



Annex IV Risk Assessment

Balbriggan Harbour Maintenance Dredging

Report No. M1104-AYE-R-ENV-02

30 October 2025

Revision 00

Fingal County Council

Document Control

Project

Balbriggan Harbour Maintenance Dredging

Client

Fingal County Council

Document

Annex IV Risk Assessment

Report Number:

M1104-AYE-R-ENV-02

Document Checking:

Date	Rev	Details of Issue	Prepared by	Checked by	Approved by
30 October 2025	00	Draft Issued to Client	John Tobin	Jackelyn Wren	Steve Gregan

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Contents

[1] Introduction.....	1
[1.1] Preamble.....	1
[1.2] Project Overview.....	1
[1.3] Project Location	2
[1.4] Purpose of Report.....	3
[1.5] Legislation.....	4
[1.6] Relevant Annex IV Species	5
[2] Outline of Scope of Works	7
[2.1] Description of Proposed Works	7
[2.2] Brief Description of Works	8
[3] Baseline Desktop Study	9
[3.1] Zone of Influence (Zol)	9
[3.2] Annex IV Marine Species within the Zol	9
[3.2.1] Overview of Cetacean Species.....	18
[3.2.2] Pinnipeds	19
[4] Source of Impacts.....	21
[4.1] Siltation and Turbidity	21
[4.2] Hydrocarbon or Other Contaminants.....	21
[4.3] Noise and Vibration	22
[5] Impact Assessment	25
[5.1] Siltation and Turbidity	25
[5.2] Hydrocarbon or Contaminant Spills.....	25
[5.3] Noise and Vibration	26
[5.4] Summary of Potential Impacts.....	27
[5.4.1] Cetaceans.....	27
[5.4.2] Pinnipeds	27
[5.4.3] Otter (<i>Lutra lutra</i>)	28
[6] Conclusions	30

[7] References 31

[1] Introduction

[1.1] Preamble

Ayesa have been appointed by Fingal County Council (FCC) to assist in the preparation of environmental documentation in support of a Foreshore Licence Application for the Balbriggan Harbour Maintenance Dredging Project, County Dublin.

This Annex IV Species Risk Assessment Report has been prepared in accordance with the requirements of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) and the EU Habitats Directive (92/43/EEC). The report assesses the potential for impacts on European Protected Species (EPS), specifically those listed under Annex IV of the Directive, and forms part of the suite of environmental submissions accompanying the application.

The assessment builds upon baseline ecological information presented in the Natura Impact Statement (NIS) (Report No. M1104-AYE-R-ENV-01).

[1.2] Project Overview

The Balbriggan Harbour Maintenance Dredging Project involves the removal of accumulated sediments from within the inner and outer harbour basins to maintain navigable depths for vessels operating from the harbour. The works are required to ensure the safe operation of fishing, leisure, and emergency access vessels, and to maintain the ongoing functionality of this active coastal facility.

Over time, sediment deposition within Balbriggan Harbour has resulted in the progressive infilling of berthing and manoeuvring areas. The proposed works will remove these deposits using a backhoe dredger supported by a plough vessel, operating entirely within the existing dredge footprint.

The dredged material will be collected and transported to an appropriately licensed onshore facility for treatment or disposal in accordance with EPA waste management requirements. No disposal at sea is proposed.

The dredging works are expected to extend over an approximate duration of 12 weeks, with operations potentially continuing on a 24-hour basis to accommodate tidal cycles and minimise disruption to harbour users.

The primary components of the project include:

- Mobilisation of dredging plant and support vessels within Balbriggan Harbour;
- Excavation and removal of accumulated sediments using a backhoe dredger;
- Local levelling and redistribution of material using a plough vessel (if required);
- Handling, temporary storage, and transport of dredged material to an onshore licensed facility; and
- Implementation of environmental controls and mitigation measures in accordance with the Environmental Management Plan (EMP).

All works will be undertaken under the supervision of Fingal County Council and in consultation with relevant statutory bodies, ensuring compliance with national and EU environmental legislation.

[1.3] Project Location

Balbriggan Harbour is located on the north Dublin coast, within the administrative area of Fingal County Council, approximately 30 km north of Dublin City and 20 km south of Drogheda (see Figure 1-1, below). The harbour lies immediately east of Balbriggan town centre and is bounded by the M1 Dublin–Belfast Motorway to the west and the Irish Sea to the east.

The harbour comprises an inner basin, outer basin, and entrance channel, enclosed by the North and South Piers, which provide shelter from prevailing easterly swells. The surrounding coastline consists of mixed rocky and sandy substrates with intermittent areas of intertidal flats and cobble beaches.

Balbriggan Harbour functions as a multi-use facility, accommodating local fishing vessels, leisure craft, and the Royal National Lifeboat Institution (RNLI) station. It is situated within a heavily modified, operational marine environment that experiences regular vessel movements and tidal exchange with the Irish Sea.

The approximate central coordinates of the dredging area are:

- Latitude: 53° 36' 38" N
- Longitude: –6° 11' 30" W

The project footprint is confined to the existing dredged harbour area, extending across approximately 2.8 ha (combined inner and outer basins). All activities will be undertaken within the existing harbour infrastructure, with no encroachment beyond the established navigation limits.

The surrounding area includes Balbriggan Beach immediately north of the harbour, with the River Bracken (Matt) discharging adjacent to the South Pier. The coastal waters form part of the Irish Sea transitional zone, characterised by moderate tidal currents and relatively high flushing rates, which contribute to rapid dispersion of suspended sediments generated during dredging operations.

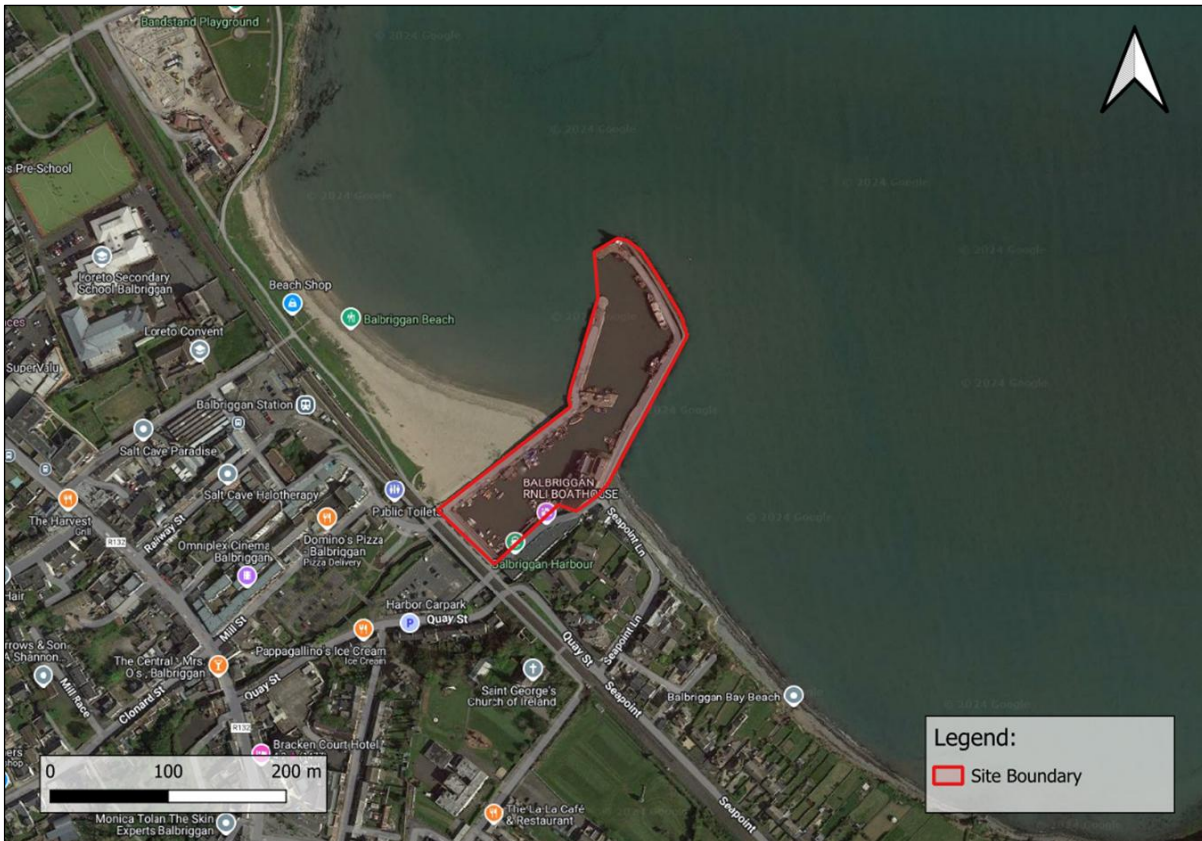


Figure 1.1: Location of the proposed maintenance dredging works at Balbriggan Harbour, Co. Dublin.

[1.4] Purpose of Report

ByrneLooby, an Ayesa company, has been commissioned by FCC to prepare this Annex IV Species Risk Assessment Report in support of the Foreshore Licence Application for the Balbriggan Harbour Maintenance Dredging Project, County Dublin.

