Arklow Bank Wind Park 2

Environmental Impact Assessment Report

Volume III, Appendix 13.5: Offshore Bats – 2025 Survey Report
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Sure Partners Ltd

Arklow Bank Wind Park 2

Bat Monitoring 2025

Results Report

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APEM Group Woodrow Ref P18175

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Glossary

Term	Meaning
Arklow Bank Wind Park 1 (ABWP1)	Arklow Bank Wind Park 1 consists of seven wind turbines, offshore export cable and inter-array cables. Arklow Bank Wind Park 1 has a capacity of 25.2 MW. Arklow Bank Wind Park 1 was constructed in 2003/04 and is owned and operated by Arklow Energy Limited. It remains the first and only operational offshore wind farm in Ireland.
Arklow Bank Wind Park 2 – Offshore Infrastructure	"The Proposed Development", Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements under the existing Maritime Area Consent (MAC).
Arklow Bank Wind Park 2 (ABWP2) (the Project)	Arklow Bank Wind Park 2 (ABWP2) (The Project) is the onshore and offshore infrastructure. This EIAR is being prepared for the Offshore Infrastructure. Consents for the Onshore Grid Infrastructure (Planning Reference 310090) and Operations Maintenance Facility (Planning Reference 211316) has been granted on 26th May 2022 and 20th July 2022, respectively. • Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements to be consented in accordance with the MAC. This is the subject of this EIAR and will be referred to as 'the Proposed Development' in the EIAR. • Arklow Bank Wind Park 2 Onshore Grid Infrastructure: This relates to the onshore grid infrastructure for which planning permission has been granted. • Arklow Bank Wind Park 2 Operations and Maintenance Facility (OMF): This includes the onshore and nearshore infrastructure at the OMF, for which planning permission has been granted. • Arklow Bank Wind Park 2 EirGrid Upgrade Works: any non-contestable grid upgrade works, consent to be sought and works to be completed by EirGrid.
Array Area	The Array Area is the area within which the Wind Turbine Generators (WTGs), the Offshore Substation Platforms (OSPs), and associated cables (export, inter- array and interconnector cabling) and foundations will be installed.
Cable Corridor and Working Area	The Cable Corridor and Working Area is the area within which export, inter-array and interconnector cabling will be installed. This area will also facilitate vessel jacking operations associated with installation of WTG structures and associated foundations within the Array Area.
T1/T7	Turbine structures within ABWP1 used for monitoring.
EirGrid	State-owned electric power Transmission System Operator (TSO) in Ireland and Transmission Asset Owner (TAO) for the Project's transmission assets.
Onshore locations	Brittas Bay (Brittas) A coastal dune system north of the ABWP2 landfall. Seabank A headland/small cliff adjacent to improved grassland, south of Brittas Bay. Clone Strand A small grass paddock located beside the sea.

Monopile	A marine platform structure located approximately 8 km offshore of Arklow, Co. Wicklow, used as the primary offshore acoustic monitoring station in all baseline survey years.

Experience

Leona McSharry - Assistant Ecologist

Leona McSharry holds a Hons BSc in Zoology from the National University of Ireland Galway and has assisted with the data collection, analysis and has authored this report. She joined APEM Group Woodrow in December 2024 as Ecology support and data officer. Previously she worked in the Venom systems Lab in NUI Galway as an Intern Ecologist, where she primarily conducted research involving invertebrates. Her work in Woodrow has been focused on bats; she has become increasingly proficient in bat call analysis using Kaleidoscope and BatExplorer. Leona also has ample scientific writing experience having been author on several scientific publications. She is also experienced with invertebrate and other terrestrial animal surveys.

Patrick Power - Ecologist

Patrick Power is an Ecologist with Woodrow and coordinated fieldwork and data collection for this report. 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 possesses reptile, mammal, and woodland tree surveying skills. Patrick currently holds bat licences from the Department of Housing, Local Government and Heritage.

Jason Guile – Associate Director; Technical Lead

Jason Guile is an Associate Director with Woodrow and has authored and 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, EcIA, AA Screening reports and NIS's) for a number of projects including historic landfill remediation works, urban planning applications and commercial regeneration sites.

Bruno Mels – GIS / Statistical Analysis Lead

Bruno joined the Woodrow team in September 2022. He obtained a MSc in Conservation Biology at the University of Antwerp in 2015 and worked for several conservation organisations in South-Africa and Seychelles after his studies. Bruno has a vast amount of experience mapping with both ArcGIS and QGIS, as well as data management using Excel and Access. He is also experienced in undertaking habitat suitability models, connectivity models, and statistical analysis using Maxent, Graphab and R, along with being proficient with Kaleidoscope and BatExplorer. Besides technical skills he is also experienced in carrying out mammal, bird, bat and invasive species surveys.

Qualifications:

Leona McSharry:

BSc (Hons) Zoology, University of Galway, Ireland

Patrick Power:

BSc in Forestry, South Eastern Technological University

BSc (Hons) in Land Management in Forestry, South Eastern Technological University

PG Certificate in Wildlife Biology and Conservation, Edinburgh Napier University

Jason Guile:

BSc (Joint Hons) Marine Biology/ Oceanography, University of Wales, Bangor

HND in Coastal Conservation with Marine Biology, Blackpool and Fylde College

Bruno Mells:

MSc in Conservation Biology at the University of Antwerp

1. INTRODUCTION

1.1. Offshore Bat Monitoring Summary – Arklow Bank Wind Park (ABWP2)

Offshore bat surveys have been carried out to inform the impact assessment of bats from offshore wind infrastructure as part of Arklow Bank Wind Park 2 (ABWP2). In response to the Request for Further Information (RFI) received from An Coimisiún Pleanála as part of the planning application for ABWP2, two additional monitoring locations were included in the 2025 survey programme at turbine structures within the existing Arklow Bank 1 windfarm which is located within the proposed Array area for ABWP2.

1.1.1. 2025 Survey overview

The information contained within this report is intended to summarise the results of bat monitoring for 2025, consisting of three main survey components-

- Monitoring at offshore monopile within the ABWP2 Array Area;
- Monitoring at two structures (Turbine 1 and Turbine 7) within the existing Arklow Bank 1 windfarm and also within theABWP2 Array Area;
- Monitoring on headlands inland from ABWP2 Array Area.

The 2025 surveys are a continuation of the monitoring that has been conducted for in 2021, 2022, 2023 and 2024.

1.2. Survey Team and Data Management

Field deployments and equipment maintenance were carried out by Patrick Power, Leona McSharry and Damien McAndrew (Woodrow). Offshore deployment and maintenance were conducted by Alpha Marine in collaboration with Woodrow’s onshore team.

Data analysis was undertaken by Leona McSharry, Patrick Power and Bruno Mels (Woodrow).

Report compilation was completed by Leona McSharry and Jason Guile (Woodrow).

2. METHODOLOGY

2.1. Monopile static detector surveys

Static acoustic bat surveys were conducted using SM4 detectors. Two detectors were deployed on a marine Lidar monopile that is located approximately 8km offshore of Arklow, Co. Wicklow, at coordinates 52.88544136, -5.92343633 (Figure 1). These detectors were deployed between May 15 and October 10 2025 (ref to Figure 2).

The detectors were powered by external lithium-ion batteries and housed in modified Peli-cases. These modifications allowed for cable routing (power and microphone) and provided protection against marine conditions and biofouling, particularly from seabirds known to frequent the monopile structure.

Each detector was equipped with two memory cards ranging from 32 GB to 512 GB, anticipating high volumes of acoustic data due to ambient marine noise and seabird activity. The detectors were set with 16 kHz as the minimum frequency trigger for recording (NatureScot, 2021). This threshold was selected to reduce the amount of interfering noise files produced by the seabirds and the marine environment in general, while still recording within the normal echolocation frequencies of relevant species.

Detectors were configured with a sample rate of 256 kHz, enabling detection of frequencies up to 128 kHz. Detector units and batteries were securely mounted to the platform floor, and microphones were affixed to the surrounding handrails at approximately 12 metres above Lowest Astronomical Tide (LAT). Respective pictures for context are shown in Appendix A.

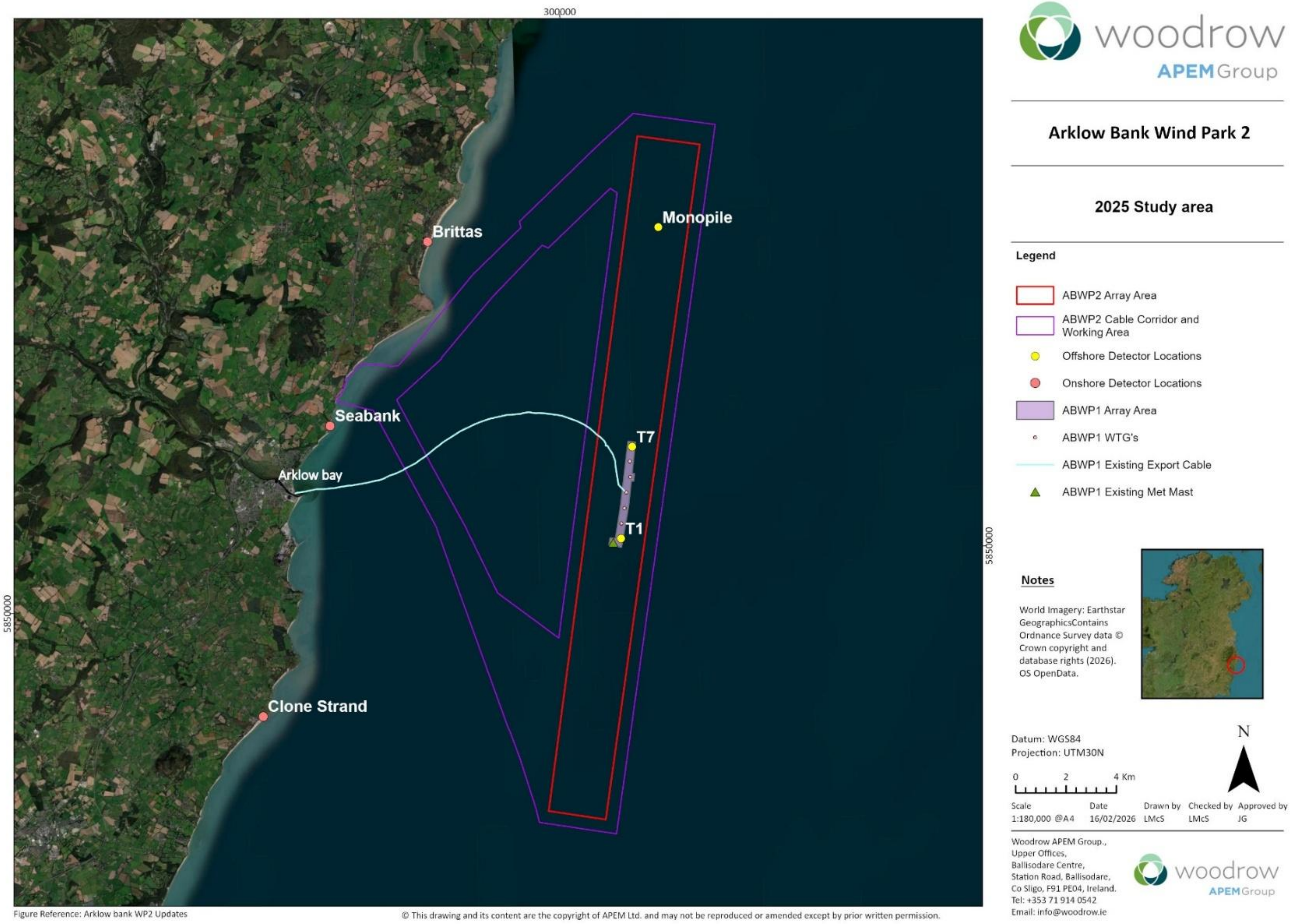

Figure 1: Survey Locations

2.2. Turbine 1 and 7 static detector surveys

Static acoustic bat monitoring was conducted at Turbine 1 (T1) and Turbine 7 (T7) of the existing Arklow Bank 1 Windfarm, within the ABWP2 Array Area. At the time of the surveys, the ABWP1 turbines were not operational. T1 and T7 are located approximately 10Km offshore Arklow at coordinates 52.77482857, -5.95046997 and 52.80736818, -5.94240188 respectively (Figure 1). Deployment dates spanned from May 15 to October 10 2025 (refer to Figure 2). These new locations were introduced in response to the RFI to monitor bat activity at additional offshore locations within the Array Area and supplement the data collected previously at the monopile location so as to inform the RFI response and broaden representation across the Array area.

At each turbine, four SM4 detectors were deployed, with one detector positioned to face each of the cardinal directions: north, south, east, and west. This configuration was designed to capture directional bat activity, to mitigate call obstruction caused by the turbine tower and to provide continuous recording in the event of a detector failure.

Detectors were housed in modified Peli-cases, following the same protocol for storage and set up as those deployed at the monopile. Respective pictures for context are shown in Appendix A.

This turbine-based monitoring complements existing offshore and inland survey locations, contributing to a comprehensive understanding of bat activity across the Array Area.

