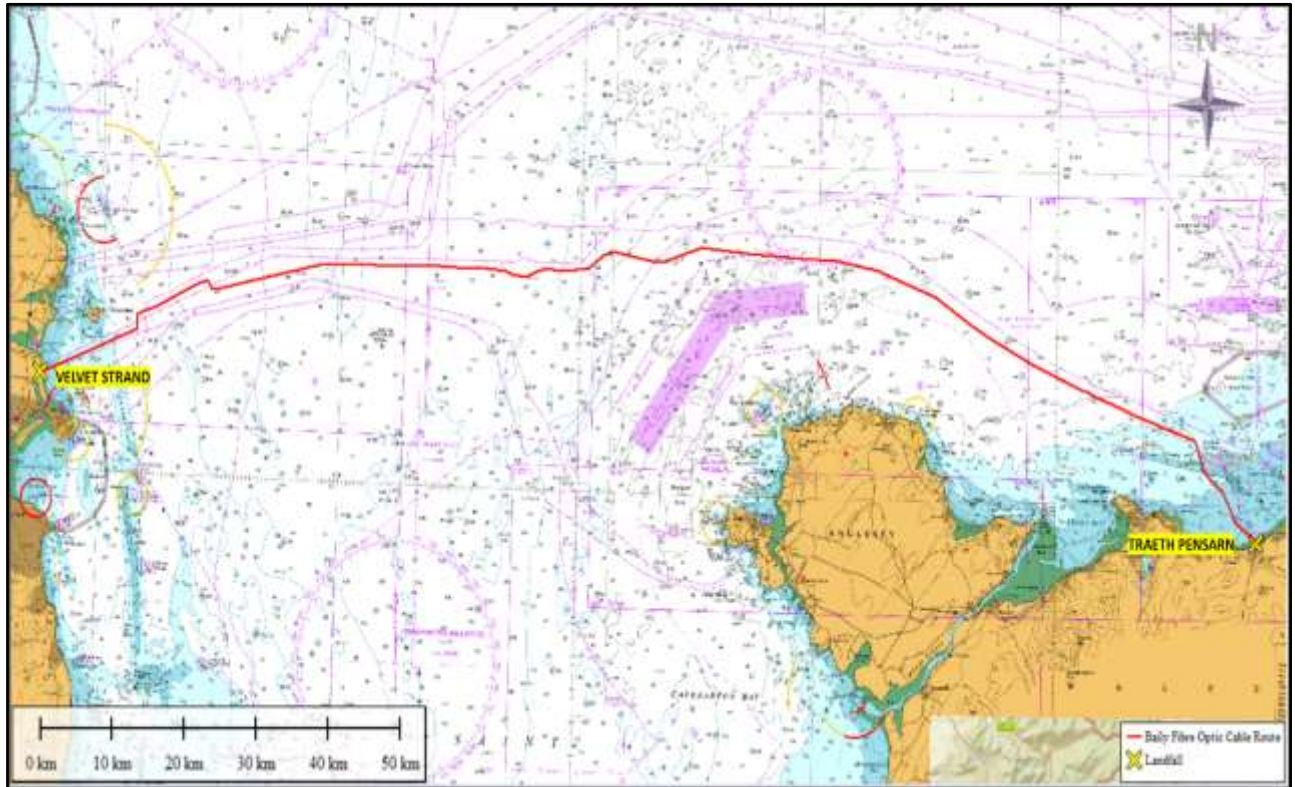


Ecological Impact Assessment (EcIA) for Marine Survey and Site Investigation Works for a Fibre Optic Cable at Velvet Strand, Portmarnock, Co. Dublin.



01st September 2026

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1. Introduction

1.1 Background

Ecological Impact Assessment (EclA) has been defined as *‘the process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components’* (Treweek, 1999). *“The purpose of EclA is to provide decision-makers with clear and concise information about the likely ecological effects associated with a project and their significance both directly and in a wider context. Protecting and enhancing biodiversity and landscapes and maintaining natural processes depends upon input from ecologists and other specialists at all stages in the decision-making and planning process; from the early design of a project through implementation to its decommissioning”* (IEEM, 2010).

The following EclA has been prepared by Altemar Ltd. at the request of euNetworks Fiber UK Limited for marine survey and site investigation works for a fibre optic cable at Portmarnock, Co. Dublin.

1.2 Study Objectives

The objectives of this EclA are to:

1. Outline the project and any alternatives assessed;
2. Undertake a baseline ecological feature, resource and function assessment of the site and zone of influence;
3. Assess and define significance of the direct, indirect and cumulative ecological impacts of the project during its construction, lifetime and decommissioning stages;
4. Refine, where necessary, the project and propose mitigation measures to remove or reduce impacts through sustainable design and ecological planning; and
5. Suggest monitoring measures to follow up the implementation and success of mitigation measures and ecological outcomes.

The following guidelines have been used in preparation of this EclA:

- Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002);
- Draft Guidelines on the information to be contained in EIARs (2018);
- Guidelines for Ecological Impact Assessment (EclA) (IEEM, 2019);
- Advice Notes on current practice in the preparation of EIS’s (EPA, 2003);
- Institute of Ecology and Environmental Management Guidelines for EIA (IEEM, 2005).

1.3 Altemar Ltd.

Since its inception in 2001, Altemar has been delivering ecological and environmental services to a broad range of clients. Operational areas include: residential; infrastructural; renewable; oil & gas; private industry; Local Authorities; EC projects; and, State/semi-State Departments. Bryan Deegan, the managing director of Altemar, is an Environmental Scientist and Marine Biologist with over 32 years’ experience working in Irish terrestrial and aquatic environments, providing services to the State, Semi-State and industry. He is currently contracted to Inland Fisheries Ireland as the sole “External Expert” to environmentally assess internal and external projects. Bryan Deegan (MCIEEM) holds a MSc in Environmental Science, BSc (Hons.) in Applied Marine Biology, NCEA National Diploma in Applied Aquatic Science and a NCEA National Certificate in Science (Aquaculture). Bryan has been involved in twelve international sub marine fibre optic cable projects, many of which involved Horizontal Directional Drills within designated sites and all works required ecological supervision.

2. Description of the Proposed Project

2.1 Background

The applicant plans to investigate the feasibility of constructing a new subsea telecoms cable system, Baily, linking Ireland to the United Kingdom, from a landfall at Velvet Strand, Dublin to a landfall at Traeth Pensarn, Wales as shown in Figure 1 below. The applicant intends to undertake the survey campaign at the proposed Licence Application Area within the IRL Exclusive Economic Zone (EEZ) in order to inform the location and design of the proposed cable route and landfall.

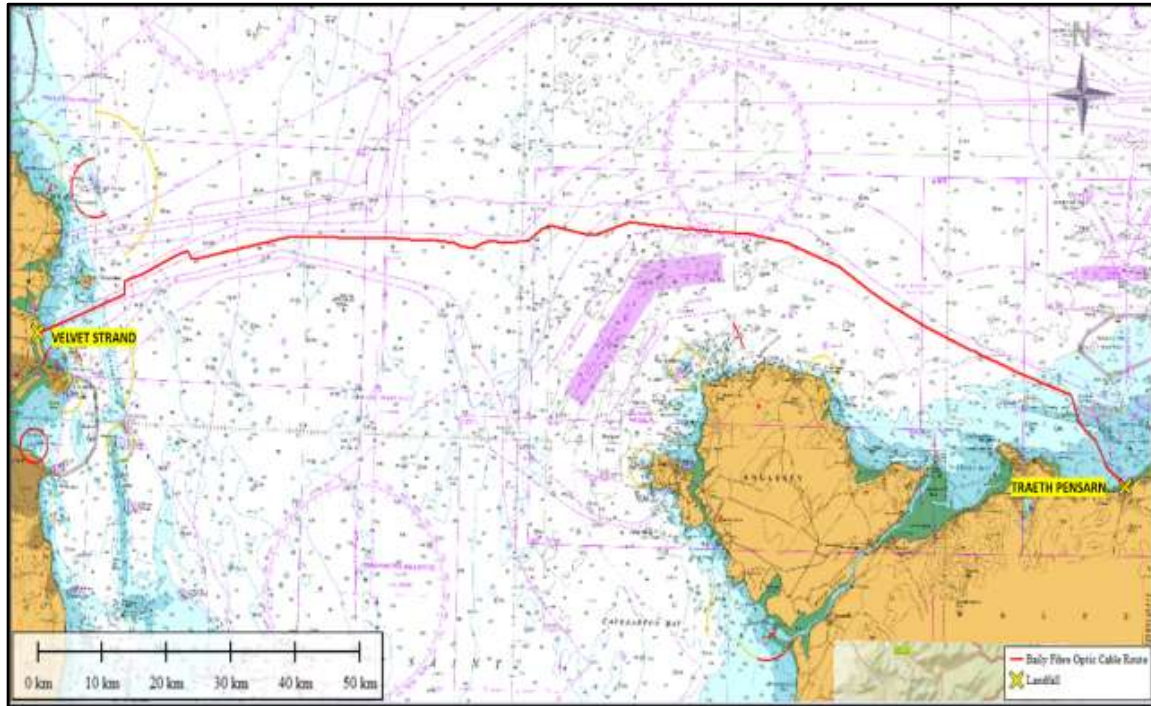


Figure 1. *Proposed Baily Telecoms Cable System (source: MDM)*

The works will be carried out predominantly by remote seabed mapping techniques (geophysical survey) with some selective sampling of the upper layers of the seabed (geotechnical survey). Once the results of the survey are obtained and analysed a preferred route corridor will be determined, design and method statements will be developed, and a final Route Position List (RPL) will be defined as part of further submissions for a Maritime Area Consent and Planning consent for the installation works.

PROPOSED SURVEY ROUTE AND SURVEY LICENCE APPLICATION AREA IN IRISH TERRITORIAL WATERS

Licence Application Area

The License Application Area is situated off the coast of North Dublin (Figure 2). The licensed survey corridor has length of approx. 60 km and a total area of 3000 hectares within EEZ limits. A cable route corridor of approx. 500m width will be surveyed within the licence application area.

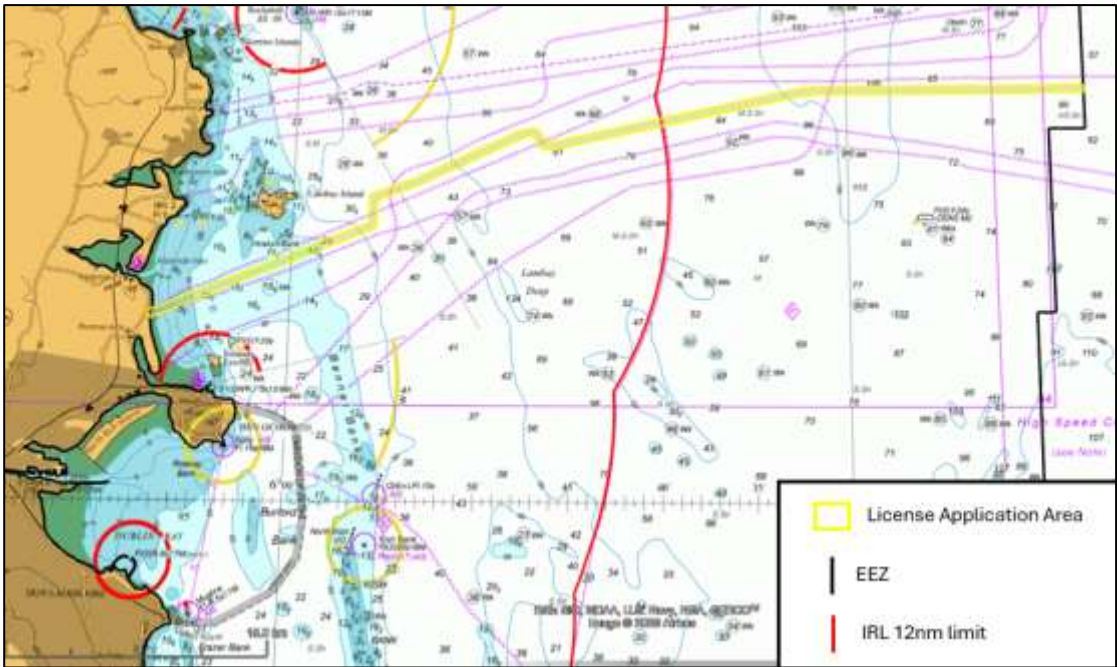


Figure 2. Proposed Survey Licence Application Area (Source: MDM)

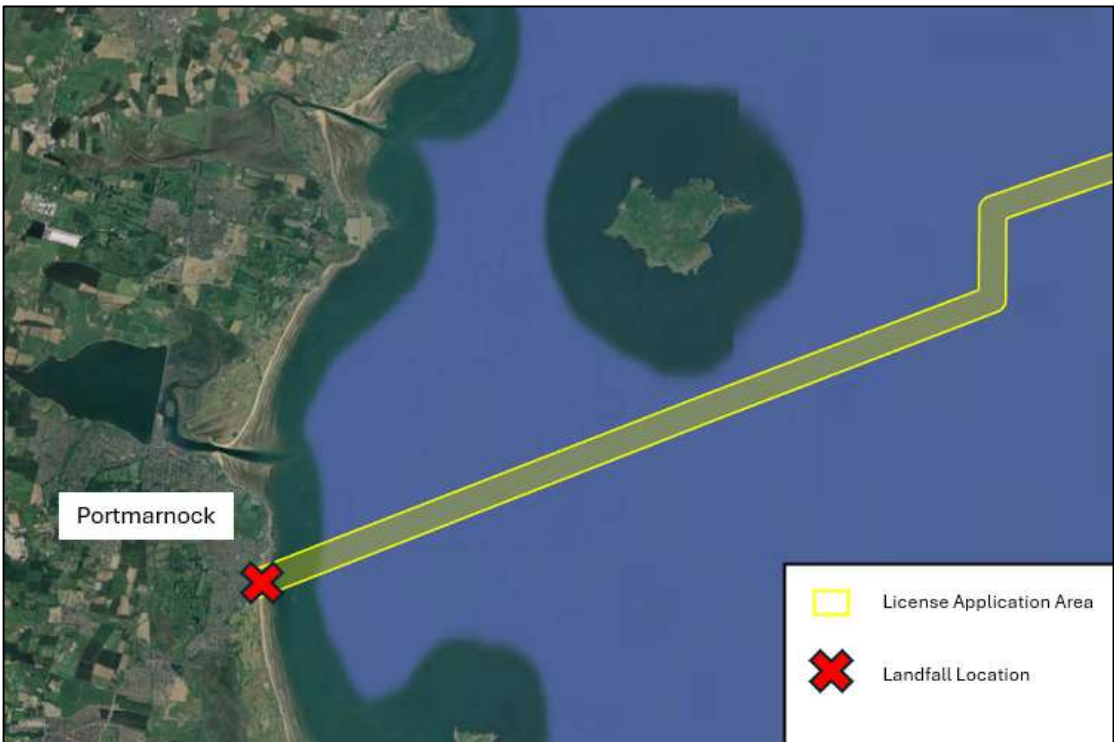


Figure 3. Landfall Location (Source: MDM)

Landfall & Inshore Survey Corridors

The License application area covers the proposed landfall option at Portmarnock. The location of the proposed landfall and proposed survey route is shown above in Figure 3.

Portmarnock

The License application area covers potential landfall at Portmarnock. At Portmarnock the landfall location is adjacent to the Portmarnock Resort & Jameson Golf Links. The Route Position List represents the survey corridor and encompasses the landfall area. If required, access to the beach and intertidal zone at the landfall for vehicles or equipment will be via the concrete public slipway off the R106 Coast Road (Figure 4).

The Route Position List for the Licence Application Area is presented in Table 1.

Table 1. Survey Licence Area RPL (Source: MDM)

Idx	Latitude	Longitude	Idx	Latitude	Longitude
1	53° 25' 42.1995" N	6° 07' 26.5107" W	30	53° 33' 27.3736" N	5° 17' 4.8869" W
2	53° 26' 8.1669" N	6° 05' 41.7828" W	31	53° 33' 26.6720" N	5° 18' 58.5380" W
3	53° 26' 34.1083" N	6° 03' 57.0203" W	32	53° 33' 25.7897" N	5° 20' 52.2245" W
4	53° 27' 0.0170" N	6° 02' 12.2186" W	33	53° 33' 25.2761" N	5° 22' 45.9216" W
5	53° 27' 25.7409" N	6° 00' 27.2726" W	34	53° 33' 24.7323" N	5° 24' 39.6194" W
6	53° 27' 51.4567" N	5° 58' 42.3047" W	35	53° 33' 24.1585" N	5° 26' 33.3177" W
7	53° 28' 16.9428" N	5° 56' 57.1633" W	36	53° 33' 23.5547" N	5° 28' 27.0166" W
8	53° 28' 50.0408" N	5° 55' 27.5673" W	37	53° 33' 22.9296" N	5° 30' 20.7160" W
9	53° 29' 42.1344" N	5° 54' 48.3812" W	38	53° 33' 19.6834" N	5° 32' 14.0607" W
10	53° 30' 6.3266" N	5° 53' 2.3556" W	39	53° 33' 7.0152" N	5° 34' 5.6824" W
11	53° 30' 35.4342" N	5° 51' 19.8012" W	40	53° 32' 52.1330" N	5° 35' 56.5924" W
12	53° 31' 4.5167" N	5° 49' 37.2085" W	41	53° 32' 37.2431" N	5° 37' 47.4898" W
13	53° 31' 33.4103" N	5° 47' 54.4485" W	42	53° 32' 22.5097" N	5° 39' 38.4368" W
14	53° 31' 14.7959" N	5° 46' 25.3995" W	43	53° 32' 7.4024" N	5° 41' 29.2327" W
15	53° 31' 25.5822" N	5° 44' 34.1982" W	44	53° 31' 52.2520" N	5° 43' 20.0022" W
16	53° 31' 40.6710" N	5° 42' 43.4235" W	45	53° 31' 37.1517" N	5° 45' 10.7800" W
17	53° 31' 55.8584" N	5° 40' 52.6771" W	46	53° 31' 51.2870" N	5° 46' 42.9362" W
18	53° 32' 10.6500" N	5° 39' 1.7717" W	47	53° 31' 41.5394" N	5° 48' 29.8405" W
19	53° 32' 25.3795" N	5° 37' 10.8323" W	48	53° 31' 12.7371" N	5° 50' 12.6780" W
20	53° 32' 40.2886" N	5° 35' 19.9515" W	49	53° 30' 43.4891" N	5° 51' 55.1441" W
21	53° 32' 55.5876" N	5° 33' 29.2112" W	50	53° 30' 14.8125" N	5° 53' 37.9877" W
22	53° 33' 6.4570" N	5° 31' 37.1263" W	51	53° 29' 51.2561" N	5° 55' 24.4663" W
23	53° 33' 6.7738" N	5° 29' 43.4360" W	52	53° 28' 54.1453" N	5° 55' 54.3420" W
24	53° 33' 7.1774" N	5° 27' 49.7464" W	53	53° 28' 25.6606" N	5° 57' 32.5017" W
25	53° 33' 7.6351" N	5° 25' 56.0584" W	54	53° 27' 59.9412" N	5° 59' 17.4899" W
26	53° 33' 8.3431" N	5° 24' 2.3752" W	55	53° 27' 34.1957" N	6° 01' 2.4437" W
27	53° 33' 8.6489" N	5° 22' 8.6883" W	56	53° 27' 8.4241" N	6° 02' 47.3629" W
28	53° 33' 9.4403" N	5° 20' 15.0094" W	57	53° 26' 42.6264" N	6° 04' 32.2476" W
29	53° 33' 11.0904" N	5° 18' 21.3579" W	58	53° 26' 16.8025" N	6° 06' 17.0978" W



Figure 4. Landfall at Portmarnock (Source: MDM)

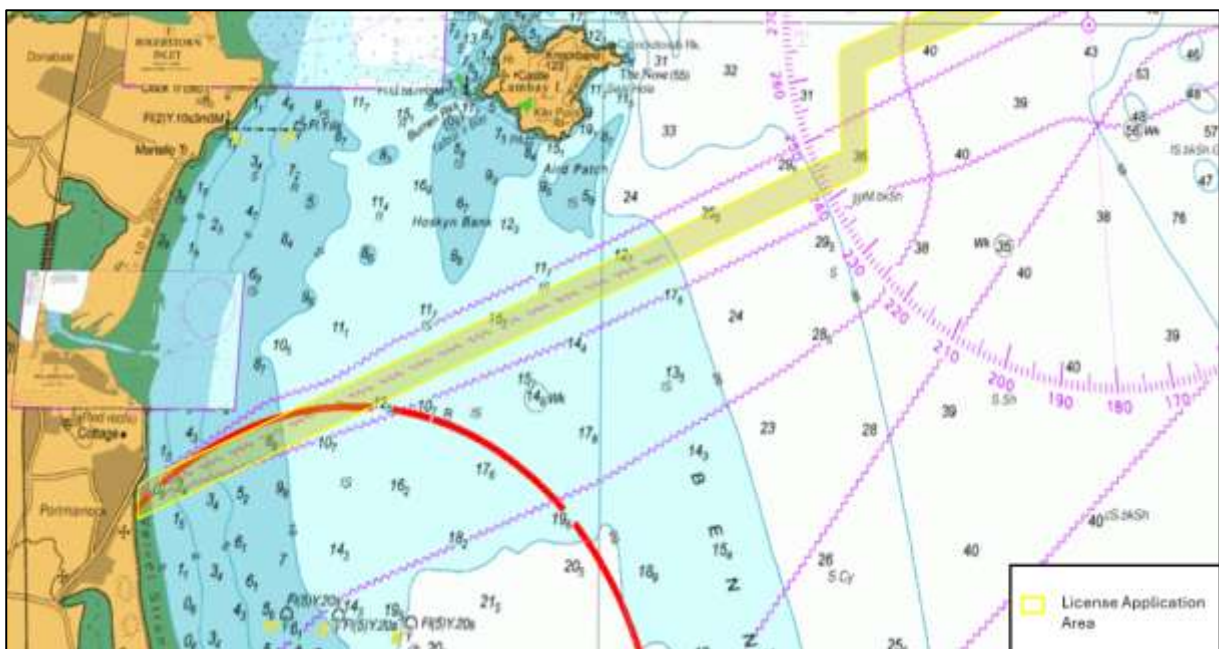


Figure 5. Inshore Survey Sections and Landfalls (Source: MDM)

PROPOSED MARINE SURVEY & SITE INVESTIGATIONS SCHEDULE OF WORKS

The principal objective of the Marine Survey & Site Investigations is to ascertain a feasible and safe route for cable system design, deployment, survivability and subsequent maintenance with due regard for environmental and ecological considerations. The survey will also enable decisions to be made on cable armouring and burial. The survey will identify the necessary water depths, route features, seabed obstructions, seabed geomorphology and cable hazards and will also provide detailed information on the seabed sediment, subsurface stratigraphy and upper sediment layers to support cable route and installation engineering. The site investigations will provide “ground-truthing” of the geophysical data along the route.

The objectives of the marine geophysical survey shall be:

- To collect up to date high-resolution bathymetry along a 400 – 500m wide cable corridor within the License Application Area;
- To obtain information on the seabed surface (type, texture, variability, etc.) and in particular, to identify any seabed features that may be of interest.
- Identify any shallow geohazards and man-made hazards (including but not limited to outcropping, boulders, shallow gas, wrecks, debris etc.);
- Determine the stratigraphy of the upper layers of the seabed along the cable route and quantify the variability in the lateral and vertical extents to depths of 2-5m
- Identify any magnetic anomalies;
- Identify sensitive marine habitats which will need to be avoided during site investigations and sampling.

The survey operations will be broken down into separate but overlapping areas, with boundaries defined by water depth as specified in the technical requirements outlined below. These water depth boundaries may be adjusted due to suitability of the survey vessel(s) and survey spread. The survey and survey line spacing will be designed to ensure adequate coverage and overlap of geophysical measurements.

- Landfall Survey – Intertidal Zone
- Inshore Survey – from 3m Chart Datum to 15m Chart Datum
- Offshore Survey – Water depths greater than 15m Chart Datum

In order to ensure data continuity, coverage between the survey areas is required with indicated overlap below;

- Landfall Survey to Inshore Survey – 50m overlap
- Inshore Survey to Offshore Survey – 500m overlap

Landfall Survey & Site Investigations

A non-intrusive topographic survey along the line of the proposed cable route at the landfall is required to the low water mark. Intertidal and beach surveys (walkover survey) will be carried out on the beach by the project ecologist and the project archaeologist. Access to the beach and intertidal zone at the landfall for vehicles or equipment will be via the concrete public slipway off the R106 Coast Road (Figure 4).

The topographical survey would typically be carried out by GPS Rover, Total Station or UAV Aerial Drone using photogrammetry or LiDAR techniques. The terrestrial geophysical survey will comprise remote sensing techniques such as Ground Penetrating Radar or Electrical Resistivity Tomography (ERT) to establish subsurface features and depth to bedrock and magnetometer or handheld marine metal detector to locate buried ferrous objects.

Landfall Site Investigations will be undertaken to establish the depth and nature of the sediment. The focus of the site investigations will be on the upper layers of sediment to assess the feasibility of cable burial and installation techniques. The following may be undertaken at the landfall:

- Bar probes on the intertidal at 10m spacing (approx. 8 to 10 at the landfall).
- Bar probes from the Low Water Line to the 3m water depth contour at 30m spacing. (approx. 8 to 10 at the landfall)
- 3 Trial Pits on the beach (target depth 2.5m).

The bar probes on the intertidal are manually driven to a depth of 2 metres simply to prove the depth of upper layers of sand, gravel or soft material.

The Trial Pits will be positioned at approximately 30 to 50m centres starting seaward of the High Water Mark. The Trial Pits will be excavated, logged, photographed and backfilled in a single tidal cycle. The trial pits will be backfilled with the original excavated materials in the sequence in which they are excavated.

A summary Method Statement for excavation of the Trial Pits is as follows;

- Excavate sand and place to one side.
- Excavate substrate and place separate from sand.
- Measure, log and photograph each Trial Pit.
- Backfill in sequence compacting with bucket of back-hoe as the backfilling proceeds.

Inshore Marine Survey

The area extending seaward from the low water mark at the landfall and inshore of the safe working draft limits of the primary survey vessel will be accurately surveyed with a small craft or Unmanned Survey Vessel (USV) using Multibeam Echosounder (MBES), sidescan sonar, marine magnetometer and sub-bottom profile equipment. Sub-bottom profile equipment will be able to discern the nature and density of the upper 3 metres of seabed and will be used on a non-interfering basis with other sounding systems. A minimum of seven survey lines, based upon the Survey RPL, is required.

Features such as shallow reefs, surge channels, debris fields, archaeological features or anything that could be a hazard to the cable or installation team will be noted. General reconnaissance of the survey corridor beyond the planned survey lines and tie-lines may be necessary to describe the seabed as accurately as possible. A line plan showing number of survey lines as a function of depth will be determined prior to start of survey operations.

Table 2. Inshore Survey (Source: MDM)

Survey Area	Depth Range	Survey Corridor Width	Min. # of Lines	Min. Overlap	Typical Survey Speed
Inshore	3m to 15m	400 - 500m	9	SSS: 100% MBES Bathy: 20%	4 knots

Offshore Marine Survey

The area extending seaward from the outer limits of the inshore survey to the EEZ limits will be surveyed by the primary survey vessel using Multibeam Echosounder (MBES), sidescan sonar, marine magnetometer and sub-bottom profiler equipment. A continuous bathymetric swathe along with side scan sonar imagery and sub-bottom traces will be obtained, centred on the preliminary route and along all wing lines needed to complete the route corridor coverage. A minimum of seven survey lines, based upon the Survey RPL, is required.

Sub-bottom profile equipment will be able to discern the nature and density of the upper 3 metres of seabed and will be used on a non-interfering basis with other sounding systems.

Table 3. Offshore Survey (Source: MDM)

Survey Area	Depth Range	Survey Corridor Width	Min. # of Lines	Min. Overlap	Typical Survey Speed
Offshore	> 15m	500m	7	SSS: 100% MBES Bathy: 20%	4 knots

Marine Site Investigations and Seabed Sampling

The purpose of the marine site investigations and seabed sampling is to evaluate the physical properties of the superficial seabed sediments along the cable route. These methodologies will ensure that a full understanding of the subsurface is achieved, focussing on the upper 3 metres of sediment to subsequently develop a cable burial assessment, installation and burial plan.

The scheduled site investigations and seabed sampling within EEZ limits will comprise of the following techniques:

- Up to 15 CPTs (2m to 3m)
- Up to 12 Gravity Cores / Vibrocores (3m)
- Up to 11 Grab Samples

Indicative locations for the relevant site investigation activities (Gravity or Vibrocore and CPT's) are shown in Figure 6. Typically, individual sampling positions will be determined following initial interpretation of the geophysical survey data. The positioning of individual site investigation locations will also take into consideration environmental constraints such as the position of sensitive habitats or archaeological features.

Two or more attempts may be made at each location to acquire a suitable sample. If an acceptable sample is achieved on the first attempt, there is no need to perform a second attempt.

An acceptable sample is defined as;

- Grab Sample – recovery of approximately a full bucket of sediment. Recovery of large size granular material may be taken as indication of a hard seabed.
- Gravity Core / Vibrocore – recovery of < 3m core of soil. If stiff or hard soils are encountered and are clearly indicated in the sample, it sample may be deemed acceptable. Any sample site yielding less than 1m of recovery must be investigated a second or third time unless there is obvious damage to the coring equipment indicating a hard or rocky substrate.
- CPT – Penetration to the 2m target depth or refusal. Any push resulting in less than 2m penetration will warrant a second attempt.

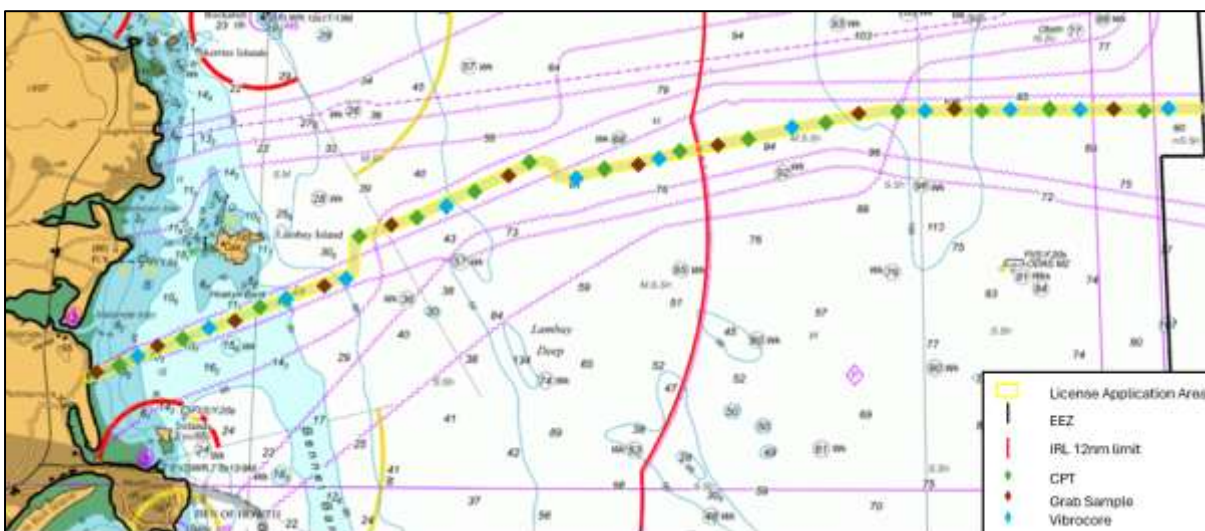


Figure 5. Indicative CPT and Vibrocore Locations (Source: MDM)

The total overall scope of the Site Investigations is as follows

- Bar Probes 10 No. on the intertidal
- Trial Pits 3 No. on the beach
- Bar Probes 10 No. from Low Water to 3m contour.
- Grab Samples 11 No. along the route corridor.
- Gravity Cores / Vibrocores 12 No. along the route corridor.
- Cone Penetration Tests 15 No. along the route corridor.

Underwater Video Survey

Underwater video camera system may be used for inspections of the seabed to investigate seabed obstructions, marine archaeology or benthic habitats. An underwater drop-down camera system or similar may be used in a series of video transects which would be georeferenced and later mapped in GIS.

Archaeological Survey

The proposed survey specification takes into account archaeological data acquisition to enable professional archaeological interpretation and analysis of data. The survey equipment deployed and data acquisition and processing shall comply with the requirements of the National Monuments Service, Underwater Archaeology Unit.

All archaeological assessments will be carried out by a suitably qualified and experienced marine archaeologist to determine the location of all known archaeological features in advance of the intrusive site investigations and seabed sampling. The data collected will be used to support the archaeological assessments.

SURVEY EQUIPMENT PARAMETERS

Multibeam Echosounder (MBES)

Echo-sounders are a diverse group of acoustic sources used to collect information on bathymetry, seabed features and objects in the water column (e.g. Multi beam echosounder, scientific echo-sounders/ fish-finders). They measure water depth by emitting rapid pulses of sound towards the seabed and measuring the sound reflected back.

Multibeam Echosounder (MBES) will be used during the marine survey to provide detailed 3 dimensional bathymetric mapping of the cable route corridor using multiple beams elongated in the across-track direction to cover a fan-shaped sector (or swath) (Figure 7). Measurements of the across-track beam from MBES showed 3 dB beam widths of 150-160°; in the along-track orientation beam width is narrow, typically ~1.5-3.0° (Crocker & Fratantonio 2016).

MBES is non-intrusive and does not interact with the seabed. The MBES system will be used will be confirmed following the appointment of a survey contractor but typical systems which can be taken as examples would be the R2 Sonic 2024, Kongsberg EM2040 or Teledyne Seabat T50 which would be hull mounted on the survey vessel.

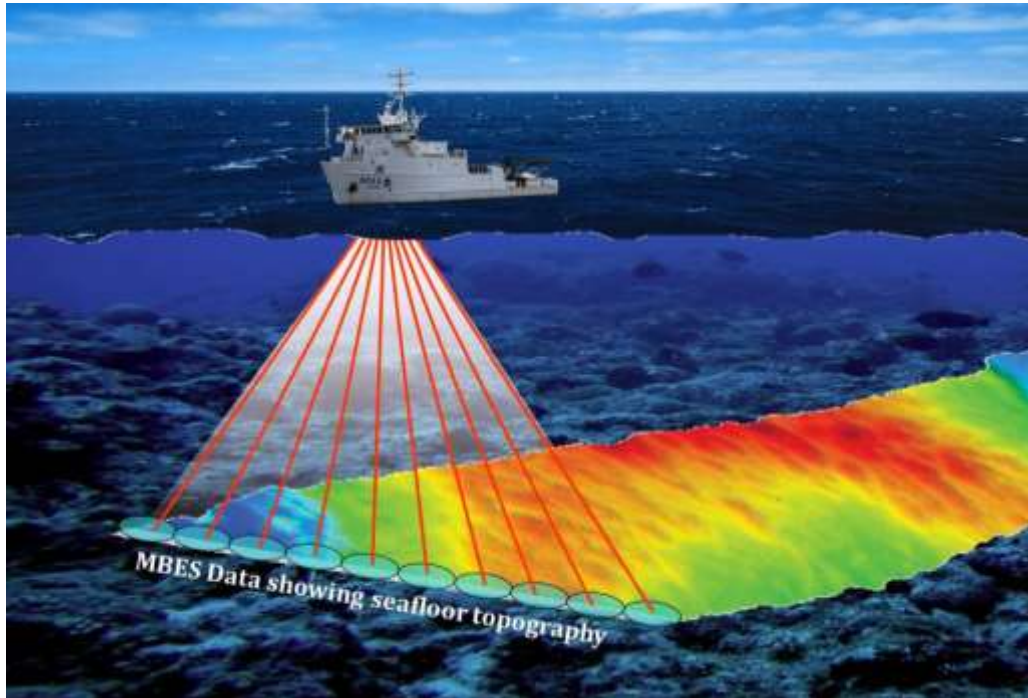


Figure 7. *Graphic of MBES survey in operation*

The acoustic signal emitted by MBES systems is short duration, typically of a few milliseconds or less, and can be configured to within the range 0.05-10 ms for certain systems. Repetition rates are highly customisable, varying with signal frequency and water depth. Ping rates of up to 10-20 pings per second may be used in very high frequency systems, whereas there may be several seconds between pings in low-frequency deep-water applications.

For collecting information on the seabed, emitted sound frequencies are typically between 12 – 400 kHz depending on water depth, with surveys in continental shelf applications operating at between 70 to 150 kHz, and in shallower waters of less than 200 m using multi-beam echosounders operating at between 200 and 500 kHz. The typical operating frequencies for the cable route survey within the licence application area will be in the range of 200kHz to 500kHz. (Danson 2005, Hopkins 2007, Lurton and DeReutier 2011)

Maximum sound source pressure levels of MBES have been reported as ranging from 210-245 dB re 1 μ Pa at 1m with the highest levels corresponding to the lowest frequency systems (DECC 2011, Lurton and DeReutier 2011, Lurton 2016, BEIS 2020). The highest measured source levels among three MBES systems when operated at maximum power for central operating frequencies of ≥ 100 kHz was between L_p,pk 225-228 dB re 1 μ Pa at 1m (L_E,p 181-197 dB re 1 μ Pa² s at 1m (Crocker & Fratantonio 2016).

Side Scan Sonar

Side-scan sonar (SSS) is a seabed imaging technique used to provide high-resolution and detailed 2-dimensional imagery of the seabed for a variety of purposes. SSS involves the use of an acoustic beam to obtain an accurate image over a narrow area of seabed to either side of the instrument.

Piezoelectric transducers in the SSS generate high-frequency acoustic pulses which are directed either side of the tow fish. The transducers are oriented such that the acoustic signal covers a wide angle perpendicular to the path of the tow fish through the water, providing information on a strip either side of the device (port and starboard). The intensity of the acoustic reflections from the seafloor is recorded in a series of cross-track images. When stitched together along the direction of motion, these images form a waterfall view of the sea floor within the swath of the beam. The range (swath width) is dependent upon the frequency, power and other source configurations, but is typically between 50-300 m on both sides.

Analysis of SSS data can aid identification of seafloor sediment, surficial bedrock outcrops and geomorphology mapping. Obstacles rising proud of the seafloor, such as shipwrecks, boulders, pipelines, outfalls, exposed cables, fishing gear etc. can cast shadows on the resulting seafloor image where no acoustic signal is returned. The size of the shadow can be used to determine the size of the feature casting it (Figure 8).

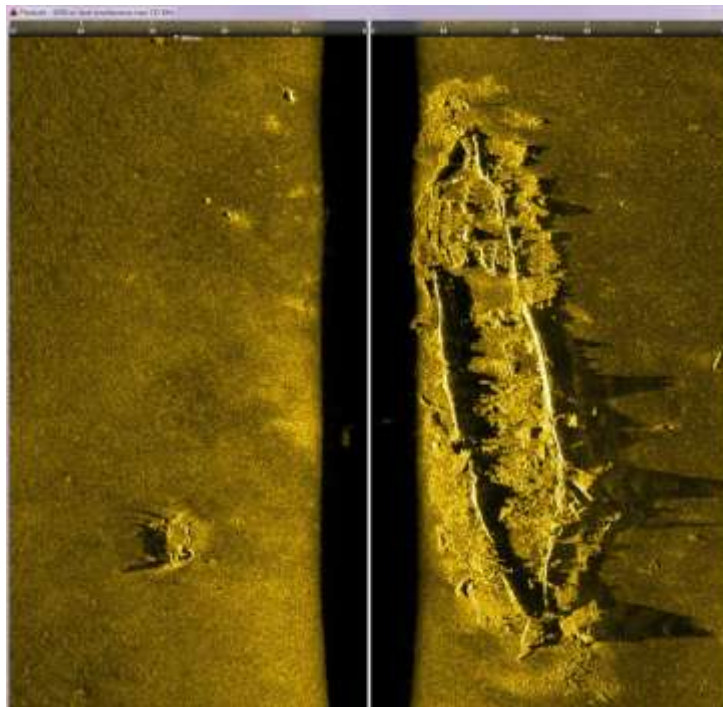


Figure 8. SSS image of shipwreck on seabed and nadir gap (Source: MDM)

SSS is non-intrusive and does not interact with the seabed. The SSS system will be used will be confirmed following the appointment of a survey contractor but typical systems which can be taken as examples would be the Klein 3000 or Edgetech 4200 (Figure 9). The SSS may be hull mounted but is typically towed at depth behind the survey vessel on an armoured tow cable.



Figure 9. Deployment of Edgetech 4200 Tow fish (Source: MDM)

Acoustic signal durations of SSS systems are short (0.4ms – 1.0ms) but vary between models and configurations with longer signal durations are required to survey greater ranges. Repetition rates are highly customisable with ping rates of up to several tens of pings per second (Crocker & Fratantonio 2016).

The frequencies used by side-scan sonar are relatively very high, typically between 100 and 900 kHz. Most SSS systems offer real-time dual frequency operation which allows acquisition of both frequencies across a swath independently and simultaneously. The higher frequency produces higher resolution data and sharper images but with a narrow swath width while the lower frequency results in wider seabed coverage at lower resolutions.

SSS typically offer a selection of two operational frequencies in the range of 100-500 kHz, or may operate both simultaneously. Some models may offer an upper frequency of up to 900 kHz for applications requiring the highest resolution data. Across-track resolutions vary between 1-8 cm with finer resolution at higher operating frequencies. The typical operating frequencies for the cable route survey within the licence application area will be between 200 to 700 kHz.

The line spacing for the survey will be determined after consideration of all factors including water depth and prevailing conditions at time of survey. Generally for SSS, full coverage requires two passes with 100% overlap over a given area of seafloor, with the two passes each insonifying the sea-floor from opposite directions to ensure targets are adequately imaged. This also ensures that the 'nadir gap' or the centre of the image directly under the path of the towfish is fully covered (Figure 8).

Sound source pressure levels of SSS systems have been reported typically in the range $L_{p,pk}$ 200-240 dB re $1\mu Pa$ at 1m. (BOEM 2016, BEIS 2020, DAHG 2014). Maximum calibrated source levels, (sound pressure) measured by Crocker & Fratantonio (2016) were $L_{p,pk}$ 227 dB re $1\mu Pa$ at 1m for a 0.1 ms pulse, whereas the highest energy source level of LE, p 205 dB re $1\mu Pa^2 s$ at 1m corresponded to a longer pulse of 1.1 ms at lower maximum pressure ($L_{p,pk}$ 210 dB re $1\mu Pa$ at 1m).

Marine Magnetometer

A marine magnetometer is a passive towed sensor used to measure magnetic field strength and to detect variations in the total magnetic field of the underlying seafloor. The magnetometer does not transmit any signals into the marine environment.

Usually, the increased magnetization is caused by the presence of ferrous (unoxidized) iron on the seafloor or buried below the surface, whether from a shipwrecked vessel made of steel or from natural rock formations containing grains of magnetite. After corrections are made to measurements of the total magnetic field, magnetic data is used to locate existing infrastructure such as buried pipelines, undersea cables and to identify shipwrecks and potential unexploded ordnance.

Marine magnetometers are non-intrusive and do not interact with the seabed. They are towed at depth at least two and a half ship-lengths behind the survey vessel, so that the ship's magnetic field does not interfere with magnetic measurements. The marine magnetometer may be integrated and towed in tandem with the SSS. The marine magnetometer will be of the Caesium Vapour type and capable of recording variations in magnetic field strength during survey to an accuracy of $\pm 0.5nT$.

The marine magnetometer system to be used will be confirmed following the appointment of a survey contractor but typical systems which can be taken as examples would be the Geometrics G-882 or Marine Magnetics SeaSpy (Figure 10). The line spacing and coverage will generally match the SSS as they are towed in tandem and the parameters of the survey may be determined by the requirements of the Underwater Archaeology Unit of the National Monuments Service.



Figure 10. Marine Magnetics SeaSpy towfish (Source: MDM)

Sub-bottom profiler

Sub-bottom profilers (SBPs) encompass a range of acoustic systems which are designed to collect information on the characteristics of strata below the seabed, establish changes in sediments and detect and image structures buried within the sediments (Figure 11). Shallow Sub-bottom profiling can penetrate the seabed to a range of depths, from a few metres to tens of metres depending on the geological conditions encountered, and with vertical resolutions from a few centimetres to a few metres. Most are towed behind a survey vessel, either at/near the surface or at depth, whereas some smaller devices may be hull-mounted or lowered over the side of a vessel on a pole mount.

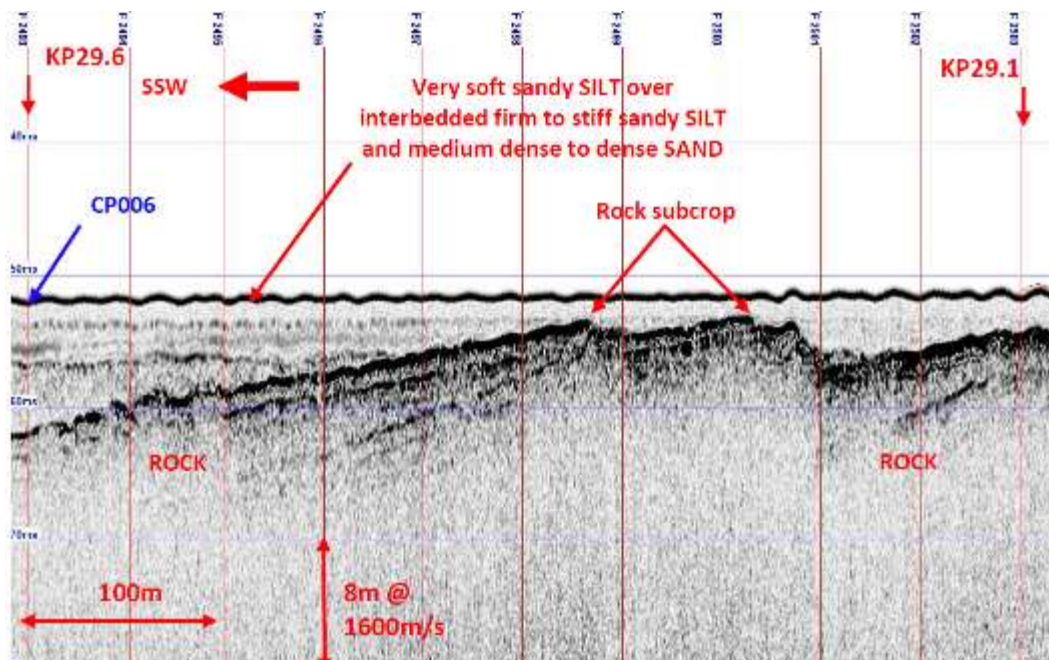


Figure 11. Interpreted SBP seabed profile.