The purpose of this report is to assess the potential for the proposed dredging works to result in disturbance, injury, or mortality to species listed under Annex IV of the EU Habitats Directive (92/43/EEC), including otter (*Lutra lutra*), harbour porpoise (*Phocoena phocoena*), grey seal (*Halichoerus grypus*), and harbour seal (*Phoca vitulina*).

This assessment supplements the findings of the accompanying NIS (Ayesa, 2025), which has been prepared to inform the Appropriate Assessment process under Article 6(3) of the Habitats Directive. The present Annex IV assessment is specifically concerned with compliance under Article 12, which requires Member States to establish a system of strict protection for European Protected Species (EPS) throughout their natural range, both within and outside designated Natura 2000 sites.

The report has therefore been prepared to:

- Identify Annex IV species that may occur within or near the proposed works area;
- Evaluate the potential for the proposed activity to cause disturbance, injury, or destruction of breeding or resting sites;

- Outline appropriate mitigation and management measures to ensure compliance with the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended); and
- Support the Foreshore Licence Application and assist the competent authority in determining that the proposed works can proceed without risk of contravening Article 12 of the Directive.

[1.5] Legislation

Under Articles 12 and 13 of the Habitats Directive (92/43/EEC), Member States are required to establish systems of strict protection for animal and plant species listed under Annex IV, which are considered to be of community interest and in need of protection throughout their natural range.

Article 12 requires that Member States take appropriate measures to prohibit the deliberate capture, killing, disturbance, or destruction of breeding or resting sites of Annex IV species. Article 16 of the Directive provides for derogations from these prohibitions only under specific, strictly controlled circumstances.

These provisions are transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended. Regulations 51, 52, and 54 make it an offence to deliberately capture, injure, or disturb protected species, or to damage or destroy their breeding or resting places.

Annex IV species are afforded protection throughout their entire range, both inside and outside Natura 2000 sites. It is therefore an offence to deliberately kill, injure, or disturb a specimen in the wild, or to damage or destroy a breeding site or resting place of such an animal.

In addition to the Habitats Directive and associated Irish legislation, Annex IV species - including cetaceans, otters, and seals - are also protected under several international conventions and national legal instruments. These provide a complementary framework ensuring the conservation and management of marine mammals in Irish waters.

Table 1-1 below summarises the key legislative and policy instruments relevant to the protection of Annex IV species in the study area.

Table 1-1: Summary of national and international legislation and guidance relevant to Annex IV species in the study area

Legislation / Convention	Annex IV Species Receptor(s)
Habitats Directive (European Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora)	All cetaceans, grey and harbour seals, marine turtles, otter
European Communities (Birds and Natural Habitats) Regulations 2011 (as amended)	All cetaceans, grey and harbour seals, marine turtles, otter
Marine Strategy Framework Directive (2008/56/EC)	All cetaceans, grey and harbour seals, marine turtles
Wildlife Acts (1976–2018)	All cetaceans, grey and harbour seals, otter

OSPAR Convention (1998) – Convention for the Protection of the Marine Environment of the North-East Atlantic	Bowhead whale, northern right whale, blue whale, harbour porpoise
Convention on the Conservation of Migratory Species of Wild Animals (CMS / Bonn Convention, 1979)	All cetaceans, marine turtles
Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention, 1979)	All cetaceans, grey and harbour seals, marine turtles, otter
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973)	All cetaceans, marine turtles
DAHG (2014) Guidance to Manage the Risk to Marine Mammals from Man-Made Sound Sources in Irish Waters	Marine mammals (all cetaceans and seals)
NPWS (2007) Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters	Marine mammals (all cetaceans and seals)

[1.6] Relevant Annex IV Species

A number of Annex IV species listed under the EU Habitats Directive (92/43/EEC) are known to occur within Irish coastal and marine waters, including cetaceans (whales, dolphins, and porpoises), pinnipeds (seals), marine turtles, and otter (*Lutra lutra*). These species are afforded strict protection throughout their range, both within and outside designated Natura 2000 sites.

Irish coastal waters, including the western Irish Sea, are known to support a diverse assemblage of cetacean species, with at least 25 species recorded in national waters (Berrow et al., 2010; IWDG, 2025). Of these, harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*), and common dolphin (*Delphinus delphis*) are the most frequently observed and are considered resident or regularly occurring along the east coast. Other species such as minke whale (*Balaenoptera acutorostrata*), Risso's dolphin (*Grampus griseus*), and white-beaked dolphin (*Lagenorhynchus albirostris*) are occasionally recorded further offshore.

The grey seal (*Halichoerus grypus*) and harbour seal (*Phoca vitulina*) are the two pinniped species regularly present in the Irish Sea. Breeding and haul-out sites are known to occur on Lambay Island, Rockabill, and Skerries Islands, located approximately 10–20 km south of Balbriggan. Seals are known to forage widely along the coast and may occasionally occur within or near Balbriggan Harbour.

The otter (*Lutra lutra*) is a semi-aquatic mammal commonly associated with riverine, estuarine, and coastal habitats. It is widespread in Ireland, with records of occurrence along the Fingal coastline. Otters may use the harbour area intermittently for foraging, particularly near the outfall of the River Bracken (Matt) at the southern boundary of the harbour. No holts or resting sites are known within the works area, which is heavily modified and subject to regular disturbance.

Marine turtles such as leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*) are considered vagrant or infrequent visitors to the Irish Sea and are not expected to occur within the inshore waters of Balbriggan Harbour.

Based on a review of existing records from the National Biodiversity Data Centre (NBDC), Irish Whale and Dolphin Group (IWDG), and NPWS online mapping, the following Annex IV species groups are considered relevant to this assessment:

- Otter (*Lutra lutra*)
- Cetaceans (primarily harbour porpoise, *Phocoena phocoena*)
- Pinnipeds (grey seal, *Halichoerus grypus*, and harbour seal, *Phoca vitulina*)

The species have been brought forward to the Risk Assessment (Section 5).

[2] Outline of Scope of Works

[2.1] Description of Proposed Works

The proposed Balbriggan Harbour Maintenance Dredging Project will involve the removal of accumulated sediments from within the inner and outer harbour basins and entrance channel to maintain safe navigational depths for vessels operating from the harbour.

Over time, the harbour has experienced siltation and sediment build-up due to natural deposition processes and tidal action. The dredging works are required to restore the design depth and ensure the continued safe operation of fishing vessels, leisure craft, and RNLI lifeboat services based at the harbour.

The works will be undertaken using a long-reach excavator, supported by a hopper barge, tugboat and pontoon barge. All material will be brought to shore and transferred to a licensed waste facility for disposal or treatment in compliance with Environment Protection Agency (EPA) and local authority requirements. No offshore disposal is proposed.

Indicative dredging volumes are estimated at approximately 8,000–10,000 m³ of material, comprising predominantly fine to coarse sands, gravels, and silts. The dredging depth will generally extend to –2.5 m Chart Datum, consistent with historical maintenance records.

The key activities associated with the project are anticipated to include:

- Mobilisation of plant and equipment to Balbriggan Harbour;
- Establishment of safety exclusion zones and placement of temporary silt control measures;
- Mechanical dredging of accumulated sediments using a backhoe dredger;
- Local bed-levelling using a plough vessel to ensure navigational uniformity;
- Transfer of dredged material to shore-based containment for dewatering and drying, and onward transport to a licensed facility; and
- Demobilisation and reinstatement of the working area on completion of the dredging operations.

To optimise efficiency and minimise water content in the dredged material, dredging will be undertaken during lower tides when the harbour basin has naturally dried out. It should be noted that all areas to be dredged will naturally dry out during lower tides. The dredged material is expected to remain in the barge for drying, with periodic mechanical disturbance by the excavator to aid the drying process, supplemented by air drying as required.

The dredging campaign is expected to last approximately 12 weeks, subject to tidal conditions and weather. Works will be carried out during daylight hours where practicable, though tidally influenced scheduling may occasionally necessitate limited night operations.

All works will be supervised by Fingal County Council and implemented in accordance with the Outline Construction Method Statement (Ayesa, 2025) and the Construction Environmental Management Plan (CEMP) to ensure compliance with all relevant environmental and safety legislation.

[2.2] Brief Description of Works

The Balbriggan Harbour Maintenance Dredging Project involves the removal of accumulated sediments from within the inner and outer harbour basins and entrance channel, with the objective of maintaining navigable depths for safe vessel access and operation. The works will be carried out entirely within the existing dredge footprint and will not extend beyond the established harbour boundaries.

The dredging campaign will utilise mechanical dredging methods, primarily a backhoe dredger, operating from a floating pontoon or barge, supported by a plough vessel and transport barge as required. The dredged material will be brought ashore and transferred to a licensed waste facility for appropriate disposal or treatment, in full compliance with EPA waste management requirements. No offshore disposal is proposed as part of this project.

The following are the main components of the proposed works:

- Mobilisation of dredging plant and support vessels to Balbriggan Harbour;
- Establishment of temporary exclusion zones, environmental protection measures, and silt containment systems;
- Mechanical dredging of accumulated sediment using a backhoe dredger;
- Local bed levelling using a plough vessel where necessary;
- Temporary storage and dewatering of dredged material within the harbour confines;
- Transport of dewatered material to a licensed onshore disposal or treatment facility; and
- Demobilisation of dredging equipment and reinstatement of the working area upon completion.

