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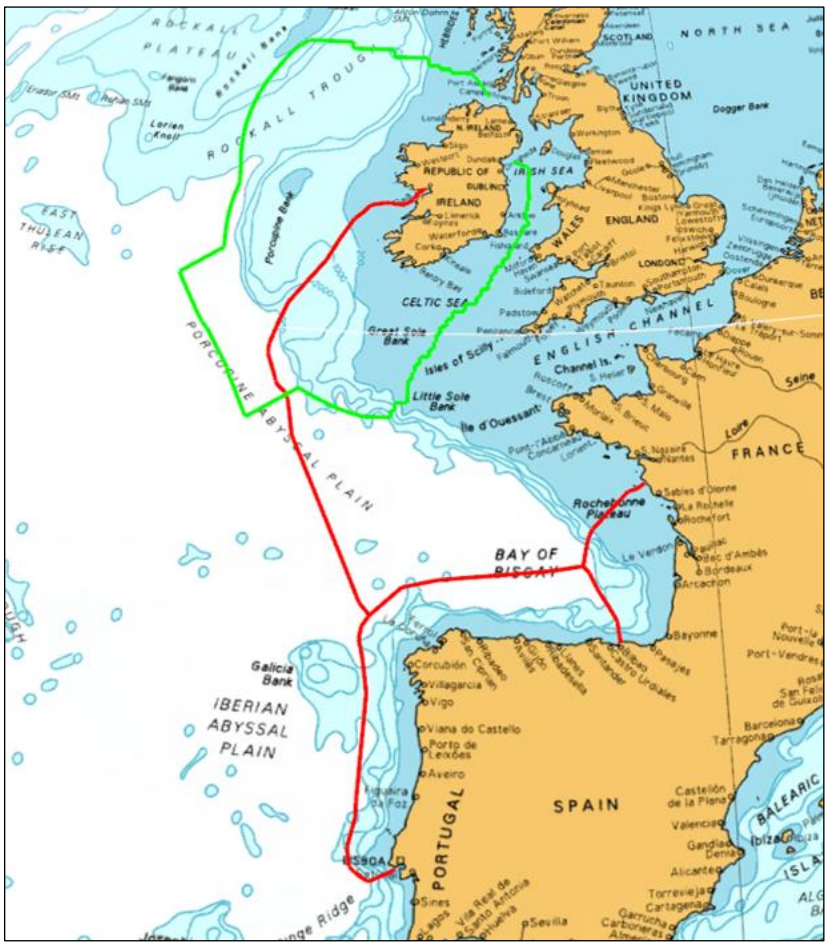
Marine & Environmental Consultancy

Natura Impact Statement – Information for a Stage 2 (Natura Impact Statement) AA for marine survey and site investigation works at Ballyloughane, Co. Galway.



12th March 2024

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On behalf of: McMahon Design and Management Ltd.

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1. Introduction

The following Natura Impact Statement (NIS) has been prepared by **Altemar Ltd.** for marine survey and site investigation works at Ballyloughane, Co. Galway.

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). An AA Screening was carried out 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. [redacted] the managing director of Altemar, is an Environmental Scientist and Marine Biologist with 28 years' experience working in Irish terrestrial and aquatic environments, providing services to the State, Semi-State and industry. He is currently contracted to Inland Fisheries Ireland as the sole "External Expert" to environmentally assess internal and external projects. He is also chair of an internal IFI working group on environmental assessment. [redacted] (MCIEEM) holds a MSc in Environmental Science, BSc (Hons.) in Applied Marine Biology, NCEA National Diploma in Applied Aquatic Science and a NCEA National Certificate in Science (Aquaculture). [redacted] carried out all elements of this Appropriate Assessment Screening. [redacted] 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;*
    - *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.*

[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;

- *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 project is not directly connected with, or necessary to the management of Natura 2000 sites.

4.2 Description of the Proposed Project

The applicant plans to investigate the feasibility of constructing a new subsea telecoms cable system, PISCES, linking Ireland to EU member states, from a landfall at Ballyloughane, Co. Galway to landfalls in France, Spain and Portugal 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 Maritime Area in order to inform the location and design of the cable route and landfall.

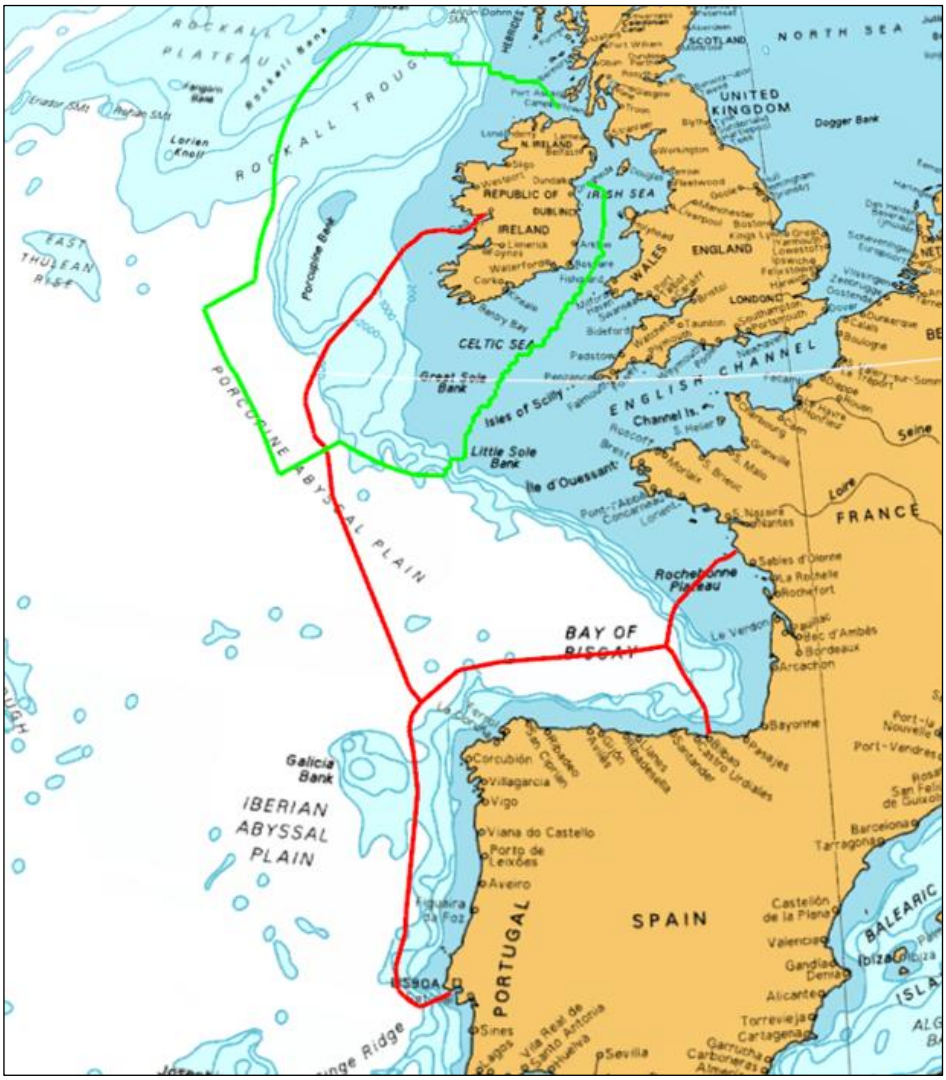

Figure 1: The PISCES Telecoms Cable System & IRL Maritime Area

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

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

Licence Application Area

The License Application Area begins at a landfall at Ballyloughane Strand in Galway Bay, traverses Galway Bay and through the South Sound to the 12nm limit, continuing to the west offshore of the County Clare coast and onwards in a southwest to south direction until it crosses the continental shelf and leaves the Irish Maritime Area (Figure 2). The survey corridor has total length of approx. 710km and a total area of 3,607km^2 within the Maritime Area. A cable route corridor of between 250m to 12,000m in width will be surveyed within the licence application area.

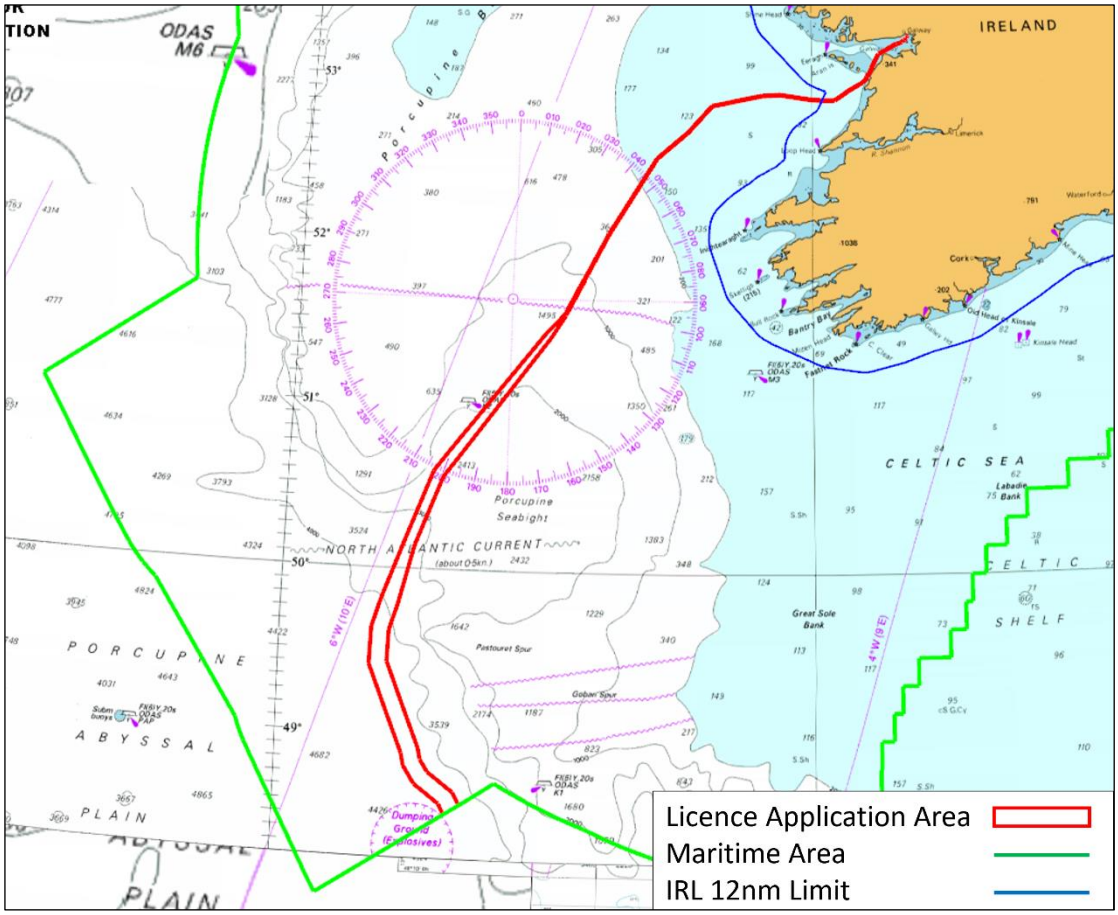

Figure 1. Survey Licence Application Area.

Landfall & Inshore Survey Corridors

The licence application area covers the landfall at Ballyloughane, with a survey corridor traversing Galway Bay. The landfall location is shown in Figure 3 and the general inshore location is shown in Figure 4 on an admiralty chart base. The route heads southwest from the landfall, parallel to the existing IRIS cable, before turning south and then south westerly again to the north of Black Head before turning to the south and leaving the bay through the South Sound as shown in Figure 5.

Figure 3: Landfall at Ballyloughane Strand, Renmore, Co. Galway

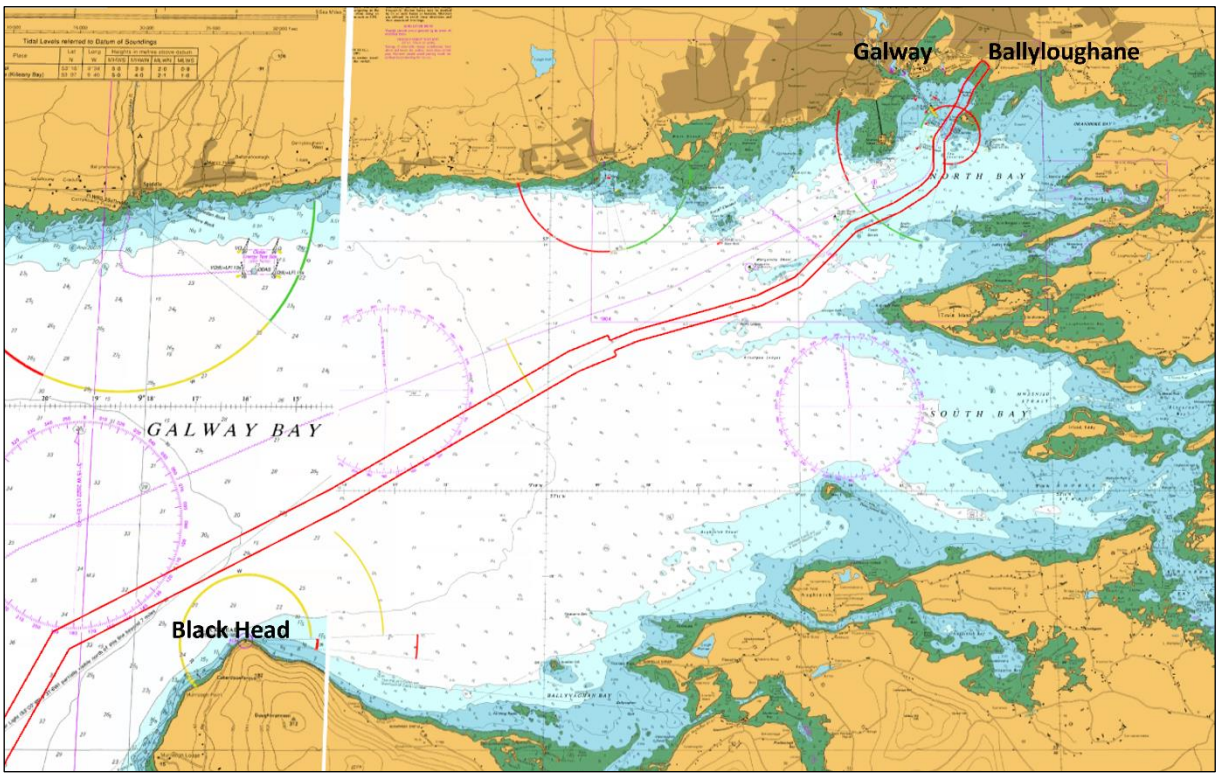

Figure 4: Landfall & Inshore Survey Licence Application Area in Galway Bay

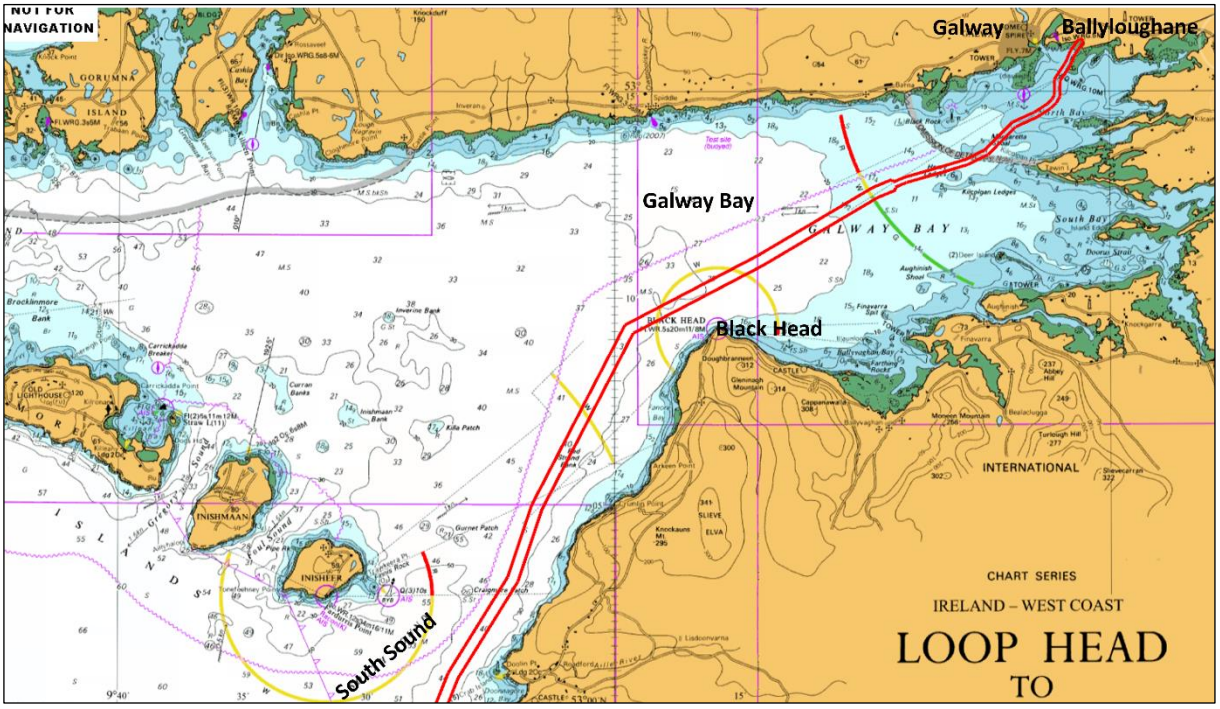

Figure 5: Survey Licence Application Area in Galway Bay

The offshore survey corridor as the route leaves Galway Bay and crosses the 12nm limit is shown in Figure 6.

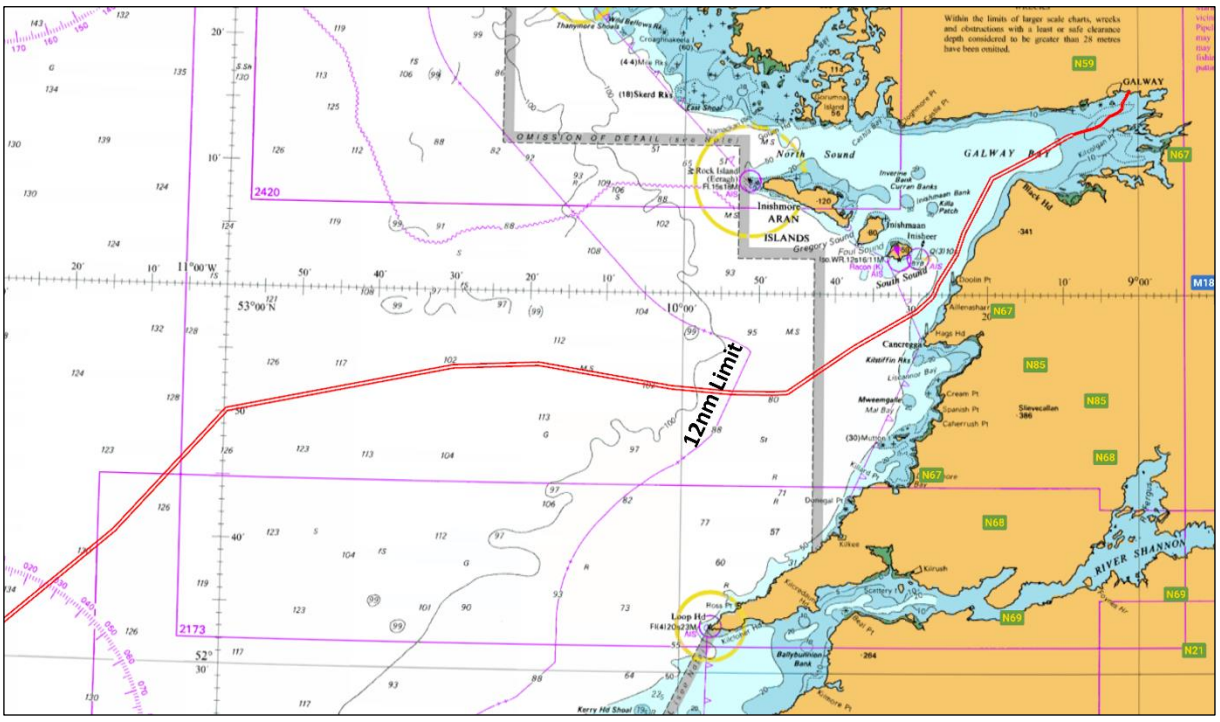

Figure 6: Survey Licence Application Area Offshore of Galway

The offshore survey corridor continues in a southwestern direction entering the deep waters of the Porcupine Seabight and traversing the continental shelf before leaving the Irish Maritime Area and continuing in a southern direction towards a subsea Branching Unit which will bring system legs to France, Spain and Portugal respectively. The width of the seabed covered by a single survey line increases as a function of water depth. Therefore, in deep water the survey corridor width increases as the survey progresses into deeper waters.

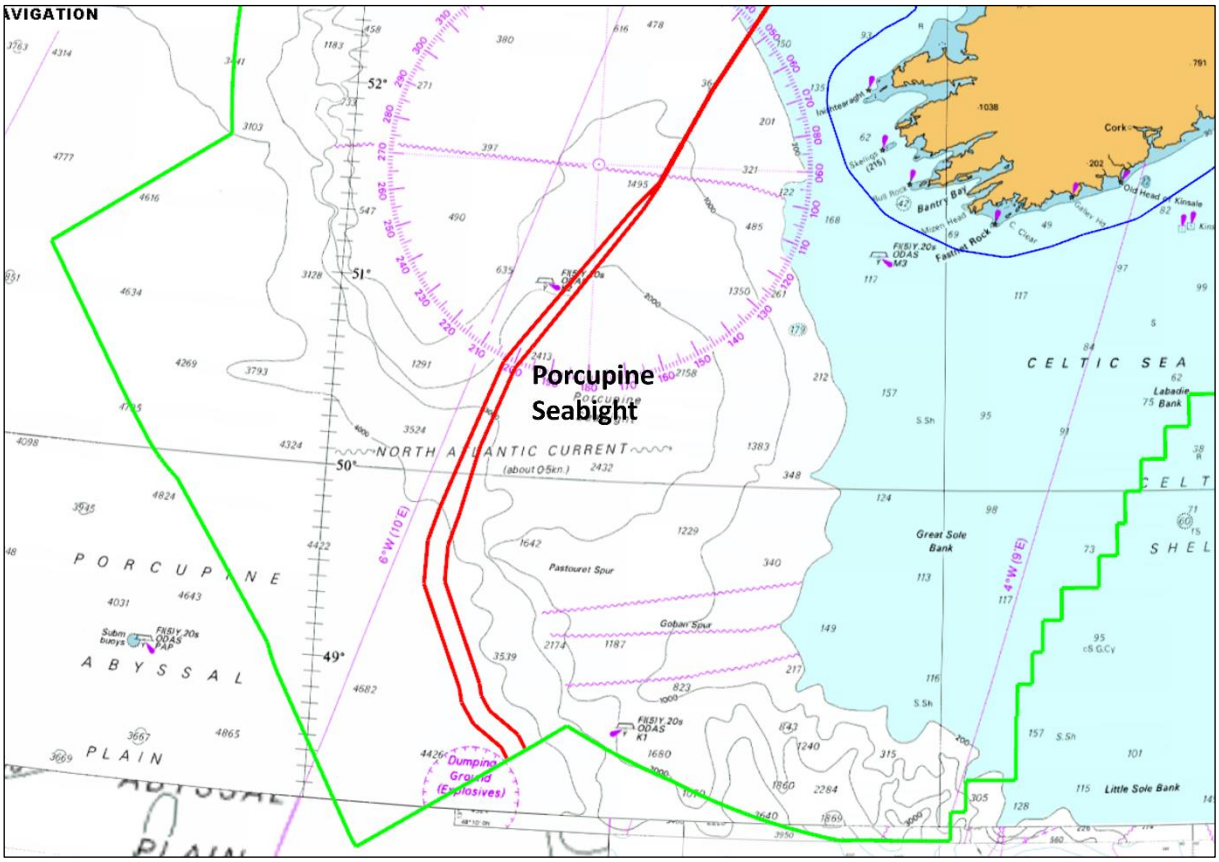

Figure 7: Survey Licence Application Area in Deep Water

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

Table 1: Survey Licence Application Area Route Position List

Idx	Longitude	Latitude	Idx	Longitude	Latitude
1	13° 15' 40.6602" W	48° 35' 05.9241" N	41	9° 06' 55.2641" W	53° 13' 00.7071" N
2	13° 19' 28.3570" W	48° 39' 46.3066" N	42	9° 06' 37.1111" W	53° 13' 03.8033" N
3	13° 33' 36.5808" W	48° 46' 46.0106" N	43	9° 05' 44.8350" W	53° 13' 13.1578" N
4	13° 37' 55.4916" W	48° 51' 13.7382" N	44	9° 04' 55.9719" W	53° 13' 27.4651" N
5	13° 39' 10.1792" W	48° 55' 08.1926" N	45	9° 03' 49.1407" W	53° 14' 07.6656" N
6	13° 49' 38.1849" W	49° 11' 54.9773" N	46	9° 02' 56.5110" W	53° 14' 21.8296" N
7	13° 58' 33.7124" W	49° 26' 13.6475" N	47	9° 02' 23.6463" W	53° 14' 34.4860" N
8	13° 58' 04.5249" W	49° 37' 29.0694" N	48	9° 02' 10.2903" W	53° 14' 42.0380" N
9	13° 53' 35.6169" W	49° 47' 07.3325" N	49	9° 02' 01.1462" W	53° 14' 51.2711" N
10	13° 45' 27.8725" W	50° 08' 37.1570" N	50	9° 02' 00.5431" W	53° 15' 14.3059" N
11	13° 30' 47.9275" W	50° 33' 39.6285" N	51	9° 01' 59.6009" W	53° 15' 15.6754" N
12	13° 22' 49.4965" W	50° 40' 30.5128" N	52	9° 01' 53.2766" W	53° 15' 20.8228" N
13	12° 31' 26.0974" W	51° 25' 00.4497" N	53	9° 01' 38.5897" W	53° 15' 34.1200" N
14	12° 23' 30.6015" W	51° 33' 04.1614" N	54	9° 01' 31.8507" W	53° 15' 41.2755" N
15	12° 13' 05.0465" W	51° 45' 52.6812" N	55	9° 01' 23.7643" W	53° 15' 53.3603" N
16	12° 13' 16.6686" W	51° 45' 56.3420" N	56	9° 01' 03.3247" W	53° 16' 10.3606" N
17	11° 59' 17.1772" W	52° 02' 55.3974" N	57	9° 01' 03.9036" W	53° 16' 10.6626" N
18	11° 31' 58.2790" W	52° 30' 36.0315" N	58	9° 01' 04.9116" W	53° 16' 12.3204" N
19	11° 13' 50.1244" W	52° 40' 12.8647" N	59	9° 01' 10.4214" W	53° 16' 15.4272" N
20	10° 59' 33.0179" W	52° 49' 59.5201" N	60	9° 01' 13.5984" W	53° 16' 15.2256" N
21	10° 30' 00.7955" W	52° 53' 45.4284" N	61	9° 01' 14.8793" W	53° 16' 14.5864" N
22	10° 18' 51.0571" W	52° 54' 05.0846" N	62	9° 01' 35.6743" W	53° 15' 57.2892" N
23	10° 01' 26.4248" W	52° 52' 22.8686" N	63	9° 01' 44.0398" W	53° 15' 44.7860" N
24	9° 59' 58.0369" W	52° 52' 18.6471" N	64	9° 01' 50.1025" W	53° 15' 38.3479" N
25	9° 53' 38.0336" W	52° 52' 00.2869" N	65	9° 02' 04.3380" W	53° 15' 25.4587" N
26	9° 48' 09.9457" W	52° 51' 58.6803" N	66	9° 02' 11.4416" W	53° 15' 19.6765" N
27	9° 46' 08.5261" W	52° 52' 03.0793" N	67	9° 02' 13.9914" W	53° 15' 15.9700" N
28	9° 37' 24.9826" W	52° 55' 41.3048" N	68	9° 02' 14.5764" W	53° 14' 53.5512" N
29	9° 29' 08.4352" W	52° 58' 35.3813" N	69	9° 02' 20.9194" W	53° 14' 47.1460" N
30	9° 27' 12.6426" W	52° 59' 39.1394" N	70	9° 02' 31.9860" W	53° 14' 40.8883" N
31	9° 26' 50.5369" W	52° 59' 58.7339" N	71	9° 03' 02.9491" W	53° 14' 28.9640" N
32	9° 26' 17.6225" W	53° 00' 48.7213" N	72	9° 03' 56.9299" W	53° 14' 14.4360" N
33	9° 23' 53.8215" W	53° 03' 08.6062" N	73	9° 05' 03.9179" W	53° 13' 34.1404" N
34	9° 22' 56.1031" W	53° 04' 53.2502" N	74	9° 05' 49.7491" W	53° 13' 20.7206" N
35	9° 19' 15.7727" W	53° 09' 08.8661" N	75	9° 06' 40.8795" W	53° 13' 11.5711" N
36	9° 14' 03.1758" W	53° 10' 46.8008" N	76	9° 06' 58.9490" W	53° 13' 08.4890" N
37	9° 09' 24.0033" W	53° 12' 25.4751" N	77	9° 08' 18.1355" W	53° 12' 54.9721" N
38	9° 08' 38.8823" W	53° 12' 36.6865" N	78	9° 08' 46.6116" W	53° 12' 47.8997" N
39	9° 08' 41.4586" W	53° 12' 40.4243" N	79	9° 08' 49.1883" W	53° 12' 51.6374" N
40	9° 08' 13.7006" W	53° 12' 47.3183" N	80	9° 09' 36.0453" W	53° 12' 39.9944" N

Table 1: Survey Licence Application Area Route Position List (cont.)

Id	Longitude	Latitude	Id	Longitude	Latitude
81	9° 14' 16.2409" W	53° 11' 00.9566" N	100	11° 59' 40.1258" W	52° 03' 03.2559" N
82	9° 19' 35.7536" W	53° 09' 20.8481" N	101	12° 13' 39.9142" W	51° 46' 03.6626" N
83	9° 23' 20.9374" W	53° 04' 59.5614" N	102	12° 13' 51.5378" W	51° 46' 07.3224" N
84	9° 24' 18.3111" W	53° 03' 15.5134" N	103	12° 24' 14.7705" W	51° 33' 21.3975" N
85	9° 26' 41.6821" W	53° 00' 56.0239" N	104	12° 34' 31.5841" W	51° 26' 28.4427" N
86	9° 27' 14.3740" W	53° 00' 06.3634" N	105	13° 27' 56.2484" W	50° 42' 54.9242" N
87	9° 27' 33.0421" W	52° 59' 49.8140" N	106	13° 36' 25.7921" W	50° 35' 36.5216" N
88	9° 29' 24.3735" W	52° 58' 48.5082" N	107	13° 51' 25.6644" W	50° 09' 54.6815" N
89	9° 37' 39.3236" W	52° 55' 54.9831" N	108	14° 03' 09.5703" W	49° 48' 59.1051" N
90	9° 46' 17.5769" W	52° 52' 18.9622" N	109	14° 07' 59.4399" W	49° 38' 31.1007" N
91	9° 48' 10.6320" W	52° 52' 14.8653" N	110	14° 08' 31.6508" W	49° 25' 02.2185" N
92	9° 53' 36.8583" W	52° 52' 16.4627" N	111	13° 58' 45.7494" W	49° 09' 27.7664" N
93	9° 59' 55.9279" W	52° 52' 34.7772" N	112	13° 48' 35.0613" W	48° 53' 13.6017" N
94	10° 01' 23.2071" W	52° 52' 38.9458" N	113	13° 47' 08.4353" W	48° 48' 44.1665" N
95	10° 18' 49.5627" W	52° 54' 21.3250" N	114	13° 40' 53.1282" W	48° 42' 17.1260" N
96	10° 30' 04.1943" W	52° 54' 01.5252" N	115	13° 27' 02.4693" W	48° 35' 26.8473" N
97	10° 59' 47.1668" W	52° 50' 14.2294" N	116	13° 23' 52.6522" W	48° 31' 34.0455" N
98	11° 14' 08.8948" W	52° 40' 24.3831" N	117	13° 15' 40.6602" W	48° 35' 05.9241" N
99	11° 32' 18.7977" W	52° 30' 46.5738" N			

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 250 – 12,000m wide cable corridor within the License Application Area;
- To obtain information on the seabed surface (type, texture, variability, etc.) and in particular, to identify any seabed features that may be of interest.
- Identify any shallow geohazards and man-made hazards (including but not limited to outcropping, boulders, shallow gas, wrecks, debris etc.);
- Determine the stratigraphy of the upper layers of the seabed along the cable route and quantify the variability in the lateral and vertical extents to depths of 2-5m.
- Identify any magnetic anomalies;
- Identify sensitive marine habitats which will need to be avoided during site investigations and sampling.

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

- Landfall Survey – Intertidal Zone
- Inshore Survey – from 3m Chart Datum to 15m Chart Datum

- Offshore Survey – Water depths greater than 15m Chart Datum

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

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

Landfall Survey & Site Investigations

The landfall survey and site investigations will be limited as the PISCES cable will be installed at the landfall by sharing existing infrastructure (a duct installed by horizontal directional drilling for the IRIS system installation in 2022) to cross the shoreline at Ballyloughane.

A non-intrusive topographic survey along the line of the cable route at the landfall is required to the low water mark. Intertidal and beach surveys (walkover survey) will be carried out on the beach by the project ecologist and the project archaeologist.

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

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

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

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

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

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

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

The proposed intertidal works will be carried out during late Spring / Summer (April-September) 2024.

Inshore Marine Survey

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

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

Table 2: Inshore Survey

Survey Area	Depth Range	Survey Corridor Width	Min. # of Lines	Min. Overlap	Typical Survey Speed
Inshore	0m to 15m	250m	7	SSS: 100% MBES Bathy: 20%	4 knots

Offshore Marine Survey

The area extending seaward from the outer limits of the inshore survey up to a water depth of 1,500m will be surveyed by the primary survey vessel using Multibeam Echosounder (MBES), sidescan sonar, marine magnetometer and sub-bottom profiler equipment. A continuous bathymetric swathe along with side scan sonar imagery and sub-bottom traces will be obtained, centred on the preliminary route and along all wing lines needed to complete the route corridor coverage. A minimum of seven survey lines, based upon the Survey RPL, is required.

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

Table 3: Offshore Survey

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	1,000m	7	SSS: 100% MBES Bathy: 20%	4 knots

Deep Water Marine 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 3 times the water depth. This is illustrated in Figure 12 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. The survey corridor width will therefore extend up to a maximum of approximately 12,000m at the Maritime Area extents.

Table 4: Deep Water Survey

Survey Area	Depth Range	Survey Corridor Width	Min. # of Lines	Min. Overlap	Typical Survey Speed
Offshore	> 1,500m	3 x WD Max. approx. 12,000m	1	NA	4 knots

Marine Site Investigations and Seabed Sampling

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

Site investigations and seabed sampling will only be undertaken up to a limit of 1,500m water depth and the scheduled site investigations and seabed sampling within Maritime Area limits will comprise of the following techniques:

- Up to 85 CPTs (2m to 3m deep at approximately 4km spacing along the route to a limit of 1,500m water depth)
- Up to 35 Gravity Cores / Vibrocores (3m deep at approximately 4km spacing along the route to a limit of 1,500m water depth)
- Up to 11 Grab Samples (at approximately 1km spacing up to 15m water depth)

Indicative locations for the relevant site investigation activities (Gravity or Vibrocore and CPT's) are shown in Figures 8-11. 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 3m target depth or refusal. Any push resulting in less than 3m penetration will warrant a second attempt.

