ALTEMAR
Marine & Environmental Consultancy

Supporting Information for Screening for Appropriate Assessment Report for the proposed main lay of the 2Africa submarine fibre-optic cable system within the Irish EEZ.

15th December 2023

Prepared by: [redacted](MCIEEM) of Altemar Ltd.
On behalf of: **Apollo Submarine Cable System Limited**

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1 Table of Contents

1. Introduction

An Appropriate Assessment is an assessment of the potential effects of a proposed project or plan, on its own, or in combination with other plans or projects, on one or more Natura 2000 sites. Natura 2000 sites are those sites designated as Special Areas of Conservation (SAC) or Special Protection Areas (SPA).

The AA Screening stage examines the likely significant effects of a plan or project, either on its own, or in combination with other plans and projects, upon a Natura 2000 site and considers whether, on the basis of objective scientific evidence, it can be concluded that there are not likely to be significant effects on any European site, in view of best scientific knowledge and the conservation objectives of the relevant European sites.

The following Supporting Information for Screening for Appropriate Assessment Report (SISAA) has been prepared by **Altemar Ltd.** at the request of **Apollo Submarine Cable System Limited, a Vodafone Group Services Ltd company,** as part of this Maritime Area Usage Licence (MAUL). The MAUL application relates to the proposed installation and operation of the 2Africa Submarine Cable System within the Irish Exclusive Economic Zone (EEZ). The planned cable will extend from Widemouth Bay in Cornwall to a number of countries in Europe, Africa, and the Middle East. The proposed new cable will traverse through the offshore areas in Irish waters including the Southern Canyons cSAC. The purpose of this SISAA is to determine the impact, if any, of the installation and operation of the proposed submarine cable system within the Irish EEZ, individually or in combination with other plans or projects, on Natura 2000 sites.

1.1 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. [redacted], the managing director of Altemar, is an Environmental Scientist and Marine Biologist with 28 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. He is also chair of an internal IFI working group on environmental assessment. [redacted] (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). [redacted] carried out all elements of this SISAA. [redacted] has been involved in eleven international sub marine fibre optic cable projects, many of which involved Horizontal Directional Drills within designated sites and all works required ecological supervision.

2 Background to the Appropriate Assessment

The Habitats Directive 92/43/EEC (together with the Birds Directive (2009/1477/EC)) forms the cornerstone of Europe's nature conservation policy. The Directive protects over 1000 animals and plant species and over 200 "habitat types" which are of European importance. In the Habitats Directive, Articles 3 to 9 provide the legislative means to protect habitats and species of European Community interest through the establishment and conservation of an EU-wide network of conservation sites (NATURA, 2000). These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Birds Directive), Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites (Annex 1.1). Under the terms of the Habitats Directive, Ireland is required to transmit details of candidate SACs (cSAC) to the European Commission for adoption as sites of Community importance. Transmitted sites are examined by representatives of other member states, independent scientists and representatives of Non-Governmental Organisations (NGOs). These sites are not yet formally designated but do have protection under the Habitats Directive. Article 6(3) establishes the requirement for Appropriate Assessment:

"Any plan or project not directly connected with or necessary to the management of the [NATURA 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the component national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."

As outlined in "Managing European sites, The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC" (European Commission, 21 November 2018) *"The purpose of the appropriate assessment is to assess the implications of the plan or project in respect of the site's conservation objectives, either individually or in combination with other plans or projects. The conclusions should enable the competent authorities to ascertain whether the plan or project will adversely affect the integrity of the site concerned. The focus of the appropriate assessment is therefore specifically on the species and/or the habitats for which the European site is designated."*

As outlined in the EC guidance document on Article 6(4) (January 2007)[1]:

"Appropriate assessments of the implications of the plan or project for the site concerned must precede its approval and take into account the cumulative effects which result from the combination of that plan or project with other plans or projects in view of the site's conservation objectives. This implies that all aspects of the plan or project which can, either individually or in combination with other plans or projects, affect those objectives must be identified in the light of the best scientific knowledge in the field.

Assessment procedures of plans or projects likely to affect European sites should guarantee full consideration of all elements contributing to the site integrity and to the overall coherence of the network, both in the definition of the baseline conditions and in the stages leading to identification of potential impacts, mitigation measures and residual impacts. These determine what has to be compensated, both in quality and quantity. Regardless of whether the provisions of Article 6(3) are delivered following existing environmental impact assessment procedures or other specific methods, it must be ensured that:

- *Article 6(3) assessment results allow full traceability of the decisions eventually made, including the selection of alternatives and any imperative reasons of overriding public interest.*
- *The assessment should include all elements contributing to the site's integrity and to the overall coherence of the network as defined in the site's conservation objectives and Standard Data Form, and be based on best available scientific knowledge in the field. The information required should be updated and could include the following issues:*
  - *Structure and function, and the respective role of the site's ecological assets;*
  - *Area, representativity and conservation status of the priority and nonpriority habitats in the site;*
  - *Population size, degree of isolation, ecotype, genetic pool, age class structure, and conservation status of species under Annex II of the Habitats Directive or Annex I of the Birds Directive present in the site;*

[1]European Commission. (2007).Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission;

- *Role of the site within the biographical region and in the coherence of the European network; and,*
- *Any other ecological assets and functions identified in the site.*

- *It should include a comprehensive identification of all the potential impacts of the plan or project likely to be significant on the site, taking into account cumulative impacts and other impacts likely to arise as a result of the combined action of the plan or project under assessment and other plans or projects.*
- *The assessment under Article 6(3) applies the best available techniques and methods, to estimate the extent of the effects of the plan or project on the biological integrity of the site(s) likely to be damaged.*
- *The assessment provides for the incorporation of the most effective mitigation measures into the plan or project concerned, in order to avoid, reduce or even cancel the negative impacts on the site.*
- *The characterisation of the biological integrity and the impact assessment should be based on the best possible indicators specific to the European assets which must also be useful to monitor the plan or project implementation."*

3 Stages of the Appropriate Assessment

This SISAA was undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC, 2001), Part XAB of the Planning and Development Act 2000, as amended, in addition to the December 2009 publication from the Department of Environment, Heritage and Local Government; 'Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities' and the European Communities (Birds and Natural Habitats) Regulations 2011. In order to comply with the above Guidelines and legislation, the Appropriate Assessment process must be structured as follows:

1) Screening stage:
   - Description of plan or project, and local site or plan area characteristics;
   - Identification of relevant European sites, and compilation of information on their qualifying interests and conservation objectives
   - Identification and description of individual in combination effects likely to result from the proposed project;
   - Assessment of the likely significance of the effects identified above. Exclusion of sites where it can be objectively concluded that there will be no likely significant effects; and,
     Conclusions
2) Appropriate Assessment (Natura Impact Statement):
   - Description of the European sites that will be considered further;
   - Identification and description of potential adverse impacts on the conservation objectives of these sites likely to occur from the project or plan; and,
   - Mitigation Measures that will be implemented to avoid, reduce or remedy any such potential adverse impacts
   - Assessment as to whether, following the implementation of the proposed mitigation measures, it can be concluded, beyond all reasonable scientific doubt, that there will be no adverse impact on the integrity of the relevant European Site in light of its conservation objectives"
   - Conclusions.

If it can be demonstrated during the AA screening phase (Stage 1), that the proposed project will not have a significant effect, whether alone or in combination with other plans or projects, on the conservation objectives of a Natura 2000 site, then no further AA (Stage 2) will be required. It is important to note that there is a requirement to apply a precautionary approach to AA screening. Therefore, where effects are possible, certain or unknown at the screening stage, AA will be required.

In addition, it should be noted that Article 6(3) of the Habitats Directive must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an AA of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site.

4 Stage 1 Screening Assessment

4.1 Management of the Site

The plan or project is not directly connected with, or necessary to the management of NATURA 2000 sites.

4.2 Description of the Proposed Project

4.2.1 Project Overview

2Africa is a new submarine cable system over 45,000km in length that will connect the UK to a number of countries in Europe, Africa, the Middle East and Asia to support global data growth. The level of broadband traffic is growing exponentially. Consumer appetites for new applications like cloud computing, on-demand video and social media appear limitless. The demand for new connectivity is driven by a business environment in which ultra-broadband access is essential for sustainable growth and development. The purpose of the submarine cable project is to significantly increase the capacity, quality and availability of internet connectivity between Africa and the rest of the world. This is of particular significance for a continent that has historically been behind the global average in internet penetration.

By directly connecting numerous countries around the entire coast of Africa to Europe and the Middle East region, businesses and consumers will benefit from enhanced capacity and reliability for services such as telecommuting, HD TV broadcasting, internet services, video conferencing, advanced multimedia and mobile video applications. The project will also underpin future mobile and fixed broadband access. This will help African leaders to implement their 2030 visions and to meet many of the Sustainable Development Goal (SDG) challenges related to or depending on internet connectivity.

Alcatel Submarine Networks (ASN) have been contracted by the 2Africa Consortium to engineer, manufacture and install the cable system, which is expected to be ready for service in 2024. The system is to extend from a landfall in the UK through the Irish Exclusive Economic Zone (EEZ) as shown in Figures 2 and 3.The cable will contain optical repeaters powered by high-voltage Power Feed Equipment (PFE) which is located in the existing Cable Landing Station (CLS) at Bude, UK. The PFE has an Ocean Ground Bed (OGB) consisting of an 8-electrode earth array which is already installed adjacent to the CLS. As the CLS and OGB are already in-situ, they are not part of the scope of this project / document.

4.2.2 Project Installation Timeframes

The 2Africa cable installation within Ireland's EEZ and the Southern Canyon cSAC was planned for December 2023, and is now being rescheduled for Q2 2024.

