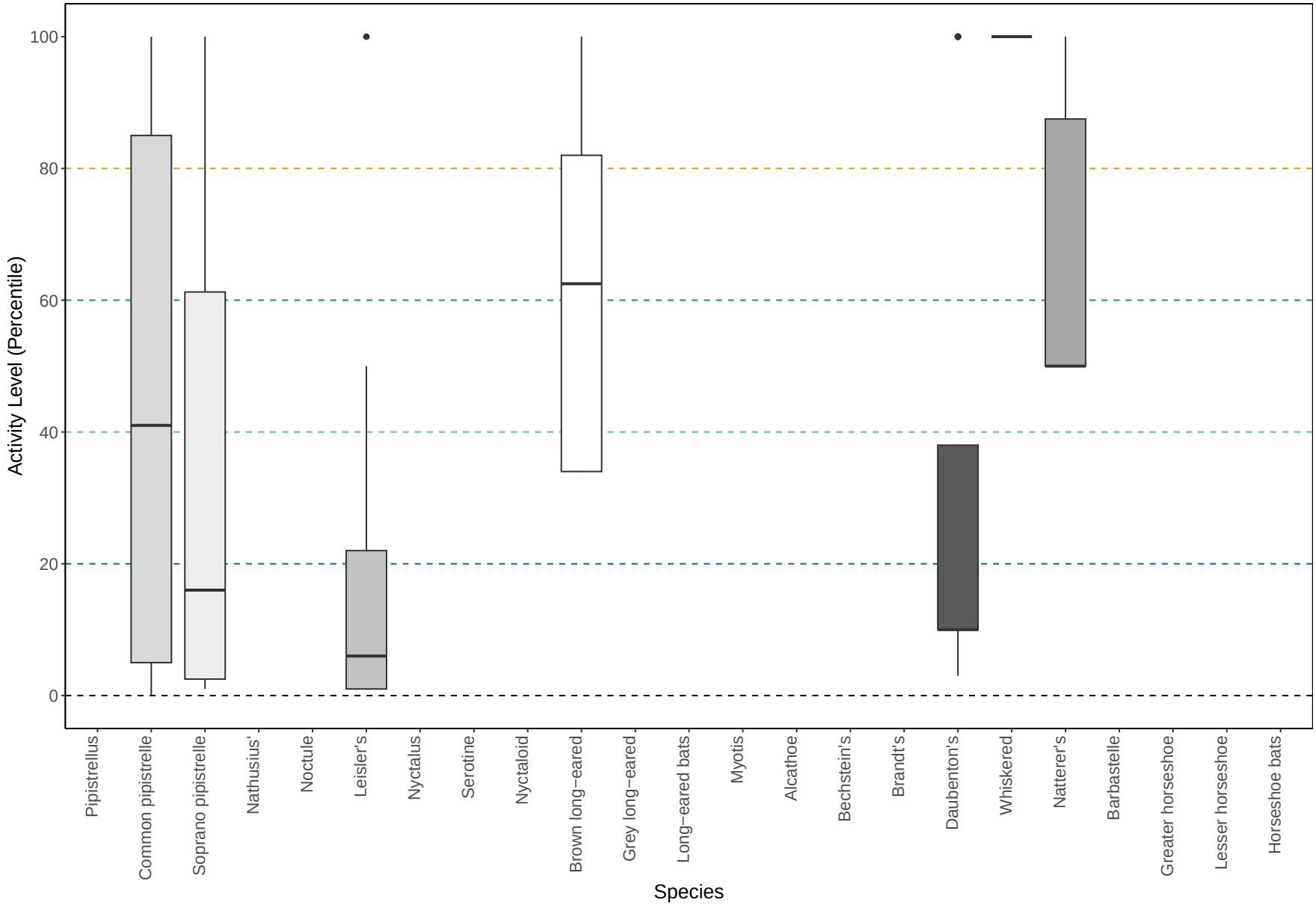

Activity Level (Percentile)
100
80
60
40
20
0
Pipistrellus
Common pipistrelle
Soprano pipistrelle
Nathusius'
Noctule
Leisler's
Nyctalus
Serotine
Nyctaloid
Brown long−eared
Grey long−eared
Long−eared bats
Myotis
Alcathoe
Bechstein's
Brandt's
Daubenton's
Whiskered
Natterer's
Barbastelle
Greater horseshoe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

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

## Per Site, Per Month

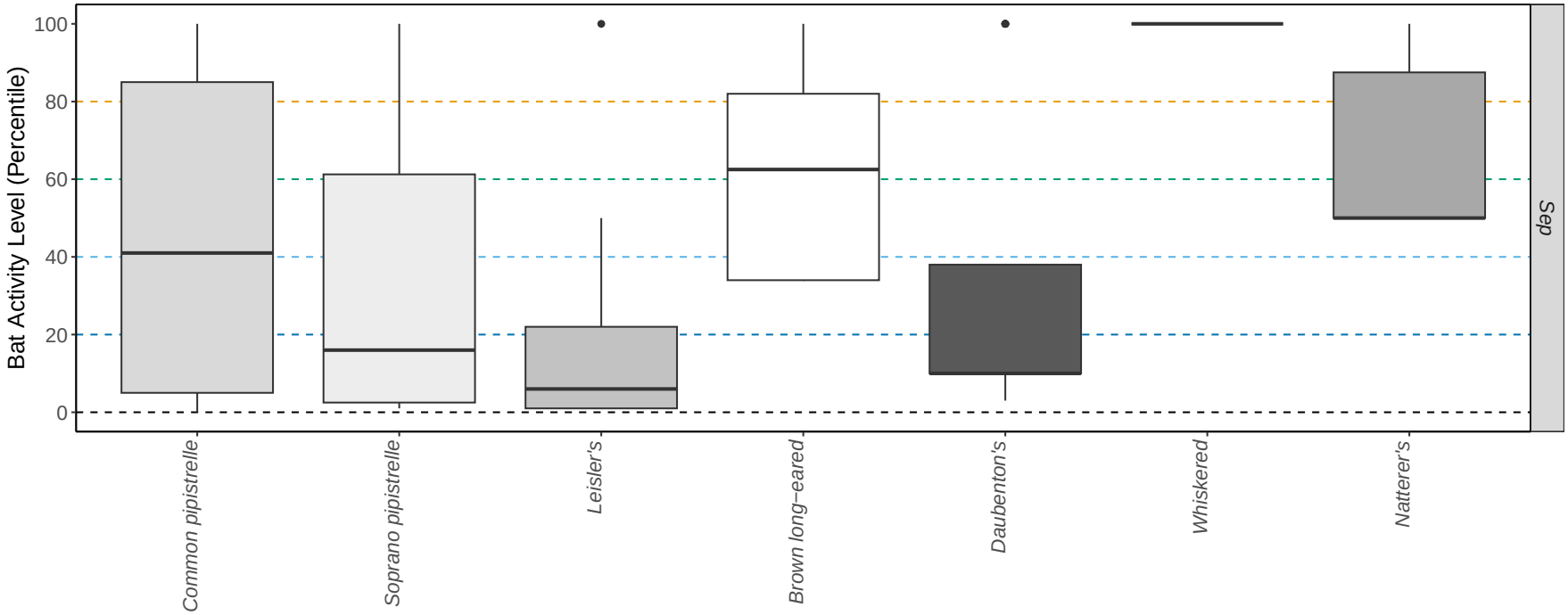
**Table 9.** Summary table showing the number of nights recorded bat activity fell into each activity band for each species during each month.

| Species/Species Group | month | Nights of Exceptional Activity | Nights of High Activity | Nights of Moderate/High Activity | Nights of Moderate Activity | Nights of Low/Moderate Activity | Nights of Low Activity |
|---|---|---|---|---|---|---|---|
| Myotis daubentonii | Sep | 4 | 0 | 0 | 0 | 3 | 11 |
| Myotis mystacinus | Sep | 1 | 0 | 0 | 0 | 0 | 0 |
| Myotis nattereri | Sep | 2 | 0 | 0 | 4 | 0 | 0 |
| Nyctalus leisleri | Sep | 1 | 0 | 0 | 1 | 5 | 19 |
| Pipistrellus pipistrellus | Sep | 2 | 4 | 1 | 4 | 0 | 10 |
| Pipistrellus pygmaeus | Sep | 2 | 1 | 2 | 2 | 0 | 11 |
| Plecotus auritus | Sep | 2 | 5 | 0 | 1 | 6 | 0 |

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

| Species/Species Group | month | Median Percentile | 95% CIs | Max. Percentile | Nights Recorded |
|---|---|---|---|---|---|
| Myotis daubentonii | Sep | 10 | 69 - 100 | 100 | 18 |
| Myotis mystacinus | Sep | 100 | 0 | 100 | 1 |
| Myotis nattereri | Sep | 50 | 50 - 50 | 100 | 6 |
| Nyctalus leisleri | Sep | 6 | 19 - 62 | 100 | 26 |
| Pipistrellus pipistrellus | Sep | 41 | 41 - 41 | 100 | 21 |
| Pipistrellus pygmaeus | Sep | 16 | 41 - 41 | 100 | 18 |
| Plecotus auritus | Sep | 63 | 38.5 - 91 | 100 | 14 |

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


Bat Activity Level (Percentile)
100
80
60
40
20
0
sep
Common pipistrelle
Soprano pipistrelle
Leisler's
Brown long−eared
Daubenton's
Whiskered
Natterer's

Species

## Part 2: Nightly Analysis

# Entire Survey Period

### Sunrise and Sunset Times

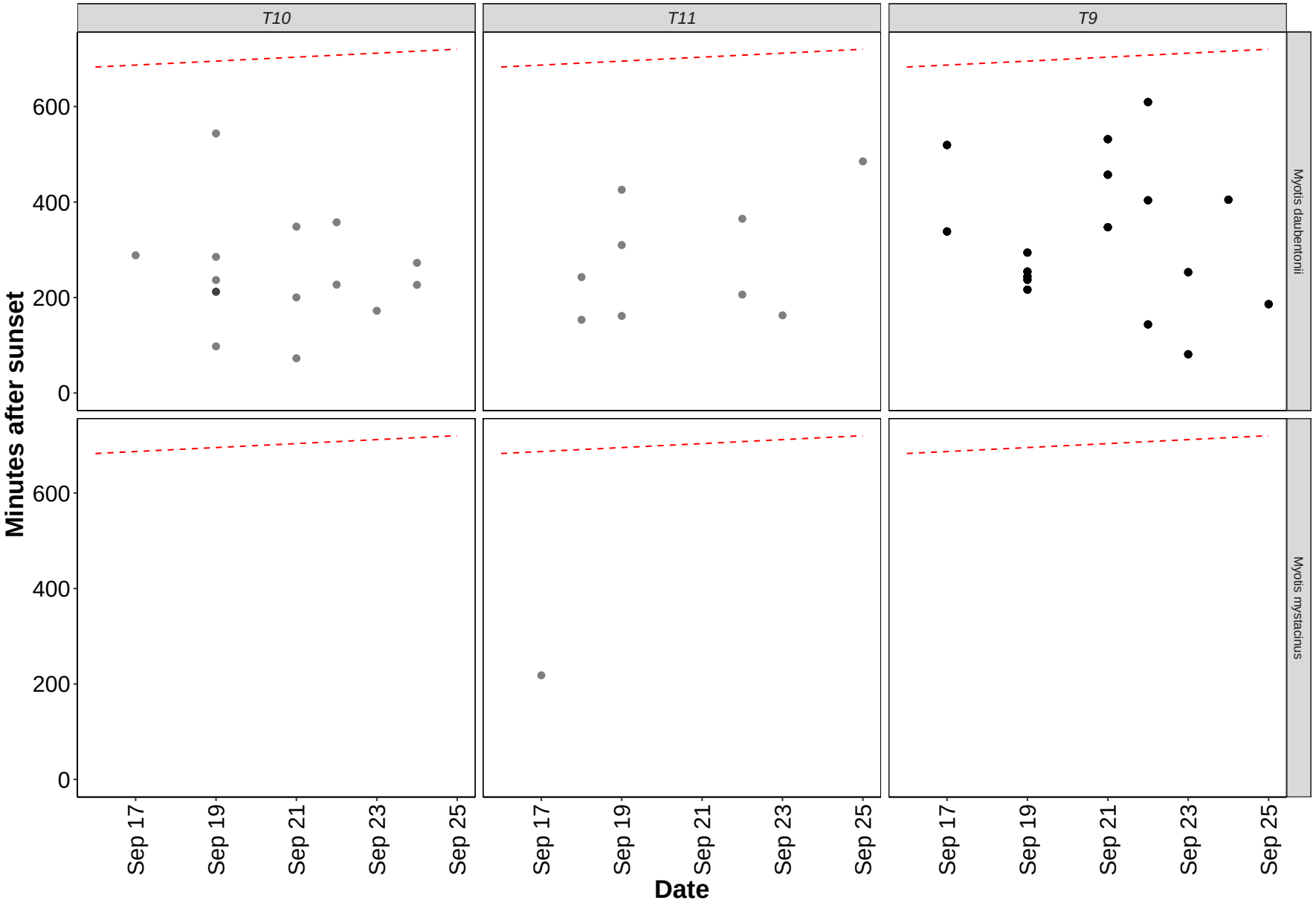
**Table 11. The times of sunset and sunrise the following morning for surveys beginning on the date shown.**

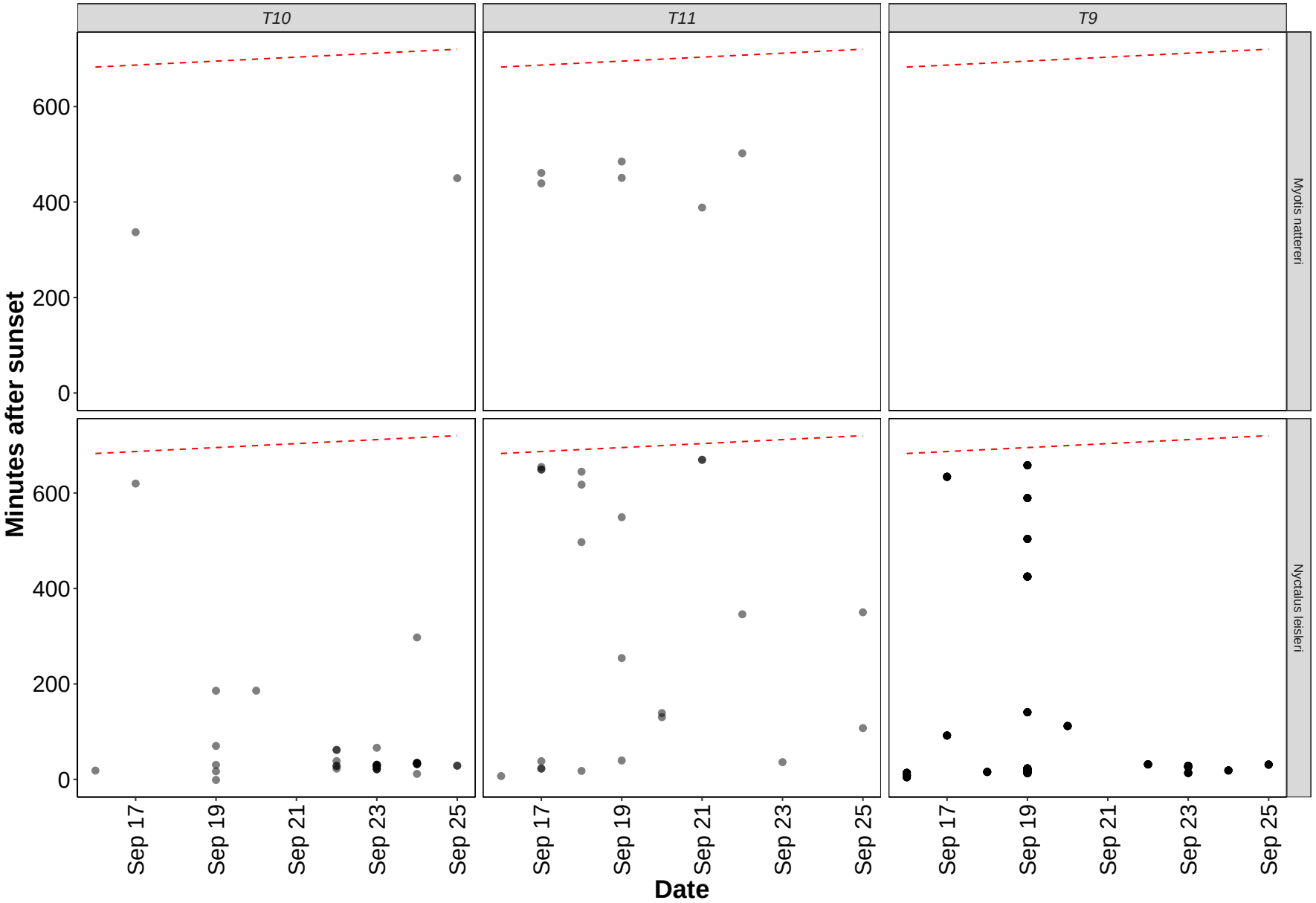
| Night (y-m-d) | Sunset (h:m) | Sunrise (h:m) | Night Length (hours) |
|---|---|---|---|
| 2025-09-16 | 19:47 | 07:10 | 11.4 |
| 2025-09-17 | 19:44 | 07:11 | 11.4 |
| 2025-09-18 | 19:42 | 07:13 | 11.5 |
| 2025-09-19 | 19:39 | 07:15 | 11.6 |
| 2025-09-20 | 19:37 | 07:16 | 11.7 |
| 2025-09-21 | 19:34 | 07:18 | 11.7 |
| 2025-09-22 | 19:32 | 07:20 | 11.8 |
| 2025-09-23 | 19:30 | 07:21 | 11.9 |
| 2025-09-24 | 19:27 | 07:23 | 11.9 |
| 2025-09-25 | 19:25 | 07:25 | 12.0 |

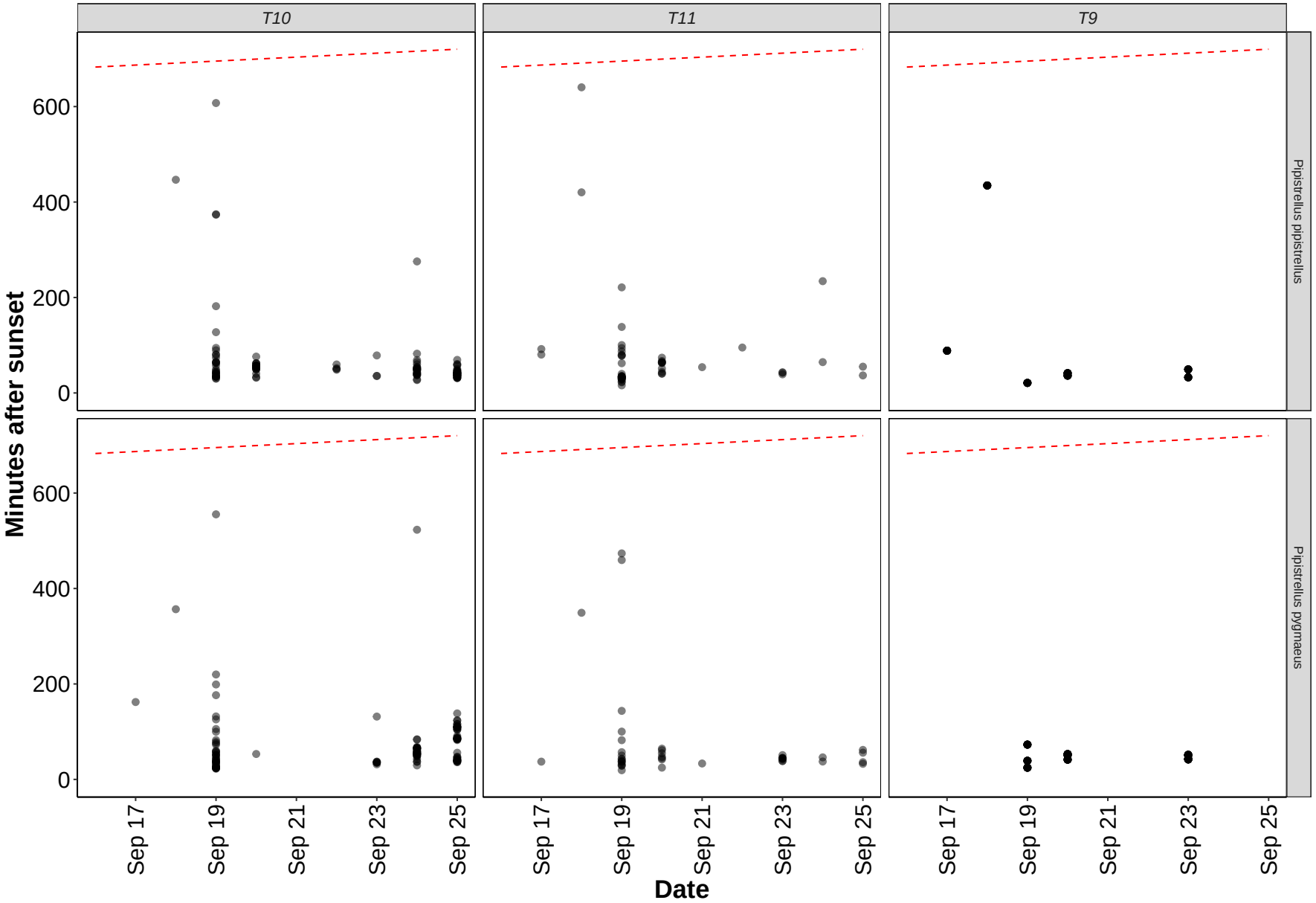
# Distribution of Bat Activity Across the Night through Time