Pulsed waveform SBPs generate an acoustic signal either through the impulsive physical processes of electrostatic discharge, as in sparkers, or electromechanically via accelerated water mass, as in boomers. All periodic waveform SBPs i.e. pingers, chirpers and parametric SBPs are electromechanical sources which employ piezoelectric transducers to generate an acoustic waveform by converting electrical energy into mechanical movement i.e. vibrations. Through the reverse of this process, the transducers can also detect sound. As such, these sources are highly customisable; in many cases, the signal is modulated in frequency and/or amplitude to improve its detectability and performance.

The systems most commonly used for high-resolution surveying are the boomer (such as the Applied Acoustics S-Boom), pinger (such as the Kongsberg GeoPulse), chirp (such as the Edgetech SB-424, Figure 12) and parametric chirp systems (such as the Innomar SES-2000). Whereas the boomer system provides best results for coarser sediments, the pinger and chirp systems deliver detail for finer sediments.

The objective of the SBP cable route survey is to investigate the upper layers of the seabed sediments for cable burial potential and installation risk from seabed obstructions such as subcropping rock formations and is not focussed on deep seabed conditions such as required for investigation of offshore wind farm foundations or deepwater seismic surveys carried out by Oil and Gas Exploration. The SBP system used for the survey will be confirmed following the appointment of a survey contractor and the most appropriate system chosen depending on the seabed, anticipated geological environment and the survey vessel capabilities.

Sound source pressure levels of various SBP systems have been reported typically in the range $L_{p,pk}$ 185-247 dB re $1\mu Pa$ at 1m. (Hartley Anderson 2020, Crocker & Fratantonio 2016). A summary of the Maximum Sound Pressure Levels for SBP systems is described in Table 4 below. The SBP survey is non-intrusive therefore does not interact with the seabed.



Figure 12. Edgetech SB-424 tow body (Source: MDM)

Table 4. Typical SBP specifications (Source: MDM)

Equipment Type	Frequency Range	Duration	Maximum Source Pressure Level (re 1µPa at 1 m)	Reference
Sub-bottom Profiler (SBP) - Pinger	2 kHz to 15 kHz	0.5 - 30 ms	214 dB.	Hartley Anderson 2020
Sub-bottom Profiler (SBP) - Chirper	2 kHz to 13 kHz	5 - 40 ms	185 - 215 dB.	Crocker & Fratantonio 2016, Hartley Anderson 2020
Sub-bottom Profiler (SBP) - Boomer	500 Hz to 15 kHz	0.5 - 1.0 ms	205 - 215 dB.	Crocker & Fratantonio 2016
Sub-bottom Profiler (SBP) - Parametric	4 to 15 kHz, 85 to 115 kHz	0.2 - 30 ms	238 - 247 dB. 200 - 206 dB.	Hartley Anderson 2020

Ultra-Short Baseline (USBL) Subsea Positioning

An Ultra-Short Baseline (USBL) is a subsea positioning system widely used by the offshore marine industry and scientific research vessels to accurately track the position of towed equipment and sensors. The USBL system consists of a transceiver mounted to the survey vessel, and transponders on the towed equipment.

To calculate a subsea position, the USBL calculates both a range and an angle from the transceiver to the subsea beacon. Angles are measured by the transceiver, which contains an array of transducers. The transceiver emits an acoustic signal at predetermined periods (often 0.5 seconds) which is returned by the transponder and allows for the bearing and distance to be calculated.

USBL systems are designed for close range transmission and thus typically emit pulses of medium frequency sound (20 to 50 kHz). Manufacturers report SPL values of 194 to 207dB re 1µPa at 1m depending on the model used, taking as an example the higher range of USBL source (Kongsberg HiPAP) with a SPL of 207dB re 1µPa at 1m.

Cone Penetration Test (CPT)

The survey vessel will position itself over the target position to carry out the CPT. The seabed CPT rig (such as a Neptune 3000, Figure 13) is deployed to the seabed from the vessel crane, A-frame or dedicated Launch and Recovery System (LARS). Once on the seabed, in a stable position, a steel rod with a conical tip (typically an apex angle of 60° and a diameter of 35.7 mm) is pushed at a steady rate into the seabed until it reaches target penetration depth of 3 to 6m or refusal. The penetration resistance at the tip and along a section of the shaft (friction sleeve) is measured and recorded for later analysis

Refusal is indicated by peak system thrust, excessive load on the tip or excessive inclination of the cone. If target penetration depth is not met, the CPT rig may be moved to a nearby position on the seabed and the test repeated. The time taken to complete a shallow CPT is typically less than 10 minutes but the total time in the water from deployment to recovery may be 1 to 2 hours at each position, depending on water depth and sea state.

There is very little published information on the sound pressure levels generated from CPT equipment, collected either from field experimentation or from manufactures specifications. Data from a similar device, deep boring, indicates that sound pressure source levels are typically within the range 118 - 145 decibels (dB) (BOEM 2012, EIRGRID 2014).



Figure 13. Neptune 3000 CPT rig (Source: MDM)

Gravity Core

Gravity corers (Figure 14) provide a rapid means of obtaining a continuous core sample in water depths from a few metres down to several thousand metres. A gravity corer consists of a steel tube in which is inserted a plastic liner to hold the core sample. Gravity corers are commonly used for cable route investigations.

A set of heavy weights, up to 750 kg, is attached at the top end of the tube above which is a fin arrangement to keep the corer stable and vertical during its fall to the seabed. The sampler penetrates the seabed under its own weight. Normal practice is to lower the device to within 10 m of the seabed before releasing. The penetration depth is between 1 m and 3 m. Penetration in stiffer clays or sands is usually limited.

The penetrating end of the tube is fitted with a cutter and a concave spring-steel core-catcher to retain the sample when the corer is retracted from the soil. The suction caused when withdrawing a core barrel from a soft soil such as clay, can pull the sample from the barrel, or in other ways disturb its homogeneity. By fitting a piston above the sample, the partial vacuum caused above the piston, when the barrel is withdrawn, keeps the sample from being pulled out of the tube.

Upon refusal or at target depth of 3m, the sampler is recovered on deck where the sample is split, typically into 1m lengths, logged, sealed and stored for later laboratory analysis. The typical diameter of the liner is in the region of 90mm with a typical maximum diameter of 120mm.



Figure 14. Gravity Corer schematic

Vibrocorer

Vibrocorers are used wherever soil conditions are unsuited to gravity corers or where greater penetration of the seabed is necessary. Vibrocore is best suited to non-cohesive soils (e.g. gravel or sand) as samples recovered are considered disturbed. Vibrocorers are commonly used for cable route investigations.

To penetrate soils such as dense sands and gravels, or to reach deeper into stiff clays, rather than depending on a gravity free-fall, the corer's barrel is vibrated, thus facilitating its penetration into the soil. This vibration energy allows the core barrel to penetrate the sediments under self-weight. In other respects, the barrel and sample retention systems are similar to gravity corers.

The typical vibrocorer consists of a tall steel frame and tripod support. Within the frame is a standard 102 mm steel coring barrel in which is inserted a PVC liner to contain the sample. The typical diameter of the PVC liner is in the region of 90mm with a typical maximum diameter of 120mm. A spring steel core catcher is fitted to the cutting shoe, as with the gravity corer. Two linear electric motors enclosed in a pressure housing provide the vibratory motion; the core barrel is attached directly to the motor housing. Power is fed to the motors via an electrical control line from the survey vessel.

Once in motion, the heavy motor housing provides the mass to drive the core barrel into the seabed. The penetration depth can be from 2m to 8m depending on seabed conditions. A typical 6 m vibrocorer will weigh nearly two tonnes and requires a crane for A-Frame or deployment and recovery. Vibrocorers come with barrel lengths of 3m, 6m and 8m. A normal coring operation in 100 m water depth will take about one hour.

Once coring is started, the core barrel will penetrate to the target depth. Upon refusal or at target depth of 3m, the vibrocore is recovered on deck where the sample in the liner is removed from the barrel, the sample is split, typically into 1m lengths, logged, sealed and stored for later laboratory analysis.

The sounds produced by the operation of a vibrocorer on the seabed consist of a series of impulses corresponding to the movement and impacts of the mechanics of the vibrating motion from the oscillating motors on the core barrel. Expected sound pressure levels generated by vibrocore equipment would be approximately 187.4 dB re 1 μ Pa at 1m (LGL, 2010).



Figure 15. *Deployment of Vibrocorer from Survey Vessel (Source: MDM)*

Grab-samplers

Grab samplers are one of the most common methods of retrieving soil samples from the seabed surface. The grab sampler is a device that simply grabs a sample of the topmost layers of the seabed by bringing two steel clamshells together and cutting a bite from the seabed surface to a depth of 0.1 to 0.5m. The information they provide can be applied in a number of applications such as seabed classification, environmental sampling, chemical and biological analysis and ground truthing for morphological mapping and geophysical survey. Grab samplers can be used to recover samples of most seabed soils, although care is needed in selecting the right size unit for the task.

There are various grab sampler types to include but not limited to Van Veen (single or double, Figure 16), Hamon, Shipek and Day Grab samplers. Generally, some variants may come both as single or double, and in a variety of different sizes. The grab sampler comprises two steel clamshells acting on a single or double pivot. The shells are brought together either by a powerful spring (Shipek type) or powered hydraulic rams operated from the survey vessel.

In operation, the grab is lowered from the survey vessel to the seabed with the clamshells in the open position and which trigger shut when the sampler is in contact with the seafloor. The shells swivel together in a cutting action and retains a sample of seabed. The sampler is then recovered to the survey vessel for visual inspection, processing, logging and transfer to suitable sample containers for storage and later laboratory analysis. Typical performance rates are between three and four samples per hour.

The smaller Shipek type grab sampler is useful for ground truthing geophysical surveys for the surface layer, and samples are taken to about 0.1 m below the seabed. Larger hydraulic grabs are capable of recovering relatively intact samples of consolidated soils to a depth of about 0.5 m. In areas of large cobbles or boulders, grabs can become jammed open and their contents washed away during recovery to the surface. However, the hydraulic grab is more likely to recover cobbles and small boulders than any other system, and in this respect is invaluable. Various grabs will be available for the survey to ensure adequate sampling equipment for various sediment types.

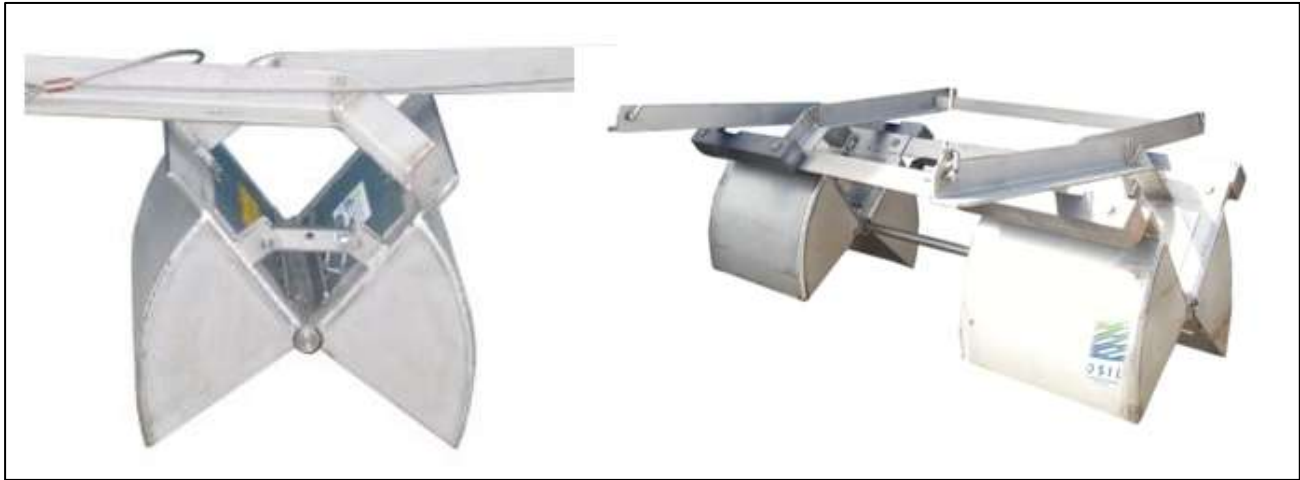


Figure 16. Single and Double Van Veen Grab (Source: MDM)

SURVEY VESSELS

Offshore survey vessels are typically between 15m and 75m in length with potential for smaller vessels to be used in nearshore / shallow water areas. Offshore survey vessels typically have an endurance of approximately 14 to 28 days. A vessel with a shallow water draft will be utilised for the inshore survey area. An unmanned surface vehicle (USV) and/or autonomous surface vehicle (ASV) may also be used for the geophysical survey. The survey vessels may use a local port for personnel / equipment mobilisation, bunkering and provisioning.

The marine survey works will consist of a dedicated marine spread which will be suitable for the scope of work required, the water depth and the anticipated seabed conditions of the survey area. The exact equipment to be used will be confirmed following a tender process to procure the marine survey contractor.

All survey vessels will be fit for purpose, will possess all relevant classification certificates and capable of safely undertaking the survey work required. Health, safety, environment and welfare considerations will be a priority and will be actively managed during the course of the survey scopes of work. Appointed contractors will be required to comply with all legislation relevant to the activities within their scope of work. Prior to survey works taking place under Licence, both Project Supervisor for Design Process (PSDP) and Project Supervisor for Construction Stage (PSCS) will be appointed under the relevant legislation and project / survey specific HSE plans will be put in place which will form part of the survey project execution plans.

The vessels will conform to the following minimum requirements as appropriate:

- Compliance with Safety of Life at Sea (SOLAS), International Maritime Organization (IMO) and national requirements for operating within Irish territorial waters.
- Station-keeping and sea keeping capabilities required to carry out the proposed survey operations safely;
- Calibrated equipment and spares with necessary tools for all specified works;
- Endurance (e.g. fuel, water, stores, etc.) to undertake the required survey works;
- Sufficient qualified staff to allow the survey operations to be carried out efficiently, (typically 24 hour continuous for offshore survey, 12 hour for nearshore survey); and
- Appropriate accommodation and crew welfare facilities.

Survey vessels will generate some subsea noise in the marine environment from engine noise and dynamic positioning thrusters. Shipping noise is typically within the 50-300 Hz frequency band and is the dominant noise source in deeper water (DECC, 2011). Propellers on vessels all have the potential to produce cavitation noise. This sound is caused by vacuum bubbles that were generated by the collapse of bubbles created by the spinning of the propellers.

Acoustic broadband source pressure levels typically increase with increasing vessel size, with smaller vessels (<50 m) having source pressure levels 160-175 dB (re 1µPa at 1m), medium size vessel (50-100 m) 165-180 dB (re 1µPa at 1m) and large vessels (>100 m) 180-190 dB (re 1µPa at 1m) (DECC, 2011). Every vessel has a unique noise signature and for each vessel this can change in response to a number of factors, including; ship speed, operational status, vessel load, the condition of the vessel and even the properties of the water that the vessel is operating in.

MARINE SURVEY AND SITE INVESTIGATIONS SOUND PRESSURE LEVEL SUMMARY

All survey works that involve the use of acoustic instrumentation will follow the Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters, 2014.

The ranges of noise frequency and sound pressure levels associated with all the surveys outlined in previous sections is summarised in Tables 5 and 6 below. It can be noted that as the focus of the cable route surveys within the licence application area is the seabed surface and upper layers of seabed sediments and generally obtaining higher resolution data, the geophysical equipment such as MBES and SSS is generally operated more towards the higher end of the frequency range where possible.

TIMELINE AND DURATION OF SURVEY ACTIVITIES

The intention is to commence the survey as soon as feasible following license award, taking into account survey vessel availability, the overall cable route survey programme, seasonality and suitable weather windows. The exact mobilisation dates will not be known until the process of procuring a contractor and issue of the marine licence is complete. It is anticipated that the marine geophysical survey and site investigations activities within the marine licence area will take less than 6 weeks in total and will be completed over a 6 month period.

The estimated time required to complete the cable route survey campaign activities is described in Table 7 below.

Table 5. Marine Survey Activities (Source: MDM)

Equipment Type	Purpose	Frequency Range	Duration	Maximum Source Pressure Level (re 1µPa at 1 m)	Reference
Multibeam Echo Sounder (MBES)	Measure detailed bathymetry by transmitting sound pulses (active sonar).	200 kHz to 500 kHz	0.05 - 10 ms	210 - 245 dB.	Danson 2005, Hopkins 2007, DECC 2011, Lurton and DeReutier 2011, Lurton 2016, BEIS 2020, Crocker & Fratantonio 2016
Side Scan Sonar (SSS)	Determine surficial nature of the seabed and detect objects by transmitting sound pulse.	200 kHz to 700 kHz	0.4 - 1.0 ms	200 - 240 dB.	BOEM 2016, BEIS 2020, DAHG 2014, Crocker & Fratantonio 2016
Sub-bottom Profiler (SBP) - Pinger	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	2 kHz to 15 kHz	0.5 - 30 ms	214 dB.	Hartley Anderson 2020
Sub-bottom Profiler (SBP) - Chirper	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	2 kHz to 13 kHz	5 - 40 ms	185 - 215 dB.	Crocker & Fratantonio 2016, Hartley Anderson 2020
Sub-bottom Profiler (SBP) - Boomer	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	500 Hz to 15 kHz	0.5 - 1.0 ms	205 - 215 dB.	Crocker & Fratantonio 2016
Sub-bottom Profiler (SBP) - Parametric	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	4 to 15 kHz, 85 to 115 kHz	0.2 - 30 ms	238 - 247 dB. 200 - 206 dB.	Hartley Anderson 2020
Ultra-Short Base Line (USBL)	Subsea positioning.	20 kHz to 50 kHz	5 - 10 ms	194 - 207 dB.	Kongsberg
Magnetometer	Identify ferrous anomalies for metal obstructions, shipwrecks, etc. on and under the seabed.	Passive	N/A	Passive	N/A
Survey Vessels	Carry out the survey and deploy the equipment.	50 Hz to 300 Hz	N/A	160 - 190 dB.	DECC 2011

Table 6. Marine Site Investigation Activities (Source: MDM)

Equipment Type	Purpose	Number of locations within Licence Application Area (up to)	Frequency Range	Maximum Source Pressure Level (re 1µPa at 1 m)	Reference
Cone Penetration Test (CPT)	Determine geotechnical engineering properties of seabed sediments.	15	28 Hz	118 - 145 dB.	BOEM 2012, EIRGRID 2014
Gravity Corer	Retrieve a seabed sediment sample by penetrating seabed with a steel core barrel under self-weight	12	N/A	N/A	N/A
Vibrocorer	Retrieve a seabed sediment sample by penetrating seabed with a vibrating steel core barrel	12	30 Hz	187.4 dB.	LGL 2010
Grab Samples	Collect small sediment samples from seabed surface with clamshell mechanism	11	N/A	N/A	N/A

Table 7. Estimated Time and Duration of Survey Activities (Source: MDM)

Activity	Typical Time Period Required for Activity	Total Number of SI Locations	Total Time for SI	Foot Print Affected per SI	Foot Print Affected per SI (ha)	Total Foot Print (ha)	Area Directly Affected as % of Licence Application Area
Inshore Geophysical Survey	3 to 4 days (weather and sea state dependent)	400 - 500 m cable route corridor	3 to 4 days (weather and sea state dependent)	N/A	N/A	560 ha	18.66667%
Offshore Geophysical Survey	8 to 10 days (weather and sea state dependent)	500 m cable route corridor	10 to 12 days (weather and sea state dependent)	N/A	N/A	2441 ha	81.3667%
CPT	30 minutes - 2 hours in any one location	15	30 hours within total 8 days of Site Investigations campaign (weather and sea state dependent)	8m ²	0.0008 ha	0.012 ha	<1%
Gravity Corer	30 minutes - 2 hours in any one location	12	24 hours within total 8 days of Site Investigations campaign (weather and sea state dependent)	1m ²	0.0001 ha	0.0012 ha	<1%
Vibro Corer	30 minutes - 2 hours in any one location	12	24 hours within total 8 days of Site Investigations campaign (weather and sea state dependent)	8m ²	0.0008 ha	0.0096 ha	<1%
Grab Samples	20 minutes - 45 minutes in any one location	11	9 hours within total 8 days of Site Investigations campaign (weather and sea state dependent)	0.5m ²	0.00005 ha	0.0006 ha	<1%

3. Ecological Assessment Methodology

3.1 Desk Study

A desk study was undertaken to gather and assess ecological data. Sources of datasets and information included:

- The National Parks and Wildlife Service
- National Biodiversity Data Centre
- Marine Institute
- INFOMAR (Lidar, backscatter and multibeam) (WMS data)
- Irish Whale and Dolphin Group
- Bord Iascaigh Mhara
- Environmental Protection Agency (Water Quality Data)
- Bing Maps (ArcGIS)
- EU marine habitat data (incl. EMODnet)

A provisional desk-based assessment of the potential subtidal habitats was carried out. This included a detailed assessment of INFOMAR data (backscatter, multibeam and LIDAR) in addition to Marine Strategy Framework Directive habitat mapping of the offshore area, Admiralty charts, NPWS Data, broadscale habitat data, and EUSEAMAP data.

3.2 Field Surveys

Field surveys at Portmarnock were carried out by Bryan Deegan (MCIEEM) Altemar Ltd. on the 18th September 2023 and 10th July 2026. The survey covered intertidal and terrestrial elements of the project. It also included areas that involved equipment movements e.g. car park and in addition to beach access routes.

The purpose of the field surveys was to identify habitat extents in relation to the proposed works. In addition, more detailed information on the species composition and structure of habitats, conservation value and other data were gathered.

Survey Limitations

Intertidal field surveys were carried out in September 2023 and revised in July 2026, outside the wintering bird season. Significant local pedestrian and canine activity was noted within the landfall areas of the proposed survey works. In light of this, additional detail was gleaned from the desk based review particularly in relation to the conservation objectives supporting documents for both the SPAs and SACs.

3.3 Consultation

The National Parks and Wildlife Service (NPWS) were consulted in relation to the project, species data and sites of conservation interest. The National Biological Data Centre (NBDC) (Appendix I) and Irish Whale and Dolphin Group (IWDG) records were consulted for species of conservation significance.

3.4 Spatial Scope and Zone of Influence

IEEM (2006) defined the zone of influence as *“the areas/resources that may be affected by the biophysical changes caused by activities associated with a project”*. To define the extent of the study area for assessment, all elements of the project were assessed and reviewed in order to identify the spatial scale at which ecological features could be impacted. Due to the limited temporal and geographical scale of the project and the use of Best Available Techniques (BAT), and the slow speed of the survey vessel (4kn), it is considered that the potential impacts of the proposed works could only extend beyond 500 m of the subtidal elements of the project due to noise generation and potential disturbance of sediment. However, as outlined in IEEM (2010) *“in the marine environment it is more difficult to define the geographical framework precisely and to accommodate all factors that should influence the definition of value, e.g. size or conservation status of populations or the quality of habitats.”* As a result, *“it is very unlikely that the impacts on integrity can be evaluated without considering functions and processes acting outside the site’s formal boundary.”* It is important to note that unlike other maritime operations, the research vessel speed will be very slow (4 knots). However, the project has the potential to introduce noise into the marine environment particularly through the use of Ultra-Short Baseline (USBL), Multibeam Echosounder (MBES), and Side-scan Sonar (SSS) equipment, which may extend the effects of the project beyond 2km.

Marine Mammals – Seals and Cetaceans

As outlined in NPWS¹ “Cetaceans account for 48% of all the native species of mammals, both marine and terrestrial, recorded in Ireland and Irish waters are thought to contain important habitats for cetaceans within the northeast Atlantic. To date, 24 species of cetacean, or 28% of species described worldwide, have been recorded in Ireland. Irish cetaceans include six species of baleen whale and eighteen species of toothed whale, including five species of beaked whale. Twenty-two of these have been reported stranded ashore and 20 species observed at sea. Two species (Pygmy sperm whale and Gervais’ beaked whale) are only known from stranded individuals and two species (Northern right whale and White whale/beluga) have only been recorded historically, with neither species occurring in the stranding record so far.

Ireland also has two species of seals, the Common Seal (or Harbour Seal) and the Grey Seal. Whilst both species haul out on land for key stages of their life history, the majority of their time is spent in the marine environment.

In Ireland, the 1992 EC Habitats Directive as transposed by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) requires that both seal species and all cetaceans occurring in Ireland are maintained at favourable conservation status. Under Article 12 of the Directive, all cetaceans should receive strict protection within the Exclusive Economic Zone. Under Article 4 of the Directive, Special Areas of Conservation (SACs) must be proposed for the following species:”

- Bottlenose Dolphin
- Harbour Porpoise
- Common Seal
- Grey Seal

The protection afforded to marine mammals in Ireland is summarised below:

- Harbour Porpoise Annex II of EC Habitats Directive Annex IV of EC Habitats Directive/Protected species of Wildlife (Amendment) Act/OSPAR List of Threatened and Declining Species and Habitats
- Bottlenose Dolphin Annex II of EC Habitats Directive/Annex IV of EC Habitats Directive/Protected species of Wildlife (Amendment) Act
- All Cetacea Annex IV of EC Habitats Directive/Protected species of Wildlife (Amendment) Act
- Grey Seal/Harbour Seal Annex II of EC Habitats Directive/Protected species of Wildlife (Amendment) Act

Beaked whales (*Ziphiidae*) are a family of odontocete cetaceans that typically live in deep offshore waters and perform long, deep dives in search of their prey (Quick *et al.*, 2020; Hooker *et al.*, 2019). Due to their preference for deep waters and given that they perform long, deep dives, beaked whales are difficult to study and little information is available on their distribution and population structure (Rogan *et al.*, 2017). Studies indicate that the distribution of these species is associated with steep continental slope habitats in the Northeast Atlantic and have been recorded in northwestern areas of Ireland’s offshore waters². Beaked whales are sensitive to anthropogenic noise (Barile *et al.*, 2021), and their diving and hunting behaviours can be impacted by increased underwater noise. Beaked whale species recorded in Irish waters include Cuvier’s beaked whale (*Ziphius cavirostris*), Sowerby’s beaked whales (*Mesoplodon bidens*), True’s beaked whales (*Mesoplodon mirus*), and Northern bottlenose whale (*Hyperoodon ampullatus*). Records of beaked whales in Irish waters are seen in Figures 41-44.

Recent research suggests that there is the foraging range for grey seals is 448km (Carter *et al.*, 2022). Further, the foraging range for the harbour seal is estimated at 273 km (Carter *et al.*, 2022). There are a number of SACs designated for cetaceans (harbour porpoise and common dolphin) in Ireland. As these species are highly mobile and designated as qualifying interests of Natura 2000 sites outside the Irish EEZ, specific Management Units (MU) are utilised to assess the potential impacts of a proposed project on these species. Management Units are based on the JNCC Review of Management Unit boundaries for cetaceans in UK waters (2023) methodology³. The proposed project is located within the Celtic and Irish Seas MU for harbour porpoise, and the Offshore Channel, Celtic Sea & SW England MU for bottlenose dolphin (IAMMWG, 2015). The Zol of the proposed project has been extended to include the potential for significant

¹ <https://www.npws.ie/marine/marine-species/cetaceans>

² <https://oap.ospar.org/en/ospar-assessments/intermediate-assessment-2017/biodiversity-status/marine-mammals/abundance-distribution-cetaceans/abundance-and-distribution-cetaceans/>

³ <https://data.jncc.gov.uk/data/b48b8332-349f-4358-b080-b4506384f4f7/jncc-report-734.pdf>

effects on grey seal, harbour seal, harbour porpoise and common bottlenose dolphin as there is potential for these mobile marine mammals to enter the ZOI from within the aforementioned MU's.

Otter

Otters are a semi-aquatic species that use the marine environment for foraging and are protected under Annex II and Annex IV of the Habitats Directive. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5 km in length along a riverine environment and 6.5 ± 1.0 km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3 km in length with a high degree of variability. Out of an abundance of caution, the ZOI of the proposed project has been extended to include the potential for significant effects on otters that may enter the proposed area of survey works.

Migratory Fish

In relation to Atlantic salmon, it has been found that salmon populations from southeast Ireland appear to migrate towards the shelf edge before crossing the Atlantic towards Greenland for feeding (Rikardson et al., 2021).

Twaite Shad is a rare red-listed (vulnerable) species that has an affinity for coastal habitats (Maitland & Hatton-Ellis, 2003), with recent studies recording movement of this species up to 950 km from the River Severn with one individual detected in the Blackwater Estuary (Davies *et al.*, 2020). However, based on King et al. (2011), the twaite shad is restricted to the lower reaches of a handful of rivers in the south, with evidence of recruitment only from the Barrow, Suir and Munster Blackwater. The primary conservation objectives for Natura 2000 sites along the south coast of Ireland for which Twaite Shad are a designated Qualifying Interest (Slaney River Valley SAC [000781]; River Barrow and River Nore SAC [002162]; Lower River Suir SAC [002137]; Blackwater River (Cork/Waterford) SAC [002170]) relate to the restoration of freshwater habitats for this species. The proposed survey works are located within areas of existing vessel activity within Dublin Bay. In the unlikely event that Twaite Shad may be present along the proposed Baily Offshore Cable Survey Route, vessel speeds will be slow (4 knots) and operations are on a continual basis, therefore, the vessel and equipment would be easily avoided by this species if encountered. The proposed survey works will be isolated to the route corridor and will not impact on spawning grounds or migratory routes of this species.

Similarly, no likely significant effects on lamprey species are foreseen as a result of the proposed project. As outlined in King *et al.* 2011 '*juvenile river/brook lamprey (the two species are indistinguishable at juvenile stage) are widely distributed in catchments where suitable habitat is available and, on this basis, both river and brook lamprey have now been classified as of 'least concern'. The same survey programmes have also demonstrated that sea lamprey can be found in many of our larger river systems. However, these surveys have shown that sea lampreys are normally scarce, with low densities of juveniles where they do occur and a tendency for migrating adult fish to be concentrated downstream of major weirs in rivers. This species is now listed as Near Threatened.*' At sea, sea lamprey are widely dispersed and their movements are largely dictated by their host fish (Igoe et al, 2004). Within the marine environment, river lamprey inhabit estuarine and coastal waters (Igoe et al, 2004).

Given the spatial and temporal nature of the proposed survey works, and given the minimum distance to Natura 2000 sites designated for sea and river lamprey (33.8 km to River Boyne and River Blackwater SAC), no likely significant effects on sea lamprey distribution or spawning habitats are foreseen as a result of the proposed project.

Birds

The marine waters off the coast of County Dublin constitute an important resource for marine birds. The estuaries and bays that open into it along with connecting coastal stretches of intertidal and shallow subtidal habitats, provide safe feeding and roosting habitats for waterbirds throughout the winter and migration periods. These areas, along with more pelagic marine waters further offshore, provide additional supporting habitats (for foraging and other maintenance behaviours) for those seabirds that breed at colonies on islands and coastal headlands. These marine areas are also important for seabirds outside the breeding period (NPWS, 2023). The proposed survey works are located within the intertidal at Velvet Strand, Portmarnock and offshore subtidal (up to EEZ Boundary), within Co. Dublin's coastal waters and North-West Irish Sea SPA. Given the location of the proposed works to these valuable waters, and given the potential for seabirds to utilise offshore waters within the proposed works corridor for transiting / feeding, the ZOI has been extended to include Natura 2000 Sites designated for seabirds which utilise this area; namely, Malahide Estuary SPA and North-West Irish Sea SPA

3.5 Impact Assessment Significance Criteria

This section of the EclA examines the potential causes of impact that could result in likely significant effects to the species and habitats that occur within the ZOI of the proposed development. These impacts could arise during either the construction or operational phases of the proposed development. The following terms are derived from EPA EIAR Guidance (2022) and are used in the assessment to describe the predicted and potential residual impacts on the ecology by the construction and operation of the proposed development.

Magnitude of effect and typical descriptions

Magnitude of effect (change)		Typical description
High	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Medium	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Low	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial effect on attribute or a reduced risk of negative effect occurring
Negligible	Adverse	Very minor loss or alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.

Criteria for Establishing Receptor Sensitivity/Importance

Importance	Ecological Valuation
International	Sites, habitats or species protected under international legislation e.g. Habitats and Species Directive. These include, amongst others: SACs, SPAs, Ramsar sites, Biosphere Reserves, including sites proposed for designation, plus undesignated sites that support populations of internationally important species.
National	Sites, habitats or species protected under national legislation e.g. Wildlife Act 1976 and amendments. Sites include designated and proposed NHAs, Statutory Nature Reserves, National Parks, plus areas supporting resident or regularly occurring populations of species of national importance (e.g. 1% national population) protected under the Wildlife Acts, and rare (Red Data List) species.
Regional	Sites, habitats or species which may have regional importance, but which are not protected under legislation (although Local Plans may specifically identify them) e.g. viable areas or populations of Regional Biodiversity Action Plan habitats or species.
Local/County	Areas supporting resident or regularly occurring populations of protected and red data listed-species of county importance (e.g. 1% of county population), Areas containing Annex I habitats not of international/national importance, County important populations of species or habitats identified in county plans, Areas of special amenity or subject to tree protection constraints.
Local	Areas supporting resident or regularly occurring populations of protected and red data listed-species of local importance (e.g. 1% of local population), Undesignated sites or features which enhance or enrich the local area, sites containing viable area or populations of local Biodiversity Plan habitats or species, local Red Data List species etc.
Site	Very low importance and rarity. Ecological feature of no significant value beyond the site boundary

Quality of Potential Impacts on Biodiversity

Quality of Effects	Effect Description
Negative /Adverse Effect	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Neutral Effect	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Positive Effect	A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).

Significance of Effects

Significance of Effect	Description of Potential Effect
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Duration of Impacts

Duration and Frequency of Effect	Description
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
Short-term	Effects lasting one to seven years.
Medium-term	Effects lasting seven to fifteen years.
Long-term	Effects lasting fifteen to sixty years.
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

Possibility of Impact

Describing the Probability of Effects	Description
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

4. Results

4.1 Proximity to Designated Conservation Sites

Designated conservation sites (National and international) within 15 km of the proposed survey works are seen in Figures 18-22.

The proposed cable survey corridor is located within four designated conservation sites (Malahide Estuary SAC & Malahide Estuary pNHA, Rockabill to Dalkey Island SAC, and North-West Irish Sea SPA). There is one designated Natural Heritage Areas (NHAs) within 15km of the proposed survey works (Skerries Islands NHA) (Figure 21).

The intertidal section of this project will involve trial pits and machinery that will enter the upper shore (within Malahide Estuary SAC & pNHA and North-west Irish Sea SPA). The proposed works within the Malahide Estuary SAC & pNHA in addition to North West Irish Sea SPA, will consist of machinery and equipment entering the conservation sites and digging and backfilling three trial pits down the shore.

Given that there are proposed survey works located within Malahide Estuary SAC & pNHA, Rockabill to Dalkey Island SAC, and North-West Irish Sea SPA, mitigation measures are required to ensure that there are no significant impacts on these sites. Access to the beach at Portmarnock will be via an existing concrete public slipway off the R106 Coast Road.

In addition, there is potential for marine mammals from Rockabill to Dalkey Island SAC (*Phocoena phocoena* (harbour porpoise)) and from Lambay Island SAC (*Halichoerus grypus* (Grey Seal) and *Phoca vitulina* (Harbour Seal)) to be in the vicinity of the proposed survey route and mitigation measures for the protection of marine mammals will be in place. Marine mammals may also be in the vicinity of the proposed survey route within the marine environment.

The proposed survey route corridor and works (to Irish 12 Nautical Mile Limit and Irish EEZ) is demonstrated in Figure 17. The proposed Survey Route Corridor within Portmarnock Beach is demonstrated in Figure 23. Conservation sites and Waterbodies proximate to the proposed Survey Route Corridor are demonstrated in Figures 24-29.

There are no offshore SACs in proximity to any of the proposed survey works (Figure 30). IE, UK, & FR Sites designated for grey seal within 448km (foraging range for grey seal (Carter et al., 2022)) of the proposed survey works is demonstrated in Figure 31. IE, UK, & FR Sites designated for harbour seal within 273km (foraging range for harbour seal (Carter et al., 2022)) of the proposed survey works within the Irish EEZ are demonstrated in Figure 32. IE, UK, & FR Sites designated for harbour porpoise and bottlenose dolphin that are located in the same Management Unit's (MU) as the proposed survey works (12nm - Irish EEZ) are demonstrated in Figures 33 & 34.

Tables 8-10 outline the designated conservation sites within 15km of the proposed route, and conservation sites designated for marine mammals that may be impacted by the proposed project (incl. IE, UK, & FR Sites).

Table 8. Proximity to designated sites of conservation importance (IE)

Designation	European Site	Distance
SAC	Malahide Estuary SAC	Within
SAC	Rockabill to Dalkey Island SAC	Within
SAC	Baldoyle Bay SAC	1.2 km
SAC	Lambay Island SAC	2 km
SAC	Ireland's Eye SAC	3.5 km
SAC	North Dublin Bay SAC	4.5 km
SAC	Rogerstown Estuary SAC	5.4 km
SAC	Howth Head SAC	5.7 km
SAC	South Dublin Bay SAC	10.3 km
SAC	Slaney River Valley SAC	53.9 km
SAC	Saltee Islands SAC	140.7 km
SAC	Ballysadare Bay SAC	179.4 km
SAC	Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC	180.6 km
SAC	Donegal Bay (Murvagh) SAC	184.6 km
SAC	Galway Bay Complex SAC	185.7 km
SAC	West of Ardara/Maas Road SAC	201.5 km
SAC	Slieve Tooley/Tormore Island/Loughros Beg Bay SAC	210.3 km
SAC	Killala Bay/Moy Estuary SAC	213 km
SAC	Rutland Island and Sound SAC	223.5 km
SAC	Kilkieran Bay and Islands SAC	227.8 km
SAC	Clew Bay Complex SAC	230 km
SAC	Inishbofin and Inishshark SAC	265.2 km
SAC	Horn Head and Rinclevan SAC	266.5 km
SAC	Slyne Head Islands SAC	266.6 km
SAC	Duvillaun Islands SAC	273.8 km
SAC	Inishkea Islands SAC	277.2 km
SAC	Roaring Water Bay and Islands SAC	304.9 km
SAC	Blasket Islands SAC	325.9 km
SPA	North-West Irish Sea SPA	Within
SPA	Malahide Estuary SPA	500m
SPA	Baldoyle Bay SPA	1.2 km
SPA	Lambay Island SPA	1.7 km
SPA	Ireland's Eye SPA	3 km
SPA	North Bull Island SPA	4.5 km
SPA	Rogerstown Estuary SPA	4.9 km
SPA	Howth Head Coast SPA	5.7 km
SPA	Rockabill SPA	7.7 km
SPA	South Dublin Bay and River Tolka SPA	8.6 km
SPA	Skerries Islands SPA	12.5 km
RAMSAR	Baldoyle Bay	1.2 km
RAMSAR	Broadmeadow Estuary	2 km
RAMSAR	North Bull Island	4.6 km
RAMSAR	Rogerstown Estuary	6.4 km
RAMSAR	Sandymount Strand/Tolka Estuary	10.3 km
NHA	Skerries Island NHA	12.6 km
pNHA	Malahide Estuary	Within

pNHA	Baldoyle Bay	1.2 km
pNHA	Sluice River Marsh	1.6 km
pNHA	Lambay Island	2.1 km
pNHA	Ireland's Eye	3.4 km
pNHA	Portraine Shore	4.1 km
pNHA	Feltrim Hill	4.1 km
pNHA	North Dublin Bay	4.6 km
pNHA	Rogerstown Estuary	5.6 km
pNHA	Howth Head	5.6 km
pNHA	Santry Demesne	8.2 km
pNHA	South Dublin Bay	10.2 km
pNHA	Dolphins, Dublin Docks	10.7 km
pNHA	Royal Canal	11.4 km
pNHA	Loughshinny Coast	11.5 km
pNHA	Grand Canal	11.9 km
pNHA	Rockabill Island	11.9 km
pNHA	Boooterstown Marsh	14 km

Table 9. Proximity to designated sites of conservation importance (UK)

Designation	European Site	Distance
SAC	North Anglesey Marine/Gogledd Môn Forol	Borders the Survey Area (Within MU for Harbour Porpoise)
SAC	Murlough	65.8 km
SAC	North Channel	68.4 km (Within MU for Harbour Porpoise)
SAC	West Wales Marine / Gorllewin Cymru Forol	76.4 km (Within MU for Harbour Porpoise)
SAC	Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau	78.5 km (Within MU for Bottlenose Dolphin)
SAC	Strangford Lough	82.8 km
SAC	Cardigan Bay / Bae Ceredigion	139.8 km (Within MU for Bottlenose Dolphin)
SAC	The Maidens SAC	146.4 km
SAC	Pembrokeshire Marine / Sir Benfro Forol	170.5 km
SAC	Bristol Channel Approaches/Dynesfeydd Môr Hafren	207 km (Within MU for Harbour Porpoise)
SAC	South-East Islay Skerries	233 km
SAC	Lundy	263 km
SAC	Isles of Scilly Complex	381.7 km

Table 10. Proximity to designated sites of conservation importance (FR)

Designation	European Site	Distance
SAC	Nord Bretagne DH	452 km (Within MU for Harbour Porpoise)
SAC	Récifs et landes de la Hague	480.4 km (Within MU for Harbour Porpoise)
SAC	Mers Celtiques – Talus du golfe de Gascogne	480.8 km (Within MU for Harbour Porpoise)
SAC	Anse de Vauville	488.7 km (Within MU for Harbour Porpoise)
SAC	Banc et récifs de Surtainville	507 km (Within MU for Harbour Porpoise)
SAC	Côte de Granit rose-Sept-Iles	514.1 km (Within MU for Harbour Porpoise)
SAC	Trégor – Goëlo	519.1 km (Within MU for Harbour Porpoise)
SAC	Baie de Morlaix	538 km (Within MU for Harbour Porpoise)
SAC	Abers – Côtes des légendes	539.5 km (Within MU for Harbour Porpoise)
SAC	Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay	546.6 km (Within MU for Harbour Porpoise)
SAC	Ouessant-Molène	550.5 km (Within MU for Harbour Porpoise)
SAC	Cap d'Erquy-Cap Fréhel	555.5 km (Within MU for Harbour Porpoise)
SAC	Chausey	557.1 km (Within MU for Harbour Porpoise)
SAC	Baie de Saint-Brieuc - Est	574.1 km (Within MU for Harbour Porpoise)
SAC	Côtes de Crozon	582.8 km (Within MU for Harbour Porpoise)
SAC	Baie du Mont Saint-Michel	585 km (Within MU for Harbour Porpoise)
SAC	Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard	586.6 km (Within MU for Harbour Porpoise)
SAC	Estuaire de la Rance	594.7 km (Within MU for Harbour Porpoise)
SAC	Chaussée de Sein	600.3 km (Within MU for Harbour Porpoise)
SAC	Récifs du talus du golfe de Gascogne	605 km (Within MU for Harbour Porpoise)

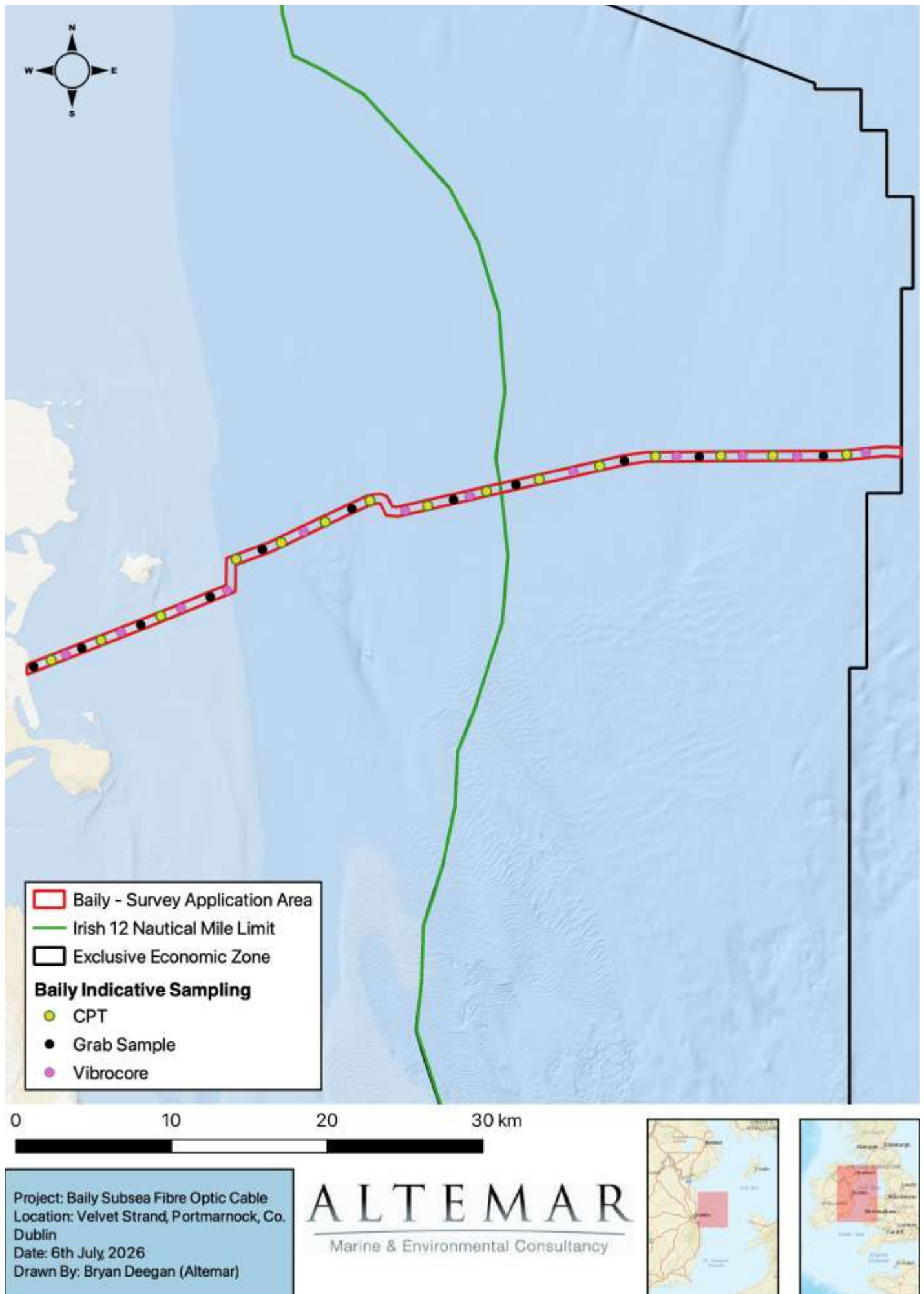


Figure 17: Proposed Survey Route Corridor and Works (to Irish Exclusive Economic Zone).

