Ecobat: Nightly Bat Activity Analysis

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

*The analyses are based on data supplied by the user to the Mammal Society’s Ecobat website. The outputs are designed to assist decision-making, but do not replace expert interpretation by the user.*

# Summary

Bat surveys were conducted on 49 nights between 2018-07-09 and 2018-09-09, using 5 static bat detectors. Throughout this period 7 species were recorded.

# Sunrise and Sunset Times

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

|  |  |  |  |
| --- | --- | --- | --- |
| Night (y-m-d) | Sunset (hh:mm) | Sunrise (hh:mm) | Night Length (hours) |
| 2018-07-09 | 22:05 | 05:02 | 7.0 |
| 2018-07-10 | 22:04 | 05:04 | 7.0 |
| 2018-07-11 | 22:03 | 05:05 | 7.0 |
| 2018-07-12 | 22:02 | 05:06 | 7.1 |
| 2018-07-13 | 22:01 | 05:07 | 7.1 |
| 2018-07-14 | 22:00 | 05:09 | 7.1 |
| 2018-07-15 | 21:59 | 05:10 | 7.2 |
| 2018-07-16 | 21:58 | 05:12 | 7.2 |
| 2018-07-17 | 21:56 | 05:13 | 7.3 |
| 2018-07-18 | 21:55 | 05:15 | 7.3 |
| 2018-07-22 | 21:49 | 05:21 | 7.5 |
| 2018-07-23 | 21:48 | 05:23 | 7.6 |
| 2018-07-24 | 21:46 | 05:24 | 7.6 |
| 2018-07-25 | 21:45 | 05:26 | 7.7 |
| 2018-07-26 | 21:43 | 05:28 | 7.7 |
| 2018-07-29 | 21:38 | 05:33 | 7.9 |
| 2018-07-30 | 21:36 | 05:35 | 8.0 |
| 2018-08-01 | 21:32 | 05:38 | 8.1 |
| 2018-08-02 | 21:30 | 05:40 | 8.2 |
| 2018-08-03 | 21:28 | 05:42 | 8.2 |
| 2018-08-04 | 21:26 | 05:44 | 8.3 |
| 2018-08-05 | 21:24 | 05:46 | 8.4 |
| 2018-08-06 | 21:22 | 05:47 | 8.4 |
| 2018-08-07 | 21:20 | 05:49 | 8.5 |
| 2018-08-08 | 21:18 | 05:51 | 8.5 |
| 2018-08-09 | 21:16 | 05:53 | 8.6 |
| 2018-08-10 | 21:14 | 05:55 | 8.7 |
| 2018-08-11 | 21:12 | 05:57 | 8.7 |
| 2018-08-12 | 21:10 | 05:59 | 8.8 |
| 2018-08-13 | 21:08 | 06:00 | 8.9 |
| 2018-08-15 | 21:03 | 06:04 | 9.0 |
| 2018-08-16 | 21:01 | 06:06 | 9.1 |
| 2018-08-17 | 20:59 | 06:08 | 9.2 |
| 2018-08-19 | 20:54 | 06:12 | 9.3 |
| 2018-08-20 | 20:52 | 06:14 | 9.4 |
| 2018-08-22 | 20:47 | 06:17 | 9.5 |
| 2018-08-24 | 20:42 | 06:21 | 9.6 |
| 2018-08-25 | 20:40 | 06:23 | 9.7 |
| 2018-08-27 | 20:35 | 06:27 | 9.9 |
| 2018-08-29 | 20:30 | 06:30 | 10.0 |
| 2018-08-30 | 20:28 | 06:32 | 10.1 |
| 2018-09-01 | 20:23 | 06:36 | 10.2 |
| 2018-09-02 | 20:20 | 06:38 | 10.3 |
| 2018-09-03 | 20:18 | 06:40 | 10.4 |
| 2018-09-04 | 20:15 | 06:42 | 10.4 |
| 2018-09-05 | 20:12 | 06:43 | 10.5 |
| 2018-09-07 | 20:07 | 06:47 | 10.7 |
| 2018-09-08 | 20:05 | 06:49 | 10.7 |
| 2018-09-09 | 20:02 | 06:51 | 10.8 |

# Counts of Bat Passes

## All detectors

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

|  |  |  |
| --- | --- | --- |
| Species | Count (No) | Percentage of total (%) |
| Brown long-eared | 4 | 0.2 |
| Common pip | 563 | 26.3 |
| Leisler’s | 1296 | 60.6 |
| Myotis spp. | 25 | 1.2 |
| Nathusius’ | 44 | 2.1 |
| Pip spp. | 7 | 0.3 |
| Soprano pip | 199 | 9.3 |
| Total | 2138 | 100.0 |

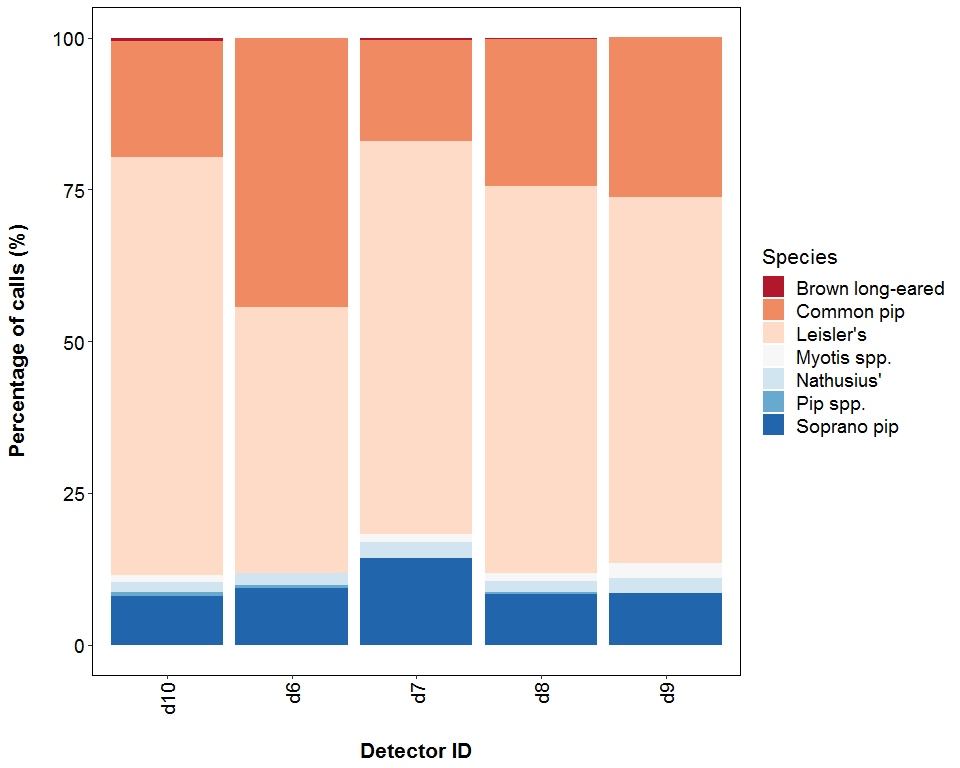
# Counts of Bat Passes

## Per Detector

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

|  |  |  |  |
| --- | --- | --- | --- |
| Species | Detector ID | Count (No) | Percentage by Detector (%) |
| Brown long-eared | d10 | 2 | 0.4 |
| Brown long-eared | d7 | 1 | 0.3 |
| Brown long-eared | d8 | 1 | 0.2 |
| Common pip | d10 | 100 | 19.1 |
| Common pip | d6 | 195 | 44.3 |
| Common pip | d7 | 49 | 16.6 |
| Common pip | d8 | 144 | 24.2 |
| Common pip | d9 | 75 | 26.4 |
| Leisler’s | d10 | 361 | 69.0 |
| Leisler’s | d6 | 193 | 43.9 |
| Leisler’s | d7 | 191 | 64.7 |
| Leisler’s | d8 | 380 | 63.8 |
| Leisler’s | d9 | 171 | 60.2 |
| Myotis spp. | d10 | 6 | 1.1 |
| Myotis spp. | d7 | 4 | 1.4 |
| Myotis spp. | d8 | 8 | 1.3 |
| Myotis spp. | d9 | 7 | 2.5 |
| Nathusius’ | d10 | 9 | 1.7 |
| Nathusius’ | d6 | 9 | 2.0 |
| Nathusius’ | d7 | 8 | 2.7 |
| Nathusius’ | d8 | 11 | 1.8 |
| Nathusius’ | d9 | 7 | 2.5 |
| Pip spp. | d10 | 3 | 0.6 |
| Pip spp. | d6 | 2 | 0.5 |
| Pip spp. | d8 | 2 | 0.3 |
| Soprano pip | d10 | 42 | 8.0 |
| Soprano pip | d6 | 41 | 9.3 |
| Soprano pip | d7 | 42 | 14.2 |
| Soprano pip | d8 | 50 | 8.4 |
| Soprano pip | d9 | 24 | 8.5 |
|  |  |  |  |