The dredging works are expected to generate approximately 8,000–10,000 m³ of sediment composed primarily of sands, gravels, and silts. The campaign is expected to extend over approximately 12 weeks, subject to tidal windows and weather conditions.

Details relating to the working methodology, environmental controls, and sequencing of operations are outlined in the accompanying Outline Construction Method Statement (Ayesa, 2025), which should be read in conjunction with this report.

[3] Baseline Desktop Study

[3.1] Zone of Influence (Zol)

The “zone of influence” (Zol) is defined as the area within which ecological receptors may be affected by biophysical or behavioural changes as a result of the proposed project and associated activities. This may extend beyond the immediate project site where ecological, hydrological, or acoustic links exist (CIEEM, 2019).

Given the coastal location of the proposed dredging works, the potential mobility of marine mammals, and the localised nature of underwater noise and sediment dispersion, a precautionary Zol of 10 km has been applied for this assessment.

This approach is consistent with the guidance provided in the *Office of the Planning Regulator – Appropriate Assessment Screening for Development Management (2021)* and ensures that all relevant Annex IV marine species potentially utilising the nearshore waters around Balbriggan are considered.

The Zol therefore encompasses Balbriggan Harbour, adjacent coastal waters to the north and south, and the nearshore zone extending approximately 10 km offshore.

[3.2] Annex IV Marine Species within the Zol

Species protected under Annex IV of the Habitats Directive (92/43/EEC) that may occur within the 10 km Zone of Influence of Balbriggan Harbour include cetaceans, pinnipeds, and otter.

No records of marine turtle species were identified within the Zol. Data sources reviewed include the National Biodiversity Data Centre (NBDC, 2025), Irish Whale and Dolphin Group (IWDG, 2025), and NPWS online mapping.

IWDG records for Balbriggan Harbour over the last 12 months include three confirmed sightings of Harbour Porpoise (*Phocoena phocoena*) and Dolphin species, possibly Harbour Porpoise, recorded between January and September 2025.

Within the western Irish Sea, the most frequently recorded cetacean species include:

- Harbour porpoise (*Phocoena phocoena*) – recorded year-round, regularly observed along the Fingal coastline;
- Bottlenose dolphin (*Tursiops truncatus*) – occasional visitor to nearshore waters;
- Common dolphin (*Delphinus delphis*) – typically offshore but may enter coastal waters opportunistically; and
- Minke whale (*Balaenoptera acutorostrata*) – infrequent and transient in nearshore areas during summer months.

Other cetaceans such as Risso’s dolphin (*Grampus griseus*), white-beaked dolphin (*Lagenorhynchus albirostris*), and fin whale (*Balaenoptera physalus*) have been recorded further offshore in the Irish Sea but are not expected within the Balbriggan nearshore zone due to shallow depth and high vessel activity.

Pinniped species known from the wider area include:

- Grey seal (*Halichoerus grypus*), and
- Harbour seal (common) seal (*Phoca vitulina*), both of which forage widely and may occasionally occur near the harbour entrance. Established haul-out and breeding sites are located on Lambay Island, Rockabill, and Skerries Islands, situated 10–20 km south of the site.

The otter (*Lutra lutra*), also listed under Annex IV, is recorded along the Fingal coastline and may utilise the River Bracken (Matt) and adjacent intertidal habitats for foraging. However, the harbour itself is highly modified and subject to frequent disturbance, reducing the likelihood of otter resting or breeding activity within the works area.

A review of records from the National Biodiversity Data Centre (NBDC, 2025) confirms recent (2018–2025) observations of Annex IV marine species within the 10 km Zone of Influence around Balbriggan Harbour. Confirmed records include harbour porpoise, bottlenose dolphin, common dolphin, minke whale, humpback whale, and striped dolphin. In addition, grey seal, harbour seal, and Eurasian otter have been recorded. No records of marine turtle species were identified within the Zol.

A summary of relevant Annex IV species recorded within the Zol is presented in Table 3-1, and illustrated in Figures 3.1 to 3.6.

Species record data were compiled for grid O16 (project location) and adjacent coastal grid squares O26, O27, O16 and O17 to represent the full 10 km Zone of Influence relevant to marine mammal mobility.

Table 3.1: Annex IV Species Recorded within Grid Square O16

Species	Group	Record Count	Last Record Date	Dataset Source
Harbour Porpoise (<i>Phocoena phocoena</i>)	Cetacean	12	06/12/2023	IWDG Casual Cetacean Sightings
Common Dolphin (<i>Delphinus delphis</i>)	Cetacean	5	24/09/2023	IWDG Cetacean Strandings Database
Bottlenose Dolphin (<i>Tursiops truncatus</i>)	Cetacean	1	04/11/2011	IWDG Casual Cetacean Sightings
Grey Seal (<i>Halichoerus grypus</i>)	Pinniped	2	20/04/2015	Atlas of Mammals in Ireland 2010–2015
Otter (<i>Lutra lutra</i>)	Semi-aquatic Mammal	2	11/08/2014	Atlas of Mammals in Ireland 2010–2015
Long-finned Pilot Whale (<i>Globicephala melas</i>)	Cetacean	1	20/06/2013	IWDG Cetacean Strandings Database

Northern Bottlenose Whale Cetacean 1 30/10/1976 IWDG Cetacean
(*Hyperoodon ampullatus*) Strandings Database

Table 3.2: Annex IV Species Recorded within Grid Square O26

Species	Group	Record Count	Last Record Date	Dataset Source
Harbour Porpoise (<i>Phocoena phocoena</i>)	Cetacean	155	31/12/2023	IWDG Casual Cetacean Sightings
Common Dolphin (<i>Delphinus delphis</i>)	Cetacean	4	01/08/2023	Explore Your Shore
Bottlenose Dolphin (<i>Tursiops truncatus</i>)	Cetacean	6	03/06/2018	IWDG Casual Cetacean Sightings
Minke Whale (<i>Balaenoptera acutorostrata</i>)	Cetacean	1	15/06/2021	IWDG Casual Cetacean Sightings
Humpback Whale (<i>Megaptera novaeangliae</i>)	Cetacean	1	14/07/2010	IWDG Casual Cetacean Sightings
Grey Seal (<i>Halichoerus grypus</i>)	Pinniped	27	18/01/2024	Dublin Port Seal Survey of Dublin Bay
Harbour Seal (<i>Phoca vitulina</i>)	Pinniped	1	17/02/2015	Atlas of Mammals in Ireland 2010–2015
Otter (<i>Lutra lutra</i>)	Semi-aquatic Mammal	3	13/02/2015	Atlas of Mammals in Ireland 2010–2015

Table 3.3: Annex IV Species Recorded within Grid Square O27

Species	Group	Record Count	Last Record Date	Dataset Source
Common Dolphin (<i>Delphinus delphis</i>)	Cetacean	1	08/11/2018	IWDG Casual Cetacean Sightings
Harbour Porpoise (<i>Phocoena phocoena</i>)	Cetacean	3	11/07/2016	IWDG Casual Cetacean Sightings

Table 3.4: Annex IV Species Recorded within Grid Square O17

Species	Group	Record Count	Last Record Date	Dataset Source
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Harbour Porpoise (<i>Phocoena phocoena</i>)	Cetacean	29	02/12/2023	IWDG Cetacean Strandings Database
Common Dolphin (<i>Delphinus delphis</i>)	Cetacean	7	04/04/2024	Explore Your Shore
Bottlenose Dolphin (<i>Tursiops truncatus</i>)	Cetacean	3	29/07/2021	IWDG Casual Cetacean Sightings
Minke Whale (<i>Balaenoptera acutorostrata</i>)	Cetacean	3	10/07/2018	IWDG Cetacean Strandings Database
Grey Seal (<i>Halichoerus grypus</i>)	Pinniped	6	30/07/2019	Explore Your Shore
Harbour Seal (<i>Phoca vitulina</i>)	Pinniped	9	18/01/2025	Explore Your Shore
Otter (<i>Lutra lutra</i>)	Semi-aquatic Mammal	15	06/01/2015	Atlas of Mammals in Ireland 2010–2015
Long-finned Pilot Whale (<i>Globicephala melas</i>)	Cetacean	1	20/06/2013	IWDG Cetacean Strandings Database
Striped Dolphin (<i>Stenella coeruleoalba</i>)	Cetacean	1	02/09/2006	IWDG Cetacean Strandings Database