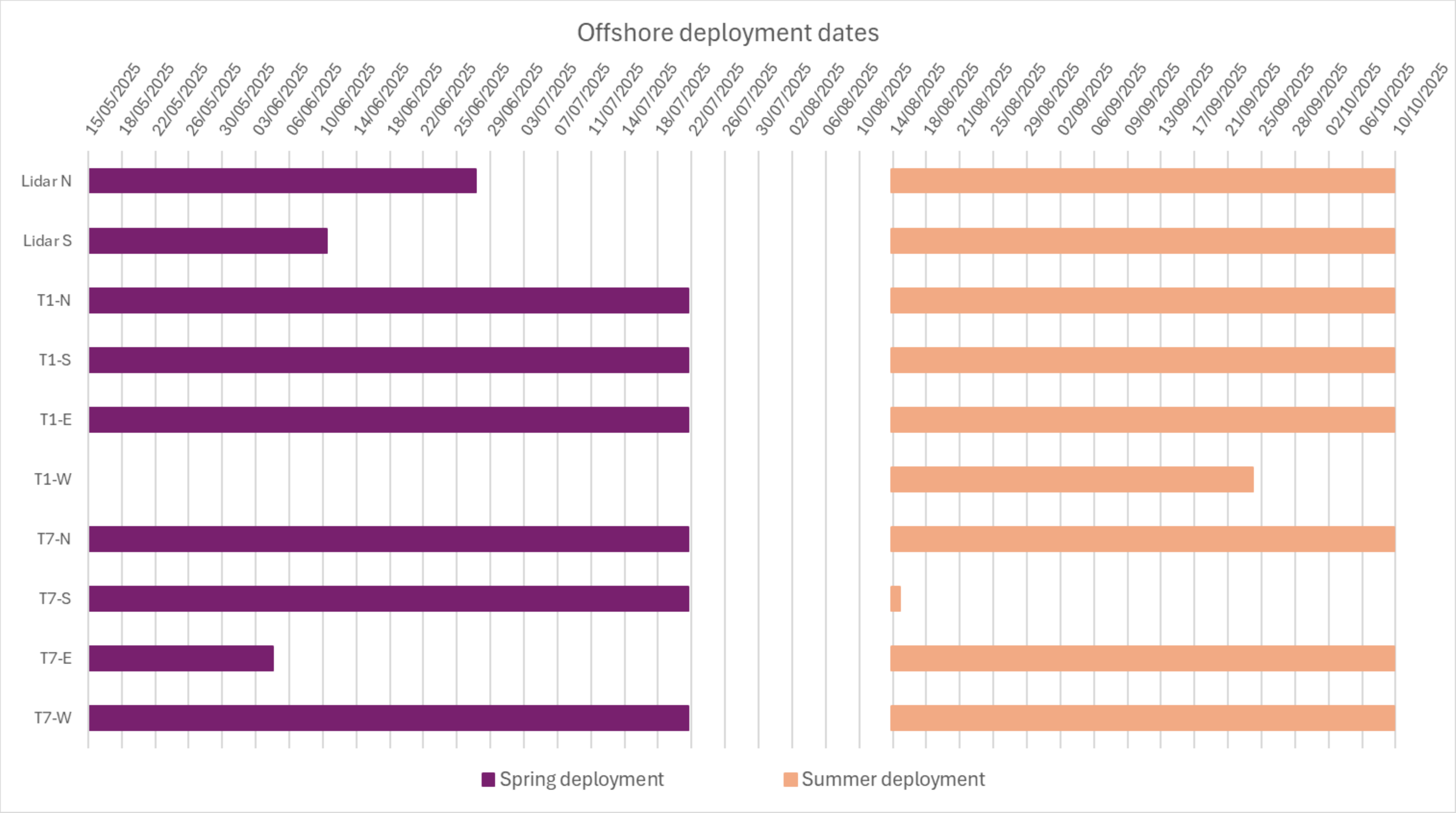

Figure 2: Offshore Deployment Survey Programme

(Spring deployment: 15 May to 22 July, Summer deployment:14 August to 10 October)

2.3. Headland static detector surveys

A mix of Elekon Bat Logger C and SM4 static detectors were deployed at three headland locations, to obtain onshore baseline data and assess if bat activity events at the offshore locations coincided with activity changes onshore. These detectors were deployed between 15 May and 10 October 2025 (refer to Figure 3).

The detector(s) at Clone strands were deployed adjacent to a small grass paddock located next to the sea. Those at Brittas Bay were placed on a pine tree in the dunes, and Seabank were deployed at the headland/small cliff adjacent to improved grassland. The locations of these detectors relative to each other and the offshore locations can be seen in Figure 1. Respective pictures for context are shown in Appendix B.

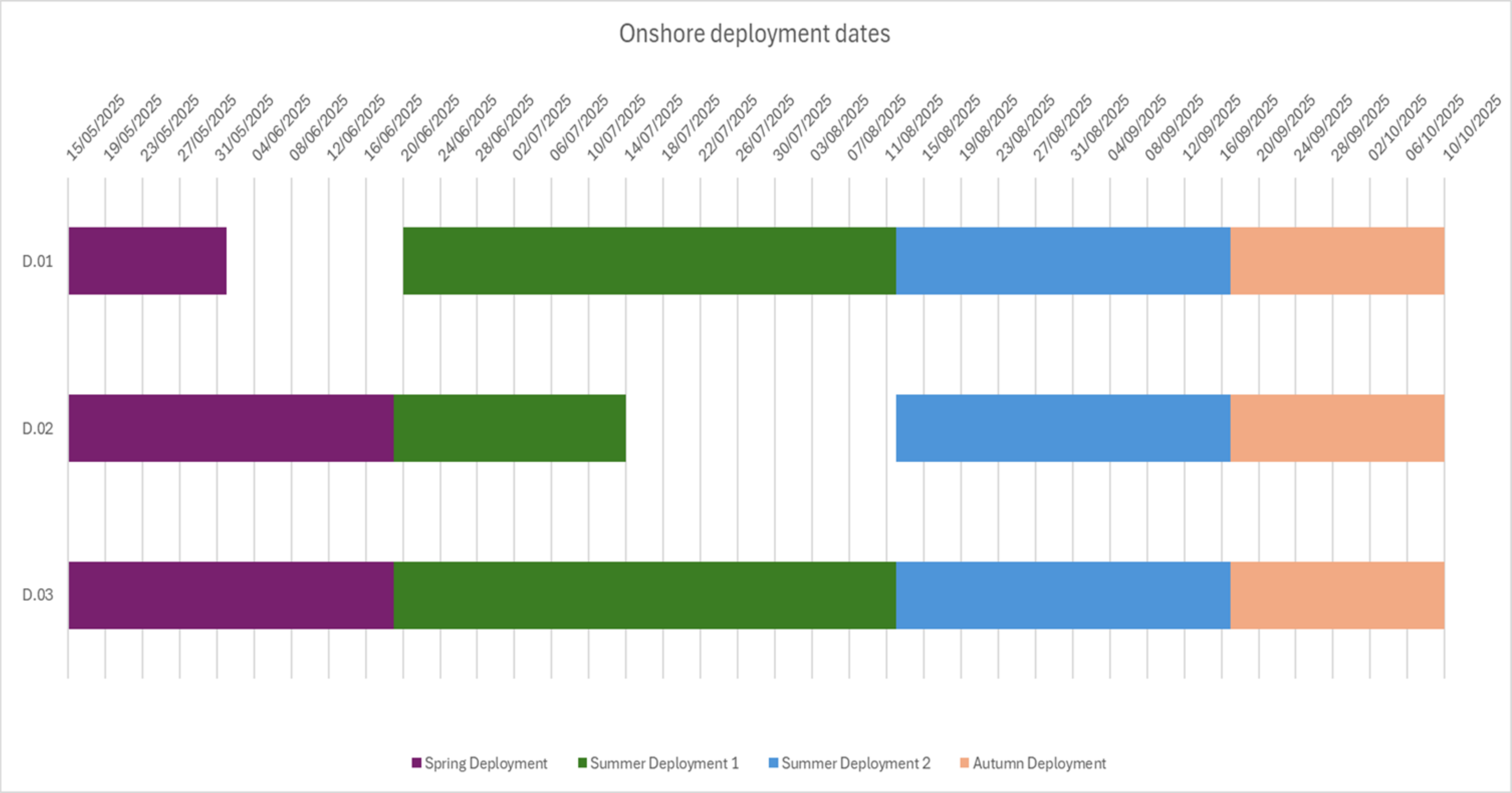

Figure 3: Onshore Deployment Survey Programme

(Spring deployment: 15 May to 19 June, Summer Deployment 1: 20 June to 12 August, Summer Deployment 2: 13 August to 17 September, Autumn Deployment: 18 September to 10 October)

2.4. Calibration and testing of recording equipment

All detectors were tested and settings checked prior to deployment. The sensitivity of all microphones was tested prior to and after each deployment, and all microphone checks were logged in an excel spreadsheet.

2.5. Data Analysis

Sound files recorded using SM4 detectors were analysed using Kaleidoscope Pro with automatic European classifiers filtered to Irish and UK species. Sound files recorded using Batlogger detectors were analysed using BatExplorer software. All files were manually verified by Patrick Power and Leona McSharry, of the Woodrow bat ecology team, with the aid of guidance material for identifying calls, Russ et al 2012, Barataud 2015 and Middleton et al 2022.

Weather data for the offshore locations was gathered from the M2 weather buoy in the Irish Sea accessed via the Marine Institute website (Irish Weather Buoy Data[1]). This buoy is located offshore, which is a limitation in that there may be localised differences to at the monopile unaccounted for, i.e., there may be higher wind and lower temperature effects from the mainland. However, it provides an insight into the weather conditions in a marine context for the Irish Sea rather than using a land-based weather station. The weather data for the headland sites was obtained from Johnstown Castle weather station located in Wexford (MET Éireann Historical Weather Data[2]), which provided land-based weather data.

2.6. Limitations

2.6.1. Offshore

The SM4 detector (WSS036) at T1-W failed to record during the spring monitoring period (15 May to 22 July) due to a technical error. The remaining three detectors on T1 successfully recorded throughout the spring season and because the survey design intentionally deployed more detectors than were required to characterise overall bat activity levels, these functioning detectors still provided complete temporal coverage at the turbine location. As a result, the dataset still captures the full pattern of nightly and seasonal bat activity at T1. The primary limitation arising from the detector failure is a reduced ability to infer flight direction from the monitoring data; however, directionality

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[1] Available at https://www.marine.ie/site-area/data-services/real-time-observations/irish-weather-buoy-network-observations?instrumentname=M2 [Accessed July 2025]

[2] Available at https://www.met.ie/climate/available-data/historical-data [Accessed July 2025]

analysis requires a full 360° array, whereas activity-level assessment does not. Because at least three detectors remained active, the ability to quantify bat presence and relative activity rates is unaffected.

Similarly, the detector deployed at T7-E (WSS096), failed on the 5 June due to a technical error. All remaining detectors on T7 recorded successfully, again maintaining complete temporal data coverage for activity-level analysis, meaning this partial failure has little effect on the data collected.

The SM4 detector at Lidar S (WSS106) ran out of storage on the 11 June followed by that at Lidar N (WSS080) on the 28 June. As a result, data collection unexpectedly ceased until the detectors were retrieved for their scheduled maintenance visit on the 22 July. Recording resumed on 14 August after maintenance; the detectors were deployed with larger SD cards to prevent similar issues in subsequent deployments. This unplanned gap in data collection reduced temporal coverage at the monopile locations for this period; however, sufficient pre- and post-gap data were collected to allow seasonal-level comparison. As a results the gap does not materially affect interpretation of bat activity trends, and therefore does not constitute a significant limitation to the dataset.

A three-week period between the 22 July and 14 August was unrecorded while maintenance of equipment was undertaken. Detectors were deployed at the first available weather window after maintenance had occurred.

During the summer deployment, the SM4 detector WSS036 at turbine 1 ceased recording on the 24 September due to a technical error. The remaining 3 detectors on turbine 1 recorded successfully, meaning there is no impact on data collection from turbine 1. The SM4 detector WSS061 at turbine 7 had a technical issue with the clock battery. While the detector recorded, the dates and time were not logged and thus could not be associated with the deployment dates, so it cannot be confirmed what period was recorded. The recorded files were analysed, and no bat calls were identified. The remaining three detectors on turbine 7 recorded successfully during the deployment period.

2.6.2. Onshore

During the Spring recording period, the Elekon Bat Logger C at Clone Strand failed after 17 days, recording between 15 May and 1 June 2025 before ceasing operation due to equipment issues. This resulted in an 18 day lapse in data collection, representing a limitation due to reduced temporal coverage at this location. This limitation is partially offset by the continued successful operation of the two remaining onshore detectors (Seabank and Brittas Bay) throughout the spring period. Furthermore, Clone Strand was reinstated during the first maintenance visit on 20 June 2025 and subsequently recorded continuously until the end of the deployment on 10 October 2025. Although complete spring coverage was not achieved at Clone Strand, the initial 17 days of spring data provide confirmed early-season presence and species composition for the site. The uninterrupted datasets from Seabank and Brittas Bay allow for regional-scale contextual comparison across the wider coastline; however, because these sites are several kilometres apart, the Clone Strand gap means that fine-scale comparisons between individual onshore locations during mid-spring cannot be made with full confidence. The extended period of reliable recording at Clone Strand from late June through autumn provides additional temporal context, thereby reducing the influence of the earlier data gap. Overall, despite this temporary lapse, the dataset remains sufficient to characterise broad seasonal patterns in bat activity across the onshore network; however, the gap represents a location-specific limitation in mid-spring coverage at Clone Strand and is acknowledged as such within the assessment.

