



Arklow Bank Wind Park 2

Environmental Impact Assessment Report

Volume III, Appendix 12.20: Offshore Ornithology Technical Report
- Migratory Bird Survey Report (RFI March 2026)

Arklow Bank Wind Park 2 (ABWP2)

Migratory Bird Survey Report 2025



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COMMERCIAL IN CONFIDENCE

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1.0	12/02/2026	Final submission	MRO	ML	ML



Statement of Authority

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Expert	Qualifications	Experience
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Expert	Qualifications	Experience
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Ryan Irvine	BSc Rural Surveying	<p>Ryan has worked on several offshore wind farm projects for GoBe, leading in the offshore ornithology and compensation workstreams. Prior to this, Ryan was a freelance Environmental Consultant in the UK, mainly carrying out survey work for birds and marine mammals on renewable, oil and gas, and nuclear projects. Ryan also worked as the Ornithology team leader at Gardline for over seven years, designing and managing the boat-based ornithological surveys for several offshore wind farm projects and oil and gas developments. Through this role, Ryan helped with the ornithological chapters of the EIA and HRAs for each project.</p>



Expert	Qualifications	Experience
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Expert

Qualifications

Experience

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Sean is an Associate Director and Offshore Wind Lead (Australia) for the APEM Group. He is an experienced ecologist, ornithologist and leader, having headed up major plans and projects and their impact assessments (particularly renewable energy projects) across the UK, Ireland, US, Australia and globally for over 20 years. He previously led APEM's ornithology team, undertaking ornithological EIAs for National Significant Infrastructure Projects and smaller scale projects (EclAs or ecological appraisals).

He continually embraces new and innovative methods of predicting potential impacts from proposed developments on key species and exploring new mitigation and compensation methods to reduce the impacts identified and adapting developments to both address species specific issues and overall impacts. He also has a wealth of experience in stakeholder engagement and communications, from leading community and specialist consultations to appearing as Expert Witness during planning inspections multiple times, an integral part of both managing individual projects and pursuing new business opportunities.



Expert

Qualifications

Experience

Katherine Cully

MSc Marine Systems and Policies

MA (Hons) International Relations

Katherine is an ornithological consultant with more than two years' experience in consultancy. She has experience working on the delivery of several large-scale EIA and HRA work streams for wind farm projects across the UK and Ireland. She has also been involved in derogation and compensation workstreams for several offshore wind farm projects.



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Acronyms

Term	Definition
ABWP1	Arklow Bank Wind Park 1
ABWP2	Arklow Bank Wind Park 2
DCCAE	Department of Communications, Climate Action and Environment
DCCE	Department of Climate, Energy and the Environment
HWM	High Water Mark
KM	Kilometres
km ²	Kilometres Squared
LAT	Lowest Astronomical Tide
m	Metres
MAC	Maritime Area Consent
NPWS	National Parks and Wildlife Service
OSP	Offshore Subunit Platform
OWF	Offshore Wind Farm
PAM	Passive Acoustic Monitoring
QA	Quality Assurance
RFI	Request for Information
SM4	Song Meter 4
SPA	Special Protection Area
SPL	Sure Partners Limited
VP	Vantage Point
WTG	Wind Turbine Generator



Executive Summary

Following receipt of the Request for Information (RFI) from An Coimisiún Pleanála and the submission received from the Development Applications Unit for the Arklow Bank Wind Park 2 offshore wind farm (the Proposed Development), GoBe Consultants Ltd. was commissioned by Sure Partners Ltd. to undertake migratory bird surveys to address points 12f and 12j in the RFI concerning a lack of site-specific migratory bird data for waders, waterfowl and terrestrial bird species.

The monitoring programme consisted of a combination of onshore diurnal Vantage Point surveys and data capture from one onshore and two offshore nocturnal Passive Acoustic Monitoring units to record the diversity and abundance (where possible) of migratory non-seabird species ('target species') in the vicinity of the proposed Array Area. This report presents an overview of the Vantage Point and onshore Passive Acoustic Monitoring data captured during the survey programme between early September and late November 2025, covering the full 2025 post-breeding (autumn) migratory season.

A total of 45 target species were recorded during the Vantage Point (VP) surveys, comprised of a minimum of 5,068 individual birds. Hirundine species, specifically house martin and swallow, were recorded in the highest numbers across the survey programme (n=2,362 and n=1,301 respectively), primarily due to a large movement of birds in early September. The next three most abundant species were black-tailed godwit (n=178), common scoter (n=152) and golden plover (n=116). The least abundant species recorded were pintail, pochard, whimbrel, hen harrier, merlin, grey wagtail and yellowhammer (all with n=1).

Of the target species recorded (excluding staging birds), 66.8% were flying south and 27.0% were flying north, either following the coastline or over open sea adjacent to the land. The only birds recorded flying west inland from the open sea were one grey wagtail, 14 redpoll, seven siskin, four skylark, eight swallow and one yellowhammer, equating to 5.3% the total target species flight records. One merlin and one peregrine were recorded flying east, equating to 0.9% of the flight records, as well as single wheatear recorded stationary on the headland at VP1.

A total of 62 nights of PAM data collected from the onshore monitoring unit at Wicklow Head were analysed, as well as 40 nights of offshore PAM data, covering the period of 29th August to 30th August, 1st September to 7th October and 10th to 13th November 2025. This dataset comprises 1,011 recording blocks. Of the 1,011 recording blocks processed, a total of 407 had good recording quality, 324 had moderate recording quality and 263 had poor recording quality. As such, detections can be assumed to be complete in 72.3% of the recording blocks analysed.

Nocturnal migration was dominated by passerines, with 17 species recorded, totalling 430 records comprising of an estimated 2,540 individuals. Waders were the next most numerous group of species, with 18 species recorded, totalling 237 records comprising of an estimated 329 individuals. Eight species of wildfowl and rails were recorded, comprising of 13 records of 36 individuals. While these species will migrate both by day and by night, it is considered that these records are all comprised of migrating birds.

Additional species were recorded, including barn owl, dunnoek, and raven. All of these should be considered residents, with the exception of barn owl, as they are known to occur in the Wicklow Head area.



1 Introduction

1.1 Project Aim and Document Scope

1.1.1 A request for information (RFI) was received from An Bord Pleanála (now referred to as An Coimisiún Pleanála), on 10 April 2025 in relation to Arklow Bank Wind Park 2 (ABWP2). This RFI stated the following under line items 12f and 12j, respectively:

RFI Reference	Content of request
12f	<p>Migratory Waterbirds: The EIAR and NIS make little or no reference to migratory waterbirds in general. The DAU notes that a significant number of migratory waterbirds (in terms of species and absolute numbers) migrate to and from Ireland across the Irish Sea. The south-east region comprises a large number of internationally important wetlands including North Wicklow Coastal Marshes, Cahore, Wexford Harbour and Slobs, Tacumshin, Lady’s Island and Ballyteigue which hold birds a large proportion of which, given their breeding ranges, migrate across the Irish Sea. These populations of waterfowl and waders originate from breeding areas largely to the East (continental Europe/Asia), North-East (Scandinavia) and North-West (Iceland). No information has been provided with respect to their migration patterns – including timings, flight altitudes, orientation and primary migration corridors.</p> <p>The DAU observation raises concerns in relation to surveying of migratory waterbird species during key migration times (i.e. spring and autumn). It is stated that coastal vantage point surveys are insufficient and that reliance on published literature does not provide detailed or precise data movements. The DAU has concerns that the proposed development has the potential to have significant impacts upon migratory waterbirds and the Conservation Objectives of the SPAs where they are listed. The DAU states that the applicant should have not only considered but implemented appropriate survey methodologies in order to detect and assess the level of bird migration through the proposed development area, working collaboratively with other Irish Sea ORE applicants.</p> <p>The VP (vantage point) survey results submitted by the applicant have spatial limitations in terms of robustness and have not been used in quantifiable assessments. There is also limited information on flux or passage of birds through the proposed array area itself during migration (east-west and north-south).</p> <p>Having reviewed all the information presented, the Board is of the view that impacts to migratory species have been insufficiently assessed. The applicant is requested to address the purported data gap to enable the assessment of potential impacts of the proposed development on migratory birds. Radar (horizontal and vertical surveys) (or similar) at the array area during peak migration periods should be utilised to provide site-specific data, which could be used to support the applicant’s current assessment and provide quantitative information on the passage of birds to feed into collision modelling. Should radar not be conducted and an alternative survey methodology utilised, comprehensive justification for the alternative should be provided. Peak migration periods during which data are to be collected can be further informed through review of existing data and published literature</p>



RFI Reference	Content of request
	<p>relevant to the project area and region. Whilst the DAU makes reference to the key migration times being spring and autumn, the Board considers that migration information during the winter months would also be of assistance to the assessment (e.g. irruptive cold weather movements from the continent and UK). The applicant is invited to consider this aspect for inclusion also. The applicant should note reliance on literature to fill knowledge gaps, while useful, does not provide adequate data to ensure a comprehensive assessment of potential effects on birds.</p>
12j	<p>Terrestrial Bird Species: The DAU consider there to be deficiencies in the assessment of land-based avifauna, with CRM data based on general assumptions and omission of migrant non-seabird species.</p> <p>The DAU recommends additional data and consideration of survey/monitoring options such as: targeted deployment of passive acoustic devices at headlands and offshore nocturnal boat transects; review of available ringing/tracking data for migratory species and/or species which are known/likely to conduct staging/dispersal movements; and use of thermal imaging devices (hand-held/drone) surveys targeted at likely peak periods of passage.</p> <p>The Board requests that further assessment is carried out regarding impacts on terrestrial bird species. The applicant is requested, having regard to the above comments to address the purported data gap and potential impacts of the proposed development on terrestrial birds.</p>

- 1.1.2 On this basis and to respond to the RFI, GoBe Consultants Ltd. (GoBe) was commissioned by Sure Partners Ltd. (SPL) (“the Developer”) to undertake migratory bird surveys to address RFI points made in line items 12f and 12j (see the associated Migratory Bird Survey Methods Review (GoBe Consultants, 2026)).
- 1.1.3 The surveys consisted of a combination of onshore diurnal Vantage Point (VP) surveys and both onshore and offshore nocturnal Passive Acoustic Monitoring (PAM) to record the diversity and abundance (where possible) of migratory bird species in the vicinity of the proposed ABWP2 Array Area.
- 1.1.4 This report presents an overview of the data that have been captured between early September and late November 2025, covering the full 2025 post-breeding migratory season. The survey period and associated results reflect what was feasible to capture, analyse, report on and consider in the necessary timeframe in order to support the response to the RFI.



1.2 Proposed Development Background

- 1.2.1 ABWP2 is an offshore wind farm (OWF) located off the coast of Co. Wicklow and Co. Wexford on the east coast of Ireland. A Maritime Area Consent (MAC) (Ref 2022-MAC-002) was granted in December 2022 for the construction and operation of an OWF and associated infrastructure (including decommissioning and other works) on and around the Arklow Bank in the Irish Sea. Collectively, the constituent parts of ABWP2 seaward of the high-water mark (HWM) are hereafter referred to as “Proposed Development”.
- 1.2.2 The Proposed Development comprises of an Array Area (the area within which the Wind Turbine Generators (WTGs), the Offshore Subunit Platforms (OSPs) and associated cables (export, inter-array and interconnector cabling) and foundations will be installed, as well as an (export) Cable Corridor and Working Area. The overall Proposed Development site area is 139.4 kilometres squared (km²). The Array Area is located approximately 6 km to 15 km off the east Irish coast and covers an area of 63.4 km². The Cable Corridor and Working Area extend from the Array Area to the HWM at Johnstown North, north of Arklow Town, Co. Wicklow, where the offshore export cables make landfall (the “Landfall Site”). The area of the Cable Corridor and Working Area is 76.0 km².
- 1.2.3 An application for the Proposed Development was made to An Bord Pleanála (now referred to as An Coimisiún Pleanála) in June 2024 with a RFI subsequently received in relation to that application on 10 April 2025. This document has been prepared to support the response for the RFI.



2 Methodology

2.1 Statement of Authority

- 2.1.1 All VP survey work has been undertaken by local subcontractors Niall Keogh, Cian Cardiff and Nick Veale. All are extremely experienced professional ornithologists with an in-depth knowledge both of Ireland's bird species (including abundance, distribution and conservation status) and environmental legislation pertaining to birds in Ireland, as well as the survey methods employed and the equipment used.
- 2.1.2 Analysis of PAM data was led by Mark Lewis and Ryan Irvine, both of whom have extensive experience in analysis of bioacoustic data for birds using Audacity (a free audio editor and recording application) and excellent knowledge of the nocturnal vocalisations of European birds.

2.2 VP and PAM Combination Rationale

- 2.2.1 This section provides an overview of the rationale for the use of VP and PAM methodologies. For further information, including justification for the selection of these methods in favour of others such as the use of radar, please refer to the associated report that has been prepared to support the RFI response on Migratory Bird Survey Methods (GoBe, 2025). These methods have been considered within the context of the Department of Communications, Climate Action and Environment (DCCA) (2018) guidance.
- 2.2.2 Birds will often migrate at night owing to the usually cooler, calmer weather conditions resulting in lower energy expenditure (Komal *et al.*, 2017), the increased potential for predator avoidance (Lank, 1989), and the ability to make the most of diurnal foraging opportunities (Brewster, 1886). Some bird species are also known to use celestial orientation to aid them in nocturnal navigation during migratory flights (Åkesson *et al.*, 1996). Indeed, while the percentage split varies depending on location and regional species composition, higher numbers of bird species will migrate at night as opposed to during the day, with smaller species, such as passerines, in particular favouring nocturnal conditions (Alerstam, 1993; Berthold *et al.*, 2013).
- 2.2.3 However, some groups such as waders and larger species of wildfowl may undertake both nocturnal and diurnal migration journeys. For waders, a driving factor is thought to be in response to reduced foraging opportunities. This can stem either from high tides during the day that reduce access to foraging grounds such as mudflats, or at night from low foraging success in darkness (Lank, 1989). For large species of wildfowl, such as geese, diurnal migration may be undertaken owing to their use of visual landscape cues to aid navigation (Wege and Raveling, 1983) as well as their lower susceptibility to predation due to their size. Habitat specialism may also drive waders and wildfowl to migrate both during the day and at night as they move across large swathes of habitat without suitable foraging opportunities (Van Gils *et al.*, 2005; Komal *et al.*, 2017).



2.2.4 Nocturnal PAM surveys allow for the capture of vocalising migratory species passing within the vicinity of the acoustic recorders. The VP surveys were designed to complement the PAM surveys by allowing for the capture of data on any species undertaking diurnal migration flights, including those arriving early in the morning after setting off under the cover of darkness. Moreover, the VP surveys allowed for the recording of behavioural data such as flight height and direction, as well as number of individuals, which cannot be inferred with any degree of precision from sound recordings.

2.3 VP Surveys

2.3.1 VP surveys were undertaken on a weekly basis, where possible, between early September and late November comprising of a six-hour watch from each of the two VP locations; VP1 and VP2. The VP survey locations were situated on headlands to the west of the Proposed Development with a good view of the surrounding habitats (up to 5 km offshore) within the vicinity of the Proposed Development. VPs were located at the following locations (shown in Figure 2.1):

- **VP1:** Wicklow Head (52.96579361, -5.99838304) north-west of the northern end of the array area; and
- **VP2:** Kilmichael Point (52.73609081, -6.14169837) west of the southern portion of the array area.

2.3.2 Should a collaborative approach be deemed appropriate by Phase 1 projects, then data collected during these surveys would be appropriate for use in contextualising regional bird migration for other Phase 1 projects. For the purpose of this report, whilst the application documentation has been considered, further data were not available from other Phase 1 projects on migratory birds at the time of preparing this report and thus only project and site-specific data was available in response to the RFI.

2.3.3 Watches commenced at sunrise and were split into two parts, each lasting three hours with a 30-minute break in between to avoid surveyor fatigue in line with NatureScot onshore wind survey guidelines (NatureScot, 2025). The surveys were designed to capture data on both nocturnal migrants arriving early morning (after setting off under the cover of darkness), as well as diurnal migrants. This survey design focussing on the morning was considered the most appropriate when considering that the PAM units record from sunset to sunrise, so will capture data on any migratory species moving at dusk. Moreover, diurnal migrants are more likely to move in the morning hours and use the afternoon for foraging (Newton, 2023). In addition, as the day lengths get shorter as the survey period progresses, the six-hour surveys will naturally cover a higher percentage of daylight hours.

2.3.4 Target species were defined as all waders, waterfowl and terrestrial bird species passing over or perpendicular to the coast in direct flight (i.e., considered to be on migration) to address the RFIs detailed in Section 1.1.1. All VP surveys were undertaken during suitable weather conditions conducive to migration, avoiding surveying during blocking winds (i.e., those blowing in the opposite direction to the majority of migrating birds) and heavy precipitation, both of which impair migratory rates. VP visit dates and environmental conditions are presented in Table 2.1.



2.3.5 Flight height and distance bands were estimated using known geographical features (e.g., Wicklow Head cliffs extend to approximately 60m in height), as well as surveyor experience/ professional judgement.

