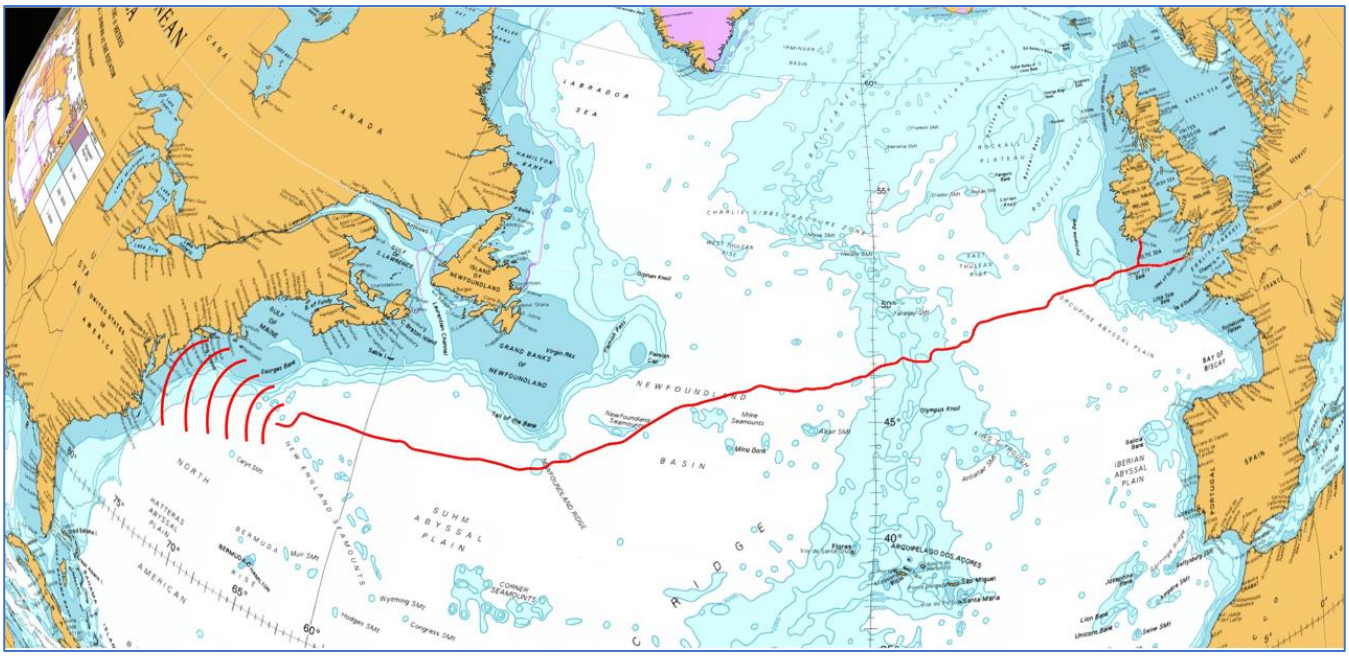
ALTEMAR

Marine & Environmental Consultancy

Natura Impact Statement – Information for a Stage 2 (Natura Impact Statement) AA for marine survey and site investigation works for a fibre optic cable with a landfall at Glandore Bay and Castlefreke, Long Strand, Co. Cork.



14th May 2024

Prepared by: [redacted] (MCIEEM) of Altemar Ltd.
On behalf of: McMahon Design and Management Ltd.

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Document Control Sheet			
Project	Natura Impact Statement - Information for a Stage 2 (Natura Impact Statement) AA for marine survey and site investigations for a fibre optic cable with a landfall at Glandore Bay and Castlefreke, Long Strand, Co. Cork		
Report	Natura Impact Statement		
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Draft 01	[redacted]	[redacted]	20th March 2024
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1. Introduction

The following Natura Impact Statement (NIS) has been prepared by **Altemar Ltd.** for marine survey and site investigations for a fibre optic cable with a landfall at Glandore Bay and Castlefreke, Long Strand, Co. Cork.

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 European sites. European sites are those sites designated as Special Areas of Conservation (SAC) or Special Protection Areas (SPA). A Supporting Information for Screening for Appropriate Assessment report was prepared for the proposed project and concluded that '*Acting on a strictly precautionary basis, NIS is required in respect of the effects of the project on the Natura 2000 sites screened IN for NIS (potential habitat and disturbance effects in the absence of mitigation) 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.*

An NIS or Stage 2 Appropriate Assessment is not required for the effects of the project on all other Natura sites because it can be excluded on the basis of the best objective scientific information following screening that the plan or project, individually and/or in combination with other plans or projects, will have a significant effect on the European Site/s. ***A Stage 2 AA is required for the proposed project****.'*

This Natura Impact Statement (NIS) examines whether the plan or project, either alone, or in combination with other plans and projects, in the view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the European sites or species populations for which the site/s were designated.

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. Bryan Deegan, the managing director of Altemar, is an Environmental Scientist and Marine Biologist with 30 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. 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 Deegan carried out all elements of this Appropriate Assessment Screening. Bryan has been involved in eight 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). 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 Appropriate Assessment screening 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 2: Appropriate 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

The applicant plans to investigate the feasibility of constructing a new subsea telecoms cable system, linking United States to Ireland, from a landfall on the north east coast of the USA to a landfall at Glandore Bay, County Cork on the south west coast of Ireland as shown in Figure 1 below. This Works Methodology is produced in support of an application for a marine survey and site investigations licence under the Maritime Area Planning Act 2021, and should not be used for any other purpose apart from that expressly stated in this document. The applicant intends to undertake the survey campaign across the Licence Application Area within the IRL Exclusive Economic Zone (EEZ) and Maritime Area in order to inform the location and design of the cable route and landfall.

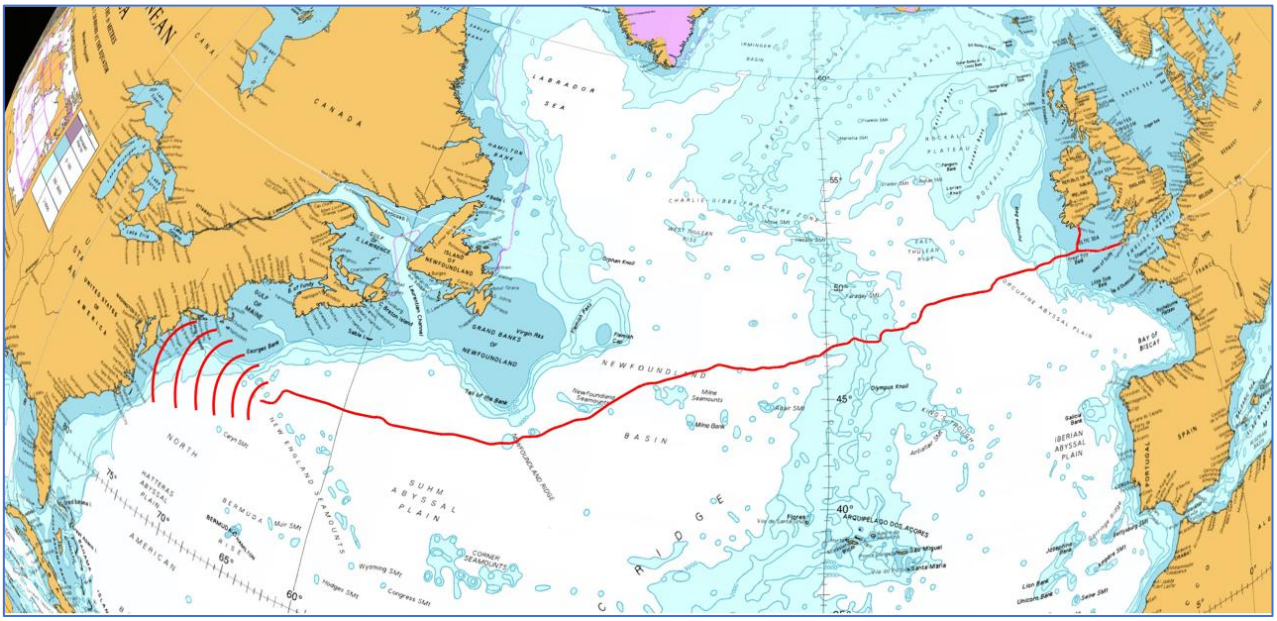

Figure 1. Proposed Telecoms Cable System (final configuration subject to change)

The works will be carried out within a 500m corridor within the licensed area, predominantly by seabed mapping techniques (geophysical survey) with some selective sampling of the upper layers of the seabed (geotechnical survey). The licence application area is wider than the survey corridor to give flexibility to move the survey corridor within the permitted area based on the cable route planning experts view. 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 a further submission for a Maritime Area Consent and Planning consent for the installation works.

4.2.2 Proposed Survey Route and Survey Application Area in Irish Maritime Area

Licence Application Area

The License Application Area is situated off the coast of County Cork (Figure 2). The survey corridor has length of 898.5 km and a total area of 16,880 km^2. A cable route corridor of approx. 500m width will be surveyed within the licence application area. The survey corridor will be approximately 3 x Water Depth (up to 10km in width) in areas where the water depth is greater than 1500m off the Continental Shelf. The general lines of the proposed offshore survey corridors within Irish EEZ are shown in Figure 3.

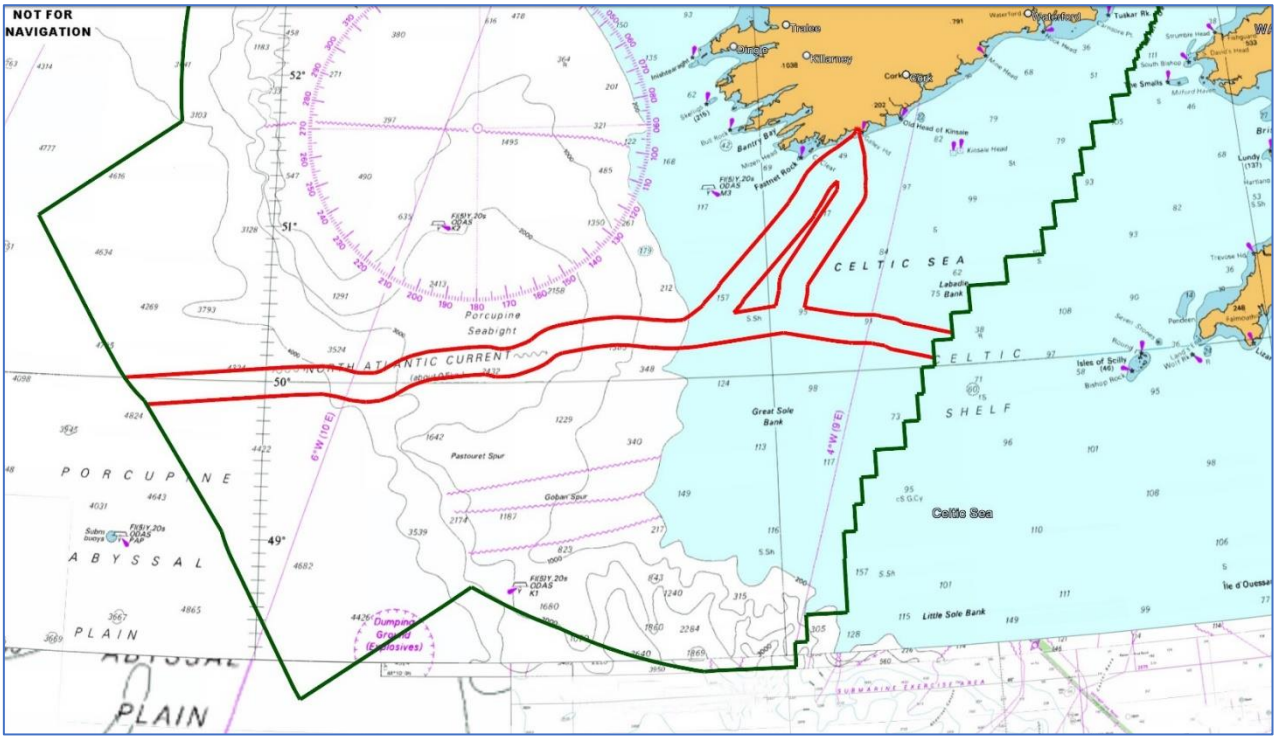

Figure 2. Proposed Survey Licence Application Area.

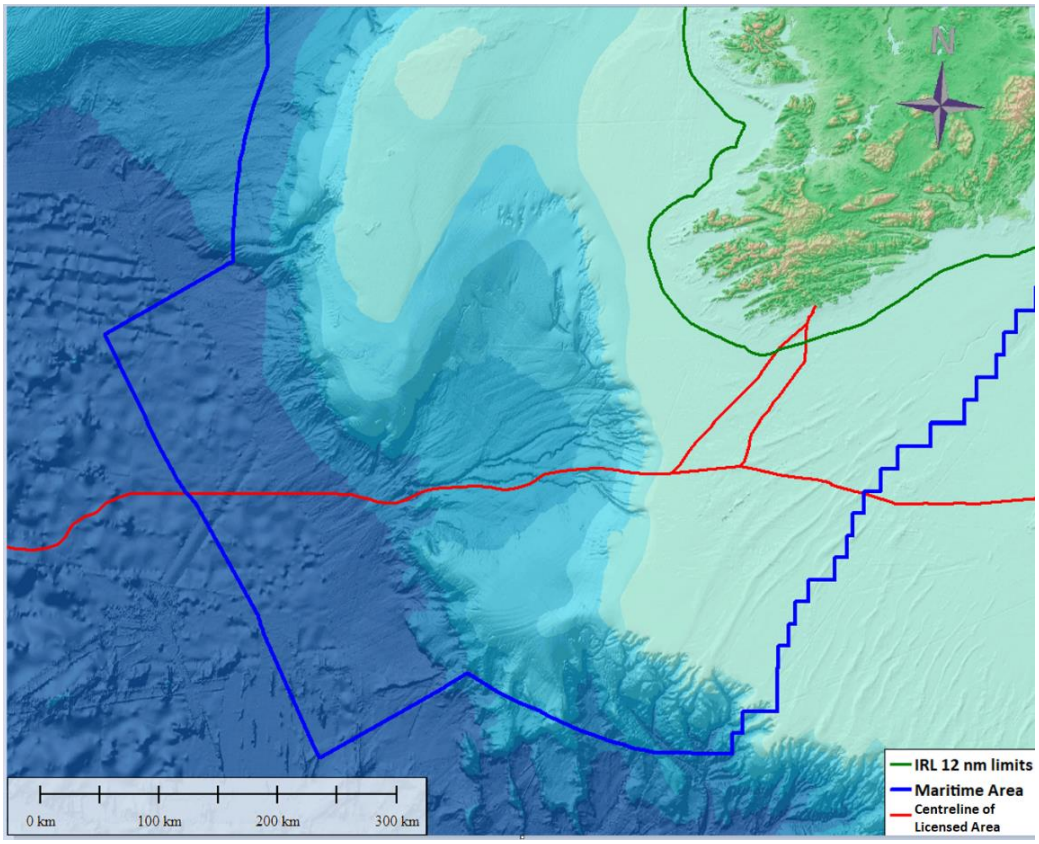

Figure 3. Offshore Survey Route.

The Co-ordinates for the Survey Area is presented in Table 1 below

Table 1. Survey Area RPL

Idx	Latitude	Longitude	Idx	Latitude	Longitude
1	50° 12' 24.7947" N	8° 12' 00.0000" W	44	51° 15' 27.2163" N	8° 56' 39.4434" W
2	50° 13' 52.6159" N	8° 20' 29.7388" W	45	51° 20' 08.3629" N	8° 56' 44.0419" W
3	50° 13' 59.3369" N	8° 21' 03.0425" W	46	51° 23' 03.7623" N	8° 56' 22.5306" W
4	50° 15' 05.0601" N	8° 27' 14.1305" W	47	51° 30' 59.7680" N	8° 58' 32.5676" W
5	50° 15' 05.8335" N	8° 27' 18.5894" W	48	51° 32' 11.5706" N	8° 58' 35.4110" W
6	50° 17' 30.5697" N	8° 41' 34.3995" W	49	51° 33' 06.7367" N	8° 58' 08.9715" W
7	50° 17' 41.9756" N	8° 41' 52.7713" W	50	51° 33' 29.2953" N	8° 58' 08.4742" W
8	50° 17' 52.7701" N	8° 42' 12.0234" W	51	51° 33' 37.7189" N	8° 58' 34.8189" W
9	50° 18' 00.0218" N	8° 42' 25.6399" W	52	51° 33' 37.2137" N	8° 58' 37.6689" W
10	50° 18' 16.7160" N	8° 42' 59.8586" W	53	51° 33' 36.7325" N	8° 58' 37.8615" W
11	50° 18' 31.4826" N	8° 43' 36.1766" W	54	51° 33' 36.2734" N	8° 58' 37.8551" W
12	50° 18' 44.2141" N	8° 44' 14.3298" W	55	51° 33' 35.3584" N	8° 58' 36.2360" W
13	50° 18' 48.9467" N	8° 44' 30.1228" W	56	51° 33' 22.7922" N	8° 58' 49.9910" W
14	50° 18' 56.7930" N	8° 44' 58.5500" W	57	51° 32' 43.6693" N	8° 59' 31.5684" W
15	50° 19' 03.5083" N	8° 45' 27.6764" W	58	51° 33' 49.6724" N	8° 59' 20.7983" W
16	50° 19' 09.0673" N	8° 45' 57.3922" W	59	51° 33' 52.4838" N	8° 59' 23.9611" W
17	50° 19' 12.1540" N	8° 46' 15.9979" W	60	51° 33' 57.1536" N	8° 59' 43.9247" W
18	50° 19' 14.7808" N	8° 46' 33.0490" W	61	51° 33' 57.1013" N	8° 59' 47.6406" W
19	50° 20' 10.4320" N	8° 53' 05.4726" W	62	51° 33' 56.0684" N	8° 59' 50.5104" W
20	50° 20' 13.0822" N	8° 53' 13.0390" W	63	51° 33' 49.2598" N	8° 59' 50.7161" W
21	50° 20' 25.2505" N	8° 53' 51.5939" W	64	51° 33' 47.9840" N	8° 59' 53.7048" W
22	50° 20' 35.2753" N	8° 54' 31.6293" W	65	51° 33' 49.8527" N	8° 59' 55.0104" W
23	50° 20' 39.5063" N	8° 54' 50.9109" W	66	51° 34' 00.7667" N	8° 59' 55.2567" W
24	50° 20' 46.5931" N	8° 55' 27.7253" W	67	51° 34' 01.8829" N	9° 00' 00.1770" W
25	50° 20' 51.8667" N	8° 56' 05.2771" W	68	51° 34' 02.1284" N	9° 00' 06.8029" W
26	50° 20' 54.1746" N	8° 56' 25.3344" W	69	51° 33' 59.5452" N	9° 00' 09.4498" W
27	50° 20' 56.7699" N	8° 56' 51.9524" W	70	51° 33' 40.0023" N	9° 00' 34.1180" W
28	50° 20' 58.4535" N	8° 57' 18.7492" W	71	51° 32' 34.2711" N	9° 00' 35.6293" W
29	50° 21' 33.0764" N	9° 10' 13.1950" W	72	51° 31' 06.3951" N	9° 02' 23.8692" W
30	50° 22' 33.6653" N	9° 19' 27.3991" W	73	51° 26' 28.5544" N	9° 13' 10.6245" W
31	50° 25' 12.3414" N	9° 39' 03.5705" W	74	51° 25' 39.5883" N	9° 15' 48.8283" W
32	50° 30' 43.9419" N	9° 36' 46.2312" W	75	51° 23' 42.7577" N	9° 20' 35.7655" W
33	50° 32' 59.6297" N	9° 36' 34.4270" W	76	51° 21' 24.7807" N	9° 25' 45.0972" W
34	50° 33' 51.8130" N	9° 36' 16.2691" W	77	51° 18' 22.5455" N	9° 30' 59.9013" W
35	50° 34' 58.3993" N	9° 34' 56.0798" W	78	51° 17' 33.3694" N	9° 32' 11.8681" W
36	50° 50' 42.8301" N	9° 16' 21.1004" W	79	51° 16' 51.1392" N	9° 33' 08.4134" W
37	51° 04' 33.8362" N	8° 59' 49.6290" W	80	51° 13' 20.0250" N	9° 36' 47.1566" W
38	51° 06' 01.7041" N	8° 58' 22.0115" W	81	51° 10' 06.5325" N	9° 40' 03.1335" W
39	51° 07' 00.0804" N	8° 57' 47.7053" W	82	51° 06' 24.4958" N	9° 44' 31.9576" W
40	51° 08' 10.1589" N	8° 57' 17.8808" W	83	51° 05' 48.6931" N	9° 44' 55.5525" W
41	51° 10' 11.4295" N	8° 57' 17.6961" W	84	50° 55' 14.3771" N	10° 00' 05.3184" W
42	51° 10' 54.0956" N	8° 57' 18.8833" W	85	50° 35' 38.9646" N	10° 28' 53.8422" W
43	51° 13' 49.5393" N	8° 56' 37.9742" W	86	50° 34' 13.7565" N	10° 30' 03.3086" W

Idx	Latitude	Longitude	Idx	Latitude	Longitude
87	50° 30' 32.2350" N	10° 35' 43.8587" W	130	50° 03' 50.5006" N	13° 54' 46.3206" W
88	50° 28' 21.2608" N	10° 39' 03.3527" W	131	50° 03' 51.8720" N	14° 03' 46.6143" W
89	50° 27' 30.9308" N	10° 39' 38.9889" W	132	50° 03' 56.9459" N	14° 05' 27.6481" W
90	50° 24' 03.4904" N	10° 47' 06.1042" W	133	50° 05' 14.7727" N	14° 13' 20.7705" W
91	50° 22' 19.5399" N	10° 51' 38.5036" W	134	50° 05' 53.0763" N	14° 20' 04.1122" W
92	50° 22' 12.4232" N	10° 57' 39.4019" W	135	50° 06' 14.2169" N	14° 24' 19.2068" W
93	50° 22' 13.8756" N	11° 00' 07.1365" W	136	50° 05' 56.5160" N	14° 40' 17.0983" W
94	50° 22' 45.2030" N	11° 08' 53.9816" W	137	50° 05' 42.1970" N	14° 47' 00.7019" W
95	50° 22' 47.6390" N	11° 09' 53.8751" W	138	50° 00' 14.0513" N	16° 26' 15.6274" W
96	50° 23' 21.0761" N	11° 15' 45.8819" W	139	50° 00' 08.3564" N	16° 26' 08.6198" W
97	50° 23' 28.4490" N	11° 17' 14.2863" W	140	49° 59' 22.1386" N	16° 25' 09.6488" W
98	50° 23' 52.2735" N	11° 23' 17.8315" W	141	49° 57' 51.2408" N	16° 23' 08.2465" W
99	50° 23' 59.8721" N	11° 26' 43.9291" W	142	49° 55' 40.0233" N	16° 19' 57.7592" W
100	50° 24' 11.1238" N	11° 31' 31.5306" W	143	49° 53' 35.0207" N	16° 16' 37.6427" W
101	50° 24' 10.8972" N	11° 32' 02.3352" W	144	49° 51' 36.5288" N	16° 13' 08.3824" W
102	50° 24' 00.1298" N	11° 35' 54.8087" W	145	49° 50' 07.9693" N	16° 11' 35.7482" W
103	50° 23' 39.7889" N	11° 42' 49.3406" W	146	49° 50' 11.1504" N	16° 11' 09.4136" W
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112	50° 18' 43.4839" N	12° 16' 40.1391" W	155	49° 59' 40.8428" N	13° 30' 26.8608" W
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128	50° 06' 15.2202" N	13° 46' 44.5626" W	171	50° 13' 00.4249" N	11° 43' 32.5188" W
129	50° 04' 54.0184" N	13° 50' 11.0431" W	172	50° 13' 17.6376" N	11° 37' 39.5659" W

Idx	Latitude	Longitude	Idx	Latitude	Longitude
173	50° 13' 35.6983" N	11° 31' 43.1639" W	194	50° 09' 54.8634" N	8° 58' 35.4923" W
174	50° 13' 22.0632" N	11° 25' 11.5198" W	195	50° 09' 50.9752" N	8° 58' 14.6499" W
175	50° 12' 58.1970" N	11° 19' 42.0965" W	196	50° 09' 45.4662" N	8° 57' 40.7929" W
176	50° 12' 13.5902" N	11° 11' 39.4218" W	197	50° 09' 41.4744" N	8° 57' 06.4249" W
177	50° 12' 13.4355" N	11° 09' 14.8841" W	198	50° 09' 41.0728" N	8° 57' 02.1220" W
178	50° 11' 50.9770" N	11° 04' 16.6517" W	199	50° 09' 04.0902" N	8° 52' 40.9073" W
179	50° 11' 36.4628" N	10° 58' 14.1489" W	200	50° 08' 44.7053" N	8° 52' 07.4655" W
180	50° 11' 40.7220" N	10° 53' 36.0400" W	201	50° 08' 27.3146" N	8° 51' 31.4698" W
181	50° 11' 56.3894" N	10° 44' 56.1893" W	202	50° 08' 20.7334" N	8° 51' 16.5027" W
182	50° 12' 47.1228" N	10° 34' 07.2453" W	203	50° 08' 09.0373" N	8° 50' 47.8865" W
183	50° 15' 14.2903" N	10° 02' 26.8876" W	204	50° 07' 58.6034" N	8° 50' 18.1139" W
184	50° 15' 55.0301" N	9° 52' 18.9596" W	205	50° 07' 49.4790" N	8° 49' 47.3197" W
185	50° 15' 55.8673" N	9° 52' 11.5538" W	206	50° 07' 44.6810" N	8° 49' 29.5835" W
186	50° 11' 59.2029" N	9° 22' 47.4828" W	207	50° 07' 36.4346" N	8° 48' 55.7606" W
187	50° 11' 56.6586" N	9° 22' 26.7085" W	208	50° 07' 29.7680" N	8° 48' 21.1067" W
188	50° 10' 52.3624" N	9° 12' 38.7127" W	209	50° 04' 40.5338" N	8° 31' 39.0166" W
189	50° 10' 49.9882" N	9° 12' 13.2755" W	210	50° 03' 35.9283" N	8° 25' 45.4688" W
190	50° 10' 48.4482" N	9° 11' 47.6835" W	211	50° 03' 15.2034" N	8° 24' 06.7466" W
191	50° 10' 17.0718" N	9° 00' 03.7540" W	212	50° 10' 00.0012" N	8° 24' 00.0000" W
192	50° 10' 12.2892" N	8° 59' 47.7565" W	213	50° 10' 00.0012" N	8° 12' 00.0000" W
193	50° 10' 02.6878" N	8° 59' 12.1428" W			

Landfalls & Inshore Survey Corridors

The survey area covers two potential landfalls close to Rosscarbery, County Cork, with survey corridors through Rosscarbery Bay to a potential landfall at Ownahincha / Little Island Strand to the West and a landfall at Long Strand to the East. The general location is shown in Figure 4.

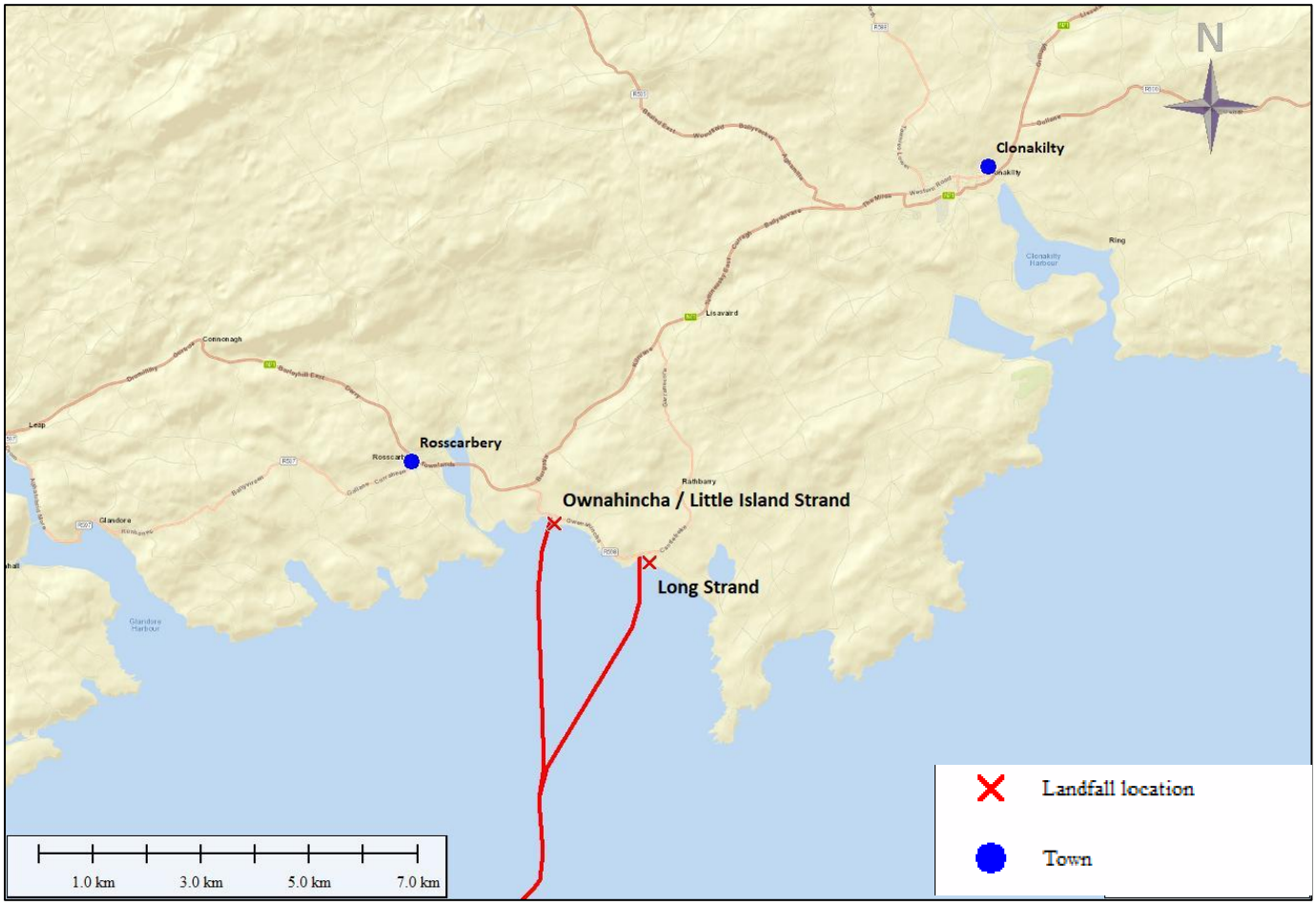


Figure 4. Landfall Locations.

Long Strand

The survey area covers a potential landfall at Long Strand. The beach is a long and uninterrupted stretch of sand and is buffered to the North from the R598 (Clonakilty Rd) and L4006 (to Galley Head) by a belt of grassy coastal sand dunes. (Figure 5.) Any requirement for beach access for vehicles or equipment will be solely via the existing track way adjacent to the Fish Basket Café. (Figure 6.) No vehicles or equipment will traverse the sand dune system.

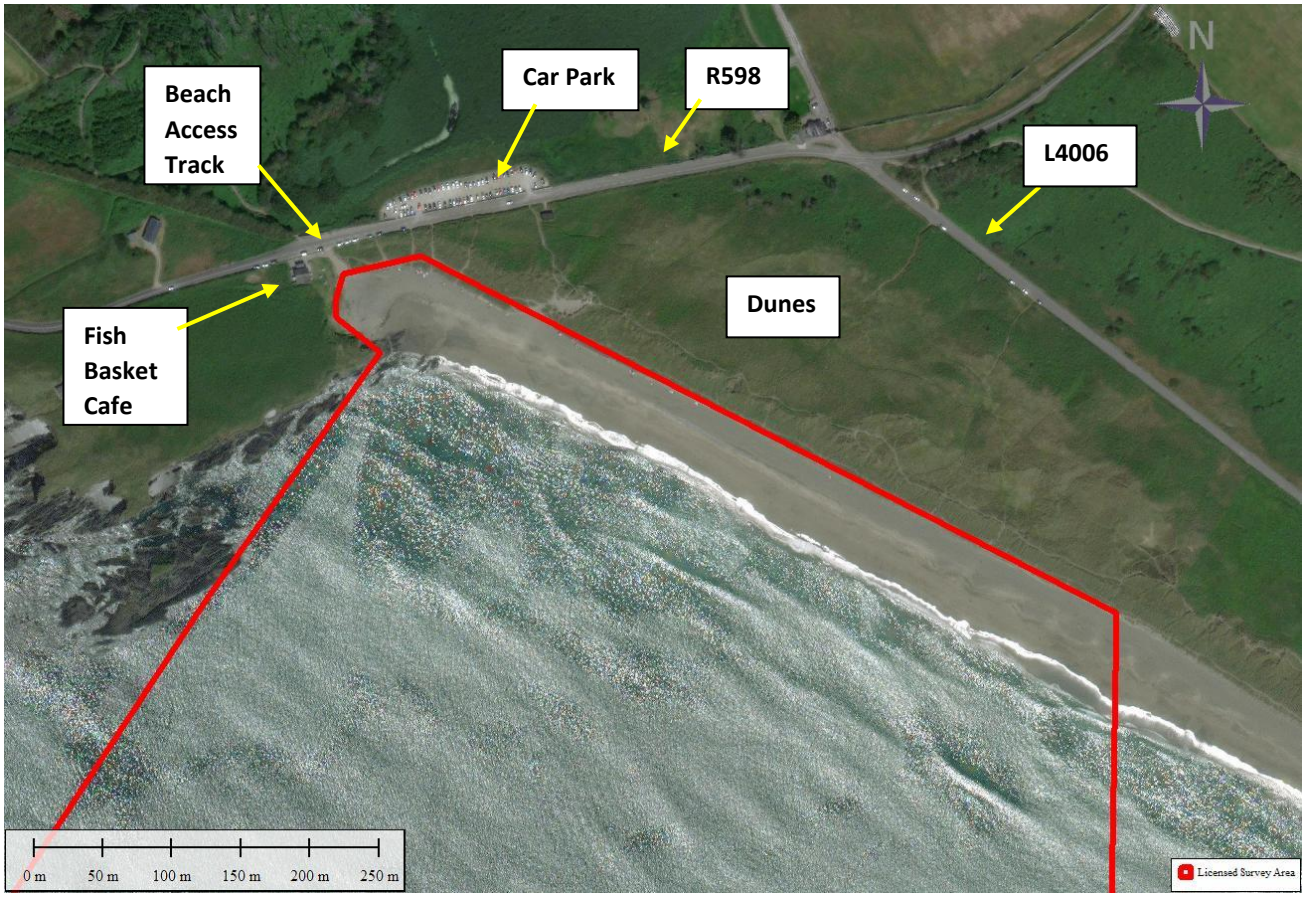


Figure 5. Long Strand.