During the summer deployment 1 recording period (20 June to 12 August), the Elekon Bat Logger C at Clone Strand failed to record. However, following the issues experienced with the same detector in spring, an SM4BAT-FS unit was deployed at the same location. The SM4 successfully recorded throughout the entire deployment period without any issues, ensuring a complete dataset was captured at Clone strand for the deployment. The Elekon Bat Logger C at Seabank failed after 24 days, ceasing operation on 14 July 2025 until maintenance was carried out on 12 August 2025. This resulted in a 29 day lapse in data collection at this location, attributable to damaged components, likely caused by adverse weather conditions. While this represents a temporary limitation due to reduced temporal coverage, Brittas Bay and Clone Strand both continued to record successfully throughout this period and Seabank recorded both before and after the lapse, providing contextual data for this site. Collectively, the uninterrupted datasets from Clone Strand and Brittas Bay, alongside the early and late-season data captured at Seabank, allow for robust interpretation of seasonal-scale bat activity across the onshore network. However, the data gap at Seabank represents a location-specific limitation and reduces confidence in mid-season, site-level comparisons for this detector alone. This limitation is acknowledged, but it does not compromise the ability to characterise overall bat activity patterns across the onshore survey area for the deployment period.

3. RESULTS

3.1. Monopile static detector surveys

Three bat species were detected at the monopile site during the 2025 survey period: Leisler's bat (*Nyctalus leisleri*), Nathusius' pipistrelle (*Pipistrellus nathusii*), and soprano pipistrelle (*Pipistrellus pygmaeus*). Over the 103 days of deployment, between 15 May to 10 October, a total of 25 bat passes were recorded on 11 different days. Table 1 shows the distribution of these recordings by species and month. Leisler's bat accounted for 84% of all bat passes recorded at the monopile.

Figure 4 represents the wind speed and cardinal direction on record for when bat passes were recorded during the 2025 survey period (M2 weather buoy). This wind rose shows 48% of passes were recorded when the wind direction was SSE. Although 12 passes were recorded in this direction, the results are slightly skewed since 10 of them were clustered within a 20-minute period on August 22nd.

Wind speed in m/s converted to Marine Beaufort Scale (Met Éireann accessed June 2025)

- <1 m/s – 0 /Calm
- 1-4 m/s – 0 to 3 / Calm to Gentle breeze
- 4-7 m/s – 3 to 4 / Gentle breeze to Moderate breeze
- 7-10 m/s – 4 to 5 / Moderate breeze to Fresh breeze
- 10-13 m/s – 5 to 6 / Fresh breeze to Strong breeze

Table 1: Monopile static detector results

Species/ month	May	June	July	Aug	Sep	Oct	Grand total	Percentage activity
Leisler's bat	0	0	0	11	9	1	**21**	84%
Nathusius's pipistrelle	0	0	0	0	0	1	**1**	4%
Soprano pipistrelle	2	0	0	1	0	0	**3**	12%
Grand total	**2**	**0**	**0**	**12**	**9**	**2**	**25**	100%
Percentage activity	8%	0%	0%	48%	36%	8%	100%	

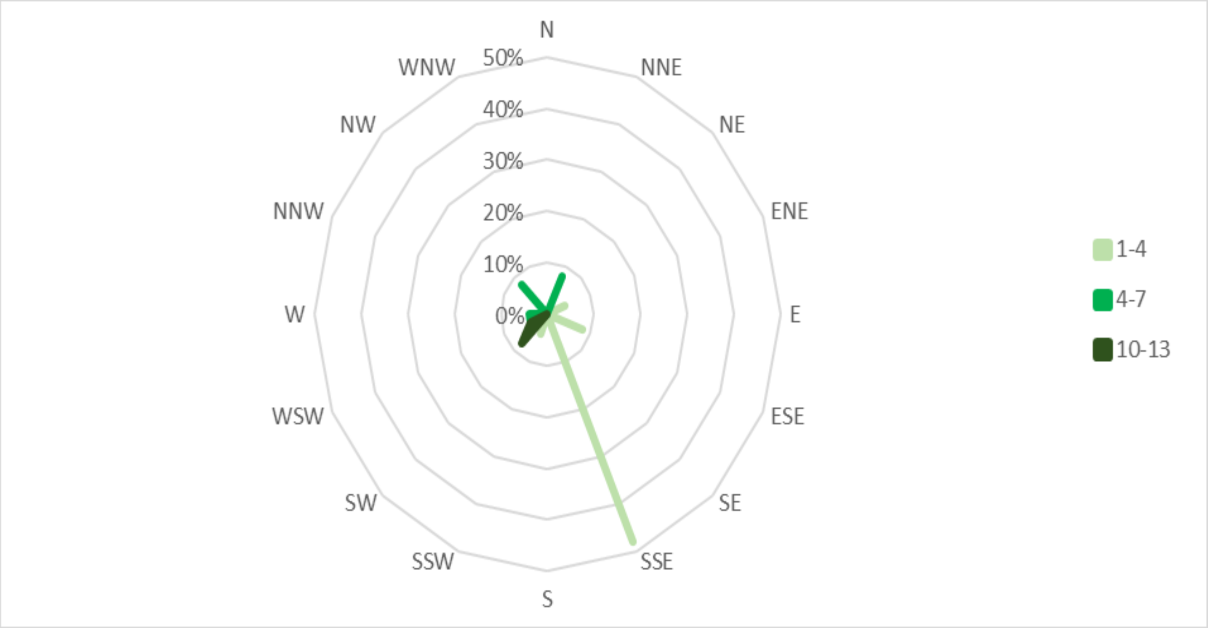

Figure 4: Wind speed (m/s) and direction (°) associated with bat passes recorded at the monopile

3.1.1. Leisler’s bat activity

The overall activity of Leisler’s recorded at the monopile detectors is shown in Figure 5. A total of 21 Leisler’s passes were recorded during the 2025 survey period. Leisler’s bat activity is low compared to 2024 despite there being a longer deployment period (by 15 days). The deployment season however differs between 2025 and 2024 with the deployments beginning in May and August respectively. All passes were recorded between 19:27 and 03:21, which is outside the typical roosting period for Irish bat species (Aughney et al., 2022) This dispersed pattern of detections suggests that the bats were using the area only intermittently and in low numbers.

During the deployment, most days recorded only a single bat pass, each of which were interpreted as single individuals. The maximum number of passes recorded in one day was ten, on the 22 August. These were made within a 20-minute period (23:17-23:39), the timing and arrangement of the detectors suggests repeated passes around the structure, likely attributed to an individual circling the monopile for the full duration of the event. Similarly, on 11 September, two calls were detected within a minute of each other, first by the north detector and then the south, indicating one individual passing by. There was a total of four calls recorded on the 29 September, a pair of calls at 01:38, detected by the north, then south detector, indicating one individual passing by. The second set of calls on the 29 September were recorded between 03:16 and 03:20 first by the north then south detector. While it is possible these represent two different bats based on the precautionary principle; it is more likely one based on the activity pattern. Although circling behaviour may have been present, this movement can occur for non-foraging reasons and is not indicative of feeding.

Consistent with previous offshore datasets (2024), no feeding buzzes were identified in 2025, indicating no evidence of active foraging behaviour at the monopile.

The activity for 2025 is most comparable to 2024. The survey period in 2025 ranged from May to October, with all Leisler’s passes detected in August to October. In 2024, the survey period ran from

August to November, passes were detected in all four months. All passes for Leisler's recorded in 2023 were in June (4 passes), while all passes in 2022 were recorded in August (2 passes).

As seen in Figure 6 Leisler's activity is primarily coincided with SSE winds (M2 weather buoy). This trend is heavily driven by the peak of activity on the 22 August (57%). Leisler's activity is primarily linked to wind speeds of 1-4 m/s. The skew on wind speed preference is also heavily driven by the peak on 22 August (57%), the remaining 43% is evenly split between 1-4, 4-7 and 10-13 m/s.

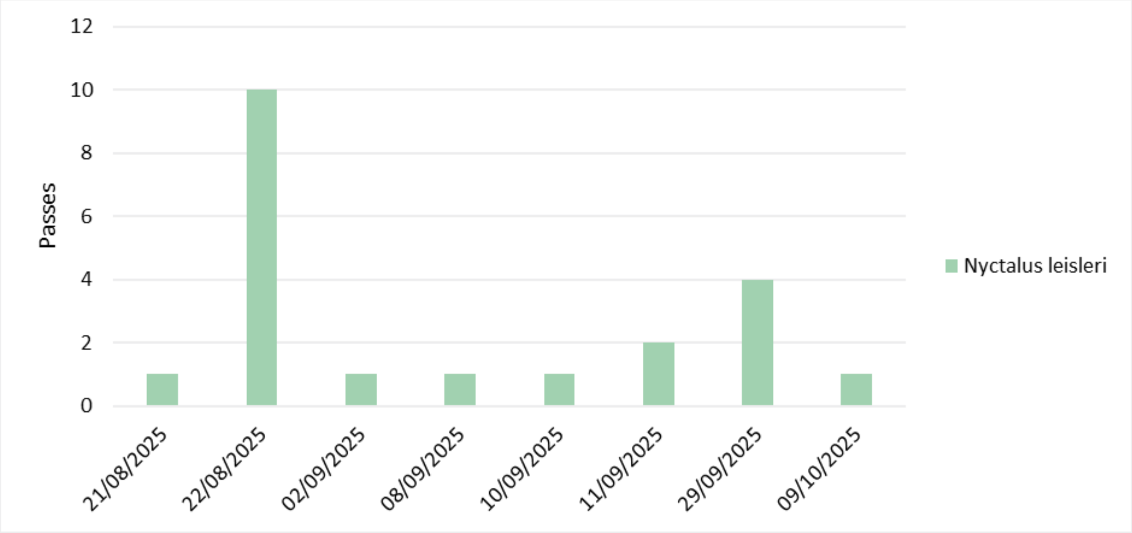

Figure 5: Leisler's bat activity across the deployment period at monopile detectors.

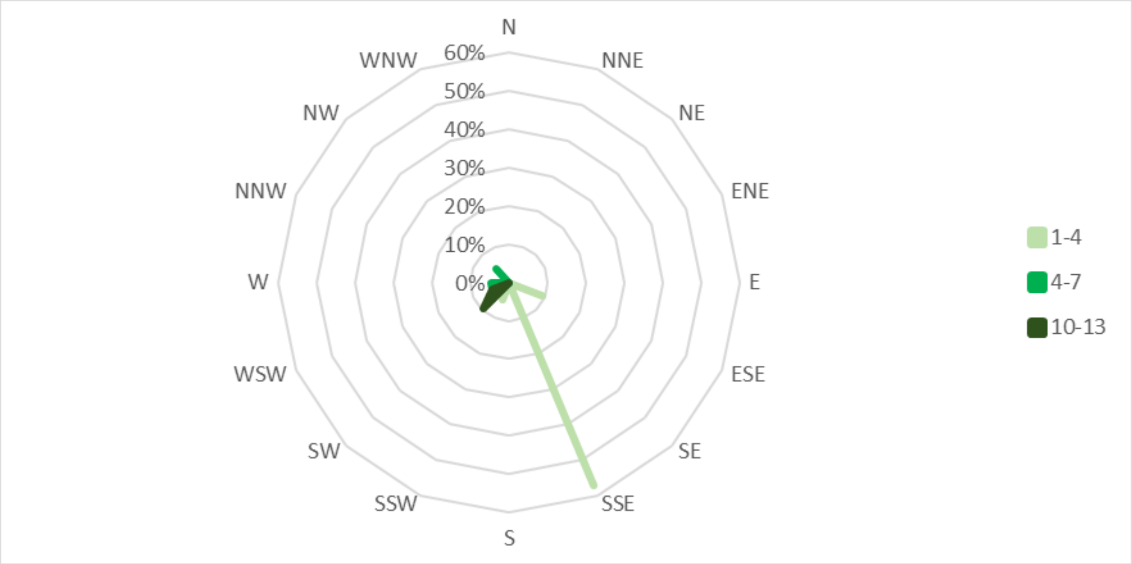

Figure 6: Wind speed (m/s) and direction (°)associated with Leisler's bat passes recorded at the monopile

3.1.2. Pipistrelle activity

The overall activity of pipistrelle bats recorded at the monopile detectors is shown in Figure 7. A total of four pipistrelle bat passes were recorded during the 2025 survey period, three soprano pipistrelles and one Nathusius' pipistrelle. Given there was a low number of pipistrelle passes recorded, both pipistrelle species were grouped together when assessing trends associated with wind speed and direction, however, due to the low number of individuals detected, the dataset is too small to support any reliable interpretation of potential relationships between wind speed, wind direction, and offshore pipistrelle activity. Figure 8 shows wind direction and speed for the recorded passes.

Similarly to Leisler's, pipistrelle activity is low compared to 2024, despite the longer deployment period. All bat passes were recorded between 21:09 and 23:02, within approximately two and a half hours of sunset. An individual bat pass was recorded on the 14 August (soprano) and 07 October (Nathusius), and two on the 16 May (soprano). The passes in May were recorded within seconds of each other by each detector, indicating movement past or around the structure by one individual. Based on these temporal patterns, it is estimated that a total of three individuals were detected offshore at the monopile during the 103 days of deployment. Although movement consistent with a bat passing or briefly circling the structure was observed, such behaviour can occur for non-foraging reasons and is not indicative of feeding.

