

Technical Appendix 5-3

Bat survey report

EIAR – Volume 3

Muingmore Wind Farm

SLR Project No.: 501.065301.00001

April 2026

Muingmore RWE

Muingmore Wind Farm

Bat Qualitative Statement

Jason Guile

Woodrow Ref: P00012301

Date: March 2026

COMMERCIAL IN CONFIDENCE

Client: RWE

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Revision and Amendment Register

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QUALITATIVE STATEMENT

A review of bat activity across the Muingmore site for the years 2021 to 2024 shows a clear and consistent ecological pattern, with no evidence of year-to-year instability or unexpected change in how bats use the landscape. When viewed alongside the detailed 2024 baseline reported, the multi-year dataset reinforces the conclusion that Muingmore supports a predictable and seasonally structured bat assemblage dominated overwhelmingly by soprano pipistrelle (*Pipistrellus pygmaeus*). These findings align closely with ecological expectations for upland plantation-edge and open-bog environments and confirm that the 2024 results are representative of the Site.

Across all four years, bat activity follows a stable seasonal rhythm. Spring begins relatively quietly as bats emerge from winter and activity gradually increases; Summer sees stronger and more sustained foraging, particularly among pipistrelle species; and Autumn consistently represents the period of peak activity. This pattern is repeated every year for which data are available, regardless of variation in survey effort. The high activity recorded in Autumn 2021 reflects its exclusive Autumn dataset, while Spring-only periods (2022 and 2023) show the expected early-season suppression. The 2024 dataset, spanning Spring through Autumn, falls squarely along this multi-year seasonal trajectory, further demonstrating that inter-year differences are ecological rather than methodological.

Species composition is equally stable. Soprano pipistrelle remains the primary species detected in every dataset, followed by steady, low-level detections of *Myotis* spp., Leisler's bat (*Nyctalus leisleri*), brown long-eared bat (*Plecotus auritus*), and occasional common pipistrelle (*Pipistrellus pipistrellus*). No new or unexpected species appear in any year, and no shifts in assemblage structure are apparent. This reinforces the understanding that the Site functions predominantly as foraging and commuting habitat for a predictable suite of common species, with no indication of heightened sensitivity or unique ecological importance emerging over time.

Patterns in nightly activity also show strong consistency. Pipistrelle species typically peak shortly after dusk, while *Myotis* spp. and brown long-eared bats exhibit later activity, often extending into the early hours of the morning. These diel signatures match the 2024 baseline results and are repeated in previous years with only minor seasonal variation. The alignment of diel curves across years further supports the conclusion that habitat use and behavioural patterns at the Site are stable and typical for these species.

Spatially, the inter-year analysis confirms the same habitat associations reported in the 2024 baseline report. Detectors positioned along plantation edges, treelines, or other linear vegetated features consistently record higher levels of bat activity across all seasons and all years. In contrast, detectors situated in open bog or exposed upland conditions show markedly lower activity, again mirroring the 2024 results. This repeated pattern reinforces the importance of maintaining dark corridors and limiting artificial lighting near linear features, mitigation measures already embedded in the EIAR.

Taken together, the inter-year dataset provides strong evidence that bat activity at Muingmore is ecologically stable, predictable, and primarily driven by natural seasonal cycles.

Muingmore RWE

Muingmore Wind Farm

Bat technical results report

Jason Guile, Róisín O'Connell

Woodrow Ref: P00012301

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1. INTRODUCTION

Woodrow APEM Group (Woodrow) were commissioned by RWE to carry out a programme of bat surveys and prepare an associated bat survey report to support the application of a proposed wind farm development at Muingmore, Co. Mayo (proposed development).

For the basis of this assessment “the Site” only refers to the area within the redline boundary (incorporating the potential development area) as displayed in Figure 1.

1.1. Background

RWE are applying for planning consent for a renewable energy development referred to as the Muingmore Wind Farm (further referred to as the ‘proposed development’, located c. 8 km west of Bangor-Erris village

This bat report provides a summary of the methods used to survey the bat species present within the proposed development site, along with presenting the results to survey the bat species present within the proposed development site, along with providing the discussion of the results for further assessment.

Baseline surveys for bats aimed to identify the species occurring within the Site, and to provide an understanding of how local bat populations utilise the area in terms of density of use for foraging, roosting (maternity and hibernation), social interactions, and commuting.

1.2. Site description

The proposed site is located c. 8 km west of Bangor-Erris village and c. 2.5 km east of Doolough strand, Co. Mayo. [ITM: 476251 823558] The Site is accessed by L1205 road from Bangor-Erris village. The Site lies approximately 5 km from the Mayo coast. Habitats within the Site consist mainly of peatland and commercial forestry, including areas of recent clear-fell. These habitats provide good foraging and commuting opportunities for bats across the area.

1.3. Project description summary

The proposed development during the fourth year in 2024 was a full static deployment of 13 statics, two roost emergence surveys in July and September. The roost confirmed in 2022 and 2023 was re-confirmed as still active in 2024. The data gathered in 2024 is to provide supplementary data to the existing data collected from 2021 – 2023.

1.4. Protected status of bats in Ireland

Bats are protected by law in the Republic of Ireland under the Wildlife Act 1976 and subsequent amendments (2000 and 2010). The latest is the wildlife amendment Act 2023. Under the Wildlife Act, it is an offence to intentionally or unintentionally kill or injure bats, or to destroy or interfere with bat roosts during any construction or engineering works. Roosts are protected whether bats are present or not, provided there is a reasonable likelihood that the site is used as a breeding or resting place.

NPWS (2021a and 2021b) guidelines outline further legal protection afforded to species listed in the Annex IV under the EU Habitats Directive (92/43/EEC) as required by Articles 12, 13 and 16. All bat species occurring in Ireland are listed on Annex IV of the Directive, which requires strict protection across their entire natural range. The Directive is transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 to 2021. Regulation 51 sets out the system of strict protection for Annex IV species, including prohibitions on deliberate or non-deliberate capture, killing, disturbance, and damage or destruction of breeding or resting places. Regulation 54 provides for derogation licences where certain actions cannot be avoided. Any activity with potential to impact bats or their roosts may constitute an offence if undertaken without the necessary derogation licence.

Regulation (EU) 2024/1991 on Nature Restoration, which entered into force in 2024, places additional obligations on Member States to restore degraded ecosystems and support the long-term recovery of biodiversity. This regulation strengthens the overall protection framework by requiring measures that contribute to favourable conservation conditions for species, including bats, across a wide range of terrestrial and freshwater habitats.

For all bat species other than the lesser horseshoe bat (*Rhinolophus hipposideros*), strict protection requirements under Annex IV apply across all habitat types, within and outside designated sites. The lesser horseshoe bat is also listed on Annex II of the Habitats Directive. This listing requires the designation of Special Areas of Conservation for sites of importance to the species. The core sustenance zone around maternity roosts is generally considered to be within 2.5 km, with seasonal movements between summer and winter roosts reaching 5 km to 10 km (Collins et al. 2016).

Ireland is also a signatory to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979). This international agreement aims to protect migratory species throughout their range and provides an additional framework supporting bat conservation across national boundaries.

Planning authorities may refuse permission where predicted impacts on protected species, including bats, cannot be adequately avoided or mitigated. Demonstrating due diligence is therefore essential, particularly where work has potential to affect bat roosts, foraging habitats, or commuting corridors.

1.5. Outline of scope of works

To inform the impact assessment of the proposed development, a suite of bat surveys was undertaken, comprising a desk-based review and a range of field-based survey methods. As there are currently no national Irish guidelines for the collection of baseline data for bats, the guidance provided in *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation* (Scottish Natural Heritage (SNH) et al. 2019, updated by NatureScot et al. 2021) has been adopted for this project. Hereafter these guidelines are referenced as NatureScot et al. (2021).

Although Ireland does not have nationally adopted survey standards for baseline bat monitoring, relevant Irish guidance from the National Parks and Wildlife Service (NPWS) and Bat Conservation Ireland (BCI) is used where specific requirements apply, particularly in relation to mitigation, licensing considerations, and species protection. Reference is also made to documents such as the *Bat Mitigation Guidelines for Ireland V2* (Marnell et al., 2022) and other best practice protocols that support species conservation within the Irish context.

This report serves as a technical results document to be included as an appendix to the Environmental Impact Assessment Report (EIAR) for the proposed development. It outlines the methodologies and survey effort undertaken for all bat survey components, including tabulated results, maps, charts, and outputs from roost suitability assessments, bat activity surveys, and seasonal static detector surveys. Together, these elements characterise baseline bat activity, species presence, and habitat suitability across the Site.

Bat surveys were undertaken fully in accordance with NatureScot (2021). Static bat detectors were deployed at locations representative of the proposed turbine layout. Deployments were completed on three occasions during the 2023 active bat season, supported by continuous climatic monitoring on the Site to ensure that recording periods met compliant weather criteria.

In addition to static monitoring, targeted roost emergence and re-entry surveys were completed following an assessment of potential roost features within the Site. Bat activity transects were also undertaken to provide further context on species distribution and flight behaviour. Observations from these surveys collectively inform an understanding of how bats utilise the Site.

1.6. Evidence of competence and experience

Jason Guille – Associate director – QA of report

Jason Guille is an experienced Associate Director with Woodrow and has reviewed this report. Jason has over 15 years' experience in ecological assessment and holds a BSc in Marine Biology/Oceanography from the University of Wales, Bangor and a HND in Coastal Conservation with Marine Biology from Blackpool and Fylde College. Jason has a wide range of experience in the preparation of Environmental Impact Assessment Reports, Appropriate Assessment Screening reports and Natura Impact Statements. Jason was the lead ecologist on a range of projects in the UK, including large scale infrastructural schemes. Since moving to Ireland, he has been lead ecologist / author (EIAR, EclA, AA Screening reports and NIS's) for a number of projects including renewables, historic landfill remediation works, urban planning applications and commercial regeneration sites.

Róisín O Connell – Ecologist (Bat specialist) – Author - Lead Surveyor and Lead analyst for bat Data and Call Verification.

Róisín O'Connell is an ecologist with Woodrow with specialist experience in bat ecology and acoustic data analysis. She holds a B.Sc. (Hons) in Environmental Science from Atlantic Technological University, Sligo.

Róisín's professional work focuses on bat activity assessments, roost inspections, habitat suitability surveys, and the analysis of acoustic datasets. She is proficient in Kaleidoscope and BatExplorer and routinely undertakes detailed call identification and verification for ecological impact assessment. She has coordinated and delivered a wide range of bat surveys including static detector deployment, transect surveys, emergence and re-entry surveys, and surveys associated with large infrastructure and wind energy projects.

Róisín also has experience in freshwater ecological assessment and supports aquatic baseline surveys where required. She is a Qualifying Member of CIEEM and holds a bat roost survey licence issued by the Department of Housing, Local Government and Heritage.

Patrick Power – Ecologist (Bat Specialist) - Bat surveyor for this assessment.

Patrick Power is an ecologist with Woodrow. Patrick has completed a BSc in Forestry, BSc (Hons) in land management in Forestry with Waterford Institute of Technology and a PGCert in Wildlife Biology and Conservation with Edinburgh Napier University. His work with Woodrow is focused on bat data analysis including bat call identification and bat roost/habitat suitability surveys. Patrick has developed a high level of proficiency with Kaleidoscope and BatExplorer, the analysis software used to assess bat calls and activity. Patrick also possess Reptile, mammal, and woodland tree surveying skills. Patrick currently has a bat licence from the Department of Culture Heritage and the Gaeltacht.

Damien Mac Andrew – Ecologist (Bat Specialist) - bat surveyor for this assessment

Damien Mac Andrew joined Woodrow as a Bat Ecologist in 2024. Having come from a background in general ecology, Damien received in-house training whilst working for JBA Consulting in bat survey techniques for dusk/pre-dawn emergence and re-entry surveys, walked transects, and roost inspections (such as for buildings and trees). Damien's bat survey experience includes preliminary roost assessments on trees and bat survey experience includes preliminary roost assessments on trees and structures, endoscope inspections of potential roost features (PRFs) on trees and structures (including attic spaces), walked bat activity transects, presence/absence surveys of PRFs on trees and structures, deployment of static detectors, assessment of habitat suitability and bat call analysis.

Daithí Lavelle Seasonal Field Surveyor - Bat surveyor for this assessment

Daithí Lavelle is a senior seasonal field worker with Woodrow. Daithí has completed various courses including permaculture design, outdoor vegetable crop production, and much more. Daithí is also a qualified beekeeper and a self-employed environmental education officer. He manages 13 acres of native woodland and delivers many workshops to various community groups for adults and children.

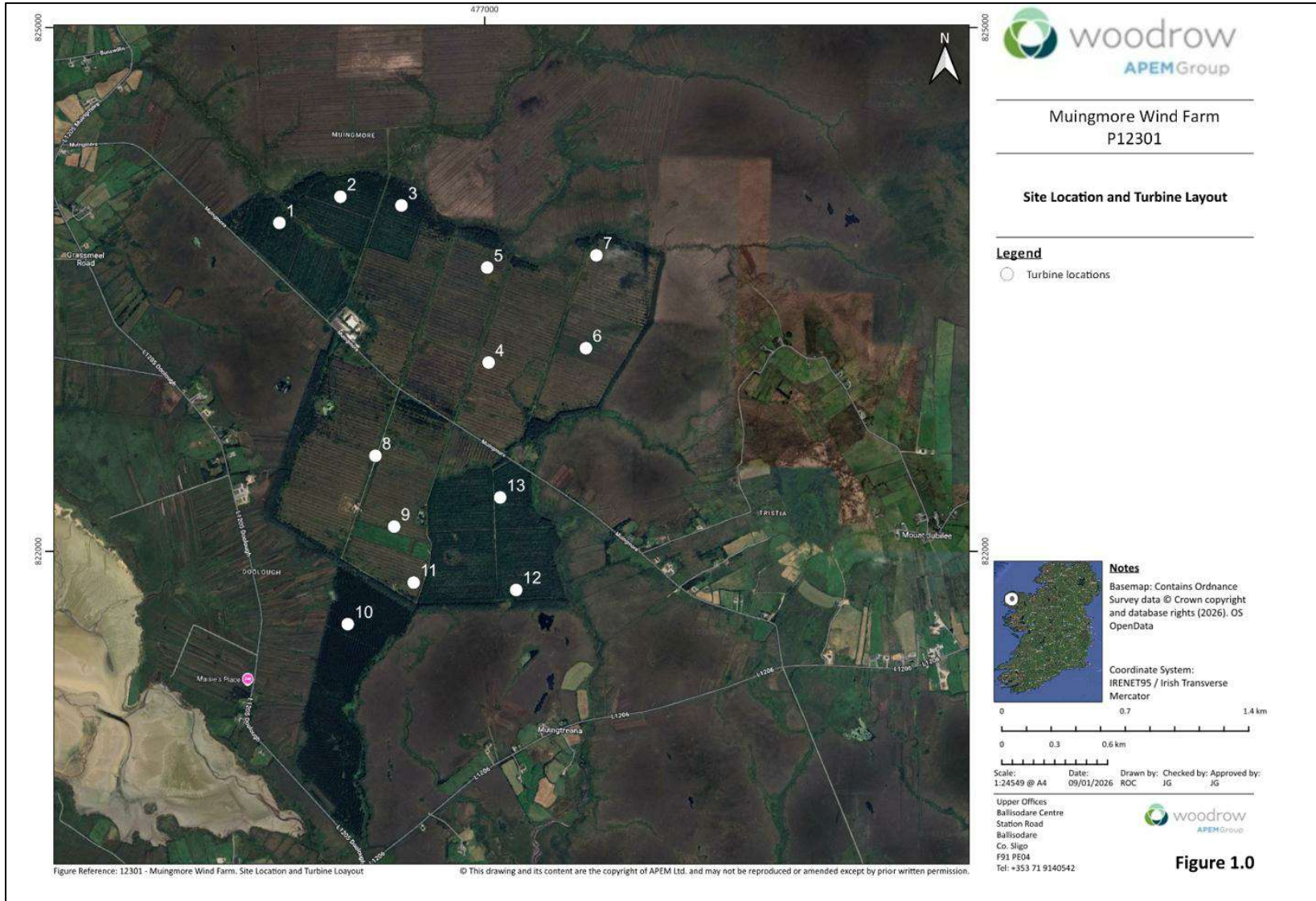


Figure 1: Proposed Windfarm layout

2. METHODOLOGY

2.1. Desk based Study

A desk-based review of habitat availability in grid square [Ref: F 76290 23542] of the proposed site, and the available bat data was used to inform the scope of the bat surveys required. Standard guidance (BCI, 2012 and NatureScot *et al.*, 2021) outlines that the search area covered by the desk-based review is 10 km from the proposed development. The desk-based study included:

- Review of potential habitat suitability for bats (Lundy et al. 2011) from National Biodiversity Data Centre (NBDC) online maps¹, which provides a high-level assessment of potential habitat suitability for Irish bat species.
- Identification of sites designated for bats² (Special Areas of Conservation SACs) and any connective features from these to the Site.
- Examining aerial imagery and 6-inch maps to identify potential bat foraging and roosting habitats.
- Review of data received from Bat Conservation³ Ireland within 10 km of the wind farm site.
- Results of NBDC⁴ report for the 10 km squares covering the site [F72], including species recorded and known roosting sites.

2.2. Field surveys

Bat field surveys were conducted by Róisín O’Connell, Paddy Power, Damien Mac Andrew and Daithí Lavelle during the 2024 active bat season in accordance with NatureScot (2021). This guidance document supersedes some aspects of the previous guidelines (Collins, 2016 Hundt, 2012 & BCI, 2012) and recommends a site-by-site approach to survey design, with the only prescriptive element being the positioning, number, and duration of static bat detector deployments, as well as the strongly recommended continual monitoring of site-specific weather data on rainfall, temperature, and wind speeds.

As of October 2023, the 4th edition of Bat surveys for professional ecologists has been updated. Collins (2016) is now referred to as Collins (2023) to reflect this update. All bat surveys were carried out following the Collins (2016) guidance, which is still compliant with the newly updated 2023 guidance.

As a minimum, the latest NatureScot, 2021 guidelines require three deployments of static detectors aimed at covering Spring (April to May), Summer (June to mid-August) and Autumn (mid-August to October), each with a minimum deployment period of 10 nights (within compliant weather parameters). Seasonal deployments of static detectors are set out at all potential turbine locations for proposals comprising 10

¹ National Biodiversity Data Centre (NBDC) – Biodiversity Maps. from <https://maps.biodiversityireland.ie/Map> (accessed 11.12.2024). The report uses a suitability index that refers to areas geographically, as well as suitable roosting habitat. These patterns combined can provide a broad scale geographical area (habitat suitability) for all Irish bats combined and individual Irish species of bats. The suitability index ranges from 0 – 100 with 0 being least favourable and 100 being the most favourable.

² The only bat SACs in Ireland are for lesser horseshoe bat *Rhinolophus hipposideros* - NPWS - <https://experience.arcgis.com/experience/edf34d92e28040fd87d3d14f55d8d95f> (accessed 10.10.2024)

³ BCI - _ (Accessed 10.10.2024)

⁴ National Biodiversity Data Centre (NBDC) – Biodiversity Maps. from <https://maps.biodiversityireland.ie/Map> (accessed 10.10.2024)

or less turbines, with a third of any additional locations also covered up to a maximum of 40 detectors. Compliant weather conditions are defined as: temperatures at $\geq 8^{\circ}\text{C}$ at dusk, maximum ground level wind speed of 5 m/s and no, or only very light, periodic rainfall. Additional requirements of the NatureScot, 2021 guidelines include swarming surveys, and winter roost inspections if potential hibernation roosts are identified. Transect and/or vantage point surveys are seen as methods used to complement the static detector surveys, with applicability being discretionary, based on professional judgement, and on a case-by-case site-specific basis.

2.2.1. Habitat and roost assessment surveys.

NatureScot, (2021) recommend that “(...) features that could support maternity roosts and significant hibernation and/or swarming sites (both of which may attract bats from numerous colonies from a large catchment) within 200 m plus rotor radius of the boundary of the proposed development should be subject to further investigation”.

Turbine specifications, as well as locations are regularly altered during the design phase of projects, and as a precaution, Woodrow conduct roost assessment surveys within a 300m radius of the potential build area. Wide reaching roost and foraging habitat assessment of the Site were undertaken during the 2023-2024 survey season.

Surveyors utilised the assessment criteria described in Collins (2023), which provides guidelines for assessing potential suitability of habitat features as bat roosts and for foraging bats. This allows surveyors to assign Potential Roost Features (PRFs) as None, Negligible, Low, Moderate, or High status in terms of their potential for bats in structures as shown on Table 1. Alternatively, for trees they are assessed using the categorisation on Table 2.

Initial surveys conducted in 2021 for the Site included potential roost feature (PRF) and foraging assessment to record the types of bats species and to provide an overview of how bat activity is broadly distributed across different habitats within the site. Winter hibernation assessments were carried out in March 2022 and PRF surveys for buildings and trees were carried out in 2022. There was one confirmed roost in October.

Table 1: Guidelines for assessing the potential suitability of proposed development sites for bats based on the presence of habitat features within the landscape, to be applied using professional judgement (Collins, 2023).

Suitability	Description Roosting Habitats	Commuting and Foraging Habitats
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 grounds /underground levels).	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e., no habitats that provide continuous lines of shade/protection for flight-lines or generate/shelter insect populations available to foraging bats).
Negligible ^a	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 unsuitable features on occasion.	No obvious habitat features on site likely to be used as flightpaths or by foraging bats; however, a small element of uncertainty remains to account for non-standard bat behaviour.
Suitability	Description Roosting Habitats	Commuting and Foraging Habitats
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 ^b 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 ^c).	Habitat that could be used by small numbers of commuting bats such as a hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^b , and/or surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland, or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats

Suitability	Description Roosting Habitats	Commuting and Foraging Habitats
	on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat. These structures have the potential to support high conservation status roosts e.g. maternity or classic cool/stable hibernation site.	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, treelined watercourses and grazed parkland. Site is close to and connected to known roosts.

^a 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 would (due to another attribute).

^b for example, in terms of temperature, humidity, height above ground level, lights levels or levels of disturbance.

^c Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten et al., 2016 and Jansen et al., 2022.) Common pipistrelle swarming has been observed in the UK (Bell, 2022 and Tomlinson, 2020) and winter hibernation of numbers of this species has been detected at Seaton Hall in Northumberland (National trust, 2018). This phenomenon requires some research in the UK, but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in prominent buildings in the landscape, urban or otherwise.

The above categorisation does not work well for trees. A better categorisation is that shown in Table 2. This categorisation of trees uses two categories (PRF-I or PRF-M). Further to this, if a woodland/tree line is made up of multiple PRF-I's this area is best categorised as a roost resource. Appropriate compensation for all PRF-I's in advance of impacts and a Precautionary Working Method Statement (PWMS) for works is required.

Table 2: Guidelines for categorising the potential suitability of PRF's

Suitability	Description
PRF-I	PRF is only suitable for individual bats or 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.

Based on the features present and the location of the trees or other structures, the potential use of the feature can also be considered, and classified as per Hundt, 2012:

- Maternity (breeding roost).
- Summer/transitional (to include transitional, occasional, satellite, night, and day roosts); and Hibernation roost.

Surveyors initially inspect using non-invasive external and internal techniques for any building encountered. All trees encountered were assessed from the ground level.

2.2.2. Roost emergence/re-entry surveys.

The locations for dusk emergence and dawn re-entry surveys were informed by the roost assessment survey results within a 300m buffer from the proposed turbine locations at time of surveying. Locations beyond the 300m buffer may also be considered, provided they have strong connectivity to the proposed turbine area.

Dusk surveys commenced 15 mins before sunset and concluded 1.5 hours after sunset and dawn re-entry surveys commenced 1.5 hours before sunrise to 30 mins after sunrise.

Roost assessment surveys were carried out on 31 July and 24 September 2024 at the previously confirmed roosting site referred to as location F6 (Figure 3). Surveyors (Róisín O’Connell and Daithí Lavelle) observed the structure for dusk emergence activity and recorded any peripheral bat movements. The surveys were aided using IR (Canon xa60) and thermal cameras. Survey notes were recorded using the ESRI Survey123 mobile app and detections by hand-held Elekon Batlogger M bat detectors, which enabled the collection of geo-referenced recordings of bat activity.

Subsequently, the captured acoustic recordings were subjected to analysis using the BatExplorer software. All dusk surveys (emergence) were undertaken within prescribed favourable weather conditions, i.e., a temperature of at least 8°C at sunset, a maximum ground level wind speed of 5 m/s, and no or very light periodic precipitation. Roost survey times and details are shown Table 3.

Table 3: Roost survey times and details 2024

Date	Sunrise/ sunset	Start time	End time	Location (PRF reference)	Survey type	Weather conditions temperature, wind speed, cloud coverage and precipitation
July 31	21:37	21:22	23:08	F6	Emergence	15°C, 1 m/s, 5 oktas* and 0 mm.
24 Sept	19:33	19:05	20:53		Emergence	10 °C, 0.7 m/s, 2 oktas and 0 mm.

* Oktas represent the cloud coverage scale from 0-9. One okta is a cloud amount of one eighth or less. Seven oktas are a cloud amount of seven eighths or more, but not full cloud cover. Eight oktas are full cloud cover with no breaks. Nine oktas are sky obscured by fog or other meteorological phenomena.

2.2.3. Static bat detector surveys

Static detector surveys were undertaken using Wildlife Acoustics, Song Meter 4 BAT Full Spectrum (SM4BAT-FS, with a SMM-U2 microphone), and SM MiniBat detectors. A sampling rate of 384 kHz was set for detectors, and recording was scheduled to be continuous subject to triggering from 30 minutes before sunset until 30 minutes after sunrise, for a minimum of 10 weather-compliant nights. Static bat detectors are deployed to record the types of bat species present and to provide an overview of how bat activity is broadly distributed over the Site at given habitat features and turbine locations. This provides context to bat activity within the Site to supplement and provide a comparison for the turbine locations, for example comparing bat activity along habitat features vs bat activity in open areas removed from features, emulating post-construction conditions around turbines. In 2024 there were 14 detectors (D.01 – D.14)

deployed to monitor bat activity. NatureScot, (2021) sites the use of 14 detectors as adequate coverage. *“Where developments have more than ten turbines, detectors should be placed within the developable area at ten potential turbine locations plus a third of additional potential turbine sites up to a maximum of 40 detectors for the largest developments”*. Table 4 shows the dates of each static deployment. The location of all static detectors for each deployment in 2024 is shown in Figure 1 and is pictured in Appendix A. The weather conditions prevalent during the deployment periods are outlined in Appendix B.

Table 4: Static deployment details

Season	Deployment date	Collection date
Spring	28 May	11 June
Summer	16 July	31 July
Autumn	24 September	07 October

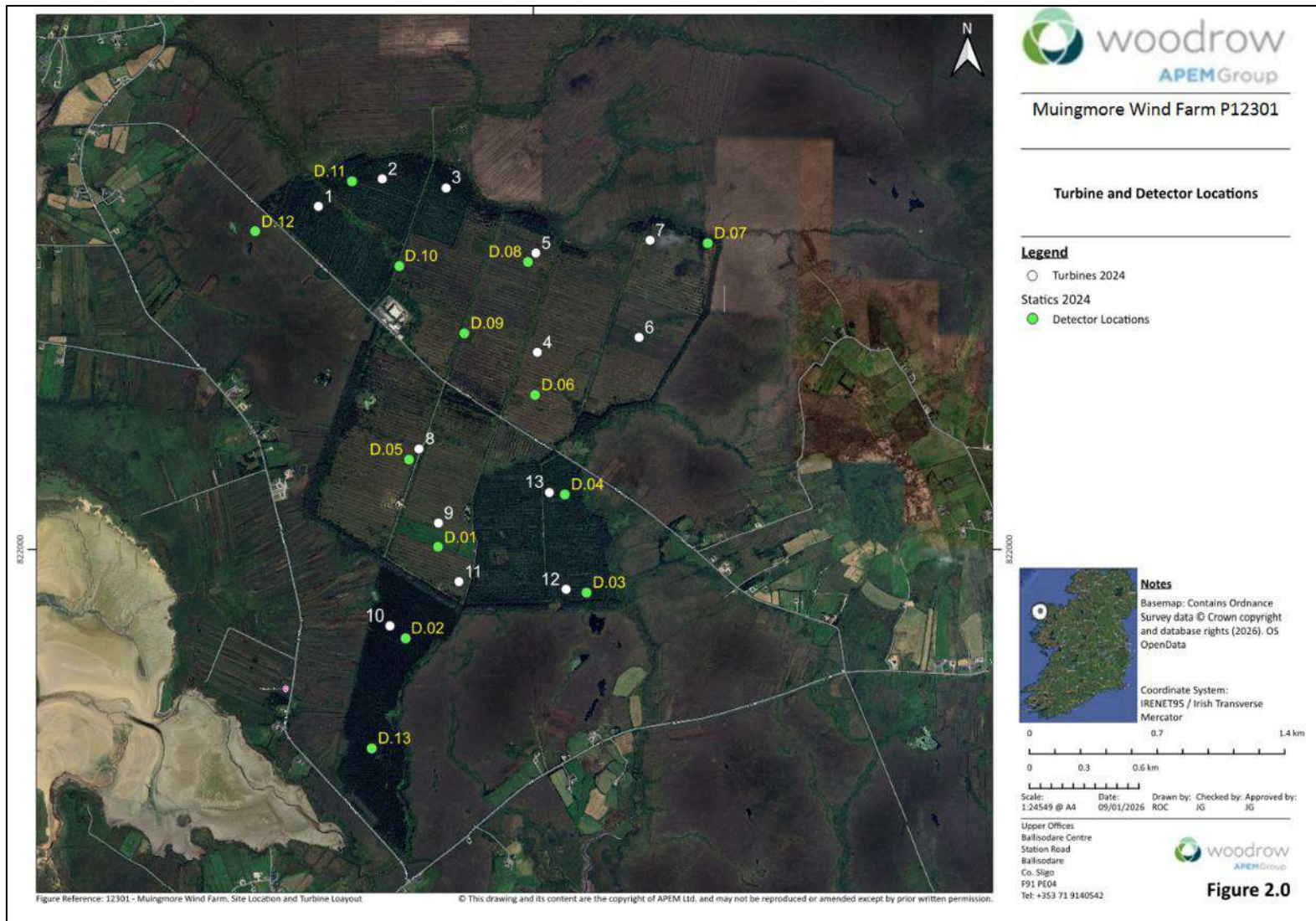


Figure 2 Static Detector Location 2024

2.3. Climatic Monitoring

Weather conditions were monitored during 2024 using the Met Eireann public synoptic weather station located in Belmullet⁵. The range of weather data collated includes temperature, wind speed and rainfall, enabling surveyors to determine compliant deployment nights with the prescribed weather parameters ($\geq 8^{\circ}\text{C}$ at dusk, max. ground level wind speed of 5 m/s and minimal rainfall) as per the NatureScot *et al.*, (2021) guidance on weather data. Deployment periods can then be adjusted to ensure 10 nights of compliant data are captured.

2.3.1. Calibration and testing of recording equipment

Calibration and testing of recording equipment is required by the NatureScot *et al.* (2021) guidelines, and as a standard operating procedure Woodrow have a stringent schedule of assessing all bat recording equipment prior to and during deployment in the field. Checks are logged in excel, providing an audit trail to ensure that all data can be relied on and form a robust and defensible data set. Unique numbering of static detectors, SD cards and microphones allows for reverse checking, if any issues arise, e.g., following a microphone failure. Checks undertaken include pre-deployment device setting including battery charge levels and pre-/post-deployment microphone sensitivity tests.

2.4. Data analysis

For data collected using SM2BAT+, SM mini bat and SM4BAT-FS, analysis of sound recordings was undertaken using kaleidoscope software (version 5.6.3), and BatExplorer software was used for the data collected using Batlogger m detectors. This analysis aimed to confirm species (or genus for myotis species) and bat activity (exact number of bat passes) for each deployment and transect survey. All sound files were run through kaleidoscope pro's auto-identification (version 5.6.3), and then manual verification was undertaken by Woodrow operatives. Russ (2012), Middleton *et al.* (2014), and Middleton *et al.* (2022) were used to aid in the species identification of bat calls during data analysis.

Recordings of common and soprano pipistrelles for which kaleidoscope determined a match ratio of 100% (meaning every recorded call matched the known species call parameters) were deemed accurate to a degree that did not necessitate manual verification. Nevertheless, all other automatically identified bat species were subjected to manual check, which is above the recommended 10% manual verification outlined in SNH *et al.* (2019) and NatureScot *et al.* (2021).

Recordings automatically identified as noise were determined to fall outside of the recording parameters for the survey and were classified as noise. Any calls showing up as "NOID," in which the software cannot identify any species, were also checked and manually identified.

Bat activity was quantified by the number of bat passes recorded, a widely accepted metric for assessing activity and species presence (Kerbiriou *et al.*, 2019). EcoBat was then used to provide an objective, standardised interpretation of acoustic data by comparing site-specific activity levels against a large national dataset (primarily UK, with an expanding Irish dataset). This approach, recommended in NatureScot's 2021 guidance, ensures transparent, evidence-based baseline reporting, contextualising activity within regional norms and supporting robust risk assessment.

2.5. Survey limitations

⁵ <https://www.met.ie/climate/available-data/historical-data> (accessed December 2024)

2.5.1. Survey coverage

The spring static surveys did not start till 28 May, therefore the 10 compliant days are within the summer season survey window, however, as the survey data is time stamped, the spring survey analysis is as stated in Table 4. This does not impact the analysis of the data.

In summer 2024 the detectors at d.11 and at d.12 failed to record any data. While this infers that no data was collected for this location there are significant numbers of detectors at similar habitats around the Site that collected data. These locations are comparable and therefore can be used as proxy for the analysis as assumed activity levels for the location d.11 and d.12. Furthermore, the deployment of 13 detectors exceeded the survey effort recommended in NatureScot (2021) for the season.

3. RESULTS

3.1. Desk study

BCI records indicate a total of three roosts within 10km of the site, none of which are lesser horseshoe roosts. Refer to Appendix C for more detail.

There are no natura 2000 sites designated for bats within 10 km of the site. The closest such natura 2000 site is/are Kilcashel SAC, co. Mayo located 109 km to the west of the site. There will be no direct effect on this site from the proposed development.

3.2. Habitat and roost suitability assessment

The roost assessment identified six buildings within the Site with low to moderate roost potential. The locations are shown in Figure 3. and accompanying pictures are in Appendix A.

No Potential Roost Features (PRFs) are located within 300 m of the proposed turbine locations (Table 5). However, several PRFs occur within the site boundary and have been fully considered as part of the assessment. Their presence has informed the evaluation of potential bat activity and behaviour across the site, including any influence these features may have on flight patterns or foraging behaviour within the development area Table 6.

Table 5: Habitat classification as per Collins 2023 within 300m of the proposed turbine locations

Refer to Table 1 for roosting potential for trees and buildings.

	Habitat classification	Roost potential within c. 300 m of turbine location
T1	Low - Plantation	There are no PRFs within the 300 m search buffer of this turbine location
T2	Low - Plantation	There are no PRFs within the 300 m search buffer of this turbine location
T3	Low - Plantation	There are no PRFs within the 300 m search buffer of this turbine location
T4	Low - Open Bog, with track c. 50m to the west	There are no PRFs within the 300 m search buffer of this turbine location
T5	Low - Open Bog	There are no PRFs within the 300 m search buffer of this turbine location
T6	Low - Open Bog	There are no PRFs within the 300 m search buffer of this turbine location
T7	Low - Open Bog, with track c. 50m to the west	There are no PRFs within the 300 m search buffer of this turbine location
T8	Low - Road lined with hedgerow within open bog	There are no PRFs within the 300 m search buffer of this turbine location

	Habitat classification	Roost potential within c. 300 m of turbine location
T9	Low - Open Bog	There are no PRFs within the 300 m search buffer of this turbine location
T10	Low - Plantation with fire break c. 50m to the west	There are no PRFs within the 300 m search buffer of this turbine location
T11	Low - Open Bog with track c. 40m to the east	There are no PRFs within the 300 m search buffer of this turbine location
T12	Low - Plantation	There are no PRFs within the 300 m search buffer of this turbine location
T13	Low - Plantation with fire break c. 30m to the west	There are no PRFs within the 300 m search buffer of this turbine location

Table 6: Potential Roost Features (PRFs) identified within the Site.

Label ¹	PRF Suitability ²	Feature notes	X ⁶	Y
1	Moderate	subterranean path,	-9.894968	54.143172
2	Low	East face of building. Cracks and crevices in brick work, potential night roosts	-9.89496	54.143513
3	Negligible	Southern gable of old metal factory - brick and corrugate no features	-9.893446	54.143468
4	Low	South Gable of office building night roost potential	-9.895129	54.143322
5	Low	North gable of office building - Possible Night roost	-9.895703	54.143658
6	Negligible	Shed - confirmed transitional roost	-9.89424	54.143361

⁶ X and Y co-ordinates are in decimal degrees



Figure 3: Roost survey locations

3.3. Roost emergence/re-entry surveys

Roost emergence/re-entry surveys were undertaken at each identified PRF to confirm if it was used by roosting bats during the 2022 season. Figure 3 shows the locations where these surveys were conducted and Table 7 provides a summary of surveys and results at each of these locations. These surveys confirmed the presence of one roost within the building. The table further details the species present, count, roost type, survey type and approximate distance to the closest proposed turbine.

Based on the results of the emergence surveys, the roost F6 has been classified as a day roost being utilised on a transitional basis.

Table 7: Summary of emergence and re-entry surveys and results of PRF

PRF Reference	Species (Count)	Roost type	Survey type	Approx. distance from closest turbine
F1	0	No roost	1 Emergence 1 re-entry (2022)	704 m
F2	0	No roost	1 Emergence (2022)	800 m
	0	No roost	1 Emergence (2023)	
	0	No roost	2 Emergence (2024)	
F3	0	No roost	1 Emergence 1 re-entry (2022)	741 m
F4	0	No roost	3 Emergence 1 re-entry (2022)	720 m
F5	0	No roost	2 Emergence 1 re-entry (2022)	726 m
F6	soprano pipistrelle (2).	Transitional/day roost	1 Emergence (2022)	739 m
	soprano pipistrelle (2).	Transitional/day roost	1 Emergence (2023)	
	soprano pipistrelle (2).	Transitional/day roost	2 Emergence (2024)	

Details of emergence/ re-entry survey results are provided below.

Emergence Survey (F6)

Findings: (31 July 2024) A single soprano pipistrelle emerged at 21:50 and travelled east. A second emergence occurred moments later, after which sustained foraging behaviour was recorded.

Findings: (24 September 2024) A single soprano pipistrelle emerged at 21:50:10 where it flew in a westerly direction to the front of the structure.

3.4. Static detector results

3.4.1. Spring

During the spring deployment (28 May to 11 June) there were a total of 2,832 passes recorded (refer to Table 8). Soprano pipistrelle account for the highest proportion of activity representing 91.7% of passes recorded. The next was Myotis species at 5.44% of all passes, with the remaining species (including common pipistrelle) accounting for only 2.86% of all passes.

While the EcoBat analysis (Appendix D) for the spring deployment shows that soprano pipistrelle was the dominant species across the site, the results show that there were no nights of extremely high, high, moderate/high or moderate activity for the species during this period. All activity was determined to be low/moderate and low for the species. All the remaining species were determined to have low activity.

The spring activity is dominated by soprano pipistrelle, as illustrated in Figure 4, which peaks at 23:00. Leisler’s bat shows an earlier peak at 22:00, while Myotis spp. activity peaks shortly after midnight (00:00). Brown long-eared bats peak later in the night at 03:00, and common pipistrelle activity remains very low throughout spring, with a small peak at 01:00.

These peak times align broadly with activity after the expected emergence windows in relation to sunset (Appendix D), with all species showing characteristics of foraging behaviours rather than emergence within the spring results. The average wind speed and direction during the spring survey period was 5.5m/s and westerly, with a high of 9.5m/s north-westerly and low of 1.1m/s westerly. Refer to Appendix B.

Table 8 : Total number of passes recorded per species per detector for spring

Detector	Myotis sp.	Nyctalus leisleri	Pipistrellus pipistrellus	Pipistrellus pygmaeus	Plecotus auritus	Total	
D.01	4			6	2	12	0.42%
D.02	7	2		258	7	274	9.68%
D.03	9	7		298	1	315	11.12%
D.04	3			224		227	8.02%
D.05				19	1	20	0.71%
D.06				22	2	24	0.85%
D.07	61	5	2	434		502	17.73%
D.08	29		4	61	3	97	3.43%
D.09	9			28		37	1.31%
D.10	7			676		683	24.12%
D.11	8	13	3	528	2	554	19.56%
D.12	16			28		44	1.55%
D.13	1	7		15	20	43	1.52%

Detector	Myotis sp.	Nyctalus leisleri	Pipistrellus pipistrellus	Pipistrellus pygmaeus	Plecotus auritus	Total
Total	154	34	9	2597	38	2832
	5.44%	1.20%	0.32%	91.70%	1.34%	5.44%

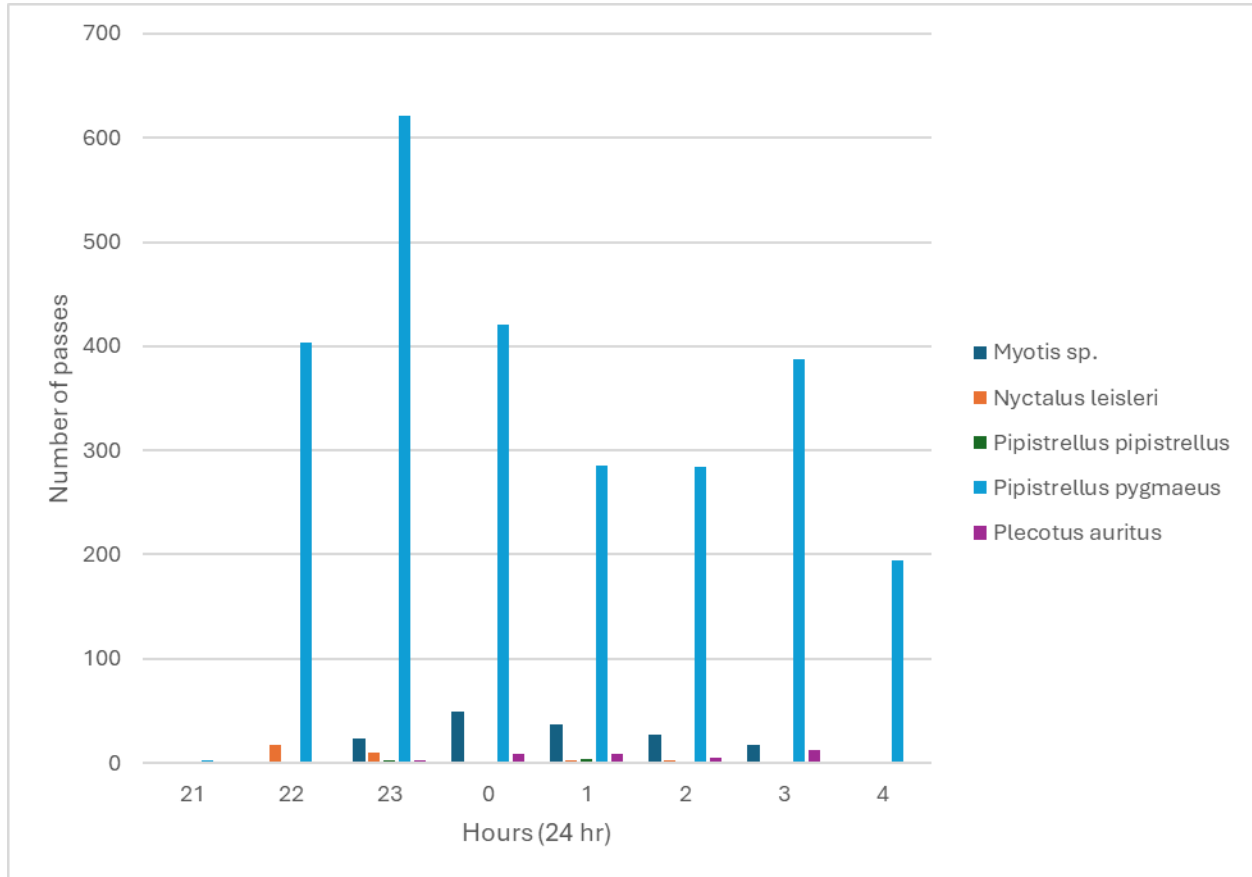


Figure 4: Total passes per hour per species for Spring

3.4.2. Summer

During the summer deployment there were a total of 2,048 calls recorded (refer to Table 9). Soprano pipistrelle account for the highest proportion of activity representing 89.72% of passes recorded. The next was Myotis species at 5.73% percent of all passes, with the remaining species (including common pipistrelle) accounting for less than 4.5% of all passes.

While the EcoBat analysis (Appendix D) for the summer deployment shows that soprano pipistrelle was the dominant species across the site, the results show that there were no nights of extremely high, high, or moderate/high activity for the species during this period. All activity was determined to be low/moderate and low for the species, with the exception of two nights in July at D.04. All the remaining species were determined to have low activity.

Figure 5 shows that summer activity is strongly dominated by soprano pipistrelle, peaking at 01:00. Myotis spp. and brown long-eared bats show peak detections around 23:00. Leisler’s bat peaks around midnight, while common pipistrelle activity is low with occasional late detections near 04:00 but no clear peak. The activity for Leisler bats (Appendix D) shows activity at d.02 before the upper time of the species-specific emergence time range, which may be consistent with proximity to a roost, but this cannot be confirmed from acoustic data alone. The remaining activity for all species, with the exception of a small number (less than 10) passes for soprano pipistrelle, show characteristics of foraging behaviours rather than emergence within the summer results. The average wind speed and direction during the spring survey period was 5.5m/s and southerly, with a high of 12.6m/s southerly and low of 1.1m/s south-westerly. Refer to Appendix B

Table 9: Total number of passes recorded per species per detector for summer

Row Labels	Myotis sp.	Nyctalus leisleri	Pipistrellus pipistrellus	Pipistrellus pygmaeus	Plecotus auritus	Total	
D.01	7	0	1	12	0	20	0.97%
D.02	0	15	1	200	1	217	10.54%
D.03	7	6	1	416	0	430	20.89%
D.04	3	1	1	121	0	126	6.12%
D.05	4	0	3	21	2	30	1.46%
D.06	11	0	11	4	4	30	1.46%
D.07	10	2	2	156	3	173	8.41%
D.08	33	1	12	257	1	304	14.77%
D.09	0	0	1	12	4	17	0.83%
D.10	43	2	2	396	2	445	21.62%
D.13	0	9	0	252	5	266	12.93%
Total	118	36	35	1847	22	2048	
	5.73%	1.75%	1.70%	89.72%	1.07%		

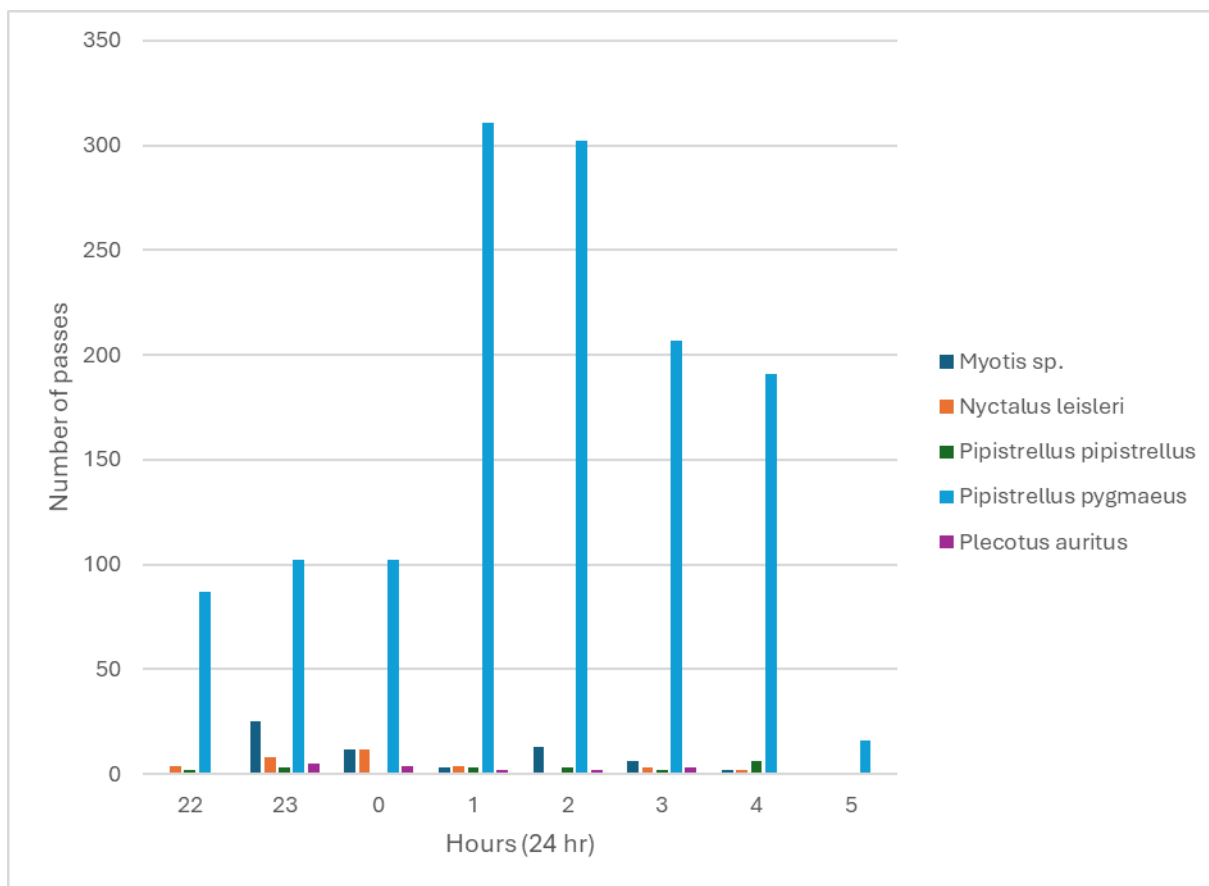


Figure 5: Total passes per hour per species for Summer

3.4.3. Autumn

During the autumn deployment a total of 9,139 calls were recorded (refer to Table 10), with activity strongly dominated by soprano pipistrelle which accounted for 95.2% of all activity. All other species recorded accounted for less than 5% of all activity

While the EcoBat analysis (Appendix D) for the autumn deployment shows that soprano pipistrelle was the dominant species across the site, the results show that there were no nights of extremely high or high, activity for the species during this period. All activity was determined to be low/moderate and low for the species with the exception of moderate/high or moderate at d.07 and d.10 with three and five nights respectively. Myotis spp. also showed moderate/high at D.11 for two nights and moderate at d.11 and d.12 for one and two nights respectively. All the remaining species activity were determined to have low/moderate or low activity.

Figure 6 shows that summer activity is strongly dominated by soprano pipistrelle, exhibiting a pronounced shift toward early-night activity, peaking at 20:00. With activity before, during and immediately after the upper time of the species-specific emergence time range, which therefore may potentially indicate the presence of a nearby roost (refer also to Appendix D for specific activity at detector locations). Common pipistrelle, brown long-eared bat, and Leisler’s bat all show similar earlier, however, the potential for a nearby roost is not as well supported by the data (refer to Appendix D). Overall activity after 21:00 tapers

off for the rest of the night. The remaining activity for all species (after 21:00), show characteristics of foraging behaviours rather than emergence within the summer results. The average wind speed and direction during the spring survey period was 6m/s and south-easterly, with a high of 15.3m/s north-easterly and lows of 2.1m/s easterly, north-easterly and westerly. Refer to Appendix B.

Table 10: Total number of passes recorded per species per detector for autumn

Detector	Myotis sp.	Nyctalus leisleri	Pipistrellus pipistrellus	Pipistrellus pygmaeus	Plecotus auritus	Total	
D.01	4		3	30	2	39	0.43%
D.02	2	4	2	19	6	33	0.36%
D.03	8	5	3	774		790	8.64%
D.04	23	8	70	1969		2070	22.65%
D.05			2	5		7	0.08%
D.06	4	5	23	34	6	72	0.79%
D.07	16	6	4	1523	11	1560	17.07%
D.08	32		4	299	3	338	3.70%
D.09	30			27	1	58	0.63%
D.11	100		1	291	3	395	4.32%
D.12	1		1	13	1	16	0.18%
D.13	1	3		11	7	22	0.24%
D10	23		5	3706	5	3739	40.91%
Total	244	31	118	8701	45	9139	
	2.67%	0.34%	1.29%	95.21%	0.49%		

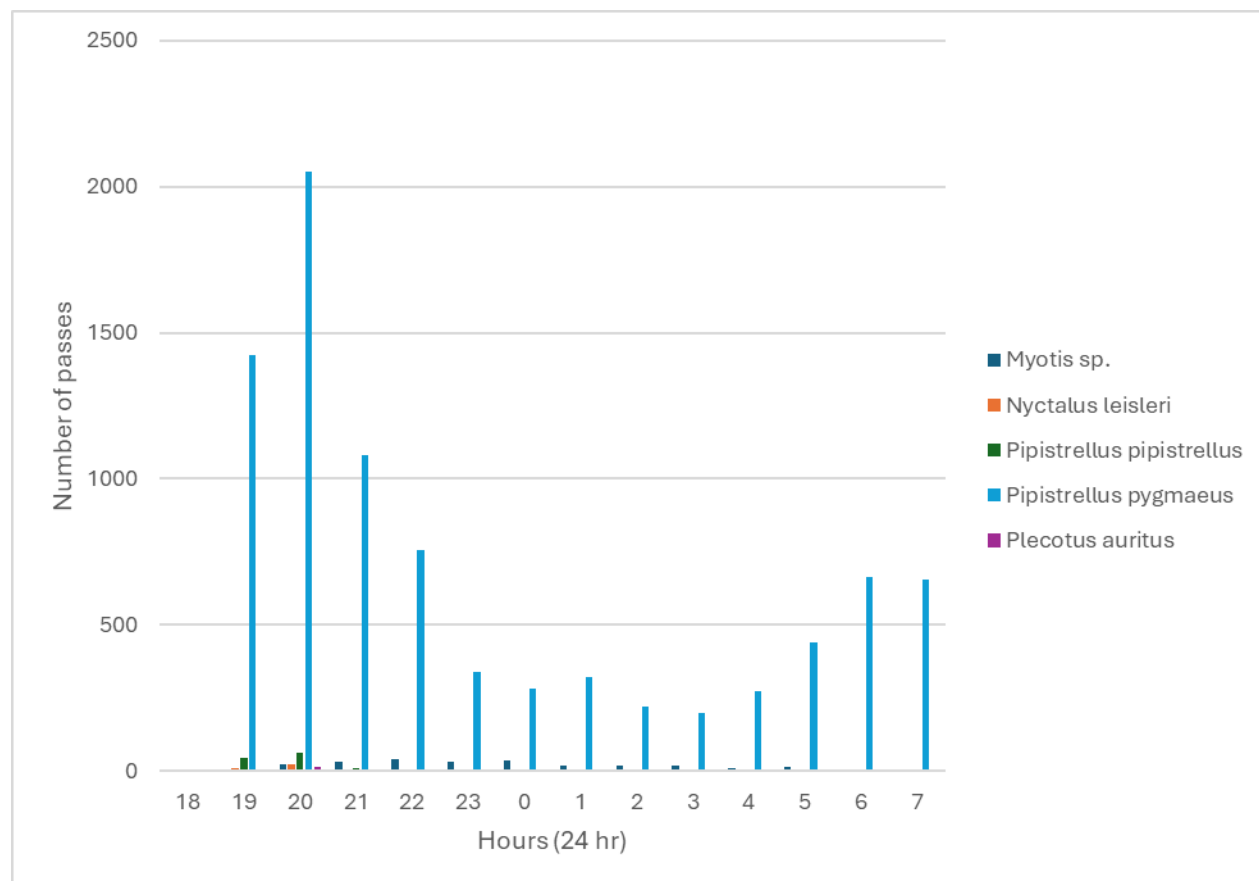


Figure 6: Total passes per hour per species for Autumn

3.5. Association of bat activity with habitat features

While some static detector locations were not positioned directly at proposed turbine locations, they were selected to represent similar habitat types and provide reliable data for assessing bat activity across the Site. This approach is consistent with NatureScot et al. (2021) guidance, which allows for representative placement of detectors where direct siting is impractical due to access or habitat constraints.

Table 11 identifies the detector associated with each proposed turbine location and indicates whether the activity data is considered accurate (detector placed at the turbine location) or representative (detector placed in similar habitat within the Site). This classification supports further analysis of bat activity in relation to turbine siting and informs risk assessment and mitigation planning. Detector placement rationale considers habitat context (e.g. hedgerow, woodland edge, open field) and proximity to linear features.

Table 11: Turbine locations and associated detectors

Proposed Turbine	Accurate Detector (A)	Representative Detector(s) (R)	Closest Detector	Rationale
T.01	D.11	D.11, D.08	D.11	T.01 is located within plantation habitat in the northern part of the site. Detector D.11 is positioned within the same plantation context and within the c.100 m edge influence zone, providing the most accurate representation of turbine footprint conditions. Detector D.08 occupies a similar plantation-associated setting in the same northern sector and is therefore also representative. D.11 is the closest detector spatially.
T.02	D.11	D.11, D.08	D.11	T.02 lies within plantation habitat in the north-central portion of the site. Detector D.11 provides the closest habitat match, being located within plantation and edge-influenced conditions comparable to the turbine footprint. Detector D.08 supports this representation as it shares similar plantation-associated characteristics within the same sector. D.11 is also the closest detector by proximity.
T.03	D.08	D.08, D.07	D.08	T.03 is located close to plantation edge habitat in the north-eastern sector. Detector D.08 is situated on a sparse spruce adjacent to plantation and best reflects the turbine’s edge-influenced context. Detector D.07, while slightly more edge-defined, shares similar commuting and foraging characteristics and is therefore also representative. D.08 is the closest detector spatially.
T.04	D.06	D.05, D.06, D.09	D.06	T.04 is located within open bog habitat away from plantation edges. Detector D.06 occupies open bog with low foraging and commuting potential and provides the most accurate habitat match. Detectors D.05 and D.09, also located within open bog, supports this representation. D.06 is the closest detector to the turbine location.
T.05	D.05	D.05, D.06, D.09	D.08	T.05 is located within open bog habitat away from plantation edges or linear woodland features. Detectors D.05, D.06 and D.09 are all situated within comparable open bog environments with low foraging and commuting potential and are therefore considered representative of turbine-level conditions. Minor local features, such as grazing or track presence, do not materially alter habitat function at the scale of the turbine footprint.
T.06	D.06	D.05, D.06, D.09	D.07	T.06 is located within open bog habitat away from plantation edges or linear woodland features. Detectors D.05, D.06 and D.09 are all situated within comparable open bog environments with low foraging and commuting potential and are therefore considered representative of turbine-

Proposed Turbine	Accurate Detector (A)	Representative Detector(s) (R)	Closest Detector	Rationale
				level conditions. Minor local features, such as grazing or track presence, do not materially alter habitat function at the scale of the turbine footprint.
T.07	D.09	D.09, D.06	D.07	Detector D.09 provides the most accurate representation due to its open bog setting with low foraging and commuting potential. Detector D.06 supports this baseline representation. Detector D.07 is physically closest to the turbine but is influenced by nearby plantation edge habitat and is therefore not considered representative of turbine footprint conditions.
T.08	D.05	D.05, D.06, D.09	D.05	T.08 is located within open bog habitat in the western-central part of the site. Detector D.05 occupies open bog with low foraging and commuting potential and provides the most accurate habitat match. Detectors D.06 and D.09, also located within open bog, supports this representation. D.05 is the closest detector spatially.
T.09	D.09	D.05, D.06, D.09	D.01	T.09 is situated within open bog habitat in the south-central part of the site. Detector D.09 is located within the same habitat type and provides a direct representation of turbine footprint conditions. Detectors D.05 and D.06 support this interpretation as it occupies similar open bog habitat. D.01 is the closest detector.
T.10	D.02	D.02	D.02	T.10 is located within plantation habitat (with a nearby firebreak), the detector that best represents turbine footprint conditions is D.02 because it is situated within the same plantation context. Although D.05 appears physically closest to T.10 on the map, it is not habitat-matched (open bog context) and is not used as the accurate or representative detector for this turbine.
T.11	D.01	D.01, D.05	D.01	T.11 is located within open bog habitat in the south-central-west portion of the site. Detector D.01 occupies open bog with low commuting and foraging potential and provides an accurate representation of turbine-level conditions. Detector D.05 supports this representation as it shares the same habitat type. D.01 is the closest detector.
T.12	D.03	D.03, D.04	D.03	T.12 is best represented by detector D.03, positioned on a spruce at the edge of dense Sitka forestry beside a drainage ditch, reflecting turbine footprint conditions. Detector D.04, on a forestry track within the Sitka plantation, is included due to the similar plantation and linear-feature setting and comparable commuting and foraging potential. D.03 is the closest detector to T.12.

Proposed Turbine	Accurate Detector (A)	Representative Detector(s) (R)	Closest Detector	Rationale
T.13	D.04	D.04, D.03	D.04	T.13 is best represented by detector D.04, located on alder along a Sitka spruce forestry track, reflecting turbine footprint conditions. Detector D.03 is also included due to the shared plantation-edge context and comparable commuting and foraging conditions linked to linear features. D.04 is the closest detector to T.13.

3.5.1. Summary

A total of 13,423 bat passes were recorded across all detectors during the 2024 monitoring season (spring, summer, autumn). Seasonal variation was evident with autumn accounting for 68% of all passes (9,139), spring for 21% (2,832), and summer for 14.67% (2,058) (see Figure 7 and Table 8, Table 9 and Table 10). Species composition was dominated by soprano pipistrelle (>90% of passes), followed by Myotis spp. (~4–5%) and occasional records of Leisler’s bat, common pipistrelle, and brown long-eared bat. Spatial distribution was uneven with detectors near plantation edges and linear habitats recording the higher activity, particularly D.10, D.07, and D.04 in autumn, and D.10 and D.11 in spring. Open upland detectors (e.g., D.01, D.05, D.06) recorded minimal activity. Timing patterns varied seasonally with autumn peaking at 20:00, spring at 23:00, and summer at 01:00 (Figure 4, Figure 5 and Figure 6)

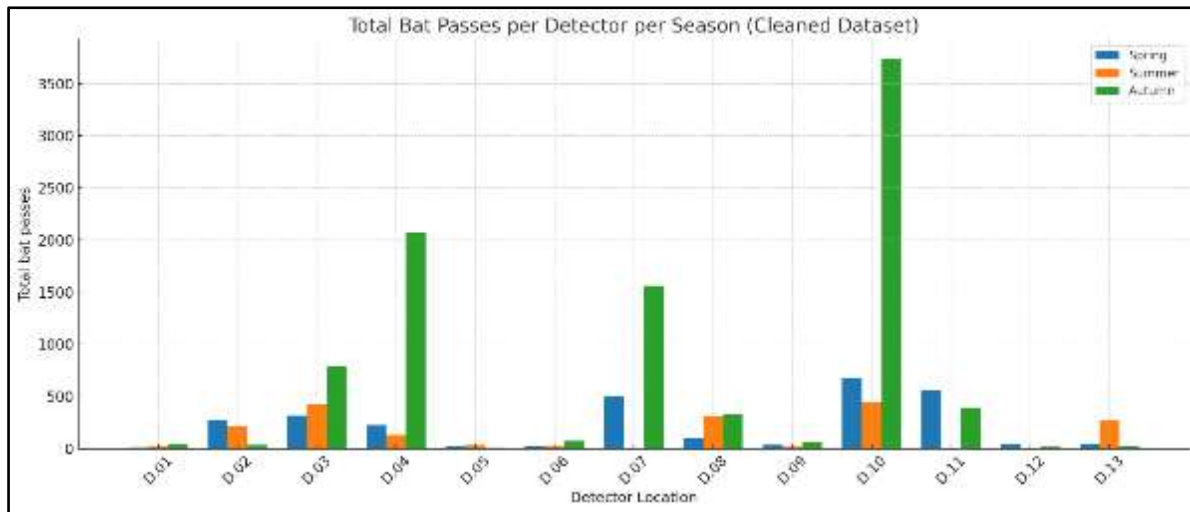


Figure 7: Total bat passes per season 2024

4. DISCUSSION

Bat activity across the Site exhibited clear seasonal variation, with the highest levels recorded in autumn, moderate activity in spring, and the lowest in summer; across the three deployments a total of 13,423 bat passes were logged. Seasonal shifts of this kind are widely reported in temperate bat communities and are consistent with changes in prey availability and diel insect patterns through the year (Salvarina, 2018; Kohles et al., 2024).

Activity was strongly dominated by soprano pipistrelle (*Pipistrellus pygmaeus*) in all seasons (>90% of passes), with *Myotis* spp. forming the second most frequently detected group and occasional detections of Leisler's bat, common pipistrelle, and brown long-eared bat. While this species composition is consistent with national datasets in which soprano pipistrelle is the most widespread Irish bat, it differs in that common pipistrelle was not the second most frequently recorded species at the Site (Bat Conservation Ireland, 2024; BATLAS 2020).

Spatially, activity was unevenly distributed across detectors. Those positioned near plantation edges, treelines, and structurally diverse stands consistently recorded the highest activity, particularly D.10, D.07, and D.04, whereas more open upland detectors showed markedly fewer passes (D.01, D.05, D.06 and D.09). Turbine-detector associations (Table 11) confirm that turbines located within plantation contexts (e.g., T.01 - T.03, T.10, T.12 - T.13) correspond to detectors with higher activity, while turbines in open bog habitats align with detectors representing open bog habitat with low foraging and commuting potential. This concentration is consistent with extensive evidence that bats preferentially use linear features and edge habitats (hedgerows, treelines, woodland margins) for commuting and foraging (Bat Conservation Trust; Finch et al., 2020; Fill et al., 2022).

Timing analyses indicate bats within the Site show a combination of early-night peaks and records within or before typical species-specific emergence windows. Autumn exhibited an early-night peak around 20:00, indicating nearby roost influence or short commuting distance, while spring peaked around 23:00, and summer activity extended into the early hours (peak ≈ 01:00). Such seasonal differences in hourly activity match broader observations that bat activity tracks diel prey availability and seasonal prey pulses (Jones & Rydell, 1994; Salvarina, 2018).

Across deployments, EcoBat outputs indicated low to low/moderate activity on most nights, with occasional moderate or moderate/high nights at specific detectors for soprano pipistrelle and *Myotis* spp. EcoBat provides standardised, percentile-based bands that contextualize nightly activity against regional datasets, supporting transparent reporting in ecological assessments (Lintott et al., 2017; Mammal Society, 2024).

Roost potential within the Site is very limited. Habitat classification at turbine locations (Table 5) indicates uniformly low suitability, and no PRFs were recorded within 300 m of any turbine. Emergence and re-entry surveys confirmed only one soprano pipistrelle transitional/day roost (F6), located approximately 305 m from detector D.10, beyond the turbine buffer zone (NatureScot, 2021). All other surveyed features exhibited negligible or low potential and did not support confirmed roosts. These

findings confirm that the Site functions primarily as a foraging and commuting landscape, with minimal roost-related constraints.

Therefore, maintaining connected edge habitats (treelines, hedgerows) and avoiding new lighting of these corridors would safeguard functional connectivity and prey availability for the species recorded (Bat Conservation Trust; Mammal Society, 2021; NatureScot, 2021).

5. REFERENCES

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APPENDIX A: Static Locations 2024



D.01 (54.12986, -
9.879476)



D.02 (54.127292, -
9.891656)

D.03 (54.12986, -
9.879476)



D.05 (54.13992, -
9.882278)

D.04 (54.13497, -
9.88142)



D.06 (54.139917, -
9.882278)



**D.07 (54.14763, -
9.868086)**

**D.08 (54.1483, -
9.88604)**



**D.11 (54.15019, -
9.898119)**

**D.12 (54.15129, -
9.895528)**

**D.09 (54.14286, -
9.888361)**

**D.10 (54.14611, -
9.89424)**



**D.13 (54.12139, -
9.895528)**

APPENDIX B: Weather data for each static deployment period 2024

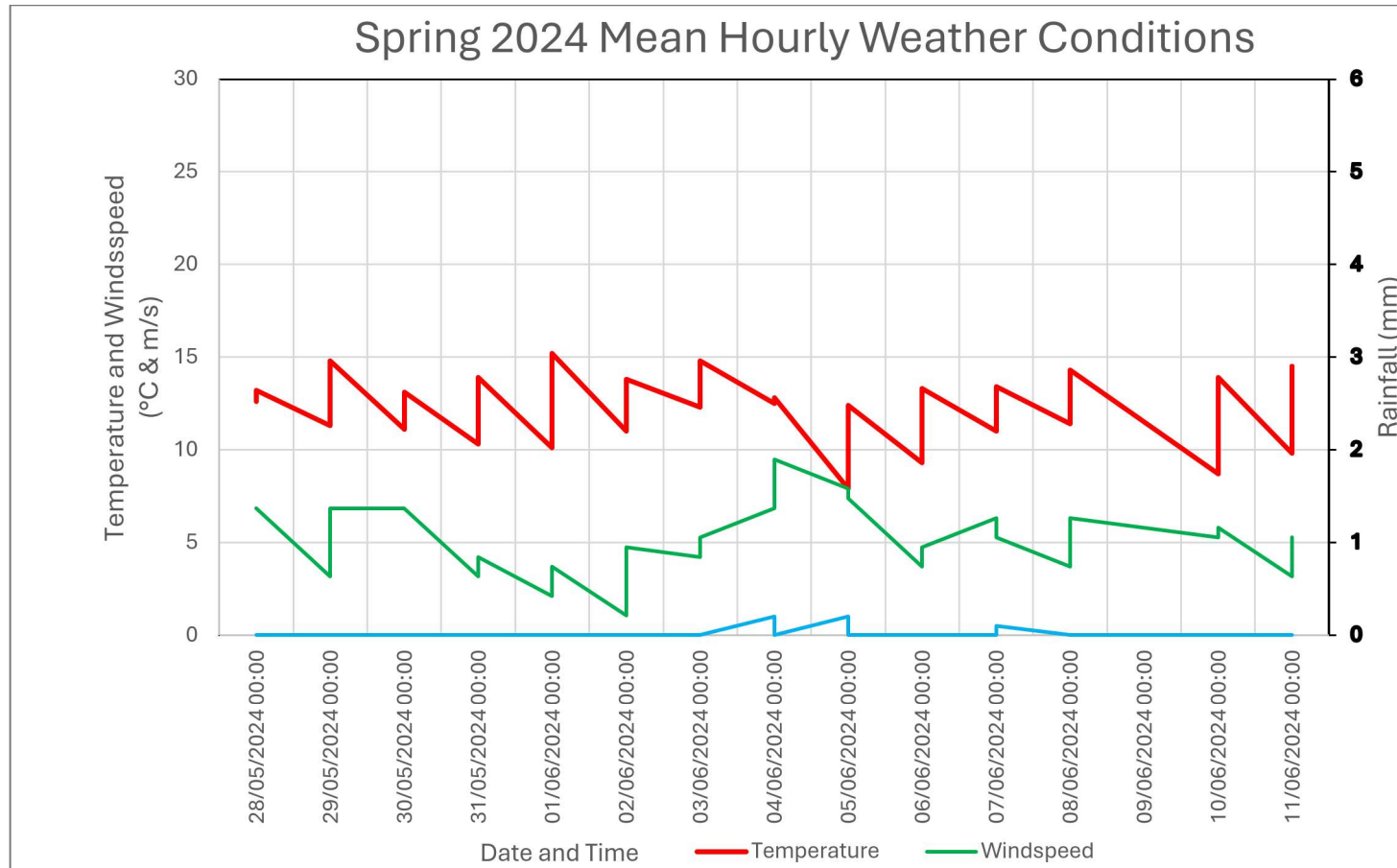


Figure 8: Mean hourly weather conditions for the duration of the 2024 Spring deployment

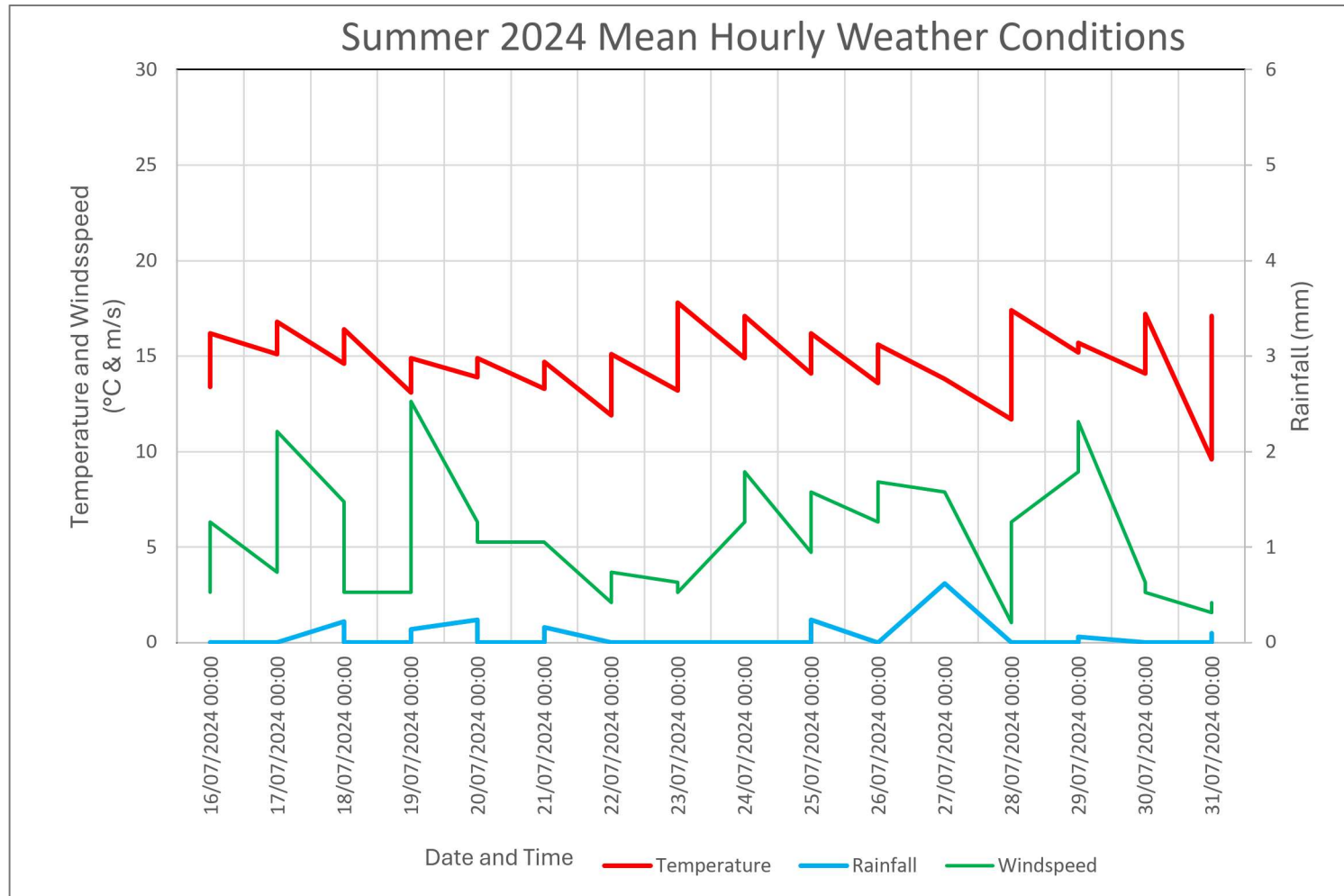


Figure 9: Mean hourly weather conditions for the duration of the 2024 Summer deployment

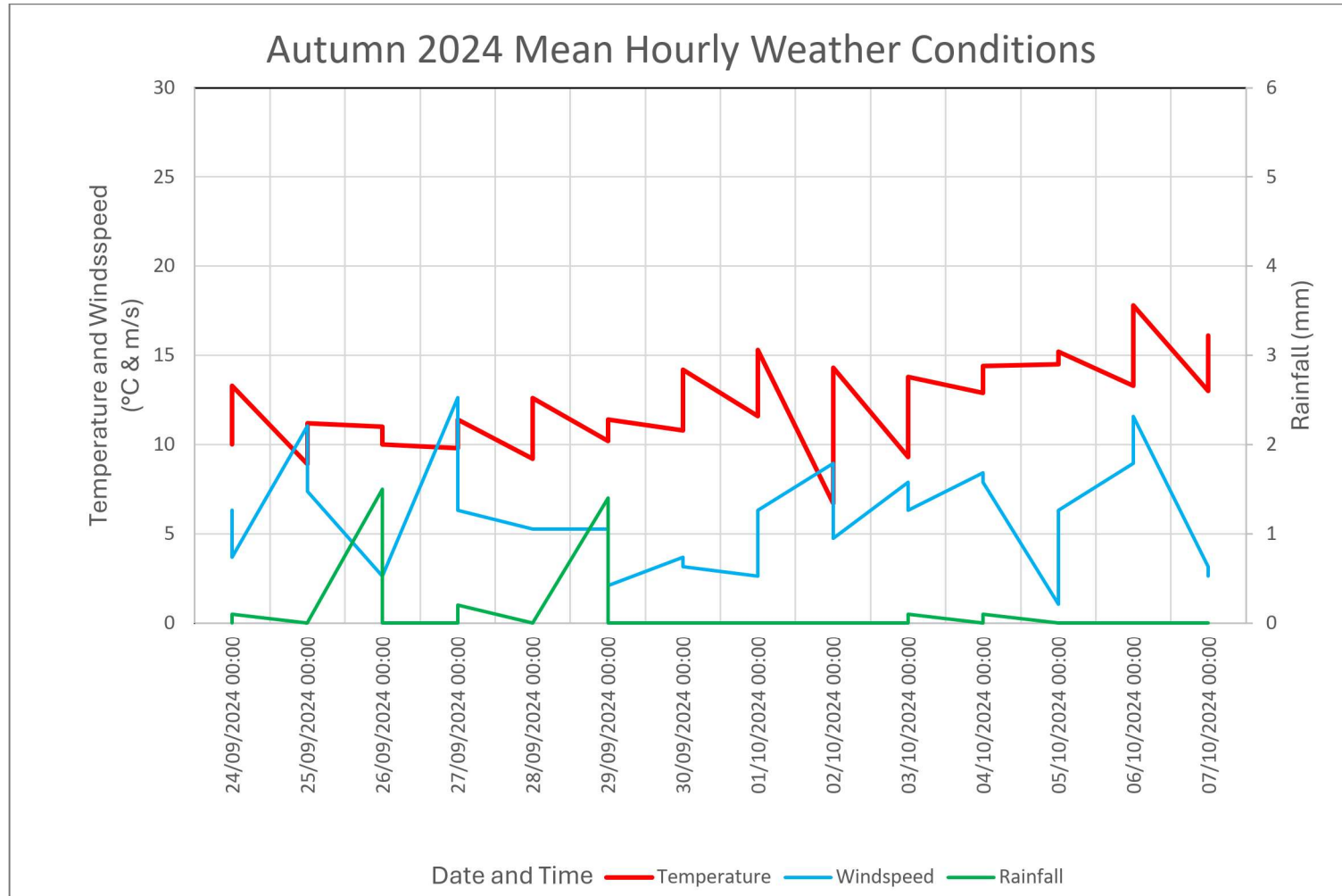


Figure 10: Mean hourly weather conditions for the duration of the 2024 Autumn deployment

APPENDIX C: BCI Data

Table 12: BCI roost and survey data within 10km of the site

Survey	Distance from buildable turbine envelope centre	Species	Date
BATLAS 2020	c. 8km	Species data not provided	06/09/2018
BATLAS 2020	c. 7km	Species data not provided	04/09/2018
BATLAS 2020	c. 6km	Species data not provided	03/09/2018
BATLAS 2020	c. 11km	Species data not provided	08/06/2018
BATLAS 2020	c. 9km	<i>Pipistrellus pygmaeus</i>	06/09/2018
BATLAS 2020	c. 10km	<i>Pipistrellus pygmaeus</i>	04/09/2018
BATLAS 2020	c. 3km	Species data not provided	03/09/2018
BATLAS 2020	c. 9km	Species data not provided	08/06/2018
BATLAS 2020	c. 10km	Species data not provided	06/09/2018
BATLAS 2020	c. 13km	Species data not provided	19/08/2016
Consultancy Surveys	c. 13km	<i>Nyctalus leisleri</i>	07/09/2007

APPENDIX D: ECO Bat Results



Ecobat Report

2025-10-24

Geo filter: country, Time filter: all

Summary

Bats were detected on **65** nights between **27/05/2024** and **17/10/2024**, using **31** static bat detectors. Throughout this period, **5** species were recorded. **Table 1.**
Detectors were placed at the following locations:

Detector ID	Latitude	Longitude
WSS026	54.13228	-9.89009
WSS056	54.15013	NA
WSS064	54.13653	-9.89271
WSS077	54.13992	-9.88229
WSS059	54.14831	-9.88604
WSS103	54.13231	-9.89014
WSS105	54.12991	-9.87942
WSS029	54.13653	-9.89271
WSS034	54.13231	-9.89014
WSS104	54.14761	-9.86815
WSS060	54.12232	-9.89519
WSS037	54.13231	-9.89008
WSS038	54.12729	-9.89166
WSS105	54.14286	-9.88836
WSS029	54.13399	-9.88228
WSS063	54.14763	-9.86809
WSS097	54.15013	NA
WSS031	54.14831	-9.88604
WSS033	54.14286	-9.88836
WSS061	54.15019	-9.89812
WSS076	54.15019	-9.89812
WSS027	54.12139	-9.89553
WSS053	54.14831	-9.88604
WSS059	54.13992	-9.88229
WSS106	54.14611	-9.89439
WSS101	54.12232	-9.89519
WSS033	54.14611	-9.89439
WSS071	54.14287	-9.88835
WSS073	54.14761	-9.86815
WSS074	54.15131	NA
WSS100	54.13497	NA
WSS074	54.14761	NA
WSS058	54.13497	NA
WSS036	54.13228	-9.89009
WSS062	54.12991	-9.87942
WSS105	54.14287	-9.88835

Detector ID	Latitude	Longitude
WSS035	54.13497	NA
WSS056	54.12986	-9.87948
WSS104	54.13992	-9.88228

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
WSS026	2
WSS027	2
WSS029	4
WSS031	3
WSS033	14
WSS034	5
WSS035	15
WSS036	2
WSS037	3
WSS038	2
WSS053	2
WSS056	11
WSS058	3
WSS059	6
WSS060	2
WSS061	3
WSS062	8
WSS063	5
WSS064	2
WSS071	2
WSS073	10
WSS074	4
WSS076	2
WSS077	5
WSS097	2
WSS100	6
WSS101	2
WSS103	2
WSS104	4
WSS105	9
WSS106	3

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



Part 1: Percentile Analysis

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

Per Detector

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

Detector ID	Species/Species Group	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
WSS026	Myotis	0	0	0	0	0	2
WSS026	Pipistrellus pygmaeus	0	0	0	0	0	2
WSS026	Plecotus auritus	0	0	0	0	0	1
WSS027	Myotis	0	0	0	0	0	1
WSS027	Nyctalus leisleri	0	0	0	0	0	1
WSS027	Pipistrellus pygmaeus	0	0	0	0	0	2
WSS027	Plecotus auritus	0	0	0	0	2	0
WSS029	Myotis	0	0	0	0	0	4
WSS029	Nyctalus leisleri	0	0	0	0	0	1
WSS029	Pipistrellus pipistrellus	0	0	0	0	0	3
WSS029	Pipistrellus pygmaeus	0	0	0	0	0	4
WSS029	Plecotus auritus	0	0	0	0	2	1
WSS031	Myotis	0	0	0	0	2	0
WSS031	Pipistrellus pipistrellus	0	0	0	0	0	1
WSS031	Pipistrellus pygmaeus	0	0	0	0	2	1
WSS031	Plecotus auritus	0	0	0	0	0	2
WSS033	Myotis	0	0	0	0	0	6
WSS033	Pipistrellus pipistrellus	0	0	0	0	0	3
WSS033	Pipistrellus pygmaeus	0	0	3	2	9	0
WSS033	Plecotus auritus	0	0	0	0	0	2
WSS034	Nyctalus leisleri	0	0	0	0	0	2

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
WSS034	Pipistrellus pipistrellus	0	0	0	0	0	1
WSS034	Pipistrellus pygmaeus	0	0	0	0	0	5
WSS034	Plecotus auritus	0	0	0	0	0	1
WSS035	Myotis	0	0	0	0	2	1
WSS035	Nyctalus leisleri	0	0	0	0	0	3
WSS035	Pipistrellus pipistrellus	0	0	0	0	0	4
WSS035	Pipistrellus pygmaeus	0	0	0	2	7	5
WSS036	Myotis	0	0	0	0	0	2
WSS036	Pipistrellus pipistrellus	0	0	0	0	0	1
WSS036	Pipistrellus pygmaeus	0	0	0	0	0	2
WSS037	Myotis	0	0	0	0	0	2
WSS037	Pipistrellus pipistrellus	0	0	0	0	0	1
WSS037	Pipistrellus pygmaeus	0	0	0	0	0	3
WSS037	Plecotus auritus	0	0	0	0	0	1
WSS038	Myotis	0	0	0	0	0	1
WSS038	Nyctalus leisleri	0	0	0	0	0	1
WSS038	Pipistrellus pipistrellus	0	0	0	0	0	1
WSS038	Pipistrellus pygmaeus	0	0	0	0	0	2
WSS038	Plecotus auritus	0	0	0	0	2	0
WSS053	Myotis	0	0	0	0	0	2
WSS053	Pipistrellus pipistrellus	0	0	0	0	0	2
WSS053	Pipistrellus pygmaeus	0	0	0	0	0	2

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
WSS053	Plecotus auritus	0	0	0	0	0	1
WSS056	Myotis	0	0	0	0	0	8
WSS056	Nyctalus leisleri	0	0	0	0	0	5
WSS056	Pipistrellus pipistrellus	0	0	0	0	0	6
WSS056	Pipistrellus pygmaeus	0	0	0	0	7	4
WSS056	Plecotus auritus	0	0	0	0	0	1
WSS058	Myotis	0	0	0	0	0	3
WSS058	Nyctalus leisleri	0	0	0	0	0	1
WSS058	Pipistrellus pipistrellus	0	0	0	0	0	1
WSS058	Pipistrellus pygmaeus	0	0	0	0	0	3
WSS059	Myotis	0	0	0	0	2	3
WSS059	Pipistrellus pipistrellus	0	0	0	0	0	5
WSS059	Pipistrellus pygmaeus	0	0	0	0	0	6
WSS059	Plecotus auritus	0	0	0	0	0	3
WSS060	Nyctalus leisleri	0	0	0	0	0	2
WSS060	Pipistrellus pygmaeus	0	0	0	0	2	0
WSS060	Plecotus auritus	0	0	0	0	0	2
WSS061	Myotis	0	0	2	1	0	0
WSS061	Pipistrellus pipistrellus	0	0	0	0	0	1
WSS061	Pipistrellus pygmaeus	0	0	0	0	2	1
WSS061	Plecotus auritus	0	0	0	0	0	2
WSS062	Myotis	0	0	0	0	0	2
WSS062	Nyctalus leisleri	0	0	0	0	0	2
WSS062	Pipistrellus pipistrellus	0	0	0	0	0	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
WSS062	Pipistrellus pygmaeus	0	0	0	0	0	7
WSS063	Myotis	0	0	0	0	0	3
WSS063	Nyctalus leisleri	0	0	0	0	0	2
WSS063	Pipistrellus pipistrellus	0	0	0	0	0	3
WSS063	Pipistrellus pygmaeus	0	0	2	1	2	0
WSS063	Plecotus auritus	0	0	0	0	2	0
WSS064	Pipistrellus pygmaeus	0	0	0	0	0	2
WSS064	Plecotus auritus	0	0	0	0	0	1
WSS071	Myotis	0	0	0	0	0	2
WSS071	Pipistrellus pygmaeus	0	0	0	0	0	2
WSS073	Myotis	0	0	0	0	3	3
WSS073	Nyctalus leisleri	0	0	0	0	0	2
WSS073	Pipistrellus pipistrellus	0	0	0	0	0	1
WSS073	Pipistrellus pygmaeus	0	0	0	0	2	7
WSS074	Myotis	0	0	0	0	0	4
WSS074	Pipistrellus pygmaeus	0	0	0	0	0	4
WSS076	Myotis	0	0	0	1	0	0
WSS076	Pipistrellus pipistrellus	0	0	0	0	0	1
WSS076	Pipistrellus pygmaeus	0	0	0	0	2	0
WSS076	Plecotus auritus	0	0	0	0	0	1
WSS077	Pipistrellus pygmaeus	0	0	0	0	0	5
WSS077	Plecotus auritus	0	0	0	0	0	2

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
WSS097	Pipistrellus pipistrellus	0	0	0	0	0	1
WSS097	Pipistrellus pygmaeus	0	0	0	0	0	2
WSS097	Plecotus auritus	0	0	0	0	0	2
WSS100	Myotis	0	0	0	0	0	3
WSS100	Pipistrellus pygmaeus	0	0	0	0	4	2
WSS101	Myotis	0	0	0	0	0	1
WSS101	Nyctalus leisleri	0	0	0	0	0	2
WSS101	Pipistrellus pygmaeus	0	0	0	0	0	2
WSS101	Plecotus auritus	0	0	0	2	0	0
WSS103	Myotis	0	0	0	0	0	2
WSS103	Nyctalus leisleri	0	0	0	0	0	2
WSS103	Pipistrellus pygmaeus	0	0	0	0	0	2
WSS103	Plecotus auritus	0	0	0	0	1	0
WSS104	Myotis	0	0	0	0	0	2
WSS104	Nyctalus leisleri	0	0	0	0	0	2
WSS104	Pipistrellus pipistrellus	0	0	0	0	0	3
WSS104	Pipistrellus pygmaeus	0	0	0	0	2	2
WSS104	Plecotus auritus	0	0	0	0	0	1
WSS105	Myotis	0	0	0	0	4	1
WSS105	Nyctalus leisleri	0	0	0	0	0	3
WSS105	Pipistrellus pipistrellus	0	0	0	0	0	2
WSS105	Pipistrellus pygmaeus	0	0	0	0	2	7
WSS105	Plecotus auritus	0	0	0	0	0	2
WSS106	Myotis	0	0	0	2	0	0
WSS106	Nyctalus leisleri	0	0	0	0	0	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
WSS106	Pipistrellus pipistrellus	0	0	0	0	0	2
WSS106	Pipistrellus pygmaeus	0	0	0	0	3	0
WSS106	Plecotus auritus	0	0	0	0	0	2

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

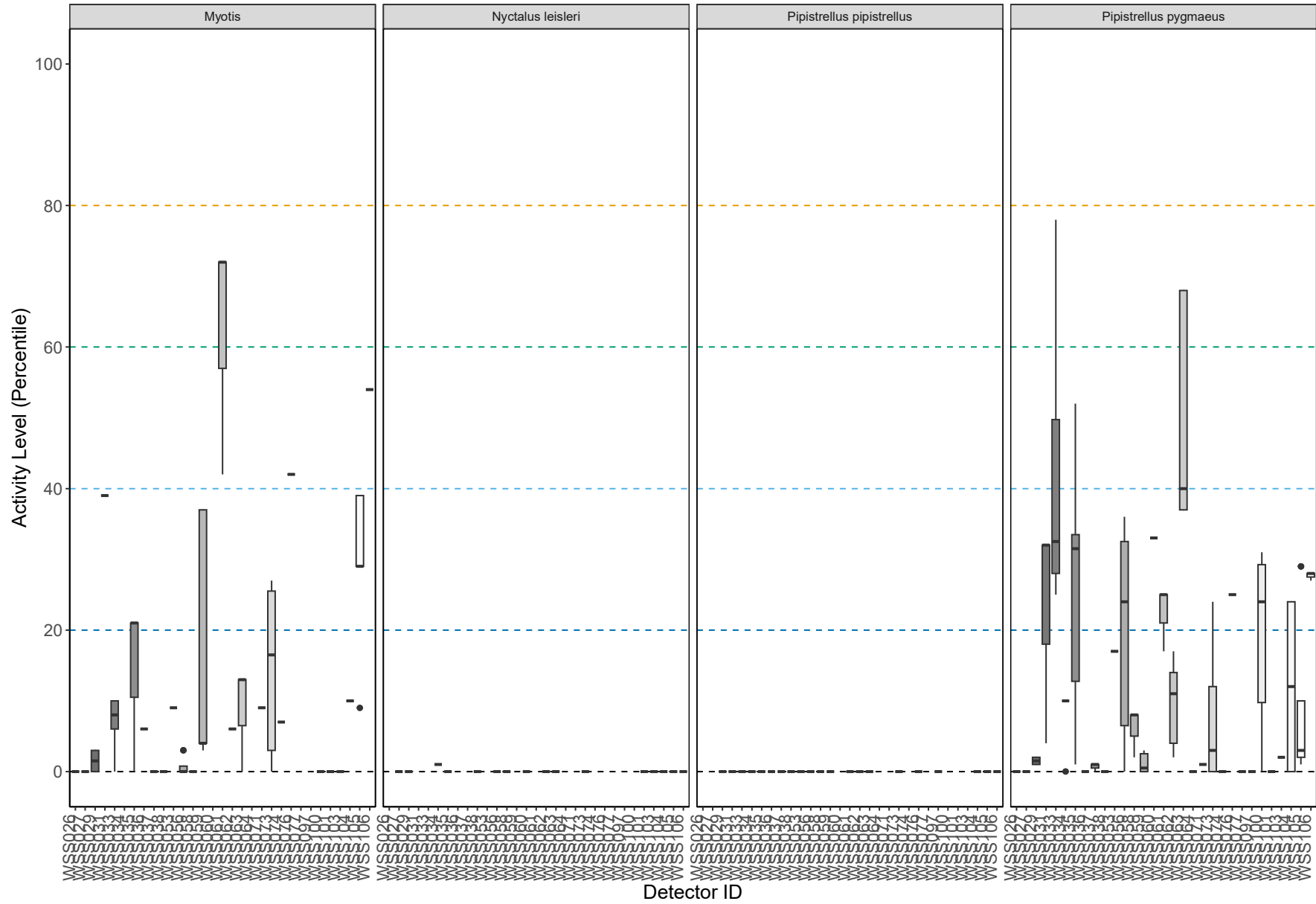
Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
WSS026	Myotis	0	0 - 0	0	2	12046
WSS026	Pipistrellus pygmaeus	0	0 - 0	0	2	97427
WSS026	Plecotus auritus	3	0	3	1	3370
WSS027	Myotis	0	0	0	1	12046
WSS027	Nyctalus leisleri	0	0	0	1	31136
WSS027	Pipistrellus pygmaeus	0	0 - 0	0	2	97427
WSS027	Plecotus auritus	23	23 - 23	23	2	3370
WSS029	Myotis	2	1.5 - 1.5	3	4	12046
WSS029	Nyctalus leisleri	0	0	0	1	31136
WSS029	Pipistrellus pipistrellus	0	0 - 0	0	3	199248
WSS029	Pipistrellus pygmaeus	2	1 - 2	2	4	97427
WSS029	Plecotus auritus	20	20 - 20	20	3	3370
WSS031	Myotis	39	39 - 39	39	2	12046
WSS031	Pipistrellus pipistrellus	0	0	0	1	199248
WSS031	Pipistrellus pygmaeus	32	32 - 32	32	3	97427
WSS031	Plecotus auritus	6	6 - 6	6	2	3370
WSS033	Myotis	8	8 - 10	10	6	12046
WSS033	Pipistrellus pipistrellus	0	0 - 0	0	3	199248
WSS033	Pipistrellus pygmaeus	33	28 - 53.5	78	14	97427
WSS033	Plecotus auritus	5	4.5 - 4.5	6	2	3370
WSS034	Nyctalus leisleri	1	1 - 1	1	2	31136
WSS034	Pipistrellus pipistrellus	0	0	0	1	199248
WSS034	Pipistrellus pygmaeus	10	10 - 10	10	5	97427
WSS034	Plecotus auritus	0	0	0	1	3370
WSS035	Myotis	21	21 - 21	21	3	12046
WSS035	Nyctalus leisleri	0	0 - 0	0	3	31136
WSS035	Pipistrellus pipistrellus	0	0 - 0	0	4	199248
WSS035	Pipistrellus pygmaeus	32	17.5 - 34	52	14	97427
WSS036	Myotis	6	6 - 6	6	2	12046
WSS036	Pipistrellus pipistrellus	0	0	0	1	199248
WSS036	Pipistrellus pygmaeus	0	0 - 0	0	2	97427
WSS037	Myotis	0	0 - 0	0	2	12046
WSS037	Pipistrellus pipistrellus	0	0	0	1	199248

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
WSS037	Pipistrellus pygmaeus	1	1 - 1	1	3	97427
WSS037	Plecotus auritus	3	0	3	1	3370
WSS038	Myotis	0	0	0	1	12046
WSS038	Nyctalus leisleri	0	0	0	1	31136
WSS038	Pipistrellus pipistrellus	0	0	0	1	199248
WSS038	Pipistrellus pygmaeus	0	0 - 0	0	2	97427
WSS038	Plecotus auritus	20	20 - 20	20	2	3370
WSS053	Myotis	9	9 - 9	9	2	12046
WSS053	Pipistrellus pipistrellus	0	0 - 0	0	2	199248
WSS053	Pipistrellus pygmaeus	17	17 - 17	17	2	97427
WSS053	Plecotus auritus	0	0	0	1	3370
WSS056	Myotis	0	0 - 0	3	8	12046
WSS056	Nyctalus leisleri	0	0 - 0	0	5	31136
WSS056	Pipistrellus pipistrellus	0	0 - 0	0	6	199248
WSS056	Pipistrellus pygmaeus	24	16 - 36	36	11	97427
WSS056	Plecotus auritus	0	0	0	1	3370
WSS058	Myotis	0	0 - 0	0	3	12046
WSS058	Nyctalus leisleri	0	0	0	1	31136
WSS058	Pipistrellus pipistrellus	0	0	0	1	199248
WSS058	Pipistrellus pygmaeus	8	8 - 8	8	3	97427
WSS059	Myotis	4	3.5 - 37	37	5	12046
WSS059	Pipistrellus pipistrellus	0	0 - 0	0	5	199248
WSS059	Pipistrellus pygmaeus	1	3 - 3	3	6	97427
WSS059	Plecotus auritus	3	4.5 - 4.5	6	3	3370
WSS060	Nyctalus leisleri	0	0 - 0	0	2	31136
WSS060	Pipistrellus pygmaeus	33	33 - 33	33	2	97427
WSS060	Plecotus auritus	6	6 - 6	6	2	3370
WSS061	Myotis	72	72 - 72	72	3	12046
WSS061	Pipistrellus pipistrellus	0	0	0	1	199248
WSS061	Pipistrellus pygmaeus	25	25 - 25	25	3	97427
WSS061	Plecotus auritus	11	11 - 11	11	2	3370
WSS062	Myotis	6	6 - 6	6	2	12046
WSS062	Nyctalus leisleri	0	0 - 0	0	2	31136
WSS062	Pipistrellus pipistrellus	0	0	0	1	199248
WSS062	Pipistrellus pygmaeus	11	4 - 14	17	7	97427
WSS063	Myotis	13	13 - 13	13	3	12046

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
WSS063	Nyctalus leisleri	0	0 - 0	0	2	31136
WSS063	Pipistrellus pipistrellus	0	0 - 0	0	3	199248
WSS063	Pipistrellus pygmaeus	40	37 - 68	68	5	97427
WSS063	Plecotus auritus	35	35 - 35	35	2	3370
WSS064	Pipistrellus pygmaeus	0	0 - 0	0	2	97427
WSS064	Plecotus auritus	0	0	0	1	3370
WSS071	Myotis	9	9 - 9	9	2	12046
WSS071	Pipistrellus pygmaeus	1	1 - 1	1	2	97427
WSS073	Myotis	17	19.5 - 27	27	6	12046
WSS073	Nyctalus leisleri	0	0 - 0	0	2	31136
WSS073	Pipistrellus pipistrellus	0	0	0	1	199248
WSS073	Pipistrellus pygmaeus	3	3 - 24	24	9	97427
WSS074	Myotis	7	7 - 7	7	4	12046
WSS074	Pipistrellus pygmaeus	0	0 - 0	0	4	97427
WSS076	Myotis	42	0	42	1	12046
WSS076	Pipistrellus pipistrellus	0	0	0	1	199248
WSS076	Pipistrellus pygmaeus	25	25 - 25	25	2	97427
WSS076	Plecotus auritus	11	0	11	1	3370
WSS077	Pipistrellus pygmaeus	0	0 - 0	0	5	97427
WSS077	Plecotus auritus	0	0 - 0	0	2	3370
WSS097	Pipistrellus pipistrellus	0	0	0	1	199248
WSS097	Pipistrellus pygmaeus	0	0 - 0	0	2	97427
WSS097	Plecotus auritus	11	11 - 11	11	2	3370
WSS100	Myotis	0	0 - 0	0	3	12046
WSS100	Pipistrellus pygmaeus	24	14.5 - 31	31	6	97427
WSS101	Myotis	0	0	0	1	12046
WSS101	Nyctalus leisleri	0	0 - 0	0	2	31136
WSS101	Pipistrellus pygmaeus	0	0 - 0	0	2	97427
WSS101	Plecotus auritus	44	44 - 44	44	2	3370
WSS103	Myotis	0	0 - 0	0	2	12046
WSS103	Nyctalus leisleri	0	0 - 0	0	2	31136
WSS103	Pipistrellus pygmaeus	2	2 - 2	2	2	97427
WSS103	Plecotus auritus	23	0	23	1	3370
WSS104	Myotis	10	10 - 10	10	2	12046
WSS104	Nyctalus leisleri	0	0 - 0	0	2	31136
WSS104	Pipistrellus pipistrellus	0	0 - 0	0	3	199248

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
WSS104	Pipistrellus pygmaeus	12	12 - 12	24	4	97427
WSS104	Plecotus auritus	6	0	6	1	3370
WSS105	Myotis	29	19 - 39	39	5	12046
WSS105	Nyctalus leisleri	0	0 - 0	0	3	31136
WSS105	Pipistrellus pipistrellus	0	0 - 0	0	2	199248
WSS105	Pipistrellus pygmaeus	3	2 - 19.5	29	9	97427
WSS105	Plecotus auritus	0	0 - 0	0	2	3370
WSS106	Myotis	54	54 - 54	54	2	12046
WSS106	Nyctalus leisleri	0	0	0	1	31136
WSS106	Pipistrellus pipistrellus	0	0 - 0	0	2	199248
WSS106	Pipistrellus pygmaeus	28	28 - 28	28	3	97427
WSS106	Plecotus auritus	3	3 - 3	3	2	3370

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



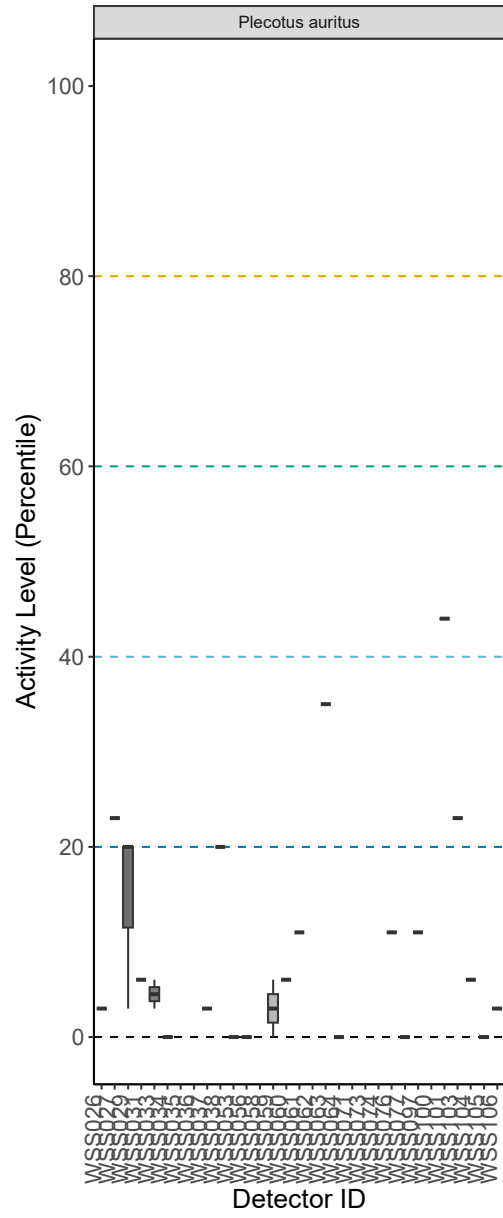
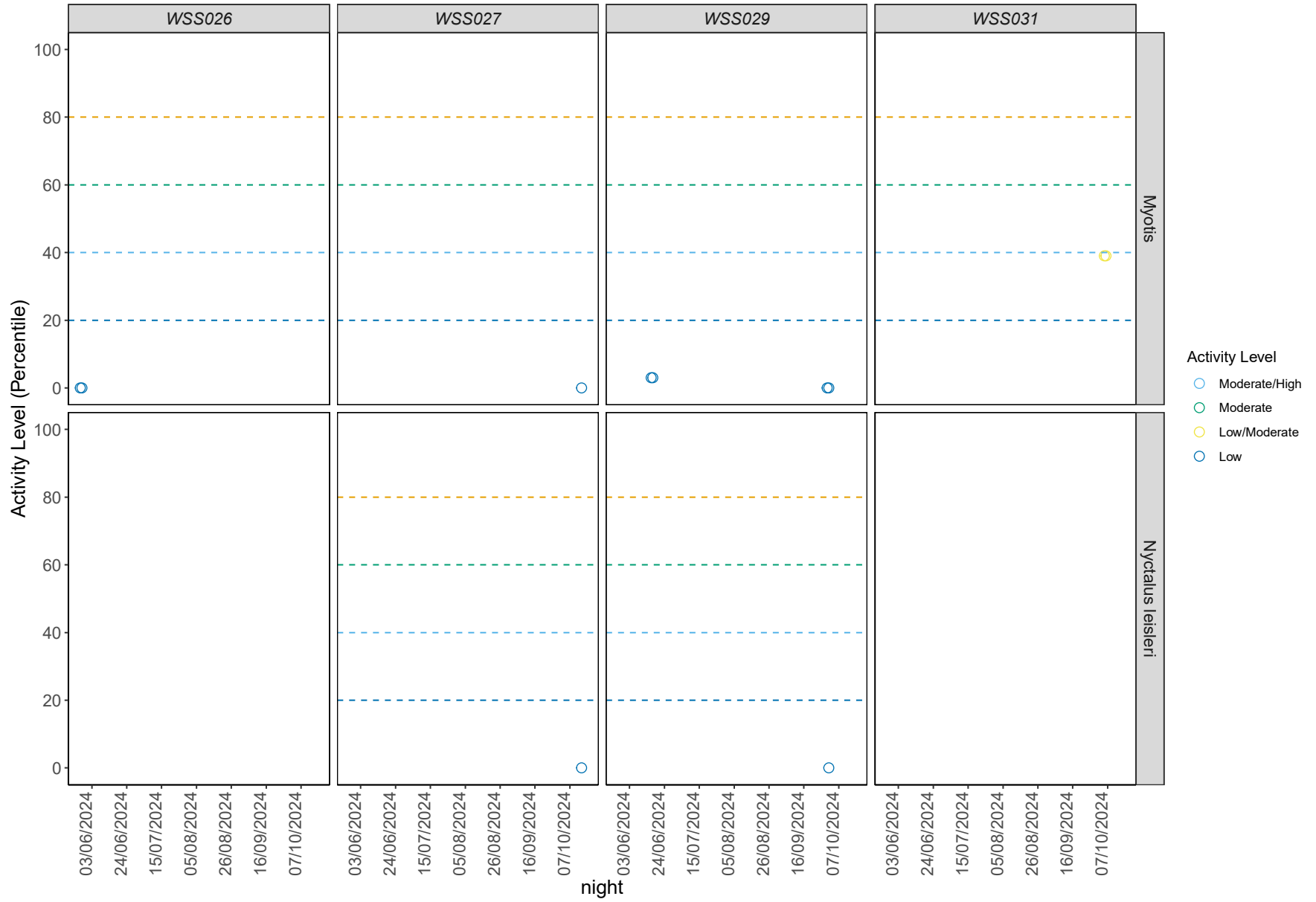
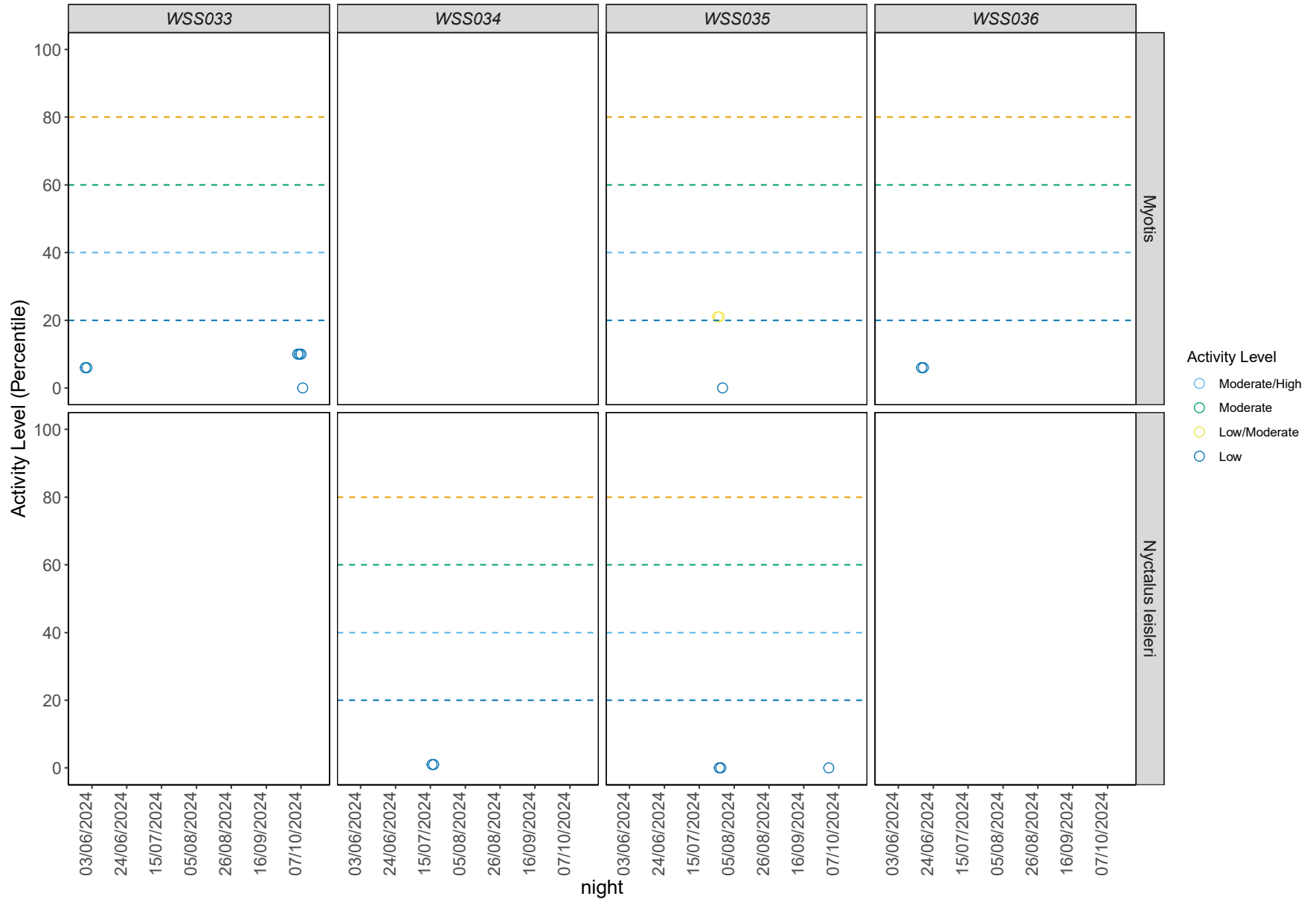
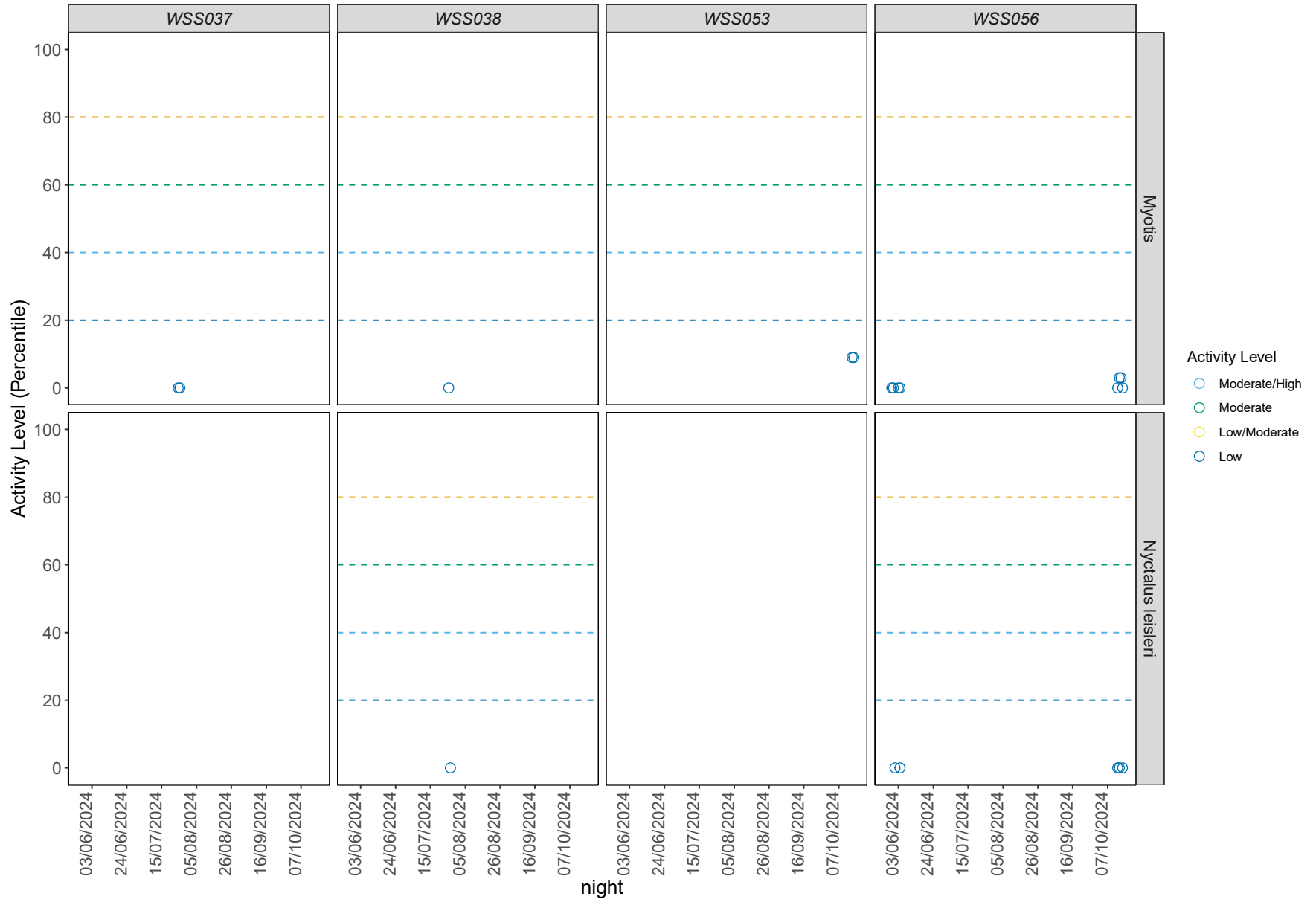
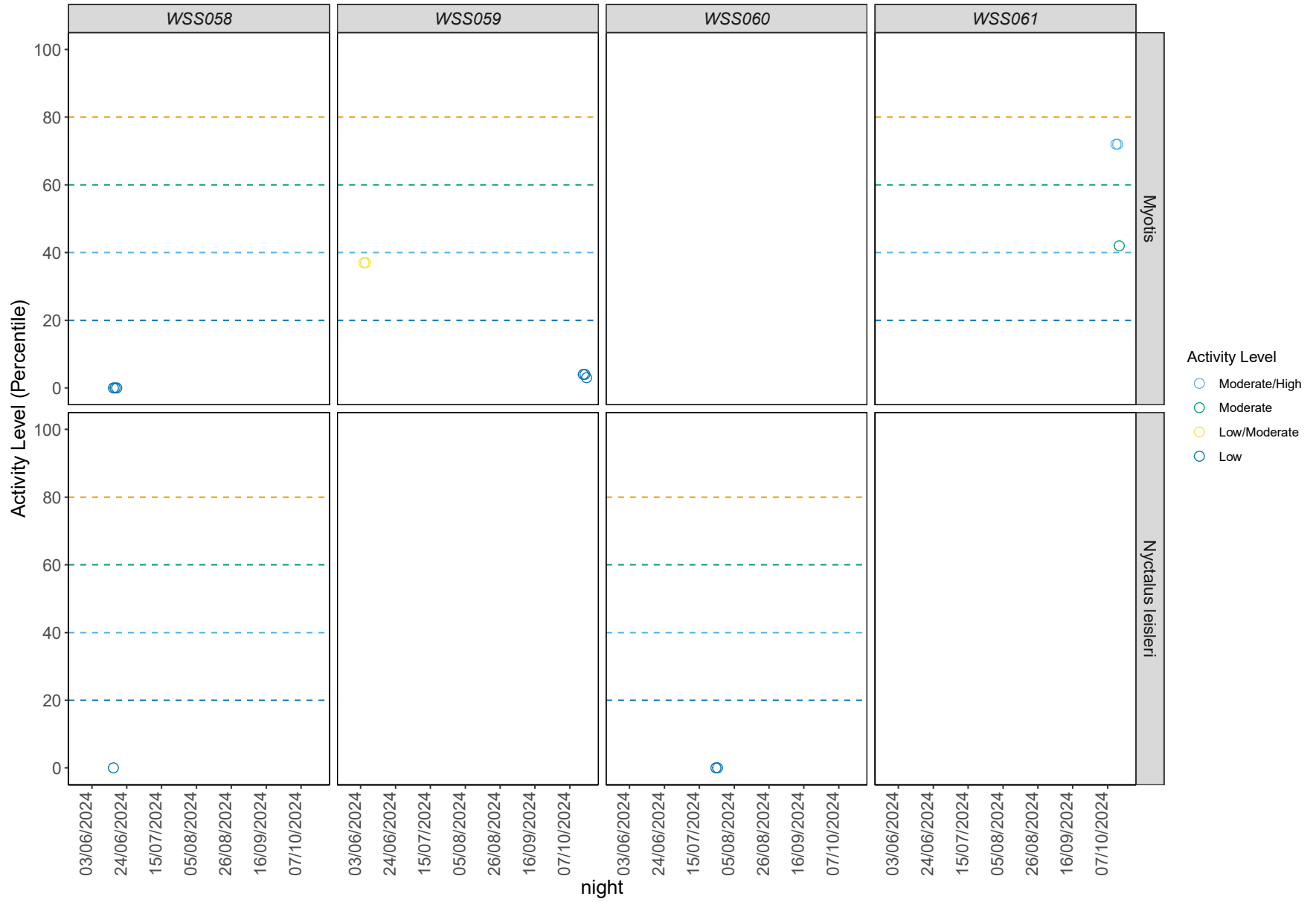


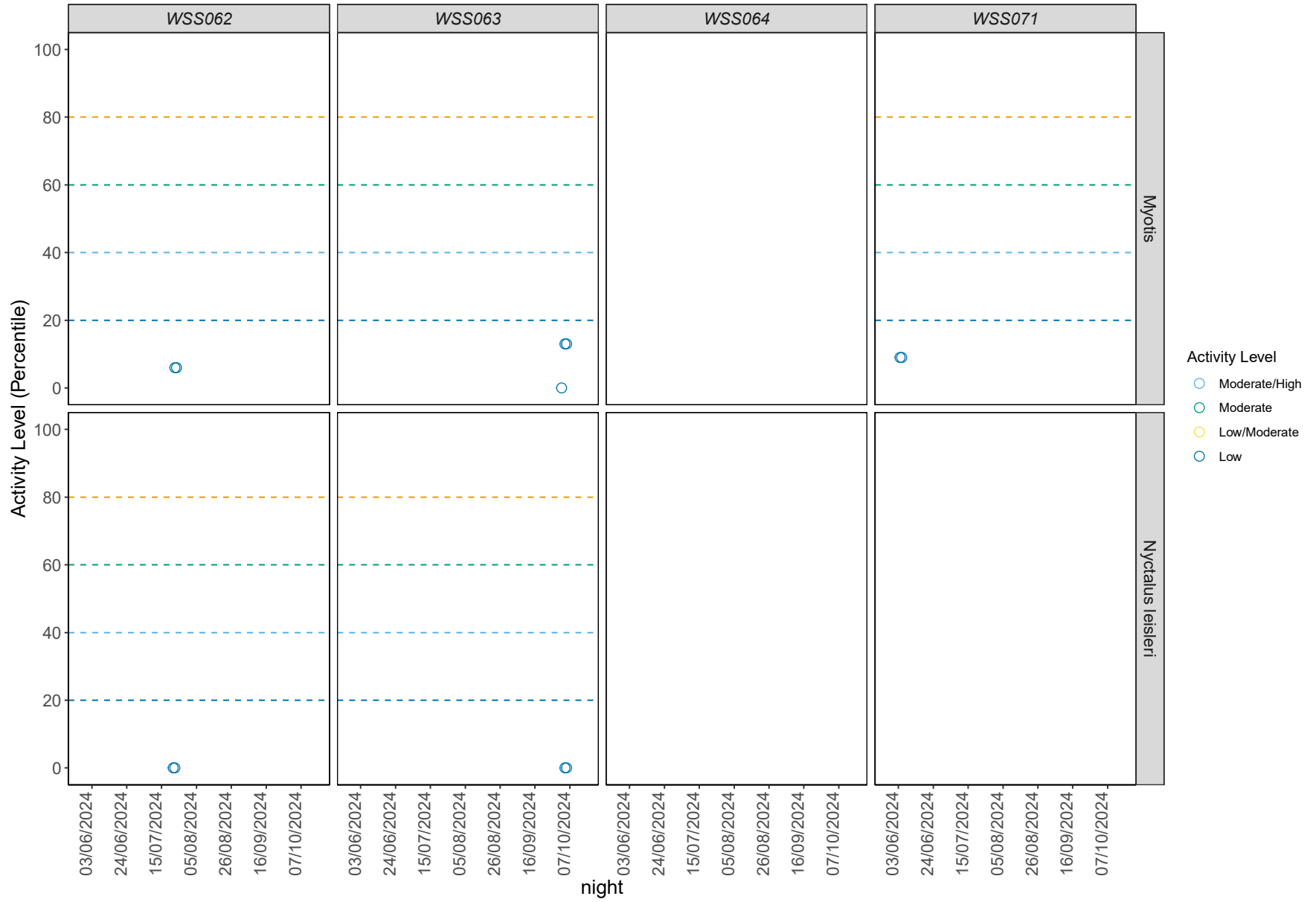
Figure 3. The activity level (percentile) of bats recorded across each night of the bat survey.