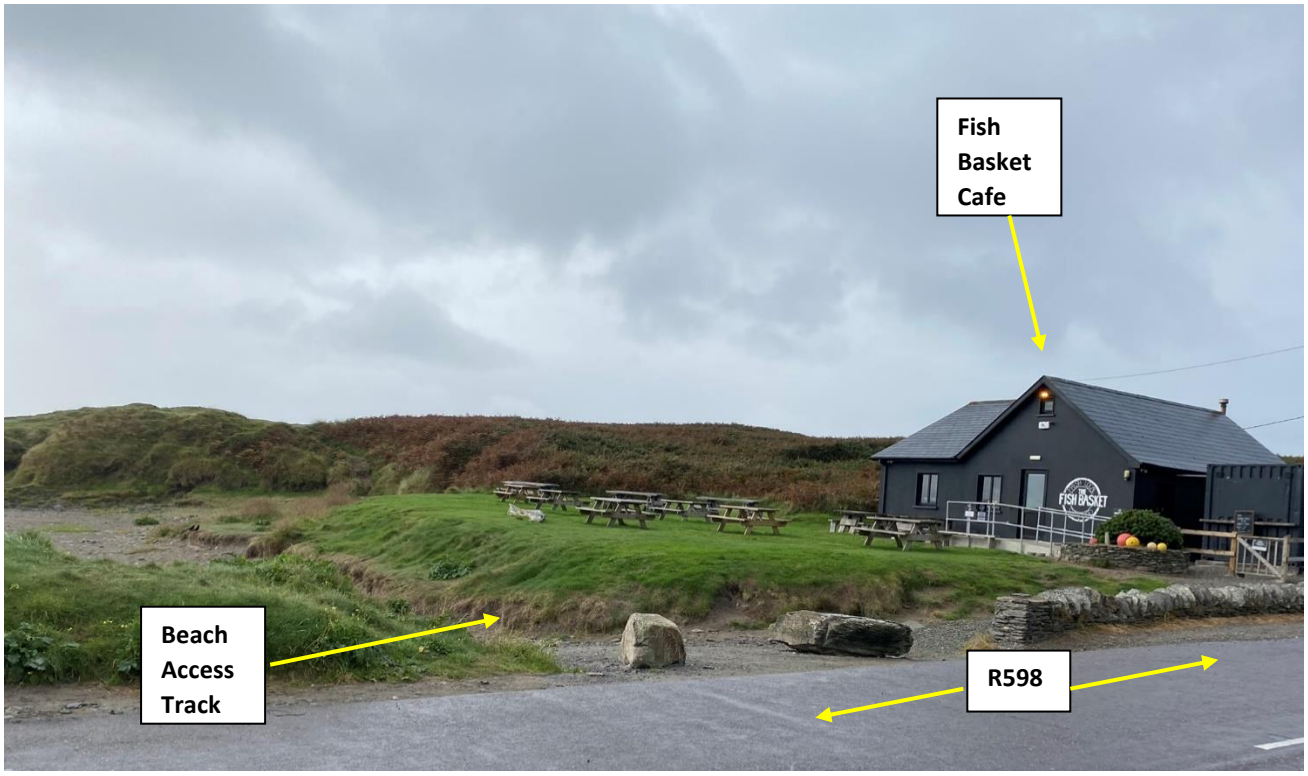


Figure 6. Beach Access track at Long Strand.

The survey area covers a potential landfall at Ownahincha / Little Island Strand. This is effectively two beaches linked by a spit at Iron Rock with shingle and Ownahincha River to the west and with sand, dunes and rocky inlets to the east. The R598 (Clonakilty Rd) runs parallel to the beach, separated by a belt of grassy coastal sand dunes on the eastern side. (Figure 7.) Any requirement for beach access for vehicles or equipment will be via the existing established access tracks from the R598. (Figures 8 & 9). No vehicles or equipment will traverse the sand dune system.

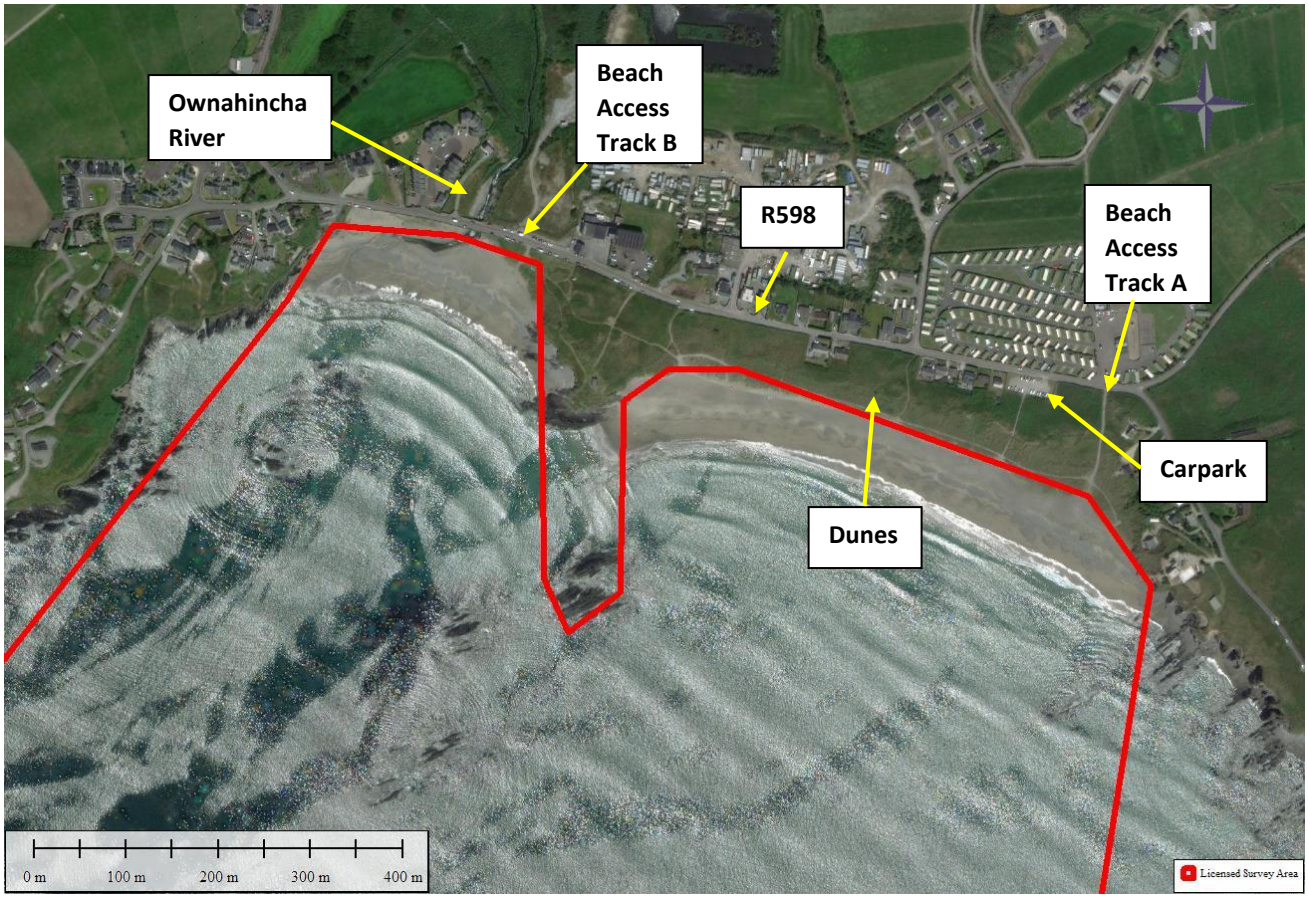


Figure 7. Ownahincha / Little Strand.

Figure 8. Little Island Beach Access A.

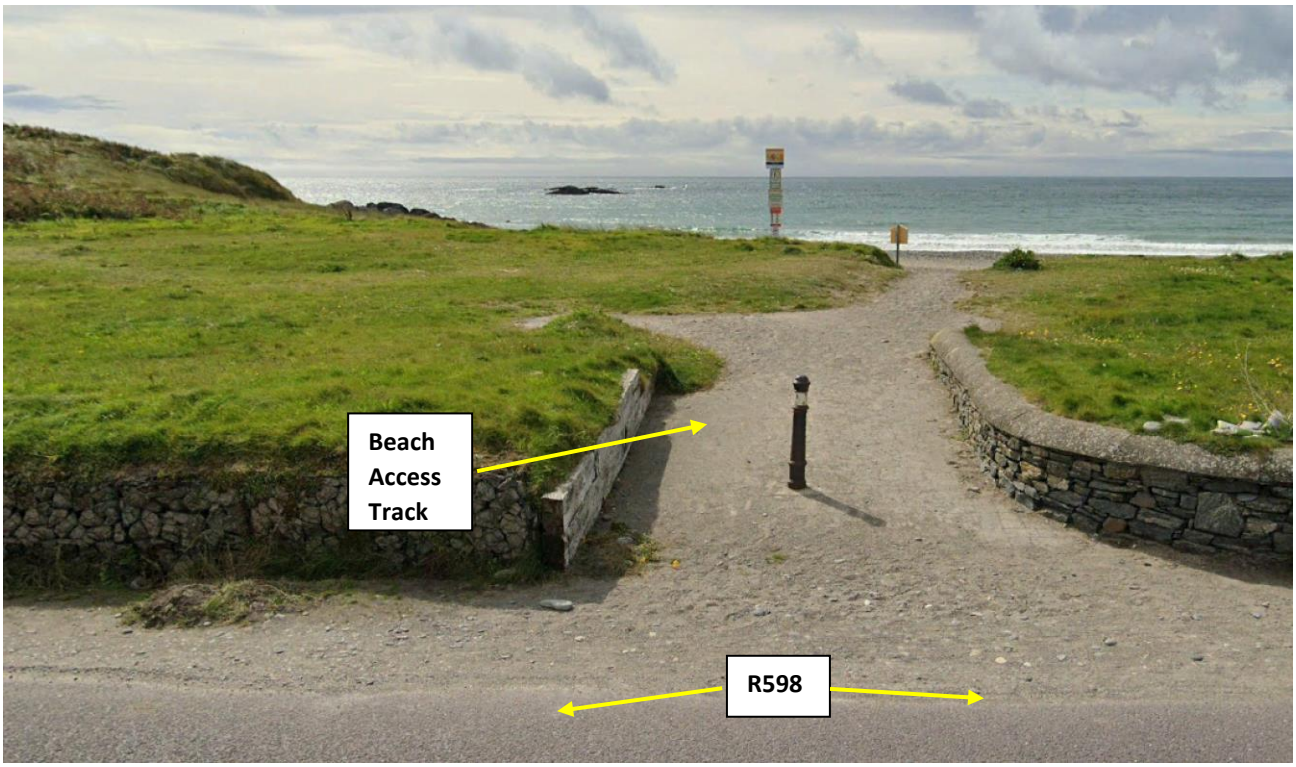


Figure 9 Ownahincha Beach Access B.

The landfall locations shown on Admiralty and Ordnance Survey Maps are provided in Drawings 1355-A-101 Licence Map, 1355-A-102 Site Layout Map 1 & 1355-A-103 Site Layout Map 2 and included with the Licence Application

The general line of the inshore section of the proposed survey route is shown on an Admiralty Chart base in Figure 10. After approx. 2.5km, the survey corridors converge in Glandore Bay and head in a south westerly direction from the landfalls, staying west of Galley Head.

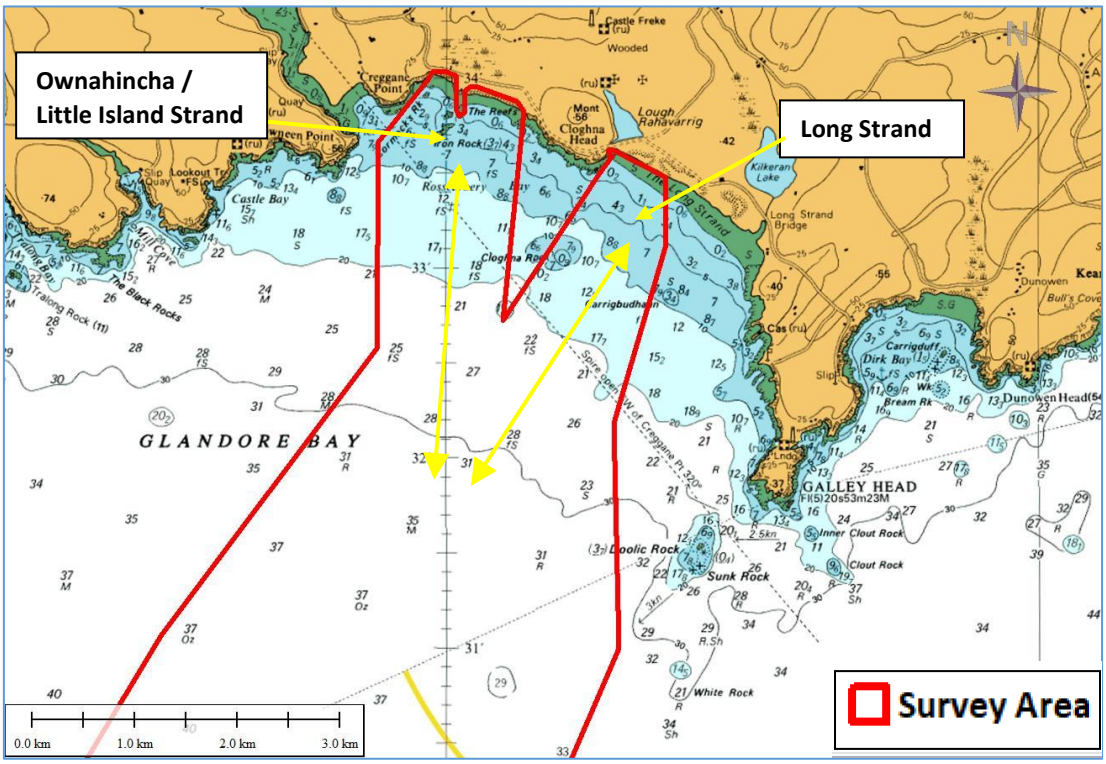


Figure 10. Inshore Sections and Landfalls.

After exiting Glandore Bay, the survey corridor continues in a southwestern direction with eastern and western route options as shown on Figure 11. The survey will be carried out on one of the route options and will survey a 500m swathe within the licensed area. Approximately 150km form the landfall, the route corridor changes to an east-west orientation. The route east across the Celtic Sea towards Cornwall, UK stays South of the Labadie Bank.

The route west (Figures 12 & 13) crosses the continental shelf to enter the deep waters of the Porcupine Seabight, south of the primary Gollum Channel and the Mound Provinces which are located north of the Gollum Channel System. The route traverses the ultra deepwaters of the Porcupine Abyssal Plain before leaving the Irish Maritime Area and continuing in a westerly direction towards the United States.

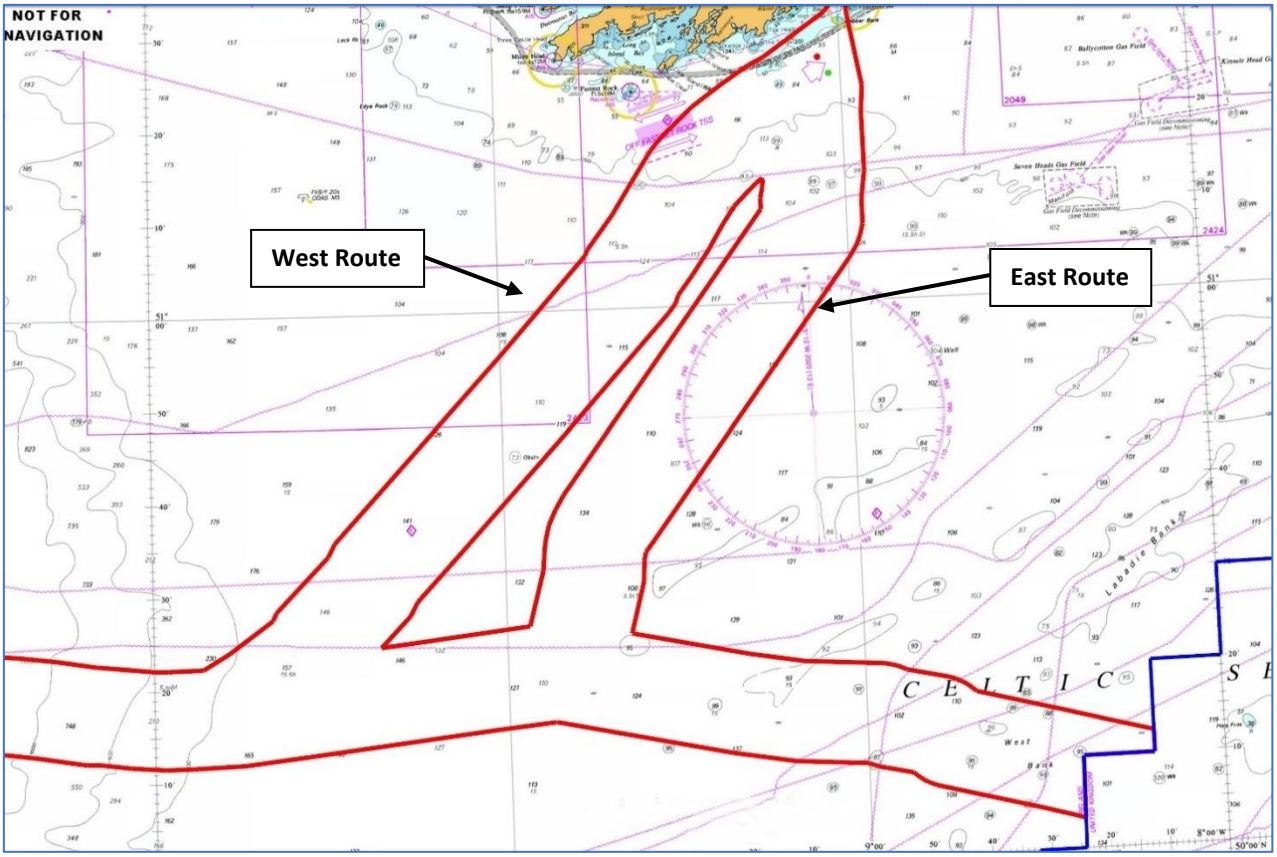


Figure 12. Offshore Survey Corridor options .

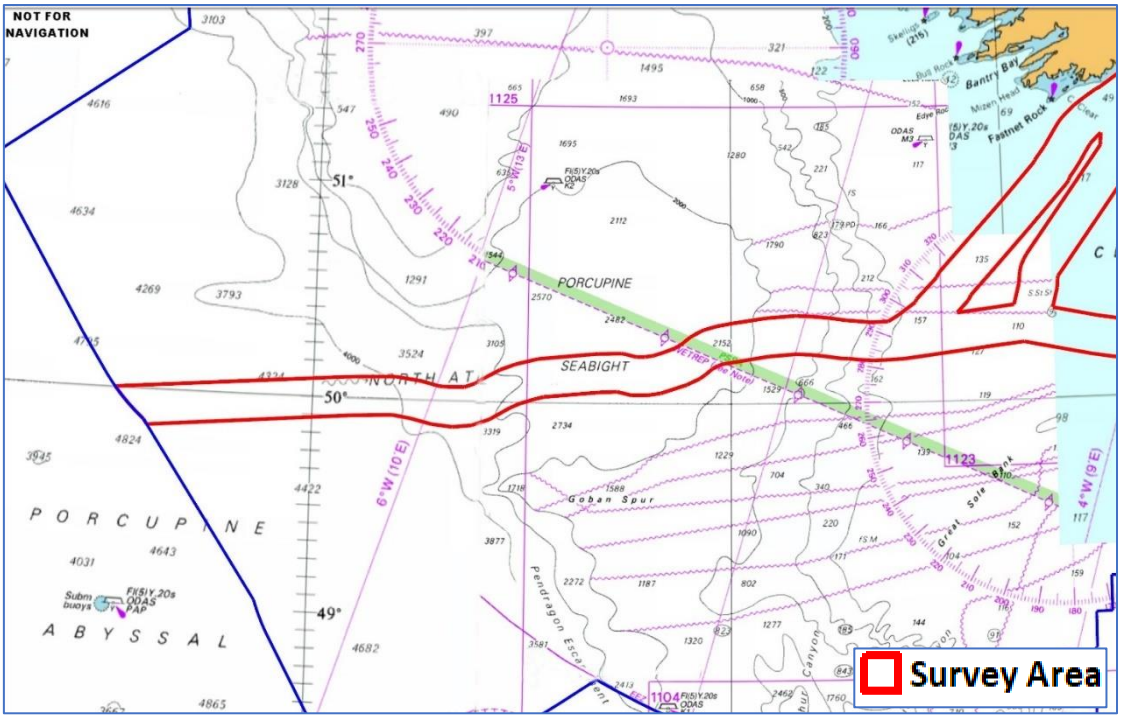


Figure 11. Deepwater Survey Corridor.

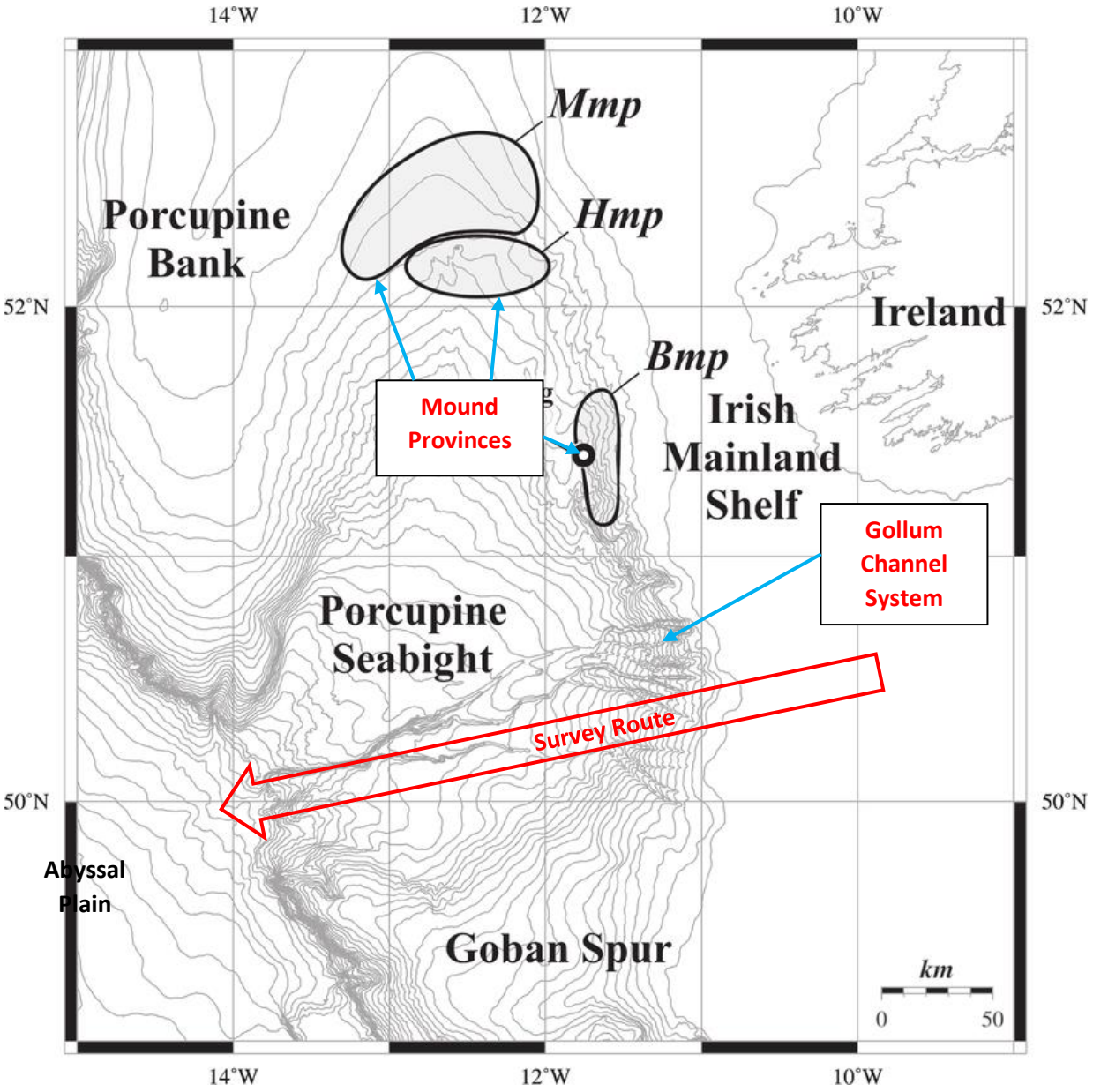


Figure 13. Porcupine Sea Bight

4.2.3 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 500m wide cable corridor (or 3 x Water Depth up to 10km in Deepwater) within the Maritime Usage 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 seabed obstructions;
- 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 Beach Survey – Terrestrial Beach and Intertidal Zone
- Inshore Survey – from 3m Chart Datum to 15m Chart Datum
- Offshore Survey – Water depths greater than 15m Chart Datum up to 1500m
- Deepwater Survey - Water depths greater than 1500m Chart Datum

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

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

Landfall Beach Survey & Site Investigations

A non-intrusive topographic and geophysical survey of the beach along the line of the proposed cable route at each landfall is required to the low water mark.

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 to establish subsurface features and depth to bedrock and magnetometer or handheld marine metal detector to locate buried ferrous objects.

An intertidal and beach survey (walkover survey) will be carried out on the beach by the project ecologist. The intertidal surveys will be undertaken at low or Spring tides in line with guidance in the JNCC Marine Monitoring Handbook (Davies et al., 2001).

An intertidal and beach survey (walkover survey) will be carried out on the beach by the project archaeologist under licence from the National Monuments Service. The intertidal surveys will be undertaken at low or Spring tides. A camera, GPS and marine metal detector will be deployed, scanning a series of survey lines in a grid pattern on the beach and intertidal zones. All archaeological survey will be carried out to determine the location of all known archaeological or cultural heritage features in advance of the landfall site investigations.

Landfall Site Investigations will be undertaken on the beach to establish the depth and nature of the sediment and depth to bedrock. 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 each landfall:

- 3 Trial Pits on the beach (target depth 2.5m).
- Bar probes on the beach at 10m spacing (approx. 6 to 8).
- Bar probes from the Low Water Line to the 3m water depth contour at 10m spacing. (approx. 6 to 8)

The Trial Pits will be positioned at approximately 30m 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 any 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.

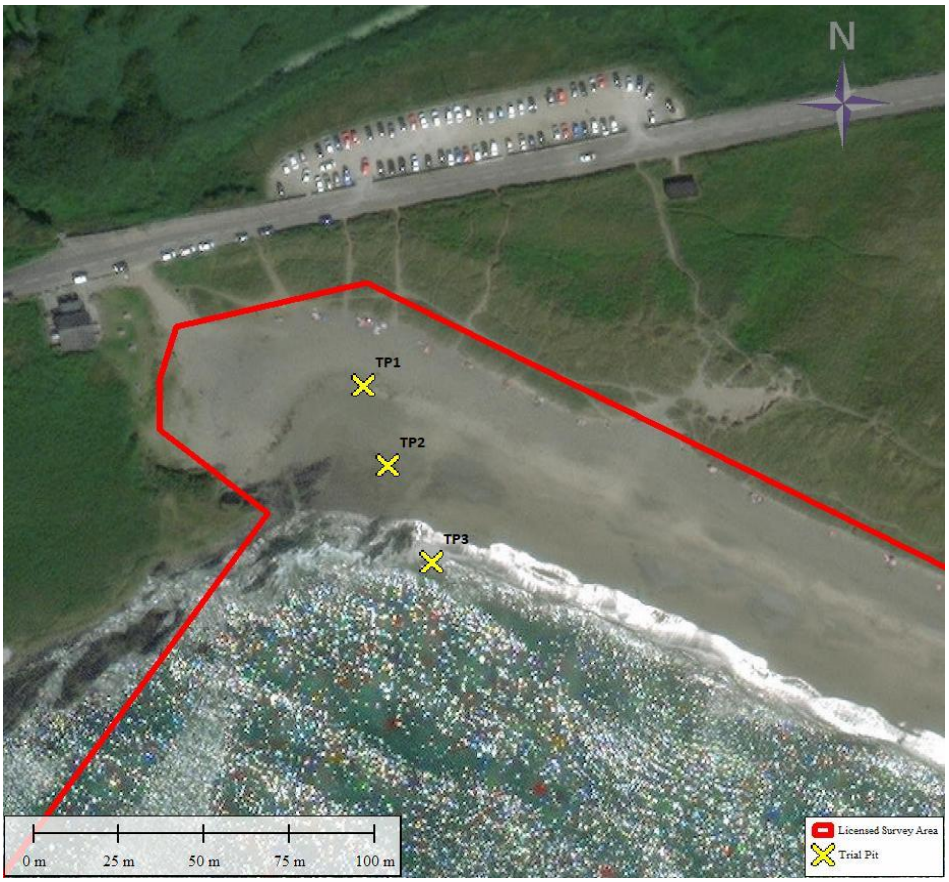


Figure 14 Long Strand Trial Pit Locations.

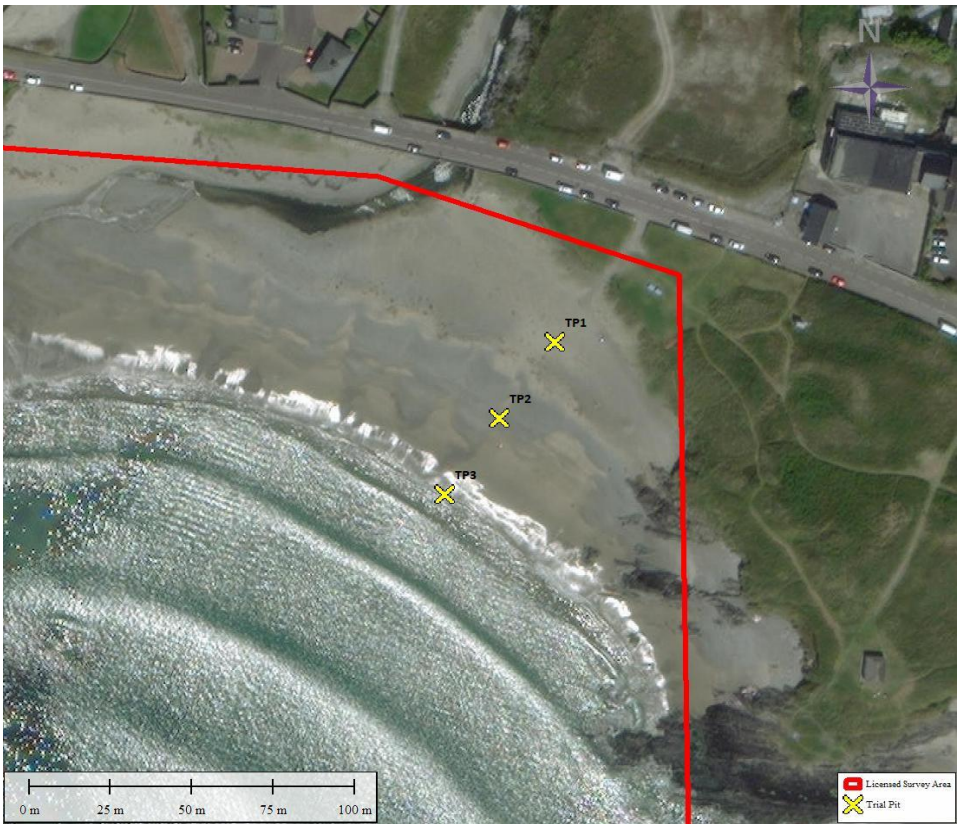


Figure 15 Ownahincha Trial Pit locations.

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

A non-invasive Electrical Resistivity Tomography (ERT) survey may be required (tbc) and would be utilized within the Study Area on the beach. ERT survey involves the measurement of electric potential differences between a series of dispersed electrodes that are generated by an electrical current that is injected into the subsurface. Typically, this involves the placement of multiple vertical electrode strings (VES) in the ground where the electrodes are equally spaced. Additional electrodes can also be placed, temporarily, just beneath the surface to aid measurements. The ERT survey provides:

a) Depth of Penetration below ground,

b) High resolution of vertical geomorphic boundaries and

c) Is not sensitive to velocity inversions.

Furthermore, the combined results of the ERT and topographic survey (Section 3.6) will allow for a better understanding of the existing stratigraphy.

Inshore Marine Survey

The area extending seaward from the low water mark at each 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.

Survey Area	Depth Range	Survey Corridor Width	Min. # of Lines	Min. Overlap	Typical Survey Speed
Inshore	3m to 15m	500m	7	SSS: 100% MBES Bathy: 20%	4 knots

Table 2 Inshore Survey

Offshore Marine Survey

The area extending seaward from the outer limits of the inshore survey to the 12nm 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 five 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.

Survey Area	Depth Range	Survey Corridor Width	Min. # of Lines	Min. Overlap	Typical Survey Speed
Offshore	15m to 100m	500m	7	SSS: 100% MBES Bathy: 20%	4 knots
Offshore	100m to 1,000m	500m	5	SSS: 100% MBES Bathy: 20%	4 knots
Offshore	1,000m to 1,500m	500m	7	SSS: 100% MBES Bathy: 20%	4 knots

Table 3. Offshore Survey

The area extending seaward from 1,500m water depth to the Maritime Area limits will be surveyed by the primary survey vessel using Multibeam Echosounder (MBES) equipment. A continuous bathymetric swathe will be obtained, centred on the preliminary route and along all wing lines needed to complete the route corridor coverage. One survey line, based upon the Survey RPL, is required.

The width of the seabed covered by a single survey line increases as a function of water depth, with the width approximately equal to up to 3 times the water depth. This is illustrated in Figure 19 below. Therefore, in deep water the survey corridor width increases as the survey progresses into deeper waters. The maximum water depth of the survey within the Maritime Area is approximately 4,000m. Based on previous experience of deepwater cable route surveys, the survey corridor corridor width will therefore extend up to a maximum of approximately 10,000m at the Maritime Area extents.

Survey Area	Depth Range	Survey Corridor Width	Min. # of Lines	Min. Overlap	Typical Survey Speed
Offshore	> 1,500m	3 x WD Max. approx. 10,000m	1	NA	4 knots

Table 4. Deep Water Survey

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 the maritime area limits will comprise of the following techniques:

- Up to 96 CPTs (2m to 3m)
- Up to 48 Gravity Cores / Vibrocores (3m)
- Up to 26 Grab Samples

Indicative locations for the relevant site investigation activities (Gravity or Vibrocore, Grab Samples and CPT's) are shown in Figure 16 - 18. Site investigations and seabed sampling will only be undertaken up to a limit of 1,500m water depth. 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 - 3m target depth or refusal. Any push resulting in less than 2m penetration will warrant a second attempt.