As with Leisler's bats, no feeding buzzes were identified, and there was no evidence of foraging behaviour at the monopile, consistent with previous offshore seasons (2023 and 2024).

The activity for 2025 is somewhat comparable to previous years, with a consistently low number of passes. Although 2024 recorded a slightly higher number of passes, year-to-year variation in offshore detections is common where overall activity is low, and the small number of recordings in both years indicates consistently infrequent offshore use by pipistrelle species.

All bat passes were recorded during wind speeds of less than 7 m/s, three of which were below 4 m/s.

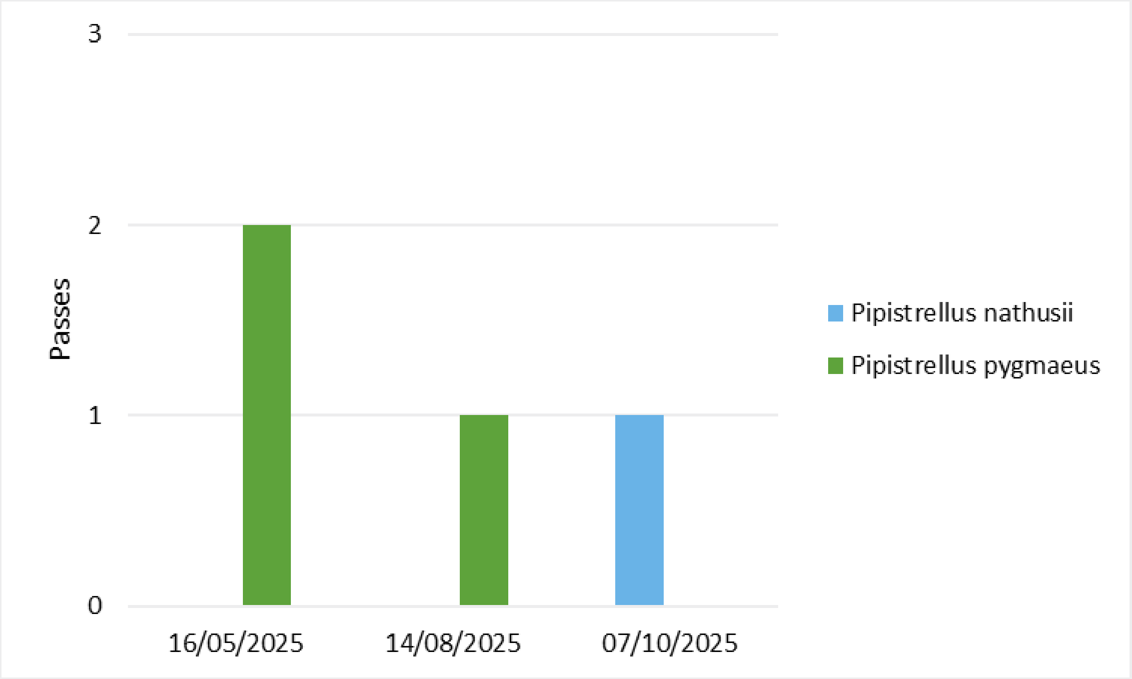

Figure 7: Pipistrelle bat activity across the deployment period at monopile detectors

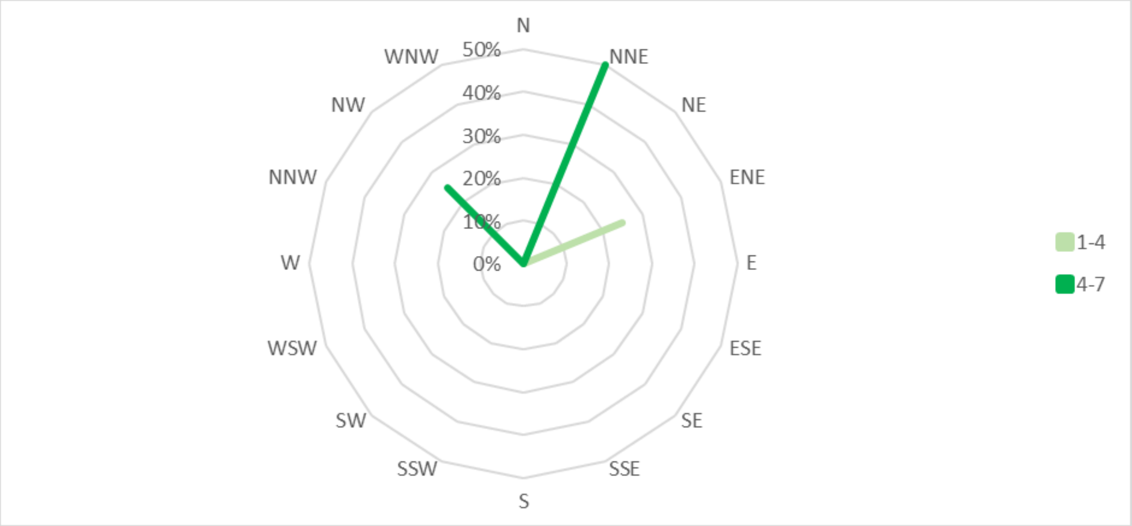

Figure 8: Wind speed (m/s) and direction (°) associated with Pipistrelle bat passes recorded at the monopile

3.2. Turbine static detector

Four species were recorded at the turbine locations during the 2025 survey period: Leisler's bat, Nathusius's pipistrelle, common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle. There are a total of 151 passes recorded during the 125 days of deployment, between the 15 May and 10 October. Table 2 shows the split of these recordings between different species per month. Bat passes were detected on a total of 21 days. Leisler activity accounts for 88.24% of all passes recorded at the turbines.

Figure 9 represents the wind speed and direction (M2 weather buoy) when bat passes were recorded during the 2025 survey period. This wind rose shows ENE, S and SSE account for 65% of passes (21%, 22% and 22% respectively).

Table 2: Turbine static detector results

Species/ month	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Grand total**	**Percentage activity**
Leisler's bat	3	4	31	46	45	5	**134**	88.74%
Nathusius's pipistrelle	0	0	0	0	3	2	**5**	3.31%
Common pipistrelle	2	0	0	6	2	0	**10**	6.62%
Soprano pipistrelle	1	0	0	1	0	0	**2**	1.32%
Grand total	**6**	**4**	**31**	**53**	**50**	**7**	**151**	100 %
Percentage activity	3.97 %	2.65 %	20.53 %	35.10 %	33.11 %	4.64 %	100 %	

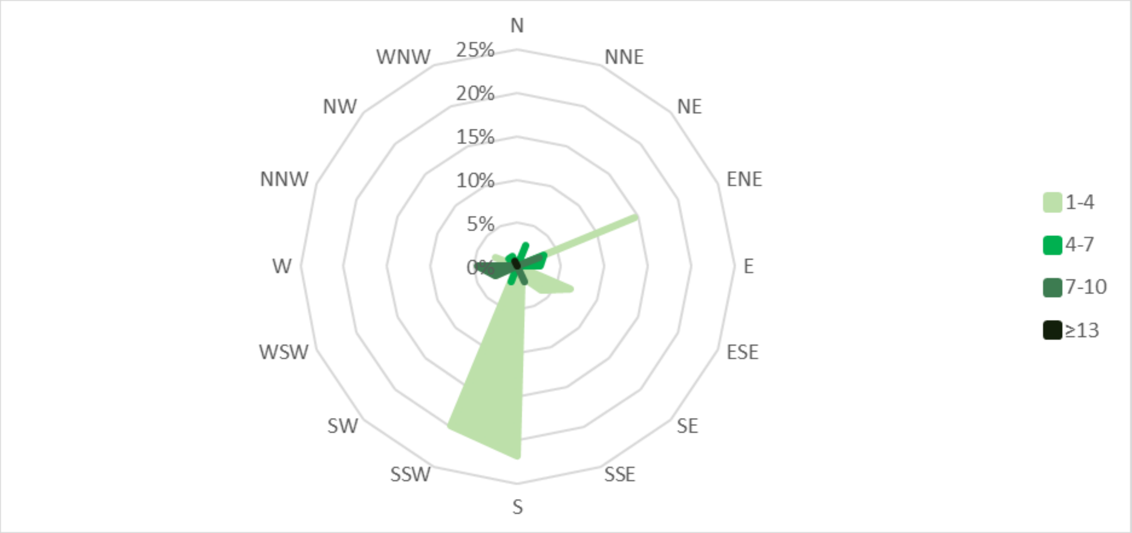

Figure 9: Wind speed (m/s) and direction (°) associated with bat passes recorded at the turbine static detectors

3.2.1. Leisler's bat activity

Figure 10 presents the overall activity of Leisler's bat passes recorded at all the turbine detectors. Across the eight deployed SM4 detectors, a total of 134 passes were detected, 60 at T1 and 74 at T7. Notable peaks in activity were recorded on the 10 July (T7), 14 August, 28 September and 29 September (T1) with 25, 26, 20, and 11 passes recorded on these dates, respectively.

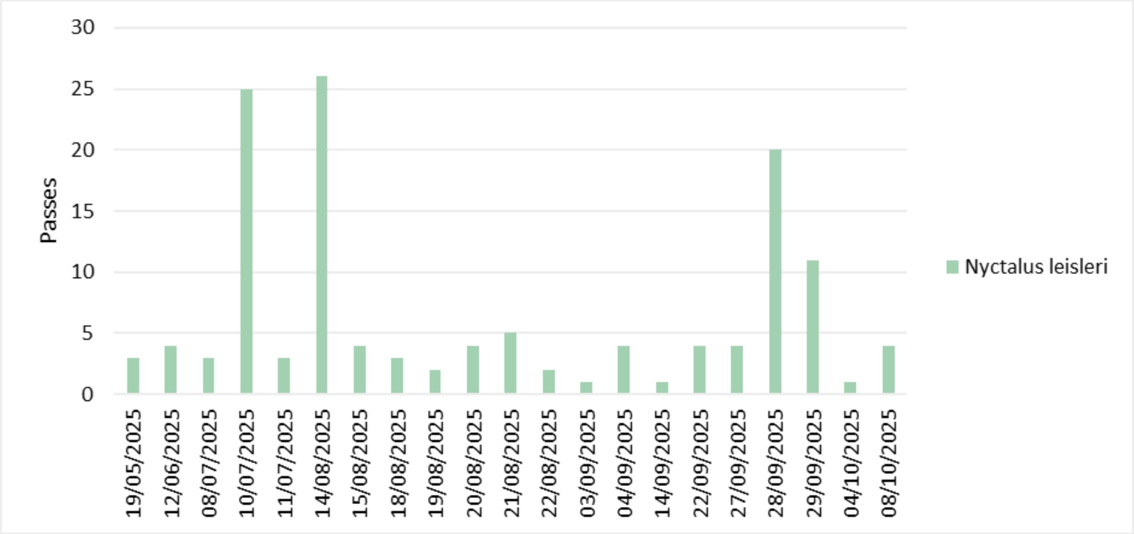

Figure 10: Leisler's bat activity across the deployment period at Turbine detectors

3.2.1.1. T1

For the passes recorded on August 14th (21:54–22:19) and September 28th (22:33–23:45), the timing and arrangement of the detectors support the hypothesis that a single individual was circling the turbine for the full duration of each event. All dates with more than one detection show similar patterns in movement around the turbine (refer to Figure 11) apart from 29 September. The data reveals a pattern of three distinct timing events, strongly indicating that three separate individuals passed by or circled the turbine on this date. Activity patterns suggest multiple passes by one or more individuals; interpretation is indicative, not definitive. Although circling behaviour may have been present, this movement can occur for non-foraging reasons and is not indicative of feeding. As with the monopile dataset, no feeding buzzes were identified at T1, indicating no evidence of offshore foraging behaviour at this location.

As seen in Figure 12 Leisler's activity at T1 primarily coincided with south, east-south-east and east-north-east winds. This trend is heavily driven by the peak of activity on the 14 August, 28 September and 29 September. Leisler's activity is primarily linked to wind speeds of 1-4 m/s. This is also heavily driven by the peaks on the same days.