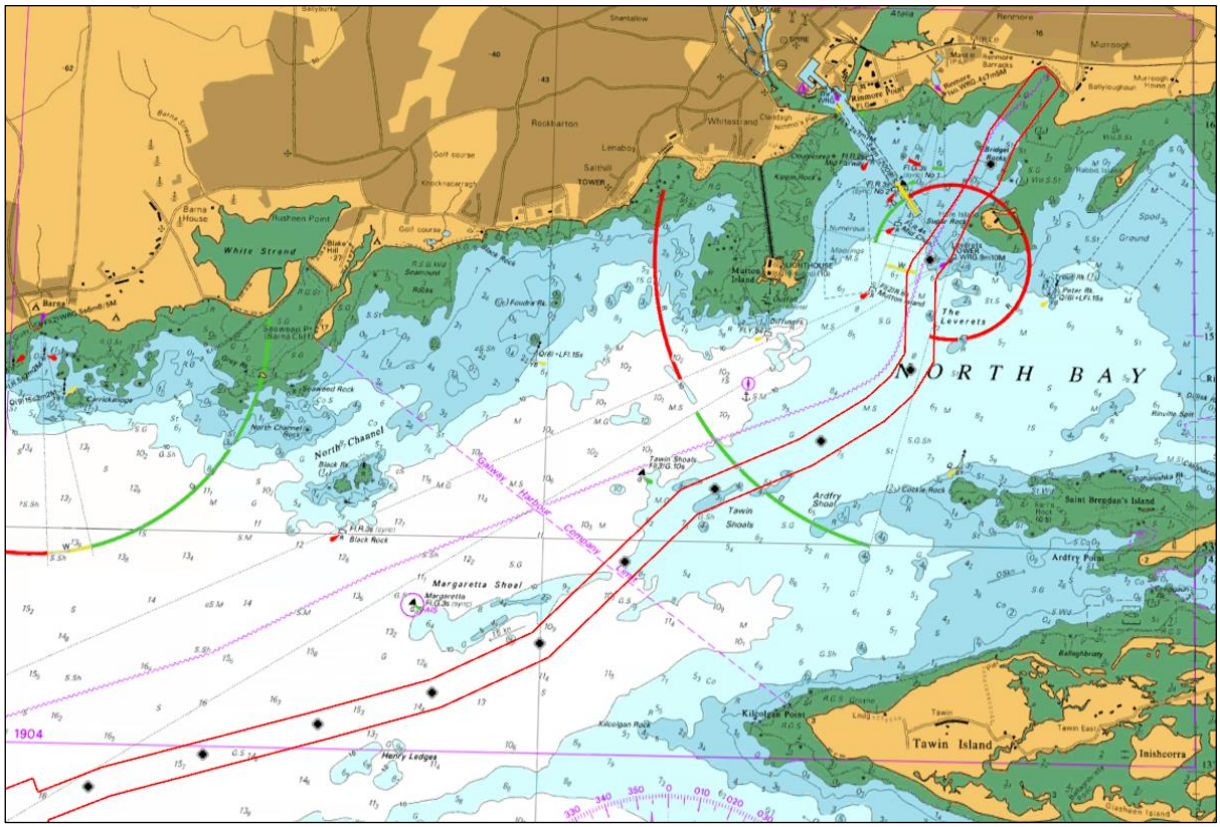

Figure 8: Indicative Grab Sample Locations (11no. to 15m water depth)

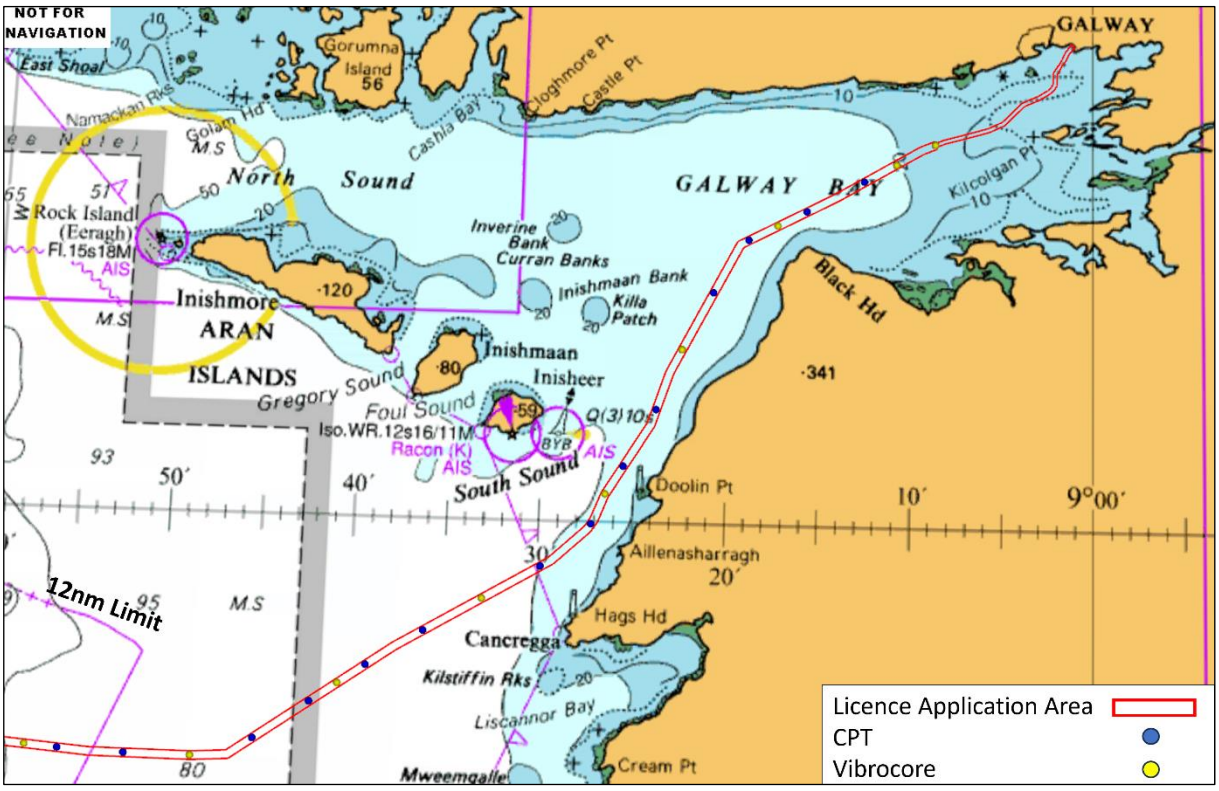

Figure 9: Indicative CPT and Vibrocore Locations (1 of 3)

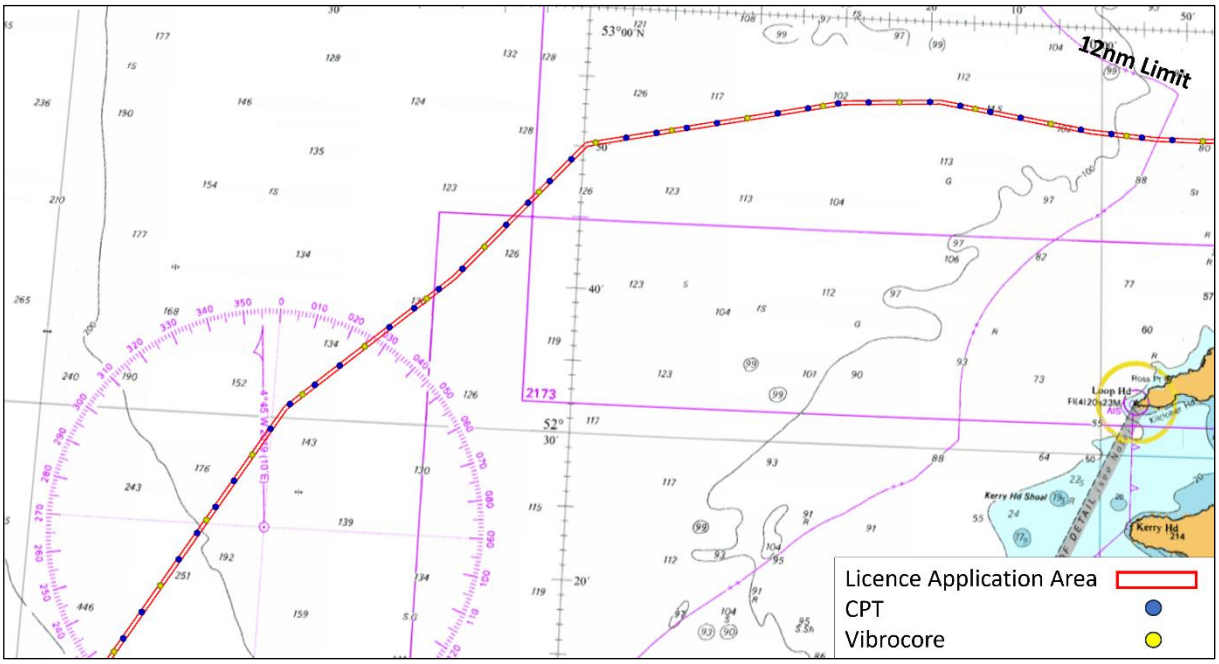

Figure 10: Indicative CPT and Vibrocore Locations continued (2 of 3)

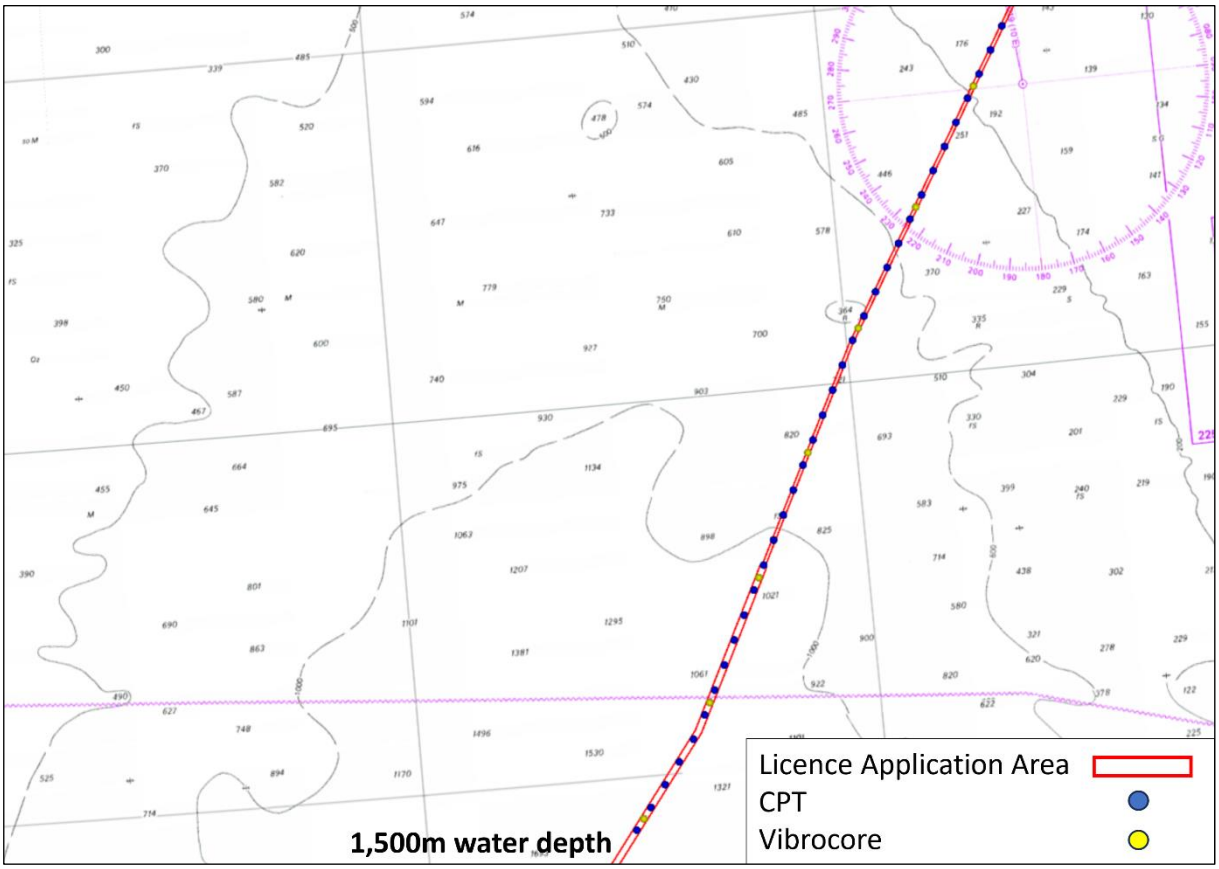

Figure 11: Indicative CPT and Vibrocore Locations continued (3 of 3)

Seabed Sampling

The total overall scope of the Site Investigations is as follows

- Bar Probes 10 No. on the intertidal
- Trial Pits 3 No. on the beach
- Bar Probes 10 No. from Low Water to 3m contour.
- Grab Samples 11 No. along the route corridor.
- Gravity Cores / Vibrocores 35 No. along the route corridor.
- Cone Penetration Tests 85 No. along the route corridor.

Underwater Video Survey

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

Archeological Survey

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

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

SURVEY EQUIPMENT PARAMETERS

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 12). 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 that 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 typical systems which can be taken as examples would be the Kongsberg EM304 or Teledyne Seabat 7150 which would be hull mounted on the survey vessel.

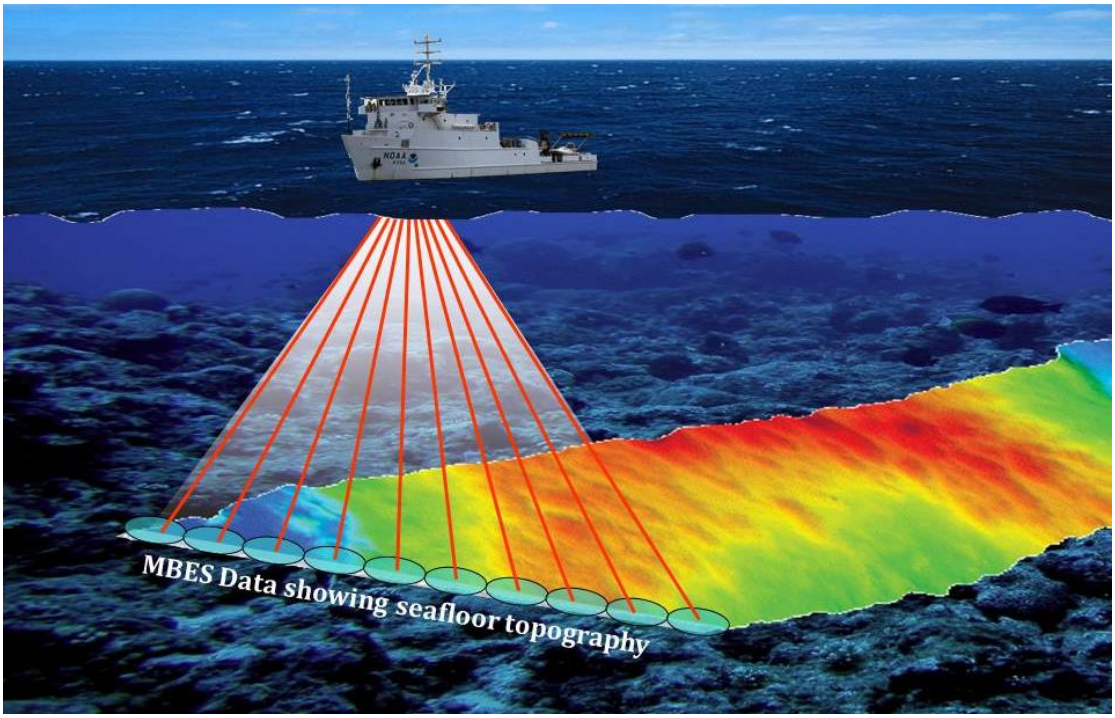

Figure 12: Graphic of MBES Survey in Operation

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 200m using multi-beam echosounders operating at between 200 and 500 kHz The typical operating frequencies for the cable route survey within the licence application area will be in the range of 12kHz to 500kHz. (Danson 2005, Hopkins 2007, Lurton and DeReutier 2011).

Maximum sound source pressure levels of MBES have been reported as ranging from 210-245 dB re 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 1µPa2 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 13).

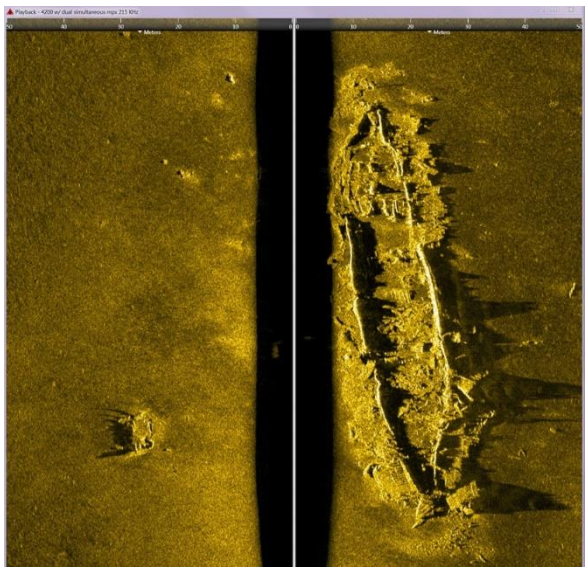

Figure 13: SSS Image of Shipwreck on Seabed and Nadir Gap

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

Figure 14: 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 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 13).

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 1µPa2 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 11). 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 14: 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 15). 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.

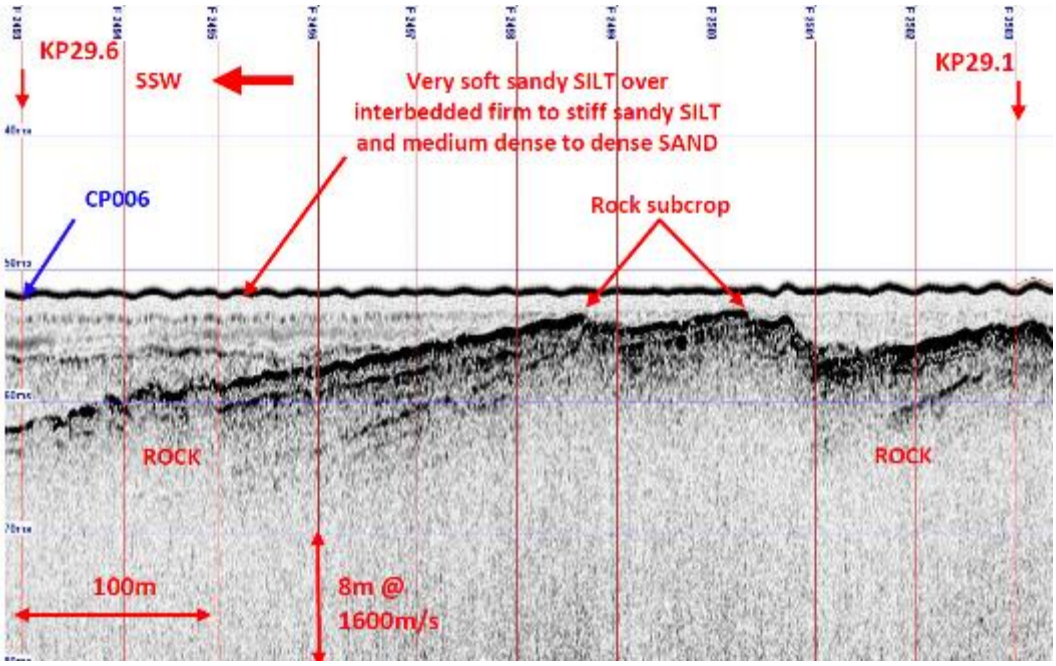

Figure 15: Interpreted SBP Seabed Profile

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 136) 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 16: Edgetech SB-424 Tow Body

Table 4: Typical SBP Specifications

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

Ultra-Short Baseline (USBL) Subsea Positioning

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

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

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

Cone Penetration Test (CPT)

The survey vessel will position itself over the target position to carry out the CPT. The seabed CPT rig (such as a Neptune 3000, Figure 14) is deployed to the seabed from the vessel crane, A-frame or dedicated Launch and Recovery System (LARS). Once on the seabed, in a stable position, a steel rod with a conical tip (typically an apex angle of 60° and a diameter of 35.7 mm) is pushed at a steady rate into the seabed until it reaches target penetration depth of 3 to 6m or refusal. The penetration resistance at the tip and along a section of the shaft (friction sleeve) is measured and recorded for later analysis.

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

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

Figure 17: Neptune 3000 CPT Rig

Gravity Core

Gravity corers (Figure 15) 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.

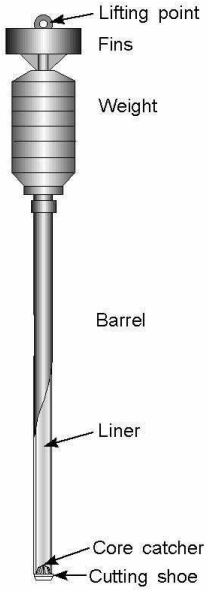

Figure 18: Gravity Corer Schematic

Vibrocorer

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

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

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

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

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

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

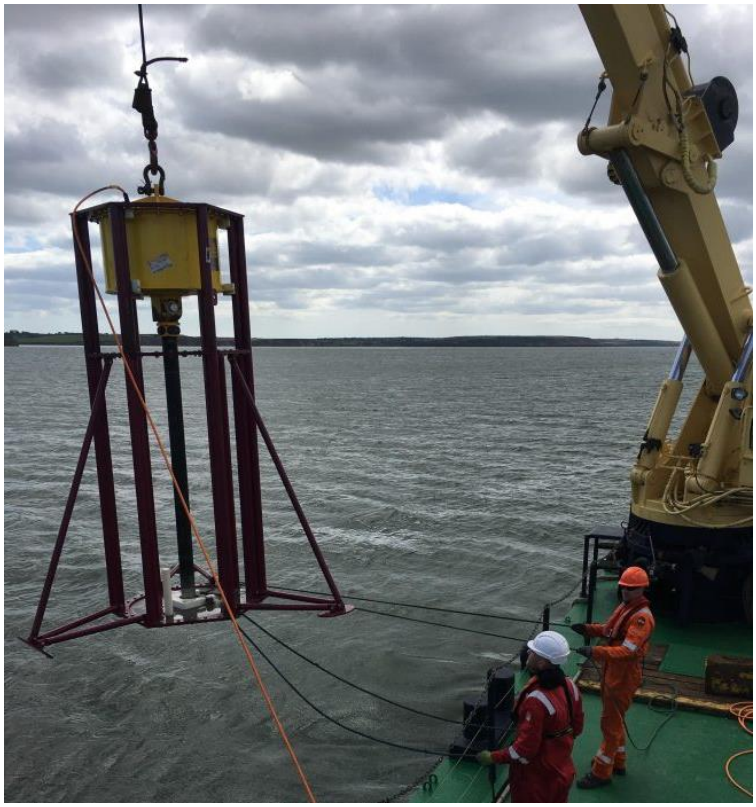

Figure 19: Deployment of Vibrocorer from Survey Vessel

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 17), 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 20: Single and Double Van Veen Grab

4.2.3 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 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 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.

4.2.4 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 6 and 7 below. It can be noted that as the focus of the cable route surveys within the licence application area is the seabed surface and upper layers of seabed sediments and generally obtaining higher resolution data, the geophysical equipment such as MBES and SSS is generally operated more towards the higher end of the frequency range where possible.

4.2.5 Timeline and Duration of Survey Activities

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

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

Table 5. Marine Survey Activities.

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

Table 6. Marine Site Investigation Activities.

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.	85	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	35	N/A	N/A	N/A
Vibrocorer	Retrieve a seabed sediment sample by penetrating seabed with a vibrating steel core barrel	35	30 Hz	187.4 dB.	LGL 2010
Grab Samples	Collect small sediment samples from seabed surface with clamshell mechanism	11	N/A	N/A	N/A

Table 7. Estimated Time and Duration of Survey Activities

Activity	Typical Time Period Required for Activity	Total Number of SI Locations	Total Time for SI	Foot Print Affected per SI	Foot Print Affected per SI (km^2)	Total Foot Print (km^2)	Area Directly Affected as % of Licence Application Area
Inshore Geophysical Survey (to 15m WD)	2 to 3 days (weather and sea state dependent)	250 m cable route corridor	2 to 3 days (weather and sea state dependent)	N/A	N/A	2.8 km^2	0.08%
Offshore Geophysical Survey (100m – 1,500m WD)	35 to 40 days (weather and sea state dependent)	500 - 1000 m cable route corridor	35 to 40 days (weather and sea state dependent)	N/A	N/A	218.6 km^2	6.06%
Deep Water Geophysical Survey (>1,500m WD)	5 to 10 days (weather and sea state dependent)	4,500 – 12,000 m cable route corridor	5 to 10 days (weather and sea state dependent)	N/A	N/A	3,386.1 km^2	93.88%
CPT	30 minutes - 2 hours in any one location	85	170 hours within total 50 days of Site Investigations campaign (weather and sea state dependent)	8m^2	0.0000008 km^2	0.00068 km^2	0.0000002%
Gravity Corer	30 minutes - 2 hours in any one location	35	70 hours within total 50 days of Site Investigations campaign (weather and sea state dependent)	1m^2	0.0000001 km^2	0.000035 km^2	0.00000001%
Vibro Corer	30 minutes - 2 hours in any one location	35	70 hours within total 50 days of Site Investigations campaign (weather and sea state dependent)	8m^2	0.0000008 km^2	0.00028 km^2	0.00000008%
Grab Samples	20 minutes - 45 minutes in any one location	11	8 hours within total 50 days of Site Investigations campaign (weather and sea state dependent)	0.5m^2	0.00000005 km^2	0.0000175 km^2	0.000000005%

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), it is considered that the potential impacts of the proposed works could only extend beyond 500 m of the subtidal elements of the project due to noise generation and potential disturbance of sediment. However, as outlined in IEEM (2010) "*in the marine environment it is more difficult to define the geographical framework precisely and to accommodate all factors that should influence the definition of value, e.g. size or conservation status of populations or the quality of habitats*." As a result, "*it is very unlikely that the impacts on integrity can be evaluated without considering functions and processes acting outside the site's formal boundary*." It is important to note that unlike other maritime operations, the research vessel speed will be very slow (4 knots). However, the project has the potential to introduce noise into the marine environment particularly through the use of Ultra-Short Baseline (USBL), Multibeam Echosounder (MBES), and Side-scan Sonar (SSS) equipment, which may extend the effects of the project beyond 2km. 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 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 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), 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, a portion of the proposed survey works will be located within the Galway Bay Complex SAC and Inner Galway Bay SPA.

Given that the proposed survey route is located within the Galway Bay Complex SAC and Inner Galway Bay SPA, out of an abundance of caution, in the absence of mitigation, it is considered that during the survey works there is the potential for significant effects on the qualifying interests of these European Sites through pollution and physical impact on habitats and species. Further information is required to assess the potential effects of the proposed works on European Sites.

In relation to marine mammals, given that the proposed survey route is located within Galway Bay Complex SAC, there is potential for marine mammals from Galway Bay Complex SAC (Harbour seal (*Phoca vitulina*)) 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):

- Slaney River Valley SAC (IE)
- Saltee Islands SAC (IE)
- Roaring Water Bay and Islands SAC (IE)
- Blasket Islands SAC (IE)
- Kilkieran Bay And Islands SAC (IE)
- Lower River Shannon SAC (IE)
- Slyne Head Peninsula SAC (IE)
- West Connacht Coast SAC (IE)
- Slyne Head Islands SAC (IE)
- Clew Bay Complex SAC (IE)
- Slyne Head Islands SAC (IE)
- Inishbofin and Inishshark SAC (IE)
- Killala Bay/Moy Estuary SAC (IE)
- Ballysadare Bay SAC (IE)
- Kenmare River SAC (IE)
- Cummeen Strand/Drumcliffe Bay (Sligo Bay) SAC (IE)
- Duvillaun Islands SAC (IE)
- Inishkea Islands SAC (IE)
- Glengarriff Harbour and Woodland SAC (IE)
- Slieve Tooey/Tormore Island/Loughbros Beg Bay SAC (IE)
- Donegal Bay (Murvagh) SAC (IE)
- West of Adara/Maas Road SAC (IE)
- Rutland Island and Sound SAC (IE)
- Rockabill to Dalkey Islands SAC (IE)
- Lambay Island SAC (IE)
- Horn Head and Rinclevan SAC (IE)
- North Anglesey Marine/Gogledd Môn Forol (UK)
- West Wales Marine / Gorllewin Cymru Forol (UK)
- Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau (UK)
- Murlough (UK)
- North Channel (UK)

- Strangford Lough (UK)
- Cardigan Bay / Bae Ceredigion (UK)
- Pembrokeshire Marine / Sir Benfro Forol (UK)
- The Maidens SAC (UK)
- Bristol Channel Approaches/Dynesfeydd Môr Hafren (UK)
- Treshnish Isles (UK)
- Lundy (UK)
- Isles of Scilly Complex (UK)
- Nord Bretagne DH (FR)
- Récifs et landes de la Hague (FR)
- Anse de Vauville (FR)
- Mers Celtiques – Talus du golfe de Gascogne (FR)
- Banc et récifs de Surtainville (FR)
- Côte de Granit rose-Sept-Iles (FR)
- Trégor – Goëlo (FR)
- Baie de Morlaix (FR)
- Abers – Côtes des legends (FR)
- Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay (FR)
- Cap d'Erquy-Cap Fréhel (FR)
- Ouessant-Molène (FR)
- Chausey (FR)
- Baie de Saint-Brieuc – Est (FR)
- Côtes de Crozon (FR)
- Baie du Mont Saint-Michel (FR)
- Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard (FR)
- Estuairie de la Rance (FR)
- Chaussée de Sein (FR)
- Récifs du talus du golfe de Gascogne (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 landfall onto Ballyloughane Beach) is demonstrated in Figures 21-24. Waterbodies located proximate to the Survey Route Corridor is demonstrated in Figure 25. SPAs and SACs within / proximate to the proposed Survey Route Corridor are demonstrated in Figures 26 & 27. SACs and SPAs within 15 km of the proposed Survey Route Corridor are seen in Figures 28 & 29. 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 30. IE, FR, & UK SACs designated for Grey Seals (*Halichoerus grypus*) within 448km of the Proposed Survey Route Corridor are demonstrated in Figure 31. IE, FR, & UK SACs designated for Harbour Seals (*Phoca vitulina*) within 273km of the Proposed Survey Route Corridor are demonstrated in Figure 32. IE, FR, & UK SACs located within the Management Units (MU) for Bottlenose dolphin (*Tursiops truncatus*) and Harbour Porpoise (*Phocoena phocoena*) are demonstrated in Figures 33 & 34.