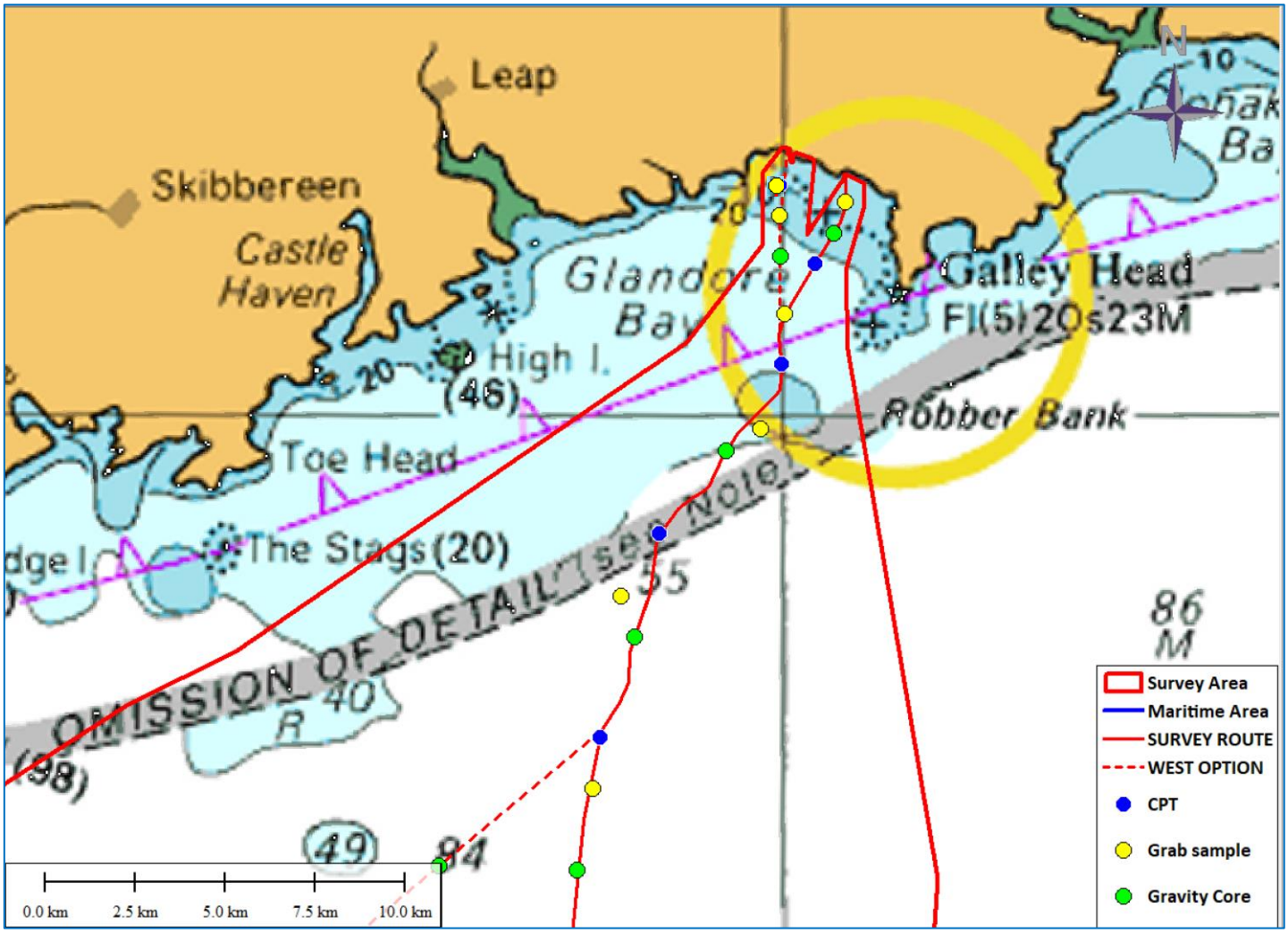


Figure 16. Indicative CPT, Grab sample and GC Locations.

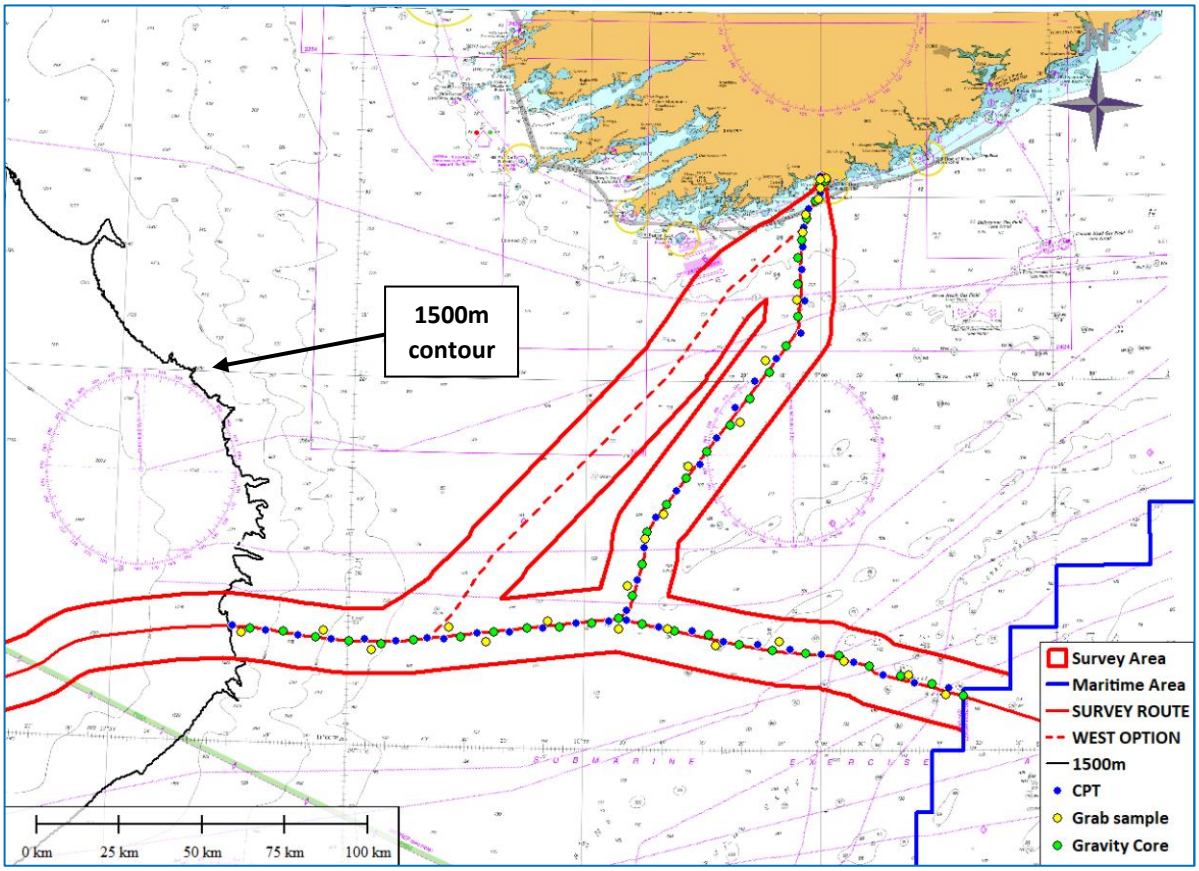


Figure 17. Indicative Sampling Locations - Eastern Route Option

Seabed Sampling

The total overall scope of the Site Investigations is as follows

- Trial Pits — Up to 3 No. on the beach.
- Bar Probes — 16 No. on the beach.
- Bar Probes — 16 No. from Low Water to 3m contour.
- Grab Samples — 26 No. along the route corridor.
- Gravity Cores / Vibrocores — 48 No. along the route corridor.
- Cone Penetration Tests — 96 No. along the route corridor.

Underwater Video Surveys

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.

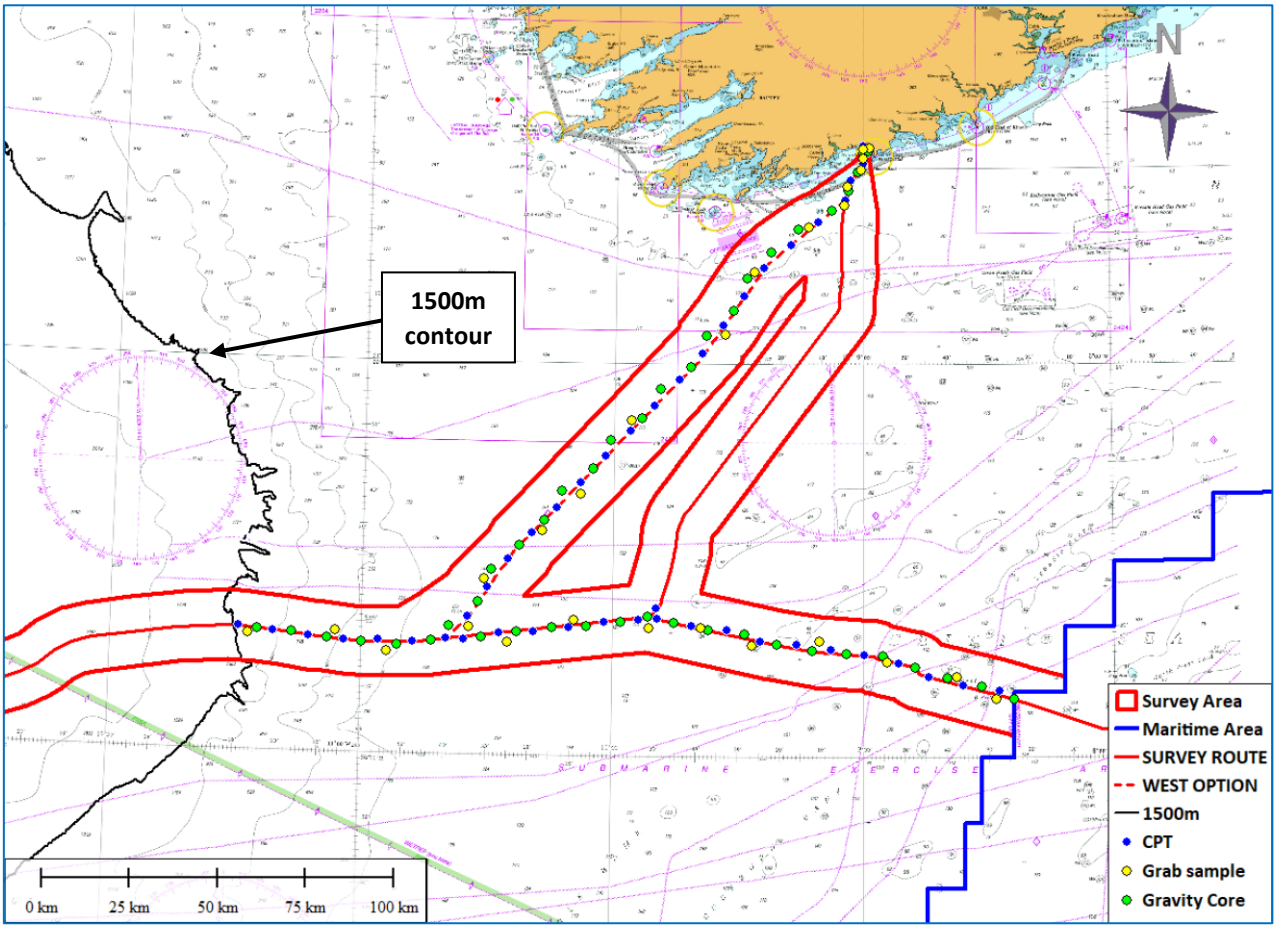


Figure 18. Indicative Sampling Locations - Western Route Option

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. Walk over surveys will be conducted within the intertidal area to check for marine archaeology features and evidence of features of cultural heritage significance.

All archaeological assessments will be carried out under 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.

4.2.4 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 19). 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.

A specific deepwater Multibeam system will be required for surveying in water depths greater than 1,500m. The deepwater MBES system that will be used will be confirmed following the appointment of a survey contractor but a typical system which can be taken as examples would be the Kongsberg EM122 operating at 12kHz with 1x1 degree beamwidth.

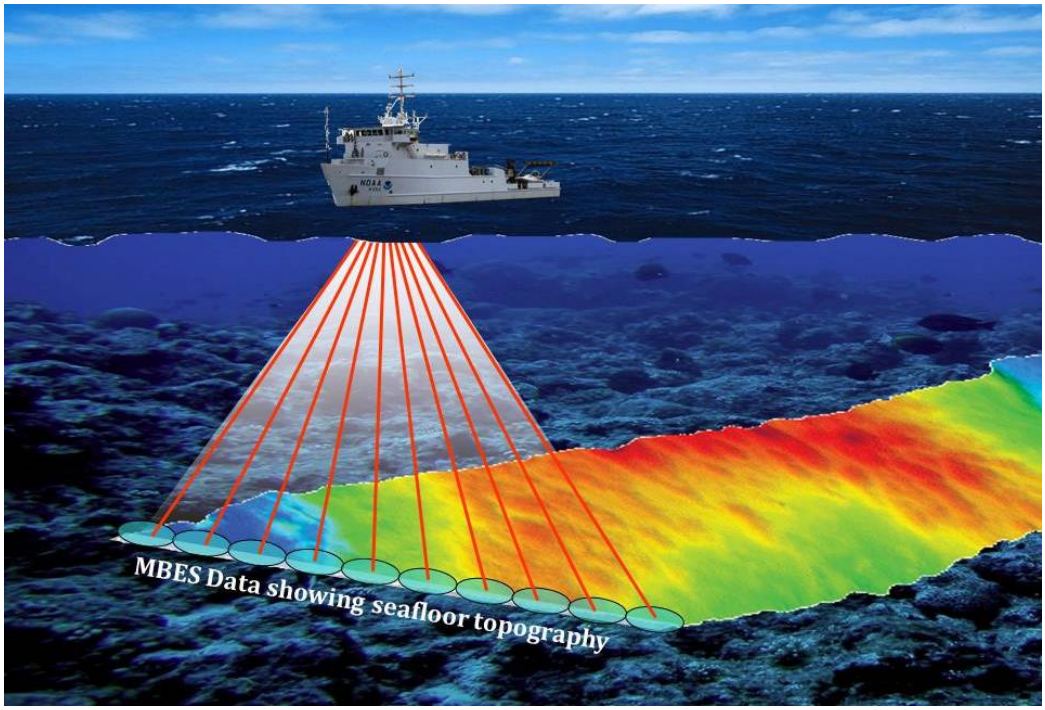


Figure 19 Graphic of MBES survey in operation

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 Maritime Usage Licence application area will be in the range of 200kHz to 500kHz in shallow water and 12kHz in deep water (>1500m) . (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 1µPa 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 Lp,pk 225-228 dB re 1µPa at 1m (LE,p 181-197 dB re 1µPa^2 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 20).

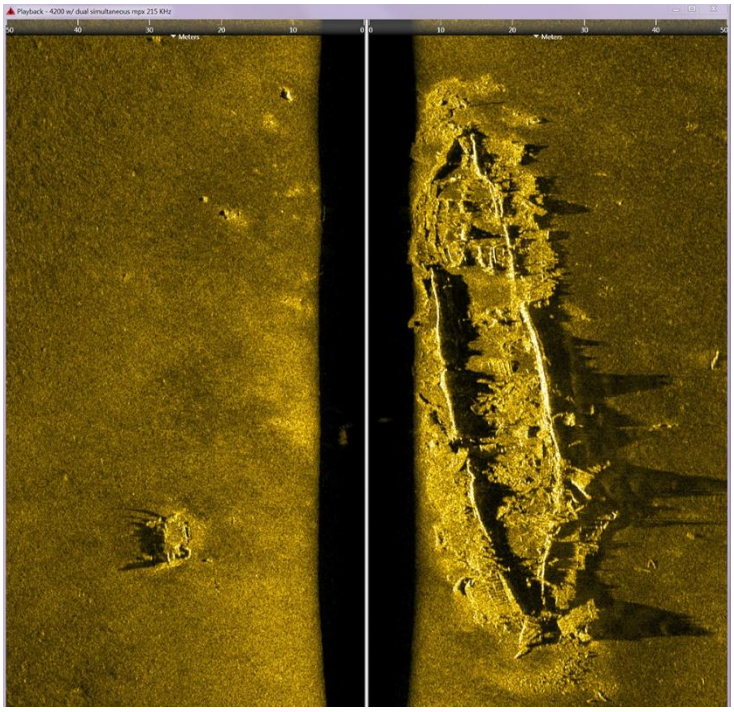


Figure 20. SSS image of shipwreck on seabed and nadir gap.

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 21). The SSS may be hull mounted but is typically towed at depth behind the survey vessel on an armoured tow cable.

Figure 21. Deployment of Edgetech 4200 Tow fish.

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 Maritime Usage 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 sea-floor, 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 20).

Sound source pressure levels of SSS systems have been reported typically in the range Lp,pk 200-240 dB re 1µPa at 1m. (BOEM 2016, BEIS 2020, DAHG 2014). Maximum calibrated source levels, (sound pressure) measured by Crocker & Fratantonio (2016) were Lp, pk 227 dB re 1µPa at 1m for a 0.1 ms pulse, whereas the highest energy source level of LE, p 205 dB re 1µPa^2 s at 1m corresponded to a longer pulse of 1.1 ms at lower maximum pressure (Lp, pk 210 dB re 1µPa 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 ±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 22). 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 22. Marine Magnetics SeaSpy towfish.

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 23). 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.

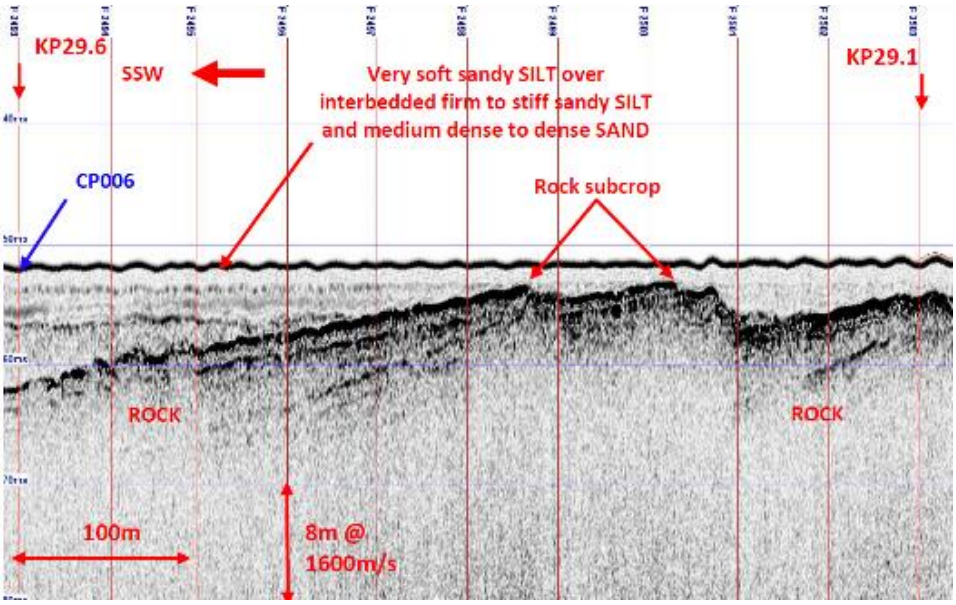


Figure 23. Interpreted SBP seabed profile

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 24) 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 Lp,pk 185-247 dB re 1µPa 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 24. Edgetech SB-424 tow body

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

Table 4. Typical SBP specifications

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 25) 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, indicates that sound pressure source levels are typically within the range 118 - 145 decibels (dB) (BOEM 2012, EIRGRID 2014.

Figure 25. Neptune 3000 CPT rig

Gravity Core

Gravity corers (Figure 26) 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.

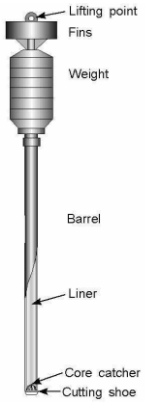


Figure 26. Gravity Corer schematic

Vibrocore

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 with a 3m core proposed for this survey. 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 1µPa at 1m (LGL, 2010).

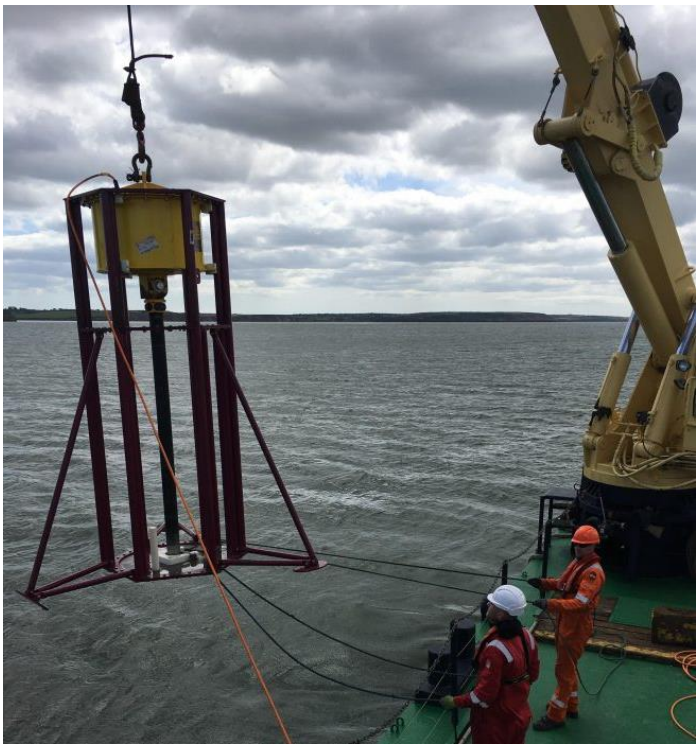


Figure 27. Deployment of Vibrocorer from Survey Vessel

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 28), 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 28. Single and Double Van Veen Grab.

4.2.5 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 vessel 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 a Maritime Usage 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

4.2.6 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 Maritime Usage 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.

4.2.7 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 transatlantic 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 Maritime Usage Licence is complete. It is anticipated that the marine geophysical survey and site investigations activities within the Maritime Usage Licence area will take less than 4 months in total and ideally will be completed in one operation. However, depending on operational factors this may be split up over 8 months. The estimated time required to complete the cable route survey campaign activities is described in Table 7 below.

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
Deepwater Multibeam Echo Sounder (MBES)	Measure detailed bathymetry by transmitting sound pulses (active sonar).	12 kHz	2 – 15 ms	210 Db.	Kongsberg
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 5. Marine Survey Activities

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.	96	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	48	N/A	N/A	N/A
Vibrocorer	Retrieve a seabed sediment sample by penetrating seabed with a vibrating steel core barrel	48	30 Hz	187.4 dB.	LGL 2010
Grab Samples	Collect small sediment samples from seabed surface with clamshell mechanism	26	N/A	N/A	N/A

Table 6. Marine Site Investigation Activities

Activity	Typical Time Period Required for Activity	Total Number of Site Investigation Locations	Total Time for Survey Activity	Seabed Area per Location	Seabed Area per Activity (ha)	Total Area (ha)	Area Directly Affected as % of Maritime Usage Licence Application Area
Inshore Geophysical Survey	3 to 4 days (weather and sea state dependent)	500m cable route corridor	3 to 4 days (weather and sea state dependent)	N/A	1.9 km^2	1.9 km^2	0.0113%
Offshore Geophysical Survey	20 to 23 days (weather and sea state dependent)	500m cable route corridor	20 to 23 days (weather and sea state dependent)	N/A	294 km^2	294 km^2	1.7417%
Deepwater MBES Survey	7 to 9 days (weather and sea state dependent)	3 x Water Depth (10km maximum)	7 to 9 days (weather and sea state dependent)	N/A	3915 km^2	3915 km^2	23.1931%
CPT	30 minutes - 3 hours in any one location	96	192 hours within total 16 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)	8m^2	0.0008 ha	0.076 ha	0.0002%
Gravity Corer	30 minutes - 3 hours in any one location	48	96 hours within total 16 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)	1m^2	0.0001 ha	0.0048 ha	0.0000%
Vibro Corer	30 minutes - 3 hours in any one location	48	96 hours within total 16 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)	8m^2	0.0008 ha	0.0384 ha	0.0001%
Grab Samples	20 minutes – 2 hours in any one location	26	26 hours within total 16 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)	0.5m^2	0.00005 ha	0.0013 ha	0.0000%

Table 7. Estimated Time and Duration of Survey Activities

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 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 survey vessel (4kn), or stationary during sampling, 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 survey vessel speed will be very slow (4 knots) or stationary. 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. In the interest of carrying out a thorough assessment in line with both the Habitats Directive, and the precautionary principle, the ZoI was expanded for this assessment to include designated sites within 15km of the proposed development site, and sites beyond 15km that have the potential to be impacted by the proposed survey works based on the Source-Pathway-Receptor model. This was done in the interest of ensuring that any potential impacts, however indirect or remote, were taken into account.

4.3.1 Marine Mammals

Seals and Cetaceans

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

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

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.

Recent research suggests that the foraging range for grey seals is 448km Carter et al., 2022). Further, the foraging range for harbour seal is estimated at 273 km (Carter et al., 2022). Further, there are a number of SACs designated for cetaceans (harbour porpoise and common dolphin) in Ireland. As these species are a highly mobile species, and are designated as qualifying interests of Natura 2000 sites within and outside the Irish EEZ, specific Management Units (MU) are utilised to assess the potential impacts of a proposed project on these species, based on the JNCC Review of Management Unit boundaries for cetaceans in UK waters (2023) methodology[3]. The proposed project is located within the Celtic and Irish Seas MU for harbour porpoise, and Oceanic Waters MU, Offshore Channel, Celtic Sea & SW England MU, and West Coast of Ireland MUs for bottlenose dolphin (IAMMWG, 2015). The ZoI of the proposed project has been extended to include the potential for significant 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 Celtic and Irish Seas MU (harbour porpoise), Oceanic Waters MU (bottlenose dolphin), Offshore Channel, Celtic Sea & SW England MU (bottlenose dolphin), and West Coast of Ireland MU (bottlenose dolphin).

Otter

Otters are a semi-aquatic species who 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 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km 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 otter that may enter the proposed area of works.

4.3.2 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). The recorded areas of salmon migration are demonstrated in Figure AI.1 in Appendix I.

Recent studies on Twaite Shad recorded movement of up to 950km from the River Severn with one individual detected in the Blackwater Estuary (Davies et al. 2020). However, given the spatial and temporal nature of the proposed works, the proposed project is considered too distant from Natura 2000 sites where it is a feature of interest, for any significant interaction to occur. Similarly distant SACs designated for lamprey species were considered too distant for any significant interaction to occur.

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

4.4 Identification of Relevant Natura 2000 Sites

4.4.1 Management of the Site

The proposed works are not directly connected with, or necessary to, the management of Natura 2000 sites.

4.4.2 Relevant Natura 2000 Sites to the Proposed Project

A key factor in the consideration as to whether or not a particular European site is likely to be affected by the proposed survey works is its distance from the works location. It is generally, but not necessarily, the case that the greater the distance from the plan or project the smaller the likelihood of impacts.

In this case, the proposed survey works are located within the Kilkeran Lake and Castlefreke Dunes SAC. The proposed works are not proximate habitats that are features of interest of this SAC. However, out of an abundance of caution, in the absence of mitigation, during the survey works, there is the potential for significant effects on the features of interest of this SAC through physical impact on the features of interest of this SAC. Further information is required to assess the potential effects of the proposed works on this SAC.

In relation to marine mammals, the proposed subtidal survey works are located 8.1 km from the Roaringwater Bay and Islands SAC. There is potential for marine mammals from Roaringwater Bay and Islands SAC ((*Halichoerus grypus* (grey seal) and *Phocoena phocoena* (harbour porpoise)) to be in the vicinity of the proposed survey works. Further, following an examination of relevant MU's and foraging areas for grey seal and harbour seal, the following Natura 2000 sites have been screened IN due to the potential movements of harbour porpoise, common bottlenose dolphin, harbour seals, and grey seals (qualifying interests of these SAC):

- Roaringwater Bay and Islands SAC (IE)
- Glengarriff Harbour and Woodland SAC (IE)
- Kenmare River SAC (IE)
- Lower River Shannon SAC (IE)
- Blasket Island SAC (IE)
- Saltee Islands SAC (IE)
- Galway Bay Complex SAC (IE)
- Slaney River Valley SAC (IE)
- Kilkieran Bay And Islands SAC (IE)
- Slyne Head Peninsula SAC (IE)
- Slyne Head Islands SAC (IE)
- West Connacht Coast SAC (IE)
- Inishbofin and Inishshark SAC (IE)
- Clew Bay Complex SAC (IE)
- Rockabill to Dalkey Islands SAC (IE)
- Duvillaun Islands SAC (IE)
- Lambay Island SAC (IE)
- Inishkea Islands SAC (IE)
- Slieve Tooey/Tormore Island/Loughbros Beg Bay SAC (IE)
- Horn Head and Rinclevan SAC (IE)
- Isles of Scilly Complex (UK)
- Bristol Channel Approaches/Dynesfeydd Môr Hafren (UK)
- Pembrokeshire Marine / Sir Benfro Forol (UK)
- West Wales Marine / Gorllewin Cymru Forol (UK)
- Cardigan Bay / Bae Ceredigion (UK)
- Lundy (UK)
- Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau (UK)
- North Anglesey Marine/Gogledd Môn Forol (UK)
- North Channel (UK)
- The Maidens (UK)
- Mers Celtiques – Talus du golfe de Gascogne (FR)
- Récifs du talus du golfe de Gascogne (FR)
- Ouessant-Molène (FR)

- Nord Bretagne DH (FR)
- Abers – Côtes des legends (FR)
- Anse de Goulven, dunes de Keremma (FR)
- Chaussée de Sein (FR)
- Côtes de Crozon (FR)
- Presqu'lle de Crozon (FR)
- Baie de Morlaix (FR)
- Rade de Brest, estuaire de l'Aulne (FR)
- Cap Sizun (FR)
- Côte de Granit rose-Sept-Iles (FR)
- Baie d'Audieme (FR)
- Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay (FR)
- Trégor – Goëlo (FR)
- Roches de Penmarch (FR)
- Archipel des Glénan (FR)
- Dunes et côtes de Trévignon (FR)
- Baie de Saint-Brieuc – Est (FR)
- Cap d'Erquy-Cap Fréhel (FR)
- Récifs et landes de la Hague (FR)
- Anse de Vauville (FR)
- Banc et récifs de Surtainville (FR)
- Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard (FR)
- Chaucy (FR)
- Côte de Cancale á Parmè (FR)
- Estuairie de la Rance (FR)
- Récifs et marais arrière-littoraux du Cap Lévi à la Pointe de Saire (FR)
- Baie du Mont Saint-Michel (FR)
- Baie de Seine occidentale (FR)
- Baie de Seine orientale (FR)
- Littoral Cauchois (FR)
- Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant (FR)

Further information is required to assess the potential effects of the proposed works on these European Sites.

All Natura 2000 sites within 15km, and beyond 15km with the potential for significant effects on Natura 2000 sites (including Irish, French, and UK sites), are listed in Tables 8-10. The qualifying interests, and the potential impact of the development on each European site and qualifying interest, are screened in/out in Table 11.

The proposed Survey Route Corridor and Works (including deepwater survey and sampling locations) from the landfall area to the Irish EEZ is demonstrated in Figures 29-33. Waterbodies (incl. high & low water marks and proximate sampling locations) located proximate to the Survey Route Corridor is demonstrated in Figure 34. Waterbodies, SACs and SPAs within / proximate to the proposed Survey Route Corridor are demonstrated in Figures 35 & 36. SACs and SPAs within 15 km of the proposed Survey Route Corridor are seen in Figures 37 & 38. The proposed 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) is demonstrated in Figure 39. Irish, FR, & UK SACs designated for Grey Seals (*Halichoerus grypus*) within 448km of the Proposed Survey Route Corridor are demonstrated in Figure 40.Irish, FR, & UK SACs designated for Harbour Seals (*Phoca vitulina*) within 273km of the Proposed Survey Route Corridor are demonstrated in Figure 41. Irish, FR, & UK SACs located within the Management Units (MU) for Bottlenose dolphin (*Tursiops truncatus*) and Harbour Porpoise (*Phocoena phocoena*) are demonstrated in Figures 42 & 43.