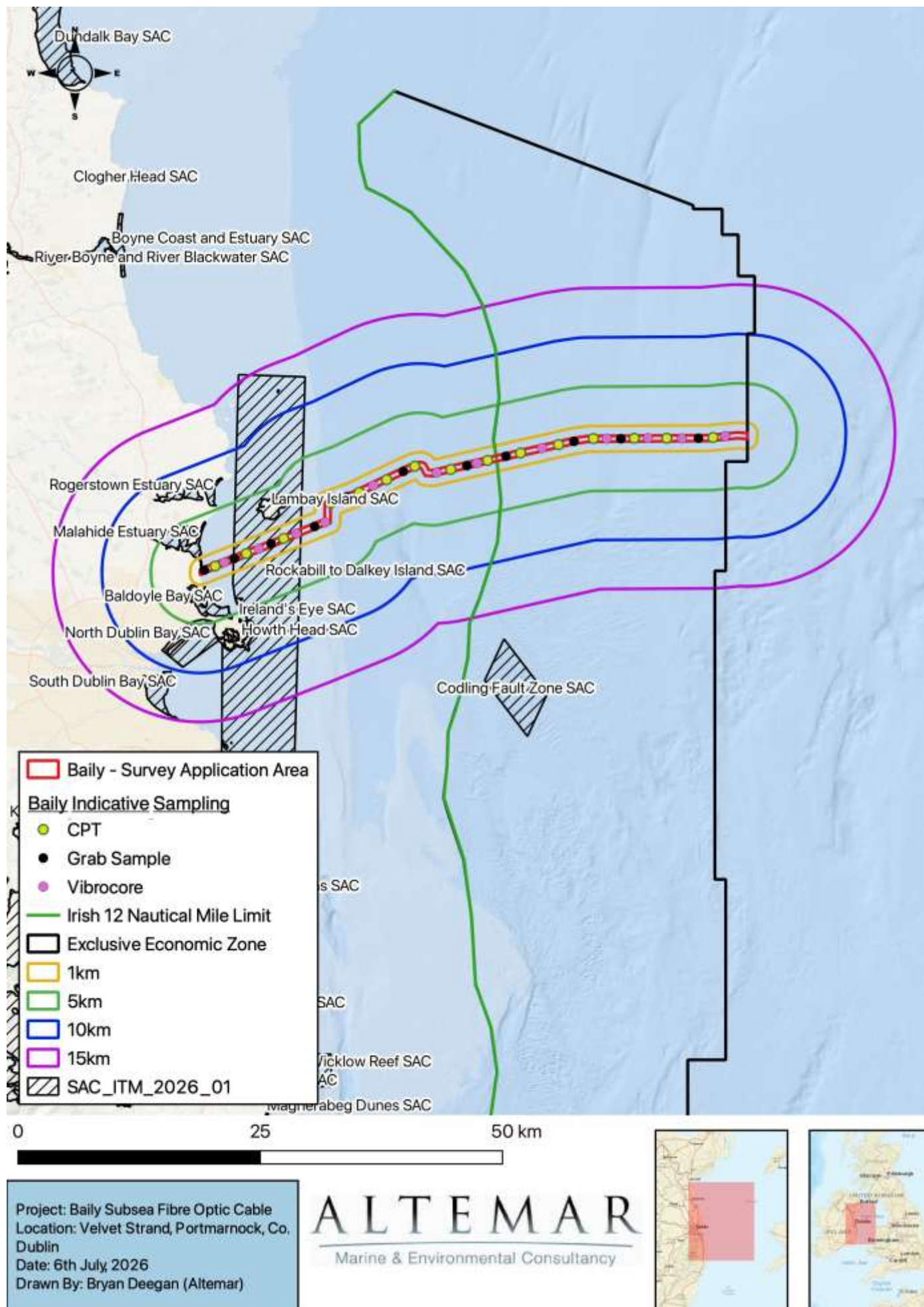


Figure 18: Special Areas of Conservation within 15 km of the proposed Survey Route Corridor.

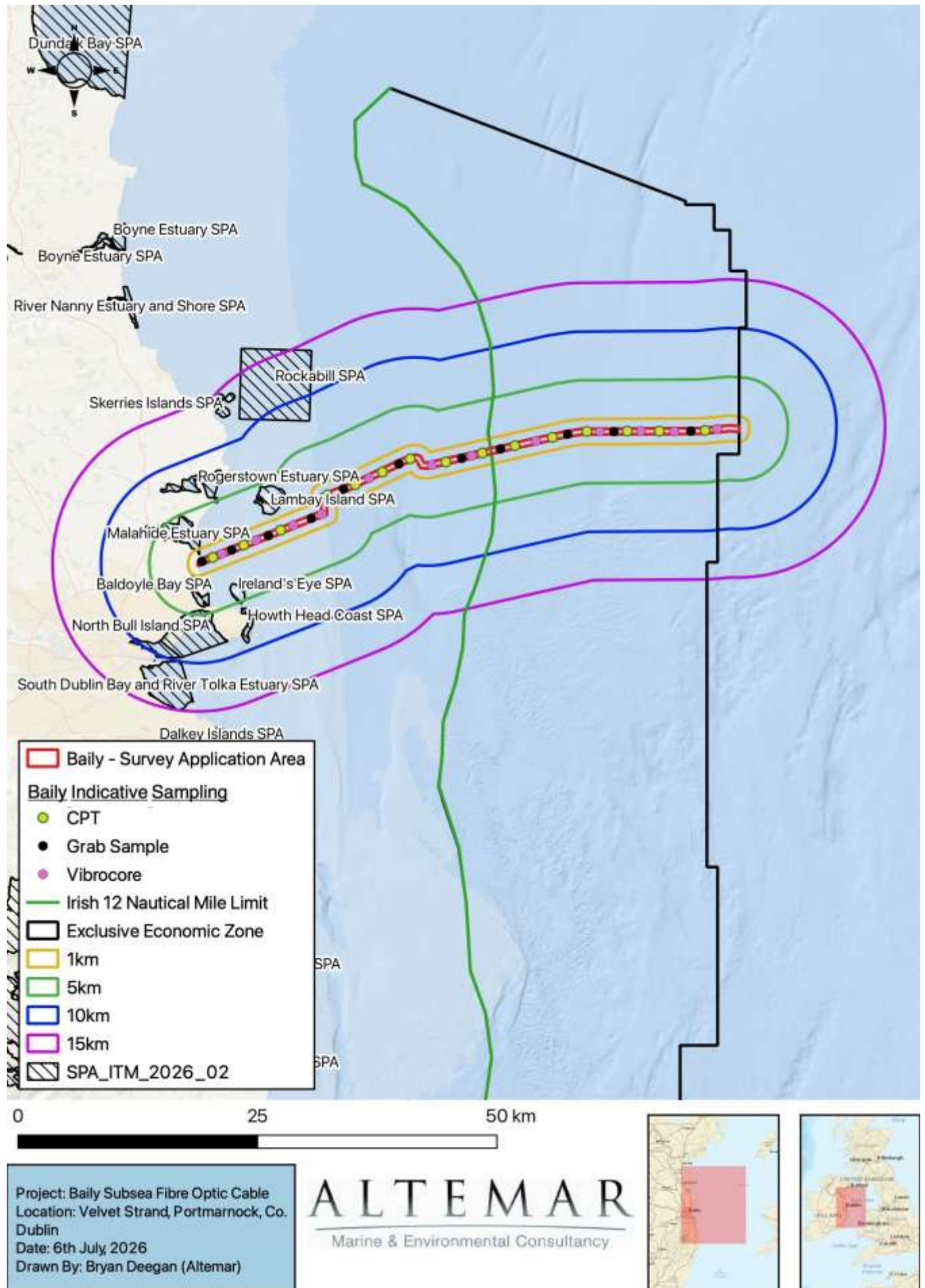


Figure 19: Special Protection Areas within 15 km of the proposed Survey Route Corridor.

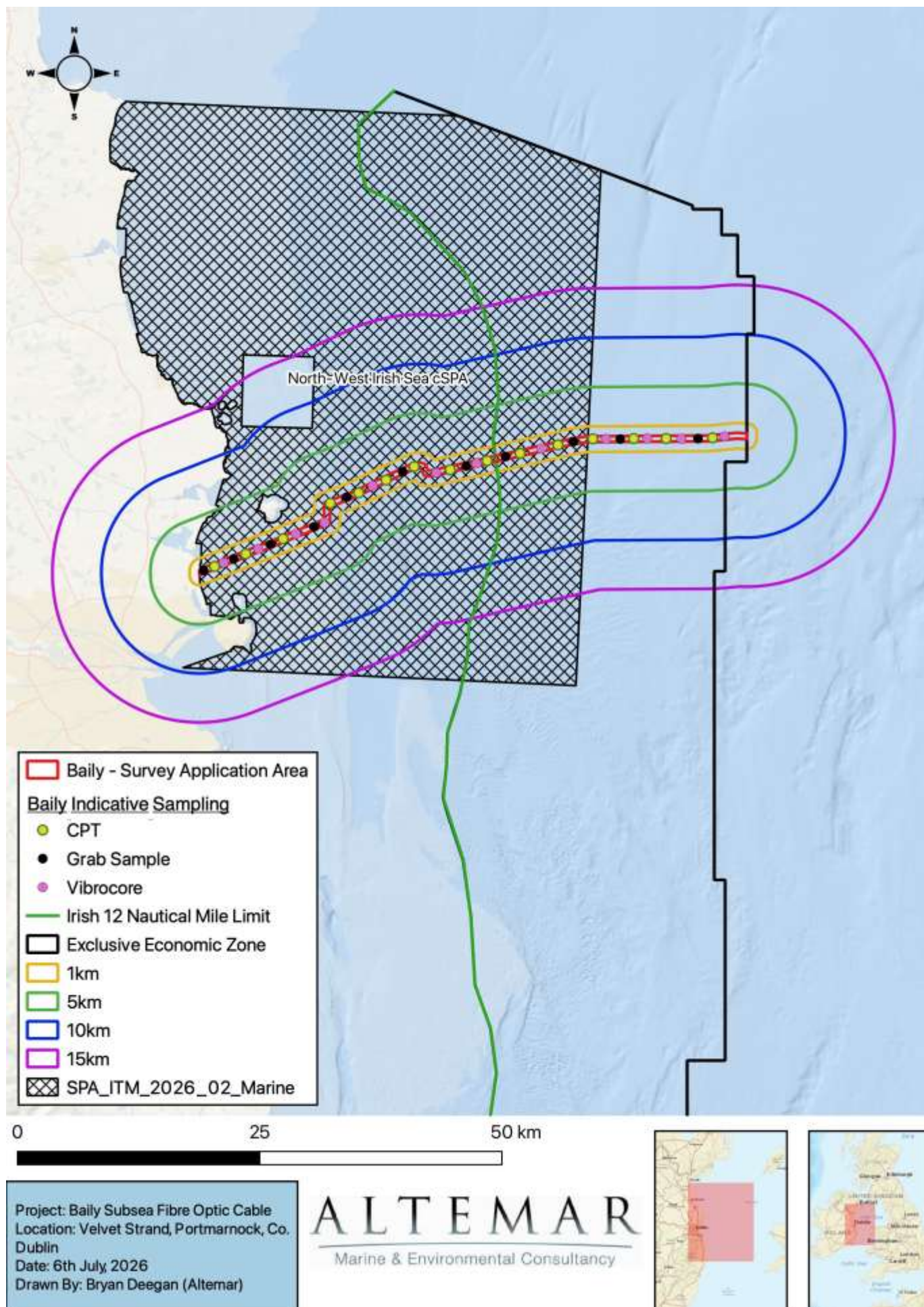


Figure 20: Marine SPAs within 15 km of the proposed Survey Route Corridor.

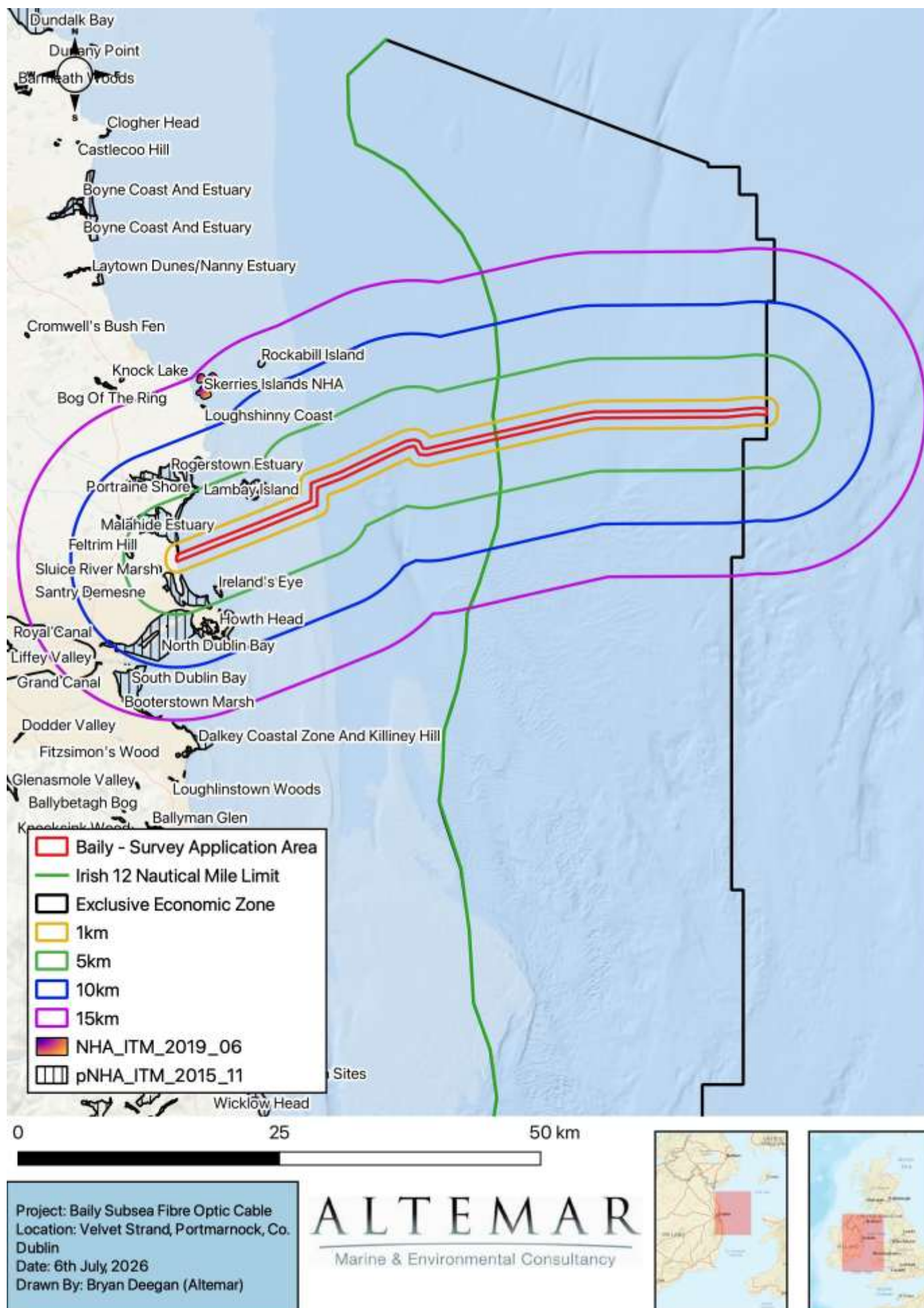


Figure 21: Proposed Natural Heritage Areas and Natural Heritage Areas within 15 km of the proposed survey works

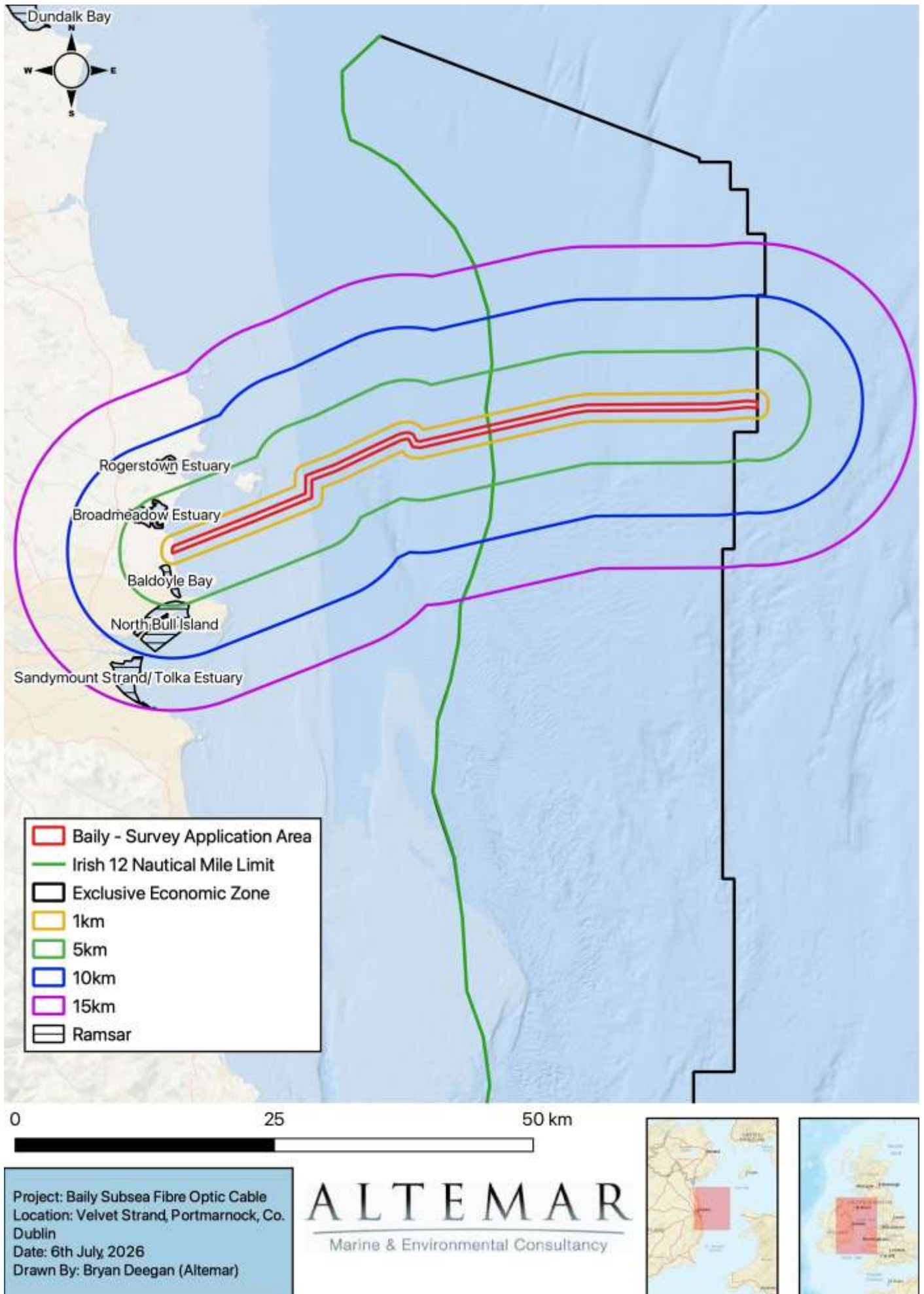


Figure 22: Ramsar sites within 15 km of the proposed survey works



Figure 23. Proposed Survey Route Corridor within Portmarnock Beach

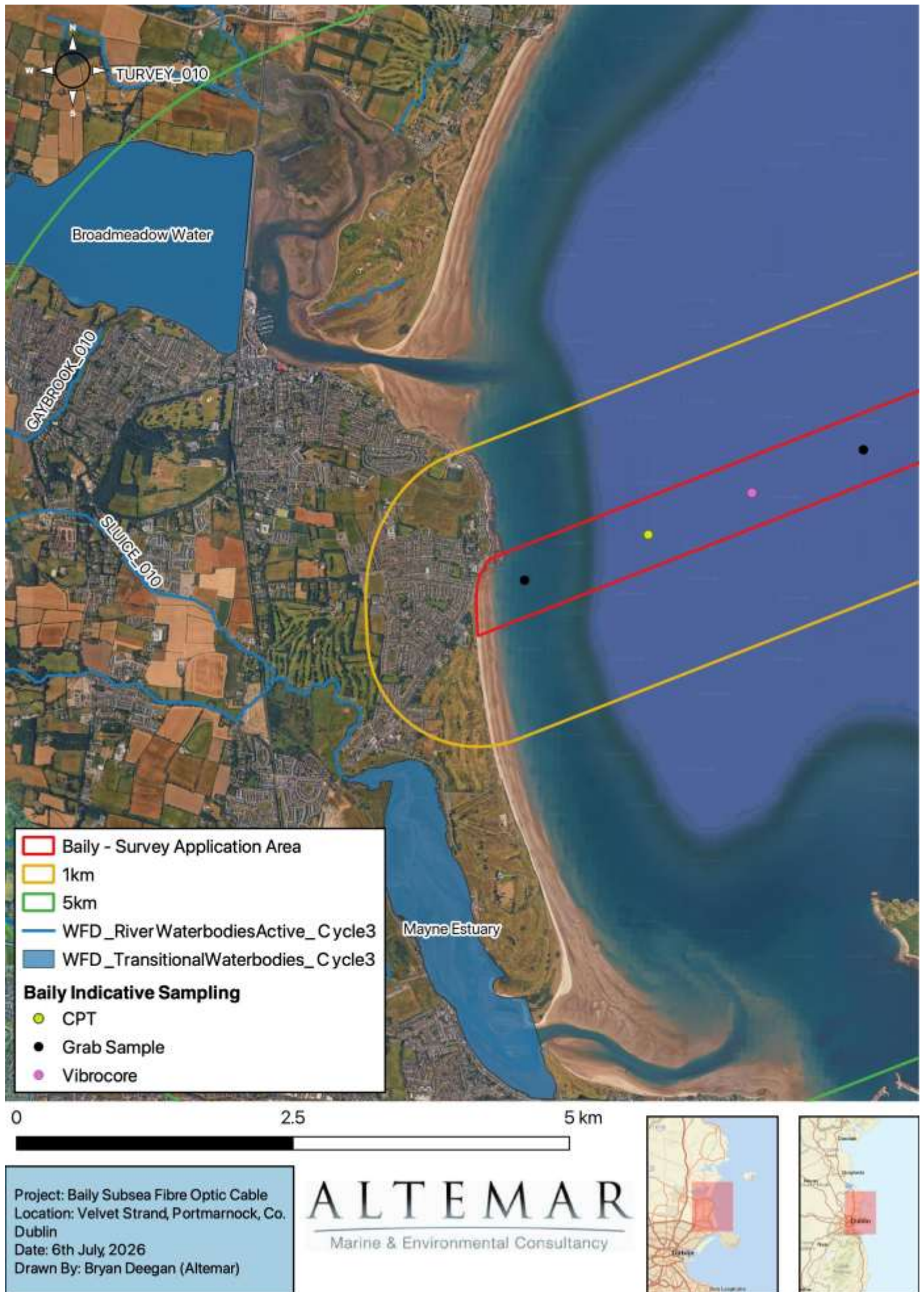


Figure 24. Waterbodies proximate to the proposed Survey Route Corridor.

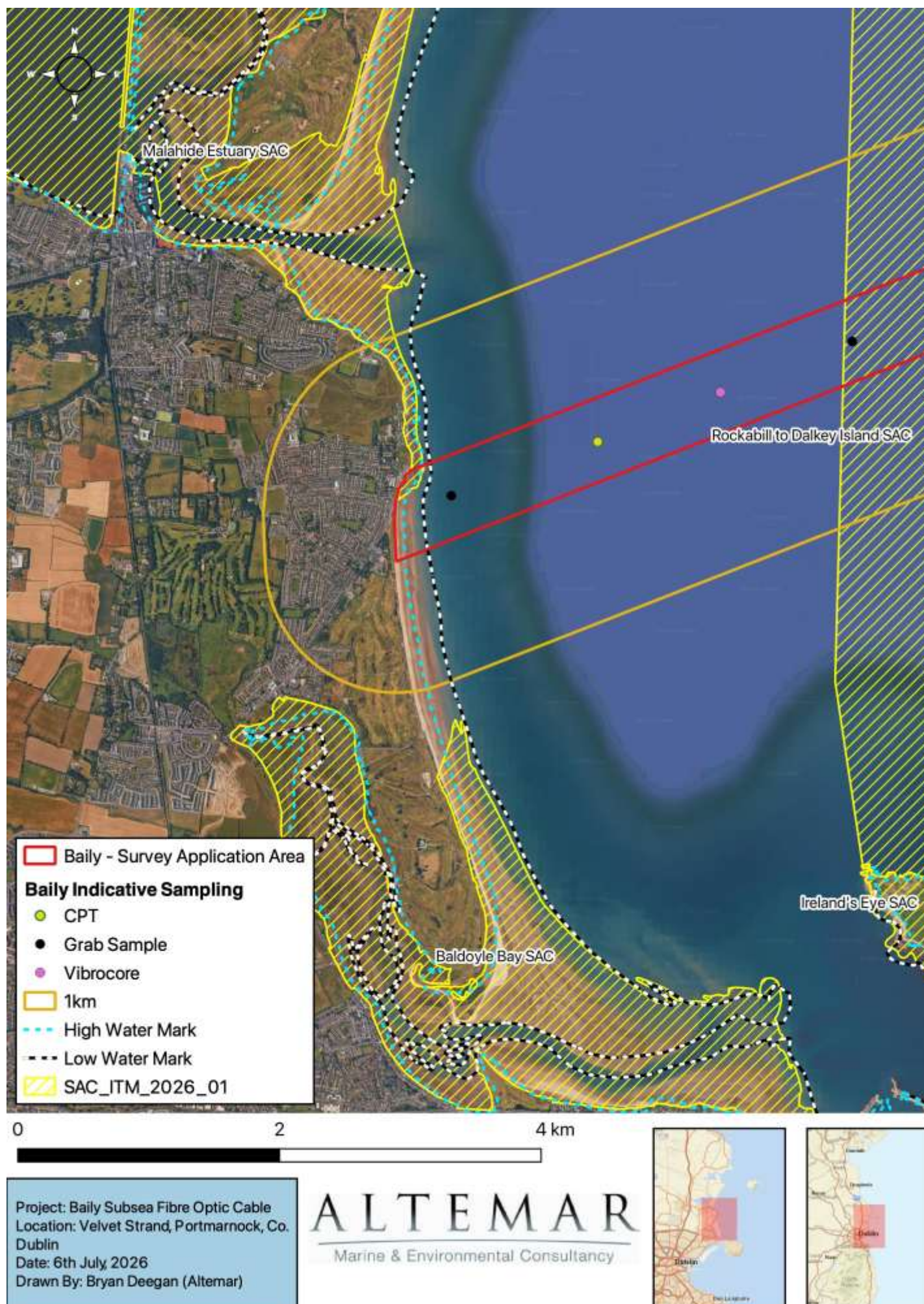


Figure 25: Special Areas of Conservation proximate to the proposed Survey Route Corridor Landfall.

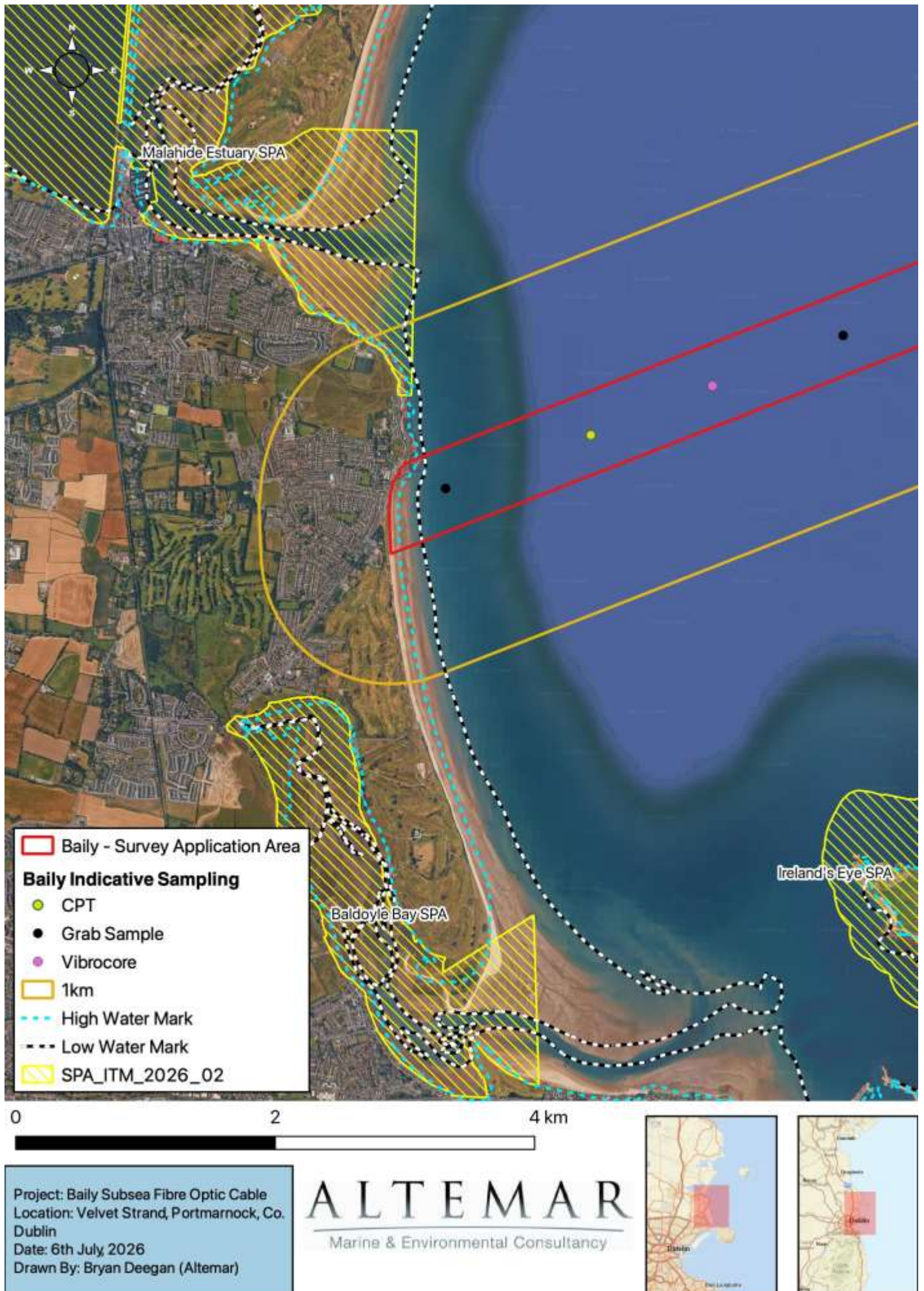


Figure 26: Special Protection Areas proximate to the proposed Survey Route Corridor Landfall.

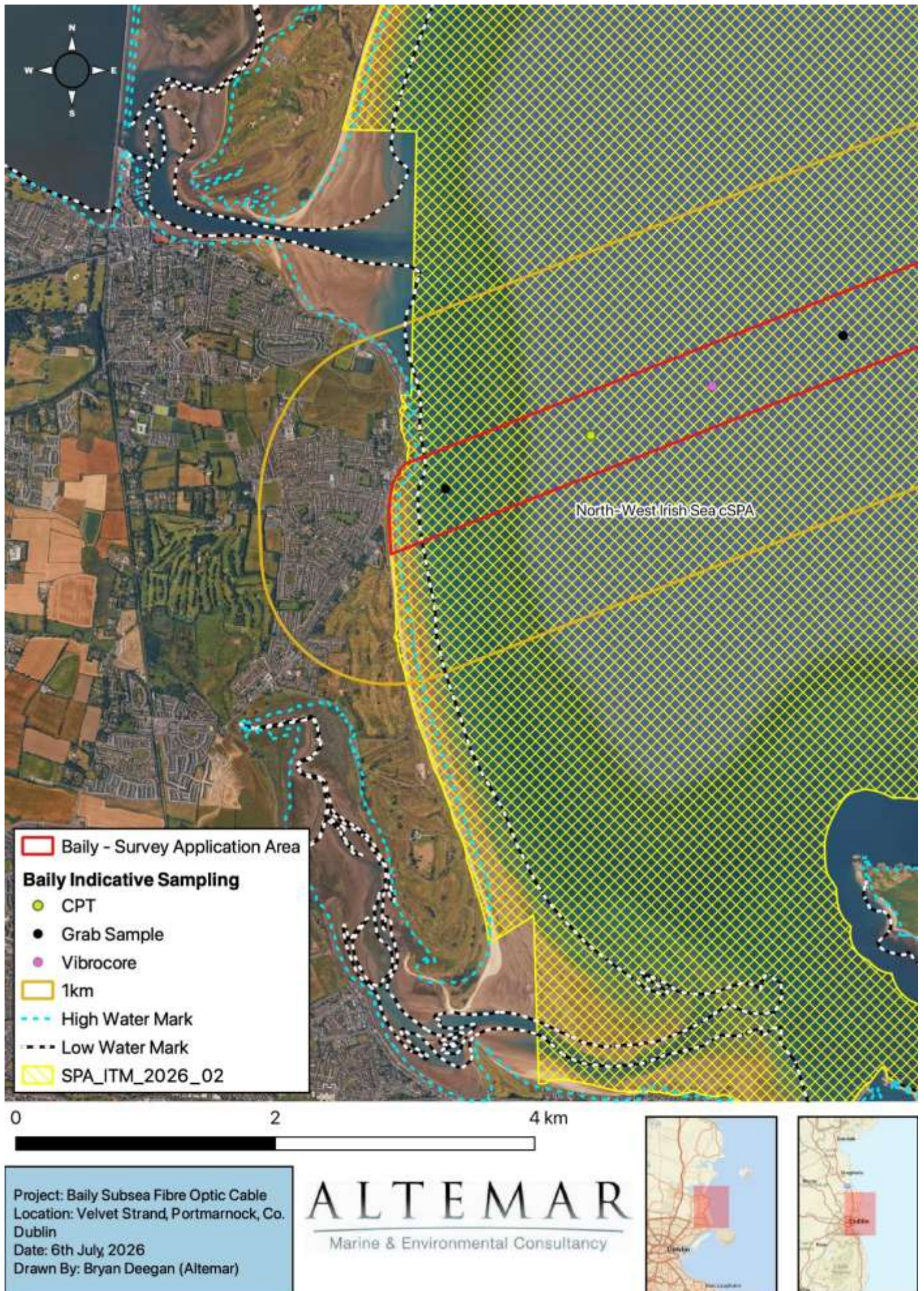


Figure 27: Marine SPAs proximate to the proposed Survey Route Corridor Landfall.

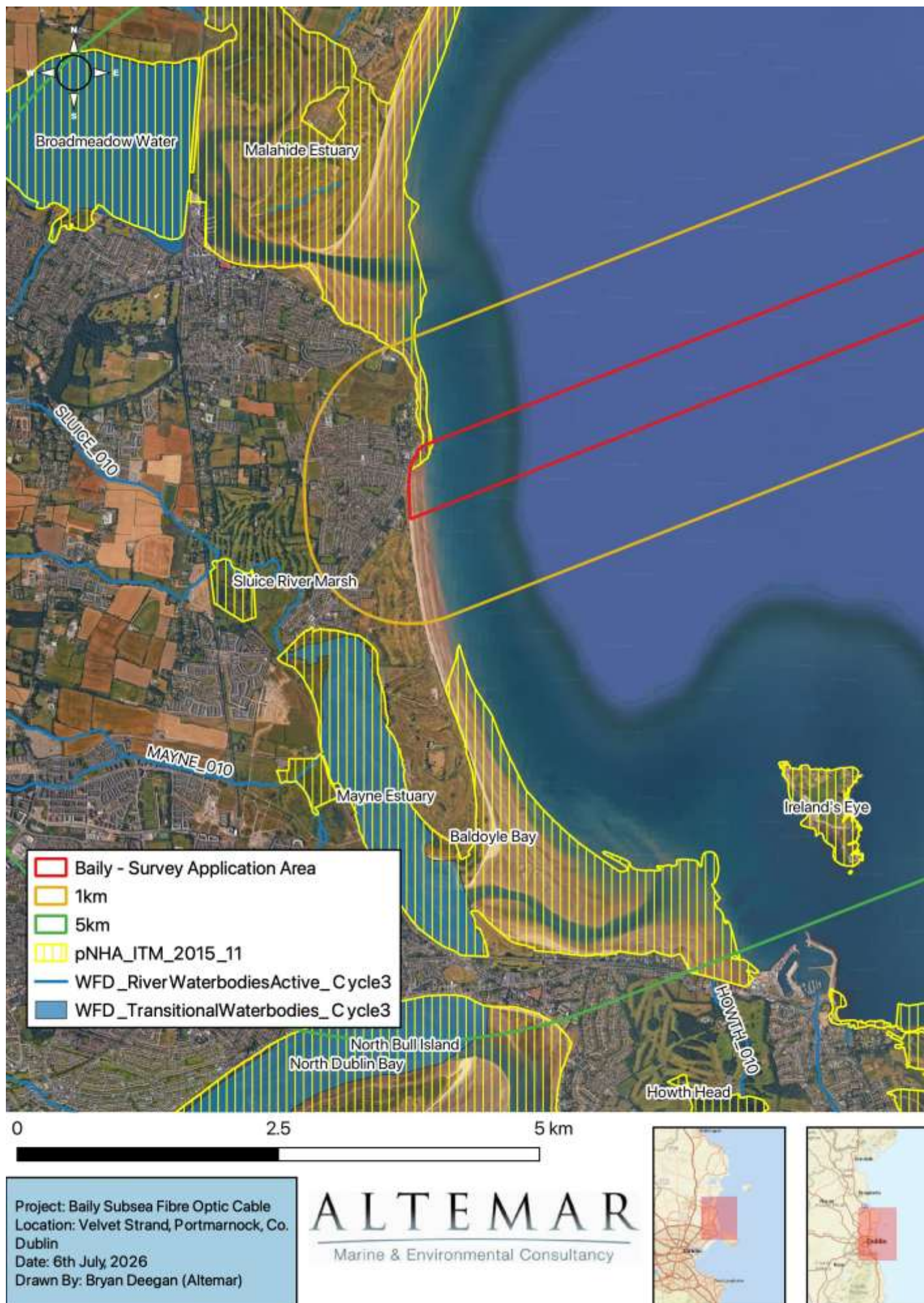


Figure 28. Proposed Natural Heritage Areas and watercourses in close proximity to the proposed survey works



Figure 29. Ramsar sites and watercourses proximate to the proposed survey works

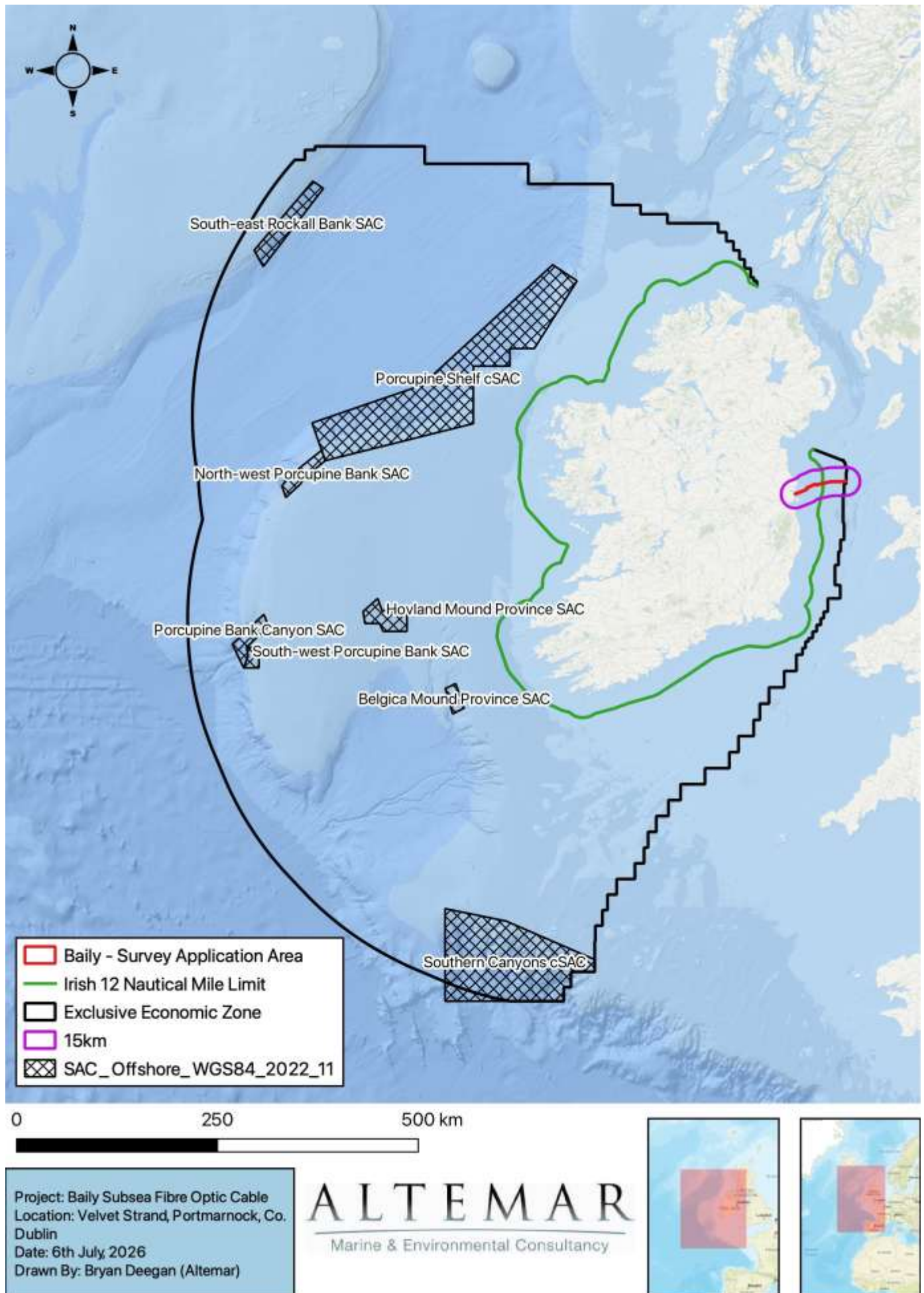


Figure 30: Fibre optic survey route in relation to the 12 nm limit, Designated Irish Continental shelf and Offshore SAC's (no offshore SAC's in the area).

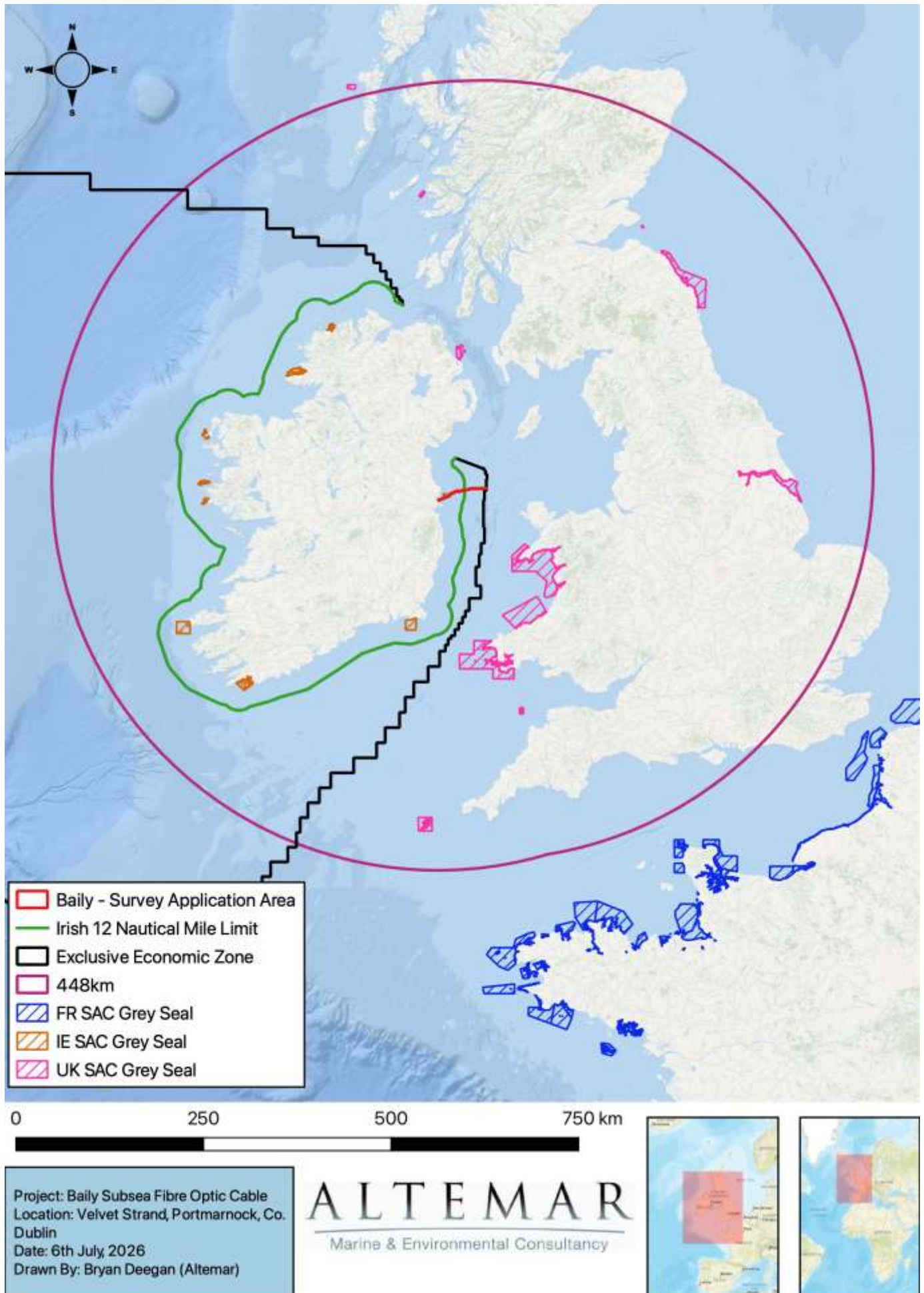


Figure 31: IE, FR, & UK SACs designated for Grey Seals (*Halichoerus grypus*) within 448km of the Proposed Survey Route Corridor.