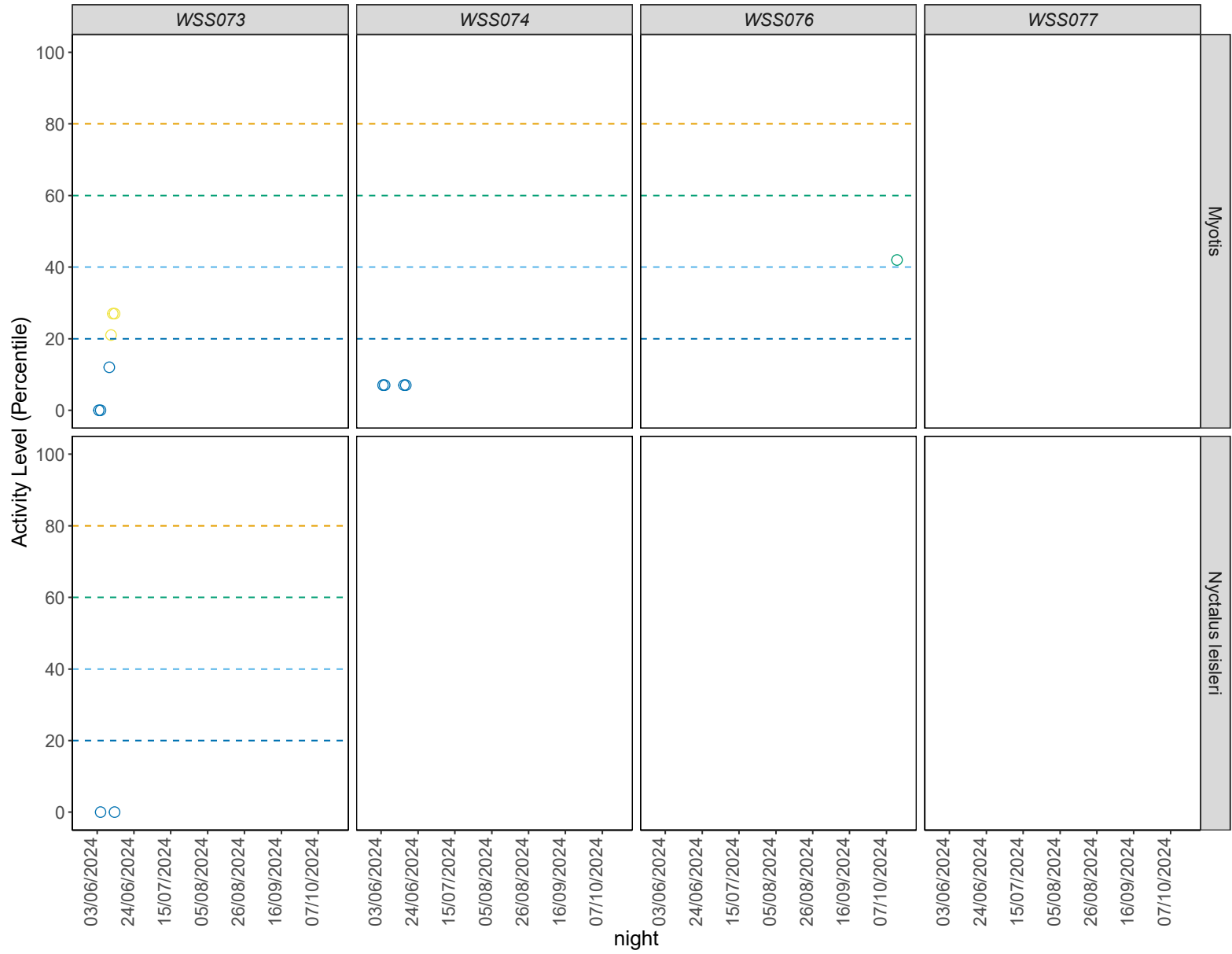


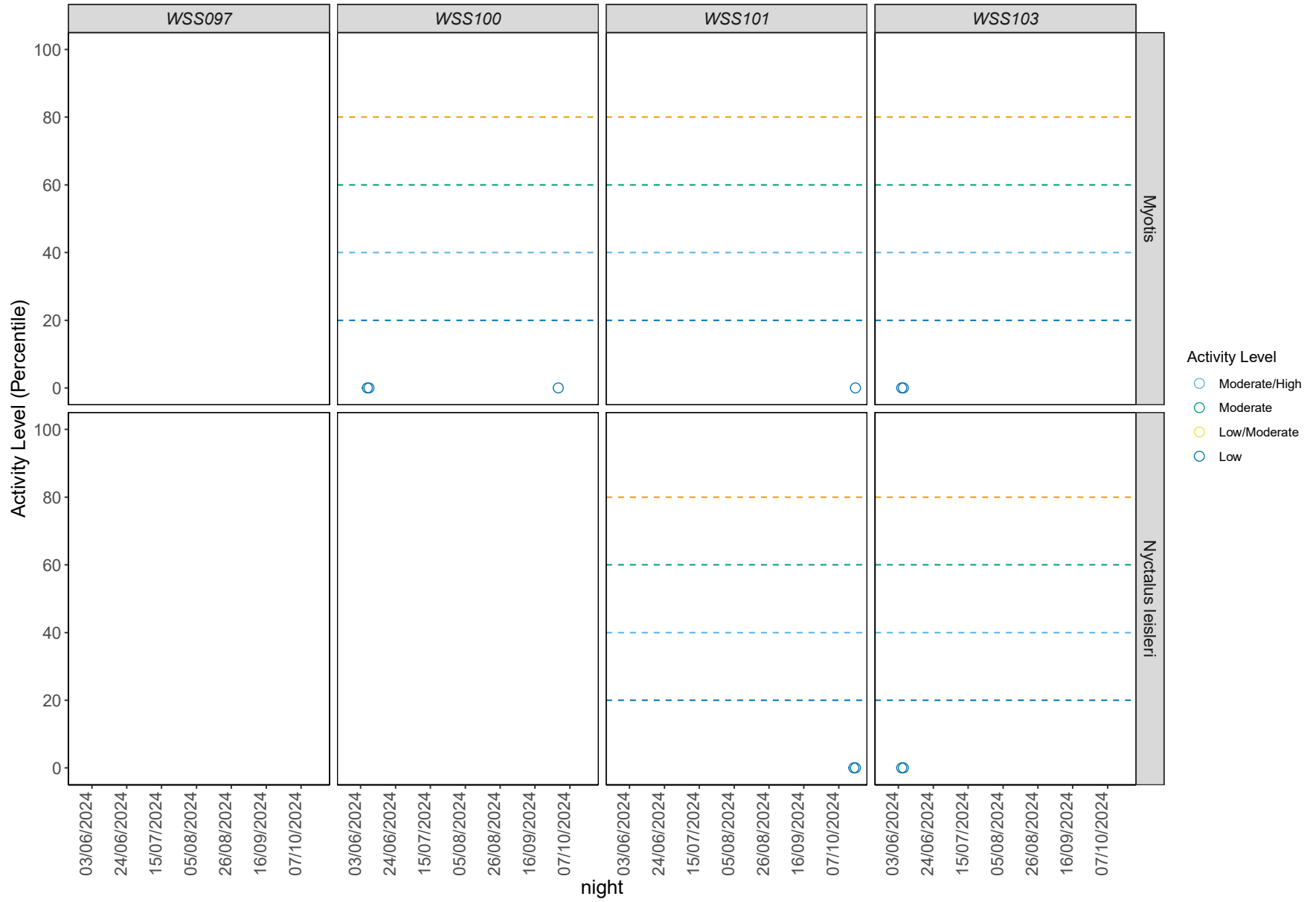


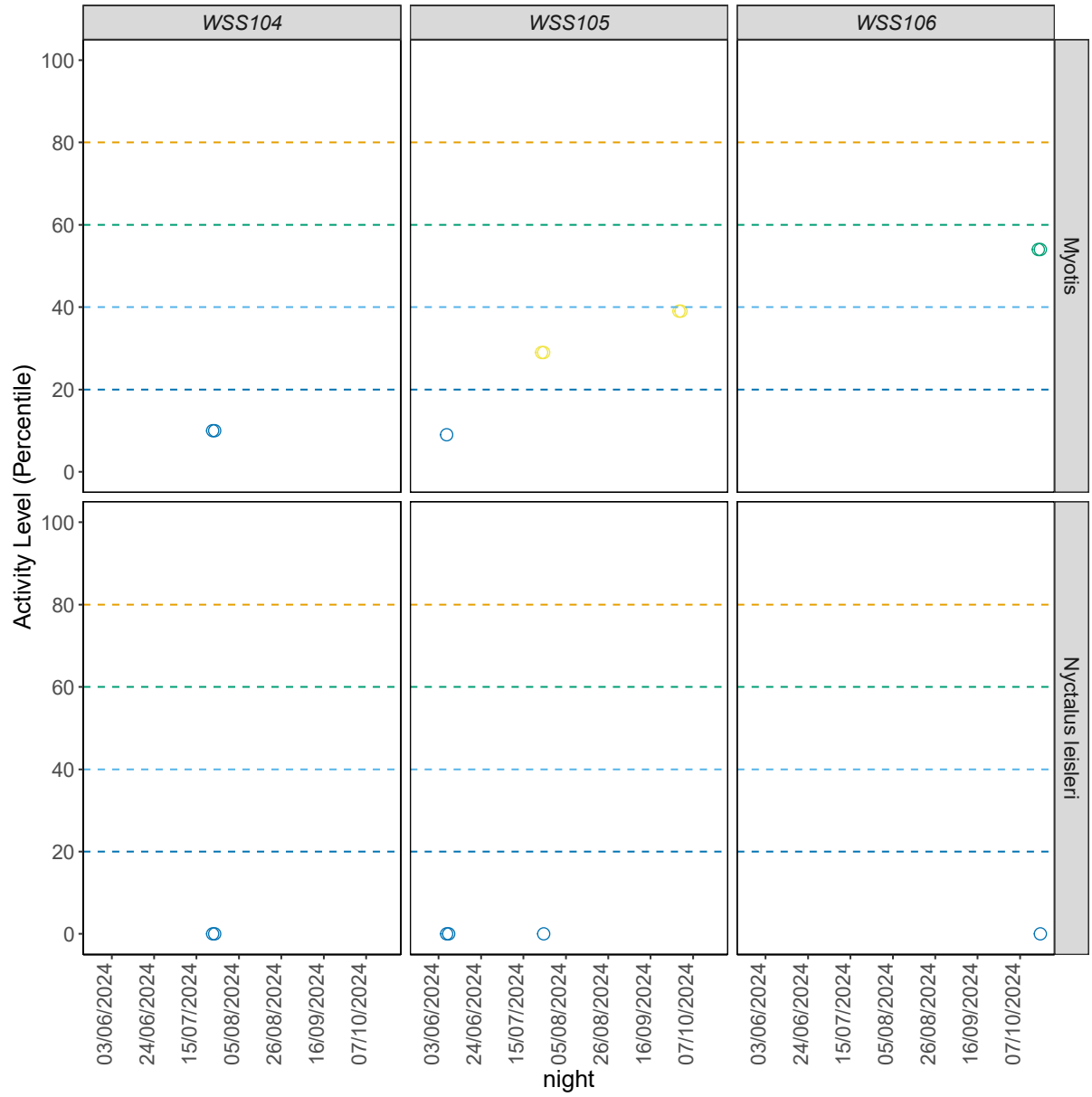






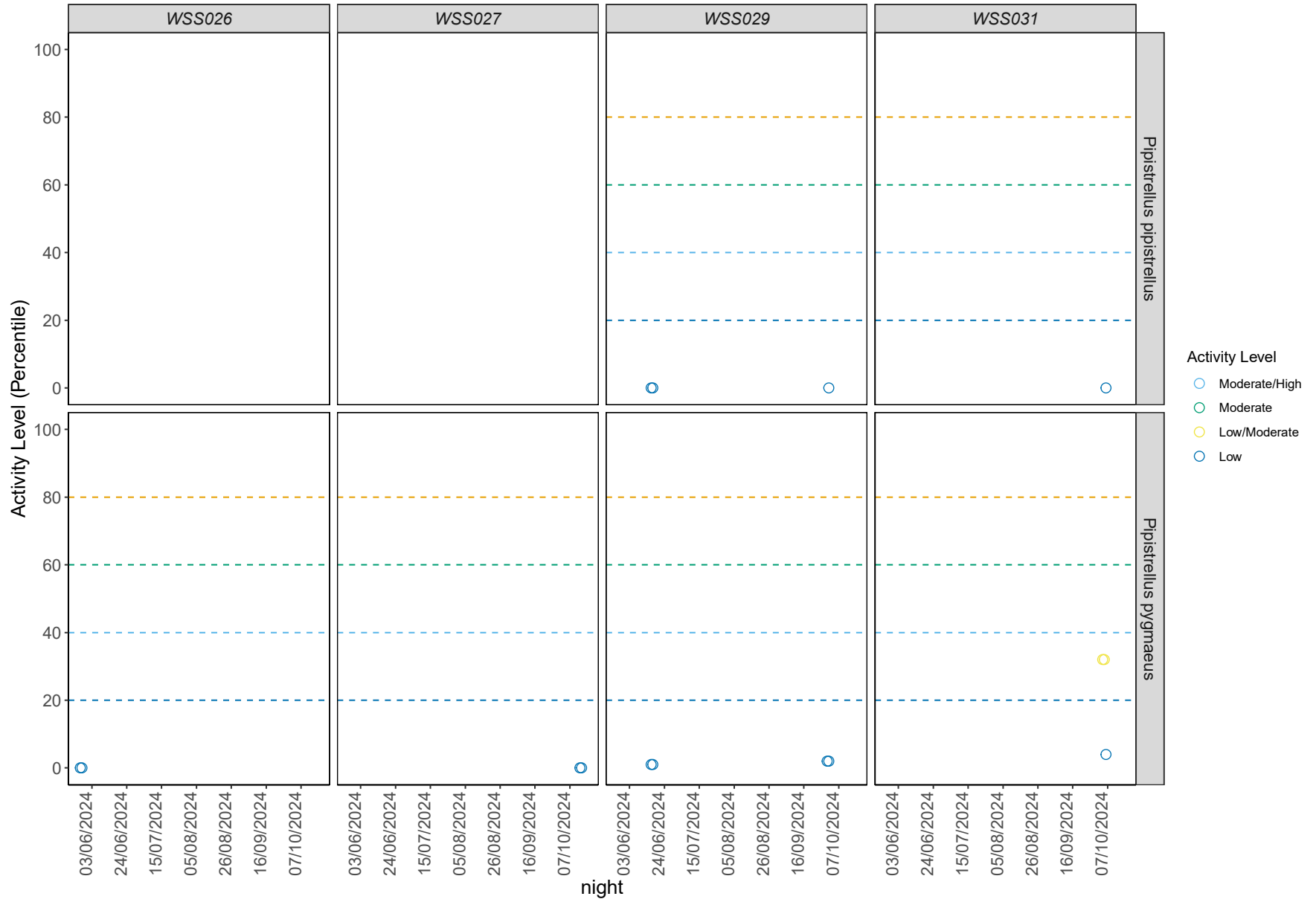


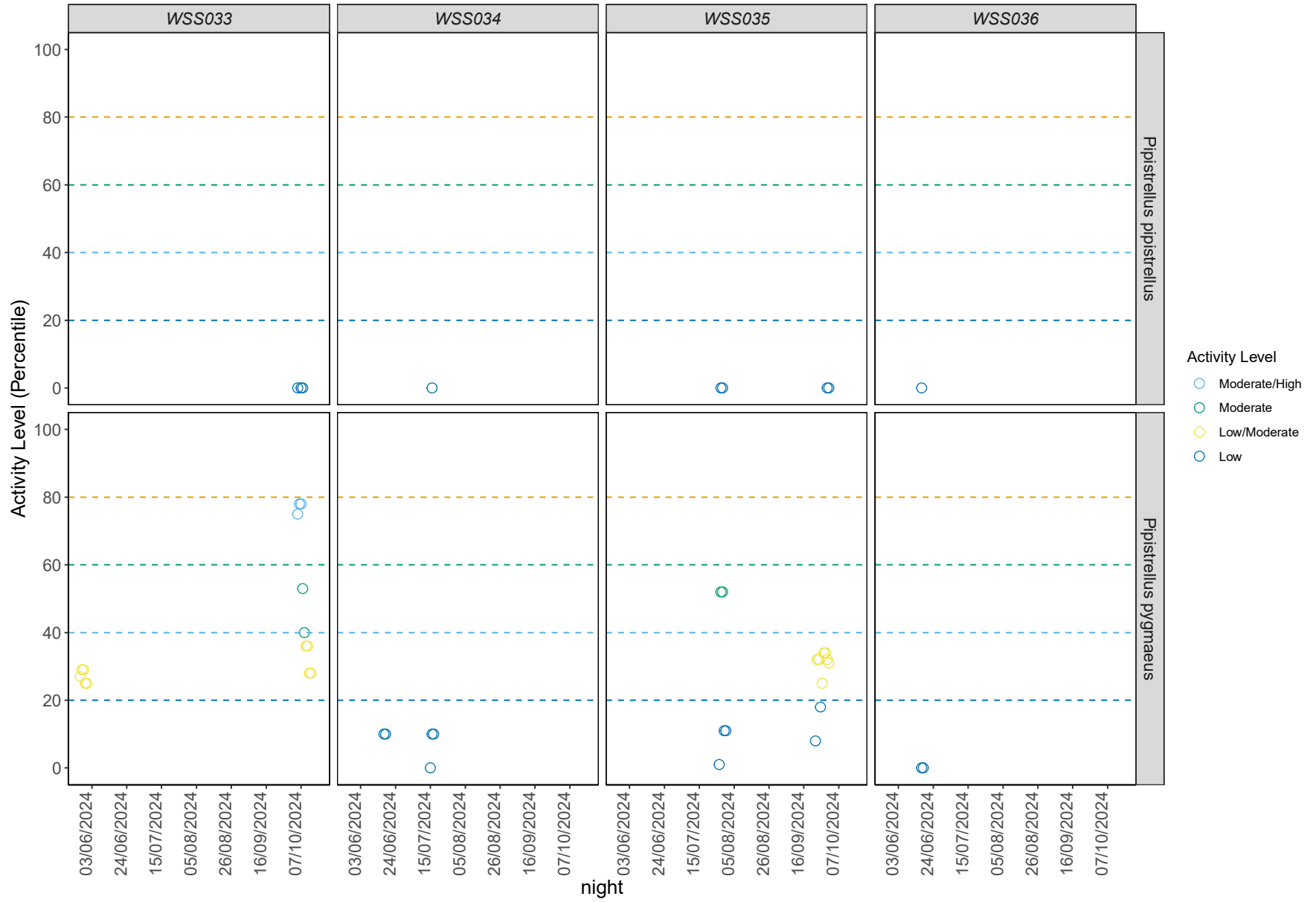


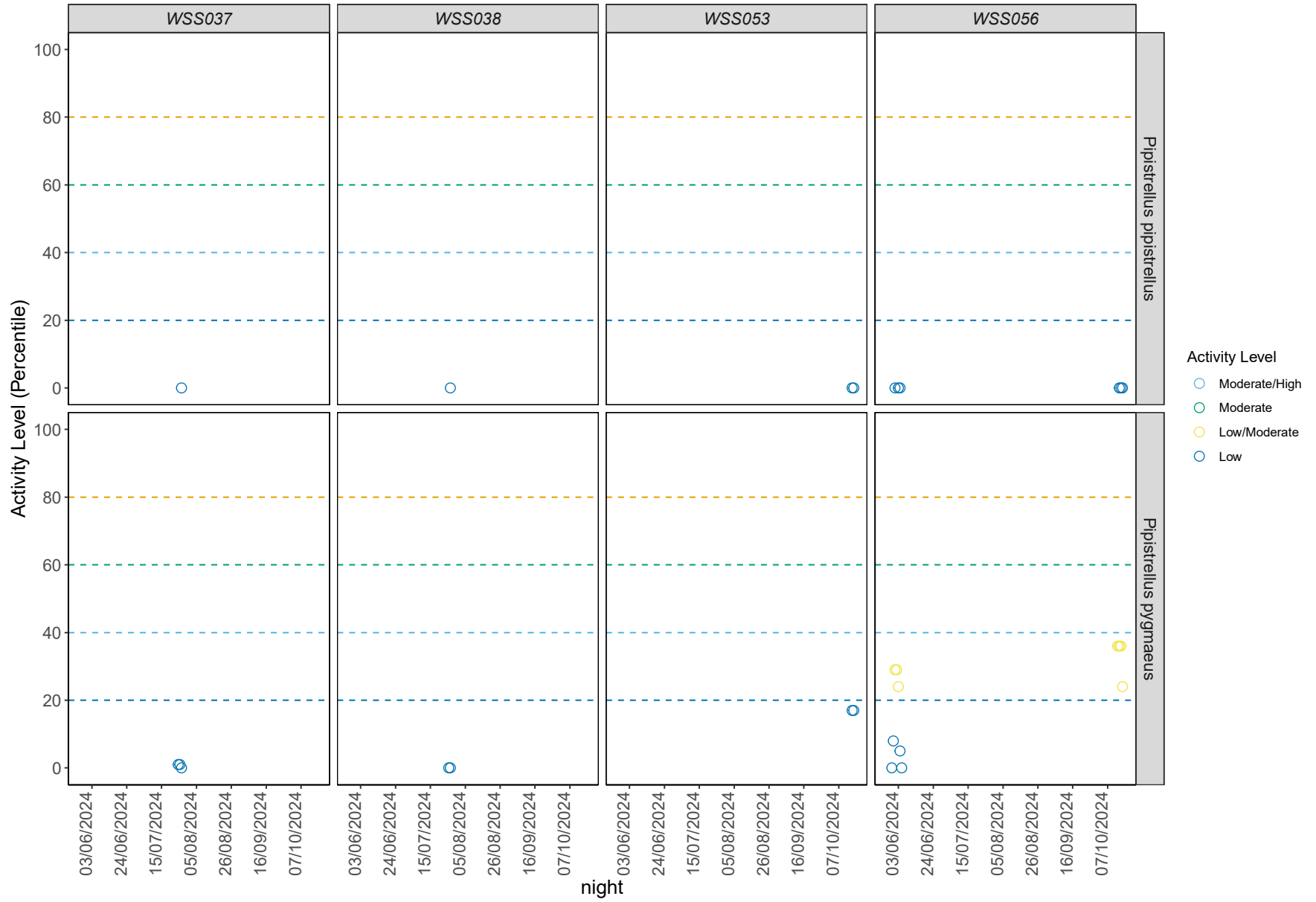


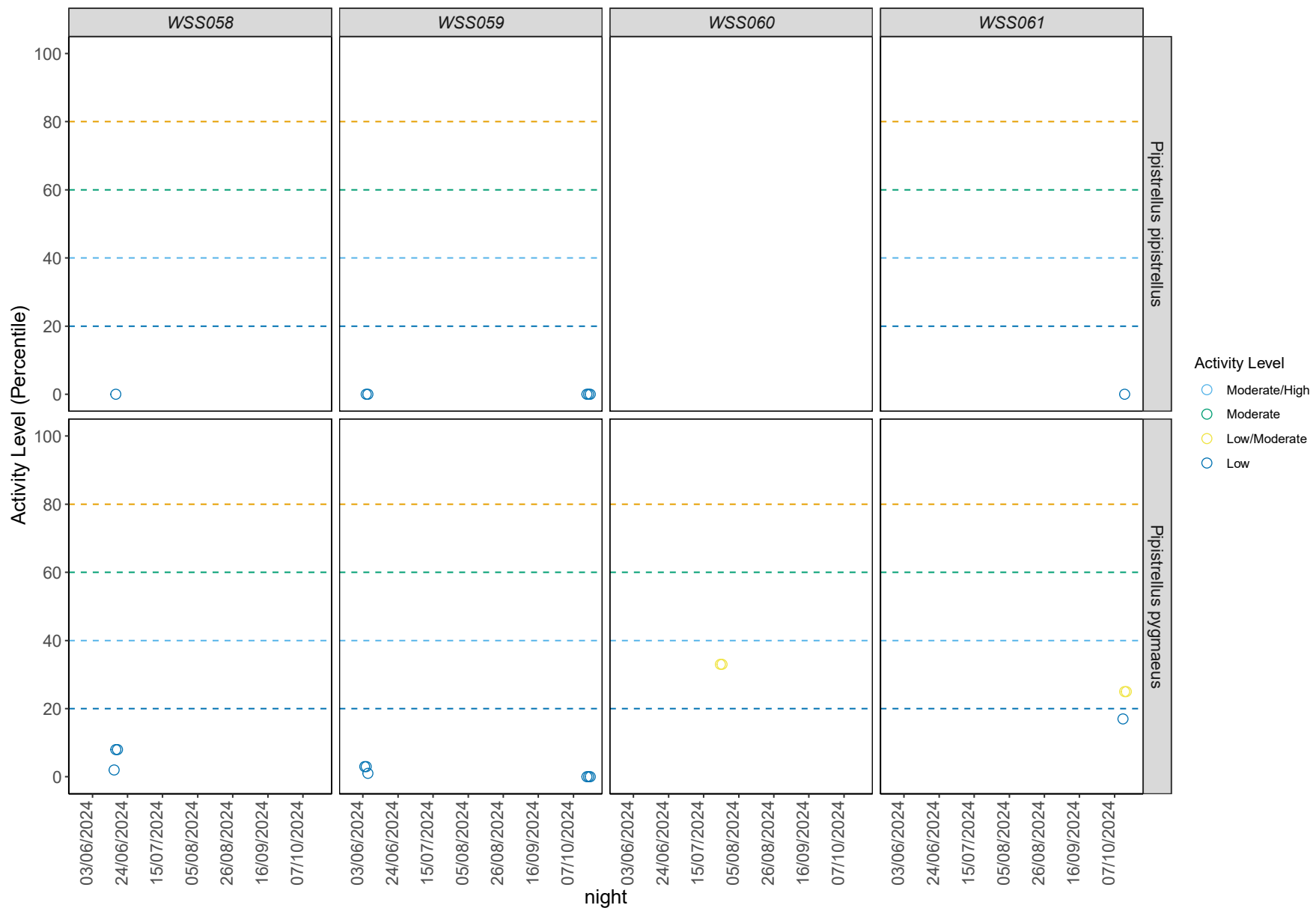
Activity Level

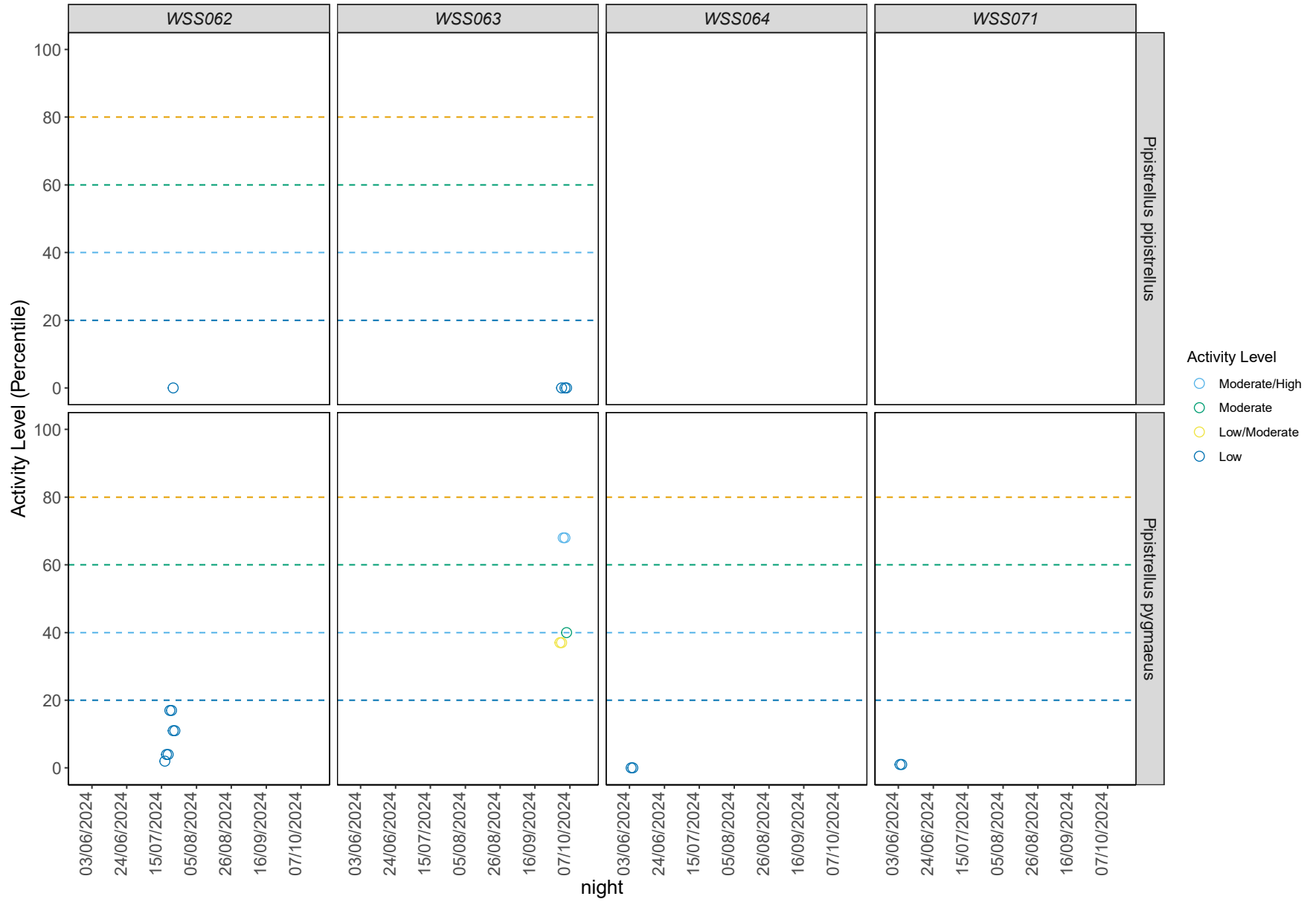
- Moderate/High
- Moderate
- Low/Moderate
- Low

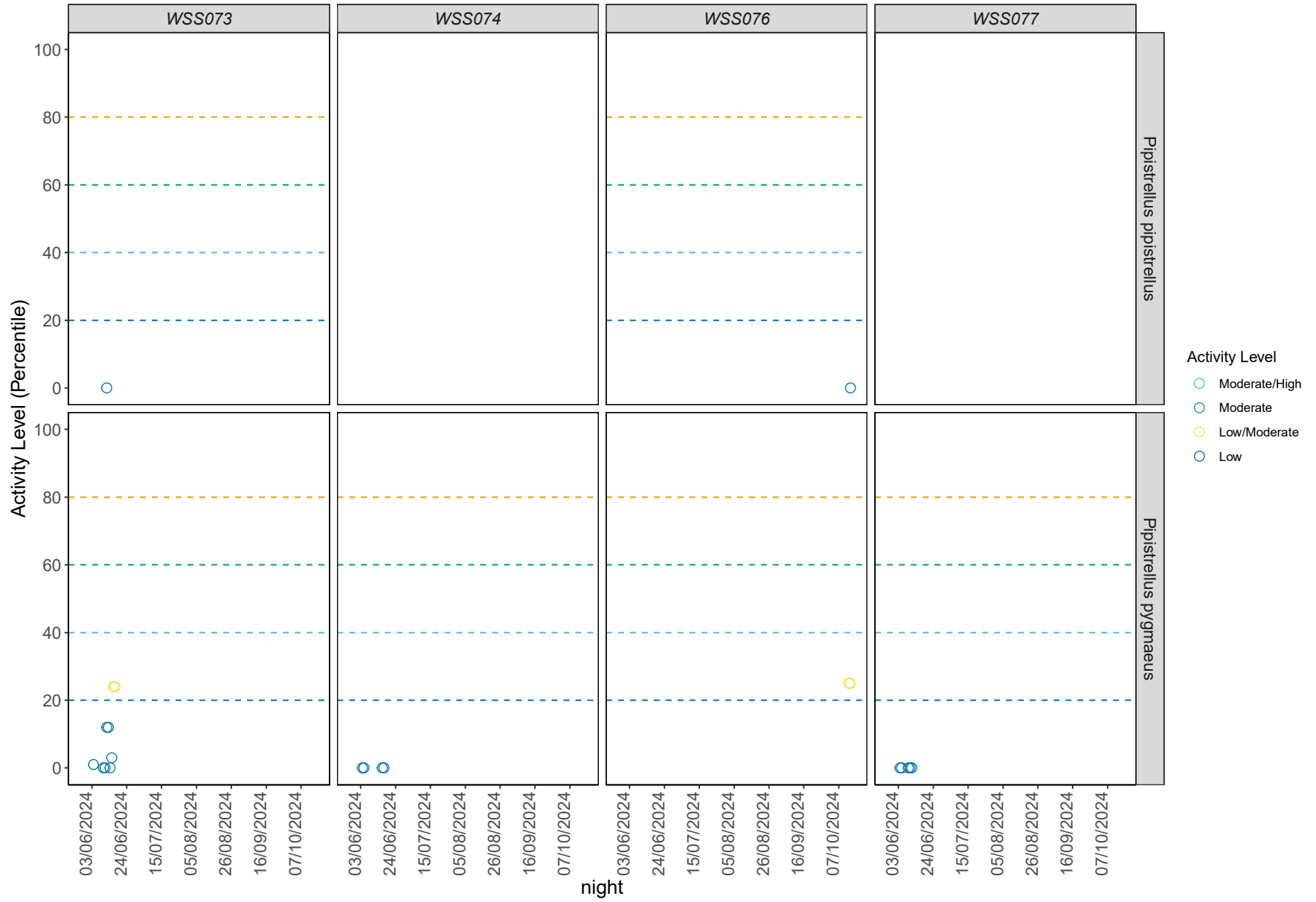


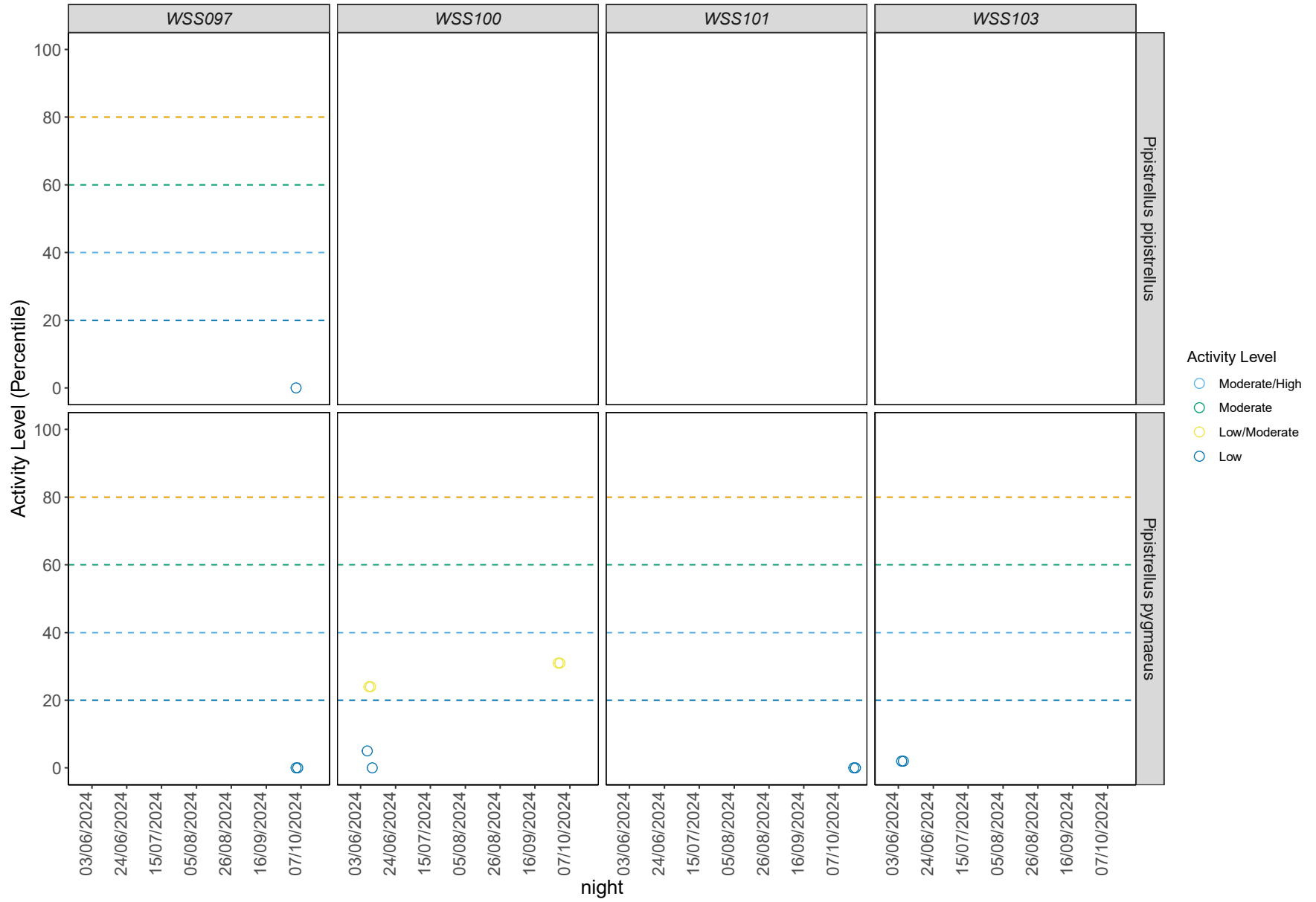












Per Detector, Per Month

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

Detector ID	Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
WSS026	Myotis	May	0	0	0	0	0	2
WSS026	Pipistrellus pygmaeus	May	0	0	0	0	0	2
WSS026	Plecotus auritus	May	0	0	0	0	0	1
WSS027	Myotis	Oct	0	0	0	0	0	1
WSS027	Nyctalus leisleri	Oct	0	0	0	0	0	1
WSS027	Pipistrellus pygmaeus	Oct	0	0	0	0	0	2
WSS027	Plecotus auritus	Oct	0	0	0	0	2	0
WSS029	Myotis	Jun	0	0	0	0	0	2
WSS029	Myotis	Sep	0	0	0	0	0	1
WSS029	Myotis	Oct	0	0	0	0	0	1
WSS029	Nyctalus leisleri	Oct	0	0	0	0	0	1
WSS029	Pipistrellus pipistrellus	Jun	0	0	0	0	0	2
WSS029	Pipistrellus pipistrellus	Oct	0	0	0	0	0	1
WSS029	Pipistrellus pygmaeus	Jun	0	0	0	0	0	2
WSS029	Pipistrellus pygmaeus	Sep	0	0	0	0	0	1
WSS029	Pipistrellus pygmaeus	Oct	0	0	0	0	0	1
WSS029	Plecotus auritus	Jun	0	0	0	0	0	1
WSS029	Plecotus auritus	Sep	0	0	0	0	1	0
WSS029	Plecotus auritus	Oct	0	0	0	0	1	0
WSS031	Myotis	Oct	0	0	0	0	2	0
WSS031	Pipistrellus pipistrellus	Oct	0	0	0	0	0	1

Detector ID	Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
WSS031	Pipistrellus pygmaeus	Oct	0	0	0	0	2	1
WSS031	Plecotus auritus	Oct	0	0	0	0	0	2
WSS033	Myotis	May	0	0	0	0	0	2
WSS033	Myotis	Oct	0	0	0	0	0	4
WSS033	Pipistrellus pipistrellus	Oct	0	0	0	0	0	3
WSS033	Pipistrellus pygmaeus	May	0	0	0	0	5	0
WSS033	Pipistrellus pygmaeus	Oct	0	0	3	2	4	0
WSS033	Plecotus auritus	Oct	0	0	0	0	0	2
WSS034	Nyctalus leisleri	Jul	0	0	0	0	0	2
WSS034	Pipistrellus pipistrellus	Jul	0	0	0	0	0	1
WSS034	Pipistrellus pygmaeus	Jun	0	0	0	0	0	2
WSS034	Pipistrellus pygmaeus	Jul	0	0	0	0	0	3
WSS034	Plecotus auritus	Jun	0	0	0	0	0	1
WSS035	Myotis	Jul	0	0	0	0	2	1
WSS035	Nyctalus leisleri	Jul	0	0	0	0	0	2
WSS035	Nyctalus leisleri	Oct	0	0	0	0	0	1
WSS035	Pipistrellus pipistrellus	Jul	0	0	0	0	0	2
WSS035	Pipistrellus pipistrellus	Sep	0	0	0	0	0	1
WSS035	Pipistrellus pipistrellus	Oct	0	0	0	0	0	1
WSS035	Pipistrellus pygmaeus	Jul	0	0	0	2	0	3
WSS035	Pipistrellus pygmaeus	Sep	0	0	0	0	6	2

Detector ID	Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
WSS035	Pipistrellus pygmaeus	Oct	0	0	0	0	1	0
WSS036	Myotis	Jun	0	0	0	0	0	2
WSS036	Pipistrellus pipistrellus	Jun	0	0	0	0	0	1
WSS036	Pipistrellus pygmaeus	Jun	0	0	0	0	0	2
WSS037	Myotis	Jul	0	0	0	0	0	2
WSS037	Pipistrellus pipistrellus	Jul	0	0	0	0	0	1
WSS037	Pipistrellus pygmaeus	Jul	0	0	0	0	0	3
WSS037	Plecotus auritus	Jul	0	0	0	0	0	1
WSS038	Myotis	Jul	0	0	0	0	0	1
WSS038	Nyctalus leisleri	Jul	0	0	0	0	0	1
WSS038	Pipistrellus pipistrellus	Jul	0	0	0	0	0	1
WSS038	Pipistrellus pygmaeus	Jul	0	0	0	0	0	2
WSS038	Plecotus auritus	Jul	0	0	0	0	2	0
WSS053	Myotis	Oct	0	0	0	0	0	2
WSS053	Pipistrellus pipistrellus	Oct	0	0	0	0	0	2
WSS053	Pipistrellus pygmaeus	Oct	0	0	0	0	0	2
WSS053	Plecotus auritus	Oct	0	0	0	0	0	1
WSS056	Myotis	May	0	0	0	0	0	2
WSS056	Myotis	Jun	0	0	0	0	0	2
WSS056	Myotis	Oct	0	0	0	0	0	4
WSS056	Nyctalus leisleri	Jun	0	0	0	0	0	2
WSS056	Nyctalus leisleri	Oct	0	0	0	0	0	3
WSS056	Pipistrellus pipistrellus	Jun	0	0	0	0	0	3

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
WSS056	Pipistrellus pipistrellus	Oct	0	0	0	0	0	3
WSS056	Pipistrellus pygmaeus	May	0	0	0	0	0	2
WSS056	Pipistrellus pygmaeus	Jun	0	0	0	0	3	2
WSS056	Pipistrellus pygmaeus	Oct	0	0	0	0	4	0
WSS056	Plecotus auritus	Jun	0	0	0	0	0	1
WSS058	Myotis	Jun	0	0	0	0	0	3
WSS058	Nyctalus leisleri	Jun	0	0	0	0	0	1
WSS058	Pipistrellus pipistrellus	Jun	0	0	0	0	0	1
WSS058	Pipistrellus pygmaeus	Jun	0	0	0	0	0	3
WSS059	Myotis	Jun	0	0	0	0	2	0
WSS059	Myotis	Oct	0	0	0	0	0	3
WSS059	Pipistrellus pipistrellus	Jun	0	0	0	0	0	2
WSS059	Pipistrellus pipistrellus	Oct	0	0	0	0	0	3
WSS059	Pipistrellus pygmaeus	Jun	0	0	0	0	0	3
WSS059	Pipistrellus pygmaeus	Oct	0	0	0	0	0	3
WSS059	Plecotus auritus	Jun	0	0	0	0	0	1
WSS059	Plecotus auritus	Oct	0	0	0	0	0	2
WSS060	Nyctalus leisleri	Jul	0	0	0	0	0	2
WSS060	Pipistrellus pygmaeus	Jul	0	0	0	0	2	0
WSS060	Plecotus auritus	Jul	0	0	0	0	0	2
WSS061	Myotis	Oct	0	0	2	1	0	0
WSS061	Pipistrellus pipistrellus	Oct	0	0	0	0	0	1

Detector ID	Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
WSS061	Pipistrellus pygmaeus	Oct	0	0	0	0	2	1
WSS061	Plecotus auritus	Oct	0	0	0	0	0	2
WSS062	Myotis	Jul	0	0	0	0	0	2
WSS062	Nyctalus leisleri	Jul	0	0	0	0	0	2
WSS062	Pipistrellus pipistrellus	Jul	0	0	0	0	0	1
WSS062	Pipistrellus pygmaeus	Jul	0	0	0	0	0	7
WSS063	Myotis	Oct	0	0	0	0	0	3
WSS063	Nyctalus leisleri	Oct	0	0	0	0	0	2
WSS063	Pipistrellus pipistrellus	Oct	0	0	0	0	0	3
WSS063	Pipistrellus pygmaeus	Oct	0	0	2	1	2	0
WSS063	Plecotus auritus	Oct	0	0	0	0	2	0
WSS064	Pipistrellus pygmaeus	Jun	0	0	0	0	0	2
WSS064	Plecotus auritus	Jun	0	0	0	0	0	1
WSS071	Myotis	Jun	0	0	0	0	0	2
WSS071	Pipistrellus pygmaeus	Jun	0	0	0	0	0	2
WSS073	Myotis	Jun	0	0	0	0	3	3
WSS073	Nyctalus leisleri	Jun	0	0	0	0	0	2
WSS073	Pipistrellus pipistrellus	Jun	0	0	0	0	0	1
WSS073	Pipistrellus pygmaeus	Jun	0	0	0	0	2	7
WSS074	Myotis	Jun	0	0	0	0	0	4
WSS074	Pipistrellus pygmaeus	Jun	0	0	0	0	0	4
WSS076	Myotis	Oct	0	0	0	1	0	0
WSS076	Pipistrellus pipistrellus	Oct	0	0	0	0	0	1

Detector ID	Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
WSS076	Pipistrellus pygmaeus	Oct	0	0	0	0	2	0
WSS076	Plecotus auritus	Oct	0	0	0	0	0	1
WSS077	Pipistrellus pygmaeus	Jun	0	0	0	0	0	5
WSS077	Plecotus auritus	Jun	0	0	0	0	0	2
WSS097	Pipistrellus pipistrellus	Oct	0	0	0	0	0	1
WSS097	Pipistrellus pygmaeus	Oct	0	0	0	0	0	2
WSS097	Plecotus auritus	Oct	0	0	0	0	0	2
WSS100	Myotis	Jun	0	0	0	0	0	2
WSS100	Myotis	Sep	0	0	0	0	0	1
WSS100	Pipistrellus pygmaeus	Jun	0	0	0	0	2	2
WSS100	Pipistrellus pygmaeus	Sep	0	0	0	0	1	0
WSS100	Pipistrellus pygmaeus	Oct	0	0	0	0	1	0
WSS101	Myotis	Oct	0	0	0	0	0	1
WSS101	Nyctalus leisleri	Oct	0	0	0	0	0	2
WSS101	Pipistrellus pygmaeus	Oct	0	0	0	0	0	2
WSS101	Plecotus auritus	Oct	0	0	0	2	0	0
WSS103	Myotis	Jun	0	0	0	0	0	2
WSS103	Nyctalus leisleri	Jun	0	0	0	0	0	2
WSS103	Pipistrellus pygmaeus	Jun	0	0	0	0	0	2
WSS103	Plecotus auritus	Jun	0	0	0	0	1	0
WSS104	Myotis	Jul	0	0	0	0	0	2
WSS104	Nyctalus leisleri	Jul	0	0	0	0	0	2
WSS104	Pipistrellus pipistrellus	Jul	0	0	0	0	0	2

Detector ID	Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
WSS104	Pipistrellus pipistrellus	Oct	0	0	0	0	0	1
WSS104	Pipistrellus pygmaeus	Jul	0	0	0	0	2	0
WSS104	Pipistrellus pygmaeus	Oct	0	0	0	0	0	2
WSS104	Plecotus auritus	Jul	0	0	0	0	0	1
WSS105	Myotis	Jun	0	0	0	0	0	1
WSS105	Myotis	Jul	0	0	0	0	2	0
WSS105	Myotis	Sep	0	0	0	0	1	0
WSS105	Myotis	Oct	0	0	0	0	1	0
WSS105	Nyctalus leisleri	Jun	0	0	0	0	0	2
WSS105	Nyctalus leisleri	Jul	0	0	0	0	0	1
WSS105	Pipistrellus pipistrellus	Jul	0	0	0	0	0	2
WSS105	Pipistrellus pygmaeus	Jun	0	0	0	0	2	2
WSS105	Pipistrellus pygmaeus	Jul	0	0	0	0	0	3
WSS105	Pipistrellus pygmaeus	Sep	0	0	0	0	0	1
WSS105	Pipistrellus pygmaeus	Oct	0	0	0	0	0	1
WSS105	Plecotus auritus	Jun	0	0	0	0	0	1
WSS105	Plecotus auritus	Oct	0	0	0	0	0	1
WSS106	Myotis	Oct	0	0	0	2	0	0
WSS106	Nyctalus leisleri	Oct	0	0	0	0	0	1
WSS106	Pipistrellus pipistrellus	Oct	0	0	0	0	0	2
WSS106	Pipistrellus pygmaeus	Oct	0	0	0	0	3	0
WSS106	Plecotus auritus	Oct	0	0	0	0	0	2

Table 6. Summary table showing key metrics for each species recorded per month. Please note that we cannot split the reference range by month, hence this column is not shown in this table.

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
WSS026	Myotis	May	0	0 - 0	0	2
WSS026	Pipistrellus pygmaeus	May	0	0 - 0	0	2
WSS026	Plecotus auritus	May	3	0	3	1
WSS027	Myotis	Oct	0	0	0	1
WSS027	Nyctalus leisleri	Oct	0	0	0	1
WSS027	Pipistrellus pygmaeus	Oct	0	0 - 0	0	2
WSS027	Plecotus auritus	Oct	23	23 - 23	23	2
WSS029	Myotis	Jun	3	1.5 - 1.5	3	2
WSS029	Myotis	Sep	0	1.5 - 1.5	0	1
WSS029	Myotis	Oct	0	1.5 - 1.5	0	1
WSS029	Nyctalus leisleri	Oct	0	0	0	1
WSS029	Pipistrellus pipistrellus	Jun	0	0 - 0	0	2
WSS029	Pipistrellus pipistrellus	Oct	0	0 - 0	0	1
WSS029	Pipistrellus pygmaeus	Jun	1	1 - 2	1	2
WSS029	Pipistrellus pygmaeus	Sep	2	1 - 2	2	1
WSS029	Pipistrellus pygmaeus	Oct	2	1 - 2	2	1
WSS029	Plecotus auritus	Jun	3	20 - 20	3	1
WSS029	Plecotus auritus	Sep	20	20 - 20	20	1
WSS029	Plecotus auritus	Oct	20	20 - 20	20	1
WSS031	Myotis	Oct	39	39 - 39	39	2
WSS031	Pipistrellus pipistrellus	Oct	0	0	0	1
WSS031	Pipistrellus pygmaeus	Oct	32	32 - 32	32	3
WSS031	Plecotus auritus	Oct	6	6 - 6	6	2
WSS033	Myotis	May	6	8 - 10	6	2
WSS033	Myotis	Oct	10	8 - 10	10	4
WSS033	Pipistrellus pipistrellus	Oct	0	0 - 0	0	3
WSS033	Pipistrellus pygmaeus	May	27	28 - 53.5	29	5
WSS033	Pipistrellus pygmaeus	Oct	40	28 - 53.5	78	9
WSS033	Plecotus auritus	Oct	5	4.5 - 4.5	6	2
WSS034	Nyctalus leisleri	Jul	1	1 - 1	1	2
WSS034	Pipistrellus pipistrellus	Jul	0	0	0	1
WSS034	Pipistrellus pygmaeus	Jun	10	10 - 10	10	2
WSS034	Pipistrellus pygmaeus	Jul	10	10 - 10	10	3

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
WSS034	Plecotus auritus	Jun	0	0	0	1
WSS035	Myotis	Jul	21	21 - 21	21	3
WSS035	Nyctalus leisleri	Jul	0	0 - 0	0	2
WSS035	Nyctalus leisleri	Oct	0	0 - 0	0	1
WSS035	Pipistrellus pipistrellus	Jul	0	0 - 0	0	2
WSS035	Pipistrellus pipistrellus	Sep	0	0 - 0	0	1
WSS035	Pipistrellus pipistrellus	Oct	0	0 - 0	0	1
WSS035	Pipistrellus pygmaeus	Jul	11	17.5 - 34	52	5
WSS035	Pipistrellus pygmaeus	Sep	32	17.5 - 34	34	8
WSS035	Pipistrellus pygmaeus	Oct	31	17.5 - 34	31	1
WSS036	Myotis	Jun	6	6 - 6	6	2
WSS036	Pipistrellus pipistrellus	Jun	0	0	0	1
WSS036	Pipistrellus pygmaeus	Jun	0	0 - 0	0	2
WSS037	Myotis	Jul	0	0 - 0	0	2
WSS037	Pipistrellus pipistrellus	Jul	0	0	0	1
WSS037	Pipistrellus pygmaeus	Jul	1	1 - 1	1	3
WSS037	Plecotus auritus	Jul	3	0	3	1
WSS038	Myotis	Jul	0	0	0	1
WSS038	Nyctalus leisleri	Jul	0	0	0	1
WSS038	Pipistrellus pipistrellus	Jul	0	0	0	1
WSS038	Pipistrellus pygmaeus	Jul	0	0 - 0	0	2
WSS038	Plecotus auritus	Jul	20	20 - 20	20	2
WSS053	Myotis	Oct	9	9 - 9	9	2
WSS053	Pipistrellus pipistrellus	Oct	0	0 - 0	0	2
WSS053	Pipistrellus pygmaeus	Oct	17	17 - 17	17	2
WSS053	Plecotus auritus	Oct	0	0	0	1
WSS056	Myotis	May	0	0 - 0	0	2
WSS056	Myotis	Jun	0	0 - 0	0	2
WSS056	Myotis	Oct	2	0 - 0	3	4
WSS056	Nyctalus leisleri	Jun	0	0 - 0	0	2
WSS056	Nyctalus leisleri	Oct	0	0 - 0	0	3
WSS056	Pipistrellus pipistrellus	Jun	0	0 - 0	0	3
WSS056	Pipistrellus pipistrellus	Oct	0	0 - 0	0	3
WSS056	Pipistrellus pygmaeus	May	4	16 - 36	8	2
WSS056	Pipistrellus pygmaeus	Jun	24	16 - 36	29	5
WSS056	Pipistrellus pygmaeus	Oct	36	16 - 36	36	4

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
WSS056	Plecotus auritus	Jun	0	0	0	1
WSS058	Myotis	Jun	0	0 - 0	0	3
WSS058	Nyctalus leisleri	Jun	0	0	0	1
WSS058	Pipistrellus pipistrellus	Jun	0	0	0	1
WSS058	Pipistrellus pygmaeus	Jun	8	8 - 8	8	3
WSS059	Myotis	Jun	37	3.5 - 37	37	2
WSS059	Myotis	Oct	4	3.5 - 37	4	3
WSS059	Pipistrellus pipistrellus	Jun	0	0 - 0	0	2
WSS059	Pipistrellus pipistrellus	Oct	0	0 - 0	0	3
WSS059	Pipistrellus pygmaeus	Jun	3	3 - 3	3	3
WSS059	Pipistrellus pygmaeus	Oct	0	3 - 3	0	3
WSS059	Plecotus auritus	Jun	6	4.5 - 4.5	6	1
WSS059	Plecotus auritus	Oct	2	4.5 - 4.5	3	2
WSS060	Nyctalus leisleri	Jul	0	0 - 0	0	2
WSS060	Pipistrellus pygmaeus	Jul	33	33 - 33	33	2
WSS060	Plecotus auritus	Jul	6	6 - 6	6	2
WSS061	Myotis	Oct	72	72 - 72	72	3
WSS061	Pipistrellus pipistrellus	Oct	0	0	0	1
WSS061	Pipistrellus pygmaeus	Oct	25	25 - 25	25	3
WSS061	Plecotus auritus	Oct	11	11 - 11	11	2
WSS062	Myotis	Jul	6	6 - 6	6	2
WSS062	Nyctalus leisleri	Jul	0	0 - 0	0	2
WSS062	Pipistrellus pipistrellus	Jul	0	0	0	1
WSS062	Pipistrellus pygmaeus	Jul	11	4 - 14	17	7
WSS063	Myotis	Oct	13	13 - 13	13	3
WSS063	Nyctalus leisleri	Oct	0	0 - 0	0	2
WSS063	Pipistrellus pipistrellus	Oct	0	0 - 0	0	3
WSS063	Pipistrellus pygmaeus	Oct	40	37 - 68	68	5
WSS063	Plecotus auritus	Oct	35	35 - 35	35	2
WSS064	Pipistrellus pygmaeus	Jun	0	0 - 0	0	2
WSS064	Plecotus auritus	Jun	0	0	0	1
WSS071	Myotis	Jun	9	9 - 9	9	2
WSS071	Pipistrellus pygmaeus	Jun	1	1 - 1	1	2
WSS073	Myotis	Jun	17	19.5 - 27	27	6
WSS073	Nyctalus leisleri	Jun	0	0 - 0	0	2
WSS073	Pipistrellus pipistrellus	Jun	0	0	0	1

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
WSS073	Pipistrellus pygmaeus	Jun	3	3 - 24	24	9
WSS074	Myotis	Jun	7	7 - 7	7	4
WSS074	Pipistrellus pygmaeus	Jun	0	0 - 0	0	4
WSS076	Myotis	Oct	42	0	42	1
WSS076	Pipistrellus pipistrellus	Oct	0	0	0	1
WSS076	Pipistrellus pygmaeus	Oct	25	25 - 25	25	2
WSS076	Plecotus auritus	Oct	11	0	11	1
WSS077	Pipistrellus pygmaeus	Jun	0	0 - 0	0	5
WSS077	Plecotus auritus	Jun	0	0 - 0	0	2
WSS097	Pipistrellus pipistrellus	Oct	0	0	0	1
WSS097	Pipistrellus pygmaeus	Oct	0	0 - 0	0	2
WSS097	Plecotus auritus	Oct	11	11 - 11	11	2
WSS100	Myotis	Jun	0	0 - 0	0	2
WSS100	Myotis	Sep	0	0 - 0	0	1
WSS100	Pipistrellus pygmaeus	Jun	15	14.5 - 31	24	4
WSS100	Pipistrellus pygmaeus	Sep	31	14.5 - 31	31	1
WSS100	Pipistrellus pygmaeus	Oct	31	14.5 - 31	31	1
WSS101	Myotis	Oct	0	0	0	1
WSS101	Nyctalus leisleri	Oct	0	0 - 0	0	2
WSS101	Pipistrellus pygmaeus	Oct	0	0 - 0	0	2
WSS101	Plecotus auritus	Oct	44	44 - 44	44	2
WSS103	Myotis	Jun	0	0 - 0	0	2
WSS103	Nyctalus leisleri	Jun	0	0 - 0	0	2
WSS103	Pipistrellus pygmaeus	Jun	2	2 - 2	2	2
WSS103	Plecotus auritus	Jun	23	0	23	1
WSS104	Myotis	Jul	10	10 - 10	10	2
WSS104	Nyctalus leisleri	Jul	0	0 - 0	0	2
WSS104	Pipistrellus pipistrellus	Jul	0	0 - 0	0	2
WSS104	Pipistrellus pipistrellus	Oct	0	0 - 0	0	1
WSS104	Pipistrellus pygmaeus	Jul	24	12 - 12	24	2
WSS104	Pipistrellus pygmaeus	Oct	0	12 - 12	0	2
WSS104	Plecotus auritus	Jul	6	0	6	1
WSS105	Myotis	Jun	9	19 - 39	9	1
WSS105	Myotis	Jul	29	19 - 39	29	2
WSS105	Myotis	Sep	39	19 - 39	39	1
WSS105	Myotis	Oct	39	19 - 39	39	1

Detector ID	Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
WSS105	Nyctalus leisleri	Jun	0	0 - 0	0	2
WSS105	Nyctalus leisleri	Jul	0	0 - 0	0	1
WSS105	Pipistrellus pipistrellus	Jul	0	0 - 0	0	2
WSS105	Pipistrellus pygmaeus	Jun	16	2 - 19.5	29	4
WSS105	Pipistrellus pygmaeus	Jul	10	2 - 19.5	10	3
WSS105	Pipistrellus pygmaeus	Sep	1	2 - 19.5	1	1
WSS105	Pipistrellus pygmaeus	Oct	1	2 - 19.5	1	1
WSS105	Plecotus auritus	Jun	0	0 - 0	0	1
WSS105	Plecotus auritus	Oct	0	0 - 0	0	1
WSS106	Myotis	Oct	54	54 - 54	54	2
WSS106	Nyctalus leisleri	Oct	0	0	0	1
WSS106	Pipistrellus pipistrellus	Oct	0	0 - 0	0	2
WSS106	Pipistrellus pygmaeus	Oct	28	28 - 28	28	3
WSS106	Plecotus auritus	Oct	3	3 - 3	3	2

Per Site

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

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

Species/Species Group	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
Myotis	0	0	2	4	13	58
Nyctalus leisleri	0	0	0	0	0	32
Pipistrellus pipistrellus	0	0	0	0	0	44
Pipistrellus pygmaeus	0	0	5	5	46	86
Plecotus auritus	0	0	0	2	9	28

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

Species/Species Group	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
Myotis	6	9 - 9	72	77
Nyctalus leisleri	0	1 - 1	1	32
Pipistrellus pipistrellus	0	0 - 0	0	44
Pipistrellus pygmaeus	10	8 - 8	78	142
Plecotus auritus	6	6 - 6	44	39

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

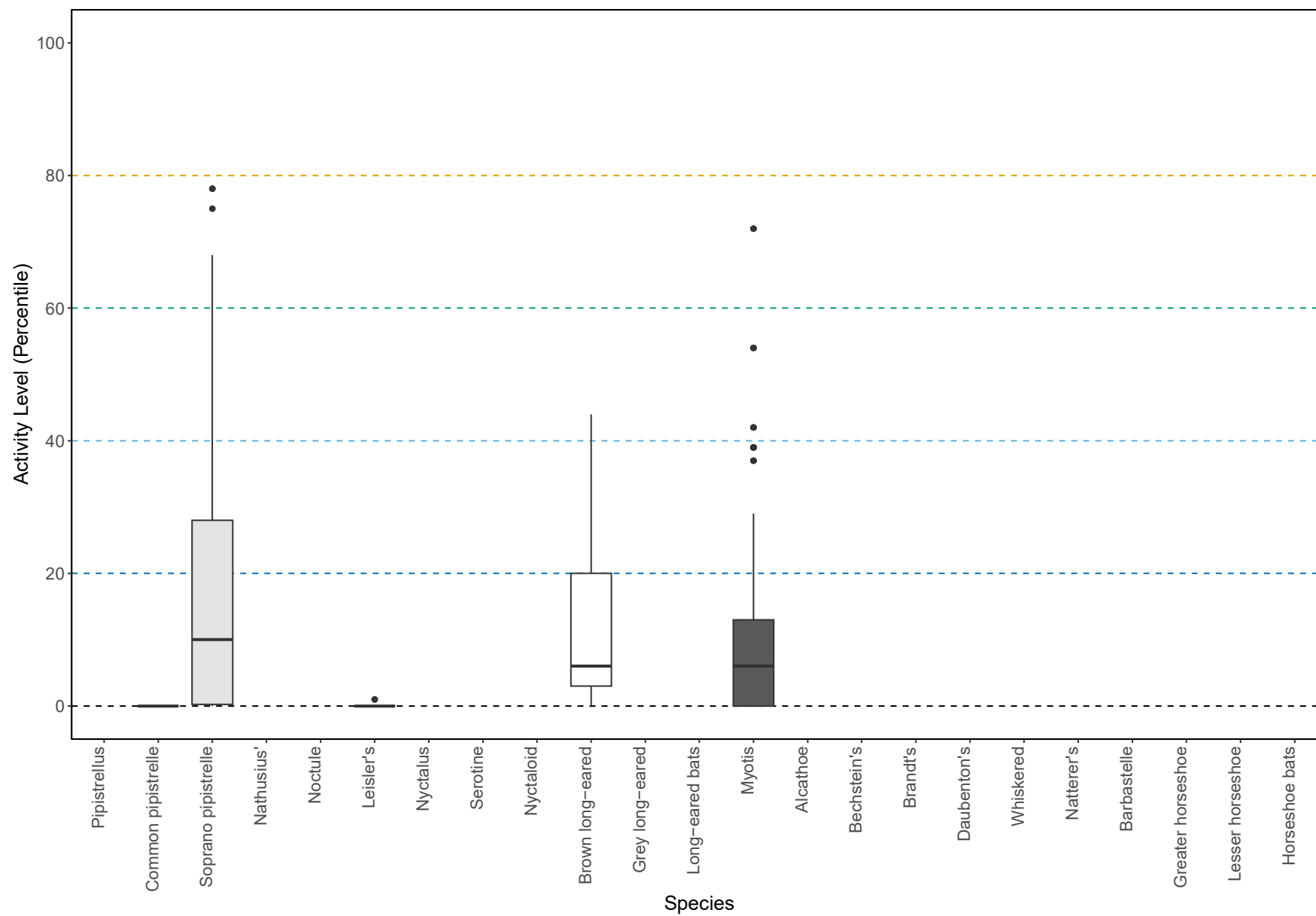
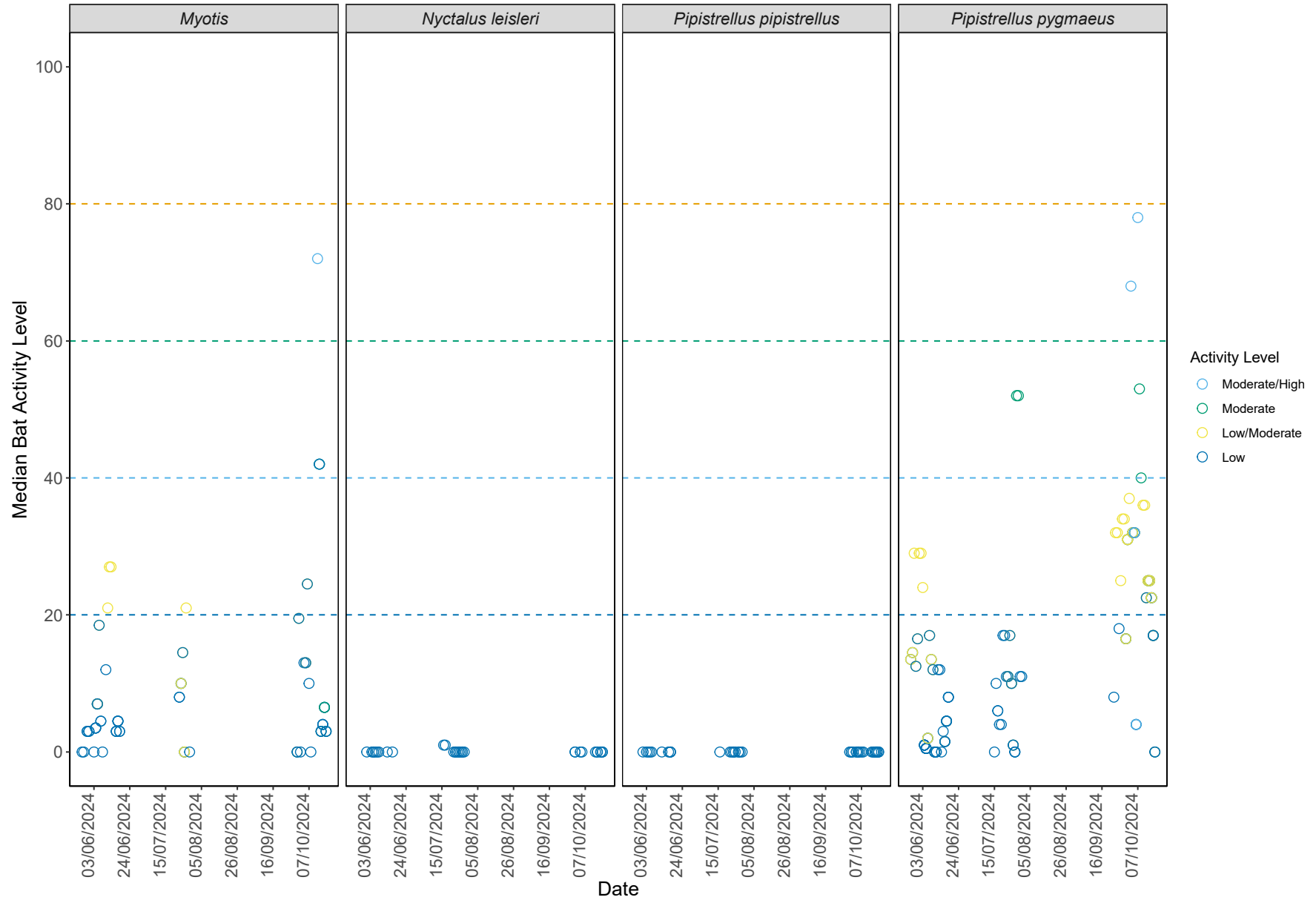
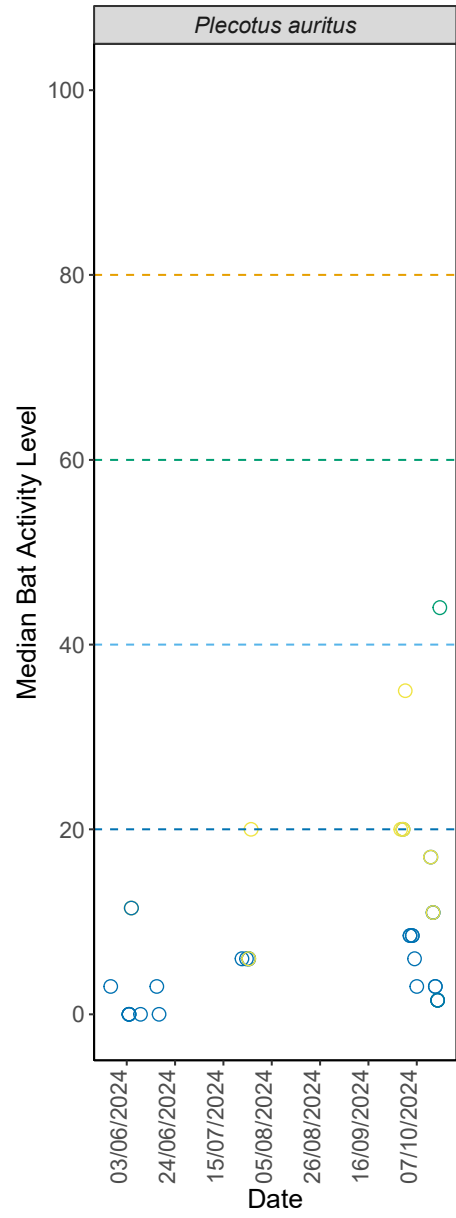


Figure 5. The median activity levels of bats recorded across all detectors each night.





Activity Level

- Moderate/High
- Moderate
- Low/Moderate
- Low

Per Site, Per Month

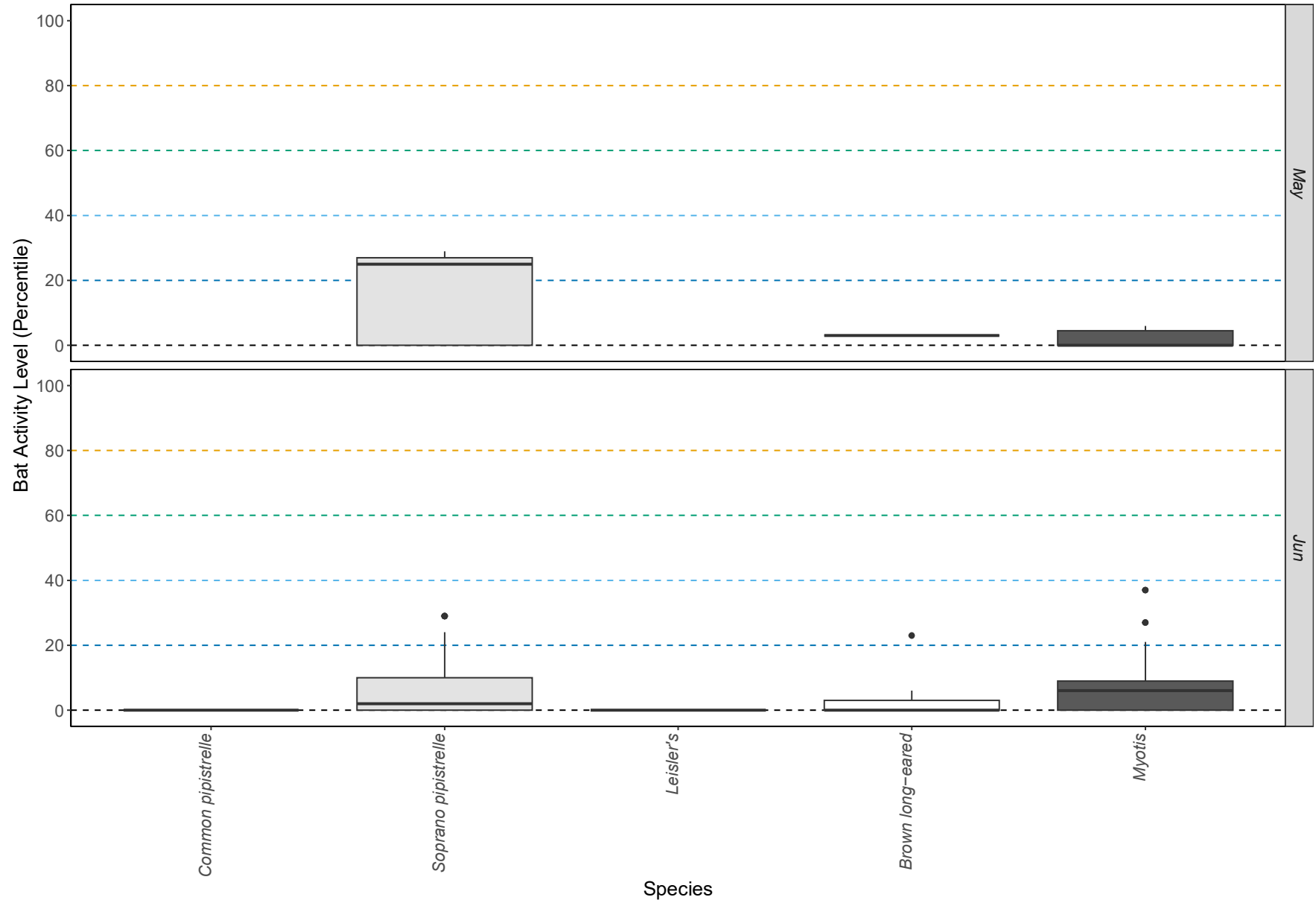
Table 9. Summary table showing the number of nights recorded bat activity fell into each activity band for each species during each month.

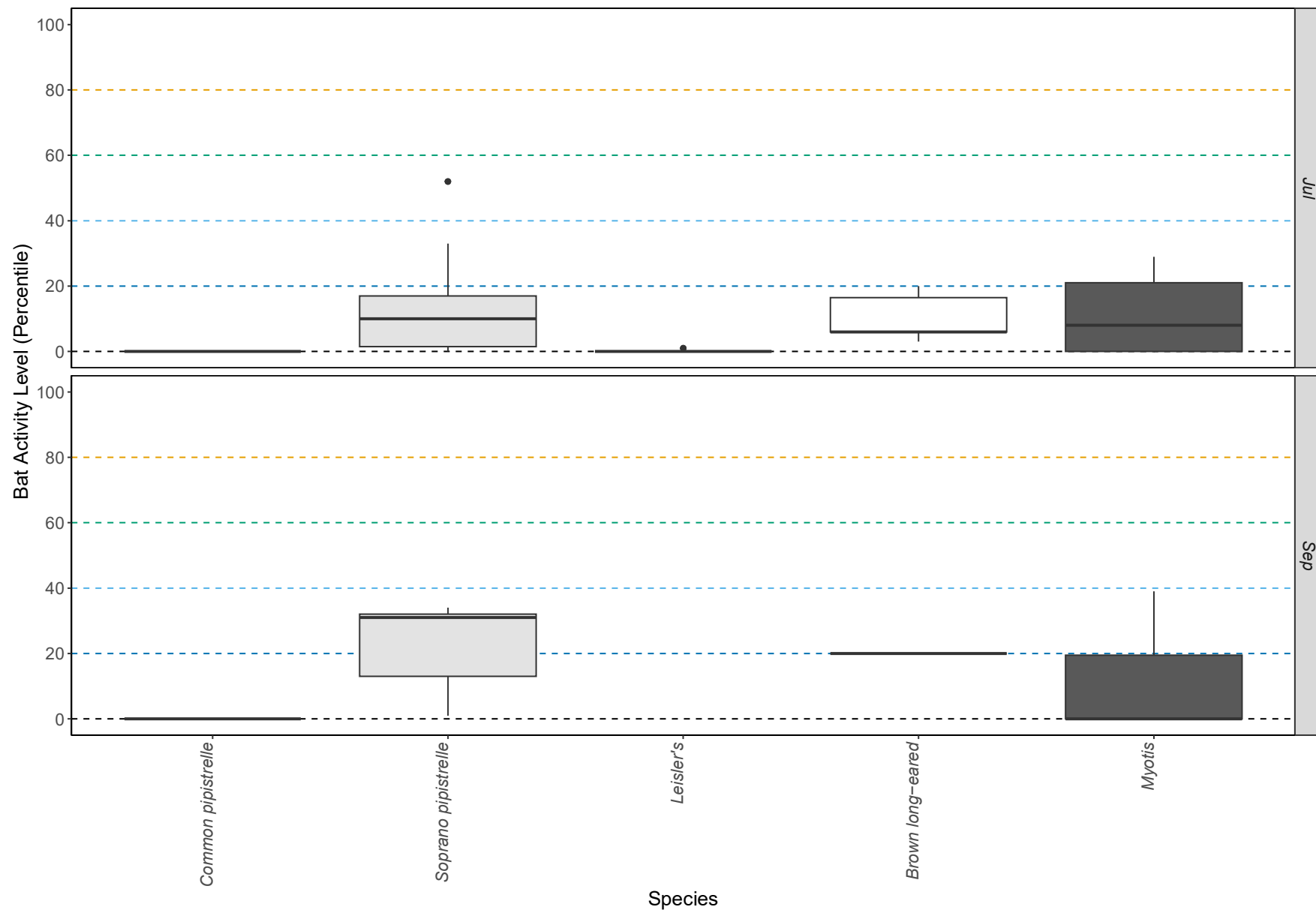
Species/Species Group	month	Nights of Exceptional Activity	Nights of High Activity	Nights of Moderate/High Activity	Nights of Moderate Activity	Nights of Low/Moderate Activity	Nights of Low Activity
Myotis	May	0	0	0	0	0	6
Myotis	Jun	0	0	0	0	5	23
Myotis	Jul	0	0	0	0	4	8
Myotis	Sep	0	0	0	0	1	2
Myotis	Oct	0	0	2	4	3	19
Nyctalus leisleri	Jun	0	0	0	0	0	9
Nyctalus leisleri	Jul	0	0	0	0	0	12
Nyctalus leisleri	Oct	0	0	0	0	0	11
Pipistrellus pipistrellus	Jun	0	0	0	0	0	10
Pipistrellus pipistrellus	Jul	0	0	0	0	0	10
Pipistrellus pipistrellus	Sep	0	0	0	0	0	1
Pipistrellus pipistrellus	Oct	0	0	0	0	0	23
Pipistrellus pygmaeus	May	0	0	0	0	5	4
Pipistrellus pygmaeus	Jun	0	0	0	0	9	40
Pipistrellus pygmaeus	Jul	0	0	0	2	4	21
Pipistrellus pygmaeus	Sep	0	0	0	0	7	4
Pipistrellus pygmaeus	Oct	0	0	5	3	21	17
Plecotus auritus	May	0	0	0	0	0	1
Plecotus auritus	Jun	0	0	0	0	1	8
Plecotus auritus	Jul	0	0	0	0	2	4
Plecotus auritus	Sep	0	0	0	0	1	0
Plecotus auritus	Oct	0	0	0	2	5	15

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

Species/Species Group	month	Median Percentile	95% CIs	Max. Percentile	Nights Recorded
Myotis	May	0	8 - 10	6	6
Myotis	Jun	6	9 - 9	37	28
Myotis	Jul	8	6 - 6	29	12
Myotis	Sep	0	19 - 39	39	3
Myotis	Oct	10	9 - 9	72	28
Nyctalus leisleri	Jun	0	0 - 0	0	9
Nyctalus leisleri	Jul	0	1 - 1	1	12
Nyctalus leisleri	Oct	0	0 - 0	0	11
Pipistrellus pipistrellus	Jun	0	0 - 0	0	10
Pipistrellus pipistrellus	Jul	0	0 - 0	0	10
Pipistrellus pipistrellus	Sep	0	0 - 0	0	1
Pipistrellus pipistrellus	Oct	0	0 - 0	0	23
Pipistrellus pygmaeus	May	25	28 - 53.5	29	9
Pipistrellus pygmaeus	Jun	2	8 - 8	29	49
Pipistrellus pygmaeus	Jul	10	4 - 14	52	27
Pipistrellus pygmaeus	Sep	31	2 - 19.5	34	11
Pipistrellus pygmaeus	Oct	28	37 - 68	78	46
Plecotus auritus	May	3	0	3	1
Plecotus auritus	Jun	0	4.5 - 4.5	23	9
Plecotus auritus	Jul	6	6 - 6	20	6
Plecotus auritus	Sep	20	20 - 20	20	1
Plecotus auritus	Oct	11	6 - 6	44	22

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





Part 2: Nightly Analysis

Entire Survey Period

Sunrise and Sunset Times

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

Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2024-05-27	21:56	05:18	7.4
2024-05-28	21:57	05:17	7.3
2024-05-29	21:59	05:16	7.3
2024-05-30	22:00	05:15	7.2
2024-05-31	22:01	05:14	7.2
2024-06-01	22:03	05:13	7.2
2024-06-02	22:04	05:12	7.1
2024-06-03	22:05	05:12	7.1
2024-06-04	22:06	05:11	7.1
2024-06-05	22:07	05:10	7.0
2024-06-06	22:08	05:10	7.0
2024-06-07	22:09	05:09	7.0
2024-06-08	22:10	05:08	7.0
2024-06-09	22:11	05:08	6.9
2024-06-10	22:12	05:08	6.9
2024-06-11	22:13	05:07	6.9
2024-06-12	22:13	05:07	6.9
2024-06-13	22:14	05:07	6.9
2024-06-14	22:15	05:07	6.9
2024-06-15	22:15	05:07	6.9
2024-06-16	22:16	05:06	6.8
2024-06-17	22:16	05:06	6.8
2024-06-18	22:17	05:07	6.8
2024-07-15	22:05	05:28	7.4
2024-07-16	22:04	05:30	7.4
2024-07-17	22:03	05:31	7.5
2024-07-18	22:02	05:33	7.5
2024-07-19	22:00	05:34	7.6

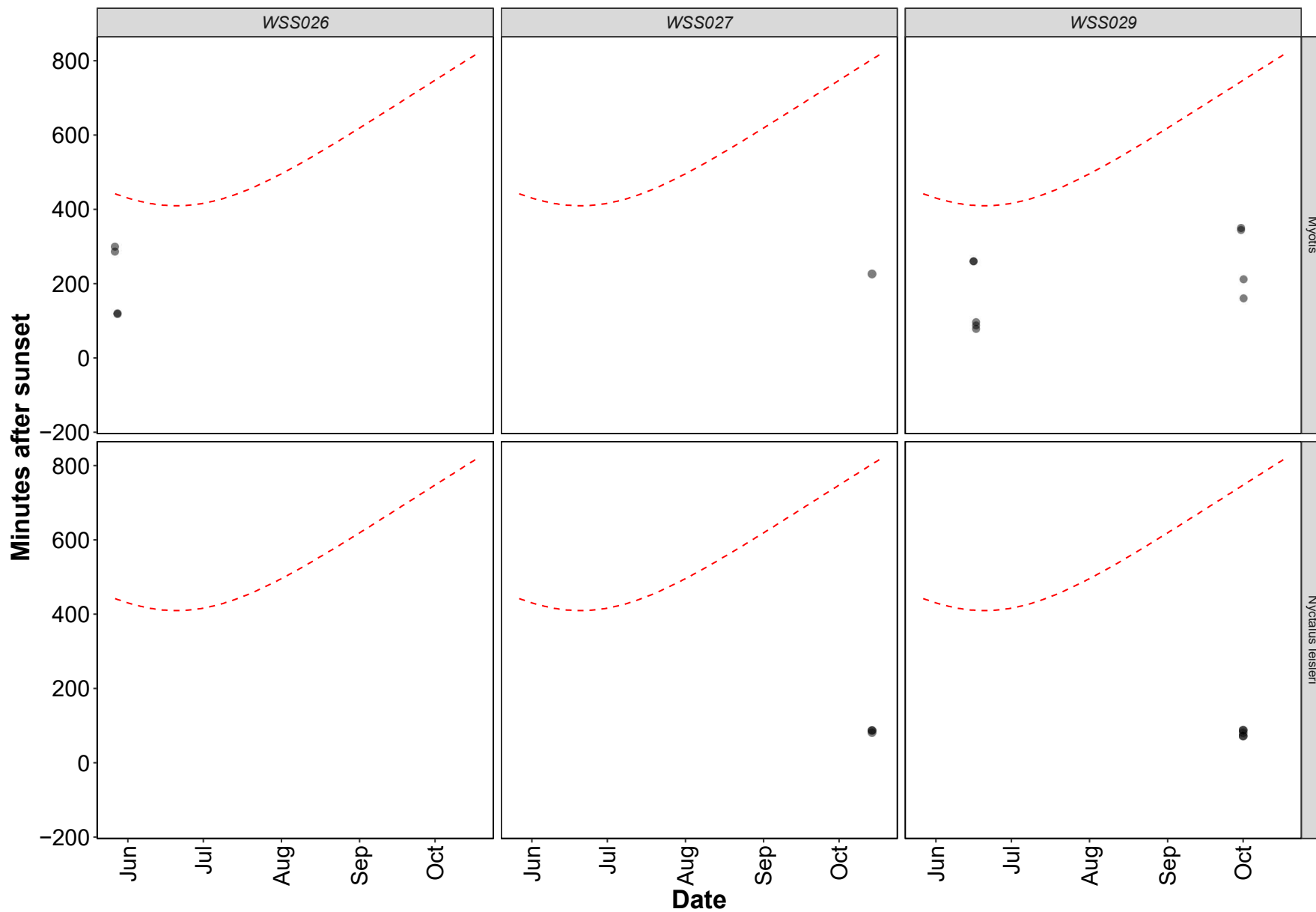
Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2024-07-20	21:59	05:36	7.6
2024-07-21	21:58	05:37	7.7
2024-07-22	21:56	05:39	7.7
2024-07-23	21:55	05:40	7.8
2024-07-24	21:53	05:42	7.8
2024-07-25	21:52	05:43	7.9
2024-07-26	21:50	05:45	7.9
2024-07-27	21:48	05:47	8.0
2024-07-28	21:47	05:48	8.0
2024-07-29	21:45	05:50	8.1
2024-07-30	21:43	05:52	8.1
2024-07-31	21:41	05:54	8.2
2024-09-23	19:37	07:30	11.9
2024-09-24	19:35	07:32	12.0
2024-09-25	19:32	07:34	12.0
2024-09-26	19:30	07:35	12.1
2024-09-27	19:27	07:37	12.2
2024-09-28	19:25	07:39	12.2
2024-09-29	19:22	07:41	12.3
2024-09-30	19:20	07:43	12.4
2024-10-01	19:17	07:44	12.5
2024-10-02	19:15	07:46	12.5
2024-10-03	19:12	07:48	12.6
2024-10-04	19:10	07:50	12.7
2024-10-05	19:07	07:52	12.7
2024-10-06	19:05	07:54	12.8
2024-10-07	19:02	07:56	12.9
2024-10-08	19:00	07:57	13.0
2024-10-09	18:57	07:59	13.0
2024-10-10	18:55	08:01	13.1
2024-10-11	18:53	08:03	13.2
2024-10-12	18:50	08:05	13.2
2024-10-13	18:48	08:07	13.3
2024-10-14	18:45	08:09	13.4
2024-10-15	18:43	08:11	13.5
2024-10-16	18:41	08:12	13.5

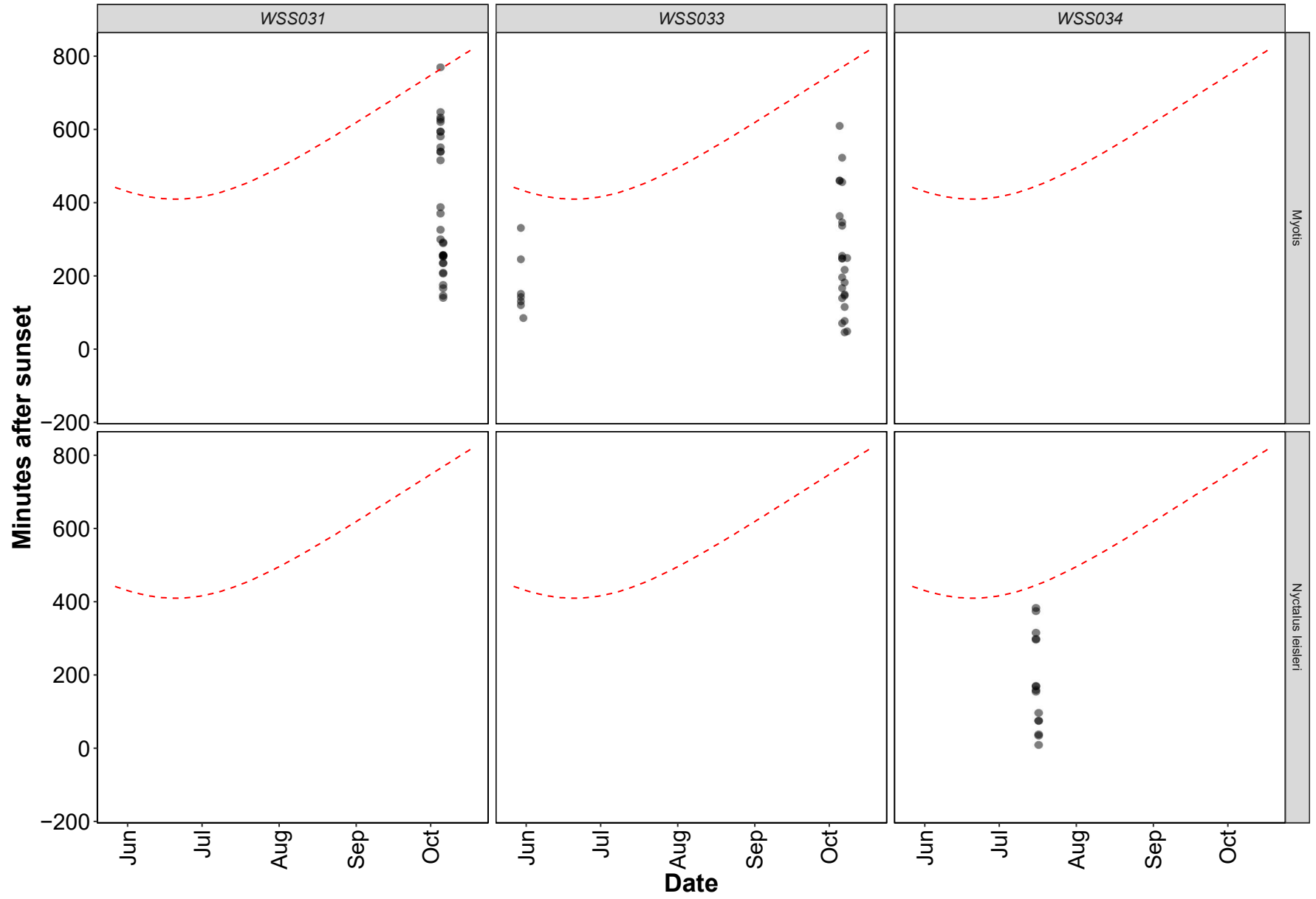
Night (y-m-d)	Sunset (h:m)	Sunrise (h:m)	Night Length (hours)
2024-10-17	18:38	08:14	13.6