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

Designation	European Site	Distance
SAC	Kilkeran Lake and Castlefreke Dunes SAC	Within
SAC	Lough Hyne Nature Reserve and Environs SAC	5.8 km
SAC	Clonakilty Bay SAC	5.9 km
SAC	Castletownshend SAC	6.5 km
SAC	Roaringwater Bay and Islands SAC	8.1 km **(Within MU for Harbour Porpoise)**
SAC	Myross Wood SAC	9.5 km
SAC	Glengarriff Harbour and Woodland SAC	38.2 km
SAC	Kenmare River SAC	49.8 km
SAC	Lower River Shannon SAC	76.9 km **(Within MU for Common Bottlenose Dolphin)**
SAC	Blasket Island SAC	102.5 km **(Within MU for Harbour Porpoise)**
SAC	Saltee Islands SAC	166.7 km
SAC	Galway Bay Complex SAC	172.7 km
SAC	Slaney River Valley SAC	182.6 km
SAC	Kilkieran Bay And Islands SAC	186.4 km
SAC	Slyne Head Peninsula SAC	217.3 km **(Within MU for Common Bottlenose Dolphin)**
SAC	Slyne Head Islands SAC	219 km **(Within MU for Common Bottlenose Dolphin)**
SAC	West Connacht Coast SAC	223.3 km **(Within MU for Common Bottlenose Dolphin)**
SAC	Inishbofin and Inishshark SAC	240.5 km
SAC	Clew Bay Complex SAC	249.2 km
SAC	Rockabill to Dalkey Islands SAC	271.4 km **(Within MU for Harbour Porpoise)**
SAC	Duvillaun Islands SAC	285.3 km **(Within MU for Common Bottlenose Dolphin)**
SAC	Lambay Island SAC	292.8 km
SAC	Inishkea Islands SAC	293.1 km
SAC	Slieve Tooey/Tormore Island/Loughbros Beg Bay SAC	349.6 km
SAC	Horn Head and Rinclevan SAC	405 km
Special Protection Areas		
SPA	Galley Head to Duneen Point SPA	0.9 km
SPA	Sheeps Head to Toe Head SPA	3.7 km
SPA	Clonakilty Bay SPA	5.9 km
SPA	Seven Heads SPA	12.9 km

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

Designation	European Site	Distance
SAC	Isles of Scilly Complex	125 km
SAC	Bristol Channel Approaches/Dynesfeydd Môr Hafren	193.4 km **(Within MU for Harbour Porpoise)**
SAC	Pembrokeshire Marine / Sir Benfro Forol	233.1 km
SAC	West Wales Marine / Gorllewin Cymru Forol	235 km **(Within MU for Harbour Porpoise)**
SAC	Cardigan Bay / Bae Ceredigion	286.9 km
SAC	Lundy	293.6 km
SAC	Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau	309.7 km
SAC	North Anglesey Marine/Gogledd Môn Forol	318.3 km **(Within MU for Harbour Porpoise)**
SAC	North Channel	376.2 km **(Within MU for Harbour Porpoise)**
SAC	The Maidens	426.8 km

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

Designation	European Site	Distance
SAC	Mers Celtiques – Talus du golfe de Gascogne	164.1 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Récifs du talus du golfe de Gascogne	202 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Ouessant-Molène	285.6 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Nord Bretagne DH	287.1 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Abers – Côtes des légendes	302.8 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Anse de Goulven, dunes de Keremma	326.9 km
SAC	Chaussée de Sein	313.9 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Côtes de Crozon	331.4 km **(Within MU for Harbour Porpoise)**
SAC	Presqu'lle de Crozon	333.9 km
SAC	Baie de Morlaix	337.2 km **(Within MU for Harbour Porpoise)**
SAC	Rade de Brest, estuaire de l'Aulne	340.4 km
SAC	Cap Sizun	345.2 km
SAC	Côte de Granit rose-Sept-Iles	345.2 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Baie d'Audieme	367.9 km
SAC	Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay	369.2 km **(Within MU for Harbour Porpoise)**
SAC	Trégor – Goëlo	372.3 km

Designation	European Site	Distance
		(Within MU for Bottlenose Dolphin & Harbour Porpoise)
SAC	Roches de Penmarch	373.3 km
SAC	Archipel des Glénan	395 km
SAC	Dunes et côtes de Trévignon	400.7 km
SAC	Baie de Saint-Brieuc - Est	438 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Cap d'Erquy-Cap Fréhel	443.3 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Récifs et landes de la Hague	447.1 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Anse de Vauville	448.6 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Banc et récifs de Surtainville	452.4 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard	463.6 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Chaucy	469.7 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Côte de Cancale á Parmè	479.5 km **(Within MU for Bottlenose Dolphin)**
SAC	Estuairie de la Rance	479.6 km **(Within MU for Harbour Porpoise)**
SAC	Récifs et marais arrière-littoraux du Cap Lévi à la Pointe de Saire	482.8 km **(Within MU for Bottlenose Dolphin)**
SAC	Baie du Mont Saint-Michel	488.9 km **(Within MU for Bottlenose Dolphin & Harbour Porpoise)**
SAC	Baie de Seine occidentale	501.3 km **(Within MU for Bottlenose Dolphin)**
SAC	Baie de Seine orientale	571.5 km **(Within MU for Bottlenose Dolphin)**
SAC	Littoral Cauchois	601.9 km **(Within MU for Bottlenose Dolphin)**
SAC	Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant	696.2 km **(Within MU for Bottlenose Dolphin)**

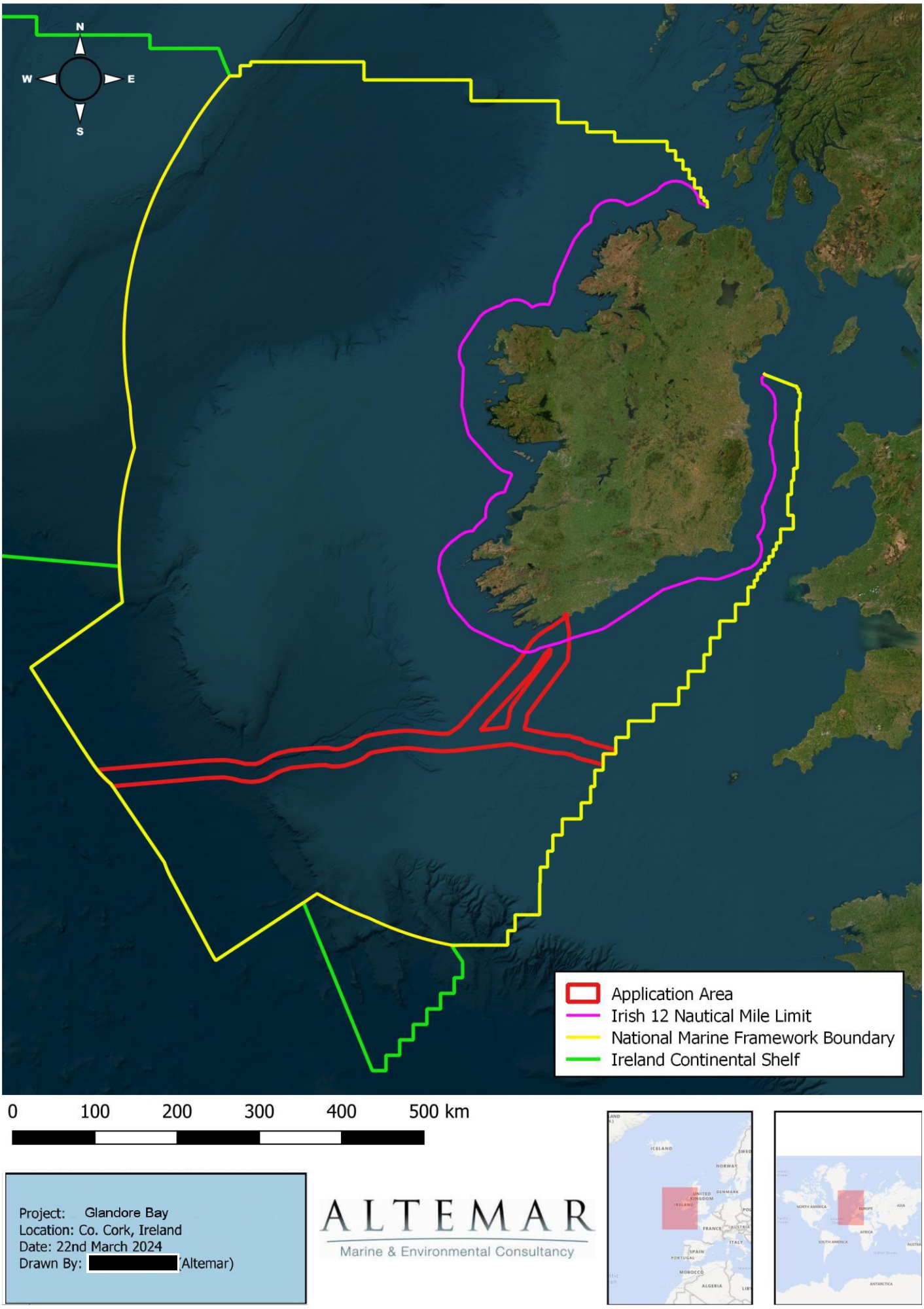


Figure 29: Proposed Survey Route Corridor (incl. 12nm limit, EEZ, & Irish Continental Shelf)

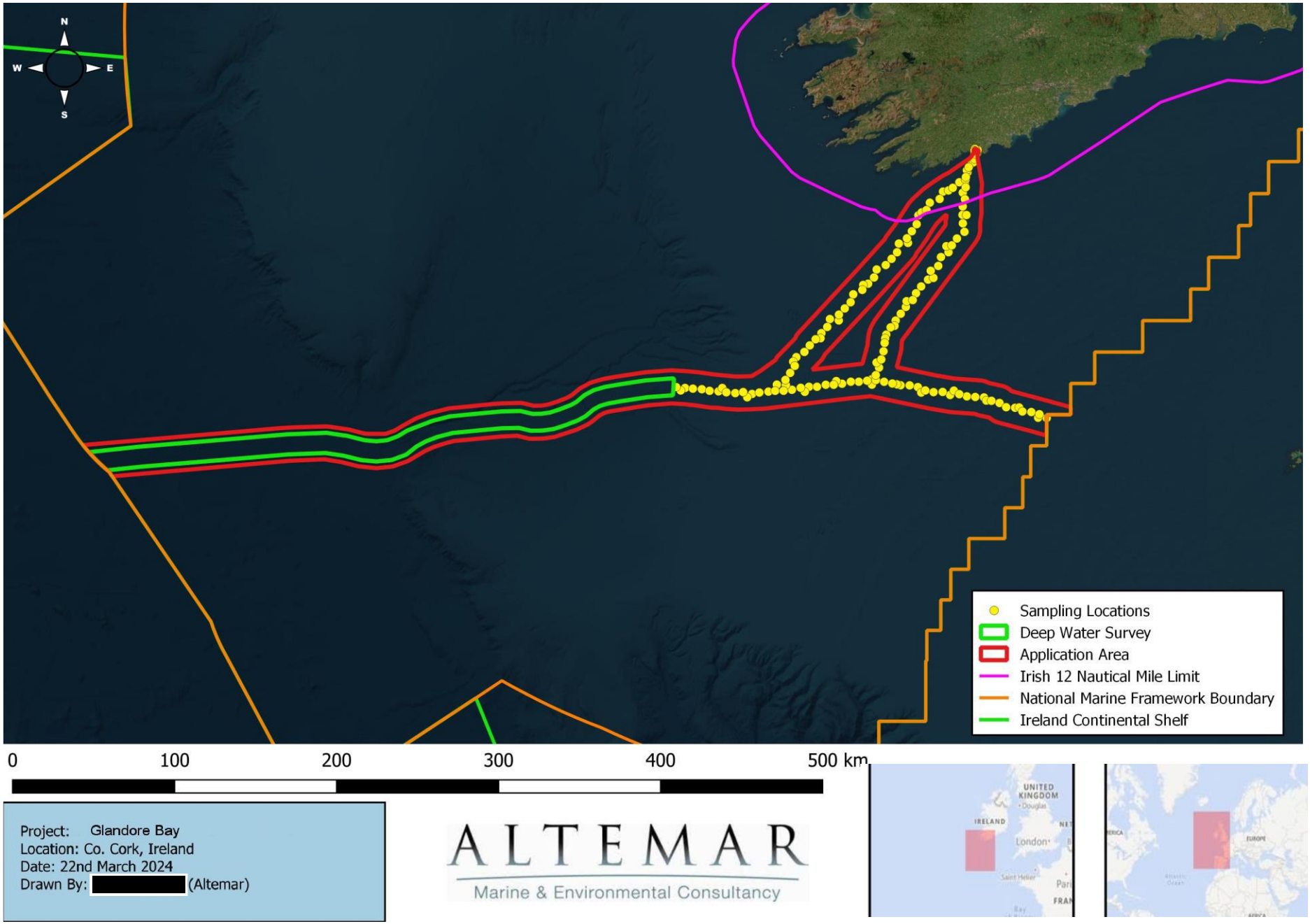


Figure 30: Proposed Survey Route Corridor & Sampling Locations (incl. 12nm limit, EEZ, & Irish Continental Shelf)

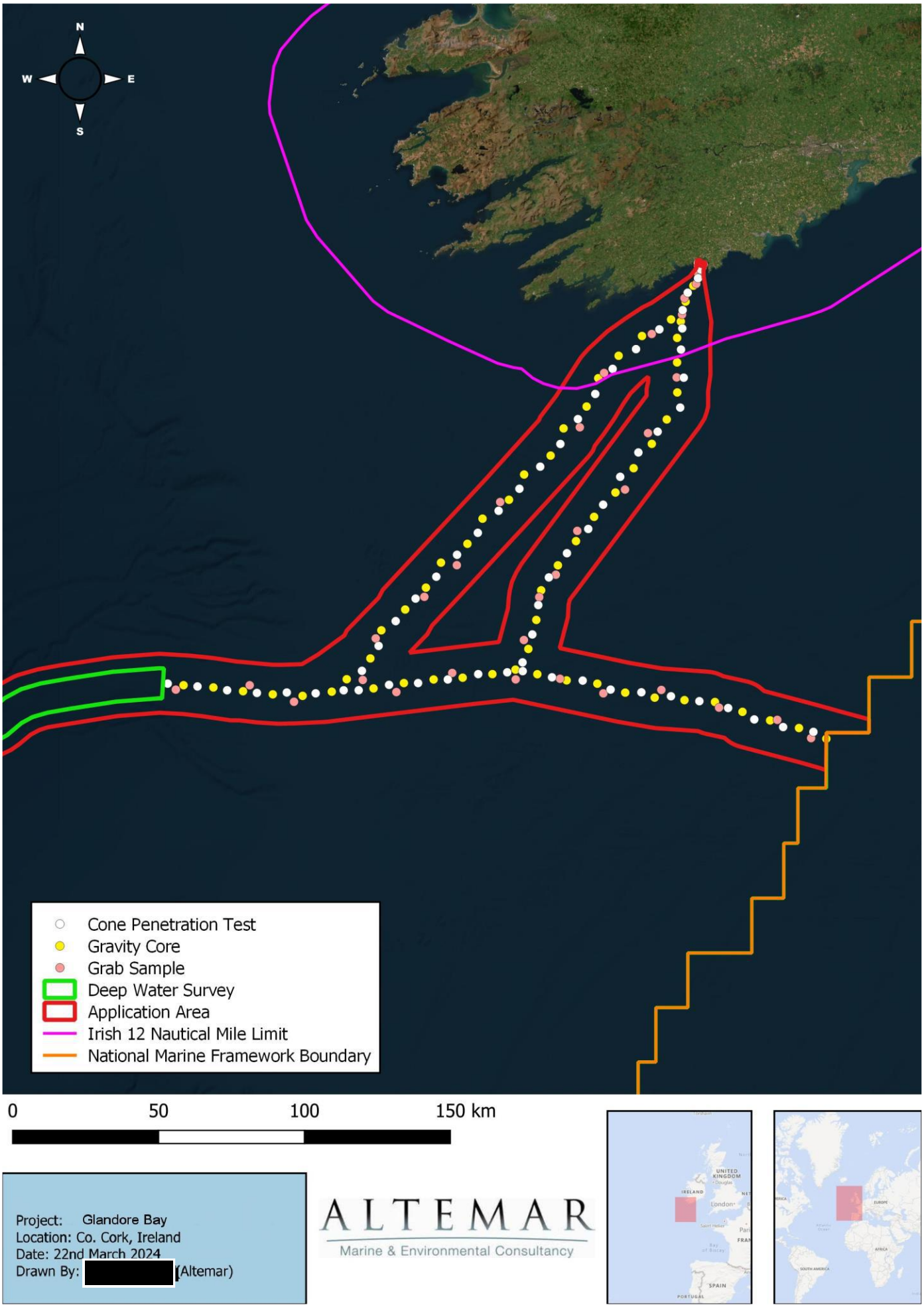


Figure 31: Proposed Survey Route Corridor & Sampling Locations (CPT, Grab Samples, and Gravity Core) (incl. 12nm limit, EEZ, & Irish Continental Shelf)

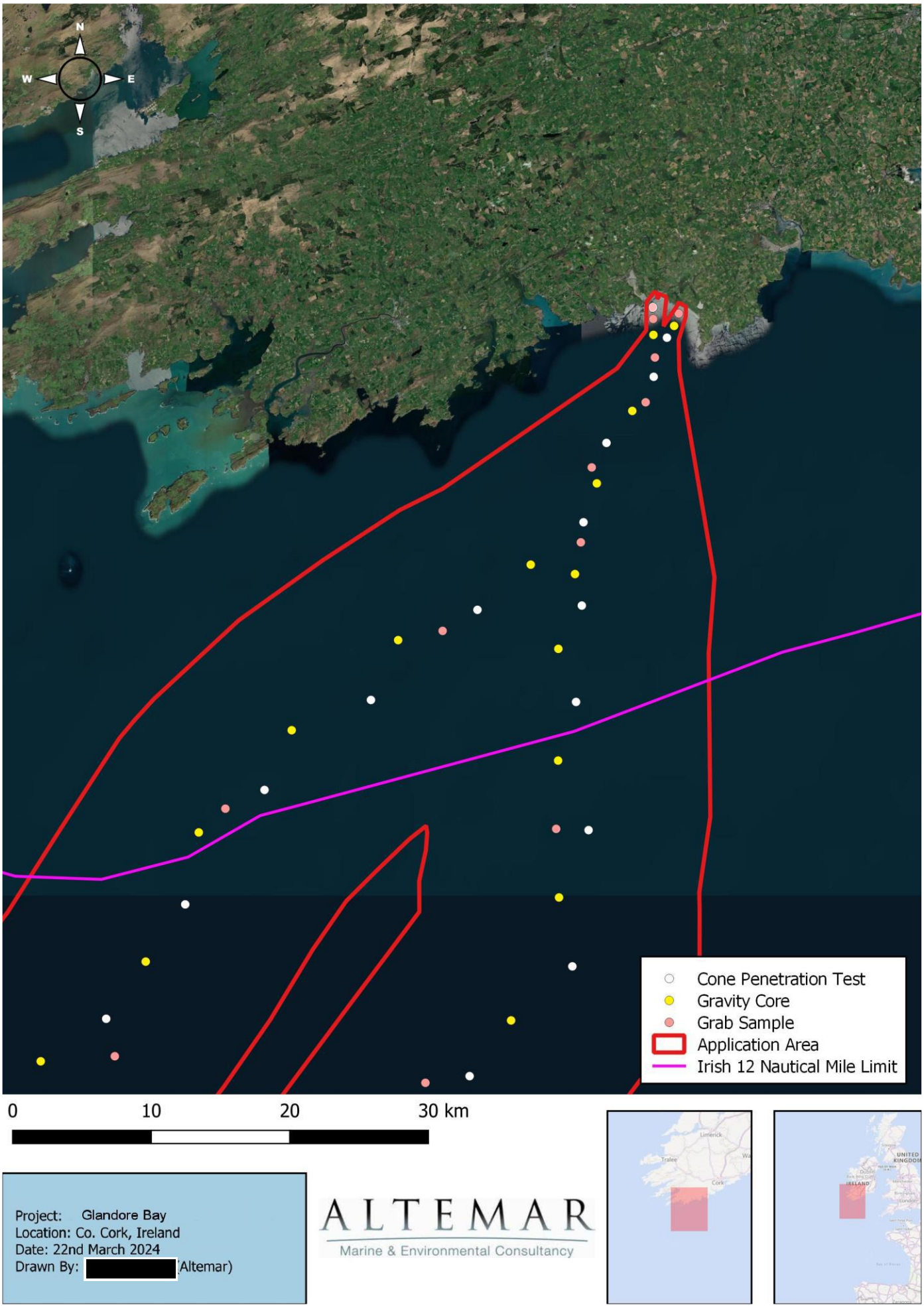


Figure 32: Proposed Survey Route Corridor & Sampling Locations (CPT, Grab Samples, and Gravity Core) to 12nm limit

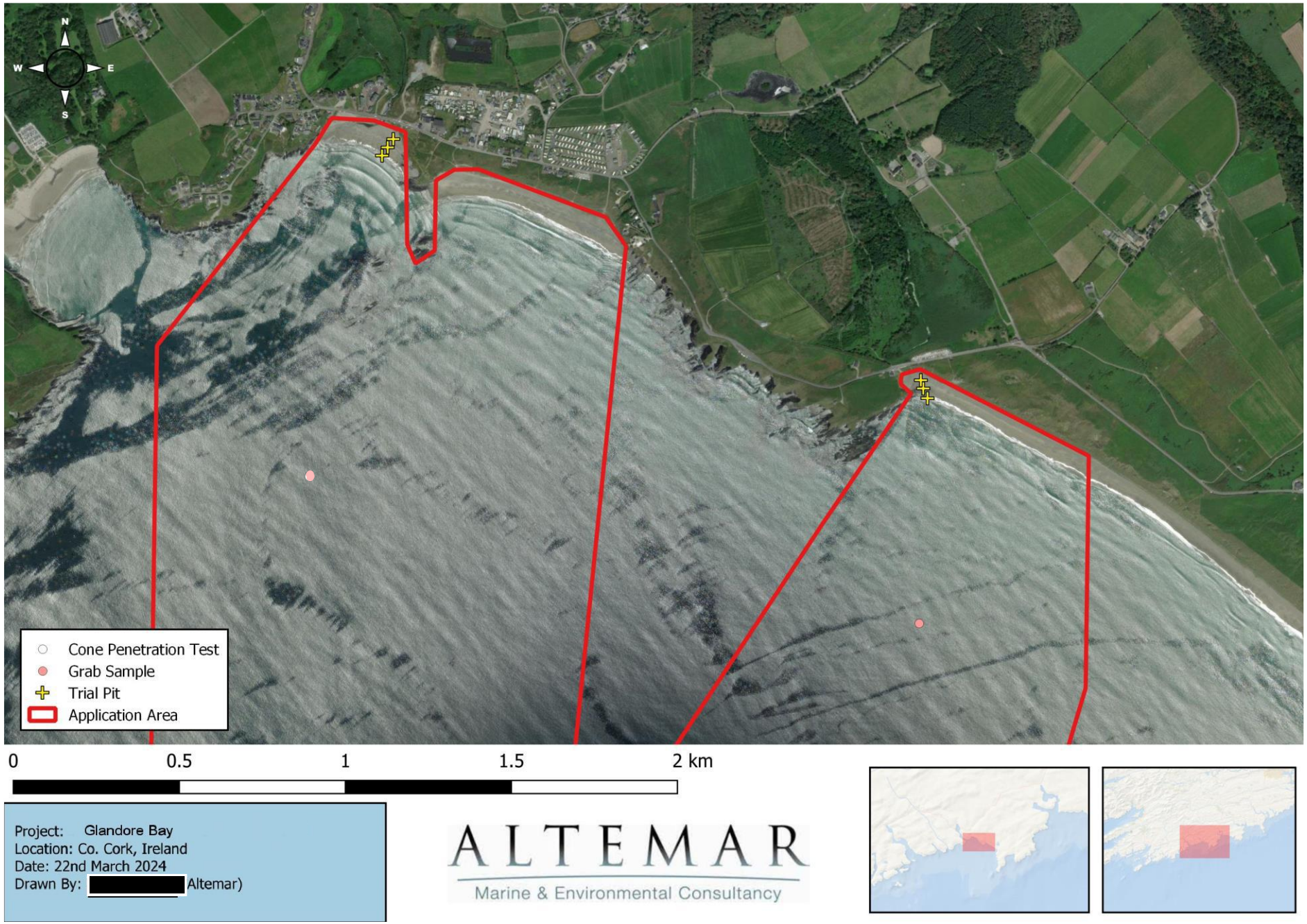


Figure 33. Proposed survey route corridor at landfall sites (incl. sampling locations)

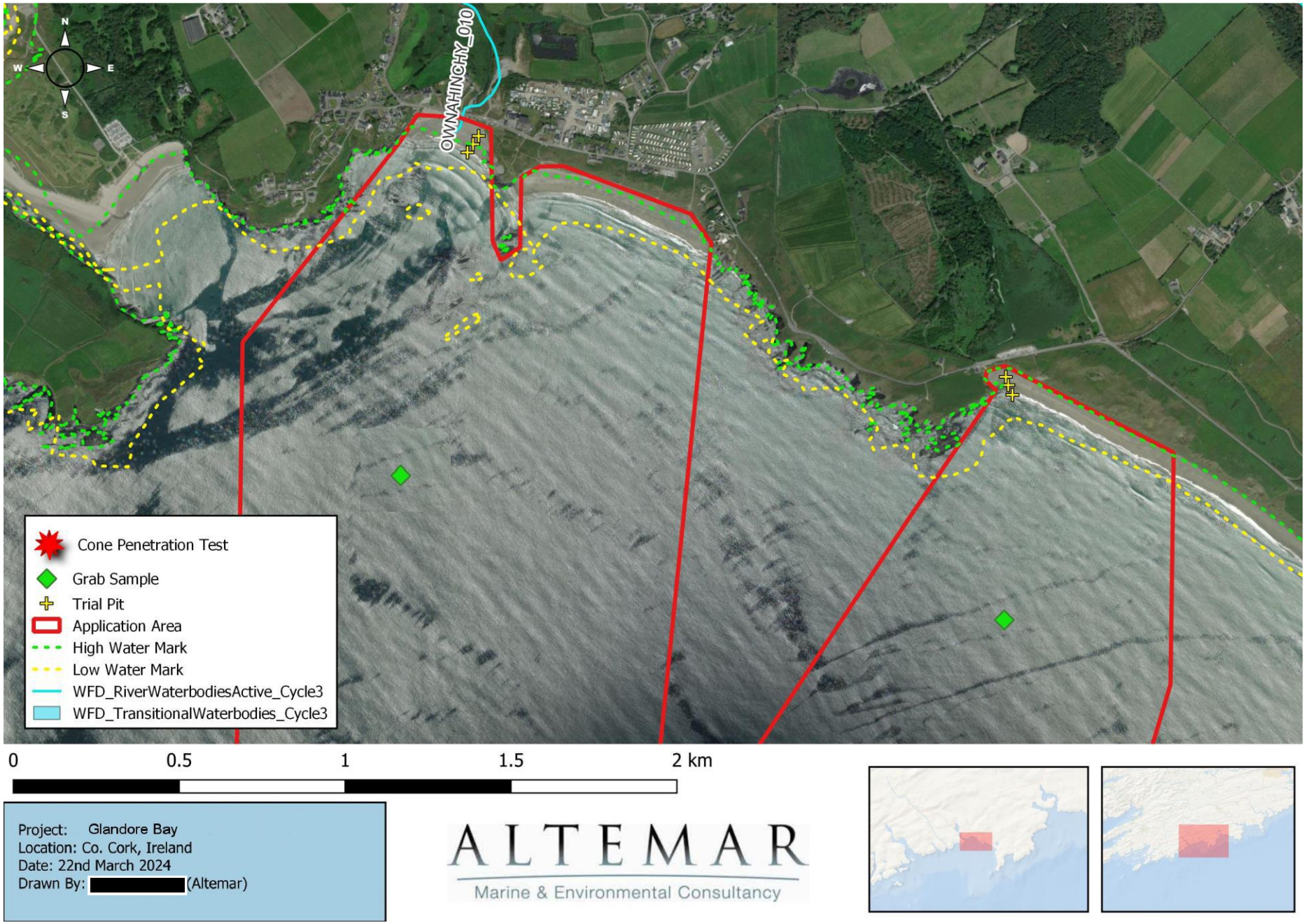


Figure 34. Proposed survey route corridor, sampling locations, HWM / LWM, and proximate watercourses to the landfall area.

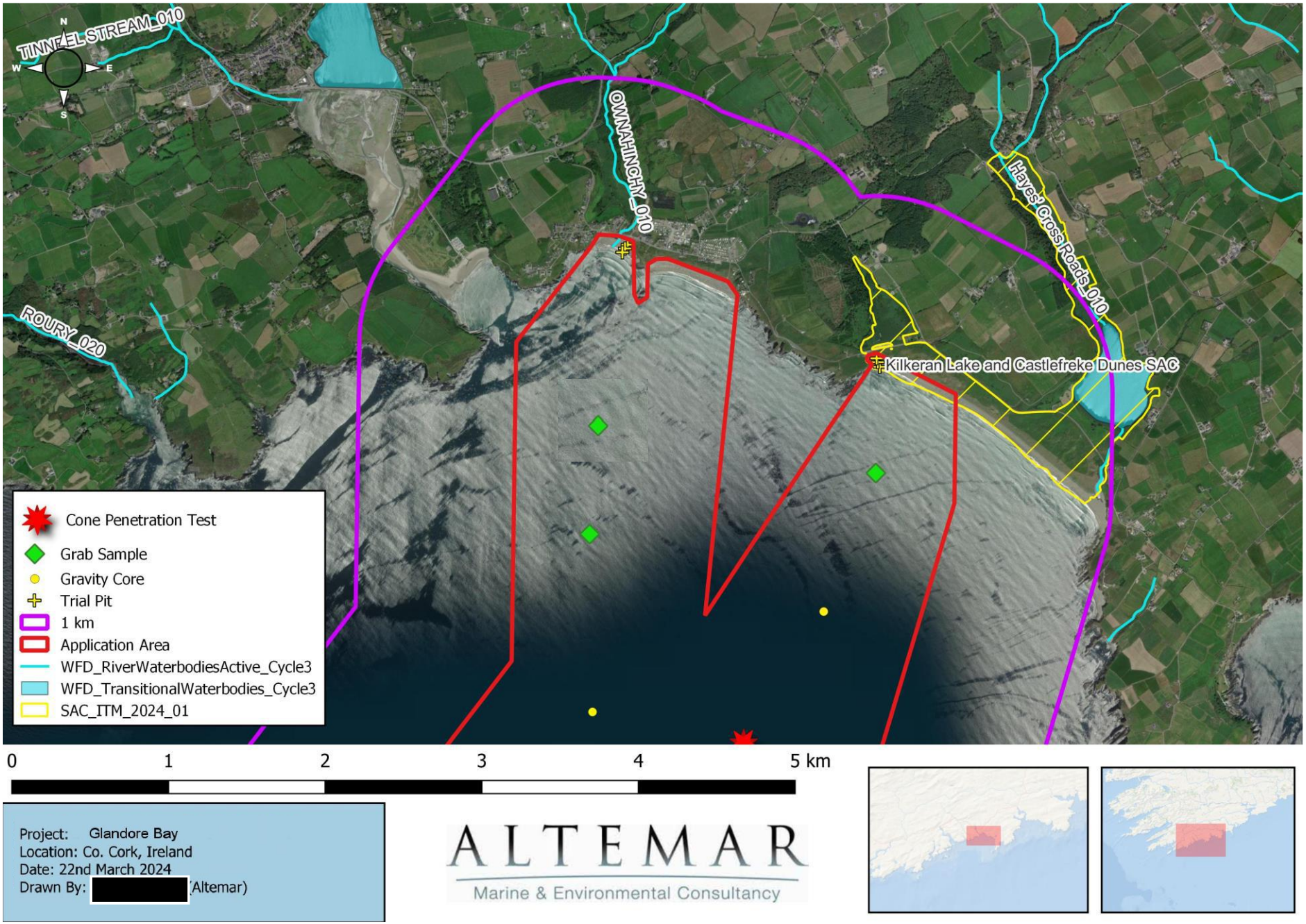


Figure 35. Proposed survey route corridor, sampling locations**,** waterbodies, and SACs proximate to the landfall area

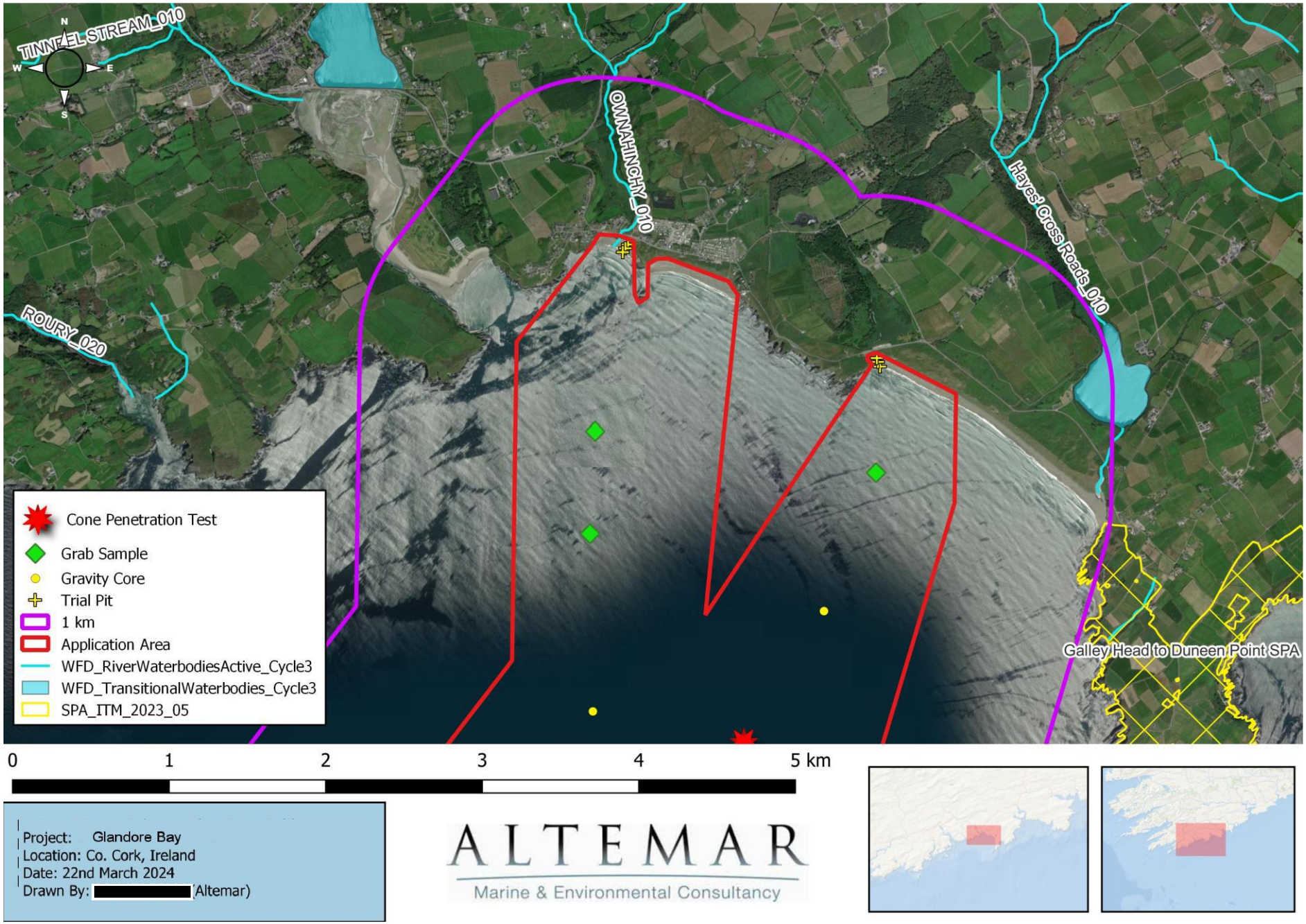


Figure 36. Proposed survey route corridor, sampling locations, waterbodies, and SPAs proximate to the landfall area.

