



Cenos Offshore Windfarm Limited



Cenos EIA

Appendix 20 – Intertidal & Nearshore Bird Surveys

ASSIGNMENT A100907-S01
DOCUMENT CEN001-FLO-CON-ENV-RPT-0070



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REV	DATE	DESCRIPTION	ISSUED	CHECKED	APPROVED	CLIENT
01	09/07/2024	Drafted	[Redacted]	[Redacted]	[Redacted]	Cenos Offshore Windfarm Ltd.
02	20/11/2024	Client comment amends	[Redacted]	[Redacted]	[Redacted]	Cenos Offshore Windfarm Ltd.
A01	18/12/2024	FOR ISSUE	[Redacted]	[Redacted]	[Redacted]	Cenos Offshore Windfarm Ltd.

Cenos Offshore Windfarm Ltd

Cenos OWF Intertidal & Nearshore Bird Survey Report

[Redacted]



COMMERCIAL IN CONFIDENCE



Client: Cenos Offshore Windfarm Limited

Address: 5 Justice Mill Ln

Aberdeen

AB11 6EQ

SCOTLAND

APEM reference no: P00014457

Cenos document no: CEN001-FLO-CON-ENV-RPT-0070

Date of issue: December 2024

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This report should be cited as:

APEM. (2024). CENOS OWF Intertidal & Nearshore Bird Surveys. APEM Scientific Report P00014457. Cenos Offshore Windfarm Ltd., December 2024, 32 pp.

Registered in England No. 2530851, Registered Address Riverview A17 Embankment Business Park, Heaton Mersey, Stockport, SK4 3GN

Revision and Amendment Register

Version Number	Date	Section(s)	Page(s)	Summary of Changes	Approved by
1.0	09/07/2024	All	All	Drafted	MB
2.0	18/12/2024	All	All	Final report	MD/TP/MB

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Executive summary

This report provides details of six intertidal bird surveys undertaken at monthly intervals by APEM Ltd of the proposed Export/Import Cable Corridor (EICC) landfall site at Longhaven Cliffs for the Cenos Offshore Windfarm. The survey programme aimed to establish baseline data on the abundance, distribution, and behaviour of waterbirds in the intertidal and nearshore areas around the proposed landfall site. This information will validate the findings from previous NorthConnect surveys and support the ecological assessments related to the installation, operation, and decommissioning of the Project.

Surveys consisted of one visit to the site per month by an experienced bird surveyor. Surveys covered all areas within 500 m of the potential export cable landfall sites extending out to 2 km from the shoreline. All waterbirds and marine mammals present within the Survey Area across a six-hour tide cycle were recorded at hourly intervals. In addition, any human-induced disturbance events on target species were also recorded. Surveys captured both rising and falling tides, where possible, alternating monthly, to build a robust baseline for the EICC landfall site.

The six surveys within the Survey Area identified the nearshore zone (within 500 m of shore) as a loafing site utilised by the seabirds that breed at Longhaven Cliffs nature reserve throughout the breeding season. Furthermore, the series of islets and exposed intertidal reefs located along the shoreline were used for foraging and roosting by a wide range of species. Species diversity and abundance decreased with distance from the shore and in the months following the breeding season. Eight species recorded within the Survey Area are Birds of Conservation Concern 5a (BoCC5a) red-listed, five feature on the Scottish Biodiversity List (SBL), and two can be found on Annex I of the EU Bird Directive. In addition, eight species are qualifying features and thus have potential linkage to at least one Special Protection Area (SPA) within 20 km, with four of these having peak hourly counts exceeding 1% of a SPA population. Disturbance events were infrequently recorded within the Survey Area, with most disturbance events being caused by fishing boats or recreational watercraft. Bird's responses were typically being flushed before resettling in the same position or a short distance away within one minute.

The six surveys within the Survey Area recorded a total of 22 bird species compared to 13 recorded during a 12-month survey programme for the NorthConnect High Voltage Direct Current (HVDC) cable infrastructure Project. The differences between counts were considered to be due to possible natural variability, changes in population trends and minor methodological differences. Overall, however, results were not considered materially different to those previously recorded by NorthConnect.

1. Introduction

1.1. Background

APEM Ltd (herein referred to as APEM) were commissioned by Cenos Offshore Windfarm Ltd. to undertake six monthly intertidal and nearshore bird surveys at the EICC landfall site for connecting the Cenos Offshore Windfarm (herein referred to as the Project) to the electrical grid network. Surveys were undertaken covering the landfall location plus a 500 m buffer extending from the Mean High-Water Springs (MHWS) mark out to 2 km offshore (**Figure 1**). A total of six-monthly surveys were undertaken between April to September 2024 inclusive, as confirmed as appropriate with NatureScot during the ornithology consultation meeting held on the 7th August 2024. Further details of consultation to date relating to offshore and intertidal ornithology is provided in EIAR Volume 3, Chapter 12: Ornithology.

The Survey Area is located in Scotland, along the north-west Aberdeenshire coastline, four miles south from Peterhead within the Scottish Wildlife Trust (SWT) Longhaven Cliffs nature reserve. The survey method was designed to optimise the data collection for all waterbird species using a 'Through The Tide Cycle Count' (TTCC) method (**2.1 - Field methods**), observations of which extend over a 500 m Zone of Influence (ZoI) either side of the EICC landfall site for the Project (**Figure 1**).

The Survey Area covered was previously surveyed in 2016 and 2017 by the NorthConnect HVDC cable infrastructure Project^{1,2} (hereafter 'NorthConnect'). However, due to the age of the surveys being beyond five years old, there is uncertainty regarding such data being able to confidently characterise this Project's proposed EICC landfall site, as identified by NatureScot during the Scoping Workshop held 29th February 2024. To address NatureScot's concerns, additional surveys were undertaken to assess whether changes have occurred within the EICC which may materially alter assessment conclusions for the Project, in contrast to those drawn for NorthConnect^{1,2}.

Bird species names used in this report follow the British List³, which is maintained by the British Ornithologist's Union (BOU), with all species referred to by their British name. A list of scientific names, as well as details of conservation status, of all bird species recorded during surveys is provided in **Appendix 1 – Species**.

¹ NorthConnect KS (2018) UK Environmental Impact Assessment Report. Volume 2 – Chapter 17: Ornithology. Document No. NCGEN-NCT-X-RA-0004. Available at: https://marine.gov.scot/sites/default/files/17_ornithology_0.pdf.

² NRP. (2017). NorthConnect technical report on Ornithological surveys

³ McInerny, C.J., Musgrove, A.J., Gilroy, J.J. and Dudley, S.P. (2022). *The British List: A Checklist of Birds of Britain (10th edition)*. Ibis 164: 860-910.

1.2. Aims

The aims of the surveys are to provide baseline information on the abundance, distribution, and behaviour of waterbirds within the Survey Area as part of the ecological assessments in connection within the installation, operation, and decommissioning of the export cable landfall sites for the Project. Surveyors also recorded any instances of marine mammals in each survey. These data are collected and presented to support the EIAR Vol. 3, Chapter 11: Marine Mammal Ecology and EIAR Vol. 3, Chapter 12: Ornithology.

Additionally, this report aims to provide a comparative analysis of the survey results collected in contrast to the 2016 and 2017 NorthConnect Project to inform whether any material changes to assessment conclusions are necessary for the Project in contrast to those concluded by NorthConnect¹.