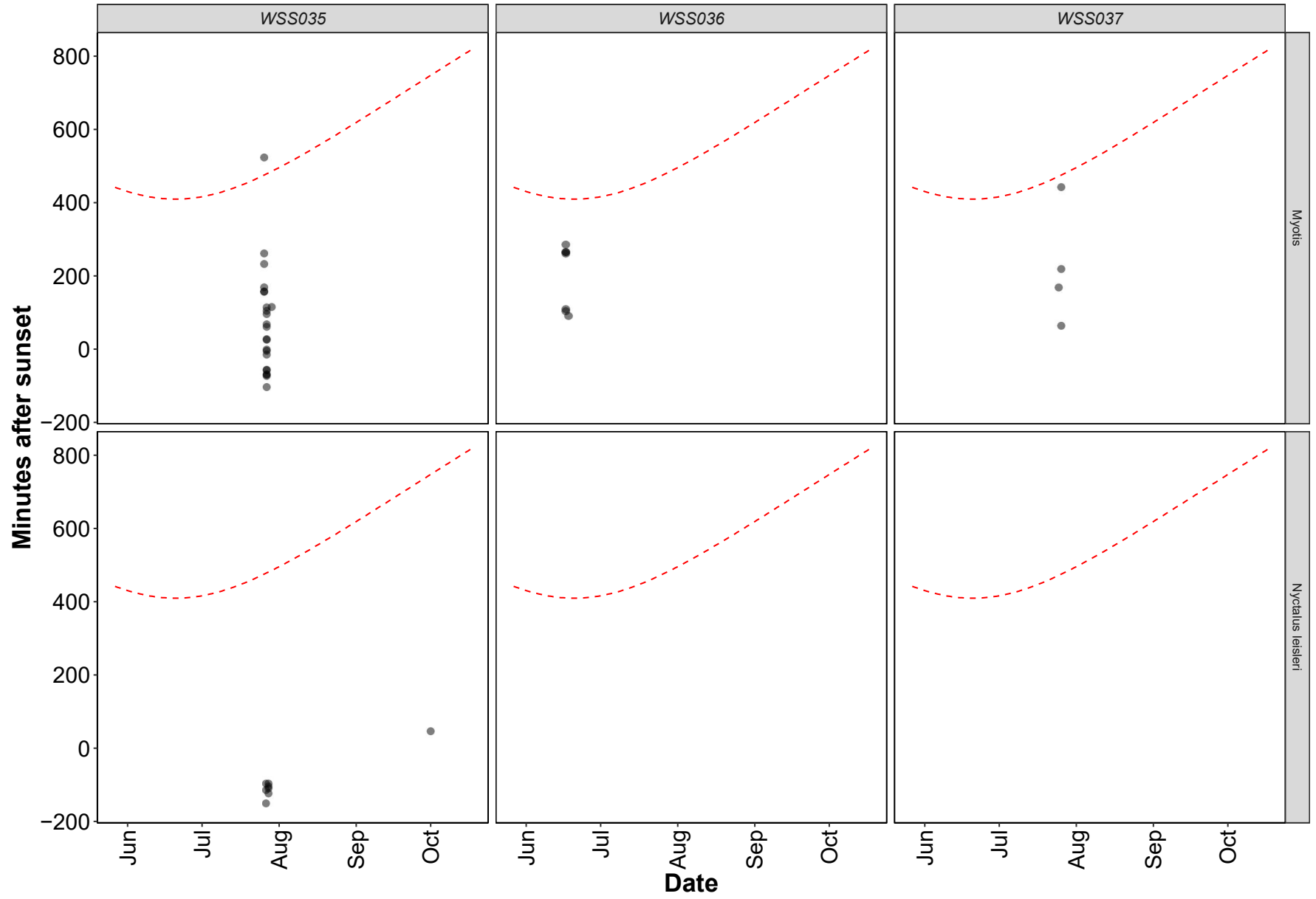
Distribution of Bat Activity Across the Night through Time

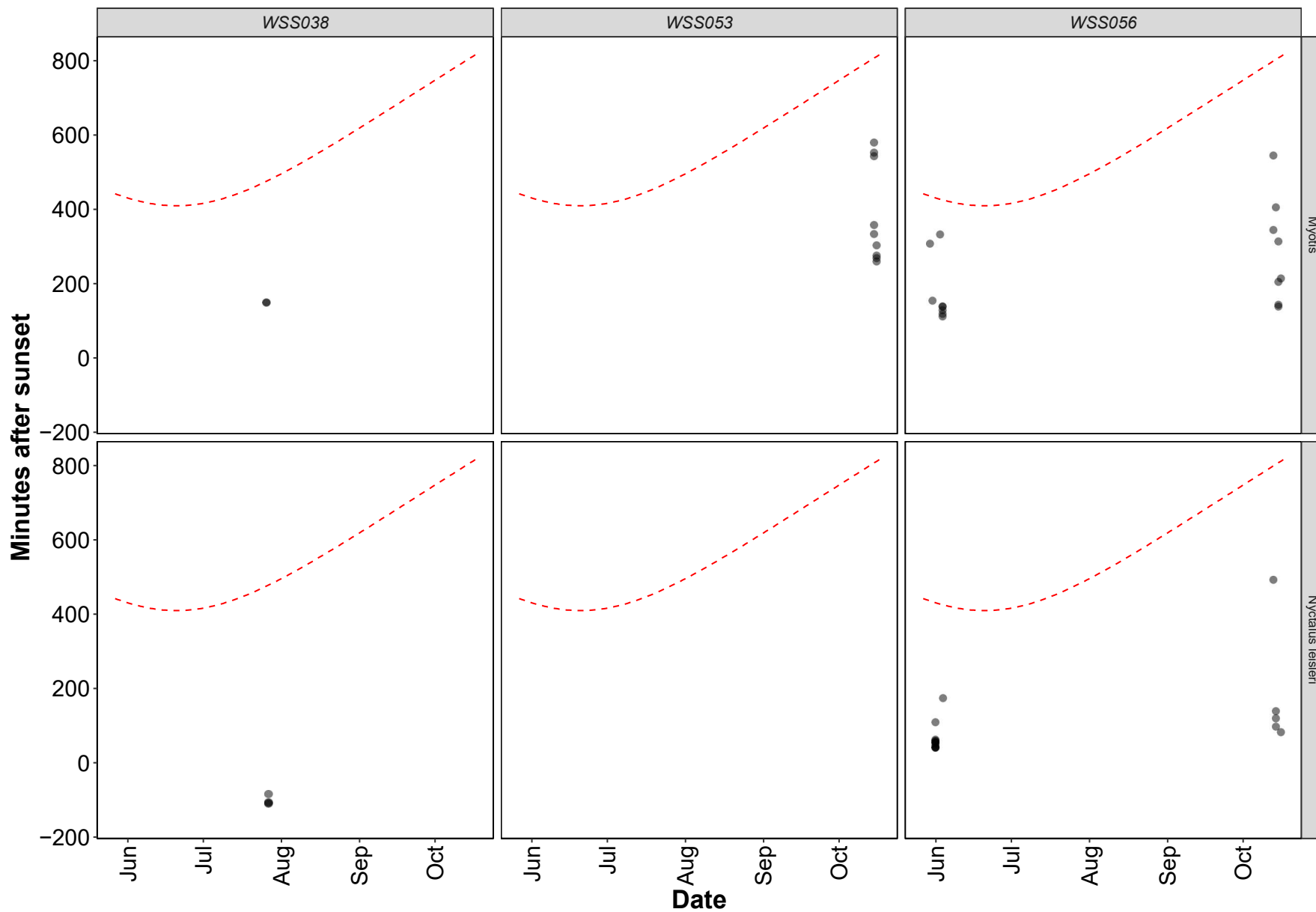
Per Detector

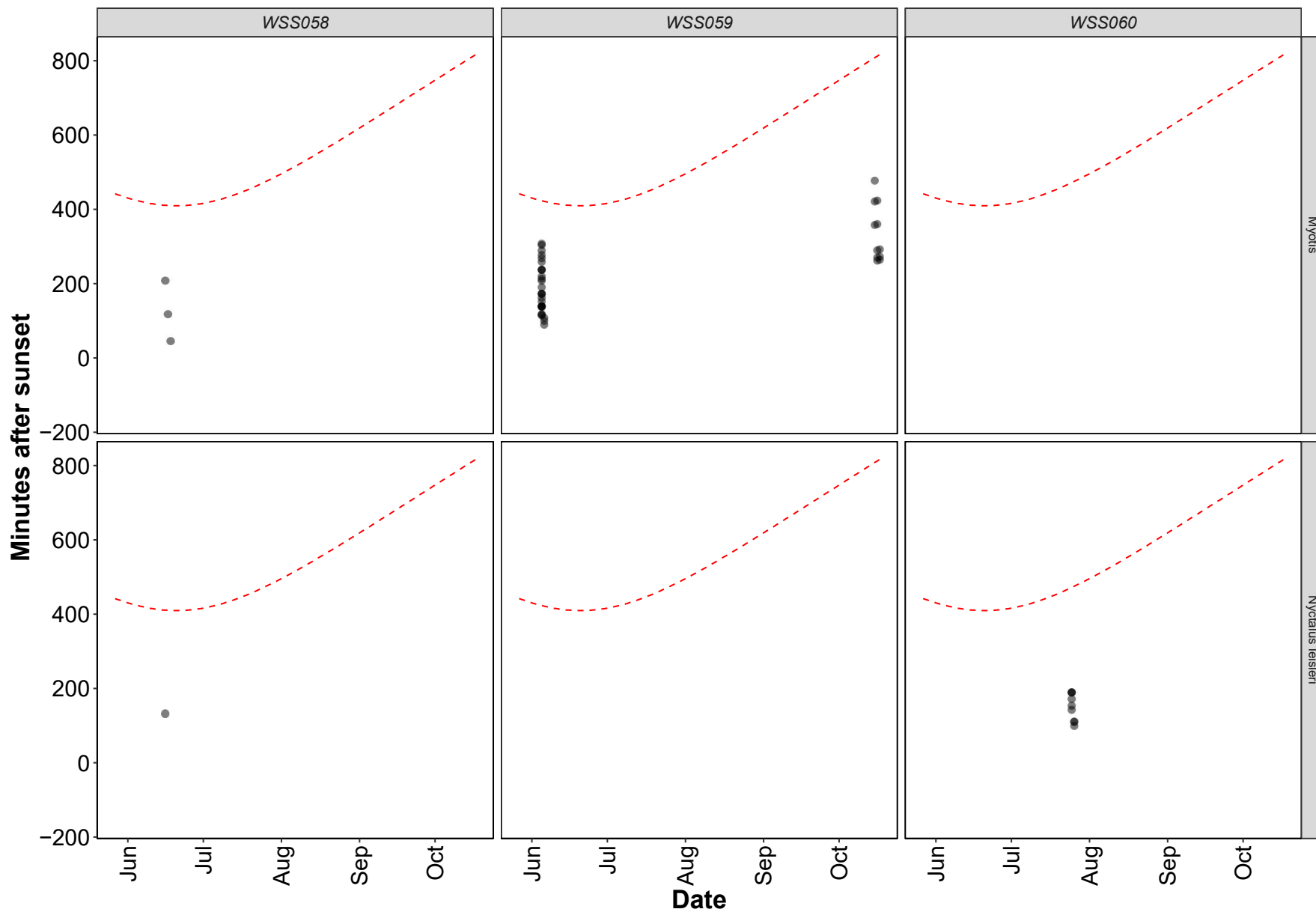
Figure 7. Timing of bat calls plotted as minutes before/after sunset, whereby 0 on the y axis represents sunset. Sunrise throughout the survey period is depicted as the red dashed line. Colours indicate kernel densities, with darkest colours showing peaks of activity. These colours are comparative only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

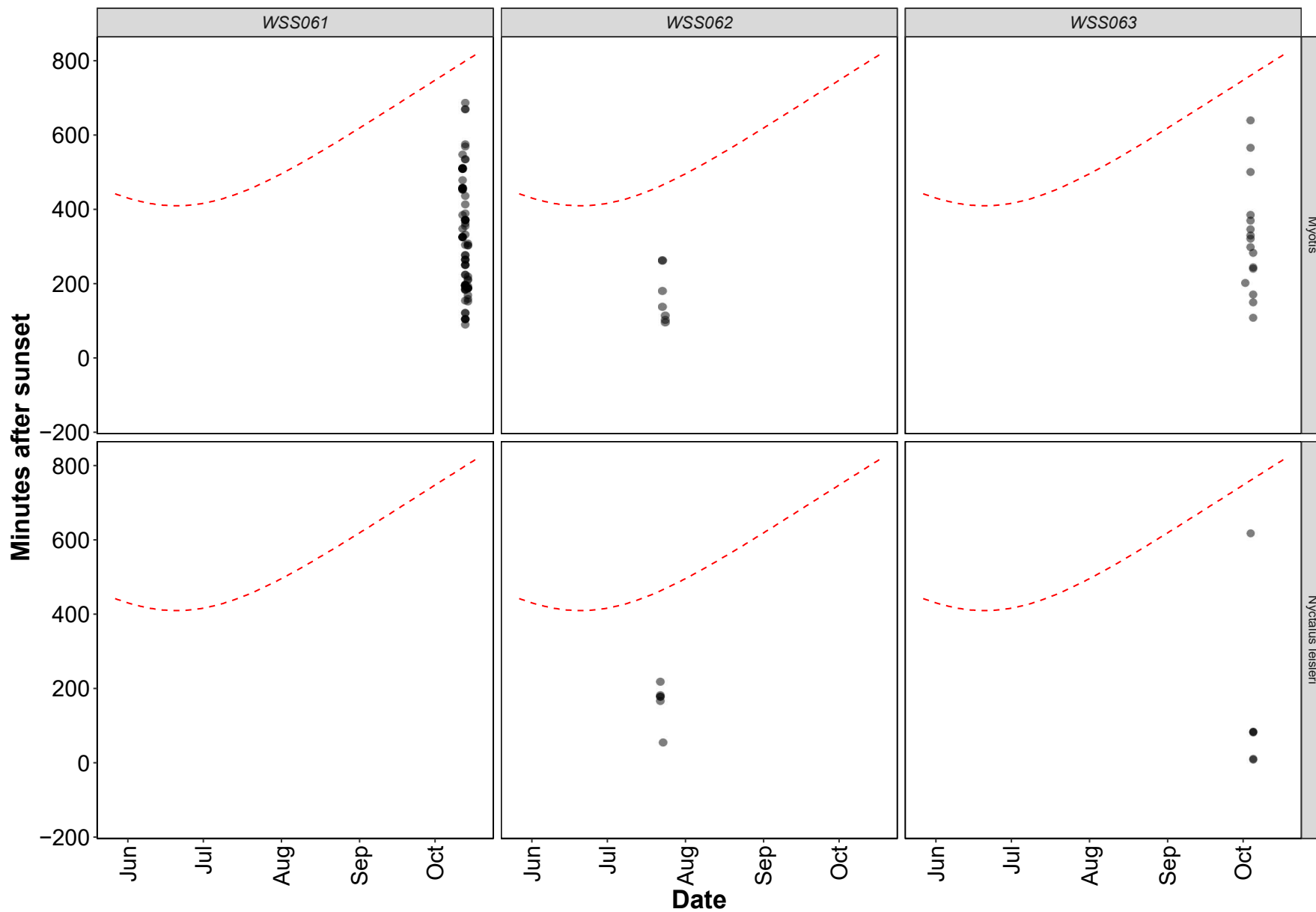


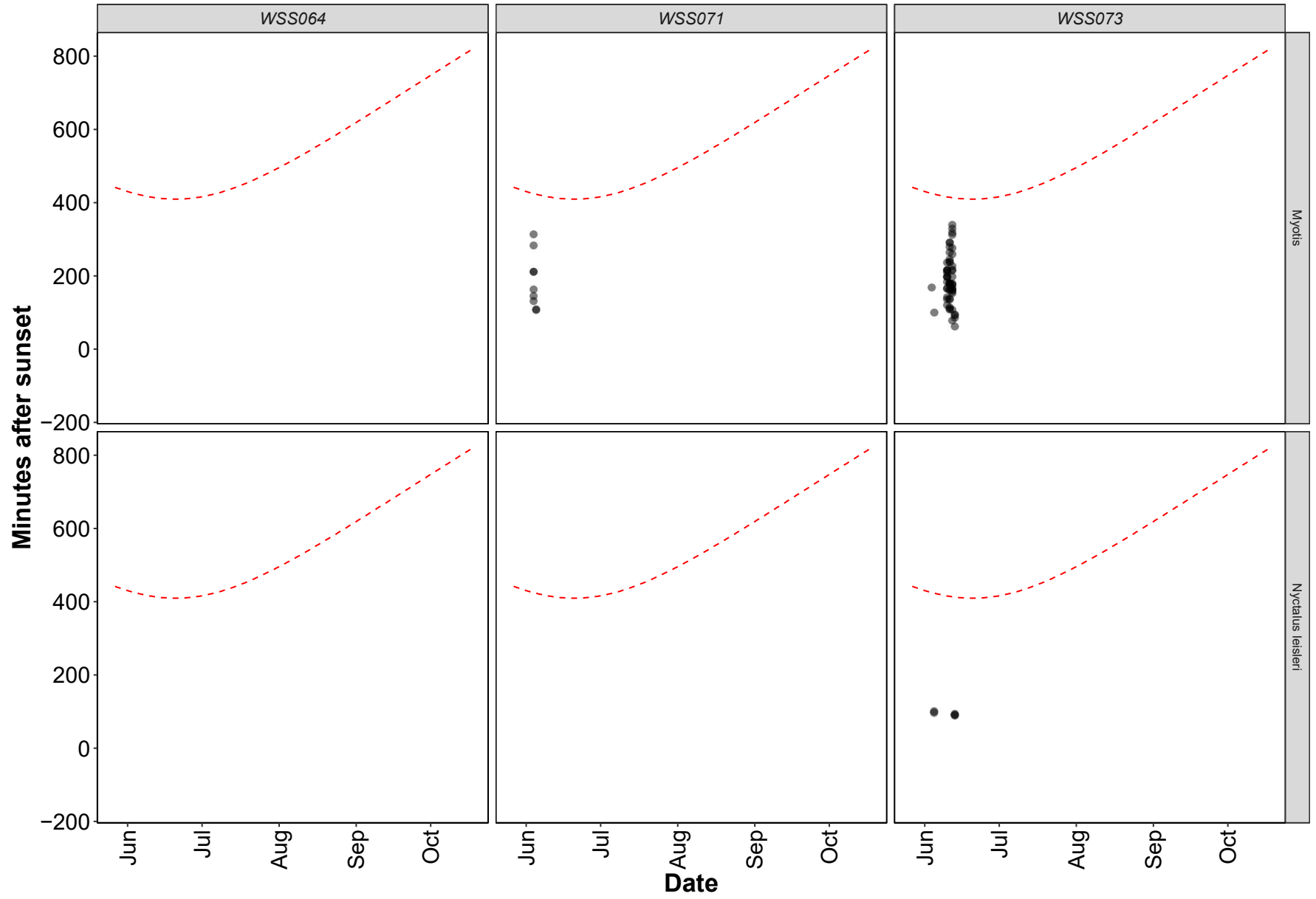


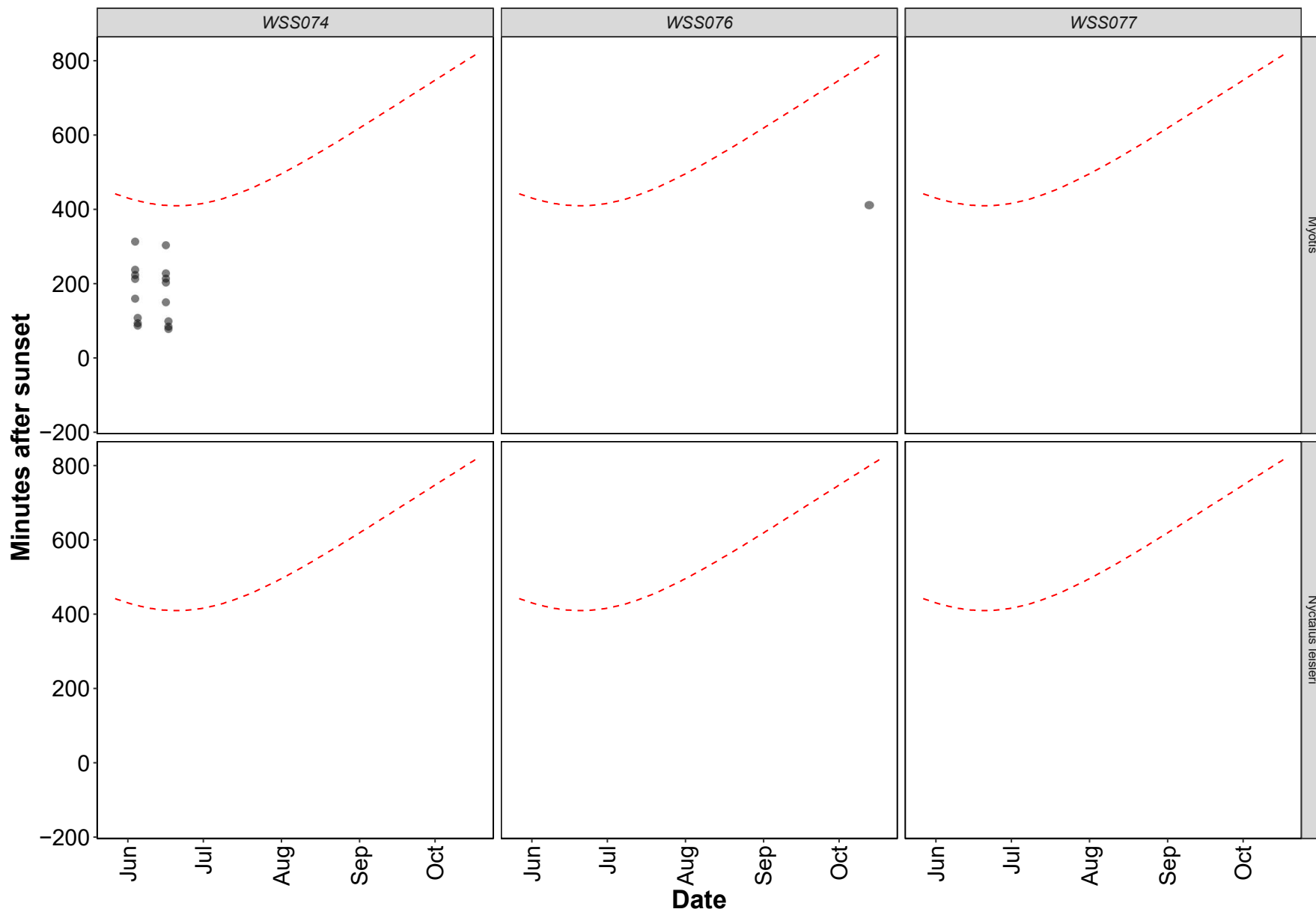


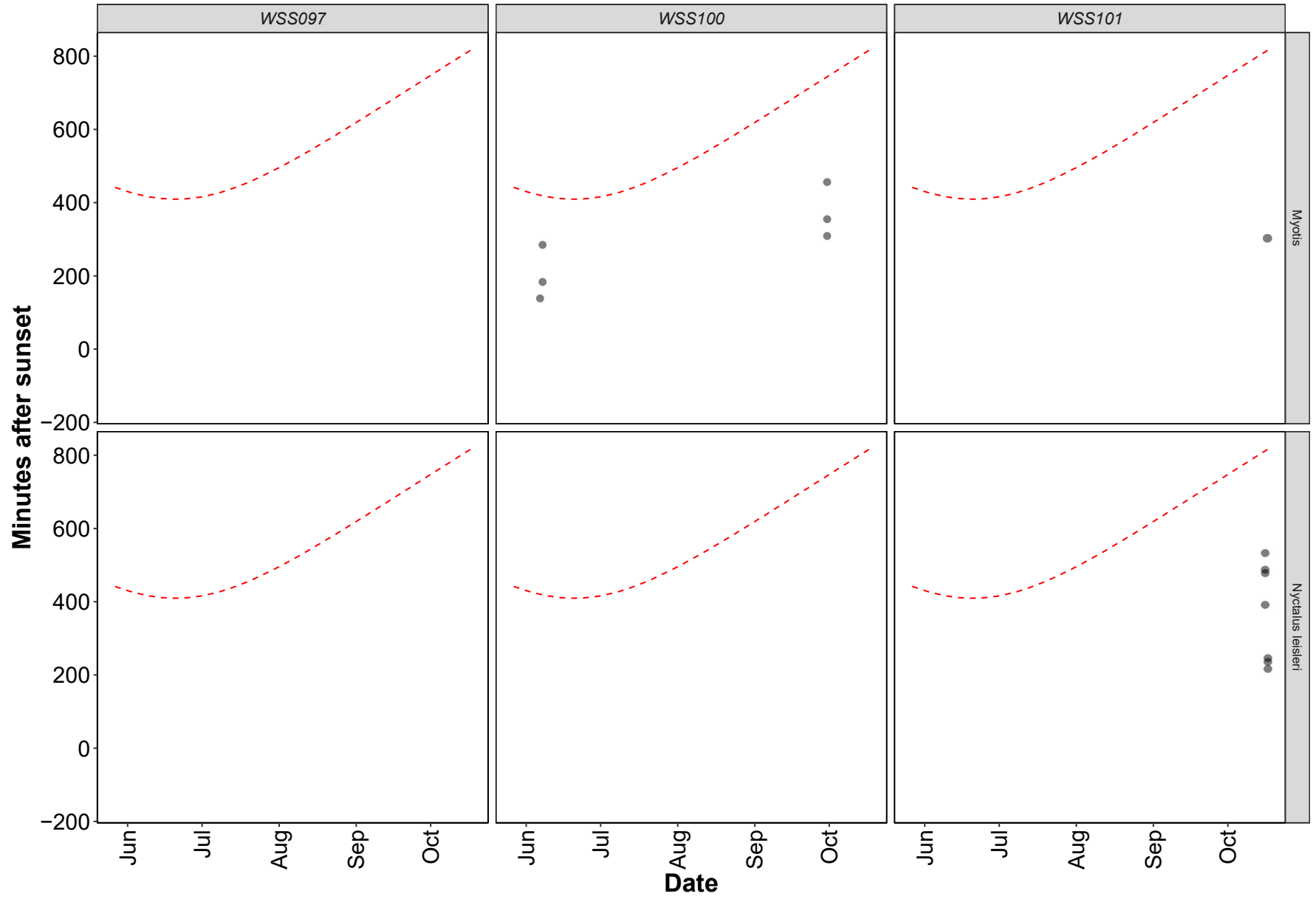


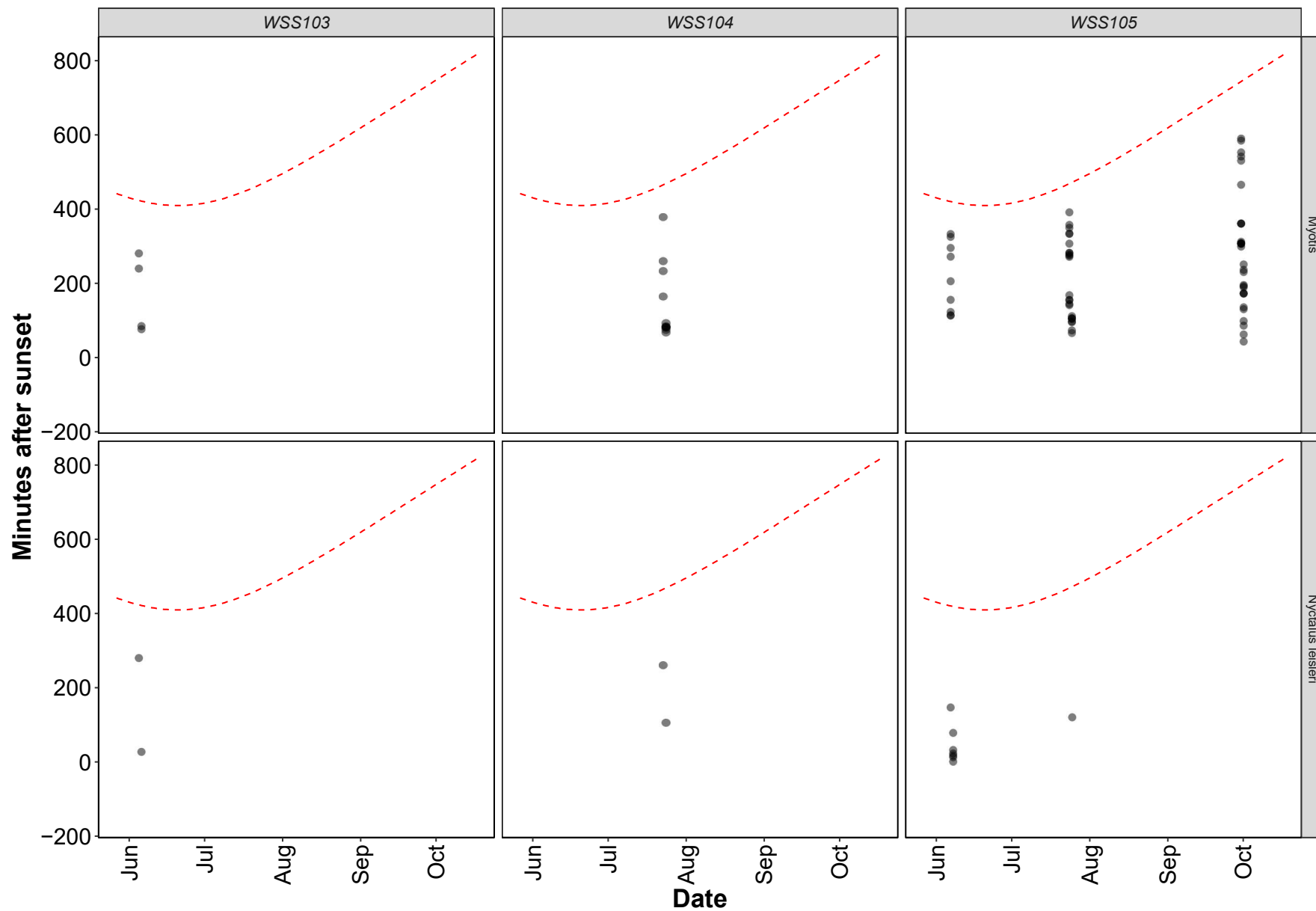


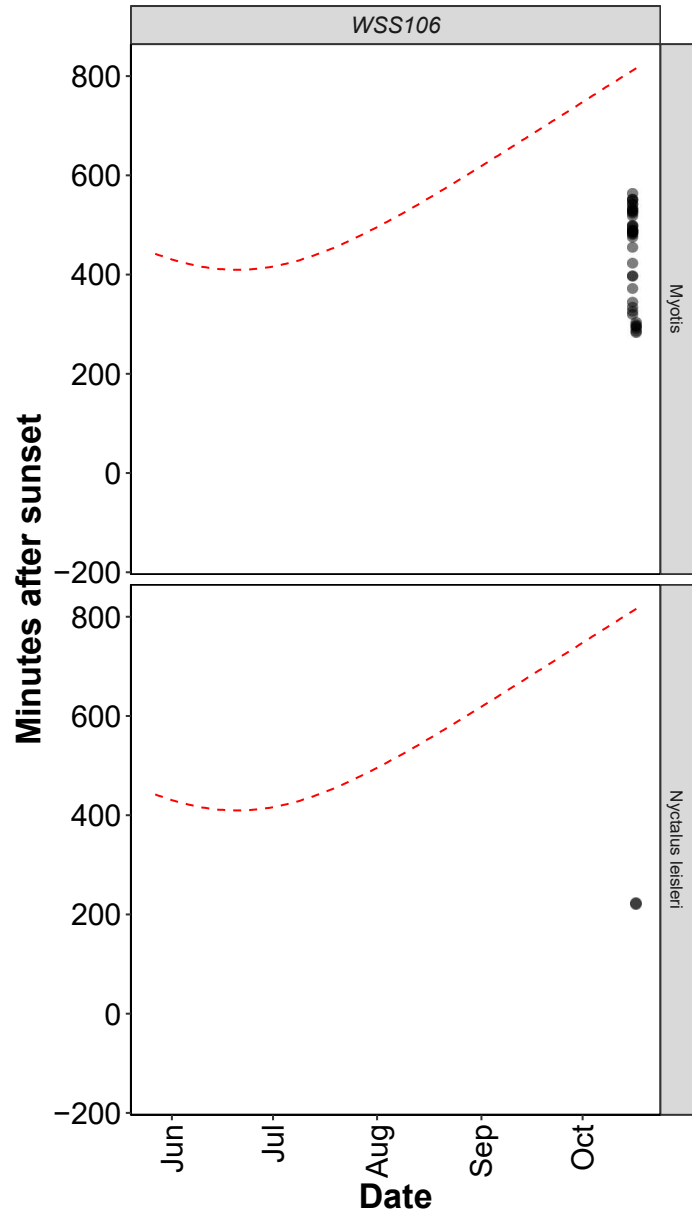


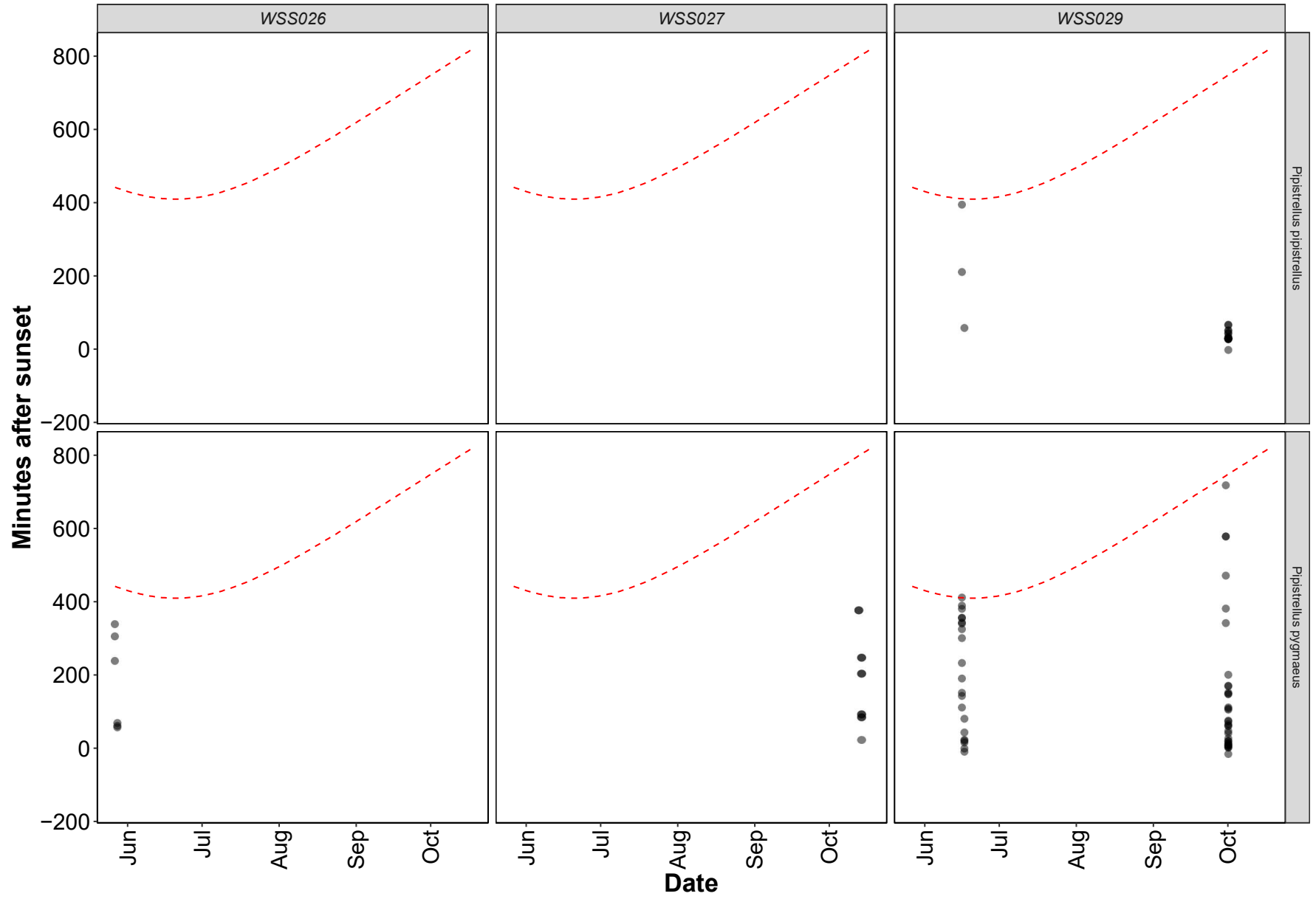


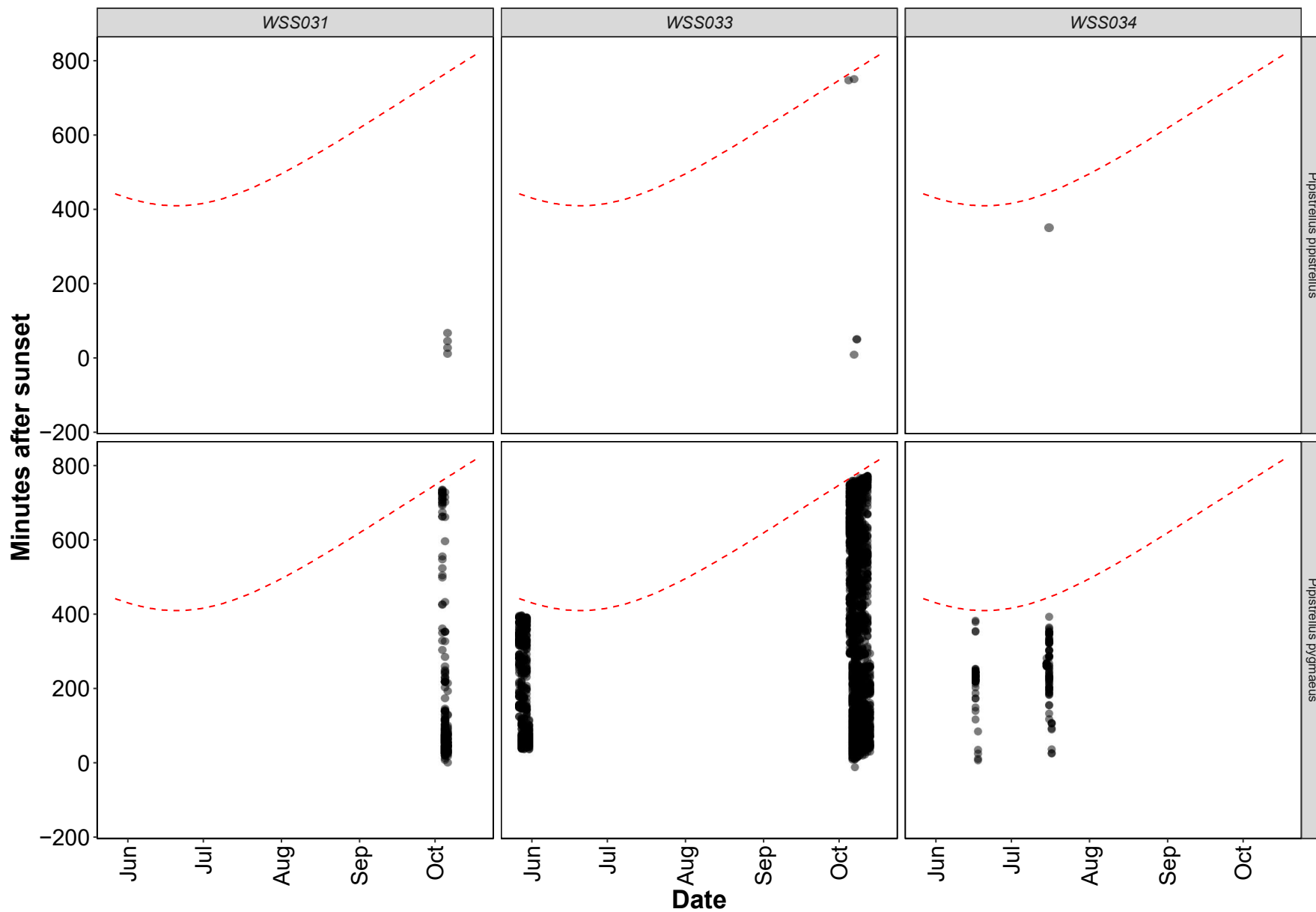


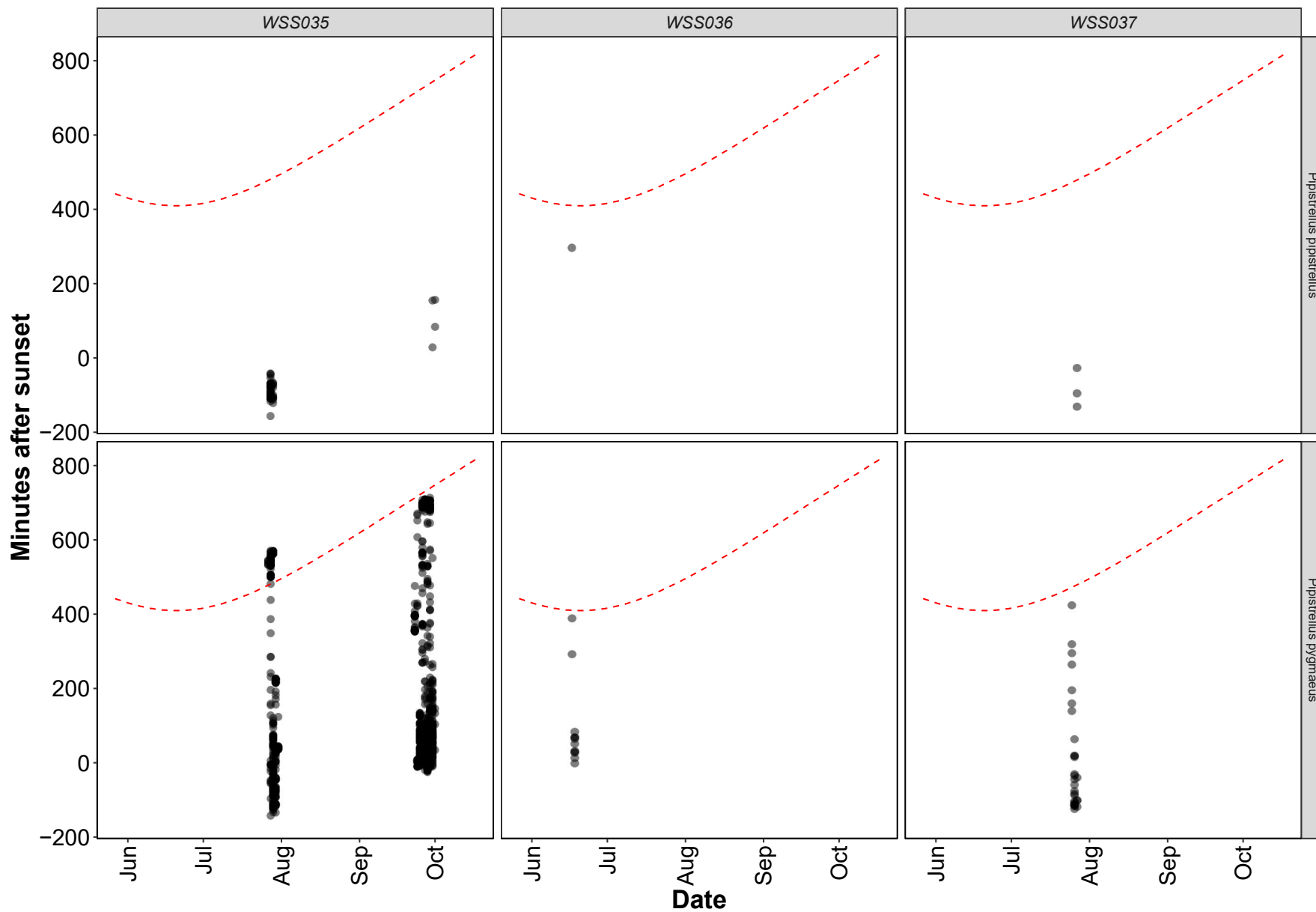


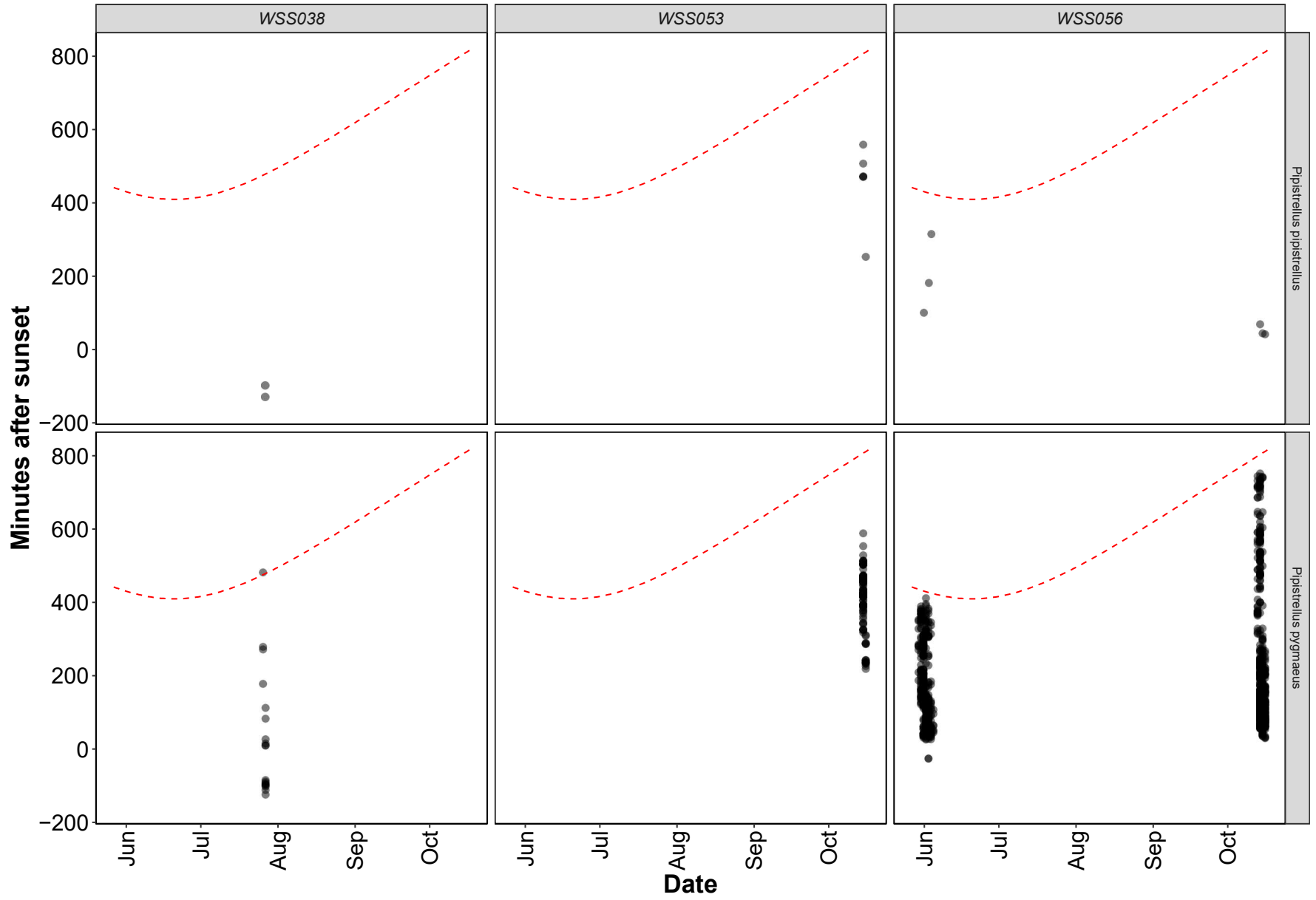


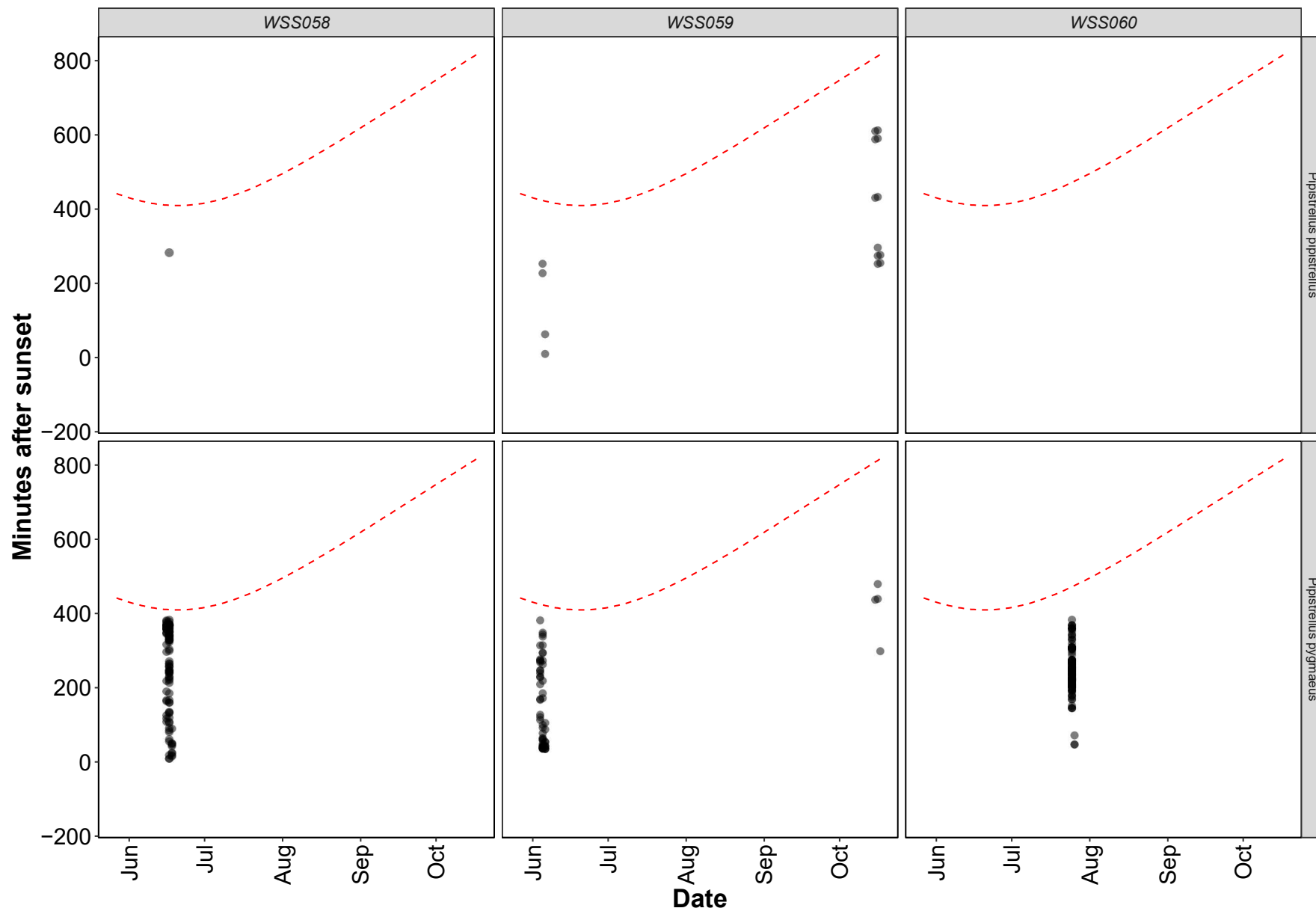


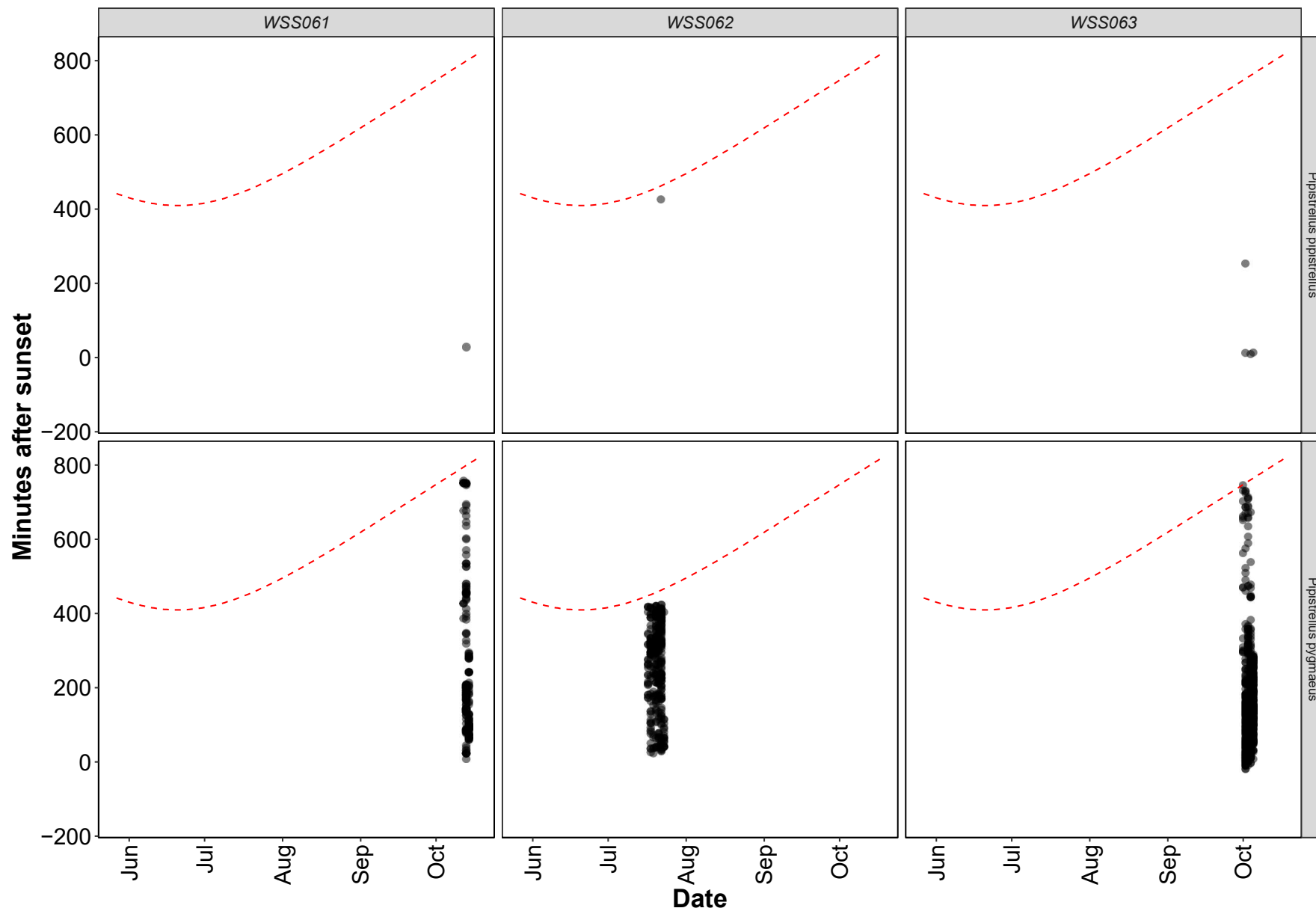


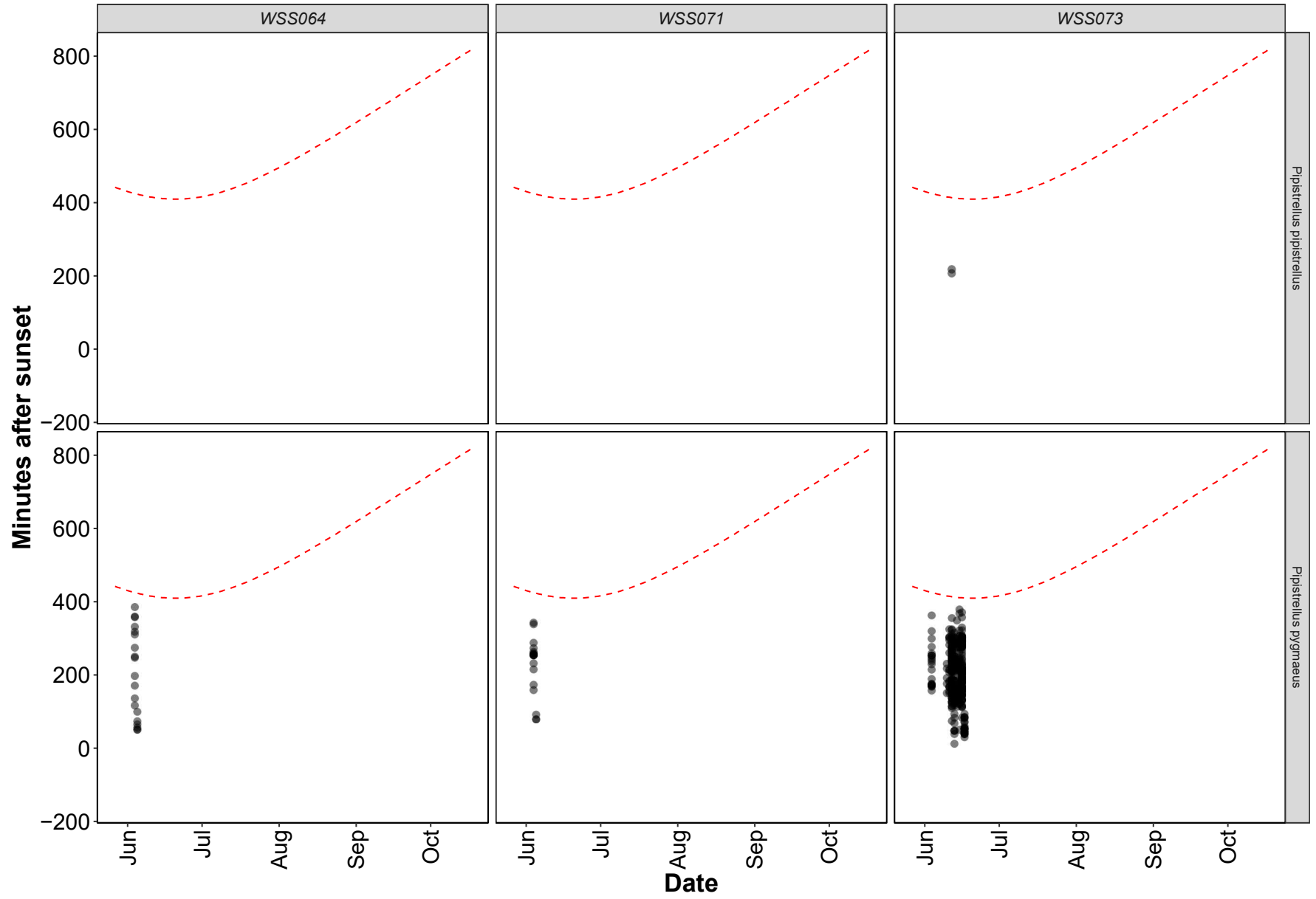


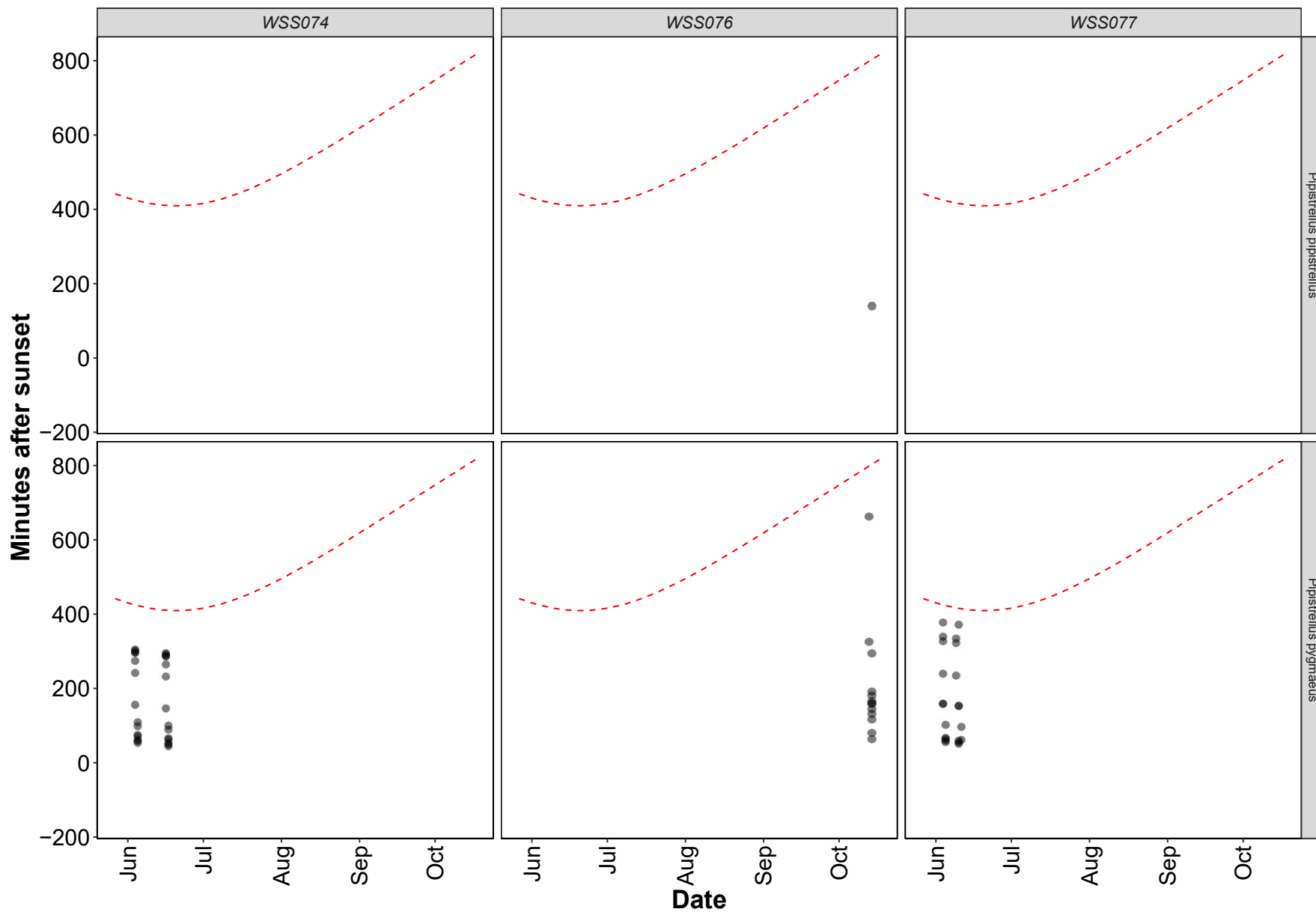


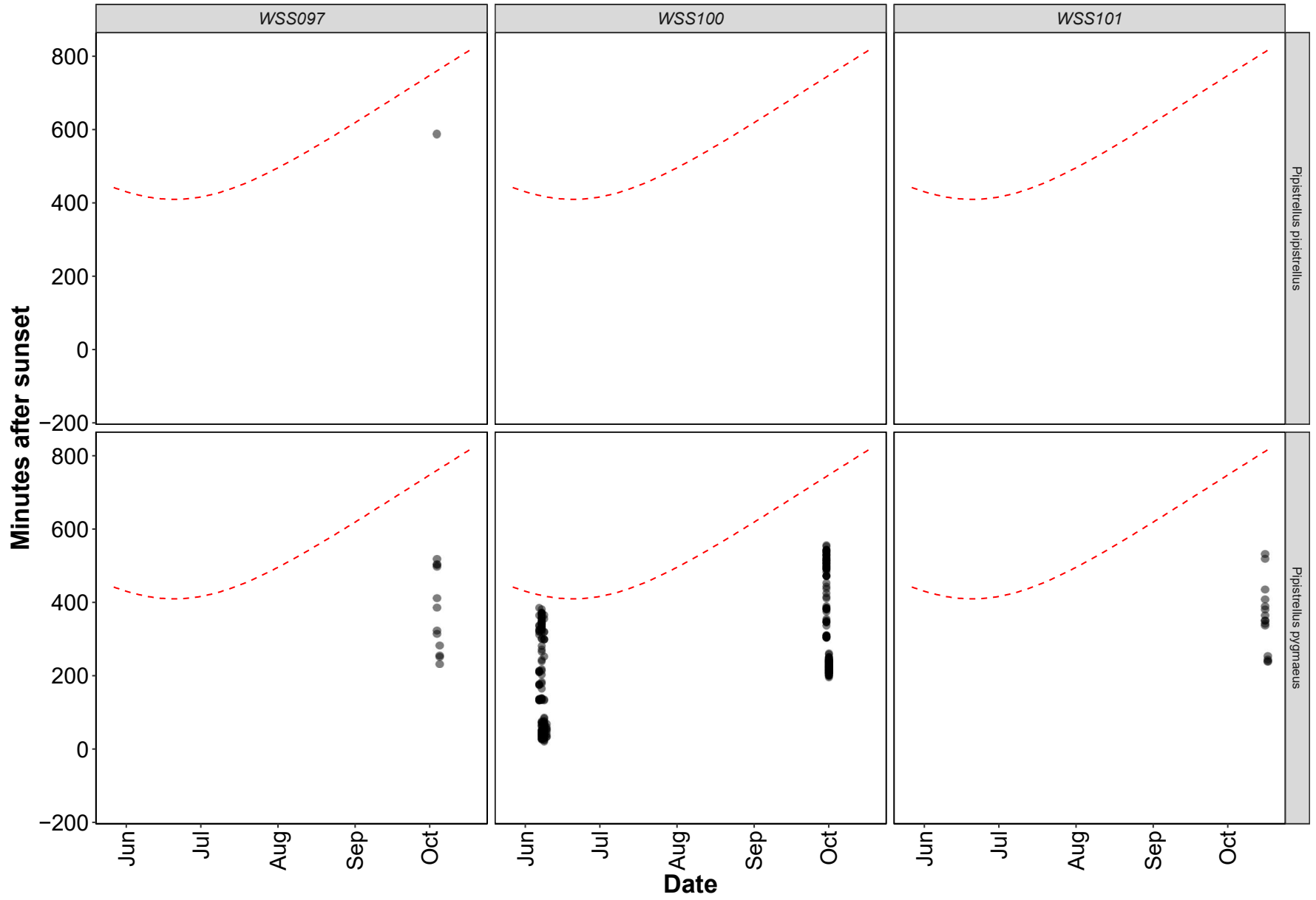












Roost Emergence Time and Bat Observation

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

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

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

Table 12: Table continues below

Species	Detector ID	2024-06-02	2024-06-03	2024-06-04	2024-06-06	2024-06-08
Common pipistrelle	WSS029	0	0	0	0	0
Common pipistrelle	WSS031	0	0	0	0	0
Common pipistrelle	WSS033	0	0	0	0	0
Common pipistrelle	WSS035	0	0	0	0	0
Common pipistrelle	WSS037	0	0	0	0	0
Common pipistrelle	WSS038	0	0	0	0	0
Common pipistrelle	WSS059	0	0	0	1	0
Common pipistrelle	WSS061	0	0	0	0	0
Common pipistrelle	WSS063	0	0	0	0	0
Soprano pipistrelle	WSS027	0	0	0	0	0
Soprano pipistrelle	WSS029	0	0	0	0	0
Soprano pipistrelle	WSS031	0	0	0	0	0
Soprano pipistrelle	WSS033	0	0	0	0	0
Soprano pipistrelle	WSS034	0	0	0	0	0
Soprano pipistrelle	WSS035	0	0	0	0	0
Soprano pipistrelle	WSS036	0	0	0	0	0
Soprano pipistrelle	WSS037	0	0	0	0	0
Soprano pipistrelle	WSS038	0	0	0	0	0
Soprano pipistrelle	WSS056	1	2	1	0	0
Soprano pipistrelle	WSS058	0	0	0	0	0
Soprano pipistrelle	WSS061	0	0	0	0	0
Soprano pipistrelle	WSS062	0	0	0	0	0
Soprano pipistrelle	WSS063	0	0	0	0	0
Soprano pipistrelle	WSS073	0	0	0	0	0
Soprano pipistrelle	WSS100	0	0	0	0	1

Species	Detector ID	2024-06-02	2024-06-03	2024-06-04	2024-06-06	2024-06-08
Soprano pipistrelle	WSS104	0	0	0	0	0
Soprano pipistrelle	WSS105	0	0	0	0	2
Leisler's	WSS034	0	0	0	0	0
Leisler's	WSS035	0	0	0	0	0
Leisler's	WSS038	0	0	0	0	0
Leisler's	WSS063	0	0	0	0	0
Leisler's	WSS105	0	0	0	0	3
Brown long-eared	WSS029	0	0	0	0	0
Brown long-eared	WSS033	0	0	0	0	0
Brown long-eared	WSS037	0	0	0	0	0
Brown long-eared	WSS038	0	0	0	0	0
Brown long-eared	WSS063	0	0	0	0	0
Myotis	WSS033	0	0	0	0	0
Myotis	WSS035	0	0	0	0	0
Myotis	WSS037	0	0	0	0	0
Myotis	WSS058	0	0	0	0	0
Myotis	WSS073	0	0	0	0	0
Myotis	WSS104	0	0	0	0	0
Myotis	WSS105	0	0	0	0	0

Table 13: Table continues below

2024-06-09	2024-06-13	2024-06-17	2024-06-18	2024-07-17	2024-07-18	2024-07-19
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	5	0	0	0	0

Table 14: Table continues below

2024-07-24	2024-07-25	2024-07-26	2024-07-27	2024-07-28	2024-07-29	2024-07-30
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	54	12	0
0	0	0	3	0	0	0
0	0	0	2	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	14	232	59
0	0	0	0	0	0	0
0	0	18	4	0	0	0
0	0	0	13	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
2	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	3	4	0	0
0	0	0	4	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

2024-07-24	2024-07-25	2024-07-26	2024-07-27	2024-07-28	2024-07-29	2024-07-30
0	0	2	0	0	0	0
0	0	0	2	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	13	0	0	0
0	0	1	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
1	0	0	0	0	0	0
0	1	0	0	0	0	0

Table 15: Table continues below

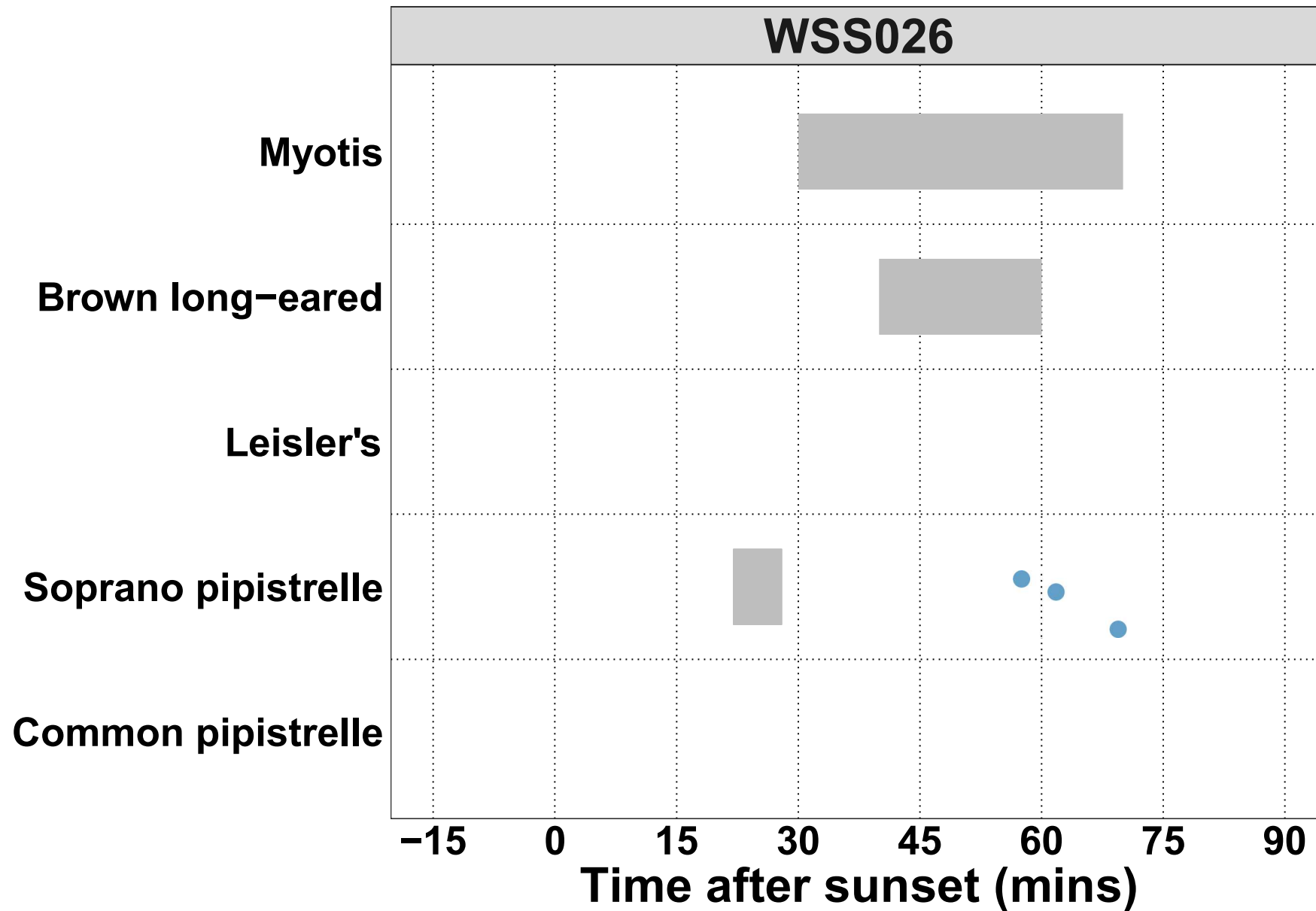
2024-09-24	2024-09-25	2024-09-26	2024-09-27	2024-09-28	2024-09-29	2024-09-30
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0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	1
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
31	60	4	12	135	45	16
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

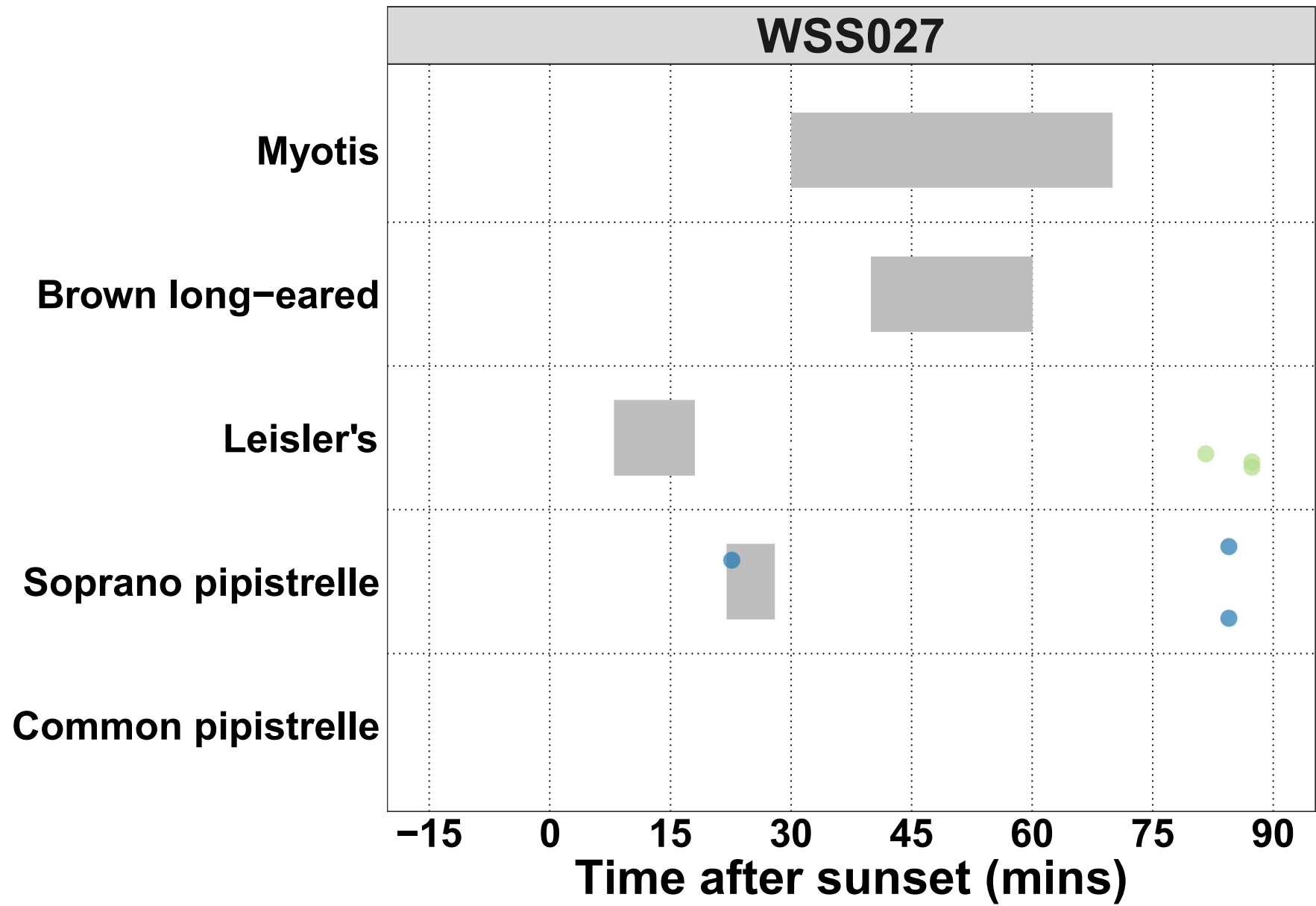
2024-10-01	2024-10-02	2024-10-03	2024-10-04	2024-10-05	2024-10-06	2024-10-07
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0	0	0	0	0	0	0
0	1	0	1	1	0	0
0	0	0	0	0	0	0
12	0	0	0	0	0	0
0	0	0	0	20	5	0
0	0	0	0	0	15	33
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	145	95	20	2	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
5	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	2	0	0
0	0	0	0	0	0	0
1	0	0	0	0	0	0
0	0	0	0	0	1	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	1	0	0	0	0	0
0	0	0	0	0	0	1
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

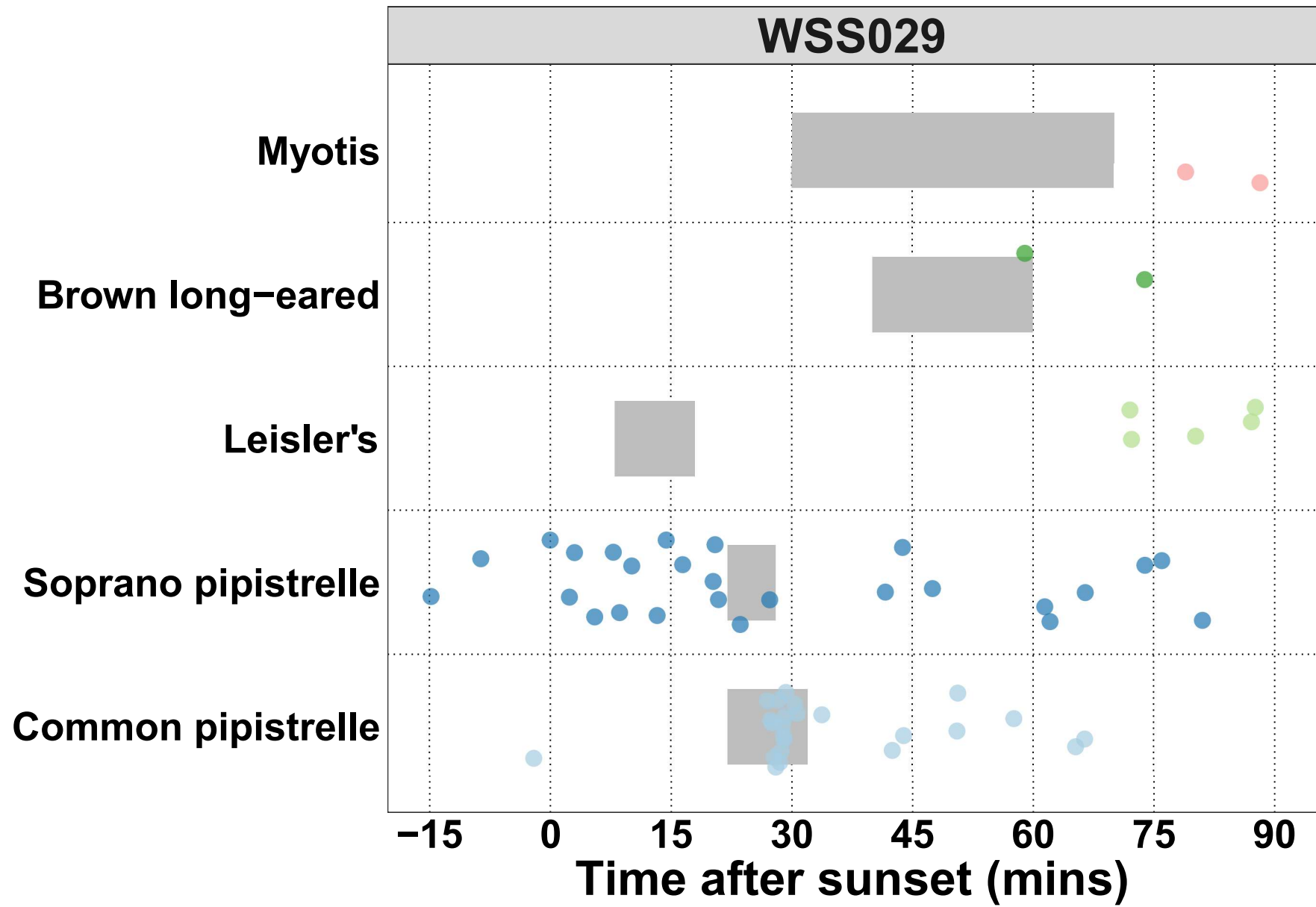
2024-10-08	2024-10-09	2024-10-10	2024-10-11	2024-10-13	2024-10-14
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
1	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

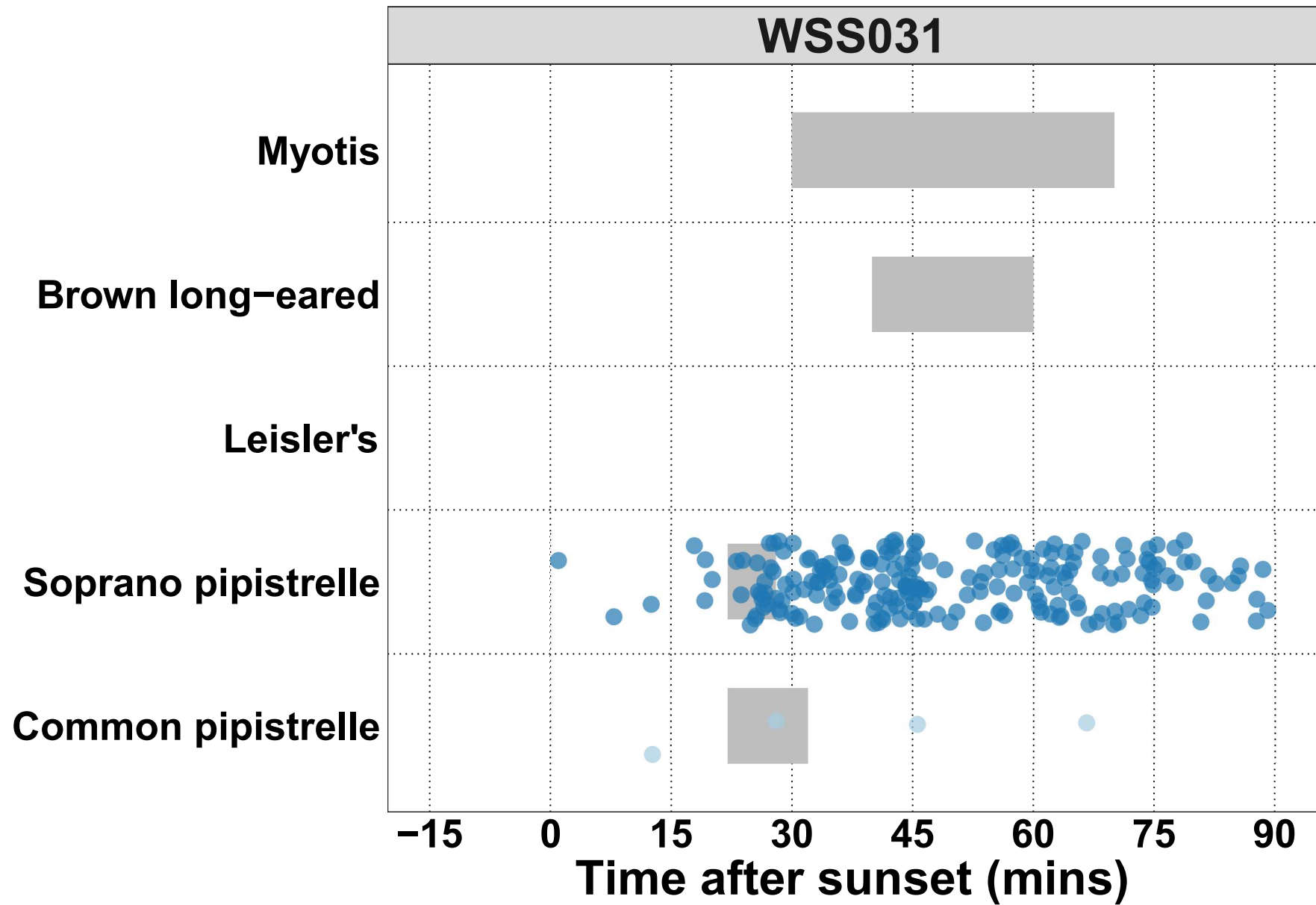
Bat Passes Potentially Indicating Close Proximity to a Roost (Russ 2012)

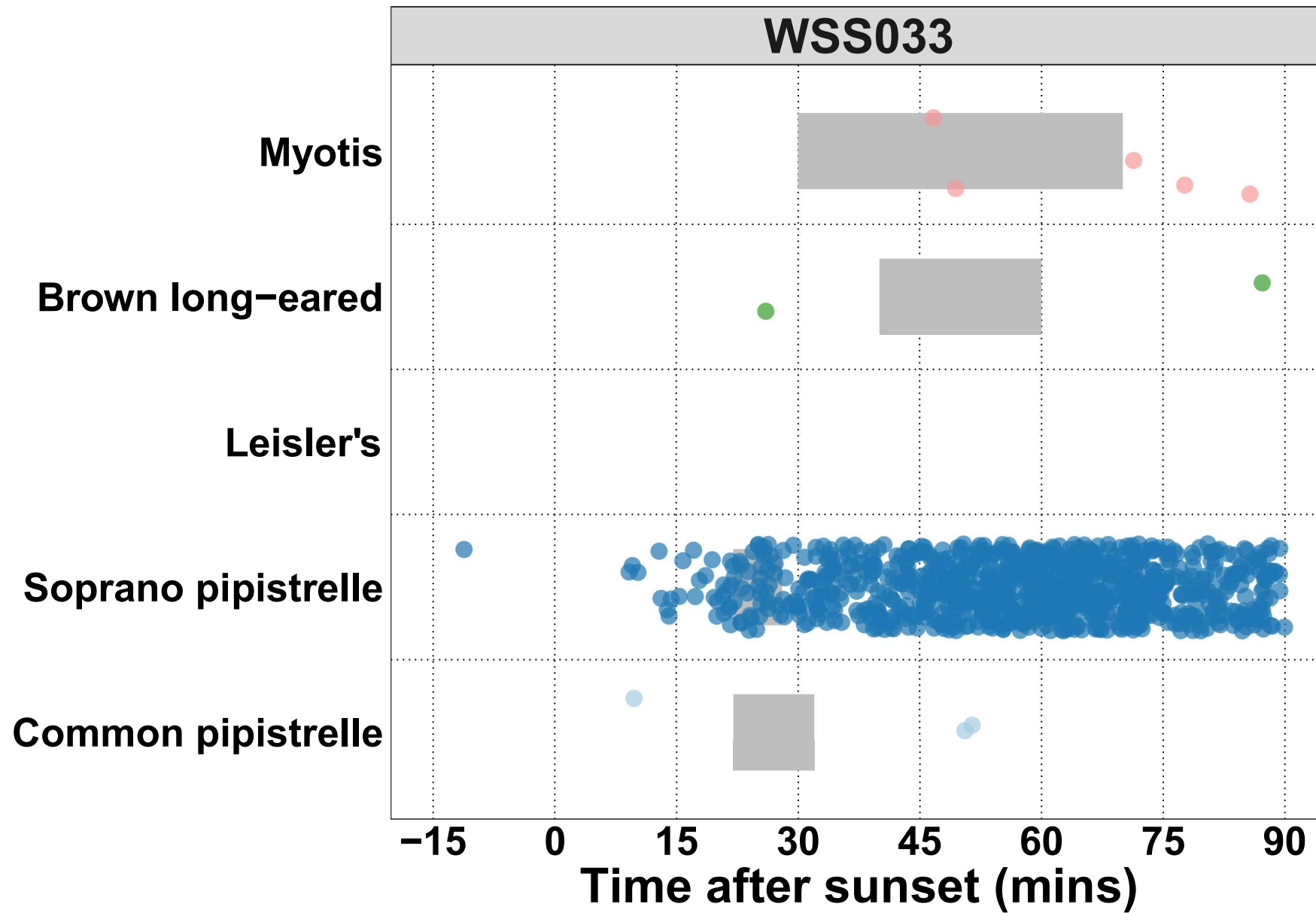
Figure 8. Time from 15 minutes before to 90 minutes after sunset. Species-specific emergence time ranges are shown as grey bars. Bat passes overlapping species-specific grey bars, or occurring earlier than this time range, may potentially indicate the presence of a nearby roost.