## Per Detector

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


T10
T11
T9
Myotis daubentonii
Myotis mystacinus
Minutes after sunset
0
200
400
600
Sep 17
Sep 19
Sep 21
Sep 23
Sep 25
Date


T10
T11
T9
Myotis nattereri
Nyctalus leisleri
Minutes after sunset
0
200
400
600
Sep 17
Sep 19
Sep 21
Sep 23
Sep 25
Date


T10
T11
T9
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Minutes after sunset
0
200
400
600
Sep 17
Sep 19
Sep 21
Sep 23
Sep 25
Date

# Roost Emergence Time and Bat Observation

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

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

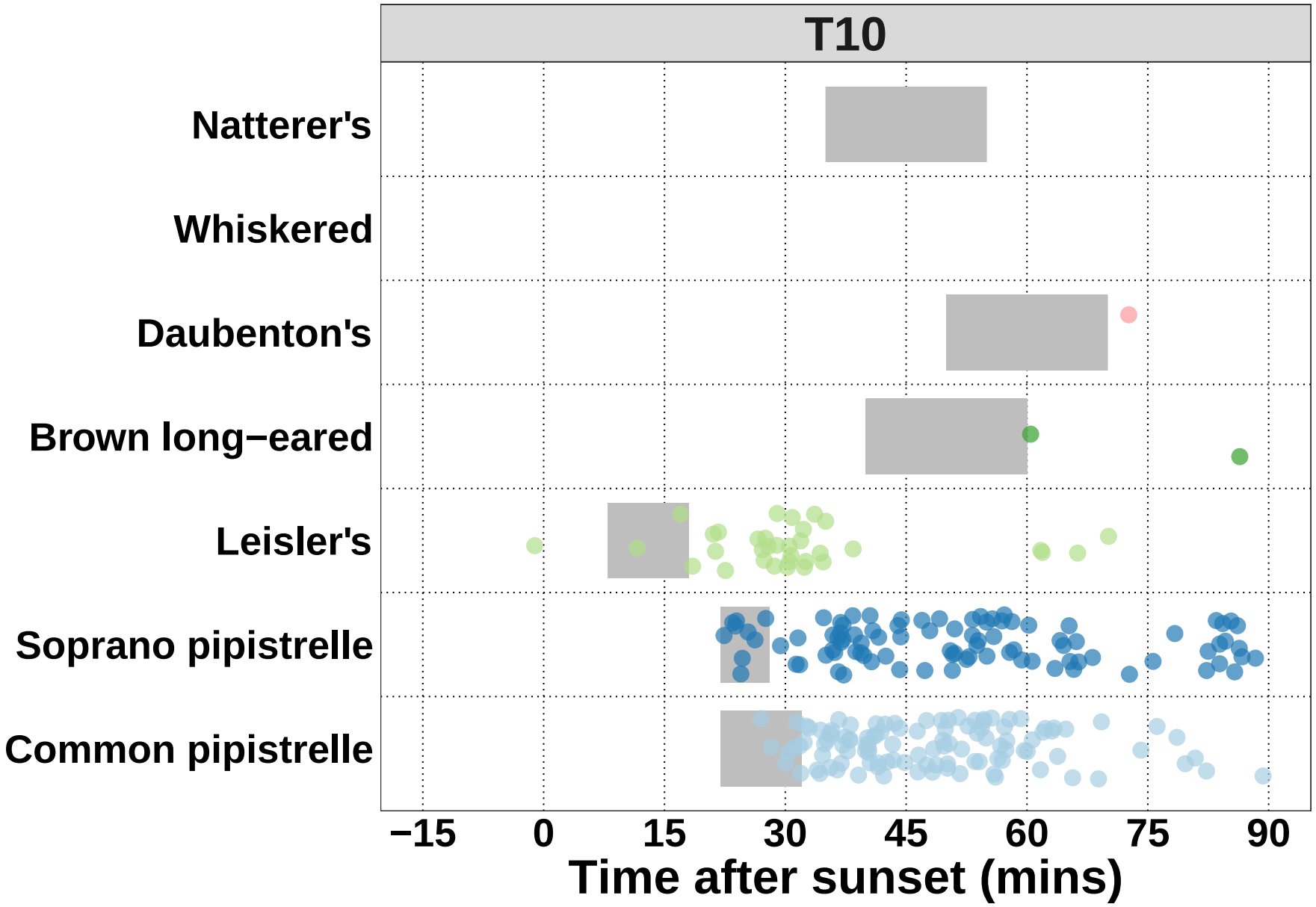
**Table 12. Number of bat calls recorded before the upper time of the species-specific emergence time range, and which therefore may potentially indicate the presence of a nearby roost.**

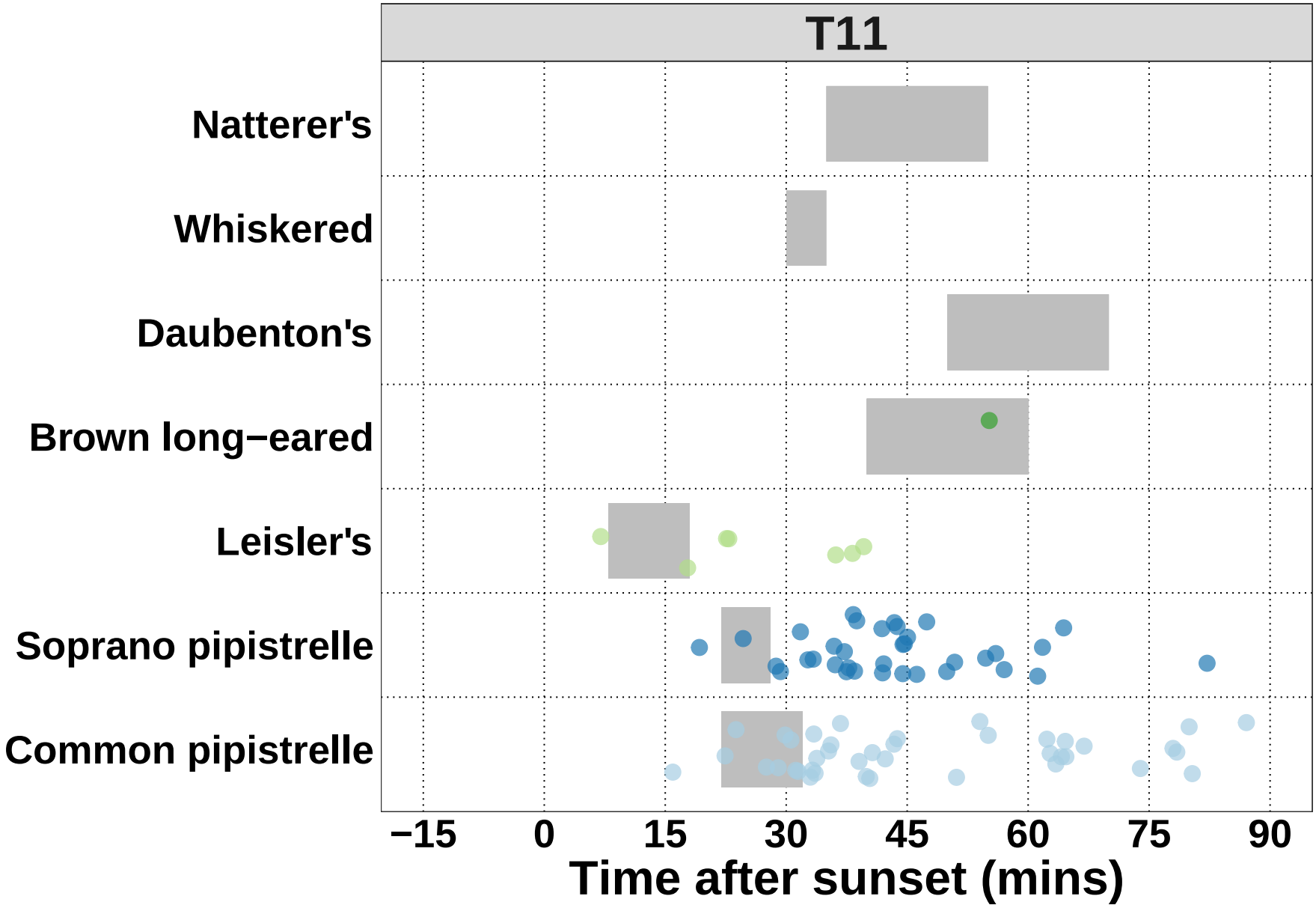
Table 12: Table continues below

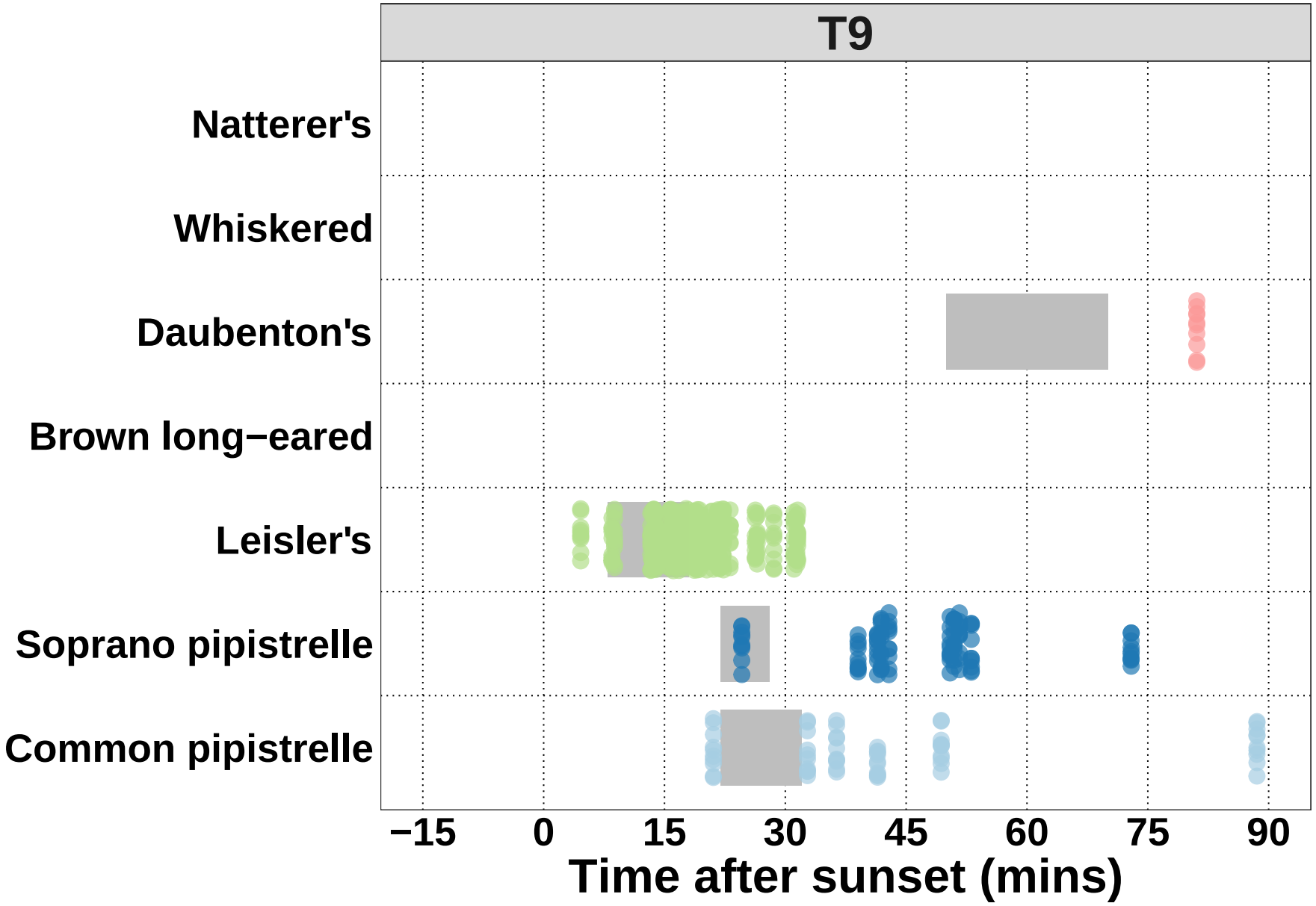
| Species | Detector ID | 2025-09-16 | 2025-09-18 | 2025-09-19 | 2025-09-20 | 2025-09-22 | 2025-09-23 | 2025-09-24 | 2025-09-25 |
|---|---|---|---|---|---|---|---|---|---|
| Common pipistrelle | T10 | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 3 |
| Common pipistrelle | T11 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 |
| Common pipistrelle | T9 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 |
| Soprano pipistrelle | T10 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 |
| Soprano pipistrelle | T11 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Soprano pipistrelle | T9 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 |
| Leisler’s | T10 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Leisler’s | T11 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| Leisler’s | T9 | 40 | 10 | 120 | 0 | 0 | 0 | 0 | 0 |
| Brown long-eared | T11 | 0 | 0 | 0 | 0 | 1 | 10 | 0 | 0 |
| | | | | | | | 0 | 0 | 0 |

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

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


T10
Natterer's
Whiskered
Daubenton's
Brown long−eared
Leisler's
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


T11
Natterer's
Whiskered
Daubenton's
Brown long−eared
Leisler's
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)


T9
Natterer's
Whiskered
Daubenton's
Brown long−eared
Leisler's
Soprano pipistrelle
Common pipistrelle
−15
0
15
30
45
60
75
90
Time after sunset (mins)

# Count of Bat Passes

## All Detectors

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

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

| Species | Passes (no.) | Percentage of Total (%) |
|---|---|---|
| Myotis daubentonii | 194 | 15.3 |
| Myotis mystacinus | 1 | 0.1 |
| Myotis nattereri | 8 | 0.6 |
| Nyctalus leisleri | 540 | 42.6 |
| Pipistrellus pipistrellus | 238 | 18.8 |
| Pipistrellus pygmaeus | 263 | 20.8 |
| Plecotus auritus | 23 | 1.8 |
| Total | 1267 | 100.0 |

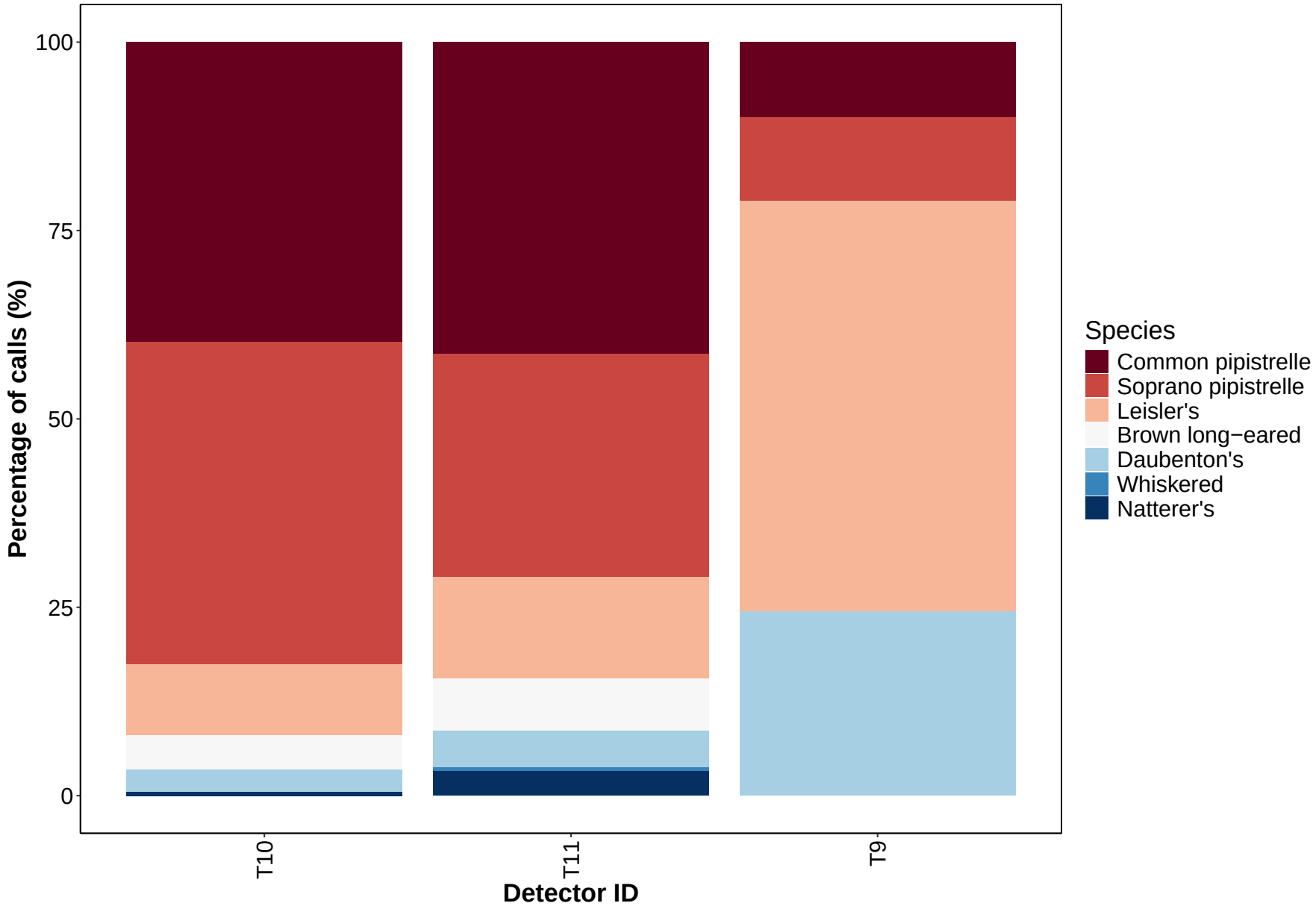
## Per Detector

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

| Species | Detector ID | Count (no.) | Percentage by Detector (%) |
|---|---|---|---|
| Common pipistrelle | T10 | 119 | 38.5113269 |
| Common pipistrelle | T11 | 49 | 35.5072464 |
| Common pipistrelle | T9 | 70 | 8.5365854 |
| Soprano pipistrelle | T10 | 123 | 39.8058252 |
| Soprano pipistrelle | T11 | 40 | 28.9855072 |
| Soprano pipistrelle | T9 | 100 | 12.1951220 |
| Leisler's | T10 | 38 | 12.2977346 |
| Leisler's | T11 | 22 | 15.9420290 |
| Leisler's | T9 | 480 | 58.5365854 |
| Brown long-eared | T10 | 12 | 3.8834951 |
| Brown long-eared | T11 | 11 | 7.9710145 |
| Daubenton's | T10 | 15 | 4.8543689 |
| Daubenton's | T11 | 9 | 6.5217391 |
| Daubenton's | T9 | 170 | 20.7317073 |
| Whiskered | T11 | 1 | 0.7246377 |
| Natterer's | T10 | 2 | 0.6472492 |
| Natterer's | T11 | 6 | 4.3478261 |

## Species Composition

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


100
75
50
25
0
Percentage of calls (%)
T10
T11
T9
Detector ID
Species
Common pipistrelle
Soprano pipistrelle
Leisler's
Brown long−eared
Daubenton's
Whiskered
Natterer's

## Part 2a: Presence Only

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

### Nighlty Bat Passes Per Hour

# Median Per Detector

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

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

| Species | Detector ID | Median Pass Rate |
|---|---|---|
| Common pipistrelle | T10 | 2.4 |
| Common pipistrelle | T11 | 0.2 |
| Common pipistrelle | T9 | 1.7 |
| Soprano pipistrelle | T10 | 3.3 |
| Soprano pipistrelle | T11 | 0.5 |
| Soprano pipistrelle | T9 | 2.6 |
| Leisler's | T10 | 0.3 |
| Leisler's | T11 | 0.2 |
| Leisler's | T9 | 1.8 |
| Brown long-eared | T10 | 0.3 |
| Brown long-eared | T11 | 0.1 |
| Daubenton's | T10 | 0.2 |
| Daubenton's | T11 | 0.2 |
| Daubenton's | T9 | 3.4 |
| Whiskered | T11 | 0.1 |
| Natterer's | T10 | 0.1 |
| Natterer's | T11 | 0.1 |