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

Code	NATURA 2000 Site	Distance
Special Areas of Conservation		
000268	Galway Bay Complex SAC	**Route passes through site**
000020	Black Head-Poulsallagh Complex SAC	1 km
000297	Lough Corrib SAC	1.9 km
001275	Inisheer Island SAC	5.5 km
000036	Inagh River Estuary SAC	7.8 km
001926	East Burren Complex SAC	8.3 km
000054	Moneen Mountain SAC	8.5 km
000996	Ballyvaughan Turlough SAC	8.8 km
000994	Ballyteige (Clare) SAC	9.1 km
002034	Connemara Bog Complex SAC	9.3 km
000606	Lough Fingall Complex SAC	10.7 km
000212	Inishman Island SAC	10.8 km
001021	Carrowmore Point to Spanish Point and Islands SAC	12.8 km
000213	Inishmore Island SAC	13.6 km
001285	Kiltiernan Turlough SAC	13.9 km
002111	Kilkieran Bay And Islands SAC	19.2 km
002165	Lower River Shannon SAC	24.4 km **(Within MU for Common Bottlenose Dolphin)**
002074	Slyne Head Peninsula SAC	57 km **(Within MU for Common Bottlenose Dolphin)**
002998	West Connacht Coast SAC	63.1 km **(Within MU for Common Bottlenose Dolphin)**
000328	Slyne Head Islands SAC	64.7 km **(Within MU for Common Bottlenose Dolphin)**
001482	Clew Bay Complex SAC	67.6 km
000328	Slyne Head Islands SAC	64.7 km
002172	Blasket Island SAC	67.7 km **(Within MU for Harbour Porpoise)**
000278	Inishbofin and Inishshark SAC	76.2 km
000458	Killala Bay/Moy Estuary SAC	94.2 km
000622	Ballysadare Bay SAC	108.1 km
002158	Kenmare River SAC	114.2 km
000627	Cummeen Strand/Drumcliffe Bay (Sligo Bay) SAC	114.7 km
000495	Duvillaun Islands SAC	116 km **(Within MU for Common Bottlenose Dolphin)**
000507	Inishkea Islands SAC	120.3 km
000090	Glengarriff Harbour and Woodland SAC	121.8 km
000101	Roaring Water Bay and Islands SAC	146.9 km **(Within MU for Harbour Porpoise)**
000190	Slieve Tooey/Tormore Island/Loughbros Beg Bay SAC	160.5 km
000133	Donegal Bay (Murvagh) SAC	157.4 km
000781	Slaney River Valley SAC	158.3 km

000197	West of Adara/Maas Road SAC	170.4 km
002283	Rutland Island and Sound SAC	187.5 km
003000	Rockabill to Dalkey Islands SAC	195.3 km **(Within MU for Harbour Porpoise)**
000707	Saltee Islands SAC	198.7 km
000204	Lambay Island SAC	199.8 km
000147	Horn Head and Rinclevan SAC	220.4 km
Special Protection Areas		
004031	Inner Galway Bay SPA	**Route passes through site**
004152	Inishmore SPA	3.2 km
004005	Cliffs of Moher SPA	4.1 km
004042	Lough Corrib SPA	5.1 km
004142	Cregganna Marsh SPA	5.9 km
004181	Connemara Bog Complex SPA	9.7 km

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

Designation	European Site	Distance
SAC	Murlough	227.6 km
SAC	North Anglesey Marine/Gogledd Môn Forol	245.7 km **(Within MU for Harbour Porpoise)**
SAC	Strangford Lough	251.3 km
SAC	North Channel	257.8 km **(Within MU for Harbour Porpoise)**
SAC	West Wales Marine / Gorllewin Cymru Forol	265.7 km **(Within MU for Harbour Porpoise)**
SAC	Pembrokeshire Marine / Sir Benfro Forol	274.8 km
SAC	The Maidens	277.5 km
SAC	Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau	284.2 km
SAC	Cardigan Bay / Bae Ceredigion	295.3 km
SAC	Bristol Channel Approaches/Dynesfeydd Môr Hafren	335.2 km **(Within MU for Harbour Porpoise)**
SAC	Lundy	372.2 km
SAC	Isles of Scilly Complex	391.5 km
SAC	Treshnish Isles	393 km

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

Code	Natura 2000 Site	Distance
Special Areas of Conservation		
Marine Mammals		
SAC	Mers Celtiques – Talus du golfe de Gascogne	251.6 km **(Within MU for Harbour Porpoise & Common Bottlenose Dolphin)**
SAC	Récifs du talus du golfe de Gascogne	305.2 km **(Within MU for Harbour Porpoise & Common Bottlenose Dolphin)**
SAC	Nord Bretagne DH	530.2 km **(Within MU for Harbour Porpoise)**
SAC	Ouessant-Molène	581.9 km **(Within MU for Harbour Porpoise)**
SAC	Abers – Côtes des légendes	587.7 km **(Within MU for Harbour Porpoise)**
SAC	Chaussée de Sein	589.4 km **(Within MU for Harbour Porpoise)**
SAC	Côte de Granit rose-Sept-Iles	594.8 km **(Within MU for Harbour Porpoise)**
SAC	Baie de Morlaix	603.1 km **(Within MU for Harbour Porpoise)**
SAC	Trégor – Goëlo	613 km **(Within MU for Harbour Porpoise)**
SAC	Côtes de Crozon	623.5 km **(Within MU for Harbour Porpoise)**
SAC	Récifs et landes de la Hague	623.9 km **(Within MU for Harbour Porpoise)**
SAC	Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay	627 km **(Within MU for Harbour Porpoise)**
SAC	Anse de Vauville	630.1 km **(Within MU for Harbour Porpoise)**
SAC	Banc et récifs de Surtainville	643.9 km **(Within MU for Harbour Porpoise)**
SAC	Cap d'Erquy-Cap Fréhel	670.4 km **(Within MU for Harbour Porpoise)**
SAC	Baie de Saint-Brieuc - Est	681.3 km **(Within MU for Harbour Porpoise)**
SAC	Chaucy	687.6 km **(Within MU for Harbour Porpoise)**
SAC	Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard	699.3 km **(Within MU for Harbour Porpoise)**
SAC	Estuairie de la Rance	714.6 km **(Within MU for Harbour Porpoise)**
SAC	Baie du Mont Saint-Michel	715 km **(Within MU for Harbour Porpoise)**

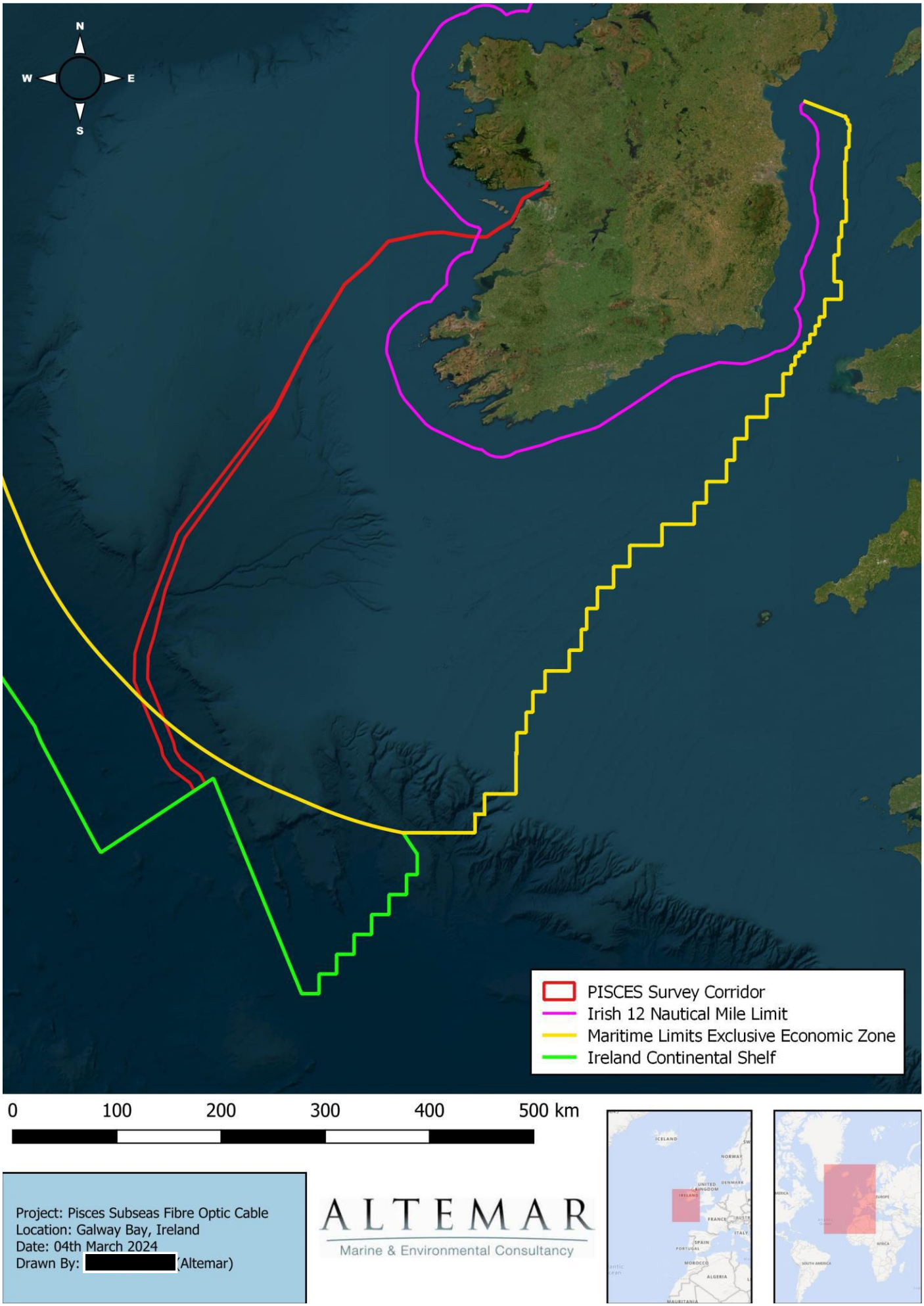

Figure 21: Proposed Survey Route Corridor (incl. 12nm limit, EEZ, & Irish Continental Shelf)

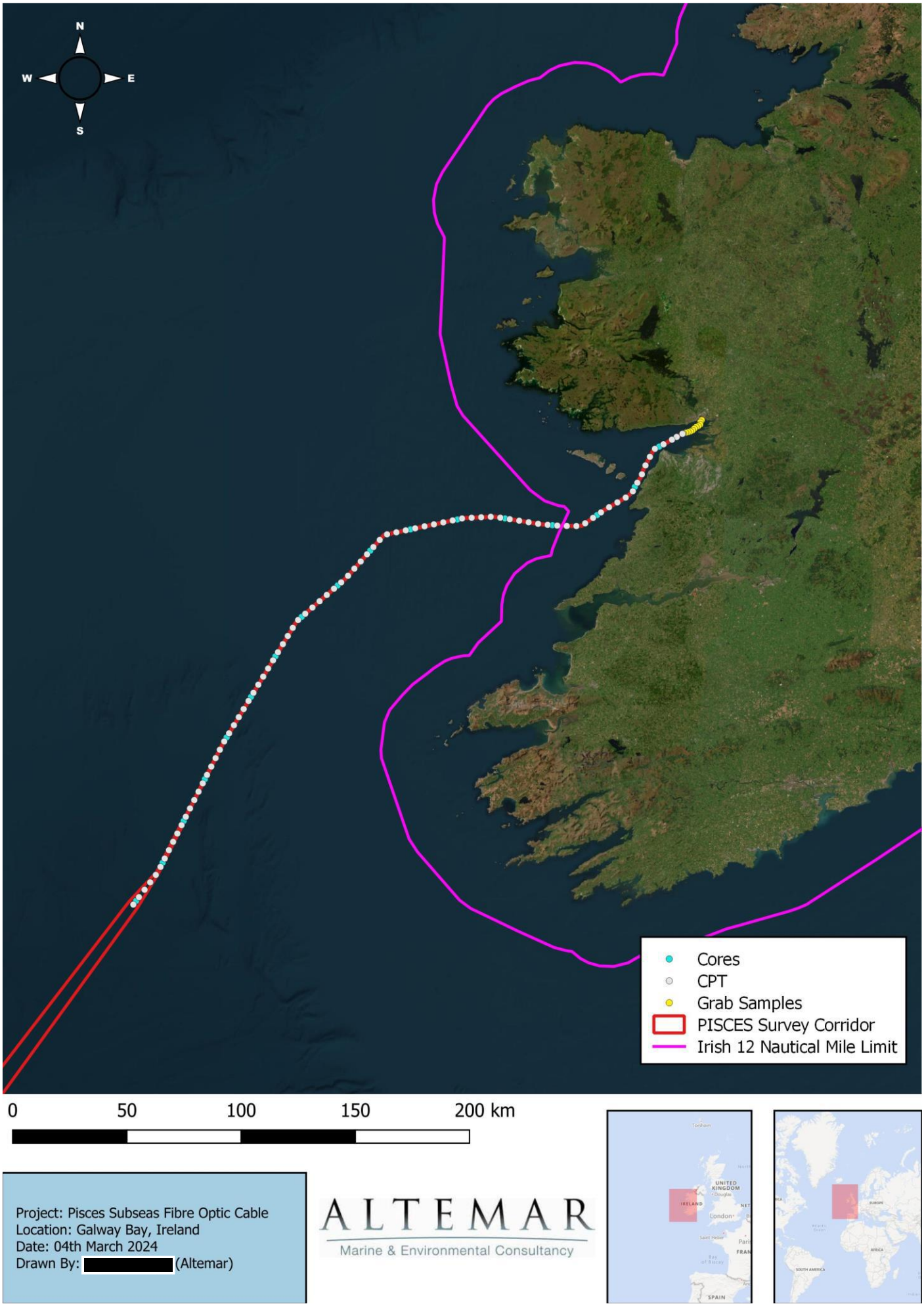

Figure 22: Proposed Survey Route Corridor and Works

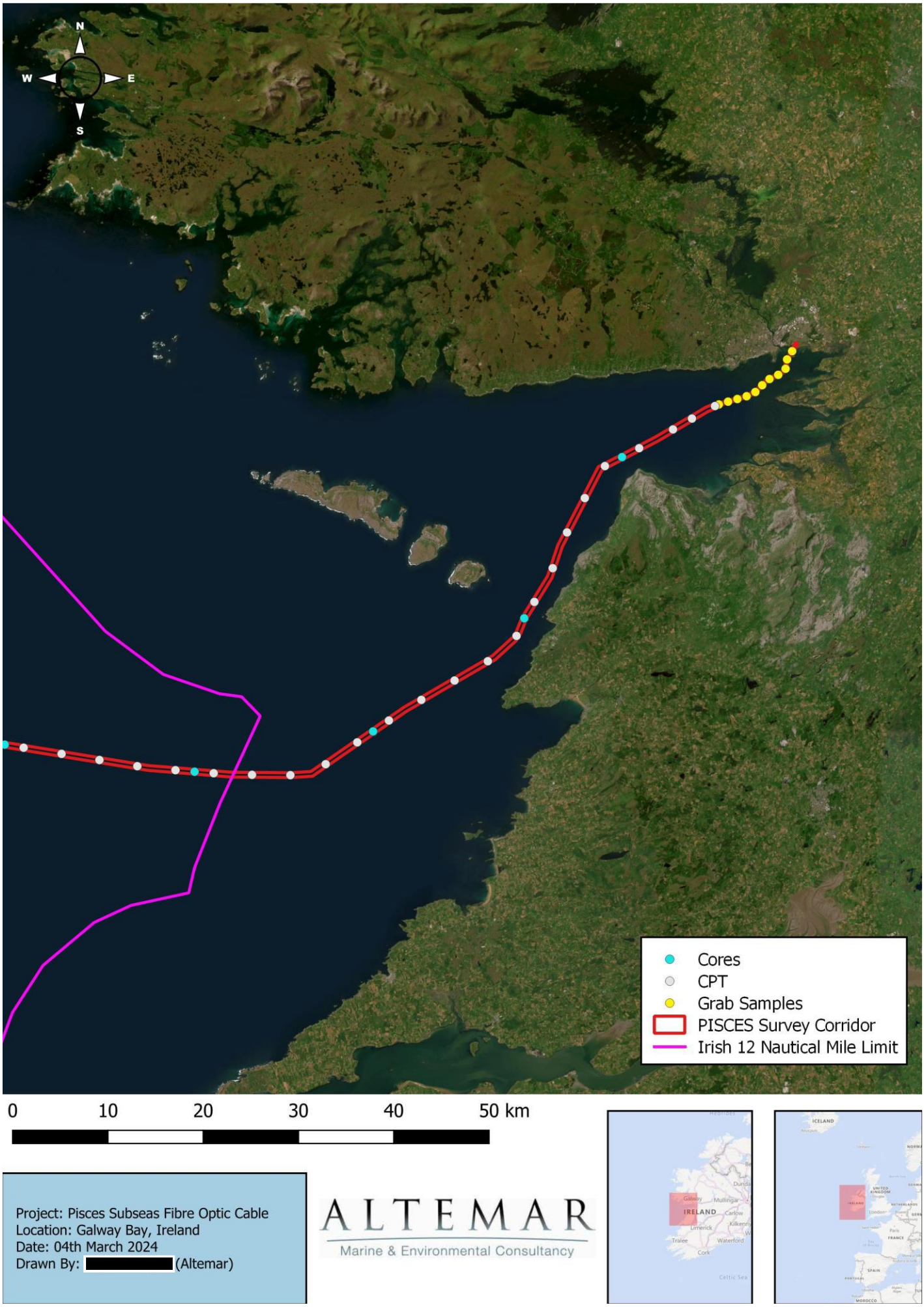

Figure 23: Proposed Survey Route Corridor and Works (to Irish 12 Nautical Mile Limit).

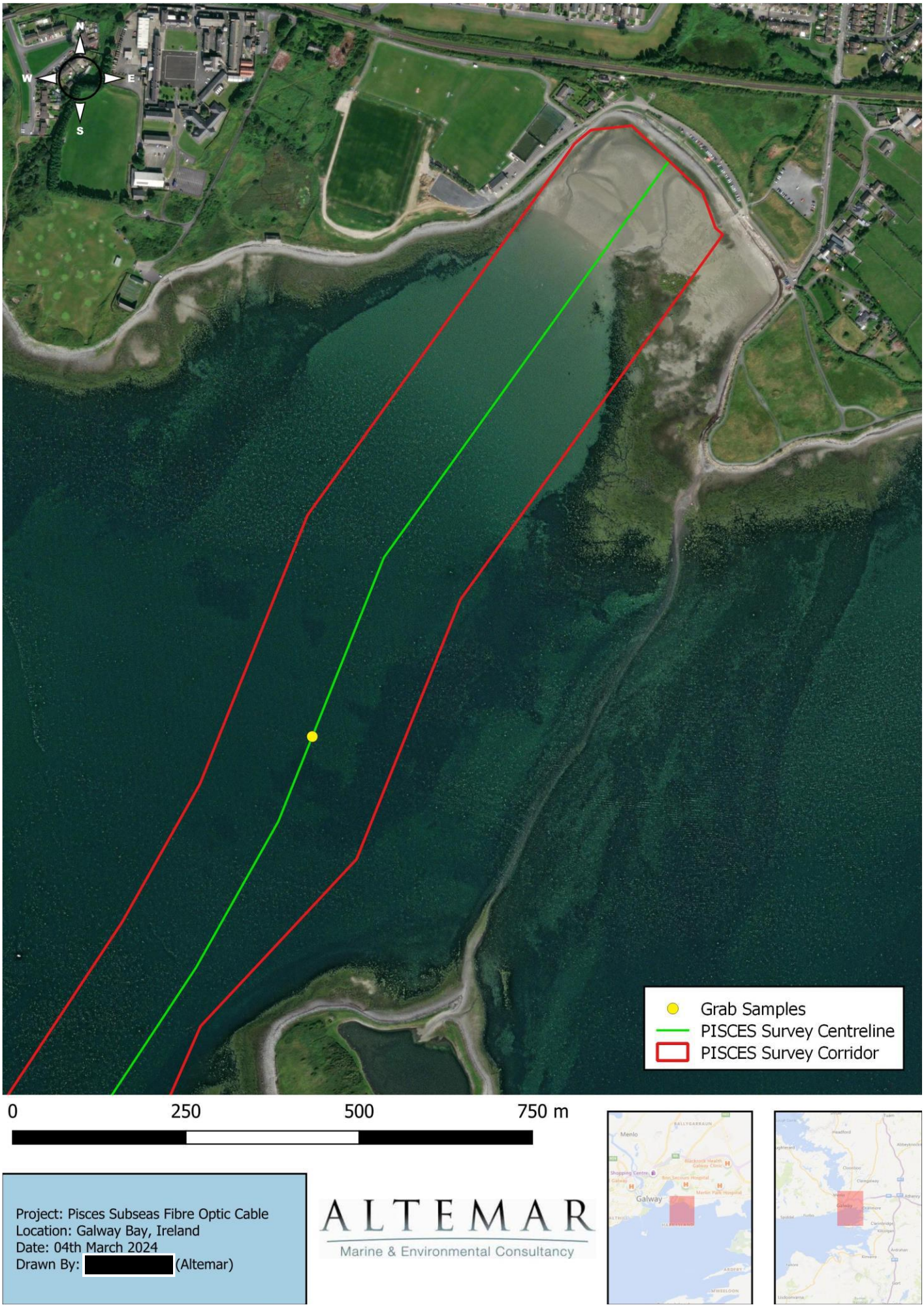

Figure 24. Proposed Survey Route Corridor within Ballyloughane Beach

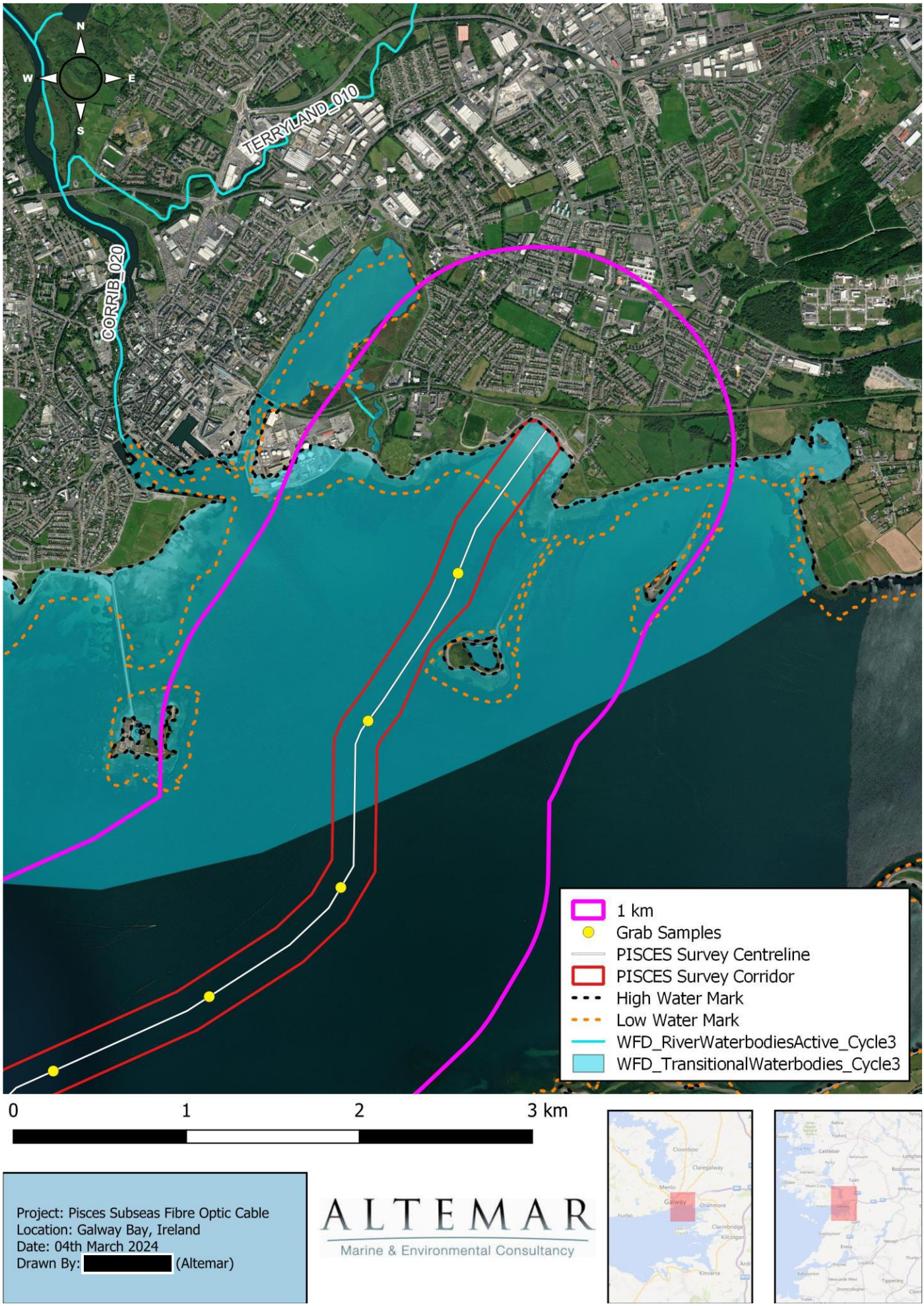

Figure 25. Waterbodies proximate to the proposed Survey Route Corridor.

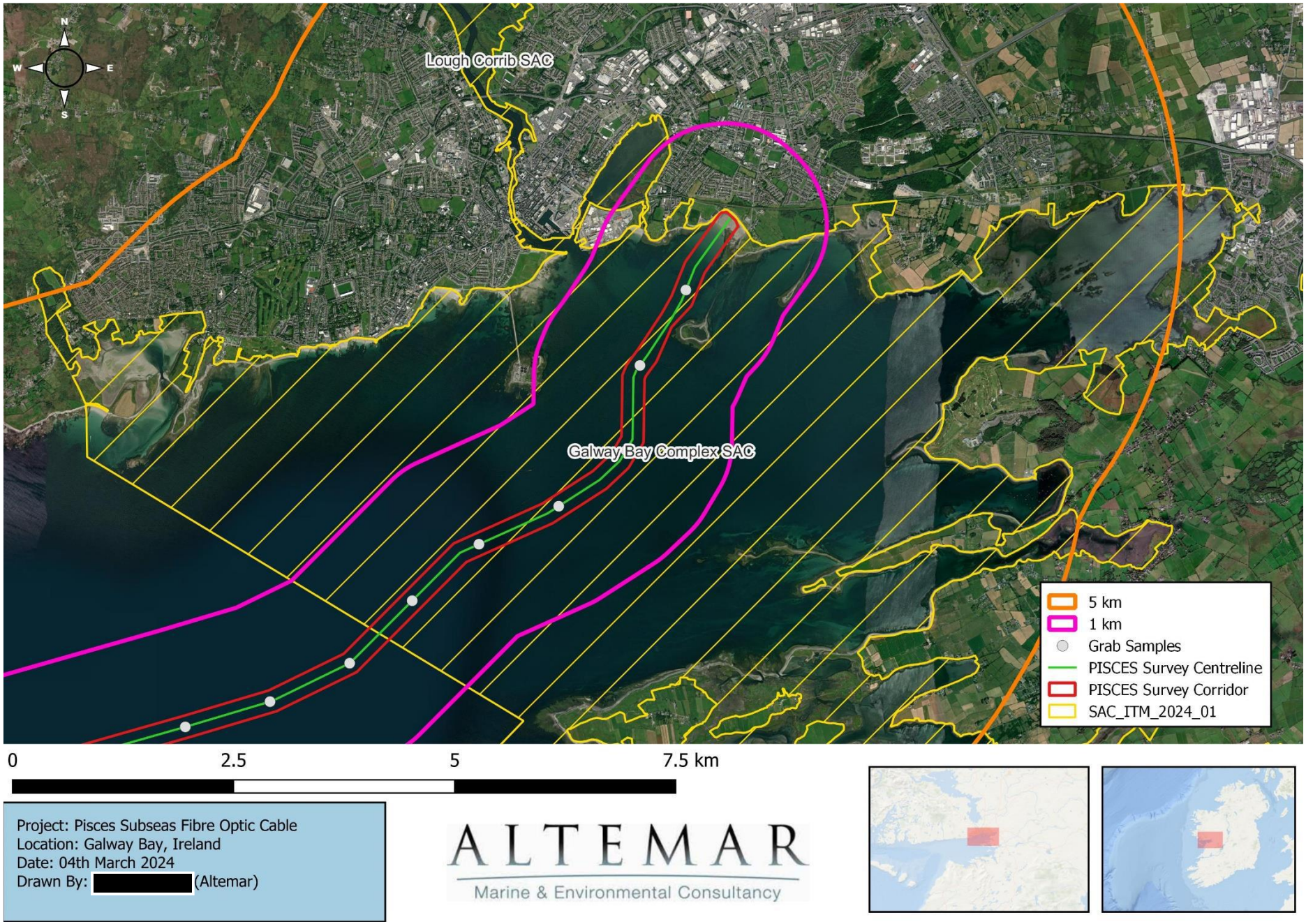

Figure 26: Special Areas of Conservation proximate to the proposed Survey Route Corridor and Works.

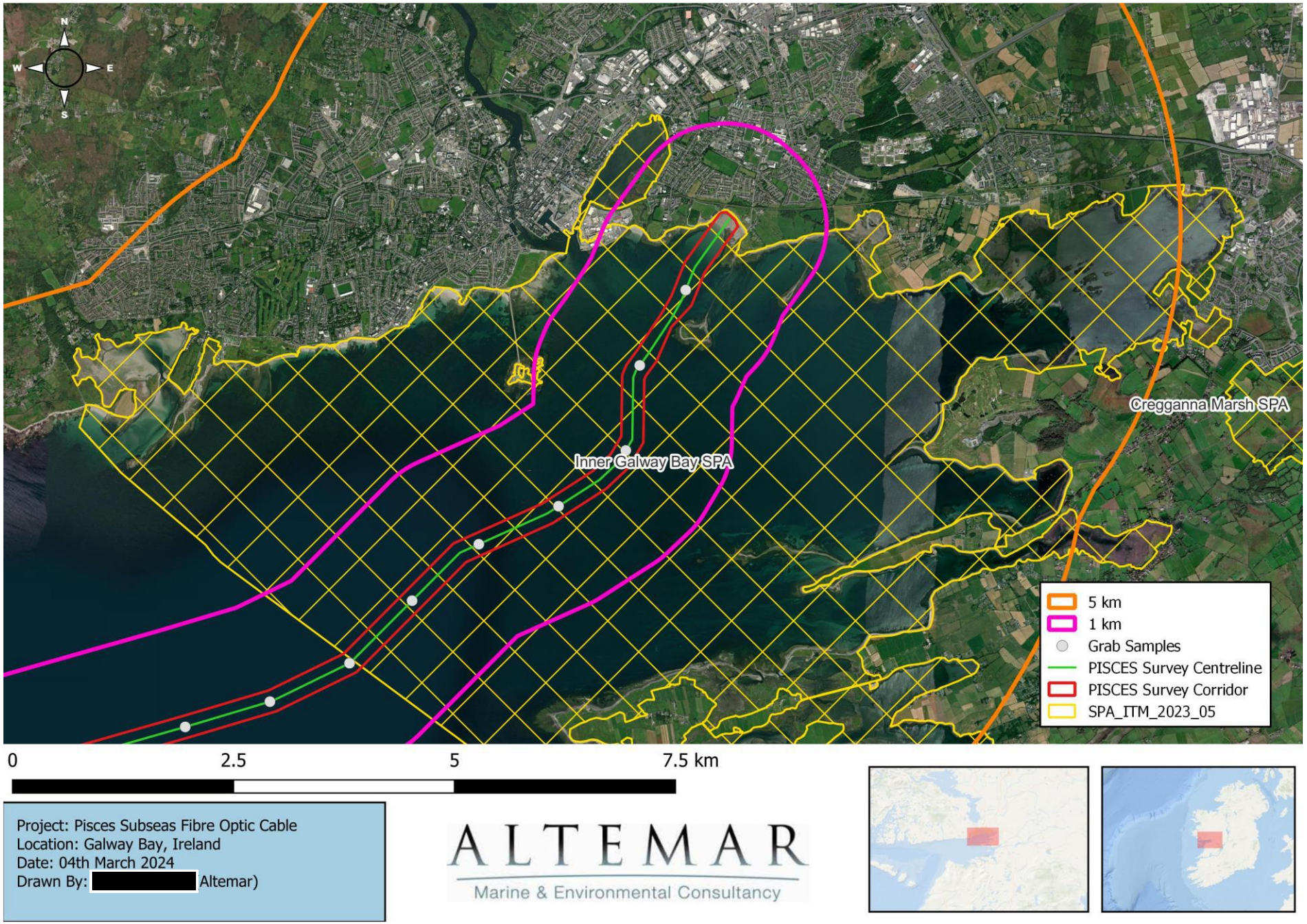

Figure 27: Special Protection Areas proximate to the proposed Survey Route Corridor and Works

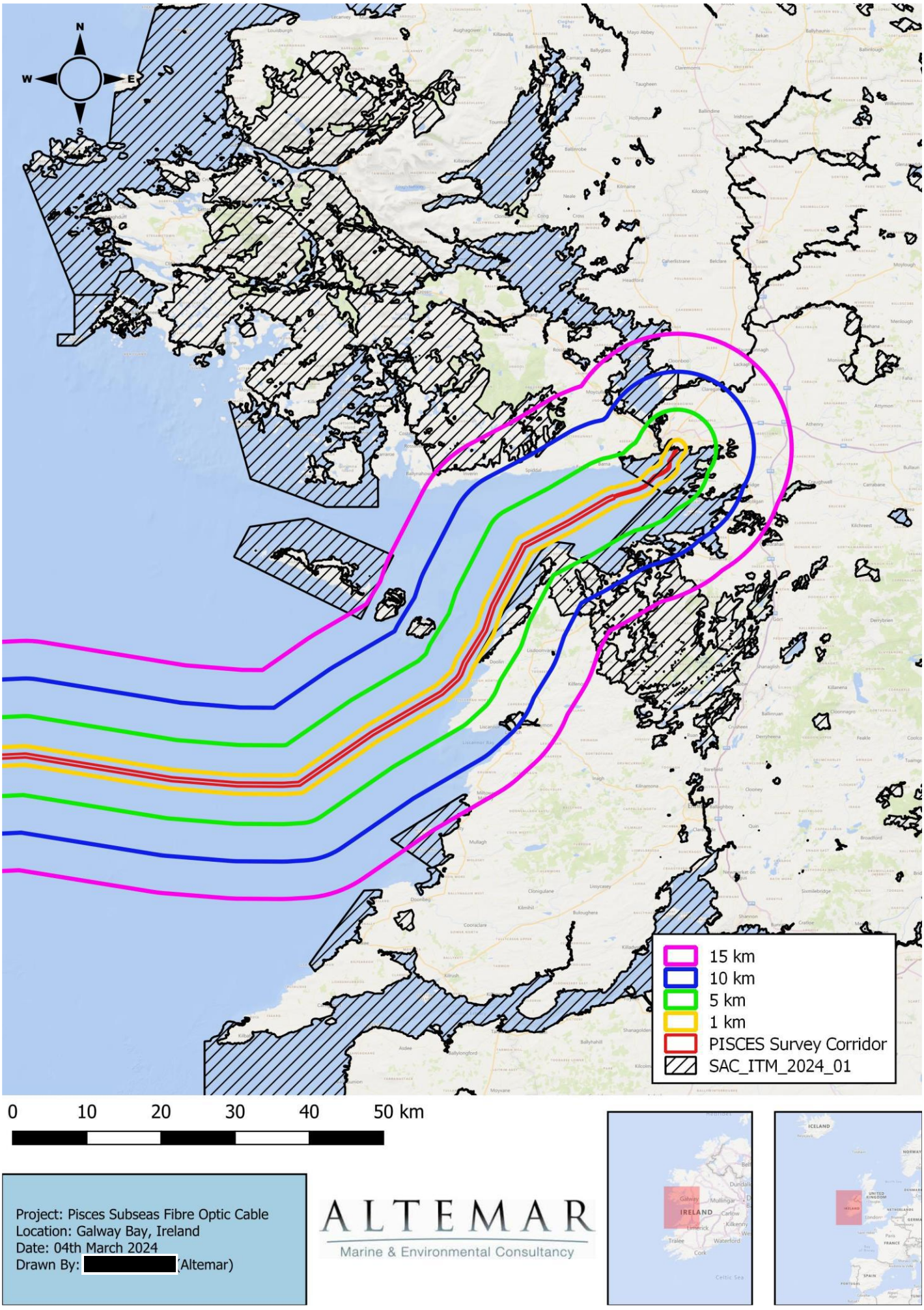

Figure 28: Special Areas of Conservation within 15 km of the proposed Survey Route Corridor.

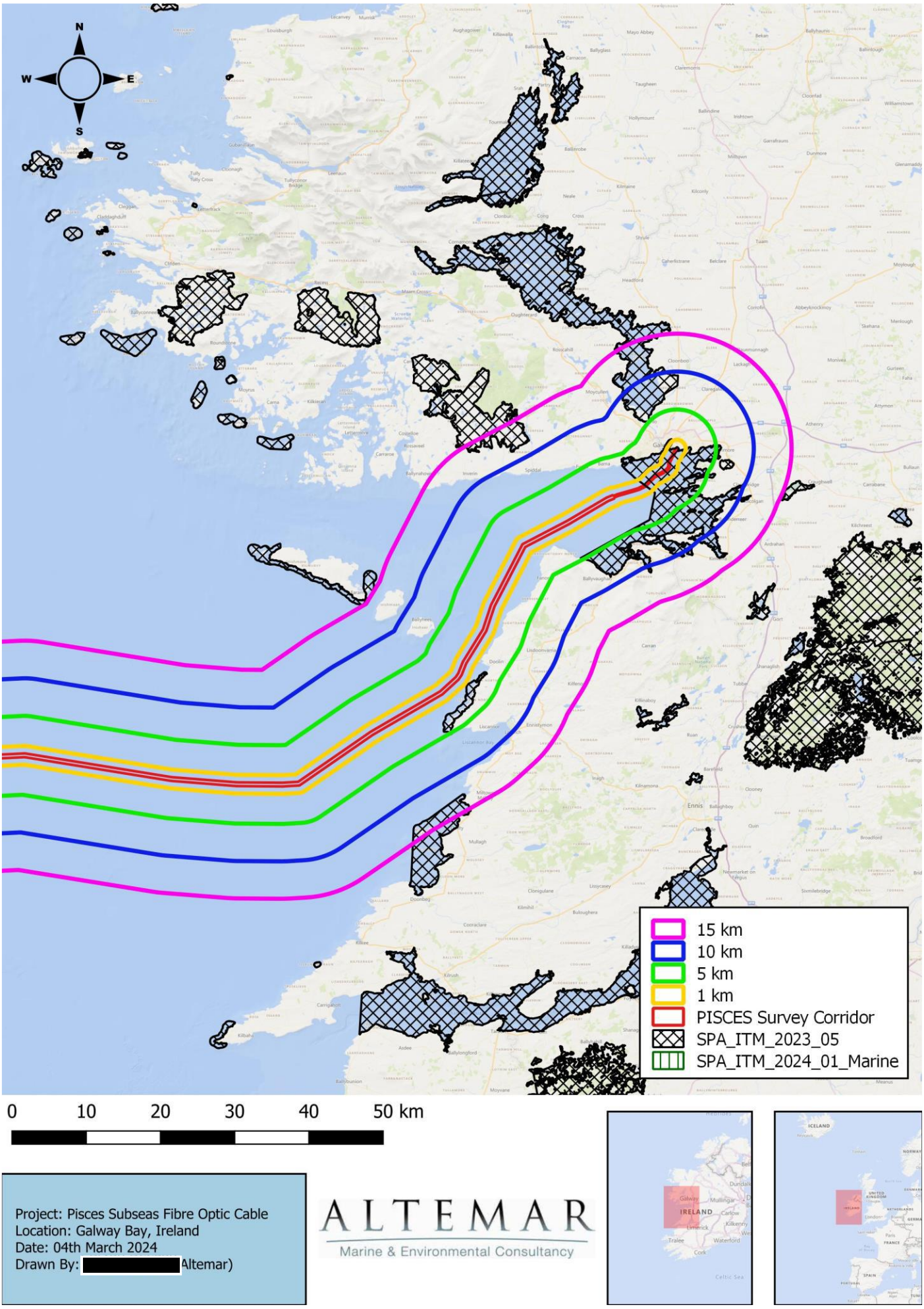

Figure 29: Special Protection Areas within 15 km of the proposed Survey Route Corridor.