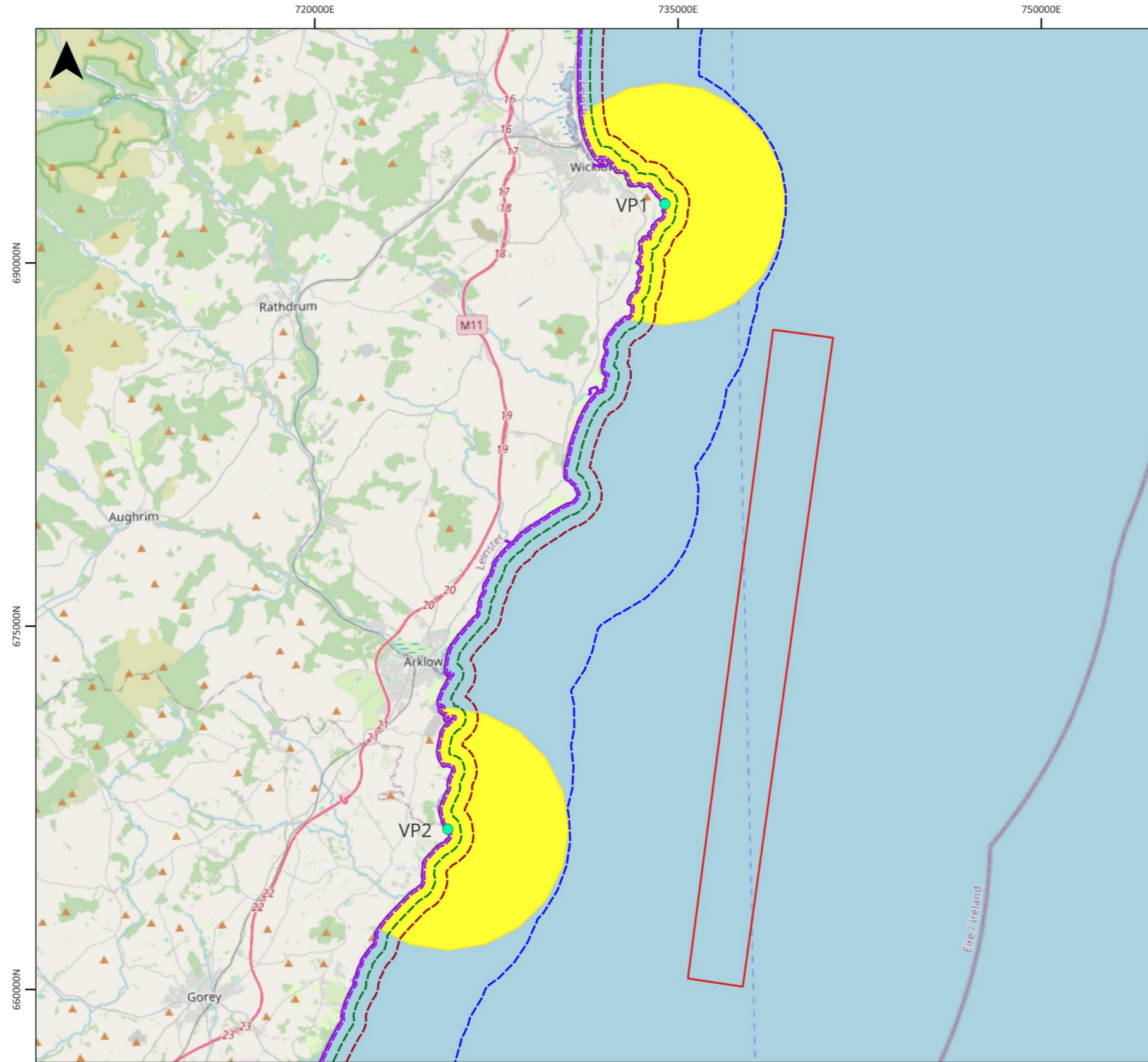
2.3.6 Surveyors used a combination of binoculars and a telescope to record migrating birds, noting the following for each record:

- Species;
- Abundance;
- Hour of record;
- Direction of flight;
- Vocalisations;
- Age (where possible);
- Sex (where possible);
- Behaviour;
- Flight height band¹ (m); and
- Distance offshore band² (m / km) (Figure 2.1).

¹ A: 0-5 m; B: 5-20 m; C: 20-40 m; D: 40 m+ (noting any at 375 m +).

² A: 0-100 m; B: 100-500 m; C: 500-1,000m; D: 1-5 km; E: 5 km+.





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P18383

Vantage Point Survey Locations

Legend

- Vantage Point Survey Locations
- Offshore Distance Band A
- Offshore Distance Band B
- Offshore Distance Band C
- Offshore Distance Band D
- Vantage Point Viewing Arcs
- ABWP2 Proposed Array Area



Scale: 1: 218,000 Date: 12/02/2026 Drawn by: MR

Coordinate System:
IRENET95 / Irish Transverse
Mercator

Basemap: OpenStreetMap © URL:
<https://www.openstreetmap.org/copyright>

Figure 2.1 Vantage Point Survey Locations



Table 2.1 VP visit dates, times and environmental conditions (early September to late November 2025)

Location	Visit	Date	Sunrise	Start time	End time	Start wind speed (BF ³)	End wind speed (BF)	Start wind direction	End wind direction	Start rain	End rain	Start temp. (°C)	End temp. (°C)	Start visibility	End visibility	Start cloud cover (x/8)	End cloud cover (x/8)	Start Douglas sea state ⁴	End Douglas sea state
VP1	1	05/09/25	06:41	06:40	13:10	3	3	NE	N	None	Light	10	17	Good	Good	2	7	2	3
VP2	1	01/09/25	06:37	06:30	13:00	4	4	W	W	None	None	14	16	Good	Good	7	5	1	1
VP1	2	12/09/25	06:53	06:53	13:23	3	3	WSW	WSW	None	None	9	14	Good	Good	3	2	2	2
VP2	2	11/09/25	06:52	06:52	13:22	3	4	SSW	SW	None	None	11	15	Good	Good	1	3	2	3
VP1	3	18/09/25	07:03	07:00	13:30	2	2	E	E	Very light	None	11	18	Good	Good	4	6	1	1
VP2	3	15/09/25	07:00	07:00	13:30	4-5	4-5	W	W	None	None	11	15	Good	Good	8	8	5	4
VP1	4	22/09/25	07:11	07:10	13:40	2	2	NW	NNW	None	None	7	13	Very good	Very good	0	3	2	2
VP2	4	26/09/25	07:28	07:18	13:48	< 1	3	Variable	SE	None	None	8	16	Good	Very good	1	4	1	2
VP1	5	07/10/25	07:37	07:30	14:00	2	2	S	S	None	None	11	14	Good	Good	5	7	1	2
VP2	5	02/10/25	07:29	07:29	14:00	4	4-5	S	SW	None	Light	10	14	Good	Good	8	8	6-7	6-7

³ **Beaufort scale** **Wind speed (km)** **Wave height (m)** **Wind and sea description**

0	<1	0	Calm, glassy
1	1-3	0	Light airs, glassy
2	4-6	0.1	Light breeze, smooth
3	7-10	0.4	Gentle breeze, slight
4	11-16	1	Moderate breeze, slight to moderate
5	17-21	2	Fresh breeze, moderate
6	22-27	3	Strong breeze, rough
7	29-33	4	Moderate gale, rough to very rough
8	34-40	5.5	Fresh gale, rough to high

⁴ **Sea state** **Wave height (m)** **Description**

0	no wave	Calm (Glassy)
1	0-0.10	Calm (rippled)
2	0.10-0.50	Smooth
3	0.50-1.25	Slight
4	1.25-2.50	Moderate
5	2.50-4.00	Rough
6	4.00-6.00	Very rough
7	6.00-9.00	High
8	9.00-14.00	Very high
9	>14.00	Phenomenal



Location	Visit	Date	Sunrise	Start time	End time	Start wind speed (BF ³)	End wind speed (BF)	Start wind direction	End wind direction	Start rain	End rain	Start temp. (°C)	End temp. (°C)	Start visibility	End visibility	Start cloud cover (x/8)	End cloud cover (x/8)	Start Douglas sea state ⁴	End Douglas sea state
VP1	6	10/10/25	07:43	07:43	14:13	2	2	W	WNW	None	None	9	11	Good	Good	5	8	2	2
VP2	6	08/10/25	07:39	07:30	14:00	2	2	W	W	None	None	10	13	Good	Good	3	2	2	1
VP1	7	14/10/25	07:51	07:51	14:21	1	2	N	NNE	Very light	None	11	13	Moderate	Good	8	8	1	1
VP2	7	14/10/25	07:50	08:00	14:30	3	3	E	E	None	Very light	10	14	Good	Good	8	8	2	3
VP1	8	24/10/25	08:07	08:00	14:30	3	3 to 4	SW	W	None	Showers	8	9	Good	Good	7	7	2	2
VP2	8	21/10/25	08:02	08:00	14:30	3	3	W	W	None	None	8	14	Good	Good	8	6	2	2
VP1	9	09/11/25	07:35	07:35	13:25	2	2	SSW	SW	Light	None	13	14	Good	Excellent	8	8	2	2
VP2	9	28/10/5	07:15	07:00	13:30	3	3	W	W	None	Very light	9	11	Excellent	Excellent	7	4	2	2 to 3
VP1	10	11/11/25	07:40	07:40	14:20	4	5	S	SSW	Rain	Heavy rain	9	11	Moderate	Moderate	8	8	4	5
VP2	10	05/11/25	07:29	07:30	14:00	3	3	S	S	Showers	None	11	14	Moderate	N/A	8	4	5	4
VP1	11	20/11/25	07:57	08:00	14:30	4 to 5	4 to 5	NW	NW	None	None	3	4	Excellent	Excellent	2	1	4	4
VP2	11	12/11/25	07:42	07:30	14:00	2	2	N	N	None	Constant, heavy	10	11	Excellent	Poor	8	8	2	2
VP1	12	25/11/25	08:05	08:00	14:00	4	2	NW	W	None	None	6	8	Excellent	N/A	4	4	3 to 4	2
VP2	12	17/11/25	07:50	07:30	14:00	4	3	NE	NE	None	None	7	8	Excellent	Excellent	6	5	2	2
VP2	13	26/11/25	08:06	08:00	14:30	5	3	S	SW	Very light	None	10	12	Good	N/A	8	4	5	3

Table note: There was no visit 13 to VP1 due to inclement weather conditions at the end of November 2025.



2.4 PAM Surveys

2.4.1 Acoustic data have been captured during nocturnal hours (as defined by sunset and sunrise times) using Song Meter 4 Acoustic Detectors (SM4s). The SM4s were deployed at three locations within the vicinity of the Proposed Development. One unit was situated onshore on a headland north-west of the Proposed Development and two units were deployed offshore within the Proposed Development Array Area (Figure 2.2), as follows:

- **Onshore PAM:** Wicklow Head (52.96579361, -5.99838304) north-west of the northern end of the Array Area;
- **Offshore PAM 1:** Within the northern section of the Proposed Development Array Area (52.88544917, -5.92342806) on the existing Arklow Bank Wind Park 1 (ABWP1) OWF Met Mast; and
- **Offshore PAM 2:** Deployed centrally within the Proposed Development Array Area (52.80782291, -5.94291936) on the existing ABWP1 WTG T7 which was the most southerly location available within the Array Area.

2.4.2 Note that, given the offshore location and associated wind and wave noise interfering with the audio recordings, the offshore PAM data from the period early September to mid-October 2025 were assessed for their quality and were deemed unsuitable for analysis. Therefore, onshore PAM data only from this period is presented herein.

2.4.3 Data from the SM4s were analysed manually using Audacity, which is free software for visualising and editing audio recordings. Audacity is widely used for bioacoustic data analysis, and especially for nocturnal bird recordings, as there is an abundance of software-specific guidance available in the public domain that details how best to set up the software for this task.

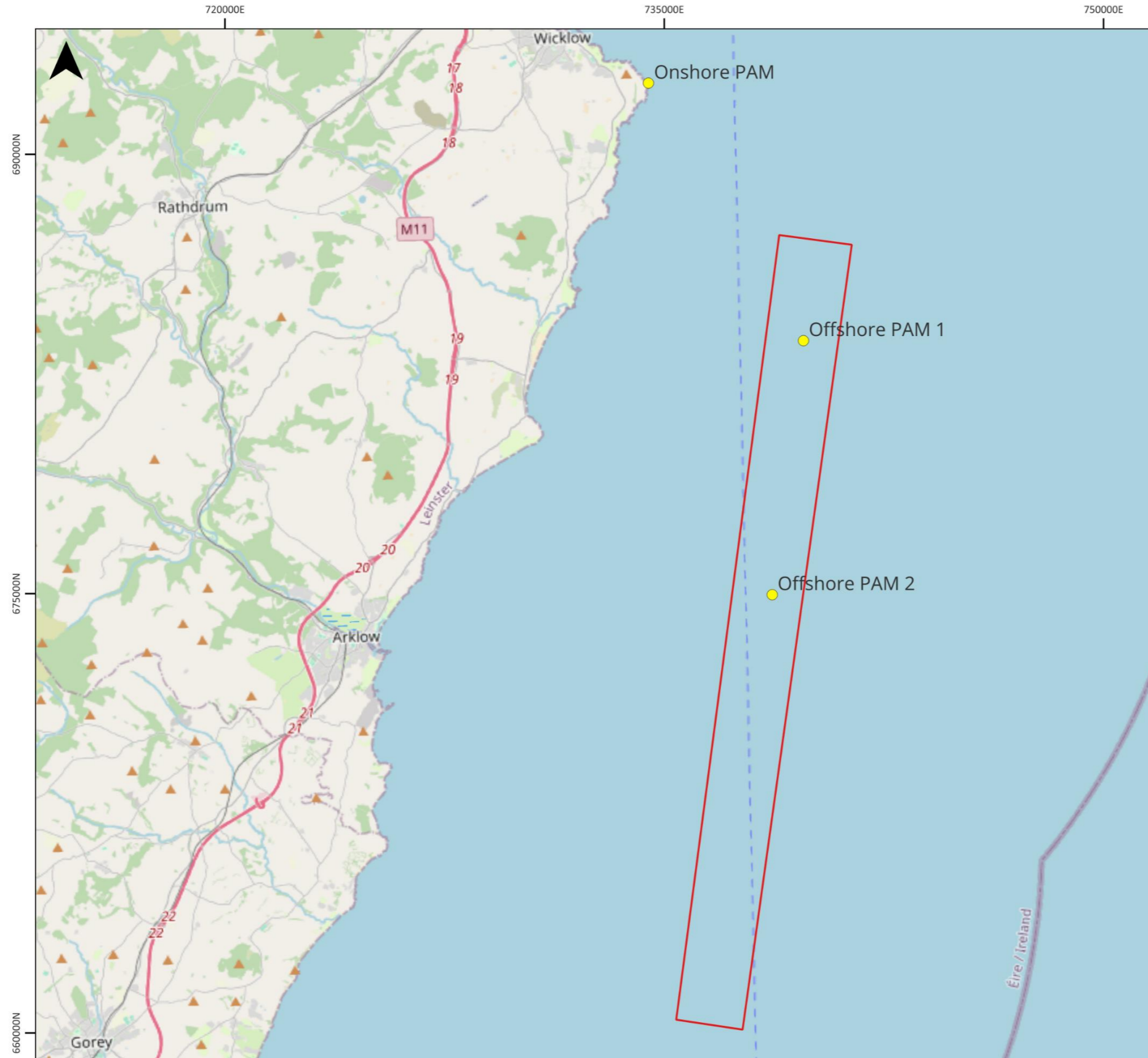
2.4.4 Tracks were uploaded into Audacity, with spectrograms (graphical representations of the audio content of the file) scanned by experienced bioacoustic analysts visually to locate vocalisations. For each detection, the species identification was informed by both the spectrogram and the audio, whilst for each vocalisation event detected the following were recorded:

- Key – a unique identifier for each record, recorded as a sequential number;
- Project – the relevant development;
- Recorder – a unique identifier for the three recorders deployed;
- Location – the location of the recorder;
- Date – the date at the start of the hour-long recording block;
- Time – the time at the start of the hour-long recording block;
- Species – the species, or species group, that the vocalisations are from;
- Number of calls – the number of calls made. In species where calls are made up of compound sounds (e.g., the three-note call of a redshank *Tringa totanus*), each phrase (i.e., collection of three notes) was counted as one call;
- Best estimate – how many individual birds the analyst thinks were involved; and
 - QA file – a link to a clip of the recording so that the record can be quality assured (QA).



- 2.4.5 Quality assurance (QA) was carried out by randomly selecting 20% of observations and checking that the identification made by the analyst matches that made at the QA stage. If there was $\geq 10\%$ discrepancy between the identifications made during analysis and QA, the whole batch was re-analysed. Where identifications did not match, or the identification was up for debate, the identification was discussed amongst the selected experts, as detailed in Section 2.1.2. The QA process for the data analysis was considered complete when no discrepancies existed between analysts' identifications, either through analysts agreeing to change the species identification, or agreeing a lower taxonomic rank (e.g., 'gull spp.').
- 2.4.6 The SM4 recorders output audio files of one hour (or less, when the sunrise time on a given date has been reached). Each audio file is hereafter referred to as a recording 'block'. During analysis, each recording block was assigned a level of recording quality (either 'Good', 'Moderate', or 'Poor') as a broad indication of the audio quality that was reviewed. The quality varied with the environmental conditions (strength of wind and amount of rain), with high levels of either having the potential to compromise the ability of the analyst to detect bird vocalisations within the recording. Recording blocks with high levels of wind and/ or rain are classified herein as being of 'Poor' quality. Detections were assumed to be complete in both recording blocks with both 'Good' and 'Moderate' recording quality.