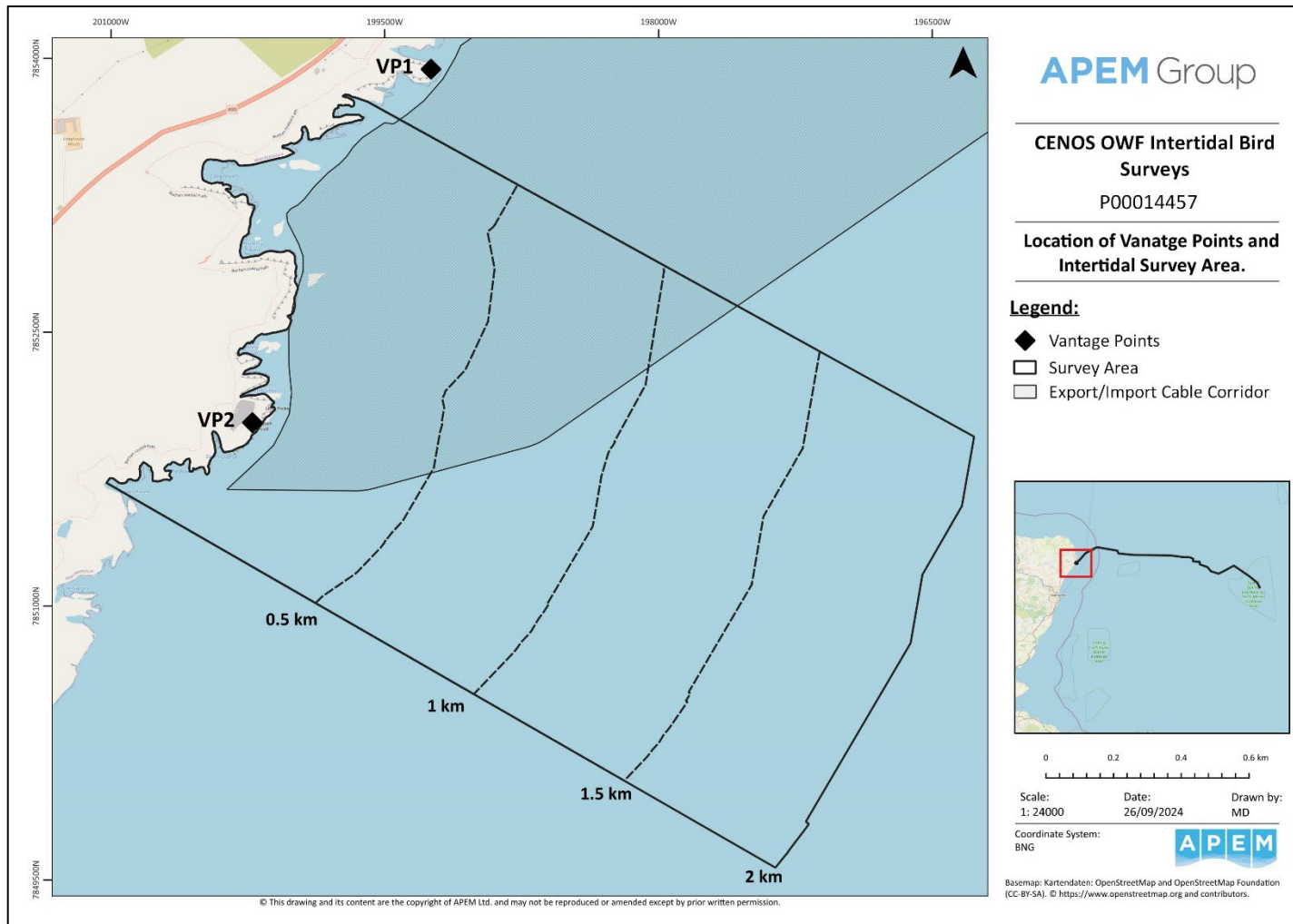


Figure 1. Location of Vantage Points and Intertidal Survey Area.

2. Survey and analysis methods

Presented here are the methods and outputs from the intertidal bird surveys, which encompass nearshore and intertidal areas and extend out to 2 km from the MHWS mark of the potential EICC landfall site (hereafter referred to as the 'Survey Area'). To provide robust baseline data of the Survey Area, intertidal surveys followed standardised approaches to record bird species occurrence and counts along with incidents of disturbance and associated weather conditions.

The ZoI was determined to extend 500 m either side of the EICC landfall site perpendicular along the coast and out to the 2 km survey boundary offshore. The size of the ZoI is based on typical bird responses to disturbance stimuli, with activities more than 500 m away from individuals unlikely to cause disturbance, as per Cutts *et al.* (2013)⁴ and Goodship and Furness (2022)⁵.

The vantage points (VPs) previously identified for the NorthConnect project were used to ensure consistency in survey design. The VPs provided optimal visibility over the Survey Area, including the intertidal zone and nearshore out to 2 km (**Figure 1**).

2.1. Field methods

Intertidal bird surveys were undertaken within the Survey Area using the TTTCC method, which is based upon 'look-see' methods⁵. As outlined by Gilbert *et al.* (1998)⁶, the TTTCC method is deemed the most appropriate approach to determine usage of the intertidal zone by waterbirds within the UK. The approach utilised to fully capture usage of the intertidal area was to undertake monthly visits at the Survey Area, with alternate visits, where possible, capturing the rising or flood tides and the falling or ebb tides, to characterise any differences related to food availability and energy budgets for each stage of the tidal cycle. Capturing both high tide and low tide roosting and foraging activities during each visit results in a more robust baseline for use in the assessment of the potential impacts from any cable landfall construction activities upon ornithological receptors within the intertidal and nearshore areas. The dates, times, and tidal conditions for each survey are presented in **Table 1**.

The bird surveyor mapped the waterbirds and other species of interest present within the intertidal zone across six hours per survey between the mean low-water (MLW) and mean high-water (MHW) marks. In addition to this any significant roosts above the high-water mark were recorded, as well as birds and marine mammals present in the nearshore waters out to 2 km from the shoreline. Surveys covered all areas considered within the ZoI of the EICC landfall site. The surveyor covered half a tidal cycle during each survey, splitting the time

⁴ Cutts, N., Hemingway, K. and Spencer, J. (2013). *Waterbird Disturbance & Mitigation Toolbox 3.2*. University of Hull.

⁵ Goodship, N.M. and Furness, R.W. (2022). *NatureScot Research Report 1283-Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species*.

⁶ Gilbert, G., Gibbons, D.W. & Evans, J. (1998). *Bird Monitoring Methods*. RSPB, Sandy.

between both VPs. Due to the distance between the two VPs, the surveys were conducted in two three-hour blocks (one at each VP). All waterbirds (including seabirds) were considered target species for the intertidal surveys. The Survey Area and VPs are shown in **Figure 1**.

All bird species observed were recorded and their location plotted on maps, with the number of individuals noted and any behaviour added for context. For all species, flight lines over the intertidal, nearshore, and landward areas were also mapped, including flight time and direction. It is noted that this activity is viewed as subsidiary to other recording activities and where aggregations or large numbers of birds in flight occurred, summary lines or data were recorded. These were excluded from any data analyses as these records were considered to be commuting through and thus not interacting with the Survey Area. Any marine mammal sightings from these shore-based surveys, including seal haul outs within the intertidal zone were also recorded. In addition, notes were made of any disturbance events including type, intensity of the stimuli and the reaction of the birds using the methods outlined in Briggs (2007⁷).

