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Bremore Ireland Port
Maritime Usage Licence Application for Site Investigation Works
Supporting Information for Screening for Appropriate Assessment

BREMORE
IRELAND PORT

Client	**Bremore Ireland Port**
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DISCLAIMER

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00	09/05/2024	All.	First draft for client comment.
01	23/07/2024	All	Final Report

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List of Abbreviations

AA	Appropriate Assessment
ADCP	Acoustic Doppler Current Profiler
AIMU	Assessment of Impact on the Maritime Usage
AIS	Automatic Identification System
API	American Petroleum Institute
BH	Borehole
BIM	Bord Iascaigh Mhara
BSF	Below Seafloor
CESS	Cumulative Effects Spatial Scope
CETS	Cumulative Effects Temporal Scope
CPOD	Continuous Porpoise Detectors
CO	Conservation Objective
COMREG	Commission for Communications Regulation
CPT	Cone Penetration Test
DAFM	Department of Agriculture, Food, and the Marine
DAHG	Department of Arts, Heritage and the Gaeltacht
DCCAE	Department of Communications, Climate Action & Environment
DEHLG	Department of Environment, Heritage and Local Government
DHPLG	Department of Housing, Planning and Local Government
DHLGH	Department of Housing, Local Government and Heritage
DTTAS	Department of Transport, Tourism and Sport
EC	European Commission
EDR	Effective Deterrence Range
EEZ	Exclusive Economic Zone
EIAR	Environmental Impact Assessment Report
EMODnet	The European Marine Observation and Data Network
EPA	Environmental Protection Agency
EPS	European Protected Species
EU	European Union
FCS	Favourable Conservation Status
FLO	Fisheries Liaison Officer
GDG	Gavin and Doherty Geosolutions Ltd.
GSI	Geological Survey of Ireland
IMO	International Maritime Organization
INFOMAR	Integrated Mapping for the Sustainable Development of Ireland's Marine Resource
IROPI	Imperative Reasons of Overriding Public Interest
ISO	International Organization for Standardization
ITM	Irish Transverse Mercator
IWDDS	Interactive Web Data Delivery System
JNCC	Joint Nature Conservation Committee

LiDAR	Light Detection and Ranging
LSE	Likely Significant Effects
MAP	Maritime Area Planning
MARPOL	The International Convention for the Prevention of Pollution from Ships
MBES	Multibeam echosounder
MI	Marine Institute
MAP	Maritime Area Planning Act 2021
MARA	Maritime Area Regulatory Authority
MU	Management Unit
MUL	Maritime Usage Licence
NIS	Natura Impact Statement
NM	Nautical Mile
NMS	National Monuments Database
NPWS	National Parks and Wildlife Service
NRW	Natural Resources Wales
OPR	Office for Planning Regulation
OWF	Offshore Wind Farm
PTS	Permanent Threshold Shift
QI	Qualifying Interests
SAC	Special Areas of Conservation
SBI	Sub Bottom Imager
SBP	Sub Bottom Profiler
SCI	Special Conservation Interest
SPA	Special Protection Areas
SPL	Sound Pressure Level
SPR	Source Pathway Receptor
SSS	Side Scan Sonar
TTS	Temporary Threshold Shift
UK	United Kingdom
USBL	Ultra -Short Baseline
UXO	Unexploded Ordnance
VC	Vibrocore
WWTP	Wastewater Treatment Plant
ZOI	Zone of Influence

Glossary of Terms

Acoustic Doppler Current Profiler (ADCP)	An Acoustic Doppler Current Profiler is a hydroacoustic current meter similar to a sonar, used to measure water current velocities over a depth range using the Doppler effect of sound waves scattered back from particles within the water column.
Appropriate Assessment (AA)	An Appropriate Assessment (AA) is an assessment of the potential adverse effects of a plan or project (in combination with other plans or projects) on Special Areas of Conservation and Special Protection Areas. These Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) are protected by both National and European Law.
Aquaculture Sites	Aquaculture sites include shellfish, finfish and seaweed production areas as monitored for licensing purposes.
Array Investigation Area	Area where site investigations will take place to determine the suitability of that area as an offshore wind farm
Benthic Ecology	Benthic ecology is the study of organisms that make up bottom communities (sediments, seagrass communities and rock outcrops) in lakes, streams, estuaries and oceans, to determine environmental health and conduct environmental appraisals.
Coastal Lagoons	Lagoons are expanses of coastal salt water, of varying salinity, which are wholly or partially separated from the sea by sand banks or shingle, or less frequently, by rocks.
Designated Shellfish Waters	Designated Shellfish Waters under the European Union Shellfish Waters Directive are sites designed to protect the aquatic habitat of bivalve and gastropod molluscs, including oysters, mussels, cockles, scallops and clams.
Dredge Fishing	A fishing dredge, also known as a scallop dredge or oyster dredge, is type of fishing gear which is towed along the bottom of the sea by a fishing boat in order to collect a targeted bottom-dwelling species.
Drift Lines	Drift lines occur on sandy or shingle substrate at the upper part of the strand, around the high tide mark. Water-borne material including organic matter is deposited on the shore and provides nutrients and a seed source for vegetation.
Ecology	Ecology is a branch of biology concerning the spatial and temporal patterns of the distribution and abundance of organisms, including the causes and consequences.
Environmental Receptors	Environmental receptors are any organism, habitat or natural resource which could be adversely affected by an activity.
Estuaries	Estuaries are coastal inlets with a significant freshwater influence. They are diverse, dynamic habitats that help maintain the health of coastal ecosystems. They are a significant resource for bird and mammal species for feeding, breeding, and resting, and depending on their geomorphology

	and hydrology support a mosaic of other habitats, including Annex I habitats such as mudflats.
Favourable Conservation Status	The EU Habitats Directive requires EU Member States to achieve FCS of natural habitats and species, defined with respect to species by Article 1 (i) of the Directive as below: "conservation status will be taken as 'favourable' when: population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis."
Fish Nursery Grounds	Nursery grounds are habitats that enhance the growth and survival of juvenile fish.
Fish Spawning Grounds	Spawning grounds are areas where fish congregate to lay and fertilise their eggs.
Geophysical Surveys	Geophysical surveys are ground-based physical sensing techniques that produce a detail image or map of an area. Ground-based surveys may include: Seismic surveys - vibrations are recorded with geophones to provide information about the properties of rocks.
Geotechnical investigation and evaluation	Geotechnical investigation and evaluation include methods to acquire and evaluate subsurface information, including drilling and sampling, laboratory testing, cone penetration testing, and pressure meter testing.
Grab Samples	A grab sample is a sample of sediment taken from the seabed.
Habitats Directive	Adopted in 1992, the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. It forms the cornerstone of Europe's nature conservation policy with the Birds Directive and establishes the EU wide Natura 2000 ecological network of protected areas, safeguarded against potentially damaging developments.
LiDAR	LiDAR is a method for measuring distances by illuminating the target with laser light and measuring the reflection with a sensor. Differences in laser return times and wavelengths can then be used to make digital 3-D representations of the target. It has terrestrial, airborne, and mobile applications.
Magnetometer	A magnetometer is a device that measures magnetism—the direction, strength, or relative change of a magnetic field at a particular location.
Maritime Usage Licence Area	Within this report: The areas within the outer limit of the State's continental shelf and high water mark for which a Maritime Usage Licence Application is submitted to MARA for a licence under the Maritime Area Planning Act 2021.
MARPOL	MARPOL is the main international convention aimed at the prevention of pollution from ships caused by operational or accidental causes. It was

	adopted at the International Maritime Organization (IMO) in 1973. The Protocol of 1978 was adopted in response to a number of tanker accidents in 1976–1977.
Metocean	Metocean conditions refer to the combined wind, wave, and climate conditions as found on a certain location. They are most often presented as statistics, including seasonal variations, scatter tables, wind roses and probability of exceedance.
Mudflats	Tidal mudflat habitat is comprised of the intertidal section of the coastline where muds dominate.
Multibeam Echosounder (MBES)	An echosounder uses sound waves to measure water depth. A transducer mounted under a vessel emits a pulse which travels through the water to the seafloor and bounces back to a receiver. The time it takes for the signal to return is measured, and because the speed of sound through water) is known, the water depth under the boat is measured. This is the basic principle of hydrography and seafloor mapping. A multibeam echosounder (MBES) measures multiple echoes at a time.
Natura Impact Statement	A Natura Impact Statement (NIS) is the statement prepared following Appropriate Assessment (AA) of Natura 2000 sites as required under the EU Habitats Directive which presents information on the assessment and the process of collating data on a project and its potential significant impacts on Natura 2000 site(s).
Pollution Event	A 'pollution incident' includes a leak, spill or escape of a substance, or circumstances in which this is likely to occur.
Pot Fishing	Pots and traps are used in commercial fishing to catch crustaceans such as lobster, crab, and shrimp.
Cable Investigation Area	Area where site investigations will take place to determine the suitability of that area as a route for the export electricity cable from the wind farm to land.
Receiving Environment	The receiving environment is the environment upon which a proposed activity might have effects.
Reefs	Reefs are marine features with hard substrate available for colonisation by plants and animals. In Irish waters they range from the intertidal to depths of 4,500m and more than 400km from the coast.
Sandbanks	Sandbanks are distinct banks that arise from horizontal or sloping plains of sediment that ranges from gravel to fine sand. They are primarily composed of sandy sediments permanently covered by water, at depths of less than 20m below chart datum.
Sandflats	Tidal sandflat habitat is comprised of the intertidal section of the coastline where sands dominate.
Side Scan Sonar (SSS)	Side-scan uses a sonar device that emits conical or fan-shaped pulses down toward the seafloor across a wide-angle perpendicular to the path of the sensor through the water, which may be towed from a surface vessel or submarine or mounted on the ship's hull.

Special Areas of Conservation (SAC)	These are prime wildlife conservation areas considered to be important on a European as well as national level. The EU Habitats Directive lists certain habitats and species that must be protected within SACs.
Special Protection Areas (SPA)	Ireland is required under the terms of the EU Birds Directive (2009/147/EC) to designate Special Protection Areas (SPAs) for the protection of: Listed rare and vulnerable species; regularly occurring migratory species and wetlands, especially those of international importance.
Sub-Bottom Profiler	A sub-bottom profiler is a type of sonar system that produces a 2-dimensional stratigraphic cross section by using acoustic energy to image sub-surface features in an aquatic environment.
Sea Cliffs	A sea cliff is a steep or vertical slope located on the coast, the base of which is in either the intertidal or subtidal zone. Hard cliffs, composed of hard rock such as basalt, are at least 5m high, while soft cliffs, composed of softer substrates such as shale or boulder clay, are at least 3m high.
Vibrocore	Vibrocoring is a sediment sampling methodology for retrieving continuous, undisturbed cores. Vibrocorers can work in a variety of water depths and can retrieve core samples at different lengths depending on sediment lithology and project objectives.
Water Courses	Natural or artificial channels through which water flows.
Wave Buoy	Wave buoys are used to measure the movement of the water surface as a wave train. The wave train is analysed to determine wave characteristics such as the significant wave height and period, and wave direction.

EXECUTIVE SUMMARY

This report is submitted in support of the Maritime Usage Licence Application for the Bremore Ireland Port project Site Investigation works and includes information in support of Stage 1 of the Appropriate Assessment (Screening for Appropriate Assessment (AA)) process as required under the Habitats Directive (92/43/EEC).

The report aims to support the Licence application process and provide the necessary information to the competent authorities to assist them in making an informed decision on the likely impact of the proposed Site Investigation works on Special Areas of Conservation (SACs) and their designated Annex I habitats and Annex II species Qualifying Interests (QIs) and Special Protection Areas (SPAs) and their designated Special Conservation Interest (SCI) species.

52 no. SACs, 29 no. SPAs and two candidate SPAs (the North-west Irish Sea cSPA and the Seas off Wexford cSPA) were considered for the potential for likely significant effects to arise via the identified source-receptor-pathways.

Screening has found that likely significant effects on 53 no. Natura 2000 sites as a result of the proposed works could not be excluded. The possibility of likely significant effects from underwater noise on Annex II listed Qualifying Interest species of the following SACs could not be excluded.

Ireland SACs

- Rockabill to Dalkey Island SAC (IE003000)
- River Boyne and River Blackwater SAC (IE002299)
- Lambay Island SAC (IE000204)
- Codling Fault Zone SAC (IE00204)
- Blackwater Bank SAC (IE002953)
- Slaney River Valley SAC (IE000781)
- Carnsore Point SAC (IE002269)
- Saltee Islands SAC (IE000707)
- Hook Head SAC (IE00764)
- Horn Head and Rinclevan SAC (IE000147)
- Slieve Tooey/ Tormore Island/Loughros Beg Bay SAC (IE000190)
- Roaringwater Bay And Islands SAC (IE000101)
- Kenmare River SAC (IE002158)
- Blasket Islands SAC (IE002172)
- Belgica Mound Province SAC (002327)
- Inishmore Island SAC (000213)

- Kilkieran Bay and Islands SAC (002111)
- West Connacht Coast SAC (002998)
- Bunduff Lough and Machair/Trawalua/Mullaghmore SAC (000625)

UK SACs

- North Anglesey Marine / Gogledd Môn Forol SAC (UK0030398)
- Murlough (UK0016612)
- Strangford Lough SAC (UK0016618)
- North Channel SAC (UK0030399)
- West Wales Marine SAC (UK0030397)
- Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC (UK 0013117)
- The Maidens SAC (UK 0030384)
- Cardigan Bay/ Bae Ceredigion SAC (UK0012712)
- Pembrokeshire Marine SAC (UK0013116)
- South-East Islay Skerries (UK0030067)
- Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC (UK 0030396)
- Lundy SAC (UK0013114)
- Treshnish Isles (UK0030289)
- Isles of Scilly Complex SAC (UK0013694)
- French SACs
- Mers Celtiques - Talus du golfe de Gascogne FR5212016
- Abers - Côte des legends FR5300017
- Ouessant-Molène FR5310072
- Nord Bretagne DH FR2502022
- Cote de Granit Rose-Sept Iles FR5310011
- Tregor Goëlo FR5310070
- Côtes de Crozon FR5302006
- Chaussée de Sein FR5302007
- Récifs du talus du golfe de Gascogne FR5302016
- Récifs et landes de la Hague FR2500084
- Anse de Vauville FR2502019

- Cap d'Erquy-Cap Fréhel FR5300011
- Baie de Saint-Brieuc – Est FR5300066
- Banc et récifs de Surtainville FR2502018
- Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard FR5300012
- Chausey FR2510037
- Estuaire de la Rance FR5300061
- Baie du Mont Saint Michel FR2510048

The possibility of likely significant effects due to physical disturbance to marine benthic communities and habitat loss impacting foraging grounds for foraging birds could not be ruled out for proposed bird species Special Conservation Interests of the North-west Irish Sea cSPA.

Further information regarding these sites will therefore be provided within a Natura Impact Statement (NIS), to support Stage 2 AA.

The following species and their corresponding SACs and cSPA have been screened in for further consideration in Stage 2 Appropriate Assessment (Natura Impact Statement):

- Harbour porpoise (*Phocoena phocoena)*
- Bottlenose dolphin (*Tursiops truncatus)*
- Grey seal (*Halichoerus grypus)*
- Common/harbour seal (*Phoca vitulina)*
- Otter (*Lutra lutra*)
- Twaite Shad (*Alosa fallax*)
- Allis Shad (*Alosa alosa*)
- Common Scoter (*Melanitta nigra*)
- Red-throated Diver (*Gavia stellata*)
- Great Northern Diver (*Gavia immer*)
- Fulmar (*Fulmarus glacialis*)
- Manx Shearwater (*Puffinus puffinus*)
- Shag (*Phalacrocorax aristotelis*)
- Cormorant (*Phalacrocorax carbo*)
- Little Gull (*Larus minutus*)
- Kittiwake (*Rissa tridactyla*)
- Black-headed Gull (Chroicocephalus ridibundus)
- Common Gull (*Larus canus*)
- Lesser Black-backed Gull (*Larus fuscus*)
- Herring Gull (*Larus argentatus*)
- Great Black-backed Gull (*Larus marinus*)
- Little Tern (*Sterna albifrons*)
- Roseate Tern (*Sterna dougallii*)
- Common Tern (*Sterna hirundo*)
- Arctic Tern (*Sterna paradisaea*)

- Puffin (*Fratercula arctica*)
- Razorbill (*Alca torda*)
- Guillemot (*Uria aalge*)

Survey activities planned by the Lir Offshore Windfarm, Setanta Offshore Windfarm, Clogher Head Offshore Windfarm, Statkraft North Irish Sea Array Cable Route, Statkraft North Irish Sea Array Site Investigations Array Area Offshore Windfarm (FS007031) and Mares Connect Electricity Interconnector may coincide with the timeline of the Bremore Ireland Port development site investigation activities. Cumulative impacts of these activities on SACs are therefore screened in for Stage 2 Appropriate Assessment and **will be** considered further in a **Natura Impact Statement**.

No other impacts on the habitats or species that were examined in the initial screening process because of the site investigation activities have been identified. There will be no other direct or indirect impacts on the qualifying interests or conservation objectives of the additional Natura sites identified and these are not considered for Stage 2 Appropriate Assessment and not included in the Natura Impact Statement which accompanies this application.

1 INTRODUCTION

Bremore Ireland Port Designated Activity Company (BIPDAC) proposes to investigate the feasibility of developing port infrastructure at Bremore in counties Dublin and Meath.

BIPDAC has prepared this report in support of an application for a Maritime Usage Licence under the Maritime Area Planning Act (2021) to undertake site investigation activities to determine the suitability of the site for the development of new deep-water, multi-modal energy port, supporting the construction and maintenance of offshore wind farms in the Irish and Celtic Seas. This development is crucial for Ireland to meet its 2030 decarbonisation targets and to manage the expected increase in maritime freight demand and port capacity requirements up to 2050. Additionally, the project will bring economic and social benefits to local coastal communities, fostering job creation and sustainable development. The project encapsulates Ireland's commitment to sustainable development and positions Bremore Port as a cornerstone of the nation's green and economic future.

BIPDAC intends to undertake a site investigation survey campaign in the Maritime Usage Licence Application Area to inform the location and design of the proposed port infrastructure. The site investigation (SI) will include marine geophysical, geotechnical, environmental, metocean and archaeological surveys.

The Maritime Usage Licence (MUL) area (Figure 1-1) is 159.59 km^2, and includes the Proposed Development Area is (4.21 km^2) and the wider sediment cell, to ensure site investigation activities gather a sufficiently robust spatial coverage of marine geophysical, geotechnical, environmental, metocean and archaeological datasets.

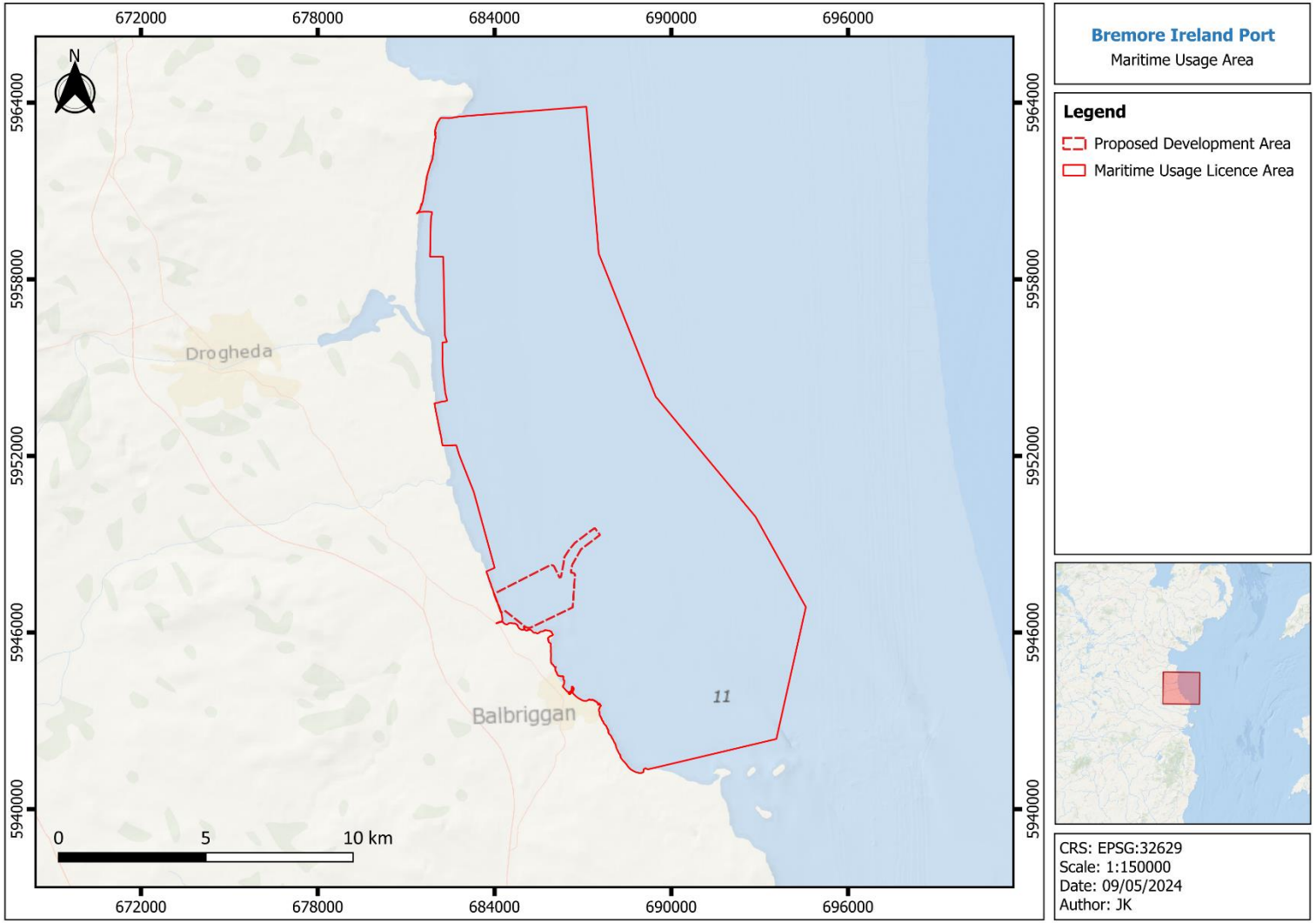


Figure 1-1 Bremore Ireland Port Maritime Usage Licence Area (solid red boundary) and the Proposed Development Area (dashed red boundary).

1.1 AIM OF THIS REPORT

This report is part of the Maritime Usage Licence (MUL) application to the Maritime Area Regulatory Authority (MARA) and aims to provide information documenting the current state of the environment in the vicinity of the proposed site investigation activities and on the potential effects from the proposed activities on the receiving environment. This report includes information in support of Stage 1 of the Appropriate Assessment (Screening for Appropriate Assessment) process as required under the Habitats Directive (92/43/EEC).

This report aims to support the Licence application process and provide the necessary information to the competent authorities to assist them in making an informed decision on the likely impact of this project on Special Areas of Conservation (SACs) and their designated Annex I habitats and Annex II species Qualifying Interests (QIs), and Special Protection Areas (SPAs) and their designated Special Conservation Interests (SCIs). The process of AA Screening is a determination as to whether:

a) the Proposed Activities are directly connected to or necessary to the management of a site as a European Site; and

b) in view of best scientific knowledge and in view of the conservation objectives of any European Site, the Proposed Activities, individually or in combination with other plans or projects are likely to have significant effect on European Sites.

Within this report, the term "**No LSE**" (i.e. No Likely Significant Effect) will be used where the Proposed Activities, or a specified source of impact from the Proposed Activities, are not likely to have a significant effect on a Natura 2000 site.

If it is concluded that significant effects are likely, these effects are examined further in the Natura Impact Assessment (NIS) that also accompanies this MUL Application.

1.2 STRUCTURE OF THE REPORT

This report is structured into the following chapters to include information relating to the AA process, proposed activities and potential impacts, and the receiving environment, including relevant Natura 2000 sites and features. Specifically, the chapters of this report are as follows:

- Executive Summary
- Chapter 1: Introduction (This chapter)
- Chapter 2: Habitats Directive (92/43/EEC) (outlines key aspects of the AA process)
- Chapter 3 Identification of potential environmental impacts of proposed site investigation activities
- Chapter 4: Identification of relevant European Sites within Zone of Influence of works (using Source-Pathway-Receptor approach) and Assessment of Likely Significant Effects
- Chapter 5: (Stage 1) Screening Determination Statement

- Chapter 6: Screening Statement Outcome

1.3 LICENCE AREA

This document has been produced in support of a Maritime Usage Licence Application, which seeks consent to conduct site investigation activities to inform the proposed development of a deep-water multi-modal energy port situated north of Balbriggan, spanning the border of County Meath and Dublin at Gormanston Bay Beach and Knocknagin Bay Beach.

The MUL application area (shown in Figure 1-1) has been drawn to include the wider sediment cell and the Potential Development Area. The inclusion of the wider sediment cell will ensure site investigation activities gather a sufficiently robust spatial coverage of marine geophysical, geotechnical, environmental, metocean and archaeological datasets. The MUL application area covers a total area of 159.59 km^2 (1595 ha). The site boundary co-ordinates points of the MUL area are shown included in the accompanying AIMU report. Note most of proposed survey works will be conducted within the Potential Development Area.

1.4 SITE INVESTIGATION ACTIVITIES

The objective of the proposed Bremore Ireland Port site investigation campaigns is to determine the environmental conditions and seafloor and subsurface geological characteristics within the MUL area to feed into the design of a port facility to support the construction and maintenance of offshore wind farms in the Irish Sea.

The proposed programme of site investigations to be undertaken within the MUL area is described in detail in the Programme of Works section of the Assessment of Impacts on the Maritime Usage (AIMU) document accompanying this Application. The exact technical specifications of the equipment to be used will not be known until the survey contracts have been awarded. However, a description of typical equipment and expected survey parameters is provided in the Programme of Works section of the AIMU.

If the MUL application area site investigation activities, together with desktop studies and stakeholder engagement, indicates the feasibility of developing a port facility, the project will be progressed at that point in accordance with the National Marine Planning Framework and other relevant legislation including the new consenting regime for offshore renewable energy being legislated for through the Maritime Area Planning Act 2021 (MAPA). This MUL application is a consent to conduct site investigation activities and should not be confused with a Maritime Area Consent (MAC) application for port development consent, which will be subject to the Maritime Area Planning Act 2021 (MAPA) and the Planning and Development Act, 2000-2021. This is not a MAC application for a port development.

All efforts will be made to follow survey recommendations outlined in the *Guidance on Marine Baseline Ecological Assessments & Monitoring Activities for Offshore Renewable Energy Projects Part 1 and 2* (DCCAE, April 2018).

1.5 SURVEY SCHEDULE

The intention is to begin survey activities as soon as feasible in 2024 following license award, with a staged programme of investigations capitalising on suitable weather windows over the licence duration. The approximate durations of each of the SI activities are provided in Table 2-3 in Section 2.2 of the AIMU document accompanying this application. This phased approach will be used to inform the overall development and design of the Bremore Ireland Port development as it progresses towards detailed design stage. The exact mobilisation dates for particular surveys will not be known until the process of procuring survey contractors is complete. Timing of the site investigation activities is dependent on many factors including weather, tidal flows, availability of vessels and the grant of a licence. The granting of a licence will have a direct effect on the timing of site investigation activities.

2 HABITATS DIRECTIVE (92/43/EEC)

The purpose of this report is to inform the AA process as required under the Habitats Directive (92/43/EEC). The AA Screening informed by this information will determine whether the proposed surveys, both alone and in combination/cumulatively with other planned activities under the remit of this project and others, are likely to have a significant effect on any Natura 2000 site or its qualifying interests. This document includes Stage 1 of the Appropriate Assessment process. For Stage 2 (Natura Impact Statement (NIS) please see the accompanying Bremore Ireland Port Development Maritime Usage Licence Application NIS document.

This report has been prepared in accordance with the following guidance:

1 Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (Department of Environment, Heritage and Local Government, 2010 revision)
2 Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10
3 Guidance to Manage the Risk to Marine Mammals from Manmade Sound Sources in Irish Waters. Prepared by National Parks and Wildlife Service, DAHG (2014).
4 Guidelines for Good Practice: Appropriate Assessment of Plans under Article 6(3) Habitats Directive (International Workshop on Assessment of Plans under the Habitats Directive, 2011);
5 Marine Natura Impact Statements in Irish Special Areas of Conservation: A working document. Prepared by National Parks and Wildlife Service, DAHG (2012).
6 Managing Natura 2000 Sites - The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (European Commission - 21 November 2018)
7 Office of the Planning Regulator – Practice Note 01 – PN01 (March 2021)

2.1 LEGISLATIVE BACKGROUND

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna), which was adopted in 1992, transposed into Irish Law in 1997 and subsequently amended and consolidated, aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. It provides a framework for legal protection to ensure the conservation of a wide range of rare, threatened, or endemic animal and plant species throughout the European Union. The Birds Directive (Conservation of Wild Birds Directive (79/409/EEC) aims to protect all of the 500 wild bird species naturally occurring in the European Union. The Habitats Directive and Birds Directive form the cornerstone of Europe's nature conservation policy. Together they form a coherent network of protected areas (SACs and SPAs), called Natura 2000, safeguarded against potentially damaging developments.

The requirement for "Appropriate Assessment" is set out in Articles 6(3) and 6(4) of the Habitats Directive (92/43/EEC). If a project is likely to have a significant effect on a Natura 2000 site, either alone or in combination with other plans or projects, it must undergo an Appropriate Assessment (AA). According to Article 6(3) of the Habitats Directive:

“Any plan or project not directly connected with or necessary to the management of the site (Natura 2000 site) but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the site's conservation objectives”.

In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only having ascertained that it will not adversely affect the integrity of the site concerned and if appropriate, after having obtained the opinion of the general public.

Article 6(4) states: “If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for environment or, further to an opinion from the Commission to other imperative reasons of overriding public interest.”

2.2 THE APPROPRIATE ASSESSMENT PROCESS

The European Commission’s methodological guidance (EC, 2021) promotes a three-stage process to complete an AA and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required. The steps and procedures involved in completing each stage, as described in the guidance, are shown below (Figure 2-1).

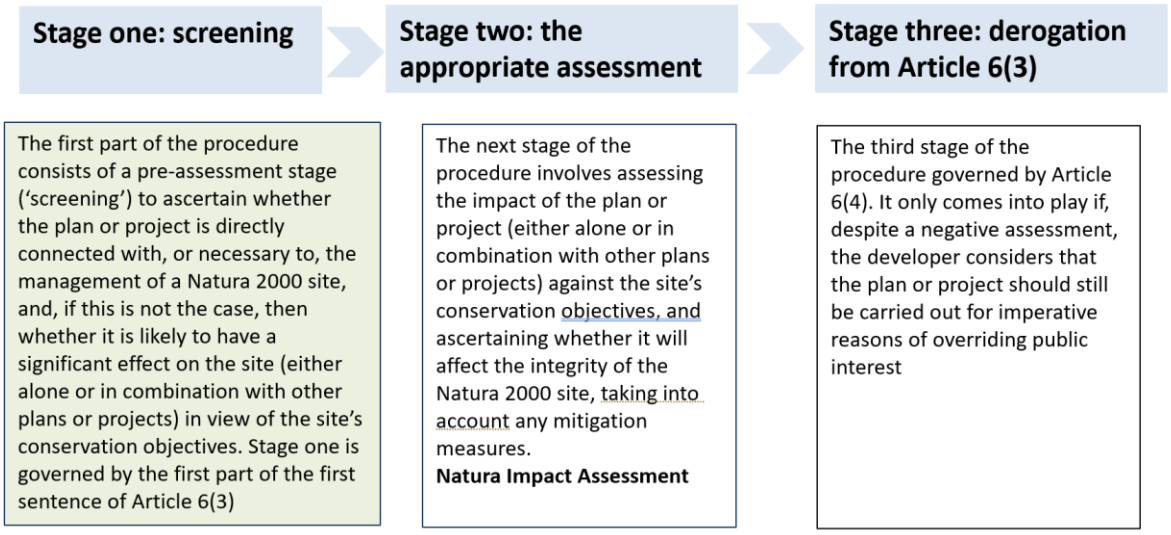


Figure 2-1: Stages in the AA process (Source: EC, 2021)

2.3 METHODOLOGY FOR THE PREPARATION OF THIS REPORT

This report includes information to support Stage 1 of the Appropriate Assessment process, as detailed in section 2.2 above, and has been prepared in accordance with the guidance numbered 1 to 7 in the first paragraphs of this section above.

As the proposed works are not directly connected to or necessary for the management of a Natura 2000 site, this report focuses on assessing whether the works, alone or cumulatively with other plans and projects, are likely to have significant effects on any Natura 2000 site in view of its conservation objectives.

This report has been informed by a review of publicly available datasets and available scientific literature that allowed the characterisation of the receiving environment and supported the identification and assessment of potential impacts and their significance. The sources of the information used are cited throughout the report and listed in the References section.

The examination, analysis and evaluation of the relevant information that supported the Appropriate Assessment process conducted and documented in this report followed the precautionary principle throughout.