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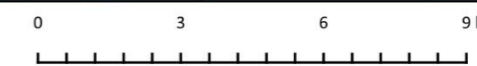
ABWP2: Migratory Bird Survey Report 2025

P18383

Passive Acoustic Monitoring Survey Locations

Legend

- PAM Locations
- ABWP2 Proposed Array Area



Scale: 1: 180,000 Date: 12/02/2026 Drawn by: MR

Coordinate System:
IRENET95 / Irish Transverse
Mercator

Basemap: OpenStreetMap © URL:
<https://www.openstreetmap.org/copyright>

Figure 2.2 Passive Acoustic Monitoring Survey Locations



2.5 Limitations

- 2.5.1 Weather windows and logistics played an important role in the selection of VP surveys dates as well as PAM deployment and maintenance visits, particularly for the offshore PAM units. Selecting dates with suitable weather and sea conditions during autumn and early winter can be challenging from a health and safety perspective, when considering that personnel are required to undertake climbing on existing offshore infrastructure to perform routine maintenance on the PAM units which also requires specific weather and tidal conditions to facilitate safe vessel passage on Arklow bank. Moreover, these dates were further limited by the availability of climbing equipment and qualified personnel with the ability to access the existing ABWP1 infrastructure on which the offshore PAM units were deployed. These inherent logistical challenges and associated costs, to undertake offshore monitoring, can be considered minor limitations to the survey programme given that offshore deployment and maintenance visits were frequently postponed. However, these logistical challenges have not resulted in any data gaps or data loss.
- 2.5.2 When considering the poor weather limitation discussed above, the Week 7 VP surveys were both undertaken on the same date due to constraints related to suitable weather windows. While undertaking the VP surveys on different dates is preferable to avoid the risk of double-counting species, given the distance between the two VP locations (*circa* 27 km), the risk was deemed to be minimal. Moreover, anecdotal evidence from the surveyors indicated that while birds may be recorded at one area of coastline, they will not necessarily be recorded further along the coast by other surveyors. This can be due to migrating birds either changing flight trajectory between the two VPs, or birds landing to rest or forage. Therefore, the VP dataset is still considered to be both robust and fit for purpose.
- 2.5.3 The detection of birds can be limited by environmental conditions (i.e. visibility) and by species, as detection rates will decay with distance from shore, especially for smaller species such as passerines. Therefore, detection rates within the 5 km viewshed may differ between species. The decline in detection rates with distance from shore is likely to be a product of the methodology but is also likely to comprise, to some degree, a reduction in the number of birds involved as well. From the data collected, it is not possible to ascertain to what degree each of these factors acts upon the dataset.
- 2.5.4 Results from the PAM survey specifically (and PAM data in general) should be considered within the context of the following limitations;
- PAM is only effective for those birds that vocalise audibly while migrating; and
 - Certain species such as warblers tend not to vocalise while migrating and, therefore, even with best efforts PAM could be an incomplete picture of migration at any given time.
- 2.5.5 However, warblers will often vocalise once landed and can be picked up by the onshore PAM unit. This is evidenced by, for example, the chiffchaff *Phylloscopus collybita* records presented in Table 3.36.
- 2.5.6 Likewise, birds that are flying too high for their calls to be detected by the PAM recorders would also be missing from the data capture and any associated analysis. However, it can be inferred using expert judgement that any birds flying at this height, especially louder species such as geese, would likely be flying above collision risk height.



2.5.7 For each audio detection, limited information is available. The number of birds involved can only be estimated and there is no information on the direction of travel (unless a full array of PAM devices is deployed). Likewise, there is no means of determining the flight height of any birds detected. To mitigate this, it is assumed that to be detected a bird would have to be at or below Flight Height Band D¹ (40 m+). Therefore, as a precautionary measure, detections of all birds (including those likely to be below Flight Height Band D) will be considered as flying at Flight Height Band D. Note that, at the time of the surveys, the surveyors were not aware of the tip height. However, this is confirmed at 37 m above lowest astronomical tide (LAT) and, for the purposes of this report, rotor swept height has been assumed as height bands C (20-40 m) and D (40 m+) as a precautionary approach.



3 Results

3.1 VP Surveys

- 3.1.1 A total of 45⁵ target species were recorded from 228 records (defined as per sighting, either of a single bird or a flock) across both VP locations, which have been estimated to comprise of a minimum of 5,068 individual birds. Hirundine species, specifically house martin and swallow, were recorded in the highest numbers across the survey programme (n=2,362 and n=1,301, respectively), primarily due to a large movement of birds in early September. The next three most abundant species were black-tailed godwit (n=178), common scoter (n=152) and golden plover (n=116). The least abundant species recorded were pintail, pochard, whimbrel, hen harrier, merlin, grey wagtail and yellowhammer (all with n=1).
- 3.1.2 A total of 4,107 birds were recorded from VP1 compared with 961 at VP2. The highest number of birds recorded at each VP was during Visit 1 at VP1 (5th September, n=3,205) and Visit 2 at VP2 (11th September, n=535), with large hirundine movements recorded on both these dates. If the swallow and house martin records from VP1 Visit 1 are removed, the total birds recorded at VP 1 would be 907 across all visits. Similarly, if the sand martin, swallow and house martin records are removed from VP2 Visit 2, the total birds recorded at this VP would be 586 across all visits. Therefore, it can be inferred that timing and calm environmental conditions being conducive to migration are more important than headland location when it comes to recording migratory birds. This is despite VP1 at Wicklow Head being the most easterly point in the Republic of Ireland and, in theory, an ideal location from which to record birds migrating along the coast and in the offshore environment.
- 3.1.3 Of the total 228 target species records from both VPs, 212 were able to have their flight heights estimated within the pre-defined bands¹, while 226 had their distance offshore estimated in the same way². These results are presented in Table 3.1 and Table 3.2, respectively. Flight heights recorded were primarily within Bands A and B, with 15 records in Band C and five in Band D. Similarly, the bulk of the records were within offshore distance bands A to C (i.e., within 1 km of the coast). There were eight records beyond this distance, comprising a total of 37 common scoter *Melanitta nigra* and two great crested grebe *Podiceps cristatus*.
- 3.1.4 Records of target species⁶ recorded either as a flyover or in direct flight (i.e., those considered to be undertaking migratory movements) are presented in Table 3.7 (VP1), Table 3.8 (VP2), while Table 3.9 presents the total from both VPs by visit. The detailed results from the VP surveys are presented in Appendix O.

⁵ Note that the VP1 results include a single record of two wheatear that were recorded on the headland itself but deemed by the surveyor to be on migration (staging). Consequently, this record has been included in the target species total, as well as the flight height records at 0 m.

⁶ All species are presented in BirdWatch Ireland (2025) taxonomic order, which follows a very similar structure to that of the International Ornithological Community (IOC) World Bird List (Gill *et al.*, 2025).



Table 3.1 Flight height results from VP surveys

Flight Height Band	Band Definition	Number of records	Percentage of total records
A	0-5 m	117	55.19
B	5-20 m	75	35.38
C	20-40 m	15	7.08
D	40 m+	5	2.36
Total		212	100.00%

Table 3.2 Distance offshore results from VP surveys

Distance Offshore Band	Band Definition	Number of records	Percentage of total records
A	0-100 m	119	52.65
B	100-500 m	61	26.99
C	500-1,000 m	38	16.81
D	1-5 km	8	3.54
E	5 km+	0	0.00
Total		226	100.00%

- 3.1.5 Of the target species recorded (excluding staging birds, i.e., those on a migratory stopover) (Appendix A.1.1), 66.8% were recorded flying south and 27.0% were recorded flying north, either following the contours of the coastline or over open sea adjacent to the land. The only birds recorded flying west inland from the open sea were one grey wagtail, 14 redpoll, seven siskin, four skylark, eight swallow and one yellowhammer, equating to 5.3% the total target species flight records. One merlin and one peregrine were recorded flying east, equating to 0.9% of the flight records, as well as single wheatear recorded stationary on the headland at VP 1.
- 3.1.6 The flight directions of target species by group are presented in rose diagrams (Figure 3.1 to Figure 3.7) although it should be noted that not all rose diagrams produced are statistically significant. Bearings of bird directions were plotted using the R statistical package to summarise overall directions of movement. The mean angle and mean vector have been used to describe directional patterns and extent of 'agreement'. A Rayleigh test that assumes a null hypothesis of uniformity (i.e., scattered orientation in all directions) was used, whereby a significant test indicates directionality of movement.



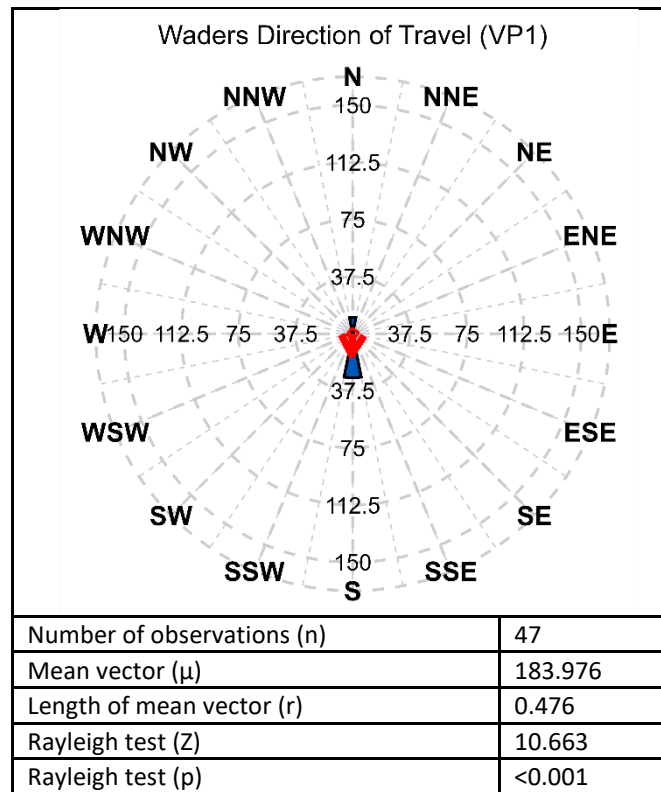


Figure 3.1 Wader directions of travel (VP1) (statistically significant)

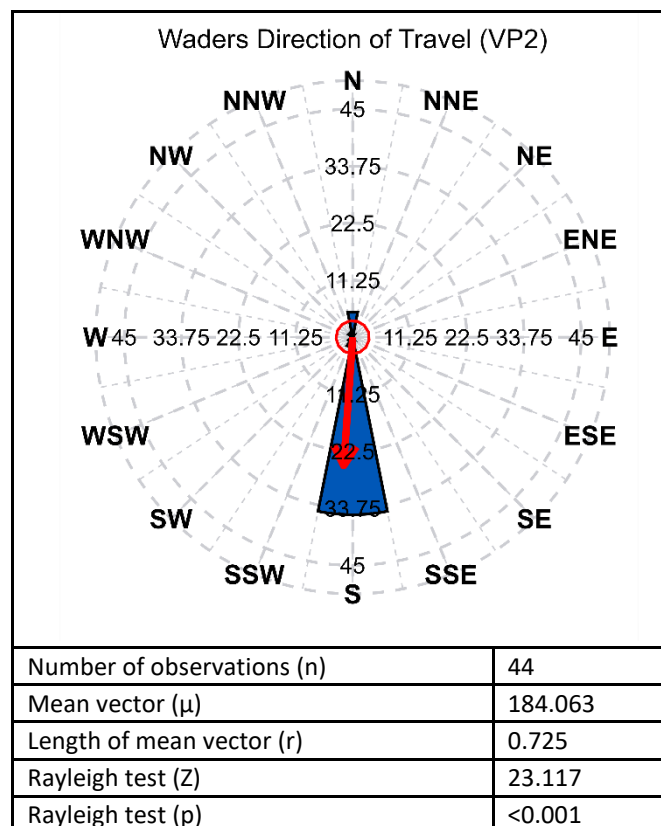


Figure 3.2 Wader directions of travel (VP2) (statistically significant)



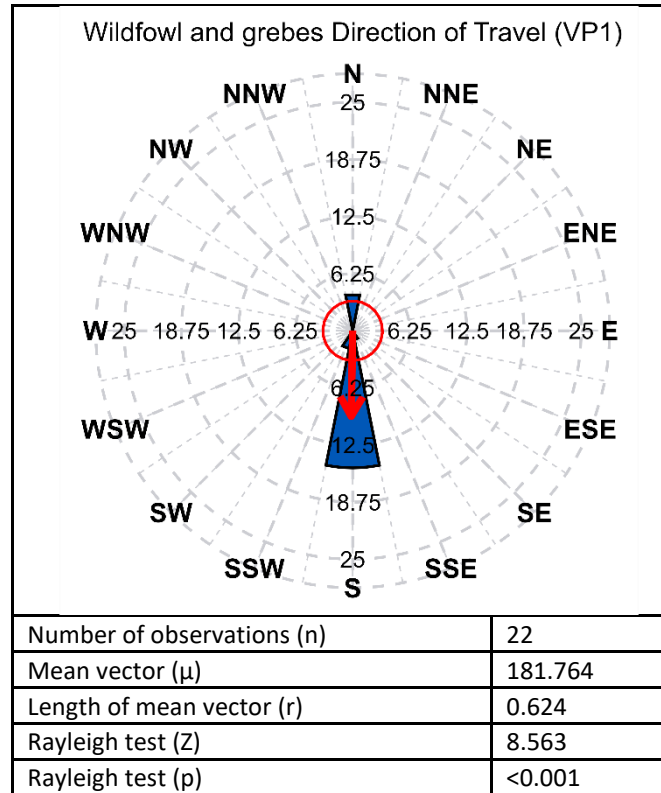


Figure 3.3 Wildfowl and grebe directions of travel (VP1) (statistically significant)

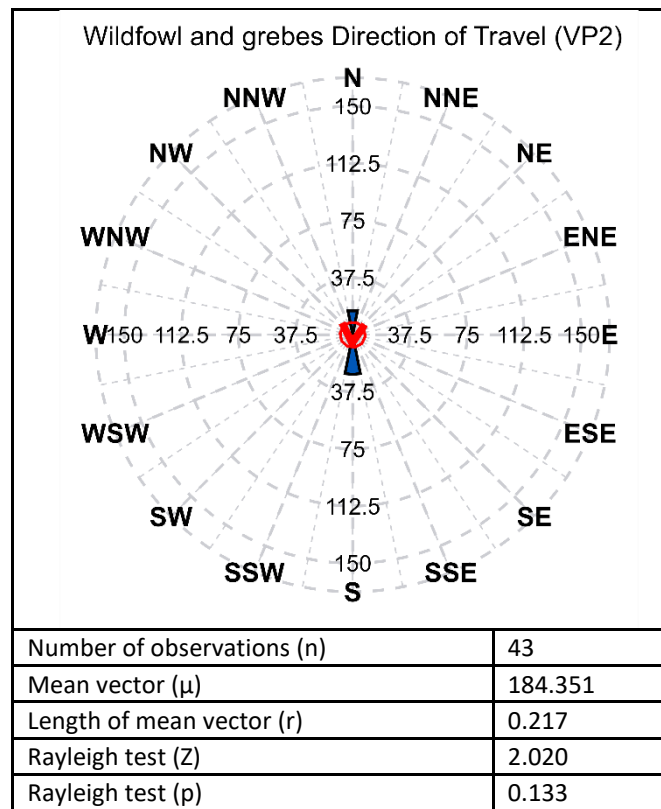


Figure 3.4 Wildfowl and grebe directions of travel (VP2) (non-statistically significant)



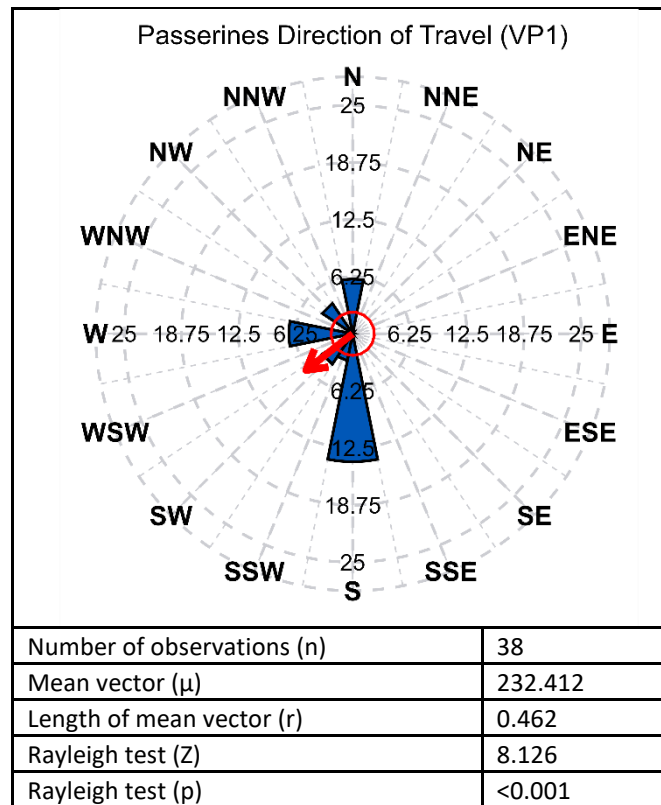


Figure 3.5 Passerine directions of travel (VP1) (statistically significant)

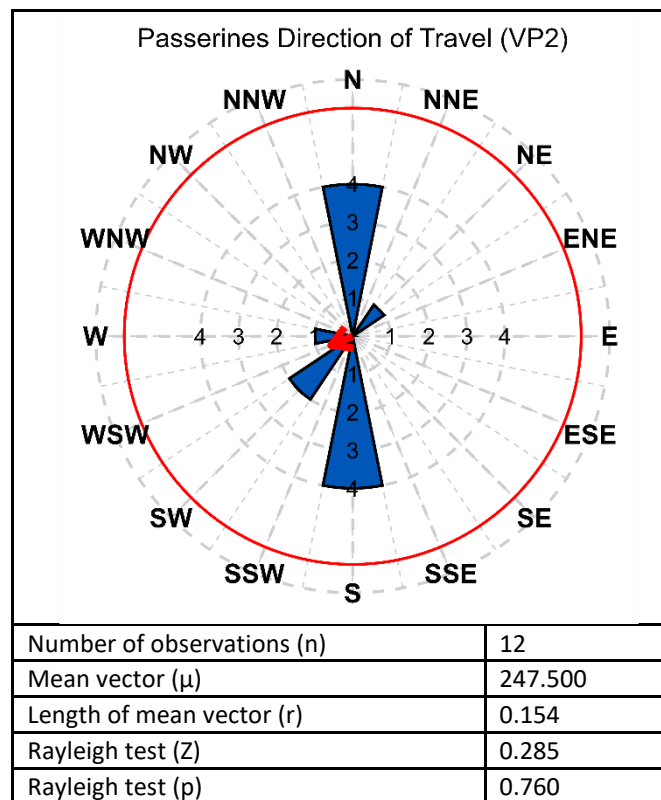


Figure 3.6 Passerine directions of travel (VP2) (non-statistically significant)



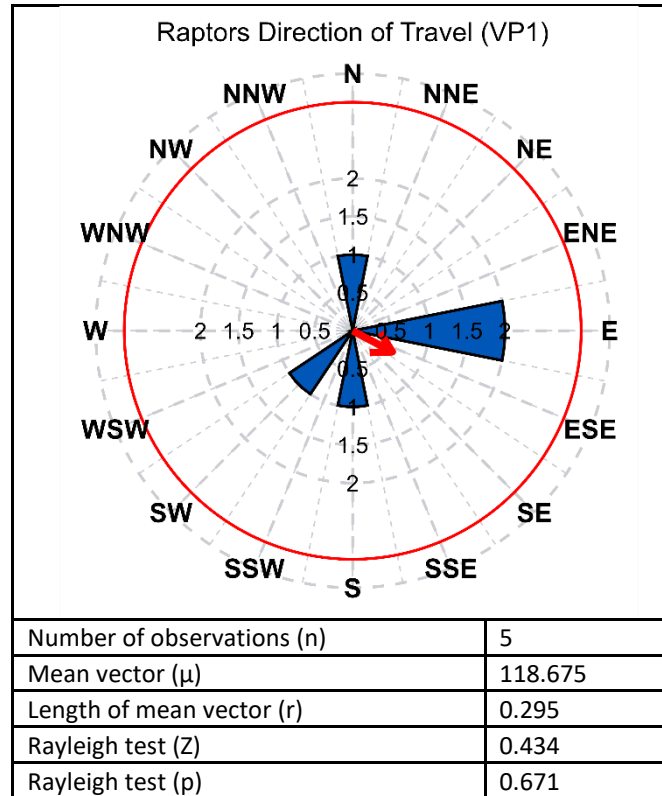


Figure 3.7 Raptor directions of travel (VP1) (non-statistically significant)



Waders

3.1.7 A total of 772 individual waders from 14 species were recorded across both VPs during the survey programme, as presented in Table 3.3.