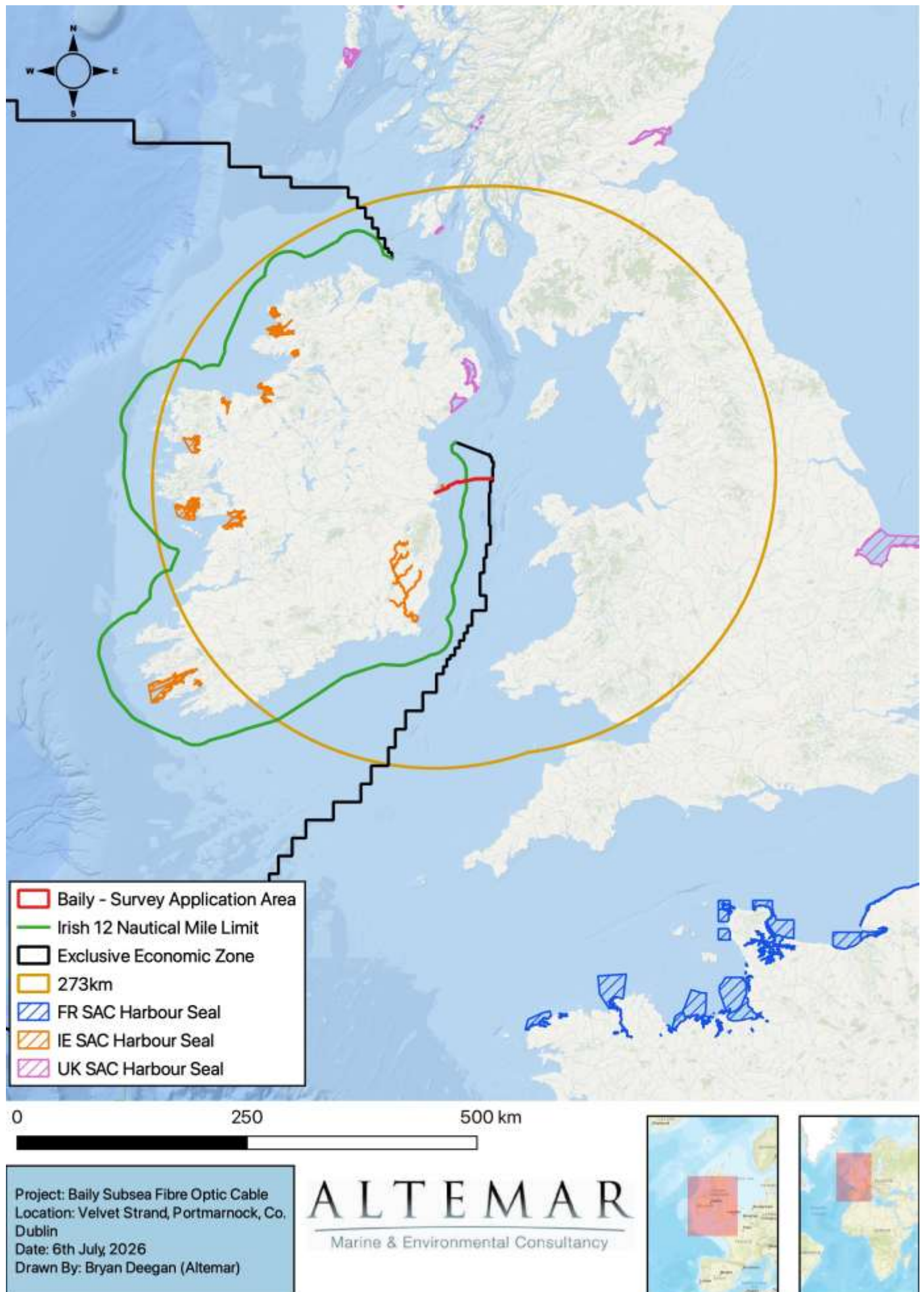


Figure 32: IE, FR, & UK SACs designated for Harbour Seals (*Phoca vitulina*) within 273km of the Proposed Survey Route Corridor

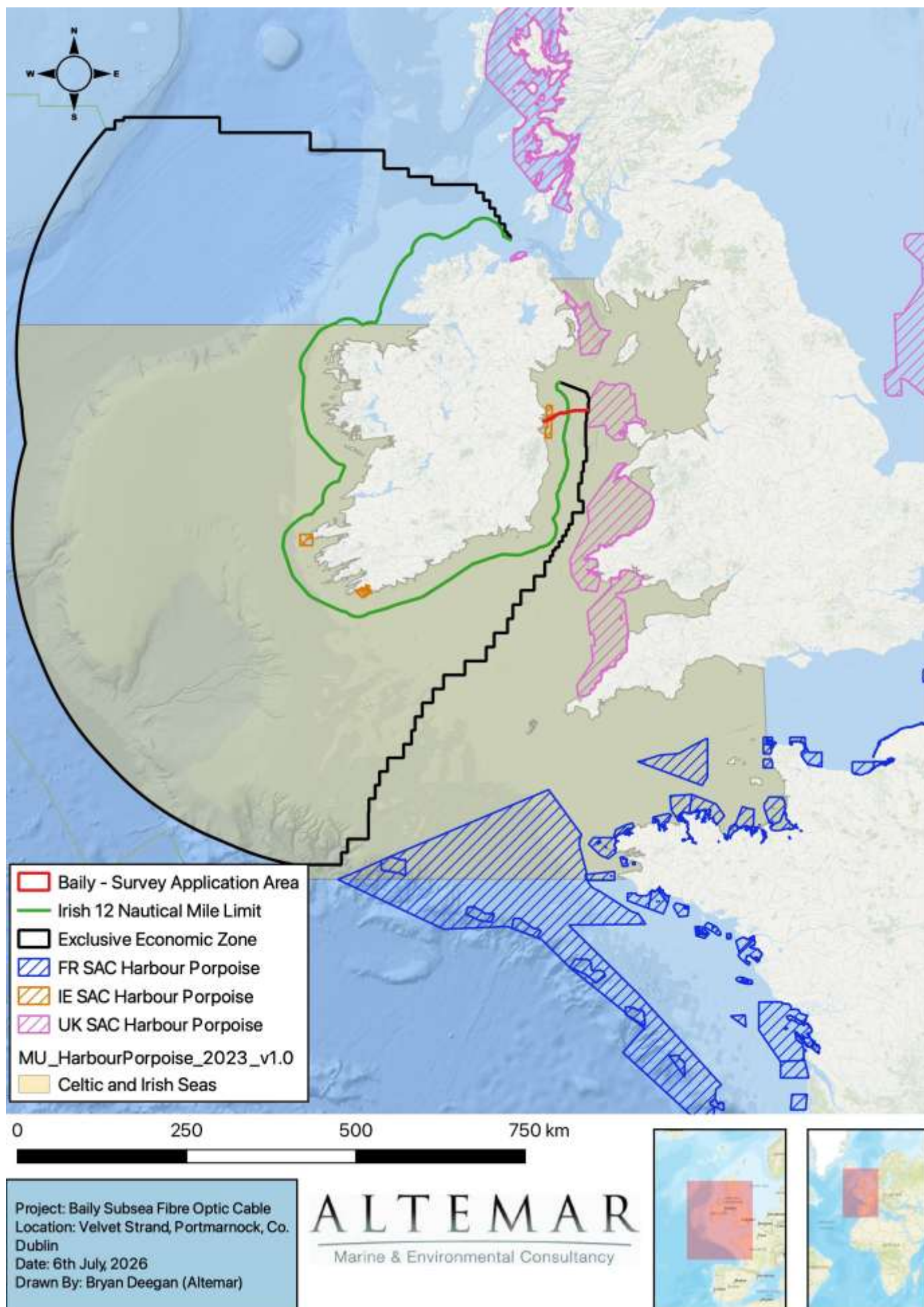


Figure 33: IE, FR, & UK SACs designated for Harbour Porpoise (*Phocoena phocoena*) within the Celtic and Irish Seas MU for Harbour Porpoise

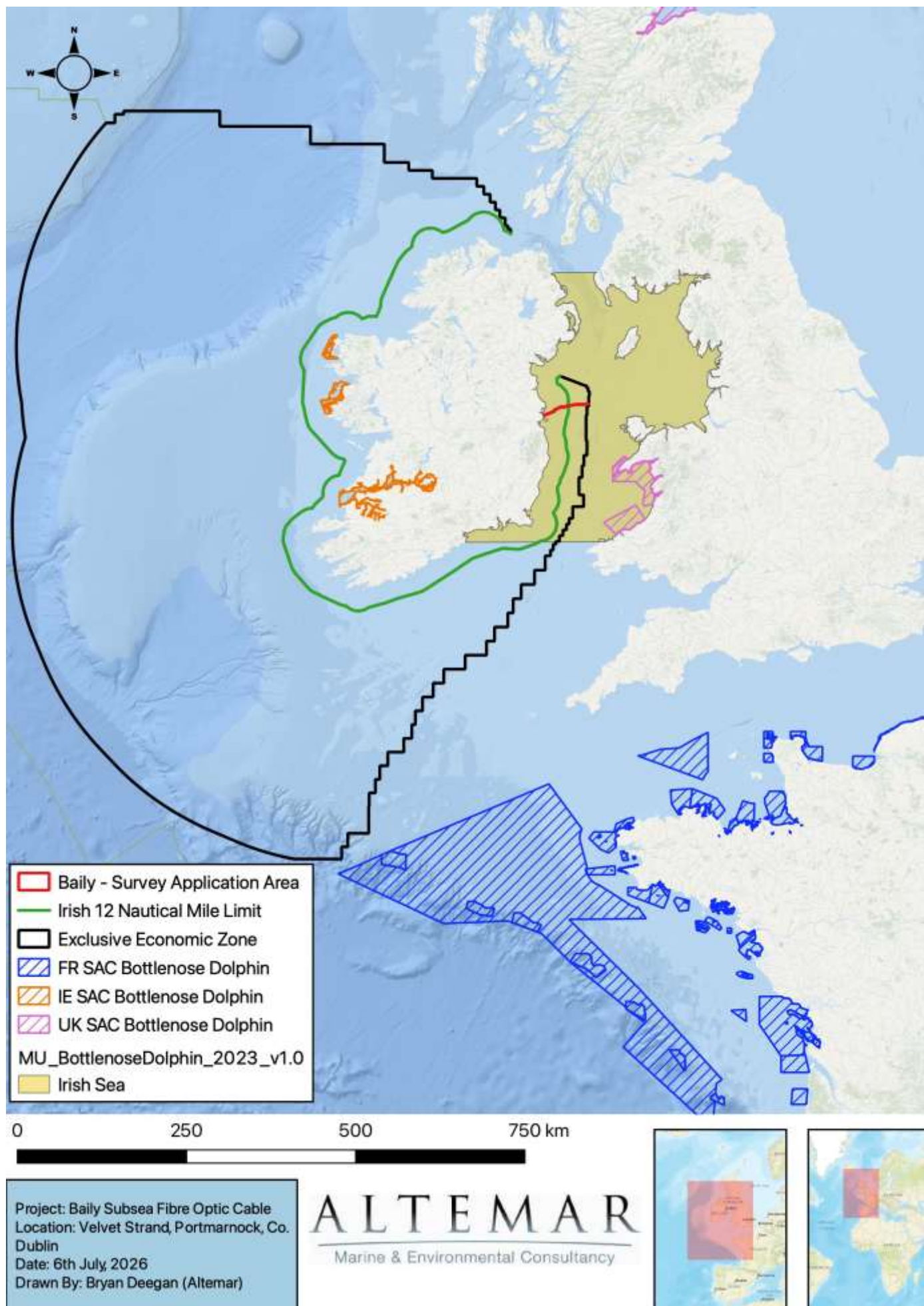


Figure 34: IE, FR, & UK SACs designated for Bottlenose Dolphin (*Tursiops truncatus*) within the Celtic and Irish Seas MU for Bottlenose Dolphin

4.2 Habitats and Species

During the initial baseline assessment of the route, discussions took place between Altemar and MDM in relation to sensitive habitats/designations that may be present along the route and modifications of the proposed survey route. The proposed route is considered to be the optimal route for survey from an ecological and logistical perspective.

Infomar backscatter, European Marine Observation and Data Network (EMODnet), in addition to satellite imagery, Admiralty Charts and BioMar data were assessed, where available and relevant, for the entire route within the EEZ.

Based on a desktop evaluation, clear habitats were distinguishable along the proposed survey route from the Infomar backscatter (Figure 35), Marine Strategy Framework Directive (MSFD) Benthic Boad Habitat Types (Figure 36), EUSeaMap (2025) Broad Scale Predictive Habitat Map (Figure 37) and MSFD Predominant Habitat Types (Figure 38). Areas in the vicinity of the landfall areas consist primarily of sand. This is visible on the inshore backscatter (Figure 35). No reef is present along the proposed survey route within Rockabill to Dalkey Island SAC. Further offshore habitat consists primarily of mud and sand.

Site visits to the landfall areas were carried out on the 18th September 2023 and 10th July 2026. As seen in Plate 1 there is an existing formal slipway entrance to the beach which allows good access to the beach at all tides. Blow lugworm (*Arenicola marina*) was prominent in the lower shore area of the beach, as demonstrated in Plate 5. A small freshwater inflow was noted at the top of the beach which has led to the exposure of stones and the presence of gut weed (*Ulva intestinalis*) on the mid shore (Plate 7).

No birds were roosting on the shores during the site visit. No amphibians of conservation importance are recorded on NPWS data. No badger setts, otter holts or evidence of terrestrial mammals of conservation importance were seen in the vicinity of the landfall areas. Grey Seal (*Halichoerus grypus*) and Common Seal (*Phoca vitulina*) have also been noted in the vicinity of the landfall area and along the cable route.

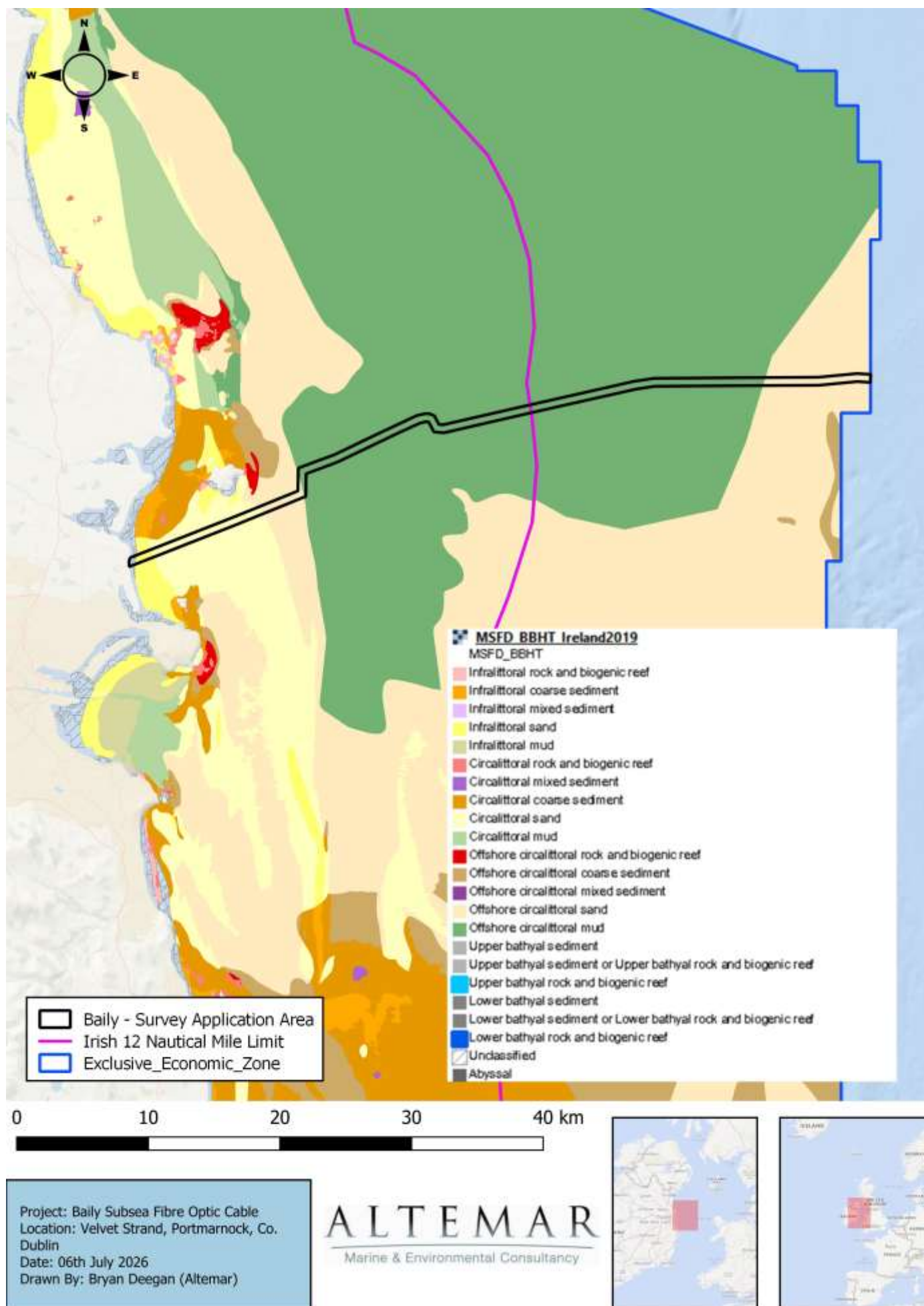


Figure 35. MSFD Benthic Boad Habitat Types along the Fibre optic survey route (Primarily offshore circalittoral mud)

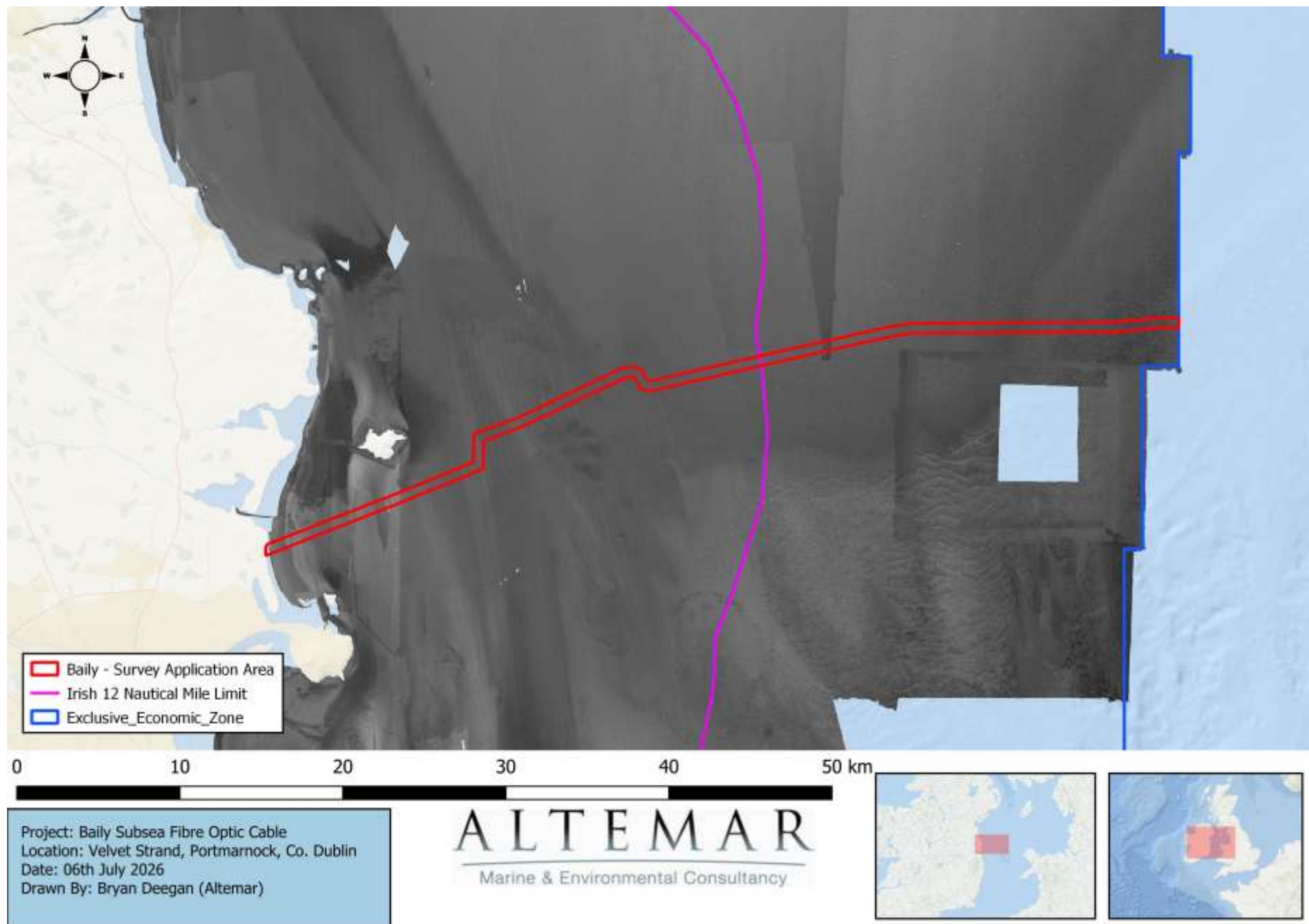


Figure 36. INFOMAR Backscatter along the Fibre optic survey route

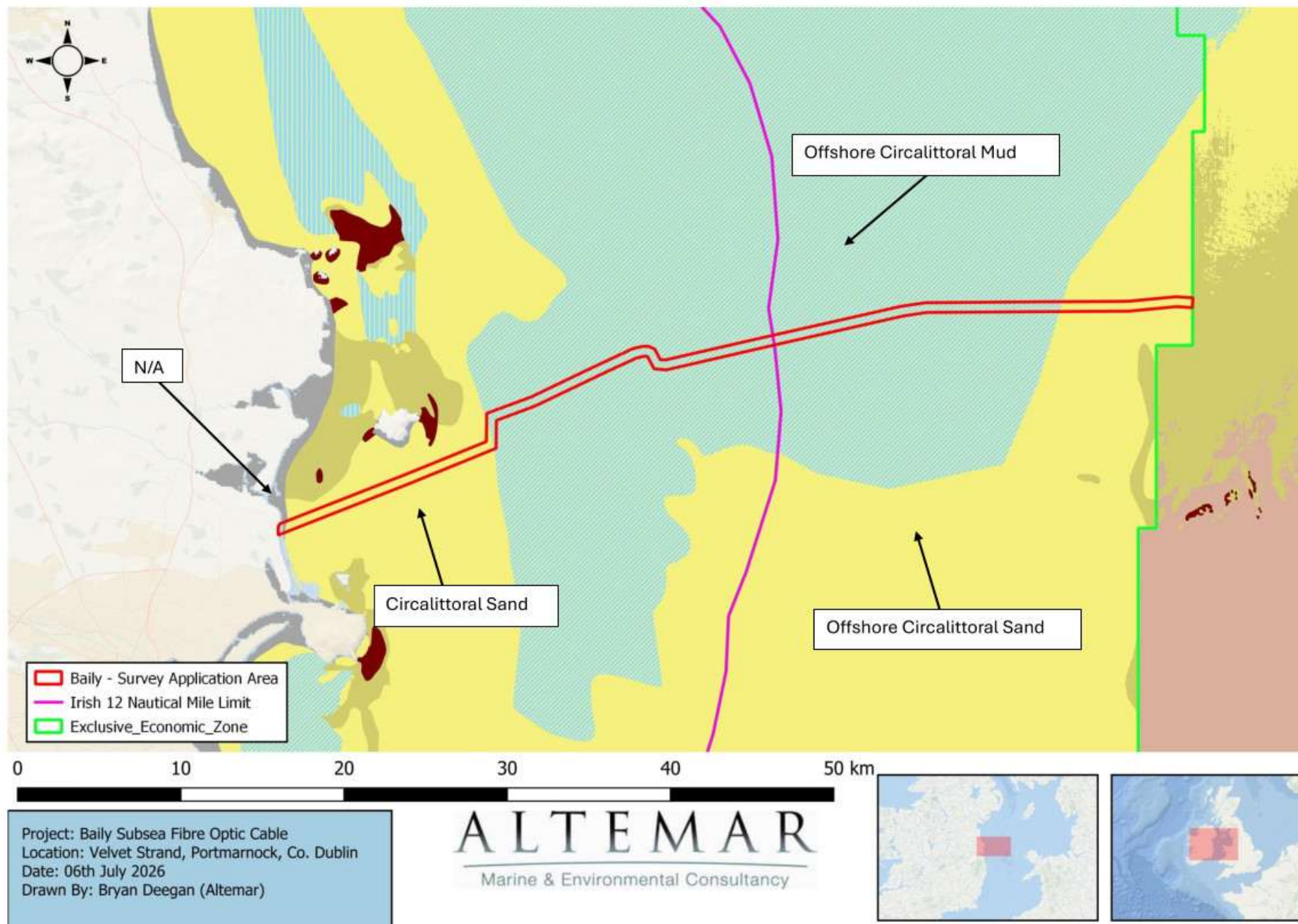


Figure 37. EUSeaMap (2025) Broad Scale Predictive Habitat Map along the Fibre optic survey route

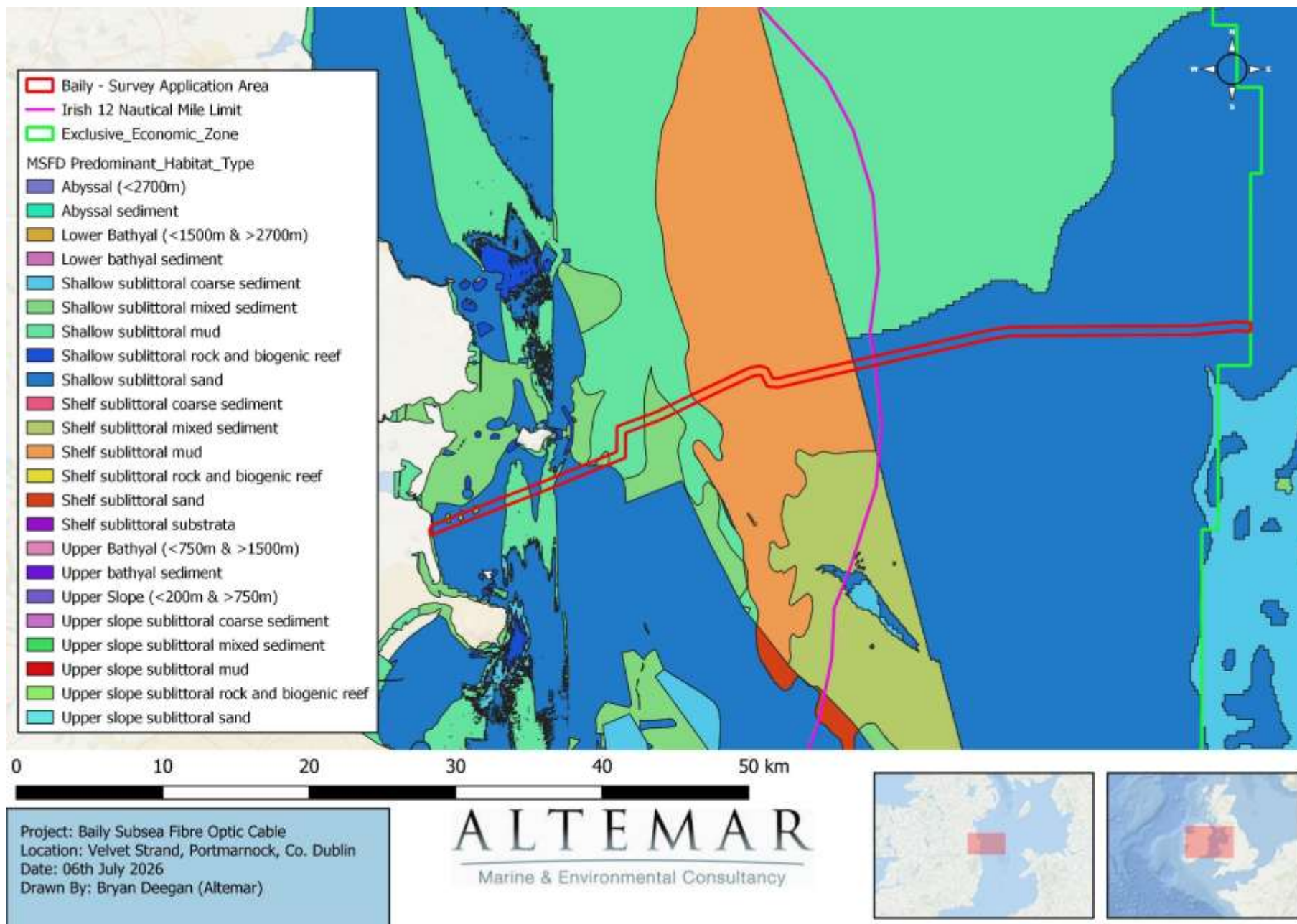


Figure 38. MSFD Predominant Habitat Types along the Fibre optic survey route



Plate 1. Access Ramp to Portmarnock Beach



Plate 2. Portmarnock Beach



Plate 3. Portmarnock Beach



Plate 4. Portmarnock Beach



Plate 5. Blow lugworm(*Arenicola marina*) present along the lower shore



Plate 6. Portmarnock Beach - High Water Mark

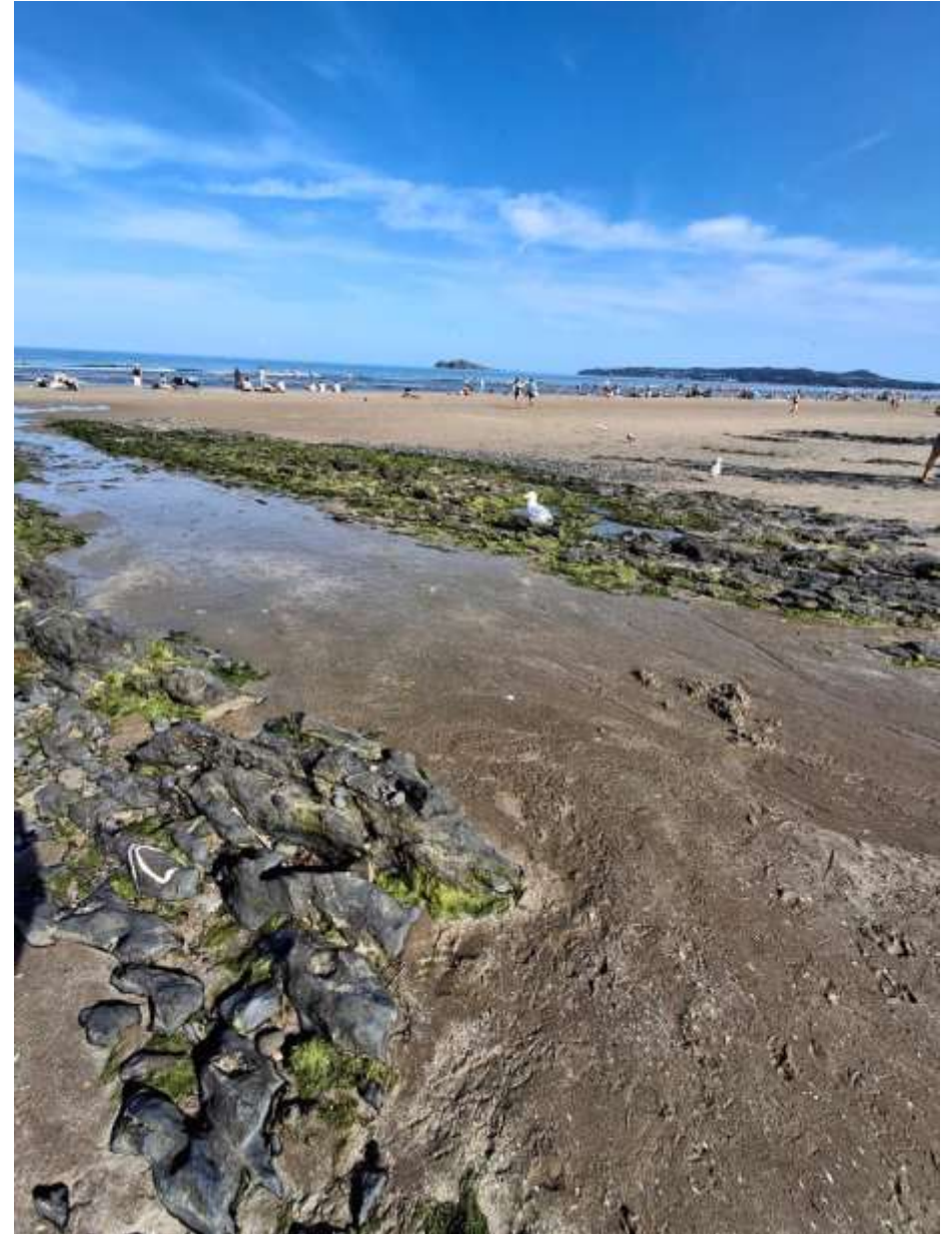


Plate 7. Portmarnock Beach - Rocks Covered at High Tide

4.3 Marine Mammals

Marine mammals are afforded protection under the Habitats Directive. The proposed project has the potential to introduce noise into the marine environment, and mitigation measures are required to protect marine mammals. As can be seen from Figure 39, the proposed survey route is within the vicinity of resting, moulting or breeding sites. It is noted that, as outlined in NPWS 2013, *“in acknowledging the limited understanding of aquatic habitat use by the species within the site, it should be noted that all suitable aquatic habitat is considered relevant to the species range and ecological requirements at the site and is therefore of potential use by harbour seals.”* As a result, the survey teams will need to be cognisant of this and take into account due diligence in relation to seal disturbance when deploying and recovering equipment.

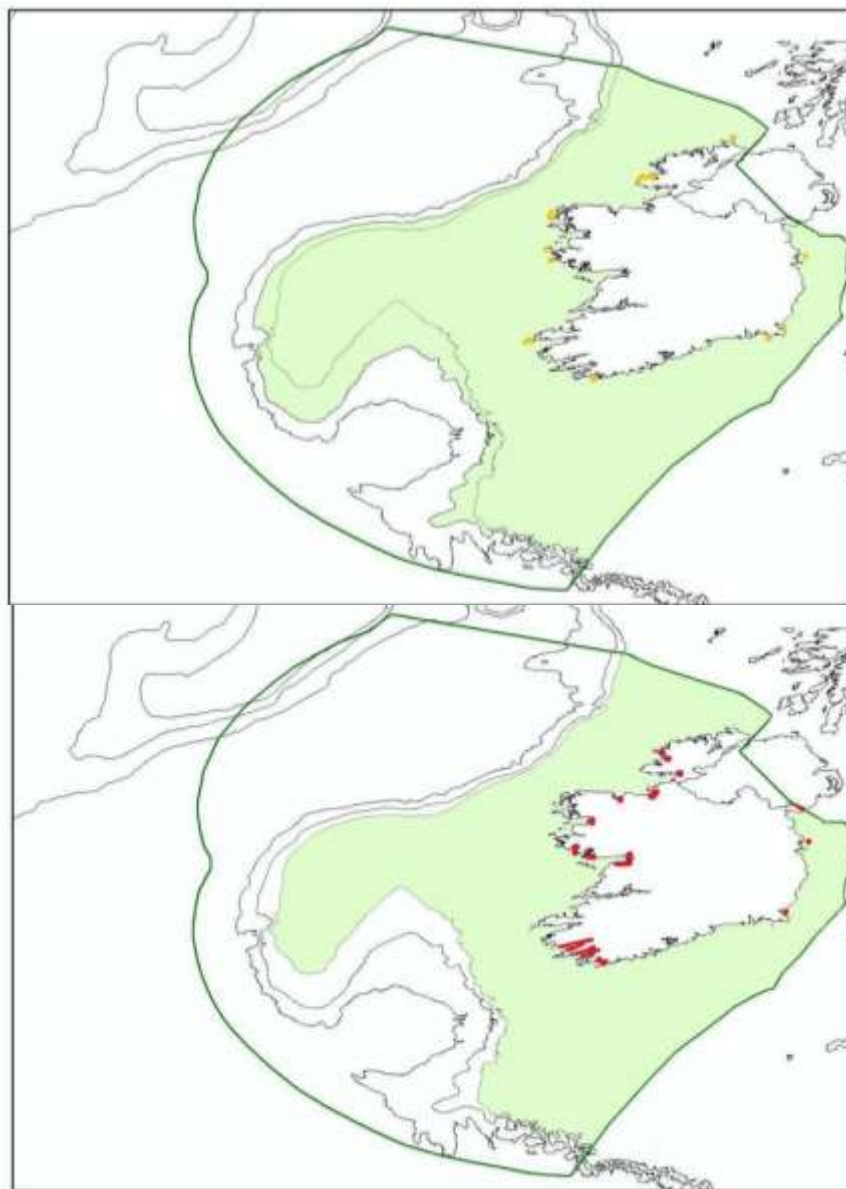


Figure 39. Harbour seal (red) and grey seal (yellow) distribution (green) and haul-out sites in the inshore area.

Figure 40 shows all cetacean species in the vicinity of the proposed survey corridor, as recorded by the IWDG sightings scheme. Cetacean activity has been seen in the vicinity of the proposed survey works. Species seen in the area include primarily harbour porpoise (*Phocoena phocoena*). It would be expected that both grey and common seals could be present in the vicinity of the proposed survey route, given that Lambay Island SAC has been designated with both species as qualifying interests. Records of beaked whales in Irish waters (including NBDC data) are seen in Figures 41-44. Records of beaked whales are concentrated along the continental shelf and are not located in proximity to the proposed survey works.

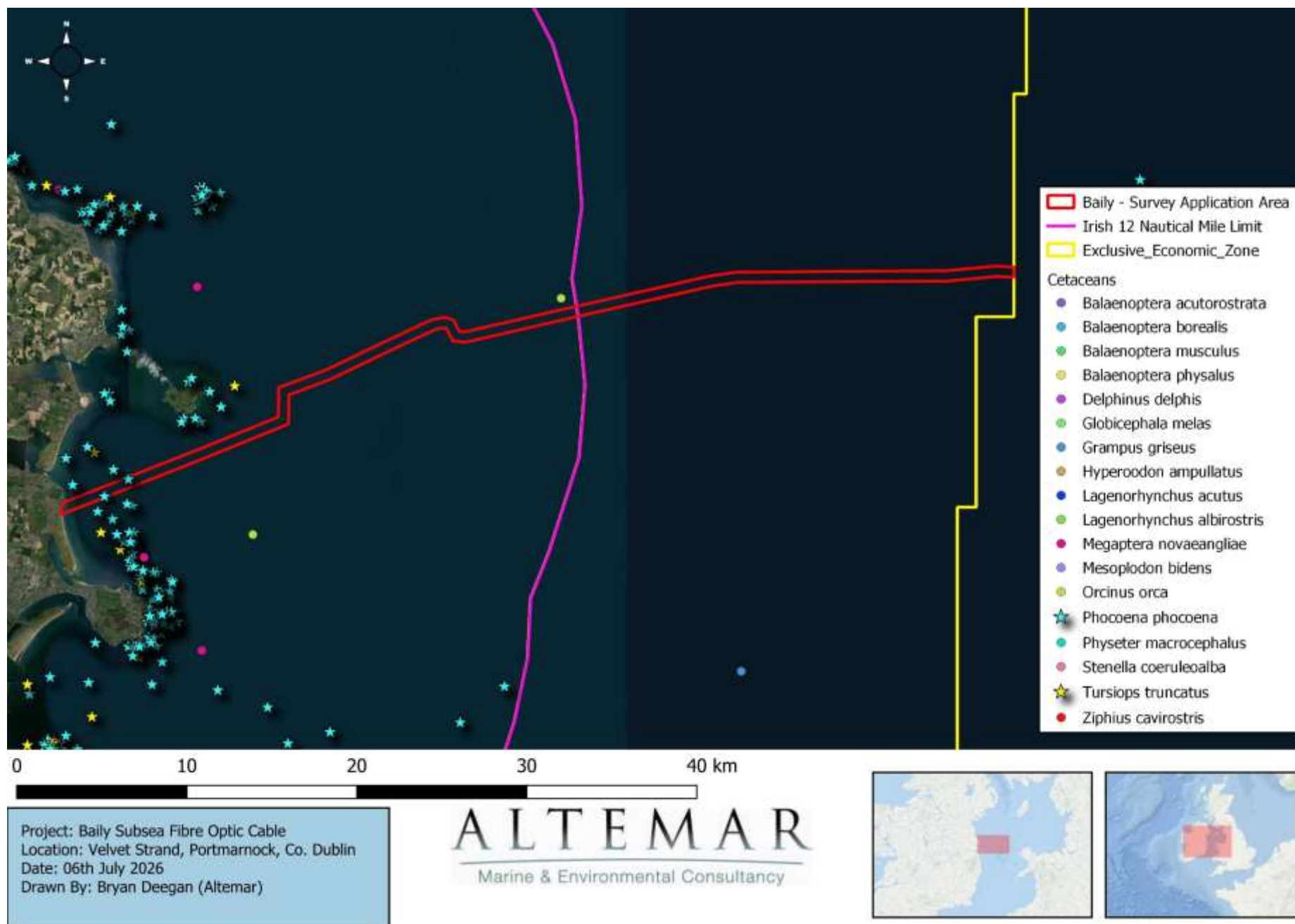


Figure 40. Recorded Cetacean species sightings (Source NBDC sightings data) proximate to survey corridor

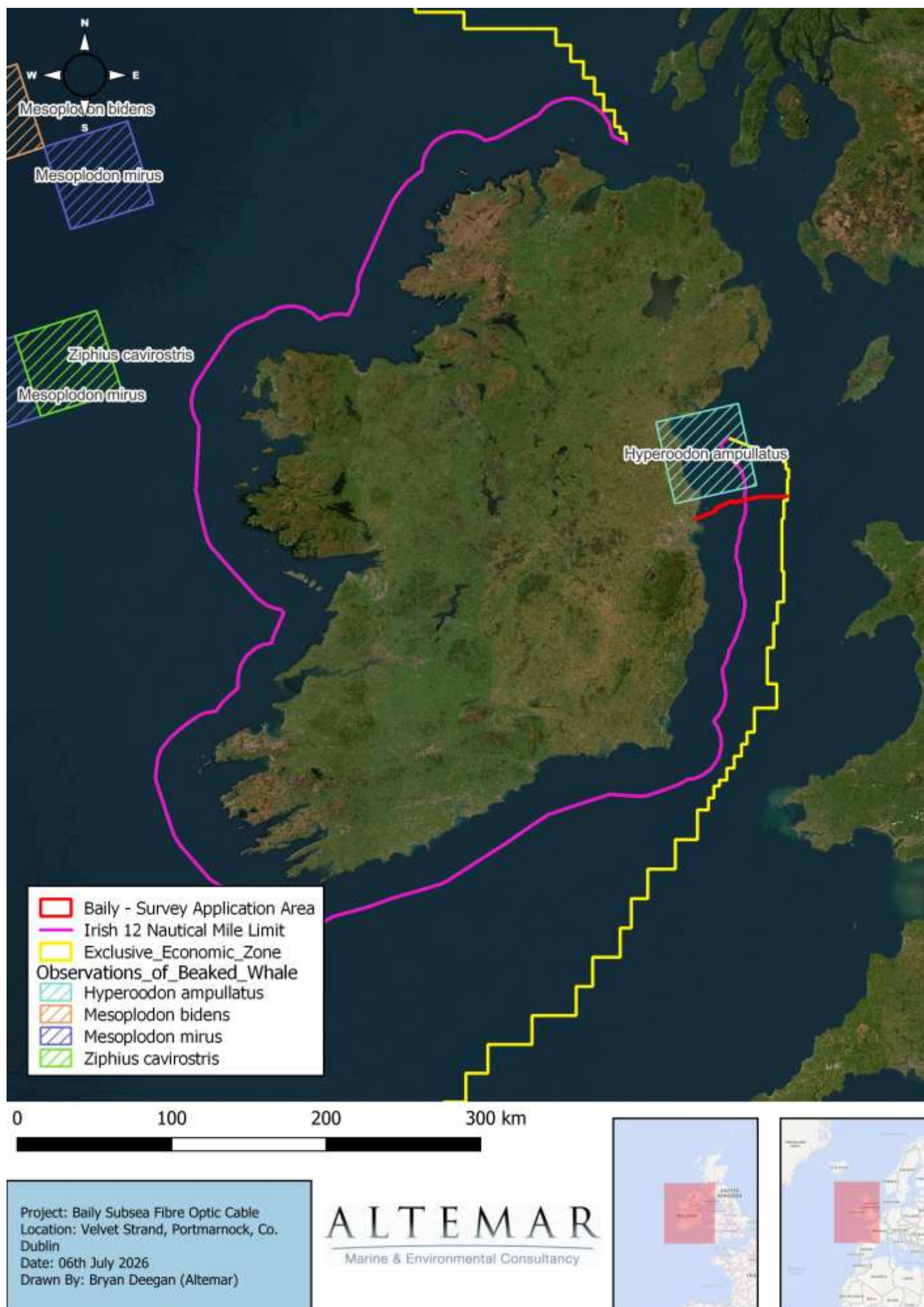


Figure 41. Observations of Beaked Whales (Marine Institute data)

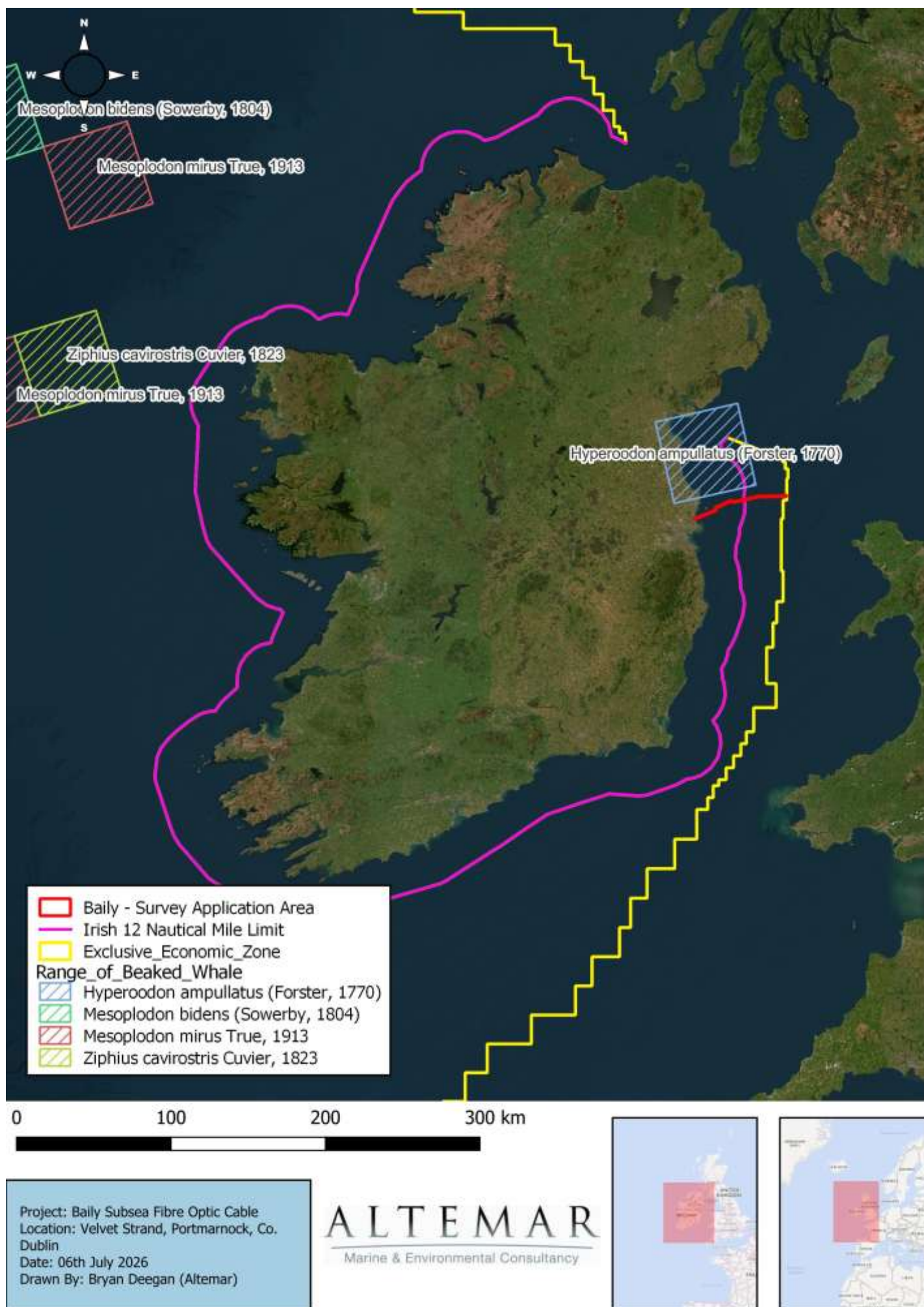


Figure 42. Range of Beaked Whales (Marine Institute data)

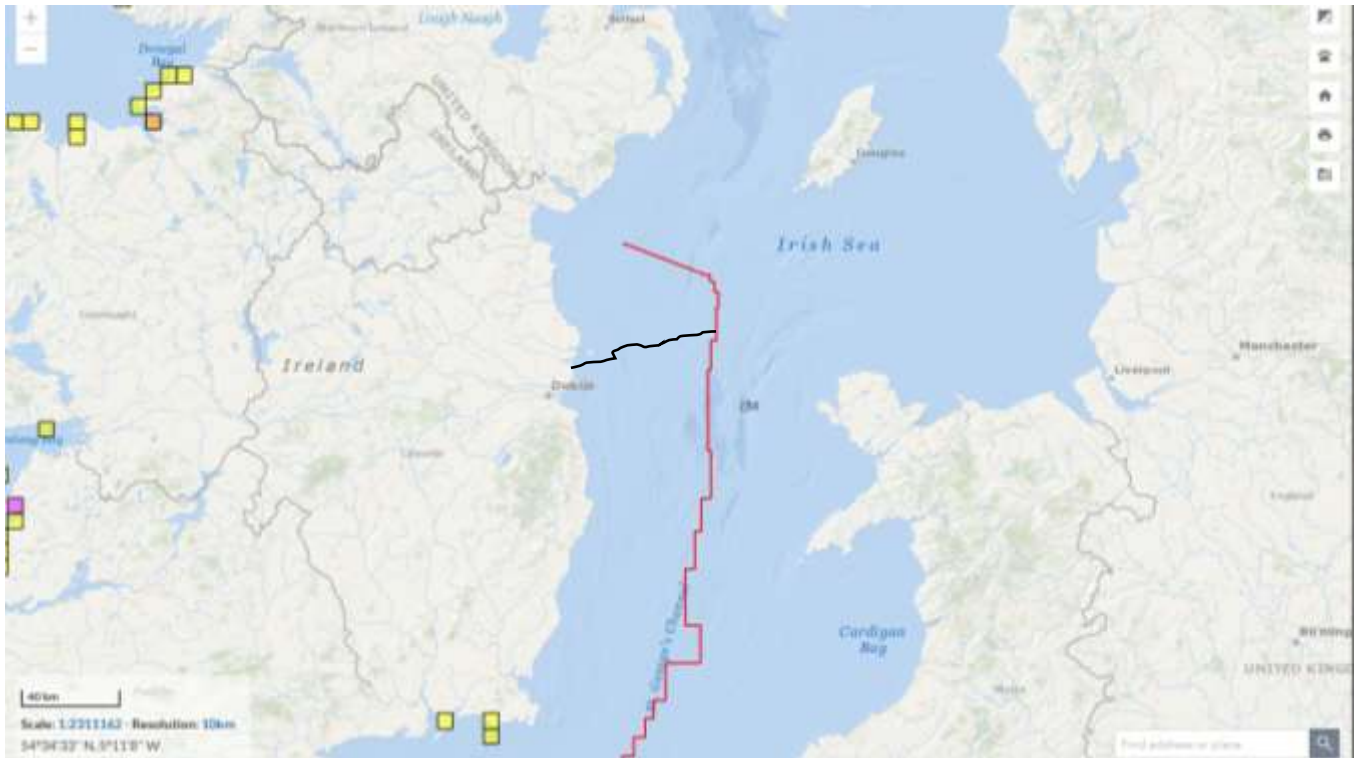


Figure 43. Cuvier's beaked whale (*Ziphius cavirostris*) (yellow), True's beaked whale (*Mesoplodon mirus*) (purple), and both species (orange) (Source: NBDC) (Approx. cable route: Black line)



Figure 44. Sowerby's beaked whale (*Mesoplodon bidens*) (yellow) and Gervais' Beaked Whale (*Mesoplodon europaeus*) (Source: NBDC) (Approx. cable route: Black line)

4.4 Additional Information on Species

National Biodiversity Data Centre

The National Biodiversity Data Centre's online viewer was consulted in order to determine the extent of biodiversity and/or species of interest in the area. Species observations in proximity to the proposed cable route is demonstrated in Appendix I.