Counts occurred every hour, starting at either high or low tide ('scan and count', undertaken as rapidly as possible to reduce the risk of pseudo-replication), with disturbance events monitored between counts. Surveyors recorded all bird species (using standard BTO two-letter codes)⁸, abundance, and behaviours. Behaviour codes comprised of roosting (R), foraging (F), flying (Y), loafing (L), comfort / preening (C), swimming (S), and other (to be specified).

Where disturbance events were noted, they were defined according to the disturbance stimuli categories listed in **Table 2**. Following such observations surveyors noted the time of the disturbance event, the stimuli type, the species affected, the number of individuals affected, the distance of birds from the stimuli, the effect level (**Table 3**), and any other relevant details (for example, how long the disturbance lasted, and how long it took for birds to revert to their previous behaviour). The codes used in **Table 2** and **Table 3** were used for recording purposes. Full disturbance records are available in **Appendix 3 - Disturbance**.

⁷ Briggs, B.D.J. (2007) *The use of waterbodies in SW London by Gadwall and Shoveler; Implications for nature conservation*. D.Phil. Thesis, Oxford University.

⁸ BTO Bird species codes.

https://www.bto.org/sites/default/files/u16/downloads/forms_instructions/bto_bird_species_codes.pdf

Table 1. Survey dates, start/end times (British Summer Time), and tidal conditions for each intertidal bird survey from April to September 2024.

Survey No.	Date	Start time (HH:MM)	End time (HH:MM)	Tidal conditions
1	29/04/2024	09:30	15:30	Low to High (Flood)
2	29/05/2024	11:45	17:45	Low to High (Flood)
3	20/06/2024	12:45	18:45	High to Low (Ebb)
4	24/07/2024	09:45	15:45	Low to High (Flood)
5	29/08/2024	10:30	16:30	High to Low (Ebb)
6	17/09/2024	07:00	13:00	Low to High (Flood)

Table 2. Disturbance stimuli descriptors and codes.

Disturbance	Code	Disturbance	Code
Small vessel	SV	Uncontrolled dog	UD
Large vessel	LV	Birdwatcher	BW
Canoe / kayak	CN	Cyclist	CY
Stand-up paddleboard	SP	Vehicle	VH
Other watercraft	OW	Raptor	RP
Aircraft	AC	Other bird	BI
Drone	DN	Mammal	MA
Fisher	FS	Weather	WE
Walker	WK	Other (describe)	OT
Walker with dog	WD	Unknown	UN

Table 3. Disturbance stimuli effect level and descriptors.

Effect code	Effect description
1	No effect
2	Alert: head(s) up by bird(s)
3	Small movements (<10m; not flying)
4	Bird(s) flushed for <30 seconds
5	Bird(s) flushed for >30 seconds

2.2. Data analysis

The abundance and distribution of bird species considered to be of significance are presented below, with further survey, weather and disturbance information provided in the appendices. Bird species considered to be of significance are those of potential national and international importance observed within the Survey Area. These species were identified as being protected through Annex I of the Birds Directive (Directive 2009/147/EC), species that are red listed on the BoCC5a^{9,10}, feature on the SBL¹¹, or are qualifying features of at least one SPA with potential connectivity to the Survey Area (see also within the Report to Inform Appropriate Assessment (RIAA)).

Bird species recorded in the Survey Area which may be functionally linked to SPAs were identified through spatial analysis with a connectivity distance set to 20 km from the Survey Area. This distance was chosen using professional judgement as it is a maximum distance for potential functional connectivity linking to designated sites for geese, which typically commute further than other intertidal bird species (SNH, 2016¹²). While seabirds typically have foraging ranges exceeding 20 km, this study includes only those species within that distance. This decision was based on the low proportion of birds from sites beyond 20 km that are likely to utilise the area, highlighting the connectivity to local key sites. All SPAs within this radius were then noted and qualifying features (bird species) listed as found on NatureScot Site Link webpage¹³. The results of the spatial analysis are detailed in **Table 4**. Qualifying features (bird species) were used as selection criteria to identify those species of significance within the results from the intertidal bird surveys.

The abundance and spatial distribution for each species are presented within one of three groups to reduce the number of tables and figures required based on the observation data. Figures have been created which present the spatial distribution of all species recorded within the Survey Area. Figures have all been produced using QGIS in project co-ordinate system reference EPSG: 27700 – OSGB36 / British National Grid. The peak count of birds recorded during the survey is presented as a percentage of potentially linked SPA populations of a species at designation (see **Table 4** i.e. peak number recorded expressed as a percentage of a selected SPA population).

⁹ Stanbury et al., (2021). *The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain*. British Birds 114: 723 -747.

¹⁰ Stanbury et al., (2024). *The status of the UK's breeding seabirds: an addendum to the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain*. British Birds 117: 471 – 487.

¹¹ NatureScot. (2020). Scottish Biodiversity List. <https://www.nature.scot/doc/scottish-biodiversity-list>

¹² Scottish Natural Heritage (2016). *Assessing Connectivity with Special Protection Areas (SPA) Guidance*.

¹³ NatureScot. (2024). Site Link. <https://sitelink.nature.scot/home>

Table 4. The SPAs found within 20 km of the Survey Area and their qualifying features.

SPA Name	NatureScot Site Code	Distance from the Study Area	Qualifying Features
Buchan Ness to Collieston Coast	8473	0.00 km	Kittiwake (<i>Rissa tridactyla</i>) Guillemot (<i>Uria aalge</i>) Herring gull (<i>Larus argentatus</i>) European shag (<i>Phalacrocorax aristotelis</i>) Fulmar (<i>Fulmarus glacialis</i>) Seabird assemblages
Ythan Estuary, Sands of Forvie and Meikle Loch	8592	5.08 km	Sandwich tern (<i>Sterna sandvicensis</i>) Common tern (<i>Sterna hirundo</i>) Little tern (<i>Sterna albifrons</i>) Pink-footed goose (<i>Anser brachyrhynchus</i>) Eider (<i>Somateria mollissima</i>) Lapwing (<i>Vanellus vanellus</i>) Redshank (<i>Tringa totanus</i>) Waterbird assemblages
Loch of Strathbeg	8537	16.91 km	Barnacle goose (<i>Branta leucopsis</i>) Greylag goose (<i>Anser anser</i>) Pink-footed goose (<i>Anser brachyrhynchus</i>) Sandwich tern (<i>Sterna sandvicensis</i>) Teal (<i>Anas crecca</i>) Whooper swan (<i>Cygnus cygnus</i>) Goldeneye (<i>Bucephala clangula</i>) Waterfowl assemblage

2.3. Survey limitations

There were no access restrictions which impacted survey effort. As far as possible, surveys were timed to coincide with suitable weather conditions, however, periods of poor weather (e.g. rain or strong winds) were occasionally encountered during the surveys. It is considered that surveying in a variety of conditions is more representative of the variable weather conditions and associated levels of bird activity within the Survey Area. As such, sub-optimal weather is not considered to represent a constraint to the robustness of these data. Weather data (including tide state) from all surveys are provided in **Appendix 2 - Weather data**.

3. Survey results

The following sections detail the observations from six months of survey, including species observed, counts, and locations within the Survey Area. Disturbance events were recorded during surveys and the type of disturbance events, species involved, and effect level are detailed in **Appendix 3 - Disturbance**.

The peak count for each species per survey is presented for all surveys. The peak count has been used as a proxy of abundance in this case, as the use of the raw hourly counts may lead to inflated species numbers due to double counting of individuals during a survey. The spatial distributions maps present all records across the Survey Area. For ease of presentation seabirds were split into two groups 'gulls, terns, and skuas' and 'other seabirds'.