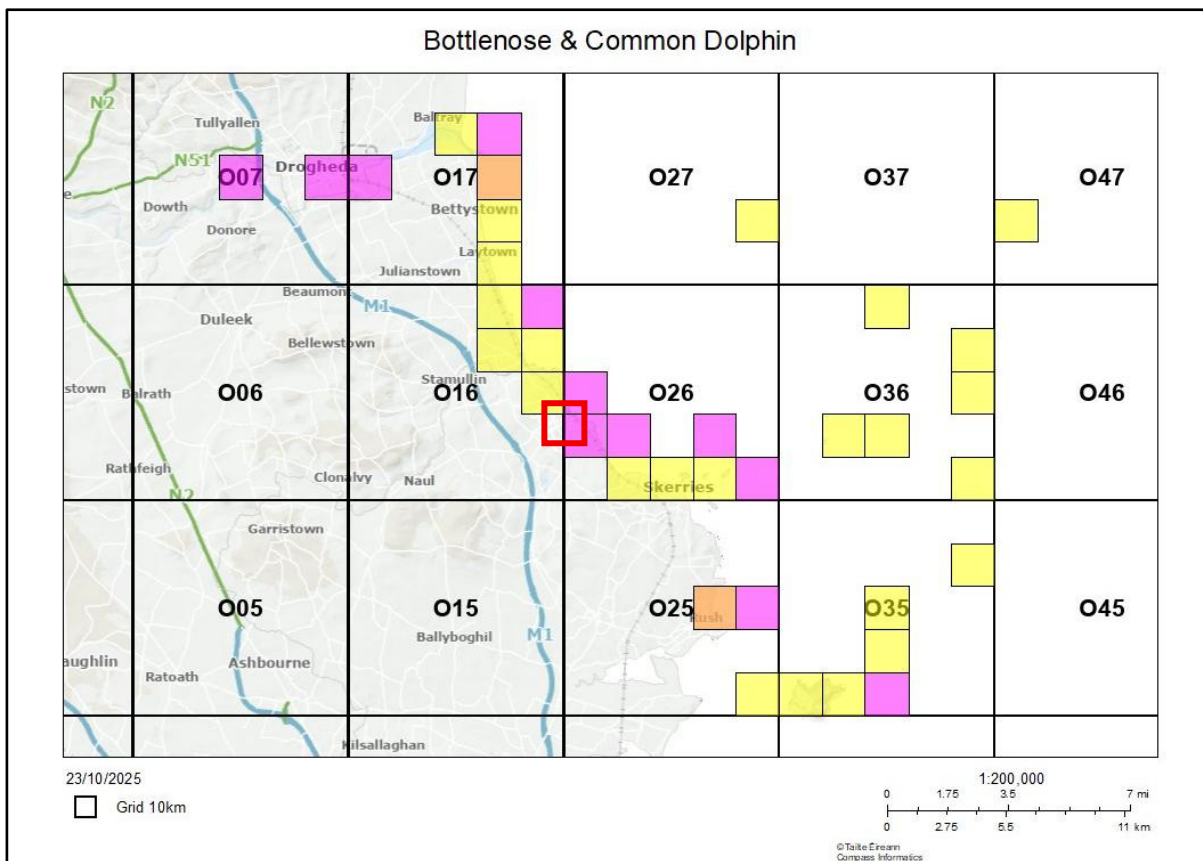


Figure 3.1: Records of Bottlenose Dolphin and Common Dolphin within the 10 km grid squares surrounding Balbriggan Harbour (NBDC, 2025). Pink grid squares indicate records of Bottlenose Dolphin, yellow grid squares indicate records of Common Dolphin, and the orange grid square indicates areas where both species have been recorded.

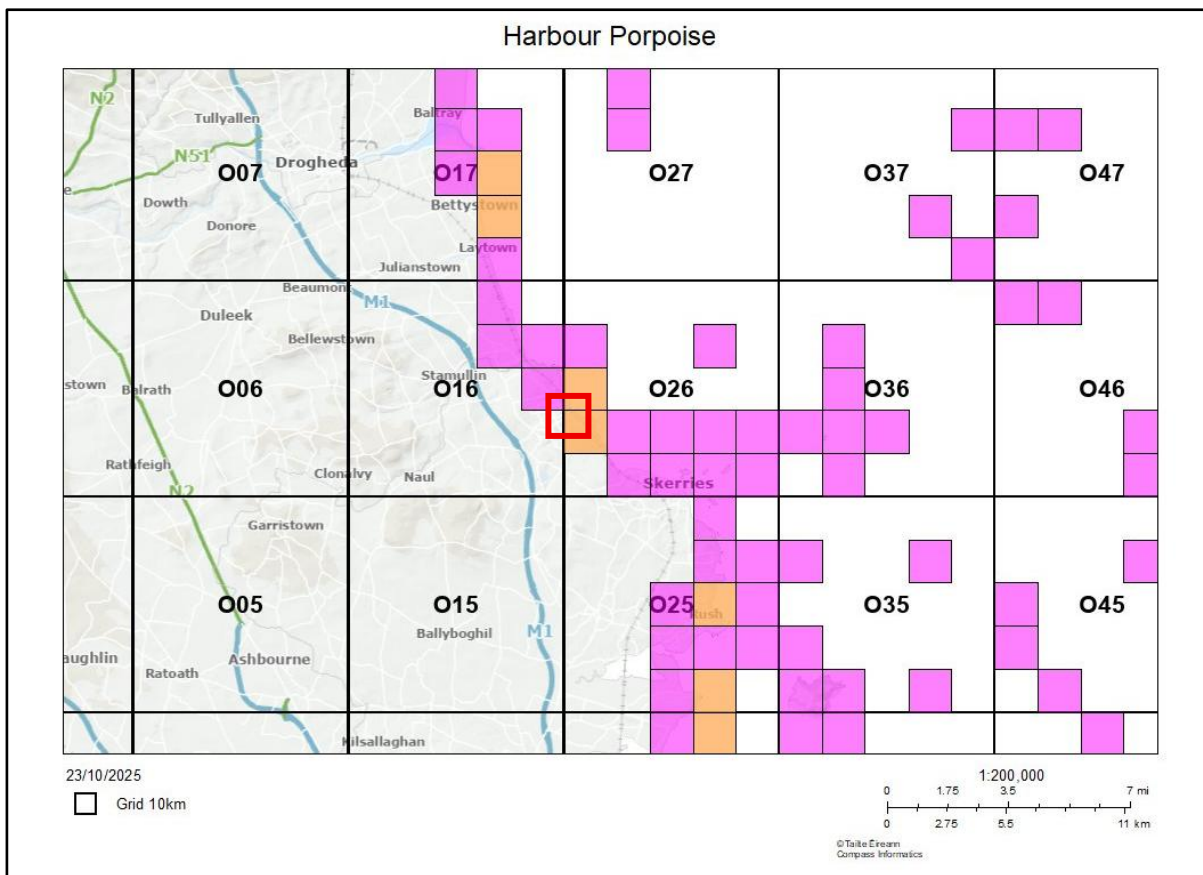


Figure 3.2: Distribution of Harbour Porpoise records within 10 km grid squares in the vicinity of Balbriggan Harbour (NBDC, 2025). Pink grid squares represent confirmed Harbour Porpoise records; yellow grid squares represent records identified as “dolphin species possibly Harbour Porpoise”; and orange grid squares represent grid squares where both records occur.

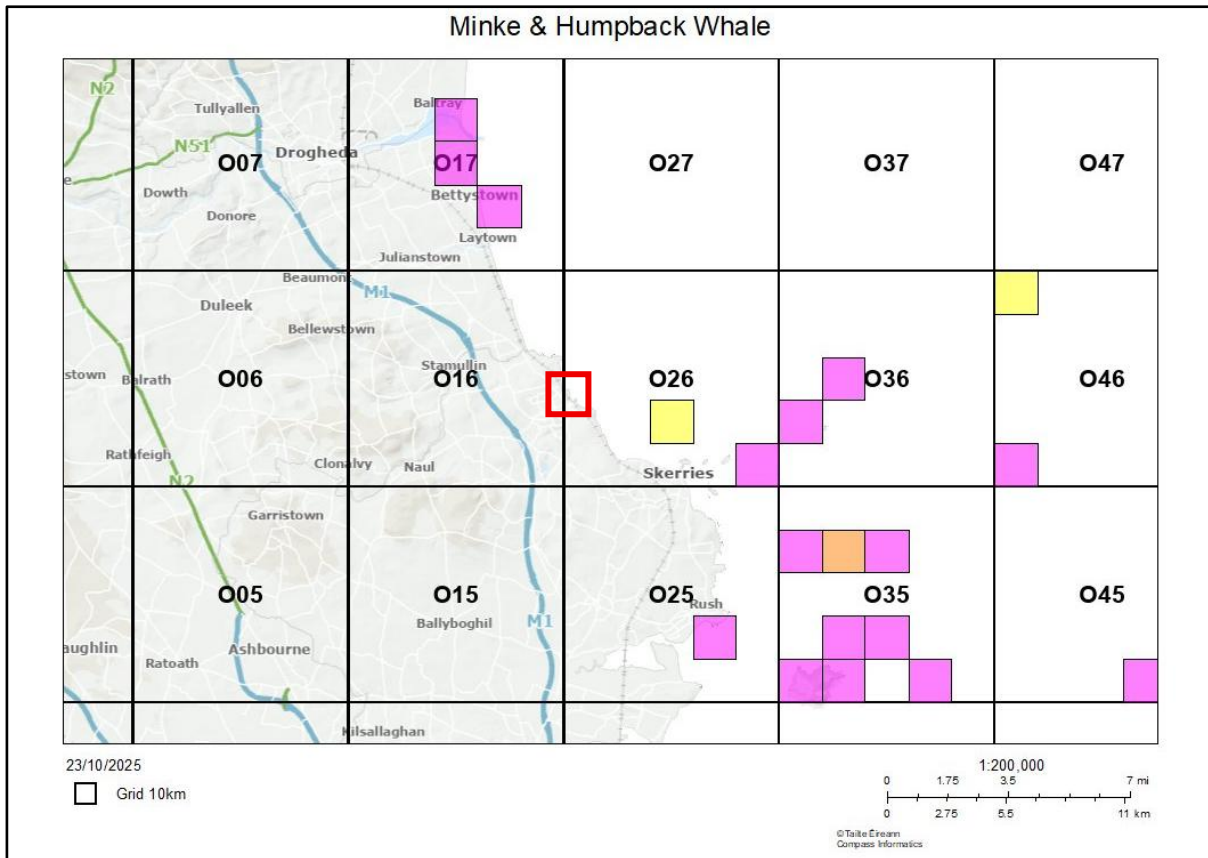


Figure 3.3: Confirmed records of Minke Whale and Humpback Whale within 10 km grid squares around Balbriggan Harbour (NBDC, 2025). Pink cells = Minke Whale; Yellow cells = Humpback Whale; Orange = both species recorded within the same grid.

