

VOLUME 4: APPENDIX V1-7.5: BAT TECHNICAL REPORT

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REPORT

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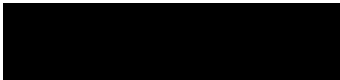
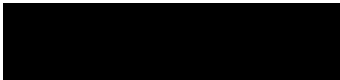
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Contents

| | | |
|----------|--|-----------|
| 1 | INTRODUCTION | 2 |
| 1.1 | Background | 2 |
| 2 | METHODOLOGY | 3 |
| 2.1 | Desk Study | 3 |
| 2.2 | 2022 Static Detector Surveys..... | 3 |
| 2.3 | Habitat Suitability Assessment..... | 6 |
| 2.3.2 | Data Analysis | 7 |
| | Weather Data | 8 |
| | Bat Activity Indices | 8 |
| 2.4 | Limitations | 8 |
| 2.4.1 | Surveys | 8 |
| | Accurate Lifespan of Ecological Data | 9 |
| 3 | RESULTS | 10 |
| 3.1 | Desk Study | 10 |
| 3.2 | Automated Detector Surveys: Overall Activity Levels..... | 12 |
| 3.3 | Automated Detector Surveys: Species Composition | 13 |
| 4 | CONCLUSION | 16 |
| | REFERENCES | 17 |

Tables

| | |
|--|----|
| Table 2-1: Location of Static Detectors | 4 |
| Table 2-2: Bat Habitat Suitability Criteria..... | 6 |
| Table 2-3: Bat Species and their Call Frequency Parameters | 7 |
| Table 2-4: Relative Bat Activity within the Site | 8 |
| Table 3-1: Known Bat Records..... | 10 |
| Table 3-2: Bat Activity Survey Completed for Developments Surrounding the Proposed Development and Their Key Results..... | 10 |
| Table 3-3: Static Detector Results: Bat Activity Levels | 12 |
| Table 4-1: Weather Conditions During Automated Detector Surveys 2022..... | 19 |

Figures (see Volume 2 of the EIA Report)

Figure V1-7-5: Static Bat Detector Locations

Annexes

Annex A Weather data

1 INTRODUCTION

1.1 Background

- 1.1.1 RPS Consulting Services Ltd. (RPS) was commissioned by ASH Design + Assessment Ltd (ASH) to undertake an assessment of the potential impacts of construction and operation of the Proposed Development (as part of the wider Connagill Cluster Grid Connections project) to bat species in the area.
- 1.1.2 To complete this assessment consideration was given to the use of the area by bat species. This includes:
- Consideration and review of data collected for the surrounding wind farm developments in the wider landscape including the Strathy South, Strathy North, Armadale¹, Kirkton, Strathy Wood, and Melvich Wind Farms.
 - A review of the suitability of the habitats along the length of the Proposed Development (and wider Connagill Cluster Grid Connection developments) to provide suitable foraging, commuting and roosting habitat for bat species.
 - Bat activity surveys of the Proposed Development (as part of the wider Connagill Cluster Grid Connections) to provide additional information surrounding the use of the area by bat species.
- 1.1.3 The aim of this Appendix is to summarise the above works allowing an assessment of the potential effects from construction and operation of the Proposed Development on the use of the landscape by bat species.

¹ The proposed Armadale Wind Farm was originally included as part of the Connagill Cluster Grid Connections. However, in May 2024 the developer of the proposed Armadale Wind Farm withdrew the section 36 application and consequently no longer require a grid connection. As such, this project has been removed from the Connagill Cluster Grid Connections. Nevertheless, the survey data collected for this development is potentially relevant to the desk study for the Proposed Development and therefore has been included within this Technical Appendix.

2 METHODOLOGY




2.1 Desk Study

- 2.1.1 A desk study was undertaken in 2019 to support the (now consented) Strathy South Wind Farm development. Data obtained from this search is referenced within this Appendix where appropriate. The following groups were approached for data in 2019:
- Highland Biological Recording Group (HBRG) were contacted for records for all bat species within a 10 km buffer of the Strathy South Wind Farm development site.
 - The Bat Conservation Trust were approached to obtain contact details of any local bat groups, but north Highland is under-recorded for bat data and no bat groups cover this area.
- 2.1.2 Further to the above local record centre information, the Strathy North, Strathy South, Armadale, Kirkton and Melvich wind farm development planning applications were reviewed with regards to the bat surveys completed and the species and number of bats recorded during these assessments. This information provides a comprehensive overview of bat activity across the wider landscape. Due to the number of surveys undertaken in the area for neighbouring developments and the otherwise remote location, it was considered that an update records request was not required as it would be unlikely to add any additional information over and above that collected for the neighbouring developments.




2.2 2022 Static Detector Surveys



- 2.2.1 Activity surveys were completed in 2022 across the Proposed Development and more widely across the Connagill Cluster Grid Connections. Surveys were completed through the peak bat activity season (August to October) to cover the key activity period of dispersal and mating. Static bat detectors were deployed in eight locations for a minimum of ten consecutive nights during two deployments:
- 24 August 2022 to 07 September 2022
 - 15 September 2022 to 04 October 2022
- 2.2.2 Anabat Swift bat detectors recording in full spectrum to SD cards were used for the static monitoring. Omnidirectional microphones were used on all detectors, and each unit was placed at least 1 m above the ground. They were programmed to begin recording an hour before sunset and end one hour after sunrise. Standard guidance recommends recording within 30 minutes of sunset and sunrise; however, extending this to 1 hour of sunrise and sunset allows for the assessment of any early emerging species on the survey site.
- 2.2.3 The survey locations were selected to cover a representative sample of the different habitats present across the site. The locations of the static detectors are shown in **Volume 2: Figure V1-7.5** within Volume 2 of the EIA Report with the habitats at each location shown in **Table 2-1** below.