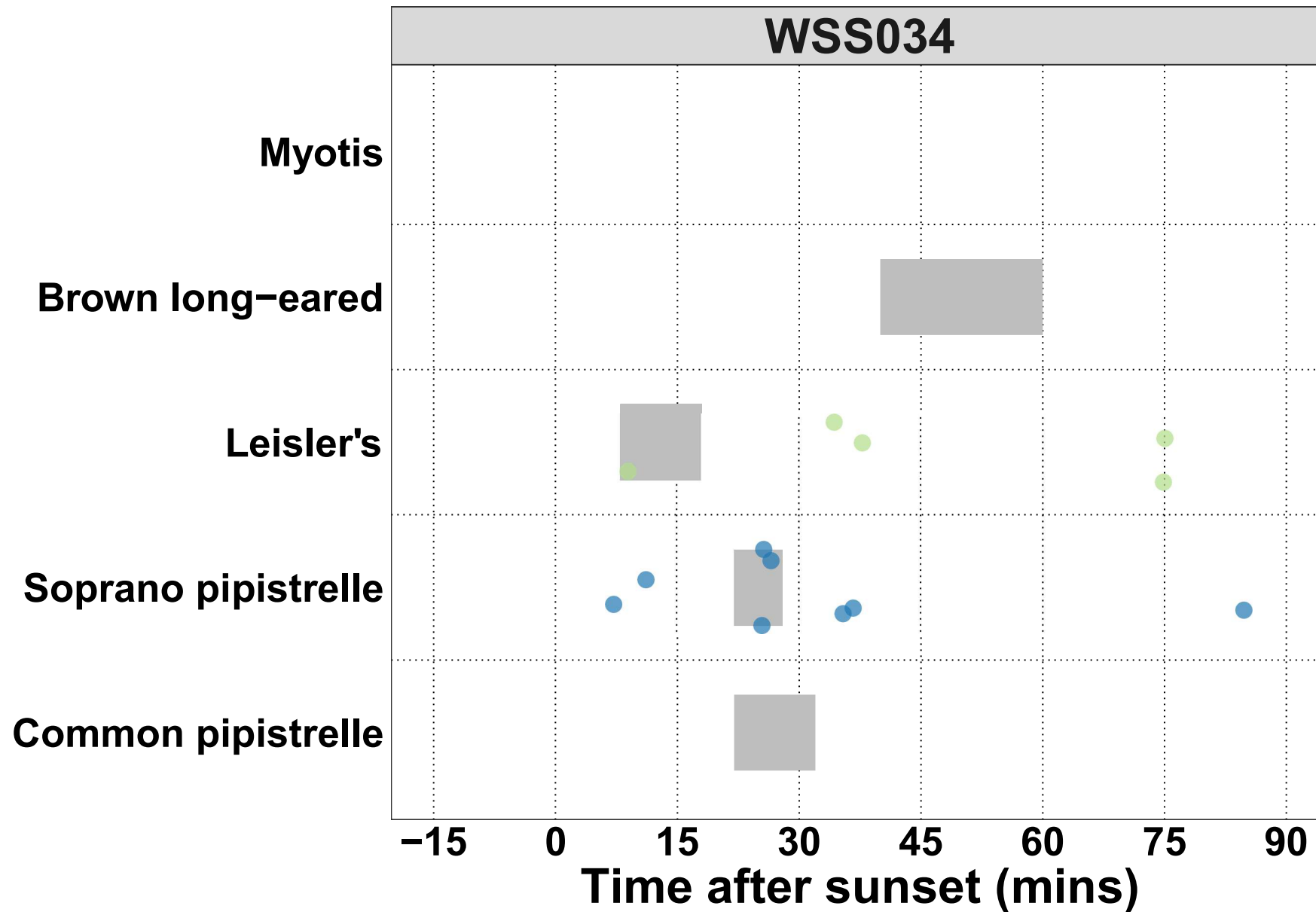


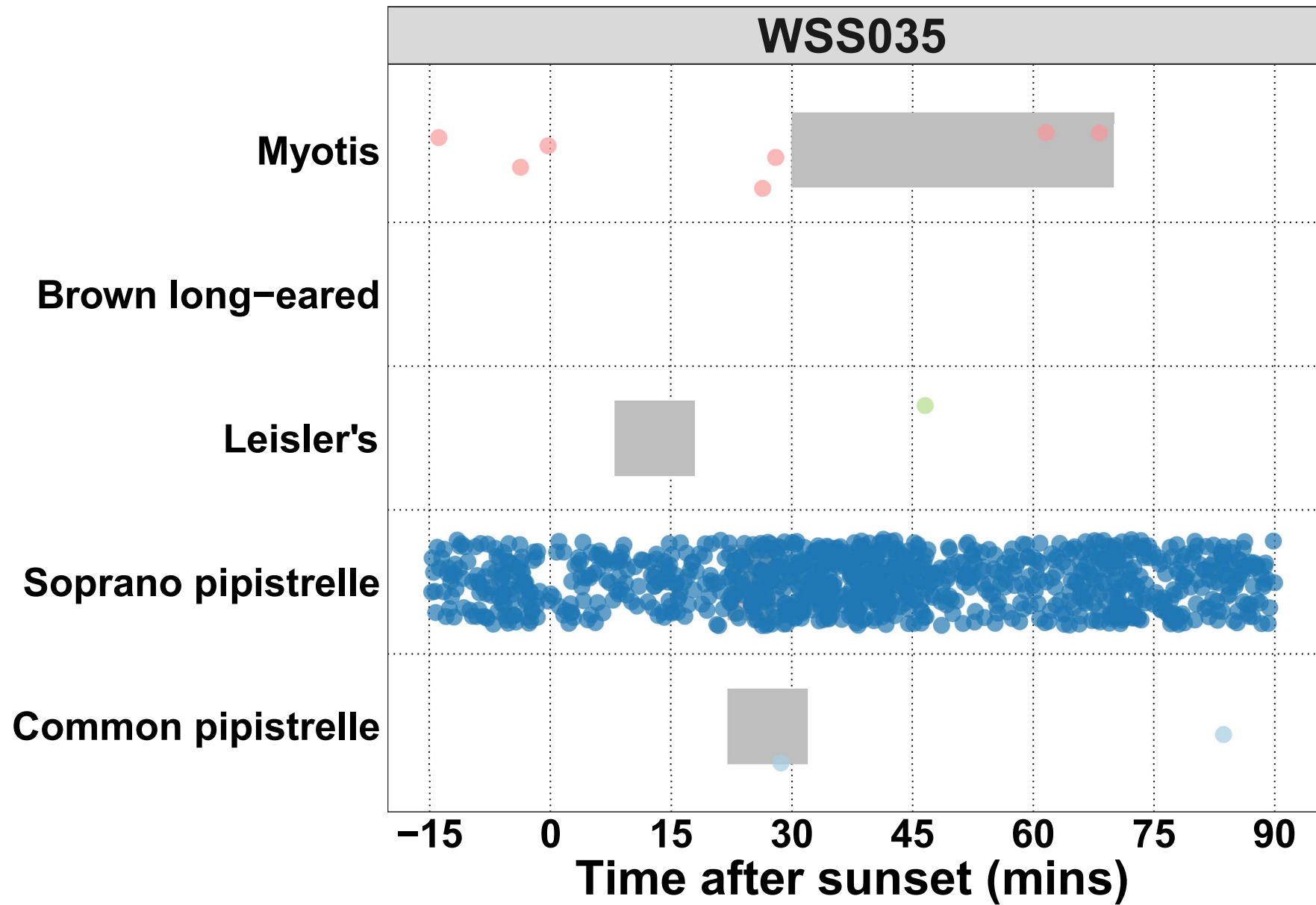


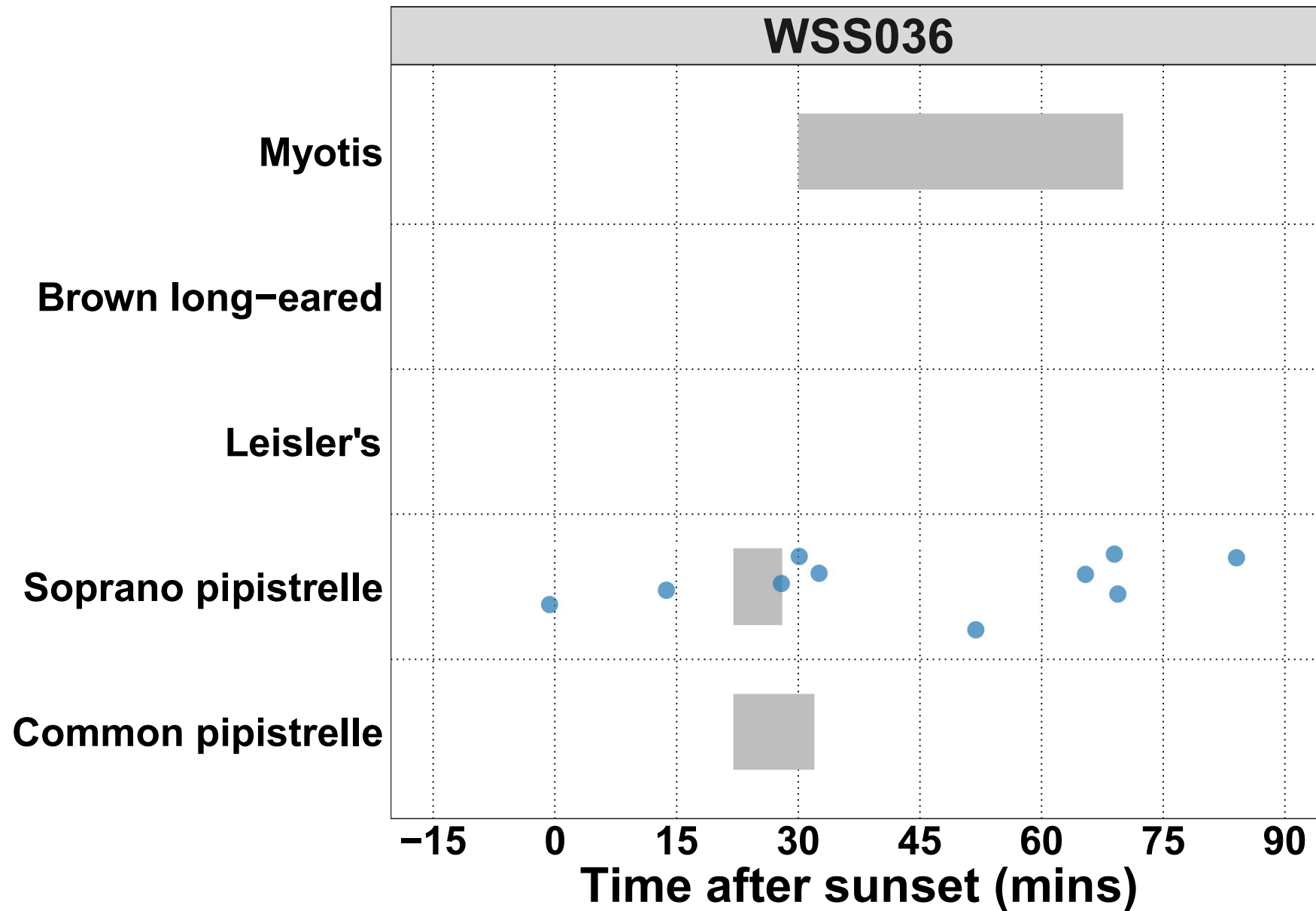


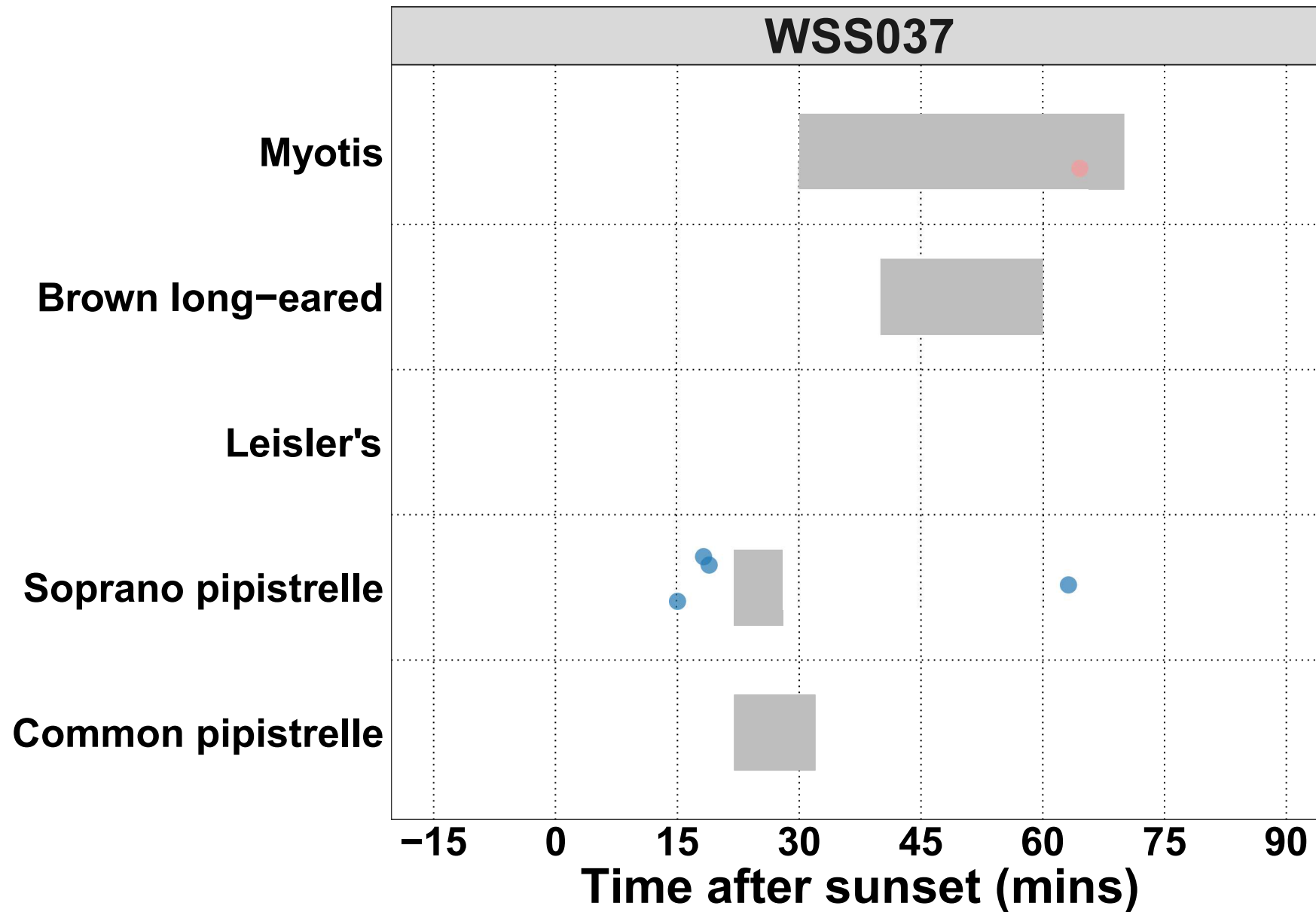


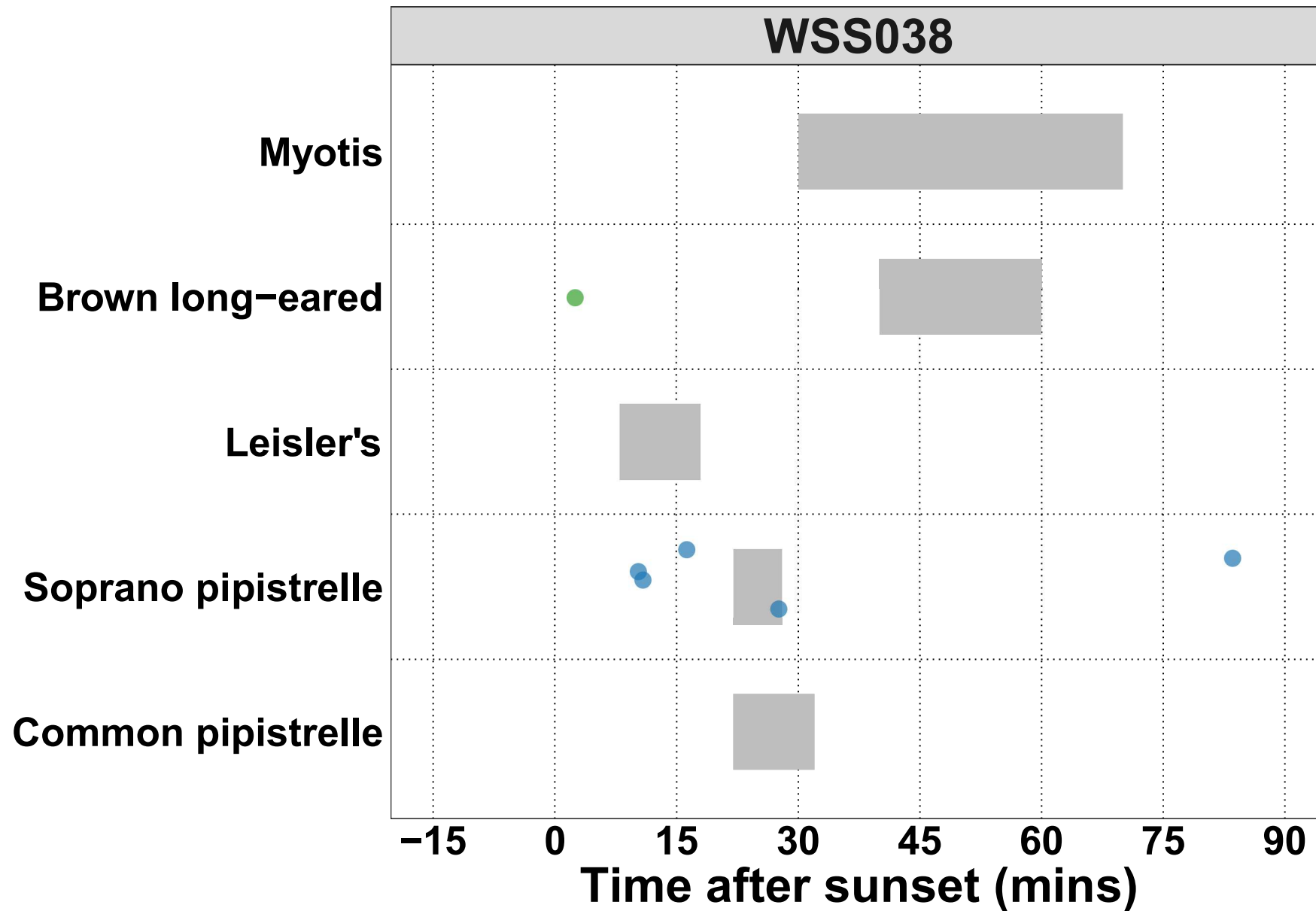


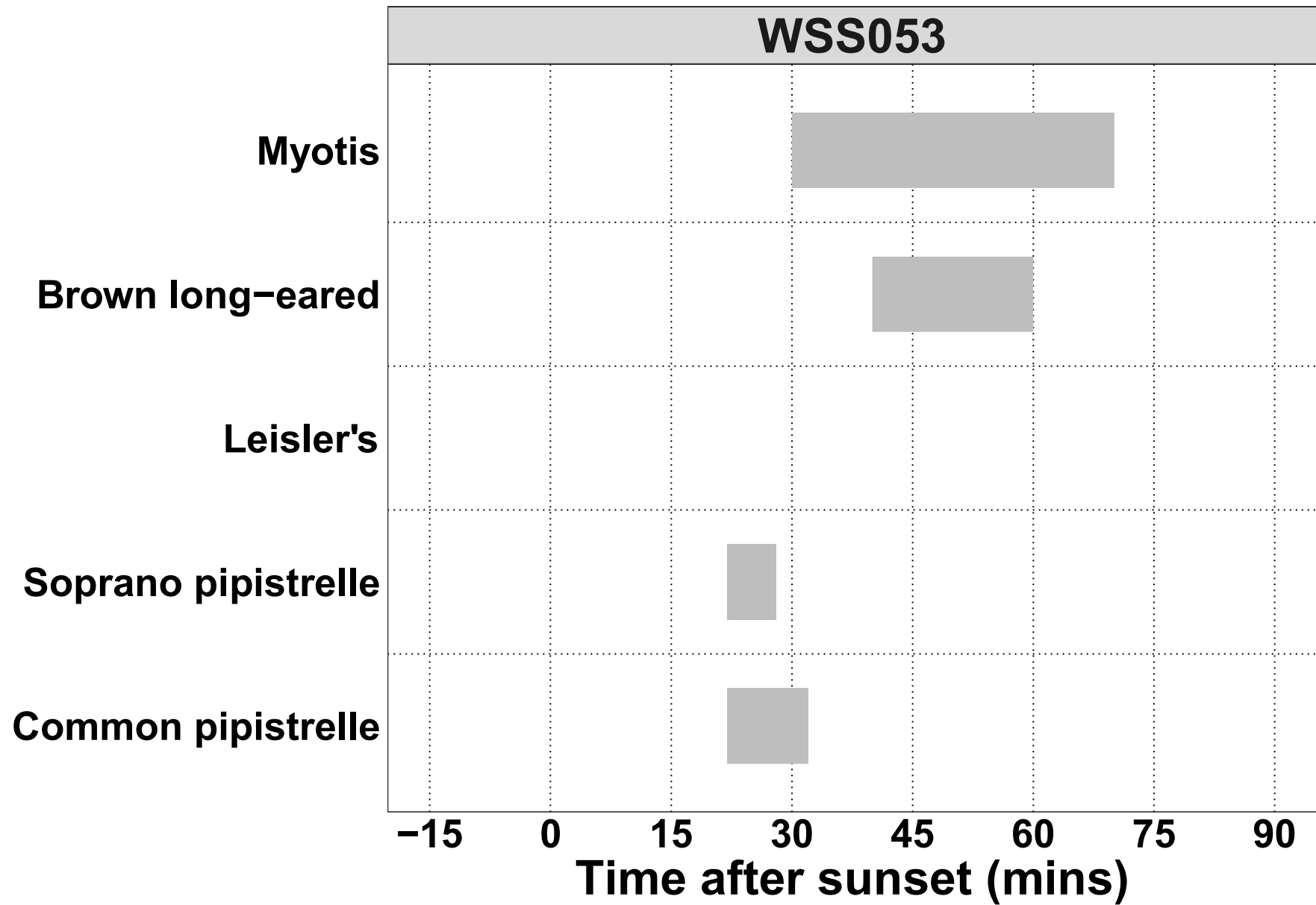


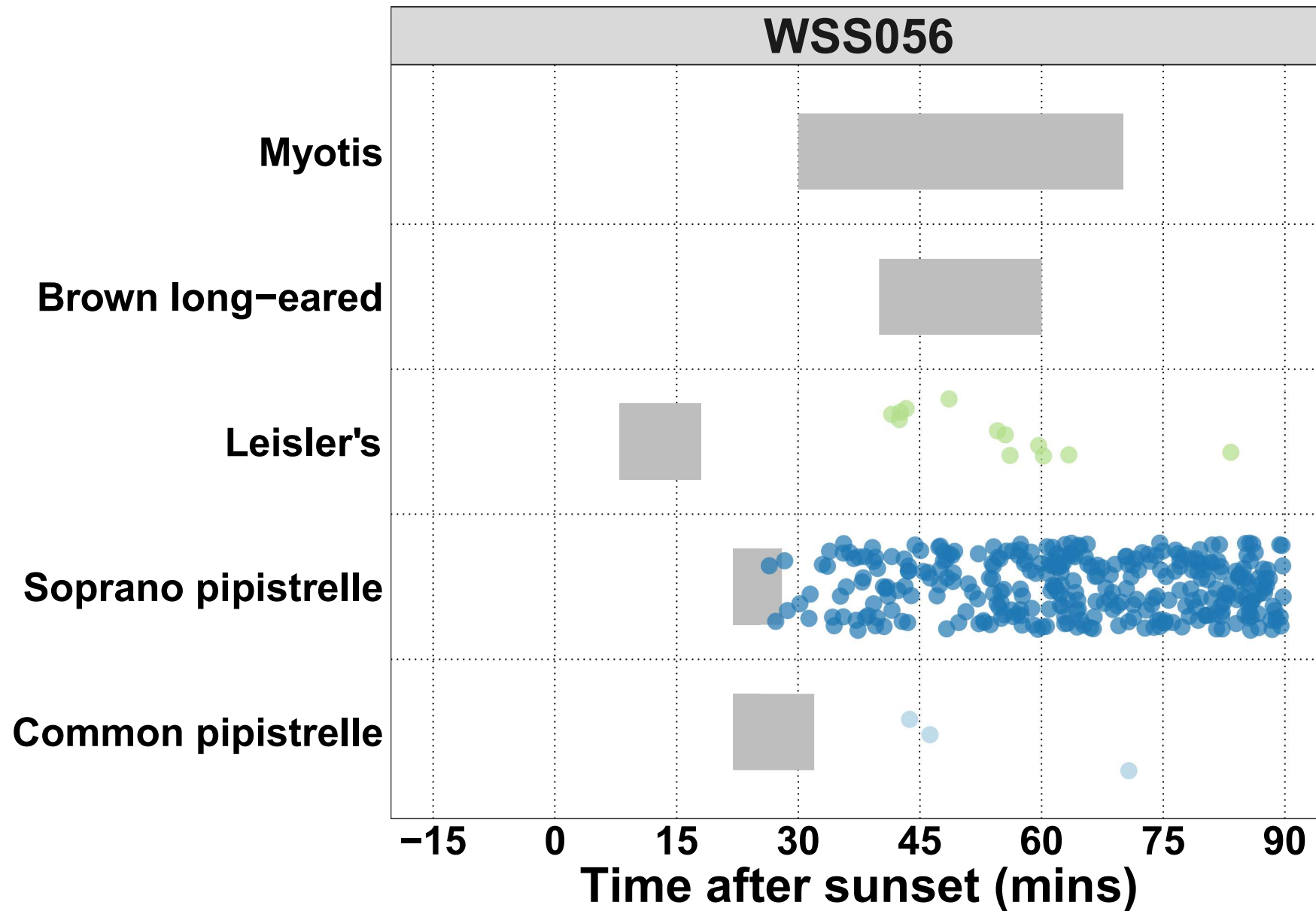


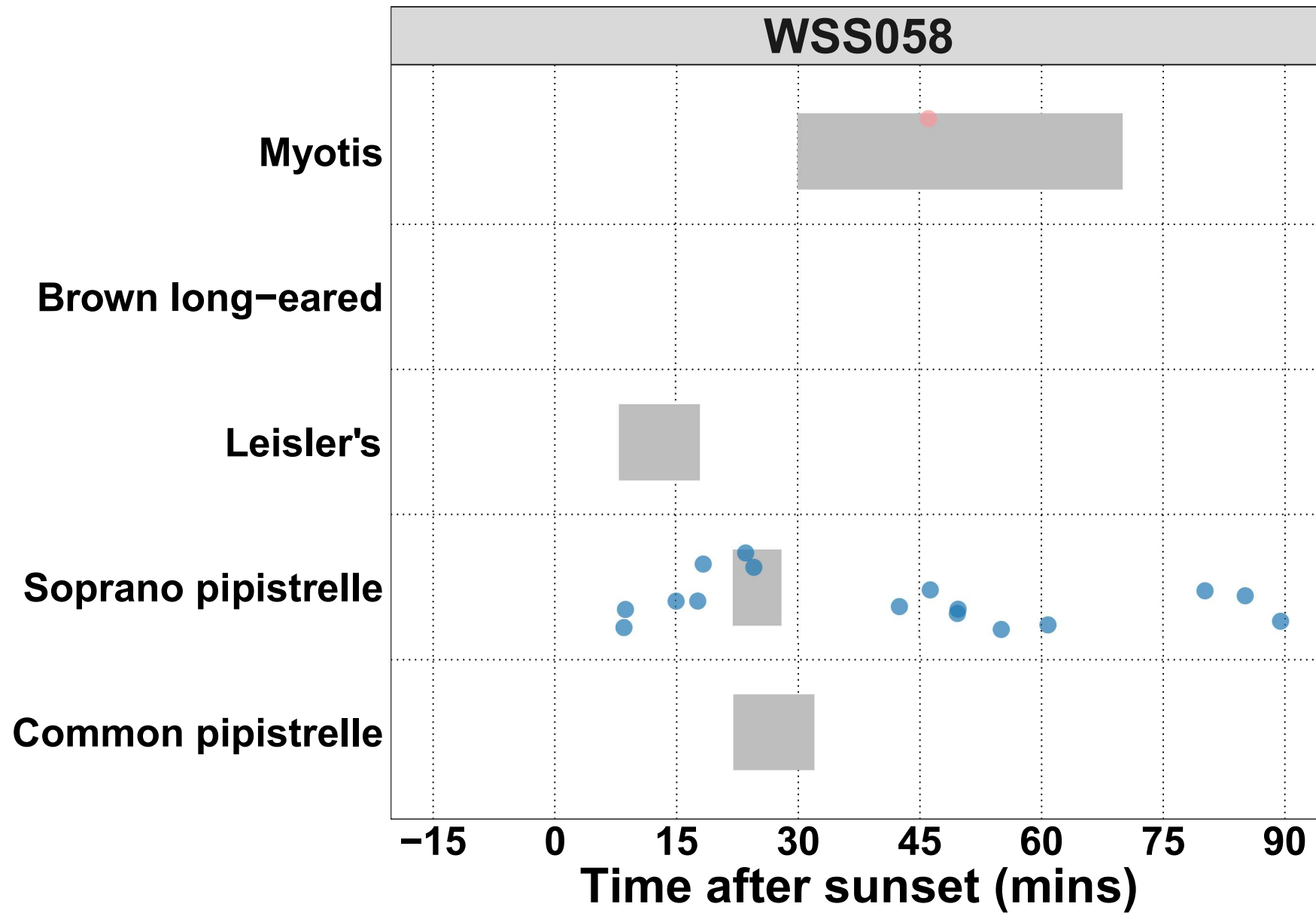


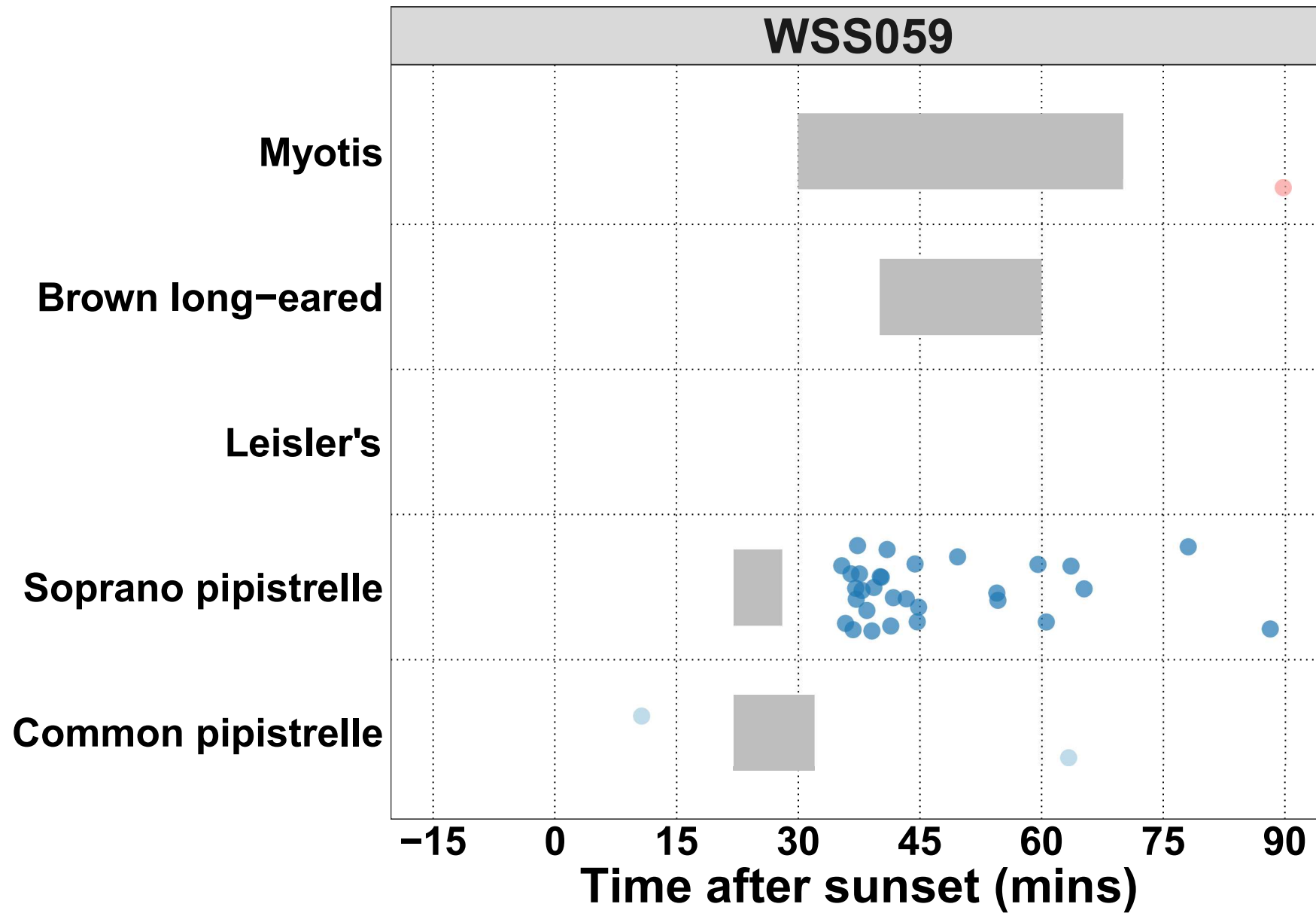


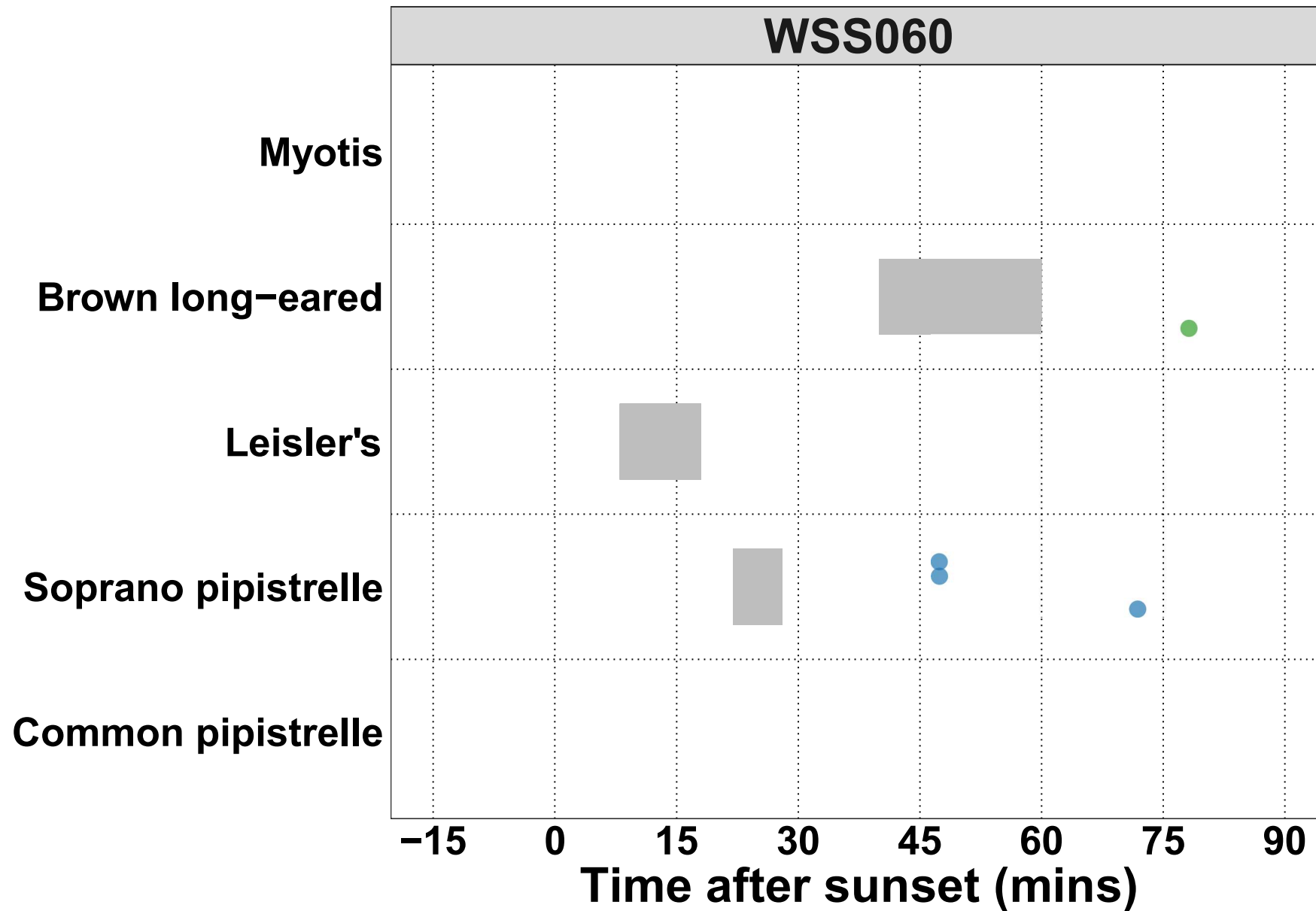


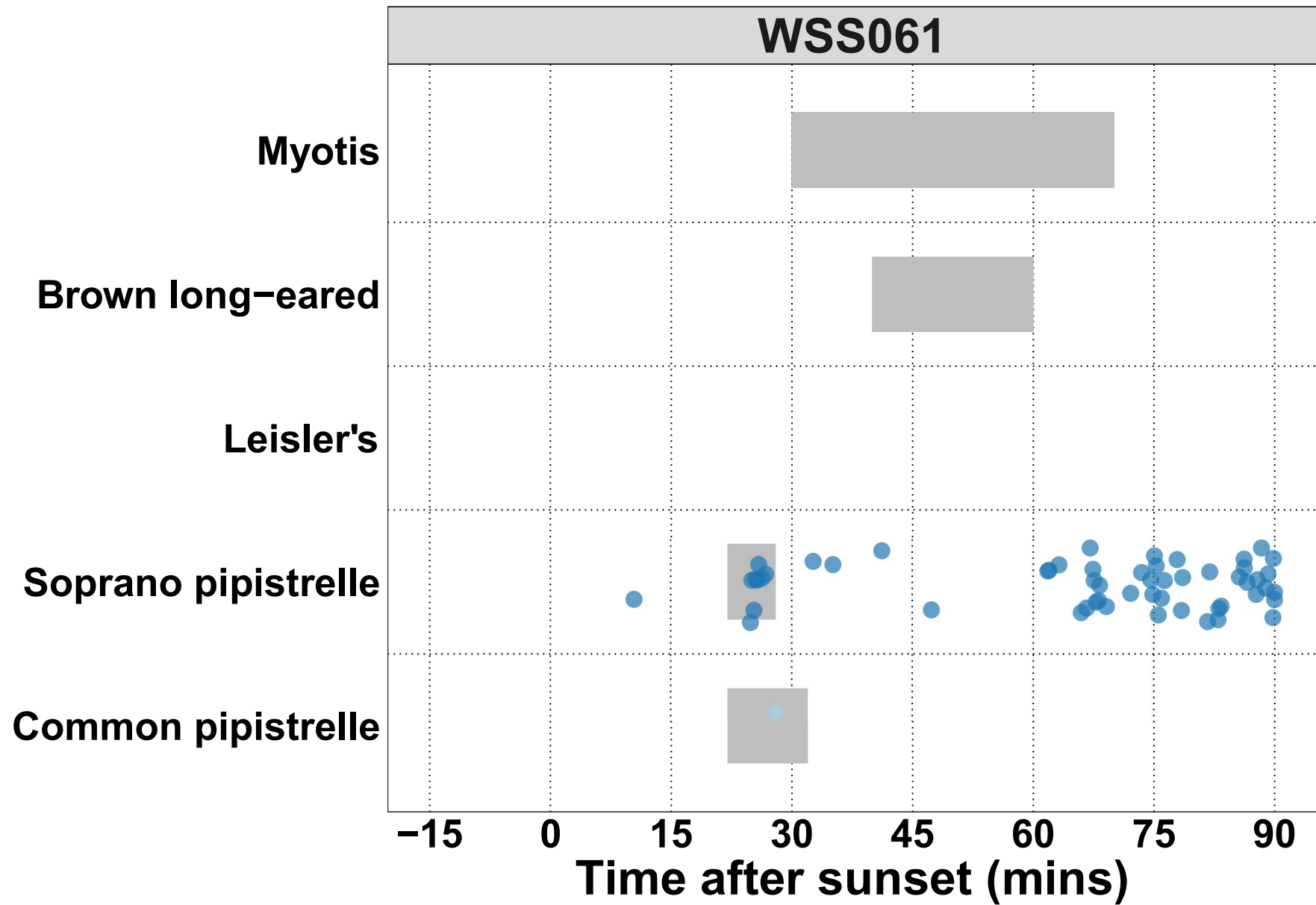


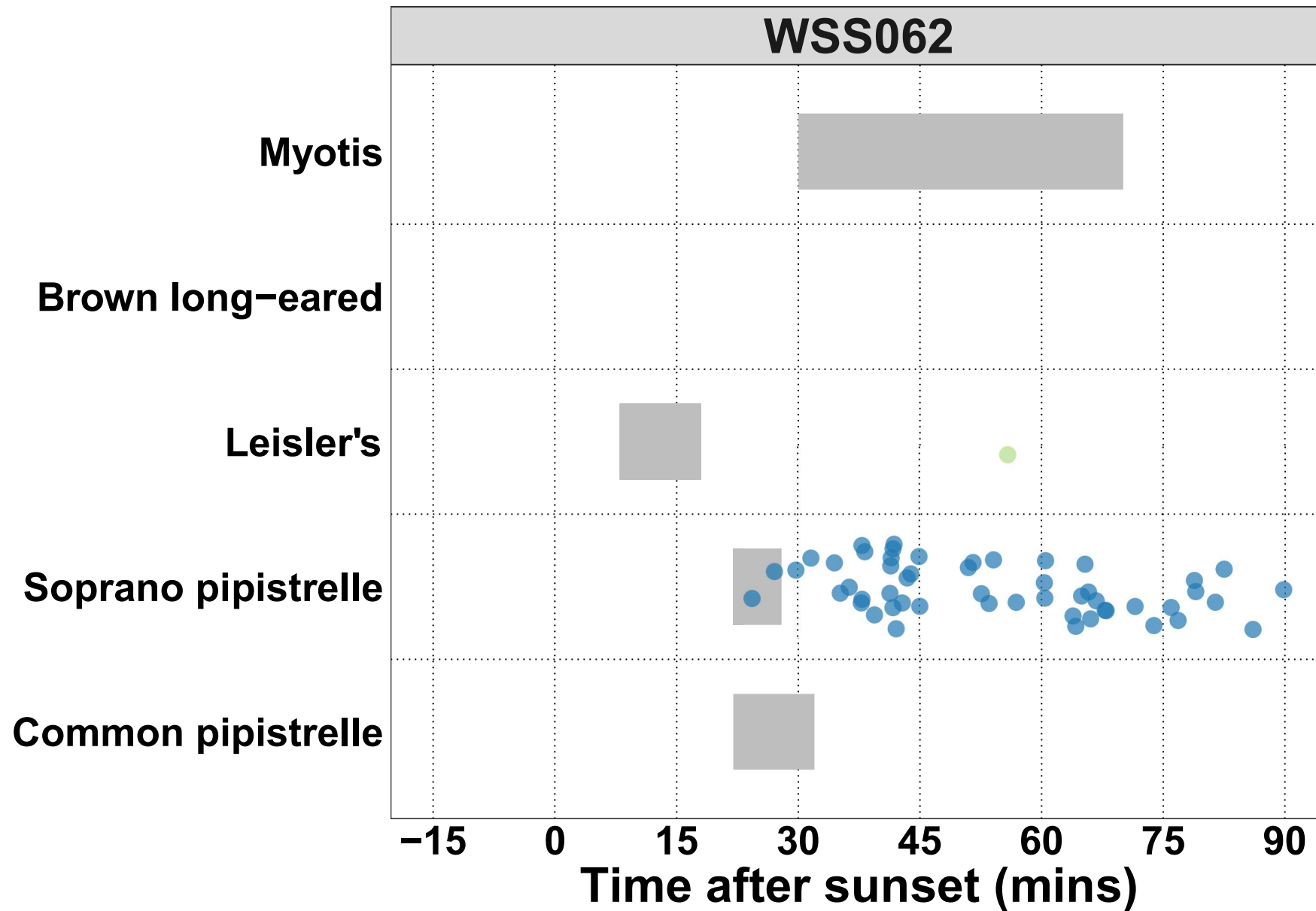


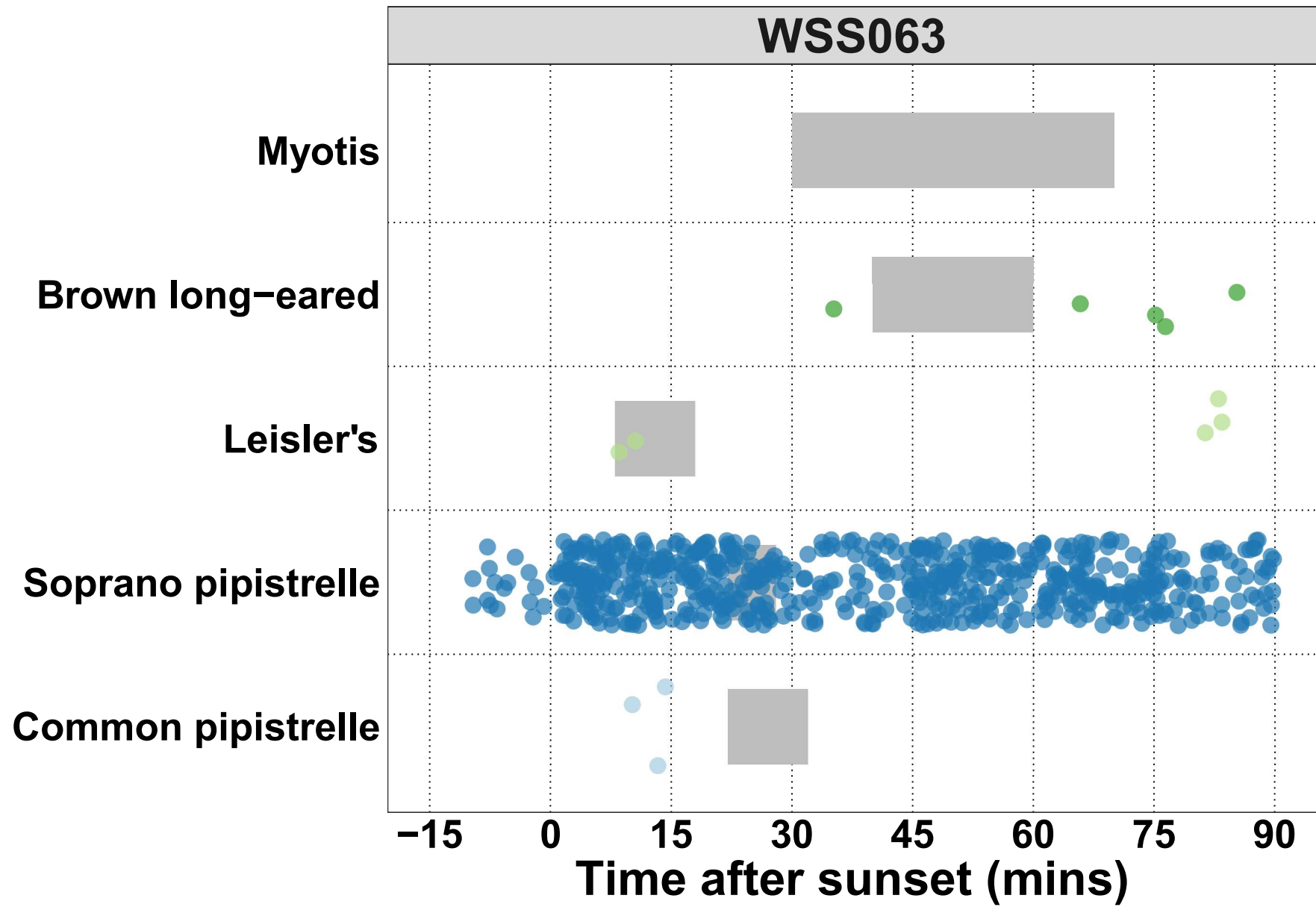


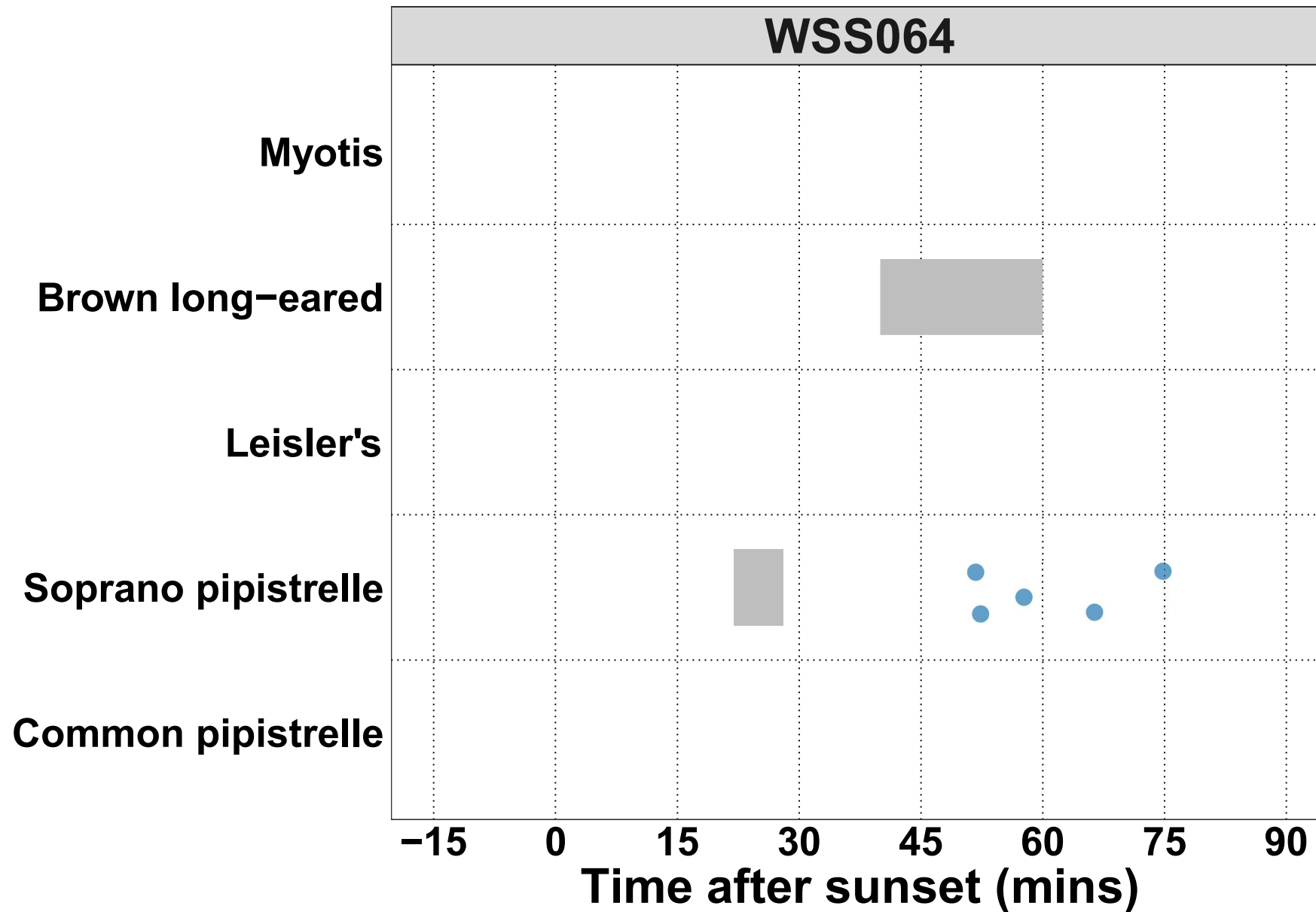


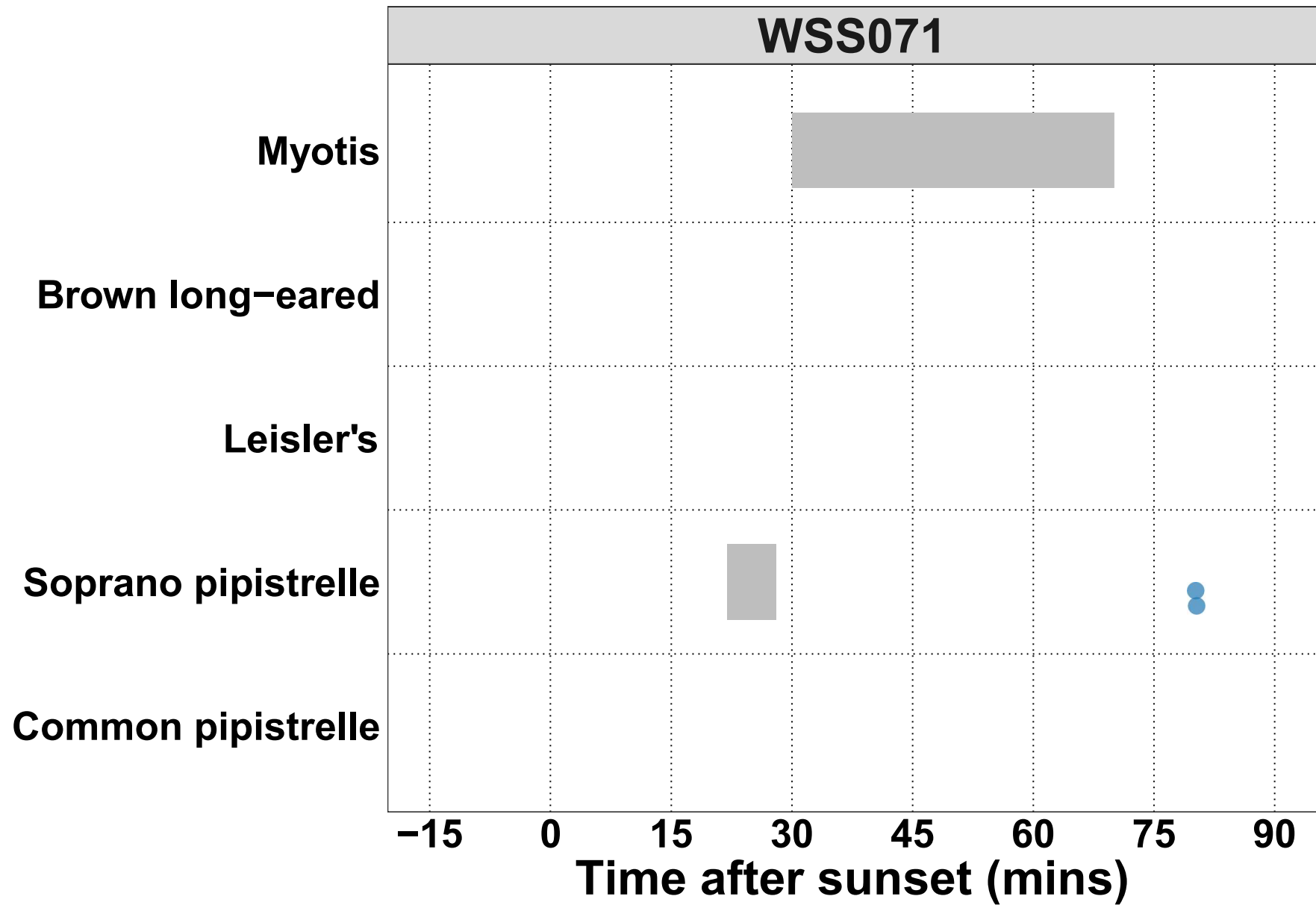


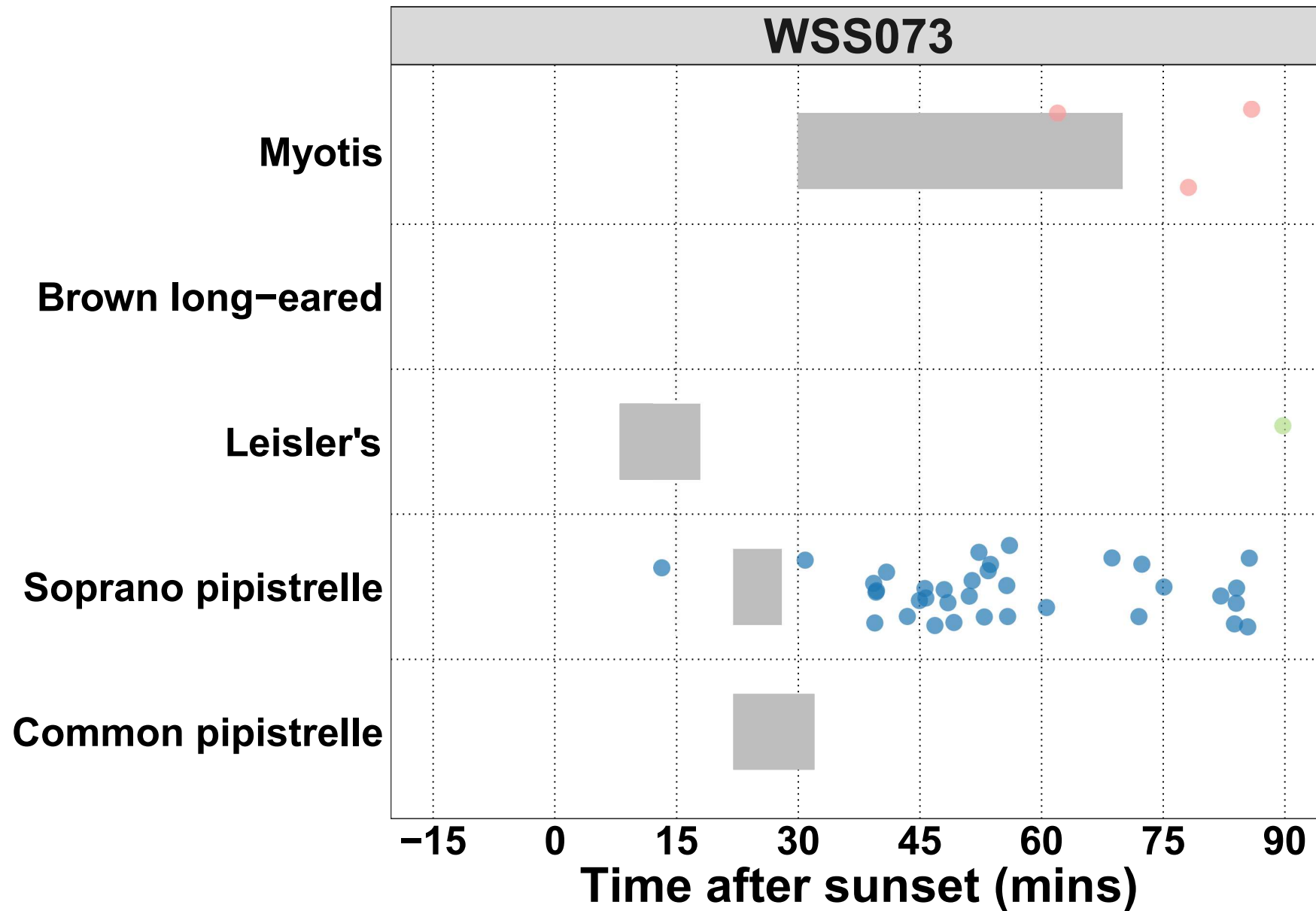


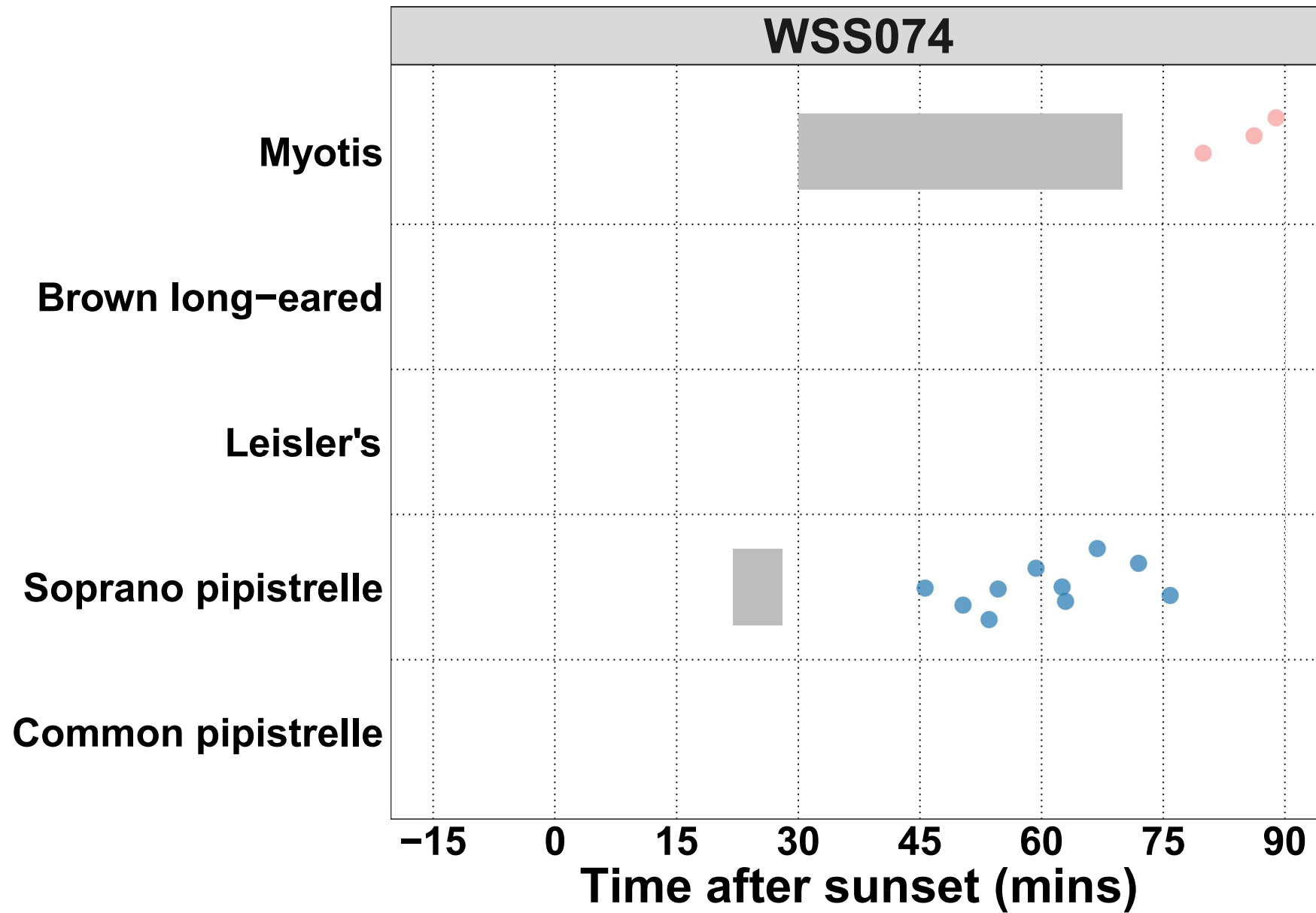


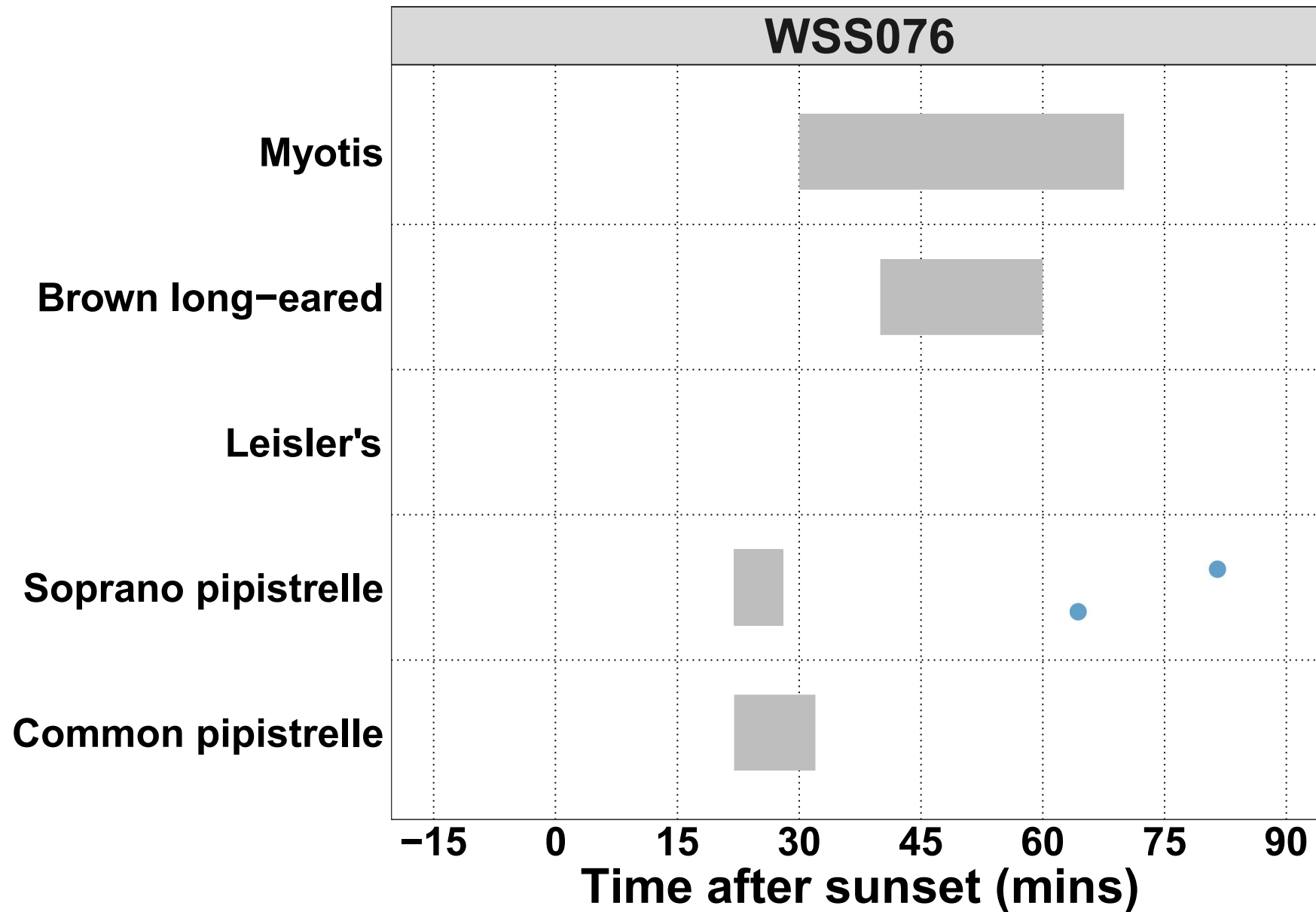


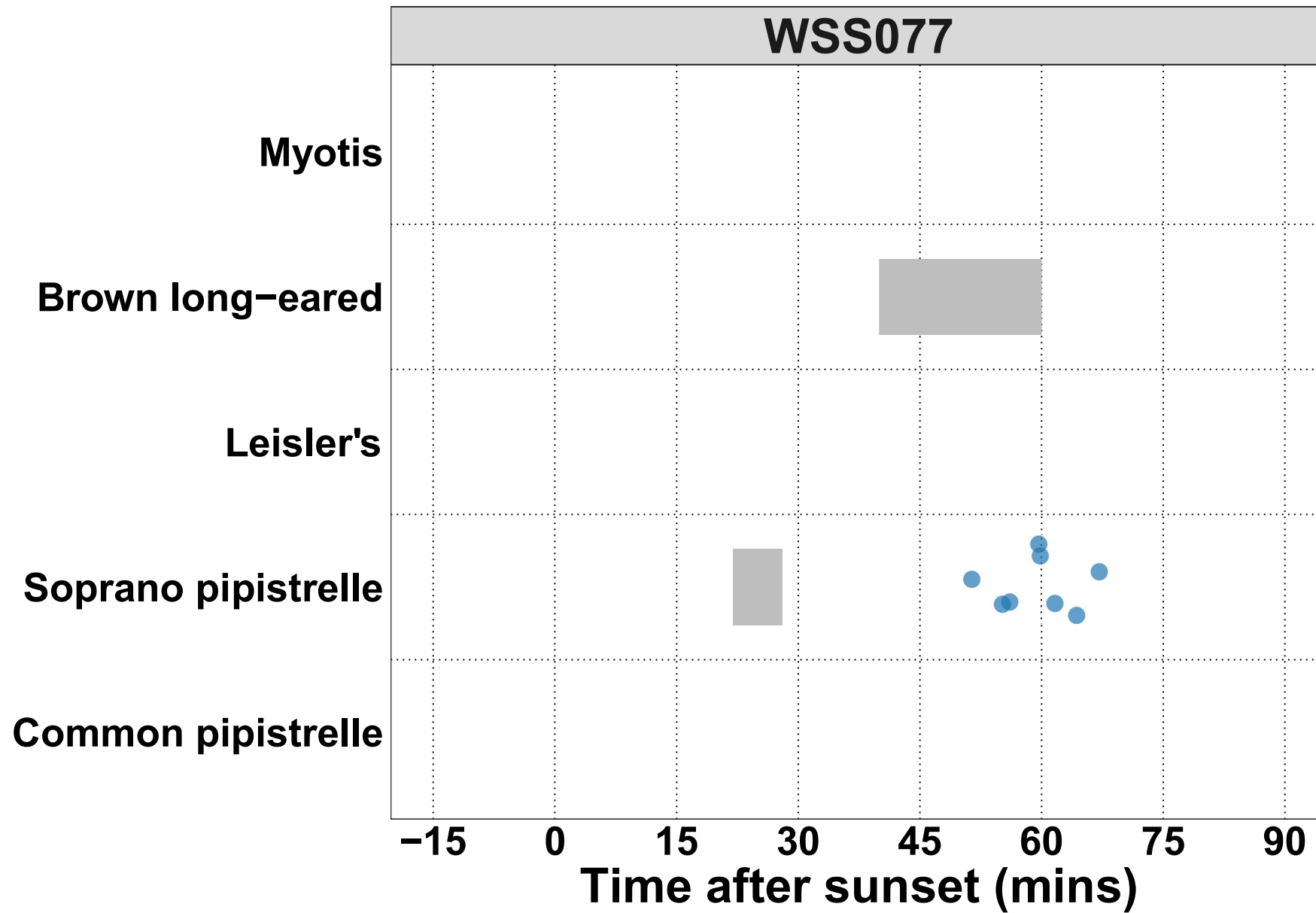


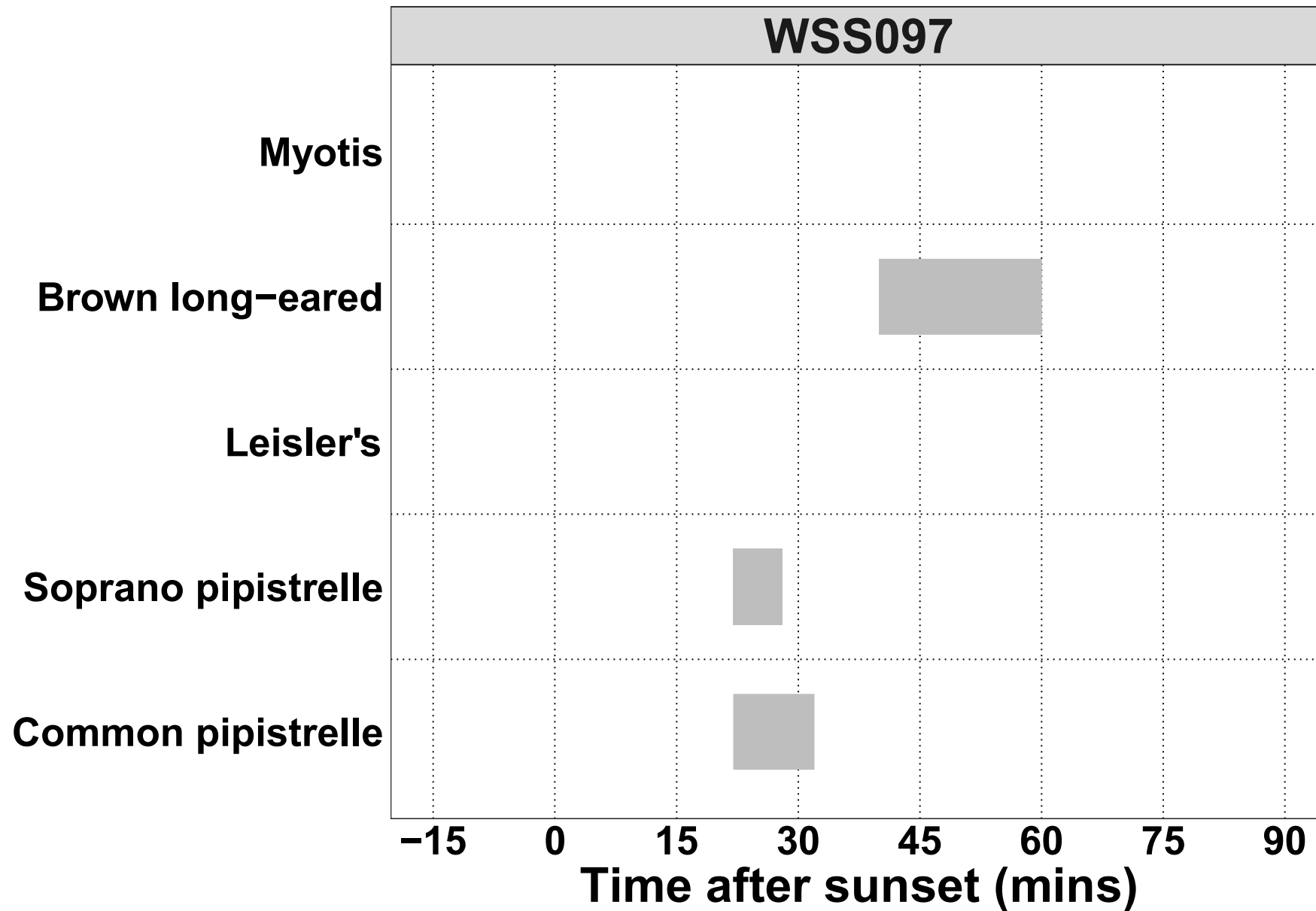


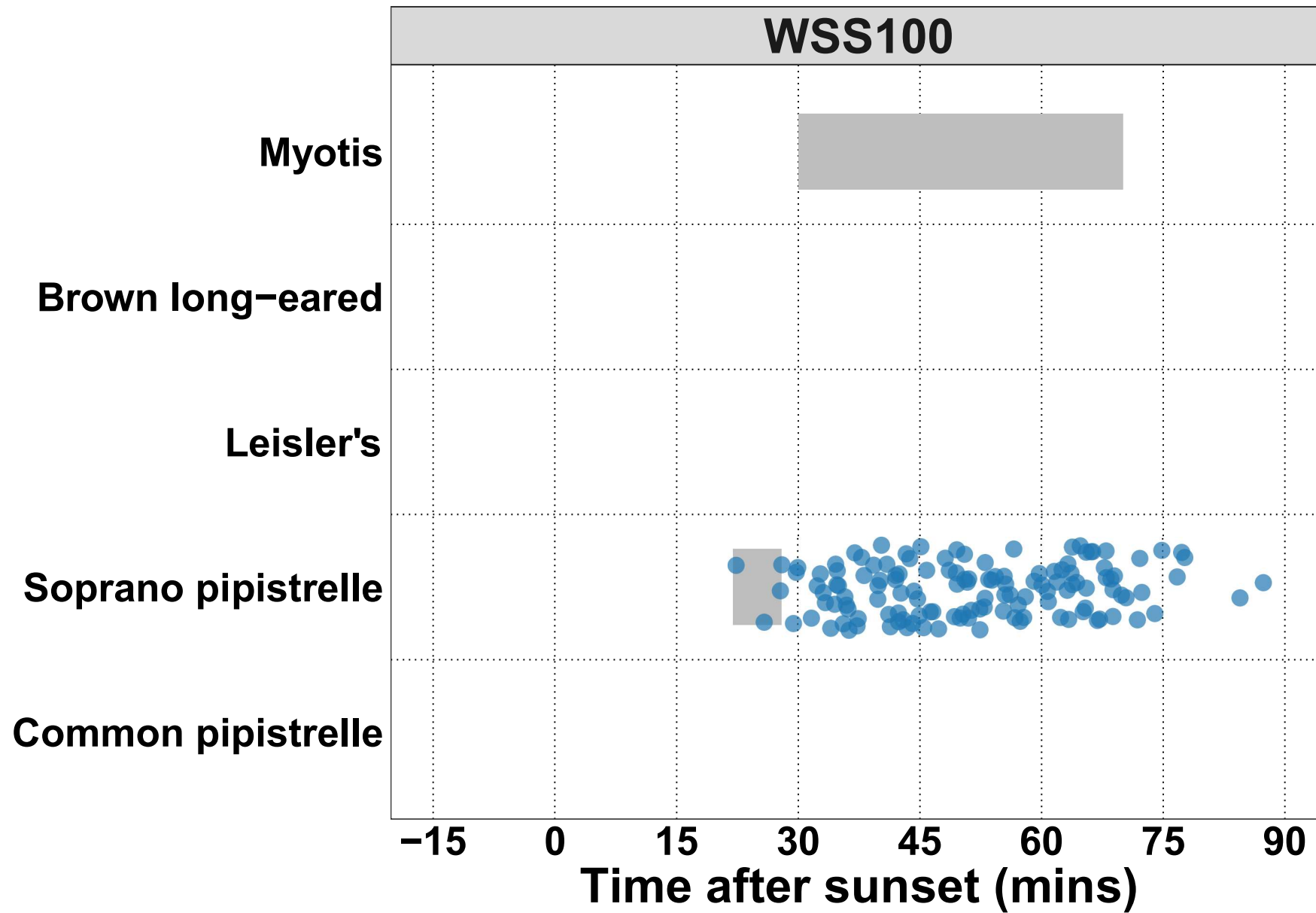


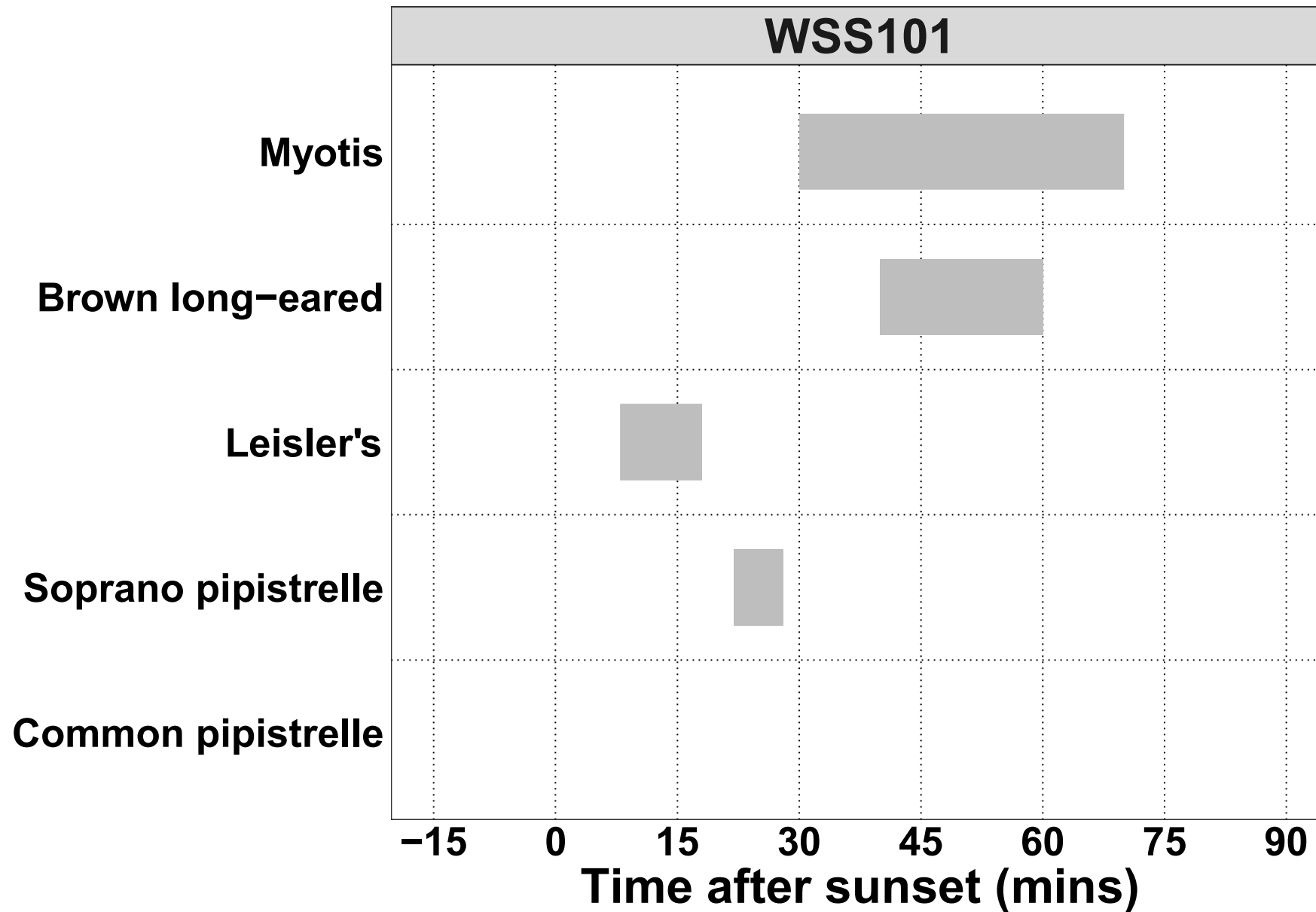


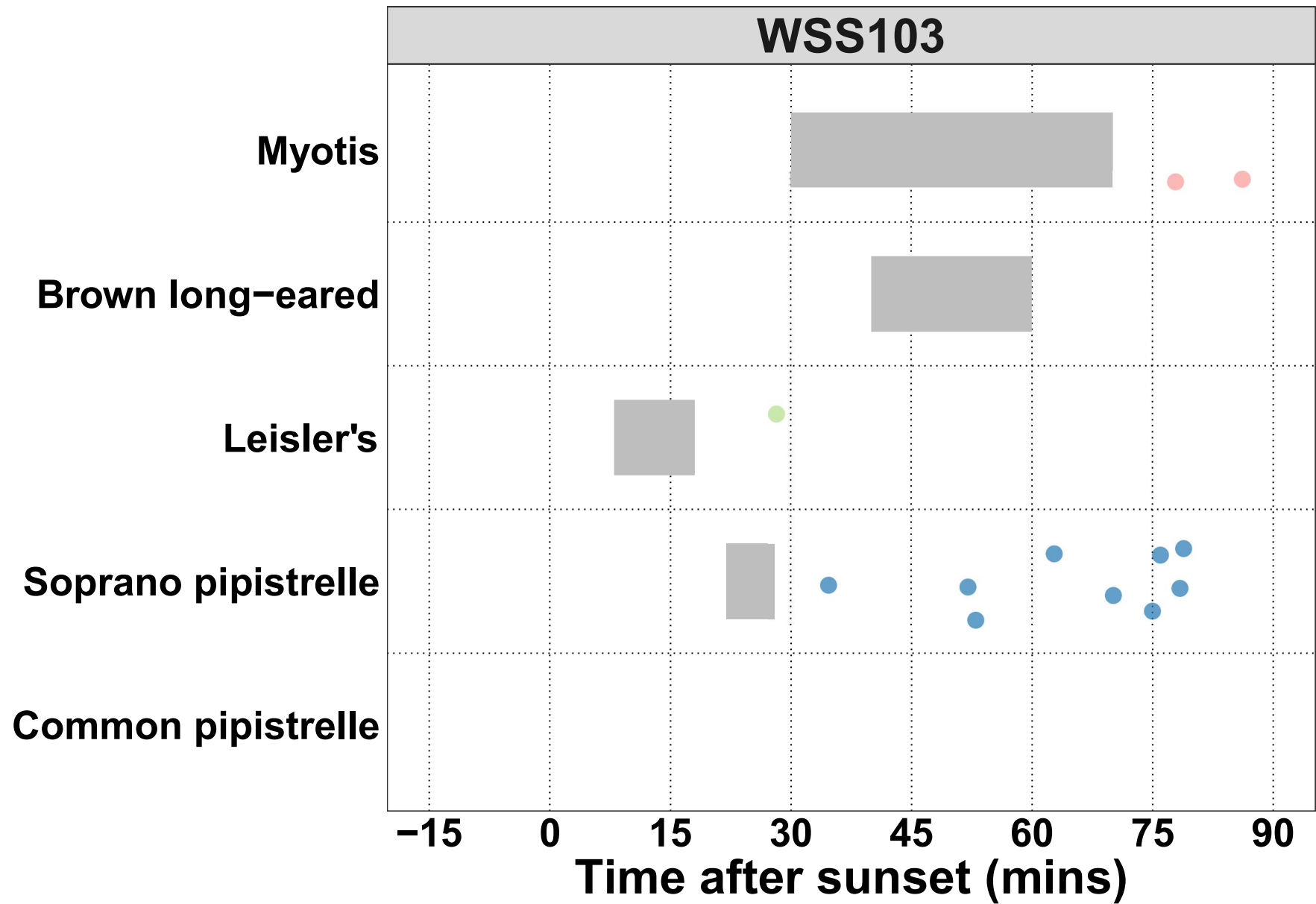


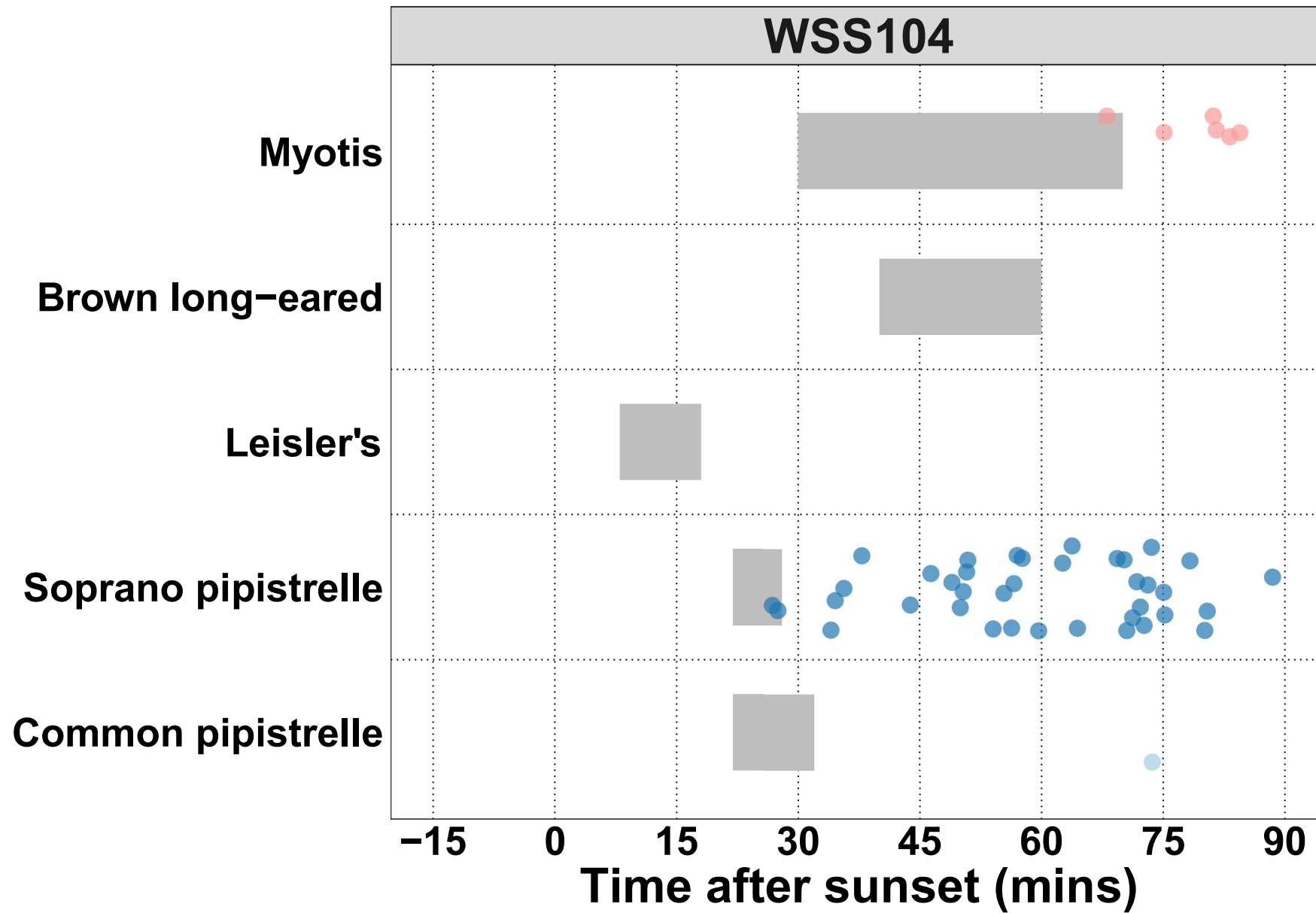


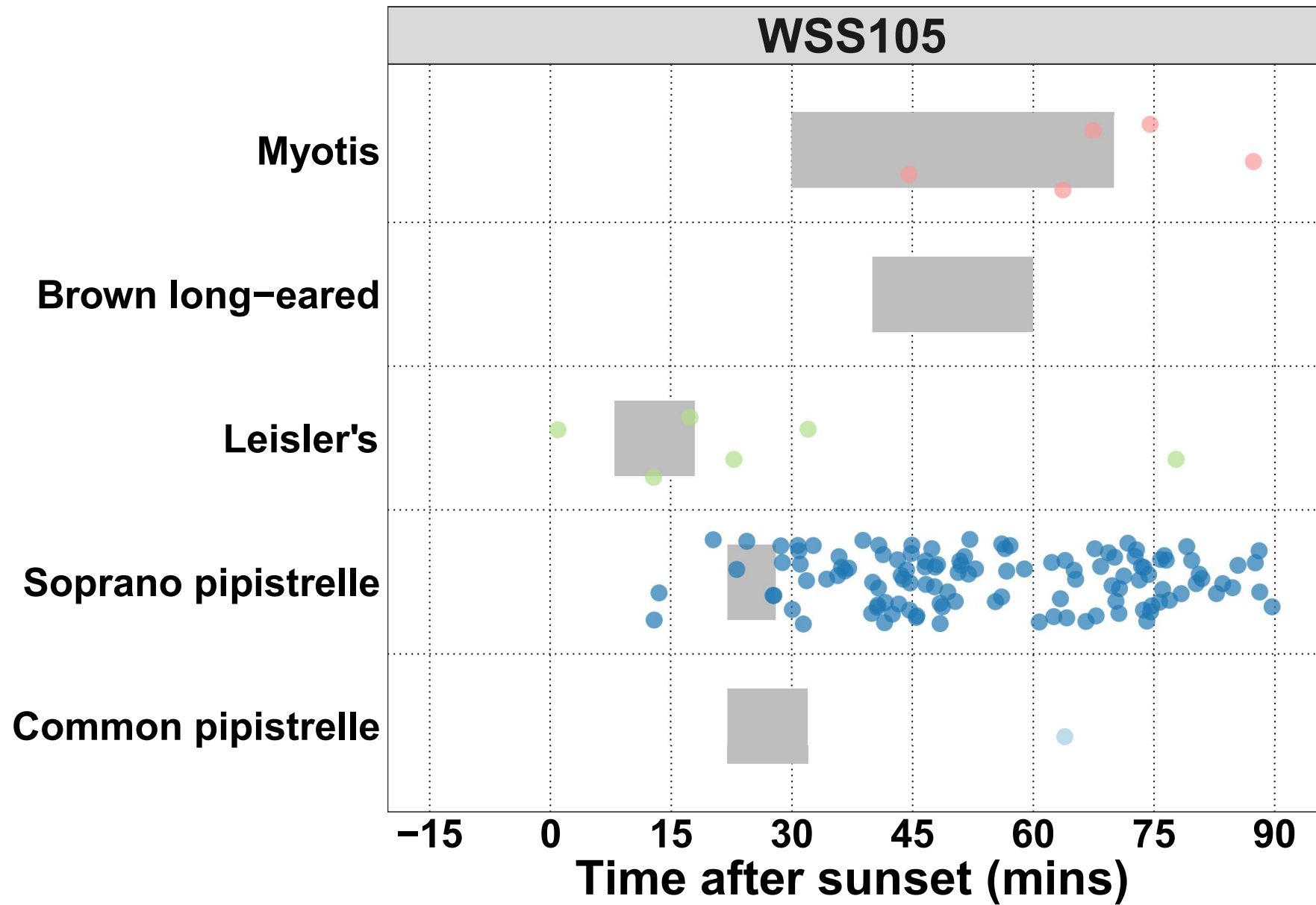


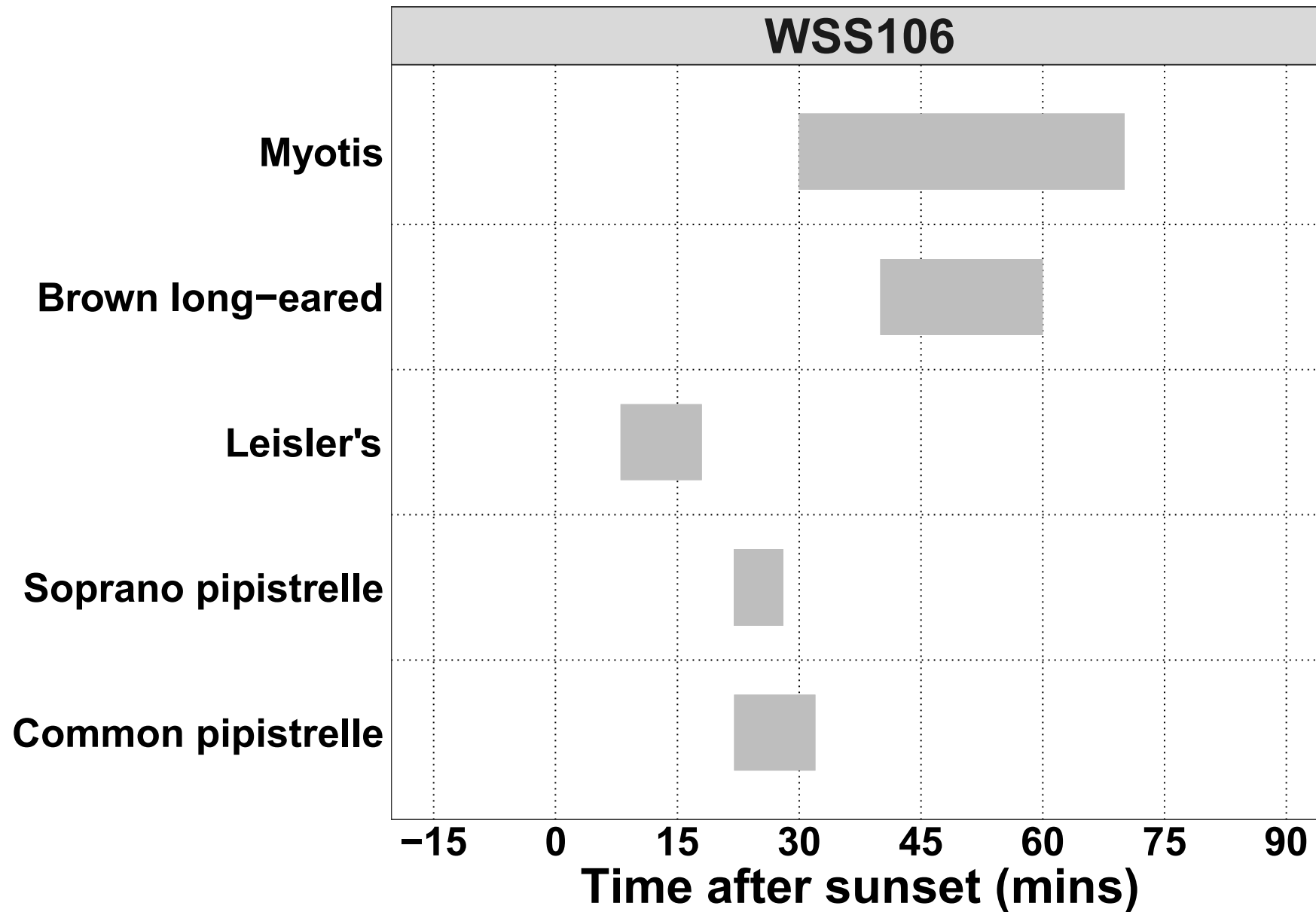












Bat Passes Potentially Indicating Close Proximity to a Roost (Maternity Period Only) - *Maternity period defined as 15th June - 30th July.

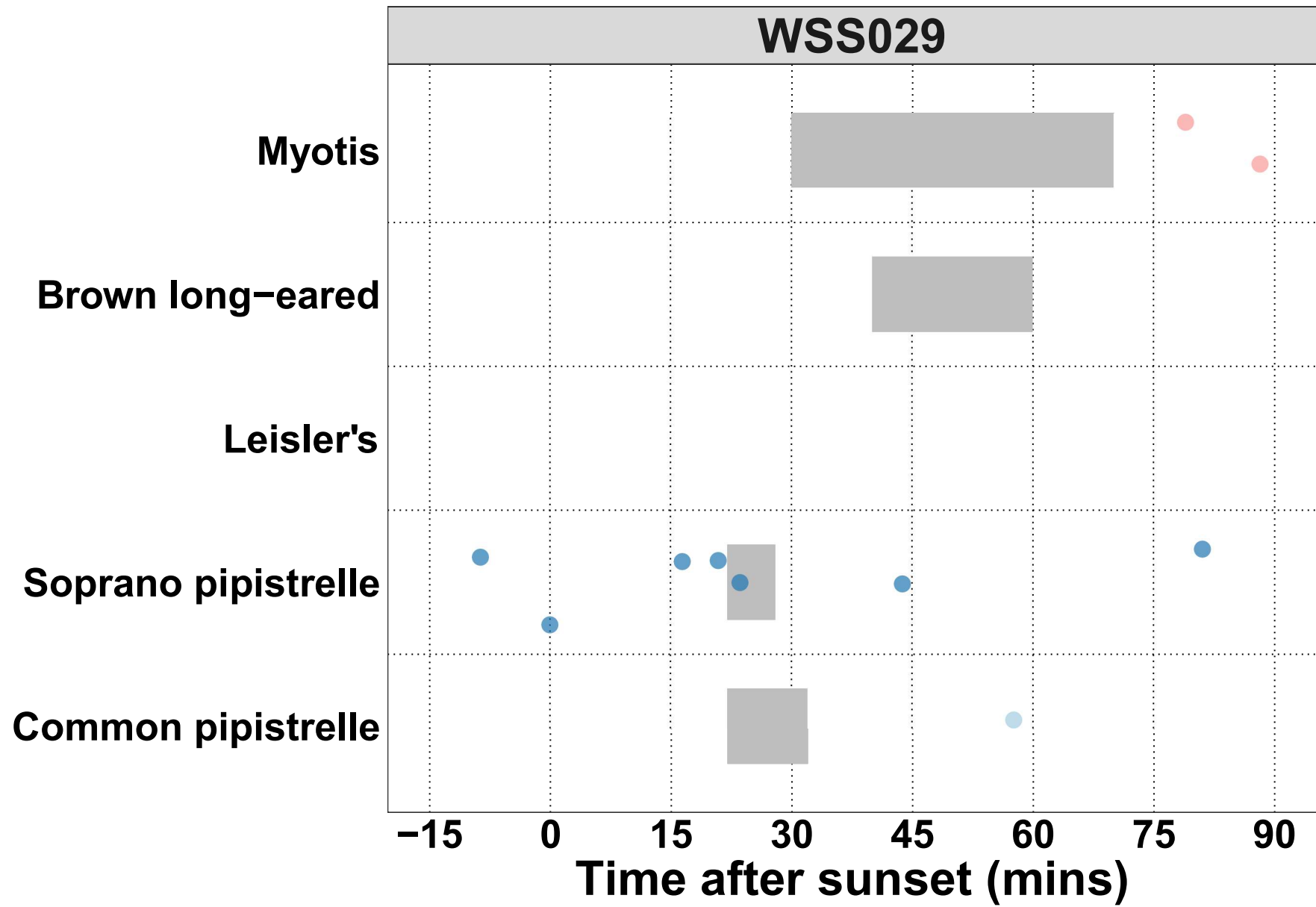
Table 18: Table continues below

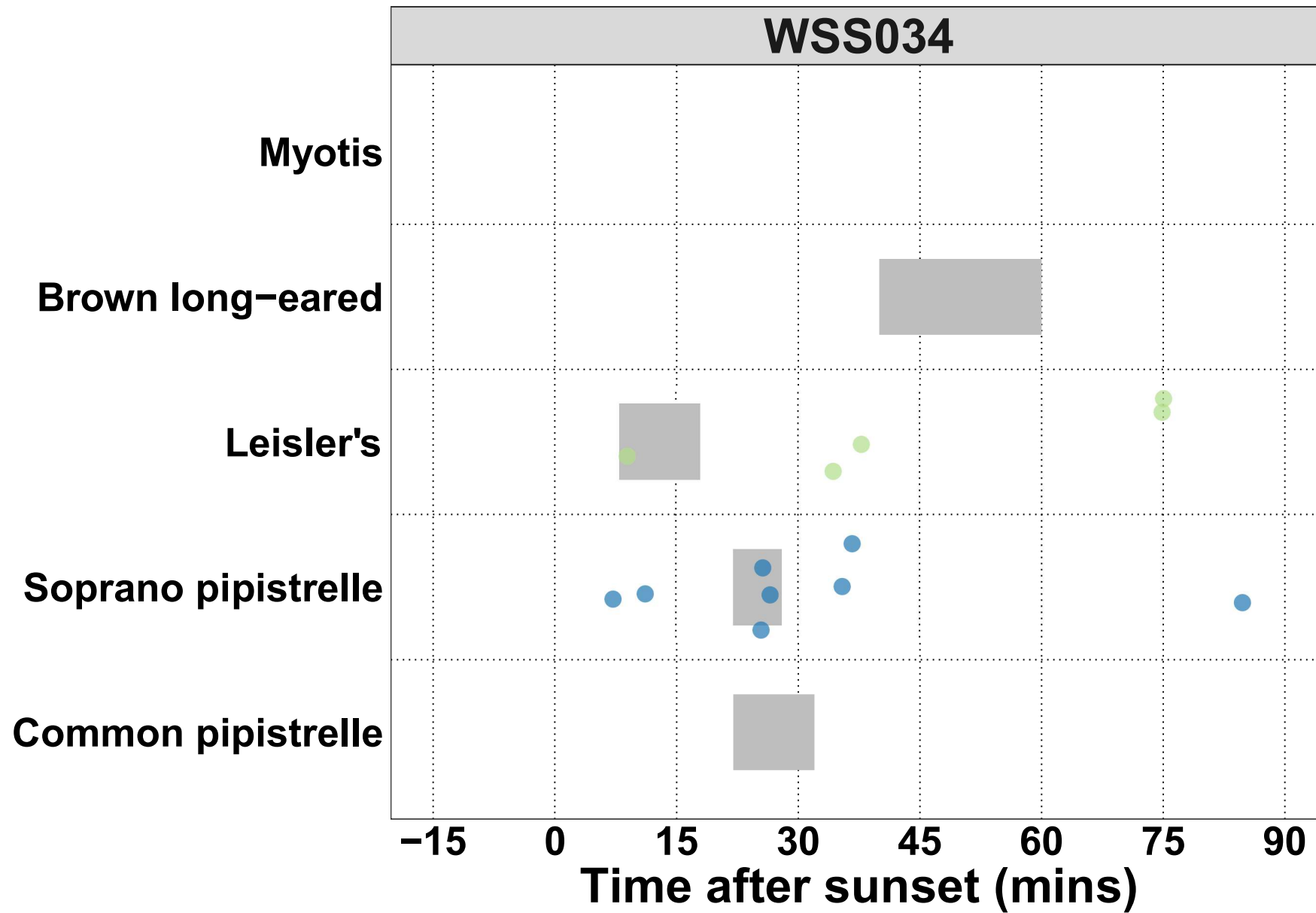
Species	Detector ID	2024-06-17	2024-06-18	2024-07-17	2024-07-18	2024-07-19
Common pipistrelle	WSS035	0	0	0	0	0
Common pipistrelle	WSS037	0	0	0	0	0
Common pipistrelle	WSS038	0	0	0	0	0
Soprano pipistrelle	WSS029	5	0	0	0	0
Soprano pipistrelle	WSS034	0	3	2	0	0
Soprano pipistrelle	WSS035	0	0	0	0	0
Soprano pipistrelle	WSS036	0	3	0	0	0
Soprano pipistrelle	WSS037	0	0	0	0	0
Soprano pipistrelle	WSS038	0	0	0	0	0
Soprano pipistrelle	WSS058	3	4	0	0	0
Soprano pipistrelle	WSS062	0	0	0	1	1
Soprano pipistrelle	WSS104	0	0	0	0	0
Leisler's	WSS034	0	0	1	0	0
Leisler's	WSS035	0	0	0	0	0
Leisler's	WSS038	0	0	0	0	0
Brown long-eared	WSS037	0	0	0	0	0
Brown long-eared	WSS038	0	0	0	0	0
Myotis	WSS035	0	0	0	0	0
Myotis	WSS037	0	0	0	0	0
Myotis	WSS058	0	1	0	0	0
Myotis	WSS104	0	0	0	0	0
Myotis	WSS105	0	0	0	0	0

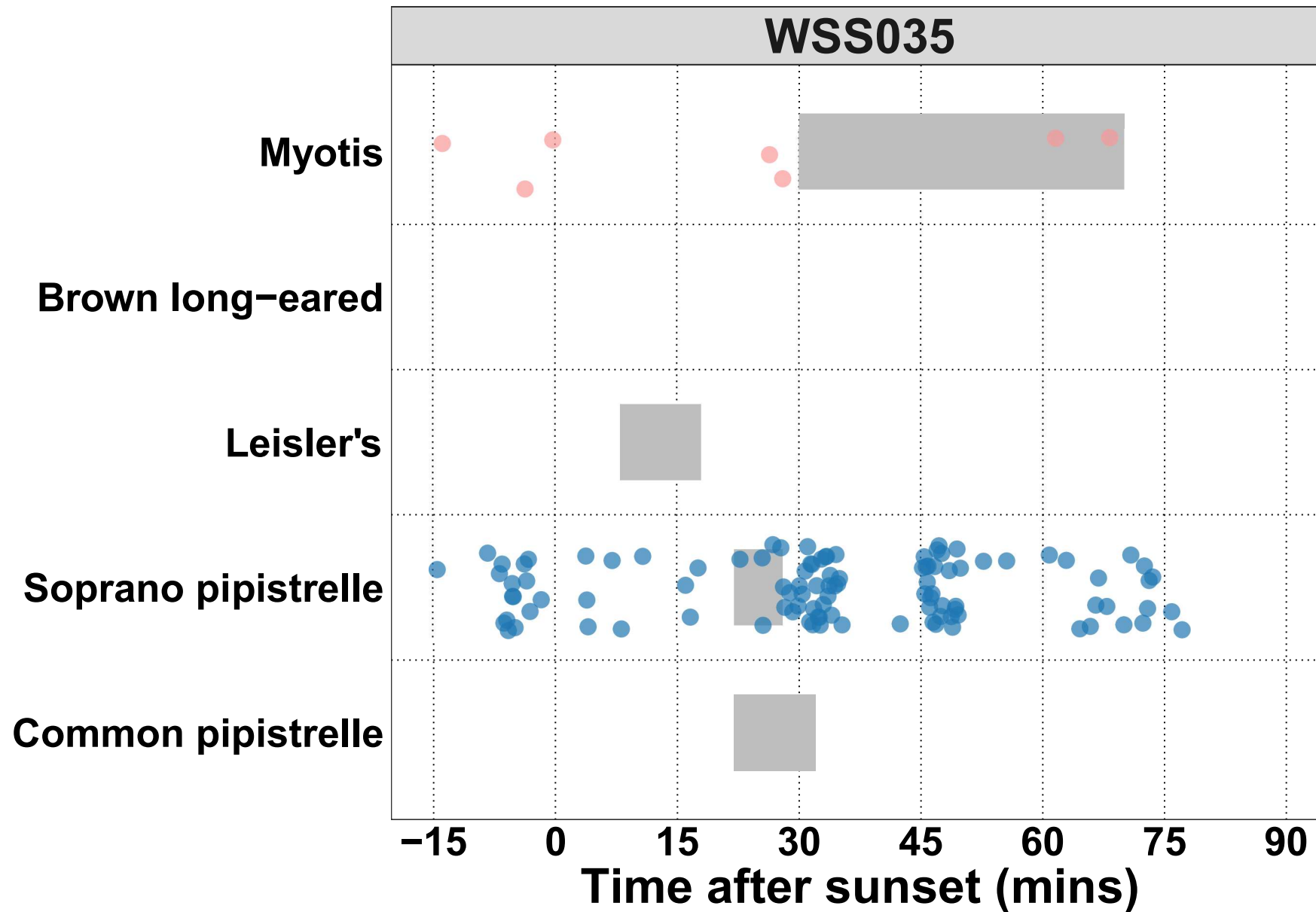
2024-07-24	2024-07-25	2024-07-26	2024-07-27	2024-07-28	2024-07-29	2024-07-30
0	0	0	0	54	12	0
0	0	0	3	0	0	0
0	0	0	2	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	14	232	59

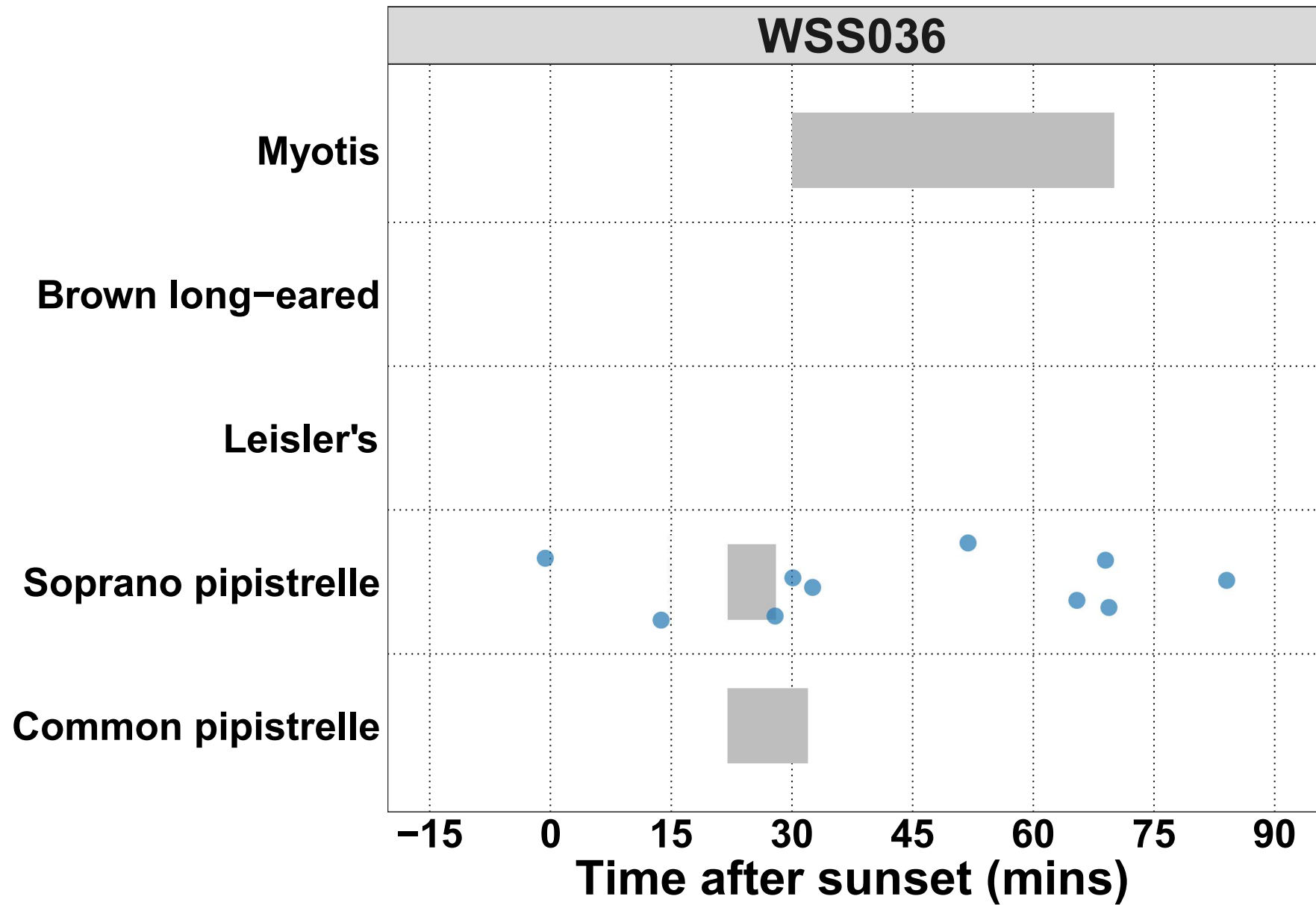
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0	0	18	4	0	0	0
0	0	0	13	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
2	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	3	4	0	0
0	0	0	4	0	0	0
0	0	2	0	0	0	0
0	0	0	2	0	0	0
0	0	0	13	0	0	0
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1	0	0	0	0	0	0
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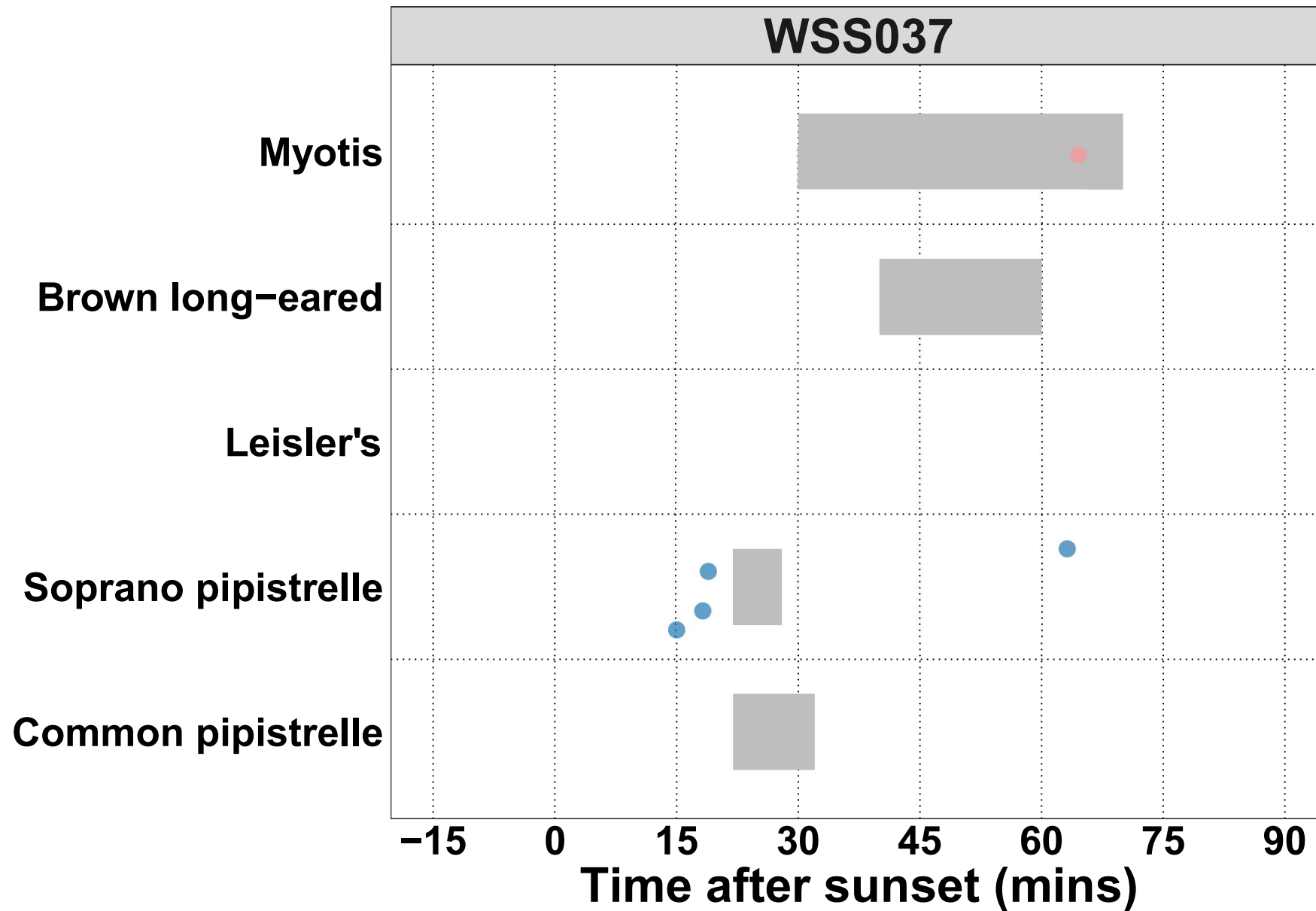
Bat Passes Potentially Indicating Close Proximity to a Roost (Maternity Period Only) - Maternity period defined as 15th June - 30th July.