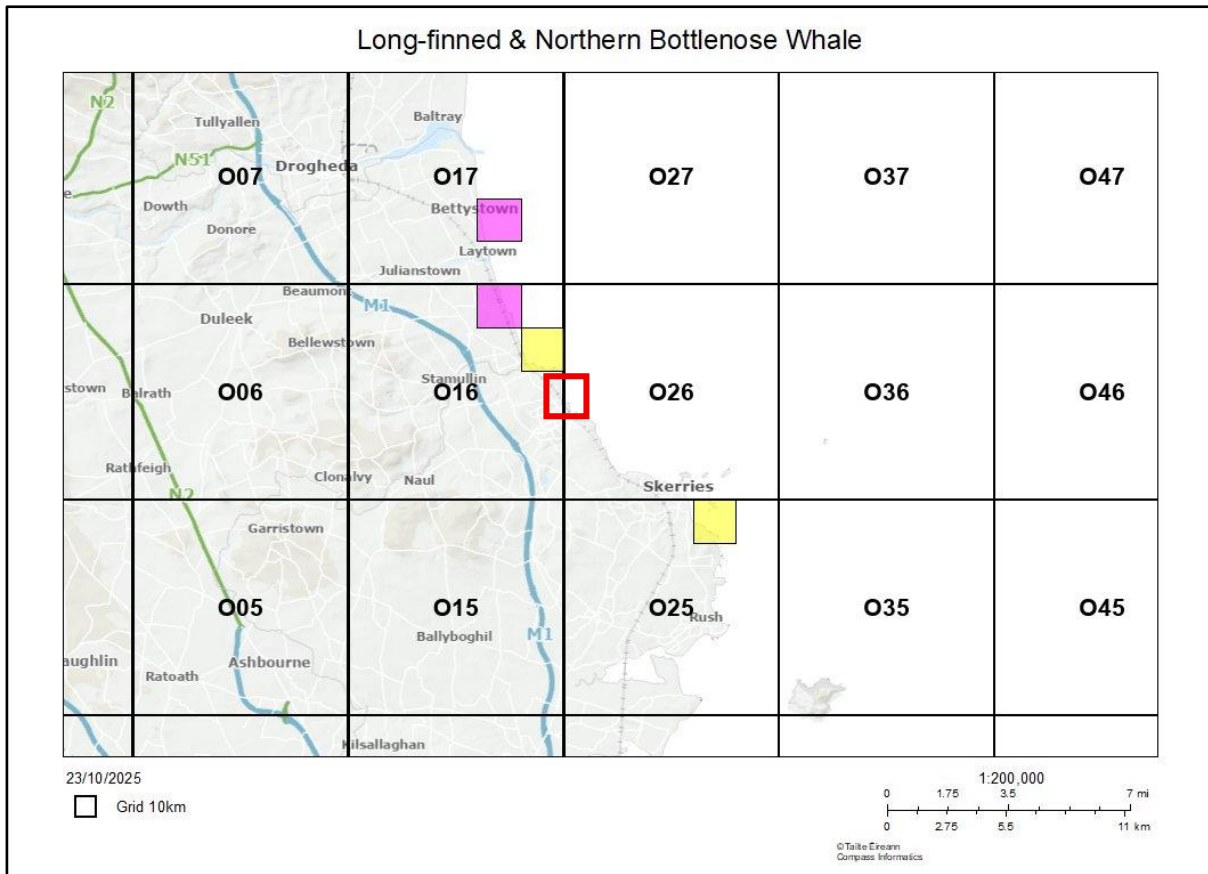


Figure 3.4: Confirmed records of Long-finned Pilot Whale and Northern Bottlenose Whale within 10 km grid squares around Balbriggan Harbour (NBDC, 2025). Pink cells = Long-finned Whale; Yellow cells = Northern Bottlenose Whale.

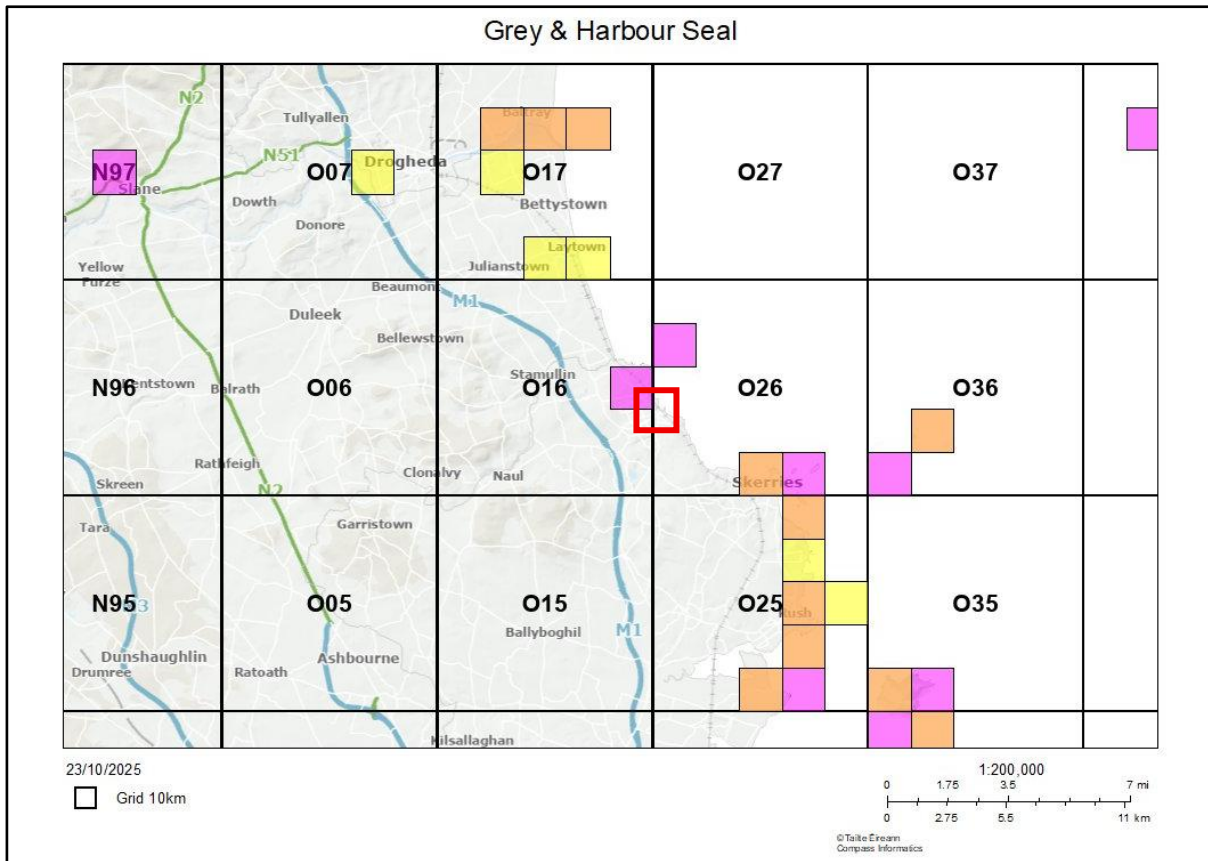


Figure 3.5: Confirmed records of Grey and Harbour Seal within 10 km grid squares around Balbriggan Harbour (NBDC, 2025). Pink cells = Grey Seals, Yellow cells = Harbour Seals, Orange = both species recorded within the same grid.