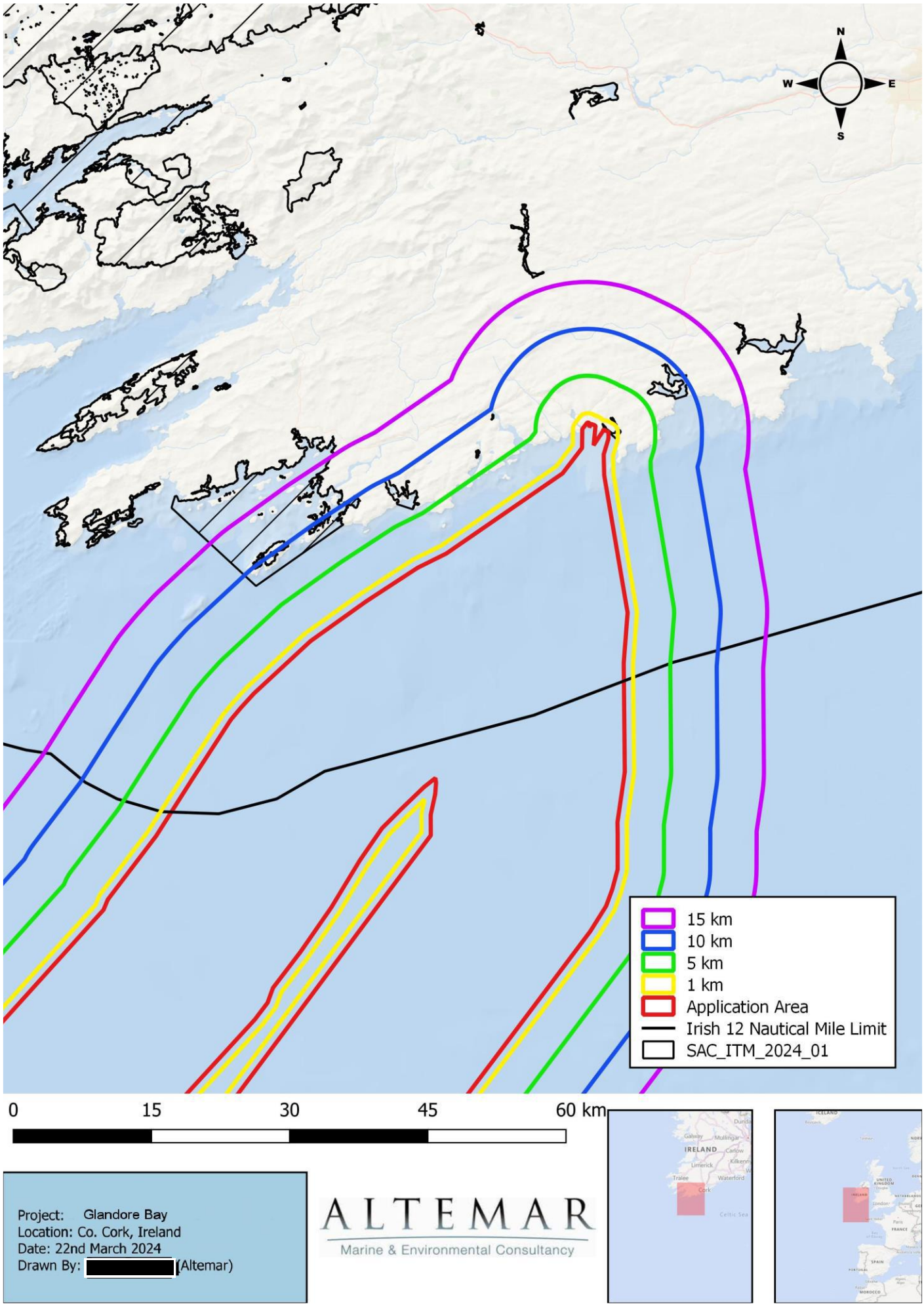


Figure 37. Special Areas of Conservation (SAC) within 15km of the proposed Survey Route Corridor

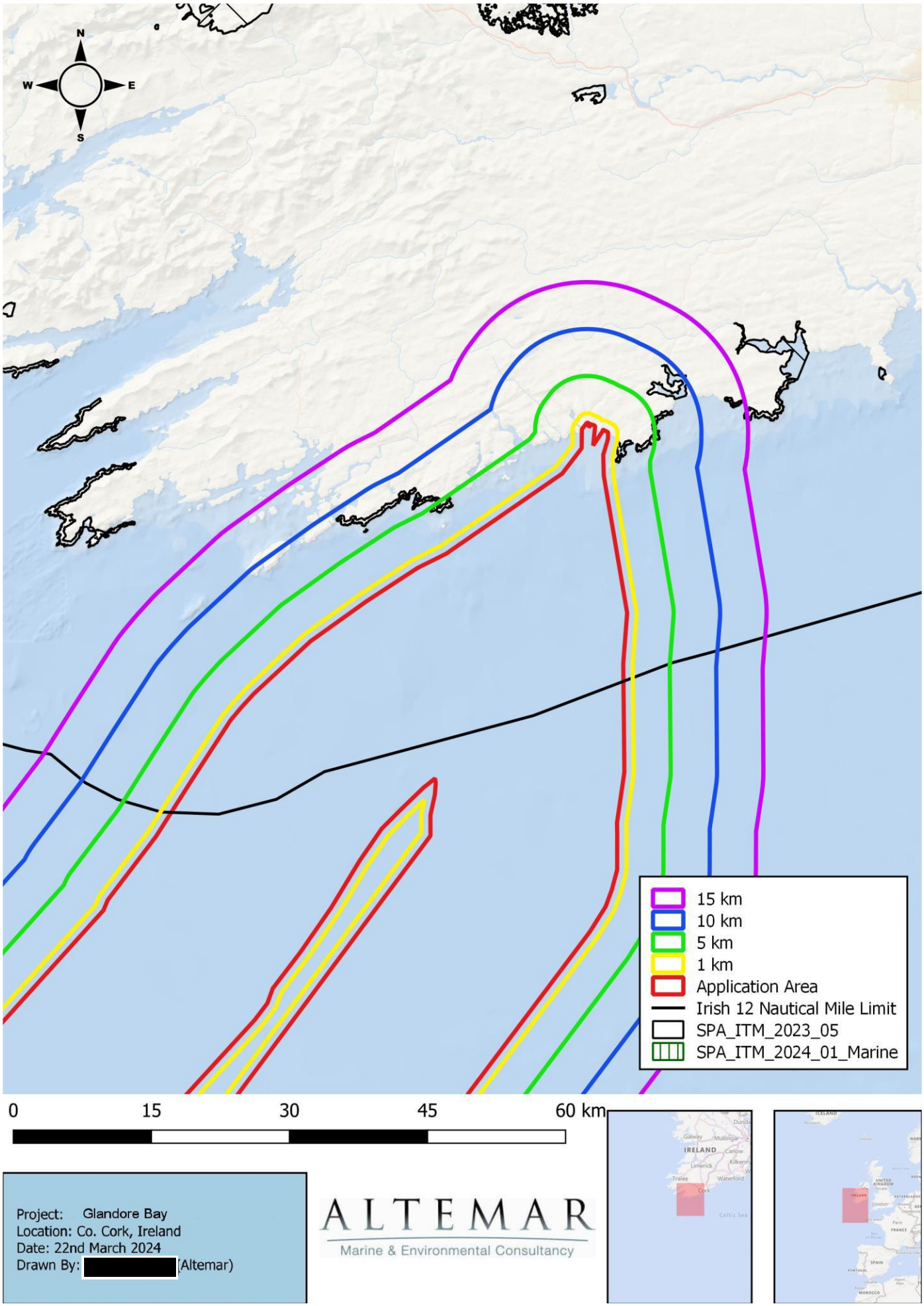


Figure 38. Special Protection Areas (SPA) (incl. marine SPAs) within 15km of the proposed Survey Route Corridor

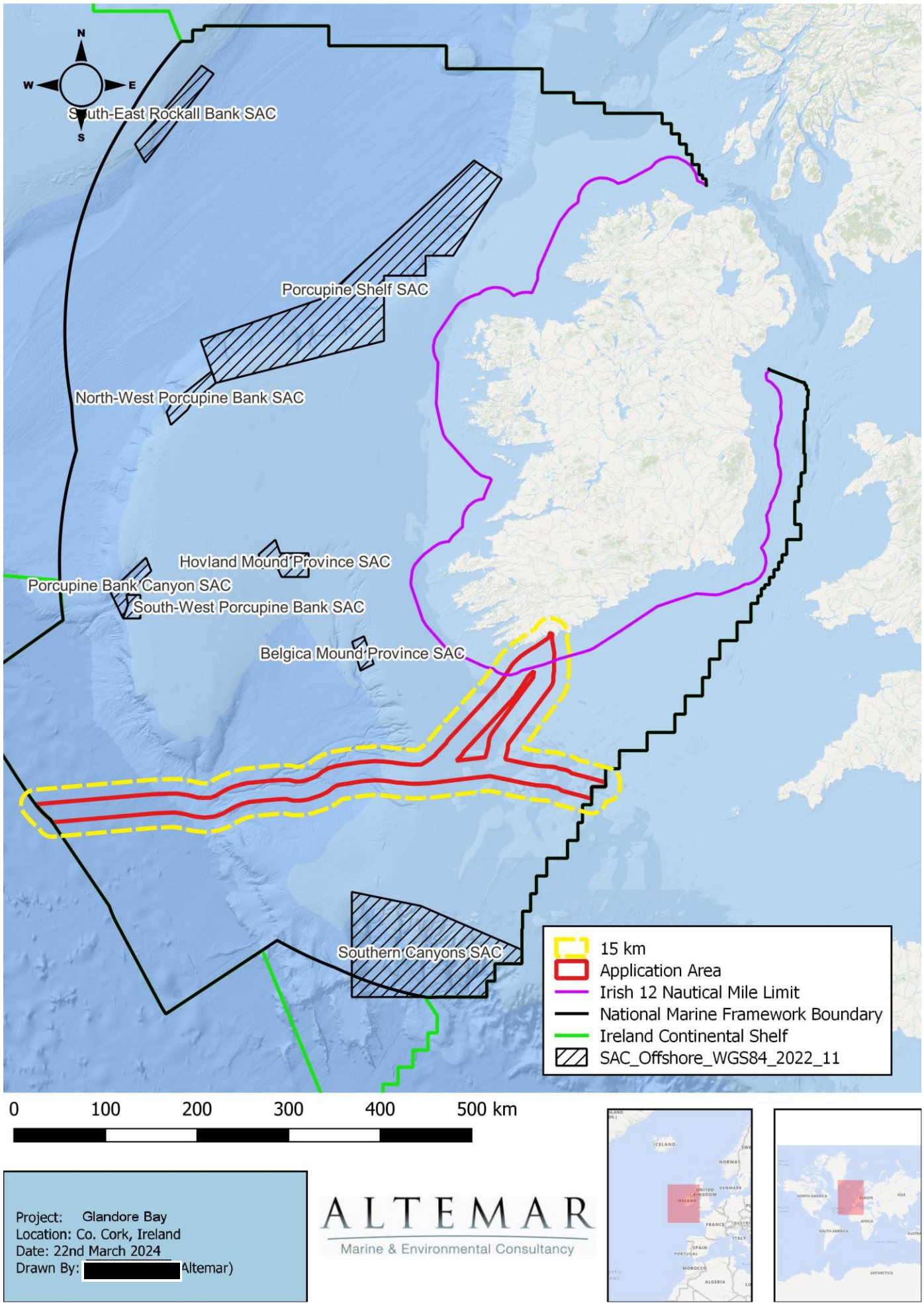


Figure 39: Proposed survey route corridor in relation to the 12 nm limit, Designated Irish Continental shelf and Offshore SAC's (no offshore SAC's in the area)

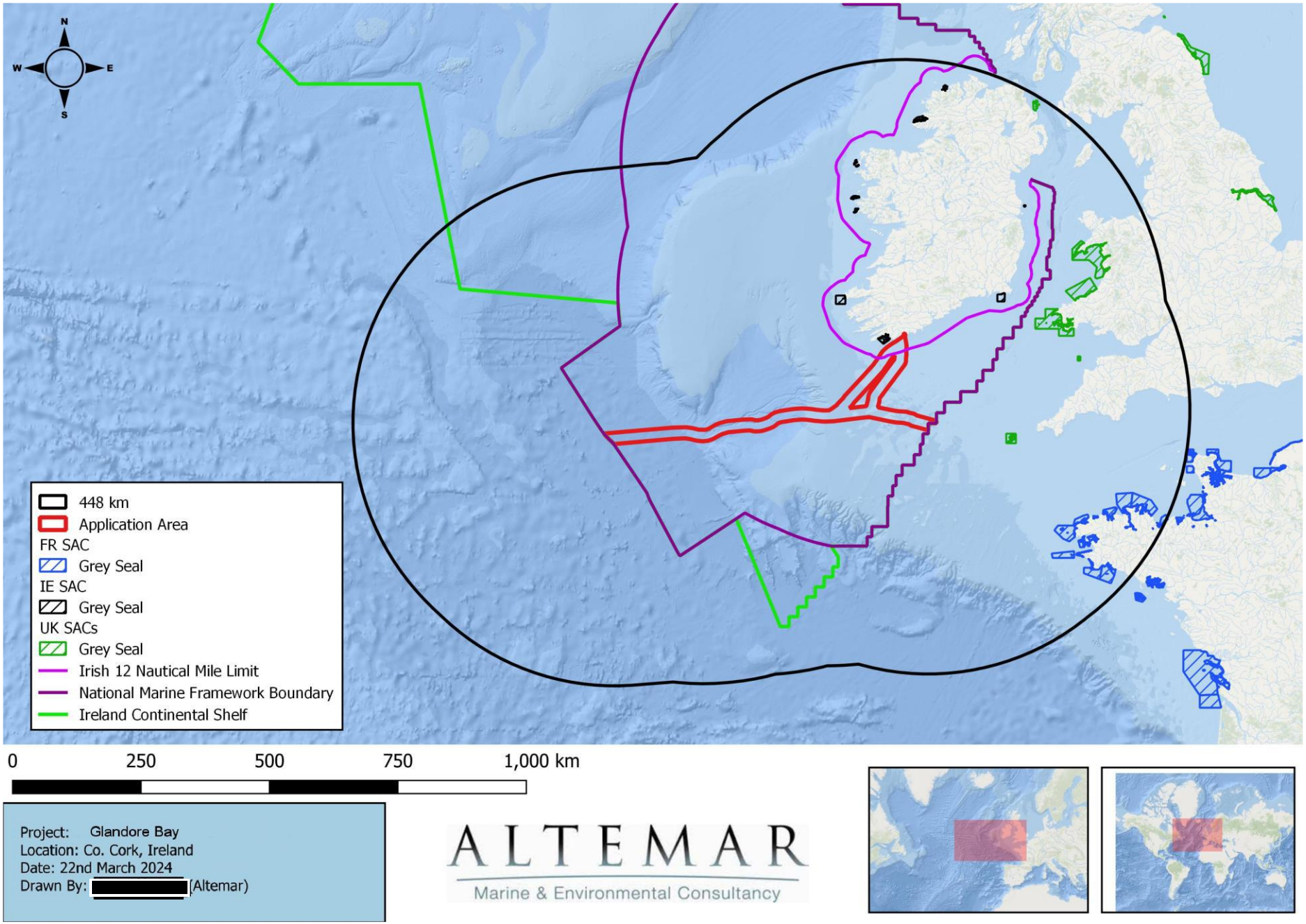


Figure 40: IE, FR, & UK SACs designated for Grey Seals (*Halichoerus grypus*) within 448km of the Proposed Survey Route Corridor

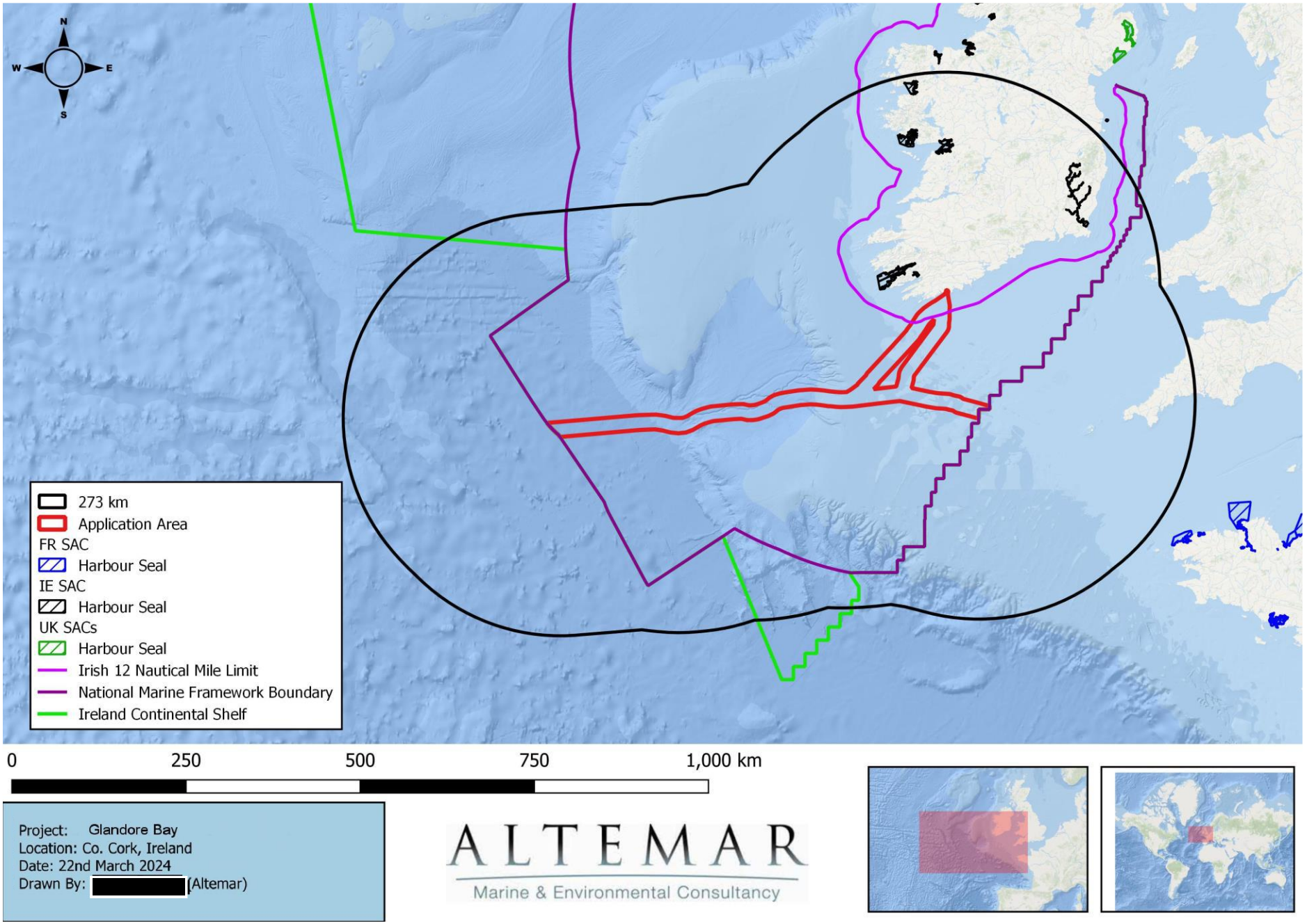


Figure 41: IE, FR, & UK SACs designated for Harbour Seals (*Phoca vitulina*) within 273km of the Proposed Survey Route Corridor

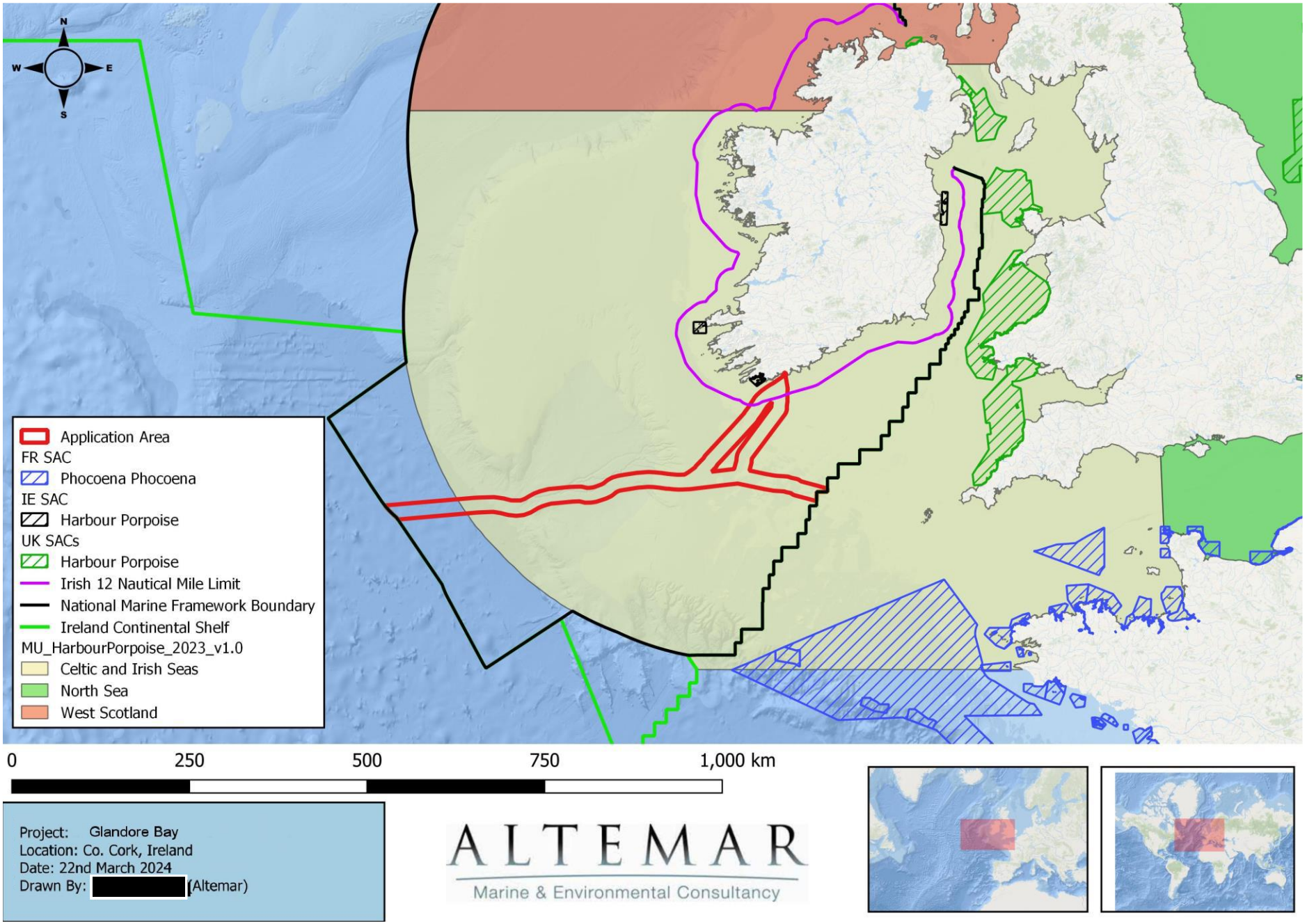


Figure 42: IE, FR, & UK SACs designated for Harbour Porpoise (*Phocoena phocoena*) within the Celtic and Irish Seas MU for Harbour Porpoise

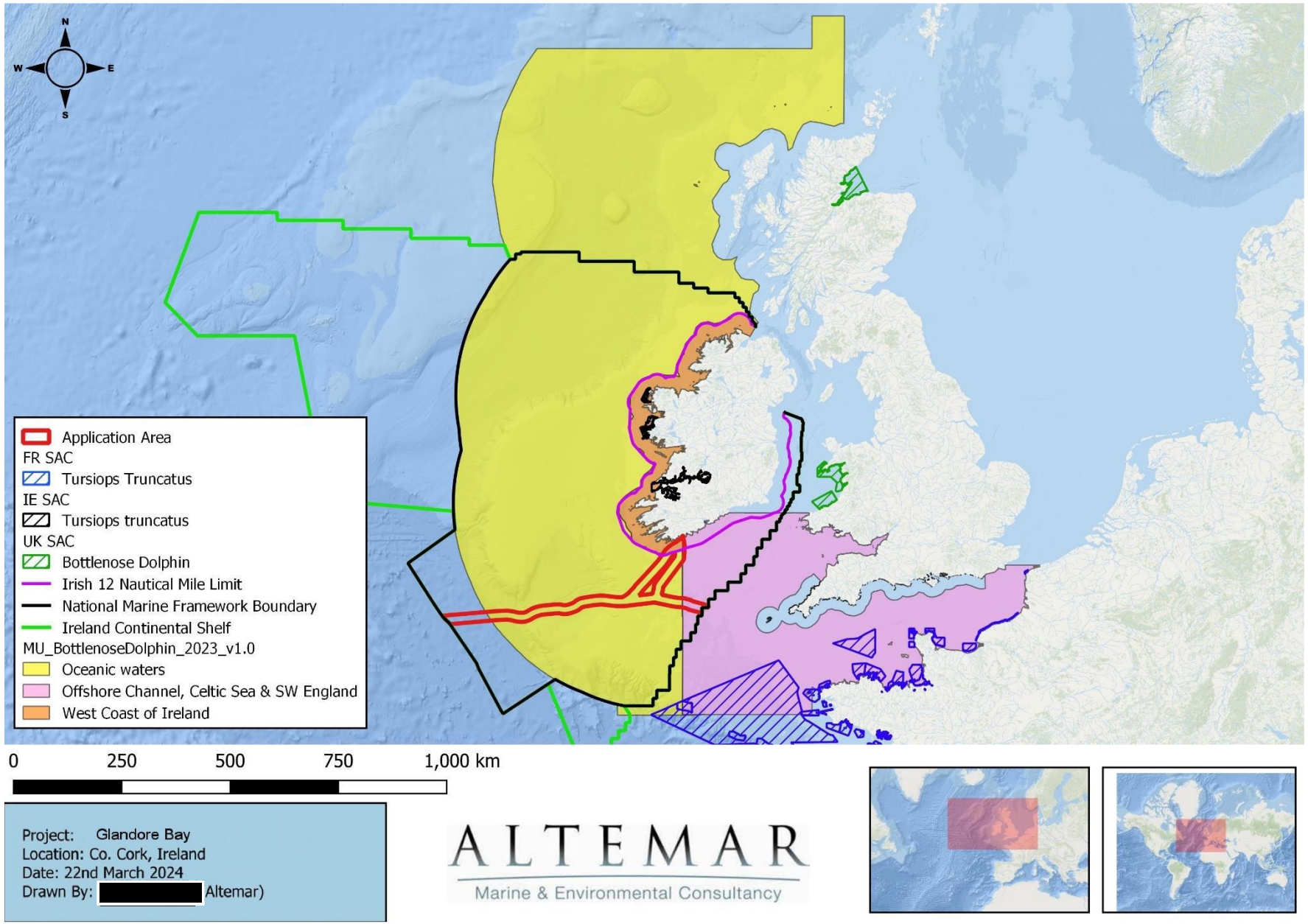


Figure 43: IE, FR, & UK SACs designated for Bottlenose Dolphin (*Tursiops truncatus*) within the Irish Sea MU, West Coast of Ireland MU, and Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin

Table 11. Initial screening of Natura 2000 sites.

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
Special Areas of Conservation			
IE 001061	Kilkeran Lake and Castlefreke Dunes SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Features of Interest** 1150 Coastal lagoons* 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* **Potential Impact** The proposed landfall survey area and access route is within this SAC, and the cable survey route passes through this SAC. The survey area is in the intertidal element of Long Strand beach. The intertidal element is on a popular beach with a car park, restaurant and existing human and dog walking activity. However, initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on the features of interest of this SAC through physical impact on the intertidal and subtidal sediments within the SAC and physical disturbance which could impact the Features of Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. **Natura Impact Statement Required**
IE000101	Roaringwater Bay and Islands SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected: **Features of Interest** 1160 Large shallow inlets and bays 1170 Reefs 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 1351 Harbour porpoise (*phocoena phocoena*) 1355 Otter (*Lutra lutra*) 1364 Grey seal (*Halichoerus grypus*) 4030 European dry heaths 8330 Submerged or partly submerged sea caves **Potential Impacts** This SAC is located 8.1 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023) and is also

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			located within the foraging range of grey seal (448 km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal and harbour porpoise (features of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 8.1 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on habitats protected as qualifying interests of this SAC are foreseen from the proposed works associated with this license application. Given the distance to this SAC (8.1 km), otter may be present at the time of the survey works. The survey works are solely in the terrestrial/intertidal elements of Glandore Bay and Long Strand, and the marine environment. Vessel speeds are slow (4 kn) for a limited period in Glandore Bay and Long Strand and impacts will be localised in nature. Following commencement of the survey works, underwater noise levels would increase gradually as the vessel approaches otter species. Otter would easily avoid the vessel as noise levels increase as speeds are slow. Vessel activity in the region of this SAC is 8.1 km offshore in the deeper water off the coast of Glandore Bay / Long Strand. This temporary disturbance is deemed to be insignificant in relation to potential effects on otter from Roaringwater Bay. In the absence of mitigation measures, no significant impacts on otter species are foreseen as a result of the proposed survey works. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal and harbour porpoise that are features of interest of this site. **Natura Impact Statement Required**
IE000090	Glengarriff Harbour and Woodland SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Geomalacus maculosus* (Kerry Slug) [1024] *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303] *Lutra lutra* (Otter) [1355]

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			Phoca vitulina (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 38.2 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of harbour seal (273km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on harbour seal (feature of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 38.2 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats, lesser horseshoe bat, or Kerry slug protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the significant distance between the proposed cable survey area and this SAC (38.2 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour seal. **Natura Impact Statement Required**
IE002158	Kenmare River SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			European dry heaths [4030] Juniperus communis formations on heaths or calcareous grasslands [5130] Calaminarian grasslands of the *Violetalia calaminariae* [6130] Submerged or partially submerged sea caves [8330] *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303] *Lutra lutra* (Otter) [1355] *Phoca vitulina* (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 49.8 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of harbour seal (273km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on harbour seal (features of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 49.8 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats, lesser horseshoe bat, or Narrow-mouthed Whorl Snail protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the significant distance between the proposed cable survey area and this SAC (49.8 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour seal. **Natura Impact Statement Required**
IE002165	Lower River Shannon SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Sandbanks which are slightly covered by sea water all the time [1110]

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Petromyzon marinus (*Sea Lamprey) [1095] *Lampetra planeri* (Brook Lamprey) [1096] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Lutra lutra* (Otter) [1355] **Potential for likely significant effects** This SAC is 76.9 km from the proposed cable survey area. The proposed cable survey area is located within the West Coast of Ireland MU for bottlenose dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on bottlenose dolphin (feature of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 76.9 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats, Lamprey species (Sea, Brook, and River), or Freshwater pearl mussel protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. In relation to Atlantic salmon, it has been found that salmon from southeast Ireland tend to move out to the shelf edge before crossing the Atlantic towards Greenland (Rikardson et al., 2021). The proposed project is located within the area of salmon migration recorded as part of Rikardson et al.'s (2021) study (see Appendix AI.1). However, given the nature of the proposed works, and the short timeframe of the proposed

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			works, no significant impacts on salmon are foreseen as a result of the proposed project in the absence of mitigation. Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the significant distance between the proposed cable survey area and this SAC (76.9 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect bottlenose dolphin. **Natura Impact Statement Required**
IE002172	Blasket Islands SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030] Submerged or partially submerged sea caves [8330] *Phocoena phocoena* (Harbour Porpoise) [1351] *Halichoerus grypus* (Grey Seal) [1364] **Potential for likely significant effects** This SAC is 102.5 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448km) (Carter et al., 2022) and the Celtic and Irish Seas MU for harbour porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal and harbour porpoise (features of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 102.5 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application.

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal and harbour porpoise. **Natura Impact Statement Required**
IE000707	Saltee Islands SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160] Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Submerged or partially submerged sea caves [8330] Halichoerus grypus (Grey Seal) [1364] **Potential for likely significant effects** This SAC is 166.7 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal (features of interest of this SAC) through underwater noise and physical disturbance which could impact the Features of Interest of this SAC should this mobile marine mammal enter the ZoI. Mitigation measures are required to protect the SAC from significant effects. The survey area is located 166.7 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on habitats protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this survey license application. The proposed project has the potential to introduce noise, pollution, and physical disturbance into the marine environment and mitigation measures are required to protect grey seals. **Natura Impact Statement Required**
IE000268	Galway Bay Complex SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** 1140 Mudflats and sandflats not covered by seawater at low tide 1150 Coastal lagoons*

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			1160 Large shallow inlets and bays 1170 Reefs 1220 Perennial vegetation of stony banks 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) 1355 Otter *Lutra lutra* 1365 Harbour seal *Phoca vitulina* 1410 Mediterranean salt meadows (*Juncetalia maritimi*) 3180 Turloughs* 5130 *Juniperus communis* formations on heaths or calcareous grasslands 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*)(*important orchid sites) 7210 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae** 7230 Alkaline fens **Potential for likely significant effects** This SAC is 172.7 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range for harbour seal (273km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on harbour seal (feature of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 172.7 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the significant distance between the proposed cable survey area and this SAC (172.7 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour seal. **Natura Impact Statement Required**

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
IE000781	Slaney River Valley SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra planeri* (Brook Lamprey) [1096] *Lampetra fluviatilis* (River Lamprey) [1099] *Alosa fallax fallax* (Twaite Shad) [1103] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Phoca vitulina* (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 182.6 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of harbour seal (273km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on harbour seal (feature of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 182.6 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats, Lamprey species (Sea, Brook, and River), or Freshwater pearl mussel protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. In relation to Atlantic salmon, it has been found that salmon from southeast Ireland tend to move out to the shelf edge before crossing the Atlantic towards Greenland (Rikardson et al., 2021). The proposed project is located within the area of salmon migration recorded as part of Rikardson et al.'s (2021) study (see Appendix AI.1). However, given the nature of the

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			proposed works, and the short timeframe of the proposed works, no significant impacts on salmon are foreseen as a result of the proposed project in the absence of mitigation. In relation to Twaite Shad, given the spatial and temporal nature of the proposed works, and the distance to this SAC, the proposed project is considered too far for any significant interaction to occur. Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the significant distance between the proposed cable survey area and this SAC (182.6 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour seals. **Natura Impact Statement Required**
IE002111	Kilkieran Bay and Islands SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Machairs (* in Ireland) [21A0] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] *Lutra lutra* (Otter) [1355] *Phoca vitulina* (Harbour Seal) [1365] *Najas flexilis* (Slender Naiad) [1833] **Potential for likely significant effects** This SAC is 186.4 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range for harbour seal (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on harbour seal (feature of interest of this SAC) through underwater noise and

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 186.4 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats or Slender Naiad protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the significant distance between the proposed cable survey area and this SAC (186.4 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour seal. **Natura Impact Statement Required**
IE002074	Slyne Head Peninsula	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] Machairs (* in Ireland) [21A0] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130] Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140] European dry heaths [4030] Juniperus communis formations on heaths or calcareous grasslands [5130]

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] Alkaline fens [7230] *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Petalophyllum ralfsii* (Petalwort) [1395] *Najas flexilis* (Slender Naiad) [1833] **Potential for likely significant effects** This SAC is 217.3 km from the proposed cable survey area. The proposed cable survey area is located within the West Coast of Ireland MU for bottlenose dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on bottlenose dolphin (features of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 217.3 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats, petalwort, or slender naiad protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect bottlenose dolphin. **Natura Impact Statement Required**
IE000328	Slyne Head Islands SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Reefs [1170] *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Halichoerus grypus* (Grey Seal) [1364] **Potential for likely significant effects** This SAC is 219 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448km) (Carter et al., 2022) and the West Coast of Ireland MU for bottlenose dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal and bottlenose dolphin (features of interest of this SAC) through

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 219 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on reefs protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal and bottlenose dolphin. **Natura Impact Statement Required**
IE002998	West Connacht Coast SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] **Potential for likely significant effects** This SAC is 223.3 km from the proposed cable survey area. The proposed cable survey area is located within the West Coast of Ireland MU for bottlenose dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on bottlenose dolphin (features of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect bottlenose dolphin. **Natura Impact Statement Required**
IE000278	Inishbofin and Inishshark SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Coastal lagoons [1150] Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Northern Atlantic wet heaths with Erica tetralix [4010] European dry heaths [4030] *Halichoerus grypus* (Grey Seal) [1364] **Potential for likely significant effects**

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			This SAC is 240.5 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal (features of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 240.5 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal. **Natura Impact Statement Required**
IE001482	Clew Bay Complex SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Machairs (* in Ireland) [21A0] Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] *Lutra lutra* (Otter) [1355] *Phoca vitulina* (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 249.2 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of harbour seal (273km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on harbour seal (features of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 249.2 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the significant distance between the proposed cable survey area and this SAC (249.2 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour seal. **Natura Impact Statement Required**
IE003000	Rockabill to Dalkey Islands SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Reefs [1170] *Phocoena phocoena* (Harbour Porpoise) [1351] **Potential for likely significant effects** This SAC is 271.4 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise (qualifying interest of this SAC) through underwater noise, pollution, and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The survey area is located 271.4 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on reefs

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this survey license application. The proposed project has the potential to introduce noise, pollution, and physical disturbance into the marine environment and mitigation measures are required to protect harbour porpoise. **Natura Impact Statement Required**
IE000495	Duvillaun Islands SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Halichoerus grypus* (Grey Seal) [1364] **Potential for likely significant effects** This SAC is 285.3 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448km) (Carter et al., 2022) and the West Coast of Ireland MU for bottlenose dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal and bottlenose dolphin (features of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal and bottlenose dolphin. **Natura Impact Statement Required**
IE000204	Lambay Island SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] *Halichoerus grypus* (Grey Seal) [1364] *Phoca vitulina* (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 292.8 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448km) and harbour seal (273km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal and harbour seal (features of interest of this SAC) through

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			underwater noise and physical disturbance which could impact the Features of Interest of this SAC should these mobile marine mammals enter the ZoI. Mitigation measures are required to protect the SAC from significant effects. The survey area is located 292.8 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on habitats protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this survey license application. The proposed project has the potential to introduce noise, pollution, and physical disturbance into the marine environment and mitigation measures are required to protect grey seals and harbour seals. **Natura Impact Statement Required**
IE000507	Inishkea Islands SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Machairs (* in Ireland) [21A0] *Halichoerus grypus* (Grey Seal) [1364] *Petalophyllum ralfsii* (Petalwort) [1395] **Potential for likely significant effects** This SAC is 293.1 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal (feature of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 293.1 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats or Petalwort protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			significant distance between the proposed cable survey area and this SAC (293.1 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seals. **Natura Impact Statement Required**
IE000190	Slieve Tooey/Tormore Island/Loughbros Beg Bay SAC	In	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Decalcified fixed dunes with Empetrum nigrum [2140] Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) [2150] Dunes with Salix repens ssp. argentea (*Salicion arenariae*) [2170] Humid dune slacks [2190] Alpine and Boreal heaths [4060] Blanket bogs (* if active bog) [7130] *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] *Lutra lutra* (Otter) [1355] *Halichoerus grypus* (Grey Seal) [1364] **Potential for likely significant effects** This SAC is 349.6 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal (feature of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC should this species enter the Zone of Influence. Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 349.6 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats or Narrow-mouthed Whorl Snail protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application.