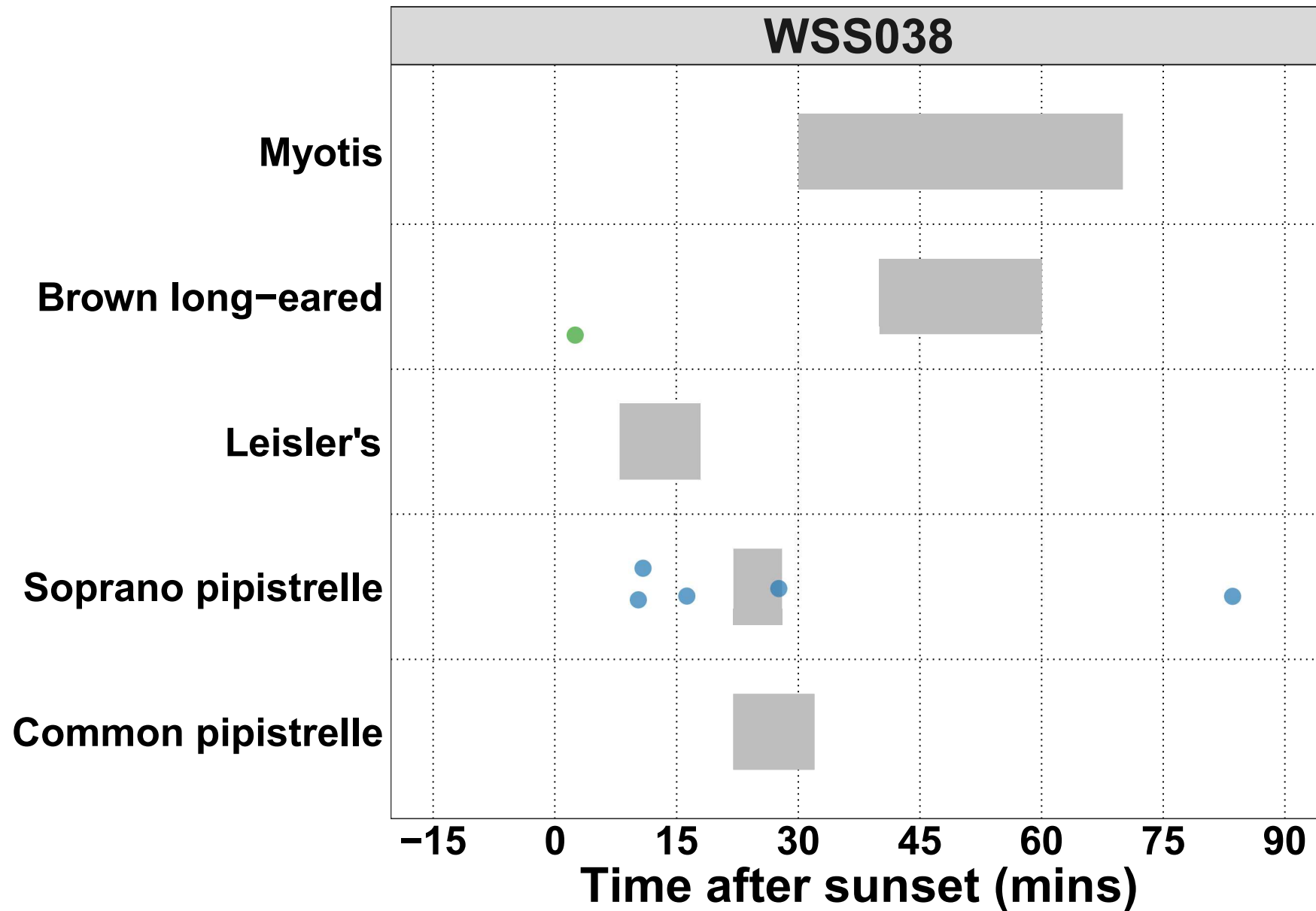


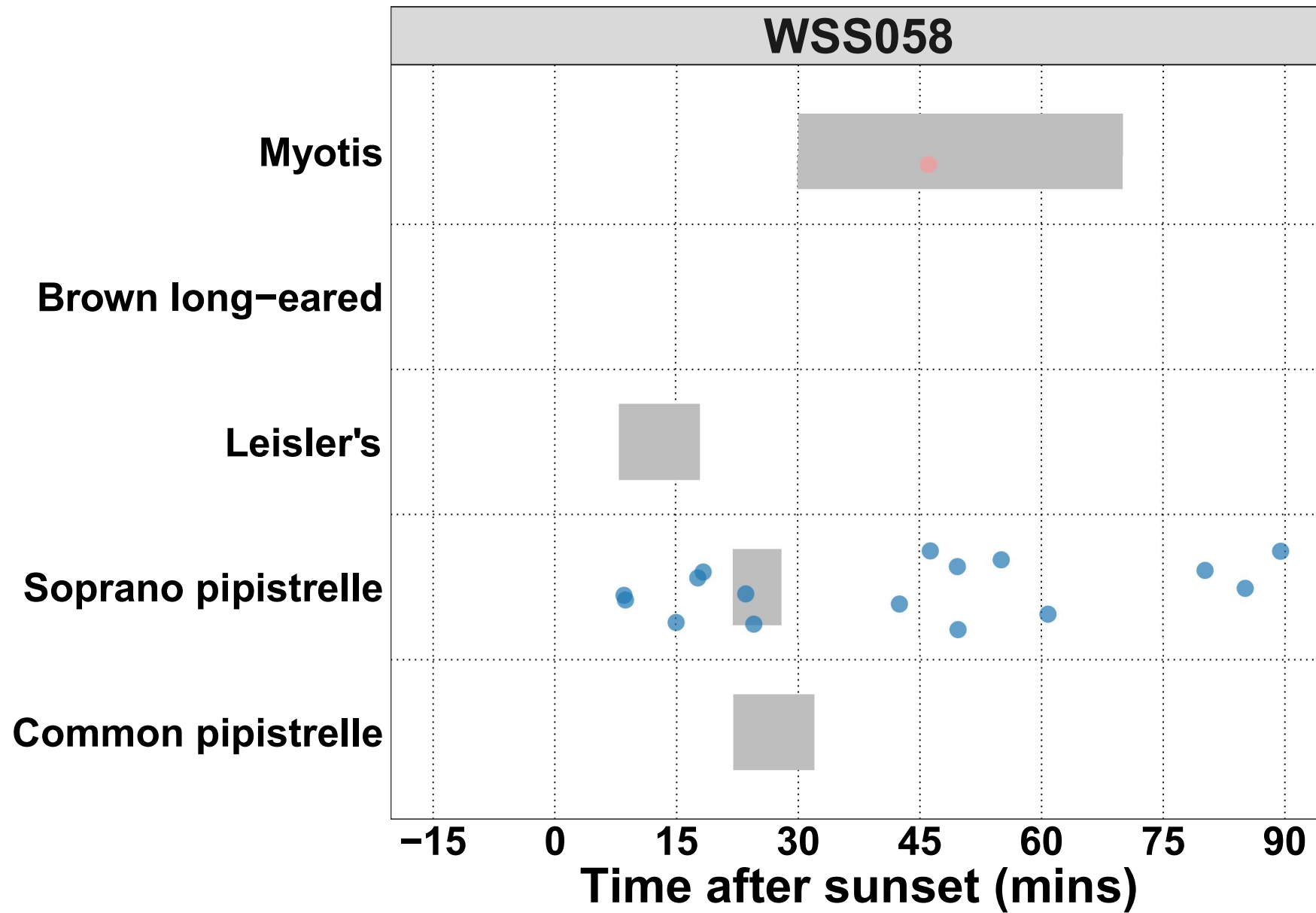


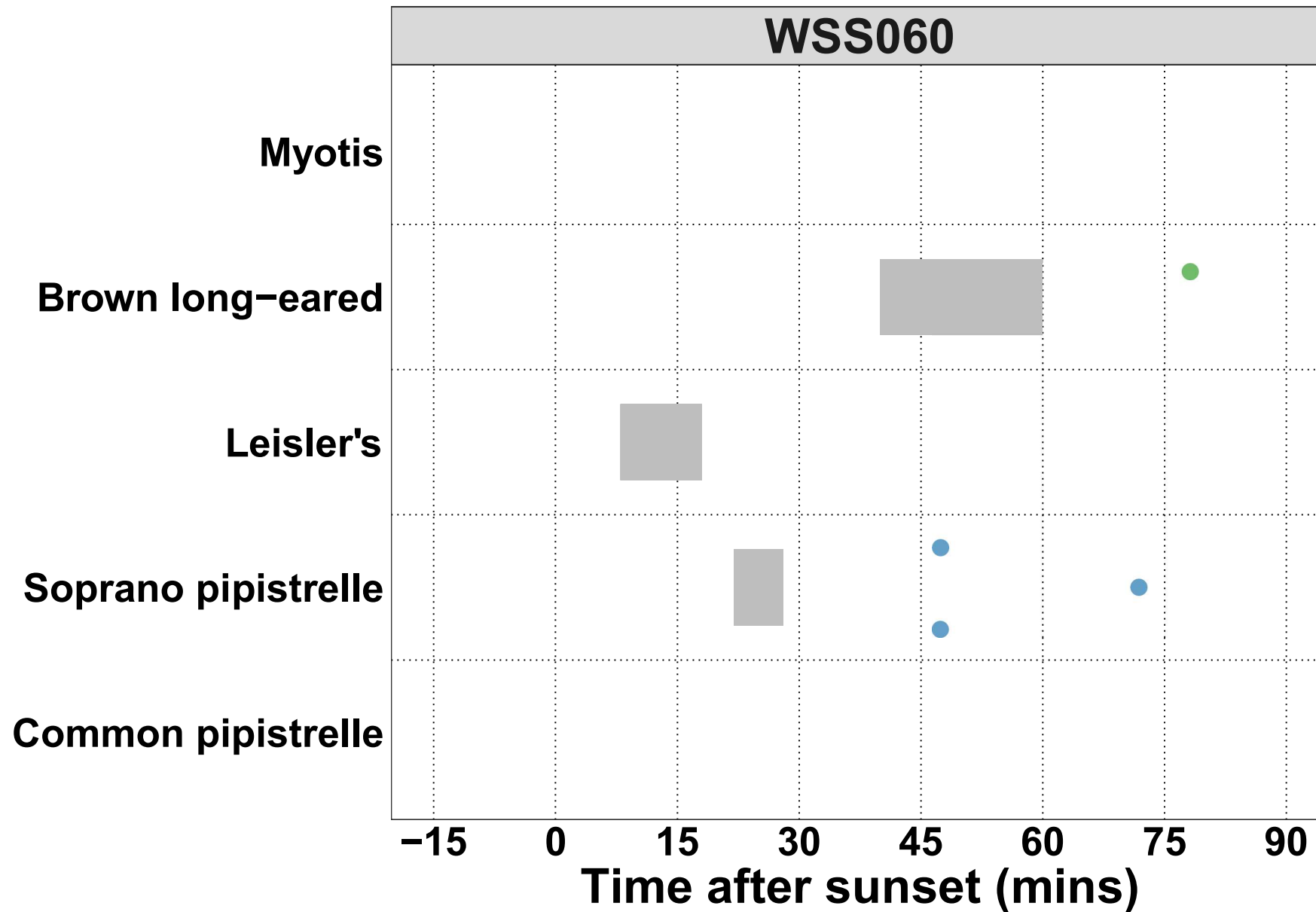


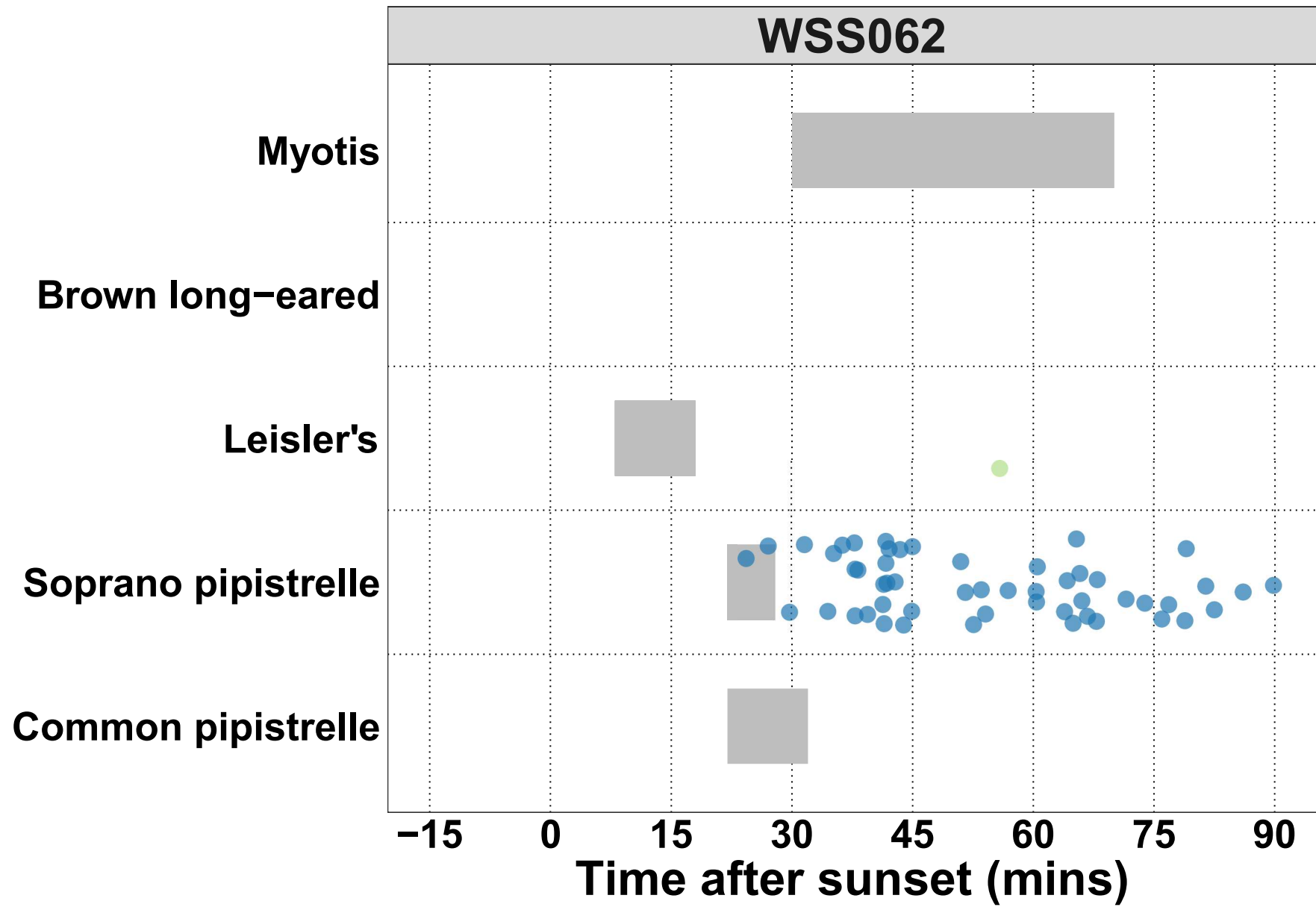


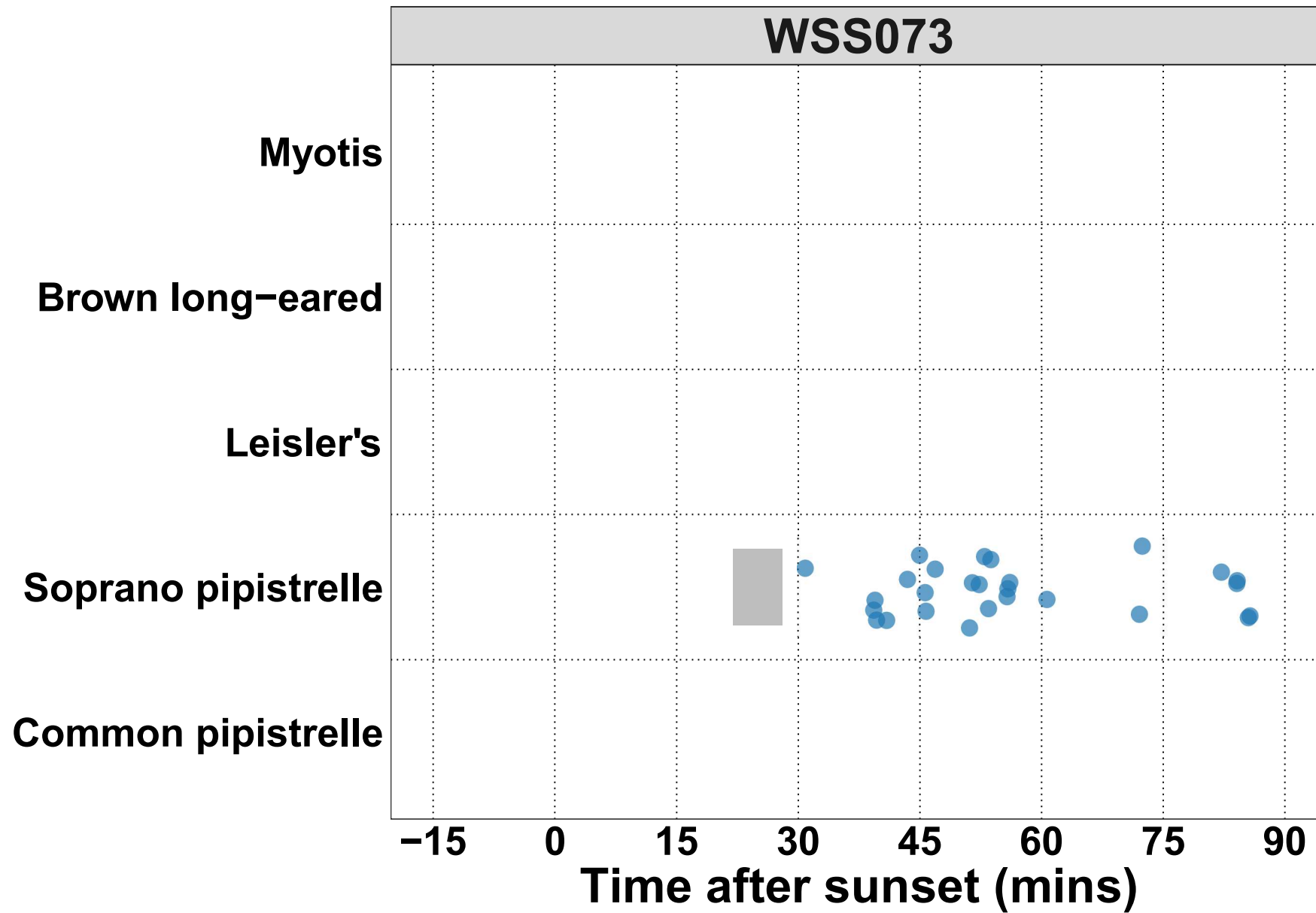


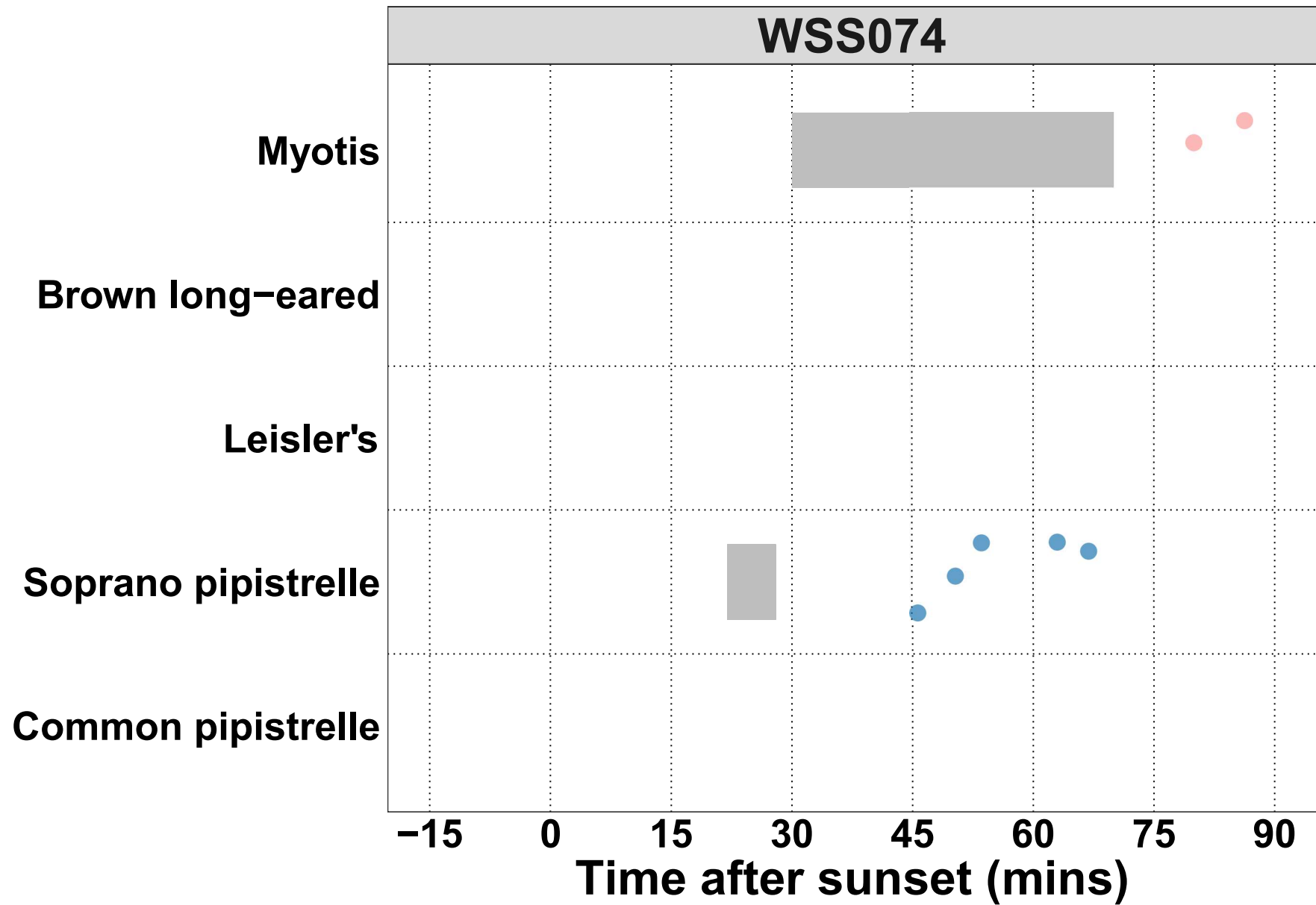


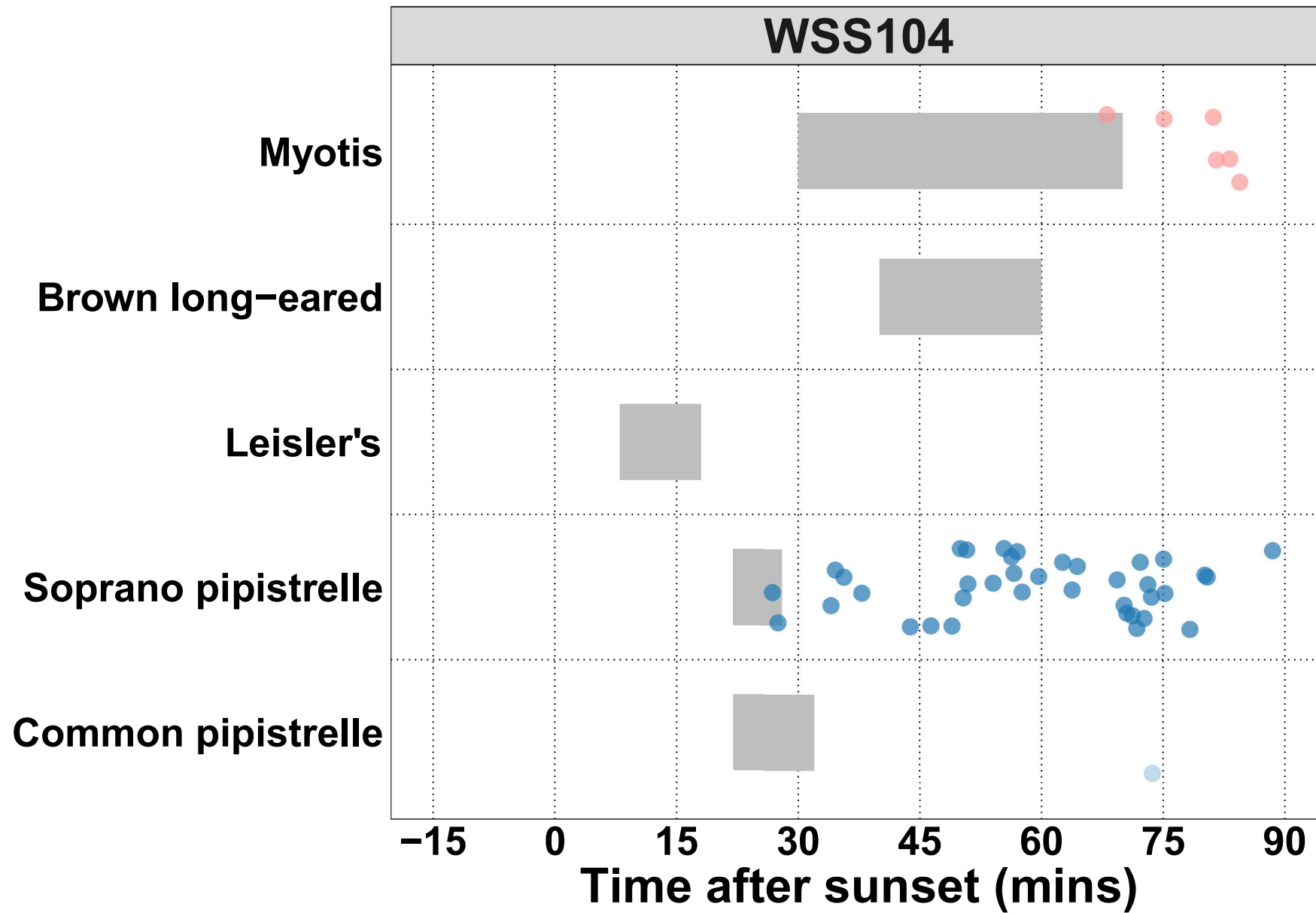


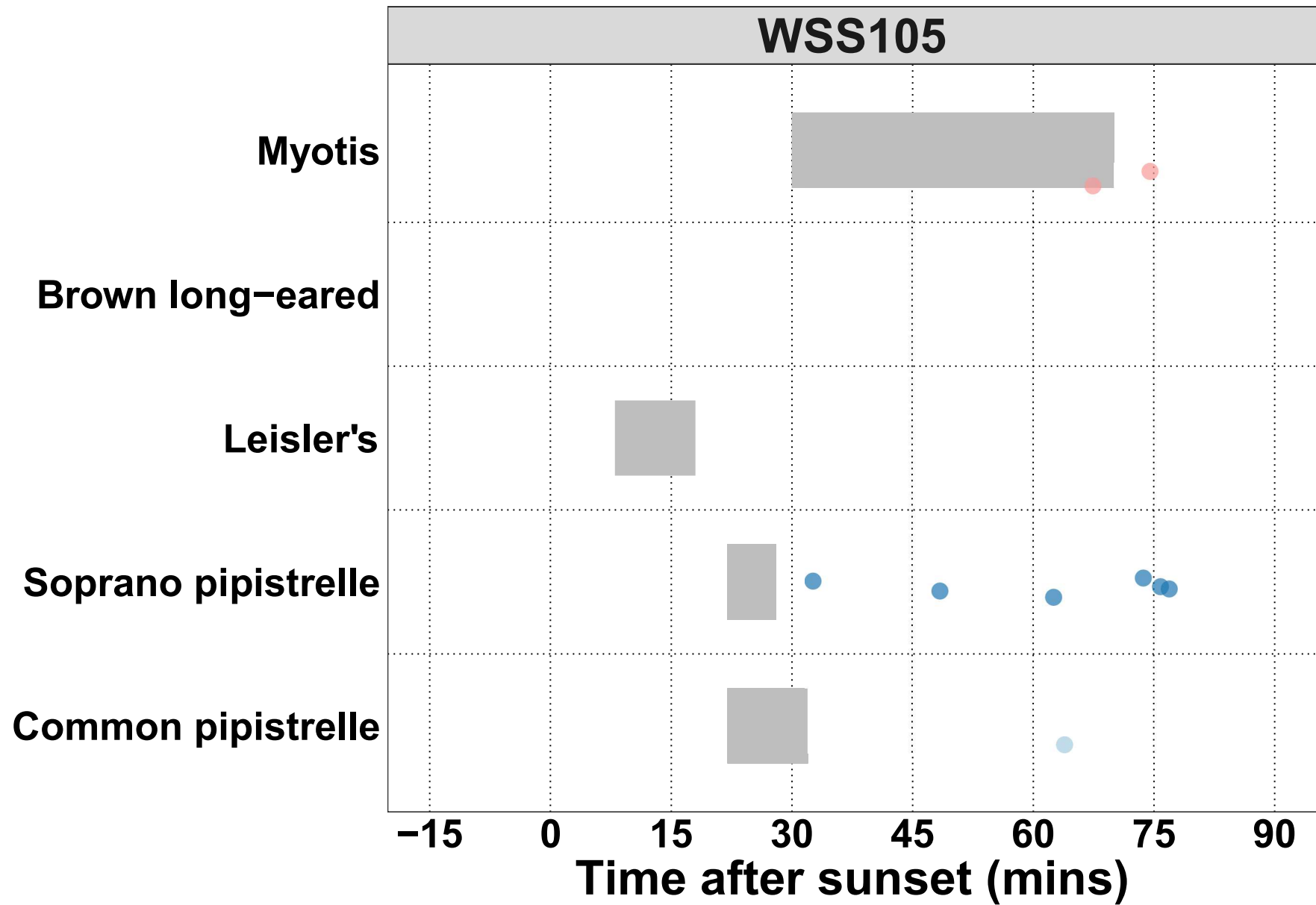












Count of Bat Passes

All Detectors

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

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

Species	Passes (no.)	Percentage of Total (%)
Myotis	519	3.7
Nyctalus leisleri	101	0.7
Pipistrellus pipistrellus	162	1.2
Pipistrellus pygmaeus	13145	93.7
Plecotus auritus	104	0.7
Total	14031	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	WSS029	26	25.2427184
Common pipistrelle	WSS031	4	1.1834320
Common pipistrelle	WSS033	5	0.1130454
Common pipistrelle	WSS034	1	0.4608295
Common pipistrelle	WSS035	70	3.3816425
Common pipistrelle	WSS036	1	5.0000000
Common pipistrelle	WSS037	3	7.6923077
Common pipistrelle	WSS038	2	6.0606061
Common pipistrelle	WSS053	6	4.0540541
Common pipistrelle	WSS056	6	0.4464286
Common pipistrelle	WSS058	1	0.7936508
Common pipistrelle	WSS059	15	11.9047619
Common pipistrelle	WSS061	1	0.2531646
Common pipistrelle	WSS062	1	0.2325581
Common pipistrelle	WSS063	4	0.2564103
Common pipistrelle	WSS073	2	0.3984064
Common pipistrelle	WSS076	1	6.2500000
Common pipistrelle	WSS097	1	5.8823529
Common pipistrelle	WSS104	4	2.2099448
Common pipistrelle	WSS105	6	1.1342155
Common pipistrelle	WSS106	2	0.4494382
Soprano pipistrelle	WSS026	6	50.0000000
Soprano pipistrelle	WSS027	11	50.0000000
Soprano pipistrelle	WSS029	55	53.3980583
Soprano pipistrelle	WSS031	299	88.4615385
Soprano pipistrelle	WSS033	4382	99.0730274
Soprano pipistrelle	WSS034	200	92.1658986
Soprano pipistrelle	WSS035	1969	95.1207729
Soprano pipistrelle	WSS036	12	60.0000000
Soprano pipistrelle	WSS037	30	76.9230769
Soprano pipistrelle	WSS038	19	57.5757576
Soprano pipistrelle	WSS053	132	89.1891892

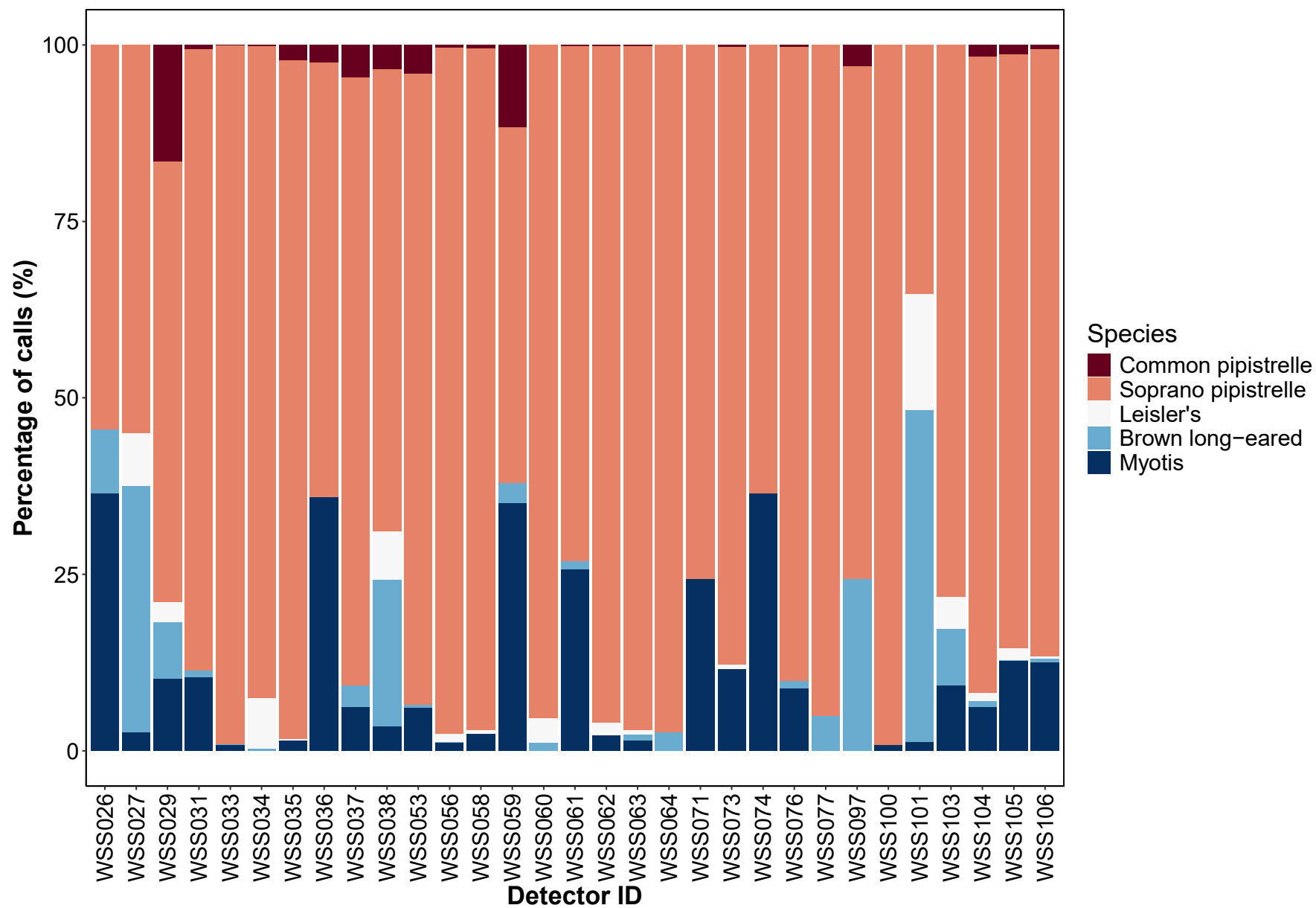
Species	Detector ID	Count (no.)	Percentage by Detector (%)
Soprano pipistrelle	WSS056	1302	96.8750000
Soprano pipistrelle	WSS058	121	96.0317460
Soprano pipistrelle	WSS059	65	51.5873016
Soprano pipistrelle	WSS060	252	94.7368421
Soprano pipistrelle	WSS061	291	73.6708861
Soprano pipistrelle	WSS062	416	96.7441860
Soprano pipistrelle	WSS063	1523	97.6282051
Soprano pipistrelle	WSS064	19	95.0000000
Soprano pipistrelle	WSS071	28	75.6756757
Soprano pipistrelle	WSS073	434	86.4541833
Soprano pipistrelle	WSS074	28	63.6363636
Soprano pipistrelle	WSS076	13	81.2500000
Soprano pipistrelle	WSS077	22	91.6666667
Soprano pipistrelle	WSS097	12	70.5882353
Soprano pipistrelle	WSS100	448	98.6784141
Soprano pipistrelle	WSS101	15	34.8837209
Soprano pipistrelle	WSS103	34	72.3404255
Soprano pipistrelle	WSS104	161	88.9502762
Soprano pipistrelle	WSS105	450	85.0661626
Soprano pipistrelle	WSS106	396	88.9887640
Leisler's	WSS027	3	13.6363636
Leisler's	WSS029	5	4.8543689
Leisler's	WSS034	15	6.9124424
Leisler's	WSS035	8	0.3864734
Leisler's	WSS038	4	12.1212121
Leisler's	WSS056	18	1.3392857
Leisler's	WSS058	1	0.7936508
Leisler's	WSS060	9	3.3834586
Leisler's	WSS062	6	1.3953488
Leisler's	WSS063	6	0.3846154
Leisler's	WSS073	5	0.9960159
Leisler's	WSS101	7	16.2790698
Leisler's	WSS103	2	4.2553191
Leisler's	WSS104	2	1.1049724
Leisler's	WSS105	8	1.5122873
Leisler's	WSS106	2	0.4494382

Species	Detector ID	Count (no.)	Percentage by Detector (%)
Brown long-eared	WSS026	2	16.666667
Brown long-eared	WSS027	7	31.8181818
Brown long-eared	WSS029	8	7.7669903
Brown long-eared	WSS031	3	0.8875740
Brown long-eared	WSS033	5	0.1130454
Brown long-eared	WSS034	1	0.4608295
Brown long-eared	WSS037	2	5.1282051
Brown long-eared	WSS038	6	18.1818182
Brown long-eared	WSS053	1	0.6756757
Brown long-eared	WSS056	2	0.1488095
Brown long-eared	WSS059	6	4.7619048
Brown long-eared	WSS060	5	1.8796992
Brown long-eared	WSS061	3	0.7594937
Brown long-eared	WSS063	11	0.7051282
Brown long-eared	WSS064	1	5.0000000
Brown long-eared	WSS076	1	6.2500000
Brown long-eared	WSS077	2	8.3333333
Brown long-eared	WSS097	4	23.5294118
Brown long-eared	WSS101	20	46.5116279
Brown long-eared	WSS103	7	14.8936170
Brown long-eared	WSS104	3	1.6574586
Brown long-eared	WSS105	2	0.3780718
Brown long-eared	WSS106	2	0.4494382
Myotis	WSS026	4	33.3333333
Myotis	WSS027	1	4.5454545
Myotis	WSS029	9	8.7378641
Myotis	WSS031	32	9.4674556
Myotis	WSS033	31	0.7008818
Myotis	WSS035	23	1.1111111
Myotis	WSS036	7	35.0000000
Myotis	WSS037	4	10.2564103
Myotis	WSS038	2	6.0606061
Myotis	WSS053	9	6.0810811
Myotis	WSS056	16	1.1904762
Myotis	WSS058	3	2.3809524
Myotis	WSS059	40	31.7460317

Species	Detector ID	Count (no.)	Percentage by Detector (%)
Myotis	WSS061	100	25.3164557
Myotis	WSS062	7	1.6279070
Myotis	WSS063	16	1.0256410
Myotis	WSS071	9	24.3243243
Myotis	WSS073	61	12.1513944
Myotis	WSS074	16	36.3636364
Myotis	WSS076	1	6.2500000
Myotis	WSS100	6	1.3215859
Myotis	WSS101	1	2.3255814
Myotis	WSS103	4	8.5106383
Myotis	WSS104	11	6.0773481
Myotis	WSS105	63	11.9092628
Myotis	WSS106	43	9.6629213

Species Composition

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



Part 2a: Presence Only

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

Nightly Bat Passes Per Hour

Median Per Detector

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

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

Species	Detector ID	Median Pass Rate
Common pipistrelle	WSS029	0.4
Common pipistrelle	WSS031	0.3
Common pipistrelle	WSS033	0.2
Common pipistrelle	WSS034	0.1
Common pipistrelle	WSS035	0.8
Common pipistrelle	WSS036	0.1
Common pipistrelle	WSS037	0.4
Common pipistrelle	WSS038	0.2
Common pipistrelle	WSS053	0.4
Common pipistrelle	WSS056	0.1
Common pipistrelle	WSS058	0.1
Common pipistrelle	WSS059	0.4
Common pipistrelle	WSS061	0.1
Common pipistrelle	WSS062	0.1
Common pipistrelle	WSS063	0.1
Common pipistrelle	WSS073	0.3
Common pipistrelle	WSS076	0.1
Common pipistrelle	WSS097	0.1
Common pipistrelle	WSS104	0.3
Common pipistrelle	WSS105	0.8
Common pipistrelle	WSS106	0.1
Soprano pipistrelle	WSS026	0.8
Soprano pipistrelle	WSS027	0.8
Soprano pipistrelle	WSS029	2.9
Soprano pipistrelle	WSS031	19.1
Soprano pipistrelle	WSS033	26.5
Soprano pipistrelle	WSS034	12.5
Soprano pipistrelle	WSS035	19.2
Soprano pipistrelle	WSS036	1.8
Soprano pipistrelle	WSS037	3.3
Soprano pipistrelle	WSS038	2.4
Soprano pipistrelle	WSS053	9.8
Soprano pipistrelle	WSS056	21.2
Soprano pipistrelle	WSS058	12.1
Soprano pipistrelle	WSS059	1.6
Soprano pipistrelle	WSS060	31.9

Species	Detector ID	Median Pass Rate
Soprano pipistrelle	WSS061	13.0
Soprano pipistrelle	WSS062	14.7
Soprano pipistrelle	WSS063	28.5
Soprano pipistrelle	WSS064	2.7
Soprano pipistrelle	WSS071	4.0
Soprano pipistrelle	WSS073	7.6
Soprano pipistrelle	WSS074	2.0
Soprano pipistrelle	WSS076	13.0
Soprano pipistrelle	WSS077	0.9
Soprano pipistrelle	WSS097	0.9
Soprano pipistrelle	WSS100	18.4
Soprano pipistrelle	WSS101	1.1
Soprano pipistrelle	WSS103	4.8
Soprano pipistrelle	WSS104	10.2
Soprano pipistrelle	WSS105	6.5
Soprano pipistrelle	WSS106	14.7
Leisler's	WSS027	0.2
Leisler's	WSS029	0.4
Leisler's	WSS034	2.0
Leisler's	WSS035	0.4
Leisler's	WSS038	0.5
Leisler's	WSS056	0.3
Leisler's	WSS058	0.1
Leisler's	WSS060	1.1
Leisler's	WSS062	0.8
Leisler's	WSS063	0.5
Leisler's	WSS073	0.4
Leisler's	WSS101	0.5
Leisler's	WSS103	0.3
Leisler's	WSS104	0.3
Leisler's	WSS105	1.0
Leisler's	WSS106	0.1
Brown long-eared	WSS026	0.3
Brown long-eared	WSS027	0.5
Brown long-eared	WSS029	0.5
Brown long-eared	WSS031	0.2

Species	Detector ID	Median Pass Rate
Brown long-eared	WSS033	0.2
Brown long-eared	WSS034	0.1
Brown long-eared	WSS037	0.2
Brown long-eared	WSS038	0.8
Brown long-eared	WSS053	0.1
Brown long-eared	WSS056	0.1
Brown long-eared	WSS059	0.1
Brown long-eared	WSS060	0.4
Brown long-eared	WSS061	0.3
Brown long-eared	WSS063	0.9
Brown long-eared	WSS064	0.1
Brown long-eared	WSS076	0.3
Brown long-eared	WSS077	0.1
Brown long-eared	WSS097	0.3
Brown long-eared	WSS101	1.5
Brown long-eared	WSS103	1.0
Brown long-eared	WSS104	0.4
Brown long-eared	WSS105	0.1
Brown long-eared	WSS106	0.1
Myotis	WSS026	0.5
Myotis	WSS027	0.1
Myotis	WSS029	0.5
Myotis	WSS031	2.5
Myotis	WSS033	0.9
Myotis	WSS035	2.8
Myotis	WSS036	1.0
Myotis	WSS037	0.2
Myotis	WSS038	0.2
Myotis	WSS053	0.7
Myotis	WSS056	0.2
Myotis	WSS058	0.3
Myotis	WSS059	0.4
Myotis	WSS061	5.0
Myotis	WSS062	0.9
Myotis	WSS063	1.2
Myotis	WSS071	1.3

Species	Detector ID	Median Pass Rate
Myotis	WSS073	2.6
Myotis	WSS074	1.1
Myotis	WSS076	2.5
Myotis	WSS100	0.2
Myotis	WSS101	0.1
Myotis	WSS103	0.6
Myotis	WSS104	1.4
Myotis	WSS105	2.4
Myotis	WSS106	3.2

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	WSS029	0.9
Common pipistrelle	WSS031	0.3
Common pipistrelle	WSS033	0.2
Common pipistrelle	WSS034	0.1
Common pipistrelle	WSS035	2.1
Common pipistrelle	WSS036	0.1
Common pipistrelle	WSS037	0.4
Common pipistrelle	WSS038	0.2
Common pipistrelle	WSS053	0.4
Common pipistrelle	WSS056	0.1
Common pipistrelle	WSS058	0.1
Common pipistrelle	WSS059	0.5
Common pipistrelle	WSS061	0.1
Common pipistrelle	WSS062	0.1
Common pipistrelle	WSS063	0.1
Common pipistrelle	WSS073	0.3
Common pipistrelle	WSS076	0.1
Common pipistrelle	WSS097	0.1
Common pipistrelle	WSS104	0.2
Common pipistrelle	WSS105	0.8
Common pipistrelle	WSS106	0.1
Soprano pipistrelle	WSS026	0.8
Soprano pipistrelle	WSS027	0.8
Soprano pipistrelle	WSS029	2.9
Soprano pipistrelle	WSS031	14.2
Soprano pipistrelle	WSS033	38.2
Soprano pipistrelle	WSS034	10.8
Soprano pipistrelle	WSS035	22.3
Soprano pipistrelle	WSS036	1.8
Soprano pipistrelle	WSS037	2.4

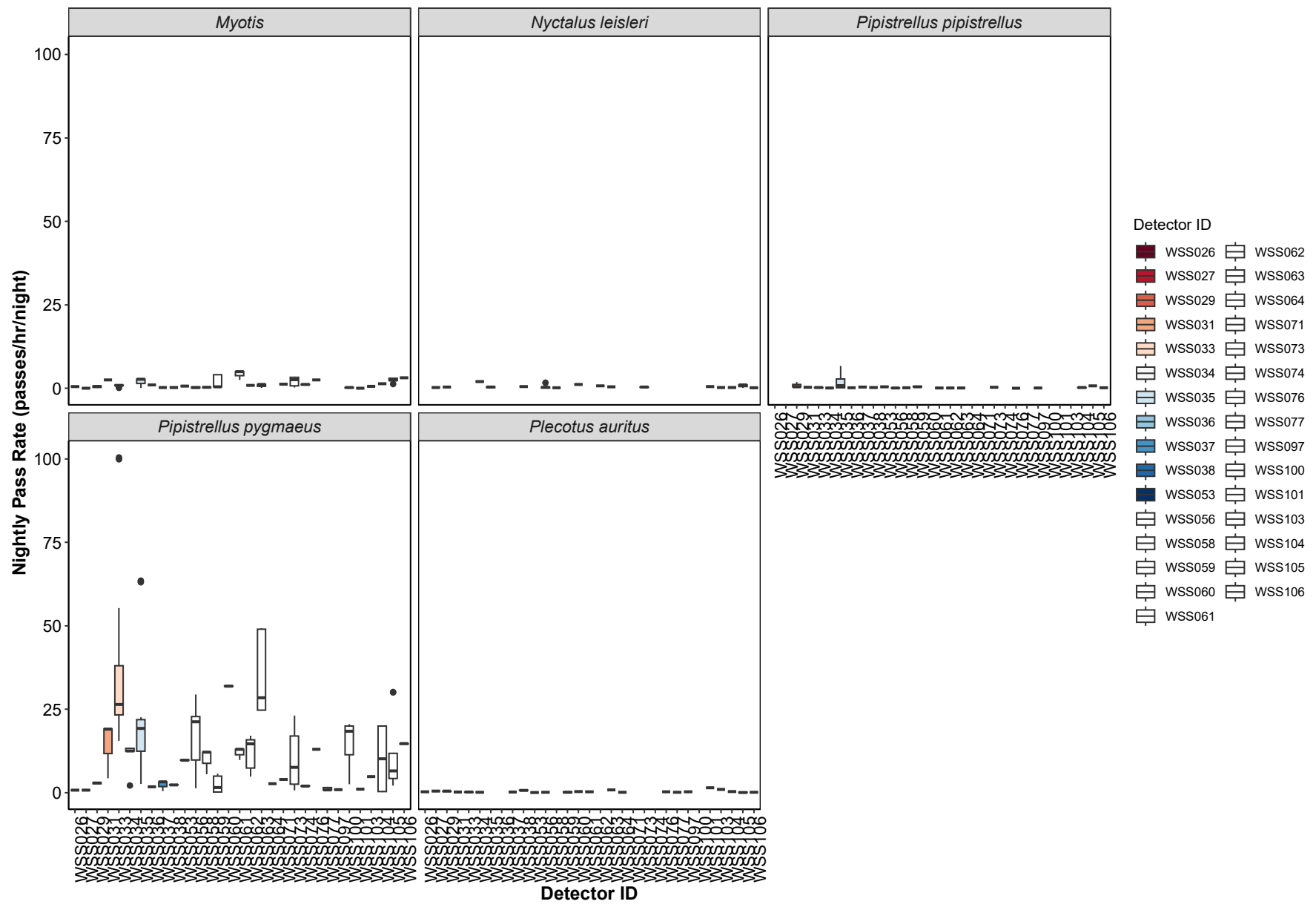
Species	Detector ID	Mean Pass Rate
Soprano pipistrelle	WSS038	2.4
Soprano pipistrelle	WSS053	9.8
Soprano pipistrelle	WSS056	16.7
Soprano pipistrelle	WSS058	9.9
Soprano pipistrelle	WSS059	2.5
Soprano pipistrelle	WSS060	31.9
Soprano pipistrelle	WSS061	12.0
Soprano pipistrelle	WSS062	11.9
Soprano pipistrelle	WSS063	35.2
Soprano pipistrelle	WSS064	2.7
Soprano pipistrelle	WSS071	4.0
Soprano pipistrelle	WSS073	10.6
Soprano pipistrelle	WSS074	2.0
Soprano pipistrelle	WSS076	13.0
Soprano pipistrelle	WSS077	1.1
Soprano pipistrelle	WSS097	0.9
Soprano pipistrelle	WSS100	14.9
Soprano pipistrelle	WSS101	1.1
Soprano pipistrelle	WSS103	4.8
Soprano pipistrelle	WSS104	10.2
Soprano pipistrelle	WSS105	11.6
Soprano pipistrelle	WSS106	14.7
Leisler's	WSS027	0.2
Leisler's	WSS029	0.4
Leisler's	WSS034	2.0
Leisler's	WSS035	0.3
Leisler's	WSS038	0.5
Leisler's	WSS056	0.5
Leisler's	WSS058	0.1
Leisler's	WSS060	1.1
Leisler's	WSS062	0.8
Leisler's	WSS063	0.5
Leisler's	WSS073	0.4
Leisler's	WSS101	0.5
Leisler's	WSS103	0.3
Leisler's	WSS104	0.3

Species	Detector ID	Mean Pass Rate
Leisler's	WSS105	0.7
Leisler's	WSS106	0.1
Brown long-eared	WSS026	0.3
Brown long-eared	WSS027	0.5
Brown long-eared	WSS029	0.4
Brown long-eared	WSS031	0.2
Brown long-eared	WSS033	0.2
Brown long-eared	WSS034	0.1
Brown long-eared	WSS037	0.2
Brown long-eared	WSS038	0.8
Brown long-eared	WSS053	0.1
Brown long-eared	WSS056	0.1
Brown long-eared	WSS059	0.2
Brown long-eared	WSS060	0.4
Brown long-eared	WSS061	0.3
Brown long-eared	WSS063	0.9
Brown long-eared	WSS064	0.1
Brown long-eared	WSS076	0.3
Brown long-eared	WSS077	0.1
Brown long-eared	WSS097	0.3
Brown long-eared	WSS101	1.5
Brown long-eared	WSS103	1.0
Brown long-eared	WSS104	0.4
Brown long-eared	WSS105	0.1
Brown long-eared	WSS106	0.1
Myotis	WSS026	0.5
Myotis	WSS027	0.1
Myotis	WSS029	0.5
Myotis	WSS031	2.5
Myotis	WSS033	0.8
Myotis	WSS035	1.9
Myotis	WSS036	1.0
Myotis	WSS037	0.2
Myotis	WSS038	0.2
Myotis	WSS053	0.7
Myotis	WSS056	0.3

Species	Detector ID	Mean Pass Rate
Myotis	WSS058	0.2
Myotis	WSS059	1.9
Myotis	WSS061	4.2
Myotis	WSS062	0.9
Myotis	WSS063	0.8
Myotis	WSS071	1.3
Myotis	WSS073	2.1
Myotis	WSS074	1.1
Myotis	WSS076	2.5
Myotis	WSS100	0.2
Myotis	WSS101	0.1
Myotis	WSS103	0.6
Myotis	WSS104	1.4
Myotis	WSS105	2.4
Myotis	WSS106	3.2

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.



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	Jun	Jul	Sep	Oct
Common pipistrelle	WSS029	0	6	0	0	23
Common pipistrelle	WSS031	0	0	0	0	4
Common pipistrelle	WSS033	0	0	0	0	7
Common pipistrelle	WSS034	0	0	1	0	0
Common pipistrelle	WSS035	0	0	66	2	2
Common pipistrelle	WSS036	0	1	0	0	0
Common pipistrelle	WSS037	0	0	3	0	0
Common pipistrelle	WSS038	0	0	2	0	0
Common pipistrelle	WSS053	0	0	0	0	12
Common pipistrelle	WSS056	0	3	0	0	3
Common pipistrelle	WSS058	0	1	0	0	0
Common pipistrelle	WSS059	0	8	0	0	17
Common pipistrelle	WSS061	0	0	0	0	1
Common pipistrelle	WSS062	0	0	1	0	0
Common pipistrelle	WSS063	0	0	0	0	4
Common pipistrelle	WSS073	0	2	0	0	0
Common pipistrelle	WSS076	0	0	0	0	1
Common pipistrelle	WSS097	0	0	0	0	1
Common pipistrelle	WSS104	0	0	4	0	2
Common pipistrelle	WSS105	0	0	12	0	0
Common pipistrelle	WSS106	0	0	0	0	4
Soprano pipistrelle	WSS026	12	0	0	0	0
Soprano pipistrelle	WSS027	0	0	0	0	22
Soprano pipistrelle	WSS029	0	42	0	34	34
Soprano pipistrelle	WSS031	0	0	0	0	542
Soprano pipistrelle	WSS033	975	0	0	0	5177
Soprano pipistrelle	WSS034	0	182	202	0	0
Soprano pipistrelle	WSS035	0	0	1251	1689	229
Soprano pipistrelle	WSS036	0	24	0	0	0
Soprano pipistrelle	WSS037	0	0	56	0	0
Soprano pipistrelle	WSS038	0	0	38	0	0
Soprano pipistrelle	WSS053	0	0	0	0	264
Soprano pipistrelle	WSS056	90	648	0	0	1079
Soprano pipistrelle	WSS058	0	204	0	0	0
Soprano pipistrelle	WSS059	0	101	0	0	7
Soprano pipistrelle	WSS060	0	0	504	0	0

Species	Detector ID	May	Jun	Jul	Sep	Oct
Soprano pipistrelle	WSS061	0	0	0	0	478
Soprano pipistrelle	WSS062	0	0	636	0	0
Soprano pipistrelle	WSS063	0	0	0	0	2221
Soprano pipistrelle	WSS064	0	38	0	0	0
Soprano pipistrelle	WSS071	0	56	0	0	0
Soprano pipistrelle	WSS073	0	656	0	0	0
Soprano pipistrelle	WSS074	0	56	0	0	0
Soprano pipistrelle	WSS076	0	0	0	0	348
Soprano pipistrelle	WSS077	0	39	0	0	0
Soprano pipistrelle	WSS097	0	0	0	0	24
Soprano pipistrelle	WSS100	0	367	0	229	229
Soprano pipistrelle	WSS101	0	0	0	0	30
Soprano pipistrelle	WSS103	0	68	0	0	0
Soprano pipistrelle	WSS104	0	0	312	0	10
Soprano pipistrelle	WSS105	0	509	217	27	27
Soprano pipistrelle	WSS106	0	0	0	0	595
Leisler's	WSS027	0	0	0	0	3
Leisler's	WSS029	0	0	0	0	5
Leisler's	WSS034	0	0	30	0	0
Leisler's	WSS035	0	0	7	0	1
Leisler's	WSS038	0	0	4	0	0
Leisler's	WSS056	0	13	0	0	9
Leisler's	WSS058	0	1	0	0	0
Leisler's	WSS060	0	0	18	0	0
Leisler's	WSS062	0	0	12	0	0
Leisler's	WSS063	0	0	0	0	12
Leisler's	WSS073	0	5	0	0	0
Leisler's	WSS101	0	0	0	0	14
Leisler's	WSS103	0	4	0	0	0
Leisler's	WSS104	0	0	4	0	0
Leisler's	WSS105	0	14	1	0	0
Leisler's	WSS106	0	0	0	0	2
Brown long-eared	WSS026	2	0	0	0	0
Brown long-eared	WSS027	0	0	0	0	14
Brown long-eared	WSS029	0	2	0	6	6
Brown long-eared	WSS031	0	0	0	0	6

Species	Detector ID	May	Jun	Jul	Sep	Oct
Brown long-eared	WSS033	0	0	0	0	5
Brown long-eared	WSS034	0	1	0	0	0
Brown long-eared	WSS037	0	0	2	0	0
Brown long-eared	WSS038	0	0	12	0	0
Brown long-eared	WSS053	0	0	0	0	1
Brown long-eared	WSS056	0	1	0	0	0
Brown long-eared	WSS059	0	3	0	0	3
Brown long-eared	WSS060	0	0	6	0	0
Brown long-eared	WSS061	0	0	0	0	8
Brown long-eared	WSS063	0	0	0	0	22
Brown long-eared	WSS064	0	1	0	0	0
Brown long-eared	WSS076	0	0	0	0	4
Brown long-eared	WSS077	0	2	0	0	0
Brown long-eared	WSS097	0	0	0	0	8
Brown long-eared	WSS101	0	0	0	0	40
Brown long-eared	WSS103	0	7	0	0	0
Brown long-eared	WSS104	0	0	3	0	0
Brown long-eared	WSS105	0	1	0	0	1
Brown long-eared	WSS106	0	0	0	0	4
Myotis	WSS026	8	0	0	0	0
Myotis	WSS027	0	0	0	0	1
Myotis	WSS029	0	10	0	4	4
Myotis	WSS031	0	0	0	0	64
Myotis	WSS033	14	0	0	0	35
Myotis	WSS035	0	0	45	0	0
Myotis	WSS036	0	14	0	0	0
Myotis	WSS037	0	0	4	0	0
Myotis	WSS038	0	0	2	0	0
Myotis	WSS053	0	0	0	0	18
Myotis	WSS056	2	6	0	0	13
Myotis	WSS058	0	5	0	0	0
Myotis	WSS059	0	58	0	0	17
Myotis	WSS061	0	0	0	0	168
Myotis	WSS062	0	0	14	0	0
Myotis	WSS063	0	0	0	0	31
Myotis	WSS071	0	18	0	0	0

Species	Detector ID	May	Jun	Jul	Sep	Oct
Myotis	WSS073	0	86	0	0	0
Myotis	WSS074	0	32	0	0	0
Myotis	WSS076	0	0	0	0	34
Myotis	WSS100	0	3	0	3	0
Myotis	WSS101	0	0	0	0	1
Myotis	WSS103	0	8	0	0	0
Myotis	WSS104	0	0	22	0	0
Myotis	WSS105	0	9	48	30	30
Myotis	WSS106	0	0	0	0	86

Survey Effort

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

month	Detector ID	No. of Survey Nights
May	WSS026	2
May	WSS033	5
May	WSS056	2
Jun	WSS029	2
Jun	WSS034	2
Jun	WSS036	2
Jun	WSS056	5
Jun	WSS058	3
Jun	WSS059	3
Jun	WSS064	2
Jun	WSS071	2
Jun	WSS073	10
Jun	WSS074	4
Jun	WSS077	5
Jun	WSS100	4
Jun	WSS103	2
Jun	WSS105	4
Jul	WSS034	3
Jul	WSS035	6
Jul	WSS037	3
Jul	WSS038	2
Jul	WSS060	2
Jul	WSS062	8
Jul	WSS104	2
Jul	WSS105	3
Sep	WSS029	1
Sep	WSS035	8
Sep	WSS100	1
Sep	WSS105	1
Oct	WSS027	2
Oct	WSS029	1
Oct	WSS031	3

month	Detector ID	No. of Survey Nights
Oct	WSS033	9
Oct	WSS035	1
Oct	WSS053	2
Oct	WSS056	4
Oct	WSS059	3
Oct	WSS061	3
Oct	WSS063	5
Oct	WSS076	2
Oct	WSS097	2
Oct	WSS100	1
Oct	WSS101	2
Oct	WSS104	2
Oct	WSS105	1
Oct	WSS106	3

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	Jun	Jul	Sep	Oct
Common pipistrelle	WSS029	NA	0.4	NA	NA	1.9
Common pipistrelle	WSS031	NA	NA	NA	NA	0.3
Common pipistrelle	WSS033	NA	NA	NA	NA	0.2
Common pipistrelle	WSS034	NA	NA	0.1	NA	NA
Common pipistrelle	WSS035	NA	NA	4.1	0.2	0.2
Common pipistrelle	WSS036	NA	0.1	NA	NA	NA
Common pipistrelle	WSS037	NA	NA	0.4	NA	NA
Common pipistrelle	WSS038	NA	NA	0.2	NA	NA
Common pipistrelle	WSS053	NA	NA	NA	NA	0.4
Common pipistrelle	WSS056	NA	0.1	NA	NA	0.1
Common pipistrelle	WSS058	NA	0.1	NA	NA	NA
Common pipistrelle	WSS059	NA	0.6	NA	NA	0.4
Common pipistrelle	WSS061	NA	NA	NA	NA	0.1
Common pipistrelle	WSS062	NA	NA	0.1	NA	NA
Common pipistrelle	WSS063	NA	NA	NA	NA	0.1
Common pipistrelle	WSS073	NA	0.3	NA	NA	NA
Common pipistrelle	WSS076	NA	NA	NA	NA	0.1
Common pipistrelle	WSS097	NA	NA	NA	NA	0.1
Common pipistrelle	WSS104	NA	NA	0.3	NA	0.2
Common pipistrelle	WSS105	NA	NA	0.8	NA	NA
Common pipistrelle	WSS106	NA	NA	NA	NA	0.1
Soprano pipistrelle	WSS026	0.8	NA	NA	NA	NA
Soprano pipistrelle	WSS027	NA	NA	NA	NA	0.8
Soprano pipistrelle	WSS029	NA	3.1	NA	2.8	2.7
Soprano pipistrelle	WSS031	NA	NA	NA	NA	19.1
Soprano pipistrelle	WSS033	25.6	NA	NA	NA	27.3
Soprano pipistrelle	WSS034	NA	13.3	12.4	NA	NA
Soprano pipistrelle	WSS035	NA	NA	13.6	20.2	18.4
Soprano pipistrelle	WSS036	NA	1.8	NA	NA	NA
Soprano pipistrelle	WSS037	NA	NA	3.3	NA	NA
Soprano pipistrelle	WSS038	NA	NA	2.4	NA	NA
Soprano pipistrelle	WSS053	NA	NA	NA	NA	9.8
Soprano pipistrelle	WSS056	6.2	21.2	NA	NA	22.4
Soprano pipistrelle	WSS058	NA	12.1	NA	NA	NA
Soprano pipistrelle	WSS059	NA	5.7	NA	NA	0.2
Soprano pipistrelle	WSS060	NA	NA	31.9	NA	NA

Species	Detector ID	May	Jun	Jul	Sep	Oct
Soprano pipistrelle	WSS061	NA	NA	NA	NA	13.0
Soprano pipistrelle	WSS062	NA	NA	14.7	NA	NA
Soprano pipistrelle	WSS063	NA	NA	NA	NA	28.5
Soprano pipistrelle	WSS064	NA	2.7	NA	NA	NA
Soprano pipistrelle	WSS071	NA	4.0	NA	NA	NA
Soprano pipistrelle	WSS073	NA	7.6	NA	NA	NA
Soprano pipistrelle	WSS074	NA	2.0	NA	NA	NA
Soprano pipistrelle	WSS076	NA	NA	NA	NA	13.0
Soprano pipistrelle	WSS077	NA	0.9	NA	NA	NA
Soprano pipistrelle	WSS097	NA	NA	NA	NA	0.9
Soprano pipistrelle	WSS100	NA	14.8	NA	18.5	18.4
Soprano pipistrelle	WSS101	NA	NA	NA	NA	1.1
Soprano pipistrelle	WSS103	NA	4.8	NA	NA	NA
Soprano pipistrelle	WSS104	NA	NA	20.0	NA	0.4
Soprano pipistrelle	WSS105	NA	18.3	11.7	2.2	2.2
Soprano pipistrelle	WSS106	NA	NA	NA	NA	14.7
Leisler's	WSS027	NA	NA	NA	NA	0.2
Leisler's	WSS029	NA	NA	NA	NA	0.4
Leisler's	WSS034	NA	NA	2.0	NA	NA
Leisler's	WSS035	NA	NA	0.4	NA	0.1
Leisler's	WSS038	NA	NA	0.5	NA	NA
Leisler's	WSS056	NA	0.9	NA	NA	0.3
Leisler's	WSS058	NA	0.1	NA	NA	NA
Leisler's	WSS060	NA	NA	1.1	NA	NA
Leisler's	WSS062	NA	NA	0.8	NA	NA
Leisler's	WSS063	NA	NA	NA	NA	0.5
Leisler's	WSS073	NA	0.4	NA	NA	NA
Leisler's	WSS101	NA	NA	NA	NA	0.5
Leisler's	WSS103	NA	0.3	NA	NA	NA
Leisler's	WSS104	NA	NA	0.3	NA	NA
Leisler's	WSS105	NA	1.0	0.1	NA	NA
Leisler's	WSS106	NA	NA	NA	NA	0.1
Brown long-eared	WSS026	0.3	NA	NA	NA	NA
Brown long-eared	WSS027	NA	NA	NA	NA	0.5
Brown long-eared	WSS029	NA	0.3	NA	0.5	0.5
Brown long-eared	WSS031	NA	NA	NA	NA	0.2

Species	Detector ID	May	Jun	Jul	Sep	Oct
Brown long-eared	WSS033	NA	NA	NA	NA	0.2
Brown long-eared	WSS034	NA	0.1	NA	NA	NA
Brown long-eared	WSS037	NA	NA	0.2	NA	NA
Brown long-eared	WSS038	NA	NA	0.8	NA	NA
Brown long-eared	WSS053	NA	NA	NA	NA	0.1
Brown long-eared	WSS056	NA	0.1	NA	NA	NA
Brown long-eared	WSS059	NA	0.4	NA	NA	0.1
Brown long-eared	WSS060	NA	NA	0.4	NA	NA
Brown long-eared	WSS061	NA	NA	NA	NA	0.3
Brown long-eared	WSS063	NA	NA	NA	NA	0.9
Brown long-eared	WSS064	NA	0.1	NA	NA	NA
Brown long-eared	WSS076	NA	NA	NA	NA	0.3
Brown long-eared	WSS077	NA	0.1	NA	NA	NA
Brown long-eared	WSS097	NA	NA	NA	NA	0.3
Brown long-eared	WSS101	NA	NA	NA	NA	1.5
Brown long-eared	WSS103	NA	1.0	NA	NA	NA
Brown long-eared	WSS104	NA	NA	0.4	NA	NA
Brown long-eared	WSS105	NA	0.1	NA	NA	0.1
Brown long-eared	WSS106	NA	NA	NA	NA	0.1
Myotis	WSS026	0.5	NA	NA	NA	NA
Myotis	WSS027	NA	NA	NA	NA	0.1
Myotis	WSS029	NA	0.7	NA	0.3	0.3
Myotis	WSS031	NA	NA	NA	NA	2.5
Myotis	WSS033	1.0	NA	NA	NA	0.9
Myotis	WSS035	NA	NA	2.8	NA	NA
Myotis	WSS036	NA	1.0	NA	NA	NA
Myotis	WSS037	NA	NA	0.2	NA	NA
Myotis	WSS038	NA	NA	0.2	NA	NA
Myotis	WSS053	NA	NA	NA	NA	0.7
Myotis	WSS056	0.1	0.4	NA	NA	0.3
Myotis	WSS058	NA	0.3	NA	NA	NA
Myotis	WSS059	NA	4.1	NA	NA	0.4
Myotis	WSS061	NA	NA	NA	NA	5.0
Myotis	WSS062	NA	NA	0.9	NA	NA
Myotis	WSS063	NA	NA	NA	NA	1.2
Myotis	WSS071	NA	1.3	NA	NA	NA

Species	Detector ID	May	Jun	Jul	Sep	Oct
Myotis	WSS073	NA	2.6	NA	NA	NA
Myotis	WSS074	NA	1.1	NA	NA	NA
Myotis	WSS076	NA	NA	NA	NA	2.5
Myotis	WSS100	NA	0.2	NA	0.2	NA
Myotis	WSS101	NA	NA	NA	NA	0.1
Myotis	WSS103	NA	0.6	NA	NA	NA
Myotis	WSS104	NA	NA	1.4	NA	NA
Myotis	WSS105	NA	1.3	3.1	2.4	2.4
Myotis	WSS106	NA	NA	NA	NA	3.2

Mean Per Detector

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

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

Species	Detector ID	May	Jun	Jul	Sep	Oct
Common pipistrelle	WSS029	NA	0.4	NA	NA	1.9
Common pipistrelle	WSS031	NA	NA	NA	NA	0.3
Common pipistrelle	WSS033	NA	NA	NA	NA	0.2
Common pipistrelle	WSS034	NA	NA	0.1	NA	NA
Common pipistrelle	WSS035	NA	NA	4.1	0.2	0.2
Common pipistrelle	WSS036	NA	0.1	NA	NA	NA
Common pipistrelle	WSS037	NA	NA	0.4	NA	NA
Common pipistrelle	WSS038	NA	NA	0.2	NA	NA
Common pipistrelle	WSS053	NA	NA	NA	NA	0.4
Common pipistrelle	WSS056	NA	0.1	NA	NA	0.1
Common pipistrelle	WSS058	NA	0.1	NA	NA	NA
Common pipistrelle	WSS059	NA	0.6	NA	NA	0.4
Common pipistrelle	WSS061	NA	NA	NA	NA	0.1
Common pipistrelle	WSS062	NA	NA	0.1	NA	NA
Common pipistrelle	WSS063	NA	NA	NA	NA	0.1
Common pipistrelle	WSS073	NA	0.3	NA	NA	NA
Common pipistrelle	WSS076	NA	NA	NA	NA	0.1
Common pipistrelle	WSS097	NA	NA	NA	NA	0.1
Common pipistrelle	WSS104	NA	NA	0.3	NA	0.2
Common pipistrelle	WSS105	NA	NA	0.8	NA	NA
Common pipistrelle	WSS106	NA	NA	NA	NA	0.1
Soprano pipistrelle	WSS026	0.8	NA	NA	NA	NA
Soprano pipistrelle	WSS027	NA	NA	NA	NA	0.8
Soprano pipistrelle	WSS029	NA	3.1	NA	2.8	2.7
Soprano pipistrelle	WSS031	NA	NA	NA	NA	14.2
Soprano pipistrelle	WSS033	26.8	NA	NA	NA	44.5
Soprano pipistrelle	WSS034	NA	13.3	9.0	NA	NA
Soprano pipistrelle	WSS035	NA	NA	31.0	17.4	18.4
Soprano pipistrelle	WSS036	NA	1.8	NA	NA	NA
Soprano pipistrelle	WSS037	NA	NA	2.4	NA	NA

Species	Detector ID	May	Jun	Jul	Sep	Oct
Soprano pipistrelle	WSS038	NA	NA	2.4	NA	NA
Soprano pipistrelle	WSS053	NA	NA	NA	NA	9.8
Soprano pipistrelle	WSS056	6.2	18.2	NA	NA	20.1
Soprano pipistrelle	WSS058	NA	9.9	NA	NA	NA
Soprano pipistrelle	WSS059	NA	4.8	NA	NA	0.2
Soprano pipistrelle	WSS060	NA	NA	31.9	NA	NA
Soprano pipistrelle	WSS061	NA	NA	NA	NA	12.0
Soprano pipistrelle	WSS062	NA	NA	11.9	NA	NA
Soprano pipistrelle	WSS063	NA	NA	NA	NA	35.2
Soprano pipistrelle	WSS064	NA	2.7	NA	NA	NA
Soprano pipistrelle	WSS071	NA	4.0	NA	NA	NA
Soprano pipistrelle	WSS073	NA	10.6	NA	NA	NA
Soprano pipistrelle	WSS074	NA	2.0	NA	NA	NA
Soprano pipistrelle	WSS076	NA	NA	NA	NA	13.0
Soprano pipistrelle	WSS077	NA	1.1	NA	NA	NA
Soprano pipistrelle	WSS097	NA	NA	NA	NA	0.9
Soprano pipistrelle	WSS100	NA	13.2	NA	18.5	18.4
Soprano pipistrelle	WSS101	NA	NA	NA	NA	1.1
Soprano pipistrelle	WSS103	NA	4.8	NA	NA	NA
Soprano pipistrelle	WSS104	NA	NA	20.0	NA	0.4
Soprano pipistrelle	WSS105	NA	18.2	9.2	2.2	2.2
Soprano pipistrelle	WSS106	NA	NA	NA	NA	14.7
Leisler's	WSS027	NA	NA	NA	NA	0.2
Leisler's	WSS029	NA	NA	NA	NA	0.4
Leisler's	WSS034	NA	NA	2.0	NA	NA
Leisler's	WSS035	NA	NA	0.4	NA	0.1
Leisler's	WSS038	NA	NA	0.5	NA	NA
Leisler's	WSS056	NA	0.9	NA	NA	0.2
Leisler's	WSS058	NA	0.1	NA	NA	NA
Leisler's	WSS060	NA	NA	1.1	NA	NA
Leisler's	WSS062	NA	NA	0.8	NA	NA
Leisler's	WSS063	NA	NA	NA	NA	0.5
Leisler's	WSS073	NA	0.4	NA	NA	NA
Leisler's	WSS101	NA	NA	NA	NA	0.5
Leisler's	WSS103	NA	0.3	NA	NA	NA
Leisler's	WSS104	NA	NA	0.3	NA	NA

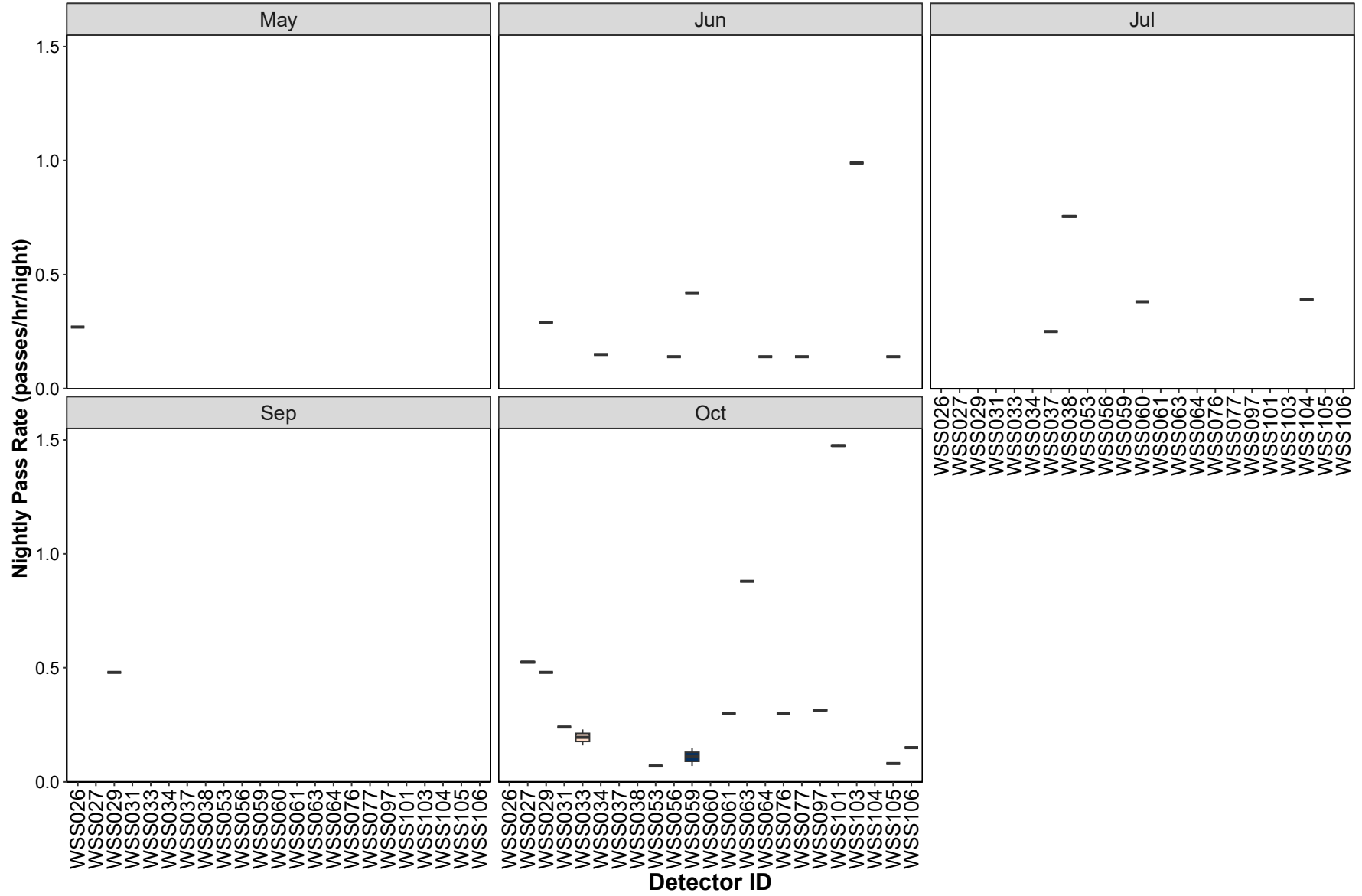
Species	Detector ID	May	Jun	Jul	Sep	Oct
Leisler's	WSS105	NA	1.0	0.1	NA	NA
Leisler's	WSS106	NA	NA	NA	NA	0.1
Brown long-eared	WSS026	0.3	NA	NA	NA	NA
Brown long-eared	WSS027	NA	NA	NA	NA	0.5
Brown long-eared	WSS029	NA	0.3	NA	0.5	0.5
Brown long-eared	WSS031	NA	NA	NA	NA	0.2
Brown long-eared	WSS033	NA	NA	NA	NA	0.2
Brown long-eared	WSS034	NA	0.1	NA	NA	NA
Brown long-eared	WSS037	NA	NA	0.2	NA	NA
Brown long-eared	WSS038	NA	NA	0.8	NA	NA
Brown long-eared	WSS053	NA	NA	NA	NA	0.1
Brown long-eared	WSS056	NA	0.1	NA	NA	NA
Brown long-eared	WSS059	NA	0.4	NA	NA	0.1
Brown long-eared	WSS060	NA	NA	0.4	NA	NA
Brown long-eared	WSS061	NA	NA	NA	NA	0.3
Brown long-eared	WSS063	NA	NA	NA	NA	0.9
Brown long-eared	WSS064	NA	0.1	NA	NA	NA
Brown long-eared	WSS076	NA	NA	NA	NA	0.3
Brown long-eared	WSS077	NA	0.1	NA	NA	NA
Brown long-eared	WSS097	NA	NA	NA	NA	0.3
Brown long-eared	WSS101	NA	NA	NA	NA	1.5
Brown long-eared	WSS103	NA	1.0	NA	NA	NA
Brown long-eared	WSS104	NA	NA	0.4	NA	NA
Brown long-eared	WSS105	NA	0.1	NA	NA	0.1
Brown long-eared	WSS106	NA	NA	NA	NA	0.1
Myotis	WSS026	0.5	NA	NA	NA	NA
Myotis	WSS027	NA	NA	NA	NA	0.1
Myotis	WSS029	NA	0.7	NA	0.3	0.3
Myotis	WSS031	NA	NA	NA	NA	2.5
Myotis	WSS033	1.0	NA	NA	NA	0.7
Myotis	WSS035	NA	NA	1.9	NA	NA
Myotis	WSS036	NA	1.0	NA	NA	NA
Myotis	WSS037	NA	NA	0.2	NA	NA
Myotis	WSS038	NA	NA	0.2	NA	NA
Myotis	WSS053	NA	NA	NA	NA	0.7
Myotis	WSS056	0.1	0.4	NA	NA	0.2

Species	Detector ID	May	Jun	Jul	Sep	Oct
Myotis	WSS058	NA	0.2	NA	NA	NA
Myotis	WSS059	NA	4.1	NA	NA	0.4
Myotis	WSS061	NA	NA	NA	NA	4.2
Myotis	WSS062	NA	NA	0.9	NA	NA
Myotis	WSS063	NA	NA	NA	NA	0.8
Myotis	WSS071	NA	1.3	NA	NA	NA
Myotis	WSS073	NA	2.1	NA	NA	NA
Myotis	WSS074	NA	1.1	NA	NA	NA
Myotis	WSS076	NA	NA	NA	NA	2.5
Myotis	WSS100	NA	0.2	NA	0.2	NA
Myotis	WSS101	NA	NA	NA	NA	0.1
Myotis	WSS103	NA	0.6	NA	NA	NA
Myotis	WSS104	NA	NA	1.4	NA	NA
Myotis	WSS105	NA	1.3	3.1	2.4	2.4
Myotis	WSS106	NA	NA	NA	NA	3.2

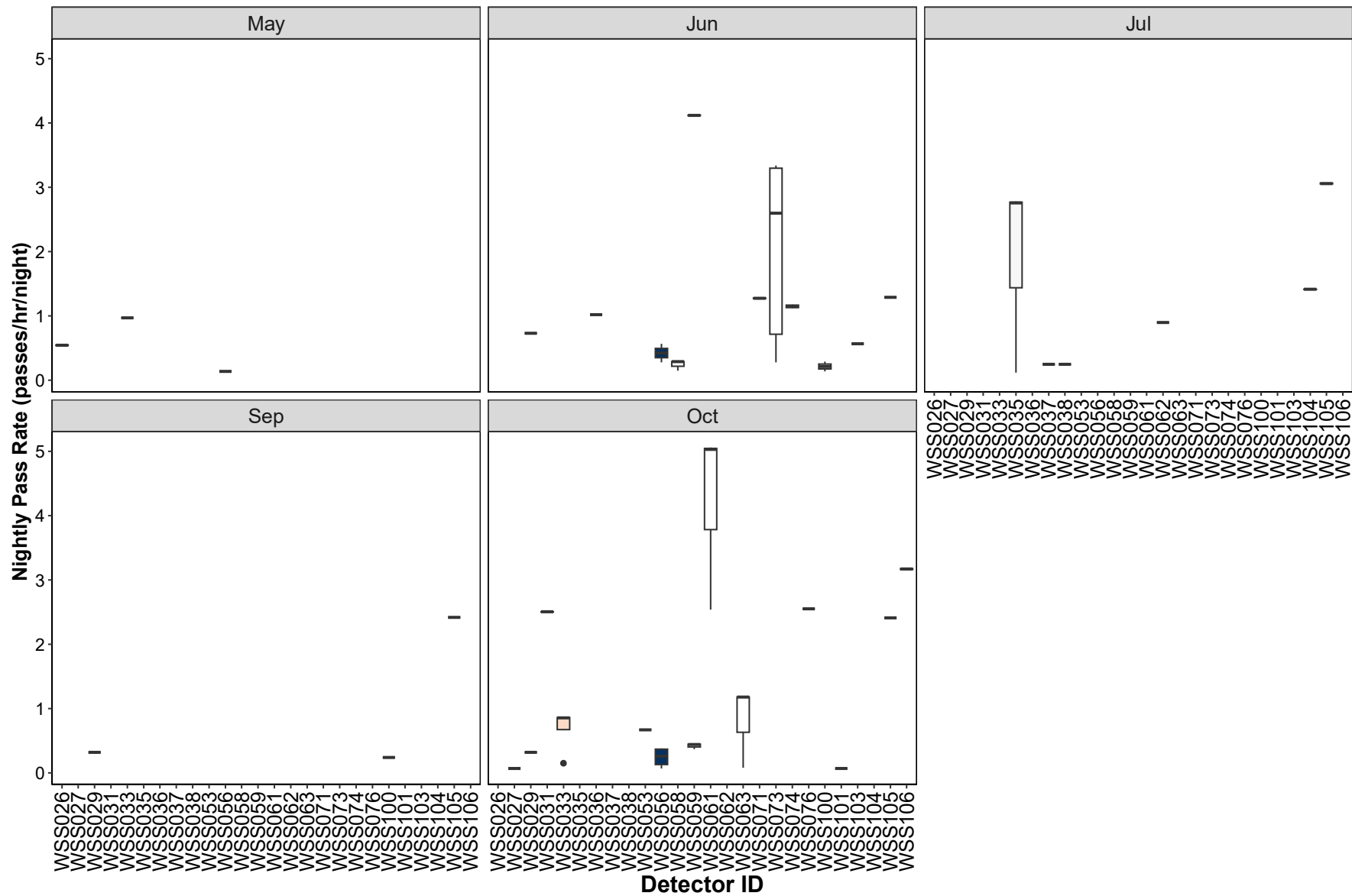
Per Detector

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.

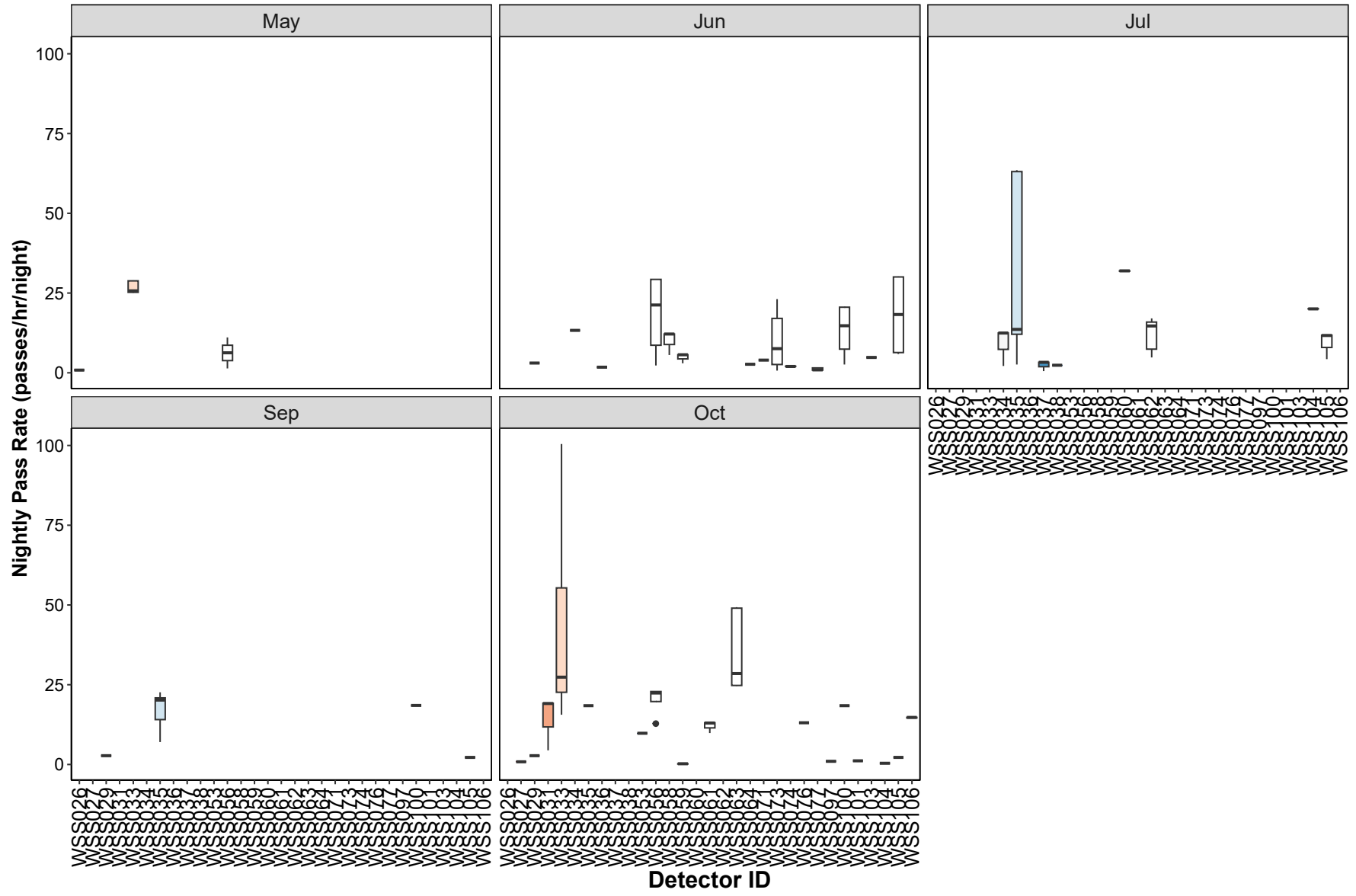
Brown long-eared



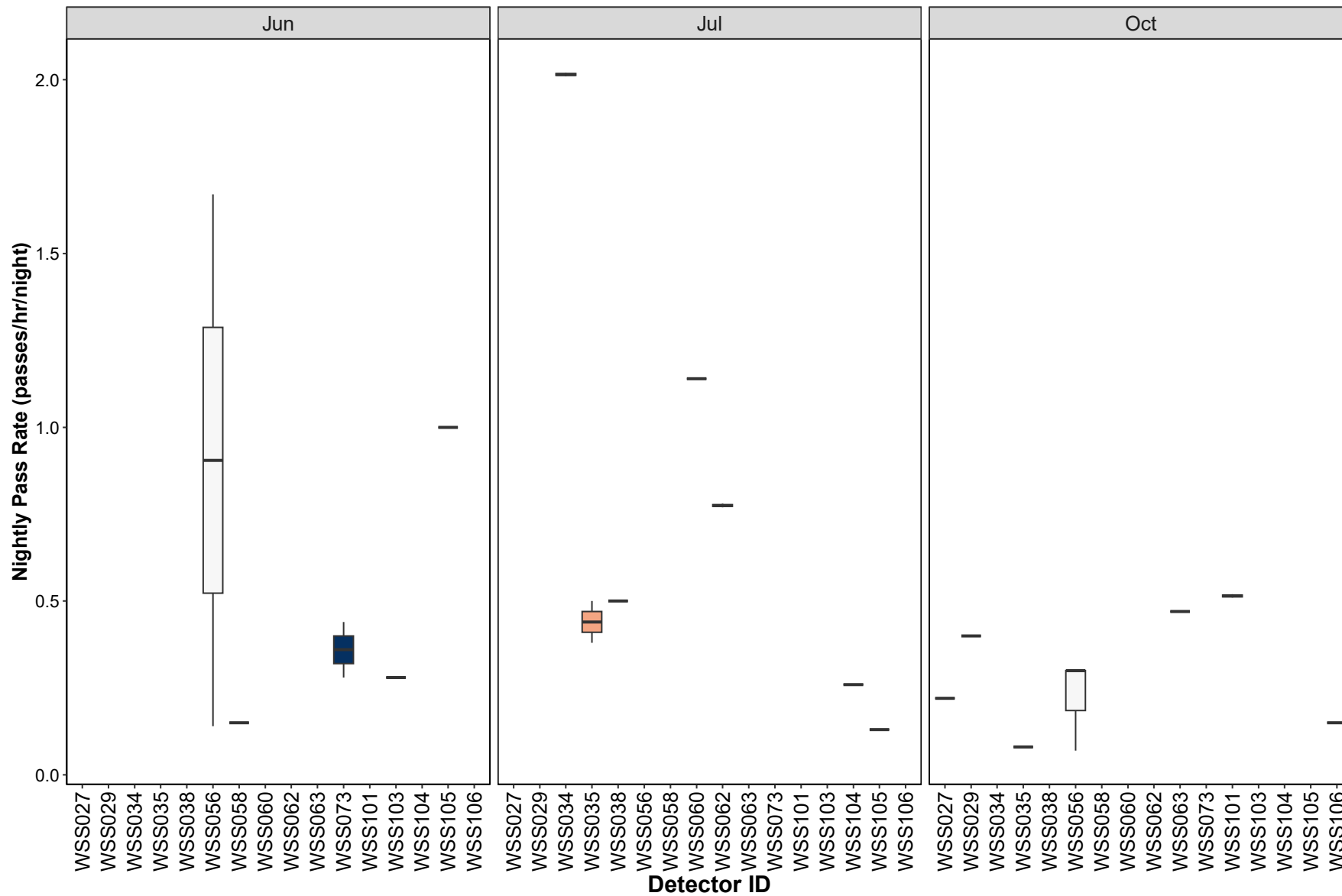
Myotis



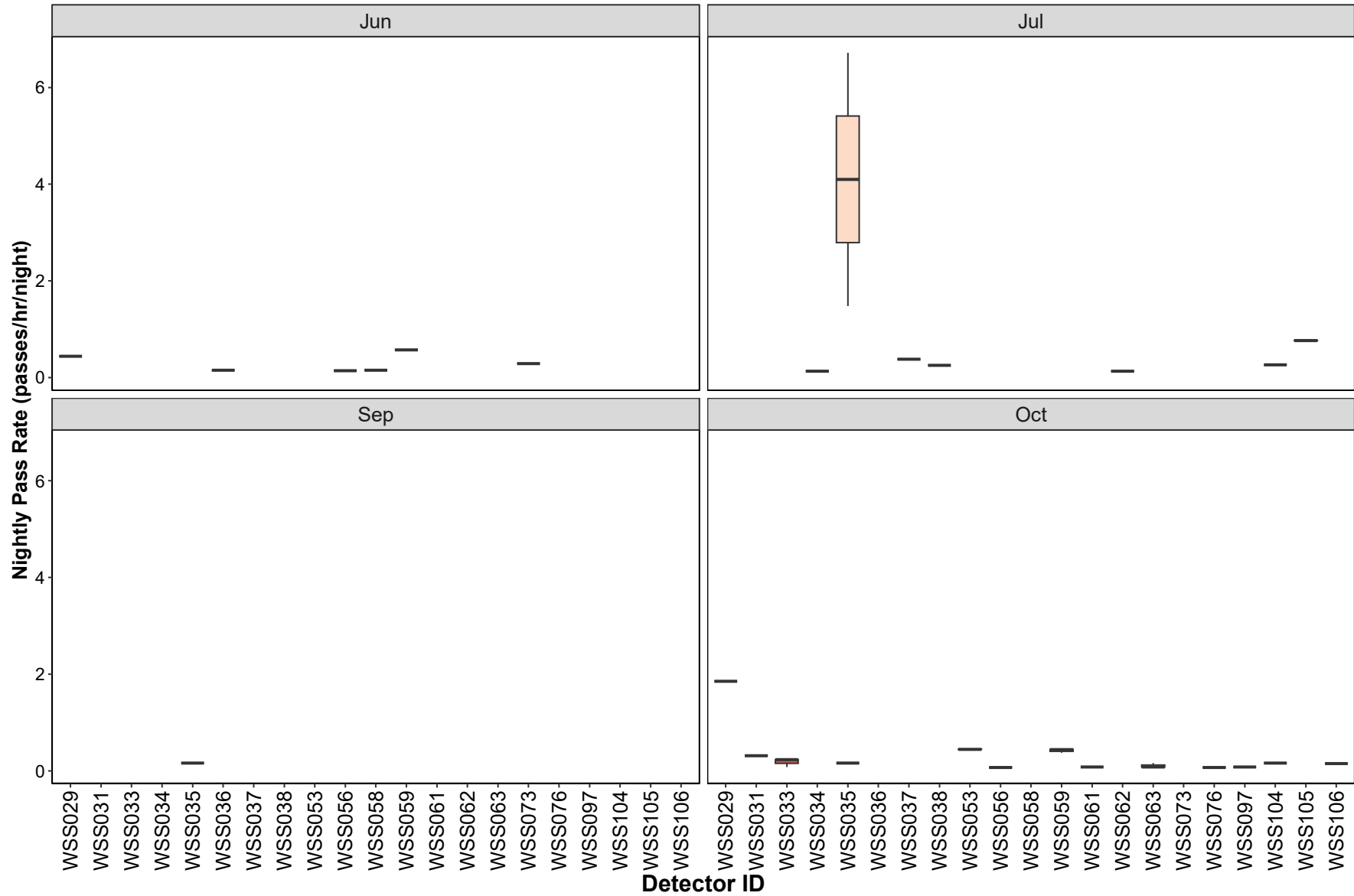
Soprano pipistrelle



Leisler's



Common pipistrelle



Bat Activity per Detector Location

Figure 13. Detector ID reference:

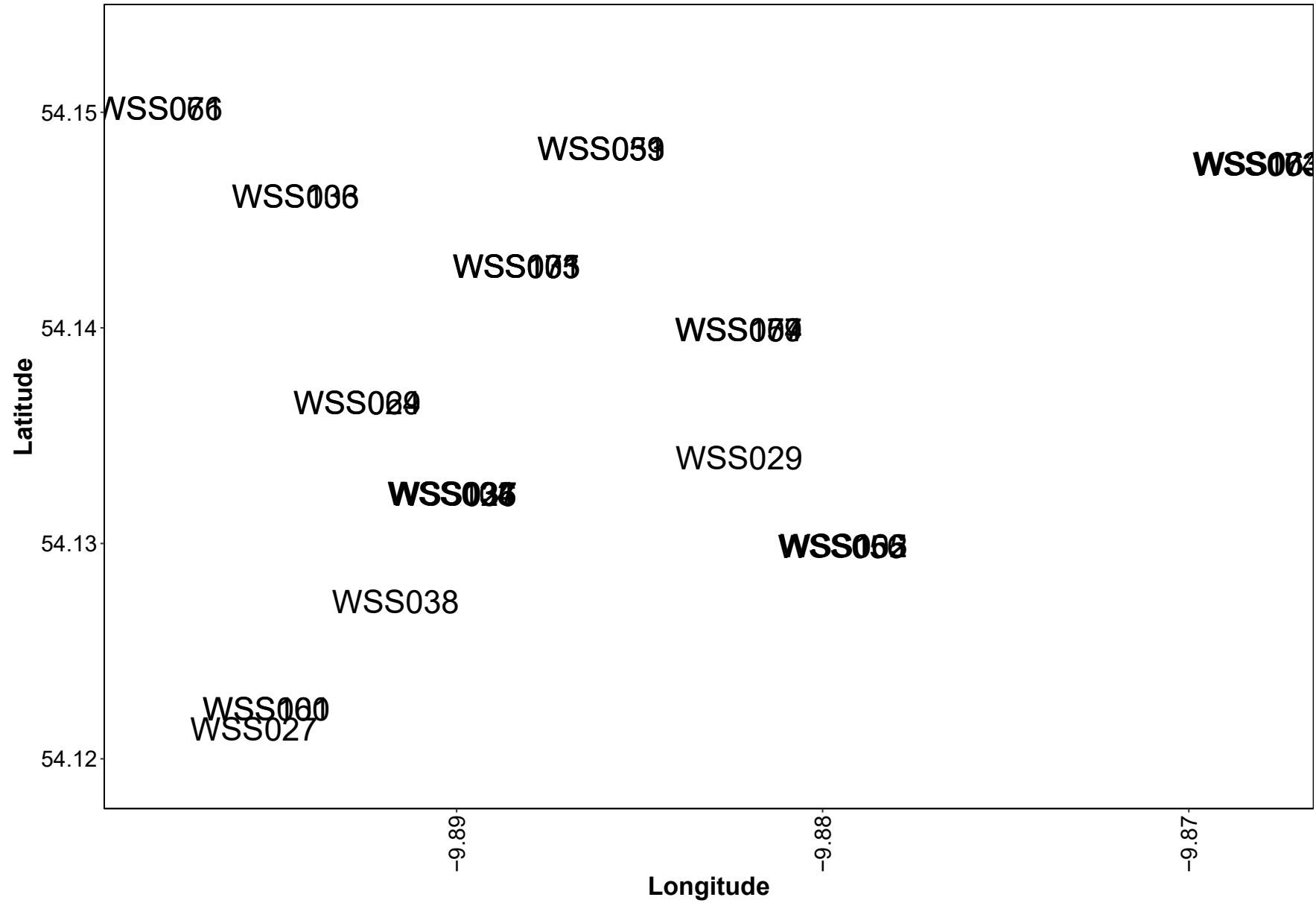


Figure 14. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.

Median_Pass_Rate 10 20 30

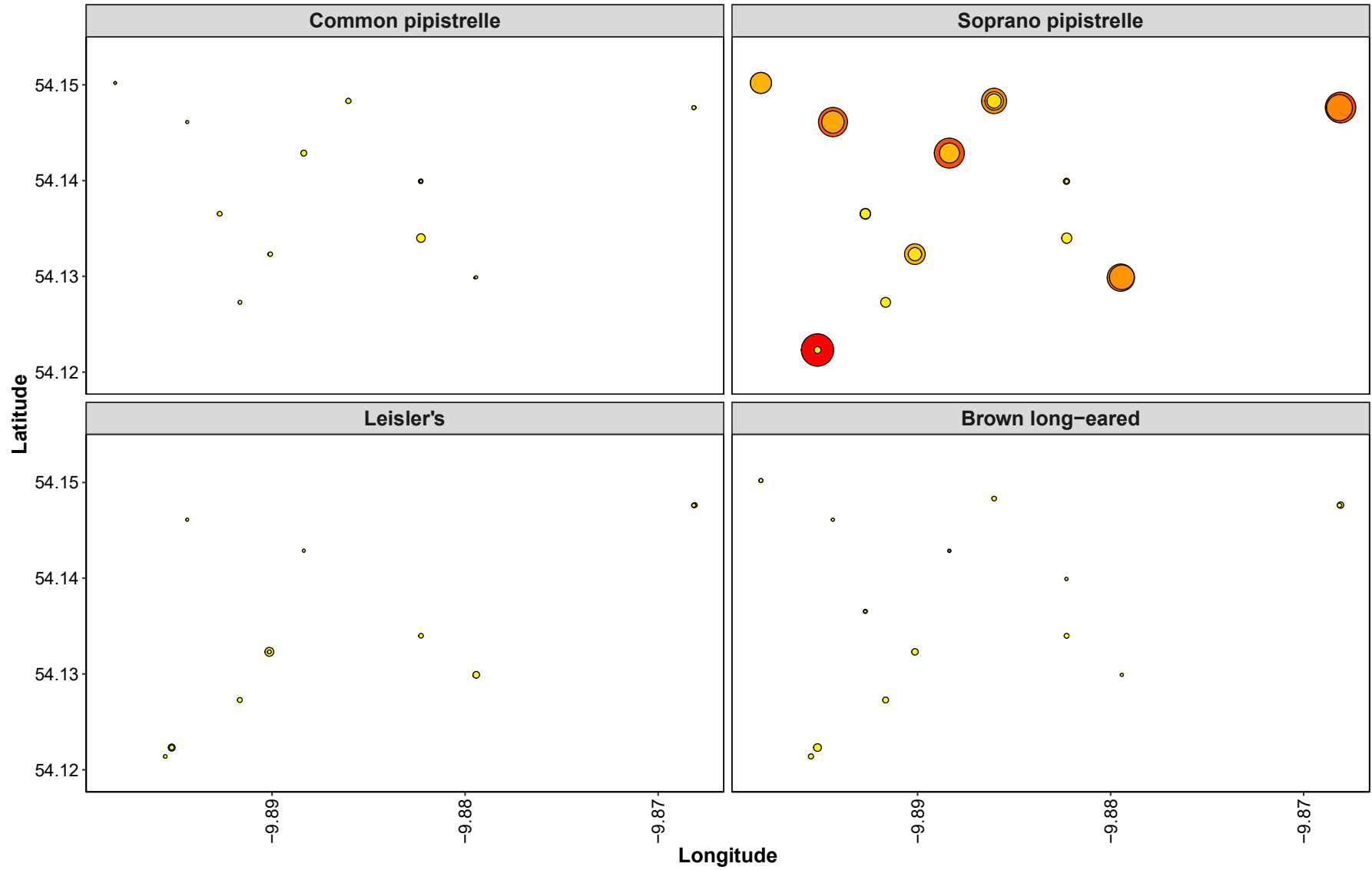
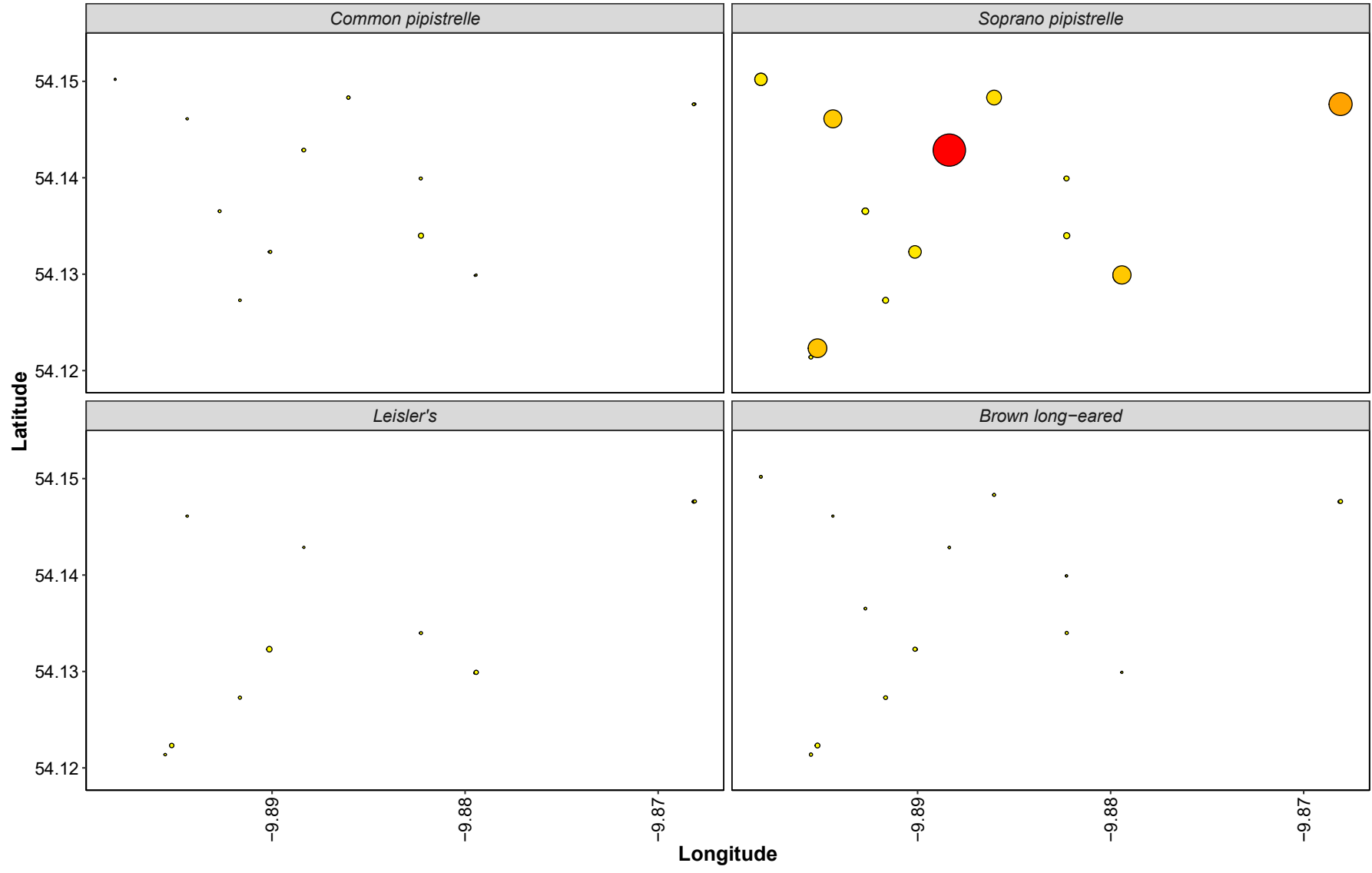


Figure 15. Maximum Nightly Pass Rate (bat passes/hr/night) recorded in a single night throughout the survey period - represented by the size and colour of the point at each detector location.