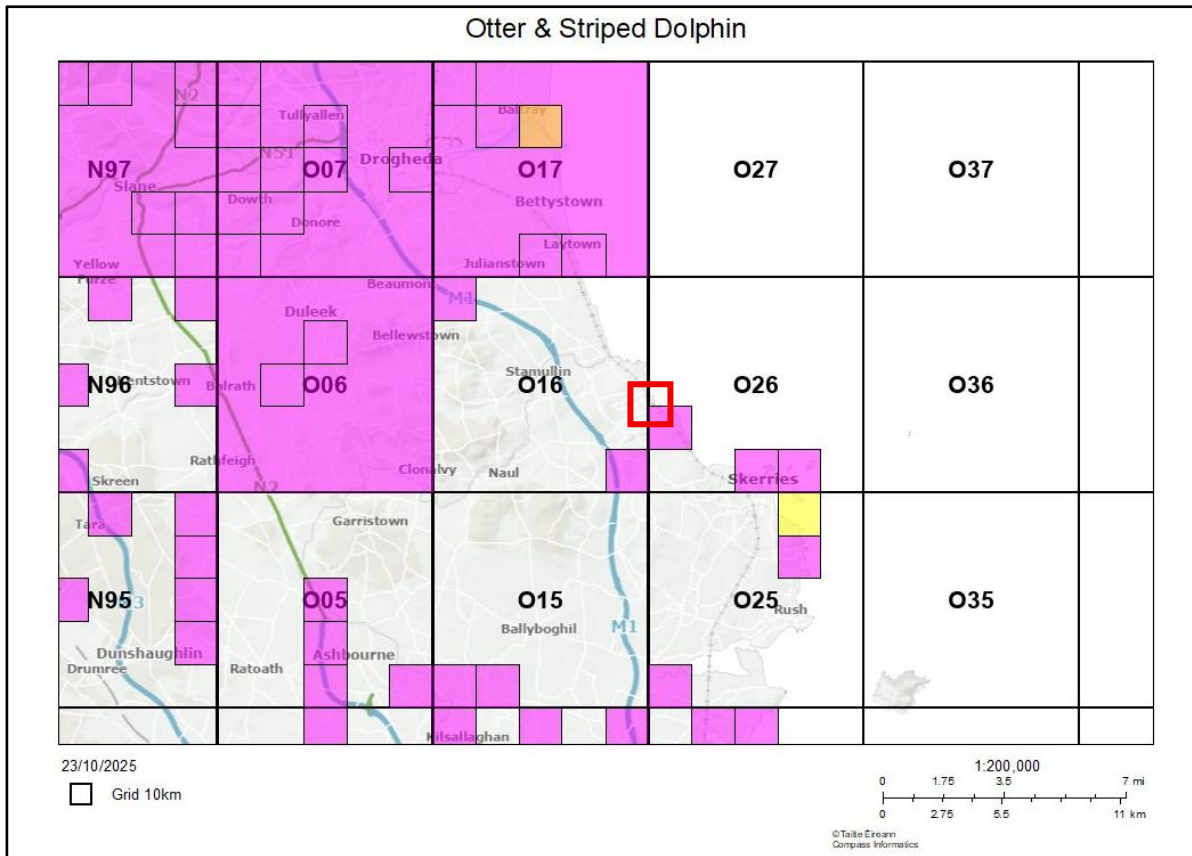


Figure 3.6: Confirmed records of Otter and Striped Dolphin within 10 km grid squares around Balbriggan Harbour (NBDC, 2025). Pink cells = Otter, Yellow cells = Striped Dolphin, Orange = both species recorded within the same grid.

[3.2.1] Overview of Cetacean Species

The Irish Sea supports a range of cetacean species listed under Annex IV of the Habitats Directive, with records concentrated along the coastal and offshore zones of the east coast. The area around Balbriggan Harbour and adjacent waters (within approximately 10 km) is characterised by shallow coastal depths (<20 m), moderate tidal currents, and regular vessel traffic, resulting in a marine environment that is utilised intermittently by a small number of regularly occurring coastal species.

[3.2.1.1] Harbour Porpoise (*Phocoena phocoena*)

The harbour porpoise is the most frequently recorded cetacean along the north Dublin and Meath coastlines and is known to occur year-round within the western Irish Sea (IWDG, 2025; NBDC, 2025). This species prefers shallow (<50 m) coastal and shelf waters and is regularly observed near Howth Head, Lambay Island, and Rockabill, with occasional sightings extending northwards towards Balbriggan and Gormanston. Harbour porpoise are typically observed singly or in small groups feeding on schooling fish such as sandeel and herring. Acoustic monitoring data from the IWDG indicate that the species exhibits seasonal peaks in activity between April and September, likely associated with prey availability. Given their mobility and tolerance of moderate vessel disturbance, occasional transient presence near Balbriggan Harbour is considered likely.

[3.2.1.2] Bottlenose Dolphin (*Tursiops truncatus*)

Bottlenose dolphins are widely distributed around the Irish coastline, with resident populations in the Shannon Estuary and Cardigan Bay, and a coastal transient population ranging between Dublin Bay and Dundalk Bay (IWDG, 2025; Berrow et al., 2010). Sightings of bottlenose dolphins have been recorded near Howth, Skerries, and Rockabill, suggesting occasional foraging or exploratory movements through the area. Although not considered resident within the Balbriggan Zol, small groups may occasionally enter nearshore waters, particularly during calm sea conditions in summer. Their presence near the site is therefore classified as infrequent but possible.

[3.2.1.3] Common Dolphin (*Delphinus delphis*)

The common dolphin is one of the most abundant cetacean species in Irish waters but is more frequently associated with deeper offshore environments (>100 m). The species occurs occasionally in coastal waters of the Irish Sea, particularly during periods of high prey concentration. Sightings along the Dublin-Meath coastline are generally infrequent, and the species is considered transient within the Balbriggan Zol.

[3.2.1.4] Minke Whale (*Balaenoptera acutorostrata*)

Minke whales are among the most commonly sighted baleen whales in Irish waters and are typically found over the continental shelf during the summer months (Wall et al., 2013; IWDG, 2025). They have been recorded intermittently in the western Irish Sea, including offshore of Dublin Bay and Skerries, where they feed on shoaling fish such as sprat and herring. Due to the shallow depths and confined nature of Balbriggan Harbour, the likelihood of this species occurring within the immediate project area is low, although occasional offshore foraging individuals may occur within 10 km of the Zol boundary.

[3.2.1.5] Risso's Dolphin (*Grampus griseus*) and White-beaked Dolphin (*Lagenorhynchus albirostris*)

These species are infrequently recorded along the east coast and are generally associated with deeper offshore habitats (>100 m) (IWDG, 2025). Occasional offshore sightings occur near Dundalk Bay and Wicklow Trough, but these are considered rare vagrants in the vicinity of Balbriggan Harbour.

[3.2.2] Pinnipeds

Two pinniped species occur in Irish waters and are listed under Annex II and Annex IV of the Habitats Directive: the grey seal and the harbour (common) seal. Both species are protected under national and EU legislation and are known to utilise the Irish Sea for breeding, foraging, and resting.

[3.2.2.1] Grey Seal (*Halichoerus grypus*)

Grey seals occur year-round in Irish coastal waters and are distributed widely throughout the Irish Sea, with key breeding and haul-out sites located on Lambay Island, Rockabill, and Skerries Islands, approximately 10-20 km south of Balbriggan Harbour (NPWS, 2013; IWDG, 2025). The total Irish population is estimated at between 7,000 and 10,000 individuals (Ó Cadhla et al., 2013).

Grey seals are highly mobile foragers, capable of travelling tens of kilometres daily in search of prey such as sand eels, flatfish, and cephalopods. They are known to forage along the north Dublin coastline and may occasionally occur within or near Balbriggan Harbour, particularly during high tide when fish may concentrate around the pier walls and river outflow.

However, given the confined nature of the harbour, frequent vessel activity, and human presence, regular use of the harbour by seals is considered unlikely. Occasional transient individuals may pass through the area but are not expected to remain for extended periods or to use the site as a haul-out location.

[3.2.2.2] Harbour (Common) Seal (*Phoca vitulina*)

Harbour seals are present along the Irish east coast but occur in lower densities compared to the west and south coasts. The species favours sheltered estuaries, tidal channels, and sandy bays for resting and breeding. The nearest confirmed breeding populations occur on Lambay Island and Skerries Islands, where regular counts are undertaken by NPWS.

Harbour seals are known to forage along the Fingal and Meath coastlines, occasionally moving into nearshore waters around Balbriggan, Bremore Point, and Gormanston. Sightings data from the IWDG (2025) indicate that these individuals are infrequent and transient, likely associated with seasonal prey movements rather than regular residency.

No known haul-out sites or resting areas occur within Balbriggan Harbour itself, and the potential for disturbance or displacement from the proposed dredging activities is therefore considered low.

[4] Source of Impacts

Potential impacts on Annex IV species may arise from a range of construction and operational activities associated with the proposed maintenance dredging works at Balbriggan Harbour. The primary sources of potential impact include:

- Sediment disturbance and increased turbidity during dredging operations;
- Underwater noise and vibration generated by dredging plant and support vessels;
- Vessel movements and collision risk; and
- Potential accidental release of pollutants, such as hydrocarbons or suspended sediments.

Each potential source of disturbance has been evaluated with respect to its likely magnitude, duration, and spatial extent, and the sensitivity of Annex IV species known or likely to occur within the Zone of Influence (Zol). The potential implications of these impacts are discussed in the following subsections.