5. Potential Effects

The marine and intertidal survey of a deep sea fibre-optic cable is a complex and challenging procedure. From the beginning of the planning stage to determining the final cable route, careful thought has gone into ensuring the longevity of the cable and uninterrupted service. This, in tandem with licencing and environmental legislation results in the routing of the cable in as stable an environment as possible that will have minimal impact on the environment and threat of anthropogenic disturbance. The laying of a cable within the 12nm limit, will involve burial in sediment, surface laying on hard substrate and elements of diver works in the shallow subtidal. The marine survey is to identify the optimal route for the cable. The survey elements will involve intertidal trial pits/bar probes and acoustic/geophysical survey off shore.

The terrestrial activities will involve the movement of personnel and machinery on existing wide worn paths, roads and car park areas. The principal elements of the terrestrial activities are the facilitation of access for machinery to the intertidal. Intertidal works involve excavation of trial pits and bar probed during a single falling tide on each beach. One single return journey for machinery will be carried out on the beach. The presence of machinery and personnel in the intertidal may temporarily disturb wildlife. However, it should be noted that the area is of high amenity with existing car parks, vehicle and pedestrian/canine activity. Disturbance of the sediments in the intertidal will occur due to site investigation works. Pollution generated from machinery/construction activities could potentially impact the intertidal and terrestrial habitats. Potential impacts on habitats and species and the extent of these impacts that could potentially be encountered during the project are seen in Table 11a (habitats) and 11b (species).

In the subtidal, the process will involve a ship moving at a speed of approximately 4kn and generating acoustic noise with the use of acoustic equipment. In addition, geotechnical sampling will also generate localised noise but also localised disturbance of sediment. However, as the vessel will be stationary during geotechnical sampling (cores grabs etc.) this disturbance of silt will be very localised. During the acoustic survey disturbance of cetaceans may occur due to the presence of the vessel and underwater noise.

Table 11a. Potential impacts on habitats during construction.

Habitat	Fossitt	Habitats Directive	Rating	Survey effects	Impact Significance in the absence of mitigation.
Moderately Exposed Infralittoral Rock	SR2	"Reef - 1170"	A	No geotechnical surveys will be carried out on reef habitat. Acoustic geophysical surveys will not impact on this habitat. No Infralittoral rock is noted along the proposed survey route within Rockabill to Dalkey SAC.	Neutral/localised/short-term/not significant. No mitigation is required.
Moderately Exposed Circalittoral Rock	SR5	"Reef - 1170"	A	No geotechnical surveys will be carried out on reef habitat. Acoustic geophysical surveys will not impact on this habitat.	Neutral/localised/short-term/not significant. No mitigation is required.
Sand Shores	LS2		A	Temporary displacement of birds may occur in the vicinity of the works. However, the beaches are highly disturbed by human and canine activity. Short term impacts would be expected on infauna due to compression/redistribution of sediments. The beaches are moderately exposed and consist of coarse sand and faunal densities would be expected to be very low. There is potential for pollution on site. Mitigation measures are required.	Minor Adverse/localised/short-term/not significant. Mitigation is required.
Circalittoral gravels and Sands	SS5		D	Temporary disturbance will occur during geotechnical sampling. Short term impacts would be expected on infauna due to compression/redistribution of sediments. No mitigation measures are required.	Minor Adverse/localised/short-term/not significant.
Circalittoral Mixed sediments	SS8		D	Temporary disturbance will occur during geotechnical sampling. Short term impacts would be expected on infauna due to compression/redistribution of sediments. No mitigation measures are required.	Minor Adverse/localised/short-term/not significant.

Table 11b. Potential impacts on species during construction.

Species	Rating	Survey Effect	Impact Significance
Mammal-Cetaceans		A detailed section on the impact of the proposed survey follows this table. Subtidal survey works may be carried out in vicinity of cetaceans. Localised disturbance may occur due to the presence of the vessel and acoustic noise generated from survey works on the sea floor. Vessel speeds are slow (4kn). Lurton (2016) modelled the sound field radiated by multibeam echosounders for acoustical impact assessment. Lurton (2016) states <i>“considering the injury criteria, the results illustrate that injury hazards are possible only at very short distances from the source: e.g. about 5 m for maximum Sound Pressure Level and 12 m for cumulative Sound Exposure Level in the case of a 240-dB source level, considering cetaceans. For behavioural response criteria, the corresponding values are 9 m and 70 m.”</i> Mitigation measures are required. The operations would comply with the NPWS (2014) <i>“Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters”</i> .	Minor Adverse/localised/short-term/Not significant. Mitigation measures are required.
Mammal-Seals	A	A detailed section on the impact of the proposed survey follows this table. Subtidal survey works may be carried out in vicinity of seals. Localised disturbance may occur due to the presence of the vessel and acoustic noise generated from survey works on the sea floor. Vessel speeds are slow (4kn). Lurton (2016) modelled the sound field radiated by multibeam echosounders for acoustical impact assessment. Lurton (2016) states <i>“considering the injury criteria, the results illustrate that injury hazards are possible only at very short distances from the source: e.g. about 5 m for maximum Sound Pressure Level and 12 m for cumulative Sound Exposure Level in the case of a 240-dB source level, considering cetaceans. For behavioural response criteria, the corresponding values are 9 m and 70 m.”</i> Mitigation measures are required. The operations would comply with the NPWS (2014) <i>“Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters”</i> .	Minor Adverse/localised/short-term/Not significant. Mitigation measures are required.
Mammal-Bats	A	There was no evidence of bat species at this site. Survey works in the intertidal will be carried out during daylight hours and will not involve additional lighting or noise after dusk. It will not impact on the food source for bat species or habitats important for roosting.	Neutral
Mammals-Terrestrial	A-D	Survey works will be carried out during daylight hours and any impacts would be primarily due to disturbance. There was no evidence of terrestrial mammal species at this site. However, otter could be present in the marine environment close to the shore. Mitigation measures are required in relation to mammals.	Minor Adverse/localised/short-term
Birds-Overwintering	A	Survey works in the intertidal will be carried out during daylight hours and impacts would be primarily due to disturbance. The proposed works are on beaches with high levels of disturbance during a single tide proximate to existing car parks.	Minor Adverse/localised/short-term/Not significant. Mitigation measures are required.

Species	Rating	Survey Effect	Impact Significance
Birds-residential	D	Survey works in the intertidal and terrestrial area will be carried out during daylight hours and impacts would be primarily due to disturbance. The works are in an existing highly disturbed environment and do not involve the removal of nesting or foraging habitats.	Minor Adverse/localised/short-term/Not significant. Mitigation measures are required.
Amphibians-Frogs	B	The intertidal or subtidal area is not a habitat for amphibian species.	Neutral. Mitigation measures are required.
Terrestrial Flora	A-D	Access to the beach at Portmarnock will be via an existing concrete ramp. No terrestrial flora is located along the proposed access route. No potential impacts on terrestrial flora is foreseen as a result of the proposed survey works.	Neutral
Marine algae	D	Intertidal marine algae are not located proximate to the proposed survey works. Subtidal marine algae are primarily associated with hard substrata and will not be impacted by the proposed survey works. Subtidal geotechnical works (cores, grabs etc.) will not be in bedrock areas.	Neutral
Fish Species	A	Localised disturbance of marine species may occur due to survey activities. Vessel speeds are very slow and significant impacts on fish would be expected to be avoided during works. Important fishing areas and fishery areas are seen in Appendix II.	Minor Adverse/localised/short-term. No mitigation measures are required.

5.1 Potential Acoustic Impacts on Cetaceans and Pinnipeds

All cetaceans are listed under Annex IV of the Habitats Directive, which means that they are protected wherever they occur. Bottle-nosed Dolphin and Harbour Porpoise are also listed under Annex II of the Directive. Annex II species require that core areas of their habitat be designated as sites of Community importance. Grey seals and Harbour seals are also listed under Annex II & Annex V of the Habitats Directive.

The proposed survey would be expected to impact on marine mammals primarily through the emission of noise due to the vessel and from survey equipment, including multibeam. It should be noted that, given the slow speed (4 knots) of the vessel, no collision impacts with the proposed works vessel and equipment are foreseen as a result of the proposed works.

As outlined by O'Brien (2005), 'sound travels 4.5 times faster in water than in air and low frequency sounds travel farther underwater than high frequency sounds.' Multi-beam can be defined as Low frequency (<1 kHz), Mid-frequency (1-10 kHz) and High Frequency (>10 kHz).

Southall *et al.* (2019), in their publication "Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects" revised the marine mammal hearing groups, which are seen in Table 12.

Table 12. Marine Mammal Functional Hearing Groups and Estimated Functional Hearing groups Proposed by Southall *et al.* (2019)

Marine mammal hearing group	Auditory weighting function	Genera (or species) included
Low-frequency cetaceans	LF	<i>Balaenidae</i> (<i>Balaena</i> , <i>Eubalaenidae</i> spp.); <i>Balaenopteridae</i> (<i>Balaenoptera physalus</i> , <i>B. musculus</i>)
		<i>Balaenopteridae</i> (<i>Balaenoptera acutorostrata</i> , <i>B. bonaerensis</i> , <i>B. borealis</i> , 1 <i>B. edeni</i> , <i>B. omurai</i> ; <i>Megaptera novaeangliae</i>); <i>Neobalenidae</i> (<i>Caperea</i>); <i>Eschrichtiidae</i> (<i>Eschrichtius</i>)
High-frequency cetaceans	HF	<i>Physeteridae</i> (<i>Physeter</i>); <i>Ziphiidae</i> (<i>Berardius</i> spp., <i>Hyperoodon</i> spp., <i>Indopacetus</i> , <i>Mesoplodon</i> spp., <i>Tasmacetus</i> , <i>Ziphius</i>); <i>Delphinidae</i> (<i>Orcinus</i>)
		<i>Delphinidae</i> (<i>Delphinus</i> , <i>Feresa</i> , <i>Globicephala</i> spp., <i>Grampus</i> , 2 <i>Lagenodelphis</i> , <i>Lagenorhynchus acutus</i> , <i>L. albirostris</i> , <i>L. obliquidens</i> , <i>L. obscurus</i> , <i>Lissodelphis</i> spp., <i>Orcaella</i> spp., <i>Peponocephala</i> , <i>Pseudorca</i> , <i>Sotalia</i> spp., <i>Sousa</i> spp., <i>Stenella</i> spp., <i>Steno</i> , <i>Tursiops</i> spp.); <i>Montodontidae</i> (<i>Delphinapterus</i> , <i>Monodon</i>); <i>Plantanistidae</i> (<i>Plantanista</i>)
Very high frequency cetaceans	VHF	<i>Delphinidae</i> (<i>Cephalorhynchus</i> spp.; <i>Lagenorhynchus cruciger</i> , <i>L. australis</i>); <i>Phocoenidae</i> (<i>Neophocaena</i> spp., <i>Phocoena</i> spp., <i>Phocoenoides</i>); <i>Iniidae</i> (<i>Inia</i>); <i>Kogiidae</i> (<i>Kogia</i>); <i>Lipotidae</i> (<i>Lipotes</i>); <i>Pontoporiidae</i> (<i>Pontoporia</i>)
Phocid carnivores in water	PCW	<i>Phocidae</i> (<i>Cystophora</i> , <i>Erignathus</i> , <i>Halichoerus</i> , <i>Histriophoca</i> , <i>Hydrurga</i> , <i>Leptonychotes</i> , <i>Lobodon</i> , <i>Mirounga</i> spp., <i>Monachus</i> , <i>Neomonachus</i> , <i>Ommatophoca</i> , <i>Pagophilus</i> , <i>Phoca</i> spp., <i>Pusa</i> spp.)

The Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (NOAA, 2018) outlined the hearing groups of marine mammals, including the generalised hearing range of these cetacean groups (Table 13). They also noted that "Exposures exceeding the specified respective criteria level for any exposure metric are interpreted as resulting in predicted temporary threshold shift (TTS) or permanent threshold shift (PTS) onset." The onset of PTS in marine mammals was also outlined in NOAA 2018 (Table 14). The updated figures for PTS and TTS are outlined in Table 15.

The hearing ranges and sensitivity of marine mammals differ from one species to another depending on their audiogram. "For example, harbour porpoises are sensitive from 3 kHz to 130 kHz, with peak sensitivity at 125-130 kHz, and bottlenose dolphins from 5-110 kHz, with peak sensitivity at 40 and 60-116 kHz" (Southall *et al.*, 2007). Common seals are sensitive 4-45 kHz (peak sensitivity at 32 kHz) and grey seals 8-40 kHz. Humans are sensitive only to frequencies from 20 Hz to 16-18 kHz but with peak sensitivity from 2-4 kHz.

Table 13. Hearing Groups of Marine Mammals (NOAA, 2018)

Hearing Group	Generalized Hearing Range*
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz
High-frequency (HF) cetaceans (true porpoises, Kogia, river dolphins, cephalorhynchid, Lagenorhynchus cruciger & L. australis)	275 Hz to 160 kHz
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz

* Represents the generalized hearing range for the entire group as a composite (i.e., all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall et al. 2007) and PW pinniped (approximation).

Table 14. Onset of PTS in Marine mammals

	PTS Onset Thresholds (Received Level)	
Hearing Group	Impulsive ¹	Non-impulsive ²
Low-Frequency (LF) Cetaceans	Cell 1 <i>Lpk,flat</i> : 219 dB <i>LE,LF,24h</i> : 183 dB	Cell 2 <i>LE,LF,24h</i> : 199 dB
Mid-Frequency (MF) Cetaceans	Cell 3 <i>Lpk,flat</i> : 230 dB <i>LE,MF,24h</i> : 185 dB	Cell 4 <i>LE,MF,24h</i> : 198 dB
High-Frequency (HF) Cetaceans	Cell 5 <i>Lpk,flat</i> : 202 dB <i>LE,HF,24h</i> : 155 dB	Cell 6 <i>LE,HF,24h</i> : 173 dB
Phocid Pinnipeds (PW) (Underwater)	Cell 7 <i>Lpk,flat</i> : 218 dB <i>LE,PW,24h</i> : 185 dB	Cell 8 <i>LE,PW,24h</i> : 201 dB
Otariid Pinnipeds (OW) (Underwater)	Cell 9 <i>Lpk,flat</i> : 232 dB <i>LE,OW,24h</i> : 203 dB	Cell 10 <i>LE,OW,24h</i> : 219 dB

¹Impulsive: produce sounds that are typically transient, brief (less than 1 second), broadband, and consist of high peak sound pressure with rapid rise time and rapid decay (ANSI 1986; NIOSH 1998; ANSI 2005).

²Non-impulsive: produce sounds that can be broadband, narrowband or tonal, brief or prolonged, continuous or intermittent) and typically do not have a high peak sound pressure with rapid rise/decay time that impulsive sounds do (ANSI 1995; NIOSH 1998).

Table 15. Southall *et al.* (2019) TTS- and PTS-onset thresholds for marine mammals exposed to impulsive noise: SEL thresholds in dB re 1 $\mu\text{Pa}^2\text{s}$ under water and dB re (20 μPa)²s; and peak SPL thresholds in dB re 1 μPa under water.

Hearing Group	Impulsive Noise		Non-impulsive Noise
	Unweighted SPLpeak(dB re 1 μPa)	Weighted SELcum (dB re 1 $\mu\text{Pa}^2\text{s}$)	Weighted SELcum (dB re 1 $\mu\text{Pa}^2\text{s}$)
PTS Criteria			
Low-frequency (LF) cetaceans	219	183	199
High-frequency (HF) cetaceans	230	185	198
Very-frequency cetaceans (VHF)	202	155	173
Phocid carnivores in water (PCW)	218	185	201
TTS Criteria			
Low-frequency cetaceans	213	168	179
High-frequency cetaceans	224	170	178
Very high-frequency cetaceans	196	140	153
Phocid carnivores in water	212	170	181

Most small cetaceans, excluding harbour porpoise, have an auditory bandwidth of 150 Hz to – 160 kHz, while harbour porpoise have an auditory bandwidth within 200 Hz to 180 kHz. Pinnipeds in water are thought to have an auditory bandwidth of between of 75 Hz to 75 kHz and from 75 Hz to 30 kHz in air (Southall et al. 2007)."

The proposed survey equipment and the noise frequency emissions are seen in Table 16.

Equipment Type	Purpose	Frequency Range	Duration	Maximum Source Pressure Level (re 1µPa at 1 m)	Reference
Multibeam Echo Sounder (MBES)	Measure detailed bathymetry by transmitting sound pulses (active sonar).	200 kHz to 500 kHz	0.05 - 10 ms	210 - 245 dB.	Danson 2005, Hopkins 2007, DECC 2011, Lurton and DeReutier 2011, Lurton 2016, BEIS 2020, Crocker & Fratantonio 2016
Side Scan Sonar (SSS)	Determine surficial nature of the seabed and detect objects by transmitting sound pulse.	200 kHz to 700 kHz	0.4 - 1.0 ms	200 - 240 dB.	BOEM 2016, BEIS 2020, DAHG 2014, Crocker & Fratantonio 2016
Sub-bottom Profiler (SBP) - Pinger	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	2 kHz to 15 kHz	0.5 - 30 ms	214 dB.	Hartley Anderson 2020
Sub-bottom Profiler (SBP) - Chirper	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	2 kHz to 13 kHz	5 - 40 ms	185 - 215 dB.	Crocker & Fratantonio 2016, Hartley Anderson 2020
Sub-bottom Profiler (SBP) - Boomer	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	500 Hz to 15 kHz	0.5 - 1.0 ms	205 - 215 dB.	Crocker & Fratantonio 2016
Sub-bottom Profiler (SBP) - Parametric	Identify different geological layers encountered in the shallow sediments and sediment thicknesses beneath the seabed.	4 to 15 kHz, 85 to 115 kHz	0.2 - 30 ms	238 - 247 dB. 200 - 206 dB.	Hartley Anderson 2020
Ultra-Short Base Line (USBL)	Subsea positioning.	20 kHz to 50 kHz	5 - 10 ms	194 - 207 dB.	Kongsberg
Magnetometer	Identify ferrous anomalies for metal obstructions, shipwrecks, etc. on and under the seabed.	Passive	N/A	Passive	N/A
Survey Vessels	Carry out the survey and deploy the equipment.	50 Hz to 300 Hz	N/A	160 - 190 dB.	DECC 2011

Table 16a. Details of the proposed types of acoustic equipment which emit sound.

Equipment Type	Purpose	Number of locations within Licence Application Area (up to)	Frequency Range	Maximum Source Pressure Level (re 1µPa at 1 m)	Reference
Cone Penetration Test (CPT)	Determine geotechnical engineering properties of seabed sediments.	15	28 Hz	118 - 145 dB.	BOEM 2012, EIRGRID 2014
Gravity Corer	Retrieve a seabed sediment sample by penetrating seabed with a steel core barrel under self-weight	12	N/A	N/A	N/A
Vibrocorer	Retrieve a seabed sediment sample by penetrating seabed with a vibrating steel core barrel	12	30 Hz	187.4 dB.	LGL 2010
Grab Samples	Collect small sediment samples from seabed surface with clamshell mechanism	11	N/A	N/A	N/A

Table 16b. Details of the proposed types of geophysical equipment which emit sound.

Activity	Typical Time Period Required for Activity	Total Number of SI Locations	Total Time for SI	Foot Print Affected per SI	Foot Print Affected per SI (ha)	Total Foot Print (ha)	Area Directly Affected as % of Licence Application Area
Inshore Geophysical Survey	3 to 4 days (weather and sea state dependent)	400 - 500 m cable route corridor	3 to 4 days (weather and sea state dependent)	N/A	N/A	560 ha	18.66667%
Offshore Geophysical Survey	8 to 10 days (weather and sea state dependent)	500 m cable route corridor	10 to 12 days (weather and sea state dependent)	N/A	N/A	2441 ha	81.3667%
CPT	30 minutes - 2 hours in any one location	15	30 hours within total 8 days of Site Investigations campaign (weather and sea state dependent)	8m ²	0.0008 ha	0.012 ha	<1%
Gravity Corer	30 minutes - 2 hours in any one location	12	24 hours within total 8 days of Site Investigations campaign (weather and sea state dependent)	1m ²	0.0001 ha	0.0012 ha	<1%
Vibro Corer	30 minutes - 2 hours in any one location	12	24 hours within total 8 days of Site Investigations campaign (weather and sea state dependent)	8m ²	0.0008 ha	0.0096 ha	<1%
Grab Samples	20 minutes - 45 minutes in any one location	11	9 hours within total 8 days of Site Investigations campaign (weather and sea state dependent)	0.5m ²	0.00005 ha	0.0006 ha	<1%

Table 16c. Estimated Time and Duration of Survey Activities (Source: MDM)

The cetacean species observed in the survey area are high-frequency, mid-frequency and low-frequency cetaceans. Grey and Common Seals may also be present. The proposed survey equipment and the noise frequency emissions are seen in Table 16. The high frequencies emitted from the equipment are above the auditory range of mid-frequency (150Hz-160 kHz) but within the hearing range of high-frequency cetaceans (275Hz- 160 kHz)- observed in and on the proposed survey area.

The Multibeam Echo Sounder (MBES) (200 kHz to 500 kHz) and Side Scan Sonar (SSS)(200 kHz to 700 kHz), single beam echo sounder and Multibeam Echo Sounder (MBES) will emit noise above the hearing frequency of marine mammals. The hull-mounted Sub-bottom Profiler (SBP) – Pinger (2 kHz to 15 kHz), Sub-bottom Profiler (SBP) - Chirper (2 kHz to 13 kHz), Sub-bottom Profiler (SBP) – Boomer (500 Hz to 15 kHz), Sub-bottom Profiler (SBP) – Parametric (4 to 15 kHz, 85 to 115 kHz) and Ultra-Short Base Line (USBL) Subsea positioning. (20 kHz to 50 kHz) emits low and mid-frequency noise, within the auditory range of all marine mammals, including harbour porpoise, grey seal and harbour seal. However, all of the equipment (peak noise) at 1m from the source emits noise above the onset of PTS for non-impulsive sounds for high, medium, low frequency cetaceans and Phocid Pinnipeds outlined by NOAA (2018) was 173 dB, 198 dB, 199 dB and 219 dB, respectively, and the 198dB proposed injury levels indicated by Southall et al. (2019). As a result, negative impacts may be foreseen if marine mammals are close enough to the equipment to receive sound levels above this indicative threshold. As outlined in Table 7, the inshore Geophysical Survey is predicted to take 3 to 4 days (weather and sea state dependent), and the offshore Geophysical Survey 10 to 12 days (weather and sea state dependent).

Lurton (2016) modelled the sound field radiated by multibeam echosounders for acoustical impact assessment. He stated that *“considering the injury criteria, the results illustrate that injury hazards are possible only at very short distances from the source: e.g. about 5 m for maximum Sound Pressure Level and 12 m for cumulative Sound Exposure Level in the case of a 240-dB source level, considering cetaceans. For behavioural response criteria, the corresponding values are 9 m and 70 m.”*

As previously outlined, the estimated time that the survey would take (excluding SI) within the Rockabill to Dalkey SAC would be approx. 63.3 hrs. The operations would comply with the NPWS (2014) *“Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters”* [http://www.npws.ie/sites/default/files/general/Underwater sound guidance Jan 2014.pdf](http://www.npws.ie/sites/default/files/general/Underwater%20sound%20guidance%20Jan%202014.pdf).

These guidelines would be deemed adequate to mitigate the negative impacts of the proposed works. Cetaceans in the vicinity of the vessel during start-up procedures would be given ample time to leave the site with the soft start procedures outlined in the guidelines. In addition, vessel speeds are extremely slow, which would give marine mammals ample opportunity to move from the area.

Note: in relation to consistency between Southall (2019) and NOAA (2018)

The Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (NOAA, 2018) (or National Marine Fisheries Service, 2018 (as quoted in Southall 2019)), outlines the hearing groups of marine mammals, including the generalised hearing range of these cetacean groups (Annex II). NOAA (2018) also noted that *“Exposures exceeding the specified respective criteria level for any exposure metric are interpreted as resulting in predicted temporary threshold shift (TTS) or permanent threshold shift (PTS) onset.”* The thresholds for the onset of PTS in marine mammals were also outlined in NOAA 2018. The updated Southall (2019) figures for PTS and TTS are outlined in Annex IV.

Southall (2019) outlined the main differences between their publication and previous publications, including NOAA (2018), which was referenced as NMFS (2018) in Southall (2019). Southall (2019) states that *“The noise criteria here represent the next step in a sequential process of evolution of the criteria proposed by Southall et al. (2007), substantially modified with new analytical methods by Finneran (2016), and recently adopted as U.S. regulatory guidance by the NMFS (2016, 2018). While the quantitative process described herein and the resulting exposure criteria here are based on, and in many respects are identical to, those derived by Finneran (2016) and adopted by the NMFS (2016, 2018), there are a number of significant distinctions. The exposure criteria here appear in a peer-reviewed publication and include all marine mammal species for all noise exposures, both underwater and in air for amphibious species. NMFS (2016, 2018) provides regulatory guidance only for the subset of marine mammals under their jurisdiction and does not include criteria for aerial noise exposures, an important consideration in many locations for which some earlier assessments were made (Finneran & Jenkins, 2012). The exposure criteria here, while based on the Finneran (2016) quantitative method and consistent with the NMFS (2016, 2018) guidance where they overlap, are thus more broadly relevant, peer-reviewed, and less subject to potential changes in national regulatory policy.”*

Southall (2019) also stated that *“It should be noted that this results in some proposed differences in the terminology of hearing groups relative to those used in Finneran (2016) and NMFS (2016, 2018). These proposed differences in nomenclature may be confusing, but we believe they are justified (see the “Marine Mammal Hearing Groups and Estimated Group Audiograms” section and Appendices 1-6) and will support future criteria as new information emerges.”*

The difference in nomenclature between NOAA 2018 and Southall (2019) is that NOAA (2018) classified cetaceans as Low-frequency (LF) cetaceans (baleen whales), Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales) and High-frequency (HF) cetaceans (true porpoises, Kogia, river dolphins, cephalorhynchid, Lagenorhynchus cruciger & L. australis) while Southall reclassified these groups to Low-frequency cetaceans, High-frequency cetaceans, Very high-frequency cetaceans. As outlined in Southall (2019) *“The distinction between HF and VHF cetacean groups (as opposed to mid- and high-frequency) reflects the regions of best hearing sensitivities within these groups, often including frequencies approaching or exceeding 100 kHz; these frequencies would be more appropriately described within marine bioacoustics as high to very high. Further, as discussed in more detail below, a number of anatomical and sound production properties suggest a potential distinction of very low-(VLF) and LF cetaceans among mysticetes. Some evidence also suggests a potential segregation of mid-frequency (MF) and HF cetaceans in addition to the distinction of HF and VHF cetaceans.”* This is, in effect, a relabelling of Mid-Frequency (MF) Cetaceans and High-Frequency (HF) Cetaceans to High-frequency cetaceans and Very high-frequency cetaceans, respectively. It should be clearly noted that the PTS values within the updated groups were identical between NOAA, 2018 and Southall, 2019, and it was, in effect, a renaming of the groups.

6. Cumulative Effects

As outlined by (OSPAR, 2012) “Cumulative effects, the combined effect of more than one activity, may reinforce the impacts of a single activity due to temporal and/or spatial overlaps”. The potential for in-combination effects within the ZOI that may occur as a result of the proposed project, during and post works has been assessed. The following cumulative impact assessment has been guided by the EC 2021 AA guidance document⁴, with particular reference to “Table 2. Cumulative impact assessment”.

6.1 Geographic Boundaries and the Timeline for Assessment

The proposed project is primarily located within the intertidal and subtidal elements of Portmarnock Beach (Velvet Strand) and within the Irish EEZ. The potential ZOI for in-combination effects for this assessment has been deemed to be projects located proximate to the landfall and intertidal elements of the survey works, in addition to subtidal elements relating to underwater noise. Terrestrial planning applications have been examined for the potential for in-combination effects. Given that the proposed survey works extend to the offshore subtidal in the Irish Sea, the geographic boundaries of assessment were expanded to include coastal and offshore marine projects located within the Irish Sea.

MARA licensing in Ireland relates to licence applications out to the Irish EEZ limit. In order to assess the potential transboundary effects, details of designated sites within UK waters were investigated. The survey works within UK waters are subject to this UK permitting process, and the potential impacts on designated sites are subject to a separate application process assessed by UK authorities. For the UK element of the proposed survey works to proceed, it has to be approved by UK authorities, and the reporting concludes that, following the implementation of appropriate mitigation, the proposed project would not adversely affect the integrity of UK designated sites, alone or in combination with other projects.

In relation to the timeline for assessment, given the short temporal nature of the proposed survey works and the fact that the proposed works will be isolated to the survey corridor extents with potential for noise to extend beyond the survey area, the most recent projects located in the vicinity of the proposed survey works area have been examined for potential in-combination effects.

6.2 Identification of Plans/Projects that could act In Combination

Fingal County Council planning permissions, Foreshore Applications, Maritime Area Consent (MAC) Applications, Maritime Usage Licence (MUL) Applications, EIA portal, and An Coimisiún Pleanála (ACP) Applications were examined for projects in proximity to the proposed Baily survey works route. Projects within the potential ZOI of the proposed survey works are outlined in Tables 17-22.

Table 17. Fingal County Council Planning Permissions.

Ref. No.	Address	Proposal
F24A/0082	Martello Tower, Portmarnock, Co. Dublin	(Protected Structure Ref. 476) Mary Nagle intends to apply for Planning Permission for the following :- a) To repair the fabric of the building and to replace existing windows, b) To raise the parapet wall to the ground floor extension, c) To extend by approx. 8 sq.m. the single storey part of the building, d) To infill the space at the eastern end of the existing sheds located close to the main building by way of a 2.6m ² corner extension, e) To provide a new steel spiral staircase from the ground floor to the second floor,

⁴ [Official Journal C 437/2021 \(europa.eu\)](https://eur-lex.europa.eu/eli/reg/2021/1717/oj)

		f) To extend the area of the existing sheds located close to the main building by a total of 20.12m² including the infill corner as above, g) To convert the existing four apartments and extension into a single four bed residence (220.1m²), h) To open a new vehicular entrance to the site and close up the existing one, i) To repair the existing boundary walls and erect a small railing on top, j) To include a landscape plan for the site including all siteworks necessary to complete the development, all at the Martello Tower, Portmarnock Co. Dublin.
F24A/0894	Sea Scape, 4b Strand Road, Portmarnock, Co Dublin	Planning Permission is sought for i) 2-storey extension to the rear, and additional 2-storey extension to the front elevation ii) framed structure forming patio area to the North elevation iii) internal alterations, together with all engineering works necessary to facilitate the development.
F24A/0131	57 Portmarnock Crescent, Portmarnock, County Dublin	The development will consist of (a) Demolition of existing single storey conservatory and existing boiler house/garden shed at rear. (b) Construction of two storey extension at rear (South East Elevation) containing new kitchen/lounge area at ground level and 1 no. bedroom at first floor level with feature corner window (South East and North East Facing), (c) Construction of first floor extension over existing single storey structure at side (South West Elevation) containing new bathroom with 1 no. opaque window at front (North West Elevation) and new pitched roof over to match existing house. (d) Removal of existing external door at first floor landing area and build-up of opening to form 1 no. opaque window at side (South West Facing Elevation). (e) New replacement flat roof with parapet finish to existing single storey structure at front and side, including new smooth sand and cement painted plaster finish at front (North West Elevation). Together with internal alterations and associated site works.
F24A/1127E	37, Strand Road, Portmarnock, Dublin, D13 HK58	To make alterations and extensions to existing house to include demolition of existing back kitchen return with all associated and ancillary site works, drainage and landscaping works.
F25A/1042E	Portmarnock Hotel and Golf Links, Strand Road, Portmarnock, Co. Dublin, D13V2X7	The Development will consist of the construction of an outdoor freshwater swimming pool, plant room, changing rooms, showers, sauna and steam room, a new door from the existing spa within the hotel, a new pedestrian access path from hotel to the pool area, a new wall separating the pool and changing rooms from the adjacent car park, and all associated landscaping and site works.
F23A/0215	Portmarnock Golf Club, Golf Links Road, Portmarnock, Co. Dublin, D13 KD96	The proposed development will consist of: i) Maintenance and repair of the existing rock armour revetment (c. 490 metres in length) north of Hole 15, ii) Provision of a temporary access approximately 20 metres in length to facilitate transport of materials to the repair works area, within a planning application area of c. 0.2 hectares. The proposed works will take place over 5 to 10 working days (Monday to Friday only) within a time window from mid-September to end October each year, for up to 5 years. The works will necessitate the transport of machinery and materials along a section of Portmarnock Beach on a daily basis for the duration of the works. A Natura Impact Statement (NIS) will be submitted with the application.
F24A/0935E	Portmarnock Golf Club, Golf Links	Permission is sought for The proposed development that will consist of: i) Maintenance and repair of the existing rock armour revetment (c. 560 metres in length) south of Hole 15,

	Road, Portmarnock, D13KD96	ii) Provision of a temporary access approximately 20 metres in length to facilitate transport of materials to the repair works area (as already permitted for maintenance and repair works under Plan. Ref. F23A/0215), within a planning application area of c. 0.34 hectares. The proposed works will take place over 5 to 10 working days (Monday to Friday only) within a time window from mid-September to end October each year, for up to 5 years. The works will necessitate the transport of machinery and materials along a section of Portmarnock Beach on a daily basis for the duration of the works.
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Table 18. Foreshore/Marine licence applications proximate to the proposed survey corridor

Reference	Applicant	Year	Location	Activity	Status
FS006984	Rush Sailing Club	2022	Rush Sailing Club, Rogerstown, Rush, Co. Dublin, K56 RH52	Foreshore lease application for the construction of a new disability access landing pontoon to include new floating pontoon, access gangway, landing area, and alterations to existing boundary sea wall, boundary wall, and footpath to accommodate same, and associated site works.	Consultation
FS007546	Codling Wind Park Limited	2022	Off County Wicklow and County Dublin.	The main aims and objectives of the proposed activities are to: • Provide up to date detailed bathymetric mapping of the seabed; • Provide further information on the soil stability and morphology of the seabed; • Provide detailed information on ground conditions and geology; • Obtain up to date wind resource and metocean data for the site; and • To generate environmental and ecological data to inform the EIA and AA for the Codling Wind Park project.	Determination
FS006909	Fingal County Council	2021	Malahide Demesne to Newbridge Demesne	Fingal County Council proposes to develop the Broadmeadow Way, a new greenway (shared footpath and cycleway) between Malahide Demesne and Newbridge Demesne via the railway causeway across the Malahide Estuary. The proposed greenway would be c. 6km in length. Much of the the proposed greenway follows existing pathways and roads.	Determination
FS007358	North Irish Sea Array (NISA) Windfarm Limited, which is a fully owned subsidiary of	2021	Off the coast of County Louth, County Meath, County Dublin.	This Foreshore Licence application is for site investigation surveys necessary to determine the seabed and sub-sea conditions to establish the optimum location for and design of the export cable(s) to shore, and to establish	Determination

Reference	Applicant	Year	Location	Activity	Status
	Statkraft Ireland Ltd.			the most appropriate route corridor and landfall location for the export cable(s) from the proposed North Irish Sea Array (NISA) offshore wind farm, located off the coasts of Dublin, Meath and Louth. The application includes for geophysical surveys (mutli-beam echo sounder, sub bottom profiling, side-scan sonar and magnetometer), geotechnical surveys (cone penetration tests and vibrocores along the potential routes and boreholes at the landfalls) and ecological surveys (fisheries surveys, benthic grab samples, intertidal benthic sampling).	
FS007383	Oriel Windfarm Limited	2021	Off the coast of County Louth, to the east of Dundalk Bay.	Oriel Windfarm Limited (Oriel) is an Irish renewable energy company developing the proposed Oriel offshore wind farm located in the North-West Irish Sea, 22km off the coast of Dundalk, County Louth. The proposed Oriel offshore wind farm will include wind turbines mounted onto a foundation installed into the seabed, an offshore substation and interlinking cabling between the turbines and the substation and an export cable between the substation and the shore. Oriel has applied for a Foreshore Licence to undertake detailed geotechnical and geophysical investigations, ecological surveys and metocean surveys. The purpose of the geotechnical investigation is to investigate the stability of the soil for the design of foundations and the detailed routing of the inter array and export cables. The purpose of the geophysical survey is to characterise the layers of sediment/rock underneath the seafloor and to achieve a detailed seabed morphology and seafloor mapping. Further ecological surveys and measurements of the wind, wave and currents (metocean) will also be undertaken. This Foreshore Licence application is for permission to undertake these survey works on the proposed development site. Oriel	Determination

Reference	Applicant	Year	Location	Activity	Status
				proposes to apply for a licence for a duration of 36 months.	
FS007359	Drogheda Port Company	2021	River Boyne, Co. Louth	Foreshore temporary licence application for maintenance dredging of the commercial estuary and seaward approaches to the River Boyne	Determination
FS007290	Dun Laoghaire Rathdown County Council	2021	Dun Laoghaire, Co. Dublin	Foreshore application in respect of the replacement of the existing fendering system at Carlisle Pier.	Determination
FS007188	RWE Renewables Ireland Ltd.	2021	Off the coast of County Dublin & County Wicklow.	Foreshore Licence to undertake geotechnical and geophysical site investigations and ecological, wind, wave and current monitoring to provide further data to refine wind farm design, cable routing, landfall design and associated installation methodologies for the proposed Dublin Array offshore wind farm.	Determination
FS007164	Dublin Port Company	2021	Dublin Port	Foreshore application in respect of Capital Dredging at various locations around Dublin Port	Determination
FS007406	Islandbridge Bellevue Developments Limited (In Receivership)	2021	Bellevue, Islandbridge, Dublin 8	Foreshore licence application for emergency remedial works to the river wall at Bellevue, Islandbridge, Dublin 8	Determination
FS007223	Sean O'Hanlon (O'Hanlon and Sons Ltd)	2021	Dundalk Port, Dundalk, Co. Louth	Foreshore licence application for Maintenance dredging	Determination
FS007132	Dublin Port Company	2021	Dublin Port, Dublin	Foreshore application in respect of maintenance dredging at various locations in Dublin Port for the years 2022 to 2029.	Determination

Table 19. Maritime Area Consent (MAC) applications proximate to the proposed survey works within the Irish EEZ

Reference	Applicant	Year	Location	Activity	Status
MAC20240007 Site Ref: A-D	Fingal County Council	2024	Burrow Road, Marsh Lane and Portrane Beach, Fingal, Dublin	Coastal Protection including Flood Embankment, Flood Wall and other works	Consented
2022-MAC-005 Site Ref: A-B	North Irish Sea Array Windfarm Limited	2022	Off Dublin and Louth coast	Offshore Windfarm	Consented
MAC20230034 Site Ref: A-E	National Transport Authority	2024	Ringsend to City Centre	Proposed road development as part of Ringsend to City Centre Core Bus Corridor Scheme	Consented
MAC240028	Dublin City Council	2024	River Liffey, Dublin	Outfall at Sir John Rogerson's Quay as part of the Grand Canal Docks Storm Water Outfall Extension project	Consented
MAC240014 Site Ref: A-C	Dublin City Council	2024	Tom Clarke Bridge, Dublin City	Construction of a pedestrian and cyclist bridge (Point Bridge) to the west of Tom Clarke Bridge, widening of Tom Clarke Bridge, dismantling of existing and construction of a new control room building, dismantling of existing vessel	Consented

Reference	Applicant	Year	Location	Activity	Status
				collision structures and construction of new vessel collision structures to the west of the proposed Point Bridge.	
2022-MAC-006 Site Ref: A-C	Codling Wind Park, c/o Cooney Carey Consulting Limited	2022	Off Wicklow coast	Offshore Windfarm	Consented
MAC240013	Electricity Supply Board (ESB)	2024	North Wall to Poolbeg	Replacement of high voltage underground cables.	Consented
2022-MAC-003 and 004 Site Ref: A - C	Bray Offshore Wind Limited and Kish Offshore Wind Limited	2022	Off Dublin and Wicklow coast	Offshore Windfarm	Consented
MAC20230009	Iarnród Éireann (IÉ)	2025	Merrion Gates to Seapoint Beach	Coastal Protection	Consented
MAC250050 Site Ref: A-D	Dun Laoghaire Rathdown County Council	2026	Dun Laoghaire Harbour	The installation of slipways, a pontoon and the creation of areas of reclaimed land within designated zones.	Consented
MAC20230015	DunLaoghaire Rathdown County Council	2024	DunLaoghaire Harbour	Inflatable Waterpark	Consented
MAC250061-A	Dun Laoghaire Rathdown County Council	2026	Dun Laoghaire Harbour	Extension of the MAC area granted under MAC250061 and the installation of a multi-user pontoon alongside the Old Quay at Dun Laoghaire Rathdown, Co. Dublin.	Consented
MAC250056	Dun Laoghaire Rathdown County Council	2025	Dun Laoghaire Harbour	Regularisation of two existing areas of reclaimed foreshore, currently used as car park.	Consented
MAC250050	Dun Laoghaire Rathdown County Council	2026	Dun Laoghaire Harbour	The installation of slipways, a pontoon and the creation of areas of reclaimed land within designated zones.	Consented
MAC240020	Dun Laoghaire Rathdown County Council; Kish Offshore Wind Limited; Bray Offshore Wind Limited, Dublin	2024	Dun Loghaire Harbour, Dublin	Removal of existing Roll-on Roll off structure and provision of an Operations and Maintenance Facility for Dublin Array Offshore Wind Farm	Consented

Table 20. Maritime Usage Licence (MUL) applications proximate to the proposed survey works within the Irish EEZ

Reference	Applicant	Year	Location	Activity	Status
LIC230018	Microsoft Ireland Operations Ltd	2023	Portmarnock, Dublin	Geophysical survey and site investigations for a proposed subsea fibre optic cable having a landfall in Portmarnock, County Dublin to evaluate options for the route traversing the Irish Sea to Abergele, Wales	Licensed
LIC230001	North Irish Sea Array Windfarm Limited	2023	Off the coasts of counties Dublin, Meath and Louth	Site investigation activities to inform the development of the North Irish Sea Array (NISA) offshore windfarm (OWF) and export cable, off the coasts of counties Dublin, Meath and Louth	Licensed

Reference	Applicant	Year	Location	Activity	Status
MUL240008	MaresConnect Ltd	2024	Portmarnock to Ardgillan, Dublin	The proposed maritime usage involves conducting site investigation surveys to assess various factors, including seabed suitability and stability for routing cables and other electrical infrastructure associated with the interconnector project from the 12 nautical mile (nm) limit to the EEZ	Licensed
MUL250013 Site Ref: A-B	Uisce Eireann	2025	Baldoyle Bay and the Irish Sea	Site investigation to inform detailed engineering design for the Greater Dublin Drainage Project.	Licensed
LIC230016	Microsoft Ireland Operations Ltd	2023	Dublin Port	Geophysical survey and site investigations for a proposed subsea fibre optic cable having a landfall in Dublin Port, County Dublin and to evaluate options for the route traversing Dublin Bay, across the Irish Sea to Anglesey, Wales	Licensed
LIC230007	Dublin City Council	2024	Point Bridge and Tom Clarke	Environmental survey and ground investigation works in order to inform the design of proposed Point Bridge and Tom Clarke Widening Project	Licensed
MUL230034 Site Ref: B	Codling Wind Park Limited (CWPL)	2024	East Coast of Ireland	CWPL intends to undertake survey mobilisations at the proposed Licence Area to inform the location and detailed design of the proposed CWP OWF, export cable route, potential operations and maintenance base, potential land reclamation area at the potential onshore substation location, and additional buffer zones	Licensed
MUL240010	EirGrid PLC	2024	Dublin Bay from Blackrock Park to Shellybanks	Site investigation works to inform the engineering design and environmental assessments of a proposed electrical cable circuit crossing Dublin Bay.	Licensed
MUL230034	Codling Wind Park Limited (CWPL)	2024	East Coast of Ireland	CWPL intends to undertake survey mobilisations at the proposed Licence Area to inform the location and detailed design of the proposed CWP OWF, export cable route, potential operations and maintenance base, potential land reclamation area at the potential onshore substation location, and additional buffer zones	Licensed
MUL250003	Dun Laoghaire Rathdown County Council	2025	Dún Laoghaire Harbour	Schedule 7 (3): Marine environmental surveys for the purposes of site investigation – to undertake a suite of marine site investigation activities to assess the feasibility of potential future dredging within the harbour.	Licensed

Table 21. Developments identified on the EIA Portal – Directive 2014/52/EU proximate to the proposed survey works

Reference	Applicant	Year	Location	Activity	Status
2025125	Portmarnock Real Estate Developments Limited	2025	At lands in the townland of Maynetown, Portmarnock, County Dublin, and partially in the townland of Stapolin, Baldoyle, Co. Dublin.	LRD proposal comprising 296no. residential units, public open space, vehicular access and assoc. works, new temporary rising main of c. 1.7km.	Consented

Table 22. Developments identified on the An Coimisiún Pleanála Portal proximate to the proposed survey works

Reference	Applicant	Year	Location	Activity	Status
312131	Irish Water	2025	Townlands of Clonsagh, Dubber and Newtown, County Fingal and Dublin City	Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility	Grant Perm. w/ Conditions

In relation to **Planning Ref No. F23A/0215**, an NIS was prepared for the development by SLR Consulting Ireland, which concludes the following: *‘Based on the available scientific information and project details, we submit that the competent authority has sufficient information to allow it to determine that the proposed activities and rock armour revetment maintenance and repair works, individually or in combination with other plans or projects, will not have an adverse effect on the integrity of or pose a risk of likely significant effects on Baldoyle Bay SAC or Baldoyle Bay SPA, or any other European (Natura 2000) sites.’*

In relation to EIA **Ref No. 2025125 (Planning Ref No. LRD0058/S3E)**, an NIS was prepared for the development by Brady Shipman Martin, which concludes the following: *‘This report concludes on the best scientific evidence that it can be clearly demonstrated that no elements of the project will result in any impact on the integrity or Qualifying Interests/Special Conservation Interests of any relevant European site, either on their own or in-combination with other plans or projects, in light of their conservation objectives.’*

In relation to The Greater Dublin Drainage Project (**ACP Ref No. 312131**), an NIS was prepared by RPS. The NIS concludes the following: *‘It is therefore concluded, beyond reasonable scientific doubt, that the proposed project with the implementation of the prescribed mitigation measures will not give rise to significant impacts, either individually or in combination with other plans and projects, in a manner which adversely affects the integrity of any designated site within the Natura 2000 network.’*

In addition to the above projects, the following plans and policies were reviewed and considered for possible in-combination effects with the Proposed Development:

- The South Coast Designated Maritime Area Plan for Offshore Renewable Energy (SC-DMAP)
- Project Ireland 2040: National Marine Planning Framework
- Project Ireland 2040: National Planning Framework

6.3 Pathway Identification

The proposed cable survey route is in an area that experiences existing vessel activity (due to proximity to Malahide Marina and Howth Harbour). Given that intertidal elements of the proposed survey works are located within the intertidal of Portmarnock Beach (Velvet Strand), there is a potential hydrological pathway from the research vessel to designated conservation sites located within Malahide Estuary. These conservation sites are located downstream of a number of terrestrial planning applications outlined in Table 17. In the marine offshore subtidal of Malahide Estuary and the Irish Sea, there is a potential hydrological pathway from the research vessel to marine-based conservation sites within the Irish Sea. No Foreshore applications are within the corridor of the proposed survey works. The survey corridor partially overlaps with the approved **MUL240008 & LIC230018**, and is proximate to the approved **MUL250013**.