3.1. Waterfowl and wader species

A total of three waterfowl and three wader species were recorded in the Survey Area (**Table 5**). A count of 16 eider in April 2024 was the highest recorded peak count for all waterfowl and wader species recorded. In addition, eider was the only species to be recorded in every survey. A peak count of 15 shelduck was also recorded in April. The peak counts of each of the three wader species recorded in the Survey Area were made in September, with oystercatcher (5 individuals) being the most abundant wader species.

Table 5. Peak counts of all waterfowl and wader species recorded in the Survey Area (April to September 2024).

Species	Month						Peak count
	April	May	June	July	August	September	
Shelduck	15	0	0	0	0	0	15
Eider	16	8	3	2	2	3	16
Oystercatcher	0	0	0	2	0	5	5
Curlew	0	0	0	0	0	1	1
Redshank	0	0	0	0	0	2	2
Red-throated diver	0	0	0	0	0	1	1

With the exception of red-throated diver, all records of waterfowl and waders were made within 500 m of the shoreline (**Figure 2**). Eider were predominately recorded loafing in or around the series of coves that are found throughout the shoreline. Shelduck were recorded loafing in the largest cove (Long Haven) in the north-western part of the Survey Area. Oystercatcher, curlew, and redshank were recorded foraging in the intertidal zones of the series of rocky islets and exposed reefs at lower tide states that comprises the Survey Area. Oystercatcher were also recorded roosting on sections of the islets and reefs that are present at higher tide states. A single red-throated diver was observed initially loafing over 800 m from shore before drifting out to approximately 1.25 km as the tide rose.

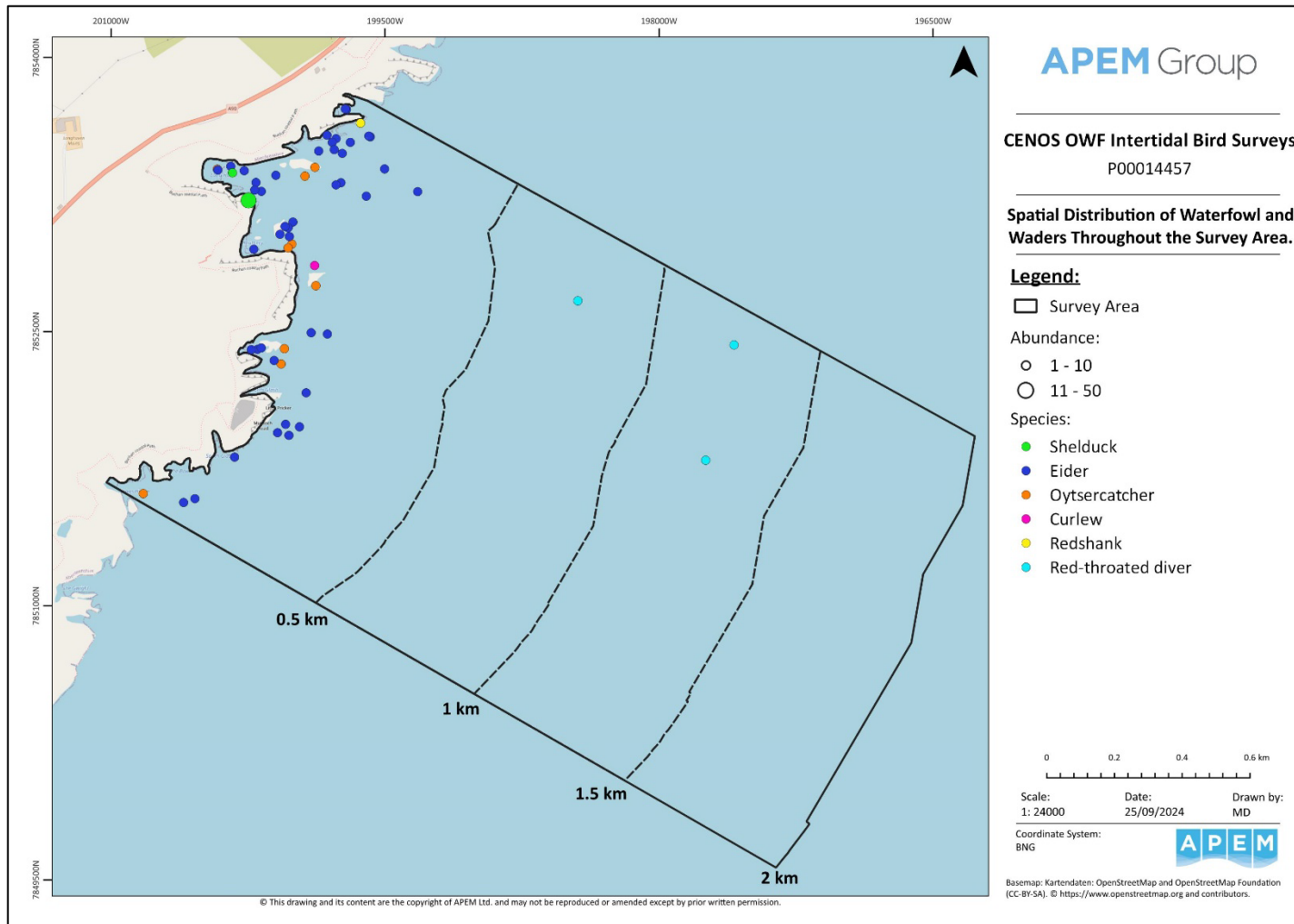


Figure 2. Spatial distribution of waterfowl and waders throughout the Survey Area.

3.2. Gull, tern, and skua species

Five species of gull, two species of skua, and a single species of tern were recorded in the Survey Area (**Table 6**). Kittiwake were recorded with the highest peak count of 726 individuals during the June survey. Kittiwake were recorded in counts of 100+ individuals in the first four surveys before dropping to a count of 18 individuals in September. Herring gull had the next highest peak count of 112 individuals recorded in April. Kittiwake, great black-backed gull, and herring gull were recorded in all six surveys. The other five species were recorded in three or fewer surveys.

Table 6. Peak counts of all gull, tern, and skua species recorded in the Survey Area (April to September 2024).

Species	Month						Peak count
	April	May	June	July	August	September	
Kittiwake	200	244	726	196	84	18	726
Black-headed gull	0	0	0	0	0	10	10
Common gull	0	0	0	0	0	31	31
Great black-backed gull	1	2	1	3	2	4	4
Herring gull	112	3	20	35	34	32	112
Sandwich tern	0	0	0	0	50	0	50
Great skua	0	0	1	1	1	0	1
Arctic skua	0	0	0	1	1	0	1

Gull, tern, and skua species were recorded throughout the Survey Area, but these records were not evenly distributed, with records concentrated in the nearshore zone within 500 m of shore (**Figure 3**). The largest and most frequent aggregation, mostly consisting of loafing kittiwake and roosting great black-backed and herring gulls, was recorded south of VP1 in or around the rocky islets and breeding seabird cliffs of Long Haven throughout the survey programme. During the June survey, varying numbers of large foraging flocks of kittiwake, totalling 600+ birds, were present between 1.5 km and 2 km offshore. Comparatively, the offshore zone spanning from 500 m to 1.5 km was sparsely distributed.