# Mean Per Detector

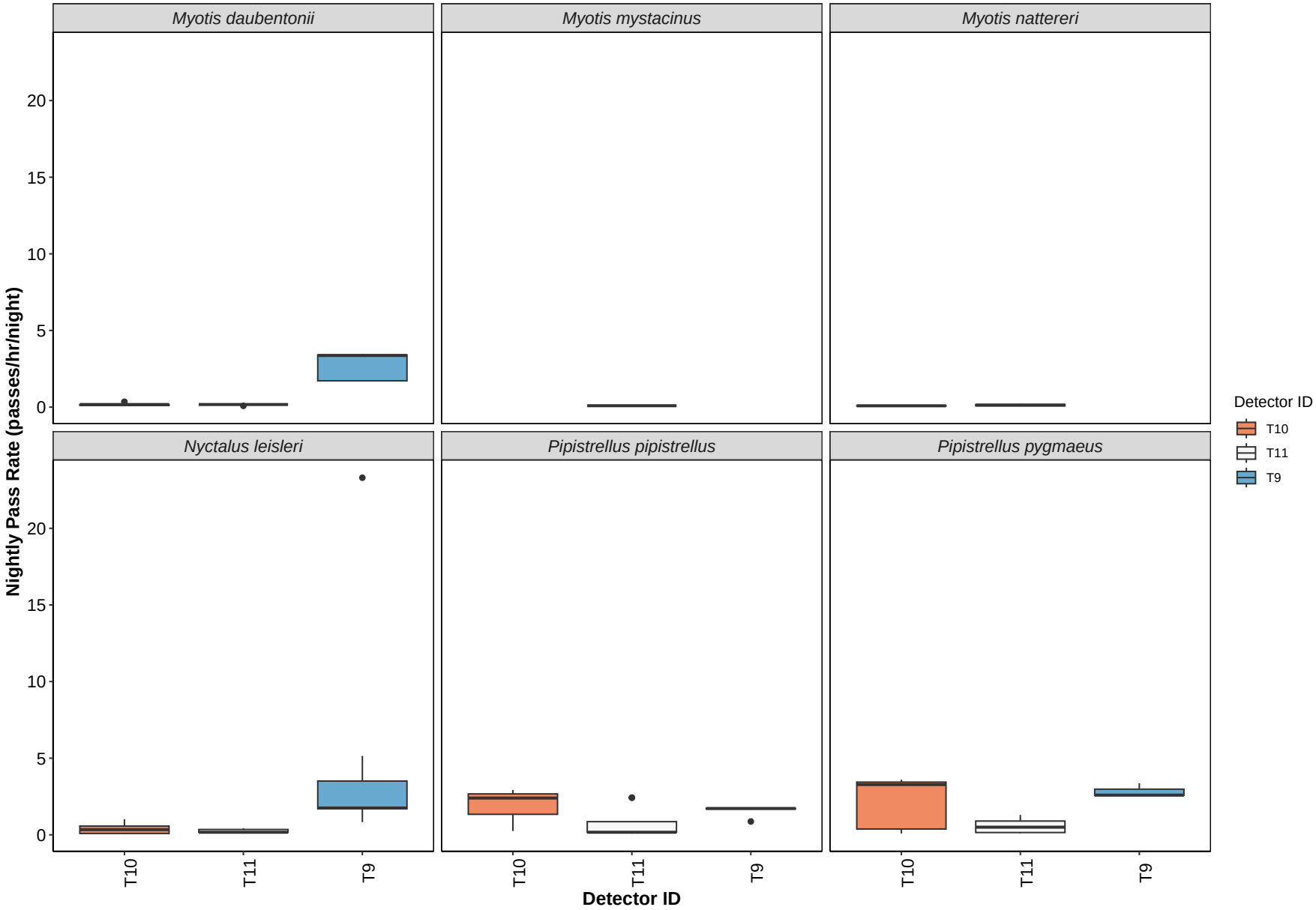
**Table 17. The mean Nightly Pass Rate (bat passes per hour, per night) of each species at each detector. Values are given to 1 decimal place.**

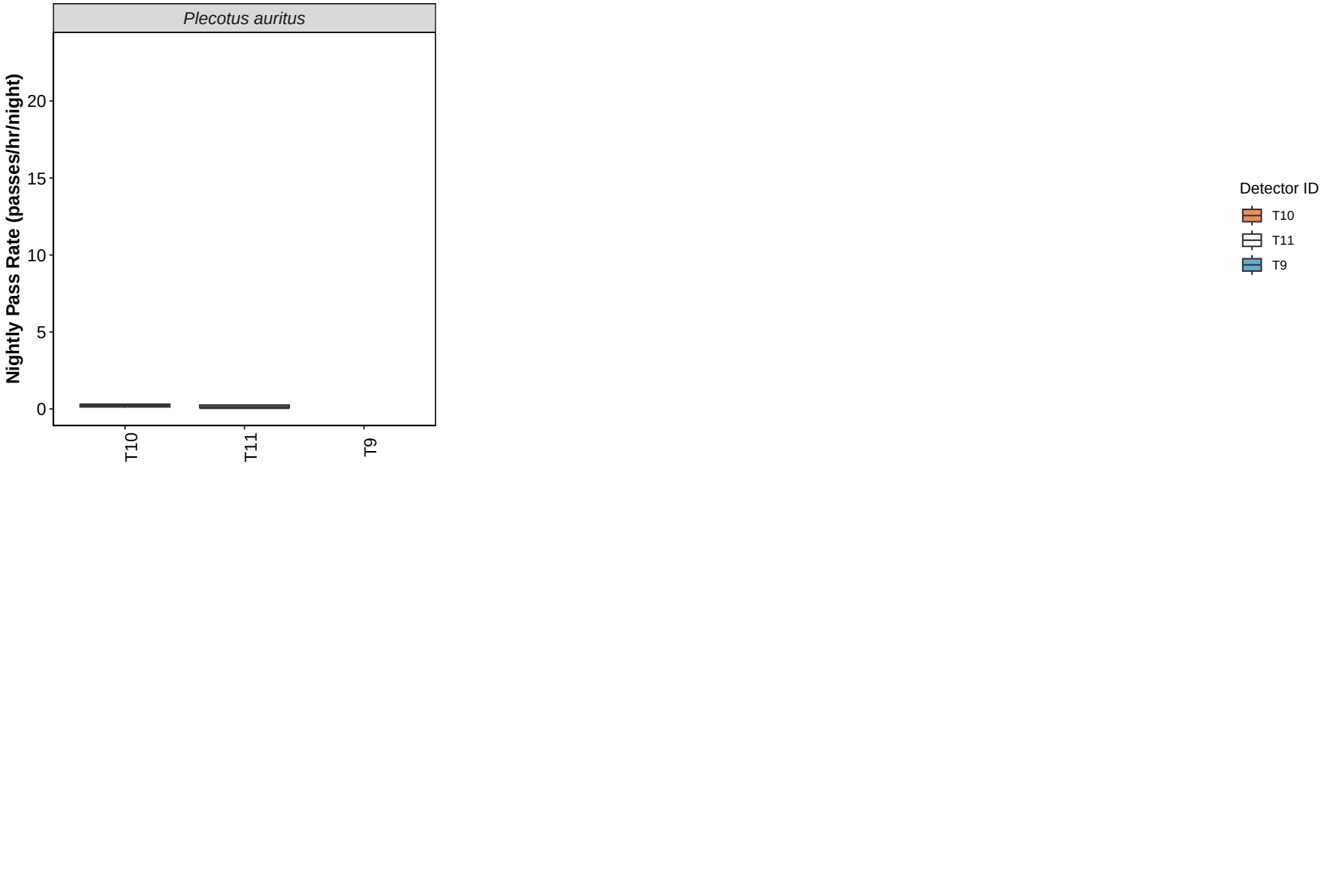
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

| Species | Detector ID | Mean Pass Rate |
|---|---|---|
| Common pipistrelle | T10 | 1.9 |
| Common pipistrelle | T11 | 0.7 |
| Common pipistrelle | T9 | 1.6 |
| Soprano pipistrelle | T10 | 2.1 |
| Soprano pipistrelle | T11 | 0.6 |
| Soprano pipistrelle | T9 | 2.8 |
| Leisler's | T10 | 0.4 |
| Leisler's | T11 | 0.2 |
| Leisler's | T9 | 4.7 |
| Brown long-eared | T10 | 0.2 |
| Brown long-eared | T11 | 0.2 |
| Daubenton's | T10 | 0.2 |
| Daubenton's | T11 | 0.2 |
| Daubenton's | T9 | 2.7 |
| Whiskered | T11 | 0.1 |
| Natterer's | T10 | 0.1 |
| Natterer's | T11 | 0.1 |

## Per Detector

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


Myotis daubentonii
Myotis mystacinus
Myotis nattereri
Nyctalus leisleri
Pipistrellus pipistrellus
Pipistrellus pygmaeus
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
T10
T11
T9
Detector ID
Detector ID
T10
T11
T9


Plecotus auritus
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
T10
T11
T9
Detector ID
Detector ID
T10
T11
T9

# Split by Month

## Total Bat Passes per Detector each Month

**Table 18. The total number of bat passes of each species in each month at each detector.**

This table simply tells you how many bats of each species were recorded passing each detector during each month. These numbers are not standardised by the night length, or how many nights each detector was active for during each month.

| Species | Detector ID | Sep |
|---|---|---|
| Common pipistrelle | T10 | 160 |
| Common pipistrelle | T11 | 77 |
| Common pipistrelle | T9 | 90 |
| Soprano pipistrelle | T10 | 172 |
| Soprano pipistrelle | T11 | 55 |
| Soprano pipistrelle | T9 | 100 |
| Leisler's | T10 | 38 |
| Leisler's | T11 | 25 |
| Leisler's | T9 | 490 |
| Brown long-eared | T10 | 18 |
| Brown long-eared | T11 | 13 |
| Daubenton's | T10 | 12 |
| Daubenton's | T11 | 9 |
| Daubenton's | T9 | 220 |
| Whiskered | T11 | 1 |
| Natterer's | T10 | 2 |
| Natterer's | T11 | 6 |

# Survey Effort

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

| month | Detector ID | No. of Survey Nights |
|---|---|---|
| Sep | T10 | 10 |
| Sep | T11 | 10 |
| Sep | T9 | 10 |

## Nightly Bat Passes for Each Month

# Median Per Detector

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

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

| Species | Detector ID | Sep |
|---|---|---|
| Common pipistrelle | T10 | 2.4 |
| Common pipistrelle | T11 | 0.2 |
| Common pipistrelle | T9 | 1.7 |
| Soprano pipistrelle | T10 | 3.3 |
| Soprano pipistrelle | T11 | 0.5 |
| Soprano pipistrelle | T9 | 2.6 |
| Leisler's | T10 | 0.3 |
| Leisler's | T11 | 0.2 |
| Leisler's | T9 | 1.8 |
| Brown long-eared | T10 | 0.3 |
| Brown long-eared | T11 | 0.1 |
| Daubenton's | T10 | 0.2 |
| Daubenton's | T11 | 0.2 |
| Daubenton's | T9 | 3.4 |
| Whiskered | T11 | 0.1 |
| Natterer's | T10 | 0.1 |
| Natterer's | T11 | 0.1 |

# Mean Per Detector

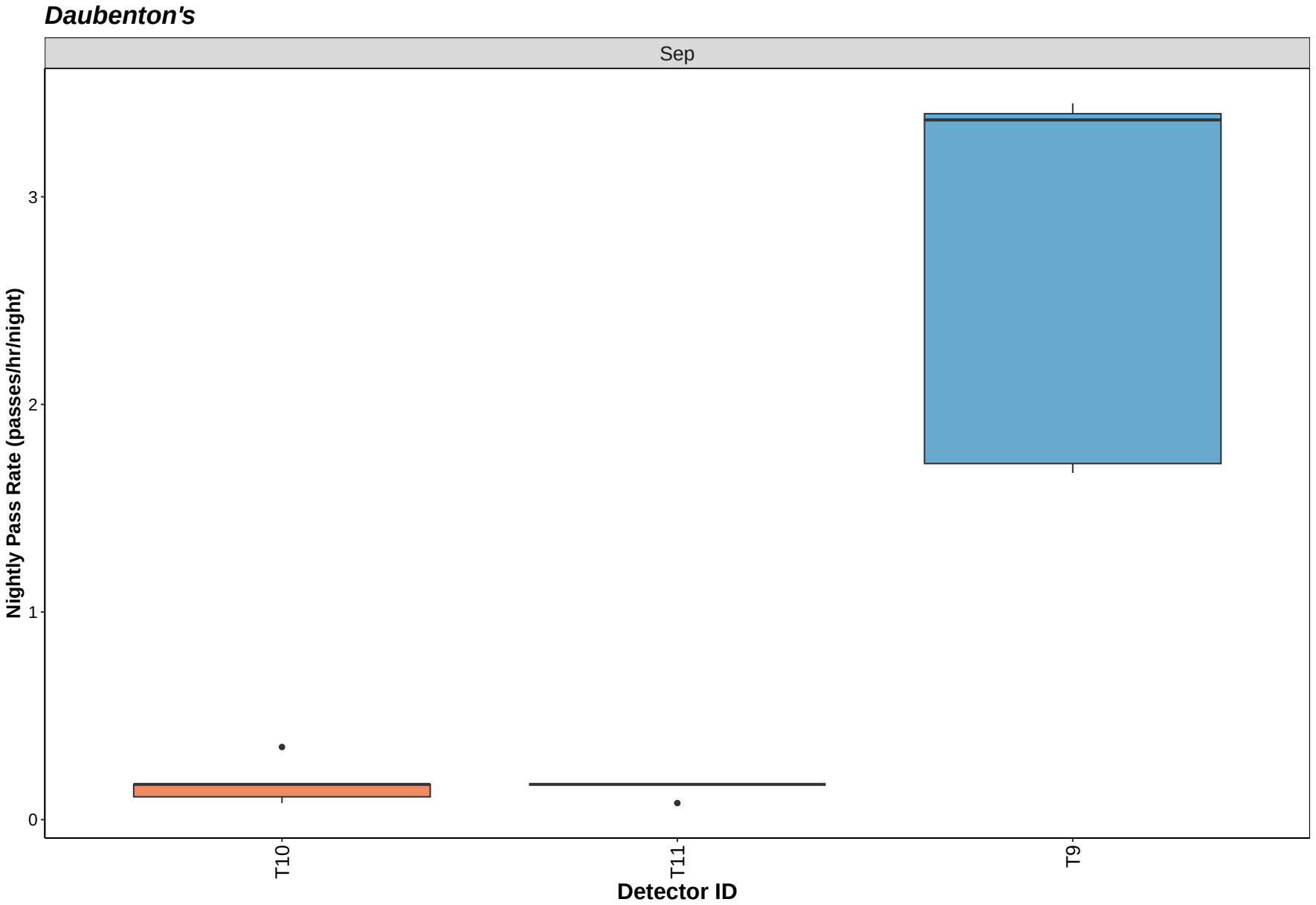
**Table 21: The mean Nightly Pass Rate (bat passes per hour, per night) of each species throughout each month. Values are given to 1 decimal place.**

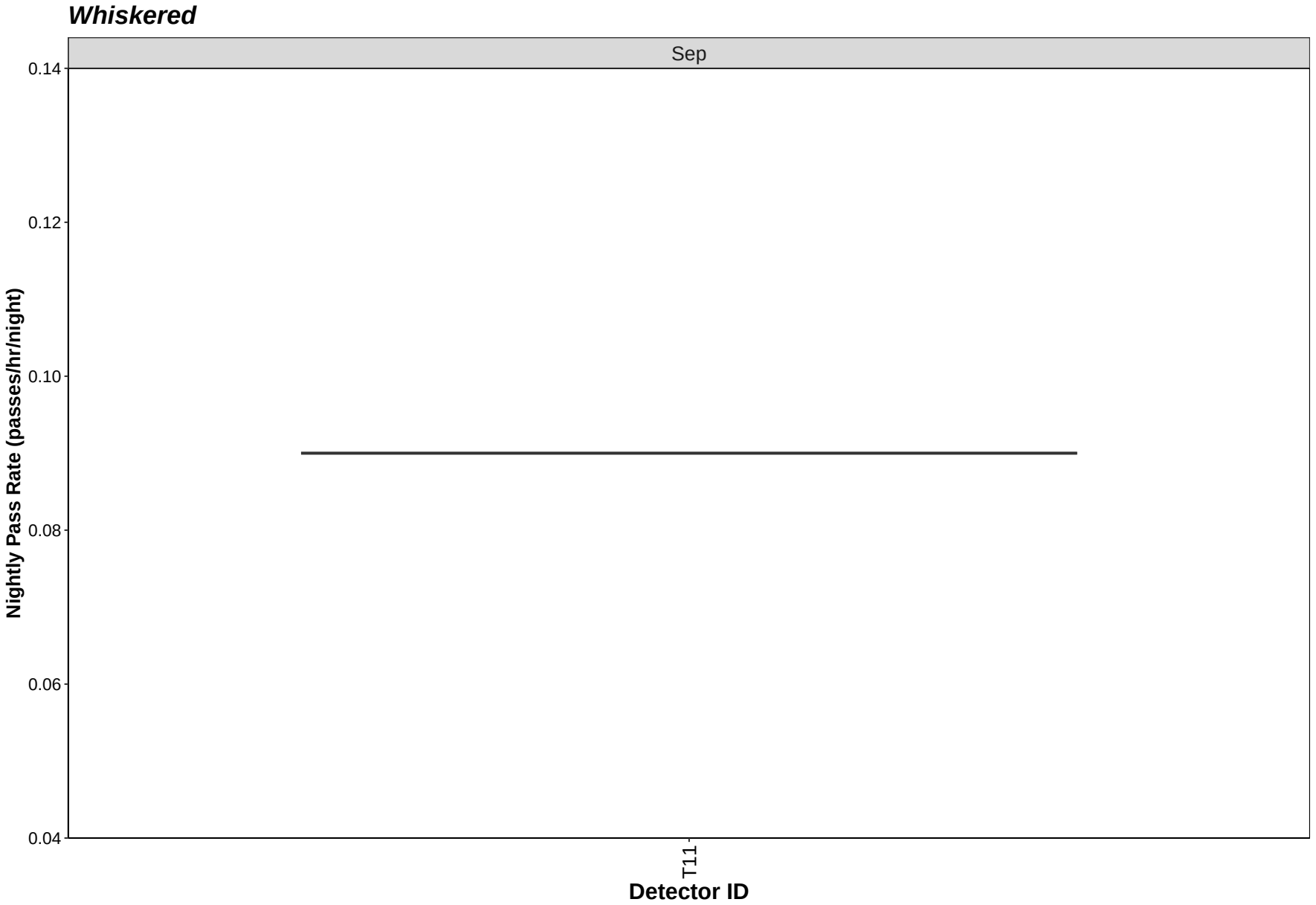
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

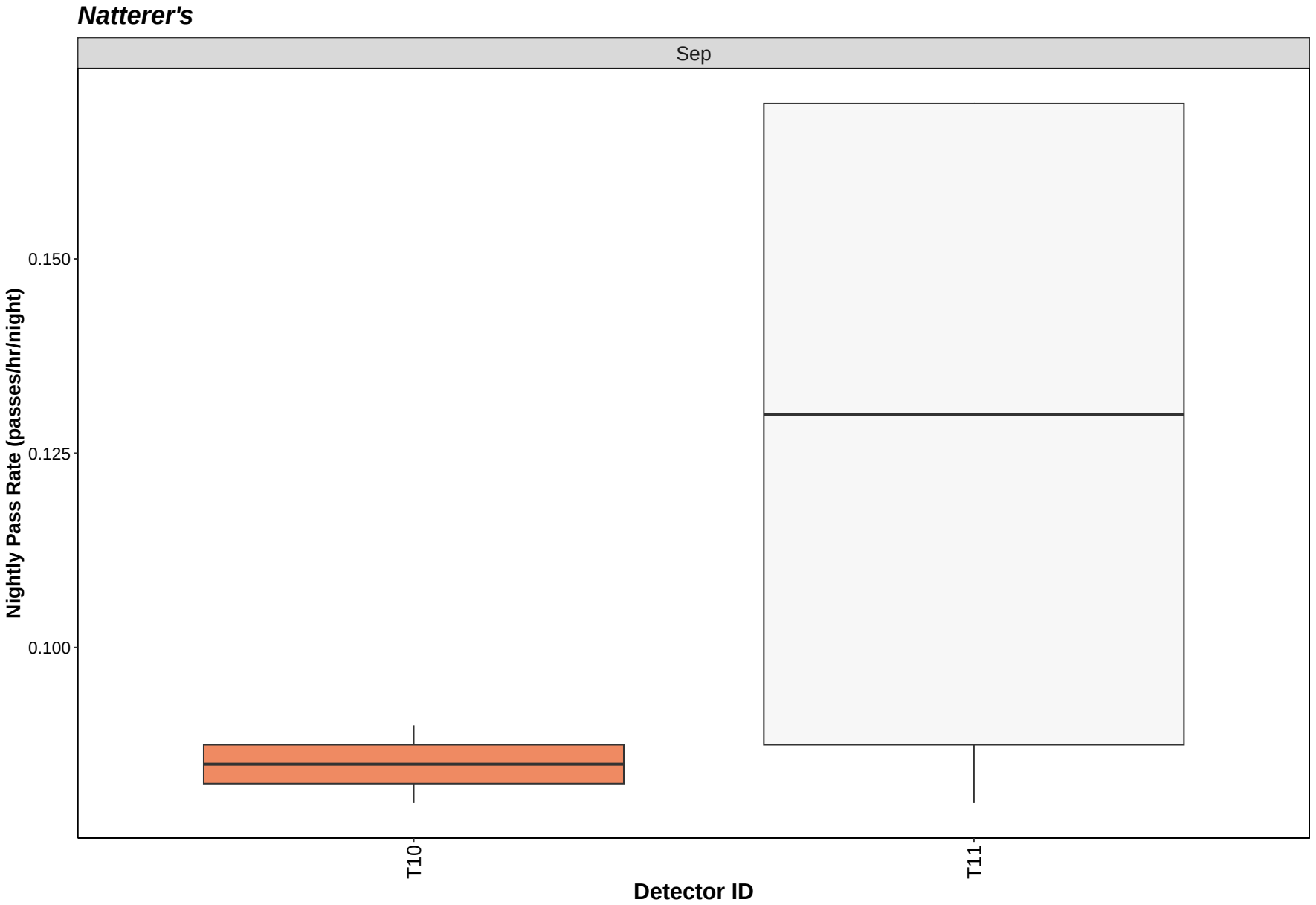
| Species | Detector ID | Sep |
|---|---|---|
| Common pipistrelle | T10 | 1.9 |
| Common pipistrelle | T11 | 0.7 |
| Common pipistrelle | T9 | 1.6 |
| Soprano pipistrelle | T10 | 2.1 |
| Soprano pipistrelle | T11 | 0.6 |
| Soprano pipistrelle | T9 | 2.8 |
| Leisler's | T10 | 0.4 |
| Leisler's | T11 | 0.2 |
| Leisler's | T9 | 4.7 |
| Brown long-eared | T10 | 0.2 |
| Brown long-eared | T11 | 0.2 |
| Daubenton's | T10 | 0.2 |
| Daubenton's | T11 | 0.2 |
| Daubenton's | T9 | 2.7 |
| Whiskered | T11 | 0.1 |
| Natterer's | T10 | 0.1 |
| Natterer's | T11 | 0.1 |