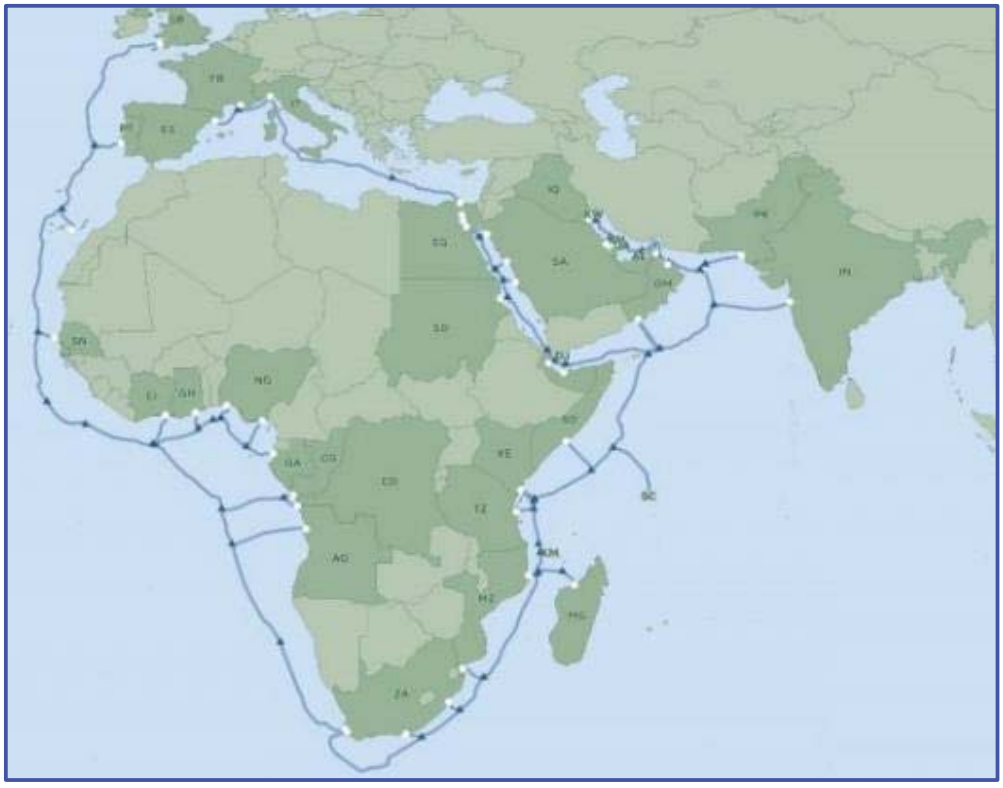

***Figure 1**: 2Africa Overview Chart (Source: ASN, 2021)*

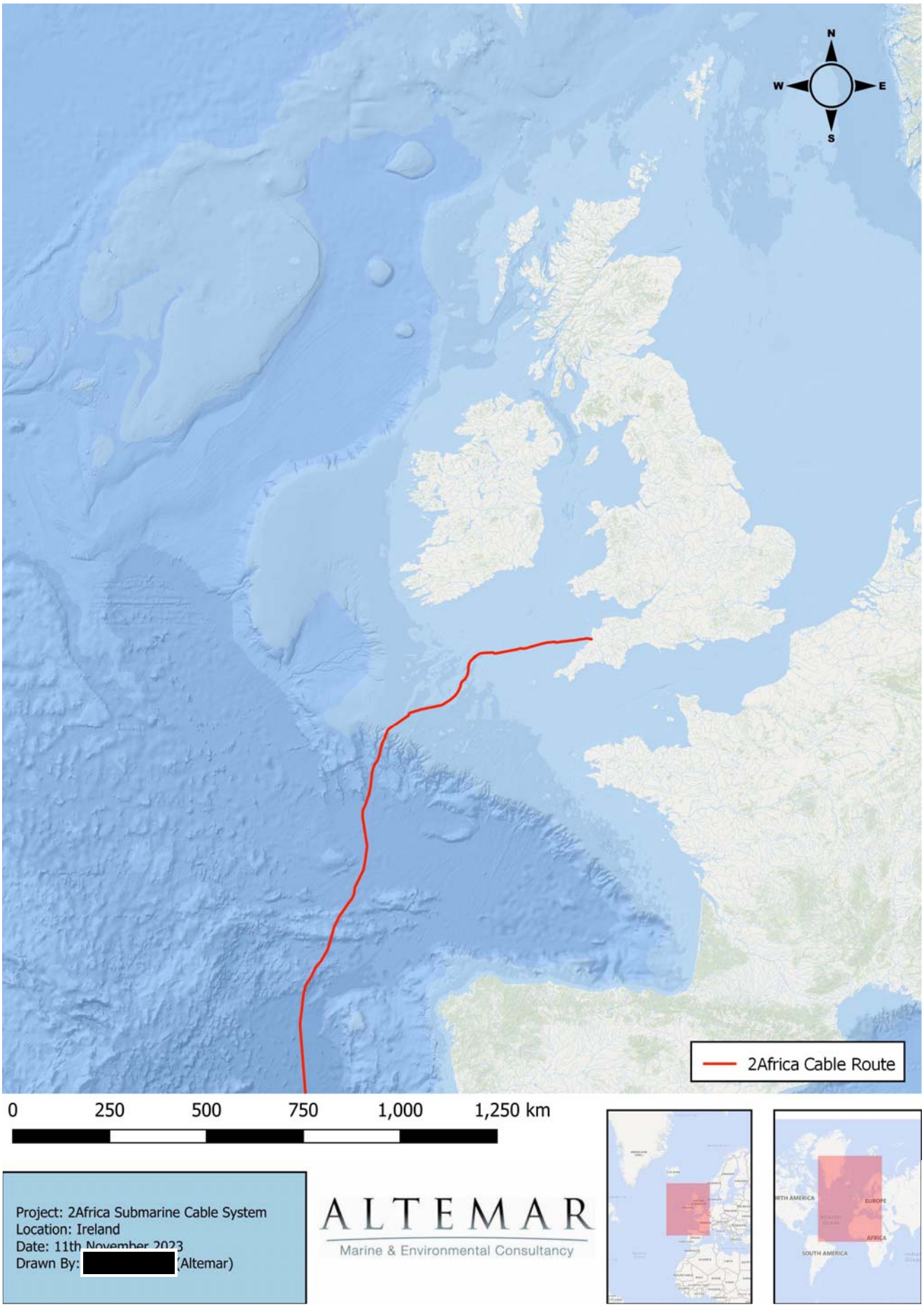

Figure 2. *Schematic of the proposed network*

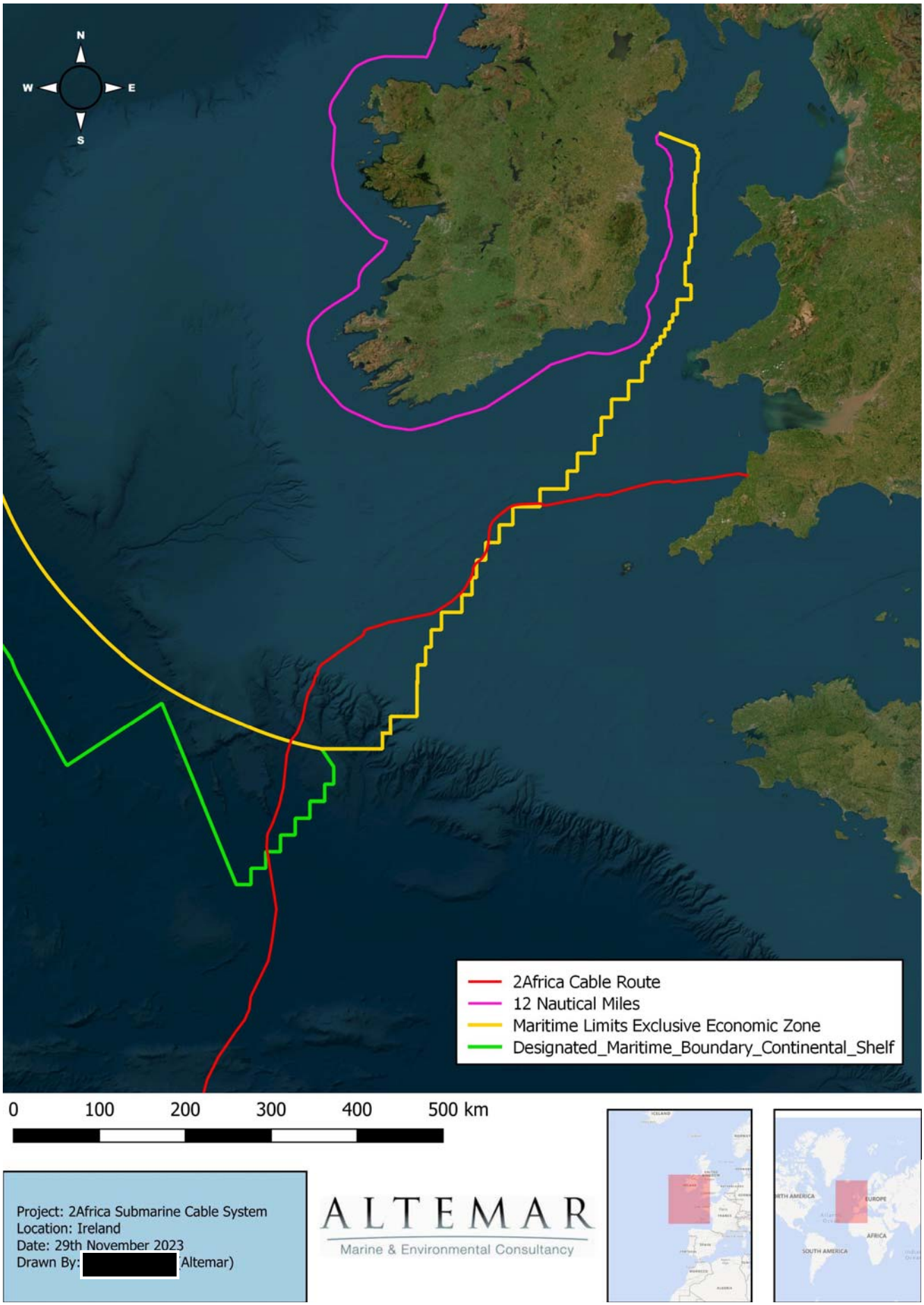

Figure 3. *Proposed route through Irish waters*

4.2.3 2Africa Subsea Cable Design

The subsea fibre optic cable installed for the 2Africa system in the UK will be the OALC4 cable, developed and manufactured by ASN. One of the functions of submarine cables is to protect the fibre pairs they contain to ensure data can be transmitted across the system. They also contain metallic elements which power the repeaters in the system as well as feed an electric current to enable cable breaks to be localised so any issues can be identified and fixed quickly, minimising disruption.

To meet these functions, submarine cables contain fibre optic pairs that float freely in a hydrophobic jelly which are then encased in a stainless-steel tube. Two layers of steel wires are wrapped around the outside of the tube to protect against pressure, any contact with the cable and to provide tensile strength. This is then contained in a hermetically sealed conductor tube and insulated with a layer of polyethylene to form the basic Light Weight (LW) cable that is used in deep-sea environments. The polyethylene layer provides high voltage electrical insulation. In shallow water or high-risk areas, additional layers of steel armour wires are added to further protect the cable from external factors such as anchor damage and trawling.

All components encased within the cable package are environmentally benign and stable. There is no possibility of any chemical leaching or similar.

There are five types of protection available for the OALC4 cable: Light Weight (LW), Light Weight Protected (LWP), Single Armour (SA), Double Armour (DA) and Double Armour Heavy (DAH). Figures 4 and 5 show the specifications of each of these cables.

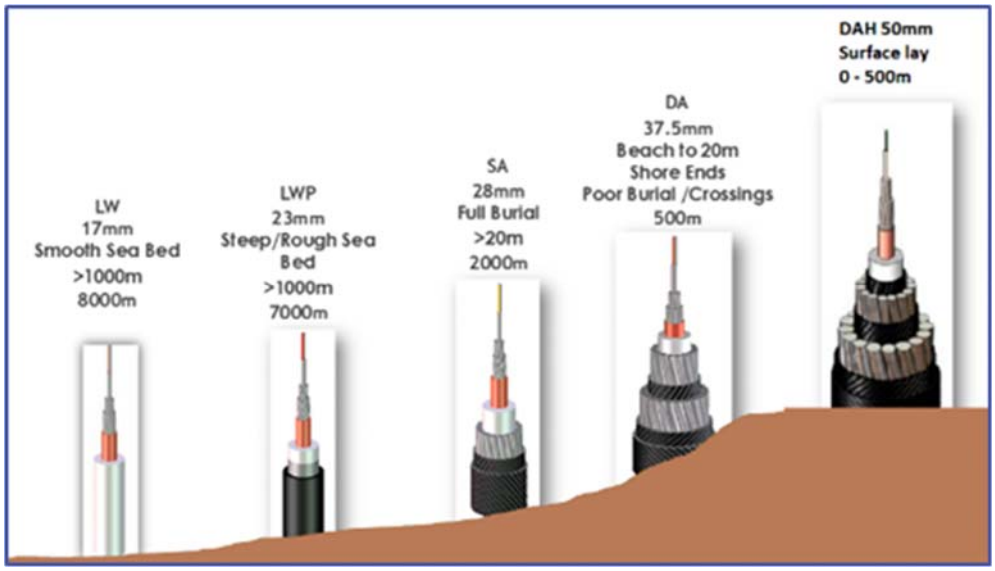

***Figure 4**: Protection choices and conditions of the OALC4 cable (Source: ASN, 2021)*

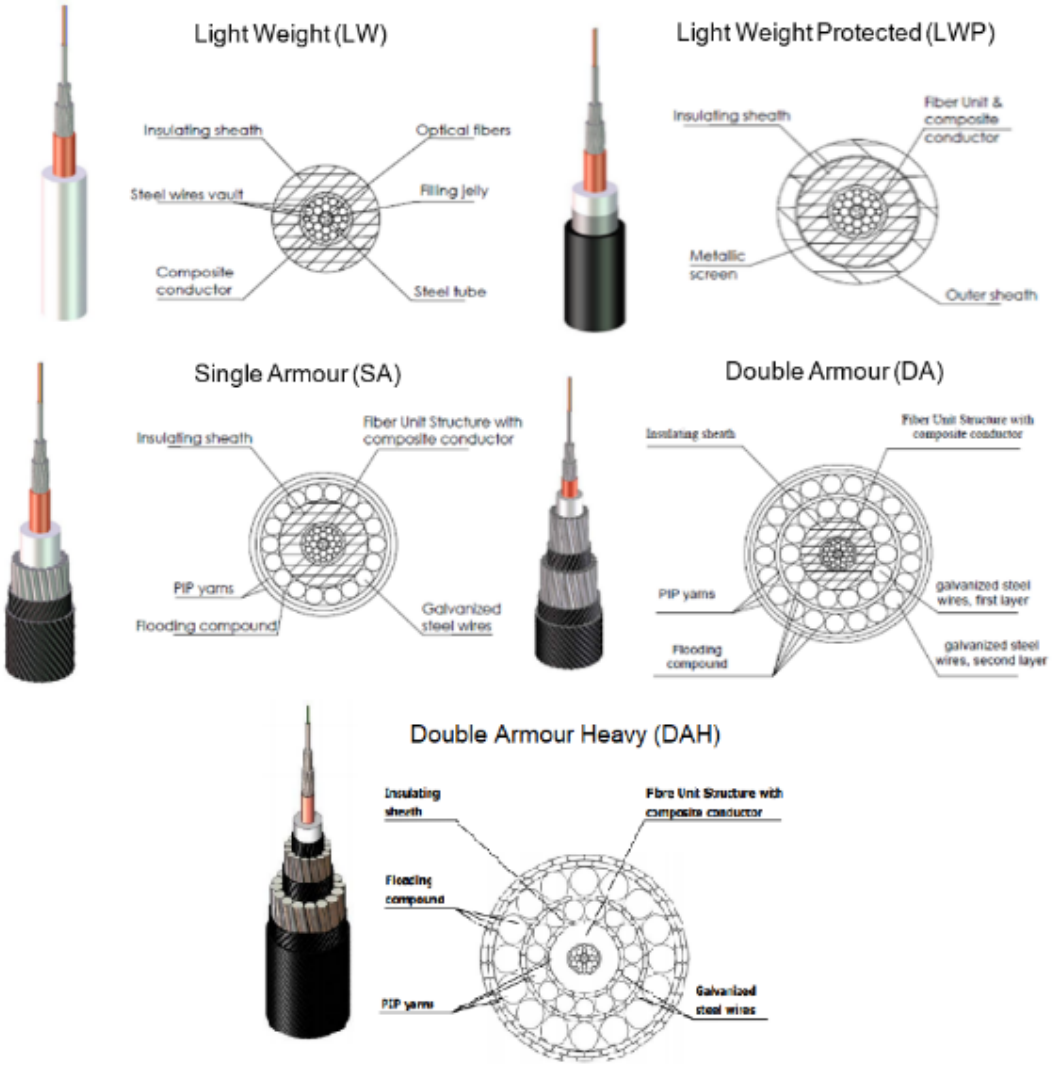

***Figure 5**: Cross sections of OALC4 cable types (Source: ASN, 2021)*

4.2.4 Installation of 2Africa in the Southern Canyons cSAC and Through the Irish EEZ

Work Performed Prior to Installation

Cable Route Selection & Cable Engineering

During the planning and engineering stage, desktop studies were completed to assess site-specific conditions and areas to avoid when routing the cable, as well as identifying key stakeholders in the area. Some of the key factors assessed during the desktop study include anthropogenic factors (such as fishing, shipping and anchoring), meteorological conditions, oceanographic conditions, geological conditions, marine protected areas, permitting and marine operations. The desktop study was conducted in July 2020; it did avoid all established marine protected areas proximate to the 2Africa route within the Irish EEZ and Continental Shelf, however at that time the Southern Canyons cSAC had not been established. It was declared on 18th November 2022. A key output of the study includes a Route Position List (RPL) which was used for initial planning, approximate cable quantities and the subsequent cable route survey operations. The RPL is a list of coordinates, normally referred to the WGS84 Datum, that describes the planned cable route via a number of alter courses positions, cable slack, cable type, water depth, heading, maritime boundaries, cable body placement (where appropriate), planned burial locations, and crossing locations of other undersea cables.