Max_Pass_Rate 25 50 75 100



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	WSS026	0.1
Brown long-eared	WSS027	0.5
Brown long-eared	WSS029	0.4
Brown long-eared	WSS031	0.2
Brown long-eared	WSS033	0.0
Brown long-eared	WSS034	0.0
Brown long-eared	WSS035	0.0
Brown long-eared	WSS036	0.0
Brown long-eared	WSS037	0.0
Brown long-eared	WSS038	0.8
Brown long-eared	WSS053	0.0
Brown long-eared	WSS056	0.0
Brown long-eared	WSS058	0.0
Brown long-eared	WSS059	0.0
Brown long-eared	WSS060	0.4
Brown long-eared	WSS061	0.3
Brown long-eared	WSS062	0.0
Brown long-eared	WSS063	0.0
Brown long-eared	WSS064	0.1
Brown long-eared	WSS071	0.0
Brown long-eared	WSS073	0.0
Brown long-eared	WSS074	0.0
Brown long-eared	WSS076	0.1
Brown long-eared	WSS077	0.0
Brown long-eared	WSS097	0.3
Brown long-eared	WSS100	0.0
Brown long-eared	WSS101	1.5
Brown long-eared	WSS103	0.5
Brown long-eared	WSS104	0.0
Brown long-eared	WSS105	0.0
Brown long-eared	WSS106	0.1
Common pipistrelle	WSS026	0.0
Common pipistrelle	WSS027	0.0
Common pipistrelle	WSS029	0.4
Common pipistrelle	WSS031	0.0
Common pipistrelle	WSS033	0.0

Species	Detector ID	Median Pass Rate
Common pipistrelle	WSS034	0.0
Common pipistrelle	WSS035	0.0
Common pipistrelle	WSS036	0.1
Common pipistrelle	WSS037	0.0
Common pipistrelle	WSS038	0.1
Common pipistrelle	WSS053	0.4
Common pipistrelle	WSS056	0.1
Common pipistrelle	WSS058	0.0
Common pipistrelle	WSS059	0.4
Common pipistrelle	WSS060	0.0
Common pipistrelle	WSS061	0.0
Common pipistrelle	WSS062	0.0
Common pipistrelle	WSS063	0.1
Common pipistrelle	WSS064	0.0
Common pipistrelle	WSS071	0.0
Common pipistrelle	WSS073	0.0
Common pipistrelle	WSS074	0.0
Common pipistrelle	WSS076	0.0
Common pipistrelle	WSS077	0.0
Common pipistrelle	WSS097	0.0
Common pipistrelle	WSS100	0.0
Common pipistrelle	WSS101	0.0
Common pipistrelle	WSS103	0.0
Common pipistrelle	WSS104	0.2
Common pipistrelle	WSS105	0.0
Common pipistrelle	WSS106	0.1
Leisler's	WSS026	0.0
Leisler's	WSS027	0.1
Leisler's	WSS029	0.0
Leisler's	WSS031	0.0
Leisler's	WSS033	0.0
Leisler's	WSS034	0.0
Leisler's	WSS035	0.0
Leisler's	WSS036	0.0
Leisler's	WSS037	0.0
Leisler's	WSS038	0.2

Species	Detector ID	Median Pass Rate
Leisler's	WSS053	0.0
Leisler's	WSS056	0.0
Leisler's	WSS058	0.0
Leisler's	WSS059	0.0
Leisler's	WSS060	1.1
Leisler's	WSS061	0.0
Leisler's	WSS062	0.0
Leisler's	WSS063	0.0
Leisler's	WSS064	0.0
Leisler's	WSS071	0.0
Leisler's	WSS073	0.0
Leisler's	WSS074	0.0
Leisler's	WSS076	0.0
Leisler's	WSS077	0.0
Leisler's	WSS097	0.0
Leisler's	WSS100	0.0
Leisler's	WSS101	0.5
Leisler's	WSS103	0.3
Leisler's	WSS104	0.1
Leisler's	WSS105	0.0
Leisler's	WSS106	0.0
Myotis	WSS026	0.5
Myotis	WSS027	0.0
Myotis	WSS029	0.5
Myotis	WSS031	2.5
Myotis	WSS033	0.0
Myotis	WSS034	0.0
Myotis	WSS035	0.0
Myotis	WSS036	1.0
Myotis	WSS037	0.2
Myotis	WSS038	0.1
Myotis	WSS053	0.7
Myotis	WSS056	0.1
Myotis	WSS058	0.3
Myotis	WSS059	0.4
Myotis	WSS060	0.0

Species	Detector ID	Median Pass Rate
Myotis	WSS061	5.0
Myotis	WSS062	0.0
Myotis	WSS063	0.1
Myotis	WSS064	0.0
Myotis	WSS071	1.3
Myotis	WSS073	0.3
Myotis	WSS074	1.1
Myotis	WSS076	1.3
Myotis	WSS077	0.0
Myotis	WSS097	0.0
Myotis	WSS100	0.1
Myotis	WSS101	0.0
Myotis	WSS103	0.6
Myotis	WSS104	0.7
Myotis	WSS105	1.3
Myotis	WSS106	3.2
Soprano pipistrelle	WSS026	0.8
Soprano pipistrelle	WSS027	0.8
Soprano pipistrelle	WSS029	2.9
Soprano pipistrelle	WSS031	19.1
Soprano pipistrelle	WSS033	26.5
Soprano pipistrelle	WSS034	12.5
Soprano pipistrelle	WSS035	18.4
Soprano pipistrelle	WSS036	1.8
Soprano pipistrelle	WSS037	3.3
Soprano pipistrelle	WSS038	2.4
Soprano pipistrelle	WSS053	9.8
Soprano pipistrelle	WSS056	21.2
Soprano pipistrelle	WSS058	12.1
Soprano pipistrelle	WSS059	1.6
Soprano pipistrelle	WSS060	31.9
Soprano pipistrelle	WSS061	13.0
Soprano pipistrelle	WSS062	11.1
Soprano pipistrelle	WSS063	28.5
Soprano pipistrelle	WSS064	2.7
Soprano pipistrelle	WSS071	4.0

Species	Detector ID	Median Pass Rate
Soprano pipistrelle	WSS073	5.3
Soprano pipistrelle	WSS074	2.0
Soprano pipistrelle	WSS076	13.0
Soprano pipistrelle	WSS077	0.9
Soprano pipistrelle	WSS097	0.9
Soprano pipistrelle	WSS100	18.4
Soprano pipistrelle	WSS101	1.1
Soprano pipistrelle	WSS103	4.8
Soprano pipistrelle	WSS104	10.2
Soprano pipistrelle	WSS105	6.5
Soprano pipistrelle	WSS106	14.7

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	WSS026	0.1
Brown long-eared	WSS027	0.5
Brown long-eared	WSS029	0.3
Brown long-eared	WSS031	0.2
Brown long-eared	WSS033	0.0
Brown long-eared	WSS034	0.0
Brown long-eared	WSS035	0.0
Brown long-eared	WSS036	0.0
Brown long-eared	WSS037	0.1
Brown long-eared	WSS038	0.8
Brown long-eared	WSS053	0.0
Brown long-eared	WSS056	0.0
Brown long-eared	WSS058	0.0
Brown long-eared	WSS059	0.1
Brown long-eared	WSS060	0.4
Brown long-eared	WSS061	0.2
Brown long-eared	WSS062	0.0
Brown long-eared	WSS063	0.4
Brown long-eared	WSS064	0.1
Brown long-eared	WSS071	0.0
Brown long-eared	WSS073	0.0
Brown long-eared	WSS074	0.0
Brown long-eared	WSS076	0.1
Brown long-eared	WSS077	0.1
Brown long-eared	WSS097	0.3
Brown long-eared	WSS100	0.0
Brown long-eared	WSS101	1.5
Brown long-eared	WSS103	0.5
Brown long-eared	WSS104	0.1
Brown long-eared	WSS105	0.0
Brown long-eared	WSS106	0.1
Common pipistrelle	WSS026	0.0
Common pipistrelle	WSS027	0.0
Common pipistrelle	WSS029	0.7
Common pipistrelle	WSS031	0.1
Common pipistrelle	WSS033	0.0

Species	Detector ID	Mean Pass Rate
Common pipistrelle	WSS034	0.0
Common pipistrelle	WSS035	0.6
Common pipistrelle	WSS036	0.1
Common pipistrelle	WSS037	0.1
Common pipistrelle	WSS038	0.1
Common pipistrelle	WSS053	0.4
Common pipistrelle	WSS056	0.1
Common pipistrelle	WSS058	0.0
Common pipistrelle	WSS059	0.4
Common pipistrelle	WSS060	0.0
Common pipistrelle	WSS061	0.0
Common pipistrelle	WSS062	0.0
Common pipistrelle	WSS063	0.1
Common pipistrelle	WSS064	0.0
Common pipistrelle	WSS071	0.0
Common pipistrelle	WSS073	0.0
Common pipistrelle	WSS074	0.0
Common pipistrelle	WSS076	0.0
Common pipistrelle	WSS077	0.0
Common pipistrelle	WSS097	0.0
Common pipistrelle	WSS100	0.0
Common pipistrelle	WSS101	0.0
Common pipistrelle	WSS103	0.0
Common pipistrelle	WSS104	0.2
Common pipistrelle	WSS105	0.2
Common pipistrelle	WSS106	0.1
Leisler's	WSS026	0.0
Leisler's	WSS027	0.1
Leisler's	WSS029	0.1
Leisler's	WSS031	0.0
Leisler's	WSS033	0.0
Leisler's	WSS034	0.8
Leisler's	WSS035	0.1
Leisler's	WSS036	0.0
Leisler's	WSS037	0.0
Leisler's	WSS038	0.2

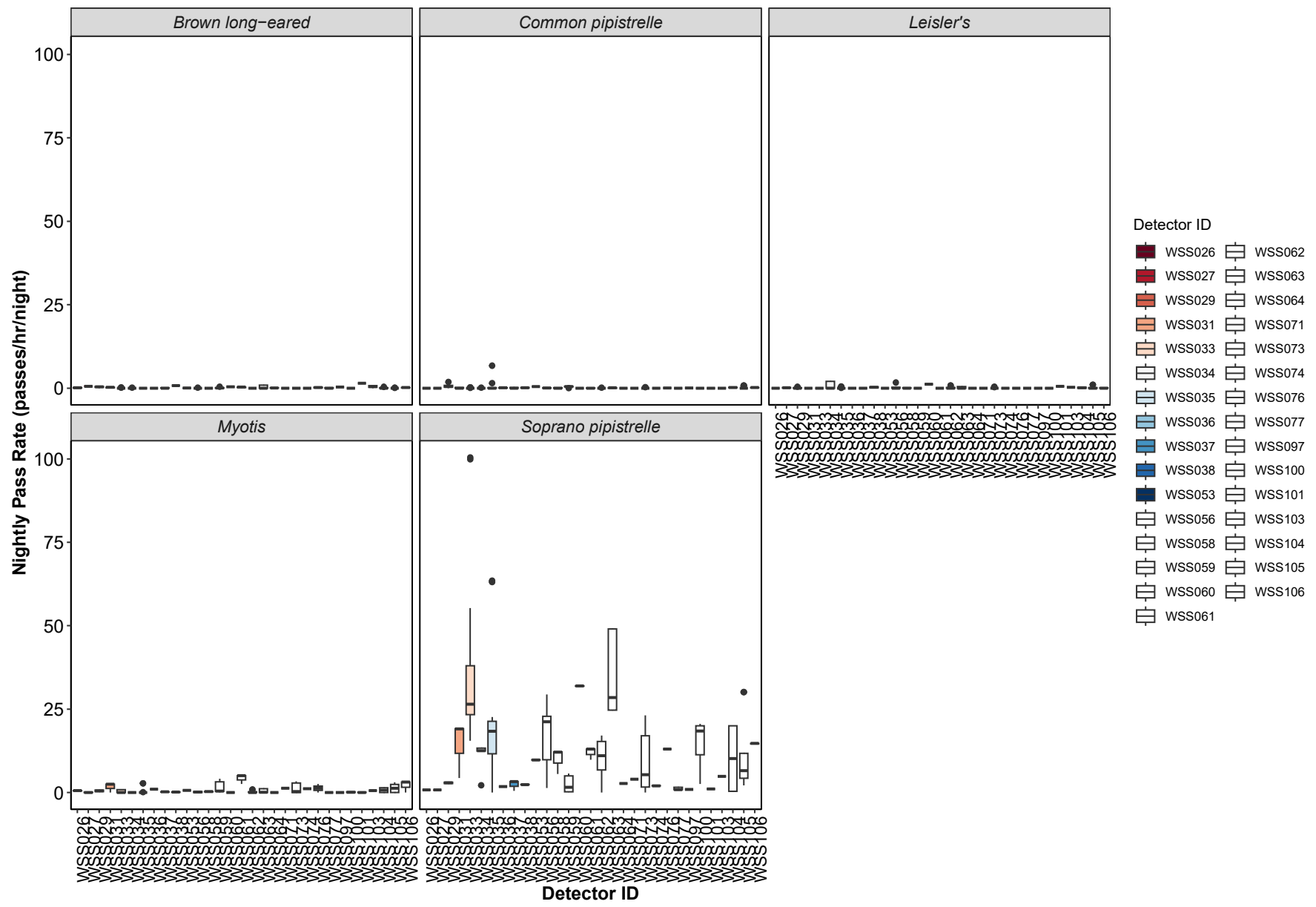
Species	Detector ID	Mean Pass Rate
Leisler's	WSS053	0.0
Leisler's	WSS056	0.2
Leisler's	WSS058	0.0
Leisler's	WSS059	0.0
Leisler's	WSS060	1.1
Leisler's	WSS061	0.0
Leisler's	WSS062	0.2
Leisler's	WSS063	0.2
Leisler's	WSS064	0.0
Leisler's	WSS071	0.0
Leisler's	WSS073	0.1
Leisler's	WSS074	0.0
Leisler's	WSS076	0.0
Leisler's	WSS077	0.0
Leisler's	WSS097	0.0
Leisler's	WSS100	0.0
Leisler's	WSS101	0.5
Leisler's	WSS103	0.3
Leisler's	WSS104	0.1
Leisler's	WSS105	0.2
Leisler's	WSS106	0.0
Myotis	WSS026	0.5
Myotis	WSS027	0.0
Myotis	WSS029	0.5
Myotis	WSS031	1.7
Myotis	WSS033	0.3
Myotis	WSS034	0.0
Myotis	WSS035	0.4
Myotis	WSS036	1.0
Myotis	WSS037	0.2
Myotis	WSS038	0.1
Myotis	WSS053	0.7
Myotis	WSS056	0.2
Myotis	WSS058	0.2
Myotis	WSS059	1.6
Myotis	WSS060	0.0

Species	Detector ID	Mean Pass Rate
Myotis	WSS061	4.2
Myotis	WSS062	0.2
Myotis	WSS063	0.5
Myotis	WSS064	0.0
Myotis	WSS071	1.3
Myotis	WSS073	1.2
Myotis	WSS074	1.1
Myotis	WSS076	1.3
Myotis	WSS077	0.0
Myotis	WSS097	0.0
Myotis	WSS100	0.1
Myotis	WSS101	0.0
Myotis	WSS103	0.6
Myotis	WSS104	0.7
Myotis	WSS105	1.4
Myotis	WSS106	2.1
Soprano pipistrelle	WSS026	0.8
Soprano pipistrelle	WSS027	0.8
Soprano pipistrelle	WSS029	2.9
Soprano pipistrelle	WSS031	14.2
Soprano pipistrelle	WSS033	38.2
Soprano pipistrelle	WSS034	10.8
Soprano pipistrelle	WSS035	20.8
Soprano pipistrelle	WSS036	1.8
Soprano pipistrelle	WSS037	2.4
Soprano pipistrelle	WSS038	2.4
Soprano pipistrelle	WSS053	9.8
Soprano pipistrelle	WSS056	16.7
Soprano pipistrelle	WSS058	9.9
Soprano pipistrelle	WSS059	2.5
Soprano pipistrelle	WSS060	31.9
Soprano pipistrelle	WSS061	12.0
Soprano pipistrelle	WSS062	10.4
Soprano pipistrelle	WSS063	35.2
Soprano pipistrelle	WSS064	2.7
Soprano pipistrelle	WSS071	4.0

Species	Detector ID	Mean Pass Rate
Soprano pipistrelle	WSS073	9.5
Soprano pipistrelle	WSS074	2.0
Soprano pipistrelle	WSS076	13.0
Soprano pipistrelle	WSS077	1.1
Soprano pipistrelle	WSS097	0.9
Soprano pipistrelle	WSS100	14.9
Soprano pipistrelle	WSS101	1.1
Soprano pipistrelle	WSS103	4.8
Soprano pipistrelle	WSS104	10.2
Soprano pipistrelle	WSS105	11.6
Soprano pipistrelle	WSS106	14.7

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.



Survey Effort

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

month	Detector ID	No. of Survey Nights
May	WSS026	2
May	WSS033	5
May	WSS056	2
Jun	WSS029	2
Jun	WSS034	2
Jun	WSS036	2
Jun	WSS056	5
Jun	WSS058	3
Jun	WSS059	3
Jun	WSS064	2
Jun	WSS071	2
Jun	WSS073	10
Jun	WSS074	4
Jun	WSS077	5
Jun	WSS100	4
Jun	WSS103	2
Jun	WSS105	4
Jul	WSS034	3
Jul	WSS035	6
Jul	WSS037	3
Jul	WSS038	2
Jul	WSS060	2
Jul	WSS062	8
Jul	WSS104	2
Jul	WSS105	3
Sep	WSS029	1
Sep	WSS035	8
Sep	WSS100	1
Sep	WSS105	1
Oct	WSS027	2
Oct	WSS029	1
Oct	WSS031	3

month	Detector ID	No. of Survey Nights
Oct	WSS033	9
Oct	WSS035	1
Oct	WSS053	2
Oct	WSS056	4
Oct	WSS059	3
Oct	WSS061	3
Oct	WSS063	5
Oct	WSS076	2
Oct	WSS097	2
Oct	WSS100	1
Oct	WSS101	2
Oct	WSS104	2
Oct	WSS105	1
Oct	WSS106	3

Nightly Bat Pass Rate for Each Month

Median per Detector

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

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

Species	Detector ID	Jul	Jun	May	Oct	Sep
Brown long-eared	WSS026	NA	NA	0.1	NA	NA
Brown long-eared	WSS027	NA	NA	NA	0.5	NA
Brown long-eared	WSS029	NA	0.1	NA	0.5	0.5
Brown long-eared	WSS031	NA	NA	NA	0.2	NA
Brown long-eared	WSS033	NA	NA	0.0	0.0	NA
Brown long-eared	WSS034	0.0	0.1	NA	NA	NA
Brown long-eared	WSS035	0.0	NA	NA	0.0	0.0
Brown long-eared	WSS036	NA	0.0	NA	NA	NA
Brown long-eared	WSS037	0.0	NA	NA	NA	NA
Brown long-eared	WSS038	0.8	NA	NA	NA	NA
Brown long-eared	WSS053	NA	NA	NA	0.0	NA
Brown long-eared	WSS056	NA	0.0	0.0	0.0	NA
Brown long-eared	WSS058	NA	0.0	NA	NA	NA
Brown long-eared	WSS059	NA	0.0	NA	0.1	NA
Brown long-eared	WSS060	0.4	NA	NA	NA	NA
Brown long-eared	WSS061	NA	NA	NA	0.3	NA
Brown long-eared	WSS062	0.0	NA	NA	NA	NA
Brown long-eared	WSS063	NA	NA	NA	0.0	NA
Brown long-eared	WSS064	NA	0.1	NA	NA	NA
Brown long-eared	WSS071	NA	0.0	NA	NA	NA
Brown long-eared	WSS073	NA	0.0	NA	NA	NA
Brown long-eared	WSS074	NA	0.0	NA	NA	NA
Brown long-eared	WSS076	NA	NA	NA	0.1	NA
Brown long-eared	WSS077	NA	0.0	NA	NA	NA
Brown long-eared	WSS097	NA	NA	NA	0.3	NA
Brown long-eared	WSS100	NA	0.0	NA	0.0	0.0
Brown long-eared	WSS101	NA	NA	NA	1.5	NA
Brown long-eared	WSS103	NA	0.5	NA	NA	NA
Brown long-eared	WSS104	0.2	NA	NA	0.0	NA
Brown long-eared	WSS105	0.0	0.0	NA	0.1	0.0
Brown long-eared	WSS106	NA	NA	NA	0.1	NA
Common pipistrelle	WSS026	NA	NA	0.0	NA	NA
Common pipistrelle	WSS027	NA	NA	NA	0.0	NA
Common pipistrelle	WSS029	NA	0.4	NA	1.9	0.0
Common pipistrelle	WSS031	NA	NA	NA	0.0	NA
Common pipistrelle	WSS033	NA	NA	0.0	0.0	NA

Species	Detector ID	Jul	Jun	May	Oct	Sep
Common pipistrelle	WSS034	0.0	0.0	NA	NA	NA
Common pipistrelle	WSS035	0.0	NA	NA	0.2	0.0
Common pipistrelle	WSS036	NA	0.1	NA	NA	NA
Common pipistrelle	WSS037	0.0	NA	NA	NA	NA
Common pipistrelle	WSS038	0.1	NA	NA	NA	NA
Common pipistrelle	WSS053	NA	NA	NA	0.4	NA
Common pipistrelle	WSS056	NA	0.1	0.0	0.1	NA
Common pipistrelle	WSS058	NA	0.0	NA	NA	NA
Common pipistrelle	WSS059	NA	0.6	NA	0.4	NA
Common pipistrelle	WSS060	0.0	NA	NA	NA	NA
Common pipistrelle	WSS061	NA	NA	NA	0.0	NA
Common pipistrelle	WSS062	0.0	NA	NA	NA	NA
Common pipistrelle	WSS063	NA	NA	NA	0.1	NA
Common pipistrelle	WSS064	NA	0.0	NA	NA	NA
Common pipistrelle	WSS071	NA	0.0	NA	NA	NA
Common pipistrelle	WSS073	NA	0.0	NA	NA	NA
Common pipistrelle	WSS074	NA	0.0	NA	NA	NA
Common pipistrelle	WSS076	NA	NA	NA	0.0	NA
Common pipistrelle	WSS077	NA	0.0	NA	NA	NA
Common pipistrelle	WSS097	NA	NA	NA	0.0	NA
Common pipistrelle	WSS100	NA	0.0	NA	0.0	0.0
Common pipistrelle	WSS101	NA	NA	NA	0.0	NA
Common pipistrelle	WSS103	NA	0.0	NA	NA	NA
Common pipistrelle	WSS104	0.3	NA	NA	0.1	NA
Common pipistrelle	WSS105	0.8	0.0	NA	0.0	0.0
Common pipistrelle	WSS106	NA	NA	NA	0.1	NA
Leisler's	WSS026	NA	NA	0.0	NA	NA
Leisler's	WSS027	NA	NA	NA	0.1	NA
Leisler's	WSS029	NA	0.0	NA	0.4	0.0
Leisler's	WSS031	NA	NA	NA	0.0	NA
Leisler's	WSS033	NA	NA	0.0	0.0	NA
Leisler's	WSS034	2.0	0.0	NA	NA	NA
Leisler's	WSS035	0.0	NA	NA	0.1	0.0
Leisler's	WSS036	NA	0.0	NA	NA	NA
Leisler's	WSS037	0.0	NA	NA	NA	NA
Leisler's	WSS038	0.2	NA	NA	NA	NA

Species	Detector ID	Jul	Jun	May	Oct	Sep
Leisler's	WSS053	NA	NA	NA	0.0	NA
Leisler's	WSS056	NA	0.0	0.0	0.2	NA
Leisler's	WSS058	NA	0.0	NA	NA	NA
Leisler's	WSS059	NA	0.0	NA	0.0	NA
Leisler's	WSS060	1.1	NA	NA	NA	NA
Leisler's	WSS061	NA	NA	NA	0.0	NA
Leisler's	WSS062	0.0	NA	NA	NA	NA
Leisler's	WSS063	NA	NA	NA	0.0	NA
Leisler's	WSS064	NA	0.0	NA	NA	NA
Leisler's	WSS071	NA	0.0	NA	NA	NA
Leisler's	WSS073	NA	0.0	NA	NA	NA
Leisler's	WSS074	NA	0.0	NA	NA	NA
Leisler's	WSS076	NA	NA	NA	0.0	NA
Leisler's	WSS077	NA	0.0	NA	NA	NA
Leisler's	WSS097	NA	NA	NA	0.0	NA
Leisler's	WSS100	NA	0.0	NA	0.0	0.0
Leisler's	WSS101	NA	NA	NA	0.5	NA
Leisler's	WSS103	NA	0.3	NA	NA	NA
Leisler's	WSS104	0.3	NA	NA	0.0	NA
Leisler's	WSS105	0.0	0.5	NA	0.0	0.0
Leisler's	WSS106	NA	NA	NA	0.0	NA
Myotis	WSS026	NA	NA	0.5	NA	NA
Myotis	WSS027	NA	NA	NA	0.0	NA
Myotis	WSS029	NA	0.7	NA	0.3	0.3
Myotis	WSS031	NA	NA	NA	2.5	NA
Myotis	WSS033	NA	NA	0.0	0.0	NA
Myotis	WSS034	0.0	0.0	NA	NA	NA
Myotis	WSS035	0.1	NA	NA	0.0	0.0
Myotis	WSS036	NA	1.0	NA	NA	NA
Myotis	WSS037	0.2	NA	NA	NA	NA
Myotis	WSS038	0.1	NA	NA	NA	NA
Myotis	WSS053	NA	NA	NA	0.7	NA
Myotis	WSS056	NA	0.0	0.1	0.3	NA
Myotis	WSS058	NA	0.3	NA	NA	NA
Myotis	WSS059	NA	4.1	NA	0.4	NA
Myotis	WSS060	0.0	NA	NA	NA	NA

Species	Detector ID	Jul	Jun	May	Oct	Sep
Myotis	WSS061	NA	NA	NA	5.0	NA
Myotis	WSS062	0.0	NA	NA	NA	NA
Myotis	WSS063	NA	NA	NA	0.1	NA
Myotis	WSS064	NA	0.0	NA	NA	NA
Myotis	WSS071	NA	1.3	NA	NA	NA
Myotis	WSS073	NA	0.3	NA	NA	NA
Myotis	WSS074	NA	1.1	NA	NA	NA
Myotis	WSS076	NA	NA	NA	1.3	NA
Myotis	WSS077	NA	0.0	NA	NA	NA
Myotis	WSS097	NA	NA	NA	0.0	NA
Myotis	WSS100	NA	0.1	NA	0.0	0.2
Myotis	WSS101	NA	NA	NA	0.0	NA
Myotis	WSS103	NA	0.6	NA	NA	NA
Myotis	WSS104	1.4	NA	NA	0.0	NA
Myotis	WSS105	3.0	0.0	NA	2.4	2.4
Myotis	WSS106	NA	NA	NA	3.2	NA
Soprano pipistrelle	WSS026	NA	NA	0.8	NA	NA
Soprano pipistrelle	WSS027	NA	NA	NA	0.8	NA
Soprano pipistrelle	WSS029	NA	3.1	NA	2.7	2.8
Soprano pipistrelle	WSS031	NA	NA	NA	19.1	NA
Soprano pipistrelle	WSS033	NA	NA	25.6	27.3	NA
Soprano pipistrelle	WSS034	12.4	13.3	NA	NA	NA
Soprano pipistrelle	WSS035	12.9	NA	NA	18.4	20.2
Soprano pipistrelle	WSS036	NA	1.8	NA	NA	NA
Soprano pipistrelle	WSS037	3.3	NA	NA	NA	NA
Soprano pipistrelle	WSS038	2.4	NA	NA	NA	NA
Soprano pipistrelle	WSS053	NA	NA	NA	9.8	NA
Soprano pipistrelle	WSS056	NA	21.2	6.2	22.4	NA
Soprano pipistrelle	WSS058	NA	12.1	NA	NA	NA
Soprano pipistrelle	WSS059	NA	5.7	NA	0.2	NA
Soprano pipistrelle	WSS060	31.9	NA	NA	NA	NA
Soprano pipistrelle	WSS061	NA	NA	NA	13.0	NA
Soprano pipistrelle	WSS062	11.1	NA	NA	NA	NA
Soprano pipistrelle	WSS063	NA	NA	NA	28.5	NA
Soprano pipistrelle	WSS064	NA	2.7	NA	NA	NA
Soprano pipistrelle	WSS071	NA	4.0	NA	NA	NA

Species	Detector ID	Jul	Jun	May	Oct	Sep
Soprano pipistrelle	WSS073	NA	5.3	NA	NA	NA
Soprano pipistrelle	WSS074	NA	2.0	NA	NA	NA
Soprano pipistrelle	WSS076	NA	NA	NA	13.0	NA
Soprano pipistrelle	WSS077	NA	0.9	NA	NA	NA
Soprano pipistrelle	WSS097	NA	NA	NA	0.9	NA
Soprano pipistrelle	WSS100	NA	14.8	NA	18.4	18.5
Soprano pipistrelle	WSS101	NA	NA	NA	1.1	NA
Soprano pipistrelle	WSS103	NA	4.8	NA	NA	NA
Soprano pipistrelle	WSS104	20.0	NA	NA	0.4	NA
Soprano pipistrelle	WSS105	11.7	18.3	NA	2.2	2.2
Soprano pipistrelle	WSS106	NA	NA	NA	14.7	NA

Mean per Detector

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

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

Species	Detector ID	Jul	Jun	May	Oct	Sep
Brown long-eared	WSS026	NA	NA	0.1	NA	NA
Brown long-eared	WSS027	NA	NA	NA	0.5	NA
Brown long-eared	WSS029	NA	0.1	NA	0.5	0.5
Brown long-eared	WSS031	NA	NA	NA	0.2	NA
Brown long-eared	WSS033	NA	NA	0.0	0.0	NA
Brown long-eared	WSS034	0.0	0.1	NA	NA	NA
Brown long-eared	WSS035	0.0	NA	NA	0.0	0.0
Brown long-eared	WSS036	NA	0.0	NA	NA	NA
Brown long-eared	WSS037	0.1	NA	NA	NA	NA
Brown long-eared	WSS038	0.8	NA	NA	NA	NA
Brown long-eared	WSS053	NA	NA	NA	0.0	NA
Brown long-eared	WSS056	NA	0.0	0.0	0.0	NA
Brown long-eared	WSS058	NA	0.0	NA	NA	NA
Brown long-eared	WSS059	NA	0.1	NA	0.1	NA
Brown long-eared	WSS060	0.4	NA	NA	NA	NA
Brown long-eared	WSS061	NA	NA	NA	0.2	NA
Brown long-eared	WSS062	0.0	NA	NA	NA	NA
Brown long-eared	WSS063	NA	NA	NA	0.4	NA
Brown long-eared	WSS064	NA	0.1	NA	NA	NA
Brown long-eared	WSS071	NA	0.0	NA	NA	NA
Brown long-eared	WSS073	NA	0.0	NA	NA	NA
Brown long-eared	WSS074	NA	0.0	NA	NA	NA
Brown long-eared	WSS076	NA	NA	NA	0.1	NA
Brown long-eared	WSS077	NA	0.1	NA	NA	NA
Brown long-eared	WSS097	NA	NA	NA	0.3	NA
Brown long-eared	WSS100	NA	0.0	NA	0.0	0.0
Brown long-eared	WSS101	NA	NA	NA	1.5	NA
Brown long-eared	WSS103	NA	0.5	NA	NA	NA
Brown long-eared	WSS104	0.2	NA	NA	0.0	NA
Brown long-eared	WSS105	0.0	0.0	NA	0.1	0.0
Brown long-eared	WSS106	NA	NA	NA	0.1	NA
Common pipistrelle	WSS026	NA	NA	0.0	NA	NA
Common pipistrelle	WSS027	NA	NA	NA	0.0	NA
Common pipistrelle	WSS029	NA	0.4	NA	1.9	0.0
Common pipistrelle	WSS031	NA	NA	NA	0.1	NA
Common pipistrelle	WSS033	NA	NA	0.0	0.1	NA

Species	Detector ID	Jul	Jun	May	Oct	Sep
Common pipistrelle	WSS034	0.0	0.0	NA	NA	NA
Common pipistrelle	WSS035	1.4	NA	NA	0.2	0.0
Common pipistrelle	WSS036	NA	0.1	NA	NA	NA
Common pipistrelle	WSS037	0.1	NA	NA	NA	NA
Common pipistrelle	WSS038	0.1	NA	NA	NA	NA
Common pipistrelle	WSS053	NA	NA	NA	0.4	NA
Common pipistrelle	WSS056	NA	0.1	0.0	0.1	NA
Common pipistrelle	WSS058	NA	0.0	NA	NA	NA
Common pipistrelle	WSS059	NA	0.4	NA	0.4	NA
Common pipistrelle	WSS060	0.0	NA	NA	NA	NA
Common pipistrelle	WSS061	NA	NA	NA	0.0	NA
Common pipistrelle	WSS062	0.0	NA	NA	NA	NA
Common pipistrelle	WSS063	NA	NA	NA	0.1	NA
Common pipistrelle	WSS064	NA	0.0	NA	NA	NA
Common pipistrelle	WSS071	NA	0.0	NA	NA	NA
Common pipistrelle	WSS073	NA	0.0	NA	NA	NA
Common pipistrelle	WSS074	NA	0.0	NA	NA	NA
Common pipistrelle	WSS076	NA	NA	NA	0.0	NA
Common pipistrelle	WSS077	NA	0.0	NA	NA	NA
Common pipistrelle	WSS097	NA	NA	NA	0.0	NA
Common pipistrelle	WSS100	NA	0.0	NA	0.0	0.0
Common pipistrelle	WSS101	NA	NA	NA	0.0	NA
Common pipistrelle	WSS103	NA	0.0	NA	NA	NA
Common pipistrelle	WSS104	0.3	NA	NA	0.1	NA
Common pipistrelle	WSS105	0.5	0.0	NA	0.0	0.0
Common pipistrelle	WSS106	NA	NA	NA	0.1	NA
Leisler's	WSS026	NA	NA	0.0	NA	NA
Leisler's	WSS027	NA	NA	NA	0.1	NA
Leisler's	WSS029	NA	0.0	NA	0.4	0.0
Leisler's	WSS031	NA	NA	NA	0.0	NA
Leisler's	WSS033	NA	NA	0.0	0.0	NA
Leisler's	WSS034	1.3	0.0	NA	NA	NA
Leisler's	WSS035	0.1	NA	NA	0.1	0.0
Leisler's	WSS036	NA	0.0	NA	NA	NA
Leisler's	WSS037	0.0	NA	NA	NA	NA
Leisler's	WSS038	0.2	NA	NA	NA	NA

Species	Detector ID	Jul	Jun	May	Oct	Sep
Leisler's	WSS053	NA	NA	NA	0.0	NA
Leisler's	WSS056	NA	0.4	0.0	0.2	NA
Leisler's	WSS058	NA	0.0	NA	NA	NA
Leisler's	WSS059	NA	0.0	NA	0.0	NA
Leisler's	WSS060	1.1	NA	NA	NA	NA
Leisler's	WSS061	NA	NA	NA	0.0	NA
Leisler's	WSS062	0.2	NA	NA	NA	NA
Leisler's	WSS063	NA	NA	NA	0.2	NA
Leisler's	WSS064	NA	0.0	NA	NA	NA
Leisler's	WSS071	NA	0.0	NA	NA	NA
Leisler's	WSS073	NA	0.1	NA	NA	NA
Leisler's	WSS074	NA	0.0	NA	NA	NA
Leisler's	WSS076	NA	NA	NA	0.0	NA
Leisler's	WSS077	NA	0.0	NA	NA	NA
Leisler's	WSS097	NA	NA	NA	0.0	NA
Leisler's	WSS100	NA	0.0	NA	0.0	0.0
Leisler's	WSS101	NA	NA	NA	0.5	NA
Leisler's	WSS103	NA	0.3	NA	NA	NA
Leisler's	WSS104	0.3	NA	NA	0.0	NA
Leisler's	WSS105	0.0	0.5	NA	0.0	0.0
Leisler's	WSS106	NA	NA	NA	0.0	NA
Myotis	WSS026	NA	NA	0.5	NA	NA
Myotis	WSS027	NA	NA	NA	0.0	NA
Myotis	WSS029	NA	0.7	NA	0.3	0.3
Myotis	WSS031	NA	NA	NA	1.7	NA
Myotis	WSS033	NA	NA	0.4	0.3	NA
Myotis	WSS034	0.0	0.0	NA	NA	NA
Myotis	WSS035	0.9	NA	NA	0.0	0.0
Myotis	WSS036	NA	1.0	NA	NA	NA
Myotis	WSS037	0.2	NA	NA	NA	NA
Myotis	WSS038	0.1	NA	NA	NA	NA
Myotis	WSS053	NA	NA	NA	0.7	NA
Myotis	WSS056	NA	0.2	0.1	0.2	NA
Myotis	WSS058	NA	0.2	NA	NA	NA
Myotis	WSS059	NA	2.7	NA	0.4	NA
Myotis	WSS060	0.0	NA	NA	NA	NA

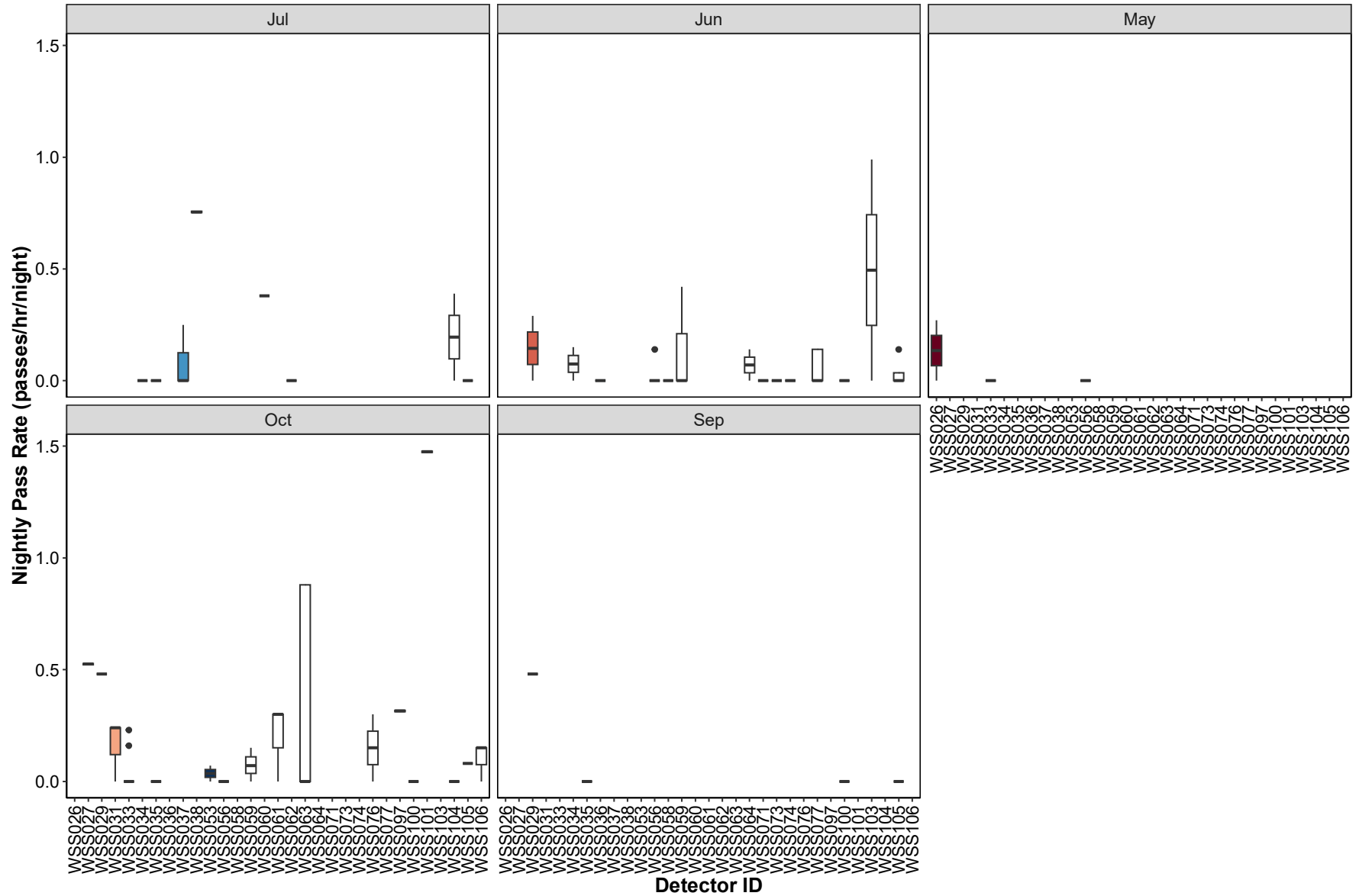
Species	Detector ID	Jul	Jun	May	Oct	Sep
Myotis	WSS061	NA	NA	NA	4.2	NA
Myotis	WSS062	0.2	NA	NA	NA	NA
Myotis	WSS063	NA	NA	NA	0.5	NA
Myotis	WSS064	NA	0.0	NA	NA	NA
Myotis	WSS071	NA	1.3	NA	NA	NA
Myotis	WSS073	NA	1.2	NA	NA	NA
Myotis	WSS074	NA	1.1	NA	NA	NA
Myotis	WSS076	NA	NA	NA	1.3	NA
Myotis	WSS077	NA	0.0	NA	NA	NA
Myotis	WSS097	NA	NA	NA	0.0	NA
Myotis	WSS100	NA	0.1	NA	0.0	0.2
Myotis	WSS101	NA	NA	NA	0.0	NA
Myotis	WSS103	NA	0.6	NA	NA	NA
Myotis	WSS104	1.4	NA	NA	0.0	NA
Myotis	WSS105	2.0	0.3	NA	2.4	2.4
Myotis	WSS106	NA	NA	NA	2.1	NA
Soprano pipistrelle	WSS026	NA	NA	0.8	NA	NA
Soprano pipistrelle	WSS027	NA	NA	NA	0.8	NA
Soprano pipistrelle	WSS029	NA	3.1	NA	2.7	2.8
Soprano pipistrelle	WSS031	NA	NA	NA	14.2	NA
Soprano pipistrelle	WSS033	NA	NA	26.8	44.5	NA
Soprano pipistrelle	WSS034	9.0	13.3	NA	NA	NA
Soprano pipistrelle	WSS035	25.8	NA	NA	18.4	17.4
Soprano pipistrelle	WSS036	NA	1.8	NA	NA	NA
Soprano pipistrelle	WSS037	2.4	NA	NA	NA	NA
Soprano pipistrelle	WSS038	2.4	NA	NA	NA	NA
Soprano pipistrelle	WSS053	NA	NA	NA	9.8	NA
Soprano pipistrelle	WSS056	NA	18.2	6.2	20.1	NA
Soprano pipistrelle	WSS058	NA	9.9	NA	NA	NA
Soprano pipistrelle	WSS059	NA	4.8	NA	0.2	NA
Soprano pipistrelle	WSS060	31.9	NA	NA	NA	NA
Soprano pipistrelle	WSS061	NA	NA	NA	12.0	NA
Soprano pipistrelle	WSS062	10.4	NA	NA	NA	NA
Soprano pipistrelle	WSS063	NA	NA	NA	35.2	NA
Soprano pipistrelle	WSS064	NA	2.7	NA	NA	NA
Soprano pipistrelle	WSS071	NA	4.0	NA	NA	NA

Species	Detector ID	Jul	Jun	May	Oct	Sep
Soprano pipistrelle	WSS073	NA	9.5	NA	NA	NA
Soprano pipistrelle	WSS074	NA	2.0	NA	NA	NA
Soprano pipistrelle	WSS076	NA	NA	NA	13.0	NA
Soprano pipistrelle	WSS077	NA	1.1	NA	NA	NA
Soprano pipistrelle	WSS097	NA	NA	NA	0.9	NA
Soprano pipistrelle	WSS100	NA	13.2	NA	18.4	18.5
Soprano pipistrelle	WSS101	NA	NA	NA	1.1	NA
Soprano pipistrelle	WSS103	NA	4.8	NA	NA	NA
Soprano pipistrelle	WSS104	20.0	NA	NA	0.4	NA
Soprano pipistrelle	WSS105	9.2	18.2	NA	2.2	2.2
Soprano pipistrelle	WSS106	NA	NA	NA	14.7	NA

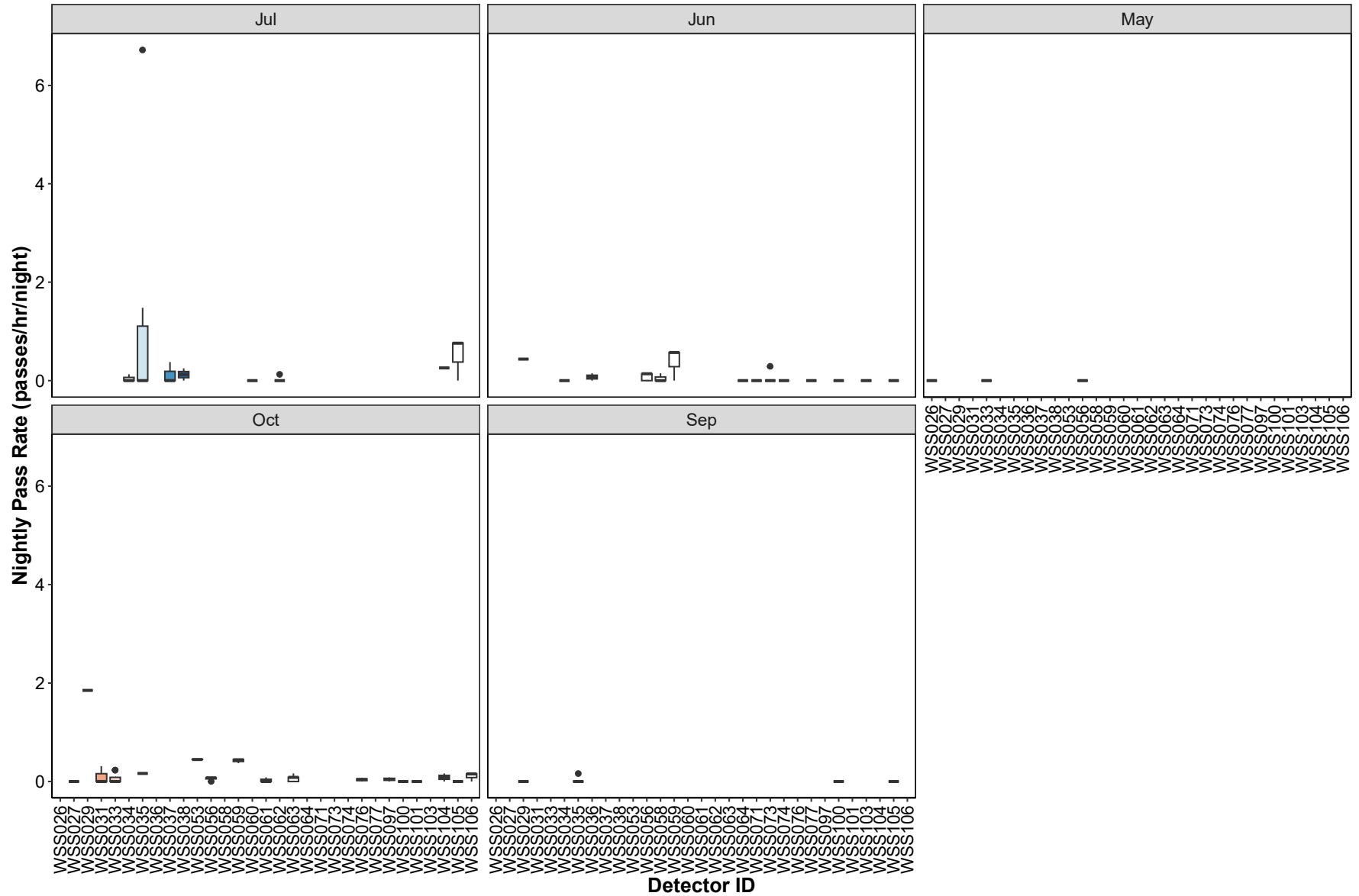
Per Detector

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

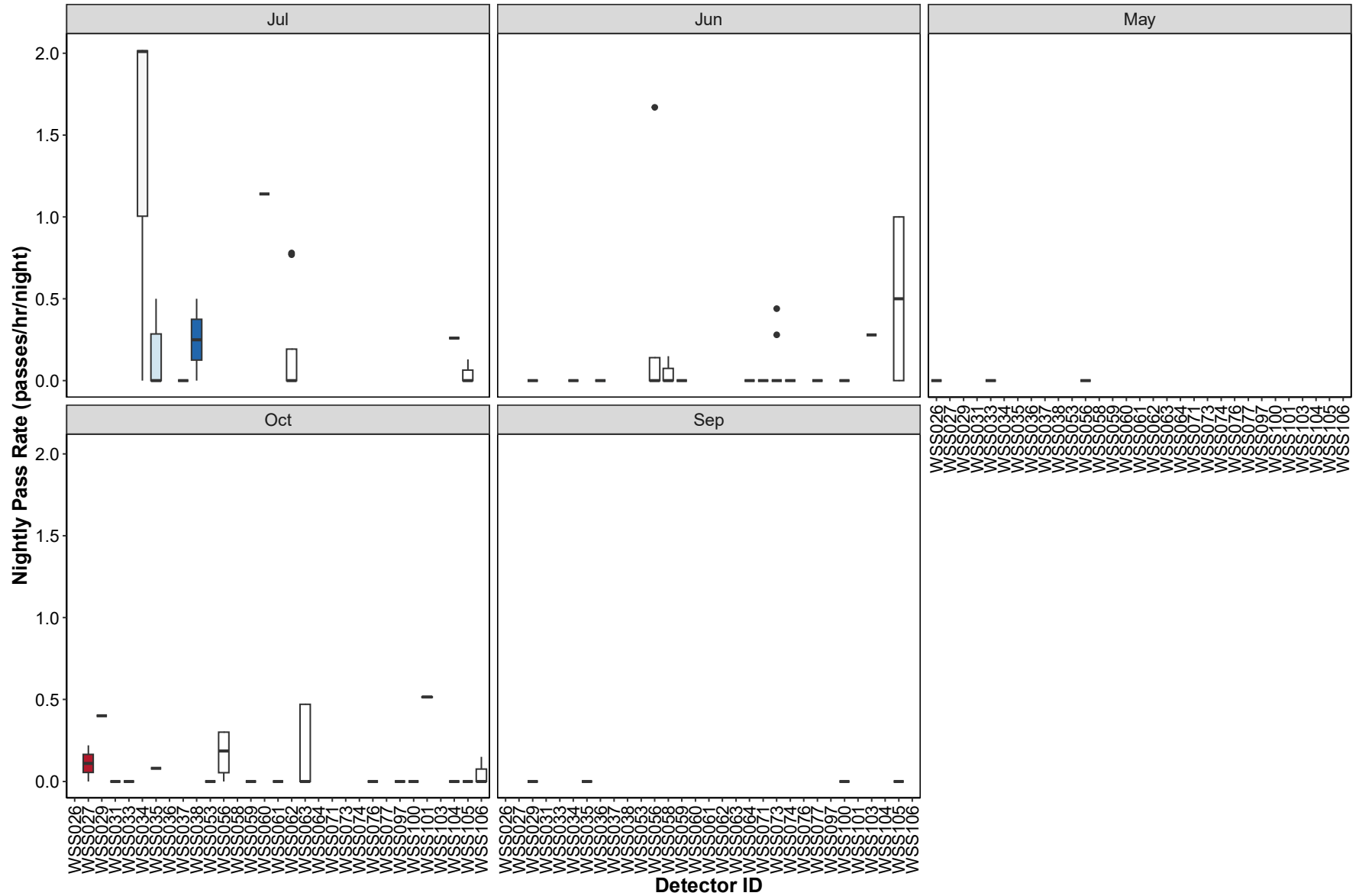
Brown long-eared



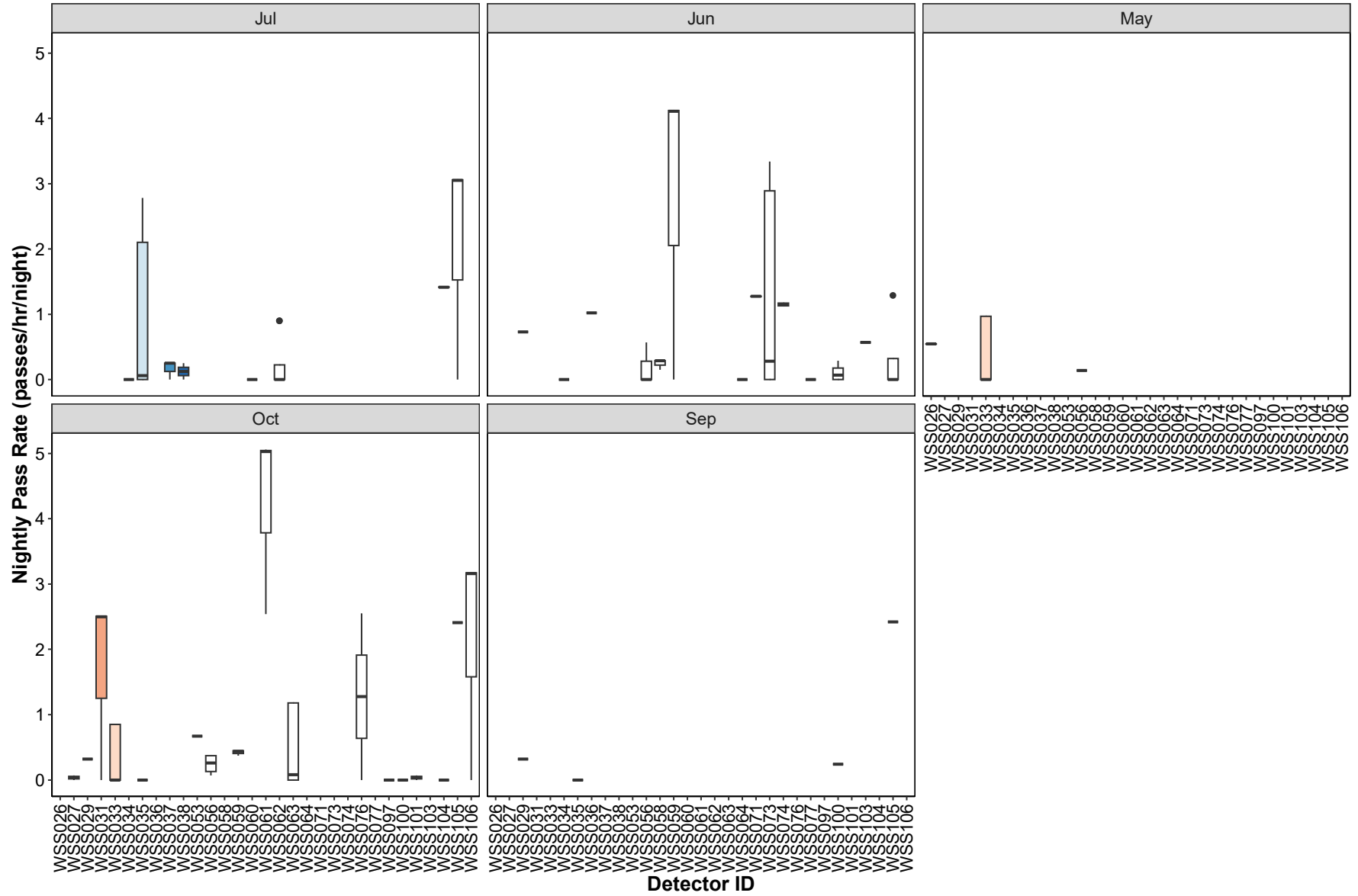
Common pipistrelle



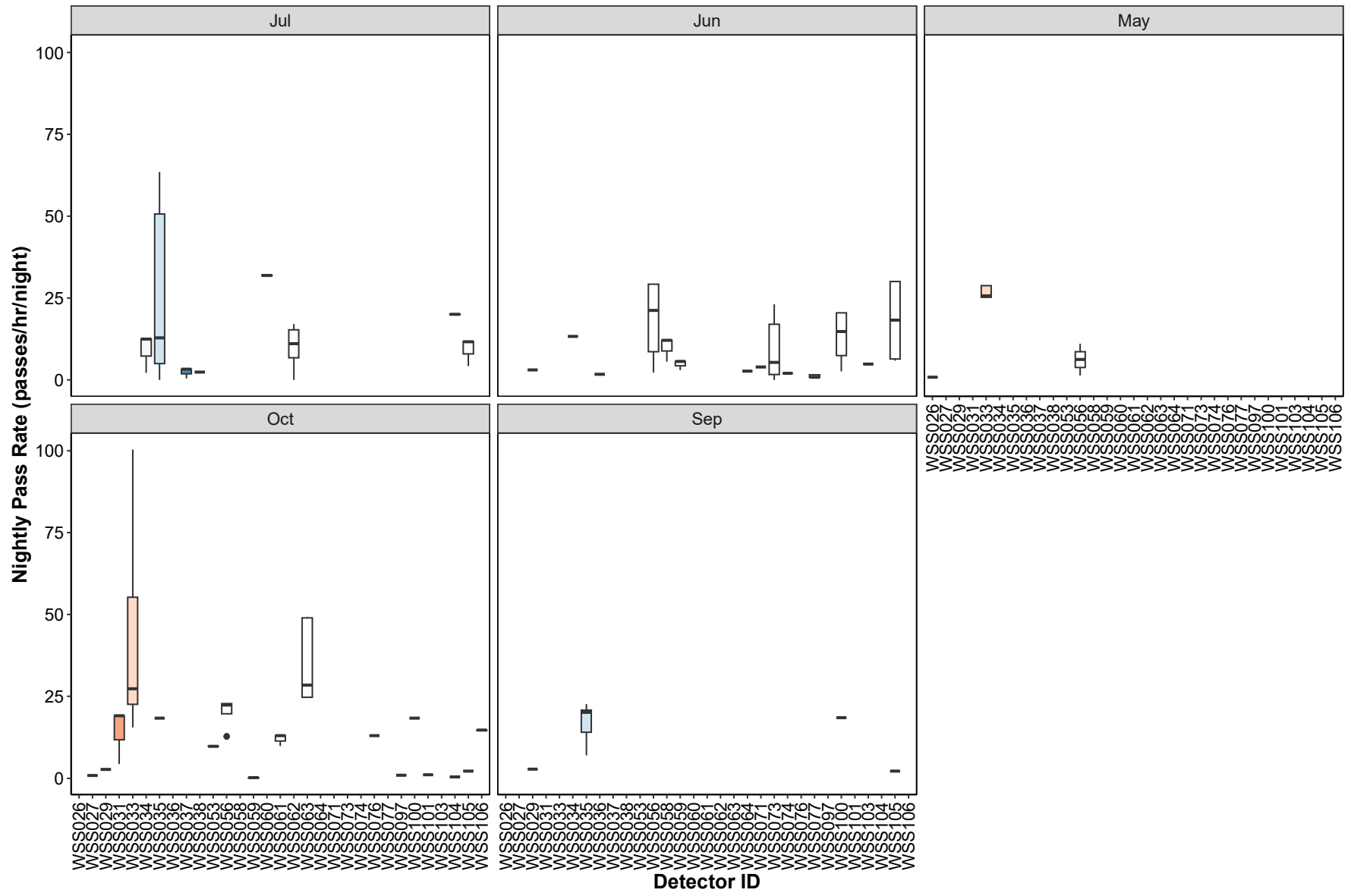
Leisler's



Myotis



Soprano pipistrelle



Bat Activity per Detector Location

Figure 18. Detector ID reference:

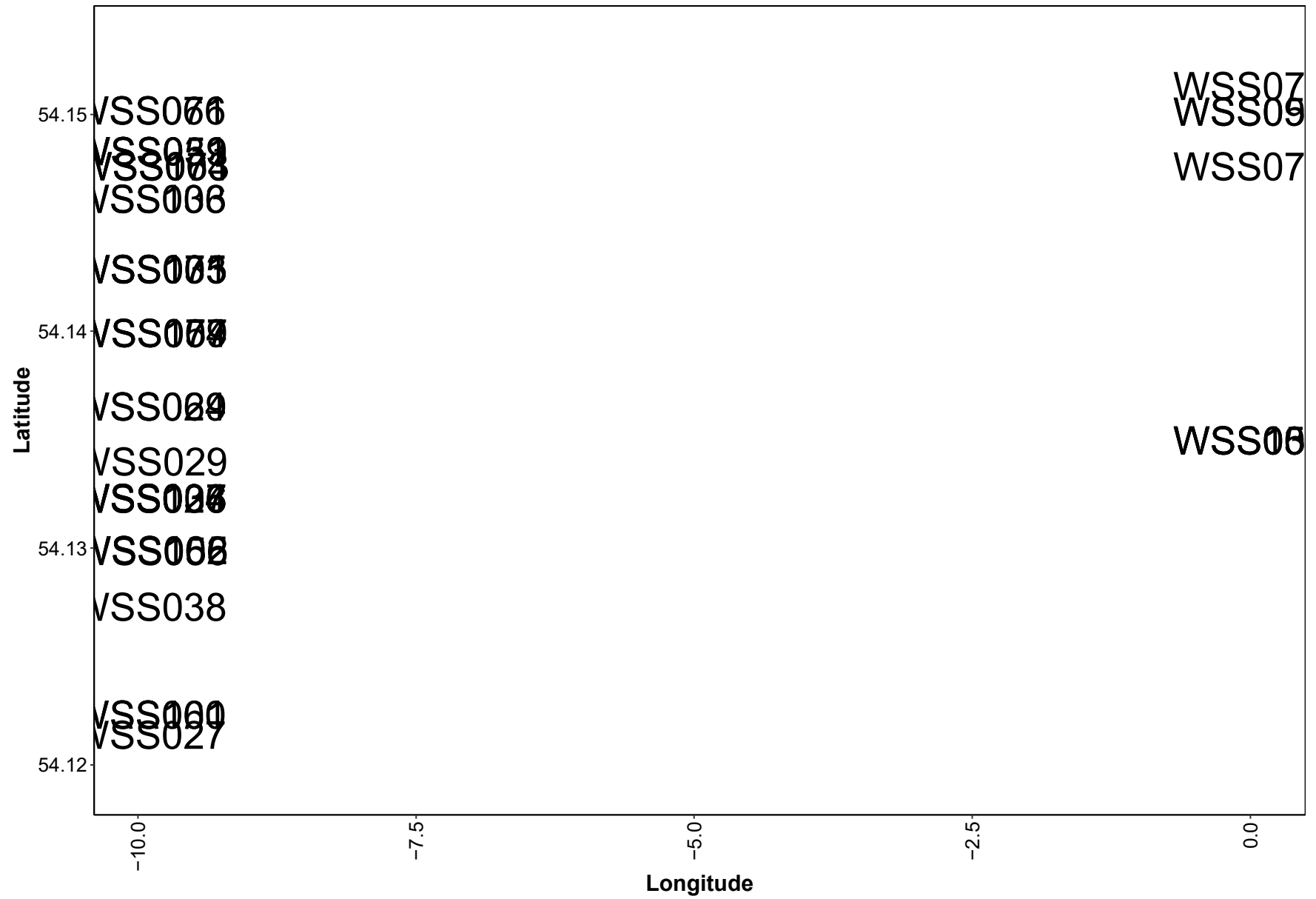


Figure 19. Median Nightly Pass Rate (bat passes/hr/night) throughout the survey period - represented by the size and colour of the point at each detector location.

Median_Pass_Rate · 0 10 20 30

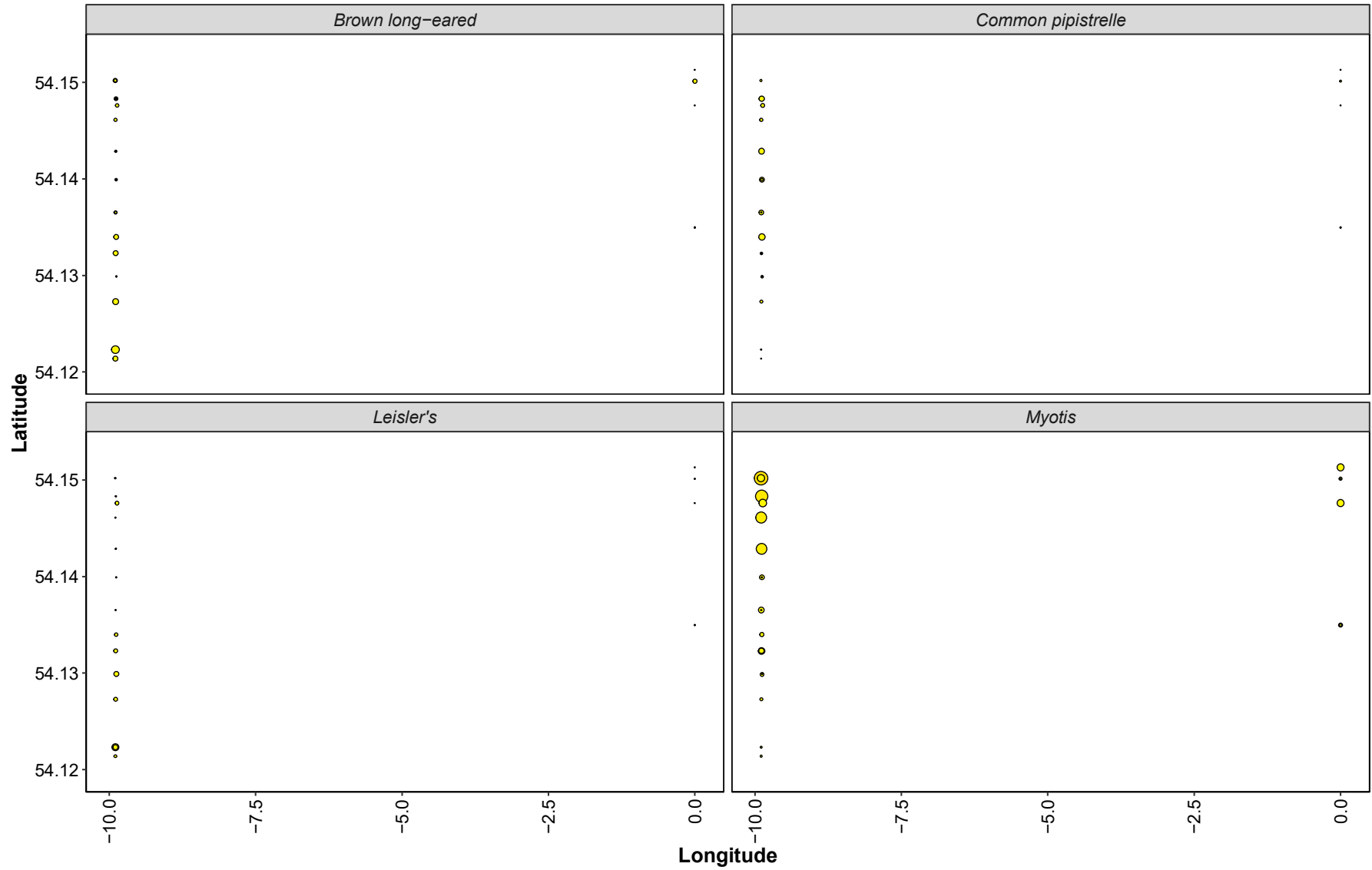
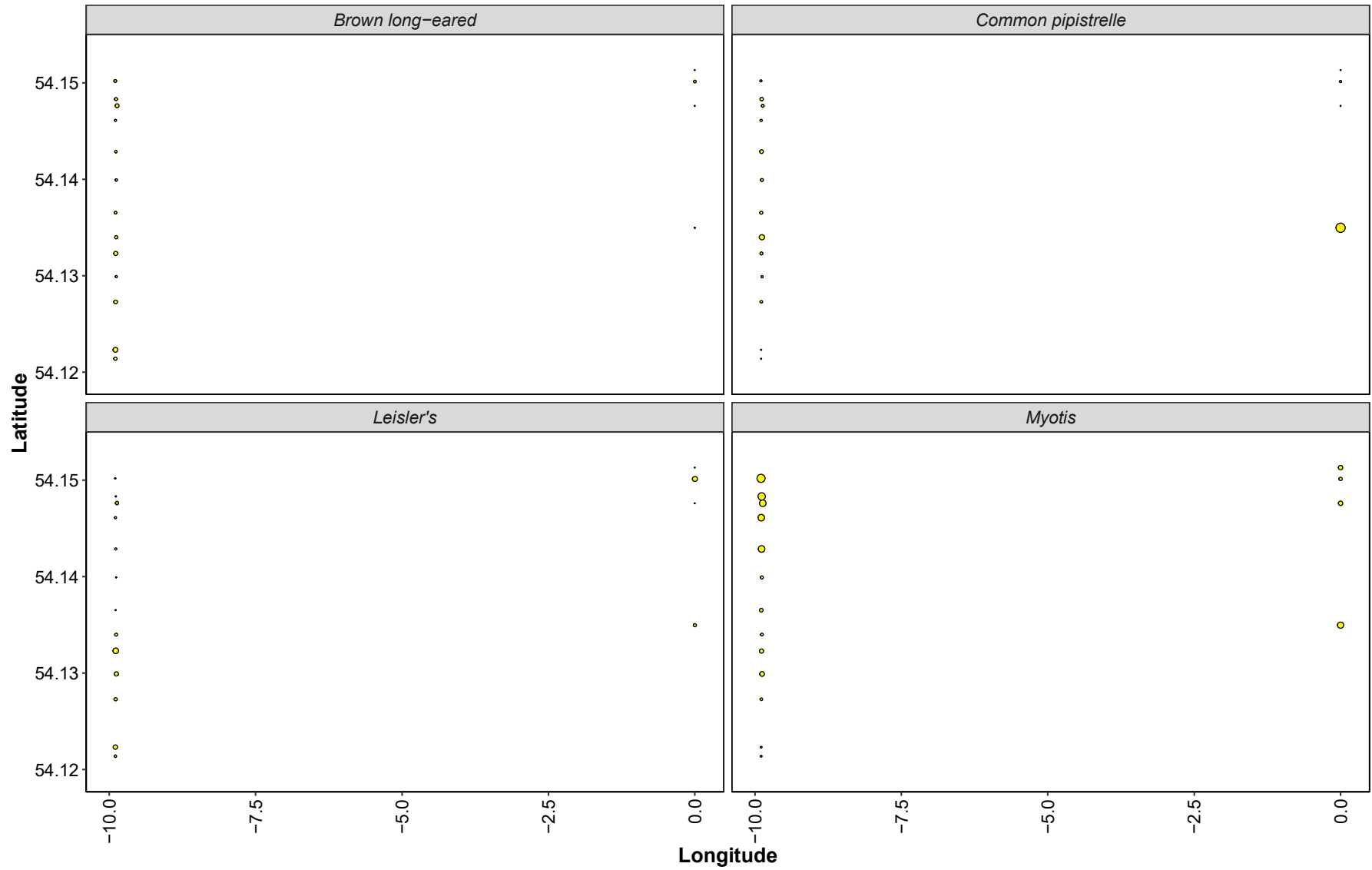


Figure 20. Maximum Nightly Pass Rate (bat passes/hr/night) recorded in a single night throughout the survey period - represented by the size and colour of the point at each detector location.

Max_Pass_Rate · 0 25 50 75 100



Thank you for using Ecobat!



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APEM Group

2022 and 2023 Bat Survey Results Report for the Proposed Muingmore Wind Farm, Co. Mayo



Report prepared by Woodrow APEM Group

For RWE

24 Mar 2026

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DOCUMENT CONTROL

Document	2022 and 2023 Bat Survey Results Report for the Proposed Muingmore Wind Farm, Co. Mayo
Client	RWE
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Approved by	Maeve Maher-McWilliams
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STATEMENT OF AUTHORITY

Bat surveys conducted at Muingmore Wind Farm in 2022 and 2023 were undertaken by appropriately experienced staff from Woodrow APEM Group ('Woodrow'), and site visits for surveying and static deployments were completed by specialist bat surveyors including: Róisín O'Connell, Patrick Power, Daithí Lavelle, Louise Gannon and Oisín O Sullivan. This report was prepared by Louise Gannon and Róisín O'Connell, technically reviewed by Oisín O Sullivan and was approved by Maeve Maher-McWilliams.

Róisín O'Connell is an Ecologist with Woodrow. Róisín has completed a BSc (Hons) in Environmental Science at Atlantic Technological University in Sligo. Her final year thesis involved carrying out aquatic macrophyte surveys of Lough Doon in County Leitrim. Her work as an ecologist with Woodrow is focused on bat data analysis including bat call identification and bat roost/habitat suitability surveys. Róisín has developed a high level of proficiency with Kaleidoscope and BatExplorer, the analysis software used to assess bat calls and activity. Róisín also possesses marine and freshwater habitat survey skills from her time studying at ATU. Since joining Woodrow, Róisín has authored multiple bat activity reports and coordinated the bat surveys conducted at Woodrow in 2022. Róisín is a Qualifying member of CIEEM and holds a license to survey bat roosts from the Department of Culture Housing, Local Government and Heritage.

Patrick Power is an Ecologist with Woodrow. Patrick has completed a BSc in Forestry, BSc (Hons) in land management in Forestry with Waterford Institute of Technology. He is currently doing an MSc in Wildlife Biology and Conservation with Edinburgh Napier University. His work as a graduate ecologist with Woodrow is focused on bat data analysis including bat call identification and bat roost/habitat suitability surveys. Patrick has developed a high level of proficiency with Kaleidoscope and BatExplorer, the analysis software used to assess bat calls and activity. Patrick also possess

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Reptile, mammal and habitat surveying skills. Patrick is a student member of CIEEM and is currently training to gain a license to survey bat roosts from the Department of Culture Heritage and the Gaeltacht.

Daithí Lavelle is a seasonal field worker with Woodrow. Daithí has completed various courses including permaculture design, outdoor vegetable crop production, and much more. Daithí is also a qualified beekeeper and a self-employed environmental education officer. He manages 13 acres of native woodland and delivers many workshops to various community groups for adults and children.

Louise Gannon is an Ecologist with Woodrow. Louise has completed a BSc in Environmental Science. Her main experience lies in carrying out emergence/re-entry bat survey and activity transect surveys for bats, deployment of static bat detectors and reporting on the same. She also carries out bat call analysis using Kaleidoscope and BatExplorer, the analysis software used to assess bat calls and activity. Louise has a licence to survey bat roosts from the Department of Culture, Heritage and the Gaeltacht. She is also a Qualifying member of CIEEM.

Oisín O'Sullivan is a Senior Ecologist with Woodrow. Oisín has completed a BSc in Ecology and Environmental Biology at University College Cork. His final year thesis involved bat surveys of urban habitats in Cork City. His work as a graduate ecologist with Woodrow was focused on bat data analysis including bat call identification and bat roost/habitat suitability surveys. Oisín has developed a high level of proficiency with Kaleidoscope, Ecobat and BatExplorer, all of which are analysis software used to assess bat calls and activity. Since joining Woodrow, Oisín current work involves coordinating, surveying, analysing data, and writing summary bat activity reports for all onshore wind developments that Woodrow has worked on in the 2021 and 2022 survey seasons. This also involves the use of R to provide data on bat activity relative to weather conditions with the goal of informing curtailment as a mitigation measure. During 2022 Woodrow began undertaking offshore bat surveys including Oisín as a technical lead on these projects. These surveys involve the long-term recording of activity on islands and headlands to record migration events. Oisín is a Qualifying member of CIEEM and holds a license to survey bat roosts from the Department of Culture Heritage and the Gaeltacht.

Maeve Maher-McWilliams is an Associate Director with Woodrow. Maeve has completed a BSc (Hons) in Biological Sciences and a MSc in Evolutionary and Behavioural Ecology. Maeve is an experienced ecologist and has worked for over thirteen years on complex environmental impact assessments and mitigation strategies for development projects across Ireland, Northern Ireland and Scotland. Maeve has been involved in projects across several sectors such as renewable energy; linear infrastructure; flood relief schemes and port developments; tourism and recreation; residential, pharmaceutical and data centre developments. She is proficient in Ecological Impact Assessment and Appropriate Assessment.

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1 INTRODUCTION

1.1 The proposed site

The proposed site at Muingmore Wind Farm is located c. 8 km west of Bangor-Erris village and c. 2.5 km east of Doolough strand, Co. Mayo. Habitats within the lands mainly comprise commercial forestry, areas of clear fell forestry and peatland habitats.

1.2 Protected status of bats in Ireland

Bats are protected by law in the Republic of Ireland under the Wildlife Act 1976 and subsequent amendments (2000 and 2010). Under the Wildlife Act and amendments, it is an offence to intentionally disturb, injure or kill a bat or disturb its resting place.

NPWS (2021a & 2021b) guidelines outline the further legal protection afforded to species listed on Annex IV of the of the Habitats Directive (92/43/EEC), as required by Articles 12, 13 and 16. The Habitats Directive is transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations, 2011-2021 (Habitats Regulations) and this legislates for requirements in relation to Strict Protection of animals listed on Annex IV of the Habitats Directive, which are set out in Regulation 51, with Regulation 54 pertaining to derogation licences, including Regulation 54 A when the Minister is applying for a derogation

All species of bat are listed on Annex IV of the EU Habitats Directive (1992). The system of Strict Protection is applied across the entire natural range of Annex IV species, even outside of protected sites. As set out in Regulation 51, carrying out of any work with the potential to capture or kill any specimen of a Strictly Protected species, or to disturb these species, and for which a derogation licence has not been granted, may constitute an offence under Regulation 51 of the Habitats Regulations. Furthermore, any action resulting in damage to, or destruction of, a breeding or resting place of an animal may constitute an offence unless a derogation licence has been granted. This action does not need to be deliberate, i.e. places onus on demonstrating due diligence. Breeding and resting places are protected even when the animals are not using them, once there is a high probability that they will return. Planning authorities may refuse planning permission solely on grounds of the predicted impact on protected species like bats.

The lesser horseshoe bat (*Rhinolophus hipposideros*), which occurs only in Counties Cork, Kerry, Limerick, Clare, Mayo and Galway in the Republic of Ireland (NPWS, 2019), is listed in Annex II of the EU Habitats Directive 1992. The level of protection offered to the lesser horseshoe bat effectively means that areas important for this species are designated as Special Areas of Conservation (SACs). For remaining bats, the EU requires that they are strictly protected. Among Ireland's obligations under the Habitats Directive, is the obligation to '*maintain favourable conservation status*' of Annex-listed species.

Ireland has ratified two international conventions, which afford protection to bats amongst other species. These are known as the 'Bern' and 'Bonn' Conventions. The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) exists to conserve all species and their habitats, including bats. The Convention on the Conservation of Migratory Species of Wild

Animals (Bonn Convention 1979, enacted 1983) was instigated to protect migrant species across all European boundaries, which covers certain species of bat.

1.3 Scope of works

In order to comply with the requirements of the EU Habitats Directive 1992 and the EC Habitats Regulations 2011, wind farm applications in Ireland need to be assessed as to their potential impact on bat populations. To inform the impact assessment at the proposed site a range of bat surveys were undertaken including a desk-based study and field surveys. The appropriate methodological approach for assessing bat population on proposed wind farm sites is Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. (Scottish Natural Heritage (SNH) *et al.*, 2019, as updated NatureScot *et al.*, 2021). Hereafter these guidelines will be referenced as NatureScot *et al.* (2021).

This report was written to serve as technical results report to be included as an appendix of an Environmental Impact Assessment Report (EIAR) for the proposed Muingmore Wind Farm development hereafter referred to as the proposed site. It provides details of methodologies and survey effort for the suite of bat surveys conducted for the proposed site, including tabulated results, maps and charts, as well as reports from roost suitability surveys, bat activity surveys and seasonal static bat detector surveys. These surveys highlight baseline bat populations and habitat suitability of the proposed site.

In summary, bat surveys undertaken are in compliance with NatureScot *et al.*, (2021) guidelines. Static bat recording equipment was deployed three times at selected locations representative of the proposed turbine layout for the proposed site. In 2022 three deployments each lasting a minimum of 10 nights and covered spring (03 – 17 May), summer (06 – 19 July) and autumn (13 – 27 September) active seasons for bats and in 2023 covered the spring (16 – 31 May), summer (11 – 26 July) and autumn (06 – 25 September) active seasons for bats. These were undertaken in conjunction with continuous monitoring of climatic conditions using the Met Eireann meteorological service station in Belmullet to ensure recording windows were inline within compliant weather parameters. In addition, informed by an assessment of potential bat roost features within the proposed site, manual roost emergence/re-entry surveys and bat activity transects were undertaken. The observations recorded during roost emergence/re-entry survey and bat activity surveys contextualise how bats utilise the proposed site.

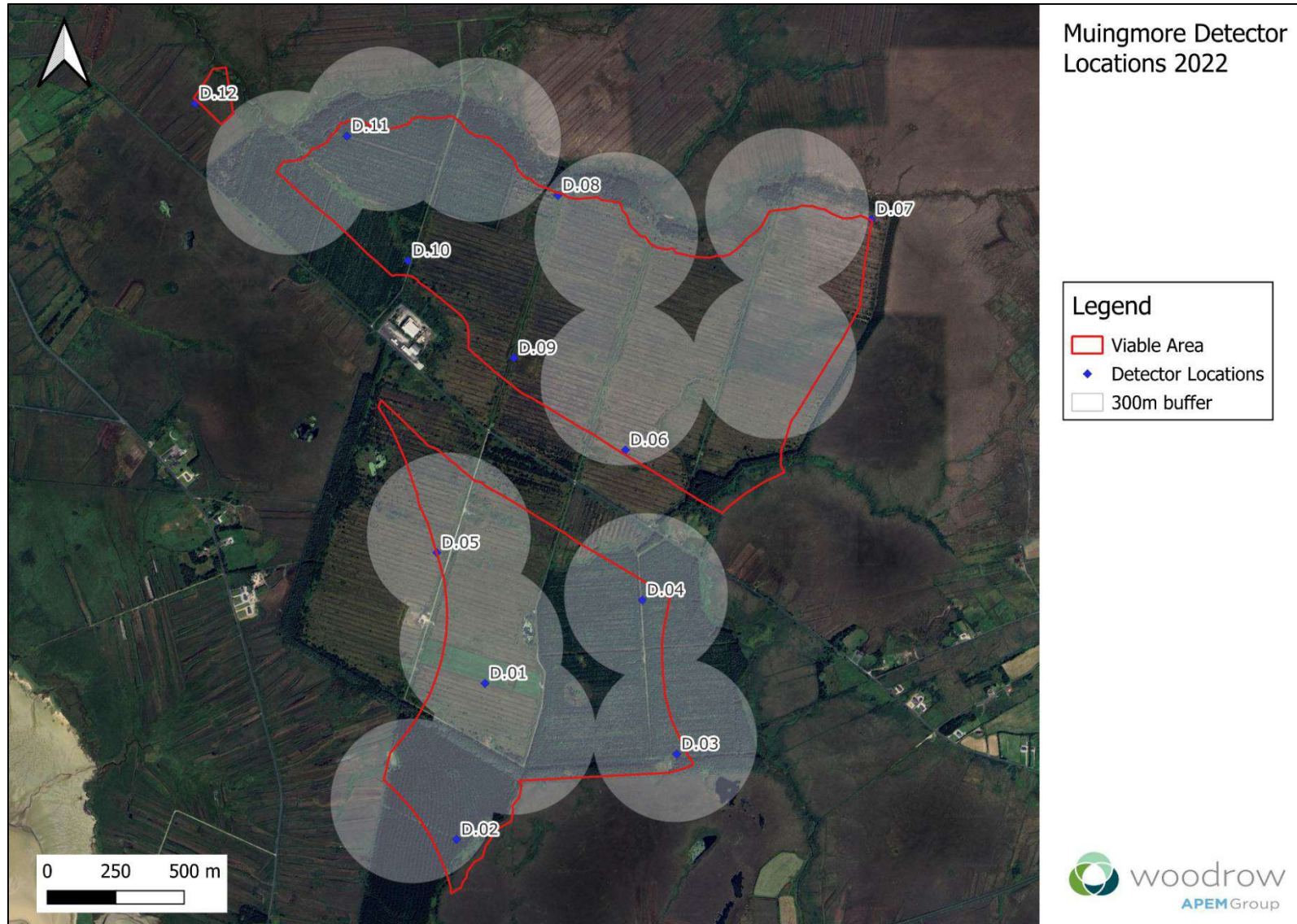


Figure 1: Proposed turbine locations and potential 300m zone of influence.

2 METHODOLOGY

Baseline surveys for bats aim to identify the species occurring within the proposed site, and to provide an understanding of how local bat populations utilise the site in terms of density of use for foraging, roosting (maternity and hibernation), social interactions and commuting.

Bat surveys were conducted by Woodrow at Muingmore over the 2022 active bat season to ensure compliance with the most recently published guidelines pertaining to bat surveying, impact assessment and mitigation for bats at onshore wind turbines (NatureScot *et al.*, 2021). This guidance document supersedes some aspects of the previous guidelines (Collins, 2016 updating Hundt, 2012 & Bat Conservation Ireland (BCI), 2012) and requires a site-by-site approach to survey design, with the only prescriptive element being the positioning, number and duration of static bat detector deployments, as well as strongly recommending continual monitoring of site-specific weather data on rainfall, temperature and wind speeds.

As a minimum, the latest NatureScot *et al.* (2021) guidelines require three deployments of static detectors aimed at covering spring (April to May), summer (June to mid-August) and autumn (mid-August to October), each with a minimum deployment period of 10 nights (within compliant weather parameters). Seasonal deployments of static detectors are set out at all potential turbine locations for proposals comprising ten or less turbines, with a third of any additional locations also covered up to a maximum of 40 detectors. Compliant weather conditions are defined as: temperatures at $\geq 8^{\circ}\text{C}$ at dusk, maximum ground level wind speed of 5 m/s and no, or only very light, periodic rainfall.

Additional requirements of the NatureScot *et al.* (2021) guidelines include swarming surveys, and winter roost inspections if potential hibernation roosts are identified. Transect and/or vantage point surveys are seen as methods used to complement the static detector surveys, with applicability being discretionary, based on professional judgement, and on a case-by-case site-specific basis.

2.1 Desk study

A desk-based review of habitat availability in the environs of the proposed site, and the available bat data was used to inform the scope of the bat surveys required. As recommended by both BCI (2012) and NatureScot *et al.* (2021) the area covered by the desk-based review was extended to 10 km surrounding the wind farm site. The desk-based study included:

- Reviewing distances from closest Natura 2000 sites designated for bats (the only bat SACs in Ireland are designated for lesser horseshoe bat *Rhinolophus hipposideros*).
- Examining aerial imagery and 6-inch maps to identify potential bat foraging and roosting habitats.
- Lundy *et al.* (2011) provides a high-level assessment of potential habitat suitability for different species of bat occurring in Ireland.
- Review of data received from BCI within 10 km of the wind farm site and the results of Biodiversity Maps report for the 10 km squares covering the site [F72], including species recorded and known roosting sites (NBDC, 2023).

2.2 Roost assessment surveys

The most recent guidelines (NatureScot *et al.*, 2021) recommend that:

“.....features that could support maternity roosts and significant hibernation and/or swarming sites (both of which may attract bats from numerous colonies from a large catchment) within 200 m plus rotor radius of the boundary of the proposed development should be subject to further investigation”.

Turbine specification, as well as locations are regularly altered during the design phase of projects, and, as a precaution, Woodrow conduct roost assessment surveys within 300 m of the potential build area. Features along the access tracks between turbines (within c. 30 m) were also assessed for roost features. Wide reaching roost and foraging habitat assessment of the wind farm site were undertaken during March 2020, as part of a scoping exercise.

Surveyors utilised the assessment criteria described in Collins (2016) which provides guidelines for assessing potential suitability of habitat features as bat roosts and for foraging bats. This allows surveyors to assign Potential Roost Features (PRFs), as negligible, low, moderate or high status in terms of their potential for bats, see **Table 1**.

Collins (2016) guidelines was the prevailing guidance document at the time of roost assessment surveys. Bat Conservation Trust (BCT) published updated guidelines in September 2023, *Bat Surveys for Professional Ecologists: Good Practice Guidelines 4th edition*, Collins (2023). In particular the updated guidelines relate to a newer classification system for potential roost features in trees. Consequently, consistency was maintained with assessment criteria described in Collins (2016), which provides guidelines for assessing potential suitability of habitat features as bat roosts and for foraging bats as set out in Table 1.

Table 1: Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement (Collins, 2016)

Suitability	Description Roosting Habitats	Commuting and Foraging Habitats
Negligible	Negligible habitat features on the site likely to be used by roosting bats	Negligible habitat features on site likely to be used by commuting or foraging bats
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions ^a and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation ^b). a tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential ^c .	Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.

Suitability	Description Roosting Habitats	Commuting and Foraging Habitats
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions ^a and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, conditions ^a and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, treelined watercourses and grazed parklands. Site is close to and connected to known roosts.

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

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

^c This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI,2015).

Based on the features present and the location of the trees or other structures, the potential use of the feature can also be considered, and classified (as in Hundt, 2012):

- Maternity (breeding roost).
- Summer/transitional (to include transitional, occasional, satellite, night and day roosts); and,
- Hibernation roost.

Surveyors initially employed non-invasive external and internal inspection techniques for any building encountered, and trees were assessed from the ground.

All roost inspections and, full building/tree inspections are undertaken under licence from NPWS, and these would include inspecting any potential hibernation roosts. Based on the findings of roost assessment and PRF surveys, roost inspections were required at a subterranean path adjacent to the abandoned factory buildings. This was classified as moderate PRF and needing winter roost inspections. There were also some PRF's identified in the attic of the old office building on the

factory grounds, a single bat dropping was found here. However, the results yielded no hibernating bats were found on inspection.

Based on the findings of the roost assessment surveys features classed as having moderate to high suitability for bats and/or demonstrating likely occupancy, (e.g., dropping found) were targeted for further bat activity surveys, including dusk emergence/dawn re-entry surveys.

2.3 Roost emergence/re-entry surveys

Dusk emergence/dawn re-entry surveys were completed in 2022 to ascertain if PRFs identified on site were in use by roosting bats. PRFs classified as low were surveyed a minimum of once and moderate features were surveyed a minimum of two times. Dusk surveys commenced 15 mins before sunset and were conducted until 1.5 hours after sunset and were typically undertaken prior to or after undertaking walkover transect surveys of the site. Dawn surveys commenced 1.5 hours before sunrise and concluded 15 minutes after sunrise. Dusk emergence/dawn re-entry surveys were undertaken using Elekon Batlogger M bat detectors to collect geo-referenced records of bat activity, which were then analysed using BatExplorer. Survey times and roost survey effort are shown in **Table 3** below.

An interim guidance note published by ((BCT), 2022) indicated the requirement for night vision aids to be used during roost emergence surveys. Night vision aids were not applicable during the 2022 emergence surveys as no guidance had yet been published in this regard. Night vision aids were used to increase precision of emergence surveys during the dusk survey completed on 06 June 2023.

APPENDIX 1: contains images of the features surveyed.

Table 2: Summary of roost emergence/re-entry survey effort

Date	Start time	End time	Location	Survey type	Weather Conditions
02-Jun-2022 (Sunset 22:00)	21:45	23:30	54.143658, -9.895703	<u>Emergence Survey</u> - At gables of old office (O. O Sullivan & D. Lavelle)	Wind: 3.6 km/h Temp: 13° Oktas: 5 Precipitation: Dry
03-Jun-2022 (Sunrise 05:11)	03:45	05:24	54.14326, - 9.894948	<u>Re-entry Survey</u> – North and east office faces (O. O Sullivan & D. Lavelle)	Wind: 3.6 km p/h Temp: 9° Precipitation: Dry
06-Jul-2022 (Sunset 22:15)	20:26	23:30	54.143468, -9.893446	<u>Emergence Survey</u> – Southern face of the metal factory (P. Power & D. Lavelle)	Wind: 11 km/h Temp: 14° Precipitation: Misty
07-Jul-2022 (Sunrise 05:15)	03:45	04:07	54.143406, -9.895358	<u>Re-Entry survey</u> – Survey cancelled due to bad weather (P. Power & D. Lavelle)	Wind: 7 km/h Temp: 13° Precipitation: Heavy

Date	Start time	End time	Location	Survey type	Weather Conditions
19-Jul-2022 (Sunset 22:00)	21:45	23:30	54.14335, -9.895081	<u>Emergence survey</u> - Southeast face of old office building (P. Power & D. Lavelle).	Wind: 4 km/h Temp: 15° Precipitation: Dry
20-Jul-2022 (Sunrise 05:30)	04:00	05:45	54.143316, -9.895089	<u>Re-Entry survey</u> – Southern gable of metal factory (P. Power & D. Lavelle)	Wind:9 km/h Temp: 13° Precipitation: Misty
13-Sep-2022 (Sunset 20:02)	19:46	21:32	54.14349, -9.895429	<u>Emergence survey</u> – Southern section office building (P. Power & D. Lavelle)	Wind: 10.8 km/h Temp: 13° Precipitation: Dry
20-Oct-2022 (Sunrise 08:15)	07:00	08:30	54.143406, -9.895358	<u>Re-Entry survey</u> – Southwest section of office building (R. O’Connell)	Wind: 12 km/h SE Temp: 12° Precipitation: Dry
	07:00	08:30	54.143361, -9.89424	<u>Re-Entry survey</u> – front entrance of metal factory (P. Power)	Wind: 12 km/h SE Temp: 12° Precipitation: Dry
06-Jun-2023	21:47	23:33	54.143495, -9.894216	<u>Emergence survey</u> – Front entrance of metal factory (R. O’Connell)	Wind:6 m/s NE Temp:15°C Perception: Dry

2.4 Winter roost inspections

NatureScot *et al.*, (2021) recommend that winter roost surveys should also be carried out for any potential hibernation roost within 200m plus rotor radius of developable area. In practice roost surveys are carried out within a 300m plus rotor radius to account for possible turbine relocation and or turbine model variations. The survey was conducted on the 09 March 2022, within the timeframe in which bats would still be utilising the hibernation roosts. Surveys involved searching for and collecting bat faecal samples to be sent for DNA analysis, closer examination of roost potential, the primary use of an endoscope and a thermal imaging camera as a secondary device, as thermal imagery is limited to accuracy to detect the heat signatures of hibernating bats due to bats being in a state of torpor. Structures assessed as PRFs of low to moderate roost potential and which were judged to have potential for occupation as a winter roost were examined. These investigations carried out on 09 March 2022 ruled out the potential structures as hibernation roosts and this data is valid for the survey period of 2022 and 2023. As such no further surveys were carried out in 2023.

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06-Jul-2022 (Sunset 22:15)	20:26	23:30	54.143468, -9.893446	<u>Emergence Survey</u> – Southern face of the metal factory (P. Power & D. Lavelle)	Wind: 11 km/h Temp: 14° Precipitation: Misty
07-Jul-2022 (Sunrise 05:15)	03:45	04:07	54.143406, -9.895358	<u>Re-Entry survey</u> – Survey cancelled due to bad weather (P. Power & D. Lavelle)	Wind: 7 km/h Temp: 13° Precipitation: Heavy
19-Jul-2022 (Sunset 22:00)	21:45	23:30	54.14335, -9.895081	<u>Emergence survey</u> - Southeast face of old office building (P. Power & D. Lavelle).	Wind: 4 km/h Temp: 15° Precipitation: Dry
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	07:00	08:30	54.143361, -9.89424	<u>Re-Entry survey</u> – front entrance of metal factory (P. Power)	Wind: 12 km/h SE Temp: 12° Precipitation: Dry
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2.7 Bat activity transect surveys

The NatureScot *et al.*, (2021) guidance considers the application of transect surveys to be discretionary, with survey requirements designed on a site-by-site basis. Transects are complementary to data collected from static bat detectors; and are important for identifying flight lines and for gaining understanding of bat abundance within the survey area. Driven transects can provide useful information on the wider landscape in the vicinity of the proposed site. If driven

transects are undertaken, it is important that appropriate microphones are used and are directed above the vehicle. It is also important to remain at a constant low speed (< 10 km/h). Point counts (of a fixed duration) can be incorporated into transects to survey specific features to provide information on comparative density of use.

Four transects were completed in 2022 and one transect was completed in 2023 which included coverage of the proposed site. Survey dates and weather conditions for transects conducted in 2022 and in 2023 are provided in **Table 4**, with the transect routes illustrated on **Figure 2**.

During transects, field records were made of bat species encountered, number of bat passes, activity (where known e.g., foraging, commuting, advertising), travelling direction and approximate height (where known). Temperature and wind speed were measured at intervals throughout the survey. Batloggers recorded temperature throughout the surveys.

Table 4: Summary of bat activity transect survey effort

Date	Start time	End time	Survey type	Weather Conditions
02-Jun-2022 (Sunset 22:00)	23:32	01:00	<u>Transect Survey</u> - Walked transect, started at the buildings in the western section of the site and continued up north (O. O Sullivan & D. Lavelle)	Wind: 3.6 km/h Temp: 12° Precipitation: Some low mist
06-Jul-2022 (Sunset 22:15)	23:31	01:00	<u>Transect survey</u> - Walked transect in the south section of the site (P. Power & D. Lavelle)	Wind: 2 km/h NNW Temp: 14° Precipitation: Drizzle
19-Jul-2022 (Sunset 22:00)	23:30	00:42	<u>Transect survey</u> – Walked transect of northern section of the site (P. Power & D. Lavelle)	Wind:4 km/h Temp: 14° Precipitation: Dry
13-Sep-2022 (Sunset 20:02)	21:48	23:00	<u>Transect survey</u> – Walked transect of the northern section of the site. (Power & D. Lavelle).	Wind: 7 km/h Temp: 13° Precipitation: Dry
06 -Jun-2023 (Sunset 22:08)	23:56	00:35	<u>Transect survey</u> - Walked transect in the south section of the site. (O’Reilly & R. O’Connell)	Wind: 14 km/h E Temp: 13° Precipitation: Dry

2.8 Static bat detector surveys

Static detector surveys were undertaken using Wildlife Acoustics Song Meters, Song Meter 2 (SM2BAT+) and Song Meter 4 (SM4BAT-FS) , on three occasions covering spring, summer and autumn in 2022 and 2023. Static bat detectors were deployed to record the types of bat species present and to provide an overview of how bat activity is broadly distributed over the site at given habitat features and specifically at selected turbine locations. This provides context to bat activity within the site to supplement and provide a comparison for the turbine locations, for example comparing bat activity along habitat features vs bat activity in open areas removed from features, emulating post-construction conditions around turbines.

Table 5 and **Table 6** below shows dates and duration of each static deployment. The location of all static detectors for each deployment in 2022 and 2023 is shown on **Figure 3. APPENDIX 2: Weather data for each static deployment period** shows the weather conditions during the three deployments.

and **2023** shows photographic evidence of each detector location in the field.

Table 5: Static detector deployment dates for each season

Survey year	Season	Deployment date	Collection date
2022	Spring	03-May-2022	17-May-2022
	Summer	06-Jul-2022	19-Jul-2022
	Autumn	13-Sep-2022	27-Sep-2022
2023	Spring	15-May-2023	30-May-2023
	Summer	06-Jul-2023	19-Jul-2023
	Autumn	11-Sep-2023	26-Sep-2023

Table 6: Static detector survey effort in 2022

Map ID	Associated feature	Spring Deployment		Summer Deployment		Autumn Deployment	
		Unit	Run time	Unit	Run time	Unit	Run time
D.01	Open bog area beside drain that is adjacent to pasture used for silage.	WSS046	14 nights (8397min)	WSS025	13 nights (7003min)	WSS058	16 nights (12080min)
D.02	On pine tree adjacent to fire break/ride line in pine plantation.	WSS027	14 nights (8397min)	WSS027	13 nights (7003min)	WSS037	16 nights (12080min)
D.03	On spruce on edge of dense Sitka forestry also adjacent to drainage ditch.	WSS034	14 nights (8397min)	WSS052	13 nights (7003min)	WSS033	16 nights (12080min)
D.04	On alder lining Sitka spruce forestry track.	WSS029	14 nights (8397min)	WSS029	13 nights (7003min)	WSS032	16 nights (12080min)
D.05	Open bog.	WSS025	14 nights (8397min)	WSS061	13 nights (7003min)	WSS052	16 nights (12080min)
D.06	Open bog with sheep grazing in the area. Some regen pine trees in the area.	WSS031	14 nights (8397min)	WSS057	13 nights (7003min)	WSS056	16 nights (12080min)
D.07	On spruce with scrub bog surrounding. On the plantation edge c. 25m away.	WSS024	14 nights (8397min)	WSS033	13 nights (7003min)	WSS034	16 nights (12080min)
D.08	Sparse individual spruce near plantation.	WSS040	14 nights (8397min)	WSS030	13 nights (7003min)	WSS040	16 nights (12080min)
D.09	Open bog beside track where sheep are grazing. 300m east of the metal factory.	WSS028	14 nights (8397min)	WSS035	13 nights (7003min)	WSS029	16 nights (12080min)

Map ID	Associated feature	Spring Deployment		Summer Deployment		Autumn Deployment	
		Unit	Run time	Unit	Run time	Unit	Run time
D.10	On semi mature larch disjointed young forestry edge.	WSS032	14 nights (8397min)	WSS031	13 nights (7003min)	WSS059	16 nights (12080min)
D.11	Larch on Sitka mature spruce plantation edge with mature spruce plantation c. 50m away.	WSS026	14 nights (8397min)	WSS037	13 nights (7003min)	WSS063	16 nights (12080min)
D.12	Open bog near drain.	WSS054	14 nights (8397min)	WSS045	13 nights (7003min)	WSS030	16 nights (12080min)

Table 7: Static detector survey effort in 2023

Map ID	Associated feature	Spring Deployment		Summer Deployment		Autumn Deployment	
		Unit	Run time	Unit	Run time	Unit	Run time
D.01	Open bog area beside drain that is adjacent to pasture used for silage.	WSS007	15 nights (8273min)	WSS013	13 nights (7003min)	WSS047	16 nights (12080min)
D.02	On pine tree adjacent to fire break/ride line in conifer plantation.	WSS013	15 nights (8273min)	WSS083	13 nights (7003min)	WSS050	16 nights (12080min)
D.03	On spruce on edge of dense Sitka forestry also adjacent to drainage ditch.	WSS010	15 nights (8273min)	WSS006	13 nights (7003min)	WSS033	16 nights (12080min)
D.04	On a birch tree.	WSS006	15 nights (8273min)	WSS023	13 nights (7003min)	WSS009	16 nights (12080min)
D.05	Open bog.	WSS021	15 nights (8273min)	WSS021	13 nights (7003min)	WSS006	16 nights (12080min)
D.06	Open bog with sheep grazing with	WSS023	15 nights (8273min)	WSS010	13 nights (7003min)	WSS014	16 nights (12080min)

Map ID	Associated feature	Spring Deployment		Summer Deployment		Autumn Deployment	
		Unit	Run time	Unit	Run time	Unit	Run time
	some pine trees in the area.						
D.07	On spruce with scrub bog surrounding. On the plantation edge c. 25m away.	WSS018	15 nights (8273min)	WSS006	13 nights (7003min)	WSS004	16 nights (12080min)
D.08	Sparse individual spruce near conifer plantation.	WSS008	15 nights (8273min)	WSS067	13 nights (7003min)	WSS066	16 nights (12080min)
D.09	Open bog beside track where sheep are grazing. Adjacent to the old factory in the distance.	WSS014	15 nights (8273min)	WSS014	13 nights (7003min)	WSS011	16 nights (12080min)
D.10	On alder tree by forestry edge.	WSS009	15 nights (8273min)	WSS018	13 nights (7003min)	WSS084	No data ¹
D.11	Larch on Sitka mature spruce plantation edge mature spruce plantation c. 50m.	WSS012	15 nights (8273min)	WSS020	13 nights (7003min)	WSS020	16 nights (12080min)
D.12	Open bog near drain.	WSS016	15 nights (8273min)	WSS017	13 nights (7003min)	WSS017	No data ²
D.13	On a birch tree in a pine woodland	WSS017	15 nights (8273min)	WSS084	No data	WSS049	16 nights (12080min)

2.9 Monitoring climatic of conditions

Monitoring climatic conditions during 2022 was undertaken through the deployment of an on-site fully automated weather station with 3G connectivity. The Davis Vantage Vue is a wireless integrated sensor suite weather station and was deployed to provide data on a real-time basis. This allows weather station functionality to be checked daily during the survey season and for action to

¹ Technical failure occurred in 2023 autumn deployment no data recorded

² Technical failure occurred in 2023 autumn deployment no data recorded

be taken if a station fails or there are concerns regarding the data. This obviates the need for a second, backup, weather station. The weather station collected the full range of weather data, including temperature, wind speed and rainfall, enabling surveyors to determine compliant deployment nights with the prescribed weather parameters ($\geq 8^{\circ}\text{C}$ at dusk, max. ground level wind speed of 5 m/s and minimal rainfall) as per the NatureScot *et al.*, (2021) guidance on weather data. Deployment periods can then be adjusted to ensure 10 nights of compliant data are captured.

In addition, site specific weather data can be useful for investigating the recorded patterns of site usage by bats, for instance exposed, open sites can receive an influx of foraging bats during nights that are warm and relatively still, especially towards the end of the summer and into the autumn, as bats disperse from maternity roosts (Woodrow per. obs.).

Weather conditions were monitored during 2023 using the public synoptic weather station in Belmullet.

Weather data for the three deployment periods during each year has been extracted and shown graphically in **APPENDIX 2: Weather data for each static deployment period** for spring, summer and autumn deployments, respectively.

2.10 Calibration and testing of recording equipment

Calibration and testing of recording equipment is required by the NatureScot *et al.* (2021) guidelines, and as a standard operating procedure Woodrow have a stringent schedule of testing all bat recording equipment prior to and during deployment in the field. Checks are logged in excel, providing an audit trail to ensure that all data can be relied on and form a robust and defensible data set. Unique numbering of static detectors, SD cards and microphones allows for reverse checking, if any issues arise, e.g., following a microphone failure. Checks undertaken include pre-deployment device setting including battery charge levels and pre-/post-deployment microphone sensitivity tests.

2.11 Data analysis

For data collected using Song Meter 2 (SM2BAT+) and Song Meter 4 (SM4BAT-FS) analysis of sound recordings was undertaken using Kaleidoscope software to confirm species (or genus for *Myotis* species calls or *Pipistrelle* species social calls) and exact number of bat passes for each transect survey or deployment. For data collected using the Batloggers, analysis of sound recordings was undertaken using BatExplorer software. Russ (2012) and Middleton *et al.* (2022) were used to aid in identification of bat calls during data analysis.

All sounds files were run through auto-identification and then manual verification was undertaken by Woodrow operatives. Recordings identified as noise were determined to fall outside of the recording parameters for the survey and were manually classified as noise. Common and soprano pipistrelles which Kaleidoscope determined to be a match ratio of 100% (every pulse recorded matched the species call parameters) were considered to be accurate to a level not requiring manual verification. Recordings in which multiple species were recorded were split into separate passes. The number of passes generated were considered to be species presence within a 15 second sound file.

Average bat passes per hour were generated and visualised in R as boxplots. Activity levels were assessed using the criteria applied by Matthews *et al.* 2016. This study examines the risk of European bats to wind energy developments in the UK. Activity levels are classified as in the study are summarised in **Table 8**. We have adapted this scale to be applied to average bat passes per hour. This adaptation assumes an average figure of 10 hours per night across the active bat season to determine the cut-off of 'high' activity. **Table 9** shows the adapted activity levels.

Table 8: Activity levels as per Matthews *et al.* 2016

Classification	Bat passes per night
Low	<3
Medium	3 - 49
High	≥50

Table 9: Activity level classification as per Mathews *et al.* 2016 adapted to hourly activity levels

Classification	Bat passes per hour
Low	<1.99
Medium	2 - 4
High	≥5

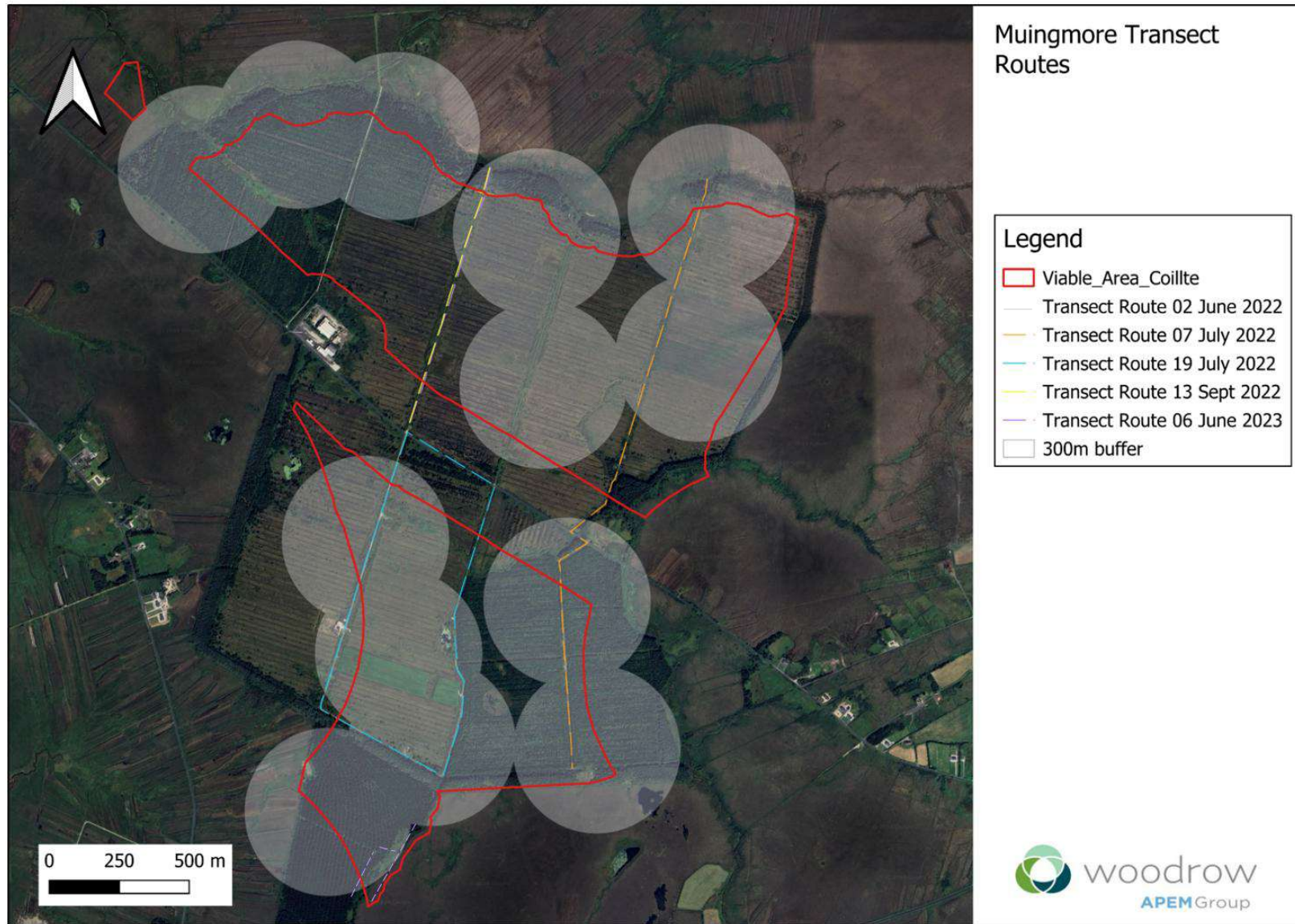


Figure 2: 2022 and 2023 Transect routes surveyed

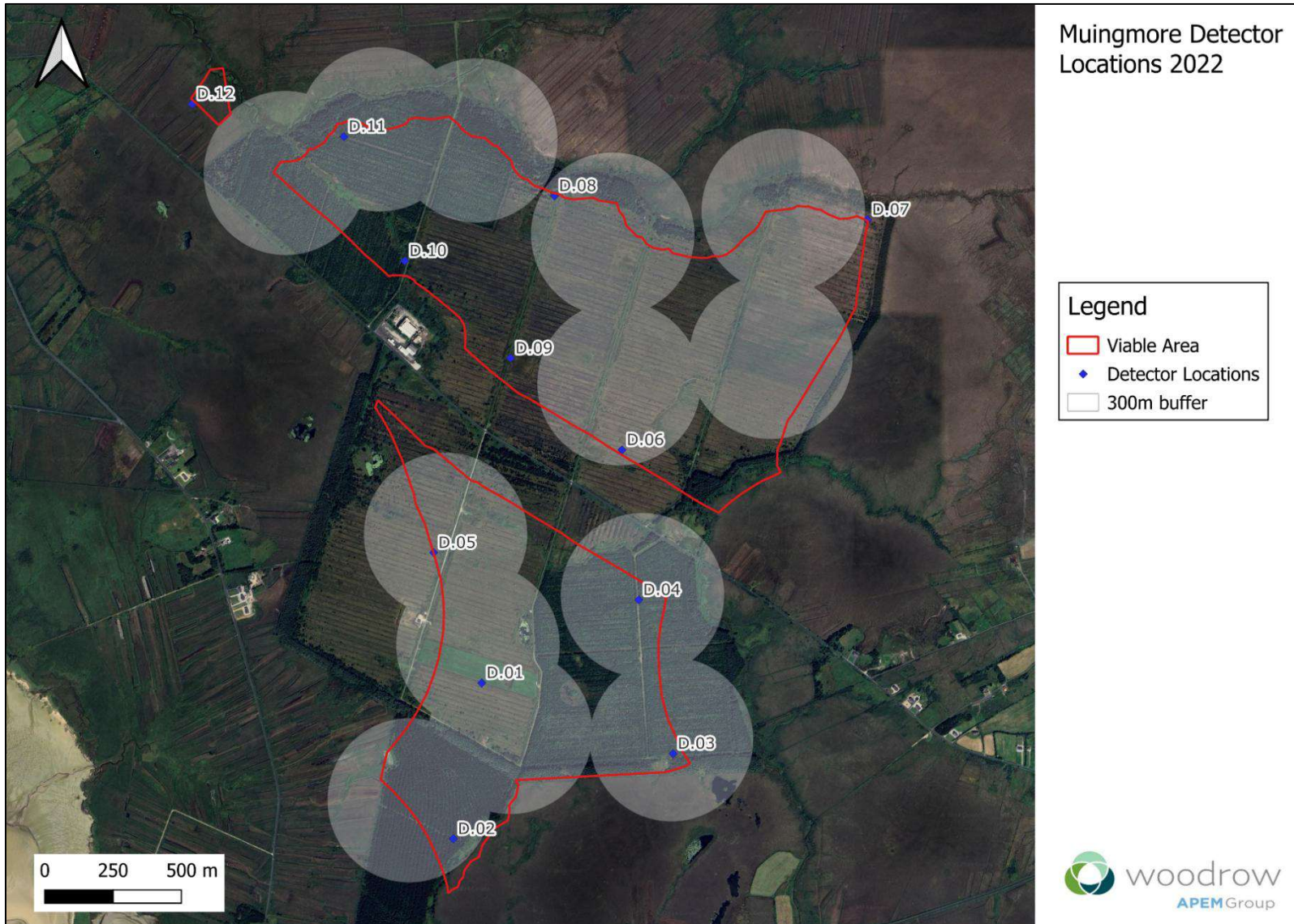


Figure 3: 2022 Static detector deployment locations

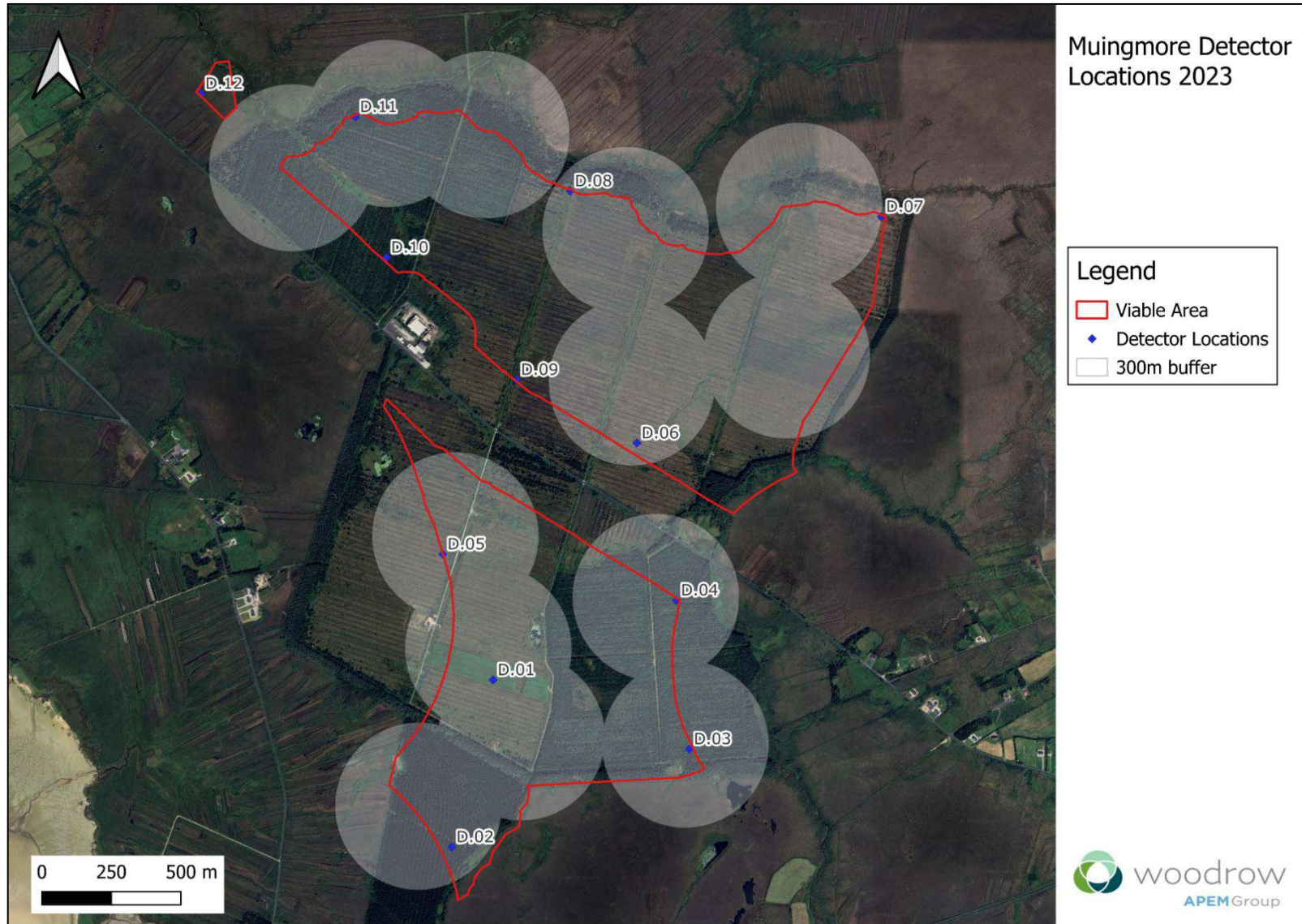


Figure 4: 2023 Static detector deployment locations (additional detector in southern location D.13)

2.12 Survey limitations

In the case of bat surveys, survey limitations often relate to weather conditions at the time of the surveying and equipment failing in the field, for example microphones can be damaged by livestock or can lose sensitivity when exposed to prolonged episodes of heavy rainfall. The following sections provide details for any potential limitations to bat surveys conducted in 2022 and 2023.