The report content (and corresponding chapters) includes:

- Description of the proposed project (see chapter 1)
- Description of legislative background, of the Appropriate Assessment process and Methodology for the preparation of the report (this chapter)

- Identification and description of the potential direct and indirect effects on the Natura 2000 sites (see chapter 3)
- Identification of the relevant Natura 2000 sites and their Qualifying Interests (QIs)/Special Conservation Interests (SCIs), and their AA Screening (Stage 1) against the identified potential impacts (see chapter 4 and 5)
- Natura Impact Statement (Stage 2) is presented in the accompanying document 22032-REP-006-00 MUL NIS.

This report has been prepared by [redacted] (BSc. Hons Marine Sciences, MMO). [redacted] s a Marine Ecologist with experience in marine, terrestrial and freshwater ecology, and is a trained MMO and marine ornithologist. Her current work includes ecological/environmental consulting, marine licence application preparation, report writing and environmental mapping. This report has been checked by [redacted] (BSc. Hons Geological Science, MSc. Geochemistry). [redacted] s a Senior Environmental Scientist with extensive experience as an environmental consultant, undertaking various multi-disciplinary projects within consulting engineering.

This report has been reviewed and approved by [redacted](BSc. Hons Marine Science, MSc. Engineering in the Coastal Environment). [redacted] is a Marine Ecologist with coastal engineering expertise and extensive experience of offshore benthic survey and Marine Protected Area monitoring who has undertaken multiple environmental assessments under the Habitats Directive for GDG and as a statutory adviser to the UK government and its devolved administrations with the Joint Nature Conservation Committee.

3 IDENTIFICATION OF POTENTIAL ENVIRONMENTAL IMPACTS AND EFFECTS

3.1 OVERVIEW OF POTENTIAL EFFECTS FROM THE PROPOSED SITE INVESTIGATIONS.

The potential direct and indirect environmental effects identified for appraisal are set out in Table 3-1 and described below, given the site investigation activities proposed (note the proposed activities are summarised in Section 1.4 and described in the Programme of Works within the AIMU document submitted as part of this Licence Application).

Table 3-1 sets out the possible effects from the proposed site investigation activities considered relevant. The potential impacts may have direct and indirect effects on the marine environment, and these are discussed under the following Sections:

- Section 3.2 – Marine Ornithology
- Section 3.3 – Annex I Habitats
- Section 3.4 – Annex II Species

Table 3-1 Potential direct and indirect environmental impacts of activities identified for appraisal

Impact	Effect (Direct/Indirect)
Physical disturbance from increased suspended sediment concentrations from geotechnical and benthic sampling	Direct
Disturbance from vibration and underwater noise associated with surveys	Direct
Injury due to collision (survey vessels/sampling equipment)	Direct
Visual and above water noise disturbance from inshore and intertidal surveys	Direct
Accidental events including pollution and littering	Indirect
Introduction of invasive non-native species	Indirect

Consideration for spatial and temporal footprint of Proposed Activities

The overall spatial and temporal scale of the Proposed Activities has been considered appropriately identify the potential impacts and subsequent effects that may arise on Natura 2000 Sites. The MUL application area is 159.59 km^2, however at any one time during the licence period the proposed site investigation activities will occupy a minimal spatial footprint of the licenced area, with most of the proposed survey activities to be conducted within the Potential Development Area. Within the wider MUL area, the survey activities will mainly consist of metocean and Static Acoustic Monitoring (SAM) equipment moorings, grab sampling for sediment classification and collection of multibeam bathymetry and backscatter. Within the Potential Development Area survey activities will include geophysical, geotechnical, environmental and archaeological survey activities (AIMU report Table 2-2 for details). A licence duration of 7 years is sought, however site investigation activities will not be conducted continuously over that time period.

Potential impacts will therefore be limited to a relatively small percentage of the entire application area at any given time. Deployed equipment moorings ,such as wave buoys, may remain in situ for extended periods of time, however the spatial footprint of these moorings is small and moorings will not be in place continuously over the entire licence term.

As the proposed site investigations for this project are localised, transient in nature and of short duration this implies that:

(1) there will be a negligible number of survey vessel(s) compared to the current marine traffic, which includes cargo ships, ferries, fishing vessels, and pleasure craft that run to a very large number of passages a year in the Irish Sea; and

(2) at any given time, the survey vessels would only occupy a very small percentage of the proposed MUL application area available to foraging species due to the highly localised, transient, and short duration of the proposed site investigation activities.

The parameters of these potential impacts in the context of the specific activities being applied for under this MUL application are examined in the following sub-sections to identify if they should be considered under an Appropriate Assessment Stage 1 Screening.

3.2 MARINE ORNITHOLOGY

The following potential effects of the proposed SI activities on SCIs or the habitats that support SCIs are considered in Table 3-2.

Table 3-2: Summary Potential Effects

Potential Effect	Description
Direct impact of disturbance and displacement from increased underwater noise	Vessel activity associated with survey activities requiring a vessel; the deployment and retrieval of equipment (e.g. Metocean buoys and Marine Mammal Acoustic recording devices), benthic

Potential Effect	Description
	sampling, fish and shellfish surveys (trawls and epibenthic trawls, pots, etc.), geotechnical surveys, and geophysical surveys. Survey equipment associated with geophysical and hydrographic surveys, geotechnical surveys (borehole of CPT surveys), benthic sampling, ecological surveys (trawling equipment).
Direct impact of disturbance and displacement from increased above-water noise	Vessel activity associated with survey activities requiring a vessel (as listed above). Geotechnical surveys within the intertidal areas from borehole excavation. Onshore survey activities in the intertidal area including, intertidal ecological (surveyor-related pressures) and archaeological (surveyor and equipment related pressures) walkover surveys, nearshore geotechnical surveys.
Direct impact from increased visual disturbance and displacement	Vessel activity associated with survey activities requiring a vessel (as listed above). Onshore survey activities in the intertidal area (including the intertidal or nearshore activities as listed above).
Indirect effects through impacts on prey availability and prey acquisition	Underwater noise inducing activities within the MUL area (vessel noise and equipment from survey activities such as geophysical, hydrographic and geotechnical surveys. Impacts to marine benthic communities and intertidal habitats from geotechnical and ecological surveys such as borehole excavations and grab sampling, archaeological excavations within the intertidal, and fisheries surveys (pelagic and epibenthic trawls). Accidental events such as pollution or littering affecting prey species.
Mortality and/or injury	Accidental events such as pollution and littering during/from vessel and survey activities.

Marine/estuarine birds which have a designation as Special Conservation Interests (SCIs) have been categorised into two functional feeding groups, as per their feeding mechanisms, for consideration of the potential effects set out in Table 3-2:.

1. Diving birds (i.e. seabirds including diving and offshore foraging surface feeders)
2. Non-diving birds (i.e. shorebirds, including nearshore or onshore waders and dabblers)

The potential impacts considered relevant to these groups are listed in Table 3-3.

Table 3-3 SCI Groups and Potential Impacts from SI Activities.

Impact	Functional Feeding Group
Disturbance and displacement from underwater noise	Diving Birds

Disturbance and displacement from above-water noise	Diving Birds and Non-Diving Birds
Disturbance and displacement from visual impacts	Diving Birds and Non-Diving Birds
Indirect effects through impacts on prey availability and prey acquisition	Diving Birds and Non-Diving Birds
Mortality and/or injury resulting from pollution and litter	Diving Birds and Non-Diving Birds

3.2.1 Disturbance and Displacement from SI Activities and Vessel Movements

Seabird species exhibit varying species-specific sensitivities to anthropogenic noise and behavioural responses can vary between seasons (i.e. inside and outside the breeding season), time of day, flock size and whether the seabird species is foraging or roosting (Cutts 2013., Goss-Custard *et al*., 2019). Displacement can pose a potential ecological threat to seabirds as it can result in habitat loss (i.e. in the form of foraging and rafting areas). Responses depend on the context, magnitude and predictability of the noise source within the context of their surrounding environment. Depending on whether a species is adaptive or if a species is less adaptive or constrained (e.g. during the breeding season), disturbance and displacement of species may have consequences at individual and population levels (Joint SNCB Interim Displacement Advice Note, 2022, Pg. 2-3). Seabirds may also be indirectly affected through prey acquisition where, due to the site investigation activities, prey availability is reduced which may then adversely affect survival and productivity of the individual or at a population level.

Many of the SCIs of coastal SPAs are highly mobile and have large foraging ranges. These waterbirds and waders utilise a range of feeding and roosting sites throughout the overwintering period.

Seabird foraging ranges vary between the breeding and wintering/migrating seasons). Birds in the breeding season are known to exhibit “central-place foraging”, where the forager brings their captured items to a given location (Orians and Pearson (1979). The most obvious example of central place foragers is birds during the breeding season while rearing their chicks. Chick-rearing seabirds are more likely to alternate between chick-feeding foraging excursions and self-feeding foraging excursions when there are large differences between habitat quality near and far from the breeding site (Phillips, Guilford and Fayet, 2023). In addition, foraging range disparities can be seen between single-prey loaders and multi-prey loaders (i.e. bringing back one prey at a time to chicks or bring back several prey items to chicks, respectively).

In identifying potential SPAs for the AA Screening, the foraging ranges, taken from mean maximum foraging range distances outlined in Woodward *et al*. (2019), migration routes and distribution density maps from ObSERVE programme and associated papers, along with the specific seasons for the designated SCI species has been considered.

3.2.1.1 DISTURBANCE AND DISPLACEMENT FROM UNDERWATER NOISE

Diving seabirds have an underwater hearing range of approximately 500Hz to 4kHz (Crowell 2014, Crowell et al. 2015, Hansen et al. 2017). McCauley (1994) inferred from vocalisation ranges that the threshold of perception for low frequency seismic noise in some species (e.g. penguins, considered as a proxy for auk species) could be high, hence individuals could be adversely affected near to a low frequency seismic noise source.

The diving bird species listed in Table 3-4 are known to engage in pursuit diving or benthic feeding in marine, coastal and estuarine waters at least during part of the year and as such may be vulnerable to underwater noise.

Table 3-4 Migratory and/or Annex I diving bird species considered potentially vulnerable to underwater noise

Migratory and/or Annex I diving bird species considered potentially vulnerable to underwater noise effects		
Divers and grebes	**Seabirds**	**Diving ducks**
Great northern diver (*Gavia immer)*	Manx shearwater *Puffinus puffinus*	Pochard *Aythya ferina*
Red-throated diver *(Gavia stellata)*	Gannet *Morus bassanus*	Tufted duck *Aythya fuligula*
Black-throated diver (*Gavia arctica)*	Cormorant *Phalacrocorax carbo carbo*	Scaup *Aythya marila*
Little grebe (*Tachybaptus ruficollis)*	Shag *Phalacrocorax aristotelis*	Eider *Somateria mollissima*
Great crested grebe (*Podiceps cristatus)*	Guillemot *Uria aalge*	Long-tailed duck *Clangula hyemalis*
Slavonian grebe (*Podiceps auritus)*	Razorbill *Alca torda*	Common scoter *Melanitta nigra*
	Puffin *Fratercula arctica*	Velvet scoter *Melanitta fusca*
		Goldeneye *Bucephala clangula*
		Red-breasted merganser *Mergus serrator*
		Goosander *Mergus merganser*

Very high amplitude low frequency underwater noise may result in acute trauma to diving seabirds, with several studies reporting mortality of diving birds in close proximity (i.e. tens of metres) to underwater explosions (Yelverton et al. 1973, Cooper 1982, Stemp 1985, Danil & St Leger 2011). The noise caused explosions, which is impulsive in nature, would be many magnitudes greater than that produced by the activities proposed under this application.

Direct effects from underwater seismic surveys on diving birds could potentially occur through physical damage, given exposure to sufficiently high amplitudes, or through behavioural disturbance.

Deeper-diving species which spend longer periods of time underwater (e.g. auks) may be most at risk of exposure, but all species which routinely submerge in pursuit of prey and benthic feeding opportunities in marine and estuarine habitats may be exposed to anthropogenic noise (BEIS, 2019). While changes in penguin abundance and distribution concurrent with seismic survey activity has been recorded by Pichegru et al. (2017), no significant difference was observed in abundance of thick-billed murre (Brünnich's guillemot), or fulmar or kittiwake in the Hudson Strait during shooting and non-shooting periods of seismic surveys undertaken over a three-year campaign (Stemp, 1985). Mortality of seabirds has not been reported during extensive seismic operations in the North Sea and elsewhere.

While seabird responses to approaching vessels are highly variable (e.g. Fleissbach *et. al*., 2019), flushing disturbance would be expected to displace most diving seabirds from close proximity to the survey vessel and any towed equipment, thereby limiting their exposure to the highest sound pressures generated.

Underwater noise is likely to cause disturbance to diving seabirds, either directly as a deterrence causing displacement from habitat or evoking an escape flight response, or indirectly affecting prey acquisition. Special Conservation Interests (SCIs) designated for SPAs whose predominant foraging method is shallow diving, dip diving or surface/skim feeding, are considered unlikely to be impacted by underwater noise due to the brevity of exposure time and low disturbance sensitivity.

Note, there is no route to impact between non-diving SCIs and underwater noise, as these species are not fully immersed in the water column when foraging. Underwater noise is unlikely to cause disturbance to dabbling species due to the brevity of exposure time and as these species forage onshore, effects on prey acquisition, if any, are considered to be unlikely to cause an adverse effect. Likewise, diving seabirds whose predominant method of foraging is surface feeding, shallow diving and dip diving are considered unlikely to be affected by underwater noise as there is no route to impact or due to the brevity of exposure time and sensitivity to disturbance (Fleissbach, *et al*., 2019).

3.2.1.2 Disturbance and Displacement from Above-water Noise

The physical presence of and airborne noise from the survey vessels and activities may cause displacement and/or other behavioural responses (including habituated responses) in birds, including during the breeding season. Seabirds and, more generally, wildfowl species, including foraging or roosting aggregations of dabbling ducks and geese, respond differently to visual disturbance depending on their activity, the species concerned and context to their stimulus (Cutts, *et al*., 2013).

3.2.1.3 Disturbance and Displacement from Visual Impacts

The proposed site investigation activities may have adverse effects on wintering and breeding birds as a result in additional anthropogenic visual impacts in the marine environment and in intertidal habitats within and onshore from the MUL application area. Sea and shore birds vary in their responses and susceptibilities to visual disturbances and displacement. This is discussed in further detail below where relevant bird species are screened in (see Section 4.2).

While rafting birds which are Qualifying Interests of SPAs within foraging range of the MUL application area may move in response to vessels in transit, such effects are of low magnitude and short duration, and will represent negligible additional disturbance over other vessel movements, including existing fishing, cargo and tanker traffic.

The physical presence of the survey vessels may result in temporary disturbance to individual birds present in the immediate vicinity of the Screening Area. There is also the potential for disturbance to roosting birds due to the proposed site investigation activities, including intertidal benthic survey and trial pit works.

Birds may be disturbed by the activities during the breeding season while nesting. Disturbance causing birds to temporarily take flight may leave chicks vulnerable to predation by predators, thereby affecting the successful fledging of chicks and reducing the reproduction rate. Breeding birds in the area are habituated to vessel movements in and out of Skerries Harbour, Balbriggan Harbour, Drogheda Port, Clogherhead Harbour, Dundalk Port and Warrenpoint Port which are busy shipping areas subject to multiple vessel movements every day, and other local harbours and the coastal SPAs in the area afford breeding birds physical separation from marine activities. As there is existing shipping activity in the region, birds are already accustomed to physical disturbance from marine traffic, therefore the introduction of a small number of slow-moving additional vessels is not likely to cause significant disturbance. Additionally, a slow-moving survey vessel (circa. 3-5 knots) in the area will not pose a collision risk to seabirds foraging the area who are accustomed to vessels traversing the area.

3.2.2 Indirect Effects through Impacts on Prey Availability and Prey Acquisition

Both SCI groups may vary in their susceptibilities to indirect effects through impacts upon prey species, potentially affecting their availability for diving and non-diving SCI birds.

There is a potential that fish within the MUL area will be temporarily displaced by noise, thus also displacing the food resource for seabirds. Noise from the survey activities will be temporary and highly localised. In addition, fish in the area are most likely habituated to noise as the MUL area is busy with regular vessel activity. Therefore, any effects from noise impacting prey availability for sea- and shorebirds due to the proposed survey activities will be highly unlikely and is therefore considered insignificant. Surveys are also unlikely to create a barrier to connectivity.

Increased suspended sediment concentrations (SSC) may deter fish and other mobile invertebrates from the disturbed area by the proposed SI geotechnical and ecological surveys that make contact with the seabed. However, given that birds ability to feed on a wide range of prey and large foraging areas, it is considered that the effects on prey availability would not be significant.

3.2.3 Mortality and/or Injury Resulting from Pollution and Litter

Seabirds are considered vulnerable to oil pollution, in particular diving birds given the time they spend resting on the water surface, and diving through it in search of food.

The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78[1]), is an international marine environmental convention which aims to prevent both operational and accidental discharge into the marine from sea going vessels. Ireland ratified the various elements of the MARPOL Convention through the Sea Pollution Act 1991, the Sea Pollution (Amendment) Act 1999 and the Sea Pollution (Miscellaneous Provisions) Act 2006. MARPOL 73/78 was given further legal effect through Statutory Instruments introduced under these Acts. The Acts place a legal obligation upon operators of vessels to implement measures to prevent both operational and accidental discharges from ships of substances, which may damage the marine environment as well as human health.

While the site investigation activities will result in a temporary increase in vessels using the area which increases the risk of accidents and resultant fuel and/or oil spills, an incidence of pollution whether from an accidental occurrence or operational activities is not considered likely considering the legal obligations to comply with MARPOL 73/78 with the increased risk of a pollution event occurring due to these activities considered minimal and not to be over and above existing background risk.

All vessels used during the survey campaign shall, as required by law, be MARPOL Compliant and fully certified by the Maritime Safety Office. This is standard practice for all survey activities irrespective of the survey operator and as it is required by law is built into the survey design.

3.3 ANNEX I BENTHIC HABITATS

Physical disturbance to marine benthic communities and sensitive habitats as a result of site investigation survey activities in the footprint of the proposed MUL area may result in:

- Direct physical disturbance to habitats from geotechnical and environmental surveys;
- Smothering/scour from increased suspended sediment concentrations (SSC) in the water column arising from geotechnical and environmental surveys;

3.3.1 DIRECT PHYSICAL DISTURBANCE

SI activities that could potentially cause direct physical disturbance to habitats (i.e. where QIs of SACs are situated within the MUL application area) located offshore and intertidally include benthic grab sampling, trawling surveys, metocean surveys (deployment and retrieval), and geotechnical SI surveys, as a result of their direct contact with the seabed.

Benthic organisms do not have auditory structures and will not be impacted by any noise inducing activities, however, are sensitive to vibration (Rogers, *et al.*, 2016). SI activities directly interacting with the seabed such as rotary drilling from geotechnical activities can produce substrate vibrations that have the potential to impact benthic invertebrates, including sediment dwelling infauna, in the vicinity of the anthropogenic source. Responses include deterrence of mobile benthic species from

[1] Note MARPOL stands for maritime pollution while 73/78 stands for 1973 and 1978.

the source and temporary retreat of tube dwelling species. These stimuli may interfere with behaviours including predator avoidance and foraging/filter-feeding.

Finer sediments such as those found within the MUL application area (i.e. Infralittoral fine sand or Infralittoral muddy sand, and Circalittoral fine sand or Circalittoral muddy sand) are highly recoverable to disturbance and typical species can recolonise the area once the SI geotechnical equipment is retrieved and any disturbance to the sediment will recover naturally (Tyler-Walters, *et. Al.,* 2024).

Boreholes within the Potential Development Area may be up to 20 to 40m deep. This will cause disturbance to the area of the drill pipe penetration itself and the area directly surrounding this by the mound created by drill risings. Immediately following the removal of the cores, the void in the seabed will fill naturally leaving only a minor impression on the seafloor.

Cone Penetration Testing (CPT) does not involve the removal of any material and the hole created by the penetration of the cone (approx. 5cm diameter), will infill upon extraction of the rods. The CPT unit has a footprint of approximately 8 m^2 which will sit on the sea floor for the duration of the test which typically takes 2-3 hours.

No impacts are predicted during geophysical or ROV surveys on marine benthic communities as no contact with seabed during these activities. In addition, these site investigation activities are conducted in a dynamic area (within the Irish Sea, tidal flows are known to interact with and mobilise unconsolidated seabed sediments) so it is considered unlikely that physical disturbance to benthic communities such as reefs will be above natural levels experienced.

3.3.2 SMOTHERING/SCOUR FROM INCREASED SSC

The benthic survey will involve the extraction of sediment material directly from the seabed using a grab sampler. As grab sampling by its nature can only be carried out in soft sediments (muds, sands, gravels) once the sampling device is retrieved, any disturbance to the sediment will recover naturally.

Any potential smothering will be a thin layer due to small volumes of sediment displaced during the sampling.

Certain geotechnical and environmental site investigations activities that physically disturb the seabed can cause a localised increase in suspended sediments concentrations (SSC) that may induce smothering of certain species, especially filter feeding species by blocking their feeding apparatus, smothering sessile species or interfering with respiratory function. In certain strong tidal conditions, scour can occur from an increase in SSC.

The geotechnical sampling methods proposed are likely to cause a small amount of sediment to become suspended. The resulting sediment suspension will be dispersed and deposited on the sea floor at a location subject to wave action and tidal stream. As a result, the deposition levels of this material is considered not to be significant and within storm background levels of sediment migration in the MUL application area.

3.4 ANNEX II SPECIES

3.4.1 MARINE MAMMALS

Potential effects to Annex II marine mammal species resulting from the proposed site investigation survey activities include:

- Disturbance and displacement resulting in behavioural responses including PTS or TTS from under water noise (geophysical surveys, positioning equipment and geotechnical surveys).
- Mortality or injury due to collision (with survey vessel).
- Mortality or injury resulting from litter and pollution.

Injury and disturbance to marine and semi-aquatic mammals as a result of geophysical site investigation survey activities and positioning equipment in the footprint of the proposed MUL area may result in:

- Behavioural responses (disturbance and/or displacement), Temporary Threshold Shift (TTS), or Permanent Threshold Shift (PTS) from increased anthropogenic noise from survey activities including geophysical surveys and positioning equipment.
- Behavioural responses (disturbance and/or displacement), TTS, PTS, from increased anthropogenic noise from geotechnical SI surveys.

SI survey activities such as intertidal walkover surveys (archaeological and ecological), metocean, benthic sampling (grab samplers), marine mammal passive acoustic monitoring and trawls do not require sound generating devices/equipment. Therefore, there is no route to impact from these SI activities to affect mammals.

3.4.1.1 DISTURBANCE, DISPLACEMENT, PTS AND TTS RESULTING FROM ANTHROPOGENIC INDUCED UNDERWATER NOISE (GEOPHYSICAL SURVEYS, POSITIONING EQUIPMENT AND GEOTECHNICAL SURVEYS)

The main environmental concern relating to marine mammals is the potential effects of anthropogenic underwater noise (see Nowacek *et al*., 2007 for review), as marine mammals use their auditory ability to locate food, for communication and aid in navigation (Richardson *et al*., 1995). Exposure to noise can induce a range of effects on marine mammals: physical effects may include a temporary reduction in hearing sensitivity (Temporary Threshold Shift (TTS)) which is reversible over time; or following intense noise exposure, Permanent Threshold Shift (PTS). Other effects include masking of biologically important noises (or cues) by anthropogenic noise (perceptual effects); behavioural changes such as displacement from feeding, resting, or breeding grounds; and stress (Southall *et al*., 2007, Southall *et al*., 2019; DAHG, 2014).

Southall *et al*. (2007) divide marine mammals into groups based on their functional hearing, namely low-frequency cetaceans, mid-frequency cetaceans, high-frequency cetaceans, and pinnipeds in water and pinnipeds in air. Updated noise criteria are proposed by the US National Marine Fisheries Service (NMFS, 2016; NMFS, 2018) and Southall *et al*. (2019) criteria, with hearing groups more

differentiated (i.e. specifically, the distinction and re-labelling of High Frequency and Very High Frequency cetacean groups) than those set out in Southall *et al*. (2007). The relevant PTS values within the re-labelled groups are identical between NOAA (2018) and Southall et al. (2019) with no substantive change compared to Southall *et al*. (2007).

As Southall *et al.* (2019) is the most recent scientific evidence-based publications on the topic, the 2019 thresholds for received sound levels that have potential to induce the onset of instantaneous PTS and TTS were used for this screening assessment.

DAHG (now DHLGH) 2014 *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters* is based on the thresholds detailed in Southall *et al*. (2007), however it is considered the 2019 thresholds are more suitable for the application within the Appropriate Assessment process. For AA, it is required that the assessment screening be based on best scientific knowledge, therefore the more conservative and recently published 2019 thresholds are considered.

Acoustic equipment including positioning equipment used during marine site investigations produce sound at frequencies within the hearing range of marine mammals (Nowacek *et al*., 2007). Geotechnical surveys such as drilling/coring emit non-pulsed (continuous) sound, therefore, have the potential to affect marine mammals by increasing anthropogenic noise in the marine environment. Potential effects of geotechnical surveys on marine mammals are considered to be of low significance as drilling/coring is usually short in duration and occurs over a small spatial scale (JNCC, 2010).

Due to the potential for all Annex II marine mammal species with connectivity to the proposed SI activities to be affected by this route to impact, it is considered within the screening assessment against all relevant species. This is summarised in Table 3-5.

To evaluate the potential of the proposed survey equipment to induce PTS, TTS, and/or disturbance to marine mammals, an assessment has been conducted on equipment where frequencies emitted by the equipment falls within species' hearing range. Noise characteristics of the proposed positioning equipment, and geophysical and geotechnical survey equipment including typical operating frequencies and maximum peak sound pressure levels (SPL_{PEAK}) are detailed in Table 3-6 below.

Table 3-5 Underwater Auditory Range for Marine Mammal Species (Southall et al., 2019).

Frequency	Marine Mammal/Species	Estimated Auditory Band Width (kHz) Southall et al. (2019)
Low Frequency Cetaceans	Baleen whales (Minke whale, Humpback whale)	0.007 – 35
High Frequency cetaceans	Most toothed whales and dolphins (including Common & Risso's Dolphin)	0.15 - 160
Very high frequency	Certain toothed whales and porpoises (including Harbour porpoise)	0.2 - 180
Phocids carnivores in water (PCW)	Grey seal & harbour seal	0.05 - 86

Table 3-6 Noise sources during site investigation activities.

Survey technique	Operating frequency (kHz)	Sound pressure level (SPL_{PEAK}) (dB re 1µPa @1m)	Source/Reference
Side-scan sonar (SSS)	65 -500 (low) 500-900 (high)	196 - 224	L3 Klein 5000, Edgetech 4200 (BlueWise Marine, 2023)
Multi-beam Echosounder (MBES)	12 - 6001	175 - 245	Kongsberg EM122, EM302, EM710, Reson 7160, ME70 (BlueWise Marine, 2023)
Sub Bottom Profiler (Parametric Pinger)	85 - 115	232	CSA (2020)
Sub Bottom Profiler (Sparker)	0.3 – 1.4	203	Applied Acoustics Delta Sparker, SIG ELC sparker (BlueWise Marine, 2023)
Sub Bottom Profiler (Boomer)	0.3 - 3	185 - 207	Applied Acoustics S-boom (BlueWise Marine, 2023)
Sub Bottom Imager (SBI)	4.5 – 12.5	190	Kraken Robotics
Vessel noise	0.05 – 0.3	160 – 175	Southall et al., 2007
Geotechnical Drilling (Rotary)	0.6 - 50	146-190	API drill string, Geobor „S“, Fugro C25 (BlueWise Marine, 2023)
Geotechnical Drilling (Rotary)	(0.041 – 0.045kHz) (0.028 – 0.120kHz)	146-193(158.9) (118-145)	Long-Fei Huang et al, 2023 SubAcousTech, 2021

The sound pressure levels that would result in injury (PTS or TTS) that were proposed for individuals exposed to pulsed and non-pulsed sound sources are provided in Table 3-7 below for each of the marine mammal groups considered in Table 3-5.

Table 3-7 Thresholds (SPL_{PEAK}; dB re 1µPa @1m) of marine mammal hearing groups to assess the potential for PTS and TTS (Southall et al., 2007, for non-pulsed, and Southall et al., 2019 for pulsed sound).

Frequency	Marine Mammal/Species	Pulsed Sound (SPL_{PEAK}; dB re 1µPa @1m)		Non-pulsed Sound* (SPL_{PEAK}; dB re 1µPa @1m)
		TTS	PTS	PTS
Low Frequency Cetaceans	Baleen whales (Minke whale, Humpback whale)	213	219	230
Mid Frequency Cetaceans	Most toothed whales and dolphins (including Common & Bottle-nosed Dolphin)	224	230	230

Frequency	Marine Mammal/Species	Pulsed Sound (SPL_{PEAK}; dB re 1µPa @1m)		Non-pulsed Sound* (SPL_{PEAK}; dB re 1µPa @1m)
		TTS	PTS	PTS
High Frequency Cetaceans	Certain toothed whales and porpoises (including Harbour porpoise)	196	202	230
Low Frequency Phocid carnivores in water & Otter**	Grey seal & Harbour seal	212	218	218
* There are no available SPL thresholds for non-pulsed sounds that could potentially induce the onset of TTS. ** Sea otter have not been included in the SPL injury criteria proposed by Southall *et al*. (2007, or 2019) however as their Estimated Auditory Band Width is within that of the low frequency pinnipeds in water**, the Phocid carnivores (in water) criteria have been used as a proxy for sea otter**.				

3.4.1.2 INDIRECT EFFECTS THROUGH IMPACTS ON PREY AVAILABILITY AND PREY ACQUISITION

Potential effects on prey species of marine mammals include underwater noise, increase suspended sediment concentrations and sediment re-deposition, and physical disturbance to and temporary loss of seabed habitat (e.g. nursery and spawning grounds including reefs).

Cetaceans including the Harbour Porpoise and Bottle-nosed Dolphin, and pinnipeds, the Grey and Common/Harbour seal, have a wide variety of prey species that vary geographically and seasonally, reflecting availability of food resources. Marine mammals such as the harbour porpoise and bottle-nosed dolphin have high daily energy requirements, and as a result need to capture enough prey to meet these demands.

As outlined above, the potential for any effects on prey species from physical disturbance and/or temporary loss of seabed habitat or the potential effects of SSC on benthic habitats and fish is unlikely.

Potential for significant effects of underwater noise on prey species is not considered likely as marine mammals are more sensitive to noise than prey species and would also be deterred/disturbed from an area of potential prey displacement.

3.4.1.3 MORTALITY OR INJURY DUE TO COLLISION (WITH SURVEY VESSEL)

The key factors contributing to collision between marine mammals and vessels are the presence of both in the same area and vessel speed (see Schoeman et al., 2020 for review). Injuries to marine mammals from vessel strikes are species-dependent but generally are more severe at higher impact speeds (Wang et al., 2007). Vessels involved in these surveys are likely to be either stationary or travelling slowly (c. 5 knots) thus allowing any animal in the area time to avoid collision.

Cetacean and pinnipeds in the area are exposed to vessels of all sizes on a regular basis due to other activities in the area including fishing and shipping. As a result, they are likely to maintain a distance

from all survey vessels for the short duration of site investigation activities before returning to the area once site investigation activities have finished.

There is a risk of collision between marine mammals and survey vessels which may cause injury to marine mammals. Vessels strikes may also result in individuals becoming vulnerable to secondary infections. However, while the risk of fatality is greatly reduced if vessels are moving slowly, slower vessels following a consistent trajectory (such is the case for SI survey activities) afford marine mammals the opportunity to avoid such collisions.

3.4.1.4 MORTALITY OR INJURY RESULTING FROM LITTER AND POLLUTION

Marine mammals are considered highly vulnerable to oil pollution through inhalation, ingestion and dermal pathways, due to the regular frequency at which marine mammals will surface to breathe and/or rest, and to breach. Effects on marine mammals from an accidental oil pollution event can largely depend upon prey species (Venn-Watson, *et al*., 2015). Effects may include toxic effects and secondary organ dysfunction from consuming oiled prey; damaged airways and interstitial emphysema due to inhalation of oil droplets/vapour when re-emerging to take a breath, rest and/or breach; skin lesions due to long exposure to oil; and the ingestion of oil during grooming can cause ulceration and haemorrhaging (Helm, *et al*., 2014). Other subsequent consequences are stress and behavioural changes, and a restricted diet and subsequent decrease in body mass.

3.4.2 ANNEX II ANADROMOUS FISHES

The primary means of identifying relevant species and consequent SACs for which Annex II anadromous fish species are listed is based on their geographical range (i.e. occurrence in relation to this site), seasonal patterns/variations, life cycles and their biology (noise sensitivity/swim bladders in detecting sound potentially inducing barotrauma) referencing thresholds of potential susceptibility to damage by sound from geophysical and geotechnical site investigation activities. Details of the fish assessment is described further in Section 4 below.