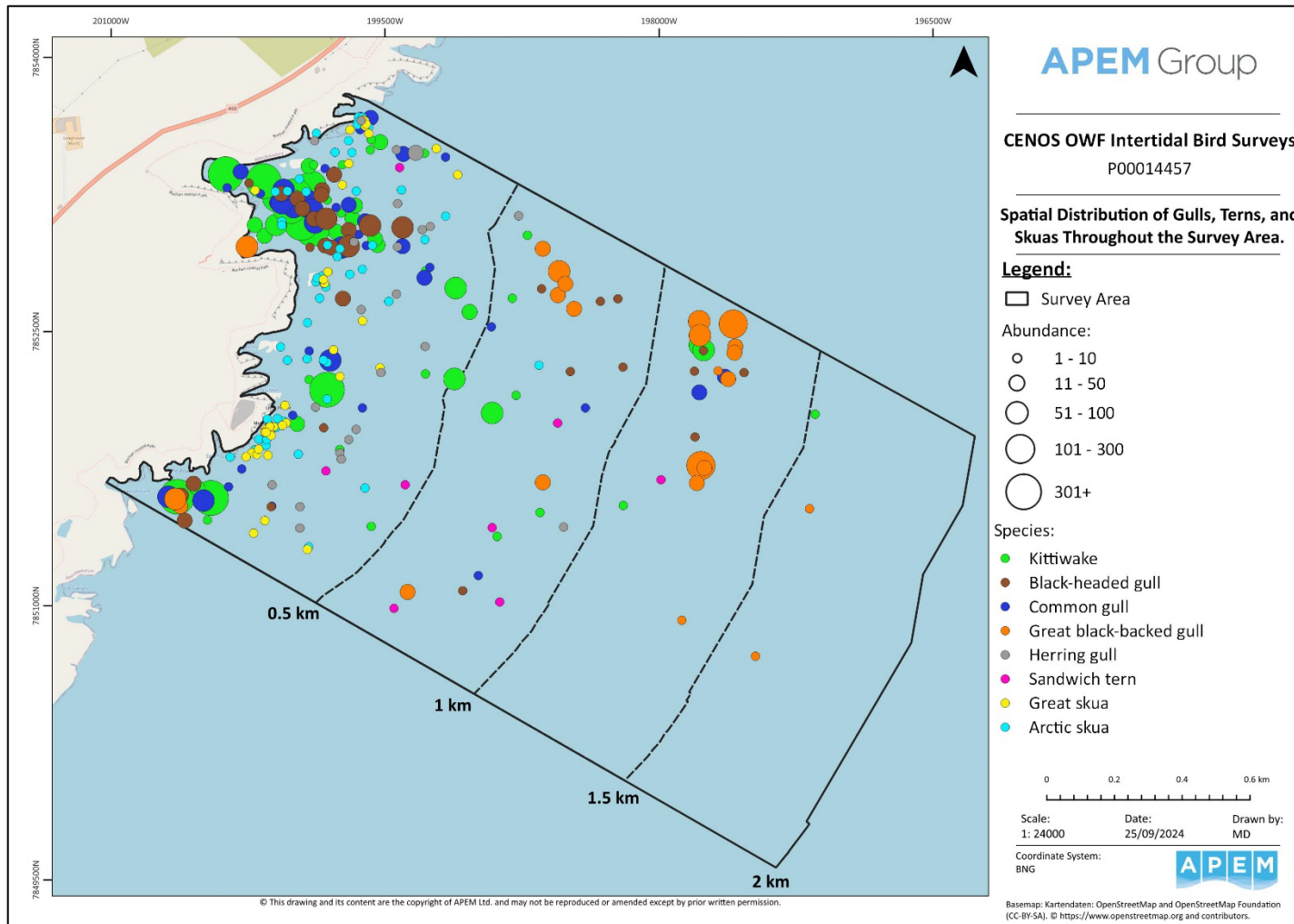


Figure 3. Spatial distribution of gulls, terns, and skuas throughout the Survey Area.

3.3. Other seabird species

Seven other seabird species were present within the Survey Area at least once during the six surveys (**Table 7**). The highest recorded peak count was 530 guillemots during the May survey. In some instances (e.g. distant birds or birds obscured by glare on the water) auks could not be identified to species level so have been grouped together as 'auk species'. The peak count of auk species was 243 in June. Five of the seven other seabird species recorded had peak counts between May and July.

Table 7. Peak counts of other seabird species recorded in the Survey Area (April to September 2024).

Species	Month						Peak count
	April	May	June	July	August	September	
Guillemot	65	530	432	32	61	11	530
Razorbill	47	78	88	19	0	4	88
Puffin	0	21	28	76	0	0	76
Auk species	0	144	243	44	0	6	243
Fulmar	0	14	20	9	10	5	20
Gannet	0	0	0	0	5	1	5
Cormorant	0	3	5	5	1	2	5
Shag	5	5	7	9	13	10	13

Most observations of other seabird species were within 1 km of shore, with two large aggregations of loafing guillemot, razorbill, and puffin found in the north and south sections of the nearshore zone within 500 m from shore. Cormorant and shag were recorded foraging across the Survey Area from the shore to 500 m. In addition, roosting cormorant and shag were recorded on the exposed intertidal zone beneath VP2 and southwest of VP1 throughout the survey programme.