Table 2-1: Location of Static Detectors

| Static Detector Number | Grid Reference | Habitat | Photo | Proximity to Proposed Development |
|------------------------|----------------|--|--|-----------------------------------|
| 1 | NC82874 56595 | Located on the south-west of the site on a hill slope along the edge of immature plantation Sitka spruce. |  <p>Photo 01. Static detector 1 location</p> | 4.3 km south |
| 2 | NC82749 58547 | Located in open blanket bog habitat. |  <p>Photo 02. Static detector 2 location</p> | 2.3 km south |
| 3 | NC82917 60088 | Located in open wet heath / bracken habitat on the opposite side of the track from Uidh nan Con Luatha Burn. |  <p>Photo 03. Static detector 3 location</p> | c. 200 m south |

REPORT

| Static Detector Number | Grid Reference | Habitat | Photo | Proximity to Proposed Development |
|------------------------|----------------|---|--|---|
| 4 | NC83183 61312 | Located in open wet heath habitat. |  <p>Photo 04. Static detector 4 location</p> | Within OHL LoD |
| 5 | NC84689 62688 | Located in open blanket bog habitat adjacent to a peat extraction site. |  <p>Photo 05. Static detector 5 location</p> | Within LoD for Access Track close to Tower 32 |
| 6 | NC87246 62889 | Located in open blanket bog habitat adjacent to a peat extraction site. |  <p>Photo 06. Static detector 6 location</p> | Within OHL LoD close to Tower 43 |

| Static Detector Number | Grid Reference | Habitat | Photo | Proximity to Proposed Development |
|------------------------|----------------|--|---|---|
| 7 | NC88607 60822 | Located adjacent to immature broadleaved woodland and Allt na h-Eaglaise Burn. |  <p>Photo 07. Static detector 7 location</p> | Within OHL LoD between Towers 53 and 54 |
| 8 | NC90101 59778 | Located on the east of the site beside a small lochan and marshy grassland. |  <p>Photo 08. Static detector 8 location</p> | >100 m north-east of OHL LoD |

2.3 Habitat Suitability Assessment

- 2.3.1 The potential value of the habitats and features present for foraging and commuting bats across the Proposed Development was assessed, using the criteria from the guidance at the time (Collins, 2016)², which are summarised in **Table 2.2** below. Areas of potential roosting habitat were also identified and where possible assessed for their suitability.

Table 2-2: Bat Habitat Suitability Criteria

| Suitability | Description of Roosting Habitat | Foraging and Commuting Habitat |
|-------------|---|---|
| Negligible | Negligible habitat features on site not likely to be used by roosting bats. | Negligible habitat features on site not likely to be used by commuting or foraging bats. |
| Low | A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). | Habitat that could be used by small numbers of commuting bats such as gappy hedgerow or un-vegetated streams, 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. |

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

| Suitability | Description of Roosting Habitat | Foraging and Commuting Habitat |
|-------------|--|---|
| Moderate | A structure or tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential. | 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 could be used by bats due to its size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed). | Continuous, 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. Site close to and connected to known roosts. |

2.3.2 Data Analysis

- 2.3.1 All recordings from the static detectors were analysed with specialised software (Kaleidoscope Pro, Version 5.4.8) to confirm bat species present. All calls were automatically identified to species by the Kaleidoscope Pro software which compares the echolocation pulses to an integrated library of bat calls. Following this batch analysis, 10% of all *Pipistrelle* spp. calls and noise files were manually checked. All calls of *Myotis* spp., *Nyctalus* spp. and calls with no auto-identification or with multiple bats within the same call were checked manually to confirm identification.
- 2.3.2 During manual analysis, calls were assigned to species according to their key parameters and where relevant call frequency as shown in **Table 2-3** below (Russ, 2021).

Table 2-3: Bat Species and their Call Frequency Parameters

| Species | Latin Name | Call Frequency |
|--------------------------|------------------------------|--|
| Soprano pipistrelle | <i>Pipistrellus pygmaeus</i> | FM/qCF calls above 52 kHz |
| <i>Pipistrellus</i> spp. | - | FM/qCF calls between 40 and 42 kHz; and, 48 and 52 kHz |
| Common pipistrelle | <i>Pipistrellus</i> | FM/qCF calls between 40 kHz and 48 kHz |
| Nathusius' pipistrelle | <i>Pipistrellus nathusii</i> | FM/qCF calls below 40 kHz |
| Natterer's bat | <i>Myotis nattereri</i> | FM call with wide range between 23 and 107 kHz |
| Daubenton's bat | <i>Myotis daubentonii</i> | FM call with wide range between 30 and 81 kHz |
| <i>Myotis</i> spp. | - | FM calls greater than 30 kHz |
| Brown long-eared bat | <i>Plecotus auritus</i> | FM calls greater than 30 kHz with two harmonics |
| Noctule | <i>Nyctalus noctula</i> | FM/qCF calls below 23 kHz |
| Leisler's bat | <i>Nyctalus leisleri</i> | qCF calls between 23 and 28 kHz |
| <i>Nyctalus</i> spp. | - | Low (less than 30 kHz) qCF or FM calls |

FM – Frequency Modulated call; CF – Constant Frequency call; qCF – quasi-Constant Frequency call. Bats combine variation within their echolocation pulses to create different call 'shapes'. These call shapes can be described in terms of the degree of FM, CF and qCF components they contain.