Atlantic Salmon (*Salmo salar*) are listed in Annex II of the EU Habitats Directive (92/43/EEC) and their conservation in freshwater is mandated in European countries (i.e. spawning grounds in freshwater systems for protection). However, it should be noted, their conservation status in Ireland is classified as vulnerable due to a decline in abundance, caused primarily by mortality at sea, habitat loss, barriers to migration, poor water quality, overfishing and sea lice (Inland Fisheries Ireland), accessed online 12/03/2024). As Atlantic Salmon, as well as Shad species Twaite and Allis, have a homing system, returning to their natal river and spawning grounds, any barrier to species movement resulting from survey activities, either as adult salmon returning to their natal river to spawn, or as young salmon *smolts* migrating out to sea must be assessed in cases where estuaries enter the sea with known salmon migration.

Although freshwater pearl mussel (FWPM) is a non-migratory freshwater invertebrate that remain in freshwater habitats for their entire life cycle, pressures occurring in the marine environment affecting

the anadromous salmonid species, Atlantic Salmon, can potentially cause an indirect, yet impactful, effect to the survival of FWPM. Atlantic salmon play a critical part of their life cycle, forming a symbiotic relationship whereby the salmon provide the essential step during the obligate host-dependent phase of the mussels' life cycle, and mussels improve the water quality by filtering water.

As adults, metamorphosed Sea and River Lamprey are parasitic, hematophagous (external) feeders that can parasitize upon an extensively broad range of fish which means their distribution is largely dictated by their host. Parasitic Lamprey do not display homing behaviour, relying on their host to return to a freshwater course to spawn. Sea and River Lamprey are parasitic to fish such as trout, elasmobranchs (skates and sharks), cephalopod species, and have been reported to occasionally occur as parasites on marine mammals, however, in particular, Atlantic salmon and adult shad are their preferred hosts. Therefore, it is considered that any impact from the survey activities that affects their hosts, Atlantic Salmon and adult shad species (twaite and allis), may have significant effects on Sea and River Lamprey by reducing the host availability to complete their life cycle. Therefore, the assessment of sea and river lamprey and FWPM includes examination of impacts to their annexed hosts.

As freshwater brook lamprey (*Lampetra planeri*) lives exclusively in freshwater, remaining in both large and small river channels (typically in smaller rivers), this species, unlike the other lamprey species, is not an anadromous fish and do not reside in brackish waters found within estuaries.Freshwater white-clawed crayfish (*Austropotamobius pallipes*) (FWCC) are freshwater relatives of the marine lobsters and are found in rivers, streams and lakes particularly in those with a calcareous influence. Their distribution is restricted to freshwater systems and this species have no dependency (no connection) on the marine environment to complete their life-cycle. As all proposed site investigations are located within the marine environment, brook lamprey and FWCC are identified as having no source-pathway-receptor.

The potential effects on Annex II anadromous fish QIs from the proposed survey activities are:

- Injury and disturbance from underwater noise from geophysical and geotechnical surveys
- Increased SSC from environmental and geotechnical surveys
- Mortality or injury resulting from litter and pollution event.

3.4.2.1 Disturbance, Displacement and Injury from Underwater Noise from Geophysical and Geotechnical Surveys

Underwater anthropogenic sound (such as geophysical exploration, underwater blasting and pile driving) can cause physical, physiological and behavioural impacts on fishes. It is widely known that underwater sound can kill, cause a wide range of physiological impacts, and result in behavioural changes affecting the fitness and survival of fishes (Popper, *et al*., 2014). Fish use either detect kinetic energy in the form of particle motion or detect sound pressure for detecting sound; while all fish detect and use particle motion hearing it is the presence of ancillary hearing structures that

determines their hearing sensitivity. Only a subset of fish can detect sound pressure (Putland *et al*., 2018). It is suggested that by detecting sound pressure, it is thought to broaden the bandwidth and increase noise sensitivity in fishes while potentially contributing to sound source localisation (Popper, *et al*., 2022)

Fish vary in their abilities to detect sound as well as their susceptibility to damage by sound (Popper *et al*., 2014) and are assessed in further detail in Section 5 below. Fish species are either hearing specialists (e.g. Twaite Shad and Allis Shad) or hearing generalists (Atlantic Slamon and lamprey species) with only the former being directly susceptible to underwater noise. In general, fish species without a swim bladder (i.e., lamprey, sharks, some flatfish and tunas), or those that have small or reduced swim bladders (i.e. typically, benthic species, including some flatfish), tend to have relatively poor auditory sensitivity and generally cannot hear sounds at frequencies above 1 kHz. Hearing for these fish involves particle motion, not sound pressure (NOAA, 2016).

Fish species with anatomical specializations between the swim bladder and the ear generally have lower thresholds and wider hearing bandwidths than species without such specializations and may have greater ability to detect, and therefore respond to sound pressure. This is the case of fish belonging to clupeiform species (e.g., shad, herring, sardines, and alewives). Clupeids of the shad family (*Alosinae*) in particular, have shown sensitivity to a range of frequencies that can extend to >100 kHz. (Mann *et al*., 2001). Teague & Clough (2011) recorded positive significant reactions in juvenile twaite shad to sound frequencies of between 30 and 60 kHz with a peak at 45kHz. Behavioural studies of the responses of American shad to ultrasound (Mann *et al.*, 2001; Popper *et al*., 2004) demonstrate that they show a graded series of responses depending on the sound level and, to a lesser degree, on the frequency of the stimulus. Low-intensity stimuli elicit a non-directional movement of the fish, whereas somewhat higher sound levels elicit a directional movement away from the sound source and still higher-level sounds produce a ‘‘wild’’ chaotic movement of the fish.

Fish that possess swim bladders but without anatomical connections typically do not show a comparable degree of hearing sensitivity to shad. For example, Atlantic Salmon (*Salmo salar*) have poor hearing sensitivity and are only capable of detecting low frequency tones (below 380 Hz) and particle motion rather than sound pressure (NOAA, 2016). Species with a swim bladder have a greater potential to suffer from barotrauma from sudden pressure changes (e.g., from sudden changes to sound pressure) than those without swim bladders (Popper, *et al*., 2014).

Mickle et al (2009) tested auditory responses in the sea lamprey, which do not possess swim bladders, and found sea lampreys can detect noise frequencies of 50–300 Hz with equal sensitivity but did not detect sounds above 300Hz. While shipping noise is likely audible to lamprey, lamprey are not sensitive to sound pressure. However, as adults, metamorphosed Sea and River Lamprey are parasitic, hematophagous (external) feeders that can parasitize upon an extensively broad range of fish, elasmobranchs, cephalopods, and marine mammals, however, in particular, Atlantic Salmon and adult Shad are their preferred host (OSPAR, 2009). Therefore, their distribution is largely dictated by their host species. Parasitic Lamprey do not display homing behaviour, relying on their host to return to a

freshwater course to spawn. It is therefore considered that any impact from the site investigation activities that affects their hosts, Atlantic Salmon and adult shad species (twaite and allis), may also have significant effects on Sea and River Lamprey by reducing the host availability to complete their life cycle. The examination of Sea and River Lamprey includes examination of impacts to their annexed host species.

Temporary threshold shift (TTS) is a non-injurious temporary reduction in hearing sensitivity caused by exposure to intense sound. TTS has been documented in some fish, though only after multiple exposures to intense sounds (e.g. 190 dB re 1 µPa rms) or as a result of long-term exposure (e.g. tens of minutes or hours) to less intense sounds (Popper & Hawkins, 2019). Popper & Hawkins (2019) suggest that, as sensory hair cells are constantly added in fish and replaced when damaged, both hearing specialists and generalists were able to recover from varying levels of substantial TTS in less than 18 hours after exposure. Permanent hearing loss has not been documented in fish (NOAA, 2016).

Popper & Hawkins (2019) suggest that exposure to very high intensity low and mid-frequency sonars and seismic airguns does not result in mortality in fish. They found that fish experienced damage to body tissues (i.e. barotrauma) after receiving high intensity impulsive sounds.

As the site investigation activities will not produce high intensity impulsive noise only fish species that use sound pressure to hear may be directly impacted by the site investigation activities. Twaite shad may therefore be impacted by some of the geophysical site investigation activities and shipping noise. Given that twaite, allis and the American shad are in the same genus (Alosa) and are morphometrically similar, allis shad may be similarly sensitive to underwater noise.

The physical presence of the survey vessel and the site investigation activities may introduce vibration and noise to the underwater environment. Use of geophysical survey and positioning equipment may potentially cause disturbance to certain fish species such as hearing specialists Twaite Shad and Allis Shad, and potentially affect host availability for the parasitic feeders, Sea and River Lamprey, if the operating frequencies of the sound emitted falls within their hearing range. Therefore, likely or possible effects of underwater noise on Annex II fish species from these activities **cannot be excluded.**

Please see Section 3.3.1 for details on operating frequencies and sound pressure levels of the proposed equipment to be used during geophysical and geotechnical surveys.

3.4.2.2 DISTURBANCE FROM INCREASED SSC (FROM ENVIRONMENTAL AND GEOTECHNICAL SURVEYS)

Elevated levels of suspended sediment concentrations (SSC) can directly impact fish by physically damaging tissues and organs (i.e. damaging gill tissue or reducing respiration by clogging gills) and indirectly impact fish by decreasing light penetration and visual clarity in the water, which can cause a range of effects from behavioural changes, decreased resistance to infection/disease, reduced growth and mortality (Kemp, *et al*., 2011). Various factors can increase the severity of the impact such as sediment concentration, particle size and shape, species, associated pollutants, duration/frequency of exposure, and life stage at time of exposure (Kemp, *loc cit*.).

The geotechnical sampling methods proposed are likely to cause a small amount of sediment to become suspended. The resulting sediment suspension will be dispersed and deposited on the sea floor at a location subject to wave action and tidal stream. As a result, the deposition levels of this material is considered not to be significant and within storm background levels of sediment migration in the MUL application area. Therefore, likely or possible significant effects as a result of increased SSC from these proposed activities on migratory Annex II fish species are considered negligible and are excluded from further screening.

3.4.2.3 Mortality or Injury Resulting from Pollution/Littering Event

Pollution and littering can directly impact on the fitness and health of species/communities connected with the marine environment, which could in turn alter habitat structure/habitats. Annex II fish species can be affected from a pollution/littering event which could result in death or induce a reduction in health and fitness levels in populations (i.e. feeding and breeding success).

As previously discussed above in Section 3.2.3 (Marine Ornithology), the potential for accidental discharge and spillage of oils, fuels and materials will be managed through compliance with MARPOL. Therefore, likely or possible significant effects from accidental littering or a pollution event on Annex II anadromous fish species from the survey activities and vessels are not considered likely and can be excluded**.**

3.4.3 Other Annex II Species

Otters are opportunistic semi-aquatic predators preying on a range of prey sources where available, including but not limited to insects, freshwater and marine invertebrates, small mammals, birds, amphibians and fruit. Otters residing along coastlines have a greater niche breadth than otters living in freshwater systems, encompassing a wide range of intertidal prey (NPWS, 2010/12). Coastal otters mostly feed close to the shore with a diving depth limit of up to 10m. Due to their plasticity in habitat types suitable for otter and their wide variety in prey taxa, their territories and hunting range can reach several kilometers, depending on food availability. Generally, otters residing along a coastline (such as the River Boyne estuary and coastline, and the River Nanny that enters the sea through Laytown and along the coastline) tend to have smaller hunting/foraging range as food resources are plentiful.

Although otters are a mobile species, they have defined territories, with territorial markings typically occurring by means of sprainting or anal secretions deposited as territorial signposts. Male otter territories are approximately 13.2 ± 5.3km in length along mesotrophic (i.e. rivers with an intermediate level of productivity) and oligotrophic rivers (i.e. river with low levels of productivity), however with a high degree of variability as territorial males respond quickly to social perturbation. The territory of female otters in mesotrophic rivers is approximately 7.5 ± 1.5km in length and 6.5 ± 1.0km in coastal environments (Reid, *et al*., 2013, and references therein).

The potential effects on Otter from the proposed SI survey activities are:

- Disturbance and displacement from SI survey activities from visual impacts in the intertidal or shallow subtidal area.
- Disturbance and displacement from SI survey activities from underwater noise in the shallow subtidal area (**outlined above in Section 3.3.1**)
- Indirect effects through impacts on prey availability and prey acquisition
- Mortality or injury resulting from litter and pollution event.

It is considered that there are no other Annex II species for which Natura 2000 Sites have been designated with connectivity to the proposed survey activities.

3.4.3.1 Disturbance and Displacement from SI Survey Activities

There is a potential for behavioural effects due to increase noise levels and visual stimuli from the proposed SI activities (including ecological and archaeological intertidal walkover surveys, or intertidal geotechnical surveys) in the intertidal and the shallow subtidal for the otter. Potential effects include a reduction in resting spots (known as 'couches') and breeding locations (known as 'natal holts' where the rearing of cubs occurs), reduced foraging opportunities, and disruption/disturbance to commuting routes.

Note, behavioural effects such as disturbance, displacement, PTS and TTS resulting from anthropogenic induced underwater noise from the proposed SI survey activities is evaluated in Section 3.3.1 under Marine Mammals for otter.

In relation to Otter, the River Boyne and Blackwater SAC is within the ZoI of the MUL area and the proposed survey activities. Therefore, LSE as a result of underwater noise from the proposed survey activities on Otter **cannot be excluded.**

3.4.3.2 Indirect Effects through Impacts on Prey Availability and Prey Acquisition

Prey availability of otter may be affected by the proposed survey activities due to disturbance and displacement of certain mobile prey species such as fish. Increased SSC (as discussed in Section 3.4.2 above) may have an impact on prey species such as mobile fish and invertebrates avoiding the affected/disturbed area. This may result in prey species to smother and cover immobile benthic prey from the otter.

3.4.3.3 Mortality or Injury Resulting from Litter and Pollution

Otters can be affected by pollution events or littering in the marine and estuarine environments leading to reduced breeding and feeding success that can lead to death or a reduced level of health or fitness.

As previously discussed above in Section 3.2.3 (Marine Ornithology), the potential for accidental discharge and spillage of oils, fuels and materials will be managed through compliance with MARPOL. Therefore, likely or possible significant effects from accidental littering or a pollution event on the Annex II and IV semi-aquatic mammal species, the Otter, from the survey activities and vessel can be excluded.

4 SCREENING FOR APPROPRIATE ASSESSMENT (AA)

This Chapter outlines the criteria used for defining the Zone of Influence (ZOI)[2] relevant to the potential impacts of the proposed site investigation works, outlines how European Natura 2000 sites have been identified (i.e. using the Source-Pathway-Receptor model) and describes the sites which have been identified as having the potential to be affected by the proposed works. In determining the ZoI of the proposed SI survey activities on relevant SPAs, SACs, SCIs and QIs, guidance issued by the Office of the Planning Regulator, OPR Practice Note 01:PN01 (OPR, 2021) was used for the Source-Pathway-Receptor (S-P-R) model.

"A European site will only be at risk from likely significant effects where the Source-Pathway-Receptor link exist between the proposed development and the European site" (OPR, 2021).

The European Natura 2000 site information is based on the most up-to-date data available from the site synopses published by the National Parks and Wildlife Service (NPWS, www.npws.ie), the Joint Nature Conservation Committee (JNCC, https://jncc.gov.uk/) and the European Commission (https://ec.europa.eu/environment/nature/natura2000/index_en.htm).

Note, candidate Natura 2000 Sites (cSAC and cSPA) were also considered and were given equal consideration to SACs and SPAs.

The chapter continues to consider the Likely Significant Effect (LSE) to sites. QIs of SACs and SCIs of SPAs are assessed, with the assessment taking into account connectivity with European sites within Ireland as well as further afield (i.e. transboundary considerations). Potential connectivity includes direct effects (i.e. overlap with the MUL area and a European site), and indirect effects (i.e. if the European site is within range of the effects of the proposed survey activities).

4.1 ZONE OF INFLUENCE OF THE SITE INVESTIGATION ACTIVITIES.

The following SACs and SPAs have been identified as potentially falling within the ZOI of the proposed works:

- Any SAC within or adjacent to the MUL application area designated for Annex I habitats which have the potential to be affected by the proposed works given the nature of the activities using the S-P-R model (Figure 4-1). It should be noted, as the proposed SI activities for this MUL application are located completely within the marine environment no pathway has been

[2] The zone of influence (ZOI) of a project is the area over which ecological/environmental features may be affected by biophysical changes as a result of the proposed project and associated activities. This has the potential to extend far beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries.

identified to purely terrestrial habitats without any marine element (i.e. terrestrial habitats are outside the ZoI).

- Any SAC designated for mobile Annex II species which have the potential to occur within the MUL application area and be affected by the works (Table 4-7, Table 4-8, and Figure 4-2 and Figure 4-3). Depending on the QI, foraging distances and/or management units (Celtic and Irish Sea) have been used to determine relevant sites for screening. Foraging ranges may be in the region of 12km for Otter, 448km for Grey Seal, 273km for Common (Harbour) Seal, or the limits of the management units for Bottle-nosed Dolphin and Harbour Porpoise.

- Any SPA (or cSPA) designated for birds, including SPAs with breeding seabirds listed as species of Special Conservation Interests (SCIs), which have the potential to occur within the MUL application area and be affected by the proposed works are considered within this screening (Figure 4-5 to Figure 4-6 , Table 4-5). Indicative breeding season mean maximum foraging ranges from Woodward *et al*. (2019) have been used to determine relevant species (Table 4-4), where mean maximum is the maximum range reported in each study averaged across studies. See Appendix I for a description of how the mean maximum foraging ranges have been used to determine relevant sites and Woodward *et al.*, 2019, for the criteria used for assigning confidence levels. Considering the very temporary and localised nature of the effects of the proposed activities, a conservative ZoI is adopted with respect to SPAs and their SCIs, with all those sites in the vicinity of the MUL application area considered. For migratory and wintering species of wildfowl and wader species outside the breeding season, and wintering gull populations at estuarine SPAs, sites within 15km of the MUL application area have been considered.

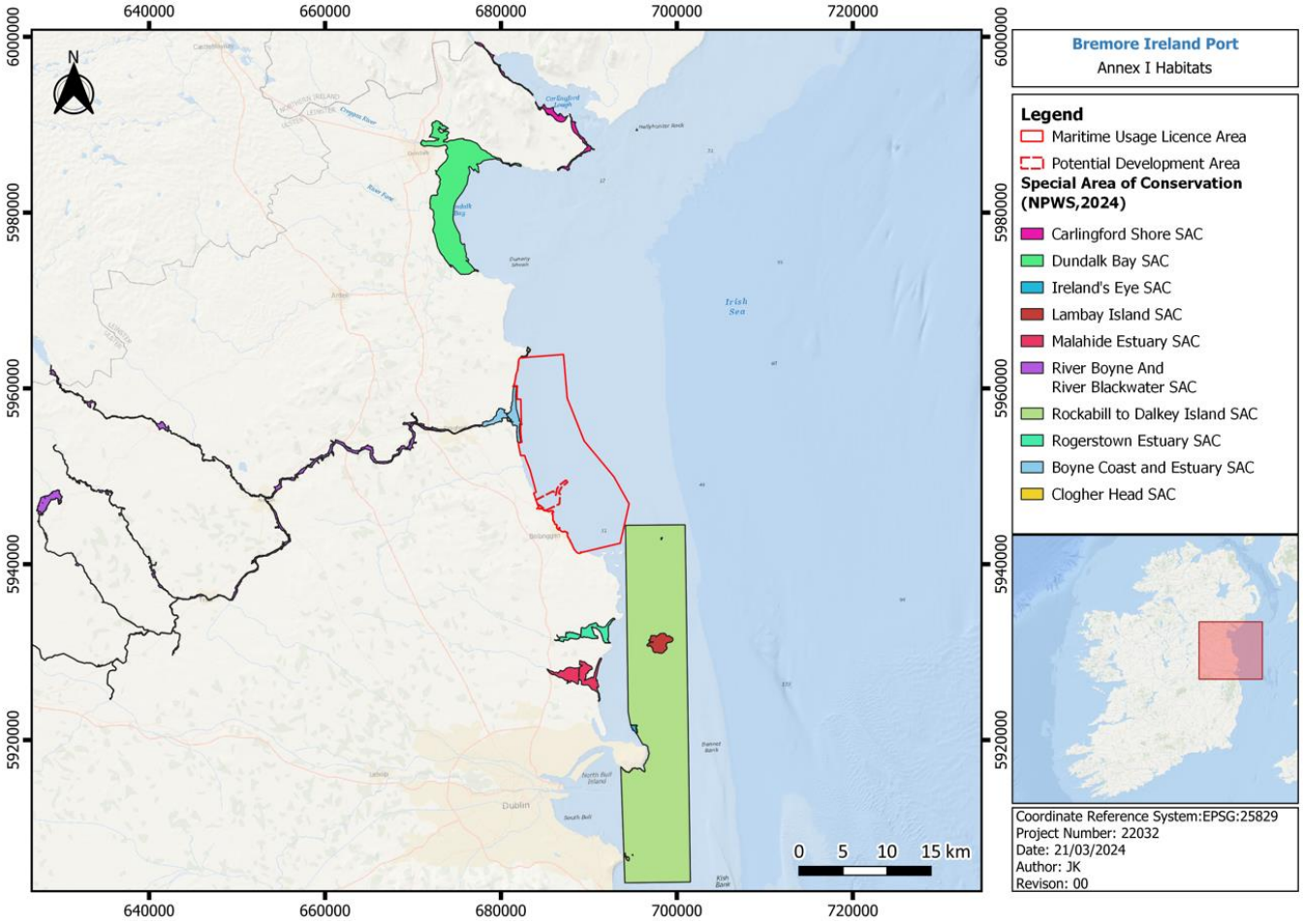


Figure 4-1: SAC Annex I Habitats

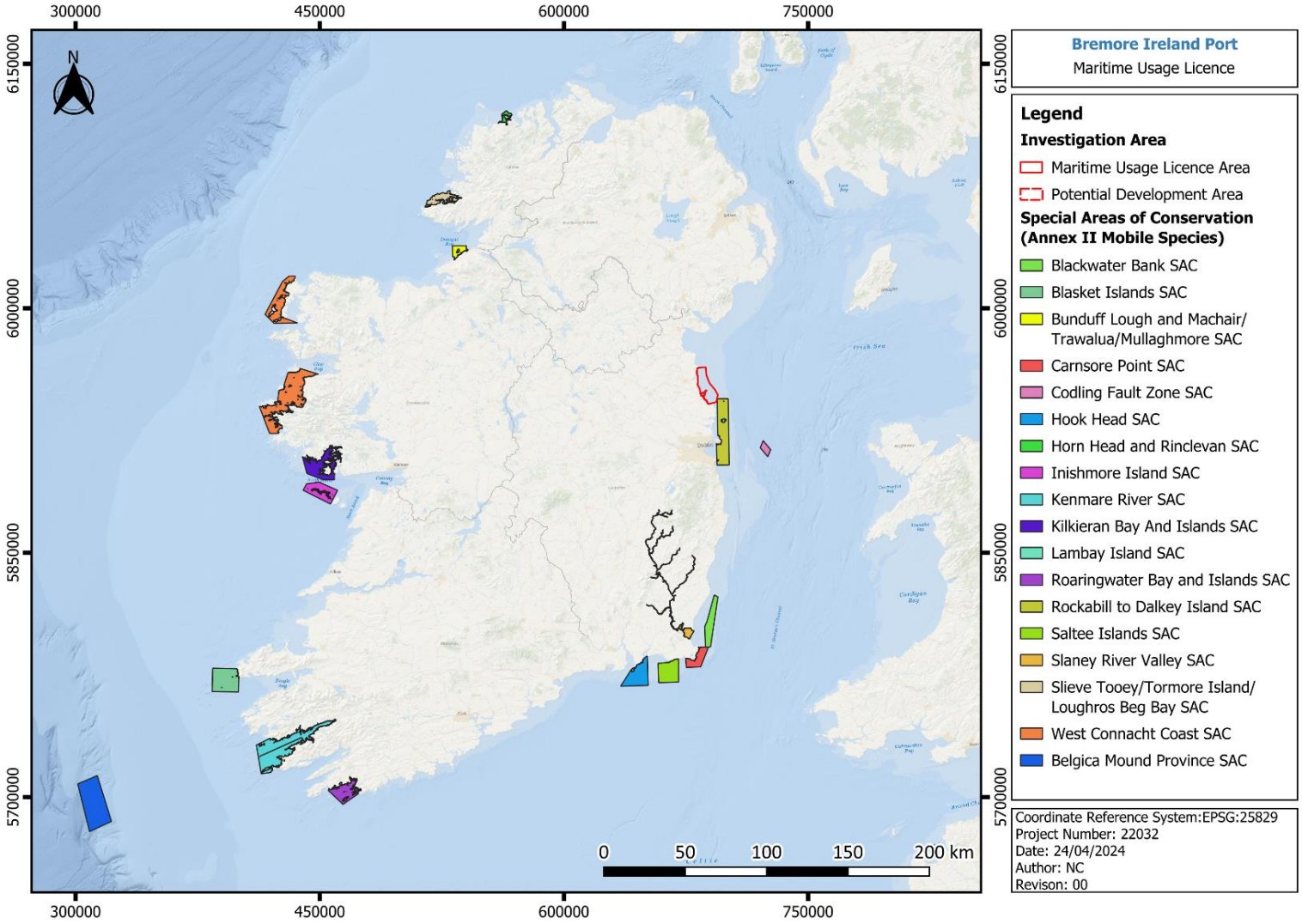


Figure 4-2: SAC Annex II Mobile Species Ireland

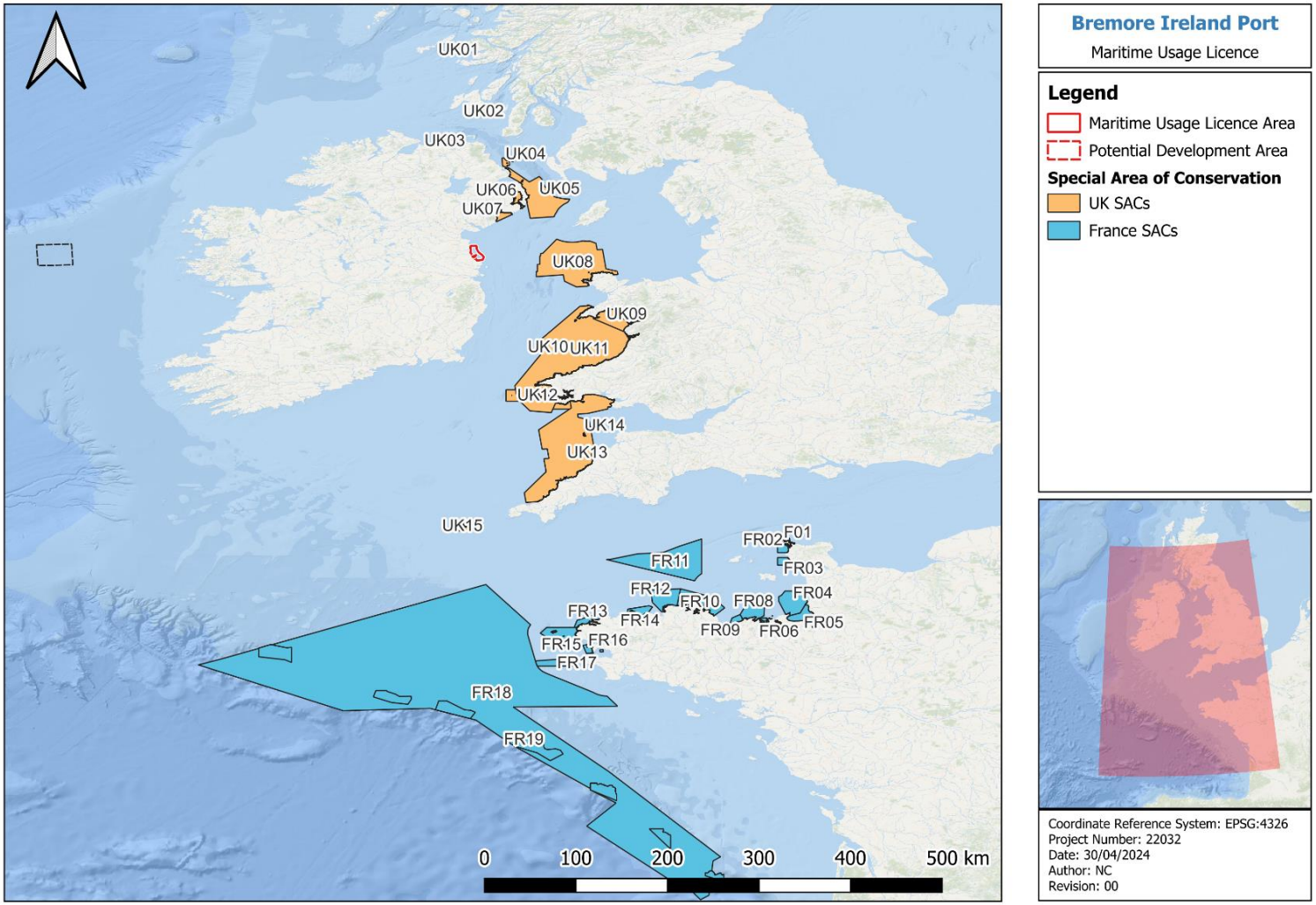


Figure 4-3: SAC Annex II Mobile Species UK (JNCC, 2020) and France (EEA, 2021)

Table 4-1 UK and France SAC Annex II Mobile Species Map Key

Labels	Site Code	Site Name	Labels	Site Code	Site Name
UK01	UK0030289	Treshnish Isles	FR01	FR2500084	Récifs et Landes de la Hague
UK02	UK0030067	South-East Islay Skerries	FR02	FR2502019	Anse de Vauville
UK03	UK0030383	Skerries and Causeway	FR03	FR2502018	Banc et Récifs de Surtainville
UK04	UK0030384	The Maidens	FR04	FR2500079	Chausey
UK05	UK0030399	North Channel	FR05	FR2500077	Baie du Mont Saint-Michel
UK06	UK0016618	Strangford Lough	FR06	FR5300061	Estuaire de la Rance
UK07	UK0016612	Murlough	FR07	FR5300012	Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard
UK08	UK0030398	North Anglesey Marine / Gogledd Môn Forol	FR08	FR5300011	Cap d'Erquy - Cap Fréhel

Labels	Site Code	Site Name	Labels	Site Code	Site Name
UK09	UK0013117	Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau	FR09	FR5300066	Baie de Saint-Brieuc - Est
UK10	UK0030397	West Wales Marine / Gorllewin Cymru Forol	FR10	FR5300010	Tregor Goëlo
UK11	UK0012712	Cardigan Bay/ Bae Ceredigion	FR11	FR2502022	Nord Bretagne DH
UK12	UK0013116	Pembrokeshire Marine/ Sir Benfro Forol	FR12	FR5300009	Côte de Granit Rose-Sept-Iles
UK13	UK0030396	Bristol Channel Approaches / Dynesfeydd Môr Hafren	FR13	FR5300015	Baie de Morlaix
UK14	UK0013114	Lundy	FR14	FR5300017	Abers - Côte des Legendes
UK15	UK0013694	Isles of Scilly Complex	FR15	FR5300018	Ouessant-Molène
			FR16	FR5302006	Côtes de Crozon
			FR17	FR5302007	Chaussée de Sein
			FR18	FR5302015	Mers Celtiques - Talus du Golfe de Gascogne
			FR19	FR5302016	Récifs du talus du golfe de Gascogne