3.1.8 Wader records were distributed across the survey programme, with the highest number of individuals (n=227) recorded on Visit 2 (11th September at VP2 and 12th September at VP1). The lowest number of waders at both VPs combined were recorded during Visit 8 (21st October at VP2 and 24th October at VP1) (n=2), which may be attributed to weather conditions. As all waders across the survey programme were recorded flying either north or south, the south-westerly and westerly winds that were present during the Visit 8 surveys were likely not conducive to the movements of these populations. Furthermore, a single sanderling was recorded at VP2 during Visit 13 (26th November).

Table 3.3 Total waders recorded across both VP1 and VP2

Species	Latin name	Total number of individuals recorded
Oystercatcher	<i>Haematopus ostralegus</i>	70
Golden plover	<i>Pluvialis apricaria</i>	22
Ringed plover	<i>Charadrius hiaticula</i>	2
Lapwing	<i>Vanellus vanellus</i>	116
Whimbrel	<i>Numenius phaeopus</i>	1
Curlew	<i>Numenius arquata</i>	31
Bar-tailed godwit	<i>Limosa lapponica</i>	12
Black-tailed godwit	<i>Limosa limosa</i>	178
Grey phalarope	<i>Phalaropus fulicarius</i>	91
Redshank	<i>Tringa totanus</i>	92
Turnstone	<i>Arenaria interpres</i>	7
Knot	<i>Calidris canutus</i>	6
Sanderling	<i>Calidris alba</i>	102
Dunlin	<i>Calidris alpina</i>	42
Total		772



Wildfowl and grebes

3.1.9 A total of 310 individual wildfowl and grebes were recorded from 12 species across both VPs during the survey programme, as presented in Table 3.4.

3.1.10 Records of these species were more frequent in the middle of the survey programme from Visit 4 to Visit 9 (22nd September for VP1 and 26th September for VP2 to 28th October for VP1 and 9th November for VP2). The highest number of birds in this group were recorded on Visit 7 (14th October at both VP1 and VP2) (n=122), more than during Visits 8 (21st October at VP2 and 24th October at VP1) to Visits 13 (26th November at VP2) combined (n=65).

3.1.11 Of note is the high number of common scoter recorded (n=152). However, as this is a species of seaduck, notable numbers in the offshore environment are not an unexpected result.

Table 3.4 Total wildfowl and grebes recorded across both VP1 and VP2

Species	Latin name	Total number of individuals recorded
Brent goose	<i>Branta bernicla</i>	31
White-fronted goose	<i>Anser albifrons</i>	15
Shelduck	<i>Tadorna tadorna</i>	4
Wigeon	<i>Mareca penelope</i>	17
Mallard	<i>Anas platyrhynchos</i>	8
Pintail	<i>Anas acuta</i>	1
Teal	<i>Anas crecca</i>	56
Pochard	<i>Aythya ferina</i>	1
Tufted duck	<i>Aythya fuligula</i>	7
Common scoter	<i>Melanitta nigra</i>	152
Red-breasted merganser	<i>Mergus serrator</i>	8
Great crested grebe	<i>Podiceps cristatus</i>	10
Total		310



Passerines

3.1.12A minimum of 3,981 individual passerines were recorded from 16 species across both VPs during the survey programme, as presented in Table 3.5.

3.1.13The highest numbers of passerines were recorded on Visit 1 (1st September at VP2 and 5th September at VP1) (n=3,202, excluding meadow pipit) owing to a large house martin and swallow movement, while Visit 2 (11th September at VP2 and 12th September at VP1) also saw high numbers (n=391). As different passerine species will migrate at different times, variation in numbers throughout the survey programme are in line with expectations.

Table 3.5 Total passerines recorded across both VP1 and VP2

Species	Latin name	Total number of individuals recorded
Skylark	<i>Alauda arvensis</i>	14
Sand martin	<i>Riparia riparia</i>	25
Swallow	<i>Hirundo rustica</i>	1,301
House martin	<i>Delichon urbicum</i>	2,362
Redwing	<i>Turdus iliacus</i>	64
Fieldfare	<i>Turdus pilaris</i>	47
Wheatear	<i>Oenanthe oenanthe</i>	2
Grey wagtail	<i>Motacilla cinerea</i>	1
Meadow pipit	<i>Anthus pratensis</i>	24
Chaffinch	<i>Fringilla coelebs</i>	4
Linnet	<i>Linaria cannabina</i>	45
Redpoll	<i>Acanthis flammea</i>	47
Crossbill	<i>Loxia curvirostra</i>	7
Goldfinch	<i>Carduelis carduelis</i>	7
Siskin	<i>Spinus spinus</i>	30
Yellowhammer	<i>Emberiza citrinella</i>	1
Total		3,981

Raptors

3.1.14A total of five individual raptors were recorded from three species across VP1 only during the survey programme, as presented in **Table 3.6**.

3.1.15The highest numbers of raptors were recorded on Visit 8 (24th October) (hen harrier n=1, and merlin n=1), with an individual peregrine recorded on Visits 6 (10th October), 7 (14th October) and 10 (11th November).

Table 3.6 Total raptors recorded across both VP1 and VP2

Species	Latin name	Total number of individuals recorded
Hen harrier	<i>Circus cyaneus</i>	1
Merlin	<i>Falco columbarius</i>	1
Peregrine	<i>Falco peregrinus</i>	3
Total		5



Table 3.7 Survey Results: VP1 total counts by species and visit

Species	Visit date												Total
	05/09/25	12/09/25	18/09/25	22/09/25	07/10/25	10/10/25	14/10/25	24/10/25	09/11/2025	11/11/25	20/11/25	25/11/25	
Brent goose	0	0	0	12	0	0	8	0	5	0	0	0	25
White-fronted goose	0	0	0	0	0	0	0	15	0	0	0	0	15
Shelduck	0	0	0	0	0	0	2	0	0	2	0	0	4
Mallard	0	0	0	0	0	2	0	0	0	0	0	0	2
Pochard	0	0	0	0	0	0	0	0	0	0	1	0	1
Common scoter	2	3	0	6	0	13	20	0	0	0	0	0	44
Red-breasted merganser	0	0	0	0	0	4	2	0	0	2	0	0	8
Great crested grebe	0	0	0	0	0	3	0	0	4	2	0	0	9
Oystercatcher	0	2	1	12	0	9	4	0	9	6	0	0	43
Golden plover	0	0	1	0	0	83	0	0	0	32	0	0	116
Ringed plover	1	0	0	0	0	6	0	0	0	0	0	0	7
Lapwing	0	0	0	0	0	0	0	0	0	0	0	2	2
Curlew	0	11	0	2	0	2	2	0	3	0	0	0	20
Black-tailed godwit	0	25	0	30	0	14	0	0	0	0	0	0	69
Turnstone	0	8	0	12	0	8	12	0	9	12	0	8	69
Knot	0	0	0	0	0	0	32	0	0	0	0	0	32
Sanderling	0	0	0	9	0	35	0	0	14	15	0	0	73
Dunlin	0	21	0	0	0	0	31	0	0	0	0	0	52
Hen harrier	0	0	0	0	0	0	0	1	0	0	0	0	1
Merlin	0	0	0	0	0	0	0	1	0	0	0	0	1
Peregrine	0	0	0	0	0	1	1	0	0	1	0	0	3
Swallow	1,000	0	9	33	15	0	0	0	0	0	0	0	1,057
House martin	2,200	0	0	11	1	0	0	0	0	0	0	0	2,212
Redwing	0	0	0	0	0	0	0	0	64	0	0	0	64
Fieldfare	0	0	0	0	0	0	0	0	47	0	0	0	47
Wheatear	2	0	0	0	0	0	0	0	0	0	0	0	2
Grey wagtail	0	0	0	0	0	0	0	1	0	0	0	0	1
Meadow pipit	Unknown*	16	0	7	0	0	0	0	0	0	1	0	24
Chaffinch	0	0	0	0	0	0	0	0	0	0	4	0	4
Linnet	0	0	0	0	0	0	0	14	0	0	6	8	28
Redpoll	0	0	2	0	4	0	0	4	0	0	7	12	29
Crossbill	0	0	0	0	0	0	0	7	0	0	0	0	7
Goldfinch	0	0	0	0	0	0	0	0	0	0	7	0	7
Siskin	0	0	11	0	2	0	0	9	0	0	0	6	28
Yellowhammer	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	3,205	86	24	134	22	180	114	52	115	72	26	37	4,107

* Large numbers reported throughout survey, but no count or estimate provided.



Table 3.8 Survey Results: VP2 total counts by species and visit

Species	Visit date													Total
	01/09/25	11/09/25	15/09/25	26/09/25	02/10/25	08/09/25	14/10/25	21/10/25	28/10/25	05/11/25	12/11/25	17/11/25	26/11/25	
Brent goose	0	0	0	6	0	0	0	0	0	0	0	0	0	6
Wigeon	0	0	0	6	0	0	7	0	4	0	0	0	0	17
Mallard	0	0	0	4	0	0	0	0	0	0	0	0	2	6
Pintail	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Teal	0	0	0	0	0	0	55	0	1	0	0	0	0	56
Tufted duck	0	0	0	0	0	0	7	0	0	0	0	0	0	7
Common scoter	3	0	2	11	39	6	21	12	1	2	5	6	0	108
Great crested grebe	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Oystercatcher	1	14	0	5	2	0	0	0	0	2	3	0	0	27
Ringed plover	7	8	0	0	0	0	0	0	0	0	0	0	0	15
Whimbrel	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Curlew	0	4	0	6	0	0	1	0	0	0	0	0	0	11
Bar-tailed godwit	1	11	0	0	0	0	0	0	0	0	0	0	0	12
Black-tailed godwit	1	90	0	18	0	0	0	0	0	0	0	0	0	109
Grey phalarope	0	0	7	0	0	0	0	0	0	0	0	0	0	7
Redshank	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Turnstone	0	15	0	14	0	0	0	2	1	0	0	0	1	33
Knot	0	0	0	0	10	0	0	0	0	0	0	0	0	10
Sanderling	0	18	0	0	0	0	0	0	0	0	0	0	0	18
Dunlin	29	0	2	0	3	0	6	0	0	0	0	0	0	40
Skylark	0	0	0	0	0	0	0	10	4	0	0	0	0	14
Sand martin	0	25	0	0	0	0	0	0	0	0	0	0	0	25
Swallow	0	200	0	0	14	0	30	0	0	0	0	0	0	244
House martin	0	150	0	0	0	0	0	0	0	0	0	0	0	150
Linnet	0	0	0	0	0	0	17	0	0	0	0	0	0	17
Redpoll	0	0	0	0	2	0	0	16	0	0	0	0	0	18
Siskin	0	0	0	0	0	0	2	0	0	0	0	0	0	2
Total	49	535	11	70	70	7	146	41	11	4	7	6	3	961



Table 3.9 Survey Results: Total counts by species and visit

Species	Visit date														Total
	VP1: VP2:	05/09/25 01/09/25	12/09/25 11/09/25	18/09/25 15/09/25	22/09/25 26/09/25	07/10/25 02/10/25	10/10/25 08/09/25	14/10/25 14/10/25	24/10/25 21/10/25	09/11/2025 28/10/25	11/11/25 05/11/25	20/11/25 12/11/25	25/11/25 17/11/25	05/09/25 26/11/25	
Brent goose		0	0	0	18	0	0	8	0	5	0	0	0	0	31
White-fronted goose		0	0	0	0	0	0	0	15	0	0	0	0	0	15
Shelduck		0	0	0	0	0	0	2	0	0	2	0	0	0	4
Wigeon		0	0	0	6	0	0	7	0	4	0	0	0	0	17
Mallard		0	0	0	4	0	2	0	0	0	0	0	0	2	8
Pintail		0	0	0	0	0	1	0	0	0	0	0	0	0	1
Teal		0	0	0	0	0	0	55	0	1	0	0	0	0	56
Pochard		0	0	0	0	0	0	0	0	0	0	1	0	0	1
Tufted duck		0	0	0	0	0	0	7	0	0	0	0	0	0	7
Common scoter		5	3	2	17	39	19	41	12	1	2	5	6	0	152
Red-breasted merganser		0	0	0	0	0	4	2	0	0	2	0	0	0	8
Great crested grebe		0	0	0	0	0	3	0	1	4	2	0	0	0	10
Oystercatcher		1	16	1	17	2	9	4	0	9	8	3	0	0	70
Golden plover		0	0	1	0	0	83	0	0	0	32	0	0	0	116
Ringed plover		8	8	0	0	0	6	0	0	0	0	0	0	0	22
Lapwing		0	0	0	0	0	0	0	0	0	0	0	2	0	2
Whimbrel		1	0	0	0	0	0	0	0	0	0	0	0	0	1
Curlew		0	15	0	8	0	2	3	0	3	0	0	0	0	31
Bar-tailed godwit		1	11	0	0	0	0	0	0	0	0	0	0	0	12
Black-tailed godwit		1	115	0	48	0	14	0	0	0	0	0	0	0	178
Grey phalarope		0	0	7	0	0	0	0	0	0	0	0	0	0	7
Redshank		6	0	0	0	0	0	0	0	0	0	0	0	0	6
Turnstone		0	23	0	26	0	8	12	2	10	12	0	8	1	102
Knot		0	0	0	0	10	0	32	0	0	0	0	0	0	42
Sanderling		0	18	0	9	0	35	0	0	14	15	0	0	0	91
Dunlin		29	21	2	0	3	0	37	0	0	0	0	0	0	92
Hen harrier		0	0	0	0	0	0	0	1	0	0	0	0	0	1
Merlin		0	0	0	0	0	0	0	1	0	0	0	0	0	1
Peregrine		0	0	0	0	0	1	1	0	0	1	0	0	0	3
Skylark		0	0	0	0	0	0	0	10	4	0	0	0	0	14
Sand martin		0	25	0	0	0	0	0	0	0	0	0	0	0	25
Swallow		1,000	200	9	33	29	0	30	0	0	0	0	0	0	1,301
House martin		2,200	150	0	11	1	0	0	0	0	0	0	0	0	2,362
Redwing		0	0	0	0	0	0	0	0	64	0	0	0	0	64
Fieldfare		0	0	0	0	0	0	0	0	47	0	0	0	0	47
Wheatear		2	0	0	0	0	0	0	0	0	0	0	0	0	2
Grey wagtail		0	0	0	0	0	0	0	1	0	0	0	0	0	1
Meadow pipit		Unknown*	16	0	7	0	0	0	0	0	0	1	0	0	24
Chaffinch		0	0	0	0	0	0	0	0	0	0	4	0	0	4
Linnet		0	0	0	0	0	0	17	14	0	0	6	8	0	45
Redpoll		0	0	2	0	6	0	0	20	0	0	7	12	0	47
Crossbill		0	0	0	0	0	0	0	7	0	0	0	0	0	7
Goldfinch		0	0	0	0	0	0	0	0	0	0	7	0	0	7
Siskin		0	0	11	0	2	0	2	9	0	0	0	6	0	30
Yellowhammer		0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total		3,254	621	35	204	92	187	260	93	166	76	33	43	3	5,068

* Large numbers reported throughout survey, but no count or estimate provided.



3.2 PAM surveys

- 3.2.1 A total of 62 nights of PAM data collected from the onshore monitoring unit at Wicklow Head were analysed, as well as 40 nights of PAM data from an offshore monitoring unit, covering the period of 29th August to 30th August, 1st September to 7th October and 10th to 13th November 2025. This dataset comprises 1,011 recording blocks.
- 3.2.2 Of the 1,011 recording blocks processed a total of 407 had good recording quality, 324 had moderate recording quality and 263 had poor recording quality. A further 17 recording blocks were deemed to be unsuitable for analysis based on their very poor audio quality. As such, detections can be assumed to be complete in 72.3% of the recording blocks analysed.
- 3.2.3 Where recording quality was poor due to wind and/or rain, but birds were still detected, these data were considered appropriate for analysis with the caveat that some bird vocalisations may not have been detected. A full summary of effort and recording quality is presented in **Table 3.10**.
- 3.2.4 Due to wind and wave noise interfering with the audio recordings, the offshore PAM data from the period early September to mid-October 2025 was unable to be analysed. However, a full summary of effort and recording quality is presented in **Table 3.11**.