- 2.3.3 Not all calls could be positively assigned to species. Call frequencies and shapes can be shared by bat species within the same genus and can change according to the habitat they are flying in, i.e. open areas with no trees or structures such as moorlands, or cluttered environments which contain trees, areas of scrub or linear features such as burns and plantation / woodland edge. Bats adapt their call patterns within their habitats to enable prey detection and navigation and as such, the recordings may differ in parameters. For example, both Leisler's bat and Noctules can echolocate at the same frequency and with the same call shape and therefore, where not possible to distinguish species, they have been assigned to the *Nyctalus* spp. category and not identified to species level. Similarly, a bat was classified as *Myotis* spp. if differences in call shape and frequency between Daubenton's bats and Natterer's bats (most likely *Myotis* spp. bat to be found in the area) could not be discerned.

Weather Data

- 2.3.4 The weather data (temperature, wind speed and rainfall) was collected by the Met Office from the Altnaharra No.2 weather station at NC 56956 35860 (www.metoffice.gov.uk).
- 2.3.5 The weather data is displayed in **Table 4-1, Annex A**. Nights where weather conditions were deemed suboptimal including high rainfall, windspeed over 5 m/s and nights under 8°C, are highlighted in grey.

Bat Activity Indices

- 2.3.6 Static detectors record bats as they pass but there is no observer to record whether one bat passes a hundred times, or a hundred bats pass in succession, or the direction of flight. Therefore, to standardise the data and enable some comparison of deployment nights, the accepted approach is to use bat 'passes' as a unit of activity.
- 2.3.7 Numbers of bat 'passes' recorded are used as the standard measure to create a relative index of bat activity. A bat 'pass' was defined as a series of ≥ 2 consecutive echolocation calls having <1 second separating each call, and up to 10 seconds long (Hayes, 1997; Cook *et al.*, 2008).
- 2.3.8 For automated detector data, the index of bat activity used was the number of files recorded each night which contained bat calls, taken as the number of bat passes per night (bppn). As one file has been taken to equating to one bat pass, an average nightly activity index was calculated for each detector deployment. The Bat Activity Index (BAI) also removes any bias created by the variation in the duration of the static detector deployment periods.
- 2.3.9 The relative bat activity within the site has been defined as shown in **Table 2-4**. The BAI levels (number of bat passes per night) has been derived by professional opinion as high, moderate or low and allows a comparison of the results within the site and gives a descriptive parameter for the data generated.

Table 2-4: Relative Bat Activity within the Site

| BAI (bppn) | Bat Activity Level |
|----------------|--------------------|
| 10.1 and above | High |
| 5.1 to 10.0 | Moderate |
| 0 to 5.0 | Low |

2.4 Limitations

2.4.1 Surveys

- 2.4.1 No surveys were completed during part of the main bat activity season (May to July) which cover the spring migration and maternity periods. To compensate for this, a greater number of detectors than required by guidance were placed throughout the site to fully capture the use of the site by bats during the key activity period of dispersal and mating. This is determined to be the period of greatest activity and when peak numbers of bats would be present across the site; therefore, the period of potentially greatest impact from any development.
- 2.4.2 The static detector at Location 4 was deployed for 14 nights in deployment 1 and 18 nights in deployment 2. During this time, the detector failed to record any bat calls, only noise, and therefore it is thought the detector at this location failed. This detector was the closest to one of the historic roosts identified during previous surveys (roost at Bowside), and therefore it is possible that activity associated with the roost has been under recorded.
- 2.4.3 Sixteen of the thirty-five deployment dates were noted to have suboptimal weather conditions for bat surveys (high rainfall, windspeed over 5m/s and nights under 8°C). However, bat activity was

captured on the detectors on all but five of the deployment dates (07, 15 and 16 September, 03 and 04 October 2022) and therefore the weather conditions are not thought to have affected the robustness of the data collected.

- 2.4.4 Given the coverage of the site and the data collected is it deemed that these limitations will not have a detrimental effect on the assessment of the site, or the conclusions drawn from the data.

Accurate Lifespan of Ecological Data

- 2.4.5 The majority of ecological data remain valid for only short periods due to the inherently transient nature of the subject. Under current CIEEM guidance survey results and associated assessments are usually considered valid for two years, assuming no significant changes to the site conditions. It was agreed with NatureScot that the surveys are sufficient to inform the ecological impact assessment for the Proposed Development, particularly given the large amount of ecology baseline data that has been recorded for the existing, consented and proposed wind farms within the Connagill Cluster around the Proposed Development.