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the significant distance between the proposed cable survey area and this SAC (349.6 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seals. **Natura Impact Statement Required**
IE000147	Horn Head and Rinclevan SAC	**In**	**Conservation Objective** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. **Qualifying Interest** Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Dunes with Salix repens ssp. argentea (*Salicion arenariae*) [2170] Humid dune slacks [2190] Machairs (* in Ireland) [21A0] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130] *Vertigo geyeri* (Geyer's Whorl Snail) [1013] *Halichoerus grypus* (Grey Seal) [1364] *Petalophyllum ralfsii* (Petalwort) [1395] *Najas flexilis* (Slender Naiad) [1833] **Potential for likely significant effects** This SAC is 405 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal (features of interest of this SAC) through underwater noise and physical disturbance which could impact the Features of Interest of this SAC should this mobile marine mammal enter the ZoI. Mitigation measures are required to protect the SAC from significant effects. The survey area is located 405 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on habitats, Geyer's Whorl Snail, Petalwort, or Slender Naiad

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this survey license application. The proposed project has the potential to introduce noise, pollution, and physical disturbance into the marine environment and mitigation measures are required to protect grey seals. **Natura Impact Statement Required**

* denotes a priority habitat

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
Special Areas of Conservation (UK)			
UK0013694	Isles of Scilly Complex	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interest** Sandbanks which are slightly covered by seawater all the time [1110] Mudflats and sandflats not covered by seawater at low tide [1140] Reefs [1170] Shore Dock (*Rumex rupestris*) [1441] Grey Seal (*Halichoerus grypus*) [1364] **Potential Impact** This SAC is 125 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448 km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal (feature of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The survey area is located 125 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on habitats or shore dock protected as qualifying interests of this SAC are foreseen from the proposed works associated with this survey license application. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seals. **Natura Impact Statement Required**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
UK0030396	Bristol Channel Approaches/Dynesfeydd Môr Hafren	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interest** Harbour porpoise (*Phocoena phocoena*) [1351] **Potential Impact** This SAC is 193.4 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for harbour porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise. **Natura Impact Statement Required**
UK0013116	Pembrokeshire Marine / Sir Benfro Forol	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interests** Sandbanks which are slightly covered by seawater all the time [1110] Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Reefs [1170] Submerged or partially submerged sea caves [8330] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Grey Seal (*Halichoeurus grypus*) [1364] Otter (*Lutra lutra*) [1355] Allis shad (*Alosa alosa*) [1102] Twaite shad (*Alosa fallax*) [1103] River lamprey (*Lampetra fluviatilis*) [1099] Sea lamprey (*Petromyzon marinus*) [1095] Shore dock (*Rumex rupestris*) [1441] **Potential Impact** This SAC is 233.1 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448 km) (Carter et al., 2022).

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The survey area is located 233.1 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats, Lamprey species (Sea and River), or Shore dock protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this survey license application. In relation to Twaite shad and Allis shad, given the spatial and temporal nature of the proposed works, and the distance to this SAC, the proposed project is considered too far for any significant interaction to occur. Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the significant distance between the proposed survey area and this SAC (233.1 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour seals. **Natura Impact Statement Required**
UK0030397	West Wales Marine / Gorllewin Cymru Forol	**In**	**Conservation Objective** Maintain site integrity by ensuring: 1. Harbour porpoise are a viable component of the site. 2. There is no significant disturbance of the species. 3. The condition of supporting habitats and processes, and the availability of prey is maintained. **Qualifying Interest** Harbour Porpoise (*Phocoena phocoena*) [1351] **Potential Impact** This SAC is 235 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise (qualifying interest

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise. **Natura Impact Statement Required**
UK0012712	Cardigan Bay / Bae Ceredigion	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interest** Sandbanks which are slightly covered by seawater all the time [1110] Reefs [1170] Submerged or partially submerged sea caves [8330] Grey Seal (*Halichoerus grypus*) [1364] River lamprey (*Lampetra fluviatilis*) [1099] Sea lamprey (*Petromyzon marinus*) [1095] *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 286.9 km from the proposed cable survey area within the Irish EEZ. The proposed cable survey area is located within the foraging range of grey seal (448 km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed cable survey area within the Irish EEZ is located 286.9 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on designated habitats or Lamprey species (Sea and River) protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this license application. It should be noted that this SAC is located in the Irish Sea MU for bottlenose dolphin. As demonstrated in Figure 43, the proposed cable survey area within the Irish EEZ is not located within this MU. Given the minimum distance from the cable survey area to this SAC (286.9 km), the nature of the proposed works, and the fact that this SAC is not located in the Irish Sea MU for bottlenose dolphin, in the absence of

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			mitigation, no significant effects on this qualifying interest of the SAC is foreseen. Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal. **Natura Impact Statement Required**
UK0013114	Lundy	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interest** Sandbanks which are slightly covered by seawater all the time [1110] Reefs [1170] Submerged or partially submerged sea caves [8330] Grey Seal (*Halichoerus grypus*) [1364] **Potential Impact** This SAC is 293.6 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448 km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal (feature of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The survey area is located 293.6 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on habitats protected as qualifying interests of this SAC are foreseen from the proposed works associated with this survey license application. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seals. **Natura Impact Statement Required**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
UK0013117	Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau	**In**	**Conservation Objective** To achieve favourable conservation status all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve favourable conservation status. **Qualifying Interest** Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonizing mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Submerged or partially submerged sea caves [8330] *Lutra lutra* (Otter) [1355] *Tursiops truncatus* (Common Bottlenose Dolphin) [1349] *Halichoerus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 309.7 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448 km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal (feature of interest of this SAC) through underwater noise and physical disturbance which could impact the Features of Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. It should be noted that this SAC is located in the Irish Sea MU for bottlenose dolphin. As demonstrated in Figure 43, the proposed cable survey area within the Irish EEZ is not located within this MU. Given the minimum distance from the proposed cable survey area to this SAC (309.7 km), the nature of the proposed works, and the fact that this SAC is not located in the Irish Sea MU for bottlenose dolphin, in the absence of mitigation, no significant effects on this qualifying interest of the SAC is foreseen. The survey area is located 309.7 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on habitats protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this survey license application. Further, no significant impacts on otter are foreseen. As detailed by Reid et al. (2013), female otters have territories of 7.5 ± 1.5km in length along a riverine environment and 6.5 ± 1.0km in coastal environments, while male otter territory along rivers is approximately 13.2 ± 5.3km in length with a high degree of variability. Given the nature of the proposed works and the significant distance between the proposed survey area and this SAC (309.7 km), in the absence of

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			mitigation, no significant effects on otter species are likely as a result of the proposed project. Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seals (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seals. **Natura Impact Statement Required**
UK0030398	North Anglesey Marine/Gogledd Môn Forol	**In**	**Conservation Objective** Maintain site integrity by ensuring: 1. Harbour porpoise are a viable component of the site. 2. There is no significant disturbance of the species. 3. The condition of supporting habitats and processes, and the availability of prey is maintained. **Qualifying Interest** Harbour Porpoise (*Phocoena phocoena*) [1351] **Potential Impact** This SAC is located 318.3 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise (qualifying interest of this SAC) through underwater noise, pollution, and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise. **Natura Impact Statement Required**
UK0030399	North Channel	**In**	**Conservation Objective** Maintain site integrity by ensuring: 1. Harbour porpoise are a viable component of the site. 2. There is no significant disturbance of the species. 3. The condition of supporting habitats and processes, and the availability of prey is maintained. **Qualifying Interest** Harbour Porpoise (*Phocoena phocoena*) [1351]

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Potential Impact This SAC is 376.2 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise. **Natura Impact Statement Required**
UK0030384	The Maidens	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interest** Sandbanks which are slightly covered by seawater all the time [1110] Reefs [1170] Grey Seal (*Halichoerus grypus*) [1364] **Potential Impact** This SAC is 426.8 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of grey seal (448 km) (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, there may be potential for impact on grey seal (feature of interest of this SAC) through underwater noise and physical disturbance which could impact the Feature of Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The survey area is located 426.8 km from this conservation site. Given the nature of the proposed works, and the significant distance to this SAC across a marine environment, in the absence of mitigation measures, no significant impacts on sandbanks or reefs protected as qualifying interests of this SAC are foreseen from the proposed works associated with this survey license application. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seals. **Natura Impact Statement Required**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
Special Areas of Conservation (FR)			
FR5302015	Mers Celtiques – Talus du golfe de Gascogne	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 164.1 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023) and also the Oceanic Waters MU and Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise and bottlenose dolphin. **Natura Impact Statement Required**
FR5302016	Récifs du talus du golfe de Gascogne	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 202 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023) and also the Oceanic Waters MU and Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects.

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise and bottlenose dolphin. **Natura Impact Statement Required**
FR5300018	Ouessant-Molène	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] *Halichoeurus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 285.6 km from the proposed cable survey area. The proposed cable survey area is located within foraging range for grey seal (448km) (Carter et al., 2022) and also within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise, grey seal, and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal, bottlenose dolphin, and harbour porpoise. **Natura Impact Statement Required**
FR2502022	Nord Bretagne DH	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 287.1 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise and bottlenose dolphin. **Natura Impact Statement Required**
FR5300017	Abers – Côtes des légendes	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] *Halichoeurus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 302.8 km from the proposed cable survey area. The proposed cable survey area is located within foraging range for grey seal (448km) (Carter et al., 2022) and also within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise, grey seal, and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal, bottlenose dolphin, and harbour porpoise. **Natura Impact Statement Required**
FR5300016	Anse de Goulven, dunes de Keremma	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Halichoerus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 326.9 km from the proposed cable survey area within the Irish EEZ. The proposed cable survey area within the Irish EEZ is located within the foraging range (448km) of grey seal (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal. **Natura Impact Statement Required**
FR5302007	Chaussée de Sein	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] *Halichoeurus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 313.9 km from the proposed cable survey area. The proposed cable survey area is located within foraging range for grey seal (448km) (Carter et al., 2022) and also within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise, grey seal, and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal, bottlenose dolphin, and harbour porpoise. **Natura Impact Statement Required**
FR5302006	Côtes de Crozon	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Halichoeurus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 331.4 km from the proposed cable survey area. The proposed cable survey area is located within foraging range for grey seal (448km) (Carter et al., 2022) and also within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and grey seal

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			(qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal and harbour porpoise. **Natura Impact Statement Required**
FR5300019	Presqu'lle de Crozon	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Halichoerus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 333.9 km from the proposed cable survey area within the Irish EEZ. The proposed cable survey area within the Irish EEZ is located within the foraging range (448km) of grey seal (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal. **Natura Impact Statement Required**
FR5300015	Baie de Morlaix	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Halichoeurus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 337.2 km from the proposed cable survey area. The proposed cable survey area is located within foraging range for grey seal (448km) (Carter et al., 2022) and also within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and grey seal (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal and harbour porpoise. **Natura Impact Statement Required**
FR5300046	Rade de Brest, estuarie de l'Aulne	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Halichoerus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 340.4 km from the proposed cable survey area within the Irish EEZ. The proposed cable survey area within the Irish EEZ is located within the foraging range (448km) of grey seal (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal. **Natura Impact Statement Required**
FR5310055	Cap Sizun	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Halichoerus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 345.2 km from the proposed cable survey area within the Irish EEZ. The proposed cable survey area within the Irish EEZ is located within the foraging range (448km) of grey seal (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal. **Natura Impact Statement Required**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
FR5300009	Côte de Granit rose-Sept-Iles	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Halichoeurus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 345.2 km from the proposed cable survey area. The proposed cable survey area is located within foraging range for grey seal (448km) (Carter et al., 2022) and also within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and grey seal (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal and harbour porpoise. **Natura Impact Statement Required**
FR5310056	Baie d'Audieme	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Halichoerus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 367.9 km from the proposed cable survey area within the Irish EEZ. The proposed cable survey area within the Irish EEZ is located within the foraging range (448km) of grey seal (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal. **Natura Impact Statement Required**
FR5300008	Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Phocoena phocoena (Harbour Porpoise) [1351] *Halichoeurus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 369.2 km from the proposed cable survey area. The proposed cable survey area is located within foraging range for grey seal (448km) (Carter et al., 2022) and also within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and grey seal (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal and harbour porpoise. **Natura Impact Statement Required**
FR5300010	Trégor – Goëlo	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] *Halichoeurus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 372.3 km from the proposed cable survey area. The proposed cable survey area is located within foraging range for grey seal (448km) (Carter et al., 2022) and also within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise, grey seal, and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal, bottlenose dolphin, and harbour porpoise. **Natura Impact Statement Required**
FR5302008	Roches de Penmarch	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition.

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Relevant Qualifying Interests *Halichoerus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 373.3 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range (448km) of grey seal (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal. **Natura Impact Statement Required**
FR5310057	Archipel des Glénan	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Halichoerus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 395 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range (448km) of grey seal (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal. **Natura Impact Statement Required**
FR5300049	Dunes et côtes de Trévignon	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Halichoerus grypus* (Grey Seal) [1364] **Potential Impact**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			This SAC is 400.7 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range (448km) of grey seal (Carter et al., 2022). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on grey seal (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal. **Natura Impact Statement Required**
FR5300066	Baie de Saint-Brieuc - Est	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] *Halichoeurus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 438 km from the proposed cable survey area. The proposed cable survey area is located within foraging range for grey seal (448km) (Carter et al., 2022) and also within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise, grey seal, and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal, bottlenose dolphin, and harbour porpoise. **Natura Impact Statement Required**
FR5300011	Cap d'Erquy-Cap Fréhel	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			This SAC is 443.3 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise and bottlenose dolphin. **Natura Impact Statement Required**
FR2500084	Récifs et landes de la Hague	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] *Halichoeurus grypus* (Grey Seal) [1364] **Potential Impact** This SAC is 447.1 km from the proposed cable survey area. The proposed cable survey area is located within foraging range for grey seal (448km) (Carter et al., 2022) and also within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise, grey seal, and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect grey seal, bottlenose dolphin, and harbour porpoise. **Natura Impact Statement Required**
FR2502019	Anse de Vauville	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351]

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Tursiops truncates (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 448.6 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise and bottlenose dolphin. **Natura Impact Statement Required**
FR2502018	Banc et récifs de Surtainville	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 452.4 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise and bottlenose dolphin. **Natura Impact Statement Required**
FR5300012	Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351]

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Tursiops truncates (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 463.6 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise and bottlenose dolphin. **Natura Impact Statement Required**
FR2500079	Chausey	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 469.7 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise and bottlenose dolphin. **Natura Impact Statement Required**
FR5300052	Côte de Cancale á Parmè	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			This SAC is 479.6 km from the proposed cable survey area. The proposed cable survey area is located within the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on bottlenose dolphin (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect bottlenose dolphin. **Natura Impact Statement Required**
FR5300061	Estuairie de la Rance	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] **Potential Impact** This SAC is 479.6 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise. **Natura Impact Statement Required**
FR2500085	Récifs et marais arrière-littoraux du Cap Lévi à la Pointe de Saire	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 479.6 km from the proposed cable survey area. The proposed cable survey area is located within the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023).

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on bottlenose dolphin (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect bottlenose dolphin. **Natura Impact Statement Required**
FR2500077	Baie du Mont Saint-Michel	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Phocoena phocoena* (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 488.9 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise and the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on harbour porpoise and bottlenose dolphin (qualifying interests of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interests of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect harbour porpoise and bottlenose dolphin. **Natura Impact Statement Required**
FR2502020	Baie de Seine occidentale	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 501.3 km from the proposed cable survey area. The proposed cable survey area is located within the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on bottlenose dolphin (qualifying interest

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect bottlenose dolphin. **Natura Impact Statement Required**
FR2502021	Baie de Seine orientale	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 571.5 km from the proposed cable survey area. The proposed cable survey area is located within the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on bottlenose dolphin (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect bottlenose dolphin. **Natura Impact Statement Required**
FR2300139	Littoral Cauchois	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 601.9 km from the proposed cable survey area. The proposed cable survey area is located within the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on bottlenose dolphin (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects.

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect bottlenose dolphin. **Natura Impact Statement Required**
FR3100478	Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Relevant Qualifying Interests** *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 696.2 km from the proposed cable survey area. The proposed cable survey area is located within the Offshore Channel, Celtic Sea & SW England MU for Bottlenose Dolphin (JNCC, 2023). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be potential for impact on bottlenose dolphin (qualifying interest of this SAC) through underwater noise and physical disturbance which could impact the Qualifying Interest of this SAC. Mitigation measures are required to protect the SAC from significant effects. The proposed project has the potential to introduce noise into the marine environment and mitigation measures are required to protect bottlenose dolphin. **Natura Impact Statement Required**

4.5 In-combination effect Assessment

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 document[d], with particular reference to "Table 2. Cumulative impact assessment".

4.5.1 Geographic Boundaries and the Timeline for Assessment

The proposed project is primarily located within the intertidal and subtidal elements of Glandore Bay and Long Strand, Co. Cork, 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 Celtic Sea, the geographic boundaries of assessment was expanded to include coastal and offshore marine projects located within the Celtic Sea.

In relation to the timeline for assessment, given the short temporal nature of the proposed 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 within the vicinity of the proposed survey works area have been examined for potential in-combination effects.

4.5.2 Identification of Plans/Projects that could act In Combination

Cork County Council planning permissions, Foreshore Applications, MARA Licence Applications, and EIA portal were examined, and the potential for in-combination effects due to development in the area.

Table 12. *Cork County Council Planning Permissions.*

Ref. No.	Address	Proposal
23642	Creganne, Rosscarbery, Co. Cork	Alterations and extensions to side and rear of existing dwellinghouse and all associated site works
23205	Little-Island, Owenhincha, Rosscarbery, Co. Cork	Permission for demolition of 1 no. house, 1 no. cabin style dwelling and 1 no. domestic shed and for construction of a dwellinghouse and garage and all associated site works
2282	Castlefreke-Warren, Rathbarry, Co. Cork	Construction of a new Coast Guard Station
20723	Creganne, Rosscarbery, Co. Cork	Permission for alterations to elevations, ground and first floor extensions with first floor terrace area all to existing dwelling with associated site works (change of plan from that permitted under 20/0150 located at the existing site)
2079	Little-Island (Townland), Owenhincha, Rosscarbery, Co. Cork	Permission for the demolition of the former hotel and the construction of 9 no. dwellings, realignment and widening of the Coast Road (R598) and all associated landscaping, car parking and site development works

[d] Official Journal C 437/2021 (europa.eu)

Table 13. *Foreshore licence applications proximate to the proposed survey route corridor*

Applicant	FSL Application No.	Date	Status	Activity	Distance from Survey Area	Potential for In-Combination Effects	Screening In/Out
Irving Oil Whitegate Refinery Ltd	FS007111	21/02/2022	Applied	Construction of Catchment Basin on shoreline	approx 66 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Port of Cork	FS007126	23/02/2022	Applied	Maintenance Dredging	approx 64 km to disposal area	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Kinsale Offshore Wind Ltd	FS007354	10/01/2022	Applied	Site Investigations (Geophysical, Geotechnical, Environmental and Metocean) for the proposed Kinsale Project offshore wind farm array	approx 31 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Uisce Eireann	FS007376	30/09/2022	Applied	Strategic modelling study of water currents within Cork Harbour & environs.	Approx. 53km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Tulca Offshore Array Limited	FS007431	14/02/2022	Applied	Site Investigations - Geophysical, Geotechnical, Environmental and Metocean for wind farm	181 km^2 overlap with Survey Area	As outlined in the Foreshore Licence Application ORE for this project: '*The results of the Stage 1 Screening found significant effects on Annex II qualifying interests could not be ruled out for all potential impacts, therefore a Stage 2 Appropriate Assessment will be necessary. As a result of this we have prepared the accompanying Natura Impact Statement (NIS). The NIS concludes that, in view of best scientific evidence and methods, there will be no adverse effects from the proposed survey on the integrity of a Natura 2000 site, alone or in combination with other local projects. Further details on this conclusion can be found in the NIS report.*	OUT

Table 13. *Foreshore licence applications proximate to the proposed survey route corridor*

Applicant	FSL Application No.	Date	Status	Activity	Distance from Survey Area	Potential for In-Combination Effects	Screening In/Out
						As outlined in the Risk Assessment for Annex IV Species Report, the employment of best practice measures will ensure that no marine mammals (non-qualifying interests) whose range overlap the survey area will be impacted by the proposed marine surveys. *It has, therefore, been objectively concluded following examination, analysis, and evaluation of the relevant information, including, in particular, the nature of the predicted impacts from the proposed marine surveys, that the proposed marine surveys will not have a significant negative effect on any Natura 2000* *sites and will not adversely affect the integrity of a Natura 2000 site, having regard to the qualifying interests of the relevant Natura 2000 sites, either alone or in combination with other plans or projects, and there is no reasonable scientific doubt in relation to this conclusion.'* In relation to the timing of the proposed project, this report outlines the following: '*it is expected that survey works will be carried out on a phased basis between April and October of each year and over five years.*' Therefore, given the nature of activities proposed under this application, there would be no in-combination effects between them even if they were to occur at the same time.	
Floating Cork Offshore Wind Limited	FS007471	22/09/2022	Applied	Benthic Ecology Surveys for proposed Offshore Wind Farm export cable route	170 km^2 overlap with Survey Area	As outlined in the Foreshore Licence Application ORE for this project: '*Stage 1 Screening concluded that the proposed benthic ecology survey will not have a likely significant effect either alone or in combination with other plans or projects of any European sites*.' In terms of the nature of the proposed works, this report details the following: '*In the nearshore area, the proposed benthic ecology surveys will comprise a walkover survey of the landfall locations, which will involve 2-3 people walking on the foreshore and manually taking sediment samples with a hand corer. In the*	OUT

Table 13. *Foreshore licence applications proximate to the proposed survey route corridor*

Applicant	FSL Application No.	Date	Status	Activity	Distance from Survey Area	Potential for In-Combination Effects	Screening In/Out
						offshore area, the benthic survey will consist of 1-2 vessels slowly transiting the area and extracting sediment material from the seabed using a grab sampler at set sampling locations.' In relation to the duration of the proposed survey works, this report outlines the following: '*The typical time period for a subtidal benthic survey campaign takes up to 3 hours in any one location; the total duration of the proposed benthic ecology surveys within the application area is expected to be 5 to 6 weeks*'. Therefore, given the nature of activities proposed under this application, there would be no in-combination effects between them even if they were to occur at the same time.	
Department of Defense	FS007482	13/07/2023	Applied	• Maintenance dredging of the Naval Basin and Approach Channel. • Capital dredging of the Graving Dock.	Approx.. 55 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Seabed Sanctuary Collective	FS007497	04/04/2023	Applied	Seabed Sanctuary Collective Sub-marine Sculpture Garden	Approx. 38 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
John Renos	FS007503	11/03/2022	Applied	Benthic Surveys in Horse Island Channel for electrical cable installation	approx 16 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
RNLI Ireland	FS007552	28/02/2023	Applied	Site Investigation works to inform the design of a new RNLI jetty and berth and to inform disposal options for dredged sediment material.	Approx. 20km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Kinsale Offshore Wind Limited	FS007575	26/08/2022	Applied	Site Investigations (Geophysical, Geotechnical, Environmental and Metocean) for the	approx 35 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT

Table 13. *Foreshore licence applications proximate to the proposed survey route corridor*

Applicant	FSL Application No.	Date	Status	Activity	Distance from Survey Area	Potential for In-Combination Effects	Screening In/Out
				proposed Kinsale Project export cable			
Cork County Council	FS007620	02/05/2023	Applied	Installation of a pedestrian and cycle bridge across the Owenabue River in Carrigaline, County Cork	Approx.. 50km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Monica Gonzalez	FS007282	01/03/2021	Consultation	Seaweed Harvesting at Croslea and Lickowen, Castlehaven, Co. Cork	approx 5 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Irish Water	FS007027	17/02/2021	Consultation	Construct Marine Outfall and Wastewater Collection System - Aghada & Whitegate	approx 56 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Cork County Council	FS007037	25/05/2021	Consultation	Ballycotton Harbour Dredging	approx 64 km to disposal area	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
UCD	FS007207	15/01/2021	Consultation	Soil and Vegetation Sampling - Fota Island	approx 60 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
UCD	FS007202	15/01/2021	Applied	Soil and Vegetation Sampling - Ballymacoda salt marsh	approx 80 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
EirGrid	FS006916	08/07/2021	Determination	Installation of Celtic Interconnector HVDC Electricity Cable - Claycastle Beach	approx 85 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT

Table 13. *Foreshore licence applications proximate to the proposed survey route corridor*

Applicant	FSL Application No.	Date	Status	Activity	Distance from Survey Area	Potential for In-Combination Effects	Screening In/Out
Inis Ealga Marine Energy Park (IEMEP)	FS007404	30/07/2021	Consultation	Inis Ealga Marine Energy Park (IEMEP) Site Investigations - Geophysical, Geotechnical, Environmental and Metocean - for the export cable route from wind farm	approx 75 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
ORCA Ireland	FS007459	29/11/2021	Determination	Deployment of 1 Static Acoustic Monitoring (SAM) SmartBuoy off Toe Head to listen to cetaceans in real-time.	approx 0.5 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Emerald Offshore Wind Limited	FS007139	22/05/2020	Consultation	Site Investigations - Geophysical, Geotechnical, Environmental and Metocean for possible Floating Offshore Wind project off Kinsale	approx 37 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Irish Water	FS007022	02/04/2020	Consultation	Temporary Wall and Working Area at Ballycotton Pier	approx 72 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Irish Water	FS007258	01/04/2020	Determination	Construction of Marine outfall for Castletownshend wastewater treatment system	approx 7 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
DP Energy	FS006859	21/10/2019	Consultation	Site Investigations - Geophysical, Geotechnical, Environmental and Metocean at Inis Ealga wind farm project	approx 50 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Cork County Council	FS006970	14/10/2019	Consultation	Dredging at Glengarriff Pier, Cork and disposal on land	Approx. 40km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT

Table 13. *Foreshore licence applications proximate to the proposed survey route corridor*

Applicant	FSL Application No.	Date	Status	Activity	Distance from Survey Area	Potential for In-Combination Effects	Screening In/Out
Cork County Council	FS006969	14/10/2019	Determination	Dredging at Courtmacsherry Pier, Cork and disposal on land	approx 20 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Cork County Council	FS006971	14/10/2019	Determination	Dredging at Reen Pier, Cork	approx 10 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Dursey Island Cable Car	FS007068	11/10/2019	Applied	Construction of new cable car system to Dursey Island	approx 55 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Irish Water	FS006985	01/08/2019	Determination	Storm Outfall Pipe at Gibbon's Quay, Kinsale	approx 35 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Greenlink Interconnector Ltd.	FS007050	03/09/2021	Determination	Subsea and underground electricity interconnector cable between Irish and UK electricity grids	Approx. 160km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Irish Water	FS007046	01/08/2019	Determination	Site Investigation for Storm Water Outfall Extension, Kinsale	approx 50 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Skibbereen Rowing Club	FS005806	14/04/2019	Applied	Construction of concrete wall, floating pontoon and three gangways	approx 13 km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT

Table 14. *MARA licence applications proximate to the proposed survey area*

Applicant	MARA Application No.	Activity	Distance from Survey Area	Potential for In-Combination Effects	Screening In/Out
Doyle Shipping Group	LIC230019	Site Investigation in the maritime area including reclaimed dockland and surrounding nearshore to aid the design of increased port facilities in support of the ORE industry	Approx. 55km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Microsoft Ireland Operations Ltd.	LIC230017	Geophysical survey and site investigations for a proposed subsea fibre optic cable having a landfall in Kilmore Quay, County Wexford and to evaluate options for the route traversing Ballyteige Bay, across the Celtic Sea and St Georges Channel to Pembrokeshire, Wales	Approx. 170km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Apollo Submarine Cable System Limited	LIC230033	Proposed installation and operation of the 2Africa Submarine Cable System within the Irish Exclusive Economic Zone (EEZ).	Passes through portion of Survey Route Corridor (0.386 km^2)	As outlined in the Natura Impact Statement (NIS) prepared for this project: '*This report presents a Natura Impact Statement for the proposed laying of a marine fibre optic cable. It outlines the information required for the competent authority to screen for appropriate assessment and to determine whether or not the proposed development, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites conservation objectives, will adversely affect the integrity of the European site. On the basis of the content of this report, the competent authority is enabled to conduct an Appropriate Assessment and consider whether, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites conservation objectives, will adversely affect the integrity of the European site*.' Therefore, given the nature of activities proposed under this application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Port of Waterford Company	LIC230025	Maintenance dredging of accumulated sediments to maintain the port's navigational trade areas	Approx. 150km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT
Department of the Environment, Climate & Communications	LIC240006	Deployment of the Marine Institute's R.V. to undertake a geophysical survey in the South Coast DMAP to inform future offshore renewable energy development	Approx. 40km	No spatial overlap and given the nature of activities proposed under each application, there would be no in-combination effects between them even if they were to occur at the same time.	OUT

4.5.3 Impact Identification

There are no projects, identified within Cork County Council, Foreshore Licence applications, or MARA planning records, that have been granted planning or currently under construction, proximate to the proposed survey works, that could potentially cause significant in combination effects on European sites.

The potential impacts of the proposed cable route survey are Temporary (i.e. Effects lasting less than a year) in relation to seabed sampling and brief, lasting less than a day, in relation to underwater noise and primarily to occur during the brief survey period (with the presence of boats, machinery and personnel in the vicinity of the works). Impacts on infauna would be deemed to be temporary (i.e. Effects lasting less than a year).

4.5.4 Pathway Identification

The proposed landfall survey works are in a populated area and is a popular destination for the local community. It is a location with a regular stream of dog walkers and pedestrians on the shore. Given that intertidal elements of the proposed survey works are located within the intertidal of Glandore Bay and Castlefreke, Long Strand, there is a potential hydrological pathway from the research vessel to designated conservation sites located within the application area (Kilkeran Lake and Castlefreke Dunes SAC). This conservation site is located proximate to a number of terrestrial planning applications outlined in Table 12. In the marine offshore subtidal of Glandore Bay and the Celtic Sea, there is a potential hydrological pathway from the research vessel to marine-based conservation sites within the marine environment. A number of Foreshore applications are located in this area, and may share a hydrological pathway with the proposed survey works.

4.5.5 Prediction

The survey works would not be seen to have a significant impact on water quality of the area, including impacting 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 - 14 are considered to be minimal, and no significant cumulative effects on designated conservation sites are foreseen.

4.5.6 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 using 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 in combination effects are foreseen from the project in conjunction with other projects.

5. Further Information on European Sites Screened in for NIS

5.1 Kilkeran Lake and Castlefreke Dunes SAC (Site code: 001061)

As outlined in the Kilkeran Lake and Castlefreke Dunes SAC Site Synopsis[5] (NPWS: Dated 24/09/2013):

'*Kilkeran Lake and Castlefreke Dunes are situated about 6 km south-east of Rosscarbery in Co. Cork. It is coastal site in which well-developed sand dunes have impounded two streams to create wetland areas of open water, freshwater marsh and swamp. The site also contains an area of mixed woodland.*

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (= priority; numbers in brackets are Natura 2000 codes):*

*[1150] Coastal Lagoons**

[2110] Embryonic Shifting Dunes

[2120] Marram Dunes (White Dunes)

[2130] Fixed Dunes (Grey Dunes)

In the Castlefreke system the sand dune flora is rich for this area of west Cork. Embryonic shifting dunes occur along the seaward side of the dune system where there is some movement of sand. Marram (Ammophila arenaria) occurs thinly, along with Sea Couch (Elymus pycnanthus), Frosted Orache (Atriplex laciniata) and Sea Sandwort (Honkenya peploides). Marram dunes, dominated by Marram, are the principal dune type at the site. Over much of the system Marram is dense due to the absence of grazing in recent years. The system is undulating, with some dunes at least 15 m high. Other species present include Sea Bindweed (Calystegia soldanella) and Sea Couch. Bramble (Rubus fruticosus agg.) and Bracken (Pteridium aquilinum) are invading in parts.

Owing to the dominance of Marram across much of the dune system, fixed dune vegetation is rather limited. However, there are open areas, including a dune slack with standing water and Creeping Willow (Salix repens). Much of the area is dominated by Bracken, and some parts have a heathy character. A small stand of Monterey Pine (Pinus radiata) occurs

There are two main waterbodies on the site. Kilkeran Lake is a natural sedimentary lagoon, connected to the sea by a narrow, intermittently blocked channel. The lagoon has a sandy bed with some stones and is fringed by Common Reed (Phragmites australis) and the club-rushes Scirpus maritimus and S. lacustris. The aquatic flora includes Fennel Pondweed (Potamogeton pectinatus) and Tasselweed (Ruppia sp.). Kilkeran Lake is brackish and receives freshwater from one mainstream, and saltwater during breaches of the outlet channel by the sea. Saltwater probably also enters the lagoon through seepage. The lagoon is prone to algal blooms and the once thriving trout fishery has now disappeared. The invertebrate fauna of the lagoon has been well-studied and several rare and lagoon-indicator species have been recorded. North-west of Kilkeran Lake areas of freshwater marsh, swamp and wet grassland are found, following the stream which enters the lagoon.