There are no other projects, identified within the Foreshore Licence applications, EIA portal, ACP or MARA planning records, that have been granted planning or currently under construction, located within the ZOI of the proposed survey works.

6.4 Impact Identification

The potential impacts of the proposed survey works are Temporary (i.e. Effects lasting less than a year) and primarily to occur during the brief survey period (with the presence of boats, machinery and personnel in the vicinity of the works) as sediments redistribute over sampling areas. Impacts on infauna would be deemed to be temporary (i.e. Effects lasting less than a year). No maintenance or decommissioning works are associated with the proposed survey works.

It is noted that there is the remote potential for proposed plans and projects within the offshore subtidal waters off Co. Dublin to have cumulative disturbance impacts on marine mammals and seabirds. However, the core strategy, policies and objectives of relevant Planning Frameworks have been developed to anticipate and avoid the need for developments that would be likely to significantly affect the integrity of any European site. Furthermore, such developments are required to conform to the relevant regulatory provisions and implement mitigation for the prevention of pollution, nuisance or other environmental effects likely to significantly affect the integrity of European sites. In addition, sustainable development is inherent in the objectives of all development plans within Irish waters in addition to compliance within the Habitats and Birds Directives. As a result, there are no projects identified within Fingal County Council, Foreshore Licence applications records, or MARA planning records that have been granted planning permission or are currently under construction, proximate to the proposed survey works, that could potentially cause significant in-combination effects on European sites.

6.5 Prediction

The survey works would not be seen to have a significant impact on the water quality of the area, including affecting the water quality status. Given the scale and the temporal nature of the proposed survey works, no significant cumulative effects with other identified plans or projects are foreseen. Any potential impacts from a pathway that the research vessel may share with projects identified in Tables 12 - 17 are considered to be minimal, and no significant cumulative effects on designated conservation sites are foreseen.

6.6 Assessment

The projects outlined above are either completed or are currently going through planning stages and are not expected to be carried out concurrently, or are not at a scale or location where in-combination effects are foreseen with the proposed project. This report pertains to survey works for the proposed route for a marine fibre optic cable in subtidal and intertidal habitats. As can be seen from the use of the Best Available Techniques and mitigation measures during survey works, considerable effort has gone into minimising the potential environmental impact of the project. *“Generally all mitigation measures applied for individual cables also contribute to reduction of cumulative impacts”* (OSPAR, 2012).

No likely cumulative effects are foreseen from the project in conjunction with other projects.

7. Mitigation Measures & Monitoring

Specific controls will be incorporated into the proposed development project to minimise the potential negative impacts on the ecology within the Zone of Influence (Zol) within / proximate to the subject site are outlined in below.

Route Planning within the Landfall Area.

A strict route selection process was carried out to assess the optimal route and landing site at Portmarnock Beach, taking into account the lowest environmental impact, highest resource efficiency and wave exposure on the basis of sound and comparable data. This included addressing engineering issues as well as environmental concerns and assessing existing infrastructure.

The potential landfall location is located within/proximate to three sites of conservation significance (Malahide Estuary SAC, SPA, & pNHA). The conservation significance of the habitats, fauna and flora within Portmarnock Beach, and these conservation sites were assessed. The proposed survey route was deemed to be the optimal route of satisfying conservation significance based on the assessment of NPWS ratings data, the optimal from an engineering perspective and for the stability and longevity of the cable.

Intertidal Works

As was seen during the fieldwork, the beach on which the intertidal works are proposed to be carried out on is moderately exposed with coarse sand, proximate to public car park areas. Human activity and canine (off-leash) activity was noted on-site. The site is a popular coastal walking site. It would be expected that increased human activity on the beach and the main access to the beach (via the proposed access route) for a single tidal cycle would not significantly impact on bird populations due to the high levels of existing activity on site. However, there is potential to impact on habitats in the absence of mitigation. As a result, mitigation of impacts in the intertidal will concentrate on minimising the following:

Disturbance

The proposed survey routes are within a popular beach with existing high levels of canine and human activity and vehicular access. As a result, the presence of additional personnel/machinery on the shore would not be thought to cause a significant additional disturbance. However, there is potential for physical disturbance of the intertidal habitat, and as a result, the following mitigation measures would be carried out:

1. An ecologist would be on-site during the surveys in order to minimise disturbance and ensure site integrity is maintained. Prior to the commencement of the works (min 1 week's notice), the NPWS will be informed of the proposed works.
2. If access is required, the ecologist will supervise the access across the beach to ensure matting is in place and the machinery does not stray from the existing informal vehicular track.
3. A track will be marked out by the ecologist prior to machinery accessing the beach. This will be marked out prior to access of personnel and machinery to the shore to avoid the qualifying interests of the SAC.
4. Drift lines and vegetation on the shore in close proximity to the proposed route would contain the highest proportion of potential food sources for bird species. If present, these should be avoided by machinery and personnel.
5. The surveys should commence on a receding tide. This is to ensure all operations are done within one tide. Operations must be completed before an incoming tide when many of the birds return to feed. This should result in the site investigations being imperceptible following a single or several tidal cycles.
6. Any temporary access arrangements or structures that are put in place to allow machinery access to the beach area should be prepared in consultation with an ecologist, and the site should be fully reinstated post-works.
7. Roosting birds, if present in the vicinity of the works, will not be disturbed. The ecologist will ensure that roosting birds are not impacted by the works.

Reinstatement

Reinstatement of the terrestrial and intertidal habitat will be carried out to pre-survey conditions. Any concerns in relation to the survey process or resulting reinstatement of the habitat to pre-survey conditions will be raised with NPWS by the project ecologist prior to the removal of personnel from the site.

Subtidal

Mitigation impacts are primarily concerned with the survey, and the following mitigation measures will be enforced.

1. A certified Marine Mammal Observer (MMO) will be onboard the vessel at all times in Irish waters to implement standard NPWS marine mammal mitigation measures. “Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters” (NPWS, 2014) will be applied to ensure noise introduced into the marine environment have minimum effect.
2. Mitigation measures will include the presence of a MMO onboard the vessel. The purpose of the MMO is to ensure that there is no disturbance of seal /cetacean or other Annex IV species e.g. marine turtles, to ensure that project anthropogenic noise is minimised.
3. In line with “Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters” (NPWS, 2014) “Sound-producing activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible” and “in waters up to 200m deep, the MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO”.
4. A project ecologist (separate to the MMO) with sufficient ornithological expertise in the identification of diving seabirds will be onboard. Where the ecologist observes a significant cluster of actively diving birds in the works corridor, within 500 m of the vessel works will be mitigated based on the instruction of the ecologist. This could include slowing vessel speed or pausing works if there is potential for significant effect on birds.
5. Sufficient resources will be made immediately available on the vessel to deal with accidental oil spills, including hydraulic hoses bursting etc. and reported to the on board ecologist.

8. Adverse Effects likely to occur from the project (post-mitigation)

Standard and specific mitigation measures are proposed. These would ensure that the proposed survey works do not adversely affect any of the habitats or fauna inhabiting them throughout the duration of the works. However, early implementation of ecological supervision and consultation with NPWS, prior to the survey works, is seen as an important element of the project.

With the successful implementation of standard and specific mitigation measures to limit impacts on biodiversity, no significant impacts are foreseen from the proposed works on aquatic ecology. Residual impacts of the proposed survey works will be localised to the immediate vicinity of the proposed works.

The mitigation proposed for the development satisfactorily addresses the mitigation of potential impacts on aquatic biodiversity through the application of the standard controls as outlined above. In particular, mitigation measures to ensure compliance with the Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters. It is essential that these measures outlined are complied with, to ensure that the proposed project does not have environmental impacts and impacts on local biodiversity.

Residual effect: Minor Adverse/ localised/short-term/Not significant.

9. Residual Impacts and Conclusion

The mitigation proposed for the Baily Fibre Optic Cable Survey Works satisfactorily addresses the mitigation of potential impacts on the sensitive receptors through the application of standard controls. The overall impact on the ecology of the proposed works will result in a short term / minor adverse / not significant residual effect on the ecology of the area and locality overall.

10. References

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Appendix I-Recorded Species, Associated Designations and Grid References

Species name	Date of last record	Designation
Survey Area - Polygon		
Blue Crab (<i>Callinectes sapidus</i>)	25/09/2023	Invasive Species: High Risk Invasive Species (2013 Report)
Common Porpoise (<i>Phocoena phocoena</i>)	30/06/2022	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention
Common Dolphin (<i>Delphinus delphis</i>)	10/07/2021	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Minke Whale (<i>Balaenoptera acutorostrata</i>)	07/07/2014	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Golden Plover (<i>Pluvialis apricaria</i>)	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Bar-tailed Godwit (<i>Limosa lapponica</i>)	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Common Tern (<i>Sterna hirundo</i>)	10/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Leach's Storm Petrel (<i>Hydrobates leucorhous</i>)	02/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Little Tern (<i>Sternula albifrons</i>)	05/07/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Red-throated Diver (<i>Gavia stellata</i>)	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Roseate Tern (<i>Sterna dougallii</i>)	05/07/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Sandwich Tern (<i>Thalasseus sandvicensis</i>)	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Storm Petrel (<i>Hydrobates pelagicus</i>)	10/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Whooper Swan (<i>Cygnus cygnus</i>)	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Mallard (<i>Anas platyrhynchos</i>)	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

<i>Wigeon (Mareca penelope)</i>	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Snipe (Gallinago gallinago)</i>	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Common Scoter (Melanitta nigra)</i>	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Curlew (Numenius arquata)</i>	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Lapwing (Vanellus vanellus)</i>	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Long-tailed Duck (Clangula hyemalis)</i>	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Red-breasted Merganser (Mergus serrator)</i>	31/12/2001	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Black-headed Gull (Chroicocephalus ridibundus)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Common Gull (Larus canus)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Cormorant (Phalacrocorax carbo)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Fulmar (Fulmarus glacialis)</i>	17/09/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Gannet (Morus bassanus)</i>	30/06/2022	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Great Crested Grebe (Podiceps cristatus)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Great Skua (Stercorarius skua)</i>	01/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Manx Shearwater (Puffinus puffinus)</i>	10/07/2021	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Mute Swan (Cygnus olor)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Ringed Plover (Charadrius hiaticula)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Shelduck (Tadorna tadorna)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Turnstone (Arenaria interpres)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

<i>Black-tailed Godwit (Limosa limosa)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Dunlin (Calidris alpina)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Grey Plover (Pluvialis squatarola)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Knot (Calidris canutus)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Oystercatcher (Haematopus ostralegus)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Puffin (Fratercula arctica)</i>	05/07/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Razorbill (Alca torda)</i>	10/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Redshank (Tringa totanus)</i>	31/12/2001	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Common Guillemot (Uria aalge)</i>	28/08/2023	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Kittiwake (Rissa tridactyla)</i>	30/06/2022	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Basking Shark (Cetorhinus maximus)</i>	06/10/2008	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Endangered
<i>Herring Gull (Larus argentatus)</i>	25/02/2016	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Lesser Black-backed Gull (Larus fuscus)</i>	19/01/2017	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Blonde Ray (Raja brachyura)</i>	17/03/2012	Threatened Species: Near threatened
<i>Spotted Ray (Raja montagui)</i>	17/03/2012	Threatened Species: OSPAR Convention
<i>Spurdog (Squalus acanthias)</i>	17/03/2012	Threatened Species: OSPAR Convention Threatened Species: Endangered
024		
<i>New Zealand Flatworm (Arthurdendyus triangulatus)</i>	29/04/2018	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: High Risk Invasive Species (2013 Report)
<i>Himalayan Balsam (Impatiens glandulifera)</i>	11/07/2018	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Detailed Risk Assessment Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: Detailed Risk Assessment >> High Risk
<i>Ruddy Duck (Oxyura jamaicensis)</i>	02/01/2011	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland)
<i>Giant Hogweed (Heracleum mantegazzianum)</i>	28/05/2019	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland)
<i>Grey Squirrel (Sciurus carolinensis)</i>	05/12/2022	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland)
<i>Japanese Knotweed (Fallopia japonica)</i>	06/07/2025	Invasive Species: EU Invasive Alien Species Regulation No. 1143/2014 Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985
<i>Ring-necked Parakeet (Psittacula krameri)</i>	12/06/2022	Invasive Species: High Risk Invasive Species (2013 Report)

Blue Crab (<i>Callinectes sapidus</i>)	22/10/2023	Invasive Species: High Risk Invasive Species (2013 Report)
Cherry Laurel (<i>Prunus laurocerasus</i>)	30/05/2016	Invasive Species: High Risk Invasive Species (2013 Report)
Pacific Oyster (<i>Magallana gigas</i>)	08/01/2022	Invasive Species: High Risk Invasive Species (2013 Report)
Brown Rat (<i>Rattus norvegicus</i>)	21/05/2010	Invasive Species: High Risk Invasive Species (2013 Report)
Austrominius modestus	10/08/2023	Invasive Species: Medium Risk Invasive Species (2013 Report)
Black Currant (<i>Ribes nigrum</i>)	22/05/2010	Invasive Species: Medium Risk Invasive Species (2013 Report)
Butterfly-bush (<i>Buddleja davidii</i>)	21/04/2020	Invasive Species: Medium Risk Invasive Species (2013 Report)
Canadian Fleabane (<i>Conyza canadensis</i>)	23/08/2017	Invasive Species: Medium Risk Invasive Species (2013 Report)
Common Broomrape (<i>Orobanche minor</i>)	22/06/2022	Invasive Species: Medium Risk Invasive Species (2013 Report)
Evergreen Oak (<i>Quercus ilex</i>)	22/05/2010	Invasive Species: Medium Risk Invasive Species (2013 Report)
Field Penny-cress (<i>Thlaspi arvense</i>)	22/06/2020	Invasive Species: Medium Risk Invasive Species (2013 Report)
Himalayan Honeysuckle (<i>Leycesteria formosa</i>)	13/07/2022	Invasive Species: Medium Risk Invasive Species (2013 Report)
Japanese Rose (<i>Rosa rugosa</i>)	06/08/2023	Invasive Species: Medium Risk Invasive Species (2013 Report)
Red Oak (<i>Quercus rubra</i>)	22/05/2010	Invasive Species: Medium Risk Invasive Species (2013 Report)
Sycamore (<i>Acer pseudoplatanus</i>)	21/04/2020	Invasive Species: Medium Risk Invasive Species (2013 Report)
Traveller's-joy (<i>Clematis vitalba</i>)	04/08/2020	Invasive Species: Medium Risk Invasive Species (2013 Report)
Turkey Oak (<i>Quercus cerris</i>)	20/08/2020	Invasive Species: Medium Risk Invasive Species (2013 Report)
Wall Cotoneaster (<i>Cotoneaster horizontalis</i>)	23/08/2017	Invasive Species: Medium Risk Invasive Species (2013 Report)
Budapest Keeled Slug (<i>Tandonia budapestensis</i>)	22/05/2010	Invasive Species: Medium Risk Invasive Species (2013 Report)
Common Garden Snail (<i>Cornu aspersum</i>)	05/05/2002	Invasive Species: Medium Risk Invasive Species (2013 Report)
Jenkins' Spire Snail (<i>Potamopyrgus antipodarum</i>)	31/10/2017	Invasive Species: Medium Risk Invasive Species (2013 Report)
Rabbit (<i>Oryctolagus cuniculus</i>)	05/08/2018	Invasive Species: Medium Risk Invasive Species (2013 Report)
Japanese Honeysuckle (<i>Lonicera japonica</i>)	04/08/2020	Invasive Species: Medium Risk Invasive Species (2013 Report) Invasive Species: The Wildlife (Northern Ireland) Order 1985
Rhododendron ponticum	22/05/2010	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Detailed Risk Assessment Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: Detailed Risk Assessment >> High Risk
Three-cornered Garlic (<i>Allium triquetrum</i>)	05/04/2024	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Detailed Risk Assessment Invasive Species: Medium Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: Detailed Risk Assessment >> Moderate Risk
Sea-buckthorn (<i>Hippophae rhamnoides</i>)	25/06/2022	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Detailed Risk Assessment Invasive Species: Medium Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985 Invasive Species: Detailed Risk Assessment >> Moderate Risk
Harlequin Ladybird (<i>Harmonia axyridis</i>)	14/10/2025	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland)
Wireweed (<i>Sargassum muticum</i>)	23/05/2026	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985
Common Cord-grass (<i>Spartina anglica</i>)	20/08/2020	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985

<i>Didemnum vexillum</i>	05/07/2006	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985
Canada Goose (<i>Branta canadensis</i>)	10/04/2024	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985 Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species
Canadian Waterweed (<i>Elodea canadensis</i>)	31/12/1999	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: High Risk Invasive Species (2013 Report) Invasive Species: The Wildlife (Northern Ireland) Order 1985
Spanish Bluebell (<i>Hyacinthoides hispanica</i>)	22/05/2010	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985
Townsend's Cord-grass (<i>Spartina maritima</i> x <i>alterniflora</i> = <i>S. x townsendii</i>)	19/06/2012	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Regulation S.I. 374/2024 (Ireland) Invasive Species: The Wildlife (Northern Ireland) Order 1985
Greylag Goose (<i>Anser anser</i>)	30/09/2024	Invasive Species: Regulation S.I. 477/2011 (Ireland) Invasive Species: Regulation S.I. 374/2024 (Ireland) Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Barnacle Goose (<i>Branta leucopsis</i>)	23/11/2024	Invasive Species: The Wildlife (Northern Ireland) Order 1985 Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bottle-nosed Dolphin (<i>Tursiops truncatus</i>)	08/09/2018	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Otter (<i>Lutra lutra</i>)	10/12/2022	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Common Porpoise (<i>Phocoena phocoena</i>)	25/11/2023	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention
Grey Seal (<i>Halichoerus grypus</i>)	25/06/2024	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Harbour Seal (<i>Phoca vitulina</i>)	21/06/2016	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Petalwort (<i>Petalophyllum ralfsii</i>)	31/12/1904	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: Flora Protection Order (FPO) Protected Species: Flora Protection Order (FPO) >> FPO 2022 Schedule C (Liverworts)
Common Dolphin (<i>Delphinus delphis</i>)	03/09/2023	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Humpback Whale (<i>Megaptera novaeangliae</i>)	15/07/2010	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Northern Bottlenose Whale (<i>Hyperoodon ampullatus</i>)	27/09/1954	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Striped Dolphin (<i>Stenella coeruleoalba</i>)	29/01/2001	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Brown Long-eared Bat (<i>Plecotus auritus</i>)	06/05/2017	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Common Pipistrelle (<i>Pipistrellus pipistrellus sensu stricto</i>)	03/06/2021	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Leisler's Bat (<i>Nyctalus leisleri</i>)	03/06/2021	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>)	17/06/2017	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	03/06/2021	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts

Leatherback Turtle (<i>Dermochelys coriacea</i>)	24/01/2026	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention
Common Frog (<i>Rana temporaria</i>)	10/08/2020	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Mountain Hare (<i>Lepus timidus</i>)	21/05/2010	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Pine Marten (<i>Martes martes</i>)	05/07/2021	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Meadow Barley (<i>Hordeum secalinum</i>)	31/12/1991	Protected Species: Flora Protection Order (FPO) Protected Species: Flora Protection Order (FPO) >> FPO 2022 Schedule A (Vascular Plants) Threatened Species: Vulnerable
Warne's Thread-moss (<i>Bryum warneum</i>)	31/12/1910	Protected Species: Flora Protection Order (FPO) Protected Species: Flora Protection Order (FPO) >> FPO 2022 Schedule B (Mosses) Threatened Species: Critically Endangered
Ceruous Thread-moss (<i>Bryum uliginosum</i>)	31/12/1860	Protected Species: Flora Protection Order (FPO) Protected Species: Flora Protection Order (FPO) >> FPO 2022 Schedule B (Mosses) Threatened Species: Endangered
Many-seasoned Thread-moss (<i>Bryum intermedium</i>)	31/12/1860	Protected Species: Flora Protection Order (FPO) Protected Species: Flora Protection Order (FPO) >> FPO 2022 Schedule B (Mosses) Threatened Species: Endangered
Smooth Newt (<i>Lissotriton vulgaris</i>)	17/03/2012	Protected Species: Wildlife Acts
Great Spotted Woodpecker (<i>Dendrocopos major</i>)	09/05/2025	Protected Species: Wildlife Acts
Lesser Whitethroat (<i>Curruca curruca</i>)	08/01/2022	Protected Species: Wildlife Acts
Little Grebe (<i>Tachybaptus ruficollis</i>)	27/12/2024	Protected Species: Wildlife Acts
Mistle Thrush (<i>Turdus viscivorus</i>)	26/12/2024	Protected Species: Wildlife Acts
Reed Warbler (<i>Acrocephalus scirpaceus</i>)	08/05/2024	Protected Species: Wildlife Acts
Robin (<i>Erithacus rubecula</i>)	26/12/2024	Protected Species: Wildlife Acts
Sparrowhawk (<i>Accipiter nisus</i>)	01/08/2025	Protected Species: Wildlife Acts
Stonechat (<i>Saxicola rubicola</i>)	25/11/2024	Protected Species: Wildlife Acts
Common Lizard (<i>Zootoca vivipara</i>)	01/07/2018	Protected Species: Wildlife Acts
Badger (<i>Meles meles</i>)	09/08/2015	Protected Species: Wildlife Acts
Hedgehog (<i>Erinaceus europaeus</i>)	14/07/2025	Protected Species: Wildlife Acts
Pygmy Shrew (<i>Sorex minutus</i>)	18/07/2013	Protected Species: Wildlife Acts
Little Egret (<i>Egretta garzetta</i>)	28/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species
Peregrine (<i>Falco peregrinus</i>)	26/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species
Golden Plover (<i>Pluvialis apricaria</i>)	26/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Arctic Tern (<i>Sterna paradisaea</i>)	05/07/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Bar-tailed Godwit (<i>Limosa lapponica</i>)	27/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Black-throated Diver (<i>Gavia arctica</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Common Tern (<i>Sterna hirundo</i>)	13/08/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Corncrake (<i>Crex crex</i>)	31/07/1972	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Curlew Sandpiper (<i>Calidris ferruginea</i>)	13/10/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Great Northern Diver (<i>Gavia immer</i>)	26/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kingfisher (<i>Alcedo atthis</i>)	26/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Little Gull (<i>Hydrocoloeus minutus</i>)	17/04/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Little Tern (<i>Sternula albifrons</i>)	29/07/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Mediterranean Gull (<i>Ichthyaeetus melanocephalus</i>)	24/07/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Merlin (<i>Falco columbarius</i>)	06/07/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Red Kite (<i>Milvus milvus</i>)	11/07/2020	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Red-necked Phalarope (<i>Phalaropus lobatus</i>)	23/06/2019	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Red-throated Diver (<i>Gavia stellata</i>)	10/10/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Roseate Tern (<i>Sterna dougallii</i>)	25/06/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Ruff (<i>Calidris pugnax</i>)	29/10/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Sandwich Tern (<i>Thalasseus sandvicensis</i>)	14/09/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Short-eared Owl (<i>Asio flammeus</i>)	25/06/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Slavonian Grebe (<i>Podiceps auritus</i>)	14/01/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of

		Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Smew (<i>Mergellus albellus</i>)	02/11/1992	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Storm Petrel (<i>Hydrobates pelagicus</i>)	20/07/2008	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Whooper Swan (<i>Cygnus cygnus</i>)	20/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Wood Sandpiper (<i>Tringa glareola</i>)	30/08/2023	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Rock Dove (<i>Columba livia</i>)	27/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species
Pheasant (<i>Phasianus colchicus</i>)	08/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
Grey Partridge (<i>Perdix perdix</i>)	31/07/1972	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Mallard (<i>Anas platyrhynchos</i>)	28/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Coot (<i>Fulica atra</i>)	26/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Pintail (<i>Anas acuta</i>)	14/01/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Pochard (<i>Aythya ferina</i>)	14/05/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Teal (<i>Anas crecca</i>)	28/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Tufted Duck (<i>Aythya fuligula</i>)	22/10/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Wigeon (<i>Mareca penelope</i>)	26/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Jack Snipe (<i>Lymnocryptes minimus</i>)	16/04/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species

<i>Shoveler (Spatula clypeata)</i>	26/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Snipe (Gallinago gallinago)</i>	27/01/2025	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Woodcock (Scolopax rusticola)</i>	16/12/2022	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Gadwall (Mareca strepera)</i>	16/09/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Garganey (Spatula querquedula)</i>	21/05/2023	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Pink-footed Goose (Anser brachyrhynchus)</i>	07/10/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species
<i>Eider (Somateria mollissima)</i>	15/08/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>White-fronted Goose (Anser albifrons)</i>	20/10/2007	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species
<i>Common Scoter (Melanitta nigra)</i>	12/09/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Scaup (Aythya marila)</i>	21/09/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Curlew (Numenius arquata)</i>	26/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Goldeneye (Bucephala clangula)</i>	27/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Goosander (Mergus merganser)</i>	02/10/2006	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Lapwing (Vanellus vanellus)</i>	28/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Long-tailed Duck (Clangula hyemalis)</i>	26/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Red-breasted Merganser (Mergus serrator)</i>	27/12/2024	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Velvet Scoter (<i>Melanitta fusca</i>)	08/10/2006	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Black Guillemot (<i>Cepphus grylle</i>)	06/08/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Black Tern (<i>Chlidonias niger</i>)	09/09/1979	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	28/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Brambling (<i>Fringilla montifringilla</i>)	19/03/2022	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Common Gull (<i>Larus canus</i>)	28/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Common Sandpiper (<i>Actitis hypoleucos</i>)	12/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Cormorant (<i>Phalacrocorax carbo</i>)	27/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Fulmar (<i>Fulmarus glacialis</i>)	30/07/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Gannet (<i>Morus bassanus</i>)	25/09/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Goldcrest (<i>Regulus regulus</i>)	12/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Great Crested Grebe (<i>Podiceps cristatus</i>)	27/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Greenfinch (<i>Chloris chloris</i>)	26/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
House Martin (<i>Delichon urbicum</i>)	23/09/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Light-bellied Brent Goose (<i>Branta bernicla hrota</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Linnet (<i>Linaria cannabina</i>)	26/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Little Ringed Plover (<i>Charadrius dubius</i>)	23/04/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Manx Shearwater (<i>Puffinus puffinus</i>)	27/06/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Mute Swan (<i>Cygnus olor</i>)	28/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Ringed Plover (<i>Charadrius hiaticula</i>)	26/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Sand Martin (<i>Riparia riparia</i>)	16/09/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Shag (<i>Gulosus aristotelis</i>)	26/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

<i>Shelduck (Tadorna tadorna)</i>	27/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Skylark (Alauda arvensis)</i>	25/11/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Spotted Flycatcher (Muscicapa striata)</i>	30/06/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Spotted Redshank (Tringa erythropus)</i>	17/05/2023	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Swallow (Hirundo rustica)</i>	07/10/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Tree Sparrow (Passer montanus)</i>	23/09/2021	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Turnstone (Arenaria interpres)</i>	28/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Wheatear (Oenanthe oenanthe)</i>	07/10/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Willow Warbler (Phylloscopus trochilus)</i>	30/07/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Yellow Wagtail (Motacilla flava)</i>	06/08/1993	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Barn Owl (Tyto alba)</i>	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Black-necked Grebe (Podiceps nigricollis)</i>	23/01/2018	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Black-tailed Godwit (Limosa limosa)</i>	28/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Dunlin (Calidris alpina)</i>	27/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Grey Plover (Pluvialis squatarola)</i>	26/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Grey Wagtail (Motacilla cinerea)</i>	28/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Kestrel (Falco tinnunculus)</i>	21/01/2025	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Knot (Calidris canutus)</i>	27/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Meadow Pipit (Anthus pratensis)</i>	12/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Oystercatcher (Haematopus ostralegus)</i>	28/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Puffin (Fratercula arctica)</i>	21/07/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Purple Sandpiper (Calidris maritima)</i>	08/10/2022	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List

Razorbill (<i>Alca torda</i>)	07/05/2025	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Redshank (<i>Tringa totanus</i>)	28/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Redwing (<i>Turdus iliacus</i>)	06/11/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Stock Dove (<i>Columba oenas</i>)	26/12/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Swift (<i>Apus apus</i>)	30/06/2025	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Whinchat (<i>Saxicola rubetra</i>)	07/08/1987	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Yellowhammer (<i>Emberiza citrinella</i>)	15/07/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Common Guillemot (<i>Uria aalge</i>)	24/09/2025	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kittiwake (<i>Rissa tridactyla</i>)	09/09/2024	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Herring Gull (<i>Larus argentatus</i>)	28/12/2024	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
House Sparrow (<i>Passer domesticus</i>)	13/05/2025	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Lesser Black-backed Gull (<i>Larus fuscus</i>)	23/10/2024	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Starling (<i>Sturnus vulgaris</i>)	26/12/2024	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Trimmer's Mining Bee (<i>Andrena trimmerana</i>)	07/05/2003	Threatened Species: Critically Endangered
Agabus conspersus	31/12/1929	Threatened Species: Endangered
Small Blue (<i>Cupido minimus</i>)	02/06/2021	Threatened Species: Endangered
Wall (<i>Lasiommata megera</i>)	13/08/2021	Threatened Species: Endangered
Barbut's Cuckoo Bee (<i>Bombus barbutellus</i>)	30/07/1941	Threatened Species: Endangered
Gooden's Nomad Bee (<i>Nomada goodeniana</i>)	25/04/2022	Threatened Species: Endangered
Great Yellow Bumblebee (<i>Bombus distinguendus</i>)	20/05/1921	Threatened Species: Endangered
Moss Chrysalis Snail (<i>Pupilla (Pupilla) muscorum</i>)	05/05/2002	Threatened Species: Endangered
Abietinella abietina var. abietina	31/12/1912	Threatened Species: Endangered
Black Horehound (<i>Ballota nigra</i>)	22/06/2020	Threatened Species: Near threatened
Bugloss (<i>Anchusa arvensis</i>)	22/06/2020	Threatened Species: Near threatened
Corn Marigold (<i>Glebionis segetum</i>)	06/06/2017	Threatened Species: Near threatened
Hound's-tongue (<i>Cynoglossum officinale</i>)	04/08/2020	Threatened Species: Near threatened
Milk Thistle (<i>Silybum marianum</i>)	07/05/2019	Threatened Species: Near threatened
Pale Flax (<i>Linum bienne</i>)	07/05/2019	Threatened Species: Near threatened
Slender Thistle (<i>Carduus tenuiflorus</i>)	03/06/2018	Threatened Species: Near threatened

Upright Brome (<i>Bromopsis erecta</i>)	19/06/2012	Threatened Species: Near threatened
Gyrinus natator	22/05/2010	Threatened Species: Near threatened
Ochthebius auriculatus	03/09/1902	Threatened Species: Near threatened
Ochthebius marinus	24/07/1927	Threatened Species: Near threatened
Gatekeeper (<i>Pyronia tithonus</i>)	31/12/1976	Threatened Species: Near threatened
Grayling (<i>Hipparchia semele</i>)	27/08/2021	Threatened Species: Near threatened
Small Heath (<i>Coenonympha pamphilus</i>)	14/06/2023	Threatened Species: Near threatened
Bare-saddled Colletes (<i>Colletes similis</i>)	08/08/1997	Threatened Species: Near threatened
Bronze Furrow Bee (<i>Halictus tumulorum</i>)	22/05/1921	Threatened Species: Near threatened
Gold-Fringed Mason Bee (<i>Osmia aurulenta</i>)	14/05/1994	Threatened Species: Near threatened
Gypsy Cuckoo Bee (<i>Bombus bohemicus</i>)	01/05/1921	Threatened Species: Near threatened
Moss Carder Bee (<i>Bombus muscorum</i>)	09/08/2022	Threatened Species: Near threatened
Painted Mining Bee (<i>Andrena fucata</i>)	20/06/1977	Threatened Species: Near threatened
Panzer's Nomad Bee (<i>Nomada panzeri sensu lato</i>)	22/05/1921	Threatened Species: Near threatened
Red-tailed Bumblebee (<i>Bombus lapidarius</i>)	31/07/2025	Threatened Species: Near threatened
Sandpit Mining Bee (<i>Andrena barbilabris</i>)	20/06/1977	Threatened Species: Near threatened
Willughby's Leafcutter Bee (<i>Megachile willughbiella</i>)	05/07/1977	Threatened Species: Near threatened
Dog's Tooth (<i>Lacanobia suasa</i>)	31/12/1893	Threatened Species: Near threatened
Mouse Moth (<i>Amphipyra tragopoginis</i>)	15/08/2006	Threatened Species: Near threatened
Reddish Light Arches (<i>Apamea subulstris</i>)	24/06/2006	Threatened Species: Near threatened
Sandy Carpet (<i>Perizoma flavofasciata</i>)	18/06/1983	Threatened Species: Near threatened
Yellow Shell (<i>Camptogramma bilineata</i>)	01/08/2014	Threatened Species: Near threatened
Common Whorl Snail (<i>Vertigo (Vertigo) pygmaea</i>)	31/12/1919	Threatened Species: Near threatened
Fine-leaved Marsh Feather-moss (<i>Kandaea elodes</i>)	31/12/1852	Threatened Species: Near threatened
Megapolitan Feather- moss (<i>Rhynchostegium megapolitanum</i>)	27/01/2021	Threatened Species: Near threatened
Side-fruited Crisp-moss (<i>Tortella squarrosa</i>)	26/05/2006	Threatened Species: Near threatened
Spotted Ray (<i>Raja montagui</i>)	09/06/2012	Threatened Species: OSPAR Convention
Common Oyster (<i>Ostrea edulis</i>)	23/05/2026	Threatened Species: OSPAR Convention
Icelandic Cyprine (<i>Arctica islandica</i>)	23/05/2026	Threatened Species: OSPAR Convention
European Eel (<i>Anguilla anguilla</i>)	22/05/2010	Threatened Species: OSPAR Convention Threatened Species: Critically Endangered
Rigid Aloe-moss (<i>Aloina rigida</i>)	31/12/1879	Threatened Species: Regionally Extinct

Cuckoo Ray (<i>Leucoraja naevus</i>)	27/02/2013	Threatened Species: Vulnerable
Irish Whitebeam (<i>Sorbus hibernica</i>)	31/12/1929	Threatened Species: Vulnerable
Prickly Poppy (<i>Papaver argemone</i>)	03/06/2018	Threatened Species: Vulnerable
Prostrate Broom (<i>Cytisus scoparius</i> subsp. <i>maritimus</i>)	31/12/1929	Threatened Species: Vulnerable
Helophorus fulgidicollis	31/05/1895	Threatened Species: Vulnerable
Dark Green Fritillary (<i>Speyeria aglaja</i>)	22/07/2019	Threatened Species: Vulnerable
Buffish Mining Bee (<i>Andrena nigroaenea</i>)	13/04/2023	Threatened Species: Vulnerable
Field Cuckoo Bee (<i>Bombus campestris</i>)	30/07/1926	Threatened Species: Vulnerable
Red-shanked Carder Bee (<i>Bombus rudarius</i>)	20/05/1921	Threatened Species: Vulnerable
Shiny-margined Mini-miner (<i>Andrena semilaevis</i>)	22/05/1921	Threatened Species: Vulnerable
Tufted Furrow Bee (<i>Lasioglossum nitidiusculum</i>)	08/08/1997	Threatened Species: Vulnerable
Narrow-bordered Five-spot Burnet (<i>Zygaena lonicerae</i>)	13/06/2023	Threatened Species: Vulnerable
Blind Snail (<i>Cecilioides</i> (<i>Cecilioides</i>) <i>acicula</i>)	31/12/1919	Threatened Species: Vulnerable
English Chrysalis Snail (<i>Leiostyla</i> (<i>Leiostyla</i>) <i>anglica</i>)	31/12/1919	Threatened Species: Vulnerable
Heath Snail (<i>Helicella itala</i>)	31/12/1940	Threatened Species: Vulnerable
Tree Snail (<i>Balea</i> (<i>Balea</i>) <i>perversa</i>)	22/05/2010	Threatened Species: Vulnerable
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Bottle-nosed Dolphin (<i>Tursiops truncatus</i>)	29/04/2023	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Common Porpoise (<i>Phocoena phocoena</i>)	08/10/2023	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention
Grey Seal (<i>Halichoerus grypus</i>)	18/01/2024	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Harbour Seal (<i>Phoca vitulina</i>)	20/08/2003	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Common Dolphin (<i>Delphinus delphis</i>)	16/08/2023	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Killer Whale (<i>Orcinus orca</i>)	09/04/2011	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Robin (<i>Erithacus rubecula</i>)	31/12/2011	Protected Species: Wildlife Acts
Sooty Shearwater (<i>Ardeanna grisea</i>)	16/08/1987	Protected Species: Wildlife Acts
Arctic Tern (<i>Sterna paradisaea</i>)	16/08/1987	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Little Gull (<i>Hydrocoloeus minutus</i>)	19/01/2017	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Little Tern (<i>Sternula albifrons</i>)	05/07/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of

		Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Red-throated Diver (<i>Gavia stellata</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Roseate Tern (<i>Sterna dougallii</i>)	05/07/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Rock Dove (<i>Columba livia</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species
Pheasant (<i>Phasianus colchicus</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section I Bird Species Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
Common Scoter (<i>Melanitta nigra</i>)	19/01/2017	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Curlew (<i>Numenius arquata</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Red-breasted Merganser (<i>Mergus serrator</i>)	31/12/2011	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Black Guillemot (<i>Cepphus grylle</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	19/01/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Common Gull (<i>Larus canus</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Cormorant (<i>Phalacrocorax carbo</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Fulmar (<i>Fulmarus glacialis</i>)	07/06/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Gannet (<i>Morus bassanus</i>)	07/06/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Manx Shearwater (<i>Puffinus puffinus</i>)	07/06/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Shag (<i>Gulosus aristotelis</i>)	07/06/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Shelduck (<i>Tadorna tadorna</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kestrel (<i>Falco tinnunculus</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Meadow Pipit (<i>Anthus pratensis</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Oystercatcher (<i>Haematopus ostralegus</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Puffin (<i>Fratercula arctica</i>)	07/06/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List

Razorbill (<i>Alca torda</i>)	07/06/2024	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Redshank (<i>Tringa totanus</i>)	31/12/2011	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Common Guillemot (<i>Uria aalge</i>)	07/06/2024	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kittiwake (<i>Rissa tridactyla</i>)	07/06/2024	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Herring Gull (<i>Larus argentatus</i>)	31/12/2011	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Lesser Black-backed Gull (<i>Larus fuscus</i>)	19/09/2016	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Blonde Ray (<i>Raja brachyura</i>)	04/10/1997	Threatened Species: Near threatened
Spotted Ray (<i>Raja montagui</i>)	04/10/1997	Threatened Species: OSPAR Convention
Cuckoo Ray (<i>Leucoraja naevus</i>)	27/09/2013	Threatened Species: Vulnerable
Bottle-nosed Dolphin (<i>Tursiops truncatus</i>)	29/04/2023	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
O44		
Common Porpoise (<i>Phocoena phocoena</i>)	22/05/2016	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention
Minke Whale (<i>Balaenoptera acutorostrata</i>)	24/06/2022	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Arctic Tern (<i>Sterna paradisaea</i>)	05/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Common Tern (<i>Sterna hirundo</i>)	10/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Little Tern (<i>Sternula albifrons</i>)	05/07/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Roseate Tern (<i>Sterna dougallii</i>)	05/07/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Storm Petrel (<i>Hydrobates pelagicus</i>)	05/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Black-headed Gull (<i>Chroicocephalus ridibundus</i>)	19/01/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Fulmar (<i>Fulmarus glacialis</i>)	29/11/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Gannet (<i>Morus bassanus</i>)	19/01/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Manx Shearwater (<i>Puffinus puffinus</i>)	17/09/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Razorbill (<i>Alca torda</i>)	10/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List