Cable Route Survey

The geophysical and geotechnical surveys for the Irish EEZ section of the proposed 2Africa subsea cable system were conducted by Fugro between December 2020 and March 2021. This data informed further route engineering within the survey swathe to find the optimum route for the cable, avoiding known hazards and rough topography. The RPL was subsequently revised to present the optimum route based on the survey data.

As part of the preliminary work and the cable route survey, cable crossings along the proposed route were identified. The 2Africa system crosses 6 in-service cables within the Ireland EEZ, but none are situated within the Southern Canyons cSAC.

Stakeholder Engagement

Fisheries

Brown & May Marine Ltd (BMML) were contracted to act as Fishery Liaison Consultants for the 2Africa cable survey operations. Fisheries liaison will continue prior to and throughout cable installation.

Marine Aggregates

There will be no interaction with any marine aggregates activity.

Offshore Energy

There will be no interaction with any offshore energy activity within Irish waters or the Southern Canyon cSAC during cable installation.

Oil and Gas

There will be no interaction with any offshore oil and gas activity within Irish waters or the Southern Canyon cSAC during cable installation.

Cable Laying Operations through Ireland's EEZ and Southern Canyons cSAC

Cable Route Selection & Cable Engineering

The 2Afica cable first enters the Irish EEZ at position 50° 31.7852'N, 007° 36.000'W.

Thereafter, the cable sequentially exits the Irish EEZ, re-enters the UK EEZ at several locations. The reason for the several exit/entry points is due to the stepped nature of the UK and Ireland EEZ boundary in this area.

The positions are as follows:

Exit UK EEZ/Enter Ireland EEZ - 50° 31.7852'N, 007° 36.0000'W.

Exit Ireland EEZ/Enter UK EEZ - 50° 10.0000'N, 008° 21.5637'W.

Exit UK EEZ/Enter Ireland EEZ - 50° 04.3746'N, 008° 24.0000'W.

Exit Ireland EEZ/Enter UK EEZ - 50° 00.0000'N, 008° 28.7633'W.

Exit UK EEZ/Enter Ireland EEZ - 49° 58.3420'N, 008° 32.0226'W.

Enter Southern Canyons cSAC - 49° 01.3370'N, 010° 46.1588'W.

Exit Ireland EEZ to High Seas - 48° 15.1144'N, 011° 15.9334'W

Exit Southern Canyons cSAC - 48° 10.8165'N, 011° 17.8675'W.

See Figure 6 below.

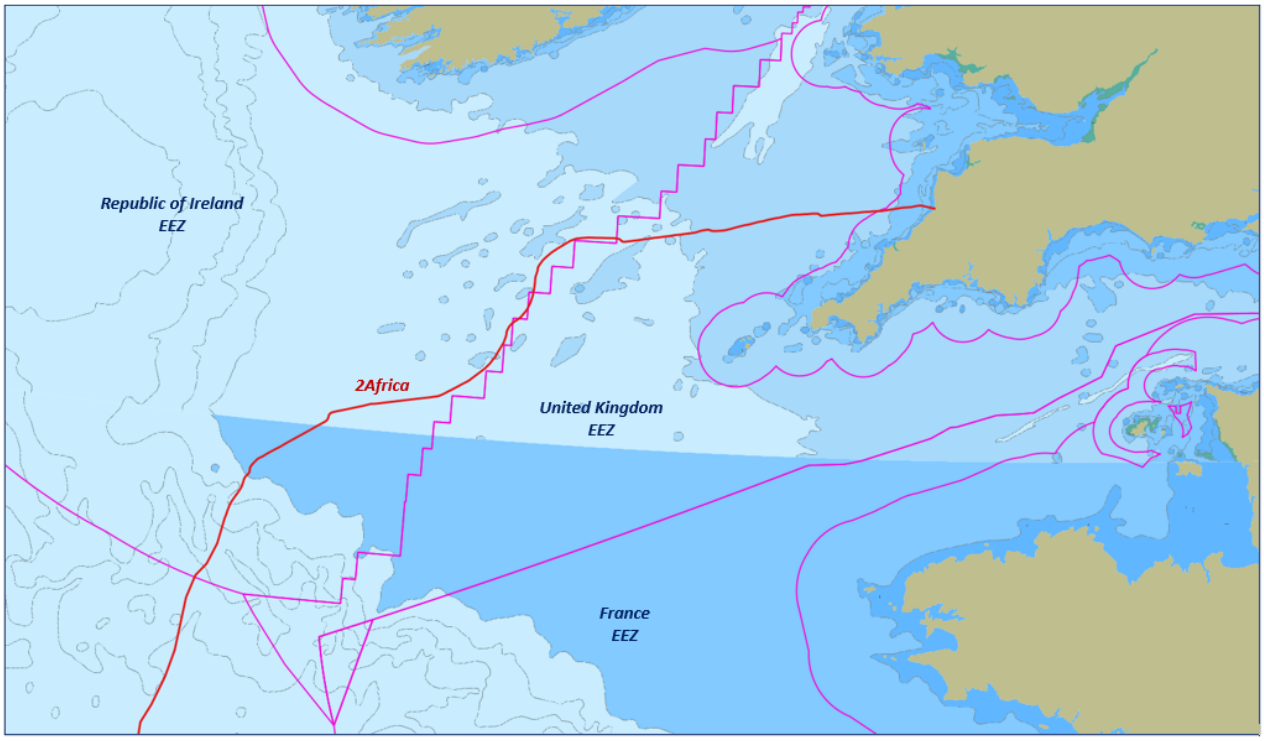

***Figure 6**: Entry & Exit Points of the Irish EEZ*

The 2Africa cable system will be predominantly buried by cable plough (see Figure 9) in water depths to 1,470 metres, at which point, ploughing operations will cease. The main rationale for plough burial is to protect the cable against external aggression; in this case demersal fishing activities i.e. bottom trawling. Without such protection, the cable could become easily damaged by fishing activities, requiring unnecessary, costly and time-consuming cable repairs. Cable protection/burial by plough has proven to be a very effective protection methodology, with a very low seabed surface area affected and is extensively utilised worldwide.

At crossings with other in-service cables, the plough is recovered and the short unburied section is latterly buried by means of a water jetting Remotely Operated Vehicle (ROV) see Figure 12.

In some limited areas within Ireland's EEZ, cable burial cannot be conducted due to unavoidable hard bottom conditions or areas of steep seabed slopes, high relief, or similar.

Pre-Lay Grapnel Run (PLGR) Operations

Prior to the cable installation and burial activities, a PLGR operation campaign will be conducted only in areas of burial to detect and clear any possible objects or debris along the route so that the trenching tools can operate safely and to maximise burial potential. Examples of debris can include old out-of-service telecommunications cables (usually telegraph) which may have been broken and pulled out of position, old fishing gear, rope and anchor chains.

A towed grapnel will be used (see Figures 7 and 8), the type of which are selected depending on the seabed conditions. Adjustments may be made to the grapnel train offshore subject to site experience – for instance, more chain may be added to weigh down the leading end of the assembly. This is determined by the Master/Officer on Watch, based on the seabed and tension feedback recorded.

The operations will follow the recommendations set out in ICPC Recommendation No. 2 (ICPC, 2015). Any debris recovered during the PLGR operations will be disposed of appropriately onshore. The PLGR operations can be performed by the cable ship or another vessel with specific equipment fitted and the same specification navigation and positioning system as the main lay vessel.

***Figure 7**: Spearpoint Grapnel & Giffords*

***Figure 8:** Typical PLGR rigging (Source: ASN, 2021)*

Main Lay Operations

Within Ireland's EEZ and through the Southern Canyons cSAC, the 2Africa cable system will be installed using a dedicated cable lay vessel. Where the cable is to be buried, a plough will be used to a target burial depth of 2m (depending on seabed conditions). The cable will be surface laid whilst traversing an area of hard ground with some boulders at the entry point to the cSAC. From KP 544 – 553, the cable will be surface laid from the edge of the shelf break to deeper water due to steep side slopes and high relief etc., from the 264 to 440 metre water depth contours (Table 1). Within this surface laid section, cable slack is engineered such that the cable accurately conforms to the seabed contours, eliminating the potential for any lateral movement of the cable and ensuring its stability on the seabed. No trawl scars have been noted within this area. At the end of last section of plough burial at KP577, the cable will be surface laid thereon to the exit of the Southern Canyons cSAC at KP 632 at a water depth of 4,003 metres. During surface lay operations, the cable slack i.e. the excess cable paid out vs. ground covered is laid slightly positive at c. 3%, such that the cable thus closely follows the seabed contours and remains in contact with it. This laying methodology ensures that the cable remains stable on the seabed without any lateral movement. The cable lay vessel will use a dual high accuracy Dynamic Global Positioning System (DGPS) navigation system to lay the cable as per the target route shown in the RPL.

KP[1] range	Latitude/Longitude	Water Depth (metres)	Comments
528	49° 01.3370'N 010° 46.1588'W	**155**	**Enter Southern Canyons cSAC – no plough burial due to boulders**
529	49° 01.1268'N 010° 46.6925'W	**156**	**Commence plough burial**
531	49° 00.7114'N 010° 47.7468'W	156	Trawl scar north of cable line
536	48° 58.6362'N 010° 50.5012'W	158	Trawl scars across cable route
536 - 542	48° 58.6362'N 010° 50.5012'W to 48° 55.6511'N 010° 51.9127'W	158 - 194	Very heavy accumulation of trawl scars
544 - 553	48° 54.6941'N 010° 52.5352'W to 48° 50.3281'N 010° 55.2881'W	**264 - 550**	**No plough burial due side slopes, steep slopes, high relief at shelf break**
553	48° 50.3281'N 010° 55.2881'W	550	Resume plough burial
557	48° 48.4750'N 010° 56.7500'W	730	Trawl scars
558	48° 48.4700'N 010° 57.0000'W	780	Trawl scars
561 - 567	48° 46.4259'N 010° 58.1431'W to 48° 43.7171'N 011° 00.3797'W	836 – 1,000	Numerous trawl scars
568.5	48° 43.0000'N 011° 00.9000'W	1,060	Trawl scars
571	48° 41.4721'N 011° 01.4836'W	1,150	Trawl scars
573 - 574	48° 40.5011'N 011° 01.8722'W to 48° 40.0955'N 011° 01.9962'W	1,210 – 1,270	Numerous trawl scars
577	48° 38.5311'N 011° 02.5770'W	**1,470**	**End of plough burial**
580	48° 36.9968'N 011° 03.1443'W	1,733	Cable transition from Single Armoured Light (SAL) to Lightweight Protected cable (LWP)
622	48° 16.2646'N 011° 15.1230'W	3,781	Cable transition from LWP to Lightweight cable (LW)
632	48° 10.8165'N 011° 17.8675'W	**4,003**	**Exit Southern Canyons cSAC**

[1] KP refers to "kiliometre point" and refers to the distance from the beach manhole (BMH) at Widemouth, UK.

Table 1: *Lengths of cable to be buried and surface laid within Southern Canyons cSAC.*

Onboard, the cable will be stowed into the integrated cable storage tank(s). The cable lay vessel is also equipped with high-end cable laying equipment to load and lay the fibre optic cable. The cable lay vessel will be dynamic positioning (DP) controlled. Vessel specifications for ASN's main lay cable ships are included in Appendix I of this document. One of these vessels or similar will be used to install the 2Africa cable system.

During main lay operations, the average operational speed of the vessel during plough burial is 0.3 knots and up to 4 knots (averaging around 500m / hour) for surface lay in waters shallower than 1500m water depth. The speed may need to be adjusted during installation depending on the topography of the area and weather conditions.

Burial Operations

Beyond the 15m water depth where burial is proposed, a jetting plough will be used for burial, with a target burial depth of between 1.5m and 2m (or to bedrock, whichever is reached first). The plough is in contact with the seabed using its four plough skids and the plough share, which is approximately 0.2m wide. The jets on the plough lubricate the ploughshare to reduce friction between the plough and the seabed during burial operations. The jets naturally fluidise the seabed ahead of the ploughshare and cable burial, making the burial operation smoother and potentially improving the burial depth (although burial depth is dependent on the nature of the seabed). Temporary track marks are left from the plough which will disappear over time leaving the seabed to its natural state due to sediment movement. Figure 10 shows a jetting plough setup.

