



EIAR Addendum

Appendix 11-A Update to
Marine Mammal Baseline
Characterisation



SMRU Consulting

understand ♦ assess ♦ mitigate

Update to: Marine Mammal Baseline Characterisation

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1	30/11/25	First draft	JC	RRS	SL
2	30/1/2026	Second draft	AS	RRS	SL
3	20/02/2026	Third draft – including landfall and vessel data	RRS	RRS	SL

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1 Introduction

This document – in response to RFI Items 10q, 10r, and 10s – provides an update to the original baseline environmental characterisation for the Codling Wind Park (CWP) Project in EIAR Volume 4 Appendix 11.3 Baseline Technical Report. This document incorporates newly available data sources which provides a contemporary validation of the existing characterisation and understanding of marine mammal species distribution, abundance, and density within the study area, as described within the application documentation.

Marine mammal density estimates change on a daily, monthly, seasonal and annual basis given the fact that they are highly mobile species with large home ranges. Density estimates obtained from different survey methods each have their own set of assumptions and limitations. Thus, it is expected that for a range of surveys conducted within the Irish Sea, there will be a large variety of resulting density estimates. For this reason, several density estimates were presented in the 2024 EIAR quantitative assessment for cetaceans. Since the submission of the 2024 Application, additional density estimates have become available which further add to the compiled baseline data, and serve to validate the density estimates used in the 2024 EIAR.

2 Data Sources

Table 1 and the following sections provide detail on the new data sources used to update and validate the baseline for marine mammals in relation to CWP Project. This section details the survey and analysis methodology implemented in each study and the potential limitations associated with these.

Table 2-1 Data sources examined to inform the baseline characterisation for marine mammals.

Data source	Type of data	Temporal and spatial coverage
Additional Site-specific DAS	Aerial survey data.	CWP array area + 4 km buffer + inshore area: Nov 2024 – Apr 2025 CWP Array Area + 10 km buffer: May 2025 – Nov 2025
Additional site-specific boat based surveys	Visual vessel surveys	CWP array area + 4 km buffer: Apr - Oct 2025
Seal landfall surveys	Landbased counts of seals within the landfall area, both at-sea and hauled-out on land	CWP landfall area: Jan 2025 – Jan 2026
Gilles et al. (2025). SCANS IV density surface	Predictive habitat-based models of cetaceans in European Atlantic waters in the summer of 2022 based on SCANS IV survey data.	Modelled density surfaces cover the entire SCANS IV survey area. CWP is located within SCANS IV block CS-D.
ObSERVE 2 (Giralt Paradell <i>et al.</i> , 2024)	Visual aerial surveys.	3 surveys: summer 2021, summer 2022 and the winter of 2022-2023. Offshore waters around Ireland, within and beyond Ireland’s continental shelf. The offshore development area is entirely located

		within ObSERVE survey Stratum 5.
Morris et al. (2025)	Aerial thermal-imaging of hauled out seals	August 2024, surveys covered the whole Irish coastline.
Berrow <i>et al.</i> (2024)	UAV surveys of seal haul out sites	10 seal haul-out sites in Dublin Bay and adjacent coastal waters were surveyed on 16 days between 30 June 2023 and 18 January 2024
Dublin Port Company 3FM Project baseline (Dublin Port Company, 2025)	Cetacean vessel-based surveys and acoustic monitoring and seal vessel-based and haul-out surveys.	Data covering the Dublin coastal area from the Dublin Port’s Alexandra Basin Redevelopment (ABR) Project from 2016 to 2021. Data from Masterplan Phase 2 (MP2) Project from 2022 to 2023.

2.1 Site-specific DAS

EIAR Volume 4 Appendix 11.3 Baseline Technical Report presented site-specific DAS covering the array area plus 4 km buffer. There were 24 aerial surveys were conducted between May 2020 – April 2022. The species sighted were:

- Harbour porpoise
- Common dolphin
- Grey seal
- Harbour seal
- Seal species (no ID)
- Cetacean species (no ID)

There were 6 winter aerial surveys were conducted between Nov 2024 – April 2025. These surveys covered the array area + 4 km buffer and an inshore survey area (Figure 2-1). The species sighted were:

- Harbour porpoise
- Common dolphin
- Grey seal
- Harbour seal
- Seal species (no ID)
- Cetacean species (no ID)

These surveys validate the marine mammal species present in the area.

In response to RFI Item 10r, further site-specific surveys have been repeated since the original application was made, to include a 10 km buffer around the array area, as recommended in DCCAE (2018). The 10 km buffer surveys were conducted monthly between May 2025 and Nov 2025.

Species sighted:

- Harbour porpoise
- Bottlenose dolphin

- Common dolphin
- Minke whale
- Harbour seal
- Grey seal
- Seal species (no ID)
- Cetacean species (no ID)
- Marine mammal species (no ID)

These surveys further validate the marine mammal species present in the area.

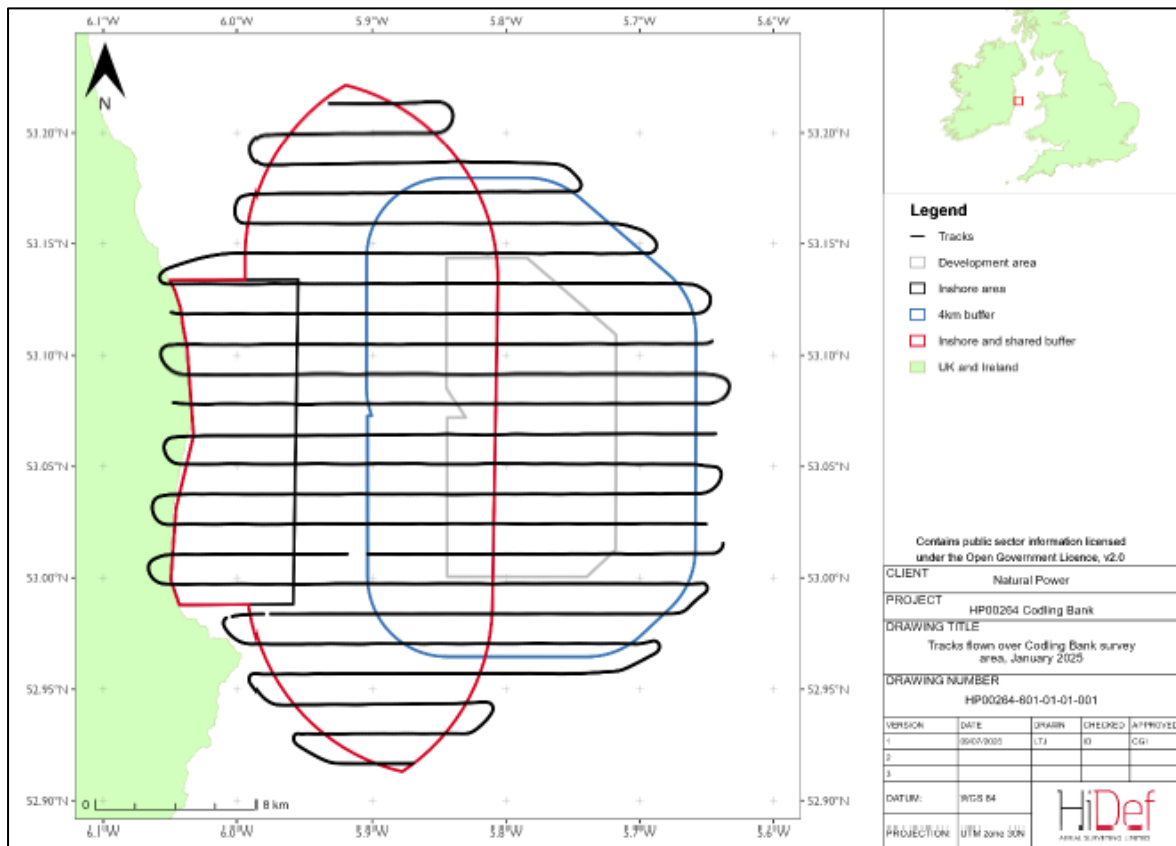


Figure 2-1 1.5km-spaced survey transects flown monthly during the Natural Power Codling Bank surveys: Nov 2024 – Apr 2025

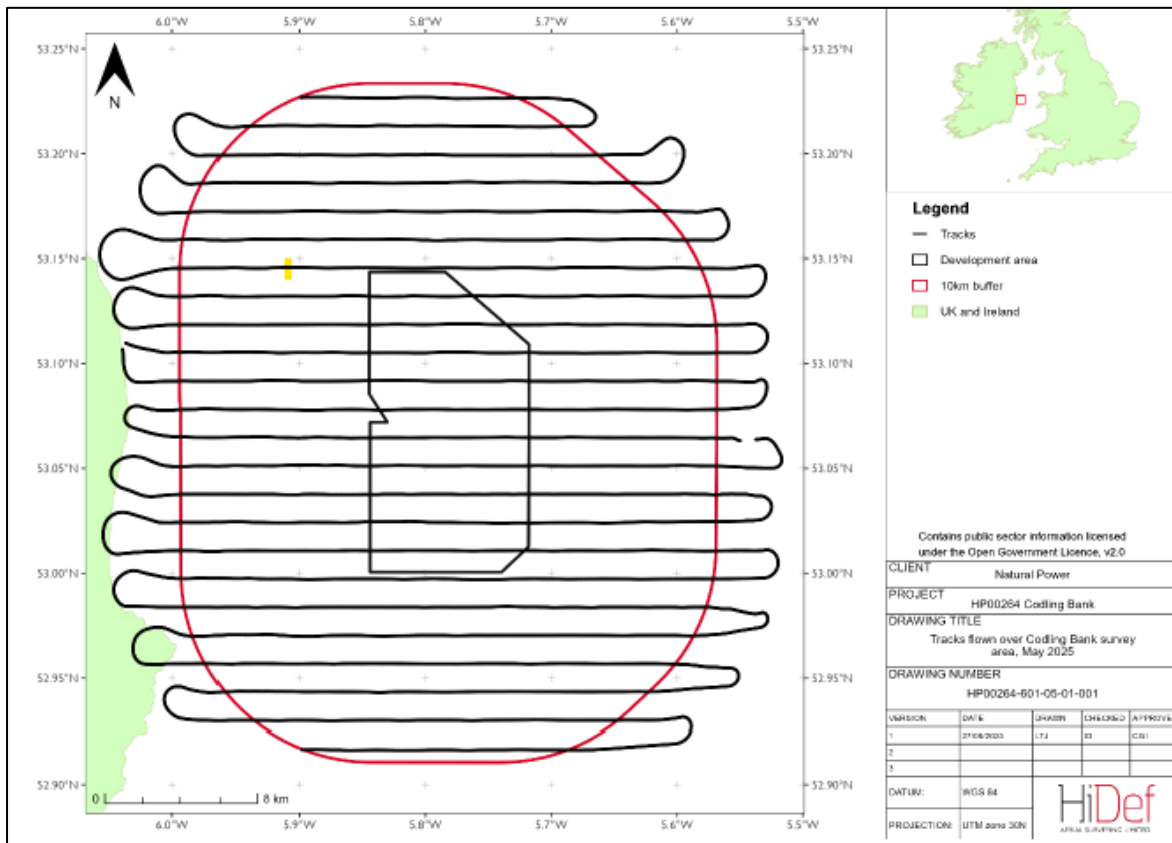


Figure 2-2 1.5km-spaced survey transects flown during the Natural Power Codling Bank surveys: May 2025 - Nov 2025

2.2 Site-specific boat based surveys

Between April 2025 and October 2025, 20 boat based surveys of the array area plus 4 km buffer have been conducted (Figure 2-3). Marine mammals were sighted on 19 of these surveys, with recorded sightings of 40 grey seals, 17 harbour porpoise and 5 minke whales. No density estimates were calculated; however these surveys provide additional data to confirm the presence of these species in the area.

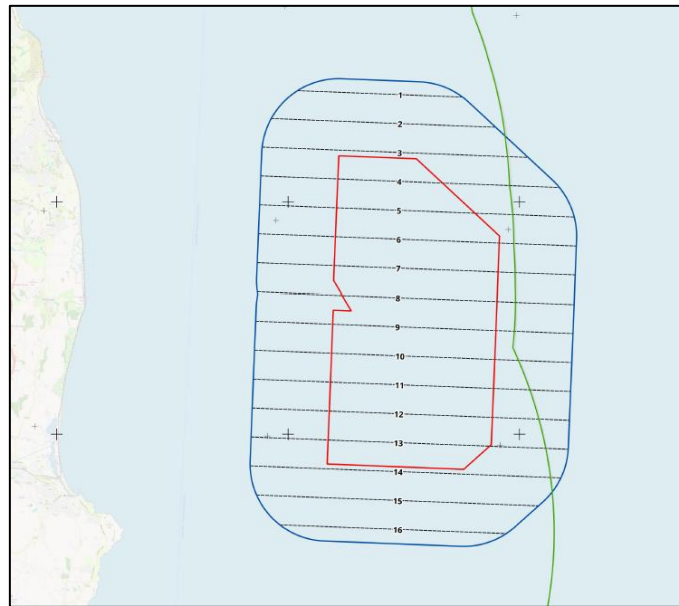


Figure 2-3 Boat based survey area (blue line) relative to the Array site (red line). The 14 transect lines are shown in black dashed lines, with 1.5 km spacing.

2.3 ObSERVE2

EIAR Volume 4 Appendix 11.3 Baseline Technical Report presented the data for ObSERVE 1 in 2015-2017. These surveys have since been updated with the ObSERVE 2 surveys in 2021-2022, details of which are provided here.

The ObSERVE 2 Aerial Project, commissioned in 2021, was designed to build on the baseline established under ObSERVE Phase 1 (Rogan *et al.*, 2018) and expand understanding of marine mammal and seabird occurrence across Ireland's offshore waters. The programme applied broad-scale line transect aerial surveys across Ireland's Exclusive Economic Zone (EEZ), covering continental shelf, slope and deep-water habitats in summer 2021, summer 2022 and the winter of 2022, generating approximately 31,000 km of survey effort. The ObSERVE2 summer surveys were conducted later in the year (July – September) than the ObSERVE Phase 1 surveys (late May – mid July). In addition, fine-scale aerial survey blocks were implemented off the south and southwest coasts during summer, autumn and winter seasons, adding over 13,000 km of targeted coverage to assess coastal and nearshore distributions in greater detail (Giralt Paradell *et al.*, 2024). Surveys were conducted using aircraft, with paired observers on either side (four observers in total) recording sightings of seabirds, cetaceans and other large marine fauna in real time, alongside environmental variables. Standardised distance-sampling protocols were employed to ensure robust detection functions and enable abundance estimation, with transects designed to achieve systematic, representative coverage of the survey blocks. The aerial platform facilitated rapid coverage of extensive areas, providing snapshots of seasonal and interannual variability while minimising disturbance to target species (Giralt Paradell *et al.*, 2024). This structured approach ensured consistency with international best practice for aerial wildlife surveys and provided a statistically rigorous dataset for baseline characterisation of marine megafauna in Irish waters.

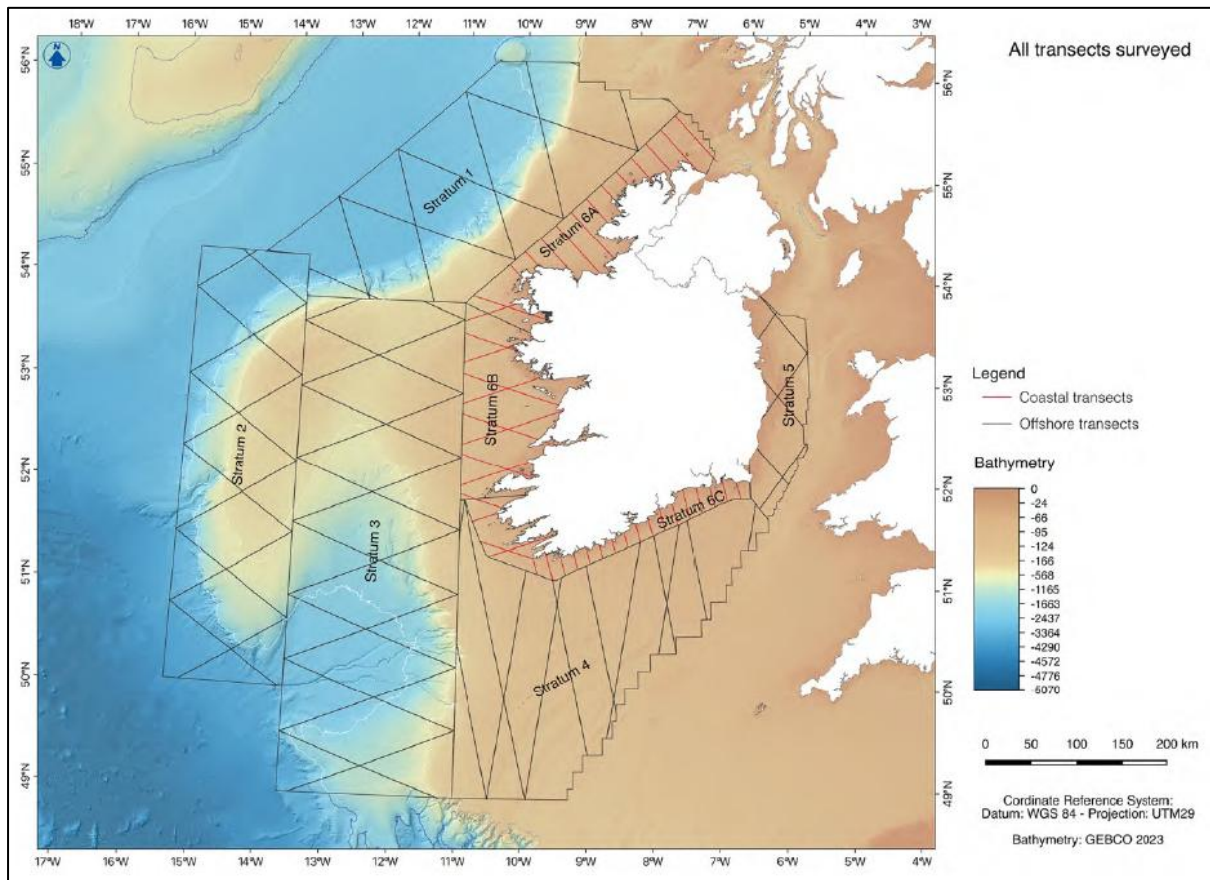


Figure 2-4 Map of the survey area for the ObSERVE2 surveys in 2021 and 2022 (Giralt Paradell *et al.*, 2024). CWP is located within ObSERVE 2 stratum 5.