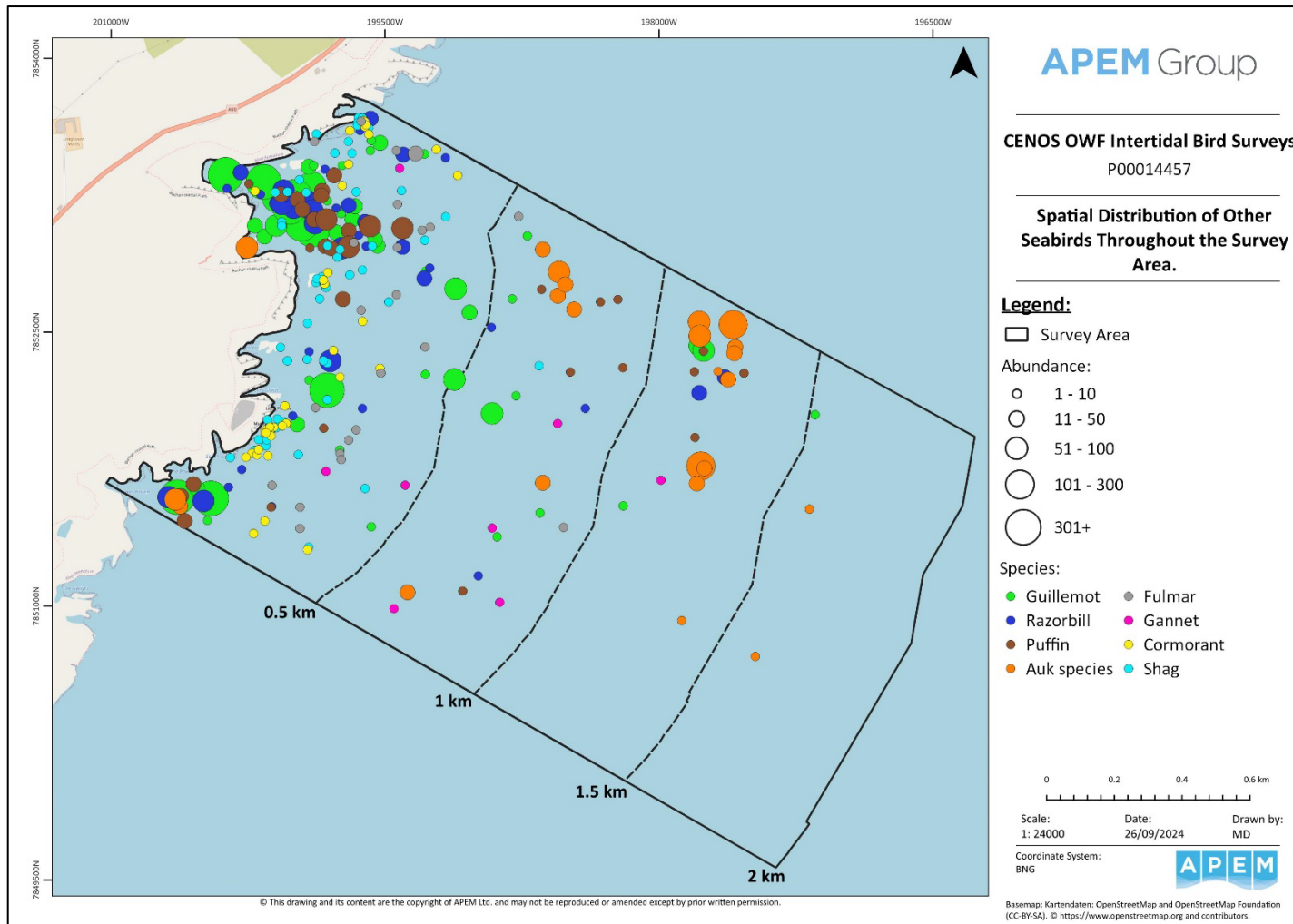


Figure 4. Spatial distribution of other seabirds throughout the Survey Area.

3.4. Marine mammal species

Four species of marine mammal were recorded in the Survey Area. Three species of marine mammal had peak counts recorded in September, with four harbour porpoise being the highest recorded count of any marine mammal. Grey seal were recorded in four of the six surveys.

Table 8. Peak counts of all marine mammal species recorded in the Survey Area (April to September 2024).

Species	Month						Peak count
	April	May	June	July	August	September	
Bottlenose dolphin	0	2	0	0	0	0	2
Risso's dolphin	0	0	0	0	0	1	1
Harbour porpoise	0	0	0	0	0	4	4
Grey seal	0	1	1	1	0	2	2

Marine mammals were recorded between the shoreline to 1.5 km offshore. Grey seal were exclusively recorded within 500 m of shore. The other three species of marine mammal were only recorded once.

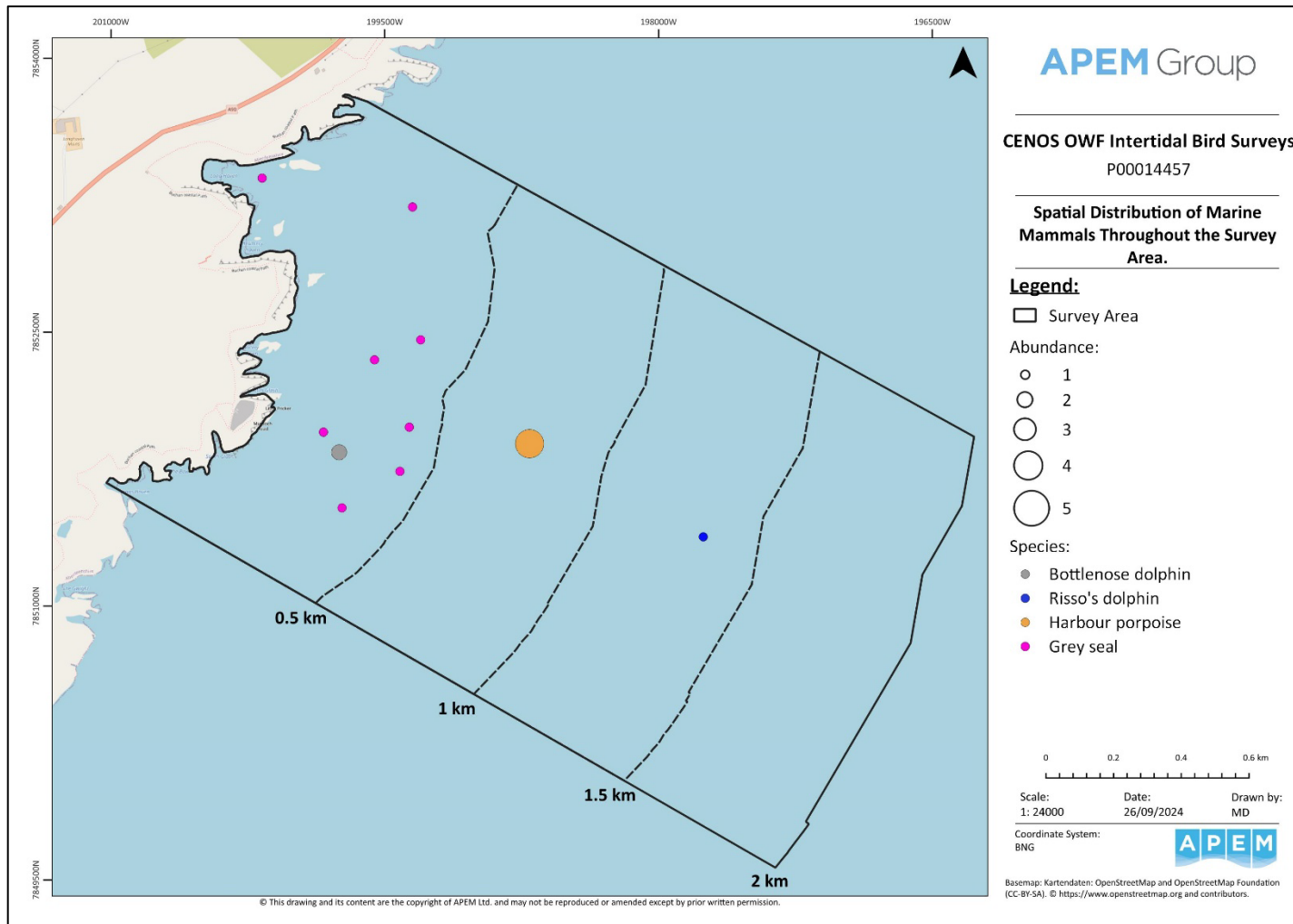


Figure 5. Spatial distribution of marine mammals throughout the Survey Area.

4. Discussion of key findings

The intertidal zone out to 500 m of the Survey Area showed the most consistent usage across all species groups throughout the survey programme. Generally, species diversity and abundance decreased with distance from shore. However, kittiwake were a notable exception, with 600 of the 726 individuals recorded over 1.5 km offshore in June. The peak counts of most species largely consisted of birds loafing on the water or roosting and foraging on or around the islets and exposed reefs that comprise the coastline within the Survey Area, particularly along the coast from southwest of VP1 to the exposed intertidal zone beneath VP2. Two concentrations of loafing birds were found within the nearshore zone. The largest was recorded in Long Haven cove, southwest of VP1 and another small aggregation was recorded south of VP2.

The peak counts of all other seabird species, except gannet and shag, were recorded between May and July which coincides with the breeding seasons of these species. SWT Longhaven Cliffs reserve is noted for its breeding seabirds, and it is likely the loafing kittiwake, guillemot, razorbill, and puffin in the nearshore zone are breeding adults departing from or returning to these colonies.