Sharp-leaved Fluellen (Kickxia elatine), a rare Red Data Book species, has been recorded from arable fields in the site. The uncommon sedge hybrid, Carex paniculata x C. remota (C. x boenninghausiana) has also been recorded from the site, north-west of Kilkeran Lake.

Kilkeran Lake was formerly used by large numbers of diving duck (Pochard and Tufted Duck) but these no longer occur, possibly due to poor water visibility as a result of eutrophication. The site is now visited by only very low numbers of waterfowl in winter. It has breeding Little Grebe and Mute Swan, and there is a sizeable heronry nearby. This site contains two priority habitats listed on Annex I of the E.U. Habitats Directive, lagoon and fixed dune. The presence of a lagoon on the site is of particular significance as these are becoming increasingly rare in Ireland as well as in Europe, and Kilkeran Lake is the best example of a sedimentary lagoon in south-west Ireland. The wide range of habitat types and high diversity of plant and animal species found adds considerably to the importance of the site. Part of the site is State-owned and managed for conservation purposes.'

[5] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY001061.pdf

Works proposed in Kilkeran Lake and Castlefreke Dunes SAC

The proposed works within the Kileran Lake and Castlefreke Dunes SAC will consist of vehicles, machinery and equipment entering the SAC and digging and backfilling three trial pits down the shore. As stated in the Maritime Usage Licence Application - Works Methodology; *'Any requirement for beach access for vehicles or equipment will be solely via the existing track way adjacent to the Fish Basket Café. (Figure 6.) No vehicles or equipment will traverse the sand dune system.'* The conservation objectives which are screened in are Coastal Lagoons, Embryonic Shifting Dunes, Marram Dunes (White Dunes) and Fixed Dunes (Grey Dunes). As seen in Figures 44-46, these trial pits do not overlap with any conservation objectives and works will be short term. This was confirmed by site visits conducted on the 17th December 2022 (Plates 1-4) and 14th March 2024 (Plates5-8).

Field Observations

During fieldwork, only those features relevant to the proposed cable route survey, the potential cumulative effects and surrounding impacts, that may have an adverse effect on the integrity of NATURA 2000 sites, other conservation sites and species/habitats of conservation importance, have been considered.

An initial site visit was carried out on at low tide in the 17th December 2022 by Bryan Deegan MCIEEM. Bryan Deegan carried out a second site visit at low tide on the 14th March 2024. The proposed terrestrial access route and location of trial pits was walked and photographed (Plates 1-8).

No works are proposed in the vicinity of the features of interest of the SAC and beach access is wide enough to allow for machinery to enter the intertidal without impacting on features of interest of this SAC. It should be noted that the sand on this beach is coarse and there is a paucity of infauna. It would be expected that the trial pits would cause minor short term effects on the beach and given the moderately exposed nature of the beach and the coarse sand on site, effects on the beach would only last several tides. However, mitigation measures will need to be in place to ensure that the features of interest are not impacted by the proposed works, particularly while accessing the site. Algal drift lines were present on the coarse sand beach at the time of survey and were dominated by Fucoids and Laminaria species. No infauna were noted on site. There was significant local pedestrian and canine activity at the restaurant and along the beach.

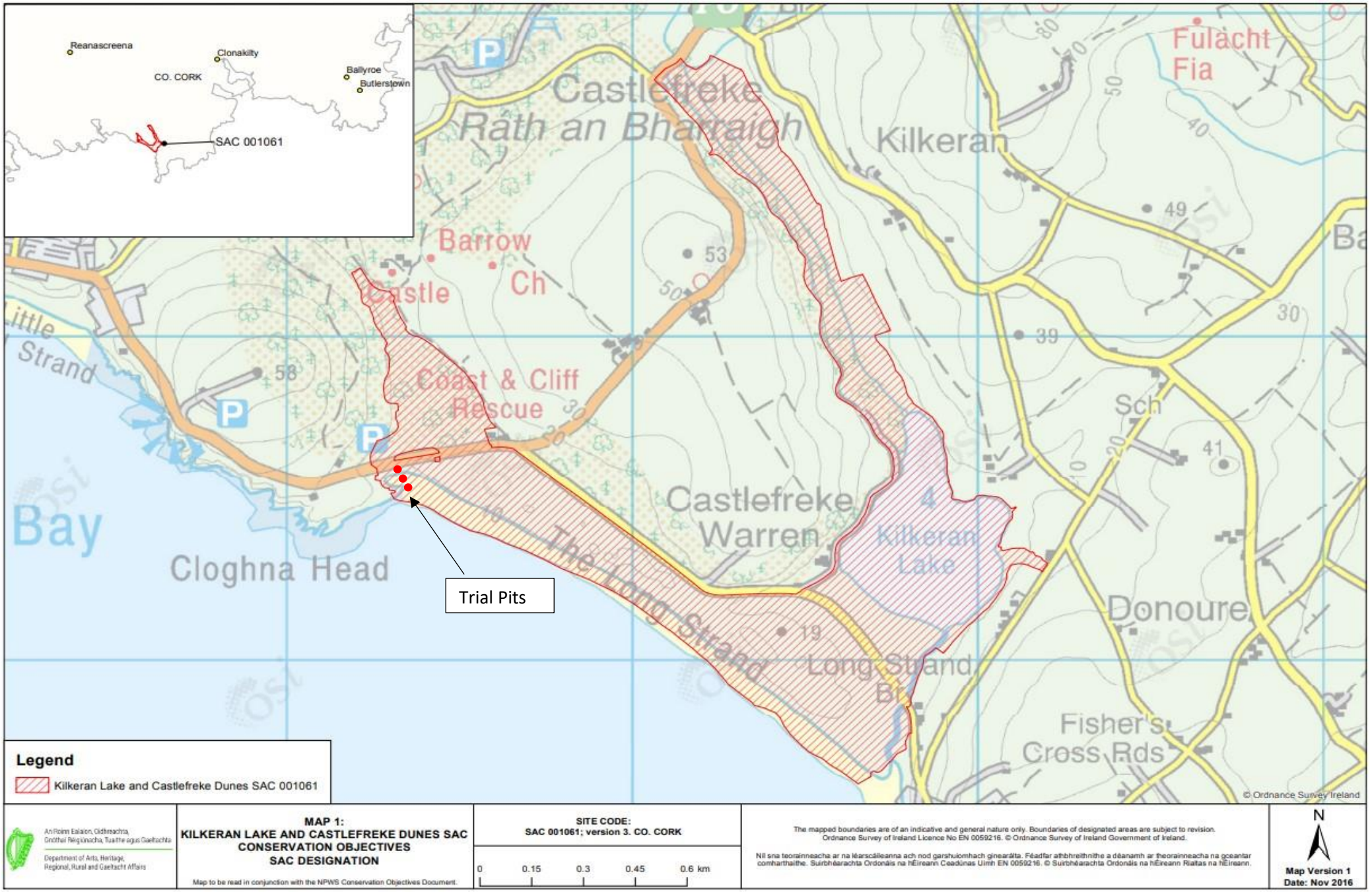


Figure 44. Kilkeran Lake and Castelfreek Dunes SAC Designation.

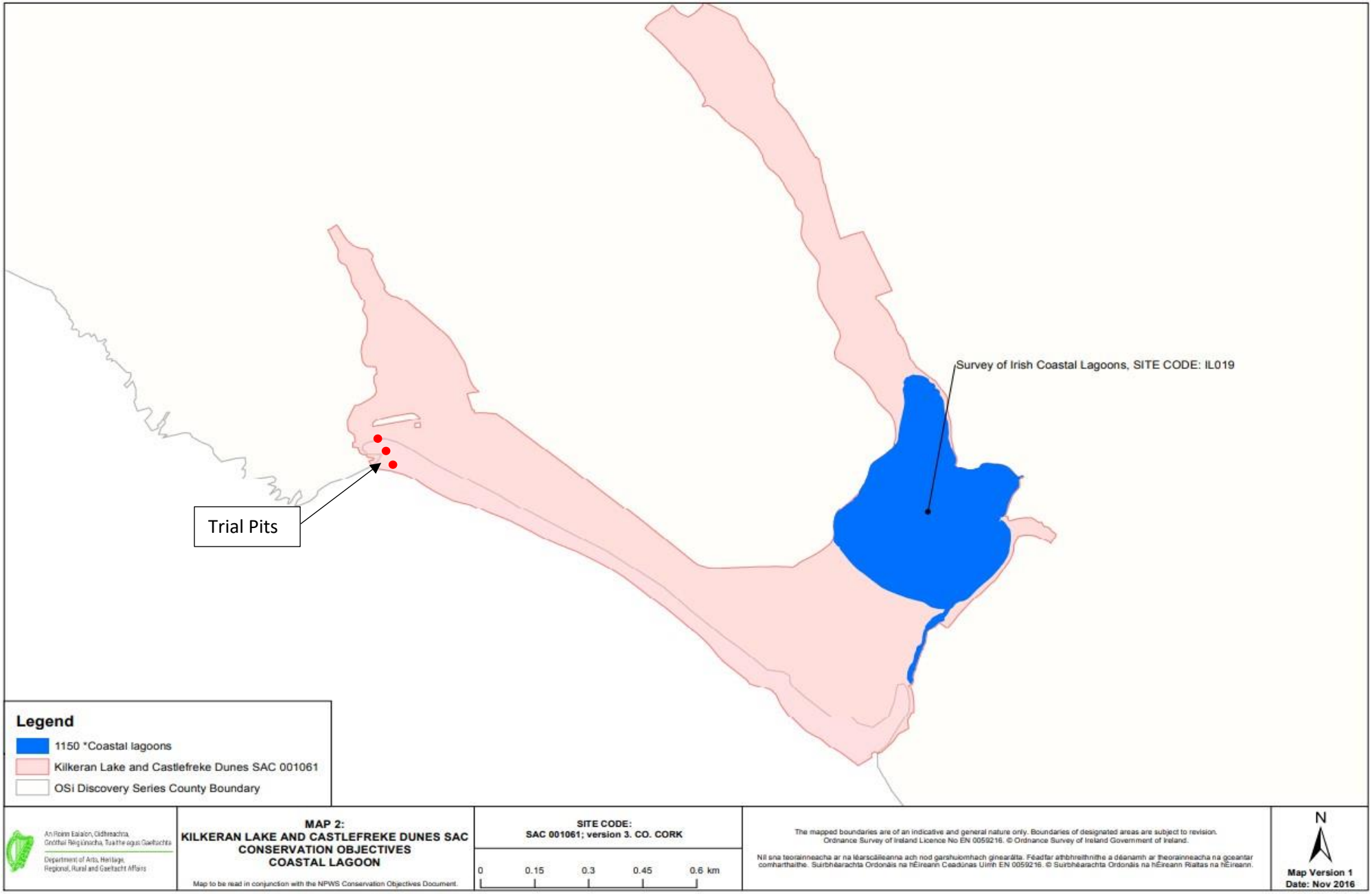


Figure 45. Kilkeran Lake and Castlefreke Dunes SAC Coastal Lagoon.

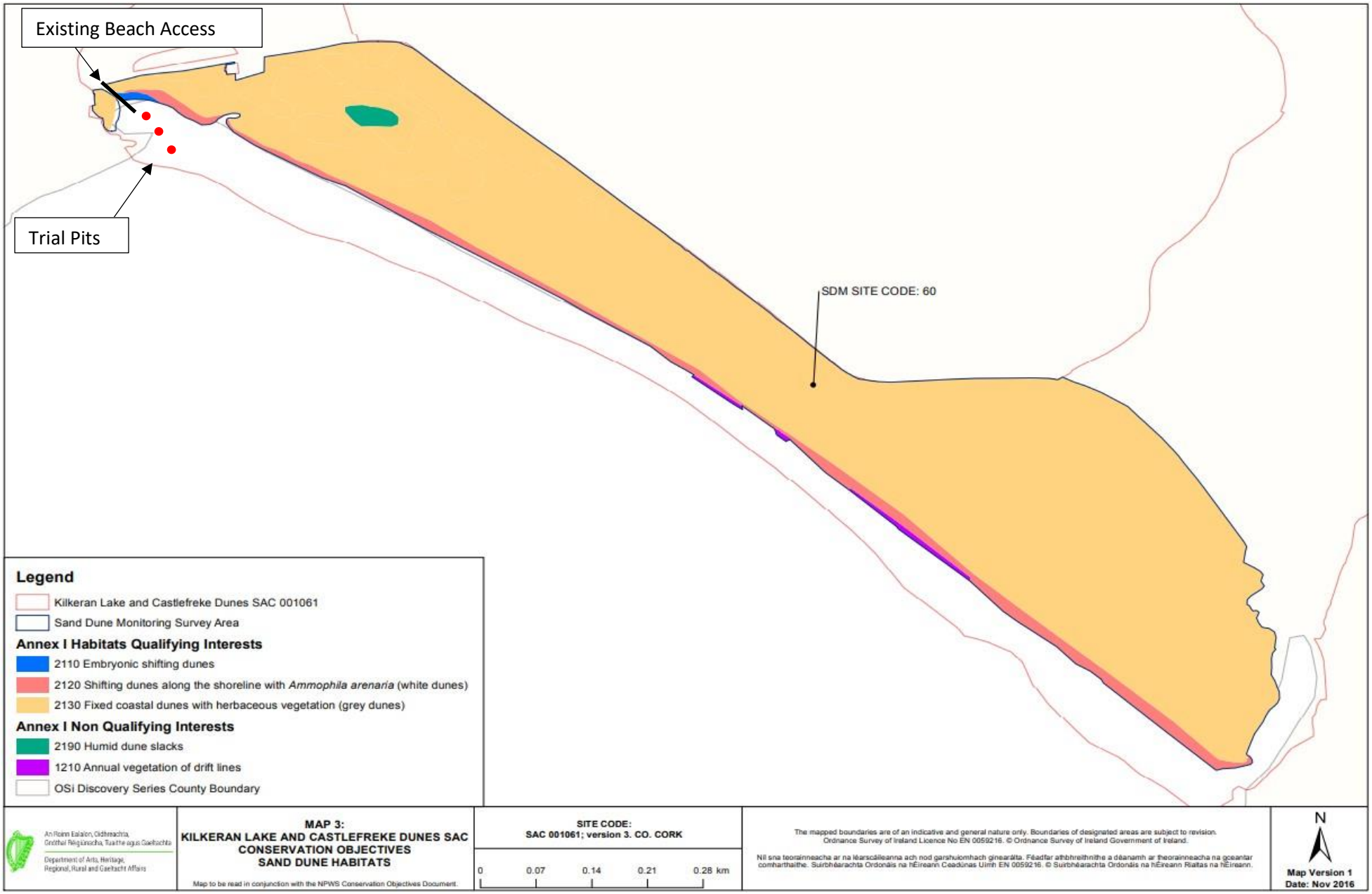
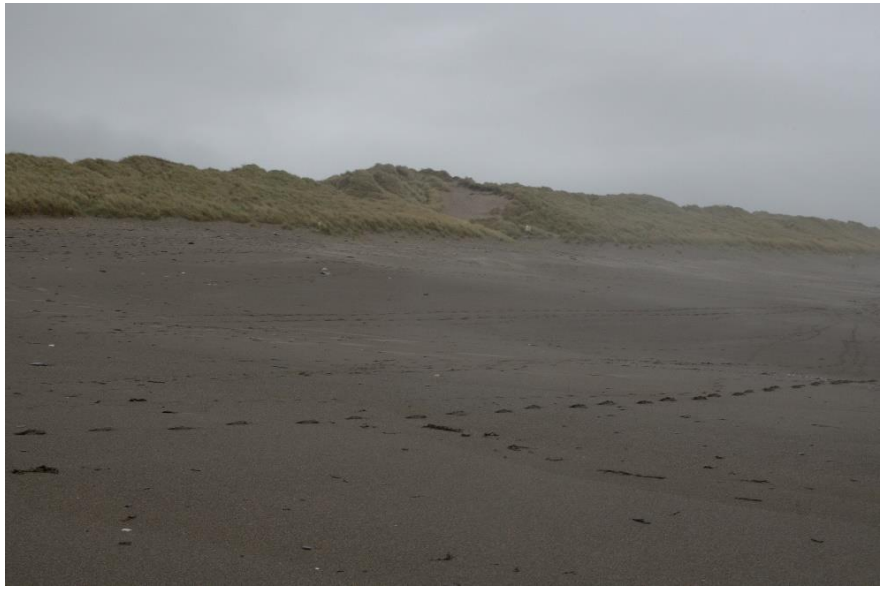


Figure 46. Kilkeran Lake and Castlefreeke Dunes SAC Sand Dune Habitats.

Plates 1-4 (Clockwise from top left) Beach access at road(TL), Access to beach (TR), Area of trial pits (BL) & coarse sand at pit locations (BR) (17th December 2022)



Plates 5-8 (Clockwise from top left) Access to beach (TL), Area of trial pits (TR), Beach assess and Fish Basket (BL), & coarse sand and dune locations (BR) (14th March 2024)

The qualifying interests, their attributes, targets and the potential impact of the proposed fibre-optic cable survey on each of the features of interest of Kilkeran Lake and Castlefreke Dunes SAC are seen in Table 15.

Table 15. The site-specific Conservation Objectives, overall status of species and habitats and the potential impact of the proposed works on the features of interest and conservation objectives of Kilkeran Lake and Castlefreke Dunes SAC.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
[1150] Coastal lagoons	**Bad**	**To restore the favourable conservation condition of Coastal lagoons* in Kilkeran Lake and Castlefreke Dunes SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Habitat area.* Area stable, subject to slight natural variation. Favourable reference area 76.7ha. *Habitat distribution.* No decline, subject to natural processes. *Salinity regime.* Median annual salinity and temporal variation within natural ranges *Hydrological regime.* Annual water level fluctuations and minima within natural ranges *Barrier: connectivity between lagoon and sea*. Appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management. *Water quality: Chlorophyll a.* Annual median chlorophyll a within natural ranges and less than 5ug/L *Water quality:* Molybdate Reactive Phosphorus (MRP). Annual median MRP within natural ranges 0.1mg/L *Water quality:* Dissolved Inorganic Nitrogen (DIN): Annual median DIN within natural ranges and less than 0.15mg/L *Depth of macrophyte colonisation*. Macrophyte colonisation to at least 2m depth. *Typical plant species.* Maintain number and extent of listed lagoonal specialists, subject to natural variation *Typical animal species.* Maintain listed lagoon specialists, subject to natural variation *Negative indicator species.* Negative indicator species absent or under control **Potential Effect** The cable survey route is not within or proximal to Coastal Lagoons. An outflow from the lagoon in located in the vicinity of the access route. The headwall allows the outflow water to dissipate into the sand. The proposed works will not interfere with or impact on this

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		headwall or the sand in the vicinity of the headwall. No significant impacts are foreseen on attributes or targets of Coastal Lagoons in Kilkeran Bay and Castlefreke Dunes SAC.
[2110] Embryonic shifting dunes	**Inadequate**	**To maintain the favourable conservation condition of Embryonic shifting dunes in Kilkeran Lake and Castlefreke Dunes SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Habitat area:* Area stable or increasing, subject to natural processes including erosion and succession. For the sub-site mapped: Castlefreke - 0.04ha. *Habitat distribution:* No decline or change in habitat distribution, subject to natural processes. *Physical structure: functionality and sediment supply:* Maintain the natural circulation of sediment and organic matter, without any physical obstructions *Vegetation structure: zonation:* Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession *Vegetation composition: plant health of foredune grasses:* More than 95% of sand couch grass (Elytrigia juncea) and/or lyme-grass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present) *Vegetation composition: typical species and subcommunities:* Maintain the presence of species-poor communities with typical species: sand couch grass (Elytrigia juncea) and/or lyme-grass (Leymus arenarius) *Vegetation composition: negative indicator species:* Negative indicator species (including non-native species) to represent less than 5% cover **Potential Effect** The proposed location of the trial pits on the beach at Long Strand do not directly overlap with the conservation objectives of the embryonic shifting dunes. As outlined in NPWS (2016b) the embryonic shifting dunes at this location were not well developed, due to the exposed nature of the beach, but are still considered to be in favourable condition at this location. The proposed access route for vehicles and equipment passes directly adjacent to the location of the embryonic shifting dunes, as seen in Figure 46 along an existing well-worn route. There is, therefore, potential for significant impacts on the conservation objectives of the embryonic shifting dunes within this Natura 2000 site in the absence of mitigation.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		Mitigation measures and supervision by an ecologist will be required to be in place to minimise potential adverse effects on this habitat.
[2120] Shifting dunes along the shoreline with Ammophila arenaria (white dunes)	**Inadequate**	**To maintain the favourable conservation condition of Shifting dunes along the shoreline with Ammophila arenaria (white dunes) in Kilkeran Lake and Castlefreke Dunes SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Habitat area:* Area stable or increasing, subject to natural processes including erosion and succession. For the sub-site mapped: Castlefreke - 1.65ha. *Habitat distribution:* No decline or change in habitat distribution, subject to natural processes. *Physical structure: functionality and sediment supply:* Maintain the natural circulation of sediment and organic matter, without any physical obstructions *Vegetation structure: zonation:* Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession *Vegetation composition: plant health of dune grasses:* More than 95% of marram grass (Ammophila arenaria) and/or lymegrass (Leymus arenarius) should be healthy (i.e. green plant parts above ground and flowering heads present) *Vegetation composition: typical species and subcommunities:* Maintain the presence of species-poor communities dominated by marram grass (Ammophila arenaria) and/or lymegrass (Leymus arenarius) *Vegetation composition: negative indicator species:* Negative indicator species (including non-native species) to represent less than 5% cover **Potential Impact** The proposed location of the trial pits on the beach at Long Strand do not directly overlap with the conservation objectives of the shifting dunes along the shoreline with Ammophila arenaria (white dunes)/marram dunes. As outlined in NPWS (2016b) this feature runs the length of the strand in a thin band in front of the fixed dunes (grey dunes) except for one break, which is the access path to the beach. This feature is considered to be in favourable condition at this location. The proposed access route for vehicles and equipment passes directly adjacent to the location of the embryonic shifting dunes, as seen in Figure 46. There is, therefore, potential for significant impacts on the conservation objectives of the embryonic shifting dunes within this Natura 2000 site in the absence of mitigation. Mitigation measures and supervision by an ecologist will be required to be in place to minimise potential adverse effects on this habitat.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
[2130] Fixed coastal dunes with herbaceous vegetation (grey dunes)	**Bad**	**To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes)* in Kilkeran Lake and Castlefreke Dunes SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Habitat area.* Area stable or increasing, subject to natural processes, including erosion and succession *Habitat distribution.* No decline, or change in habitat distribution, subject to natural processes. *Physical structure:* Maintain the natural circulation of sediment and organic matter, without any physical obstructions *Vegetation structure: zonation:* Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession *Vegetation structure: bare ground:* Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes *Vegetation structure: sward height:* Maintain structural variation within sward *Vegetation composition: typical species and subcommunities:* Maintain the range of subcommunities with typical species listed in Delaney et al. (2013) *Vegetation composition: negative indicator species:* Negative indicator species (including non-native species) to represent less than 5% cover *Vegetation composition: scrub/trees:* No more than 5% cover or under control **Potential Impact** The proposed location of the trial pits on the beach at Long Strand do not directly overlap with the conservation objectives of the fixed coastal dunes with herbaceous vegetation (grey dunes). As outlined in NPWS (2016b) this feature has the highest presence within this site. When last assessed, it was considered to be a status of favourable (improving) at this location. The proposed access route for vehicles and equipment passes directly adjacent to the location of the embryonic shifting dunes, as seen in Figure 46. There is, therefore, potential for significant impacts on the conservation objectives of the embryonic shifting dunes within this Natura 2000 site in the absence of mitigation. Mitigation measures and supervision by an ecologist will be required to be in place to minimise potential adverse effects on this habitat.

5.2 Irish SACs Designated for Grey Seal

The potential impact of the proposed survey works on the features of interest (screened in) of the following sites designated for grey seal are seen in Table 16:

- Roaring Water Bay and Islands SAC (000101)
- Blasket Island SAC (002172)
- Saltee Islands SAC (000707)
- Slyne Head Islands SAC (000328)
- Inishbofin and Inishshark SAC (000278)
- Duvillaun Islands SAC (000495)
- Lambay Island SAC (000204)
- Inishkea Islands SAC (000507)
- Slieve Tooey/Tormore Island/Loughbros Beg Bay SAC (000190)
- Horn Head and Rinclevan SAC (000147)

Table 16. The Conservation Objectives, overall status of grey seal, and the potential impact of the proposed works on this feature of interest and conservation objectives of the above sites.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives* and perceived impacts.
Grey Seal (*Halichoerus grypus*) [1364]	**Favourable**	**To maintain the favourable conservation condition of Grey Seal.** **Potential Effect** The proposed works will introduce underwater noise into the marine environment. The proposed cable survey area is located within 448km (foraging range of grey seal (Carter et al., 2022)) of the following SACs: • Roaring Water Bay and Islands SAC (000101) • Blasket Island SAC (002172) • Saltee Islands SAC (000707) • Slyne Head Islands SAC (000328) • Inishbofin and Inishshark SAC (000278) • Duvillaun Islands SAC (000495) • Lambay Island SAC (000204) • Inishkea Islands SAC (000507) • Slieve Tooey/Tormore Island/Loughbros Beg Bay SAC (000190) • Horn Head and Rinclevan SAC (000147) Detailed assessment is required in relation to the potential effects on Grey Seal. Mitigation measures are required.

5.3 Irish SACs Designated for Harbour Seal

The potential impact of the proposed survey works on the features of interest (screened in) of the following sites designated for harbour seal are seen in Table 17:

- Glengarriff Harbour and Woodland SAC (000090)
- Kenmare River SAC (002158)
- Galway Bay Complex SAC (000268)
- Slaney River Valley SAC (000781)
- Kilkieran Bay And Islands SAC (002111)
- Clew Bay Complex SAC (001482)

Table 17. The Conservation Objectives, overall status of harbour seal, and the potential impact of the proposed works on this feature of interest and conservation objectives of the above sites.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives* and perceived impacts.
[1365] Harbour Seal (*Phoca vitulina*)	**Favourable**	**To maintain the favourable conservation condition of Harbour Seal.** **Potential Effect** The proposed works will introduce underwater noise into the marine environment. The proposed cable survey area is located within 273km (foraging range of harbour seal (Carter et al., 2022)) of the following SACs: • Glengarriff Harbour and Woodland SAC (000090) • Kenmare River SAC (002158) • Galway Bay Complex SAC (000268) • Slaney River Valley SAC (000781) • Kilkieran Bay And Islands SAC (002111) • Clew Bay Complex SAC (001482) Detailed assessment is required in relation to the potential effects on Harbour Seal. Mitigation measures are required.

5.4 Irish SACs Designated for Harbour Porpoise

The potential impact of the proposed survey works on the features of interest (screened in) of the following sites designated for harbour porpoise are seen in Table 18:

- Roaring Water Bay and Islands SAC (000101)
- Blasket Island SAC (002172)
- Rockabill to Dalkey Islands SAC (003000)

Table 18. The Conservation Objectives, overall status of harbour porpoise, and the potential impact of the proposed works on this feature of interest and conservation objectives of the above sites.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives* and perceived impacts.
[1351] Harbour Porpoise (Phocoena phocoena)	**Favourable**	**To maintain the favourable conservation condition of Harbour Porpoise.** **Potential Effect** The proposed works will introduce underwater noise into the marine environment. The proposed cable survey area is located within Celtic and Irish Seas MU (JNCC, 2023), which includes the following SACs: • Roaring Water Bay and Islands SAC (000101) • Blasket Island SAC (002172) • Rockabill to Dalkey Islands SAC (003000) Detailed assessment is required in relation to the potential effects on Harbour Porpoise. Mitigation measures are required.

5.5 Irish SACs Designated for Bottlenose Dolphin

The potential impact of the proposed survey works on the features of interest (screened in) of the following sites designated for bottlenose dolphin are seen in Table 19:

- Lower River Shannon SAC (002165)
- Slyne Head Peninsula SAC (002074)
- Slyne Head Islands SAC (000328)
- West Connacht Coast SAC (002998)
- Duvillaun Islands SAC (000495)

Table 19. The Conservation Objectives, overall status of bottlenose dolphin, and the potential impact of the proposed works on this feature of interest and conservation objectives of the above sites.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives* and perceived impacts.
[1349] Bottlenose Dolphin (Tursiops truncatus)	**Favourable**	**To maintain the favourable conservation condition of Bottlenose Dolphin.** **Potential Effect** The proposed works will introduce underwater noise into the marine environment. The proposed cable survey area is located within West Coast of Ireland MU, Oceanic Waters MU, and Offshore Channel, Celtic Sea & SW England MU for bottlenose dolphin (JNCC, 2023), which includes the following Irish SACs: • Lower River Shannon SAC (002165) • Slyne Head Peninsula SAC (002074) • Slyne Head Islands SAC (000328) • West Connacht Coast SAC (002998) • Duvillaun Islands SAC (000495) Detailed assessment is required in relation to the potential effects on bottlenose dolphin. Mitigation measures are required.

5.6 UK SACs Designated for Harbour Porpoise

The potential impact of the proposed survey works on the features of interest (screened in) of the following sites designated for harbour porpoise are seen in Table 20:

- Bristol Channel Approaches/Dynesfeydd Môr Hafren (**UK0030396**)
- West Wales Marine / Gorllewin Cymru Forol (**UK0030397**)
- North Anglesey Marine/Gogledd Môn Forol (**UK0030398**)
- North Channel (**UK0030399**)

Table 20. The site-specific Conservation Objectives, overall status of harbour porpoise, and the potential impact of the proposed works on this feature of interest and conservation objectives of the above sites.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives* and perceived impacts.
[1351] Harbour Porpoise (Phocoena phocoena)	**Unknown**	**Ensuring:** **1. Harbour porpoise are a viable component of the site.** **2. There is no significant disturbance of the species.** **3. The condition of supporting habitats and processes, and the availability of prey is maintained.** **Potential Effect** The proposed works will introduce underwater noise into the marine environment. The proposed works area is located within the Celtic and Irish Seas MU for Harbour Porpoise, which includes the following SACs (JNCC, 2023): • Bristol Channel Approaches/Dynesfeydd Môr Hafren (**UK0030396**) • West Wales Marine / Gorllewin Cymru Forol (**UK0030397**) • North Anglesey Marine/Gogledd Môn Forol (**UK0030398**) • North Channel (**UK0030399**) Detailed assessment is required in relation to the potential effects on Harbour Porpoise. Mitigation measures are required.

5.7 UK SACs Designated for Grey Seal

The potential impact of the proposed survey works on these features of interest (screened in) of the following sites designated for grey seal are seen in Table 21:

- Isles of Scilly Complex (**UK0013694**)
- Pembrokeshire Marine / Sir Benfro Forol (**UK0013116**)
- Cardigan Bay / Bae Ceredigion (**UK0012712**)
- Lundy (**UK0013114**)
- Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau (**UK0013117**)
- The Maidens (**UK0030384**)

Table 21. The site-specific Conservation Objectives, overall status of grey seal, and the potential impact of the proposed works on this feature of interest and conservation objectives of the above sites.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives* and perceived impacts.
[1364] Grey Seal (*Halichoeurus grypus*)	**Favourable**	**To maintain / restore the favourable conservation condition of Grey Seal.** **Potential Effect** The proposed works will introduce underwater noise into the marine environment. The proposed works area is located within the 448km foraging range of grey seal (Carter et al., 2022), which includes the following SACs where Grey Seal are a feature of interest: • Isles of Scilly Complex (**UK0013694**) • Pembrokeshire Marine / Sir Benfro Forol (**UK0013116**) • Cardigan Bay / Bae Ceredigion (**UK0012712**) • Lundy (**UK0013114**) • Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau (**UK0013117**) • The Maidens (**UK0030384**) Detailed assessment is required in relation to the potential effects on Grey Seal. Mitigation measures are required.

5.8 French SACs Designated for Harbour Porpoise

The potential effects of the proposed survey works on these features of interest of the following sites designated for harbour porpoise are seen in Table 22:

- Nord Bretagne DH (**FR2502022**)
- Récifs et landes de la Hague (**FR2500084**)
- Anse de Vauville (**FR2502019**)
- Mers Celtiques – Talus du golfe de Gascogne (**FR5302015**)
- Banc et récifs de Surtainville (**FR2502018**)
- Côte de Granit rose-Sept-Iles (**FR5300009**)
- Trégor – Goëlo (**FR5300010**)
- Baie de Morlaix (**FR5300015**)
- Abers – Côtes des legends (**FR5300017**)
- Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay (**FR5300008**)
- Cap d'Erquy-Cap Fréhel (**FR5300011**)
- Ouessant-Molène (**FR5300018**)
- Chausey (**FR2500079**)
- Baie de Saint-Brieuc – Est (**FR5300066**)
- Côtes de Crozon (**FR5302006**)
- Baie du Mont Saint-Michel (**FR2500077**)
- Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard (**FR5300012**)
- Estuairie de la Rance (**FR5300061**)
- Chaussée de Sein (**FR5302007**)
- Récifs du talus du golfe de Gascogne (**FR5302016**)

Table 22. The site-specific Conservation Objectives, overall status of harbour porpoise, and the potential impact of the proposed works on this feature of interest (screened in) and conservation objectives of the above sites.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives* and perceived impacts.
[1351] Harbour Porpoise (Phocoena phocoena)	**Poor**	**To maintain (or restore where appropriate) the qualifying interests to favourable condition.** **Potential Effect** The proposed works will introduce underwater noise into the marine environment. The proposed works area is located within the Celtic and Irish Seas MU for Harbour Porpoise, which also includes the following SACs (JNCC, 2023): • Nord Bretagne DH (**FR2502022**) • Récifs et landes de la Hague (**FR2500084**) • Anse de Vauville (**FR2502019**) • Mers Celtiques – Talus du golfe de Gascogne (**FR5302015**) • Banc et récifs de Surtainville (**FR2502018**) • Côte de Granit rose-Sept-Iles (**FR5300009**) • Trégor – Goëlo (**FR5300010**) • Baie de Morlaix (**FR5300015**) • Abers – Côtes des legends (**FR5300017**) • Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay (**FR5300008**) • Cap d'Erquy-Cap Fréhel (**FR5300011**) • Ouessant-Molène (**FR5300018**)

Annex Species/Habitats-Qualifying Interest	Overall Conservation Status	*Site Specific Conservation Objectives* and perceived impacts.
		• Chausey (**FR2500079**) • Baie de Saint-Brieuc – Est (**FR5300066**) • Côtes de Crozon (**FR5302006**) • Baie du Mont Saint-Michel (**FR2500077**) • Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard (**FR5300012**) • Estuairie de la Rance (**FR5300061**) • Chaussée de Sein (**FR5302007**) • Récifs du talus du golfe de Gascogne (**FR5302016**) Detailed assessment is required in relation to the potential effects on Harbour Porpoise. Mitigation measures are required.