Broad-scale surveys recorded over 2,200 cetacean sightings of 17 species across all Strata. Common dolphins were the most abundant cetacean (up to ~600,000 in summer 2021), followed by bottlenose dolphins (~35,000), while beaked whales (≥ 3 species) showed concentrations along the shelf break, with winter estimates of ~3,700 animals. Harbour porpoises were less abundant than in ObSERVE Phase 1 but were concentrated mainly in the Irish Sea. Minke whales (2,000–4,600 in summer) dominated baleen whale records, complemented by regular fin and humpback whale sightings (Giralt Paradell *et al.*, 2024). CWP is located within ObSERVE2 stratum 5.

2.4 SCANS IV density surface

EIAR Volume 4 Appendix 11.3 Baseline Technical Report presented the uniform density estimates for each SCANS IV block, as the density surface estimates for SCANS IV were unavailable.

Since the EIAR submission, the SCANS IV survey data have been modelled in relation to spatially linked environmental features to produce (grid-cell specific) density surface maps (Gilles *et al.*, 2025). The cetacean data used in the models were the same as those obtained in 2022 (SCANS IV) (Gilles *et al.*, 2023). The environmental covariates used in the density surface modelling were selected due to their potential to explain the additional variability in the cetacean density estimates (for example, water depth and sea surface temperature (see Gilles *et al.* (2025)) for the full list of environmental covariates)). The models were fitted using a spatial resolution of 10 km and predicted onto a 10 x 10 km spatial grid. Using the predicted density estimates from the surface models, density and abundance estimates, updates can be generated for an entire survey area or a defined area within it, such as CWP.

The SCANS IV density surface replaces the previous SCANS III density surface and the SCANS IV uniform density estimate.

2.5 Irish seal counts

In August 2024, Morris *et al.* (2025) conducted aerial surveys of harbour and grey seals around Ireland using aerial thermal-imaging. These surveys update those conducted in 2003, 2011/2012, and 2017/2018. Surveys were restricted to the peak harbour seal moult season in August and to within 2 hours of low tide with no surveys occurring during periods of moderate, heavy or prolonged rainfall. Both high resolution colour images and thermal-images were obtained.

The counts obtained represent the number of seals that were onshore at the time of the survey and are an estimate of the minimum size of the population. They do not represent the total size of the local population since a number of seals would have been at sea at the time of the survey. However, telemetry data from tagged seals can be used to scale this estimate to take account of the proportion of animals at sea at the time of survey. It is noted that these data refer to the numbers of seals found within the surveyed areas only at the time of the survey; numbers and distribution may differ at other times of the year. The surveys were conducted in August since this is the period when harbour seals are moulting and is therefore the time of year when the largest numbers of harbour seals are ashore. While grey seals are also counted during these August surveys, these data do not necessarily provide a reliable index of population size. Grey seals aggregate in the autumn to breed at traditional colonies, therefore their distribution during the breeding season can be very different to their distribution at other times of the year.

2.6 Seal landfall surveys

In response to Item 10s, Points i and ii, the Applicant has conducted monthly seal haul-out surveys at the landfall site. Since the EIAR submission, 25 seal landfall surveys have been conducted in the intertidal landfall survey area (Figure 2-5) between January 2025 and January 2026. These surveys have confirmed the presence of grey seals.

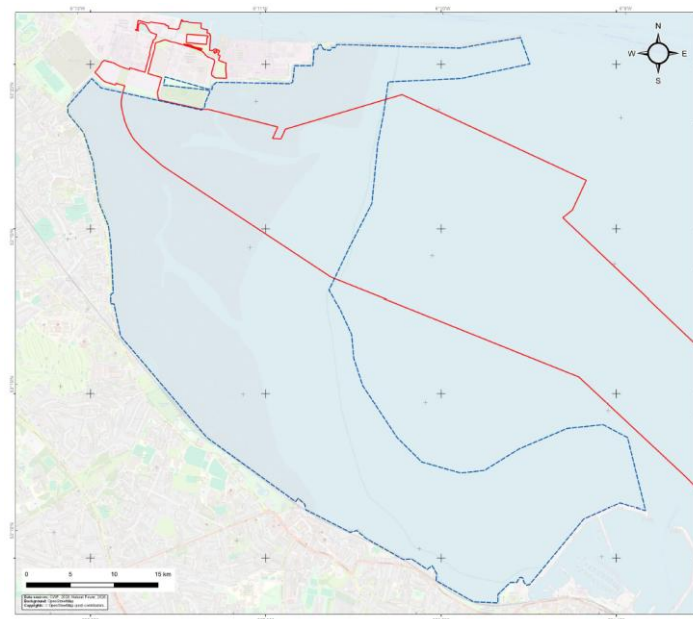


Figure 2-5 Intertidal landfall survey area (blue dashed line) relative to the Planning Application Boundary (red line)

2.7 Dublin Bay seal surveys

Since the EIAR submission, new data on seal haul out sites in the Dublin Bay area have been published. These have been considered here in the baseline addendum to compliment the landfall seal surveys.

Berrow *et al.* (2024) conducted seal haul-out surveys in the Dublin Bay area over 16 days between 30 June 2023 and 18 January 2024. The aim of the surveys was to assess whether infrastructural development at Dublin Port impacted on seals during pupping and moulting seasons. A total of 10 sites were monitored: Skerries, Smugglers Cove, Rush Head, Lambay Island, Irelands Eye and Howth Head (all north of Dublin Bay), Bull Island (within Dublin Bay), Sandy Cove and Dalkey & Maidens Islands (south of Dublin Bay).

2.8 Dublin Port Company 3FM Project baseline surveys

As Dublin Bay and the adjacent marine areas are important for marine mammals, baseline data for the area was obtained from visual and acoustic surveys undertaken from 2013 to 2022 as part of the Port redevelopment (Dublin Port Company, 2025). The surveys conducted are described below.

2.8.1 ABR Project and MP2 Projects

Dublin Port's Alexandra Basin Redevelopment (ABR) Project commenced in 2016 as the first phase of the Dublin Port Masterplan 2024. Monitoring was conducted during the maintenance and capital dredge campaigns from 2017 to 2022. From 2022 onwards, the second phase of monitoring began to continue monitoring the maintenance and capital dredge campaigns as part of the MP2 Project. Surveys were conducted for cetaceans and seals by Marine Mammal Observers working simultaneously on two dredging vessels. Therefore, it should be noted that sightings of animals may be duplicated across both sets of observers.

2.8.2 Acoustic Monitoring

Static Acoustic Monitoring (SAM) has been conducted in Dublin Bay as part of the ABR and MP2 Projects since 2017, using a combination of Cetacean Porpoise Detectors (C-PODs), Full waveform capture Passive Acoustic Monitoring (F-PODs) and SoundTraps. During the ABR Project from September 2017 to May 2021, four stations were monitored using C-PODs: three stations at the spoil grounds and one control site in Scotsman's Bay (Figure 2-6). Monitoring then continued at one station until January 2022. As part of the MP2 Project, monitoring was conducted at two of the spoil sites and the control site from January 2022 (Figure 2-7) using both C-PODs and F-PODs. Data collected during acoustic monitoring as part of the ABR and MP2 Projects provides information on seasonal, diel and tidal patterns of porpoise occurrence at individual sites.

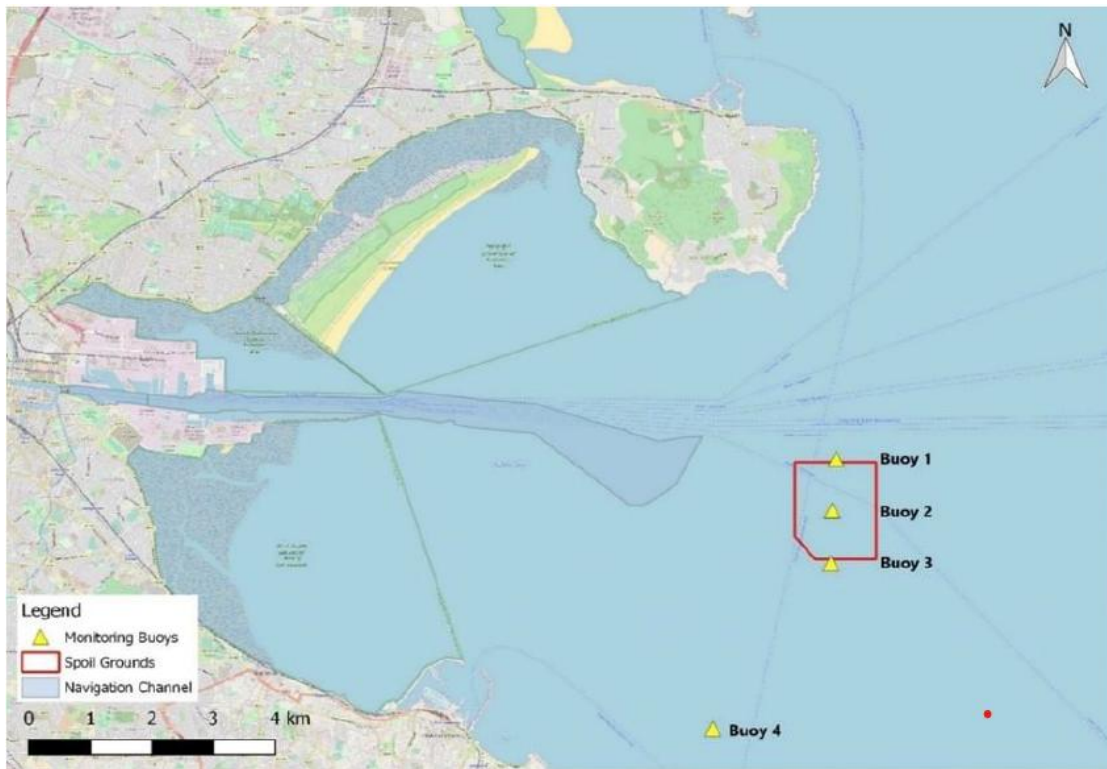


Figure 2-6 SAM stations on monitoring buoy positions within the spoil grounds and Dublin Bay as part of the ABR Project from 2017 to 2021



Figure 2-7 SAM stations monitored as part of the MP2 Project from 2022 to 2023

2.8.3 Bull Island haul-out Counts

Monthly seal counts at a haul-out site on Bull Island have been carried out since May 2016 under the ABR and MP2 Projects Marine Mammal Monitoring Programme.

3 Harbour porpoise

3.1 Site-specific DAS

EIAR Volume 4 Appendix 11.3 Baseline Technical Report presented a density surface for harbour porpoise across the survey area. The density surface average using MRSea (using both boat and DAS data) was 0.1225 porpoises per km² across the survey area (CI: 0.1147 – 0.1313).

The additional DAS surveys covering a 4 km buffer around the array area and inshore survey area observed harbour porpoise in all months from November 2024 to April 2025. The mean density was 0.70 (CI: 0.09 – 0.45) harbour porpoise/km², with the maximum density of 1.53 harbour porpoise/km² occurring in February 2025 (Table 3-1).

The additional DAS surveys covering a 10 km buffer around the array area also observed harbour porpoise in all months from May to November 2025. The mean density was 0.40 (CI: 0.19 – 0.67) harbour porpoise/km², with the maximum density of 1.43 harbour porpoise/km² occurring in August 2025 (Table 3-1).

Table 3-1 Harbour porpoise density estimates (#/km², apportioned and adjusted for availability bias)

Month	Survey area	Mean	Lower CI	Upper CI
Average	4 km buffer (Oct 2018 – Apr 2022)	0.1225	0.01147	0.1313
Nov 24	4 km buffer + inshore area	0.21	0	0.43
Dec 24	4 km buffer + inshore area	1.01	0.47	1.76
Jan 25	4 km buffer + inshore area	0.47	0.06	0.89
Feb 25	4 km buffer + inshore area	1.53	0.87	2.26
Mar 25	4 km buffer + inshore area	0.69	0.27	1.23
Apr 25	4 km buffer + inshore area	0.27	0.09	0.45
Average	4 km buffer + inshore area (Nov 2024 – Apr 2025)	0.70	0.29	1.17
May 25	10 km buffer	0.12	0.04	0.27
Jun 25	10 km buffer	0.08	0	0.21
Jul 25	10 km buffer	0.47	0.21	0.77
Aug 25	10 km buffer	1.43	0.82	2.21
Sep 25	10 km buffer	0.37	0.16	0.63
Oct 25	10 km buffer	0.2	0.07	0.31
Nov 25	10 km buffer	0.13	0.02	0.31
Average	10 km buffer	0.40	0.19	0.67

(May 2025 – Nov 2025)

3.2 ObSERVE2

With 128 sightings comprising 212 individuals, harbour porpoise was the second most frequently sighted cetacean species across the surveyed area in 2021 and 2022 (Giralt Paradell *et al.*, 2024), and were primarily observed in Stratum 5 which CWP is located within. Although most sightings were of single individuals, mean group size was slightly larger in the Winter (1.5 individuals) than in the Summer (1.3 individuals) across all strata. Density and abundance estimates (both design-based and model-based) per season and per stratum indicate interannual variability in the abundance of harbour porpoise (Summer 2021 abundance estimate of 20,991 (95% CI's 16,586 – 26,567) decreasing to 7,510 (95% CI's 5,940– 9,495) in Summer 2022) (Giralt Paradell *et al.*, 2024).

Greatest abundance and density estimates can be seen in the Irish Sea (stratum 5) for all seasons, with predicted distribution of harbour porpoise for Summer highlighting the northern section of stratum 5, in the Irish Sea, as an area of importance (Figure 3-1 and Figure 3-2) (Giralt Paradell *et al.*, 2024). Due to relatively few sightings, the predicted distribution reflects low densities of harbour porpoise throughout the Irish Sea for Winter (Giralt Paradell *et al.*, 2024).

Within survey stratum 5, in which proposed development is located, the harbour porpoise density estimate was highest in summer 2021, where corrected estimates reached 0.416 animals/km². Corrected density estimates reached 0.262 and 0.379 animals/km² for Summer 2022 and Winter respectively.

These surveys confirmed the presence of harbour porpoise in off the east coast of Ireland, and highlighted the variability in porpoise density estimates between surveys. The summer density estimates range from 0.150 – 1.046 porpoise/km and the winter density estimates range from 0.379 – 0.924 porpoise/km (Table 3-2).

These findings are within anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation.

Table 3-2 Harbour porpoise groups, design-based and model-based density (#/km²) and abundance estimates for stratum 5 of the ObSERVE 1 and 2 surveys (Rogan *et al.*, 2018 and Giralt Paradell *et al.*, 2024).

Survey	Corrected design based estimates		Corrected model based estimates	
	Density	Abundance	Density	Abundance
Summer 2015	0.696	7,734	0.675	7,495
Summer 2016	1.046	11,624	0.942	10,466
Summer 2021	0.968	10,655	0.416	4,339
Summer 2022	0.150	1,653	0.262	2,738
Summer average	0.715	7,917	0.574	6,260
Winter 2015-16	0.867	9,636	NA	
Winter 2016-17	0.924	10,263	NA	
Winter 2022	0.413	4,547	0.379	3,822
Winter average	0.735	8,149	NA	NA

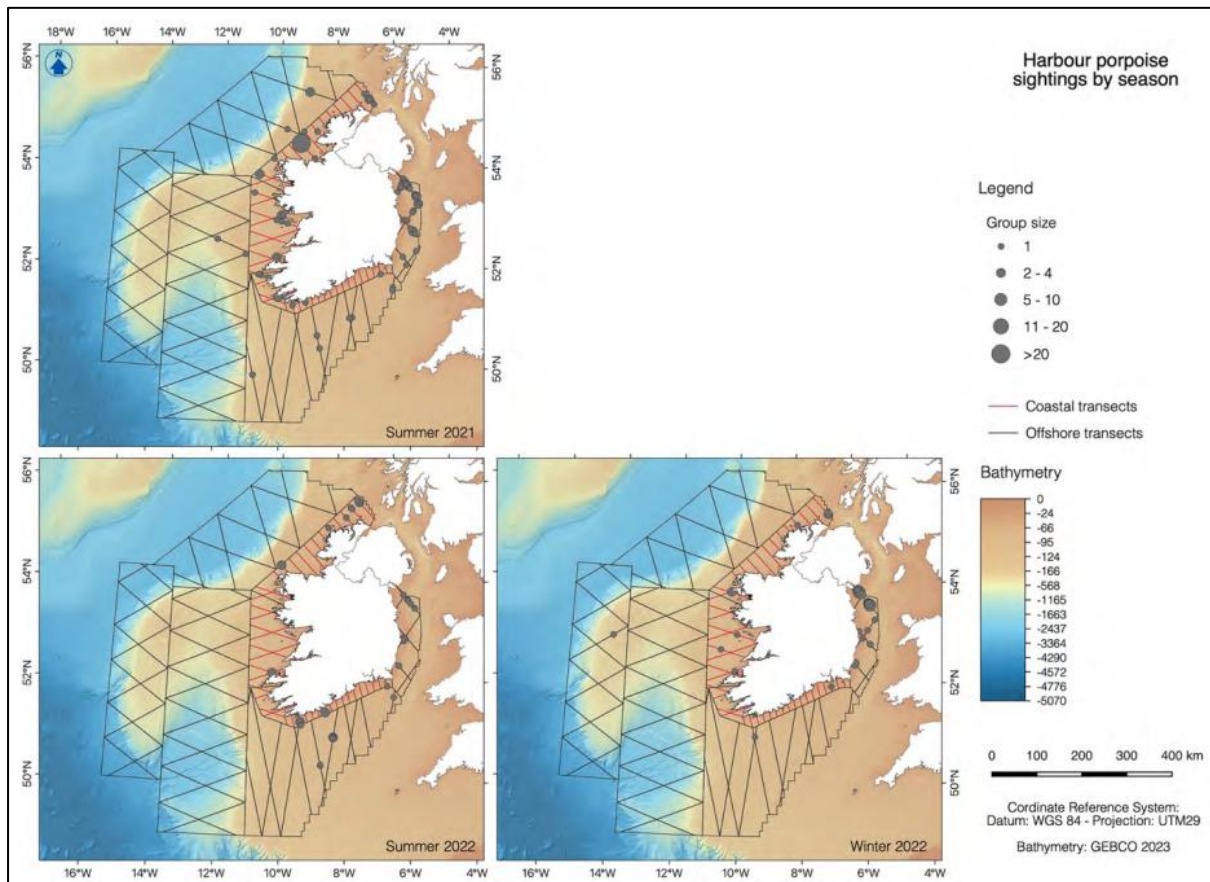


Figure 3-1 Sightings of harbour porpoise across all surveys (top) and in each survey period (bottom). Note that no surveys were carried out in winter 2021. Grey lines indicate the survey tracklines in the offshore strata and red lines indicate the tracklines in the coastal strata. Circles are proportional to the number of porpoises in each sighting. Figure from Giralt Paradell *et al.* (2024).