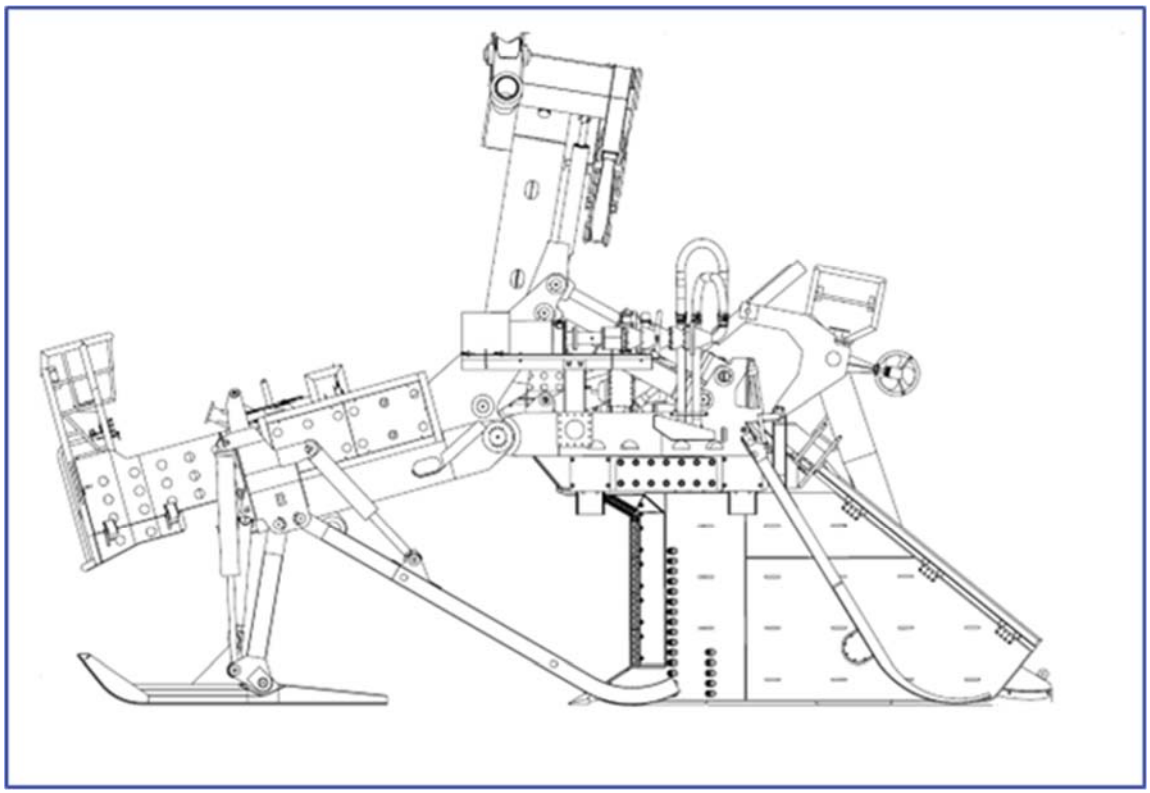

Figure 9: *Jetting plough diagram (Source: ASN, 2021)*

Cable laying commences at a slow speed to ensure correct grade-in of the burial tool, i.e. 10m horizontal movement per 1m grade-in. During grade-in, the cable tension is continuously monitored at the deck tensioner and the catenary is continuously monitored at the chute of the vessel. If there is too much tension in the cable, the pay-out speed of cable needs to be increased accordingly to reduce the tension in the cable such that the cable can approach the natural catenary shape. One of the aims of the jetting plough is to reduce the cable tension at the point of burial.

The cable lay vessel will proceed at a steady speed along the cable route. Typically, during the lay the plough is towed 2-3 times the water depth behind the vessel in a straight line except at alter course positions. Acoustic positioning is used to ensure the plough follows the planned route as precisely as possible. The plough's position behind the vessel is calculated using acoustic positioning, the tow wire length deployed and the water depth in the area.

The tension on the cable will be constantly monitored during this lay operation, along with the cable slack compared to relative ship movement, and the position and orientation of the cable. These measures prevent the formation of loops and help to ensure the minimum bending radius is not compromised.

Key data for monitoring purposes include:

- Cable length;
- Departure angle (visual monitoring);
- Tension at the tensioner;
- Water depth;
- Position of the burial tool; and
- Cable burial depth.

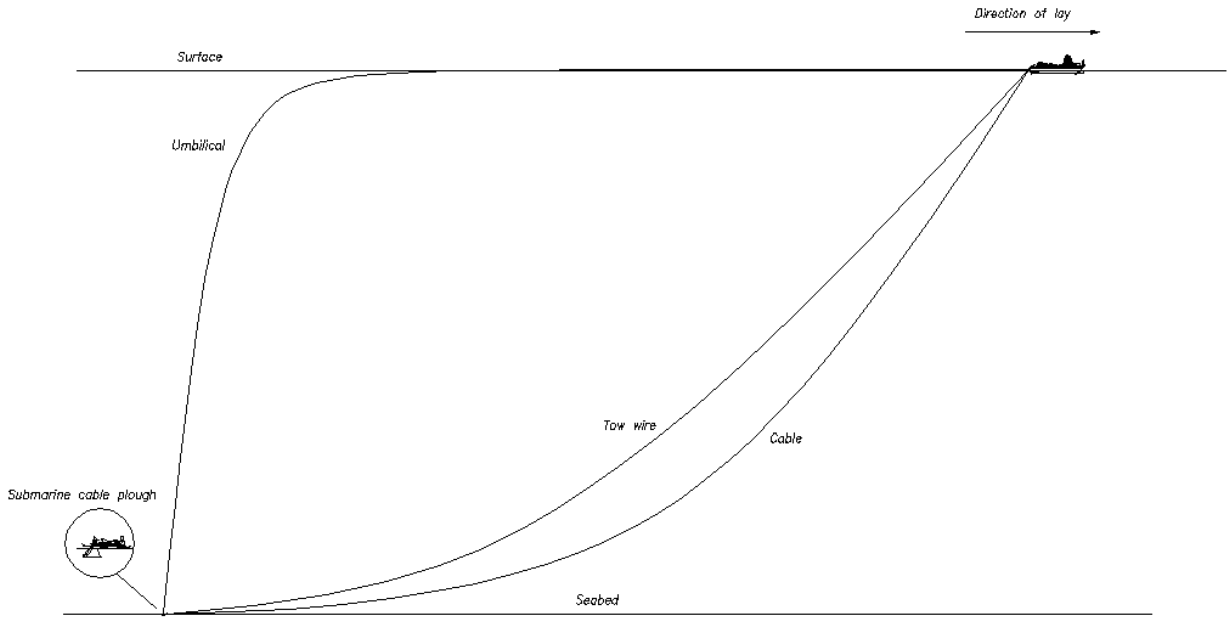

Figure 10: *Diagram of plough operations (Source: ASN, 2021)*

Surface Lay Operations

During the surface lay operations within the Southern Canyons cSAC and into deeper water, the surface lay precision on the seabed is +/- 1% of water depth from the centreline. The surface lay and touchdown positioning is calculated using a force based 2D model which is used across the industry as a standard calculation method to ensure that the cable naturally conforms to the seabed contours. The cable will have very limited movement on the seabed once installed as it is held in position under its own weight.

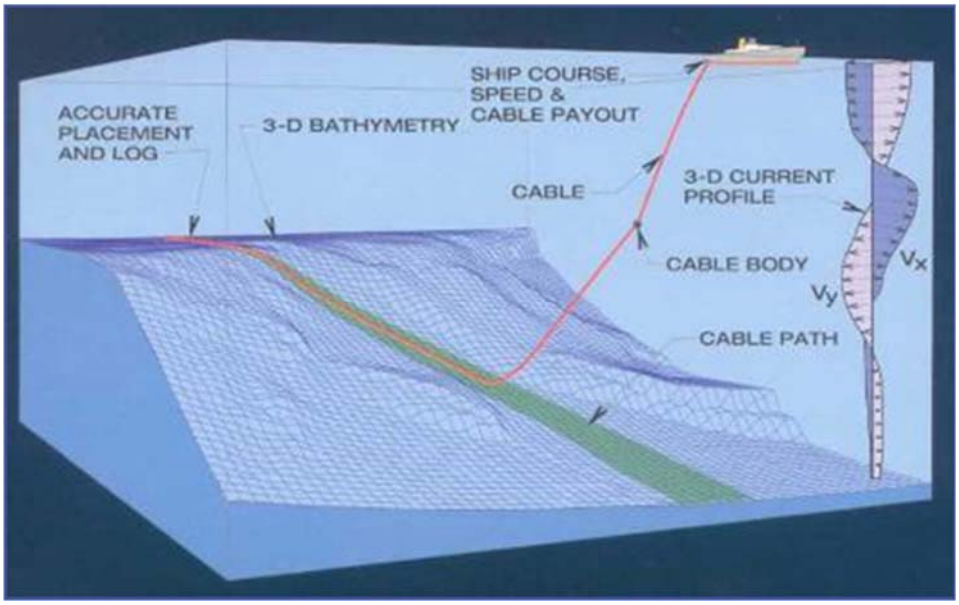

Figure 11: *Surface lay operations diagram (Source: ASN, 2021)*

Post Lay Inspection & Burial (PLIB) Operations

Post Lay Inspection and Burial (PLIB) operations may be carried out in some areas along the route. A visual inspection will be dependent on visibility at the time of the inspection, alternatively the inspection will use cable tracking sensors and forward-facing sonar to determine the burial.

Post lay burial operations will be carried out in plough burial areas at several locations:

- At in-service cable crossings (none planned within the Southern Canyons cSAC, but there are 6 in-service cable crossings within the Ireland EEZ);
- Initial, intermediate and final splices;
- Unplanned plough skips; and
- Areas where seabed slopes are not suited for ploughing and jetting burial is viable (not planned within the Southern Canyons cSAC).

A remotely operated vehicle (ROV) will be deployed to bury the cable (in areas identified in the bullet points above) using a jetting tool.

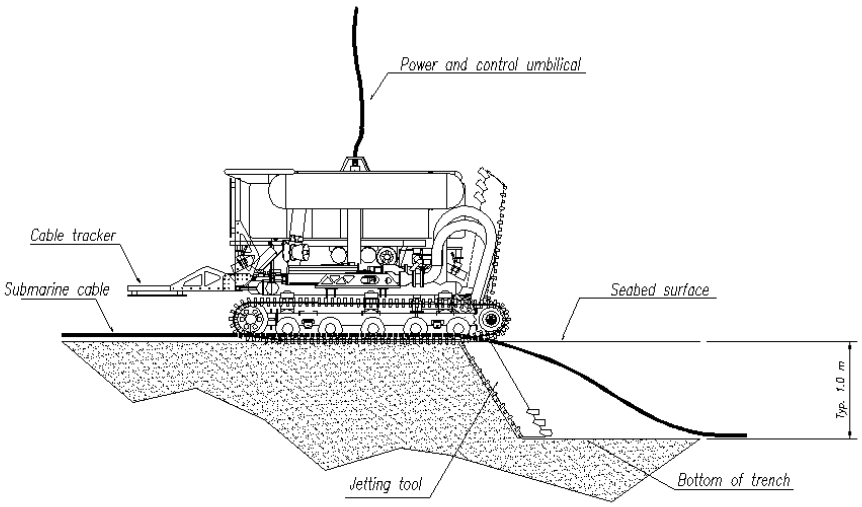

Figure 12: *ROV jetting operations diagram (Source: ASN, 2021)*

4.2.5 Time in Irish waters and in Southern Canyons cSAC

The following is an outline of the perceived time spent in Irish waters and the activities that will be carried out:

Table 1. Time spent in Irish waters

	Activity	Time	Within cSAC
	Enter EEZ		
	Ploughing 8.7 km	0.6 days	No
	Plough up	0.3 days	No
	Cable Crossing	0.3 days	No
	Plough Down	0.3 days	No
	Ploughing 13.5 km	1.1 day	No
	Plough up	0.3 days	No
	Surface Lay 2.1km	0.3 days	No
	Plough Down	0.3 days	No
	Ploughing 0.6km km	0.04 day	No
	Plough up	0.3 days	No
	Cable Crossing	0.3 days	No
	Plough Down	0.3 days	No
	Ploughing 49.4km km	3.4 day	No
	Plough up	0.3 days	No
	Cable Crossing	0.3 days	No
	Plough Down	0.3 days	No
	Ploughing 43km km	3 day	No
	Plough up	0.3 days	No
	Cable Crossing	0.3 days	No
	Plough Down	0.3 days	No
	Ploughing 31.8km km	2.2 day	No
	Plough up	0.3 days	No
	Cable Crossing	0.3 days	No
	Plough Down	0.3 days	No
	Ploughing 52km km	3.6 day	No
	Plough up	0.3 days	No
	Cable Crossing	0.3 days	No
	Plough Down	0.3 days	Yes
	Ploughing 14.6km km	**1.0 day**	**Yes**
	Plough up	0.3 days	Yes
	Surface Lay 9km	0.3 days	Yes
	Plough Down	0.3 days	Yes
	Ploughing 23.9km km	**1.7 day**	**Yes**
	Plough up	0.3 days	Yes
	Surface Lay 52.3km	0.3 days	Yes
	Exit EEZ		No

4.2.6 Plough Deployment Procedure

When commencing ploughing operations, the plough is loaded with the telecommunications cable on the deck of the cableship. The plough is then lifted from deck and slowly deployed overboard vis the use of an 'A' frame.