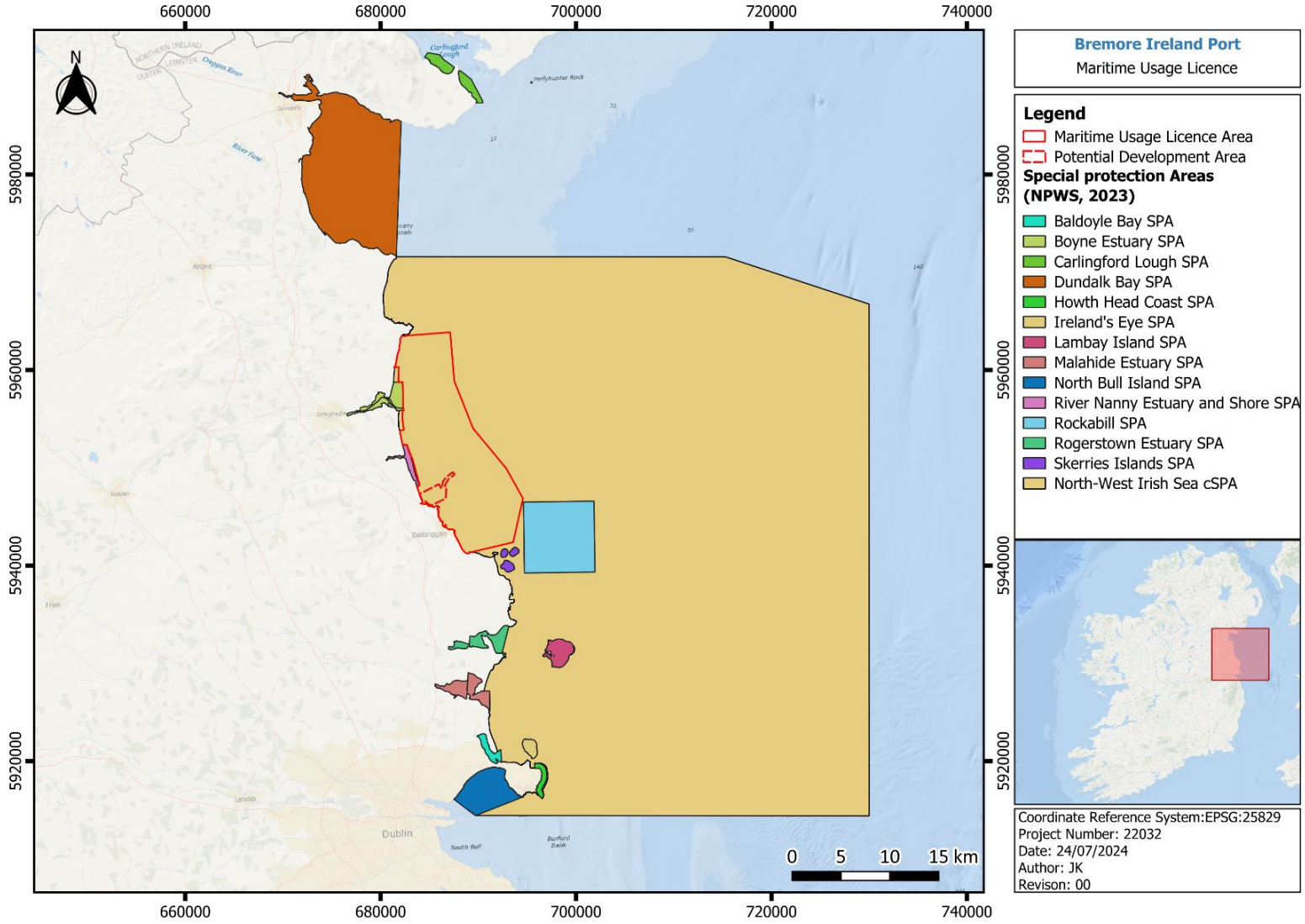


Figure 4-4 SPAs Ireland in the vicinity of the Licence Area

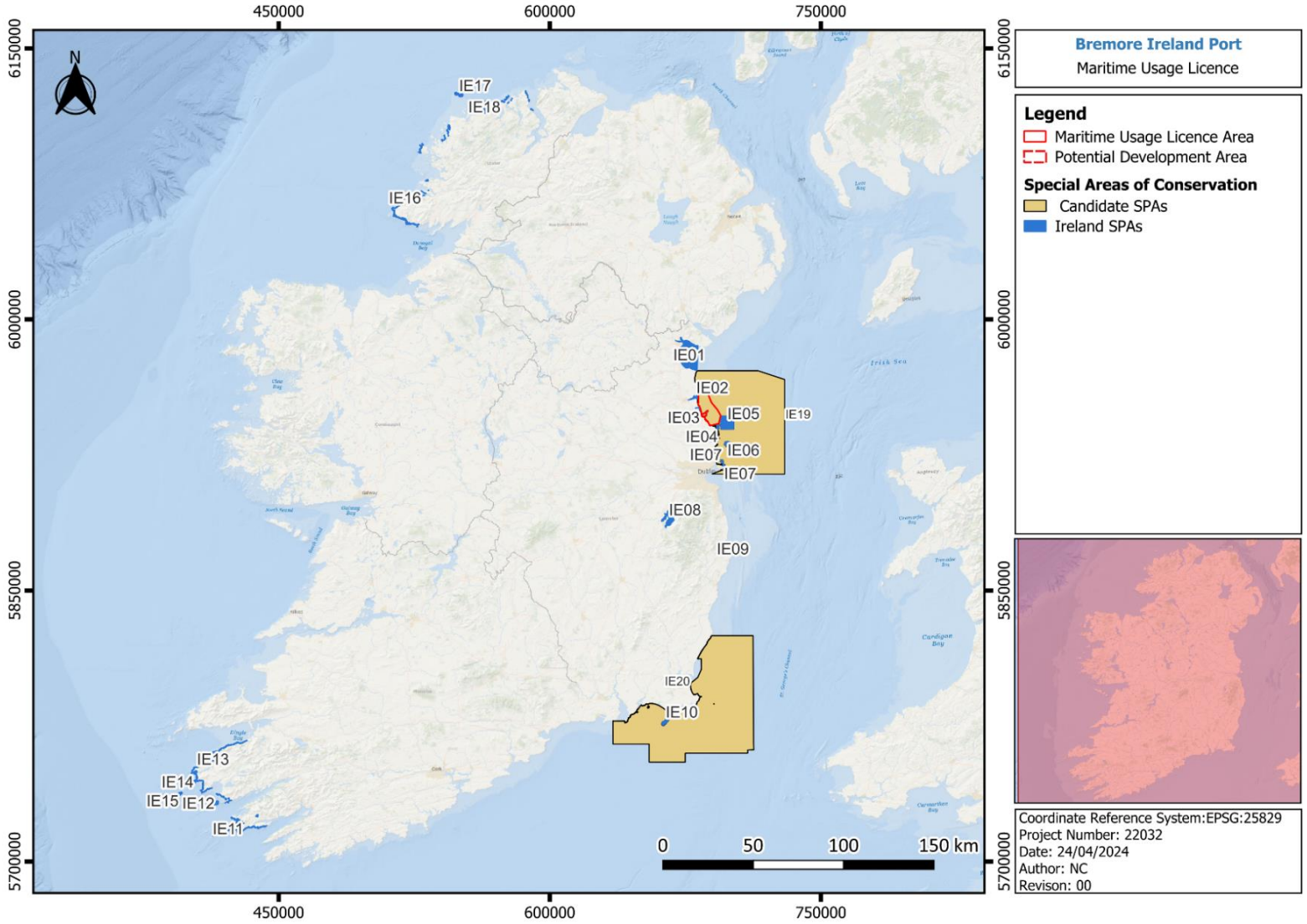


Figure 4-5: SPAs Ireland

Table 4-2 Ireland SPAs Map Key

Label	Site Code	Site Name	Label	Site Code	Site Name
IE01	4026	Dundalk Bay SPA	IE14	4003	Puffin Island SPA
IE02	4080	Boyne Estuary SPA	IE15	4007	Skelligs SPA
IE04	4122	Skerries Islands SPA	IE16	4150	West Donegal Coast SPA
IE05	4014	Rockabill SPA	IE17	4073	Tory Island SPA
IE06	4069	Lambay Island SPA	IE18	4194	Horn Head to Fanad Head SPA
IE07	4113	Howth Head Coast SPA		4063	Poulaphouca Reservoir SPA
IE07	4117	Ireland's Eye SPA	IE19	IE004236	North-west Irish Sea cSPA
IE08	4063	Poulaphouca Reservoir SPA	IE20	IE004237	Seas off Wexford cSPA
IE09	4127	Wicklow Head SPA			
IE10	4002	Saltee Islands SPA			
IE11	4155	Beara Peninsula SPA			
IE13	4154	Iveragh Peninsula SPA			

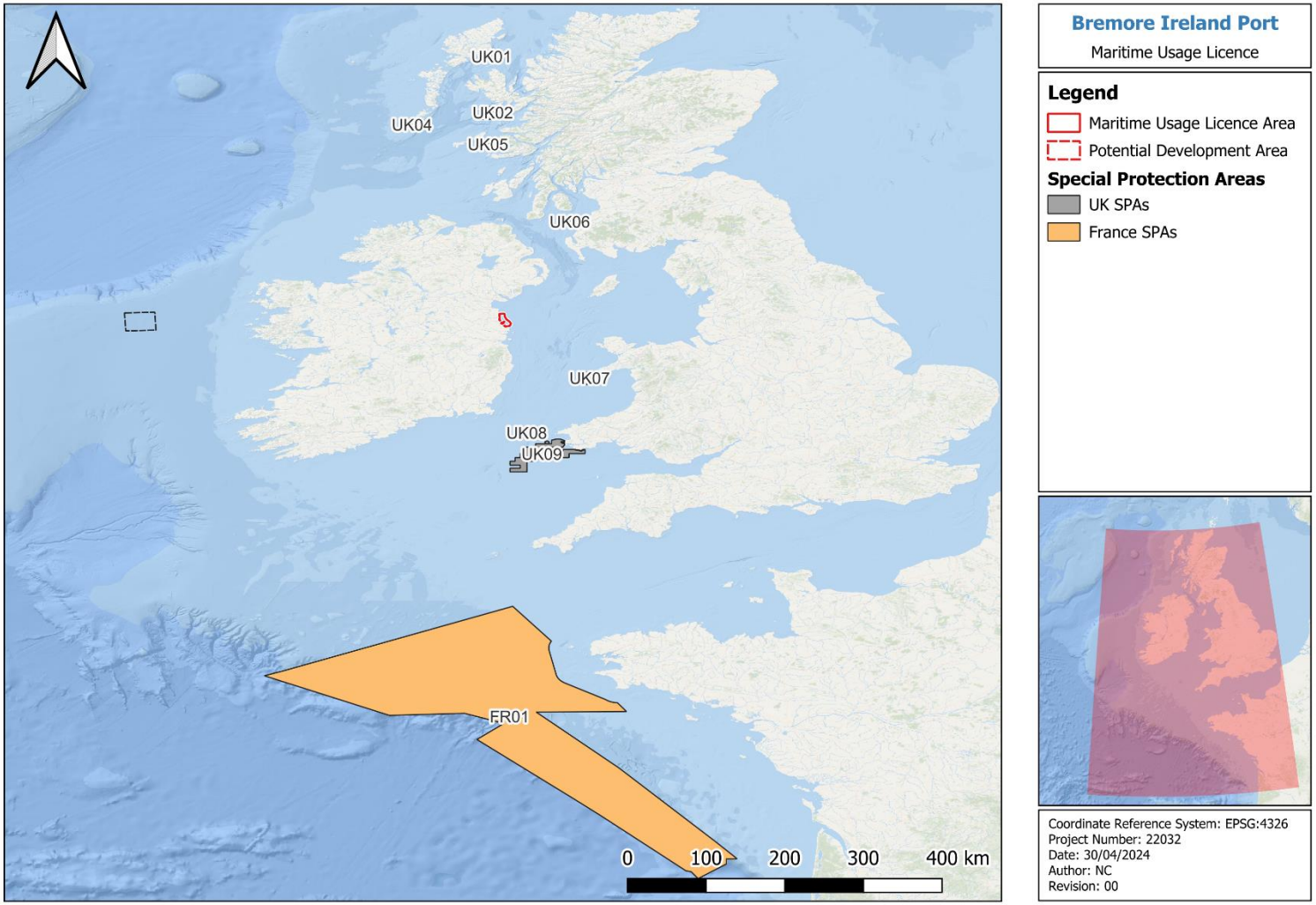


Figure 4-6: SPA UK (JNCC, 2021) and France (EEA, 2021)

Table 4-3 SPAs UK and France Map Key

Label	Site Code	Site Name	Label	Site Code	Site Name
UK01	UK9001041	The Shiant Isles	FR01	FR5212016	Mers Celtiques - Talus du golfe de Gascogne SPA
UK02	UK9001341	Rum			
UK04	UK9001121	Mingulay and Berneray			
UK05	UK9003041	Treshnish Isles			
UK06	UK9003091	Ailsa Craig			
UK07	UK9013121	Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island			
UK08	UK9014041	Grassholm			
UK09	UK9014051	Skomer, Skokholm and the Seas off Pembrokeshire			

4.2 PRE-SCREENING OF NATURA 2000 SITES USING SOURCE-PATHWAY-RECEPTOR MODEL AND ASSOCIATED DESIGNATED INTERESTS

A Source-Pathway-Receptor (SPR) model has been used to identify the existence and characteristics of the pathways that could link these European sites in the ZOI of the proposed site investigation activities, and their Qualifying Interests to the proposed (Table 4-6) as outlined in OPR Practice Note 01: PN01 (OPR, 2021).

As outlined in Office of the Planning Regulator (2021) "*The zone of influence of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. This should be established on a case-by-case basis using the Source-Pathway-Receptor framework and not by arbitrary distances (such as 15 km)*."

Full European site and feature background information has not been reproduced from the NPWS website as PN01 states "short paraphrasing and/or cross reference to NPWS is acceptable – it is not necessary to reproduce the full text on the QI/SC"; instead, the relevant information has been paraphrased with NPWS resources referenced as appropriate**.**

Please note:

- Where site investigation activities are located outside of and not adjacent to SACs, no source-pathway-receptor connection has been identified to the designated Annex I habitats within these SACs.

It should be noted, a pre-screening has been undertaken to identify European Sites (i.e. SACs and SPAs) with the Qualifying Interests of Annex I habitats, Annex II marine mobile species (marine mammals, otter and migratory fish) and the Special Conservation Interests of SPAs to be considered in the Stage 1 Screening for Appropriate Assessment. This approach allowed for the assessment of impacts to be focused on the impacts that could potentially have likely significant effects on the receiving European Sites (i.e. the Annexed habitat/species).

4.2.1 MARINE ORNITHOLOGY

Ireland is a highly important breeding, wintering and migratory stop-over destination for many species of birds. The estuaries, coastal sea cliffs and offshore islands of Ireland are host to nationally and internationally important assemblage of seabirds (diving and surface feeding spp.), shorebirds (i.e. wader and dabbler spp.) and wildfowl (passerines), and as such many sites are designated as SPAs for these SCI bird species under the terms of the EU Birds Directive (2009/147/EC) and are protected under national legislation (i.e. Wildlife Acts, as amended). Estuarine habitats, such as the River Boyne and estuary adjacent to the MUL application area, are critical stopover feeding grounds for many internationally and nationally important waterfowl, waders and passerines that are migrating on the East Atlantic Flyway (EAF) migratory route. The EAF is one of eight great global flyways, extending from Arctic breeding grounds in Canada/Greenland/Scandinavia/Siberia as far south as Sub-Saharan Africa.

The primary means of identifying relevant SCI species of relevant SPAs for this proposed project is based on their foraging ranges, their method of foraging, their occurrence in relation to the Site, and predicted density distributions of the relevant species in the MUL application area.

For seabirds, waders and waterfowl SCIs during the breeding season, foraging distances of breeding SCIs between an SPA and the proposed SI activities was screened for potential connectivity using the published information on foraging ranges from Woodware *et al.* (2019). The mean-maximum foraging ranges of the SCIs of relevant SPAs were used to predict if the SCIs were within distance of the MUL application area to forage, pass through or undertake other behaviours (i.e. bathing and preening). Within Table 4-4, the mean-max foraging range of relevant breeding seabird SCIs are provided.

Table 4-4 Indicative breeding season foraging ranges (in bold) and associated confidence levels (Woodward et al. 2019).

Indicative breeding season foraging ranges		
Species	Mean maximum (km ± SD)	Confidence Level
Eider	**21.5**	Poor
Red-throated diver	9	Low
Fulmar*	**542.3** ± 657.9	Good
Manx shearwater*	**1,346.8** ±,1,018.7	Moderate
European storm petrel	**336**	Poor
Leach's storm petrel	n/a	Moderate
Gannet	**315.2** ± 194.2	Highest
Cormorant	**25.6** ± 8.3	Moderate
Shag	**13.2** ± 10.5	Highest
Arctic skua	n/a	Poor
Great skua	**443.3** ± 487.9	Uncertain
Black-headed gull	**18.5**	Uncertain
Common gull	**50**	Poor
Mediterranean gull	**20**	Uncertain
Herring gull	**58.8** ± 26.8	Good
Lesser black-backed gull	**127** ± 109	Highest
Kittiwake	**156.1** ± 144.5	Good
Sandwich tern	**34.3** ± 23.2	Moderate
Roseate tern	**12.6** ± 10.6	Moderate
Common tern	**18.0** ± 8.9	Good
Arctic tern	**25.7** ± 14.8	Good
Little tern	**5**	Moderate
Guillemot	**73.2** ± 80.5	Highest
Razorbill	**88.7** ± 75.9	Good
Puffin	**137.1** ± 128.3	Good

Indicative breeding season foraging ranges		
Species	Mean maximum (km ± SD)	Confidence Level
* For SCI species with mean-max foraging ranges exceeding 500km (i.e. Fulmar and Manx Shearwater), a maximum range of 500 km has been applied. Though individual birds may forage in locations at distances exceeding 500 km from more distant breeding SPAs, the abundance of these birds within the very large foraging sites of these species likely to occur within the MUL application area is considered negligible. No route to LSE is concluded as the MUL application area would not constitute a core part of their foraging range.		

For migratory and wintering species (including wintering gull populations at estuarine SPAs) of seabirds, waders and waterfowl SCIs during the non-breeding seasons, SPAs within 15km of the MUL application area have been considered for screening. It is known that wintering SCIs within estuarine SPAs have much smaller foraging distances than foraging distances of breeding seabirds, however, wintering estuarine SCIs are known to move between estuaries which are in close proximity in search of resources. Therefore, as wintering SCIs may relocate to estuarine habitats outside designated sites close to the MUL application area, it is possible that the proposed SI activities may impact upon SCIs using ex-situ habitats for which they are designated SCIs.

Given that such movements will occur most frequently between estuarine habitats within the surrounding areas and the highly localised, temporary nature and short duration of the proposed SI activities, directly overlapping SPAs with the MUL application area, or within 15km, have been considered within this screening exercise for LSE. SPAs situated outside the 15 km ZoI from the MUL application area are considered negligible as no potential for LSE on the SCIs of these SPAs. In Table 4-5, the SPAs and SCIs to be included in screening are listed.

Table 4-5 SPAs included in screening.

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)		
North-west Irish Sea cSPA IE004236	0 km overlapping	**Wintering** Red-throated Diver [A001] Great Northern Diver [A003] Fulmar [A009] Common Scoter [A065] Little Gull [A177] Black-headed Gull [A179] Common Gull [A182] Herring Gull [A184] Great Black-backed Gull [A187] Kittiwake [A188] Guillemot [A199] Razorbill [A200]	**Breeding** Manx Shearwater [A013] Cormorant [A017] Shag [A018] Lesser Black-backed Gull [A183] Roseate Tern [A192] + Post-breeding aggregation Common Tern [A193] + Post-breeding aggregation Arctic Tern [A194] + Post-breeding aggregation Little Tern [A195] Puffin [A204]	**Diving** Red-throated Diver [A001] Great Northern Diver [A003] Manx Shearwater [A013] Cormorant [A017] Shag [A018]
River Nanny Estuary and Shore SPA IE004158	0.14 km	**Wintering** Oystercatcher [A130] Ringed Plover [A137] Golden Plover [A140] Knot [A143] Sanderling [A144] Herring Gull[A184] Wetland & Waterbirds [A999]		
Boyne Estuary SPA IE004080	0.14 km	**Wintering** Shelduck [A048] Oystercatcher [A130] Golden Plover [A140] Grey Plover [A141] Lapwing [A142] Knot [A143]	**Breeding** Little Tern [A195]	

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)		
		Sanderling [A144] Black-tailed Godwit [A156] Redshank [A162] Turnstone [A169] Wetland and Waterbirds [A999]		
Rockabill SPA IE004014	0.2 km	**Wintering** Purple Sandpiper [A148]	**Breeding** Roseate Tern [A192] Common Tern [A193] Arctic Tern [A194]	
Skerries Islands SPA IE004122	0.5 km	**Wintering** Cormorant [A017] Shag [A018] Light-bellied Brent Goose [A046] Purple Sandpiper [A148] Turnstone [A169] Herring Gull [A184]	**Breeding** Cormorant [A017] Shag [A018]	**Diving** Cormorant [A017] Shag [A018]
Dundalk Bay SPA IE004026	8.8 km	**Wintering** Great Crested Grebe [A005] Greylag Goose [A043] Light-bellied Brent Goose [A046] Shelduck [A048] Teal [A052] Mallard [A053] Pintail [A054] Common Scoter [A065] Red-breasted Merganser [A069] Oystercatcher [A130] Ringed Plover [A137] Golden Plover [A140] Grey Plover [A141]		**Diving** Red-breasted Merganser [A069] Great Crested Grebe [A005] Common Scoter [A065]

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)		
		Lapwing [A142] Knot [A143] Dunlin [A149] Black-tailed Godwit [A156] Bar-tailed Godwit [A157] Curlew [A160] Redshank [A162] Black-headed Gull [A179] Common Gull [A182] Herring Gull [A184] Wetland and Waterbirds [A999]		
Lambay Island SPA IE004069	10.7 km	**Wintering** Greylag Goose [A043] Herring Gull [A184]	**Breeding** Fulmar [A009] Cormorant [A017] Shag [A018] Lesser Black-backed Gull [A183] Herring Gull [A184] Kittiwake [A188] Guillemot [A199] Razorbill [A200] Puffin [A204]	**Diving** Cormorant [A017] Shag [A018] Guillemot [A199] Razorbill [A200] Puffin [A204] Fulmar [A009]
Ireland's Eye SPA IE004117	20.2 km	**Breeding** Cormorant [A017] Herring Gull [A184] Guillemot [A199] Razorbill [A200] Kittiwake [A188] **Diving** Cormorant [A017] Guillemot [A199] Razorbill [A200]		
Howth Head Coast SPA IE004113	22.7 km	**Breeding** Kittiwake [A188]		

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)		
Irish Sea Front SPA UK9020328	57.5 km	**Breeding/Diving** Manx Shearwater[A013]		
Poulaphouca Reservoir SPA IE004063	64.1 km	**Wintering** Lesser Black-backed Gull [A183]		
Wicklow Head SPA IE004127	68.8 km	**Breeding** Kittiwake [A188]		
Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA UK9013121	115.8 km	**Breeding/Diving** Manx Shearwater[A013]		
Seas off Wexford cSPA IE004237	119.5 km	**Breeding** Gannet [A016] Fulmar [A009] Manx Shearwater[A013] Kittiwake [A188] Lesser Black-backed Gull [A183] Puffin [A204]	**Wintering**	**Diving** Gannet [A016] Fulmar [A009] Manx Shearwater[A013] Kittiwake [A188] Puffin [A204]
Saltee Islands SPA IE004002	176.9 km	**Breeding/Diving** Fulmar [A009] Gannet [A016]		
Ailsa Craig SPA	176.9 km	**Breeding/Diving** Gannet [A016]		

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)
UK9003091		
Skomer, Skokholm and the Seas off Pembrokeshire SPA UK9014051	207.6 km	**Breeding** European Storm Petrel [A014]
Grassholm SPA UK9014041	208.9 km	**Breeding/Diving** Gannet [A016]
Horn Head to Fanad Head SPA IE004194	309 km	**Breeding/Diving** Fulmar [A009]
Tory Island SPA IE004073	321.7 km	**Breeding/Diving** Fulmar [A009]
Treshnish Isles UK9003041	327.1 km	**Breeding** European Storm Petrel [A014]
Rum SPA UK9001341	373.2 km	**Breeding/Diving** Manx Shearwater [A013]
Mingulay and Berneray SPA UK9001121	380.1 km	**Breeding/Diving** Fulmar [A009]
West Donegal Coast SPA IE004150	382.5 km	**Breeding/Diving** Fulmar [A009]
Beara Peninsula SPA IE004155	448.7 km	**Breeding/Diving** Fulmar [A009]
Deenish Island and Scariff Island SPA IE004175	464.6 km	**Breeding/Diving** Fulmar [A009] Manx Shearwater [A013]
Iveragh Peninsula SPA IE004154	470.5 km	**Breeding/Diving** Fulmar [A009]
Skelligs SPA IE004007	477.6 km	**Breeding/Diving** Fulmar [A009]

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)
		Manx Shearwater [A013]
Puffin Island SPA IE004003	479 km	**Breeding/Diving** Fulmar [A009] Manx Shearwater [A013]
The Shiant Isles SPA UK9001041	487.8 km	**Breeding/Diving** Fulmar [A009]
Mers Celtiques - Talus du golfe de Gascogne SPA FR5212016	499.2 km	**Breeding/Diving** Fulmar [A009] Manx Shearwater [A013]

4.2.2 ANNEX I BENTHIC HABITATS

All site investigation activities are located outside of Natura 2000 sites designated for Annex I habitat QIs and no source-pathway-receptor connection has been identified, therefore there will be **no direct effect** on designated Annex I habitat QIs within Natura 2000 sites. Therefore, there is no overlap between the proposed Maritime Usage Licence area and any SACs designated for the protection of the Qualifying Interest Annex I Habitats.

Rockabill to Dalkey Island SAC (003000), Boyne Coast and Estuary SAC and Clogher Head SAC are adjacent to the MUL application area. Therefore, there is a potential for transport of suspended sediment to these sites from increased sedimentation caused by the site investigation activities. Note Rockabill to Dalkey Island SAC is designated to protect a benthic habitat (Annex I Reef) (Table 4-6).

A source pathway receptor connection is possible for transport of suspended sediment to the Annex I reef feature of Rockabill to Dalkey Island SAC. However, the spatial footprint of the site investigation SI is small and temporary in duration. In addition, these site investigation activities are conducted in a dynamic area within the Irish Sea, where tidal flows regularly interact with and mobilise unconsolidated seabed sediments. It is considered unlikely that physical disturbance to benthic communities such as reefs will be above natural levels experienced. The above listed potential effects from physical disturbance to marine benthic communities will be confined to the footprint of the equipment used as the seafloor in this area is that of sand mainly which will infill from surrounding sediments almost immediately.

As explained in Section 3.3, potential connectivity is considered for SACs within range (i.e. 1km) of indirect impacts of proposed SI activities. In Table 4-6, the SACs with Annex I habitats as QIs that are considered to have potential for connectivity are listed.

Table 4-6 SACs with Annex I habitats as QIs considered to have potential for connectivity.

SAC site name and code	Qualifying Interests (Habitats)	Distance (km)
Rockabill to Dalkey Island SAC IE003000	Reefs [1170]	0.2 km

4.2.3 ANNEX II SPECIES

The following section includes the identification of relevant SACs as associated with their Annex II marine mobile species; marine mammals, anadromous fishes, and otter.

Under Annex II, the listed species are '*animal and plant species of community interest whose conservation requires the designation of SACs'.*

4.2.3.1 MARINE MAMMALS

Annex II marine mammals of the Habitats Directive (Council Directive 92/43/EEC) that are present in the Irish Sea include:

- Cetaceans; and
    - Bottle-nosed Dolphin (*Tursiops truncatus*)
    - Harbour Porpoise (*Phocoena phocoena*)
- Pinnipeds;
    - Grey Seal (*Halichoerus grypus*)
    - Common (Harbour) Seal (*Phoca vitulina*)

*Note for pinnipeds, grey and common seals, a certain amount of time is spent hauled-out on land to rest, moult and pup. Once the breeding season is completed, most Grey Seals leave the haul-out sites after 2 to 3 weeks once their pups have fully moulted their white lanugo coat. The use of a particular SAC for pupping is very time and location specific.

The newly available data on grey and common seal movements (Carter, *et* al., 2022) provide SAC-specific estimates of at-sea distribution for use in marine spatial planning, demonstrating that hotspots of at-sea density in UK and Ireland-wide maps cannot always be apportioned to the nearest SAC.

Table 4-7 below summarises the ZoI for Marine Mammals and the management units are shown on

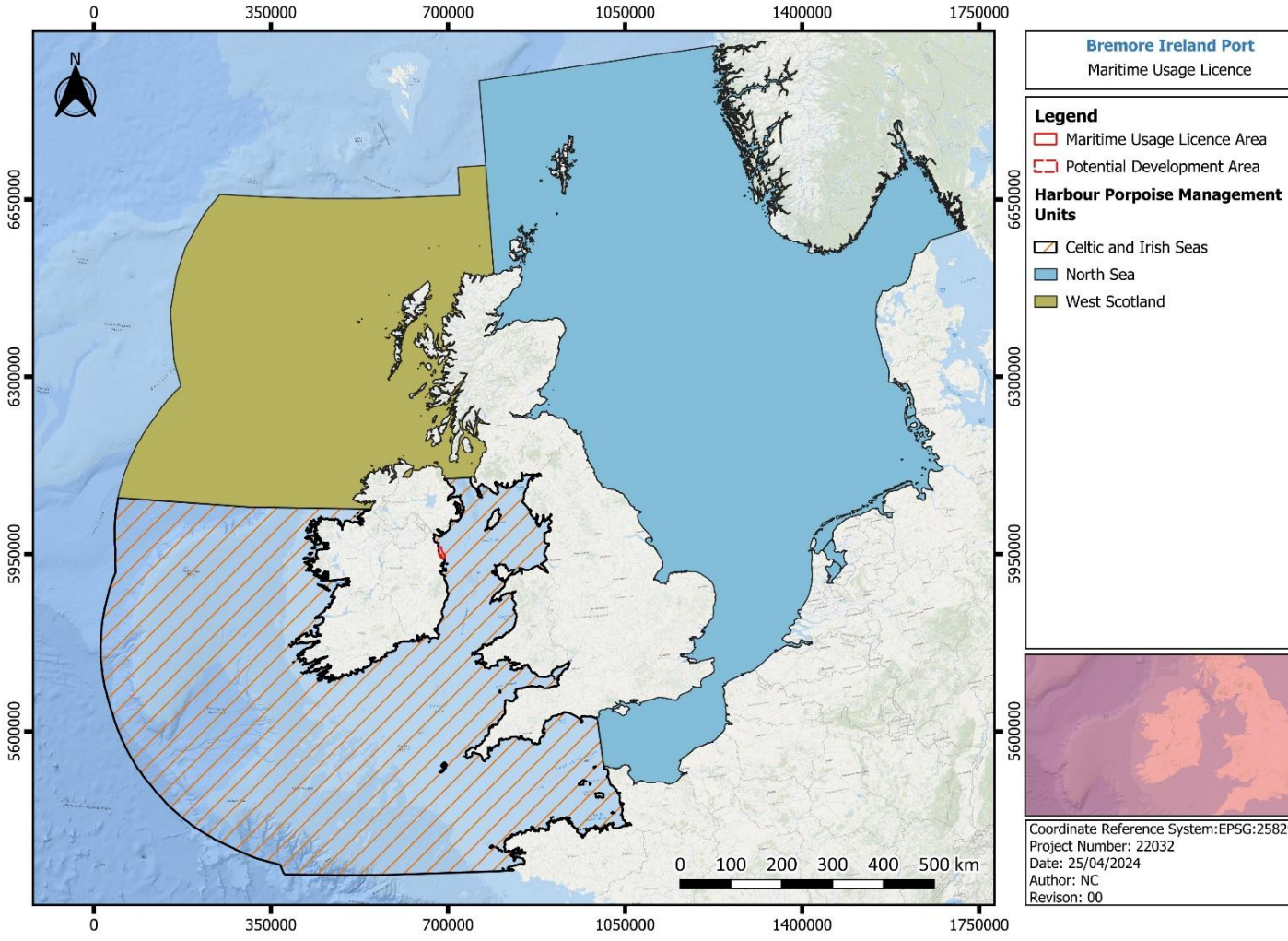


Figure 4-7 and Figure 4-8.