2.12.1 Weather

For 2022, the weather data for the spring deployment period (03 – 17 May 2022) was fully compliant with NatureScot *et al.* (2021) guidance for weather conditions. The weather data for the summer deployment period (06 – 19 July 2022) was fully compliant with the NatureScot *et al.* (2021) guidance for weather conditions. There was one non-compliant day on 07 July 2022. This also resulted in the cancellation of a re-entry survey which had started on 07 July 2022. The weather data for the autumn deployment period (13 – 27 September 2022) was fully compliant with the NatureScot *et al.* (2021) guidance for weather conditions.

For 2023, the weather data for the spring deployment period (16 – 30 May 2023) was fully compliant with NatureScot *et al.* (2021) guidance for weather conditions. The weather data for the summer deployment period (06- 19 July 2023) was fully compliant with the NatureScot *et al.* (2021) guidance for weather conditions. The weather data for the autumn deployment period (11 – 26 Sep 2023) was fully compliant with NatureScot *et al.* (2021) guidance for weather conditions.

2.12.2 Survey coverage

Two detector failures occurred during the 2023 autumn survey season, detector locations D.10 and D.12. Overall, the combined survey approach and coverage over the 2022 and 2023 survey seasons, provides robust data giving a full insight into the use of the proposed site by bats. The survey methodologies employed are in line with the recommended guidelines set out within *Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation* NatureScot *et al.* (2021), and as such, this information can be appropriately used to assess the potential impacts of the proposed site on the local bat population.

2.12.3 Equipment

Equipment failures/technical issues was limited to the following detectors over the course of the 2023 survey: autumn deployments at locations D.10 and D.12 (no data recovered)

Despite the technical issues during the autumn 2023 survey year, due to the volume of data collected over the seasons, it is considered that the data collected during this survey remains robust and compliant with NatureScot *et al.* (2021).

3 SURVEY RESULTS

3.1 Desk study

Examining the National Biodiversity Data Centre (NBDC) bat habitat suitability maps the 5x5 km grid square containing the site has been classed as low (Lundy *et al.*, 2011), see **Figure 5**. From this output **Table 10** shows the suitability of the area for bats overall, and for each bat species. The suitability index refers to areas geographically, as well as suitable roosting habitat. These patterns combined can provide a broad scale geographical area (habitat suitability) for all Irish bats combined and individual Irish species of bats. The suitability index ranges from 0 – 100 with 0 being least favourable and 100 being the most favourable. The overall site for all bats was classified from moderate to low for habitat suitability. Individually, the habitat suitability for soprano pipistrelles was classified as high. This indicates potentially high levels of foraging and potential roosting areas. The Leisler’s bats habitat suitability was classified as moderate/high. Brown long-eared bats, Daubenton’s bats, Natterer’s bats and common pipistrelles were classed as having moderate habitat suitability. Habitat suitability is classed as low for species: Lesser horseshoe bats, Nathusius’ pipistrelles and Whiskered bats indicating very low activity from these species in this area.

Table 10: NBDC species specific habitat suitability index

Bat species	Suitability index	Suitability level
All Bats	20.78	Moderate/Low
Soprano pipistrelle	50	High
Brown long-eared bat	25	Moderate
Common pipistrelle	28	Moderate
Lesser horseshoe bat	3	Low
Leisler's bat	33	Moderate/High
Whiskered bat	3	Low
Daubenton's bat	23	Moderate
Nathusius' pipistrelle	4	Low
Natterer's bat	18	Moderate

A data request was submitted to Bat Conservation Ireland (BCI) for known roost records within 10 km of the proposed site. A total of 11 bat records were provided, none of which were bat roosts. The closest roost to the site is within c. 3 km of the proposed site. The BCI data shown in **Table 11** shows bat data recorded in transect and ad hoc surveys with distances from site provided, and indicates two species have been recorded in the environs, including:

- Soprano pipistrelle *Pipistrellus pygmaeus*
- Leisler’s bat *Nyctalus leisleri*

The only Natura 2000 sites designated for bats in Ireland are for lesser horseshoe bats (*Rhinolophus hipposideros*). The proposed site in northwest Co. Mayo is outside of the known range of lesser horseshoe bat.

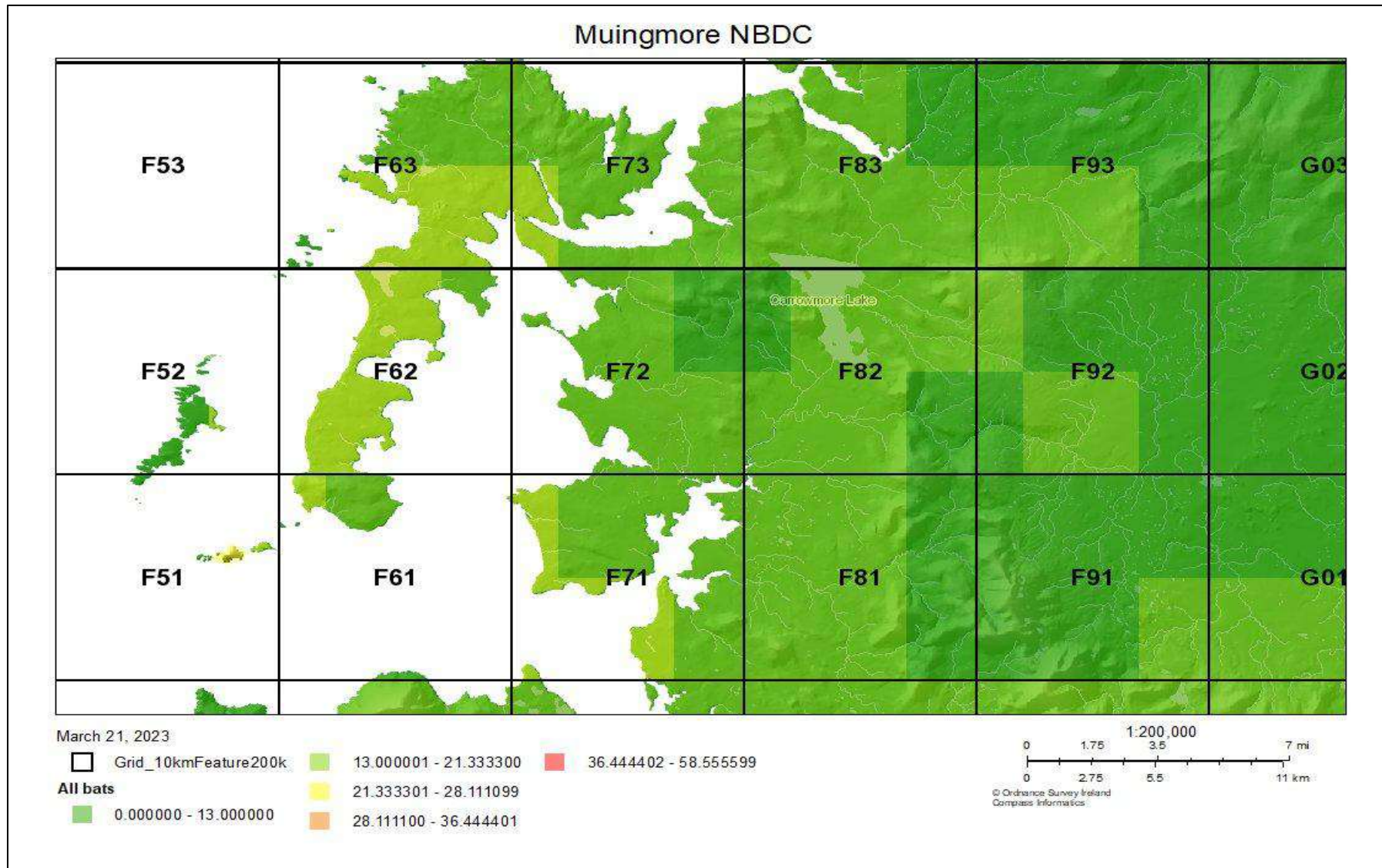


Figure 5: Bat Suitability from NBDC

Table 11: BCI roost and survey data within 10km of the site

Survey	Distance from buildable turbine envelope centre	Species	Date
BATLAS 2020	c. 8 km	Species data not provided	06/09/2018
BATLAS 2020	c. 7 km	Species data not provided	04/09/2018
BATLAS 2020	c. 6 km	Species data not provided	03/09/2018
BATLAS 2020	c. 11 km	Species data not provided	08/06/2018
BATLAS 2020	c. 9 km	<i>Pipistrellus pygmaeus</i>	06/09/2018
BATLAS 2020	c. 10 km	<i>Pipistrellus pygmaeus</i>	04/09/2018
BATLAS 2020	c. 3 km	Species data not provided	03/09/2018
BATLAS 2020	c. 9 km	Species data not provided	08/06/2018
BATLAS 2020	c. 10 km	Species data not provided	06/09/2018
BATLAS 2020	c. 13 km	Species data not provided	19/08/2016
Consultancy Surveys	c. 13 km	<i>Nyctalus leisleri</i>	07/09/2007

3.2 Habitat and roost suitability assessment

3.2.1 Habitat suitability assessment

The habitat within the proposed site is comprised of primarily peatland habitat and Sitka spruce plantation with some pine plantation and clear fell in the southern section of the site. A continuous line of forestry in the northern section of the site provides a suitable linear habitat for commuting and foraging bats. This section of forestry intersects the recording locations D.08 and D.09. While the southern edge of this forestry in the north was surveyed, a watercourse runs along the northern edge of this habitat feature which would be considered a suitability habitat for foraging and commuting bats. Periphery habitat in the east of the site is also suitable foraging and commuting habitat for bats for the same reasons.

In the wider area, the site is surrounded by open peatland habitat with watercourses forming the northern boundary and sections of the eastern boundary. Open peatland habitat devoid of linear habitat features or ecological corridors is considered less suitable for commuting and foraging bats. The below table, **Table 12**, provides an assessment of habitat suitability within the site at each of the static detector location which represents the provisional turbine locations.

Table 12: Foraging/commuting bat habitat suitability within the site based on the detector locations

Detector Location	Foraging/commuting features at detector locations/provisional turbine buffer (c. 100m)	Roost potential within c. 300m of detectors of moderate or higher suitability
D.01	Located in an open bog area, beside a drain which is adjacent to pasture used for silage. This is of low commuting or foraging potential.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.
D.02	Located on a pine tree adjacent to fire break/ride line in pine plantation. There is moderate foraging and commuting potential here in this plantation.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.
D.03	Located on a spruce on the edge of a dense Sitka forestry, which is also adjacent to a drainage ditch. There is moderate foraging and commuting potential here at this plantation.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.
D.04	Located on an alder lining Sitka spruce forestry track. There is moderate foraging and commuting potential here at this plantation.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.
D.05	Located in open bog. There is low suitability foraging or commuting potential.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.
D.06	Located in open bog with sheep grazing in the area. There are some regenerating pine trees in the area. There is low foraging and commuting potential here.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.
D.07	Located on spruce with scrub and bog surrounding. On the plantation edge c. 25m away. This is of moderate commuting and foraging potential.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.
D.08	Located on a sparse individual spruce near the plantation. There is moderate foraging and commuting potential here in this plantation.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.

Detector Location	Foraging/commuting features at detector locations/provisional turbine buffer (c. 100m)	Roost potential within c. 300m of detectors of moderate or higher suitability
D.09	Located in open bog beside a track where sheep were grazing. This is of low foraging and commuting potential.	Built structures in the central section of the site which have been classified as having low to moderate PRF suitability are c. 300m to the west.
D.10	Located on semi-mature larch disjointed young forestry edge, with a watercourse to the north. There is moderate foraging and commuting potential at this location.	There are built structures classified as low roosting potential features (F.2 and F.5) within the 300m buffer. There are also low to moderate roosting potential features (F.1, F.3, F.4 and F.6) also present here just outside of the 300m buffer which are on the same yard as the potential roosting features within the buffer.
D.11	Located c. 50m from the edge of mature plantation. This is of moderate foraging and commuting potential as it is within the c. 100m buffer.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.
D.12	Located in open bog near a drain. This is of low foraging or commuting potential.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.
D.13	Located in a clearing at the centre of the wooded Sitka spruce area. This is of moderate foraging and commuting potential.	There are no potential roost features classed as moderate or high within 300m of the proposed location associated with this detector.

3.2.2 Roost suitability assessment

Preliminary surveys of potential roost features (PRFs) found several structures of low to moderate suitability within the proposed site, some of which lie within the 300m turbine Zone of Influence for bats. **Table 13** shows the following roost features classed as low to moderate suitability which are centred around the built structures in the central section of the site:

- The basement area of the factory, or subterranean path, is very wet for the first section but has a dry section towards the back (eastern end). There are several cracks and crevices in which bats could potentially roost in, along with a plentiful food source. For this reason, the area has been classified as moderate [54.143172, -9.894968].
- The warehouse stone walls have some cracks and crevices in the brickwork. There is also shipping containers and a big drum, all of which could potentially be used for night roosts/transitional roosts by a small number of bats. For this reason, the area has been classified as low [54.14326, -9.894129].
- The office building has rotted wood in the eave creating crevices and access to the attic on the eastern face which could potentially hold a number of roosting bats. In the attic of this

building, there was a single bat dropping found during the hibernation inspection. For this reason, the building has been classified as moderate [54.143371, -9.894977].

All PRFs identified within with the site are detailed in the table below, **Table 13**, and photographic evidence is located in **APPENDIX 1**:

Table 13: Potential Roost Features (PRFs) identified within the proposed site

Feature ID	Feature description	Location	PRF suitability (Collins, 2016)
F.1	Subterranean path	54.143172, -9.894968	Moderate
F.2	East face of office building	54.143513, -9.89496	Low
F.3	Southern gable of old metal factory	54.143468, -9.893446	Negligible (low potential walls within structure)
F.4	South Gable of office building	54.143322, -9.895129	Low
F.5	North gable of office building	54.143658, -9.895703	Low
F.6	Shed	54.143361, -9.89424	Low

3.3 Roost surveys

The locations of potential roosts classified as low and moderate suitability can be seen in Figure 6. Roost feature locations for which emergence and re-entry surveys were conducted are shown in **Figure 7** while photographic evidence of these locations can be found in **APPENDIX 1**:

3.3.1 Roost emergence/re-entry surveys

Roost emergence/re-entry surveys were undertaken at each identified PRF to confirm if it was used by roosting bats during the 2022 season. **Figure 7**: Roost survey locations shows the locations where these surveys were conducted and **Table 14** provides a summary of surveys and results at each of these locations. Images of these locations can be found in **APPENDIX 1**: . The following is the results of each survey:

Emergence survey 1: 02 June 2022

North and east office building (F.5 & F.2): No bats were recorded or seen on this survey.

Results: No emergence recorded at the northeast and east faces of the building.

Re-entry survey 1: 03 June 2022

Subterranean path (F.1): The first bat recorded was a soprano pipistrelle at 03:59am, which was seen commuting from the north to the south. Another bat was then seen at 04:11 commuting back from the south to the north. No bats re-entering was seen.

Results: No re-entry recorded at subterranean entrance.

Emergence survey 2: 06 July 2022

Southern gable of old metal factory (F.3): The first bat seen was a soprano pipistrelle which was foraging.

Results: No emergence recorded at southern gable of metal factory

Re-entry survey 2: 07 June 2022

Re-Entry survey had to be postponed due to bad weather and unfavourable conditions for bat species.

Results: N/A.

Emergence survey 3: 19 July 2022

Southeast face of old office building (F.4): The first bat seen was a soprano pipistrelle at 21:45, however, it was noted that this bat was not showing activity near the potential roost location. Another soprano pipistrelle was also recorded, which was not showing activity near the potential roost location. A third soprano pipistrelle was recorded at 23:02, but this bat was not seen.

Results: No emergence recorded at office building

Re-entry survey 3: 20 July 2022

Southern gable of metal factory (F.3): One soprano pipistrelle was recorded at 03:55, but this bat was not seen. A mist closed in at 04:35.

Results: No re-entry recorded at southern gable.

Emergence survey 4: 13 September 2022

Southeast and north gables of office building (F.3 & F.5) The first bat recorded was a soprano pipistrelle at 19:47. Further soprano pipistrelles species were recorded at 20:32 and 21:05. At 21:12, a brown long eared call was recorded. And a last soprano pipistrelle call was recorded at 21:27.

Results: No emergence recorded at southeast and north gables of office building.

Re-entry survey 4: 14 September 2022

North gable of office building (F.5): A Leisler's bat was recorded but not seen at 06:18. This was the only bat recorded during this survey.

Results: No re-entry recorded during the re-entry survey.

Re-entry survey 5: 20 October 2022

Shed (F.6): A soprano pipistrelle was seen at 07:20 re-entering the building. At 07:52, there was another possible soprano pipistrelle re-entry, but the surveyor couldn't fully confirm this. Again at 08:02, another soprano pipistrelle re-entered the building.

Results: Confirmed roost re-entry recorded during the re-entry survey.

Re-entry survey 1: 06 June 2023

Shed (F.6): A soprano pipistrelle was seen emerging at 00:27:32 and circled around the front and made a re-entry at 00:28:01. A total of three Soprano pipistrelles were observed conducting social behaviour this is including the one emergence from the shed.

Results: Confirmed roost emergence during the emergence survey. Appendix 1[**Plate 10**]

Table 14: Summary of emergence/re-entry surveys and results at each PRF location

Feature ID	Feature	PRF classification	Emergence/re-entry survey dates	Winter Roost inspection survey dates	Conclusion
F.1	Subterranean path	Moderate	Dusk: 19-Jul-22 Dawn: 03-Jun-22	09-Mar-22	Low activity outside – two soprano pipistrelles commuting. No roost confirmed.
F.2	East face of office building	Low	Dusk: 02-Jun-22	09-Mar-22	No activity. No roost confirmed
F.3	Southern gable of old metal factory	Negligible (inside)	Dusk: 06-Jul-22 Dawn: 20-Jul-22	09-Mar-22	Low activity – one soprano pipistrelle foraging. No roost confirmed
F.4	South Gable of office building	Low	Dusk: 13-Sep-22 Dusk: 19-Jul-22 Dusk: 13-Sep-22 Dawn: 20-Jul-22	09-Mar-22	Low activity – two soprano pipistrelles recorded. No roost confirmed
F.5	North gable of office building	Low	Dusk: 02-Jun-22 Dusk: 13-Sep-22 Dawn: 14-Sep-22	09-Mar-22	Low activity – possible brown long-eared bat social call. No roost confirmed
F.6	Shed	Low	Dusk: 20-Oct-22	09-Mar-22	One confirmed Re-entry seen with another possible re-entry. Confirmed roost
F.6	Shed	Low	Dusk: 06-Jun-23	09-Mar-22	One confirmed emergence seen with a possible re-entry. Confirmed roost

3.3.2 Winter roost inspections

On 09 March 2022 hibernation surveys were carried out on all identified PRFs that were considered suitable to hold hibernating bats. The basement area of the factory, or subterranean path, is very wet for the first section and has a dry section towards the back which has many mosquitos hibernating. There are several cracks and crevices in which bats could potentially roost in, along with a plentiful food source. The basement is also likely to have constant temperatures during the winter months, and along with damp conditions, which is advantageous for roosting bats. This feature has the greatest potential to hold hibernating bats.

Internal building inspections found no evidence of hibernating bats.



Figure 6: Bat roost potential of buildings within the viable area of the site



Figure 7: Roost survey locations

3.4 Bat activity transect surveys

The following section summarises the transect results recorded in 2022 and 2023. The distribution of bats recorded along transects are displayed in **Figure 2**, **Figure 8** and **Figure 9**. Note no bats were recorded during the 02 June 2022 and 07 July 2022 transects, therefore there are no figures for these. The total pass results, obtained using Elekon Batlogger M bat detectors, are presented in **Table 15**.

Transect 1: 02 June 2022

The first transect began at 23:32 on 02 June 2022. This transect was completed by foot in the northwest section of the site. No bats were recorded during this transect.

Transect 2: 07 July 2022

This transect covered the South section of the site and was completed by foot. No bats were recorded during this transect in July 2022.

Transect 3: 19 July 2022

This transect covered the northern section of the site. This transect was completed by foot. A soprano pipistrelle was seen commuting along forestry edge c. 6m in height. This was the only bat noted during the transect.

Transect 4: 13 September 2022

This transect covered the northern section of the site. The transect was completed by foot. The first bat recorded was a Leisler’s bat which was seen commuting at 20:15. A soprano pipistrelle was heard foraging at 20:16. A Leisler’s bat and *Myotis* sp. were heard making social/mating calls. Another Leisler’s bat was seen commuting at 20:23 and a final soprano pipistrelle bat was seen commuting at 20:33. This was the last bat noted during the survey which then finished at 23:00.

Transect 5: 06 June 2023

This transect covered the South section of the site and was completed by foot. No bats where 1 Soprano pipistrelle was recorded.

Overall activity recorded during transect surveys undertaken in summer and autumn reflected low bat activity within the site, with bats being recorded on two surveys only.

Table 15: Number of bat passes recorded during 2022 transect surveys

Species	02-Jun-2022	06-Jul-2022	19-Jul-2022	13-Sep-2022	06-Jun-2023
<i>Myotis</i> spp.	0	0	1	0	0
Leisler’s bat	0	0	0	0	0
Common pipistrelle	0	0	0	0	0
Soprano pipistrelle	0	0	18	1	1
Pipistrellus spp.	0	0	0	0	0

Brown long-eared bat	0	0	0	0	0
Total	0	0	19	1	1



Figure 8: Survey results for Transect Route 19-Jul-22

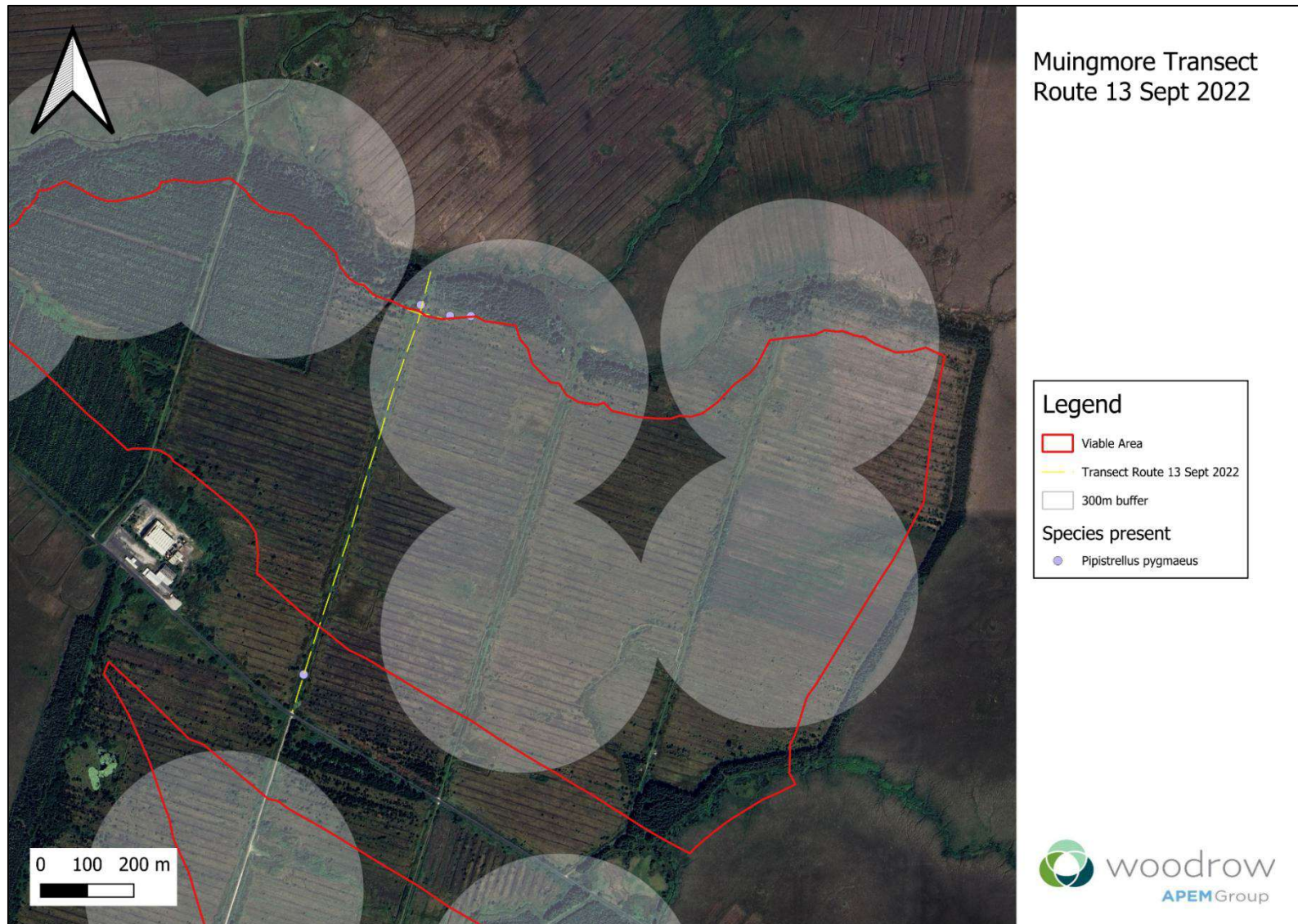


Figure 9: Survey results for Transect Route 13-Sep-22

3.5 Static detector surveys

In compliance with NatureScot *et al.* (2021) guidelines, static bat detectors were deployed separately during three seasons over the 2022 and 2023 active seasons at or in areas adjacent to the proposed turbines as shown in **Figure 3** and **Figure 4** for year 2022 and 2023 respectively with deployment dates and durations detailed in **Table 5** and **Table 6**. Weather conditions during the three deployment periods were compliant with NatureScot *et al.*, (2021) requirements and details are provided in **APPENDIX 2: Weather data for each static deployment period 2022 and 2023**.

The following section detail the results from static monitoring surveys for each of the three seasonal deployments: spring, summer, and autumn.

The average value in **Table 16** represents the average bat passes per hour. The standard deviation shows how dispersed the data is from the average. A low standard deviation shows how data is clustered around the average. A high standard deviation shows how the data is more spread out from the average. The interquartile range indicates the data lies within the middle of the data set. The interquartile range indicates the data that lies within the middle half of the data set. This data excluding outliers is represented in the box plots in **Figure 10** and **Figure 11** for year 2022 and 2023 respectively.

Geographical and temporal context for activity levels was examined through the analysis of the data using the software R. Graphs have been created which shows the observed activity level at each detector during the survey in relation to literature-documented activity times relative to sunset. The contrast is displayed with the grey boxes indicating the literature based documented activity, while the coloured boxes denote observed activity during the survey see **APPENDIX 4: Year 2023 R Graphs of activity in relation to sunset**. While the relationship between levels of bat activity and weather conditions, specifically wind speed and temperature, is displayed in **APPENDIX 5: 2023 Weather data showing 95% interval ellipse of bp/h windspeed (m/s) vs temperature (°C)**.

3.5.1 Results for Spring 2022 and 2023

In 2022 each of the 12 detectors recorded for a total of 14 nights (8397mins) and in 2023 for a total of 15 nights (8273). This is compliant with the minimum consecutive 10-day deployment. There were no technical issues during the deployment.

There was a total of 2583 calls recorded during the 2022 spring deployment. These calls were mainly made up of soprano pipistrelles with a total of 2448 calls attributable to soprano pipistrelles alone. There were also common pipistrelles (41), a Nathusius' pipistrelle, *Pipistrellus* sp. (8), *Myotis* sp. (40), brown long-eared bats (16) and Leisler's bats (29) also recorded. These eight *Pipistrellus* sp. were identified as social calls. Social calls differ from the typical species related echolocations. A social call is a call of a much lower frequency that can indicate the bat is either protecting its' territory, advertising for a mate, or calls from a parent bat guiding its' young bat pups flying alongside it.

There was a total of 536 calls recorded during the 2023 spring deployment. The majority of these calls were of the soprano pipistrelle's species (440). There were also common pipistrelles (70), *Myotis* sp. (11), and Leisler's bats (15) recorded. There were social calls from the pipistrelle's species (36) likely an indication of territory protection given the time of year.

3.5.2 Results for Summer 2022 and 2023

In 2022, each of the 12 detectors recorded for a total of 13 nights (7003mins) and in 2023 the 13 detectors recorded for 13 nights (7003min). This is compliant with the minimum consecutive 10-day deployment. Some technical issues during the 2023 deployment occurred which is further discussed in the methodology section under limitations.

There was a total of 935 calls recorded during the 2022 summer deployment with a total of 815 calls attributable to soprano pipistrelles alone. There were also common pipistrelles (6), *Pipistrellus* spp. (4), *Myotis* spp. (66), brown long-eared bats (3) and Leisler's bats (41) also recorded.

During the 2023 Summer deployment there were a total of 308 calls out of which 277 calls were soprano pipistrelles. Other bat species recorded were a common pipistrelle (1), a Nathusius' pipistrelle (1), Leisler's bats (15) and the remaining were myotis species bat calls (9).

3.5.3 Results for Autumn 2022 and 2023

Each of the 12 detectors recorded for a duration of 14 nights (11330 mins). This is compliant with the minimum consecutive 10-day deployment. There were no technical issues during the deployment.

During the 2022 seasons there was a total of 1727 calls recorded during the autumn deployment. These calls were mainly made up of soprano pipistrelles with a total of 908 calls attributable to soprano pipistrelles alone. There were also common pipistrelles (139), *Pipistrellus* spp. (599), *Myotis* spp. (64), brown long-eared bats (13) and Leisler's bats (4) also recorded. 596 of the 599 *Pipistrellus* spp. were social calls.

During the 2023 seasons there was a total of 485 calls recorded of which 381 are the soprano pipistrelles species. There were also common pipistrelles (34), *Pipistrellus* spp. (10), *Myotis* spp. (19) brown long-eared bats (5), and Leisler's bats (36). There are also an additional 50 calls that are social calls mainly from the pipistrelle's species but also from the brown long eared bat this can be related to mating social advertising calls.

3.5.4 Association of bat activity with habitat features

In the 2022 and 2023 survey seasons, detectors D.01 D.05, D.06, D.09, D.10 and D.12 were placed in open areas of the proposed site, be it peatland habitats or clear-fell habitats. These locations recorded less activity from species present compared to the other detectors located in more favourable habitats for species.

During 2022, detectors recorded the greatest levels of activity at D.03, D.04, D.08, D.10 and D.11. as shown in **Figure 10 and 11**.

During 2023, detectors recorded the greatest levels of activity at D.02, D.03, D.04, D.07, D.08, D.10 and D.11 as shown in **Figure 13**.

These detectors were all placed at proposed turbine locations which are in close proximity to foraging and commuting habitat features which have been assessed as having moderate to low foraging potential within the 300m buffers. See **Figures 3 and 4**.

3.5.5 Site specific weather data and bat activity during the 2023 survey season

The guidelines pertaining to bat surveying, impact assessment and mitigation for bats at onshore wind turbines (NatureScot *et al.*, 2021) strongly recommends continual monitoring of site-specific weather data on rainfall, temperature and wind speeds. Compliant weather conditions are defined as: temperatures at $\geq 8^{\circ}\text{C}$ at dusk, a maximum ground level wind speed of 5 m/s and no, or only very light, periodic rainfall.

APPENDIX 5: 2023 Weather data showing 95% interval ellipse of bp/h windspeed (m/s) vs temperature ($^{\circ}\text{C}$) illustrates wind and temperature conditions the bats are most active at each detector location during each survey season of 2023. Typically, the wind speed between 3 to 10 meters per second with temperature conditions between 7 and 12 degrees Celsius is shown to record 95% of the bat activity. Locations that are open landscapes: D.01, D.05, D.06, D.09 and D.12 show recordings at these with a decreased activity during high wind whereas locations with linear features at locations D.02, D.03, D.04, D.07, D.08, D.10, D.11 and D.13 recorded an increase in bat activity.

There appears to be a difference in trend based on whether a detector location was beside a feature or in an open area. The detector locations along linear features with moderate foraging and commuting routes for bats appear to have higher incidents of bat activity during higher wind speeds than that of the locations where detectors were recording in open areas.

Table 16: Year 2022 Bat activity (average bat passes per hour, bp/h) for each bat species across all the deployments. ³

Activity level classification based on mean bat passes per hour: < 2 bp/h = **Low**, 2 to < 5 bp/h = **Moderate**, ≥ 5 bp/h = **High**

Deployment		Myotis spp.			Leisler's bat			Nathusius' pipistrelle			Common pipistrelle			Soprano pipistrelle			Pipistrellus spp.			Brown long-eared bat		
		Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR
Spring 2022	D.01	0.018	0.018	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.072	0.293	0	0.000	0.000	0	0.000	0.000	0
	D.02	0.009	0.009	0	0.018	0.133	0	0.000	0.000	0	0.000	0.000	0	0.270	0.632	0	0.000	0.000	0	0.036	0.187	0
	D.03	0.027	0.027	0	0.117	0.697	0	0.009	0.094	0	0.000	0.000	0	1.631	3.508	1.5	0.009	0.095	0	0.027	0.211	0
	D.04	0.009	0.009	0	0.000	0.000	0	0.000	0.000	0	0.009	0.095	0	5.045	8.082	6	0.000	0.000	0	0.000	0.000	0
	D.05	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.189	0.640	0	0.000	0.000	0	0.000	0.000	0
	D.06	0.009	0.009	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.117	0.375	0	0.000	0.000	0	0.027	0.163	0
	D.07	0.036	0.036	0	0.000	0.000	0	0.000	0.000	0	0.009	0.095	0	0.243	0.690	0	0.000	0.000	0	0.018	0.134	0
	D.08	0.027	0.027	0	0.018	0.133	0	0.000	0.000	0	0.225	1.326	0	3.432	8.285	2	0.000	0.000	0	0.009	0.095	0
	D.09	0.090	0.090	0	0.018	0.133	0	0.000	0.000	0	0.000	0.000	0	0.036	0.187	0	0.000	0.000	0	0.000	0.000	0
	D.10	0.036	0.036	0	0.045	0.248	0	0.000	0.000	0	0.000	0.000	0	1.207	3.826	2	0.000	0.000	0	0.000	0.000	0
	D.11	0.009	0.009	0	0.018	0.133	0	0.027	0.162	0	0.000	0.000	0	5.847	12.614	6	0.027	0.163	0	0.000	0.000	0
	D.12	0.027	0.027	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.036	0.187	0	0.000	0.000	0	0.000	0.000	0

³ Notation: Std Dev = standard deviation and IQR = interquartile range

Deployment		<i>Myotis</i> spp.			Leisler's bat			Nathusius' pipistrelle			Common pipistrelle			Soprano pipistrelle			<i>Pipistrellus</i> spp.			Brown long-eared bat		
		Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR
Summer 2022	D.01	0.022	0.147	0	0.022	0.147	0	0.000	0.000	0	0.033	0.180	0	0.099	0.300	0	0.000	0.000	0	0.000	0.000	0
	D.02	0.011	0.105	0	0.011	0.105	0	0.000	0.000	0	0.000	0.000	0	0.516	1.047	1	0.000	0.000	0	0.011	0.105	0
	D.03	0.011	0.105	0	0.121	0.443	0	0.000	0.000	0	0.011	0.105	0	1.670	3.320	2	0.022	0.147	0	0.000	0.000	0
	D.04	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	2.121	4.008	2	0.000	0.000	0	0.000	0.000	0
	D.05	0.022	0.210	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.088	0.285	0	0.000	0.000	0	0.000	0.000	0
	D.06	0.044	0.206	0	0.033	0.233	0	0.000	0.000	0	0.011	0.105	0	0.077	0.372	0	0.000	0.000	0	0.011	0.105	0
	D.07	0.044	0.254	0	0.022	0.147	0	0.000	0.000	0	0.000	0.000	0	0.088	0.285	0	0.022	0.147	0	0.011	0.105	0
	D.08	0.121	0.417	0	0.055	0.229	0	0.000	0.000	0	0.011	0.105	0	2.505	5.273	2	0.022	0.147	0	0.000	0.000	0
	D.09	0.132	0.542	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.033	0.180	0	0.000	0.000	0	0.000	0.000	0
	D.10	0.077	0.307	0	0.011	0.105	0	0.000	0.000	0	0.000	0.000	0	0.440	0.909	1	0.000	0.000	0	0.000	0.000	0
	D.11	0.011	0.105	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.165	0.429	0	0.000	0.000	0	0.000	0.000	0
	D.12	0.022	0.147	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.033	0.180	0	0.000	0.000	0	0.000	0.000	0

Deployment		<i>Myotis</i> spp.			Leisler's bat			Nathusius' pipistrelle			Common pipistrelle			Soprano pipistrelle			<i>Pipistrellus</i> spp.			Brown long-eared bat		
		Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR
Autumn 2022	D.01	0.018	0.133	0	0.006	0.077	0	0.000	0.000	0	0.108	0.348	0	0.181	0.444	0	0.006	0.077	0	0.000	0.000	0
	D.02	0.024	0.189	0	0.000	0.000	0	0.000	0.000	0	0.024	0.154	0	0.392	0.836	1	0.006	0.077	0	0.012	0.109	0
	D.03	0.018	0.133	0	0.000	0.000	0	0.000	0.000	0	0.247	0.788	0	0.886	1.639	1	0.000	0.000	0	0.000	0.000	0
	D.04	0.018	0.133	0	0.000	0.000	0	0.000	0.000	0	0.066	0.332	0	0.813	1.432	1	0.000	0.000	0	0.000	0.000	0
	D.05	0.012	0.109	0	0.000	0.000	0	0.000	0.000	0	0.042	0.201	0	0.187	0.511	0	0.018	0.173	0	0.012	0.109	0
	D.06	0.018	0.232	0	0.000	0.000	0	0.000	0.000	0	0.006	0.077	0	0.151	0.448	0	0.012	0.109	0	0.006	0.077	0
	D.07	0.060	0.305	0	0.000	0.000	0	0.000	0.000	0	0.018	0.133	0	0.217	0.651	0	3.313	10.619	1	0.024	0.154	0
	D.08	0.042	0.229	0	0.000	0.000	0	0.000	0.000	0	0.048	0.393	0	0.410	1.224	0	0.012	0.109	0	0.012	0.109	0
	D.09	0.030	0.171	0	0.006	0.077	0	0.000	0.000	0	0.012	0.155	0	0.072	0.282	0	0.000	0.000	0	0.000	0.000	0
	D.10	0.012	0.109	0	0.000	0.000	0	0.000	0.000	0	0.169	0.665	0	0.976	1.755	1	0.000	0.000	0	0.000	0.000	0
	D.11	0.060	0.262	0	0.006	0.077	0	0.000	0.000	0	0.066	0.314	0	0.596	4.050	0	0.018	0.133	0	0.006	0.077	0
	D.12	0.024	0.154	0	0.006	0.077	0	0.000	0.000	0	0.012	0.109	0	0.127	0.367	0	0.000	0.000	0	0.000	0.000	0 ⁴

Table 17: Year 2023 Bat activity (average bat passes per hour, bp/h) for each bat species across all the deployments.⁵ Activity level classification based on mean bat passes per hour: < 2 bp/h = **Low, 2 to < 5 bp/h = **Moderate**, ≥ 5 bp/h = **High**⁵**

Deployment	Myotis spp.			Leisler's bat			Nathusius' pipistrelle			Common pipistrelle			Soprano pipistrelle			Pipistrellus spp.			Brown long-eared bat			
	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	
Spring 2023	D.01	0.022	0.148	0	0.000	0.000	0	0	0	0	0.000	0.000	0	0.030	0.170	0	0.000	0.000	0.000	0	0	0
	D.02	0.000	0.000	0	0.030	0.171	0	0	0	0	0.000	0.000	0	0.444	1.484	0	0.000	0.000	0.000	0	0	0
	D.03	0.000	0.000	0	0.015	0.122	0	0	0	0	0.030	0.244	0	0.496	1.229	1	0.000	0.000	0.000	0	0	0
	D.04	0.000	0.000	0	0.000	0.000	0	0	0	0	0.000	0.000	0	0.024	0.199	0	0.000	0.000	0.000	0	0	0
	D.05	0.000	0.000	0	0.016	0.126	0	0	0	0	0.000	0.000	0	0.144	0.453	0	0.000	0.000	0.000	0	0	0
	D.06	0.000	0.000	0	0.000	0.000	0	0	0	0	0.016	0.179	0	0.104	0.306	0	0.000	0.000	0.000	0	0	0
	D.07	0.009	0.092	0	0.034	0.182	0	0	0	0	0.496	1.337	0	0.197	0.685	0	0.000	0.000	0.000	0	0	0
	D.08	0.000	0.000	0	0.008	0.089	0	0	0	0	0.016	0.126	0	0.688	1.793	1	0.000	0.000	0.000	0	0	0
	D.09	0.051	0.222	0	0.017	0.130	0	0	0	0	0.017	0.185	0	0.128	0.361	0	0.000	0.000	0.000	0	0	0
	D.10	0.000	0.000	0	0.000	0.000	0	0	0	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0.000	0	0	0
	D.11	0.009	0.093	0	0.000	0.000	0	0	0	0	0.017	0.186	0	1.259	3.917	0.25	0.000	0.000	0.000	0	0	0
	D.12	0.000	0.000	0	0.000	0.000	0	0	0	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0.000	0	0	0
	D.13	0.000	0.000	0	0.000	0.000	0	0	0	0	0.000	0.000	0	0.060	0.356	0	0.000	0.000	0.000	0	0	0

⁵ Notation: Std Dev = standard deviation and IQR = interquartile range

Deployment		Myotis spp.			Leisler's bat			Nathusius' pipistrelle			Common pipistrelle			Soprano pipistrelle			Pipistrellus spp.			Brown long-eared bat		
		Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR
Summer 2023	D.01	0.008	0.087	0	0.015	0.122	0	0.000	0.000	0	0.000	0.000	0	0.023	0.149	0	0.000	0.000	0	0.000	0.000	0
	D.02	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0
	D.03	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.750	1.389	1	0.000	0.000	0	0.000	0.000	0
	D.04	0.000	0.000	0	0.009	0.093	0.009	0.000	0.000	0	0.000	0.000	0	0.426	1.528	0	0.000	0.000	0	0.000	0.000	0
	D.05	0.000	0.000	0	0.000	0.000	0.000	0.000	0.000	0	0.000	0.000	0	0.081	0.273	0	0.000	0.000	0	0.000	0.000	0
	D.06	0.000	0.000	0	0.007	0.084	0.007	0.000	0.000	0	0.000	0.000	0	0.035	0.185	0	0.000	0.000	0	0.000	0.000	0
	D.07	0.026	0.208	0.026	0.061	0.425	0.061	0.000	0.000	0	0.000	0.000	0	0.130	0.469	0	0.000	0.000	0	0.026	0.160	0
	D.08	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0
	D.09	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0
	D.10	0.007	0.084	0.007	0.007	0.084	0.007	0.000	0.000	0	0.000	0.000	0	0.437	0.985	0.75	0.000	0.000	0	0.000	0.000	0
	D.11	0.008	0.090	0.008	0.008	0.090	0.008	0.000	0.000	0	0.000	0.000	0	0.032	0.218	0	0.000	0.000	0	0.000	0.000	0
	D.12	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0
	D.13	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0

Deployment		Myotis spp.			Leisler's bat			Nathusius' pipistrelle			Common pipistrelle			Soprano pipistrelle			Pipistrellus spp.			Brown long-eared bat		
		Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR	Mean	Std Dev	IQR
Autumn 2023	D.01	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0
	D.02	0.016	0.126	0	0.016	0.126	0	0.000	0.000	0	0.000	0.000	0	0.339	0.958	0	0.005	0.073	0	0.000	0.000	0
	D.03	0.022	0.145	0	0.016	0.126	0	0.000	0.000	0	0.005	0.073	0.005	0.505	1.046	0	0.005	0.073	0	0.005	0.073	0
	D.04	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0
	D.05	0.011	0.103	0	0.000	0.000	0	0.000	0.000	0	0.005	0.073	0	0.075	0.382	0	0.000	0.000	0	0.000	0.000	0
	D.06	0.005	0.073	0	0.022	0.231	0	0.000	0.000	0	0.000	0.000	0	0.065	0.287	0	0.000	0.000	0	0.000	0.000	0
	D.07	0.016	0.126	0	0.059	0.478	0	0.000	0.000	0	0.000	0.000	0	0.070	0.330	0	0.011	0.103	0	0.016	0.126	0
	D.08	0.005	0.073	0	0.043	0.326	0	0.000	0.000	0	0.172	1.799	0	0.538	1.915	0	0.016	0.126	0	0.000	0.000	0
	D.09	0.000	0.000	0	0.016	0.164	0	0.000	0.000	0	0.000	0.000	0	0.081	0.373	0	0.000	0.000	0	0.000	0.000	0
	D.10	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0
	D.11	0.016	0.126	0	0.005	0.073	0	0.000	0.000	0	0.000	0.000	0	0.220	0.792	0	0.005	0.073	0	0.005	0.073	0
	D.12	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0	0.000	0.000	0
	D.13	0.011	0.103	0	0.016	0.126	0	0.000	0.000	0	0.000	0.000	0	0.113	0.379	0	0.011	0.103	0	0.000	0.000	0

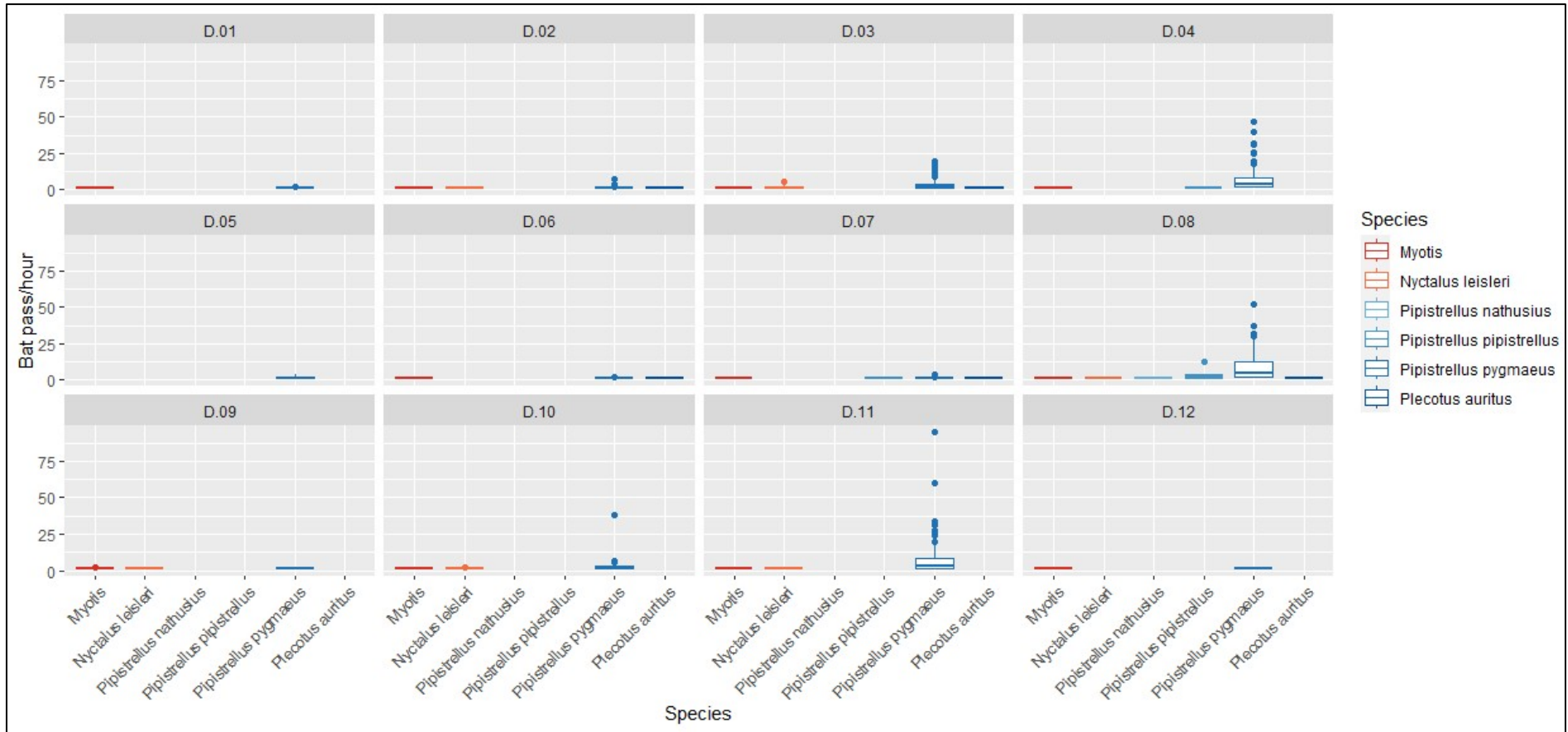


Figure 10: 2022 Mean passes of each species at detector locations

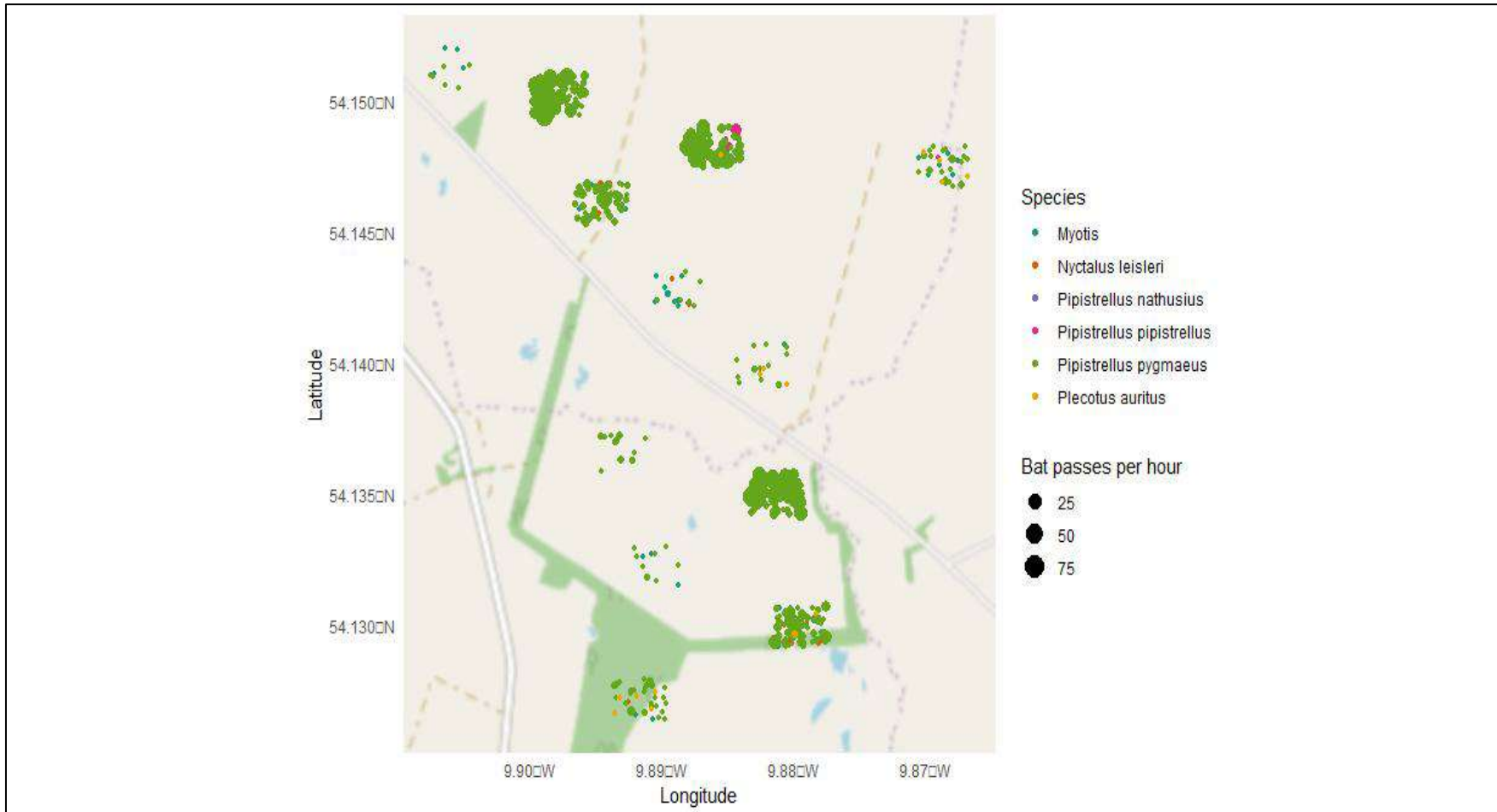


Figure 11: 2022 Overall species activity at each detector location

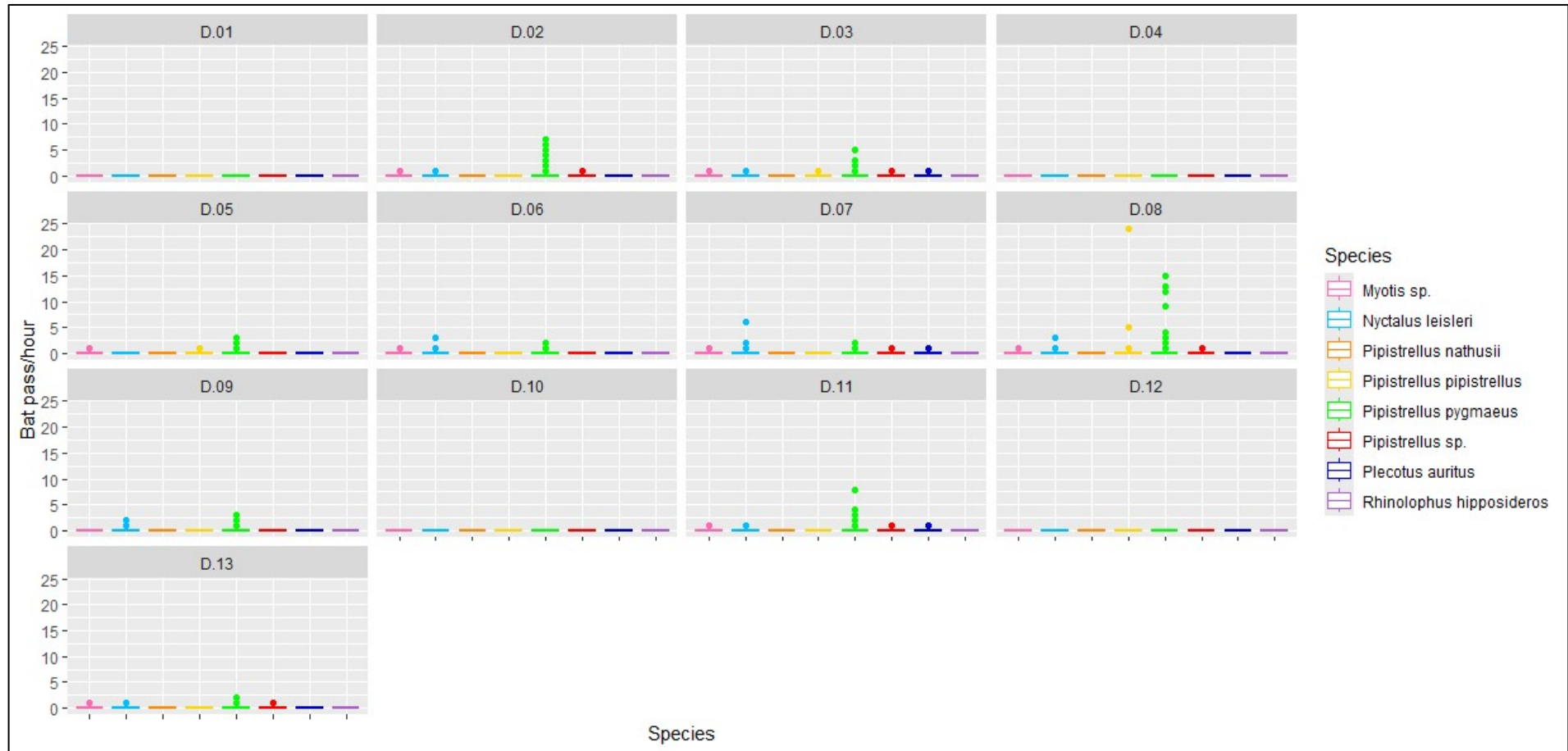


Figure 12: 2023 Mean passes of each species at detector locations

4 DISCUSSION

4.1 Summary of roost survey results

As detailed in **Section 3.3 Roost surveys**, one roost was confirmed in the existing building on site to be used by one bat and was assessed as suitable to hold small numbers of bats only or be used as a transitional roost, and was assessed as a low suitability PRF. **Table 14** details the summarised results of roost surveys conducted on site in 2022 and 2023 and shows the locations of where these surveys were carried out.

A total of six PRFs were identified at the built structures in the central section of the proposed site. Five were identified as having low PRF suitability and one was identified as having moderate PRF suitability to hold numbers of roosting bats. From the 2022 survey results, there was two confirmed re-entries of a soprano pipistrelle into the building (F.6) and a possible third. From the 2023 survey results there was a confirmed soprano pipistrelle emergence at the same building. There were no other confirmed roosts, with little to no activity recorded at the other potential roosts surveyed. Building F.6 lies just outside the 300m buffer from the nearest turbine.

4.2 Summary of bat activity survey results

During the 2022 and 2023 seasons, bat activity was recorded within the site for a minimum of six species, including common pipistrelles, soprano pipistrelles, Nathusius's pipistrelle, Leisler's bats, *Myotis* sp., and brown long-eared bats. The majority of bat activity was attributed to soprano pipistrelles. Soprano pipistrelles were recorded in all months during transect and static surveys and were the most commonly encountered species for static surveys during all of the seasonal deployments.

Activity within the site was largely recorded in proximity to habitat features that were assessed as being suitable for foraging and commuting bats, i.e. forestry edge habitat. A summary of activity by species, and a visual representation of overall bat activity in 2022 is shown in **Figure 8** and **Figure 9**: **2022** Mean passes of each species at detector locations and in 2023 in the **APPENDIX 2** which illustrates wind and temperature conditions the bats are most active at each detector location during each survey season of 2023.

Typically, the wind speed between 3 to 10 meters per second with temperature conditions between 7 and 12 degrees Celsius is shown to record 95% of the bat activity. Locations that are open landscapes: D.01, D.05, D.06, D.09 and D.12 show recordings with a decreased activity during high wind whereas locations with linear features at D.02, D.03, D.04, D.07, D.08, D.10, D.11 and D.13 recorded an increase in bat activity.

An overall view of the mean bat activity per detector location is shown **Figure 10** for 2022 and **Figure 12** for 2023.

4.2.1 Pipistrelle species

As mentioned above, soprano pipistrelles were recorded across the proposed site, during all deployments in 2022 and 2023 and were the most active species within the proposed site. There

was a total of 4171 soprano pipistrelles calls in 2022 and 1311 calls in 2023 detected throughout the three deployments. Common pipistrelles were the second most active species at the site with a total of 186 calls in 2022 and 115 in 2023 this is the total recorded throughout the three deployments. It is further outlined below the tabulated data from the three seasons of survey years 2022 and 2023 from **Tables 14, 15 and 16**.

4.2.1.1 2022 Data analysis

In 2022, the data analysis indicates that soprano pipistrelles were recorded as having low to moderate activity levels across all deployments. They had moderate activity at the following:

- Spring: D.04, D.08 and D.11
- Summer: D.04 and D.08

A common mean activity occurrence happens at D.03 and D.04 on all three deployments. The area at D.03 has a dense Sitka spruce forestry alongside a drainage ditch, while the area at D.04 also has Sitka spruce forestry running along the forestry track these areas would be of moderate foraging and commuting potential as per Collins *et al.* (2016), which explains the constant mean activity of Sopranos in these areas.

Common pipistrelles had low activity levels overall with a slight increase during the autumn season at the following location:

- Autumn: D.07

There was also one recording of a Nathusius' pipistrelle at D.08 north of the site during the spring deployment.

Transect survey results for 2022 showed soprano pipistrelles were also the most active species recorded during transect activity surveys. This was mainly during transect 19 July 2022 with a total of 18 records and on the transect survey 13 September 2022 with one recorded during the survey, see **Figure 2**. This is beside woodland of moderate foraging potential.

4.2.1.2 2023 Data analysis

The 2023 data indicates the soprano pipistrelles species as with 2022 were the most recorded species over the entire site. In contrast, however, they are recorded having a very low activity level throughout the three seasons and on most deployments as noted here below.

- Spring: D.01, D.02, D.03, D.04, D.05, D.06, D.07, D.08, D.09 and D.11
- Summer: D.01, D.03, D.04, D.05, D.06, D.07, D.10 and D.11
- Autumn: D.02, D.03, D.05, D.06, D.07, D.08, D.09, D.11, and D.13

As with 2022 there was also just one recording of a Nathusius' pipistrelle instead at location D.04 south of the site and during the summer instead of the spring deployment.

The transect on 06 June 2023, recorded one soprano pipistrelle who was observed commuting in a northly direction from the southern location near D.03.

4.2.2 Leisler's bat

4.2.2.1 2022 Data analysis

Leisler's bats were classed as having low activity during all deployments. Leisler's bats will frequently fly at heights greater than other species and are also less reliant on the use of linear features generally increasing their risk of turbine collision. D.03 recorded the greatest Leisler's bat activity throughout the 2022 deployment with a total of 37 calls detected. There was a total of 74 calls recorded throughout the deployments. Leisler's had low activity at the following detector locations:

- Spring: D.02, D.03, D.08, D.09, D.10 and D.11
- Summer: D.03, D.06 and D.08
- Autumn: D.01, D.09, D.11 and D.12

Leisler's bats were not recorded during the transect activity surveys. No Leisler's bats were detected at D.04 during any of the deployments.

4.2.2.2 2023 Data analysis

During the 2023 survey year a total of 66 Leisler's bat calls were recorded over the three seasons. In contrast to 2022 D.07 had the greatest Leisler's bat activity throughout the 2023 deployment with a total of 22 calls detected. This lies directly north of the previous year's high location count at D.03. The Leisler's bat activity is classed as having an overall very low mean activity level in the following locations:

- Spring: D.02, D.03, D.05, D.07, D.08 and D.09
- Summer: D.01, D.04, D.06, D.07, D.10 and D.11
- Autumn: D.02, D.03, D.06, D.07, D.08, D.09, D.11, and D.13

4.2.3 Myotis species

4.2.3.1 2022 Data analysis

During the 2022 survey period a total of 170 calls were recorded for *Myotis* sp. across the total three deployment periods. They were mainly of low activity at all the detector locations during each of the three seasons.

There was also only one *Myotis* sp. recorded during all of the transect activity surveys. This was recorded during the 19 July 2022 transect, see **Figure 8**.

4.2.3.2 2023 Data analysis

During the 2023 survey period a total of 60 calls were recorded for *Myotis* species across the three deployment periods with a highest during the autumn season. The calls were of a very low activity at most locations as listed here below.

- Spring: D.01, D.07, D.09, and D.11
- Summer: D.01, D.07, D.10, and D.11
- Autumn: D.02, D.03, D.05, D.06, D.07, D.08 D.11 and D.13

4.2.4 Brown long-eared bat

It is acknowledged that accurately monitoring brown long-eared activity can prove quite difficult as this species is known to make low amplitude calls and frequently forage using their eyes or ears rather than echolocation (Collins, 2016 and Russ, 2012). As a result, brown long-eared bats are frequently underrepresented in surveys which rely on the use of bat detectors.

4.2.4.1 2022 Data analysis

During the 2022 survey year brown long-eared bats recorded 32 calls in total across all seasons of deployments. There was one moderate median activity recorded at D.03 during the spring deployment. They were of low activity at the following detector locations:

- Spring: D.02, D.06, D.07 & D.08
- Summer: D.02, D.03 & D.06
- Autumn: D.02, D.05, D.06, D.07, D.08 & D.11

There is a common occurrence of the brown long-eared bat being recorded at D.02, D.06 and D.07, during each seasonal deployment. However, there were no brown long-eared bats recorded during any of the 2022 transect activity surveys.

4.2.4.2 2023 Data analysis

During the 2023 survey year there was a total of 10 brown long-eared bat calls, these were recorded during the summer and autumn and at a very low activity level at locations D.07 mostly and some were recorded at D.02 and D.11.

4.3 Conclusion

As previously mentioned, activity within the site is recorded in proximity to habitat features that are assessed as being suitable for foraging and commuting bats, i.e. forestry edge habitat. While both in survey years 2022 and 2023 indicate the most prominent species throughout the site remains to be the soprano pipistrelle and followed by the common pipistrelle. In contrast to the 2022 survey year, 2023 has recorded a lower level of activity while the data analysis in 2023 indicates the bat activity appears more widely dispersed across most locations.

As mentioned in the static results section **3.5.5** There appears to be a difference in trend based on whether a detector location was beside a feature or in an open area. The detector locations along linear features with moderate foraging and commuting routes for bats appear to have higher incidents of bat activity during higher wind speeds than that of the locations where detectors were recording in open areas.

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APPENDIX 1: POTENTIAL ROOST FEATURES AND ROOST EMERGENCE/RE-ENTRY SUREVY LOCATIONS



Plate 1: North face of office building (F.5) (54.143658, -9.895703)



Plate 2: East face of office building (F.2) (54.143513, -9.89496)



Plate 3: North side of old metal factory (F.3) (54.143657, -9.893473)



Plate 4: East side of Old metal factory (F.3) (54.143468, -9.893446)



Plate 5: South side of old office building (F.4) (54.14335, -9.895081)



Plate 6: Southeast side of old office building (F.2) (54.143373, -9.894731)



Plate 7: Southwest face of old office building (F.4) (54143322, -9.895129)



Plate 8: Building of Re-Entry survey (Between F.5 and F.4) (54.143406, -9.895358)



Plate 9: Entrance of shed where re-entries were seen (F.6) (54.143361, -9.89424)



Plate 10: Footage of bat emergence during roost survey 06-06-2023 (F.6) (54.143361, -9.89424)

APPENDIX 2: WEATHER DATA FOR EACH STATIC DEPLOYMENT PERIOD 2022 AND 2023

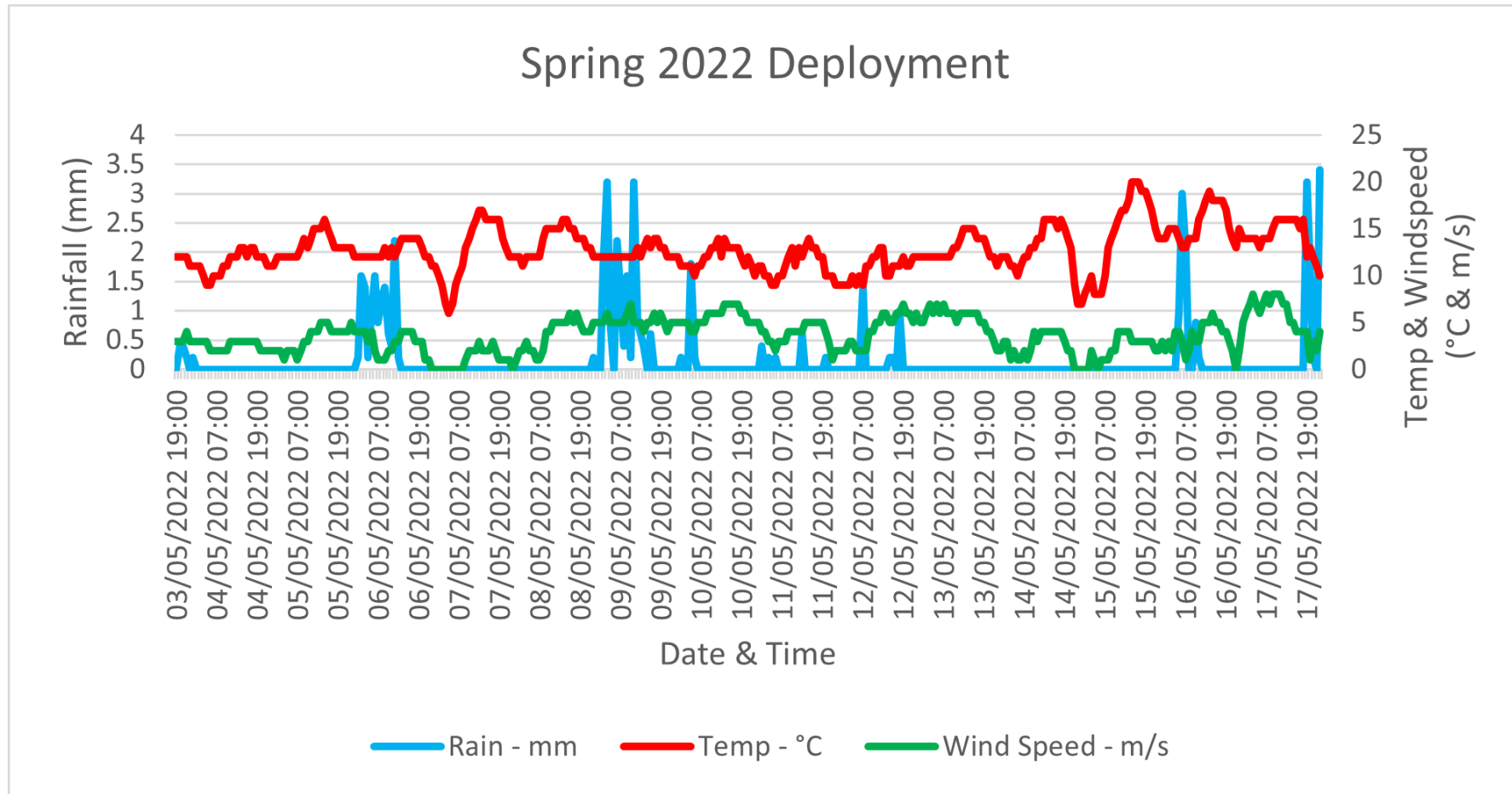


Figure A2.1 - Mean hourly weather conditions for the duration of the 2022 Spring deployment

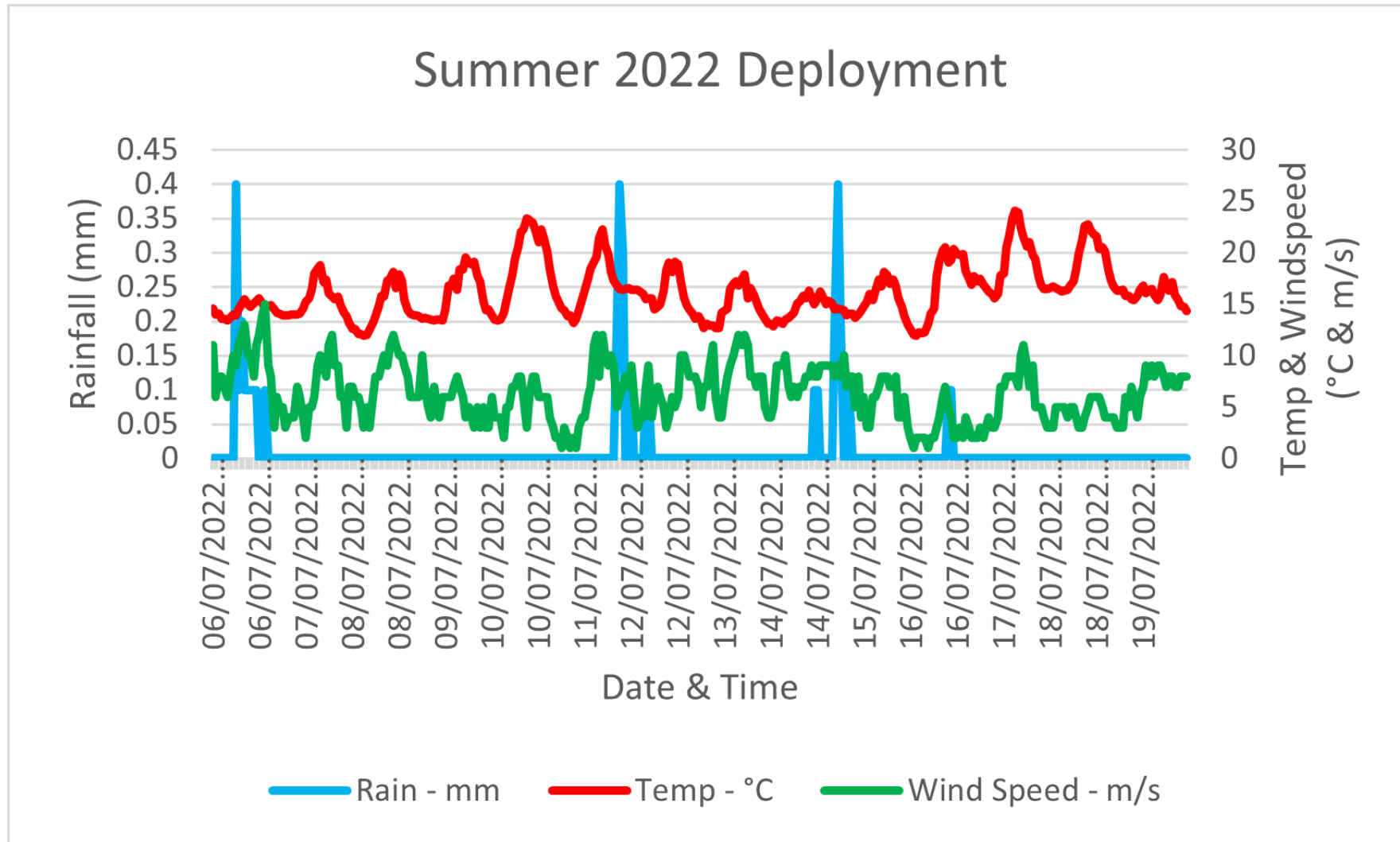


Figure A2.2 – Mean hourly weather conditions for the duration of the 2022 Summer Deployment

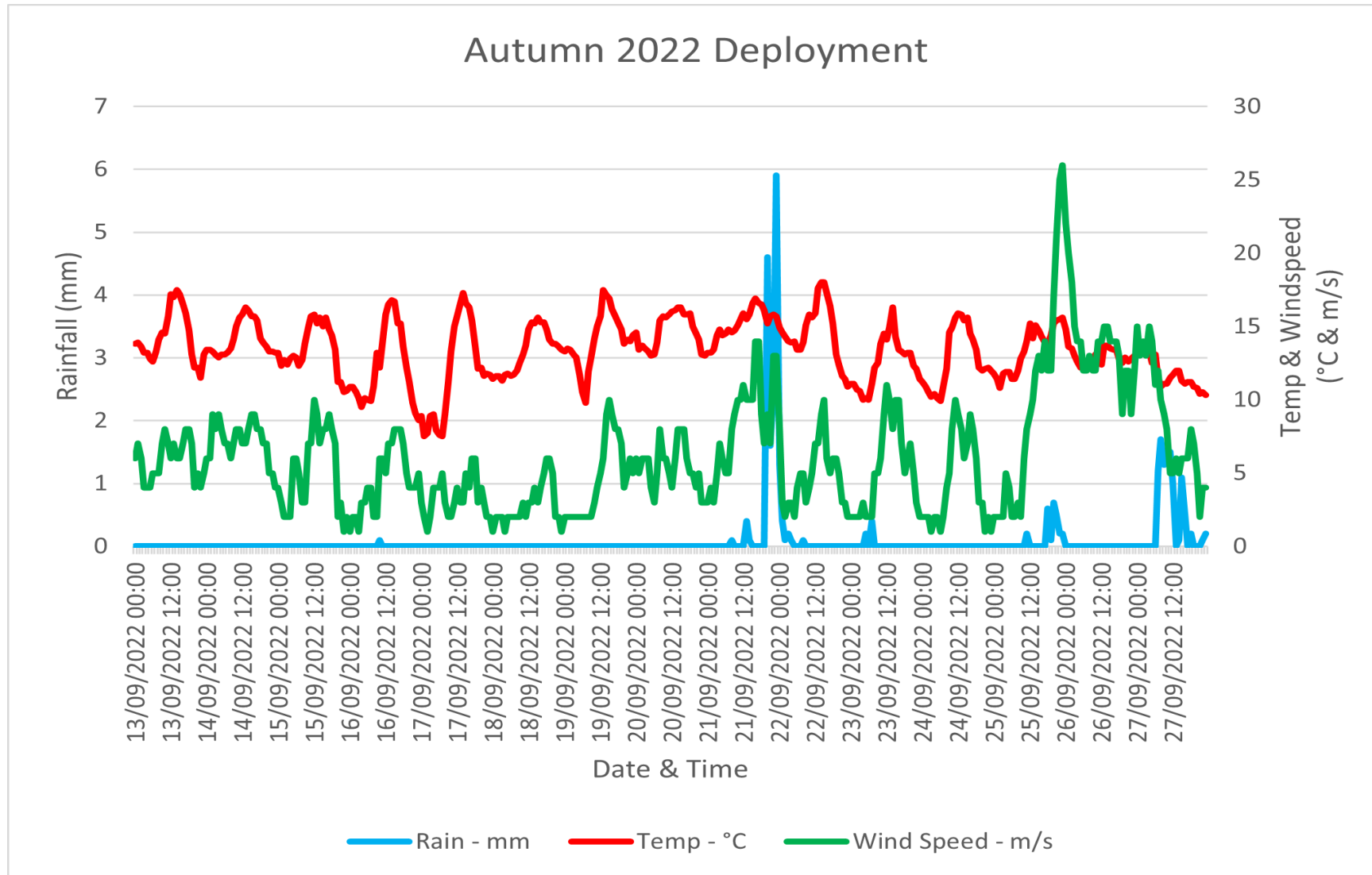


Figure A2.3 - Mean Hourly weather conditions for the duration of the 2022 Autumn Deployment

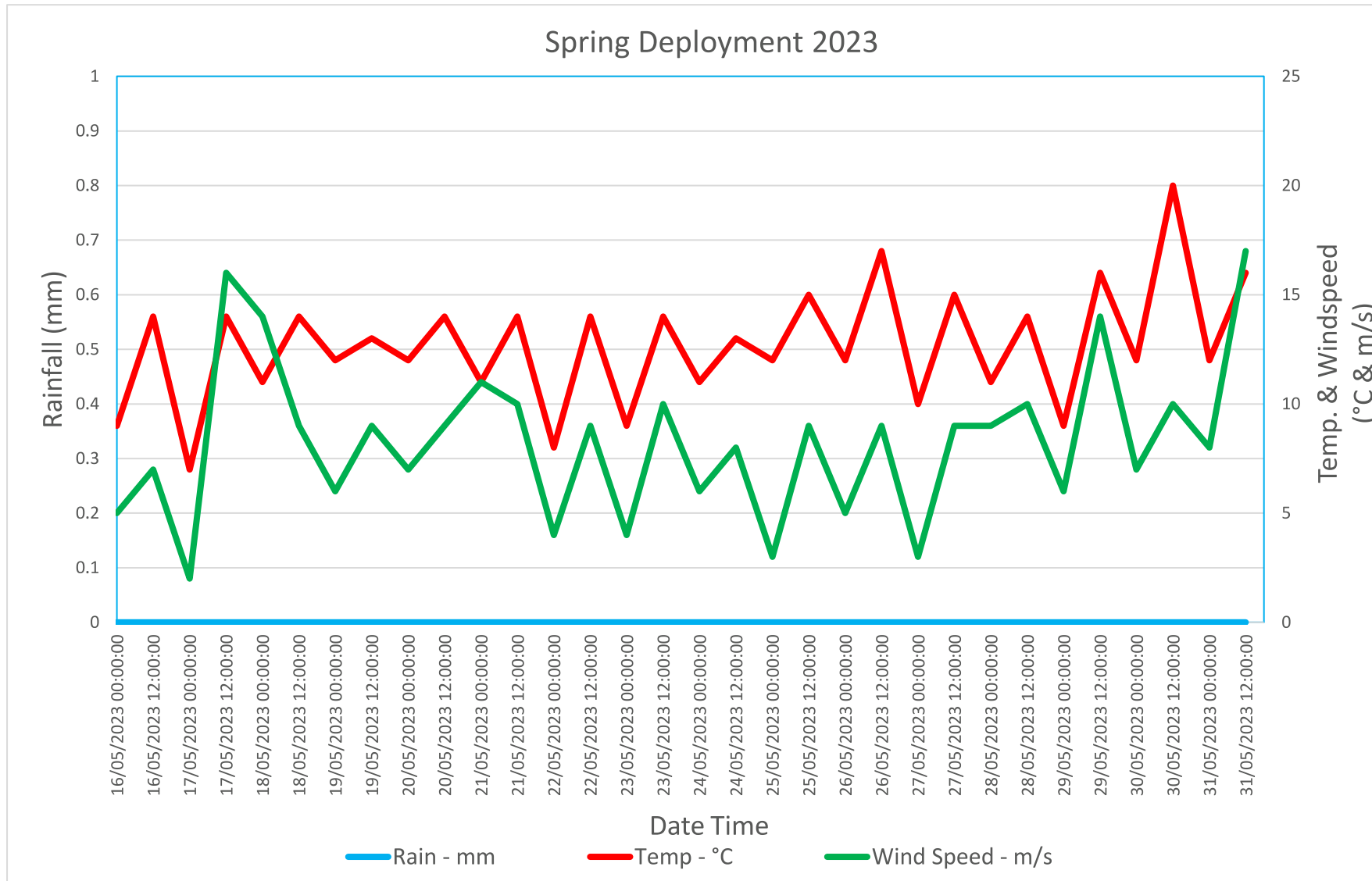


Figure A2.4- Mean hourly weather conditions for the duration of the 2023 Spring Deployment

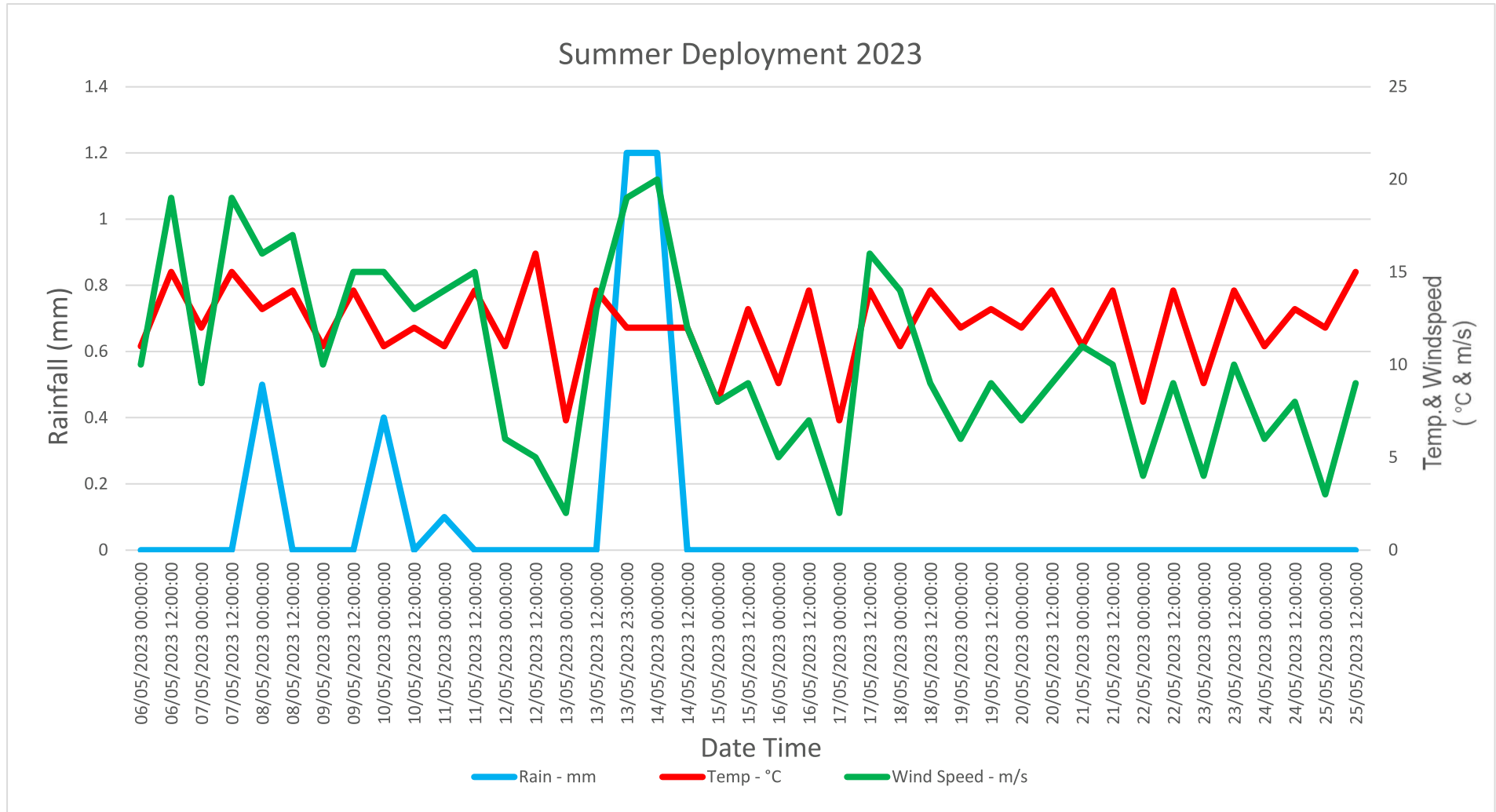


Figure A2.5 - Mean hourly weather conditions for the duration of the 2023 Summer Deployment

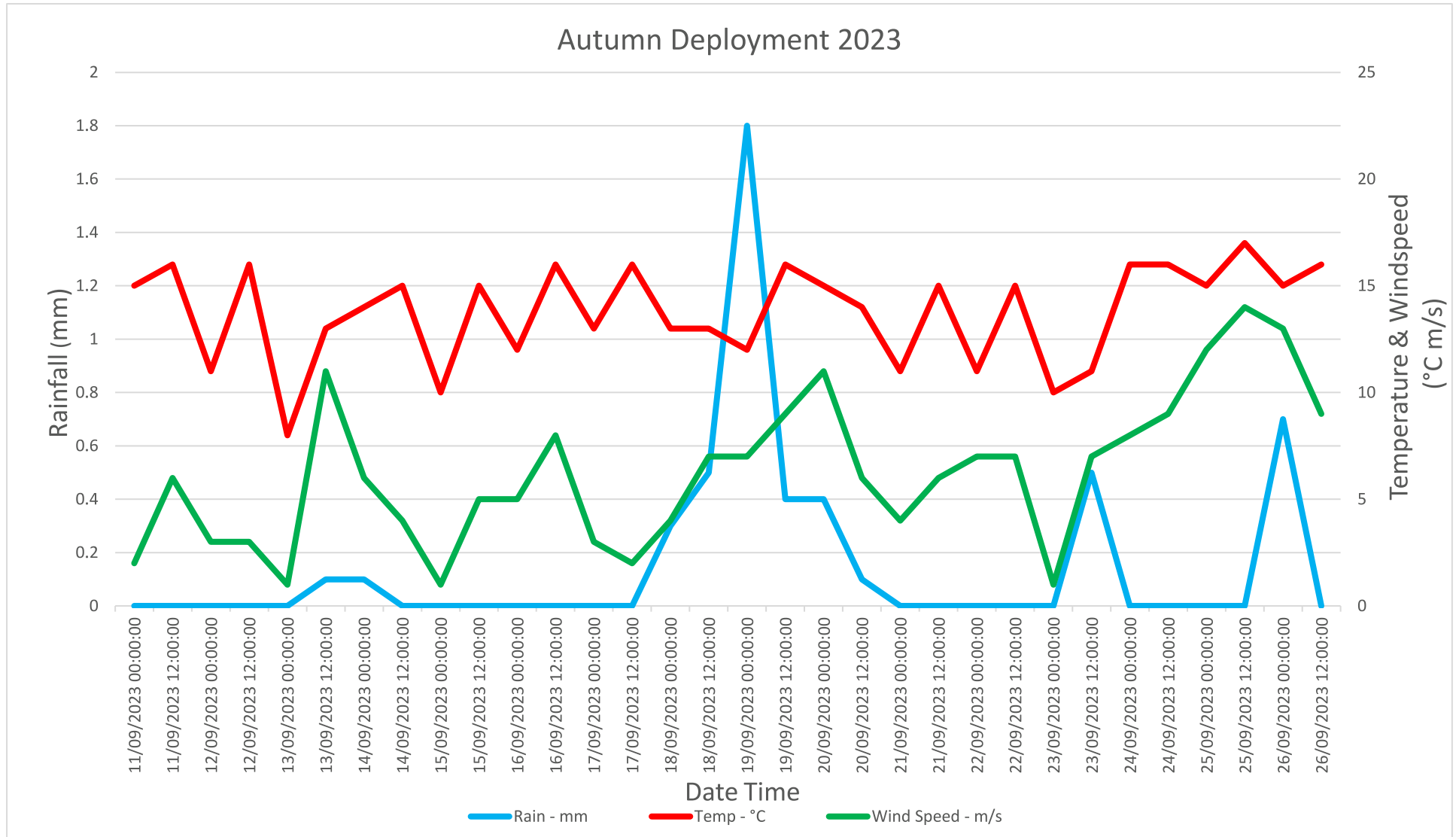


Figure A2.6 - Mean hourly weather conditions for the duration of the 2023 Autumn Deployment

APPENDIX 3: Static Locations 2022 and 2023



Plate 11 - D.01 (54.13229, -9.89014)



Plate 13 - D.03 (54.12994, -9.87945)



Plate 12 - D.02 (54.12722, -9.89161)



Plate 14 - D.04 (54.13499, -9.8813)



Plate 15 - D.05 (54.13655, -9.89285)



Plate 17 - D.07 (54.14748, -9.86806)



Plate 16 - D.06 (54.13989, -9.88231)



Plate 18 - D.08 (54.14828, -9.88606)



Plate 19 - D.09 (54.14292, -9.88855)

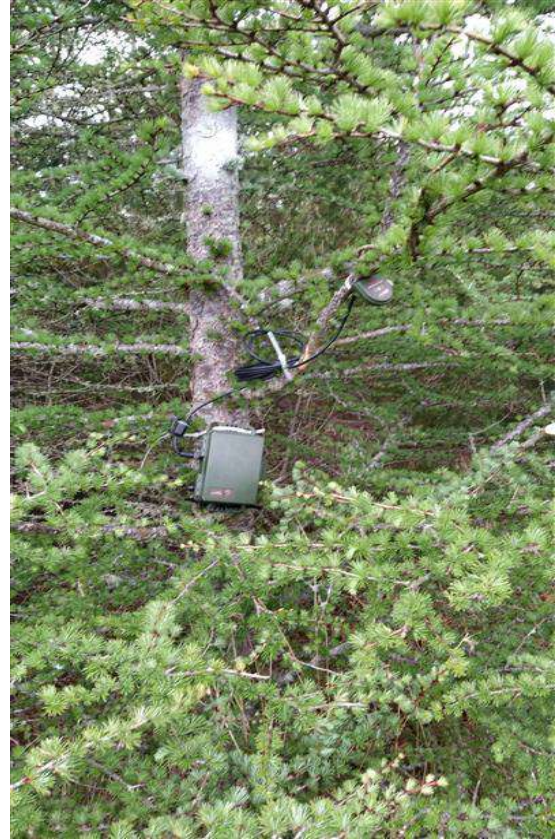


Plate 21 - D.11 (54.1507, -9.89784)



Plate 20 - D.10 ((54.1461, -9.89457)



Plate 22 - D.12 (54.1513, -9.90615)



Plate 23 – Weather Station (54.136554, -9.89288)

APPENDIX 4: YEAR 2023 R GRAPHS OF ACTIVITY IN RELATION TO SUNSET

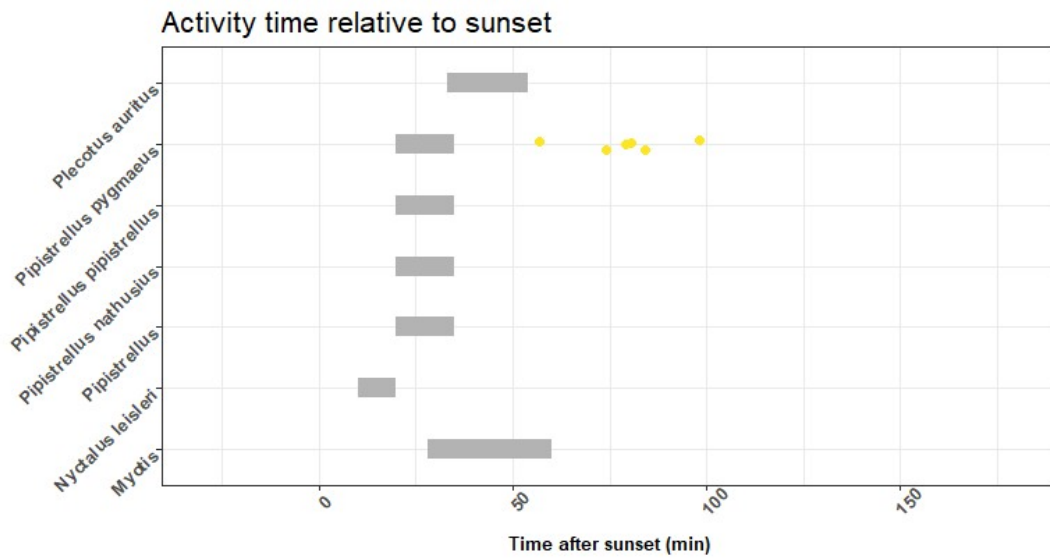


Figure A4.1: Detector 1 (D.01) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

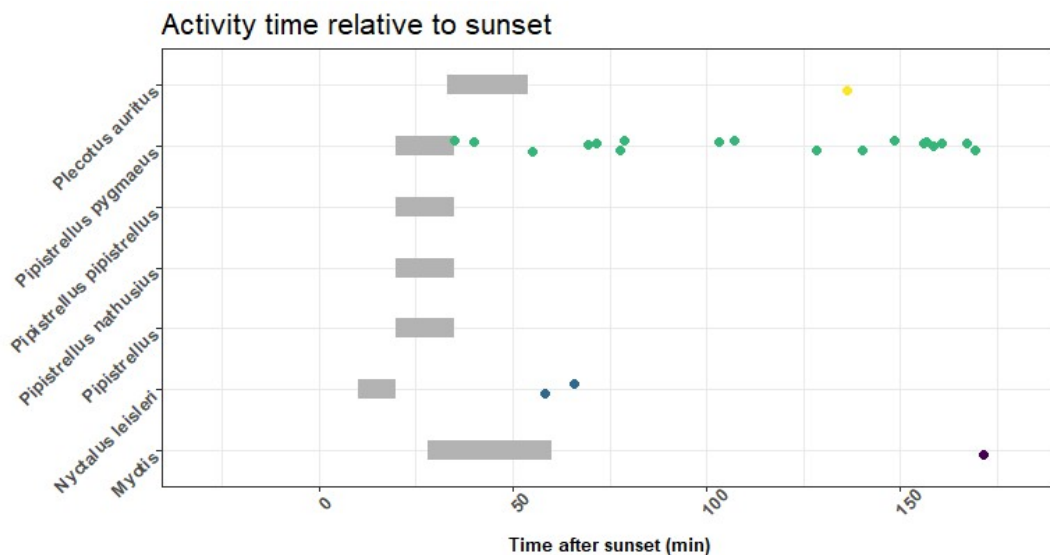


Figure A4.2: Detector 2 (D.02) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

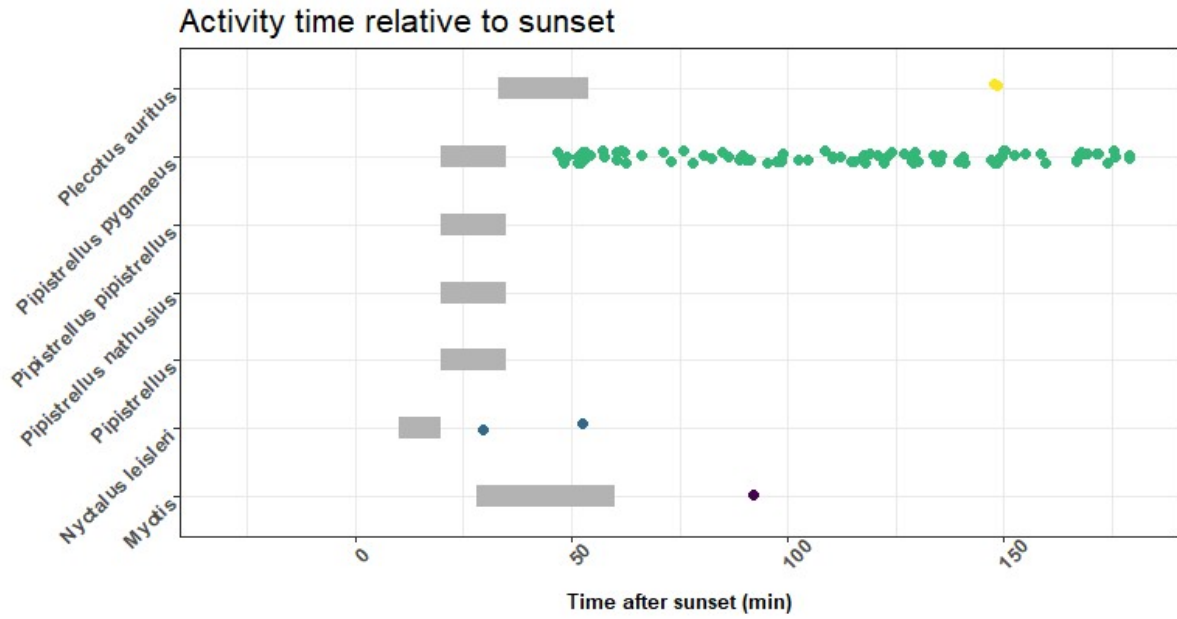


Figure A4.3: Detector 3 (D.03) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

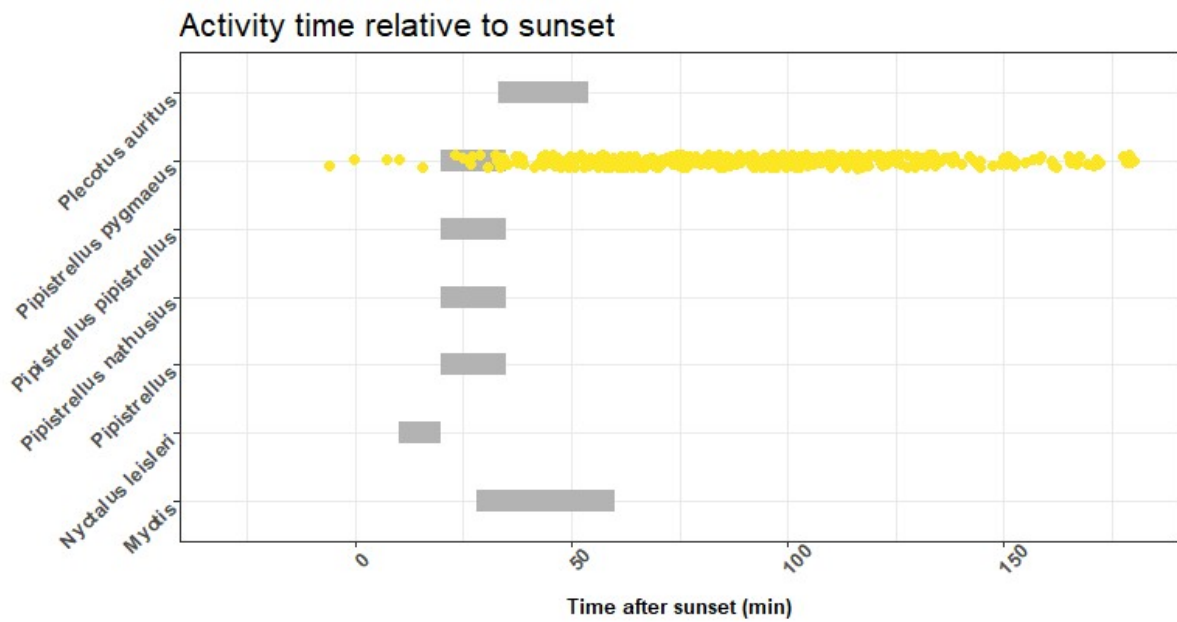


Figure A4.4: Detector 4 (D.04) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

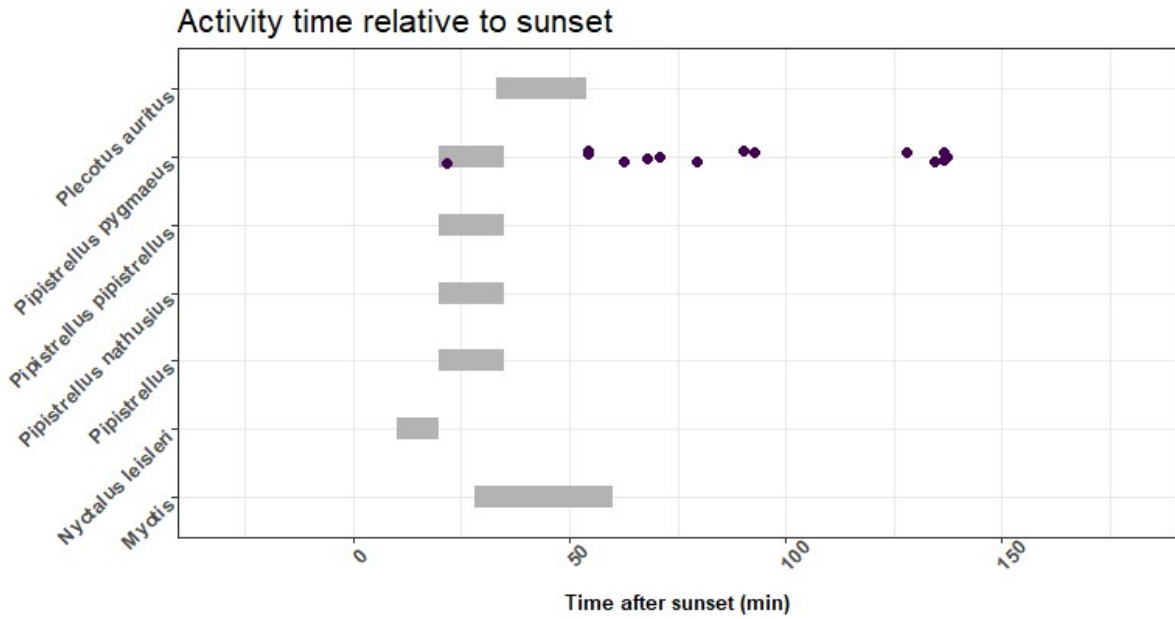


Figure A4.5: Detector 5 (D.05) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