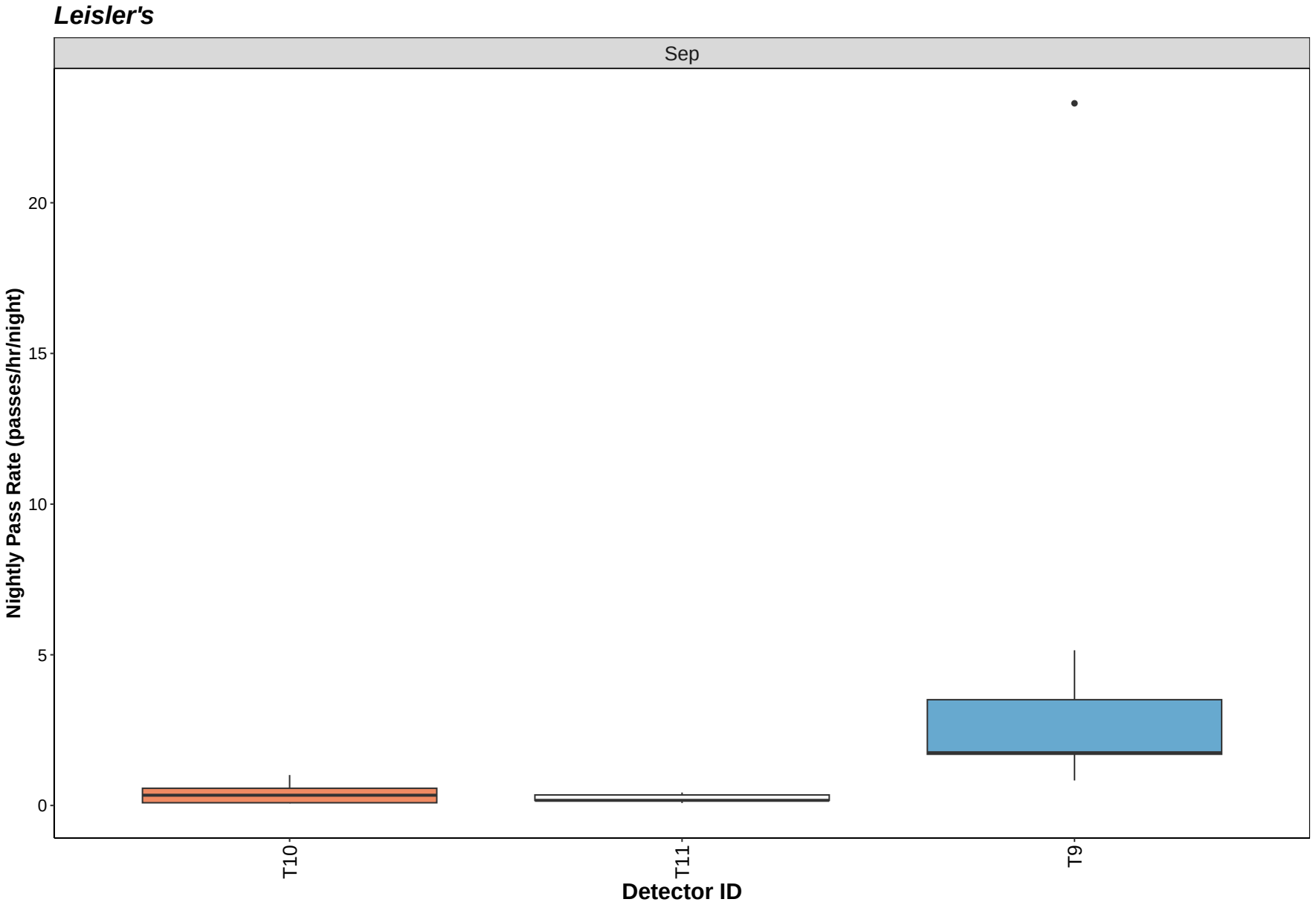
## Per Detector

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

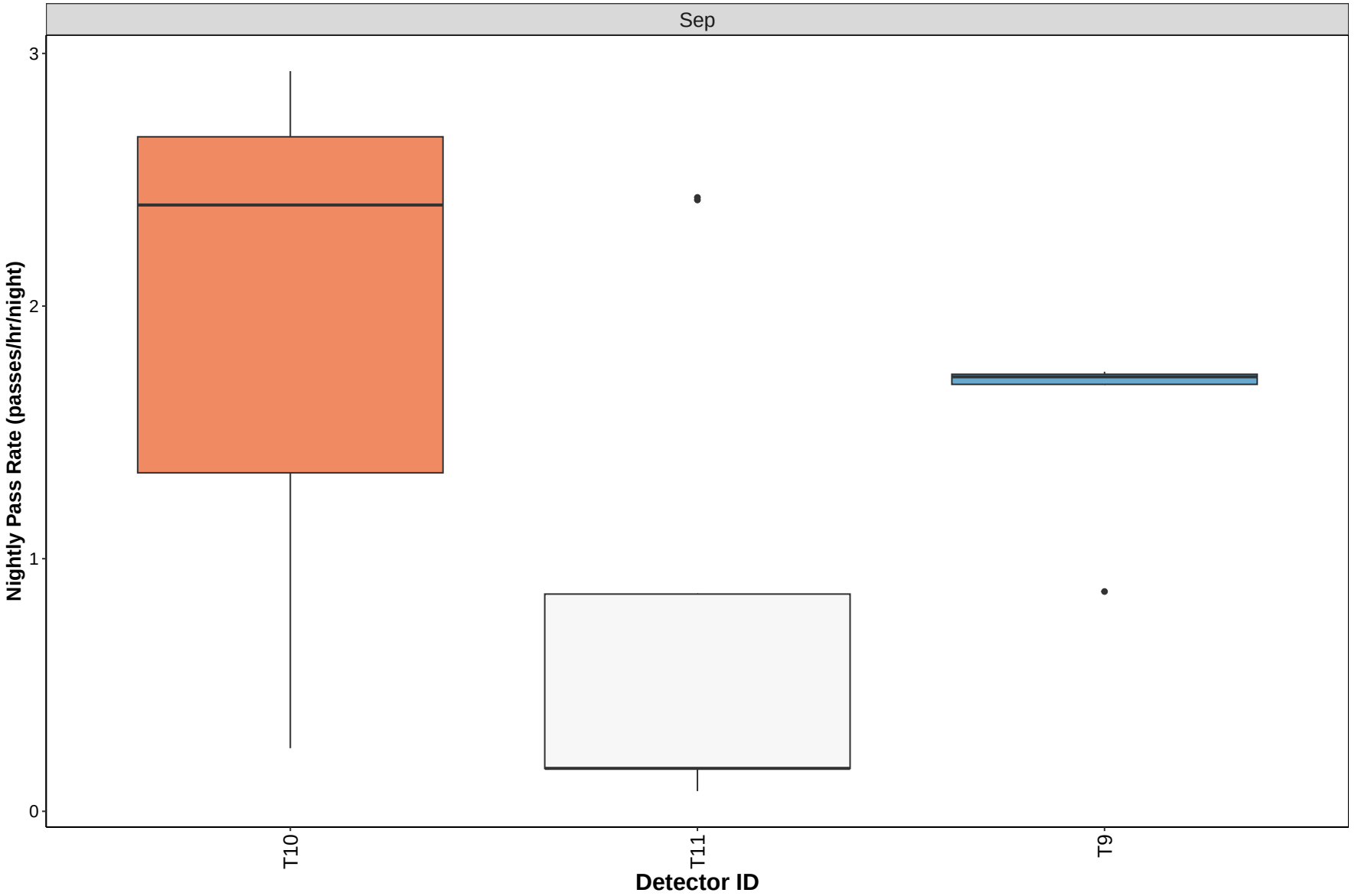

Daubenton's
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
T10
T11
T9
Detector ID


Whiskered
Sep
0.14
0.12
0.10
0.08
0.06
0.04
Nightly Pass Rate (passes/hr/night)
T11
Detector ID

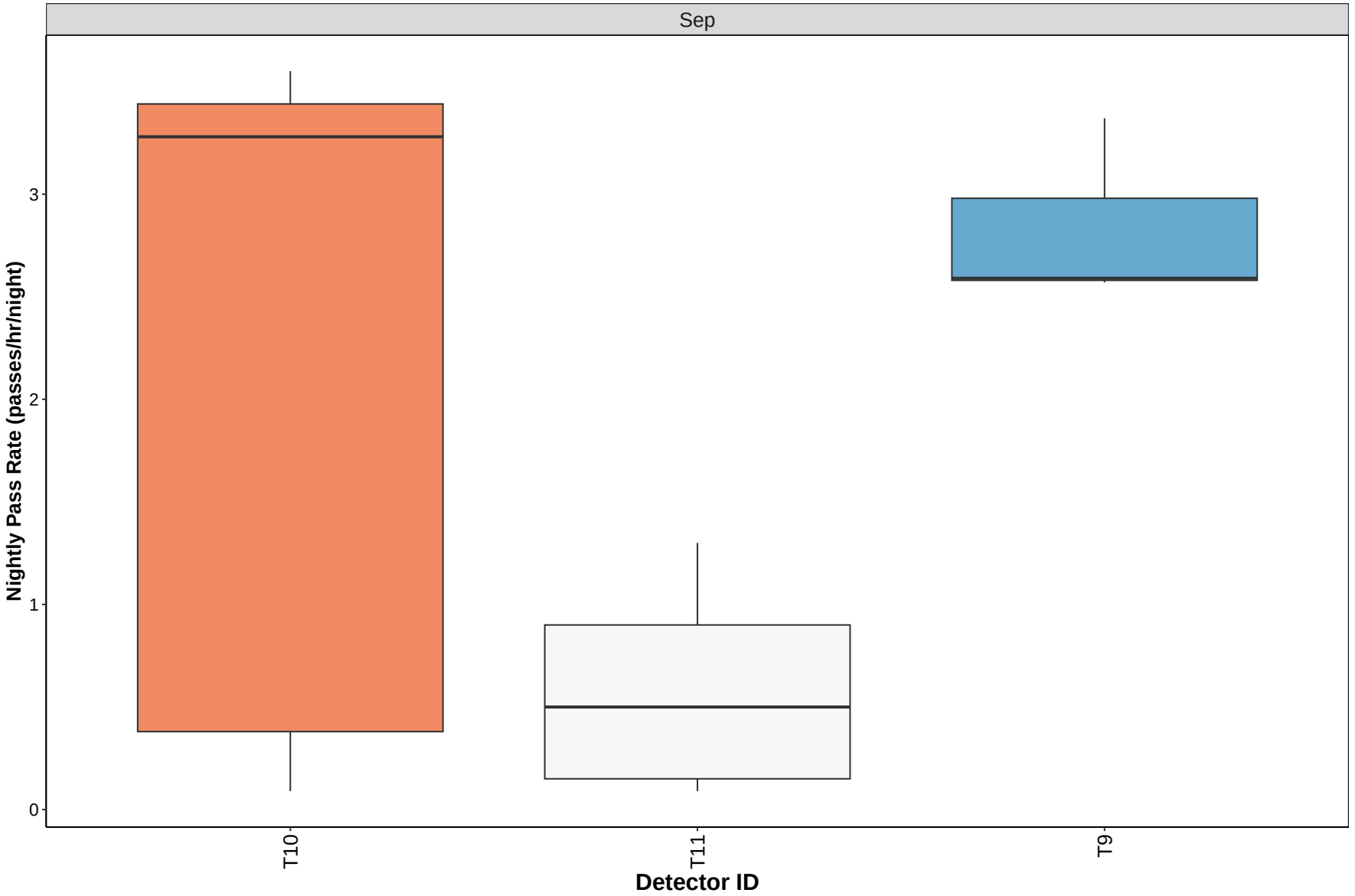

Natterer's
Sep
0.150
0.125
0.100
Nightly Pass Rate (passes/hr/night)
T10
T11
Detector ID

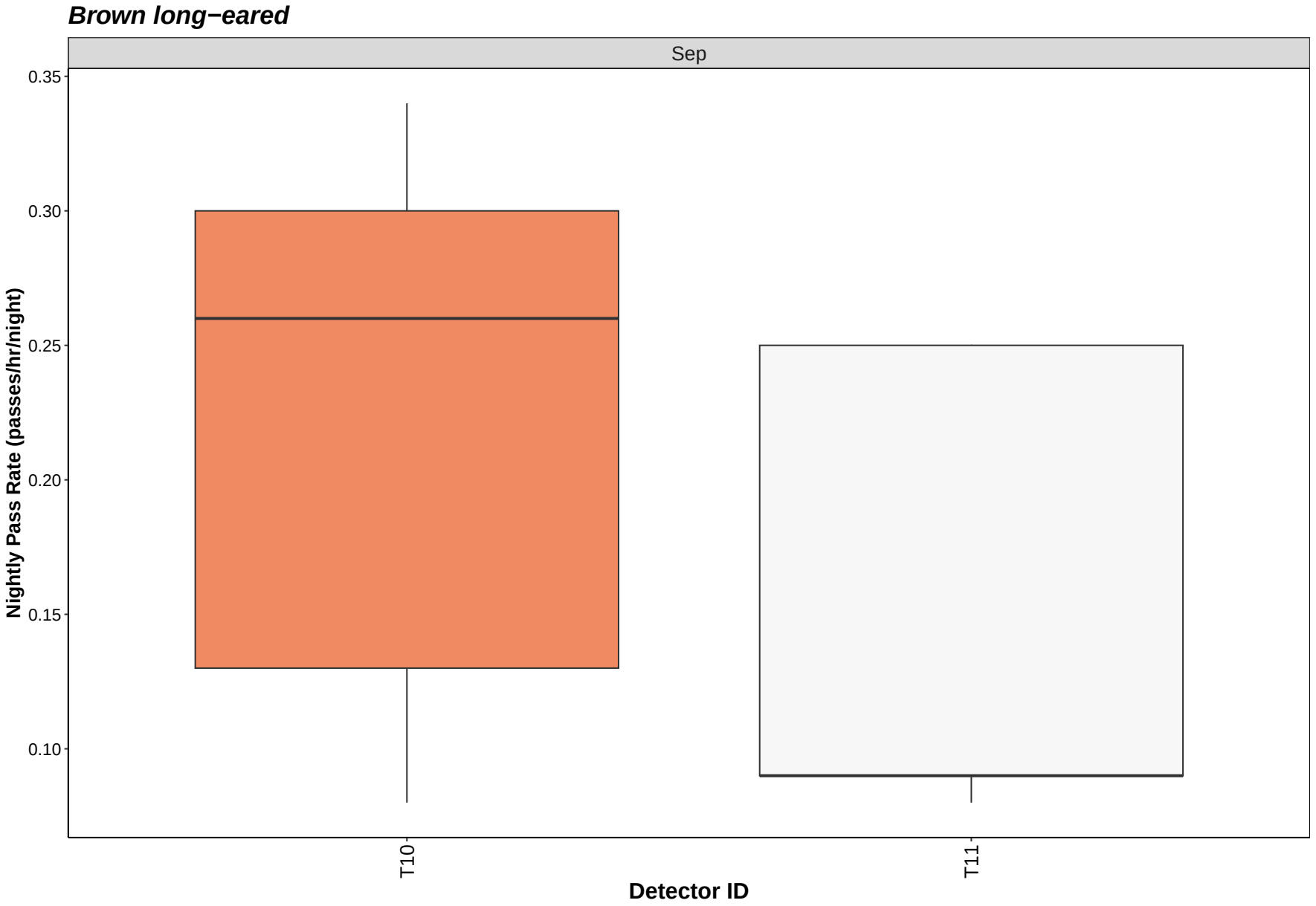

Leisler's
Sep
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
T10
T11
T9
Detector ID

***Common pipistrelle***



***Soprano pipistrelle***




Brown long−eared
Sep
0.35
0.30
0.25
0.20
0.15
0.10
Nightly Pass Rate (passes/hr/night)
T10
T11
Detector ID