3 RESULTS

3.1 Desk Study

- 3.1.1 The table below shows the bat records received from HBRG when a data search was conducted in 2019 within 10 km of the (now consented) Strathy South Wind Farm Development site boundary (which overlaps the Proposed Development). The search returned only one record of common pipistrelle bat. Further records of roosts from surveys to support wind farm developments within the vicinity of the Proposed Development included two small common pipistrelle roosts. One was a small roost of three bats identified at Braerathy Lodge c. 4 km to the south of the Proposed Development in 2011 in relation to the planning application for the (now consented) Strathy Wood Wind Farm development*. The other was located approximately 12 km south of the Proposed Development in Croft House and was recorded in 2019 in association with the (now consented) Strathy South Wind Farm development**.

Table 3-1: Known Bat Records

| Species | Record Type | Date of Record | Distance and Direction from the Proposed Development | Grid Reference |
|--------------------|-------------|----------------|--|----------------|
| Common pipistrelle | Sighting | 15 June 2006 | 800m south-west | NC 82 60 |
| Common pipistrelle | Roost | 2011* | Braerathy Lodge c. 4 km south | NC 82308 56159 |
| Common pipistrelle | Roost | 2019** | Croft House c. 12 km south | NC 792 488 |

*Strathy Wood 2019 Environmental Impact Assessment Report (EIAR), Section A8.4.1

** RPS (2019) Bat Survey Report Technical Appendix Addendum 9.2

- 3.1.2 Further to the above, **Table 3-2** summarises the surveys completed for the surrounding wind farm development planning applications and the key findings of these surveys.

Table 3-2: Bat Activity Survey Completed for Developments Surrounding the Proposed Development and Their Key Results

| Development | Date of Surveys | Scope of Surveys | Summary of Results |
|------------------------|------------------|-------------------------------|--|
| Kirkton Energy Park | 2020 | Habitat assessment | Predominantly upland habitats. Few landscape features. |
| | May- August 2021 | Static detectors | Only common pipistrelle activity was recorded, with a peak of 33 passes recorded at one location, equivalent to 0.21 bat passes per hour. |
| Melvich Energy Hub | 2022 | Habitat assessment | Limited roost potential. Watercourses provided best bat habitat. |
| | 2022 | Static detectors | Common pipistrelle and a single soprano pipistrelle recorded. ~1 bat pass per hour recorded overall. |
| Strathy Wood Wind Farm | 2011 and 2012 | Habitat and Roost assessments | Braerathy Lodge the only building identified. No trees with bat roost potential identified. Habitats dominated by open habitats with areas of plantation woodland present. |
| | August 2011 | Emergence survey | A small number of common pipistrelle bats considered to be roosting in Braerathy Lodge. On emerging bats commuted towards River Strathy. |

| Development | Date of Surveys | Scope of Surveys | Summary of Results |
|-------------------------|-------------------------------------|----------------------------------|---|
| | August 2011 and May and August 2012 | Transects | Four common pipistrelle passes in 2011. A single pass recorded in 2012. |
| | 2011 and 2012 | Static detectors | Common pipistrelle, soprano pipistrelle, Pipistrellus sp. Myotis sp. and Chiroptera sp. Common and soprano activity accounted for 98% of activity. Two Myotis species passes recorded along with seven passes where species could not be determined. Highest levels of activity were recorded near to Braerathy Lodge, with an average of 4.5 passes per hour. Activity elsewhere was very low with less than one pass per hour recorded. |
| Armadale Wind Farm | April - October 2019 | Static detectors | A total of 133 bat passes were recorded, equating to a bat activity index of 0.025 passes per hour. 96.24% of activity was of common pipistrelle bats and 3.76% was soprano pipistrelle bats. |
| Strathy North Wind Farm | April-August 2016 | Roost searches Radio-tracking | 11 confirmed common pipistrelle roosts. No roosts considered to be maternity roosts. Roosts in proximity to the Proposed Development were located at: <ul style="list-style-type: none"> • Bowside Lodge (NGR: NC 829 610) • Dallangwell Cottage (NGR: NC 825 598) • Stock Shed (NGR: NC 830 859) • With other roosts recorded further away at Dyke (NGR: NC 870 503) Bats found to forage up and down the River Strathy and adjacent forest edge. Mean foraging range was 1.2km and maximum was 7.4km. One potential Daubenton's bat roost in a disused building at Dyke. A potential brown-long eared bat roost was recorded during a daytime inspection in a dilapidated building at Dyke but no further evidence of the species was recorded during any of the further surveys. |
| | July 2016 | Transects | 1-2 bat passes per survey. All but 1 pass recorded were of common pipistrelle. A single Daubenton's bat pass was recorded on the River Strathy near Bowside. |
| | July-August 2016 | Static detectors | Common pipistrelle activity: Highest levels of activity recorded at Braerathy Lodge (502 passes). 120 passes recorded adjacent to River Strathy (Bowside), 127 River Strathy (Strathy road bridge) and 6 passes |

| Development | Date of Surveys | Scope of Surveys | Summary of Results |
|-------------|-----------------|------------------|---|
| | | | River Strathy (Dallangwell Bridge), with low numbers recorded at other locations. |
| | | | Daubenton's bat activity: Recorded in two locations Strathy road bridge and Dallangwell Bridge. Five passes recorded in total |

3.2 Automated Detector Surveys: Overall Activity Levels

- 3.2.1 Of the surveys undertaken in 2022 across the Proposed Development, a total of 179 survey nights were undertaken with a total of 539 files with bat passes collected. Three species of bats were recorded: common pipistrelle, soprano pipistrelle and *Myotis* spp. bats.
- 3.2.2 **Table 3-3** provides the total number of bat passes at each location during each deployment. In addition, it lists the Bat Activity Index (number of bat passes per night whilst detectors were operational) and presents the relative bat activity within the site giving a comparison of bat activity levels between the eight locations.