Table 3.10 Onshore PAM survey effort and recording quality

Date	Blocks of Good audio quality	Blocks of Moderate audio quality	Blocks of Poor audio quality	Total blocks recorded
01/09/2025	4	-	-	4
02/09/2025	9	2	-	11
03/09/2025	6	3	2	11
04/09/2025	11	-	-	11
05/09/2025	8	3	-	11
06/09/2025	-	-	11	11
07/09/2025	3	1	7	11
08/09/2025	11	1	-	12
09/09/2025	2	2	7	11
10/09/2025	3	2	6	11
11/09/2025	7	3	1	11
12/09/2025	2	7	3	12
13/09/2025	12	-	-	12
14/09/2025	4	7	1	12
15/09/2025	6	6	2	14
16/09/2025	8	2	2	12
17/09/2025	6	3	3	12
18/09/2025	11	1	-	12
19/09/2025	7	2	3	12
20/09/2025	8	3	1	12
21/09/2025	10	1	1	12
22/09/2025	12	-	-	12
23/09/2025	7	4	1	12



Date	Blocks of Good audio quality	Blocks of Moderate audio quality	Blocks of Poor audio quality	Total blocks recorded
24/09/2025	7	1	4	12
25/09/2025	12	-	-	12
26/09/2025	3	5	5	13
27/09/2025	5	1	7	13
28/09/2025	12	1	-	13
29/09/2025	12	1	-	13
30/09/2025	6	7	-	13
01/10/2025	-	13	-	13
02/10/2025	-	13	1	14
03/10/2025	9	3	1	13
04/10/2025	4	8	1	13
05/10/2025	10	3	-	13
06/10/2025	11	2	-	13
07/10/2025	2	5	-	7
16/10/2025	3	11	-	14
17/10/2025	6	8	1	15
18/10/2025	-	11	3	14
19/10/2025	4	10	-	14
20/10/2025	-	6	9	15
21/10/2025	-	13	1	14
22/10/2025	1	11	2	14
23/10/2025	6	8	-	14
24/10/2025	5	9	-	14
25/10/2025	-	13	2	15
26/10/2025	6	9	-	15
27/10/2025	2	13	-	15
28/10/2025	-	16	-	16
29/10/2025	9	6	-	15
30/10/2025	11	-	1	12
31/10/2025	9	4	2	15
01/11/2025	15	-	-	15
02/11/2025	10	4	1	15
03/11/2025	9	6	-	15
04/11/2025	9	4	2	15
05/11/2025	8	5	2	15
06/11/2025	12	2	1	15
07/11/2025	7	4	4	15
08/11/2025	16	-	-	16
09/11/2025	9	3	4	16
Total	407	292	105	804



Table 3.11 Offshore PAM survey effort and recording quality

Date	Blocks of Good audio quality	Blocks of Moderate audio quality	Blocks of Poor audio quality	Total blocks recorded
29/08/2025	-	-	3	3
30/08/2025	-	-	10	10
01/09/2025	-	-	3	3
02/09/2025	-	-	2	2
03/09/2025	-	-	2	2
04/09/2025	-	-	3	3
05/09/2025	-	-	2	2
06/09/2025	-	-	2	2
07/09/2025	-	-	3	3
08/09/2025	-	-	2	2
09/09/2025	-	-	2	2
10/09/2025	-	-	2	2
11/09/2025	-	-	2	2
12/09/2025	-	-	2	2
13/09/2025	-	-	3	3
14/09/2025	-	-	2	2
15/09/2025	-	-	2	2
16/09/2025	-	-	2	2
17/09/2025	-	-	2	2
18/09/2025	-	-	2	2
25/09/2025	-	-	2	2
28/09/2025	-	1	1	2
29/09/2025	-	-	2	2
03/10/2025	-	-	1	1
05/10/2025	-	-	2	2
06/10/2025	-	-	2	2
10/10/2025	-	3	3	6
11/10/2025	-	7	7	14
12/10/2025	-	2	12	14
13/10/2025	-	11	3	14
14/10/2025	-	1	13	14
15/10/2025	-	2	12	14
10/11/2025	-	-	16	16
11/11/2025	-	-	16	16
12/11/2025	-	-	10	10
13/11/2025	-	5	3	8
Total	-	32	158	190



3.2.5 Target species for the PAM survey were defined as all waders, waterfowl and terrestrial bird species. A total of 43 target species and four ‘target species groups’ (where a specific identification could not be made) were detected from the onshore PAM audio files. Of these, three species (wren *Troglodytes troglodytes*, dunnock *Prunella modularis*, and common raven *Corvus corax* (hereafter ‘raven’)) were determined to comprise resident, non-migratory birds, based either on knowledge of the species ecology/ behaviour and/ or the type of vocalisations that were recorded. These species are, therefore, not considered within this summary of migratory bird activity.

3.2.6 In addition, five species of seabird were detected, as follows:

- Manx shearwater *Puffinus puffinus*;
- Black-headed gull *Croicocephalus ridibundus*;
- Herring gull *Larus argentatus*;
- Sandwich tern *Thalasseus sandvicensis*; and
- Common tern *Sterna hirundo*.

3.2.7 These are also not considered within this summary of migratory bird activity as seabirds were not target species.

3.2.8 Summaries of the 43 species identified as migrants are presented in the following sections by species group.

Herons

Grey heron *Ardea cinerea*

3.2.9 In total there were six records of grey heron, comprising six individual birds, as presented in **Table 3.12**. These records were spread across the survey period. Given the availability of suitable habitat in the vicinity of the PAM unit, it is uncertain whether these birds were engaged in active migration.

Table 3.12 Records of grey heron from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
12/09/2025	23:47	16	1
15/09/2025	19:40	7	1
27/09/2025	19:10	7	1
28/09/2025	02:10	11	1
04/10/2025	18:53	1	1
26/10/2025	08:05	2	1



Wildfowl and rails

Whooper swan *Cygnus cygnus*

3.2.10 Four records of whooper swan were detected, comprising eight individual birds, as presented in Table 3.13. The records were all from October 2025, and it is considered highly likely that both birds were engaged in active migration.

Table 3.13 Records of whooper swan from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
05/10/2025	20:51	1	1
07/10/2025	00:49	3	1
21/10/2025	22:14	12	3
24/10/2025	19:07	8	3

White-fronted goose

3.2.11 There was a single record of white-fronted goose, judged to refer to a single bird on 6th November 6th. It is considered highly likely that this bird was engaged in active migration.

Brent goose

3.2.12 A single record of what was interpreted as a small flock of brent geese was detected on 5th October at 20:51 (Table 3.14). Twenty calls were recorded with an estimated flock size of five birds, and it is considered highly likely that these birds were engaged in active migration. In addition, a small group estimated to comprise of three individuals were recorded on 23rd October.

Table 3.14 Records of brent goose from the onshore PAM unit.

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
05/10/2025	20:51	20	5
23/10/2025	22:09	12	3

Shelduck

3.2.13 A single record of shelduck comprising seven calls was recorded on 11th September at 22:50, interpreted as being a single bird. It is considered highly likely that this bird was engaged in active migration.

Mallard

3.2.14 A single of mallard comprising of a single call given by a single bird, was detected at 05:10 on 28th September. It is considered highly likely that this bird was engaged in active migration.

Common scoter

3.2.15 There were two records of this species, both from the second half of October with birds recorded on the 16th and 22nd of that month, as presented in Table 3.15.



Table 3.15 Records of common scoter from the onshore PAM unit.

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
16/10/2025	04:31	5	5
22/10/2025	04:14	75	10

Moorhen *Gallinula chloropus*

3.2.16A single record of moorhen, comprising one recorded call given by a single bird, was identified at 03:10 on 28th September. It is considered highly likely that this bird was engaged in active migration.

Coot *Fulica atra*

3.2.17A single record of coot, comprised of two recorded calls interpreted as given by a single bird, was recorded at 21:15 on 25th September 25th. It is considered highly likely that this bird was engaged in active migration.

Waders

Golden plover

3.2.18In total there were 10 records of golden plover, estimated to comprise 10 individual birds, as presented in Table 3.16. Records were spread across September and October and all birds encountered were considered to be actively migrating.

Table 3.16 Records of golden plover from the onshore PAM unit.

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
04/09/2025	05:09	4	1
12/09/2025	02:50	2	1
17/09/2025	20:35	11	1
19/09/2025	02:33	15	1
21/09/2025	02:28	9	1
25/09/2025	00:18	1	1
04/10/2025	22:53	2	1
17/10/2025	00:25	2	1
20/10/2025	06:18	2	1
23/10/2025	23:09	4	1

Ringed plover

3.2.19In total there were 25 records of ringed plover, estimated to comprise 45 individual birds, as presented in Table 3.17. The majority of records were from September 2025 with 16 of the 21 September records picked up during the first half of the month. While it is likely that there is some suitable ringed plover habitat within the vicinity of the PAM unit, it is considered likely that the birds recorded were engaged in active migration.



Table 3.17 Records of ringed plover from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
30/08/2025	05:21	3	1
01/09/2025	21:14	1	1
02/09/2025	3:14	1	1
02/09/2025	22:12	25	2
03/09/2025	0:12	100	10
03/09/2025	1:12	50	5
05/09/2025	0:07	2	1
05/09/2025	1:07	30	2
08/09/2025	4:00	1	1
11/09/2025	23:50	3	1
11/09/2025	21:50	9	2
12/09/2025	0:50	1	1
13/09/2025	2:47	1	1
13/09/2025	2:47	1	1
14/09/2025	3:45	21	2
14/09/2025	3:45	1	1
16/09/2025	1:40	15	2
18/09/2025	1:35	1	1
20/09/2025	2:30	12	2
23/09/2025	0:23	3	1
25/09/2025	6:18	2	1
29/09/2025	4:08	10	2
06/10/2025	5:51	2	1
16/10/2025	06:31	2	1
30/10/2025	01:57	1	1

Lapwing

3.2.20 There was a single record of this species, with a single call recorded on 16th October 2025. It is considered likely that the bird was engaged in active migration.

Knot

3.2.21 There was a single record of this species, with a single call recorded on 8th November 2025. It is considered likely that the bird was engaged in active migration.

Sanderling

3.2.22 There was a single record of this species, with a single call recorded on 6th November 2025. It is considered likely that the bird was engaged in active migration.



Curlew sandpiper *Calidris ferruginea*

3.2.23 There was a single record of this species, with a single call recorded on 20th October 2025. It is considered likely that the bird was engaged in active migration.

Oystercatcher

3.2.24 In total there were 96 records of oystercatcher, estimated to comprise 118 individual birds, as presented in Table 3.18. Within this table, nightly totals for oystercatcher are summarised, rather than presenting the data from every individual observation. 66 records were from September, with the majority recorded during the first half of the month. As there is suitable oystercatcher habitat within the vicinity of the PAM unit, it is uncertain which proportion of these birds were engaged in active migration.

Table 3.18 Records of oystercatcher from the onshore PAM unit

Date	Number of calls recorded	Estimated number of individuals
01/09/2025	29	5
02/09/2025	20	3
03/09/2025	2	1
04/09/2025	27	4
05/09/2025	6	2
06/09/2025	5	1
08/09/2025	127	11
09/09/2025	2	1
10/09/2025	15	4
11/09/2025	10	3
12/09/2025	8	3
13/09/2025	4	3
14/09/2025	27	4
15/09/2025	118	11
16/09/2025	10	4
17/09/2025	2	1
18/09/2025	11	2
19/09/2025	20	2
20/09/2025	2	2
21/09/2025	10	3
23/09/2025	15	3
24/09/2025	1	1
25/09/2025	9	3
26/09/2025	40	2
27/09/2025	1	1
29/09/2025	10	3
30/09/2025	1	1
01/10/2025	4	2
04/10/2025	7	2
06/10/2025	18	3



Date	Number of calls recorded	Estimated number of individuals
17/10/2025	33	2
21/10/2025	3	3
23/10/2025	1	1
24/10/2025	2	2
26/10/2025	1	1
29/10/2025	5	2
30/10/2025	3	2
02/11/2025	5	2
05/11/2025	2	2
06/11/2025	8	3
07/11/2025	21	5
08/11/2025	18	2

Turnstone

3.2.25 There were three records of this species (Table 3.19). A single record of turnstone comprising 60 recorded calls, interpreted as being given by a minimum of five birds, was captured on 25th September at 04:18. Two more records came from late October. Given the availability of suitable habitat in the vicinity of the PAM unit, it is uncertain whether these birds were engaged in active migration. However, the paucity of records of turnstone during the PAM surveys at this site suggest that this species is not resident during the non-breeding season and that therefore it is highly likely that birds recorded during PAM were actively migrating.

Table 3.19 Records of turnstone from PAM monitoring.

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
25/09/2025	04:18	60	5
20/10/2025	20:16	1	1
21/10/2025	04:16	1	1

Dunlin

3.2.26 In total there were 23 records, estimated to comprise 43 individual birds. Records are presented in Table 3.20. Records came from across the survey period, with eight of 20 records coming from mid-September. It is considered highly likely that these birds were engaged in active migration.



Table 3.20 Records of dunlin from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
02/09/2025	3:14	24	3
02/09/2025	4:14	1	1
04/09/2025	23:07	6	1
07/09/2025	22:00	1	1
08/09/2025	2:00	1	1
08/09/2025	2:00	1	1
08/09/2025	4:00	1	1
11/09/2025	4:52	1	1
16/09/2025	4:40	30	5
16/09/2025	22:38	7	2
19/09/2025	1:33	22	2
19/09/2025	4:33	30	2
19/09/2025	20:30	8	2
19/09/2025	22:30	15	2
20/09/2025	2:30	5	1
20/09/2025	3:30	1	1
28/09/2025	2:10	5	1
29/09/2025	4:08	3	1
03/10/2025	23:56	1	1
03/10/2025	4:58	10	1
16/10/2025	00:31	6	1
16/10/2025	02:31	1	1
17/10/2025	04:25	47	10

Common sandpiper *Acticis hypoleucos*

3.2.27 In total there were 29 records of common sandpiper, estimated to comprise 33 individual birds as presented in Table 3.21. Records originated from across the survey period, but with 17 of 29 records coming from mid-September. It is considered highly likely that these birds were engaged in active migration.



Table 3.21 Records of common sandpiper from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
12/09/2025	1:50	2	1
02/09/2025	20:12	2	1
02/09/2025	23:12	10	3
03/09/2025	3:12	1	1
04/09/2025	0:09	1	1
04/09/2025	0:09	1	1
04/09/2025	20:07	1	1
05/09/2025	20:05	3	1
07/09/2025	21:00	1	1
09/09/2025	0:57	1	1
10/09/2025	19:52	2	1
11/09/2025	22:50	2	1
11/09/2025	22:50	1	1
11/09/2025	19:50	1	1
14/09/2025	19:43	1	1
15/09/2025	19:40	1	1
15/09/2025	19:40	3	1
16/09/2025	5:40	1	1
16/09/2025	19:38	3	1
17/09/2025	0:38	20	2
17/09/2025	4:38	1	1
17/09/2025	19:35	5	1
17/09/2025	19:35	2	1
19/09/2025	19:30	2	1
20/09/2025	19:28	2	1
20/09/2025	19:28	4	1
22/09/2025	19:23	1	1
28/09/2025	23:08	6	2
04/10/2025	18:53	1	1

Redshank

3.2.28 There were 25 redshank records, estimated to comprise 41 individual birds, as presented in Table 3.22. All records were captured early in the survey period from early to mid-September, apart from four records from late October and early November. Given the availability of suitable habitat in the vicinity of the PAM unit, it is uncertain whether these birds were engaged in active migration.



Table 3.22 Records of redshank from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
01/09/2025	22:14	20	2
02/09/2025	5:14	1	1
03/09/2025	1:12	20	2
04/09/2025	1:09	1	1
04/09/2025	3:09	12	3
04/09/2025	4:09	1	1
04/09/2025	6:09	1	1
04/09/2025	23:07	1	1
05/09/2025	3:07	5	1
08/09/2025	3:00	2	1
08/09/2025	5:00	2	1
10/09/2025	20:52	1	1
10/09/2025	4:55	1	1
14/09/2025	5:45	2	1
14/09/2025	0:45	1	1
16/09/2025	22:38	50	5
19/09/2025	4:33	10	1
20/09/2025	2:30	100	5
20/09/2025	2:30	8	2
20/09/2025	2:30	15	3
20/09/2025	4:30	20	2
18/10/2025	03:23	1	1
24/10/2025	02:09	3	1
02/11/2025	00:51	1	1
07/11/2025	20:39	1	1

Greenshank Tringa nebularia

3.2.29 In total there were two greenshank records from two individual birds, both captured in early September, as presented in Table 3.23. The records were both from early September. It is considered highly likely that both birds were engaged in active migration.

Table 3.23 Records of greenshank from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
04/09/2025	4:09	1	1
08/09/2025	3:00	4	1



Black-tailed godwit

3.2.30 Two records of black-tailed godwit were captured, comprising three individual birds, as presented in Table 3.24. It is considered highly likely that all three birds were engaged in active migration.

Table 3.24 Records of black-tailed godwit from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
04/09/2025	5:09	15	1
29/09/2025	2:08	13	2

Bar-tailed godwit

3.2.31 There was a single record of this species, with one bird recorded on the evening of 2nd November. It is considered highly likely that this bird was engaged in active migration.

Curlew

3.2.32 In total there were seven records of curlew from seven individual birds, from the first half of September and late October, as presented in Table 3.25. Given the availability of suitable habitat in the vicinity of the PAM unit, it is uncertain whether these birds were engaged in active migration.

Table 3.25 Records of curlew from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
02/09/2025	0:14	3	1
03/09/2025	5:12	2	1
07/09/2025	3:02	4	1
08/09/2025	0:00	1	1
12/09/2025	1:50	2	1
21/10/2025	22:14	1	1
23/10/2025	01:12	2	1

Whimbrel

3.2.33 A single record of whimbrel was captured on 15th September at 19:40, comprising of eight recorded calls interpreted as being given by a single bird. As this species does not breed locally or winter on this stretch of coast it can be concluded that this individual was engaged in active migration.

Snipe *Gallinago gallinago*

Three records of snipe were captured from late September to mid October, comprising seven individual birds. Records are presented in Table 3.26. It is considered highly likely that all seven birds were engaged in active migration.



Table 3.26 Records of snipe from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
24/09/2025	20:18	12	2
25/09/2025	0:18	31	3
16/10/2025	00:31	7	2

Raptors

Barn owl *Tyto alba*

3.2.34 There were two records of this species which were included herein, as it is known to migrate. However, there is potential that both recordings captured are of resident birds. Both records were from September 2025 and are presented in Table 3.27.