## Bat Activity per Detector Location

**Figure 13.** Detector ID reference:

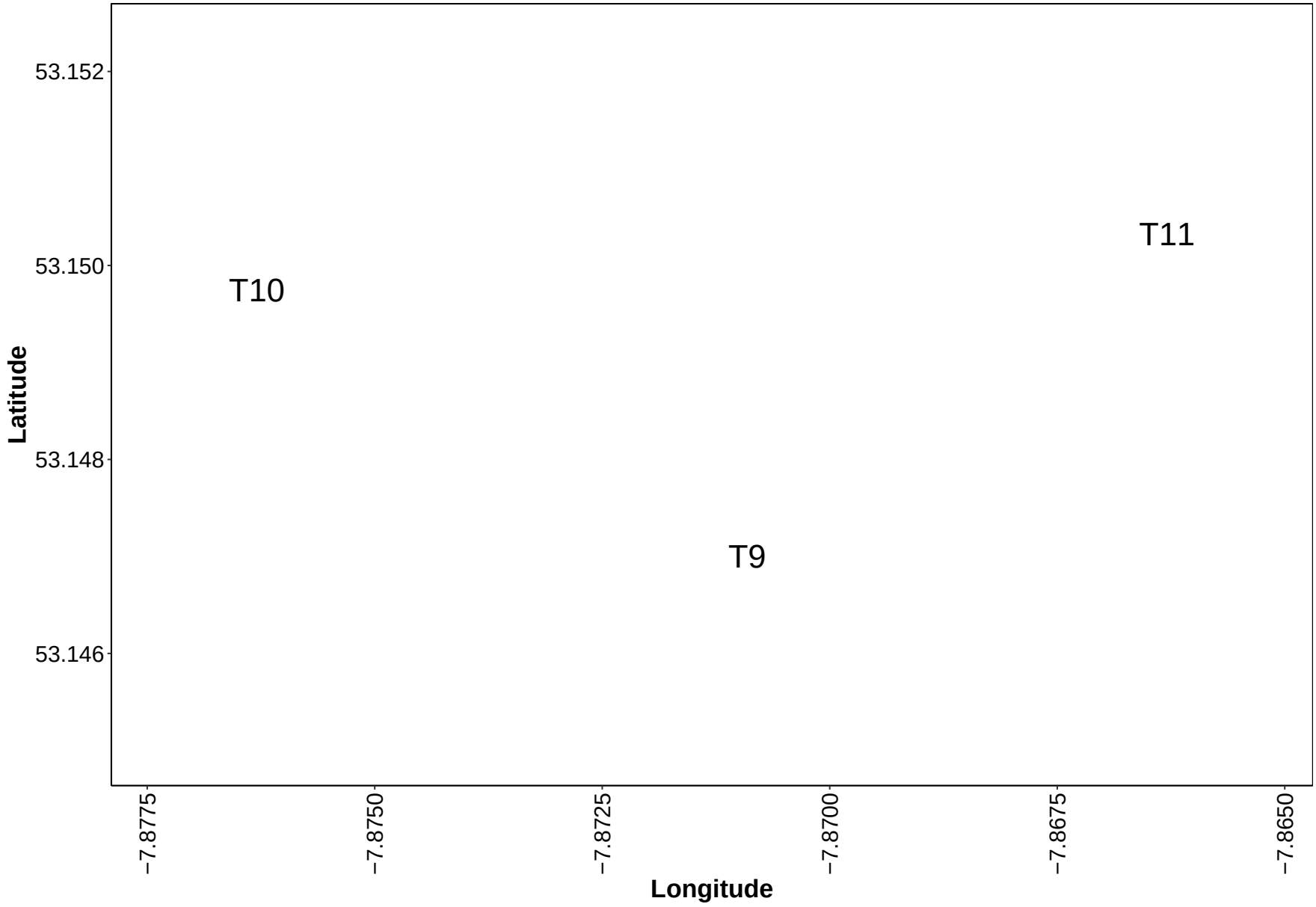
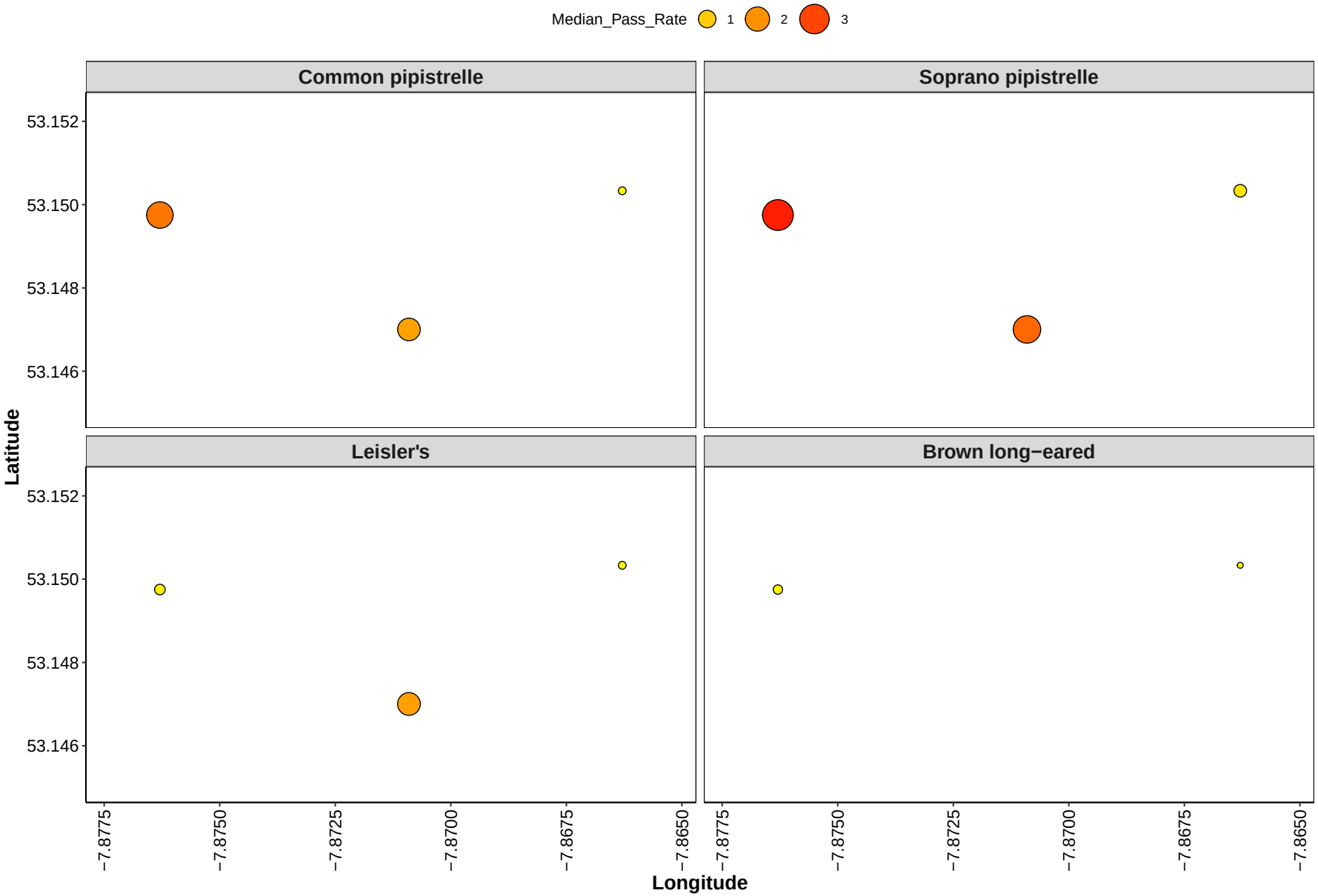

53.152
53.150
53.148
53.146
Latitude
T10
T11
T9
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

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


Median_Pass_Rate
1
2
3
Common pipistrelle
Soprano pipistrelle
Leisler's
Brown long−eared
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

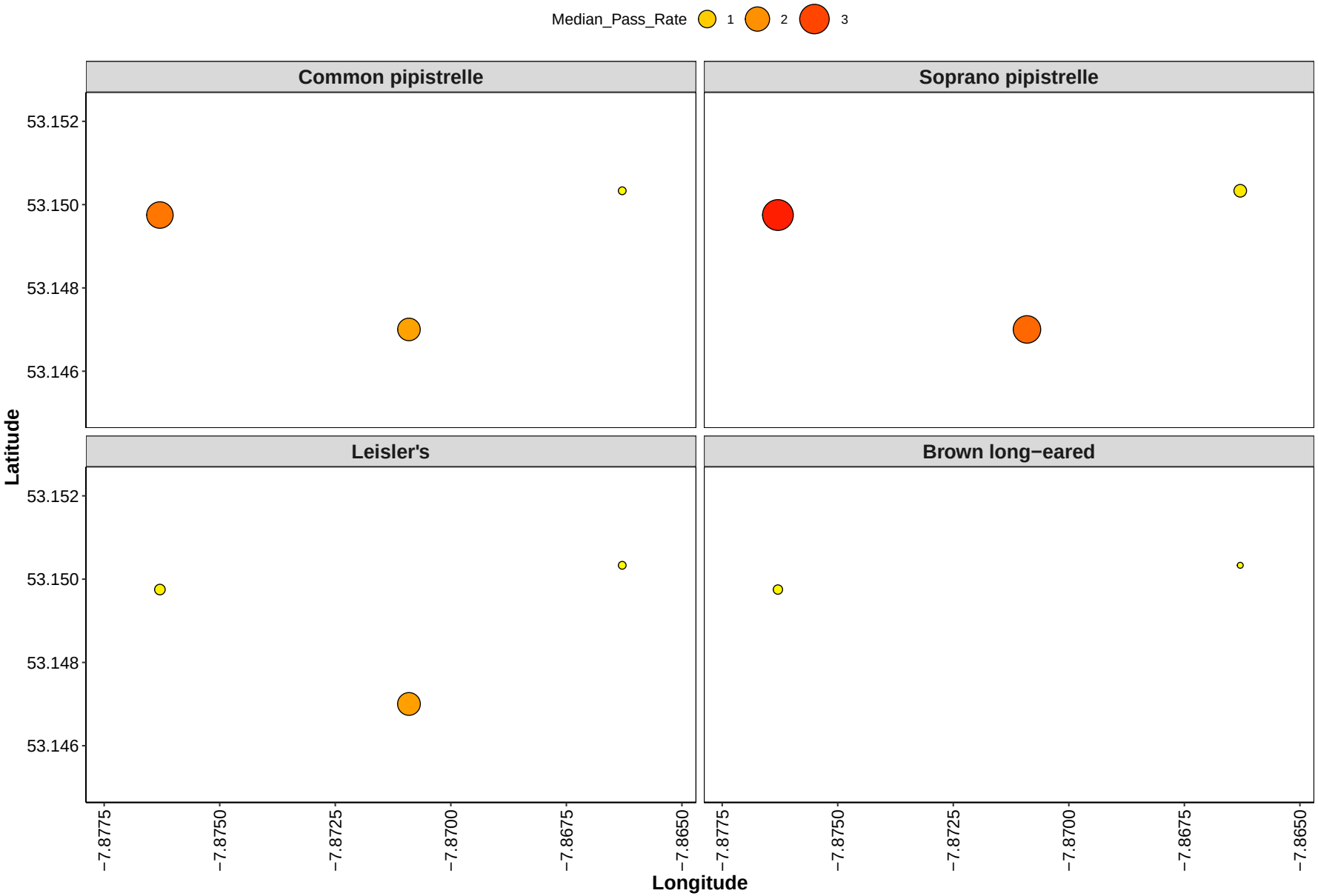
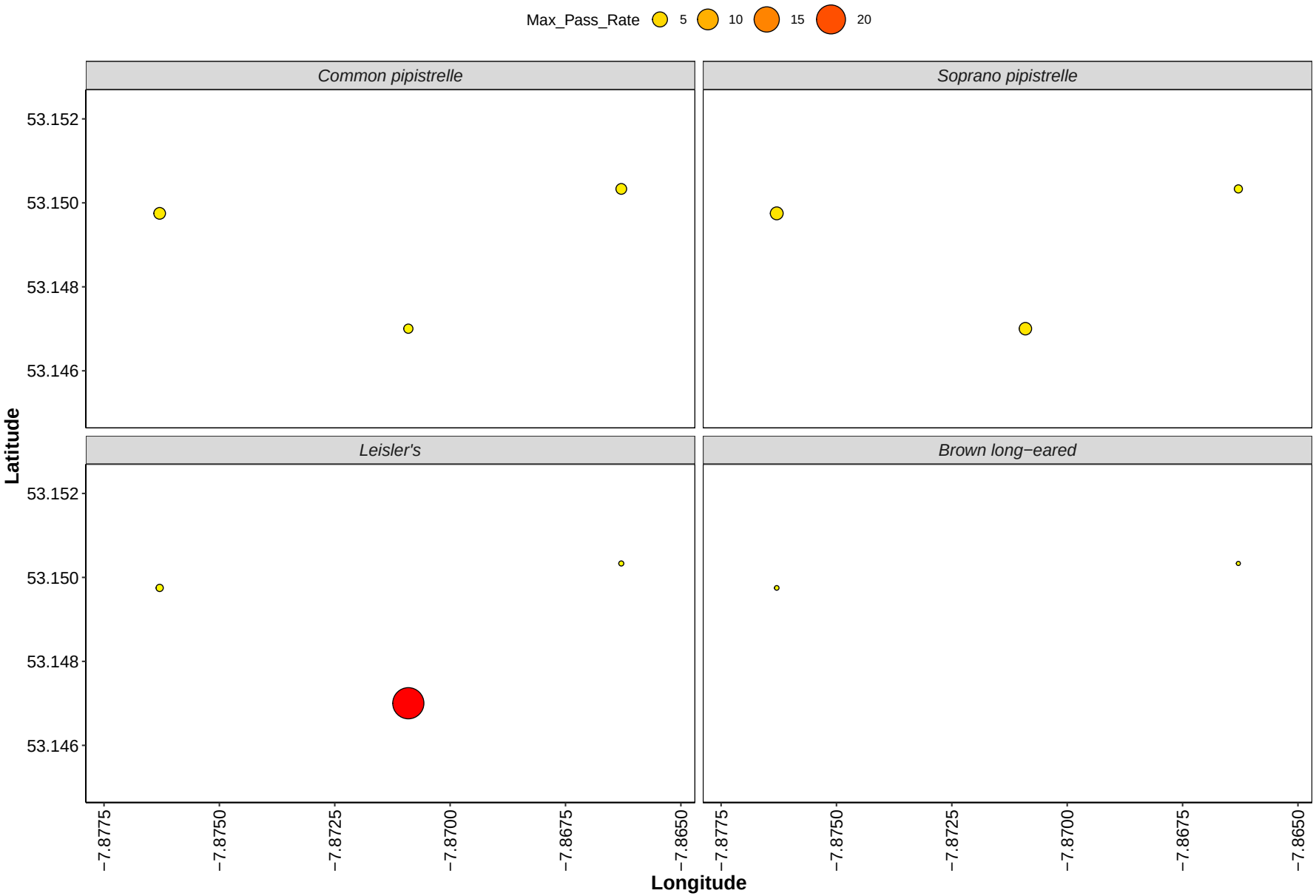
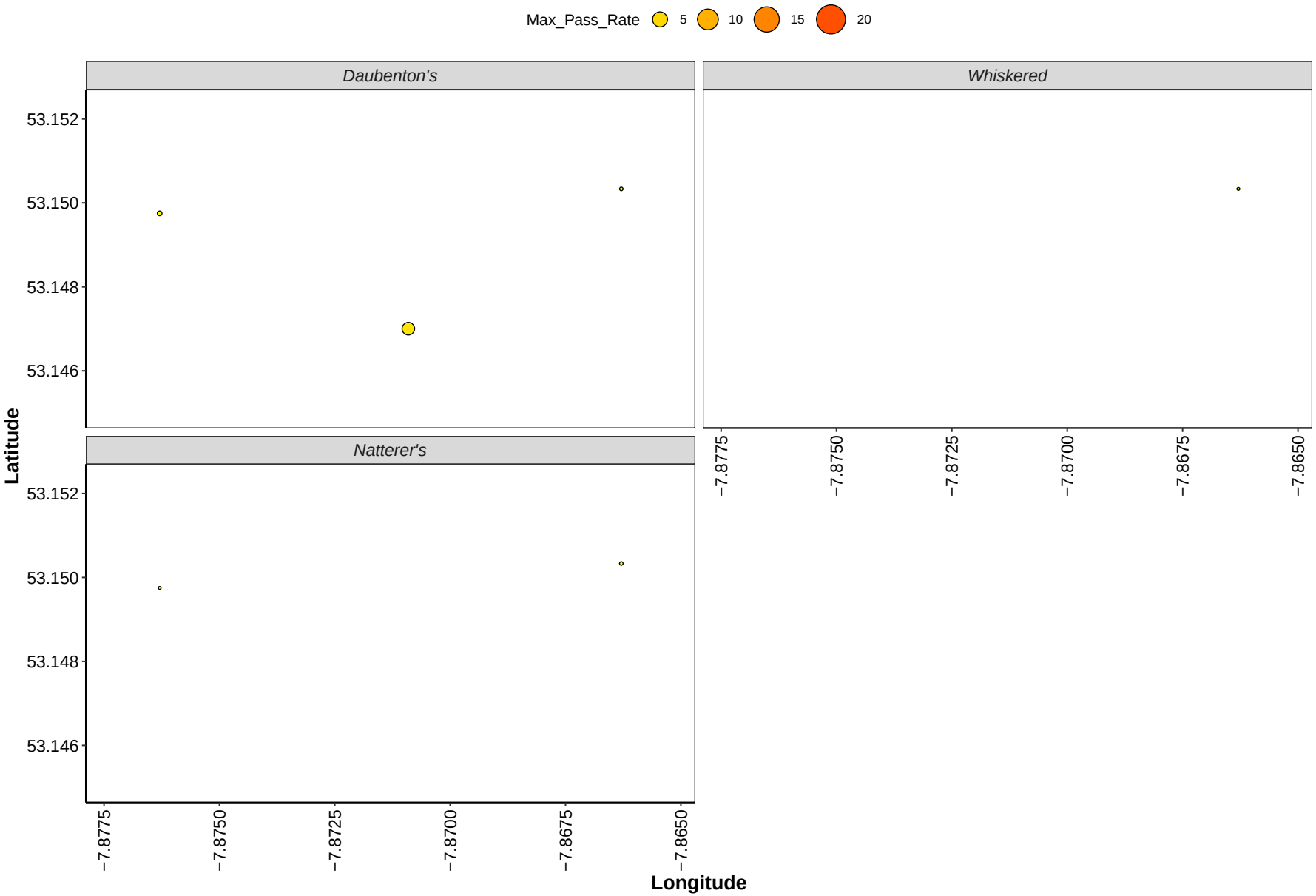

Median_Pass_Rate
1
2
3
Common pipistrelle
Soprano pipistrelle
Leisler's
Brown long−eared
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

**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
Leisler's
Brown long−eared
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude


Max_Pass_Rate
5
10
15
20
Daubenton's
Whiskered
Natterer's
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
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

# 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 | T10 | 0.1 |
| Brown long-eared | T11 | 0.1 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 1.3 |
| Common pipistrelle | T11 | 0.2 |
| Common pipistrelle | T9 | 0.4 |
| Daubenton's | T10 | 0.1 |
| Daubenton's | T11 | 0.0 |
| Daubenton's | T9 | 1.7 |
| Leisler's | T10 | 0.2 |
| Leisler's | T11 | 0.2 |
| Leisler's | T9 | 1.7 |
| Natterer's | T10 | 0.0 |
| Natterer's | T11 | 0.0 |
| Natterer's | T9 | 0.0 |
| Soprano pipistrelle | T10 | 0.4 |
| Soprano pipistrelle | T11 | 0.2 |
| Soprano pipistrelle | T9 | 0.0 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

# Mean per Detector

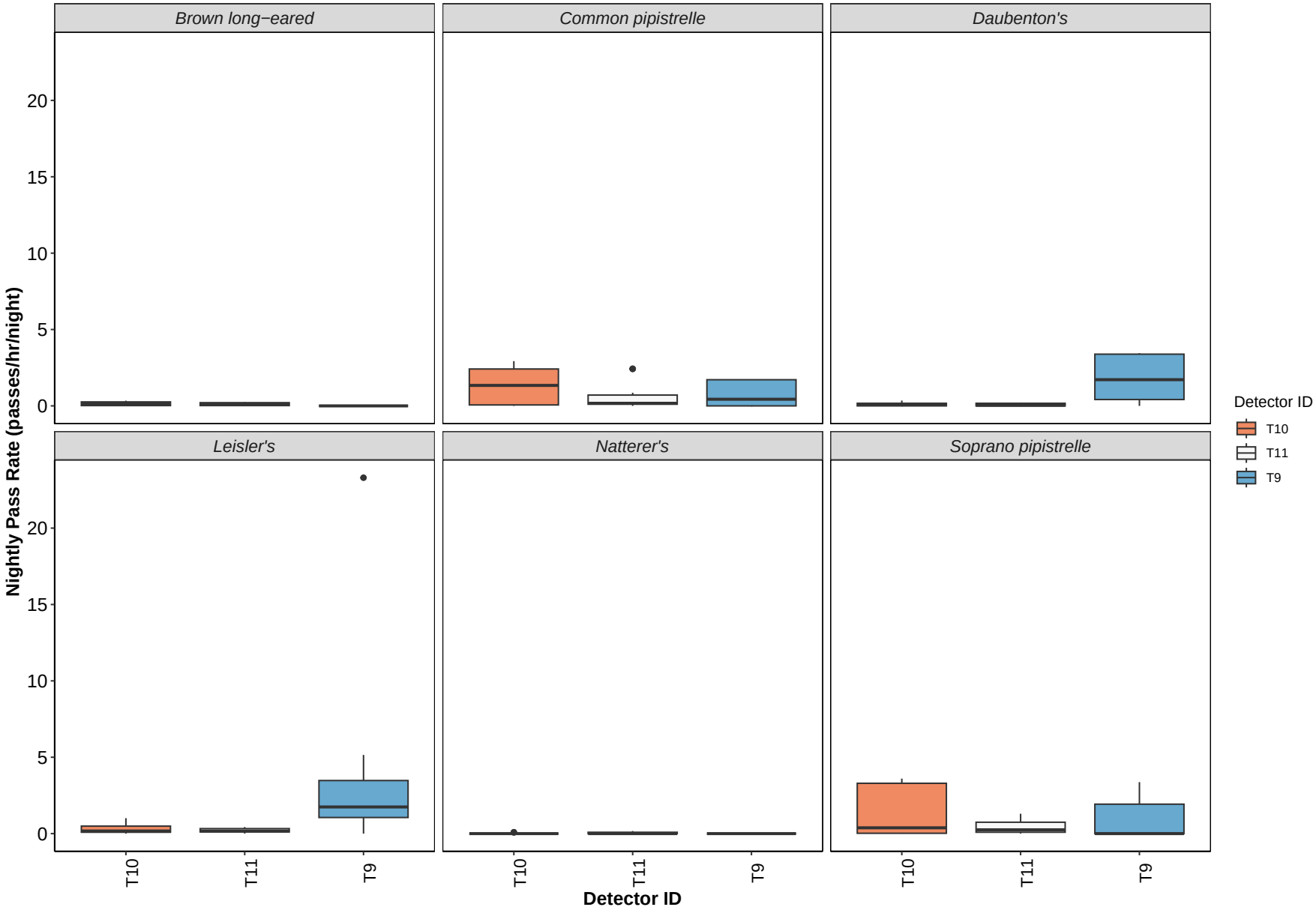
**Table 23. The mean Nightly Pass Rate (bat passes per hour, per night) of each species at each detector. Values are given to 1 decimal place.**