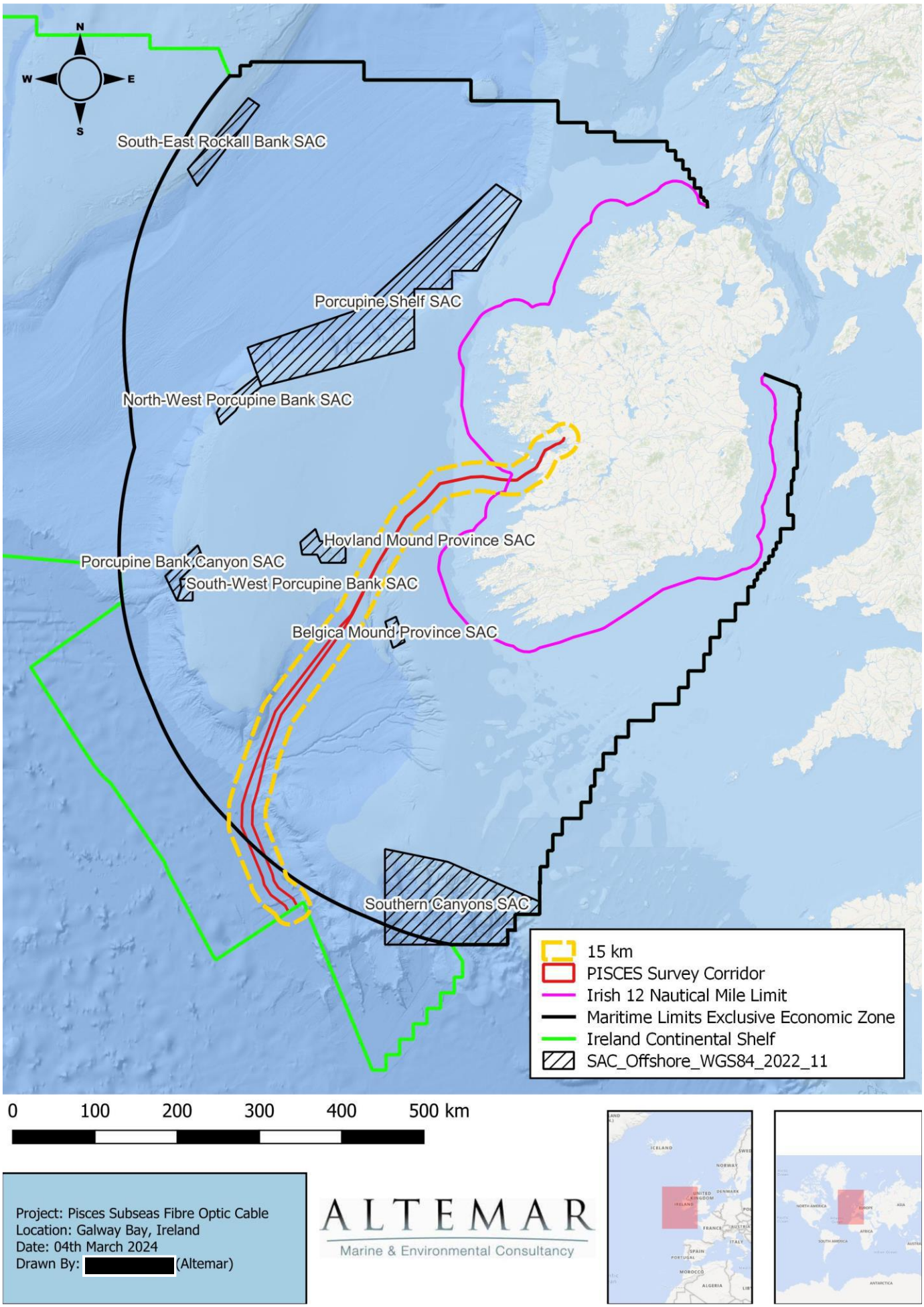

Figure 30: Fibre optic survey route in relation to the 12 nm limit, Designated Irish Continental shelf and Offshore SAC's (no offshore SAC's in the area).

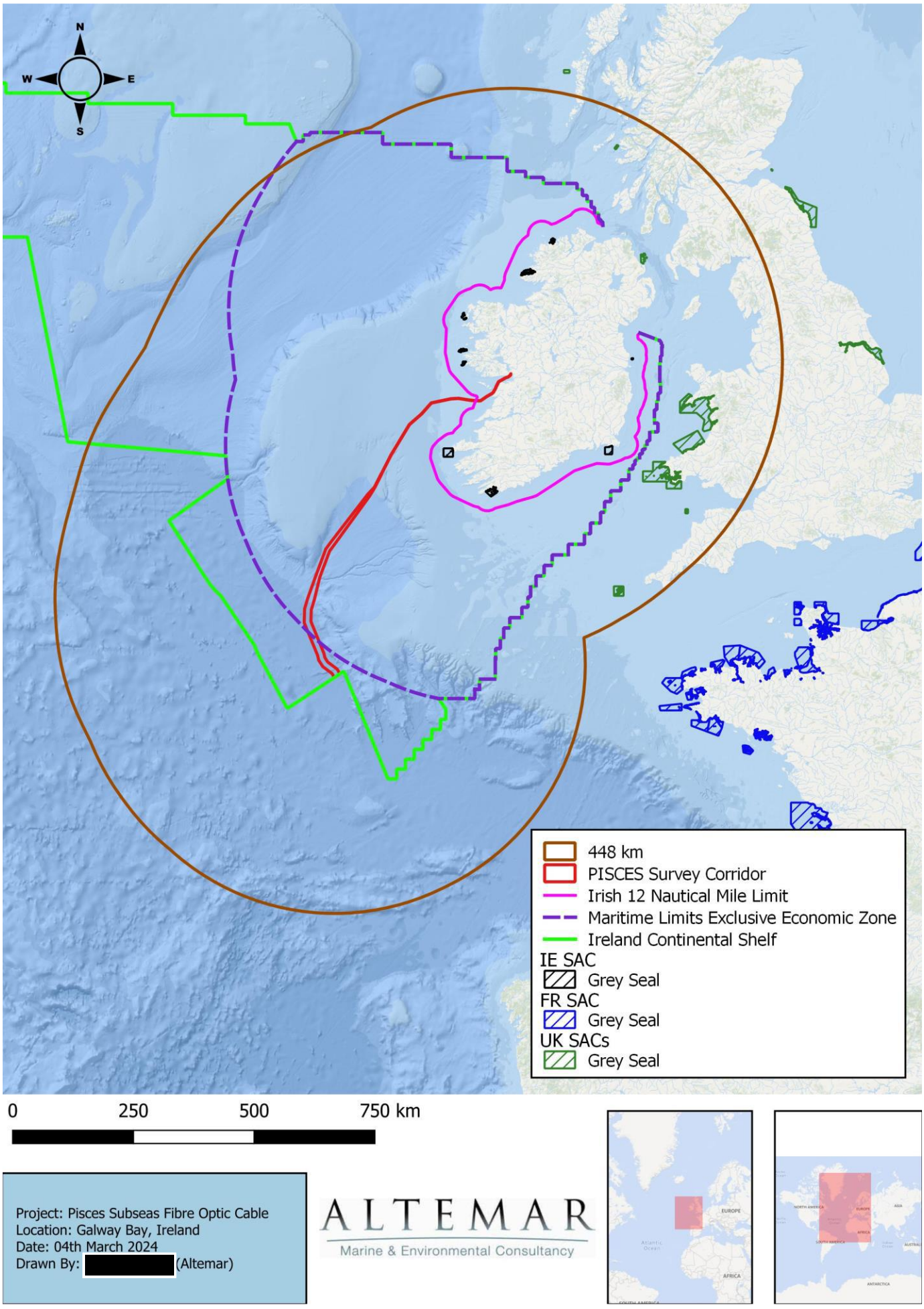

Figure 31: IE, FR, & UK SACs designated for Grey Seals (*Halichoerus grypus*) within 448km of the Proposed Survey Route Corridor.

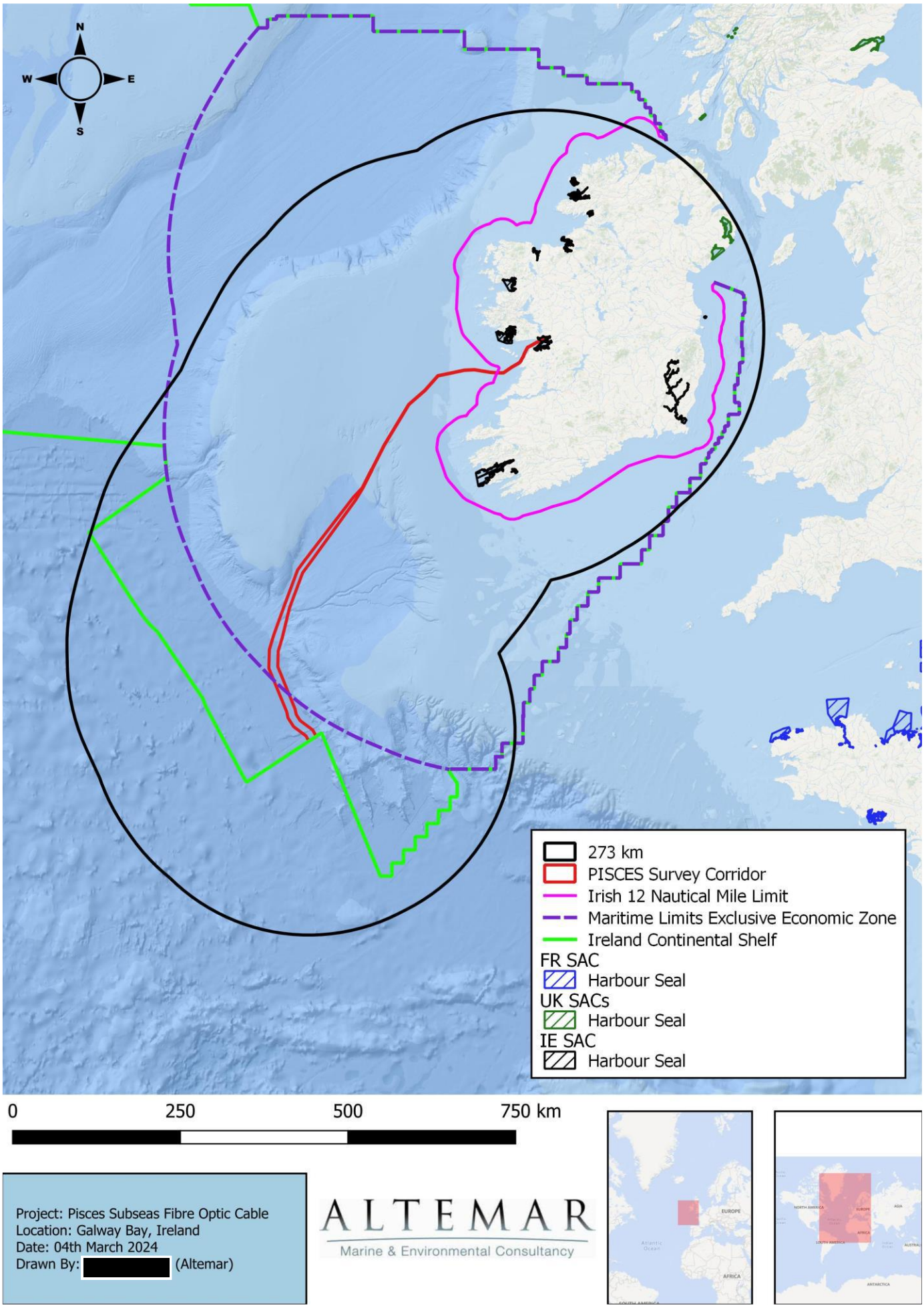

Figure 32: IE, FR, & UK SACs designated for Harbour Seals (*Phoca vitulina*) within 273km of the Proposed Survey Route Corridor

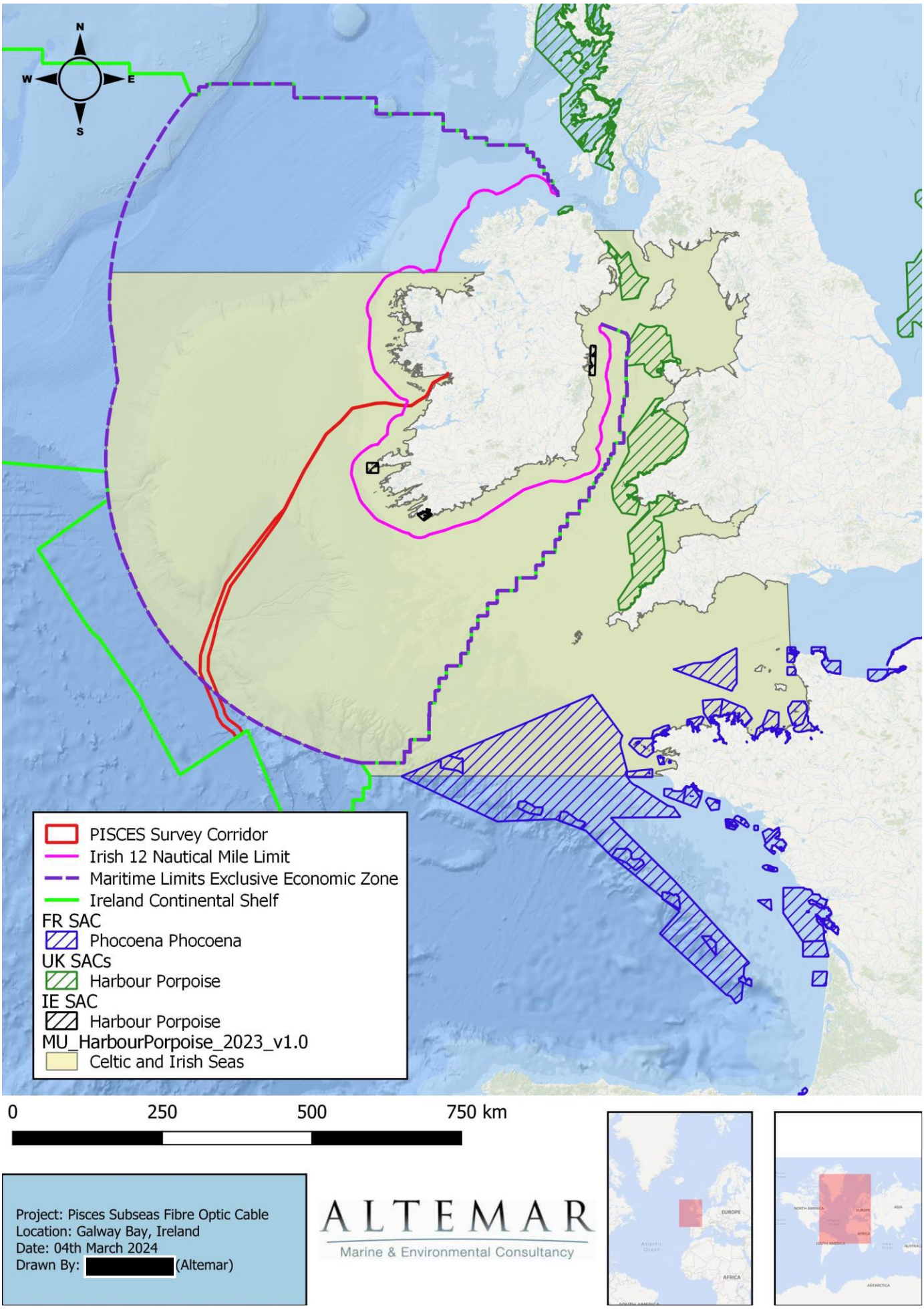

Figure 33: IE, FR, & UK SACs designated for Harbour Porpoise (*Phocoena phocoena*) within the Celtic and Irish Seas MU for Harbour Porpoise

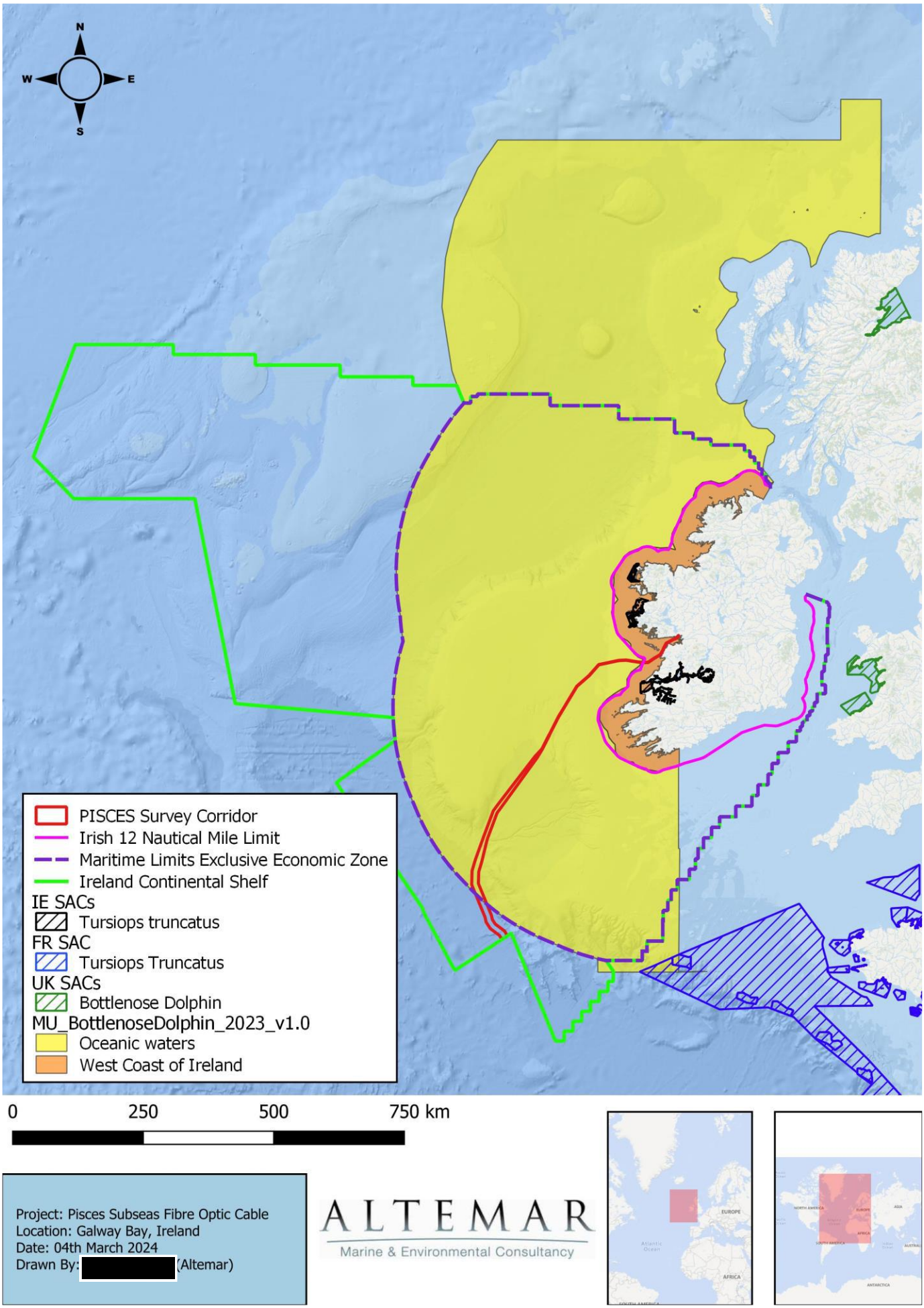

Figure 34: IE, FR, & UK SACs designated for Bottlenose Dolphin (*Tursiops truncatus*) within the Oceanic Waters MU and West Coast of Ireland MU for Bottlenose Dolphin

Table 11. Initial screening of Natura 2000 sites within 15km of the proposed survey route.

NATURA Site Code	NAME	Screened In/Out	SSCO's/ Potential for likely significant effects.
Special Protection Areas			
IE004031	Inner Galway Bay SPA	**IN**	*Objective:* To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA: A002 Black-throated Diver *Gavia arctica* A003 Great Northern Diver *Gavia immer* A017 Cormorant *Phalacrocorax carbo* A028 Grey Heron *Ardea cinerea* A046 Light-bellied Brent Goose *Branta bernicla hrota* A050 Wigeon *Anas penelope* A052 Teal *Anas crecca* A056 Shoveler *Anas clypeata* A069 Red-breasted Merganser *Mergus serrator* A137 Ringed Plover *Charadrius hiaticula* A140 Golden Plover *Pluvialis apricaria* A142 Lapwing *Vanellus vanellus* A149 Dunlin *Calidris alpina alpina* A157 Bar-tailed Godwit *Limosa lapponica* A160 Curlew *Numenius arquata* A162 Redshank *Tringa totanus* A169 Turnstone *Arenaria interpres* A179 Black-headed Gull *Chroicocephalus ridibundus* A182 Common Gull *Larus canus* A191 Sandwich Tern *Sterna sandvicensis* A193 Common Tern *Sterna hirundo* A999 Wetlands *Potential for likely significant effects.* The proposed cable survey route passes through this SPA. The survey is in the marine intertidal of Ballyloughane Strand, in addition to the terrestrial environment in the vicinity of the beach and within the subtidal marine environment, including offshore areas. Landfall Site Investigations will be undertaken to establish the depth and nature of the sediment. The focus of the site investigations will be on the upper layers of sediment to assess the feasibility of cable burial and installation techniques. The following may be undertaken at the landfall: • Bar probes on the intertidal at 10m spacing (approx. 8 to 10 at the landfall). • Bar probes from the Low Water Line to the 3m water depth contour at 30m spacing. (approx. 8 to 10 at the landfall) • 3 Trial Pits on the beach (by digger) (target depth 2.5m). The bar probes on the intertidal are manually driven to a depth of 2 metres simply to prove the depth of upper layers of sand, gravel or soft material. The Trial Pits will be positioned at approximately 30 to 50m centres starting seaward of the High Water Mark. The Trial Pits will be excavated by machinery, 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. The site investigation works are

NATURA Site Code	NAME	Screened In/Out	SSCO's/ Potential for likely significant effects.
			outside the over wintering bird season and will be carried out in the April-September 2024 period. The works are within an area of existing vessel traffic in Galway Bay and the intertidal element is on a popular beach with a car park 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 SPA through physical impact on the intertidal and subtidal sediments within the SPA and physical disturbance which could impact the Features of Interest of this SPA. Mitigation measures are required to protect the SPA from significant effects. **Natura Impact Statement Required**

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
Special Areas of Conservation			
IE 000268	Galway Bay Complex SAC	**IN**	**Objective:** To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected: 1140 Mudflats and sandflats not covered by seawater at low tide 1150 Coastal lagoons* 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 significant effects.*** The proposed cable survey route passes through this SAC. The survey is in the marine intertidal of Ballyloughane Strand, in addition to the terrestrial environment in the vicinity of the beach and within the subtidal marine environment, including offshore areas. Landfall Site Investigations will be undertaken to establish the depth and nature of the sediment. The focus of the site investigations will be on the upper layers of sediment to assess the feasibility of cable burial and installation techniques. The following may be undertaken at the landfall:

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			• Bar probes on the intertidal at 10m spacing (approx. 8 to 10 at each landfall). • Bar probes from the Low Water Line to the 3m water depth contour at 30m spacing. (approx. 8 to 10 at each landfall) • 3 Trial Pits on the beach (target depth 2.5m). The bar probes on the intertidal are manually driven to a depth of 2 metres simply to prove the depth of upper layers of sand, gravel or soft material. The Trial Pits will be positioned at approximately 30 to 50m centres starting seaward of the High Water Mark. The Trial Pits will be excavated, logged, photographed and backfilled in a single tidal cycle. The trial pits will be backfilled with the original excavated materials in the sequence in which they are excavated. The works would result in temporary impacts on sediment and infauna within the qualifying habitat (1140 Mudflats and sandflats not covered by seawater at low tide) in the immediate vicinity of the footprint of the beach works. No physical loss of the Habitat area of 1140 Mudflats and sandflats not covered by seawater at low tide or would be foreseen. The proposed marine survey will not impactsubtidal reef habitat within the SAC. The proposed works could result in minor localised sedimentation if reef areas are adjacent to the works. However, these impacts would be localised and temporary. Harbour seal (*Phoca vitulina*) is a conservation interest of this SAC and mitigation measures are required in relation marine mammals during the proposed project. The proposed survey works on Ballyloughane Beach are not within the area defined as Large shallow inlets and Bays in Galway Bay Complex SAC. However, subtidal elements of the project are within approximately 2km of the area. The sensitive communities (Zostera-dominated community complex and the maërl-dominated community) as outlined in MERC (2006) were avoided in the initial proposed cable route planning. Groundtruthing of this route by video camera identified additional Maerl areas in addition to a *Virgularia mirabilis* habitat. The survey corridor was devised to avoid maerl (Conservation Interest) areas. Additional video surveys have been carried out to further optimise the route in the vicinity of *Virgularia mirabilis* (not listed as a conservation interest). Routing of the proposed survey corridor has been informed by the subtidal surveys in 2021 so as to cause minimal impact on this sensitive subtidal community that is not a feature of interest of the SAC. The habitat area of the Large shallow inlets and Bays would not be impacted by the works and impacts would be temporary and in the immediate vicinity of the proposed works along the proposed survey corridor. The survey works will be within an area of existing vessel traffic in Galway Bay and the intertidal element is on a popular beach

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			with a car park 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 disturbance and the physical impact on the intertidal and subtidal sediments within the SAC and disturbance which could impact the Features of Interest of this SAC. Further information is required to assess the potential impact. **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 19.2 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 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 19.2 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 or Slender Naiad 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 (19.2 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**
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] 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 24.4 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).

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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 24.4 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, 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 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 (24.4 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 bottlenose dolphin. **Natura Impact Statement Required**
IE002074	Slyne Head Peninsula 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] 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]

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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] 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 57 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 57 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**
IE002998	West Connacht Coast SAC	**IN**	**Conservation Objective**

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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 63.1 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**
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 64.7 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) 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 cable survey area is located 64.7 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 reefs 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 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 64.7 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) 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 cable survey area is located 64.7 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 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**
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]

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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 67.6 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 (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 67.6 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 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 (67.6 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 seal. **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]

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			Potential for likely significant effects This SAC is 67.7 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) 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 67.7 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. 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**
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** This SAC is 76.2 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 76.2 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

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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**
IE000458	Killala Bay/Moy Estuary 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] Annual vegetation of drift lines [1210] 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] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] *Petromyzon marinus* (Sea Lamprey) [1095] *Phoca vitulina* (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 94.2 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 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 94.2 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, Sea Lamprey, 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
			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**
IE000622	Ballysadare 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** Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] *Phoca vitulina* (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 108.1 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 108.1 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 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 (108.1 km), in the absence of mitigation, no significant effects on otter species are likely as a result of the proposed project.

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 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] 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 114.2 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 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 114.2 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 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 ±

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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 (114.2 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**
IE000627	Cummeen Strand/Drumcliffe Bay (Sligo 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** Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Juniperus communis formations on heaths or calcareous grasslands [5130] Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) [6210] Petrifying springs with tufa formation (*Cratoneurion*) [7220] *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] *Petromyzon marinus* (Sea Lamprey) [1095] *Lampetra fluviatilis* (River Lamprey) [1099] *Phoca vitulina* (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 114.7 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 114.7 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, Lamprey species (Sea and River), or Narrow-mouthed Whorl Snail protected as a qualifying interest

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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 harbour seals. **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 116 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**
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 120.3 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). 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.

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			Mitigation measures are required to protect the SAC from significant effects. The cable survey area is located 120.3 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 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 significant distance between the proposed cable survey area and this SAC (120.3 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**
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] *Phoca vitulina* (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 121.8 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 (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 121.8 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

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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 (121.8 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**
IE000101	Roaring Water 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** Large shallow inlets and bays [1160] 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] *Lutra lutra* (Otter) [1355] *Halichoerus grypus* (Grey Seal) [1364] **Potential for likely significant effects** This SAC is 146.9 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 also within 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 146.9 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 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 (146.9 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 grey seals and harbour porpoise. **Natura Impact Statement Required**
IE000133	Donegal Bay (Murvagh) 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] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Dunes with Salix repens ssp. argentea (*Salicion arenariae*) [2170] Humid dune slacks [2190] *Phoca vitulina* (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 157.4 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 157.4 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 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 harbour seals. **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 158.3 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 158.3 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, 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 (158.3 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**
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 160.5 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).

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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 160.5 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 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 (160.5 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**
IE000197	West of Ardara/Maas Road 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] Large shallow inlets and bays [1160] Annual vegetation of drift lines [1210] 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]

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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] Northern Atlantic wet heaths with Erica tetralix [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] Juniperus communis formations on heaths or calcareous grasslands [5130] 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] Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the Rhynchosporion [7150] Alkaline fens [7230] *Vertigo geyeri* (Geyer's Whorl Snail) [1013] *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] *Euphydryas aurinia* (Marsh Fritillary) [1065] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355] *Phoca vitulina* (Harbour Seal) [1365] *Petalophyllum ralfsii* (Petalwort) [1395] *Najas flexilis* (Slender Naiad) [1833] **Potential for likely significant effects** This SAC is 170.4 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 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 170.4 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 habitats, Geyer's Whorl Snail, Freshwater Pearl Mussel, Marsh Fritillary, Petalwort, or Slender Naiad protected as a qualifying interest of this SAC are foreseen from the proposed works associated with this survey 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

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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 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 survey area and this SAC (170.4 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, pollution, and physical disturbance into the marine environment and mitigation measures are required to protect harbour seals. **Natura Impact Statement Required**
IE002283	Rutland Island and Sound 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] Large shallow inlets and bays [1160] Reefs [1170] Annual vegetation of drift lines [1210] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] *Phoca vitulina* (Harbour Seal) [1365] **Potential for likely significant effects** This SAC is 187.5 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 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 187.5 km from this conservation site. Given the nature of the proposed works, and the significant

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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 harbour seals. **Natura Impact Statement Required**
IE003000	Rockabill to Dalkey 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] *Phocoena phocoena* (Harbour Porpoise) [1351] **Potential for likely significant effects** This SAC is 195.3 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 survey area is located 195.3 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 reefs 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**
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]

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			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 198.7 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 198.7 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**
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 199.8 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 underwater noise and physical disturbance which could impact the Features of Interest of this SAC should these mobile marine

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			mammals enter the ZoI. Mitigation measures are required to protect the SAC from significant effects. The survey area is located 199.8 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**
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 220.4 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 220.4 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

NATURA Site	NAME	Screened In/Out	SSCO's/Reason
			absence of mitigation measures, no significant impacts on habitats, Geyer's Whorl Snail, Petalwort, or Slender Naiad 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**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
Special Areas of Conservation (UK)			
UK0016612	Murlough	In	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interest** Fixed coastal dunes with herbaceous vegetation ("grey dunes") [2130] *priority habitat. Atlantic decalcified fixed dunes (*Calluno-Ulicetea*) [2150] *priority habitat. Sandbanks which are slightly covered by sea water all the time [1110] Mudflats and sandflats not covered by seawater at low tide [1140] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with Ammophila arenaria ("white dunes") [2120] Dunes with Salix repens ssp. argentea (*Salicion arenariae*) [2170] Marsh fritillary butterfly (*Euphydryas (Eurodryas, Hypodryas) aurinia*) [1065] Harbour Seal (*Phoca vitulina*) [1365] **Potential Impact** This SAC is 227.6 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of harbour seal (273 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 harbour seals (qualifying interests 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 survey area is located 227.6 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 or the marsh fritillary butterfly 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 into the marine environment and mitigation measures are required to protect harbour 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 245.7 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (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**
UK0016618	Strangford Lough	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interest** Large shallow inlet and bay [1160] Coastal lagoons [1150] Mudflats and sandflats not covered by sea water at low tide [1140] Reefs [1170] Annual vegetation of drift lines [1210]

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Harbour (Common) Seal (*Phoca vitulina*) [1351] **Potential Impact** This SAC is 251.3 km from the proposed cable survey area. The proposed cable survey area is located within the foraging range of harbour seal (273 km) (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. Mitigation measures are required to protect the SAC from significant effects. The survey area is located 251.3 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 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 harbour seals. **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] **Potential Impact** This SAC is 257.8 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

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			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**
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 265.7 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (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]

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			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 274.8 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, 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 274.8 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, 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 (274.8 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 seals. **Natura Impact Statement Required**
UK0030384	The Maidens	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interest**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Sandbanks which are slightly covered by seawater all the time [1110] Reefs [1170] Grey Seal (*Halichoeurus grypus*) [1364] **Potential Impact** This SAC is 277.5 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 277.5 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 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**
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 284.2 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

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			(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 34, 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 (284.2 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 284.2 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 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 (284.2 km), in the absence of 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**
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]

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Grey Seal (*Halichoeurus grypus*) [1364] River lamprey (*Lampetra fluviatilis*) [1099] Sea lamprey (*Petromyzon marinus*) [1095] *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 295.3 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 295.3 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 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 34, 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 (295.3 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. 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**
UK0030396	Bristol Channel Approaches/Dynesfeydd Môr Hafren	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interest**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Harbour porpoise (*Phocoena phocoena*) [1351] **Potential Impact** This SAC is 335.2 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**
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 (*Halichoeurus grypus*) [1364] **Potential Impact** This SAC is 372.2 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 372.2 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 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.
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 (*Halichoeurus grypus*) [1364] **Potential Impact** This SAC is 391.5 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 391.5 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 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**
UK0030289	Treshnish Isles	**In**	**Conservation Objective** To maintain (or restore where appropriate) the qualifying interests to favourable condition. **Qualifying Interest** Reefs [1170] Grey Seal (*Halichoeurus grypus*) [1364] **Potential Impact** This SAC is 393 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

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			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 393 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 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 251.6 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) and also the Oceanic Waters 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**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Phocoena phocoena (Harbour Porpoise) [1351] *Tursiops truncates* (Bottlenose Dolphin) [1349] **Potential Impact** This SAC is 305.2 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) and also the Oceanic Waters 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**
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] **Potential Impact** This SAC is 530.2 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**
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]

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			Potential Impact This SAC is 581.9 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (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**
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] **Potential Impact** This SAC is 587.7 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (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**
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] **Potential Impact**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			This SAC is 589.4 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**
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] **Potential Impact** This SAC is 594.8 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**
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] **Potential Impact** This SAC is 603.1 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). Initial assessment identifies that, in the absence of mitigation measures, and out of an abundance of caution, there may be

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			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**
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] **Potential Impact** This SAC is 613 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**
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] **Potential Impact** This SAC is 623.5 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.