# Percentage of bat passes at each detector



# Bat Passes per Month

## Per Detector

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Species | Detector ID | Jul | Aug | Sep |
| Brown long-eared | d10 | 1 | 1 | 0 |
| Brown long-eared | d7 | 1 | 0 | 0 |
| Brown long-eared | d8 | 0 | 0 | 1 |
| Common pip | d10 | 33 | 57 | 10 |
| Common pip | d6 | 37 | 104 | 54 |
| Common pip | d7 | 6 | 43 | 0 |
| Common pip | d8 | 17 | 103 | 24 |
| Common pip | d9 | 26 | 43 | 6 |
| Leisler’s | d10 | 141 | 209 | 11 |
| Leisler’s | d6 | 58 | 134 | 1 |
| Leisler’s | d7 | 84 | 107 | 0 |
| Leisler’s | d8 | 132 | 227 | 21 |
| Leisler’s | d9 | 101 | 64 | 6 |
| Myotis spp. | d10 | 0 | 4 | 2 |
| Myotis spp. | d7 | 1 | 3 | 0 |
| Myotis spp. | d8 | 1 | 6 | 1 |
| Myotis spp. | d9 | 0 | 7 | 0 |
| Nathusius’ | d10 | 1 | 6 | 2 |
| Nathusius’ | d6 | 1 | 8 | 0 |
| Nathusius’ | d7 | 0 | 8 | 0 |
| Nathusius’ | d8 | 0 | 7 | 4 |
| Nathusius’ | d9 | 0 | 5 | 2 |
| Pip spp. | d10 | 0 | 2 | 1 |
| Pip spp. | d6 | 0 | 1 | 1 |
| Pip spp. | d8 | 0 | 1 | 1 |
| Soprano pip | d10 | 4 | 27 | 11 |
| Soprano pip | d6 | 1 | 37 | 3 |
| Soprano pip | d7 | 20 | 22 | 0 |
| Soprano pip | d8 | 5 | 39 | 6 |
| Soprano pip | d9 | 3 | 19 | 2 |

## Bat Passes per Month

# Survey Effort

**The average number of bat passes of each species per night throughout each month. Calculated with (Nnumber of passes each month) / (Number of survey nights each month).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Species | Detector ID | Jul | Aug | Sep |
| Brown long-eared | d10 | 0.059 | 0.042 | 0.00 |
| Brown long-eared | d7 | 0.059 | 0.000 | 0.00 |
| Brown long-eared | d8 | 0.000 | 0.000 | 0.12 |
| Common pip | d10 | 1.900 | 2.400 | 1.20 |
| Common pip | d6 | 2.200 | 4.300 | 6.80 |
| Common pip | d7 | 0.350 | 1.800 | 0.00 |
| Common pip | d8 | 1.000 | 4.300 | 3.00 |
| Common pip | d9 | 1.500 | 1.800 | 0.75 |
| Leisler’s | d10 | 8.300 | 8.700 | 1.40 |
| Leisler’s | d6 | 3.400 | 5.600 | 0.12 |
| Leisler’s | d7 | 4.900 | 4.500 | 0.00 |
| Leisler’s | d8 | 7.800 | 9.500 | 2.60 |
| Leisler’s | d9 | 5.900 | 2.700 | 0.75 |
| Myotis spp. | d10 | 0.000 | 0.170 | 0.25 |
| Myotis spp. | d7 | 0.059 | 0.120 | 0.00 |
| Myotis spp. | d8 | 0.059 | 0.250 | 0.12 |
| Myotis spp. | d9 | 0.000 | 0.290 | 0.00 |
| Nathusius’ | d10 | 0.059 | 0.250 | 0.25 |
| Nathusius’ | d6 | 0.059 | 0.330 | 0.00 |
| Nathusius’ | d7 | 0.000 | 0.330 | 0.00 |
| Nathusius’ | d8 | 0.000 | 0.290 | 0.50 |
| Nathusius’ | d9 | 0.000 | 0.210 | 0.25 |
| Pip spp. | d10 | 0.000 | 0.083 | 0.12 |
| Pip spp. | d6 | 0.000 | 0.042 | 0.12 |
| Pip spp. | d8 | 0.000 | 0.042 | 0.12 |
| Soprano pip | d10 | 0.240 | 1.100 | 1.40 |
| Soprano pip | d6 | 0.059 | 1.500 | 0.38 |
| Soprano pip | d7 | 1.200 | 0.920 | 0.00 |
| Soprano pip | d8 | 0.290 | 1.600 | 0.75 |
| Soprano pip | d9 | 0.180 | 0.790 | 0.25 |