Table 4-7 Migratory species with a marine element for which SACs have been designated in Ireland and UK

Marine Species			Comments
1349	Bottlenose dolphin	*Tursiops truncatus*	Management units for harbour porpoise and bottlenose dolphin have been used to determine relevant sites depending on the Qualifying Interests
1351	Harbour porpoise	*Phocoena phocoena*	
1364	Grey seal	*Halichoerus grypus*	Foraging distances of 448 km for grey seals (from Carter et al, 2022),
1365	Common (Harbour) seal	*Phoca vitulina*	Foraging distances of 273 km for harbour seals (from Carter et al, 2022),

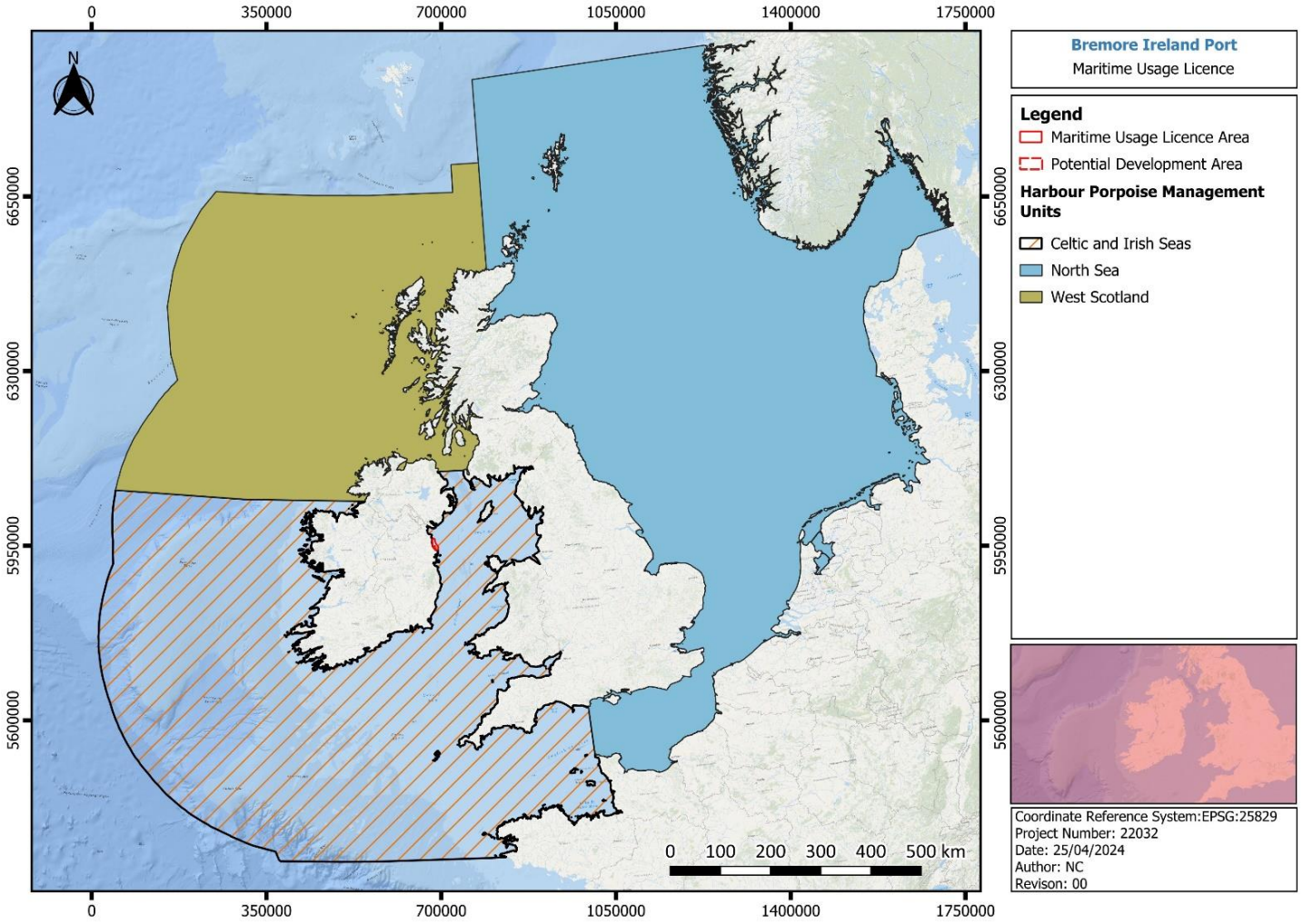
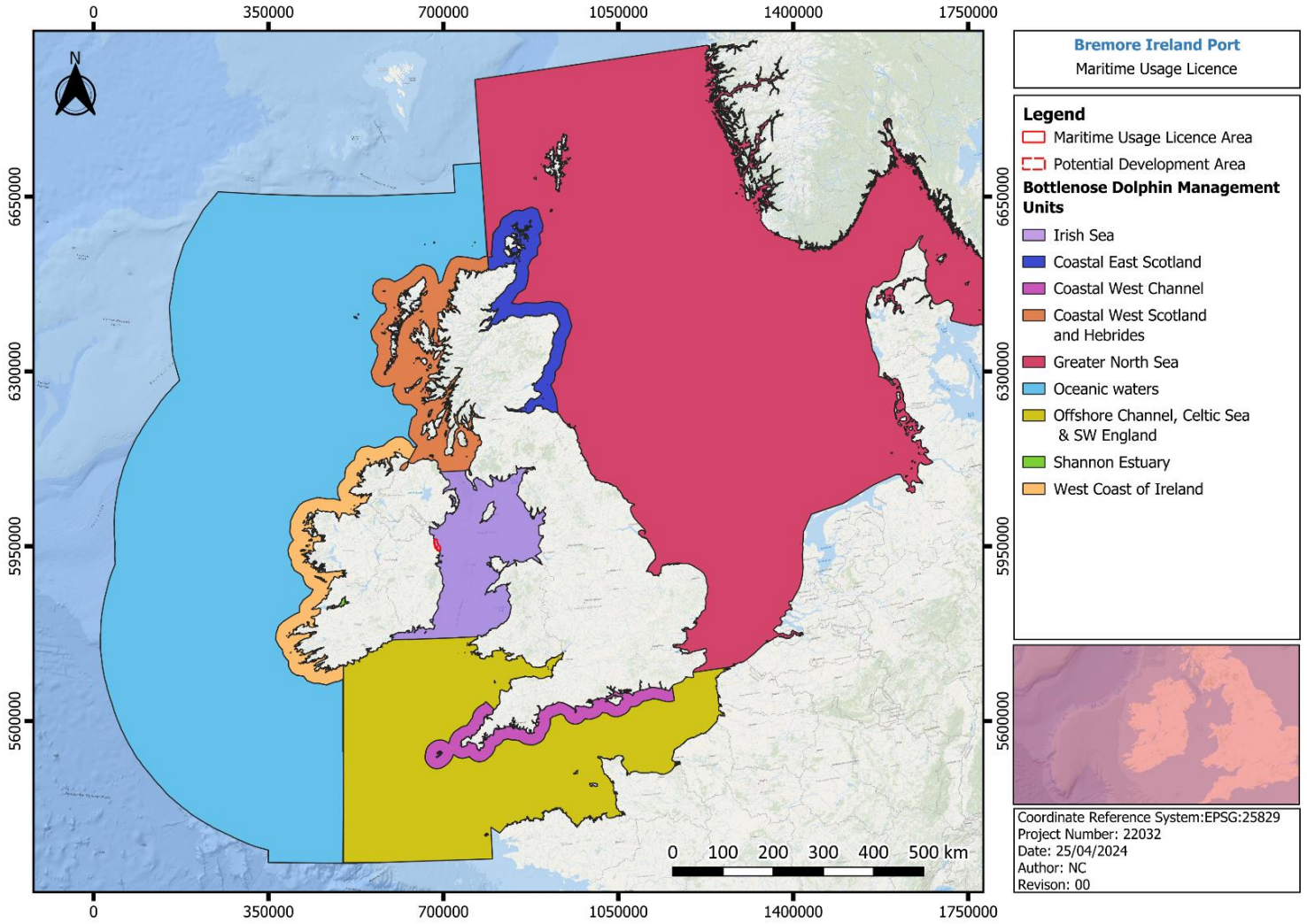


Figure 4-7: Harbour Porpoise Management Units (JNCC, 2023 Management Units)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350000
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Maritime Usage Licence
Legend
Maritime Usage Licence Area
Potential Development Area
Bottlenose Dolphin Management Units
Irish Sea
Coastal East Scotland
Coastal West Channel
Coastal West Scotland and Hebrides
Greater North Sea
Oceanic waters
Offshore Channel, Celtic Sea & SW England
Shannon Estuary
West Coast of Ireland
Coordinate Reference System:EPSG:25829
Project Number: 22032
Date: 25/04/2024
Author: NC
Revison: 00

Figure 4-8: Bottlenose Dolphin Management Units (JNCC, 2023)

In Table 4-8, the SACs with Annex II species as QIs that are considered to have potential for connectivity are listed.

Table 4-8 SACs included in screening

SAC Site code	SAC Site name	By sea distance from MUL Area (km)	QIs
003000	Rockabill to Dalkey Island	2.2	Harbour Porpoise *(Phocoena phocoena)* [1351]
000204	Lambay Island SAC	11.2	Grey Seal *(Halichoerus grypus)* [1364] Harbour Seal (*Phoca vitulina*) [1365] Harbour Porpoise *(Phocoena phocoena)* [1351]
003015	Codling Fault Zone SAC	40.1	Harbour Porpoise *(Phocoena phocoena)* [1351]
002953	Blackwater Bank SAC	120.57	Harbour Porpoise *(Phocoena phocoena)* [1351]
000781	Slaney River Valley SAC	143.9	Harbour Seal (*Phoca vitulina*) [1365]
002269	Carnsore Point SAC	152.8	Harbour Porpoise (*Phocoena phocoena*) [1351]
000707	Saltee Islands SAC	172.1	Grey Seal (*Halichoerus grypus*) [1364]
00764	Hook Head SAC	191.54	Harbour Porpoise *(Phocoena phocoena)* [1351]
000147	Horn Head and Rinclevan SAC	310.5	Grey Seal (*Halichoerus grypus*) [1364]
000190	Slieve Tooey/Tormore Island/Loughros Beg Bay SAC	378.7	Grey Seal (*Halichoerus grypus*) [1364]
000101	Roaringwater Bay and Islands SAC	385.5	Harbour Porpoise (*Phocoena phocoena*) [1351] Grey Seal (*Halichoerus grypus*) [1364]
002158	Kenmare River SAC	444.8	Harbour Porpoise (*Phocoena phocoena*) [1351]
002172	Blasket Islands	500.1	Harbour Porpoise (*Phocoena phocoena*) [1351]
002327	Belgica Mound Province SAC	574.27	Harbour Porpoise (*Phocoena phocoena*) [1351]
000213	Inishmore Island SAC	622.0	Harbour Porpoise (*Phocoena phocoena*) [1351]
002111	Kilkieran Bay and Islands SAC	603.7	Harbour Porpoise (*Phocoena phocoena*) [1351]
002998	West Connacht Coast SAC	476.5	Harbour Porpoise (*Phocoena phocoena*) [1351]
000625	Bunduff Lough and Machair/Trawalua/Mullaghmore SAC	431.8	Harbour Porpoise (*Phocoena phocoena*) [1351]
UK SAC Annex II			

SAC Site code	SAC Site name	By sea distance from MUL Area (km)	QIs
UK0016612	Murlough	41.3	Harbour Seal (*Phoca vitulina*) [1365]
UK0030398	North Anglesey Marine / Gogledd Môn Forol	50.3	Harbour Porpoise (*Phocoena phocoena*) [1351]
UK0030399	North Channel	64.6	Harbour Porpoise (*Phocoena phocoena*) [1351]
UK0016618	Strangford Lough	71.2	Harbour Seal (*Phoca vitulina*) [1365]
UK0030397	West Wales Marine / Gorllewin Cymru Forol	114.7	Harbour Porpoise (*Phocoena phocoena*) [1351]
UK0013117	Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau	117.1	Bottlenose Dolphin (*Tursiops truncatus*) [1349] Grey Seal (*Halichoerus grypus*) [1364]
UK0030384	The Maidens	140.3	Grey Seal (*Halichoerus grypus*)[1364]
UK0012712	Cardigan Bay/ Bae Ceredigion	168.9	Bottlenose Dolphin (*Tursiops truncatus*) [1349]
UK0013116	Pembrokeshire Marine/ Sir Benfro Forol	187.6	Grey Seal (*Halichoerus grypus*) [1364]
UK0030383	Skerries and Causeway	208.1	Harbour Seal (*Phoca vitulina*) [1365]
UK0030067	South-East Islay Skerries	225.9	Harbour Seal (*Phoca vitulina*) [1365]
UK0030396	Bristol Channel and Approaches	249.1	Harbour Porpoise (*Phocoena phocoena*) [1351]
UK0013114	Lundy	283.8	Grey Seal (*Halichoerus grypus*) [1364]
UK0030289	Treshnish Isles	325.8	Grey Seal (*Halichoerus grypus*) [1364]
UK0013694	Isles of Scilly Complex	400.4	Grey Seal (*Halichoerus grypus*) [1364]
France SAC Annex II			
FR5302015	Mers Celtiques - Talus du golfe de Gascogne	499.2	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR2502022	Nord Bretagne DH	569.9	Harbour Porpoise (*Phocoena phocoena*) [1351]

SAC Site code	SAC Site name	By sea distance from MUL Area (km)	QIs
FR5300017	Abers - Côte des légendes	568.6	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5300018	Ouessant-Molène	569.9	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5300009	Côte de Granit rose-Sept-Iles	576.6	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5300015	Baie de Morlaix	580.7	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5300010	Tregor Goëlo	599.6	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5302006	Côtes de Crozon	607.6	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5302007	Chaussée de Sein	618.6	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5302016	Récifs du talus du golfe de Gascogne	632.8	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR2500084	Récifs et landes de la Hague	664.9	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR2502019	Anse de Vauville	666.2	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5300011	Cap d'Erquy-Cap Fréhel	667.4	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5300066	Baie de Saint-Brieuc - Est	668.3	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR2502018	Banc et récifs de Surtainville	670.2	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5300012	Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard	690.9	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR2500079	Chausey	692.1	Harbour Porpoise (*Phocoena phocoena*) [1351]
FR5300061	Estuaire de la Rance	707.9	Harbour Porpoise (*Phocoena phocoena*) [1351]

SAC Site code	SAC Site name	By sea distance from MUL Area (km)	QIs
FR2500077	Baie du Mont Saint-Michel	720.9	Harbour Porpoise (*Phocoena phocoena*) [1351]

4.2.3.2 ANNEX II ANADROMOUS FISHES

The following anadromous fish species are listed under Annex II of the Habitats Directive (Council Directive 92/43/EEC), which means that they are 'animal and plant species of community interest whose conservation requires the designation of special areas of conservation (SACs)':

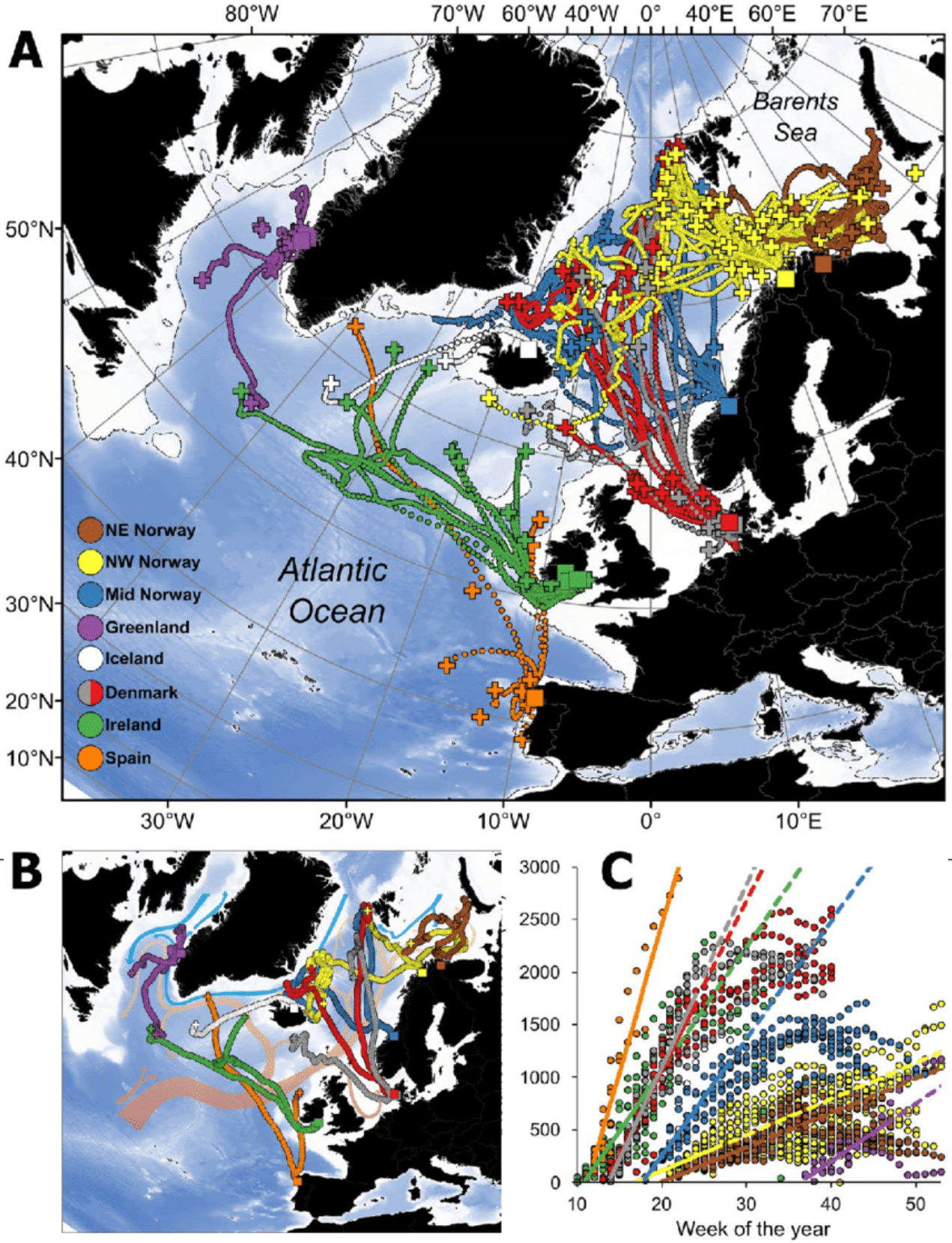
- Twaite shad (*Alosa fallax*) [1103];
- Allis shad (*Alosa alosa*) [1102];
- Atlantic salmon (*Salmo salar*) [1106];
- Sea lamprey (*Petromyzon marinus*) [1095];
- River lamprey (*Lampetra fluviatilis*) [1099]; and
- Freshwater Pearl Mussel (FWPM) (*Margaritifera margaritifera*) [1029] *

* Not an anadromous fish, however, this species has a symbiotic relationship with the anadromous fish, Atlantic Salmon.

There are a number of SAC rivers designated for Annex II migratory fish on the coast of Ireland. Although these SAC rivers are not within the marine environment, the abovementioned designated fish have a marine phase of their life cycle, relying on the sea to migrate to foraging grounds before returning to freshwater river systems to spawn. As such, there is a potential for these species to be within the MUL application area. There was considered to be potential connectivity with the SAC if the MUL application area overlapped the potential migration routes of any Annex II diadromous fish QIs.

Atlantic Salmon

In a recent acoustic telemetry study on Atlantic salmon smolts from in the Irish Sea and their migratory trajectory, it was revealed/found that Atlantic salmon smolts leaving rivers along the northeast coast of Ireland undertook a northerly migration out of the Irish Sea through the North Channel into deeper offshore waters further north (Barry *et al*., 2020). In addition, Atlantic salmon from SACs in Wales are also considered to migrate along prevailing currents north (Cefas, 2024) and the migratory route is unlikely to pass directly through Irish coastal waters. In another study, it was shown that salmon, migrating from southeast Ireland, and northwest Spain primarily migrated westward towards oceanographic fronts, out to the shelf edge before crossing the North Atlantic onto East Greenland for feeding (Rikardsen, *et al.,* 2021) – see Figure 4-9. **The zone of influence for Atlantic Salmon was therefore considered to be those rivers on the eastern seaboard north of Dublin Bay.**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Week of the year

Figure 4-9 Migrations of Atlantic salmon tagged in eight different geographic areas (Rikardsen, *et al.*, 2021).

Freshwater Pearl Mussel

As noted above in section 3.4.2, the freshwater pearl mussel (FWPM), although not a anadromous species, remaining in freshwater rivers for the entirety of their life cycle, do rely on their symbiotic relationship with Atlantic salmon (and brown trout) for a specific stage within their life-cycle. Therefore, it is considered that **the assessment of FWPM includes the assessment of impacts to Atlantic Salmon.**

Lamprey Species

As river and sea lamprey rely on their parasitic relationship with Atlantic salmon and shad species, the same logic for FWPM was applied to lamprey. Therefore, **the ZoI for these species includes the assessment of impacts to their annexed hosts, Atlantic salmon and shad species.** River lamprey are known to generally remain in the transitional waters of major estuaries, some near coastal habitats also utilised. They migrate from their coastal feeding grounds into freshwater to spawn. As such, only SAC rivers on the east coast, north of Dublin Bay are considered to have potential connectivity with the MUL application area and more distant SACs are considered too distant for any interaction resulting in significant impacts to occur. **A precautionary approach to the identification of relevant European sites has been applied; a 35km foraging distance has been applied, based on JNCC (2019), for sea and river lamprey.**

Shad Species

Twaite Shad are iteroparous (multiannual spawners) and possibly philopatric (homing to natal rivers to spawn) (King and Roche, 2008). Allis shad is native to Ireland and occur in very low numbers in coastal waters and estuaries in the southeast. The requirements of shads at sea are very poorly understood, but they appear to be mainly coastal and pelagic in habit . Allis shad have been reported from depths of 10–150 m, and twaite from depths of 10–110 m, with a preference for water 10–20 m deep, but have been found in deeper waters (Maitland and Hatton-Ellis, 2003, and references therein). Very little is known about the distribution and movements of shad during their marine life-phase. There are no recent records of spawning populations in Ireland (IFI, species information, accessed online 2024).

In a recent study, the movement of 58 acoustic-tagged Twaite Shad emigrating from the River Severn (western England) were recorded. One of the tagged Twaite Shad was detected in the Munster Blackwater Estuary (Ireland) and then in the River Severn, indicating a minimum movement distance of 950km (Davies, *et al.,* 2020). However, given the spatial footprint of the site investigation activities and temporal nature of the proposed works, connectivity with the MUL application area and more distant SACs designated for shad species are not likely to be connected and are considered too far from the MUL application area for any significant interaction to occur. **The same approach was taken**

when considering the ZoI for SACs designated for lamprey species – precautionary 35km foraging distance has been applied, based on JNCC, 2019.

Given known factors relating to the species such as migratory routes, marine spatial distribution and preferred water depths, the European sites pre-screened in for consideration are outlined below in Table 4-9. Where sites also have Annex I Habitats and other Annex II species (i.e. marine mammals and otter, etc.) as Qualifying Interests (QIs), they have been considered separately in Sections 4.2.2, 4.2.3.1 and 4.2.3.3, respectively.

Table 4-9 European Sites pre-screened in for consideration for Annex II Migratory Fish QIs.

SAC site name and code	Qualifying Interests	Distance (km)
River Boyne and River Blackwater SAC IE002299	Alkaline fens [7230] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] **River Lamprey (*Lampetra fluviatilis*)** **Atlantic Salmon (*Salmo salar*)** Eurasian Otter (*Lutra lutra*)	4.9 km

4.2.3.3 Other Annex II Species

The Annex II semi-aquatic Otter (*Lutra lutra*) [1355] are considered to have potential for connectivity with the proposed SI activities.

The otter is a designated Qualifying Interest (QI) of the River Boyne and River Blackwater SAC which enters the Irish Sea below Drogheda, between the town lands Mornington and Baltray. There is potential for Otter to be present in coastal environments which overlap with the MUL application area. Using the precautionary principal the Zone of Influence for otter is 12km along the shoreline around the MUL application area where intertidal surveys are conducted. As such, SACs with Otter as a designated QI within 12 km of the MUL application area are considered to have potential for connectivity to the proposed SI activities.

Table 4-10 SACs with Otter as Qualifying Interests with potential connectivity.

SAC site name and code	SAC site name	Distance (km)
IE002299 River Boyne and River Blackwater SAC	Alkaline fens [7230] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]	4.9 km

	River Lamprey (*Lampetra fluviatilis*) Atlantic Salmon (*Salmo salar*) **Eurasian Otter (*Lutra lutra*)**	

4.2.3.4 SUMMARY OF ANNEX II SPECIES' ZONE OF INFLUENCE

A summary of Annex II species including marine mammals, otter and migratory fish, their respective ZoIs and the European Sites considered for screening are shown in Table 4-11 below. Other designated habitat and species features of the SACs listed below that are not considered for screening have been omitted from the QI column for this summary.

Table 4-11 Summary of Annex II Species' Zone of Influence.

Annex II Marine Species			ZoI
	Bottle-nosed Dolphin	***Tursiops truncatus***	Management units for harbour porpoise and bottlenose dolphin have been used to determine relevant sites depending on the Qualifying Interests
1351	**Harbour Porpoise**	***Phocoena phocoena***	
1364	**Grey Seal**	***Halichoerus grypus***	Foraging distances of 448 km for grey seals (from Carter et al, 2022),
1365	**Common (Harbour) Seal**	***Phoca vitulina***	Foraging distances of 273 km for harbour seals (from Carter et al, 2022),
Marine/Freshwater Species			**ZoI**
1106	**Atlantic Salmon**	***Salmo Salar***	The ZoI for Atlantic Salmon was considered to be those rivers eastern seaboard north of Dublin Bay designated for Atlantic Salmon.
1095	**Sea Lamprey**	***Petromyzon marinus***	Precautionary 35 km foraging distance has been applied, based on JNCC, 2019
1099	**River Lamprey**	***Lampetra fluviatilis***	Precautionary 35 km foraging distance has been applied, based on JNCC, 2019
1103	**Twaite Shad**	***Alosa fallax fallax***	ZoI for this species includes the assessment of impacts to their annexed hosts, Atlantic salmon and shad species. Precautionary 35 km foraging distance has been applied, based on JNCC, 2019, and all designated rivers eastern seaboard north of Dublin Bay.

1029	**Freshwater Pearl Mussel (FWPM)**	***Margaritifera margaritifera***	The ZoI for this species includes the assessment of impacts to their annexed hosts, Atlantic salmon, (i.e. those rivers eastern seaboard north of Dublin Bay designated for Atlantic Salmon).
1355	**Eurasian Otter**	***Lutra lutra***	12 km alongshore for otter (from Reid *et. al.,* 2013) and 80 m seaward; "Typically, otters do not forage >80m from riverbanks or lake or coastal shores (Kruuk & Moorhouse, 1991)", from Reid *et. al*., 2013

4.2.4 SUMMARY

In total, **84 Natura 2000** sites were identified as being in the zone of influence of the Application area and deemed relevant for screening in Section 4.3.

The SAC for Annex I benthic habitats, **53** SACs and their QIs which have been included for screening in Section 5 are summarised in Table 4-12 - Table 4-13 and the **31** SPAs and their SCIs, including the North-west Irish Sea cSPA and the Seas off Wexford cSPA, which have been included for screening are summarised in Table 4-12.

For UK and French SACs, only the designated migratory QIs in the zone of influence of the proposed activities (as defined for the relevant species above) are considered. Annex I Habitats or other Annex II species are therefore not included in Table4-6 and Table 4-7 or considered in further screening.

- For UK, French and Spanish SPAs only the designated SCIs within the zone of influence are considered as defined Table 4-5.
- The North-West Irish Sea candidate SPA, announced in July 2023, has been included in this assessment.
- The Seas of Wexford candidate SPA, announced in January 2024, has been included in this assessment.

4.3 SCREENING ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS (LSE)

4.3.1 MARINE ORNITHOLOGY

This section considers the potential for LSE on marine ornithology features of the SPAs within the ZoI (Table 4-12). SPAs are proposed to be screened in where LSE cannot be ruled out for one or more SCIs, for one or more routes to impact. SPAs are screened out where LSE can be ruled out for all routes to impact to all SCIs. A rationale is given for each SPA for each SCI and route to impact to explain the screening decision.

Table 4-12 Screening of SPAs and all SCIs within 15km of the MUL application area

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)	Potential Source of Impact	Screened In /Out	Justification
North-west Irish Sea cSPA IE004236	0 km	**Wintering** Red-throated Diver [A001] Great Northern Diver [A003] Fulmar [A009] Common Scoter [A065] Little Gull [A177] Black-headed Gull [A179] Common Gull [A182] Herring Gull [A184] Great Black-backed Gull [A187] Kittiwake [A188] Guillemot [A199] Razorbill [A200] **Breeding** Manx Shearwater [A013] Cormorant [A017] Shag [A018] Lesser Black-backed Gull [A183] Roseate Tern [A192] + Post-breeding aggregation Common Tern [A193] + Post-breeding aggregation Arctic Tern [A194] + Post-breeding aggregation Little Tern [A195] Puffin [A204] **Diving** Red-throated Diver [A001]	Visual impacts. Above-water noise. Underwater noise Impacts upon prey species	**In**	The North-west Irish Sea cSPA is an important resource for marine birds foraging offshore and roosting in intertidal areas of the cSPA. Likely significant effects cannot be ruled out for indirect impacts of physical disturbance on foraging grounds for foraging seabirds or roosting grounds for roosting seabirds designated within the North-west Irish Sea cSPA. As significant effects on designated bird species features of this Natura 2000 site due to the proposed site investigation activities are therefore determined to be likely, this will be considered further in this assessment. **Proceed to NIS**

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)	Potential Source of Impact	Screened In /Out	Justification
		Great Northern Diver [A003] Manx Shearwater [A013] Cormorant [A017] Shag [A018]			
River Nanny Estuary and Shore SPA IE004158	0.14 km	**Wintering** Oystercatcher [A130] Ringed Plover [A137] Golden Plover [A140] Knot [A143] Sanderling [A144] Herring Gull[A184] Wetland & Waterbirds [A999]	Visual impacts	**Out**	The physical presence of vessels, taking grab samples in the immediate vicinity of the SPA will be low magnitude and short in duration. Significant effects are considered unlikely.
			Above -water noise	**Out**	The physical presence of vessels, taking grab samples in the immediate vicinity the SPA will be low magnitude and short in duration. Significant effects are considered unlikely.
			Underwater noise	**Out**	These SCIs do not feed within the intertidal areas and not underwater – no pathway and therefore no LSE.
Boyne Estuary SPA IE004080	0.14 km	**Wintering** Shelduck [A048] Oystercatcher [A130] Golden Plover [A140] Grey Plover [A141] Lapwing [A142] Knot [A143] Sanderling [A144] Black-tailed Godwit [A156] Redshank [A162] Turnstone [A169] Wetland and Waterbirds [A999] **Breeding** Little Tern [A195]	Visual impacts	**Out**	The physical presence of vessels, taking grab samples in the immediate vicinity the SPA will be low magnitude and short in duration. Significant effects are considered unlikely.
			Above -water noise	**Out**	The physical presence of vessels, taking grab samples in the immediate vicinity the SPA will be low magnitude and short in duration. Significant effects are considered unlikely.
			Underwater noise	**Out**	These SCIs do not feed within the intertidal areas and not underwater – no pathway and therefore no LSE.

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)	Potential Source of Impact	Screened In /Out	Justification
Rockabill SPA IE004014	0.2 km	**Wintering** Purple Sandpiper [A148] **Breeding** Roseate Tern [A192] Common Tern [A193] Arctic Tern [A194]	Visual impacts	**Out**	The physical presence of vessels, in the immediate vicinity the SPA will be low magnitude and short in duration. Significant effects are considered unlikely.
			Above -water noise	**Out**	The physical presence of vessels, in the immediate vicinity the SPA will be low magnitude and short in duration. Significant effects are considered unlikely.
			Underwater noise	**Out**	These SCIs do not underwater – no pathway and therefore no LSE.
Skerries Islands SPA IE004122	0.5 km	**Wintering** Cormorant [A017] Shag [A018] Light-bellied Brent Goose [A046] Purple Sandpiper [A148] Turnstone [A169] Herring Gull [A184] **Breeding** Cormorant [A017] Shag [A018] **Diving** Cormorant [A017] Shag [A018]	Visual impacts	**Out**	The physical presence of vessels, in the immediate vicinity the SPA will be low magnitude and short in duration. Significant effects are considered unlikely.
			Above -water noise	**Out**	
			Underwater noise	**Out**	These SCIs do not underwater – no pathway and therefore no LSE.
			Underwater noise	**Out**	Underwater noise is likely to cause disturbance to diving seabirds, either directly as a deterrence causing displacement from habitat or evoking an escape flight response, or indirectly affecting prey acquisition. Special Conservation Interests (SCIs) designated for SPAs whose predominant foraging method is shallow diving, dip diving or surface/skim feeders are

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)	Potential Source of Impact	Screened In /Out	Justification
					considered unlikely to be impacted by underwater noise due to the brevity of exposure time and disturbance sensitivity.
Dundalk Bay SPA IE004026	8.8 km	**Wintering** Great Crested Grebe [A005] Greylag Goose [A043] Light-bellied Brent Goose [A046] Shelduck [A048] Teal [A052] Mallard [A053] Pintail [A054] Common Scoter [A065] Red-breasted Merganser [A069] Oystercatcher [A130] Ringed Plover [A137] Golden Plover [A140] Grey Plover [A141] Lapwing [A142] Knot [A143] Dunlin [A149] Black-tailed Godwit [A156] Bar-tailed Godwit [A157] Curlew [A160] Redshank [A162] Black-headed Gull [A179] Common Gull [A182] Herring Gull [A184]	Visual impacts Above -water noise Underwater noise	**Out** **Out** **Out**	The physical presence of vessels, in the immediate vicinity the SPA will be low magnitude and short in duration. Significant effects are considered unlikely. These SCIs do not dive underwater (with exception of Red-breasted Merganser [A069] Great Crested Grebe [A005] Common Scoter [A065] – no pathway and therefore no LSE. Underwater noise is likely to cause disturbance to diving seabirds, either directly as a deterrence causing displacement from habitat or evoking an escape flight response, or indirectly affecting prey acquisition. Special Conservation Interests (SCIs) designated for SPAs whose predominant foraging method is shallow diving, dip diving or surface/skim feeders are considered unlikely to be impacted by underwater noise due to the brevity of exposure time and disturbance sensitivity.

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)	Potential Source of Impact	Screened In /Out	Justification
		Wetland and Waterbirds [A999] **Diving** Red-breasted Merganser [A069] Great Crested Grebe [A005] Common Scoter [A065]			
Lambay Island SPA IE004069	10.7 km	**Wintering** Greylag Goose [A043] Herring Gull [A184] **Breeding** Fulmar [A009] Cormorant [A017] Shag [A018] Lesser Black-backed Gull [A183] Herring Gull [A184] Kittiwake [A188] Guillemot [A199] Razorbill [A200] Puffin [A204] **Diving** Cormorant [A017] Shag [A018] Guillemot [A199] Razorbill [A200] Puffin [A204] Fulmar [A009]	Visual impacts Above -water noise Underwater noise	**Out** **Out** **Out**	The physical presence of vessels, in the immediate vicinity the SPA will be low magnitude and short in duration. Significant effects are considered unlikely. Underwater noise is likely to cause disturbance to diving seabirds, either directly as a deterrence causing displacement from habitat or evoking an escape flight response, or indirectly affecting prey acquisition. Special Conservation Interests (SCIs) designated for SPAs whose predominant foraging method is shallow diving, dip diving or surface/skim feeders are considered unlikely to be impacted by underwater noise due to the brevity of exposure time and disturbance sensitivity.
All SPA	0-15km	All SCIs	Impact on prey species	**Out**	There is a potential that fish within the MUL area will be temporarily displaced by noise, thus also displacing the food resource for seabirds. Noise from the survey activities will be temporary and highly localised. In addition, fish in the area are

SPA Site name and code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)	Potential Source of Impact	Screened In /Out	Justification
					most likely habituated to noise as the MUL area is busy with regular vessel activity. Therefore, any effects from noise impacting prey availability for sea- and shorebirds due to the proposed survey activities will be highly unlikely and is therefore considered insignificant.
All SPA	0-15km	All SCIs	Litter and Pollution	**Out**	All vessels used during the survey campaign shall, as required by law, be MARPOL Compliant and fully certified by the Maritime Safety Office. This is standard practice for all survey activities irrespective of the survey operator and as it is required by law is built into the survey design.