A total of 16 species recorded within the Survey Area were considered as species of importance as outlined in **2.2. Data analysis**. Of these species, eight are BoCC5a red-listed, five feature on the SBL, two can be found on Annex I of the EU Bird Directive. In addition, eight of these species are qualifying features and thus have potential linkage to at least one SPA within the 20 km radius considered. The peak count of kittiwake, herring gull, Sandwich tern, and guillemot were equivalent to or greater than 1% of the population of at least one SPA with potential connectivity (**Table 9**). Values that do not exceed the 1% threshold of SPA populations for at least one SPA for which they are listed are displayed as '< 1'. Dashed lines denote that a species was not a qualifying feature for that SPA.

Nine disturbance events were recorded throughout the survey programme. However, of these nine, only five caused a behaviour response from nearby birds (see **Appendix 3 - Disturbance** for a full breakdown of recorded disturbance). Helicopters were recorded passing low over the Survey Area in three of the six surveys but never caused a disturbance event. The most frequent type of disturbance event to elicit a behavioural response was from small vessels, particularly fishing boats utilising the nearshore zone for lobster potting. Behavioural responses to disturbance from fishing boats varied between species groups. For example, loafing guillemot relocated short distances without flying whereas species observed on the intertidal rocks such as curlew and cormorant were flushed by boats as they passed close to shore before resettling after 30 seconds or more. In contrast, herring gull were attracted to the boats. A kayaker was recorded flushing two oystercatcher in August causing them to vacate the Survey Area.

Table 9. Peak counts as a percentage equivalent to SPA populations recorded within the Survey Area.

Species	Peak counts as a percentage equivalent of the SPA population (%)		
	Buchan Ness to Collieston Coast	Ythan Estuary, Sands of Forvie and Meikle Loch	Loch of Strathbeg
Eider	-	< 1	-
Redshank	-	< 1	-
Kittiwake	1.18	-	-
Herring gull	1.30	-	-
Sandwich tern	-	2.22	8.93
Guillemot	3.07	-	-
Fulmar	< 1	-	-
Shag	< 1	-	-

4.1 Comparisons with NorthConnect intertidal bird survey results.

A total of 22 bird species were recorded in the six month 2024 survey programme compared to 13 species recorded in the 12-month NorthConnect intertidal survey programme. Of the 13 species recorded during the NorthConnect surveys, only lesser black-backed gull (*Larus fuscus*) was not recorded within the Survey Area. The peak counts differed between 1.5 – 8.4x for every species recorded within both survey programmes. Eider, kittiwake, puffin and cormorant were recorded at a higher peak count within the survey programme. The range and frequency of abundance within the breeding season for seabirds known to breed at Longhaven Cliffs was similar between the two data sets. The pattern of abundance for guillemot and razorbill were broadly similar with increasing or similar monthly counts recorded through the breeding season until July, where decreased abundance of both species were observed during the 2024 survey programme (432 to 32 guillemot and 88 to 19 razorbill in June and July respectively). This contrasts the NorthConnect data where the peak count of guillemot and second highest count of razorbill were recorded in July. This difference may reflect the poor breeding season of both auk species this year where many individuals did not attempt to breed or failed early and left breeding colonies early as a result¹⁴.

The differences in peak counts of species such as kittiwake recorded during this survey programme may reflect local population trends. A total of 13,547 kittiwake Apparently Occupied Nests (AONs) were recorded in the Buchan Ness to Collieston Coast SPA in 2023, which was an increase from 11,265 AONs recorded in 2019¹⁵. Counts made of other qualifying

¹⁴ Fair Isle Bird Observatory. (2024). *Latest Sightings 16th – 19th July*. Available at: https://www.fairislebirdobs.co.uk/latest_sightings.html [accessed on: 29/09/2024].

¹⁵ BTO. (2024). *Seabird Monitoring Programme*. Available at: <https://app.bto.org/seabirds/public/index.jsp>.

features of the Buchan Ness to Collieston Coast SPA were comparable (herring gull, guillemot, and fulmar) or increased (shag) between 2019 and 2023. Therefore, the differences in recorded peak count could be explained by daily variation in the number of individuals, particularly 'off-duty' adults and non-breeding individuals, which do not accurately represent the breeding population of the area¹⁶. For example, the peak count and the range and frequency in abundance of puffin was significantly different. A peak and range of 76 in this survey programme compared to a peak count and range of 9 recorded during the NorthConnect survey programme. A total of three and six apparently occupied burrows (AOBs) were recorded across the Buchan Ness to Collieston Coast SPA in 2023 and 2019 respectively. Therefore, it is possible that the majority of the puffin recorded in the Survey Area were non-breeding birds and thus variation is expected to be high.

In addition, the NorthConnect peak counts of species such as fulmar and shag were recorded in months not captured in this survey programme. Species such as fulmar regularly return to breeding colonies throughout the winter to defend favourable nest sites and / or prospect potential breeding sites¹⁷. If the months not captured in this survey programme are omitted from the NorthConnect data, the abundance patterns of fulmar and shag are similar.

Furthermore, comparisons made between the two data sets may be limited by differences in the methodologies used. The methodology employed during the NorthConnect surveys state that the counts included flying birds. However, the methodology outlined within this current study (**2.1. Field methods**) considers flying observations subsidiary and excluded them from analysis. Northeast Scotland hosts large breeding populations of seabirds, and these counts of flying birds (primarily north-south passage over 1.5 km from shore) were considered to be birds commuting through the Survey Area that breed elsewhere and thus considered to not be interacting with the Survey Area. As no breakdown of species counts by behaviour are provided for the NorthConnect data, nor any information on spatial distributions to indicate behaviour, comparisons made between the datasets are limited. If counts of flying birds were factored into the counts recorded in this survey programme, the counts of many species, particularly of species known to breed in Northeast Scotland, would surpass those made during the NorthConnect surveys. No comparisons on spatial distributions can be drawn between the data sets as no information on species distributions within the NorthConnect survey programme are provided.

Seven of nine species recorded in the Survey Area were not captured in the NorthConnect surveys. These were curlew, redshank, black-headed gull, common gull, Sandwich tern, great skua, and Arctic skua. However, with the exception of 50 Sandwich tern in August, these species were only recorded in single digit counts and / or in a single month. The flock of 50 Sandwich tern are likely birds stopping to forage whilst on passage and represent a 'snapshot' record and not considered a regularly occurring species within the Survey Area.

¹⁶ Harris, M.P., Wanless, S., & Rothery, P. (1983). *Assessing changes in the numbers of guillemots *Uria aalge* at breeding colonies*. *Bird Study* 30: 57-66.

¹⁷Macdonald, M.A. (1980). *The winter attendance of Fulmars at land in NE Scotland*. *Ornis Scand* 11: 23-29

5. Conclusions

In contrast to the NorthConnect survey results, although a greater number of different species were recorded, the key species for the area remained consistent, with the majority of other species recorded infrequently and in low abundance. As to be expected given the timeframe between the two survey programmes and in accordance with natural variability, differences in the abundance of key species using the area generally aligned with nearby colony trends. The exceptions to this relate to the auk species, though possible explanation for such differences is provided in **Section 4.1**.

Additionally, the disturbance data collected for the Survey Area provides useful context of the current baseline level of disturbance within the EICC Landfall. As detailed in **Appendix 3 - Disturbance**, disturbance events due to the presence of small vessels elicited only highly localised short term displacement events with birds still remaining within the overall Survey Area.

Appendix 1 – Species list

Table 10. Complete list of all species recorded during the survey programme and their conservation status.