Once overboarded, the plough is then very slowly lowered into the water column, utilising the towing wire. The plough is then slowly lowered to the seabed vertically while paying out the tow wire, the plough control umbilical and the telecommunications cable. The USBL would be activated at the point of lowering to the seabed in order to monitor the plough position relative to the cableship.

Once on the seabed, the plough is then reconfigured into full ploughing mode. The tow wire, umbilical and telecommunications cables are all paid out slowly to reposition the plough directly behind the cableship to be able to commence ploughing. At the same time, the cableship commences to transition into forward motion, towing the plough behind the cableship and the plough share grades into the seabed to the predetermined burial depth and burial thus commences. The plough positioning behind the cableship is monitored by means of the USBL and navigation positioning systems.

The plough deployment is conducted in a very slow, determined manner to avoid the potential for damage to the plough or telecommunications cable. The deployment can take up to 12 hours.

Plough recovery is a reverse process whereby the cable ship slowly stops burial, the plough share is graded out of the seabed at the same time. Once the cable ship is positioned directly over the plough, the plough is then lifted from the seabed by the tow wire and the plough is slowly recovered to deck. This operation may also take up to 12 hours.

4.2.7 Future Maintenance Activities

In the waters of Ireland's Exclusive Economic Zone (EEZ) and within the Southern Canyons Special Area of Conservation (SAC), the 2Africa cable system may require repairs primarily due to external factors like fishing activities e.g. fishing gear strikes, and occasionally, product failures. The precise frequency of these repairs cannot be accurately anticipated. The location and extent of future repairs are difficult to predict but is not expected to exceed five repairs over the 25 year design life within Irish Waters but is expected to be considerably fewer.

4.2.8 Decommissioning

There is no definitive position on decommissioning of telecommunication submarine cables. UNEP-WCMC (United Nations Environment Program) document, CARTER *et al,* 2009, points out that the removal of submarine telecommunication cables should be evaluated on a case-by-case basis, as the procedures for withdrawal and some local conditions (soil type, crossing with other cables, etc.) can often have a greater environmental impact than the procedures related to the installation itself. In some cases, cables that have a depleted business life may serve research and teaching purposes, which in other words is an extension of their “useful life”, but now under the responsibility of another owner / manager.

The system has a system design life of 25 years however cable system can operate long after this period, and its deactivation can only be performed by the shutdown of the electrical / electronic system and disabling the transmission of information. There are no plans to recover the cable as part of the decommissioning plan.

4.3 Zone of Influence

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

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*". In order to define the extent of the study area for ecological 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), the slow speed of the cable lay (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 during main lay cable installation works, the installation vessel speed will be very slow (0.3 knots during plough burial and 4 knots during surface lay). In light of this, and based on the localised nature of the cable laying impacts, the Zone of Influence in the subtidal was extended to 2 km either side of the cable route to take into account localised resuspension due to cable laying activity. It should be noted that the noise generated from the vessel laying activity is relatively minor, similar in nature to trawling activity. The proposed project is for main lay operations and not marine survey. However, despite the lack of extensive underwater acoustics, that would be used in a tradition marine survey, the project has the potential to introduce noise into the marine environment particularly through the use of a USBL (Ultra Short Baseline) equipment used to locate underwater equipment e.g. plough and ROV's etc. which may extend the effects of the project beyond 2km.

4.4 Identification of Relevant Natura 2000 Sites

The proposed works are not directly connected with, or necessary to, the management of Natura 2000 sites. Special Areas of Conservation and Special Protection Areas (SPA's) within 15 km of the proposed cable route are seen in Figure 13 and Figure 14 respectively. The cable route, Irish 12nm Limit, Irish EEZ, and Irish continental shelf, with a 15km buffer showing proximity to Offshore cSAC's, is seen in Figure 15. The areas where plough burial will be carried out in the cSAC are seen in Figure 16.

There is no landfall proposed within Irish waters and works are solely within the marine Irish EEZ Subtidal outside of the 12nm limit. It should be noted that cable laying works are proposed within the Southern Canyons cSAC (offshore cSAC). There are no other Natura 2000 sites located within 15km of the proposed cable route. Detailed design following survey has resulted in the selection of an optimal route for burial to 1500m (for the security of the cable). Given that there are proposed burial works located within Southern Canyons cSAC, mitigation measures are required to ensure that there are no likely significant effects on the Qualifying Interest of this Natura 2000 site (Reefs [1170]).

The proposed cable route is not located proximate to any European Sites that contain marine mammals as a Qualifying Interest. The nearest European Site containing marine mammals as a Qualifying Interest is Roaringwater Bay and Islands SAC (*Phocoena phocoena* (Harbour Porpoise) [1351] and *Halichoerus grypus* (Grey Seal) [1364]), which is located 142km from the proposed cable route. No significant effects on European Sites that contain marine mammals as a Qualifying Interest are likely as a result of the proposed works. However, out of an abundance of caution, mitigation measures are required to ensure that there are no significant effects on marine mammals protected as an Annex II and Annex IV species via underwater noise during works.

It should be noted that there are no Special Protection Areas (SPA) located proximate to the proposed cable route. The proposed project involves the subtidal laying of a marine cable in the offshore environment. Given the nature of the proposed works and the distance between the proposed cable route and the nearest SPA (128km to Seven Heads SPA), in the absence of mitigation, no significant effects on bird species protected as Special Conservation Interests of any SPA are likely.

Table 2 outlines the NATURA 2000 sites within 15km of the proposed route. Due to the localised and minor nature of the impacts during the installation and operation of the fibre optic cable it is purely out of an abundance of caution that all Natura 2000 sites within 15km of the cable are assessed. No likely significant effects are foreseen on Natura 2000 sites beyond 15km due to the minor and localised nature of the works. An initial screening of NATURA 2000 sites within 15km of the proposed route can be seen in Table 3.

Table 2. Proximity to designated sites of conservation importance

Code	NATURA 2000 Site	Distance
Special Areas of Conservation		
Offshore		
002267	Southern Canyons cSAC	Route passes through site
Special Protection Areas		
N/A	None	N/A