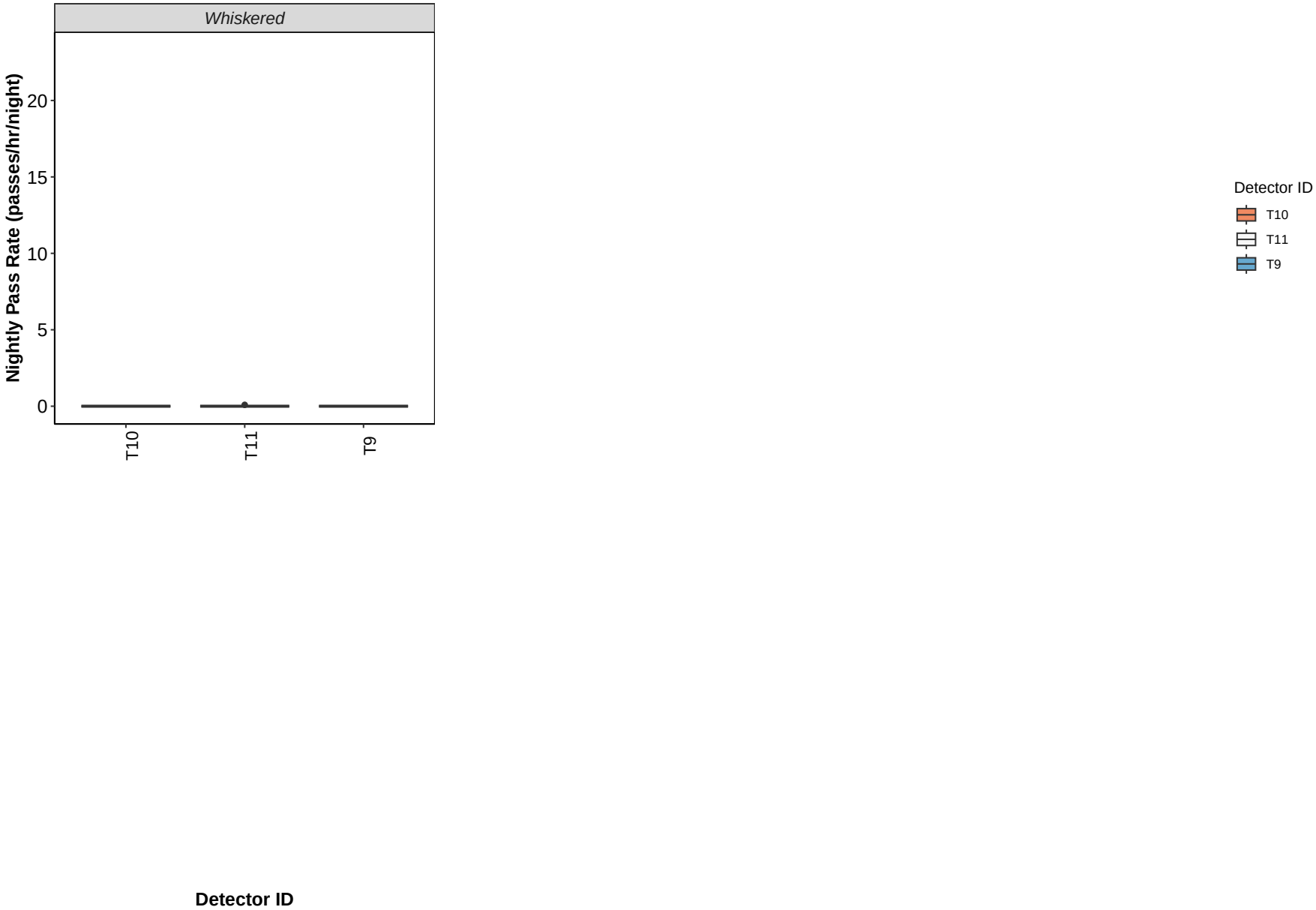
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

| Species | Detector ID | Mean Pass Rate |
|---|---|---|
| Brown long-eared | T10 | 0.2 |
| Brown long-eared | T11 | 0.1 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 1.4 |
| Common pipistrelle | T11 | 0.7 |
| Common pipistrelle | T9 | 0.8 |
| Daubenton's | T10 | 0.1 |
| Daubenton's | T11 | 0.1 |
| Daubenton's | T9 | 1.9 |
| Leisler's | T10 | 0.3 |
| Leisler's | T11 | 0.2 |
| Leisler's | T9 | 4.2 |
| Natterer's | T10 | 0.0 |
| Natterer's | T11 | 0.1 |
| Natterer's | T9 | 0.0 |
| Soprano pipistrelle | T10 | 1.5 |
| Soprano pipistrelle | T11 | 0.5 |
| Soprano pipistrelle | T9 | 0.9 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

## Per Detector

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


Brown long−eared
Common pipistrelle
Daubenton's
Leisler's
Natterer's
Soprano pipistrelle
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
T10
T11
T9
Detector ID
Detector ID
T10
T11
T9


Whiskered
Nightly Pass Rate (passes/hr/night)
20
15
10
5
0
T10
T11
T9
Detector ID
Detector ID
T10
T11
T9

# Survey Effort

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

| month | Detector ID | No. of Survey Nights |
|---|---|---|
| Sep | T10 | 10 |
| Sep | T11 | 10 |
| Sep | T9 | 10 |

## Nighlty Bat Pass Rate for Each Month

# Median per Detector

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

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

| Species | Detector ID | Sep |
|---|---|---|
| Brown long-eared | T10 | 0.1 |
| Brown long-eared | T11 | 0.1 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 1.3 |
| Common pipistrelle | T11 | 0.2 |
| Common pipistrelle | T9 | 0.4 |
| Daubenton's | T10 | 0.1 |
| Daubenton's | T11 | 0.0 |
| Daubenton's | T9 | 1.7 |
| Leisler's | T10 | 0.2 |
| Leisler's | T11 | 0.2 |
| Leisler's | T9 | 1.7 |
| Natterer's | T10 | 0.0 |
| Natterer's | T11 | 0.0 |
| Natterer's | T9 | 0.0 |
| Soprano pipistrelle | T10 | 0.4 |
| Soprano pipistrelle | T11 | 0.2 |
| Soprano pipistrelle | T9 | 0.0 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

# Mean per Detector

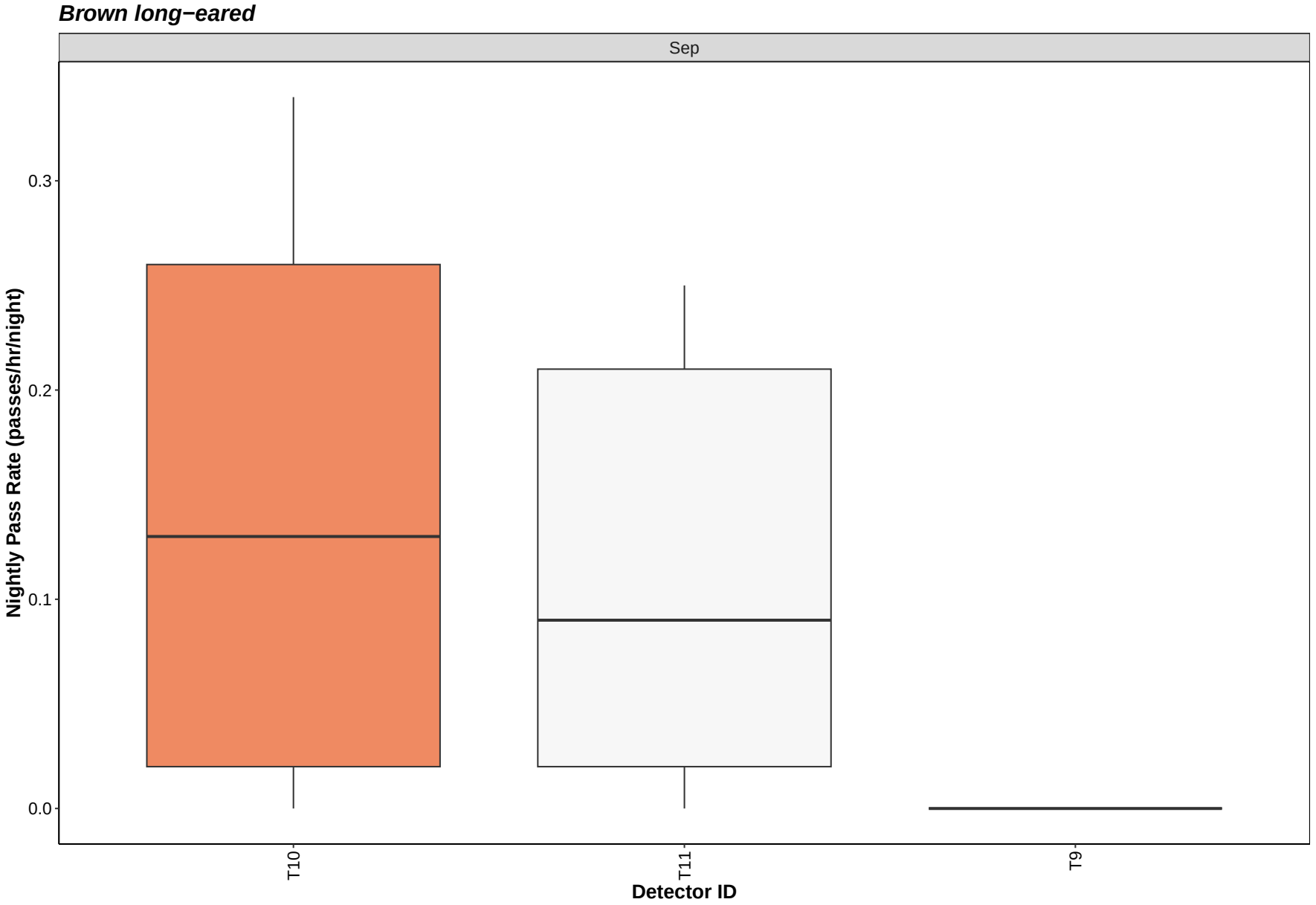
**Table 26. The mean Nightly Pass Rate (bat passes per hour, per night) of each species throughout each month. Values are given to 1 decimal place.**

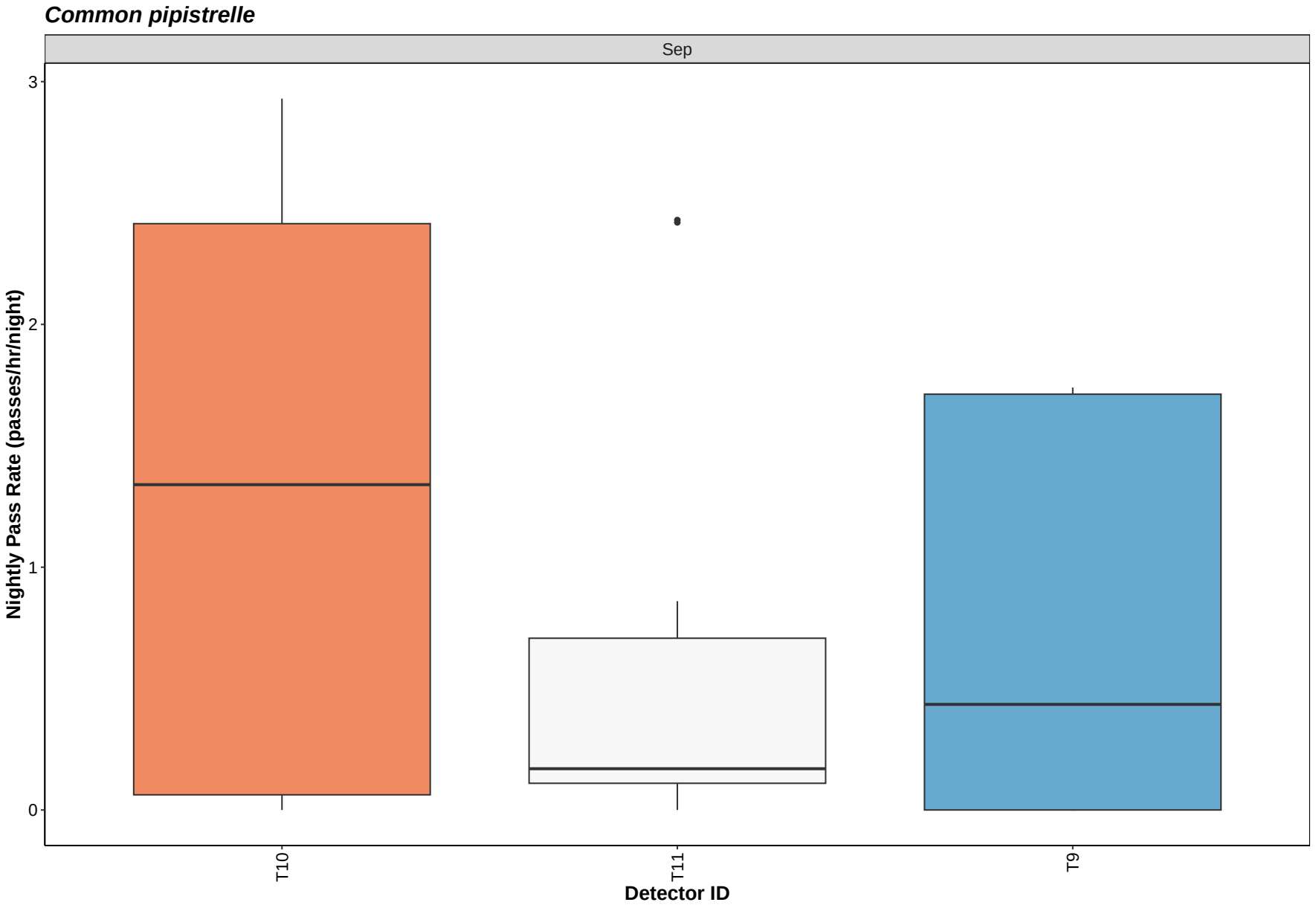
We recommend using the median values given above, for the reasons stated above, but provide the mean values in the table below.

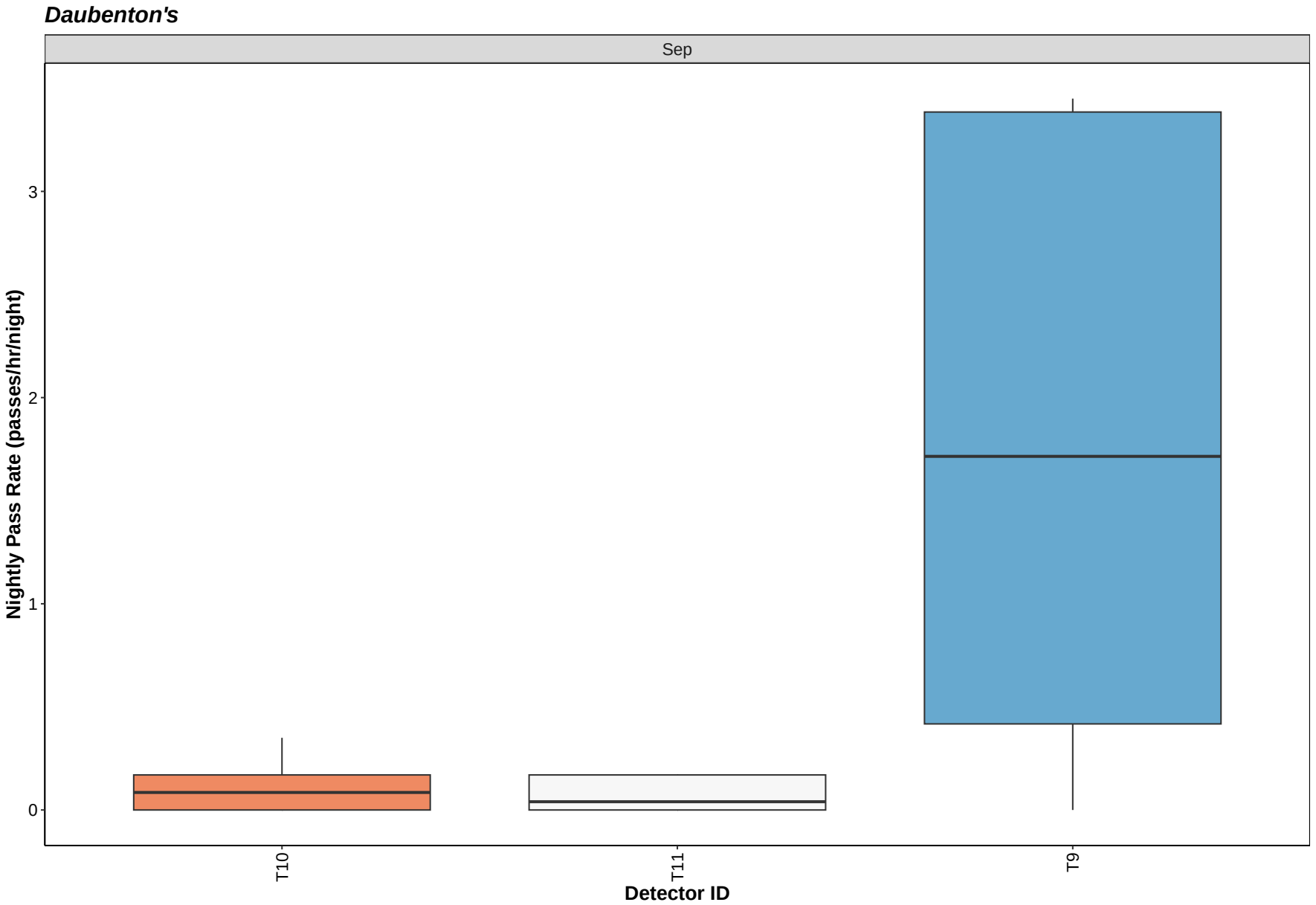
| Species | Detector ID | Sep |
|---|---|---|
| Brown long-eared | T10 | 0.2 |
| Brown long-eared | T11 | 0.1 |
| Brown long-eared | T9 | 0.0 |
| Common pipistrelle | T10 | 1.4 |
| Common pipistrelle | T11 | 0.7 |
| Common pipistrelle | T9 | 0.8 |
| Daubenton's | T10 | 0.1 |
| Daubenton's | T11 | 0.1 |
| Daubenton's | T9 | 1.9 |
| Leisler's | T10 | 0.3 |
| Leisler's | T11 | 0.2 |
| Leisler's | T9 | 4.2 |
| Natterer's | T10 | 0.0 |
| Natterer's | T11 | 0.1 |
| Natterer's | T9 | 0.0 |
| Soprano pipistrelle | T10 | 1.5 |
| Soprano pipistrelle | T11 | 0.5 |
| Soprano pipistrelle | T9 | 0.9 |
| Whiskered | T10 | 0.0 |
| Whiskered | T11 | 0.0 |
| Whiskered | T9 | 0.0 |