Table 3-3: Static Detector Results: Bat Activity Levels

| Location | Dates Deployed | | Nights Deployed | Nights Operative (%) | Nights Bats Recorded (Activity Period) | Files with Bat Activity Recorded | BAI Over Total Deployment Period (bppn*) | Relative Bat Activity within the Site*** |
|--------------|----------------|----------|-----------------|----------------------|--|----------------------------------|--|--|
| Deployment 1 | | | | | | | | |
| 1 | 24.08.22 | 07.09.22 | 14 | 100 | 14 | 209 | 14.93 | High |
| 2 | 24.08.22 | 07.09.22 | 14 | 29 | 4 | 4 | 1.00 | Low |
| 3 | 24.08.22 | 07.09.22 | 14 | 100 | 14 | 40 | 2.86 | Low |
| 4 | 24.08.22 | 07.09.22 | 14 | 21 | 0** | 0 | N/A | N/A |
| 5 | 24.08.22 | 07.09.22 | 14 | 50 | 7 | 7 | 1.00 | Low |
| 6 | 25.08.22 | 06.09.22 | 12 | 92 | 11 | 18 | 1.64 | Low |
| 7 | 25.08.22 | 06.09.22 | 12 | 67 | 8 | 15 | 1.88 | Low |
| 8 | 25.08.22 | 07.09.22 | 13 | 92 | 12 | 56 | 4.67 | Low |
| Deployment 2 | | | | | | | | |
| 1 | 15.09.22 | 03.10.22 | 18 | 89 | 16 | 38 | 2.38 | Low |
| 2 | 15.09.22 | 03.10.22 | 18 | 83 | 15 | 9 | 0.60 | Low |
| 3 | 15.09.22 | 03.10.22 | 18 | 100 | 18 | 18 | 1.00 | Low |
| 4 | 15.09.22 | 03.10.22 | 18 | 33 | 0** | 0 | N/A | N/A |
| 5 | 15.09.22 | 03.10.22 | 18 | 72 | 13 | 1 | 0.08 | Low |
| 6 | 16.09.22 | 04.10.22 | 18 | 61 | 11 | 1 | 0.09 | Low |
| 7 | 16.09.22 | 04.10.22 | 18 | 50 | 9 | 4 | 0.44 | Low |
| 8 | 16.09.22 | 04.10.22 | 18 | 100 | 18 | 119 | 6.61 | Moderate |

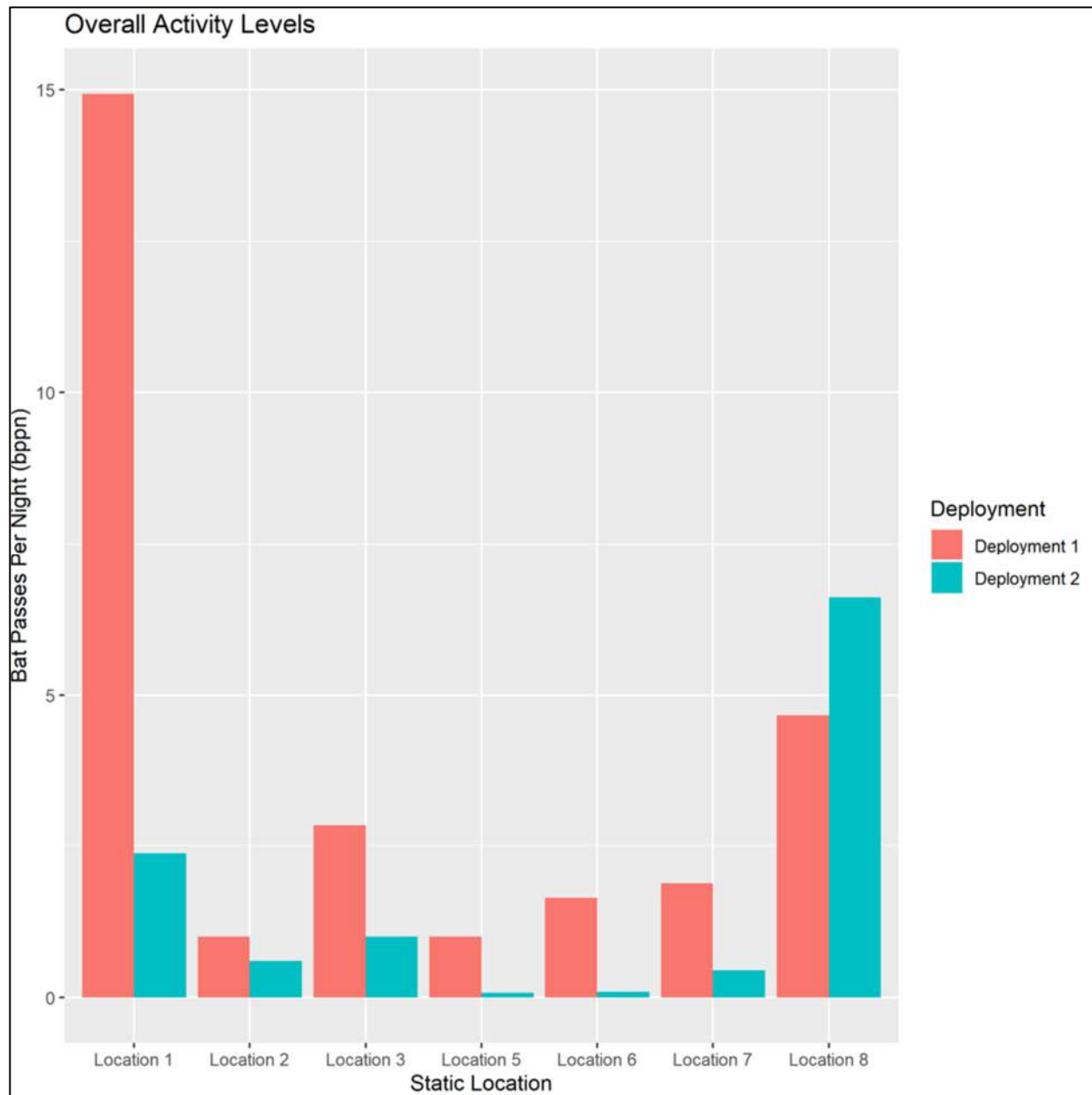
Note:

* bppn = bat passes per night

**The detector at Location 4 is thought to have failed during both deployments as only noise files were recorded.

***The relative bat activity within the site is derived from **Table 2-4** from professional opinion and allows a comparison of the bat activity within the site only and between each of the eight locations.

- 3.2.3 **Graph 1** gives a general overview of the differences in activity levels across the two deployments.
- 3.2.4 During deployment 1 bats were recorded at all of the active static detector locations (the detector at Location 4 suffered equipment failure). Location 1 experienced the highest activity levels with 14.93 bppn. All other active static detector locations experienced low activity levels. Deployment 1 exhibited the highest activity levels of the two deployment periods.



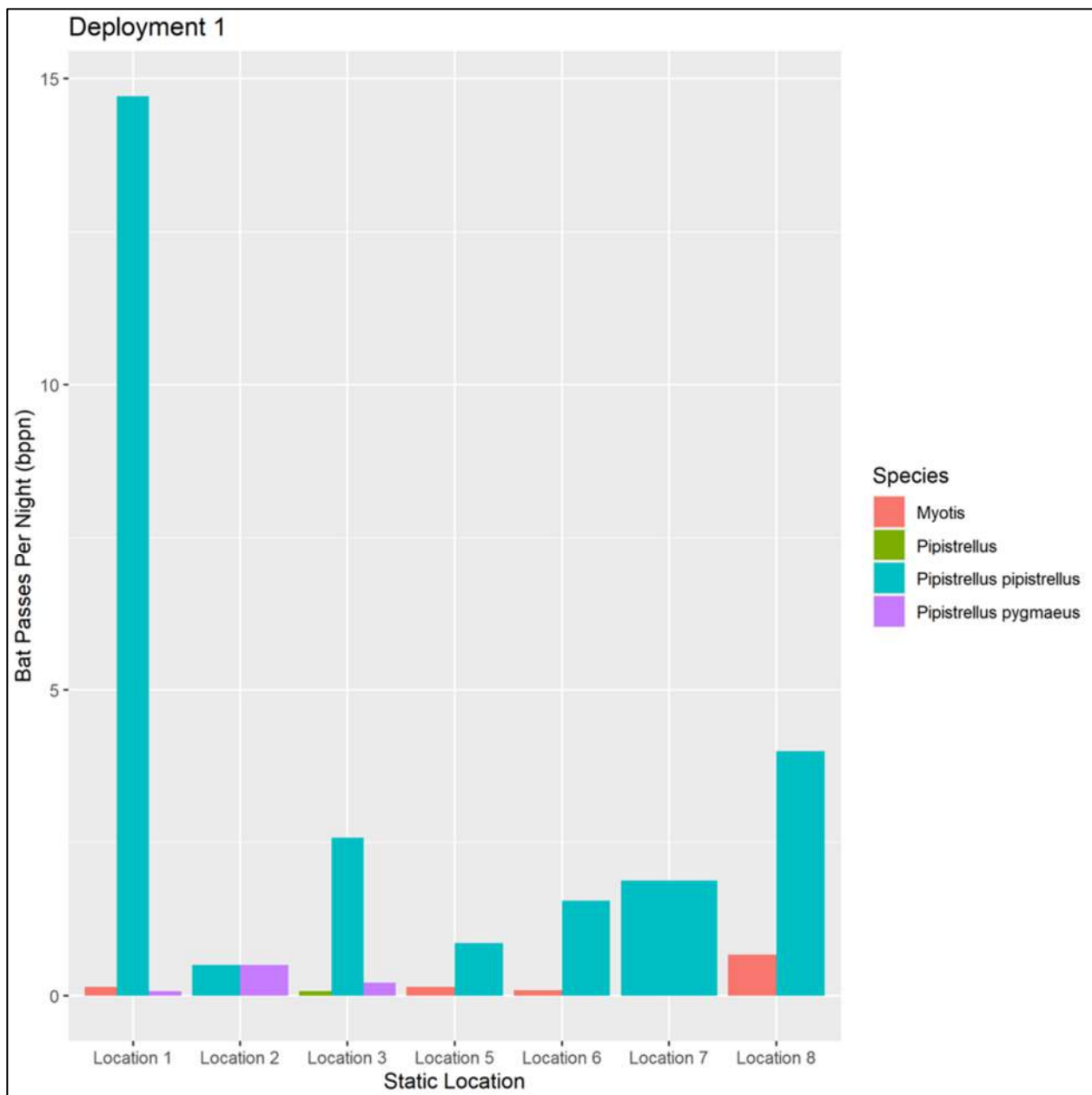
Graph 1: Summary of bat activity at each detector location through the two deployment periods.