Table 3.27 Records of barn owl from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
05/09/2025	0:07	1	1
23/09/2025	23:20	11	1

Passerines

House martin

3.2.35 There were four records of house martin comprising six individual birds from the first half of September, as presented in



3.2.36 Table 3.28. In addition, as diurnal migrants will often use visual cues, where available, it is considered likely that these birds will follow the coast south during migration before crossing over open sea to the mainland Europe.

3.2.37 It is considered highly likely that all five birds were engaged in active migration. Like the majority of other passerine species recorded, most of the house martins recorded were detected just before sunrise. As this species is not an obligate nocturnal migrant, it is highly likely that these detections refer to the beginning of a diurnal movement rather than the end of a nocturnal movement. As such, it is considered unlikely that these birds would have the potential to pass through the Proposed Development Array Area given the results of the VP surveys that show this species moving south along the coast in large numbers. In addition, as diurnal migrants will often use visual cues, where available, it is considered likely that these birds will follow the coast south during migration before crossing over open sea to the mainland Europe.



Table 3.28 Records of house martin from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
05/09/2025	6:07	50	1
08/09/2025	6:00	4	2
08/09/2025	6:00	8	1
13/09/2025	19:45	14	2

Rock pipit *Anthus petrosus*

3.2.38 There were 16 records of rock pipit, comprising an estimated 18 individual birds. The species is included here as it is known to migrate. However, there is potential that the recordings are of resident birds. Records were captured primarily across late October 2025, as presented in Table 3.29.

Table 3.29 Records of rock pipit from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
15/09/2025	6:43	1	1
22/09/2025	6:25	4	1
28/09/2025	19:08	5	1
30/09/2025	7:06	12	1
03/10/2025	18:56	11	1
20/10/2025	07:18	7	1
20/10/2025	18:16	5	3
21/10/2025	18:14	2	1
23/10/2025	07:12	1	1
26/10/2025	08:05	1	1
26/10/2025	18:03	2	1
27/10/2025	18:01	4	1
28/10/2025	07:01	8	1
29/10/2025	17:57	3	1
02/11/2025	17:49	1	1
03/11/2025	17:47	2	1



Meadow pipit

3.2.39 There were 74 records of meadow pipit comprising an estimated 191 individual birds, as presented in Table 3.30. Within this table, nightly totals for meadow pipit are summarised, rather than presenting the data from every observation. The records were from across the whole survey period with most activity in the second half of September into October. It is considered highly likely that all birds were engaged in active migration. As with the majority of other passerine records, a large proportion of meadow pipit were detected just before sunrise. As this species is not an obligate nocturnal migrant, it is highly likely that these detections refer to the beginning of a diurnal movement rather than the end of a nocturnal movement. As such, it is considered unlikely that these birds would have the potential to pass through the Proposed Development Array Area given the results of the VP surveys that show this species moving south along the coast in large numbers. In addition, diurnal migrants will often use visual cues, where available, so it is considered likely that these birds will follow the coast south during migration.

Table 3.30 Records of meadow pipit from the onshore PAM unit

Date	Number of calls recorded	Estimated number of individuals
02/09/2025	15	2
04/09/2025	19	2
05/09/2025	25	2
08/09/2025	16	3
09/09/2025	1	1
12/09/2025	15	2
13/09/2025	32	4
14/09/2025	69	8
15/09/2025	33	4
16/09/2025	27	3
18/09/2025	4	1
20/09/2025	10	1
22/09/2025	54	7
24/09/2025	180	18
25/09/2025	74	11
27/09/2025	45	7
28/09/2025	195	24
29/09/2025	62	8
30/09/2025	55	6
02/10/2025	10	2
04/10/2025	40	5
05/10/2025	557	12
06/10/2025	35	3
07/10/2025	18	1
13/10/2025	9	2
16/10/2025	5	5
17/10/2025	102	9



Date	Number of calls recorded	Estimated number of individuals
19/10/2025	15	2
21/10/2025	30	1
22/10/2025	50	2
24/10/2025	6	5
26/10/2025	10	1
27/10/2025	20	1
28/10/2025	21	4
29/10/2025	47	8
30/10/2025	50	7
02/11/2025	11	2
05/11/2025	1	1
08/11/2025	30	4

Pied/ white wagtail *Motacilla alba*

3.2.40 Records for this species may either refer to the local breeding subspecies pied wagtail *M. a. yarelli* or the migratory subspecies white wagtail *M. a. alba*. There were 16 records of this species comprising an estimated 20 individual birds from across September and October, with one record from November, as presented in **Table 3.31**. It is considered highly likely that all birds were engaged in active migration. Like almost all other passerines, this species was detected just before sunrise. As they are not obligate nocturnal migrants, it is highly likely that these detections refer to the beginning of a diurnal movement rather than the end of a nocturnal movement. As such, it is considered unlikely that these birds would have the potential to pass through the Proposed Development Array Area. Diurnal migrants will often use visual cues, where available, and it is considered likely that these birds will follow the coast south during migration before crossing over open sea as per the other diurnal migrant passerines recorded in the VP surveys.



Table 3.31 Records of pied wagtail from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
9/14/2025	6:45	3	1
9/8/2025	6:00	5	1
9/12/2025	6:50	12	1
9/14/2025	6:45	5	1
9/14/2025	6:45	8	1
9/23/2025	6:23	7	1
9/23/2025	6:23	8	1
9/25/2025	6:18	12	1
9/26/2025	6:15	15	1
17/10/2025	07:25	4	2
22/10/2025	07:14	3	3
24/10/2025	07:09	5	1
27/10/2025	08:03	3	1
29/10/2025	07:59	17	1
29/10/2025	07:59	18	2
08/11/2025	07:39	11	1

Robin *Erithacus rubecula*

3.2.41 The vast majority of robin records captured were determined to have been given by unitary, non-migrating birds. However, on two occasions in September the nocturnal flight call of the species was detected, which were deemed to originate from actively migrating birds, as presented in Table 3.32.

Table 3.32 Records of robin from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
18/09/2025	19:33	1	1
30/09/2025	1:06	2	1

Song thrush *Turdus Philomena*

3.2.42 There were three records of song thrush r comprising an estimated four birds. One call from a single bird was captured on 8th September at 23:57. This bird was recorded well before the other migrating thrushes were recorded and, therefore, has the potential to be a resident bird. The two records from November are considered likely to be migrant birds as this is more in line with their regular migration period. Records of song thrush are presented in Table 3.33.



Table 3.33 Records of song thrush from PAM monitoring

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
08/09/2025	23:57	1	1
05/11/2025	21:43	3	2
13/11/2025	20:29	1	1

Redwing

3.2.43 Redwing were encountered in large numbers during the second half of the survey period, peaking in early November. In total there were 1,901 individuals estimated. A sum of the individual observations is not possible as on nights such as 5th November, where 1,279 individuals were estimated, these birds were counted in ten-minute blocks as opposed to treating each encounter as a discrete observation. This is also reflected in Table 3.34, where nightly totals for redwing are summarised, rather than presenting the data from every observation or ten-minute block. All calls are assumed to be from birds actively migrating.

Table 3.34 Records of redwing from PAM monitoring

Date	Number of calls recorded	Estimated number of individuals
13/10/2025	20	14
15/10/2025	2	2
16/10/2025	9	7
17/10/2025	1	1
18/10/2025	1	1
19/10/2025	2	1
20/10/2025	1	1
21/10/2025	1	1
22/10/2025	2	2
24/10/2025	5	2
25/10/2025	4	2
26/10/2025	8	5
28/10/2025	1	1
30/10/2025	2	2
31/10/2025	4	3
02/11/2025	5	5
04/11/2025	4	2
05/11/2025	2138	1729
06/11/2025	101	71
07/11/2025	15	12
08/11/2025	12	7
09/11/2025	1	1
13/11/2025	33	28



Blackbird *Turdus merula*

3.2.44 There were 25 records of this species captured, comprising an estimated 25 individual birds, as shown in Table 3.35. The records were almost exclusively from October, and November suggesting that the calls were recorded from migrant birds rather than residents, as residents would have been expected to be captured in the September recordings as well. As such, it is considered highly likely that all birds recorded were engaged in active migration.

Table 3.35 Records of blackbird from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
23/09/2025	06:23	10	1
02/10/2025	6:01	3	1
02/10/2025	7:01	2	1
02/10/2025	7:01	17	1
04/10/2025	6:56	8	1
05/10/2025	6:53	1	1
05/10/2025	6:53	6	1
14/10/2025	06:32	5	1
16/10/2025	01:31	1	1
16/10/2025	02:31	3	1
17/10/2025	03:25	1	1
20/10/2025	00:18	1	1
05/11/2025	22:43	1	1
05/11/2025	22:43	2	1
05/11/2025	22:43	1	1
06/11/2025	19:41	1	1
06/11/2025	07:43	3	1
06/11/2025	06:43	1	1
06/11/2025	05:43	1	1
06/11/2025	01:43	1	1
08/11/2025	07:39	9	1
08/11/2025	06:39	2	1
08/11/2025	06:39	3	1
08/11/2025	01:39	1	1
09/11/2025	00:38	1	1

Chiffchaff

3.2.45 There were two records of this species from early and mid-September, comprising two individual birds, as presented in Table 3.36. Both records are unlikely to be actively migrating birds, although they are considered likely to be migrants, i.e., birds that are staging within the vicinity of the PAM unit as this species is not known to call while on migratory flights.



Table 3.36 Records of chiffchaff from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
02/09/2025	4:14	5	1
13/09/2025	2:47	1	1

Goldcrest *Regulus regulus*

3.2.46 There were four records of goldcrest; three from late September, comprising three individual birds, and a single bird from early November, as presented in Table 3.37. As with the chiffchaff records, these birds are considered unlikely to be actively migrating but are likely to be staging migrants as this species is not known to call while on migratory flights.

Table 3.37 Records of goldcrest from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
22/09/2025	6:25	1	1
29/09/2025	4:08	4	1
29/09/2025	7:08	2	1
02/11/2025	07:51	8	1

Spotted flycatcher *Muscicapa striata*

3.2.47 A single record, comprising one call from a single spotted flycatcher, was captured at 22:07 on 4th September. Given that the call recorded was the standard nocturnal flight call of the species, it is highly likely that this bird was actively migrating.

Chaffinch

3.2.48 There were five records of this species from late September to early November comprising nine individual birds, as shown in Table 3.38. It is considered highly likely that all birds were engaged in active migration. Like most of the other passerine records, chaffinch were detected just before sunrise. As this species is not an obligate nocturnal migrant, it is highly likely that these detections refer to the beginning of a diurnal movement rather than the end of a nocturnal movement. As such, it is considered unlikely that these birds have the potential to pass through the Proposed Development Array Area. Diurnal migrants will often use visual cues, where available, so it is considered likely that these birds will follow the coast south during migration as per the other diurnal migrant passerines recorded in the VP surveys.

Table 3.38 Records of chaffinch from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
22/09/2025	6:25	1	1
06/10/2025	6:51	2	1
29/10/2025	07:59	50	4
01/11/2025	07:53	14	2
02/11/2025	07:51	6	1



Linnet

3.2.49 There were 15 records of linnet comprising of 88 individual birds, as shown in Table 3.39. It is considered highly likely that all birds were engaged in active migration given the calls recorded and the cluster and timing of the records around late September. Like most other passerines recorded, linnet were detected just before sunrise. As this species is not an obligate nocturnal migrant, it is highly likely that these detections are from the beginning of a diurnal movement rather than the end of a nocturnal movement. As such, it is considered unlikely that these birds have the potential to pass through the Proposed Development Array Area. Diurnal migrants will often use visual cues, where available, so it is considered likely that these birds will follow the coast south during migration as per the other diurnal migrant passerines recorded in the VP surveys.

Table 3.39 Records of linnet from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
28/09/2025	7:10	20	5
28/09/2025	7:10	15	2
29/09/2025	7:08	100	10
30/09/2025	7:06	10	2
16/10/2025	07:31	20	5
17/10/2025	07:25	100	10
21/10/2025	07:16	100	10
22/10/2025	07:14	20	4
26/10/2025	08:05	20	5
29/10/2025	07:59	100	10
29/10/2025	06:59	20	5
02/11/2025	07:51	30	5
02/11/2025	07:51	16	5
02/11/2025	07:51	30	5
02/11/2025	07:51	40	5

Redpoll

3.2.50 Redpoll has been treated as a single species herein, in line with BirdWatch Ireland taxonomy, and as there are no known ways to separate the different (likely) redpoll taxa from their flight calls. Redpoll were encountered on 17 occasions, comprising an estimated 73 individuals, with records almost exclusively from October (Table 3.40). Like almost all other passerines, these birds were detected just before sunrise. As this species is not an obligate nocturnal migrant, it is highly likely that these detections refer to the beginning of a diurnal movement rather than the end of a nocturnal movement. As such, it is considered unlikely that these birds have the potential to pass through the Proposed Development Array Area. Diurnal migrants will often use visual cues, where available, so it is considered likely that these birds will follow the coast south during migration as per the other diurnal migrant passerines recorded in the VP surveys.



Table 3.40 Records of redpoll from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
06/10/2025	06:51	100	10
16/10/2025	07:31	6	3
17/10/2025	06:25	5	3
17/10/2025	07:25	50	10
21/10/2025	07:16	50	5
22/10/2025	06:14	10	2
22/10/2025	07:14	50	10
23/10/2025	18:09	10	3
24/10/2025	07:09	20	2
26/10/2025	07:05	8	3
26/10/2025	08:05	8	3
27/10/2025	07:03	8	1
29/10/2025	07:59	30	4
29/10/2025	07:59	10	2
30/10/2025	07:57	40	5
30/10/2025	06:57	50	5
02/11/2025	07:51	15	2

Goldfinch

3.2.51 There were 19 records of this species comprising 146 individual birds, almost exclusively from October and November, as shown in Table 3.41. It is considered highly likely that all birds were engaged in active migration given the calls recorded the timing of the records. Like the majority of other passerine records, goldfinch were detected just before sunrise. As this species is not an obligate nocturnal migrant, it is highly likely that these detections refer to the beginning of a diurnal movement rather than the end of a nocturnal movement. As such, it is considered unlikely that these birds have the potential to pass through the Proposed Development Array Area. Diurnal migrants will often use visual cues, where available, so it is considered likely that these birds will follow the coast south during migration as per the other diurnal migrant passerines recorded in the VP surveys.



Table 3.41 Records of goldfinch from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
22/09/2025	6:25	1	1
06/10/2025	6:51	50	10
17/10/2025	07:25	50	10
21/10/2025	07:16	150	20
22/10/2025	07:14	100	20
24/10/2025	07:09	100	20
26/10/2025	07:05	3	1
27/10/2025	08:03	10	7
28/10/2025	08:01	5	1
29/10/2025	07:59	50	5
29/10/2025	07:59	100	10
29/10/2025	07:59	40	5
29/10/2025	07:59	200	10
29/10/2025	06:59	25	3
29/10/2025	06:59	50	5
01/11/2025	07:53	30	5
02/11/2025	07:51	50	5
02/11/2025	07:51	20	3
08/11/2025	07:39	20	5

Siskin

3.2.52 There were eight records of siskin, estimated to number at least 45 birds, between late September and Late October (Table 3.42). Like most other passerines recorded, siskin were detected just before sunrise. As this species is not an obligate nocturnal migrant, it is highly likely that these detections refer to the beginning of a diurnal movement rather than the end of a nocturnal movement. As such, it is considered unlikely that these birds have the potential to pass through the Proposed Development Array Area. Diurnal migrants will often use visual cues, where available, so it is considered likely that these birds will follow the coast south during migration as per the other diurnal migrant passerines recorded in the VP surveys.

Table 3.42 Records of siskin from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
22/09/2025	06:25	15	2
17/10/2025	07:25	50	10
21/10/2025	07:16	10	3
22/10/2025	07:14	30	20
24/10/2025	07:09	20	3
27/10/2025	08:03	4	1
29/10/2025	07:59	2	1
29/10/2025	07:59	20	5



Reed bunting *Emberiza schoeniclus*

3.2.53 There were four records of this species comprising an estimated five individual birds. All records came from the second half of October, as presented in Table 3.43. Like most other passerines recorded, reed bunting were detected just before sunrise. As this species is not an obligate nocturnal migrant, it is highly likely that these detections refer to the beginning of a diurnal movement rather than the end of a nocturnal movement. As such, it is considered unlikely that these birds have the potential to pass through the Proposed Development Array Area. Diurnal migrants will often use visual cues, where available, so it is considered likely that these birds will follow the coast south during migration as per the other diurnal migrant passerines recorded in the VP surveys.

Table 3.43 Records of reed bunting from the onshore PAM unit

Date	Start time of recording block	Number of calls recorded	Estimated number of individuals
16/10/2025	06:31	1	1
16/10/2025	06:31	5	2
21/10/2025	07:16	8	1
22/10/2025	07:14	3	1



4 Discussion

4.1 VP Surveys

- 4.1.1 Passerines were the most abundant species group recorded during the VP survey programme (n=3,981 individuals), with the bulk of the records being hirundine species, primarily house martin and swallow. Waders (n=772 individuals) were the next most abundant species group, followed by wildfowl and grebes (n=3105 individuals), and raptors (n=5 individuals).
- 4.1.2 The vast majority of target species migration flights (93.8%) were birds moving either north or south along or perpendicular to the coast, with the remainder (6.2%) recorded flying in a direction that indicates that they had the potential to have passed through the Proposed Development Array Area. Moreover, most (90.6%) target species records that were subject to flight height estimation were recorded flying within flight height bands A or B (i.e., below 20 m) (Appendix 0), with the remaining 9.4% estimated to be flying at a height greater than 20 m. Similarly 96.5% of target species migratory flights recorded were within 1 km of the coast (Offshore Distance Bands A to C), with the remaining 3.5% comprising of common scoter and great crested grebe only, within 5 km of the coast. No migratory flights were recorded beyond 5 km offshore, though it is recognised that many passerines and other species may not be detectable at this distance and beyond.