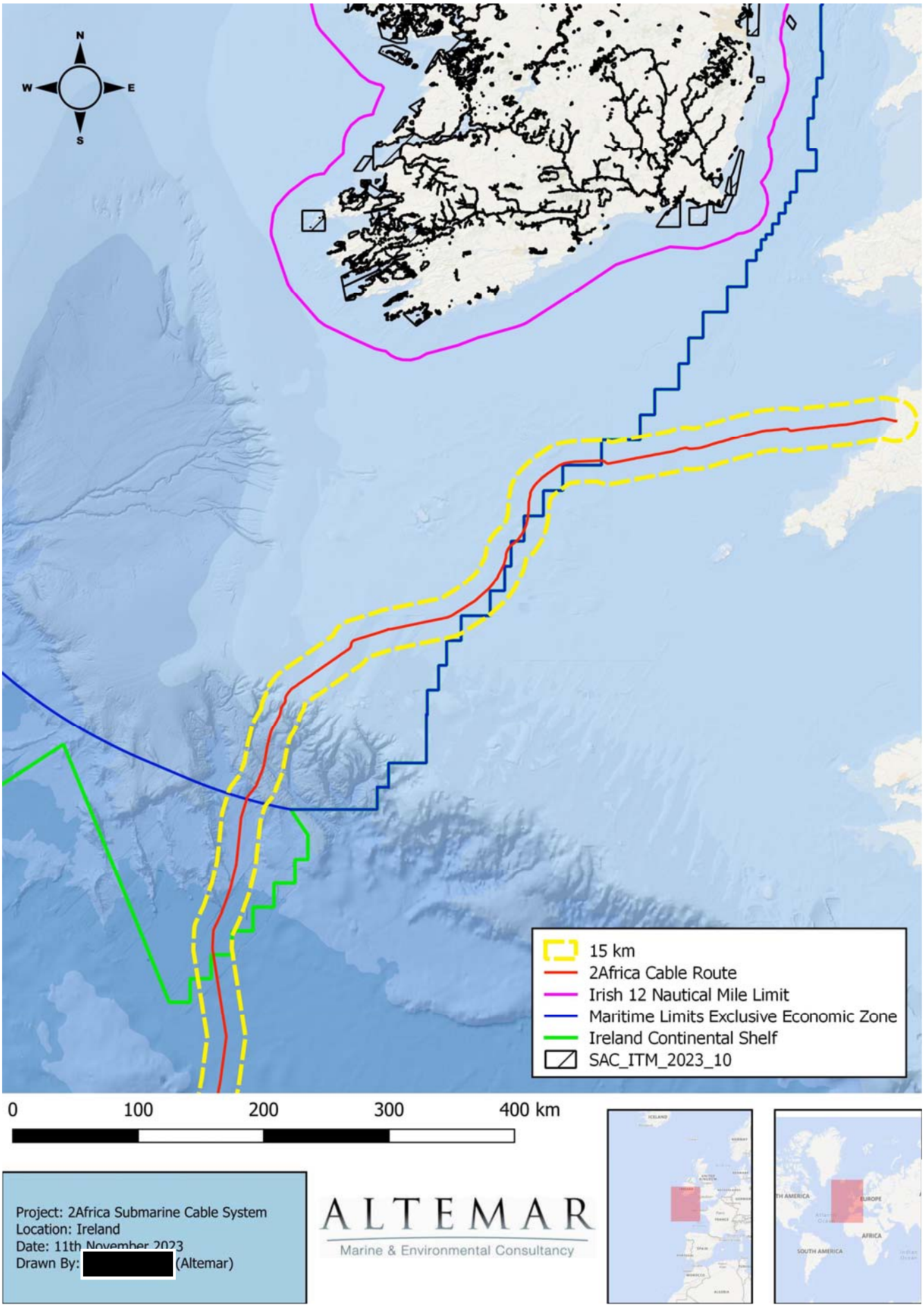

Figure 13. *Terrestrial Special Areas of Conservation*

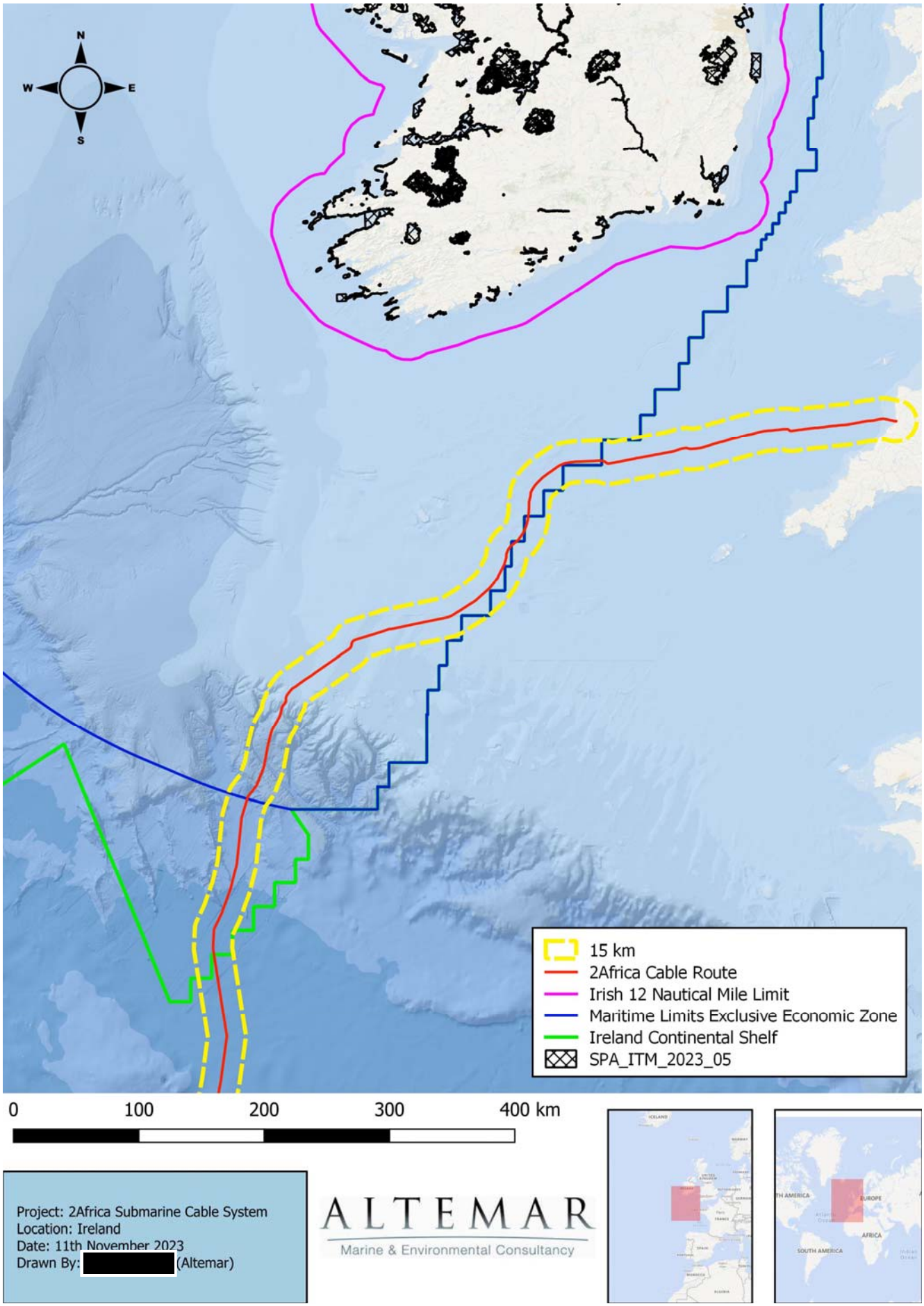

Figure 24. *Special Protection Areas*

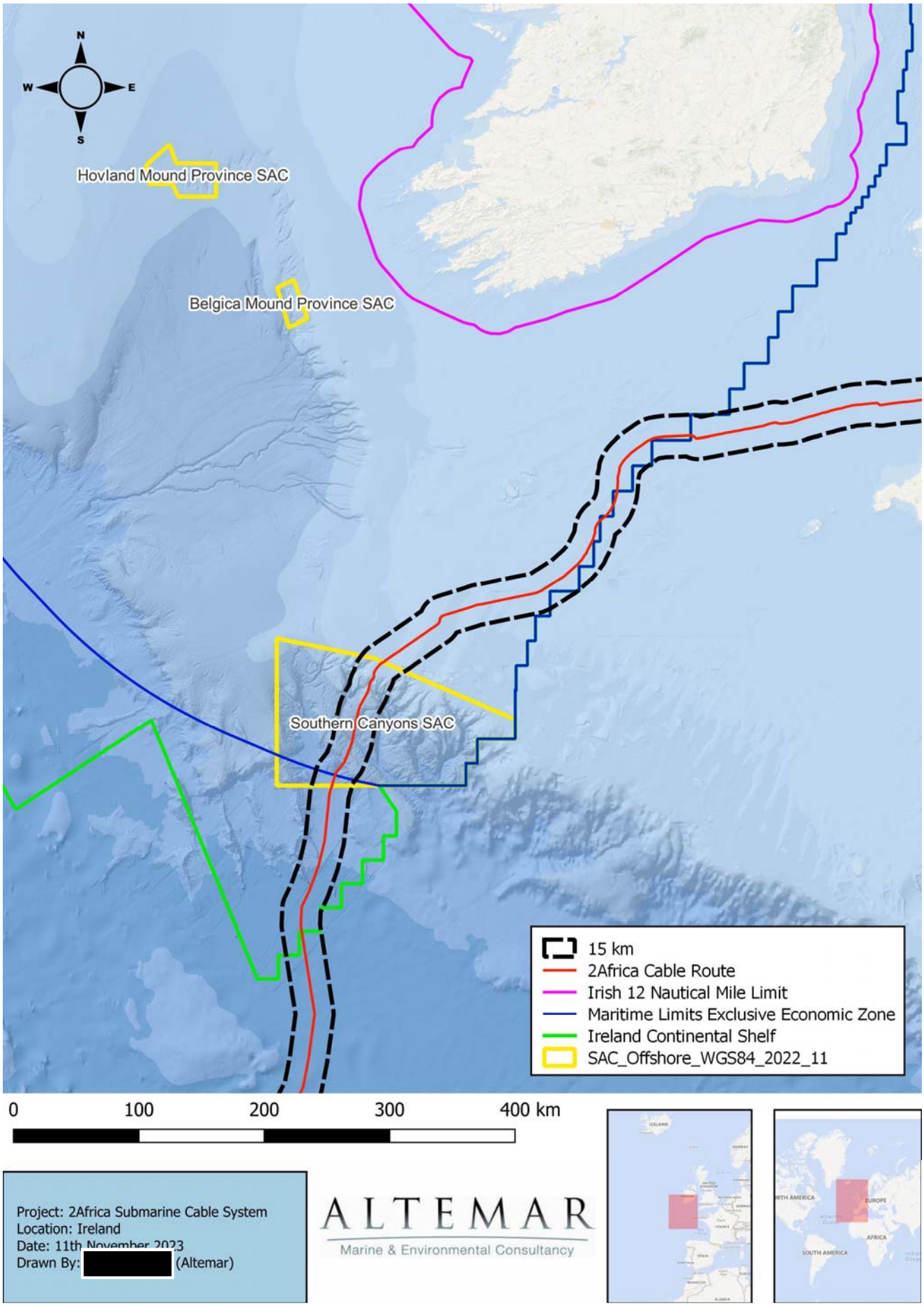

Figure 35. *2Africa cable route in relation to the Irish EEZ, Designated Irish Continental Shelf, and Offshore SACs*

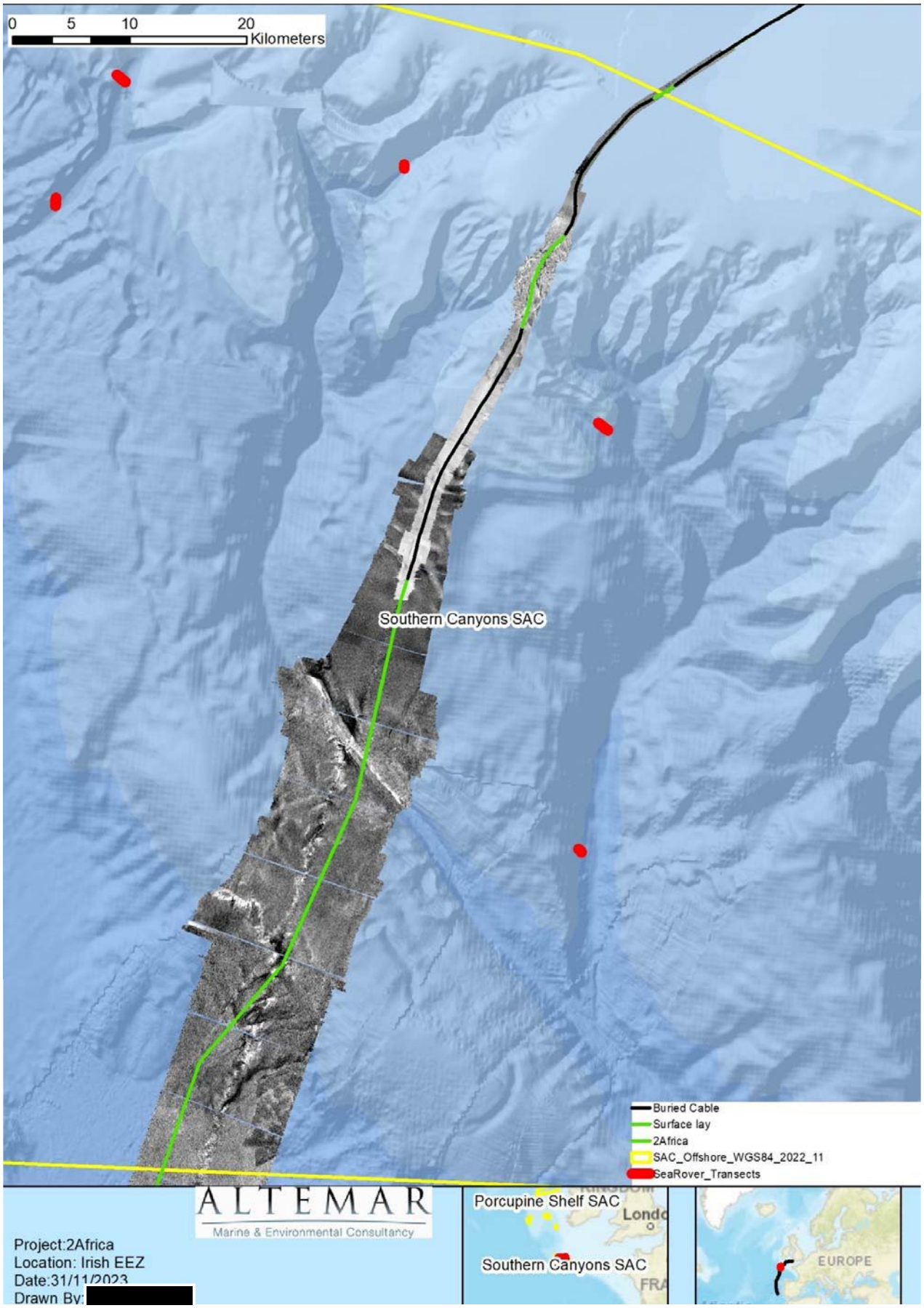

Figure 46. *2Africa cable route in plough and surface lay within the Offshore cSAC.*

Table 1. Initial screening of NATURA 2000 sites within 15km

NATURA 2000 Site	Name	Screened In/Out	Conservation Objectives, Features of Interest and potential for significant effects.
IE 002278	Southern Canyons cSAC	**IN**	**Objective:** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected: 1170 Reefs It should be noted that the designation of this cSAC is recent and the First Order Site-specific Conservation Objectives were prepared on the 09/03/2023. As outlined in the Site Synopsis "*An extensive offshore survey of this site was completed in 2019 using the RV Celtic Explorer and the Holland I ROV. This survey was completed by a team of internationally recognised deep sea ecologists. A total of 50 dives were completed during this leg of the survey. The canyon systems cutting into the continental shelf were formed by sediment erosion events that scoured deep canyons with flanking escarpments. The thalwegs of these canyons exit thousands of meters deep into the abyssal plains below. The SAC boundaries have been designed to encompass this unique habitat, which is exceptional in a European context.*" "*The ecology of the Southern Canyons is understandably complex. There are areas of hard rocky substrate and areas of muddy or sandy sediment. Along the top of the canyon systems, sediment is the dominant substrate. In the canyons, depending on slope, it grades away to bedrock. Bottom currents also play a strong role in the type of fauna observed. Marine snow flushes through the canyons providing a rich food resource for various invertebrates and vertebrates*." **Potential for significant effects** The proposed cable laying route passes through this offshore cSAC. The priorities of the route selection are to provide burial to 1500m to ensure longevity of the cable and to result in minimal impacts on sensitive ecosystems. As a result the route selection has prioritised routing away from Reef habitat along the cable route and within the Southern Canyons cSAC (Figures 19 & 20). Both plough burial and surface lay installation works will be carried out in this cSAC. As demonstrated in Figure 16 and Table 1, the proposed 2Africa cable will be buried via plough burial in this cSAC from 156m to 264 water depth and from 550m to 1470m (Table 1). At depth below 1470m, the cable will be installed via surface lay where no burial is involved. The cable will be surface laid across the canyon seen in Figure 16. Given that main lay works in this cSAC will involve plough burial and surface lay, there is the potential for significant effects on reef habitats within this offshore cSAC in the absence of mitigation. Out of an abundance of caution it is considered that, in the absence of mitigation measures, there may be potential for impact on the qualifying interest of this cSAC through disturbance and the physical impact on the qualifying interest of this cSAC. Mitigation measures are required to ensure that there are no impacts on reefs. Further information is required to determine the potential for adverse effects on this cSAC. **Natura Impact Statement Required**

4.5 Marine Mammals

As outlined in NPWS[2] "*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

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. Figure 17 shows all cetacean species and Figure 18 shows monthly activity trends, in the vicinity of the proposed cable route, as recorded by IWDG sightings scheme. Cetacean activity has been seen in the vicinity of the cable route corridor. Species seen in the area and along the cable route include Fin Whale (*Balaenoptera physalus*), Long-finned pilot whale (*Globicephala melas*), and common dolphin (*Delphinus delphis*). Harbour porpoise (*Phocoena phocoena*) and minke whale (*Balaenoptera acutorostrata*) were noted over 50km from the proposed cable route.