Common Guillemot (<i>Uria aalge</i>)	08/06/2001	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kittiwake (<i>Rissa tridactyla</i>)	19/01/2017	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Herring Gull (<i>Larus argentatus</i>)	22/05/2016	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Lesser Black-backed Gull (<i>Larus fuscus</i>)	05/08/1998	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Spotted Ray (<i>Raja montagui</i>)	13/04/2014	Threatened Species: OSPAR Convention
Cuckoo Ray (<i>Leucoraja naevus</i>)	13/04/2014	Threatened Species: Vulnerable
045		
Common Porpoise (<i>Phocoena phocoena</i>)	29/11/2016	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention
Minke Whale (<i>Balaenoptera acutorostrata</i>)	25/07/2010	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Leatherback Turtle (<i>Dermochelys coriacea</i>)	31/07/1976	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention
Arctic Tern (<i>Sterna paradisaea</i>)	05/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Common Tern (<i>Sterna hirundo</i>)	01/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Roseate Tern (<i>Sterna dougallii</i>)	05/07/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Fulmar (<i>Fulmarus glacialis</i>)	19/01/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Gannet (<i>Morus bassanus</i>)	19/01/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Great Skua (<i>Stercorarius skua</i>)	16/09/1987	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Manx Shearwater (<i>Puffinus puffinus</i>)	17/09/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Puffin (<i>Fratercula arctica</i>)	05/07/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Razorbill (<i>Alca torda</i>)	10/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Common Guillemot (<i>Uria aalge</i>)	10/08/1998	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kittiwake (<i>Rissa tridactyla</i>)	19/01/2017	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Basking Shark (<i>Cetorhinus maximus</i>)	06/10/2008	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Endangered
Herring Gull (<i>Larus argentatus</i>)	25/02/2016	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Lesser Black-backed Gull (<i>Larus fuscus</i>)	19/01/2017	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Spotted Ray (<i>Raja montagui</i>)	13/04/2014	Threatened Species: OSPAR Convention

Cuckoo Ray (<i>Leucoraja naevus</i>)	19/03/2013	Threatened Species: Vulnerable
O55		
Common Porpoise (<i>Phocoena phocoena</i>)	31/08/2017	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention
Common Dolphin (<i>Delphinus delphis</i>)	31/08/2017	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Killer Whale (<i>Orcinus orca</i>)	19/02/2013	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Leatherback Turtle (<i>Dermochelys coriacea</i>)	31/08/1984	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention
Common Tern (<i>Sterna hirundo</i>)	10/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Roseate Tern (<i>Sterna dougallii</i>)	05/07/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Storm Petrel (<i>Hydrobates pelagicus</i>)	10/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Fulmar (<i>Fulmarus glacialis</i>)	19/01/2017	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Gannet (<i>Morus bassanus</i>)	29/11/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Great Skua (<i>Stercorarius skua</i>)	27/09/1999	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Manx Shearwater (<i>Puffinus puffinus</i>)	17/09/2016	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Shag (<i>Gulosus aristotelis</i>)	20/03/1996	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Razorbill (<i>Alca torda</i>)	27/09/1999	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Common Guillemot (<i>Uria aalge</i>)	28/08/2023	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kittiwake (<i>Rissa tridactyla</i>)	05/07/2016	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Basking Shark (<i>Cetorhinus maximus</i>)	22/05/2016	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Endangered
Herring Gull (<i>Larus argentatus</i>)	29/11/2016	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Blonde Ray (<i>Raja brachyura</i>)	17/03/2010	Threatened Species: Near threatened
Spotted Ray (<i>Raja montagui</i>)	13/04/2014	Threatened Species: OSPAR Convention
Spurdog (<i>Squalus acanthias</i>)	19/03/2013	Threatened Species: OSPAR Convention Threatened Species: Endangered
Cuckoo Ray (<i>Leucoraja naevus</i>)	05/03/2011	Threatened Species: Vulnerable
O65		
Bottle-nosed Dolphin (<i>Tursiops truncatus</i>)	30/06/2022	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Common Porpoise (<i>Phocoena phocoena</i>)	30/06/2022	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention

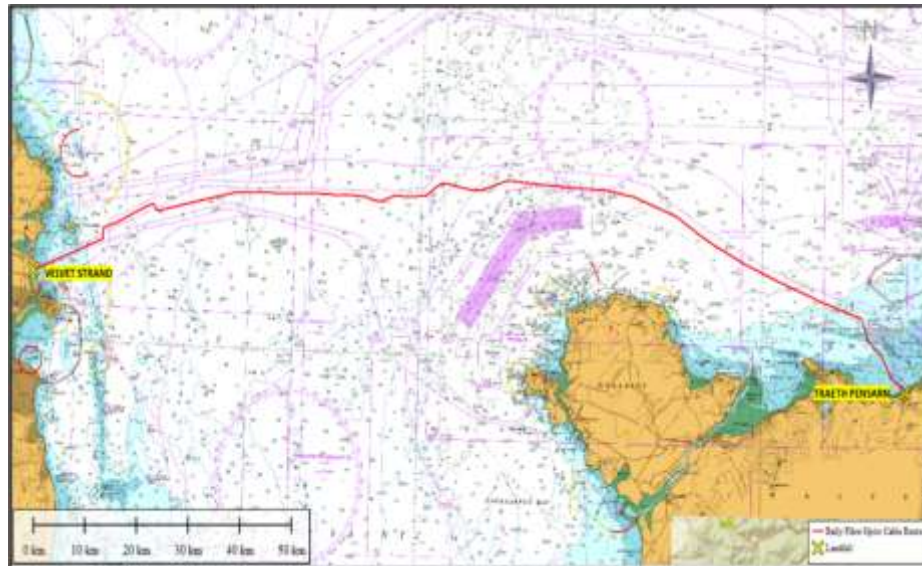
Grey Seal (<i>Halichoerus grypus</i>)	10/08/1998	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex V Protected Species: Wildlife Acts
Common Dolphin (<i>Delphinus delphis</i>)	10/07/2021	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Minke Whale (<i>Balaenoptera acutorostrata</i>)	06/06/2016	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
Sooty Shearwater (<i>Ardenna grisea</i>)	17/10/1995	Protected Species: Wildlife Acts
Arctic Tern (<i>Sterna paradisaea</i>)	10/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Common Tern (<i>Sterna hirundo</i>)	10/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Leach's Storm Petrel (<i>Hydrobates leucorhous</i>)	02/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Sandwich Tern (<i>Thalasseus sandvicensis</i>)	05/07/2016	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Storm Petrel (<i>Hydrobates pelagicus</i>)	10/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Common Scoter (<i>Melanitta nigra</i>)	10/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex II, Section II Bird Species Protected Species: EU Birds Directive >> Annex III, Section III Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Fulmar (<i>Fulmarus glacialis</i>)	15/11/2022	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Gannet (<i>Morus bassanus</i>)	30/06/2022	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Manx Shearwater (<i>Puffinus puffinus</i>)	30/06/2022	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Puffin (<i>Fratercula arctica</i>)	10/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Razorbill (<i>Alca torda</i>)	10/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Common Guillemot (<i>Uria aalge</i>)	10/08/1998	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kittiwake (<i>Rissa tridactyla</i>)	15/11/2022	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Herring Gull (<i>Larus argentatus</i>)	10/08/1998	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Lesser Black-backed Gull (<i>Larus fuscus</i>)	10/08/1998	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Blonde Ray (<i>Raja brachyura</i>)	13/03/2008	Threatened Species: Near threatened
Spotted Ray (<i>Raja montagui</i>)	13/03/2008	Threatened Species: OSPAR Convention
Cuckoo Ray (<i>Leucoraja naevus</i>)	13/03/2008	Threatened Species: Vulnerable

<i>Bottle-nosed Dolphin (Tursiops truncatus)</i>	30/06/2022	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
<i>Common Porpoise (Phocoena phocoena)</i>	10/08/1998	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention
<i>Minke Whale (Balaenoptera acutorostrata)</i>	09/07/2015	Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts
<i>Storm Petrel (Hydrobates pelagicus)</i>	10/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Fulmar (Fulmarus glacialis)</i>	10/07/2021	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Gannet (Morus bassanus)</i>	10/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Manx Shearwater (Puffinus puffinus)</i>	30/06/2022	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Puffin (Fratercula arctica)</i>	10/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Razorbill (Alca torda)</i>	10/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Common Guillemot (Uria aalge)</i>	10/08/1998	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Kittiwake (Rissa tridactyla)</i>	15/11/2022	Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Herring Gull (Larus argentatus)</i>	10/08/1998	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Lesser Black-backed Gull (Larus fuscus)</i>	10/08/1998	Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Blonde Ray (Raja brachyura)</i>	01/04/2014	Threatened Species: Near threatened
<i>Spotted Ray (Raja montagui)</i>	01/04/2014	Threatened Species: OSPAR Convention
<i>Spurdog (Squalus acanthias)</i>	04/03/2013	Threatened Species: OSPAR Convention Threatened Species: Endangered
<i>Cuckoo Ray (Leucoraja naevus)</i>	01/04/2014	Threatened Species: Vulnerable
O85		
<i>Storm Petrel (Hydrobates pelagicus)</i>	02/08/1998	Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Fulmar (Fulmarus glacialis)</i>	18/02/2000	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Gannet (Morus bassanus)</i>	18/02/2000	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Manx Shearwater (Puffinus puffinus)</i>	08/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
<i>Puffin (Fratercula arctica)</i>	02/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
<i>Razorbill (Alca torda)</i>	08/08/1998	Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List

<i>Common Guillemot (Uria aalge)</i>	08/08/1998	<i>Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>
<i>Kittiwake (Rissa tridactyla)</i>	18/02/2000	<i>Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List</i>
<i>Herring Gull (Larus argentatus)</i>	02/08/1998	<i>Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>
095		
<i>Common Porpoise (Phocoena phocoena)</i>	04/07/1991	<i>Protected Species: EU Habitats Directive Protected Species: EU Habitats Directive >> Annex II Protected Species: EU Habitats Directive >> Annex IV Protected Species: Wildlife Acts Threatened Species: OSPAR Convention</i>
<i>Arctic Tern (Sterna paradisaea)</i>	08/08/1998	<i>Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>
<i>Common Tern (Sterna hirundo)</i>	08/08/1998	<i>Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>
<i>Storm Petrel (Hydrobates pelagicus)</i>	29/04/1994	<i>Protected Species: Wildlife Acts Protected Species: EU Birds Directive Protected Species: EU Birds Directive >> Annex I Bird Species Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>
<i>Fulmar (Fulmarus glacialis)</i>	08/08/1998	<i>Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>
<i>Gannet (Morus bassanus)</i>	08/08/1998	<i>Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>
<i>Manx Shearwater (Puffinus puffinus)</i>	08/08/1998	<i>Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>
<i>Puffin (Fratercula arctica)</i>	08/08/1998	<i>Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List</i>
<i>Razorbill (Alca torda)</i>	02/08/1998	<i>Protected Species: Wildlife Acts Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List</i>
<i>Common Guillemot (Uria aalge)</i>	08/08/1998	<i>Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>
<i>Kittiwake (Rissa tridactyla)</i>	02/08/1998	<i>Protected Species: Wildlife Acts Threatened Species: OSPAR Convention Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List</i>
<i>Herring Gull (Larus argentatus)</i>	08/08/1998	<i>Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>
<i>Lesser Black-backed Gull (Larus fuscus)</i>	04/07/1991	<i>Threatened Species: Birds of Conservation Concern Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List</i>



Fisheries Impact Report for Marine Survey and Site Investigation Works for a Fibre Optic Cable within the Irish Exclusive Economic Zone.



17TH AUGUST 2026

PREPARED BY:

Frank Spellman of Altemar Ltd.

On behalf of:

euNetworks Fiber UK Limited

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Directors: Bryan Deegan and Sara Corcoran

Company No.427560 VAT No. 9649832U

www.altemar.ie

1. Introduction

The following report has been prepared by Altamar Ltd. at the request of euNetworks Fiber UK Limited. This report provides information on known fish spawning and nurse areas, as well as inshore and offshore commercial fishing areas/efforts, and considers the methodology, duration and scale of the proposed project in the context of these areas. It also provides details on the potential impacts of the proposed survey equipment on commercial fish stocks, the spawning areas of which overlap with the survey route, and any necessary mitigation in relation to fish stocks and commercial fishing activities.

2. Background to Altamar Ltd.

Since its inception in 2001, Altamar has been delivering ecological and environmental services to a broad range of clients. Operational areas include residential, infrastructural, renewable, oil & gas, private industry, local authorities, EC projects and State/Semi-State Departments.

Bryan Deegan (reviewer) is the managing director of Altamar Ltd. He is a marine biologist and an environmental scientist with over 30 years' experience working in Irish terrestrial and aquatic environments, providing services to the State, Semi-State and industry. Bryan Deegan (MCIEEM) holds a MSc in Environmental Science (Trinity College Dublin), BSc (Hons.) in Applied Marine Biology (Heriot-Watt, Edinburgh), NCEA National Diploma in Applied Aquatic Science and a NCEA National Certificate in Science (Aquaculture) (GMIT, Galway). Bryan has carried out over 1,500 marine biodiversity/habitat mapping based SCUBA dives for the National Parks and Wildlife Service in Ireland and carried out annual rocky shore ecology surveys for the Environmental Protection Agency. Altamar have previously carried out environmental assessments for site survey and main lay (AA screenings, NIS, and EclA's) for 14 fibre optic cables in Ireland and the UK.

Frank Spellman (author) joined Altamar as an ecologist in 2023. He holds a BSc in Zoology from University College Dublin and a research-based MSc from the department of Zoology at Trinity College Dublin. He has had previous experience with governmental bodies, aquaculture settings, and academic research. He also contributes to a number of citizen science programs. At Altamar, Frank has been lead ecologist on numerous development projects within Ireland, carrying out full non-avian mammal, ornithological, bat, Fossitt, freshwater, invasive species, and fisheries impact assessments on a diverse array of marine, freshwater and terrestrial sites and projects. He is also involved in the preparation of AA/NIS, EclA, EIAR Biodiversity Chapters, Preliminary Ecological Assessment reports, and performing Ecological Clerk of Works roles. He strives to develop creative yet practical strategies for clients to navigate ecological constraints while providing positive outcomes for the environment.

3. Potential impacts on known spawning/nursery areas of commercially important fish species

The following sections detail the potential effects of carrying out the proposed works within the area located between Velvet Strand, north County Dublin, Ireland, and the Irish Exclusive Economic Zone. The survey corridor, spawning areas and Marine Institute survey data are seen in Figures 1-13.

Spawning / Nursery Areas Overlapping with License Area

In relation to spawning grounds, Ellis *et al.* (2012)¹ outline: *"There are numerous modes of reproduction in fishes, and broadcast spawning, which involves shedding the eggs and sperm into the water column, is one of the more frequent strategies (Balon, 1984). Such species may have more extensive spawning grounds than those species which deposit eggs on the sea floor or on biogenic structures. The presence of eggs and larvae of broadcast spawners can be indicative of spawning grounds, although it should be noted that later larval stages may have been advected away from the spawning site. Mature fish with running eggs or sperm can also be indicative of spawning grounds, although these data were not used in the current project, as not all areas have surveys at the right time of year in order to assess the spawning state."*

In relation to nursery grounds, Ellis *et al.* (2012)¹ outline: *“The grounds where juveniles are found are termed nursery grounds. It has been suggested that nursery grounds are those sites where juveniles occur at higher densities, have reduced rates of predation and have faster growth rates than in other habitats, which should result in nursery grounds providing a greater relative contribution to adult recruitment in comparison to non-nursery ground habitats (see Beck et al., 2003; Heupel et al., 2007). Whilst field data are available to highlight areas where juveniles occur at higher densities, comparable data to confirm that they avoid predation more successfully, have enhanced growth rates and provide greater relative contributions to recruitment are generally lacking.”*

The license application area overlaps with the known spawning and/or nursery areas of several commercial fish species:

Cod

The proposed license application area passes through known cod (*Gadus morhua*) spawning and nursery grounds (Figure 1). These spawning grounds span large areas off the east and southeast coasts of Ireland, and so any disturbances to spawning activity due to site investigations and seabed sampling within the proposed license application area would be minimal, short-term, and not likely to have any significant effect. The proposed Application Area also overlaps with known cod nursery areas which span waters around the entire Irish coastline.

The spawning area of concern for cod constitutes a sea area of approximately 4,337 km², of a total of 24,818 km² known spawning areas within Irish and western UK waters. The total area of the subject spawning area potentially impacted by the proposed works is 19 km², equating to approximately 0.44% of the subject spawning area and approximately 0.08% of the total known spawning areas in Irish and western UK waters.

Offshore marine survey methodologies are proposed to be carried out within the subject known cod spawning areas, comprising of Multibeam Echosounder (MBES), sidescan sonar, marine magnetometer and sub-bottom profiler equipment. Based on estimated timelines it is predicted that these activities would be carried out in this spawning area over approximately 124 hours (~5 days). Physical sampling (CPT, grab sample and core sampling) activities within the subject spawning area are estimated to take approximately 31.75 hours (19 sampling points), with the largest footprint (vibrocorers) of any sampling technique being 8 m² and smallest (grab samples) being 0.5 m². Overall, disturbance from all survey activities is anticipated to occur over approximately 155.75 hours (~6.5 days).

The spawning period for cod peaks in February and March. Assuming direct overlap with known cod spawning areas during peak spawning season, based on the total area potentially impacted in relation to the overall non-impacted known spawning area, the duration of time over which these surveys are estimated to take place and the amount of time survey efforts are estimated to occur in any particular area within known spawning grounds, in the event of direct overlap of survey efforts with peak spawning season, the potential impact on spawning cod is predicted to be negligible-adverse/local/not significant/brief. The probability of significant effects is unlikely.

Cod nursery areas span significantly greater areas than spawning areas and are located a geographically wider range. Therefore, potential impacts on cod nursery area are predicted to be negligible-adverse/local/not significant/brief. The probability of significant effects is unlikely.

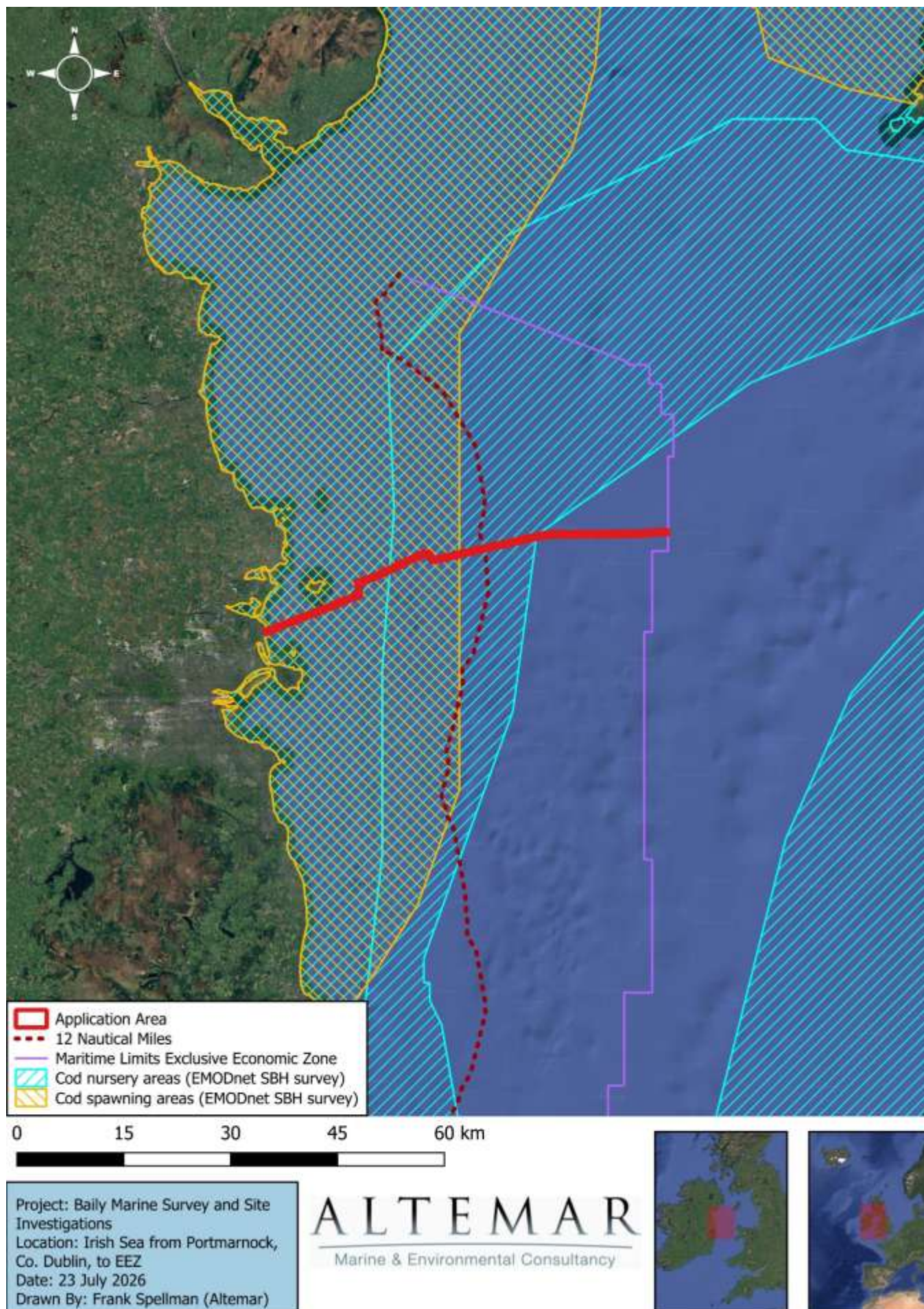


Figure 1. Cod nursery and spawning areas proximate to the license application area.

Horse mackerel

The proposed license application area passes through known horse mackerel (*Trachurus trachurus*) nursery grounds (Figure 2). These known nursery grounds span over the majority water within the Irish EEZ between the coast and continental shelf, including the entirety of the Celtic Sea and Irish Sea. Due to the expansive nursery range, pelagic nature and lack of specific habitat features sensitive to disturbance, any disturbances to juveniles from site investigations and seabed sampling within the proposed license application area would not be significant.

The proposed Application Area does not pass through or adjacent to any known horse mackerel spawning areas.

Based on the total area potentially impacted in relation to the overall non-impacted known nursery areas, limited time over which these surveys are estimated to take place, the amount of time survey efforts are likely to occur in any particular area within known nursery grounds and the pelagic nature of this species, the potential impact on juvenile horse mackerel is predicted to be negligible-adverse/local/not significant/brief. The probability of significant effects is unlikely.

Haddock

The proposed License Application Area passes through known haddock (*Melanogrammus aeglefinus*) spawning grounds (Figure 3). These spawning grounds span large areas off the west, northwest, east and south coasts of Ireland, and so any disturbances to spawning activity due to site investigations and seabed sampling activities within the proposed license application area would be minimal, short-term, and not likely to have any significant effect.

The spawning area of concern for haddock constitutes a sea area of approximately 2,950 km², of a total of 31,542 km² known spawning areas within Irish waters. The total area of the subject spawning area potentially impacted by the proposed Application Area is 7 km², equating to approximately 0.24% of the subject spawning area and 0.02% of the total known spawning areas in Irish waters.

Offshore marine survey methodologies are proposed to be carried out within the subject known haddock spawning areas, comprising of Multibeam Echosounder (MBES), sidescan sonar, marine magnetometer and sub-bottom profiler equipment. Based on estimated timelines it is predicted that these activities would be carried out in this spawning area over approximately 48 hours (2 days). Physical sampling (CPT, grab sample and core sampling) activities within the subject spawning area are estimated to take approximately 12.25 hours (8 sampling points), with the largest footprint (vibrocorders) of any sampling technique being 8 m² and smallest (grab samples) being 0.5 m². Overall, disturbance from all survey activities is anticipated to occur over approximately 60.25 hours (~2.5 days).

The spawning period for haddock peaks in March and April. Assuming direct overlap with known haddock spawning areas during peak spawning season, based on the total area potentially impacted in relation to the overall non-impacted known spawning area, the duration of time over which these surveys are estimated to take place and the amount of time survey efforts are estimated to occur in any particular area within known spawning grounds, in the event of direct overlap of survey efforts with peak spawning season, the potential impact on spawning haddock is predicted to be negligible-adverse/local/not significant/brief. The probability of significant effects is unlikely.

Haddock nursery areas span similarly large areas to spawning areas and are located at geographically similar locations. Therefore, potential impacts on haddock nursery areas are predicted to be negligible-adverse/local/not significant/brief. The probability of significant effects is unlikely.

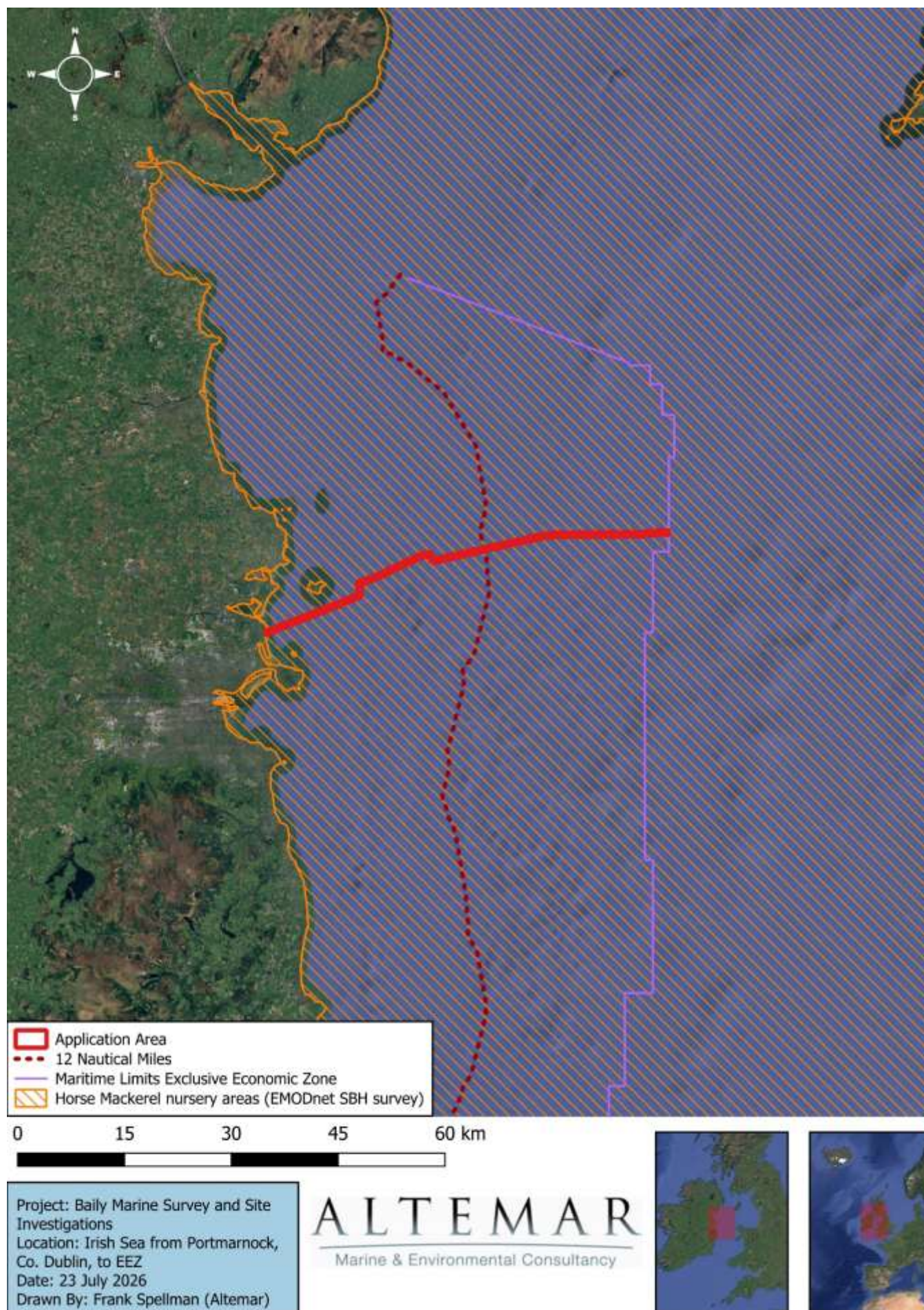


Figure 2. Horse mackerel nursery areas proximate to the license application area.

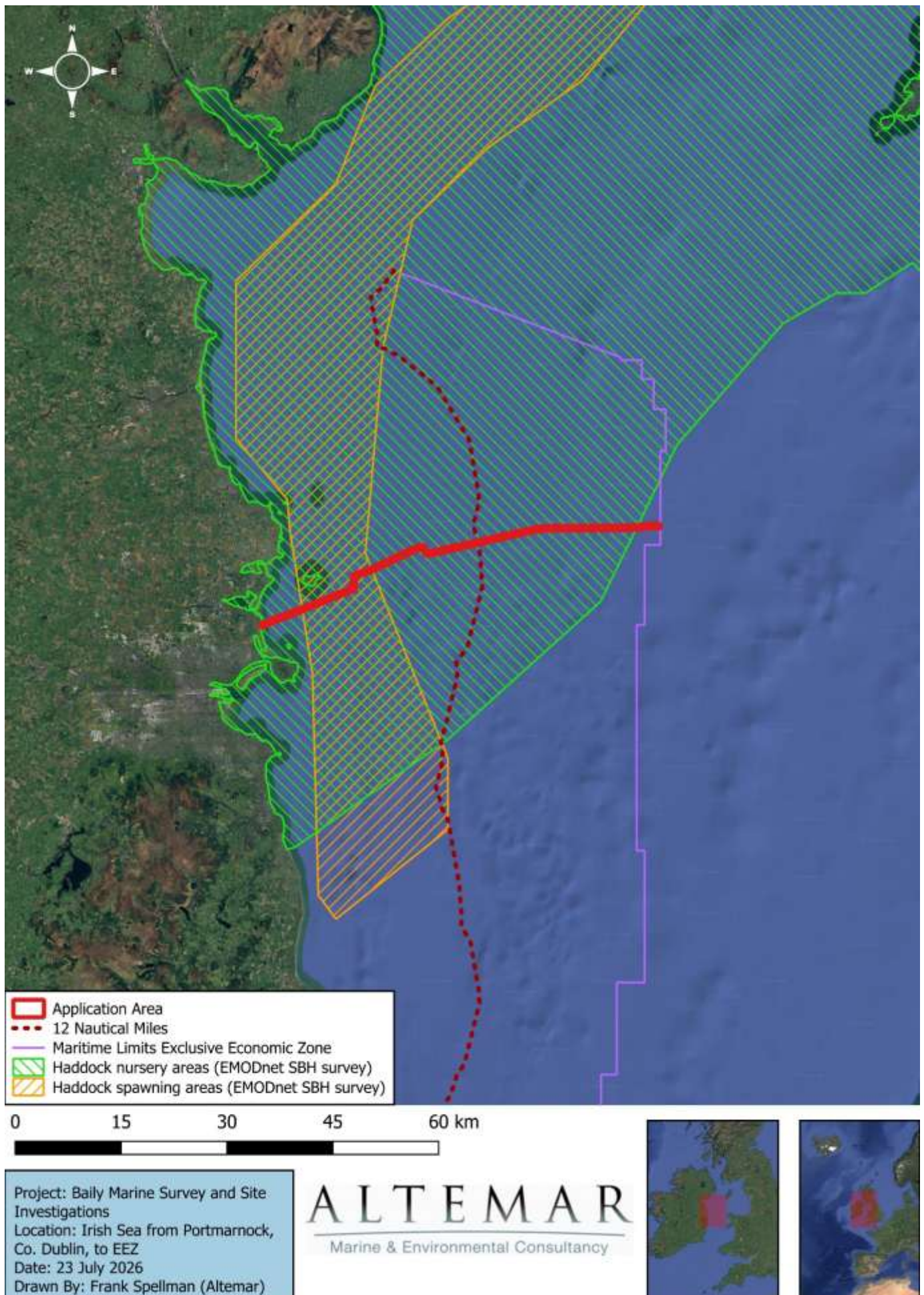


Figure 3. Haddock spawning and nursery areas proximate to the license application area.

Mackerel

The proposed License Application Area passes through known mackerel (*Scomber scombrus*) nursery grounds (Figure 4). These known nursery grounds span the full length of the Irish coast, effectively covering the entirety of the 12 nm limit, Irish Sea, and much of the Celtic Sea. Due to the expansive nursery range, any disturbances to juveniles from site investigations and seabed sampling within the proposed license application area would not be significant on a population level.

The proposed Application Area does not pass through or adjacent to any known mackerel spawning areas.

Based on the total area potentially impacted in relation to the overall non-impacted known nursery areas, limited time over which these surveys are estimated to take place and the amount of time survey efforts are likely to occur in any particular area within known nursery grounds, the potential impact on juvenile mackerel is predicted to be negligible-adverse/local/not significant/brief. The probability of significant effects is unlikely.

Nephrops

The proposed license application area passes through known *Nephrops norvegicus* (Dublin Bay Prawn) grounds (Functional Unit 15 Irish Sea West) (Figure 5). The proposed license application area passes through the southern portion of these nephrops grounds.

These specific nephrops grounds constitutes a sea area of approximately 5,823 km², of a total of 43,115 km² known nephrops grounds within Irish waters. The total area of the subject grounds potentially impacted by the proposed Application Area is 19 km², equating to approximately 0.33% of the subject area and 0.04% of the total known nephrops grounds in Irish waters and surrounds.

Offshore marine survey methodologies are proposed to be carried out within the subject known nephrops grounds, comprising of Multibeam Echosounder (MBES), sidescan sonar, marine magnetometer and sub-bottom profiler equipment. Based on estimated timelines it is predicted that these activities would be carried out in these grounds to the same extent as for cod spawning areas, over approximately 124 hours (~5 days). Physical sampling (CPT, grab sample and core sampling) activities within the subject spawning area are estimated to take approximately 31.75 hours (19 sampling points), with the largest footprint (vibrocorers) of any sampling technique being 8 m² and smallest (grab samples) being 0.5 m². Overall, disturbance from all survey activities is anticipated to occur over approximately 155.75 hours (~6.5 days).

The reproductive period for nephrops generally takes place through the months of August and September, with peak hatching occurring in the Irish Sea in June-July. Assuming direct overlap with Functional Unit 15 during reproduction periods, based on the total area potentially impacted in relation to the overall non-impacted functional unit area, the duration of time over which these surveys are estimated to take place, the amount of time survey efforts are estimated to occur in any particular area within this functional unit, and negligible direct contact with the seabed, in the event of direct overlap of survey efforts during reproductive periods, the potential impact on nephrops within functional unit 15 is predicted to be negligible-adverse/local/not significant/brief. The probability of significant effects is unlikely.

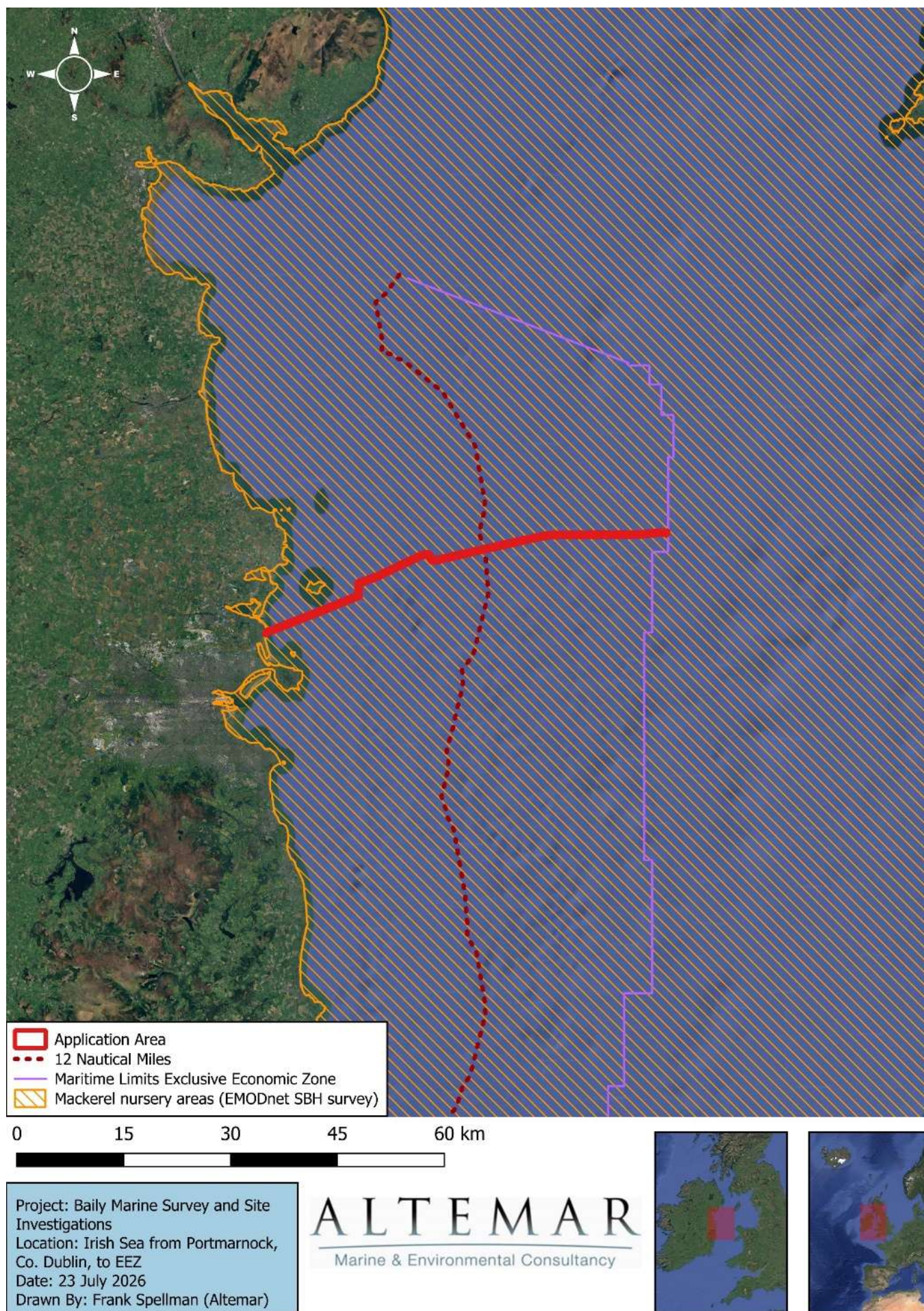


Figure 4. Mackerel nursery areas proximate to the license application area.

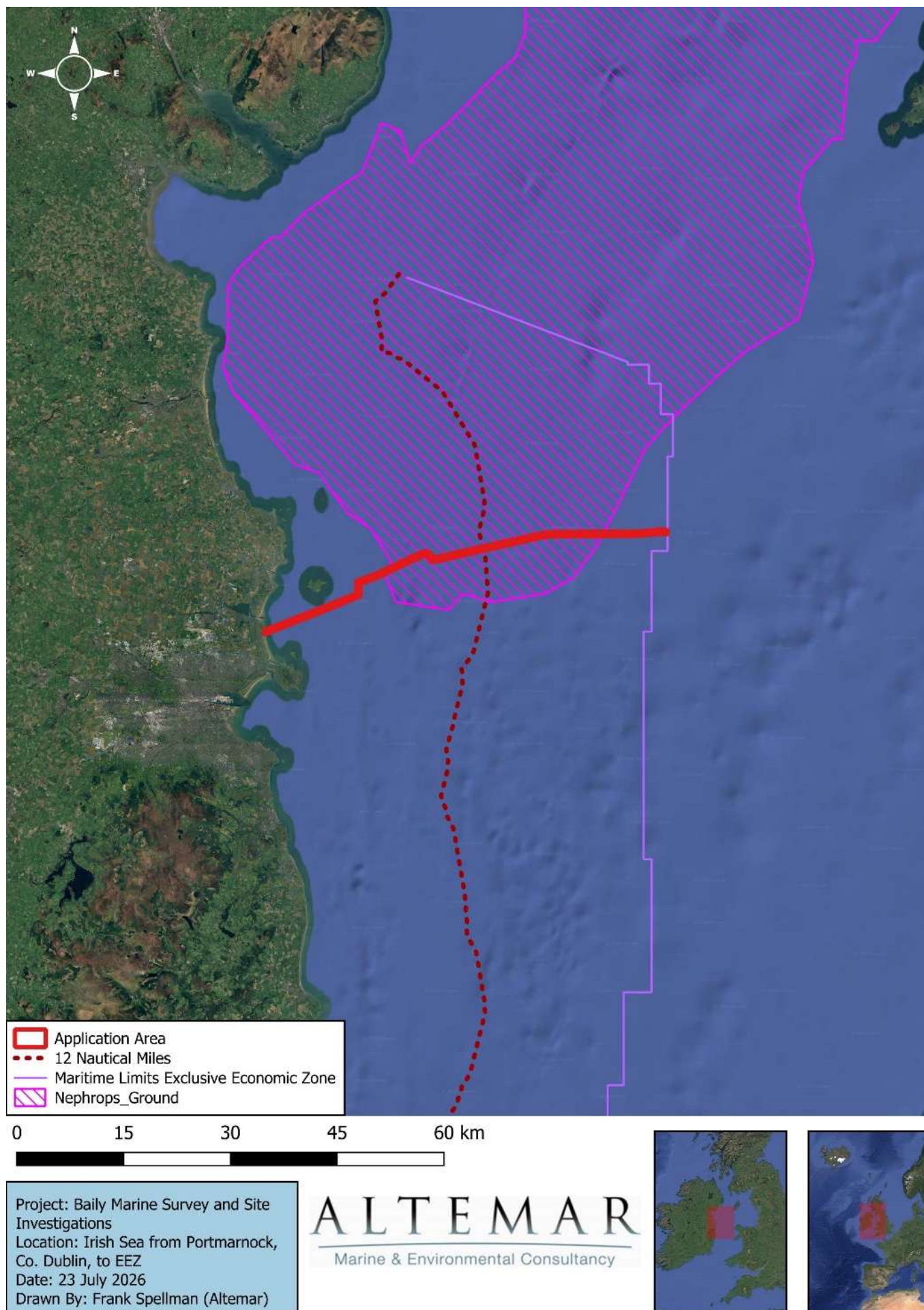


Figure 5. Nephrops grounds (FU15) proximate to the license application area.

Whiting

The proposed license application area passes through known whiting (*Merlangius merlangus*) spawning and nursery grounds (*Figure 6*). These spawning grounds span large areas off the west, northwest, east and south coasts of Ireland, and so any disturbances to spawning activity due to site investigations and seabed sampling within the proposed license application area would be minimal, short-term, and not likely to have any significant effect. The proposed Application Area also overlaps with known whiting nursery areas which span similar geographical areas and locations.

The spawning area of concern for whiting constitutes a sea area of approximately 18,604 km², of a total of 59,512 km² known spawning areas within Irish and western UK waters. The total area of the subject spawning area potentially impacted by the proposed works is 14 km², equating to approximately 0.08% of the subject spawning area and approximately 0.02% of the total known spawning areas in Irish and western UK waters.

Offshore marine survey methodologies are proposed to be carried out within the subject known whiting spawning areas, comprising of Multibeam Echosounder (MBES), sidescan sonar, marine magnetometer and sub-bottom profiler equipment. Based on estimated timelines it is predicted that these activities would be carried out in this spawning area over approximately 92 hours (<4 days). Physical sampling (CPT, grab sample and core sampling) activities within the subject spawning area are estimated to take approximately 25.75 hours (16 sampling points), with the largest footprint (vibrocorers) of any sampling technique being 8 m² and smallest (grab samples) being 0.5 m². Overall, disturbance from all survey activities is anticipated to occur over approximately 117.75 hours (<5 days).

The spawning period for whiting occurs between the months of February and June. Assuming direct overlap with known whiting spawning areas during peak spawning season, based on the total area potentially impacted in relation to the overall non-impacted known spawning area, the duration of time over which these surveys are estimated to take place and the amount of time survey efforts are estimated to occur in any particular area within known spawning grounds, in the event of direct overlap of survey efforts with peak spawning season, the potential impact on spawning whiting is predicted to be negligible-adverse/local/not significant/brief. The probability of significant effects is unlikely.

Whiting nursery areas span similarly expansive areas to spawning areas and are located in geographically similar locations across Irish waters (apart from the northwest coast where known nursery areas are absent). Therefore, similarly to spawning areas, potential impacts on whiting nursery areas are predicted to be negligible-adverse/local/not significant/brief. The probability of significant effects is unlikely.

Atlantic Salmon

The proposed Application Area passes through the range of wild Atlantic salmon (*Salmo salar*) (*Figure 7*). Salmon native to catchments in Ireland, other European countries, and the UK utilise Irish waters as transitional habitat. Atlantic salmon will be present within the proposed survey route year-round, peaking in June when out-migrating smolts overlap with adults returning to spawn. Due to the extent of the range of Atlantic salmon and transitory nature of the species in this region, the area within the proposed survey route corridor is not of specific importance to this species. Based on the proposed estimated survey durations, the survey period would not likely overlap significantly with peak periods of Atlantic salmon numbers within the subject area. Therefore, potential impacts on Atlantic salmon are predicted to be negligible-neutral/local/not significant/brief. The probability of significant effects is unlikely.

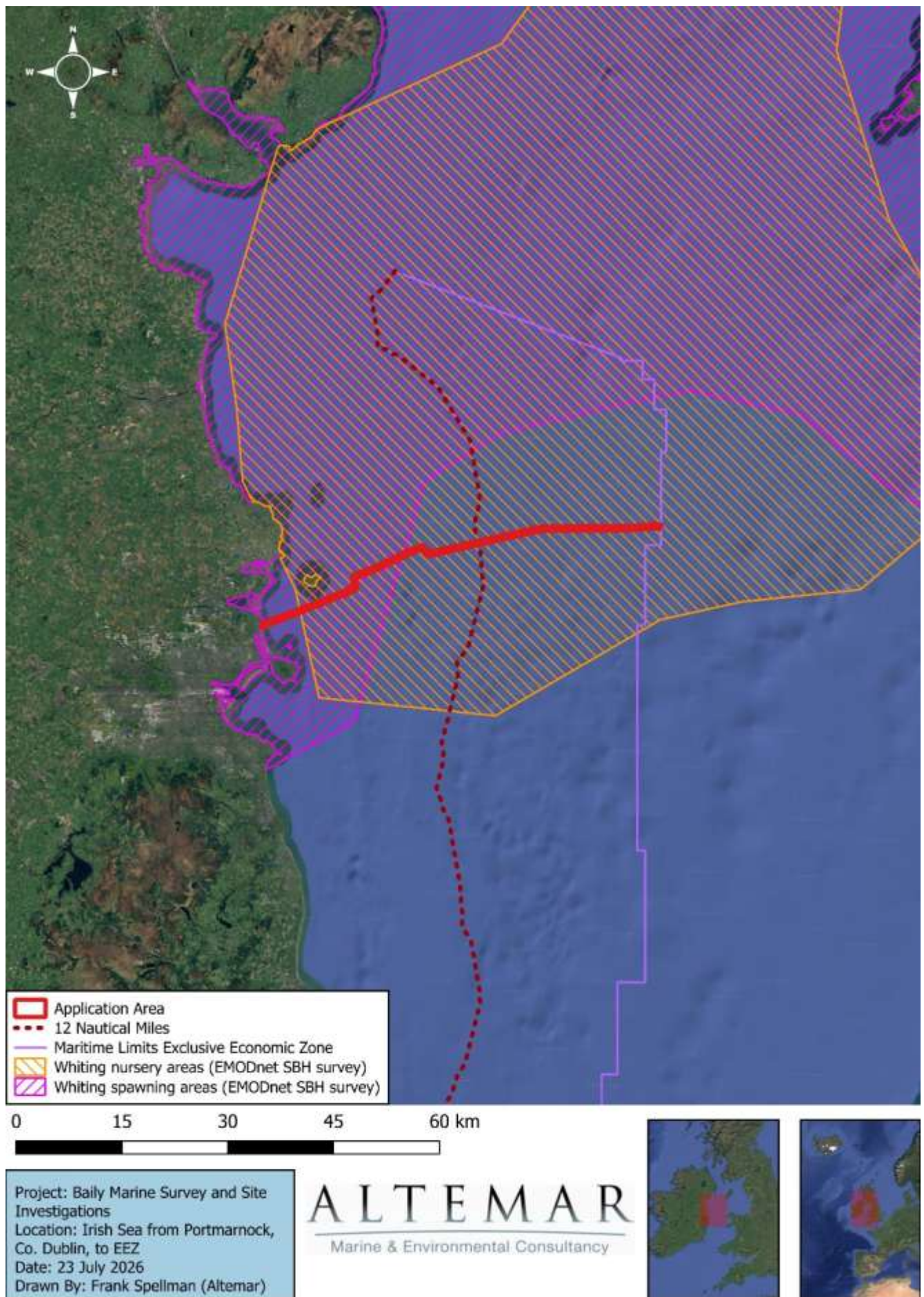


Figure 6. Whiting spawning and nursery areas proximate to the license application area.