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. **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] **Potential Impact** This SAC is 623.9 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (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**
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** *Phocoena phocoena* (Harbour Porpoise) [1351] **Potential Impact** This SAC is 627 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**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
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] **Potential Impact** This SAC is 630.1 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). 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**
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] **Potential Impact** This SAC is 643.9 km from the proposed cable survey area. The proposed cable survey area is located within the Celtic and Irish Seas MU for Harbour Porpoise (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**
FR5300011	Cap d'Erquy-Cap Fréhel	**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] **Potential Impact** This SAC is 670.4 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**
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] **Potential Impact** This SAC is 681.3 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 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**
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] **Potential Impact**

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			This SAC is 687.6 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 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**
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] **Potential Impact** This SAC is 699.3 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 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**
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 714.6 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

NATURA Site Code	NAME	Screened In/Out	Conservation Objectives/ Features of interest/ Potential impact on Natura 2000 site.
			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**
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] **Potential Impact** This SAC is 715 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**

4.5 Cumulative Impact 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[4], 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 Ballyloughane Beach, Galway Bay, and within the Irish EEZ. The potential ZoI for in-combination effects for this assessment has been deemed to be projects located proximate to the landfall and intertidal elements of the survey works in addition to subtidal elements relating to underwater noise. Terrestrial planning applications have been examined for the potential for in-combination effects. Given that the proposed survey works extend to the offshore subtidal in the Irish Sea, the geographic boundaries of assessment was expanded to include coastal and offshore marine projects located within the Irish 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

Galway City 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. *Galway City Council Planning Permissions.*

Ref. No.	Address	Proposal
22127	Ballyloughane, Renmore, Galway	Permission for development which will consist of a dwelling house, domestic garage, on-site treatment system along with all associated site works. Access from the site to the public road is to be via proposed roadway permitted under pl. ref. no. 20/221
21405	Ballyloughane, Renmore, Galway	Permission for development which will consist of: (a) conversion of attic storage void to habitable space (b) additional roof windows to front and rear facades (c) all associated building works and site works
21391	Ballyloughane, Renmore, Galway	Permission for development which will consist of the construction of a dwelling house, domestic garage, on-site treatment system along with all associated site works.
20221	Ballyloughane, Renmore, Galway	Permission for the development which will consist of the construction of a new two storey dwelling and garage, with new access road plus wastewater treatment system and associated site works

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

Table 13. *Foreshore licence applications in vicinity of Pisces Survey Works*

Reference	Title	Year	Location	Activity	Status
FS007569	Galway Wandering Kite Festival	2022	Omey Strand, Claddaghduff, Co. Galway	Galway Wandering Kite Festival	Determination
FS007161	Site Investigations for the proposed Sceirde Rocks Offshore Wind Farm	2022	Off County Galway	Site Investigation for Offshore Wind Farm	Determination
FS007461	UCD Research Experiments, Inishmaan	2022	Inishmaan, Co. Galway	Short term deployment of 1 no. Offshore Met Ocean Data Buoy, 1 no. Acoustic Doppler Current Profiler (ADCP) on the seabed and 1 no. Inshore String of 5 Buoys with monitoring devices, all with associated moorings etc. at various of locations within the licensed area	Determination
FS007495	Atlantic Offshore Renewable Energy 2	2021	Off County Galway	Site Investigations for proposed offshore wind farm	Applied
FS007246	Main lay and construction works for installation of the IRIS sub-sea fibre optic cable system, Co. Galway	2021	Galway	Main lay and construction works for installation of the IRIS sub-sea fibre optic cable system	Determination. Installed in 2022 under ecological supervision (Altemar)
FS007100	Health Service Executive Deployment of 6 Swim Buoys along Salthill Promenade	2021	Salthill Promenade, Co. Galway	To deploy 6 swim buoys along Salthill promenade in support of Healthy Galway City programme which is the structure to implement Healthy Ireland at the local level	Consultation
FS007543	Fuinneamh Sceirde Teoranta	2022	Off County Galway	Sceirde Rocks export cable corridor site investigations is to determine geotechnical, geophysical and benthic characteristics within the Foreshore Licence Area.	Determination
FS006916	EirGrid Celtic Interconnector Electricity Cable	2021	Co. Cork	Installation of Subsea Cable	Determination

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

Reference	Title	Year	Location	Activity	Status
LIC230033	LIC230033 – Apollo Submarine Cable System Limited	2023	Irish Deep Offshore Subtidal	Proposed installation and operation of the 2Africa Submarine Cable System within the Irish Exclusive Economic Zone (EEZ). The planned cable will extend from Widemouth Bay in Cornwall to a number of countries in Europe, Africa, and the Middle East.	Applied
LIC230019	LIC230019 – Doyle Shipping Group	2023	Lower Harbour of Cork on the western side of the River Lee, Co. Cork	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.	Applied
LIC230017	LIC230017 – Microsoft Ireland Operations Ltd.	2023	Kilmore Quay, Co. Wexford	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.	Applied
LIC230014	LIC230014 – Shannon Foynes Port Company	2023	Foynes Island, Co. Limerick	A Marine Site Investigation to support the preliminary and detailed engineering design of the Deep-Water Terminal Development on Foynes Island.	Applied
LIC230004	LIC230004 – Aughinish Alumina Ltd	2023	Moneypoint, Co. Clare	ESB intends to undertake a survey campaign at the Moneypoint Generating Station site to inform the engineering design of the proposed Moneypoint Hub Project. The marine surveys will include geophysical, geotechnical, environmental, and met ocean surveys.	Applied

4.5.3 Impact Identification

In relation to Foreshore Application **FS007246**, all main lay and construction works have been completed. An Ecological Clerk of Works (Altemar) was in place for the works. Main lay works on Ballyloughane Strand were completed in June 2022. The landfall survey and site investigations will be limited as the PISCES cable will be installed at the landfall by sharing existing infrastructure (a duct installed by horizontal directional drilling for the IRIS system installation in 2022) to cross the shoreline at Ballyloughane. The proposed routing of the Pisces cable has been designed to run as close as possible to the IRIS cable so as to minimise the potential for in combination effects. Communities within the vicinity of the IRIS cable route would be expected to have recovered within the intervening period and no in-combination effects would be foreseen.

In relation to **FS007543** (Sceirde Rocks export cable corridor site investigations) there are currently two potential offshore export cable corridors, one making landfall in Galway Bay, the second making landfall further south along the coast near Milltown Malbay and Doonbeg. Surveys include Shallow Sampling (75 grab samples), Cone Penetration Tests (CPT), Borehole sampling, Bathymetric surveying and benthic ecology surveys. As outlined in the project's NIS '*Due to the potential for injury to harbour porpoise, bottlenose dolphin, grey seal and harbour seal resulting from the site investigations, marine mammal mitigation will be implemented. Available mitigation measures specifically designed for geophysical surveys have been incorporated into the mitigation measures described below and the protocol 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (Department of Arts, Heritage and the Gaeltacht (DAHG), 2014) will be followed at all times for all site investigation activities. Section 4.3.4 of the DAHG 2014 guidance specifically relates to geophysical survey activities. These best practice guidelines are now incorporated as standard operating procedures for all noise emitting surveys in Irish Waters and are considered sufficient by the competent authority (National Parks and Wildlife Service (NPWS)) to mitigate for disturbance to marine mammal species*.'

It should be noted that Sceirde Rocks Survey Licences have been granted and survey works were carried out in 2023. There is the potential for further survey works to be carried out as part of this project. Following a review of the Sceirde Rocks foreshore application, it has been determined that the proposed PISCES survey vessel would be within the Sceirde Rocks Licence Area for approximately 5 hours (based on a survey vessel speed of 4 knots). In the event that the proposed PICSES survey works overlap with survey works undertaken as part of the Sceirde Rocks survey (including the Export Cable Corridor), no significant in-combination effects are foreseen as that it is anticipated that the PISCES survey vessel would be within the Sceirde Rocks Licence Area for a short timeframe (approx. 5 hours) and mitigation measures will be in place. In the event that further survey works are proposed, they will be subject to the MARA licencing process and further assessment of potential in-combination effects will be conducted at this stage.

There are no projects, identified within Galway City 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. The proposed subtidal cable survey route is in an area that experiences existing vessel activity (due to proximity to Galway Docks). Given that intertidal elements of the proposed survey works are located within the intertidal of Ballyloughane Beach, there is a potential hydrological pathway from the research vessel to designated conservation sites located within Galway Bay. These conservation sites are located downstream of a number of terrestrial planning applications outlined in Table 12. In the marine offshore subtidal of Galway Bay and the Atlantic Ocean, 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 foresee 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 Inner Galway Bay SPA (Site code: 004031)

As outlined in the SPA Site Synopsis, Inner Galway Bay SPA is also a Ramsar Convention site and part of the Inner Galway Bay SPA is a Wildfowl Sanctuary. The site is a SPA for the following species: Great Northern Diver, Cormorant, Grey Heron, Light-bellied Brent Goose, Wigeon, Teal, Shoveler, Red- breasted Merganser, Ringed Plover, Golden Plover, Lapwing, Dunlin, Bar -tailed Godwit, Curlew, Redshank, Turnstone, Black- headed Gull, Common Gull, Sandwich Tern and Common Tern. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

As outlined in the SPA supporting document "*the Selection Species listed for Inner Galway Bay SPA are as follows:-*

1. *During winter the site regularly supports 1% or more of the biogeographical population of Light-bellied Brent Goose (Branta bernicla hrota). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 676 individuals.*
2. *During winter the site regularly supports 1% or more of the all-Ireland population of Red-breasted Merganser (Mergus serrator). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 249 individuals.*
3. *During winter the site regularly supports 1% or more of the biogeographical population of the Annex I species Great Northern Diver (Gavia immer). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 94 individuals.*
4. *During winter the site regularly supports 1% or more of the all-Ireland population of Cormorant (Phalacrocorax carbo). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 266 individuals. The site is also selected for its breeding population of Cormorant. In 2000, as part of the Seabird 2000 survey, 200 pairs of Cormorant (based on apparently occupied nests) were estimated on Deer Island; exceeding the all-Ireland 1% threshold and making the site of national importance for this species.*
5. *During winter the site regularly supports 1% or more of the all-Ireland population of Grey Heron (Ardea cinerea). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 102 individuals.*
6. *During winter the site regularly supports 1% or more of the all-Ireland population of Ringed Plover (Charadrius hiaticula). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 335 individuals.*
7. *During winter the site regularly supports 1% or more of the all-Ireland population of Bar-tailed Godwit (Limosa lapponica). The mean peak number of this Annex I species within the SPA during the baseline period (1995/96 – 1999/00) was 447 individuals.*
8. *During winter the site regularly supports 1% or more of the all-Ireland population of Turnstone (Arenaria interpres). The mean peak number of this species within the SPA during the baseline period (1995/96 – 1999/00) was 182 individuals. 9. In 1995, as part of the All-Ireland Tern survey, the breeding population of Sandwich Tern (Sterna sandvicensis) of Inner Galway Bay was surveyed and 81 pairs (based on apparently occupied nests) were recorded. This exceeds the All-Ireland 1% threshold for this Annex I species.*
9. *In 1995, as part of the All-Ireland Tern survey, 98 pairs of Common Tern (Sterna hirundo) (based on apparently occupied nests) were recorded on Green Island in Ballyvaughan Bay in Co. Clare. The Seabird 2000 Survey recorded 46 pairs of Common Tern (based on apparently occupied nests) on Mutton Island in Co. Galway in 2001. Both counts exceed the All-Ireland 1% threshold for this Annex I species.*

The following species are identified as additional Special Conservation Interests (SCIs) for Inner Galway Bay SPA as they were recorded in numbers of all-Ireland importance during the baseline period (1995/96 – 1999/00) Wigeon (Anas penelope), Teal (Anas crecca), Shoveler (Anas clypeata), Golden Plover (Pluvialis apricaria),

Lapwing (Vanellus vanellus), Dunlin (Calidris alpina), Curlew (Numenius arquata), Redshank (Tringa totanus), Black-headed Gull (Chroicocephalus ridibundus) and Common Gull (Larus canus).

The wetland habitats contained within Inner Galway Bay SPA are identified of conservation importance for non-breeding (wintering) migratory waterbirds. Therefore the wetland habitats are considered to be an additional Special Conservation Interest."

The overarching Conservation Objective for Inner Galway Bay Special Protection Area is to ensure that waterbird populations and their wetland habitats are maintained at, or restored to, favourable conservation condition. This includes, as an integral part, the need to avoid deterioration of habitats and significant disturbance; thereby ensuring the persistence of site integrity.

Conservation Interest species listed for Inner Galway Bay SPA.

Objective 1: To maintain the favourable conservation condition of the waterbird Special Conservation Interest species listed for Inner Galway Bay SPA.

This objective is defined by the following attributes and targets:-

- To be favourable, the long term population trend for each waterbird Special Conservation Interest species should be stable or increasing. Waterbird populations are deemed to be unfavourable when they have declined by 25% or more, as assessed by the most recent population trend analysis.
- To be favourable, there should be no significant decrease in the range, timing or intensity of use of areas by the waterbird species of Special Conservation Interest, other than that occurring from natural patterns of variation.

Factors that can adversely affect the achievement of Objective 1 include:

- Habitat modification: activities that modify discrete areas or the overall habitat(s) within the SPA in terms of how one or more of the listed species use the site (e.g. as a feeding resource) could result in the displacement of these species from areas within the SPA and/or a reduction in their numbers.
- Disturbance: anthropogenic disturbance that occurs in or near the site and is either singular or cumulative in nature could result in the displacement of one or more of the listed waterbird species from areas within the SPA, and/or a reduction in their numbers
- Ex-situ factors: several of the listed waterbird species may at times use habitats situated within the immediate hinterland of the SPA or in areas ecologically connected to it. The reliance on these habitats will vary from species to species and from site to site. Significant habitat change or increased levels of disturbance within these areas could result in the displacement of one or more of the listed waterbird species from areas within the SPA, and/or a reduction in their numbers.

Objective 2: To maintain the favourable conservation condition of the wetland habitat at Inner Galway Bay SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

This objective is defined by the following attributes and targets:-

• To be favourable, the permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 13,267 ha, other than that occurring from natural patterns of variation

The proposed area of work is within OG497- Ballyloughane (Figure 35). Inner Galway Bay Subsite assessment – total numbers during LT surveys (across all behaviours and habitats) (L Low, M Moderate; H High V Very high) (Table 15).

Table 15. Inner Galway Bay Subsite assessment – total numbers during LT surveys

Species ► Subsites ▼	*n*	PB	RM	ND	CA	H.	RP	BA	TT	WN	T.	SV	GP	L.	DN	CU	RK	BH	CM
0G497	4	L	H	M	H	L	M	H	M	M					M	L	M	H	L

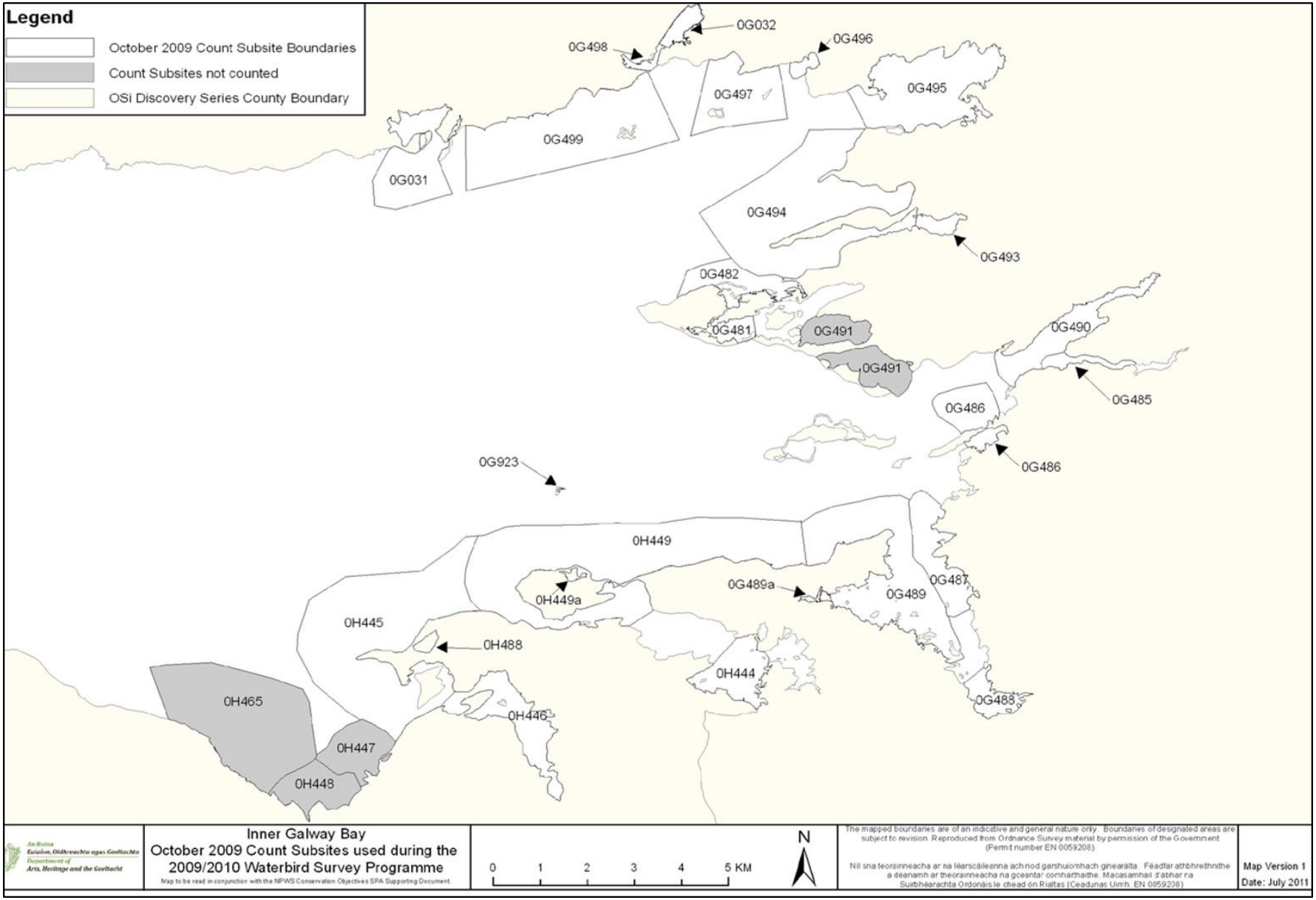

Figure 35. SPA Subsites.

Table 16 shows the Inner Galway Bay Subsite assessment – total numbers foraging intertidally,[I] subtidally[II] and intertidal/subtidal combined [III](LT surveys).Low, M Moderate; H High, V Very high;) for the following species

Table 16. *Ballyloughane Subsite assessment – total numbers foraging LT surveys*

PB	Light-bellied Brent Goose	*Branta bernicla hrotra*
ND	Great Northern Diver	*Gavia immer*
RM	Red-breasted Merganser	*Mergus serrator*
CA	Cormorant	*Phalacrocorax carbo*
H.	Grey Heron	*Ardea cinerea*
BA	Bar-tailed Godwit	*Limosa lapponica*
RP	Ringed Plover	*Charadrius hiaticula*
TT	Turnstone	*Arenaria interpres*
WN	Wigeon	*Anas penelope*
GP	Golden Plover	*Pluvialis apricaria*
T.	Teal	*Anas crecca*
SV	Shoveler	*Anas clypeata*
DN	Dunlin	*Calidris alpina*
L.	Lapwing	*Vanellus vanellus*
CU	Curlew	*Numenius arquata*
BH	Black-headed Gull	*Chroicocephalus ridibundus*
CM	Common Gull	*Larus canus*
RK	Redshank	*Tringa totanus*

Species ▶ / Subsites ▼	*n*	PB[I]	PB[II]	RM[II]	ND[II]	CA[II]	H.[II]	RP[I]	BA[III]	TT[III]	WN[I]	WN[II]	T.[I]	T.[II]	SV[II]	GP[I]	L.[I]	DN[III]	CU[III]	RK[I]	BH[I]	CM[I]
0G497	4	L		H	L	H	L	M	H	M	L	M						M	L	M	H	M

Table 17 shows the Inner Galway Bay Subsite assessment – total numbers (roosting/other behaviour) within LT surveys (Intertidal[I], Subtidal[II], Intertidal/Supratidal[III] and Int/Supra/Sub combined[IV]. Low, M Moderate; H High, V Very high) Table 9 shows the ranked total numbers for HT surveys (all habitats) across the SPA. Ballyloughane in red.

Table 17. *Ballyloughane Subsite assessment – total numbers total numbers (roosting/other behaviour) within LT surveys*

Species ▶ / Subsites ▼	*n*	PB[I]	PB[I]	RM[I]	ND[I]	CA[II]	H.[II]	RP[II]	BA[I]	TT[II]	WN[I]	WN[II]	T.[I]	T.[II]	SV[I]	SV[I]	GP[I]	L.[V]	DN[II]	CU[V]	RK[V]	BH[I]	BH[II]	CM[I]	CM[I]
0G497	4					H			V																

Table 18. Ranked total numbers for HT surveys (all habitats) across the SPA.

Species ▶ / Subsites ▼	PB	RM	ND	CA	RP	H.	BA	TT	WN	T.	SV	GP	L.	DN	CU	RK	BH	CM
0G031	11	11	11	2	1	5	2		13			2	7	1	13	1	4	18
0G032								11	16	14			2			22	5	6
0G479	6	13	11			5		9	18	12			14		20	22	22	
0G480	8	7	6	6		1			24						23	17	18	22
0G481	4	1	3	8	9	4	5	1		17		1	4	4	15	2	11	3
0G482	3		2					13	15	12					16	22	22	
0G483	12	8	6		5			6	5	14				8	5	13	22	15
0G484	17	3				5	7	5	14				9	10	4	10	14	22
0G485		15	11						20	11							18	
0G486	7								9	1			13		16	15	16	19
0G487	20	11							10						23	11	20	21
0G488								13	12	9			5		12	21	20	17
0G489	1		3	8	6	5	8	1	4	6			1	9	1	17	13	5
0G490	15		11						7	10			10		9	14	14	22
0G491																		
0G493	19						6	13	17	4	2			3	6	3	9	1
0G494																		26
0G495	16	16	5	10				3	2	2			3	7	3	7	6	9
0G496						5	10		21	8				12	18	16	7	19
0G497	18	9	10		2		4	4	19						19	19	3	22
0G498				10		2										26	2	7
0G499	20			3			1	6	23					13	20	6	1	3
0G923				1														
0H444		6							1	3	1		8		10	4	10	8
0H445	5	5	11	6	8	5				17			12	5	8	12		9
0H446	10	2		4	4	2		10	8	5			6		2	5	8	2
0H447	12		6		7				21	7					22	19	11	13
0H448	9	4			3		3		6	16			11	6	10	22	17	12
0H449	2	9	1	5			9	8	11					2	13	8	22	16
0H465	14	14	6				10	11						11	7	8		11
0H488									3	19								13
n	21	16	15	11	9	10	11	15	24	19	2	2	14	13	24	26	25	26

Recreation and disturbance

As outlined in the conservation objectives supporting document "*Inner Galway Bay offers a great deal in terms of coastal and marine leisure and tourism for the region. Galway City's coastal area is an important tourist and recreational amenity. Although sandy beaches are relatively limited across the site, two areas (Salthill beach (subsite 0H499) and Silverstrand (subsite 0G031) have achieved EU Blue Flag status in recent years. The urban village of Salthill is a traditional seaside resort and major tourist attraction. Silverstrand and Ballyloughan beaches (subsite 0G497) are also considered significant recreational assets for the city.*

Of the activities that were recorded as causing disturbance during field surveys, walking (intertidal areas and including dogs) was the most widespread (13 subsites) and responsible for the peak disturbance score for 11 subsites (Table 8). 64% of field observations resulted in a response from waterbirds, the most common response being 'moderate' in that the waterbirds were displaced for short periods of time, most often to another part of the subsite. Higher disturbance scores relate to records where dogs, and particularly loose dogs, were involved in the activity. The overall 'high' score attained at 0G497 (Ballyloughlan) relates to humans and loose dogs recorded walking within this subsite frequently, with waterbirds displaced whilst the activity was occurring."

Potential Impact of the Proposed works on Inner Galway Bay SPA

The status of the qualifying interests is demonstrated in Table 19. As outlined in the SPA conservation objectives supporting document, the proposed survey corridor is in an area of high disturbance. Terns are not located in the vicinity of the landfall and would be used to vessel activity in the region of Mutton Island where they nest during the summer. The proposed survey works in the intertidal is within the Mudflats and Sandflats not covered by Low tide habitat, which would be an area where birds would forage when disturbance levels are low. Mitigation measures are proposed including having an ecologist present on site to ensure birds (roosting or foraging) are not disturbed by the proposed works. The survey works would see invertebrate mortalities along the machinery access areas and in the vicinity of the trial pits.

Table 19 Current Status of Qualifying interests.

Natura 2000 Site	Qualifying Interests	Current Status[5]
Special Protection Areas (SPA)		
Inner Galway Bay SPA [004031]	A003 Great Northern Diver *Gavia immer*	Amber
	A017 Cormorant *Phalacrocorax carbo*	Amber
	A028 Grey Heron *Ardea cinerea*	Green
	A046 Brent Goose *Branta bernicla hrota*	Amber
	A050 Wigeon *Anas penelope*	RED
	A052 Teal *Anas crecca*	Amber
	A056 Shoveler *Anas clypeata*	RED
	A069 Red-breasted Merganser *Mergus serrator*	Amber
	A137 Ringed Plover *Charadrius hiaticula*	Amber
	A140 Golden Plover *Pluvialis apricaria*	RED
	A142 Lapwing *Vanellus vanellus*	RED
	A149 Dunlin *Calidris alpina alpina*	RED
	A157 Bar-tailed Godwit *Limosa lapponica*	Amber
	A160 Curlew *Numenius arquata*	RED
	A162 Redshank *Tringa totanus*	RED
	A169 Turnstone *Arenaria interpres*	Green
	A179 Black-headed Gull *Chroicocephalus ridibundus*	RED
	A182 Common Gull *Larus canus*	Amber
	A191 Sandwich Tern *Sterna sandvicensis*	Amber
	A193Common Tern *Sterna hirundo*	Amber

[5] Birds of Conservation Concern in Ireland 4: 2020–2026

Table 20. *Recreation and disturbance activities in each SPA subsite*

Number of activities recorded to cause disturbance to waterbirds during field surveys (2009/10 wate survey programme) plus the calculated peak disturbance score (see text for explanation)
Scores 0 – 3 = Low Scores 4 – 6 = Moderate Scores 7 – 9 = High
Grey shading = no activity recorded to cause disturbance during field surveys

Subsite Code	Subsite Name	Number Activities causing disturbance	Peak Disturbance Score	Activity Responsible
0G031	Lough Rusheen	1	3	• Walking (incl. dogs)
0G032	Lough Atalia	1	3	• Walking (incl. dogs)
0G479	Rinville & Ardfry South	2	3	• Flight path (aircraft)
0G480	Rinville & Ardfry North	4	4	• Motorised watercraft
0G481/482	Tawin South & North	0		
0G483/484	Bayynacourty South & North	0		
0G485	Tyrone House & Morans	0		
0G486	Killeenaran	0		
0G487	Tarrea & adjacent areas	0		
0G488	Kinvarra	1	3	• Intertidal aquaculture (associated activities)
0G489	Traught & Doorus	0		
0G490	Cave – Clarinbridge	3	5	• Flight path
0G493	Kilcaimin	2	6	• Walking (incl. dogs)
0G495	Oranmore Bay	2	4	• Walking (incl. dogs)
0G496	Rosshill	0		
0G497	Ballyloughlan	1	7	• Walking (incl. dogs)
0G498	Nimmo's Pier & Docks	1	4	• Walking (incl. dogs)
0G499	Salthill & environs	2	4	• Walking (incl. dogs)
0H444	Coranroo	0		
0H445	Martello Tower, L. Muree & shore	1	6	• Motorised watercraft
0H446	Castle – bell Harbour – Finvarra	3	6	• Walking (incl. dogs)
0H447	Bishop's Quarter	2	5	• Walking (incl. dogs)
0H448	Ballyvaughanan Bay	1	5	• Motorised vehicles
0H449	Aughinish	3	6	• Walking (incl. dogs)
0H465	Rinn	2	6	• Walking (incl. dogs)
0H488	Rine Lough Murree Flaggy Shore	0		

5.2 Galway Bay Complex SAC (Site code: 000268)

The qualifying interests, their attributes, targets, and the potential impact of the proposed site investigation and survey works on each feature of interest in Galway Bay Complex SAC are seen in Table 21.

Table 21. 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 Galway Bay Complex SAC.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
[1140 Mudflats and sandflats not covered by seawater at low tide	**Inadequate**	**To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Habitat area.* The permanent habitat area is stable or increasing, subject to natural processes. Habitat area was estimated using OSI data as 744ha (Figure 15). *Community distribution.* Conserve the following community types in a natural condition: Intertidal sandy mud community complex; and Intertidal sand community complex. See (Figure 16) **Potential Effect** The proposed survey corridor on Ballyloughane Strand is within this habitat. Landfall Site Investigations will be undertaken to establish the depth and nature of the sediment. The focus of the site investigations will be on the upper layers of sediment to assess the feasibility of cable burial and installation techniques. The following may be undertaken at the landfall: • Bar probes on the intertidal at 10m spacing (approx. 8 to 10 at the landfall). • Bar probes from the Low Water Line to the 3m water depth contour at 30m spacing. (approx. 8 to 10 at the landfall) • 3 Trial Pits on the beach (target depth 2.5m). The bar probes on the intertidal are manually driven to a depth of 2 metres simply to prove the depth of upper layers of sand, gravel or soft material. The Trial Pits will be positioned at approximately 30 to 50m centres starting seaward of the High Water Mark. The Trial Pits will be excavated, logged, photographed and backfilled in a single tidal cycle. The trial pits will be backfilled with the original excavated materials in the sequence in which they are excavated. No intertidal infaunal species data was present in the Inner Galway Bay SPA Conservation Objectives which overlaps with a portion of this habitat in the SAC. During the Altemar surveys *Arenicola marina* appeared abundant on the lower shore during on site survey. An existing beach access slip is present on site. The access route and digging of trial pits along the intertidal will result in a temporary compression of sediment due to machinery and remixing of sediment due to the digging of trial pits. It would be seen that any impacts

Annex Species/Habitats-Qualifying Interest	Overall Conservation Status	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		would be short-term (1-2 days during a receding tide) and would not significantly impact the community within the medium or long term. Mitigation measures will be in place (Section 6 of NIS) to minimise potential minor adverse effects. No significant adverse effects are foreseen on the attributes or targets of Mudflats and sandflats not covered by seawater at low tide in Galway Bay Complex SAC. Mitigation measures will be in place to limit the effects of the works.
[1150] Coastal lagoons	**Bad**	**To restore the favourable conservation condition of Coastal lagoons in Galway Bay Complex 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.* (Number and % cover) Negative indicator species absent or under control **Potential Impact** The cable route is not within or proximate to Coastal Lagoons (Figure 40). No significant adverse effects are foreseen on attributes or targets of Coastal Lagoons in Galway Bay Complex SAC.
[1160] Large shallow inlets and bays	**Inadequate**	**To maintain the favourable conservation condition of Large shallow inlets and bays in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:**

Annex Species/Habitats- Qualifying Interest	Overall Conservation Status	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		(Attribute. Target) *Habitat area.* The permanent habitat area is stable or increasing, subject to natural processes. *Community extent.* Hectares Maintain the extent of the Zostera-dominated community complex and the maërl-dominated community, subject to natural processes. *Community structure: Zostera density*. Conserve the high quality of Zostera-dominated communities, subject to natural processes *Community structure:* Biological composition Conserve the high quality of the maërl-dominated community, subject to natural processes *Community distribution.* Conserve the following community types in a natural condition: Intertidal sandy mud community complex; Intertidal sand community complex; Fine to medium sand with bivalves community complex; Sandy mud to mixed sediment community complex; Mixed sediment dominated by Mytilidae community complex; Shingle; Fucoid-dominated community complex; Laminaria-dominated community complex; and Shallow sponge-dominated community complex. **Potential Impact** The proposed survey corridor on Ballyloughane Beach is not within the area defined as Large shallow inlets and bays in Galway Bay Complex SAC (Figure 34). However, subtidal elements of the project are within the area. The sensitive communities Zostera-dominated community complex and the maërl-dominated community as outlined in (Figure 32) and in MERC (2006) are avoided by the proposed cable route. However, groundtruthing in the area proximate to the proposed survey route by video camera identified additional Maerl areas in addition to a *Virgularia mirabilis* habitat. The proposed survey route has been designed to avoid significant maerl (Conservation Interest) areas. Additional video surveys have previously been carried out in the vicinity of *Virgularia mirabilis* (not listed as a qualifying interest of this SAC). Routing of the survey route has been informed by the previously conducted subtidal surveys in 2021 so as to cause minimal impact on this sensitive subtidal *Virgularia mirabilis* community that is not a feature of interest of the SAC. Minor sedimentation may occur in the vicinity of the survey works. Maerl distribution in the area was sparse, as observed by video surveys and given the shallow nature of the area within Galway Bay impacts of sedimentation would be temporary and not significant due to wave action within the shallow elements of Galway Bay. The proposed survey route will pass through Intertidal sandy mud community complex, Sandy mud to mixed sediment community complex, and Mixed sediment dominated by Mytilidae community complex within the SAC. Short term disturbance of these habits will occur as a result of the proposed survey works (incl. grab samples, CBTs, and cores) which would result in compression and suspension of sediment within the immediate vicinity of the cable survey corridor.