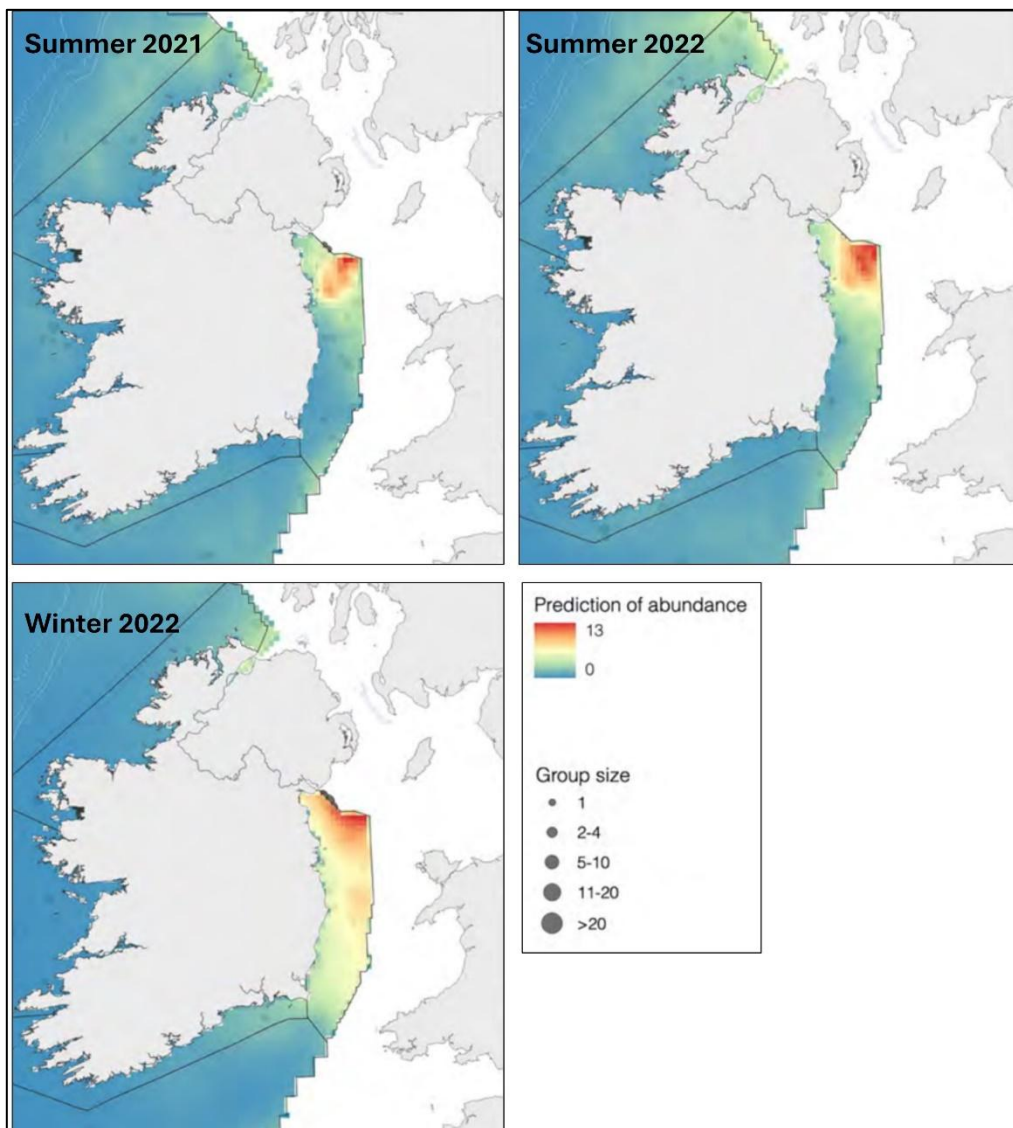


Figure 3-2 Predicted density distributions of harbour porpoise for Summer 2021 (top left), Summer 2022 (top right) and Winter 2022 (bottom left). Figures from Giralt Paradell *et al.* (2024).

3.3 SCANS IV density surface

Gilles *et al.* (2025) used the SCANS IV data and spatially referenced environmental features to predict density estimates for harbour porpoises. This shows that the predicted SCANS IV harbour porpoise distribution across the Irish Sea is not uniform. The highest densities are predicted in the eastern and northeastern Irish Sea, closer to the west coasts of England. When compared with the SCANS IV block-wide (CS-D) uniform density estimate (0.2803 porpoise/km²), the SCANS IV density surface estimates are more representative of real-world species habitat use. Using the SCANS IV density surface, the densities of harbour porpoise in the vicinity of the CWP array area and OECC are relatively low, with values <0.2 harbour porpoise/km² (Figure 3-3). The maximum, minimum and average densities of harbour porpoise within the CWP array area and ECC are summarised in Table 3-3.

These findings are within anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation.

Table 3-3 The maximum, minimum and average densities of harbour porpoise within the CWP array area and ECC.

Location	Maximum Density (animals/km ²)	Minimum Density (animals/km ²)	Average Density (animals/km ²)
ECC	0.1295	0.0386	0.0946
Array Area	0.1651	0.0671	0.1069

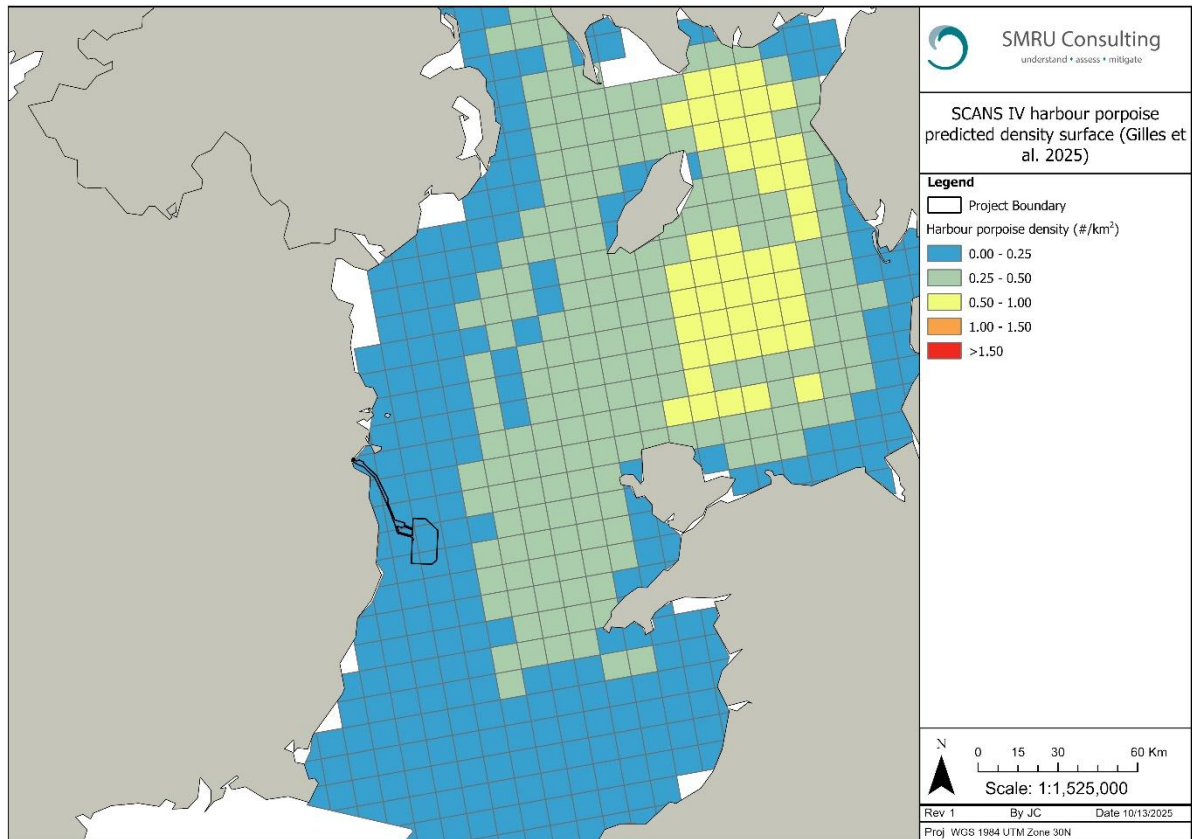


Figure 3-3 Predicted density surface for harbour porpoise (summer 2022). Data from Gilles *et al.* (2025).

3.4 Dublin Port Company 3FM Project baseline surveys

3.4.1 APR and MP2 Projects

Harbour porpoise were the most frequently observed marine mammal during the maintenance and capital dredging programmes associated with Dublin Port from 2017 to 2022. During the capital dredge campaigns, harbour porpoise were observed during all campaigns, totalling 282 animals. The most harbour porpoise (84) were observed in the 2020-2021 campaign (Table 3-4). The majority of sightings occurred outside Dublin Harbour with increased number of sightings further east, closer to the dredge spoil grounds (Figure 3-4).

Table 3-4 Summary of harbour porpoise sightings recorded during each capital dredge campaign

	2017-2018	2018-2019	2019-2020	2020-2021	2022
Harbour porpoise	77	44	84	51	26

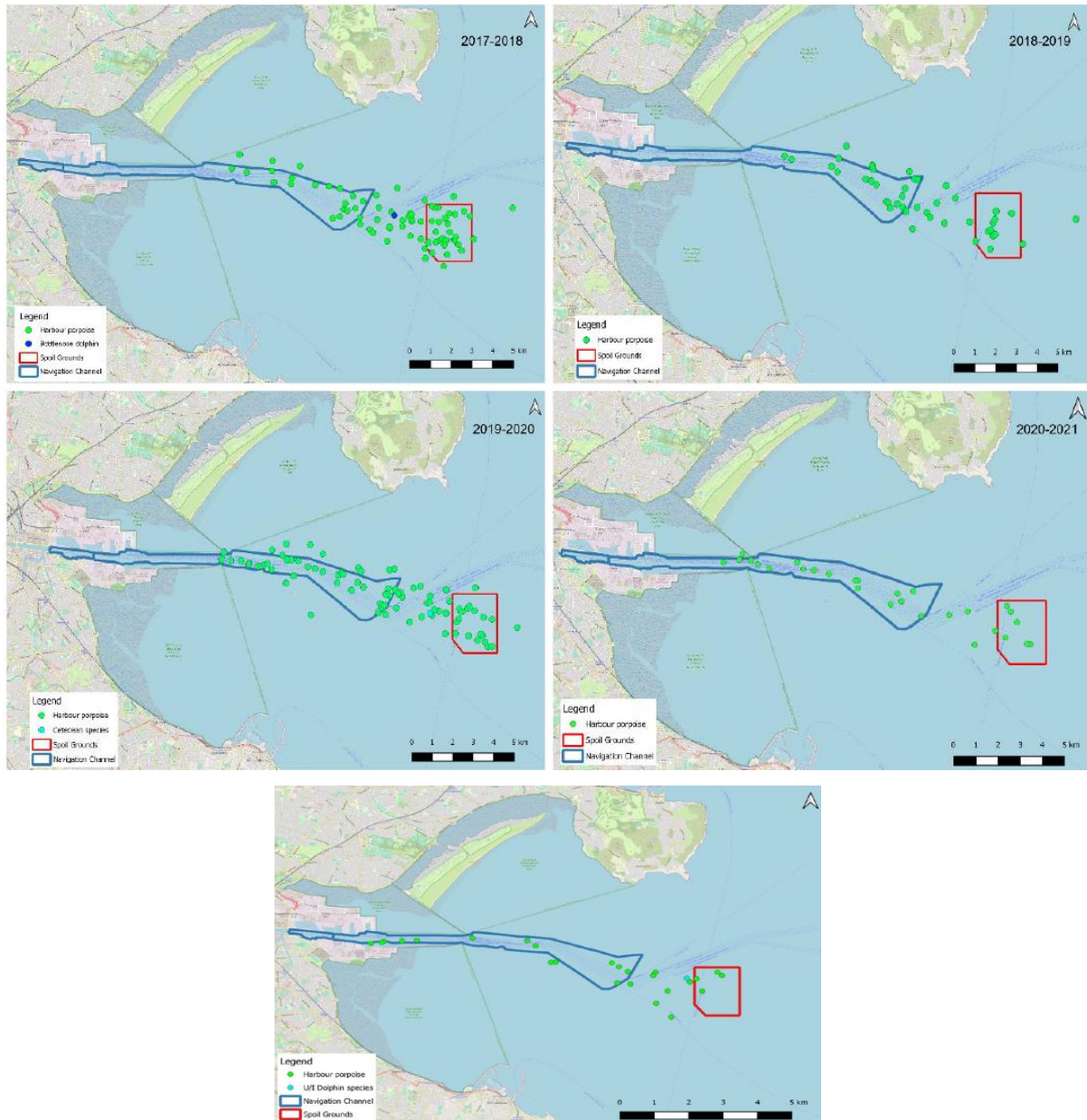


Figure 3-4 Harbour porpoise sightings during the ABR Project (2017 to 2021) and MP2 Project (2022) capital dredging programmes (Dublin Port Company, 2025)

During maintenance dredging campaign, a total of 104 harbour porpoise were observed, with sightings made in all years. The most occurred in 2020 when there were 37 sightings, accounting for 53% of all marine mammal sightings in that year (Table 3-5). Sightings occurred primarily outside Dublin Harbour (Figure 3-5).

Table 3-5 Summary of harbour porpoise sightings recorded during each maintenance dredge campaign

	2017	2018	2020	2021
Harbour porpoise	29	35	37	3

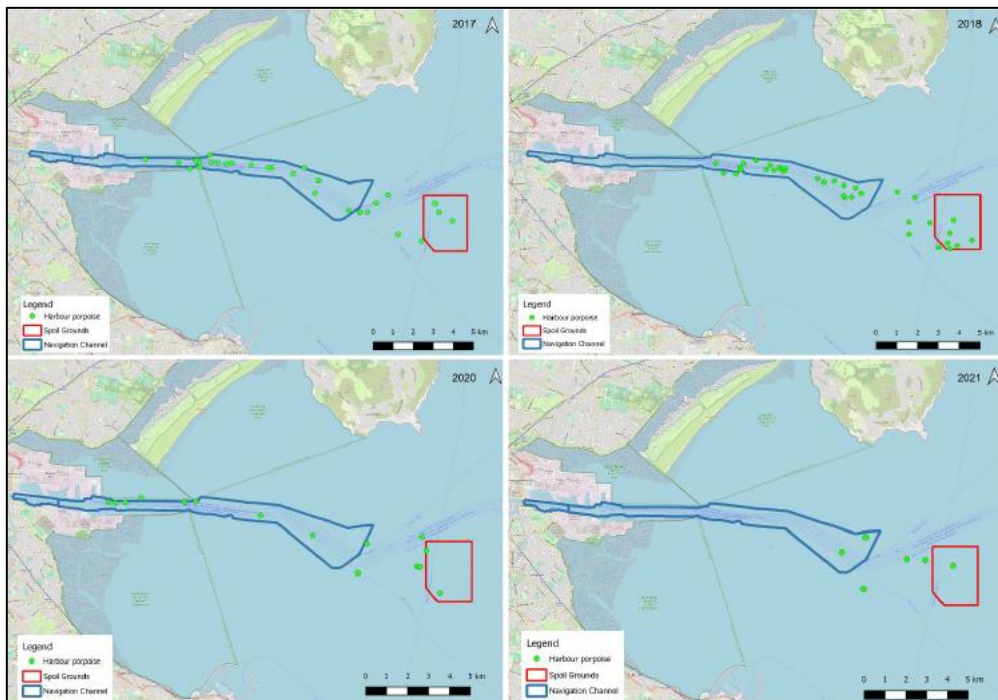


Figure 3-5 Harbour porpoise sightings during the ABR Project (2017 to 2021) capital dredging programmes (Dublin Port Company, 2025)

3.4.2 Acoustic Monitoring

The number of porpoise detections per day at each monitoring station over the period of record (2017-2023) is presented in Figure 3-6. The data showed that the area east of Dublin Port is an important habitat for the harbour porpoise with detections on an almost daily basis (90% of days on average). Harbour porpoise presence was influenced by season, diel and tidal factors, and presence was significantly greater during the winter months, during hours of darkness and at slack high tides. During the six years of data collection, no significant changes in detections occurred. There was no indication of displacement during dredging activities, with analysis of the SAM data finding significant increases in porpoise presence during dredging operations at the spoil grounds from 2017 to 2019 at Dublin Port (Dublin Port Company, 2025).

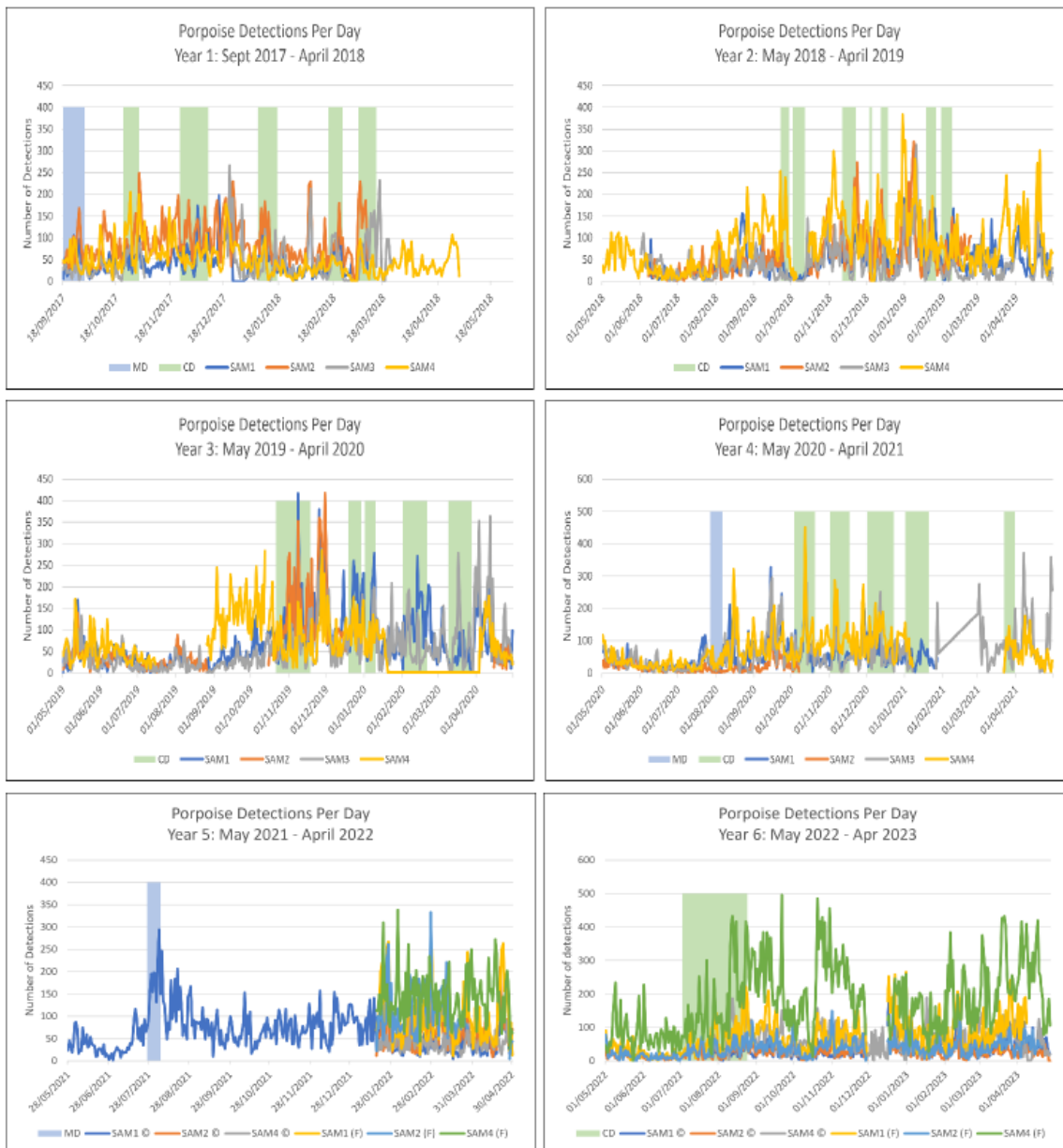


Figure 3-6 Porpoise detections per day since 2017. Data for Years 1 to 5 was collected as part of the ABR Project Year 6 data is from MP2 Project monitoring. *MD: Maintenance dredging, CD: Capital dredging periods. (Dublin Port Company, 2025)

3.5 Seasonality

In the British Isles, it is estimated that the breeding season typically occurs between June and September, with births predominantly in June (Lockyer, 1995). Dynamic energy budget modelling has shown that female porpoise are expected to be most vulnerable to disturbance (reduction in food intake) between the time the calf is born until it is able to acquire at least some food independently (June – Sept inclusive) (Harwood et al., 2020). The population will, therefore, be more vulnerable to disturbance during this breeding and early lactation season.