## Median Bat Passes per Month

# Per Detector

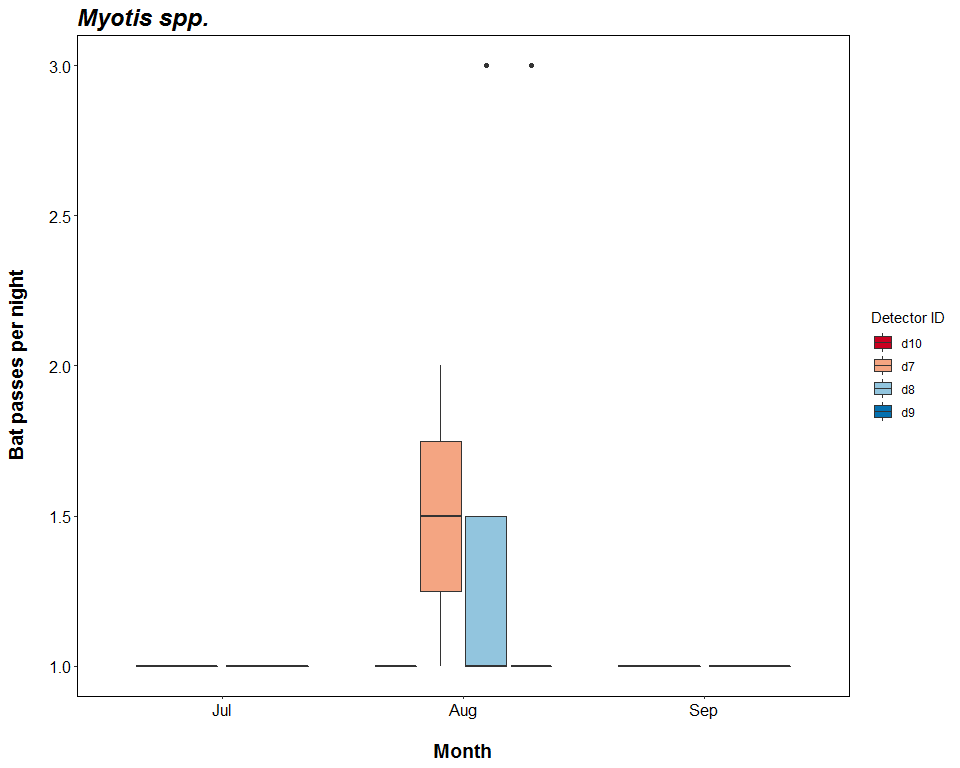
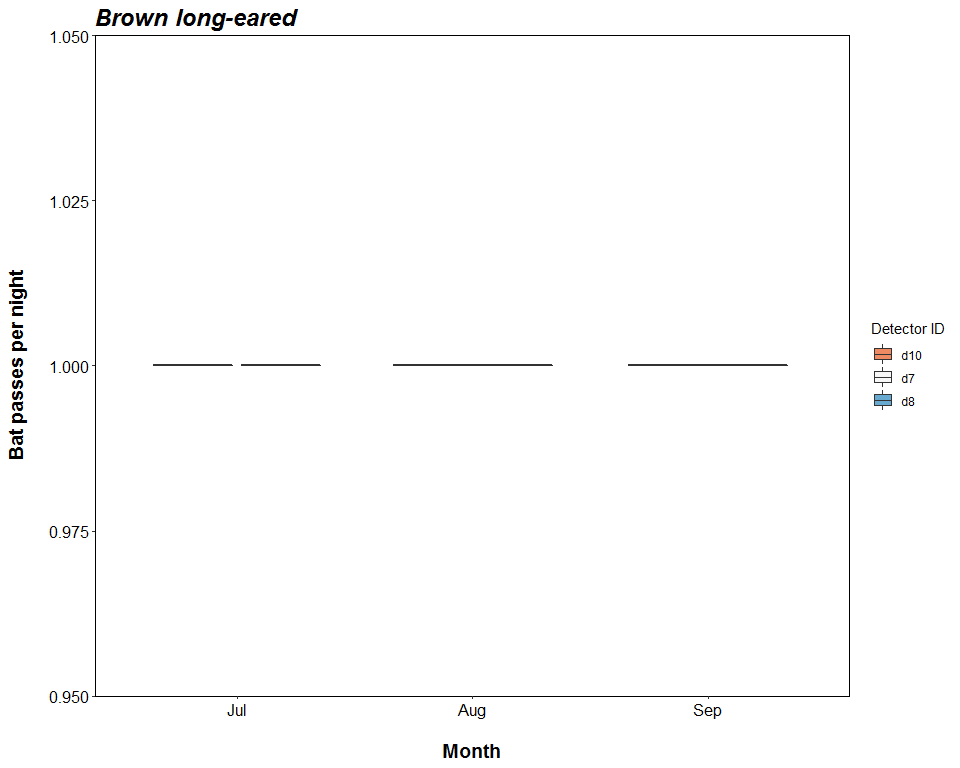
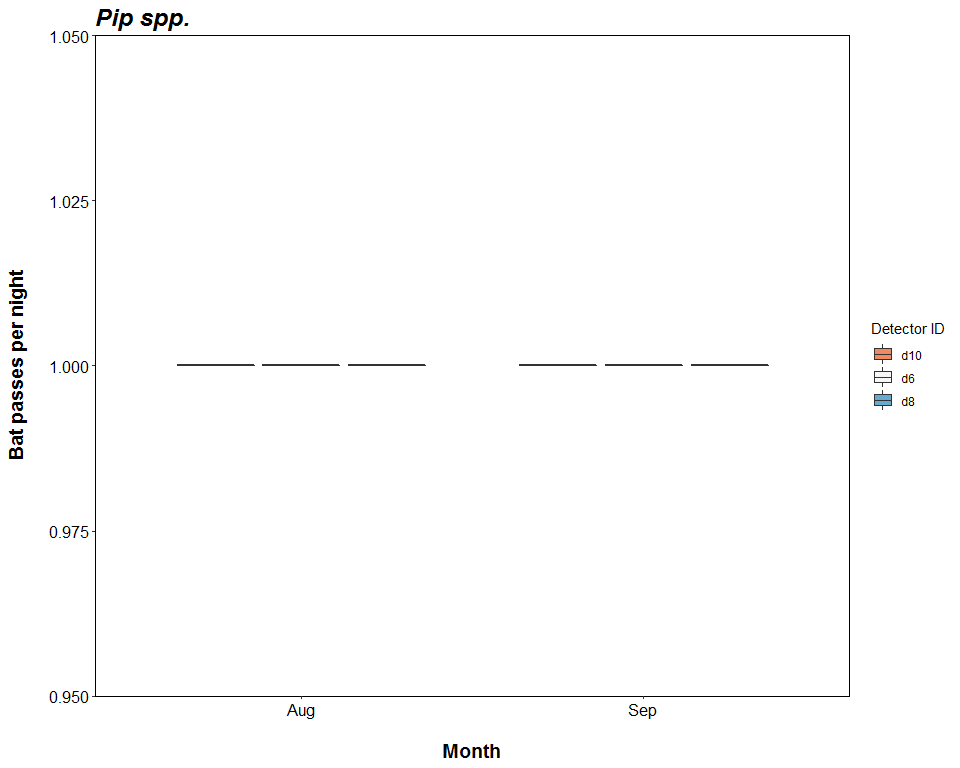
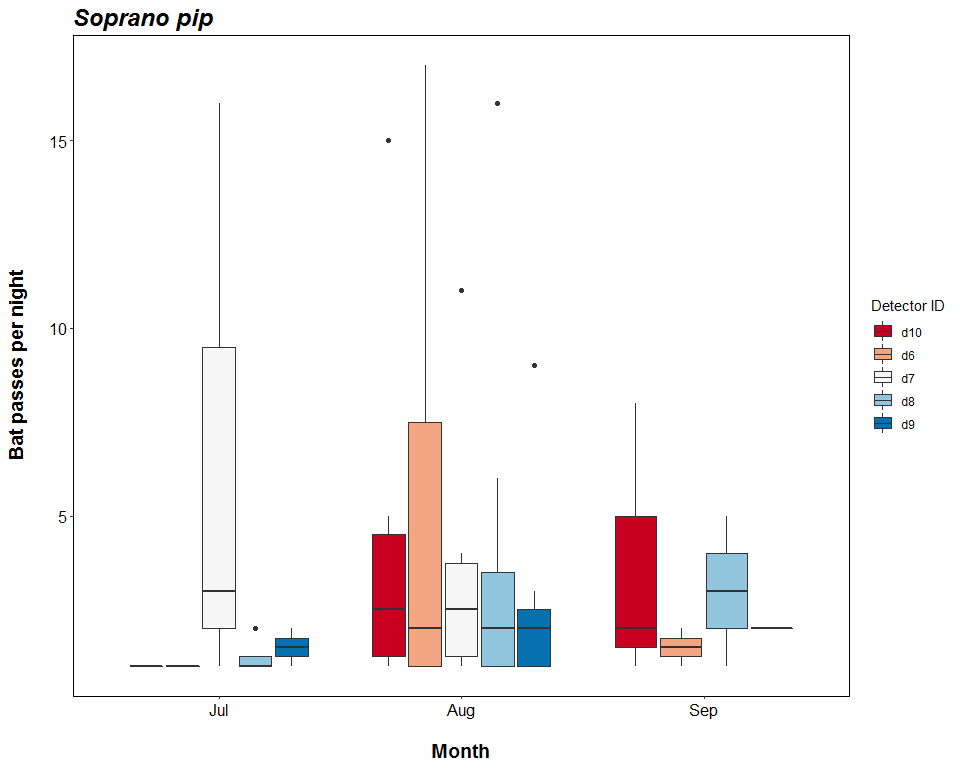
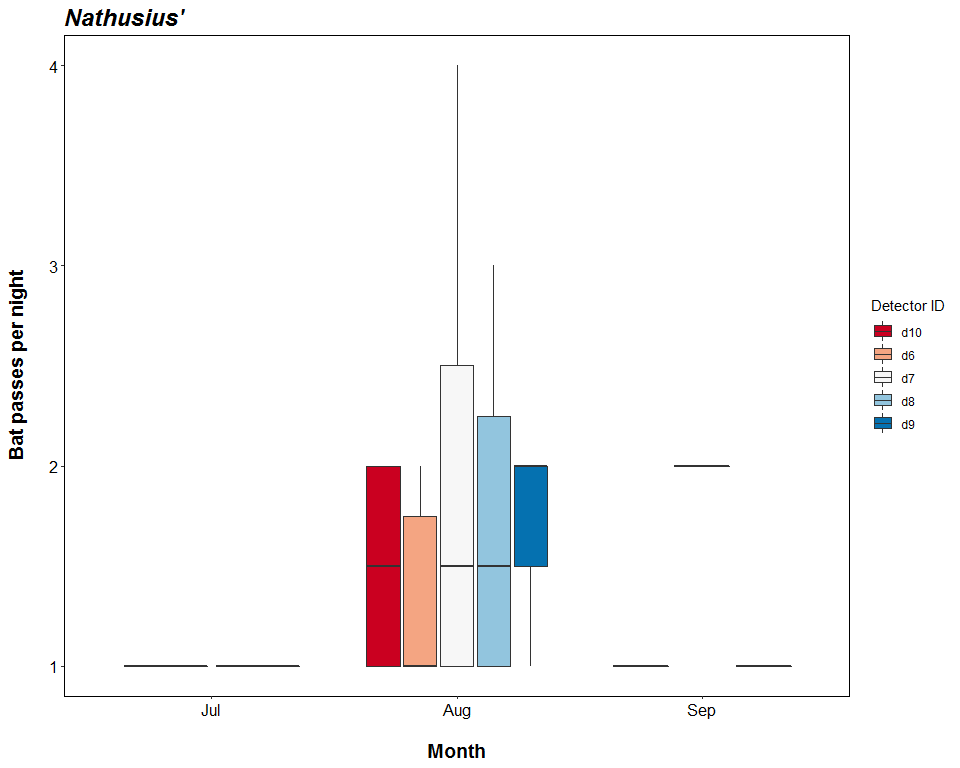
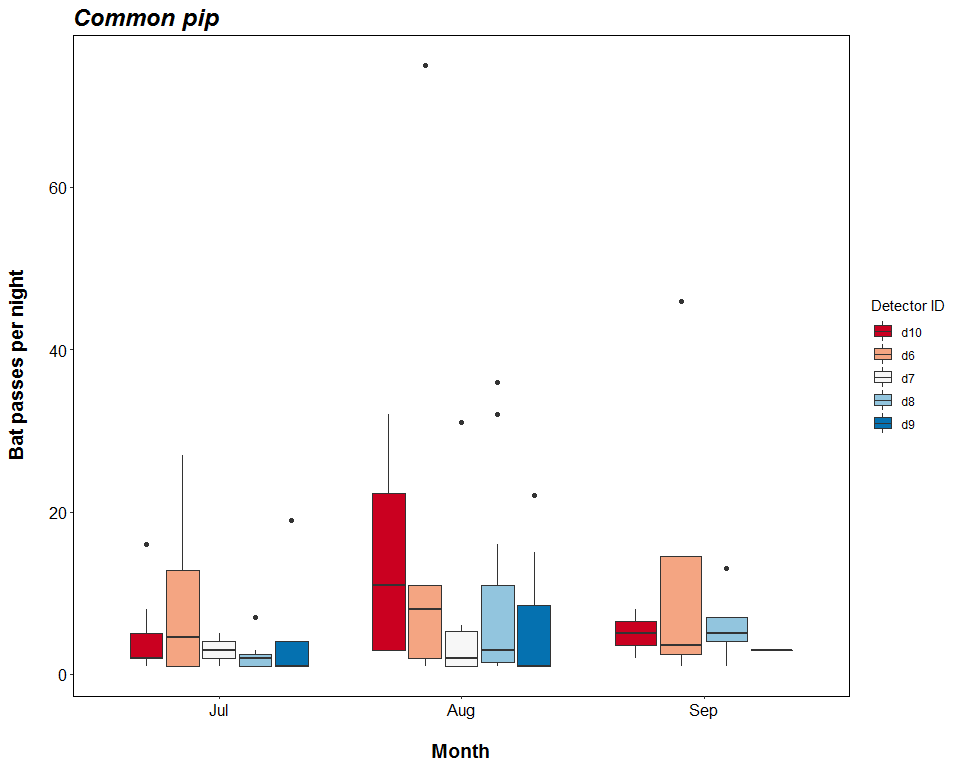
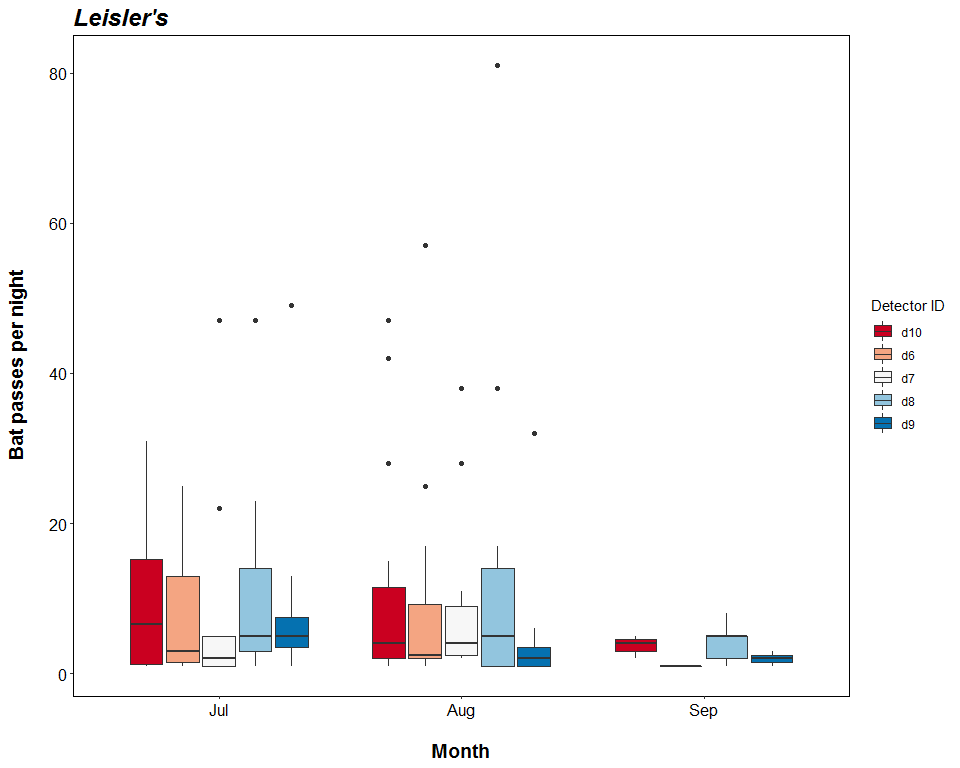
**The median number of bat passes of each species throughout each month.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Species | Detector ID | Jul | Aug | Sep |
| Brown long-eared | d10 | 1.0 | 1.0 | NA |
| Brown long-eared | d7 | 1.0 | NA | NA |
| Brown long-eared | d8 | NA | NA | 1.0 |
| Common pip | d10 | 2.0 | 11.0 | 5.0 |
| Common pip | d6 | 4.5 | 8.0 | 3.5 |
| Common pip | d7 | 3.0 | 2.0 | NA |
| Common pip | d8 | 2.0 | 3.0 | 5.0 |
| Common pip | d9 | 1.0 | 1.0 | 3.0 |