4.2 PAM Surveys

- 4.2.1 Birds detected using PAM during nocturnal migration were dominated by passerines, with 17 species recorded, totalling 430 records comprising of an estimated 2,540 individuals. In addition, many of the passerine species noted herein (in particular, hirundines, pipits, and finches) are diurnal migrants. As such, it is considered likely that the PAM unit recorded the beginning of diurnal movements around sunrise, rather than true nocturnal movements. It is therefore considered highly unlikely that these birds would have crossed the Irish Sea and interacted with any offshore infrastructure. For these species, the VP data should be considered to be more appropriate. As such, among the passerines recorded, only the data for thrushes (including closely related *Muscicapidae* species such as robin and spotted flycatcher) should be considered as true nocturnal migrants.
- 4.2.2 Waders were the next most numerous group of species, with 18 species recorded, totalling 237 records comprising of an estimated 329 individuals. Eight species of wildfowl and rails were recorded, comprising of 13 records of 36 individuals. While these species will migrate both by day and by night, it is considered that these records are all comprised of migrating birds.
- 4.2.3 Additional species were recorded, including barn owl, dunnock and raven. All of these should be considered residents, with the exception of barn owl, as they are known to occur in the Wicklow Head area
- 4.2.4 In addition to the target species, five seabird species, including common tern and sandwich tern, were recorded. As terns are known to migrate nocturnally, records of both common and Sandwich tern should be considered to be true nocturnal movements.



5 Conclusions

- 5.1.1 For diurnal species, VP surveys provided the most robust data, while PAM data provided more information on species which migrate nocturnally.
- 5.1.2 Passerines were the most abundant species group recorded during the VP survey programme, the majority of which were hirundine species, primarily house martin and swallow. Waders, wildfowl and grebes, and raptors were the next most abundant groups, respectively.
- 5.1.3 Only 6.2% of birds were recorded flying in a direction that suggests they may have crossed the sea and through the Proposed Development Array Area. However, 90.6% of target species were recorded flying within below 20 m suggesting negligible risk, subject to any caveats. No migratory flights were recorded beyond 5 km offshore.
- 5.1.4 The Developer considers that in utilising PAM the specific DAU recommendation regarding the collection of additional data on the migration of terrestrial birds has been met. The Developer also notes that PAM can be used to monitor the migration of waterbirds, and as such considers that the PAM surveys augment the data collected during the VP surveys, as requested by the DAU. The Developer considers that appropriate methods of data collection have been used, with VP, vessel-based observer surveys and PAM surveys all selected as they give species specific data. This makes them more appropriate than radar or thermal imaging surveys where species identification cannot be inferred with confidence. As such, this combination of approach can inform assessment of levels of migration through the wider area as requested by the DAU, which can give context to the Developers mCRM assessment of migratory collisions predicted for the proposed development.



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Appendix A: Full VP Survey Results

The following tables present complete results from the VP surveys. While waders, waterfowl and terrestrial species were the target species, records of other migratory species types (including marine and seabirds) have been included for completeness.



Table 6.1 Full Survey Results: VP1

Visit	Date	Survey hour	Species	Count	Direction	Vocalising	Behaviour	Flight height band	Distance band
1	05/09/2025	2	Common scoter	2	S	N	Direct flight	A	B
1	05/09/2025	1	House martin	800	S	Y	Direct flight	N/A	A
1	05/09/2025	2	House martin	1000	S	Y	Direct flight	N/A	A
1	05/09/2025	3	House martin	400	S	Y	Direct flight	N/A	A
1	05/09/2025	1-3	Meadow pipit	Unknown	S	Y	Direct flight	N/A	A
1	05/09/2025	3	Ringed plover	1	N	Y	Flyover	N/A	A
1	05/09/2025	1	Swallow	400	S	Y	Direct flight	N/A	A
1	05/09/2025	2	Swallow	300	S	Y	Direct flight	N/A	A
1	05/09/2025	3	Swallow	300	S	Y	Direct flight	N/A	A
1	05/09/2025	1	Wheatear	2	N/A	N	On headland	A	A
1	05/09/2025	3	Sandwich tern	7	S	Y	Direct flight	A	C
2	12/09/2025	3	Black-tailed godwit	18	S	N	Direct flight	B	C
2	12/09/2025	5	Black-tailed godwit	7	SSW	N	Direct flight	B	B
2	12/09/2025	3	Common scoter	3	SSE	N	Direct flight	A	D
2	12/09/2025	2	Curlew	3	S	N	Direct flight	N/A	N/A
2	12/09/2025	5	Curlew	4	S	Y	Direct flight	B	A
2	12/09/2025	6	Curlew	4	S	N	Direct flight	B	C
2	12/09/2025	7	Dunlin	21	S	N	Direct flight	A	A
2	12/09/2025	6	Meadow pipit	16	SSW	N	Flyover	B	A
2	12/09/2025	6	Oystercatcher	2	N	Y	Direct flight	A	A
2	12/09/2025	6	Turnstone	8	N	N	Direct flight	A	A
2	12/09/2025	1	Great northern diver	1	SSW	N	Direct flight	B	D
2	12/09/2025	1	Sandwich tern	12	SSW	Y	Direct flight	B	B
2	12/09/2025	2	Red-throated diver	2	S	N	Direct flight	A	D
2	12/09/2025	3	Common tern	4	S	Y	Direct flight	B	B
2	12/09/2025	4	Sandwich tern	7	S	N	Direct flight	B	B
2	12/09/2025	4	Common tern	11	S	N	Direct flight	B	C
2	12/09/2025	4	Arctic tern	4	S	N	Direct flight	B	C
2	12/09/2025	5	Red-throated diver	1	S	N	Direct flight	B	D
2	12/09/2025	6	Great northern diver	1	S	N	Direct flight	B	D
2	12/09/2025	6	Red-throated diver	1	S	N	Direct flight	A	D
2	12/09/2025	6	Arctic skua	1	S	N	Direct flight	B	B
2	12/09/2025	7	Arctic tern	9	S	N	Direct flight	B	B
3	18/09/2025	6	Golden plover	1	N	Y	Flyover	B	A
3	18/09/2025	6	Oystercatcher	1	S	Y	Direct flight	A	C
3	18/09/2025	3	Redpoll	2	W	Y	Flyover	B	A
3	18/09/2025	2	Siskin	2	W	Y	Flyover	A	A
3	18/09/2025	5	Siskin	4	S	Y	Flyover	B	A
3	18/09/2025	5	Siskin	5	W	Y	Flyover	B	A
3	18/09/2025	3	Swallow	9	S	Y	Flyover	B	A
3	18/09/2025	6	Red-throated diver	1	N	N	Direct flight	A	C
3	18/09/2025	6	Red-throated diver	1	S	N	Direct flight	A	C
3	18/09/2025	2	Common tern	1	S	N	Direct flight	B	C
3	18/09/2025	2	Sandwich tern	2	S	N	Flyover	A	C
4	22/09/2025	7	Black-tailed godwit	11	S	N	Direct flight	B	B
4	22/09/2025	7	Black-tailed godwit	19	S	N	Direct flight	B	B



Visit	Date	Survey hour	Species	Count	Direction	Vocalising	Behaviour	Flight height band	Distance band
4	22/09/2025	4	Common scoter	2	S	Y	Direct flight	A	D
4	22/09/2025	7	Common scoter	4	S	N	Direct flight	A	D
4	22/09/2025	2	Curlew	2	S	Y	Direct flight	C	B
4	22/09/2025	7	House martin	11	SW	Y	Direct flight	N/A	A
4	22/09/2025	1	Brent goose	7	S	Y	Direct flight	A	A
4	22/09/2025	5	Brent goose	5	S	N	Direct flight	A	B
4	22/09/2025	2	Meadow pipit	7	SW	Y	Flyover	N/A	A
4	22/09/2025	2	Oystercatcher	4	S	Y	Direct flight	B	A
4	22/09/2025	3	Oystercatcher	6	SW	N	Direct flight	B	A
4	22/09/2025	6	Oystercatcher	2	S	N	Direct flight	B	B
4	22/09/2025	6	Sanderling	9	S	N	Direct flight	A	B
4	22/09/2025	2	Swallow	12	SW	Y	Flyover	N/A	A
4	22/09/2025	7	Swallow	21	SW	Y	Direct flight	N/A	A
4	22/09/2025	3	Turnstone	12	S	Y	Direct flight	A	A
4	22/09/2025	1	Red-throated diver	2	S	N	Direct flight	A	D
4	22/09/2025	2	Red-throated diver	2	S	N	Direct flight	A	D
4	22/09/2025	3	Red-throated diver	1	SSW	Y	Direct flight	B	C
4	22/09/2025	2	Common tern	7	S	N	Direct flight	B	B
4	22/09/2025	4	Red-throated diver	5	S	N	Direct flight	A	D
4	22/09/2025	2	Sandwich tern	2	SSW	N	Direct flight	B	C
4	22/09/2025	5	Red-throated diver	3	SSE	N	Direct flight	A	D
4	22/09/2025	7	Red-throated diver	1	S	N	Direct flight	A	C
4	22/09/2025	5	Common tern	4	S	Y	Direct flight	A	B
4	22/09/2025	6	Common tern	8	S	N	Direct flight	A	B
5	07/10/2025	6	House martin	1	S	Y	Flyover	A	A
5	07/10/2025	4	Redpoll	4	SW	Y	Flyover	A	A
5	07/10/2025	4	Siskin	2	S	Y	Flyover	B	A
5	07/10/2025	4	Swallow	6	NW	N	Flyover	A	A
5	07/10/2025	5	Swallow	3	W	N	Flyover	B	A
5	07/10/2025	6	Swallow	1	N	N	Flyover	B	A
5	07/10/2025	6	Swallow	3	W	N	Flyover	B	C
5	07/10/2025	6	Swallow	2	W	Y	Flyover	B	A
5	07/10/2025	4	Arctic skua	1	S	N	Direct flight	A	D
5	07/10/2025	4	Great northern diver	1	N	N	Direct flight	A	C
6	10/10/2025	5	Great crested grebe	1	S	N	Direct flight	A	C
6	10/10/2025	4	Black-tailed godwit	14	S	N	Direct flight	B	B
6	10/10/2025	2	Common scoter	5	S	N	Direct flight	A	C
6	10/10/2025	6	Common scoter	8	S	N	Direct flight	A	C
6	10/10/2025	6	Curlew	2	S	N	Direct flight	B	B
6	10/10/2025	5	Great crested grebe	2	S	N	Direct flight	A	C
6	10/10/2025	2	Golden plover	46	S	N	Flyover	D	A
6	10/10/2025	4	Golden plover	37	SSW	Y	Flyover	C	A
6	10/10/2025	2	Red-breasted merganser	2	SSW	Y	Direct flight	A	B
6	10/10/2025	7	Red-breasted merganser	2	N	N	Direct flight	A	B
6	10/10/2025	8	Mallard	2	N	N	Direct flight	B	B
6	10/10/2025	3	Oystercatcher	7	S	Y	Direct flight	B	A
6	10/10/2025	4	Oystercatcher	2	N	Y	Direct flight	B	A
6	10/10/2025	3	Peregrine	1	N	N	Flyover	C	A



Visit	Date	Survey hour	Species	Count	Direction	Vocalising	Behaviour	Flight height band	Distance band
6	10/10/2025	1	Ringed plover	6	S	N	Direct flight	B	A
6	10/10/2025	3	Sanderling	19	S	N	Direct flight	B	B
6	10/10/2025	7	Sanderling	16	SSE	N	Direct flight	A	B
6	10/10/2025	1	Turnstone	8	S	N	Direct flight	B	A
6	10/10/2025	1	Red-throated diver	1	S	N	Direct flight	A	C
6	10/10/2025	3	Red-throated diver	1	S	N	Direct flight	A	D
6	10/10/2025	4	Red-throated diver	1	SE	N	Direct flight	A	D
6	10/10/2025	5	Red-throated diver	1	S	N	Direct flight	A	B
6	10/10/2025	7	Red-throated diver	1	S	N	Direct flight	A	C
6	10/10/2025	7	Great northern diver	1	S	N	Direct flight	A	D
7	14/10/2025	6	Red-breasted merganser	2	SE	N	Direct flight	A	C
7	14/10/2025	4	Common scoter	12	S	N	Direct flight	A	C
7	14/10/2025	8	Common scoter	8	S	N	Direct flight	A	D
7	14/10/2025	2	Curlew	2	S	Y	Direct flight	C	A
7	14/10/2025	7	Dunlin	31	SSE	Y	Direct flight	B	A
7	14/10/2025	6	Knot	32	S	N	Direct flight	A	B
7	14/10/2025	2	Brent goose	8	S	N	Direct flight	A	B
7	14/10/2025	2	Oystercatcher	4	SSW	Y	Direct flight	C	A
7	14/10/2025	7	Peregrine	1	SW	N	Flyover	D	A
7	14/10/2025	7	Shelduck	2	S	N	Direct flight	B	B
7	14/10/2025	4	Turnstone	12	N	N	Direct flight	B	B
7	14/10/2025	1	Red-throated diver	1	S	N	Direct flight	A	D
7	14/10/2025	3	Red-throated diver	1	S	N	Direct flight	A	D
7	14/10/2025	5	Red-throated diver	1	SE	N	Direct flight	A	D
7	14/10/2025	6	Red-throated diver	2	SSE	N	Direct flight	B	D
7	14/10/2025	8	Red-throated diver	1	S	N	Direct flight	A	B
7	14/10/2025	8	Red-throated diver	1	S	N	Direct flight	B	D
7	14/10/2025	4	Great northern diver	1	S	N	Direct flight	B	C
8	24/10/2025	2	Crossbill	7	N	Y	Flyover	B	A
8	24/10/2025	5	Grey wagtail	1	W	Y	Flyover	A	A
8	24/10/2025	2	Hen harrier	1	S	N	Hunting	A	A
8	24/10/2025	1	Linnet	14	N	Y	Flyover	B	A
8	24/10/2025	4	Merlin	1	E	N	Direct flight	B	B
8	24/10/2025	1	Redpoll	4	NW	Y	Flyover	B	A
8	24/10/2025	5	Siskin	9	N	Y	Flyover	B	A
8	24/10/2025	4	White-fronted goose	8	S	Y	Direct flight	C	A
8	24/10/2025	5	White-fronted goose	7	S	Y	Direct flight	C	B
9	09/11/2025	2	Great crested grebe	2	S	N	Direct flight	A	D
9	09/11/2025	5	Great crested grebe	2	SSW	N	Direct flight	A	C
9	09/11/2025	1	Curlew	3	S	Y	Direct flight	B	A
9	09/11/2025	3	Fieldfare	19	S	Y	Flyover	B	A
9	09/11/2025	4	Fieldfare	28	SSW	Y	Flyover	B	A
9	09/11/2025	3	Brent goose	5	S	Y	Direct flight	A	B
9	09/11/2025	1	Oystercatcher	2	N	Y	Flyover	B	A
9	09/11/2025	4	Oystercatcher	4	S	Y	Direct flight	C	A
9	09/11/2025	5	Oystercatcher	3	N	Y	Flyover	B	A
9	09/11/2025	3	Redwing	32	S	Y	Flyover	B	A
9	09/11/2025	4	Redwing	32	SSW	Y	Flyover	B	A



Visit	Date	Survey hour	Species	Count	Direction	Vocalising	Behaviour	Flight height band	Distance band
9	09/11/2025	4	Sanderling	14	S	N	Direct flight	A	B
9	09/11/2025	5	Turnstone	9	S	Y	Direct flight	A	A
9	09/11/2025	1	Red-throated diver	1	S	N	Direct flight	A	C
9	09/11/2025	3	Red-throated diver	1	SSW	N	Direct flight	A	D
9	09/11/2025	3	Red-throated diver	2	SSW	N	Direct flight	A	D
9	09/11/2025	5	Great northern diver	1	SSE	N	Direct flight	A	D
10	11/11/2025	4	Great crested grebe	2	S	N	Direct flight	A	C
10	11/11/2025	1	Red-breasted merganser	2	S	N	Direct flight	A	B
10	11/11/2025	3	Golden plover	32	S	Y	Flyover	D	A
10	11/11/2025	1	Oystercatcher	2	N	Y	Direct flight	B	A
10	11/11/2025	6	Oystercatcher	4	NNW	Y	Flyover	C	A
10	11/11/2025	2	Peregrine	1	E	N	Over cliffs	C	A
10	11/11/2025	5	Sanderling	15	S	N	Direct flight	A	B
10	11/11/2025	7	Shelduck	2	N	N	Direct flight	B	A
10	11/11/2025	3	Turnstone	12	N	N	Direct flight	A	A
10	11/11/2025	2	Red-throated diver	1	S	N	Direct flight	A	D
10	11/11/2025	6	Red-throated diver	1	S	N	Direct flight	A	D
10	11/11/2025	4	Great northern diver	1	S	N	Direct flight	A	D
11	20/11/2025	-	Chaffinch	4	NW	Y	Flyover	B	A
11	20/11/2025	-	Goldfinch	7	NW	Y	Flyover	B	A
11	20/11/2025	-	Linnet	6	N	Y	Flyover	B	A
11	20/11/2025	-	Meadow pipit	1	NW	Y	Flyover	B	A
11	20/11/2025	-	Pochard	1	N	N	Direct flight	C	C
11	20/11/2025	-	Redpoll	7	N	Y	Flyover	B	A
12	25/11/2025	3	Lapwing	2	S	N	Direct flight	B	B
12	25/11/2025	2	Linnet	8	N	Y	Flying along head	D	A
12	25/11/2025	2	Redpoll	4	W	Y	Flyover headland	C	A
12	25/11/2025	2	Redpoll	4	W	Y	Flyover headland	C	A
12	25/11/2025	2	Redpoll	4	W	Y	Flyover along head	C	B
12	25/11/2025	3	Red-throated diver	1	N	N	Direct flight	A	C
12	25/11/2025	5	Siskin	6	N	Y	Flyover head	C	A
12	25/11/2025	5	Turnstone	8	N	N	Flying along coast	A	A
12	25/11/2025	2	Yellowhammer	1	W	Y	Flyover head	D	A
12	25/11/2025	6	Red-throated diver	1	S	N	Direct flight	A	C
12	25/11/2025	2	Red-throated diver	1	S	N	Direct flight	A	B
12	25/11/2025	3	Red-throated diver	1	S	N	Direct flight	A	C
12	25/11/2025	3	Red-throated diver	4	S	N	Direct flight	A	B
12	25/11/2025	3	Red-throated diver	4	S	N	Direct flight	A	C
12	25/11/2025	3	Red-throated diver	2	S	N	Direct flight	A	C
12	25/11/2025	3	Red-throated diver	3	S	N	Direct flight	A	C
12	25/11/2025	3	Red-throated diver	1	S	N	Direct flight	B	B
12	25/11/2025	3	Red-throated diver	2	S	N	Direct flight	A	B
12	25/11/2025	3	Red-throated diver	1	S	N	Direct flight	A	B
12	25/11/2025	2	Red-throated diver	2	S	N	Direct flight	A	C
12	25/11/2025	4	Red-throated diver	2	S	N	Direct flight	A	B
12	25/11/2025	4	Red-throated diver	2	S	N	Direct flight	A	B
12	25/11/2025	4	Red-throated diver	3	S	N	Direct flight	A	C