All surveys confirm the presence of harbour porpoise in the vicinity of the CWP Project year-round:

- 2013-2022 vessel surveys and DAS across the CWP array area + 4 km buffer showed higher densities in the spring and summer months

- 2024-2025 DAS showed harbour porpoise were present all year round. Densities were variable throughout the year, with higher densities in spring and summer months
- The Irish Sea density surface predicts highest densities in the spring and summer months across the Irish Sea
- ObSERVE surveys show clear interannual variation, but overall with similar average densities in both summer and winter surveys.
- Dublin Port PAM showed higher detections in the winter months.

3.6 Summary

The findings from the new data sources are within anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation. Table 3-4 provides a summary of the range of density estimates available for harbour porpoise.

Table 3-6 Harbour porpoise density estimates (porpoise/km²)

Data source	Reference	Density estimate (#/km ²)
CWP site specific DAS 4 km buffer + inshore area (2024-2025)	CWP	Average: 0.70
CWP site specific DAS 10 km buffer (2025)	CWP	Average: 0.40
SCANS IV density surface summer 2022	Gilles <i>et al.</i> (2025)	Grid cell specific 0.0671 - 0.1651 in CWP array area
ObSERVE2 stratum 5 summer 2021	Giralt Paradell <i>et al.</i> (2024)	0.968 (design based) 0.416 (model based)
ObSERVE2 stratum 5 summer 2022		0.150 (design based) 0.262 (model based)
ObSERVE2 stratum 5 winter 2022		0.413 (design based) 0.379 (model based)
CWP Project site specific DAS (2020 - 2022)	Natural Power (2023)	0.1225 (Density surface estimate) 0.2486 (Point density estimate)
ObSERVE stratum 5 summer 2015	Rogan <i>et al.</i> (2018)	0.696 (design based) 0.675 (model based)
ObSERVE stratum 5 winter 2015-16		0.867 (design based)
ObSERVE stratum 5 summer 2016		1.046 (design based) 0.942 (model based)
ObSERVE stratum 5 winter 2016-17		0.924 (design based)
SCANS IV block CS-D summer 2022	Gilles <i>et al.</i> (2023)	0.2803
SCANS III density surface summer 2016	Lacey <i>et al.</i> (2022)	Grid cell specific <0.25 in CWP array site
SCANS III block E summer 2016	Hammond <i>et al.</i> (2017)	0.239
Welsh and Irish Sea distribution	Evans and Waggitt (2023)	Grid cell specific 0.3 – 0.4 in CWP array area

Data source	Reference	Density estimate (#/km ²)
IWDG Irish Sea Block A	Berrow <i>et al.</i> (2011)	1.585
IWDG North County Dublin	Berrow <i>et al.</i> (2008)	2.03
IWDG Dublin Bay	Berrow <i>et al.</i> (2008)	1.19
IWDG Rockabill to Dalkey Island SAC (2021)	Berrow <i>et al.</i> (2021)	0.83
IWDG Rockabill to Dalkey Island SAC (2016)	O'Brien and Berrow (2016)	1.55

4 Bottlenose dolphin

4.1 Site-specific DAS

No bottlenose dolphins were sighted in the original site-specific DAS.

During the additional DAS surveys between November 2024 – November 2025, two bottlenose dolphins were observed in July 2025 only. This resulted in a density of 0.02 (CI: 0 – 0.05) bottlenose dolphins/km².

4.2 OBSERVE2

With 112 sightings comprising 472 individuals, bottlenose dolphins were the third most frequently sighted cetacean species across the surveyed area in 2021 and 2022 (Giralt Paradell *et al.*, 2024). Bottlenose dolphins were primarily observed in Stratum 1, 2, 3 & 4, and only sporadically sighted in stratum 5 within which CWP is located. Mean group size varied between strata, but did not deviate much between seasons ranging from 3.9 or 4.2 individuals in the Summers to 4.4 in the Winter (Giralt Paradell *et al.*, 2024). In stratum 5 specifically, mean group size during Summer was 1.2 and no mean group size estimate could be provided for the Winter season.

Density and abundance estimates (both design-based and model-based) per season and per stratum indicate interannual variability between Summer 2021 and Summer 2022, with an abundance across all survey strata of 11,328 bottlenose dolphins in Summer 2021 (95% CIs 8,385- 15,302), which increased to 37,489 in Summer 2022 (95% CIs 30,611-45,913). A Winter abundance estimate of 23,778 bottlenose dolphins (95% CI's 19,156 – 29,516) (CV:28.91) was estimated across all survey strata (Giralt Paradell *et al.*, 2024).

The smallest abundance and density estimates can be seen in the Irish Sea (stratum 5), with predicted distribution of bottlenose dolphin for Summer greatest in the central, coastal sections of stratum 5 (Figure 4-1 and Figure 4-2) (Giralt Paradell *et al.*, 2024). Due to relatively few sightings, the predicted distribution reflects low densities of bottlenose dolphins throughout the Irish Sea for Winter (Giralt Paradell *et al.*, 2024). Within survey stratum 5, in which proposed development is located, the bottlenose dolphin (corrected) density estimate was only estimated for Summer 2022 only. The corrected estimate was 0.111 animals/km² (Table 4-1).

These findings are with anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation.

Table 4-1 Bottlenose dolphin design-based and model-based density (#/km²) and abundance estimates for stratum 5 of the ObSERVE 1 and 2 surveys (Rogan et al., 2018 and Giralte Paradell et al., 2024).

Survey	Corrected design based estimates		Corrected model based estimates	
	Density	Abundance	Density	Abundance
Summer 2015	NA		NA	
Winter 2015-16	NA		NA	
Summer 2016	NA		NA	
Winter 2016-17	0.036	401	0.020	223
Summer 2021	NA		NA	
Summer 2022	0.111	1,223	0.059	618
Winter 2022	NA		NA	

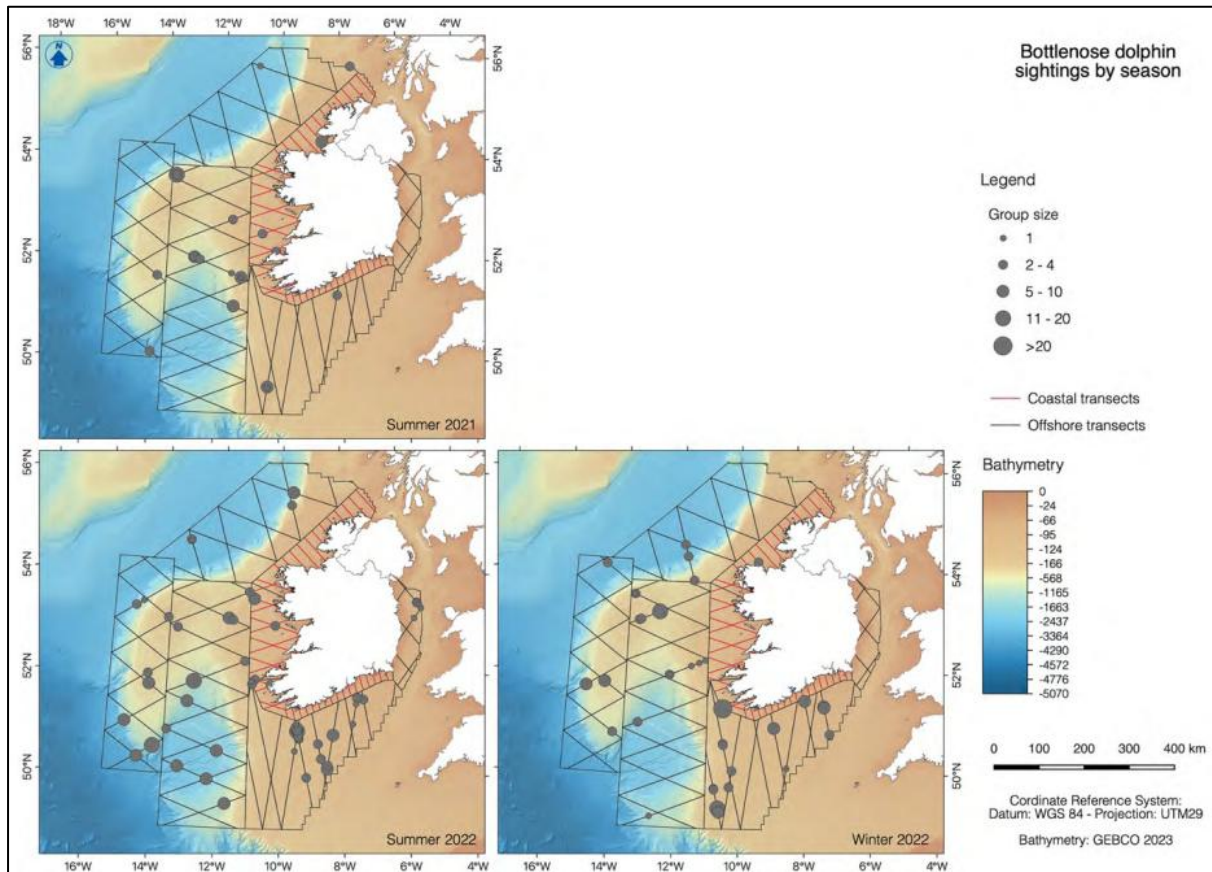


Figure 4-1 Sightings of bottlenose dolphins across all surveys (top) and in each survey period (bottom). Note that no surveys were carried out in winter 2021. Grey lines indicate the survey tracklines in the offshore strata and red lines indicate the tracklines in the coastal strata. Circles are proportional to the number of porpoises in each sighting. Figure from Giralte Paradell *et al.* (2024).

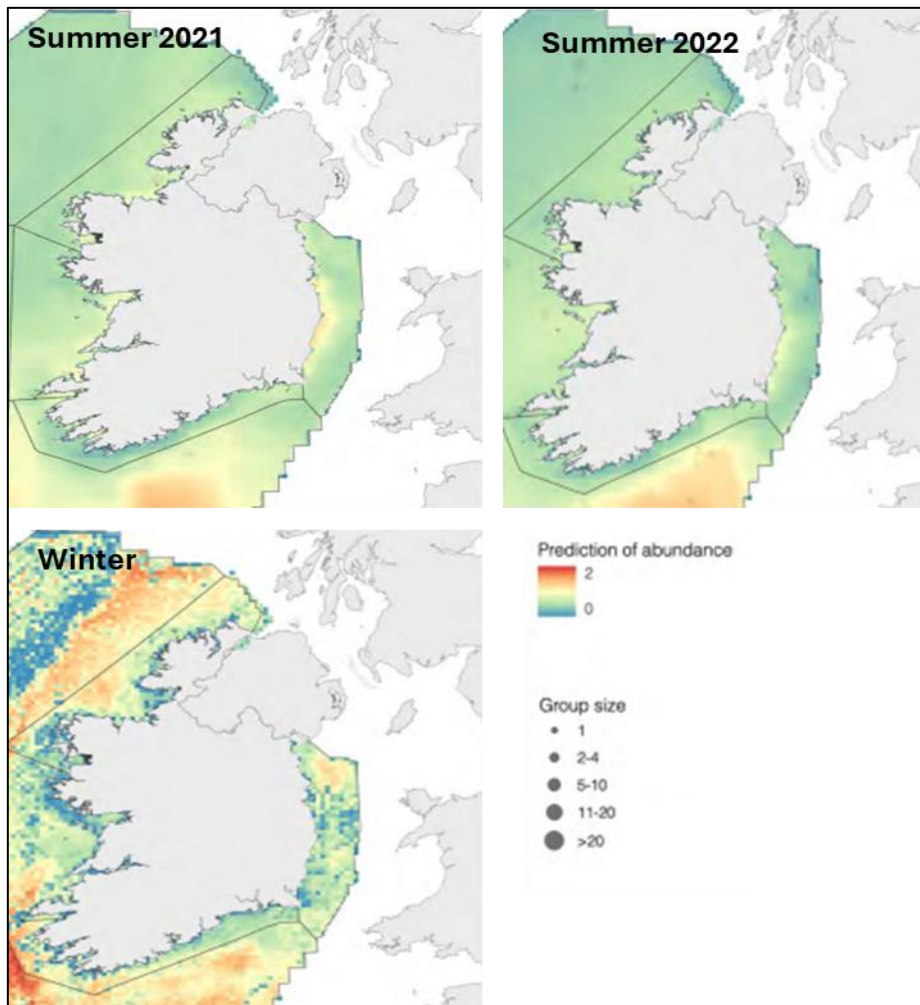


Figure 4-2 Predicted density distributions of bottlenose dolphin for Summer 2021 (top left), Summer 2022 (top right) and Winter (bottom left). Figures from Giralt Paradell *et al.* (2024).

4.3 SCANS IV density surface

Gilles *et al.* (2025) used the SCANS IV data and spatially referenced environmental features to predict density estimates for bottlenose dolphins. This shows that the predicted SCANS IV bottlenose dolphin distribution across the Irish Sea is not uniform. The highest densities are predicted in the northwestern Irish Sea close to the Isle of Man, and southern Irish Sea. When compared with the SCANS IV block-wide (CS-D) uniform density estimate (0.2352 dolphins/km²), the SCANS IV density surface estimates are more representative of real-world species habitat use. Using the SCANS IV density surface, the densities of bottlenose dolphin in the vicinity of the CWP array area and OECC are relatively low, with values <0.25 bottlenose dolphin/km² (Figure 4-3). The maximum, minimum and average densities of bottlenose dolphin within the CWP array area and ECC are summarised in Table 4-2.

Table 4-2 The maximum, minimum and average densities of bottlenose dolphin within the CWP array area and ECC.

Location	Maximum Density (animals/km ²)	Minimum Density (animals/km ²)	Average Density (animals/km ²)
ECC	0.1502	0.1384	0.1368
Array Area	0.1502	0.1035	0.1324

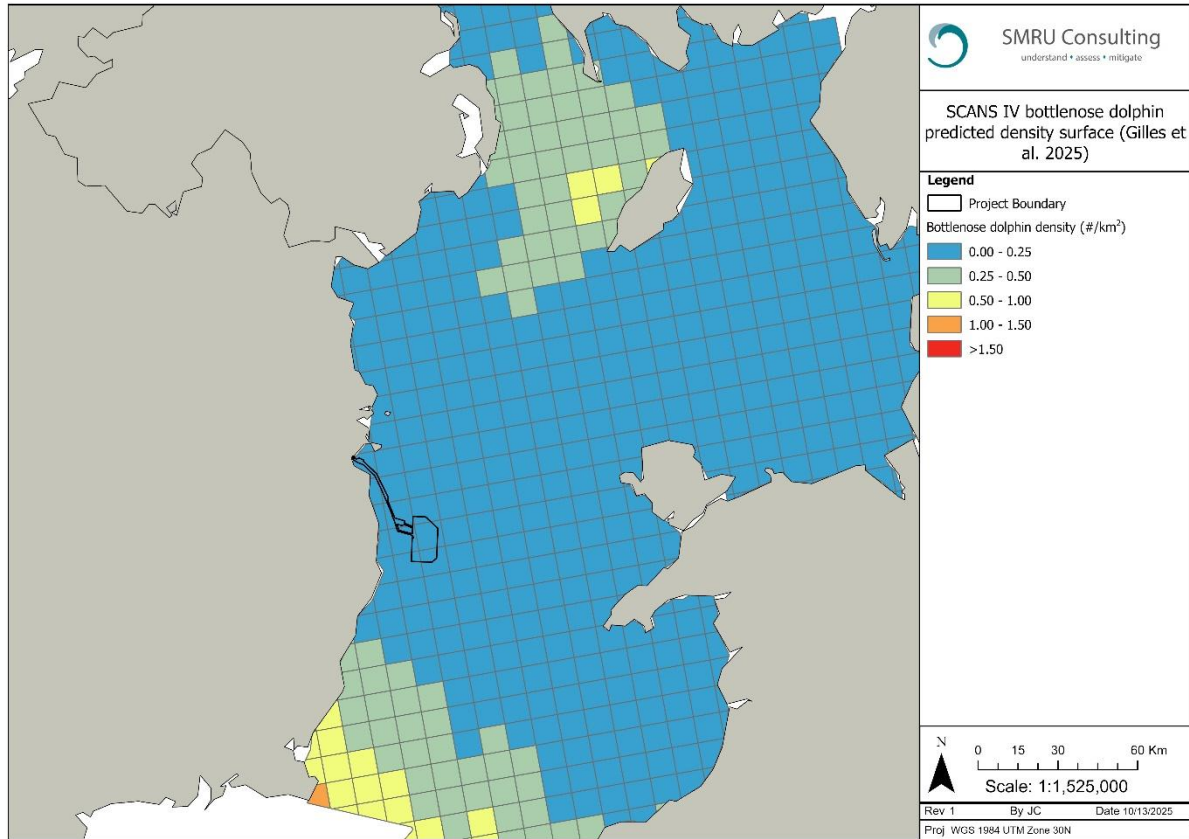


Figure 4-3 Predicted density surface for bottlenose dolphin. Data from Gilles *et al.* (2025).