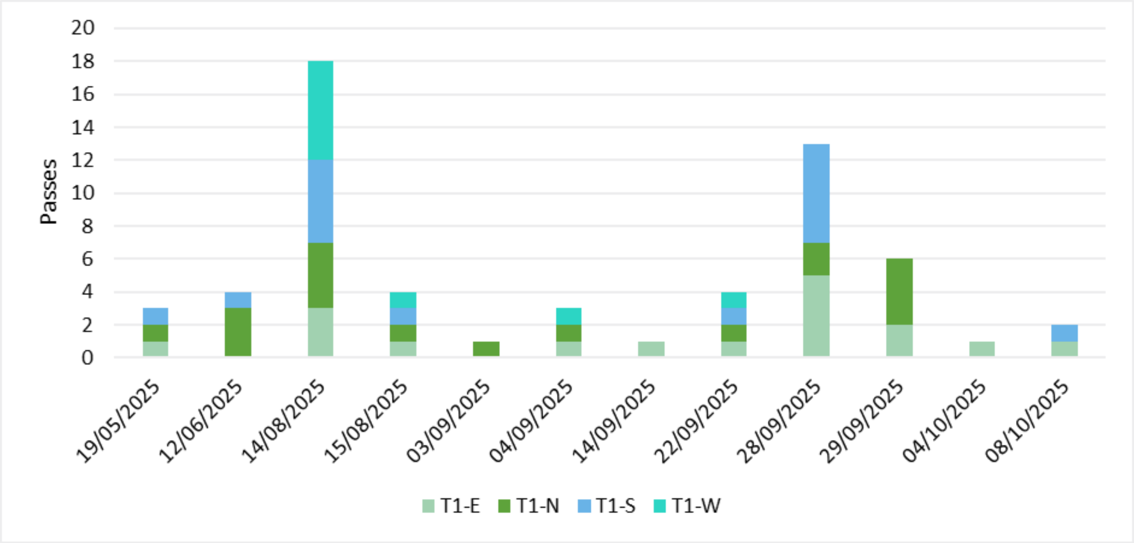

Figure 11: Distribution of Leisler bat passes per detector for each date on T1

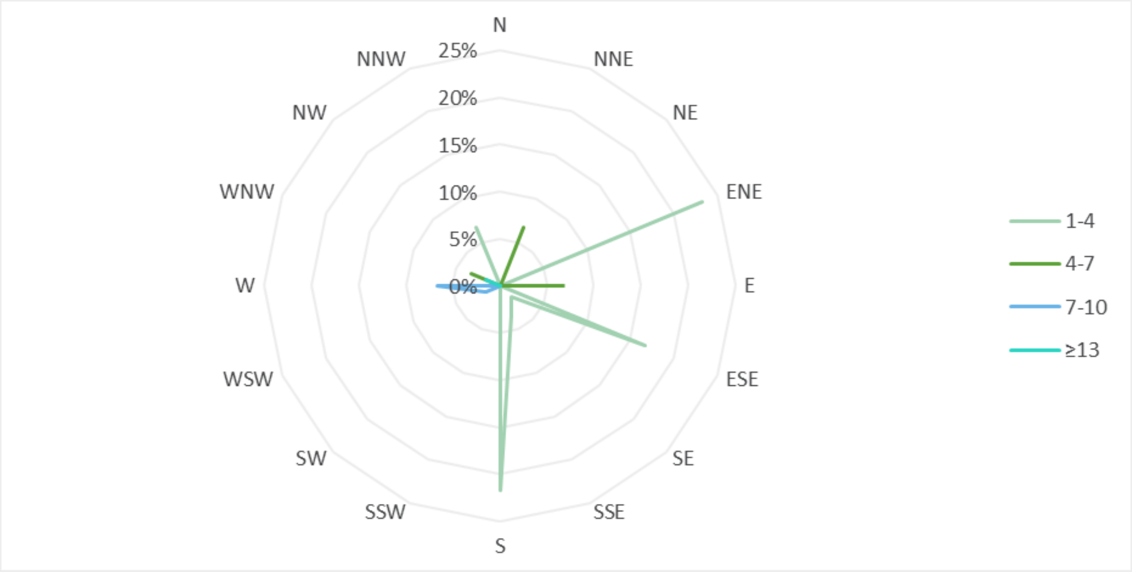

Figure 12: Wind speed (m/s) and direction (°) associated with Leisler's bat passes recorded at the T1

3.2.1.2. T7

For the detections recorded on 10 July (00:47-01:32) and 14 August (22:06–22:11), the timing and arrangement of the detectors support the hypothesis that a single individual was circling the turbine for the full duration of each event. All dates with more than one detection show similar patterns in movement around the turbine (refer to Figure 13). Activity patterns suggest multiple passes by one or more individuals; interpretation is indicative, not definitive. Although circling behaviour may have been present, this movement can occur for non-foraging reasons and is not indicative of feeding. As with the monopile and T1 datasets, no feeding buzzes were identified at T7, indicating no evidence of foraging behaviour at this offshore location.

As seen in Figure 14 Leisler's activity at T7 primarily coincided with south-south-west winds. This trend is heavily driven by the peak of activity on the 10 July. Leisler's activity is primarily linked to wind speeds of 1-4 m/s. This is also heavily driven by the peaks on the same days.

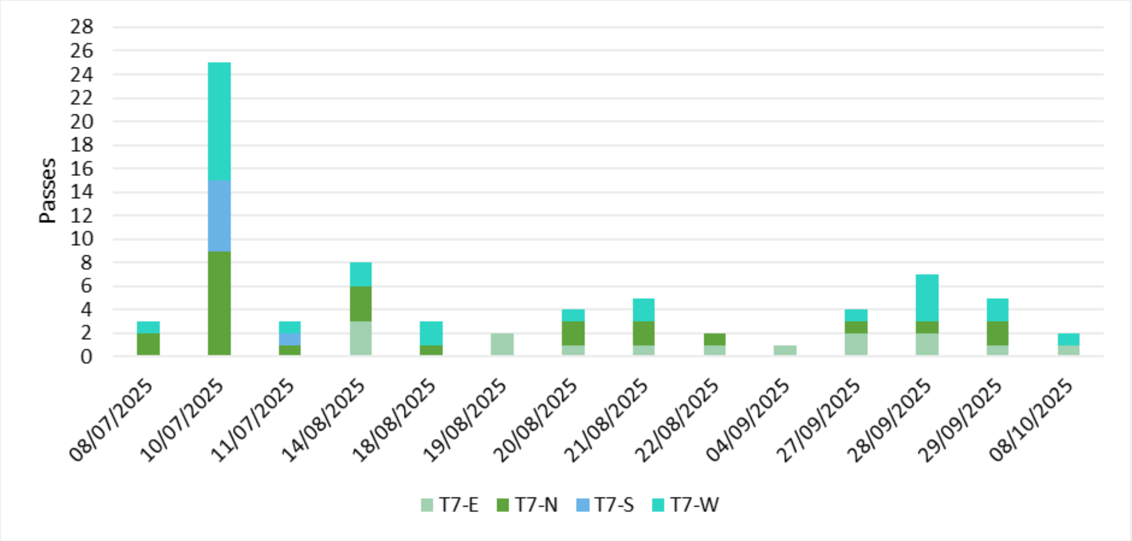

Figure 13: Distribution of Leisler bat passes per detector for each date on T7

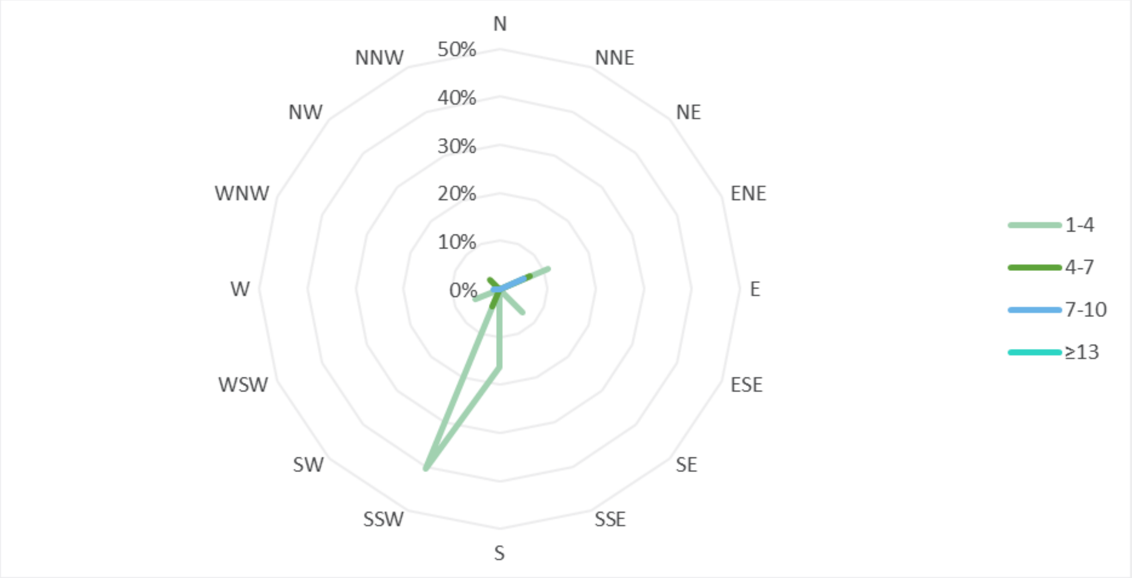

Figure 14: Wind speed (m/s) and direction (°) associated with Leisler's bat passes recorded at the T7

3.2.2. Pipistrelle activity

The overall activity of pipistrelle bats recorded at the turbines is shown in Figure 15. A total of 17 pipistrelle bat passes were recorded during the 2025 survey period, five Nathusius' pipistrelles, ten common pipistrelles and two soprano pipistrelles. Eight of which were detected at T1 and nine at T7. Given there was a low number of pipistrelle passes recorded, all pipistrelle species were grouped together when assessing trends associated with wind speed and direction, however, due to the low number of bats recorded, there are no clear influences from wind speed or direction for pipistrelle species. Refer to Figure 16. This does however, show the influence of the peak activity on the 22 August.

All pipistrelle passes were recorded between 20:37 and 00:28, with the exception of 3 passes on the 26 September recorded between 05:54 and 05:58. These passes were by Nathusius' pipistrelles, recorded about one hour before sunrise (07:15).

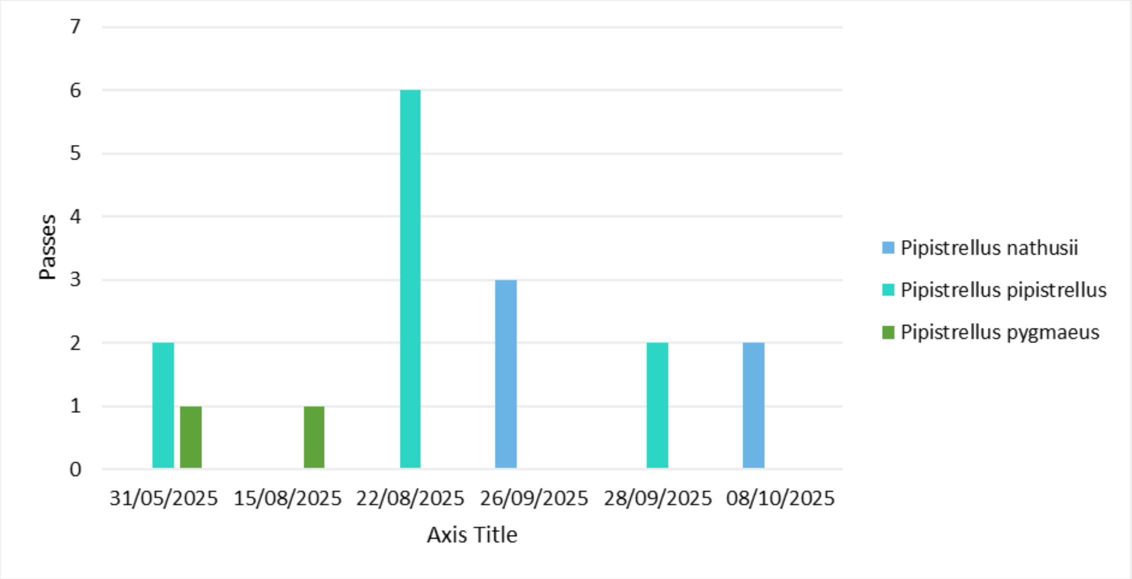

Figure 15: Pipistrelle bat activity across the deployment period at Turbine detectors

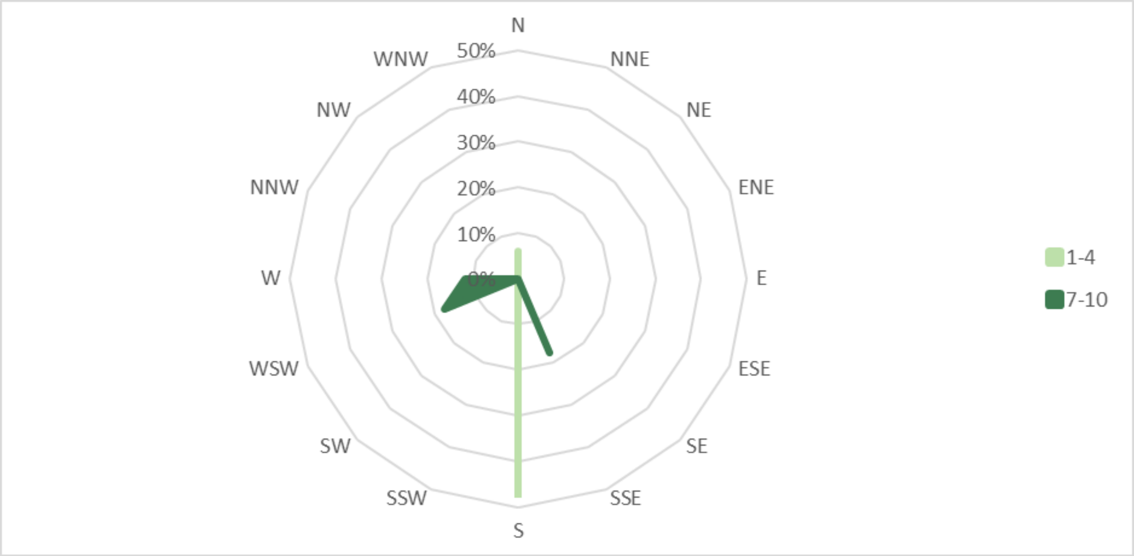

Figure 16 :Wind speed (m/s) and direction (°)associated with pipistrelle bat passes recorded at the Turbine monopiles

3.2.2.1. Nathusius Pipistrelle

For the passes recorded on 26 September (05:54-05:58) and 08 October (20:37-20:39) at T1, the timing and arrangement of the detectors support the hypothesis that a single individual was circling the turbine for the full duration of each event. No Nathusius pipistrelles were detected at T7. On this basis a total on two individuals were detected offshore at T1 during the 125 days of deployment.