| Leisler’s | d10 | 6.5 | 4.0 | 4.0 |
| Leisler’s | d6 | 3.0 | 2.5 | 1.0 |
| Leisler’s | d7 | 2.0 | 4.0 | NA |
| Leisler’s | d8 | 5.0 | 5.0 | 5.0 |
| Leisler’s | d9 | 5.0 | 2.0 | 2.0 |
| Myotis spp. | d10 | NA | 1.0 | 1.0 |
| Myotis spp. | d7 | 1.0 | 1.5 | NA |
| Myotis spp. | d8 | 1.0 | 1.0 | 1.0 |
| Myotis spp. | d9 | NA | 1.0 | NA |
| Nathusius’ | d10 | 1.0 | 1.5 | 1.0 |
| Nathusius’ | d6 | 1.0 | 1.0 | NA |
| Nathusius’ | d7 | NA | 1.5 | NA |
| Nathusius’ | d8 | NA | 1.5 | 2.0 |
| Nathusius’ | d9 | NA | 2.0 | 1.0 |
| Pip spp. | d10 | NA | 1.0 | 1.0 |
| Pip spp. | d6 | NA | 1.0 | 1.0 |
| Pip spp. | d8 | NA | 1.0 | 1.0 |
| Soprano pip | d10 | 1.0 | 2.5 | 2.0 |
| Soprano pip | d6 | 1.0 | 2.0 | 1.5 |
| Soprano pip | d7 | 3.0 | 2.5 | NA |
| Soprano pip | d8 | 1.0 | 2.0 | 3.0 |
| Soprano pip | d9 | 1.5 | 2.0 | 2.0 |