Annex Species/Habitats-Qualifying Interest	Overall Conservation Status	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		Mitigation measures (Section 6 of NIS) will be in place to minimise potential minor adverse impacts. No significant adverse effects are foreseen on the attributes or targets of Large shallow inlets and bays in Galway Bay Complex SAC.
[1170] Reefs	**Bad**	**To maintain the favourable conservation condition of Reefs in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Distribution.* The distribution of reefs is stable or increasing, subject to natural processes. (Figure 16) for mapped distribution *Habitat area.* The permanent habitat area is stable, subject to natural processes. *Community extent.* Maintain the extent of the Mytilus-dominated reef community, subject to natural processes *Community structure:* Mytilus density Individuals per m² Conserve the high quality of the Mytilus-dominated reef community, subject to natural processes *Community structure Biological composition.* Conserve the following community types in a natural condition: Fucoid dominated community complex; Laminaria dominated community complex; and Shallow sponge-dominated community complex. **Potential Impact** The proposed survey corridor is within the SAC and passes through this SAC. The survey works will be in the marine subtidal and in the terrestrial/intertidal elements of Ballyloughane Strand. It is proposed to avoid all areas of reef within Galway Bay (Figure 35). Based on an assessment of subtidal video, baseline survey information in addition to Infomar data, the proposed project will not cross reef habitat within the SAC. The proposed survey works could result in minor localised sedimentation where reef areas that are adjacent to the works. However, these impacts would be localised and temporary in the shallow areas of the SAC where reef areas are susceptible to wave action. Lager sediment particles would be expected to remain in the immediate vicinity of the works while finer particles may travel beyond the immediate vicinity of the cable route. It would be expected that these finer particles would be removed in the short term by wave action /currents within Galway Bay. The habitat area of reefs would not be impacted by the proposed project. No significant adverse effects are foreseen to attributes or targets of Reefs in Galway Bay Complex SAC.
[1220] Perennial vegetation of stony banks	**Inadequate**	**To maintain the favourable conservation condition of Perennial vegetation of stony banks in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target)

Annex Species/Habitats- Qualifying Interest	Overall Conservation Status	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		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. See Figure 18 for mapped locations *Physical structure: functionality and sediment supply.* (Presence/ absence of physical barriers) 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 composition: typical species and sub-communities* (Percentage cover at a representative sample of monitoring stops) Maintain the typical vegetated shingle flora including the range of subcommunities within the different zones. Typical species include sea sandwort (*Honckenya peploides*), sea beet (*Beta vulgaris ssp maritima*), rock samphire (*Crithmum maritimum*), sea mayweed (*Tripleurospermum maritimum*), yellow-horned poppy (*Glaucium flavum*) and sea campion (*Silene uniflora*) *Vegetation composition: typical species and sub-communities* (Percentage cover) Negative indicator species (including non-natives) to represent less than 5% cover. **Potential Impact** As seen in Figure 38, Perennial vegetation of stony banks are not located in the vicinity of the proposed survey route and were not observed during fieldwork at Ballyloughane Strand. Impacts would be restricted to the immediate vicinity of the proposed survey route. No significant adverse effects are foreseen on attributes or targets of Perennial vegetation of stony banks in Galway Bay Complex SAC.
[1310] Salicornia and other annuals colonising mud and sand	**Inadequate**	**To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in Galway Bay Complex 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 sub-sites mapped: Barna House - 0.067ha, Seaweed Point - 0.003ha, Roscam West and South -0.023ha, Kilcaimin - 0.015, Kileenaran - 0.007ha, Kinvara West - 0.017ha, Scanlan's Island - 0.117ha, Tawin Island - 1.098ha. See Figure 19. *Habitat distribution.* No decline, or change in habitat distribution, subject to natural processes. *Physical structure: sediment supply* Maintain/restore, natural circulation of sediments and organic matter, without any physical obstructions. *Physical structure: creeks and pans.* Occurrence Maintain, or where necessary restore creek and pan structure, subject to natural processes, including erosion and succession *Physical structure: flooding regime.* Maintain natural tidal regime

Annex Species/Habitats- Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		Vegetation structure: zonation. Occurrence Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. *Vegetation structure: vegetation height*. Maintain structural variation within sward *Vegetation structure: vegetation cover.* Maintain more than 90% of area outside creeks vegetated *Vegetation composition: typical species and subcommunities* Maintain the range of species-poor communities with typical species listed in SMP (McCorry and Ryle, 2009) *Vegetation structure: negative indicator species – Spartina anglica* There is currently no common cordgrass (*Spartina anglica*) in this SAC. Prevent establishment of cordgrass. **Potential Impact** As seen in Figure 39, Salicornia and other annuals colonising mud and sand are not located in the vicinity of the proposed survey route. Impacts would be restricted to the immediate vicinity of the proposed survey route. No significant adverse effects are foreseen on attributes or targets of Salicornia and other annuals colonising mud and sand in Galway Bay Complex SAC.
1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	**Inadequate**	**To restore the favourable conservation condition of Atlantic salt meadows (Glauco- Puccinellietalia maritimae) in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Habitat area* Area increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Barna House - 2.33ha, Seaweed Point - 1.41ha, Roscam West and South - 3.30ha, Oranmore North - 4.24ha, Kilcaimin - 6.82ha, Tawin Island - 53.85ha, Tyrone House- Dunbulcaun Bay - 9.83ha, Kileenaran - 15.37ha, Kinvara West - 13.33ha, Scanlan's Island - 4.13ha. See Figure 19 *Habitat distribution.* No decline or change in habitat distribution, subject to natural processes. *Physical structure: sediment supply.* Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions. *Physical structure: creeks and pans.* Maintain creek and pan structure, subject to natural processes, including erosion and succession. *Physical structure: flooding regime.* Maintain natural tidal regime. *Vegetation structure: zonation*. Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. *Vegetation structure: vegetation height.* Maintain structural variation within sward. *Vegetation structure: Percentage cover at a representative sample of monitoring stops*. Maintain more than 90% area outside creeks vegetated.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		Vegetation composition: typical species and subcommunities Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009). *Vegetation structure: negative indicator species – Spartina anglica* There is currently no common cordgrass (Spartina anglica) in this SAC. Prevent establishment of cordgrass. **Potential Impact** As seen in Figure 39, Atlantic salt meadows are not located in the vicinity of the proposed survey route. Impacts would be restricted to the immediate vicinity of the proposed survey route. No significant adverse effects are foreseen on attributes or targets of Atlantic salt meadows in Galway Bay Complex SAC.
1410 Mediterranean salt meadows (Juncetalia maritimi)	**Inadequate**	**To restore the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in Galway Bay Complex 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 sub-sites mapped: Barna House - 0.282ha, Seaweed Point - 0.931ha, Kilcaimin - 0.005ha, Tawin Island - 1.799ha. Tyrone House- Dunbulcan Bay - 8.184ha, Kileenaran - 0.271ha. See Figure 19. *Habitat distribution.* (Occurrence) No decline, subject to natural processes. *Physical structure: sediment supply*. Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions. *Physical structure: creeks and pans.* Maintain creek and pan structure, subject to natural processes, including erosion and succession *Physical structure: flooding regime.* Maintain natural tidal regime. *Vegetation structure: zonation.* Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession. *Vegetation structure: vegetation height.* Maintain structural variation in the sward. *Vegetation structure: vegetation cover.* Maintain more than 90% of area outside creeks vegetated. *Vegetation composition: typical species and subcommunities*. Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009) *Vegetation structure: negative indicator species – Spartina anglica* There is currently no common cordgrass (Spartina anglica) in this SAC. Prevent establishment of cordgrass. **Potential Impact** As seen in Figure 39, Mediterranean salt meadows are not located in the vicinity of the proposed survey route. Impacts would be restricted to the immediate vicinity of the proposed survey route.

Annex Species/Habitats- Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		No significant adverse effects are foreseen on attributes or targets of Mediterranean salt meadows (*Juncetalia maritimi*) in Galway Bay Complex SAC.
[3180] Turloughs	**Inadequate**	**To maintain the favourable conservation condition of Turloughs in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Habitat area.* Area stable at c.59ha or increasing, subject to natural processes. See Figure 16. *Habitat distribution.* No decline, subject to natural processes. *Hydrological regime: flood duration, frequency, area, depth; permanently flooded area.* Appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat *Soil type: area.* Variety, area and extent of soil types necessary to support Turlough vegetation and other biota *Soil nutrient status: nitrogen and phosphorous*. Nutrient status appropriate to soil types. *Physical structure: bare ground*. Sufficient wet bare ground, as appropriate *Chemical processes: calcium carbonate deposition and concentration* Appropriate CaCO3 deposition rates and concentration in soil *Water quality: nutrients; colour; phytoplankton; epiphyton.* Appropriate water quality to support the natural structure and functioning of the habitat *Active peat formation.* Active peat formation, where appropriate *Vegetation composition: area of vegetation communities.* Maintain area of sensitive and high conservation value vegetation communities/units at each turlough *Vegetation composition: vegetation zonation.* Maintain vegetation zonation/mosaic characteristic of each turlough *Vegetation structure: sward height.* Sward heights appropriate to the vegetation unit, and a variety of sward heights across each turlough *Typical species: terrestrial, wetland and aquatic plants, invertebrates and birds.* Maintain typical species within and across all turloughs *Fringing habitats: area.* Maintain marginal fringing habitats that support turlough vegetation, invertebrate, mammal and/or bird populations *Vegetation structure: Turlough woodland*. Maintain appropriate turlough woodland diversity and structure. **Potential Impact** As seen in Figure 33, Turloughs are not located in the vicinity of the proposed survey route. Impacts would be restricted to the immediate vicinity of the proposed survey route.

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		No significant adverse effects are foreseen on attributes or targets of Turloughs in Galway Bay Complex SAC.
[5130] *Juniperus communis* formations on heaths or calcareous grasslands	**Inadequate**	**To restore the favourable conservation condition of *Juniperus communis* formations on heaths or calcareous grasslands in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Habitat area.* Area stable or increasing, subject to natural processes. At least 1.4ha at mapped location. See Figure 14. *Habitat distribution.* No decline. *Juniper population size.* At least 50 plants *Formation structure: cover and height.* Well-developed structure with an open to closed cover of juniper up to or exceeding 0.5 m in height with associated species. *Formation structure: community diversity and extent*. Appropriate diversity and extent of formation. *Formation structure: cone bearing plants.* At least 10% of plants bearing cones. *Formation structure: seedling recruitment.* At least 10% of juniper plants within the formation are seedlings. *Formation structure: dead plants.* Not more than 10% of plants dead. *Vegetation composition: typical species.* A variety of typical native species with a minimum of 10 species present (excluding negative indicator species) *Vegetation composition: negative indicator species.* Negative indicator species, particularly non-native invasive species, absent or under control. **Potential Impact** As seen in Figure 33, *Juniperus communis* formations on heaths or calcareous grasslands are not located in the vicinity of the proposed survey route. Impacts would be restricted to the immediate vicinity of the proposed survey route. No significant adverse effects are foreseen on attributes or targets of *Juniperus communis* formations on heaths or calcareous grasslands in Galway Bay Complex SAC.
[6210] Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)(*important orchid sites)	**Bad**	**To maintain the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) in Galway Bay Complex, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Habitat area.* Area stable or increasing, subject to natural processes *Habitat distribution.* No decline, subject to natural processes *Vegetation composition: broadleaf herb: grass ratio*. Broadleaf herb component of vegetation between 40 and 90% *Vegetation composition: typical species.* At least 7 positive indicator species present, including 2 "high quality" species

Annex Species/Habitats-Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		Vegetation composition: negative indicator species. (Percentage) Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%. Non native invasive species, absent or under control. *Vegetation structure: sward height*. 30-70% of sward 5-40cm high *Vegetation structure: woody species and bracken (Pteridium aquilinum).* Cover of bracken (*Pteridium aquilinum*) and woody species (except juniper (*Juniperus communis*)) not more than 5% cover. *Physical structure: bare ground.* Not more than 10% bare ground **Potential Impact** Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) are terrestrial and not located in the vicinity of the proposed survey route. Impacts would be restricted to the immediate vicinity of the proposed survey works. No significant adverse effects are foreseen on attributes or targets of Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco Brometalia*) in Galway Bay Complex SAC.
[7210] Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*	**Bad**	**To maintain the favourable conservation condition of Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:** *(Attribute.* Target) *Habitat area.* Area stable or increasing, subject to natural processes. The full extent of this habitat within the SAC is currently unknown. Fen vegetation occurs in wetland areas to the east of Oranmore (Internal NPWS files). It has also been recorded in Ballindereen Lough. *Habitat distribution.* No decline, subject to natural processes *Hydrological regime.* Appropriate natural hydrological regime necessary to support the natural structure and functioning of the habitat. *Peat formation*. Active peat formation, where appropriate *Water quality: nutrients*. Appropriate water quality to support the natural structure and functioning of the habitat. *Vegetation composition: typical species.* Maintain vegetation cover of typical species including brown mosses and vascular plants *Vegetation composition: trees and shrubs.* Cover of scattered native trees and shrubs not more than than 10% *Physical structure: disturbed bare ground*. Percentage Cover of disturbed bare ground not more than 10%. Where tufa is present, disturbed bare ground not more than 1% *Physical structure: drainage*. Areas showing signs of drainage as a result of drainage ditches or heavy trampling not more than 10%. **Potential Impact** Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* not located in the vicinity of the proposed survey route.

Annex Species/Habitats- Qualifying Interest	Overall Conservation Status	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		Impacts would be restricted to the immediate vicinity of the proposed survey works. No significant adverse effects are foreseen on attributes or targets of Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* in Galway Bay Complex SAC.
7230 Alkaline fens	**Bad**	**To maintain the favourable conservation condition of Alkaline fens in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:** (*Attribute.* Target) *Habitat area.* Area stable or increasing, subject to natural processes *Habitat distribution.* No decline, subject to natural processes. Full distribution of this habitat in this SAC is currently unknown. *Hydrological regime*. Appropriate natural hydrological regime necessary to support the natural structure and functioning of the habitat *Peat formation*. Active peat formation, where appropriate *Water quality: nutrients.* Appropriate water quality to support the natural structure and functioning of the habitat *Vegetation composition: typical species.* Maintain vegetation cover of typical species including brown mosses and vascular plants. *Vegetation composition: trees and shrubs*. Cover of scattered native trees and shrubs less than 10% *Physical structure: disturbed bare ground.* Cover of disturbed bare ground less than 10%. Where tufa is present, disturbed bare ground less than 1% *Physical structure: drainage.* Areas showing signs of drainage as a result of drainage ditches or heavy trampling less than 10% **Potential Impact** Alkaline fens not located in the vicinity of the proposed survey route. Impacts would be restricted to the immediate vicinity of the survey works. No significant adverse effects are foreseen on attributes or targets of Alkaline fens in Galway Bay Complex SAC.
[8240] Limestone pavements	**Inadequate**	**To maintain/restore the favourable conservation condition of Limestone pavements in Galway Bay Complex SAC.** **Potential Impact** The survey route is not within or proximal to Limestone pavements, which are located along the southern fringes of this SAC. No

Annex Species/Habitats- Qualifying Interest	Overall Conservation Status	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		significant adverse effects are foreseen on Limestone pavements in Galway Bay Complex SAC.
[1355] Otter *Lutra lutra*	**Favourable**	**To restore the favourable conservation condition of Otter in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:** (*Attribute.* Target) *Distribution.* No significant decline. *Extent of terrestrial habitat.* No significant decline. Area mapped and calculated as 262ha above high water mark (HWM); 14ha along river banks/around ponds. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007) (Figure 41) *Extent of marine habitat.* No significant decline. *Extent of freshwater (river) habitat.* No significant decline. *Extent of freshwater (lake/lagoon) habitat.* No significant decline. *Couching sites and holts*. No significant decline *Fish biomass available.* No significant decline *Barriers to connectivity.* No significant increase. **Potential Impact** Otters may be present within the proposed landfall and shallow intertidal area. Short term disturbance may occur but it should be noted, as outlined in the Conservation Objectives Supporting Document that significant existing human disturbance occurs at Ballyloughane Beach. Disturbance in this area would be temporary in an area of human disturbance and in close proximity to Galway Port where there is marine vessel activity. No holts or couches were noted during fieldwork. The works will not significantly impact fish biomass or introduce barriers to connectivity. Mitigation measures are proposed (Section 6 of NIS), including having an ecologist on site during intertidal/shallow subtidal works.
[1365] Harbour seal *Phoca vitulina*	**Favourable**	**To maintain the favourable conservation condition of Harbour Seal in Galway Bay Complex SAC, which is defined by the following list of attributes and targets:** (*Attribute.* Target) *Access to suitable habitat.* Species range within the site should not be restricted by artificial barriers to site use. See Figures 42-45. *Breeding behaviour.* Conserve breeding sites in a natural condition. *Moulting behaviour.* Conserve moult haul-out sites in a natural condition. *Resting behaviour.* Conserve resting haul-out sites in a natural condition. *Disturbance*. Human activities should occur at levels that do not adversely affect the harbour seal population at the site. **Potential Impact**

Annex Species/Habitats- Qualifying Interest	**Overall Conservation Status**	*Site Specific Conservation Objectives*, attributes, targets and perceived impacts.
		Harbour seal may be present within the proximity of the survey route. Short term disturbance may occur but it should be noted, as outlined in the Conservation Objectives Supporting Document, that significant human disturbance occurs at Ballyloughane Beach. The proposed survey route is not proximal to resting and moulting sites. The proposed route is at least 1.5km from the nearest breeding sites at Earls Rock and Kilcolgan Point. Disturbance in this area would be temporary within the SAC in an area of human disturbance and in close proximity to Galway Port where there is marine vessel activity. The works will not significantly impact on haul out, resting or breeding sites. Further details on the potential effects of Mitigation measures are required (Section 6 of the NIS) in relation Marine Mammals during the project.

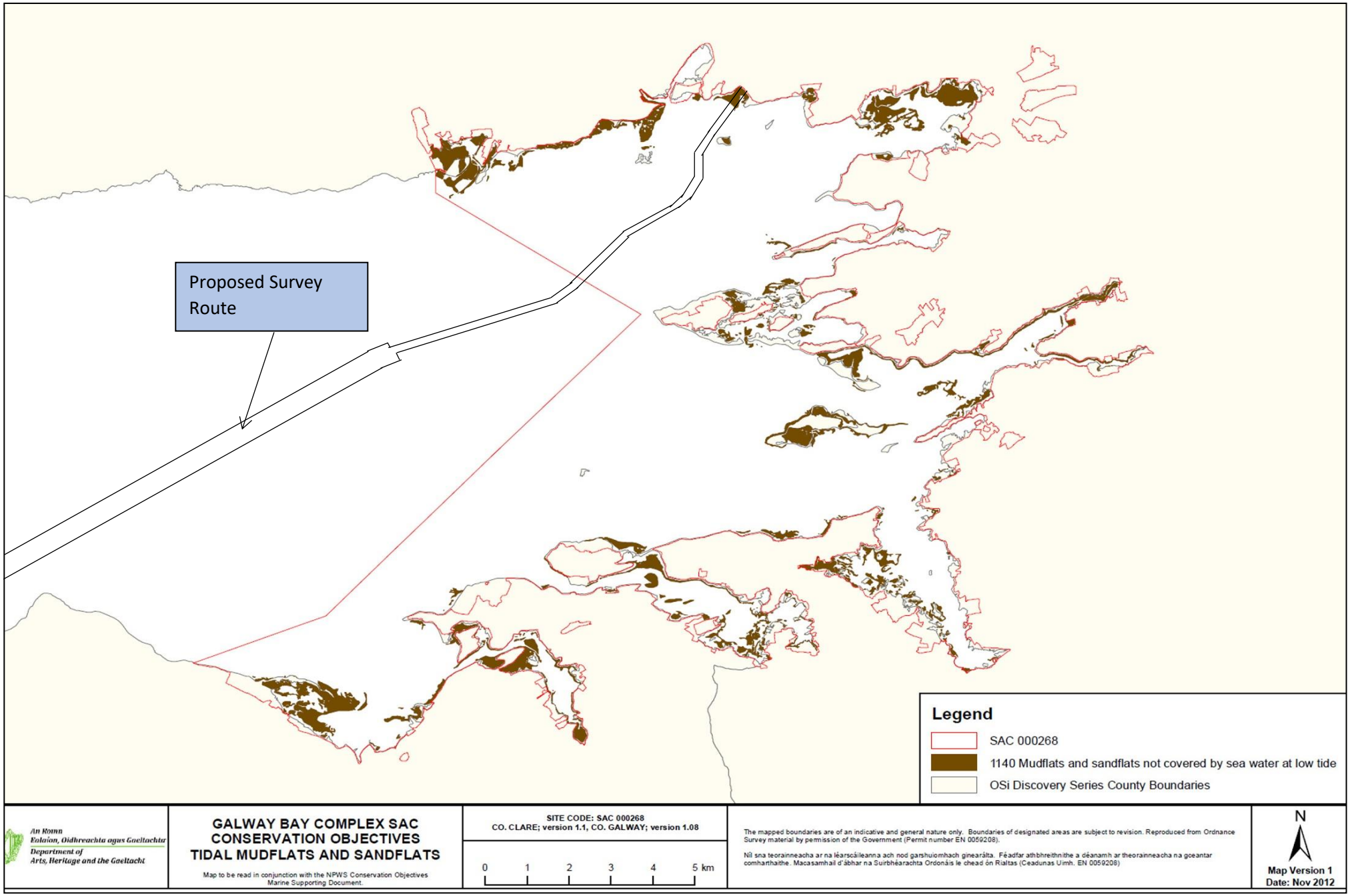

Figure 36. Location of Tidal Mudflats and Sandflats in Galway Bay Complex SAC.

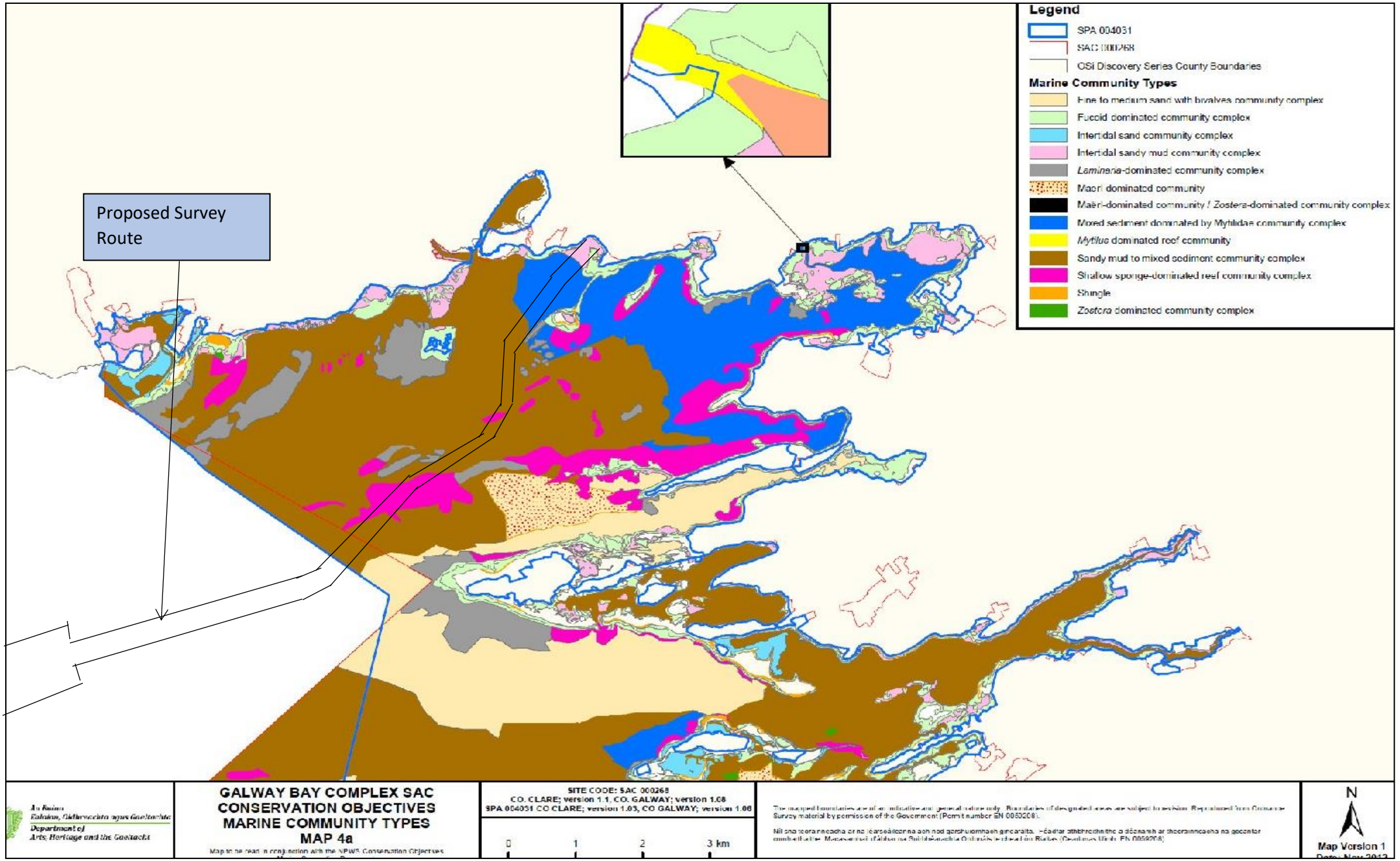

Figure 37. Marine Community Types (NPWS, 2013).

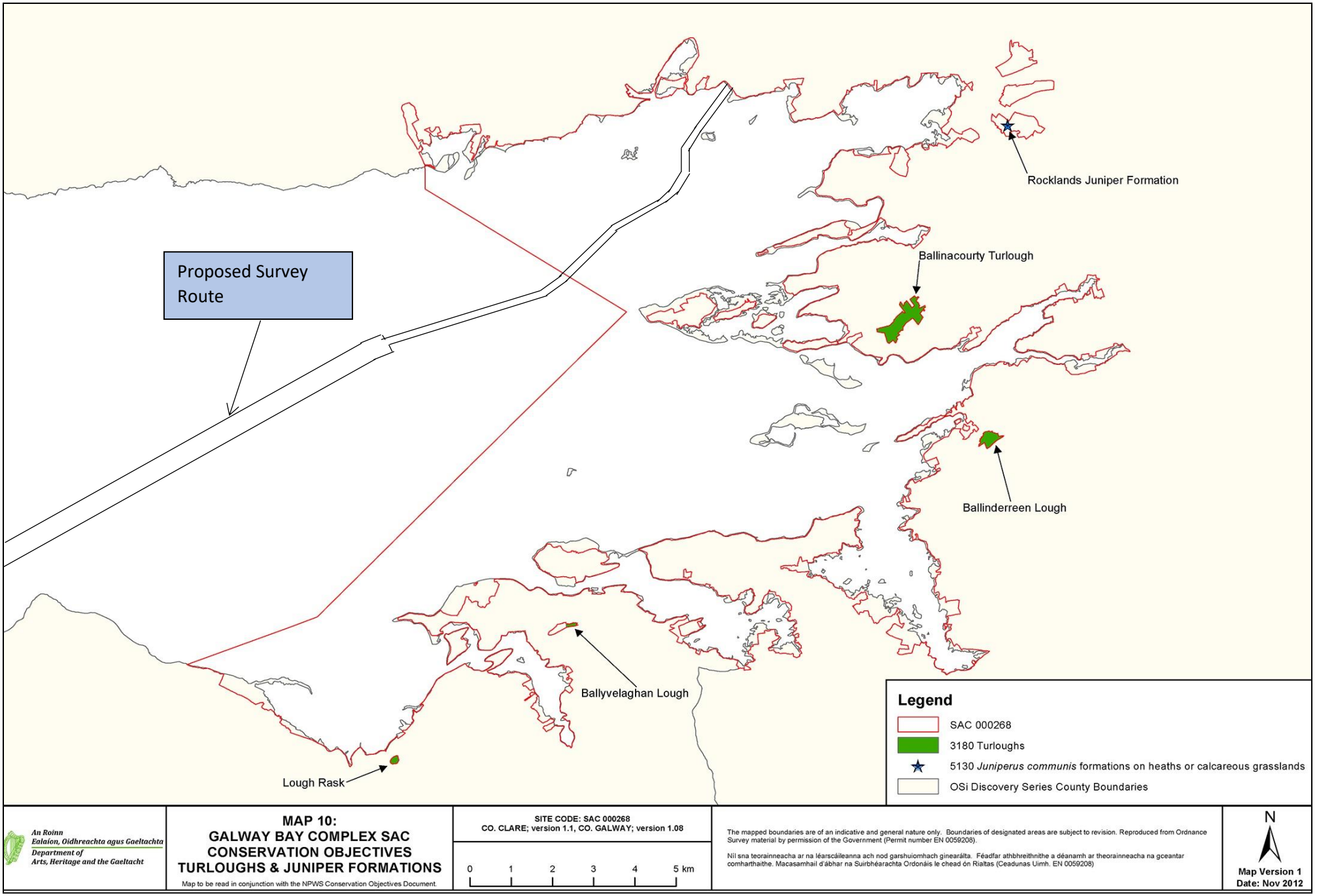

Figure 38. Location of Turloughs and Juniper formations in Galway Bay Complex SAC.

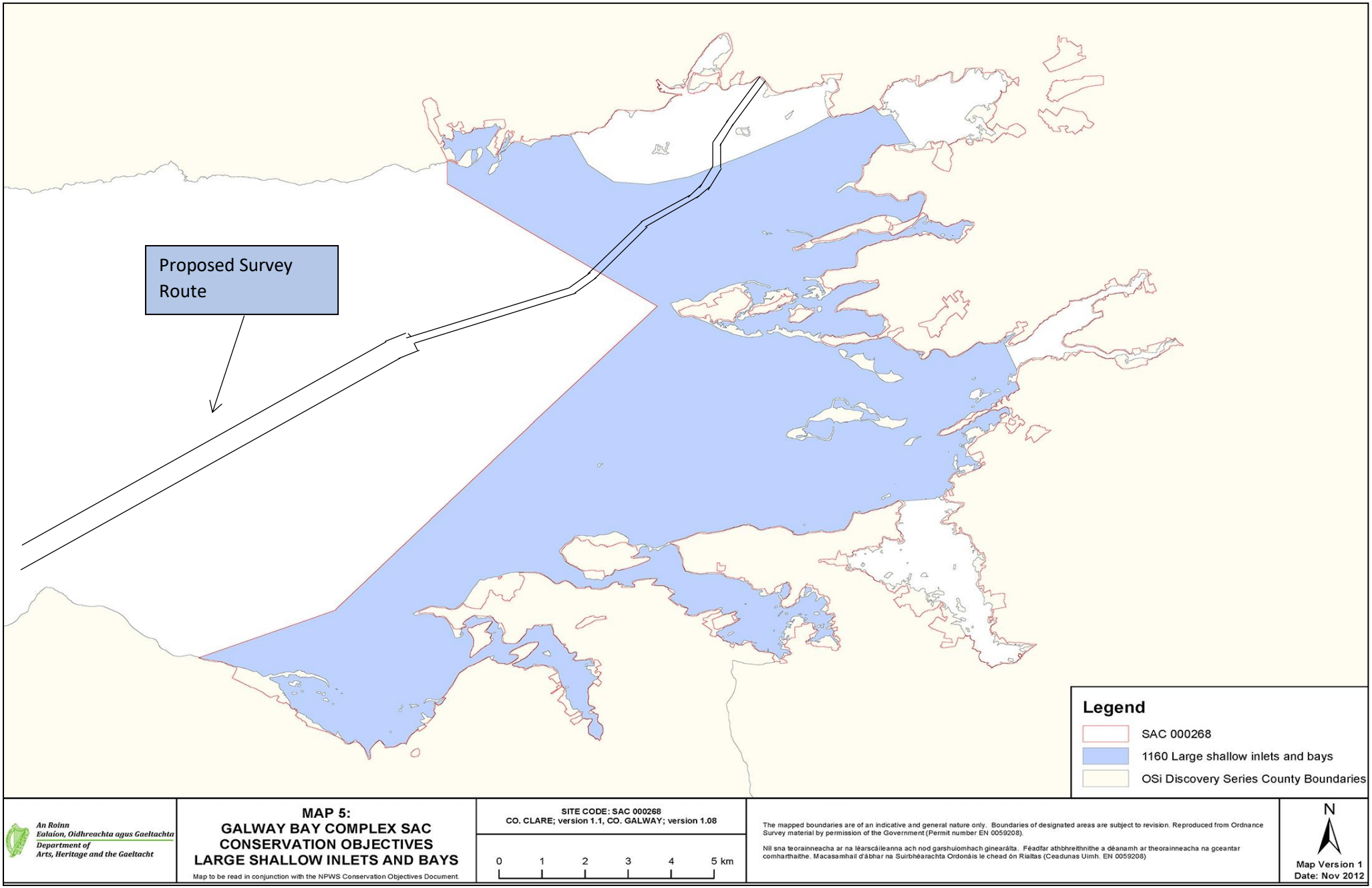

Figure 39. Location of Large Shallow inlets and Bays in Galway Bay Complex SAC.

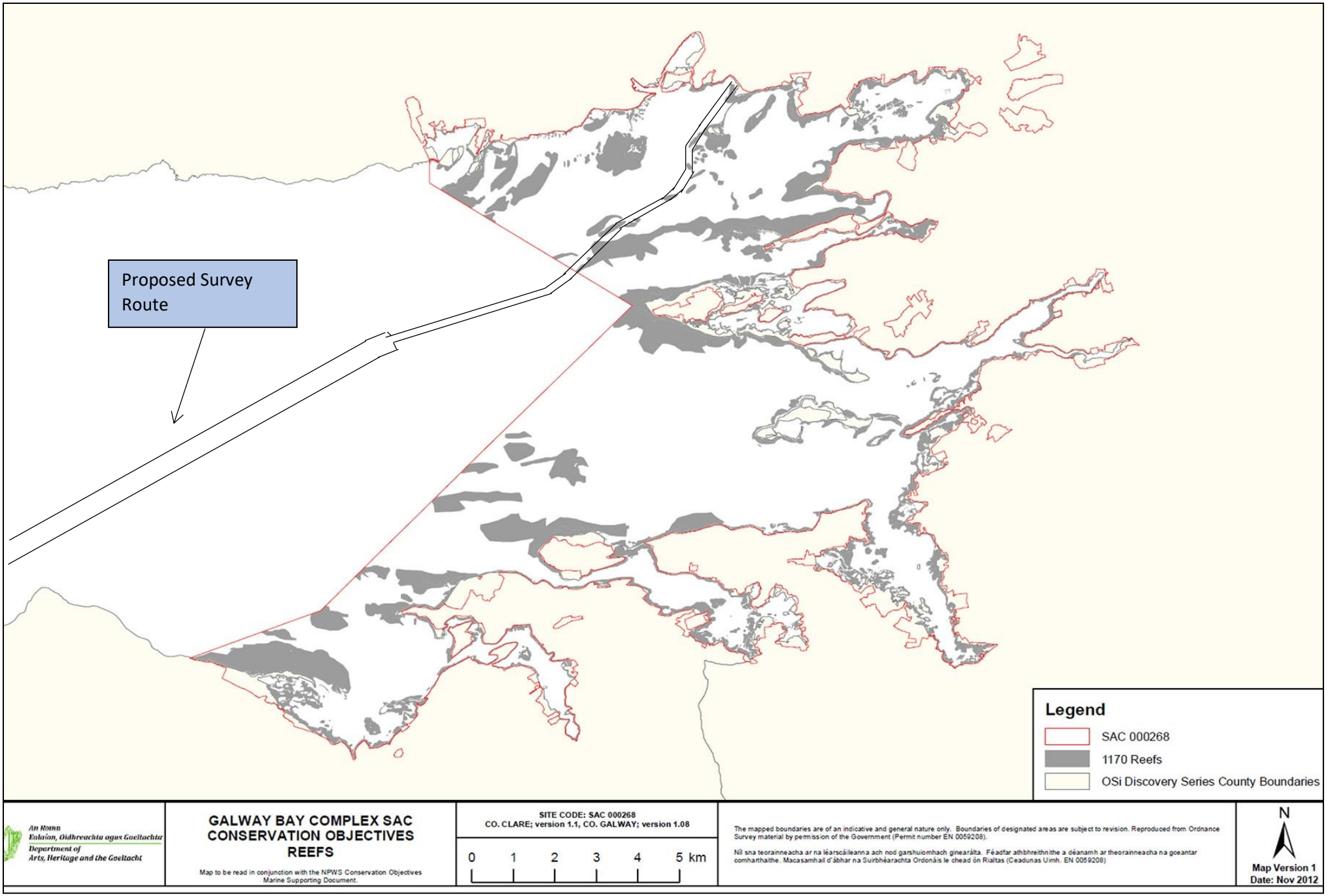

Figure 40. Location of Reefs in Galway Bay Complex SAC. (Inset location of proposed route accurately plotted in relation to "Rock" (red) habitat (i.e. reef).