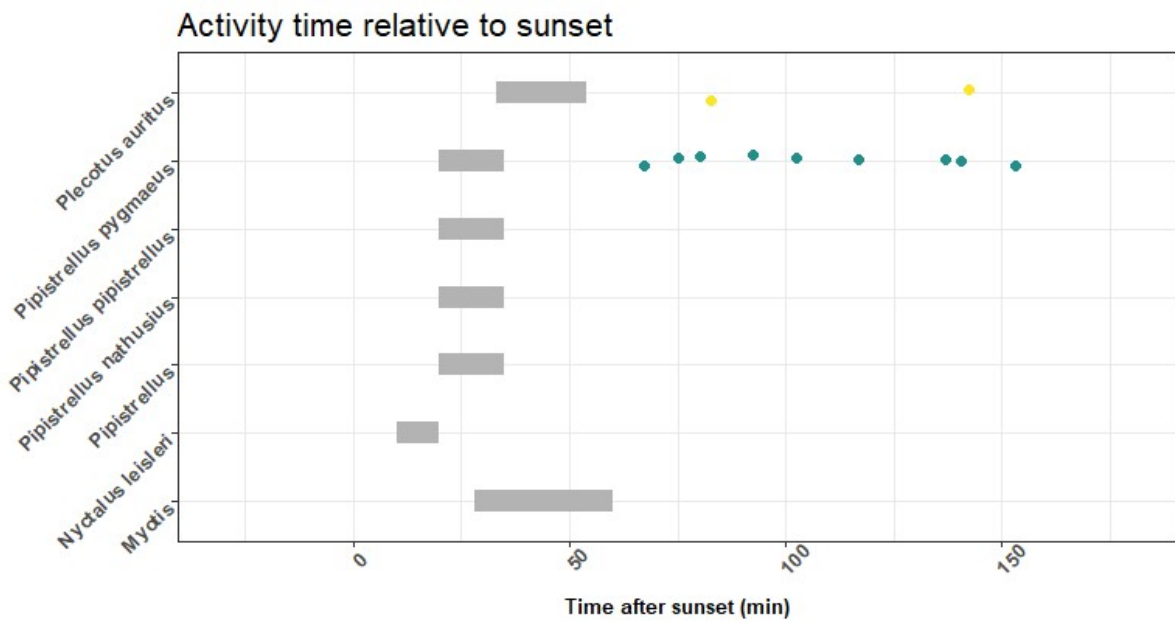


Figure A4.6: Detector 6 (D.06) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

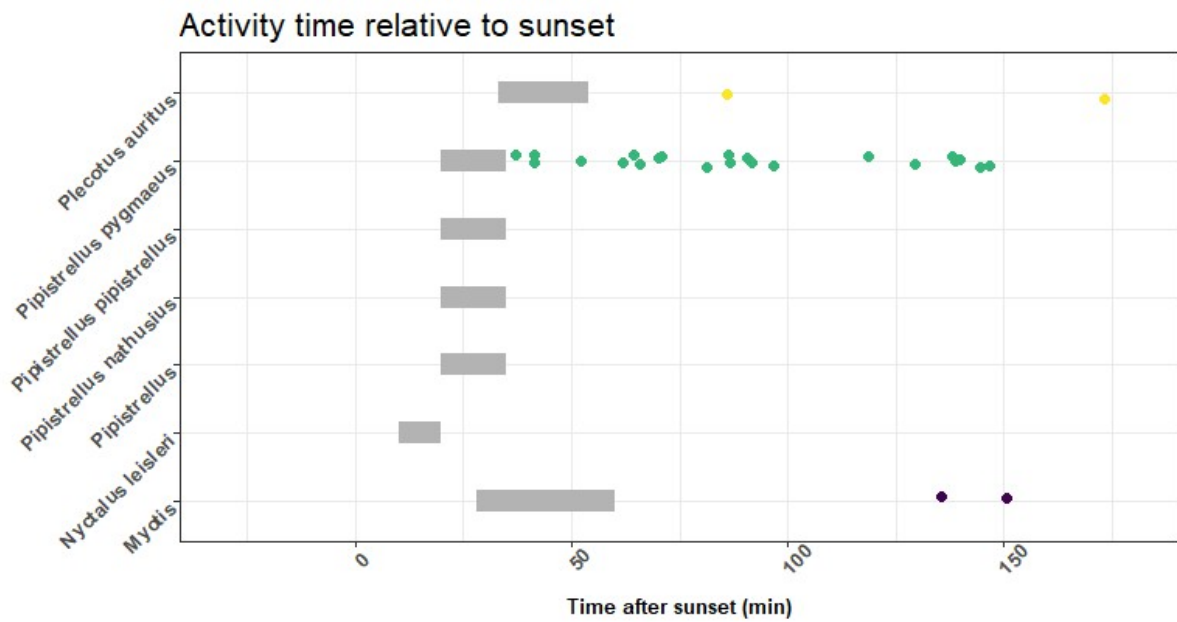


Figure A4.7: Detector 7 (D.07) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

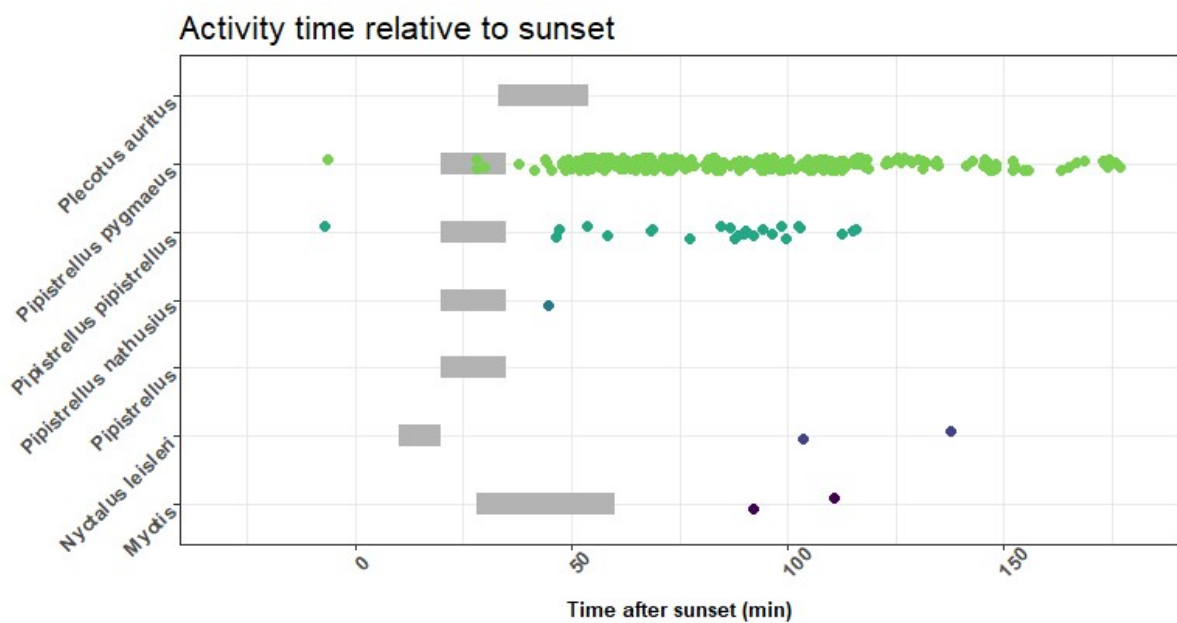


Figure A4.8: Detector 8 (D.08) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

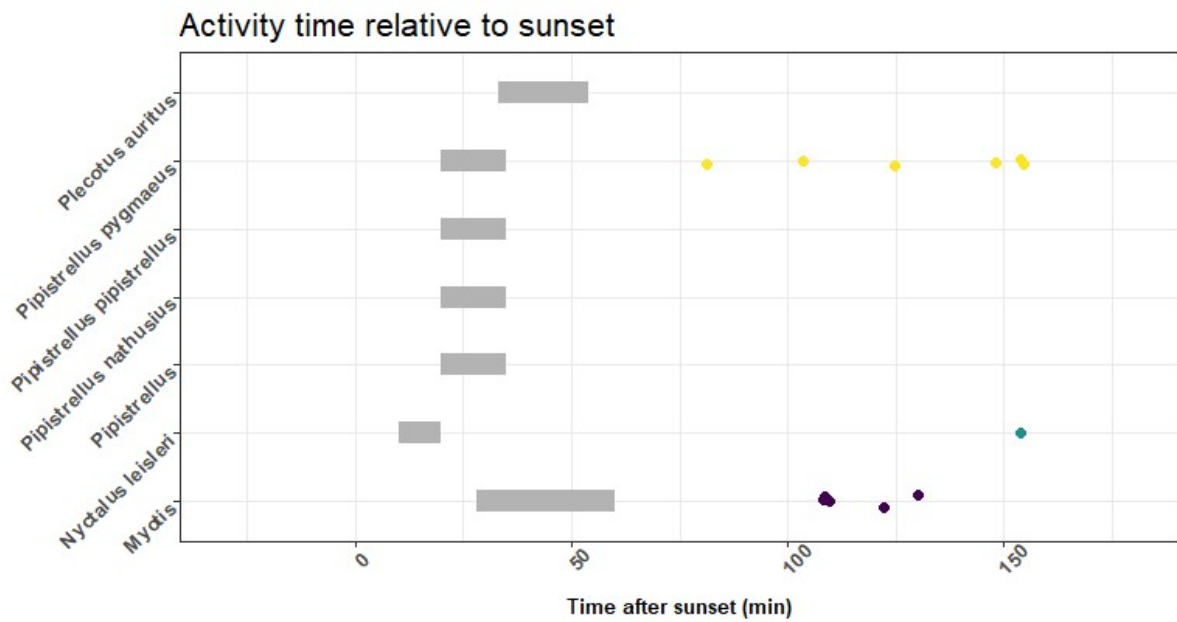


Figure A4.9: Detector 9 (D.09) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

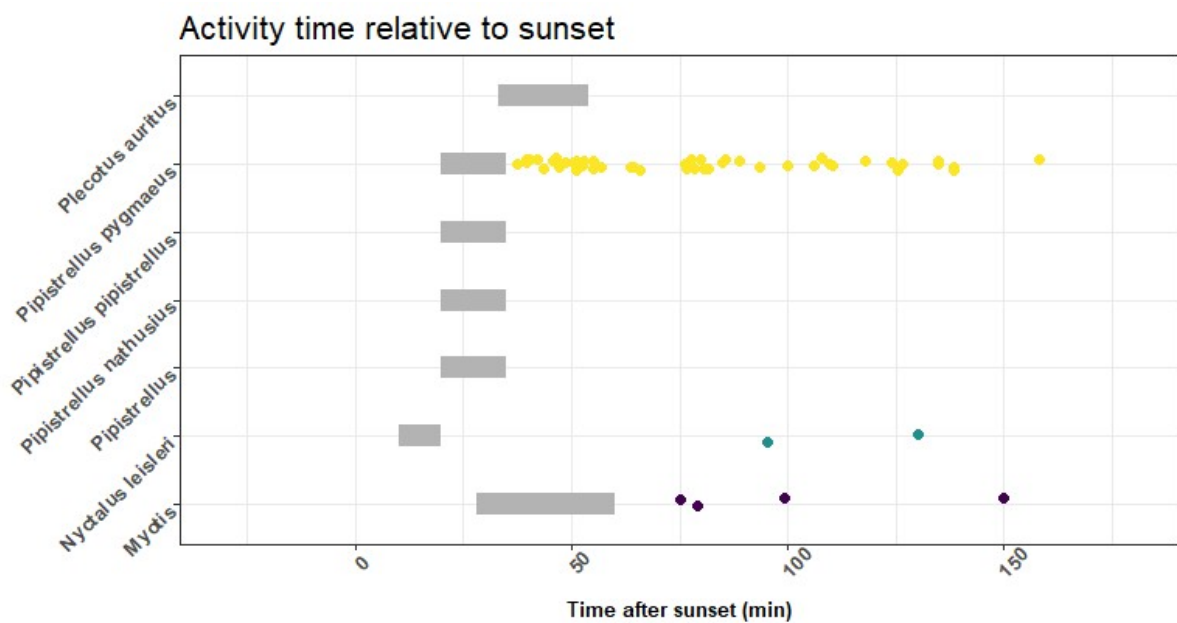


Figure A4.10: Detector 10 (D.10) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

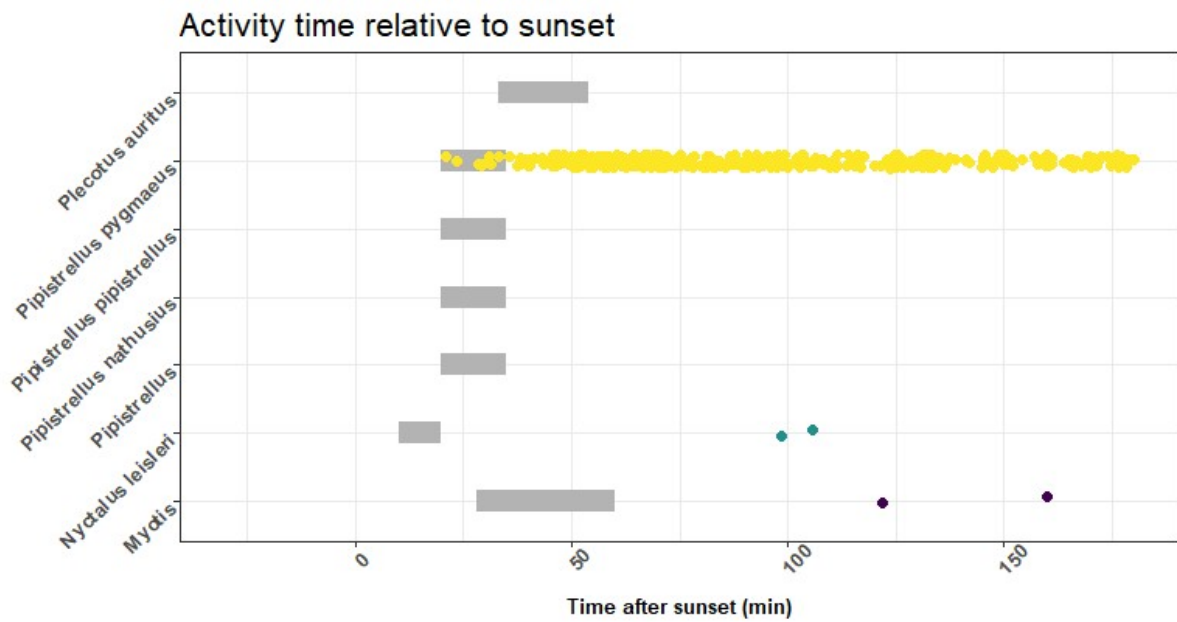


Figure A4.11: Detector 11 (D.11) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

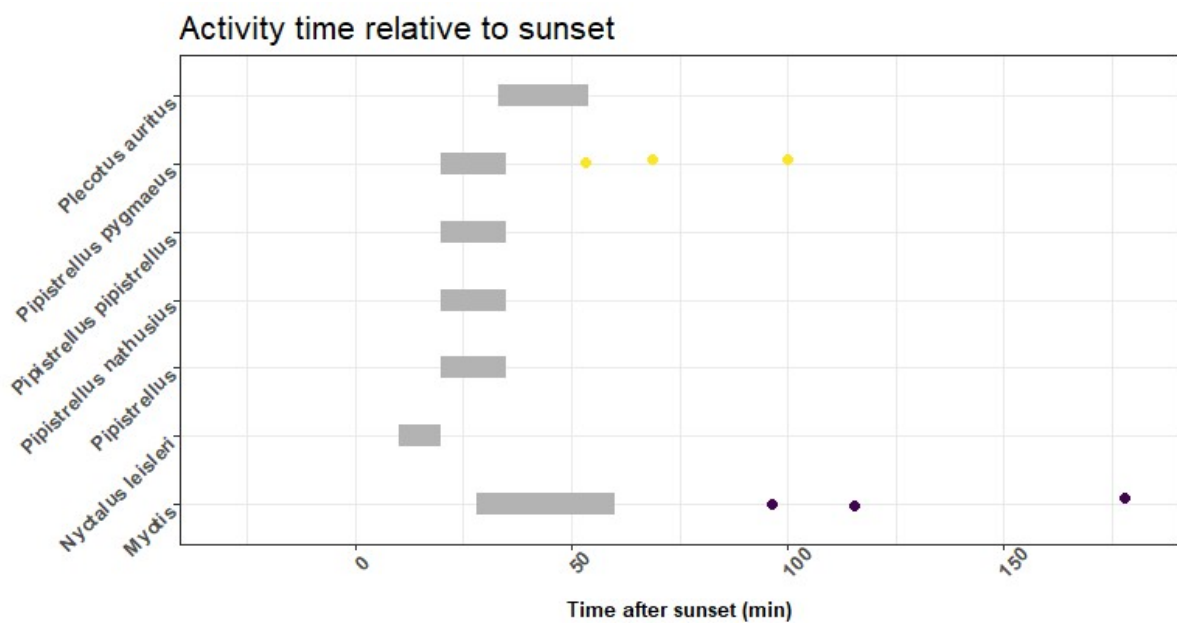


Figure A4.12: Detector 12 (D.12) activity patterns by species relative to sunset. Gray boxes indicate literature-documented activity times, while coloured boxes denote observed activity during the survey.

APPENDIX 5: 2023 WEATHER DATA SHOWING 95% INTERVAL ELLIPSE OF BP/H WINDSPEED (M/S) VS TEMPERATURE (°C)

Spring 2023

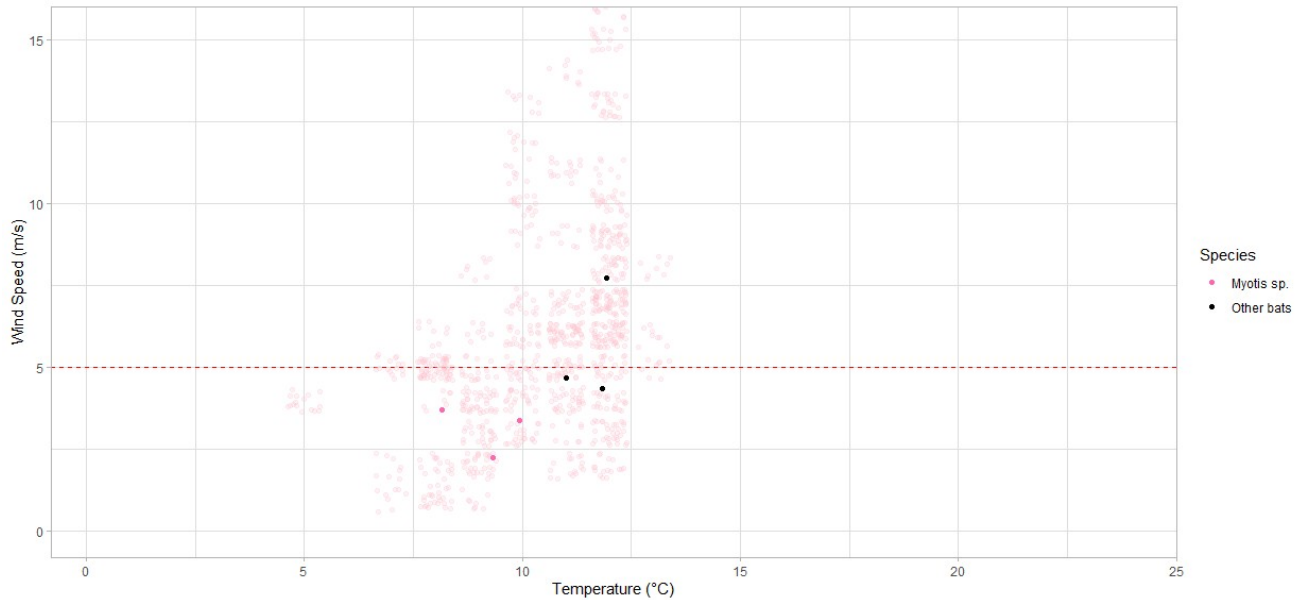


Figure A5.1: Weather data at detector 1 (D.01) vs bat activity

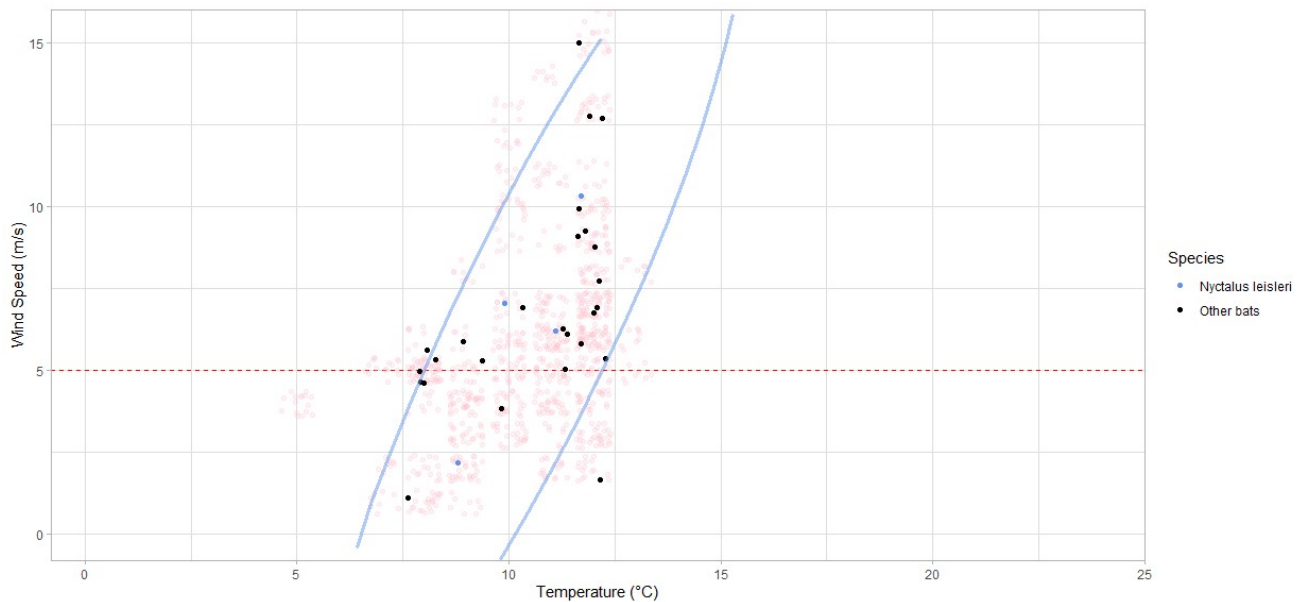


Figure A5.2: Weather data at detector 2 (D.02) vs bat activity

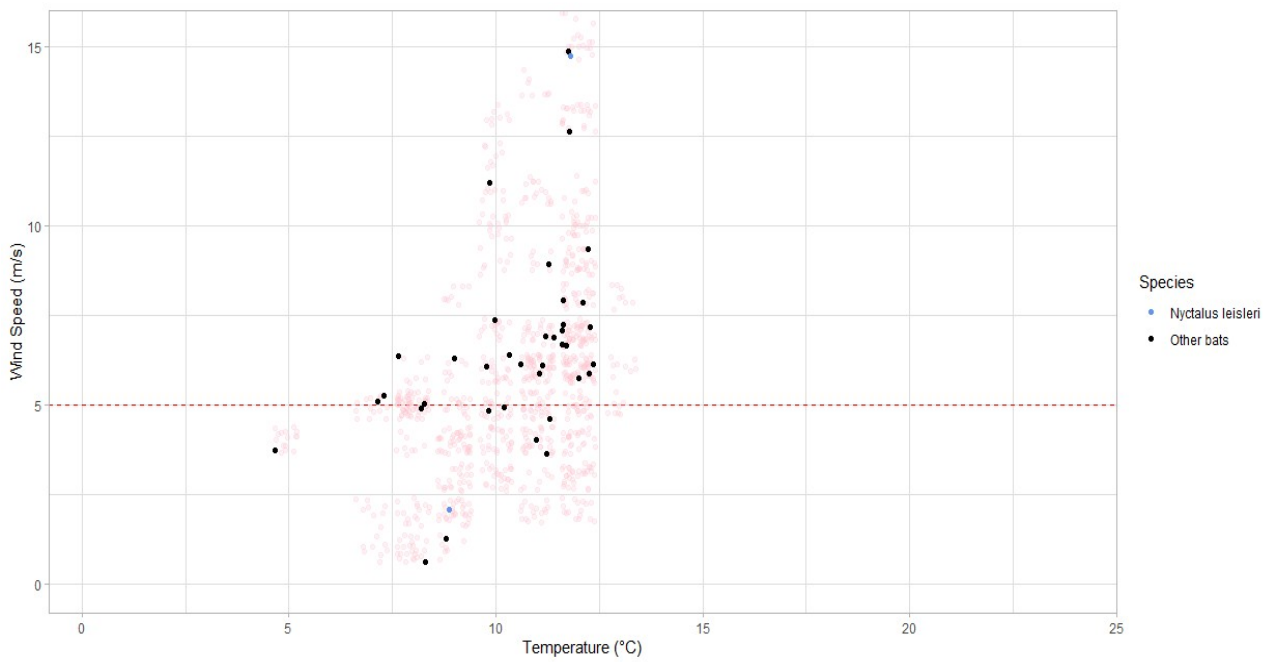


Figure A5.3: Weather data at detector 3 (D.03) vs bat activity

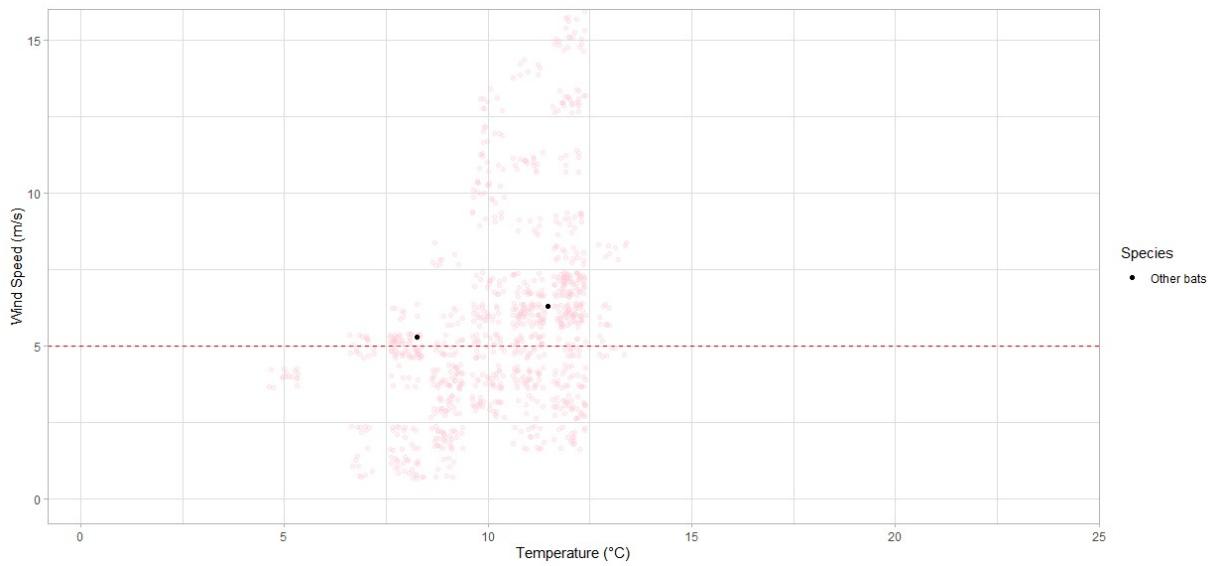


Figure A5.4: Weather at detector 4 (D.04) vs bat activity

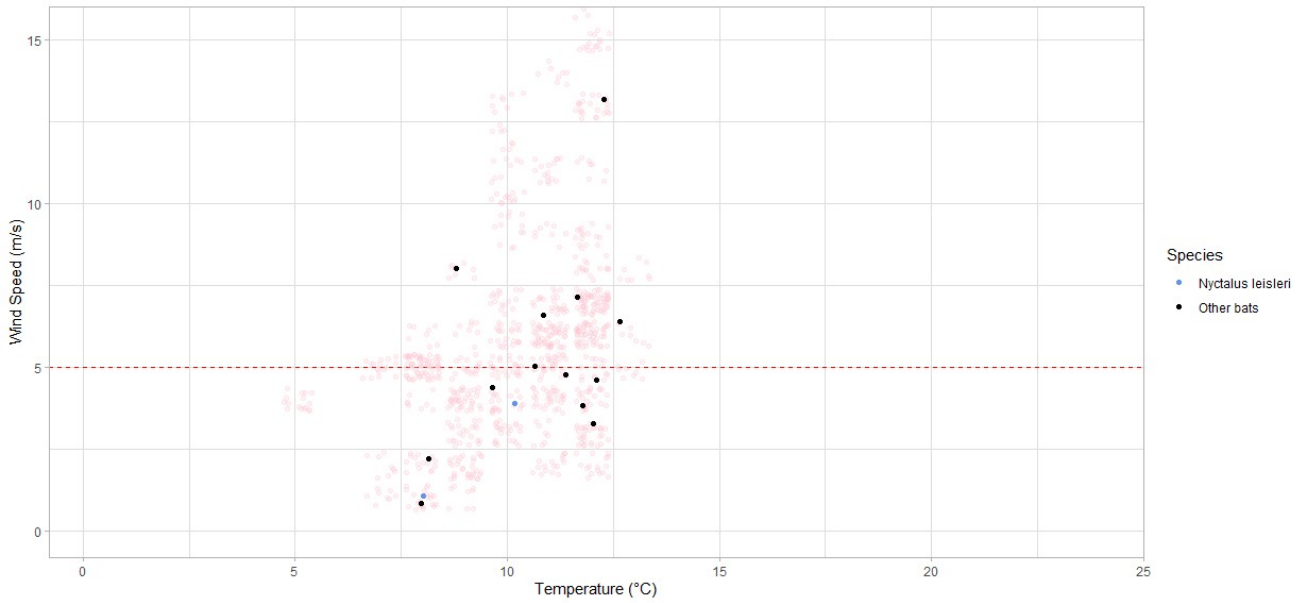


Figure A5.5: Weather at detector 5 (D.05) vs bat activity

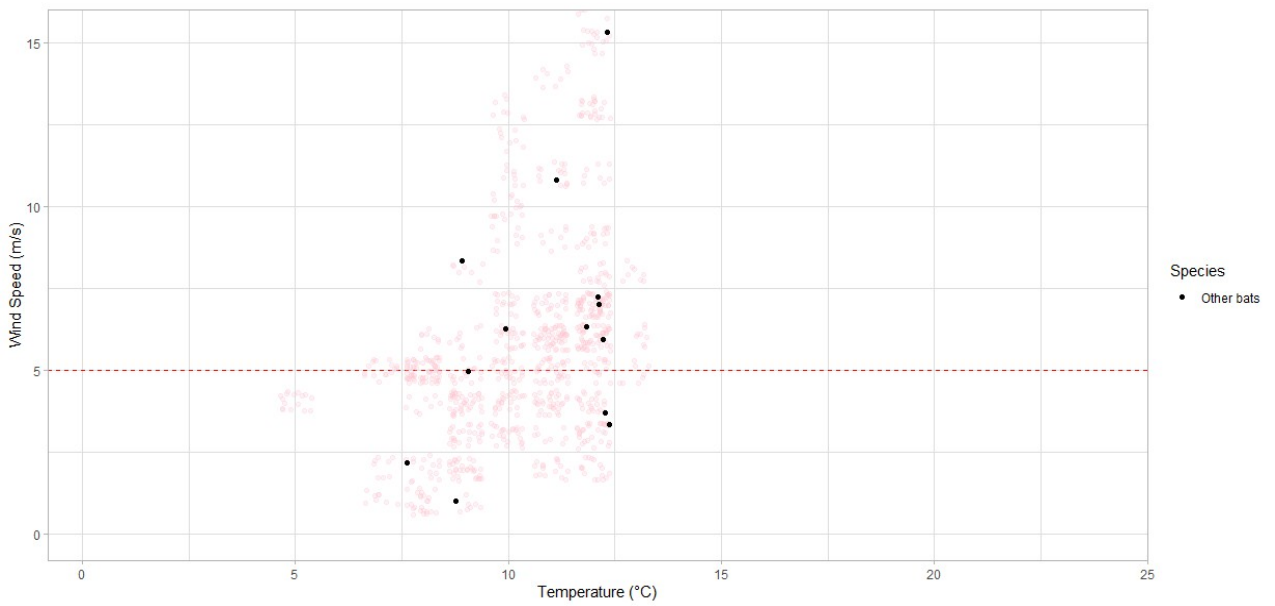


Figure A5.6: Weather at detector 6 (D.06) vs bat activity

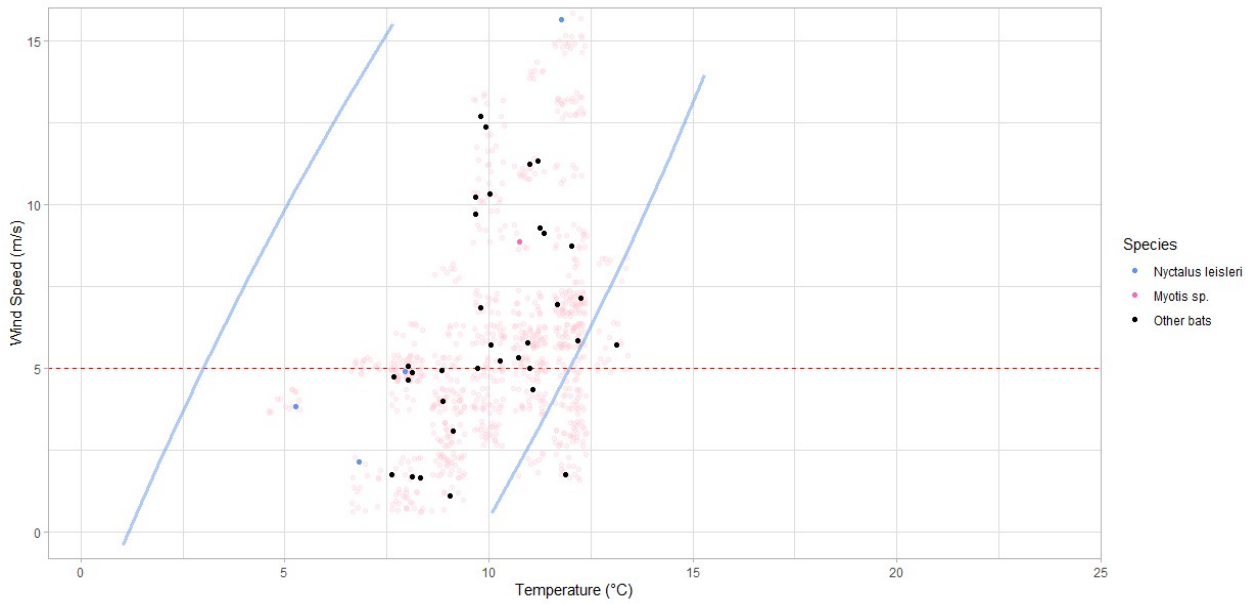


Figure A5.7 Weather at detector 7 (D.07) vs bat activity

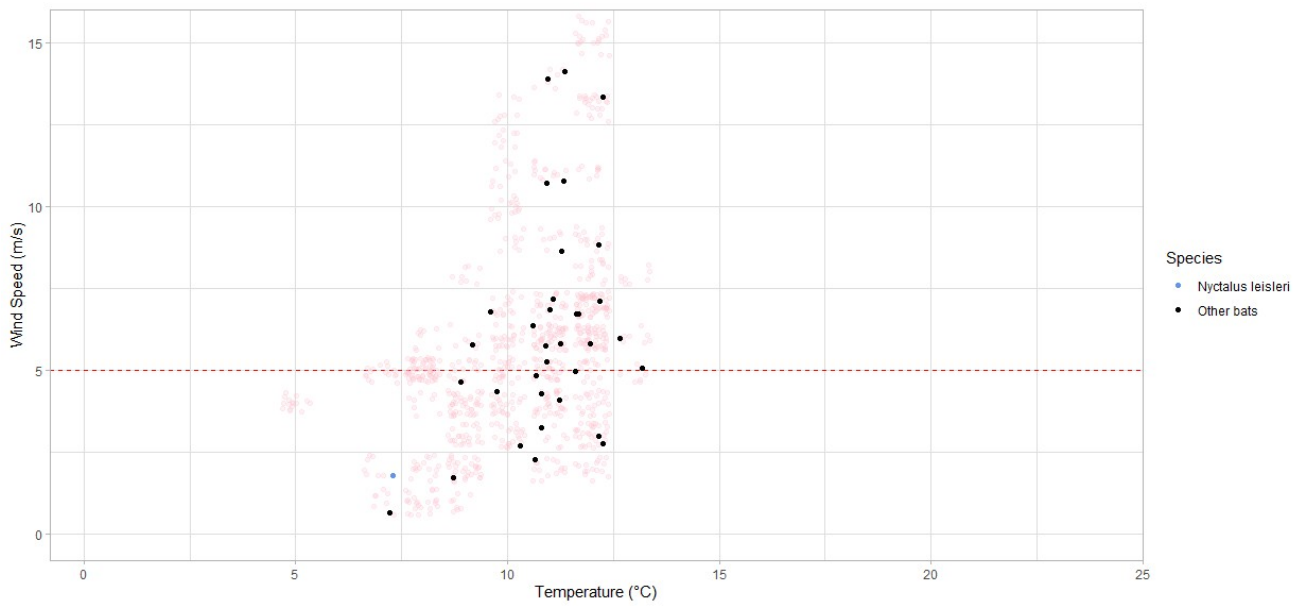


Figure A5.8: Weather at detector 8 (D.08) vs bat activity

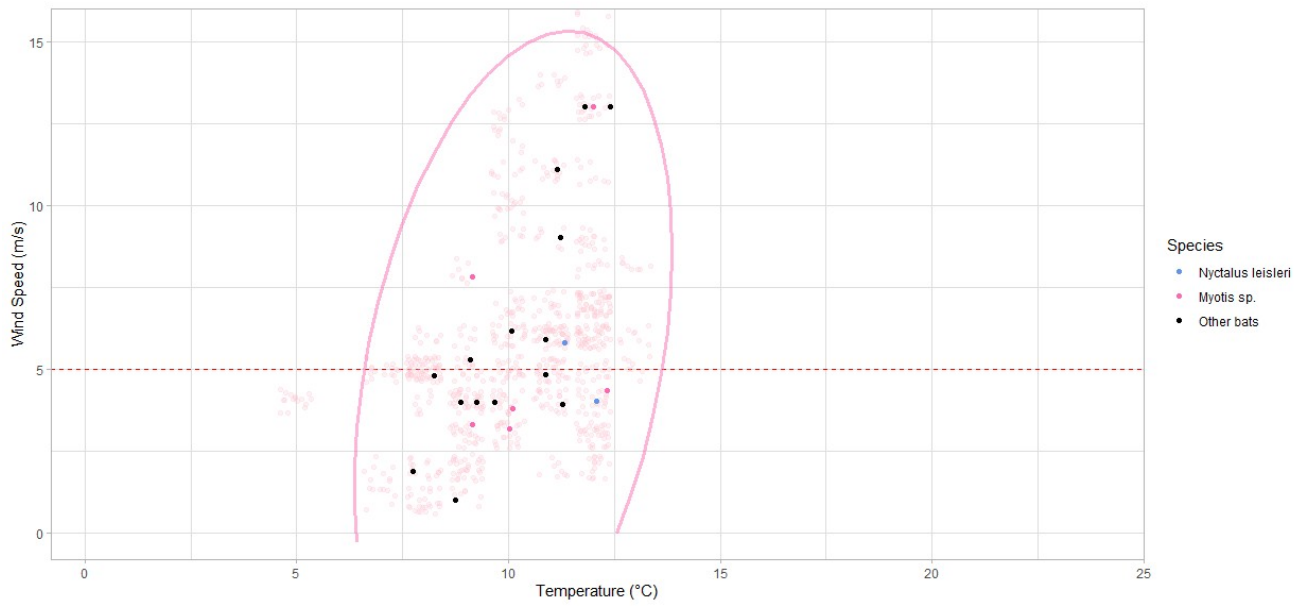


Figure A5.9: Weather at detector 9 (D.09) vs bat activity

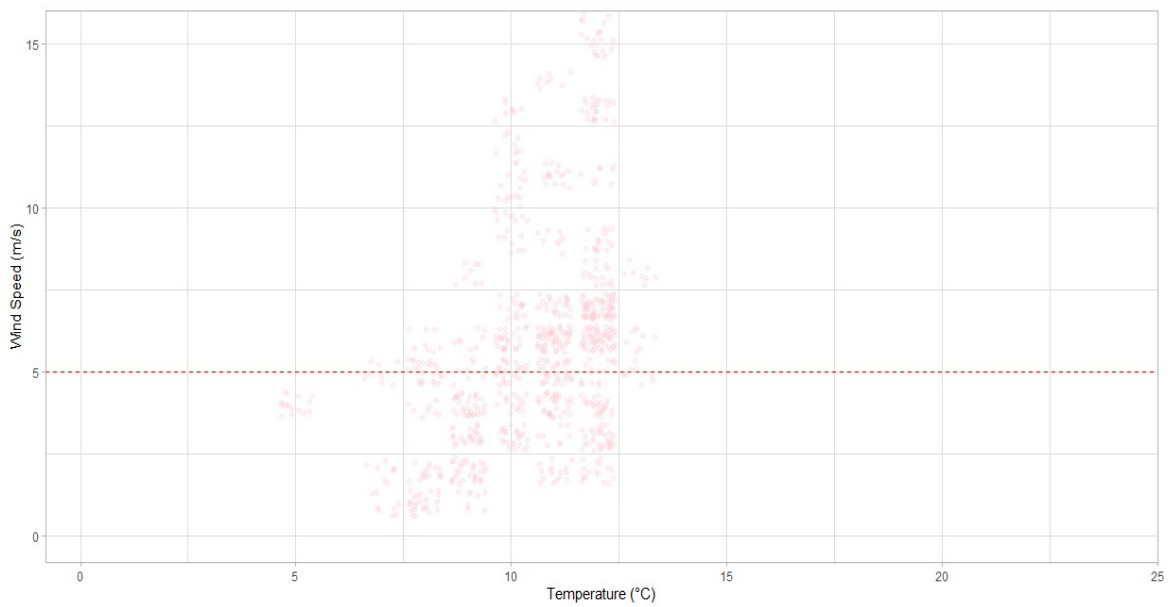


Figure A5.10: Weather at detector 10 (D.10) vs bat activity

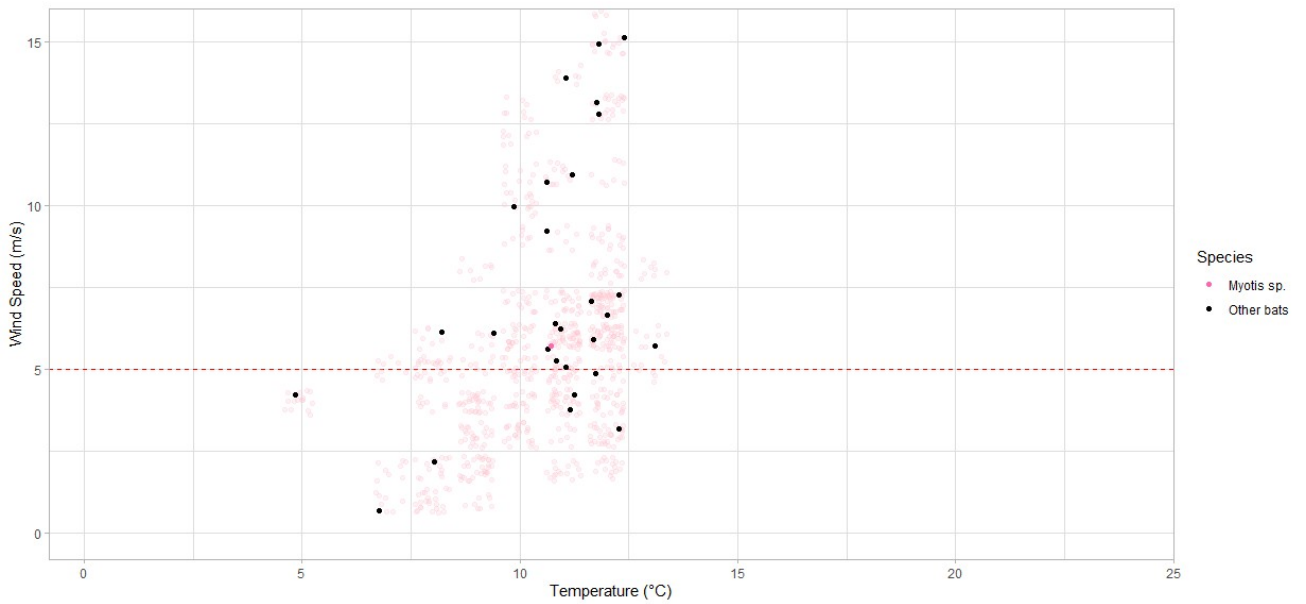


Figure A5.11: Weather at detector 11 (D.11) vs bat activity

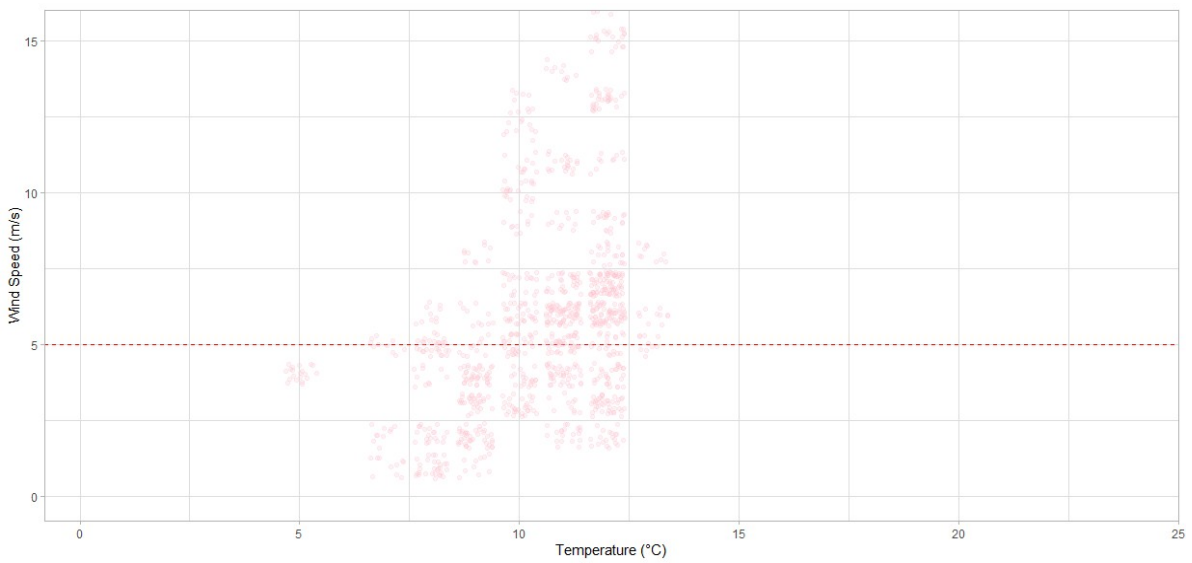


Figure A5.12: Weather at detector 12 (D.12) vs bat activity

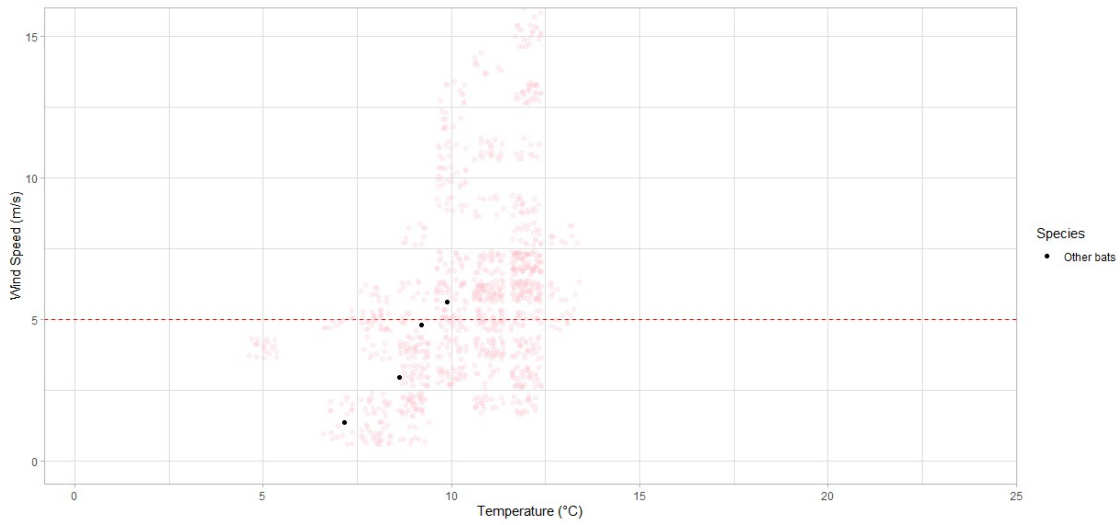


Figure A5.13 Weather at detector 13 (D.13) vs bat activity

Summer 2023

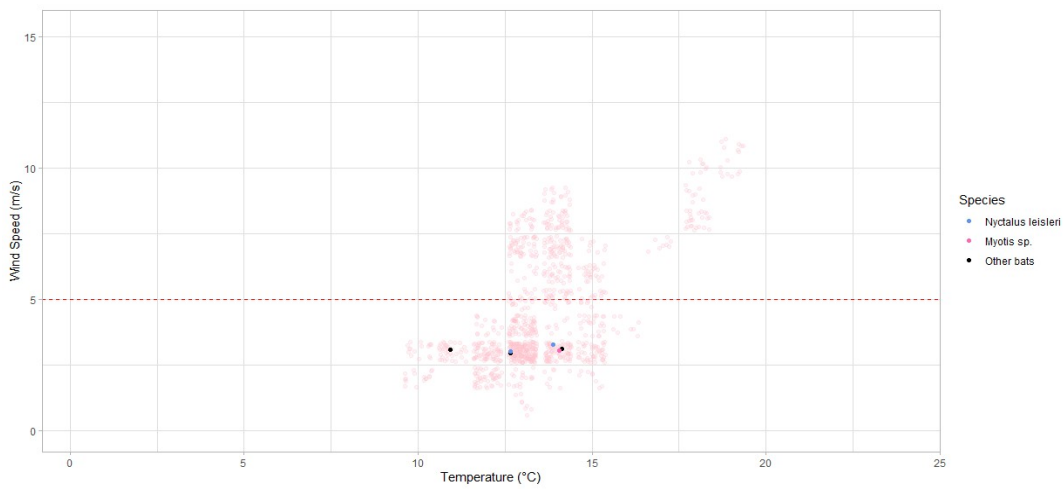


Figure A5.14 Weather data at detector 1 (D.01) vs bat activity

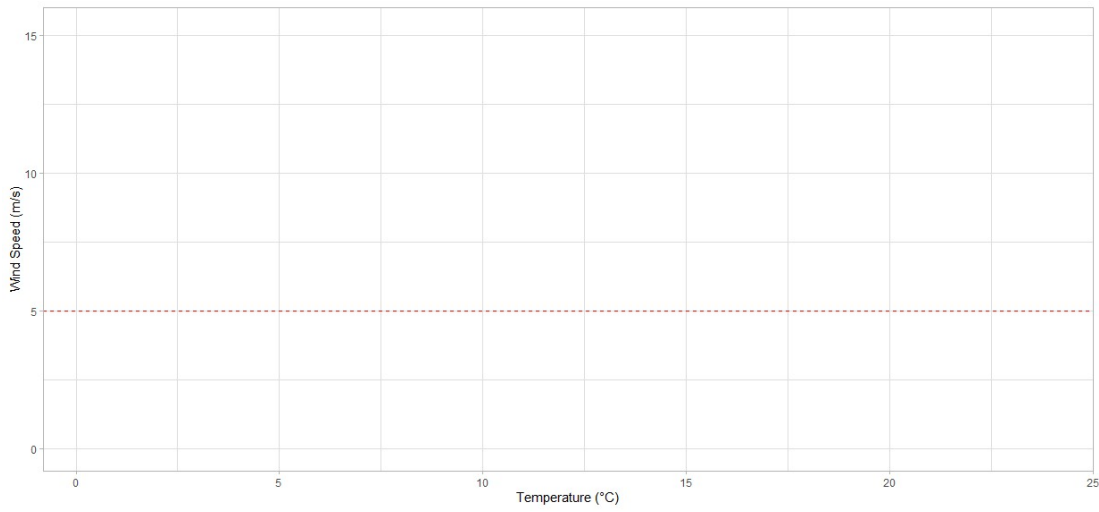


Figure A5.15 Weather data at detector 2 (D.02) vs bat activity

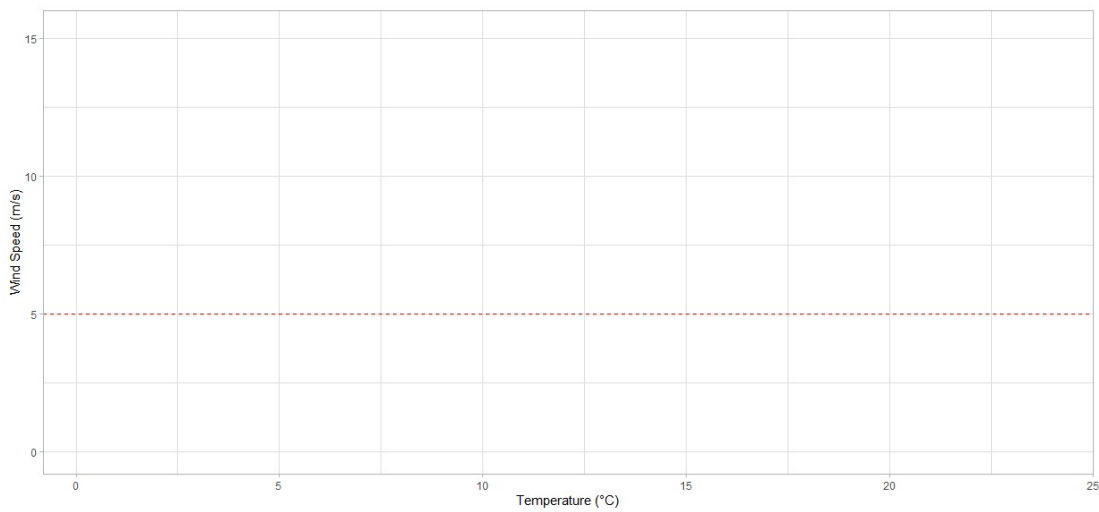


Figure A5.16: Weather at detector 3 (D.03) vs bat activity

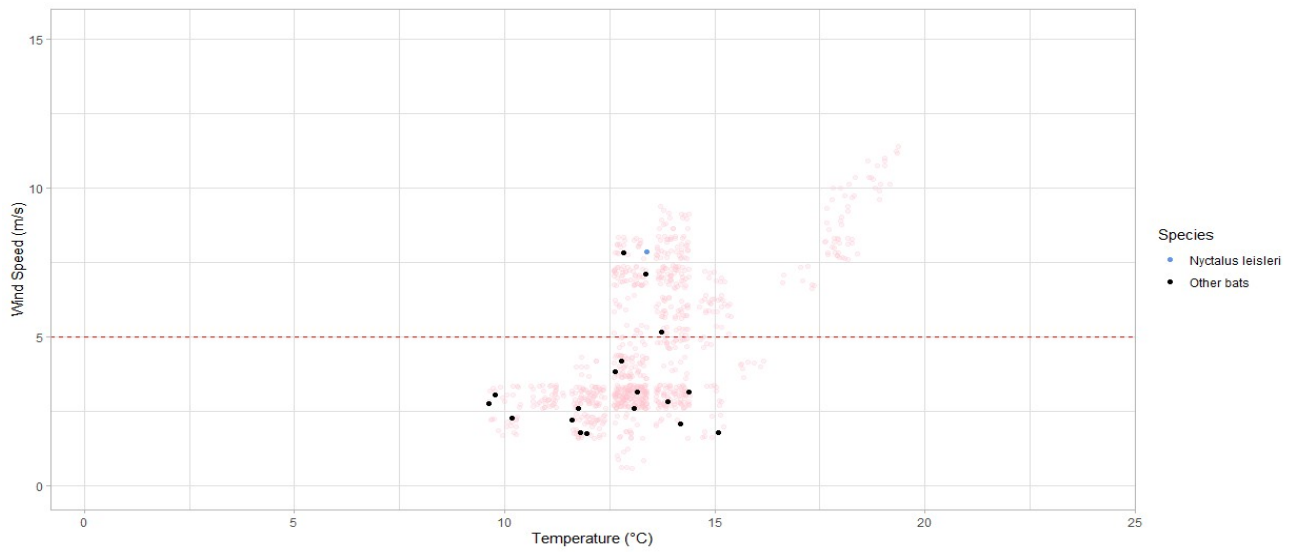


Figure A5.17 Weather at detector 4 (D.04) vs bat activity

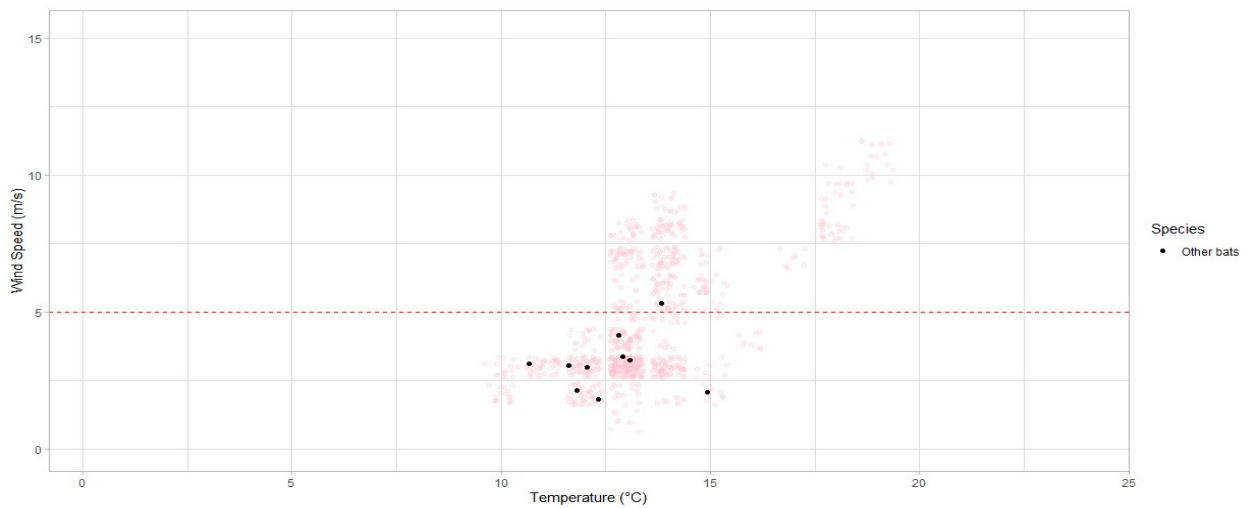


Figure A5.18 Weather data at detector 5 (D.05) vs bat activity

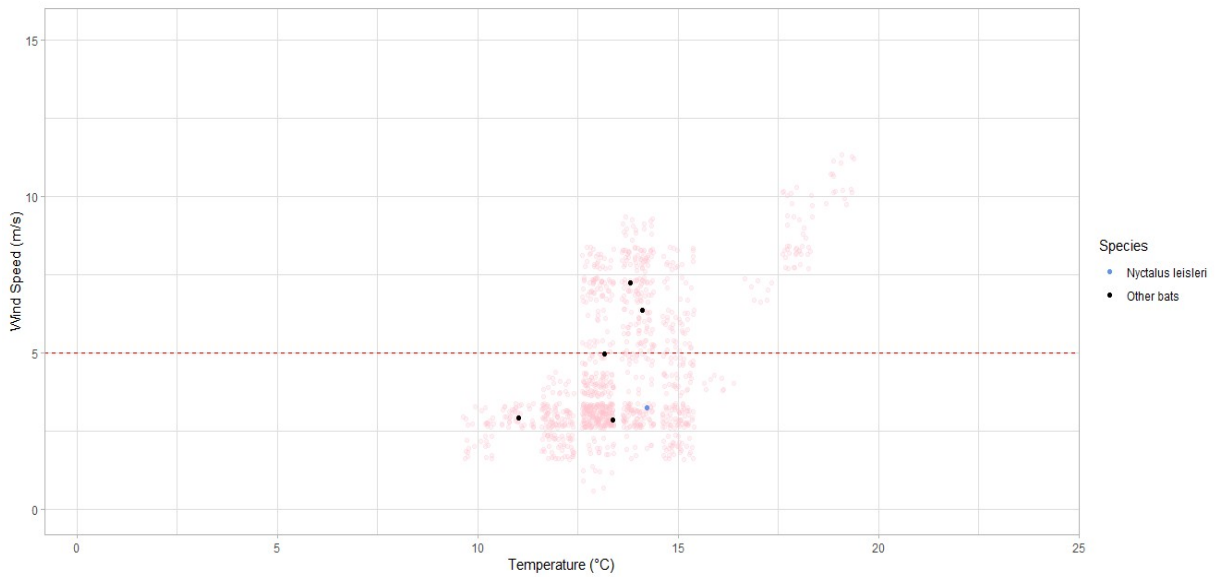


Figure A5.19: Weather data at detector 6 (D.06) vs bat activity

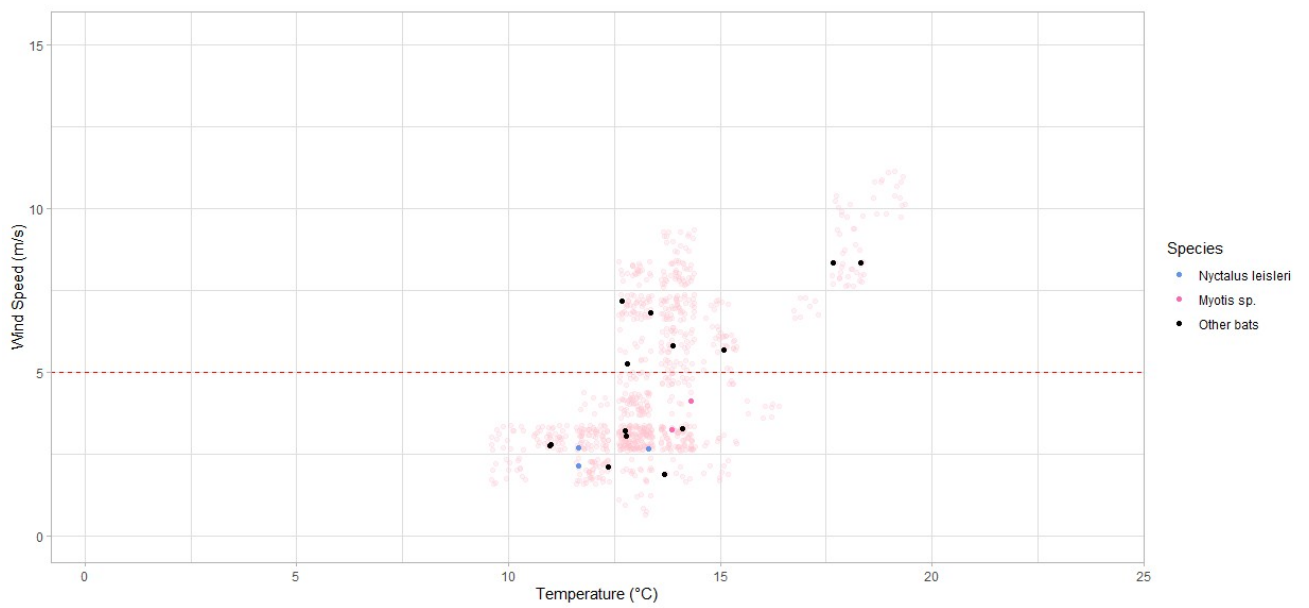


Figure A5.20: Weather data at detector 7 (D.07) vs bat activity

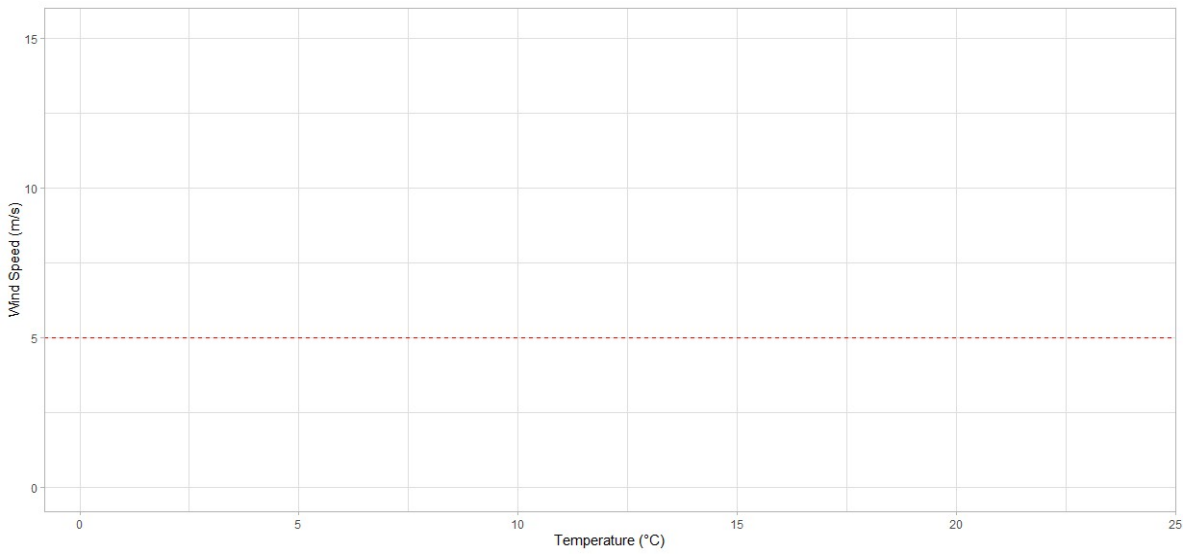


Figure A5.21: Weather data at detector 8 (D.08) vs bat activity

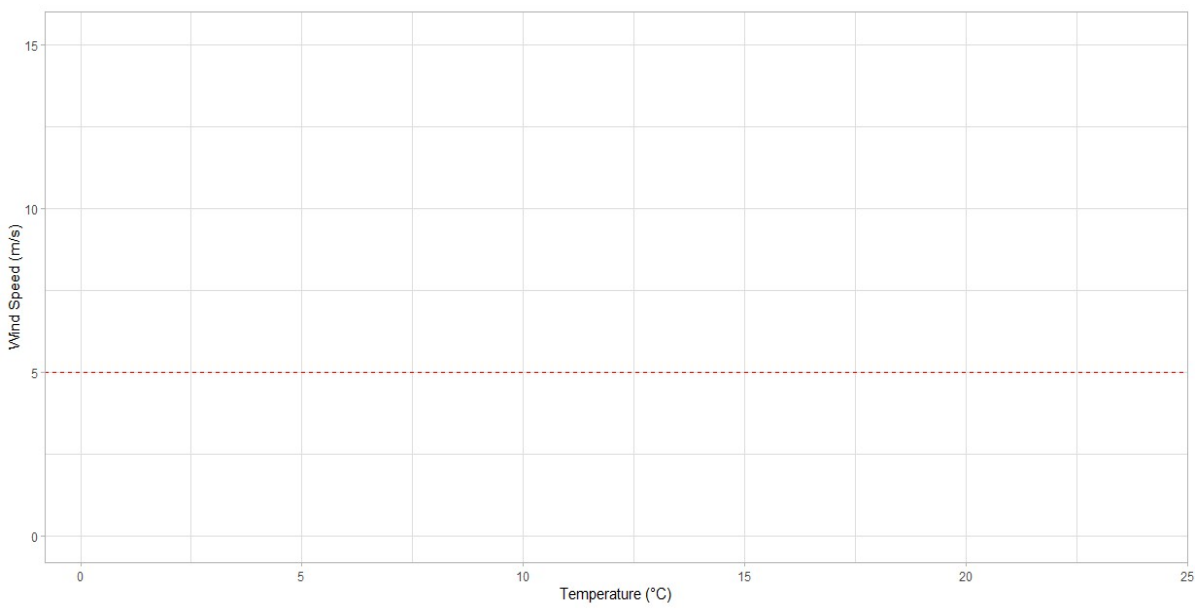


Figure A5.22: Weather data at detector 9 (D.09) vs bat activity

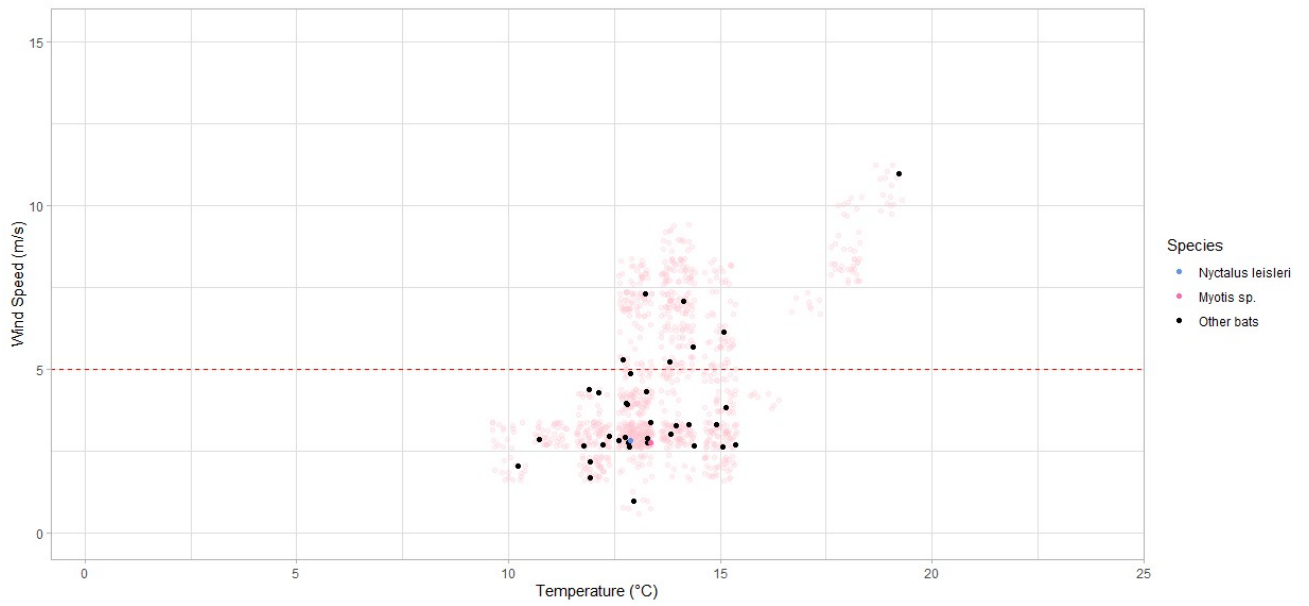


Figure A5.23: Weather data at detector 10 (D.10) vs bat activity

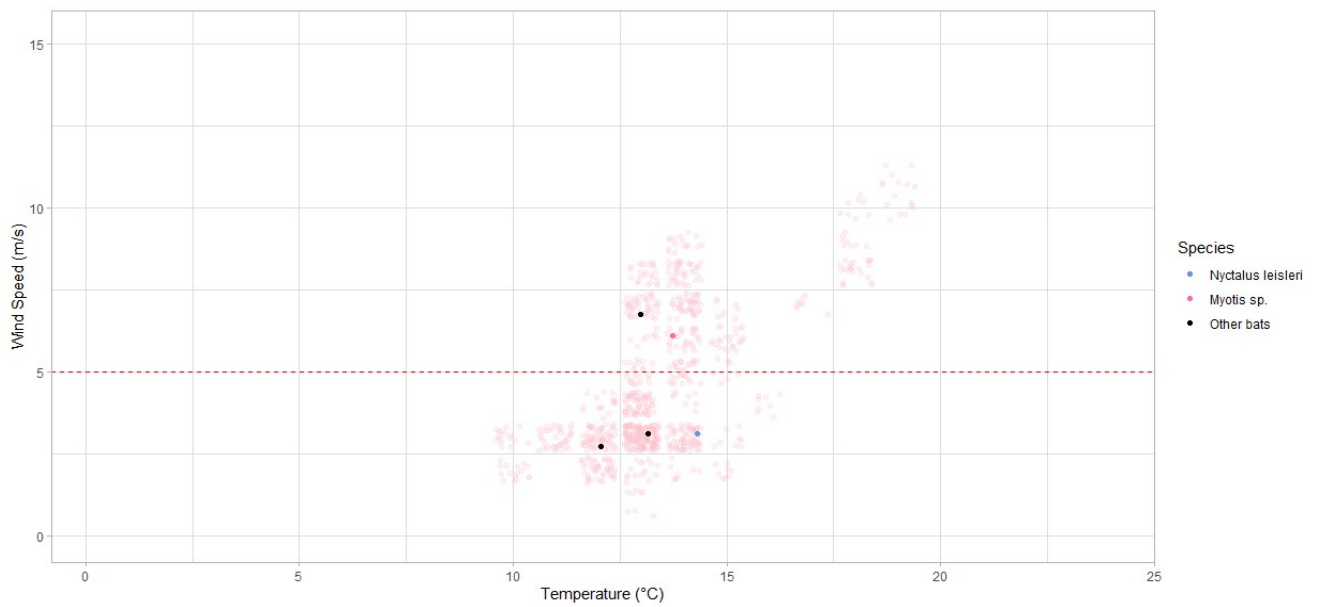


Figure A5.24: Weather data at detector 11 (D.11) vs bat activity

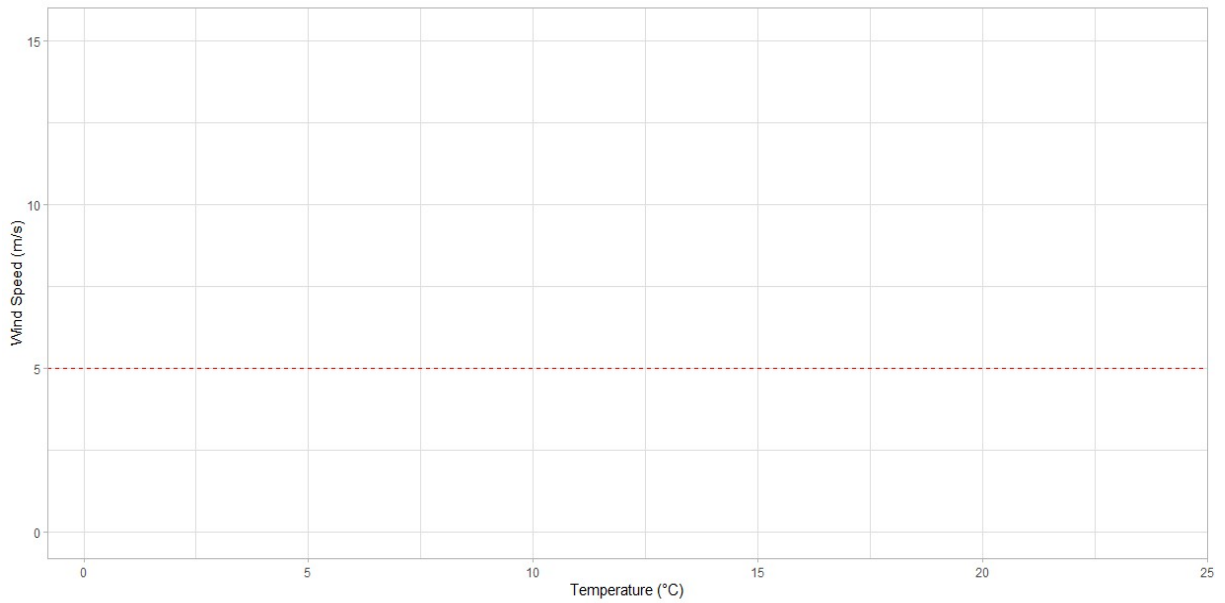


Figure A5.25: Weather data at detector 12 (D.12) vs bat activity

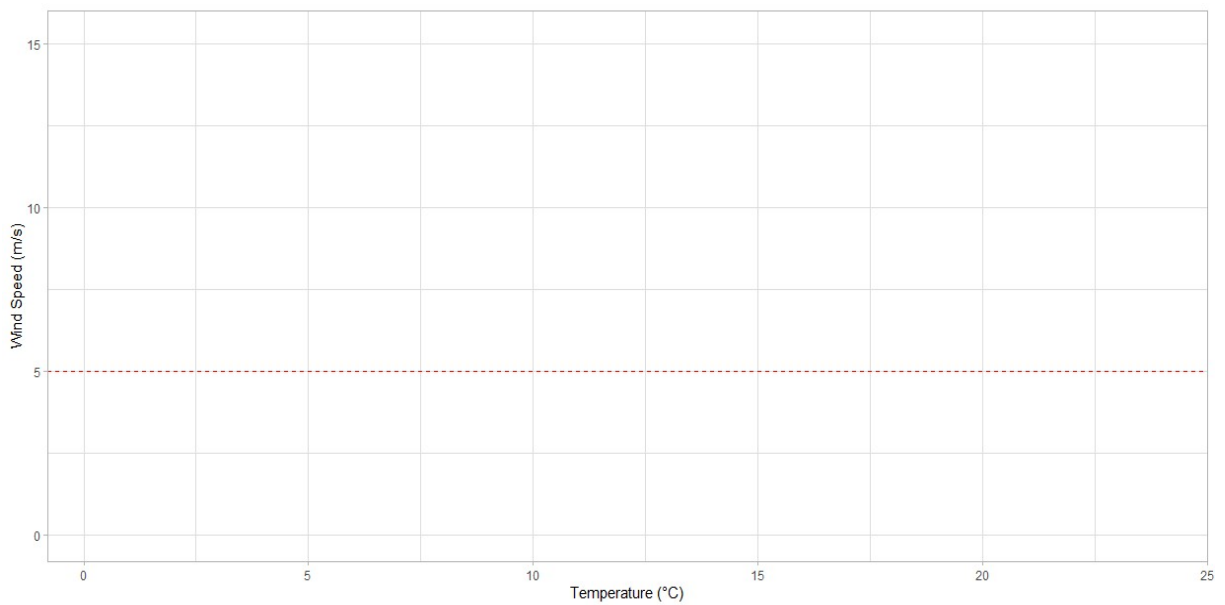


Figure A5.26: Weather data at detector 13 (D.13) vs bat activity

Autumn

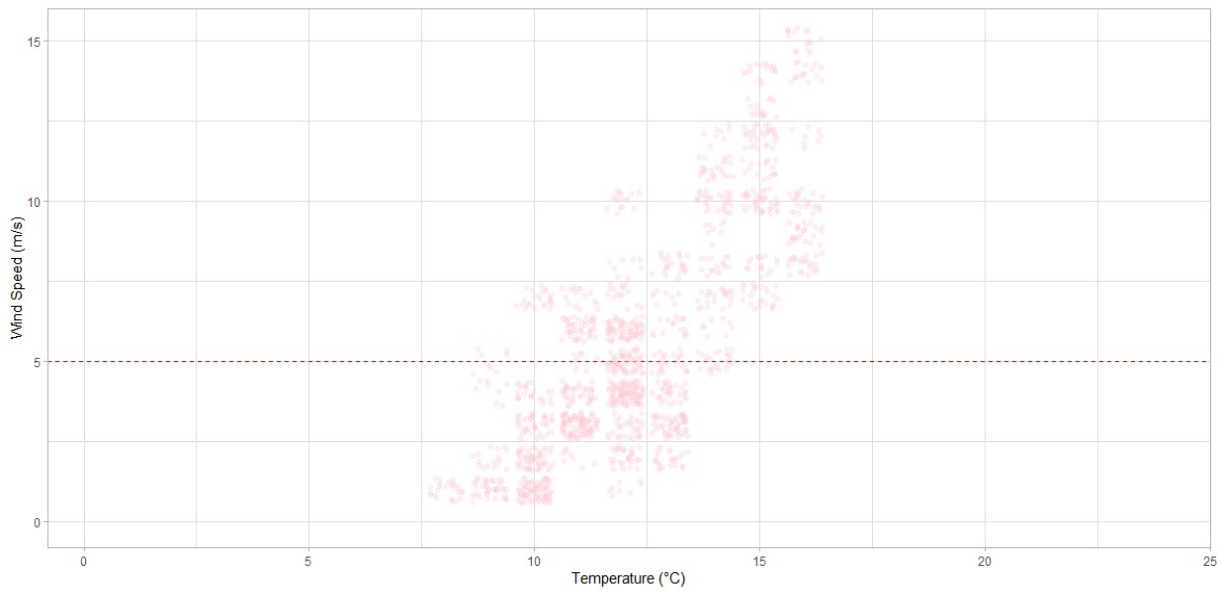


Figure A5.27: Weather data at detector 1 (D.01) vs bat activity

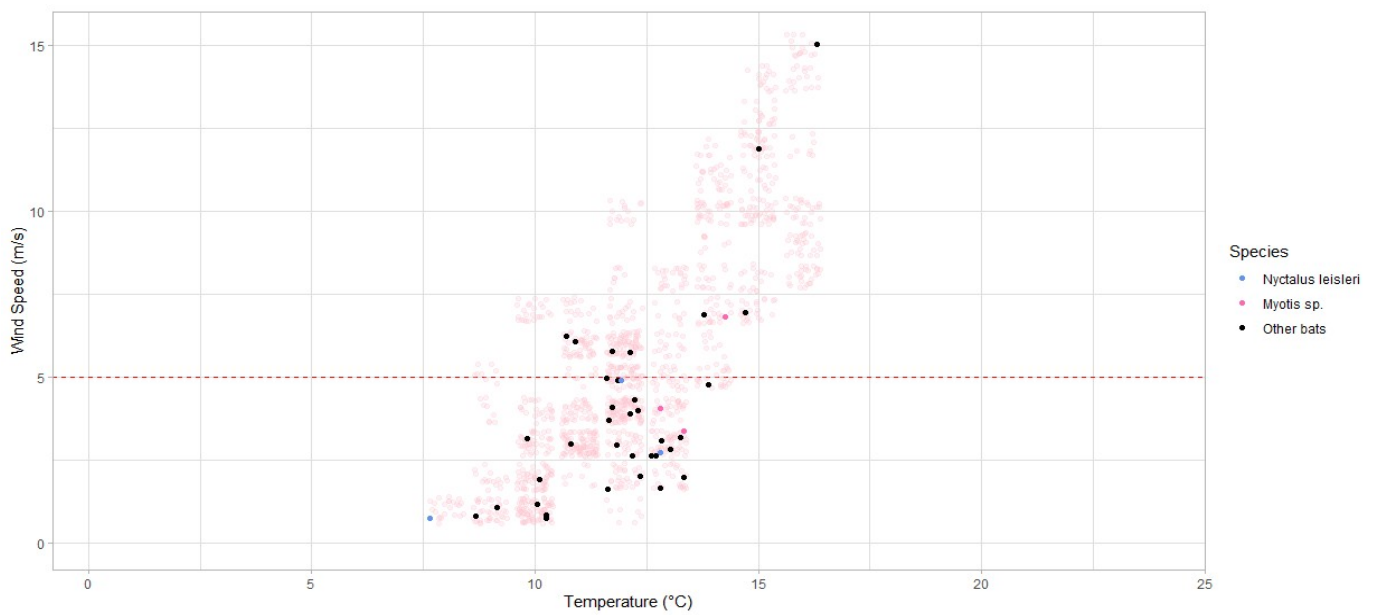


Figure A5.28: Weather data at detector 2 (D.02) vs bat activity

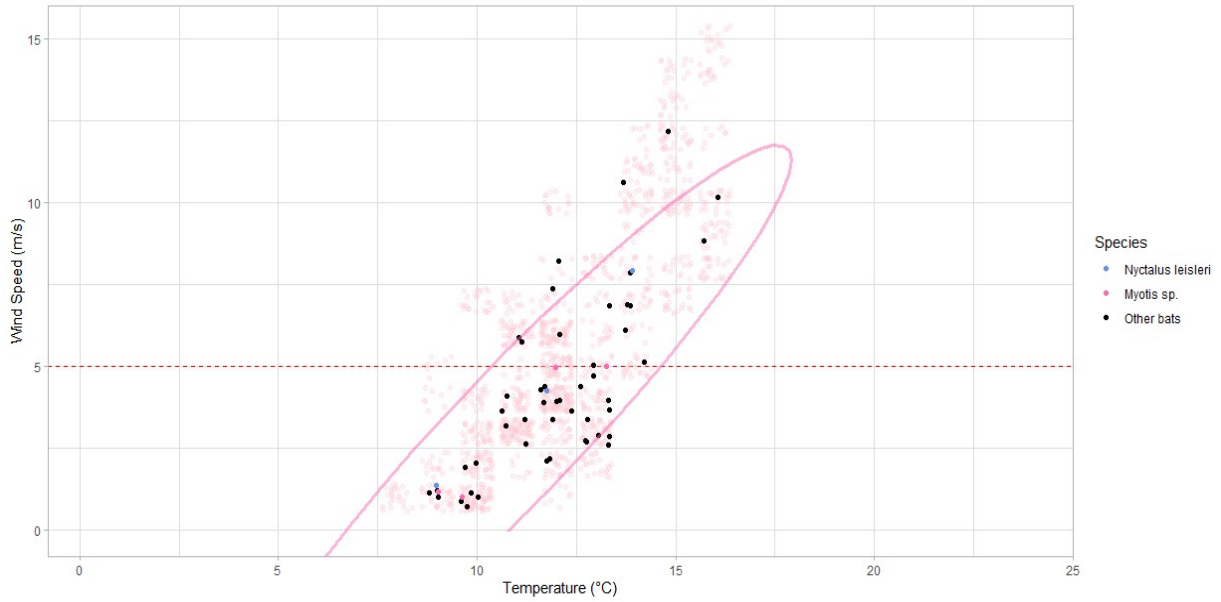


Figure A5.29: Weather data at detector 3 (D.03) vs bat activity

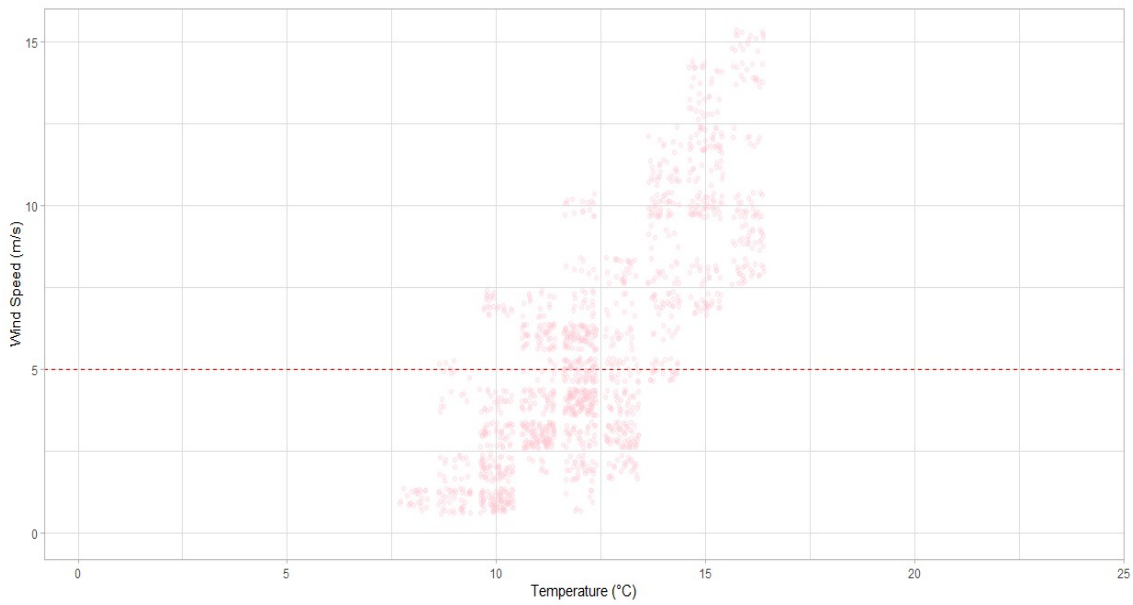


Figure A5.30: Weather data at detector 4 (D.04) vs bat activity

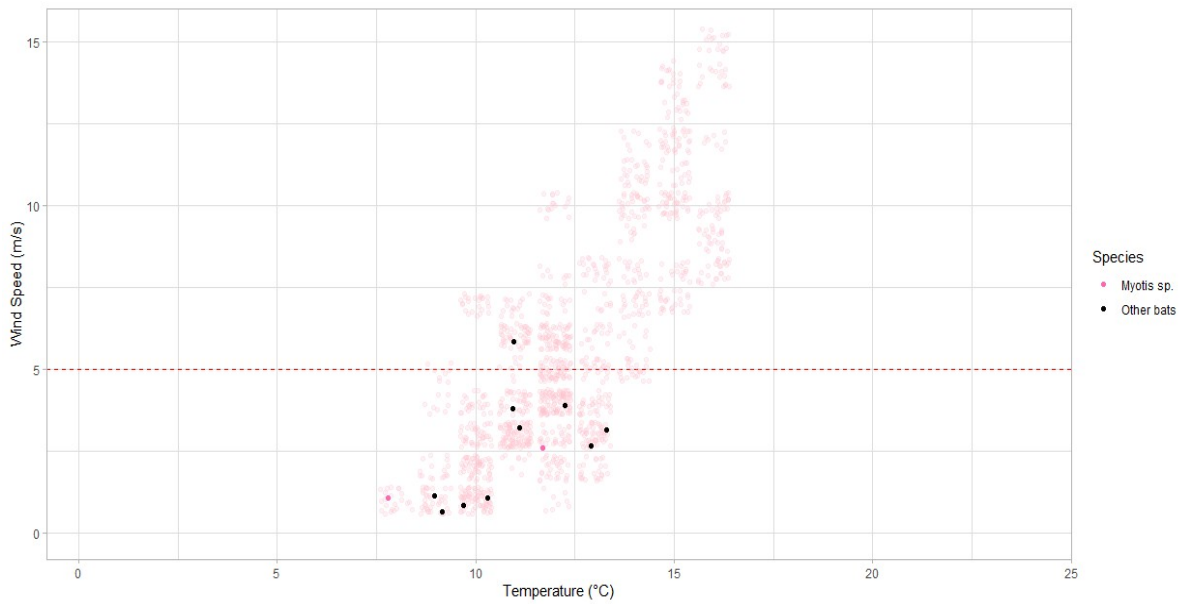


Figure A5.31 Weather data at detector 5 (D.05) vs bat activity

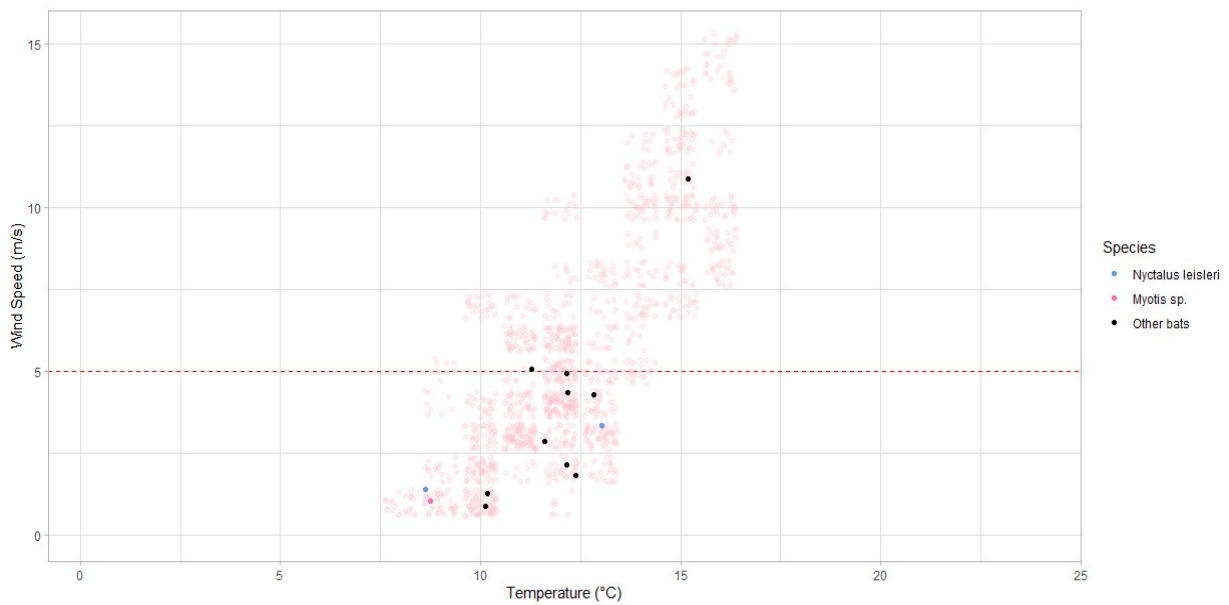


Figure A5.32 Weather data at detector 6 (D.06) vs bat activity

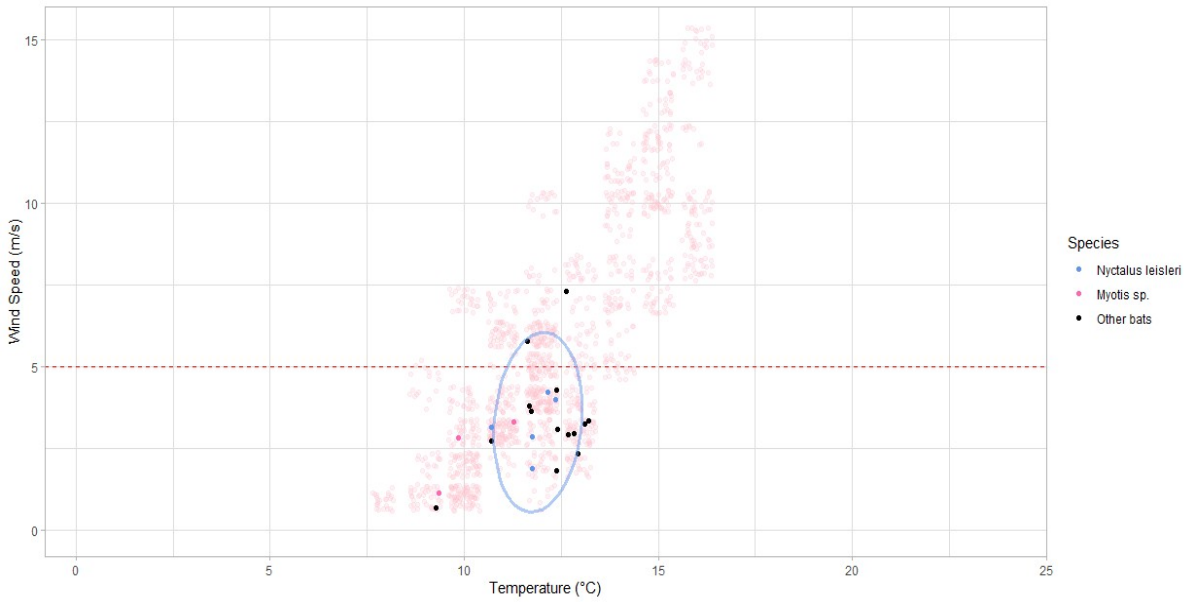


Figure A5.33 Weather data at detector 7 (D.07) vs bat activity

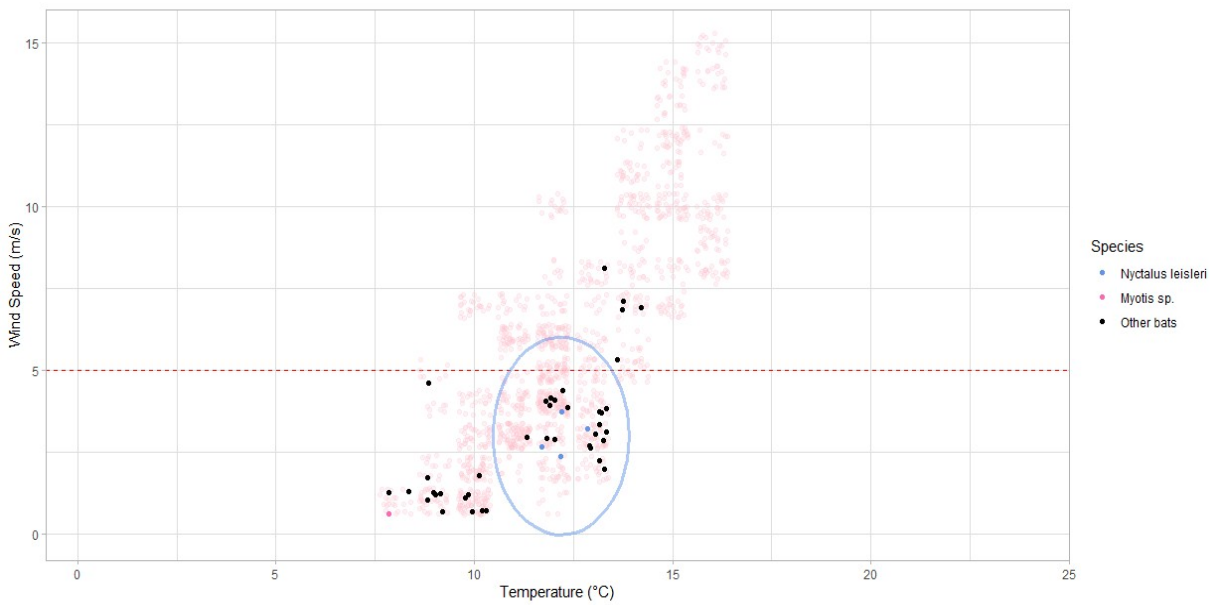


Figure A5.34 Weather data at detector 8 (D.08) vs bat activity

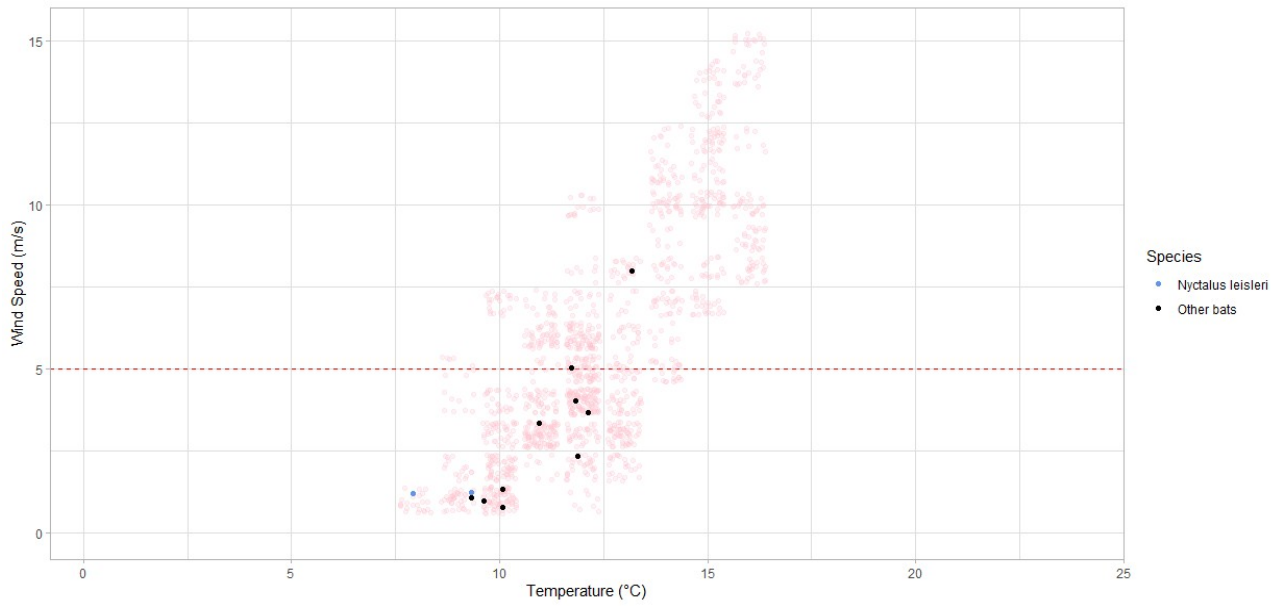


Figure A5.35 Weather data at detector 9 (D.09) vs bat activity

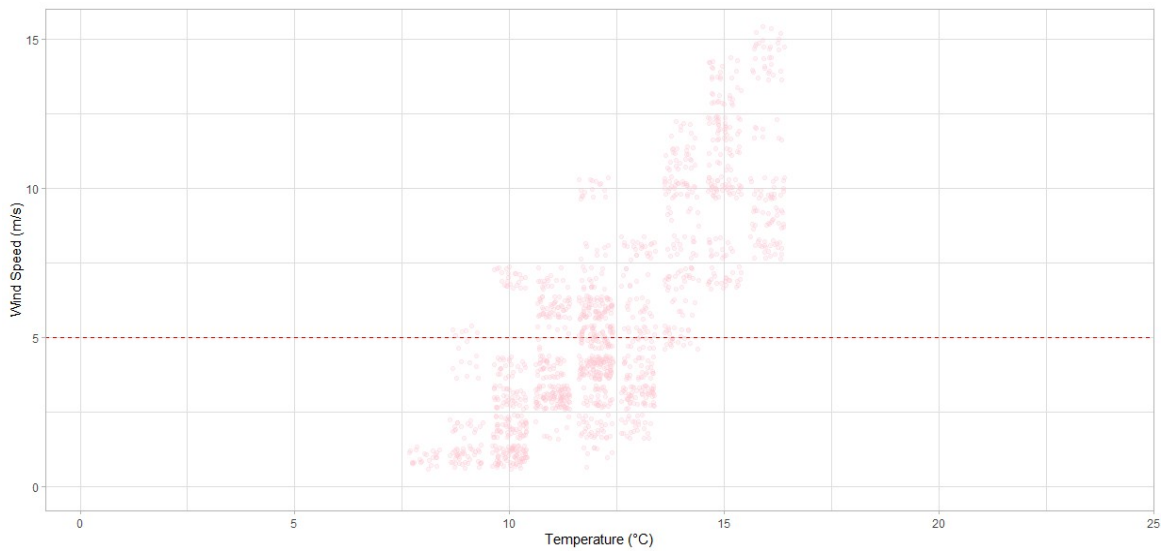


Figure A5.36 Weather data at detector 10 (D.10) vs bat activity

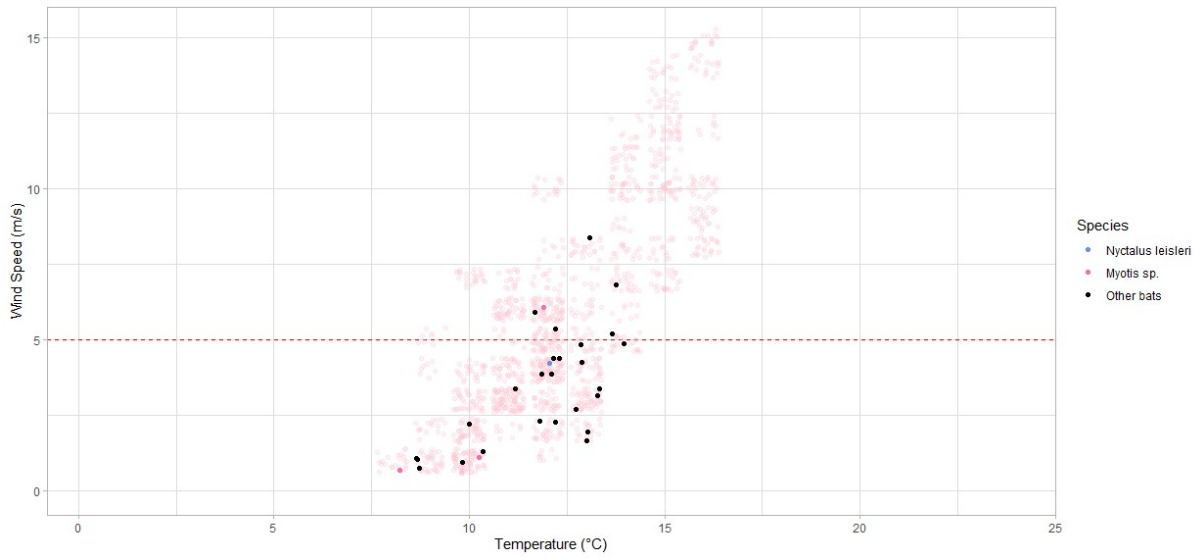


Figure A5.37 Weather data at detector 11 (D.11) vs bat activity

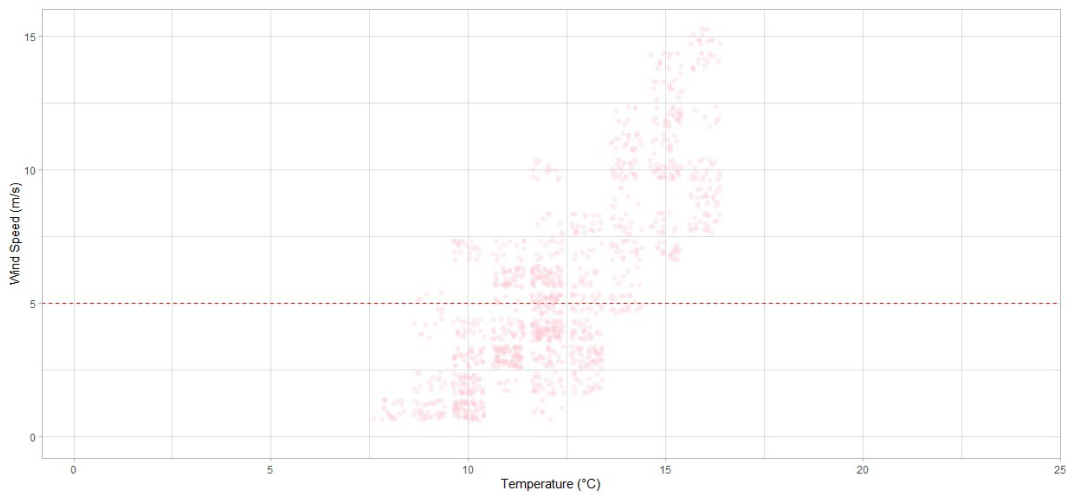


Figure A5.38 Weather data at detector 12 (D.12) vs bat activity

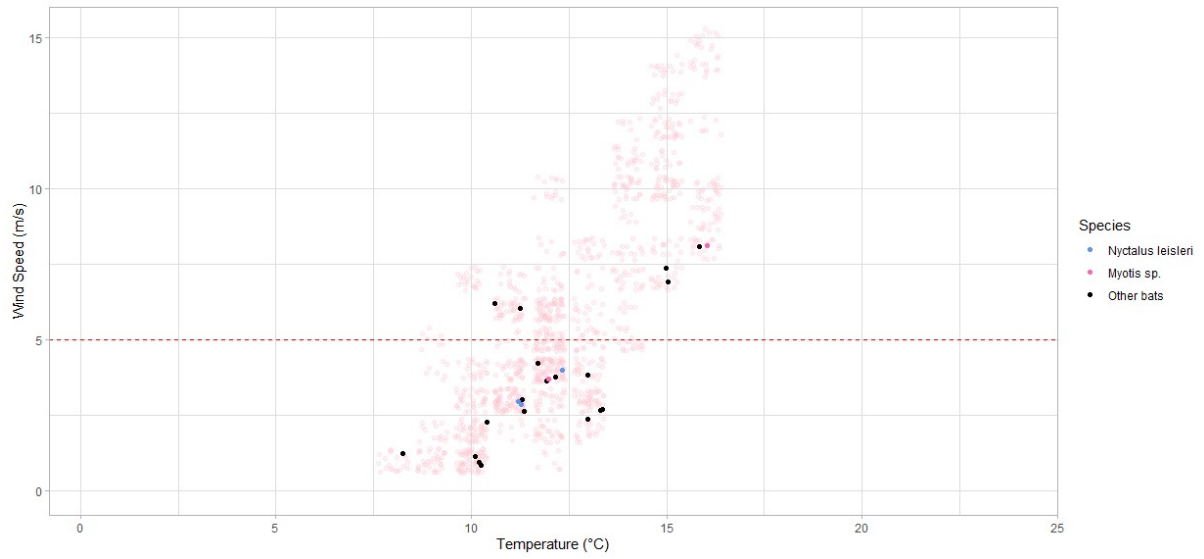


Figure A5.39 Weather data at detector 13 (D.13) vs bat activity