4.4 Dublin Port Company 3FM Project baseline surveys

A single bottlenose dolphin was observed during the ABR Project capital dredge campaign in 2017 to 2018. During the maintenance dredge campaign, there were no bottlenose dolphin sightings.

4.5 Seasonality

Various surveys confirm the presence of bottlenose dolphins in the vicinity of the CWP Project, though numbers are low and variable:

- There were not enough sightings in the site-specific surveys to comment on seasonality
- The Irish Sea density surface predicts similar densities across all seasons
- ObSERVE surveys show low densities with not enough sightings to comments on seasonality in stratum 5.

4.6 Summary

The findings from the new data sources are within anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation. Table 4-3 provides a summary of the range of density estimates available for bottlenose dolphins.

Table 4-3 Bottlenose dolphin density estimates (dolphins/km²)

Data source	Reference	Density estimate
CWP Project site specific DAS 4 km buffer + inshore area (2024-2025)	CWP	0
CWP site specific DAS 10 km buffer (2025)	CWP	0.02
SCANS IV density surface summer 2022	Gilles <i>et al.</i> (2025)	Grid cell specific 0.1035 – 0.1502 in CWP Project array area
ObSERVE2 stratum 5 summer 2021	Giralt Paradell <i>et al.</i> (2024)	0.111 (design based) 0.059 (model based)
ObSERVE stratum 5 winter 2016-17	Rogan <i>et al.</i> (2018)	0.036 (design based) 0.020 (model based)
SCANS IV block CS-D	Gilles <i>et al.</i> (2023)	0.2352
SCANS III density surface	Lacey <i>et al.</i> (2022)	Grid cell specific <0.05 in CWP array area
SCANS III block E	Hammond <i>et al.</i> (2017)	0.008
Welsh and Irish Sea distribution	Evans and Waggitt (2023)	Grid cell specific Max 0.01 in CWP array area

5 Common dolphin

5.1 Site-specific DAS

During the 2020-2022 aerial surveys, 82 common dolphins were recorded. The resulting density estimate was 0.2810 dolphins/km² (assuming a very highly precautionary availability of 0.203 that is not reliable, which will have significantly increased the density estimate compared to estimates without availability bias accounted for).

The additional DAS surveys covering a 4 km buffer around the array area and inshore survey area observed common dolphins in two of the six months from November 2024 to April 2025. The mean density was 0.05 (CI: 0.01 – 0.12) harbour porpoise/km², with the maximum density of 0.18 common dolphins/km² occurring in December 2024 (Table 5-1).

The additional DAS surveys covering a 10 km buffer around the array area also observed common dolphins in all months except May 2025. The mean density was 0.03 (CI: 0 – 0.08) common dolphins/km², with the maximum density of 0.10 (CI: 0 – 0.23) common dolphins/km² occurring in November 2025 (Table 5-1).

Table 5-1 Common dolphin density estimates (#/km², apportioned and not adjusted for availability bias)

Month	Survey area	Mean	Lower CI	Upper CI
2020-2022	4 km buffer (Oct 2018 – Apr 2022)	0.2810 (assumed availability 0.203)		
Nov 24	4 km buffer + inshore area	0	0	0
Dec 24	4 km buffer + inshore area	0.18	0	0.51
Jan 25	4 km buffer + inshore area	0	0	0
Feb 25	4 km buffer + inshore area	0.1	0.04	0.18
Mar 25	4 km buffer + inshore area	0	0	0
Apr 25	4 km buffer + inshore area	0	0	0
Average	4 km buffer + inshore area (Nov 2024 – Apr 2025)	0.05	0.01	0.12
May 25	10 km buffer	0	0	0
Jun 25	10 km buffer	0.01	0	0.02
Jul 25	10 km buffer	0.02	0	0.04
Aug 25	10 km buffer	0.03	0	0.06
Sep 25	10 km buffer	0.01	0	0.02
Oct 25	10 km buffer	0.07	0	0.17
Nov 25	10 km buffer	0.10	0	0.23
Average	10 km buffer (May 2025 – Nov 2025)	0.03	0	0.08

5.2 OBSERVE2

With 812 sightings comprising 5,725 individuals, common dolphins were the most frequently sighted cetacean species across the surveyed area in 2021 and 2022 (Giralt Paradell *et al.*, 2024). Common dolphins were observed in all strata, but were infrequently observed in stratum 5 within which CWP is located. Common dolphin occurrence showed interannual variability, with considerably more sightings in Summer 2021 than in 2022. Common dolphins were typically observed in groups, with a mean group size of 7.2 individuals in Summer and 6.7 in Winter. In stratum 5 specifically, mean group size during Summer was 1.0 and 4.0 for the Winter season (Giralt Paradell *et al.*, 2024).

Density and abundance estimates (both design-based and model-based). Design-based estimates for across all survey strata ranged from 594,293 common dolphins (95% CIs 487,570 – 724,375) in Summer 2021 to 289,893 (95% CIs 237,650- 353,621) in Summer 2022. The Winter estimate from the design-based 2022 approach was 256,142 individuals (95% CI's 205,917 – 318,618) (Giralt Paradell *et al.*, 2024). Predicted distribution maps for Summer show common dolphins widely distributed throughout Irish waters, primarily in continental shelf waters along the west coast and across the Celtic Basin (Figure 5-1 and Figure 5-2) (Giralt Paradell *et al.*, 2024). Predicted distribution maps for Winter highlighted that common dolphin are widespread across the study area in comparatively lower densities as compared to the Summer distribution (Giralt Paradell *et al.*, 2024).

Within survey stratum 5, in which proposed development is located, the corrected density estimate was only estimated for Summer 2022 only, and Winter. The corrected estimate was 0.020 animals/km² in Summer 2022, and 0.066 animals/km² in Winter (Table 5-2).

Table 5-2 Common dolphin groups, design-based and model-based density (#/km²) and abundance estimates for stratum 5 of the ObSERVE 1 and 2 surveys (Rogan et al., 2018 and Giralte Paradell et al., 2024).

Survey	Corrected design based estimates		Corrected model based estimates	
	Density	Abundance	Density	Abundance
Summer 2015	NA		NA	
Winter 2015-16	NA		NA	
Summer 2016	NA		NA	
Winter 2016-17	NA		NA	
Summer 2021	NA		NA	
Summer 2022	0.020	216	0.411	4,307
Winter 2022	0.066	725	0.762	8,363

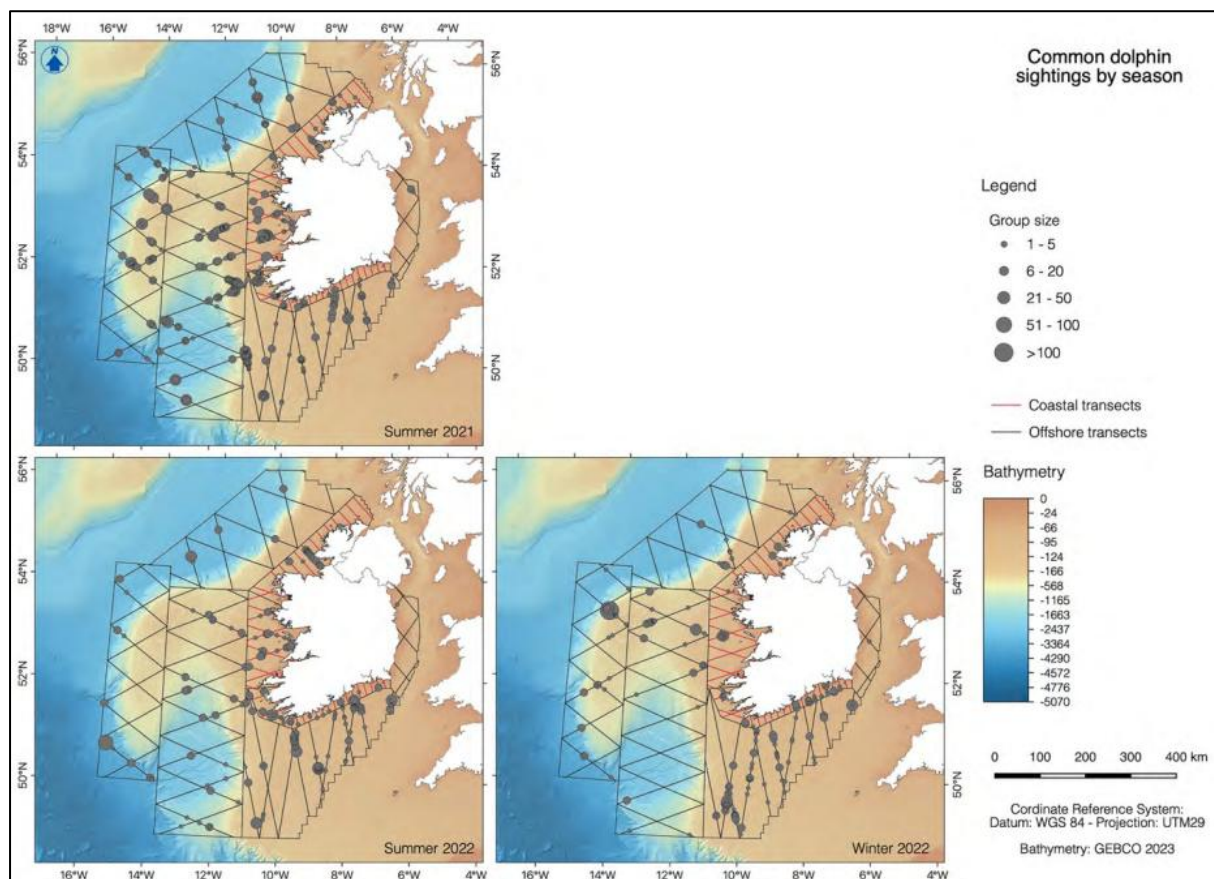


Figure 5-1 Sightings of common dolphin across all surveys (top) and in each survey period (bottom). Note that no surveys were carried out in winter 2021. Grey lines indicate the survey tracklines in the offshore strata and red lines indicate the tracklines in the coastal strata. Circles are proportional to the number of porpoises in each sighting. Figure from Giralte Paradell et al. (2024).

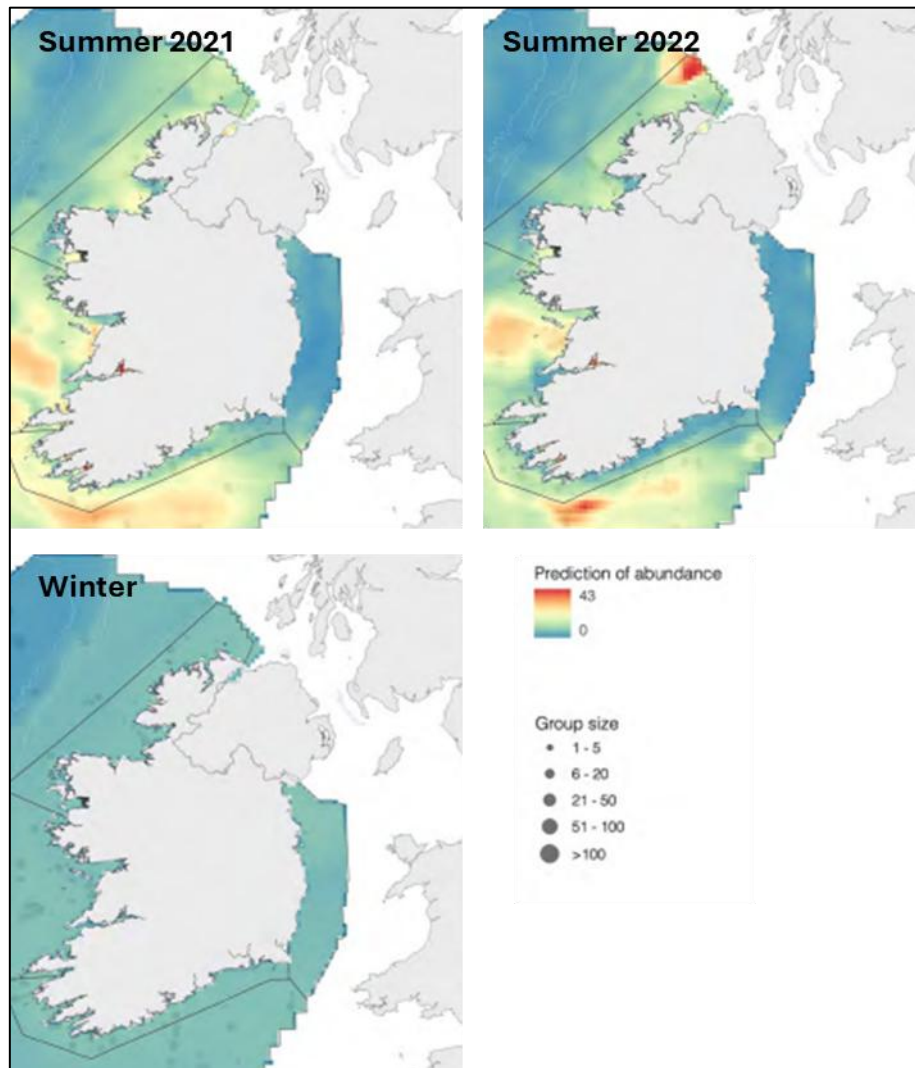


Figure 5-2 Predicted density distributions of common dolphin for Summer 2021 (top left), Summer 2022 (top right) and Winter (bottom left). Figures from Giralt Paradell *et al.* (2024).

5.3 SCANS IV density surface

Gilles *et al.* (2025) used the SCANS IV data and spatially referenced environmental features to predict density estimates for common dolphins. This shows that the predicted SCANS IV common dolphin distribution across the Irish Sea is not uniform. The highest densities are predicted in the western Irish Sea closest to shore. Particularly high densities are found in the south Irish Sea. When compared with the SCANS IV block-wide (CS-D) uniform density estimate (0.0272 dolphins/km²), the SCANS IV density surface estimates are more representative of real-world species habitat use. Using the SCANS IV density surface, the densities of common dolphin in the vicinity of the NISA array area and OECC are relatively low, with values between 0.00-0.10 common dolphin/km² (Figure 5-3). This represents a grid-cell specific density estimate potentially greater than the value of the uniform density estimate from Gilles *et al.* (2023). The maximum, minimum and average densities of common dolphin within the CWP array area and ECC are summarised in Table 5-3.

These findings are within anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation.

Table 5-3 The maximum, minimum and average densities of common dolphin within the CWP array area and ECC.

Location	Maximum Density (animals/km ²)	Minimum Density (animals/km ²)	Average Density (animals/km ²)
ECC	0.0564	0.0399	0.0470
Array Area	0.0623	0.0399	0.0500

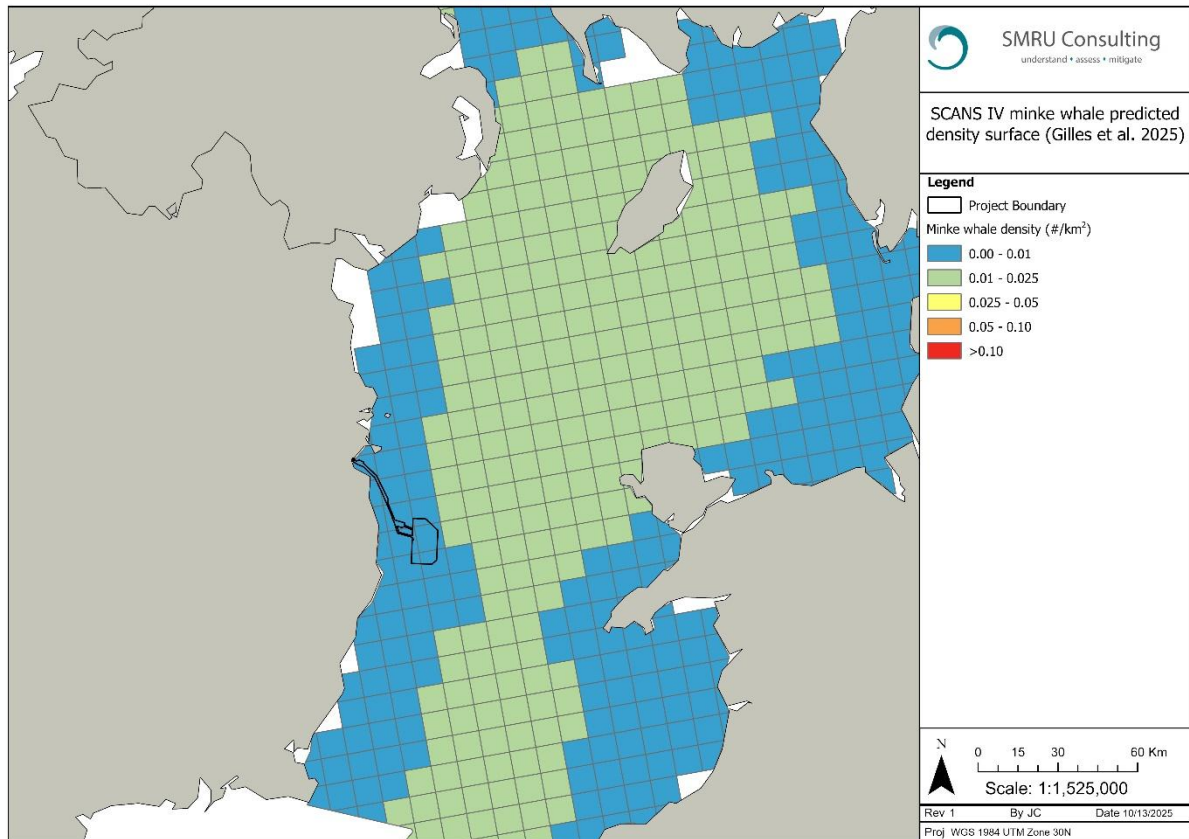


Figure 5-3 Predicted density surface for common dolphins. Data from Gilles *et al.* (2025).

5.4 Dublin Port Company 3FM Project baseline surveys

Common dolphins were not observed during the APR and MP2 Project surveys (Dublin Port Company, 2025).

5.5 Seasonality

Noting that a mistake was made in Figure 5-7 of Appendix 11.3 Baseline Technical Report of the original application, an updated record on common dolphin seasonality from original data sources is provided here in response to RFI Item 10q.

Various surveys confirm the presence of common dolphins in the vicinity of the CWP Project:

- 2013-2022 vessel surveys and DAS across the CWP array area + 4 km buffer showed highly variable numbers of encounters and group sizes, with the most individuals sighted in the winter months.

- ObSERVE2 surveys show higher densities in stratum 5 in winter months
- Irish Sea density surface shows consistent distribution patterns across seasons, with higher numbers in the summer.

5.6 Summary

The findings from the new data sources are within anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation. Table 5-4 provides a summary of the range of density estimates available for common dolphins.