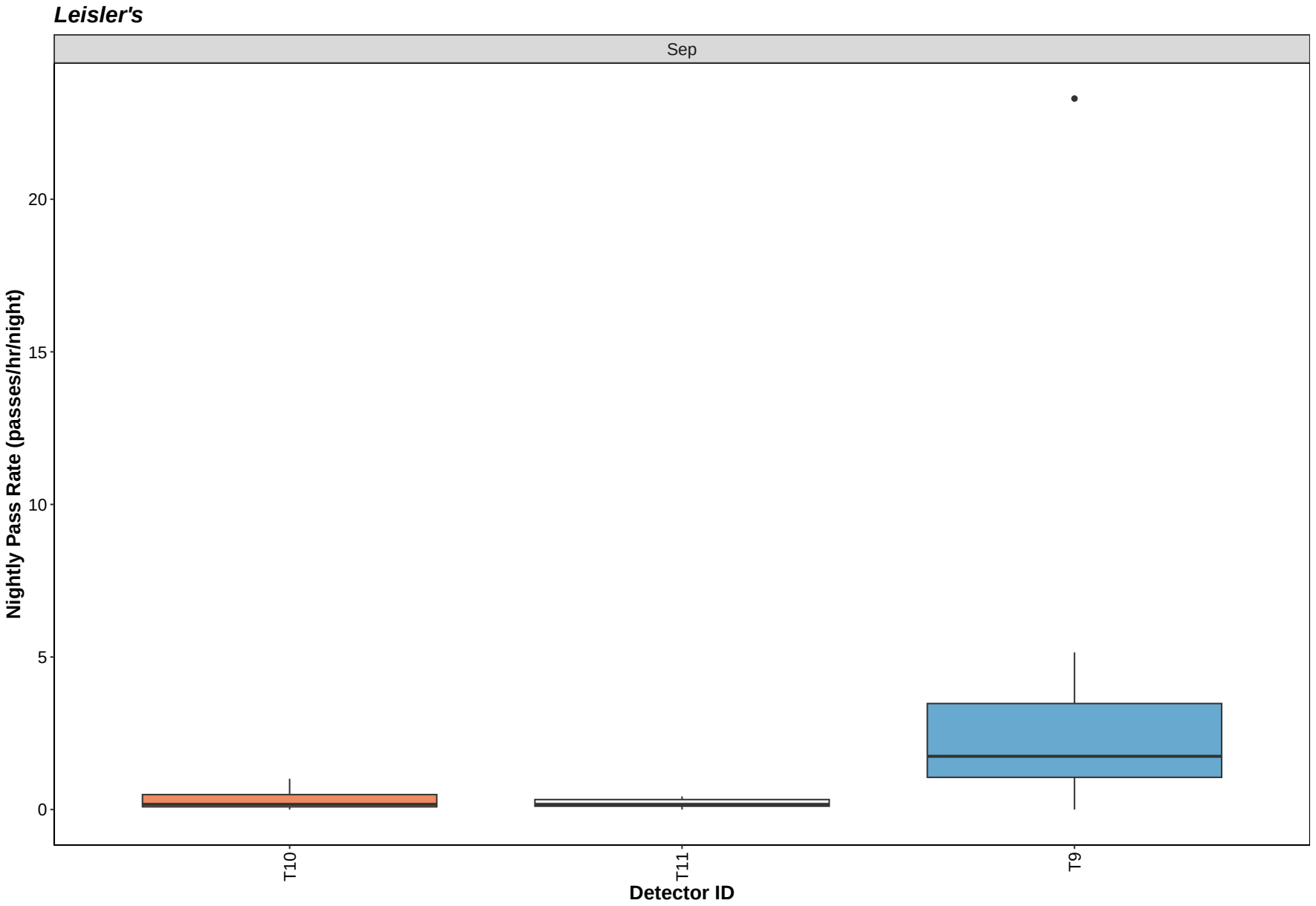
## Per Detector

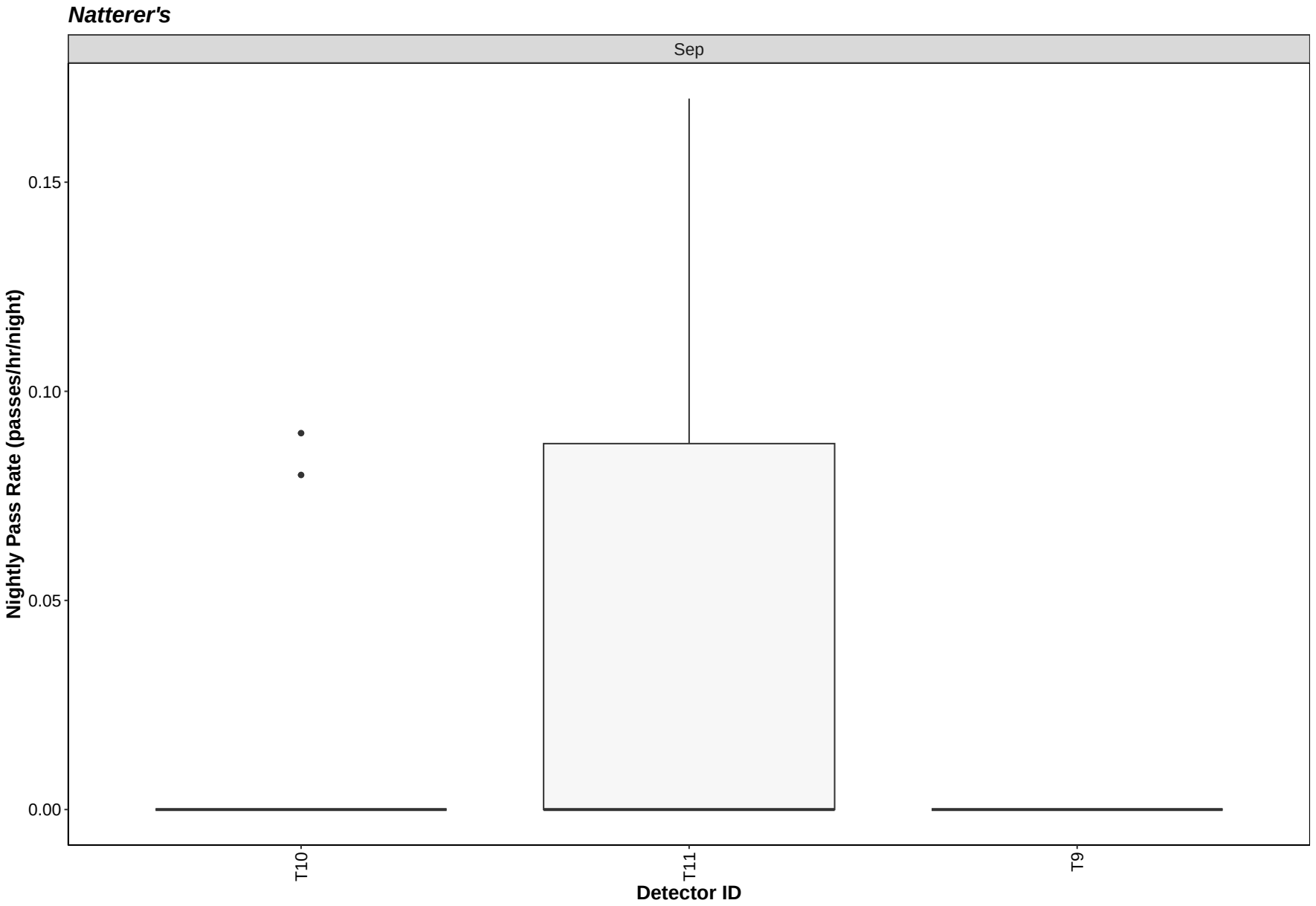
**Figure 17.** Figures show boxplots for the number of bat passes per hour by detector, for each month. The ‘box’ shows the interquartile range, which is where the middle 50% of the data lie. The line dividing the box is the median, the mid-point of the data. The ‘whiskers’ extend from the box and represent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

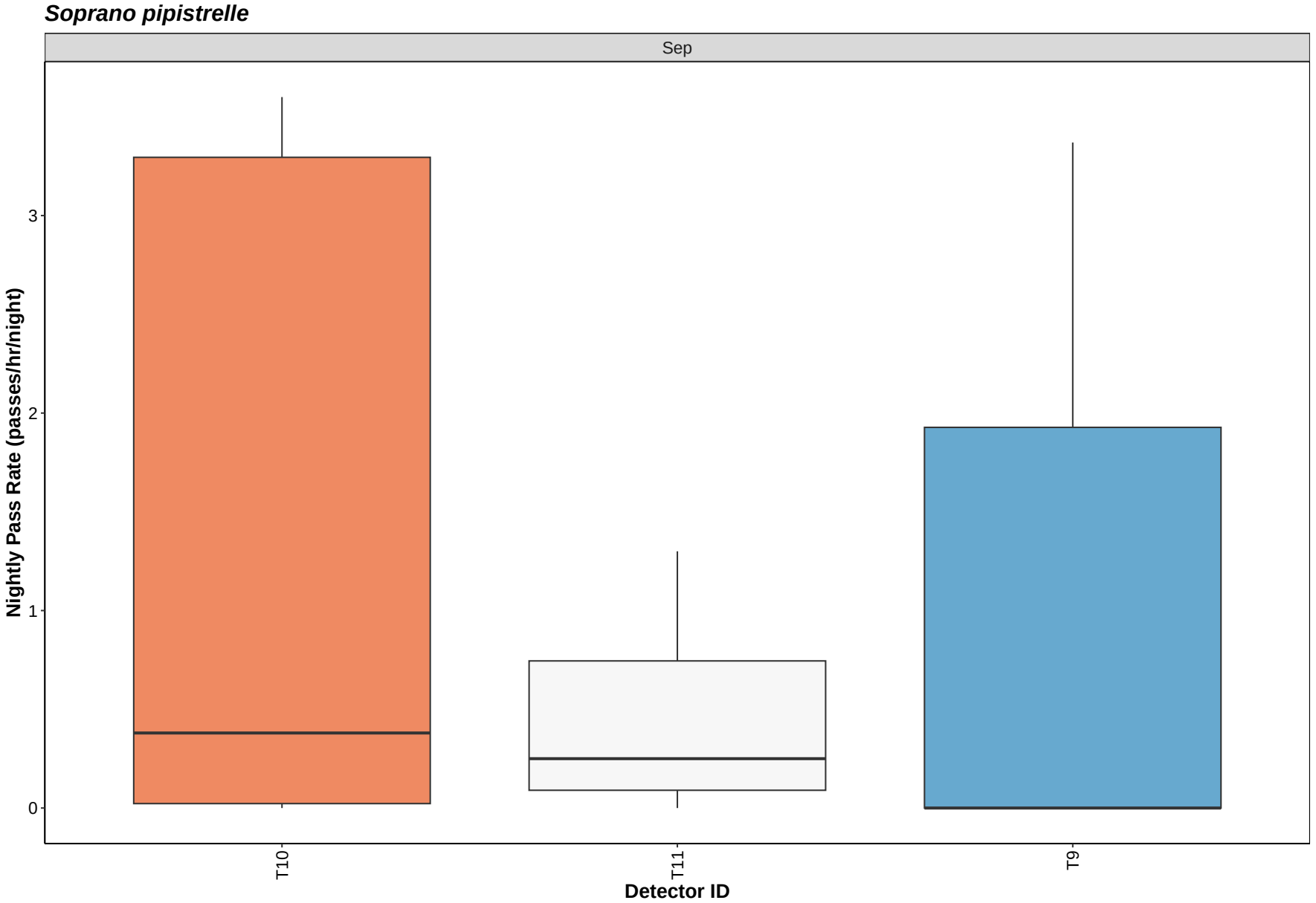

Brown long−eared
Sep
Nightly Pass Rate (passes/hr/night)
0.3
0.2
0.1
0.0
T10
T11
T9
Detector ID

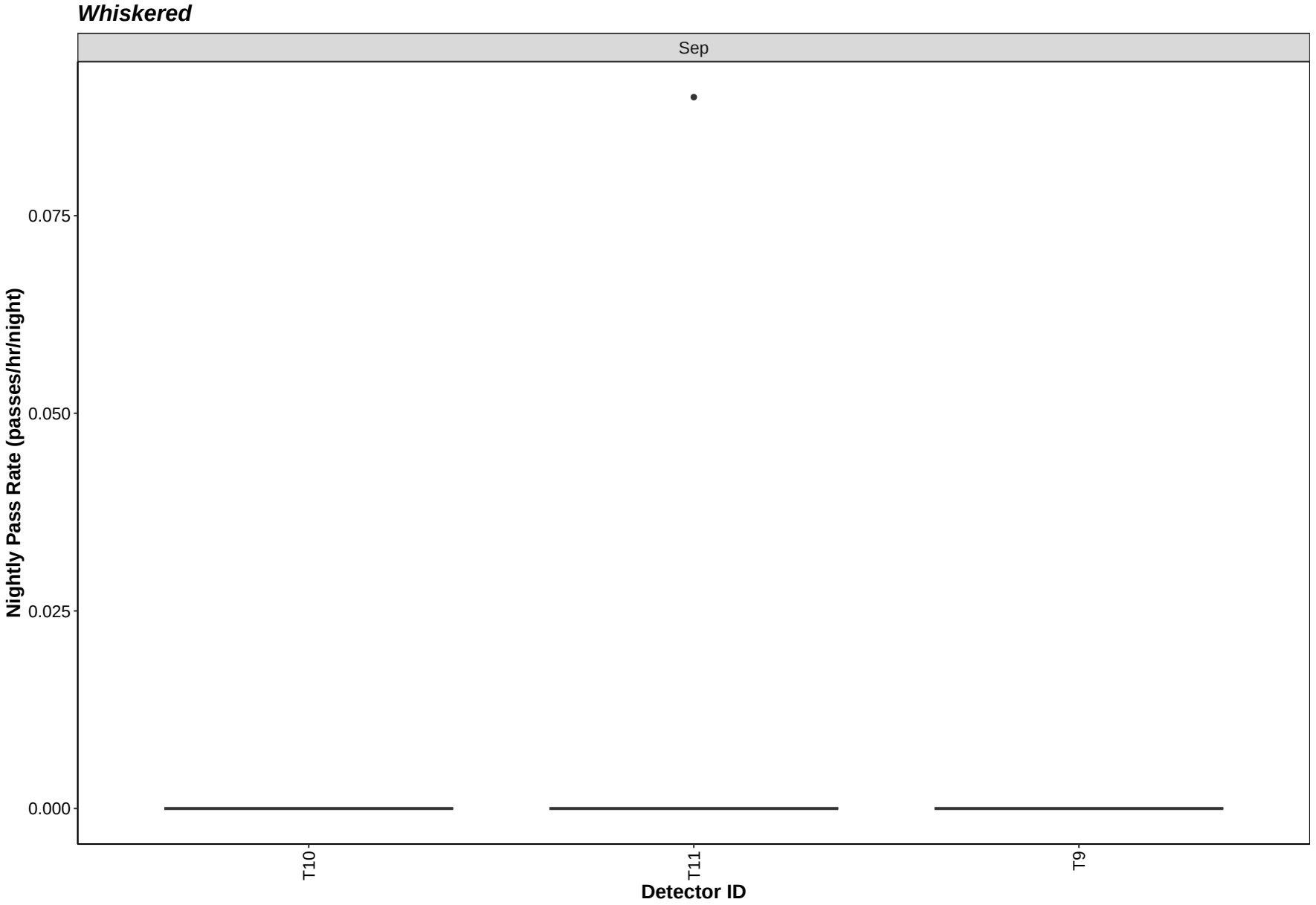

Common pipistrelle
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
T10
T11
T9
Detector ID


Daubenton's
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
T10
T11
T9
Detector ID


Leisler's
Sep
Nightly Pass Rate (passes/hr/night)
0
5
10
15
20
T10
T11
T9
Detector ID


Natterer's
Sep
0.15
0.10
0.05
0.00
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID


Soprano pipistrelle
Sep
Nightly Pass Rate (passes/hr/night)
0
1
2
3
T10
T11
T9
Detector ID


Whiskered
Sep
0.075
0.050
0.025
0.000
Nightly Pass Rate (passes/hr/night)
T10
T11
T9
Detector ID

# Bat Activity per Detector Location

**Figure 18.** Detector ID reference:

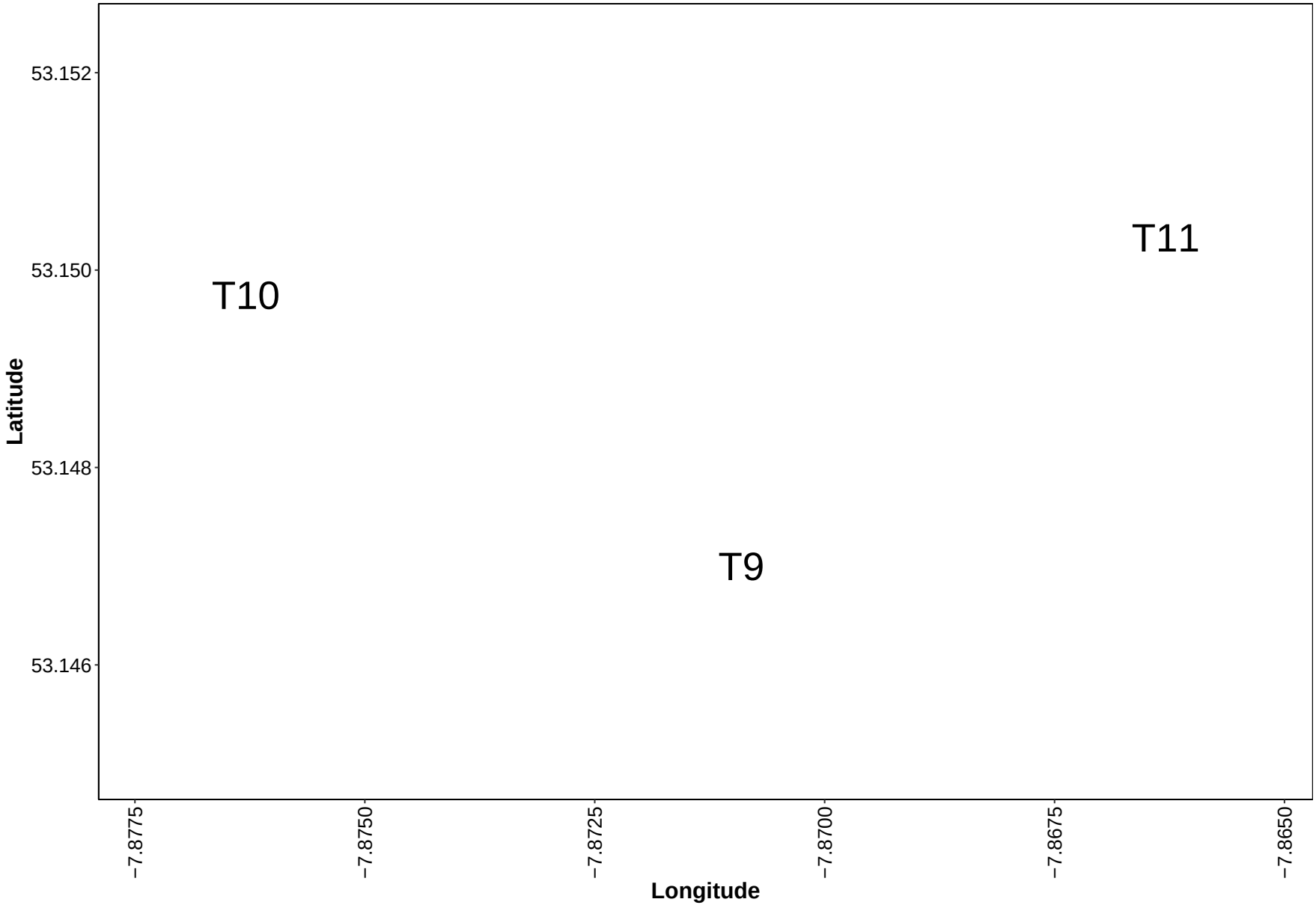
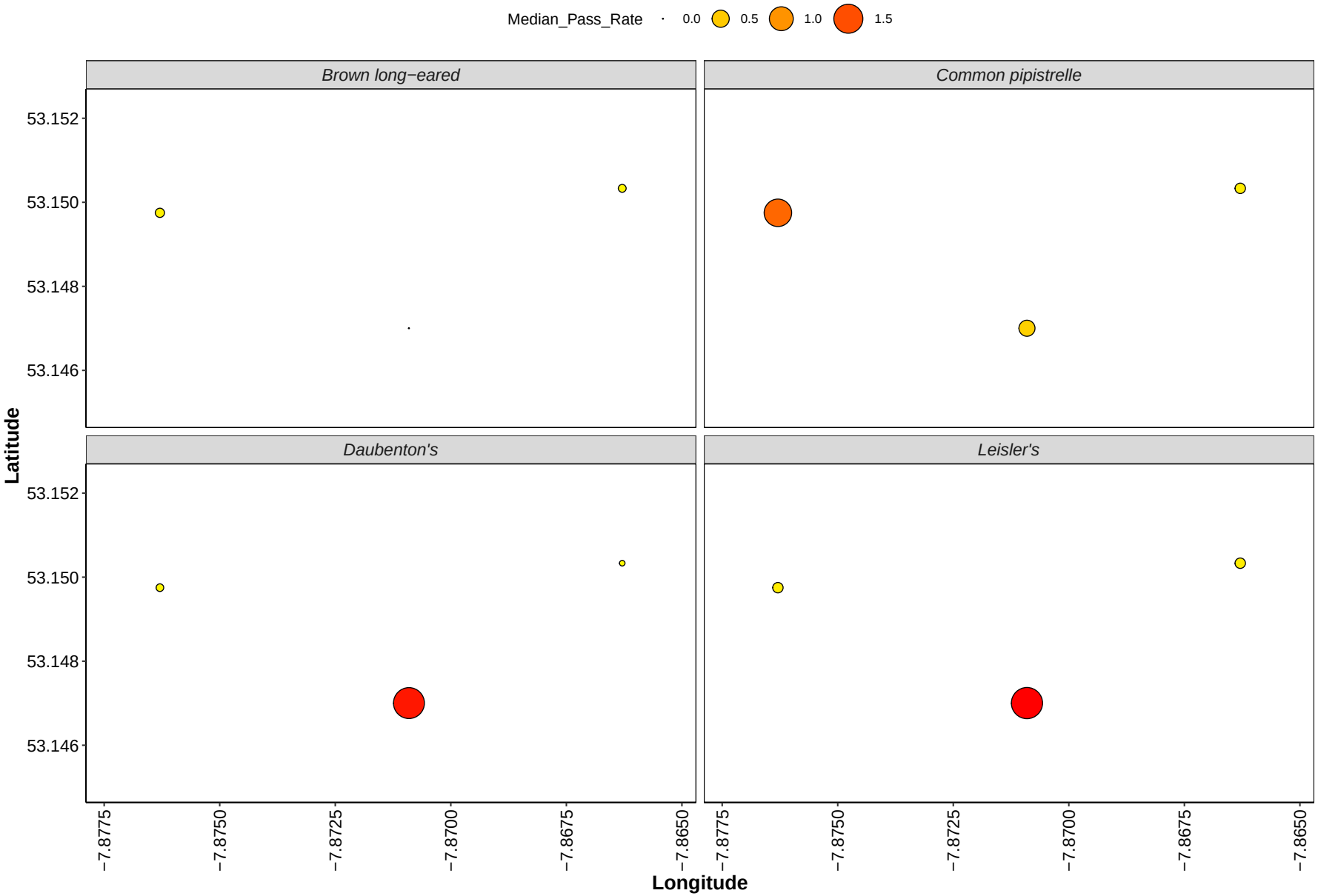

T10
T11
T9
53.152
53.150
53.148
53.146
Latitude
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

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


Median_Pass_Rate
0.0
0.5
1.0
1.5
Brown long−eared
Common pipistrelle
Daubenton's
Leisler's
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