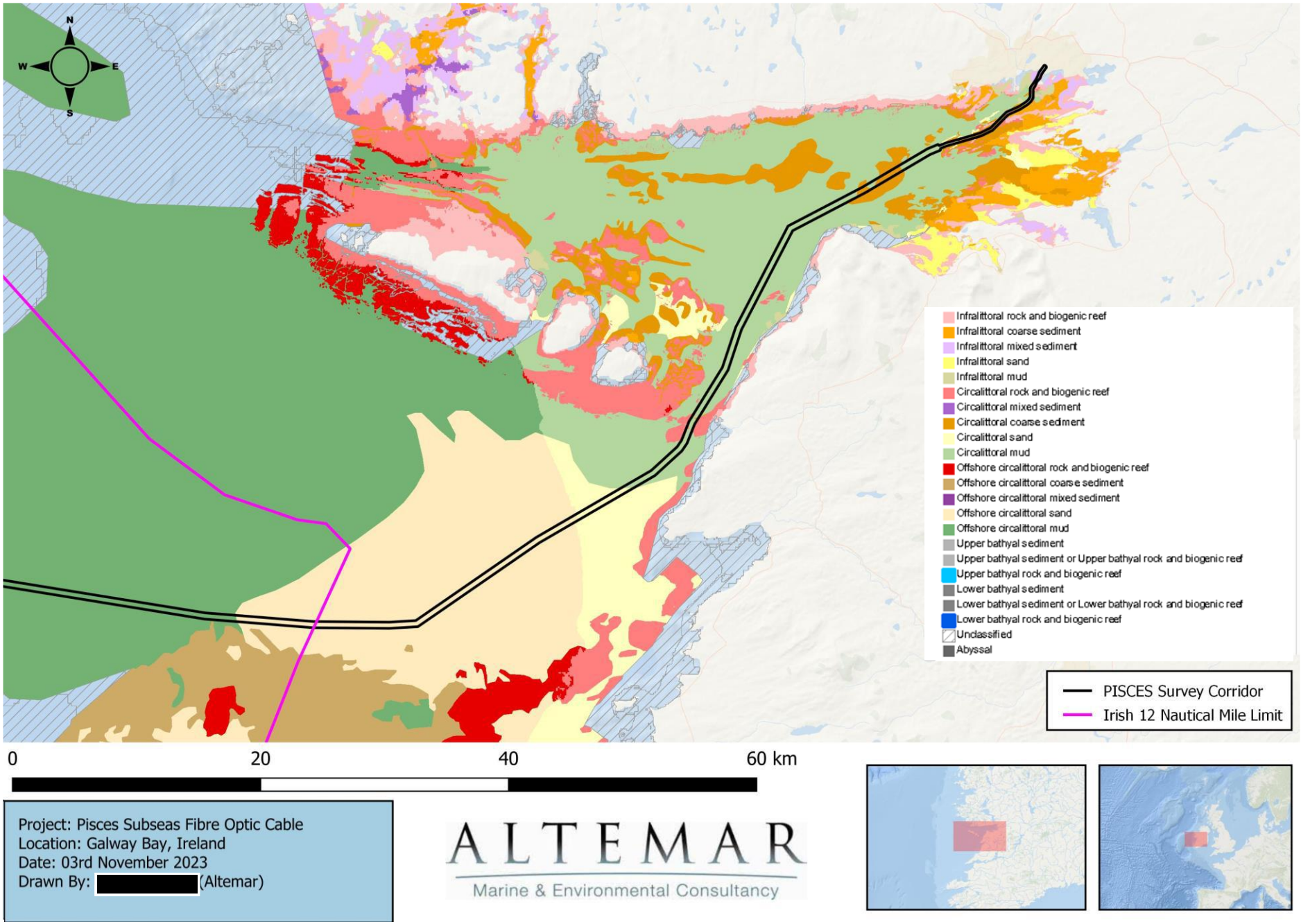

Figure 41. Predicted marine habitat data for the inshore section of the fibre optic cable survey route (Source EU Seamap (2019).

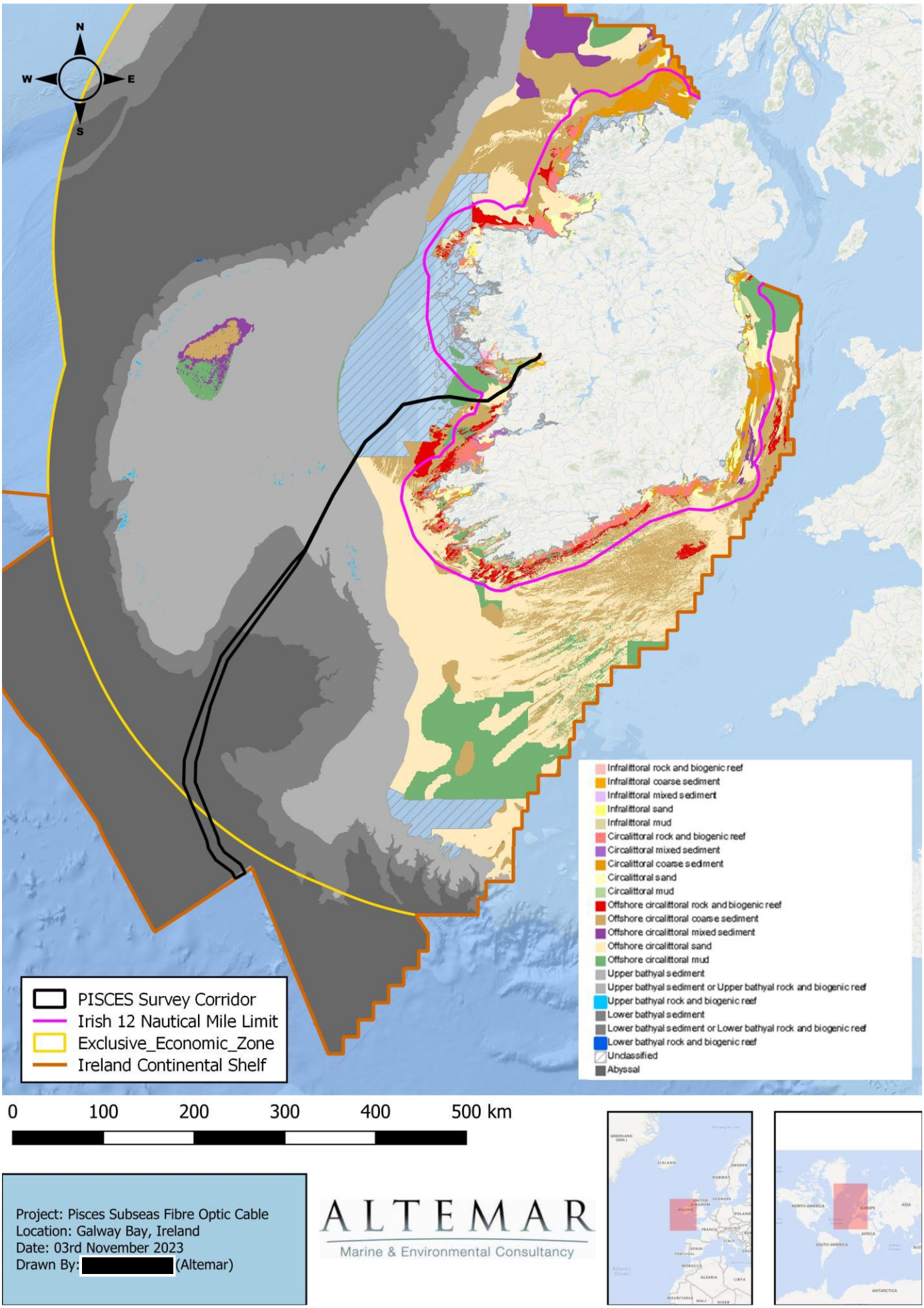

Figure 42. Predicted marine habitat data for the inshore section of the fibre optic cable survey route (Source EU Seamap (2019).

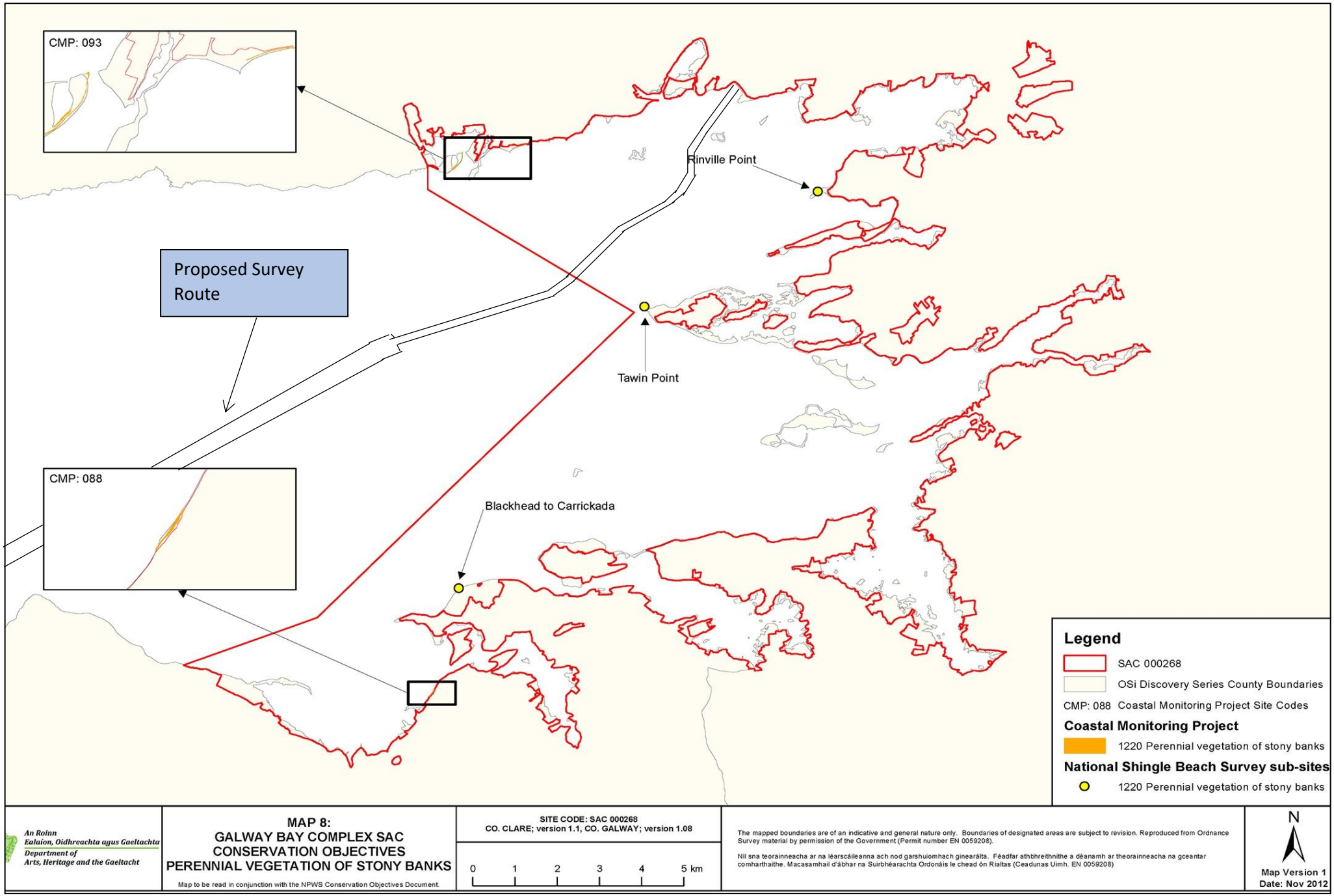

Figure 43. Location of Perennial vegetation of stony banks in Galway Bay Complex SAC.

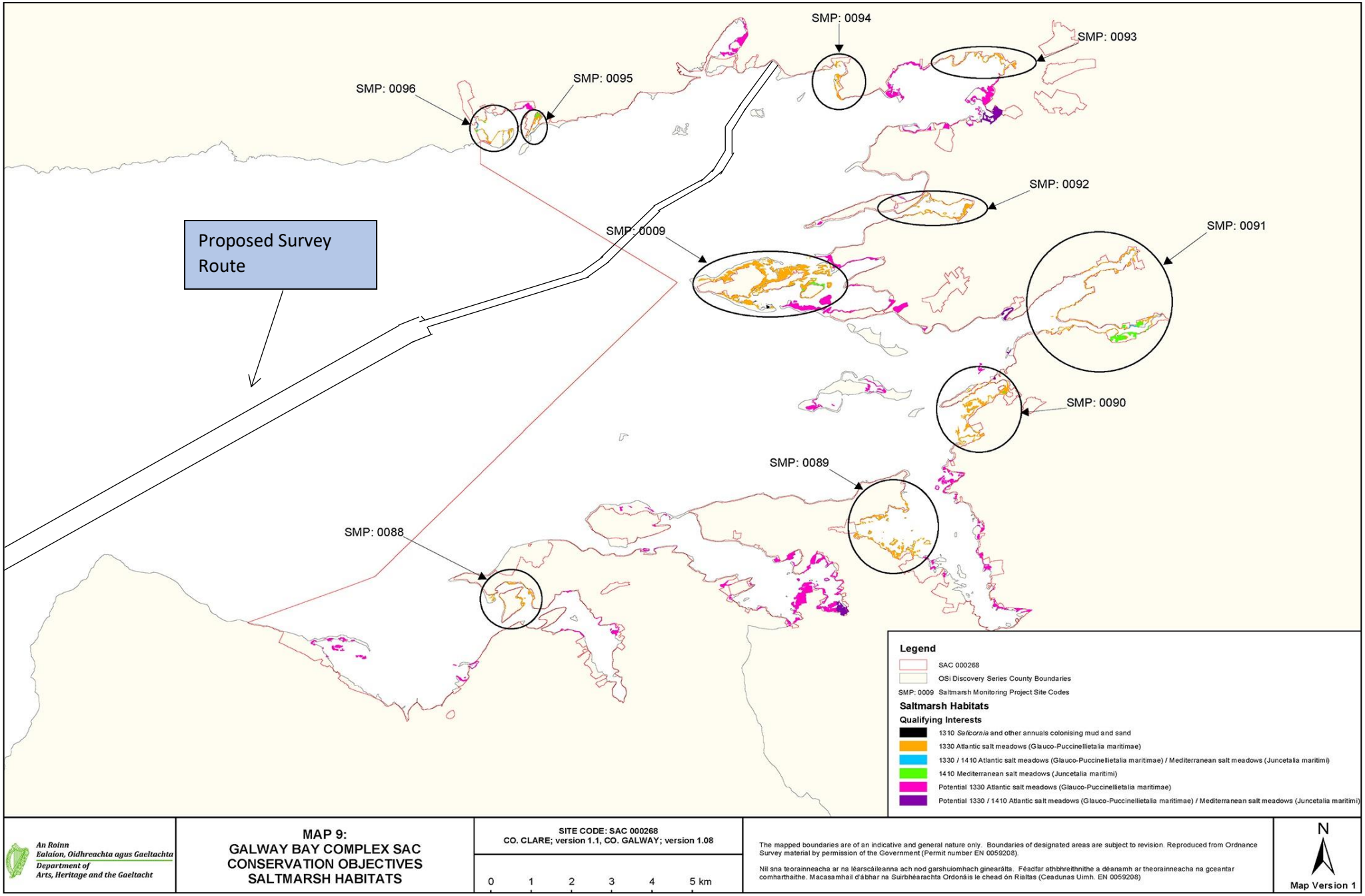

Figure 44. Location of Saltmarsh Habitats in Galway Bay Complex SAC.

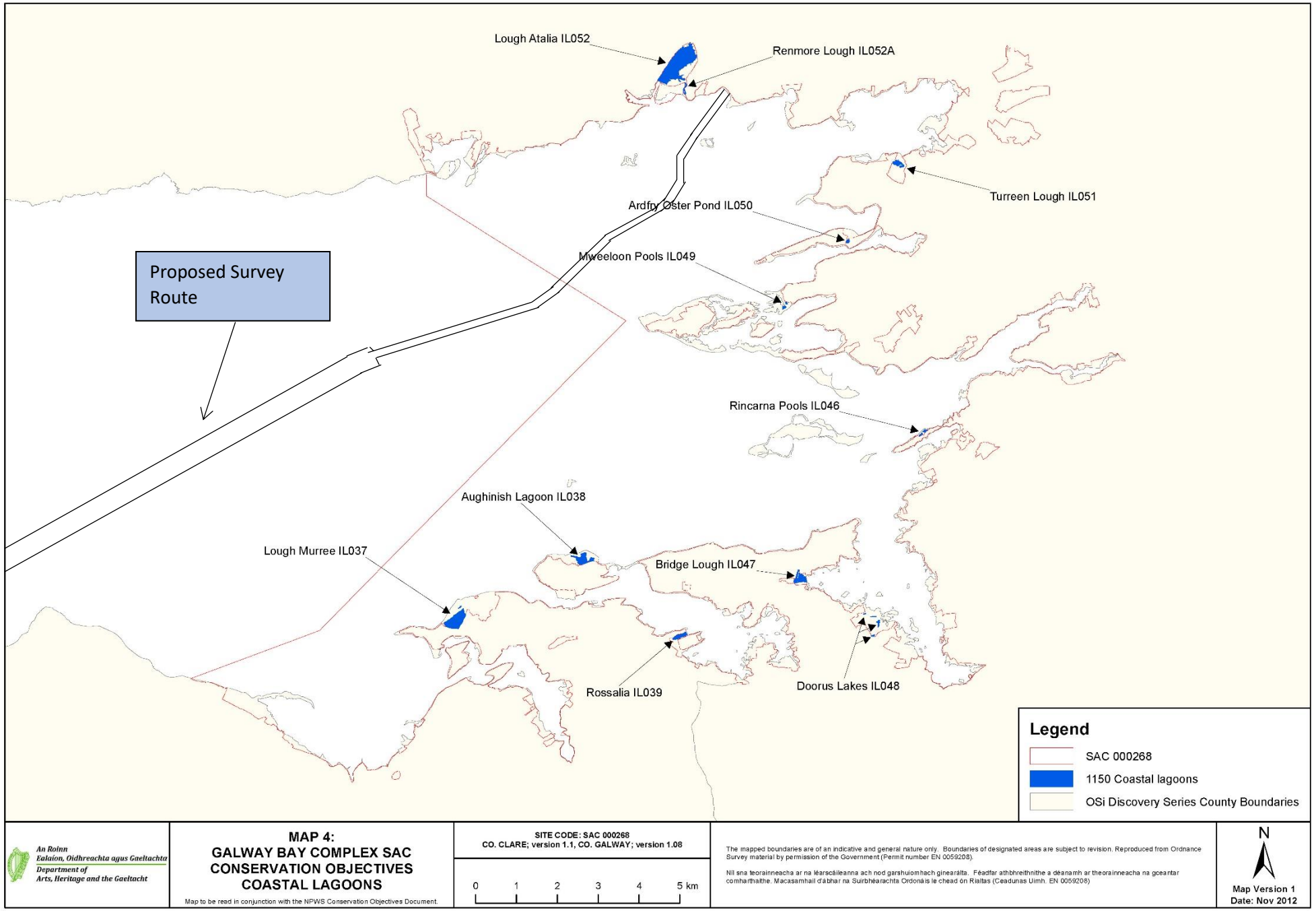

Figure 45. Coastal Lagoon Habitats in Galway Bay Complex SAC.

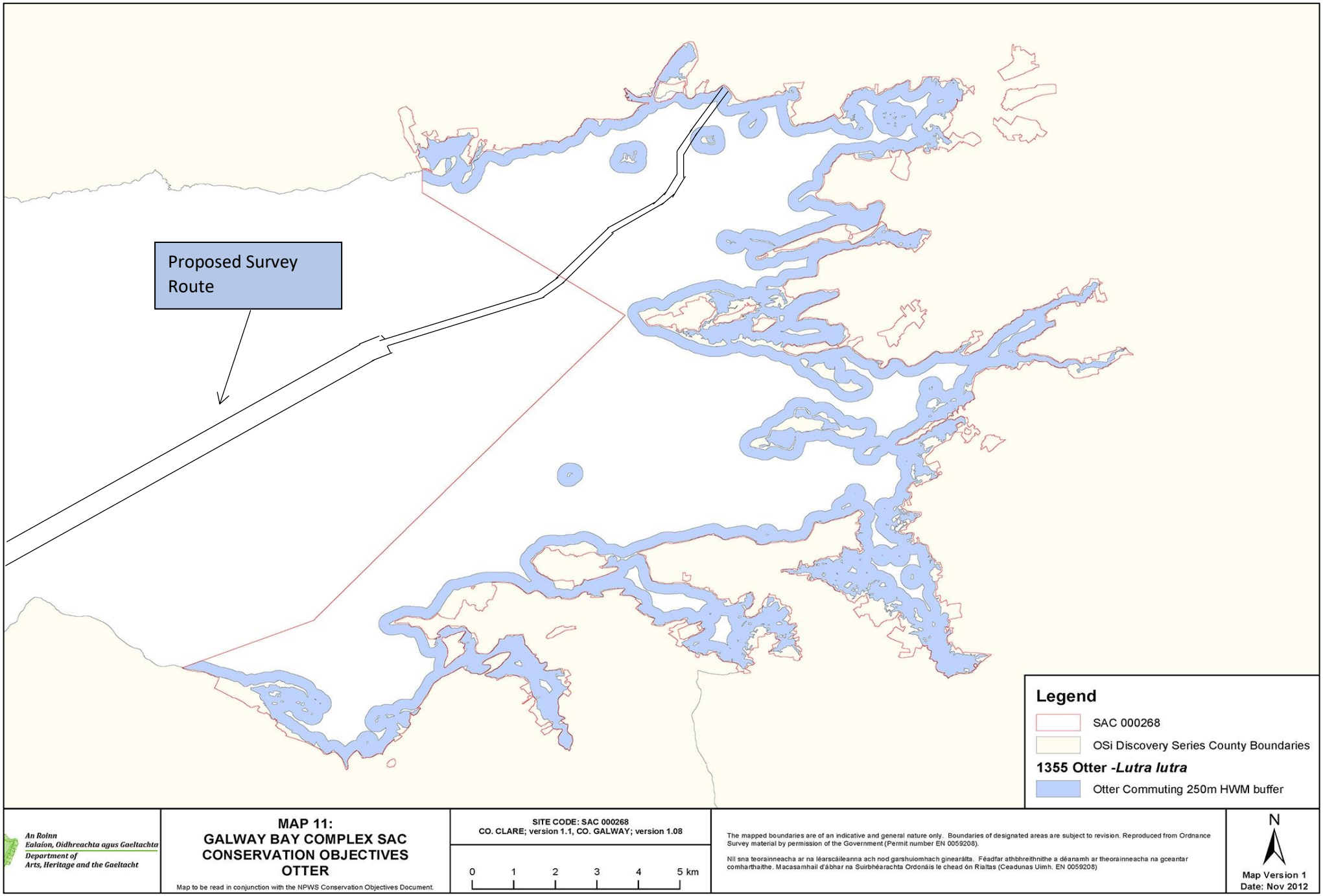

Figure 46. Location of otters in Galway Bay Complex SAC.

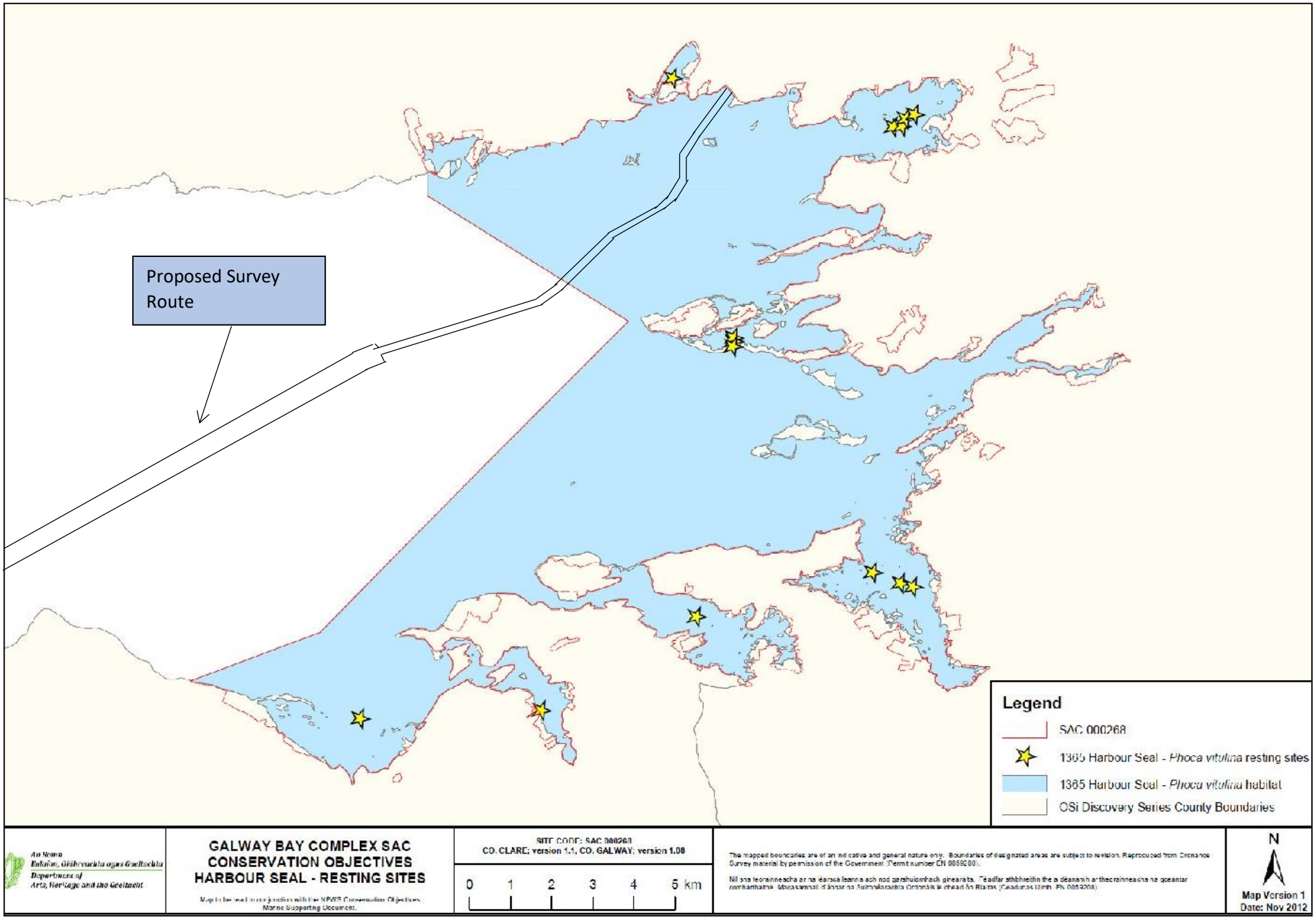

Figure 47. Harbour seal resting sites (NPWS, 2013).

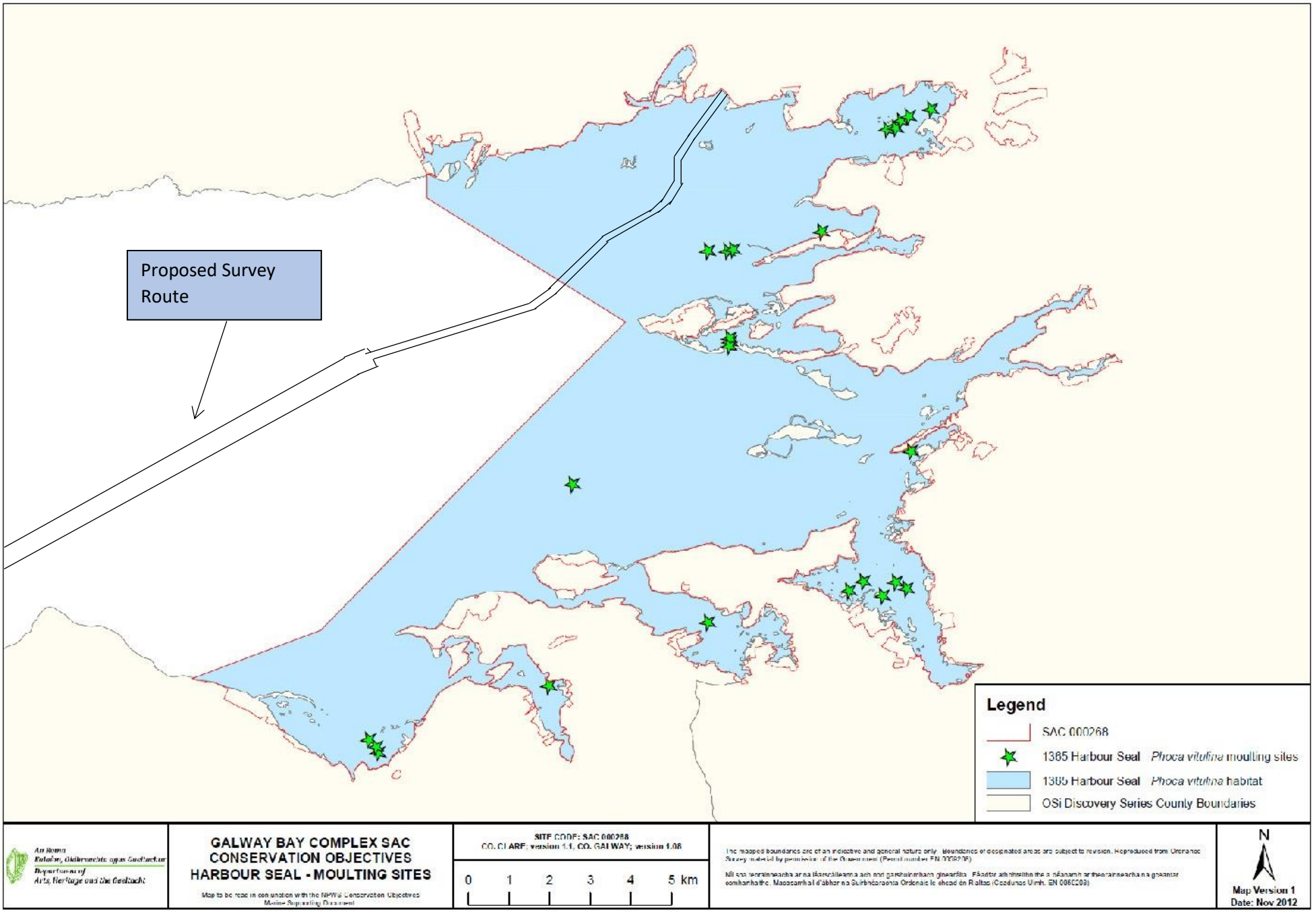

Figure 48. Harbour seal moulting sites (NPWS, 2013).

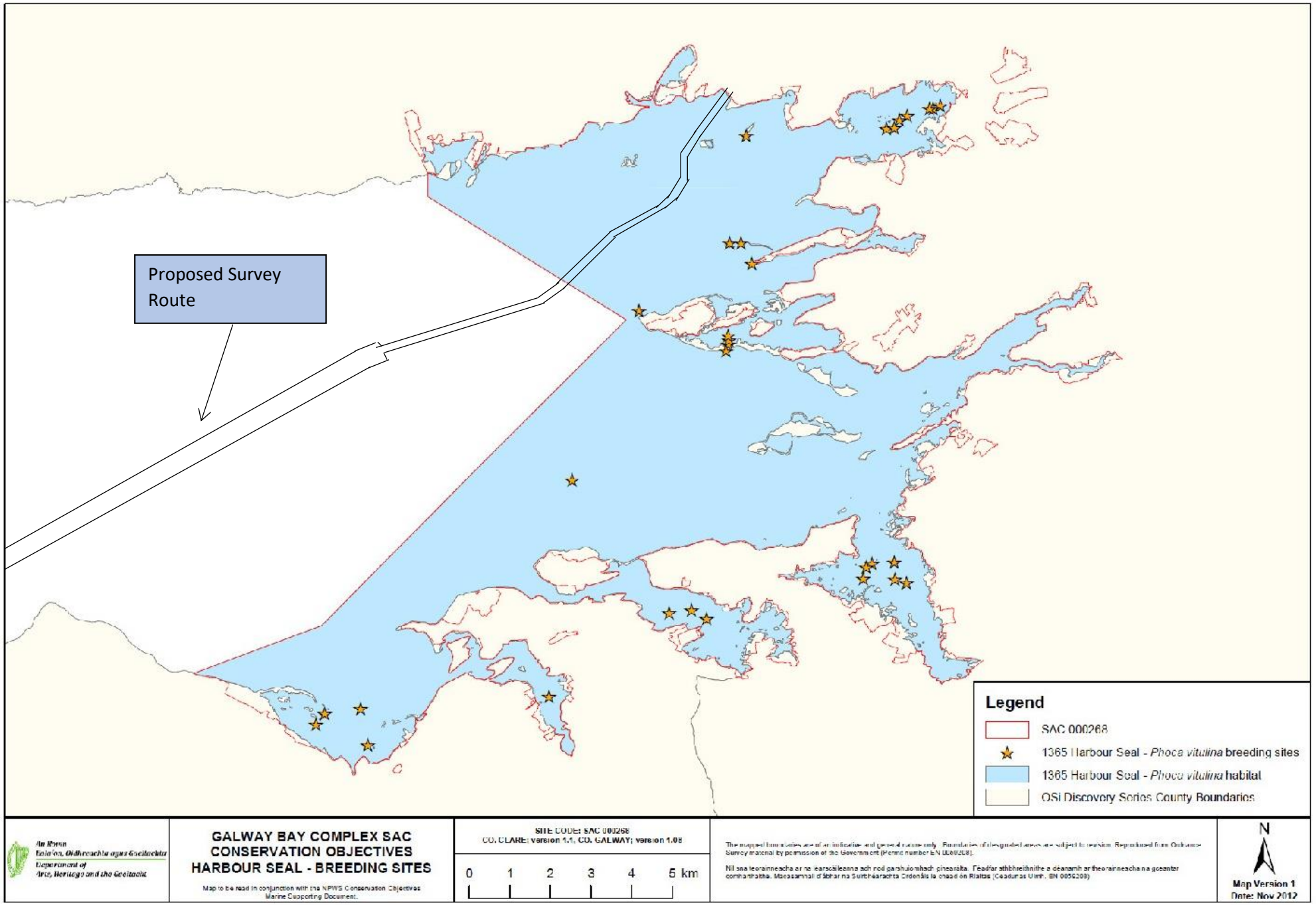

Figure 49. Harbour seal breeding sites (NPWS, 2013).

Additional Information on Sensitive Subtidal Communities

As seen in Figure 37 from the Conservation Objectives document (NPWS 2013) mixed sediment dominated by Mytilidae community complex and Sandy mud to mixed sediment community complex are predicted along the proposed survey route within the SAC.

Data from the NPWS 2006 Surveys of sensitive subtidal benthic communities in Slyne Head Peninsula SAC, Clew Bay Complex SAC and Galway Bay Complex SAC (MERC, 2006) was interrogated. The proposed survey route is not in the vicinity of recorded *Zostera marina* sites (Figure 37). The raw GIS data from this survey was overlaid on the proposed survey route and the route was designed to avoid recorded sensitive communities (See EcIA). A drop down video survey in the area of the proposed survey route was previously carried out within the SAC and 1km beyond the SAC, to identify the communities present and fine tune the proposed routing to avoid sensitive communities. *Virgularia mirabilis* and mearl communities (sprinkling on mixed sediment) were noted in several locations (Plates 1 & 2). Two additional dropdown video surveys were carried out in 2021 to map the distribution of Virgularia in an area proximate to the proposed survey route. The proposed survey route was informed by these surveys and the route was designed to minimise the impact on these sensitive communities where possible. Maerl beds are listed as a conservation interest of Galway Bay Complex SAC (Large Shallow Inlets and Bays community) while *Virgularia mirabilis* is a relatively rare subtidal community that has been mapped previously by NPWS in other SAC's. As outlined in MERC (2006) "*The over-riding feature of many of the maërl communities in this part of Galway Bay appears to be their nature. Rather than forming large beds of dense living and non-living maërl, in many cases the communities form a thin and broken veneer on top of various sedimentary seabed types, including fine and coarse sand, gravels, cobbles and muds in some instances. Where the veneer of maërl occurs with coarse gravel and cobbles, the maërl tends to occupy the spaces between grains. The covering frequently is only one layer thick (i.e. the thickness of a single rhodolith). Within these communities, the surface area covering of maërl can vary from 100% to as little as 10% and they were seen to stretch over very large areas of the seabed. Within these areas significant variability in the nature of the underlying sediments was also recorded. However the covering of maërl can be seen to extend throughout all such variability in sediments. In many cases it is perhaps questionable as to whether the occurrence of maërl in this manner actually constitutes a maërl community or not*." Despite this, the route was designed to avoid areas where maerl was found on the video survey.

MERC 2006 also stated that the "*species of maërl recorded included the discoidal form of Lithothamnion corallioides to the north of Finavarra and to the east and north of Aughinish Island. Also recorded was Phymatolithon calcareum in Muckinish Bay. Further deposits of the finely branched form of Lithothamnion coralloides were recorded in Doorus Strait, as well as to north of Tawin Peninsula*" (in the vicinity of the proposed survey route) "*where maërl communities formed an extensive veneer over underlying muddy and muddy sand sediments. No Lithophyllum dentatum was recorded during the survey of Galway Bay Complex SAC*."