[4.1] Siltation and Turbidity

Dredging and similar in-water works can result in the physical disturbance of bed sediments, leading to the resuspension of fine particulate material into the water column and an associated increase in turbidity. The magnitude, spatial extent and duration of such effects are influenced by factors including sediment composition and cohesiveness, prevailing tidal regime and current velocities, the method of dredging employed, and the duration and frequency of the activity.

Increased turbidity can influence aquatic and semi-aquatic species by altering water clarity, light penetration, and sediment deposition patterns. Such changes can, in turn, modify environmental conditions that affect foraging efficiency, prey detection, or habitat quality for species that rely on visual, tactile, or auditory cues to feed and navigate. In areas with limited water exchange, suspended sediments may remain in the water column for extended periods before resettlement, while in more dynamic tidal systems dispersion may occur rapidly.

Sediment deposition can alter substrate composition, potentially smother benthic organisms and affecting benthic community structure. Fine sediments that settle over coarse substrates may also reduce habitat heterogeneity and influence the distribution of prey species utilised by marine mammals and other fauna. Elevated suspended-solid concentrations can also temporarily affect dissolved-oxygen dynamics and localised water chemistry, with potential implications for invertebrate and fish communities.

The mechanisms described above represent the primary pathways by which dredging, bed-leveling, or similar in-water construction activities may interact with the aquatic environment. These processes can indirectly influence higher trophic levels, including Annex IV species such as cetaceans, pinnipeds, and otters, primarily through potential short-term alterations in water quality, prey distribution, or habitat characteristics.

[4.2] Hydrocarbon or Other Contaminants

The release of hydrocarbons or other chemical contaminants into the marine environment has the potential to adversely affect aquatic and semi-aquatic fauna, particularly marine mammals and

otters, which are sensitive to pollutants due to their reliance on clean water for foraging, respiration, and thermoregulation. Hydrocarbons can cause skin, eye, and respiratory irritation in marine mammals through direct contact, while chronic exposure to oil residues or associated toxic compounds can interfere with reproduction, immune response, and prey availability.

Accidental releases of hydrocarbons may occur during marine construction or dredging operations through a variety of mechanisms, including minor leaks or spills from fuel storage and transfer systems, engine maintenance, or the handling of lubricants and hydraulic fluids. Surface sheens or localised fuel residues can reduce water quality, alter surface tension, and affect gas exchange at the water–air interface. Vapour release and chemical weathering processes can further modify the dispersion, persistence, and eventual degradation of hydrocarbons in the marine environment.

In addition to petroleum-based contaminants, dredging activities can disturb sediments containing trace quantities of heavy metals or other legacy pollutants derived from historic port or industrial activity. When resuspended in the water column, these substances may become bioavailable and potentially affect aquatic organisms through direct toxicity or bioaccumulation within the food chain. The magnitude and duration of such effects are typically influenced by the concentration and form of the contaminant, the grain size of the sediment, and hydrodynamic conditions that determine the rate of dispersion and dilution.

A sediment sampling campaign was undertaken by Hydro Survey Limited (HSL) in January 2024 to inform the dredging assessment for Balbriggan Harbour (see Dredging Assessment Report No. CM1407-MA-RP-002). RILTA and WAC testing showed that most material within the basin is non-hazardous, falling within Waste Categories B or C. However, four samples were classified as hazardous (Category D), indicating the presence of localised areas of contaminated sediment requiring disposal at appropriately licensed facilities. These hazardous areas are concentrated within the harbour basin, limiting the spatial extent of contamination. The contaminants that exceeded threshold levels included the heavy metals of arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc.

As outlined in Section 2.2, dredging will be undertaken during lower tides when the harbour basin has naturally dried out. However, fine sediments disturbed during low-tide excavation may become resuspended and dispersed with the incoming tide. The resuspension of sediments containing these contaminants can temporarily increase their availability within the water column, while subsequent sedimentation may redeposit these materials nearby or within low-energy zones. Although the mobility and bioavailability of such metals are generally limited in oxygenated marine waters, short-term increases in suspended-sediment concentrations may still represent a potential pathway of exposure for benthic and pelagic fauna. The processes outlined above represent the primary mechanisms by which hydrocarbon releases or sediment-bound contaminants could interact with the marine environment during dredging or related in-water works. These mechanisms may indirectly influence protected Annex IV species through potential changes to water quality, prey distribution, or habitat condition, depending on the scale, duration, and timing of any contaminant mobilisation.

[4.3] Noise and Vibration

Noise and vibration represent important potential stressors for marine fauna, particularly cetaceans and pinnipeds, which rely extensively on underwater sound for communication, navigation, and foraging. Anthropogenic underwater noise can cause masking of communication signals, temporary shifts in behaviour, or, at very high intensities, auditory injury. The degree of potential effect is influenced by factors such as frequency, intensity, duration, and repetition rate of the sound source,

as well as proximity to the receptor and local propagation conditions (Gomez et al., 2016; Southall et al., 2021).

During dredging operations, the primary sources of underwater sound include mechanical noise from the dredge head, bucket impact, and vessel propulsion systems. These sources typically generate intermittent, low-frequency sounds in the range of 50–1,000 Hz, which overlap with the hearing ranges of many marine mammals (DAHG, 2014; Southall et al., 2019). Propeller cavitation and engine vibration from support vessels can also contribute to the overall noise field within the harbour and adjacent waters.

The acoustic characteristics of backhoe dredging differ significantly from continuous high-energy sound sources such as pile driving or seismic exploration. Dredging noise is generally of lower amplitude, irregular in pattern, and of relatively short duration, producing pulses that are spatially and temporally variable. The propagation of these sounds in shallow coastal environments is further affected by local bathymetry, sediment type, and physical boundaries such as harbour walls, which can reflect or absorb acoustic energy and limit the transmission of sound beyond the immediate working area.

Behavioural responses of marine mammals to underwater noise vary depending on the sound source, species, and behavioural context. For example, cetaceans may exhibit temporary changes in surfacing rate, orientation, or group cohesion, while pinnipeds may display alertness or short-term avoidance of elevated sound levels. Such responses do not necessarily indicate physical injury but represent potential pathways of acoustic disturbance.

Vibration generated by dredging machinery may also transmit through the substrate and surrounding water. The extent of transmission depends on sediment composition and proximity to the source, but in general, vibration effects are expected to attenuate rapidly with distance due to energy loss within the seabed matrix. These pathways represent possible routes by which dredging-related activity could interact with marine mammals or other aquatic organisms within and adjacent to the harbour.

[5] Impact Assessment

In accordance with the Habitats Directive (European Council Directive 92/43/EEC) and the Marine Strategy Framework Directive (2008/56/EC), this section evaluates the potential impacts of the proposed maintenance dredging works at Balbriggan Harbour on Annex IV species during both the construction and operational phases.

The potential sources of impact (as described in Section 4) include sediment disturbance and turbidity, underwater noise and vibration, vessel activity and collision risk, and potential hydrocarbon or pollutant release. Each source has been assessed with regard to its intensity, duration, and spatial extent, as well as the sensitivity and behaviour of Annex IV species within the Zone of Influence (Zoi).

[5.1] Siltation and Turbidity

Balbriggan Harbour is an active fishing and leisure port subject to regular vessel movements, maintenance works, and ongoing sediment transport associated with tidal and wave action. The inner and outer harbour basins experience regular tidal flushing, typical of semi-enclosed coastal environments along the north Dublin coastline.

During dredging, short-term increases in turbidity and localised suspension of fine sediments will occur within the immediate works area. However, given the small spatial extent of the dredging footprint, the low-energy nature of the backhoe dredging method, and the rapid dispersion of sediments under tidal influence, these effects are expected to be transient and confined to the harbour basin.

The surrounding marine environment is naturally dynamic and already subject to periodic sediment disturbance from tidal processes, storm events, and vessel traffic. Any temporary increase in turbidity resulting from the works will therefore remain within the normal range of background variation.

No long-term alteration of the seabed profile or sediment composition is anticipated. All dredged material will be removed to a licensed onshore disposal facility in accordance with regulatory requirements, thereby preventing re-suspension or offshore dispersion.

Given the confined nature of the harbour, the limited duration of the dredging campaign, and the rapid settlement of suspended material, indirect effects on Annex IV species, such as temporary reductions in prey visibility or availability for seals or otters, are considered **negligible**. No significant or residual effects on these species are predicted following completion of the works.

[5.2] Hydrocarbon or Contaminant Spills

The primary potential source of hydrocarbon or contaminant release during the Balbriggan Harbour Maintenance Dredging Works is associated with dredging vessels and support craft, including the backhoe dredger and work boats. These risks are typical of marine construction activities and are associated with fuel handling, hydraulic system leaks, or accidental spills.

All vessels engaged in the project will be well-maintained and required to comply with standard marine safety and environmental procedures, including the provisions of MARPOL (1973/78) and the OPW (2019) Environmental Guidance for Drainage Maintenance and Construction Activities. These require the implementation of pollution prevention measures, such as:

- The presence of spill response kits on all vessels;
- Refuelling only at designated locations under calm conditions and supervised control; and
- Immediate containment and cleanup procedures in the event of accidental spillage.