3.2.2.2. Common and Soprano Pipistrelle

For the passes recorded on 31 May (23:48) at T1 along with 22 August (22:00-22:21) and 28 September (20:43-20:46) at T7, the timing and arrangement of the detectors support the hypothesis that a single common pipistrelle individual was circling the turbine for the full duration of each event. There are only two detections for soprano pipistrelle, no pattern can be established, so it is assumed that two individuals were recorded. On this basis a total of five individuals were detected offshore at T1 and T7 during the 125 days of deployment. Although circling behaviour may have been present, this movement can occur for non-foraging reasons and is not indicative of feeding. Consistent with all other offshore detectors, no feeding buzzes were identified for either common or soprano pipistrelles at the turbine locations, indicating no evidence of offshore foraging behaviour.

3.3. Headland static detector survey

Seven species were recorded onshore by the headland detectors during the 2025 survey period: Leisler's bat (*Nyctalus leisleri*), *Nyctalus* sp., Nathusius's pipistrelle, common pipistrelle, soprano pipistrelle, Myotis bats (*Myotis* spp.) and brown long eared bat (*Plecotus auritus*). There are a total of 79,297 passes recorded during a total of 86 days deployment. Table 3 shows the split of these recordings between different species per month.. Leisler activity accounts for 48.72% of all passes recorded at the headland detectors.

Figure 17 illustrates the wind-speed ranges and directional patterns associated with headland bat activity. Most bat passes occurred during light winds of 1–4 m/s (88.78%), and activity showed a clear preference for westerly winds. In total, 65.56% of bat passes were recorded during winds from southwest through west-northwest (SW, WSW, W, WNW).

Table 3: Headland static detector results

Species/ month	May	June	July	Aug	Sep	Oct	Grand total	Percentage activity
Nyctalus leisleri	245	2,046	4,636	10,806	15,953	4,972	**38,658**	48.8%
Pipistrellus nathusii	2	34	13	4	2	14	**69**	0.1%
Pipistrellus pipistrellus	621	5,809	7,360	7,764	4,215	3,254	**29,023**	36.6%
Pipistrellus pygmaeus	170	1,839	1,647	1,742	1,971	3,012	**10,381**	13.1%
Myotis sp.	2	18	60	466	203	15	**764**	1.0%
Plecotus auritus	2	21	40	121	156	62	**402**	0.5%
Grand total	**1,042**	**9,767**	**13,756**	**20,903**	**22,500**	**11,329**	**79,297**	
Percentage activity	1.3%	12.3%	17.3%	26.4%	28.4%	14.3%	100%	

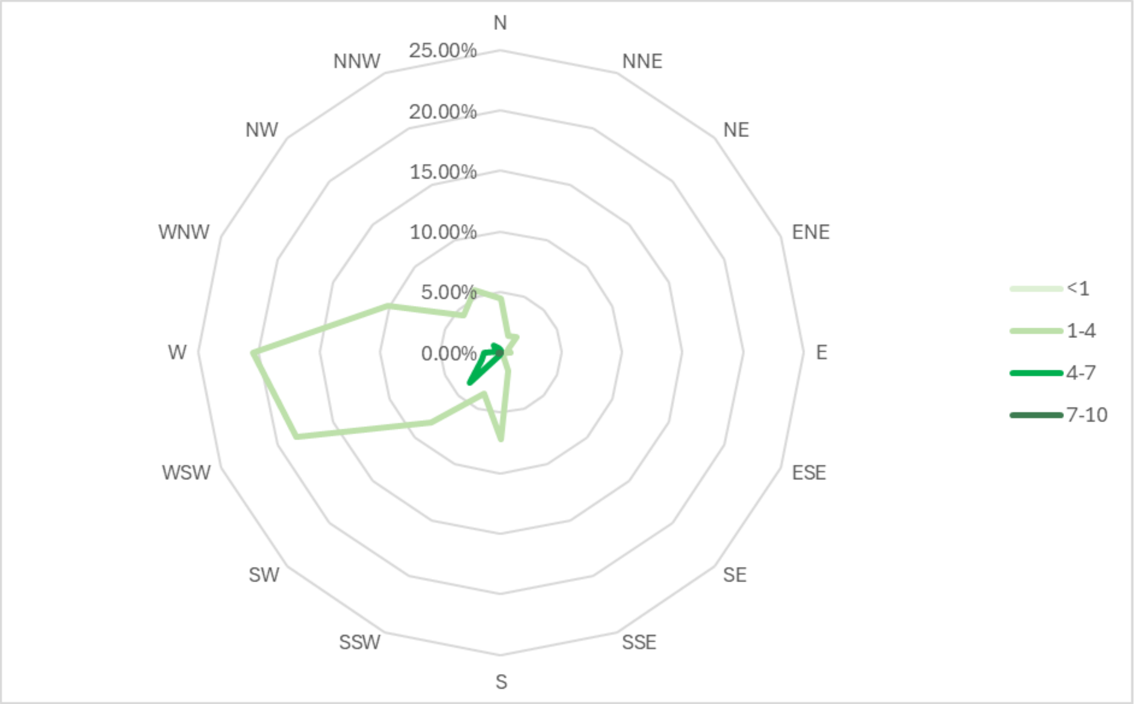

Figure 17: Wind speed (m/s) and direction (°) associated with bat passes recorded at the headland detectors

3.3.1. Leisler's bat activity

Figure 18 presents the overall activity of Leisler's bat passes recorded onshore at each headland detectors. Leisler activity makes up 48.72% of all bat activity at the headland detectors, of which over 65% comes from Clone strand. The number of Leisler passes per day varies significantly, with an average of about 125 passes per day. Peaks of over 800 calls per day occur on 14 September, 28 September and 8 October with 952, 879 and 889 passes respectively, all occurring at Clone Strand.

All site locations show a similar trend, characterised by increasing activity with the highest activity occurring in September and decreasing thereafter, although detectors were not deployed for the full month of October.

Figure 19 shows Leisler's activity was highest under light (1–4 m/s) westerly to west-southwest winds.

Figure 20 presents a comparison of activity trends over time only, showing similarities in trends between onshore (headland) and offshore detectors, rather than direct comparability in the number of calls. While both sets of detectors demonstrate broadly similar temporal patterns, with activity peaking in August offshore and September onshore, declining thereafter, there remains a marked difference in the magnitude of calls recorded (offshore Leisler passes account for just 0.4% of all Leisler calls during the 2025 deployments), indicating that bats are far more concentrated nearshore, likely using headlands as key commuting corridors or foraging locations.

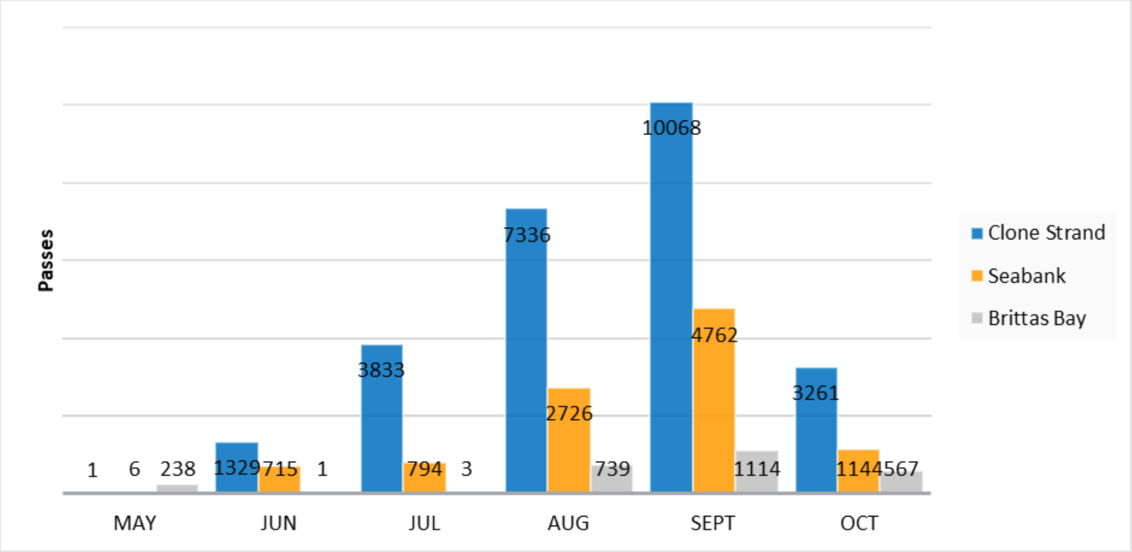

Figure 18: Leisler's bat activity onshore across the deployment period at headland detectors

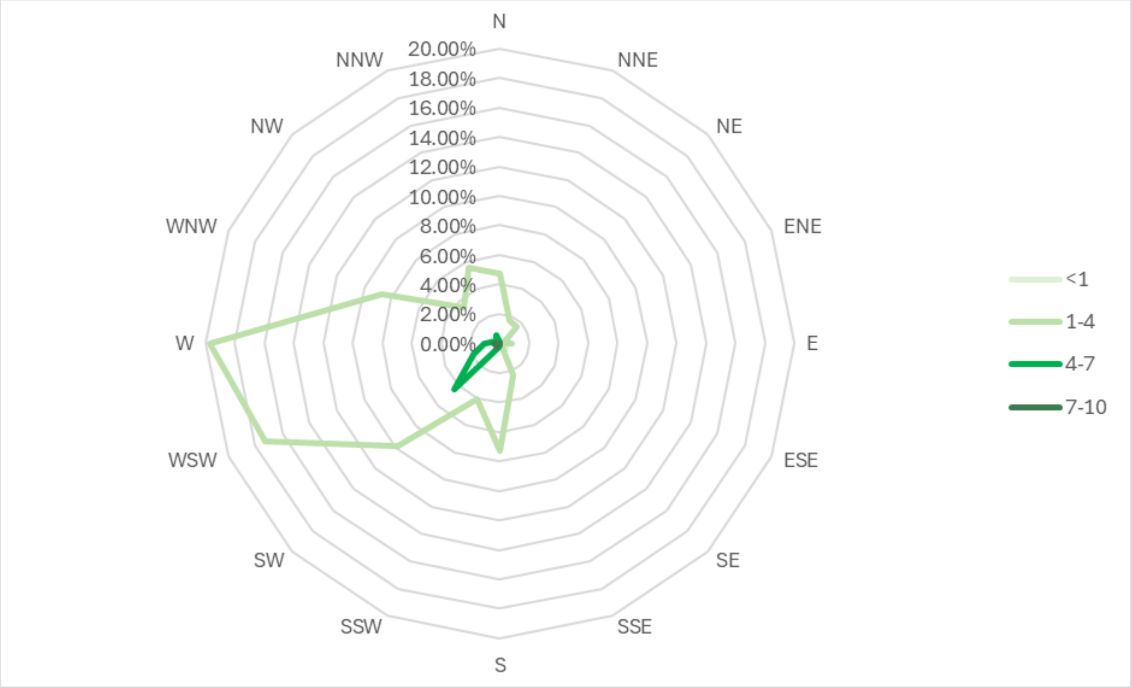

Figure 19: Wind speed (m/s) and direction (°) associated with Leisler bat passes recorded at the headland detectors