[2] https://www.npws.ie/marine/marine-species/cetaceans

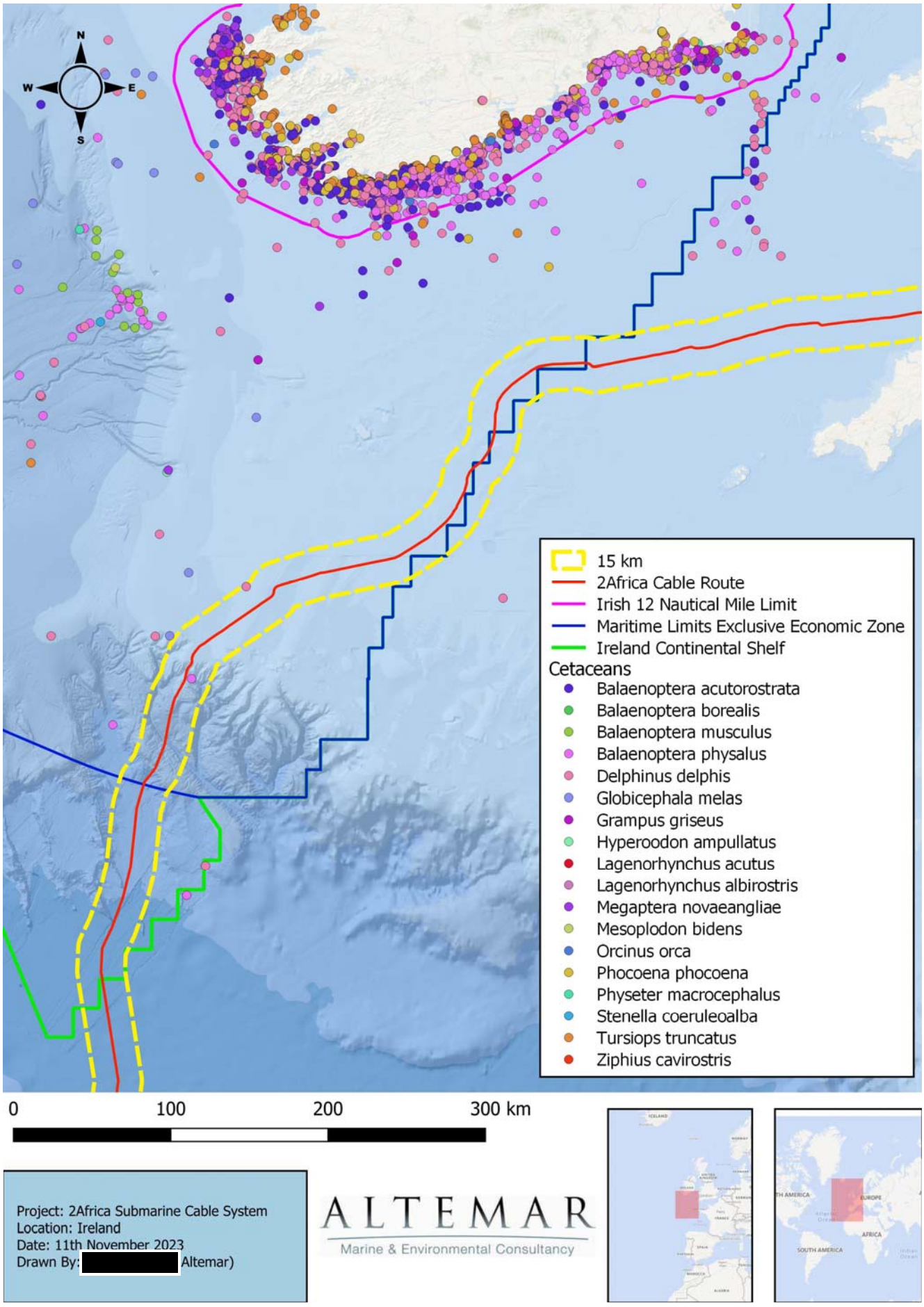

Figure 57. *Recorded cetaceans species sightings (IWDG)*

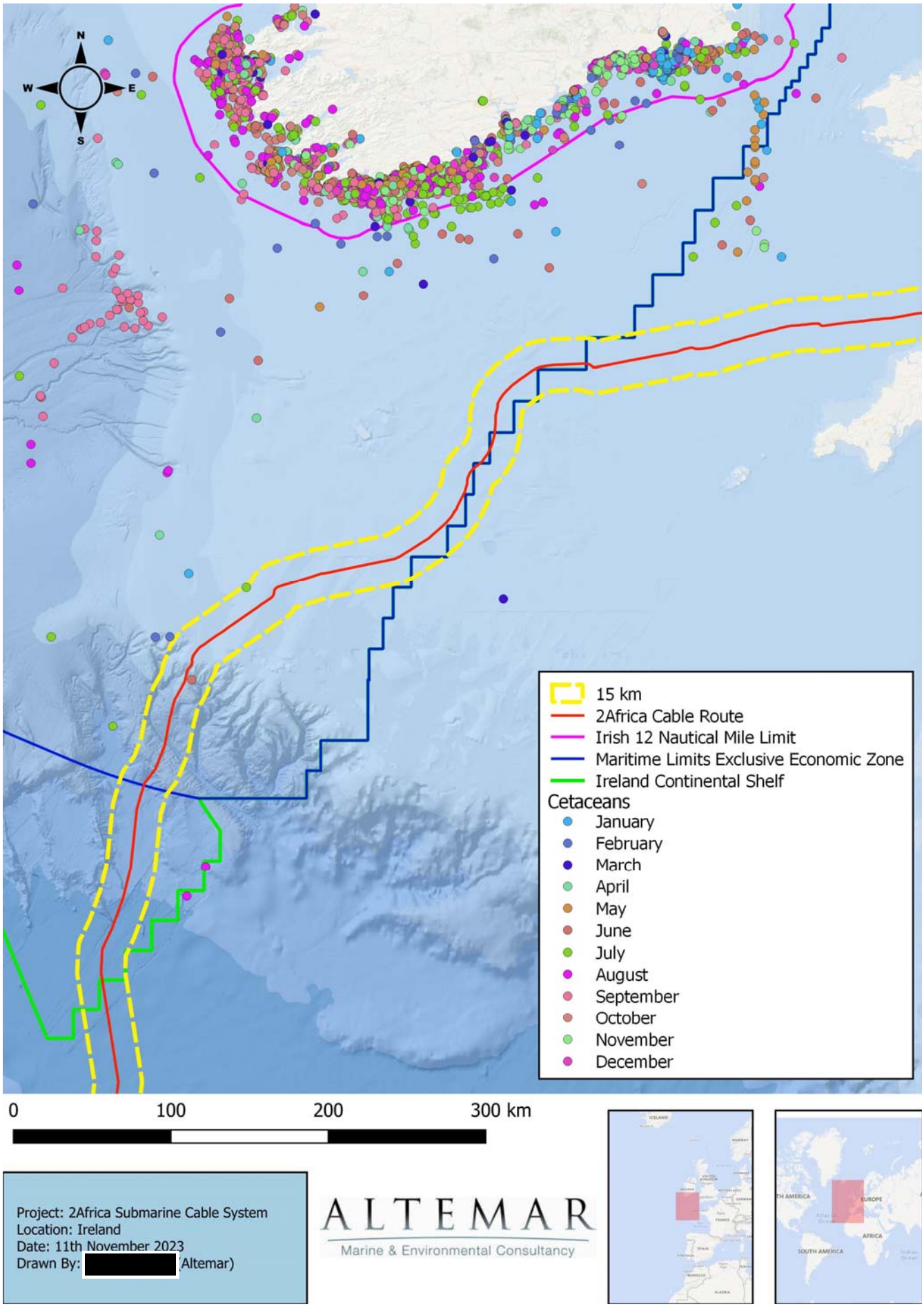

Figure 68. *Recorded cetaceans species sightings (IWDG) during the 12 months of the year. NEXT FIG IS FIG 17*

4.6 In combination 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 were assessed. It should be noted that no terrestrial works are proposed on the island of Ireland. The proposed cable installation works within the Irish EEZ are located exclusively in the offshore subtidal, 127km from the Irish shoreline at its nearest point.

4.6.1. UK Natura 2000 Sites

MARA licencing in Ireland relates to licence applications out to the Irish EEZ limit. In order to assess the potential trans-boundary effects details of designated sites within UK waters were investigated. The Marine Protected Areas (MPA's), SAC's and SPA's within UK waters are seen in Figures 19-21. As a consequence of Brexit, from 1st January 2021, previously designated UK sites are no longer part of the Natura 2000 network but have designation as SAC's and SPA's and protection under UK law. The licencing within the UK territorial sea is covered by a permitting licence system managed by the Marine Management Organisation (MMO)[3], Marine Scotland and Natural Resources Wales, depending on UK jurisdiction. The cable routes 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. Because the proposed cable system passes through UK waters and UK designated sites, mitigation measures will be implemented to protect the qualifying interests of the UK designated sites. It should be noted that a marine mammal observer will be in place within Irish waters.

For the UK element of the proposed cable lay to proceed, it has been 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. For this overall project to take place it requires permitting both within UK and Irish waters. Licencing was granted in UK waters in 2023. The nearest UK designated site to the proposed cable route within the Irish EEZ limit is Greater Haig Fras Offshore MPA, located 0.8 km from the Irish EEZ (within UK waters). Given the distance from the proposed route within the Irish marine area to UK designated sites, the project would not adversely affect the integrity of UK designated sites. These sites have been previously assessed under UK licencing permissions and no in-combination effects would be foreseen.

4.6.2. Irish Projects

The potential impacts of the proposed cable laying are Temporary (i.e. Effects lasting less than a year) and primarily to occur during the brief construction period (with the presence of boats, machinery and personnel in the vicinity of the works) as sediments redistribute over the cable. Impacts on infauna would be deemed to be temporary (i.e. Effects lasting less than a year).

Foreshore licence applications in vicinity of the 2Africa Cable are seen in Table 4. The foreshore applications were assessed for potential in-combination effects with the proposed cable.

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 the cable laying for a marine fibre optic cable in subtidal habitats. As can be seen from using the Best Available Techniques and mitigation measures during cable laying 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 in combination effects are foreseen from the project in conjunction with other projects.