Table 4-13 Screening of SPAs and all SCIs 15km to 500km of the MUL application area

SPA Site code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)	Potential Source of Impact	Screened In /Out	Justification
Ireland's Eye SPA IE004117	20.2 km	**Breeding** Cormorant [A017] Herring Gull [A184] Guillemot [A199] Razorbill [A200] Kittiwake [A188] **Diving** Cormorant [A017] Guillemot [A199] Razorbill [A200]	Above -water noise Visual impacts Underwater noise	**Out**	Above water noise and visual impacts from the physical presence of vessels, in the immediate vicinity the SPA will be low magnitude and short in duration. Significant effects are considered unlikely. Underwater noise is unlikely to cause disturbance to diving seabirds, either directly as a deterrence causing displacement from habitat or evoking an escape flight response, or indirectly affecting prey acquisition. Special Conservation Interests (SCIs) designated for SPAs whose predominant foraging method is shallow diving, dip diving or surface/skim feeders are considered unlikely to be impacted by underwater noise due to the brevity of exposure time and disturbance sensitivity. Underwater noise from the survey activities will be temporary and highly localised. Therefore, significant effects from underwater noise are considered unlikely.
Howth Head Coast SPA IE004113	22.7 km	**Breeding** Kittiwake [A188]			
Irish Sea Front SPA UK9020328	57.5 km	**Breeding/Diving** Manx Shearwater[A013]			
Poulaphouca Reservoir SPA IE004063	64.1 km	**Wintering** Lesser Black-backed Gull [A183]			
Wicklow Head SPA IE004127	68.8 km	**Breeding** Kittiwake [A188]			
Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island SPA	115.8 km	**Breeding/Diving** Manx Shearwater[A013]			

SPA Site code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)	Potential Source of Impact	Screened In /Out	Justification
UK9013121					
Seas off Wexford cSPA IE004237	119.5 km	**Breeding/Diving** Gannet [A016] Fulmar [A009] Manx Shearwater[A013] Kittiwake [A188] **Wintering** Lesser Black-backed Gull [A183] **Diving** Puffin [A204] Gannet [A016] Fulmar [A009] Manx Shearwater[A013]			
Saltee Islands SPA IE004002	176.9 km	**Breeding/Diving** Fulmar [A009] Gannet [A016]			
Ailsa Craig SPA UK9003091	176.9 km	**Breeding/Diving** Gannet [A016]			
Skomer, Skokholm and the Seas off Pembrokeshire SPA UK9014051	207.6 km	**Breeding** European Storm Petrel [A014]			

SPA Site code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)	Potential Source of Impact	Screened In /Out	Justification
Grassholm SPA UK9014041	208.9 km	**Breeding/Diving** Gannet [A016]			
Horn Head to Fanad Head SPA IE004194	309 km	**Breeding/Diving** Fulmar [A009]			
Tory Island SPA IE004073	321.7 km	**Breeding/Diving** Fulmar [A009]			
Treshnish Isles UK9003041	327.1 km	**Breeding** European Storm Petrel [A014]			
Rum SPA UK9001341	373.2 km	**Breeding/Diving** Manx Shearwater [A013]			
Mingulay and Berneray SPA UK9001121	380.1 km	**Breeding/Diving** Fulmar [A009]	Above -water noise Visual impacts Underwater noise	**Out** **Out** **Out**	
West Donegal Coast SPA IE004150	382.5 km	**Breeding/Diving** Fulmar [A009]			
Beara Peninsula SPA IE004155	448.7 km	**Breeding/Diving** Fulmar [A009]			
Deenish Island and Scariff Island SPA IE004175	464.6 km	**Breeding/Diving** Fulmar [A009] Manx Shearwater [A013]			
Iveragh Peninsula SPA IE004154	470.5 km	**Breeding/Diving** Fulmar [A009]			

SPA Site code	By sea distance from MUL Area (km)	Special Conservation Interest (SCI)	Potential Source of Impact	Screened In /Out	Justification
Skelligs SPA IE004007	477.6 km	**Breeding/Diving** Fulmar [A009] Manx Shearwater [A013]			
Puffin Island SPA IE004003	479 km	**Breeding/Diving** Fulmar [A009] Manx Shearwater [A013]			
The Shiant Isles SPA UK9001041	487.8 km	**Breeding/Diving** Fulmar [A009]			
Mers Celtiques - Talus du golfe de Gascogne SPA FR5212016	499.2 km	**Breeding/Diving** Fulmar [A009] Manx Shearwater [A013]			
All SPA	0 - 15km	All SCIs	Impact on prey species	**Out**	There is a potential that fish within the MUL area will be temporarily displaced by noise, thus also displacing the food resource for seabirds. Noise from the survey activities will be temporary and highly localised. In addition, fish in the area are most likely habituated to noise as the MUL area is busy with regular vessel activity. Therefore, any effects from noise impacting prey availability for sea- and shorebirds due to the proposed survey activities will be highly unlikely and is therefore considered insignificant.
All SPA	0 - 15km	All SCIs	Litter and Pollution	**Out**	All vessels used during the survey campaign shall, as required by law, be MARPOL Compliant and fully certified by the Maritime Safety Office. This is standard practice for all survey activities irrespective of the survey operator and as it is required by law is built into the survey design.

4.3.2 ANNEX I BENTHIC HABITATS

This section considers the potential for LSE on Annex I Benthic Habitat features within the ZoI (Table 4-14).

Table 4-14 Screening of Annex I Habitats within the ZoI of the MUL application area.

SAC site name and code	Qualifying Interests (Habitats)	Distance (km)	Potential Source of Impact	Screened In /Out	Justification
Rockabill to Dalkey Island SAC IE003000	Reefs [1170]	0.2 km	Direct physical disturbance to habitats and smothering from geotechnical and environmental surveys; Smothering/scour from increased suspended sediment concentrations	**Out**	The spatial footprint of the site investigation SI is small and temporary in duration. In addition, these site investigation activities are conducted in a dynamic area (within the Irish Sea, tidal flows are known to interact with and mobilise unconsolidated seabed sediments). Flows are known to interact with and mobilise unconsolidated seabed sediments). It is therefore considered unlikely that physical disturbance to the reef will be above natural levels experienced.

4.3.3 ANNEX II SPECIES

4.3.3.1 MARINE MAMMALS

Disturbance from Vibration and Underwater noise associated with surveys

Comparing the data on species auditory band with (Table 3-5) and the noise characteristics of the surveys (Table 3-6) it is deemed that the following will be audible to marine mammals (including otters):

- Sub Bottom Profiler (Sparker)
- Sub Bottom Profiler (Parametric Pinger)
- Sub Bottom Profiler – Boomer (SBP)
- Sub Bottom Imager (SBI)
- Vessel noise
- Geotechnical Drilling (including seismic CPTs)

- Depending on what frequency is used, the Sub Bottom Profiler (Parametric Pinger) may emit noise in an audible frequency for marine mammals which can reach a Sound Pressure Level which could cause TTS and PTS injury according to the SPL injury criteria proposed by Southall *et al.* 2007.
- Sparker and Boomer SBP systems may emit noise in an audible frequency for marine mammals which could cause TTS injury to seals and otters according to the SPL injury criteria proposed by Southall *et al.* 2007.
- None of the other proposed site investigation activities emit noise in an audible frequency for marine mammals which can reach a Sound Pressure Level which could cause lethal effects or physical injury to marine mammals.

As significant effects on designated marine mammal species features of Natura 2000 sites due to underwater noise emitted by some of the proposed site investigation activities are therefore determined to be **likely**, this will be considered further in this assessment, **screening in**.

Injury due to collision (survey vessels and sampling equipment)

The key factors contributing to collision between marine mammals and vessels are the presence of both in the same area and vessel speed (see Schoeman et al., 2020 for review). Injuries to marine mammals from vessel strikes are species-dependent but generally are more severe at higher impact speeds (Wang et al., 2007). Vessels involved in these surveys are likely to be either stationary or travelling slowly (c. 5 knots) thus allowing any animal in the area time to avoid collision.

Cetacean and pinnipeds in the area are exposed to vessels of all sizes on a regular basis due to other activities in the area including fishing and shipping. As a result, they are likely to maintain a distance from all survey vessels for the short time period of site investigation activities before returning to the area once site investigation activities have finished. Therefore, the collision risk posed by the site investigation activities is likely to be significantly lower than that posed by commercial shipping activity. A slow-moving survey vessel in the area will not pose a collision risk to seabirds foraging the area who are accustomed to vessels traversing the area.

Significant effects on designated marine mammal species features of Natura 2000 sites due to collision with vessels undertaking the proposed site investigation activities are considered highly **unlikely, screened Out**.

Pollution Event

Marine mammals are considered vulnerable to oil pollution, in particular diving birds given the time they spend resting on the water surface, and diving through it in search of food.

The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/785), is an international marine environmental convention which aims to prevent both operational and accidental discharge into the marine from sea going vessels. Ireland ratified the various elements of the MARPOL Convention through the Sea Pollution Act 1991, the Sea Pollution (Amendment) Act 1999 and the Sea Pollution (Miscellaneous Provisions) Act 2006. MARPOL 73/78 was given further legal effect through Statutory Instruments introduced under these Acts. The Acts place a legal obligation upon operators of vessels to implement measures to prevent both operational and accidental discharges from ships of substances, which may damage the marine environment as well as human health.

While the site investigation activities will result in a temporary increase in vessels using the area which increases the risk of accidents and resultant fuel and/or oil spills, an incidence of pollution whether from an accidental occurrence or operational activities is not considered likely considering the legal obligations to comply with MARPOL 73/78 with the increased risk of a pollution event occurring due to these activities considered minimal and not to be over and above existing background risk.

All vessels used during the survey campaign shall, as required by law, be MARPOL Compliant and fully certified by the Maritime Safety Office. This is standard practice for all survey activities irrespective of the survey operator and as it is required by law is built into the survey design.

Therefore, it is considered unlikely that there would be any occurrence of a pollution event either accidental or otherwise that could directly or indirectly cause a significant effect to a Natura 2000 site.

As such, pollution events are not considered further as a potential impact in this report, screened out.

4.3.3.2 ANNEX II ANADROMOUS FISHES

The Atlantic Salmon is a designated Qualifying Interest (QI) of the River Boyne and River Blackwater SAC which enters the Irish Sea below Drogheda, between the town lands Mornington and Baltray. The proposed MUL application area is situated in front of this estuary, however, geophysical survey activities that may induce a barrier to salmon migration will mainly be occurring within the Proposed Development Area that is located in the southerly section of the MUL area (i.e. 4.9 km south of the River Boyne and River Blackwater SAC). In addition, River Lamprey (*Lampetra fluviatilis*) is a designated QI of the River Boyne and River Blackwater SAC.

This section considers the potential for LSE on Annex II Migratory Fish features within the ZoI (Table 4-15).

Table 4-15 Screening of Annex II Anadromous Fish within the ZoI of the MUL application area.

SAC site name and code	Qualifying Interests (Species)	Distance (km)	Potential Source of Impact	Screened In /Out	Justification
River Boyne and River Blackwater SAC IE002299	River Lamprey (*Lampetra fluviatilis*) Atlantic Salmon (*Salmo salar*)	4.9 km	Disturbance, displacement and injury from underwater noise from geophysical and geotechnical surveys. Mortality or injury resulting from pollution/littering event.	**Out**	The Atlantic Salmon is a designated Qualifying Interest (QI) of the River Boyne and River Blackwater SAC which enters the Irish Sea below Drogheda, between the town lands Mornington and Baltray. The proposed MUL application area is situated in front of this estuary, however, geophysical survey activities that may induce a barrier to salmon migration will mainly be occurring within the Proposed Development Area that is located in the southerly section of the MUL area (i.e. 4.9 km south of the River Boyne and River Blackwater SAC). In addition, River Lamprey (*Lampetra fluviatilis*) is a designated QI of the River Boyne and River Blackwater SAC. All vessels used during the survey campaign shall, as required by law, be MARPOL Compliant and fully certified by the Maritime Safety Office. This is standard practice for all survey activities irrespective of the survey operator and as it is required by law is built into the survey design.

4.3.3.3 OTHER ANNEX II SPECIES (OTTER)

This section considers the potential for LSE on Otters within the ZoI (Table 4-16)

Table 4-16 Screening of other Annex II Species (Otter) within the ZoI of the MUL application area.

SAC site name and code	Distance (km)	Potential Source of Impact	Screened In /Out	Justification
IE002299 River Boyne and River Blackwater SAC	4.9 km	Disturbance and displacement from SI survey activities from visual impacts in the intertidal or shallow subtidal area. Disturbance and displacement from SI survey activities from underwater noise in the shallow subtidal area Indirect effects through impacts on prey availability and prey acquisition	**In**	There is potential for connectivity with the Proposed Activities and potential route to impact on otter. As such LSE cannot be ruled out.
		Mortality or injury resulting from litter and pollution event	Out	All vessels used during the survey campaign shall, as required by law, be MARPOL Compliant and fully certified by the Maritime Safety Office. This is standard practice for all survey activities irrespective of the survey operator and as it is required by law is built into the survey design.

4.4 IN-COMBINATION SCREENING FOR CUMULATIVE EFFECTS

In-combination screening for cumulative effects has been undertaken following the approach outlined in the European Commission Notice Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive (EC, 2021).

4.4.1 DEFINING CUMULATIVE EFFECTS SPATIAL SCOPE (CESS)

The boundary for examination of cumulative effects has been defined considering the types of impact which relate to the activities set out in the AIMU document which accompanies this MUL application and includes remote (off-site) locations as set out in (EC, 2021).

Impacts of noise associated with the planned survey activities are considered to have the widest spatial reach, with Harbour porpoise the designated Natura 2000 site feature which is most sensitive to noise disturbance (JNCC, 2020).

Proposed noise producing activities are provided below in Table 4-17.

Table 4-17 Noise sources during site investigation activities

Survey technique	Operating frequency (kHz)	Estimated sound level at 1m over frequency band Sound pressure level	Typical length of towed equipment	Source/ Reference	Indicative Equipment Specification
Side-scan sonar (SSS)	300-500 (low) 500-900 (high)	220-230 dB re 1µPa	<300 m from vessel	EdgeTech (2021) and IWDG (2007)	EdgeTech 4205
Multi-beam Echosounder (MBES)	211	198 re 1µPa @1m	Hull- or Pole-mounted	Kongsberg (2022)	Kongsberg EM2040
Single Beam Echosounder	200	221.6 Sound Pressure Level	Hull- or Pole-mounted	Kongsberg (2022)	200 9G
Sub Bottom Profiler (Parametric Pinger)	85 - 115	232 Source Level rms (dB re 1 µPa @ 1m)	Pole-mounted, or Equipment mounted	CSA (2020)	Innomar "Standard" Sub-Bottom Profiler
Sub Bottom Profiler (Sparker)	0.4-5 kHz	203 dB	Towed	CSA (2020)	Geomarine, Geo-source or similar dual 400 tip sparker (<800J)
Sub Bottom Profiler (Boomer)	0.1-5	205 (SLrms (dB re 1 µPa m) 211 $SL_{0\text{-}pk}$ (dB re 1 µPa m)	Towed	CSA (2020)	AA, triple plate S-Boom (700-1,000 J)[3]
Sub Bottom Imager (SBI)	4.5 – 12.5 kHz	190dB re 1uPa @1m	Pole mounted from a vessel or ROV mounted	Kraken Robotics	Kraken Robotics Sub Bottom Imager

Survey technique	Operating frequency (kHz)	Estimated sound level at 1m over frequency band Sound pressure level	Typical length of towed equipment	Source/ Reference	Indicative Equipment Specification
Vessel noise	0.05 – 0.3	160 – 175 dB re 1µPa @ 1m	-	Southall et al., 2007	-
Geotechnical Drilling (Rotary)	(0.041 – 0.045kHz)[1] (0.028 – 0.120kHz)[2]	(158.9)[1] (118-145)[2]	Seabed	[1](Long-Fei Huang et al, 2023) [2](SubAcousTech, 2021)	-

The JNCC Guidance on Assessing the Significance of Noise Disturbance Against Harbour Porpoise SACs Conservation Objectives (JNCC, 2020) has therefore been used to determine the boundary for examination of cumulative effects (Table 4-18). The guidance uses published ranges for effects of noise from different noise producing activities to determine Effective Deterrence Ranges (EDRs). Where evidence is limited for a particular activity, the EDR is informed by studies which consider the most similar sound levels or other appropriate characteristics.

Table 4-18 Noise sources and Effective Deterrence Ranges (EDR)

Survey technique	Operating frequency (kHz)	Estimated sound level at 1m over frequency band Sound pressure level	EDR (JNCC, 2020)
Side-scan sonar (SSS)	300-500 (low) 500-900 (high)	220-230 dB re 1µPa	5km using EDR range for geophysical activity.
Multi-beam Echosounder (MBES)	211	198 re 1µPa @1m	5km using EDR range for geophysical activity.
Single Beam Echosounder	200	221.6 Sound Pressure Level	5km using EDR range for geophysical activity.
Sub Bottom Profiler (Parametric Pinger)	85 - 115	232 Source Level rms (dB re 1 µPa @ 1m)	5km using EDR range for geophysical activity.
Sub Bottom Profiler (Sparker)	0.4-5 kHz	203 dB	5km using EDR range for geophysical activity.
Sub Bottom Profiler (Boomer)	0.1-5	205 (SLrms (dB re 1 µPa m) 211 $SL_{0\text{-}pk}$ (dB re 1 µPa m)	5km using EDR range for geophysical activity.

Survey technique	Operating frequency (kHz)	Estimated sound level at 1m over frequency band Sound pressure level	EDR (JNCC, 2020)
Sub Bottom Imager (SBI)	4.5 – 12.5 kHz	190dB re 1uPa @1m	5km using EDR range for geophysical activity.
Vessel noise	0.05 – 0.3	160 – 175 dB re 1µPa @ 1m	n/a
Geotechnical Drilling (Rotary)	(0.041 – 0.045kHz)[1] (0.028 – 0.120kHz)[2]	(158.9)[1] (118-145)[2]	n/a

In line with Table 4-18 above, the EDR has been conservatively chosen as 10km (a doubling of the 5km range for geophysical activities), with projects within this range judged to be within the CESS and taken forward for temporal assessment.

4.4.2 Defining Cumulative Effects Temporal Scope (CETS)

The temporal scope for examination of cumulative effects has been defined considering the period over which the licence activities would take place.

A licence period of up to 7 years is being sought for this project to ensure the licence can enable site investigation works up to the construction of the project. To take into account the uncertainty of project start dates the Cumulative Effects Temporal Scope (CETS) is therefore 8 years.

4.4.3 Impact Identification

Impact types that can affect the structure and functions of the Natura 2000 sites considered have been considered as set out in (EC, 2021).

The impacts identified are:

- Physical disturbance and habitat loss
- Increased suspended sediment concentrations
- Disturbance from vibration and underwater noise from survey activities
- Injury due to collision (survey vessels/sampling equipment)
- Physical and airborne noise disturbance to birds
- Pollution event

4.4.4 Pathway Identification

Potential cumulative pathways (e.g. via water, air; accumulation of effects in time or space) have been considered as set out in (EC, 2021) and are provided in Table 4-19.

Table 4-19: Impact and potential cumulative pathway identification

Impact	Potential Cumulative Pathway
Physical disturbance and habitat loss	Pathway requires direct spatial overlap. Potential pathway for physical disturbance and habitat loss impact where there is direct spatial and temporal overlap.
Increased suspended sediment concentrations	Pathway possible via suspended sediment in the water column with impacts possible where there is spatial and temporal overlap with projects where other suspended sediment is produced from activities.
Disturbance from vibration and underwater noise from survey activities	Pathway possible via sound travelling through water as set out in Section 3.4.1 and 4.3.1 with impacts possible within CESS where there is temporal overlap with other projects conducting noise producing site investigation activities.
Injury due to collision (survey vessels/sampling equipment)	Pathway requires direct spatial overlap. Potential pathway for injury due to collision between marine mammals and vessels with additional projects vessels where there is direct spatial and temporal overlap.
Physical and airborne noise disturbance to birds	Pathway possible via sound travelling through air, not considered likely to extend beyond MUL application area boundary. Potential pathway for disturbance from the physical presence and noise associated with survey vessels and activities from projects where there is temporal and spatial overlap in the MUL application area boundary.
Pollution event	Pathway possible via water and accumulation of effects in time or space. Impacts possible within CESS where there is spatial or temporal overlap with other projects conducting site investigation activities.

4.4.5 PREDICTION

The magnitude and extent of identified likely cumulative effects have been predicted below following EC 2021 guidance.

4.4.5.1 PHYSICAL DISTURBANCE AND HABITAT LOSS

The physical pathway for cumulative impacts for 'Physical disturbance and habitat loss' identified where direct spatial overlap occurs has been considered for potential impacts cumulatively with this and other projects. The magnitude and extent of the disturbance and loss is unlikely to be significant considering the footprint of the proposed sampling.

There is no overlap between the proposed Maritime Usage Licence area and any SACs designated for the protection of the Qualifying Interest Annex I Habitats. However, Rockabill to Dalkey Island SAC (003000) is adjacent and there is a potential source pathway receptor connection and risk of the transport of suspended sediment to the reef from increased sedimentation caused by the proposed site investigation activities and intrusive works undertaken by other projects which are adjacent to or overlap with the SAC. The spatial footprint of the site investigation SI is small and temporary in duration. In addition, these site investigation activities are conducted in a dynamic area (within the Irish Sea, tidal flows are known to interact with and mobilise unconsolidated seabed sediments) so it is considered unlikely that physical disturbance to the reef will be above natural levels experienced.

The North-west Irish Sea candidate SPA (cSPA) overlaps with the Licence Area. There is a possible indirect impact from the proposed works on the supporting habitats of the proposed bird features of the cSPA through disturbance to marine benthic communities and habitat loss impacting the ability of foraging grounds to provide food for foraging birds. Intrusive works undertaken by other projects may contribute to a possible indirect impact on the supporting habitats of the proposed birds features of the cSPA through disturbance to marine benthic communities and habitat loss impacting the ability of foraging grounds to provide food for foraging birds and will be considered further below. The impacts are considered further below.

4.4.5.2 INCREASED SUSPENDED SEDIMENT CONCENTRATIONS

Certain geotechnical and environmental site investigations activities that physically disturb the seabed can cause a localised increase in suspended sediments concentrations (SSC). There is the potential for an increase in suspended sediments effects if geotechnical or physical disturbance activities with other projects were to take place at the same time. The impacts are considered further below.

4.4.5.3 DISTURBANCE FROM VIBRATION AND UNDERWATER NOISE

The underwater noise pathway for cumulative impacts for 'Disturbance from vibration and underwater noise' where temporal overlap occurs has been considered for the potential impacts with this and other projects. There is the potential for underwater noise disturbance effects if geophysical activities with other projects were to take place at the same time. Therefore, significant likely cumulative effects will be considered further.

4.4.5.4 INJURY DUE TO COLLISION

The collision pathway for cumulative impacts 'injury due to collision' has been considered where temporal and spatial overlap occurs between this project and other projects. The magnitude and extent of the cumulative impact of increased collision risk is unlikely to be significant as vessels involved in surveys are either stationary or travelling slowly (at approx. 5 knots), allowing marine mammals time to avoid collision with these vessels. The magnitude and extent of the impact is therefore unlikely to be significant.

4.4.5.5 PHYSICAL AND AIRBORNE DISTURBANCE TO BIRDS

The airborne noise pathway for cumulative impacts to bird species for 'Physical and airborne disturbance' where temporal overlap occurs has been considered for the potential impacts with this and other projects. The North-west Irish Sea cSPA is an important resource for marine birds foraging offshore and roosting in intertidal areas of the cSPA. There is the potential for impacts of physical and

airborne disturbance for foraging seabirds or roosting grounds for roosting seabirds designated within the North-west Irish Sea cSPA if airborne noise producing activities with other projects were to take place at the same time. Therefore, significant likely cumulative effects will be considered further.

4.4.5.6 POLLUTION EVENT

The pathway for 'pollution event' has been considered for cumulative impacts between this and other projects in the vicinity. The magnitude and extent of the cumulative impact of increased risk of pollution event is unlikely to be significant as all vessels conducting survey activities will be MARPOL compliant and fully certified by the Maritime Safety Office.

4.4.6 IDENTIFICATION OF PLANS AND PROJECTS THAT COULD ACT CUMULATIVELY

Following the approach outline in (EC, 2021), which suggests that information regarding "characteristics of other plans or projects (implemented, approved or proposed) that may cause in-combination or cumulative effects with the project being assessed on Natura 2000 sites" should be sourced from databases (e.g. on SEA, EIA, appropriate assessments of plans/projects, regional or municipal plans, local authority planning applications) available from Competent Authorities, plans and projects within the CESS and CETS have been examined as part of this SISAA Screening Report.

Plans from other offshore wind projects within the CESS and CETS were examined as part of this SISAA Screening Report (Figure 4-10 and Figure 4-11).

Other consented activities/developments and applications for activities or development within the CESS and CETS have also been considered for the potential to cause cumulative effects with the site investigation activities proposed under this Licence Application on Special Areas of Conservation, Special Protection Areas and their qualifying interests.

Searches were conducted of the following:

- Applications and lease/licence database of the Department of Housing, Local Government and Heritage
- Local Authority (Louth, Meath and Dublin County Councils) Planning lists
- An Bord Pleanála Planning Lists
- General internet search (for master plans etc)
- Department of Agriculture Food and the Marine Aquaculture Licence lists
- The Maritime Area Regulatory Authority's Maritime Usage Licence Applications database

Details of these projects, their interaction with the activities proposed under this Maritime Usage Licence Application and the potential for likely cumulative effects is set out in Table 4-20 below.

Table 4-20 Activities and Developments identified for consideration as part of the screening exercise

Title	Reference Number	County	Project Type	Status
MaresConnect Electricity Interconnector Site Investigation	FS007635	Dublin	Marine Investigative Survey Works	Consultation
Lir Offshore Array Ltd	FS007392	Dublin, Louth and Meath	Offshore Wind Farm Site Investigation Activities	Applied
Statkraft North Irish Sea Array (NISA) Site Investigations Array Area	FS007031	Louth and Dublin	Offshore Wind Farm Site Investigation Activities	Determination
Statkraft North Irish Sea Array (NISA) Cable Route	FS007358	Dublin	Offshore Wind Farm Site Investigation Activities	Determination
SSE Renewables Braymore Point (now Setanta)	FS006973	Louth and Dublin	Offshore Wind Farm Site Investigation Activities	Determination
Cooley Point	FS006852	Louth	Offshore Wind Farm Site Investigation Activities	Determination
Clogher Head	FS006787	Louth	Offshore Wind Farm Site Investigation Activities	Determination
Meath County Council - Laytown Beach	FS006602	Meath	Coastal Protection	Determination
Microsoft Ireland Operations Ltd.	LIC230018	Dublin	Subsea Cable	Applied
Drogheda Port Company - Maintenance Dredging	FS007359	Louth	Maintenance Dredging	Determination
Irish Water - Omeath Sewerage Scheme	FS006575	Louth	Foreshore Licence application for the purpose of extending an existing outfall pipe and associated works in connection with the proposed Omeath Water Treatment Plant,	Determination
Aquaculture/Foreshore Licence Applications - Louth	n/a	Louth	Carlingford Lough Special Protection Area: Appropriate Assessment (Feb 2022). Aquaculture Licence Feb 2023	

Title	Reference Number	County	Project Type	Status
			application forms for Cooley Oysters Ltd. and Charm Louet-Fesser.	
Meath County Development Plan 2021-2027	n/a	Meath	General - Wastewater management, water treatment plants (new construction in Navan). Flood risk management Mornington/Bettystown scheme. Mornington Dune access and conservation management plan.	
Louth County Development Plan 2021 - 2027	n/a	Louth	The Louth County Development Plan 2021-2027 sets out the Council's overall strategy for the proper planning and sustainable development of County Louth in accordance with the Planning and Development Act 2000 (as amended).	Plan
Rush Sailing Club Landing Pontoon	FS006984	Dublin	Landing Pontoon Construction	Consultation
Oriel Windfarm Limited	FS007383	Louth	Offshore Wind Farm Site Investigation Activities	Determination
Microsoft Ireland Operations Ltd.	LIC230016	Dublin	Geophysical Survey for proposed Subsea Cable	Applied
North Irish Sea Array Windfarm Limited	LIC230001	Dublin, Meath and Louth	Offshore Wind Farm Site Investigation Activities	Consultation
Greystones Windfarm Ltd	FS007367	Dublin/Wicklow	Offshore Wind Farm Site Investigation Activities	Applied
Sunrise	FS007151	Dublin	Offshore Wind Farm Site Investigation Activities	Consultation
Usice Eireann (Irish Water) Benthic Survey	FS007065	Dublin	Benthic Survey	Determination
Leinster Offshore Wind Limited	FS007162	Dublin	Offshore Wind Farm Site Investigation Activities	Applied
Dublin Array	FS007188	Dublin	Offshore Wind Farm Site Investigation Activities	Determination
Greenore Port Limited	FS006676	Louth	Capital Dredging	Determination
Realt na Mara Offshore Wind Farm Ltd	FS007330	Dublin/Wicklow	Offshore Wind Farm Site Investigation Activities	Applied

Title	Reference Number	County	Project Type	Status
Mac Lir Offshore Wind Limited Site Investigations for proposed Offshore Wind Farm	FS007472	Dublin, Wexford and Wicklow	Offshore Wind Farm Site Investigation Activities	Applied
Dublin Planning Applications			Dublin Port Company - Alexandra Port	
Codling Wind Park Ltd	FS007546	Dublin/Wicklow	Offshore Wind Farm Site Investigation Activities	Determination
Sea Stacks	FS007134	Dublin	Offshore Wind Farm Site Investigation Activities	Consultation
UCD Soil and Vegetation Sampling - Dundalk Marshes	FS007197	Louth	Soil and vegetation sampling	Applied
Dundalk Port Maintenance Dredging	FS007223	Louth	Maintenance Dredging	Determination
Tech Works Marine Ltd Data Buoy Deployment	FS007180	Dublin	Data Buoy Deployment	Applied
Louth County Council	FS006560	Louth	Coastal Protection	Determination
Iarnród Eireann	LIC230028	Dublin to Wicklow	Rail Infrastructure	Applied
RWE Renewables Ireland	FS007188	Dublin	Offshore Wind Farm Site Investigation Activities	Determination
Dublin Port Maintenance Dredging	FS00132	Dublin	Maintenance Dredging	Determination
Dublin Port Company Site Investigations	FS006497	Dublin	Quay wall and land reclamation works	Determination
Northeast offshore wind	FS007373		Offshore Wind Farm Site Investigation Activities	Withdrawn
Meath County Council	FS006513	Meath	Coastal Protection	Withdrawn