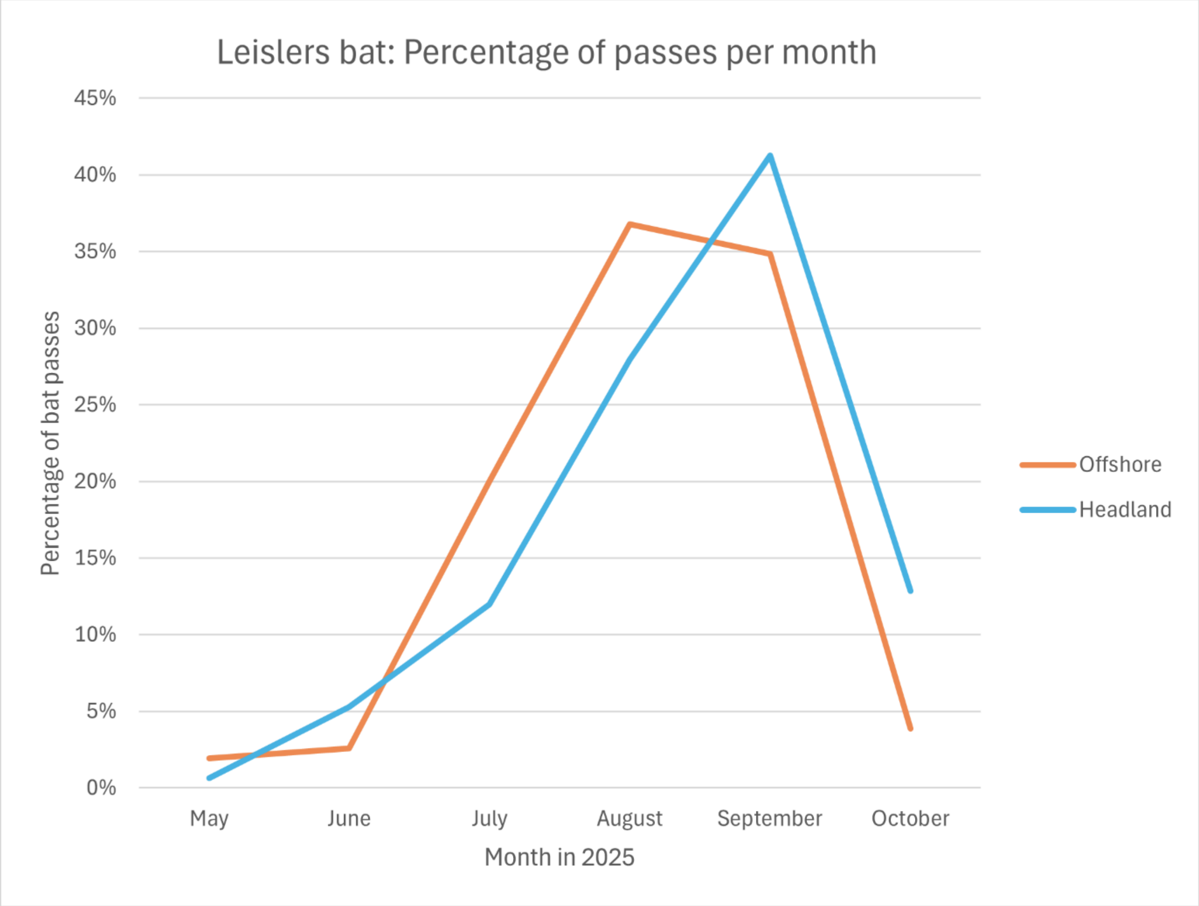

Figure 20: Leisler's onshore and offshore activity trends over time comparison (please note scale differences)

3.3.2. Pipistrelle activity

3.3.2.1. Nathusius' Pipistrelle activity

A total of 39,473 pipistrelle species passes were recorded during the 2025 survey period (refer to Table 3 Nathusius' pipistrelle activity)

Figure 21presents the overall activity of Nathusius' pipistrelle bat passes recorded at the headland detectors. Activity was highest at Seabank, accounting for 68% of all Nathusius' passes. Nearly half of all activity occurred in June, with passes recorded on 13 separate days during that month. There is no clear correlation between passes at the different headland locations. Figure 22shows Nathusius' bat activity was more sporadic in terms of wind direction preference but still showed a general preference for light (1–4 m/s) winds from the westerly direction, suggesting they also favour calmer conditions for foraging. There is a marked difference in the magnitude of calls recorded (offshore is a 7.2% comparison to onshore passes recorded), and this proportion should not be interpreted as elevated offshore activity. The percentage appears relatively high only because both offshore and onshore Nathusius' pipistrelle detections are low, especially when compared with the very high number of soprano pipistrelle detections recorded onshore. As a result, the offshore:onshore ratio reflects the small onshore dataset for this species rather than any meaningful concentration of Nathusius' pipistrelle offshore. Overall, Nathusius' activity levels were significantly lower than those recorded for other bat species discussed in this report, highlighting their comparatively limited presence within the survey area.

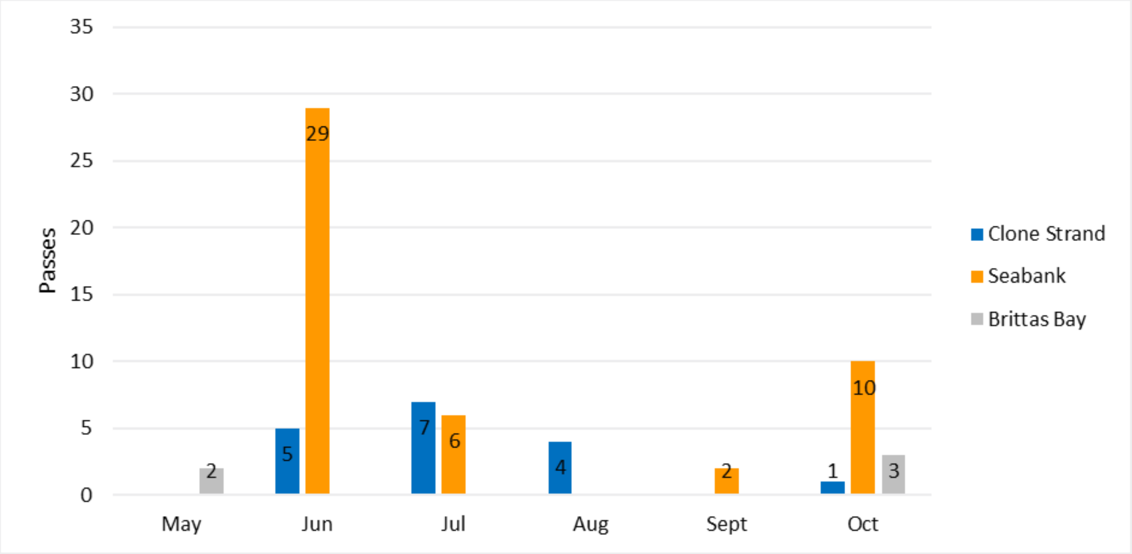

Figure 21: Nathusius' pipistrelle bat activity onshore across the deployment period at headland detectors

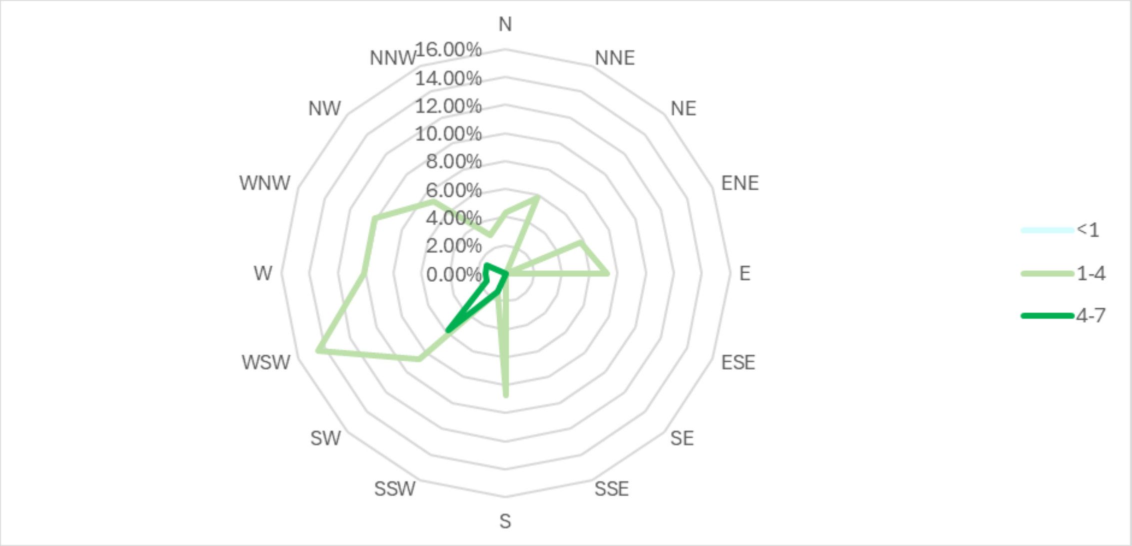

Figure 22: Wind speed (m/s) and direction (°)associated with Nathusius' pipistrelle passes recorded at the headland detectors

3.3.2.2. Common Pipistrelle activity

Figure 23 presents the overall activity of common pipistrelle bat passes recorded at each headland detector. Common pipistrelle activity made up 36.6% of all bat activity at the headland detectors with a total of 29,023 calls during the deployment period.

Despite the relatively high number of detections, there is no clear correlation between bat passes at different locations. Figure 24 shows common pipistrelle activity was highest under light (1–4 m/s) W to WSW winds. There is a marked difference in the magnitude of calls recorded (offshore common pipistrelle calls account for just 0.03% of all common pipistrelle calls during the 2025 deployment)), indicating that common pipistrelle bats are far more concentrated onshore, likely using headlands as commuting corridors or foraging locations.

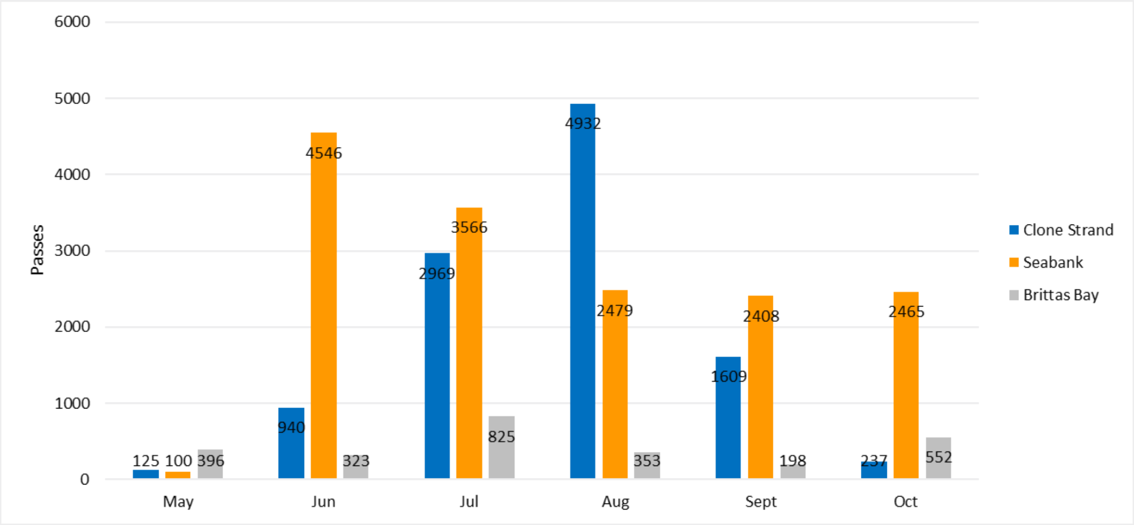

Figure 23: Common pipistrelle bat activity onshore across the deployment period at headland detectors

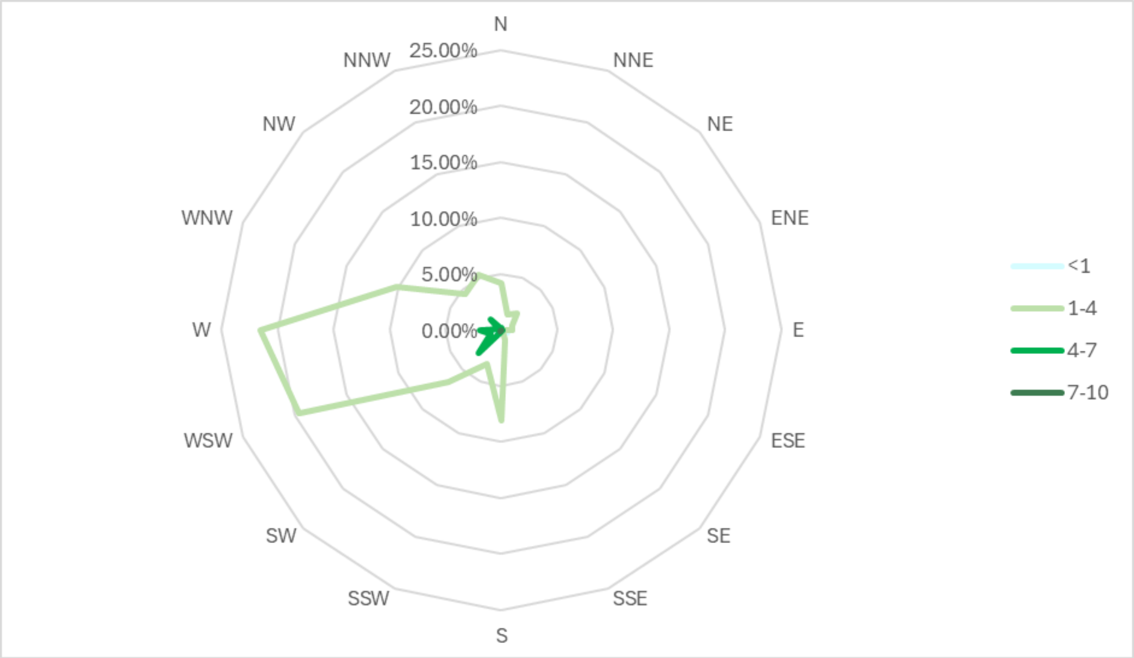

Figure 24: Wind speed (m/s) and direction (°) associated with common pipistrelle passes recorded at the headland detectors

3.3.2.3. Soprano Pipistrelle activity

Figure 25 presents the overall activity of soprano pipistrelle bat passes recorded at each headland detector. Interestingly, despite the shortened survey period in October, the soprano pipistrelle passes that month are the highest of the 2025 deployment. This is somewhat later than the peak activity period typically reported for this species (Russ et al., 2003). While this increase does not necessarily indicate a shift in overall population dynamics, it may reflect localized or short-term factors such as extended food availability or mild weather conditions. This observation underscores the variability in bat activity and suggests that occasional late-season activity can occur, even if it is not the dominant seasonal pattern. Figure 26 shows soprano pipistrelle activity was highest under light (1–4 m/s) westerly winds. There is a marked difference in the magnitude of calls recorded (offshore soprano pipistrelle calls account for just 0.02% of all soprano pipistrelle calls recorded during the 2025 deployment) , indicating that soprano pipistrelle bats are far more concentrated nearshore, likely using headlands as commuting corridors or foraging locations.