5.9 French SACs Designated for Grey Seal

The potential impact of the proposed fibre-optic cable on these features of interest of the following sites designated for grey seal are seen in Table 23:

- Ouessant-Molène (**FR5300018**)
- Abers – Côtes des legends (**FR5300017**)
- Chaussée de Sein (**FR5302007**)
- Anse de Goulven, dunes de Keremma (**FR5300016**)
- Baie de Morlaix (**FR5300015**)
- Côte de Granit rose-Sept-Iles (**FR5300009**)
- Côtes de Crozon (**FR5302006**)
- Presqu'lle de Crozon (**FR5300019**)
- Rade de Brest, estuarie de l'Aulne (**FR5300046**)
- Cap Sizun (**FR5310055**)
- Trégor – Goëlo (**FR5300010**)
- Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay (**FR5300008**)
- Baie d'Audieme (**FR5310056**)
- Récifs et landes de la Hague (**FR2500084**)
- Baie de Saint-Brieuc – Est (**FR5300066**)
- Roches de Penmarch (**FR5302008**)
- Archipel des Glénan (**FR5310057**)
- Dunes et côtes de Trévignon (**FR5300049**)

Table 23. The site-specific Conservation Objectives, overall status of grey seal, and the potential impact of the proposed works on this feature of interest (screened in) and conservation objectives of the above sites.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives* and perceived impacts.
[1364] Grey Seal (*Halichoeurus grypus*)	**Poor**	**To maintain (or restore where appropriate) the qualifying interests to favourable condition.** **Potential Effect** The proposed works will introduce underwater noise into the marine environment. The proposed works area is located within the 448km foraging range of grey seal (Carter et al., 2022), which also includes the following SACs where Grey Seal are a feature of interest: • Ouessant-Molène (**FR5300018**) • Abers – Côtes des legends (**FR5300017**) • Chaussée de Sein (**FR5302007**) • Anse de Goulven, dunes de Keremma (**FR5300016**) • Baie de Morlaix (**FR5300015**) • Côte de Granit rose-Sept-Iles (**FR5300009**) • Côtes de Crozon (**FR5302006**) • Presqu'lle de Crozon (**FR5300019**) • Rade de Brest, estuarie de l'Aulne (**FR5300046**) • Cap Sizun (**FR5310055**) • Trégor – Goëlo (**FR5300010**) • Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay (**FR5300008**) • Baie d'Audieme (**FR5310056**) • Récifs et landes de la Hague (**FR2500084**) • Baie de Saint-Brieuc – Est (**FR5300066**) • Roches de Penmarch (**FR5302008**) • Archipel des Glénan (**FR5310057**) • Dunes et côtes de Trévignon (**FR5300049**) Detailed assessment is required in relation to the potential effects on grey seal. Mitigation measures are required.

5.10 French SACs Designated for Bottlenose Dolphin

The potential effects of the proposed survey works on these features of interest of the following sites designated for bottlenose dolphin are seen in Table 24:

- Mers Celtiques – Talus du golfe de Gascogne (**FR5302015**)
- Récifs du talus du golfe de Gascogne (**FR5302016**)
- Nord Bretagne DH (**FR2502022**)
- Ouessant-Molène (**FR5300018**)
- Abers – Côtes des legends (**FR5300017**)
- Chaussée de Sein (**FR5302007**)
- Côte de Granit rose-Sept-Iles (**FR5300009**)
- Trégor – Goëlo (**FR5300010**)
- Récifs et landes de la Hague (**FR2500084**)
- Anse de Vauville (**FR2502019**)
- Baie de Saint-Brieuc – Est (**FR5300066**)
- Cap d'Erquy-Cap Fréhel (**FR5300011**)
- Banc et récifs de Surtainville (**FR2502018**)
- Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard (**FR5300012**)
- Chausey (**FR2500079**)
- Baie du Mont Saint-Michel (**FR2500077**)
- Côte de Cancale á Parmè (**FR5300052**)
- Récifs et marais arrière-littoraux du Cap Lévi à la Pointe de Saire (**FR2500085**)
- Baie de Seine occidentale (**FR2502020**)
- Baie de Seine orientale (**FR2502021**)
- Littoral Cauchois (**FR2300139**)
- Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant (**FR3100478**)

Table 24. The site-specific Conservation Objectives, overall status of bottlenose dolphin, and the potential impact of the proposed works on this feature of interest (screened in) and conservation objectives of the above sites.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives* and perceived impacts.
[1349] Bottlenose Dolphin (*Tursiops truncatus*)	**Poor**	**To maintain (or restore where appropriate) the qualifying interests to favourable condition.** **Potential Effect** The proposed works will introduce underwater noise into the marine environment. The proposed cable survey area is located within West Coast of Ireland MU, Oceanic Waters MU, and Offshore Channel, Celtic Sea & SW England MU for bottlenose dolphin (JNCC, 2023), which includes the following French SACs: • Mers Celtiques – Talus du golfe de Gascogne (**FR5302015**) • Récifs du talus du golfe de Gascogne (**FR5302016**) • Nord Bretagne DH (**FR2502022**) • Ouessant-Molène (**FR5300018**) • Abers – Côtes des legends (**FR5300017**) • Chaussée de Sein (**FR5302007**) • Côte de Granit rose-Sept-Iles (**FR5300009**) • Trégor – Goëlo (**FR5300010**) • Récifs et landes de la Hague (**FR2500084**)

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives* and perceived impacts.
		• Anse de Vauville (**FR2502019**) • Baie de Saint-Brieuc – Est (**FR5300066**) • Cap d'Erquy-Cap Fréhel (**FR5300011**) • Banc et récifs de Surtainville (**FR2502018**) • Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard (**FR5300012**) • Chausey (**FR2500079**) • Baie du Mont Saint-Michel (**FR2500077**) • Côte de Cancale á Parmè (**FR5300052**) • Récifs et marais arrière-littoraux du Cap Lévi à la Pointe de Saire (**FR2500085**) • Baie de Seine occidentale (**FR2502020**) • Baie de Seine orientale (**FR2502021**) • Littoral Cauchois (**FR2300139**) • Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant (**FR3100478**) Detailed assessment is required in relation to the potential effects on bottlenose dolphin. Mitigation measures are required.

Cetacean Sightings

Recorded sightings of Cetacean species proximate to the proposed survey area are demonstrated in Figures 47-49.

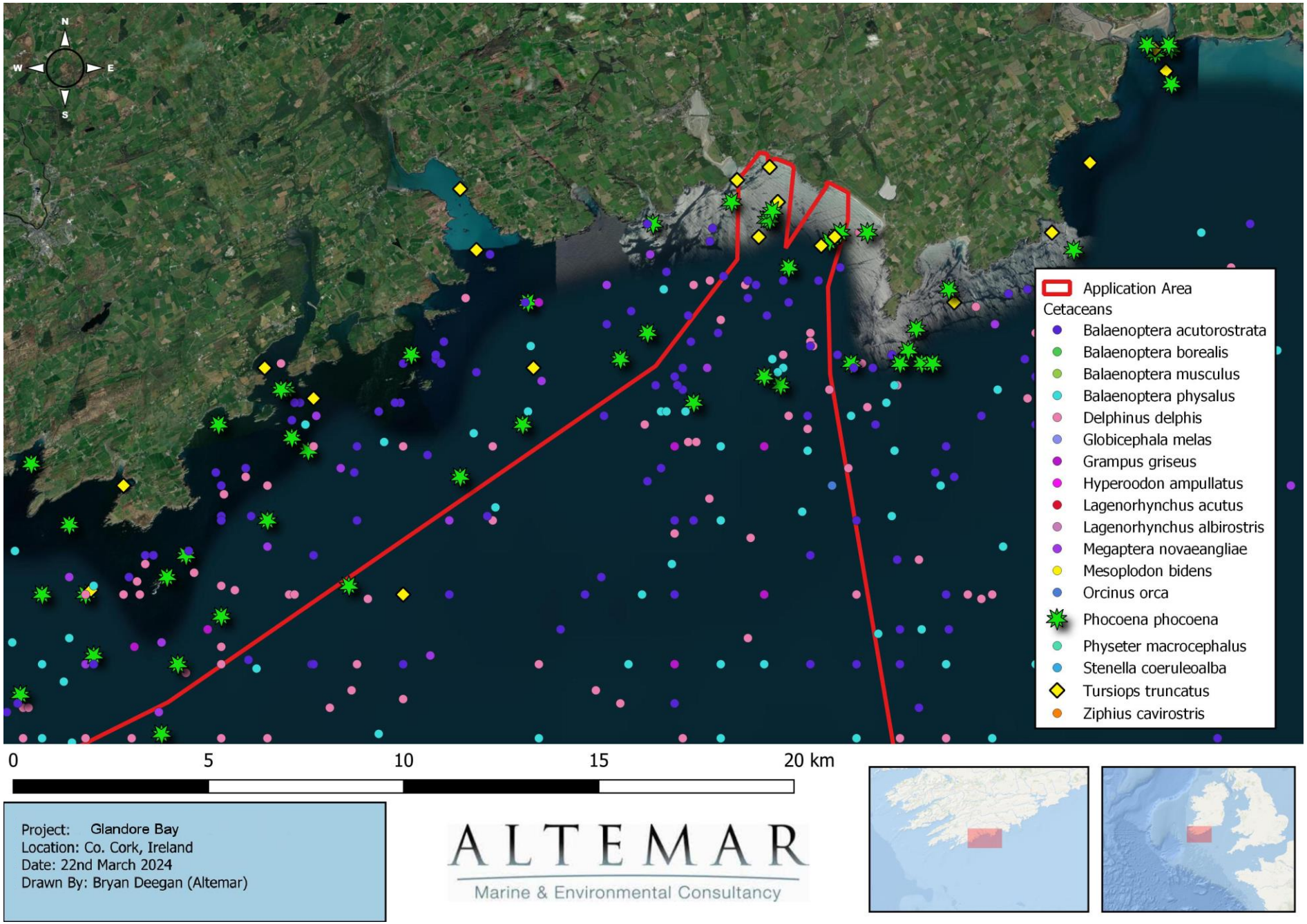


Figure 47. Recorded Cetacean species sightings (Source NBDC sightings data) proximate to landfall area

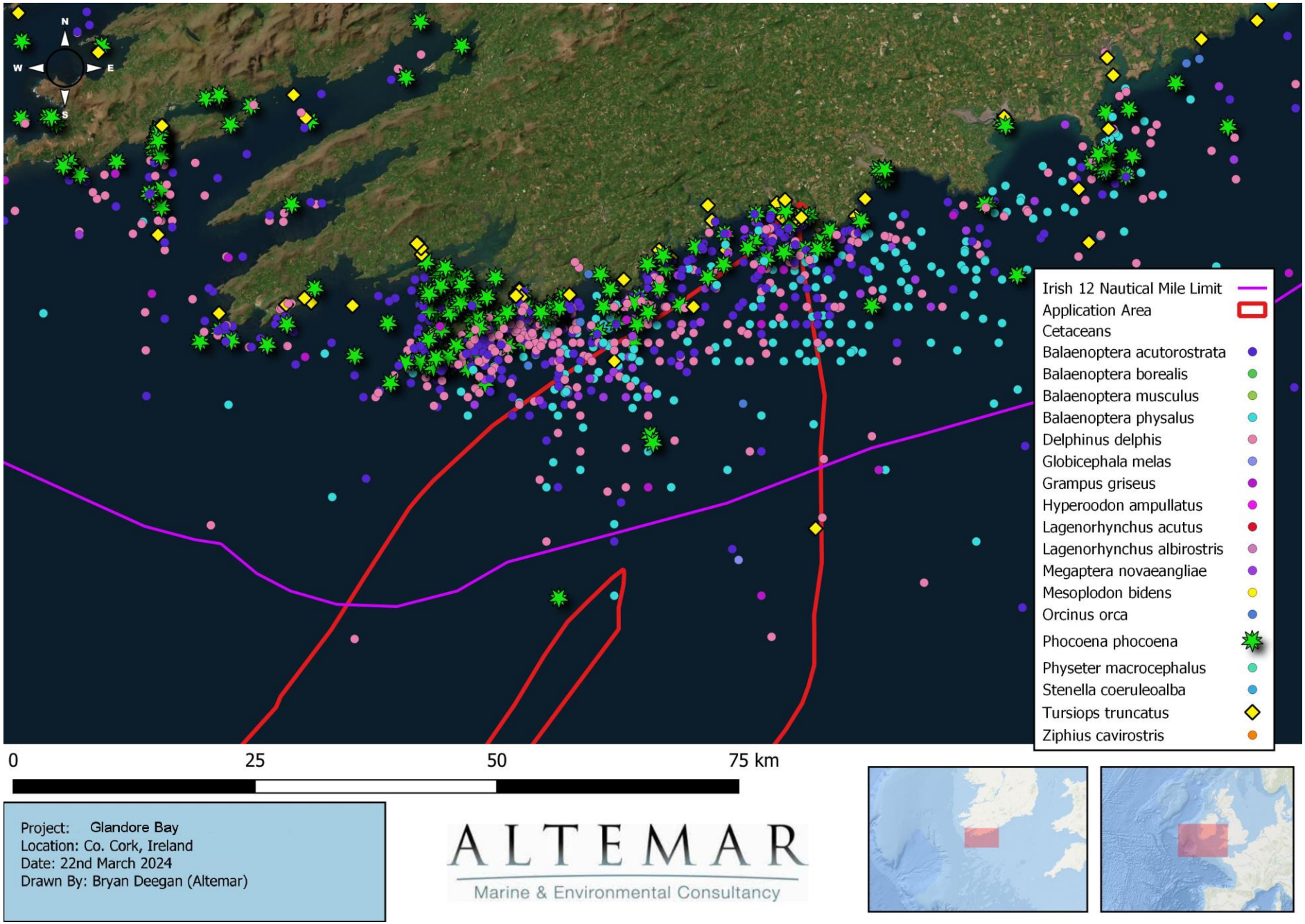


Figure 48. Recorded Cetacean species sightings (Source NBDC sightings data) within 12nm Limit

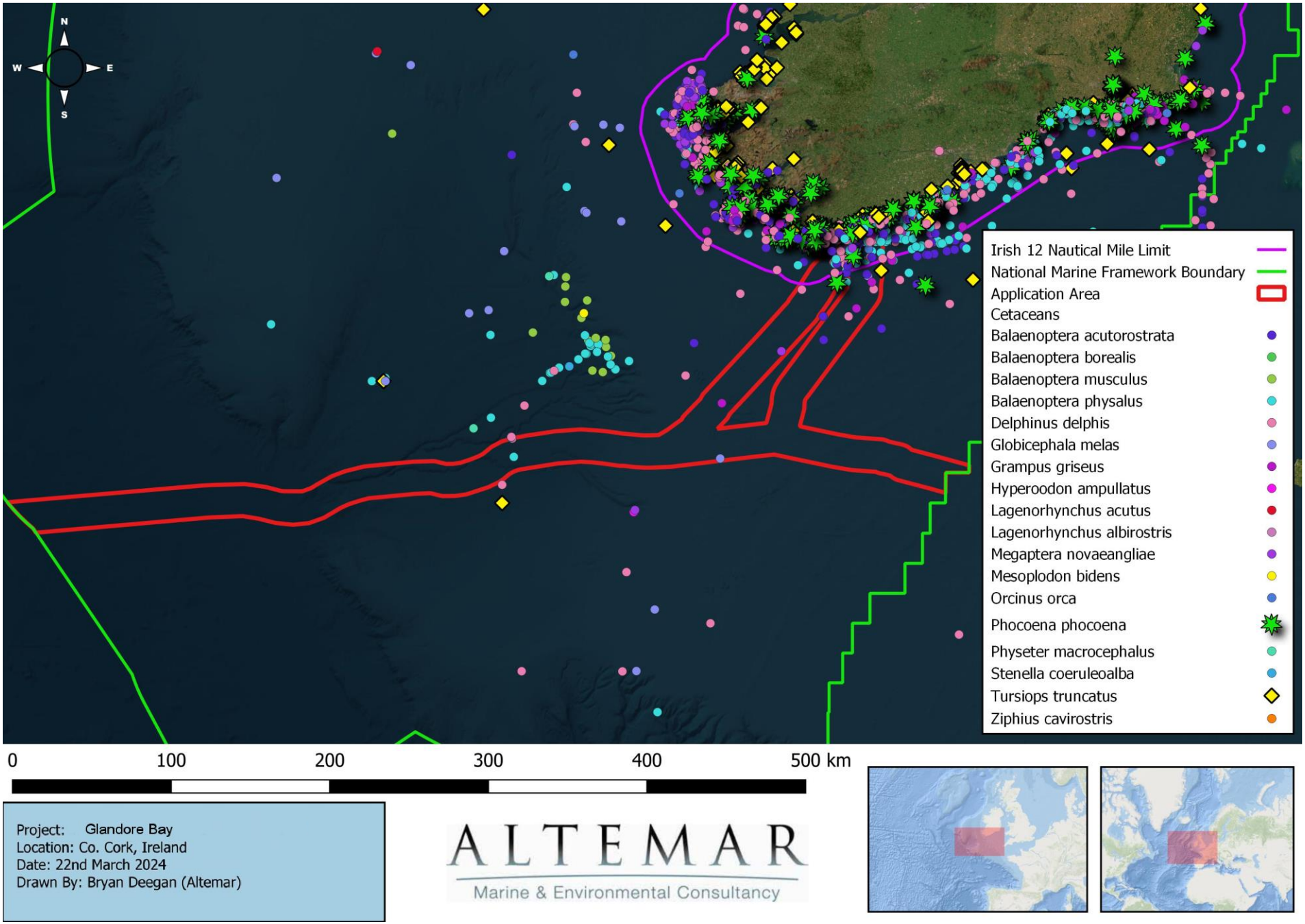


Figure 49. Recorded Cetacean species sightings (Source NBDC sightings data) within Irish EEZ

6. Further information on the potential 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, Harbour Porpoise, Grey Seal and Harbour Seal are also listed under Annex II of the Directive. Annex II species require that core areas of their habitat are designated as sites of Community importance.

The proposed survey would be expected to impact on cetaceans primarily through the emission of noise due to the vessel and from survey equipment including multibeam. 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) outlined 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 25.

Table 25. *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	*Balaenidae (Balaena, Eubalaenidae spp.); Balaenopteridae (Balaenoptera physalus, B. musculus)*
		Balaenopteridae (Balaenoptera acutorostrata, B. bonaerensis, B. borealis, 1 B. edeni, B. omurai; Megaptera novaeangliae); Neobalenidae (Caperea);Eschrichtiidae (Eschrichtius)
High-frequency cetaceans	HF	*Physeteridae (Physeter); Ziphiidae (Berardius spp., Hyperoodon spp., Indopacetus, Mesoplodon spp., Tasmacetus, Ziphius); Delphinidae (Orcinus)*
		Delphinidae (Delphinus, Feresa, Globicephala spp., Grampus, 2 Lagenodelphis, Lagenorhynchus acutus, L. albirostris, L. obliquidens, L. obscurus, Lissodelphis spp., Orcaella spp., Peponocephala, Pseudorca, Sotalia spp., Sousa spp., Stenella spp., Steno, Tursiops spp.); Montodontidae (Delphinapterus, Monodon); Plantanistidae (Plantanista)
Very high frequency cetaceans	VHF	*Delphinidae (Cephalorhynchus spp.; Lagenorhynchus cruciger, L. australis); Phocoenidae (Neophocaena spp., Phocoena spp., Phocoenoides); Iniidae (Inia); Kogiidae (Kogia); Lipotidae (Lipotes); Pontoporiidae (Pontoporia)*
Phocid carnivores in water	PCW	*Phocidae (Cystophora, Erignathus, Halichoerus, Histriophoca, Hydrurga,Leptonychotes, Lobodon, Mirounga spp., Monachus, Neomonachus, Ommatophoca, Pagophilus, Phoca spp., Pusa 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 26). 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 on marine mammals was also outlined in NOAA 2018 (Table 27). The updated figures for PTS and TTS for are outlined in Table 28.

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 26. 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 27. Onset of PTS in Marine mammals

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

[1]Impulsive: 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).

[2]Non-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 28. Southall *et al.* (2019) TTS- and PTS-onset thresholds for marine mammals exposed to impulsive noise: SEL thresholds in dB re 1 µPa^{2}s under water and dB re (20 µPa)^{2}s; 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 µPa^{2}s)	Weighted SELcum (dB re 1 µPa^{2}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 29. The estimated time and duration of survey activities is demonstrated in Figure 30.

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
Deepwater Multibeam Echo Sounder (MBES)	Measure detailed bathymetry by transmitting sound pulses (active sonar).	12 kHz	2 – 15 ms	210 Db.	Kongsberg
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 29a. 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.	96	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	48	N/A	*N/A*	N/A
Vibrocorer	Retrieve a seabed sediment sample by penetrating seabed with a vibrating steel core barrel	48	30 Hz	*187.4 dB.*	LGL 2010
Grab Samples	Collect small sediment samples from seabed surface with clamshell mechanism	26	N/A	*N/A*	N/A

Table 29b. Details of the proposed types of geophysical equipment which emit sound.

Activity	Typical Time Period Required for Activity	Total Number of Site Investigation Locations	Total Time for Survey Activity	Seabed Area per Location	Seabed Area per Activity (ha)	Total Area (ha)	Area Directly Affected as % of Maritime Usage Licence Application Area
Inshore Geophysical Survey	3 to 4 days (weather and sea state dependent)	500m cable route corridor	3 to 4 days (weather and sea state dependent)	N/A	1.9 km^2	1.9 km^2	0.0113%
Offshore Geophysical Survey	20 to 23 days (weather and sea state dependent)	500m cable route corridor	20 to 23 days (weather and sea state dependent)	N/A	294 km^2	294 km^2	1.7417%
Deepwater MBES Survey	7 to 9 days (weather and sea state dependent)	3 x Water Depth (10km maximum)	7 to 9 days (weather and sea state dependent)	N/A	3915 km^2	3915 km^2	23.1931%
CPT	30 minutes - 3 hours in any one location	96	192 hours within total 16 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)	8m^2	0.0008 ha	0.076 ha	0.0002%
Gravity Corer	30 minutes - 3 hours in any one location	48	96 hours within total 16 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)	1m^2	0.0001 ha	0.0048 ha	0.0000%
Vibro Corer	30 minutes - 3 hours in any one location	48	96 hours within total 16 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)	8m^2	0.0008 ha	0.0384 ha	0.0001%
Grab Samples	20 minutes – 2 hours in any one location	26	26 hours within total 16 days of Site Investigations campaign (weather and sea state dependent, excluding transit between locations)	0.5m^2	0.00005 ha	0.0013 ha	0.0000%

Table 30. Estimated Time and Duration of Survey Activities

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 29. The high frequencies emitted from the equipment are above the auditory range of the mid frequency (150Hz-160 kHz) but within the hearing range of high frequency cetaceans (275Hz -160kHz)- observed 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 Multi Beam Echo Sounder (MBES) will emit noise above the hearing frequency of marine mammals. Deepwater MBES (12 kHz), the hull mounted Sub-bottom Profiler (SBP) – Pinger (2 kHz to 15 kHz) and Sub-bottom Profiler (SBP) – Chirper (2 kHz to 13 kHz), Sub-bottom Profiler (SBP) – Boomer (500 Hz to 15kHz), 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 source emit 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 219dB 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 30 the inshore Geophysical Survey 3 to 4 days (weather and sea state dependent) offshore Geophysical Survey 20 to 23 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."

The operations would comply with the NPWS (2014) "*Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters*". 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.

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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 on marine mammals were also outlined in NOAA 2018. The updated Southall (2019) figures for PTS and TTS for 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 under water and in air for amphibious species. NMFS (2016, 2018) provides regulatory guidance only for the subset of marine mammals under their jurisdiction and do 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.

7. Mitigation Measures & Monitoring

Specific controls will be incorporated into the proposed project to minimise the potential negative effects on the features of interest of the Natura 2000 sites screened in for NIS and are outlined in below:

Minor short-term impacts may result as a consequence of the survey phase of the project, but these are believed not to be at the scale to impact on the integrity of the Natura 2000 sites, species or the site-specific conservation objectives. However, following the precautionary principle, substantial mitigation measures have been developed to minimise the ecological impacts of the project, not only in relation to Natura 2000 Annex habitats and species, but also additional species and habitats of conservation importance that have been recorded in the area.

Route Planning within the landfall area.

A strict route selection process was carried out to assess the optimal route and landing sites, Owenhincha and Long Strand, which is within the Kilkeran Lake and Castlefreke Dunes SAC, 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 within one site of conservation significance (SAC). The conservation significance of the habitats, fauna and flora on both shores and within this SAC was 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. All sand dune habitats were avoided as part of the route selection process. These habitats are seen in Figure 46 and the access route is seen in Plates 1-8. This access route will be marked out by the project ecologist prior to any machinery accessing the shore.

Intertidal Works

As was seen during the fieldwork, the beach at which the intertidal works are proposed is to be carried out on is moderately exposed with coarse sand. Significant human activity was noted on the beach in blistery weather conditions during a site visit in December 2022. It would be expected that there is increased human activity on the beach during summer months and the main access to the beach is via the proposed access route. This route is well used. As a result, mitigation of impacts in the intertidal should concentrate on minimising disturbance of habitats and species of conservation importance.

The proposed survey route is within a popular beach which will have increased activity during summer months. As a result, the presence of additional personnel on the shore during summer would not be thought to cause a significant additional disturbance. However, there is potential for disturbance of the dune habitat and as a result the following mitigation measures would be carried out:

1. An ecologist would be onsite during all surveys within the SAC in order to minimise disturbance and ensure site integrity is maintained.
2. A track will be marked out by the ecologist prior to machinery accessing the beach. This will be marked out to avoid features of interest of the SAC and the outlet from the lagoon in the upper shore.
3. Drift lines and vegetation on the shore in close proximity to the proposed route would contain the highest proportion of potential food source for bird species. If present, these should be avoided by machinery and personnel.
4. 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.
5. 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.

Reinstatement

Reinstatement of the terrestrial and intertidal habitat should be carried out to pre-construction 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 would be enforced.

1. Mitigation measures will include the presence of a MMO onboard the survey vessel. The purpose of the MMO is to ensure that there is no disturbance of seal /cetacean populations.
2. The NPWS Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters' (NPWS, 2014) should be followed throughout the survey.
3. The MMO should ensure that mitigation measures are carried out. Sufficient resources should be made immediately available on the survey vessel to deal with accidental oil spills including hydraulic hoses bursting etc. and reported to the on board ecologist.

8. Natura Impact Statement Conclusions

The conservation objectives of Natura 2000 sites within, and beyond 15km where there is a potential for significant effects, of the proposed cable survey route were assessed.

In the absence of mitigation, it was determined that the project may cause localised disturbance to the habitats within Kilkeran Lake and Castlefreke Dunes SAC due to pollution risk. In addition, there is potential for underwater noise effects to harbour porpoise, harbour seals, bottlenose dolphin, and grey seals during the survey periods, in the absence of mitigation . However, these impacts are deemed to be short term for the period of works (3-4 days for inshore marine survey). Mitigation measures including ecological supervision and compliance with “Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (NPWS, 2014) will be carried out.

This NIS has involved the examination, analysis, and evaluation of all relevant information including, a description of the proposed project, its survey methodology, the environment in which the project will be placed, Natura 2000 sites within the potential ZoI and has applied the precautionary principle in the preparation of the conclusion. It is the professional opinion of the author of this report that there will be no adverse effects on the integrity of any Natura 2000 sites and marine mammals following the implementation of the mitigation measures outlined. The implementation of standard mitigation measures including the measures outlined, including onsite monitoring, the presence of a MMO, will be sufficient to prevent adverse effects on the integrity of Natura 2000 sites.

The mitigation measures detailed in this NIS have been carefully considered to ensure no adverse effects on the integrity of the following NATURA 2000 sites in light of the site’s conservation objectives and status:

- Kilkeran Lake and Castlefreke Dunes SAC (potential effects as a result of pollution) and,
- Roaringwater Bay and Islands SAC, Glengarriff Harbour and Woodland SAC, Kenmare River SAC, Lower River Shannon SAC, Blasket Island SAC, Saltee Islands SAC, Galway Bay Complex SAC, Slaney River Valley SAC, Kilkieran Bay And Islands SAC, Slyne Head Peninsula SAC, Slyne Head Islands SAC, West Connacht Coast SAC, Inishbofin and Inishshark SAC, Clew Bay Complex SAC, Rockabill to Dalkey Islands SAC, Duvillaun Islands SAC, Lambay Island SAC, Inishkea Islands SAC, Slieve Tooey/Tormore Island/Loughbros Beg Bay SAC, Horn Head and Rinclevan SAC, Isles of Scilly Complex, Bristol Channel Approaches/Dynesfeydd Môr Hafren, Pembrokeshire Marine / Sir Benfro Forol, West Wales Marine / Gorllewin Cymru Forol, Cardigan Bay / Bae Ceredigion, Lundy, Pen Llyn a’r Sarnau/Lleyn Peninsula and the Sarnau, North Anglesey Marine/Gogledd Môn Forol, North Channel, The Maidens, Mers Celtiques – Talus du golfe de Gascogne, Récifs du talus du golfe de Gascogne, Ouessant-Molène, Nord Bretagne DH, Abers – Côtes des legends, Anse de Goulven, dunes de Keremma, Chaussée de Sein, Côtes de Crozon, Presqu’lle de Crozon, Baie de Morlaix, Rade de Brest, estuaire de l’Aulne, Cap

Sizun, Côte de Granit rose-Sept-Iles, Baie d'Audieme, Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay, Trégor – Goëlo, Roches de Penmarch, Archipel des Glénan, Dunes et côtes de Trévignon, Baie de Saint-Brieuc – Est, Cap d'Erquy-Cap Fréhel, Récifs et landes de la Hague, Anse de Vauville, Banc et récifs de Surtainville, Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard, Chaucy, Côte de Cancale á Parmè, Estuairie de la Rance, Récifs et marais arrière-littoraux du Cap Lévi à la Pointe de Saire, Baie du Mont Saint-Michel, Baie de Seine occidentale, Baie de Seine orientale, Littoral Cauchois, Falaises du Cran aux Oeufs et du Cap Gris-Nez, Dunes du Chatelet, Marais de Tardinghen et Dunes de Wissant (potential impact on harbour porpoise, bottlenose dolphin, grey seal, harbour seal). Standard mitigation measures used for harbour porpoise, bottlenose dolphin, grey seal, and harbour seal,

Based on the assessment of the proposed development (survey) alone and in combination with other projects and plans, including the implementation of mitigation measures, it can be concluded that no adverse effects on the sites' integrity will arise, in view of the site's conservation objectives.

This report presents a Stage II Natura Impact Statement for the proposed survey, outlining the information required for the competent authority to screen for appropriate assessment and to determine whether or not the Proposed Development, either alone or in combination with other plans and projects, in view of best scientific knowledge, will adversely affect the integrity of European sites.

On the basis of the content of this report, the competent authority is enabled to conduct an Appropriate Assessment and consider whether, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites conservation objectives, will adversely affect the integrity of the European site

No significant effects will arise on Natura 2000 sites, their features of interest or conservation objectives. The proposed project will not will adversely affect the integrity of European sites.

9. Data used for the NIS

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 Bing road maps and satellite imagery. Numerous site visits were carried out, the most recent of which was on the 14th March 2024.

10. References

1. DoEHLG, 2009. Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government 2009; http://www.npws.ie/publications/archive/NPWS_2009_AA_Guidance.pdf
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Appendix I

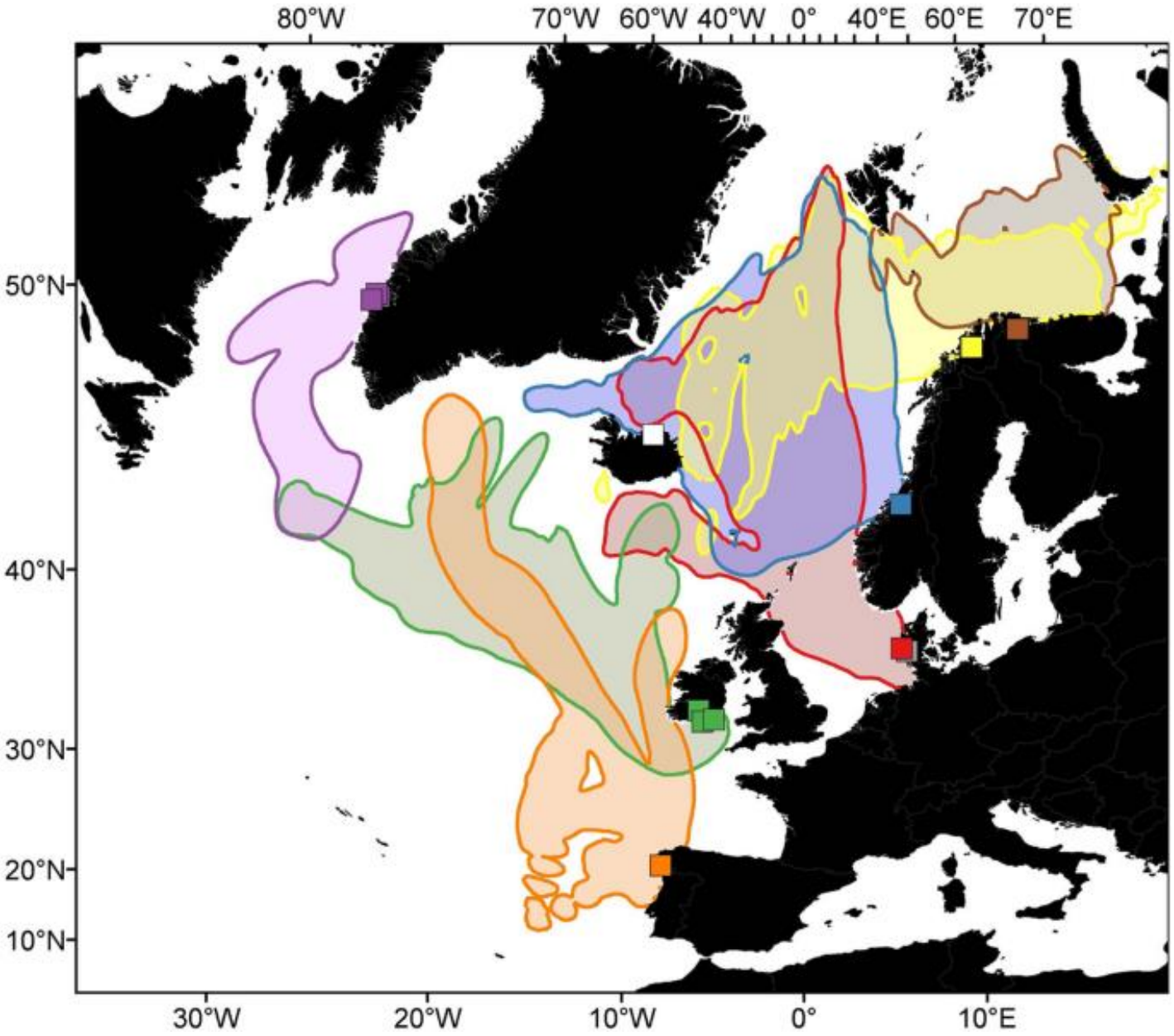

Figure AI.1. Area use during the ocean migration of tagged Atlantic salmon (Ireland = Green) (Source: Rikardsen et al., 2021).