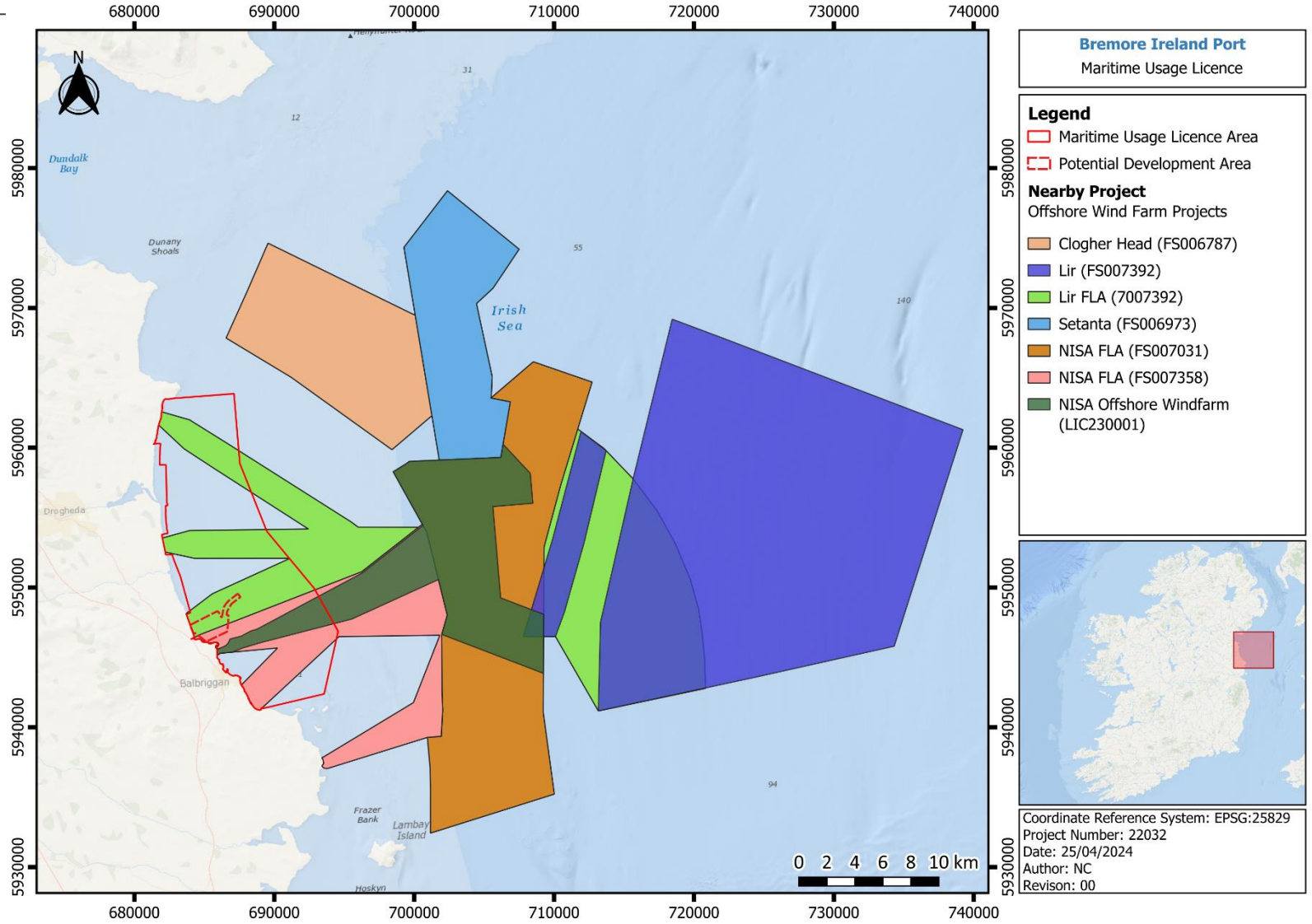

Figure 4-10 Locations of nearby proposed OWF project Site Investigation Licence Application Areas in relation to Licence Application Area

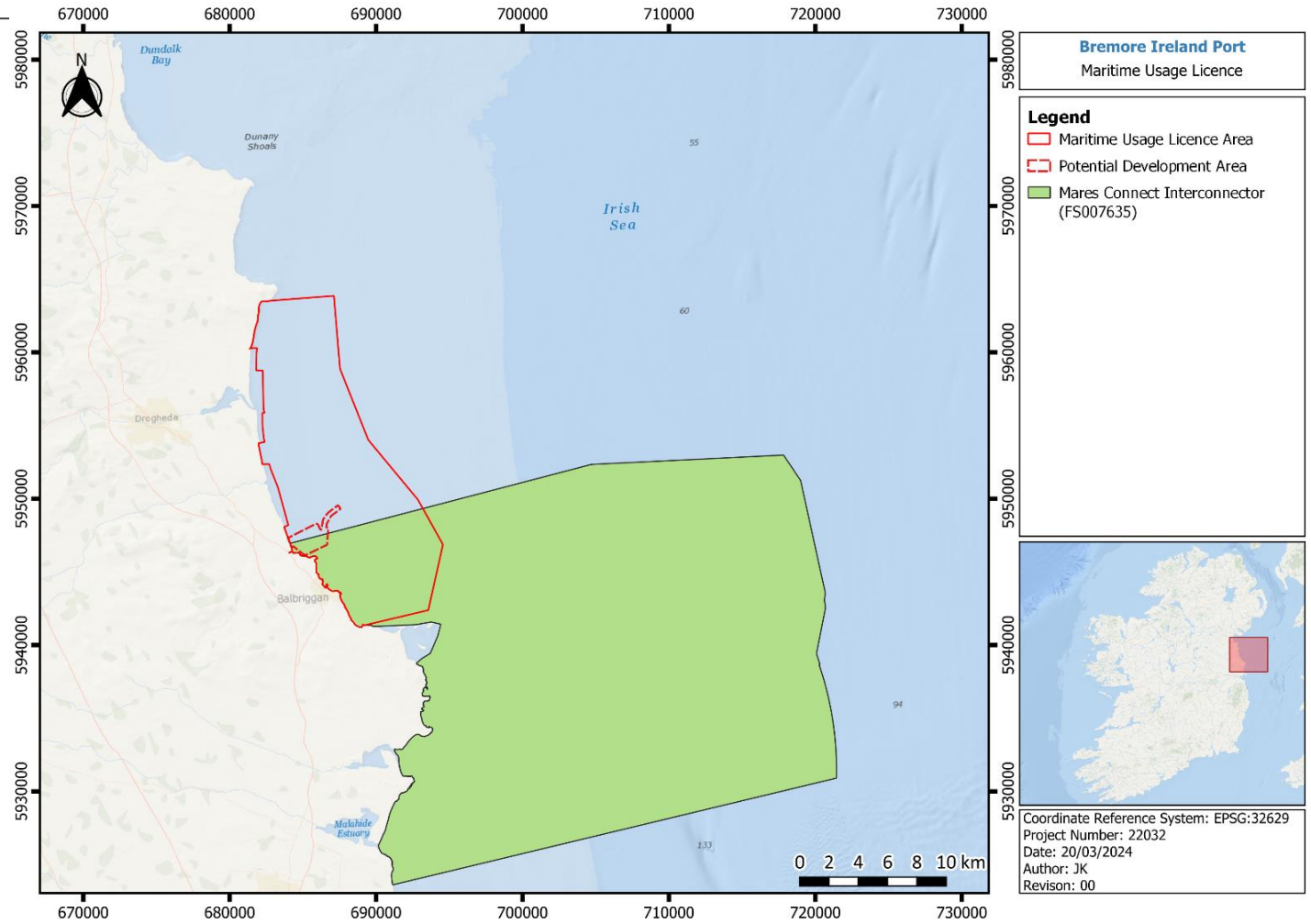

Figure 4-11 Location of Mares Connect Interconnector Foreshore Licence Application Area overlapping Licence Area, in addition to nearby identified planning applications

4.4.7 CUMULATIVE EFFECTS ASSESSMENT CONCLUSION

The conclusion of the cumulative effects assessment between the Bremore Ireland Port Site Investigation activities and other projects is provided in `

Table 4-21 and Table 4-22, which consider the CESS and CETS respectively. Cumulative effects on fish and marine mammal species features of Natura 2000 sites due to underwater noise emitted by these projects on foraging seabird species features of Natura 2000 sites due to indirect impacts on foraging grounds due to physical disturbance and airborne noise disturbance by these projects, if developed, and the proposed Bremore Site Investigation Activities are therefore considered likely and will be considered further in this assessment.

Table 4-21: Cumulative Effects Spatial Scope (CESS)

Project/Activity/ Development name and application/licence reference number	Licence status	Proposed activities	Within CESS?	Conclusion
Clogher Head FS006787	Determination	Geophysical, Geotechnical and Environmental Site Investigation works	Yes: 3.14km from MUL application area	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys are undertaken within the same time period.** **Possible cumulative indirect effects on foraging seabirds if geotechnical or physical disturbance activities are undertaken within the same time period.**
Lir FS007392	Applied	Geophysical, Geotechnical and Environmental Site Investigation works	Yes: Overlaps with MUL application area (49.66 km^2)	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys are undertaken within the same time period.**

Project/Activity/ Development name and application/licence reference number	Licence status	Proposed activities	Within CESS?	Conclusion
				Possible cumulative indirect effects on foraging seabirds if geotechnical or physical disturbance activities are undertaken within the same time period.
Statkraft North Irish Sea Array (NISA) Site Investigations Array Area FS007031	Determination	Geophysical, Geotechnical and Environmental Site Investigation works	Yes: 7.41km from MUL application area	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys are undertaken within the same time period.** **Possible cumulative indirect effects on foraging seabirds if geotechnical or physical disturbance activities are undertaken within the same time period.**
Statkraft North Irish Sea Array	Determination	Geophysical, Geotechnical and Environmental Site Investigation works	Yes: Overlap with MUL application area	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys are**

Project/Activity/ Development name and application/licence reference number	Licence status	Proposed activities	Within CESS?	Conclusion
(NISA) Cable Route FS007358			(36.46 km^2)	**undertaken within the same time period.** **Possible cumulative indirect effects on foraging seabirds if geotechnical or physical disturbance activities are undertaken within the same time period.**
North Irish Sea Array Windfarm Limited LIC230001	Consultation	Geophysical, Geotechnical and Environmental Site Investigation works	Yes: Overlaps with MUL application area (10.74 km^2)	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys are undertaken within the same time period.** **Possible cumulative indirect effects on foraging seabirds if geotechnical or physical disturbance activities are undertaken within the same time period.**

Project/Activity/ Development name and application/licence reference number	Licence status	Proposed activities	Within CESS?	Conclusion
Setanta FS006973	Determination	Geophysical, Geotechnical and Environmental Site Investigation works	Yes: Overlaps with MUL application area (36.46 km^2)	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys are undertaken within the same time period.** **Possible cumulative indirect effects on foraging seabirds if geotechnical or physical disturbance activities are undertaken within the same time period.**
Mares Connect Electricity Interconnector FS007635	Consultation	Geophysical, Geotechnical and Environmental Site Investigation works	Yes: Overlaps with MUL application area (31.42 km^2)	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys are undertaken within the same time period.**

Project/Activity/ Development name and application/licence reference number	Licence status	Proposed activities	Within CESS?	Conclusion
				Possible cumulative indirect effects on foraging seabirds if geotechnical or physical disturbance activities are undertaken within the same time period.
Drogheda Port Company – Maintenance Dredging FS007359 (temporary) and FS007028	Determination	Maintenance Dredging	Yes: Potential slight overlap	**Possible pathway for cumulative effects.**
Meath County Council – Laytown Beach FS006602	Determination	Foreshore Licence Application for the removal of the existing damaged gabion sea defence system and its replacement with a new sea defence system using a rock armour revetment at Laytown Beach. Proposed works anticipated at earliest March 2017 and latest May 2017. Notice of determination 2018.	Yes: 0.42	**No possible pathway for cumulative effects.**

Table 4-22: Temporal consideration of likelihood of cumulative effects (note only projects identified as being with the CESS Table 4-21 have been considered in this table)

Project/Activity/ Development name and application/licence reference number	Licence status	Proposed activities	Within CETS?	Conclusion
Lir FS007392	Applied	Geophysical, Geotechnical and Environmental Site Investigation works	Site Investigation works may be carried out at the same time as the site investigation works proposed in this application, however FS007392 will not be progressed unless the Lir Application Area is in a DMAP. No timeline is available for publication of the next DMAP, however progress to date with the South Coast DMAP and the ORESS 2.1 Indicative Roadmap indicate it would take 24-36 months for Lir to receive a Site Investigation Licence Licence from when the draft DMAP is published, if the Lir Application Area is in the next DMAP. Therefore, it is considered possible that there could be temporal overlap.	**Possible cumulative effects**
Setanta FS006973	Determination	Geophysical, Geotechnical and Environmental Site Investigation works	Site Investigation works may be carried out at the same time as the site investigation works proposed in this application, however it is considered unlikely these would take place unless the Setanta Application Area is in a DMAP, as the project will not be able to obtain a MAC and proceed to planning. No timeline is available for publication of the next DMAP, however progress to date with the South Coast DMAP and the	**Possible cumulative effects.**

Project/Activity/ Development name and application/licence reference number	Licence status	Proposed activities	Within CETS?	Conclusion
			ORESS 2.1 Indicative Roadmap indicate it would take 24-36 months for Setanta to receive a Site Investigation Licence Licence from when the draft DMAP is published, if the Setanta Application Area is in the next DMAP. Therefore, it is considered possible that there could be temporal overlap.	
Mares Connect Electricity Interconnector FS007635	Applied	Geophysical, Geotechnical and Environmental Site Investigation works	Mares intend to carry out survey works as soon as feasible, and within five years following the award of the Foreshore Licence. Therefore, it is considered possible that there could be temporal overlap.	**Possible cumulative effects**
Clogher Head FS006787	Determination	Geophysical, Geotechnical and Environmental Site Investigation works	Site Investigation works may be carried out at the same time as the site investigation works proposed in this application, however it is considered unlikely these would take place unless the Clogher Head Offshore Windfarm Application Area is in a DMAP, as the project will not be able to obtain a MAC and proceed to planning. No timeline is available for publication of the next DMAP, however progress to date with the South Coast DMAP and the ORESS 2.1	**Possible cumulative effects**

Project/Activity/ Development name and application/licence reference number	Licence status	Proposed activities	Within CETS?	Conclusion
			Indicative Roadmap indicate it would take 24-36 months for Clogher Head to receive a Site Investigation Licence Licence from when the draft DMAP is published, if the area is in the next DMAP. Therefore, it is considered possible that there could be temporal overlap.	
Statkraft North Irish Sea Array FS007358	Determination	Offshore Wind Farm Site Investigation Activities	Licence granted on 1st September 2022 for a period of 3 years.	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys are undertaken within the same time period.** **Possible cumulative effects on habitats due to suspended sediment from increased sedimentation caused by site investigation activities as project also overlaps with Rockabill to Dalkey Island SAC and indirect effects on foraging seabirds if geotechnical or physical disturbance activities are undertaken within the same time period.**

Project/Activity/ Development name and application/licence reference number	Licence status	Proposed activities	Within CETS?	Conclusion
Statkraft North Irish Sea Array (NISA) Site Investigations Array Area FS007031	Determination	Offshore Wind Farm Site Investigation Activities	Licence granted on 1st November 2021 for a period of 5 years.	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys are undertaken within the same time period.** **Possible cumulative effects on habitats due to suspended sediment from increased sedimentation caused by site investigation activities as project also overlaps with Rockabill to Dalkey Island SAC and indirect effects on foraging seabirds if geotechnical or physical disturbance activities are undertaken within the same time period.**
North Irish Sea Array Windfarm Limited LIC230001	Consultation	Offshore Wind Farm Site Investigation Activities	Site Investigation works may be carried out at the same time as the site investigation works proposed in this application, seeking a licence duration of up to 7 years.	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys are undertaken within the same time period.**

Project/Activity/ Development name and application/licence reference number	Licence status	Proposed activities	Within CETS?	Conclusion
				Possible cumulative effects on habitats due to suspended sediment from increased sedimentation caused by site investigation activities as project also overlaps with Rockabill to Dalkey Island SAC and indirect effects on foraging seabirds if geotechnical or physical disturbance activities are undertaken within the same time period.
Drogheda Port Company – Maintenance Dredging FS007359 (temporary) and FS007028	Determination	Maintenance Dredging	Site Investigation works may be carried out at the same time as the site investigation works proposed in this application, with a licence of 8 years for dredging between the period 2021 to 2029.	**Possible cumulative effects on marine mammals due to underwater noise disturbance if geophysical surveys and maintenance dredging activities are to take place within the same time period.**

Geotechnical and geophysical survey activities outlined in this Maritime Usage Licence Application for site investigation works could cause potential cumulative effects with activities undertaken by the following projects:

- Lir (FS007392),
- Setanta (FS006973),
- Clogher Head (FSS006787),
- Statkraft North Irish Sea Array (NISA) Site Investigations Array Area (FS007031),
- Statkraft North Irish Sea (NISA) Cable Route (FS007358),
- North Irish Sea Array Windfarm Limited (LIC230001),
- Drogheda Port Company – Maintenance Dredging (FS007359),
- Mares Connect Electricity Interconnector (FS007635).

Natura 2000 sites which may be affected by cumulative impacts of these activities (i.e. those within the CESS and CETS of the activities) are therefore screened in for Stage 2 Appropriate Assessment and **will be** considered further in the **Natura Impact Statement**.

5 SCREENING DETERMINATION STATEMENT

The following SACs and QIs and SPA and SCIs have been screened in for stage 2 Appropriate Assessment as they have designated mobile species that may enter the Maritime Usage Licence Area:

Table 5-1 Appropriate Assessment Screening Summary by Species for Mobile Marine Mammals

Summary of Relevant Sites	Species	Relevant Information
Rockabill to Dalkey Island SAC (003000) Lambay Island SAC (000204) Codling Fault Zone SAC (003015) Blackwater Bank SAC (002953) Carnsore Point SAC (002269) Hook Head SAC (00764) Roaringwater Bay And Islands SAC (000101) Kenmare River SAC (002158) Blasket Islands SAC (002172) Belgica Mound Province SAC (002327) Inishmore Island SAC (000213) Kilkieran Bay and Islands SAC (002111) West Connacht Coast SAC (002998) Bunduff Lough and Machair/Trawalua/Mullaghmore SAC (000625) North Anglesey Marine / Gogledd Môn Forol SAC (UK0030398) North Channel SAC (UK0030399) West Wales Marine SAC (UK0030397) Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC (UK 0030396) FR5302015 Mers Celtiques - Talus du golfe de Gascogne FR2502022 Nord Bretagne DH FR5300017 Abers - Côte des légendes	Harbour Porpoise *(Phocoena phocoena)*	The harbour porpoise is the smallest and most abundant cetacean in Irish waters and possibly the most abundant in the northeast Atlantic. It is common around the entire Irish coast. Sightings are common from June through the autumn/winter period but reduced sightings in spring suggest they move offshore, possibly to calving/breeding grounds. Harbour porpoise is one of two cetacean species with designated SACs considered within this Appropriate Assessment Screening. They utilise in-water acoustics for communication and echolocation and are sensitive to the noise generated by the site investigation activities (Richardson et al., 1995). Porpoises are “high-frequency” cetaceans sensitive to noise in the 200Hz – 180kHz range (Southall et al., 2007). The greatest potential impact on this species from the proposed site investigation activities would be from noise generated by SBP and HESS. This activity has the potential to be within the hearing threshold of harbour porpoise. This species is a mobile species which may be found within the Maritime Usage Licence Area and therefore, there is the possibility of likely significant effect on the conservation objectives for this species in the absence of mitigation measures, therefore this species and the relevant SACs are **screened in for Stage 2 Appropriate Assessment.**

Summary of Relevant Sites	Species	Relevant Information
FR5300018 Ouessant-Molène FR5300009 Côte de Granit rose-Sept-Iles FR5300015 Baie de Morlaix FR5300010 Tregor Goëlo FR5302006 Côtes de Crozon FR5302007 Chaussée de Sein FR5302016 Récifs du talus du golfe de Gascogne FR2500084 Récifs et landes de la Hague FR2502019 Anse de Vauville FR5300011 Cap d'Erquy-Cap Fréhel FR5300066 Baie de Saint-Brieuc - Est FR2502018 Banc et récifs de Surtainville FR5300012 Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard FR2500079 Chausey FR5300061 Estuaire de la Rance FR2500077 Baie du Mont Saint-Michel		
Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC (UK 0013117) Cardigan Bay/ Bae Ceredigion SAC (UK0012712)	Bottlenose Dolphin (*Tursiops truncatus*)	The Bottlenose dolphin is one of two cetacean species with a designated SAC considered within this Appropriate Assessment Screening. They utilise in-water acoustics for communication and echolocation and are sensitive to the noise generated by the site investigation activities (Richardson et al., 1995). Bottlenose dolphin hear in the mid frequency range (150 – 160,000 Hz) (DAHG, 2014). The greatest impact on this species from the proposed site investigation activities would be the noise generated by sub-bottom profiler (SBP). This has the potential to be within the hearing threshold of bottlenose dolphin. This species is mobile which may be found within the Maritime Usage Licence Area and therefore there is the possibility of likely significant effects on the conservation objectives for this species in the absence of mitigation measures. Therefore, this species and the relevant SACs are **screened in for Stage 2 Appropriate Assessment**.

Summary of Relevant Sites	Species	Relevant Information
Lambay Island SAC (000204) Saltee Islands SAC (000707) Horn Head and Rinclevan SAC (000147) Slieve Tooey/ Tormore Island/Loughros Beg Bay SAC (000190) Roaringwater Bay And Islands SAC (000101) Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC (UK 0013117) The Maidens SAC (UK 0030384) Cardigan Bay/ Bae Ceredigion SAC (UK0012712) Pembrokeshire Marine SAC (UK0013116) Lundy SAC (UK0013114) Treshnish Isles (UK0030289) Isles of Scilly Complex SAC (UK0013694)	Grey Seal *(Halichoerus grypus)*	The Grey seal is the larger and more abundant of the two seal species resident in Ireland. They spend much of the year at sea and may range widely in search of prey. They come ashore in autumn to form breeding colonies on rocky shores, beaches and caves – often on small uninhabited islands. They are found all around the coast wherever habitats are suitable and are most abundant along the exposed south, southwest and west coasts. The two major Irish breeding sites for grey seals are the Inishkea Islands (Mayo) and the Blasket Islands (Kerry). Smaller groups breed at Lambay Island (Dublin), Slyne Head (Galway) and the Saltee Islands (Wexford). The Grey seal is listed as a protected Annex II species for SACs assessed in this Appropriate Assessment Screening. The Grey Seal can hear sound in water at low frequencies relative to cetaceans (75Hz – 75kHz) (Southall et al., 2007) and would be sensitive to the noise from the survey equipment and vessels. As it is a mobile species with the potential to be present Within the Maritime Usage Licence Area and therefore, there is the possibility of likely significant effect on the conservation objectives for this species in the absence of mitigation measures. This species and the relevant SACs are **screened in for Stage 2 Appropriate Assessment.**
Lambay Island SAC (000204) Slaney River Valley SAC (000781) Murlough (UK0016612) Strangford Lough SAC (UK0016618) South-East Islay Skerries (UK0030067)	Common (Harbour) Seal *(Phoca vitulina)*	The common, or harbour seal, is the smaller of the two seal species resident in Ireland. Despite its name, it is less common than the grey seal. The common seal is the characteristic seal of sandflats and estuaries but are also found on rocky shores. Seals may range widely in search of prey, but individuals often return to favoured haul-out sites to rest or to give birth. The Common seal is listed as a protected Annex II species for SACs assessed in this Appropriate Assessment Screening. The Common Seal can hear sound in water at low frequencies relative to cetaceans (75Hz – 75kHz) (Southall et al.,

Summary of Relevant Sites	Species	Relevant Information
		2007) and would be sensitive to the noise from the survey equipment and vessels. As it is a mobile species with the potential to be present Within the Maritime Usage Licence Area and therefore, there is the possibility of likely significant effect on the conservation objectives for this species in the absence of mitigation measures. This species is and the relevant SACs are **screened in for Stage 2 Appropriate Assessment.**
IE002299 River Boyne and River Blackwater SAC	Otter	As it is a mobile species with the potential to be present Within the Maritime Usage Licence Area and therefore, there is the possibility of likely significant effect on the conservation objectives for this species in the absence of mitigation measures. This species is and the relevant SACs are **screened in for Stage 2 Appropriate Assessment.**

Table 5-2 SAC with their relevant Mobile Annex II species and distance to the Licence Area

Site name	Qualifying Interest	Distance to MUL (km)	Impact
Irish SACs			
Rockabill to Dalkey Island SAC (IE003000)	**Harbour Porpoise (*Phocoena phocoena)***	2.2	Disturbance due to underwater noise associated with surveys
River Boyne and River Blackwater SAC (IE002299)	**Otter (*Lutra Lutra)***	4.9	Disturbance and displacement from SI survey activities from visual impacts in the intertidal or shallow subtidal area. Disturbance and displacement from SI survey activities from underwater noise in the shallow subtidal area Indirect effects through impacts on prey availability and prey acquisition
Lambay Island SAC (IE000204)	**Grey Seal (*Halichoerus grypus*)** **Harbour Seal (*Phoca vitulina*)** **Harbour Porpoise *(Phocoena phocoena*)** **[1351]**	11.2	Disturbance due to underwater noise associated with surveys
Codling Fault Zone SAC (IE00204)	**Harbour Porpoise *(Phocoena phocoena*)** **[1351]**	40.1	Disturbance due to underwater noise associated with surveys
Blackwater Bank SAC (IE002953)	**Harbour Porpoise *(Phocoena phocoena*)** **[1351]**	120.57	Disturbance due to underwater noise associated with surveys
Slaney River Valley SAC (IE000781)	**Harbour Seal (*Phoca vitulina*)**	145.59	Disturbance due to underwater noise associated with surveys
Carnsore Point SAC (IE002269)	**Harbour Porpoise *(Phocoena phocoena*)** **[1351]**	152.8	Disturbance due to underwater noise associated with surveys
Saltee Islands SAC (IE000707)	**Grey Seal (*Halichoerus grypus*)**	174.14	Disturbance due to underwater noise associated with surveys
Hook Head SAC (IE00764)	**Harbour Porpoise *(Phocoena phocoena*)** **[1351]**	191.54	Disturbance due to underwater noise associated with surveys
Horn Head and Rinclevan SAC (IE000147)	**Grey Seal (*Halichoerus grypus*)**	304.53	Disturbance due to underwater noise associated with surveys

Slieve Tooey/ Tormore Island/Loughros Beg Bay SAC (IE000190)	**Grey Seal (*Halichoerus grypus*)**	375.12	Disturbance due to underwater noise associated with surveys
Roaringwater Bay And Islands SAC (IE000101)	**Grey Seal (*Halichoerus grypus*)** **Harbour Porpoise (*Phocoena phocoena*)**	387.83	Disturbance due to underwater noise associated with surveys
Kenmare River SAC (IE002158)	**Harbour Porpoise (*Phocoena phocoena*)**	444.8	Disturbance due to underwater noise associated with surveys
Blasket Islands SAC (IE002172	**Harbour Porpoise (*Phocoena phocoena*)**	503.93	Disturbance due to underwater noise associated with surveys
002327 Belgica Mound Province SAC	**Harbour Porpoise (*Phocoena phocoena*)**	574.27	Disturbance due to underwater noise associated with surveys
000213 Inishmore Island SAC	**Harbour Porpoise (*Phocoena phocoena*)**	622.0	Disturbance due to underwater noise associated with surveys
002111 Kilkieran Bay and Islands SAC	**Harbour Porpoise (*Phocoena phocoena*)**	603.7	Disturbance due to underwater noise associated with surveys
002998 West Connacht Coast SAC	**Harbour Porpoise (*Phocoena phocoena*)**	476.5	Disturbance due to underwater noise associated with surveys
000625 Bunduff Lough and Machair/Trawalua/Mullaghmore SAC	**Harbour Porpoise (*Phocoena phocoena*)**	431.8	Disturbance due to underwater noise associated with surveys
UK SACs			
North Anglesey Marine / Gogledd Môn Forol SAC (UK0030398)	**Harbour Porpoise (*Phocoena phocoena*)**	50.3	Disturbance due to underwater noise associated with surveys
Murlough (UK0016612)	**Harbour Seal (*Phoca vitulina*)**	41.3	Disturbance due to underwater noise associated with surveys
Strangford Lough SAC (UK0016618)	**Harbour Seal (*Phoca vitulina*)**	71.2	Disturbance due to underwater noise associated with surveys
North Channel SAC (UK0030399)	**Harbour Porpoise (*Phocoena phocoena*)**	64.6	Disturbance due to underwater noise associated with surveys
West Wales Marine SAC (UK0030397)	**Harbour Porpoise (*Phocoena phocoena*)**	114.7	Disturbance due to underwater noise associated with surveys
Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau SAC (UK 0013117)	**Grey Seal (*Halichoerus grypus*)** **Bottlenose dolphin (*Tursiops truncates*)**	117.1	Disturbance due to underwater noise associated with surveys

The Maidens SAC (UK 0030384)	**Grey Seal (*Halichoerus grypus*)**	140.3	Disturbance due to underwater noise associated with surveys
Cardigan Bay/ Bae Ceredigion SAC (UK0012712)	**Grey Seal (*Halichoerus grypus*)** **Bottlenose dolphin (*Tursiops truncates*)**	168.9	Disturbance due to underwater noise associated with surveys
Pembrokeshire Marine SAC (UK0013116)	**Grey Seal (*Halichoerus grypus*)**	187.6	Disturbance due to underwater noise associated with surveys
South-East Islay Skerries (UK0030067)	**Harbour Seal (*Phoca vitulina*)**	225.9	Disturbance due to underwater noise associated with surveys
Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC (UK 0030396)	**Harbour Porpoise (*Phocoena phocoena*)**	249.1	Disturbance due to underwater noise associated with surveys
Lundy SAC (UK0013114)	**Grey Seal (*Halichoerus grypus*)**	283.8	Disturbance due to underwater noise associated with surveys
Treshnish Isles (UK0030289)	**Grey Seal (*Halichoerus grypus*)**	325.8	Disturbance due to underwater noise associated with surveys
Isles of Scilly Complex SAC (UK0013694)	**Grey Seal (*Halichoerus grypus*)**	400.4	Disturbance due to underwater noise associated with surveys
French SACs			
Mers Celtiques - Talus du golfe de Gascogne FR5212016	**Harbour Porpoise (*Phocoena phocoena*)**	499.93	Disturbance due to underwater noise associated with surveys
Abers - Côte des legends FR5300017	**Harbour Porpoise (*Phocoena phocoena*)**	569.02	Disturbance due to underwater noise associated with surveys
Ouessant-Molène FR5310072	**Harbour Porpoise (*Phocoena phocoena*)**	570.17	Disturbance due to underwater noise associated with surveys
Nord Bretagne DH FR2502022	**Harbour Porpoise (*Phocoena phocoena*)**	528.65	Disturbance due to underwater noise associated with surveys
Côte de Granit Rose-Sept Iles FR5310011	**Harbour Porpoise (*Phocoena phocoena*)**	577.04	Disturbance due to underwater noise associated with surveys
Tregor Goëlo FR5310070	**Harbour Porpoise (*Phocoena phocoena*)**	599.97	Disturbance due to underwater noise associated with surveys
Côtes de Crozon FR5302006	**Harbour Porpoise (*Phocoena phocoena*)**	607.97	Disturbance due to underwater noise associated with surveys
Chaussée de Sein FR5302007	**Harbour Porpoise (*Phocoena phocoena*)**	618.96	Disturbance due to underwater noise associated with surveys
Récifs du talus du golfe de Gascogne FR5302016	**Harbour Porpoise (*Phocoena phocoena*)**	634.98	Disturbance due to underwater noise associated with surveys

Récifs et landes de la Hague FR2500084	**Harbour Porpoise (*Phocoena phocoena*)**	665.42	Disturbance due to underwater noise associated with surveys
Anse de Vauville FR2502019	**Harbour Porpoise (*Phocoena phocoena*)**	666.65	Disturbance due to underwater noise associated with surveys
Cap d'Erquy-Cap Fréhel FR5300011	**Harbour Porpoise (*Phocoena phocoena*)**	668.00	Disturbance due to underwater noise associated with surveys
Baie de Saint-Brieuc – Est FR5300066	**Harbour Porpoise (*Phocoena phocoena*)**	669.00	Disturbance due to underwater noise associated with surveys
Banc et récifs de Surtainville FR2502018	**Harbour Porpoise (*Phocoena phocoena*)**	670.83	Disturbance due to underwater noise associated with surveys
Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard FR5300012	**Harbour Porpoise (*Phocoena phocoena*)**	693.97	Disturbance due to underwater noise associated with surveys
Chausey FR2510037	**Harbour Porpoise (*Phocoena phocoena*)**	692.53	Disturbance due to underwater noise associated with surveys
Estuaire de la Rance FR5300061	**Harbour Porpoise (*Phocoena phocoena*)**	708.36	Disturbance due to underwater noise associated with surveys
Baie du Mont Saint Michel FR2510048	**Harbour Porpoise (*Phocoena phocoena*)**	718.06	Disturbance due to underwater noise associated with surveys

Table 5-3 Appropriate Assessment Screening by SPA[3] with relevant information

Summary of Relevant Sites	Species	Distance to MUL (km²)	Relevant Information
North-west Irish Sea cSPA (004236)	Common Scoter (*Melanitta nigra*) Red-throated Diver (*Gavia stellata*) Great Northern Diver (*Gavia immer*) Fulmar (Fulmarus glacialis) Manx Shearwater (*Puffinus puffinus*) Shag (*Phalacrocorax aristotelis*) Cormorant (*Phalacrocorax carbo*) Little Gull (*Larus minutus*) Kittiwake (*Rissa tridactyla*) Black-headed Gull (Chroicocephalus ridibundus) Common Gull (*Larus canus*) Lesser Black-backed Gull (*Larus fuscus*) Herring Gull (*Larus argentatus*) Great Black-backed Gull (*Larus marinus*) Little Tern (*Sterna albifrons*) Roseate Tern (*Sterna dougallii*) Common Tern (*Sterna hirundo*) Arctic Tern (*Sterna paradisaea*) Puffin (*Fratercula arctica*) Razorbill (*Alca torda*) Guillemot (*Uria aalge*)	Direct Overlap	The North-west Irish Sea cSPA is an important resource for marine birds. The marine areas offshore and intertidal areas provide supporting habitats for seabirds at the cSPA. Therefore, as likely significant effects cannot be ruled out for indirect impacts of physical disturbance on foraging grounds for foraging seabirds and on roosting grounds for roosting seabirds, the species and cSPA are **screened in for Stage 2 Appropriate Assessment**.