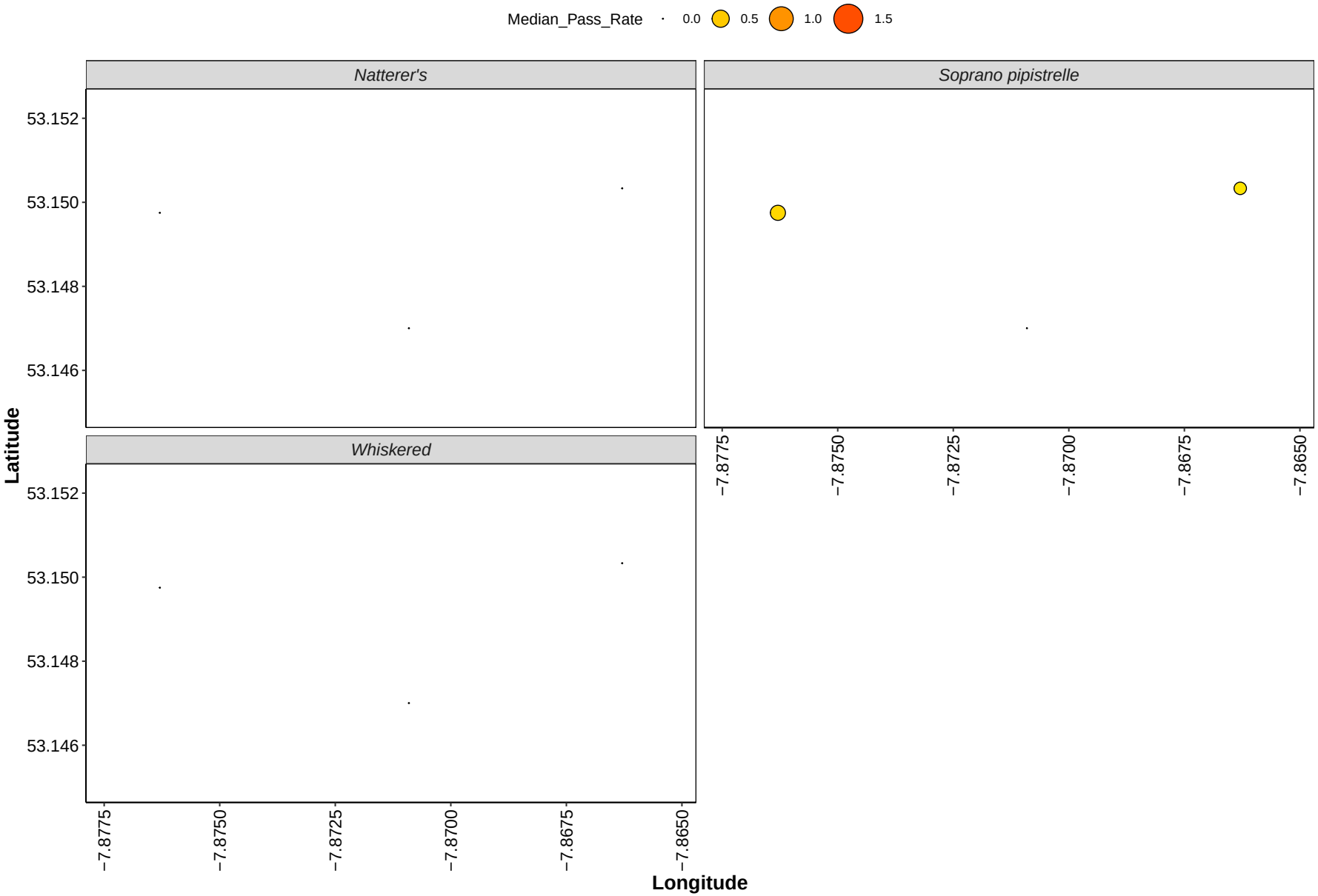
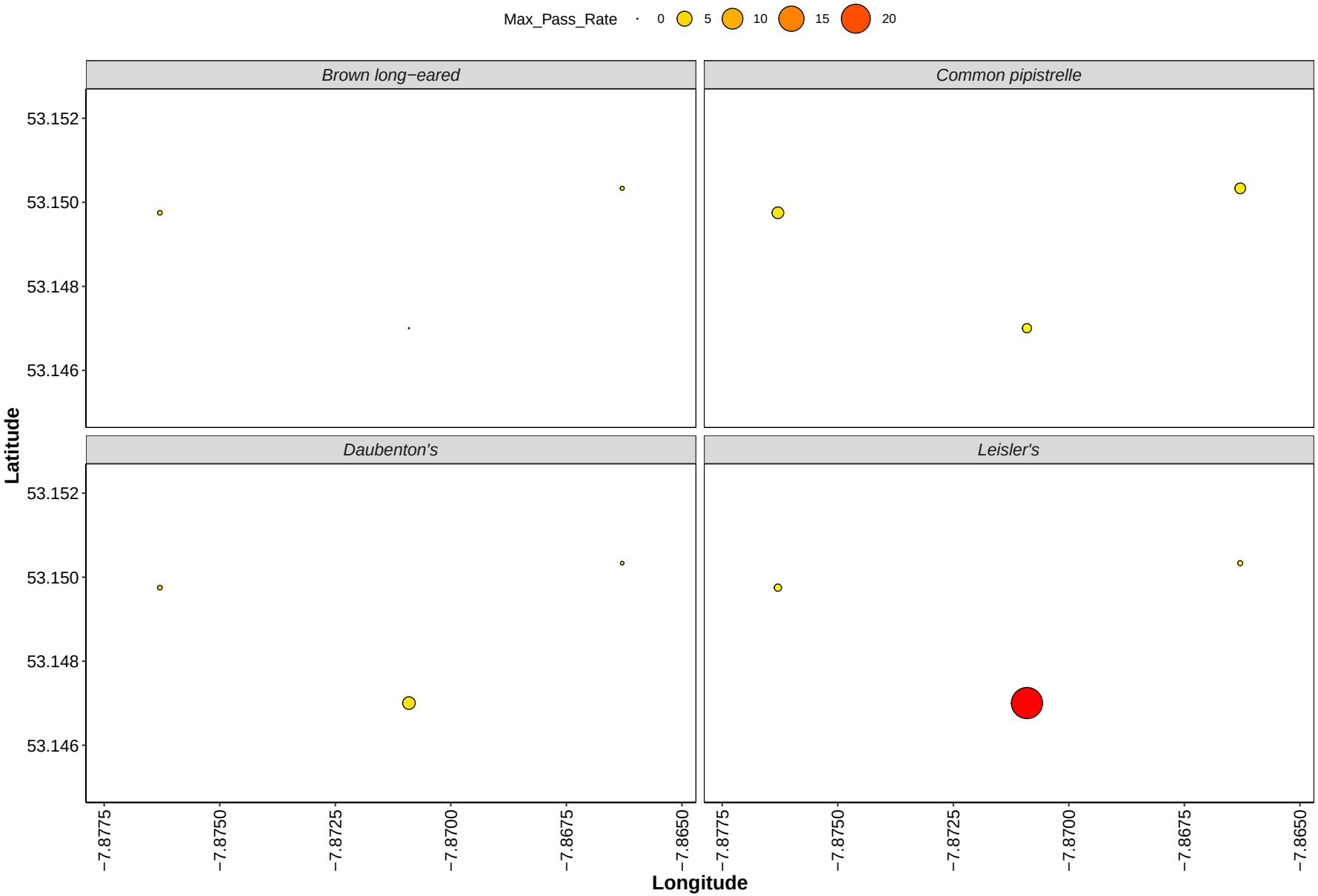
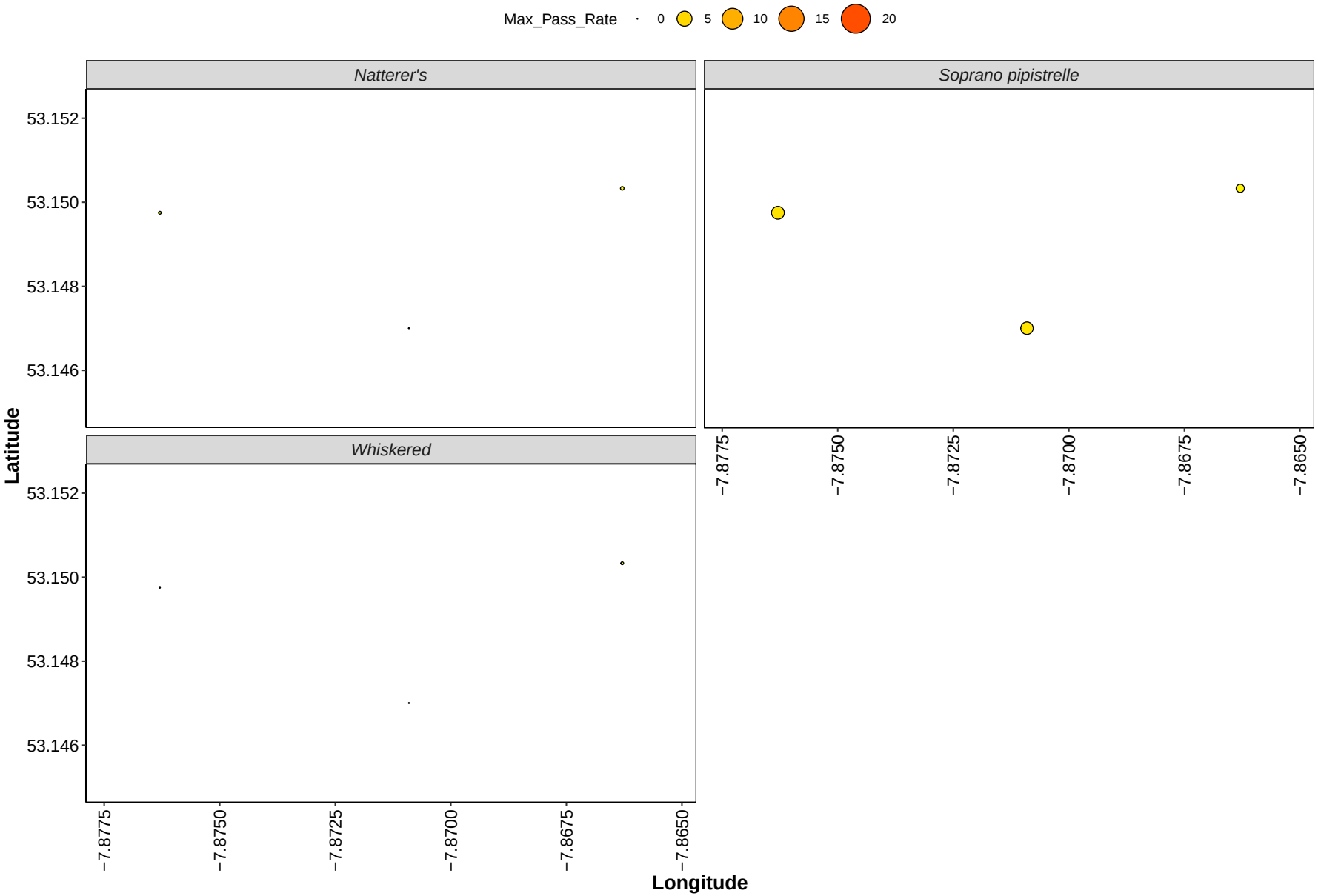

Median_Pass_Rate
0.0
0.5
1.0
1.5
Natterer's
Soprano pipistrelle
Whiskered
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Latitude
Longitude

**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
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude


Max_Pass_Rate
0
5
10
15
20
Natterer's
Soprano pipistrelle
Whiskered
Latitude
53.152
53.150
53.148
53.146
−7.8775
−7.8750
−7.8725
−7.8700
−7.8675
−7.8650
Longitude

**Thank you for using Ecobat!**

# Appendix G Weather Data

## Baseline Bat Survey Report

**Cush Wind Farm Phase IIII**

**Cush Wind Limited**

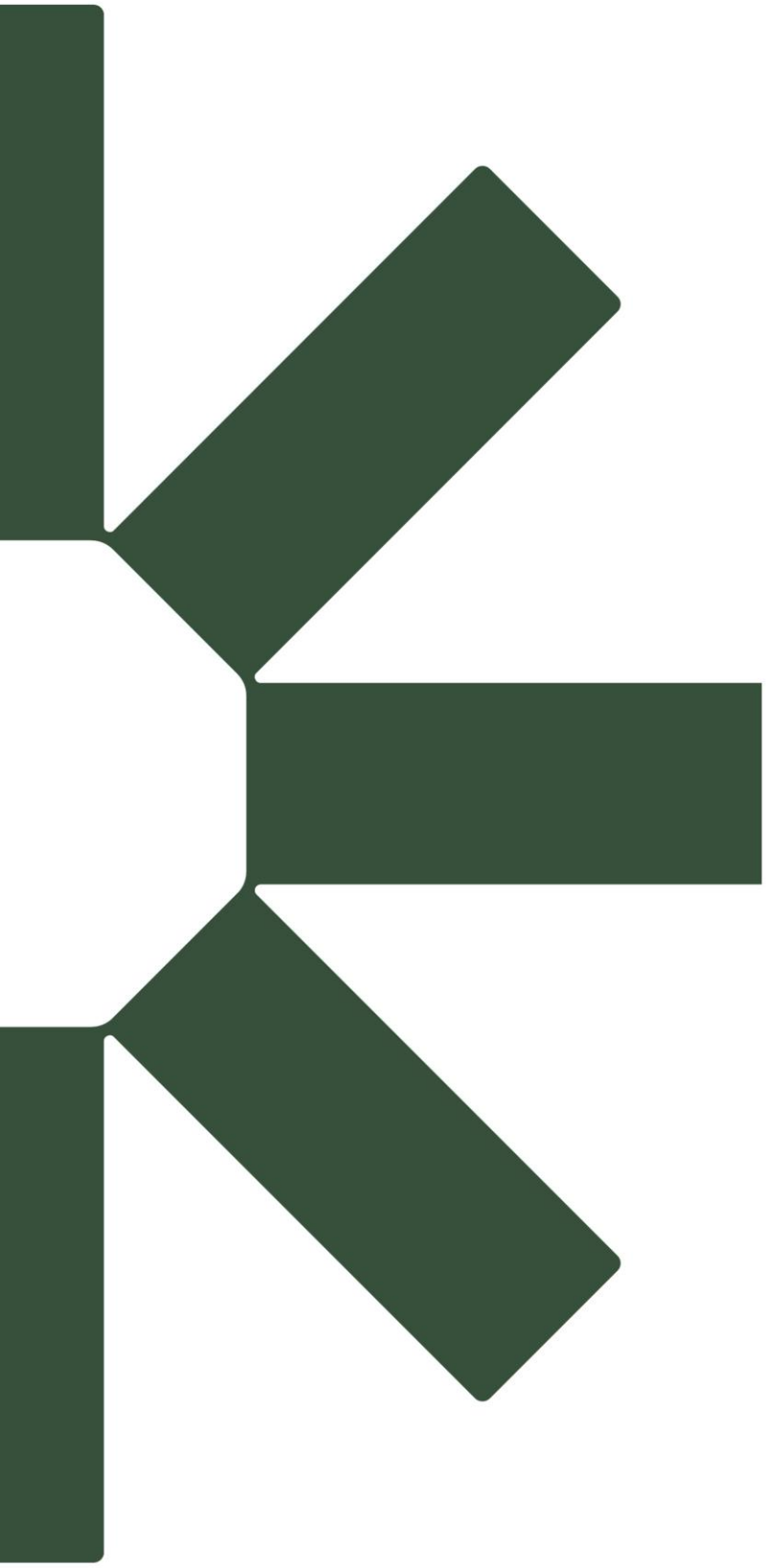
SLR Project No.: 501.065723.00001

21 October 2026

## Table G 1 Survey Dates and Weather Conditions – Static Detectors

| Survey Nights Used for Analysis | Sunset Date | Sunrise Date | Sunset (hh:mm) | Sunrise (hh:mm) | Temperature at Sunset (°C) | Mean Nightly Wind Speed (m/s) | Total Nightly Rainfall (mm) |
|---|---|---|---|---|---|---|---|
| **Spring session 2025** - deployment dates: 10 nights between 06/05/2025 and 16/05/2025 | | | | | | | |
| Night 1 | 06-May-25 | 07-May-25 | 21:08 | 05:45 | 12 | 1 | 0 |
| Night 2 | 07-May-25 | 08-May-25 | 21:10 | 05:43 | 14.6 | 2.1 | 0 |
| Night 3 | 08-May-25 | 09-May-25 | 21:12 | 05:41 | 11.6 | 1.3 | 0 |
| Night 4 | 09-May-25 | 10-May-25 | 21:13 | 05:39 | 13.7 | 3.7 | 0 |
| Night 5 | 10-May-25 | 11-May-25 | 21:15 | 05:38 | 14.2 | 1.5 | 0 |
| Night 6 | 11-May-25 | 12-May-25 | 21:17 | 05:36 | 11.9 | 3.6 | 0.3 |
| Night 7 | 12-May-25 | 13-May-25 | 21:18 | 05:34 | 15.7 | 3.2 | 0 |
| Night 8 | 13-May-25 | 14-May-25 | 21:20 | 05:33 | 15.6 | 3.7 | 0 |
| Night 9 | 14-May-25 | 15-May-25 | 21:22 | 05:31 | 14.7 | 2.6 | 0 |
| Night 10 | 15-May-25 | 16-May-25 | 21:23 | 05:30 | 15.8 | 2.7 | 0 |
| **Summer session 2025** - deployment dates: 12 nights between 04/06/2025 and 16/06/2025 | | | | | | | |
| Night 1 | 04-Jun-25 | 05-Jun-25 | 21:51 | 05:07 | 11.6 | 4.1 | 4.8 |
| Night 2 | 05-Jun-25 | 06-Jun-25 | 21:52 | 05:06 | 11 | 3.4 | 1.4 |
| Night 3 | 06-Jun-25 | 07-Jun-25 | 21:53 | 05:06 | 10.9 | 3.5 | 1.9 |
| Night 4 | 07-Jun-25 | 08-Jun-25 | 21:54 | 05:05 | 11.1 | 3.4 | 0 |
| Night 5 | 08-Jun-25 | 09-Jun-25 | 21:55 | 05:05 | 12.8 | 3.2 | 0 |
| Night 6 | 09-Jun-25 | 10-Jun-25 | 21:56 | 05:04 | 14.2 | 5.1 | 1.7 |
| Night 7 | 10-Jun-25 | 11-Jun-25 | 21:56 | 05:04 | 16.3 | 2.3 | 0.1 |
| Night 8 | 11-Jun-25 | 12-Jun-25 | 21:57 | 05:04 | 16.1 | 3.3 | 8.2 |

| Survey Nights Used for Analysis | Sunset Date | Sunrise Date | Sunset (hh:mm) | Sunrise (hh:mm) | Temperature at Sunset (°C) | Mean Nightly Wind Speed (m/s) | Total Nightly Rainfall (mm) |
|---|---|---|---|---|---|---|---|
| Night 9 | 12-Jun-25 | 13-Jun-25 | 21:58 | 05:04 | 16.5 | 5.3 | 0.3 |
| Night 10 | 13-Jun-25 | 14-Jun-25 | 21:59 | 05:03 | 15.8 | 1.7 | 0 |
| Night 11 | 14-Jun-25 | 15-Jun-25 | 21:59 | 05:03 | 14.3 | 4 | 0.4 |
| Night 12 | 15-Jun-25 | 16-Jun-25 | 22:00 | 05:03 | 13.7 | 3.3 | 0 |
| **Autumn session 2025** - deployment dates: 10 nights between 16/09/2025 and 26/09/2025 | | | | | | | |
| Night 1 | 16-Sept-25 | 17-Sept-25 | 19:44 | 07:09 | 13.2 | 7.4 | 16.6 |
| Night 2 | 17-Sept-25 | 18-Sept-25 | 19:42 | 07:11 | 14.6 | 5.6 | 0 |
| Night 3 | 18-Sept-25 | 19-Sept-25 | 19:39 | 07:12 | 17.8 | 5.3 | 3.2 |
| Night 4 | 19-Sept-25 | 20-Sept-25 | 19:37 | 07:14 | 14.3 | 1.3 | 0.7 |
| Night 5 | 20-Sept-25 | 21-Sept-25 | 19:34 | 07:16 | 11.6 | 5 | 0 |
| Night 6 | 21-Sept-25 | 22-Sept-25 | 19:32 | 07:17 | 10.5 | 1.9 | 0 |
| Night 7 | 22-Sept-25 | 23-Sept-25 | 19:29 | 07:19 | 11.7 | 0.6 | 0 |
| Night 8 | 23-Sept-25 | 24-Sept-25 | 19:27 | 07:21 | 12.3 | 2.6 | 0 |
| Night 9 | 24-Sept-25 | 25-Sept-25 | 19:25 | 07:23 | 13.4 | 3.3 | 0 |
| Night 10 | 25-Sept-25 | 26-Sept-25 | 19:22 | 07:24 | 13.8 | 4 | 0 |



Making Sustainability Happen