# Bat Passes per Month

## Per Detector - Figures

Figures show boxplots for the number of bat passes by detector each month. The ‘box’ shows the interquartlie range, which represents the middle 50% of the data. The line dividing the box is the median, the mid-point of the data. The ‘whiskers’ of the box represent data outside of the middle 50%, with outliers depicting by the dots.



# Hourly Bat Passes after Sunset

## All Detectors

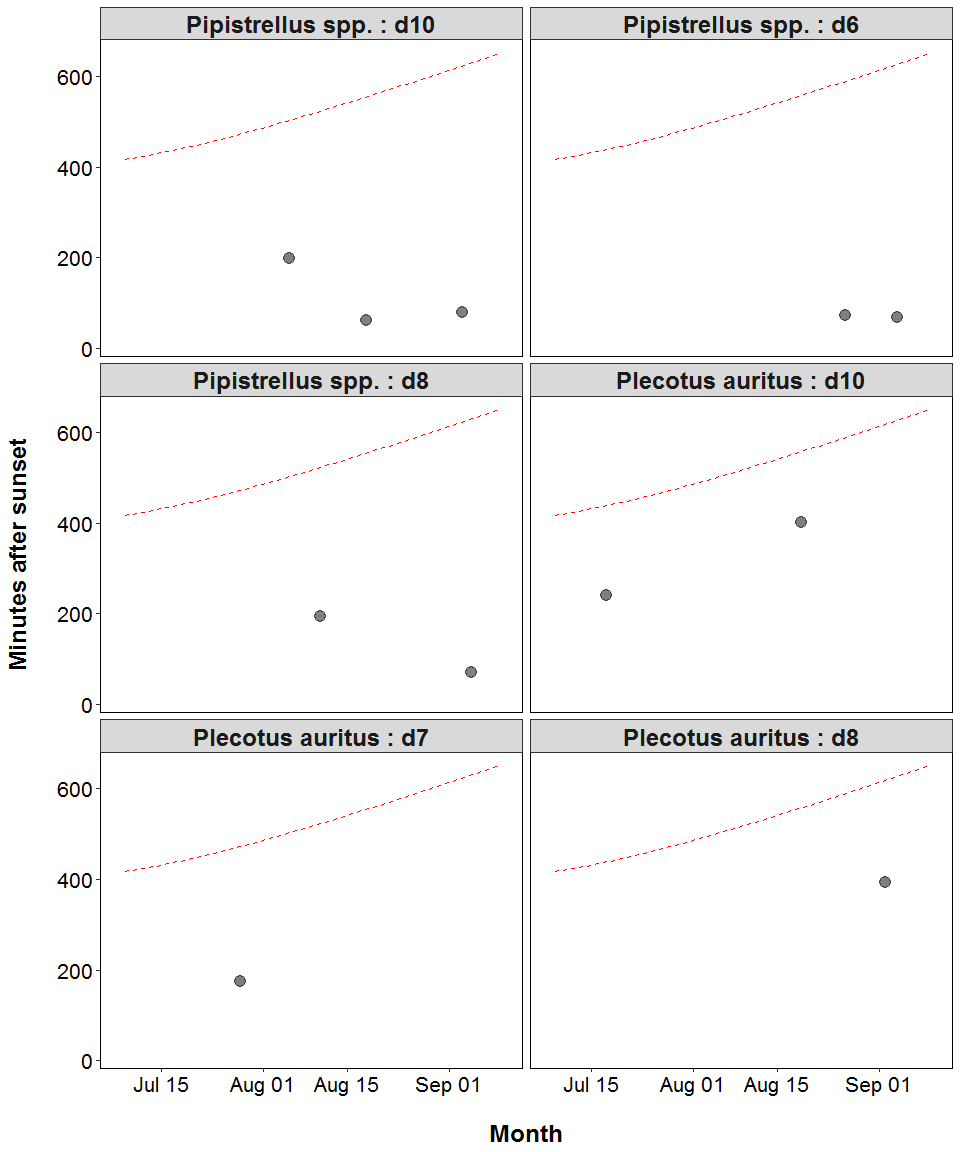
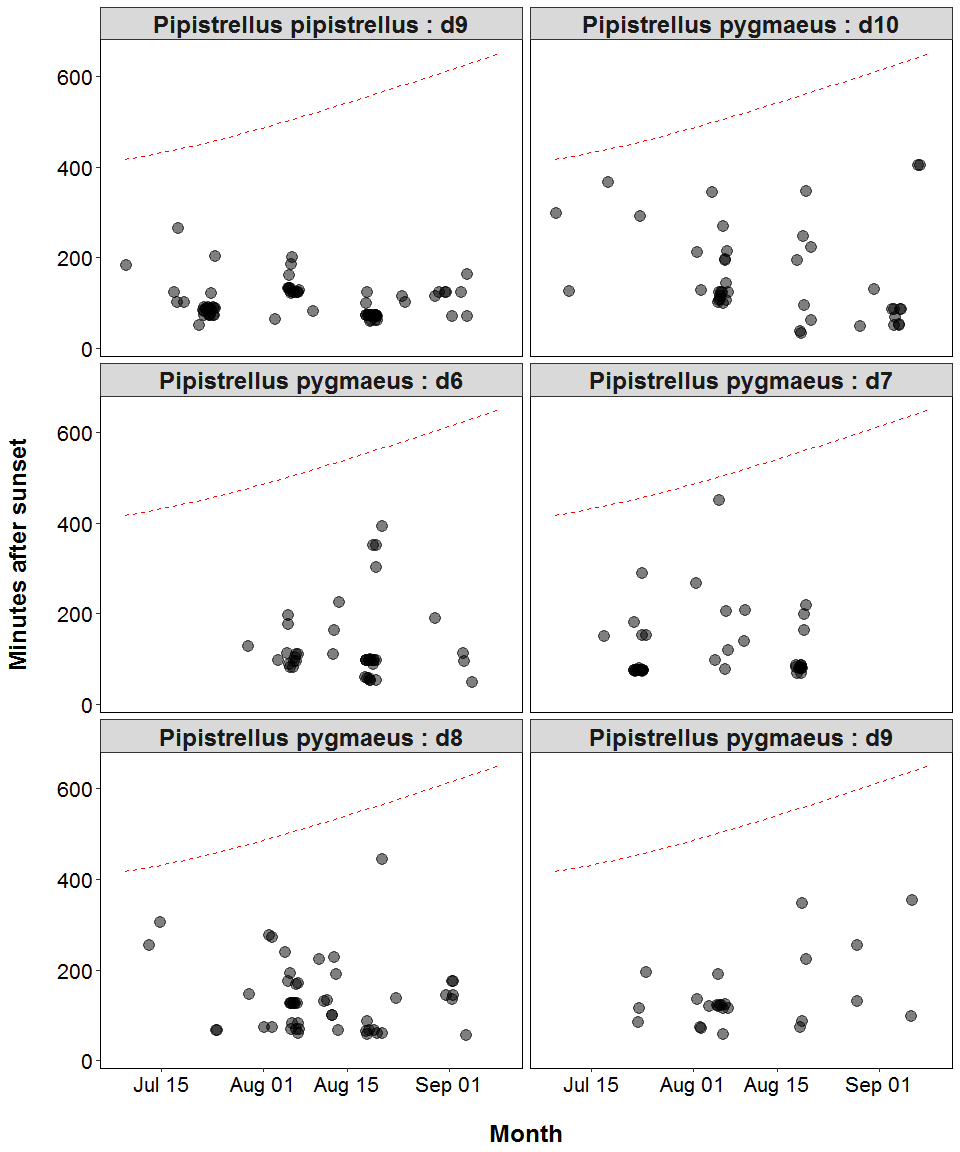
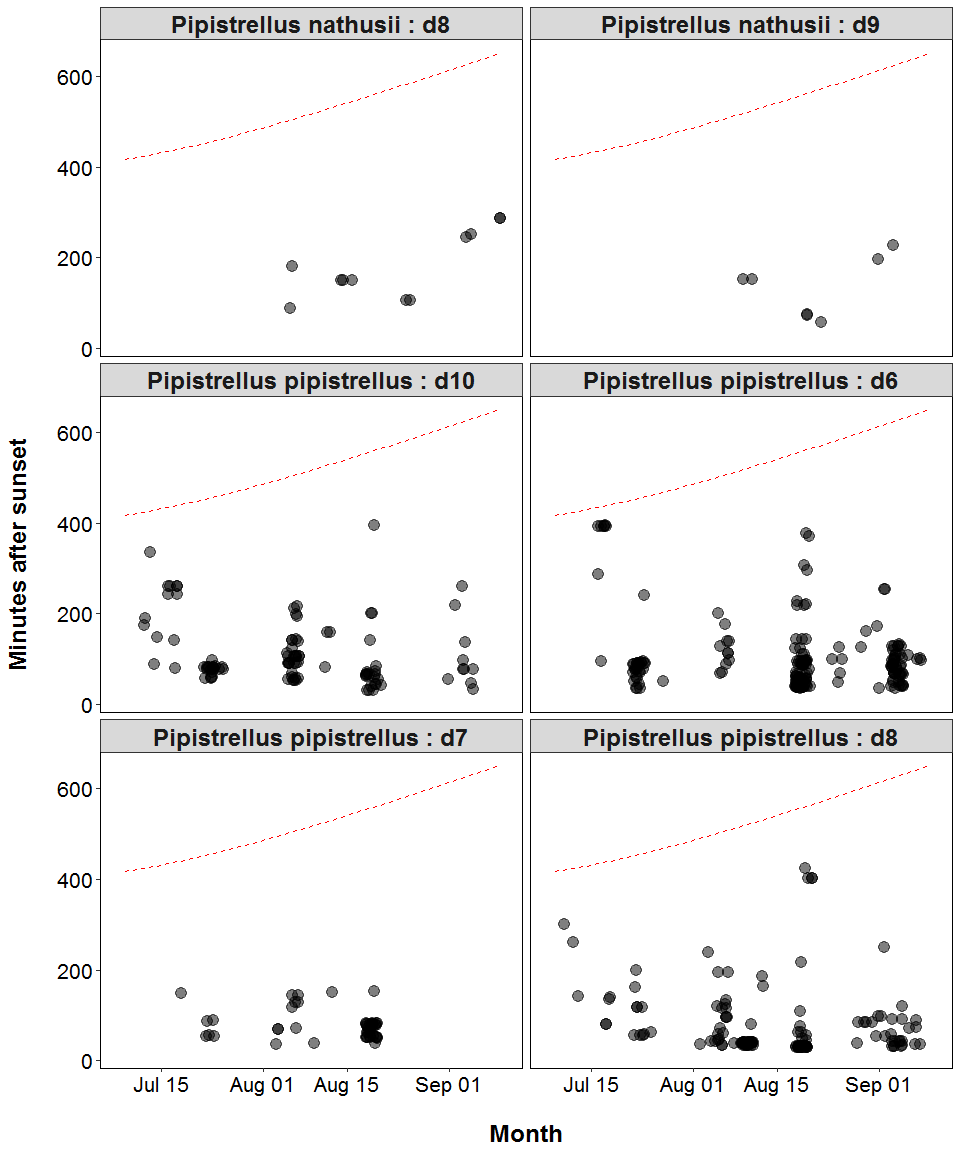
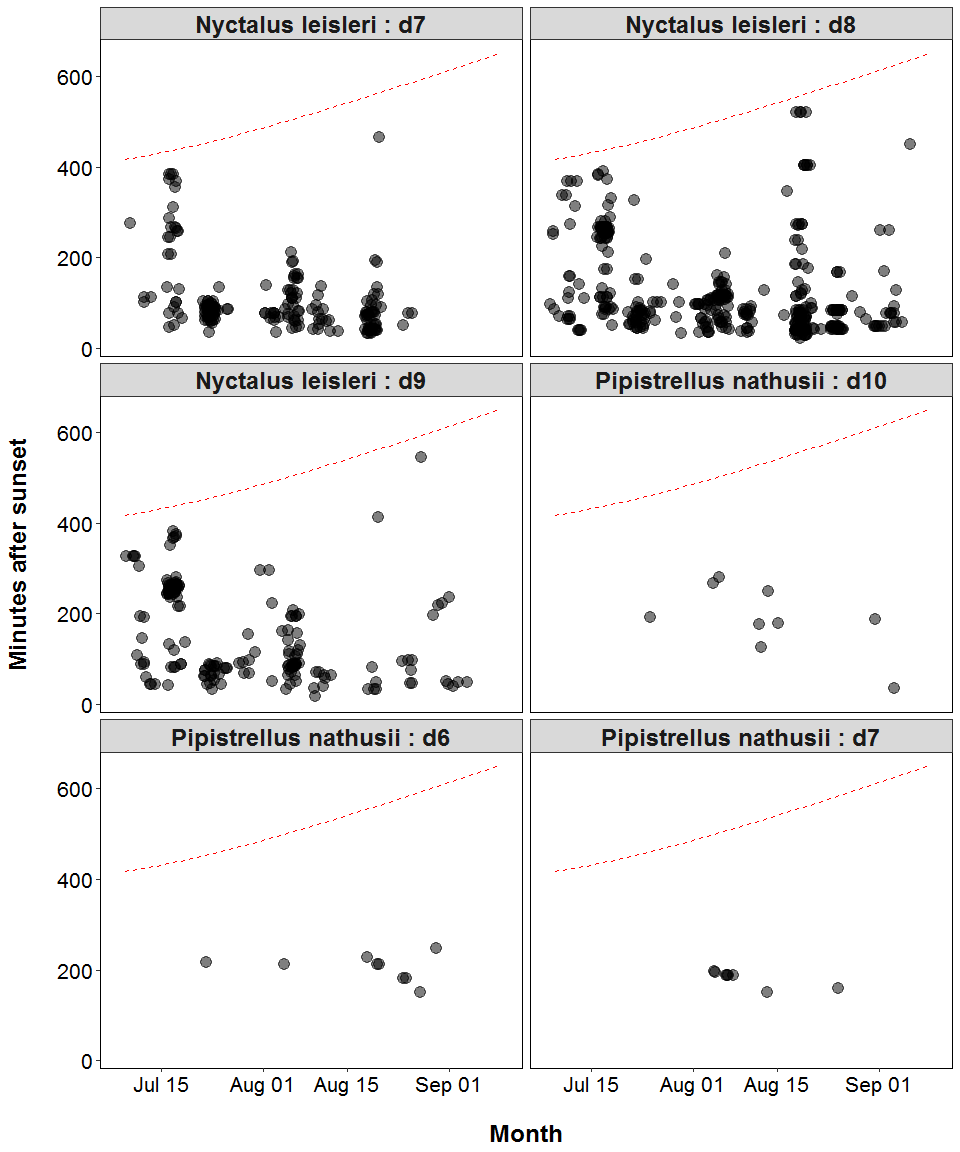
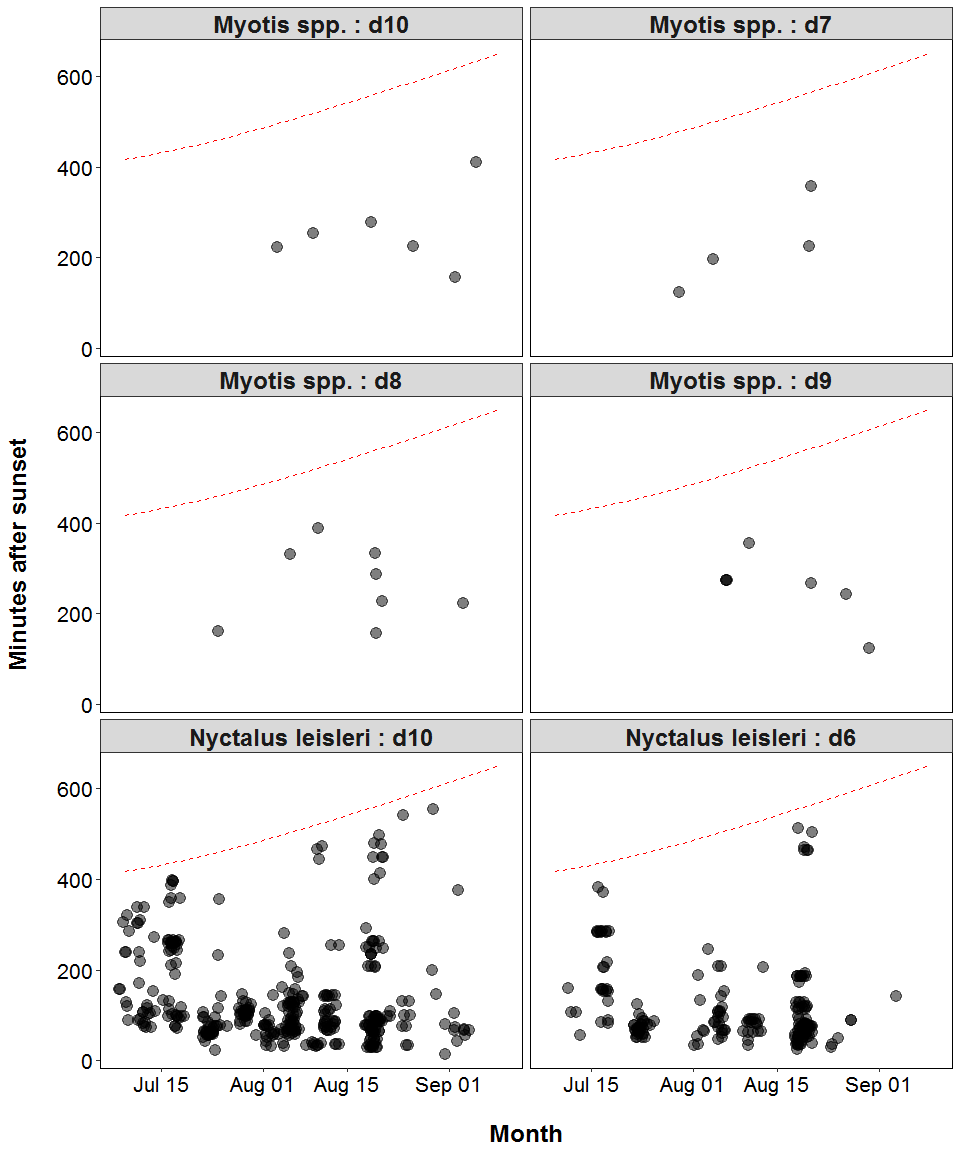
**The total number of bat passes occuring during each hour after sunset.**