Visit	Date	Survey hour	Species	Count	Direction	Vocalising	Behaviour	Flight height band	Distance band
12	25/11/2025	5	Red-throated diver	1	S	N	Direct flight	A	B
12	25/11/2025	5	Red-throated diver	1	S	N	Direct flight	A	C
12	25/11/2025	5	Red-throated diver	3	S	N	Direct flight	A	B
12	25/11/2025	6	Red-throated diver	1	S	N	Direct flight	A	C
12	25/11/2025	6	Red-throated diver	3	S	N	Direct flight	A	B
12	25/11/2025	6	Red-throated diver	1	N	N	Direct flight	B	B
12	25/11/2025	6	Red-throated diver	1	N	N	Direct flight	B	B
12	25/11/2025	7	Red-throated diver	1	N	N	Direct flight	A	B



Table 6.2 Full Survey Results: VP2

Visit	Date	Survey hour	Species	Count	Direction	Vocalising	Behaviour	Flight height band	Distance band
1	01/09/2025	1	Arctic tern	1	SW	N	Direct flight	A	B
1	01/09/2025	1	Sandwich tern	2	N	Y	Direct flight	A	B
1	01/09/2025	1	Sandwich tern	1	S	Y	Foraging	A	B
1	01/09/2025	1	Sandwich tern	1	S	Y	Foraging	A	B
1	01/09/2025	2	Sandwich tern	2	N	Y	Foraging	A	B
1	01/09/2025	2	Arctic skua	1	S	N	Direct flight	A	A
1	01/09/2025	2	Sandwich tern	1	NW	Y	Direct flight	A	B
1	01/09/2025	2	Common tern	1	N	N	Direct flight	A	B
1	01/09/2025	2	Sandwich tern	3	S	N	Foraging	A	B
1	01/09/2025	2	Sandwich tern	1	S	Y	Foraging	A	B
1	01/09/2025	3	Sandwich tern	3	N	Y	Foraging	A	B
1	01/09/2025	3	Sandwich tern	1	S	N	Foraging	A	B
1	01/09/2025	5	Sandwich tern	2	N	N	Foraging	A	B
1	01/09/2025	2	Bar-tailed godwit	1	S	N	Direct flight	B	C
1	01/09/2025	6	Black-tailed godwit	1	S	N	Direct flight	B	C
1	01/09/2025	1	Common scoter	1	N	N	Direct flight	A	B
1	01/09/2025	3	Common scoter	2	NW	N	Direct flight	A	B
1	01/09/2025	1	Dunlin	3	S	N	Direct flight	A	B
1	01/09/2025	2	Dunlin	1	S	N	Direct flight	A	A
1	01/09/2025	3	Dunlin	3	S	N	Direct flight	A	B
1	01/09/2025	4	Dunlin	22	S	N	Direct flight	A	B
1	01/09/2025	4	Oystercatcher	1	NW	Y	Direct flight	A	A
1	01/09/2025	1	Redshank	6	S	N	Direct flight	A	B
1	01/09/2025	3	Ringed plover	7	S	N	Direct flight	A	B
1	01/09/2025	3	Whimbrel	1	S	N	Direct flight	B	C
2	11/09/2025	1	Sandwich tern	63	S	N	Direct flight	B	B
2	11/09/2025	1	Arctic tern	4	S	N	Direct flight	B	B
2	11/09/2025	1	Common tern	26	S	N	Direct flight	B	B
2	11/09/2025	1	Roseate tern	2	S	N	Direct flight	B	B
2	11/09/2025	2	Sandwich tern	27	SSW	Y	Direct flight	B	B
2	11/09/2025	3	Sandwich tern	11	S	N	Direct flight	A	C
2	11/09/2025	4	Common tern	4	S	N	Direct flight	A	C
2	11/09/2025	5	Sandwich tern	9	S	N	Direct flight	A	C
2	11/09/2025	5	Common tern	6	S	N	Direct flight	A	C
2	11/09/2025	5	Arctic tern	2	S	N	Direct flight	A	C
2	11/09/2025	6	Great northern diver	1	SSW	N	Direct flight	A	D
2	11/09/2025	6	Common tern	5	S	Y	Direct flight	A	A
2	11/09/2025	2	Bar-tailed godwit	11	S	N	Direct flight	B	B
2	11/09/2025	1	Black-tailed godwit	12	S	N	Direct flight	B	B
2	11/09/2025	1	Black-tailed godwit	23	S	N	Direct flight	B	B
2	11/09/2025	2	Black-tailed godwit	41	S	N	Direct flight	B	B
2	11/09/2025	3	Black-tailed godwit	9	S	N	Direct flight	B	A
2	11/09/2025	6	Black-tailed godwit	5	S	N	Direct flight	A	B
2	11/09/2025	4	Curlew	2	S	N	Direct flight	B	A
2	11/09/2025	5	Curlew	2	S	N	Direct flight	B	A
2	11/09/2025	1	House martin	150	S	N	Direct flight	A	A



Visit	Date	Survey hour	Species	Count	Direction	Vocalising	Behaviour	Flight height band	Distance band
2	11/09/2025	2	Oystercatcher	3	S	Y	Direct flight	A	A
2	11/09/2025	6	Oystercatcher	7	SSW	Y	Direct flight	B	A
2	11/09/2025	7	Oystercatcher	4	S	Y	Direct flight	A	A
2	11/09/2025	5	Ringed plover	8	S	N	Direct flight	A	A
2	11/09/2025	1	Sand martin	25	S	N	Direct flight	A	A
2	11/09/2025	6	Sanderling	18	S	N	Direct flight	A	A
2	11/09/2025	1	Swallow	200	S	N	Flyover	A	A
2	11/09/2025	3	Turnstone	6	S	Y	Direct flight	A	A
2	11/09/2025	7	Turnstone	9	S	Y	Direct flight	A	A
2	11/09/2025	1	Red-throated diver	1	S	N	Direct flight	A	D
2	11/09/2025	4	Red-throated diver	1	S	N	Direct flight	B	D
2	11/09/2025	5	Red-throated diver	1	S	N	Direct flight	A	D
3	15/09/2025	1	Arctic tern	1	S	N	Direct flight	A	B
3	15/09/2025	1	Common tern	7	S	N	Direct flight	A	B
3	15/09/2025	1	Sabine's gull	1	S	N	Direct flight	B	B
3	15/09/2025	2	Arctic tern	2	S	N	Direct flight	N/A	C
3	15/09/2025	2	Arctic skua	2	N	N	Direct flight	N/A	C
3	15/09/2025	3	Roseate tern	1	S	N	Direct flight	N/A	C
3	15/09/2025	4	Common tern	4	S	N	Direct flight	N/A	A
3	15/09/2025	5	Roseate tern	10	S	N	Direct flight	N/A	C
3	15/09/2025	5	Sandwich tern	9	S	N	Direct flight	N/A	C
3	15/09/2025	5	Common scoter	2	S	N	Direct flight	N/A	C
3	15/09/2025	1	Dunlin	2	S	N	Direct flight	A	A
3	15/09/2025	5	Grey phalarope	7	S	N	Direct flight	N/A	A
3	15/09/2025	3	Red-throated diver	1	N	N	Direct flight	N/A	C
4	26/09/2025	1	Common tern	11	S	Y	Direct flight	A	C
4	26/09/2025	1	Arctic tern	2	S	Y	Direct flight	A	C
4	26/09/2025	4	Arctic skua	2	S	N	Direct flight	A	C
4	26/09/2025	6	Arctic skua	1	S	N	Direct flight	A	B
4	26/09/2025	7	Common tern	9	S	N	Direct flight	B	B
4	26/09/2025	7	Common tern	5	S	N	Direct flight	A	C
4	26/09/2025	3	Black-tailed godwit	18	S	N	Direct flight	A	C
4	26/09/2025	1	Common scoter	9	S	Y	Direct flight	A	D
4	26/09/2025	6	Common scoter	2	S	N	Direct flight	A	C
4	26/09/2025	1	Curlew	4	SSW	Y	Direct flight	B	A
4	26/09/2025	2	Curlew	2	SW	Y	Direct flight	B	A
4	26/09/2025	3	Brent goose	6	SSW	N	Direct flight	A	B
4	26/09/2025	2	Mallard	4	S	N	Direct flight	A	A
4	26/09/2025	1	Oystercatcher	3	S	Y	Direct flight	A	B
4	26/09/2025	5	Oystercatcher	2	S	N	Direct flight	A	A
4	26/09/2025	4	Turnstone	7	S	N	Direct flight	A	A
4	26/09/2025	6	Turnstone	7	N	N	Direct flight	A	A
4	26/09/2025	5	Wigeon	6	S	N	Direct flight	A	B
4	26/09/2025	3	Red-throated diver	1	SSSW	N	Direct flight	A	D
4	26/09/2025	4	Red-throated diver	1	SSW	N	Direct flight	A	D
4	26/09/2025	4	Red-throated diver	3	SSW	N	Direct flight	A	D
4	26/09/2025	6	Red-throated diver	1	SSW	N	Direct flight	A	C
5	02/10/2025	2	Arctic skua	2	N	N	Loafing	A	D



Visit	Date	Survey hour	Species	Count	Direction	Vocalising	Behaviour	Flight height band	Distance band
5	02/10/2025	2	Sandwich tern	3	S	N	Direct flight	A	B
5	02/10/2025	4	Arctic tern	1	S	N	Direct flight	A	B
5	02/10/2025	4	Great northern diver	1	S	N	Direct flight	A	B
5	02/10/2025	4	Arctic tern	1	S	N	Direct flight	B	B
5	02/10/2025	5	Arctic skua	2	E	N	Loafing	A	C
5	02/10/2025	1	Common scoter	10	S	N	Direct flight	A	D
5	02/10/2025	2	Common scoter	3	S	N	Direct flight	A	C
5	02/10/2025	2	Common scoter	11	N	N	Direct flight	A	C
5	02/10/2025	2	Common scoter	1	S	N	Direct flight	A	C
5	02/10/2025	3	Common scoter	2	S	N	Direct flight	A	C
5	02/10/2025	5	Common scoter	8	S	N	Direct flight	A	C
5	02/10/2025	5	Common scoter	1	S	N	Direct flight	A	B
5	02/10/2025	6	Common scoter	3	S	N	Direct flight	A	B
5	02/10/2025	1	Dunlin	3	S	N	Direct flight	A	B
5	02/10/2025	5	Knot	10	S	N	Direct flight	A	B
5	02/10/2025	2	Oystercatcher	2	S	Y	Direct flight	A	B
5	02/10/2025	3	Redpoll	2	N	Y	Flyover	B	A
5	02/10/2025	3	Swallow	5	SW	Y	Flyover	A	C
5	02/10/2025	3	Swallow	3	S	Y	Flyover	A	A
5	02/10/2025	4	Swallow	6	SW	N	Flyover	B	A
5	02/10/2025	3	Red-throated diver	1	N	N	Direct flight	B	C
5	02/10/2025	3	Red-throated diver	1	S	N	Direct flight	A	A
5	02/10/2025	4	Red-throated diver	1	N	N	Direct flight	B	B
5	02/10/2025	4	Red-throated diver	1	N	N	Direct flight	B	C
5	02/10/2025	4	Red-throated diver	1	SE	N	Direct flight	B	B
6	08/10/2025	3	Common scoter	1	S	N	Direct flight	A	D
6	08/10/2025	5	Common scoter	2	S	N	Direct flight	A	C
6	08/10/2025	5	Common scoter	1	N	N	Direct flight	A	C
6	08/10/2025	5	Common scoter	1	S	N	Direct flight	A	C
6	08/10/2025	6	Common scoter	1	N	N	Direct flight	A	C
6	08/10/2025	4	Pintail	1	N	N	Direct flight	A	C
6	08/10/2025	2	Red-throated diver	1	S	N	Direct flight	A	B
6	08/10/2025	3	Red-throated diver	1	N	N	Direct flight	A	B
6	08/10/2025	4	Red-throated diver	1	S	N	Direct flight	A	B
6	08/10/2025	4	Red-throated diver	1	S	N	Direct flight	A	C
7	14/10/2025	2	Great skua	1	S	N	Direct flight	B	C
7	14/10/2025	2	Common scoter	1	S	N	Direct flight	A	C
7	14/10/2025	3	Common scoter	7	S	N	Direct flight	A	C
7	14/10/2025	6	Common scoter	13	N	N	Direct flight	A	C
7	14/10/2025	3	Curlew	1	N	N	Direct flight	B	B
7	14/10/2025	2	Dunlin	6	N	N	Direct flight	A	B
7	14/10/2025	6	Linnet	17	N	N	Direct flight	B	B
7	14/10/2025	6	Siskin	2	NE	Y	Flyover	B	A
7	14/10/2025	6	Swallow	15	N	N	Foraging	A	A
7	14/10/2025	6	Swallow	15	N	N	Foraging	A	A
7	14/10/2025	3	Teal	9	N	N	Direct flight	A	B
7	14/10/2025	4	Teal	18	S	N	Direct flight	A	A
7	14/10/2025	5	Teal	4	N	N	Direct flight	A	A



Visit	Date	Survey hour	Species	Count	Direction	Vocalising	Behaviour	Flight height band	Distance band
7	14/10/2025	6	Teal	24	N	N	Direct flight	A	A
7	14/10/2025	2	Tufted duck	7	N	N	Direct flight	A	B
7	14/10/2025	3	Wigeon	7	N	N	Direct flight	A	B
7	14/10/2025	4	Red-throated diver	2	S	N	Direct flight	B	C
7	14/10/2025	5	Red-throated diver	1	N	N	Direct flight	A	C
8	21/10/2025	1	Common scoter	1	N	N	Direct flight	A	C
8	21/10/2025	2	Common scoter	3	N	N	Direct flight	A	C
8	21/10/2025	2	Common scoter	3	S	N	Direct flight	A	C
8	21/10/2025	5	Common scoter	5	N	N	Direct flight	A	B
8	21/10/2025	4	Redpoll	14	N	Y	Direct flight	B	A
8	21/10/2025	7	Redpoll	2	N	Y	Direct flight	B	B
8	21/10/2025	6	Skylark	10	N	N	Direct flight	B	A
8	21/10/2025	5	Turnstone	2	N	Y	Direct flight	A	B
8	21/10/2025	1	Red-throated diver	2	S	N	Direct flight	A	B
8	21/10/2025	6	Red-throated diver	2	N	N	Direct flight	A	B
8	21/10/2025	5	Great crested grebe	1	S	N	Direct flight	A	B
9	28/10/2025	2	Common scoter	1	N	N	Direct flight	A	C
9	28/10/2025	5	Skylark	4	W	Y	Flyover	B	A
9	28/10/2025	3	Teal	1	S	N	Fly past before landing	A	B
9	28/10/2025	5	Turnstone	1	S	N	Direct flight	A	A
9	28/10/2025	3	Wigeon	4	S	N	Direct flight	A	B
9	28/10/2025	3	Red-throated diver	1	S	N	Direct flight	A	B
9	28/10/2025	5	Red-throated diver	1	S	N	Direct flight	A	C
10	05/11/2025	4	Sandwich tern	1	S	N	Direct flight	A	A
10	05/11/2025	2	Common scoter	1	S	N	Direct flight	A	B
10	05/11/2025	3	Common scoter	1	S	N	Flying before landing on sea	A	B
10	05/11/2025	2	Oystercatcher	2	S	N	Direct flight	A	A
10	05/11/2025	2	Red-throated diver	2	S	N	Direct flight	B	B
10	05/11/2025	6	Red-throated diver	1	N	N	Direct flight	A	B
11	12/11/2025	3	Common scoter	5	S	N	Direct flight	B	C
11	12/11/2025	5	Oystercatcher	3	S	Y	Direct flight	A	A
11	12/11/2025	1	Red-throated diver	1	S	N	Direct flight	A	B
11	12/11/2025	2	Red-throated diver	1	S	N	Direct flight	B	B
11	12/11/2025	3	Red-throated diver	1	S	N	Direct flight	A	B
11	12/11/2025	5	Red-throated diver	2	S	N	Direct flight	B	B
12	17/11/2025	5	Common scoter	6	N	N	Direct flight	A	C
12	17/11/2025	2	Red-throated diver	1	S	N	Direct flight	A	C
12	17/11/2025	6	Red-throated diver	1	S	N	Direct flight	A	C
12	17/11/2025	6	Red-throated diver	1	S	N	Direct flight	A	A
13	26/11/2025	2	Red-throated diver	1	N	N	Direct flight	B	B
13	26/11/2025	2	Red-throated diver	1	N	N	Direct flight	B	A
13	26/11/2025	2	Mallard	2	S	N	Direct flight	B	A
13	26/11/2025	3	Red-throated diver	1	N	N	Direct flight	B	B
13	26/11/2025	5	Red-throated diver	2	S	N	Direct flight	A	B
13	26/11/2025	5	Turnstone	1	N	Y	Direct flight	A	A
13	26/11/2025	5	Red-throated diver	1	N	N	Direct flight	B	C



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