Given these controls, the likelihood of any significant hydrocarbon release is considered very low. Any minor spill that might occur would be localised and rapidly dispersed due to the tidal exchange within Balbriggan Harbour, resulting in minimal environmental persistence.

Potential impacts on Annex IV species, such as harbour porpoise, grey seal, harbour seal, or otter, would therefore be limited to short-term behavioural avoidance of the immediate area, with no long-term effects anticipated.

Sediment contamination during dredging has also been considered. Based on sediment sampling conducted in the harbour basin in 2024, portions of the basin area to be dredge contain contaminated materials, with threshold values exceeded for heavy metals (see further in Section 4.2). Dredging is to be conducted during low tides when the areas to be dredged are naturally dried out, therefore limiting the potential for contaminant resuspension. Any remaining finer contaminated sediments may become suspended with the incoming tide however it is anticipated that these will be rapidly diluted and dispersed into the water column. All dredged contaminated material is to be removed from site and disposed of within land-based and licensed waste facilities.

Therefore, the potential for remobilisation of contaminants during dredging is considered negligible and not expected to pose any risk to marine mammals or otters.

Overall, the potential risk of disturbance from hydrocarbon or contaminant spills to the marine environment is assessed as **low to negligible**.

[5.3] Noise and Vibration

The operation of dredging and support vessels within Balbriggan Harbour will generate underwater noise and vibration, primarily from engine and propeller activity and dredging operations. The dredging will be carried out using a backhoe dredger, which produces low-frequency, intermittent sounds typically associated with mechanical excavation and bucket impact on the seabed.

Measured source levels for backhoe dredging operations are typically below 170 dB re 1 μ Pa @ 1 m (Nedwell et al., 2008; DAHG, 2014), classifying such activity as a *low-intensity sound source* under the DAHG (2014) guidance. These levels are well below onset thresholds for auditory injury in marine mammals, which occur at approximately 155 dB SELcum for harbour porpoise and 201 dB SELcum for phocid seals (Southall et al., 2019; NMFS, 2018).

The confined nature of Balbriggan Harbour, combined with the shallow water depth and attenuation provided by harbour structures, will further limit sound propagation and vibration transmission into adjacent waters. Consequently, any temporary behavioural responses from harbour porpoise, seals, or otter are expected to be minor and localised, with no risk of auditory injury.

Vibration transmission through the substrate during dredging will be minimal, confined to the immediate area of the dredge head, and unlikely to be detectable by marine fauna beyond a few metres.

Noise and vibration effects will be short-term, lasting only for the duration of active dredging (expected to occur intermittently over several days). Once dredging ceases, underwater sound levels will return immediately to normal ambient conditions associated with regular harbour use.

Taking into account the low intensity, short duration, and site confinement of the dredging activities, as well as the implementation of mitigation measures outlined in Section 6 (including daylight-only operation, soft-start procedures, and marine mammal awareness), the potential risk of disturbance from noise and vibration to the marine environment is assessed as **low to negligible**.

[5.4] Summary of Potential Impacts

[5.4.1] Cetaceans

The harbour porpoise (*Phocoena phocoena*) is the most commonly occurring cetacean species along the north Dublin coastline and within the western Irish Sea. Occasional sightings of common dolphin (*Delphinus delphis*) and bottlenose dolphin (*Tursiops truncatus*) have also been reported further offshore, though these species are typically transient and infrequent within the nearshore zone around Balbriggan Harbour.

Given the location of the proposed dredging works within an active and confined harbour basin, the likelihood of cetaceans entering the area during operations is very low. The harbour environment is already subject to elevated anthropogenic noise from fishing vessels, leisure craft, and other port-related activities, meaning that marine mammals in the vicinity are habituated to moderate levels of disturbance.

The proposed dredging operations will be short-term (intermittent over several days) and generate low-level underwater noise that is well below injury thresholds for cetaceans (Southall et al., 2019). Any behavioural avoidance by passing harbour porpoise is expected to be temporary and spatially limited to the immediate works area.

Furthermore, no significant changes in prey availability or habitat quality are anticipated as a result of short-term sediment disturbance. The area within Balbriggan Harbour does not constitute critical feeding or breeding habitat for any cetacean species.

Given the small scale, short duration, and controlled nature of the works, together with the implementation of standard and specific mitigation measures (as outlined in the Project NIS), it is highly unlikely that the dredging will result in injury, mortality, or significant disturbance to any cetacean species.

The potential risk of impact to cetaceans is therefore assessed as **negligible**.

[5.4.2] Pinnipeds

Grey seal (*Halichoerus grypus*) and harbour (common) seal (*Phoca vitulina*) are known to occur along the north Dublin coastline, including the Skerries Islands, Rockabill, and Lambay Island, which support breeding and haul-out sites for both species (NPWS, 2013; IWDG, 2025). Occasional transient individuals may also forage within or near Balbriggan Harbour, particularly around the harbour mouth and tidal outflows, where fish may temporarily concentrate.

Seal species are not particularly sensitive to short-term changes in water quality or turbidity and are frequently observed in estuarine and harbour environments throughout Ireland, where similar dredging and vessel activities occur regularly.

The proposed maintenance dredging operations will be short-term and highly localised, and any underwater noise generated by the backhoe dredger will be of low frequency and intermittent character. This type of sound is unlikely to cause disturbance or behavioural avoidance beyond the immediate vicinity of the works area.

Given the absence of any haul-out or breeding sites within Balbriggan Harbour, and the distance to the nearest sensitive sites (>10 km), it is highly unlikely that the works will cause any displacement or disturbance to resident pinniped populations.

Potential indirect effects, such as temporary reductions in foraging efficiency due to localised sediment disturbance, will be minor and short-lived, with normal conditions expected to re-establish rapidly after dredging ceases.

Consequently, it is determined that the proposed dredging works are unlikely to cause injury, disturbance, or mortality to grey or harbour seals, nor will the project result in any significant impact to their foraging or breeding ecology.

The overall potential impact to pinnipeds is therefore assessed as **low to negligible**.

[5.4.3] Otter (*Lutra lutra*)

The otter (*Lutra lutra*) is listed under Annexes II and IV of the EU Habitats Directive (92/43/EEC) and is a qualifying interest for several designated sites along the east coast of Ireland. Otters occupy a wide range of freshwater, estuarine, and coastal habitats throughout the country and are relatively common in Fingal County, with records along the River Delvin, River Bracken (Matt), and adjacent coastal shorelines (NBDC, 2025).

The harbour environment at Balbriggan is, however, heavily modified, with hard quay walls, paved quaysides, and high levels of human and vessel activity. Such areas provide limited opportunity for resting, breeding, or holt establishment. The nearest suitable otter habitats are likely to occur along the River Bracken, which discharges immediately south of the harbour, and in intertidal zones northward toward Bremore Point, where natural rocky and sandy substrates persist.

Otters are known to be highly mobile, with large home ranges extending several kilometres along coastlines, and may occasionally forage within harbours or sheltered bays, particularly at night when disturbance is reduced. While an individual could potentially transit through the harbour mouth or forage briefly along the inner basin walls, regular occupancy or denning within the works area is considered very unlikely.

Potential impacts from the dredging works include temporary disturbance due to vessel movements, lighting, or noise. However, otters using the nearby coastline are expected to temporarily avoid the immediate works zone and return upon completion of activities. No direct loss of habitat or impact to breeding or resting places is anticipated, as none are present within the project footprint.

With the implementation of standard mitigation measures, including restricted working hours, spill prevention protocols, and pre-works otter checks by a qualified ecologist, the risk of significant disturbance or injury to otter is negligible.

The potential impact of the proposed maintenance dredging on otter (*Lutra lutra*) is therefore assessed as **low to negligible**.

[6] Conclusions

Considering the nature, scale, and location of the proposed maintenance dredging works within Balbriggan Harbour and based on the findings of this Annex IV Species Risk Assessment, it is the professional opinion of the undersigned ecologist that the proposed works are highly unlikely to result in any significant impact on Annex IV species.

The dredging will be localised within the inner and outer harbour basins, both of which are heavily modified and subject to regular vessel activity and tidal disturbance. The surrounding marine environment already experiences elevated background noise and turbidity, characteristic of active coastal harbours.

Potential effects from the works, such as temporary sediment disturbance, minor increases in turbidity, underwater noise, or vessel movements, will be short-term and of low intensity. No breeding, resting, or haul-out sites for Annex IV species (including cetaceans, pinnipeds, or otter) occur within or immediately adjacent to the works area.

The implementation of standard best-practice mitigation measures and those outlined in the Project NIS (Ayesa, 2025) will further ensure that potential risks are minimised. These include the use of daylight-only operations, soft-start procedures, low-speed vessel operation, and the presence of pollution prevention and spill response protocols.

Accordingly, the proposed Balbriggan Harbour Maintenance Dredging is not expected to cause injury, disturbance, or mortality to any Annex IV species, nor result in the deterioration or destruction of breeding, resting, or foraging habitats.

In conclusion, the project is assessed as being fully compliant with Article 12 of the Habitats Directive (92/43/EEC), with the overall risk to Annex IV species considered **negligible**.

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