Table 5-4 Common dolphin density estimates (dolphins/km²)

Data source	Reference	Density estimate
CWP Project site specific DAS 4 km buffer + inshore area (2024-2025)	CWP	Maximum: 0.18 Average: 0.05
CWP site specific DAS 10 km buffer (2025)	CWP	Average: 0.03
SCANS IV density surface	Gilles <i>et al.</i> (2025)	Grid cell specific 0.0399 – 0.0623 in CWP array area
ObSERVE2 stratum 5 summer 2022	Giralt Paradell <i>et al.</i> (2024)	0.020 (design based) 0.411 (model based)
ObSERVE2 stratum 5 winter 2022		0.066 (design based) 0.0762 (model based)
CWP Project site specific surveys	Natural Power (2023)	0.2810* <i>Noting this estimate was corrected for availability bias with a very highly precautionary value that is not reliable.</i>
ObSERVE summer stratum 5	Rogan <i>et al.</i> (2018)	No estimate provided
ObSERVE winter stratum 5	Rogan <i>et al.</i> (2018)	No estimate provided
SCANS IV block CS-D	Gilles <i>et al.</i> (2023)	0.0272
SCANS III density surface	Lacey <i>et al.</i> (2022)	Grid cell specific Max 0.07 in CWP array area
SCANS III block E	Hammond <i>et al.</i> (2017)	No estimate provided
Welsh and Irish Sea distribution	Evans and Waggitt (2023)	Grid cell specific Max 0.01 in CWP array area

6 Risso's dolphin

6.1 Site-specific DAS

No Risso's dolphins were recorded during any of the aerial CWP Project site-specific baseline surveys.

No Risso's dolphins have been sighted in the additional DAS between November 2024 and November 2025.

6.2 OBSERVE2

A total of 30 sightings comprising 91 individuals of Risso's dolphin were observed across the surveyed area in 2021 and 2022 (Giralt Paradell *et al.*, 2024). Risso's dolphins were primarily observed in Stratum 1, 2, 3 & 4. Risso's dolphins were sighted in both continental shelf waters and beyond the continental slope (Figure 6-1). Group size varied from one to 15 individuals, with larger group sizes recorded in Winter. Small groups of one to three individuals were more frequently sighted (Giralt Paradell *et al.*, 2024). Only one group of Risso's dolphin were sighted in stratum 5 (Summer 2022) throughout the survey period. This single group had a mean group size of four individuals (Giralt Paradell *et al.*, 2024).

Density and abundance estimates (design-based only) per season and per stratum indicate interannual variability between Summer 2021 and Summer 2022, with an abundance of 1,947 (95% CIs 1,369 – 2,769) in Summer 2021, and 3,315 (95% CIs 2,479 - 4,434) in Summer 2022. A Winter abundance estimate of 5,024 individuals (95% CIs 3,447 – 7,324) was estimated (Giralt Paradell *et al.*, 2024).

Within survey stratum 5, in which proposed development is located, the Risso's dolphin (corrected) density estimate was only estimated for Summer 2022 only. The corrected estimate was 0.027 animals/km² (Table 6-1).

Table 6-1 Risso's dolphin groups, design-based and model-based density (#/km²) and abundance estimates for stratum 5 of the OBSERVE 1 and 2 surveys (Rogan *et al.*, 2018 and Giralt Paradell *et al.*, 2024).

Survey	Corrected design based estimates		Corrected model based estimates	
	Density	Abundance	Density	Abundance
Summer 2015	0.003	35	NA	
Winter 2015-16	NA		NA	
Summer 2016	NA		NA	
Winter 2016-17	NA		NA	
Summer 2021	NA		NA	
Summer 2022	0.027	292	NA	
Winter 2022	NA		NA	

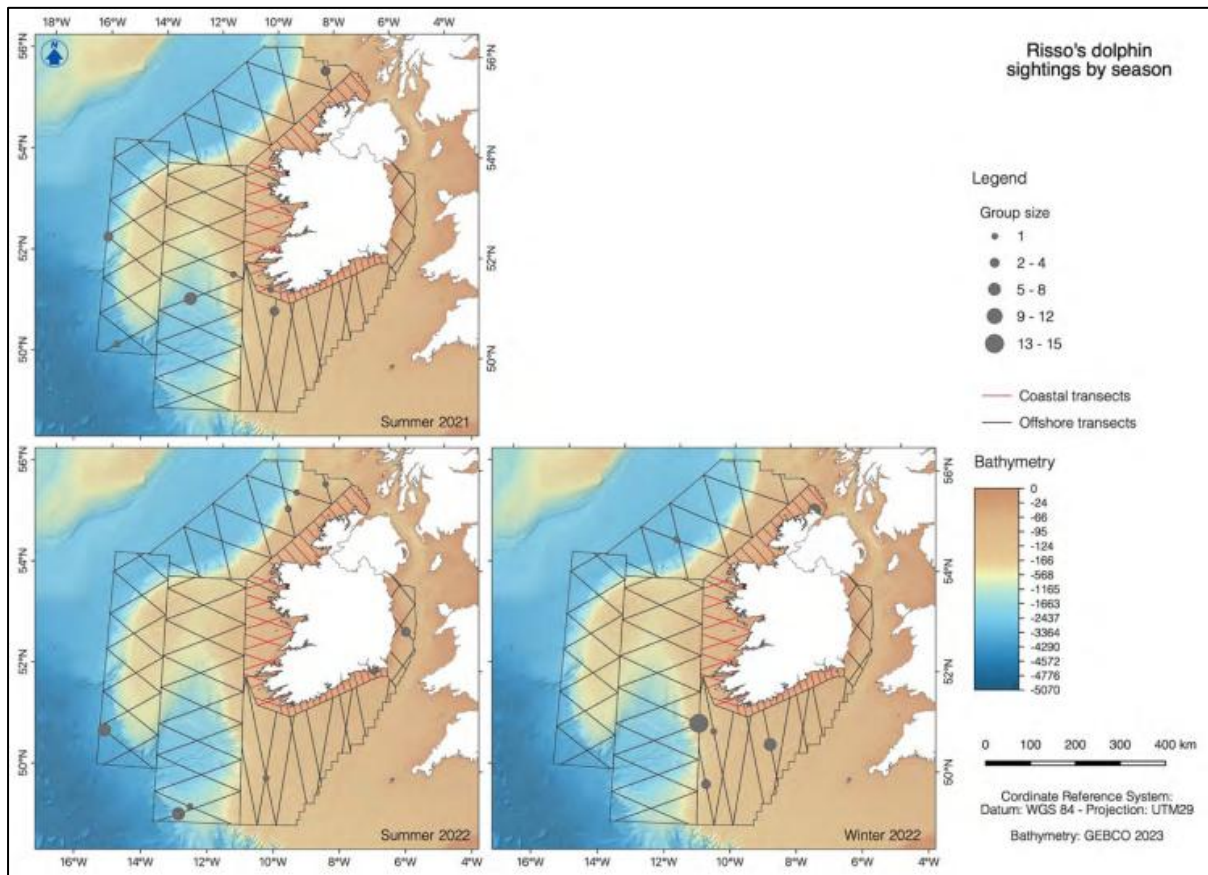


Figure 6-1 Sightings of Risso's dolphin across all surveys (top) and in each survey period (bottom). Note that no surveys were carried out in winter 2021. Grey lines indicate the survey tracklines in the offshore strata and red lines indicate the tracklines in the coastal strata. Circles are proportional to the number of porpoises in each sighting. Figure from Giralt Paradell *et al.* (2024).

6.3 SCANS IV density surface

Risso's dolphins were not included in the SCANS IV predicted density surface modelling in Gilles *et al.* (2025).

6.4 Seasonality

Various surveys confirm the presence of bottlenose dolphins in the vicinity of the CWP Project, though numbers are low and variable:

- There were not enough sightings in the site-specific surveys to comment on seasonality
- The Irish Sea density surface predicts higher densities in the summer months
- ObSERVE surveys show low densities with not enough sightings to comments on seasonality in stratum 5.

6.5 Summary

The findings from the new data sources are within anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation. Table 6-2 provides a summary of the range of density estimates available for Risso's dolphins.

Table 6-2 Risso’s dolphin density estimates (dolphins/km²)

Data source	Reference	Density estimate
CWP Project site specific DAS 4 km buffer + inshore area (2024-2025)	CWP	0
CWP site specific DAS 10 km buffer (2025)	CWP	0
SCANS IV density surface	Gilles <i>et al.</i> (2025)	NA
ObSERVE2 stratum 5 summer 2022	Giralt Paradell <i>et al.</i> (2024)	0.027 (design based)
CWP Project site specific surveys	Natural Power (2023)	0.0008
ObSERVE summer stratum 5	Rogan <i>et al.</i> (2018)	0.003
SCANS IV block CS-D	Gilles <i>et al.</i> (2023)	0.0022
Welsh and Irish Sea distribution	Evans and Waggitt (2023)	Grid cell specific Max 0.025 in the CWP array area

7 Minke whale

7.1 Site-specific DAS

No minke whales were sighted in the original site specific DAS.

During the additional DAS surveys between November 2024 – November 2025, one minke whale were observed in both July and August 2025. This resulted in densities of 0.01 (CI: 0 – 0.03) and 0.02 (CI: 0 – 0.06) whales/km² respectively and an average of 0.015 (CI: 0 – 0.045) whales/km².

7.2 ObSERVE2

A total of 39 minke whales in 39 sightings were sighted in all three seasons. This species was observed in all strata, except for stratum 6A (Giralt Paradell *et al.*, 2024).

Most of the sightings were in continental shelf waters <200m. Model-based abundance estimates were generated for Summer, no model-based estimates were generated for Winter due to low number of sightings. Interannual variation was shown between Summer 2021 and Summer 2022 from both the model and design-based estimates, with Summer 2021 twice the estimate from Summer 2022. Density and abundance estimates (design-based approach) estimates for the two seasons are as follows: Summer 2021 4,566 individuals (95% CIs 3,212 – 6,492) compared to Summer 2022 2,059 individuals (95% CIs 1,408 – 3,010). Design-based Winter abundance of minke whale was much lower than the Summer estimates for either year estimating an abundance of 535 (95% CI’s 319 – 900) (Giralt Paradell *et al.*, 2024).

Density distribution map highlights higher densities of minke whales along the south coast of Ireland, particularly in West Cork waters. There were insufficient sightings to generate model-based estimates or a predicted density distribution for Winter (Figure 7-1 and Figure 7-2) (Giralt Paradell *et al.*, 2024).

Within survey stratum 5, in which proposed development is located, the corrected density estimate was only estimated for all three survey periods (Table 7-1). The corrected estimates were as follows:

- 0.018 animals/km² in Summer 2021 and Summer 2022; and
- 0.004 animals/km² in Winter.

Table 7-1 Minke whale design-based and model-based density (#/km²) and abundance estimates for stratum 5 of the ObSERVE 1 and 2 surveys (Rogan et al., 2018 and Giralt Paradell et al., 2024).

Survey	Corrected design based estimates		Corrected model based estimates	
	Density	Abundance	Density	Abundance
Summer 2015	0.045	NA	NA	
Winter 2015-16	NA		NA	
Summer 2016	0.016	NA	NA	
Winter 2016-17	NA		NA	
Summer 2021	0.018	201	0.014	149
Summer 2022	0.018	197	0.009	93
Winter 2022	0.004	232	NA	

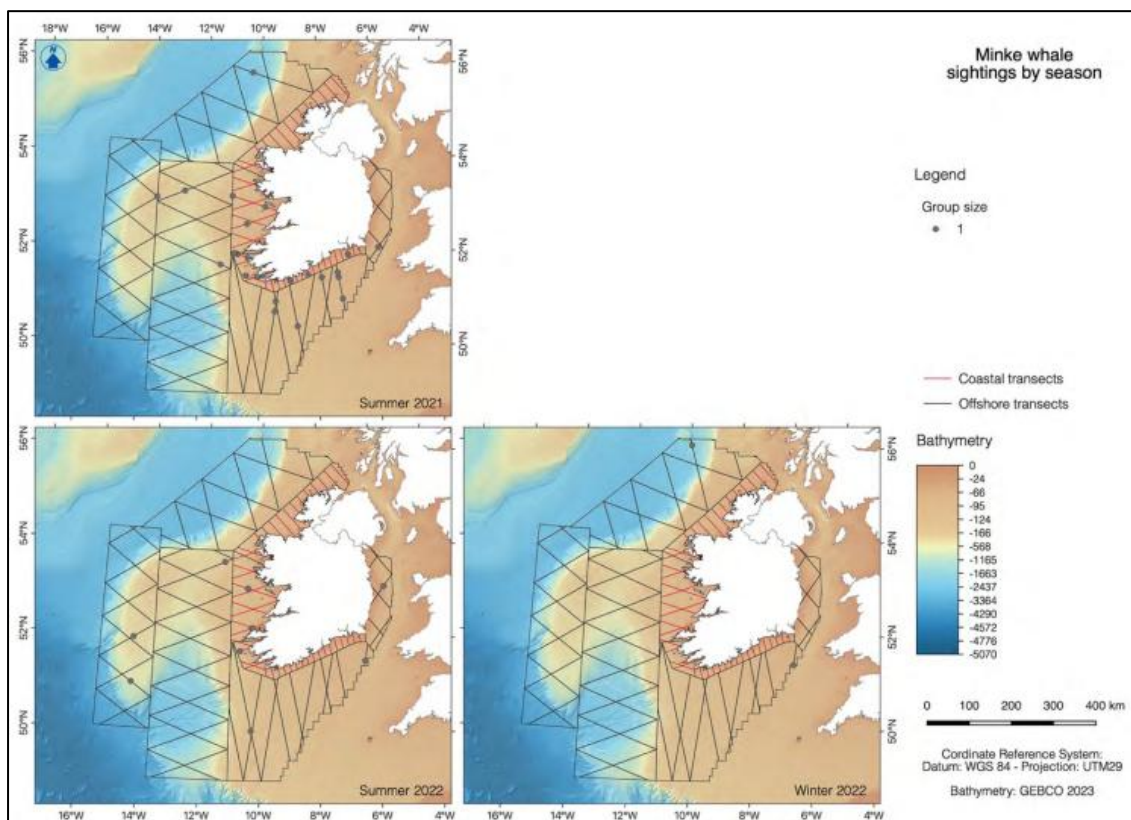


Figure 7-1 Sightings of minke whale across all surveys (top) and in each survey period (bottom). Note that no surveys were carried out in winter 2021. Grey lines indicate the survey tracklines in the offshore strata and red lines indicate the tracklines in the coastal strata. Circles are proportional to the number of porpoises in each sighting. Figure from Giralt Paradell et al. (2024).

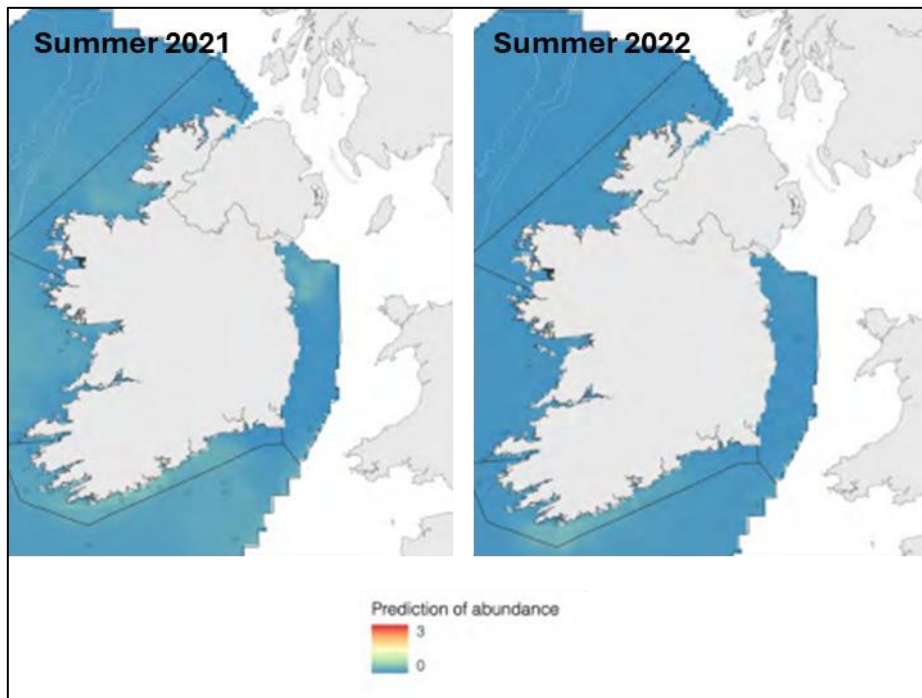


Figure 7-2 Predicted density distributions of minke whale for Summer 2021 (left) and Summer 2022 (right). There were insufficient sightings to generate model-based estimates or a predicted density distribution for Winter. Figures from Giralt Paradell *et al.* (2024).

7.3 SCANS IV density surface

Using the SCANS IV density surface, the densities of minke whale in the vicinity of the CWP array area and OECC are relatively low, with values between <0.01 minke whales/ km^2 (Figure 7-3). This represents a grid-cell specific density estimate smaller than the value of the uniform density estimate from Gilles *et al.* (2023). The maximum, minimum and average densities of minke whale within the CWP array area and ECC are summarised in Table 7-2.

Table 7-2 The maximum, minimum and average densities of minke whale within the CWP array area and ECC.