- 3.2.5 During deployment 2, bats were recorded at all of the active static detector locations (the detector at Location 4 suffered equipment failure). Location 8 experienced the highest activity levels with 6.61 bppn. All other active static detector locations recorded low activity levels.

3.3 Automated Detector Surveys: Species Composition

- 3.3.1 **Graph 2** below illustrates the activity level for each species during deployment 1.
- 3.3.2 Of the species recorded:

- common pipistrelles were recorded at all active detector locations with the highest activity of 14.71 bbpn at location 1;
- soprano pipistrelles were recorded at Locations 1, 2 and 3 only and at low levels;
- Pipistrellus genus bats were recorded at Location 3 only at a low level; and
- Myotis genus bats were recorded at Locations 1, 5, 6 and 8 at low levels.

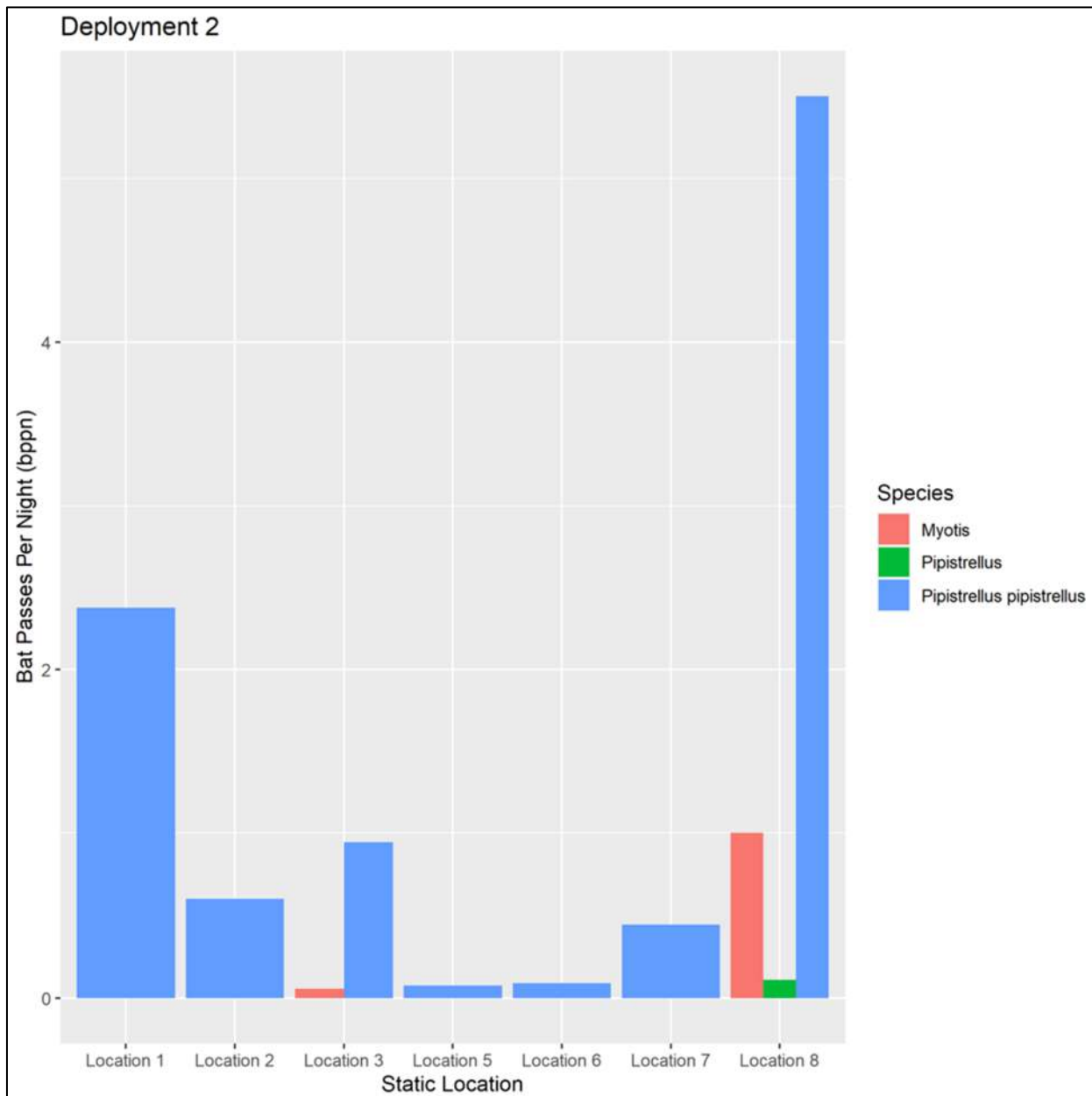


Graph 2: The activity levels for individual bat species during deployment 1.