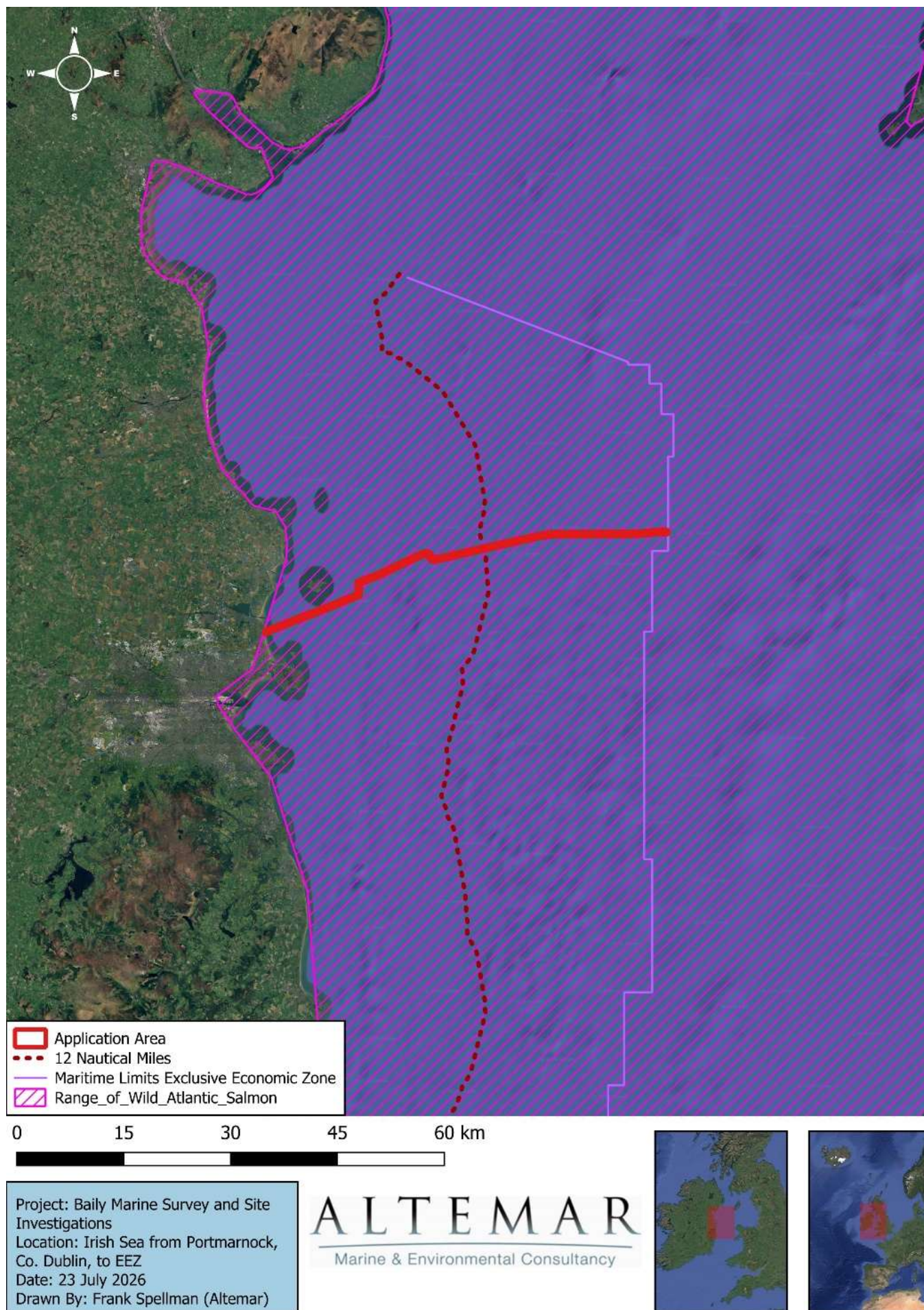


Figure 7. Range of Atlantic salmon in relation to the license application area.

4. Potential impacts on commercial fishing effort

The proposed Application Area passes through areas designated for dredge (razor clam) and pot (lobster and crab) activities by the inshore fishing fleet. It also passes through a Shellfish Waters Directive area. Designated inshore fisheries and shellfish areas in relation to the Proposed Application area are demonstrated in figures 8-9.

The proposed Application Area passes through areas of insignificant levels of beam trawl, offshore dredge, gill net, longline, and offshore pot activity by offshore fishing fleets (*Figures 10-14*). The Application Area also passes through areas with significant levels of bottom otter trawl and pelagic trawl (international fleet) activity by offshore fishing fleets, and moderate levels of seine effort (*Figures 15-17*). There is therefore the potential of overlap with the commercial fishing fleet by vessels actively engaged in fishing activity, as well as in transit to/from fishing grounds. Due to the scale and nature of the proposed survey methods within the proposed license application area in relation to the areas of fishing activity, no significant impact on the target species for these fisheries is foreseen. However, there is the potential for minor disruption by survey activities on offshore fishing activity, and of fishing activity disrupting survey activity. Furthermore, considering many of the fishing activities in the surrounding areas involve contact with the seabed, this should be taken into consideration for proposed activities along the proposed survey route.

Consultation with fisheries representatives, engagement with EU fleets and issuance of Marine Notices should be carried out prior to the proposed works to avoid disruption to fisheries and prevent a direct overlap with fishing activity that may cause interruptions to proposed survey activities.

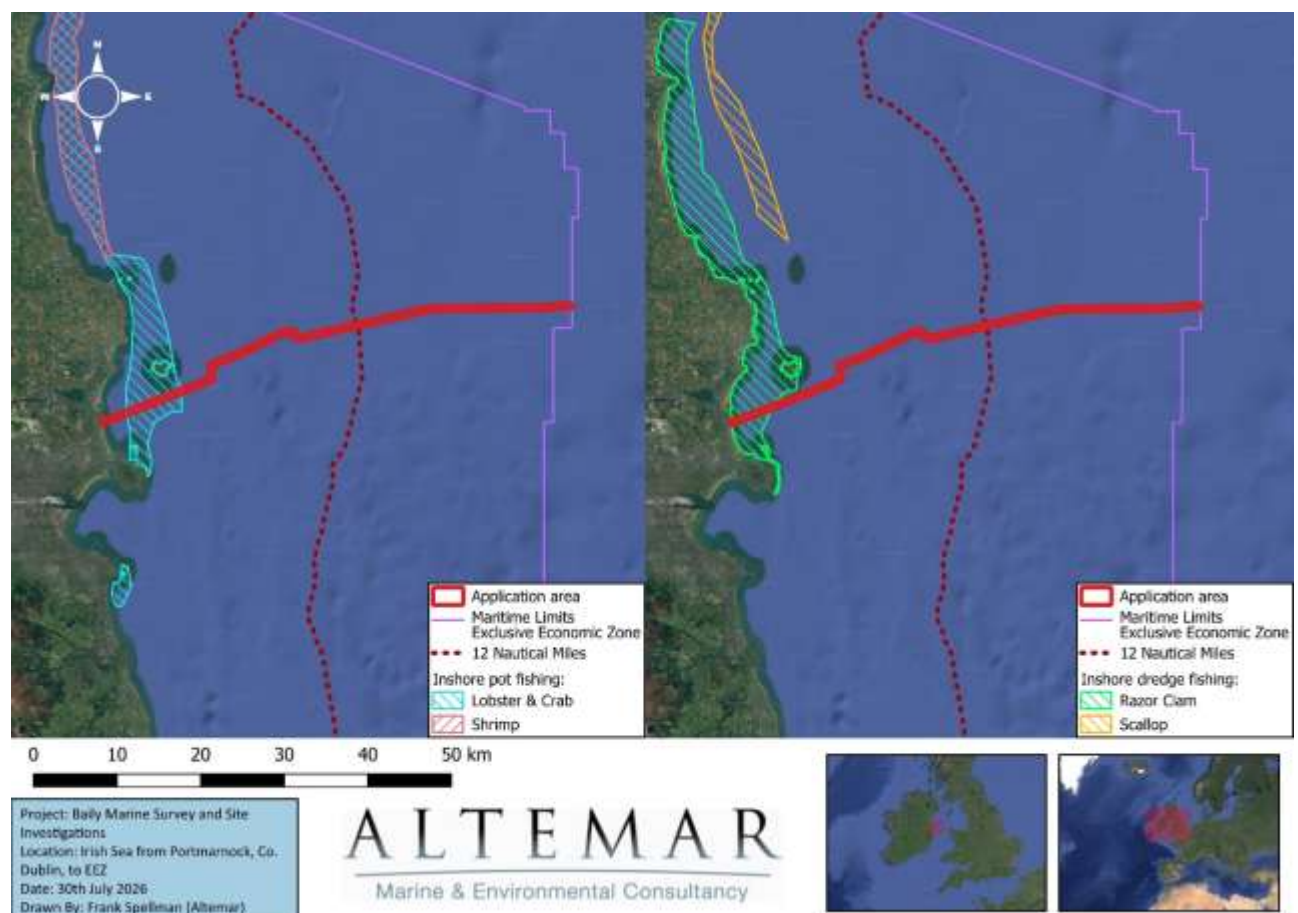


Figure 8. Inshore pot and dredge fisheries in relation to the license application area.

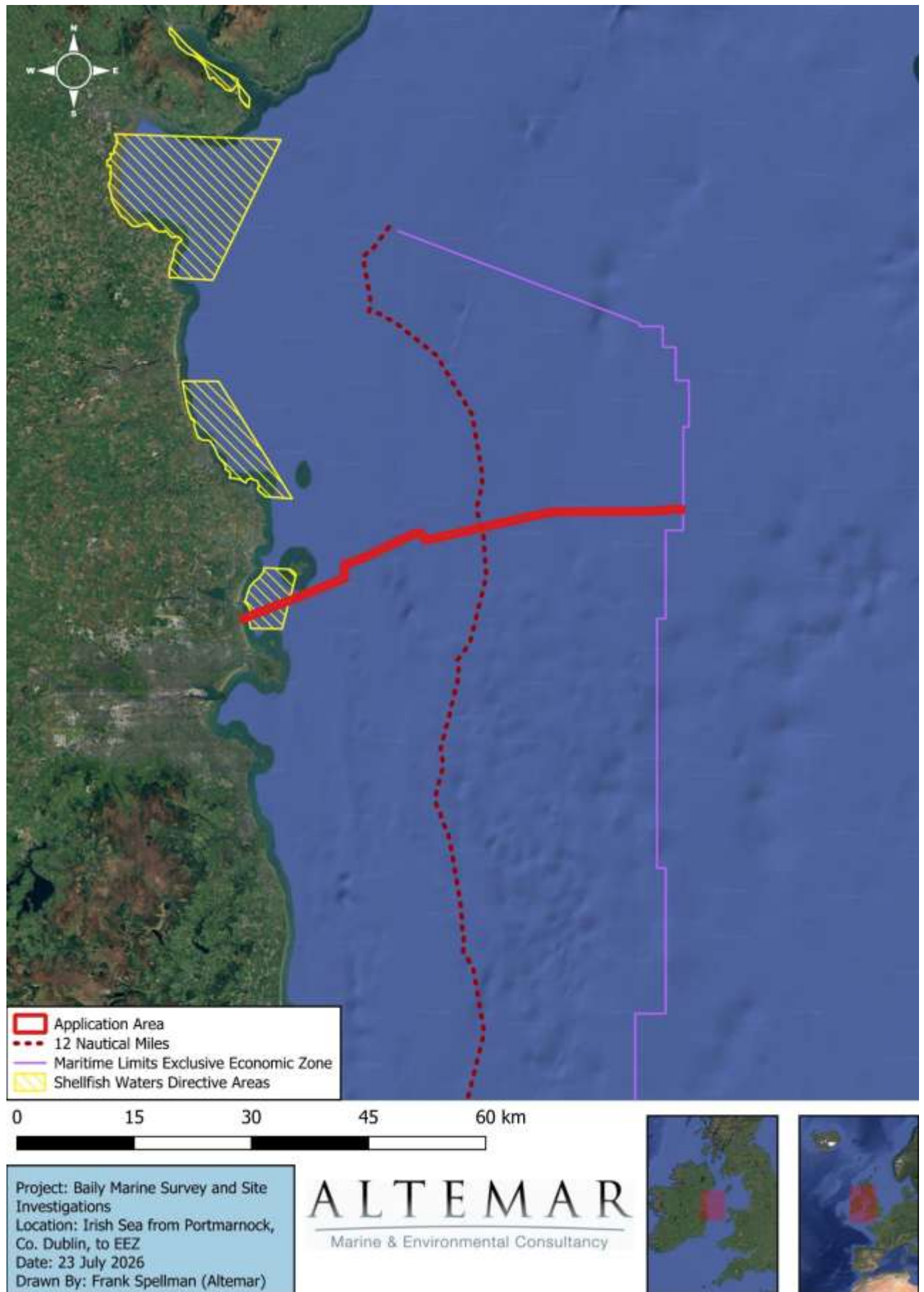


Figure 9. Shellfish Waters Directive areas in relation to the license application area.

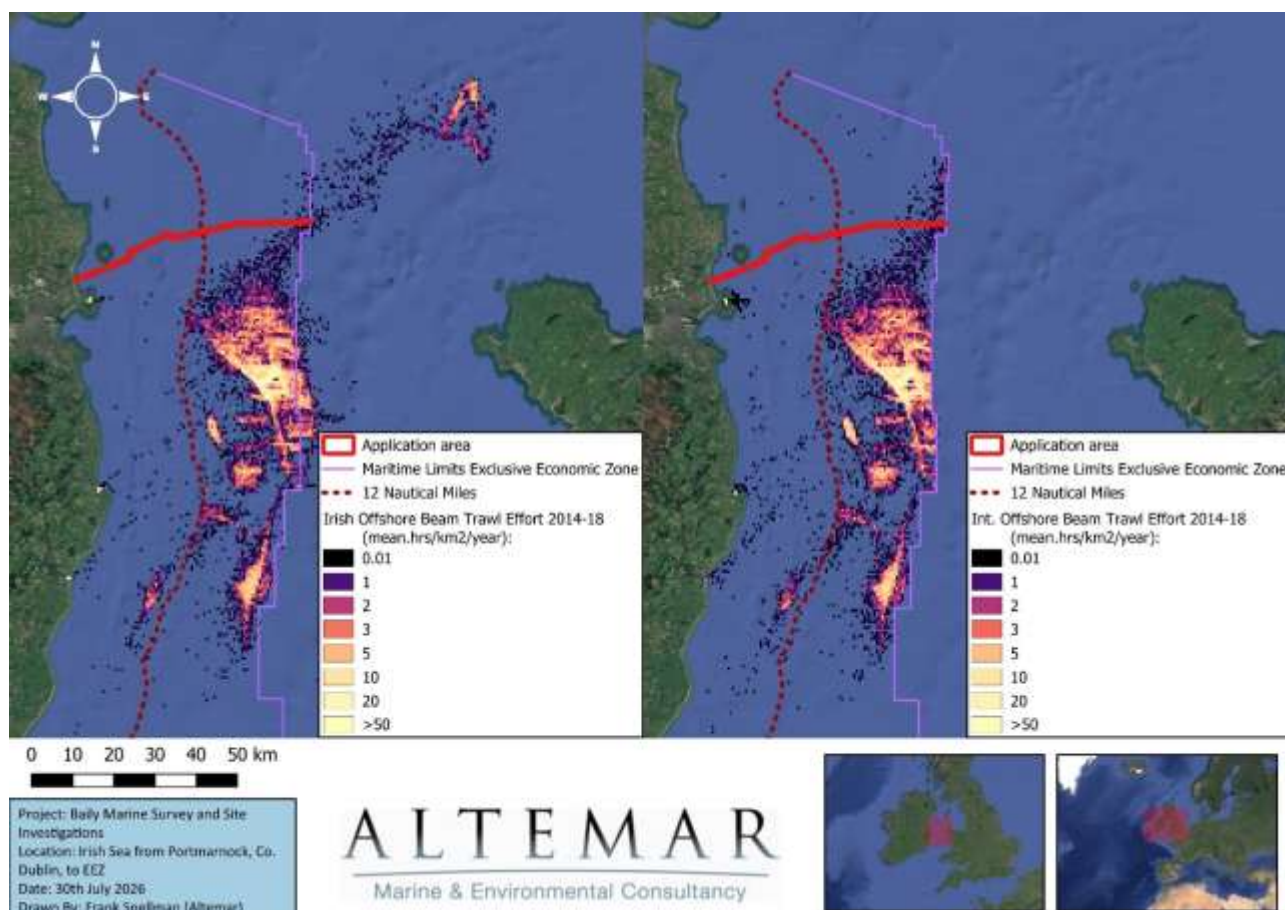


Figure 10. Offshore beam-trawl effort in relation to the license application area.

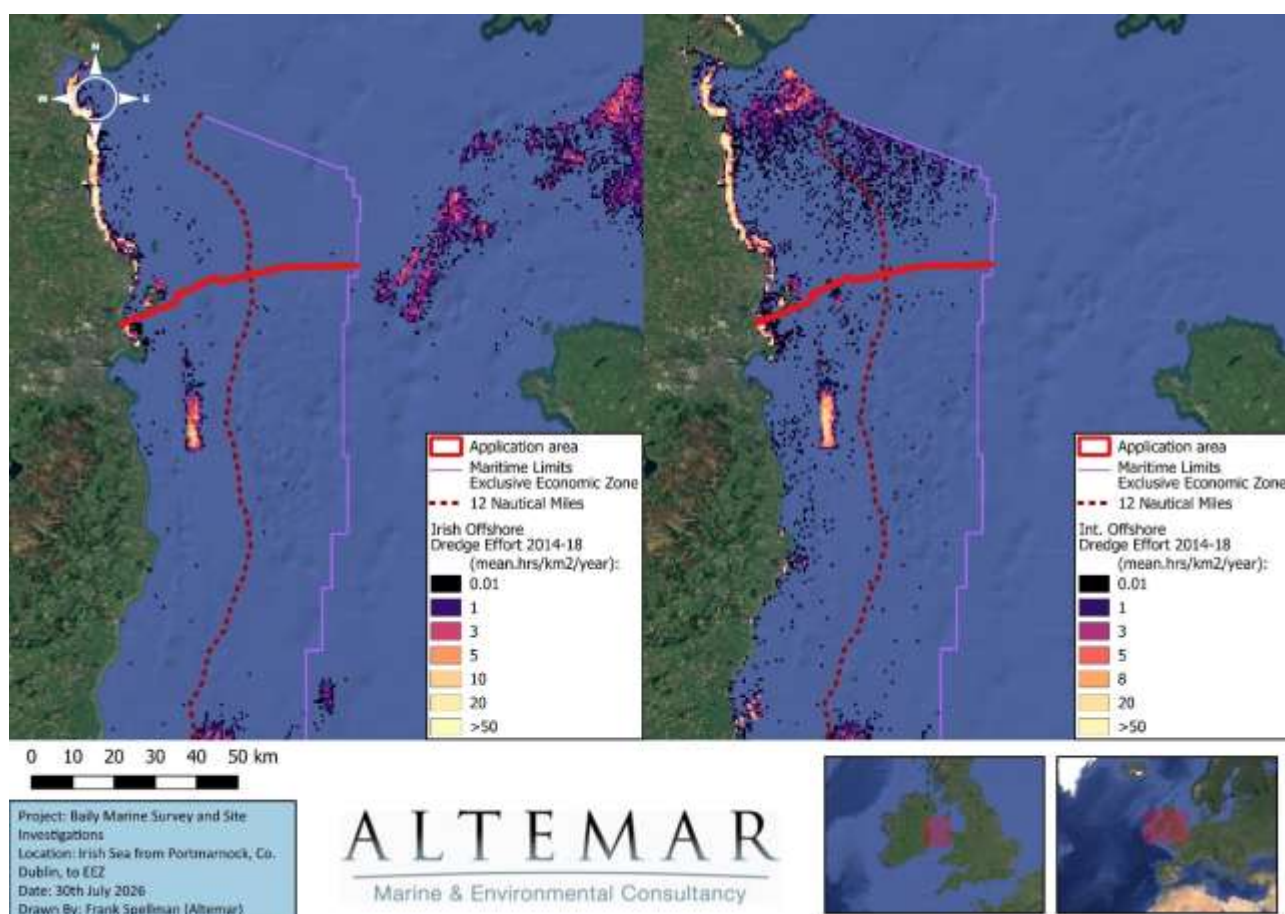


Figure 11. Offshore dredge effort in relation to the license application area.

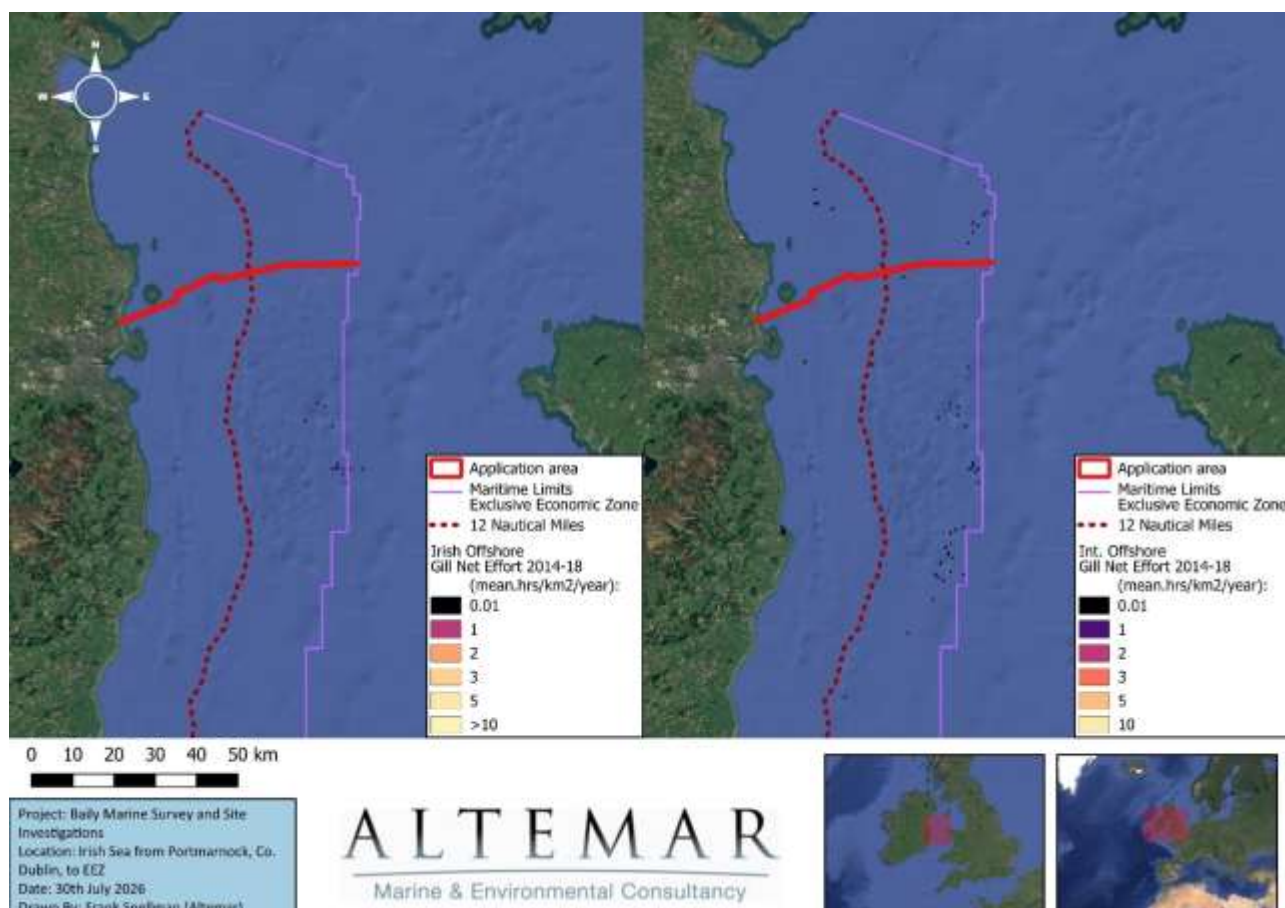


Figure 12. Offshore gill net effort in relation to the license application area.

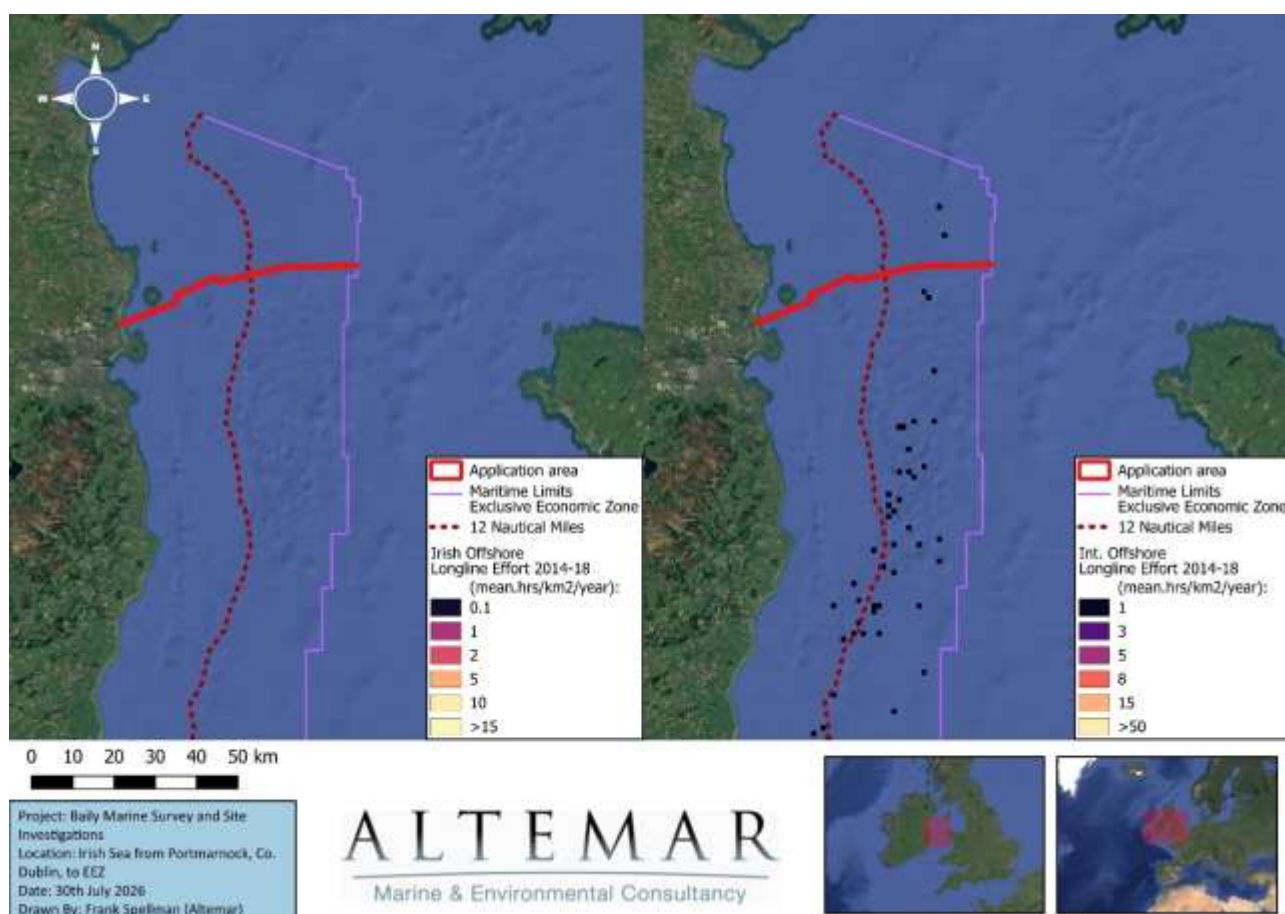


Figure 13. Offshore longline effort in relation to the license application area.

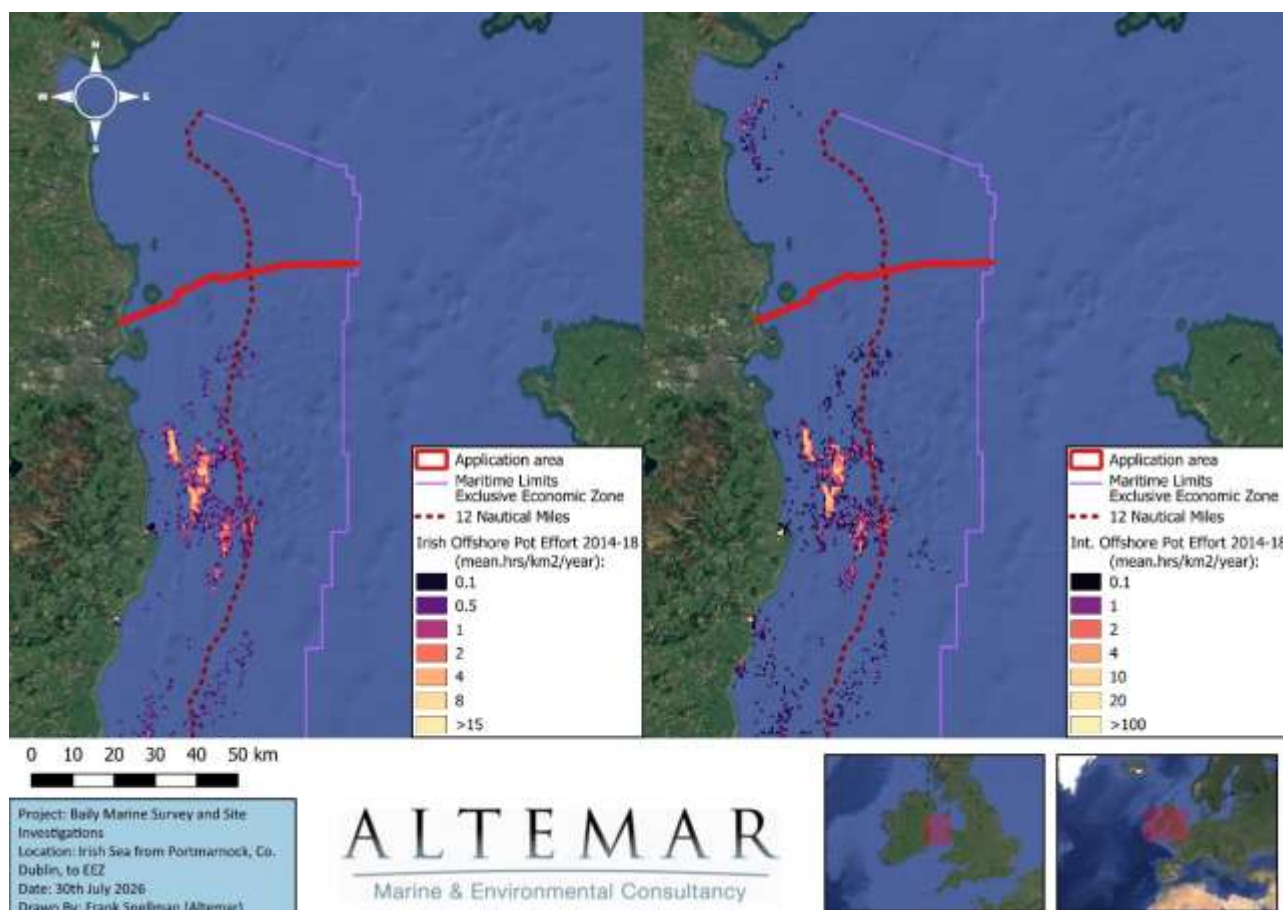


Figure 14. Offshore pot effort in relation to the license application area.

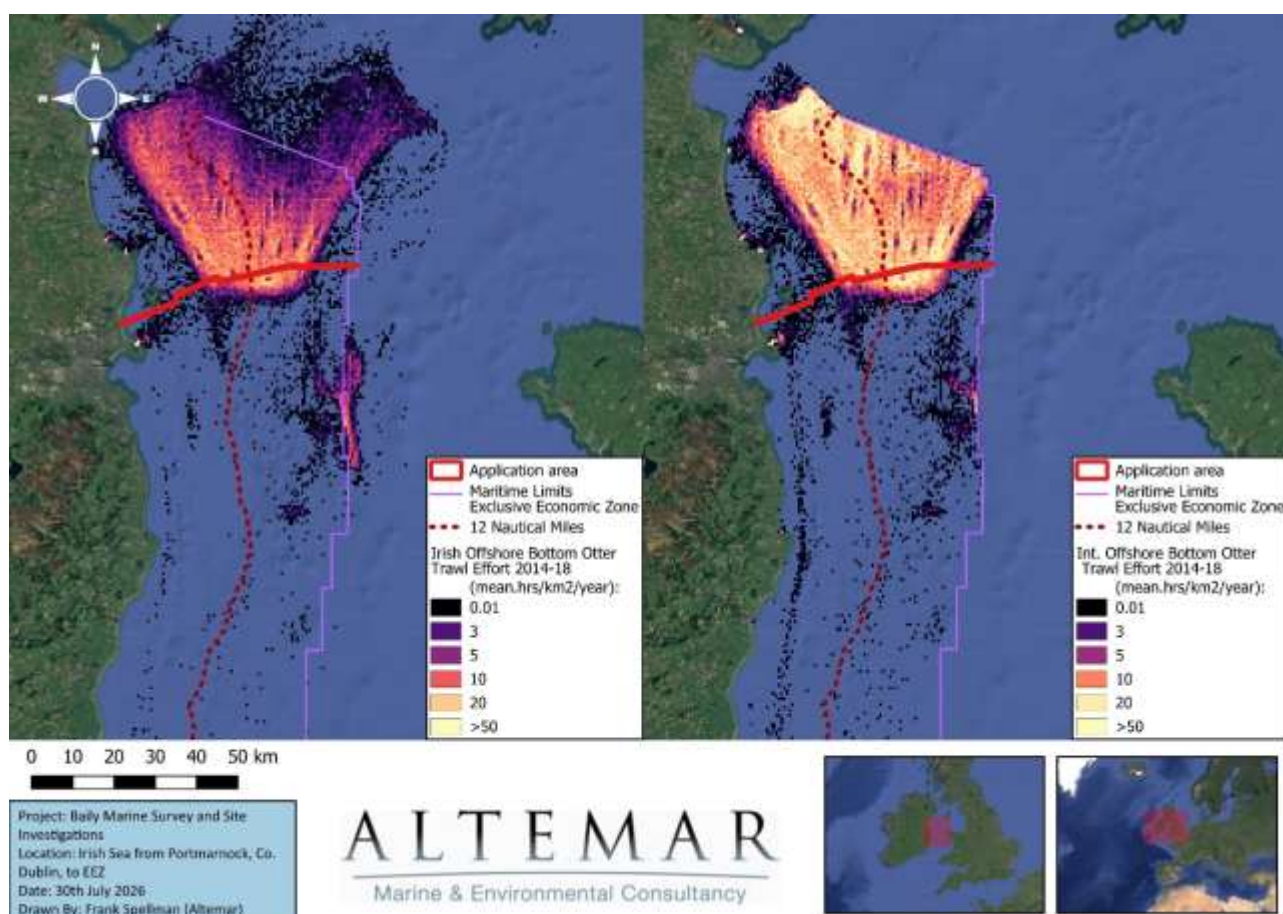


Figure 15. Offshore bottom otter trawl effort in relation to the license application area.

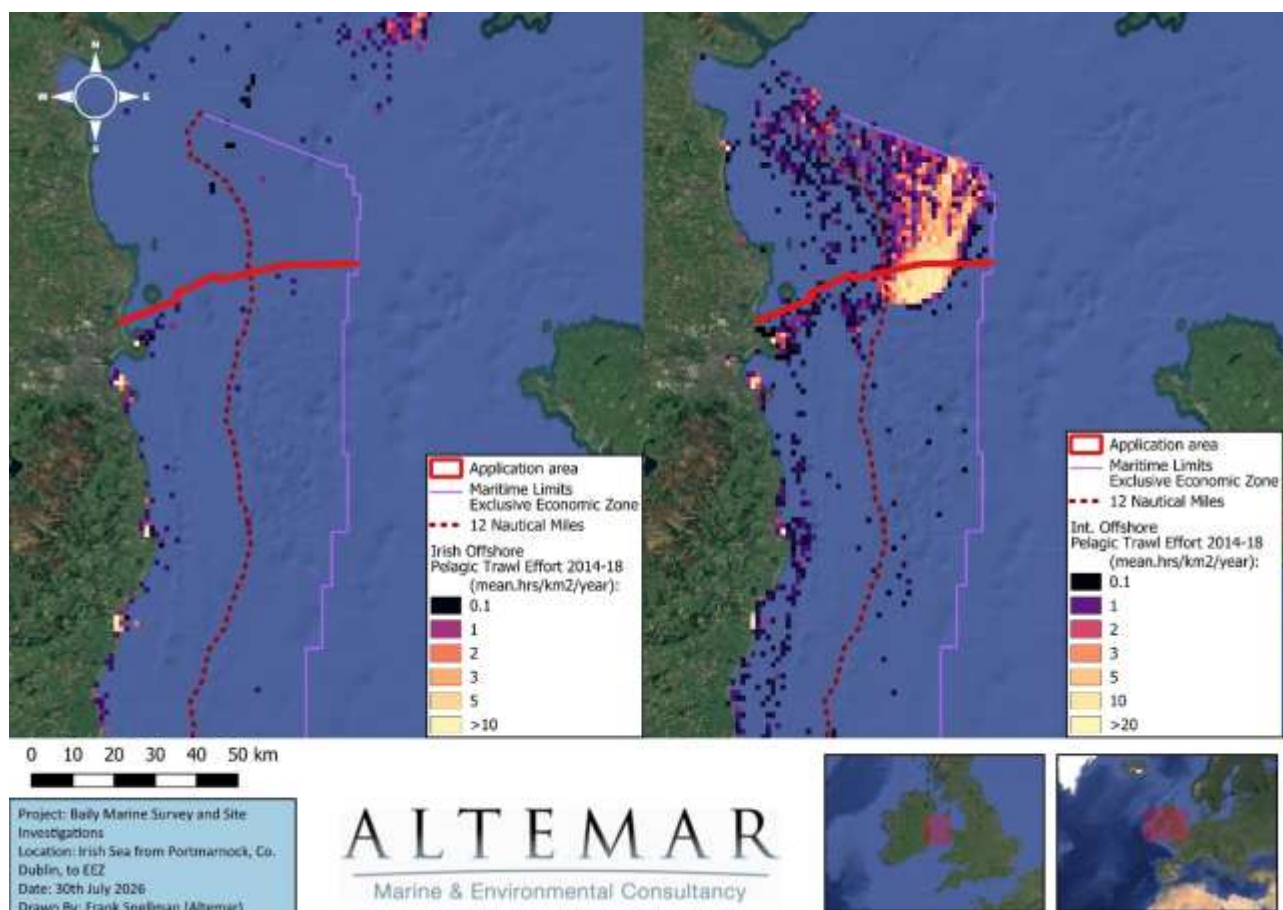


Figure 16. Offshore pelagic trawl effort in relation to the license application area.

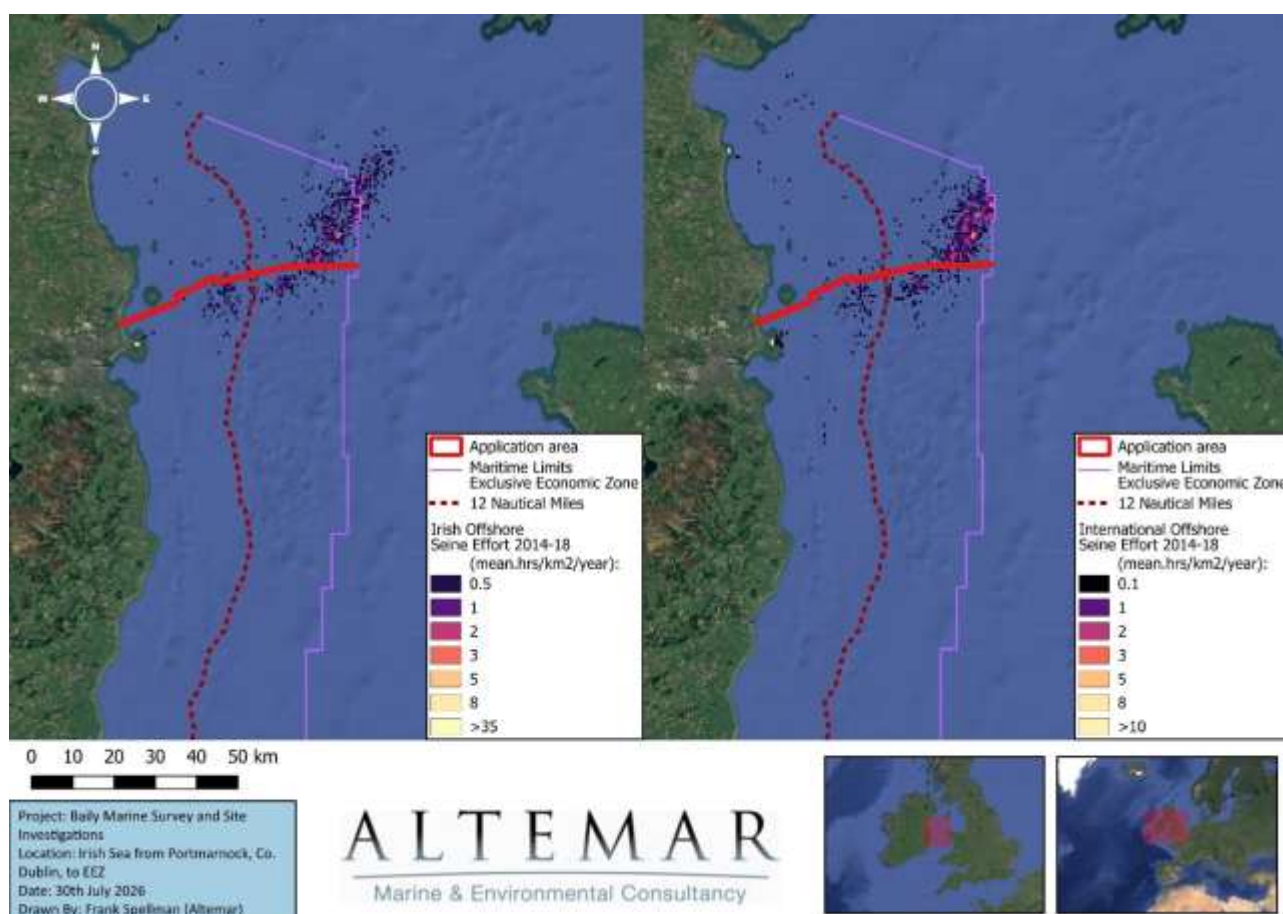


Figure 17. Offshore seine effort in relation to the license application area.

5. Cable Installation vessels

Offshore survey vessels are typically between 15m and 75m in length with potential for smaller vessels to be used in nearshore / shallow water areas. Offshore survey vessels typically have an endurance of approximately 14 to 28 days. A vessel with a shallow water draft will be utilised for the inshore survey area. An unmanned surface vehicle (USV) and/or autonomous surface vehicle (ASV) may also be used for the geophysical survey. The survey vessels may use a local port for personnel / equipment mobilisation, bunkering and provisioning.

The marine survey works will consist of a dedicated marine spread which will be suitable for the scope of work required, the water depth and the anticipated seabed conditions of the survey area. The exact equipment to be used will be confirmed following a tender process to procure the marine survey contractor. A description of the equipment types and their respective sampling/survey methodologies are described in the 'Works Methodology' document accompanying the respective submission of the proposed License Application Area.

Survey vessels will generate some subsea noise in the marine environment from engine noise and dynamic positioning thrusters. Shipping noise is typically within the 50-300 Hz frequency band and is the dominant noise source in deeper water (DECC, 2011). Propellers on vessels all have the potential to produce cavitation noise. This sound is caused by vacuum bubbles that were generated by the collapse of bubbles created by the spinning of the propellers.

Acoustic broadband source pressure levels typically increase with increasing vessel size, with smaller vessels (<50 m) having source pressure levels 160-175 dB (re 1 μ Pa at 1m), medium-size vessel (50-100 m) 165-180 dB (re 1 μ Pa at 1m) and large vessels (>100 m) 180-190 dB (re 1 μ Pa at 1m) (DECC, 2011). Every vessel has a unique noise signature and for each vessel this can change in response to a number of factors, including; ship speed, operational status, vessel load, the condition of the vessel and even the properties of the water that the vessel is operating in.

6. Conclusions

It is highly unlikely that the proposed survey works will result in the direct mortality of any fish species due to the slow-moving nature of the survey vessel, limited seabed disturbance of sampling methods, and temporary nature of acoustic surveys. In the absence of mitigation, the risk of disturbance to known fish spawning areas and their associated stocks through which the proposed routes pass (which is highest in February and March when peak haddock, cod and whiting spawning overlaps) is considered negligible-adverse/local/not significant/brief. Additionally, the risk of disturbance to nephrops reproduction in FU15 Irish Sea West from proposed survey/sampling activities in this specific area during peak spawning and hatching is considered negligible-adverse/local/not significant/brief. No significant impacts on fish nursery areas are predicted. Considering the nature of the proposed survey and site investigations methodology, no disruption to the stocks of inshore or offshore fisheries is foreseen. However, consultation with fisheries representatives, engagement with EU fleets and issuance of Marine Notices should be carried out prior to the proposed works to avoid disruption to fisheries and prevent a direct overlap with fishing activity that may cause conflict with proposed License Application Area activities and commercial fishing operations.

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