Location	Maximum Density (animals/ km^2)	Minimum Density (animals/ km^2)	Average Density (animals/ km^2)
ECC	0.0058	0.0042	0.0046
Array Area	0.0067	0.0047	0.0054

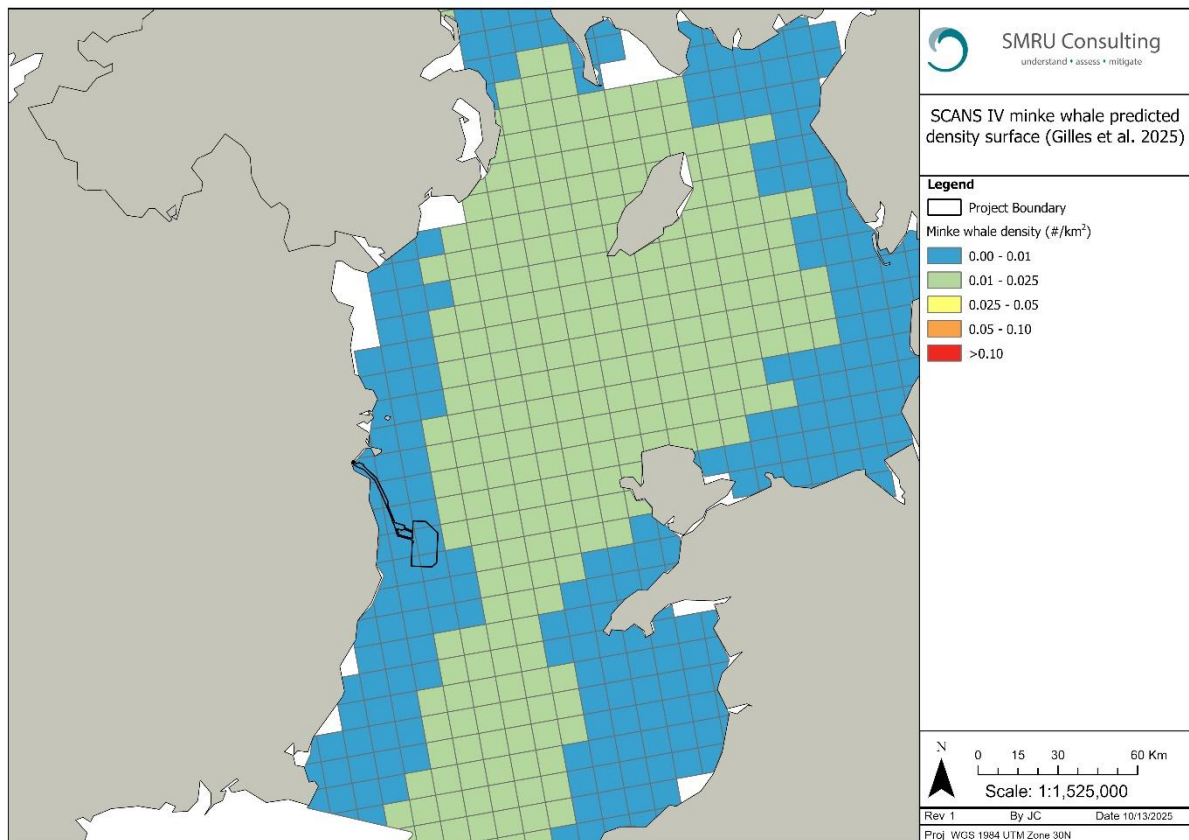


Figure 7-3 Predicted density surface for minke whale. Data from Gilles *et al.* (2025).

7.4 Dublin Port Company 3FM Project baseline surveys

Minke whales were not observed during the APR and MP2 Project surveys (Dublin Port Company, 2025).

7.5 Seasonality

Minke whales are known to exhibit a high degree of seasonal variation in their presence in the Irish Sea, with sightings occurring more frequently during the summer months (Rogan *et al.*, 2018). Minke whales are known to perform seasonal migrations between high latitude feeding grounds in the summer and low latitude area for breeding and calving in the winter months (Risch *et al.*, 2014) and their increased presence in the summer months supports this migration pattern.

This pattern of higher densities in the summer months is present in all data sources.

7.6 Summary

The findings from the new data sources are within anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation. Table 7-3 provides a summary of the range of density estimates available for minke whales.

Table 7-3 Minke whale density estimates (whales/km²)

Data source	Reference	Density estimate
CWP Project site specific DAS 4 km buffer + inshore area (2024-2025)	CWP	0
CWP site specific DAS 10 km buffer (2025)	CWP	Average: 0.015
SCANS IV density surface	Gilles <i>et al.</i> (2025)	Grid cell specific 0.0047 – 0.0067 in CWP array area
ObSERVE2 Summer 2021 Stratum 5	Giralt Paradell <i>et al.</i> (2024)	0.018 (design based) 0.014 (model based)
ObSERVE2 Summer 2022 Stratum 5		0.018 (design based) 0.009 (model based)
ObSERVE2 Winter 2022 Stratum 5		0.004 (design based)
CWP site specific vessel surveys (2013-2014 and 2018-2020)	Natural Power (2023)	0.0019
CWP site specific DAS (2020-2022)	Natural Power (2023)	0
ObSERVE summer stratum 5	Rogan <i>et al.</i> (2018)	Season 1: 0.045 Season 3: 0.016
SCANS IV block CS-D	Gilles <i>et al.</i> (2023)	0.0137
SCANS III density surface	Lacey <i>et al.</i> (2022)	Grid cell specific Max 0.02 in the CWP array area
SCANS III block E	Hammond <i>et al.</i> (2017)	0.017
Welsh and Irish Sea distribution	Evans and Waggitt (2023)	Grid cell specific Max 0.015 in the CWP array area

8 Harbour seal

8.1 Site-specific DAS

EIAR Volume 4 Appendix 11.3 Baseline Technical Report showed that seals were sighted during site specific surveys, but with low ID rates, meaning that density estimates were not derived.

The additional DAS surveys covering a 4 km buffer around the array area and inshore survey area observed harbour seals in December 2024 only where the density was 0.02 (CI: 0 – 0.04) seals/km². The mean density was 0.003 (CI: 0– 0.01) seals/km² (Table 8-1).

The additional DAS surveys covering a 10 km buffer around the array area did not identify any harbour seals from May to November 2025 (Table 8-1).

While harbour seals have been sighted in the additional DAS between November 2024 and November 2025, most seal sightings have been of unidentified species. The mean unidentified seal density in the 4 km buffer around the array area and inshore survey area was 0.032 (CI: 0.005 – 0.07) seals//km², and in the 10 km buffer was 0.02 (CI: 0.01 – 0.05) seals//km² (Table 8-1).

Table 8-1 Harbour seal density estimates (#/km², apportioned and not adjusted for availability bias)

Month	Survey	Harbour seal			Seal Species		
		Mean	Lower CI	Upper CI	Mean	Lower CI	Upper CI
Nov 24	4 km buffer + inshore area	0	0	0	0.02	0	0.05
Dec 24	4 km buffer + inshore area	0.02	0	0.04	0.02	0	0.06
Jan 25	4 km buffer + inshore area	0	0	0	0.06	0.02	0.09
Feb 25	4 km buffer + inshore area	0	0	0	0.04	0	0.09
Mar 25	4 km buffer + inshore area	0	0	0	0.01	0	0.03
Apr 25	4 km buffer + inshore area	0	0	0	0.04	0.01	0.08
Average	4 km buffer + inshore area (Nov 2024 – Apr 2025)	0.003	0	0.01	0.032	0.005	0.07
May 25	10 km buffer	0	0	0	0.04	0.01	0.07
Jun 25	10 km buffer	0	0	0	0.01	0	0.03
Jul 25	10 km buffer	0	0	0	0.01	0	0.03
Aug 25	10 km buffer	0	0	0	0.05	0.03	0.09
Sep 25	10 km buffer	0	0	0	0.01	0	0.03
Oct 25	10 km buffer	0	0	0	0.03	0.01	0.06
Nov 25	10 km buffer	0	0	0	0.01	0	0.03
Average	10 km buffer (May 2025 – Nov 2025)	0	0	0	0.02	0.01	0.05

8.2 Irish seal counts

Morris *et al.* (2025) reported on the number (Table 8-2) and distribution of hauled-out harbour seals in RoI (Figure 8-1). A total of 247 seals were counted in the East region and 69 in the Southeast region (Table 8-2). The most recent 2021 August counts for harbour seals in the Northern Ireland MU is 818 individuals (SCOS, 2022). It was noted that concerningly, counts of harbour seals in all areas surveyed in 2021, were all substantially lower than counts in recent years. It has also been reported that Northern Ireland harbour seal counts are continuing to decline slowly.

The total August counts for the East region (247), South-east region (69) and the Northern Ireland MU (818) can be scaled by the estimated proportion of animals hauled-out at the time of the survey (0.72, 95% CI 0.54 – 0.88) (Lonergan *et al.* 2013). The combined harbour seal count totals 1,134 harbour seals with a resulting population estimate of 1,575 harbour seals in the reference population (95% CI: 1,289 – 2,100). This represents an overall increase in harbour seals on the east coast of Ireland/Northern Ireland over the previous 2017/2018 survey results, however, they within

anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation.

Table 8-2 Harbour seal counts in the Republic of Ireland from 2003 – 2024

Region	Area	Harbour seal counts			
		2003	2011/12	2017/18	2024
East	1	89	61	61	178
East	2	34	29	70	69
East	3	0	0	0	0
South-east	1	17	49	33	66
South-east	2	0	0	0	0
South-east	3	1	4	1	3

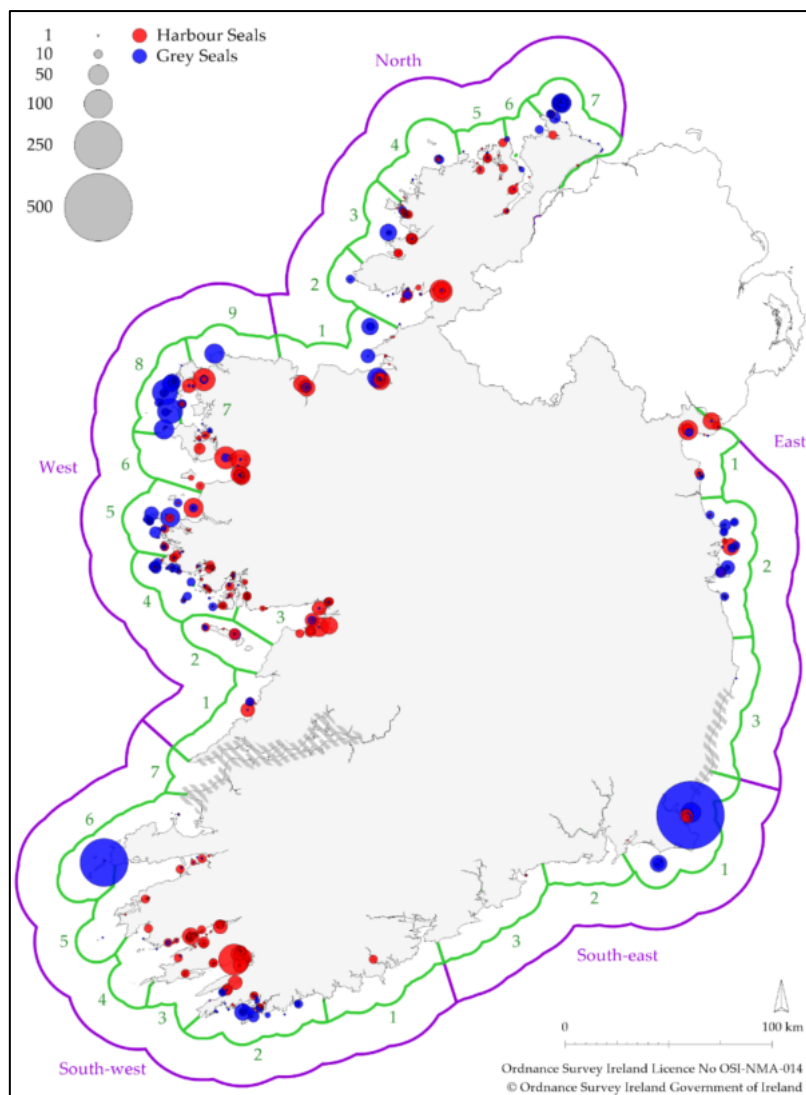


Figure 8-1 Numbers and distribution of harbour seals (red circles) and grey seals (blue circles) in Ireland in August 2024

8.3 Seal landfall surveys

No harbour seals were sighted during the seal landfall surveys between Jan 2025 – Jan 2026.

8.4 Dublin Bay seal surveys

Across the sites in the Dublin Bay survey area, harbour seals were present in smaller numbers than grey seals, with highest counts in July (117 across all sites) (Table 8-3, Figure 8-2). Within Dublin Bay (at Bull Island), harbour seal adult and juveniles were sighted but no pups. The local population in the Dublin Bay area surveyed was estimated to be >115 harbour seals. Berrow *et al.* (2024) found that the number of seals counted in 2023-2024 were consistent with those from 2017-18 (Morris and Duck, 2019). This means that the harbour seal population abundance estimate used in the 2024 EIAR remains valid.

It was also noted that despite the construction activity at Dublin Port, there appeared to be no impact on the numbers of grey seals in the area and no impact on the use of haul-out sites, and that at Bull island (closest to Dublin Port) there was a continuous increase in use by seals during a period of major infrastructure development.

Table 8-3 Maximum counts of harbour seal (all ages) at haul-out sites from Dalkey Island to Skerries for each month surveyed between July 2023 and January 2024

	Jul 2023	Oct 2023	Nov 2023	Jan 2024
Dalkey and the Muglins	0	0	0	-
Sandy Cove	3	0	0	-
Bull Island	19	18	17	-
Ireland's Eye	0	0	0	0
Lambay Island	37	0	0	2
Smugglers Cave	-	0	1	-
Rush Head	58	23	30	3
Skerries	0	0	0	0
Overall	117	41	48	5

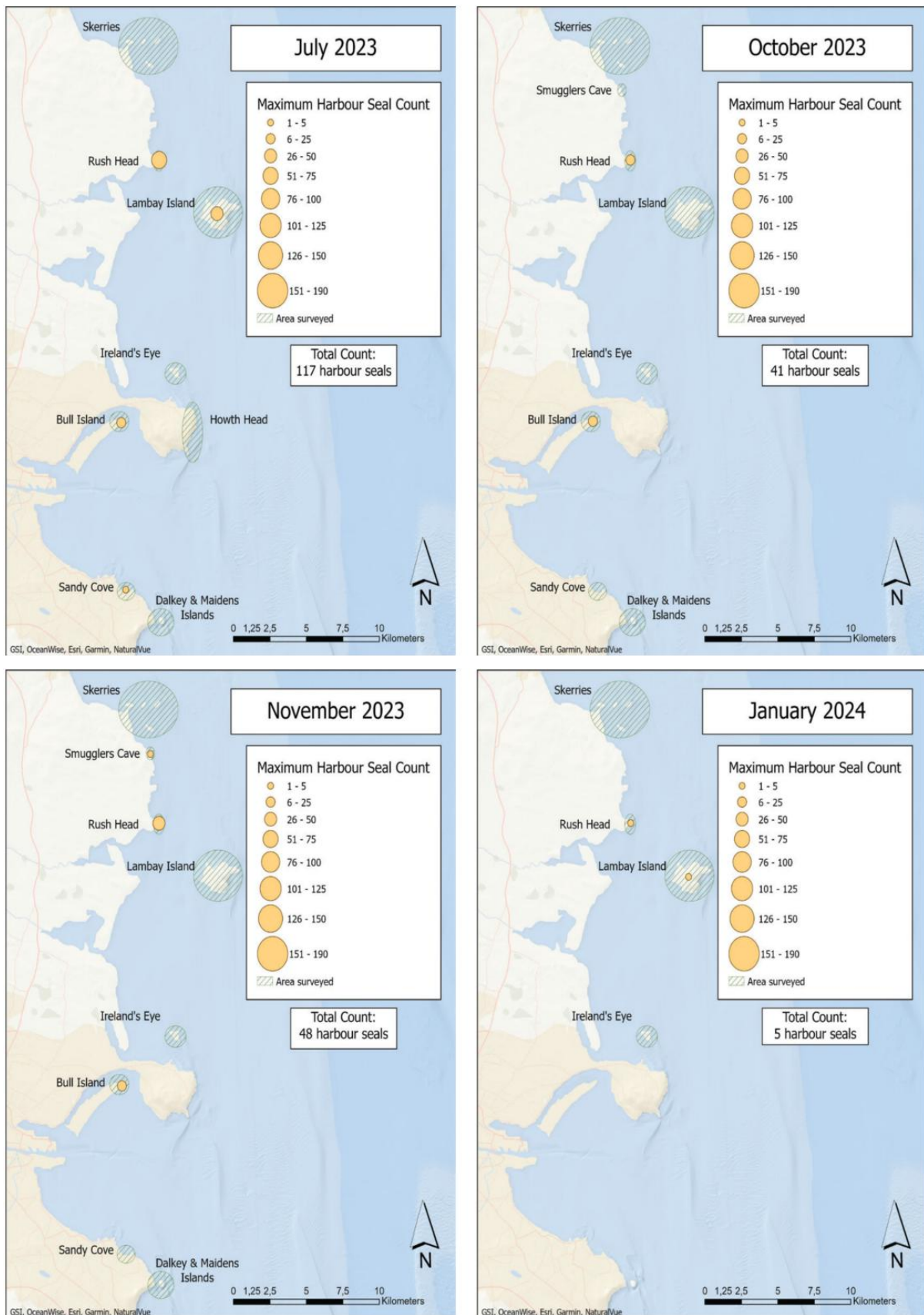


Figure 8-2 Counts of harbour seals at sites surveyed in July, October and November 2023, and in January 2024 (Dublin Port Company, 2025)

8.5 Dublin Port Company 3FM Project baseline surveys

8.5.1 APR and MP2 Projects

Surveys of Dublin Port and Dublin Bay during the capital dredge campaign from 2017 to 2022 observed harbour seals in three of the five campaigns (Table 8-4; Figure 8-3). Highest numbers were observed in 2022 (118) which accounted for 55% of all marine mammal sightings in that year. In addition, there were 62 sightings of unidentified seals during the surveys.

Table 8-4 Summary of harbour seal and unidentified seal sightings recorded during each capital dredge campaign

	2017-2018	2018-2019	2019-2020	2020-2021	2022
Harbour seal	12	0	0	76	118
Unidentified seal species	0	11	26	5	20

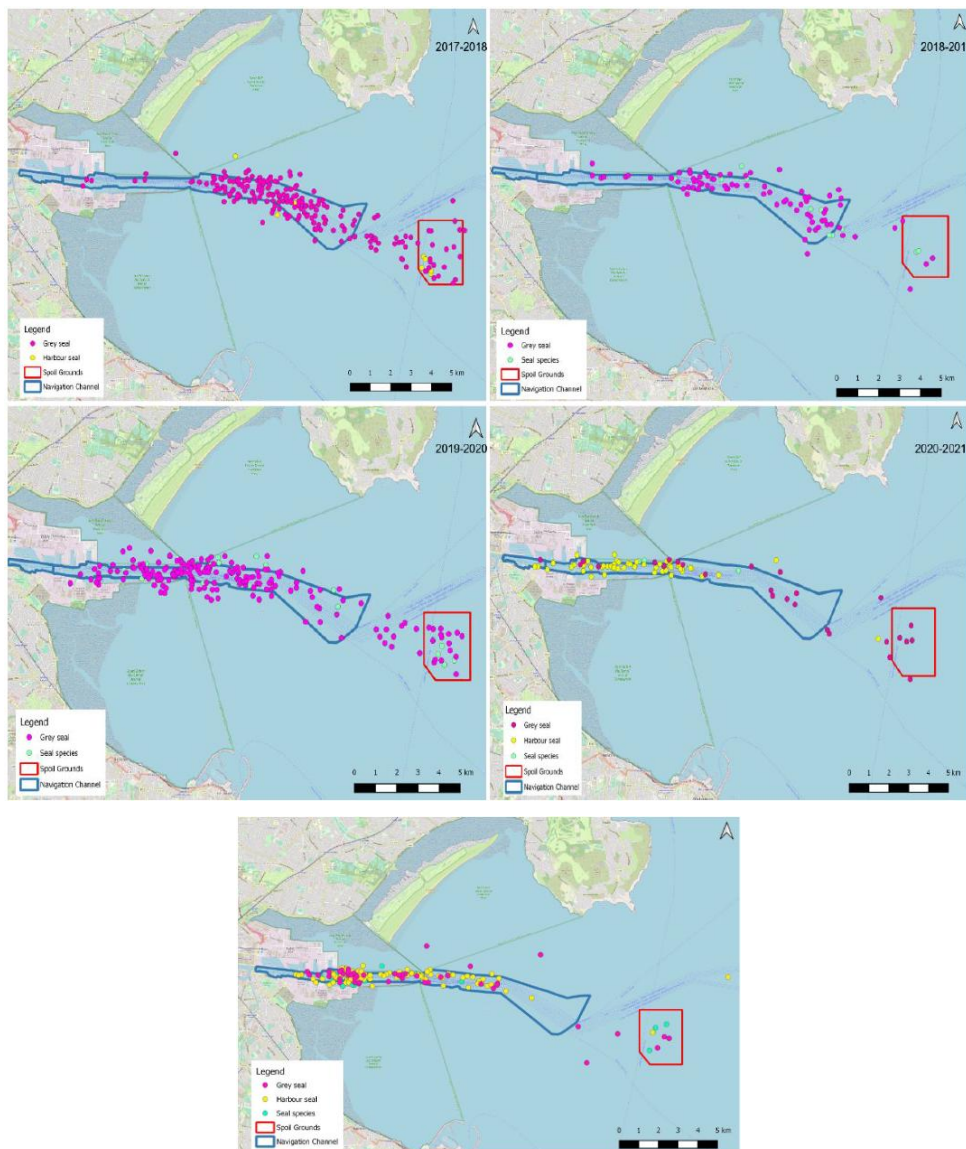


Figure 8-3 Seal sightings during the ABR Project (2017 to 2021) and MP2 Project (2022) capital dredging programmes (Dublin Port Company, 2025)

During the maintenance dredge campaign from 2017 to 2021, harbour seals were observed in all campaigns (Table 8-4). Numbers were low in all years, with the most harbour seals (12) observed in 2017. In addition, there were 12 sightings of unidentified seals during the surveys.