Common Name	Scientific Name	Species Code	Species Group	BoCC5a / SBL / Annex I status
Shelduck	<i>Tadorna tadorna</i>	SU	Waterfowl/Wader	Amber
Eider	<i>Somateria mollissima</i>	E.	Waterfowl/Wader	Amber
Oystercatcher	<i>Haematopus ostralegus</i>	OC	Waterfowl/Wader	Amber
Curlew	<i>Numenius arquata</i>	CU	Waterfowl/Wader	Red / SBL
Redshank	<i>Tringa totanus</i>	RK	Waterfowl/Wader	Amber
Kittiwake	<i>Rissa tridactyla</i>	KI	Gull/Tern/Skua	Red
Black-headed gull	<i>Chroicocephalus ridibundus</i>	BH	Gull/Tern/Skua	Amber / SBL
Common gull	<i>Larus canus</i>	CM	Gull/Tern/Skua	Red
Great black-backed gull	<i>Larus marinus</i>	GB	Gull/Tern/Skua	Red
Herring gull	<i>Larus argentatus</i>	HG	Gull/Tern/Skua	Red / SBL
Sandwich tern	<i>Thalasseus sandvicensis</i>	TE	Gull/Tern/Skua	Amber / SBL / Annex I
Great skua	<i>Stercorarius skua</i>	NX	Gull/Tern/Skua	Red
Arctic skua	<i>Stercorarius parasiticus</i>	AC	Gull/Tern/Skua	Red / SBL
Common guillemot	<i>Uria aalge</i>	GU	Seabird	Amber
Razorbill	<i>Alca torda</i>	RA	Seabird	Amber
Puffin	<i>Fratercula arctica</i>	PU	Seabird	Red
'Auk species'	-	-	Seabird	-
Red-throated diver	<i>Gavia stellata</i>	RH	Waterfowl/Wader	Green / SBL / Annex I
Fulmar	<i>Fulmarus glacialis</i>	F.	Seabird	Amber
Gannet	<i>Morus bassanus</i>	GX	Seabird	Amber
Cormorant	<i>Phalacrocorax carbo</i>	CA	Seabird	Green
Shag	<i>Gulosus aristotelis</i>	SA	Seabird	Amber
Bottlenose dolphin	<i>Tursiops truncatus</i>	-	Marine mammal	-
Risso's dolphin	<i>Grampus griseus</i>	-	Marine mammal	-
Harbour porpoise	<i>Phocoena phocoena</i>	-	Marine mammal	-
Grey seal	<i>Halichoerus grypus</i>	-	Marine mammal	-

Appendix 2 - Weather data

Table 11. Weather data recorded during the survey programme.

Survey No.	Date	VP	Time		Air Temp (°C)	Wind Force and Direction	Cloud Cover (/8)	Visibility	Precipitation	Tide state	Notes
			Start	End							
1	29/04/2024	1	09:30	11:30	9	F4 S	1	Excellent	Dry	Low to High	
		1/2	11:30	13:30	10	F6 S	4	Good	Dry		
		2	13:30	15:30	6	F4 S	8	Good	Dry		
2	29/05/2024	1	11:45	12:45	16	F2 N	7	Good	Dry	Low to High	
			12:45	13:45	16	F2 N	5	Good	Dry		
			13:45	14:45	17	F2 N	5	Good	Dry		
		2	14:45	15:45	17	F2 N	3	Good	Dry		
			15:45	16:45	17	F2 N	2	Good	Dry		
			16:45	17:45	17	F2 N	1	Good	Dry		
3	20/06/2024	2	12:45	13:45	17	F2 SE	3	Good	Dry	High to Low	Bad heat haze, sea state 2.
			13:45	14:45	17	F3 SE	3	Good	Dry		Sea state 2.
			14:45	15:45	16	F3 SE	6	Good	Dry		Sea state 2.
		1	15:45	16:45	17	F3 SE	5	Good	Dry		Sea state 3.
			16:45	17:45	17	F3 SE	4	Good	Dry		Sea state 3 - 4.
			17:45	18:45	17	F4 SE	4	Good	Dry		Sea state 4.
4	24/07/2024	1	09:45	10:45	15	F2 SE	8	Good	Dry	Low to High	Sea state 2.
			10:45	11:45	15	F2 SE	8	Good	Dry		Sea state 2.
			11:45	12:45	17	F2 SE	8	Good	Dry		Increasing glare, sea state 2.
		2	12:45	13:45	17	F3 SE	6	Good	Dry		Sea state 2- 3.
			13:45	14:45	17	F3 SE	5	Good	Dry		Strong glare, sea state 3.
			14:45	15:45	17	F3 SE	4	Good	Dry		Strong glare, sea state 3.

Survey No.	Date	VP	Time		Air Temp (°C)	Wind Force and Direction	Cloud Cover (/8)	Visibility	Precipitation	Tide state	Notes
			Start	End							
5	29/08/2024	1	10:30	11:30	18	F4 SE	3	Excellent	Dry	High to	
			11:30	12:30	18	F4 SE	2	Excellent	Dry	Low	
5	29/08/2024	1	12:30	13:30	18	F4 SE	2	Good	Dry	High to Low	Glare and sea mist.
		2	13:30	14:30	17	F3 SE	4	Good	Dry		
			14:30	15:30	18	F3 SE	4	Good	Heavy rain		
			15:30	16:30	18	F4 SE	4	Poor	Heavy rain		
6	17/09/2024	1	07:00	08:00	12	F1 SE	2	Good	Dry	Low to High	Sea state 1.
			08:00	09:00	14	F1 SE	2	Good	Dry		Sea state 1.
			09:00	10:00	15	F1 SE	2	Good	Dry		Sea state 1.
		2	10:00	11:00	18	F2 SE	2	Good	Dry		Strong glare, sea state 1.
			11:00	12:00	18	F2 SE	1	Good	Dry		Strong glare, sea state 1.
			12:00	13:00	20	F2 SE	2	Good	Dry		Strong glare, sea state 1.

Appendix 3 - Disturbance

Table 12. Full details of disturbance events recorded during the survey programme.

Event number	Date	Time	Disturbance type	Species	Number	Effect No. (1-5)	Notes
1	29/05/2024	12:22, 13:43	AC	N/A	N/A	1	Helicopter flew low over Survey Area.
2	29/05/2024	13:45	SV	GU, RA, PU	315, 68, 11	3	Creel boat moving close inshore flushing auks. Auks 'ran' short distances on water and resettled within 15 seconds.
3	29/05/2024	14:45	SV	GB, CA, SA	2, 1, 2	5	Same creel boat flushed roosting birds off rocks causing birds to relocate.
4	20/06/2024	12:58, 13:19, 14:05	AC	N/A	N/A	1	Helicopter flew low over Survey Area.
5	24/07/2024	10:07, 10:32, 13:08, 13:29, 13:52	AC	N/A	N/A	1	Helicopter flew low over Survey Area.
6	24/07/2024	09:45	SV	GB, HG	3, 35	1	Boat hauling lobster pots attracted gulls but no flushing observed.
7	29/08/2024	14:45	CN	OC	2	5	Kayaker flushed oystercatcher – left Survey Area.
8	17/09/2024	08:00	SV	CU, CA	1, 1	5	Fishing boat passed close inshore flushing birds on rocks, resettled after 45 seconds.
9	17/09/2024	12:28	OW	BH, CM	3, 31	4	Two jet skis flushed loafing gulls, resettled within 25 seconds.