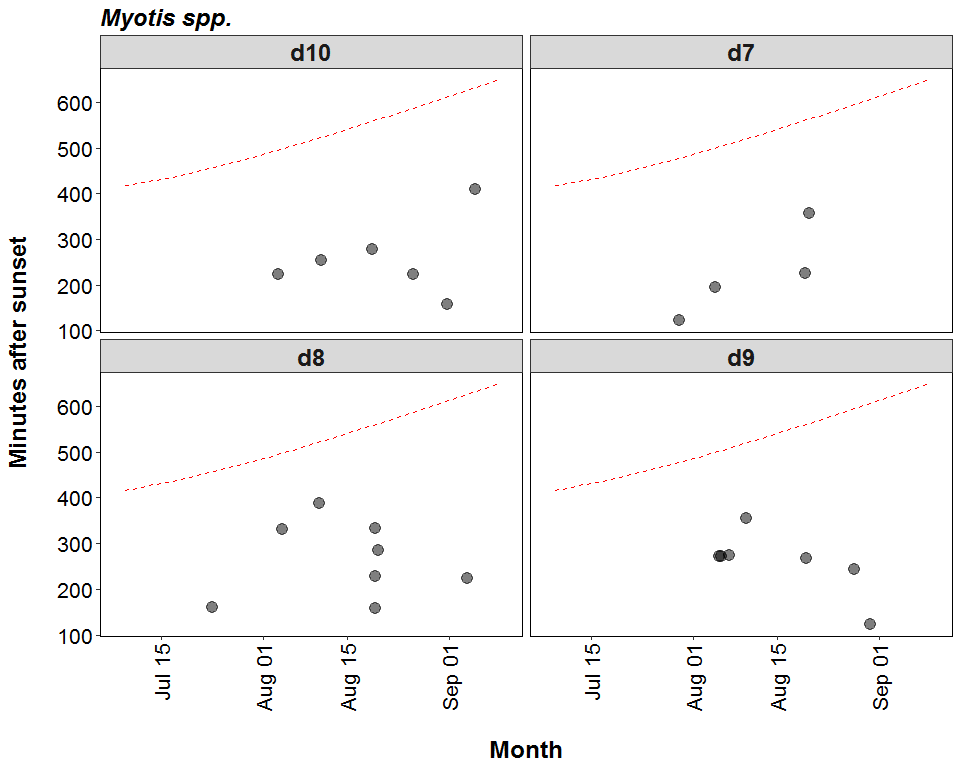
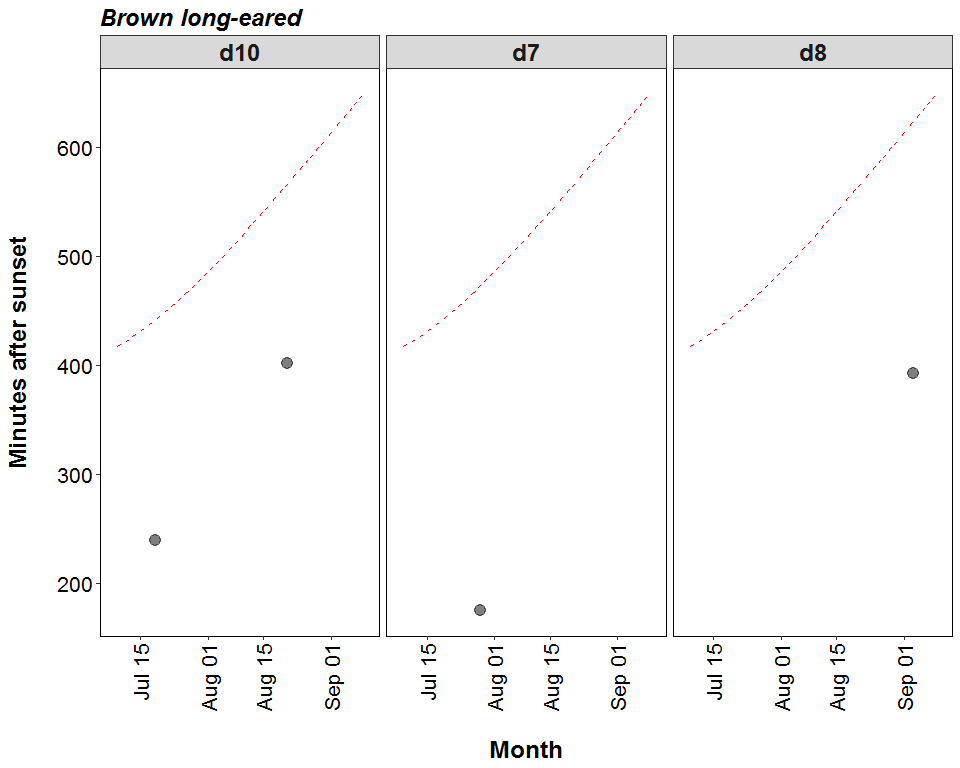
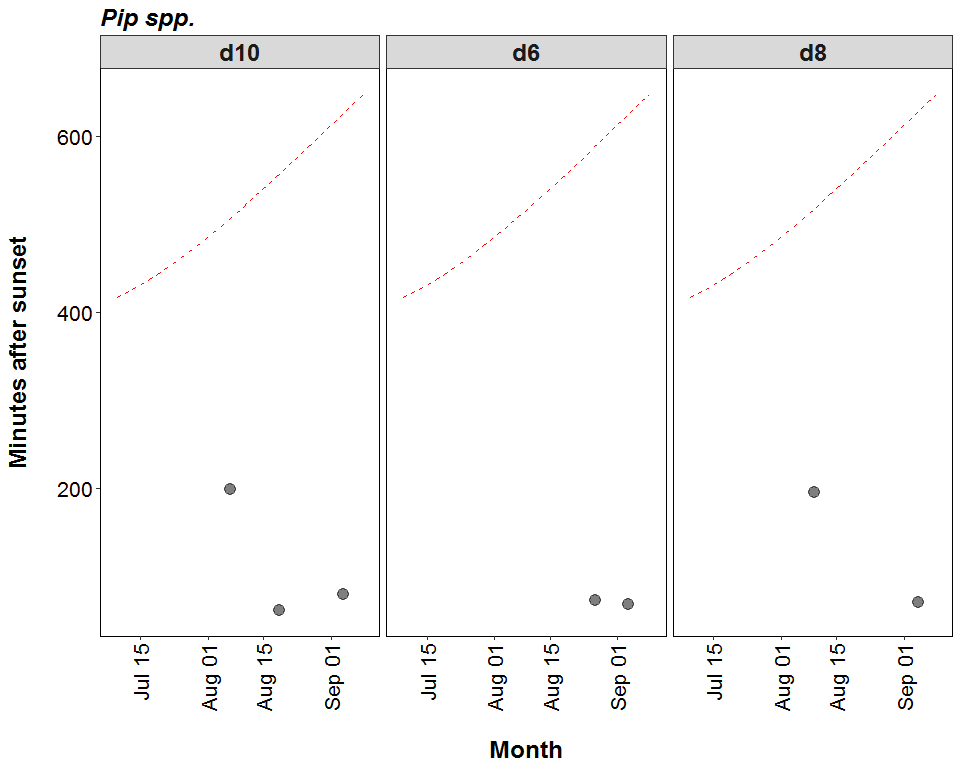
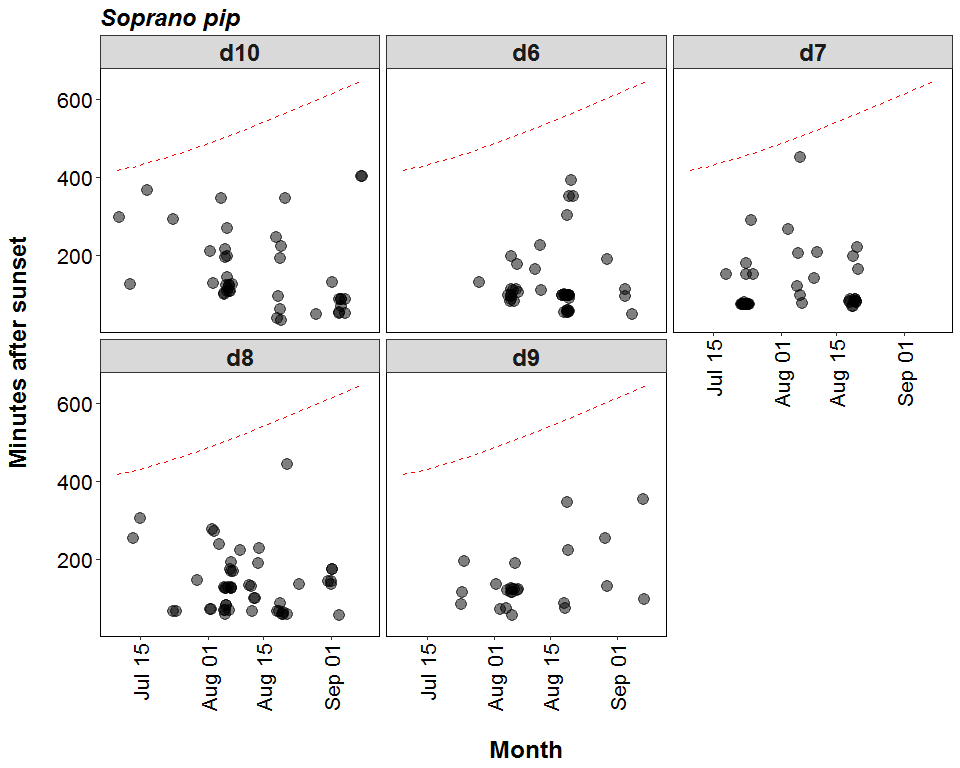
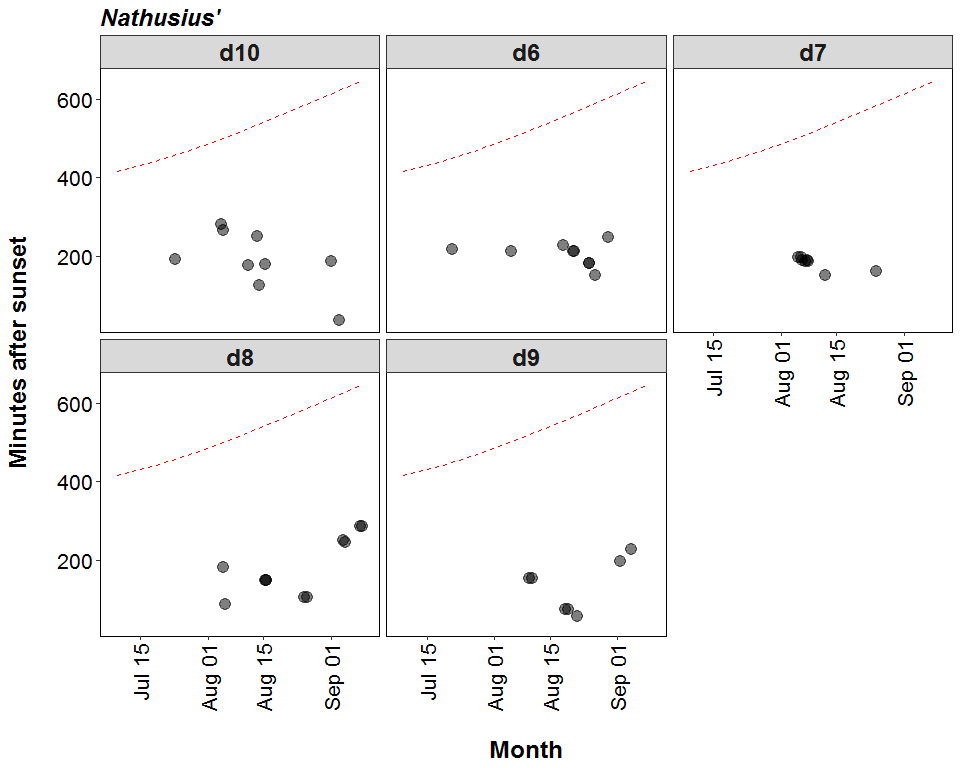
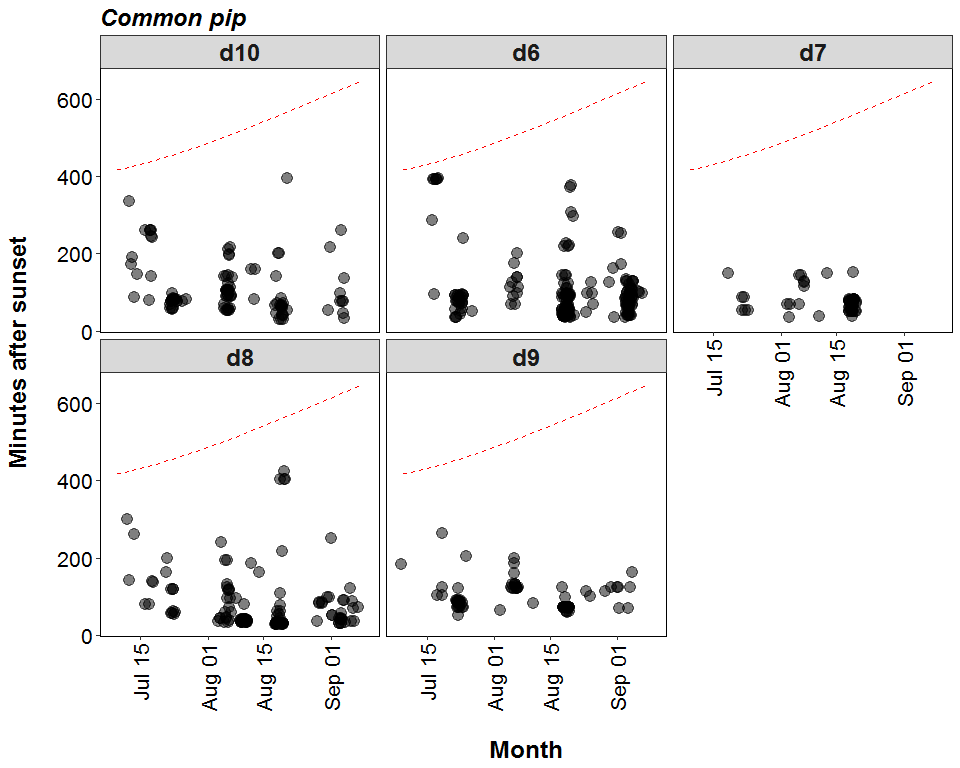
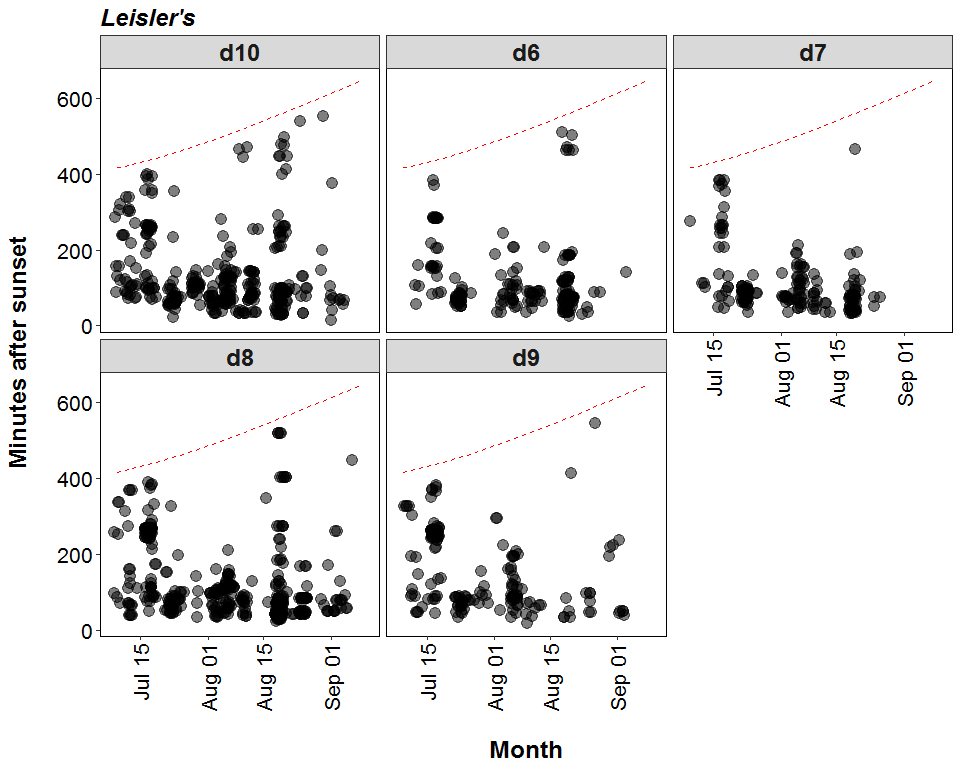
|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Species | Detector ID | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Brown long-eared | d10 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| Brown long-eared | d7 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brown long-eared | d8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Common pip | d10 | 1 | 53 | 26 | 8 | 10 | 0 | 1 | 1 | 0 | 0 |
| Common pip | d6 | 0 | 118 | 55 | 4 | 7 | 3 | 2 | 6 | 0 | 0 |
| Common pip | d7 | 0 | 41 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Common pip | d8 | 10 | 101 | 18 | 6 | 4 | 1 | 0 | 4 | 0 | 0 |
| Common pip | d9 | 0 | 42 | 26 | 6 | 1 | 0 | 0 | 0 | 0 | 0 |
| Leisler’s | d10 | 6 | 160 | 107 | 16 | 39 | 9 | 8 | 9 | 5 | 2 |
| Leisler’s | d6 | 2 | 111 | 36 | 25 | 2 | 9 | 2 | 0 | 5 | 1 |
| Leisler’s | d7 | 0 | 111 | 50 | 12 | 8 | 3 | 6 | 0 | 1 | 0 |
| Leisler’s | d8 | 6 | 209 | 73 | 18 | 40 | 12 | 10 | 8 | 0 | 4 |
| Leisler’s | d9 | 1 | 76 | 22 | 13 | 41 | 10 | 6 | 1 | 0 | 1 |
| Myotis spp. | d10 | 0 | 0 | 0 | 1 | 3 | 1 | 0 | 1 | 0 | 0 |
| Myotis spp. | d7 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| Myotis spp. | d8 | 0 | 0 | 0 | 2 | 2 | 1 | 3 | 0 | 0 | 0 |
| Myotis spp. | d9 | 0 | 0 | 1 | 0 | 2 | 3 | 1 | 0 | 0 | 0 |