[3] Note North-West Irish Sea cSPA, which was publicly advertised in July 2023, is not a designated SPA but is included as sites are legally protected once they are publicly advertised (NPWS, 2012).

6 SCREENING STATEMENT OUTCOME

52 no. SACs, 31 no. SPAs, which includes the North-West Irish Sea cSPA and the Seas off Wexford cSPA, were considered for the potential for likely significant effects to arise via the identified source-receptor-pathways.

Screening has found that likely significant effects on 53 no. Natura 2000 sites as a result of the proposed project could not be excluded. The possibility of likely significant effects from underwater noise on Annex II species of otter, harbour porpoise, bottlenose dolphin, grey seal, and common seal could not be excluded. The possibility of likely significant effects due to physical disturbance to marine benthic communities and habitat loss impacting foraging grounds for foraging birds and roosting grounds for roosting birds could not be ruled out for bird species at the North-west Irish Sea cSPA.

These sites will therefore require further information to be provided within a Natura Impact Statement (NIS) to support a Stage 2 AA.

Therefore, these SACs and the cSPA have been screened in for further consideration and must proceed to a Stage 2 Appropriate Assessment (Natura Impact Statement

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APPENDIX I: BIRD ZONE OF INFLUENCE RATIONALE

Data on foraging movements of a number of seabird species has increased over the years mainly due to technological data capture systems such as satellite and other tracking technologies (e.g. Langston et al. 2013, Wakefield et al. 2015, 2017, Thaxter et al. 2014, 2018, Cleasby et al. 2015, 2020, Bogdanova et al. 2017, Carter et al. 2016, EPA et al. 2016, Votier et al. 2017). Available information on foraging areas used by species from particular colonies is still limited. Woodward et al. (2019) have reported on representative breeding season foraging ranges for a range of species.

Table 0-1 provides indicative foraging ranges (mean maximum) travelled for a range of seabird species from a breeding colony to a foraging area, which have been used to identify relevant sites on the basis that related Qualifying Interests could interact with the Maritime Usage Licence Area during site investigation activities. The mean maximum foraging range values are used to address potential interaction with relevant SPAs; as it provides the mean across the maximum foraging distances for each colony within the study. This is a highly precautionary foraging distances as it used the maximum range as a basis of the calculation for each species and deemed appropriate foraging ranges in identifying potential for Likely Significant Effects (LSEs). It should be noted however, bird density will not be continuous throughout this range and these measurements is based on seabirds flying long distances around major land masses. It is unlikely that seabirds would travel across land or extremely large distances during chick-rearing stages of the breeding season in order to forage in an offshore site where site investigation activities are occurring. Other ways of representing foraging ranges (e.g. the mean, or percentage foraging area derived from kernel analyses) may therefore provide more useful information, where available.

Whilst applying mean maximum foraging radius would encompass the majority of a population's home-range area, the overall size of the predicted foraging areas around the colony would potentially make it too large to be a useful management tool, without further refinement using habitat and bathymetric data (Soanes et al. 2016). Similarly, the assumption that seabirds are uniformly distributed out to some threshold distance from their colonies, such as their putative maximum foraging range, is unrealistic. Seabird density declines with distance from the colony with density-dependent competition, coastal morphology and habitat preferences (Wakefield et al. 2017), for example oceanographic features at which seabirds preferentially forage including shelf-edge fronts, upwelling and tidal-mixing fronts, offshore banks and internal waves, regions of stratification, and topographically complex coastal areas subject to strong tidal flow (Cox et al. 2018), resulting in highly non-uniform distributions. While Critchley et al. (2018) used a distance-weighted foraging radius approach to project distributions at sea for a wide range of seabird species during the breeding season, the authors recognised the limitations of not considering environmental variables that contribute to such non-uniform distributions noted above.

The selection of all sites outlined in Section 4 within the mean maximum foraging range of the Maritime Usage Licence Area is a useful but simplistic approach to identifying relevant sites. The approach taken here has been to review the initial selection of sites on this basis and use expert judgement to exclude those for which an interaction would be unrealistic. For example, sites where

Fulmar is identified as a Qualifying Interest on the far north and west of Ireland as Fulmar's are highly pelagic seabirds and are highly unlikely to move large distances over land which could bring them to within the Maritime Usage Licence Area. The potential mean maximum foraging range for this species has therefore been applied across the marine area, including where birds could move around headlands.

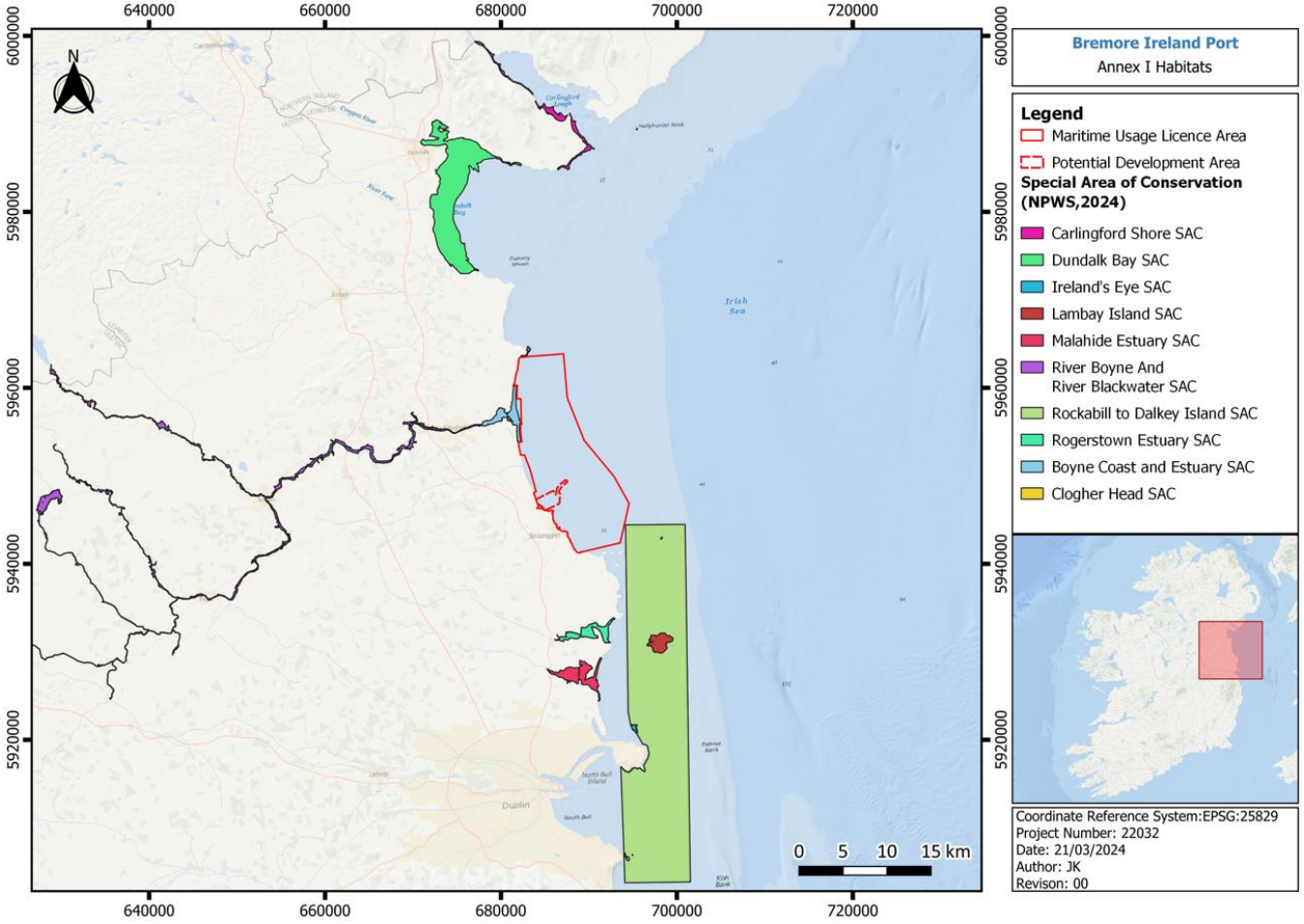
To aid in the selection process in identifying the mean maximum foraging ranges for the relevant SPAs within the zone of influence of the Maritime Usage Licence Area and the investigation activities measurements were taken across landward distance, seaward distance and some measured across headlands where there were large areas of land that could be covered. This process was used to ensure all distance measurements and foraging ranges were considered in the assessment and screening process for the seabird ranges that were identified from Woodward et al., 2019).

Table 0-1 Indicative breeding season foraging ranges (in bold) (Woodward et al, 2019) and associated confidence levels.

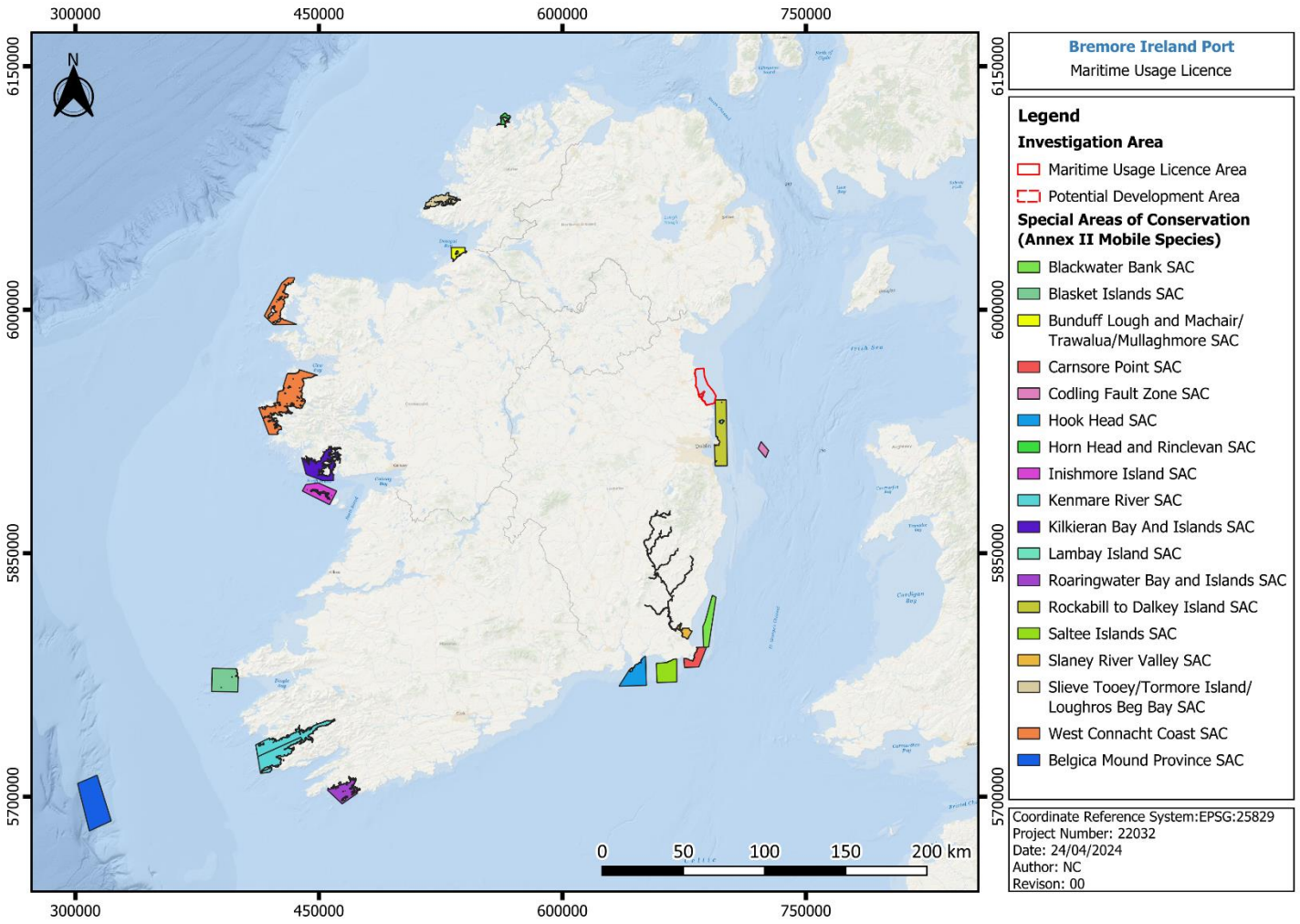
Indicative breeding season foraging ranges		
Species	Mean maximum[1] (km ± SD)	Confidence Level[2]
Eider	**21.5**	Poor
Red-throated diver	**9**	Low
Fulmar	**542.3** ± 657.9	Good
Manx shearwater	**1,346.8** ±,1,018.7	Moderate
European storm petrel	**336**	Poor
Leach's storm petrel	n/a	Moderate
Gannet	**315.2** ± 194.2	Highest
Cormorant	**25.6** ± 8.3	Moderate
Shag	**13.2** ± 10.5	Highest
Arctic skua	n/a	Poor
Great skua	**443.3** ± 487.9	Uncertain
Black-headed gull	**18.5**	Uncertain
Common gull	**50**	Poor
Mediterranean gull	**20**	Uncertain
Herring gull	**58.8** ± 26.8	Good
Lesser black-backed gull	**127** ± 109	Highest
Kittiwake	**156.1** ± 144.5	Good
Sandwich tern	**34.3** ± 23.2	Moderate
Roseate tern	**12.6** ± 10.6	Moderate
Common tern	**18.0** ± 8.9	Good
Arctic tern	**25.7** ± 14.8	Good
Little tern	**5**	Moderate
Guillemot	**73.2** ± 80.5	Highest
Razorbill	**88.7** ± 75.9	Good
Puffin	**137.1** ± 128.3	Good

[1]The maximum range reported in each study averaged across studies.
[2] Confidence levels were assigned as follows: highest (based on >5 direct studies, graphs and standard deviation suggest relatively low variability between sites and hence higher confidence); good (based on >5 direct studies; graphs and standard deviation show wider variability between sites, hence lower confidence); moderate (between 2-5 direct studies); low (indirect measures or only one direct tracking study); uncertain (survey-based estimates); poor (few survey estimates or speculative data available)

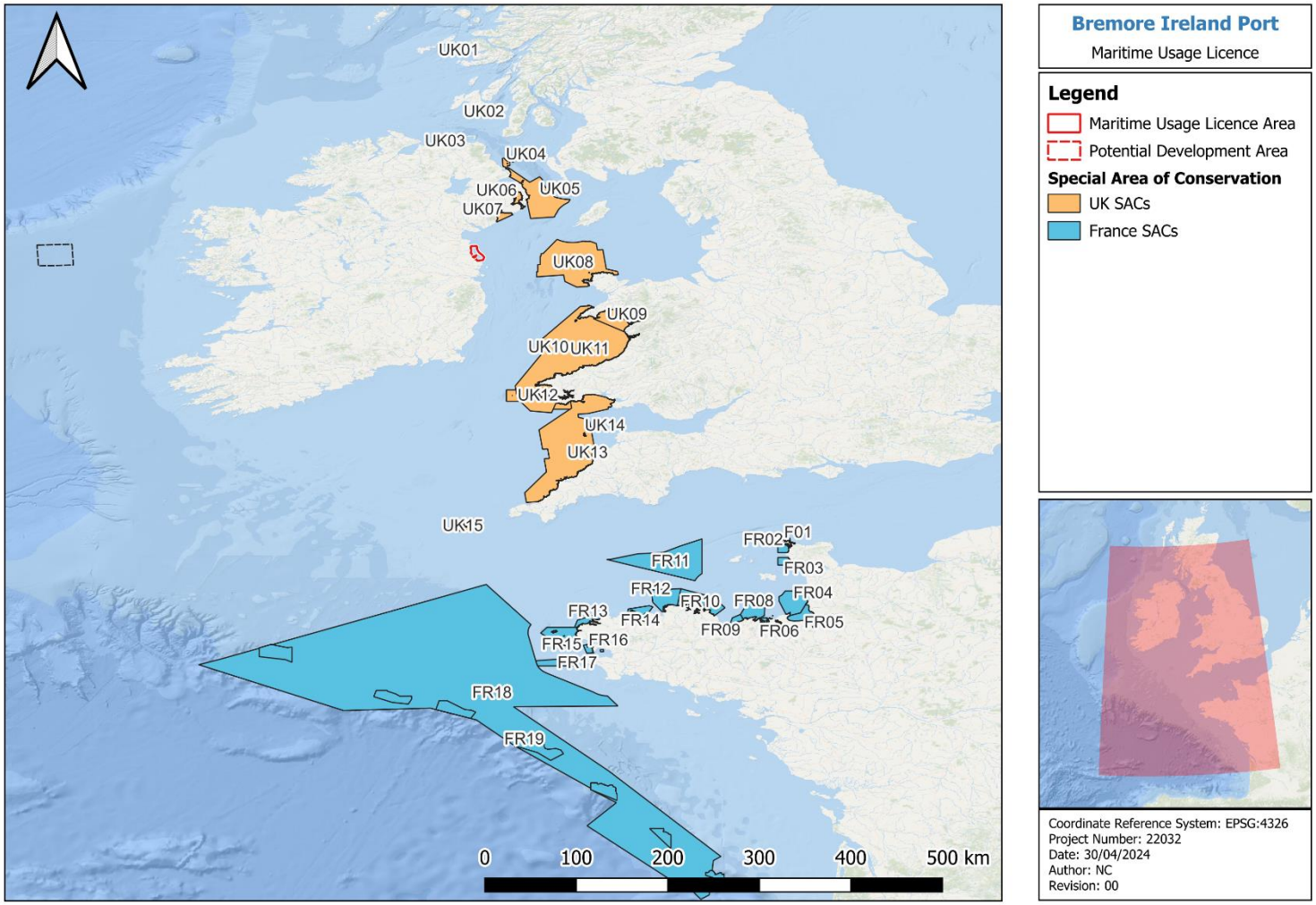
APPENDIX II: NATURA 2000 SITES WITHIN THE ZOI



SAC Annex I Habitats



SAC Annex II Mobile Species Ireland

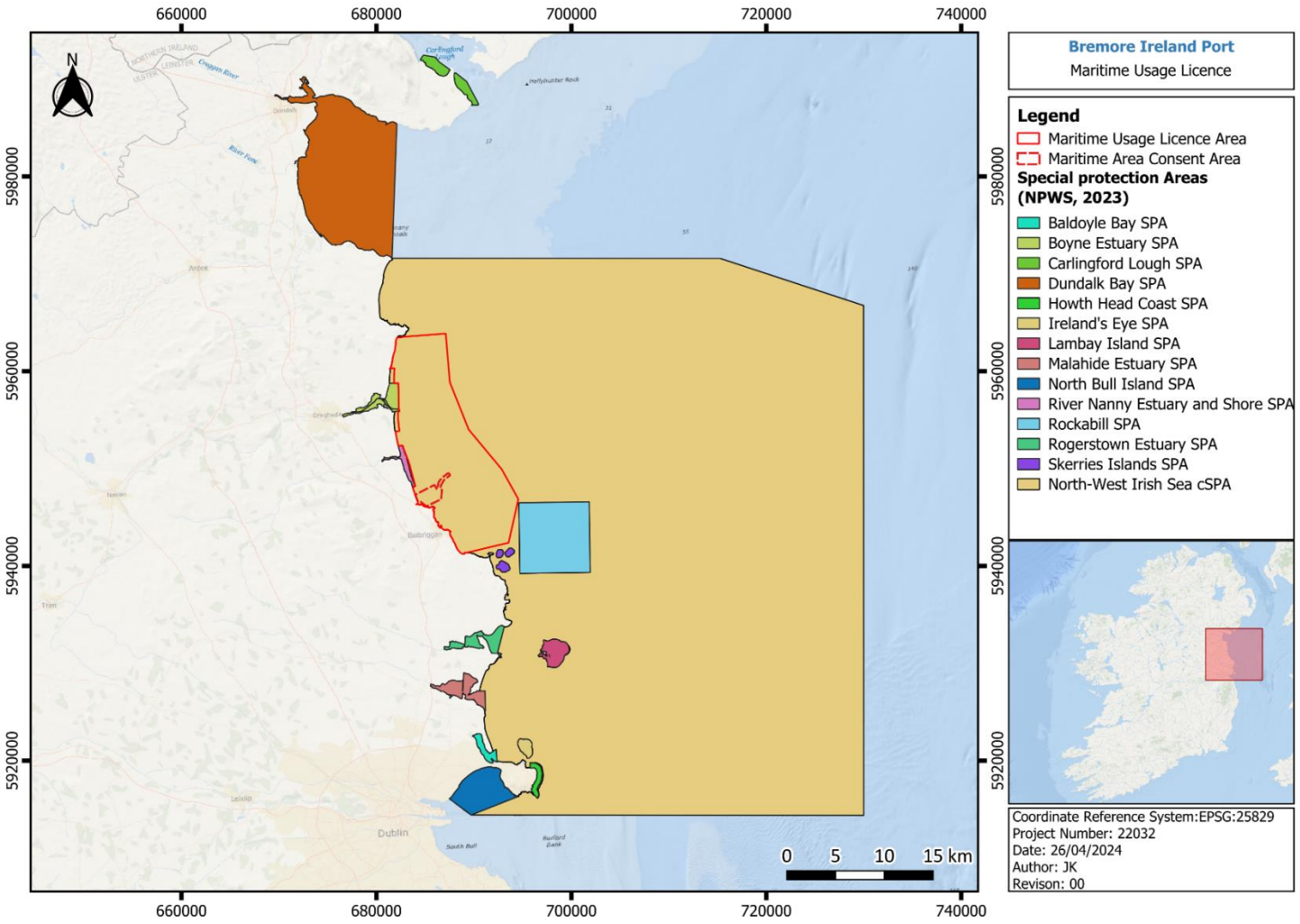


SAC Annex II Mobile Species UK (JNCC, 2020) and France (EEA, 2021)

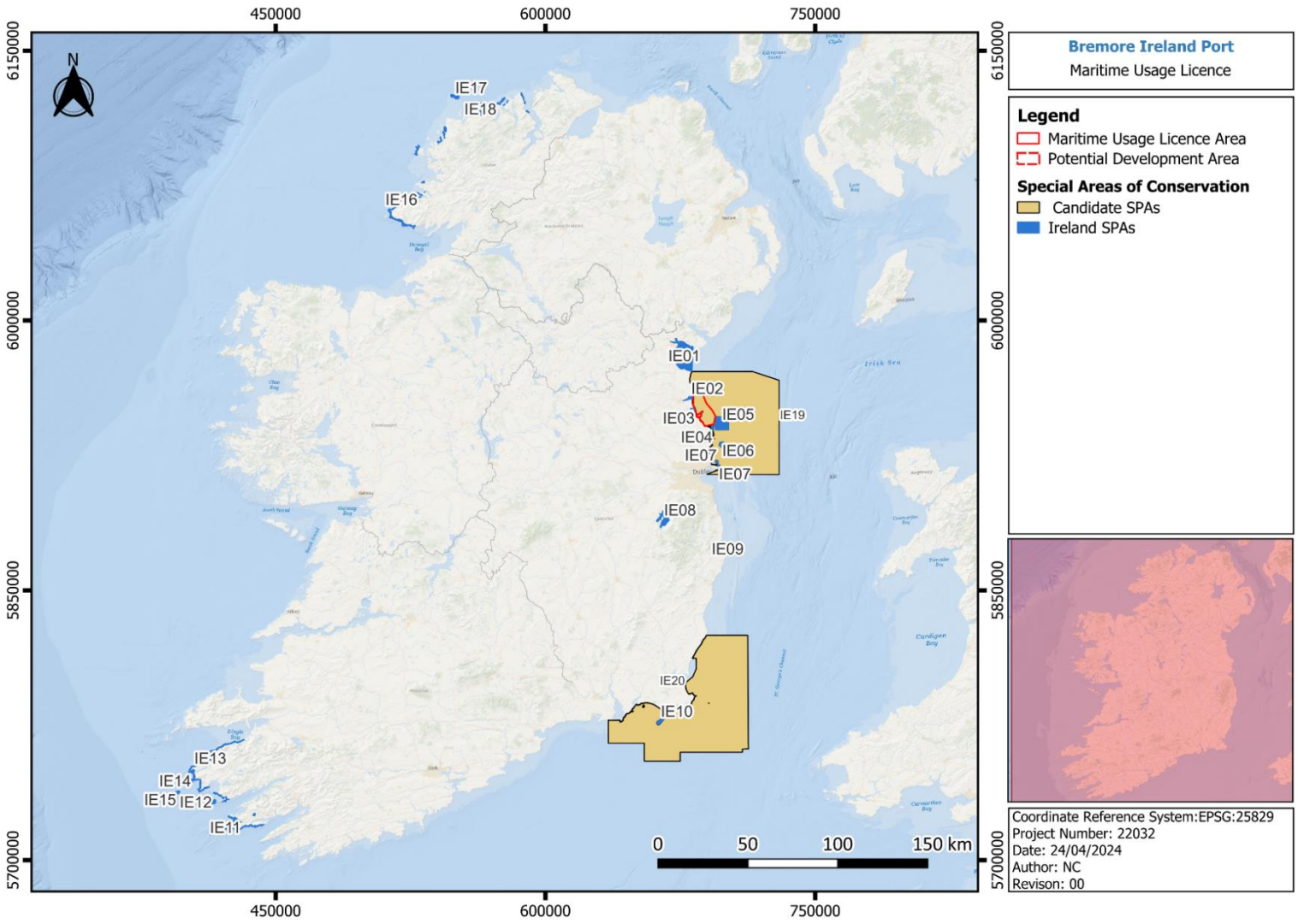
UK and France SAC Annex II Mobile Species Map Key

Labels	Site Code	Site Name	Labels	Site Code	Site Name
UK01	UK0030289	Treshnish Isles	FR01	FR2500084	Récifs et Landes de la Hague
UK02	UK0030067	South-East Islay Skerries	FR02	FR2502019	Anse de Vauville
UK03	UK0030383	Skerries and Causeway	FR03	FR2502018	Banc et Récifs de Surtainville
UK04	UK0030384	The Maidens	FR04	FR2500079	Chausey
UK05	UK0030399	North Channel	FR05	FR2500077	Baie du Mont Saint-Michel
UK06	UK0016618	Strangford Lough	FR06	FR5300061	Estuaire de la Rance
UK07	UK0016612	Murlough	FR07	FR5300012	Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard
UK08	UK0030398	North Anglesey Marine / Gogledd Môn Forol	FR08	FR5300011	Cap d'Erquy - Cap Fréhel
UK09	UK0013117	Pen Llyn a`r Sarnau/ Lleyn Peninsula and the Sarnau	FR09	FR5300066	Baie de Saint-Brieuc - Est

Labels	Site Code	Site Name	Labels	Site Code	Site Name
UK10	UK0030397	West Wales Marine / Gorllewin Cymru Forol	FR10	FR5300010	Tregor Goëlo
UK11	UK0012712	Cardigan Bay/ Bae Ceredigion	FR11	FR2502022	Nord Bretagne DH
UK12	UK0013116	Pembrokeshire Marine/ Sir Benfro Forol	FR12	FR5300009	Côte de Granit Rose-Sept-Iles
UK13	UK0030396	Bristol Channel Approaches / Dynesfeydd Môr Hafren	FR13	FR5300015	Baie de Morlaix
UK14	UK0013114	Lundy	FR14	FR5300017	Abers - Côte des Legendes
UK15	UK0013694	Isles of Scilly Complex	FR15	FR5300018	Ouessant-Molène
			FR16	FR5302006	Côtes de Crozon
			FR17	FR5302007	Chaussée de Sein
			FR18	FR5302015	Mers Celtiques - Talus du Golfe de Gascogne
			FR19	FR5302016	Récifs du talus du golfe de Gascogne



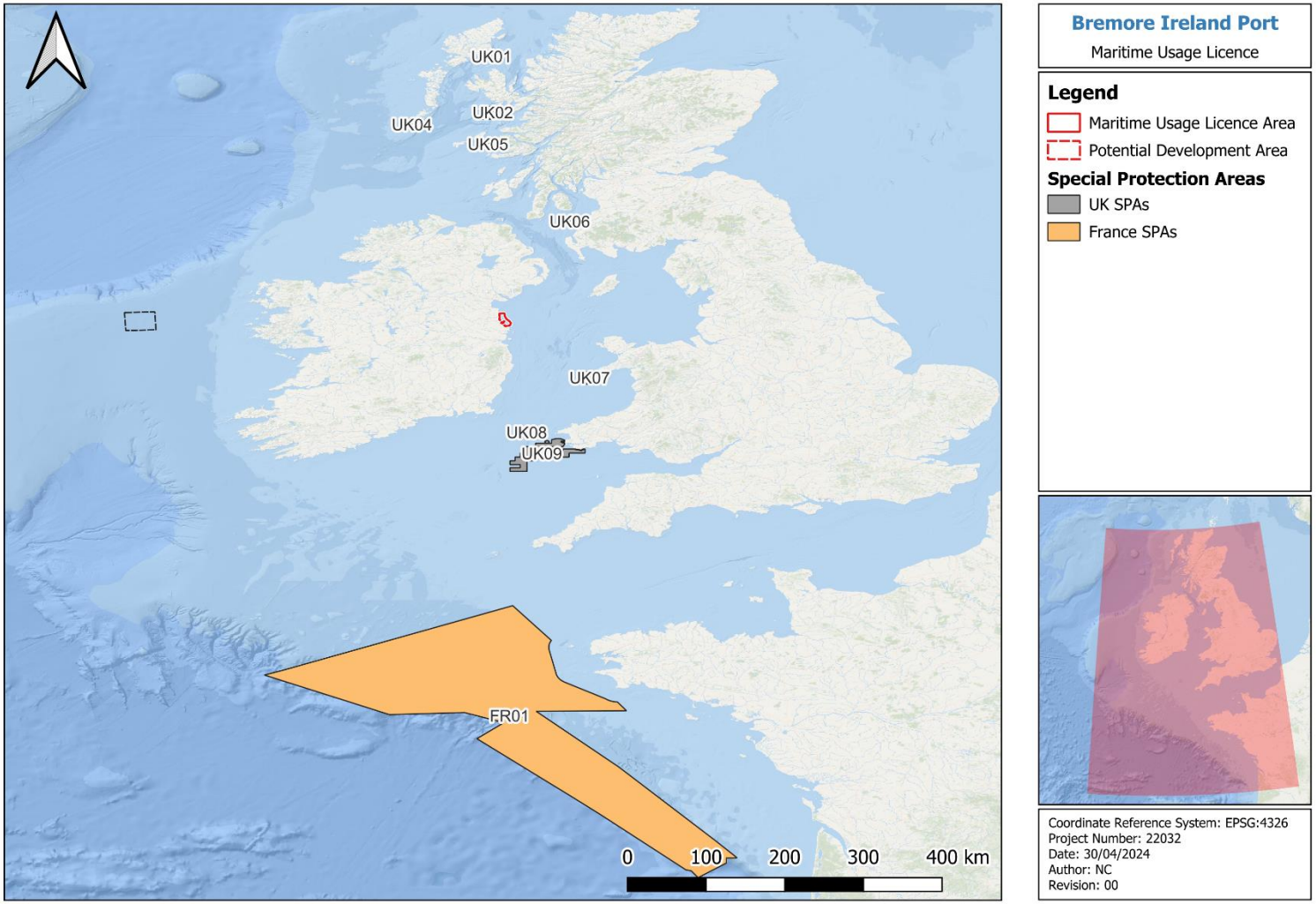
SPAs Ireland in the vicinity of the Licence Area



SPAs Ireland

Ireland SPAs Map Key

Label	Site Code	Site Name	Label	Site Code	Site Name
IE01	4026	Dundalk Bay SPA	IE14	4003	Puffin Island SPA
IE02	4080	Boyne Estuary SPA	IE15	4007	Skelligs SPA
IE04	4122	Skerries Islands SPA	IE16	4150	West Donegal Coast SPA
IE05	4014	Rockabill SPA	IE17	4073	Tory Island SPA
IE06	4069	Lambay Island SPA	IE18	4194	Horn Head to Fanad Head SPA
IE07	4113	Howth Head Coast SPA		4063	Poulaphouca Reservoir SPA
IE07	4117	Ireland's Eye SPA	IE19	IE004236	North-west Irish Sea cSPA
IE08	4063	Poulaphouca Reservoir SPA	IE20	IE004237	Seas off Wexford cSPA
IE09	4127	Wicklow Head SPA			
IE10	4002	Saltee Islands SPA			
IE11	4155	Beara Peninsula SPA			
IE13	4154	Iveragh Peninsula SPA			



SPA UK (JNCC, 2021) and France (EEA, 2021)

SPAs UK and France Map Key

Label	Site Code	Site Name	Label	Site Code	Site Name
UK01	UK9001041	The Shiant Isles	FR01	FR5212016	Mers Celtiques - Talus du golfe de Gascogne SPA
UK02	UK9001341	Rum			
UK04	UK9001121	Mingulay and Berneray			
UK05	UK9003041	Treshnish Isles			
UK06	UK9003091	Ailsa Craig			
UK07	UK9013121	Glannau Aberdaron ac Ynys Enlli/ Aberdaron Coast and Bardsey Island			
UK08	UK9014041	Grassholm			
UK09	UK9014051	Skomer, Skokholm and the Seas off Pembrokeshire			

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