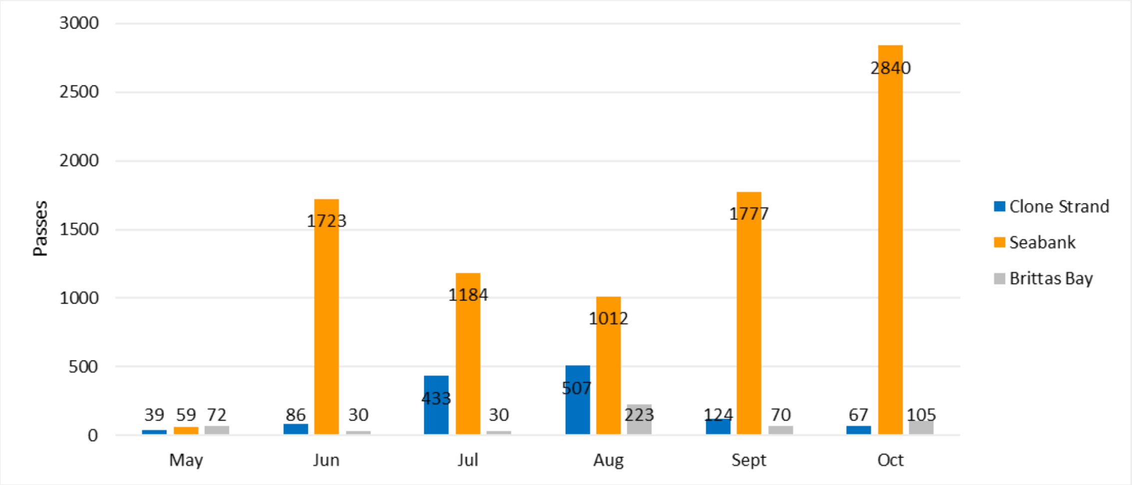

Figure 25: Soprano pipistrelle bat activity onshore across the deployment period at headland detectors

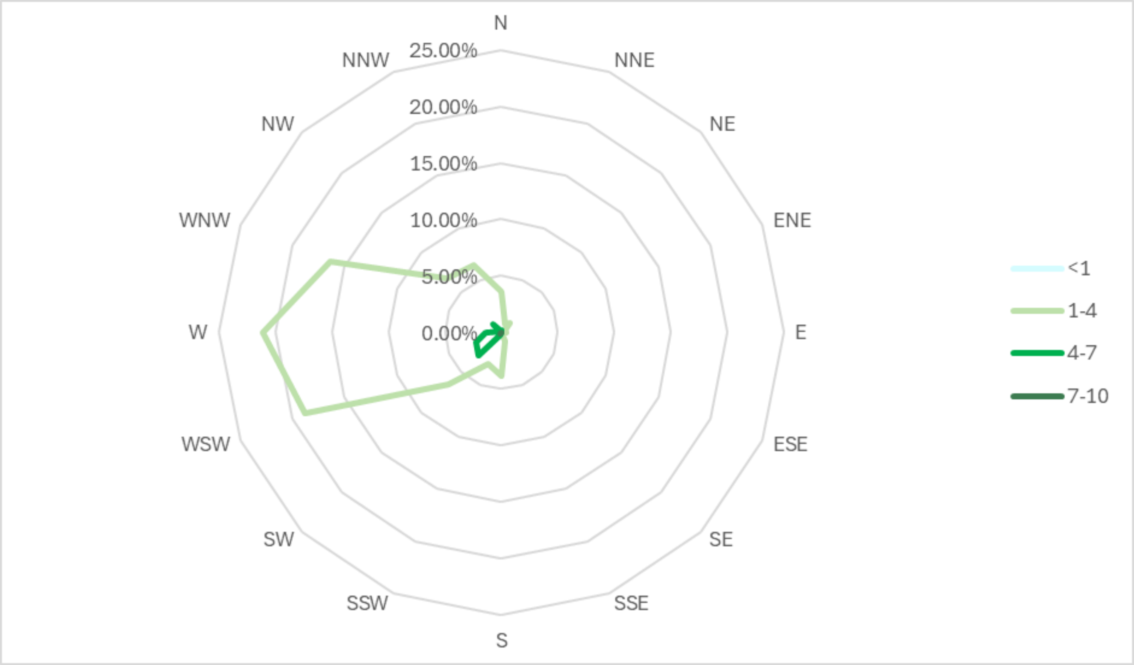

Figure 26: Wind speed (m/s) and direction (°) associated with soprano pipistrelle passes recorded at the headland detectors

Figure 27 presents a comparison of activity trends only, illustrating pipistrelle sp. activity trends recorded onshore at headland and offshore detectors. Unlike Leisler's activity, the temporal patterns between headland and offshore sites show limited alignment. While headland activity shows a clear seasonal pattern, offshore detections are relatively sporadic, as a result of the small number of offshore soprano detections, an individual can heavily influence the dataset and particularly the visualisation of the data.

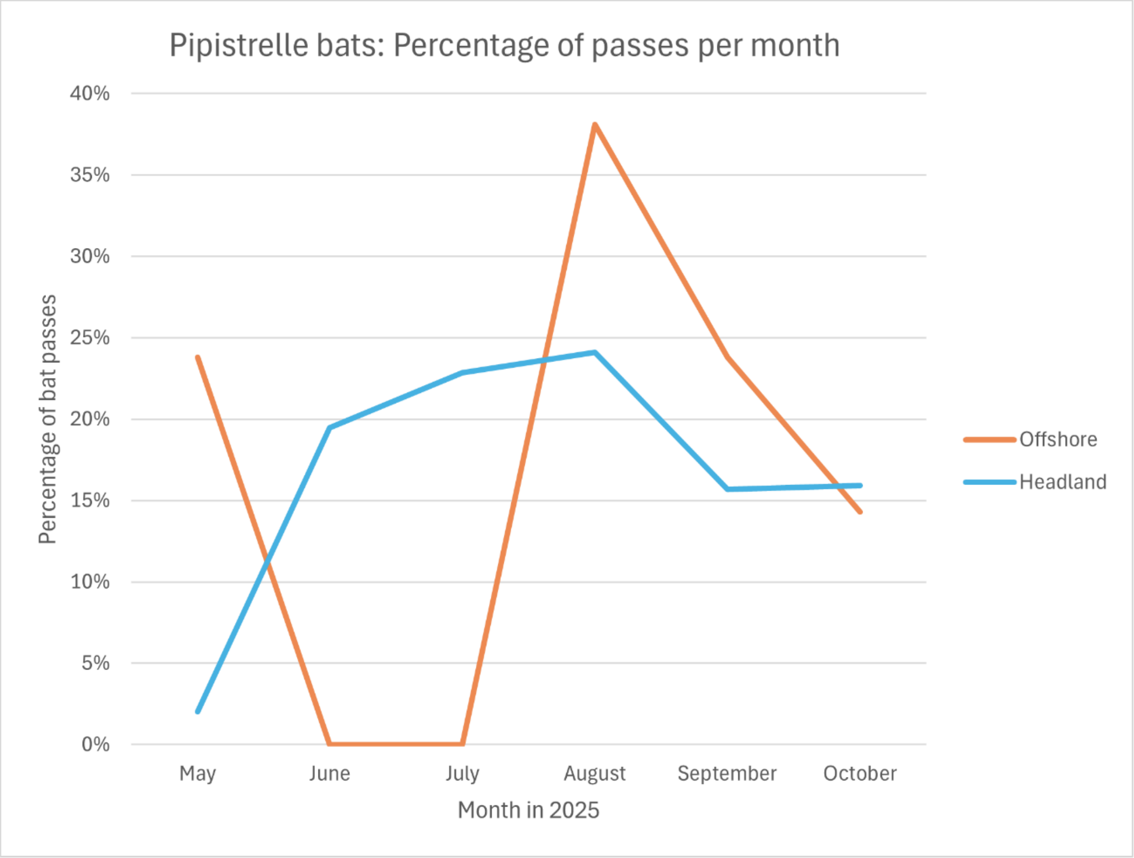

Figure 27: Pipistrelle onshore and offshore activity trends over time comparison (please note scale differences)

4. DISCUSSION

4.1. 2025

The 2025 survey recorded four species offshore: Leisler’s bat, Nathusius’ pipistrelle, common pipistrelle, and soprano pipistrelle. Leisler’s bat accounted for the majority of detections (88.7%), with activity observed on 21 days during the deployment period. Peaks occurred at turbine locations in July, August, and late September, but overall activity remained low compared to onshore sites. These patterns may indicate exploratory use of offshore structures, but interpretation should remain cautious given the small sample size despite the additional locations that were monitored offshore in 2025.

Pipistrelle species were detected infrequently offshore, with Nathusius’ pipistrelle recorded only five times and other pipistrelles detected sporadically. This suggests occasional offshore presence rather than regular or sustained activity. Offshore detections of pipistrelles are consistent with previous years, where activity has been low and sporadic.

Onshore monitoring recorded significantly higher levels of bat activity, with over 79,000 passes compared to 176 offshore. Leisler’s bat alone contributed nearly 39,000 calls onshore. This disparity indicates that headlands and coastal habitats are far more important for bats than offshore departures.

4.2. Comparison to previous years

Offshore detections remain low across all years surveyed (2021–2025), with Leisler’s bat consistently the most recorded species. Although 2025 shows a higher number of offshore detections than previous years, this increase is expected due to the greater number of offshore detectors deployed in 2025 (monopile + T1 + T7) rather than a true rise in offshore activity. Overall detections offshore remain very small compared to onshore activity, and interpretation should therefore rely on multi-year trends rather than single-year totals.

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Appendix A: Offshore detector locations

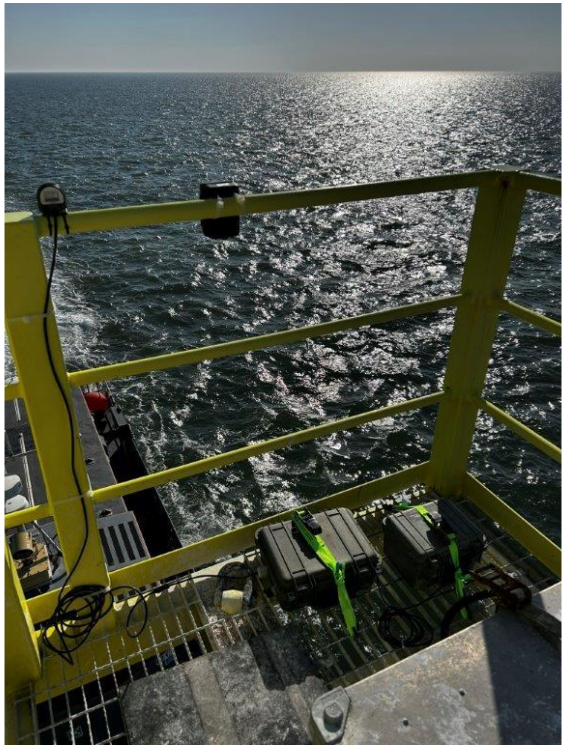

Plate 1: Example of monopile detector mounting

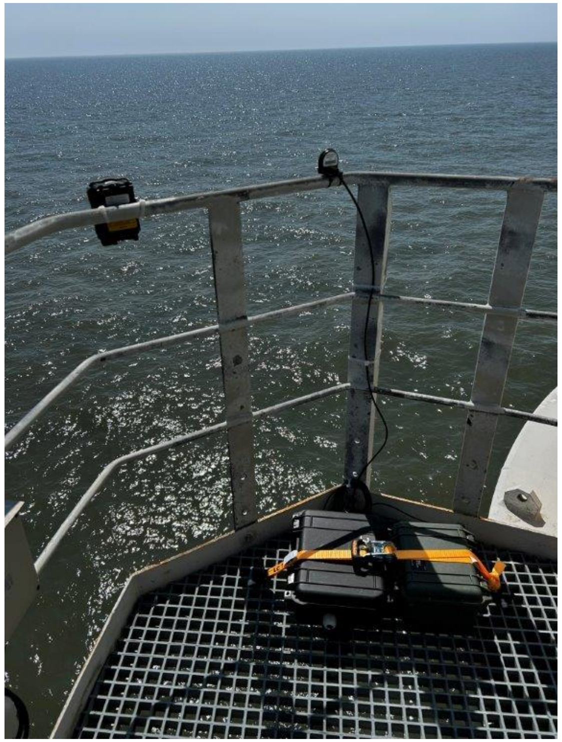

Plate 2: Example of turbine detector mounting

APPENDIX B: headland detector locations

Plate 1: D.01 Clone strand headland detector(s)

Plate 2: D.02 Seabank headland detector(s)

Plate 3: D.03 Brittas bay headland detector(s)