[3] L/2023/00095/1

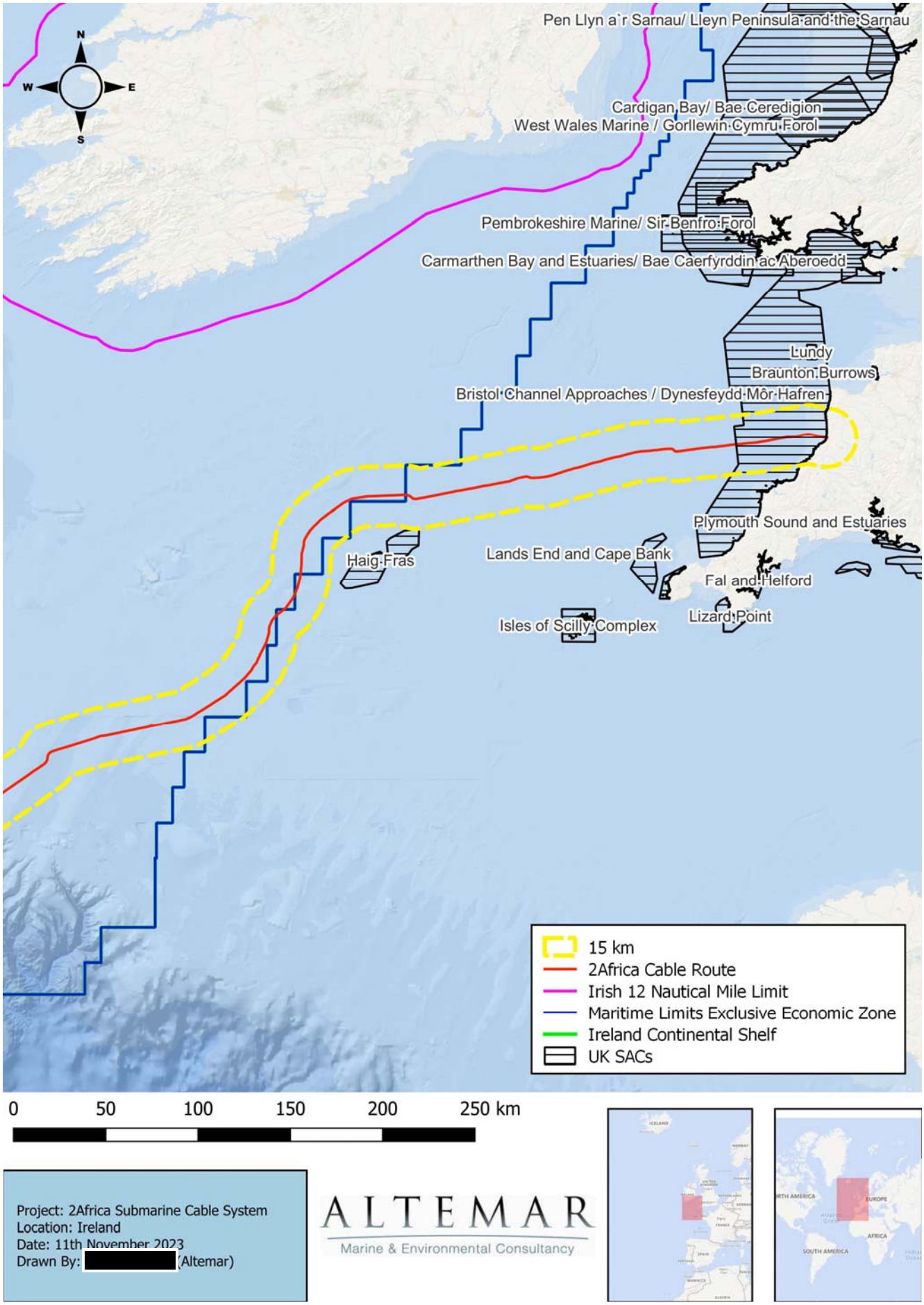

Figure 79. *UK SACs*

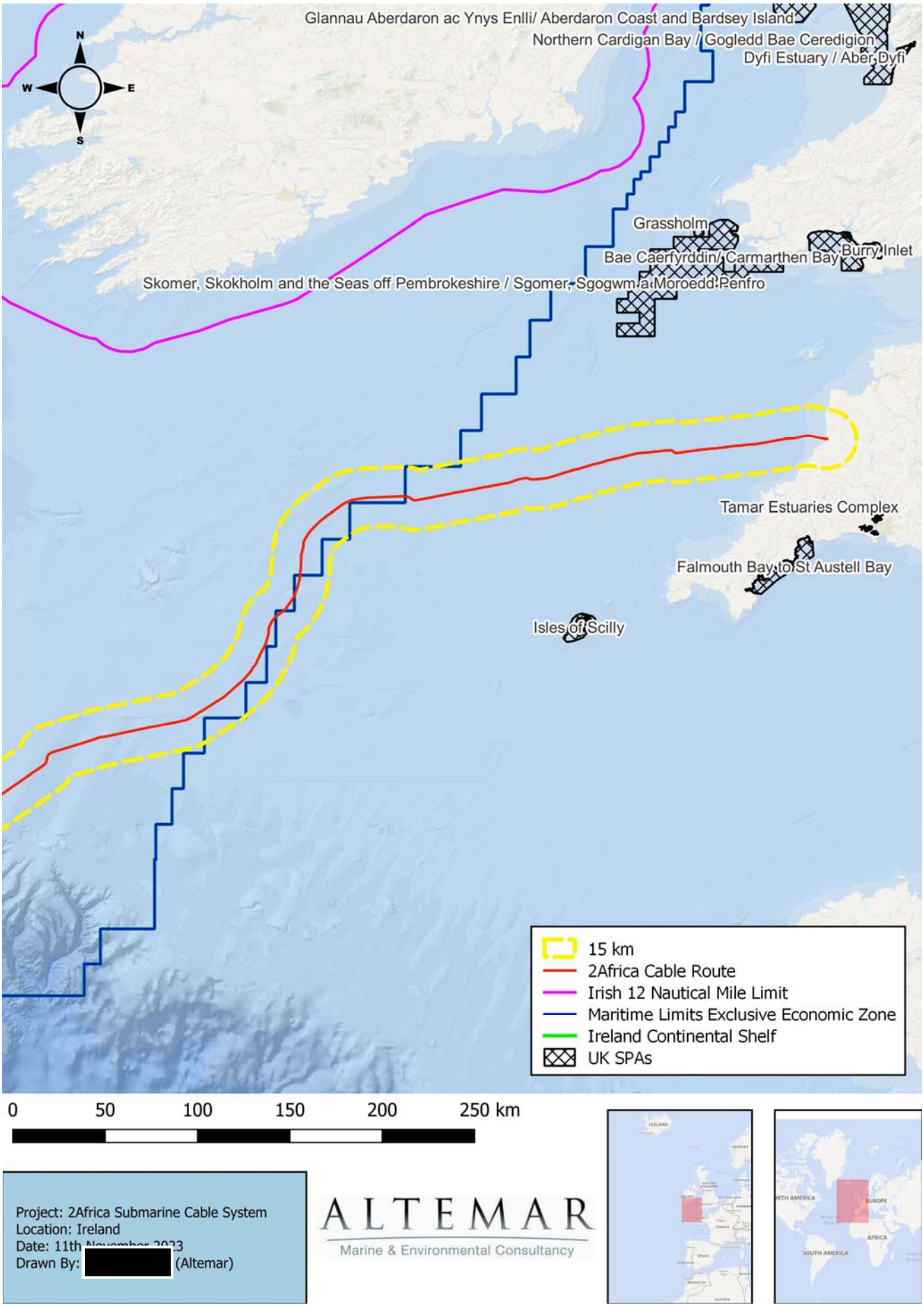

Figure 20. *UK SPAs*

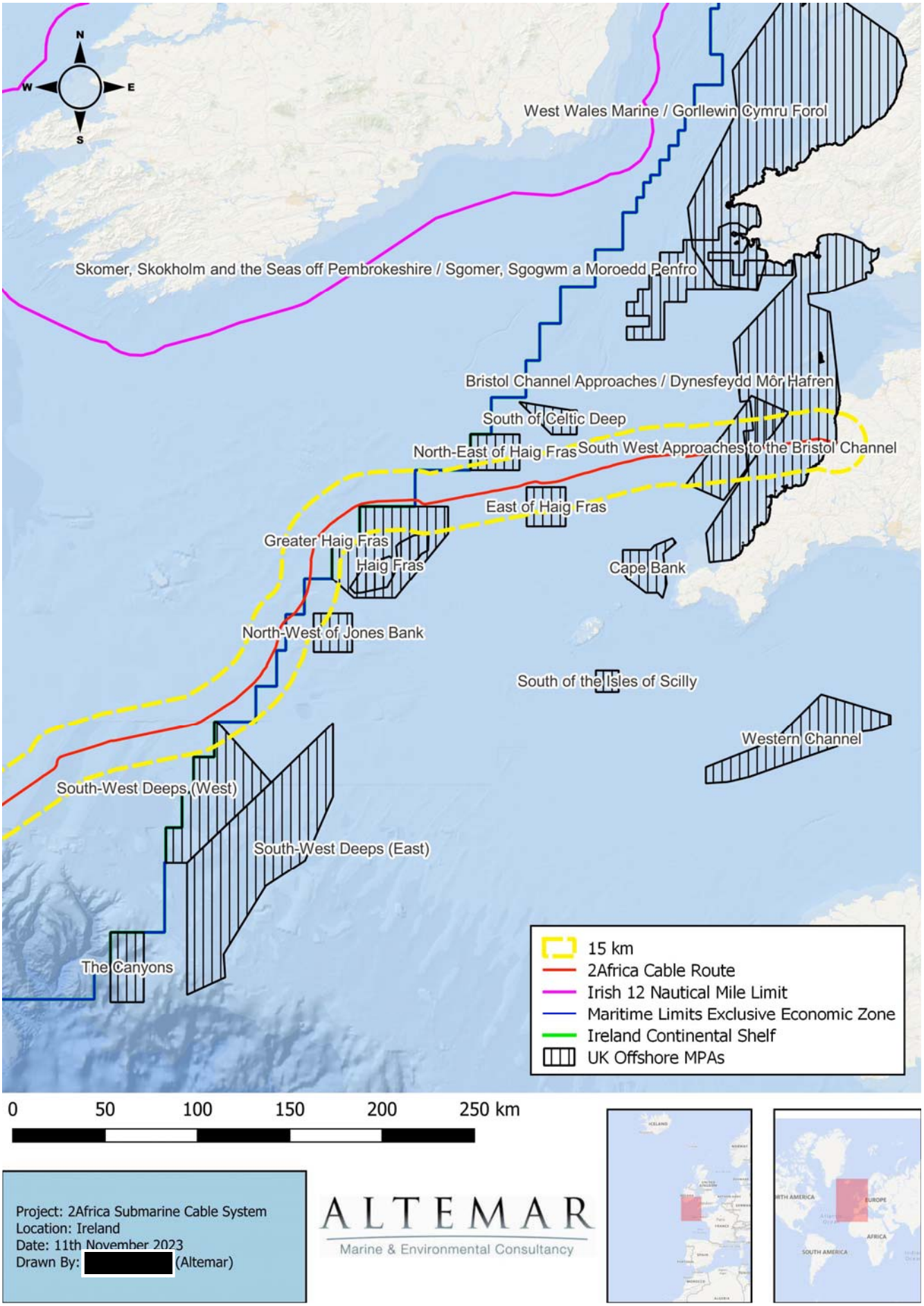

Figure 21. *UK Offshore Marine Protected Areas (MPAs)*

Table 4. *Foreshore licence applications (Accessed 01/12/23)*

Reference	Title	Year	Location	Activity	Status
FS007621	Péarla Offshore Wind Limited – Site Investigations for Export Cable Corridor for a proposed Offshore Wind Farm Project	2022	Off County Waterford	Site Investigations	Applied
FS007575	Kinsale Offshore Wind Limited Site Investigations for Export Cable Corridor for proposed Offshore Wind Farm	2022	Off County Cork	Site Investigations	Consultation
FS007488	Celtic Offshore Renewable Energy Site Investigations for proposed Offshore Wind Farm	2022	Off Counties Waterford and Wexford	Site Investigations	Applied
FS007471	Floating Cork Offshore Wind Limited Site Investigations for proposed Offshore Wind Farm	2022	Off County Cork	Site Investigations	Applied
FS007464	Bore Array Ltd., Site Investigations for Bore Array Offshore Wind Farm	2022	Off County Wexford	Site Investigations	Applied
FS007445	Blackwater Offshore Wind – Marine Surveys	2022	Wexford	Marine Surveys	Applied
FS007436	Voyage Offshore Array Limited Site Investigations for proposed Offshore Wind Farm	2022	Off Counties Waterford and Wexford	Site Investigations	Applied
FS007431	Tulca Offshore Array Limited Site Investigations for proposed Offshore Wind Farm	2022	Off County Cork	Site Investigations	Applied
FS007384	Celtic Horizon Offshore Wind Farm Limited Site Investigations for proposed Offshore Wind Farm	2021	Off Counties Wexford and Waterford	Site Investigations	Applied
FS007374	Mainstream Renewable Power Ltd.	2021	Off County Wexford	Site Investigations	Consultation
FS007361	Beaufort Sub-sea Fibre Optic Cable System	2022	Off Wexford Coast	Installation of Sub-sea Fibre Optic Cable	Consultation
FS007354	Kinsale Offshore Wind Ltd, Site Investigations for the proposed Kinsale Project offshore wind farm	2022	Off County Cork	Site Investigations	Consultation
FS007318	RWE Renewables Ireland East Celtic Ltd., Site Investigations for proposed East Celtic Offshore Wind Park	2021	Off Counties Wexford and Waterford	Site Investigations	Applied
FS007232	DP Energy – Latitude 52 Offshore Windfarm Ltd.	2021	Off Counties Wicklow and Wexford	Site Investigations	Applied
FS007135	ESB Wind Development Ltd. Site Investigations at Loch Garman Offshore Wind	2021	County Wexford	Site Investigations	Consultation
FS006916	EirGrid Celtic Interconnector Electricity Cable	2021	Co. Cork	Installation of Subsea Cable	Determination

4.7 Appropriate Assessment Screening Conclusions

An initial screening of the proposed works, using the precautionary principle (without the use of any mitigation measures) and Natura 2000 sites with the potential to result in likely significant effects on the conservation objectives and features of interest of the Natura 2000 sites was carried out in Table 2. Based on best scientific knowledge and objective information and assessment, the possibility of likely significant effects caused by the proposed project was excluded for all Natura 2000 sites except for the Southern Canyons cSAC. No in-combination effects are foreseen.

The project is limited in scale and extent and the potential zone of influence is restricted to the immediate vicinity of the cable laying route, with the exception of underwater noise that may extend beyond the cable laying. Subtidal elements of the project are within the offshore Southern Canyons cSAC.

Acting on a strictly precautionary basis, NIS is required in respect of the effects of the project on the Southern Canyons cSAC (potential habitat impacts) because it cannot be excluded on the basis of best objective scientific information following screening, in the absence of control or mitigation measures that the plan or project, individually and/or in combination with other plans or projects, will have a significant effect on the named European Site/s.

Further, out of an abundance of caution, NIS is required in respect of the potential effects of the project on marine mammals protected as an Annex IV species as a result of heightened underwater noise during the cable laying process.

A NIS or Stage 2 Appropriate Assessment is not required for the effects of the project on all other Natura sites (excluding Southern Canyons cSAC). On the basis of the best objective scientific information following screening it can be concluded that the plan or project, individually and/or in combination with other plans or projects, will not have a significant effect on other European Site/s.

A Stage 2 AA is required for the proposed project due to the potential for effects on the Southern Canyons cSAC**.**

5 Data Used for AA Screening

NPWS site synopses and Conservation objectives of sites within 15km were assessed. The most recent SAC and SPA boundary shapefiles were downloaded and overlaid on baseline oceanic mapping. A detailed desktop assessment was carried out including multiple datasets including marine Institute, Infomar, MSFD, EUSEABED Mapping.

6 References

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Appendix I – Vessel Specifications

Technical Specifications

DESCRIPTION / POSITIONING	Three state-of the art vessels, highly powerful for long stretch cable installation and burying in the harchest conditions. Duplex DP and Integrated Control System
OWNER	ALDA MARINE SERVICES S.A.S.
OPERATOR	LOUIS DREYFUS ARMATEURS S.A.S.
SHIP MANAGER	LOUIS DREYFUS ARMATEURS S.A.S.
FLAG	French
CONSTRUCTION YEAR	2002
LENGTH, OVERALL	140.36 m
BREADTH	23.40 m
DRAUGHT	8 m (summer draught)
DEADWEIGHT	9820 mt
ACCOMMODATION	Single cabins: 60, double cabins: 5
CABLE TANK CAPACITY	
main cable tank	2 x 2500 tonnes (max cap each tank: 3500 tonnes), 2 x 1500 m^3
spare cable tank	2 x 250 tonnes, 2 x 150 m^3
REPEATER STORAGE	2 x 100
CABLE MACHINERY	1 Linear Cable Engine – DOWTY 21 Wheels pair, 1 Drum Engine – DOWTY 6T DOHB / 28T Drum, 2 Transporter – DOWTY 2 Wheels Pairs, 1 Stern Hauler – DOWTY 2 Wheels Pairs
TYPE OF PLOUGH	1 SMD HD3 Plough – burial in all soils (including fractured rocks). Max burial: 3 m
CABLE LAYING SOFTWARE	MakaiLay
DYNAMIC POSITIONING	DP2 BV PDY MATAR Alstom
TRANSIT SPEED	15 knots
BOLLARD PULL	100 tonnes
POWER GENERATION	4 x 4320 kW MAK + 1 x 1360 kW MAK
THRUSTERS	2 x Lips 1500 kW Bow Thrusters 1 x Lips 720 rpm - 1500 kW AZ Fore Thruster 2 x Lips 1500 kW Aft Thrusters
PROPULSION	2 electrically driven fixed pitch propellers. Output 4000 kW each. Propeller diameter: 3700 mm. Max propeller speed: 146 rpm