Table 8-5 Summary of harbour seal and unidentified seal sightings recorded during each maintenance dredge campaign

	2017	2018	2020	2021
Harbour seal	12	11	8	4
Unidentified seal species	3	0	9	0

8.5.2 Bull Island haul-out surveys

Seal haul-outs have been recorded at Bull Island every month from May 2016 to 2023 as part of the ABR and MP2 monitoring programmes (Figure 8-4). Harbour seals were present all year round and on 91% of survey days. A seasonal trend was observed with the greatest number of seals in winter, and numbers typically declining in summer, although the greatest number of seals was observed in June 2022 when 27 seals were recorded. Over the seven years of survey, the number of harbour seals at the site has remained consistent with no displacement observed as a result of periods of construction activity.

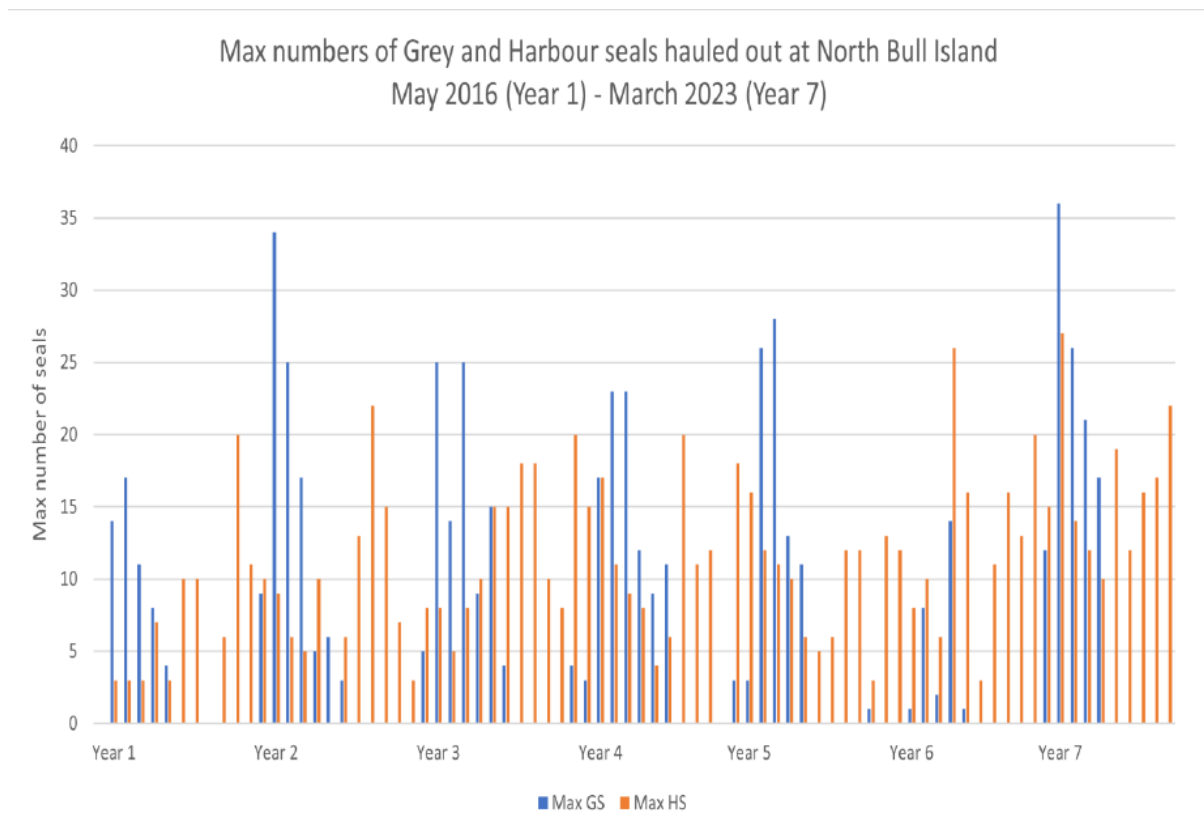


Figure 8-4 The maximum number of grey seals (GS) and harbour seals (HS) hauled out at North Bull Island (2016-2023). Year 1 starts off in May 2016, with each new year starting the following May (Dublin Port Company, 2025).

8.6 Summary

The seal haul out surveys by Berrow *et al.* (2024) in the Dublin Bay area have confirmed the presence of harbour seals, and are in alignment with the abundance estimates from Morris and Duck (2019). Thus, the abundance estimate used in the 2024 EIAR remains valid.

While seals have been sighted in the site-specific DAS, most were of unidentified seal species. Therefore the best at-sea density estimate for harbour seals is still the Carter *et al.* (2022) habitat preference map, as used in the 2024 EIAR.

9 Grey seal

9.1 Site-specific DAS

The additional DAS surveys covering a 4 km buffer around the array area and inshore survey area observed grey seals in December 2024 to February 2025. The mean density was 0.027 (CI: 0.01 – 0.08) seals/km² (Table 9-1).

The additional DAS surveys covering a 10 km buffer around the array area also observed harbour porpoise in June, July and September 2025. The mean density was 0.01 (CI: 0 – 0.02) seals/km², with the maximum density of 0.03 seals/km² occurring in July 2025 (Table 9-1).

While grey seals have been sighted in the additional DAS between November 2024 and November 2025, most seal sightings have been of unidentified species. The mean unidentified seal density in the 4 km buffer around the array area and inshore survey area was 0.032 (CI: 0.005 – 0.07) seals//km², and in the 10 km buffer was 0.02 (CI: 0.01 – 0.05) seals//km² (Table 9-1).

Table 9-1 Harbour seal density estimates (#/km², apportioned and not adjusted for availability bias)

Month	Survey	Grey seal			Seal Species		
		Mean	Lower CI	Upper CI	Mean	Lower CI	Upper CI
Nov 25	4 km buffer + inshore area	0	0	0	0.02	0	0.05
Dec 24	4 km buffer + inshore area	0.03	0	0.07	0.02	0	0.06
Jan 25	4 km buffer + inshore area	0.08	0.03	0.13	0.06	0.02	0.09
Feb 25	4 km buffer + inshore area	0.05	0.01	0.09	0.04	0	0.09
Mar 25	4 km buffer + inshore area	0	0	0	0.01	0	0.03
Apr 25	4 km buffer + inshore area	0	0	0	0.04	0.01	0.08
Average	4 km buffer + inshore area (Nov 2024 – Apr 2025)	0.027	0.01	0.048	0.032	0.005	0.07
May 25	10 km buffer	0	0	0	0.04	0.01	0.07
Jun 25	10 km buffer	0.02	0	0.05	0.01	0	0.03
Jul 25	10 km buffer	0.03	0.01	0.05	0.01	0	0.03
Aug 25	10 km buffer	0	0	0	0.05	0.03	0.09
Sep 25	10 km buffer	0.02	0	0.05	0.01	0	0.03
Oct 25	10 km buffer	0	0	0	0.03	0.01	0.06
Nov 25	10 km buffer	0	0	0	0.01	0	0.03
Average	10 km buffer (May 2025 – Nov 2025)	0.01	0	0.02	0.02	0.01	0.05

9.2 Irish seal counts

Morris *et al.* (2025) reported on the number (Table 9-2) and distribution of hauled-out grey seals in RoI (Figure 8-1). A total of 331 grey seals were counted in the East region and 671 in the Southeast region. The most recent 2021 August haul-out counts for grey seals in Northern Ireland is 549 individuals (SCOS, 2022).

The total August counts for the East region (331), South-east region (671) and the Northern Ireland MU (549) can be scaled by the estimated proportion of animals hauled-out at the time of the survey (25.15%, 95% CI 21.45% - 29.07%) (SCOS, 2021). The combined grey seal count totals 1,551 grey seals with a resulting population estimate of 6,167 grey seals in the reference population (95% CI: 5,335 – 7,231).

The findings from the new haul out surveys are within anticipated variation of the previous comparable dataset, and the results therefore validate and support the existing characterisation.

Table 9-2 Grey seal counts in the Republic of Ireland from 2003 – 2024

Region	Area	Grey seal counts			
		2003	2011/12	2017/18	2024
East	1	39	48	83	70
East	2	211	172	335	260
East	3	12	03	0	1
South-east	1	189	239	550	667
South-east	2	0	0	1	0
South-east	3	0	4	5	4

9.3 Seal landfall surveys

A total of 9 grey seals were sighted during six of the 25 seal landfall surveys between Jan 2025 – Jan 2026 (Table 9-3). This confirms the presence of grey seals in the area, though in low numbers.

Table 9-3 Grey seal sightings during the 25 seal landfall surveys between Jan 2025 – Jan 2026

Date	Notes
31/01/2025	No seals
20/02/2025	No seals
28/02/2025	No seals
14/03/2025	No seals
24/03/2025	No seals
09/04/2025	No seals
30/04/2025	1x grey seal Spotted in distance, on edge of survey area
16/05/2025	No seals
27/05/2025	No seals
11/06/2025	No seals
27/06/2025	No seals
11/07/2025	No seals
15/07/2025	No seals
18/08/2025	No seals

28/08/2025	1x Male foraging
17/09/2025	No seals
19/09/2025	No seals
26/09/2025	No seals
22/10/2025	No seals
27/10/2025	1x Male
06/11/2025	1x Male lounging, 1x Female lounging, 1x Male foraging
27/11/2025	1x Male foraging
08/12/2025	2x Males lounging
12/12/2025	No seals
14/01/2026	No seals

9.4 Dublin Bay seal surveys

Dublin Bay seal surveys Across the sites in the Dublin Bay survey area, grey seals were present in higher numbers than harbour seals, with highest counts in October (326 across all sites) (Table 9-4, Figure 9-1). Within Dublin Bay (at Bull Island), only adult grey seals were sighted. The local population in the Dublin Bay area surveyed was estimated to be >1,250 grey seals. Berrow *et al.* (2024) found that the number of seals counted in 2023-2024 were consistent with those from 2017-18 (Morris and Duck, 2019). This means that the harbour seal population abundance estimate used in the 2024 EIAR remains valid.

It was also noted that despite the construction activity at Dublin Port, there appeared to be no impact on the numbers of grey seals in the area and no impact on the use of haul-out sites, and that at Bull island (closest to Dublin Port) there was a continuous increase in use by seals during a period of major infrastructure development.

Table 9-4 Maximum counts of grey seal (all ages) at haul-out sites from Dalkey Island to Skerries for each month surveyed between July 2023 and January 2024

	Jul 2023	Oct 2023	Nov 2023	Jan 2024
Dalkey and the Muglins	49	36	79	-
Sandy Cove	4	0	0	-
Bull Island	25	4	1	-
Ireland's Eye	100	40	26	23
Lambay Island	75	190	26	93
Smugglers Cave	-	0	0	-
Rush Head	0	0	0	1
Skerries	47	56	35	85
Overall	300	326	167	202

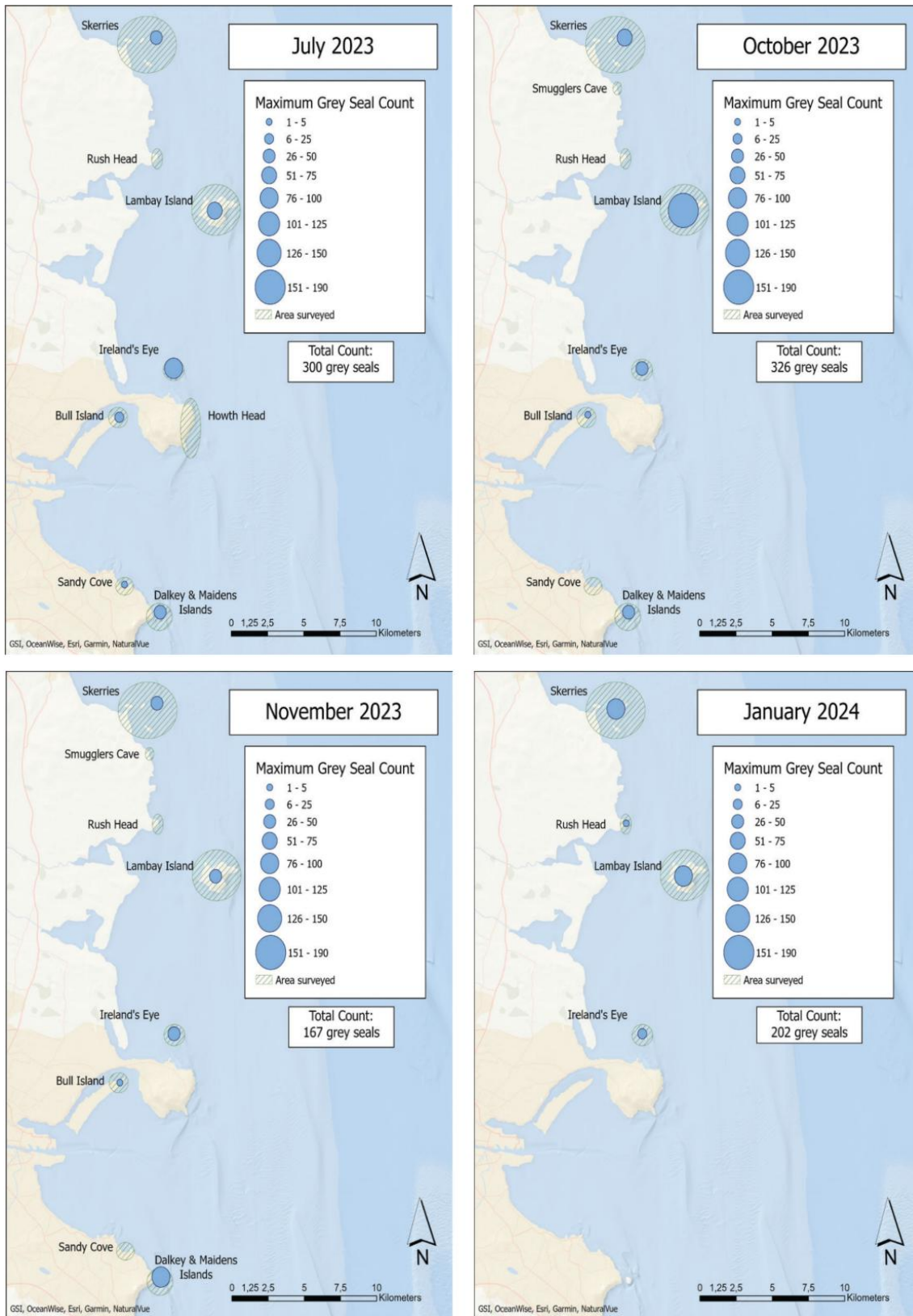


Figure 9-1 Counts of grey seals at sites surveyed in July, October and November 2023, and in January 2024

9.5 Dublin Port Company 3FM Project baseline surveys

9.5.1 APR and MP2 Projects

Surveys of Dublin Port and Dublin Bay during the capital dredge campaign from 2017 to 2022 observed grey seals during all campaigns (Table 9-5; Figure 8-3). They were the most frequently sighted marine mammal from 2017 to 2020. Highest numbers were observed in the 2017 to 2018 campaign (209) which accounted for 70% of all marine mammal sightings in that year. In addition, there were 62 sightings of unidentified seals during the surveys.

Table 9-5 Summary of grey seal and unidentified seal sightings recorded during each capital dredge campaign

	2017-2018	2018-2019	2019-2020	2020-2021	2022
Grey seal	209	80	202	29	49
Unidentified seal species	0	11	26	5	20

During the maintenance dredge campaign from 2017 to 2021, grey seals were observed in all campaigns except for 2021 (Table 9-6). Again, they were the most frequently sighted marine mammal from 2017 to 2020. The most grey seals (143) were observed in 2017, accounting for 76% of all marine mammal sightings in that year. In addition, there were 12 sightings of unidentified seals during the surveys.

Table 9-6 Summary of grey seal and unidentified seal sightings recorded during each maintenance dredge campaign

	2017	2018	2020	2021
Grey seal	143	65	16	0
Unidentified seal species	3	0	9	0

9.5.2 Bull Island haul-out Counts

Seal haul-outs have been recorded at Bull Island every month from May 2016 to 2023 as part of the ABR and MP2 monitoring programmes (see Figure 8-4). Harbour seals were present all year round and on 91% of survey days. A seasonal trend was observed with the greatest number of seals in winter, and numbers typically declining in summer, although the greatest number of seals was observed in June 2022 when 27 seals were recorded. Over the seven years of survey, the number of harbour seals at the site has remained consistent with no displacement observed as a result of periods of construction activity.

9.6 Summary

The seal haul out surveys by Berrow *et al.* (2024) in the Dublin Bay area have confirmed the presence of grey seals, and are in alignment with the abundance estimates from Morris and Duck (2019). Thus, the abundance estimate used in the 2024 EIAR remains valid.

While seals have been sighted in the site-specific DAS, most were of unidentified seal species. Therefore the best at-sea density estimate for grey seals is still the Carter *et al.* (2022) habitat preference map, as used in the 2024 EIAR.

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