| Nathusius’ | d10 | 0 | 1 | 1 | 4 | 2 | 1 | 0 | 0 | 0 | 0 |
| Nathusius’ | d6 | 0 | 0 | 1 | 2 | 6 | 0 | 0 | 0 | 0 | 0 |
| Nathusius’ | d7 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nathusius’ | d8 | 0 | 1 | 5 | 1 | 2 | 2 | 0 | 0 | 0 | 0 |
| Nathusius’ | d9 | 0 | 3 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 |
| Pip spp. | d10 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pip spp. | d6 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pip spp. | d8 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Soprano pip | d10 | 0 | 12 | 15 | 3 | 5 | 2 | 3 | 2 | 0 | 0 |
| Soprano pip | d6 | 0 | 11 | 21 | 4 | 1 | 1 | 2 | 1 | 0 | 0 |
| Soprano pip | d7 | 0 | 27 | 3 | 8 | 2 | 1 | 0 | 0 | 1 | 0 |
| Soprano pip | d8 | 0 | 19 | 16 | 7 | 4 | 3 | 0 | 1 | 0 | 0 |
| Soprano pip | d9 | 0 | 6 | 12 | 2 | 2 | 0 | 2 | 0 | 0 | 0 |

# Nightly Bat Activity

## Per Detector

**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.**





# Roost Emergence Time and Bat Observation

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

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

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

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Species | Detector ID | 2018-08-19 | 2018-09-01 | 2018-09-04 |
| Common pip | d10 | 3 | 0 | 0 |
| Common pip | d8 | 27 | 0 | 4 |
| Leisler’s | d10 | 0 | 1 | 0 |

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

Figures show 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 may potentially indicate the presence of a nearby roost.