3.3.3 **Graph 3** below illustrates the activity level for each species during deployment 2.

3.3.4 Of the species recorded:

- common pipistrelles were recorded at all active detector locations with the highest activity of 5.5 bbpn at Location 8;
- Pipistrellus genus bats were recorded at Location 8 only at a low level; and
- Myotis genus bats were recorded at Locations 3 and 8 at low levels.

Graph 3: The activity levels for individual bat species during deployment 2.

4 CONCLUSION

- 4.1.1 Bat activity surveys for wind farm developments in the area surrounding the Proposed Development found bat activity levels to be low throughout the survey season. The majority of activity recorded was of common pipistrelle, with low numbers of soprano pipistrelle also recorded. Very low levels of *Myotis* species activity has also been recorded historically (2016, 2011 and 2012). The River Strathy has been identified as the main foraging and commuting route used by the local bat population.
- 4.1.2 The automated detector surveys undertaken throughout the key autumn bat activity period in 2022 identified the presence of three species of bats: common pipistrelle, soprano pipistrelle and *Myotis* spp. bats.
- 4.1.3 Key results of the study in general are:
- common pipistrelles were recorded at every location during both deployments but mostly at low levels, with the exception of Location 1 in deployment 1 which had higher activity relative to the other locations within the site;
 - Pipistrellus spp. and soprano pipistrelle bats were recorded at low levels at 4 locations in deployment 1 and only 1 location in deployment 2; and
 - *Myotis* species bats were recorded at generally low activity levels at 4 locations in deployment 1 and 2 locations in deployment 2.
- 4.1.4 It is considered that Location 1 exhibited higher levels of bat activity relative to the other locations as the detector was placed along a tree-line which provides an attractive commuting and foraging opportunity for bats. Braerathy Lodge was located 700 m to the south-west of Location 1, and this has been previously identified as an active bat roost; however, this building has since been demolished.
- 4.1.5 According to the results of the automated detector surveys and in consideration of other survey data collected in the area it is considered that the overall level of bat activity at the site is low.

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ANNEXES

Weather data

Table 4-1: Weather Conditions During Automated Detector Surveys 2022

| Date | Weather conditions | | |
|------------|--------------------------|---------------------------------|------------------------------|
| | Temperature at dusk (°C) | Average hourly wind speed (mph) | Average hourly rainfall (mm) |
| 24.08.2022 | 15.1 | 5.88 | 0.02 |
| 25.08.2022 | 12.2 | 7.71 | 0 |
| 26.08.2022 | 7.8 | 7.38 | 0 |
| 27.08.2022 | 12.2 | 3.25 | 0 |
| 28.08.2022 | 14 | 2.13 | 0.08 |
| 29.08.2022 | 14.1 | 3.54 | 0 |
| 30.08.2022 | 11.7 | 5.79 | 0 |
| 31.08.2022 | 8.6 | 3.45 | 0 |
| 01.09.2022 | 11.5 | 2.96 | 0.01 |
| 02.09.2022 | 13.9 | 8.88 | 0 |
| 03.09.2022 | 15.8 | 17.63 | 0 |
| 04.09.2022 | 16.4 | 16.38 | 0.17 |
| 05.09.2022 | 16.1 | 15.21 | 0.10 |
| 06.09.2022 | 15.9 | 13.50 | 0.19 |
| 07.09.2022 | 14.9 | 11.54 | 0.4 |
| 15.09.2022 | 8.4 | 9.54 | 0.28 |
| 16.09.2022 | 8.5 | 10.63 | 0.14 |
| 17.09.2022 | 8.4 | 7.38 | 0.08 |
| 18.09.2022 | 8.8 | 3.71 | 0.28 |
| 19.09.2022 | 12.9 | 2.79 | 0 |
| 20.09.2022 | 14.6 | 7.46 | 0.02 |
| 21.09.2022 | 14.8 | 7.79 | 0.06 |
| 22.09.2022 | 11.2 | 7.17 | 0.02 |
| 23.09.2022 | 6.5 | 6.46 | 0.13 |
| 24.09.2022 | 9.3 | 5.58 | 0.02 |
| 25.09.2022 | 10 | 14.08 | 0.17 |
| 26.09.2022 | 6.4 | 18.04 | 0.30 |
| 27.09.2022 | 6.9 | 12.96 | 0.63 |
| 28.09.2022 | 9.9 | 5.50 | 0.18 |
| 29.09.2022 | 10.6 | 3.71 | 0 |
| 30.09.2022 | 9.8 | 18.67 | 0.78 |
| 01.10.2022 | 10.6 | 9.58 | 0.31 |
| 02.10.2022 | 13.4 | 13.50 | 0.03 |
| 03.10.2022 | 14.2 | 10.00 | 0.06 |
| 04.10.2022 | 9.7 | 10.19 | 0.34 |

Weather data provided by the Met Office from the Altnaharra No.2 weather station at NC 56956 35860 (www.metoffice.gov.uk).

Suboptimal weather conditions for bat surveys are highlighted in grey.