In relation to the *Virgularia mirabilis* MERC 2006 stated that "*despite conducting a number of specific dives in order to investigate other 'known' sensitive communities – most notably for Neopentadactyla mixta and the Sea Pen Virgularia mirabilis in the area to the north of Tawin Peninsula and south of Mutton Island, no such communities were recorded. Indeed, other than very occasional individual Lanice conchilega no other significant subtidal species or communities were encountered during the survey at this site*."

During the permitting for the IRIS cable in Galway Bay and considering the habitats present, the proposed cable laying methodologies, the routing of the IRIS cable and the future dredging of the navigation channel by Galway Port in this area was discussed with David Lyons of NPWS. It was agreed that further video drops and habitat/*Virgularia mirabilis* density mapping would be carried out at survey stage of the IRIS cable to seek to further optimise the route of the cable in this area so as to select a route of minimal impact on *Virgularia mirabilis* communities. These surveys were carried out in 2021 and the data gleaned from these surveys was utilised to inform the design of the survey route corridor for the PISCES Project.

The area where the *Virgularia mirabilis* was noted during the 2018 and 2021 camera surveys, were not covered by the 2006 surveys. No *Neopentadactyla mixta* was noted during these surveys. As stated previously the proposed survey route was designed to avoid these sensitive areas where possible. However, the survey area included some of the Galway Port future expansion. This area of future expansion needs to be avoided by the proposed PISCES cable due to the potential for future dredging operations. Therefore, in order to ensure burial the proposed PISCES cable must follow a very tight corridor in this area on the eastern boundary of the future expansion, as there is reef to the east.

It should be stated that the camera survey carried out as part of the EcIA/NIS 2022 cable extends the current distribution of Maerl but has now identified an area of *Virgularia mirabilis* within Galway Bay Complex SAC.

Predicted marine habitat data for the inshore section of the survey route is shown in Figure 50 (EUSensMap2019). The predicted habitats along the cable route, based on Infomar data, as the cable comes out of Galway is in the order of coarse sediment, sand and the mud.

Plate 1. *Virgularia mirabilis* noted during the 2021 camera survey.

Plate 2. *Mearl* noted during the 2018 camera survey.

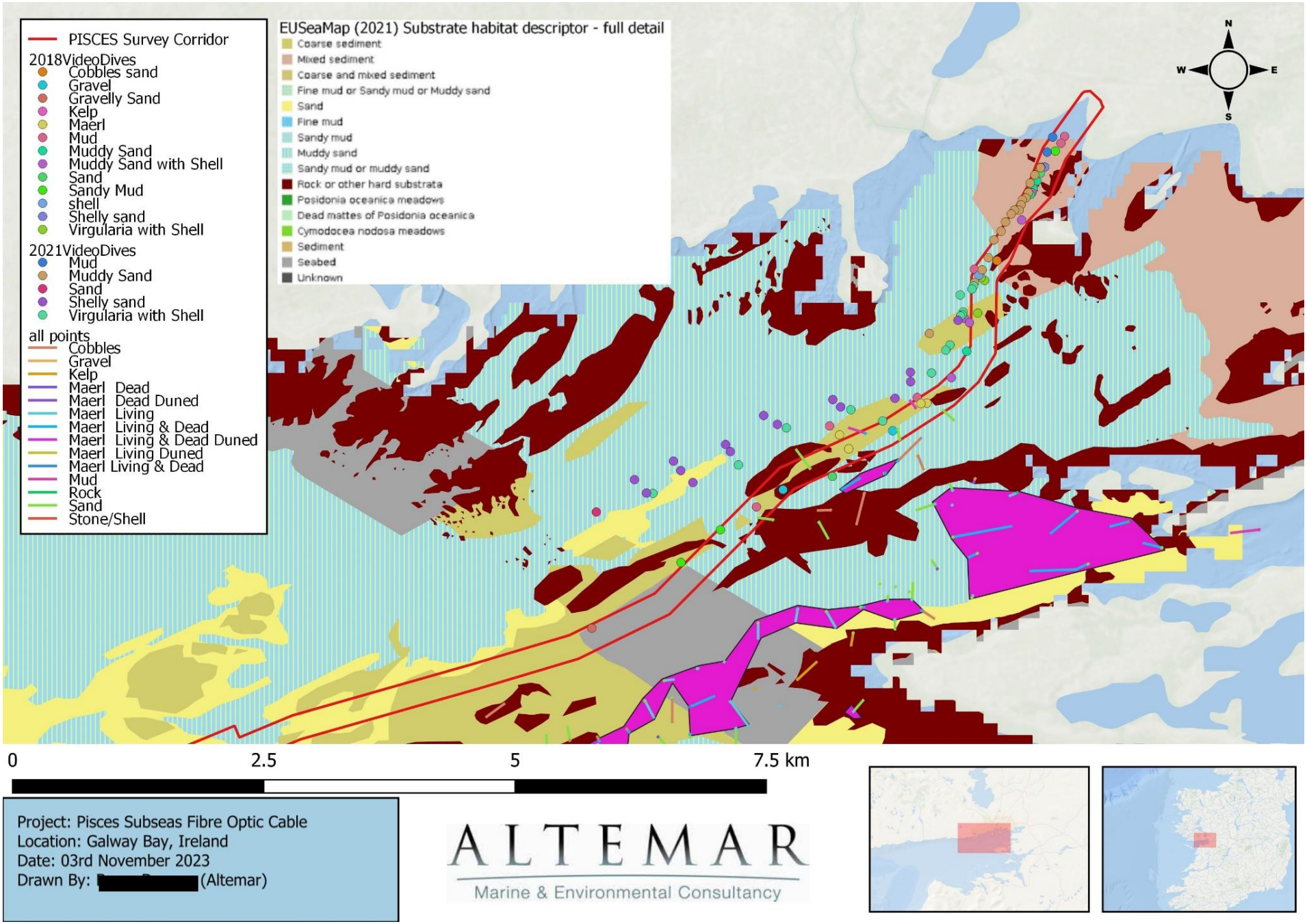

Figure 50. Data showing marine habitats (EUSensmap 2019), 2006,2018 and 2021 surveys and change in route to minimise impact on Virgularia mirabilis communities

5.3 IE 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 22:

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

Table 22. 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: • Slyne Head Islands SAC (000328) • Blasket Island SAC (002172) • Inishbofin and Inishshark SAC (000278) • Duvillaun Islands SAC (000495) • Inishkea Islands SAC (000507) • Roaring Water Bay and Islands SAC (000101) • Slieve Tooey/Tormore Island/Loughbros Beg Bay SAC (000190) • Saltee Islands SAC (000707) • Lambay Island SAC (000204) • Horn Head and Rinclevan SAC (000147) Detailed assessment is required in relation to the potential effects on Grey Seal. Mitigation measures are required.

5.4 IE 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 23:

- Kilkieran Bay And Islands SAC (002111)
- Clew Bay Complex SAC (001482)
- Killala Bay/Moy Estuary SAC (000458)
- Ballysadare Bay SAC (000622)
- Kenmare River SAC (002158)
- Cummeen Strand/Drumcliffe Bay (Sligo Bay) SAC (000627)
- Glengarriff Harbour and Woodland SAC (000090)
- Donegal Bay (Murvagh) SAC (000133)
- Slaney River Valley SAC (000781)
- West of Adara/Maas Road SAC (000197)
- Rutland Island and Sound SAC (002283)
- Lambay Island SAC (000204)

Table 23. 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: • Kilkieran Bay And Islands SAC (002111) • Clew Bay Complex SAC (001482) • Killala Bay/Moy Estuary SAC (000458) • Ballysadare Bay SAC (000622) • Kenmare River SAC (002158) • Cummeen Strand/Drumcliffe Bay (Sligo Bay) SAC (000627) • Glengarriff Harbour and Woodland SAC (000090) • Donegal Bay (Murvagh) SAC (000133) • Slaney River Valley SAC (000781) • West of Adara/Maas Road SAC (000197) • Rutland Island and Sound SAC (002283) • Lambay Island SAC (000204) Detailed assessment is required in relation to the potential effects on Harbour Seal. Mitigation measures are required.

5.5 IE 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 24:

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

Table 24. 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: • Blasket Island SAC (002172) • Roaring Water Bay and Islands SAC (000101) • Rockabill to Dalkey Islands SAC (003000) Detailed assessment is required in relation to the potential effects on Harbour Porpoise. Mitigation measures are required.

5.6 IE 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 25:

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

Table 25. 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 and Oceanic Waters MU for bottlenose dolphin (JNCC, 2023), which includes the following SACs: • Slyne Head Islands SAC (000328) • Duvillaun Islands SAC (000495) • Slyne Head Peninsula SAC (002074) • West Connacht Coast SAC (002998) • Lower River Shannon SAC (002165) Detailed assessment is required in relation to the potential effects on bottlenose dolphin. Mitigation measures are required.

5.7 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 26:

- 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 26. 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.

5.8 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 27:

- Isles of Scilly Complex (**UK0013694**)
- Pembrokeshire Marine / Sir Benfro Forol (**UK0013116**)
- Lundy (**UK0013114**)
- Cardigan Bay / Bae Ceredigion (**UK0012712**)
- Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau (**UK0013117**)
- The Maidens (**UK0030384**)
- Treshnish Isles (**UK0030289**)

Table 27. 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**) • Lundy (**UK0013114**) • Cardigan Bay / Bae Ceredigion (**UK0012712**) • Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau (**UK0013117**) • The Maidens (**UK0030384**) • Treshnish Isles (**UK0030289**) Detailed assessment is required in relation to the potential effects on Grey Seal. Mitigation measures are required.

5.9 UK SACs Designated for Harbour Seal

The potential impact of the proposed fibre-optic cable survey on these features of interest of the following sites designated for harbour seal are seen in Table 32:

- Murlough (**UK0016612**)
- Strangford Lough (**UK0016618**)

Table 28. The site-specific 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.
[1351] Harbour Seal (*Phoca vitulina*)	**Unfavourable - Inadequate**	**To maintain / restore the favourable conservation condition of Harbour Seal.** **Potential Effect** The proposed survey will introduce underwater noise into the marine environment. The proposed survey area is located within the 273km foraging range of harbour seal (Carter et al., 2022), which includes the following SACs: • Murlough (**UK0016612**) • Strangford Lough (**UK0016618**) Detailed assessment is required in relation to the potential effects on Harbour Seal. Mitigation measures are required.

5.10 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 29:

- 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 29. 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.

5.11 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 30:

- Mers Celtiques – Talus du golfe de Gascogne (**FR5302015**)
- Récifs du talus du golfe de Gascogne (**FR5302016**)

Table 30. 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 works area is located within the Oceanic Waters MU and West Coast of Ireland 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**) Detailed assessment is required in relation to the potential effects on bottlenose dolphin. Mitigation measures are required.

5. Further information on the potential impacts on Cetaceans and Pinnipeds

Harbour Seals

Inner Galway Bay is an important site for harbour seals but not for grey seals (Figure 42-44). As outlined in the Galway Bay Complex SAC (site code: 0268) Conservation objectives supporting document - Marine habitats and species, "*harbour seals in Galway Bay Complex SAC occupy both aquatic habitats and intertidal shorelines that become exposed during the tidal cycle. The species is present at the site throughout the year during all aspects of its annual life cycle, which includes breeding (May to July approx.), moulting (August to September approx.) and non-breeding foraging and resting phases. In particular, comparatively limited information is available from the last period in the annual cycle spanning the months of October to May.*

Harbour seals are vulnerable to disturbance during periods in which time is spent ashore or in shallow waters by individuals or groups of animals. This occurs immediately prior to and during the annual breeding season which takes place predominantly during the months of May to July. Pups are born on land usually on sheltered shorelines, islets or skerries and uninhabited islands removed from the risk of predation and human interference." "*Current known sites are broadly within the following areas: Oranmore Bay, Kinvarra Bay, Aughinish Bay, Poulnaclogh Bay, Ballyvaghan Bay, Rabbit Island, Earl's Rock, St. Brendan's Island, Ardfry Point, Tawin Island, Glasheen Island and Deer Island.*

The necessity for individual seals to undergo an annual moult (i.e. hair shedding and replacement), which generally results in seals spending more time ashore during a relatively discrete season, provides an opportunity to record the minimum number of harbour seals occurring in a given area (i.e. minimum population estimate). Moulting is considered an intensive, energetically-demanding process which incurs further vulnerability for individuals during this period. Terrestrial or intertidal locations where seals can be found ashore are known as haul-out sites. The harbour seal moult season takes place predominantly during the months of August to September. A total of 317 harbour seals were recorded ashore within Galway Bay Complex SAC in August 2003 during a national aerial survey for the species. Suitable habitat for the species along with known moult haul-out locations in Galway Bay Complex SAC are indicated in figure 24. This broadly consists of Oranmore Bay, Kinvarra Bay, Aughinish Bay, Poulnaclogh Bay, Ballyvaghan Bay and on Black Rock, Earl's Rock and St. Brendan's Island, Tawin Island and Glasheen Island, Ringeelaun Point and Deer Island."

As can be seen from Figure 51, the proposed survey corridor is not in the vicinity of resting, moulting or breeding sites. However, it is noted that as outlined in NPWS 2013 "*in acknowledging the limited understanding of aquatic habitat use by the species within the site, it should be noted that all suitable aquatic habitat is considered relevant to the species range and ecological requirements at the site and is therefore of potential use by harbour seals*." As a result, despite the location of the survey corridor outside key activity areas, the survey teams will need to be cognisant of this and take into account due diligence in relation to seal disturbance when deploying and recovering equipment.

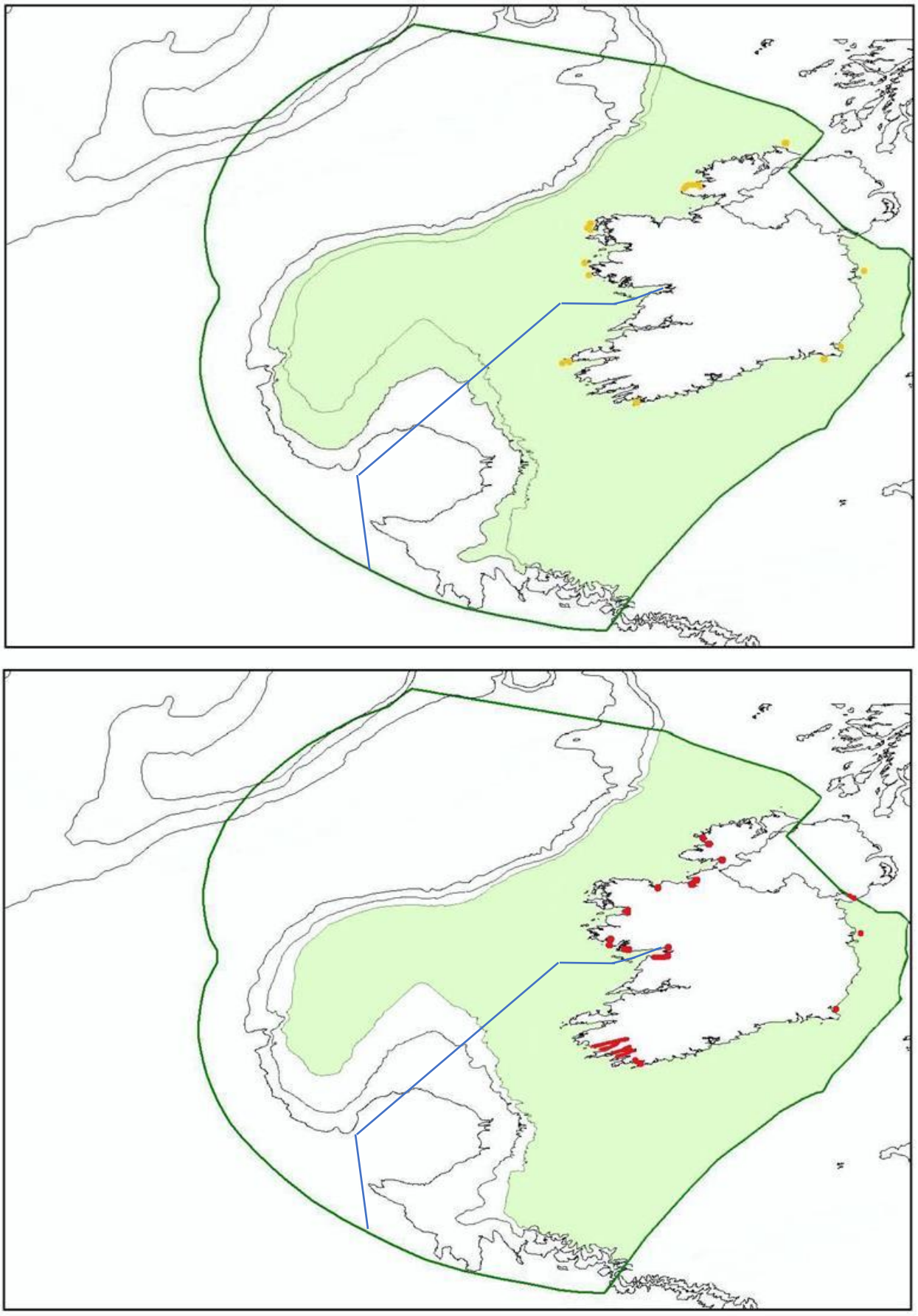

Figure 51. Harbour seal (red) and grey seal (yellow) distribution (green) and haul-out sites in the inshore area. (NPWS). Proposed cable survey route (approx..) is the blue line.

Marine Mammals

All cetaceans are listed under Annex IV of the Habitats Directive, which means that they are protected wherever they occur. Bottle-nosed Dolphin and Harbour Porpoise are also listed under Annex II of the Directive. Annex II species require that core areas of their habitat 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 31.

Table 31. *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 32). 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 33). The updated figures for PTS and TTS for are outlined in Table 34.

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 32. 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 33. 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 34. 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 35.

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

Table 35a. Details of the proposed types of acoustic equipment which emit sound.

Equipment Type	Purpose	Number of locations within 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.	85	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	35	N/A	N/A	N/A
Vibrocorer	Retrieve a seabed sediment sample by penetrating seabed with a vibrating steel core barrel	35	30 Hz	187.4 dB.	LGL 2010
Grab Samples	Collect small sediment samples from seabed surface with clamshell mechanism	11	N/A	N/A	N/A

Table 35b. Details of the proposed types of geophysical equipment which emit sound.

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 35. 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) (12 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. 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 (15 to 500 Hz), 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 35 the inshore Geophysical Survey 2 to 3 days (weather and sea state dependent) offshore Geophysical Survey 35 to 40 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.

6. Habitats and Species – On-Site Fieldwork

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

Intertidal

During fieldwork, habitats in the vicinity of the intertidal route were classified according to Fossitt (2000) (Figure 52). Observations on species were made on a receding tide, as well as at Low Water.

GA2-Amenity Grassland

Amenity grassland was found between the road and beach (Plate 3) (Figure 52). This habitat is approximately 2m above the OSI high tide limit and is behind a concrete seawall of approximately 1.2m high. The site is well maintained and appears to be regularly cut. Species diversity is poor with daisy (*Bellis perennis*), dandelion (*Taraxacum spp*.), clovers (*Trifolium spp*.), plantains (*Plantago spp*.), creeping buttercup (*Ranunculus repens*), nettle (*Urtica dioica*) and docks (Rumex spp.).

Plate 3. Amenity grassland.

BL-Built Land

Built land in the vicinity of the proposed works included the roads, footpaths, walls and car parking areas, (Figures 51). These areas are of low biodiversity importance and will not be impacted by the proposed works.

LS1-Shingle and gravel shores

The upper part of the beach is dominated by a gravel and cobble beach approximately 10-20m wide, which backs up to a concrete retaining wall (Plate 4 inset). The presence of this gravel/cobble area would tend to indicate that the beach is moderately exposed to wave action and storms that have sufficient strength to form a storm beach. Algal drift lines were present on the cobble storm beach and at the time of survey and were dominated by Fucoids and Laminaria species.

LS2 Sand Shores

The majority of the intertidal survey route consists of Littoral Sediment- Sand shores. Invasive investigations were not carried out. Casts of juvenile *Arenicola marina* were noted in the wetter portion of the habitat where water appeared to drain from the upper part of the beach and was retained on the surface (Plate 4).

LR2 Moderately exposed rocky shores

On either side of the sandy beach habitat are areas an intertidal reef. On the western side of the proposed survey route this area is primarily of boulders while on the eastern side this area is made up of cobble and boulders with varying amounts of sand interspersed between the rocks. This area is at minimum 35m from the proposed survey route. Species were typical of rocky shore, species encountered included *Fucus vesiculosus*, *Fucus serratus, Fucus spiralis, Elachista fucicola, Ulva intestinalis*, *Palmaria palmata*, *Mastocarpus stellatus*, *Ceramium sp., Chondrus crispus*, *Cladophora rupestris, Ascophyllum nodosum* and at lower levels *Laminaria digitata*. This area extended to the sublittoral i.e. SR5 Moderately exposed circalittoral rock, which was not surveyed.

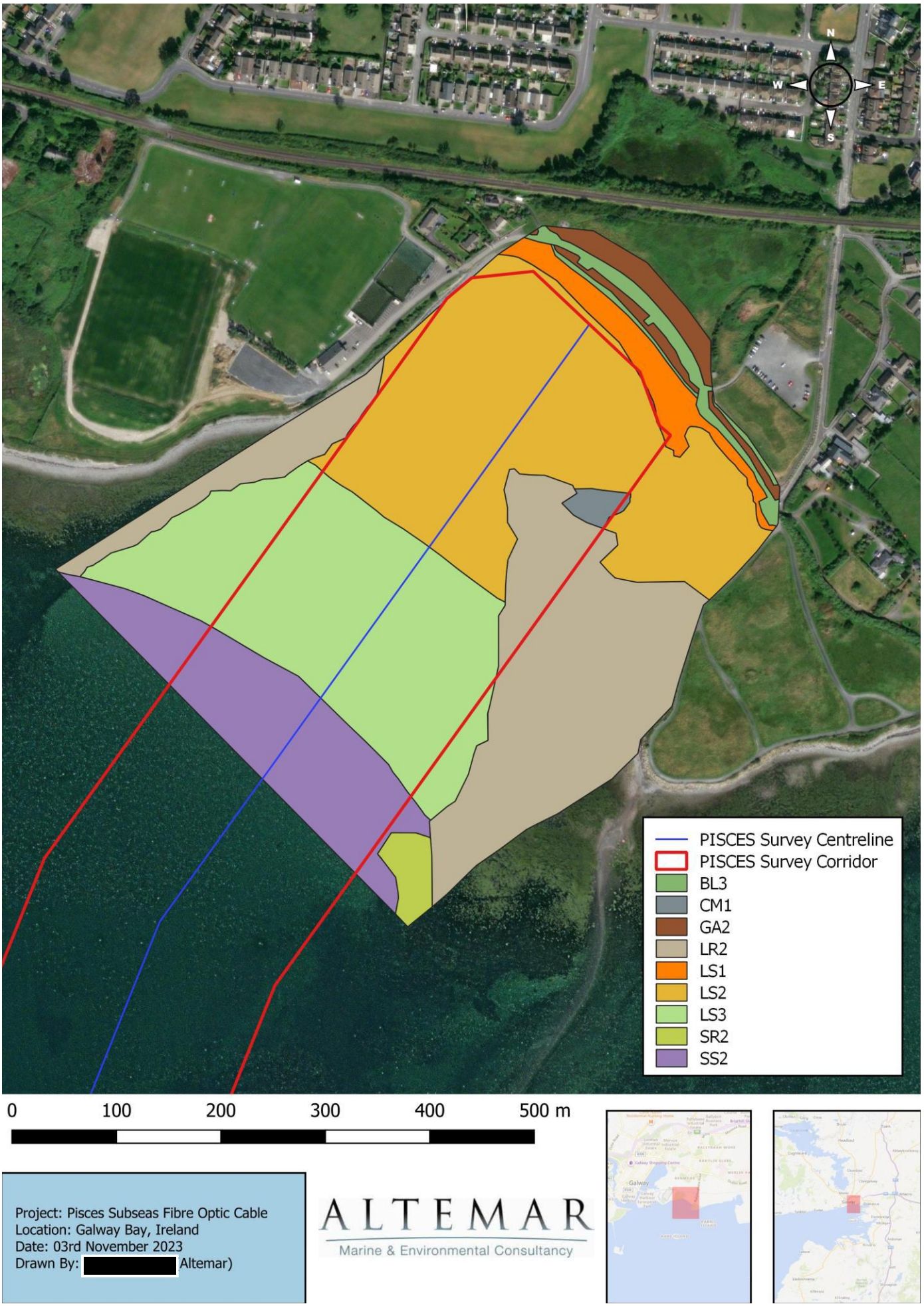

Figure 52. Fossitt (2000) habitats at the landfall area (2023).

Plate 4: *Uppershore on Ballyloughane Beach*

LS3-Muddy sand shores

Further down the beach towards the LWM the beach became more of a muddy sand and numerous juvenile *Arenicola marina* casts and areas of brown microalgae were noted (Plate 5). This area extended to the sublittoral i.e. SS2 Infralittoral muddy sands, which was surveyed by bo at and video camera. No seagrass (*Zostera sp*) was seen in either of these habitats. A small stream was located in this area on the western portion of the beach.

Plate 5: *Mid-Lower shore on Ballyloughane Beach (2023)*

CM1-Lower Salt Marsh

A small area of saltmarsh was noted on the eastern side of the beach. This area is in a small elevated portion of the beach, nestled behind the rocky shore and would be expected to be covered at high tide spring tides. This habitat appears to be relatively recent as it is not seen on 1995 orthography but is present in 2000 and is relatively stable in extent since 2000. This habitat is not in vicinity of the proposed cable route. During 2021, 2022, & 2023 surveys the level of human disturbance in this area was significant.

Additional Habitats

A range of habitats of conservation importance have been recorded and mapped in this area by NPWS. These are detailed in the NIS. The distribution maps of these habitats in the NIS indicate that the proposed cable route is not proximal to the majority of habitats of conservation interest including Coastal lagoons, Reef, Perennial vegetation of stony banks, Salicornia and other annuals colonising mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), Mediterranean salt meadows (*Juncetalia maritimi*), Turloughs, *Juniperus communis* formations on heaths or calcareous grasslands, Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia, Calcareous fens with *Cladium mariscus* and species of the *Caricion davalliana* or Alkaline fens saltmarsh areas. However, the survey route passes through the habitats Mudflats and sandflats not covered by seawater at low tide (on Ballyloughane Beach) and subtidal elements of the habitat Large shallow inlets and bays.

Species

Birds

The proposed landfall is an important area for overwintering birds. Please see main NIS document for information on the species of importance in this area. The site was visited within and outside overwintering bird season. Bird species noted on site included black-headed gull (*Larus ridibundus*), little egret (*Egretta garzetta*), grey heron (*Ardea cinerea*) and pied wagtail (*Motacilla alba yarrellii*). A flock of Eurasian oystercatcher (*Haematopus ostralegus*) (~20) were noted in 2022.

Amphibians

The common frog (*Rana temporaria*) was not observed in the amenity grassland or surrounding terrestrial areas. NPWS records of rare and threatened species in addition to the NBDC sightings records were investigated and showed no records in proximity of the landfall or beach area. No streams or drainage ditches were observed in the terrestrial element of Ballyloughane Beach. No amphibians of conservation importance are recorded on NPWS data.

Terrestrial Mammals

No badger setts or evidence of terrestrial mammals of conservation importance were seen in the vicinity of the landfall area. Records of sightings of the badger, pine marten, otter and hedgehog were examined from the NBDC and NPWS rare and threatened species records showed no records in proximity of the landfall area. However, the conservation objectives supporting document highlights a 250m buffer from High Water as otter habitat within the SAC. Otters were not observed on site. Otter (*Lutra lutra*) may be present on site at periods of low human/canine presence.

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, mitigation measures have been developed to minimise the ecological impacts of the project, in relation to Natura 2000 Annex habitats and species. This is primarily as a result of noise disturbance and the potential for pollution within the marine environment.

Intertidal Works

As evident during the fieldwork, the beach at which the intertidal works are proposed is moderately exposed with coarse sand. On all site visits at low tide there was significant human and canine activity on the beach. It would be expected that there will be human and canine activity on the beach during the proposed survey works. The main access to the beach is via the proposed access route. This route is well used and consists of a slip. As a result, mitigation of impacts in the intertidal should concentrate on minimising the following:

Disturbance

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 the surveys within the terrestrial/intertidal and subtidal within Ballyloughane Strand in order to minimise disturbance and ensure site integrity is maintained.
2. 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.
3. Any temporary access arrangements or structures that are put in place will be prepared in consultation with an ecologist, supervised by 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-survey conditions.

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 out to the Irish Maritime Area limit. 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/ecologist will 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.
4. The vessels operating within Galway Bay will be inspected by the ecologist for pollution sources. Any pollutions sources identified by the ecologist to form a risk to the European Sites will be rectified immediately before works commence/recommence. The ecologist will maintain a watching brief in relation to pollution risks and observations. A spill kit will be on board the vessel.

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 Galway Bay Complex SAC and Inner Galway Bay SPA due to pollution risk. In addition, there is potential for underwater noise to impact on harbour seal during the survey periods, in the absence of mitigation. However, these impacts are deemed to be short term for the period of works (2-3 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:

- Galway Bay Complex SAC and Inner Galway Bay SPA (potential effects as a result of pollution) and,
- Galway Bay Complex SAC, Rockabill to Dalkey Island SAC, Lambay Island SAC, Slaney River Valley SAC, Saltee Islands SAC, Roaringwater Bay and Islands SAC, Blasket Islands SAC, Kilkieran Bay And Islands SAC, Lower River Shannon SAC, Slyne Head Peninsula SAC, West Connacht Coast SAC, Slyne Head Islands SAC, Clew Bay Complex SAC, Slyne Head Islands SAC, Inishbofin and Inishshark SAC, Killala Bay/Moy Estuary SAC, Ballysadare Bay SAC, Kenmare River SAC, Cummeen Strand/Drumcliffe Bay (Sligo Bay) SAC, Duvillaun Islands SAC, Inishkea Islands SAC, Glengarriff Harbour and Woodland SAC, Slieve Tooey/Tormore Island/Loughbros Beg Bay SAC, Donegal Bay (Murvagh) SAC, West of Adara/Maas Road SAC, Rutland Island and Sound SAC, Horn Head and Rinclevan SAC, North Anglesey Marine/Gogledd Môn Forol, West Wales Marine / Gorllewin Cymru Forol, Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau, Murlough, North Channel, Strangford Lough, Cardigan Bay / Bae Ceredigion, Pembrokeshire Marine / Sir Benfro Forol, The Maidens, Bristol Channel Approaches/Dynesfeydd Môr Hafren, Treshnish Isles, Lundy, Isles of Scilly Complex, Nord Bretagne DH, Récifs et landes de la Hague, Anse de Vauville, Mers Celtiques – Talus du golfe de Gascogne, Banc et récifs de Surtainville, Côte de Granit rose-Sept-Iles, Trégor – Goëlo, Baie de Morlaix, Abers – Côtes des legends, Rivière Leguer, forêts de Beffou, Coat an Noz et Coat an Hay, Cap d'Erquy-Cap Fréhel, Ouessant-Molène, Chausey, Baie de Saint-Brieuc – Est, Côtes de Crozon, Baie du Mont Saint-Michel, Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard, Estuairie de la Rance, Chaussée de Sein, Récifs du talus du golfe de Gascogne (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. A site visit was carried out on the 27th of October 2023 in the landfall area.

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Appendix I

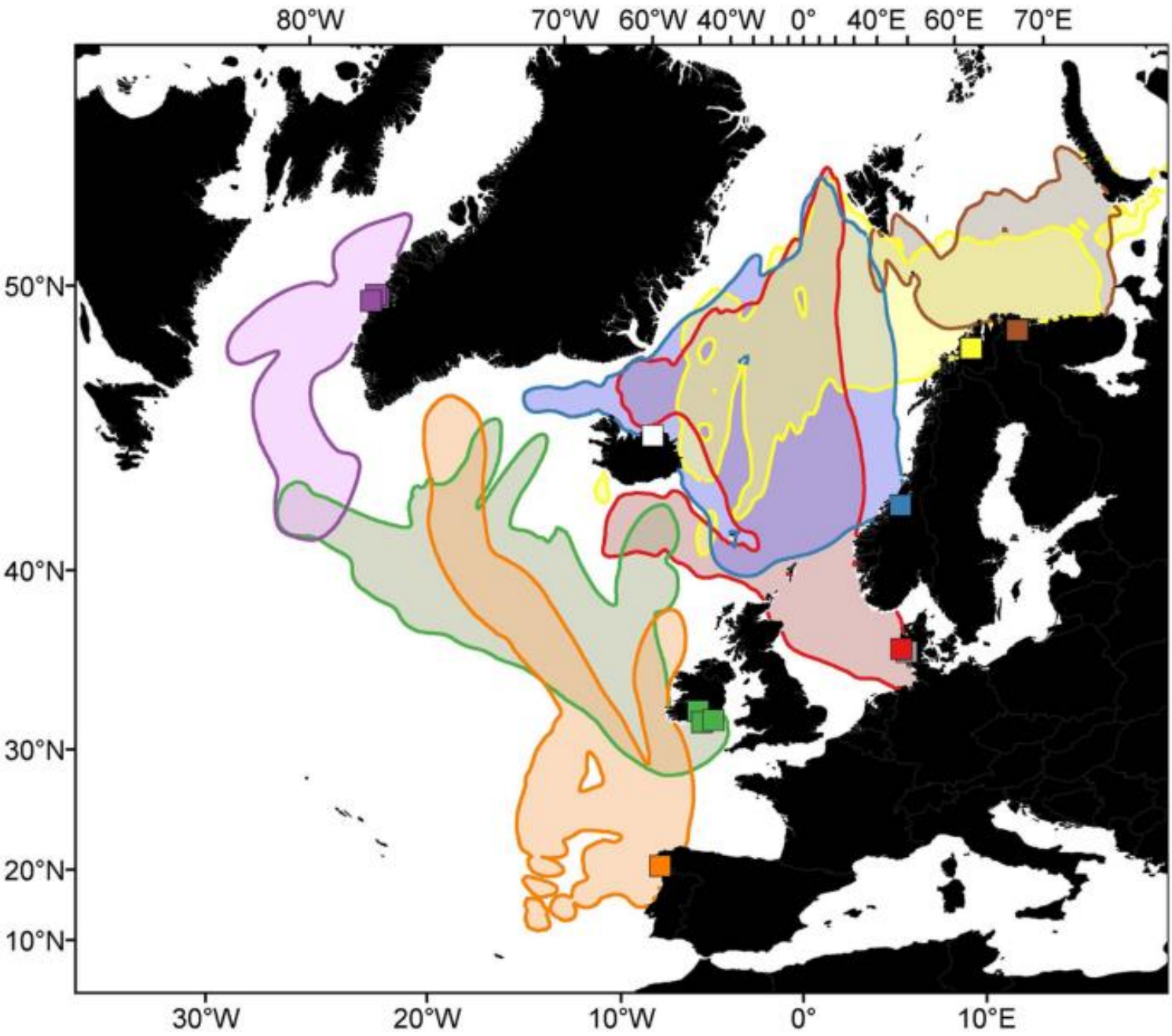

Figure AI.1. Area use during the ocean migration of tagged Atlantic salmon (Ireland = Green) (Source: Rikardsen et al., 2021).